

**McDade Classical School Annex  
Addition and Renovations  
November 2nd, 2018  
Legat Architects**

**2. Assessments**

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11/02/2018

### McDade Classical School Annex Addition & Renovations Assessment Summaries

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#### I. Civil Design Narrative

##### Proposed Improvements Submission

##### Existing Site Conditions

The existing school is located on South Indiana Avenue between East 88th Street and East 89th Street. The property is approximately +4.79 acres and contains a one-story school building, HMA parking lot, HMA playground, a grass play field, and two play lots. The play lots are located to the north and to the east of the existing building. The HMA parking lot is located south of the existing building and access is provided via Indiana Avenue.

The parking lot contains 2 Handicap Spaces and 33 regular spaces for a total of 35 parking spaces. The projected new FTE for the site is 30. The parking required for the site based on current zoning requirements is 1 space for every 3 employees plus additional parking and drop-off spaces as determined by Department of Zoning and Land Use. Therefore, the total parking required upon completion of construction is 10 spaces. The required parking is less than the existing number of spaces; therefore, additional parking is not proposed.

## **Proposed Improvements**

### *Overall Summary*

The total disturbed area for the project site will be approximately 1.21 acres. The new one-story linked annex will occupy a footprint of approximately +9,774 square-feet within the site. The primary entrance to the school will continue to be along the north side of the existing building.

### *Hardscape*

1. All proposed entrances to the linked annex will be designed to provide a handicap accessible route per CDOT requirements.
2. Localized restoration of sidewalk, curb and gutter, and street pavement is anticipated for various utility connections.

### *Softscape*

1. The play lots to the north and east of the existing building will be removed and replaced. Please refer to the landscape architect proposal for more information.

### *Utilities*

1. The following utilities may need to be removed, relocated or abandoned as part of the proposed construction:
  - a. Based on field observation, a storm sewer system is located within the proposed annex. Portions of this storm sewer system will need to be relocated and/or abandoned.
  - b. A water fountain is also located within the area to be re-constructed. Currently, we do not have any information on how this water main is fed. Water main may need to be relocated.
  - c. A transformer is located within the existing courtyard. Currently, we do not have any information on how this transformer is fed. The existing ComEd service may need to be relocated.
2. Sanitary sewer services –The new sanitary sewer service to the proposed annex will be designed upon receipt of the topographic survey. The landscape plan from 1999 indicates a combined sewer is located within South Prairie Avenue (to the east of the proposed annex.) Our goal would be to connect to this sewer to avoid impacts to the west of the annex.
  - a. It is our understanding the gymnasium will be converted to a warming kitchen. Therefore, a grease trap may need to be added on the existing sanitary sewer service and a separate service may need to be provided.
3. Stormwater – The disturbed area for the project site will be approximately +52,894 square-feet. Per the City of Chicago Stormwater Management Ordinance, rate control and volume control practices are required when 15,000 square-feet or more of land is disturbed on site. The exact rate control and volume control practice will be designed as additional information about the disturbed area and existing conditions of the site are provided. We await further direction regarding the use of an underground tank or surface detention facility. As noted under the sanitary sewer section, we are hoping to discharge the detention facilities to the existing sewer located in S Prairie Avenue.
4. Water service – The new water service will be designed upon receipt of the current topographic survey. The landscape plan from 1999 indicates a water main is located within South Prairie

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Avenue (to the east of the proposed annex.) Our goal would be to connect to this water main to avoid impacts to the west of the annex.

5. Electricity/Gas/Telecom – The location of the internal connection and service routing to be determined and coordinated with the respective utility provider and MEP.

#### *Erosion Control*

During construction, erosion control measures shall be installed and maintained until stabilization or completion of the proposed improvements. The Volume Control areas shall be protected from all contaminants. All erosion control measures and operations shall comply with IEPA requirements.

#### *Permits/Approvals*

Department of Buildings – Stormwater Management and CDOT requirements

Miscellaneous / Pending RFC's / Design Considerations

1. Pending – Geotechnical investigation is being conducted to determine the conditions of the existing underlying soil.
2. Pending – Topographic survey is being conducted to determine existing conditions and utility information.

## **II. Civil Summary**

The existing school is located on South Indiana Avenue between East 88th Street and East 89th Street. The property is approximately +4.79 acres and contains a one-story school building, HMA parking lot, HMA playground, a grass playfield, and two playlots. The playlots are located to the north and to the east of the existing building. The HMA parking lot is located south of the existing building and access is provided via Indiana Avenue. The parking lot contains 2 Handicap Spaces and 33 regular spaces for a total of 35 parking spaces. A Handicap accessible entrance is located at the southeast corner of the school adjacent to the handicap parking spaces. The primary entrance on the north side of the school is also handicap accessible.

The projected new FTE for the site is 30. The parking required for the site based on current zoning requirements is 1 space for every 3 employees plus additional parking and drop-off spaces as determined by Department of Zoning and Land Use. Therefore, the total parking required upon completion of construction is 10 spaces. The required parking is less than the existing number of spaces; therefore, additional parking is not required.

## **III. Landscape Summary**

The site is comprised of a landscaped front yard to the west, a parking lot to the south, a small playground to the north and a large playground and oval walking path surrounding a lawn to the east. There is a small space created within three sides of the building, which contains two raised planters and is open to the playground and lawn to the east. This space will be largely enclosed due to the new addition, which may

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pose some safety risks unless closed off with a fence and gate. The front yard to the west is in good condition, but the trees could use pruning. The parking lot to the south is in fair condition but will need some modification with the addition of a new trash enclosure. The north playground space will be replaced, but the adjacent trees need pruning, the adjacent fence is chipped throughout and there is a low hanging power line cutting across the space. The lawn to the east is in good condition, but there are several broken/missing site lighting fixtures as well as missing site furnishings.

#### **IV. Structural Summary**

DMA Structural conducted a visual structural assessment of McDade Classical Elementary School. The building structure was observed from the first-floor rooms and corridors, as well as the exterior. All exposed structural elements were observed to be in excellent condition. There were no visible signs (e.g. floor slopes, wall cracking, out-of-plumb construction) of damage to the main structural framing system. In general, the school has been well maintained over the years, and structurally, there are no areas of concern or elements in need of immediate repair.

#### **V. Architectural Goals**

##### **Design Goals:**

The renovation and new construction work at McDade Classical School is intended to provide the school with improved conditions for the growth and success of their students.

##### **Existing Conditions:**

The overall goal of the renovation work within the existing building is to update finishes and repair existing amenities which limit the needs of the school. The largest focus of the renovation will be the conversion of the existing cafeteria/gymnasium into a hybrid kitchen as well as an updated cafeteria/multipurpose room. The space required for the Hybrid kitchen will be achieved by absorbing adjacent storage spaces near the current cafeteria. In addition to this expansion, the kitchen and cafeteria will receive finish upgrades, acoustical treatments and a new HVAC system to accommodate student and staff needs.

Further building renovations will target areas where finish upgrades of flooring and ceiling tile are needed. The walls of classrooms and corridors are to receive fresh coats of paint to revitalize each space and create a cohesiveness throughout the school. All classroom ceilings are to be repainted as part of the scope of work. In addition, all door frames and doors are to be refinished and new door hardware is to be installed. Lastly, new lockers are to be provided to meet current & future enrollment. Existing 99 lockers are to remain and be painted to match the new.

Besides finish upgrades, classrooms will receive new marker boards and tack boards at teaching walls as well as new wardrobe/furniture units at the side walls with cased openings.

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To meet students of all needs, the existing boys' and girls' toilet rooms will receive full renovations. Restroom upgrades will include CPS standard adult ADA stalls as well as Chicago Plumbing Code compliant plumbing fixtures such as lavatories, water closets and urinals.

Lastly, the roof replacement is limited in scope and will focus on targeting areas of damage. Roof area 1 is a low slop, white modified bitumen roof with localized membrane bubbling along the eastern roof edge. Roof area 2 is a built-up roof (BUR) with a pea gravel ballast. Roof area 2 has blistering occurring in localized areas along the south side of the building as well as at internal drains.

**Alternate Scope (Computer Lab/MDF):**

To provide the CPS standard "island table" layout for the computer stations, the MDF room needs to be relocated to the newly proposed Annex. Power and data will need to accommodate the new table layouts accordingly. New flooring and updated finishes are to be provided in lab.

## **VI. Architectural Summary**

**Annex:**

The goal of the new Annex at McDade Classical School is to provide space for the expansion and growth of the Art, Science and Physical Education Programs. Programmatically, the project provides (2) new classrooms with storage spaces, rooms for building support operations and a gymnasium with basketball court and rock climbing wall. Additionally, this expansion will provide the school the space to add a unisex toilet room to serve students of all needs.

Storm water management, topography changes, walking path re-design and playground relocation will be addressed due to the location of the proposed Annex.

Façade studies will be further developed in schematic development. Access to daylighting and views have been integrated into the design and building layout of the Annex.

**Exterior Envelope Design Values:**

This project utilizes a durable, cost effective exterior envelope with thermal values meeting or exceeding current applicable energy code, including a glazing system with high performance solar heat gain values without adding additional costs.

**Glazing Systems:**

Storefront Basis of Design – EFCO Series 400

IGU, Basis of Design Guardian SNX 62/27 SHGC: 27

AW-60 Performance grade aluminum architectural window integrated into storefront system

**Wall System – Basis of Design – UL Design Number V424**

Non-Bearing Wall Interior Rating – 1 Hr.

2 Layers High Impact GWB

Non-Bearing Wall Exterior Rating – 2 Hr.

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**Envelope Wall R-Value – 16.37 min.**

4” Brick  
1 1/2” Air space  
2 1/2” High-R Expanded Polystyrene (XPS)  
Fluid Applied Air and Vapor Barrier  
5/8” Exterior Sheathing  
6” Cold Formed Metal Framing (no insulation)  
5/8” Interior GWB (1 or 2 layers)

**Roof System:**

2-Ply Modified Bitumen Roofing System  
1/2” Cover Board  
2 Layers Polyisocyanurate Insulation (R-30 minimum)  
Temporary Roof/ Vapor Barrier  
5/8” Roof Deck Sheathing  
1 1/2” Galvanized Roof Deck over sloped structure (min 1/4” per foot)

**Steel Frame Structure:**

Lateral Force Resistance System

**VII. Fire Protection Summary**

*Existing Conditions:*

Originally constructed in 1961, the main building is currently not served/protected by a sprinkler system. Therefore, there is not an existing fire protection service for the current kitchen/cafeteria/gym space. Refer to FA assessment.

*Annex:*

The proposed development of the Annex will be single story which will determine the design of the sprinkler systems and the need for a fire pump. Fire Protection to be further developed in Schematic Design.

**VIII. Plumbing Summary**

The existing building has what appears to be an existing 3” cold water service coming into the building. Exact size could not be determined due to thickened insulation with asbestos likely. There is a gate valve on the rise and water meter on this main cold-water line. There is no existing backflow preventer. Downstream of this is a pipe manifold with multiple taps. The first (2) in sequence appear to be 2” cold water taps. Exact sizing could not be determined in field due to insulation. The next (2) taps appear to be 1” cold water taps. Again, exact sizing could not be determined in field due to insulation. The last connection is a 2” tap, which is the dedicated main for the irrigation system. The domestic water booster pump will be replaced.

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The irrigation system is protected by a reduced pressure zone backflow preventer. The internal building components appear to be in good condition. Unsure of exterior lawn sprinkler system condition.

The existing water heater system has (1) gas fired, tank type water heater, hot water recirculation and recirculating pump. The existing water heater system to be replaced with a condensing, high efficiency tank type unit, sized for the existing and new load.

The existing boys and girls restrooms have a mix and match of fixtures. ADA bathroom will require selective demolition for code compliance, including and not limited to removing dead end domestic water and sanitary and vent piping. As well as removing existing wall carriers and stubs in wall.

There is no functioning kitchen and no existing floor mounted grease trap to account for.

The underground sanitary system would be existing to remain in the main building.

To accommodate the additional loads for the annex building, we recommend the following:

Reuse the incoming domestic water service. This would serve the domestic water load of the new addition. The domestic water service would have a new water meter and dual check backflow preventer. The hot water service will be provided by a new high efficiency gas fired tank type water heater with master thermostatic mixing valve and new recirculation system.

The existing domestic water booster pump will be replaced. It will be sized to account for additional GPM load requirements and friction loss.

There will be a new copper pipe domestic water distribution system and recirculation system.

The existing boy's and girl's restrooms to be renovated. Recommendation to phase and remodel once new restrooms and functional fixtures can account for the existing occupancy/fixture load. Selective demolition will be required for new domestic water distribution tie-in to new fixtures.

Existing classroom sinks do not function properly, in several classrooms sinks have been covered by staff to prevent use. Suggestion to replace existing conditions with similar type sink and faucet.

A new underground sanitary piping system will be provided and tie into the existing sewer. Kitchen grease waste will be treated with local grease interceptors.

## **IX. Mechanical Summary**

Ventilation for the existing building is via induction air units located in each classroom. Each induction unit has an outside air intake/grille located on the exterior of the building, return air opening within the space served, air filter, supply fan, heating coil, and supply air discharge grille at the top of the unit. The induction units are heating only via hot water from the boiler plant. Pneumatic thermostats in each classroom control these units. The existing induction units should be inspected for operation and possible

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repairs and/or upgrades as needed. The building is exhausted via general roof mounted exhaust fans. The fans exhaust the spaces via ceiling or wall mounted grilles and ductwork. The toilet rooms are exhausted to the outdoors via roof mounted exhaust fans. Based on field observations, one toilet exhaust fan serves the north toilet rooms while another serves the south toilet rooms. It is recommended to replace the toilet room exhaust fans due to the remodel of the existing boy's and girl's toilet rooms. The general exhaust fans are existing to remain and would not be used or extended to serve the new Annex.

Heating for the existing building is via two natural gas fired hot water boilers (each at 1500 MBH) located in the boiler room. The water (30% propylene glycol) temperature generated by the boilers 115°F, per the building engineer; though, available existing drawings at the time of survey state 170°F entering water temperature and 200°F leaving water temperature. The heating hot water is distributed to the induction units, corridor cabinet heaters, and other heating devices throughout the building. According to the building engineer; only one boiler operates at a time, but on occasion both boilers have run to maintain building temperature during severe winter conditions. The boiler name plate states a year built of 2006. Both boilers appear in good working conditions, though the circulating in-line pump of one of the boilers was leaking.

There is no central cooling system or cooling plant serving the building. Cooling is provided by window AC units at each classroom. The units remain installed year-round but are only operational during the cooling season. The units serving the classrooms were recently installed (2018).

The building engineer stated occupant complaints of overheating in the existing gym. Evaluation of the re-purposing of the gymnasium into a warming kitchen should consider providing cooling to the space via a forced air unit and exhaust of the kitchen as required. Location and type to be determined based on the new layout of the space.

The incoming natural gas service to the building is assumed to be low pressure (~5 to 7 in. wc.) from the utility at ~4" pipe size and increased to 6" inside the building. The gas meter is located inside the building, within the storage room southeast of the existing gymnasium. The piping is routed from this storage room and exposed through the gymnasium, across the corridor ceiling and into the mechanical room. Natural gas is distributed to the boilers, domestic water heater, and one natural gas boosters (9,600 ICFH at 10.4 in. wc. pressure; based on model number). Per the building engineer, the gas booster is not used. A bypass around the gas booster is installed in the piping. Consideration for a gas booster is to be evaluated based on the expected natural gas usage of the new warming kitchen and pressure requirements.

Controls for the existing building include an Alerton computer station used to monitor the boilers plant only. There is no central automation system in the building. An air compressor is in the mechanical room and appears to be working properly. The existing controls are existing to remain and would not be used or extended to serve the new Annex.

### **New System**

The programming for the new Annex is expected to include classrooms (art and science), unisex toilet room, lockers, and gymnasium. Ventilation for these spaces is to be provided by new roof top units; assuming one unit for the Gymnasium and another for the remainder of the spaces. Cooling for these spaces is to be provided by the roof top units; they shall include a packaged cooling section with refrigerant cooling coil and air-cooled condenser. A natural gas fired furnace section shall also be included in the roof top units.

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Heating for the new spaces can be accomplished in different ways. One method is to expand the existing boiler plant, while another would be to provide an independent boiler plant within the new Annex. Expansion of the existing boiler plant would involve: replacing the existing boilers and pumps with larger units and extending new hot water supply and return piping from the existing boiler plant to serve the new Annex (piping to be routed above the corridor ceiling). An independent boiler plant within the new Annex would involve: providing new boiler(s), pump(s), and ancillary equipment, and extending the natural gas service from the existing building to the new Annex (either above the corridor ceiling or on the roof); the existing boiler plant would remain as is. Both options would deliver heating hot water to the new Annex radiant heating equipment; ceiling panels, radiators, cabinet heaters, etc.

## **X. Electrical Power Normal Summary**

The existing building is served by a pad-mounted 75kVA transformer (good for 260A at 208/120V), which provides power to a two-bay service distribution, one for incoming feeders and the 800A-frame main circuit breaker with a 400A trip (per original drawings) and the other serving the building loads. The load-side has a mixture of old fused switches and relatively newer circuit breakers, the latter installed as part of the most recent building renovations. The main breaker and fused switches appear to be building original from ~1960. There are two existing 60A fused-switch spares and one 175A spare circuit breaker installed on the main distribution.

The branch panels in the building are a mixture of older and newer panelboards, generally circuit-breaker based. Typically, the newer panels serve mechanical loads during recent rehabilitations as well as the MDF room, while the older panels serve the miscellaneous classrooms and offices. Older distribution also appears to use cloth wiring and having no equipment grounding conductor with the feeders. A phased replacement of older equipment and their feeders should be considered for the long-term plans of the building.

One panelboard in the mechanical room was at an elevated location, requiring climbing the ladder to the roof to operate. This is a code violation and should be relocated at an appropriate location within the mechanical room.

There are no reported issues with nuisance tripping within the building; however, given the age of the main circuit breaker and presumed lack of maintenance it can't be ascertained that it is still operating properly. We recommend that the main circuit breaker be replaced and the rest of the main distribution having a full set of testing and maintenance performed on it. The existing fused switches should either be replaced with new or replaced with circuit breakers.

The current peak demand load (summer) is 68kVA (189A at 208/120V), although it is not known if this fully accounts for the new air-conditioning load installed this past summer. While the main board can accommodate 400A, there is limited ability for additional loads to be installed without major modifications. Coupled with the significant demand increase between the warming kitchen and the associated HVAC for it, the existing services are not adequate to accommodate both the new annex and the new kitchen.

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### **New Systems**

In line with CPS' general preference to provide separate power to building annexes and the lack of available space in the existing distribution, our strongest recommendation would be to provide a second set of feeders tapped off the service transformer secondary to provide power to the new annex. ComEd may either upgrade the size of the existing pad-mounted transformer to accommodate the additional loads, and/or provide a separate transformer to serve it.

The power distribution system will include a main distribution panel (800A nominally) which will sub-feed separate panels for lighting, general power, other specialty power if required, and smaller mechanical systems; large mechanical systems will be fed directly from the main distribution. Isolated grounding systems will be provided where required.

To accommodate changes in the existing multi-purpose room to add a warming kitchen, there are two options available, assuming a separate service for the annex is sought:

#### *Option #1:*

Upgrade the existing service (e.g. from 400A to 800A) and use that to serve the new warming kitchen. This will resolve both the issues regarding the existing condition of the equipment while accommodating the new loads. The main drawback to this is that it will require the main building to be taken offline during a summer, and that due to the poor condition of the older building loads, many of the existing feeders will require replacement as well, increasing overall construction costs.

#### *Option #2:*

Increase the size of the anticipated annex service (e.g. from 800A to 1200A) and use that to serve the kitchen. The main drawback to this option is the need for longer feeder runs routed in the hallway between the annex and the kitchen above the dropped ceiling. However, this will require no work on the existing service.

All service options should be coordinated with the mechanical design for any significant changes to the existing mechanical systems and their required electrical loads, as this may increase or decrease the existing power requirements on top of the additional requirements for the annex.

## **XI. Electrical Power Emergency Summary**

Per Chicago Code, the school requires a System II emergency power system that consists of a normal power source and at least one auxiliary source that is independent of utility power (e.g. approved battery units or a generator); CPS standards are to use individual battery units for emergency lights under this system for elementary schools.

The building appears to have had an emergency system via an automatic transfer switch (ATS), with one feed from the main switchboard and a separate feed directly from the utility. This ATS is severely aged and has an audible hum emanating from it. However, it is not clear that this ATS serves emergency loads, as a separate panel—the same panel flagged for being only operable from a ladder—has a direct connection to the main switchboard only and per its directory serves the fire alarm and emergency lights along with other additional loads (e.g. select A/C units and hardware). The ATS has two outgoing feeders,

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one was not presently traceable but does not serve the noted emergency panel, the other via an old Ryan Box seems to feed security systems.

The fire alarm system has battery backup as do all exit signs, while the emergency lights are via battery pack units that turn on during loss of power. Per Chicago Building Code, these units are already code compliant without the transfer switch.

Given the age of the transfer switch and it's not serving any emergency loads—emergency lights, exit signs, and fire alarm—we recommend for its removal. Any loads currently served by it should be re-served by existing normal power or be provided with small UPS units if some degree of standby power is desired (e.g. for security systems).

### **New Systems**

The new annex will use CPS standard EBU's and Exit Signs with 4-hour battery packs in line with the existing code-required System II emergency lighting.

The existing building does not presently have a fire pump. Per Chicago Building Code, a building of this type will not require one if the existing and new construction are of Type I-A or I-B; otherwise the building may be at the threshold for requiring one for being in excess of allowable square-footage. Should one be required, a new fire pump service will be required, sized by fire protection trades. The fire pump will presumably be in the new annex, sized to feed the existing building as well as the annex.

## **XII. Electrical Lighting Summary**

The existing building uses fluorescent lighting throughout the interior with T8 lamps. The building has some degree of lighting controls via several astronomical time clocks, likely separately serving the interior and exterior lights.

We recommend a phased replacement of the existing building fixtures with new LED equal to those of current CPS standards, as well as providing new lighting controls compliant with present energy codes. Beyond providing energy savings, it will help preserve a common aesthetic between the existing school building and the new annex.

Existing site lighting consists of building-attached lights and pole-fixtures. Most if not all these fixtures appear to be HID type. The building-attached lights had those at the building entrances on and those elsewhere off (presumably to come on at night). Some of the pole lights appeared to be on despite the daylight hours and many have a significant build-up of leaves inside the luminaire. We recommend the replacement of the HID fixtures with more efficient LED fixtures. With the construction of the new annex and the need for more centralized lighting controls, we recommend that the exterior lighting be integrated into the new lighting control system at some point in the future.

### **New Systems**

The new annex will use LED lighting with advanced lighting controls to meet LEED and energy code requirements. CPS standard types of fixtures will be used based on the space usage.

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New external building-attached lighting will be installed on the new annex where required. All new site lighting should be connected to the lighting control system for time scheduling with optional photocell override.

Some of the existing poles will need to be relocated or removed to accommodate the footprint of the annex. Relocated fixtures are recommended to have their luminaires replaced, preferably with LED.

Refer to the “Power-Emergency” section for discussion of exit signs and battery packs.

### **XIII. Electrical IT/AV/Misc. Low Voltage Summary**

The basement has a telecom service in the boiler room. Per current programming, CPS may be electing to provide a new MDF room in the annex to expand this space for a renovated computer lab. This service will likely be moved to the new annex under this option, with the existing MDF room becoming an IDF room.

The building has a single MDF room on the North end of the building within a computer lab closet to serve all the building’s current IT loads. The space appears to be well-cooled and of sufficient power and spatial capacity to meet present needs. Should the MDF room be relocated, CPS should be aware that this would require significant work with replacing the existing data drops, and the additional lengths for the South end of the building may be more than recommended maximum distances, requiring a small IDF room on the South end.

Security systems include access control and security cameras at select locations. Currently, the existing systems appear adequate. CPS should consider where additional security items would be desired and incorporate them into the building’s upgrades. Cameras and building access control should be provided to the annex per CPS standards.

The existing public address (PA) system is old and the staff has noted issues with the sound quality at its speakers. While it has a master clock, all existing building clocks are hard-wired with syncing to a radio/satellite system for time setting. We recommend for the replacement of the existing PA systems to address both the existing sound quality issues and to provide additional capacity to serve the new annex.

#### **New Systems**

A new MDF/IDF room shall be installed in the new annex. This will house the IT loads for the annex and may serve as the new MDF room for the school under proposed CPS option. Data jacks will be installed where required.

A new security control panel will also be installed in the annex to serve its intrusion detection systems. Motion sensors, keypads and CCTV cameras will be installed per CPS standards.

The existing central PA station is strongly recommended to be replaced with new. Existing systems shall re-fed by the new panel, along with new. The annex will have speakers and call buttons as required. It will be to CPS discretion if the existing clocks should be replaced and tied into the proposed new central station.

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Additional clocks will be required in the Annex. These should be chosen to match the existing building, whether or not the master clock system is implemented.

#### **XIV. Electrical Grounding & Lighting Protection Summary**

The building appears to have some degree of grounding, as the MDF room has a grounding bus. However, it is likely that the older distribution equipment does not have grounding conductors. With the limited ability to open equipment during survey the team could not ascertain whether the building is fully grounded. Further assessment of the building's electrical distribution is encouraged.

The building has no lightning protection; however, the building is only one-story tall with a somewhat limited footprint and there are taller buildings within the vicinity. A new lightning protection system is not necessary.

#### **New Systems**

All feeders in the annex will have an equipment grounding conductor. Should the annex have a separate service drop from ComEd, the main panel will have a bonded neutral and a grounding electrode system per electrical code.

#### **XV. Electrical Fire Alarm Summary**

McDade Elementary currently has a City of Chicago approved Class-1 Fire Alarm System. The original system installed is a conventional fire alarm system and not an addressable system as per current standard. The system consists of heat detectors, manual pull-stations and notification devices. There has not been any subsequent renovation of the system since it's originally installation in 2001.

The fire alarm control panel (FACP) is in the main admin office. Pull-stations are installed at each exit throughout the building. Visual alarms are installed in every classroom and toilet rooms. Audio/visual alarms are installed throughout the building in corridors and other spaces. City of Chicago city tie is installed within a 100 feet distance of the principal's office; however, according to the building engineer, the city tie is inoperable. The existing fire alarm system is not connected to the city tie or a central monitoring station. Although it is not required by code that the fire alarm system be connected to the city tie, it is good practice to do so. At present, the school administrator must physically dial 911 when the fire alarm system goes off.

The system has not been upgraded since original construction. While it appears to be in working condition, the entire system is showing signs of age. Moreover, the fire alarm control panel has been

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discontinued. At the time of the survey, there were no trouble or supervisory alarms indicated on the control panel. According to the building engineer, the school has not had any nuisance alarms. Existing conventional heat detectors and manual pull-stations are well past their rated life and are in a dire need of replacement throughout the original building. These devices are not supervised by the FACP and there is no way to tell, without a manual test, if the detector or pull-station is operable. Existing notification appliances that are part of the conventional system are also well past their rated life and need replacement.

### **New Systems**

It is highly recommended to upgrade the entire fire alarm system with a new fully addressable fire alarm system along with new notification devices and fire alarm annunciator panel in the existing building. The system shall comply with the City of Chicago Class-I fire alarm system requirements. The upgraded system can be used to serve the same types of devices in the new annex (e.g. heat detectors, audio/visual devices, pull stations). New NAC panels shall be installed to provide circuits for notification appliances, including a separate NAC panel for the annex.

In addition to the building upgrades, the existing city-tie should be replaced with new to make it operable again. The fire alarm system would also be connected to the city-tie for central station monitoring.

Should a fire pump be required with the annex, a stand-alone supervisory system for the sprinkler tamper valves shall be required for the fire alarm system.