Linder Elementary School Site Summary

Address	2800 Metcalf Road Austin, TX 78741
Number of Permanent Campus Facilities	2
Original Year of Construction	1972
Total Campus Building Area (combined)	69,544 SF

Introduction

The Linder Elementary School campus is located at 2800 Metcalf Road in Austin, Texas. Linder Elementary School was built in 1972. The Main Building (BLDG-160A) consists of administration offices, classrooms, cafeteria, library, and gymnasium. The Music Building (BLDG-160B) is devoted to music education. Building 160A and 160B are connected by a covered walkway.

MainBuilding – BLDG-160A

Building Purpose	Administration Offices, Classrooms, Cafeteria, Library, and Gymnasium
Building Area	68,085 SF
Inspection Date	August 3, 2016
Inspection Conditions	100ºF - Hot and sunny
Facility Condition Index	

System Deficiency Overview

The following table provides a summary of the systems and their respective conditions found by each discipline.

System	Subsystem	Condition and Deficiency Overview	System Condition Rating
Exterior	Exterior Walls	The exterior of the building consists of a brick façade with concrete columns. The exterior of the building appeared to be in good condition. There were louver vents about one foot from the sidewalk area around the entire building that were chipped and rusted. There were two holes in the soffit on the southwest corner near BLDG-160B.	Good
	Exterior Windows	The windows are single-paned aluminum metal frames inset into the brick façade. The windows at the side lite next to the northwest entry doors were heavily scratched. The remainder of the windows appeared to be in good condition. It was reported by staff that the windows are leaking and may need to be replaced however this was not viewed during the assessment.	Good
	Exterior Doors	There are many double exterior metal doors with lites throughout the building. Some exterior doors are solid metal with no lites. The exterior doors appeared to be in good condition. It was reported by staff that water and dirt come in through the thresholds but this was not evident during the assessment.	Good
Roofing	The main building has various roof materials. Roof A-01 is a built-up roof system. Roofs A-02, A-03, A-04, A-05, A-06, A-07, and A-08 are a modified bitumen roof		Average

System	Subsystem	Condition and Deficiency Overview	System Condition Rating
	type. Roof A-07 was observed to be in poor condition. It was bubbling, cracking, and showing signs of ponding. The rubber coverings at the corners were coming loose. The other roofs were observed to be in average condition.		
Interior Construction	Interior Walls	The interior walls are gypsum board in the classrooms, administration area, and lobby. There is CMU (concrete masonry units) in the gymnasium and cafeteria areas. The corridors are gypsum board at the top and plastic laminate from the floor up to six feet. The walls appeared to be in good condition. There were some areas where the gypsum board had been scraped down to the metal edging.	Good
	Interior Doors	The interior doors are wood veneer with a lite in metal frames or solid wood doors without side lites. The interior doors appeared to be in good condition. The paint at door window frames and astragals was chipped, and some doors were worn and needed refinishing. The door to the male restroom in room 307 did not close and was gouging the VCT (vinyl composition tile) floor.	Good
	Interior Specialties	System not present.	N/A
Stairs	Exterior Stairs	The exterior stairs are the general entrance path from the street to the entry doors. They are concrete with metal non-slip treads and metal handrails. There is another concrete staircase on the west end of the building, providing an exit from the 400-wing. That staircase is concrete with a metal railing on both sides. Both sets of stairs appeared to be in good condition. It was reported that the stairs from the street to the front drive are cracking and need to be replaced. A curb at the top of the south stair is completely cracked and needs to be repaired	Good
	Interior Stairs	System not present.	N/A
Interior Finishes	Interior Wall Finishes	The interior walls are painted gypsum board in the classrooms and administration area. There is painted CMU in the gymnasium and cafeteria areas. The corridors are plastic laminate from the floor up to six feet and gypsum board to the ceiling. Some of the corridors have wood paneling from the floor to the ceiling. Various classrooms have acoustic paneling on one wall. There are ceramic tile walls in the restrooms and kitchen. The interior wall finishes were observed to be in good condition. Some of the wood paneling in the corridor	Good

System	Subsystem	Condition and Deficiency Overview	System Condition Rating
		near the cafeteria was worn and needed refinishing.	
	Interior Floor Finishes	The interior floor finishes are VCT in the 300-wing corridors and classrooms. The majority of the corridors, the cafeteria, and 100- and 200-wing classrooms are suspected to be asbestos tile. Ceramic tile flooring is in the restrooms and kitchen. Carpet is in the library and administration offices. New carpet tiles are currently being installed in the entry portion of classrooms in the 300-wing. There is a rubber sport court in the gymnasium. There is wood flooring on the stage. All interior floors were observed to be in good condition.	Good
	Interior Ceiling Finishes	The interior ceilings are ACT (acoustical ceiling tile) in metal grid in the classrooms, corridors, kitchen, cafeteria, library, and administration areas. There are gypsum board ceilings in the restrooms. The gymnasium has tectum acoustical panels in metal grid. The ceiling systems were observed to be in good condition. The staff reported that the ceiling in the kitchen needed to be replaced however the ceiling grid and tiles were in average condition.	Good
Conveying	System not present.		N/A
Plumbing	Plumbing Fixtures	The facility contains multiple plumbing applications that service one level, consisting of in-classroom student restrooms, staff restrooms, student gymnasium restrooms, janitorial closets with service sinks, and one commercial kitchen. The restrooms located inside classrooms have vitreous china floor-mount toilets with manual flushing valves. The classroom restrooms are not equipped with sinks; however, the classrooms have laminated particle board vanities with stainless steel sink/bubbler combinations mounted inside the vanities. The remainder of the facility's restrooms have vitreous china sinks with manual or metering faucets, along with vitreous china floor/wall-mount toilets and urinals with manual flushing valves. There are also wall-mounted service sinks in the janitorial closets. The restroom plumbing fixtures were observed to be fairly aged but were in good working condition. The commercial kitchen plumbing fixtures were also observed to be in good condition. The Staff reported that new drinking fountains, sinks, and toilet fixtures throughout the campus were	Good

System	Subsystem	Condition and Deficiency Overview	System Condition Rating
		requested and that the drinking fountain in the 200-wing is scheduled to be replaced. The Staff went on to report that the floor sinks in custodial closets, KITMOPRM, CCCAFE, CC100, CC310, and CC300 were requested to be replaced. It was also reported by the Staff that the gymnasium's female and male restroom (GRRGYM and BRRGYM) fixture partitions were rusting and needed to be replaced. In addition, the Staff requested that female and male restrooms in the 200-wing be renovated, specifically, GRR200 and BRR200. Lastly, the Staff stated that the kitchen floor sink did not have enough capacity to handle the three-compartment sink. The only deficiencies recorded were in regards to extremely aged fixtures observed in the building, specifically, the porcelain wash sink located outside the cafeteria and the porcelain janitorial closet sinks located in the custodial closets.	
	Domestic Water Distribution	The majority of the plumbing fixtures are not serviced by any domestic water distribution equipment, such as a vertical water heater; however, some of the faculty sinks have individual tankless instantaneous water heaters installed under the sinks. The plumbing fixtures in the commercial kitchen and the gymnasium appear to be serviced by three water heaters. There are two vertical gas water heaters near the kitchen (99-gallon capacity). The other water heater is electric (40-gallon capacity) and is located in the main mechanical room. The domestic water distribution plumbing and equipment were observed to be in good condition. The Staff reported that the shut-off procedure for plumbing distribution piping was designed to isolate each individual wing and does not isolate each individual plumbing fixture. It was also reported that the facility's water lines and sanitary sewer was corroding. In addition, it was reported that the main water shut-off for the facility was no longer working and that the Staff also requested for a secondary shut-off to be installed for the kitchen. The Staff went on to report that the plumbing vents for the building have been extended above the mechanical unit air circulation zone to avoid circulating sanitary sewer gases into the building and need to be replaced. Lastly, it was reported by the staff	Good

System	Subsystem	Condition and Deficiency Overview	System Condition Rating
		that the kitchen water service shut-off was not working and that they have requested to have individual shut-offs for each piece of kitchen equipment installed.	
	Other Plumbing	The roof drains are predominantly designed with an interior type drainage system. The roof drains were observed to be in good condition. The Staff reported that the roof drains in the walls of the 300-wing and rooms 304, 305, ADMIN, and ADMIN3 were leaking. It was also reported that the commercial kitchen grease trap frequently emitted odors. Lastly, it was reported that an area drain in the buildings crawl space was clogged and has caused as much as 18-24 inches of standing water. The Staff frequently have to pump out the flooded area and have requested a sump pump be installed.	Good
Mechanical/ HVAC	This building has multiple HVAC (heating, ventilating, and air conditioning) systems that service one floor level. The major mechanical equipment consists of RTUs (roof top packaged units), split system heat pump/air conditioning units, indoor AHUs (air handling units), floor-mounted horizontal packaged unit ventilator systems, and indoor water source heat pump units. The HVAC system also includes one large roof-mounted rotary air-cooled chiller that has a refrigeration cooling capacity of 100-TON and two horizontal gas-fired boilers with rated output capacities of 1,050 MBH. There are 33 HVAC pieces of equipment throughout the building. The estimated capacities of the roof-mounted exhaust fans range from 150 to 1,300 CFM (cubic feet per minute). The refrigeration capacities of HVAC units range from 2.5 to 100-TON. The Staff reported that all AHUs and FCUs (fan coil units) were replaced in the main building in 2015. The Staff also reported that the indoor water source heat pumps located in the basement and AHU-8 located in the crawl space had not been replaced and were extremely aged. It was reported that the kitchen RTU does not cool the kitchen properly and that 50% of the exhaust fans throughout the building were not functioning well. The Staff went on to reported that the rotary chiller was close to its typical design service life and that it was damaged by hail. Lastly, the Staff requested that exhaust fans be added in the crawlspace because the space was only vented by one fan, which was not sufficient. The mechanical/HVAC systems for this facility were observed to be in average condition. Many of the deficiencies observed were general aging of equipment, compressor fin damage due to vandalism/weather, and enclosure and insulation damage due to excessive exposure to the elements. Another widespread observed deficiency was the use of an outdated refrigerant in some of the existing HVAC systems, refrigerant type R-22. Additionally, the roof-mounted chiller was observed to be		Average

System	Subsystem	Condition and Deficiency Overview	System Condition Rating
	installed in 2000, was originally charged with R-22 refrigerant, and was nearing the end of its typical design service life. The unit had insulation damage from exposure to the elements and also had damage to its compressor fins from weather and vandals. The chiller's ancillary equipment, such as condensation or chilled water centrifugal pump enclosures, were excessively corroded. There were also deficiencies observed in regards to the HVAC equipment located in the basement and crawlspace of the facility. The basement had four obsolete water source heat pumps (HP-102, HP-103, HP-105, and HP-106) and one obsolete heat recovery unit, HRU-1, that utilized R-22 refrigerant. The building's crawlspace also contained an obsolete unit, AHU-8, that had an estimated installation date of 1972. Lastly, the 4-TON RTU (SC011908) and 1,400 CFM supply air exhaust fan, KSU-1 (SC011907), that service the kitchen were aged and outdated.		
Fire Protection	Fire Alarm	The building has a fire alarm system that consists of alarm and signaling devices such as horns/ annunciators, strobes, horn/ strobe combinations, pull stations, and detectors. The fire alarm system is controlled by a Silent Knight control panel. The fire alarm system was observed to be in good condition. The main electronic control panel indicated all systems were normal; however, facility staff reported that the alarm sounded occasionally without cause.	Good
	Fire Protection/ Suppression	The building is not equipped with a fire sprinkler/ suppression system; however, it is protected by portable fire extinguishers stationed throughout the building. All portable fire extinguishers observed were inspected within the last year.	N/A

System	Subsystem	Condition and Deficiency Overview	System Condition Rating
Electrical	Electrical Distribution	The electrical service (utility transformer, exterior switchboard, and capacitor bank for the facility) appear to be located on the east side of the complex, north of the main mechanical room. The main mechanical room houses an untagged switchboard and a main distribution panel that feeds transformers powering subpanels throughout the building. Additional subpanels in the main mechanical room exist for various building services and feed end users that appear to have been added as demand increased. The electrical distribution equipment appeared to be in average condition. The main switchboard "SG" in the mechanical room was nearing the end of its typical design service life. Oxidation on the enclosure was a concern. Transformer "DIST A" located in the main mechanical room appeared to have been used as a workbench. Heavy corrosion and splattered paint covered the enclosure. Panelboard "LVA" located in the main mechanical room was missing a breaker void cover or breaker. This is a life safety issue. A junction/pull box located in the main mechanical room above Panel LBA was missing a conduit plug and enclosure cover, leaving energized wires exposed. Panelboard "LAC" located in the basement was missing a breaker void cover or breaker. This is a life safety issue.	Average
	Lighting	The exterior of the building is outfitted with what appears to be wall-mount HID (high-intensity discharge) fixtures located near the roofline of the building. LED (light-emitting diode) flood fixtures have been installed recently on building corners, illuminating driveway and parking areas. Covered walkways are illuminated by surface-mounted ceiling fixtures or with recessed exterior can lighting fixtures. The interior lighting is mainly fluorescent with the occasional screw-type fixture in closets and storage rooms. The stage is equipped with specifically designed lighting to support stage productions. The gymnasium is equipped with hanging fluorescent fixtures. There are exit signs at every exit. The exterior lighting was observed to be in good condition. The facility reported that the exterior lights were nearing the end of their typical design service life and were currently being replaced with LED fixtures. The facility requested an exterior light switch be added to kitchen entrance.	Good

System	Subsystem	Condition and Deficiency Overview	System Condition Rating
		The interior lighting was observed to be in good condition. Facility staff requested lighting fixtures be added to the crawlspace. Various exit signs were not illuminated..	
	Communications & Security	There is a Gemini security system currently installed with multiple keypads at various entrances. Motion detectors are installed in interior areas, and security cameras are installed throughout the interior of the building and strategically on exterior corners and walls. There are also door frame-mount proximity readers for access into certain entrances, and a call box is located at the front entrance. A main distribution frame communication closet houses network switches, hubs, and routers in a rack-style configuration. The facility appears to have wireless routers installed in classroom ceilings strategically throughout the building. The security equipment was observed to be in good condition. It appeared that one camera was in the process of being replaced north of the kitchen in the loading dock area. The facility reported that there are blind spots in the video surveillance specifically on the north side of the complex. The communications equipment was also observed to be in good condition. Facility staff reported that the wireless internet was weak across the building. The facility also reported dead spots and high decibel levels relating to the public address system.	Good

Exterior System Deficiency Examples

Exterior Walls

Exterior Windows

Roofing Deficiency Examples

Interior Construction Deficiency Examples

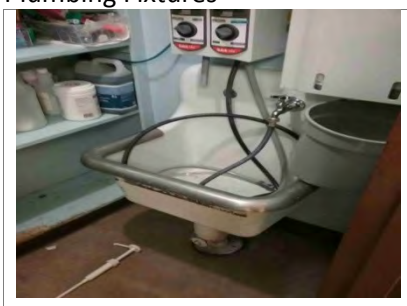
Interior Doors

Interior Finishes Deficiency Examples

Interior Wall Finishes

Plumbing System Deficiency Examples

Plumbing Fixtures



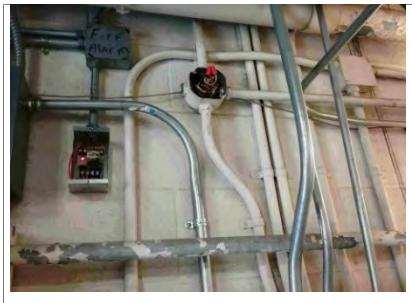

Mechanical/HVAC System Deficiency Examples






Electrical System Deficiency Examples

Electrical Distribution




Communications & Security

Music Building – BLDG-160B

Building Purpose	Music Classroom
Building Area	1,459 SF
Inspection Date	August 3, 2016
Inspection Conditions	100ºF, hot and sunny
Facility Condition Index	

System Deficiency Overview

The following table provides a summary of the conditions and deficiencies found by each discipline.

System	Subsystem	Condition and Deficiency Overview	System Condition Rating
Exterior	Exterior Walls	The exterior of the building consists of a brick façade. The exterior of the building appeared to be in good condition.	Good
	Exterior Windows	The windows are double-paned aluminum metal frames inset into the brick façade. The windows appeared to be in good condition.	Good
	Exterior Doors	There are two single exterior metal doors with lites in the building. The exterior doors appeared to be in good condition.	Good
Roofing	The roof is a single-ply membrane covering the music building. The roof was in good condition. It was reported by staff that Building B leaks. Water has been reported coming in through the wall and door of 500C and 500D. Flooding occurs inside the building. This condition was not evident upon assessment.		Good
Interior Construction	Interior Walls	The interior walls are gypsum board in the classroom and restroom. The interior walls appeared to be in good condition.	Good
	Interior Doors	The interior doors are solid wood veneer without lites. The interior doors appeared to be in good condition.	Good
	Interior Specialties	System not present.	N/A
Stairs	Exterior Stairs	System not present.	N/A
	Interior Stairs	System not present.	N/A
Interior Finishes	Interior Wall Finishes	The interior walls are painted gypsum board in the classroom, break area, and restroom.	Good

System	Subsystem	Condition and Deficiency Overview	System Condition Rating
		The interior walls appeared to be in good condition.	
	Interior Floor Finishes	The interior floor finishes are VCT in the classroom and break area. Ceramic tile is in the restroom. They all appeared to be in good condition.	Good
	Interior Ceiling Finishes	The interior ceilings are acoustical ceiling tile (ACT) in metal grid in the classrooms and administration areas. The ceiling finishes appeared to be in good condition.	Good
Conveying	System not present.		N/A
Plumbing	Plumbing Fixtures	The facility contains one multi-gender student/faculty restroom with a vitreous china floor-mounted toilet that has a manual flushing valve and a vitreous china sink with a manually operated faucet. The restroom plumbing fixtures were observed to be in good working condition.	Good
	Domestic Water Distribution	The plumbing fixtures are not serviced by any domestic water distribution equipment, such as a vertical water heater. The common area faculty sink has an individual tankless instantaneous water heater installed under the sink. The domestic water distribution plumbing and equipment were observed to be in good condition.	Good
	Other Plumbing	The roof drains for this facility were predominantly designed with an interior type drainage system. The roof drains were observed to be in good condition.	Good
Mechanical/ HVAC	This building has one large RTU with an estimated refrigeration cooling capacity of 20-TON. The mechanical/HVAC system for this facility appeared to be in good condition. The Staff reported that the exhaust fans in the crawl space do not function and that they have requested that the exhaust fans be replaced. The only deficiency noted was for the existing RTU. At the time of assessment the RTU could not be safely reached in order to determine if the unit actually utilized R-22 refrigerant. The type of refrigerant that the RTU utilized was more than likely R-22 due to the timeframe it was originally installed.		Good
Fire Protection	Fire Alarm	The building contains a fire alarm system that consists of alarm and signaling devices such as horns/ annunciators, strobes, horn/ strobe combinations, pull stations, and detectors. A control panel was not located in the building; therefore, the system is assumed to be controlled from BLDG-160A. The fire alarm system was observed to be in good condition.	Good
	Fire Protection/	The building is not equipped with a fire sprinkler/	N/A

System	Subsystem	Condition and Deficiency Overview	System Condition Rating
	Suppression	suppression system; however, it is protected by portable fire extinguishers stationed throughout the building. All portable fire extinguishers observed were inspected within the last year.	
Electrical	Electrical Distribution	Room 500D, located on the southeast corner, houses the building's electrical equipment. The room contains a transformer and panelboards of less than 200 amps that supply power to the building's end devices and mechanical equipment. The equipment appeared to be in good condition.	Good
	Lighting	The exterior of the building is outfitted with what appears to be wall-mount HID fixtures located near the roofline of the building. The interior lighting is mainly fluorescent with the occasional screw-type fixture in closets. There are exit signs at every exit. The exterior and interior lighting appeared to be in good condition. All exit signs were observed to be illuminated.	Good
	Communications & Security	There is a Gemini security system currently installed with a keypad at the front entrance. Motion detectors are installed in interior areas. Wireless routers are installed in the building supplying internet access. The security equipment appeared to be in good condition. The routers were observed to be in good condition. The facility reported a lack of video surveillance associated with this building’s exterior.	Good

Linder Elementary School Campus Summary of Recommendations

This document is based on current conditions observed during fieldwork and provides recommendations for corrective actions by each discipline. The following recommendations provide a summary of the findings.

Campus Recommendations

Electrical

1. Verify all EXIT signs are in operable condition.

Main School Building Recommendations

Exterior

1. Paint rusted louvers on the exterior walls.
2. Repair holes in the soffit on the southwest corner nearest to BLDG-160B.
3. Replace window glass in the side lite next to the doors at the northwest 300-wing entrance.
4. Investigate window leaks reported by staff.
5. Investigate thresholds for water and dirt infiltration reported by staff.
6. Investigate concrete steps near the street to drive area.

Roofing

1. Investigate reroofing A-07 in the next few years to eliminate bubbling and cracking. Repair or replace adjacent corners at the same time.

Interior Construction

1. Replace or repair the male restroom door in room 307 so that the door will close and not damage VCT flooring.
2. Repair or refinish doors and frames that need paint touch-up.

Interior Finishes

1. Replace or refinish wall paneling in corridors outside the cafeteria where the paneling is worn.
2. Investigate ceiling tile and grid in kitchen for replacement or repairs.

Plumbing

1. Continue preventive maintenance on aged plumbing fixtures and plan for replacement of the fixtures in the future as they continue to age, specifically in GRR200 and BRR200.
2. Replace or refurbish the gymnasium's female and male restroom (GRRGYM and BRRGYM) fixture partitions that have corrosion.
3. Investigate the capacity of the existing kitchen floor sink drain system. If found to be insufficient, replace with a kitchen floor sink drain system that is large enough to handle a three-compartment sink without overflowing onto the kitchen floor.
4. Perform further investigation into the source of leaking in the internal drain piping system for the roof drains of the 300-wing and rooms 304, 305, ADMIN and ADMIN3. It was reported that the roof drains that service those roof areas were leaking into the walls.
5. Replace or clean and maintain the grease trap that services the commercial kitchen. It was reported that the grease trap frequently smells.
6. Replace plumbing vents to avoid circulating sanitary sewer gases into the building.
7. Perform further investigation into why the area drain located in the crawl space is not draining properly. It is recommended that the area drains be replaced or repaired and that grading in the crawl space be reworked in order to promote drainage through the provided area drains. It is also recommended that a sump pump be

installed in the crawl space to be utilized when the provided area drains cannot effectively drain the accumulated water.

Mechanical/HVAC

1. Address any rust or corrosion observed on the equipment, its associated piping, or any other sub-asset by cleaning, repainting, or repairing to prevent further deterioration.
2. Replace equipment that uses R-22 refrigerant. The refrigerant is being phased out of manufacturing and construction use in the near future, and will make all equipment that utilizes R-22 refrigerant obsolete.
3. Continue conducting preventive maintenance checks and services for HVAC systems.
4. Conduct maintenance on the building's exhaust fans that have been reported as having efficiency issues.
5. Begin planning to replace or repair aged HVAC equipment, to include the following specific equipment: kitchen RTU (SC011908), kitchen SF-1 (SC011907), water source heat pumps (HP-102, 103, 105, and 106), heat recovery unit HRU-1 (SC011861), crawlspace AHU-8, roof top energy recovery units (ERU-1 and 2), and rotary chiller CH-1 (SC011908).

Electrical

1. Add exterior light switch to kitchen entrance.
2. Assess the north side of the complex for blind areas in video surveillance. Add cameras as necessary.
3. Install additional lighting in crawlspace areas.
4. Replace equipment nearing the end of its typical service life.
5. Remove all obstacles from electrical equipment. Do not use as storage or work benches.
6. Determine whether the wireless internet is adequate and modify accordingly.
7. Install breaker void covers in affected panels.
8. Install conduit plugs and junction box covers where necessary.
9. Assess the public address system for campus-wide communication and determine whether additional hardware is required to improve communication.

Music Building Recommendations

Exterior

1. Investigate the roofing leak into the classroom as reported by staff.

Mechanical/HVAC

1. Determine whether the RTU that services this facility uses R-22 refrigerant. If so, replace the unit.
2. Replace the exhaust fans that service the buildings crawl space.

Electrical

1. Install cameras on the building's exterior.

CRAWL SPACE – Linder ES – Main School Building (BLDG-160A)

Building Purpose	Administrative, Classrooms, Gym, and Cafeteria
Inspection Date	August 31, 2016, (Morning)
Inspection Conditions	87° - Sunny & Dry

Crawl Space System Deficiency Overview

NOTES CONCERNING CRAWL SPACE OBSERVATIONS: Building A was constructed in three different phases: 1971 original construction, 1990 north classroom addition, and 1996 south classroom addition.

The following table provides a summary of the systems and their respective conditions found by each discipline.

System	Subsystem	Condition and Deficiency Overview	System Condition Rating
Soil, Drainage, Ventilation & Access	Soil Below Building, Site Drainage in Crawl Space	The original building's crawl space originally had a drainage system comprised of 5 drains spread throughout the crawl space, and was originally graded so surface water flowed directly to the drains. However, at some point after the original construction, the crawl space was re-graded and deep channels were created below the building; the bottoms of the deep channels are below the elevations of the original drainage system so now the original drainage system has been abandoned. It is not clear how the channels below the original building are intended to drain but based on our review of renovation drawings it appears likely that the channels are intended to flow to the north addition's sump. The soil grading in the channels appears to have settled/eroded over time to create low spots in the soil and does not effectively drain water to the sump. The soil in the channels and low spots was heavily saturated and several very large pools of standing water were observed. See the attached plans for approximate locations of manmade channels and pools of standing water. Outside of the channels the soil was fairly dry but showed signs that water had been present in the recent past. The north 1990 classroom addition had a drainage system (in addition to sump) and several of the drains were holding water and appeared clogged. The soil under the north addition had a large area in the northwest corner growing mold. Some of the manmade channels have almost-vertical side walls that do not meet OSHA requirements for laid back slopes. In many locations the sides of the channels had collapsed and/or sloughed off. Note: Interview notes state that 18"-24" of standing water accumulates after heavy rainfall and must be pumped out.	Fail

		Soil/Drainage deficiencies: • Original buildings drainage system abandoned • Poor grading; manmade channels have saturated soils and two large pools of standing water at low spots • Drains in additions are clogged and holding water • Channels have steep sides that violate OSHA side slope criteria • Mold on soil in north addition • Rust on grate inlets	
	Soil Retainers	Soil retainers were observed along the building perimeter. Broken soil retainers were found in the original construction of the building. Soil retainers were beginning to undermine in the southern wing of original construction due to soil erosion. In two areas (noted on the attached plans) wood 2x retaining walls had been constructed to replace the original soil retainers. It appears that the original soil retaining panels were removed when soil in the crawl space adjacent to the building perimeter was excavated, and the wood walls accommodate the taller void height. Both wood retaining walls show preliminary signs of rot: in one location the wood wall was in constant contact with water from a large pool of standing water, and in the other location the wood was heavily saturated and soft. Cracked, damaged, and failed concrete soil retainers were found on the west wall of the northern classroom addition. Describe any soil retainer deficiencies. • Broken/collapsed/undermined soil retainers • Wood retaining walls degraded/rotted	Poor
	Areaways/Ventilation	Two areaways were found in the northern 1990 classroom addition. Both of these areaways appeared to be in good condition. Vents were found throughout the original construction but the air under the original construction was noticeable stale in the inner core of the school. Under the northern 1990 classroom the ventilation was the worst with the air being humid and stale and mold growing on the soil. Condensation was observed on suspended pipes and concrete beams and slabs. Areaway/ventilation deficiencies: • Poor ventilation, condensation on pipes and concrete structure	Average
	Access Hatches	Access to the crawl spaces was achieved via two access hatches and two doors. At the hatch in the north classroom addition, reinforcing was exposed in the slab where the access frame had been installed.	Average

		Access hatch deficiencies: • Exposed, corroded slab reinforcing at hatch frame	
Exposed Structure	Exposed Columns & Tops of Foundations	Foundations consisted of drilled piers supporting columns that extend to the underside of the floor framing. Mushrooming at the tops of piers was found throughout the entire school. In 1985 about 25 columns under the original building were retrofitted to address damage due to structural distress. The retrofit work consisted of steel collars around epoxy-repaired shear cracks and large concrete collars around portions of columns that had experienced significant lateral displacement. The repair work and concrete surrounding that could be observed appeared in good condition without visible signs of overstress, although not all retrofitted areas could be observed (access was limited due to standing water). Where piers were in close proximity to manmade channels in the soil, the drilled piers were exposed (and unbraced) for heights ranging from two feet to eight feet. It is unclear in the 1985 repair documents what maximum length of the drilled shaft wis permissible to be exposed and unbraced. The exposed pier lengths that could be observed did not show any obvious signs of distress, although many were in standing water and could not be observed. Honeycombing was found in some exterior columns. Column/Foundation deficiencies: • Honeycombing • Mushrooming at tops of piers • Two to eight feet of pier length exposed/unbraced above ground	Poor
	Exposed Faces of Perimeter Walls / Beams	Suspended cast-in-place perimeter beams were used throughout the structure. Honeycombing and left-in-place formwork nails were regularly observed. At the west access door leading to the original building's crawl space, honeycombing over the door was fairly significant. In the same beam, wood formwork had been left embedded in the beam. Perimeter wall/beam deficiencies: • Honeycombing • Embedded 2x4 formwork left in beam	Good
	Exposed Portions of Interior Floor Beams Above	Suspended cast-in-place interior beams were used throughout the building. Minor honeycombing was found in the northern classroom addition. In the locations near column retrofits, wood shoring appears to have been installed to (temporarily?) support the interior beams. In many of these	Average

		locations, the wood shoring showed signs of stress/strain implying that the beams are still being supported by the wood shoring instead of being fully supported by the repaired columns. PLEASE NOTE: interior beams, columns, and drilled shafts should be checked to ensure structural adequacy before the wood shores are removed. Beam deficiencies: • Minor honeycombing in beams • Wood shoring supporting interior beams • Chipping/spalling on inverted tee stems in the southwest of the original building	
	Underside of Suspended Floor Slabs Above	The top of the slab in the north classroom addition was covered with insulation and was not able to be inspected. In the limited areas where insulation had fallen off the floor slab, moisture was found on the underside of the slab. The floor slab system of the original construction consisted of both cast-in-place flat slabs and precast double tee floor panels. Minor spalling/cracking and exposed corroded rebar was found where the double tee flanges connected to each other. Slab deficiencies: • Moisture on underside of slab • Minor spalling, cracking and exposed/corroded rebar at double tee flange connections	Average
Pipes, Ducts, Equipment & Fireproofing	Suspended Pipes & Hangers	Multiple pipes were found throughout the building. Condensation was observed on many pipes. Metal pipes and hangers had moderate to advanced corrosion. Pipe insulation appeared in adequate condition. Several pipes discharged at the drainage inlets (air gaps). Pipe deficiencies: • Air gap for pipe discharge from equipment near far southeast access to crawl space • Almost all cast iron pipes and metal hangers were rusted (some severely) • In the north most section of the original construction, downturn of a suspended cast iron pipe was in contact with the soil • Collapsed sides of manmade channel had partially buried part of a suspended pipe	Average
	Exposed Ductwork	Ductwork was only found near the south access points in the original building. typically the ducts appeared in adequate condition. In the southwest access point to the crawl space, the ductwork was constantly leaking water on to the floor and	Average

		a small pool of water had accumulated below the ductwork. Ductwork deficiencies: • At southwest access point to crawl space, ductwork was leaking water on to the floor. Leak was fairly large and a pool of water had accumulated underneath it	
	MEP Equipment	Equipment deficiencies: • At southeast entrance to original building crawl space, there is a machine that has severe rusting on the pipes leading into it. • Moisture accumulating on the outside of electrical box in northern 1990 addition.	Average
	Spray Fireproofing/ Insulation	Insulation was found in the northern addition of the school. The insulation was falling off the floor above in areas where moisture was accumulating on the slab above. Fireproofing/Insulation deficiencies: • In northern addition, insulation was damp and falling off	Average

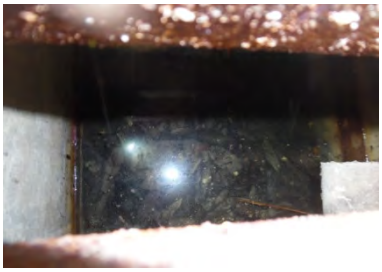
Crawl Space Deficiency Examples

Soil, Drainage, Ventilation & Access

Large pool in channel in crawl space

Manmade channels cut into crawl space soils

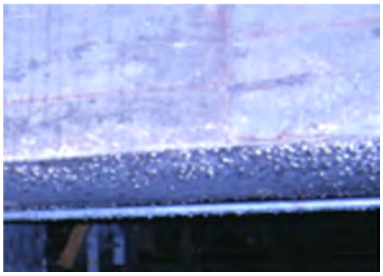
Abandoned drainage system in original building



Water standing in bottom of clogged drain

Mold on soil in north addition

Wood retaining wall in place of soil retainers

 Failed concrete soil retainers	 Condensation on underside of interior beam	

Exposed Structure

 Longer unbraced length at piers adjacent to manmade channels	 Mushrooming in at tops of piers	 Minor honeycombing in exterior beam
 Chipping in top of inverted tee interior beam	 Minor honeycombing in interior beam	 Compressed wood shoring supporting interior beam
 2x4 embeded in exterior beam	 Exposed rebar at access hatch	 Spalling at inverted tee panel flange connectors

Pipes, Ducts, Equipment & Fireproofing

Rusting on pipe and pipe hangers

Pipe bend touching soil and rusting

Air gap in pipe

Suspended pipe is burried under soil in channel

Pool of water under HVAC

Saturated and collapsing inuslation

CRAWL SPACE – Linder ES – Music Building (BLDG-160B)

Building Purpose	Classroom
Inspection Date	August 31, 2016, (Morning)
Inspection Conditions	87° - Sunny & Dry

Crawl Space System Deficiency Overview

a large portion of the crawl space for Building B was not accessible due to welded or bolted areaway grates. In the one areaway that was accessible, almost three inches of standing water was present, also restricting access to the crawl space.

System	Subsystem	Condition and Deficiency Overview	System Condition Rating
Soil, Drainage, Ventilation & Access	Soil Below Building, Site Drainage in Crawl Space	Three inches of standing water was found in the one accessible areaway. The other two areaways were not accessible but standing water could be seen below. Soil/Drainage deficiencies: • No drainage, Standing water in crawl space	Fail
	Soil Retainers	Access to crawl space was not possible and soil retainers could not be observed.	N/A
	Areaways/Ventilation	Three areaways were found for this building. One areaway grate was tack welded and another was screwed down. In the one accessible areaway, three inches of standing water was found. Adequacy of ventilation could not be assessed.	Average
	Access Hatches	This building did not contain access hatches.	N/A
Exposed Structure	Exposed Columns & Tops of Foundations	Could not enter crawl space thus columns could not be observed.	N/A
	Exposed Faces of Perimeter Walls / Beams	Could not enter crawl space thus perimeter beams could not be observed.	N/A
	Exposed Portions of Interior Floor Beams Above	Could not enter crawl space thus interior beams could not be observed.	N/A
	Underside of Suspended Floor Slabs Above	Could not enter crawl space thus suspended slabs could not be observed.	N/A

Pipes, Ducts, Equipment & Fireproofing	Suspended Pipes & Hangers	Could not enter crawl space thus pipes and hangers could not be observed.	N/A
	Exposed Ductwork	Could not enter crawl space thus ductwork, if any, could not be observed.	N/A
	MEP Equipment	Could not enter crawl space thus mechanical equipment, if any, could not be observed.	N/A
	Spray Fireproofing/ Insulation	Could not enter crawl space thus fireproofing or insulation, if any, could not be observed.	N/A

Crawl Space Deficiency Examples

Soil, Drainage, Ventilation & Access

Areaway welded shut

Areaway screwed shut

Standing water in areaway

Linder ES – Campus Summary of Crawl Space Recommendations

This document is based on current conditions observed during fieldwork and provides recommendations for corrective actions by each discipline. The following recommendations provide a summary of the findings.

Main School Building Recommendations

Soil, Drainage, Ventilation & Access

1. Investigate need for adequacy of drainage system, add drains as needed.
2. Re-grade manmade channels and surrounding soils so that water flows to sump.
3. Slope sides of manmade channels in accordance with OSHA requirements.
4. Investigate need to re-grade site so surface water flows away from building (instead of into crawl space).
5. Improve ventilation.

Exposed Structure

1. Check that exposed lengths of piers at manmade channels still have sufficient capacity to support building loads.
2. Clean any exposed corroded reinforcement and protect from further corrosion by patching surrounding concrete or painting metal with ZRC.

Pipes, Ducts, Equipment & Fireproofing

3. Clean mildly rusted pipes and paint to prevent further corrosion.
4. Repair or replace significantly rusted cast iron pipes and metal hangers.
5. Repair leaking HVAC.
6. Remove collapsed and saturated insulation and replace with new insulation.

Music Building Recommendations

Soil, Drainage, Ventilation & Access

1. Install drainage system in crawl space to prevent standing water.
2. Investigate need to re-grade site so surface water flows away from building (instead of into crawl space).
3. Investigate adequacy of ventilation.

DRAFT

APPROXIMATE LIMITS OF CRAWLSPACE OBSERVED DURING SITE VISIT

APPROXIMATE LIMITS OF CRAWLSPACE PER AVAILABLE PLANS AND SITE OBSERVATIONS

A

FLR-160A-01

DEFICIENCIES FOUND IN THIS LOCATION:
1) EXPOSED/CORRODED REINFORCING AT ACCESS HATCH
2) RUSTED CAST IRON PIPES
3) CONCRETE MUSHROOMING AT TOP OF PIERS
4) STANDING WATER IN DRAINAGE GRATES
5) CONDENSATION ON PIPES AND UNDERSIDES OF THE SUSPENDED BEAMS
6) MOLD ON SOIL UNDER NORTH MOST CLASSROOMS
7) CRACKED, DAMAGED, FAILED SOIL RETAINERS
8) MINOR HONEYCOMBING IN INTERIOR BEAMS
9) FALLEN/DETERIORATING INSULATION

AREAWAY (TYP)

ACCESS THRU FLOOR HATCH HERE

ACCESS THRU FLOOR HATCH HERE

DEFICIENCIES FOUND IN THIS LOCATION:
1) ACCESS WAS SEVERELY LIMITED DUE TO SHALLOW CRAWL SPACE (CRAWL SPACE WAS APPROXIMATELY 12" TALL)
2) RUSTING IN CAST IRON PIPES & METAL HANGERS
3) DOWNTURN OF SUSPENDED PIPE RESTING ON GRADE
4) HONEYCOMBING IN COLUMN

B

FLR-160B-01

ACCESS THRU AREAWAY NOT POSSIBLE - GRATING SCREWED SHUT

ACCESS THRU AREAWAY NOT POSSIBLE - GRATING WELDED SHUT

ACCESS THRU AREAWAY WAS RESTRICTED DUE TO 3" OF STANDING WATER IN CRAWL SPACE

DEFICIENCIES FOUND IN THIS LOCATION:
1) LARGE POOL OF WATER IN NORTH MOST AREA OF THIS SECTION OF INSPECTED CRAWLSPACE
2) WATER STANDING IN CRAWL SPACE DRAINS
3) SATURATED/ROTTING WOODEN RETAINING WALL
4) BROKEN/COLLAPSED CONCRETE SOIL RETAINERS
5) LONG UNBRACED PIER LENGTHS EXPOSED ADJACENT TO DEEP MANMADE CHANNELS
6) MUSHROOMING CONCRETE AT TOP OF PIERS
7) HONEYCOMBING IN BOTTOM OF COLUMN NEAR ACCESS DOOR
8) LIMITED CHIPPING/SPALLING AT INVERTED TEE BEAMS
9) WOOD FORMWORK CAST INTO A CONCRETE BEAM OVER ACCESS DOOR
10) SPALLED CONCRETE AT DOUBLE TEE PANEL FLANGE CONNECTORS

DEFICIENCIES FOUND IN THIS LOCATION:
1) LARGE POOL OF STANDING WATER IN THE WEST CHANNEL
2) BROKEN SOIL RETAINERS ON THE EAST AND WEST EXTERIOR WALLS
3) MULTIPLE SOIL RETAINERS ON THE VERGE OF CAVING
4) WOOD RETAINING WALL DAMP AND SHOWED SIGNS OF ROT
5) MUSHROOMING IN TOPS OF PIERS
6) LONG UNBRACED LENGTHS OF PIERS EXPOSED ADJACENT TO MANMADE CHANNELS
7) WOOD SHORING SUPPORTING BEAMS INEAR RETROFITTED COLUMNS
8) HEAVILY RUSTED PIPES, HANGERS AND EQUIPMENT
9) AIR GAP ON EQUIPMENT DRAIN PIPES

ACCESS THRU DOOR IN BASEMENT HERE

ACCESS THRU DOOR IN BASEMENT HERE

NORTH

TIN I.S.D.

ARTMENT OF
CTION MANAGEMENT

INDER
MENTARY
CHOOL

0 Metcalfe Rd.
ustin, Texas

OOR PLAN
T FLOOR

PPROVALS		
DRAWN	CHECKED	APPROVED
J.R.		
02/16/12		
DWG: 160-FLR-01		SHEET
DRAWING SCALE		
1/32" = 1'-0"		1 OF 1

DRAFT

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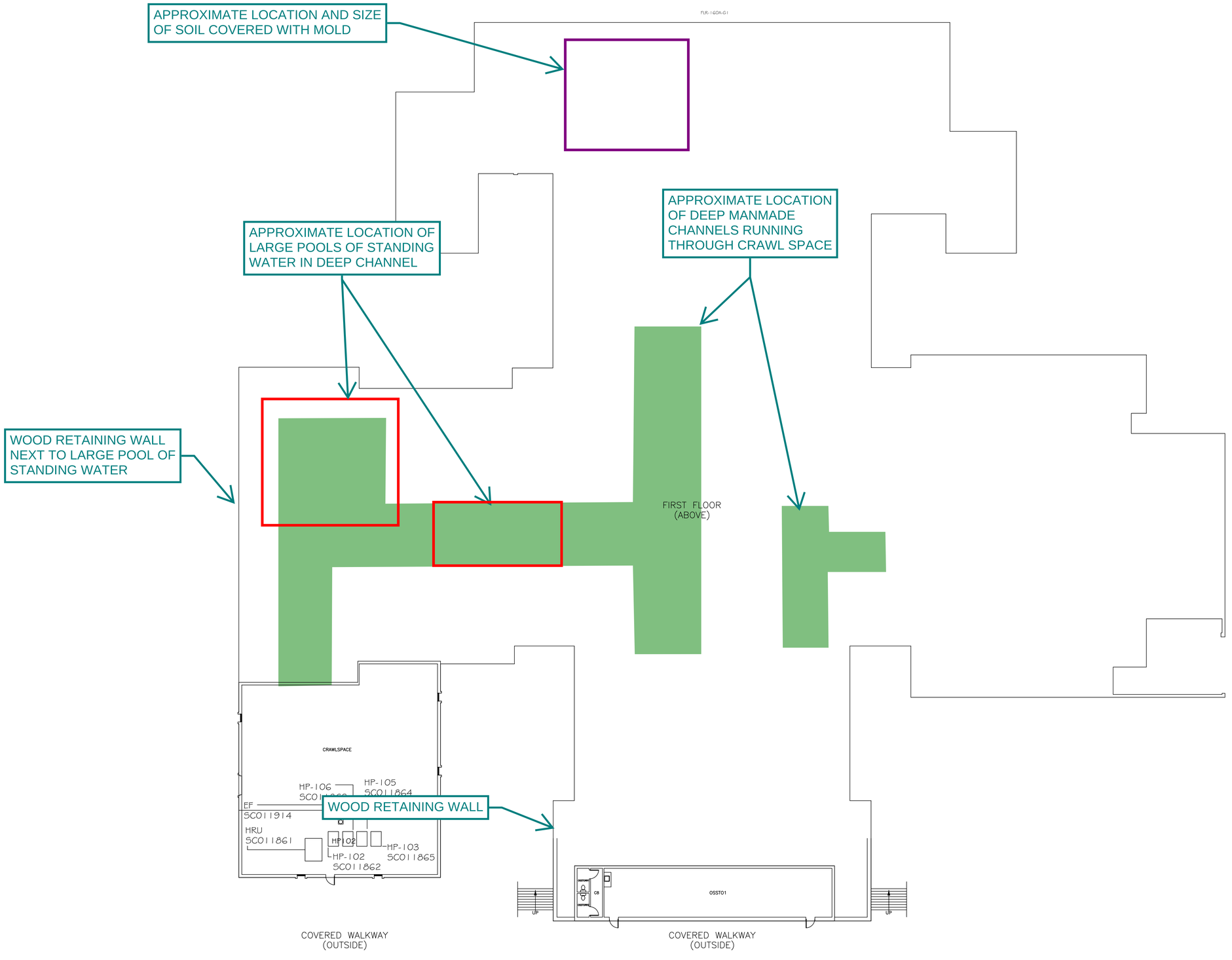

NORTH

AUSTIN I.S.D.

DEPARTMENT OF CONSTRUCTION MANAGEMENT

LINDER ELEMENTARY SCHOOL

2800 Metcalfe Rd.
Austin, Texas

GROUND FLOOR

APPROVALS		
DRAWN	CHECKED	APPROVED
J.R.		
10/05/09		

DWG: 160–FLR–G1	SHEET
DRAWING SCALE	
1/16"=1'-0"	1 OF 1