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**Board of Education**  
**Park Ridge – Niles School District 64**

Committee-of-the-Whole: Finance

Tuesday, February 20, 2018

8:30 p.m.

*(or at the conclusion of the Special Board Meeting  
no later than 9:00 p.m.)*

Jefferson School – Multipurpose Room

8200 N. Greendale Avenue

Niles, IL 60714

**AGENDA**

**APPENDIX**

1. Call to Order and Roll Call
2. Discussion of Enrollment and Recommendations for 2018-19  
at Emerson, Lincoln, and Washington Schools **A-1**
3. Discussion and Recommendation to Retrofit/Replace Two Zones of  
Carpenter HVAC Summer 2018 **A-2**
4. Public Comments
5. Adjournment

To: District 64 Board of Education  
Dr. Laurie Heinz, Superintendent

From: Dr. Joel Martin, Assistant Superintendent for Human Resources  
Luann Kolstad, Chief School Business Official

Date: February 20, 2018

Re: Discussion of Enrollment and Recommendations for 2018-19 at Emerson,  
Lincoln, and Washington Schools

Each winter, we review projected enrollment numbers and analyze building capacity. Based on projections for the 2018-19 school year and beyond, we anticipate space challenges at Emerson and Washington Schools. This memo provides a description of these challenges and outlines possible solutions for discussion and potential consideration at future Board meetings.

### **Emerson Middle School**

For the 2018-19 school year, Emerson Middle School is projected to have an enrollment of 891 students or 33 homerooms. This is an enrollment increase of 39 students and one additional homeroom. The maximum number of homerooms that Emerson can have without making modifications to existing space is 32. Further, the projection of incoming sixth grade classes at Emerson in subsequent years shows that the problem will exist for at least five more years.

Current enrollment projections show an incoming sixth grade class of 295 students for the 2018-19 school year. Sixth grade enrollment projections using the cohort survival method for the next five years at Emerson are listed below. With the exception of the 2021-22 school year, Emerson enrollment projections extend beyond current homeroom capacity:

<b>Year</b>	<b>Total</b>	<b>Sections</b>
2019-20	283	11 sections
2020-21	300	11 sections
2021-22	277	10 sections
2022-23	334	12 sections
2023-24	331	12 sections

Typically, when buildings are near or at capacity there are only a few options available: (1) exceeding class size guidelines and adding teaching assistant support; (2) putting a “program on a cart”; (3) adding mobile classrooms; (4) changing the purpose of existing space within the building; or (5) changing school boundaries to balance enrollment among schools. The benefits and challenges associated with each option are described below.

### Exceeding Class Size Guidelines

The current District 64 class size guideline for the middle schools is 28 students per classroom. Typically, when homerooms exceed class size guidelines, we add an additional section. An alternate option is to increase class sizes by 1-2 students and add teacher assistants. This makes sense when a specific grade level has exceeded guidelines by one student, and only one of the sections at a grade level will exceed the class size guideline. The advantage to this situation is that it is cost effective as the District is incurring the additional cost of a teaching assistant and not the cost of a certified teacher.

At Emerson, the incoming 2018-19 enrollment is projected to be 295 students, which sets the average class size with 11 sections and following the 28 student class size guidelines at 26.82 students. If the District divided the students up over 10 sections instead of 11, the average sixth grade class size would be 29.5 students. The end result would be five homerooms of 29 students and five homerooms of 30 students. Ten classes of this size at one grade level would negatively impact space within classes and instruction.

### Program on a Cart

The term “program on a cart” refers to a teacher who teaches in different classrooms throughout the school day instead of having a designated room of his or her own. Putting a program on a cart has and does occur at the elementary buildings in District 64. For example, at Franklin School this year, the Spanish teacher does not have a set room but travels to the students’ homeroom and teaches Spanish within that classroom. This typically occurs when there is an increase in the number of homerooms and/or special needs classrooms resulting in a special area teacher needing to give up his or her classroom.

A positive element of this option is there is little additional cost to the District. This is more common at an elementary building where the special teacher can always go into the students’ homeroom class to teach. A negative element is that a teacher is on a cart and is continually transferring their instructional material from room to room, which is not ideal when preparing for different classes.

Furthermore, at the middle school level the issue comes down to whether there are open classrooms for teachers on a cart. As stated above, at the elementary level, special teachers always have a room to teach in if they are on a cart, as they can instruct students in their homeroom. At the middle school level, however, students move from class to class each day. So, the issue at Emerson is the availability of open classrooms. Placing a program on a cart would not solve that problem, as the issue is not having enough open classrooms each period for the teacher.

### Mobile Classrooms

One option that school districts across the country use is the addition of a mobile classroom when buildings run out of space.

- A pro for the mobile classroom is that it is not a permanent addition to the structure, so when the enrollment needs decrease the mobile classroom can be easily removed.
- Mobile classrooms do not impact the current educational programming by having to move current classrooms or rededicate spaces used for instruction in a different manner.

- The District can add as many mobile classrooms as are needed to meet the increase in student enrollment.

Mobile classrooms do, however, present issues for students, staff, and the District.

- Mobile classrooms are costly and need to be ordered by a specific date to be ready for the start of school. A recent estimate for the first year of a mobile classroom is approximately \$300K. The District would need to pay to have the mobile brought on site including hooking up plumbing and electricity to the unit. There is a yearly rental cost of the unit and when finished with the unit, the District would need to pay to have the unit disconnected from utilities and moved off the site.
- Students need to physically leave and enter the building to attend class in the mobile. This can be an issue during inclement weather, as students will be exposed to rain, snow, cold, etc. unless some type of sheltering is provided (e.g., a covered walkway).
- A mobile classroom may pose an added security risk. Students and staff will be housed in a building that is not secured in the same fashion as the office entryway into the main school building. In addition, students and staff would be constantly leaving and entering the main building, which leads to the possibility of human error and a door to the main building not being secured correctly.
- Further, there can be an issue with staff members assigned to the mobile feeling disconnected from the building and staff.

### Repurposing Current Space

Another option would be for the District to take current space at Emerson Middle School and repurpose it to function as a classroom.

- The benefit to creating an additional classroom within the building is that students are kept within the building and have the same experience as any other student.
- A negative aspect of this plan is that current space already being used for a specific purpose is going to change and may have a negative impact on the building.
- Furthermore, there is a cost associated with changing existing space, as well as making sure the work is completed prior to the start of school.
- Finally, there is always the issue of determining if the space can or would need to be changed back to its original purpose at some time in the future.

At Emerson, the most compatible space is within the large Learning Resource Center (LRC) on the second floor. In preparation for this discussion with the Board, administration and Studio GC architects have met with Principal Jim Morrison and the LRC Director to explore this possibility and what the new LRC might look like. Tonight the Board will see preliminary “before and after” drawings of the Emerson LRC with the addition of a possible classroom space. During this potential remodeling, administration also is recommending that the Emerson LRC be updated into a flexible learning space similar to the Lincoln LRC model, taking into account any unique needs at Emerson for its LRC.

### Boundary Changes

The final option is to change attendance boundaries. Attendance boundary changes can be offered as a voluntary option for specific school attendance areas or as a permanent boundary change. Permanently changing boundaries is a significant decision, and we would need to

conduct a study to identify the lasting impact of such changes. Most communities do not want to change school boundaries often, and therefore, districts only explore this option when the relief is expected to be experienced for a decade or more. **The administration is not seeking permanent boundary changes for the upcoming school year.**

In the past, District 64 has implemented a voluntary “Option Area” where one part of Carpenter School’s attendance area had the option of attending Lincoln Middle School. After the 1997 referendum, the District 64 Board of Education accepted the recommendation of the Facilities Committee to create a Carpenter Option Area to balance enrollment between Emerson and Lincoln Middle Schools beginning in 1998. Each subsequent year, the Board of Education was presented with a recommendation by the Superintendent on whether to continue to allow for the continuation of the Carpenter Option Area. A map of the 1998-2008 Option Area is included as Attachment 1. The annual process of approving the Carpenter Option Area continued until 2008, when District 64 Superintendent Sally Pryor recommended that it be permanently eliminated. The rationale for the recommendation at the time was safety issues as well as the impact on planning for class sizes and staffing.

#### Recommendations for Emerson Middle School

For the 2018-19 school year, administration recommends:

- Moving forward in summer 2018 to create one classroom within a corner of the existing LRC. This would also allow the LRC to be updated into a flexible learning environment model similar to Lincoln’s new configuration and what is being implemented elsewhere across the District. This additional homeroom would provide the school with a total of 33, which would meet the currently projected enrollment for 2018-19 and potentially the following three years if actual enrollment adheres to the current projections. This remodeling would be added to the District’s summer 2018 construction projects. It would require the Board at the February 26, 2018 meeting to authorize the preparation of construction documents and bid specifications so that planning work can begin immediately.
- Rick Petricek from Studio GC and District administration will review with the Board the overall plan and cost estimates to move forward with this option.

As we look ahead toward accommodating student enrollment in the future, administration also recommends evaluating a broader opportunity to rebalance enrollment between Emerson and Lincoln. Therefore, administration recommends the Board consider:

- Exploring the *possible* reinstatement of a Carpenter Option Area as a longer-term solution. This would not only reduce the space issues at Emerson, but would also more equally balance the middle school population between the two schools.
- This *possible* Option Area would be expanded to include more students than the 1998-2008 Option Area. As shown on Attachment 2, the *possible* 2018 Option Area includes 44 Carpenter grade 5 students. A minimum of 28 students would be needed to select Lincoln Middle School in order to alleviate the space challenges at Emerson. For the upcoming 2018-19 school year, Lincoln’s enrollment projection calls for 27 homerooms, with an enrollment of 721 students. Lincoln is capable of handling up to 31 homerooms or 868 students. Thus, Lincoln would be able to easily accommodate one or two additional sections without reaching its maximum student capacity.

- At this time, therefore, administration would recommend that Carpenter families be surveyed to determine if there is enough interest in this *potential option* for the future.
- It must be clearly understood that a *potential* Carpenter Option Area would include free bus transportation of those students to Lincoln, as well as a full review with the City of Park Ridge of crossing guards and other safety measures along Touhy Avenue and the walking route to the school. A meeting has been set up with the individuals in charge of crossing guards for the City of Park Ridge.

*2018-19 Projected Middle School Total Enrollments*

<b>Lincoln</b>	721	27 homerooms
<b>Emerson</b>	891	33 homerooms

*Sixth Grade Enrollment: Five-Year Projections for Lincoln and Emerson*

<b>Lincoln</b>	<b>Enrollment</b>	<b>Homerooms</b>	<b>Emerson</b>	<b>Enrollment</b>	<b>Homerooms</b>
2019-20	219	8	2019-20	283	11
2020-21	241	9	2020-21	300	11
2021-22	242	9	2021-22	277	10
2022-23	254	10	2022-23	334	12
2023-24	230	9	2023-24	331	12

**Washington Elementary School**

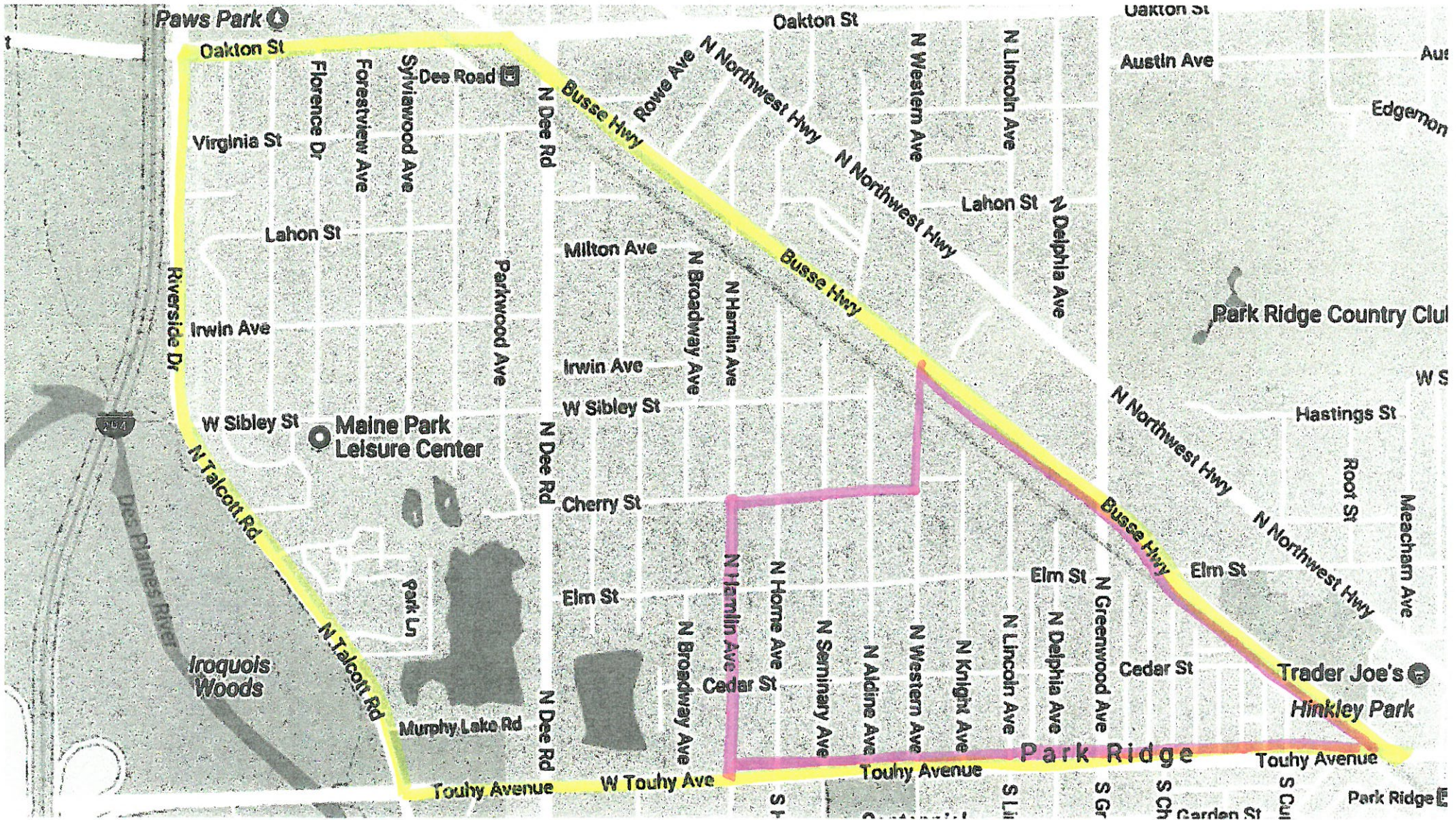
Washington Elementary School is also exceeding its homeroom limit by 1 or 1.5 sections for the upcoming school year. For the 2018-2019 school year, Washington is projected to have 27.5 sections with an anticipated enrollment of 660 students. This is an increase of 1.5 homerooms and 9 students over this school year. The .5 section is an anticipated additional kindergarten section that will be confirmed as we move through registration beginning in February. However, there will be an additional homeroom at 5<sup>th</sup> grade for the upcoming school year that does have Washington exceeding its current homeroom space.

As a result of this known increase in enrollment, administration will be reviewing the options stated above, with the exception of boundary changes. The solution at Washington may be a combination of options, such as placing a program on a cart and reclaiming current space for a classroom.

# Carpenter Boundary Area Highlighted in Yellow

Attachment 1

## 1998 - 2008 Carpenter Choice Area Highlighted in Pink



Potential 2018 Carpenter Choice Area Highlighted in Blue





To: Board of Education  
Dr. Laurie Heinz, Superintendent

From: Luann Kolstad, Chief School Business Official  
Ron DeGeorge, Director of Facility Management  
Rick Petricek, Senior Architect, Studio GC Architects  
Jeff Chamberlin, Founding Principal, 20/10 Engineering Group LLC

Date: February 20, 2018

Subject: Discussion and Recommendation to Retrofit/Replace Two Zones of Carpenter HVAC Summer 2018

### **Background**

The Carpenter Heating, Ventilating and Cooling (HVAC) system was installed over the course of two summers. Summer 2012 work included asbestos abatement, upgrading of the electrical systems to handle the proposed HVAC system, and upgrades to the north gymnasium HVAC. In Summer 2013, the actual installation of the new HVAC system took place. The architect of record on this project was Fanning Howey and the mechanical contractor was F.E. Moran for the replacement of the HVAC system. The initial cost of the system was \$2,145,000 as reported on the original Bid Tabulation document. It should be noted that the current administration was not in place at this time, so information has been compiled from prior reports.

Problems with the Carpenter HVAC were reported beginning in September 2013 with the air conditioning and heating not functioning consistently. In May 2014, a meeting was held with the architect, contractor and District 64 administration to review the unacceptable track record of the system. In summer 2014, administration hired Farnsworth to conduct a retro-commissioning study to identify issues with the system. Farnsworth reported its findings to the Board on August 25, 2014. The findings identified 218 issues with the system, with 62 of the issues being deemed critical.

Since the Farnsworth study, the District has invested considerable time, effort and funds to troubleshoot and ensure the system can continue to operate. Attachment 1 Carpenter Heating Ventilating & Cooling (HVAC) Timeline provides a high level review of what has transpired with the system following the Farnsworth study.

Since August 2015, the District has replaced over 50 motors in the cassettes, seven compressors, 10 pumps and added approximately 400 pounds of freon to replace what has leaked. During the 2016-17 school year, 393 hours of service calls were needed at a cost of approximately \$70,000.

## **Recommendation**

Based on continuing problems with the HVAC system and as part of our Master Facilities Plan efforts, the administration requested that Studio GC and 20/10 Engineers review the initial installation of the system and all of the problems that have occurred since its launch.

At the January 22, 2018 meeting, administration presented the Board with several options available to keep the current Carpenter HVAC system functioning until at least summer 2019, towards the end of the current five-year MFP. This report is included as Attachment 2. The report details current issues, including flaws in the design of the system, minimum recommended work to the system, and options to potentially begin replacing some or all of the system.

Since the January meeting, the HVAC system at Carpenter has continued to have significant problems with heating, especially in the most troublesome zones 2 and 3. This has included, but not been limited to, replacement of a compressor again and replacement of a pump.

The District has spent four years trying to identify and fix problems with the system in the hopes that a minimum 20-year useful life could be accomplished. Based on current information from 20/10 Engineering, and continued malfunctions of the system, it is highly unlikely that this goal can be met without significant changes to the current system. Therefore, administration is recommending that Option 1 be modified to include the replacement at this time of only zones 2 and 3, and that this modified project be added to the District's planned summer 2018 capital work (Attachment 3). These zones are located in the school's long east hallway running north/south along Hamlin Avenue, and encompass classrooms (used by grades 3-5 daily) and the main office that have consistently experienced the most problems.

Administration will update the financial projections to be presented at the February 26, 2018 meeting to show the expenditure of approximately \$1.5M of working cash for these recommended improvements, and will seek the Board's approval to prepare construction specifications and bid documents for the work.

Mr. DeGeorge along with Mr. Petricek from Studio GC Architects will review the modified scope of work of this recommended project with the Board at the February 20 meeting.

## **Carpenter Heating Ventilating & Cooling (HVAC) Timeline**

### **2012-13**

- The new HVAC system was installed over the course of two summers. During Summer 2012 Phase 1 prep work was the focus to prepare for the new system. Work entailed asbestos abatement, upgrading electrical systems and upgrades with the north gymnasium HVAC.

### **2013-14**

- Summer 2013 - Phase 2 of work completed; HVAC in operation.
- Fall 2013 - first time Carpenter has air conditioning to start school year.
- Beginning in September and continuing through the year, data collected about both air conditioning and heating not functioning consistently; troubleshooting of numerous problems required.
- May - meeting with architects Fanning-Howey, vendors, business manager, facilities manager and others to discuss unacceptable track record concerns throughout first year
- Farnsworth hired to conduct Retro-Commissioning study to identify causes of numerous complaints and issues identified during the year with the HVAC project

### **2014-15**

- August 2014 - Farnsworth completes investigation and reports to Board of Education (218 issues identified-62 issues deemed critical)
  - Punchlist
- Construction managers Nicholas & Associates recommended and approved by Board to complete Fanning & Howey/FE Moran/Farnsworth
- School year begins with problems with humidity levels and cooling
  - portable cooling units delivered to school
- Significant problems continue throughout the fall
- September - meeting held at ESC of all involved parties
- October - baseboard heaters installed in several rooms/offices
- November - ERV window heat added over Thanksgiving recess
- Issues continued throughout the school year related to:
  - humidity complaints
  - after winter break Zone 4 failure (not heating)
  - control inconsistencies between what was being reported in the classroom vs. what was reported to computer monitoring system
  - temporary heaters utilized in February, scheduling/timing issues of heating, baseboard heaters not working

- Zone 3 problems - temperature room swings between 8-9 degrees, cooling tower issue (June) - rooms hot (78 degrees)

### **2015-16**

- Fall - no major issues with cooling reported
- Heating problems reported as seasons shifted
- Winter recess - evacuated and weighed in proper refrigerant charge for baseline
- Remainder of school year heating and cooling - system functioning until June shutdown
- To improve comfort and performance, pilot installed for twinning of cassettes
- Spring - motors of some cassettes began emitting whining sounds (NEW PROBLEM)

### **2016-17**

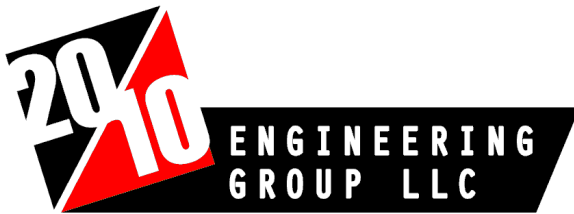
- Summer 2016
  - Based on successful pilot, twinning project completed throughout school
  - Storm damage/power surge damaged printed circuit boards throughout the system (40+) - filed insurance claim (\$35,225)
- Start of school - finished replacing circuit boards and restoring programming to individual units - initial cooling problems throughout the school addressed
- Zone 3 became ongoing issue for cooling and heating
- Fall 2016 - teachers identify noises from cassettes
  - 1 room cassette motor replaced as pilot and sent to Korea for evaluation - after much pressure, LG is providing 10 new replacement motors - D64 to ship the 10 existing motors to LG for evaluation
- Late November - temperature log created to track continuing heating issues for Zone 3 related to ERV blowing outside unconditioned air into classroom making cassettes unable to keep up with additional temperature demands.
  - Heaters rented and delivered to small number of classrooms to maintain appropriate temperature
- December 2016
  - Repeated the evacuation and weighing of charge to see how much refrigerant was lost since winter recess 2015 (baseline) - additional temporary fixes - recharged the system however system did not maintain heating primarily in zone 3
  - After extensive further troubleshooting by Harding, Delta, and D64 identified leak in refrigerant line used for both heating and cooling - leaks being repaired temporarily to restore system functioning
- Winter recess 2016
  - With source of leaks identified - we will remove leaking valves and repair system
  - System will be recharged over break
- Noisy motors will be replaced in 10 units as soon as they arrive

- Winter 2017
  - Replace HR circuit boards
  - Replace 10 cassette motors
  - Leak check, recover freon and weigh in new freon charges by weight
  - New cassette motors ordered for noisy units
  - Meet with Midwest Applied and manufacturer reps about failing motors
- Spring 2017
  - Boiler 1 down and pump fail
  - Replace more cassette motors
  - Replace more HR circuit boards
  - Replace pump ERV 4
  - Leak check, recover freon and weigh in new freon charges by weight

## **2017-18**

- Summer 2017
  - Replace compressor
  - Replace 10 more cassette motors
  - Replace more HR circuit boards
  - Zone 3 shutting down
  - Add test ports for pumps
  - Swap noisy cassette in room 134
  - Replace bearings in ERV4
  - Leak check, recover freon and weigh in new freon charges by weight
- Fall 2017
  - Repair pump seal
  - Repair control problems north gym
  - Check room 134 for heating problems
  - Zone 2 cold
  - Zone 3 cold
  - Leak check, recover freon and weigh in new freon charges by weight
  - Zone 3 erratic, in alarm
  - Replace compressor zone 3
- Winter recess 2017
  - System had problems maintaining temperature, building temperature dropped to 50 degrees.
  - Zone 3 went down, zone in alarm
  - Zone 1 is cold

- Twenty-five portable heaters were rented and placed throughout the building - given the extremely low temperatures we wanted to prevent further damage to the building.
- Harding Mechanical was able to get system up and running, however, the new compressor in zone 3 failed. New compressor ordered.
- Replace compressor zone 3
- Leak check, recover freon and weigh in new freon charges by weight
- As a result of the low temperatures in the building and extremely cold temperatures outside, a pipe in the attic froze and burst causing water damage in two classrooms. Claim filed with insurance carrier.
- As of Friday, December 29, 2017 most of building was maintaining correct temperature.



## HVAC SYSTEM RENOVATION OPTIONS GEORGE B. CARPENTER ELEMENTARY SCHOOL PARK RIDGE-NILES SCHOOL DISTRICT 64

January 12, 2018

We visited the building twice in the past month and once previously in the fall of 2016 to investigate the existing HVAC system. We have studied the original design drawings from the summer 2013 renovation project and have read the subsequent report on the system's issues from the following summer. We understand that work was done to improve the operation of the system, but given the recent performance of the system, it is obvious that the efforts have fallen short of providing the building with a reliable, properly functioning HVAC system.

### Current Issues

Based on our recent site visits and discussions with service personnel, we understand the following issues still remain with the existing HVAC system:

1. Fan Coil Unit Motors: The existing LG ceiling cassette unit motors have been failing and most of them have been replaced already. Apparently, the last time the LG factory representative visited the site, they were given approximately 50 of the failed motors so the factory could investigate why they were failing. To date, there has been no word from the factory. The LG factory representative did state that the motors had a life expectancy of 50,000 hours. Since the fan coil units operate continuously, they would last 5.7 years, which they aren't.
2. Heat Pump Unit Condenser Water Circulation Pumps: The existing TACO circulation pumps (model 2400-50-3P) at the 10 LG heat pump units in the basement have been failing. Approximately 10 pumps have failed so far. The motors run very hot, almost untouchable. The local TACO representative visited the site and provided 4 new pumps (model 2400-70-3P, same as currently installed but larger) to be tried out. These new pumps have not been installed because the flanges are different than the original ones so the piping would have to be re-worked. The original pumps have a plastic impeller and so do the larger potential replacement pumps. There is no strainer in the piping system upstream of the pumps.
3. Refrigerant Piping System Leaks/Compressor Failures: Probably the most troublesome issue is ongoing refrigerant piping leaks and compressor failures. Despite the revisions made to the refrigeration piping, leaks still plague the systems. Each refrigeration zone is served by (2) LG heat pump units. Variable Refrigerant Flow systems are very unforgiving when it comes to the amount of refrigerant in the system - the perfect amount must be present for the system to function properly. Because of the on-going refrigeration leaks, the mechanical service techs

20/10 Engineering Group, LLC

1216 Tower Rd, Schaumburg, IL 60173 847.882.2010 fax 847.882.2201

Sustainable Designs

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have to visit the school multiple times each year to remove the refrigerant from each zone and weigh it to make sure each zone has the proper amount of refrigeration installed. The following is the status of each zone:

- a. Zone 1 (serves the southwest wing): This zone has had no compressor failures, but frequently refrigerant needs to be added.
  - b. Zone 2 (serves south half of east wing): This zone requires refrigerant to be added each time it is checked and has lost one compressor.
  - c. Zone 3 (serves north half of east wing): This zone has been the most troublesome zone of all of them. It always requires refrigerant to be added and has lost 6 compressors.
  - d. Zone 4 (serves west wing): This zone has been virtually trouble-free and only one time was refrigerant required to be added.
  - e. Zone 5 (serves Gym and Auditorium): This wing has the shortest refrigeration piping, least fan coil units, and has had no trouble.
4. Cooling Tower: The cooling tower has an automatic drain function which empties the tower basin to prevent freezing when outside temperatures fall below a certain setpoint. When the pump tries to re-start the system to fill the basin, the pump becomes air bound and the entire building system goes down.
  5. Fan Coil Unit Wiring: The fan coil units in each zone are not wired together so that shutting off a breaker shuts off fan coil units on multiple zones. When the zones have trouble, the service tech must re-boot all fan coil units on that zone, but that can't be done with the current wiring arrangement.

## **HVAC System Renovation Options**

Budget Cost Opinions include mechanical and electrical work plus contingency. Not included is general construction work or fees.

### **Minimum Recommended Work** (unless all VRF is replaced under Option 4)

1. Fan Coil Unit Motors: For any fan coil units remaining under Options 1 through 3, work with LG to find a reliable replacement fan coil unit motor. Failing that, research other manufacturer motors to see if a more reliable motor can be adapted to the LG fan coil units.
2. Heat Pump Condenser Water Circulation Pumps: Remove existing TACO pumps and provide a Bell & Gossett circulation pump with a metal impeller.
3. Refrigeration System Piping Leaks/Compressor Failures: Based on the amount of work that has been done so far to revise the piping to prevent leaks and knowing that effort has failed to prevent leaks and provide a reliable system, we recommend eliminating the refrigeration piping altogether. The Options below do this starting with the most unreliable zones.
4. Cooling Tower: The cooling tower automatic drain function as a method of preventing freeze-up should be eliminated. The cooling tower should be filled in spring and drained in fall. A heater should be added to the cooling tower basin to prevent freezing once filled.
5. Fan Coil Unit Wiring: Any fan coil units remaining under Options 1 through 3 should be re-wired so that there is a single power shut-off for all fan coils on a particular zone.



**Option 1 - Remove VRF Heat Pump Units/Fan Coil Units From Zones 2 & 3**

1. Remove fan coil units, all refrigerant piping, refrigerant control boxes, etc.
2. Disconnect the 2 heat pump units serving each zone from the condenser water system and cap the branch condenser water piping at the mains. Abandon the heat pump units in place and utilize them for parts for remaining units.
3. Connect to the existing condenser water piping and route a new one-pipe condenser loop through Zones 2 & 3.
4. At each room formerly served by VRF fan coil units, provide a new heat pump unit with branch piping connections to the new one-pipe condenser water loop. Classrooms shall be served by a dedicated vertical stack heat pump unit with ductwork distribution. Toilet rooms and other spaces shall be served by console type heat pump units or above ceiling mounted horizontal heat pump units..
5. Remainder of existing system to remain in operation, including energy recovery units serving Zones 2 & 3 to continue to provide outside air ventilation to occupied spaces.

**Option 2 - Same as Option 1, Plus Remove VRF Heat Pump Units/Fan Coil Units From Zone 1**

1. All work associated with Option 1, with same scope of work for Zone 1 as described above for Zones 2 & 3.

**Option 3 - Same as Option 2, Plus Remove VRF Heat Pump Units/Fan Coil Units From Zones 4, & 5**

1. Same as Option 2, with same scope of work for Zones 4 & 5 as described above for Zones 1, 2 & 3.
2. There will be no more VRF systems in the building and all VRF heat pump units will be removed.
3. The condenser water system including cooling tower and boilers will remain in operation.
4. All heat pump units and all energy recovery units will be connected to the new one-pipe loop.

**Option 4 - Same as Option 3, Plus Remove Cooling Tower and Provide Geothermal Wellfield**

1. Same as Option 3, with additional removal of cooling tower, boilers, and pumps from the basement.
2. Provide new geothermal wellfield west of the school in the playfields. Wellfield shall consist of 48 bores at 500 ft. with piping entering the storage room adjacent to the fire protection water service room.
3. Geothermal loop circulation pumps will be installed adjacent to the geothermal loop piping entrance to circulate glycol-water solution throughout the building and wellfield.
4. One of the boilers will be relocated to the room to provide supplemental heat to the loop on the coldest of days.

# Park Ridge-Niles School District 64



Preliminary Budget

## Carpenter School HVAC Renovation

Option 1 of 20/10 Engineering Proposal

February 13, 2018

**SCOPE: Zones 2 and 3**

Carpenter School  
300 N. Hamlin Ave.  
Park Ridge, IL 60068

Area of Work - Base Bid	Qty	Unit	Total Estimate
Architectural: Demolition	1	ea	\$32,000.00
Architectural: Modifications to Rooms	23	rms	\$5,000.00
Architectural: Painting	1	ea	\$20,000.00
Architectural: New Ceiling Grid/Tile	21,500	sf	\$7.00
Electrical: Power Redistribution	21,500	sf	\$5.00
Mechanical: Piping/Equipment Replacement	1	ea	\$704,400.00
<b>Subtotal</b>			<b>\$1,129,400</b>
Contingency @ 10%			\$112,940
<b>Total</b>			<b>\$1,242,340</b>
A & E Fee @ 7.5%			\$93,176
CM Fee @ 2%			\$24,847
<b>Preliminary Total</b>			<b>\$1,360,362</b>

Provide alternate for replacement of lighting in Zones 2 and	21,500	sf	\$6.00	\$129,000
A & E Fee @ 7.5%				\$9,675
CM Fee @ 2%				\$2,580
<b>Additional Proposed Cost</b>				<b>\$141,255</b>

**Preliminary Proposed Grand Total** **\$1,501,617**