SEQUENCE OF OPERATION

OCCUPIED HOURS ARE FROM 7AM TO 10PM (ADJUSTABLE).

ALL TEMPERATURES LISTED SHALL BE ADJUSTABLE.

ALL AC UNITS SHALL BE SET TO 80F (COOLING) AND 55F (HEATING) IN UNOCCUPIED MODE.

AC-1

1. THERMOSTAT SHALL INDEX UNIT TO COOLING (65F) OR HEATING MODE (60F) AS DICTATED BY SPACE TEMPERATURE.

2. AIR CIRCULATION. WHEN THE UNIT CONTROL IS IN THE OCCUPIED MODE THE FAN SHALL OPERATE CONTINUOUSLY TO PROVIDE VENTILATION AIR. FAN SHALL CYCLE IN UNOCCUPIED MODE.

3. OUTSIDE AIR DAMPERS SHALL BE OPEN IN OCCUPIED MODE AND CLOSED IN UNOCCUPIED MODE.

AC-2, AC-3, AC-4& AC-5

1. THERMOSTAT SHALL INDEX UNIT TO COOLING (74F) OR HEATING MODE (69F) AS DICTATED BY SPACE TEMPERATURE.

2. AIR CIRCULATION. WHEN THE UNIT CONTROL IS IN THE OCCUPIED MODE THE FAN SHALL OPERATE CONTINUOUSLY TO PROVIDE VENTILATION AIR.

3. OUTSIDE AIR DAMPERS SHALL BE OPEN IN OCCUPIED MODE AND CLOSED IN UNOCCUPIED MODE.

KITCHEN HOOD SYSTEMS

1. THE KITCHEN HOOD EXHAUST FAN SHALL START THROUGH A HOOD MOUNTED SWITCH. WHEN THE HOOD FAN IS INDEXED FOR OPERATION, THE MAKEUP AIR UNIT SHALL START.

2. THE MAKEUP AIR UNITS SHALL CYCLE GAS HEATING AND DX COOLING AS REQUIRED TO MAINTAIN DISCHARGE AIR TEMPERATURE BASED ON OUTSIDE AIR TEMPERATURE AS FOLLOWS:

A. OUTSIDE AIR ABOVE 70F. UNIT INTRODUCES 73F AIR.

B. OUTSIDE AIR ABOVE 50F AND BELOW 70F. UNIT INTRODUCES UNCONDITIONED OUTSIDE AIR.

C. OUTSIDE AIR BELOW 50F. UNIT FURNACE CYCLES TO MAINTAIN 50F DISCHARGE AIR TEMPERATURE.

D. CHANGEOVER TEMPERATURES AND DISCHARGE AIR TEMPS SHALL BE ADJUSTABLE.

EF-1 & EF-2

1. INTERLOCK WITH LIGHT SWITCH.

EF-3

1, RUN CONTINUOUSLY.

EF-4 & EF-5

1. START/STOP IN RESPONSE TO LINE VOLTAGE THERMOSTAT (80F).

2. INTERLOCK ASSOCIATED MAKEUP AIR DAMPER ACTUATOR WITH FAN.

ELECTRIC WALL HEATER SCHEDULE

Unit Tag	Area Served	CFM	Watts	Volts	Phase	Model	Remarks
EH-1	SEE PLANS	175	1500	277	1	G3323TTD-RP	1 - 5

1. MODEL NUMBERS BASED ON MARKEL. EQUALS BY SINGER, CHROMALOX.
2. DISCONNECT BY MFG.
3. UNIT MOUNTED TSTAT.
4. SUFACE MOUNTED.
5. HEAVY DUTY 16 GA. LOUVERED STEEL GRILLE.

PACKAGED GAS-FIRED AC UNIT SCHEDULE

Unit Tag	Area Served	Tons (Nom.)	CFM SA	CFM OA	ESP	Fan Motor HP	Fan Motor Volts	Fan Motor Phase	DX Coil Performance EAT	DX Coil MBH Total	DX Coil MBH Sens.	Gas Heating Perf. EAT	Gas Heating Input (MBH)	Gas Heating Output (MBH)	Cond. Fan No.	Cond. Fan FLA	Compressor No.	Compressor LRA	Compressor RLA	MCA	MOCP	Volts	Phase	Model	Detail	Remarks
AC-1	SEE PLANS	8.5	2724	230	0.80	3.6	460	3	67.06/34.05	76.41	65.79	70	150	120	1	2.8	2	52.0/36.0	7.8/4.7	21	25	460	3	YHC102F	10/M301	1, 3, 4, 5, 6, 9, 10, 11, 12, 13
AC-2	SEE PLANS	3	1200	215	0.61	1/3	460	3	80/67	35.7	26.37	70	120	96	1	0.6	1	37.6	6	9.2	15	460	3	YSC036	9/M301	1-6, 9, 11
AC-3	SEE PLANS	10	3330	470	0.80	3.6	460	3	78.7/65.0	104.27	84.55	70	200	160	1	1.5	2	66.0/38.0	8.2/5.8	21.9	30	460	3	YHC120F	9/M301	1-6, 9, 11
AC-4	SEE PLANS	7.5	3000	460	0.60	2.0	460	3	80/67	86.97	66.31	70	200	162	1	2.5	2	50/39	7.6/5.4	20.5	25	460	3	YSC092	9/M301	1-6, 9, 11
AC-5	SEE PLANS	27.5	9045	2000	1.00	7.5	460	3	79.2/64.6	311.26	245.06	70	600	480	3	3.5	3	98.0/142/142	14.1/16.8/16.8	72.1	80	460	3	YCH330	9/M301	1-6, 9, 11
FAN #2	SEE PLANS		--- SEE KITCHEN EQUIPMENT DRAWINGS-----																						9/M301	2, 4-8
FAN #4	SEE PLANS		--- SEE KITCHEN EQUIPMENT DRAWINGS-----																						9/M301	2, 4-8
FAN #6	SEE PLANS		--- SEE KITCHEN EQUIPMENT DRAWINGS-----																						9/M301	2, 4-8
FAN #8	SEE PLANS		--- SEE KITCHEN EQUIPMENT DRAWINGS-----																						9/M301	2, 4-8
FAN #10	SEE PLANS		--- SEE KITCHEN EQUIPMENT DRAWINGS-----																						9/M301	2, 4-8

1. MODEL NUMBERS BASED ON TRANE. EQUALS BY CARRIER.
2. GRADE MOUNTED, HORIZONTAL DUCT CONNECTIONS.
3. WALL MOUNTED PROGRAMMABLE TSTAT BY UNIT MFG.
4. GAS REGULATOR FOR 2 PSI GAS SERVICE.
5. DISCONNECT BY E.C.
6. SINGLE POINT ELECTRICAL CONNECTION.
7. MODEL NUMBERS BASED ON CAPTIVEAIRE. EQUALS BY GREENHECK, CARNES, COOK.
8. REFER TO KITCHEN EQUIPMENT DRAWINGS. M.C. SHALL BE REPSONSIBLE FOR PROVIDING AND INSTALLING FANS, MAKEUP AIR UNITS, HOODS, DUCTS, AND UL LISTED FIRE BLANKETS.
9. MBH LISTED IS NET TOTAL, NOT GROSS. SUBMITTALS SHALL CLEARLY SHOW CAPACITIES AT SCHEDULED ENTERING AIR TEMPE[illegible] AIRFLOWS.
10. AC-1 SHALL MAINTAIN 60 DEGREES INDOOR DESIGN TEMPERATURE, 48% RELATIVE HUMIDITY IN OCCUPIED SPACE.
11. HOT GAS REHEAT.
12. AC-1 SHALL INCLUDE CDQ ENERGY RECOVERY WHEEL (WHEEL SIZE = NAC424) BETWEEN UNIT AND CURB. UNIT [illegible] M-DUCT ARR[illegible] WITH CURB TO ADAPT TO ERV AND HORIZONTAL DUCT ARRANGEMENT. ERV SHALL BE POWERED [illegible] AC-1. ERV IS IN[illegible] SCHE[illegible] PERFOR[illegible]ANCE.
13. DRAIN PAN FLOAT SWITCH COMPLYING WITH 2012 NC MECH. CODE SECTION 307.2.3.1.

FAN SCHEDULE

Unit Tag	Area Served	CFM	ESP (IN.)	Fan RPM	Sones	Drive	BHP	HP (Watts)	Volts	Phase	Type	Model	Detail	Remarks
EF-1	SEE PLANS	210	.25	953	3.0	DIRECT	.11	83	115	1	CEILING MOUNTED	SP-A250	7/M301	[illegible]
EF-2	SEE PLANS	210	.25	953	3.0	DIRECT	.11	83	115	1	CEILING MOUNTED	SP-A250	[illegible]	1-5
EF-3	SEE PLANS	75	.25	768	1.0	DIRECT	.11	80	115	1	CEILING MOUNTED	SP-B110	[illegible]	1-5
EF-4	SEE PLANS	2,500	.25	1089	10.6	DIRECT	.48	3/4	115	1	CENT. INLINE	SQ-160-VG	[illegible]	1, 2, 8-12
EF-5	SEE PLANS	2,500	.25	1089	10.6	DIRECT	.48	3/4	115	1	CENT. INLINE	SQ-160-VG	[illegible]	1, 2, 8-12
FAN #1	SEE PLANS	1680	--SEE KITCHEN EQUIP. DRAWINGS--						460	3	KITCHEN EXHAUST		9/M301	[illegible] 7
FAN #3	SEE PLANS	2000	--SEE KITCHEN EQUIP. DRAWINGS--						460	3	KITCHEN EXHAUST		9/M301	[illegible]
FAN #5	SEE PLANS	4868	--SEE KITCHEN EQUIP. DRAWINGS--						460	3	KITCHEN EXHAUST		9/M[illegible]	[illegible]
FAN #7	SEE PLANS	7680	--SEE KITCHEN EQUIP. DRAWINGS--						460	3	K[illegible]EN EXHAUST		9/M[illegible]	6, 7
FAN #9	SEE PLANS	7680	--SEE KITCHEN EQUIP. DRAWINGS--						460	3	KITC[illegible]N EXHAUST		[illegible]	6, 7

1. MODEL NUMBERS BASED ON GREENHECK. EQUALS BY CARNES, COOK.
2. NEMA 3R DISCONNECT BY MFG.
3. BACKDRAFT DAMPER.
4. BAKED ENAMEL WALL CAP BY FAN MFG.
5. UNIT MOUNTED SOLID STATE SPEED CONTROL.
6. MODEL NUMBERS BASED ON CAPTIVEAIRE. EQUALS BY GREENHECK, CARN[illegible], COOK.
7. REFER TO KITCHEN EQUIPMENT DRAWINGS (M400 SERIES). M.C. SHALL [illegible]SONSIBLE FO[illegible] PROVIDING AND INS[illegible]G FAN, DUCT, AND UL FIRE BLANKET.
8. INLET GU[illegible]
9. LINE [illegible]STAT.
10. [illegible]M "VARI[illegible] MOTOR.
11. [illegible]ERLOCK M[illegible]ED IN[illegible]T DAM[illegible]H FAN, COORDINATE OPERATOR VOLTAGE.
12. [illegible]TORIZED DAM[illegible]

GRILLE & [illegible]FFU[illegible]ER SCHEDULE

S[illegible]	TYPE	[illegible]	CFM RANGE	NECK SIZE	[illegible] SIZE	DMPR	FINISH	FRAME	PRICE MODEL NO	REMARKS
A--	[illegible]VER [illegible]	SUP[illegible] 4-WA[illegible]	SEE PLANS & RM[illegible]	[illegible]MK 5	RMK 4	OBD	OFF WHITE	RMK 3	SMD	1-6
[illegible]	[illegible]	RETURN/ EXHAUST	[illegible]ANS & RMK 6	RMK 7	RMK 4	RMK 9	OFF WHITE	RMK 3	PDDR	1-4, 7-10
[illegible]	PERF	RETURN/ [illegible]AUST	SEE PLANS & RMK 6	RMK 7	RMK 4	RMK 9	OFF WHITE	RMK 3	PDDR	1-4, 7-10
[illegible]	SIDEWALL	SUPPLY	SEE PLANS	SEE PLANS	RMK 4	OBD	RMK 12	SEE PLANS	520D	1-4, 11-13
[illegible]	SIDEWALL	RETURN/ EXHAUST	SEE PLANS	SEE PLANS	RMK 4	RMK 9	RMK 12	SEE PLANS	530	1-4, 9, 12, 13
N-2	LINEAR	SUPPLY	80/FT (MAX)	(2),3/4" SLOTS	(L+2) x 4"	NO	OFF WHITE	RMK 3	SDS	1-4, 21, 22
N-3	LINEAR	SUPPLY	120/FT (MAX)	(3),3/4" SLOTS	(L+2) x 6"	NO	OFF WHITE	RMK 3	SDS	1-4, 21, 22
N-4	LINEAR	SUPPLY	140/FT (MAX)	(4),3/4" SLOTS	(L+2) x 8"	NO	OFF WHITE	RMK 3	SDS	1-4, 21, 22
N-5	LINEAR	SUPPLY	180/FT (MAX)	(5),3/4" SLOTS	(L+2) x 9"	NO	OFF WHITE	RMK 3	SDS	1-4, 21, 22
N-6	LINEAR	SUPPLY	200/FT (MAX)	(6),3/4" SLOTS	(L+2) x 11"	NO	OFF WHITE	RMK 3	SDS	1-4, 21, 22
N-7	LINEAR	SUPPLY	240/FT (MAX)	(7),3/4" SLOTS	(L+2) x 12"	NO	OFF WHITE	RMK 3	SDS	1-4, 21, 22
N-8	LINEAR	SUPPLY	280/FT (MAX)	(8),3/4" SLOTS	(L+2) x 14"	NO	OFF WHITE	RMK 3	SDS	1-4, 21, 22

REMARKS

1. EQUALS: METALAIRE, TITUS, KRUEGER, TUTTLE & BAILEY, NAILOR, CARNES. SCHEDULE IS GENERAL, SOME MAY NOT BE USED. PAINT ALL INSIDE VISIBLE SURFACES FLAT BLACK.
2. SYMBOL EXPLANATION:
XXX/CFM = SYMBOL, FRAME (RMK 3), NECK (RMK 5,7)/CFM
3. FRAME TYPES:
S = FLUSH SURF. MTD. PLASTIC FLANGE FOR CEILING MOUNTING.
T = T-BAR
E = DUCT MOUNTED: V-BEVELED DROP SURF. (TYPE "A" DIFFUSER)
D = DROPPED FRAME
NOTE: VERIFY FRAME/CEILING COMPATIBILITY.
4. OVERALL SIZE: LAY-IN = 2'x2', OTHER GRILLES = NECK + 2"+/-.
5. LOUVER FACE SUPPLY NECK SIZES

NO.	ROUND NK SIZE	CFM	NO.	SQUARE NK SIZE	CFM
A	6"	100	H	6x6	125
B	8"	175	I	9x9	280
C	10"	275	J	12x12	500
D	12"	400	K	15x15	780
E	14"	535	L	18x18	1125
F	16"	700	M	21x21	1530
G	18"	885	N	24x24	2000

NOTE: VERIFY CFM / NECK SIZE.
6. ADJUSTABLE HORIZONTAL/VERTICAL.
7. "B" & "E" EXH/RETURN NECK SIZES ("E" = SQ. NK. ONLY):

NO.	ROUND NK SIZE	CFM	NO.	SQUARE NK SIZE	CFM
A	6"	100	G	8x8	220
B	8"	175	H	10x10	345
C	10"	275	I	12x12	500
D	12"	400	J	14x14	680
E	14"	535	K	16x16	885
F	16"	700	L	18x18	1125
NOTE: VERIFY			M	22x22	1680
CFM / NECK SIZE.			N	22x46	2600

8. NO NECK SIZE INDICATES NON-DUCTED, LAY-IN PANEL.
9. OBD IF USED AS EXHAUST.
10. ALL ALUM. CONSTRUCTION (INCLUDING BACKPAN) IF SHOWN ON PLANS.
11. VOLUME EXTRACTOR WHERE SHOWN ON PLANS.
12. PAINT TO MATCH WALL.
13. VERTICAL FRONT BLADES.
14. IF LAY-IN CEILING: EXACT GRILLE SIZE BY MFGR.. OMIT SCREW HOLES.
15. VERTICAL FRONT BLADES.
16. FINISH SUITABLE FOR PAINTING.
17. HINGED FILTER GRILLE W/2" CLIPS.
18. FILTERS: FARR 30-30, UL CLASS II, 2" THICK, PLEATED.
19. (1), 20X20 FILTER.
20. (1), 20X20 & (1), 20X24 FILTER.
21. LINEAR DIFFUSER CALLOUTS: LENGTH, XX/XX = OVERALL LENGTH/ACTIVE LENGTH
22. 1.125" BORDER.
23. 16 GAGE FRAME, 14 GAGE BLADES, 38 DEGREE HORIZ. BLADE ANGLE. SUPPORT BARS 6" O.C. (MAX).

AIR BALAN[illegible] CHA[illegible]

Unit Tag	Supply (CFM)	Return (CFM)	Outside Air (CFM)	[illegible] / Relief (C[illegible])
AC-1	[illegible]2724	[illegible]	230	-
AC-2	[illegible]	98[illegible]	215	-
AC-3	333[illegible]	2860	470	-
AC-4	3000	[illegible]540	460	-
AC-5	9045	[illegible]045	2000	-
F-[illegible]	-	-		1680
F-2	-	-	1512	
F-3	-	-		2000
F-[illegible]	-	-	1800	
F-5	-	-		4868
F-6	-	-	4381	
F-[illegible]	-	-		7680
F-8	-	-	6912	
F-9	-	-		7680
F-10	-	-	6912	
EF-1	-	-		210
EF-2	-	-		210
EF-3	-	-		75
Totals	19299	15924	24892	24403
	Building Pressurization (CFM)		489	

MECHANICAL SYSTEMS, SERVICE SYSTEMS AND EQUIPMENT METHOD OF COMPLIANCE

Prescriptive Energy Cost Budget

Thermal Zone 4A

Exterior Design Conditions

Winter Dry Bulb: 18
Summer Dry Bulb: 94

Interior Design Conditions

Winter Dry Bulb: 70
Summer Dry Bulb: 75
Relative Humidity: 50%

Building Heating Load: 697 MBH

Building Cooling Load: 49 TONS

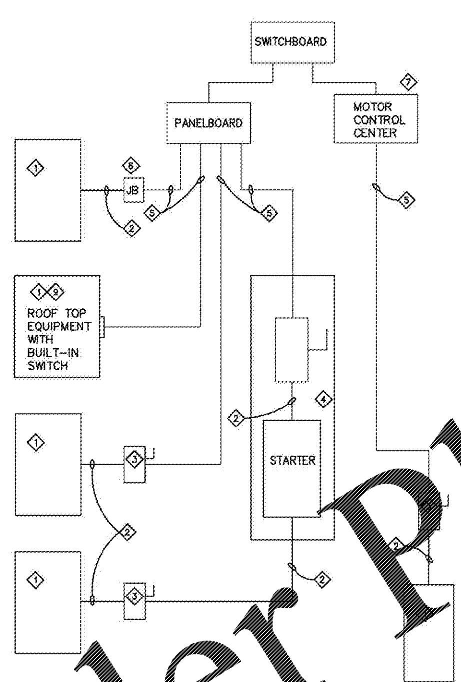
Mechanical Space Conditioning System

Unitary:
Description of Unit: 5 packaged A/C units with gas heat
Heat Output of Unit: 1270 MBH
Cooling Output of Unit: 48.5 TONS

List Equipment Efficiencies:

Equipment Schedules with Motors (Mechanical Systems)
Motor Horsepower: Specs Require Compliance w/ NC Energy Code.
Number of Phases: Specs Require Compliance w/ NC Energy Code.
Minimum Efficiency: Specs Require Compliance w/ NC Energy Code.
Motor Type: Specs Require Compliance w/ NC Energy Code.
Number of Poles: Specs Require Compliance w/ NC Energy Code.

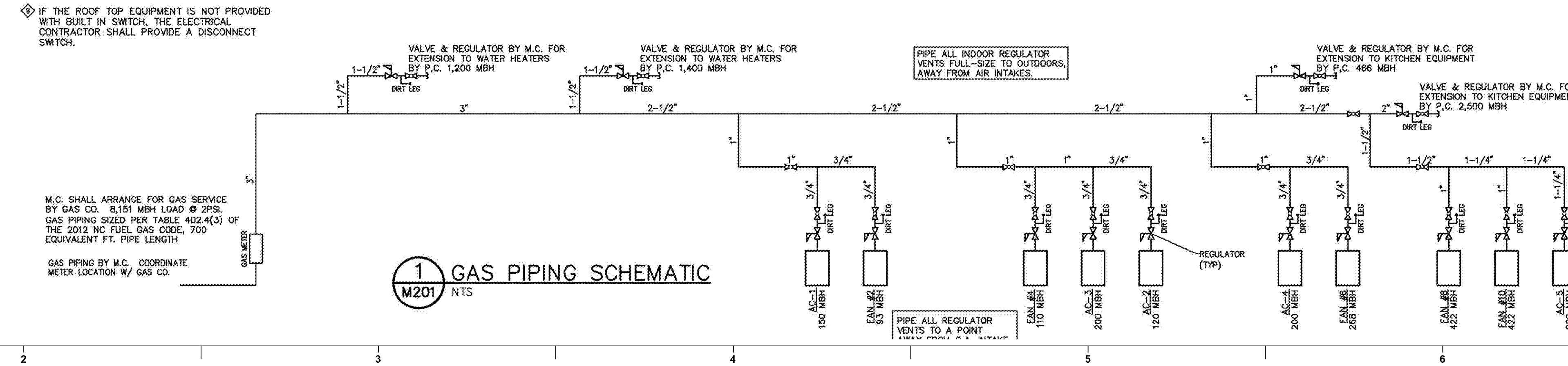
Designer Statement:
To the best of my knowledge and belief, the design of this building complies with the mechanical systems, service systems and equipment requirements of the 2012 NC Energy Code. Compliance with Section 506 shall be by "Higher Efficiency Service Water Heating" (506.2.4).



NOTES:

1. EQUIPMENT BY TRADES OTHER THAN MECHANICAL IS SHOWN DASHED.
2. CONDUIT AND WIRING BY HVAC, PLUMBING CONTRACTOR, OR OTHER TRADES.
3. IF AN ADDITIONAL DISCONNECT IS REQUIRED BY NEC, IT SHALL BE PROVIDED AND INSTALLED BY THE EQUIPMENT CONTRACTOR.
4. A COMBINATION STARTER OR VFD MAY BE USED IN LIEU OF A SEPARATE DISCONNECT SWITCH AND STARTER LOCATED ADJACENT TO EQUIPMENT.
5. FEEDER CIRCUIT WIRING AND CONDUIT IN ELECTRICAL WORK. SEE PANELBOARD SCHEDULES FOR WIRE AND BREAKER SIZES.
6. JUNCTION BOX MAY BE SHOWN ON ELECTRICAL PLANS FOR SOME EQUIPMENT. IF NO STARTER OR DISCONNECT IS SUPPLIED, A JUNCTION BOX SHALL BE INSTALLED ADJACENT TO EQUIPMENT. THE ELECTRICAL CONTRACTOR SHALL PROVIDE LINE SIDE WIRING TO THE JUNCTION BOX. LOAD SIDE WIRING WILL BE PROVIDED BY MECHANICAL CONTRACTOR OR OTHER TRADES.
7. PROJECTS UTILIZING AN MCC, THE STARTER, CB, OR VFD IN THE MCC ARE PROVIDED BY THE ELECTRICAL CONTRACTOR.
8. IN ALL CASES THE EQUIPMENT CONTRACTOR SHALL MAKE FINAL CONNECTIONS, START UP, AND TEST EQUIPMENT.
9. IF THE ROOF TOP EQUIPMENT IS NOT PROVIDED WITH BUILT IN SWITCH, THE ELECTRICAL CONTRACTOR SHALL PROVIDE A DISCONNECT SWITCH.

2 / M201 DETAIL - DIVISION OF WORK
NTS



1 / M201 GAS PIPING SCHEMATIC
NTS

WILKES COMMUNITY COLLEGE

SCO# [illegible]-01A
N[illegible]CS# 220[illegible]

CULINARY LAB

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NORTH CAROLINA PROFESSIONAL SEAL 17250 ENGINEER J. CRAIG CHAMPION 01-02-2018

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REVISIONS:

No.	Description	Date

PROJECT: 9202-169770
DATE: 1/2/18
DRAWN BY: CCO
CHECKED BY: JCC

SCHEDULES

M-201

BID SET January 2, 2018

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