

**Grafton Elementary School
Observations/Recommendations
May 2016**

Costs Secured by Grafton Staff and Trades (attached spreadsheet).

Canopy Overhang Structures

Some corrosion of steel columns, not critical, just maintenance items, scrape and paint. Consider putting canted concrete collars around the bottom of the columns to shed water and salt.

Immediate: allowance of \$5000

Long term: include in maintenance budget

Tectum Decks/Roof Structure

Observed signs of potential deterioration (discoloring, change in surface characteristics) primarily on outside exposed panels. Also noted panels displaced in some locations up to 1 inch (horizontal movement). Both issues represent conditions of concern regarding long-term service of the structural roof deck, a critical building element. Immediate need to evaluate integrity and connections. Tectum reports that panels showing visual signs of deterioration should be considered as having a loss of integrity. Tectum panels have very limited diaphragm action (not good at distributing lateral loads placed on the building such as wind loads). This may be contributing to issues and repaired tears on the roof. Need to evaluate integrity of observed panels with exterior exposure, plus evaluate movement of panels we observed. System performance represents risk.

Immediate: Include cost for removal of panels to conduct structural integrity testing, panel replacement and evaluation of connections of panels to glue-lams. May be able to conduct in-place testing as well and reduce cost. Allowance of \$50,000 to \$75,000 right now to investigate only (if panels need to be removed for testing. Consider allowance for replacement of a percentage of panels now (guestimate at 10% replacement?) depending on findings.

Long-term: costs associated with potential panel replacement and re-establishment of connections, both depending on results of investigation. Worst case is roof structure replacement if majority of panels found to have loss of integrity.

Masonry

Minor issues observed (cracked masonry and missing block), minor tuckpointing needs. Veneer masonry supported on steel angle, which is pulling away slightly in some areas where masonry repairs needed, but limited in scope. No strong evidence of water issues from exterior wall condition. No bottom flashing or weeps, but no obvious issues related to this.

Immediate: allowance of \$5000 to repair now.

Long-term: include in maintenance budget, (future tuckpointing and repair as needed) including applying silane sealer to minimize water intrusion thru block and brick. Assume that all exterior will be done over next 20 years.

Windows

One broken window observed.

Immediate: allowance of \$5000 for replacement.

Long-term: consider cost to replace all windows, some windows reported as single glazed, not energy efficient. Payback on double glazed windows from energy efficiency standpoint is long 15 -20+ years. Owner choice, not necessarily recommended to do any replacement depending on long term prospects for the building

Roof

Majority of roof is approaching end of useful life and needs replacement. Lots of blisters, patches, repairs and general deterioration. Previous evaluations of roof conducted in 2011 reported a majority of the roof as being older than 20 years with less than 5 years remaining life. Remainder of roof reported as being 15+ years old and less than 10 years of remaining life. Agree with this report. Majority of roof area (80% of 92,000 sf total) should be replaced between now or within 2 to 3 years and the remainder (20% of 92,000 sf total) replaced within the next 5 years. Less disruption if entire roof done at once.

Immediate to near term: replace entire roof or at least assume 80% of square footage replaced now.

Long term: include in maintenance budget.

Sanitary Waste Lines

Observed sections of waste lines (galvanized steel branches) which had failed showing loss of integrity (holes in the pipe and severe corrosion). Reported that lines serving bathrooms clog at least once a year, and acid is used to remove clog and avoid floor flooding as a result of clog. Condition of all lines unknown. Evidence and age suggest all lines could be compromised.

Immediate: allowance of \$5000 to conduct inspection (televising) of sanitary lines to observe conditions. Could result in immediate need of all sanitary lines for replacement. Cost to replace to include branches and main line replacement out to first sanitary manhole as cast iron mains could be subject to attack from years of chemical unclogging. Potential total replacement depending on camera results. Probably assume at least 50% replacement now.

Long term: include in maintenance budget

Water Supply and fixtures

Observed a few fixtures (shut-off valves at sinks) missing and some leaking. Also reported that urinal flush valve assembly does not function at times resulting in continuous flush and water flooding bathrooms and then hallways.

Immediate: cost to replace missing fixtures, fix leaking valves, and replace urinal flush valve timer, could also replace flush valve time with automatic flush valves on each urinal, this would help limit flooding assuming only one valve misfunctions at a time (lower flow).

Long term: Age of system and materials (galvanized pipe) suggest that supply flow is limited due to calcium carbonate build-up. This was observed on hot water supply repairs made. Assume cost to replace all supply plumbing long-term.

Flooring

Observed some cracked tiles, missing in some areas and delaminated in others near exterior wall (water intrusion issue from outside covered under site drainage). Nothing major now although tiles reported to contain asbestos. If extended building use anticipated, assume total replacement long term.

Immediate: repair and replace cracked and missing tiles. Allowance of \$2000 to \$5000 depending on extent.

Long –term: include in maintenance budget or figure on total replacement over next 30 years.

Heating/Ventilation/AC

Entire heating system, outside of the boilers, is beyond useful life (original system), is corroded, has been repaired on numerous occasions, continues to leak and as long as it continues to leak represents a potential for unpredictable total failure of the system. Supply and return piping is routed in an inaccessible perimeter trench for much of the building, and trench is subject to filling with water from site drainage issues getting to the building between block and baseplate. Saw examples of this in several places in addition to areas where heating pipe located in the trench. Some piping is also buried in concrete and shows signs of failure at the buried/exposed interface. Univent system units are original and deteriorated as well.

Immediate: replace entire piping supply and return system and controls, including 4 circulating pumps in the boiler room, replace univent system, run piping exposed, add in cost for collateral repair required to walls, ceiling tiles with pipe running exposed and elevated (not back in the trench). Consider re-design of heating system with ventilation/AC for areas currently relying on Univent units for outside air. Inspect boilers since chemical feed adds have been discontinued since large water loss is occurring.

Long-term: costs to provide roof-top units for AC to areas not currently served by roof top units. Also, figure on replacing existing AC units over next 30 years if building use extended.

Parking Lots

Observed some pot holes, aging of asphalt, cracks, and concrete deterioration in lots, but not at end of useful life. (Note: should expect to get 25 years out of asphalt with proper maintenance before mill and overlay required, guesstimate that existing lots have 5 to 7 years left, but age of existing pavement is not known. Concrete curbs not ADA complaint, but not "required" right now.

Immediate: cost to patch, fill cracks and re-stripe all lots. Patch worst concrete curb areas where deterioration presents a hazard.

Long –term: within next 5 to 7 years, cost for mill and overlay, allowance for subgrade improvement (proof roll and look for soft spots in subgrade, replace as needed), provide new curbs and ADA ramps at walks).

Site Drainage

This was observed to be a source of many problems ranging from heating system deterioration, flooring deterioration, and electrical distribution. Also represents a risk due to moisture getting into interior space and potentially enabling mold propagation and condensation on inside of windows, adding to deterioration of windows and finishes. School is at lower elevation than surrounding grade, and courtyard has no positive drainage as well, with only one outlet structure. Need to provide cut-off trenches with drain tile in front of school and connect to storm sewer system to move water away from building not allow it to travel to building from street. Same situation in courtyard. Also provide roof drainage gutter extensions out away from building to new cut-off trench location.

Immediate: design and install cut-off trench, drain tile, and hard pipe system in front of school and in courtyard area and any other area where site is unpaved next to building. Include contingency to account for unknowns when excavating.

Long term: include in maintenance budget.

Electrical Systems

Similar to hot water supply pipe, much of the electrical conduit is buried in slab or in the same trench as the pipe, and where observable has corroded. Parking lot lights reported to be subject to shorts as well, suggesting electrical distribution issues. Existing switchgear is original equipment and has not been exercised (breakers) or evaluated and at end of useful life. Any switchgear breaker failure represents a potential catastrophe as parts may be difficult to locate and the feed to GES is from the transformers at GHS. GES should have a separate feed and transformer as well the condition of the switchgear should be evaluated immediately, with the result of the evaluation potentially suggesting immediate replacement.

Immediate: replace all conduit currently buried or in boiler supply and return piping trench with overhead system. Inspect and exercise switchgear. May reveal need for immediate replacement of switchgear.

Long term: replace switchgear, secure new separate feed and transformer to GES, replace distribution panel system.

Kitchen, gym bleachers, Locker shower area class room remodeling, etc....

These costs or placeholders from Hoffman

2016 GES Needs

Item	Immediate	Long Term (10+ years)
Roof:		
Roof	\$1,225,000.00	\$245,000.00
Tectum Roof Deck (\$750 per sq. ft.)	\$67,500.00	
Environmental ACM Containing Material		
Masonry:		
Masonry Repairs		\$111,075.00
Windows:		
Windows		\$250,000.00
Plumbing:		
Fixtures		\$85,000.00
Supply Water Lines		\$170,000.00
Domestic Hot Water		\$28,000.00
Sewer Piping	\$138,750.00	
Flooring:		
Floor Tiles (Long term = asbestos tiles)	\$67,060.00	\$147,708.00
HVAC:		
HVAC	\$2,530,000.00	
Pipe Overhead & replace equipment		
ACM Containing Material		
Controls	\$282,000.00	
Electrical	\$73,850.00	
Replace A/C Roof-existing		\$40,000.00
Building A/C-NEW		
Ceiling Tiles (Due to HVAC & Electrical Run Overhead)	\$46,530.00	
Parking Lots:		
Parking Lots	\$269,935.00	\$99,905.00
Parking Lot Lights (west)	\$22,900.00	
Concrete Work	\$14,350.00	\$110,175.00
Drainage:		
Drainage	\$250,000.00	
Electrical:		
Generator		\$65,000.00
Lighting		\$141,867.00
Fire System Upgrade (not sprinklers)		\$133,914.00
Distribution Equipment		\$20,155.00
Bleachers:		
Bleachers	\$99,650.00	
Security Upgrades		\$1,018,000.00
Kitchen		\$2,213,000.00
Locker Rooms		\$1,060,000.00
Classroom & Bathrooms		\$1,928,000.00
IT Upgrades		\$435,000.00
Environmental issues	\$1,017,505.00	
TOTALS	\$6,105,030.00	\$8,301,799.00