



# Palmer Elementary School

5051 N Kenneth Ave  
Chicago, IL 60630

## 60% SCHEMATIC DESIGN REPORT

November 2, 2018

FGM ARCHITECTS

OWNER  
City of Chicago School District #299  
South Clark St., Suite 14  
Chicago, IL 60603

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FGM Job No: 18-2589.01  
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1. GENERAL

A. Project Narrative.....

B. Project Schedule .....

E. Specifications.....

2. SITE

A. Civil Conditions and Recommendations.....

B. Utility Plans .....

3. ARCHITECTURE

A. Building Program.....

4. STRUCTURAL

A. Conditions and Recommendations.....

5. MEP

A. Conditions and Recommendations.....

## PROJECT INFORMATION

John M. Palmer Elementary School Annex and Renovations [5051 N. Kenneth Ave., Chicago IL 60630]

A new approximate 33,000 sq. ft., two-story annex to an existing two-story school intended to alleviate overcrowding as well as eliminate one existing classroom modular units. The proposed annex will include (7) standard classrooms, (1) special needs classrooms for 3 age groups, (1) computer classroom, (2) art classroom with storage and Kiln, (2) admin offices, a new library/media center, new student dining/multi-purpose room, hybrid kitchen and kitchen server, kitchen office with (1) staff toilet/locker rooms, building storage, student toilets, utility rooms, an elevator with building support spaces.

The project will also include site improvements for a new parking lot, loading area, refuse w/enclosure, stormwater management infrastructure, landscaping, new green space, and a new outdoor 3-12 playground. The foundation demolition and removal of utilities with the existing flat-roofed (TBD) classroom modular building, in preparation for the new site scope. Work within the existing school building will include conversion of the existing kitchen and lunchroom into two (2) typical classrooms, converting existing art classroom into a typical classroom, and renovating the existing computer lab to provide added power/data. Additionally, exterior envelope repairs will occur along with replacement of the roof of the existing school building. The FTE is projected to increase to a total of 75 after the annex is completed. The existing student enrollment is 806 and is projected to increase for an ideal capacity of 960 students. The school has a current capacity of 690 students.

Project design follows CPS Design Guidelines, CPS Updated Design Guidelines & Prototype Designs dated October 7, 2016 and newly released standard specifications.

# PROJECT SCHEDULE

## Pre-Planning, Planning, Design and Construction

### 1. FY19 SCHOOLS: FALL 2020 DELIVERY SCHEDULE

#### a. PROCUREMENT ACTIVITIES:

i. FY19 SCHOOLS TRANSFER MTG .....7/27/18 ANX: See Above Project Listing

#### ii. PROJECT AUTHORITY

1. BUDGET: CAPITAL .....7/25/18 BOE Capital Projects Approval

2. BUDGET: FORMULATION .....8/14/18 PBC Board Approval (8 CPS

Projects per above List)

3. BUDGET: PARTIAL UNDERTAKING .....9/11/18 PBC Board Approval (8 CPS

Projects per above List)

#### iii. PBC PRE-PLANNING / SITE DUE DILIGENCE

1. SPECIALTY CONSULTANTS .....9/6/18 – 11/26/18 Assess: Geotech,  
Environmental Engineering, Survey, Traffic, Cost

2. DA – DESIGN ARCHITECT .....9/6/18 – 10/12/18 PBC Pre-Qualified  
Architects: FGM, LEGAT, SMNGA

#### iv. PBC DESIGN

1. AOR LIQ INFO SESSION .....9/20/18 All AOR/EOR LIQ Participants

2. AOR PROCUREMENT .....10/16 – 11/12/18

3. PBC BOD APPROVAL .....11/13/18 AOR – ARCHITECT OF RECORD  
(Engagement w/CM)

4. AOR ENGAGEMENT/KICK-OFF .....11/14 – 11/20/18 NOA: DD, 60%,  
90%/PERMIT, 100%/IFC, IFC

#### v. CM @ RISK – CONSTRUCTION MANAGER

1. PHASE - I RFP REQUEST .....Oct 2018

2. PHASE - I INFO SESSION .....TBD

3. PHASE - I RFP RESPONSES .....TBD

4. CM INTERVIEWS .....TBD

5. CM SELECTION .....Dec 2018 (CPS/PBC Approved)  
Engagement @ Start of DD Design w/AOR

6. PBC BOD APPROVAL/NTP .....12/11/18 TBD CM Approval / Refer to  
Preconstruction Activities below

7. CM PRELIM DELIVERABLES .....12/13 – 12/28 (Pay App Strategy, Cash  
Flow, Engagement Plans)

#### vi. GENERAL CONTRACTOR

1. GC PROCUREMENT .....May/June 2019 Per PBC Pre-Qualified GC  
Classification

2. BIDDING PHASE .....June/July 2019 Per IFB Design Documents

3. PBC BOD MEETING APPROVAL .....7/9/19 General Contractor Approval

4. NOA .....7/10/19 PBC Ltr of Engagement to CM

5. NTP .....July/Aug 2019 Refer to Preconstruction  
Activities below by CM

### 2. DESIGN ACTIVITIES

a. DESIGN ARCHITECT PRE-PLANNING KICK-OFF.....09/06/18 Design Engagement of DA's

b. CONCEPT PRG. EVAL/CONFIRMATION .....9/7 - 10/05//18 Prelim Cost Estimate (if  
applicable) – Scope Verification

i. ISSUE CONCEPT DESIGN/REVIEW .....10/5/18 (CPS, PBC, Peer Review)

ii. CNPT DESIGN APPROVAL .....TBD

c. SCHEMATIC DESIGN .....Oct – Nov 2018

i. ISSUE FOR SCHEMATIC DESIGN .....11/21/18 (CPS, PBC, Peer Review, Cost  
Estimate)

ii. SD MILESTONE REVIEW .....TBD (Milestone Meeting TBD)

d. ARCHITECT OF RECORD KICK-OFF .....11/14 – 11/20/18 DD PHASE - Design  
Engagement

e. DESIGN DEVELOPMENT .....Nov 2018 – Jan 2019

i. ISSUE FOR TRADE BIDDING #1 ..... TBD Trade Package #1: Foundations &  
Long Lead Items

ii. TRADE PKG #1REVIEW .....TBD (Stakeholder Review, Comment  
Review Mtg TBD) If Req'd

iii. ISSUED FOR DESIGN DEVELOPMENT .....1/11/19 Trade Package #2: Excavation and  
Earthwork, Concrete, Utilities

iv. DD MILESTONE REVIEW .....TBD (Stakeholder Review, Milestone  
Meeting TBD)

v. UPDATED GMP ESTIMATE .....TBD Per DB, Including Trade Pkg #1 and #2  
Costs Reconciliation

f. CONSTRUCTION DOCUMENT PHASE .....Jan – April 2019

i. ISSUE FOR TRADE BIDDING #3 ..... TBD Trade Package #3: Building Material  
Components

ii. TRADE PKG #3REVIEW .....TBD (Stakeholder Review, Comment Review  
Mtg TBD) If Req'd

iii. ISSUE FOR 60%CD – TRADE PKG #4 ..... 2/26/19 Trade Package #4: Interior/Exterior  
Components & Equipment

iv. 60%CD MILESTONE REVIEW .....TBD (Stakeholder Review, Milestone  
Meeting TBD)

v. ISSUE FOR 90%CD/PERMIT ..... 4/11/18 Trade Package #4:  
Interior/Exterior Components & Equipment

vi. 60%CD MILESTONE REVIEW .....TBD (Stakeholder Review, Milestone  
Meeting TBD)

vii. ISSUE FOR 100%CD – VERTICAL/BLDG ..... 5/13/18 Trade Package #5: Balance of  
Project Procurement (As Req'd)

viii. 100%CD MILESTONE REVIEW .....TBD (Stakeholder Review, Milestone Mtg  
TBD)

PROJECT SCHEDULE (CONT)

- ix. PRELIM FINAL GMP DRAFT .....TBD (Preliminary Final GMP Submittal & Review – TBD)

x. FINAL GMP APPROVAL ..... July/Aug 2019 (PBC Aug Board Meeting

xii. 60%CD MILESTONE REVIEW .....TBD (Stakeholder Review, Milestone Meeting TBD)

xiii. ISSUE FOR 100%CD – VERTICAL/BLDG ..... 5/13/18 Trade Package #5: Balance of Project Procurement (As Req'd)

xiv. 100%CD MILESTONE REVIEW .....TBD (Stakeholder Review, Milestone Mtg TBD)

xv. PRELIM FINAL GMP DRAFT .....TBD (Preliminary Final GMP Submittal & Review – TBD)

xvi. FINAL GMP APPROVAL ..... July/Aug 2019 (PBC Aug Board Meeting Reporting – GMP Full Undertaking)

xvii. ISSUED FOR CONSTRUCTION ..... July 2019 Includes ALL Permit & Milestone Comments w/Trade Pkg Coord.

3. PERMIT PROCESS: DDS – DIRECT DEVELOPER SERVICES (PBC Recommended Dates, Subject to Change)

a. PERMIT #1 - SHALLOW FOUNDATIONS .....Mar 01, 2019 TBD Site Preparation Scope: Per 100%DD Dwgs DOB Submittal

b. PERMIT #1A - DEEP FOUNDATIONS (Only) [Decatur ES ANX]

i. OUC INTAKE MEETING (AVIKAM) .....Dec 2018 (3 Days) Projected 90 Day Max, Goal for Reduction

ii. PREPARE CAISSONS ONLY PACKAGE .....Dec/Jan 2019 Includes Engineered Procedures for Sub-Contractor Acceptance

iii. OUC SUBMITTAL (REVIEW & COMMENT).. ...Jan 2019 Permit: Caissons only for OUC Process (2 Wks)

iv. OUC SEARCH .....Jan/Feb 2019 Typical 30 Calendar Days (Goal for 2-3Wks)

v. OUC SEARCH COMMENT RESPONSES .....Feb 2019 (1 Wk) If applicable, for found conflicts only

vi. READY FOR OUC APPROVAL .....Mar 2019 Prior to Site Prep Construction Phase #1

c. PERMIT #2 - FULL BLDG .....June/July 2019 Annex Building, Site Development and Modular Demo: 90%CD

4. PRE CONSTRUCTION ACTIVITIES:

a. NTP - NOTICE TO PROCEED .....Dec 2018 Procurement, Sub-Guard, Estimating,

i. INTERIOR RENOVATIONS .....Jun - Aug 2021 (2 Mo) Summer Critical Scope
- Reporting – GMP Full Undertaking)

xi. ISSUED FOR CONSTRUCTION ..... July 2019 Includes ALL Permit & Milestone Comments w/Trade Pkg Coord.

Peer/Constructability

i. Review, 3/4D BIM Coordination, Lead Items (Elevator/Roofing)

b. PRINCIPAL LOGISTICS/PHAZING MTG #1 .....Feb 2019 Project Phasing

c. PRE-CONSTRUCTION PERIOD (Trade Bid Packages: Issuance to Award)

i. PRE-CONSTR CONF KICKOFF MTG... .....Feb 2019 CM Quality and Safety Plans

ii. PRELIMINARY SUBMITTALS REVIEW .....Mar 2019 Site Utilization, Waste Management, Baseline Schedule,

iii. ITL PLAN - TRADE PACKAGE #1 & #2 .....Mar 2019 For PBC Procurement of project ITL Services

d. EXCAVATIONS PRE-CONSTRUCTION MTG .....Mar 2019

e. SITE UTILITIES PRE-CONSTRUCTION MTG .....Apr 2019

f. P6 BASELINE SCHEDULE SUBMITTAL .....Apr 2019 After 60%CD submittal

5. CONSTRUCTION ACTIVITIES: PHASE #1 - Site Prep Abatement & Demolition, Foundations and Steel Erection Package

a. SITE PREP MOBILIZATION .....Mar 01, 2019 TBD Site Control, Fencing, CPS Temp Parking, Temp Utilities

b. SITE PREP CONSTRUCTION:

i. DEMO/EXC./GRUBBING .....Apr 2019

ii. EXC. FTGS/UNDERGROUND MEP..... May/June 2019

6. CONSTRUCTION ACTIVITIES: PHASE #2 – Vertical/Full Bldg Construction & Site Development

a. MOBILIZATION (CONTINUED PER SITE PREP)... ..May/June 2019 (For Vertical/Full Building Construction: Site Control, Fencing)

b. VERTICAL CONSTRUCTION .....July/Aug 2019 (13 Months)

c. SITE DEVELOPMENT .....Mar 2020 (Parking Lot, Green Space)

d. CPS FF&E MOVE-IN .....Aug 2020 6 Weeks Required, Typ.

e. SUBSTANTIAL COMPLETION .....Aug 2020 (Fall School Calendar)

f. FACILITY OPENING/START OF SCHOOL .....Sept 2020 Final Acceptance (6 mo after SC) Feb 2021

7. CONSTRUCTION ACTIVITIES: PHASE #3 – Existing School Renovations & Site Development

a. INTERIOR CONVERSION

b. MODULAR DEMOLITION/PARKING .....Mar – Jun 2021 (4 Mo) Foundations, Util, Modular Components (Salvage TBD)



SPECIFICATIONS

DIVISION 00 - PROCUREMENT AND CONTRACTING REQUIREMENTS

00 01 01 PROJECT MANUAL COVER PAGE ..... PBC 00\_10/05/18

00 01 02 TABLE OF CONTENTS ..... CPS-PBC 00\_10/22/18

00 01 11 SUPPLEMENTAL PROJECT INFORMATION ..... 00\_09/17/18

DIVISION 01 - GENERAL REQUIREMENTS

01 23 00 ALTERNATES..... 00\_09/17/18

01 25 00 SUBSTITUTION PROCEDURES ..... 00\_09/17/18

01 25 00.01 SUBSTITUTION REQUEST FORM..... 00\_09/17/18

01 33 29 LEED SUSTAINABLE DESIGN REPORTING ..... 00\_09/17/18

01 33 29.01 LEED PROJECT CHECKLIST..... 00\_09/17/18

PREPARED BY AOR/EOR AS APPLICABLE..... NA

01 33 29.04 LEED MATERIAL CONTENT FORM..... 00\_09/17/18

01 33 29.07 LEED PROHIBITED CONTENT INSTALLER CERTIFICATION..... 00\_09/17/18

01 42 16 DEFINITIONS ..... 00\_09/17/18

01 50 03 TEMPORARY FACILITIES AND CONTROLS – RENOVATION ..... 00\_09/17/18

01 50 05 TEMPORARY FACILITIES AND CONTROLS – NEW CONSTRUCTION.... 00\_09/17/18

01 50 10 COMMISSION REPRESENTATIVE FIELD OFFICE ..... PBC 06\_10/05/18

01 56 11 GENERAL DUST, FUME AND ODOR CONTROLS ..... 00\_09/17/18

01 57 13 LEED TEMPORARY EROSION AND SEDIMENT CONTROL ..... 00\_09/17/18

01 57 21 LEED INDOOR AIR QUALITY CONTROLS..... 00\_09/17/18

01 57 21 INTEGRATED PEST MANAGEMENT..... 00\_09/17/18

01 60 00 PRODUCT REQUIREMENTS ..... 00\_09/17/18

01 61 16 LEED VOLATILE ORGANIC COMPOUND (VOC) RESTRICTIONS..... 00\_09/17/18

01 62 10 PRE-CONSTRUCTION PROJECT MOCK-UP..... 00\_09/17/18

01 70 00 EXECUTION REQUIREMENTS ..... 00\_09/17/18

01 73 29 CUTTING AND PATCHING ..... 00\_09/17/18

01 74 19 LEED CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL ..... 00\_09/17/18

01 91 XX COMMISSIONING ..... PENDING

DIVISION 02 - EXISTING CONDITIONS

02 13 15 SMALL SCALE DISTURBANCE ASBESTOS CONTAINING MATERIALS00\_09/17/18

02 24 00 ENVIRONMENTAL ASSESSMENT ..... 00\_09/17/18

02 24 01 ENVIRONMENTAL SCOPE SHEETS ..... 00\_09/17/18

02 26 00 HAZARDOUS MATERIALS ASSESSMENT ..... 00\_09/17/18

02 41 16 BUILDING DEMOLITION ..... 00\_09/17/18

02 41 19 SELECTIVE DEMOLITION ..... 00\_09/17/18

02 64 00 ABOVEGROUND STORAGE TANK REMOVAL ..... 00\_09/17/18

02 65 00 UNDERGROUND STORAGE TANK REMOVAL..... 00\_09/17/18

02 82 13 ASBESTOS ABATEMENT – PRIOR TO DEMOLITION ..... 00\_09/17/18

02 82 14 ASBESTOS ABATEMENT – INTERIORS ..... 00\_09/17/18

02 82 15 ASBESTOS ABATEMENT – EXTERIORS ..... 00\_09/17/18

02 83 19 LEAD-BASED PAINT ABATEMENT ..... 00\_09/17/18

02 83 20 SMALL SCALE DIST OF PAINT SURF ASSUMED CONTAIN LEAD.... 00\_09/17/18

02 86 13 HAZARDOUS AND UNIVERSAL WASTE MANAGEMENT ..... 00\_09/17/18

02 87 13 ANIMAL EXCREMENT AND CARCASS ABATEMENT .....00\_09/17/18

DIVISION 03 - CONCRETE

03 30 00 CAST-IN-PLACE CONCRETE .....00\_09/17/18

03 30 53 MISCELLANEOUS CAST-IN-PLACE CONCRETE .....00\_09/17/18

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04 43 01 STONE MASONRY .....00\_09/17/18

04 72 00 CAST STONE MASONRY.....00\_09/17/18

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05 21 00 STEEL JOIST FRAMING.....00\_09/17/18

05 31 00 STEEL DECKING .....00\_09/17/18

05 40 00 COLD-FORMED METAL FRAMING .....00\_09/17/18

05 50 00 METAL FABRICATIONS .....00\_09/17/18

05 51 00 METAL STAIRS .....00\_09/17/18

05 52 13 PIPE AND TUBE RAILINGS.....00\_09/17/18

05 53 05 GRATINGS AND FLOOR PLATES .....00\_09/17/18

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06 10 00 ROUGH CARPENTRY .....00\_09/17/18

06 20 00 FINISH CARPENTRY .....00\_09/17/18

06 61 16 SOLID SURFACING FABRICATIONS .....00\_09/17/18

DIVISION 07 - THERMAL AND MOISTURE PROTECTION

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07 01 60 MAINTENANCE OF FLASHING AND SHEET METAL.....00\_10/12/18

07 11 13 BITUMINOUS DAMPPROOFING.....00\_10/12/18

07 13 00 SHEET WATERPROOFING.....00\_10/12/18

07 18 00 TRAFFIC COATINGS .....00\_10/12/18

07 21 00 THERMAL INSULATION .....00\_10/12/18

07 42 13.23 METAL COMPOSITE MATERIAL WALL PANELS .....00\_10/12/18

07 42 47 CUSTOM COMPOSITE MATERIAL WINDOW INFILL PANELS.....00\_10/12/18

07 52 00 MODIFIED BITUMINOUS MEMBRANE ROOFING .....PENDING

07 54 33 FLEXIBLE MEMBRANE ROOFING .....00\_10/12/18

07 61 00 SHEET METAL ROOFING .....00\_10/12/18

07 62 00 SHEET METAL FLASHING AND TRIM .....00\_10/12/18

07 71 00 ROOF SPECIALTIES .....00\_10/12/18

07 72 00 ROOF ACCESSORIES.....00\_10/12/18

07 81 00 APPLIED FIREPROOFING .....00\_10/12/18

07 81 23 INTUMESCENT MASTIC FIREPROOFING.....00\_10/12/18

07 84 00	FIRESTOPPING .....	00_10/12/18
07 92 00	JOINT SEALANTS .....	00_10/12/18
07 95 13	EXPANSION JOINT COVER ASSEMBLIES .....	00_10/12/18
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08 11 13	HOLLOW METAL DOORS AND FRAMES .....	00_10/12/18
08 14 16	FLUSH WOOD DOORS .....	00_10/12/18
08 16 13	FIBERGLASS DOORS .....	00_10/12/18
08 31 00	ACCESS DOORS AND PANELS .....	00_10/12/18
08 33 13	COILING COUNTER DOORS .....	00_10/12/18
08 33 23	OVERHEAD COILING DOORS .....	00_10/12/18
08 33 26	OVERHEAD COILING GRILLES .....	00_10/12/18
08 42 29	AUTOMATIC DOOR OPERATORS .....	00_10/12/18
08 43 13	ALUMINUM-FRAMED STOREFRONTS .....	00_10/12/18
08 51 13	ALUMINUM WINDOWS .....	00_10/12/18
08 56 57	WINDOW GUARDS - EXTERIOR .....	00_10/12/18
08 71 00	DOOR HARDWARE .....	PENDING
08 71 01	DOOR HARDWARE SCHEDULE .....	PENDING
08 80 00	GLAZING .....	00_10/12/18
08 83 00	MIRRORS .....	00_10/12/18
08 87 23	SAFETY AND SECURITY GLAZING FILMS .....	00_10/12/18
08 91 00	LOUVERS .....	00_10/12/18
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09 01 22	GYPSUM PLASTER PATCHING .....	00_10/12/18
09 01 24	PLASTER RENOVATION .....	00_10/12/18
09 01 33	TILING RENOVATION .....	00_10/12/18
09 01 63	TERRAZZO FLOORING RENOVATION .....	00_10/12/18
09 01 65	WOOD ATHLETIC FLOORING RENOVATION .....	00_10/12/18
09 05 61	COMMON WORK RESULTS FOR FLOORING PREPARATION .....	00_10/12/18
09 21 16	GYPSUM BOARD ASSEMBLIES .....	00_10/12/18
09 22 16	NON-STRUCTURAL METAL FRAMING .....	00_10/12/18
09 30 00	TILING .....	00_10/12/18
09 51 00	ACOUSTICAL CEILINGS .....	00_10/12/18
09 64 29	WOOD STRIP AND PLANK FLOORING .....	00_10/12/18
09 64 66	WOOD ATHLETIC FLOORING .....	00_10/12/18
09 64 83	WOOD STAGE FLOORING .....	00_10/12/18
09 65 00	RESILIENT FLOORING .....	00_10/12/18
09 68 13	TILE CARPETING .....	00_10/12/18
09 91 03	SURFACE PREPARATION FOR RENOVATION PAINTING .....	00_10/12/18
09 91 05	RENOVATION PAINTING .....	00_10/12/18
09 91 13	EXTERIOR PAINTING .....	00_10/12/18
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10 11 01	VISUAL DISPLAY BOARDS .....	00_09/17/18
10 11 03	CHALKBOARD TO MARKERBOARD CONVERSION .....	00_09/17/18
10 14 00	SIGNAGE .....	00_09/17/18
10 21 13.19	PLASTIC TOILET COMPARTMENTS .....	00_09/17/18
10 22 13	WIRE MESH PARTITIONS AND PANELS .....	00_09/17/18

10 22 39	FOLDING PANEL PARTITIONS .....	00_09/17/18
10 26 01	WALL AND CORNER GUARDS .....	00_09/17/18
10 28 00	TOILET, BATH, AND LAUNDRY ACCESSORIES .....	00_09/17/18
10 44 00	FIRE PROTECTION SPECIALTIES .....	00_09/17/18
10 44 03	INSTALLATION OF FIRE EXTINGUISHERS AND CABINETS .....	00_09/17/18
10 51 12.11	LOCKERS – ELEMENTARY SCHOOL .....	00_09/17/18
10 82 19	EXTERIOR SOUND SCREENS .....	00_09/17/18

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11 40 00	FOODSERVICE EQUIPMENT .....	00_09/17/18
11 52 13	PROJECTION SCREENS .....	00_09/17/18
11 68 13	PLAYGROUND EQUIPMENT .....	00_09/17/18
11 68 23.13	EXTERIOR BASKETBALL EQUIPMENT .....	00_09/17/18
11 82 27	FACILITY WASTE COMPACTORS .....	00_09/17/18

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12 32 00	MANUFACTURED WOOD CASEWORK .....	00_09/17/18
12 36 00	COUNTERTOPS .....	00_09/17/18
12 48 13	ENTRANCE FLOOR MATS AND FRAMES .....	00_09/17/18

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13 48 20	ARCHITECTURAL ACOUSTIC ISOLATION .....	00_09/17/18
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14 24 23	HYDRAULIC PASSENGER ELEVATORS .....	00_09/17/18
14 42 00	VERTICAL PLATFORM LIFTS .....	00_09/17/18

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21 13 00	FIRE SUPPRESSION SPRINKLER SYSTEMS .....	00_09/17/18
21 30 00	FIRE PUMPS .....	00_09/17/18

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22 05 53	IDENTIFICATION FOR PLUMBING PIPING AND EQUIPMENT .....	00_09/17/18
22 07 16	PLUMBING EQUIPMENT INSULATION .....	00_09/17/18
22 07 19	PLUMBING PIPING INSULATION .....	00_09/17/18
22 11 16	DOMESTIC WATER PIPING .....	00_09/17/18
22 11 19	DOMESTIC WATER PIPING SPECIALTIES .....	00_09/17/18
22 13 16	SANITARY WASTE, VENT AND STORM DRAINAGE PIPING .....	00_09/17/18
22 14 23	DRAINAGE PIPING SPECIALTIES .....	00_09/17/18
22 35 00	DOMESTIC WATER PUMPS .....	00_09/17/18
22 36 00	COMMERCIAL FUEL-FIRED WATER HEATERS .....	00_09/17/18
22 37 00	SANITARY SEWAGE AND SUMP PUMPS .....	00_09/17/18
22 40 00	PLUMBING FIXTURES .....	00_09/17/18
22 66 53	CHEMICAL WASTE PIPING .....	00_09/17/18

DIVISION 23 - HEATING, VENTILATING, AND AIR-CONDITIONING (HVAC)

23 01 30.51	HVAC AIR-DISTRIBUTION SYSTEM CLEANING .....	00_09/17/18
23 05 13	COMMON MOTOR REQUIREMENTS FOR HVAC EQUIPMENT.....	00_09/17/18
23 05 16	EXPANSION FITTINGS AND LOOPS FOR HVAC PIPING.....	00_09/17/18
23 05 19	METERS AND GAGES FOR HVAC PIPING .....	00_09/17/18
23 05 23	GENERAL-DUTY VALVES FOR HVAC PIPING .....	00_09/17/18
23 05 48	VIBRATION CONTROLS FOR HVAC PIPING AND EQUIPMENT.....	00_09/17/18
23 05 53	IDENTIFICATION FOR HVAC PIPING AND EQUIPMENT .....	00_09/17/18
23 05 93	TESTING, ADJUSTING, AND BALANCING FOR HVAC.....	00_09/17/18
23 07 13	DUCT INSULATION.....	00_09/17/18
23 07 16	HVAC EQUIPMENT INSULATION .....	00_09/17/18
23 07 19	HVAC PIPING INSULATION .....	00_09/17/18
23 09 XX	BUILDING AUTOMATION SYSTEM (BAS) .....	PENDING
23 21 13	HYDRONIC PIPING.....	00_09/17/18
23 21 14	HYDRONIC SPECIALTIES.....	00_09/17/18
23 21 23	HYDRONIC PUMPS .....	00_09/17/18
23 23 00	REFRIGERANT PIPING .....	00_09/17/18
23 25 00	HVAC WATER TREATMENT .....	00_09/17/18
23 31 00	HVAC DUCTS AND CASINGS.....	00_09/17/18
23 33 00	AIR DUCT ACCESSORIES .....	00_09/17/18
23 34 16	CENTRIFUGAL HVAC FANS .....	00_09/17/18
23 36 00	AIR TERMINAL UNITS .....	00_09/17/18
23 37 00	AIR OUTLETS AND INLETS .....	00_09/17/18
23 40 00	HVAC AIR CLEANING DEVICES .....	00_09/17/18
23 51 00	BREECHINGS, CHIMNEYS, AND STACKS .....	00_09/17/18
23 52 16	CONDENSING BOILERS .....	00_09/17/18
23 73 13	MODULAR INDOOR CENTRAL AIR HANDLER .....	00_09/17/18
23 81 26.13	SMALL-CAPACITY SPLIT-SYSTEM AIR CONDITIONERS .....	00_09/17/18
23 82 23	UNIT VENTILATORS.....	00_09/17/18

DIVISION 26 - ELECTRICAL

26 05 05	SELECTIVE DEMOLITION FOR ELECTRICAL.....	PENDING
26 05 19	LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES....	PENDING
26 05 26	GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS.....	PENDING
26 05 29	HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS.....	PENDING
26 05 33.13	CONDUIT FOR ELECTRICAL SYSTEMS.....	PENDING
26 05 33.16	BOXES FOR ELECTRICAL SYSTEMS.....	PENDING
26 05 33.23	SURFACE RACEWAYS FOR ELECTRICAL SYSTEMS.....	PENDING
26 05 48	NOISE AND VIBRATION CONTROL FOR ELECTRICAL SYSTEMS.....	PENDING
26 05 53	IDENTIFICATION FOR ELECTRICAL SYSTEMS .....	PENDING
26 05 83	WIRING CONNECTIONS .....	PENDING
26 08 13	TESTING OF ELECTRICAL SYSTEMS .....	PENDING
26 09 23	LIGHTING CONTROL DEVICES.....	PENDING
26 09 43	LIGHTING CONTROLS .....	PENDING
26 21 00	LOW-VOLTAGE ELECTRICAL SERVICE ENTRANCE.....	PENDING
26 22 00	LOW-VOLTAGE TRANSFORMERS .....	PENDING
26 24 13	SWITCHBOARDS.....	PENDING
26 24 16	PANELBOARDS .....	PENDING
26 27 23	INDOOR SERVICE POLES .....	PENDING
26 27 26	WIRING DEVICES .....	PENDING

26 28 13	FUSES .....	PENDING
26 28 16.13	ENCLOSED CIRCUIT BREAKERS.....	PENDING
26 28 16.16	ENCLOSED SWITCHES .....	PENDING
26 29 13	ENCLOSED CONTROLLERS .....	PENDING
26 29 23	VARIABLE FREQUENCY MOTOR CONTROLLERS .....	PENDING
26 32 13	ENGINE GENERATORS .....	PENDING
26 36 00	TRANSFER SWITCHES.....	PENDING
26 43 00	SURGE PROTECTIVE DEVICES .....	PENDING
26 51 00	INTERIOR LIGHTING .....	PENDING
26 51 00.01	INTERIOR LIGHTING FIXTURE SCHEDULE .....	PENDING
	FOR REFERENCE – INCLUDE SCHEDULE ON DRAWINGS, EDIT PER PROJECT	
26 56 00	EXTERIOR LIGHTING.....	PENDING
26 56 00.01	EXTERIOR LIGHTING FIXTURE SCHEDULE .....	PENDING
	INCLUDE SCHEDULE ON DRAWINGS, EDIT PER PROJECT	

DIVISION 27 - COMMUNICATIONS

27 05 03	COMMUNICATIONS GENERAL REQUIREMENTS.....	00_09/17/18
27 05 38	CABLE TRAYS FOR STRUCTURED CABLING SYSTEMS .....	00_09/17/18
27 05 53	IDENTIFICATION FOR COMMUNICATION SYSTEMS .....	00_09/17/18
27 05 53.01	IDENTIFICATION FOR COMMUNICATION SYSTEMS LABELING .....	00_09/17/18
27 08 00	COMMISSIONING OF COMMUNICATIONS .....	00_09/17/18
27 11 16	COMMUNICATIONS CABINETS, RACKS, AND ENCLOSURES .....	00_09/17/18
27 13 13	COMMUNICATIONS COPPER BACKBONE CABLING .....	00_09/17/18
27 13 23	COMMUNICATIONS OPTICAL FIBER BACKBONE CABLING .....	00_09/17/18
27 15 00	DATA COMMUNICATIONS HORIZONTAL CABLING .....	00_09/17/18
27 51 00	DISTRIBUTED AUDIO-VIDEO COMMUNICATIONS SYSTEMS.....	00_09/17/18
27 51 16	PUBLIC ADDRESS SYSTEMS .....	00_09/17/18
27 53 14	CLOCK SYSTEMS .....	00_09/17/18
27 53 15	INTERCOM/MASTER CLOCK & PROGRAM EQUIPMENT INTERFACE ....	00_09/17/18
27 60 13	WIRELESS ACCESS POINTS FOR DATA COMMUNICATIONS.....	00_09/17/18

DIVISION 28 - ELECTRONIC SAFETY AND SECURITY

28 13 13	ACCESS CONTROL SYSTEM - DOOR ENTRY (SMALL INSTALLATION) .	00_09/17/18
28 13 15	ACCESS CONTROL SYSTEM - DOOR ENTRY (LARGE INSTALLATION) .	00_09/17/18
28 13 16	IP ACCESS CONTROL SYSTEM .....	00_09/17/18
28 20 00	CCTV SYSTEM AND COMPONENTS.....	00_09/17/18
28 23 07	DVS SYSTEM - EXISTING SCHOOL .....	00_09/17/18
28 23 09	DVS SYSTEM - NEW SCHOOL.....	00_09/17/18
28 26 07	EMERGENCY CALL SYSTEM.....	00_09/17/18
28 26 09	RESCUE ASSISTANCE SYSTEM .....	00_09/17/18
28 31 00	FIRE DETECTION AND ALARM.....	00_09/17/18
28 31 11	BUILDING INTRUSION DETECTION .....	00_09/17/18

DIVISION 31 - EARTHWORK

31 13 00	TREE AND LANDSCAPE PROTECTION .....	00_09/17/18
31 22 00	GRADING .....	00_09/17/18
31 22 15	EARTHWORK FOR SYNTHETIC SURFACING SYSTEMS.....	00_09/17/18
31 23 16	EXCAVATION.....	00_09/17/18
31 23 17	EXCAVATING, BACKFILLING, AND COMPACTING FOR UTILITIES .....	00_09/17/18
31 23 18.13	SOIL, FILL, BACKFILL, CU STRUCT SOIL, AND CONST DEMO DEBRIS..	00_09/17/18
31 23 18.14	CCDD UNCONTAMINATED SOIL .....	00_09/17/18
31 23 18.14D	CCDD UNCONTAMINATED SOIL-DRAWING NOTES .....	00_09/17/18



31 23 23	FILL .....	00_09/17/18
31 23 23.25	ACCEPTANCE OF BACKFILL, TOP SOIL, CU STRUCTURAL SOIL .....	00_09/17/18
31 63 29	DRILLED CONCRETE PIERS AND SHAFTS .....	00_09/17/18

**DIVISION 32 - EXTERIOR IMPROVEMENTS**

32 12 16	ASPHALT PAVING .....	00_09/17/18
32 12 36	ASPHALT SEALCOAT .....	00_09/17/18
32 13 13	CONCRETE PAVING .....	00_09/17/18
32 17 23.13	PAINTED PAVEMENT MARKINGS .....	00_09/17/18
32 18 14	SYNTHETIC GRASS SURFACING - PLAYFIELDS.....	00_09/17/18
32 18 16	PLAYGROUND PROTECTIVE SURFACING.....	00_09/17/18
32 31 13	CHAIN LINK FENCES AND GATES .....	00_09/17/18
32 31 13.43	TRASH ENCLOSURE FENCES AND GATES .....	00_09/17/18
32 31 19	DECORATIVE METAL FENCES AND GATES .....	00_09/17/18
32 33 13	SITE BICYCLE RACKS .....	00_09/17/18
32 84 23	UNDERGROUND IRRIGATION SYSTEM .....	PENDING
32 92 23	SODDING .....	00_09/17/18
32 93 00	PLANTS .....	00_09/17/18
32 93 11	NATIVE PLANTINGS.....	00_09/17/18

**DIVISION 33 - UTILITIES**

33 10 13	WATER SERVICE .....	PENDING
33 41 00	SEWERAGE AND DRAINAGE .....	00_09/17/18
33 46 17	SUB-DRAINAGE FOR SYNTHETIC GRASS SURFACING SYSTEM.....	00_09/17/18
33 51 13	NATURAL GAS PIPING.....	00_09/17/18

## **Palmer ES Civil Utility and Stormwater Items**

Site work for the project will consist of new parking, playground, paved pedestrian open space, and greenspace. An alternate is currently proposed to change greenspace near the playground to artificial turf, as such there are two stormwater detention options provided.

With respect to existing utilities the following shall be noted:

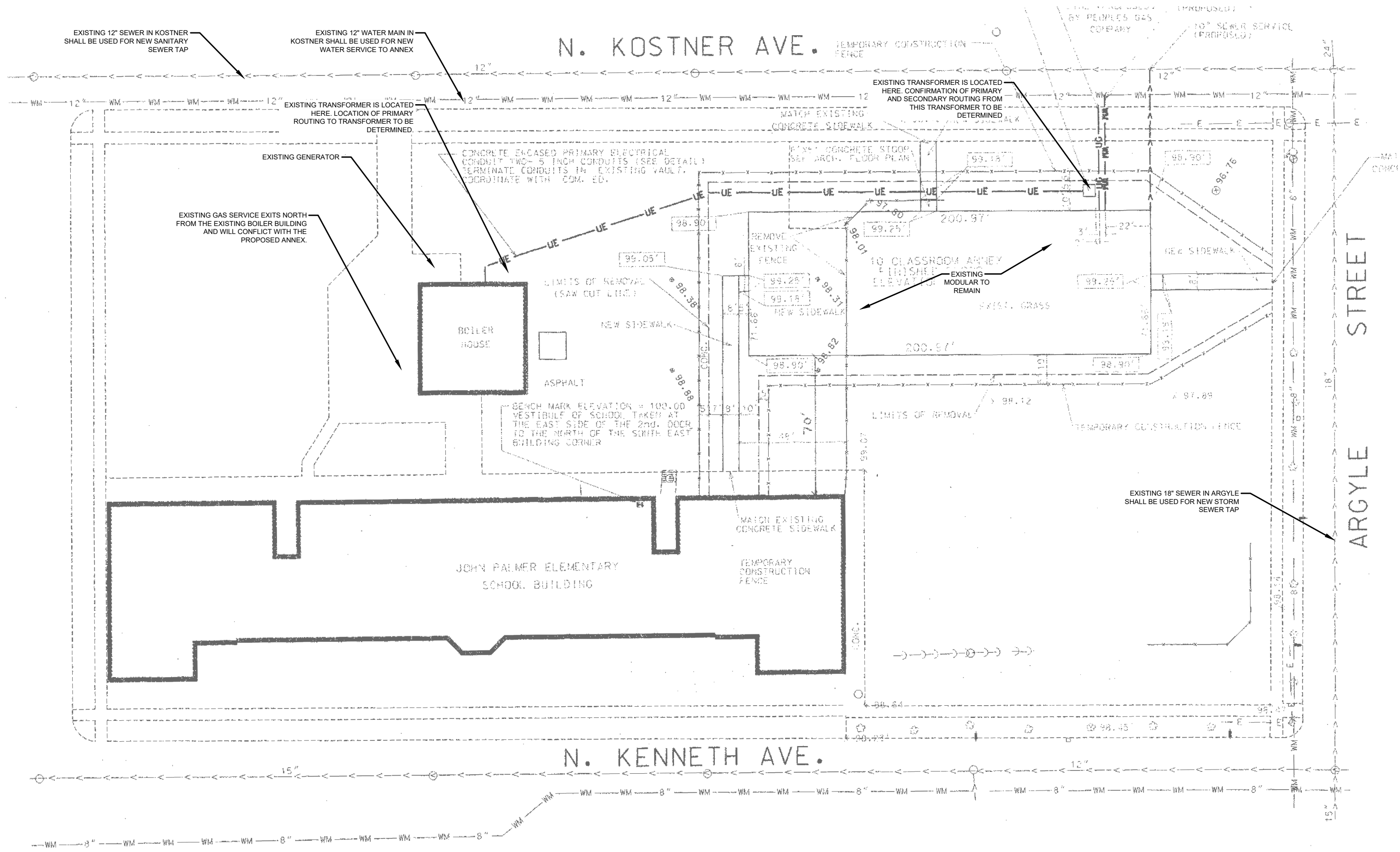
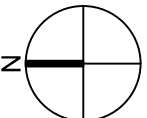
- 1) Gas – The existing gas service feeds into the boiler room from Carmen Avenue. The proposed location of the new building addition will require relocation of the existing service. Location of new gas service will be coordinated with mechanical engineer and utility provider.
- 2) Telecommunications – The existing telecommunications service is fed from a utility pole located in the southern parkway of Carmen Avenue. The proposed location of the new building addition will require relocation of the existing telecommunications service. Location and routing to be determined and coordinated with the utility provider.
- 3) Electrical – There are two existing transformers on the site, one at the existing modular at the SE corner of the school and the other near the boiler building. Primary and secondary routing from these transformers needs to be determined.

## **Stormwater**

The preliminary site layout provided by FGM Architects will fall under the City of Chicago Department of Water Management, Stormwater ordinance as a “regulated development”. It is anticipated the site will require approximately 20,564 cubic feet of storm water detention and 2,520 cubic feet of runoff volume control. It is anticipated the detention system will utilize a subsurface detention vault, and the volume control for stormwater runoff will be stored beneath the permeable playground. Location of detention system is anticipated to be located under the hardscape area south of the playground. The stormwater will discharge into the existing 18” sewer on Argyle Street.

Detention and volume control requirements will increase if artificial turf is selected to be used in place of landscape at the southwest corner of the site. The artificial turf alternate site plan will require approximately 26,047 cubic feet of storm water detention and 3,300 cubic feet of runoff volume control. It is anticipated the detention system will utilize a subsurface detention vault. The volume control for stormwater runoff will be stored beneath the permeable playground and artificial turf surface.

\*Note: Please reference MEP narrative for additional information on proposed utility connections for the project.



BUILDING PROGRAM

PALMER ELEMENTARY SCHOOL						
10/5/2018						
FGM ARCHITECTS						
QTY	Space Category	Square Footage/ Area	Total Program Area	Actual Quantity	Actual Area	Total Actual Area
	** DENOTES PROGRAMMED SPACE NOT IDENTIFIED IN THE ORIGINAL CPS SPACE PROGRAM					
	TEACHING STATION					
7	Typical 720 sf Academic Classroom	760	5320	7	760	5320
1	Special Needs (3 age Groups) Not to exceed 17 students	760	760	1	760	760
0	New Cluster Program	760	0			
0	Pull-out space for individual students w/ Special Needs	760	0			
0	Pre-K & Kindergarten (am/pm pre-k) incl toilet & storage	1180	0			
0	Science Classroom w/ storage	1080	0			
1	Computer Classroom (1 teacher & 30 student workstations)	1040	1040	1	1031	1031
0	Music Room with storage	1520	0			
2	Art Classroom with storage (1 regular art & 1 dance studio)	1080	2160	2	1095	2190
1	Art Kiln Area in mechanical room adj to art room	90	90	1	106	106
	Multi - Purpose Room -Replace existing windows with rated windows					
	TOTAL		9370			9407
	ADMINISTRATION CENTER					
0	Administration Reception	190	0			
0	School Business Office (3 clerk workstations)	250	0			
0	Conference Room	220	0			
0	School Vault / Workroom/Pantry	80	0			
0	Faculty Mailboxes	80	0			
0	Principal's Office	150	0			
2	Administrative remote from office	150	300	1	300	300
0	Business Manager Office	100	0			
0	Coat Storage	30	0			
0	Pantry	100	0			
0	Faculty Work Room (not contiguous w/ admin center)	225	0			
	TOTAL		300			300

	<b><u>NURSE'S SUITE/ STUDENT SERVICES Shared</u></b>					
0	Open Office	0	0			
0	Exam/Counseling Room	100	0			
0	Laundry stack	15	0			
0	Shower and Toilet	90	0			
0	Storage for Inclusion Students (not req'd to be contiguous)	75	0			
0	Locked Storage	75	0			
0	Waiting Area	90	0			
	<b>TOTAL</b>		0			0
	<b><u>DINING CENTER / MULTI-PURPOSE ROOM</u></b>					
1	Student Dining Room (Ideal Capacity x 15.5 sf/person/4 lunch periods)	3720	3720	1	3703	3703
1	Hybrid Kitchen	1000	1000	1	1314	1314
1	Servery (houses three serving lines)	1125	1125	1	755	755
1	Kitchen Office	100	100	1	83	83
1	Kitchen Staff Toiletrooms: Men & Women / Unisex	75	75	1	57	57
1	Kitchen Staff Lockers	150	150	1	118	118
0	Dishwashing	400	0			0
1	Recycling	100	100	1	100	100
1	Storage	200	200	1	256	256
1	Dining Storage (table storage)	500	500	1	369	369
	<b>TOTAL</b>		6970			6755
	<b><u>SPECIAL AREAS</u></b>					
1	Library	4260	4260	1	2294	2294
0	Gymnasium	3480	0			
0	Gymnasium Office	150	0			
0	Gymnasium Storage	420	0			
0	Stage (Music Room uses stage)	1800	0			
1	General Building Storage	290	290	1	282	282
	<b>**General Building Storage</b>			1	571	571
	<b>**General Building Storage</b>			1	138	138
	<b>TOTAL</b>		4550			3285
	<b><u>BUILDING SUPPORT</u></b>					
1	Main Entrance Vestibule / Annex Link	780	780	1	120	120
1	Elevator 1st Floor	200	200	1	88	88
1	Elevator 2nd Floor and above (100 sf per floor)	100	100	1	150	150
1	150' long Corridor with Lockers 15' wide (1ST FLOOR)	2250	2250	1	2661	2661
1	<b>**150' long Corridor with Lockers 15' wide (2ND FLOOR)</b>			1	4162	4162
2	Toilet Rooms: Boys, Girls Staff/Unisex & Janitors Closet	900	1800	2	695	1390
0	Toilet Rooms: Boys, Girls Staff/Unisex	690	0			
0	Stairs Main Center	690	0			



1	Stairs	400	400	1	688	688
1	2nd Grade stair	400	400	1	688	
1	Mech Rooms	1110	1110	1	1048	1048
1	MDF	280	280	1	298	298
1	Electrical Room	200	200	1	447	447
0	Chair Storage for Gymnasium / Multipurpose	200	0			
0	Engineer's Office	100	0			
0	Engineer's / Building Operations storage	500	0			
0	Yard Storage	250	0			
	TOTAL		7520		11045	11052
	AREA ALLOCATION SUMMARY					
	Program Total @ 80%		28710			30799
	Envelope, Partition & Shafts @ 20 %		5742			2018
	TOTAL BUILDING AREA		34973			32817
	Gross Square Footage Per Student (Total Capacity)					
	Gross Square Footage Per Student (Planned Capacity)					
	VARIANCE FROM CPS SPACE PROGRAM					-2156

# Structural Design Schematic Design Narrative

## New Annex at Palmer Elementary School



Rubinos &  
Mesia  
Engineers, Inc.

### 1. BUILDING SUMMARY

- A. New 2-Story annex at Palmer Elementary School. The annex will be linked to the existing building on the North-East corner.

### 2. FOUNDATIONS

- A. No geotechnical information is available at this time so the following information is based on foundation system of the existing building and previous experiences with annexes for Chicago Public Schools. Foundation assumptions will be confirmed upon receipt of the geotechnical report.
  - 1) Typical shallow foundations to be utilized as the building foundation system. Geotechnical engineer to provide recommendations for footings near the existing building foundation walls. Potential use of grade beams and caissons depending on quality of soil found by the Geotechnical Engineer. City of Chicago Office of Underground Coordination (OUC) permit will be required to drill caissons deeper than 12 feet.
  - 2) 4,000 psi concrete will be used for frost walls, footings and grade beams if required.
  - 3) The net allowable bearing at this elevation will be provided by the Geotechnical Engineer. Additionally, the bottom of footing should be minimum 3'-6" from top of exterior grade.
- B. Special Foundation Requirements
  - 1) Geotechnical testing and inspection will be required during the construction to verify the actual on-site soil conditions prior to concrete placement.
  - 2) Temporary ERS required protecting Alley and Boiler House due to open cut excavation for undercuts under footings may be required (Geotechnical Engineer to confirm extent of undercuts). For any ERS work OUC permit will be required by the EOR/contractor.

### 3. First Floor

- A. Slab on Grade
  - 1) Typical slab on grade will be 5" thick reinforced with welded wire fabric
  - 2) 4,000 psi concrete will be used for the slab on grade.
  - 3) The slab on grade will be thickened at highly loaded areas, below CMU interior partitions and at locations with depressed slab locations.
  - 4) Membrane type vapor barriers will be provided below the slab as recommended by the soils consultant.
  - 5) Unsuitable fill can be assumed to extend under the proposed slab-on-grade to an average depth of 2 feet below existing grade; assume that first floor will be set, on average, 12" above average existing grade. The unsuitable material will be replaced with a compacted well-graded engineered fill. Geotechnical engineer to confirm. Final elevation of first floor to be determined by the Architect and Civil Engineer during the Schematic Design.

### 4. Elevated Floor Framing

- A. Typical Floor Structure
  - 1) The typical floor structure is anticipated to be conventional composite steel framing consisting mainly of W-shaped steel beam/girders and 6 1/2" total thickness normal weight concrete on metal deck. The metal floor deck will be 2" deep, 18 gage galvanized composite metal deck.

- 2) To ensure composite action of the steel beams and girders they will be connected to the deck via shear studs.
- 3) The floor structure will be supported on W-shaped steel columns.
- 4) All connections between the steel members are assumed to be welded or bolted.
- 5) Floor deck above cafeteria may be thicker for acoustical purposes. Acoustical engineer to provide final design requirements.
- 6) Shelf angle will be provided at 2<sup>nd</sup> floor level to support brick above if final height of building is greater than CPS standard for continuous wall.

**B. Roof Structure**

- 1) Typical roof deck will be 1 ½" Metal Roof Deck.
- 2) Composite Metal Deck with 2" Deck + 4 ½" Concrete Fill will be provided under Roof Top Units.
- 3) The typical roof structure will consist of W-shaped steel beams and girders under composite slab and steel joists under the roof metal deck.
- 4) The roof structure will be supported on W-shaped columns.
- 5) All connections between the steel members are assumed to be welded or bolted.

**C. Lateral Framing – Steel Braced Frames**

- 1) Steel Braced Frames will be used for the lateral support of the structure. Locations of the Steel Bracing will be coordinated during the Schematic Design phase.

**D. Column**

- 1) The columns are anticipated to be structural W10 hot rolled structural steel shapes with steel base plates.

**5. LINK TO EXISTING BUILDING**

**A. Expansion Joint**

- 1) New annex building and existing building will be separated by a new CMU wall supported at the new annex. There will be an expansion joint between the existing and new building ranging in size of 1 to 2 inches pending final design.

**B. Existing Wall**

- 1) New openings will have to be made at the existing wall building. During SD phase Design Architecture team will confirm if existing lintels are available for use or if new steel masonry lintels will need to be provided for the new openings in the existing building.

**6. BUILDING/STRUCTURAL DESIGN CODES**

**A. Building Code: 2018 Chicago Building Code**

**B. Structural Design Codes:**

- 1) American Concrete Institute, Building Code Requirements for Structural Concrete (ACI 318-11)
- 2) American Institute of Steel Construction 360-10
- 3) Structural Welding Code (AWS D1.1)

**C. Design Live Loads:**

- 1) Corridors - 100 psf (1<sup>st</sup> Floor) 80 psf (Above 1<sup>st</sup> Floor)
  - 2) Public Stairways - 100 psf
  - 3) Classrooms - 40 psf
  - 4) Dining Room - 100 psf
  - 5) Multi-purpose Room - 100 psf
  - 6) Kitchen - 100 psf
  - 7) Music Room - 100 psf
  - 8) Light Storage Area - 125 psf
  - 9) Science Lab - 75 psf
  - 10) Mechanical room - 150 psf or weight of equipment
- D. Roof Snow Load:
- 1) Flat roof - 25 psf + Drift
- E. Lateral Loads: Wind loads per CBC 2015
- 1) Main Wind Force Resisting System - 20 psf
  - 2) Components and Cladding:
    - a. Non-corner wall conditions - 25 psf
    - b. Corner wall conditions - 30 psf
  - 3) Roofing Materials (at edges) - -40 psf
  - 4) Projecting Elements - +/-40 psf
- F. Other Structural Design Criteria:
- 1) Deflections (Floors) – span/360 for superimposed live loads or span/240 for total load.
  - 2) Deflections (Roof) – span/240 for superimposed live loads or span/180 for total load.
  - 3) Deflection of members supporting masonry – smaller of span/600 or 0.3"

# MECHANICAL

## Design Criteria

The design of the Mechanical system shall conform to the following Codes and Standards:

- 1. City of Chicago Building Code
- 2. Chicago Mechanical Code
- 3. Chicago Energy Conservation Code
- 4. CPS Mechanical Standards
- 5. CPS design guidelines and master specifications
- 6. NFPA-90 – Air-Conditioning and Ventilation System
- 7. ASHRAE 90.1-2010: Energy Standard
- 8. ASHRAE 62.1-2010: Ventilation Standard
- 9. ASHRAE 55-2010: Thermal Comfort
- 10. ASHRAE 55.2-2004: Filtration Standard
- 11. ANSI-American National Standards Institute
- 12. ASME-American Society of Mechanical Engineers
- 13. SMACNA-Sheet Metal and Air-Conditioning Contractors National Association
- 14. AMCA Standards

## Outdoor Design Conditions:

- 1. Summer (DB/WB): 91.7°F/ 74.9°F
- 2. Winter (DB): -10°F

## Indoor Design Conditions:

- 1. Summer
  - a. Occupied: 75°F
  - b. Unoccupied: 85°F
  - c. Relative Humidity (RH): 50%
- 2. Winter
  - a. Occupied: 70°F
  - b. Unoccupied: 60°F
  - c. Relative Humidity (RH): 25%
- 3. Kitchen
  - a. Occupied(winter): 80°F
  - b. Relative Humidity (RH - summer): 50%



**Primary Heating System**

The school will be served via a hot water heating system. The system will consist of two (2) high efficiency condensing hot water boilers. The boilers will have an estimated output capacity of 700 MBH each, for 2/3 redundancy. Boiler efficiency will be at least 95%, with hot water reset controls. Hot water will be circulated to variable air volume (VAV) boxes via two (2) circulation pumps with VFDs and 100% standby configuration, with variable primary pumping arrangement. The boilers and the pumps will be located in the Second Floor Mechanical Room.

**Air side Systems**

The school will be served via a packaged unit, mounted on the roof (estimated 100 tons). The packaged roof top unit will have a DX cooling coil and modulating gas fired heating coil. The unit will be equipped with an ECM fan array for both supply and relief fans. The unit will be provided with outside air monitoring station, MERV 8 pre-filters, and MERV 13 final filters.

Air will be distributed via medium pressure ductwork with VAV boxes and reheat coils where necessary. The air flow will be controlled via ECM fans in the roof top unit. The VAV minimum airflow will be the greater of the zone minimum outside air requirement, 1/3 the Chicago code supply air requirement, or the airflow rate of the zone continuous direct exhaust. The ductwork for any interior zone downstream of the VAV with reheat coil will be provided with a motorized damper.

The return air will be transferred back to the roof top units via plenum return to be mixed/blended with the code required fresh air.

The MDF room will be provided with a low ambient split system for cooling year-round.

**Exhaust System**

Code required exhaust will be provided for the kitchen via a Type II commercial exhaust hood for heat and smoke containment, with a roof-mounted grease rated exhaust fan. The kitchen exhaust will be controlled manually via a switch. Make-up air will be provided to the space via the VAV system.

Code required exhaust will be provided for toilets, with direct drive exhaust fans controlled via time of day schedule.

Separate exhaust will be provided for electrical distribution and elevator machine rooms, which will be controlled via local thermostat settings per CPS guidelines.

Intake and exhaust will be provided for the Kiln Room, as required.

**Controls System**

Static pressure sensors and controllers will be utilized for the variable air volume control. Air monitoring devices will be provided to maintain proper supply and return air differential for building pressurization. All individual and multi occupant spaces will be provided with thermal comfort controls (quantities as per CPS guidelines) accessible to at least 50% of the occupants in that space. Occupancy sensors (quantities as per CPS guidelines) will be provided in each space except toilets, common areas, kitchen, cafeteria, library, and offices. CO2 sensors (quantities as per CPS guidelines) will be provided in all spaces with an occupant density greater than 25 people per 1,000 square feet. All sensors and controllers will be tied into a central building automation system.

**Building Automation System**

A Building Management System (separate from that in the existing building) shall be provided for the new annex, to control all components of the HVAC system. Consideration shall be given to integration with the existing Siemens Building Automation System based on cost-effectiveness. The building automation system (BAS) will comply with ASHRAE/ANSI 135 BACNet and CPS Mechanical Standards: Control Standards.

**Classrooms**

In classrooms, supply air from the roof top unit through the VAV box will be supplied to the space ceiling mounted diffusers. Low pressure duct braches with motorized dampers will distribute air from the VAV boxes to both the perimeter and the center of the space. Return air from the classroom will transfer into the corridor return plenum.

Each classroom will be provided with temperature and occupancy sensors tied to the BAS. CO2 sensors with demand control ventilation will be provided in the classrooms.

**Vestibules and Stairs**

Vestibules and Stairs will be heated by hot water cabinet unit heaters.

**Mechanical Rooms and other Support Spaces**

Mechanical rooms and other support spaces such as Storage Rooms will be heated by hot water cabinet or unit heaters.

Per code requirements Electrical Rooms will be heated with an electric unit heater.

**Piping**

Piping sizing will be as per ASHRAE Fundamentals. Materials used for piping will be as per CPS Standard Specifications. CPS Standard procedures for installation of piping will be used.

**Natural Gas Utilities**

A new gas service is expected to provide natural gas for the roof top unit, boilers, and Kitchen equipment. However, the available gas capacity of existing service will be confirmed with the utility to determine if a new service is required for the Annex. The estimated additional gas load for the building is 2,900 MBH. The expected gas load for the Annex is approximately 200 CFH for water heating, 500 CFH for kitchen equipment, and 2,200 CFH for heating for a total load of 2,900 CFH.

**Ductwork**

All medium pressure and low pressure ductwork will be sized for velocities and pressure drop as stated in ASHRAE Fundamentals and/or CPS design guidelines. CPS Standard procedures for insulation, material and installation of ductwork will be used.

Also, all intake and exhaust louvers and grilles will be sized in accordance with CPS standards and guidelines.

**Acoustics**

No internal lining in the ductwork will be provided for noise attenuation. Sound attenuators will be provided at the supply and return of the air handling units and wherever required per Acoustical Consultant.

**Existing School Renovation**

Lunchroom will be converted into classrooms. Supply and return ductwork, piping, diffusers, thermostats, etc. will be installed to meet CPS classroom HVAC design requirement.

A thorough analysis of the existing mechanical systems in these classrooms will be conducted to determine the extent of demolition and/or retrofitting required to the ceilings, diffuser/grilles, ductwork, piping, exhaust systems, VAV boxes, etc.

**LEED Considerations**

Provide high efficiency gas-fired RTU (10.5 EER minimum), MERV 13 filters, and demand control ventilation where required by code.

# ELECTRICAL

## Codes and Standards

1. 2017 Chicago Building Code, Volume 2 ( City of Chicago Electrical Code-CCEC)
2. CPS Electrical/ITS requirements Technical Memo 2014.01 dated 07/18/2014
3. CPS New Design Guidelines and Prototype Designs Update – 02/2015
4. 2017 City of Chicago Building Code Chapter 15-16 Fire Protection Equipment
5. Elevator Safety Code ANSI/ASME A17.1 2007 as amended by Local Authority
6. ASHRAE 90.1-2013: Energy Standard (For LEED Only)
7. 2010 Americans with Disabilities Act Standards for Accessible Design
8. Federal Energy Policy Act, Energy Independence and Security Act of 2007, Title III
9. CPS Standards Update Clarification dated 3/17/17.

## MSB Service Entrance No. 1

ComEd to furnish, install and terminate new 12kV, 3-phase primary electrical service conductors. Electrical contractor shall provide a new concrete encased electrical underground duct bank with (2) 5” schedule 40 PVC conduits, buried 36” below finished grade will be extended from the existing ComEd utility pole to a new pad mounted transformer with 277/480 V 3-Phase, 4-Wire secondary located near the new proposed annex building main electrical room. ***Final location of the ComEd service transformer is to be determined.***

Secondary service entrance copper conductors in concrete encased RGS (rigid galvanized steel) conduits, will be extended to the indoor type, free standing main switchboard (MSB-2) located in the main electrical room of the new proposed annex building. Provision for ComEd specified current transformers for utility metering will be provided at the new switchboard incoming ComEd C/T section.

The main switchboard MSB to be rated at 277/480 volts, estimated at 800 amps, 3-phase, 4-wire S/N + GRD will be provided with single power main circuit breaker with digital trip units. The MSB will be provided with digital meters. All breakers in the service main switchboard shall be fully rated. Series rating will not be permitted for this equipment. Main and feeder breakers rated at 800 amps or greater shall be provided with integral solid-state ground-fault protection tripping elements.

Service entrance rated Type 1 SPD (Surge Protection Device) will be provided at the new main service switchboard “MSB” in order to protect the electrical equipment from lightning strikes and power surges.

The new proposed main electrical room located within the new annex building shall be 2 hour rated room with doors which open in the direction of egress from the room.

## Fire Pump Service Entrance No. 2

The fire pump electrical service shall be fed directly from the secondary side of the pad mounted ComEd transformer via underground secondary electrical service conductors to the fire pump controller via a ComEd utility service meter socket located within the fire pump room, dedicated for the fire pump service. The incoming underground fire pump service feeders to be rated at 277/480 V 3-Phase, 4-Wire. Secondary service entrance conductors between the outdoor pad mounted transformer and the fire pump controller located in the fire pump room shall be in concrete encased RGS (rigid galvanized steel) conduit. A C/T cabinet with meter socket will be located directly adjacent to the fire pump controller.

## Life Safety System

The life safety system will be a class II system which consists of individual emergency battery units with internal 90-minute batteries and battery unit exit signs. All life safety lighting (emergency battery units and exit signs) shall be provided with integral Chicago approved 90-minute battery complete with internal test push-button and indicator lamp. All exit signs shall be LED type. Emergency Life Safety Lighting System shall be sized for 0.1 watt per square foot based on the programmed facility size and 1-foot candle lighting levels as required by the Chicago Building Code. Exit and emergency lights will be provided as required by City of Chicago Fire Prevention Bureau. Per energy code all exit signs shall have a minimum source efficacy of 35 lm/W. All exit signs shall be wall mounted where possible.

Wall pack emergency lighting fixtures will be provided throughout the rooms and spaces as per code in order to provide the required 1-foot candle lighting levels. Lighting fixtures with integral battery packs shall NOT be acceptable per CPS standards.

A master control switch shall be provided to shut off the emergency lights within the new annex building when the building is not occupied. The switch shall be disabled by the security camera system upon activation.

### **Emergency Means of Egress Lighting**

The following areas shall have emergency illumination whether having natural illumination or not:

- a. Egress corridors and stairways
- b. Assembly areas
- c. Locker rooms
- d. Student rest rooms
- e. Main and other dedicated electrical rooms
- f. Mechanical rooms
- g. Administration and other building control areas
- h. Kitchen/student dining
- i. Interior instructional space without natural illumination
- j. Rooms with areas exceeding 1000 sq. ft.
- k. Exterior side of exterior exit doors

### **Grounding and Bonding**

Grounding: System and equipment grounding will be provided. All switchboards, transformers, motor starters, panel boards, wiring systems, etc., will be effectively grounded via a code compliant Ground Bus System.

Telecommunications Ground Bus System: The building shall have a reference “telecommunication ground bus” (TGB) within each telecommunications and systems closets (MDF room and IDF rooms/closets). Each TGB shall be bonded to the Main Building Grounding point. The Standard for this system shall be: EIA/TIA Standard 607: Commercial Building Grounding (Earthing) And Bonding Requirements for Telecommunications.

All MDF and IDF rooms shall be provided with static dissipative tile which is to be bonded to the local MDF/IDF ground bus bar.

### **Distribution**

Electrical distribution equipment shall be located in dedicated electrical rooms or mechanical rooms. Main electrical service (switchboards) distribution equipment shall be located in a separate electrical room with fire ratings as required by the Chicago Building Code. Branch circuit distribution panel boards shall be located in dedicated electrical closets. Mounting electrical distribution equipment and panels within classroom or corridor walls shall not be acceptable.

Electrical distribution panels shall be designed with a 15 percent spare amperage capacity and 30 percent spare space capacity. Panel boards shall be designed up to 70 percent of capacity and be provided with a minimum of 6 spare over-current protection devices. Provide 10 spare spaces in branch distribution panel boards and (4) 3 pole spaces on the main distribution boards.

Dedicated distribution equipment shall be provided for all mechanical equipment. Electrical branch circuits to 5 horsepower, 3-phase, and larger motors for air-handling units, exhaust fans, pumps, chillers, and condensing units shall be provided with phase loss protection. Phase loss protection equipment shall be integral to starters or variable frequency drives serving the equipment.

All mechanical and plumbing equipment shall be fed from 277/480V distribution panels, particularly all equipment loads rated 1/2 hp and larger and 2kW and greater.

All general use power receptacle and equipment circuits shall be fed from normal 120/208V branch circuit receptacle panels. These panelboards shall be provided with 10% spares minimum.

All receptacle devices located in kindergarten classrooms shall be “tamper resistant” type.



All computer use power receptacle and equipment circuits shall be fed from “Isolated Ground” type 120/208V branch circuit panels. These panels shall be provided with a type 2 surge protection device, externally mounted adjacent to panel. These panelboards shall be provided with 10% spares minimum.

All lighting circuits shall be fed from 120/208V branch circuit panelboard dedicated for lighting circuits only.

Voltage drop for feeders between the service entrance equipment and the branch circuit distribution equipment shall conform to the requirements of the city of Chicago Electrical Code and LEED as follows: 2% at full connected load for feeders and 3% at full connected load for branch circuits. All branch circuits shall be loaded to a maximum of 60% as per CPS design guidelines.

Branch circuits for the voice and data system receptacles shall contain an isolated ground wire. Neutral conductors for shared neutral multi-wire circuits shall be minimum No. 10 AWG.

All branch circuit panel boards supplying voice and data systems circuits shall be supplied from a separate feeder over current protective device (OCPD) in the main switchboard, or from a separate distribution panel supplied by its own feeder in the main switchboard.

Feeders supplying the branch circuit panel board for voice and data systems circuits shall contain three phase conductors, sized in accordance with Code requirements, a 200% neutral conductor(s), and an isolated ground conductor. The isolated ground conductor system shall be kept separate from the receptacle or branch circuits to the main switchboard ground bus or separately derived system. The isolated ground conductor and equipment ground system shall be connected only at the main switchboard or separately derived system, and shall have a surge suppression device.

Transformers serving all computer receptacle distribution panelboard shall be, K4 rated type complete with 200% neutral bus capacity and isolated ground bus.

Transformers serving all normal receptacle distribution panelboards and lighting distribution panelboards shall be standard rated type.

All dry type transformers shall be energy efficient type and compliant with DOE (Department of Energy 2016) regulations.

All unisex toilet rooms shall be provided with hard-wired electronic, infrared flush valves for water closets and urinals only. All banked restrooms and unisex toilet rooms shall be provided with electric hand dryers and switched power GFI receptacles for future changing tables.

### **Lighting Systems**

The building will consist of 120 volt LED, 3500 degrees kelvin, wall and ceiling mounted lighting fixtures throughout.

Controls shall abide to ASHRAE 90.1, 2013 and LEED requirements for achieving certification level. Ceiling mounted vacancy sensors shall be dual technology with 30 minute maximum delay. All rooms with vacancy sensors and associated manual wall switches shall be programmed to operate on a manual on/automatic off (vacancy) basis. Light fixtures shall be controlled on a per room basis where fixtures are located in accordance with individual control schemes outlined in the room level section. Circuit breakers will not be acceptable for turning lighting “on” and “off”. All lighting fixtures located within 15 feet from exterior windows shall be provided with integral automatic daylight sensors.

The building automation system shall be solely responsible for holding schedules; the lighting control systems shall receive schedule-based on/off inputs from the BAS.

Utility space (boiler room, electrical room, janitor closets, storage rooms etc.) lighting shall be controlled via local manual wall mounted timer switch.

All assembly spaces, corridors and lobbies shall be controlled via Network Low Voltage Relay System with Integral Time Clock Function, programmed for shut-off of lights between 11 pm and 5 am.

All classrooms shall be locally controlled via four manual 0-10 volt digital dimmer switches for video presentation and daylighting scene control as per CPS design guidelines. All interior lights located within daylight harvesting zones to be provided with integral automatic daylight sensors. All lights within these rooms shall be automatically shut off via ceiling mounted vacancy sensors after 30 minute time delay.

The new proposed link connection between the new annex building and existing building to be provided with new LED lighting fixtures.

**Exterior Lighting**

Site Lighting:

- a. Provide site lighting for the new proposed parking lot. Pole lights shall be energy efficient LED, 4000 degrees kelvin, full cutoff fixtures on 20 foot poles for parking areas. No light trespass will be allowed to adjacent properties. The new proposed pole lights to be fed from the existing main building.

Building Perimeter:

- b. Exterior building perimeter lighting shall be provided and mounted every 60 feet and at all exterior doors for safety and security. Perimeter lighting shall spotlight the building mounted school signage. Provide an exterior, weatherproof ground fault protected duplex receptacle outside each main exterior door. Provide weatherproof ground fault interrupter receptacles on all outdoor locations for rooftop maintenance, and same with lockable covers on all exterior wall mounted receptacles.
- c. All exterior lighting shall be controlled via building automation interface as per CPS design guidelines.

**Fire Alarm System**

The existing fire alarm control panel for the existing main building is class 1, non-coded, zoned, supervised fully addressable type detection, with initiation and notification devices throughout and is manufactured by Notifier and is currently located in the existing main building.

Provide new fire alarm system devices and associated NAC (power supply) panels for the new annex building and connect to the existing main fire alarm control panel located within the existing main building. Provide magnetic door-hold open devices and associated smoke detectors at each double-door access between the existing and new building.

All new fire alarm devices and equipment shall be the of the addressable type, incorporating activation devices such as pull stations, smoke detectors, flow switches, duct detectors, etc., and audio visual devices such as horns and strobes and shall match the existing building’s fire alarm system equipment manufacturer in order to ensure full compatibility with the existing system. Photoelectric type smoke detectors at the following locations:

- a. Electrical, MDF and IDF Rooms.
- b. Storage Areas.
- c. Duct smoke detectors on all supply and return fans including HVAC equipment serving the Kitchen Area.

A complete fire alarm and detection system shall be provided in accordance with the City of Chicago Building Code, National Fire Protection Association and the requirements of the Bureau of Fire Prevention and the Americans with Disabilities Act whichever is more stringent. All fire alarm and detection system wiring shall be installed in its own dedicated conduit system.

**Lightning Protection System**

The existing main building currently not provided with a lightning protection system. A lightning protection system for the new annex building will not be provided nor will it be required.

**LEED Considerations**

New annex building lighting systems shall be designed to meet ASHRAE 90.1 lighting power density requirements by a minimum of 30%. Lighting controls will comply with the requirements of the *Indoor Lighting* credit. Metering shall be installed to record consumption, demand, and power factor for the building electrical system. Considerations should also be given to providing electric vehicle charging stations in the parking lot.

**Existing School Renovation**

The art classroom located on the first floor in the existing main building will be converted into a regular classroom. Three existing classrooms on the first floor of the existing building will be renovated. Existing computer lab located on the second floor of the existing main building will be renovated. Provide all electrical receptacles, lighting, controls, intercom stations, low voltage, etc. to meet CPS classroom electrical design requirements.

**TECHNOLOGY**

**Design Criteria**

The design of the Technology systems shall conform to the following codes:

- 1. Chicago Building Code
- 2. National Electric Code

The design of the Technology systems shall conform to the following standards:

- 1. Standard for Safety of Information Technology Equipment
- 2. Standard for Safety of Telephone Equipment
- 3. BICSI Network Design Reference Manual
- 4. IEEE 802.1 - Telecommunications and information exchange between systems--IEEE standard for local and metropolitan area networks--Common specifications
- 5. IEEE 802. - Telecommunications and information exchange between systems--Local and metropolitan area networks—Specific requirements--Part 3: Carrier Sense Multiple Access with Collision Detection (CSMA/CD) Access Method and Physical Layer Specifications
- 6. IEEE 802.11 - Telecommunications and information exchange between systems—Local and metropolitan area networks—Specific requirements—Part 11: Wireless LAN Medium Access Control (MAC) and Physical Layer (PHY) Specifications
- 7. IEEE 802.15 - Telecommunications and Information Exchange between Systems - LAN/MAN Specific Requirements - Part 15: Wireless Medium Access Control (MAC) and Physical Layer (PHY) specifications for Wireless Personal Area Networks (WPAN)
- 8. IEEE 802.16 - Telecommunications and Information Exchange between Systems - LAN/MAN Specific Requirements - Part 16: Air Interface for Fixed Broadband Wireless Access Systems
- 9. CPS design guidelines and master specifications

**Structured Cabling System**

The new annex building cable infrastructure will be served via a copper and fiber backbone. The cable infrastructure shall provide transport to support voice/data, video and other systems residing on the CPS network. The fiber backbone shall consist of multimode fiber optic cables in protective innerducts, cabletray, conduit, sleeves and cores. Copper cabling shall consist of UTP type cable for backbone or horizontal distribution.

**Access Control System**

Contractor to upgrade existing Access Control System to accommodate new annex building. The system will control or limit access through card reader controlled doors based on the card user’s access levels to an area, floor or the building.

**Intrusion Detection System**

Contractor to upgrade existing Intrusion Detection System to accommodate new annex building. The system will monitor after hour entry into any area of the building by microwave PIR motion detection

**Two-way Intercom System**

The system will provide two-way communication between visitors, students or faculty. The system shall have the capability to release secured doors as defined by CPS.

**Video Surveillance System**

The system will be a digital IP base video monitoring system. The system will monitor internal and external movement to be captured, compressed and stored. The system will have the capability to review archived images (remotely or on-site) providing an instant video source of an incident or annunciated alarm through the CPS-OTS network via the WAN. The cable infrastructure will resemble the UTP structured cabling system.

**Master Antenna TV System**

The system will be a star topology two-way coaxial video cabling system capable of passing reverse channels. The cable infrastructure will be a combination of coaxial and UTP. Contractor to upgrade existing Master Antenna TV system to accommodate new annex building.

**Public Address System & (ALS)**

Provide a new Public Address System to accommodate new annex building and existing building. Public address system master station shall be located in the existing main building. Provide new public address system speaker devices and associated conduit and wiring throughout the existing and new annex building. All new devices in both buildings shall be connected to master station.

**Existing School Renovation**

Existing MDF room will become and IDF and a new MDF room will be provided in the new annex.

# PLUMBING

Palmer School addition has multiple space uses with respect to plumbing fixtures and fire protection requirements. The following is a brief summary of noteworthy design elements.

## Summary of Design Criteria and Standards

From the referenced standards provided by CPS, the following most recently adopted versions of the following codes have particular impact in the assessment of the plumbing and fire protection requirements.

- a. City of Chicago Building Code
- b. CPS Design Guidelines – Chapter 7
- c. Chicago MOPD requirements
- d. NFPA 10, 13, 20, 24, and 25.
- e. USGBC: Applicable LEED™ Requirements
- f. ADA: Americans with Disabilities Act
- g. IAC: Illinois Accessibility Code
- h. IDPH 270/280: Illinois Department of Public
- i. City of Chicago Energy Conservation Code
- j. State of Illinois Energy Code
- k. OSHA: Occupational Safety and Health Administration
- l. CEC: Chicago Energy Conservation Code
- m. AGA: American Gas Association
- n. MSS: manufacturers Standardization Society of the Valve and Fittings Industry
- o. Municipal Plumbing Code of Chicago
- p. Illinois Plumbing Code (IPC)
- q. City of Chicago Department of Water Management
- r. City of Chicago Accessibility Code
- s. Chicago Bureau of Fire Prevention Requirements
- t. Chicago Storm Water Ordinance

## PLUMBING

### Building Utilities

A new 8” ductile iron incoming combined water service will be served. Combined service to split into a 4” domestic water line to serve both the new annex and back feed the existing building, and a new 6” fire service with a double detector check valve assembly for new annex building.

The annex will be served by two sanitary sewers (approximately 6” and 4”) and one storm sewer (approximately 10”). Standard sanitary waste will collect into the 6” building drain and leave separate from the Kitchen Waste, which will exit the building into an exterior grease separator prior to connection to the sewer. Sewers will drain by gravity wherever possible. The need for ejecting below grade drainage is not anticipated in the new annex.

### Main systems

Palmar school is currently served by a simplex in-line booster pump system to the facility. The existing booster system shall be replaced with a new, skid-mounted duplex, variable speed system to deliver approximately 75% of the total fixture unit demand (approximately 145 gallons per minute) at the design head (approximately 70 feet) to maintain 35 psi operating at the most remote fixture and a maximum of 80 psi at any fixture in the building. Booster pump will be place in the



new annex building.

The water heating plant will be a duplex tank-type condensing system to provide 75% redundant capacity (two units at 75%). Each unit will be capable of recovering 128 gallons per hour, at a 100°F temperature rise. Gas firing will be coordinated with the available natural gas pressure. Each heater will be served by an appropriately sized ASME rated expansion tank sized on the total system water volume. Water will be heated and stored at 140°F, and distributed to the kitchen at this temperature for final boosting at dishwashers. Other spaces will receive lower temperature water at 120°F via a master thermostatic mixing valve located near the domestic water heaters, and further downstream will be controlled by individual thermostatic mixing valves at individual fixtures. All hot water fixtures will be circulated with return pumps via a programmable timer or aquastat.

### Piping

Piping will be sized to limit pressure drop to 2 psi / 100 feet of piping. The incoming water service to the pump header will be sized at 5 feet per the Chicago Plumbing Code. Other pipe velocities will be selected in addition to the pressure drop requirements not to exceed those values set out in the CPS plumbing guidelines.

3” domestic cold water and 2” domestic hot water distribution will be routed in the ceiling of the new annex to all the plumbing equipment and fixtures. All piping to be type L copper.

### Terminal equipment

Fixtures will be selected in compliance with CPS standard specifications and LEED for the project. The following flow rates have been selected for fixtures:

- 0.5 GPM Lavatories
- 1.28 GPF Water Closets
- 1.5 GPM Electric water cooler
- 0.125 Urinal
- 1.5 GPM Sinks (l
- 1.5 GPM Showers (If applicable)

Electric water cooler with bottle filling station will be provided near the gym. Recessed, vandal resistant stainless-steel electric water coolers will be provided.

Bathroom fixtures will be manually activated flush valve or metering lavatory faucet in public restrooms, vandal resistant, low flow by approved manufacturers. Water closets and urinals will be wall mounted vitreous china.

Floor drains will be selected based on space usage and finished floor. In general, finished areas will be served by 6” round floor drains with vandal resistant covers. General utility and mechanical spaces will be provided with 8” round utility grade floor drains. Kitchen areas will have floor sinks and trough drains as required.

Domestic water will be provided to exterior non-freezing hose bibs connections downstream of a reduced pressure zone backflow preventer or testable double check detector assembly. Hose threaded connections within the building shall be provided with a vacuum breaker mounted 7’-6” above the finished floor. All accessible exterior hose connections will be vandal resistant and lockable.

### Existing issues

The existing main utility building tunnel is currently experiencing foundation water infiltration near south west corner. To prevent damage to the building structure as well as to provide a safe interior environment, subsoil drain tile piping and a sump ejector pit and pumps will have to be added to dewater the subsurface soil. A geotechnical investigation and report will be required to appropriately identify the correct strategy in regards to this effort, however, extensive work to the existing floor slab will be required to install piping as well as a sump pit.

Existing storm and sanitary lines exiting near north east side of building need to be rerouted to new manholes in order to avoid conflict with the new annex building.

### LEED Considerations

New annex building goal is to achieve LEED silver. Provide low flow plumbing fixtures in new annex building to meet minimum reductions requirement of 35% (3 points) for indoor water to achieve.

**FIRE PROTECTION**

A complete automatic fire sprinkler system is required for the palmar School Annex. New 8” combined domestic water/fire service main will split to feed the domestic and fire system. The fire service main shall be a 6” diameter with double detector check and bypass meter.

**Main systems**

New annex building will be provided with a fire pump system sized at 500 GPM / 25 HP with a pump controller. The fire protection system will be installed with a pressure maintaining jockey pump.

A U.L. listed, vertical inline centrifugal type fire pump assembly will be selected to meet pressure and flow requirements. The pump assembly will include a reduced voltage starting pump controller and integral automatic transfer switch. A pressure maintenance pump assembly will be provided complete with controller. One separate sprinkler zones will be provided for each floor based on square footage requirements, for a total of two sprinkler zones. Each zone will be provided with a supervised control valve, water flow sensor, inspector’s test and drain assembly and a pressure gauge. An additional inspectors test connection will be provided at the hydraulically most remote location of each sprinkler zone.

**Piping**

4” Fire protection wet pipe will be routed in the ceiling space to all the sprinklers. All piping will be schedule 40 steel pipe, grooved coupling or threaded, depending on the pipe diameter.

**Terminal equipment**

The new annex building will be provided with new automatic sprinklers system to complete building coverage. Space are primary light hazard areas for offices, gymnasium, meeting rooms, classrooms, and corridors. Mechanical rooms, telecommunication rooms, and storage spaces will be protected at ordinary hazard levels.

New Annex will be provided with upright sprinklers in exposed areas, concealed sprinklers heads in the finish ceiling, sidewall sprinklers in all vestibules and MDF rooms.

Sprinklers shall be provided throughout the building with the exceptions of the main electrical room.

A deep floor sink receptor will be located near the fire pump for high flow testing with a 6” drain to the building sewer.