May 20, 2021
Revised June 3, 2021

Londell Pease
Senior Planner
City of Bloomington Minnesota
1800 West Old Shakopee Road
Bloomington, Minnesota 55431-3027

Re: Independent School District #271
Jefferson-Olson Mechanical Plant
Re: Permit Application No. PRBD202104233
Commission No. 202115

Dear Londell:

The above mentioned project includes the installation of two chillers and evaporative cooling tower to provide a central cooling plant for Olson Elementary School, Olson Middle School, and Jefferson High School. As requested, we have performed a noise impact study to demonstrate compliance with Ordinance No. 2016-8, Article IV: Noise Code, section 10.29.02.

Attachment 1 is a site plan showing the location of the proposed chiller building and cooling towers in relation to the neighboring properties.

Attachment 2 contains the product data for the basis-of-design cooling towers that will be located on the roof as shown on the site diagram. The sound power levels included in this product data were used in Attachment 3 to calculate the A-weighted sound pressure level at the property line in dBA.

Attachment 3 contains sound analysis at the property line for one cooling tower in operation, two cooling towers in simultaneous operation, and four cooling towers in simultaneous operation. The sound analysis was performed with a distance of 300 feet between the new chiller building and the property line as shown in Attachment 1.

As stated above, the proposed chiller building will include installation of two cooling towers. The chiller building includes space for two additional cooling towers to be installed in the future when all buildings are connected to the new chilled water plant. Upon completion of this project, two cooling towers operating at peak capacity would result in 44 dBA at the residential property line. When the chiller plant is connected to all buildings in the future, two additional cooling towers will be in operation. All four cooling towers operating at peak capacity would result in 47 dBA at the residential property line.

Since the cooling towers are only in operation when temperatures are warm enough to require mechanical cooling in the building HVAC systems, the chiller plant will mostly be in operation from May through September. A significant portion of the time the plant is in operation, it will not be operating at full capacity. Outside air temperature and occupancy levels will frequently only require that one of the cooling towers is in operation. One cooling tower operating at peak capacity would result in 40 dBA at the residential property line. Based on the occupancy and expected cooling demand that late at night, we would expect that at most two cooling towers would be in operation at night. In most cases one or none of the cooling towers would be in operation after 10:00 p.m. Overnight, the cooling towers would typically be off to conserve energy except on very warm nights.

We hope this study provides adequate information to satisfy Ordinance No. 2016-8, Article IV: Noise Code, section 10.29.04. Feel free to contact me directly with any additional questions relating to this noise impact study.

Sincerely,

Wold Architects and Engineers

Kyle Edsten | P.E.
Associate

Enclosures

cc: Tim Rybak, ISD#271
Kent Henry, KA
Andrew Dahlquist, Wold
Patrick Triggs, Wold
Joseph Matlock, Wold
Noa Nelson, Wold

LW/ISD_271/202115/crsp/jun21

ATTACHMENT 1

Sunde Land Surveying, LLC.
9001 East Bloomington Freeway (35W) • Suite 118
Bloomington, Minnesota 55420-3435
Business: 612/881-2455 • FAX: 612/888-9526

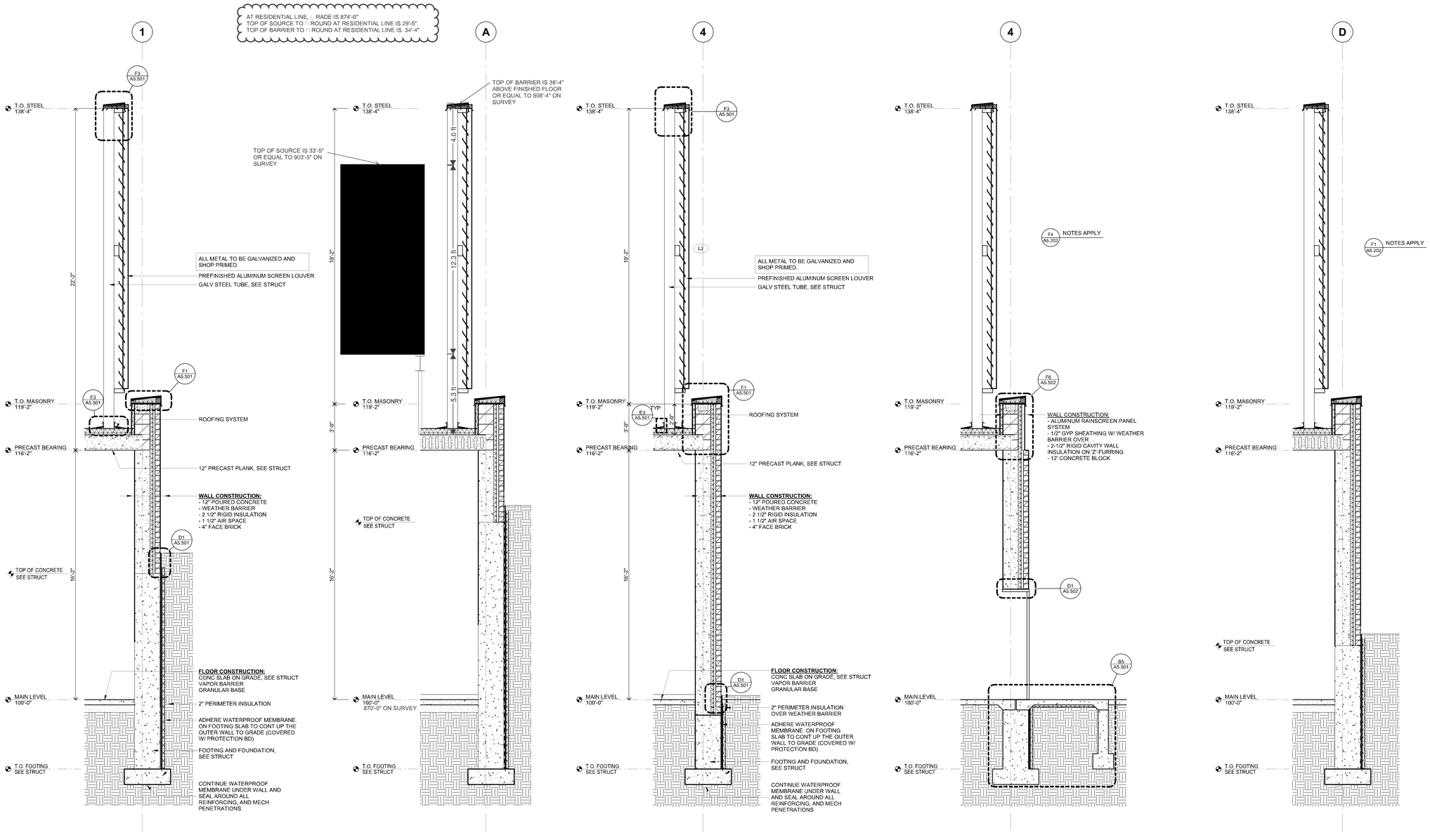
SCALE IN FEET
30 0 30 60

COOLING TOWERS CT-1, CT-2, CT-3, CT-4 ACTIVE: APPROXIMATE SOUND RATING 52dBA AT RESIDENTIAL LINE
COOLING TOWERS CT-1, CT-2, ACTIVE: APPROXIMATE SOUND RATING 50dBA AT RESIDENTIAL LINE
COOLING TOWERS CT-1 ACTIVE: APPROXIMATE SOUND RATING 46dBA AT RESIDENTIAL LINE

LITTLE ROAD
JOHNSON AVE.
102ND STREET WEST
102ND STREET
NE COR OF NW 1/4 OF NE 1/4 OF SEC. 19
NORTH LINE OF THE NE 1/4 OF SEC. 19
N89°38'09"E 1320.42
STREET EASEMENT PER DOC. NO. 3614033
STREET EASEMENT PER DOC. NO. 6675340
E. LINE OF W. 870 FT. OF NW 1/4 OF NE 1/4 OF SEC. 19, TWP. 27, RGE. 24
(ISSUE ADDRESSED IN W.D. NO. 3317355) GAP BY VIRTUE OF DESCRIPTION
OVERLAP BY VIRTUE OF DESCRIPTION (ISSUE ADDRESSED IN W.D. NO. 3317355)
LINE 40 S. AND PARALLEL WITH NORTH LINE OF NE 1/4 OF SEC 19
A LINE PARALLEL WITH E. LINE OF NW 1/4 OF NE 1/4 OF SEC. 19
DRAINAGE AND STORM SEWER EASEMENT PER DOC. NO. 5456422
POND
R=90°28'14" R=80.00 L=126.32
PERMANENT STREET EASEMENT PER DOC. NO. 3613983
HILL AVENUE
LINE 430 SOUTH AND PARALLEL WITH NORTH LINE OF NW 1/4 OF NE 1/4 OF SEC. 19
S. LINE OF N. 511.5 FT. OF NE 1/4 OF NE 1/4 OF SEC. 19
EAST LINE OF THE NW 1/4 OF THE NE 1/4 OF SEC. 19
E. LINE OF NW 1/4 OF NE 1/4 OF SEC. 19
ROAD EASEMENT PER DOC. NO. 3635543
1741.97
JOHNSON CIRCLE
JOHNSON SWAN
OLSON ELEMENTARY
4501 102ND STREET
OLSON JR. HIGH
4551 102ND STREET
MATCH LINE SEE SHEET 1
MATCH LINE SEE SHEET 4
E 1/4 OF SEC. 19
NE 1/4 OF SEC. 19
CT-1
CT-2
CT-3
CT-4
5 FT. CHAIN LINK FENCE
4 FT. CHAIN LINK FENCE
12 FT. CHAIN LINK FENCE
18 FT. CHAIN LINK FENCE
6 FT. CHAIN LINK FENCE
DRIVEWAY
GRAVEL
CONCRETE
SIDEWALK
BITUMINOUS

FOR REFERENCE ONLY
NOT FOR CONSTRUCTION

MN



F1 WALL SECTION AT NORTH WALL 3/8" = 1'-0"

F2 WALL SECTION AT WEST WALL 3/8" = 1'-0"

F4 WALL SECTION AT SOUTH WALL 3/8" = 1'-0"

F6 WALL SECTION AT SOUTH WALL DOOR 3/8" = 1'-0"

F7 WALL SECTION AT EAST WALL 3/8" = 1'-0"

A

Jefferson-Olson Mechanical Plant
4551 West 102nd Street
Bloomington, MN 55437

Independent School District #271
1350 West 106th Street
Bloomington, MN 55431

WOLD ARCHITECTS AND ENGINEERS
332 Minnesota Street, Suite W2000
Saint Paul, MN 55101
woldae.com | 651 227 7773

I hereby certify that this plan, specification or report was prepared by me or under my direct supervision and that I am a duly Licensed **ARCHITECT** under the laws of the State of **Minnesota**

Paul Aplikowski
License Number: **42737** Date: **Issue Date**

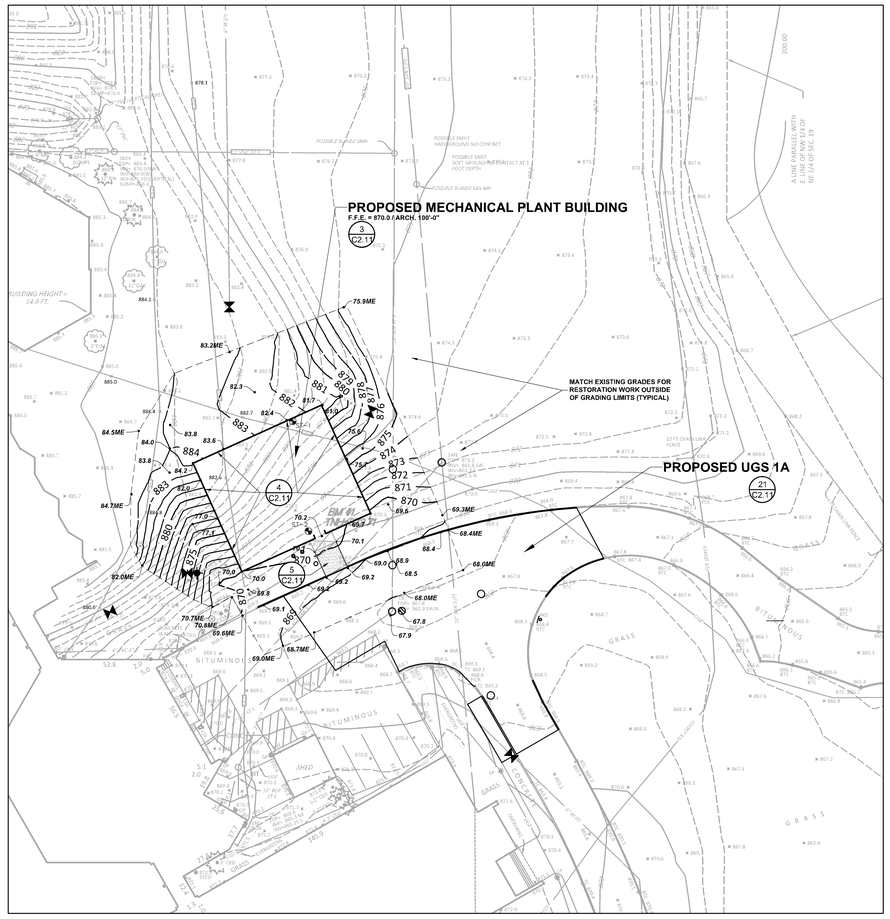
Revisions		
Description	Date	Num

Comm: **202115**
Date: **03/31/21**
Drawn: **SH**
Check: **PT**
North

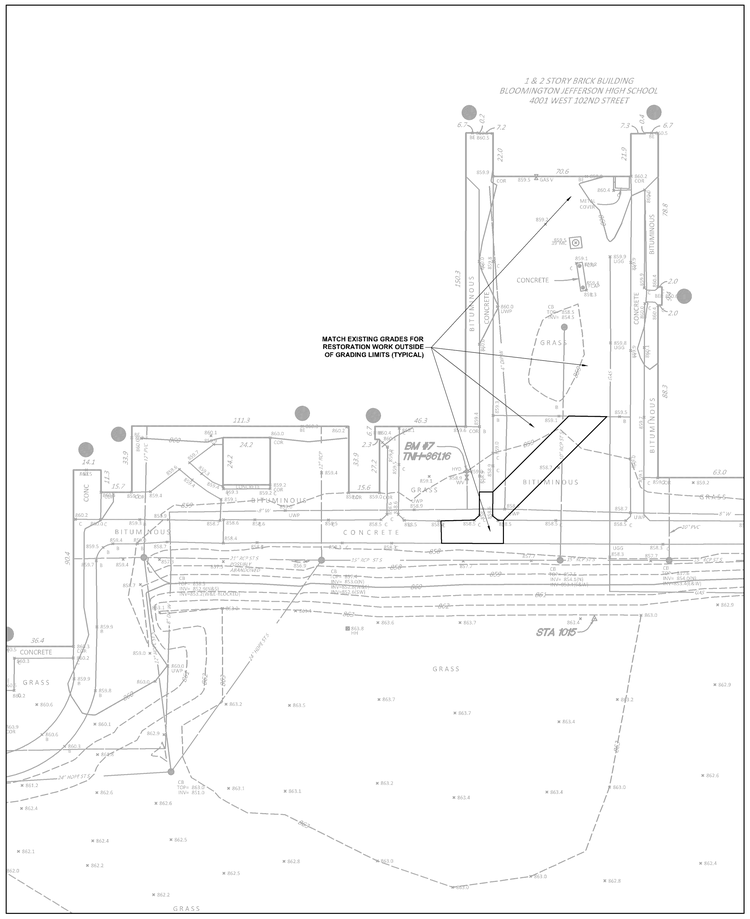
WALL SECTIONS

Scale: **3/8" = 1'-0"**

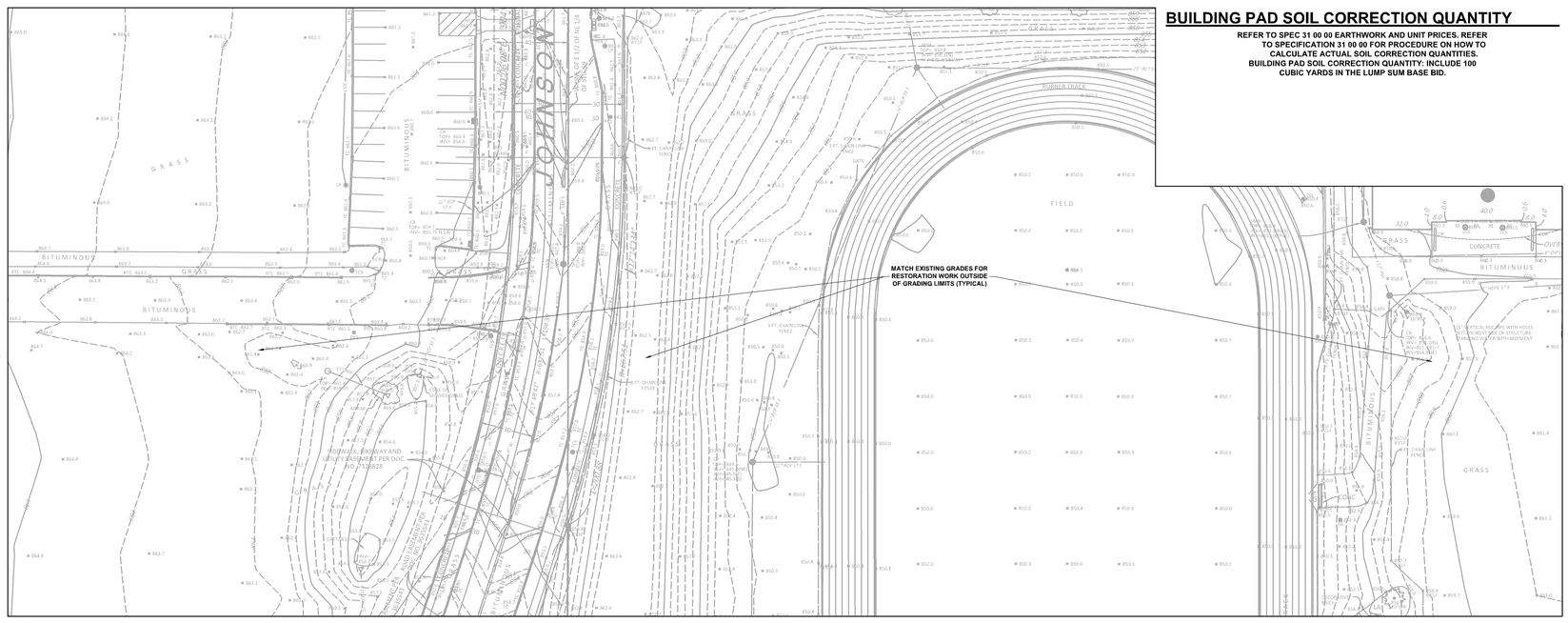
A5.202



1 C1.11 **WEST GRADING AND DRAINAGE PLAN - OLSON MS**



2 C1.11 **EAST GRADING AND DRAINAGE PLAN - JEFFERSON HS**



3 C1.11 **CENTRAL GRADING AND DRAINAGE PLAN - OLSON MS & JEFFERSTON HS**

BUILDING PAD SOIL CORRECTION QUANTITY

REFER TO SPEC 31 00 00 EARTHWORK AND UNIT PRICES. REFER TO SPECIFICATION 31 00 00 FOR PROCEDURE ON HOW TO CALCULATE ACTUAL SOIL CORRECTION QUANTITIES. BUILDING PAD SOIL CORRECTION QUANTITY: INCLUDE 100 CUBIC YARDS IN THE LUMP SUM BASE BID.

GENERAL NOTES

1. ALL CONSTRUCTION MUST COMPLY WITH APPLICABLE STATE AND LOCAL ORDINANCES.
2. THE CONTRACTOR WILL BE RESPONSIBLE FOR AND SHALL PAY FOR ALL CONSTRUCTION STAKING / LAYOUT.
3. THE CONTRACTOR SHALL OBTAIN AND PAY FOR ALL RELATED CONSTRUCTION PERMITS, INCLUDING THE NPDES PERMIT FROM THE MPCA. SUBMIT A COPY OF ALL PERMITS TO THE CITY.
4. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL TRAFFIC CONTROL SIGNAGE (CONSTRUCTION ZONES) NECESSARY TO CONSTRUCT PROPOSED IMPROVEMENTS. ALL SIGNAGE LAYOUTS MUST BE DESIGNED BY THE CONTRACTOR AND APPROVED BY LOCAL AUTHORITIES.
5. INSTALL CONTROL FENCING AND BARRICADING AS NECESSARY TO PROTECT THE PUBLIC.
6. INSPECT SITE AND REVIEW SOIL BORINGS TO DETERMINE EXTENT OF WORK AND NATURE OF MATERIALS TO BE HANDLED.
7. REFER TO SPECIFICATIONS FOR DEWATERING REQUIREMENTS.
8. CHECK ALL PLAN AND DETAIL DIMENSIONS AND VERIFY SAME BEFORE FIELD LAYOUT.
9. REFER TO ARCHITECTURAL PLANS FOR BUILDING AND STOOP DIMENSIONS AND LAYOUT.
10. REFER TO THE STORM WATER POLLUTION PREVENTION PLAN (SWPPP) NARRATIVE, PART OF SECTION 01 89 13, FOR EROSION CONTROL REQUIREMENTS. SECTION 31 00 00 SHALL BE RESPONSIBLE FOR FULL IMPLEMENTATION OF THE SWPPP.
11. MAINTAIN ADJACENT PROPERTY AND PUBLIC STREETS CLEAN FROM CONSTRUCTION CAUSED DIRT AND DEBRIS ON A DAILY BASIS. PROTECT DRAINAGE SYSTEMS FROM SEDIMENTATION AS A RESULT OF CONSTRUCTION RELATED DIRT AND DEBRIS.
12. MAINTAIN DUST CONTROL DURING GRADING OPERATIONS.
13. ALL EROSION CONTROL METHODS SHALL COMPLY WITH MPCA AND LOCAL REGULATIONS.
14. CONTRACTOR SHALL MINIMIZE DISTURBANCE TO SITE AND PROTECT EXISTING SITE FEATURES (INCLUDING TURF AND VEGETATION) WHICH ARE TO REMAIN.
15. PROPOSED CONTOURS AND SPOT ELEVATIONS ARE SHOWN TO FINISH GRADE UNLESS OTHERWISE NOTED.
16. PROPOSED ELEVATIONS SHOWN TYPICALLY AS 60.1 OR 60 SHALL BE UNDERSTOOD TO MEAN 860.1 OR 860.
17. SPOT ELEVATIONS SHOWN IN PARKING LOTS, DRIVES AND ROADS INDICATE GUTTER GRADES, UNLESS NOTED OTHERWISE. SPOT ELEVATIONS WITH LABELS OUTSIDE THE BUILDING PERIMETER INDICATE PROPOSED GRADES OUTSIDE THE BUILDING. SPOT ELEVATIONS WITH LABELS INSIDE THE BUILDING PERIMETER INDICATE PROPOSED FINISH FLOOR ELEVATIONS.
18. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR DETERMINING QUANTITIES OF CUT, FILL AND WASTE MATERIALS TO BE HANDLED, AND FOR AMOUNT OF GRADING TO BE DONE IN ORDER TO COMPLETELY PERFORM ALL WORK INDICATED ON THE DRAWINGS. IMPORT SUITABLE MATERIAL AND EXPORT UNSUITABLE / EXCESS / WASTE MATERIAL AS REQUIRED. ALL COSTS ASSOCIATED WITH IMPORTING AND EXPORTING MATERIALS SHALL BE INCIDENTAL TO THE CONTRACT.
19. NO FINISHED SLOPES SHALL EXCEED 3' HORIZONTAL TO 1' VERTICAL (3:1), UNLESS OTHERWISE NOTED.
20. ALL DISTURBED AREAS OUTSIDE THE BUILDING PAD WHICH ARE NOT DESIGNATED TO BE PAVED SHALL RECEIVE AT LEAST 6" OF TOPSOIL AND SHALL BE SODDED.
21. WHERE NEW SOD MEETS EXISTING SOD, EXISTING SOD EDGE SHALL BE CUT TO ALLOW FOR A CONSISTENT, UNIFORM STRAIGHT EDGE. JAGGED OR UNEVEN EDGES WILL NOT BE ACCEPTABLE. REMOVE TOPSOIL AT JOINT BETWEEN EXISTING AND NEW AS REQUIRED TO ALLOW NEW SOD SURFACE TO BE FLUSH WITH EXISTING.
22. FAILURE OF TURF DEVELOPMENT: IN THE EVENT THE CONTRACTOR FAILS TO PROVIDE AN ACCEPTABLE TURF, THE CONTRACTOR SHALL RE-SOD ALL APPLICABLE AREAS, AT NO ADDITIONAL COST TO THE OWNER, TO THE SATISFACTION OF THE ENGINEER.
23. ANY MANHOLE, CATCH BASIN, STORM SEWER, SANITARY SEWER, DRAINTILE OR OTHER POTENTIAL SOURCE FOR CONTAMINATION SHALL BE INSTALLED AT LEAST 10 FEET HORIZONTALLY FROM ANY WATERMAIN PER MINNESOTA PLUMBING CODE. THIS ISOLATION DISTANCE SHALL BE MEASURED FROM THE OUTER EDGE OF THE PIPE TO THE OUTER EDGE OF THE CONTAMINATION SOURCE (OUTER EDGE OF STRUCTURES OR PIPING OR SIMILAR).
24. LOCATE ALL EXISTING UTILITIES, VERIFY LOCATION, SIZE AND INVERT ELEVATION OF ALL EXISTING UTILITIES. VERIFY LOCATIONS, SIZES AND ELEVATIONS OF SAME BEFORE BEGINNING CONSTRUCTION.

LEGEND

- REFERENCE KEY TO SITE DETAILS — DETAIL I.D NUMBER (TOP) / DETAIL SHEET NUMBER (BOTTOM)
- EXISTING CONTOUR
- EXISTING SPOT ELEVATION
- PROPOSED CONTOUR
- PROPOSED SPOT ELEVATION — ME = MATCH EXISTING; EOF = EMERGENCY OVERFLOW
- PROPOSED GRADING LIMITS
- PROPOSED SAND SUBBASE AT FROST FOOTED STOOPS (5 / C2.11)
- APPROXIMATE SOIL BORING LOCATION
- PROPOSED MANHOLE (MH) (12 / C2.11) (14 / C2.11)
- PROPOSED CATCH BASIN (CB) (15 / C2.11)
- PROPOSED HYDRANT (HYD) (9 / C2.11)
- PROPOSED GATE VALVE (GV) (10 / C2.11)
- PROPOSED BUILDING STOOP - REFER TO ARCHITECTURAL PLANS
- PROPERTY LINE

BENCHMARKS - OLSON MS (FIELD VERIFY BEFORE USING)

1.) Top of top nut of fire hydrant northeast of loading dock, north of ring road, 120± feet from Olson Middle School. Elevation = 872.71 feet

2.) Top of top nut of fire hydrant on east side of ring road, 50± feet east of Olson Middle School, north of southwest baseball diamond. Elevation = 872.96 feet

3.) Top of top nut of fire hydrant west side of Johnson Avenue South near west drive entrance to Jefferson High School. Elevation = 865.87 feet

BENCHMARKS - JEFFERSON HS (FIELD VERIFY BEFORE USING)

1.) Top of top nut of fire hydrant 45 feet +/- westerly of a northwest corner of Jefferson High School. Elevation = 874.47 feet

2.) Top of top nut of fire hydrant west of Jefferson High School and northeast of track. Elevation = 866.37 feet

3.) Top of top nut of fire hydrant west side of Johnson Avenue South near west drive entrance to Jefferson High School. Elevation = 865.87 feet

4.) Top of top nut of fire hydrant south of the southwest corner of the northeast parking lot and 95 feet +/- northwesterly of building entrance #2. Elevation = 872.62 feet

5.) Top of top nut of the first fire hydrant south of West 102nd Street on the west side of France Avenue South. Elevation = 875.58 feet

6.) Top of top nut of fire hydrant 10 feet +/- south of the southeast corner of Jefferson High School. Elevation = 861.13 feet

7.) Top of top nut of fire hydrant lying 50 feet +/- southeast of building entrance #18. Elevation = 861.16 feet

0 15 30

Jefferson-Olson Mechanical Plant
4001 West 102nd Street
Bloomington, MN 55437

Independent School District 271
1350 West 106th Street
Bloomington, MN 55431

Wold

WOLD ARCHITECTS AND ENGINEERS
332 Minnesota Street, Suite W2000
Saint Paul, MN 55101
woldae.com | 651.227.7773

AJA
ANDERSON - JOHNSON ASSOCIATES, INC.
A BOLTON & MENK COMPANY

I hereby certify that this plan, specification or report was prepared by me or under my direct supervision and that I am a duly Licensed PROFESSIONAL ENGINEER under the laws of the State of MINNESOTA

DAVID A. REY
Registration Number 40180 Date 03/31/2021

Revisions		
Description	Date	Num.

Comm.: 202115
Date: 03/31/2021
Drawn: MET
Check: DAR

North

GRADING AND DRAINAGE PLAN

Scale: 1" = 30'

C1.31

Baltimore Aircoil Company

Cooling Tower Selection Report

Version:	8.11.0 NA
Product data correct as of:	October 15, 2020
Project Name:	ISD 271
Selection Name:	1222 - 40hp
Project State/Province:	Minnesota
Project Country:	United States
Date:	October 23, 2020

Model Information

Product Line:	Series 3000
Model:	S3E-1222-07P
Number of Units:	1
Fan Type:	Standard Fan
Fan Motor:	(1) 40.00 = 40.00 HP/Unit
Total Standard Fan Power:	Full Speed, 40.00 BHP/Unit
IBC 2018 Code Compliance:	No
California OSHPD Project:	No
Special Seismic Certification:	No
Intake Option:	None
Internal Option:	None
Discharge Option:	None

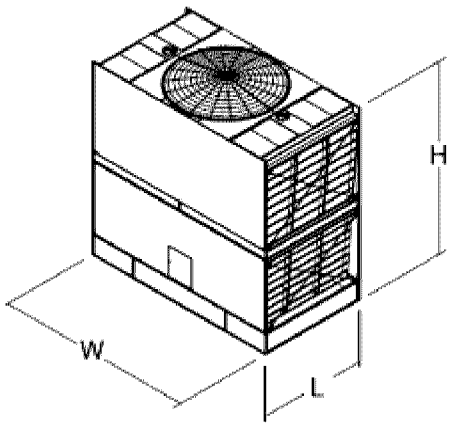
Design Conditions

Flow Rate:	1,800.00	USGPM
Hot Water Temp.:	95.00	°F
Cold Water Temp.:	85.00	°F
Wet Bulb Temp.:	78.00	°F
Tower Pumping Head:	4.91	psi
Reserve Capability:	1.23	%
Heat Rejection:	8,996,400	BTUH

Thermal performance at design conditions and standard total fan motor power is certified by the Cooling Technology Institute (CTI).

Engineering Data, per Unit

Unit Length:	11' 09.75"	
Unit Width:	21' 06.50"	
Unit Height:	12' 03.00"	
Air Flow:	149,530	CFM
Approximate Shipping Weight:	12,330	pounds
Heaviest Section:	12,330	pounds
Approximate Operating Weight:	25,360	pounds
Heater kW Data (Optional)		
0°F (-17.8°C) Ambient Heaters:	(2) 10	kW
-20°F (-28.9°C) Ambient Heaters:	(2) 14	kW



Minimum Distance Required for Single Unit:
(For multiple units, refer to Layout Guidelines)

From Solid Wall:	6.5 ft.
From 50% Open Wall:	3 ft.

Energy Rating:
54.58 per ASHRAE 90.1, ASHRAE 189 and CA Title 24.

Note: These unit weights and dimensions account for the selected fan type for the standard cataloged drive configuration, but they do not account for other options/accessories. Please contact your local BAC sales representative for weights and dimensions of units with other options/accessories.

Baltimore Aircoil Company

Cooling Tower Selection Report

Version: 8.11.0 NA
Product data correct as of: October 15, 2020

Project Name: ISD 271
Selection Name: 1222 - 40hp
Project State/Province: Minnesota
Project Country: United States
Date: October 23, 2020

Model & Fan Motor

Product Line: Series 3000
Model: S3E-1222-07P
Number of Units: 1
Fan Motor: (1) 40.00 = 40.00 HP/Unit
Total Standard Fan Power: Full Speed, 40.00 BHP/Unit

Model Accessories and Code Compliance

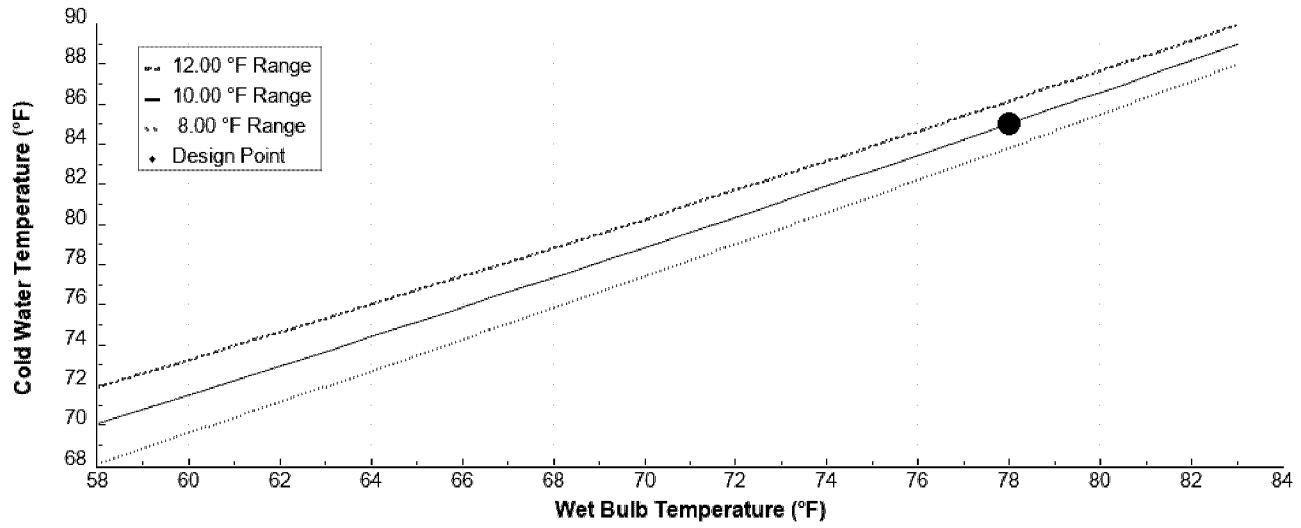
IBC 2018 Code Compliance: No
California OSHPD Project: No
Special Seismic Certification: No
Intake Option: None
Internal Option: None
Discharge Option: None
Fan Type: Standard Fan

Design Conditions @ Standard Total Fan Motor Power per Unit (40.00 HP)

Thermal performance at design conditions and standard total fan motor power is certified by the Cooling Technology Institute (CTI).

Flow Rate: 1,800.00 USGPM
Hot Water Temp.: 95.00 °F
Cold Water Temp.: 85.00 °F
Wet Bulb Temp.: 78.00 °F
Heat Rejection: 8,996,400 BTUH

Predicted Performance
Fan Motor Alternative = Full Speed, 40.00 BHP
Flow Rate = 1800.00 USGPM (100.00% of Design)



These performance curves are based on constant fan power.

Warning	Applies to Design Conditions	Applies to OffDesign Conditions
1. One or more selection parameters are outside of CTI Certification limits.	No	Yes

Baltimore Aircoil Company

Cooling Tower Selection Report

Version: 8.11.0 NA
Product data correct as of: October 15, 2020

Project Name: ISD 271
Selection Name: 1222 - 40hp
Project State/Province: Minnesota
Project Country: United States
Date: October 23, 2020

Model Information

Product Line: Series 3000
Model: S3E-1222-07P
Number of Units: 1
Fan Type: Standard Fan
Fan Motor: (1) 40.00 = 40.00 HP/Unit

IBC 2018 Code Compliance: No
California OSHPD Project: No
Special Seismic Certification: No
Intake Option: None
Internal Option: None
Discharge Option: None

Total Standard Fan Power: Full Speed, 40.00 BHP/Unit

Octave band and A-weighted sound pressure levels (Lp) are expressed in decibels (dB) reference 0.0002 microbar. Sound power levels (Lw) are expressed in decibels (dB) reference one picowatt. Octave band 1 has a center frequency of 63 Hertz.

Top
Sound Pressure (dB)

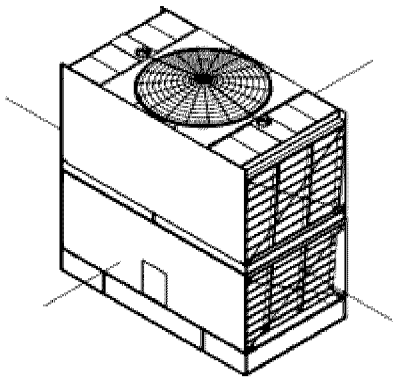
Octave Band	Distance 5 ft.	Distance 50 ft.
1	86	74
2	86	75
3	85	74
4	82	68
5	79	64
6	73	59
7	69	55
8	67	52
A-wgtd	**84**	**71**

Air Inlet
Sound Pressure (dB)

Octave Band	Distance 5 ft.	Distance 50 ft.
1	82	68
2	84	67
3	82	70
4	76	66
5	69	61
6	63	52
7	58	46
8	55	43
A-wgtd	**78**	**67**

End
Sound Pressure (dB)

Octave Band	Distance 5 ft.	Distance 50 ft.
1	79	72
2	79	67
3	77	68
4	70	63
5	65	58
6	58	49
7	51	44
8	48	39
A-wgtd	**73**	**64**



End
Sound Pressure (dB)

Octave Band	Distance 5 ft.	Distance 50 ft.
1	79	72
2	79	67
3	77	68
4	70	63
5	65	58
6	58	49
7	51	44
8	48	39
A-wgtd	**73**	**64**

Air Inlet
Sound Pressure (dB)

Octave Band	Distance 5 ft.	Distance 50 ft.
1	82	68
2	84	67
3	82	70
4	76	66
5	69	61
6	63	52
7	58	46
8	55	43
A-wgtd	**78**	**67**

Total Sound Power (dB)

Octave Band	Center Frequency (Hertz)	Lw
1	63	106
2	125	107
3	250	106
4	500	100
5	1000	96
6	2000	91
7	4000	87
8	8000	84
A-wgtd		**102**

Note: The use of frequency inverters (variable frequency drives) can increase sound levels.
Extra Notes: Sound data provided by CTI ATC-128 sound test code revision 2019

COOLING TOWERS CT-1, CT-2, CT-3, AND CT-4 ACTIVE NORTH OF 102ND STREET. REFER TO ATTACHED SURVEY.

Sums Report

Project Name:
Location:
Building Owner:
Project ID:

Sum 1

Path Name	63Hz	125Hz	250Hz	500Hz	1KHz	2KHz	4KHz	Comments
Path2	49	48	45	37	30	23	16	
Path1	50	49	46	38	31	24	17	
Path3	49	49	46	38	32	24	18	
Path4	50	49	46	38	32	25	18	
Sum	**55**	**55**	**52**	**44**	**37**	**30**	**23**	

NC 42 RC 37(N) 47 dBA

COOLING TOWERS CT-1, AND CT-2 ACTIVE NORTH OF 102ND STREET. REFER TO ATTACHED SURVEY.

Sums Report

Project Name:
Location:
Building Owner:
Project ID:

Sum 1

Path Name	63Hz	125Hz	250Hz	500Hz	1KHz	2KHz	4KHz	Comments
Path2	49	48	45	37	30	23	16	
Path1	50	49	46	38	31	24	17	
Sum	**53**	**52**	**49**	**41**	**34**	**27**	**20**	

NC 39 **RC 34(N)** **44 dBA**

COOLING TOWER CT-1 ACTIVE NORTH OF 102ND STREET. REFER TO ATTACHED SURVEY.

Sums Report

Project Name:
Location:
Building Owner:
Project ID:

Sum 1

Path Name	63Hz	125Hz	250Hz	500Hz	1KHz	2KHz	4KHz	Comments
Path2	49	48	45	37	30	23	16	
Sum	**49**	**48**	**45**	**37**	**30**	**23**	**16**	

NC 35 **RC 30(N)** **40 dBA**

COOLING TOWERS CT-1, CT-2, CT-3, AND CT-4 ACTIVE NORTH OF 102ND STREET.

Paths Report

Project Name:
Location:
Building Owner:
Project ID:

Path2

Element	63Hz	125Hz	250Hz	500Hz	1KHz	2KHz	4KHz	Comments
Custom Element	106	107	106	100	96	91	87	
Outdoor	-50	-50	-50	-50	-50	-50	-50	CT-1
Barrier	-7	-9	-11	-13	-16	-18	-21	Barrier insertion loss
Sum	**49**	**48**	**45**	**37**	**30**	**23**	**16**	

NC 35 **RC 30(N)** **40 dBA**

Path1

Custom Element	106	107	106	100	96	91	87	
Outdoor	-49	-49	-49	-49	-49	-49	-49	CT-2
Barrier	-7	-9	-11	-13	-16	-18	-21	Barrier insertion loss
Sum	**50**	**49**	**46**	**38**	**31**	**24**	**17**	

NC 36 **RC 31(N)** **41 dBA**

Path3

Custom Element	106	107	106	100	96	91	87	
Outdoor	-50	-50	-50	-50	-50	-50	-50	CT-3
Barrier	-7	-8	-10	-12	-14	-17	-19	Barrier insertion loss
Sum	**49**	**49**	**46**	**38**	**32**	**24**	**18**	

NC 36 **RC 31(N)** **41 dBA**

Path4

Custom Element	106	107	106	100	96	91	87	
Outdoor	-50	-50	-50	-50	-50	-50	-50	CT-4
Barrier	-6	-8	-10	-12	-14	-16	-19	Barrier insertion loss
Sum	**50**	**49**	**46**	**38**	**32**	**25**	**18**	

NC 36 **RC 32(N)** **41 dBA**

COOLING TOWERS CT-1, AND CT-2 ACTIVE NORTH OF 102ND STREET.

Paths Report

Project Name:
Location:
Building Owner:
Project ID:

Path2

Element	63Hz	125Hz	250Hz	500Hz	1KHz	2KHz	4KHz	Comments
Custom Element	106	107	106	100	96	91	87	
Outdoor	-50	-50	-50	-50	-50	-50	-50	CT-1
Barrier	-7	-9	-11	-13	-16	-18	-21	Barrier insertion loss
Sum	**49**	**48**	**45**	**37**	**30**	**23**	**16**	

NC 35 **RC 30(N)** **40 dBA**

Path1

Custom Element	106	107	106	100	96	91	87	
Outdoor	-49	-49	-49	-49	-49	-49	-49	CT-2
Barrier	-7	-9	-11	-13	-16	-18	-21	Barrier insertion loss
Sum	**50**	**49**	**46**	**38**	**31**	**24**	**17**	

NC 36 **RC 31(N)** **41 dBA**

COOLING TOWER CT-1 ACTIVE NORTH OF 102ND STREET.

Paths Report

Project Name:
Location:
Building Owner:
Project ID:

Path2

Element	63Hz	125Hz	250Hz	500Hz	1KHz	2KHz	4KHz	Comments
Custom Element	106	107	106	100	96	91	87	
Outdoor	-50	-50	-50	-50	-50	-50	-50	CT-1
Barrier	-7	-9	-11	-13	-16	-18	-21	Barrier insertion loss
Sum	**49**	**48**	**45**	**37**	**30**	**23**	**16**	

NC 35 **RC 30(N)** **40 dBA**