

**GERMANTOWN SCHOOL DISTRICT**

**Notice of Building Committee Meeting**

**August 10, 2020**

**6:00 PM**

**Germantown School District Performing Arts Center**

**W180 N11501 River Lane**

**Germantown, WI 53022**

**AGENDA**

**I. Meeting Called to Order**

**II. Roll Call**

**III. Agenda Revisions and Approval**

**IV. Approve Minutes**

A. July 13, 2020

**V. Reports & Updates**

A. Director of Buildings & Grounds: Capital Projects & Facility Services

**VI. Unfinished Business - Discussion with Possible Action**

A. Fund 41 Capital Projects List – Prioritized for Review Only

**VII. New Business - Discussion with Possible Action**

None

**VIII. Adjourn**

**Note:** School Board members who are not members of the Building Committee may be present at this Building Committee meeting.

**GERMANTOWN SCHOOL DISTRICT**

**TO:** Building Committee

**TOPIC:** Approval of July 13, 2020 Minutes

**FROM:** Brittany Altendorf

**BUILDING COMMITTEE MEETING:**  
August 10, 2020

**DATE:** August 6, 2020

**AGENDA ITEM:** IV. A.

**ATTACHMENTS:** See next page(s).

**RECOMMENDATION:** Motion to approve the July 13, 2020 Building Committee meeting minutes as presented.

**GERMANTOWN SCHOOL DISTRICT**  
**Minutes of July 13, 2020 Building Committee Meeting**

6:00 p.m.

Germantown High School  
Performing Arts Center  
W180 N11501 River Lane  
Germantown, WI 53022

1. The meeting of the Building Committee was called to order by Chair Medved at 6:00 p.m.  
Building Committee Members Present: Brian Medved, Michael Loth, Mark Koenke, Ray Borden-  
Absent Excused, Board of Education Members Bob Soderberg, Sarah Larson, Tom Barney,  
Amanda Reinemann, District Administration and Staff, Brett Stousland, Brittany Altendorf, Mike  
Nowak, Don Erickson, Jayne Borst, Billie Jo Mohn,
2. Motion by Loth to approve the agenda as presented. Second by Koenke. Motion carried.
3. Motion by Loth to approve the June 8, 2020, Building Committee minutes as presented.  
Second by Koenke. Motion carried.
4. Erickson led discussions on Capital Projects and Facility Services by describing the items  
included in the Committee packet. Erickson updated the Committee on Amy Belle's infiltration  
basin, with discussion on the landscaping at Amy Belle's outdoor learning pavilion. Soderberg  
asked Erickson to reach out to Richfield Village to discuss the options for the gravel parking area  
across the street from the school, with discussion about getting a quote for asphaltting it.
5. Erickson led discussions by updating the Committee on the high school pool grout situation, the  
discovery, and how it will be repaired. Committee discussion on why it happened, and who  
would be making the repairs. Soderberg asked Altendorf to look into the contract and if there  
was any type of an inspection performed and by whom, mentioning that this should have been  
discovered during that inspection of the work.
6. Erickson led discussions on concrete work bids. Motion by Loth to move forward to the Finance  
Committee with a positive recommendation to award the Kennedy Middle School sidewalk  
concrete work to J.R. Boehlke as presented, in an amount not to exceed \$46,860 which includes  
the mud jacking allowance to be funded out of the Buildings and Grounds Fund 10 budget.  
Seconded by Koenke. Motion carried.
7. Altendorf led discussions on Fund 41, mentioning that due to the unknown budget numbers  
she is suggesting that nothing gets approved or discussed until the November 9, 2020 Building  
Committee meeting. Loth mentioned that they would still like to see Erickson's project/priority  
list included in every months Committee packet regardless if there is going to be discussion or  
not. Erickson led discussions on some tuckpointing work that will need to be done at County  
Line School, and he plans to present a quote to the Committee at the August meeting.

Soderberg wants the project list to be prioritized by Erickson. Committee discussion on the track, and hallway LED lighting.

8. Motion by Koenke to adjourn the meeting. Second by Loth. Motion carried.
9. Meeting adjourned at 6:25 p.m.

DRAFT

## **GERMANTOWN SCHOOL DISTRICT**

**TO:** Building Committee

**TOPIC:** Capital Projects & Facility Services

**FROM:** Brittany Altendorf

**BUILDING COMMITTEE MEETING:**  
August 10, 2020

**DATE:** August 6, 2020

**AGENDA ITEM:** V. A.

**ATTACHMENTS:** Report provided by Don Erickson, Director of Buildings & Grounds. Report included in packet.

**RECOMMENDATION:** None

## **Building Committee August 10, 2020**

### **Amy Belle Infiltration Basin**

The earthwork contractor had to reschedule the work for the week of August 3<sup>rd</sup>. The basin was to wet to start on Monday August 3<sup>rd</sup> and Tuesday the 4<sup>th</sup> without causing more damage for the landscaper to repair. The earthwork has started and is planned to be finished on Wednesday August 5<sup>th</sup> with the landscaper following right behind them.

### **Amy Belle Pavilion Landscaping**

Mrs. Kohel is working with David J. Frank to create a landscaping plan for the nature center. The plan will be presented when it is completed.

### **Amy Belle Overflow Parking Lot**

The Village of Richfield does not believe there will be any issues making the overflow parking lot. A variance and application will need to be completed along with plans from a civil engineer. Depending on the size of the parking lot, a water retention system may be required by the DNR. Below is an estimate of \$33,645 for the asphalt work including a gate at the entrance. The estimate does not include any base work if it is needed. In addition to this cost, add \$5,000 - \$10,000 for a civil engineer and \$15,000 estimated budget for lighting. This will bring the estimated cost for the lot including the gate to \$53,645 - \$58,645, not including a retention system if needed.

Area Office  
N173 W21120 Northwest Passage Way  
Jackson, WI 53037



Roni laMarche  
[rlamarche@payneanddolan.com](mailto:rlamarche@payneanddolan.com)  
262-366-5088

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## PROPOSAL

**SUBMITTED TO:**

Germantown schools  
Don Erickson

**DATE:** July 23 2020  
**PHONE:** 1-414-406-3421 **FAX:**  
**JOB NAME:** Amy Belle School overflow parking 2020  
**JOB LOCATION:** Germantown, Wis  
**PLAN DATE:**

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*For furnishing the necessary labor, material and equipment to complete the following:*

**Base Bid**

- Install approx. 2" of Crushed aggregate stone to existing lot to provide positive drainage
- Fine grade, water and compact crushed aggregate base course approximately 1435 SY for 2 1/2" of Asphaltic pavement.
- Construct a one-course 2 1/2" compacted average depth asphalt pavement with Payne and Dolan commercial mix design, consisting of 12.5mm upper course, on approximately 1,435 SY. in the new pavement area.
- Provide striping on new pavement for approx. 32 car parking stalls

**TOTAL BASE BID: \$28,645.00**

**Alternate Bid**

- Install a 20' opening access gate across the entrance approx. 30 feet off the main road

**ALTERNATE BID: \$5,000.00**

**NOTES:**

- Includes 1 fine grading mobilization and 1 paving mobilization.
- No restoration figured on outside of asphalt pavement.
- Proposal is contingent upon site survey and confirmation of proposed grades.
- Proposal does not include any patching to binder prior to surface placement.
- If unstable subgrade or base course conditions are encountered during construction, the above pricing does not include the undercut or stabilization of the unstable material, which must take place prior to completion of the asphalt paving.
- Late season paving after November 1 and early season paving before May 1 is not figured in this bid.
- If we need to pave outside of our normal season of paving, we will negotiate a change in contract to cover those extra cost that are incurred.
- Lower layer pavements require 40 degrees or higher and surface pavements require 50 degrees or higher. Pavements placed in lower temperatures will be at the owner/contractors written direction and without warranty.

*If you have any questions on this proposal, please call me at the contact information listed above.  
Thank you!*

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## **Germantown High School Pool Deck**

Lippert Tile stopped at GHS to determine if there would be enough attic stock to complete the needed repairs. Additional tile is needed and had to be ordered. When the tile is received, a plan to complete the work will be forwarded to the District including options for the District to pick from to minimize disturbing any use in the pool.

## **District MERV 13 Filters**

MERV is an acronym for Minimum Efficiency Reporting Value. The higher the number, the smaller the particle the filter catches and the higher the airflow resistance.

Presently the District is using a MERV 10 filter on all the H.V.A.C. equipment. The filters are above the previous recommended MERV 8 rating for schools. The filters cost \$3,990 per change with 3 yearly changes for a cost of \$11,970. The filter changes are completed late August for the start of the school year, at winter break and finally spring break.

ASHRAE, American Society of Heating, Refrigeration and Air Conditioning Engineers, in response to COVID 19, released a report on July 17, 2020 which recommends retrofitting H.V.A.C. systems to a MERV 13.

Older equipment that was not designed to accept a MERV 13 filter may not be able to supply the needed airflow to properly heat and cool areas creating comfort issues. Upgrading older equipment to accept MERV 13 filters will require hiring an engineer to determine if the system can accept the higher rated filter and what modifications will be needed to accomplish the retrofit. There is a risk of burning out air conditioning systems and cracking heat exchangers if we just change the filters without confirming if the equipment can accept the lower air flow.

The cost for the MERV 13 filters per change is \$9,754. Four changes per year will be needed to properly maintain the equipment, more efficient filters plug up faster. The annual cost to install the upgraded filters is \$39,015 or an increase of just over \$27,000 which is presently not in the maintenance budget. Currently there is at least 4 – 6 week lead time to get the filters.

Below are spec sheets for the filters the District presently installs and for

MERV 13.

Additional information from Trane specific to Germantown School District buildings and other methods to improve the indoor air quality are below. All of these options will take a substantial investment to complete.



# SERIES 400 PLEATED FILTER



**1", 2" & 4"  
MERV 8 & 10**

STANDARD  
AND  
HIGH CAPACITY

*Ideal for use in*

- Commercial/Industrial
- Schools/Universities
- Hotels/Airports



## WHY THE SERIES 400?

- 100% synthetic pleated media achieves exceptionally high levels of efficiency
  - Does not rely on electrostatic charge
  - Lowest resistance to air flow available
  - Minimizes energy costs
  - Moisture resistant and will not promote microbial growth
  - Excellent pre-filter for higher efficiency air filters
  - Effectively removes airborne irritants
  - Protects cooling coils & ductwork of HVAC system
- Durable construction optimizes performance
  - Media laminated to metal grid
  - Minimized media fluttering
  - Design helps maintain pleat uniformity
  - Filter pack enclosed in heavy-duty, moisture resistant die-cut frame
  - Will not warp, crack or distort under normal operating conditions



**Filtration Group**

HVAC



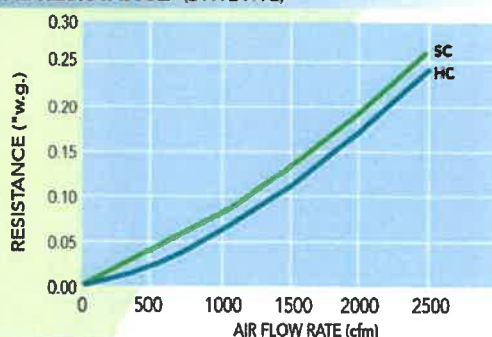
# SERIES 400 PLEATED FILTER



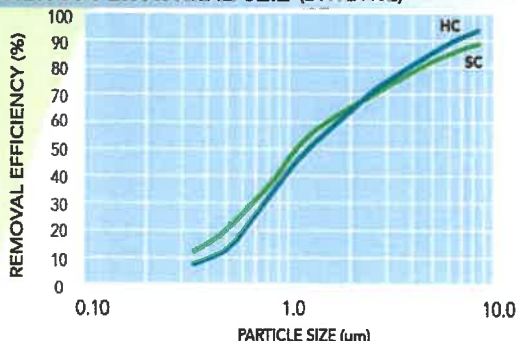
## SERIES 400 PERFORMANCE DATA (fpm)

FILTER DEPTH	MEDIUM VELOCITY	INITIAL RESISTANCE MEDIUM ("w.g.)		HIGH VELOCITY	INITIAL RESISTANCE HIGH ("w.g.)		FINAL RESISTANCE (All Filters)
		STD CAP	HIGH CAP		STD CAP	HIGH CAP	
1"	300	0.18	0.12	375	0.25	0.17	1.0
2"	375	0.13	0.11	500	0.19	0.17	1.0
4"	500	0.15	0.11	625	0.21	0.17	1.0

## INITIAL RESISTANCE (24 X 24 X 2)



## EFFICIENCY PER ASHRAE 52.2 (24 X 24 X 2)



## SERIES 400 ENGINEERING SPECIFICATIONS

### 1.0 General

- Filters shall be Aerostar® Series 400 extended surface pleated air filters as manufactured by Filtration Group.
- Filters shall be available in standard and high capacity configurations and available in nominal depths of 1", 2", and 4".
- Underwriters Laboratories classified to UL 900.
- Filters are manufactured by an ISO 9001 registered company.

### 2.0 Filter Materials of Construction

- Media shall be 100% synthetic, mechanical media that does not support microbial growth.
- Frame shall be a heavy duty, high strength, moisture resistant paperboard with a cross member design that increases filter rigidity and prevents breaching. Frame shall be made with 100% recycled paperboard with an average of 35% post-consumer content. Frame shall be recyclable.
- Filters shall have an expanded metal support grid bonded to the air-exiting side of the filter to maintain pleat uniformity and prevent fluttering. Metal support grid shall be recyclable and contain a significant amount of post-consumer and pre-consumer content.

### 3.0 Filter Performance

- Filters shall be MERV 10 in a high capacity configuration and MERV 8 in a standard capacity configuration when tested in accordance with ASHRAE 52.2-2012 Test Standard.
- For initial resistance of filters, see Performance Data chart above.
- Filters shall be rated to withstand a continuous operating temperature up to 200°F.
- Filters shall have a recommended final resistance of 1.0" w.g.

## SERIES 400 DIMENSIONS

PART NUMBER		NOMINAL SIZE*	CFM CAPACITIES	
STD CAP	HIGH CAP		MEDIUM (300)	HIGH (375)
10403	10476	8 x 16 x 1	250	325
10404	10477	10 x 10 x 1	200	250
10364	10436	10 x 20 x 1	400	525
10405	10478	10 x 24 x 1	500	625
10406	10479	10 x 25 x 1	525	650
10365	10437	12 x 12 x 1	300	375
10407	10480	12 x 16 x 1	400	500
10366	10438	12 x 20 x 1	500	625
10367	10439	12 x 24 x 1	600	750
10368	10440	12 x 25 x 1	625	775
10369	10441	14 x 20 x 1	575	725
10408	10481	14 x 24 x 1	700	875
10370	10442	14 x 25 x 1	725	900
10371	10443	15 x 20 x 1	625	775
10409	10482	15 x 25 x 1	800	975
10410	10483	16 x 16 x 1	525	650
10372	10444	16 x 20 x 1	650	825
10411	10484	16 x 24 x 1	800	1000
10373	10445	16 x 25 x 1	825	1050
10412	10485	18 x 18 x 1	675	850
10413	10486	18 x 20 x 1	750	925
10414	10487	18 x 22 x 1	825	1025
10415	10488	18 x 24 x 1	900	1125
10374	10446	18 x 25 x 1	925	1175
10375	10447	20 x 20 x 1	825	1050
10416	10489	20 x 24 x 1	1000	1250
10376	10448	20 x 25 x 1	1050	1300
10417	10490	22 x 22 x 1	1000	1250
10377	10449	24 x 24 x 1	1200	1500
10378	10450	25 x 25 x 1	1300	1625

### MEDIUM (375) HIGH (500)

10418	10491	10 x 10 x 2	250	350
10379	10451	10 x 20 x 2	525	700
10419	10492	12 x 20 x 2	625	825
10380	10452	12 x 24 x 2	750	1000
10381	10453	14 x 20 x 2	725	975
10382	10454	14 x 25 x 2	900	1200
10383	10455	15 x 20 x 2	775	1025
10420	10493	16 x 16 x 2	650	875
10384	10456	16 x 20 x 2	825	1100
10385	10457	16 x 24 x 2	1000	1325
10386	10458	16 x 25 x 2	1050	1400
10421	10494	18 x 22 x 2	1025	1375
10387	10459	18 x 24 x 2	1125	1500
10422	10495	18 x 25 x 2	1175	1550
10388	10460	20 x 20 x 2	1050	1400
10389	10461	20 x 24 x 2	1250	1650
10390	10462	20 x 25 x 2	1300	1750
10391	10463	24 x 24 x 2	1500	2000
10392	10464	25 x 25 x 2	1625	2150

### MEDIUM (500) HIGH (625)

10393	10465	12 x 24 x 4	1000	1250
10394	10466	16 x 20 x 4	1100	1400
10395	10467	16 x 25 x 4	1400	1750
10396	10468	18 x 24 x 4	1500	1875
10397	10469	20 x 20 x 4	1400	1750
10398	10470	20 x 24 x 4	1650	2100
10399	10471	20 x 25 x 4	1750	2200
10399	10472	24 x 24 x 4	2000	2500
10400	10473	25 x 29 x 4	2525	3150



## Filtration Group® HVAC

### PRODUCT OVERVIEW

- MERV 11, 13, 14, 15
- 4" high efficiency filter design
- Gradient dual density synthetic media
- Available in box or single header construction, with side gasketing options
- Max Temperature 150°F
- Ideal for use in:
  - Office and Retail
  - Manufacturing and Distribution
  - Government and Educational Facilities
  - Doctors' Offices, Assisted Living Facilities, and Hospitals
  - Hotels and Airports



## AEROSTAR GEOPLEAT®

### WHY THE GEOPLEAT?

- Advanced media and pleating technology
  - Very low resistance to air flow resulting in lower energy costs
  - Increased media per filter compared to 4" pleats or even 12" cartridge filters
  - Media lowers pressure drop and extends service life while expanding dust holding capacity
  - Maximum flow rate of 625 fpm
  - Robust media resists tearing and damage and is resistant to moisture and microbial growth
  - Exceeds LEED MERV-13 efficiency requirement and is a sustainable component for LEED Green Building Initiative
- Compact rigid filter & lightweight design
  - High impact plastic frame is formed to precise dimensions and impervious to moisture
  - Easy handling, lowers transportation costs, and utilizes less storage space
  - Weighs up to 75% lighter than competitive 12" filters
  - Geopleat will not warp or collapse under most HVAC harsh environments
  - Completely incinerable
  - Perfect for space constraints, roof top or anywhere safe filter installation is desired





GEOPLEAT®

#### PERFORMANCE DATA (24 x 24 x 4 - Box Style)

MERV	INITIAL RESISTANCE (w.g.)			FINAL RESISTANCE (w.g.)
	375 fpm	500 fpm	625 fpm	
11	0.13	0.19	0.27	1.0
13	0.22	0.34	0.48	1.0
14	0.24	0.35	0.47	1.0
15	0.25	0.36	0.50	1.0

Products tested and intended for installation with pleats to vertical orientation. Final filter dimension corresponds to the vertical dimension.



Durable media pack resists damage

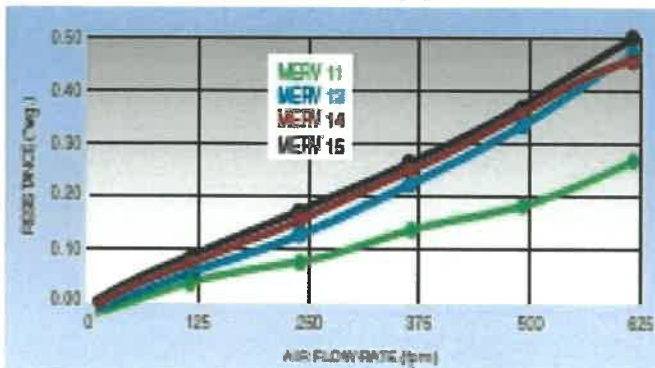


Shown with Z-fold designed to hold an optional pre-filter

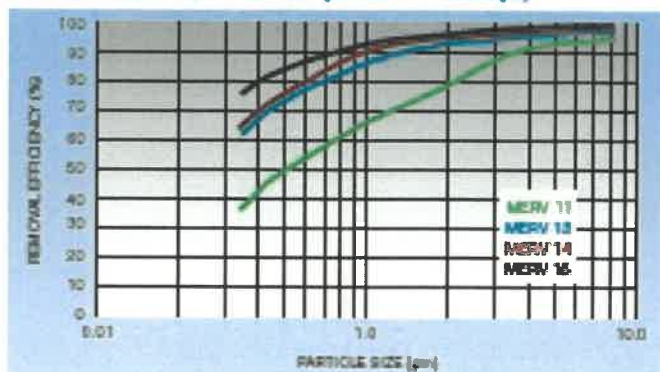


Available in both box style and single-header design

#### INITIAL RESISTANCE (24 x 24 x 4 - Box Style)



#### MINIMUM REMOVAL EFFICIENCY (24 x 24 x 4 - Box Style)



#### PRODUCT DATA

SINGLE HEADER PART NUMBER				BOX STYLE PART NUMBER				NOMINAL SIZE* (H x W x D)	ACTUAL SIZE (H x W x D)
MERV 11	MERV 13	MERV 14	MERV 15	MERV 11	MERV 13	MERV 14	MERV 15		
21605	21613	21621	728542	21629	21637	21645	718542	24 x 12 x 4	23 3/8 x 11 3/4 x 3 3/4
21609	21617	21625	728506	21633	21641	21649	718506	20 x 16 x 4	18 3/8 x 15 3/4 x 3 3/4
21606	21614	21622	728500	21630	21638	21646	718500	20 x 20 x 4	18 3/8 x 18 3/4 x 3 3/4
21611	21619	21627	728548	21635	21643	21651	718548	24 x 16 x 4	23 3/8 x 17 3/4 x 3 3/4
21607	21615	21623	728540	21631	21639	21647	718540	24 x 20 x 4	23 3/8 x 18 3/4 x 3 3/4
21608	21616	21624	728544	21632	21640	21648	718544	24 x 24 x 4	23 3/8 x 23 3/4 x 3 3/4
21610	21618	21626	728550	21634	21642	21650	718550	28 x 16 x 4	24 3/8 x 15 3/4 x 3 3/4
21612	21620	21628	728550	21636	21644	21652	718550	28 x 20 x 4	24 3/8 x 18 3/4 x 3 3/4

\* Contact Customer Care for additional sizes and information.

#### ENGINEERING SPECIFICATIONS

##### 1.0 General

- 1.1 Filters shall be Aerostar® GeoPleat mini-pleat air filters as manufactured by Filtration Group.
- 1.2 Underwriters Laboratories classified to UL 900 and ULG-S111-13.
- 1.3 Filters shall be available in a nominal depth of 4".
- 1.4 Filters are manufactured by an ISO 9001 registered company.

##### 2.0 Filter Materials of Construction

- 2.1 Media shall be 100% synthetic media that does not support microbial growth.
- 2.2 Frame shall be constructed with high-impact plastic and impervious to moisture and high humidity.
- 2.3 Media pack shall be adhered to plastic frame on all sides to prevent air by-pass.
- 2.4 Filter shall have a hot melt bead separator to maintain pleat pack stability and ensure consistent pleat spacing for optimum air flow.

##### 3.0 Filter Performance

- 3.1 Filters shall be available in MERV 11 for low efficiency, MERV 13 and MERV 14 for medium efficiency, and MERV 15 for high efficiency when tested in accordance with ASHRAE 52.2 Test Standard.
- 3.2 For initial resistance of filters, see Performance Data chart above.
- 3.3 Filter shall be rated to withstand a continuous operating temperature up to 150°F.
- 3.4 Filters shall have a maximum recommended final resistance of 1.5" w.g.
- 3.5 Changing filters at a lower resistance may save operating costs.

# Indoor Air Quality Guidelines for Reducing Micro-biologicals



## Dilute

- Disable demand-controlled ventilation (DCV)
- Raise minimum outdoor-air damper (or airflow) setpoints
- Operate mixed-air air-handling units with 100% outdoor air (no recirculation), when outdoor conditions allow
- Install additional cooling and/or heating capacity (or a Horizon packaged dedicated OA unit), if needed to enable 100% outdoor air
- Keep ventilation system operating 24/7, even if at lower airflows
- Implement a pre-occupancy purge sequence to flush the building with outdoor air



## Exhaust

- Keep restroom exhaust operating 24/7



## Contain

- Install humidity sensors and update control sequences to limit indoor humidity to less than 60% RH
- Disable discharge-air temperature reset for VAV systems during humid weather
- Ensure hot-water heating system is enabled to provide reheat for humidity control, if necessary



## Clean

- Upgrade filters to MERV-13 (or higher, if possible) and ensure effective air seals
- Add portable room air cleaners with HEPA or high-MERV filters
- Add UVGI devices in ductwork, air-handling units, or upper room
- Retrofit air-handling unit with Trane Catalytic Air Cleaning System (TCACS) or other suitable air cleaning device

Based on Trane analysis of industry guidelines from ASHRAE, REHVA, CDC



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# Technologies for Air Cleaning

Better



## Mechanical Particle Filtration (MERV 9-16)

- At higher MERV numbers, significant airside pressure drop but becomes more effective at capturing micro-biologicals (especially with adherence to particles)



## Ultraviolet Germicidal Irradiation (UVGI)

- Use of UV lights to irradiate microorganisms
- Amount of microorganism reduction dependent upon duration of exposure



## Air Ionization

- High voltage is used to create ions which can:
  - React with airborne contaminants including micro-biologicals and VOCs
  - Create clustering of particles that are then caught in filters
- May emit ozone



## Ozone Generating Cleaners

- Ozone created to attack micro-biologicals
- Can be dangerous to people at high levels



## H<sub>2</sub>O<sub>2</sub> Photolysis

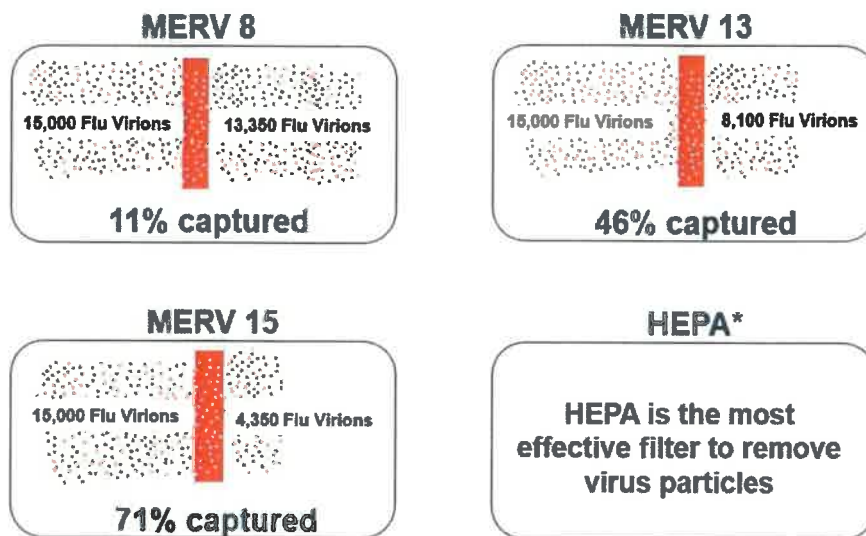
- Use of vaporized hydrogen peroxide to fill a space and disinfect the air and surfaces
- Space must be unoccupied during treatment
- Scrubbers must have zero carryover to eliminate safety concerns



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## MERV 13 Filter

### Effect on Influenza A Virus



Source: Modeling Immune Building Systems for Bioterrorism Defense; Kowalski, Bahnfleth, Musser, Journal of Architectural Engineering, June 2003, v9(2), pp222-227.

\* HEPA was not part of the study above. It's a graphical representation of 99.97% efficiency HEPA filter (defined by DOE) with particulates in 0.3µm which is the toughest size to catch

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# Indoor Air Quality Overview



**Germantown School District**

**Elementary School Overview**

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### Your Trane Team

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**Service Technician**  
Jeff Madunich  
[jeffrey.madunich@trane.com](mailto:jeffrey.madunich@trane.com)



**Account Manager**  
Ashley Henderson  
[ashley.henderson@trane.com](mailto:ashley.henderson@trane.com)



**Remote Service Specialists**  
Nate Nekich  
[nnekich@trane.com](mailto:nnekich@trane.com)



**Energy Engineer**  
Ray Lesnik  
[Ray.Lesnik@trane.com](mailto:Ray.Lesnik@trane.com)

Trane provides Germantown School District with an overall system performance review focusing on Indoor Air Quality. Our focus is to help you identify areas for improvement in order to meet industry guidelines and optimize indoor air quality. We have conducted this assessment remotely through your building automation system (BAS).





The transmission of COVID-19 may occur in a variety of ways and circumstances, many of the aspects of which are not currently known. HVAC systems, products, services and other offerings have not been tested for their effectiveness in reducing the spread of COVID-19, including through the air in closed environments

Indoor Air Quality (IAQ) should be considered a top priority in the school environment. School institutes contain a diverse day of activities that have a potential for air impurity sources including cafeterias, art and science classrooms and gymnasiums. Therefore, proper ventilation and filtration of these spaces is a critically important as these directly affect the school occupants. "The health and comfort of students and teachers are among the many factors that contribute to learning and productivity in the classroom, which in turn affect performance and achievement." (EPA, 2019)



## Assessment Overview

The U.S. Centers of Disease Control and Prevention (CDC) and World Health Organization (WHO) both published recommendations for occupying workplaces in areas with a COVID-19 outbreak<sup>1 2</sup>. In addition, two leading industry trade associations, ASHRAE and REHVA, published guidance for operating building HVAC systems under these circumstances.<sup>3 4</sup>

	<i>ASHRAE Guidelines</i>
 <b>DILUTE</b>	Proper ventilation ensures that plenty of fresh, outdoor air comes into the building to dilute the buildup of indoor contaminants. Adjusting building ventilation is one tool that can influence indoor air quality. <b>Increase outside air and manager humidity levels</b>
 <b>EXHAUST</b>	Getting exhaust air out efficiently is equally important – including recirculated air from kitchens, restrooms and combustion systems. <b>Exhaust fan schedules for exhausting the air, enable air purge after occupancy</b>
 <b>CONTAIN</b>	Maintaining indoor humidity levels within the ASHRAE recommended range maximizes the comfort of building occupants while avoiding the likelihood of harmful microbial growth in the building. <b>Ventilation and humidity control strategies</b>
 <b>CLEAN</b>	An increasing concern is the HVAC system's ability to reduce microorganisms, such as mold, bacteria and viruses. <b>MERV 13 filter upgrades with Ultra violet light filtration</b>

<sup>1</sup> Interim Guidance for Businesses and Employers to Plan and Respond to COVID-19, CDC

<sup>2</sup> Getting your workplace ready for COVID-19, WHO, dated 3 March 2020


<sup>3</sup> ASHRAE Position Document on Infectious Aerosols, dated 14 April 2020




<sup>4</sup> REHVA COVID-19 guidance document, dated 3 April 2020

## At a Glance

We reviewed the HVAC, BAS, & exhaust fans at the elementary schools

HVAC	BAS	Other
<ul style="list-style-type: none"> <li>•Rooftop Units</li> <li>•Unit Vents</li> <li>•HW system</li> </ul>	<ul style="list-style-type: none"> <li>•BACnet</li> </ul>	<ul style="list-style-type: none"> <li>•Exhaust Fans</li> </ul>

	Observations	Reccomended Action	Impact
 <b>DILUTE</b>	<ul style="list-style-type: none"> <li>• MacArthur &amp; Rockfeild is not equipped with indoor or outdoor humidity sensing devices.</li> <li>• Classroom Unit Ventilator Areas are not utilizing Night Purge ventilation strategies.</li> <li>• Classroom Units are running fixed minimum outdoor air damper positions.</li> </ul>	<ul style="list-style-type: none"> <li>• Install indoor and outdoor Humidity sensors as well as implement controls strategies applicable for heating or economizing</li> <li>• Setup the existing building automation system to utilize Night Purge sequences.</li> <li>• Augment the building automation system with new <b>Air Quality Enhancement</b> and <b>Reverse Economizing</b> modes.</li> </ul>	<ul style="list-style-type: none"> <li>• Humidity readings are instrumental in measuring air quality and comfort.</li> <li>• This mode intelligently decides when overnight conditions are ideal to flush stale air from areas. .</li> <li>• <b>Air Quality Enhancement Mode</b> prioritizes fresh air dilution throughout daily operating times. <b>Reverse Economizing</b> control maximizes fresh air ventilation while maintaining normalized space temperature conditions.</li> </ul>

	<b>Observations</b>	<b>Recommened Action</b>	<b>Impact</b>
 <b>EXHAUST</b>	<ul style="list-style-type: none"> <li>• Night Purge controls sequences with classroom equipment are not present nor coordinated with exhaust fan operation.</li> <li>• This building is not equipped with any building pressure measurement sensors.</li> </ul>	<ul style="list-style-type: none"> <li>• Setup custom programming to synchronize exhaust fan operation with Night Purge control functions.</li> <li>• Building pressure measurement sensors should be installed in key areas of the building.</li> </ul>	<ul style="list-style-type: none"> <li>• Increasing air changes via coordinated Night Purge and exhaust fan operation eliminates undesired air contaminants.</li> <li>• Measurement of building pressure allows for the practice of ventilation strategies without creating excessive pressure conditions.</li> </ul>
 <b>CONTAIN</b>	<ul style="list-style-type: none"> <li>• Most classroom units are not equipped with any cooling functionality. They are designed as heating only units.</li> <li>• Discharge Air Reset programming is active and controlling based on zone damper VAV demand.</li> </ul>	<ul style="list-style-type: none"> <li>• Install a facility level cooling system. The cooling availability should focus on serving classroom areas.</li> <li>• The RTU reset programming should be modified to prioritize increased ventilation sequences.</li> </ul>	<ul style="list-style-type: none"> <li>• Availability of cooling systems provides access to additional ventilation and humidity control strategies.</li> <li>• New reset control strategies calculate discharge air setpoints while incorporating increased air ventilation priorities.</li> </ul>
 <b>CLEAN</b>	<ul style="list-style-type: none"> <li>• The air handling equipment at the school is currently equipped with Standard MERV-10 efficiency air filtration.</li> <li>• Classroom units are equipped with MERV-10.</li> </ul>	<ul style="list-style-type: none"> <li>• Upgrade air handling units with MERV-13 rated filters and install Bi-Polar Ionizing air cleaning devices.</li> <li>• Confirm that all unit ventilators are equipped with rated, high quality filter panels.</li> </ul>	<ul style="list-style-type: none"> <li>• Higher efficiency filtration coupled with a Bi-Polar Ionizer allows for the introduction of proper levels of "fresh" diluted air.</li> <li>• Trane's unit ventilators are designed to accommodate the use of MERV 7 high capacity filters to provide greater filtration of airborne contaminants.</li> </ul>

## Key Findings

### *Fresh Air Ventilation*



#### ***What We Learned***

The general classrooms are setup with heating only, unit-ventilators. The Trane unit ventilator is tested and designed to exceed ASHRAE Standard 62-2001 - Ventilation for Acceptable Indoor Air Quality — as the minimum requirement for ventilation system design. The current unit ventilator filtration rating is unknown. Minimum outdoor air damper positions are fixed at either 0 or 10%. These low-level values limit potential fresh air intake volume.

Controls will be set-up to Night Purge and where applicable to have a Humidification sequences.

Air handling units are utilizing “Discharge Air Temperature Reset” control strategies that are not focused on optimizing ventilation strategies. Nor are they able to effectively control humidity due to no cooling configurations.

#### ***What We Can Do***

Trane implemented introduce additional control modes such as, **Air Quality Enhancement Mode**. When set to “active” by the building operator, this mode will apply newly installed ventilation sequences in local equipment programming as well as in the Tracer Synchrony system. The new ventilation sequences will prioritize the introduction of outdoor air into the building in order to dilute the buildup of indoor air contaminants.

Additionally, should site upgrades include the introduction of a facility level cooling system, these new controllers could deliver even higher air quality performance and efficiency. Mechanical cooling abilities allow for advanced control sequences; maintaining space temperature and humidity levels within recommended ranges while delivering the best air quality.

#### ***What You Can Gain***

Providing the option of activating Air Quality Enhancement Mode allows for a responsive means of HVAC operation as customer’s priorities and situations change. Additional programming modes such

as Reverse Economizing utilizing enhanced ventilation sequences that increases fresh air introduction into the building and dilutes the buildup of indoor contaminants per ASHRAE guidelines.

Introduction of mechanical cooling systems into the “heating-only” equipment will raise building comfort and air quality control to premium levels of performance with advanced indoor temperature and humidity control.

#### *Exhaust System Issues*



#### ***What We Learned***

The schools exhaust fans are controlled via the Tracer Building Control System.

#### ***What We Can Do***

Building pressure measurement devices (not at all the schools) should also be installed in strategic areas such as hallways, the multipurpose room and the main office.

Innovative programming sequences will regulate exhaust fan operation as determined for optimized ventilation.

#### ***What You Can Gain***

Managing building static pressure permits the practice ventilation strategies without creating excessive pressure conditions.

Through improved ventilation practices, stale indoor air and contaminants are exhausted and fresh, filtered outdoor air is drawn into the building.

## Indoor Humidity Control



DILUTE



EXHAUST



CONTAIN



CLEAN

### What We Learned

The Elementary schools are currently not equipped with any facility level cooling system except in a few specified spaces. Consequently, there are no active humidity control sequences for this building. There are no space humidity sensors and no method to track currently this classroom comfort metric as it pertains to humidity control.

### What We Can Do

The investment of installing a facility level cooling system can present several opportunities to regulate and maintain humidity levels as well as classroom comfort within a school. Upgrades to the schools infrastructure represent an investment in the facility as well as the health and well-being of its occupants.

For example, Trane classroom unit ventilators provide a broad range of dehumidification solutions. Active humidity control involves monitoring and managing both the dry bulb temperature and the humidity in the classroom. With this strategy, a re-heat coil is placed downstream of the cooling coil to temper the cool, dehumidified air. This avoids over-cooling and regulates space temperature comfort as well.

Additionally, the installation of humidity sensors throughout the school brings the opportunity to implement Dehumidify and Humidity Pull Down functions in the Tracer Controls system. These control sequences allow opportunities to track and actively respond to space humidity conditions.





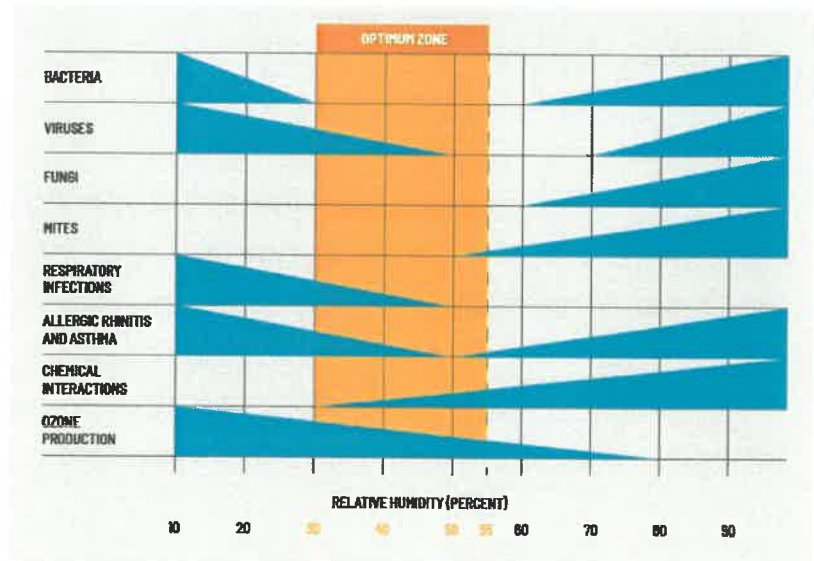
## What You Can Gain

Introduction of a facility level cooling system opens up many opportunities to improve the schools air quality. Though using the boiler system year round can also have a positive impact on the space humidity levels. System upgrades provide access to new humidity control sequences that are not available with the current infrastructure. Optimized temperature and humidity control are key to creating an ideal learning environment. Though as we have learned requires an investment either system wide or retrofit on the existing units.

Keeping indoor humidity levels within the ASHRAE recommended range maximizes occupant comfort, reduces the risk of microbial growth and also helps minimize the presence of organic air contaminants.

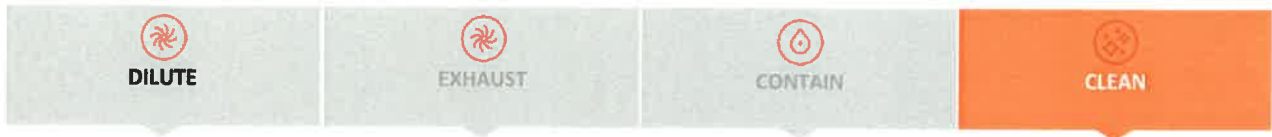
### RELATIVE HUMIDITY AND HEALTH EFFECTS

Decrease in bar width indicates decrease in effect



Source: Health Canada

## ***Air Cleaning and Filtration***



### ***What We Learned***

Existing Air handling units are designed with standard filtration systems and fitted with MERV-8 rated air filters. While the unit air filters were found to be clean and maintained, MERV-8 filters are not designed for microbiological level filtration and cleaning.

Classroom unit filtration ratings are undetermined at this time. However, installed filters appear to be at a MERV4 or 6 level. Specific ratings were not found on inspected filters.

### ***What We Can Do***

Trane's Engineering Specialist have designed methods to enhance air-cleaning performance for a range of equipment and applications. Utilizing the latest technology, existing equipment can be unfitted with Bi-Polar Ionizers. These devices introducing highly ionized air into the space. These ions proactively attack the contaminants at their source as they are introduced into the systems airflow. The result is improved air quality in the area served.

For classroom equipment, we recommend that unit ventilators be equipped with rated filtration panels. Trane's unit ventilator designed to accommodate the use of a MERV 7 high capacity filter to provide greater filtration of airborne contaminants. The Trane unit ventilator is tested and designed to exceed ASHRAE Standard 62-2001. This includes the use of a higher efficiency filtration to help introduce proper levels of "fresh" diluted air for contaminant removal.

### ***What You Can Gain***

Air filtration is a key tenant of recently published ASHRAE guidelines for Indoor Air Quality improvement. Equipping existing air handling units with the latest indoor air quality solutions can provide clean and fresh, high quality air. These devices are easily installed within existing air handling equipment. They can also provide active feedback to the building automation system of ION levels within the air stream.

Utilizing high-level filtration equipment and air cleaning technology will combine with all other strategies to provide a healthy and productive environment for students, teachers and staff.



## Summary

### ***What We Learned***

In our assessment, we found several improvements that can be implemented.

- A. Germantown Elementary Schools were originally designed as a “heating-only” building. To meet modern standards for comfort and air quality control, we advise augmenting the school with a facility level cooling system. By doing so, humidity and comfort control can be dramatically improved.
- B. Air systems are currently limited to basic air filtration standards. Installation of high-level filtration in classrooms coupled with the installation of ionization systems will help create a healthy and more productive environment.

### ***What We Can Do***

Trane can provide engineered solutions to improve ventilation, air quality and building comfort by addressing the issues identified at the school.

### ***What You Can Gain***

Better air quality ensuring the optimum fresh air, proper exhausting of air contaminants, and controlled humidity levels to improve comfort and enhance the learning environment. Building occupants can have peace of mind knowing that the site is utilizing multiple strategies to ensure premium indoor air quality.

## Top Recommendations

Top Recommendations		Estimated Price	Next Steps
1	Provide a facility level cooling system in order to provide increased levels of classroom ventilation and humidity control.	.	.
2	Control exhaust fans throughout the schools using additional programming to do better building pressure control	.	.
3	Update programming to better control ventilation.	.	.
4	Up fit all air handling units with MERV 13 rated filtration and install Bi-Polar Ionic air cleaning devices in all AHUs.	.	.

### **County Line Tuck-pointing**

Below are two quotes for tuck-pointing needed at County Line. The first for \$11,415 will be completed this year out of fund 10 maintenance budget. Pictures below show some of the repairs included in the first quote. The second is for budgeting purposes for work on the north side and the court yard. The second quote work will be included in the 2021/22, 2022/23 and the 2023/24 budgets.



# Holton Brothers, Inc. Contractors

1257 Terminal Road  
Grafton, WI 53024

Phone: 262-377-7887  
Fax: 262-377-0615

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Masonry Repairs - Tuckpointing - Caulking – Waterproofing

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☐ Please check if project is tax exempt (attach certificate of exemption)

Proposal Number AABQ16629

Date Jul 15, 2020

Proposal Submitted To:	Project Site	Your Sales Rep
Germantown School District Maintenance Building N104 W13770 Donges Bay Road Germantown, WI 53022-0893  Attn: Mr. Don Erickson	County Line Road	Thomas F. Holton President 262-377-7887 Tom@holtonbrothers.com

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We hereby propose to furnish, labor, materials, equipment and insurance complete in accordance with the following specifications.

## EXTERIOR RESTORATION

Per our walk-thru on 07-14-20, areas of brick damage on the east and west elevations of the school have been visually inspected by this contractor. It is our opinion that the proper procedure for repair should be as outlined in the following specifications.

### TUCKPOINTING OF BRICK MASONRY (PHOTOS 1 & 2)

All exterior face brick masonry on the east and west elevations shall be inspected and tested for soundness. Mortar joints which are visibly loose or eroded from adjoining brick masonry shall be cut out with a power-driven abrasive wheel to a minimum depth of three-quarter inch (3/4") and as much more as conditions require. After cleaning and flushing with water or compressed air, joints which have been cut out and all voids in mortar shall be filled with special tuckpointing mortar and finished off with a tooled surface to match adjoining areas as closely as possible. Completed work shall be wet down to insure proper curing of the mortar. NOTE: hairline cracks in mortar shall not be deemed defective and are not included in the quote.

### REPLACEMENT OF SEVERELY DAMAGED AND SPALLED BRICK MASONRY (PHOTOS 3 & 4)

Severely damaged and spalled brick masonry shall be chopped out. After proper preparation of areas where brick have been removed, new brick shall be relayed. New brick shall match surrounding brick masonry as closely as possible.

### EXTERIOR CAULKING IN THE FOLLOWING AREAS (PHOTO 5)

1) Defective vertical joints in concrete sills

The above mentioned areas in the courtyard shall be sealed with Tremco Dymonic, a one part urethane sealant. Sealant shall be white or colored as required to match existing work.

Joint backing where necessary shall be close-cell, non-staining polyethylene in round or square shapes, such as ethafoam joint backing. Joint backing shall be compatible with sealants used.

#### PREPARATION OF JOINTS

Building joints shall be examined prior to application and any conditions detrimental to achieving a positive weather-tight seal shall be remedied.

All openings, joints or channels to be sealed shall be thoroughly clean, dry and free from dust, oil, grease or any other foreign matter.

Where joints are deeper than 1/2", polyethylene joint backing shall be used and packed into the joint at within 1/2" of the surface. A size shall be selected so as to allow for a minimum of 30% compression of the backing when inserted into the joint. Where joints are 3/4" wide, the backing shall be placed so the depth of the joint to receive the sealants does not exceed 1/4".

#### APPLICATION OF SEALANTS

Sealants shall be gun applied through a nozzle of such diameter so the full bead of sealant is gunned into the joint, filling the joint completely.

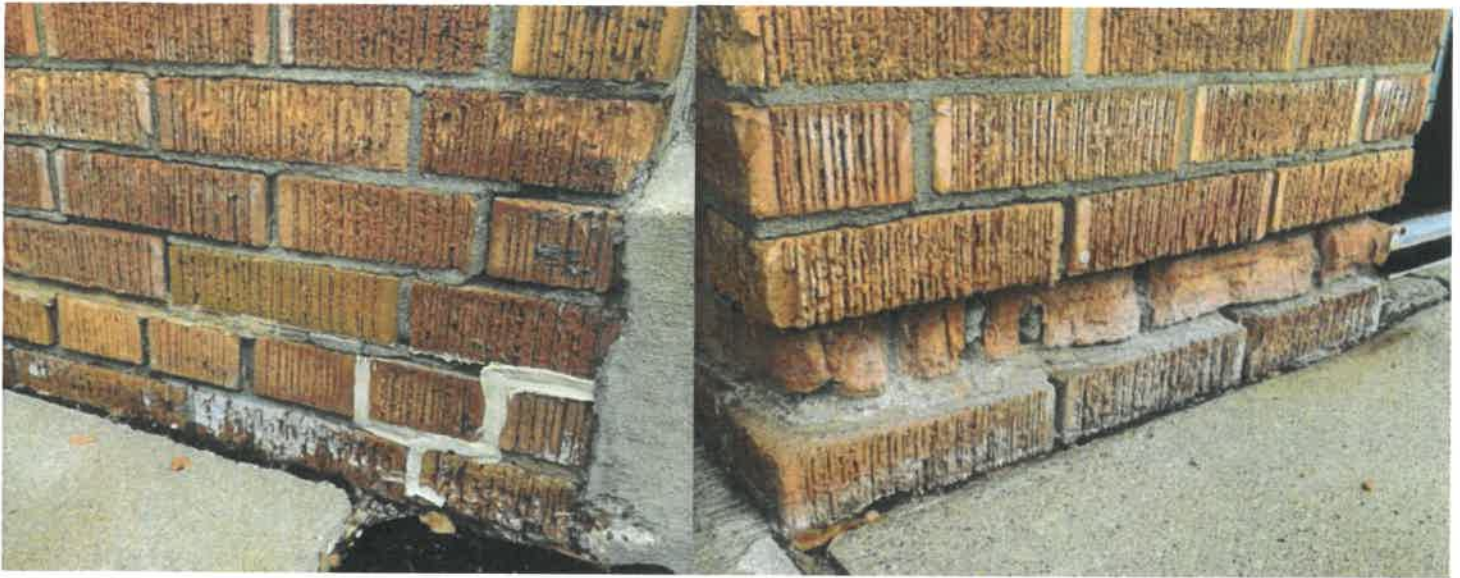
All beads shall be tooled immediately after application to insure firm, full contact with the inner faces of the joints. Excess material shall be struck off with a tooling stick or knife.

The finished bead shall be flush with the surfaces or as otherwise indicated. Caulking shall be outlined with masking tape so as to obtain a neat and uniform appearance. Movement and structural cracks which are caulked shall be dusted with a fine grade lake sand so as to attain the appearance as closely as possible of mortar.

<b>SubTotal</b>	<b>\$11,415.00</b>
<b>Total</b>	<b>\$11,415.00</b>









# Holton Brothers, Inc. Contractors

1257 Terminal Road  
Grafton, WI 53024

Phone: 262-377-7887  
Fax: 262-377-0615

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## Masonry Repairs - Tuckpointing - Caulking - Waterproofing

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☐ Please check if project is tax exempt (attach certificate of exemption)

Proposal Number AABQ16660

Date Jul 20, 2020

<b>Proposal Submitted To:</b>	<b>Project Site</b>	<b>Your Sales Rep</b>
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Germantown School District  
Maintenance Building  
N104 W13770 Donges Bay Road  
Germantown, WI 53022-0893

County Line School  
"2021 Repairs"

Thomas F. Holton

President

262-377-7887

Tom@holtonbrothers.com

Attn: Mr. Don Erickson

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We hereby propose to furnish, labor, materials, equipment and insurance complete in accordance with the following specifications.

### **EXTERIOR RESTORATION**

Per our walk-thru on 07-14-20, areas of brick damage on the north elevation and inner courtyard of the school have been visually inspected by this contractor. It is our opinion that the proper procedure for repair should be as outlined in the following specifications.

### **TUCKPOINTING OF BRICK MASONRY**

All exterior face brick masonry shall be inspected and tested for soundness. Mortar joints which are visibly loose or eroded from adjoining brick masonry shall be cut out with a power-driven abrasive wheel to a minimum depth of three-quarter inch (3/4") and as much more as conditions require. After cleaning and flushing with water or compressed air, joints which have been cut out and all voids in mortar shall be filled with special tuckpointing mortar and finished off with a tooled surface to match adjoining areas as closely as possible. Completed work shall be wet down to insure proper curing of the mortar. NOTE: hairline cracks in mortar shall not be deemed defective and are not included in the quote.

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The finished bead shall be flush with the surfaces or as otherwise indicated. Caulking shall be outlined with masking tape so as to obtain a neat and uniform appearance. Movement and structural cracks which are caulked shall be dusted with a fine grade lake sand so as to attain the appearance as closely as possible of mortar.

**COST BREAKDOWN**

North elevation repairs .....	<b>\$17,235.00</b>
Inner courtyard repairs .....	<b>\$19,010.00</b>

<b>Total</b>	<b>SEE COST ABOVE</b>
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**Germantown High School LED Lights**

A walk through of the Germantown High School halls was performed with Energy Performance Lighting for an estimate to change the lights to LED, see below. The estimate is broken down to allow areas to be completed as funding permits. The first floor halls will be replaced this year out of the maintenance fund 10 budget for \$9,999.46 with a return of \$247.80 from incentives to lower the net cost to \$9,751.66.





*Energy Performance Lighting*

243 Bonnie Road  
Cottage Grove, WI 53527  
608-661-5555

*Lighting Upgrade Proposal*  
**Germantown High School**  
**Hallways**



*Assessment & Proposal by:*

**Phil Spurley**  
**Energy Performance Lighting**  
**608-661-5555**

**August 4, 2020**



### Costs / Savings Summary

Germantown High School Primary Scope	All Remaining Halls	1st Floor	2nd Floor-A Wing	Add New Recessed Cans by Door 10, Stairwells, 2nd Floor B wing & 3rd
Current Energy Costs	\$ 3,810.47	\$ 1,437.95	\$ 2,421.28	\$ 2,639.96
Projected Energy Costs	\$ 2,212.44	\$ 373.93	\$ 773.66	\$ 970.60
Energy Savings	\$ 3,598.03	\$ 862.02	\$ 1,647.62	\$ 1,689.36
Costs of Project	\$ 30,002.21	\$ 9,999.46	\$ 9,998.57	\$ 14,799.24
Incentive Estimate	\$ (682.99)	\$ (247.80)	\$ (224.60)	\$ (217.19)
Net Cost	\$ 29,313.22	\$ 9,751.66	\$ 9,774.57	\$ 14,582.05
Annual Maintenance Savings	\$ 1,076.46	\$ 994.12	\$ 133.09	\$ 800.23
Total Annual Savings	\$ 4,674.49	\$ 1,856.14	\$ 1,800.71	\$ 2,489.61
Simple Payback	6.3	5.3	5.4	5.9
Rated Life	25 Years	25 years	25 years	25 years
Warranty	3 year	3 year	3 year	3 year

**\*Key Notes**

- EPL utilized a blended kWh rate of \$0.10

**GERMANTOWN SCHOOL DISTRICT**

**TO:** Building Committee

**TOPIC:** Fund 41 Capital Projects List

**FROM:** Brittany Altendorf

**BUILDING COMMITTEE MEETING:**  
August 10, 2020

**DATE:** August 6, 2020

**AGENDA ITEM:** VI. A.

**ATTACHMENTS:** Prioritized Capital Projects List from Don Erickson, Director of Buildings & Grounds

**RECOMMENDATION:** Recommendation to delay any approval or decisions on the Fund 41 Capital Projects priority list and fund budget until the November 9, 2020 Building Committee meeting.

## District Project List

Below is the suggested project list in a priority order. The order was determined using the following criteria excluding the service contracts and roofing:

- A. Safety
- B. Building security
- C. Urgency
- D. Ability to be completed using fund 10

- 1) Service Contracts JCI \$37,350 and Trane \$64,739 Total \$102,089
- 2) Roofing \$250,000
- 3) Germantown High School Replace 4 Stair Well Fire Doors and frames. Estimate \$44,656. \$9,164 doors and hardware with a \$2,000 for mag hold open install each opening
- 4) Safety/Lockdown Warning System Loud Areas (Flashing Light?) District Wide \$40,000 WIP
- 5) GHS JV Field Fencing \$19,000 (2019 Quote)
- 6) Bollards Mac Main Entrance & Rock Main Entrance \$17,000
- 7) GHS Door Replacement Lower B-wing 13 Doors \$150,000
- 8) Germantown High School Track Resurface \$114,625
- 9) Sidewalk Repair /Replacement GHS
- 10) District Asphalt Repairs (Playgrounds) MacArthur \$36,162 , Rockfield \$25,428 and County Line \$75,852
- 11) GHS Sprinkler System Practice Fields
- 12) Additional Cameras at Elementary Schools
- 13) Administration A.C. \$56,000 Does Not Include Board Room Unit
- 14) County Line Air Conditioning New AHU Unit Music Room \$50,000
- 15) GHS Soccer Field
- 16) KMS Outbuildings – New Siding \$10,000
- 17) Pella Window Replacements to Store Front Windows \$20,000
- 18) County Line Vestibule Door 10 \$7,000
- 19) Kennedy Middle Dugouts \$38,864
- 20) Amy Belle Overflow Parking Lot \$60,000
- 21) Kennedy Middle Track \$150,000
- 22) Administration HAVC Control Upgrade \$52,000
- 23) KMS Blue Gym Floor Replacement to Match Elementary Gyms \$120,000
- 24) Continue Kennedy Middle School LED Lighting Upgrade \$10,000 each year until complete
- 25) Kennedy Middle School G-wing VAV replacement
- 26) Continued Flooring Replacement \$10,000
- 27) County Line Tuck-pointing \$36,335
- 28) Germantown High School Hall LED Light Upgrade \$24,798