FAN SCHEDULE

MARK	TYPE	AIRFLOW (CFM)	ESP (IN. WG)	DRIVE TYPE	BASIS OF DESIGN			NOTES
					MOTOR (HP)	MANUFACTURER	MODEL NO	
EF-1	ROOF	1940	1.5	BELT	1.0	GREENHECK	GB-180HP-VGD	1,2,3,4

NOTES:
1. DISCONNECT SWITCH
2. PROVIDE FAN SPEED CONTROLLER
3. FAN CONTROLLED THROUGH THE BAS.
4. PROVIDE VARIABLE SPEED FOR BALANCING.

PACKAGED DX ROOF TOP UNITS SCHEDULE WITH GAS HEAT

MARK	SUPPLY FAN				RETURN FAN			NATURAL GAS HEATING					DX COOLING COIL									
	AIRFLOW	OUTSIDE AIR CFM	ESP (IN W.G.)	FAN (HP)	AIRFLOW	ESP (IN W.G.)	FAN (HP)	INPUT MBH	OUTPUT MBH	EFF.	GAS PRESS. IN W.C.	EAT (°F) DB	TOTAL CAPACITY MBH	SENSIBLE CAPACITY MBH	EER	IEER	EAT (°F) DB	EAT (°F) WB	LAT (°F) DB	LAT (°F) WB	MANUF.	MODEL
RTU-1	11,845	2,510	2.0	10.4	11,845	1.5	10.0	NO GAS HEATING FOR RTU-1				59.5	335,634	253,190	10.7	16.2	76.2	65.6	56.7	56.5	DAIKIN	DPSA031
RTU-2	11,470	2,570 △4	2.0	10.4	11,470	1.5	10.0	NO GAS HEATING FOR RTU-2				59.4	345.88	253.64	11.0	15.0	76.2	65.7	56.0	56.0	DAIKIN	DPSA031
RTU-3	5,000	2,100	1.0	3.0	-	-	-	300.0	240.0	80%	14-INCH	51.0	202.18	118.42	10.8	19.5	77.3	68.3	55.6	55.6	DAIKIN	DPS018A

NOTES:
1. PROVIDE VARIABLE FEQUENCY DRIVE (VFD) DIRECT DRIVE PLENUM TYPE SUPPLY AND RETURN FANS FOR BOTH RTU-1 AND RTU-2.
2. PROVIDE INTEGRAL DISCONNECT.
2. MERV 8 FILTERS WITH PERMANENT METAL RACKS.
3. FACTORY INSTALLED DUCT COLLARS.
4. SINGLE POINT POWER CONNECTION.
5. MOTORIZED DAMPERS FOR VENTILATION AIR INTAKE AND RETURN.
6. AIR COOLED CONDENSER CAPACITY BASED ON 95 F OUTDOOR AMBIENT TEMPERATURE.
6. R-410A REFRIGERANT.
7. PACKAGED UNIT CONSISTS OF CONDENSER FANS AND COMPRESSORS.
8. PROVIDE MODULATING HOT GAS REHEAT.
9. PROVIDE ENTHALPY CONTROLLED ECONOMIZER WITH BAROMETRIC RELIEF CAPABLE OF 100-PERCENT OUTSIDE AIR AND RELIEF.
10. ACOUSTICAL CURB SYSTEM. REFER TO DETAIL SHEET FOR RTU-1 AND RTU-2.
11. PROVIDE SMOKE DETECTOR IN THE RETURN AIR PATH.
12. PROVIDE STAINLESS STEEL MODULATING GAS HEAT WITH 4 STAGES.
12. PROVIDE VARIABLE SPEED COMPRESSORS.
13. PROVIDE HAIL GUARDS.
14. OUTSIDE AIR MONITORING STATION.
15. MONITORED AND CONTROL THROUGH BAS - REFER TO CONTROL SPEC.
16. STAINLESS STEEL DRAIN PANS.
17. ROOFTOP UNIT (RTU-3) IS CONSTANT AIR VOLUME.

DUCTWORK INSULATION THICKNESS TABLE

DUCT SERVICE TYPE	CONCEALED IN CONDITIONED LOCATIONS	EXPOSED IN CONDITIONED LOCATIONS	CONCEALED IN UNCONDITIONED LOCATIONS	EXPOSED IN UNCONDITIONED LOCATIONS
	FLAT OVAL OR ROUND AND RECTANGULAR	FLAT OVAL OR ROUND AND RECTANGULAR	FLAT OVAL OR ROUND AND RECTANGULAR	FLAT OVAL OR ROUND AND RECTANGULAR
SUPPLY AIR - AIR IN DUCT MAY SOMETIMES BE BELOW ROOM TEMPERATURE AIR HANDLING UNIT SUPPLY DUCT	1-1/2-INCH THICK BLANKET WITH FACTORY FSK JACKET OR 1-1/2-INCH THICK BOARD WITH FACTORY FSK JACKET	DOUBLE WALL DUCTWORK WITH 1-1/2-INCH THICK FIBROUS-GLASS INTERSTITIAL INSULATION	DOUBLE WALL DUCT WORK WITH 3-INCH THICK FIBROUS-GLASS INTERSTITIAL INSULATION	3-INCH THICK BOARD WITH PAINTABLE FACTORY FSK JACKET AND 30 MIL PVC JACKET
OUTDOOR AIR THAT HAS NOT BEEN HEATED OR COOLED	3-INCH THICK BLANKET WITH FACTORY FSK JACKET OR 2-INCH THICK BOARD WITH FACTORY FSK JACKET	DOUBLE WALL DUCTWORK WITH 3-INCH THICK FIBROUS-GLASS INTERSTITIAL INSULATION	NONE	NONE
RETURN AND TRANSFER AIR	NONE	NONE	DOUBLE WALL DUCT WORK WITH 3-INCH THICK FIBROUS-GLASS INTERSTITIAL INSULATION	3-INCH THICK BOARD WITH PAINTABLE FACTORY FSK JACKET AND 30 MIL PVC JACKET
RELIEF AIR AND HVAC EXHAUST AIR - BETWEEN SPACES AND AN EXTERIOR WALL OR ROOF OF THE BUILDING	NONE	NONE	NONE	NONE
SUPPLY AIR THAT MAY BE UP TO 15F WARMER THAN ROOM TEMP IN THE DUCT; BUT IT IS NEVER BELOW ROOM TEMP AND OUTDOOR AIR THAT HAS BEEN TREATED SO IT IS AT ROOM TEMPERATURE ENERGY RECOVERY VENTILATOR - SUPPLY AIR	NONE	NONE	DOUBLE WALL DUCT WORK WITH 3-INCH THICK FIBROUS-GLASS INTERSTITIAL INSULATION	3-INCH THICK BOARD WITH PAINTABLE FACTORY FSK JACKET AND 30 MIL PVC JACKET

NOTES:

1. SPACES THAT ARE WITHIN THE BUILDING THERMAL ENVELOPE SUCH AS SPACES WITHIN SHAFT AND CHASE ENCLOSURES AND SPACES ABOVE CEILINGS ARE CONSIDERED CONDIITONED LOCATIONS.
2. NOT TO BE INSULATED ARE FACTORY-INSULATED COMPONENTS INCLUDING, BUT NOT LIMITED TO, THE FOLLOWING: FLEXIBLE DUCTS, PLENUMS, CASINGS, ACCESS DOORS, AND ACCESS PANELS.
3. UNLESS IT IS IDENTIFIED OTHERWISE, ALL INSULATION IDENTIFIED AS BLANKET OR BOARD IS "MINERAL FIBER" TYPE.
4. EXPOSED DUCTWORK LOCATED 8-FEET AND LESS ABOVE FINISHED FLOOR LEVEL TO HAVE FIELD APPLIED 30 MIL THICK PVC JACKET.
5. MECHANICAL ROOMS ARE UNCONDITIONED LOCATIONS.
6. DUCTWORK INSULATION IN MECHANICAL ROOMS IS TO BE BOARD TYPE WITH DENSITY OF 6 POUNDS PER CUBIC FOOT. WATER HEATER ROOM IS CONSIDERED A MECHANICAL ROOM. AIR HANDLER CLOSETS ARE NOT CONSIDERED MECHANICAL ROOMS.
7. FSK IS FOIL SCRIM KRAFT JACKET MATERIAL.
8. CONDITIONED LOCATIONS ARE ANY OCCUPIED OR UNOCCUPIED SPACE LOCATED WITHIN THE BUILDING THERMAL ENVELOPE
9. SHAFT ENCLOSURES, DUCT CHASES, AND CEILING SPACES WITHIN THE BUILDING THERMAL ENVELOPE ARE CONDITIONED LOCATIONS.

DIFFUSERS, REGISTERS AND GRILLES SCHEDULE

MARK	SERVICE	AIRFLOW (CFM)	NECK/COLLAR SIZE (IN)	SHELL SIZE (IN)	TYPE	MAX NC	MATERIAL	BASIS OF DESIGN		NOTES
								MANUFACTURER	MODEL	
CD-1	SUPPLY	0-95	6"ø	24x24	SQUARE PLAQUE CEILING DIFFUSER	20	ALUMINUM	PRICE	ASPD	1,2,3,4
		100-205	8"ø	24x24						
		210-375	10"ø	24x24						
		380-530	12"ø	24x24						
		535-645	14"ø	24x24						
SG-1	SUPPLY	150	8x6	9.75x7.75	LOUVERED FACE	20	ALUMINUM	PRICE	620	1,2,3,4
RG-1	RETURN	0-1700	22x22	24x24	PERFORATED RETURN GRILLE	20	ALUMINUM	PRICE	APDDR	1,2,3,4
EG-1	EXHAUST	75-325	22x22	24x24	PERFORATED EXHAUST GRILLE	20	ALUMINUM	PRICE	APDDR	1,2,3,4

NOTES:

1. OPPOSED BLADE DAMPER IN NECK OF AIR DEVICE. FOR OUTLETS OR INLETS WITH OPPOSED BLADE DAMPERS LOCATED BEHIND THE FACE OF THE OUTLET OR INLET THE DAMPER IS BE ADJUSTED FROM THE FACE WITH A SPECIAL TOOL OR SCREW DRIVER NOT BY HAND FRONT LOUVER BLADES PARALLEL TO LONG DIMENSION.
2. WHITE POWDER COAT FINISH.
3. PROVIDE SURFACE, LAY-IN, OR DUCT MOUNTING AS APPROPRIATE. REFER TO ARCHITECTURAL REFLECTED CEILING PLAN FOR CEILING TYPE.
4. IF DAMPER IS IN BRANCH DUCT AFFILIATED WITH GRILLE OR REGISTER AND THE LOCATION IS INACCESSIBLE THEN PROVIDE OPPOSED BLADE DAMPER IN THE NECK OF THE GRILLE.

DUCT CONSTRUCTION AND LEAK CLASSIFICATION SCHEDULE

DUCTWORK TO BE LEAK TESTED INCLUDES ALL RTU SUPPLY. ALL DUCTWORK BETWEEN RTU AND INLETS AND OUTLETS.

SYSTEM	TYPE OF PRESSURE	SMACNA PRESSURE CLASS (IN WG) (NOTE 4)	SEAL CLASSIFICATION (PER SMACNA)	TYPE OF DUCTWORK	LEAKAGE CLASS (CFM/100 SQ FT)
SUPPLY AIR DUCTWORK:					
FROM AIR HANDLING UNIT OR VAV TERMINAL UNITS TO SUPPLY OUTLETS	POSITIVE	+2 MIN	A	RECTANGULAR	12
				ROUND & FLAT OVAL	6
FROM ROOF-TOP UNIT TO INLET OF VAV TERMINAL UNITS	POSITIVE	+3 MIN	A	RECTANGULAR	12
				ROUND & FLAT OVAL	6
RETURN AIR DUCTWORK:					
ALL RETURN AIR DUCTWORK	NEGATIVE	-2 MIN	A	RECTANGULAR	12
				ROUND & FLAT OVAL	6
EXHAUST & OUTSIDE AIR INTAKE DUCTWORK:					
DUCTWORK UNDER POSITIVE CONDITIONS	POSITIVE	+2 MIN	A	RECTANGULAR	6
				ROUND & FLAT OVAL	3
DUCTWORK UNDER NEGATIVE CONDITIONS	NEGATIVE	-2 MIN	A	RECTANGULAR	6
				ROUND & FLAT OVAL	3
TRANSFER & RELIEF DUCTWORK:					
DUCTWORK UNDER POSITIVE CONDITIONS	POSITIVE	+2 MIN	A	RECTANGULAR	12
				ROUND & FLAT OVAL	6
DUCTWORK UNDER NEGATIVE CONDITIONS	NEGATIVE	-2 MIN	A	RECTANGULAR	12
				ROUND & FLAT OVAL	6

NOTES:
1. SMACNA SEAL CLASS A SPECIFIES SEALANTS IN JOINTS, SEAMS AND ALL APPLICABLE WALL PENETRATIONS.
2. LEAKAGE CLASSES APPLY UNLESS OTHERWISE NOTED ON DESIGN DOCUMENTS.
3. THE MAXIMUM PERMITTED DUCT LEAKAGE SHALL BE:

$$L_{max} = C_L P^{0.65}$$

Lmax = MAXIMUM PERMITTED LEAKAGE CFM/100 SQ.FT. DUCT SURFACE AREA
CL = LEAKAGE CLASS AND IS A CONSTANT
P = TEST PRESSURE, WHICH SHALL BE EQUAL TO THE DESIGN DUCT PRESSURE CLASS RATING

4. THE LISTED PRESSURE CLASSES ARE MINIMUM CLASSES. ALL DUCT SYSTEMS WITH DEDICATED FANS SHALL HAVE PRESSURE CLASSES THAT MEET OR EXCEED THE ESP SCHEDULED FOR THE SYSTEM'S FAN.

DUCTLESS SPLIT SYSTEM SCHEDULE

MARK	INDOOR						CONDENSING UNIT				BASIS OF DESIGN	
	AIRFLOW (CFM)	MOTOR WATTS	TOTAL CAPACITY (BTU/H)	EAT (°F) DB	EAT (°F) WB	MODEL NO.	MARK	CAPACITY (BTU/H)	SEER	REFRIGERANT	MDOEL NO.	MANUFACTURER
△2 AH-1	NOT USED	NOT USED	NOT USED	NOT USED	NOT USED	NOT USED	AC-1	NOT USED	NOT USED	NOT USED	NOT USED	NOT USED
AH-2	335	30	18,000	80	67	PKA-18HA4	AC-2	18,000	15.3	R410A	PUY-A18NHA4	MITSUBISHI
AH-3	335	30	18,000	80	67	PKA-18HA4	AC-3	18,000	15.3	R410A	PUY-A18NHA4	MITSUBISHI
AH-4	335	30	18,000	80	67	PKA-18HA4	AC-4	18,000	15.3	R410A	PUY-A18NHA4	MITSUBISHI
AH-5	335	30	18,000	80	67	PKA-18HA4	AC-5	18,000	15.3	R410A	PUY-A18NHA4	MITSUBISHI

NOTES:
1. DISCONNECT SWITCH FOR AH AND AC UNITS.
2. AUXILARY FLOAT SWITCH.
3. INTEGRAL CONDENSATE PUMP.
4. LOW AMBIENT CONTROL FOR COOLING TO 0 °F
5. OUTDOOR UNIT POWERS THE INDOOR UNIT
6. INTERFACE CARD TO MONITOR POINTS THROUGH EXISTING BAS. REFER TO SPECIFICATION SECTION 230993 FOR ADDITIONAL CONTROL REQUIREMENTS.
7. PROVIDE HARD-WIRED THERMOSTAT.

ELECTRIC UNIT HEATER SCHEDULE

MARK	TYPE	HEAT CAPACITY (KW)	BASIS OF DESIGN	
			MANUFACTURER	MODEL
EH-1	WALL-MOUNTED	3	MARKEL	HF3326TD-RP

NOTES:
1. DISCONNECT SWITCH
2. INTEGRAL TAMPER RESISTANT THERMOSTAT
3. PROVIDE UNIT HEATER BY ONE OF THE FOLLOWING MANUFACTURERS: MARKEL, QMARK OR REZNOR
4. SURFACE MOUNTING KIT △2

SHARON ELEMENTARY SCHOOL ADDITION
4330 Foxcroft Rd.
Charlotte, NC 28211

Charlotte-Mecklenburg Schools

DESIGNER

CLARKNEXSEN
1111 METROPOLITAN AVE, SUITE 333
CHARLOTTE, NORTH CAROLINA 28204
704-377-8800

TIMMONS GROUP
YOUR VISION ACHIEVED THROUGH OURS.
2030 TRYON STREET, STE 3C
CHARLOTTE, NC 28203
T: 704.376.1073

CLARK NEXSEN LICENSE NUMBER: C-1028
PROFESSIONAL SEAL

Dwayne Carr

SUBMITTAL
FEBRUARY 19, 2020
FOR CONSTRUCTION ONLY

REVISIONS

1	03/13/20	REVIEW CYCLE 1
2	04/03/20	ADDENDUM 04

KEY PLAN

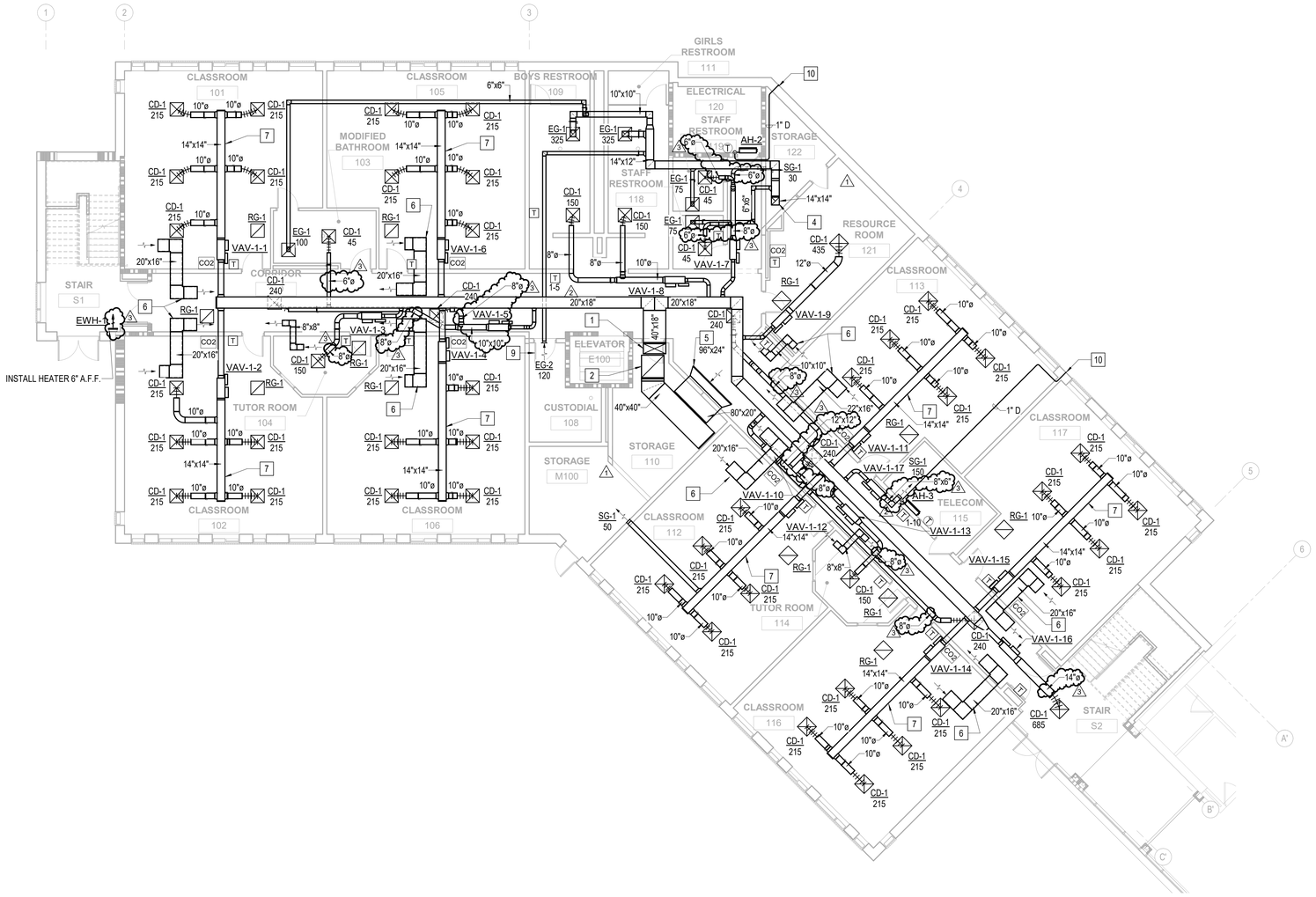
SHEET
SCHEDULE

M101

DESIGN: DAC
DRAWN: CMD
REVIEW: JNW

CN 8418

4/22/2020 1:33:58 PM
C:\Revit Projects\8418_CMS SHARON M20_dwaccnjd.rvt
1:100



1 FIRST FLOOR MECHANICAL PLAN
1/8" = 1'-0"

GENERAL NOTES

A. COORDINATE THE INSTALLATION OF THE MECHANICAL SYSTEMS WITH ALL DISCIPLINE CONTRACTORS.

B. COORDINATE LOCATION OF ALL AIR DEVICES WITH ARCHITECTURAL, FIRE PROTECTION AND ELECTRICAL PLANS. REFER TO ARCHITECTURAL CEILING PLANS FOR CEILING ELEVATIONS AND TYPES.

C. COORDINATE SPACE TEMPERATURE SENSOR, CO2 SENSORS, AND OTHER CONTROL SENSOR LOCATIONS WITH ARCHITECT PRIOR TO INSTALLATION. INSTALL SENSORS 48-INCHES AFF.

D. BRANCH SUPPLY AIR DUCTS FROM DUCTWORK MAINS TO VAV BOX INLET CONNECTIONS SHALL BE FULL-SIZE OF BOX INLET SIZE.

E. BRANCH SUPPLY AIR RUN-OUTS ARE FULL-SIZE OF DIFFUSER NECK CONNECTION UNLESS OTHERWISE NOTED ON PLANS.

KEY NOTES

1. SA DUCTWORK RISER UP TO RTU-1.
2. RA DUCTWORK RISER UP TO RTU-1.
3. SA & RA DUCTWORK UP TO RTU-2.
4. EA DUCTWORK RISER UP TO ROOF MOUNTED EXHAUST FAN EF-1.
5. OPEN ENDED RETURN DUCT W/ WIRE MESH COVERED BELL-MOUTH OPENING, TYP.
6. LINED TRANSFER DUCT ABOVE CEILING LOCATED BETWEEN STRUCTURAL JOISTS, TYP.
7. ROUTE DUCTWORK BETWEEN STRUCTURAL JOISTS.
8. 70"x32" OPEN ENDED RA DUCT W/ WIRE MESH COVERED BELL-MOUTH OPENING.
9. UNDERCUT DOOR 1-5/8".
10. ROUTE CONDENSATE TO DOWNSPOUT, TURN PIPIE DOWN TO DISCHARGE.

RATED PARTITION LEGEND

ONE HOUR FIRE RATING

GRAPHIC SCALE(S)

1/8" = 1' - 0" 0 5' 10' 15' 30'

SHARON ELEMENTARY SCHOOL ADDITION

4330 Foxcroft Rd.
Charlotte, NC 28211

cms
Charlotte-Mecklenburg Schools

DESIGNER
CLARKNEXSEN
1111 METROPOLITAN AVE, SUITE 333
CHARLOTTE, NORTH CAROLINA 28204
704·377·8800

TIMMONS GROUP
YOUR VISION ACHIEVED THROUGH OURS.
2030 TRYON STREET, STE 3C
CHARLOTTE, NC 28203
T: 704.376.1073

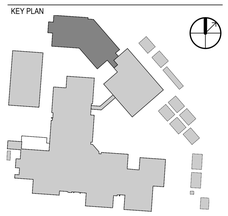
CLARK NEXSEN LICENSE NUMBER: C-1028
PROFESSIONAL SEAL

SUBMITTAL
FEBRUARY 19, 2020
FOR CONSTRUCTION ONLY

REVISIONS

1	03/13/20	REVIEW CYCLE 1
2	03/24/20	ADDENDUM 01
3	04/03/20	ADDENDUM 04

KEY PLAN



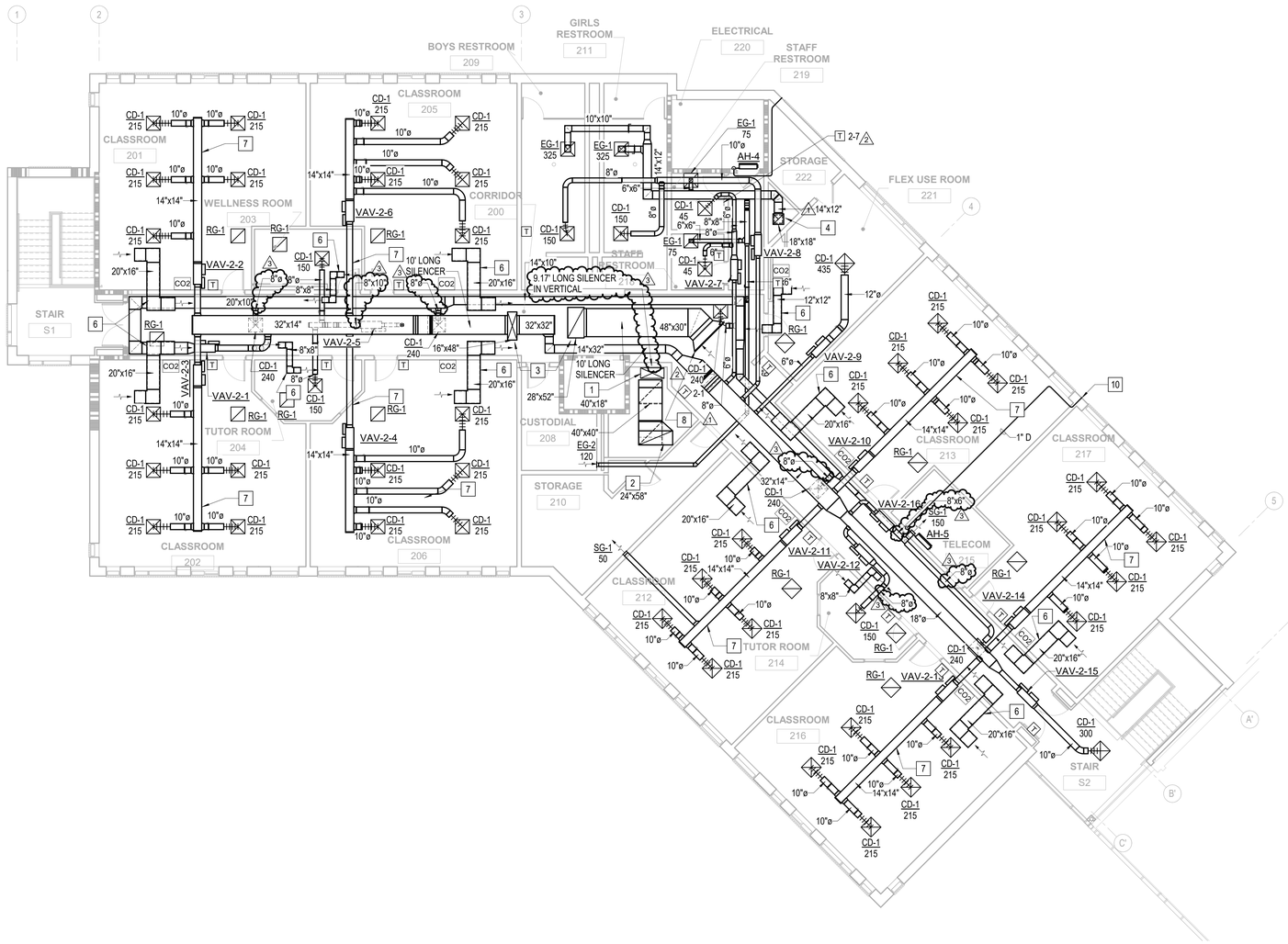
SHEET
FIRST FLOOR MECHANICAL PLAN

M300

DESIGN: DAC
DRAWN: CMD
REVIEW: JNW

CN 8418

4/2/2020 1:34:05 PM
C:\Revit Projects\8418_CMS SHARON M20_dericcjd.rvt
1101



1 SECOND FLOOR MECHANICAL PLAN
1/8" = 1'-0"

GENERAL NOTES

A. COORDINATE THE INSTALLATION OF THE MECHANICAL SYSTEMS WITH ALL DISCIPLINE CONTRACTORS.

B. COORDINATE LOCATION OF ALL AIR DEVICES WITH ARCHITECTURAL, FIRE PROTECTION AND ELECTRICAL PLANS. REFER TO ARCHITECTURAL CEILING PLANS FOR CEILING ELEVATIONS AND TYPES.

C. COORDINATE SPACE TEMPERATURE SENSOR, CO2 SENSORS, AND OTHER CONTROL SENSOR LOCATIONS WITH ARCHITECT PRIOR TO INSTALLATION. INSTALL SENSORS 48-INCHES AFF.

D. BRANCH SUPPLY AIR DUCTS FROM DUCTWORK MAINS TO VAV BOX INLET CONNECTIONS SHALL BE FULL-SIZE OF BOX INLET SIZE.

E. BRANCH SUPPLY AIR RUN-OUTS ARE FULL-SIZE OF DIFFUSER NECK CONNECTION UNLESS OTHERWISE NOTED ON PLANS.

KEY NOTES

1 SA DUCTWORK RISER UP TO RTU-1.
2 RA DUCTWORK RISER UP TO RTU-1.
3 SA & RA DUCTWORK UP TO RTU-2.
4 EA DUCTWORK RISER UP TO ROOF MOUNTED EXHAUST FAN EF-1.
5 OPEN ENDED RETURN DUCT W/ WIRE MESH COVERED BELL-MOUTH OPENING, TYP.
6 LINED TRANSFER DUCT ABOVE CEILING LOCATED BETWEEN STRUCTURAL JOISTS, TYP.
7 ROUTE DUCTWORK BETWEEN STRUCTURAL JOISTS.
8 70"x32" OPEN ENDED RA DUCT W/ WIRE MESH COVERED BELL-MOUTH OPENING.
9 UNDERCUT DOOR 1-5/8".
10 ROUTE CONDENSATE TO DOWNSPOUT, TURN PIPIE DOWN TO DISCHARGE.

RATED PARTITION LEGEND

ONE HOUR FIRE RATING

GRAPHIC SCALE(S)

1/8" = 1' - 0" 0 5' 10' 15' 30'

SHARON ELEMENTARY SCHOOL ADDITION

4330 Foxcroft Rd.
Charlotte, NC 28211

cms Charlotte-Mecklenburg Schools

DESIGNER

CLARKNEXSEN

1111 METROPOLITAN AVE, SUITE 333
CHARLOTTE, NORTH CAROLINA 28204
704·377·8800

TIMMONS GROUP
YOUR VISION ACHIEVED THROUGH OURS.

2030 TRYON STREET, STE 3C
CHARLOTTE, NC 28203
T: 704.376.1073

PROFESSIONAL SEAL

NORTH CAROLINA PROFESSIONAL SEAL 034339 ENGINEER

Dwayne "Cary" Chapman

Digitally signed by Dwayne Cary Chapman DN: cn=Dwayne Cary Chapman, o=Clark Nexsen, ou=Chapman, c=US Reason: I am approving this document Date: 2020.04.03 10:51:52-04'00'

SUBMITTAL

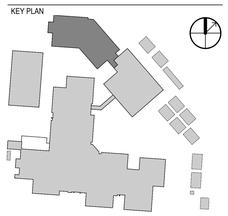
FEBRUARY 19, 2020

FOR CONSTRUCTION ONLY

REVISIONS

1	03/13/20	REVIEW CYCLE 1
2	03/24/20	ADDENDUM 01
3	04/03/20	ADDENDUM 04

KEY PLAN



SHEET

SECOND FLOOR MECHANICAL PLAN

M301

DESIGN: DAC
DRAWN: CMD
REVIEW: JNW

CN 8418

4/2/2020 1:34:09 PM
C:\Revit Projects\8418_CMS SHARON M20_dscicojid.rvt
1101