Building Observations Survey ©2016

Deer Park Community Center

Deer Park, Texas

HALFF ASSOCIATES – CIVIL ENGINEERS

BRINKLEY SARGENT WIGINTON – ARCHITECTS

SCHMITZ PARTNERS – STRUCTURAL

STANTON ENGINEERING – MEP

TEXAS ACCESSIBILITY SOLUTIONS – ACCESSIBILITY

Building Survey for Deer Park Community Center,
610 East San Augustine Street, Deer Park, Texas

Between March 29th and April 1st, 2016, several consultants visited the site to walk through the building and document their observations. Those observations are contained in this survey.

Table of Contents

View from San Augustine

Summary

This is a summary of the condition of the two main buildings as they currently exist based upon the supplied as-built drawings and relatively cursory visual observations by our team of design professionals. The resulting assumptions are based on these observations only. We did not perform invasive testing or in-depth analysis, but did attempt to get a general understanding from what we could readily see. The observations survey includes individual sections that address specific subject areas. An asbestos survey was not conducted as a part of these services. We recommend that Deer Park engage a qualified company to perform an asbestos survey of these buildings.

Opened in 1975, the original Community Center building is 41 years old and is about 15,378 square feet in size. An approximate 8,755 square foot addition was constructed on the east side in 2007, yielding a total building area of approximately 24,133 square feet. The Earl Dunn Center (gymnasium) was built west of the community center in 1982 at approximately 7,000 square feet. The two structures are served by a large parking lot that is shared by City Hall to the east and Dow Park to the south. The general building condition varies with each component (original, addition, gym). In general, the overall facility appears to have been reasonably maintained and is still functioning as its originally intended use. But as with any facility of age, it has become outdated in many respects. We find the Center to be structurally and somewhat functionally obsolete.

The building is a single-story structure without internal roof access. The floors are slab-on-grade construction. There are no stairs, elevator, or accessible spaces below grade. Accessibility compliance is addressed in a separate portion of this report; but as a synopsis, very little of the original building is compliant with the current accessibility standards.

The original building and the addition have a documented history of foundation movement which is discussed in detail in prior reports by others, and are included as exhibits to this survey. Also refer to the structural exhibit of this survey for a synopsis and further information. Notable evidence of movement remains, most severely at the addition and at the point of connection between it and the original building. This movement is exposing the facility to water damage and creating ongoing maintenance challenges. Permanent repairs to the structure would necessarily be highly invasive and lack 100% certainty. It would also be very expensive, so much so that we believe that Deer Park should seriously consider replacement versus repair of the community center. The cost and consequences of the disruption of services should also factor into such consideration. The gymnasium does not appear to be suffering similar problems.

As was common for recreation centers of the era, the original building is laid out with long corridors which isolates the program spaces from one another. While this is useful acoustically, contemporary recreation centers tend to be much more visually open. This lends itself to better staff control, efficiency, observation, more intuitive way-finding, and a less institutional quality of spaces. The addition in 2007 provided a great deal of new space to accommodate a preschool program, but did very little with regard to enhancing recreation programs or capacity, or in modernizing the original structure. The addition's second entry is necessary and convenient for the preschool, but it creates confusion to the newcomer, especially to the recreation center. Having multiple entrances is inefficient for staff, hinders patron control, and challenges the quality of customer service.

We were surprised to observe a lack of typical locker and changing areas or showers in the facility. A number of spaces within the original building have been re-purposed or slightly modified over the years. Examples of which include an activity room and "pre-teens" space being converted to administrative functions, and a permanent partition installed to separate an activity (now dance) space from the meeting room. Also, a dividable meeting room has been converted into central storage. These changes have reduced recreation program capacity over time, despite construction of the addition, which is virtually dedicated and segregated for pre-school. If the Parks & Recreation Department's administrative functions could be relocated, it would again free these spaces up for public use. Center management should remain on site.

In general, the appearance of the facility appears to be largely original to the base building and addition, with the addition noticeably newer indoors. The original interior, while well-maintained, is visibly worn and outdated. Much of it is painted concrete block or drywall. Other finishes and interior construction have substantially lived or out-lived their useful life.

Use of technology has of course matured immeasurably since the original construction, and its integration into the building over time has been ad hoc and would benefit from a coordinated overhaul. There appears to be no audio/paging system in place. Security cameras were observed. Electronic access controls are installed at exterior doors.

An extensive code report is beyond the scope of this survey, but there are undoubtedly many deficiencies in this facility with respect to contemporary code requirements. Any substantive work on this building would require substantial code-related improvements including: life safety, mechanical, plumbing and electrical systems, accessibility ("ADA"), energy efficiency, and others.

The Earl Dunn Center (gymnasium) presents itself to the street, and is functionally, a separate building, having its own entrance, lobby/check-in and toilets. It cannot be entered from the community center without going outside via a covered walkway. Separate entrances are duplicative and inefficient for staff, and again confusing for a newcomer to the site. Gym control is particularly odd, as it is functioning in a former corridor which severs the connection between other spaces, and forces all traffic to toilets through the gym itself. A former storage room is now serving as office space, also disconnected from normal adjacencies. The two buildings are separated by only about 10 feet, and are connected by an infill storage room that was not accessible for observation at the time of our visit. This juxtaposition may pose building code challenges that require more in-depth study than is included in the scope of this survey.

ARCHITECTURAL OBSERVATIONS

Site Observations

An in-depth site survey is not part of this document, but there is little topography to the park making drainage appear to be a potential issue. A concrete-lined channel along the west property line looks to be the main drainage conduit for the park. Evidence of ponding is prevalent throughout the park. A large emergency generator sits between the gymnasium and a 50-meter outdoor pool to the south.

There are approximately 245 parking spaces available at the site, plus 5 bus spaces. A drop off lane north of the facility is not striped, but is used for parking. It can accommodate about 10 vehicles. The lot has three access points, all along San Augustine. Parking capacity appears adequate for the current typical use, but it is shared with City Hall (for public, staff and fleet vehicles) to the east and the rest of the park to the south. Parking capacity is challenged during major or overlapping events. It was noted that a new City Hall project is currently in design, which will add some parking capacity, but it is not yet known how many. No fire lane is marked, and maneuvering clearances for apparatus or a bus would be difficult or impossible when the lot is full. It is assumed that fire coverage (hydrants) is provided from the streets.

The site benefits from an established lawn and mature trees. Landscaping near the building is overgrown in places, which can inhibit maintenance and hide potential drainage problems and vermin. The area around the building appears to have an irrigation system.

No gas service was apparent entering the building. Site lighting near the building is achieved with large (less than appealing) wall packs that have been added to the building over time. Parking lot lighting appears to be metal halide "shoebox" fixtures mounted to poles.

Building identification is clear on San Augustine with monument and building signage, though the building entrance is not clear for reasons already discussed. The rooftop is mostly free of equipment, though some can be seen from certain points of view. Most mechanical equipment is pad mounted on the ground and screened with chain link fencing.

Roof

Roofs are not accessible from the interior, but the community center was accessed for observation via extension ladder from outside. The gymnasium roof was not accessible for observation, except as viewed from the community center. The original community center structure's roof is a built-up asphaltic roof. It appears to be well maintained, with evidence of ongoing repair. It appears aged and possibly in the waning years of its life. The roof was free of significant debris. No leaks were observed or reported at this time at the community center. One leak was reported by staff at the NW corner of the gymnasium between the gym and office spaces. Equipment appears to be mounted safe distances away from roof edges as required by code.

Roofing insulation thickness was not able to be observed and is not clear from the record documents. However based on the building vintage and common architect with the Maxwell center, there is reasonable suspicion that the current thickness likely does not meet current code. This should be reviewed further. The roof is internally drained, but of notable concern, there appears to be no secondary drainage system at the original roof. There are no parapets at the community center, which has a gravel stop around the entire perimeter. Some ponding was observed at the original roof. This is most likely the result of insufficient roof slope. As was common at the time, the original building's roof slope appears to be 1/8" per foot. Current minimum slopes are now twice that at 1/4" per foot.

As for the addition, the record drawings are not clear with regard to roof slope, but it visually appears to be proper, or at least more sloped than the original. It is a gravel ballasted built-up roof, so the membrane was not directly observed. Evidence of minor ponding was observed. The addition is also internally drained, having primary and secondary systems. The expansion joint between the two roofs shows signs of movement and ongoing repair, but stops at the edge of the building. We find it unusual that the expansion joint does not continue down the exterior walls between the old and new. Significant movement at these locations is evident as spoken to elsewhere in this survey. According to the record drawings, the addition has 3" of roof insulation. This is also insufficient by contemporary codes.

The gymnasium is a pre-manufactured metal structure with a structural metal roof. It is insulated from beneath with draped blankets. As could be viewed from the community center roof, the metal roof appears to be maintained and in good repair. The record drawings do not indicate an R-value, but it is expected that what is present is inadequate with respect to contemporary building code. Additionally, the "over-the-purlin" installation method reduces thermal performance, and areas of damaged insulation were observed from the interior.

Exterior

Both buildings are clad with brick. The brick generally matches (in color), but closer inspection reveals different brick types were used. Finish varies slightly and there the gym utilizes different sizes. The original building and addition are steel framed structures with metal stud walls. Wall insulation values no longer meet current codes. Windows and doors are aluminum storefront assemblies. Glazing is single-pane (uninsulated), which no longer meets current code. Most of it appears to be tinted. All assemblies appear to be original to their dates of construction, with the older ones showing signs of age and weathering. No noticeable window leaks were observed, but the gasketing and sealants on the older windows have likely lived beyond their normal life.

As noted elsewhere in this survey, the community center (especially the addition) has been experiencing significant structural movement for some time. This movement manifests in cracking and separation of cladding materials, which is creating unacceptable water intrusion and water damage. These are significant problems which must be continually maintained and patched. However they are symptomatic of larger challenges and cannot be cured without first solving the structural movement issues. It is not clear what recommendations may have been implemented from the prior reports by others, but it is clear that the problems remain. Such problems were not apparent at the gymnasium.

Brick soffits were common at the time the original building was designed, and are present on this facility. They are less common now because of the waterproofing challenges they present, and damage from trapped moisture is observed here. We would recommend replacement of all brick soffits with a new design that can adequately direct water out of the building envelope.

The north façade, which receives the least amount of sun, is exhibiting some mildew growth. This is not unusual and can be mitigated by reducing vegetation in the area to promote better air circulation and drying, and regular cleaning. On the south façade, an insect infestation was observed at grade level next to the building, which appears to be covering a weep hole providing direct access into the building. This needs to be treated and any potential damage assessed.

Interior

In general, the fit and finish of the facility appears to be largely original to the buildings, with the addition noticeably newer and easier to maintain. The original interior, while well-maintained, is visibly worn and dated. Much of it appears to have lived or out-lived its useful life.

Ceilings are typically 2'x2' and 2'x4' acoustical lay-in type; with gypsum board at some locations, and at furr-downs. Partition walls in the original building and gym are typically painted concrete block. In the addition, walls are generally drywall on metal studs. Doors are typically wooden within metal frames. Hardware in the original building are all knobs (non ADA-compliant), while lever handles are used in the addition. Floors are typically vinyl composition tile, with ceramic tile in the toilet rooms. Exceptions include a wood dance floor and resilient flooring in the preschool kitchen and activity room. Almost all of the casework is laminate. A solid surface material is preferable at wet counter locations, as has been used at the preschool kitchen.

Toilets and toilet partitions are floor mounted for durability. However the partitions are laminate, which are not very durable. Toilet rooms have minimal amenity, lacking counters, lockers, showers and vanity space. Original toilet rooms are substantially non ADA-compliant. Toilet rooms in the preschool are not designed with children as the primary user in mind.

The same can be said for the gymnasium, though the gym itself has a multi-use synthetic floor. There are two racquetball courts, though one is being used as an exercise space. A mezzanine level is located between the courts and is being used for storage.

Mail Delivery
Methods were not observed.

HVAC System
The following observations were made from an architectural point of view. The main building is served by a central chiller and air handler system. The gymnasium is served by pad-mounted package units next to the building in fenced enclosures. The main building appears to be on a central control system, and the gym utilizes wall-mounted thermostats. Some evidence of moisture in the system was noted in the form of rust at diffusers. Refer to engineering report for more detailed information regarding these systems.

Lighting
The following observations were made from an architectural point of view. Interior lighting is composed of mostly fluorescent 2x4 fixtures with prismatic lens where there are ceilings, strip fluorescent at open structure conditions. All room lighting is switched (no control system). Refer to engineering report for more detailed information regarding this system.

Electrical
Refer to engineering report for more detailed information regarding this system.

Data and Telephone
The following observations were made from an architectural point of view. A work room off of the lobby has been repurposed to house the facility's data needs and also appears to house the security system. A detailed investigation of these systems is not in the scope of this report.

Fire Alarm
The community fire alarm system was installed in phase two and covers it and the original building as well. There is an "alert beacon" centrally located in a public area that is part of a city wide emergency warning system. It is not clear to this observer how this functions. A more detailed investigation of this system is not in the scope of this report. Refer to engineering report for more detailed information regarding these systems.

Fire Sprinkler
The buildings do not have sprinkler systems. We normally recommend installing fire suppression systems in assembly occupancy buildings, particularly those with children. Further analysis is required to determine if this would be required by current code. It is quite likely that any significant expansion would require installation of a full system.

Security
The building appears to have intrusion detection and access control systems installed at exterior doors. Cameras are in use both indoors and outdoors. A detailed investigation of these systems is not in the scope of this report.

EXTERIOR PHOTOGRAPHY

Community Center Entrance (north)


Preschool entrance (east)


Gym entrance

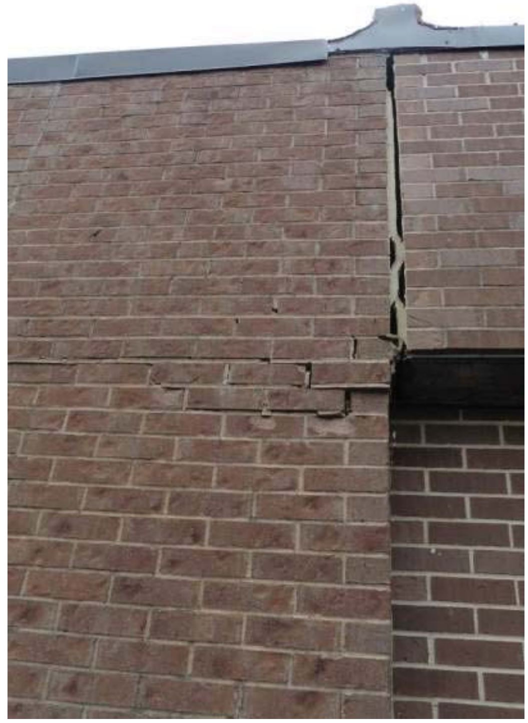

Connection between community center (left) and gym (right)



Mechanical courtyard between community center and gym



Examples of water damage



Examples of structural movement damage

Examples of movement damage

Examples of brick soffit water damage, abandoned or broken electrical

Insect infestation, and example of unprotected electrical

Spalled brick at an inset panel, example of existing security lighting

Unscreened rooftop equipment

Example of missing control joints at panel inset

Condition of roof at original building

Condition of roof at original building

Condition of expansion joint

Condition of roof at addition

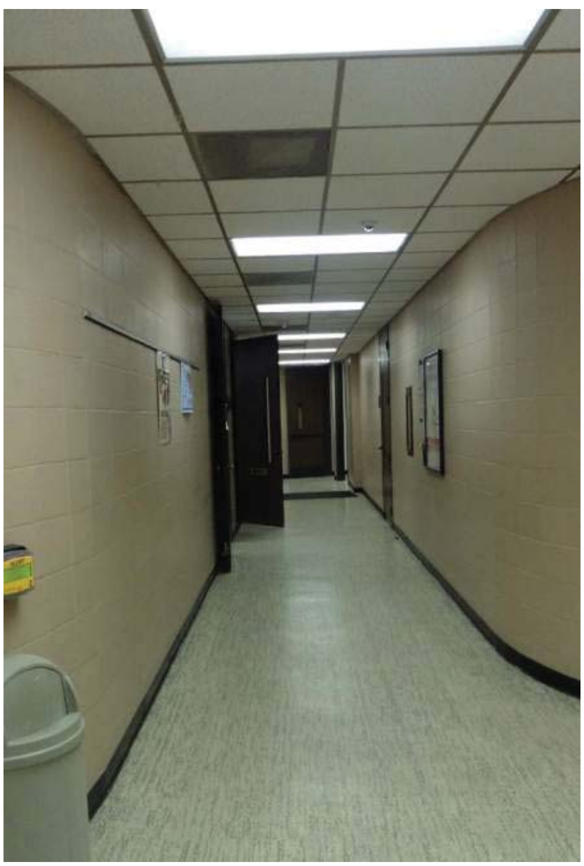
Addition canopy from above

Condition of lower gym roof


Mildew growth and damaged electrical

Gym – Example of mechanical screening, different brick


Community Center lobby



Typical corridors

Typical toilet rooms

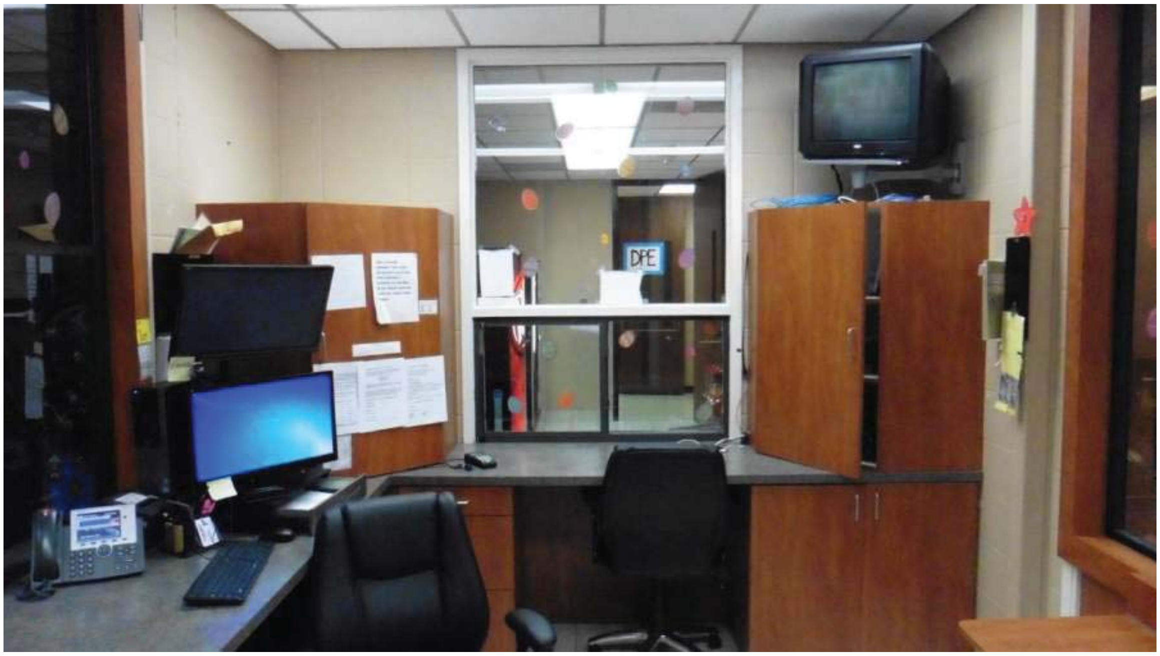
Dance room

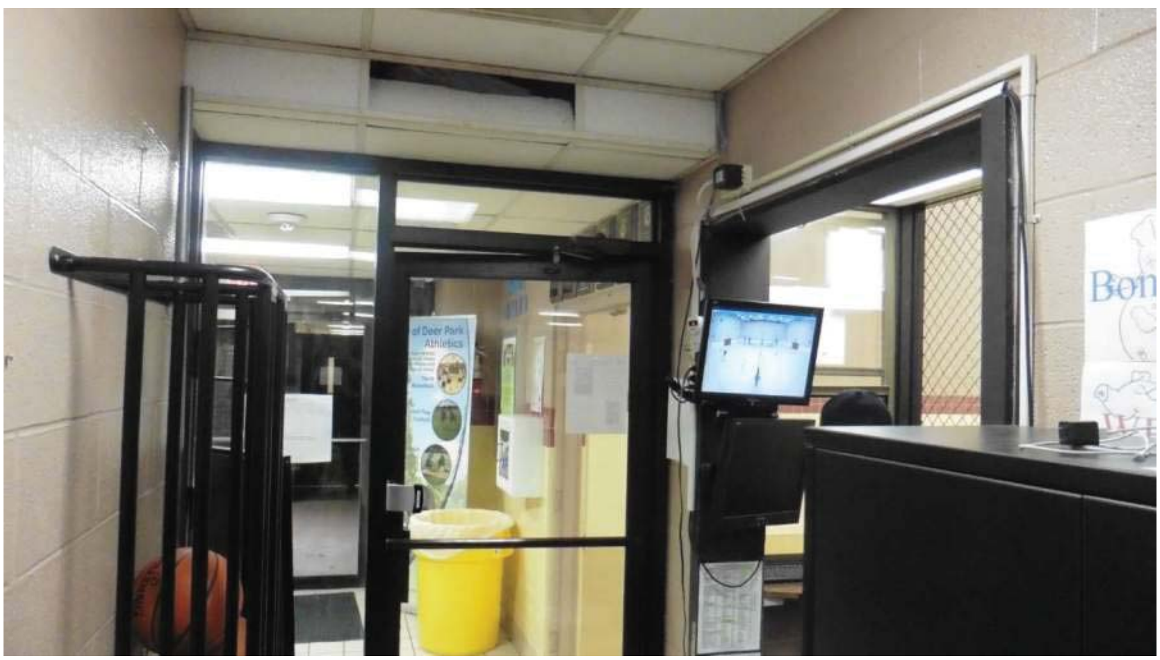
Community Center kitchen

Preschool kitchen

Typical preschool classroom

Preschool corridor


Example of makeshift office space – Community Center


Example of makeshift office space – Gym

Gym Lobby

Gym Control

Gym Court

Examples of damaged “over-the-purlin” gym roof insulation

Mezzanine storage

Racquetball court used for sport

Racquetball court being used for exercise

Condition of toilet rooms at gym

EXHIBIT A

April 25, 2016

Mr. Stephen Springs
Brinkley Sargent Wiginton Architects
5000 Quorum, Suite 600
Dallas, Texas 75254

RE: MEP Assessment
Community Center Complex at 610 E. San Augustine

Dear Stephen:

I visited the complex Tuesday and Wednesday of March 29th and 30th to assess the MEP systems installed in the facilities.

The Community Center Complex is comprised of two facilities.

The original Community Center, built in 1974-75 with an addition constructed in 2005-06. This single story building contains administration offices, activity and meeting spaces, classrooms for daycare activities, food prep/concession areas, men's/woman's restrooms and mechanical/janitorial spaces.

The Earl Dunn Center is a gymnasium facility constructed in 1982-83. The gymnasium facility consists of administrative offices, an exercise room, a basketball court, two racket ball courts, men's/women's restrooms, storage closets and mechanical/janitorial spaces.

My inspection consisted of walking the interior and exterior of both building, as well as accessing the accessible ceiling areas. I was unable to access the roof of either facility. A visual observation of MEP equipment that was accessible was performed. I also reviewed the furnished MEP drawings for both facilities. The remainder of this letter contains my observations in regards to the existing MEP systems.

GENERAL OBSERVATION

This complex is located in the City of Deer Park and Harris County. The buildings appeared to be well maintained considering the age of the facility.

MECHANICAL (HVAC) SYSTEMS DISCRIPTION

COMMUNITY CENTER: There is a central chilled water plant consisting of two air cooled water chillers with associated pumps. The chilled water piping is routed underground from the central plant up and within the exterior wall and turns into the accessible ceiling and extends to the two air handling unit rooms.

The air distribution system in the original facility consists of a chilled water multi-zone air handling unit with individual zone electric duct heaters and a chilled water single zone air handling unit with multiple zone taps from the main plenum box, each with an electric duct heater. The air supply ducts are galvanized steel with internal liner. The addition had one multizone air handling unit with an electric duct heater in each zone.

Conditioned air is distributed from the air handler units to the spaces by means of an above ceiling, internally insulated, duct system. In the addition, the ducts have external insulation. Air to the spaces is by ceiling supply diffusers and returned to the mechanical rooms in the ceiling cavity.

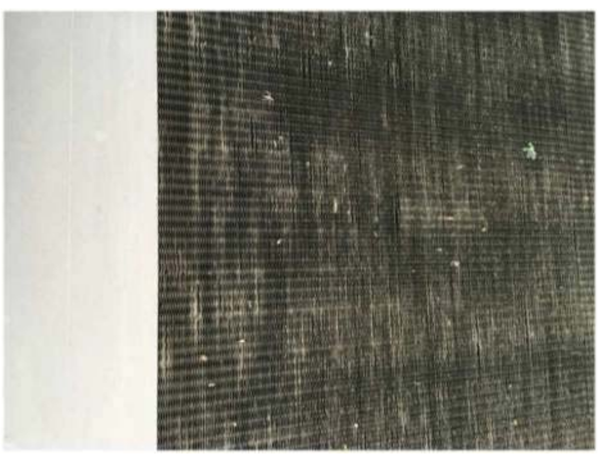
The building air conditioning is controlled by Johnson Controls Metasys DDC controls system.

EARL DUNN CENTER: The air conditioning for the gymnasium is accomplished by a combination of a multi-zone split DX systems and packaged units. The administrative areas, exercise area, and restrooms are served by a multi-zoned DX split system utilizing recirculated air. It appears that recent re-zoning took place which reconstructed ducting to include flexible, externally insulated, duct taps from the existing, rigid, internally insulated, duct system within ceiling plenum. The air conditioning for the gymnasium and racket ball courts is accomplished by means of two packaged units and one DX split system utilizing recirculated air. All equipment is locally controlled by wall mounted thermostats.

CONDITION OF THE EXISTING EQUIPMENT

COMMUNITY CENTER

1. The 70-ton Carrier 30GTN070 chiller was built in 2004. It was operating but showed signs of corrosion on the condenser coil. Compressors appeared to be in good condition and were fully charged with oil and refrigerant. Carrier has advised that the life expectancy of a well maintained chiller of this type is approximately 15 years. They can perform an oil and vibration analysis to determine the condition of the chiller and make service recommendations, in addition to, predicting remaining useful life of the chiller. This chiller uses R-22 refrigerant which is no longer in production but is still readily available.
2. The 41 ton York YCAL005TN070 chiller was built in 2007. It was operating and appeared to be in acceptable condition. Fan guards and compressor area guards were rusty but still functional. York has advised that the life expectancy of a well maintained chiller to this type is approximately 15 years. The manufacturer can perform oil and vibration analysis to determine condition and make service recommendations, in addition to, predicting remaining useful life. This chiller uses R-22 refrigerant which is no longer in production but is still readily available.
3. Both chiller pumps were running and appeared to be in serviceable condition. The 3 hp chiller pump serving the York chiller had a noticeable whine while in operation and show signs of excessive wear.
4. The chilled water pipe insulation was rigid type (foamglass or phenolic) and was in good condition. This type insulation is the proper type for chilled water. Metal covering was in good condition. Most isolating valve handles were severely rusted.
5. The two McQuay air handling units serving the original Community Center had some minor corrosion did not show signs of excessive wear. In addition, they were operating without excessive noise due to belts or bearings. There was no indication of leaks. The zone ducts had access plates installed to clean, repair or inspect the internal liner. The outside air damper appeared to be inoperable.
6. A number of the electric duct heaters serving the original Community Center appear to be recently replaced. The others appear original and may need to be replaced in the near future.
7. The Carrier air handler serving the Community Center addition appeared to be in acceptable and serviceable condition.
8. The electric duct heaters serving the Community Center addition appear to be in acceptable and serviceable condition.
9. Ceiling diffusers in the original Community Center show signs of rust or corrosion.



GYMNASIUM

1. Rheem package units were manufactured in 2011 and appear to be in acceptable and serviceable condition. Rheem has advised that this type of units have a life expectancy of approximately 15 years. With proper maintenance these units should have approximately 10 years of remaining serviceability.
2. DX split system condensers have moderate to excessive wear and moderate to excessive damage to condenser coils. The Carrier unit was manufactured in 2004 and the York in 2006, both of these units are nearing the end of their expected serviceable life.

3. Ceiling diffusers show signs of show signs of rust or corrosion.

MECHANICAL (HVAC) SYSTEMS RECOMMENDATIONS

1. The mechanical systems appear to be well maintained with items repaired or replaced as needed. Funds should be set aside to replace one or both chillers in the near future as they are reaching the end of their expected life. Replacement chillers will have better efficiency which should be a consideration for replacement timing. Balancing and shutoff valves at the chillers should be replaced when the chillers are replaced. Air devices are functional but could be replaced if the rooms are refreshed.
2. DX systems at the gymnasium will need to be replaced in the near future.

ELECTRICAL SYSTEMS DISCRIPTION

SITE ELECTRICAL SERVICE: The electrical service is provided via an overhead power line with high voltage to 480/277V pole mounted transformers located southeast of the existing Gymnasium. The complex has a 2000A bus weatherhead with various sized fused service disconnects serving each building and the central plant.

COMMUNITY CENTER: The building is served by two 400A, 3-phase, heavy duty, fused safety switches located at the service entrance. The electrical distribution consists of 480/277, 3-phase, 4-wire distribution panels for lighting, air handling units and heating. Local dry transformers provide 120/240, 1-phase, 3-wire power for low voltage panels. There are no dedicated, surge protection panels for computer/clean power.

EARL DUNN CENTER: The Gymnasium faculty is served by a 600A, 3-phase, heavy duty, fused safety switch located at the service entrance. The electrical distribution consists of 480/277, 3-phase, 4-wire distribution panels for lighting, air handling units and heating. Local dry transformers provide 120/240, 1-phase, 3-wire power for low voltage panels. There are no dedicated, surge protection panels for computer/clean power.

EMERGENCY GENERATOR: A new Caterpillar generator has recently been installed adjacent to service entrance. Associated equipment includes a 1600A main circuit breaker in NEMA 3R enclosure, ATS with NEMA 3R enclosure, 120/240 low voltage mini power zone serving adjacent low voltage Panel LG. The generator systems was not tested to confirm it properly carried the electrical loads of the facility.

LIGHTING EQUIPMENT: Community Center and Gymnasium facility generally have of recessed 2x4 and 2x2 fluorescent fixtures with acrylic prismatic lens, 2 or 3-F32T8 lamps, with optical reflectors installed in suspended acoustical ceiling. Gymnasium basketball court consists of suspended, high-bay, 2x4, 6-T8 fluorescent fixtures. Racket ball court #1 consists of 2x2 recessed, fluorescent, acrylic prismatic lens, lay-in ceiling, 2-F32T8 lamps with optical reflectors installed in suspended acoustical ceiling. Racket ball court #2 consists of 2x2 suspended, fluorescent, acrylic prismatic lens, 2-F32T8 lamps with optical reflectors. The Community Center addition had motion sensor control for room lighting control. Other areas had normal light switches. Exterior lighting consisted of metal halide wall mounted fixtures, canopy mounted fixtures, and recessed compact fluorescent fixtures in entry soffits. Parking lot lighting appeared to be comprised of metal halide fixtures.

CONDITION OF THE EXISTING EQUIPMENT

1. The main service and associated equipment (e.g. weatherhead, CT, gutter wire way, and safety switches) appear to have been reconstructed or replaced as detailed in the “Addition to Deer Park Community Center” design requirements (2006) and appear to be in serviceable condition.
2. Several safety switch enclosures serving exterior HVAC equipment (i.e. chillers serving Community Center, DX condensers and package units serving Gymnasium) appear to be substantially weathered and in poor condition due to being constantly subjected to environmental elements. Switches were not cycled to confirm operation.
3. Distribution and low voltage panels associated with the Community Center and Gymnasium appear to be in serviceable condition without unfilled spaces or circuit breakers labeled “bad”.
4. General lighting fixtures inside appeared to be newly retrofitted with T8 lamps and reflectors for improved efficiency.
5. Exterior light fixtures were not operating due to the time of day but many fixtures appeared to be in poor or inoperable condition.
6. Several exit lights were tested in the original Community Center and Gymnasium facility and were inoperable. Exit lights were tested in the Community Center addition and were found to operate correctly with internal back-up batteries. A complex wide, after-hours test should be conducted to determine the extent of emergency lighting and deficiencies.
7. The existing telephone service, communication systems, access control systems, and security systems were not assessed in this assessment.


POOL
GYM
OLD BUILDING


HI-LUMEN XL Starcoat
F32T8·XL·SPX50·HL·ECO
5000K
USA
E
Hg
32W

ELECTRICAL SYSTEMS RECOMMENDATIONS

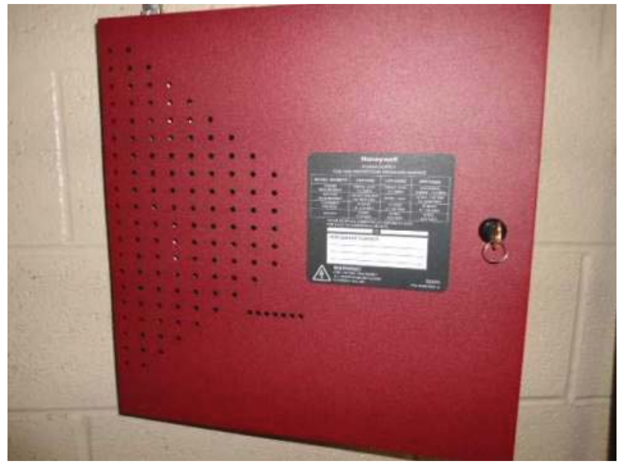
1. The system appears to be in good condition except for a number outdoor disconnect switches.
2. Outdoor security lighting should be upgraded with LED type light fixtures.
3. Since there is no dedicated computer power system, consideration should be giving to installing an isolated ground and surge protected system should computer failures or glitches be experienced.

FIRE ALARM SYSTEMS

OBSERVATIONS: The existing system is a Silent Knight IFP-100 analog/addressable system.

CONDITION OF THE EXISTING EQUIPMENT

1. The system in the Community Center had no troubles or alarms on the panel display and appears to be serviceable. An extensive review of the system was not conducted but appears to be installed in compliance with the "Addition to Deer Park Community Center" design requirements. The system has current maintenance and inspection tags.
2. A Honeywell power supply was noted in the Gymnasium facility. Devices appear to have been upgraded, consistent with the Community Center.



FIRE ALARM SYSTEMS RECOMMENDATIONS

1. The fire alarm system appears to be operable and well maintained. Although not required, consideration should be given to upgrading the system to the latest codes.

PLUMBING SYSTEMS

OBSERVATIONS: The existing plumbing systems included sanitary waste, vent, storm sewer and domestic cold water. Hot water is provided using electric water heaters at various locations throughout the facilities. There is no gas service at this facility.

The original Community Center utilizes cast iron piping for underground sanitary waste, PVC for above slab sanitary waste and venting, galvanized piping for domestic water, and cast iron for above slab storm drainage. The Community Center addition utilizes PVC for underground sanitary waste, cast iron for above slab sanitary waste and venting, copper piping for domestic water, and cast iron above slab storm drainage.

The Gymnasium facilities utility piping was identified by the entrance and exit piping located around the perimeter of the facility. No underground or above slab sanitary waste piping was assessable at time of assessment. Copper piping was noted entering the facility at time of assessment. PVC piping was noted exiting the facility at time of assessment for storm waste piping. An in depth investigation will be required to confirm the previous identifications.

The Community Center plumbing fixtures consisted of wall mounted vitreous china lavatories with hot/cold mixing manual faucets and metering faucets, wall hung vitreous china urinals with manual flush valves, wall hung and floor mounted vitreous china water closets with manual flush valves, single and double compartment stainless steel sinks with swing spout faucets and single lever controls with solids interceptors, bi-level drinking fountains, mop sinks in janitorial closets, and various other fixtures (i.e. sinks) throughout the facility.

The Gymnasium facilities plumbing fixtures consisted of under counter mounted vitreous china lavatories with hot/cold mixing faucets, wall hung vitreous china urinals and floor mounted vitreous china water closets with manual flush valves, and a single wall hung drinking fountain.

Roof drainage for the facilities is accomplished by a mixture of scuppers, roof drains, and gutters/downspouts.

CONDITION OF THE EXISTING EQUIPMENT

1. Lavatories appeared to be in serviceable condition; however, a few surface imperfections/damages were noted along with several service connection leaks. Most lavatories did not have ADA insulation kits on the water and waste piping.
2. Sinks appeared to be in serviceable condition.
3. Several faucets have superficial corrosion.
4. Urinals and water closets appeared to be in serviceable condition. Several associated flush valves have superficial corrosion.
5. Drinking fountains appear to be in serviceable condition; however, several have cosmetic damage and show signs of extensive wear.
6. It appeared that most, if not all, of the electric water heaters have been recently replaced and are in serviceable condition.
7. Above ceiling horizontal cast iron storm sewer piping, shows severe corrosion in existing Community Center.




PLUMBING RECOMMENDATIONS

1. Galvanized water pipes tend to rust on the inside and develop pin-hole leaks with age. The severity of these problems depends on the quality of the original piping and the quality of the water. I did not see indication of rust in the water and the visible piping did not show signs of leakage or repair. The piping system should be monitored and may require future replacement with other materials.
2. Underground cast iron pipe corrodes over time. If sewer stoppages occur fairly often, this may be a sign the pipes are cracked or collapsing. The condition of the piping was previously assessed by video camera and should be periodically monitored as necessary
3. Plumbing fixtures and valves are serviceable but replacement should be considered for appearance. Handicap protective wrap should be installed on sinks and lavatories. Note that contemporary codes limit the flow rates of flush valves so new valves will probably be incompatible with the existing water closets and urinals.

Yours very truly,

George L. Stanton, P.E.

EXHIBIT B

DEER PARK COMMUNITY CENTER
REVIEW AND ASSESSMENT REPORT

610 E. SAN AUGUSTINE STREET

DEER PARK, TEXAS 77536

STATE OF TEXAS
JOHN M. SCHMITZ
32940
REGISTERED
PROFESSIONAL ENGINEER

John M. Schmitz
4-1-2016

FIRM NUMBER F-8102

SCHMITZ PARTNERS
ENGINEERS, PLLC.

TABLE OF CONTENTS

REASON FOR REVIEW AND ASSESSMENT OF BUILDING:

Having been contacted by the firm of Brinkley Sargent Wiginton Architects, Schmitz Partners Engineers PLLC (SPE) was retained to perform a review and give a structural assessment of the Deer Park Community Center at 610 East San Augustine Street Deer Park, Texas. Personnel of Schmitz Partners Engineers performed a review of the project on April 1, 2016 and have performed a thorough review of documents provided to us and in our files. The following are our findings and conclusions based on our knowledge and understanding of the project.

PROJECT DESCRIPTION:

The building is a one story structure that was built in two phases. The first phase was built in approximately 1974. The structure consists of a structural steel bar joist roof system supported on steel beams and columns. The foundation is a concrete slab on grade with concrete grade beams supported on drilled footings bearing at 8'-0" below natural grade. The exterior wall construction consists of an exterior layer of 4" brick and interior layer of 4" concrete masonry block. The interior walls consist of 4" concrete masonry units. The second phase was built in approximately 2005. The roof structure consists of structural steel bar joist supported on steel beams and columns. The foundation is a slab on grade with concrete grade beams supported by drilled footing bearing at 14'-0" below existing grade. The exterior walls consist of 4" brick with a backup of 6" steel studs with sheetrock. The interior walls consist of 3 5/8" steel studs with sheetrock.

HISTORY OF WHAT WE KNOW ABOUT THE BUILDINGS:

In reviewing the documents, we have been provided, and the documents we had in our files, the following is what we could determine as the history of the projects. In the "Observations and Comments" section, that follows this "History Section", we will outline what we believe to be the cause for the movement of the building and possible solution to the problem. In the 'Conclusions and Recommendations" will be our recommendations on what should be done to help correct the problems. First it is important that all parties have a firm understanding of the history of the project as we know it.

1) PHASE ONE CONSTRUCTION DOCUMENTS OF 1974:

In November 1974 construction drawings were completed for the construction of the phase one portion of the building by Dansby & Miller Architect, E. L. Vogt Structural Engineer, and Timmerman MEP Engineer. We have reviewed a copy of those documents. A Geotechnical Engineering Report was not provided to us for our review.

Therefore, we have no basis by which to evaluate the soils that were present on the site of the phase one building. This phase of the project consisted of a one story new building of approximately 15,000 sq. ft. as described in the “Project Description” above. We have no documentation relating to the construction of this phase of the project.

2) PHASE ONE ENGINEERING REPORT BY CONTI JUMPER GARNER & ASSOCIATES OF 2003:

On April 17, 2003 the engineering firm of Conti Jumper Gardner & Associates produced a report, prepared by Mr. Jumper, and presented it to Mr. Douglas Burgess of The City of Deer Park outlining their findings of the inspection on the phase one building. In that report they gave recommendations that in their words would “solve the settlement problem”, “lead toward re-leveling the structure”, “diminish the distress in the finishes that are presently being experienced”, and “the problem should be corrected to an acceptable level at a reasonably economical cost”. In their report they also gave a recommendation of a foundation contractor “SandTech Construction” that could perform the leveling that they were recommending. To our knowledge, Mr. Jumper’s recommendations were not followed or incorporated into correcting the problems that they had discovered. Also, we observed that there was critical information that was listed in their report that was not provided for our review.

3) FOUNDATION REPAIR BY SANDTECH CONSTRUCTION CORP. IN 2003:

On May 7, 2003 the construction firm of SandTech Construction Corp. issued a proposal to The City of Deer Park for the performance of foundation repair to the Community Center. In a cover letter to me, Mr. Wade Miller of The City of Deer Park described this proposal as “information on the community foundation work that was previously done”. In Santec’s proposal they state, “reviewing the report (Jumper’s report) leads SanTech to the opinion that Mr. Jumper’s analysis of the problem is correct.” “All of Mr. Jumper’s recommendations for repair are valid methods to correct the damage and the conditions that led to the damages.” “Mr. Jumper is also very much correct in that incorporating all of the recommendations would be very expensive.” The proposal went on to say “SandTech provides the following suggestions in order to present a more cost effective plan.” Their proposal states “at some time prior, pressed pile piers had been installed along the east side.” This last statement tells us that SandTech’s leveling attempt was not the first time that distress in the structure had been observed and leveling work had been performed in an attempt to correct the problem. We have no knowledge as to what distress was discovered at that time or what work was performed in the first application of the press piles. In SandTech’s proposal, it says that they would block and shim the existing footings, that would be cut off, to the foundation after leveling. Photographs taken during the construction of phase two show that re-blocking of the existing footings was not done, this can be seen on the attachment #5 photos 2 & 3. Also, SandTech's proposal stated that the void under the slab was to be filled using slurry injection. Again photos taken during construction of phase two show a void under the slab of phase one, see attachment #5 photo 1. Obviously, the first attempt at installing the press piles, prior to SanTech's work, did not work and it is obvious that SandTech's leveling attempt also did not correct the foundation movement problem.

4) PHASE TWO CONSTRUCTION DOCUMENTS OF 2005:

In November of 2005 construction drawings were completed for the construction of the phase two portion of the building by Dansby & Miller Architects, Schmitz / Lamb Structural Engineers and JSE MEP Engineers. This phase of the project consisted of a one story building addition of approximately 9,000 sq. ft. as described in the "Project Description" above. We have reviewed a copy of those documents. A Geotechnical Engineering report for that portion of the project was prepared by A&R Engineering and Testing. We have reviewed a copy of that report. A summary of that report is as follows. Three borings were drilled under the footprint of the proposed phase two addition. The results of the testing on these soils revealed that the existing soil was described as expansive clays having a very high shrink/swell potential. The recommendation of the report was that the concrete slab be placed on a minimum of (36) inches of non-active type fill material having a Plasticity Index between 10 and 20 and a Liquid Limit less than 35. As revealed in later testing conducted by Terracon Engineers the fill thickness under the building in 5 borings was listed as, Boring one-2.5 feet, Boring two-2.5 feet, Boring three-2.5 feet, Boring four-3.5 feet, and Boring five-5.5 feet. The Plasticity Index readings were 7, 10, 22, 25, 16, & 9. The Liquid Limits were 23, 45, 38, 42, 30, & 47**.** These findings indicated that the tested fill did not meet the requirements of A&R Engineers Geotechnical report.

5) SCHMITZ / LAMB ENGINEERS (SLE) REVIEW OF THE CONDITION OF PHASE ONE FOUNDATION ON EAST SIDE OF BUILDING IN 2006:

In September 2006, SLE visited the job site per the request of Dansby & Miller to review the existing foundation on the east side of phase one that had been uncovered during the excavation of phase two. In attachment #5 are photographs taken by the phase one construction during the phase two construction. As can be seen in the photo 1, SLE observed that there was a void under the slab of the phase one foundation. As outlined in SandTech proposal the voids were to be filled using slurry injection. It appears this was not done. Photos 2 & 3 show that the existing footing shafts had been cut off and they had not been properly shimmed to the bottom of the grade beams as per SandTech's proposal. Also SLE observed that there was no shaft reinforcing extending out of the footing shaft that was to dowel into the grade beam. This reinforcing was to be provided as part of the requirements of the phase one structural drawings. A later report by Terracon Engineers, in 2013, indicates that they also did not find reinforcing extending from the footing shaft into the grade beam as called for on the drawings. In photos 2 & 3 it can be seen where the press piles had been installed either during the first leveling contract or by SandTech during their leveling contract. As can be seen there are concrete blocks under the press piles which indicates that the piles were not installed deep into the ground. If these were installed by SanTech their proposal stated that the piles were to go to a bearing elevation of 8'-0" below the existing foundation. Regardless of who installed these piles it is standard practice to press the piles deep into the ground. Since the piles appear to be bearing on blocks only a few feet below the grade beam, then they are bearing on the very expansive soils which are causing the movement problem. Also discovered in the phase two construction photographs photos 6 & 7 we observed that a major storm drain pipe line was broken and repaired using duct tape. It is our belief that this line was not properly repaired as it is being covered with fill. In later reports by Walter P Moore Engineers and Terracon Engineers it was found that storm drain lines had major breaks. It is very likely that what was observed in these photos is one of those breaks.

6) SCHMITZ / LAMB ENGINEERS (SLE) SUBMITTAL OF DETAIL AND LETTER IN SEPTEMBER 2006 TO STRENGTHEN THE PHASE ONE FOUNDATION:

On September 7 & 13, 2006 SLE submitted to Dansby & Miller details and a letter on how to pour concrete caps around the shafts of the existing phase one footings, in order to achieve proper bearing of the grade beam on the original building footings, that were not properly shimmed by SandTech. The letter included instruction on how to fill the void under the slab and how to increase the phase two footing sizes that help strengthen the foundation of the phase one project. The installation of these concrete caps can be seen in attached #5 photos 2, 3, 4, & 5.

7) SCHMITZ / LAMB ENGINEERS (SLE) LETTER OF JANUARY 2008 TO MR. MILLER OUTLINING OUR RECOMMENDATIONS OF TESTING AND REVIEWS:

On January 4, 2008 SLE submitted a letter to Mr. Bill Miller outlining reviews and testing that SLE believed needed to be performed to help determine the cause of the building movement. SLE recommended the following:

1) Conduct a slab elevation survey of both phase one and two in order to set a benchmark for future elevation readings and to help see how the foundation is moving.
2) Test all plumbing in both phase one and two to check for possible leaks.

3) Core drill the slab in both phase one and two and conduct borings to the depth of 20'-0" to review the soil under the building.
4) Take soil borings outside the building to a depth of 30'-0".

In February 2008, using a laser instrument, SLE recorded slab elevations on both phase one and two. They returned to the site in May of 2008 and recorded slab elevations in representative areas. They prepared a drawing of these elevations and forwarded it to Dansby & Miller shortly after completion. It was found that the slab elevations in phase one varied as much as 2 5/8". On phase two the slab elevations varied by as much as 1 9/16". Approximately three-months later two sets of readings were taken in representative areas. It was found that the slab had moved as much as an additional 5/8" in phase one and additional 3/4" in phase two. Schmitz Partners has no knowledge if their recommendations of items two, three, or four, as stated above, were addressed. Attachment #1 is a copy of the slab elevations recorded by SLE.

8) REVIEW AND REPORT BY WALTER P MOORE IN JUNE 2008

In January of 2008 a meeting was held by Morris Architects including all parties of the phase two design group. As a result of that meeting Morris Architects retained the firm of Walter P Moore Engineers to conduct a review of the condition of the building. In their report they used the SLE recorded slab elevations to prepare a contour mapping of the slab elevations. A copy of that mapping is attachment #2. They retained the service of a plumbing consultant, Vertex Plumbing, to review the under slab roof drain and sanitary plumbing lines of the phase two construction. The plumbing consultant found major breaks in two drain lines with a bulge in a third. In their investigation, plumbing lines in phase one were not reviewed.

In the Walter P Moore report they stated that their observed distress is the result of heave due to the increase in the soil moisture content of the expansive soils. They recommended the following steps to be undertaken by the owner.

1) Repair the two broken drain lines and retest to assure they are leak free.
2) Install clay plugs in the plumbing trenches.
3) Repair interior finishes.
4) Verify that perimeter drainage is adequate to prevent ponding at the building perimeter.
5) Monitor the slab elevations semi-annually for two years.

To Schmitz Partners knowledge none of the recommendations of Walter P Moore were initiated.

9) REVIEW AND REPORT BY TERRACON CONSULTANTS IN SEPTEMBER 2013

Terracon retained the services of a plumbing consultant HCL Services to perform leak tests on the sewer and storm lines in the phase two building. Again it appears tests were not performed on the plumbing lines in phase one. As a result of their investigation a break was found in a 10" and 12" storm line. In a recent email from Deer Park it is our understanding that these breaks were never repaired. It appears that the breaks that were discovered in Walter P Moore's report, of 2008, were not repaired as they appear to be the same lines as what were discovered in the Terracon investigation.

Terracon conducted an elevation survey on the slab in both phase one and phase two. A copy of that survey is attachment #3. In phase one they stated that the slab surface is generally flat. Their elevations show that the slab elevations vary by as much as 2 3/8", that is not a flat slab. They found that the slab elevations in phase two varied by 5 5/8". By comparing the slab contour maps of SLE, of 2008, and the contour map of Terracon, of 2013, it can be seen that they show similar results of slab movement. The slab generally has gone down in phase one and up in phase two. It is hard to numerically compare these two readings as they used different benchmarks.

Terracon conducted five borings inside the building and three outside the building. The borings inside the building show that the depth of fill and the type of fill, under the slab, did not meet the requirements of the original Geotechnical report for the phase two project. This has been described above in item 4) "PHASE TWO CONSTRUCTION DOCUMENTS". In boring 2 a void was discovered under the slab. This is the location where voids were to be filled by both SandTech and the contractor on the phase two project. In borings 1 and 3 the borings had to be terminated because of the presence of water. For a boring to be terminated due to presence of water the amount of water encountered has to be large in quantity. There should not be this amount of water under a slab unless there is a source such as plumbing leaks. The presence of a large amount of water will create moisture change in the expansive soil that will cause movement in the foundation.

Terracon conducted two test pits outside the building next to the grade beams. One on the East side of phase two and on the South side at the junction of phase one and phase two. At neither location did they see the piers (footing shaft) connected to the grade beams. In both the phase one and phase two drawings the footing shafts were to be connected to the grade beams with vertical reinforcing going from the shaft into the beam. It would appear to me that the only way to tell if the shaft is not connected to the grade beam is if there was a gap between the two. If that is the case, then the beams are being picked up from the heave of the soil. One of Terracon's recommendations was to reconnect the piers to the grade beams. To recommend that would indicate that they probably saw a gap between the pier and grade beam.

OBSERVATIONS AND COMMENTS:

Having walked the entire exterior perimeter and the interior spaces, following is a true accounting of what we observed. See the attachment #4 plan sheet "Community Center S1" for location of the photographs taken during our review along with the following photographs;

1) Photographs 1 is of the front entry.

2) Photograph 2 shows a minor separation in the caulk joint at the end of the inset brick panel where it meets the brick column. We observe that this movement is not occurring in the brick control joint above the inset panel. This was the case in all locations where we observed this separation in the caulk joint, see photos 3, 4, & 6. In reviewing the existing structural details, on both phase one and two, I observed that the brick above the brick panel inset is being supported by a steel lintel supported from the roof structure and on the brick columns. On the architectural drawing details, on both phase one and two, there was to be a brick header below the steel lintel. In both cases the brick header was omitted and a sheet metal soffit closure below the lintel was provided. These details indicate that the brick inset panel is separate from the brick columns and brick above the insert. Therefore, the insert panels are moving separately from the brick column. This tends to explain why the movement in the joint of the inset panel is not continuing up through the brick control joint.

3) Photographs 3 & 4 are showing a more severe separation in the caulk joint between the brick inset panel and the brick column. This separation was measured to be approximately one inch at the top. It was observed that the movement in the caulk joint was much less at the bottom of the joint. Again, observe that this severe separation is not reflected up into the control joint above the insert panel.

4) Photograph 5 is showing minor separation of the caulk joint at the bottom. Photograph 6 is at the same location at the top and is showing no separation in the control joint.

5) Photograph 7 is showing where the sheet metal soffit has sagged downward. We do not have information of how this metal was to be attached as there are no details of that application on the existing drawings.

6) Photograph 8 is showing the intersection between the phase one (old) and phase two (new) buildings. Phase one is on the right of the left control joint where phase two is on the left of the joint. There is a slight separation in the caulk joint between the two phases. Photo 9 shows a closer view of the phase one brick column. There is a vertical crack going through the brick that has been repaired. There is also a new step crack at approximately the elevation of the top of the inset panels.

7) Photograph 10 is at the bottom of location #8 & #9 showing repaired crack in brick and separation of caulked joint.

8) Photograph 11 is showing cracked brick in brick column at intersection of brick panel. Photo 12 is at the same location again showing crack in brick on face of column. On this phase (phase one) the steel lintels are supporting the brick above the inset panels are bearing on the brick column on the ends. As the lintels move due to thermal expansion or foundation movement the lintel is pulling the brick and causing the cracking.

9) Photograph 13 is showing horizontal crack between brick soffit and the brick on the face of the building above the soffit. In reviewing the architectural and structural drawings I observed that there is a steel lintel directly above the soffit header brick. This lintel is bearing on the brick column at each end. The architectural drawings show the brick to be epoxy glued to the steel lintel. Over time the glue is probably failing and releasing the brick. For public safety this brick should be removed. The soffit brick going into the setback entry is shown on the architectural drawings as being hung from the structure above. There are no explicit details showing how this is to be hung. Again for public safety this should be investigated to determine its stability, and possibly removed. At the left of the soffit, brick is cracking where the steel lintel is moving and dragging the brick of the column.

10) Photograph 14 is showing a vertical crack in the brick of the column. The steel lintel, supporting the brick above the inset panel, is moving due to thermal and/or foundation movement and dragging the brick of the column.

11) Photograph 15 is at the location of photo showing vertical crack in brick. This is also showing a vertical crack in the inset brick panel.

12) Photograph 16 is showing where the soffit brick, as described in photo 13, is coming down. Again this brick should be removed.

13) Photograph 17 is showing separation in caulk joint at the end of inset panel. The separation is not going up through the control joint above the inset panel, see comments on photo 2.

14) Photograph 18 same as photo 17 with a separation of approximately ½”.

15) Photograph 19 is showing separation in the caulk joint at the end of the inset panel at the bottom of the joint

16) Photograph 20 is showing where the top of the brick column has moved outward to the south approximately 1”.

17) Photograph 21 is showing where the top of the brick column has moved outward to the east approximately 1”.

18) Photograph 22 is using a level to show how the brick column is leaning outward to the east.

19) Photograph 23 is showing separation in caulk joint at the end of inset panel measuring approximately ½’. The separation is not going up through the control joint above the inset panel.

20) Photograph 24 is showing separation in caulk joint at the end of inset panel measuring approximately ½’. The separation is not going up through the control joint above the inset panel.

21) Photograph 25 is showing separation in caulk joint at the end of inset panel measuring approximately ½’. The separation is not going up through the control joint above the inset panel.

22) Photograph 26 is taken at the connection of phase one and phase two buildings. Phase one building is on the left and phase two on the right of the joint. The photo is showing separation in caulk joint at the brick above the inset panel of approximately ½”. It is also showing brick

cracking & being pushed outward on the phase one building. There is no separation of the caulk joint in the inset brick panel.

23) Photograph 27 is taken at the connection of phase one and phase two buildings. Phase one building is on the left and phase two on the right of the joint. The photo is showing a horizontal crack in the brick joint on the phase two building. It is also showing brick cracking & being pushed outward on the phase one building. There is no separation of the caulk joint in the inset brick panel.

24) Photograph 28 is showing a step crack in the brick starting from the lower corner of the window going down to the foundation. See photo 41 that was taken from the inside of the window showing the window being badly out of square due to the foundation movement.

25) Photograph 29 is showing vertical brick cracking in the brick column that had been repaired.

26) Photograph 30 is a close-up taken in the same area as photo 29. This is showing how the repaired crack continues up at the control joint above the inset brick panel. On this phase of construction, the steel lintel is bearing on the edge of the brick column. Due to this bearing and thermal and/or foundation movement, the lintel is pulling the corner of the brick and causing the vertical brick crack.

27) Photograph 31 is showing the brick soffit of the entry with a horizontal crack at the top of the brick soffit course. This condition is the same as described in photo 13 at the front entry and should be treated the same as described in that area.

28) Photograph 32 is showing a vertical crack in the brick the same as what was repaired and described in photos 29 & 30.

Having finished our review of the exterior of the building, we started our review of the interior of the building. To start our review, we met with Mrs. Dawn Crenshaw, the manager of maintenance, in order to gain information on what history she could tell us about movement or problems in the building. Mrs. Crenshaw gave us a tour of the inside of the building and pointed out areas of distress she knew of. During this tour she stated that most of what we were seeing has gotten worse over the past two years. She also said that some of the areas had been repaired and the distress has come back. During that tour Mrs. Crenshaw told us that within the last two years a broken sewer line had been discovered, and repaired, in the area of the corridor between the Activity Room and the Rest Rooms.

Following are photographs, in attachment #4, of many of the areas she pointed out to us.

1) Photograph 33 is showing a separation between the base of the CMU wall and the floor. This is an indication that the floor has settled in this area.

2) Photograph 34 is showing a cracking at the base of the wall in the floor tile.

3) Photograph 35 is showing a vertical cracking in the sheetrock and tile in the bathroom.

4) Photograph 36 is showing a vertical cracking in the tile. Mrs. Crenshaw said they recently had to move the towel dispenser at this crack, you can see holes where it was mounted. You can also see how the horizontal joints in the tile have moved vertically.

5) Photograph 37 is showing a vertical cracking in the corner of the tile in the bathroom.

6) Photograph 38 is showing a vertical cracking in the sheetrock.

7) Photograph 40 is showing how, by using a two-foot level, we could see that the floor is sloping downward at the rate of approximately 5/16" per foot.

8) Photograph 41 is showing that the exterior window has been pushed out of square from movement in the foundation. This is in the same location where cracking in the exterior brick was observed in photo #28.

9) Photograph 42 shows a visible hump upward in the middle of the exterior wall at the north side of the activity room.

10) Photograph 43 is showing how, by using a two-foot level, the floor is sloping downward at the rate of approximately 1/8" per foot. This is along the same wall as photo #42.

11) Photograph 44 is showing a vertical crack at the intersection of the walls. Based on a review of architectural drawings, a CMU wall was added at some time that separates the activity room and the meeting room.

12) Photograph 45 is showing a vertical crack at the intersection of the walls.

13) Photograph 46 is showing a horizontal crack in the CMU at the base of the wall.

14) Photograph 47 is showing a vertical crack in the CMU at the corner of the walls.

15) Photograph 48 is showing a horizontal crack in the CMU at the base of the wall.

16) Photograph 49 is showing how, by using a two-foot level, we could see that the floor is sloping downward at the rate of approximately 3/16" per foot

17) Photograph 50 is showing a vertical crack in the CMU walls.

18) Photograph 51 is showing the roof of the phase one building with water ponding on the roof. In reviewing the structural drawings I found that the roof has approximately 1/16" per foot slope. Also there are no emergency overflow drains on the roof.

19) Photograph 52 is also showing another location on phase one where water is ponding.

20) Photograph 53 is showing the roof of the phase two building and the roof drains. In reviewing the structural drawings I found that the roof has approximately ¼" per foot slope. This area does have emergency overflow drains.

21) Photograph 54 is showing the roof expansion joint between the phase one and two buildings.

22) Photograph 55 is showing the end of the roof expansion joint that has come loose.

23) Photograph 56 is showing a splice in the roof expansion joint that is broken.

In reviewing the phase one architectural drawings, I observed that the backup material of the exterior walls consists of 4" CMU. The use of 4" CMU was a common practice at the time when the phase two building was designed. However, 4" CMU used for the backup on an exterior wall will not meet the wind loading for the current building codes. Therefore, if remodeling would require an update to the present codes such upgrade to assure that the exterior walls meet present code would be quite expensive or possibly cost prohibitive. I also observed that the interior walls were 4" CMU. Again, this may be a present code issue which should be investigated further if remodeling is considered. Wall sections were not included in the architectural drawings we were provided, so we could not review how the exterior brick was attached to the inside layer of CMU. However, we know from our experience that during that time it was common practice to use flat corrugated metal ties for this purpose. Due to the extreme amount of movement observed this should be investigated to assure the stability of the exterior brick.

In reviewing the phase two architectural drawings, I observed that the backup wall on the exterior is metal stud and sheetrock and the interior walls are also metal studs and sheetrock. The difference in wall construction of the two phases is an important observation as the weight of 4” CMU is approximately 30 pounds per square foot where metal stud and sheetrock is approximately 5 pounds per square foot. This significant difference in weight would affect how the two phases are being affected from heave of the soils. The extra weight of walls in phase one means that the heave forces in phase one are being resisted by the greater weight of the walls. The lesser wall weight in phase two means the heave forces do not have as much resistance in lift the slab. In reviewing the recorded slab elevations, it can be seen that the slab in phase one has less upward movement than phase two and more downward movement, due to more downward loading. In phase two there is more upward movement and less downward movement, less downward loading.

In reviewing the phase two plumbing drawings, I observed there are a lot of plumbing lines running North and South along the line of the connection of phase two to phase one. There is also a lot of plumbing lines running North and South along the wall between the pre-school rooms and the corridor. There is considerable plumbing in the area of the restrooms. These areas are where most of the major distress in the architectural finishes and movement of the slab is occurring. This slab movement was well documented in the slab elevations recorded by the engineering firms of SLE and Terracon. We have not been provided a copy of the plumbing drawings for the phase one project. There is a suite of restrooms in phase one that is larger than the restrooms in phase two. Also, there is a kitchen in phase one. Therefore, I would expect that there is more under slab plumbing in phase one than in phase two. To our knowledge the plumbing under the slab in phase one has not been inspected. This is an important observation as leaks in phase one could be a significant cause of foundation movement in both phase one and two.

CONCLUSIONS AND RECOMMENDATIONS:

Over the forty plus years of the life of this project there have been at least, three Architectural firms, eight Engineering firms and four Construction companies, inspect, produce reports, give recommendations and performed work on how to address the movement and distress the building is experiencing during that period. The report produced by Schmitz / Lamb Engineers was one outlining steps that needed to be performed in order to better define the problem. Action on that report, for whatever reason, did not go forward. Obviously I have the knowledge that SLE was not retained to go forward with their outlined steps of investigation. The reports by Walter P Moore and Terracon were more in depth in terms of their investigation into what the cause and effect of the problems were. Both of their reports gave what I believe is a good synopsis on what the cause of the foundation movement is. Therefore, I do not see the necessity to reiterate what has been discussed in those reports regarding cause and effect. One can read their two reports for that information.

In both the Moore and Terracon reports, they gave recommendations of what needed to be done to correct, or at least help, the problem. It is my opinion that in both reports, although they had good recommendations, they did not go far enough in order to have the most effect in correcting the problem. It is my understanding that none of their recommendations were acted upon. It should be understood that by not acting on their recommendations many years ago only makes it more difficult in addressing the problem after time has passed.

Before I address what I believe to be actions that need to occur to get the best results in trying to correct the foundation problems, I would like to put the "cause and effect" of moisture change in expansive clays in terms that may be more understandable by individuals that are not schooled and trained in Geotechnical Engineering. I know this will be very elementary but please bear with me as it may help. I would like to make an analogy between expansive soils (clays) to that of an ordinary kitchen sponge. When one purchases a kitchen sponge from the store it comes in a **"sealed"** plastic bag. Inside the sealed bag the sponge is at its maximum moisture content and has its largest volume. When the seal is broken and the sponge is removed and placed on the counter it starts to lose its moisture and after a few days, if it is not subjected to additional moisture, it starts to **"shrink"** and becomes approximately half its original size. If moisture is again added to the sponge it **"swells"** and expands to its original maximum moisture content size. Expansive clays react in a similar fashion, however in a different way as they take much longer to react to moisture change because their reaction is due to an electrolysis effect between the clay and the water. The key to this analogy is the importance in **"sealing"** the clay from moisture so it is maintained at a constant moisture content and therefore at a constant volume the same as the sponge was **"sealed"** when it came from the store at a consistant volume.

In both Walter P Moore's and Terracon's report they expressed the importance of testing all under slab plumbing for leaks. They both had plumbing contractors run leak test on the storm and sanitary piping. The testing was conducted using visual inspection and gravity flow (stand pipe) water testing. However, it is my opinion that in neither case was that testing adequate to detect all possible leaks in the plumbing. Visual inspection will only detect major breaks in major lines that can be accessed. Stand pipe pressure will only detect major leaks. In Moore's report the plumbing contractor visually observed a pipe that had a bulge in it, but did not show leaks from the stand pipe test. How can there be a bulge in a pipe with no leak? In our opinion the only way to assure all pipes do not have leaks is to apply enough pressure using pressure testing that will detect even small leaks but not rupture good piping. Even a small leak will add moisture to the clay, over a period of time, that will activate the expansive clays. Testing of all plumbing lines, including all supply lines should be performed.

One of Walter P Moore's recommendations was to install clay plugs into all plumbing trenches that enter the building under the slab. This is a good recommendation as trenches can be a conduit for water to travel through. However, a better and more effective solution is to use a plug made of bentonite clay. This should be designed by a qualified engineer.

One of Terracon's recommendations was to install a moisture barrier along the east side of phase two. Again, this is a good and valid recommendation. However, in my opinion it does little good to only protect one side of the building from moisture intrusion and let water intrude from the other sides. A moisture barrier should be placed around the entire perimeter of both phase one and phase two. Terracon also stressed the importance of having good drainage away from the building so water does not collect around the building.

SUMMARY OF OUR RECOMMENDATIONS:

Considering the amount of movement in the foundation and the architectural finishes of the Community Center, it is our opinion that all of the following recommendations should be performed. In making these recommendations we have taken into consideration what we believe to be the following critical existing conditions on this project.

1) Based on the observations reveled in the Terracon inspection of 2013 and the observations of the photographs taken by the contractor of phase two it is likely that the building footings are not connected to the building grade beams and that there is a gap between the footing shaft and the grade beams.

2) The soils (clays) under the building are extremely expansive.

3) The amount and quality of fill placed between the expansive soils and the building slab was not as required by the Geotechnical Engineer to help minimize the movement in the foundation.

4) There remains leaks in the plumbing lines under the building.

5) The grading around the building is not adequate to keep rain and/or irrigation water away from the building and migrating under the building slab.

6) There is a high probability that water is entering under the slab from plumbing trenches.

7) There is such major movement in the exterior brick that its stability is in question.

8) There may not be proper drainage on the roof of the phase one building and there are no emergency overflow drains.

Item two is a condition, in our opinion, would be very difficult to altered with the building in place. If it was considered as a possibility to remove and replace the expansive clay or to treat the clays to nullify its expansive condition such an undertaking would be cost prohibitive. Therefore, to help resolve the problem the following steps need to be taken;

1) Due to the observations that the building footings may not be attached to the grade beam and the large amount of upward movement of the foundation there is a possible separation (gap) between the grade beam and the building footings. If this is the case, then the foundation has lost its support of the footings and the foundation will not function as it was designed. Due to this concern we believe the first investigation should be to verify the possible loss of this support. To achieve this, four test pits should be excavated on the exterior of the building and four on the interior of the building all to be located at existing building footings. This investigation should be performed under the supervision of a structural engineer knowledgeable in the type of foundation design of the building. As can be understood the importance of this is to determine what steps need to be taken to assure that the foundation will perform as it was designed. If reattachment of the footings to the grade beams is required, as recommended in the Terricon report, then this undertaking could be very costly and ould affect any steps going forward.

2) All under-slab piping should be tested using pressure testing not just gravity flow. Such pressure should be applied for a period of a minimum of 24 hours not just 30 minutes as has been the previous case. The pressure that is applied should be enough to detect minor leaks but not too much that would damage the piping. Such testing should be performed by a qualified plumbing testing company knowledgeable in such testing. All plumbing in both phase one and phase two should be tested in both drain and supply lines. Testing of such lines should extend for a minimum of 10’-0” beyond the building line. If there were to be a leak a few feet from the building line, water could migrate back under the building. All discovered leaks shall be repaired or replaced and retested.

3) All plumbing trenches, both drain and supply line, should be blocked from water migration back under the building using a bentonite plug

4) A non-pervasive moisture barrier should be placed around the entire building to a depth of a minimum of 5’-0” deep and shall be sealed to the building foundation. The moisture barrier should be properly sealed to all piping going under or into the building. This barrier should be performed in conjunction with the plumbing trench plug. In past projects, with foundation problems that we have conducted forensic investigations on, we have found abandoned storm lines, swales filled with gravel and dump site all going under the building that were not discovered and filled during construction. Any possible condition such as this can be found while installing the moisture barrier and addressed. At the same time of such excavation it can be determined if the footings have been lifted off of the building footings and this issue can be addressed. Terracon recommended in their report that the footing be reattached to the grade beams and their recommendation can be addressed at this time if needed. Also, it will be determined if there are any void under the building slab and if found they should be filled using a cement stabilized slurry under pressure injection.

5) The soil around the exterior of the building should be regraded to maintain proper drainage away from the building for a distance of a minimum of 10’-0”.

6) All of the exterior brick should be inspected to assure it is structurally stable and repaired as required.

7) The roof on the phase one building should be reviewed for proper roof drainage and for emergency overflow drains.

8) Before any repairs are performed on the architectural finishes the slab elevations shall be monitored every six months for a period of two years to assure movement has been held to a minimum. Once that is confirmed then all finishes can be repaired.

All items as listed above shall be designed and supervised by professionals, architects or engineers, experienced in their particular field of design or work.

It should be understood that when dealing with extremely expansive soils there is always a risk of further movement of the building placed over those expansive soils. Therefore, all of the above recommended measures do not assure 100% success in stopping future movement in the building.

LIMITATIONS:

This assessment has been conducted to assist Brinkley Sargent Wiginton Architects and Deer Park understand the structural condition of the Deer Park Community Center building. It should be understood that much of the structure was covered by architectural finishes, landscaping & furnishing that made it not possible to review the structure in its entirety. Based on this fact, there may be existing conditions that we were unable to observe, that may change our opinions in this report. A subsurface conditions review, other than the review of the phase two Geotechnical Exploration, was beyond the scope of this review. Any comments regarding concealed conditions or subsurface conditions are opinions based on our professional engineering experience and judgement using standard engineering practice.

A review of the structural design or a detailed analysis of the structure to meet the code requirements of structural design was beyond the scope of our review of this project.

We have made every reasonable effort to address areas of concerns, that in our opinion, would give a clear understanding of the structural condition of this project. If there are perceived omissions or misinterpretations in this report or if there is additional information that we were not provided, regarding our review, we ask that they be brought to our attention so we may address such issues as soon as possible.

We appreciate the opportunity to conduct this review and assessment. If any party has questions regarding this report, please feel free to contact us.

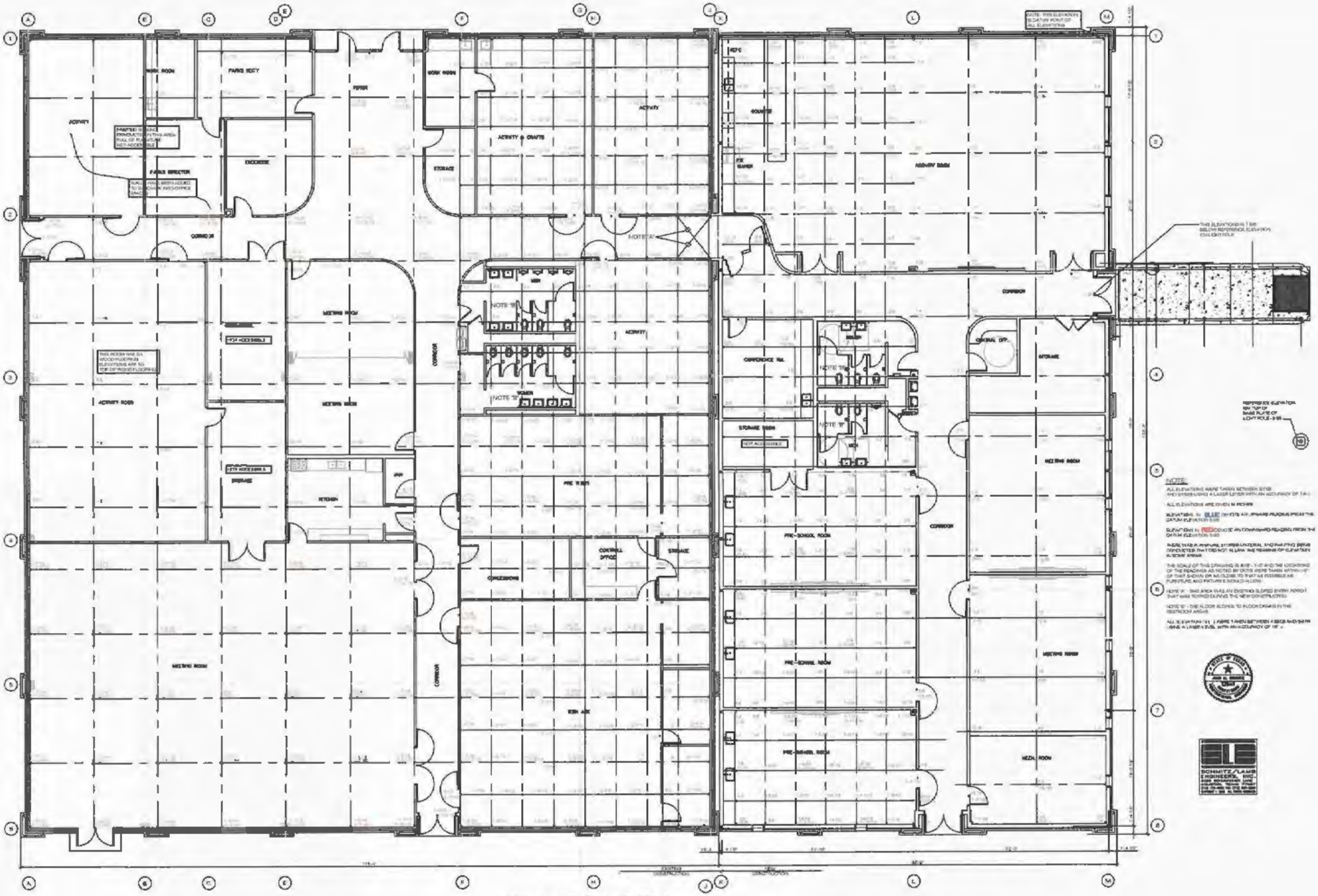
Sincerely,

John M Schmitz

John M Schmitz P. E.
Schmitz Partners PLLC
Firm Number F-8102
Attachments; 1 thru 5

ATTACHMENT NO. 1

SCHMITZ / LAMB SLAB ELEVATIONS



NOTE:

ALL ELEVATIONS ARE GIVEN IN INCHES

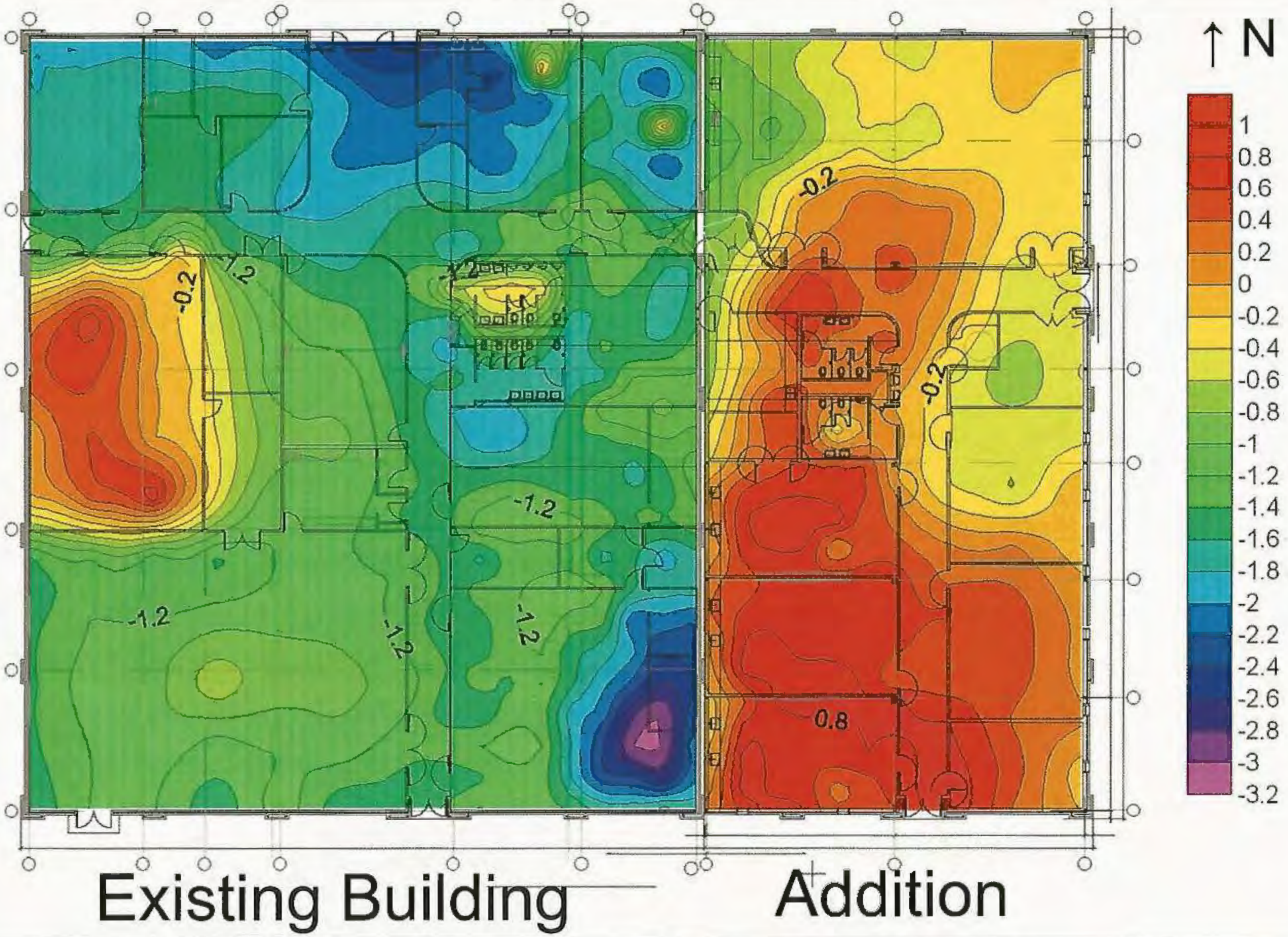
SCHMITZ/LAMB ENGINEERS, INC.

FLOOR PLAN WITH SLAB ELEVATIONS

ATTACHMENT NO. 2

WALTER P MOORE SLAB CONTOUR MAP

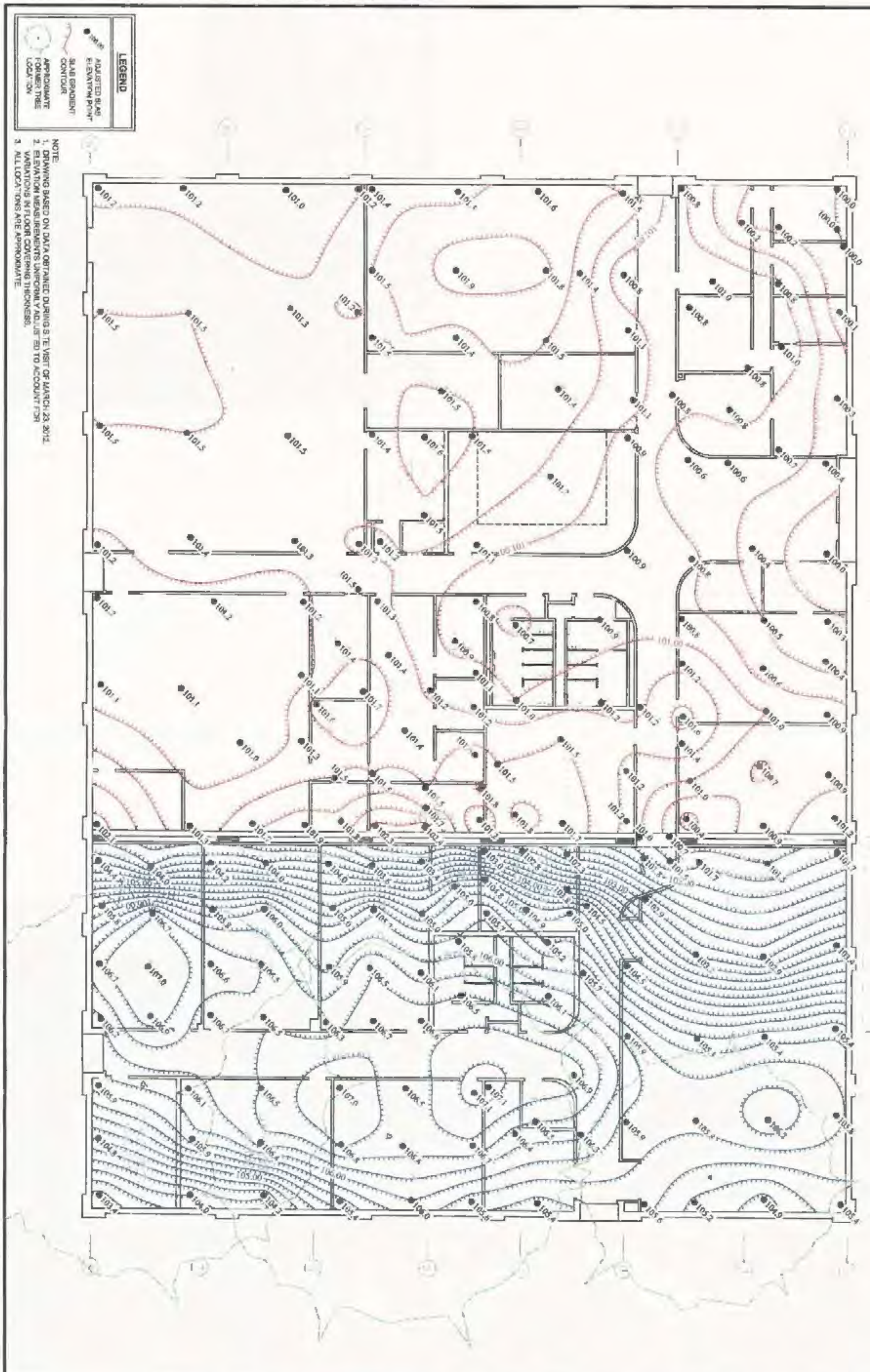
Base Line Elevation Survey 02/2008



ATTACHMENT NO. 3

TERRACON CONSULTANTS SLAB CONTOUR MAP

N:\Facilities\Dox\Drafting\2012\F3128529\F3128529 DPCC.dwg : Contour Data (3) -- 20120801P0219



0 8' 16'
APPROXIMATE SCALE: 1/16" = 1'-0"

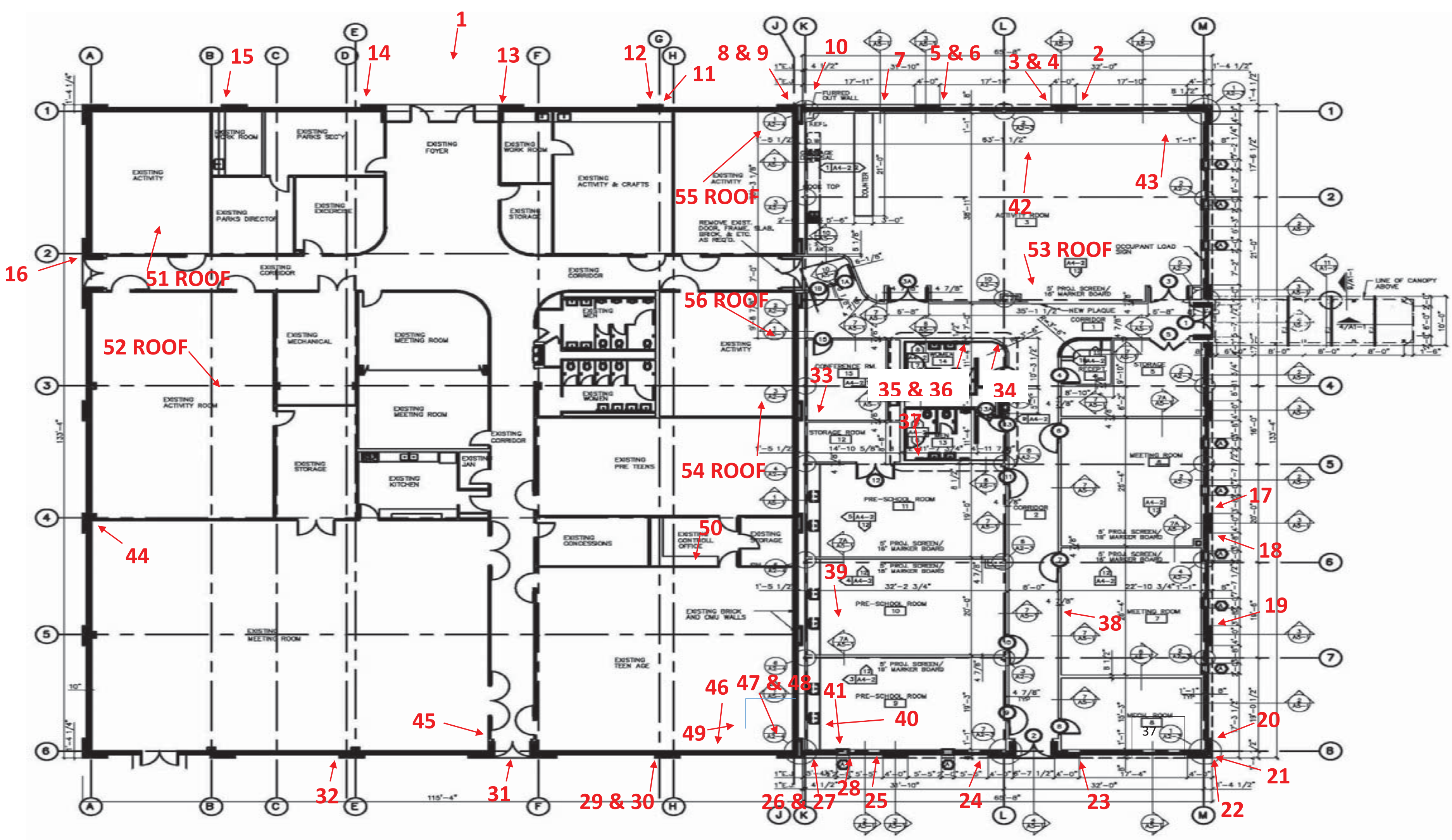
Terracon
Consulting Engineers & Scientists

DRAWN BY:	REW
CHECKED BY:	JAC
SCALE:	1/16" = 1'-0"
TERRACON NO:	P3128529

Figure 3
Site Plan with Adjusted Relative Elevation Contours
Deer Park Civic Center
610 East San Augustine Street
Deer Park, Texas 77539

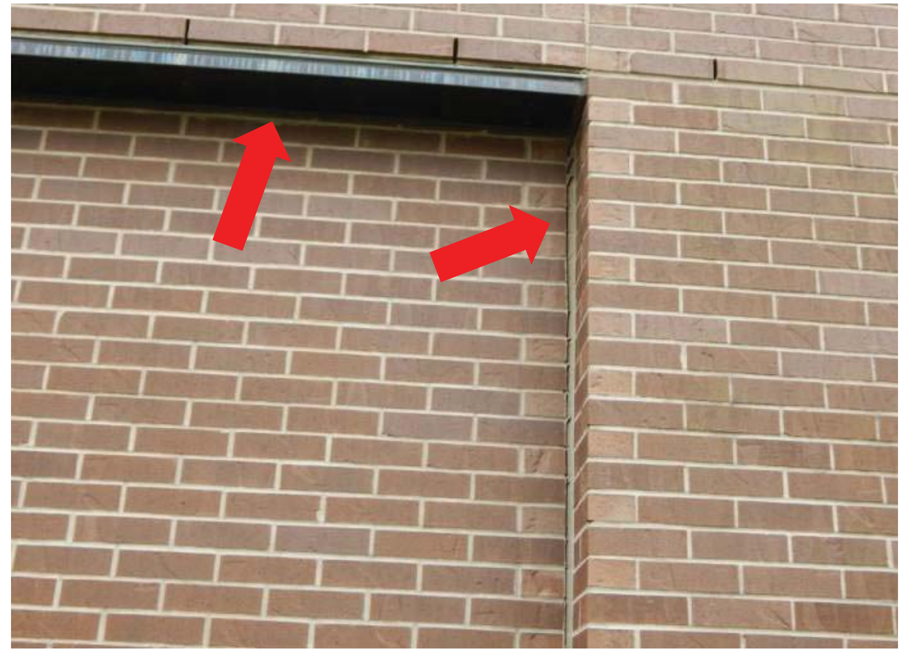
ATTACHMENT NO. 4

PLAN AND PHOTOGRAPHS RECORDED BY SCHMITZ PARTNERS ENGINEERS



1
2
3 & 4
5 & 6
7
8 & 9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26 & 27
28
29 & 30
31
32
33
34
35 & 36
37
38
39
40
41
42
43
44
45
46
47 & 48
49
50
51 ROOF
52 ROOF
53 ROOF
54 ROOF
55 ROOF
56 ROOF

#1 Photo of front entry



#2 Minor separation in caulk joint at end of inset brick panel.
No brick header per architects detail.

#3 Separation in caulk joint at end of inset brick panel of approximately 1”. No separation in brick control joint above.

#4 Separation in caulk joint at end of inset brick panel of approximately 1”. No separation in brick control joint above.

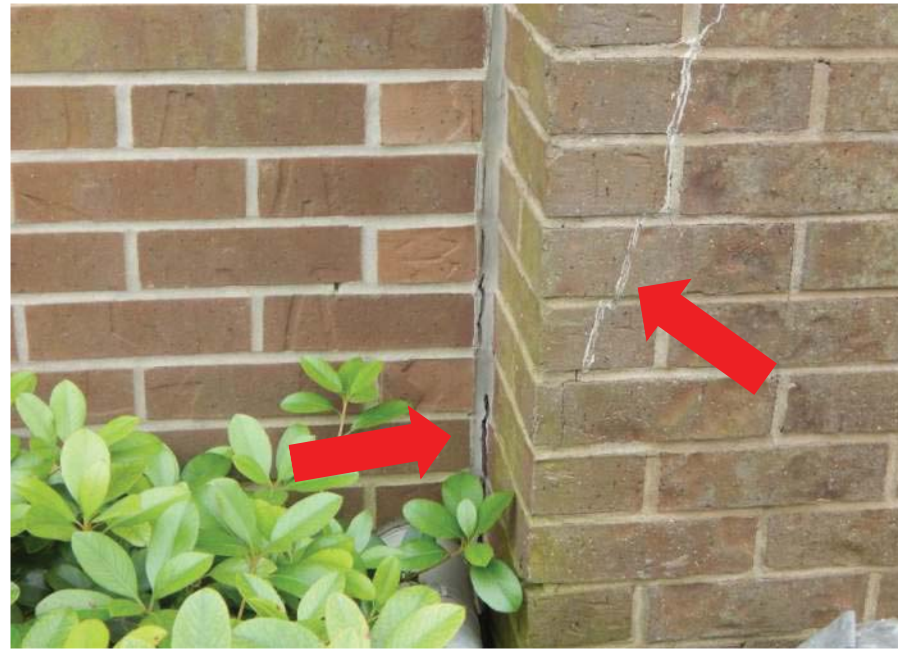
#5 Minor separation in caulk joint at end of inset panel.

#6 Same location as photo #5 at top showing no separation of control joins

#7 Sheet metal soffit is sagging down. This is where the brick header was omitted and sheet metal added (typical).

#8 Control joint between phase one (on right) and phase two (on left) showing separation in joint. Also, there is a step crack in the brick.

#9 Same as photo #8 showing step crack in brick and vertical crack in phase one that has been repaired.



#10 Same as photo #9 at bottom of crack repair and separation in caulk joint.

#11 Cracked brick at end of inset panel.

#12 Same location as photo #11 showing cracked brick in column. Lintel movement is causing this cracking.

#13 Horizontal crack between brick soffit and brick on face of building.
Cracking brick where lintel angle is bearing on brick column.

#14 Vertical crack where steel lintel over inset brick is
Moving and dragging the brick on the column

#15 Vertical crack in brick column and in brick inset panel.

#16 Crack in brick of soffit brick same as photo #13

#17 Separation in caulk joint at end of inset panel. Crack does not go up in Control joint above inset panel

#18 Separation in caulk joint at end of inset panel. Crack does not go up in control joint above inset panel. Separation at top was measured at approximately ½".

#19 Separation in caulk joint at end of inset panel at bottom of joint

#20 Showing brick column has moved outward to south approximately 1".

#21 Showing brick column has moved outward to the East approximately 1"

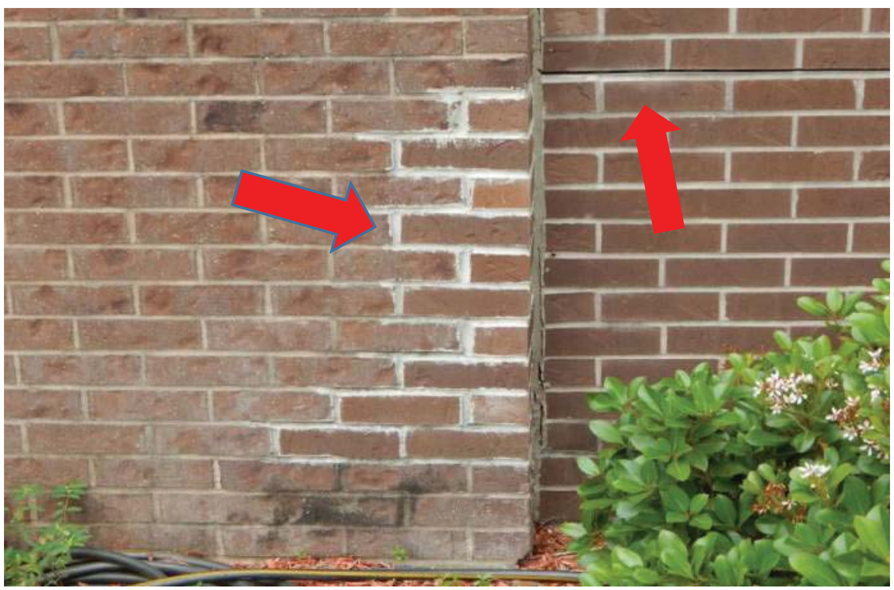
#22 Showing how brick column is leaning outward at the top of the East

#23 Separation in caulk joint at end of inset brick panel of approximately 1/2".
No separation in control joint above.

#24 Separation in caulk joint at end of inset brick panel of approximately 1/2".
No separation in control joint above.

#25 Separation in caulk joint at end of inset brick panel of approximately 1/2”.

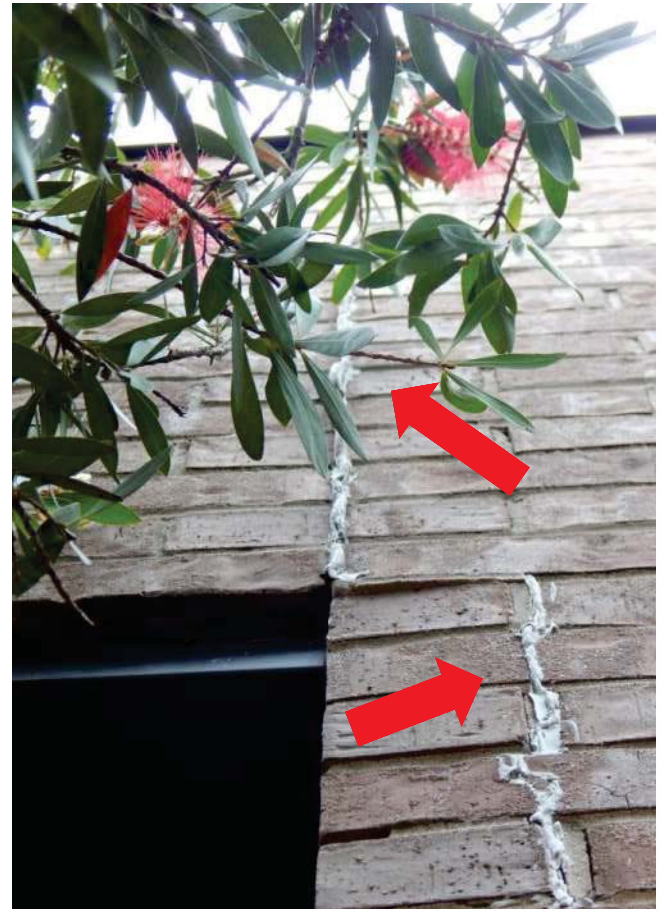
#26 Photo at connection of phase one and phase two buildings. Separation of caulk joint between phase one and phase two. Brick cracking and being pushed out on phase one building.



#27 Photo at connection of phase one and phase two buildings. Horizontal crack In brick in phase two. Repaired brick cracking in phase one.

#28 Step crack in brick going from window down to foundation. See photo #59 Which shows how the window is out of square.

#29 Vertical crack in brick column that had been repaired.



#30 Photo at same location as photo #29 at the corner of the inset brick Panel. Repaired crack goes up through control joint above inset panel

#31 Horizontal crack above soffit brick The same as described in photo #13

#32 Vertical crack in column brick the same as described in photo #30

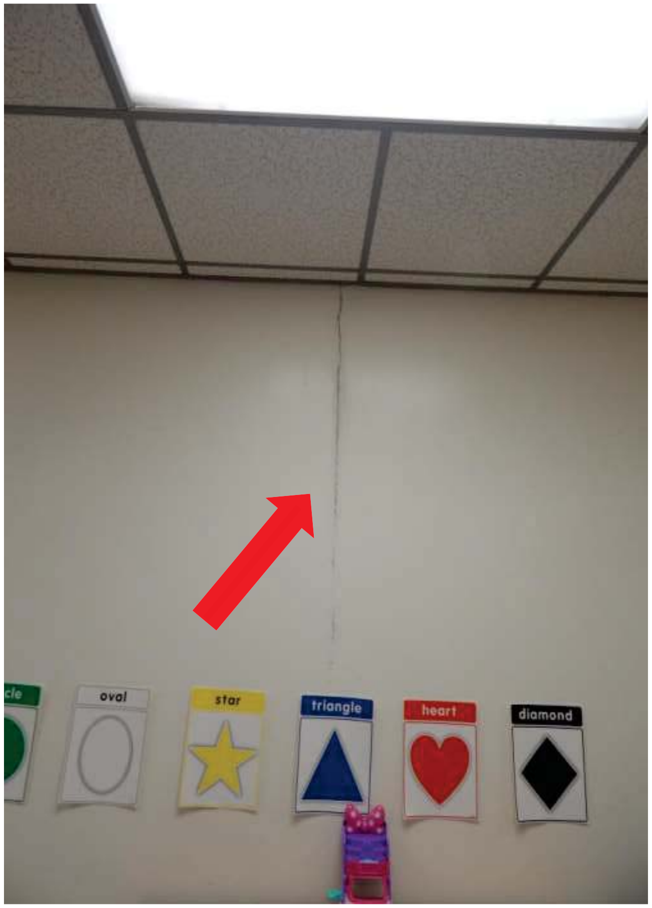
#33 Separation of base of wall to floor

#34 Cracking in the tile floor at base of wall

#35 Cracking in sheetrock wall and tile in bathroom

#36 Cracking and movement in tile joint. Mrs. Crenshaw said towel dispenser had to be moved.

#37 Cracking and separation in tile



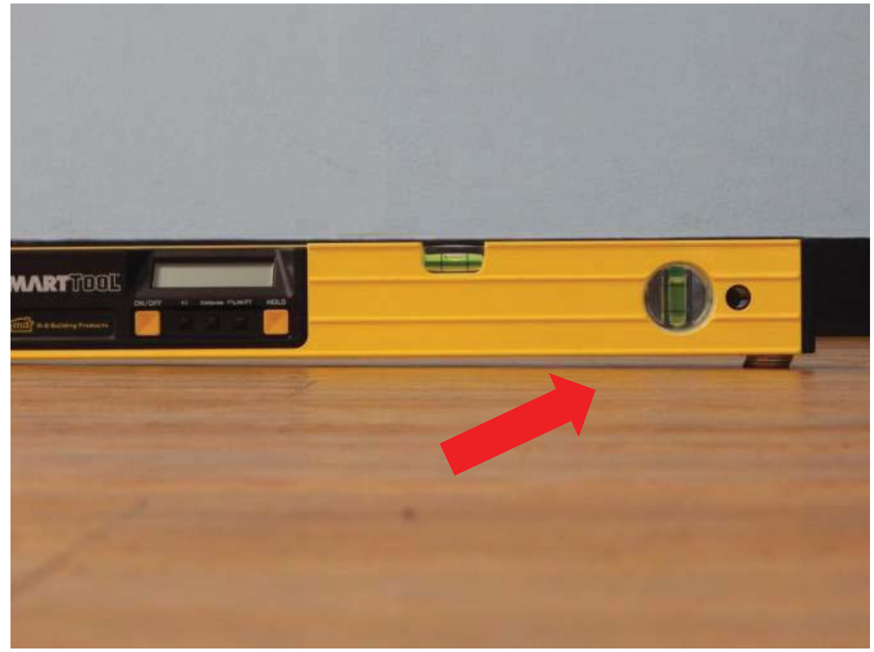
#38 Cracking in sheetrock

#39 Level on floor showing slope of approximately ¼” per foot

#40 Level on floor showing a slope of approximately 5/16" per foot

#41 Window has been tilted out of square. Photo #28 shows cracking of outside brick in this area

#42 A visible hump up of the floor can be seen in this area



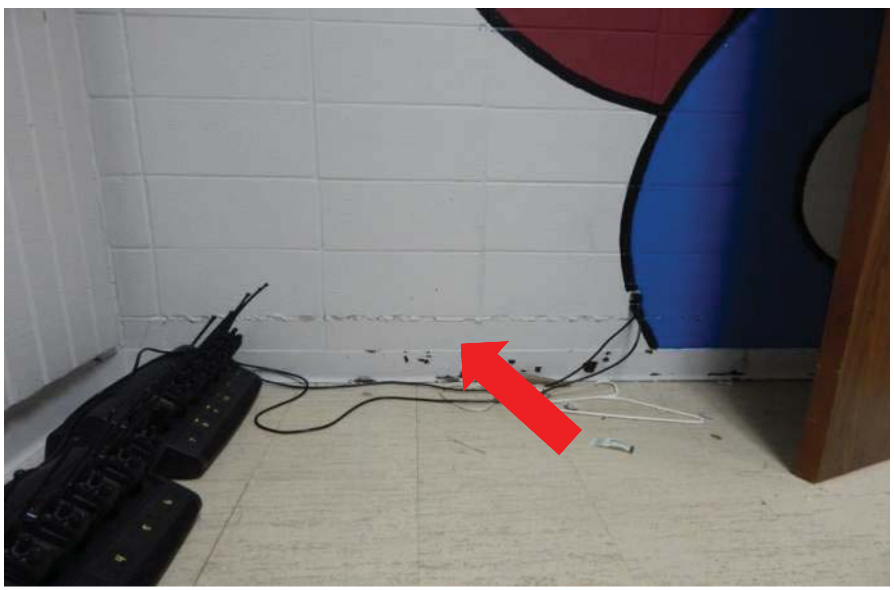
#43 Level on floor showing sloping down toward the North East corner at Approximately 1/8” per foot

#44 Crack in corner of CMU wall

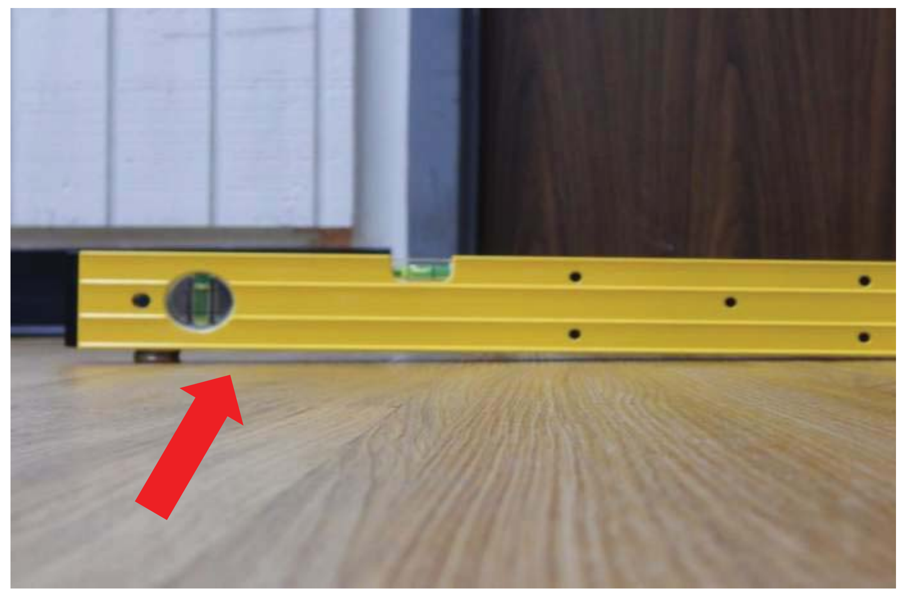
#45 Crack in corner of CMU wall

#46 Horizontal crack at base of CMU wall

#47 Crack in corner of CMU wall



#48 Horizontal crack at base of CMU wall



#49 Level on floor showing a slope of approximately 3/16" per foot

#50 Vertical crack in CMU wall

#51 Roof over phase one of community center showing standing water

#52 Roof over phase one of community center showing standing water

#53 Roof over phase two of community center showing roof drain and emergency drain

#54 Roof expansion joint cover between phase one and phase two

#55 End of roof expansion joint where join is coming loose

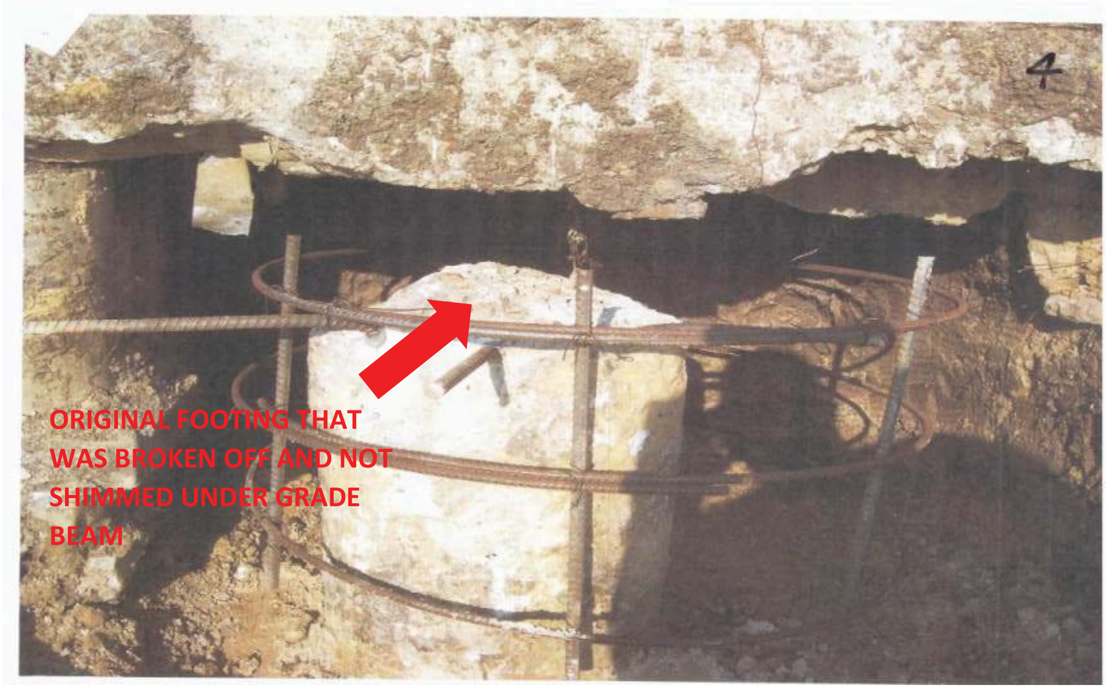
#56 Roof Expansion joint at splice where spice has come loose

ATTACHMENT NO. 5

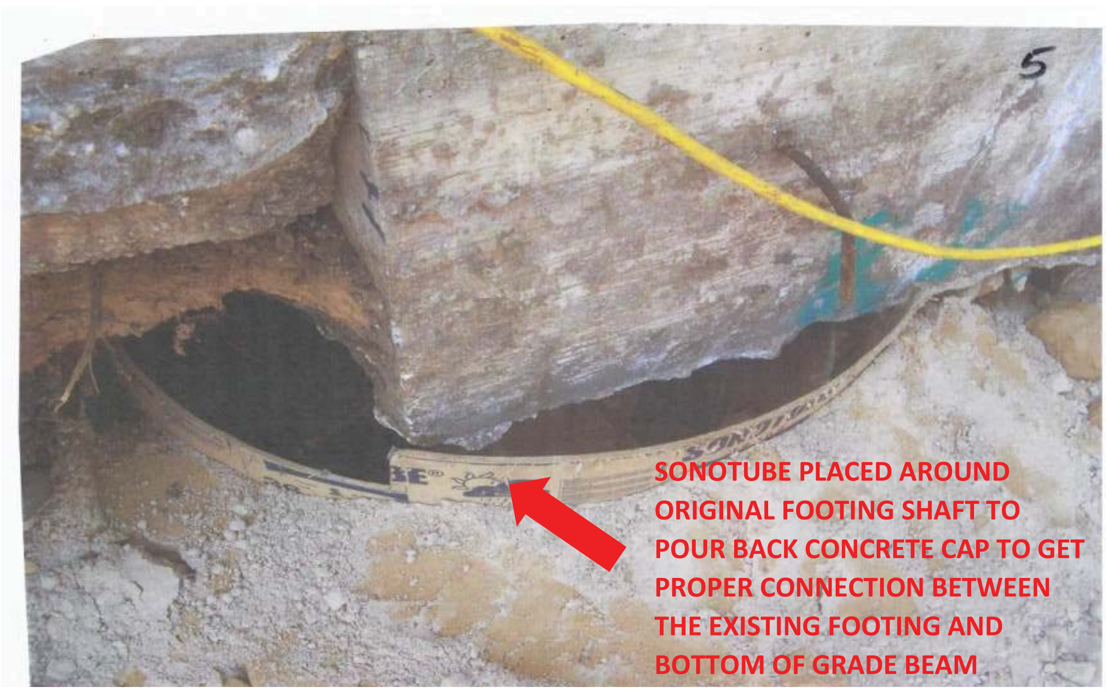
PHOTOGRAPHS TAKEN BY CONTRACTOR OF THE PHASE TWO BUILDING

#1 Photo taken by contractor of Phase Two revealing void under foundation of Phase One

#2 Photo taken by contractor of Phase Two showing no reinforcing extending out of Footing into grade beam



#3 Photo taken by contractor of Phase Two showing no reinforcing extending out of footing into grade beam



#4 Photo taken by contractor of Phase Two showing how concrete cap was being poured between existing footing and grade beam

#5 Photo taken by contractor of Phase Two showing how concrete cap was being poured between existing footing and grade beam

#6 Photo taken by contractor of Phase Two showing broken drain line that was repaired using duct tape

#7 Photo taken by contractor of Phase Two showing broken drain line that was repaired using duct tape and being covered with fill.

EXHIBIT C

PHASE 1 REVIEW
DEER PARK
COMMUNITY CENTER ADDITION

DEER PARK, TEXAS

WALTER P MOORE PROJECT NUMBER 43-08030-00

JUNE 6, 2008

WALTER P MOORE

WALTER P MOORE

June 6, 2008

Mr. Richard Chambers
Principal
Morris Architects
1001 Fannin, Suite 300
Houston, TX 77002

Re: **Phase 1 Review – Deer Park Community Center Addition**
Deer Park, Texas
Walter P Moore Project No. 43.08030.00

Dear Richard:

We have completed our initial review of the distress at the Deer Park Community Center Addition in accordance with our proposal P08-0292 dated February 21, 2008. Our scope of service included reviewing the documents and background information leading to the current condition, visually reviewing existing conditions on site, video inspection and leak testing of accessible roof drains and sanitary plumbing below the addition slab-on-grade, meeting with you and Deer Park officials, and providing the attached report with recommendations for moving forward to address the subject issues. Please see the this report of our findings and recommendations.

We very much appreciate the opportunity to provide these services to you and look forward to continuing to assist you on this project as needed. Please do not hesitate to contact us if you have any questions.

Sincerely,

WALTER P MOORE AND ASSOCIATES, INC

Dilip Choudhuri

STATE OF TEXAS
Ray F. Drexler, Jr. PE
RAY F. DREXLER, JR.
81927
REGISTERED
PROFESSIONAL ENGINEER
06 JUNE 2008

Dilip Choudhuri, P.E.
Principal
Structural Diagnostics Services Group

Ray F. Drexler, P.E.
Senior Associate
Structural Diagnostics Services Group

cc. Eric Green / Green Engineering Consulting

Enclosure

Phase 1 Review

Deer Park Community Center Addition

Deer Park, Texas

Prepared for

Morris Architects

Prepared by

Walter P. Moore and Associates, Inc.

1301 McKinney, Suite 1100

Houston, Texas 77010

43.08030.00

June 6, 2008

TABLE OF CONTENTS

EXECUTIVE SUMMARY

In 2007 an addition was added to the 1974 Deer Park Community Center facility. It is our understanding that the original structure had a history of foundation movement and related distress issues prior to the construction of the 2007 addition, and that some remediation was conducted with limited success Evidence of foundation movement and associated distress has now appeared in the addition.

Based on our review of the facility and available documentation, it is our opinion that the observed distress in the addition is related to heave of the expansive clay soil below the new slab-on-grade. This heave is a result of an increase in the soil moisture content relative to the moisture content at the time of construction.

We retained a specialty plumbing consultant who performed video observations and leak testing of the roof drains and sanitary plumbing below the addition. The plumbing consulting reported the following significant findings:

1) One cracked 10" roof drain line under the addition.
2) One leaking 12" roof drain line with no apparent breaks under the addition.
3) One bulged sanitary line. However, no leaks were found in this line.

We recommend that the owner undertake the following tasks:

1) Repair the observed break in the 10 inch diameter addition roof drain and retest the line to verify it is leak free.
2) Repair to the leaking 12 inch diameter roof drain from the original building that is below the addition and retest the line to verify it is leak free.
3) Excavate and install clay plugs at the building perimeter of the underground plumbing chases to prevent exterior surface moisture from migrating into the soil below the addition through the plumbing trench backfill.
4) Repair disturbed interior finishes in a manner capable of accommodating continued differential movement (both upwards and downwards).

5) Monitor the floor slab elevations semi-annualy for at least two years to determine if the repair of the plumbing leaks has resulted in stabilization of the soil moisture. If the foundation does not stabilize during this time period, additional investigation and/or remediation may be required.

INTRODUCTION

It is our understanding that the 2007 addition to the Deer Park Community Center began to experience interior finish distress shortly after construction. The observed distress is typical of differential foundation movement. This addition expands the original structure that was built circa 1974.

OBSERVATIONS AND FINDINGS

Document Review

Our document review indicates that the original structure had previous foundation related distress issues. Some foundation remediation was conducted with limited success circa 2003 and on at least one prior occasion.

The geotechnical report provided for the addition indicates that the soil at the site is "expansive clays classified as "CH" having a very high shrink/swell potential."[1]

Geotechnical Background

Differential movement of a building foundation can be caused by many conditions. The most frequently encountered geotechnical condition causing differential foundation movement on the Gulf Coast is shrink/swell behavior of expansive clays. Expansive clays increase in volume as they gain moisture, causing heave of supported structures, and shrink as they lose moisture, causing settlement of supported structures.

Illustration 1, on the next page, shows two of the most common sources for the introduction of water into the soil beneath a slab-on-grade foundation: plumbing leaks and precipitation penetrating the foundation perimeter. Plumbing leaks can spread under a foundation through the underground utility trenches in which the plumbing is installed. The utility trenches are typically filled with bedding sand below the pipes or conduits. Soil moisture typically travels less than a foot a year through solid clay but it can easily travel over 2 feet per minute in clean sand that is free of other materials.[2] Thus, the utility trenches can act as avenues for any leakage to spread throughout the building. Utility trenches can also provide under slab access for surface water that enters the utility trench at the perimeter of the building where the trench exits the footprint of the foundation.

Infiltration of rainwater and irrigation water at the building perimeter can be exacerbated by poor surface drainage if water is allowed to pond at the building perimeter and soak into the soil.

Post-construction moisture increases can also occur if a structure is built on top of excessively dry soil. This commonly occurs when a structure is constructed over an area where a large tree is removed shortly prior to construction. Trees remove large amounts of water from the soil, resulting in localized dry areas. After the tree is removed, the area gains moisture from environmental sources and swells. This can result in localized swelling of any structure constructed over the area where the tree was previously located.

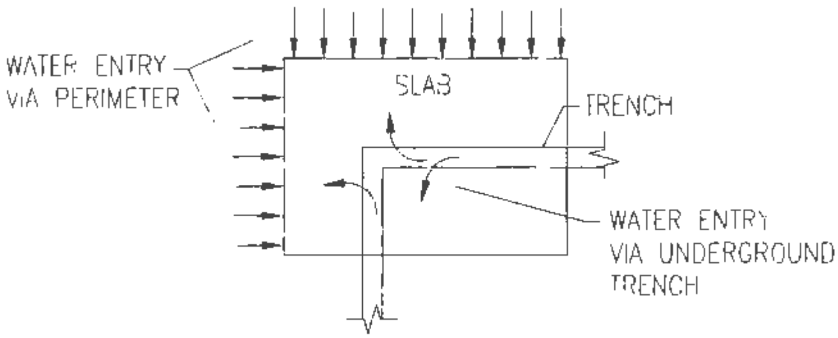


Illustration 1

Visual Observations

Representatives of Walter P Moore visited the site on March 3, April 1, and April 26 to visually observe the site conditions. During these visits we noted several cracks in the plaster board of the addition that were wider at the top than the base (Photo 1) and separation of floor tiles in the addition (Photo 2). We also noted cracks in the exterior masonry of the original building (Photo 3) and addition (Photo 4). As shown on Figure 1, this interior finish distress and exterior façade cracking is near the expected location of the underground plumbing trenches containing plumbing with known leaks.

Cracks were also observed in the exterior masonry of the original building squeezed closed near the roof in the vicinity of the addition (Photo 5) and in the concrete masonry unit walls of the original building (Photo 6). Deer Park Community Center staff also reported that some of the doors in the addition and original building had been trimmed. The orientation and locations of this distress is consistent with heave of the soil below the edge of the original building.

Elevation Data

In February of 2008 the Engineer-Of-Record (EOR) for the addition project gathered floor slab elevation data in the addition and original building. This data was used to develop a contour plot (Figure 2) of the relative floor elevations. The elevated area to the west side of the original building is a raised wooden dance floor, approximately 1 inch thick. We understand from conversations with the addition EOR and documentation provided to us that parts of the original building were underpinned in the past with limited success. The high points in the northeast corner of the original building suggest that this area may have been underpinned and possibly lifted at these locations in the past. The elevation data in Figure 2 will serve as a benchmark for use with future elevation readings to monitor any future movement of the building.

The large low area at the southeast corner of the original building suggests that this area has moved down relative to the surrounding area of the original building. This area is also adjacent to the areas of the addition experiencing the most significant signs of distress and movement. The lack of high points in the original building area also suggests that this area was not underpinned.

The EOR recently gathered limited additional elevation data that is similar to the more complete data set shown in Figure 2. This supplemental data suggests that the southern area of the addition is moving upwards relative to the rest of the building.

Plumbing Testing

Walter P Moore retained a specialty plumbing consultant to visually inspect and hydrostatically leak test the accessible underground plumbing associated with the addition. The inspection and test report is attached in the last section of this report.

These plumbing tests indicate that the main roof drain for the addition and the roof drain for the original building that is routed under the addition both leak. Neither of these lines was able to maintain a constant water level when plugged at the catch basin south of the addition (Photo 7) and filled to several inches below the finished floor slab elevation.

The video inspection (Photo 8) of the addition roof drain identified what appears to be a broken pipe joint located approximately 5.5 feet south and 9.5 feet west of the southern entry to the addition (Photo 9). Similarly, the video inspection of the original building roof drain located an unmarked line (approximately 6 inches in diameter) entering the roof drain approximately 17.5 feet south and 21 feet west of the southern entry to the addition (Photo 10). The overflow roof drain for the addition was able to maintain a constant water level for 30 minutes when plugged at the catch basin.

Plumbing tests indicate that two sanitary sewer line sections tested were essentially leak free. The specialty plumbing consultant indicated the minor head loss in sanitary system 2 (sanitary plumbing coming from original building) could have been caused by air bleeding out of the urinal flush mechanisms.

CONCLUSIONS AND RECOMMENDATIONS

Based on the geotechnical report provided for this addition project, the distress observed in both the original building and addition, and the previous foundation problems with the original building, it is our opinion that the noted movement at the addition is a result of changes in soil moisture in the underlying expansive clay soils. It is our opinion that soil and foundation movements will continue to occur unless the soil moisture is stabilized.

The results of the relative elevation survey as well as the observed damage suggest that the noted distress is a result of heave of the soil at the southwest corner of the addition. The presence of heave in this area indicates that the soil is gaining moisture, which we believe to be coming from the known plumbing leaks in the roof drain pipes. Infiltration of surface water under the foundation at these areas is another likely contributory factor. Removal of large trees from the area prior to construction of the addition could also be a contributing factor.

We recommend the following actions to further investigate the cause of movement and to assist in stabilizing the soil moisture below the foundation:

1) Repair the observed break in the 10 inch diameter addition roof drain and retest the line to verify no other leaks are present.
2) Locate and repair the leak(s) in the 12 inch diameter roof drain for the original building. Retest the system to verify no additional leaks are present.
3) Install clay plugs in the underground plumbing chases at the building perimeter to prevent exterior surface moisture from migrating into the soil below the addition.
4) Verify that perimeter drainage is adequate and that no ponding is occurring at the building perimeter.
5) Verify if any large trees were located to the east of the original structure prior to construction of the addition.
6) Repair disturbed interior finishes in a manner capable of accommodating continued differential movement (both upwards and downwards).

7) Monitor floor slab elevations semi-annually for at least two years to determine if relative movement of the floor slab is continuing.

LIMITATIONS

This report has been prepared to assist Morris Architects understand the nature and type of distress investigated in this study and determine a future course of action. Walter P Moore assessed specific issues relevant to the distress observed on the Deer Park Community Center Addition.

Walter P Moore has no direct knowledge of, and offers no warranty regarding the condition of concealed construction or subsurface conditions beyond what was revealed in our review. Any comments regarding concealed construction or subsurface conditions are our professional opinion, based on engineering experience and judgment, and derived in accordance with current standard of care and professional practice.

Various other non-structural, cosmetic and structural damage unrelated to this assessment may have been observed throughout the structure, some of which are discussed in general in this report. However, a detailed inventory of all cosmetic, nonstructural and structural damage was beyond the scope of our assessment. Comments in this report are not intended to be comprehensive but are representative of observed conditions. In this study we did not include review of the design, review of concealed conditions, or detailed analysis to verify adequacy of the structure to carry the imposed loads and to check conformance to the applicable codes. Repair recommendations discussed herein are conceptual and will require additional engineering design for implementation.

We have made every effort to reasonably present the various areas of concern identified during our site visits. If there are perceived omissions or misstatements in this report regarding the observations made, we ask that they be brought to our attention as soon as possible so that we have the opportunity to fully address them in a timely manner.

This report has been prepared on behalf of and for the exclusive use of Morris Architects. This report and the findings contained herein shall not, in whole or in part, be disseminated or conveyed to any other party or used or relied upon by any other party, in whole or in part, without prior written consent

REFERENCES

1 A&R Engineering and Testing, Inc. Project No. 05S3100 (September 2005), "GEOTECHNICAL INVESTIGATION – Proposed Community Center Addition – East San Augustine – Deer Park, Texas" Addressed to Mr. Nader Naderi, P.E. at the City of Deer Park.

2 Peck, R., Hanson, W., Thornburn, T. (1974). "Foundation Engineering", John Wiley & Sons: New York, pg 43.

PHOTOGRAPHS

Photo 1. Plaster board crack 1/8 inch wide at ceiling tapering out near floor of addition.

Photo 2. Separation of floor tiles in addition.

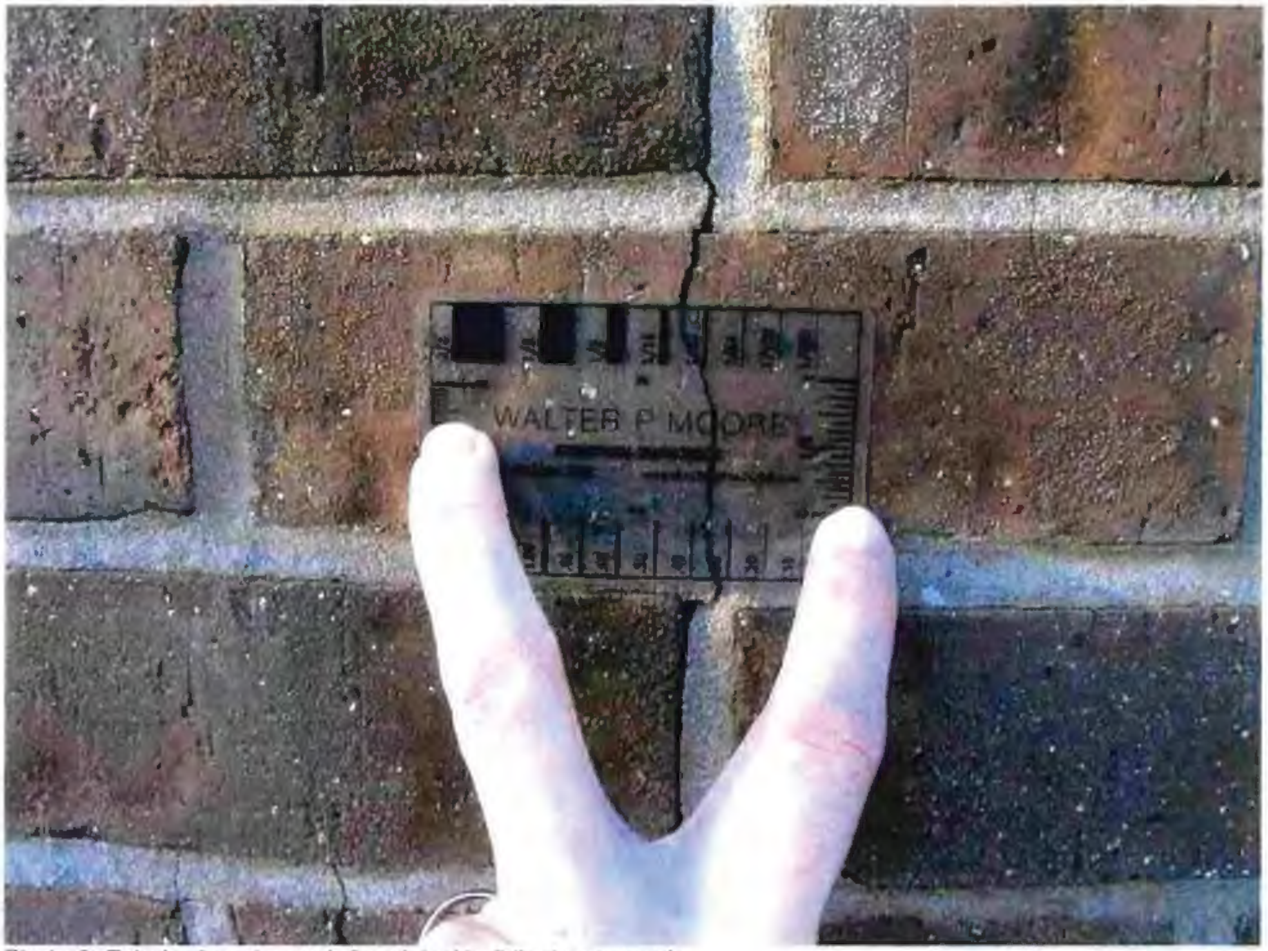


Photo 3. Exterior façade crack (in original building) near grade.

Photo 4. Exterior façade crack (in addition) near original building.

Photo 5. Exterior façade cracks (in original building) closing at top.

Photo 6. Concrete masonry unit cracks in original building wall.

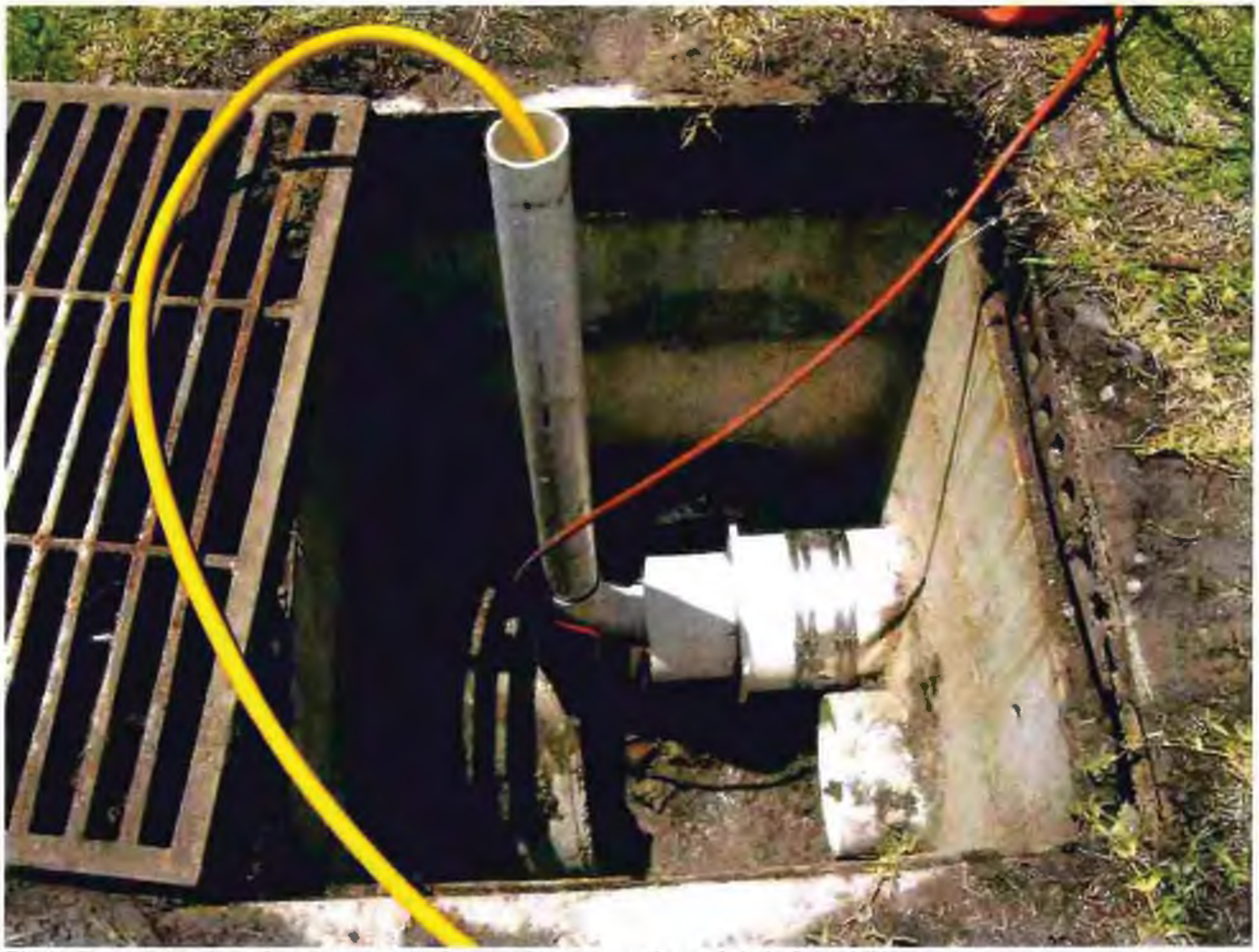


Photo 7. Leak testing of underground 10-inch diameter main roof drain for addition.

Video inspection of underground sanitary plumbing in addition.

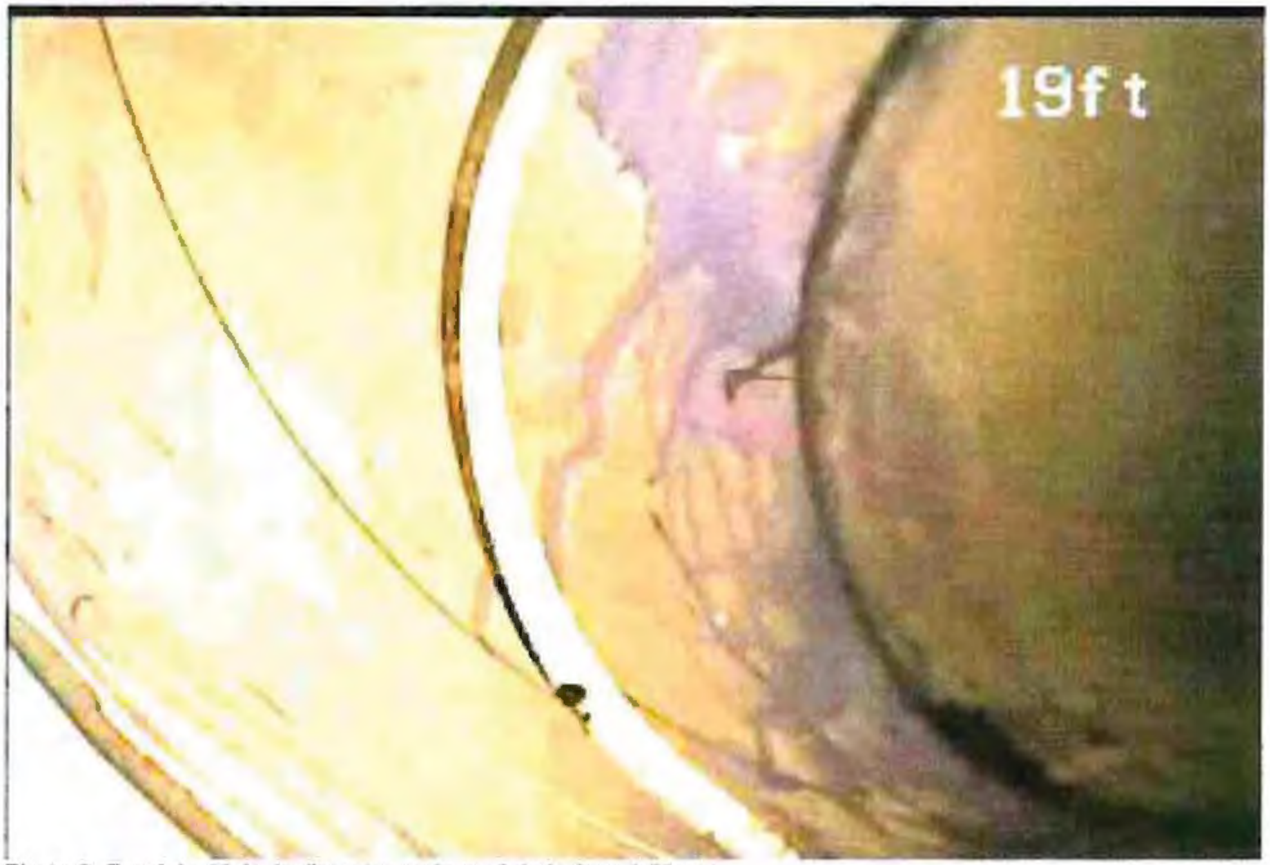


Photo 9. Break in 10-inch diameter main roof drain for addition.

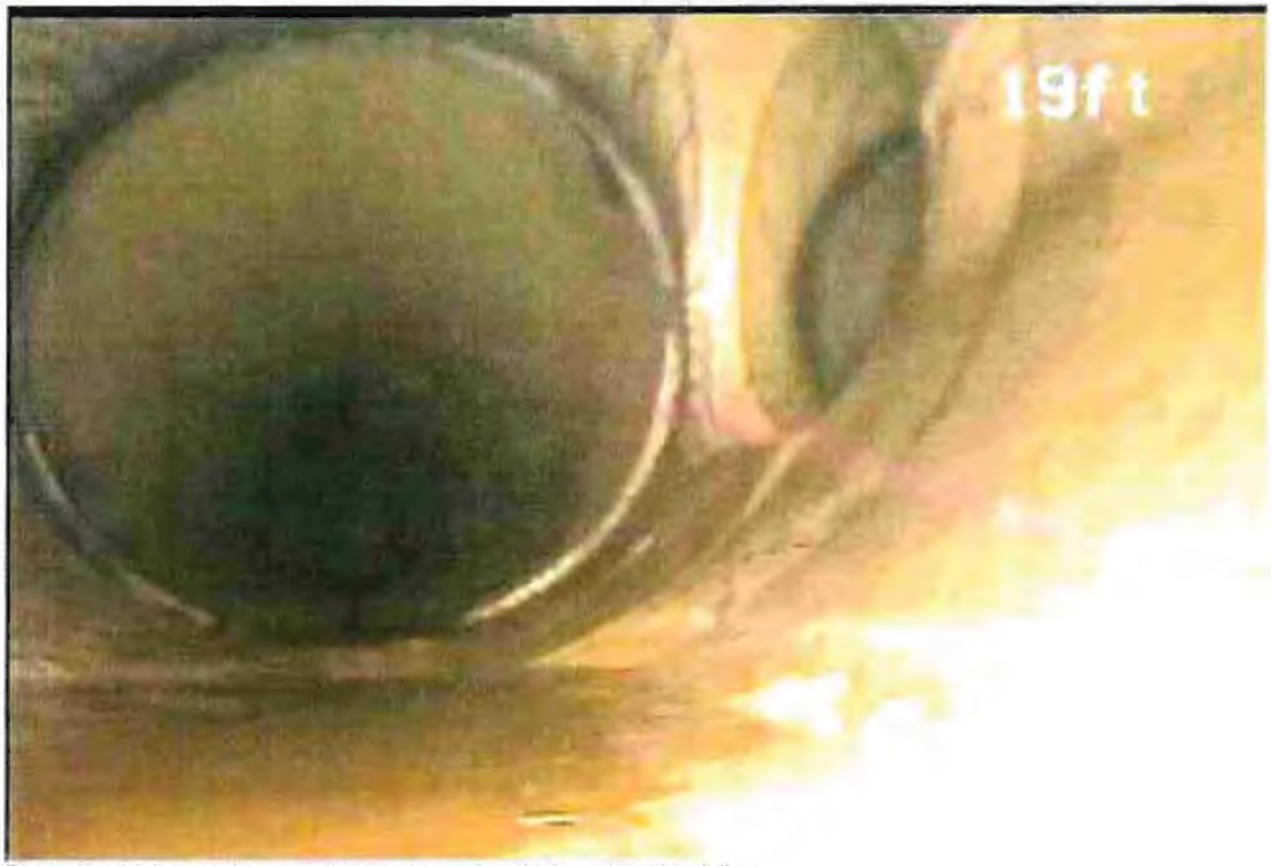
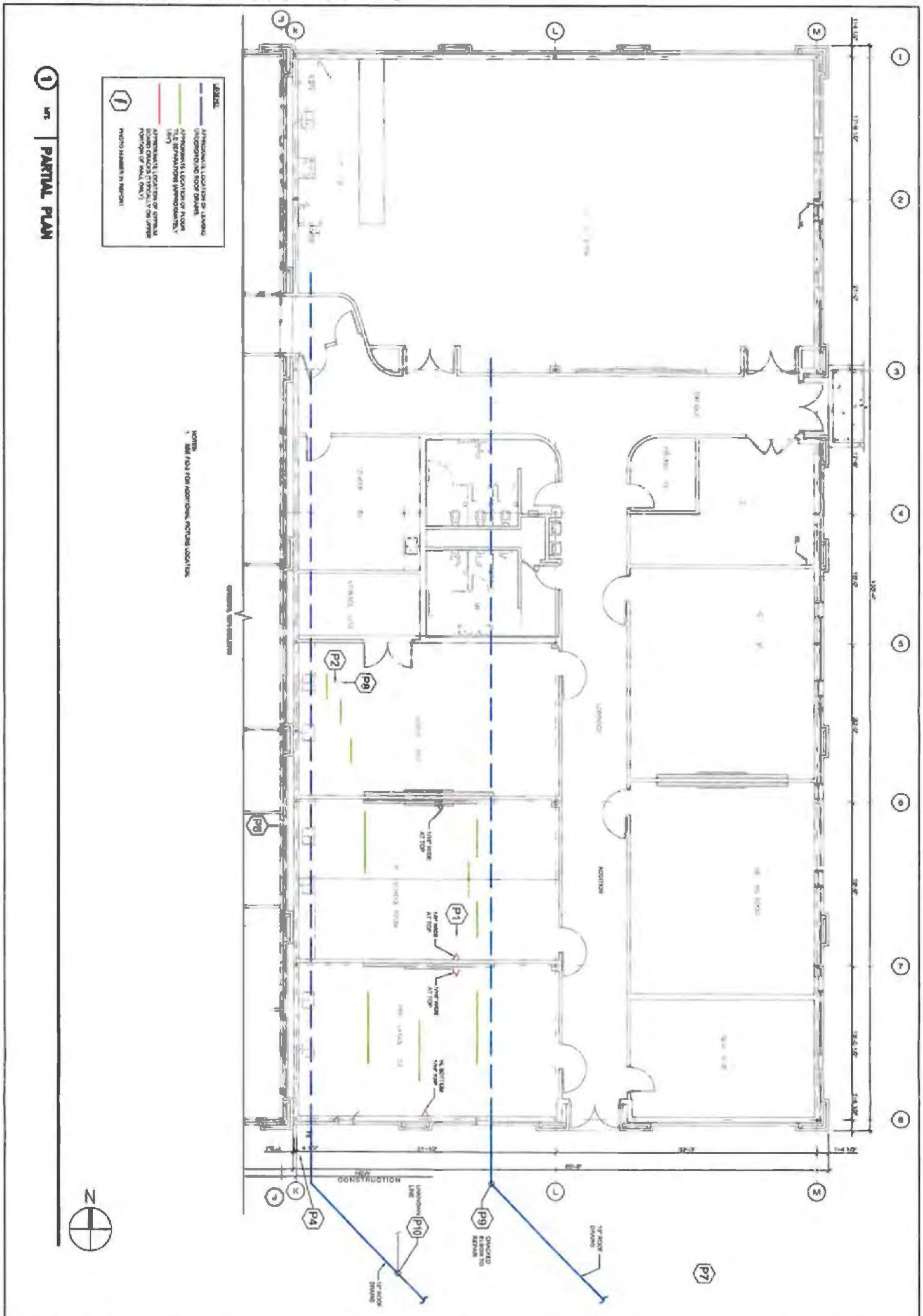


Photo 10. Unknown line entering main roof drain for original building.

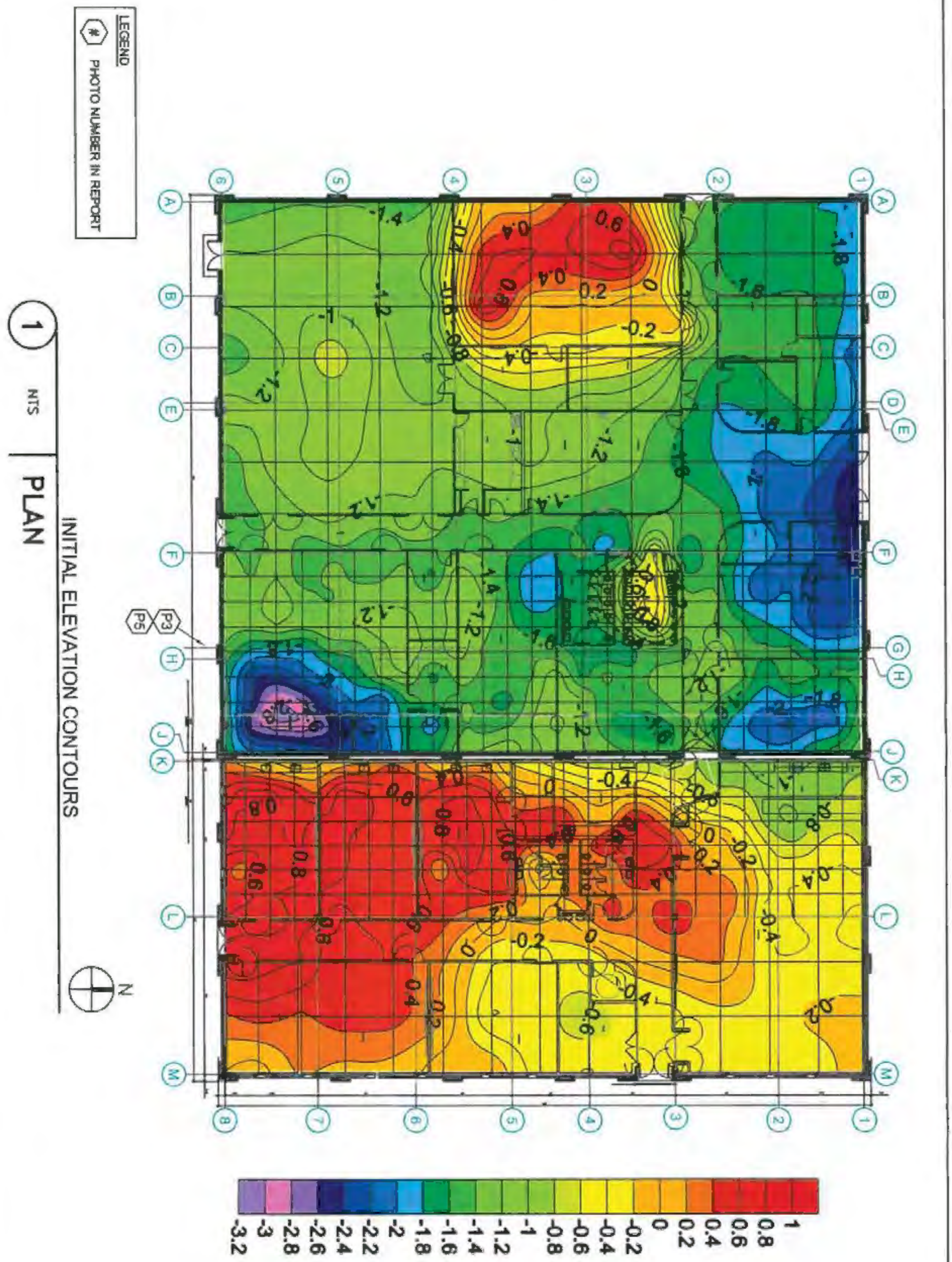
FIGURES

FILE: P:\43\2008\08030-00\CADD\Figures\FIG-1.dwg



WALTER P MOORE WALTER P. MOORE AND ASSOCIATES, INC. 1301 McKINNEY, SUITE 1100 HOUSTON, TEXAS 77010 PHONE: 713.630.7300 FAX: 713.630.7380	Project Name: DEER PARK COMMUNITY CENTER ADDITION	Date: June 6, 2008 Project No.: 43.08030.00 Engineer: RD Drafter: RC	Sheet: FIG-1
	Client: MORRIS ARCHITECS	Client Project No.:	1 of 2

FILE: P:\43\2008\08030-00\CADD\Figures\FIG-2.dwg



WALTER P MOORE WALTER P. MOORE AND ASSOCIATES, INC. 1001 McKINNEY, SUITE 1100 HOUSTON, TEXAS 77010 PHONE: 713.630.7300 FAX: 713.630.7396	Project Name: DEER PARK COMMUNITY CENTER ADDITION Client: MORRIS ARCHITECS	Date: June 6, 2008 Project No.: 43.08030.00 Engineer: RD Drafter: RD Client Project No.:	Sheet: FIG-2 2 of 2

ATTACHMENT - PLUMBING TEST REPORT

VORTEX PLUMBING, INC.
TESTING AND REPAIRS

May 19, 2008

Mr. Ray Drexler, P.E.
Walter P. Moore and Associates, Inc.
Via Email

Re: Deer Park Community Center Addition
Plumbing Tests
Vortex #08-1066

Dear Mr. Drexler:

We have tested and inspected the underslab drain systems at the above referenced location per your request. Our work was performed on April 26 and May 3, 2008. The results of our investigation are as follows:

Description

We have tested and inspected five independent drainage systems beneath the above referenced building, three storm drain systems and two sanitary drain systems. The results of our testing are as follows:

Sanitary System One

We tested sanitary system one by inflating a testball (TB1) in the piping at the location indicated on the drawing titled Drain Layout. We then filled the system with water and monitored the level at the floor cleanouts. The water level held for thirty minutes.

Sanitary System Two

We tested sanitary system two by inflating testballs (TB2 and TB2A) in the piping at the locations indicated on the drawing titled Drain Layout. We then filled the system with water and monitored the level at the cleanouts in the plumbing chase between tbe back-to-back restrooms. The water level dropped one-half inch in thirty minutes.

Overflow Roof Drain

We tested the overflow roof drain system by inflating a flow-through testplug in the piping where it enters the catch basin. We then filled the system with water and monitored the level. The water level held steady for thirty minutes.

Roof Drain (Addition)

We tested the roof drain system serving the addition by inflating a flow-through testplug in the piping where it enters the catch basin. We then filled the system with water and monitored the level. The water level dropped.

P.O. BOX 19736, HOUSTON, TX 77224
TEL (713)973-1632
FAX (713)973-1642

Roof Drain (Existing Building)

We tested the roof drain system serving the existing building by inflating a flow-through testplug in the piping where it enters the catch basin. We then filled the system with water and monitored the level. The water level dropped.

Index of Sewer Videos

File Name	Description
M0426001	Sanitary system one from cleanout in Rm. 11 (deformation @ g.b.)
M0426002	Roof drain system serving addition (possible crack at fitting)
M0426003	Overflow roof drain system
M0426004	Roof drain system serving existing building (unidentified inlet)
M0426005	Roof drain system serving addition after test
M0503001	Sanitary sewer from sample well to system two wye
M0503002	TB2 placement blocking wye serving sanitary system two
M0503003	Sanitary system two from TB2 back to C.O. in corridor
M0503004	Sanitary system two from c.o. in corridor to TB2
M0503005	Roof drain system serving existing building after test

Conclusions and Recommendations

Based upon the results of our testing and inspection, we believe that testing leaks exist on the 10-inch roof drain system (addition) and the 12-inch roof drain system (existing). Based upon the results of our investigation, we believe that the 10-inch roof and overflow drains are located farther west than indicated on the construction drawings.

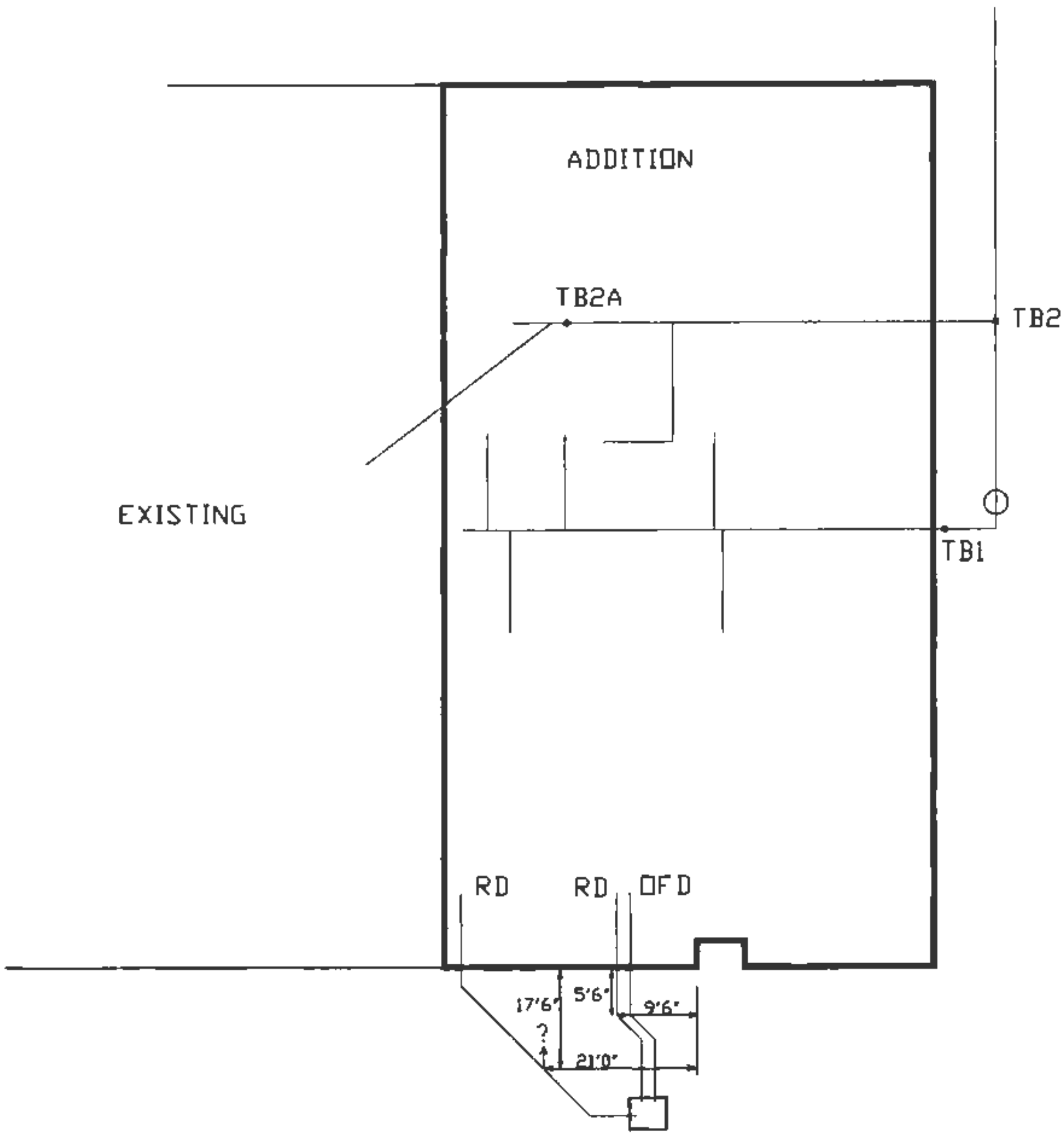
Vortex Plumbing, Inc. appreciates the opportunity to be of service. Please do not hesitate to call with any questions or comments.

Sincerely,

Mike Williams, P.E.
President

MW/mw

DRAIN LAYOUT IS FOR TESTING PURPOSES ONLY. EXACT LOCATION MAY VARY.



DRAIN LAYOUT

SCALE: NTS

VORTEX PLUMBING, INC.

DEER PARK COMMUNITY CENTER
ADDITION
DEER PARK, TX
VORTEX #08-1066

EXHIBIT D

Consulting Engineering Services

Deer Park Community Center
Deer Park, Texas 77536
September 30, 2013

Terracon Project No. F3128529

Prepared for:
City of Deer Park
610 East San Augustine Street
Deer Park, Texas 77536

Prepared by:
Terracon Consultants, Inc.
Houston, Texas

Offices Nationwide
Employee-Owned
Established in 1965
terracon.com

Terracon

Geotechnical ■ Environmental ■ Construction Materials ■ Facilities

Table of Contents

September 30, 2013

City of Deer Park
710 E. San Augustine Street
Deer Park, Texas 77536

Attn: Mr. Bill Pedersen, P.E.

Re: **CONSULTING ENGINEERING SERVICES**
Deer Park Community Center
610 East San Augustine Street
Deer Park, Texas 77536
Terracon Project No. F3128529

Dear Mr. Pedersen:

Terracon Consultants, Inc. is pleased to submit this engineering report for the Deer Park Community Center located at 610 East San Augustine Street in Deer Park, Texas. The purpose of this assessment is to render our opinion as to the cause of foundation/floor slab movement at the referenced location. This document includes background information, a discussion of our field activities, data collected during our field activities, and a discussion of our findings pertaining to the data. Site drawings and photographs are included as attachments. This work was performed, as requested by Mr. Bill Pedersen and in accordance with Terracon Proposal Number PF3120014, dated February 13, 2012.

We appreciate this opportunity to be of service to you on this project. If you have any questions regarding this document, please do not hesitate to contact Terracon.

Sincerely,
Terracon Consultants, Inc.
Texas Firm Registration F-3272

Jenna R. Halpern, E.I.T
Staff Engineer

Jigar Desai, Ph.D., P.E.
Department Manager

STATE OF TEXAS
JIGAR B. DESAI
107247
LICENSED
PROFESSIONAL ENGINEER
9/30/13

Jeff C. Roberts, P.E.
Office Manager, Vice President

CONSULTING ENGINEERING SERVICES
Deer Park Community Center
610 East San Augustine Street
Deer Park, Texas 77536
Terracon Project No. F3128529
September 30, 2013

1.0 PROJECT INFORMATION

1.1 Purpose

The purpose of Terracon Consultants, Inc.'s (Terracon) assessment is to render our opinion as to the cause of foundation/slab movement at the referenced location. This report includes background information, a discussion of our field activities, data collected during our field activities, and a discussion of our findings.

The subject is a one-story multi-purpose building located at 610 East San Augustine Street in Deer Park, Texas. The front of the building generally faces toward the north. Figure 1 of the Appendix B presents the general site plan. Terracon personnel conducted site visits on March 16 and 23, April 6 and 21, and May 14, 2012. This work is being performed as outlined in Terracon Proposal No. PF3120014, dated February 13, 2012. This work was authorized by Mr Bill Pedersen and in accordance with Terracon Proposal Number PF3120014, dated February 13, 2012.

1.2 Scope

Terracon proposed to provide the following scope of services for Testing Services at the above referenced site. The objective of these services were to obtain information as to the cause of this distress and a recommendation for a course of action to reduce future building differential movement. The following scope of work is quoted from Terracon Proposal No. PF3120014:

> **"Phase 1:**
>
> Document Review – Review available construction documents and other pertinent information regarding the history of the facility.
>
> Visual Observations – Site visit to document distress conditions of the referenced areas. Limited photographs of conditions observed will be included in our report.
>
> Relative Elevation Survey – Relative floor elevation measurements of the ground floor surface will be collected using digital measuring equipment. The elevation data collected will be used to generate a topographic drawing which will be presented in our report. A Type II benchmark will be installed in a landscape area on the property as part of this survey. This benchmark will remain in place after completion

of the project for future reference, if needed. The benchmark will not be referenced to any United State Geological Survey benchmark or other elevation datum.

Phase 2:

Soil Sampling Field Program – The soil sampling field program planned for the soil evaluation at this project will consist of drilling six test borings to depths up to 12 feet at interior locations to be determined following our relative floor elevation survey. Two test borings up to 20 feet in depth will be drilled in adjacent landscaped areas outside of the building. The borings are planned to be drilled using limited-access portable drilling in the interior and truck mounted equipment on the exterior.

Boring depths will be measured from the top of the existing floor slab or ground surface. The concrete floor slab at the interior boring locations will be cored. During drilling, test samples will generally be collected utilizing tube samplers. Once the samples have been collected and classified in the field, they will be prepared and placed in appropriate sample containers for transport to our Houston laboratory. The borings will be backfilled after completion and a temporary concrete patch will be placed at the surface. This scope and fee estimate does not include repair to floor coverings, and the City will be responsible for all repairs to any floor coverings damaged during coring and sampling operations.

Plumbing Testing Program – Testing of the plumbing system including the roof drains will be performed to determine if the system repairs recommended in 2008 have been effective. Hydrostatic tests will be performed to determine if leaks are present in the system. Leak location testing will be performed, if the hydrostatic tests indicate the presence of leaks, to isolate the location and to determine simulated normal flow loss levels. Video documentation of the piping, where conditions permit, will also be performed.

A written report will be provided detailing our field and laboratory work and reviews along with our opinion as to the cause of the observed slab movements. The report will also include recommendations for possible remedial actions, if any, that may be deemed appropriate.

Our scope does not include any strength analyses computations. If the condition of the structure warrants analyses of this nature, recommendations for such activities will be included in our report. Further, recommended remedial actions will not include detailed repair plans, specifications, or bid packages."

2.0 BACKGROUND INFORMATION

2.1 General Information

The Deer Park Civic Center is a single-story, steel framed structure with masonry exterior walls located in Deer Park, Texas. The building is founded on reinforced concrete drilled and belled piers with reinforced concrete grade beams and a slab-on-grade floor system. The original portion of the Community Center was constructed in 1975 and an addition to the building was constructed in 2007. The combined original building and addition encompass approximately 24,000 square feet.

Documents supplied to Terracon by the City indicate that the original structure and the addition are founded on highly expansive soils. Differential movement of building elements in the original building were observed during the life of the structure and foundation remediation was performed in 2003 based on recommendations by engineering consultants engaged by the City. Subsequent to this work, the addition area was constructed in 2007. Differential movement of the new addition building elements were observed shortly after completion of the addition and in 2008, the City engaged several engineering consultants to determine the cause of the noted movements and to recommend further action, if any, to prevent further movements and repair existing damage.

2.2 Design Documents

The original and addition design documents were requested from The City of Deer Park. Drawings A-2 through A-7 and S-1 through S-3 of the original structure were provided to Terracon and produced by Dansby & Miller and dated November 26, 1974. The structural drawings reviewed were sealed by Ernest L. Vogt, Jr., P.E. and Charles E. Haass, P.E. Drawings A1-0, A1-1, A1-2, A1-3, A2-1, A2-2, A2-3, A2-4, A3-1, A4-1, A4-2, A5-1, S0-1, S1-1, S4-1, S4-2, S6-1, S6-2, MEP1, M2, M3, M4, E2, E3, E4, E5, E6, P2, P3 and P4 of the addition structure were provided to Terracon and produced by Dansby & Miller and dated November 18, 2005 The structural drawings reviewed were sealed by Li-Wei Yu of JSE Consulting Engineers, Inc. of Houston, Texas.

A file containing previous engineering reports, plumbing tests, addition construction inspection records and photos, e-mails, letters, foundation repair contracts for the original building and geotechnical reports was provided by The City of Deer Park to Terracon. Two photos were provided to Terracon labeled "Trees to Be Removed for Expansion". The photos number from 1 through 7, the mature deciduous trees which were removed prior to the addition construction. See Figures 5 and 6 in Appendix B.

A previously issued engineering report entitled "Phase 1 Review" and produced by Walter P. Moore was supplied to Terracon by The City of Deer Park. The report was issued and sealed on June 6, 2008, by Mr. Ray F. Drexler, P.E. and consisted of nine typed pages. Three appendices were attached to the report with photographs, floor plan diagrams and a previous plumbing report. An elevation survey was conducted at the time of the previous report and a contoured drawing is attached in their report. The attached plumbing report was provided by Vortex Plumbing, Inc. and dated May 19, 2008. The results of the plumbing test found leaks in the 10-inch roof drain system for the addition and the 12-inch roof drain system for the existing structure. In summary, Mr. Drexler notes damage to the building including cracking in the interior sheetrock; separations in the vinyl floor tile; cracks in the exterior masonry of the original and addition structures and cracked interior masonry walls. Mr. Drexler concludes that the damage was due to plumbing leaks and differential foundation movement due to variations in soil moisture content.

3.0 PLUMBING INFORMATION

The sanitary sewer and storm lines were leak tested on July 1, 2012 by Plumbing HCL Services, LLC of Houston, Texas (HCL). A copy of their 1 page report, dated July 9, 2012, was provided to Terracon and is included in Appendix A. A static test was performed on the sanitary sewer lines in the addition area with no loss of water in an hour and a half. The 10-inch storm line for overflow drains had no loss of water. The 10-inch storm line for the addition would only fill from 6-inches to 12-inches below the finished floor slab. The 12-inch storm drain line for the original building would not fill.

The storm lines were viewed with a fiber-optic camera on July 9, 2012 by AAA Flexible Pipe Cleaning, Co., Inc. to determine the precise locations of the line breaks. The video of the lines was transferred to a DVD and sent to HCL for review. A copy of the DVD is attached to this report and a copy of the report log is included in Appendix A. This video shows a break the 10-inch PVC storm sewer line 21-feet from the camera entrance at the catch basin on the south side of the building. There is some evidence of a pipe cave-in at that location. The video also shows a break in the 12-inch PVC storm sewer line 35-feet from the camera entrance at the catch basin on the south side of the building. Both locations are on the exterior of the south side of the building and exact locations can be seen in Appendix A.

4.0 SITE INFORMATION

4.1 Relative Elevation Survey

Terracon conducted a relative interior floor elevation survey throughout the building using a Technidea ZIPLEVEL ™ PRO-2000 digital elevation measurement system and conventional line-of-sight instrumentation on March 23, 2012. The relative elevations are presented in tenths of an inch on Figure 2 of Appendix B. These measurements are adjusted, and account for variations in floor covering thickness or changes in grade.

Relative elevation contours are presented on Figure 3 of Appendix B. The elevation data collected in the field was used to generate the contour lines. The drawing presents the relative elevations in **inches**, adjusted for variations in floor covering thickness or changes in grade. The interval between contour lines is 1/4-inch.

The relative floor elevation contours demonstrate that the floor slab surface in the original building is generally flat, with high areas at the east end, at the addition joint. At the time of our survey, the foundation in the original area of the building exhibited about 2-3/8 inches of vertical elevation differential.

The relative floor elevation contours demonstrate that the addition foundation slab floor surface generally slopes downward from the corridor running north-south to the east and west perimeter of the addition. At the time of our survey, the foundation in the addition area of the building exhibited about 5-5/8 inches of vertical elevation differential.

A three dimensional representation of the floor slab elevation contours is presented in Figure 4 of Appendix B. The vertical scale in the drawing has been highly exaggerated and it must be understood that this drawing is meant strictly as a qualitative visual aid.

4.2 Soil Sampling and Data and Test Pit Information

Soil samples were obtained from the exterior and below the foundation for testing and classification purposes. A total of eight borings were made on April 6, April 21, and May 14, 2012. A benchmark was installed on the exterior of the building at boring location B-6 on April 6, 2012. Soils were obtained at this location to approximately fifteen feet by sampling the soils utilizing hydraulic sampling methods The other exterior samples, B-7 and B-8, were obtained to approximately twelve feet by sampling the soils utilizing hydraulic sampling methods The interior samples, B-1 through B-5, were obtained by coring through the existing slab and sampling the soils utilizing hydraulic sampling methods. Samples were taken to an approximate depth of twelve-feet below the finished floor surface at the interior boring locations. Boring and sampling locations are as shown on Figure 1 in Appendix B.

The soil samples obtained were returned to our Houston laboratory for testing. Boring logs are attached in Appendix C presenting the concrete slab and subsurface soil profiles noted in the field as well laboratory test results. The concrete slab thicknesses as measured in the field varied from 4-1/2 inches to 5-1/2 inches. A plastic vapor barrier was observed at all interior boring locations. A void between the bottom of the slab and the soil below was noted at B-2 and was approximately 1 inch.

The soil profile for sample B-1 generally consisted of a sandy silty clay layer and a fat clay layer which appeared to be imported fills overlaying gray, medium stiff to very stiff, fat clay with ferrous stains, scattered tree roots from 3 feet to 5 feet and calcareous nodules below eight feet. The boring was terminated at 10 feet due to the presence of water.

The soil profile for sample B-2 generally consisted of a silty sand layer and a fat clay with sand layer which appeared to be imported fills overlaying gray and light gray lean clay with sand with ferrous stains. The soil approximately seven feet to twelve feet from the top of the slab consisted of light gray, tan and reddish brown, medium stiff to stiff, fat clay with ferrous stains, calcareous nodules and sand pockets. Scattered tree roots were observed from 7 feet to 9 feet.

The soil profile for sample B-3 generally consisted of a sandy lean clay layer, a lean clay with sand layer and a poorly graded sand layer which appeared to be imported fill overlaying gray, stiff, fat clay with sand pockets and ferrous stains. The boring was terminated at 6-3/4 feet due to the presence of water

The soil profile for sample B-4 generally consisted of a lean clay with sand layer and a sandy lean clay layer which appeared to be imported fills overlaying dark gray, stiff to very stiff, fat clay with scattered roots from 4 feet to 8 feet and sand pockets below 7 feet. Below 8 feet the fat clay changes to a light gray, reddish brown and gray color with calcareous nodules and ferrous stains.

The soil profile for sample B-5 generally consisted of a sandy lean clay layer which appeared to be imported fill overlaying dark gray, very stiff, fat clay with ferrous stains and scattered roots. The soil approximately 6 feet to 10 feet from the top of the slab consisted of gray and tan, very stiff, fat clay with sand with ferrous stains, sand pockets and scattered roots. The soil approximately 10 feet to 12 feet from the top of the slab consisted of reddish brown and light gray, very stiff, fat clay with ferrous stains, calcareous nodules and silt pockets.

Natural moisture contents of the soils below the building ranged from 14 to 35 percent. Tests were performed on selected samples to obtain the Atterberg Limits. The Liquid Limits of the samples tested from the five borings ranged from 23 to 75 percent. The Plastic Limits of the samples tested ranged from 14 to 38 percent. The resulting Plasticity Indices calculated of the samples ranged from 7 to 53.

The soil profile for sample B-6 generally consisted of a lean clay with sand layer which appeared to be imported fills overlaying dark gray, stiff to very stiff, fat clay with ferrous stains, calcareous nodules and scattered roots. The soil approximately 7 feet to 9 feet from existing grade consisted of gray and tan fat clay with sand with calcareous nodules, sand pockets and scattered roots. The soil approximately 9 feet to 15 feet from existing grade consisted of light gray and reddish brown, soft to very stiff, fat clay with calcareous nodules and ferrous stains.

The soil profile for sample B-7 generally consisted of a sandy lean clay with sand layer and a sandy lean clay layer which appeared to be imported fills overlaying dark gray, very stiff, lean clay with sand pockets, ferrous stains, calcareous nodules and scattered roots. The soil approximately 5 feet to 8-1/2 feet from existing grade consisted of dark gray, very stiff, fat clay with ferrous stains, calcareous nodules and scattered roots. The soil approximately 8-1/2 feet to 12 feet from existing grade consisted of gray, light gray, and tan lean clay with calcareous nodules, ferrous stains, sand pockets and scattered roots with silt pockets below 11 feet.

The soil profile for sample B-8 generally consisted of a lean clay with sand layer which appeared to be imported fill overlaying dark gray, very stiff, fat clay with scattered roots, calcareous nodules from 4 feet to 8 feet and ferrous stains from 6 feet to 8 feet. The soil approximately 8 feet to 12 feet from existing grade consisted of reddish brown, gray and dark gray, very stiff, lean clay with calcareous nodules, ferrous stains and scattered roots.

Natural moisture contents of the exterior clay ranged from 12 to 30 percent. Tests were performed on selected samples to obtain the Atterberg Limits. The Liquid Limits of the samples tested ranged from 35 to 62 percent. The Plastic Limits of the samples tested ranged from 14 to 19 percent. The resulting Plasticity Indices calculated ranged from 21 to 45.

Two test pits were excavated on the exterior of the building. Test Pit 1 was excavated on the south end of the building at the addition joint and Test Pit 2 was excavated on the east side of the building. The location of the test pits are identified in Figure 1 of Appendix B. The grade beam around the perimeter of the building was measured to be approximately 28-inches deep. Drilled piers were observed beneath the grade beams at both locations. The grade beam did not appear to be connected to the piers at either location. Water was observed in Test Pit 2 at the base of the grade beam.

4.3 Visual Observations

Terracon conducted limited visual observations on the interior and exterior of the building. Some of our observations were limited due to finishes, room contents, etc. Although our observations were made with normal care and diligence, it is likely that not all existing conditions were documented. The general intent was to identify representative conditions. A plan view documenting the location of the photographs taken can be seen in Figure 22 of Appendix D. The photograph numbers 1 through 77 correlate to the photo numbers in the photo log which follows Figure 22 in Appendix D.

5.0 DISCUSSION

Based on our experience and published data, the soils present in this area are considered to be low to expansive soils and may be present below the structure. These soils may exhibit volumetric changes with fluctuations in the soil water content. The soils will shrink, or decrease in volume, when they lose water and swell, or increase in volume, with the addition of water. The long-term performance of a shallow concrete foundation is directly affected by changes in soil water content. Conditions that may impact foundation performance include climate, vegetation, plumbing leaks, irrigation, and site drainage to name a few.

Evapo-transpiration effects can play an important role in the behavior of shallow footings and slabs at or near grade. The type and extent of vegetation present on a site affects the water content of the soil since some types of trees, shrubs, and grasses require more moisture than others. Trees and other vegetation can remove water from the soils beneath a foundation via their root systems. Root systems of trees generally extend beyond their foliage canopy and trees growing more closely to the building than 1-1/2 times their height may affect the building foundation. In addition, the extent to which existing vegetation is watered, or not watered, may also directly affect the soil moisture conditions. Watering in dry periods will help offset the loss of moisture from the vegetation. Conversely, lack of irrigation in dry periods will aggravate the moisture removal and usage by the vegetation resulting in an increase in potential for soil shrinkage and foundation movement.

The removal of water from the foundation supporting soils by certain species of trees can lead to a desiccated or drier soil zone in the range of three to six feet below the surface. This zone is, in effect, pre-consolidated by the removal of moisture by the tree. If the tree is removed, rebound of the desiccated zone slowly occurs as water re-hydrates the soils and the soil volume expands. Terracon was provided with two photos by The City of Deer Park labeled "Trees to Be Removed for Expansion" The photos number from 1 through 7, the mature deciduous trees which were removed prior to the addition construction. See Figures 5 and 6 in Appendix B. Further, aerial photography of the site from July 2005 to March 2011 indicates that mature trees were removed from the site prior to construction. See Figures 7 through 10 in Appendix B. Whenever mature trees are removed from a site prior to construction, special procedures should be employed to allow rehydration and volume change of the soil to occur prior to the actual commencement of building. It is likely that the removal of these trees prior to construction of the building have contributed to differential movement of the building slab-on-grade foundation.

Relative floor contours were plotted using the relative floor elevation measurements recorded on March 23, 2012. These contours indicate that the floor slab surface in the **original** building is generally flat, with high areas at the east end, at the addition joint. At the time of our survey, the foundation in the original area of the building exhibited about 2-3/8 inches of vertical elevation differential. The relative floor elevation contours demonstrate that the **addition** foundation slab floor surface generally slopes downward from the corridor running north-south to the east and west perimeter of the addition. At the time of our survey, the foundation in the addition area of the building exhibited about 5-5/8 inches of vertical elevation differential.

The movement and distress observed in the building is related to slab movement due to the volumetric change of the expansive soils below the structure. The areas of high elevations correlate to areas where trees were located prior to building construction. The absence of voids in these areas, demonstrates that the soils are heaving upwards due to rebound of the desiccated zone where trees were located prior to construction.

It can be seen from the construction documents that the addition floor slab is doweled into the original floor slab. Since the addition floor slab is heaving upwards due to rebound of the desiccated zone, the original floor slab is being pulled upwards at the addition joint. This is why distress can be seen in both the exterior and interior architectural finishes at that location and a 1-inch void was observed at boring location B-2, adjacent to the addition in the original area of the building. It was observed in the test pits that the concrete piers were not connected to the grade beam. This can be due to poor construction methods or because the foundation/slab moving upwards, owing to heaving soils, and being lifted off of the piers. The piers should be reconnected to the grade beams in all locations so the foundation is adequately supported. All work performed on the foundation of the structure should be done under the guidance and supervision of a licensed professional engineer, experienced in this area of work.

Follow-up relative elevation surveys are recommended to be conducted at six-month intervals after the original and addition foundations have been detached and the piers have been attached to the grade beams to monitor the elevations in the desiccated zones. Movement of the foundations is expected after the foundation remediation has been performed. Once the elevations have appeared to have settled, additional remedial foundation repair may be recommended.

Soil samples were collected at five locations below the interior concrete floor slab and three locations on the exterior of the building. The Moisture Contents (MC's) of the selected samples with their corresponding depths for each boring are presented on Figure 21 of Appendix C. There were scattered tree roots in the native soils of all of the eight borings except for location B-3. Boring B-3 was terminated at 6-3/4 feet due to the presence of water and, therefore, only 1/2 foot of native soils was obtained. The presence of roots shows that trees were present at the current foundation locations prior to construction. More than 40 years elapsed between construction of the original foundation and the addition foundation. Even though scattered roots were present beneath the original foundation, it had already reacted to the desiccated soils before the addition was built.

Plumbing leaks were located in the storm lines adjacent to the foundation. Breaks in the storm water line systems were detected by HCL Services, LLC and AAA Flexible Pipe Cleaning, Co., Inc. on the south exterior of the addition, adjacent to the foundation slab. These breaks are assumed to be the same areas as described in the Vortex Plumbing, Inc. report dated May 19, 2008, attached to the June 6 2008, Walter P. Moore Phase 1 Review. A radial upheaval of the floor slab would be anticipated around the leak areas if sufficient water had been discharged into the clay soils. The water leaking from these breaks can be absorbed by the desiccated soils beneath the addition slab. This would speed up the process of the soil expansion, causing the soil to heave and lift the floor slab.

The soil affected by long-term tree growth may undergo volume change after removal of the tree for as much as ten years. Since the addition is approximately five years old, follow-up relative elevation surveys should be conducted at six-month intervals to determine if the soils in the desiccated zones are continuing to increase in volume. If, at that time, the relative elevation survey still shows the same or continued distress patterns, remedial foundation repair will be recommended.

The movement and distress observed in the building is related to slab movement due to the volumetric change of the expansive soils below the structure. Terracon recommends installing a moisture barrier at the east side of the building. A moisture barrier system reduces the potential ingress and egress of water under the building. The installation should be done under the guidance and supervision of a licensed professional engineer, experienced in this area of work.

6.0 OPINIONS AND CONCLUSIONS

On the basis of the data presented herein, information provided by others, and our experience with structures bearing on concrete slab-on-grade foundation systems, it is our professional opinion that:

- Evapo-transpiration effects and the subsequent removal of trees before construction have likely, in part, contributed to differential vertical movements in the supporting soils of the slab-on-grade foundation and the differential movement of the concrete foundation slab. Based on the length of time since the tree removal, approximately 5 years, the full rebound of the soils likely has not occurred.
- The water from the storm line leaks is contributing to the vertical movements in the supporting soils of the slab-on-grade foundation. A licensed plumber should repair the storm line leaks in accordance with applicable codes. Open excavations adjacent to or below the foundation should be made and backfilled as quickly as possible. Water should not be allowed to accumulate in the excavations. Any excavations beneath the building should be made and backfilled under the direction of a licensed professional engineer
- Terracon recommends that the piers be reconnected to the grade beams at all locations so the foundation is adequately supported. All work performed on the foundation of the structure should be done under the guidance and supervision of a licensed professional engineer, experienced in this area of work.
- The installation of a moisture barrier system is recommended on the east side of the building to prevent the ingress and egress of water under the building. If a moisture barrier system is elected, a licensed professional engineer should be consulted about the proper placement and depth of the barriers. The installation should be done under the guidance and supervision of a licensed professional engineer, experienced in this area of work.
- Follow-up relative elevation surveys are recommended at six-month intervals to monitor the elevations in the desiccated zones. A period of time after the moisture barrier installation, and the follow-up relative elevation surveys still show the same or continued distress patterns, additional remedial foundation repair will be recommended
- A landscape irrigation program should be implemented which will help to maintain consistent water content in the soils adjacent to and beneath the building. The goal of this program should be to maintain the soils beneath and adjacent to the foundation at as uniform a water content as possible throughout the year. The amount of water required to achieve this objective can fluctuate widely based on different parameters such as climactic conditions (wet, normal, or dry periods), soil conditions, and vegetative influences. Un-monitored, automatic programs of irrigation may result in adverse effects,

just as a total lack of irrigation may have an adverse effect. Guidance in this area may be obtained by consulting licensed landscaping architects, arborists, and / or licensed professional engineers experienced in foundation design and remediation. The goal of this program should be to maintain the soils beneath and adjacent to the foundation at as uniform a water content as possible throughout the year.

7.0 LIMITATIONS

The analysis and opinions presented in this report are based upon the information provided to us by the City of Deer Park and data collected at the project site at the time of our site visit. While additional conditions may exist that could alter our conclusions, we feel that reasonable means have been made to fairly and accurately evaluate the existing conditions at this project.

The scope of services for this project does not include either specifically or by implication any environmental or biological (e.g. mold, fungi, bacteria) assessment of the site or identification or prevention of pollutants, hazardous materials or conditions. If the owner is concerned about the potential for such contamination or pollution, other studies should be undertaken.

This report has been prepared for the exclusive use of the City of Deer Park for specific application to the project discussed and has been prepared in accordance with generally accepted engineering practices using the standard of care and skill currently exercised by professional engineers practicing in this area, for a project of similar scope and nature. No warranties, either express or implied, are intended or made. It is possible that defects and/or deficiencies exist that were not readily accessible or visible. Problems may develop with time, which were not evident at the time of this assessment. The opinions and recommendations in this report should not be construed in any way to constitute a warranty or guarantee regarding the current or future performance of any system identified. In the event that information described in this document which was provided by others is incorrect, or if additional information becomes available, the conclusions and recommendations contained in this report shall not be considered valid unless Terracon reviews the information and either verifies or modifies the conclusions of this report in writing.

APPENDIX A
Plumbing Reports

FLEXIBLE PIPE CLEANING
"WORKING FOR A CLEANER ENVIRONMENT"
3900 Underwood Road
LaPorte, Texas 77571
Phone (281) 476-5200

DVD # 1

Date: 7-9-2012
Cust: TERRACON
Area: 610 E. San Augustine Deer Park Comm. Ctr. Setup #:
Line #: Storm Sewer Page #: 1-2
From MH #: To MH #:

CLOSED CIRCUIT TELEVISION INSPECTION REPORT

DISTANCE READING (Ft.)	JOINT CONDITION	DESCRIPTION OF DEFECT OR PROBLEM	RATE OF LEAK (G.P.M.)	POSITION
		Setup # 1		
10" PVC STORM SEWER LINE @ Deer Park				
	Community Center (Back)(Line # 1 - East)			
0 FT	Televising From Catch Basin (Back of the			
	Building) going Upstream Direction.			
13 FT	Turn to the left Side (45°)			
22 FT	Turn to the Right Side. (45°)			
62 FT	Service line			3
78 FT	Far we can Push the Camera.			
78 FT	End of Inspection.			
		Setup # 2		
10" PVC	STORM SEWER Line @ Deer Park Community			
	Center (Back - Line #2 - West)			
0 FT	televising from Catch Basin going to			
	Upstream Direction on Line # 2 (West)			
12 FT	Turn to the left Side. (45°)			
21 FT	Broken Pipe (Some Evidence of Cave-in)			
21 FT	Turn to the Right Side (45°)			
62 FT	Service Line			/
63 FT	Reduce Diameter 10" — 8"			
70 FT	Far we Can Push the Camera			
70 FT	End of Inspection			
		Setup # 3		
12" PVC STORM SEWER Line @ Deer Park Community				
	Center (Back)(Line # 3)			
0 FT	Televising From Catch Basin (Back of the Building)			
	going West Direction.			

AAA
FLEXIBLE PIPE CLEANING
"WORKING FOR A CLEANER ENVIRONMENT"

3900 Underwood Road
LaPorte, Texas 77571
Phone (281) 476-5200

DVD # 1

Date: 7-9-2012
Cust: TERRACON
Area: 610 E. San Augustine / Bear Park Community Ctr. Setup #:
Line #: Storm Sewer Page #: 2
From MH #: To MH #:

CLOSED CIRCUIT TELEVISION INSPECTION REPORT

DISTANCE READING (Ft.)	JOINT CONDITION	DESCRIPTION OF DEFECT OR PROBLEM	RATE OF LEAK (G.P.M.)	POSITION
4FT	Turn to the Right Side			
20FT	Service Line			3
35FT	Change elevation - Reduce Diameter			
35FT	Broken Line			9-12
50FT	Far we Can Push the Camera on			
	12" PVC Line			
	End of Inspection			

SERVICES, LLC.

7-9-12

To: Terracon

Attention: Jenna Halpern

Reference: Deer Park Community Center

Dear Jenna,

On July 1, 2012, we performed testing on the sanitary sewer and the storm lines at Deer Park Community Center. We performed a static test on the sanitary sewer and observed it for approximately One and a half hours. There was no loss of water visible. We performed a static test on the storm lines and the results varied. On 1-10" storm line, which is the line for the overflow drains, the line held a static test with no apparent water loss. On the other 10" line which is the main drain for the new addition, we could not achieve a good test on this. We were only able to get water to hold about 6" -12" below floor level, meaning there must be some sort of separation or crack around the floor level. On the 12" line which is the storm drain for the original building, we were not able to achieve any type of measureable level. We continuously filled the line with water for over an hour and were unable to raise the level at all.

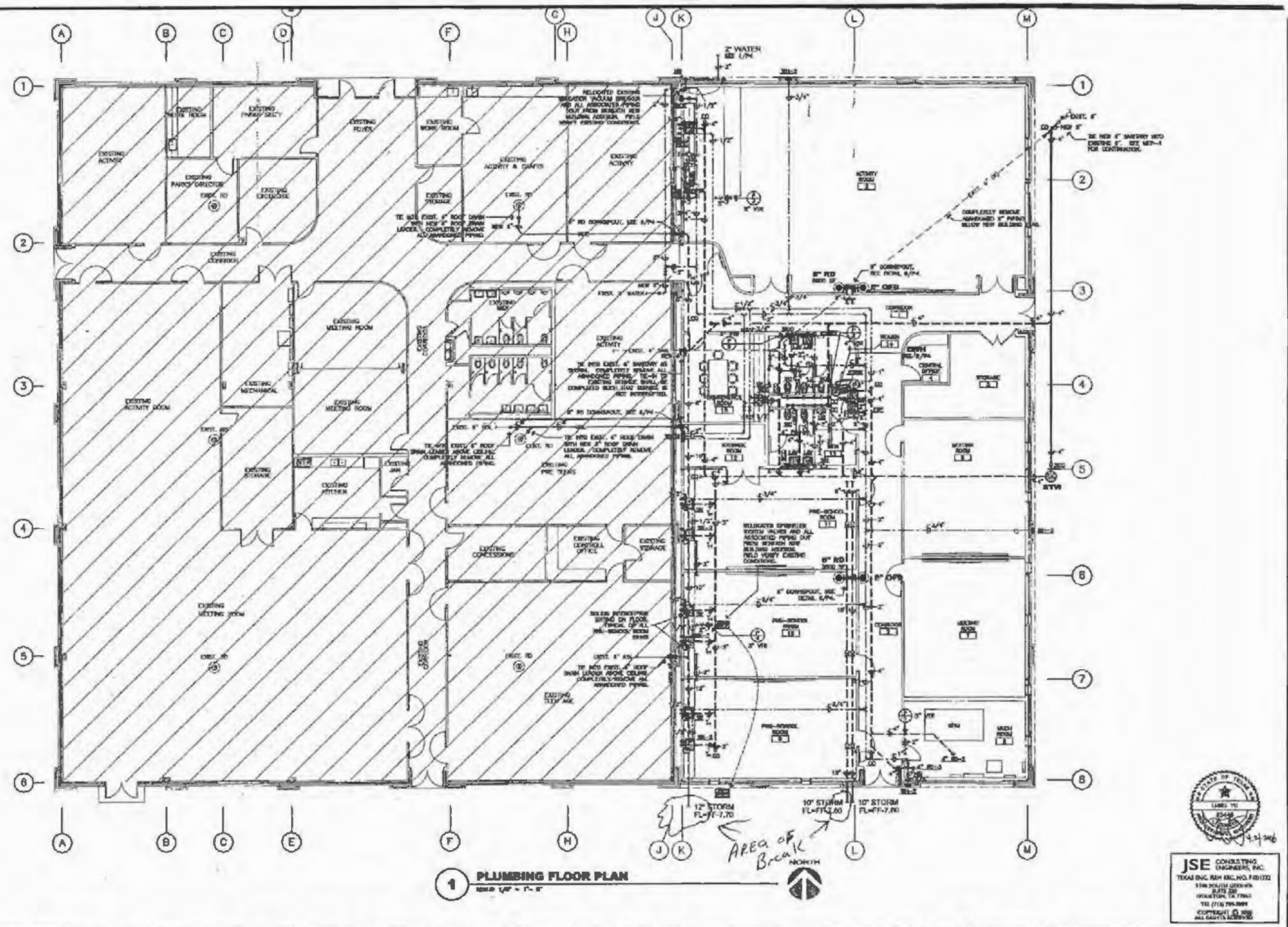
We have scheduled a third party company to camera these lines on Monday, July 9, 2012.

If you have any questions, please call me at my office at 713-686-8606.

Sincerely,

Greg Maxwell
Service Manager
HCL Services

MPL 37753
Gregory J. Maxwell



DANSBY & MILLER ▫ A.I.A. ▫ ARCHITECTS
WILLIAM K. MILLER
ROMNEY E. DANSBY

ADDITION TO
DEER PARK COMMUNITY CENTER
DEER PARK, TEXAS

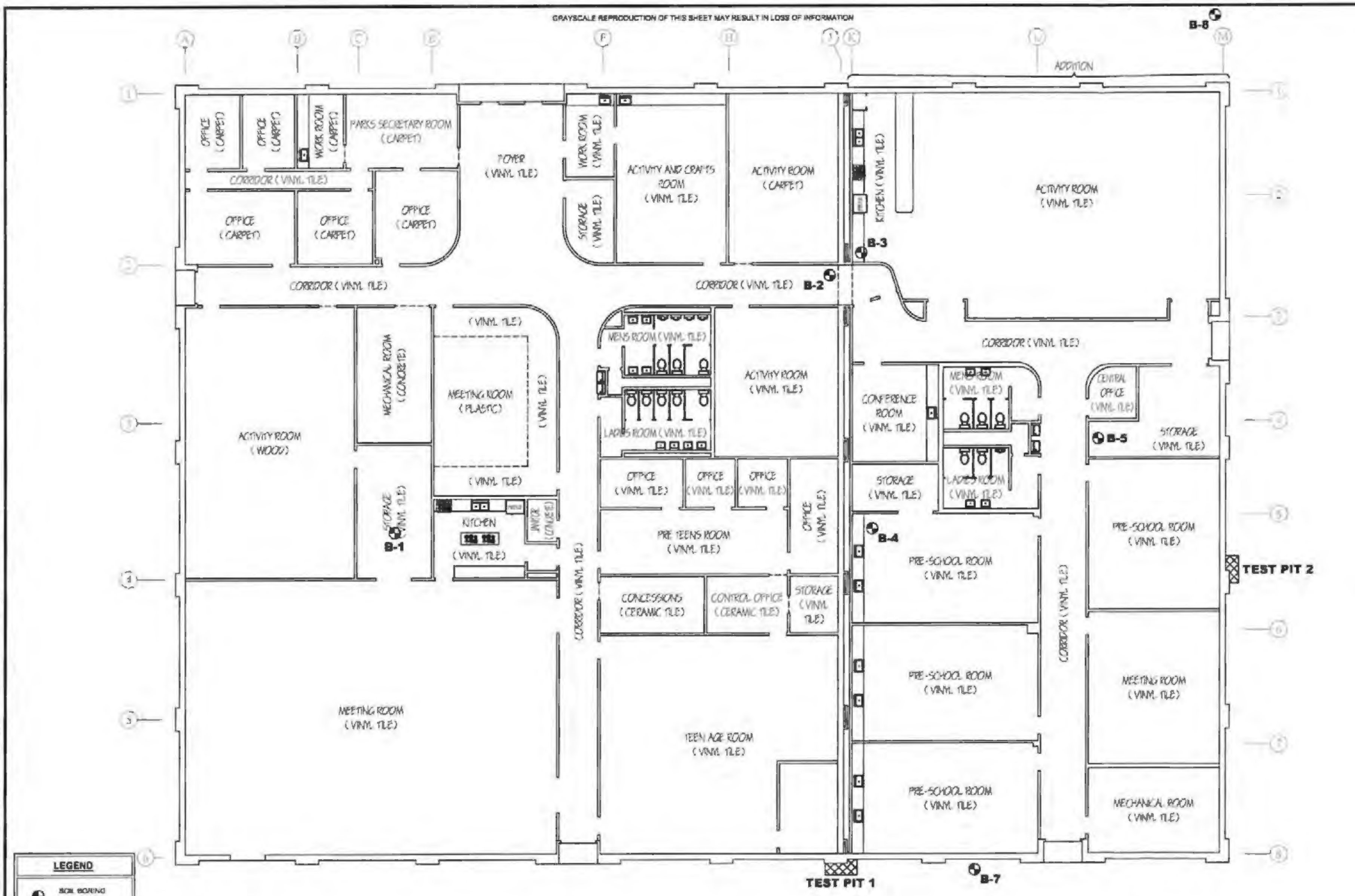
PLUMBING
FLOOR PLAN

Drawn By: JSH
Checked By: LY
Date: 11-18-00
Job #: 201-7

P2
26 of 30

APPENDIX B
Site Plans

GRAYSCALE REPRODUCTION OF THIS SHEET MAY RESULT IN LOSS OF INFORMATION



NOTE:
1. DRAWING BASED ON DATA OBTAINED DURING SITE VISIT OF MARCH 23, 2012
2. ALL LOCATIONS ARE APPROXIMATE

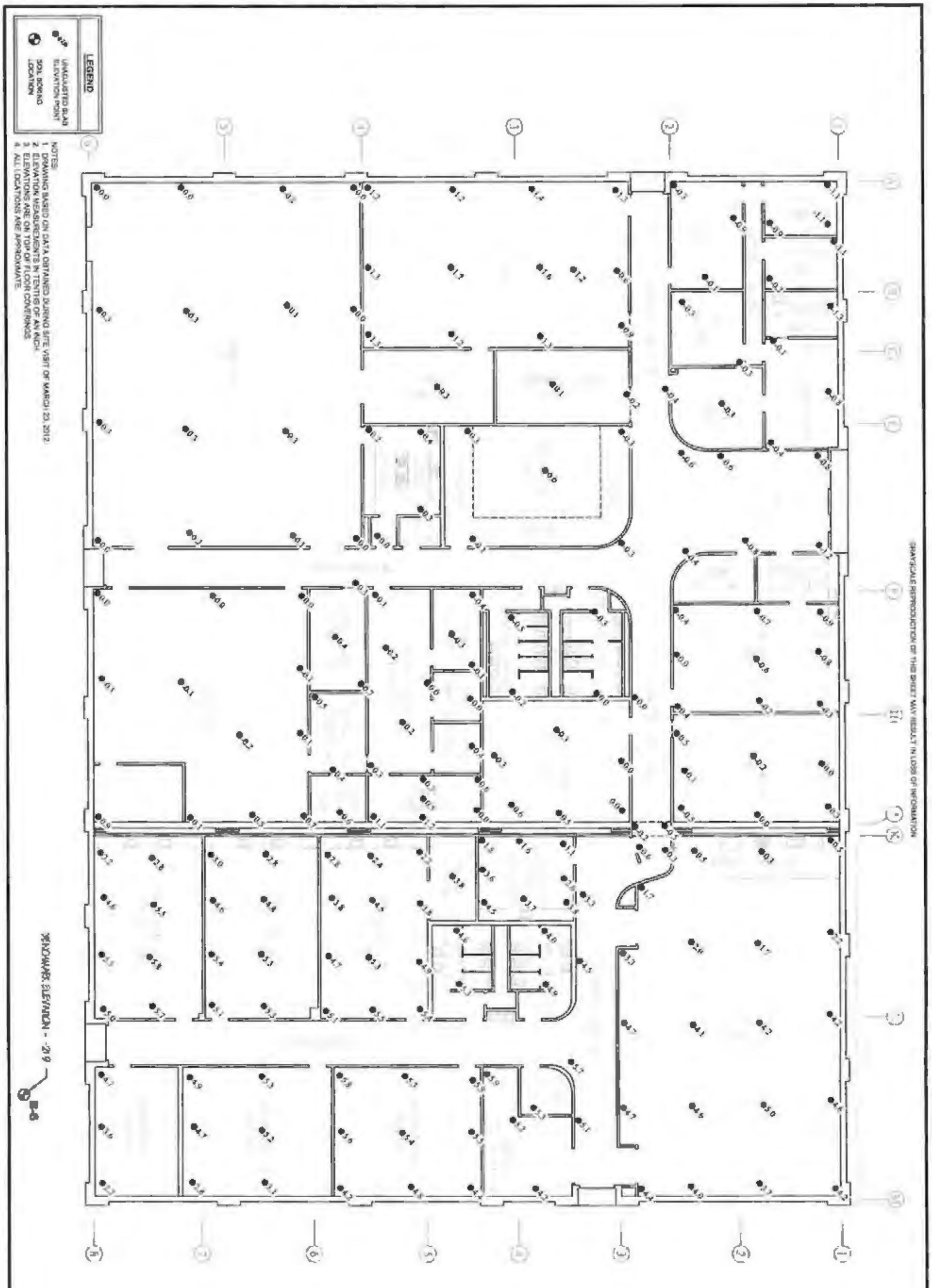
Figure 1
Site Plan
Deer Park Civic Center
610 East San Augustine Street
Deer Park, Texas 77539

DRAWN BY: REW
CHECKED BY: JAC
SCALE: 1/16" = 1'-0"
TERRACON NO. F3128529

Terracon
Consulting Engineers & Scientists

APPROXIMATE SCALE: 1/16" = 1'-0"

H:\Facilities\Dox\Drafting\2012\F3128529\F3128529 DPCC.dwg : Site Plan (1) -- 20120612P0105



0 8' 16'

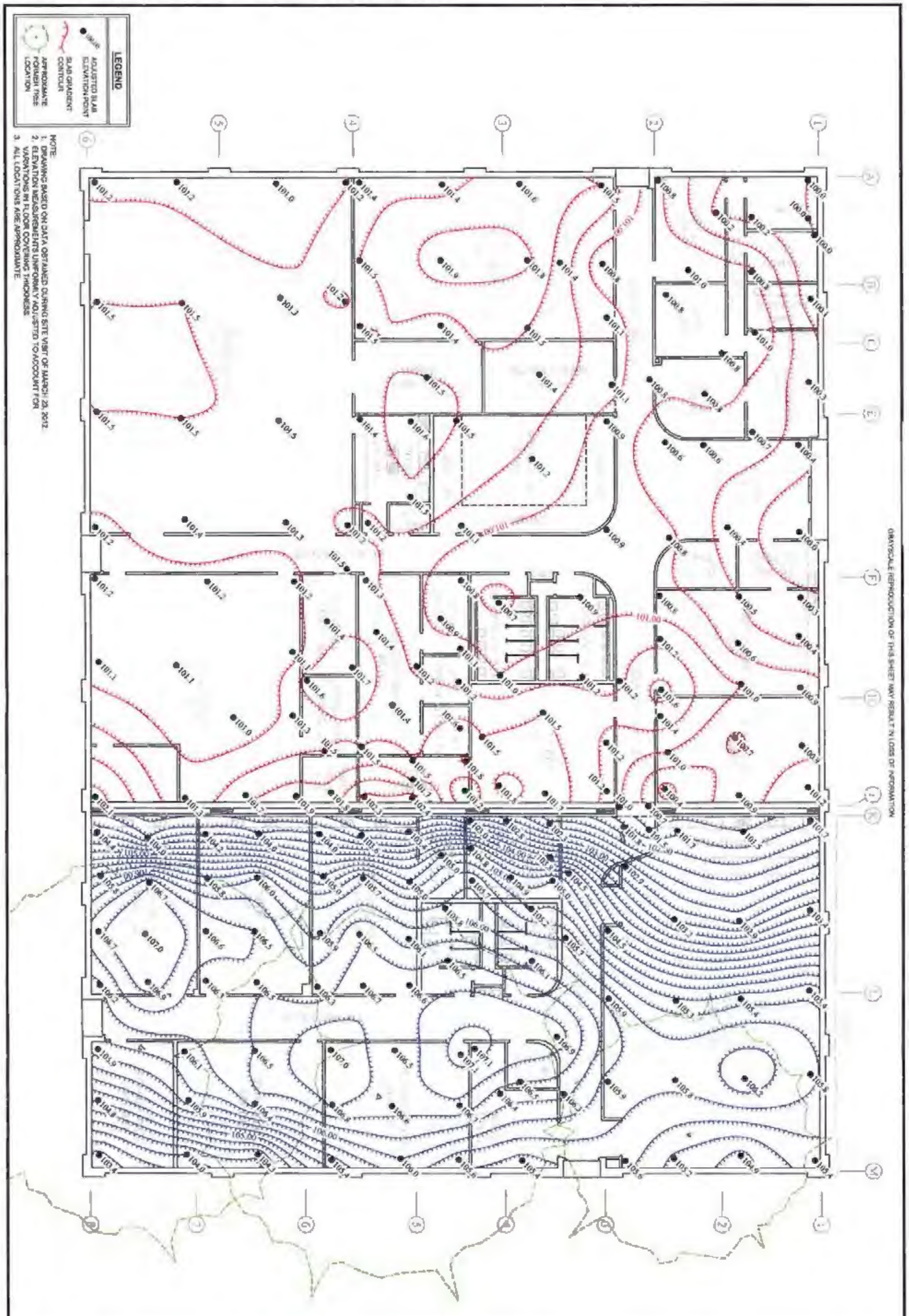
APPROXIMATE SCALE: 1/16" = 1'-0"

Terracon
Consulting Engineers & Scientists

DRAWN BY:	BEW
CHECKED BY:	JAC
SCALE:	1/16" = 1'-0"
TERRACON NO.	F3128529

Figure 2
Site Plan with Unadjusted Relative Elevation Data
Deer Park Civic Center
610 East San Augustine Street
Deer Park, Texas 77539

N:\Facilities\Dox\Drafting\2012\F3128529\F3128529 DPCC.dwg : Contour Data (3) - 20120801P0219



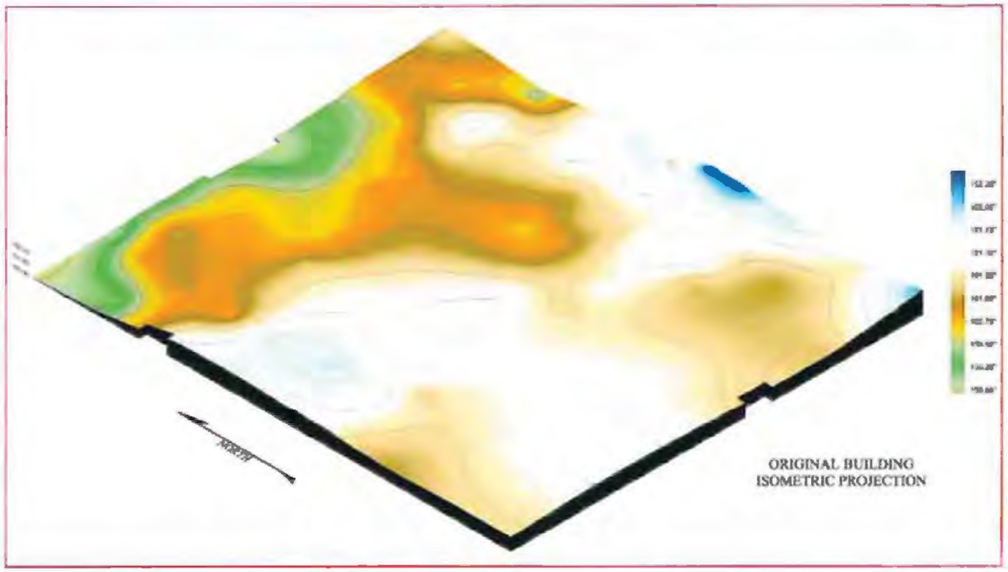
APPROXIMATE SCALE: 1/16" = 1'-0"

Terracon
Consulting Engineers & Scientists

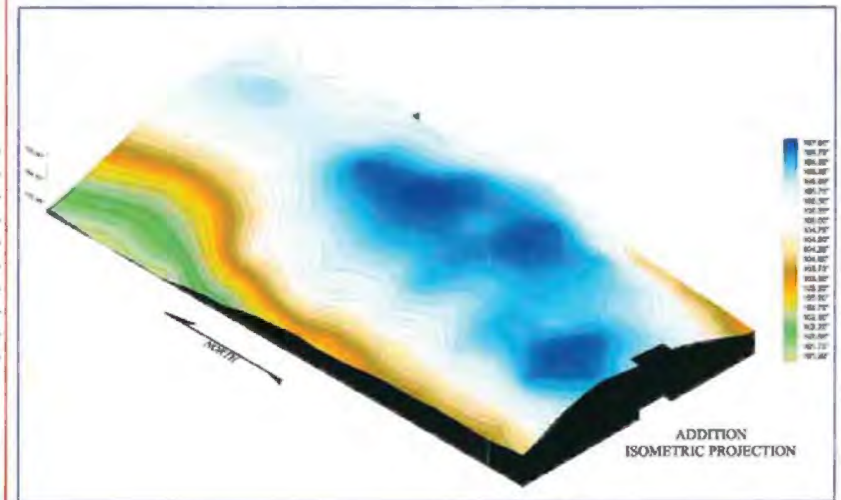
DRAWN BY:	REW
CHECKED BY:	JAC
SCALE:	1/16" = 1'-0"
TERRACON NO:	F3128529

Figure 3
Site Plan with Adjusted Relative Elevation Contours
Deer Park Civic Center
610 East San Augustine Street
Deer Park, Texas 77539

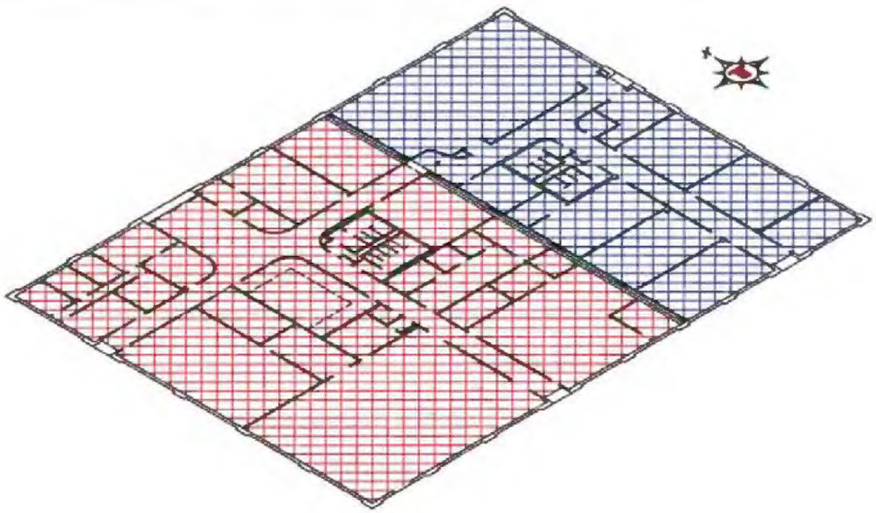
GRAYSCALE REPRODUCTION OF THIS SHEET MAY RESULT IN LOSS OF INFORMATION



ORIGINAL BUILDING
ISOMETRIC PROJECTION



ADDITION
ISOMETRIC PROJECTION



NOTES:
1. ISOMETRIC PROJECTION(S) GENERATED WITH GOLDEN SOFTWARE SURFER V.10 ON [Generation Date] USING RELATIVE SLAB ELEVATION DATA TAKEN ON MARCH 23, 2012.
2. VERTICAL SCALES ARE EXAGGERATED TO SHOW DETAIL.
3. THE GRAPHICS ON THIS SHEET ARE FOR THE PURPOSES OF DISCUSSION ONLY.

Terracon
Consulting Engineers & Scientists

DRAWN BY:	REW
CHECKED BY:	IAC
SCALE:	NTS
TERRACON NO:	F3128529

Figure 4
Isometric Projection
Deer Park Civic Center
610 East San Augustine Street
Deer Park, Texas 77539

H:\Facilities\Dox\Drafting\2012\F3128529\F3128529 SPCC.dwg : Isometric (4) -- 20120529P0411

Figure 5 – Trees to Be Removed For Expansion: Sheet 1
Deer Park Community Center
Deer Park, Texas
Source: The City of Deer Park
Terracon Project No. F3128529
September 30, 2013

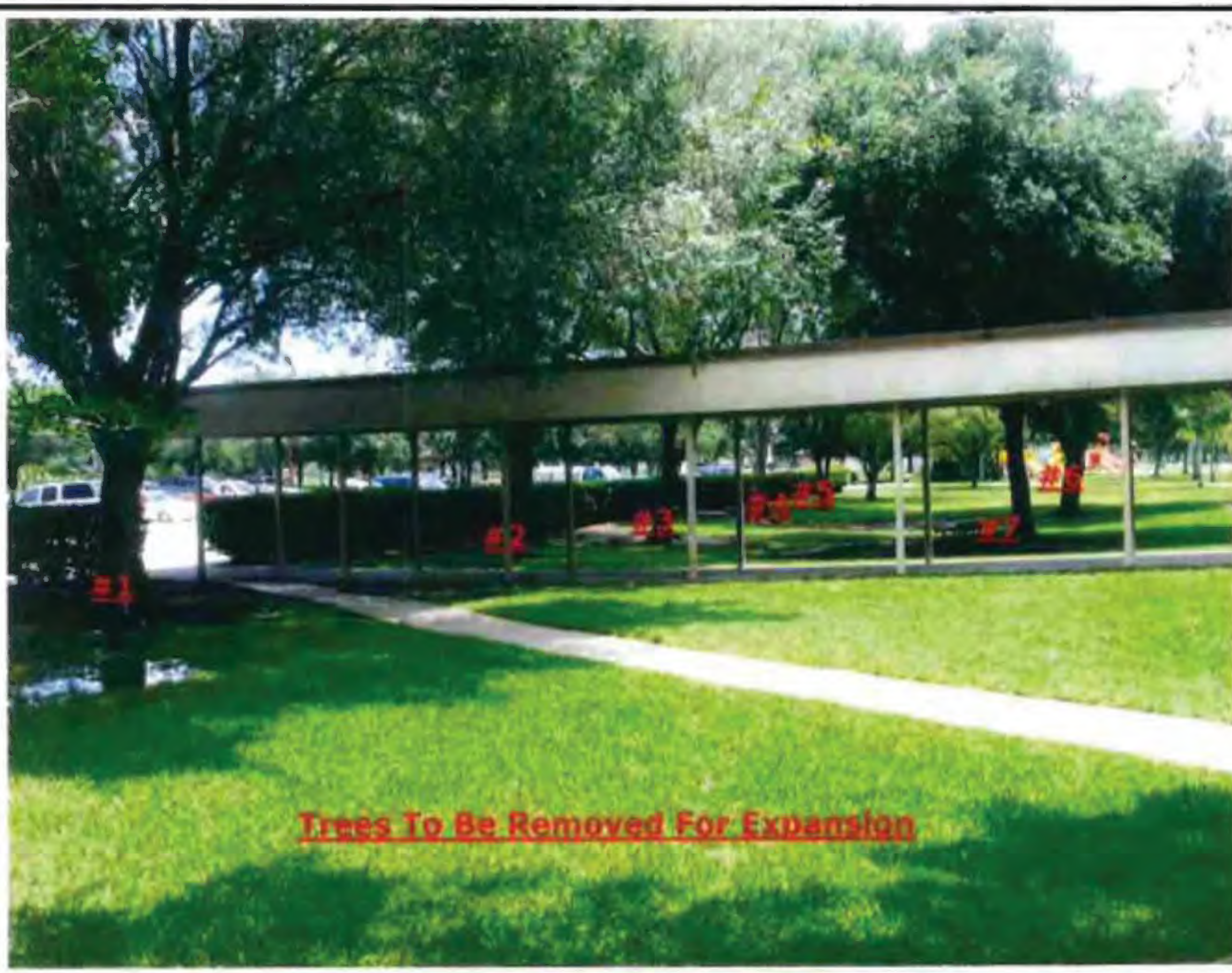


Figure 6 – Trees to Be Removed For Expansion: Sheet 1
Deer Park Community Center
Deer Park, Texas
Source: The City of Deer Park
Terracon Project No. F3128529
September 30, 2013

Figure 7 – Aerial Site Plan March 2011
Deer Park Community Center
Deer Park, Texas
Source: Google Earth
Terracon Project No. F3128529
September 30, 2013

Figure 8 – Aerial Site Plan January 2008
Deer Park Community Center
Deer Park, Texas
Source: Google Earth
Terracon Project No. F3128529
September 30, 2013

Figure 9 – Aerial Site Plan April 2006
Deer Park Community Center
Deer Park, Texas
Source: Google Earth
Terracon Project No. F3128529
September 30, 2013

Figure 10 – Aerial Site Plan July 2005
Deer Park Community Center
Deer Park, Texas
Source: Google Earth
Terracon Project No. F3128529
September 30, 2013

APPENDIX C
Soils Information

BORING LOG NO. B-1

CLIENT: City of Deer Park, Deer Park, Texas 77536	PROJECT: Deer Park Community Center
BORING LOCATION: See Site Plan Figure 1, App. B	SITE: 610 East San Augustine, Deer Park, Texas

Approx. Surface Elevation: Existing Grade

Depth of strata (ft)	Description	Depth, feet	USCS Symbol	Type	SPT, Blows/ft	Calibrated Hand Penetrom., TSF	Moisture Content, %	Dry Density, PCF	Liquid Limit, %	Plastic Limit, %	Plasticity Index	Minus #200 Sieve, %	Compressive Strength, TSF	Failure Strain, %	Confining Pressure, PSI
0.5	**SLAB** 4 1/2 inches of concrete			ST											
2.0	**FILL: SANDY SILTY CLAY** reddish brown and tan		CL-ML	ST			16								
				ST			19		23	16	7	60			
3.0	**FILL: FAT CLAY** dark gray		CH	ST		2.5	35								
	FAT CLAY gray, medium stiff to very stiff, with ferrous stains		CH	ST		2.0	23								
	- with scattered roots 3 to 5 feet			ST		1.0	26		57	17	40	90			
		5		ST		1.5	26								
	- light gray and tan below 6 feet			ST		1.5	23								
				ST		2.0	22								
	- with calcareous nodules below 8 feet			ST		1.5	24		54	16	38	89			
10.0				ST		2.25	23								
	Boring terminated at 10 feet.	10													

STRATIFICATION LINES REPRESENT APPROXIMATE BOUNDARIES BETWEEN SOIL TYPES. IN SITU, THE TRANSITION BETWEEN STRATA MAY BE MORE GRADUAL.

REMARKS: Dry augered to 10 feet.

WATER LEVEL OBSERVATIONS			
∇ 8 ft	WD	▼ 9 ft	AB
▼		▼	

Terracon

DATE DRILLED	Page 1 of 1
4/21/2012	
PROJECT NUMBER	FIGURE 11
F3128529	

BORING LOG NO. B-2

CLIENT: City of Deer Park Deer Park, Texas 77536	PROJECT: Deer Park Community Center
BORING LOCATION: See Site Plan Figure 1, App. B	SITE: 610 East San Augustine Deer Park, Texas

Approx. Surface Elevation: Existing Grade

Depth (ft)	Description	USCS Symbol	Type	SPT, Blows/ft	Calibrated Hand Penetrom., TSF	Moisture Content, %	Dry Density, PCF	Liquid Limit, %	Plastic Limit, %	Plasticity Index	Minus #200 Sieve, %	Compressive Strength, TSF	Failure Strain, %	Confining Pressure, PSI
0.4	**SLAB** 5 inches of concrete													
0.5	**VOID** 1 inch void space	SM	ST			14					17			
			ST											
	FILL: SILTY SAND tan and gray		ST			16								
3.0			ST			20								
4.0	**FAT CLAY w/ SAND** dark gray, medium stiff, with ferrous stains	CH	ST		1.0	28		50	16	34	85			
	LEAN CLAY w/ SAND gray and light gray, stiff to very stiff, with ferrous stains and sand pockets	CL	ST		2.5	21								
5			ST		3.0	20								
7.0			ST		2.0	19		46	15	31	79			
	FAT CLAY light gray, tan, and reddish brown, medium stiff to stiff, with ferrous stains, calcareous nodules, and sand pockets - with scattered roots 7 to 9 feet	CH	ST		2.0	22								
			ST		1.5	24								
			ST		2.0	21								
10			ST		1.5	24		50	17	33	90			
12.0			ST		1.0	22								

Boring terminated at 12 feet.

STRATIFICATION LINES REPRESENT APPROXIMATE BOUNDARIES BETWEEN SOIL TYPES. IN SITU, THE TRANSITION BETWEEN STRATA MAY BE MORE GRADUAL.

REMARKS: Dry augered to 12 feet.

WATER LEVEL OBSERVATIONS

FREE WATER WAS NOT OBSERVED DURING DRY DRILLING OPERATIONS

Terracon

DATE DRILLED: 4/21/2012

PROJECT NUMBER: F3128529

FIGURE 12

BORING LOG NO. B-3

CLIENT:	City of Deer Park Deer Park, Texas 77536	PROJECT:	Deer Park Community Center
BORING LOCATION:	See Site Plan Figure 1, App. B	SITE:	610 East San Augustine Deer Park, Texas

Approx. Surface Elevation: Existing Grade

Depth of stratum	DESCRIPTION	DEPTH, FEET	USCS SYMBOL	TYPE	SPT, BLOWS/FT	CALIBRATED HAND PENETROM., TSF	MOISTURE CONTENT, %	DRY DENSITY, PCF	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX	MINUS #200 SIEVE, %	COMPRESSIVE STRENGTH, TSF	FAILURE STRAIN, %	CONFINING PRESSURE, PSI
0.5	**SLAB** 5 1/2 inches of concrete														
	FILL: SANDY LEAN CLAY light gray and tan, with sand pockets - chemically treated to 1 foot		CL	ST		4.5	24		45	35	10	67			
2.0				ST		2.0	19								
	FILL: LEAN CLAY w/ SAND light gray, tan, and dark gray, with sand pockets		CL	ST		1.5	21		38	16	22	78			
4.0				ST		1.0	26								
	FILL: POORLY GRADED SAND gray and reddish brown, with scattered gravel		SP	ST			29								
6.0	▽	5		ST			33				NP	3			
6.5	**FAT CLAY** gray, stiff, with ferrous stains and sand pockets		CH	ST		1.5	23								

Boring terminated at 6.75 feet.

STRATIFICATION LINES REPRESENT APPROXIMATE BOUNDARIES BETWEEN SOIL TYPES. IN SITU, THE TRANSITION BETWEEN STRATA MAY BE MORE GRADUAL.

REMARKS: Dry augered to 6.75 feet.

WATER LEVEL OBSERVATIONS			
▽ 6 ft	WD	▼	
▽		▽	

Terracon

DATE DRILLED: 4/21/2012

PROJECT NUMBER: F3128529

FIGURE 13

BORING LOG NO. B-4

CLIENT:	City of Deer Park Deer Park, Texas 77536	PROJECT:	Deer Park Community Center
BORING LOCATION:	See Site Plan Figure 1, App. B	SITE:	610 East San Augustine Deer Park, Texas

Approx. Surface Elevation: Existing Grade

Graphic Log (depth)	DESCRIPTION	DEPTH, FEET	USCS SYMBOL	SAMPLES: TYPE	SPT, BLOWS/FT	CALIBRATED HAND PENETROM., TSF	TESTS: MOISTURE CONTENT, %	DRY DENSITY, PCF	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX	MINUS #200 SIEVE, %	COMPRESSIVE STRENGTH, TSF	FAILURE STRAIN, %	CONFINING PRESSURE, PSI
0.4	**SLAB** 5 inches of concrete														
	FILL: LEAN CLAY w/ SAND light gray, tan, and reddish brown, with sand pockets		CL	ST		2.0	20		42	17	25	77			
				ST		1.5	17								
3.0				ST		2.0	17								
4.0	**FILL: SANDY LEAN CLAY** light gray and tan, with sand pockets		CL	ST		1.0	18		30	14	16	68			
	FAT CLAY dark gray, stiff to very stiff - with scattered roots 4 to 8 feet		CH	ST		2.0	25								
		5		ST		2.0	27								
				ST		2.25	23		58	18	40	91			
	- with sand pockets below 7 feet			ST		2.5	27								
	- light gray, reddish brown, and gray, with calcareous nodules and ferrous stains below 8 feet			ST		1.5	22								
				ST		3.0	22								
		10		ST		3.5	20		54	18	36	94			
12.0				ST		3.0	23								
	Boring terminated at 12 feet.														

STRATIFICATION LINES REPRESENT APPROXIMATE BOUNDARIES BETWEEN SOIL TYPES. IN SITU, THE TRANSITION BETWEEN STRATA MAY BE MORE GRADUAL.

REMARKS: Dry augered to 12 feet.

WATER LEVEL OBSERVATIONS		DATE DRILLED	Page 1 of 1
∇	▼	4/21/2012	
∇	∇	PROJECT NUMBER	FIGURE 14
FREE WATER WAS NOT OBSERVED DURING DRY DRILLING OPERATIONS		F3128529	

Terracon

BORING LOG NO. B-5

CLIENT: City of Deer Park, Deer Park, Texas 77536	PROJECT: Deer Park Community Center
BORING LOCATION: See Site Plan Figure 1, App. B	SITE: 610 East San Augustine, Deer Park, Texas

Approx. Surface Elevation: Existing Grade

Depth (ft)	DESCRIPTION	DEPTH, FEET	USCS SYMBOL	TYPE	SPT, BLOWS/FT	CALIBRATED HAND PENETROM., TSF	MOISTURE CONTENT, %	DRY DENSITY, PCF	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX	MINUS #200 SIEVE, %	COMPRESSIVE STRENGTH, TSF	FAILURE STRAIN, %	CONFINING PRESSURE, PSI
0.5	**SLAB:** 5 1/2" of concrete														
	FILL: SANDY LEAN CLAY light gray and tan, with sand pockets - with scattered gravel 0.5 to 1 feet - chemically treated to 1 foot		CL			4.5	16		47	38	9	59			
				ST			16								
3.0				ST		2.0	17								
	FAT CLAY dark gray, very stiff, with ferrous stains and scattered roots		CH	ST		2.5	27		75	22	53	92			
				ST		2.5	28								
6.0		5		ST		2.5	29								
	FAT CLAY w/ SAND gray and tan, very stiff, with ferrous stains, sand pockets, and scattered roots		CH	ST		2.5	22		64	19	45	82			
				ST		2.5	23								
				ST		3.0	20								
10.0				ST		3.5	18								
	FAT CLAY reddish brown and light gray, very stiff, with calcareous nodules, silt pockets, and ferrous stains	10	CH	ST		4.0	21		53	18	35				
12.0				ST		4.5	22								
	Boring terminated at 12 feet.														

STRATIFICATION LINES REPRESENT APPROXIMATE BOUNDARIES BETWEEN SOIL TYPES. IN SITU, THE TRANSITION BETWEEN STRATA MAY BE MORE GRADUAL.

REMARKS: Dry augered to 12 feet.

WATER LEVEL OBSERVATIONS

FREE WATER WAS NOT OBSERVED DURING DRY DRILLING OPERATIONS

Terracon

DATE DRILLED: 4/21/2012

PROJECT NUMBER: F3128529

Page 1 of 1

FIGURE 15

BORING LOG NO. B-6

CLIENT: City of Deer Park
Deer Park, Texas 77536

PROJECT: Deer Park Community Center

BORING LOCATION: See Site Plan Figure 1, App. B

SITE: 610 East San Augustine
Deer Park, Texas

Graphic Log	DESCRIPTION Approx. Surface Elevation: Existing Grade	DEPTH, FEET	SAMPLES: USCS SYMBOL	SAMPLES: TYPE	SAMPLES: SPT, BLOWS/FT	SAMPLES: CALIBRATED HAND PENETROM., TSF	TESTS: MOISTURE CONTENT, %	TESTS: DRY DENSITY, PCF	TESTS: LIQUID LIMIT, %	TESTS: PLASTIC LIMIT, %	TESTS: PLASTICITY INDEX	TESTS: MINUS #200 SIEVE, %	TESTS: COMPRESSIVE STRENGTH, TSF	TESTS: FAILURE STRAIN, %	TESTS: CONFINING PRESSURE, PSI
	FILL: LEAN CLAY w/ SAND dark gray, tan, and gray, with scattered roots		CL	ST		3.5	15		35	14	21	71			
				ST		4.5	12								
	2.0 **FAT CLAY** dark gray, stiff to very stiff, with ferrous stains, calcareous nodules, and scattered roots		CH	ST		2.5	23								
				ST		1.75	23		58	17	41	94			
				ST		2.0	25								
		5		ST		2.0	25								
				ST		2.0	25								
	7.0 **FAT CLAY w/ SAND** gray and tan, stiff, with calcareous nodules, sand pockets and scattered roots		CH	ST		1.5	23		62	17	45	84			
				ST		1.5	22								
	9.0 **FAT CLAY** light gray and reddish brown, soft to very stiff, with calcareous nodules and ferrous stains		CH	ST		2.5	23								
		10		ST		2.0	23								
				ST		1.5	25								
				ST		1.0	27		59	19	40	95			
				ST		0.5	30								
				ST		3.5	30								
	15.0 Boring terminated at 15 feet.	15													

STRATIFICATION LINES REPRESENT APPROXIMATE BOUNDARIES BETWEEN SOIL TYPES. IN SITU, THE TRANSITION BETWEEN STRATA MAY BE MORE GRADUAL.

REMARKS: Dry augered to 15 feet.

WATER LEVEL OBSERVATIONS

FREE WATER WAS NOT OBSERVED DURING DRY DRILLING OPERATIONS

Terracon

DATE DRILLED: 4/6/2012

PROJECT NUMBER: F3126529

FIGURE 16

BORING LOG NO. B-7

CLIENT:	**City of Deer Park** **Deer Park, Texas 77536**	PROJECT:	**Deer Park Community Center**
BORING LOCATION:	**See Site Plan Figure 1, App. B**	SITE:	**610 East San Augustine** **Deer Park, Texas**

Approx. Surface Elevation: Existing Grade

Graphic Log / Description	Depth, Feet	USCS Symbol	Samples: Type	Samples: SPT, Blows/ft	Samples: Calibrated Hand Penetrom., TSF	Tests: Moisture Content, %	Tests: Dry Density, PCF	Tests: Liquid Limit, %	Tests: Plastic Limit, %	Tests: Plasticity Index	Tests: Minus #200 Sieve, %	Tests: Compressive Strength, TSF	Tests: Failure Strain, %	Tests: Confining Pressure, PSI
FILL: LEAN CLAY w/ SAND dark gray, light gray, and tan, with sand pockets and scattered roots (to 1.5)		CL	ST		1.75	20		36	15	21	79			
FILL: SANDY LEAN CLAY dark gray, with scattered roots (1.5 to 2.0)		CL	ST		2.0	22								
LEAN CLAY dark gray, very stiff, with sand pockets, ferrous stains, calcareous nodules, and scattered roots (2.0 to 5.0)		CL	ST		2.5	20								
			ST		2.75	19		47	15	32	87			
			ST		2.25	20								
FAT CLAY dark gray, very stiff, with ferrous stains, calcareous nodules, and scattered roots (5.0 to 8.5)	5	CH	ST		2.25	22								
			ST		2.5	22		53	16	37	90			
			ST		2.5	23								
LEAN CLAY gray, light gray, and tan, very stiff with calcareous nodules, ferrous stains, sand pockets, and scattered roots (8.5 to 12.0)		CL	ST		3.25	19								
- reddish brown and gray below 9 feet			ST		3.25	20								
	10		ST		3.25	19		44	15	29	98			
- with silt pockets below 11 feet			ST		4.0	20								
12.0 Boring terminated at 12 feet.														

STRATIFICATION LINES REPRESENT APPROXIMATE BOUNDARIES BETWEEN SOIL TYPES. IN SITU, THE TRANSITION BETWEEN STRATA MAY BE MORE GRADUAL.

REMARKS: Dry augered to 12 feet.

WATER LEVEL OBSERVATIONS		DATE DRILLED	Page 1 of 1
∇	▼	5/14/2012	
∇	∇	PROJECT NUMBER	**FIGURE 17**
FREE WATER WAS NOT OBSERVED DURING DRY DRILLING OPERATIONS		F3126529	

Terracon

BORING LOG NO. B-8

CLIENT:	City of Deer Park Deer Park, Texas 77536	PROJECT:	Deer Park Community Center
BORING LOCATION:	See Site Plan Figure 1, App. B	SITE:	610 East San Augustine Deer Park, Texas

Approx. Surface Elevation: Existing Grade

Depth of strata (ft)	DESCRIPTION	DEPTH, FEET	USCS SYMBOL	TYPE	SPT, BLOWS/FT	CALIBRATED HAND PENETROM., TSF	MOISTURE CONTENT, %	DRY DENSITY, PCF	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX	MINUS #200 SIEVE, %	COMPRESSIVE STRENGTH, TSF	FAILURE STRAIN, %	CONFINING PRESSURE, PSI
1.5	**FILL: LEAN CLAY w/ SAND** dark gray, gray, and tan, with sand pockets and scattered roots		CL	ST		2.25	21		39	15	24	81			
	FAT CLAY dark gray, very stiff, with scattered roots		CH	ST		2.5	22		50	16	34	90			
	- with calcareous nodules 4 to 8 feet	5		ST		2.25	24								
8.0	- dark gray and gray, with ferrous stains 6 to 8 feet			ST		2.5	23		59	15	44	91			
	LEAN CLAY reddish brown, gray, and dark gray, very stiff, with ferrous stains, calcareous nodules, and scattered roots		CL	ST		3.0	21								
12.0		10		ST		2.75	22		44	17	27	99			
	Boring terminated at 12 feet.														

STRATIFICATION LINES REPRESENT APPROXIMATE BOUNDARIES BETWEEN SOIL TYPES. IN SITU, THE TRANSITION BETWEEN STRATA MAY BE MORE GRADUAL.

REMARKS: Dry augered to 12 feet.

WATER LEVEL OBSERVATIONS		Terracon	DATE DRILLED	Page 1 of 1
∇	▼		5/14/2012	
▼	▼		PROJECT NUMBER	FIGURE 18
FREE WATER WAS NOT OBSERVED DURING DRY DRILLING OPERATIONS			F3128529	

GENERAL NOTES

DRILLING & SAMPLING SYMBOLS:

SS:	Split Spoon - 1-3/8" I.D., 2" O.D., unless otherwise noted	HS:	Hollow Stem Auger
ST:	Thin-Walled Tube - 2-7/8" O.D., unless otherwise noted	PA:	Power Auger
RS:	Ring Sampler - 2.42" I.D., 3" O.D., unless otherwise noted	HA:	Hand Auger
DB:	Diamond Bit Coring - 4", N, B	RB:	Rock Bit
BS:	Bulk Sample or Auger Sample	WB:	Wash Boring or Mud Rotary
		SA:	Straight-Flight Auger

The number of blows required to advance a standard 2-inch O.D. split-spoon sampler (SS) the last 12 inches of the total 18-inch penetration with a 140-pound hammer falling 30 inches is considered the "Standard Penetration" or "N-value". For 3" O.D. ring samplers (RS) the penetration value is reported as the number of blows required to advance the sampler 12 inches using a 140-pound hammer falling 30 inches, reported as "blows per foot," and is not considered equivalent to the "Standard Penetration" or "N-value".

WATER LEVEL MEASUREMENT SYMBOLS:

WL:	Water Level	AB:	After Boring	BCR:	Before Casing Removal
WCI:	Wet Cave in	WS:	While Sampling	ACR:	After Casing Removal
DCI:	Dry Cave in	WD:	While Drilling	EOD:	End of Day

Water levels indicated on the boring logs are the levels measured in the borings at the times indicated. Groundwater levels at other times and other locations across the site could vary. In pervious soils, the indicated levels may reflect the location of groundwatar. In low permeability soils, the accurate determination of groundwater levels may not be possible with only short-term observations.

DESCRIPTIVE SOIL CLASSIFICATION:

Soil classification is based on the Unified Soil Classification System. Coarse Grained Soils have more than 50% of their dry weight retained on a #200 sieve; their principal descriptors are: boulders, cobbles, gravel or sand. Fine Grained Soils have less than 50% of their dry weight retained on a #200 sieve; they are principally described as clays if they are plastic, and silts if they are slightly plastic or non-plastic. Major constituents may be added as modifiers and minor constituents may be added according to the relative proportions based on grain size. In addition to gradation, coarse-grained soils are defined on the basis of their in-place relative density and fine-grained soils on the basis of their consistency.

CONSISTENCY OF FINE-GRAINED SOILS

Unconfined Compressive Strength, Qu, tsf	Standard Penetration or N-value (SS) Blows/Foot	Consistency
0 - 0.25	0 - 2	Very Soft
0.25 - 0.5	2 - 4	Soft
0.5 - 1	4 - 8	Medium Stiff
1 - 2	8 - 15	Stiff
2 - 4	15 - 30	Very Stiff
> 4	> 30	Hard

RELATIVE DENSITY OF COARSE GRAINED SOILS

Standard Penetration or N-value (SS) Blows/Foot	Ring Sampler (RS) Blows/Foot	Relative Density
0 - 4	0 - 6	Very Loose
4 - 10	7 - 18	Loose
10 - 30	19 - 58	Medium Dense
30 - 50	59 - 98	Dense
> 50	> 98	Very Dense

RELATIVE PROPORTIONS OF SAND AND GRAVEL

Descriptive Term(s) of other constituents	Percent of Dry Weight
Trace	0 - 15
With	15 - 29
Modifier	> 29

GRAIN SIZE TERMINOLOGY

Major Component of Sample	Particle Size
Boulders	Over 12 in. (300mm)
Cobbles	12 in. to 3 in. (300mm to 75 mm)
Gravel	3 in. to #4 sieve (75mm to 4.75 mm)
Sand	#4 to #200 sieve (4.75mm to 0.075mm)
Silt or Clay	Passing #200 Sieve (0.075mm)

RELATIVE PROPORTIONS OF FINES

Descriptive Term(s) of other constituents	Percent of Dry Weight
Trace	0 - 5
With	5 - 12
Modifier	> 12

PLASTICITY DESCRIPTION

TERM	PLASTICITY INDEX
Non-Plastic (NP)	0
Low	1 - 10
Medium	11 - 30
High	> 30

Terracon

FIGURE 19

UNIFIED SOIL CLASSIFICATION SYSTEM

Criteria for Assigning Group Symbols and Group Names Using Laboratory Tests[A]					Soil Classification: Group Symbol	Soil Classification: Group Name[B]
Coarse Grained Soils More than 50% retained on No. 200 sieve	Gravels More than 50% of coarse fraction retained on No. 4 sieve	Clean Gravels Less than 5% fines[C]	$Cu \geq 4$ and $3^{E} \geq Cc \geq 1$		GW	Well-graded gravel[F]
			$Cu < 4$ and/or $1 > Cc > 3^{E}$		GP	Poorly graded gravel[F]
		Gravels with Fines More than 12% fines[C]	Fines classify as ML or MH		GM	Silty gravel[F,G,H]
			Fines classify as CL or CH		GC	Clayey gravel[F,G,H]
	Sands 50% or more of coarse fraction passes No. 4 sieve	Clean Sands Less than 5% fines[D]	$Cu \geq 6$ and $3^{E} \geq Cc \geq 1$		SW	Well-graded sand[I]
			$Cu < 6$ and/or $1 > Cc > 3^{E}$		SP	Poorly graded sand[I]
		Sands with Fines More than 12% fines[D]	Fines classify as ML or MH		SM	Silty sand[G,H,I]
			Fines classify as CL or CH		SC	Clayey sand[G,H,I]
Fine-Grained Soils 50% or more passes the No. 200 sieve	Silts and Clays Liquid limit less than 50	Inorganic	PI > 7 and plots on or above "A" line[J]		CL	Lean clay[K,L,M]
			PI < 4 or plots below "A" line[J]		ML	Silt[K,L,M]
		Organic	Liquid limit - oven dried	< 0.75	OL	Organic clay[K,L,M,N]
			Liquid limit - not dried			Organic silt[K,L,M,O]
	Silts and Clays Liquid limit 50 or more	Inorganic	PI plots on or above "A" line		CH	Fat clay[K,L,M]
			PI plots below "A" line		MH	Elastic Silt[K,L,M]
		Organic	Liquid limit - oven dried	< 0.75	OH	Organic clay[K,L,M,P]
			Liquid limit - not dried			Organic silt[K,L,M,Q]
Highly organic soils	Primarily organic matter, dark in color, and organic odor				PT	Peat

[A] Based on the material passing the 3-in. (75-mm) sieve

[B] If field sample contained cobbles or boulders, or both, add "with cobbles or boulders, or both" to group name.

[C] Gravels with 5 to 12% fines require dual symbols: GW-GM well-graded gravel with silt, GW-GC well-graded gravel with clay, GP-GM poorly graded gravel with silt, GP-GC poorly graded gravel with clay.

[D] Sands with 5 to 12% fines require dual symbols: SW-SM well-graded sand with silt, SW-SC well-graded sand with clay, SP-SM poorly graded sand with silt, SP-SC poorly graded sand with clay

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

[F] If soil contains ≥ 15% sand, add "with sand" to group name.

[G] If fines classify as CL-ML, use dual symbol GC-GM, or SC-SM.

[H] If fines are organic, add "with organic fines" to group name.

[I] If soil contains ≥ 15% gravel, add "with gravel" to group name.

[J] If Atterberg limits plot in shaded area, soil is a CL-ML, silty clay.

[K] If soil contains 15 to 29% plus No. 200, add "with sand" or "with gravel," whichever is predominant.

[L] If soil contains ≥ 30% plus No. 200 predominantly sand, add "sandy" to group name.

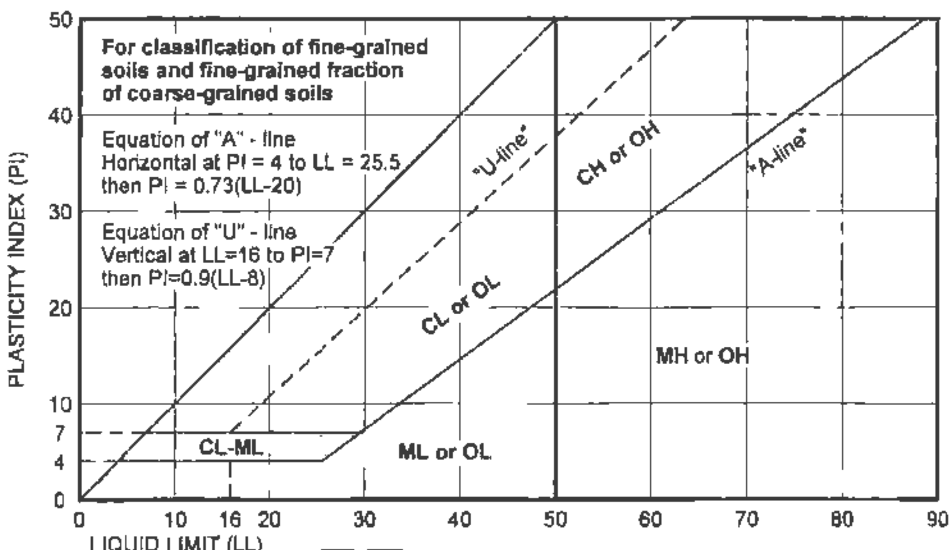
[M] If soil contains ≥ 30% plus No. 200, predominantly gravel, add "gravelly" to group name.

[N] PI ≥ 4 and plots on or above "A" line.

[O] PI < 4 or plots below "A" line.

[P] PI plots on or above "A" line.

[Q] PI plots below "A" line.



Terracon

FIGURE 20

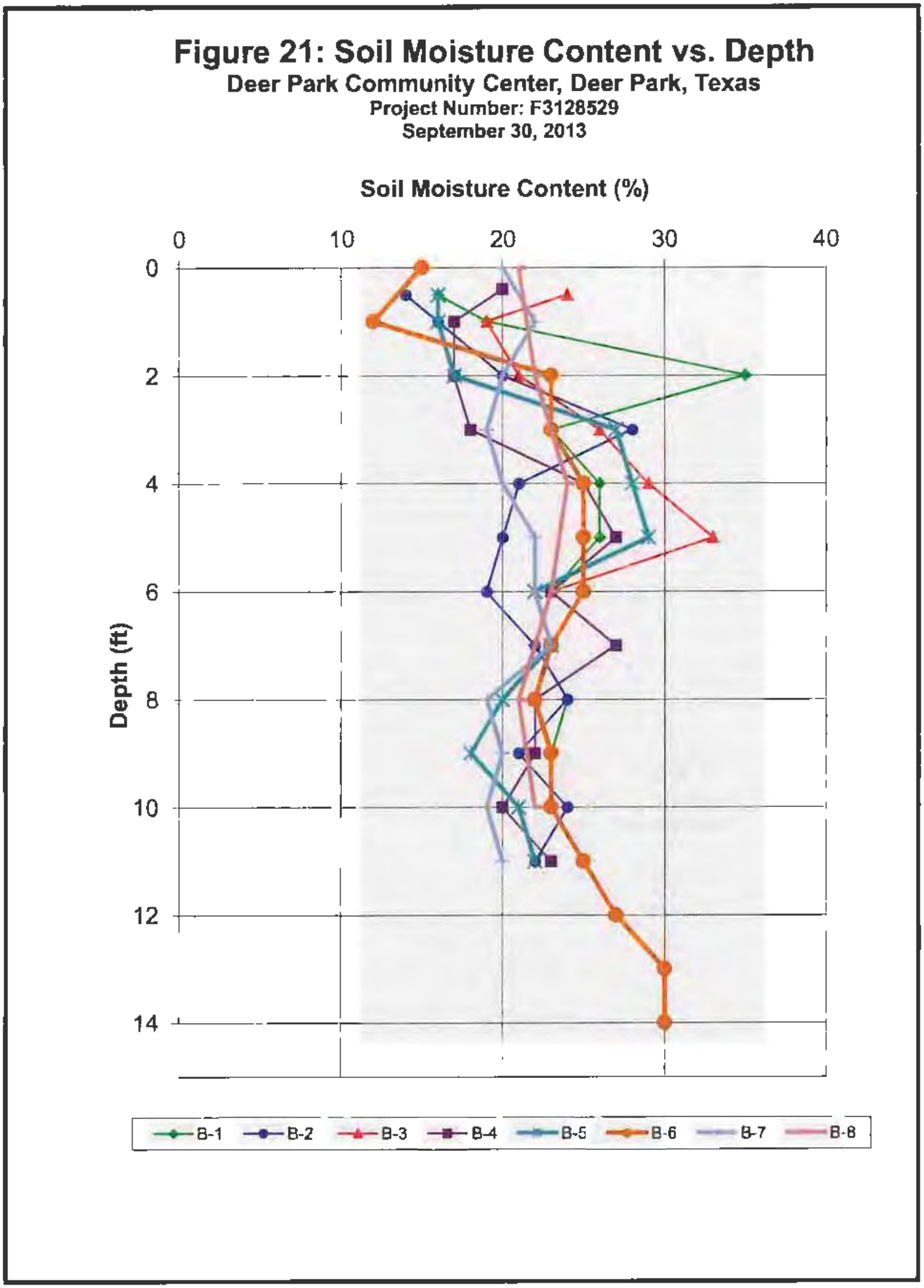
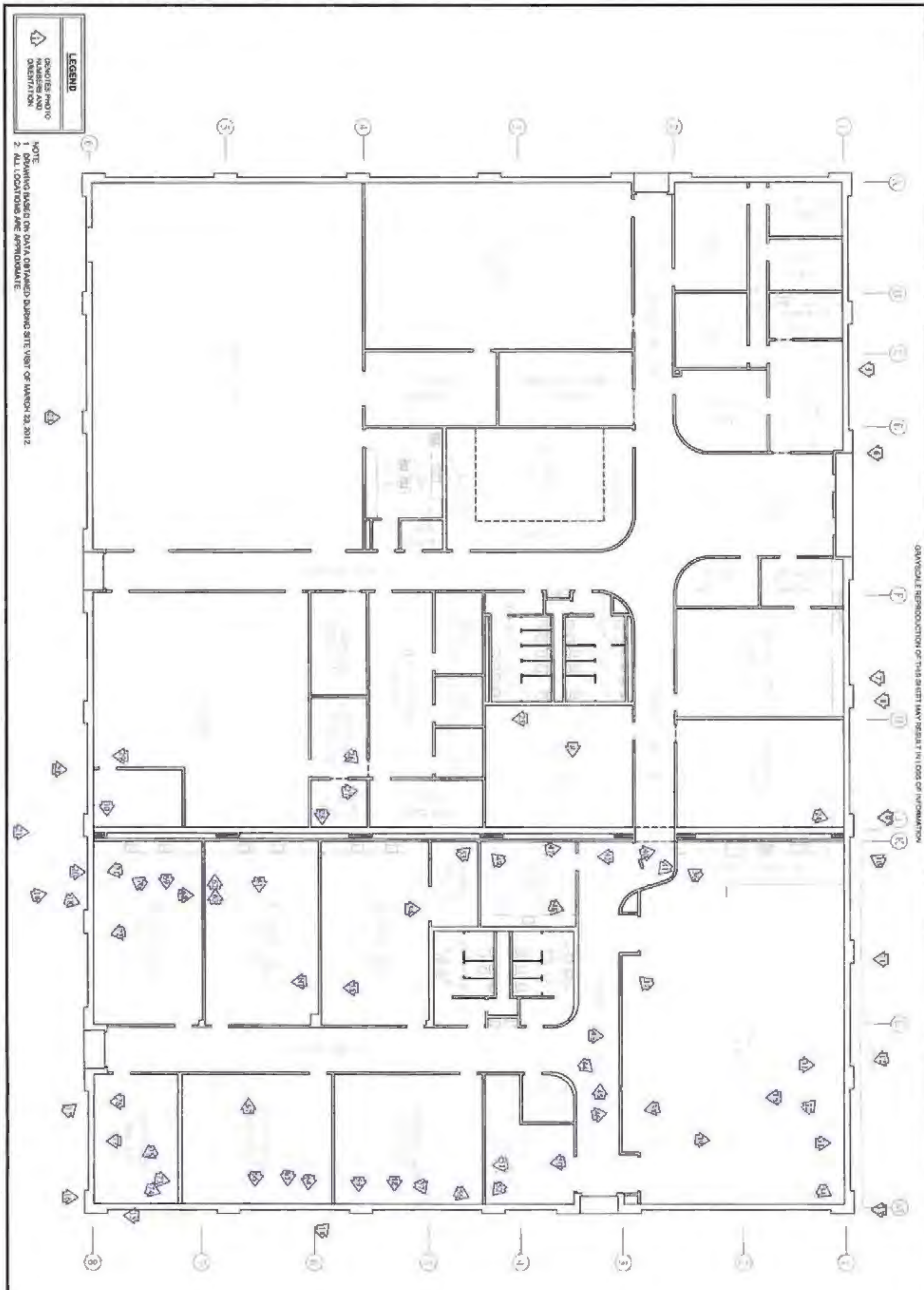


Figure 21: Soil Moisture Content vs. Depth
Deer Park Community Center, Deer Park, Texas
Project Number: F3128529
September 30, 2013
Soil Moisture Content (%)
0
10
20
30
40
0
2
4
6
8
10
12
14
Depth (ft)
B-1
B-2
B-3
B-4
B-5
B-6
B-7
B-8

APPENDIX D
Photographs

N:\Facilities\Dox\Drafting\2012\F3128529\F3128529 DPCC.dwg : Photo Log (22) - 20120801P0220



0 8' 16' APPROXIMATE SCALE: 1/16" = 1'-0"	Terracon Consulting Engineers & Scientists	DRAWN BY: REW CHECKED BY: JAC SCALE: 1/16" = 1'-0" TERRACON NO: F3128529	Figure 22 Photo Log Key Deer Park Civic Center 610 East San Augustine Street Deer Park, Texas 77539


Photo #1 Front elevation


Photo #2 Back elevation


Photo #3 Right elevation


Photo #4 Left elevation


Photo #5 Separation between the brick veneer and the metal flashing

Photo #6 Masonry-mortar-joint crack


Photo #7 Masonry-mortar-joint crack


Photo #8 Masonry-mortar-joint crack


Photo #9 Masonry-mortar-joint crack


Photo #10 Separation at expansion joint


Photo #11 Separation at expansion joint


Photo #12 Separation at expansion joint

Photo #13 Lateral movement in brick veneer

Photo #14 Separation at expansion joint

Photo #15 Lateral movement in brick veneer

Photo #16 Separation at expansion joint

Photo #17 Separation at expansion joint

Photo #18 Separation at expansion joint

Photo #19 Masonry-mortar-joint crack

Photo #20 Masonry-mortar-joint crack

Photo #21 Masonry-mortar-joint crack

Photo #22 Masonry-mortar-joint crack

Photo #23 Staining on exterior brick veneer

Photo #24 Crack at corner of concrete masonry unit walls

Photo #25 Crack through concrete masonry unit wall

Photo #26 Separation between door frame and floor

Photo #27 Joint crack in concrete masonry unit wall

Photo #28 Joint crack in concrete masonry unit wall

Photo #29 Joint crack in concrete masonry unit wall

Photo #30 Crack at corner of concrete masonry unit walls

Photo #31 Cracks in gypsum wallboard wall

Photo #32 Cracks in gypsum wallboard wall

Photo #33 Cracks in gypsum wallboard wall

Photo #34 Crack in gypsum wallboard walls

Photo #35 Separations in vinyl tile floor

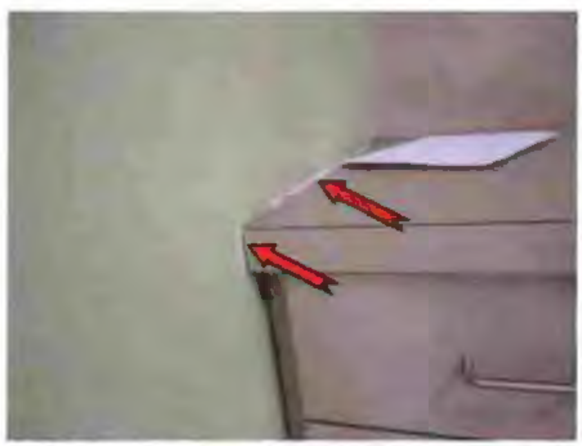


Photo #36 Separation between counter top and wall

Photo #37 Separation between the baseboard and the floor

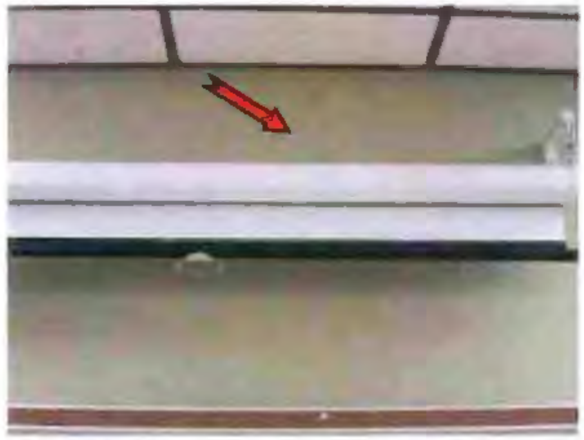


Photo #38 Crack in gypsum wallboard wall

Photo #39 Separations in vinyl tile floor

Photo #40 Crack in gypsum wallboard wall

Photo #41 Separation between the gypsum wallboard and the suspended acoustical ceiling

Photo #42 Door out-of-square with respect to its frame and binding in its frame

Photo #43 Crack in gypsum wallboard wall

Photo #44 Crack in gypsum wallboard wall

Photo #45 Separations in vinyl tile floor

Photo #46 Crack in gypsum wallboard wall

Photo #47 Crack in gypsum wallboard wall

Photo #48 Separation between wood trim and counter top


Photo #49 Separation in gypsum wallboard wall


Photo #50 Separations in vinyl tile floor


Photo #51 Crack in gypsum wallboard wall


Photo #52 Crack in gypsum wallboard wall


Photo #53 Separation in gypsum wallboard wall


Photo #54 Door out-of-square with respect to its frame and binding in its frame

Photo #55 Crack in gypsum wallboard wall

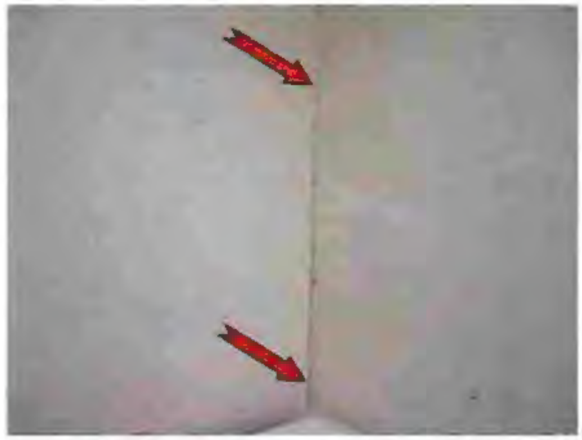


Photo #56 Crack in gypsum wallboard wall

Photo #57 Crack in gypsum wallboard wall

Photo #58 Crack in gypsum wallboard wall

Photo #59 Crack in gypsum wallboard wall

Photo #60 Separations in vinyl tile floor

Photo #61 Separations in vinyl tile floor

Photo #62 Cabinet doors out-of-square with respect to their frame

Photo #63 Separation between wood trim and counter top

Photo #64 Cracks in gypsum wallboard wall

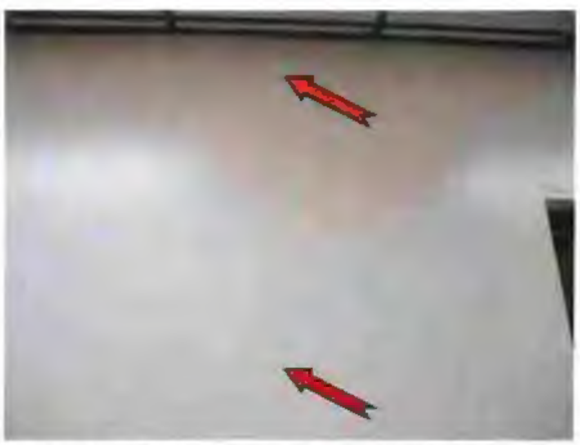


Photo #65 Crack in gypsum wallboard wall

Photo #66 Crack in gypsum wallboard wall

Photo #67 Crack in gypsum wallboard wall

Photo #68 Crack in gypsum wallboard wall

Photo #69 Separations in vinyl tile floor

Photo #70 Separation between wood trim and counter top

Photo #71 Crack in gypsum wallboard wall

Photo #72 Crack in gypsum wallboard wall


Photo #73 Crack in gypsum wallboard wall


Photo #74 Crack in gypsum wallboard wall


Photo #75 Cracks in exposed concrete floor

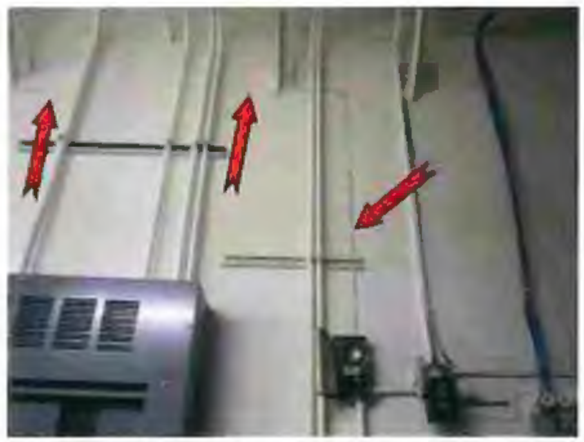


Photo #76 Crack in gypsum wallboard wall


Photo #77 Crack in gypsum wallboard wall

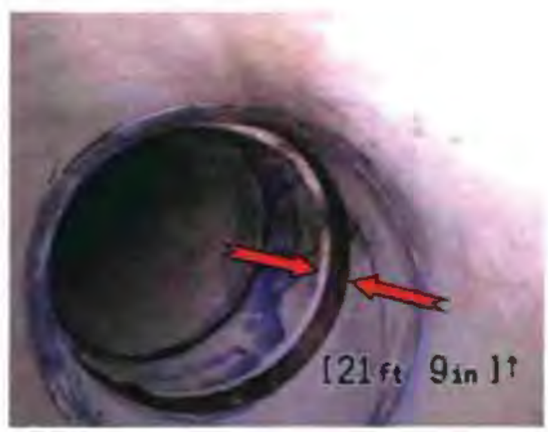


Photo #78 Broken pipe and some evidence of cave-in in the 10-inch PVC storm line for the addition building

Photo #79 Broken pipe a in the 12-inch PVC storm line for the original building

EXHIBIT E

Subject Property Location:
Deer Park Community Center Pool Area
610 E San Augustine St
Deer Park
TX 77536

Texas Accessibility Solutions
Justin Walton, RAS#1329
Office - 940.368.1989
Fax - 214.764.0021
Justin.Walton@me.com

www.Texas-Accessibility.com

Prepared For:
HALFF ASSOCIATES, INC.
4030 West Braker Lane, Suite 450
Austin
TX 78759-5356

Date of Site Visit: 3/24/2016

Date of Report: 3/31/2016

Dear: **Mr. Webb Cooley**

Enclosed are the results of the TAS compliance review that I conducted at Deer Park Community Center on March 24th, 2016. When I arrived on site, I was met by Mr. Scott Swigert, who paired me up with one of the maintenance workers who provided me access to all areas of the main building and the gymnasium.

All interior areas of both buildings were reviewed, including the exterior parking, and access to the public sidewalk.

I was also provided with a plan set for the Main Building that was dated 1974, and a plan set for the Gymnasium that was dated 1982. I have used those sets in my attached findings to note the area for each comment.

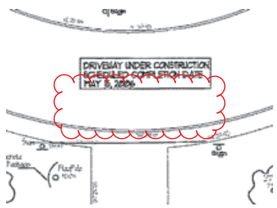
Since both buildings were constructed prior to the implementaion of the 1994 Texas Accessibility Standards, and TLDR's review process, there are quite a few items that do not currently comply with the current 2012 Texas Accessibility Standards, or meet the conditions for Safe Harbor with the 1994 Texas Accessibility Standards.

It was evident that some areas have been updated since the inital construction and are not accurately portrayed in the plan sets provided. After reviewing these findings, feel free to reach out to me to discuss any of the items listed in detail.

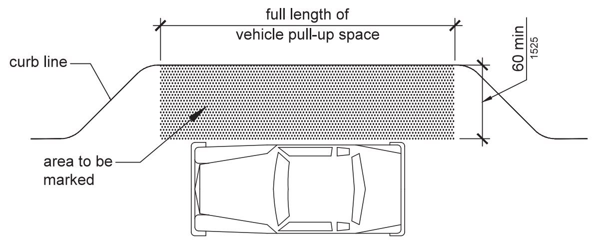
Justin K Walton, RAS#1329

Deer Park Main Building

Passenger Loading Zone (1)



Subject: Passenger Loading Zone
Page: Page A1-1
Status: Not Acceptable
Element: Passenger Loading Zone
Barrier: Access Aisle Marking
TAS Codes: 503
Web Links: http://www.tdlr.texas.gov/ab/2012abtas5.htm#503
Note: Passenger Loading Zones are required to comply with 503. The access aisle was not marked. An accessible route must connect the access aisle to the building entrance that it serves.



503.1 General. Passenger loading zones shall comply with 503.

503.2 Vehicle Pull-Up Space. Passenger loading zones shall provide a vehicular pull-up space 96 inches (2440 mm) wide minimum and 20 feet (6100 mm) long minimum.

503.3 Access Aisle. Passenger loading zones shall provide access aisles complying with 503 adjacent to the vehicle pull-up space. Access aisles shall adjoin an accessible route and shall not overlap the vehicular way.

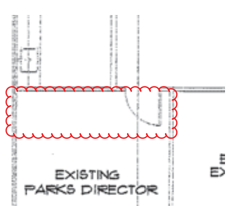
503.3.1 Width. Access aisles serving vehicle pull-up spaces shall be 60 inches (1525 mm) wide minimum.

503.3.2 Length. Access aisles shall extend the full length of the vehicle pull-up spaces they serve.

503.3.3 Marking. Access aisles shall be marked so as to discourage parking in them.

503.4 Floor and Ground Surfaces. Vehicle pull-up spaces and access aisles serving them shall comply with 302. Access aisles shall be at the same level as the vehicle pull-up space they serve. Changes in level are not permitted.

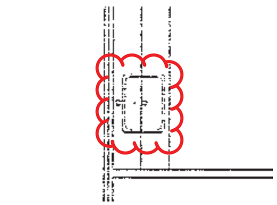
Parks Offices Corridor (1)



Subject: Parks Offices Corridor
Page: Page A2-2
Status: Not Acceptable
Element: Office Doors
Barrier: Doorway Maneuvering Clearances
TAS Codes: 404
Web Links: http://www.tdlr.texas.gov/ab/2012abtas4.htm#404
Note: The clouded area was different than the plan shows. There was a hallway that led to several offices. The hallway was only 42" wide which did not provide the appropriate doorway maneuvering clearances at all the office doors. The directors office was one of the doors that did not have the correct clearance provided. For a latch approach, from the pull side, there would need to be at least 48" of clear space extending out from the door face.

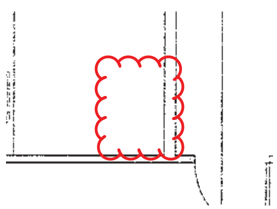
404.2.4 Maneuvering Clearances. Minimum maneuvering clearances at doors and gates shall comply with 404.2.4. Maneuvering clearances shall extend the full width of the doorway and the required latch side or hinge side clearance.

Office Break Room (2)



Subject: Office Break Room
Page: Page A2-2
Status: Not Acceptable
Element: Sink
Barrier: Clear Knee and Toe Space
TAS Codes: 305, 306, 606
Web Links: http://www.tdlr.texas.gov/ab/2012abtas6.htm#606
Note: This area is currently being utilized as a break room. Break room sinks are required to have clear knee and toe space complying with 306.

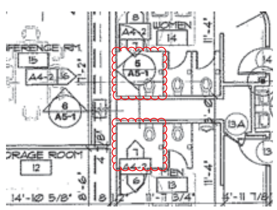
606.2 Clear Floor Space. A clear floor space complying with 305, positioned for a forward approach, and knee and toe clearance complying with 306 shall be provided.



Subject: Office Break Room
Page: Page A2-2
Status: Not Acceptable
Element: Doorway
Barrier: Doorway Maneuvering Clearance
TAS Codes: 404
Web Links: http://www.tdlr.texas.gov/ab/2012abtas4.htm#404
Note: The door to the break room area did not have the required doorway maneuving clearance.

404.2.4 Maneuvering Clearances. Minimum maneuvering clearances at doors and gates shall comply with 404.2.4. Maneuvering clearances shall extend the full width of the doorway and the required latch side or hinge side clearance.

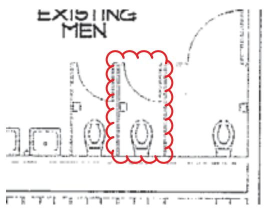
Men 13 & Women 14 (1)



Subject: Men 13 & Women 14
Page: Page A2-1
Status: Not Acceptable
Element: Water Closet
Barrier: Clear Floor Space and dimensions for fixtures
TAS Codes: 604
Web Links: http://www.tdlr.texas.gov/ab/2012abtas6.htm#604
Note: Both of these toilet compartments have been modified, and are not as represented on this sheet. The toilet compartments do not have the correct amount of clear space.

604.8.1.1 Size. Wheelchair accessible compartments shall be 60 inches (1525 mm) wide minimum measured perpendicular to the side wall, and 56 inches (1420 mm) deep minimum for wall hung water closets and 59 inches (1500 mm) deep minimum for floor mounted water closets measured perpendicular to the rear wall. Wheelchair accessible compartments for children's use shall be 60 inches (1525 mm) wide minimum measured perpendicular to the side wall, and 59 inches (1500 mm) deep minimum for wall hung and floor mounted water closets measured perpendicular to the rear wall.

Existing Mens RR (1)



Subject: Existing Mens RR
Page: Page A2-2
Status: Not Acceptable
Element: Ambulatory Stall
Barrier: Door Swing, Grab Bars
TAS Codes: 213, 604
Web Links: http://www.tdlr.texas.gov/ab/2012abtas6.htm#604
Note: Where six or more toilet compartments are provided in a toilet room, or the combination of urinals and water closets total six, an ambulatory stall must be provided. This requires one toilet compartment to have grab bars, and for the door to swing out.

213.3.1 Toilet Compartments. Where toilet compartments are provided, at least one toilet compartment shall comply with 604.8.1. In addition to the compartment required to comply with 604.8.1, at least one compartment shall comply with 604.8.2 where six or more toilet compartments are provided, or where the combination of urinals and water closets totals six or more fixtures.

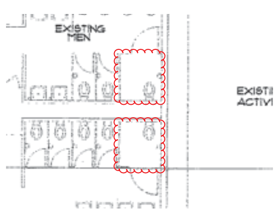
604.8.2 Ambulatory Accessible Compartments. Ambulatory accessible compartments shall comply with 604.8.2.

604.8.2.1 Size. Ambulatory accessible compartments shall have a depth of 60 inches (1525 mm) minimum and a width of 35 inches (890 mm) minimum and 37 inches (940 mm) maximum.

604.8.2.2 Doors. Toilet compartment doors, including door hardware, shall comply with 404, except that if the approach is to the latch side of the compartment door, clearance between the door side of the compartment and any obstruction shall be 42 inches (1065 mm) minimum. The door shall be self-closing. A door pull complying with 404.2.7 shall be placed on both sides of the door near the latch. Toilet compartment doors shall not swing into the minimum required compartment area.

604.8.2.3 Grab Bars. Grab bars shall comply with 609. A side-wall grab bar complying with 604.5.1 shall be provided on both sides of the compartment.

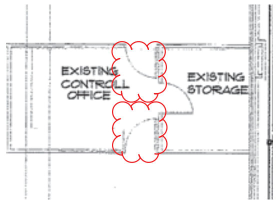
Existing Mens and Womens RR (1)



Subject: Existing Mens and Womens RR
Page: Page A2-2
Status: Not Acceptable
Element: Accessible Stall
Barrier: Door Location
TAS Codes: 604
Web Links: http://www.tdlr.texas.gov/ab/2012abtas6.htm#604
Note: When doors to accessbile toilet compartments are located on the front partition, it must be located 4" maximum from the side wall or partition furthest from the water closet. These doors are placed on the opposite side, directly in front of the water closet.

604.8.1.2 Doors. Toilet compartment doors, including door hardware, shall comply with 404 except that if the approach is to the latch side of the compartment door, clearance between the door side of the compartment and any obstruction shall be 42 inches (1065 mm) minimum. Doors shall be located in the front partition or in the side wall or partition farthest from the water closet. Where located in the front partition, the door opening shall be 4 inches (100 mm) maximum from the side wall or partition farthest from the water closet. Where located in the side wall or partition, the door opening shall be 4 inches (100 mm) maximum from the front partition. The door shall be self-closing. A door pull complying with 404.2.7 shall be placed on both sides of the door near the latch. Toilet compartment doors shall not swing into the minimum required compartment area.

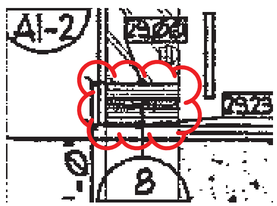
Existing Control Office (1)



Subject: Existing Control Office
Page: Page A2-2
Status: Not Acceptable
Element: Doorways
Barrier: Maneuving Clearance
TAS Codes: 404
Web Links: http://www.tdlr.texas.gov/ab/2012abtas4.htm#404
Note: Both doors maneuving clearances were obstructed by the build in millwork (desk). It is requried to have 18" of clear space extending past the latch on the pull side.

404.2.4 Maneuvering Clearances. Minimum maneuvering clearances at doors and gates shall comply with 404.2.4. Maneuvering clearances shall extend the full width of the doorway and the required latch side or hinge side clearance.

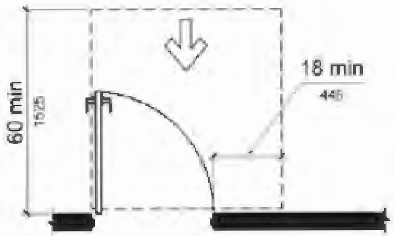
Curb Ramp (1)



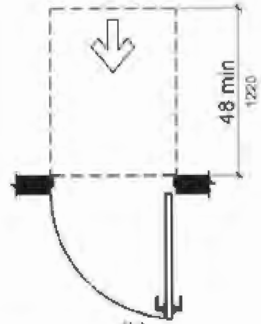
Subject: Curb Ramp
Page: Page A1-1
Status: Not Acceptable
Element: Curb Ramp
Barrier: Cross Slope
TAS Codes: 405.3
Web Links: http://www.tdlr.texas.gov/ab/2012abtas4.htm#405
Note: The cross slope of this ramp was measured at 6.5% (3.12:48) The max allowable cross slope is 1:48.

405.3 Cross Slope. Cross slope of ramp runs shall not be steeper than 1:48.

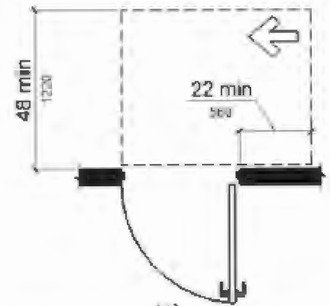
Advisory 405.3 Cross Slope. Cross slope is the slope of the surface perpendicular to the direction of travel. Cross slope is measured the same way as slope is measured (i.e., the rise over the run).



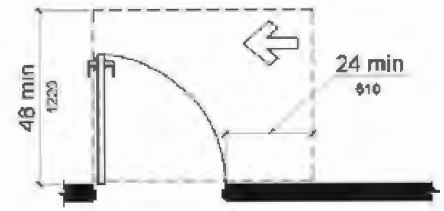
(a)
front approach, pull side



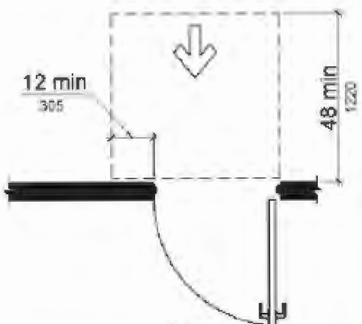
(b)
front approach, push side



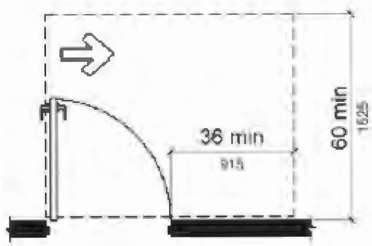
(g)
hinge approach, push side, door provided with both closer and latch



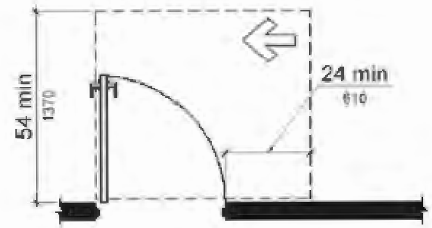
(h)
latch approach, pull side



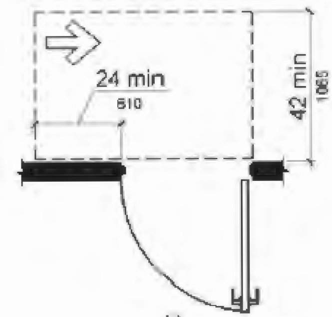
(c)
front approach, push side, door provided with both closer and latch



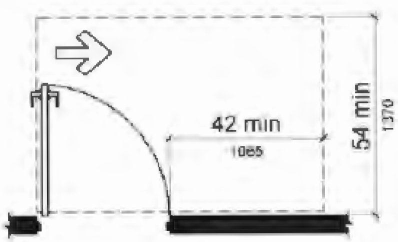
(d)
hinge approach, pull side



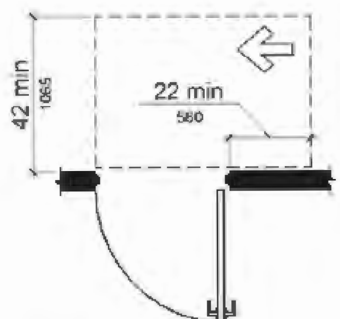
(i)
latch approach, pull side, door provided with closer



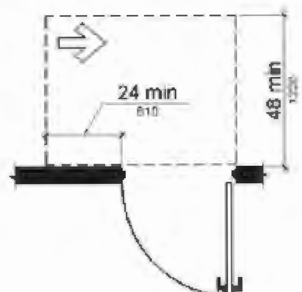
(j)
latch approach, push side



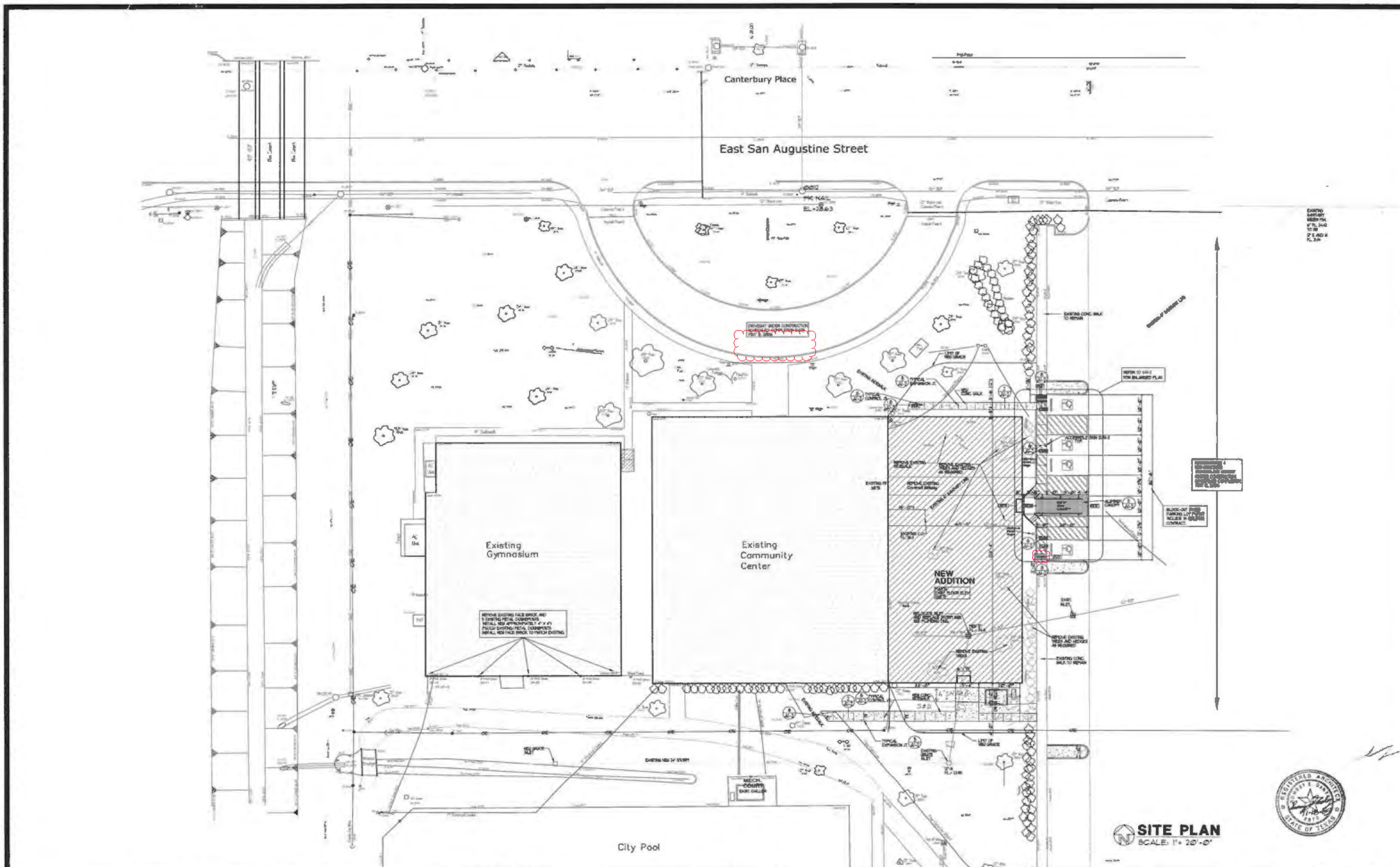
(e)
hinge approach, pull side



(f)
hinge approach, push side



(k)
latch approach, push side, door provided with closer



DANSBY & MILLER ▫ A.I.A. ▫ ARCHITECTS

WILLIAM K. MILLER

ROMNEY E. DANSBY

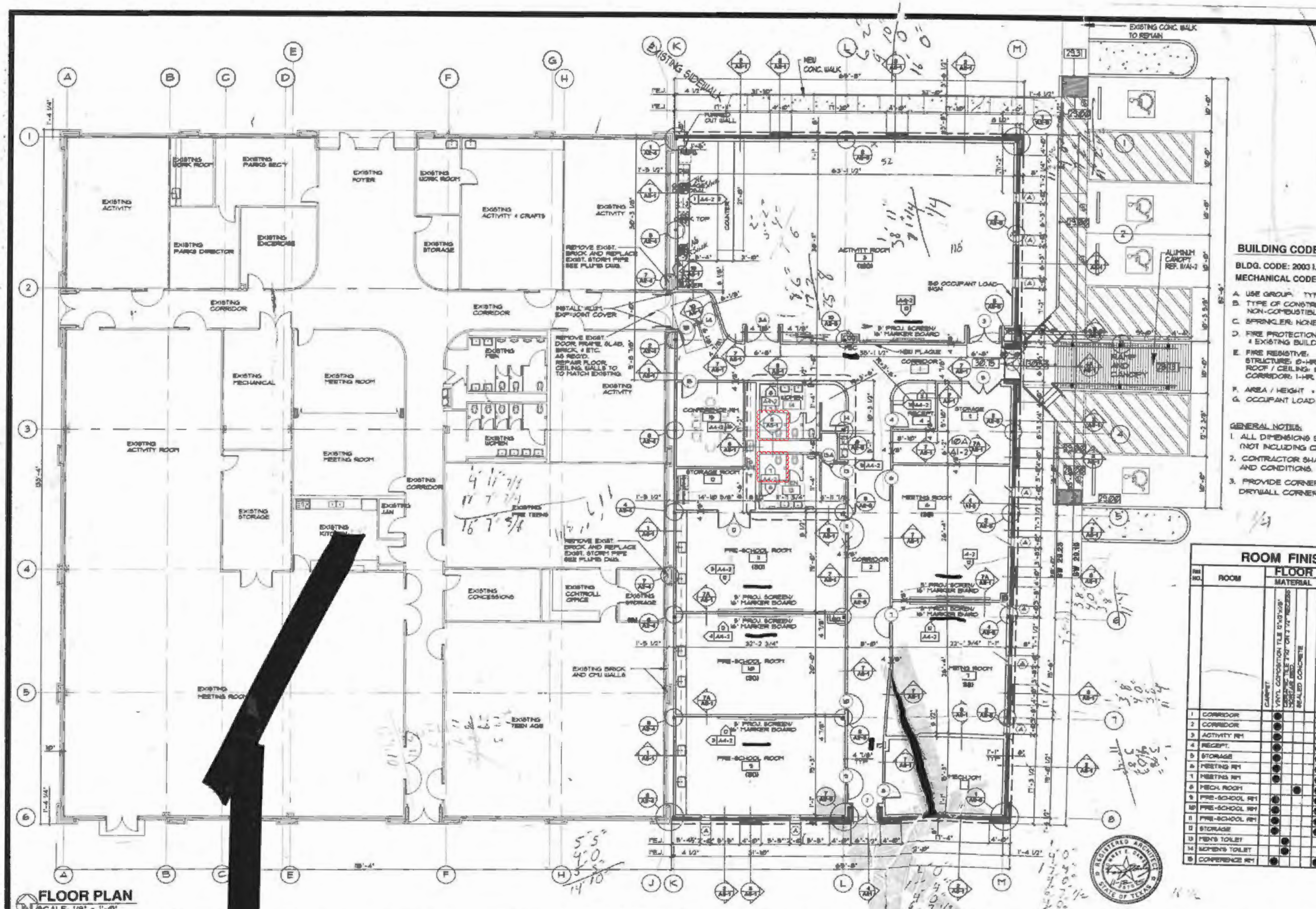
ADDITION TO
DEER PARK COMMUNITY CENTER
DEER PARK, TEXAS

OVERALL SITE PLAN

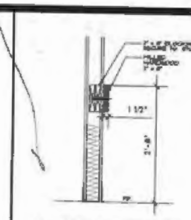
Drawn By	CE/N.R.
Checked By	B.H.L.
Date	10-28-05
Job #	201-7

A1-1

2 of 30



FLOOR PLAN
SCALE: 1/8" = 1'-0"



CHAIR RAIL DETAIL
SCALE: 3/4" = 1'-0"

BUILDING CODE ANALYSIS

BLDG. CODE: 2003 I.B.C.
MECHANICAL CODE: 2003 I.M.B.C.

A. USE GROUP: TYPE A-3
B. TYPE OF CONSTRUCTION: TYPE 2-B NON RATED / NON-COMBUSTIBLE
C. SPRINKLER: NONE
D. FIRE PROTECTION: 2-HR. FIREWALL BETWEEN & EXISTING BUILDINGS.
E. FIRE RESISTIVE:
STRUCTURE: 0-HR.
ROOF / CEILING: 0-HR.
CORRIDOR: 1-HR. (20 MIN. DOOR, 45 MIN. WINDOW)
F. AREA / HEIGHT = 8758.6 SF. 1-STORY
G. OCCUPANT LOAD: 335 OCC.

GENERAL NOTES:
1. ALL DIMENSIONS SHOWN ARE FINISH DIMENSIONS. (NOT INCLUDING CERAMIC TILE.)
2. CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS AND CONDITIONS.
3. PROVIDE CORNER GUARDS AT ALL EXPOSED DRYWALL CORNERS

ROOM FINISH SCHEDULE

RM NO.	ROOM	FLOOR MATERIAL: CARPET	VINYL COMPOSITION TILE 12"x12"x1/8"	CERAMIC TILE 2"x2" OR 2 1/2" RECESS MORTAR BED	SEALED CONCRETE		FLOOR BASE: 4" RUBBER	CERAMIC TILE (COVE) 5" HIGH 2"x2"		WALLS MAT: GYP BD	WATER RESIST. BACKER BOARD	WALLS FINISH: MULTI-COLOR PAINT	PAINT ENAMEL SEMI-GLOSS	CERAMIC TILE	PROVIDE CHAIR RAIL AS DETAIL	CEILING MAT/FIN: SUSP. ACOUSTICAL TILE (24"x24")	PAINT ROOF DECK	[illegible]	HT.	REMARKS
1	CORRIDOR		●				●			●			●			●				
2	CORRIDOR		●				●			●			●			●				
3	ACTIVITY RM		●				●			●			●		●	●				
4	RECEPT.		●				●			●			●			●				
5	STORAGE		●				●			●			●		●	●				
6	MEETING RM		●				●			●			●		●	●				
7	MEETING RM		●				●			●			●			●				
8	MECH. ROOM				●		●			●			●		●		●			
9	PRE-SCHOOL RM		●				●			●			●		●	●				
10	PRE-SCHOOL RM		●				●			●			●		●	●				
11	PRE-SCHOOL RM		●				●			●			●		●	●				
12	STORAGE		●				●			●			●			●				
13	MEN'S TOILET			●				●			●		●	●		●				
14	WOMEN'S TOILET			●				●			●		●	●		●				
15	CONFERENCE RM		●				●			●			●		●	●				

DA[redacted]BY & MILLER ▫ A.I.A. ▫ ARCHITECTS
WILLIA[redacted]MILLER
ROMNEY E. DANSBY

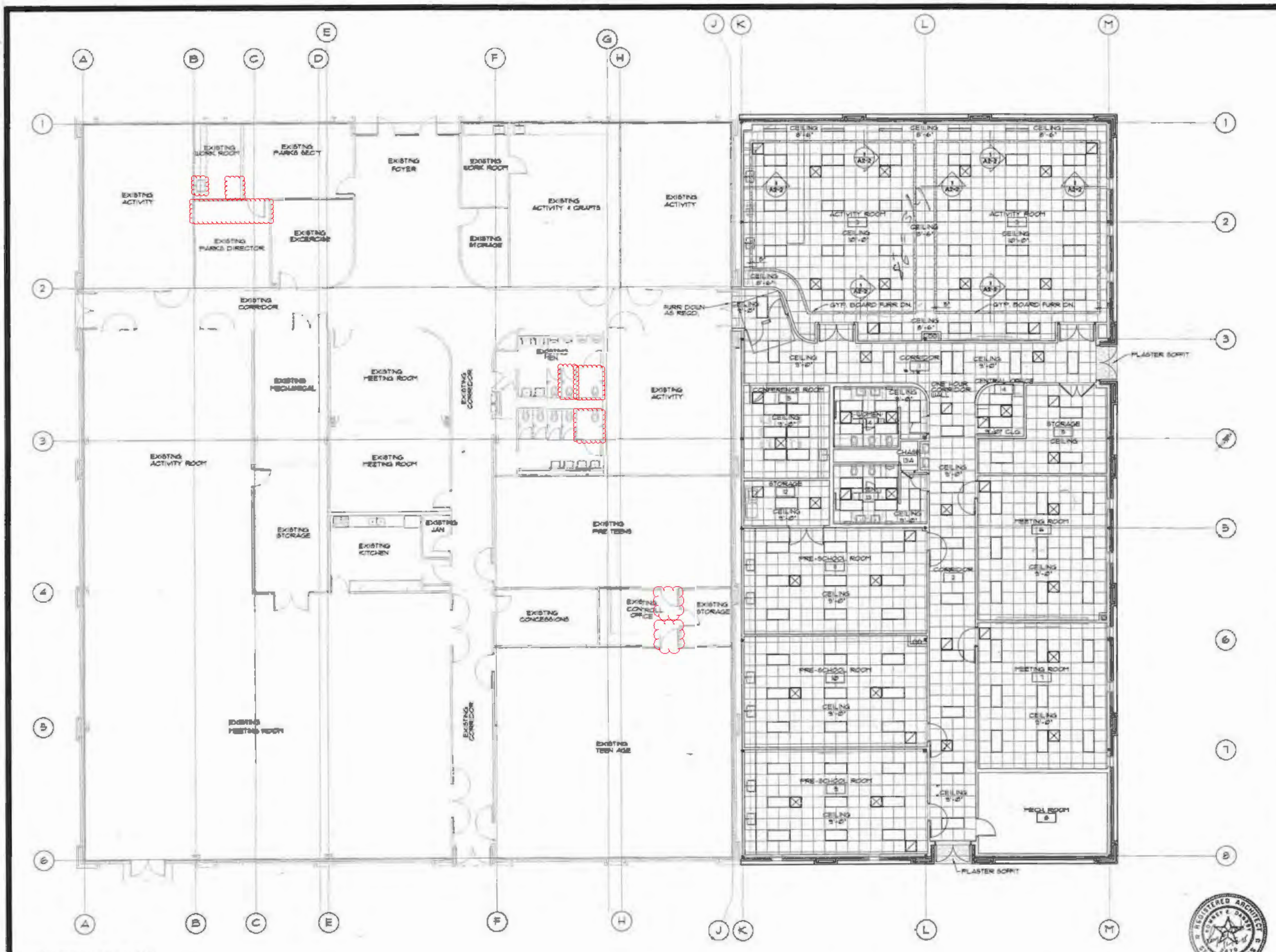
ADDITION TO
DEER PARK COMMUNITY CENTER
DEER PARK, TEXAS

FLOOR PLAN AND FINISH SCHEDULE

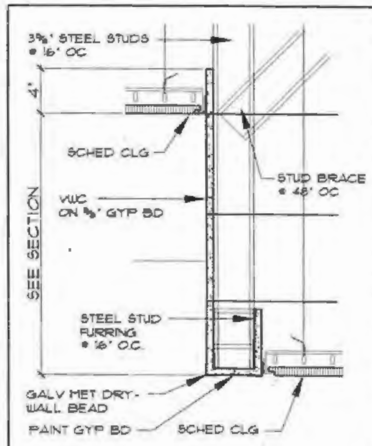
Drawn By: CE / N.S.
Checked By: B.H.L.
Date: 11-16-05
Job #: 251-7

A2-1

5 of 30



CEILING PLAN
SCALE: 1/8" = 1'-0"



1 CEILING DETAIL
SCALE: 1 1/2" = 1'-0"

DANSBY & MILLER ▫ A.I.A. ▫ ARCHITECTS
WILLIAM K. MILLER
ROMNEY E. DANSBY

ADDITION TO
DEER PARK COMMUNITY CENTER
DEER PARK, TEXAS

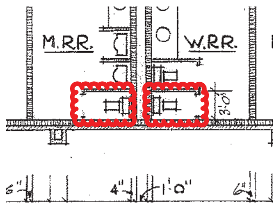
CEILING PLAN

Drawn By CE
Checked By S.H.L.
Date 11-18-08
Job # 251-7

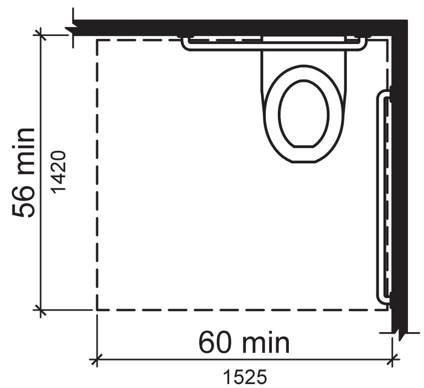
A2

Deer Park Gymnasium

Men's & Women's RR (1)



Subject: Men's & Women's RR
Page: Page 1
Status: Not Acceptable
Element: Water Closet
Barrier: Clear Floor Space and dimensions for fixtures
TAS Codes: 604
Web Links: http://www.tdlr.texas.gov/ab/2012abtas6.htm#604
Note: The water closet clear floor space must be 60" x 56". Grab bars, dispensers, and other items must comply with 604.



604.8.1.1 Size. Wheelchair accessible compartments shall be 60 inches (1525 mm) wide minimum measured perpendicular to the side wall, and 56 inches (1420 mm) deep minimum for wall hung water closets and 59 inches (1500 mm) deep minimum for floor mounted water closets measured perpendicular to the rear wall. Wheelchair accessible compartments for children's use shall be 60 inches (1525 mm) wide minimum measured perpendicular to the side wall, and 59 inches (1500 mm) deep minimum for wall hung and floor mounted water closets measured perpendicular to the rear wall.

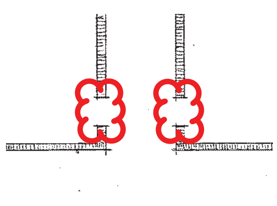
604.5 Grab Bars. Grab bars for water closets shall comply with 609. Grab bars shall be provided on the side wall closest to the water closet and on the rear wall.

604.5.1 Side Wall. The side wall grab bar shall be 42 inches (1065 mm) long minimum, located 12 inches (305 mm) maximum from the rear wall and extending 54 inches (1370 mm) minimum from the rear wall.

604.5.2 Rear Wall. The rear wall grab bar shall be 36 inches (915 mm) long minimum and extend from the centerline of the water closet 12 inches (305 mm) minimum on one side and 24 inches (610 mm) minimum on the other side.

604.7 Dispensers. Toilet paper dispensers shall comply with 309.4 and shall be 7 inches (180 mm) minimum and 9 inches (230 mm) maximum in front of the water closet measured to the centerline of the dispenser. The outlet of the dispenser shall be 15 inches (380 mm) minimum and 48 inches (1220 mm) maximum above the finish floor and shall not be located behind grab bars. Dispensers shall not be of a type that controls delivery or that does not allow continuous paper flow.

Racquet Ball Room Doors (1)

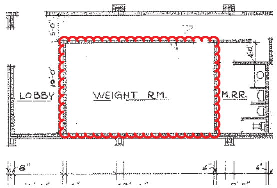


Subject: Racquet Ball Room Doors
Page: Page 1
Status: Not Acceptable
Element: Doorway
Barrier: Clear Width, Maneuvering Clearance
TAS Codes: 404
Web Links: http://www.tdlr.texas.gov/ab/2012abtas4.htm#404
Note: The clear width at the racquet ball room doors was measured to only be 23". The minimum allowed clear width is 32". Additionally, the doorway maneuvering clearance must comply with 404.

404.2.3 Clear Width. Door openings shall provide a clear width of 32 inches (815 mm) minimum. Clear openings of doorways with swinging doors shall be measured between the face of the door and the stop, with the door open 90 degrees. Openings more than 24 inches (610 mm) deep shall provide a clear opening of 36 inches (915 mm) minimum. There shall be no projections into the required clear opening width lower than 34 inches (865 mm) above the finish floor or ground. Projections into the clear opening width between 34 inches (865 mm) and 80 inches (2030 mm) above the finish floor or ground shall not exceed 4 inches (100 mm).

404.2.4 Maneuvering Clearances. Minimum maneuvering clearances at doors and gates shall comply with 404.2.4. Maneuvering clearances shall extend the full width of the doorway and the required latch side or hinge side clearance.

Weight Room (1)



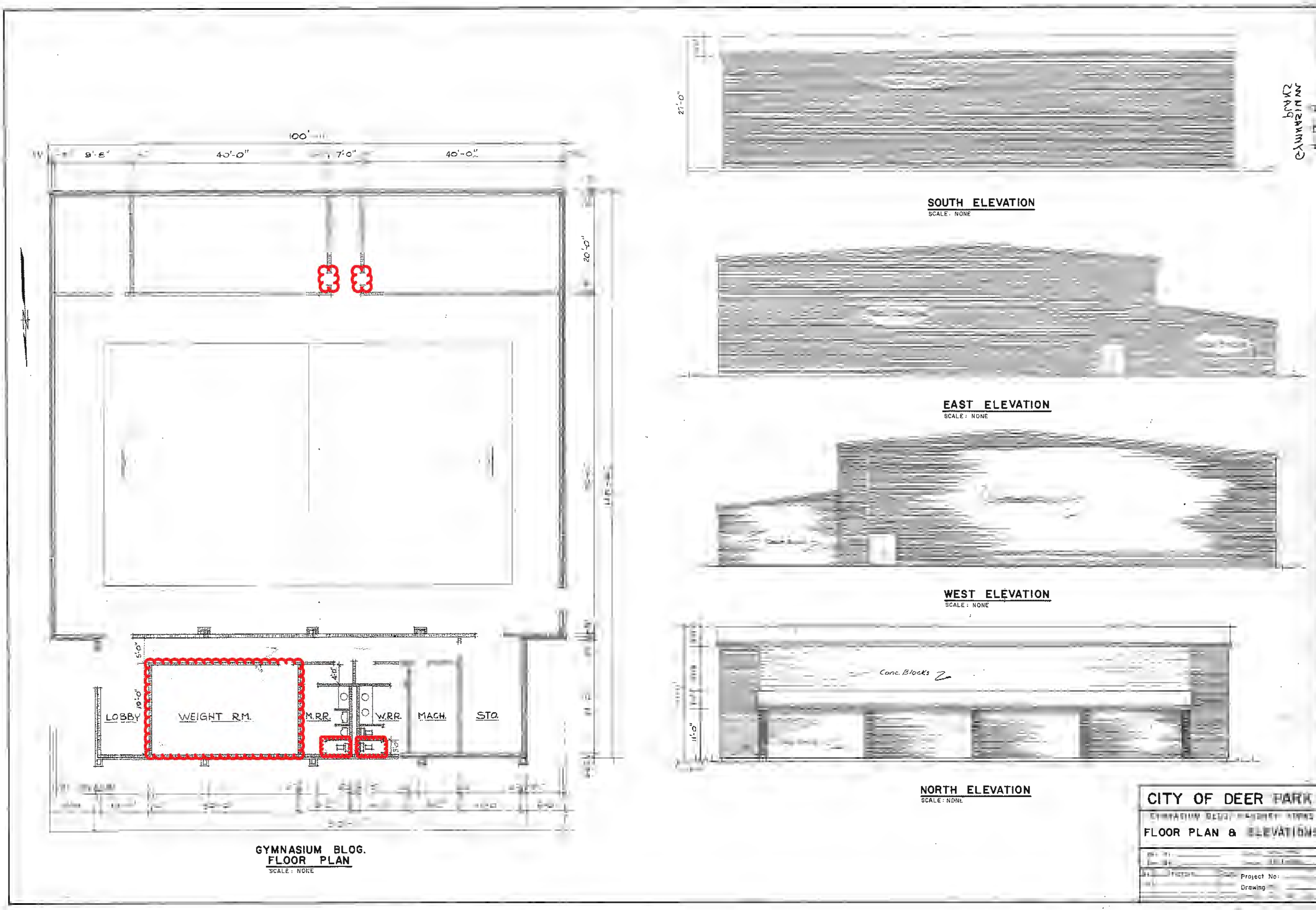
Subject: Weight Room
Page: Page 1
Status: Not Acceptable
Element: Equipment
Barrier: Clear Floor Space
TAS Codes: 236, 1004
Web Links: http://www.tdlr.texas.gov/ab/2012abtas10.htm#1004
Note: A clear floor space must be provided and positioned for transfer to at least one of each type of exercise equipment.

236.1 General. At least one of each type of exercise machine and equipment shall comply with 1004.

Advisory 236.1 General. Most strength training equipment and machines are considered different types. Where operators provide a biceps curl machine and cable-cross-over machine, both machines are required to meet the provisions in this section, even though an individual may be able to work on their biceps through both types of equipment.

Similarly, there are many types of cardiovascular exercise machines, such as stationary bicycles, rowing machines, stair climbers, and treadmills. Each machine provides a cardiovascular exercise and is considered a different type for purposes of these requirements

1004.1 Clear Floor Space. Exercise machines and equipment shall have a clear floor space complying with 305 positioned for transfer or for use by an individual seated in a wheelchair. Clear floor or ground spaces required at exercise machines and equipment shall be permitted to overlap.


100'-0"
9'-8"
40'-0"
7'-0"
40'-0"
20'-0"
5'-0"
4'-0"
19'-0"
LOBBY
WEIGHT RM.
M.R.R.
W.R.R.
MACH.
STO.
GYMNASIUM BLDG.
FLOOR PLAN
SCALE: NONE
27'-0"
SOUTH ELEVATION
SCALE: NONE
EAST ELEVATION
SCALE: NONE
WEST ELEVATION
SCALE: NONE
Conc. Blocks
11'-0"
NORTH ELEVATION
SCALE: NONE
CITY OF DEER PARK
FLOOR PLAN & ELEVATIONS
Project No:
Drawing

Subject Property Location:
Deer Park Community Center Pool Area
610 E San Augustine St
Deer Park
TX 77536

Justin Walton, RAS#1329
Office - 940.368.1989
Fax - 214.764.0021
Justin.Walton@me.com

www.Texas-Accessibility.com

Prepared For:
HALFF ASSOCIATES, INC.
4030 West Braker Lane, Suite 450
Austin
TX 78759-5356

Date of Site Visit: 5/02/2016

Date of Report: 5/09/2016

Dear: **Mr. Webb Cooley**

Enclosed are the results of the TAS compliance review that I conducted at Deer Park Community Center's Pool Area on May 2nd, 2016. When I arrived on site, I was met by an admisitrator named Charlie, who paired me up with one of the pool maintenance workers who provided me access to all areas of the pool and shower house.

Both pools were reviewed, as well as the building that serves as an entrance, exit, and provides showers, restrooms, and changing areas. The accessible routes to parking was also reviewed.

There was only a birds eye view provided. No plans were provided to me.

The building that provides showers, changing areas, and restrooms is in need of a substantial renovation to achieve compliance. My comments are attached on the following pages. After reviewing these findings, feel free to reach out to me to discuss any of the items listed in detail.

Justin K Walton, RAS#1329

Deer Park Pool Area Site Review

Main Swiming Pool (1)

Subject: Main Swiming Pool
Page: Birds Eye View
Status: Not Acceptable
Note: Two accessible means of entry are reqruied. One of those must be a pool lift, or a sloped entry. The stairs provided only count as one accessible means of entry. The stairways are not currently compliant becuase two handrails are required. They must be spaced a maximum of 24" apart, and a minimum of 20" apart.
Element: Means of Access
Barrier: Handrails, Minimum Number of Accessible Entry Points.
TAS Codes: 242, 1009
Web Links: http://www.tdlr.texas.gov/ab/2012abtas10.htm#1009

242.1 General. Swimming pools, wading pools, and spas shall comply with 242.

242.2 Swimming Pools. At least two accessible means of entry shall be provided for swimming pools. Accessible means of entry shall be swimming pool lifts complying with 1009.2; sloped entries complying with 1009.3; transfer walls complying with 1009.4; transfer systems complying with 1009.5; and pool stairs complying with 1009.6. At least one accessible means of entry provided shall comply with 1009.2 or 1009.3.

Advisory 242.2 Swimming Pools. Where more than one means of access is provided into the water, it is recommended that the means be different. Providing different means of access will better serve the varying needs of people with disabilities in getting into and out of a swimming pool. It is also recommended that where two or more means of access are provided, they not be provided in the same location in the pool. Different locations will provide increased options for entry and exit, especially in larger pools.

1009.2 Pool Lifts. Pool lifts shall comply with 1009.2.

1009.3 Sloped Entries. Sloped entries shall comply with 1009.3.

1009.6.2 Handrails. The width between handrails shall be 20 inches (510 mm) minimum and 24 inches (610 mm) maximum. Handrail extensions required by 505.10.3 shall not be required on pool stairs.

Subject: Men & Women's Locker Rooms
Page: Birds Eye View
Status: Not Acceptable
Note: One shower in each locker room needs to comply with all the applicable code in 608 for that type of shower. Seats, Grab Bars, Thresholds, and Clearance are listed in the comments, but they must comly with all applicable code in 608.
Element: Showers
Barrier: Size, Thresholds
TAS Codes: 608
Web Links: http://www.tdlr.texas.gov/ab/2012abtas6.htm#608

608.1 General. Shower compartments shall comply with 608.

608.2.1 Transfer Type Shower Compartments. Transfer type shower compartments shall be 36 inches (915 mm) by 36 inches (915 mm) clear inside dimensions measured at the center points of opposing sides and shall have a 36 inch (915 mm) wide minimum entry on the face of the shower compartment. Clearance of 36 inches (915 mm) wide minimum by 48 inches (1220 mm) long minimum measured from the control wall shall be provided.

608.2.2 Standard Roll-In Type Shower Compartments. Standard roll-in type shower compartments shall be 30 inches (760 mm) wide minimum by 60 inches (1525 mm) deep minimum clear inside dimensions measured at center points of opposing sides and shall have a 60 inches (1525 mm) wide minimum entry on the face of the shower compartment.

608.2.2.1 Clearance. A 30 inch (760 mm) wide minimum by 60 inch (1525 mm) long minimum clearance shall be provided adjacent to the open face of the shower compartment.

608.3 Grab Bars. Grab bars shall comply with 609 and shall be provided in accordance with 608.3. Where multiple grab bars are used, required horizontal grab bars shall be installed at the same height above the finish floor.

608.4 Seats. A folding or non-folding seat shall be provided in transfer type shower compartments. A folding seat shall be provided in roll-in type showers required in transient lodging guest rooms with mobility features complying with 806.2. Seats shall comply with 610.

608.7 Thresholds. Thresholds in roll-in type shower compartments shall be 1/2 inch (13 mm) high maximum in accordance with 303. In transfer type shower compartments, thresholds 1/2 inch (13 mm) high maximum shall be beveled, rounded, or vertical.

Subject: Men & Women's Locker Rooms
Page: Birds Eye View
Status: Not Acceptable
Note: One water closet in each locker room must be accessible and comply with all codes in 604.
Element: Water Closets
Barrier: Location, Clear Space, Grab Bars, Etc.
TAS Codes: 604
Web Links: http://www.tdlr.texas.gov/ab/2012abtas6.htm#604

604.1 General. Water closets and toilet compartments shall comply with 604.2 through 604.8.

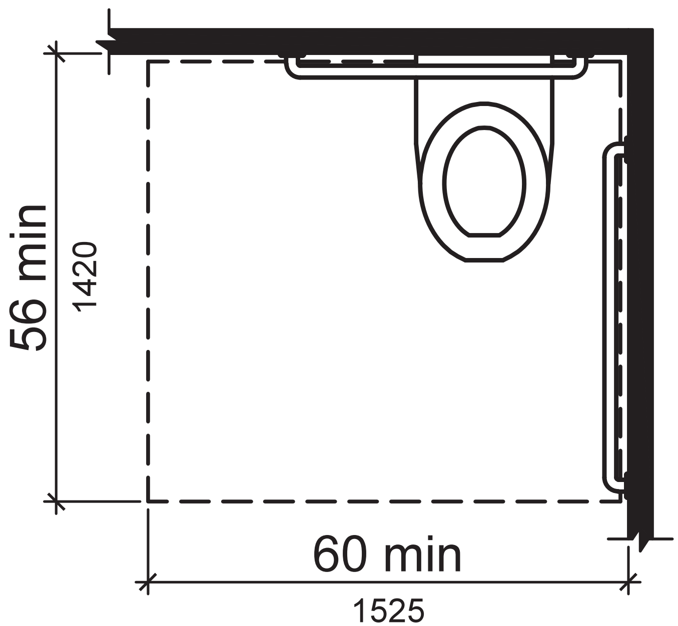
604.2 Location. The water closet shall be positioned with a wall or partition to the rear and to one side. The centerline of the water closet shall be 16 inches (405 mm) minimum to 18 inches (455 mm) maximum from the side wall or partition, except that the water closet shall be 17 inches (430 mm) minimum and 19 inches (485 mm) maximum from the side wall or partition in the ambulatory accessible toilet compartment specified in 604.8.2. Water closets shall be arranged for a left-hand or right-hand approach.

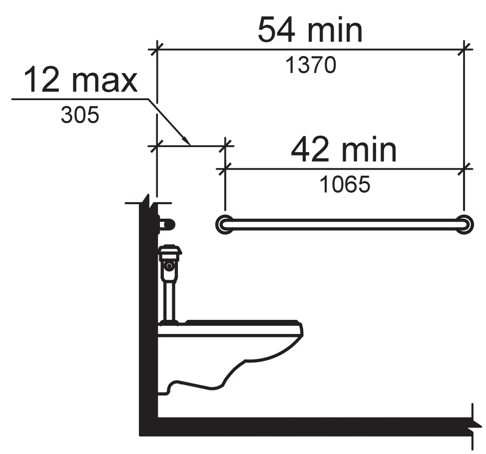
604.3 Clearance. Clearances around water closets and in toilet compartments shall comply with 604.3.

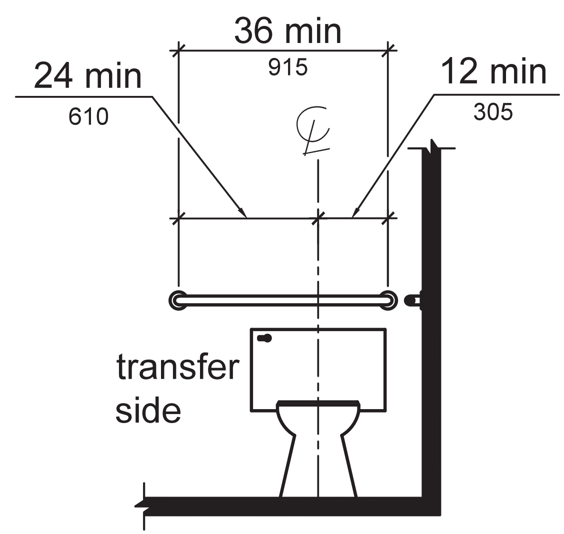
604.3.1 Size. Clearance around a water closet shall be 60 inches (1525 mm) minimum measured perpendicular from the side wall and 56 inches (1420 mm) minimum measured perpendicular from the rear wall.

604.3.2 Overlap. The required clearance around the water closet shall be permitted to overlap the water closet, associated grab bars, dispensers, sanitary napkin disposal units, coat hooks, shelves, accessible routes, clear floor space and clearances required at other fixtures, and the turning space. No other fixtures or obstructions shall be located within the required water closet clearance.

604.5 Grab Bars. Grab bars for water closets shall comply with 609. Grab bars shall be provided on the side wall closest to the water closet and on the rear wall.







Subject: Men & Women's Locker Rooms
Page: Birds Eye View
Status: Not Acceptable
Note: One dressing room in each locker room is required to comply with 803. There was not an adequate bench or turning space.
Element: Changing Rooms
Barrier: Size, Bench
TAS Codes: 803
Web Links: http://www.tdlr.texas.gov/ab/2012abtas8.htm#803

803.1 General. Dressing, fitting, and locker rooms shall comply with 803.

803.2 Turning Space. Turning space complying with 304 shall be provided within the room.

803.3 Door Swing. Doors shall not swing into the room unless a clear floor or ground space complying with 305.3 is provided beyond the arc of the door swing.

803.4 Benches. A bench complying with 903 shall be provided within the room.

Men's Locker Room (1)

Subject: Men's Locker Room
Page: Birds Eye View
Status: Not Acceptable
Note: One of the men's urinals needs to be mounted to where the rim is 17" maximum above finished floor.
Element: Urinal
Barrier: Mounting Height
TAS Codes: 605.2
Web Links: http://www.tdlr.texas.gov/ab/2012abtas6.htm#605

605.2 Height and Depth. Urinals shall be the stall-type or the wall-hung type with the rim 17 inches (430 mm) maximum above the finish floor or ground. Urinals shall be 13 1/2 inches (345 mm) deep minimum measured from the outer face of the urinal rim to the back of the fixture.

Subject: Shower House
Page: Birds Eye View
Status: Not Acceptable
Note: The push side of the exit door of the locker room building did not provide the reqruied clear 12" on the other side of the latch. Both a latch and a closer were present.
Element: Exit Doorway
Barrier: Maneuvering Clearance
TAS Codes: 404.2.4
Web Links: http://www.tdlr.texas.gov/ab/2012abtas4.htm#404

404.2.4 Maneuvering Clearances. Minimum maneuvering clearances at doors and gates shall comply with 404.2.4. Maneuvering clearances shall extend the full width of the doorway and the required latch side or hinge side clearance.

EXCEPTION: Entry doors to hospital patient rooms shall not be required to provide the clearance beyond the latch side of the door.
404.2.4.1 Swinging Doors and Gates. Swinging doors and gates shall have maneuvering clearances complying with Table 404.2.4.1.

Subject: Shower House
Page: Birds Eye View
Status: Not Acceptable
Note: The service counter is too hight to provide accessible access. It needs to be 36" high minimum above finished floor.
Element: Service Counter
Barrier: Height
TAS Codes: 904.4.1
Web Links: http://www.tdlr.texas.gov/ab/2012abtas9.htm#904

904.4.1 Parallel Approach. A portion of the counter surface that is 36 inches (915 mm) long minimum and 36 inches (915 mm) high maximum above the finish floor shall be provided. A clear floor or ground space complying with 305 shall be positioned for a parallel approach adjacent to the 36 inch (915 mm) minimum length of counter.

Subject: Shower House
Page: Birds Eye View
Status: Not Acceptable
Note: Where drinking fountains are provided, two must be provided. One far walking persons, and one that is accessible to non ambulatory people. They fountains must comply with the applicable code in 602.
Element: Drinking Fountains
Barrier: Minimum Number, Mounting Height
TAS Codes: 211, 602
Web Links: http://www.tdlr.texas.gov/ab/2012abtas6.htm#602

211.2 Minimum Number. No fewer than two drinking fountains shall be provided. One drinking fountain shall comply with 602.1 through 602.6 and one drinking fountain shall comply with 602.7.

EXCEPTION: Where a single drinking fountain complies with 602.1 through 602.6 and 602.7, it shall be permitted to be substituted for two separate drinking fountains.

602.1 General. Drinking fountains shall comply with 307 and 602.

602.2 Clear Floor Space. Units shall have a clear floor or ground space complying with 305 positioned for a forward approach and centered on the unit. Knee and toe clearance complying with 306 shall be provided.

EXCEPTION: A parallel approach complying with 305 shall be permitted at units for children's use where the spout is 30 inches (760 mm) maximum above the finish floor or ground and is 3 1/2 inches (90 mm) maximum from the front edge of the unit, including bumpers.
602.3 Operable Parts. Operable parts shall comply with 309.

602.4 Spout Height. Spout outlets shall be 36 inches (915 mm) maximum above the finish floor or ground.

602.5 Spout Location. The spout shall be located 15 inches (380 mm) minimum from the vertical support and 5 inches (125 mm) maximum from the front edge of the unit, including bumpers.

602.7 Drinking Fountains for Standing Persons. Spout outlets of drinking fountains for standing persons shall be 38 inches (965 mm) minimum and 43 inches (1090 mm) maximum above the finish floor or ground.