
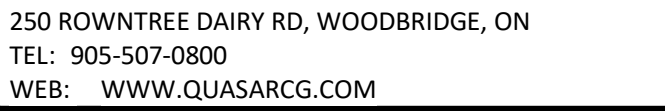


J	ISSUED FOR CONSTRUCTION	2021-12-20
I	ISSUED FOR TENDER	2021-08-12
H	ISSUED FOR BUILDING PERMIT	2021-07-27
G	90% CD	2021-05-03
F	SITE PLAN RESUBMISSION	2021-04-23
E	SPA	2021-02-12
D	90% CD	2021-02-05
C	BUILDING PERMIT	2021-02-05
B	PERMIT/SPA COORDINATION	2021-02-02
A	100% DESIGN DEVELOPMENT	2021-01-19

<p>Orientation</p>  <p>PROJECT NORTH</p>	<p>Seal</p>
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MECHANICAL SITE PLAN

Date	2021-12-20	Project No CM-20-063	Drawing No M101
Drawn by	CMW		
Scale	1 : 300		





1. DRAWINGS ARE DIAGRAMMATIC AND INDICATE GENERAL LOCATIONS OF EQUIPMENT AND CONNECTING SERVICES. DRAWINGS ARE NOT TO BE DIMENSIONED OR SCALED.
2. NOTE THAT ANY REFERENCE TO CONTRACTOR ON MECHANICAL DRAWINGS IS NOT EXCLUSIVE TO MECHANICAL WORK ONLY. IT INCLUDES ALL LAB-BY-TRADE. IT IS UNDERSTOOD THAT THE PRIME CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING ALL TRADE WORK AND AS SUCH SHALL BE RESPONSIBLE FOR REVIEW OF DOCUMENT PREPARED BY SUBCONTRACTORS (I.E. MECHANICAL AND ELECTRICAL) AND INCLUDING ALL ASSOCIATED COSTS FOR THE SCOPE OF WORK AS SPECIFIED IN ALL SCHEDULES.
3. ALL WORK TO BE DONE IN ACCORDANCE WITH THE ONTARIO BUILDING CODE AND ALL OTHER REGULATORY REQUIREMENTS.
4. SECTION 4.1 LABOUR AND MATERIALS TO PROVIDE A COMPLETE MECHANICAL INSTALLATION. ITEMS NOT EXPLICITLY ILLUSTRATED ON THE DRAWINGS ARE NOT TO BE EXCLUDED FROM THE SCOPE OF WORK IF REQUIRED AS PART OF A PROPER INSTALLATION, PERMITTING ACCESS, DRAINAGE, AND OCCUPANT OPERATIONAL TRAINING WILL BE PART OF THE WORK.
5. COORDINATE PLUMBING WITH WORK OF OTHER TRADES PRIOR TO FABRICATION OR INSTALLATION. PROJECT MANAGER TO PROVIDE OFFSETS AND TRANSITIONS REQUIRED FOR COMPLETE WORKABLE INSTALLATION.
6. COORDINATE LOCATIONS OF ALL ROOF OPENINGS WITH STRUCTURAL, MECHANICAL AND ARCHITECTURAL DRAWINGS.
7. PROVIDE FULL VENTING SYSTEM IN ACCORDANCE TO PART 7 OF THE OBC.
8. COORDINATE LOCATION OF VTRS WITH AIR INTAKES
9. EQUIPMENT SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURER'S WRITTEN GUIDELINES. PROVIDE ALL FITTINGS, OFFSETS AND TRANSITIONS AS REQUIRED FOR COMPLETE INSTALLATION.
10. CAP, PRIME AND VENT PIPING:
  - a. ALL DRAINAGE PIPING 1000 AND LONGER TO BE SLOPED AT 1% .ALL DRAINAGE PIPING 750 AND LESS TO BE SLOPED AT 2%.
  - b. MINIMUM PIPE SIZE IS 100MM UNLESS NOTED OTHERWISE.
11. PROVIDE ISOLATION VALVES AT EACH PLUMBING FIXTURE.
12. ALL DRAINAGE SINKS, TUBS AND SHOWERS TO HAVE TWO (2) BIBBS TO BE SUB-TWO CG CSA VACUUM BREAKER PER OBC REQUIREMENTS.

Date	2021-12-20	Project No CM-20-063	Drawing No M200
Drawn by	CMW		
Scale	As indicated		





Date	2021-12-20	Project No	Drawing No		
Drawn by	CMW			CM-20-063	M201
Scale	As indicated				

1. DRAWINGS ARE DIAGRAMMATIC AND INDICATE GENERAL LOCATIONS OF EQUIPMENT AND CONNECTING SERVICES. DRAWINGS ARE NOT TO BE DIMENSIONED OR SCALED. THERE MAY BE VARIANCE BETWEEN THE MECHANICAL PROVIDED C/W AND THE EXCLUSIVE TO MECHANICAL CONTRACTOR OR ON PARTICULAR SUB-TRADE. IT IS UNDERSTOOD THAT THE PRIME CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATE OF ALL TRADES AND DISCIPLINES TO BE INSTALLED. PROVIDE FOR REVIEW OF DOCUMENTS PREPARED BY ALL DISCIPLINES (I.E. MECHANICAL AND ELECTRICAL) AND INCLUDING ALL ASSOCIATED COSTS FOR THE SCOPE OF WORK AS SPECIFIED BY ALL SUB-DISCIPLINES.
2. ALL WORK TO BE DONE IN ACCORDANCE WITH THE ONTARIO BUILDING CODE AND ALL OTHER REGULATORY REQUIREMENTS.
3. PROVIDE LABOUR AND MATERIALS TO PROVIDE A COMPLETE MECHANICAL INSTALLATION. ITEMS NOT EXPLICITLY ILLUSTRATED ON THE DRAWINGS ARE NOT TO BE EXCLUDED FROM THE SCOPE OF WORK IF REQUIRED AS PART OF A PROPER INSTALLATION. PERMITS, TESTING, UNLOADING, AND OCCUPANT OPERATIONAL TRAINING WILL BE PART OF THE WORK.
4. COORDINATE PLUMBING WITH WORK OF OTHER TRADES PRIOR TO FABRICATION OF INSTALLATION. PROVIDE ALL MATERIALS AND SUPPLIES REQUIRED FOR COMPLETE WORKABLE INSTALLATION.
5. COORDINATE LOCATIONS OF ALL ROOF PENETRATIONS WITH STRUCTURAL, MECHANICAL AND ARCHITECTURAL PLANS. PROVIDE ALL OPENING INSTALLATION.
6. PROVIDE FULL VENTING SYSTEM IN ACCORDANCE TO PART 7 OF THE OBC. COORDINATE LOCATION OF VTRHS WITH AIR INTAKES.
7. EQUIPMENT SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURER'S WRITTEN GUIDELINES. PROVIDE ALL FITTINGS, OFFSETS AND TRANSITIONS AS REQUIRED FOR COMPLETE INSTALLATION.
8. PROVIDE PRIME AND VENT ALL FLOOR DRAINS.
9. ALL DRAINAGE PIPING 1000 AND LARGER TO BE SLOPED AT 1% ALL DRAINAGE PIPING 750 AND LESS TO BE SLOPED AT 2%.
10. MINIMUM PIPE SIZE IS 120 UN. NOT NOTED OTHERWISE.
11. PROVIDE ISOLATION VALVES AT EACH PLUMBING FIXTURE.
12. PLUMBING SHALL BE WALL MOUNTED. PROVIDE HOSE BIBBS TO CSA VACUUM BREAKER PER OBC REQUIREMENTS.





- |          |              |                         |                    |
|----------|--------------|-------------------------|--------------------|
| Date     | 2021-12-20   | Project No<br>CM-20-063 | Drawing No<br>M200 |
| Drawn by | CMW          |                         |                    |
| Scale    | As indicated |                         |                    |



SCALE: 1 : 50



1. DRAWINGS ARE DIAGRAMMATIC AND INDICATE GENERAL LOCATIONS OF EQUIPMENT AND CONNECTING SERVICES. DRAWINGS ARE NOT TO BE DIMENSIONED OR SCALED.
2. THAT ANY REQUIREMENT FOR THE MECHANICAL CONTRACTOR SHALL BE EXCLUSIVE TO MECHANICAL CONTRACTOR OR ON PARTICULAR SUB-TRADE. IT IS UNDERSTOOD THAT THE PRIME CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATION OF ALL TRADES WORK AND THE MECHANICAL CONTRACTOR FOR REVIEW OF DOCUMENTS PREPARED BY ALL DISCIPLINES (I.E. MECHANICAL AND ELECTRICAL) AND INCLUDING ALL ASSOCIATED COSTS FOR THE SCOPE OF WORK AS IDENTIFIED IN ALL SUB-TRADES DOCUMENTS.
3. ALL WORK TO BE DONE IN ACCORDANCE WITH THE ONTARIO BUILDING CODE AND ALL OTHER REGULATORY REQUIREMENTS.
4. EXACT LABOUR AND MATERIALS TO PROVIDE A COMPLETE MECHANICAL INSTALLATION. ITEMS NOT EXPLICITLY ILLUSTRATED ON THE DRAWINGS ARE NOT TO BE EXCLUDED FROM THE SCOPE OF WORK IF REQUIRED AS PART OF A PROPER INSTALLATION, PERFECT TESTING, BALANCING, AND OCCUPANT OPERATIONAL TRAINING WILL BE PART OF THE WORK.
5. EXACT LOCATION OF ALL CEILING DIFFUSERS, REGISTERS AND GRILLES ARE DETAILED ON ARCHITECTURAL REFLECTED CEILING PLANS.
6. THE LOCATION OF ALL ROOF OPENINGS SHALL BE AS INDICATED ON THE MECHANICAL, STRUCTURAL AND ARCHITECTURAL DRAWINGS. COORDINATE EXACT SIZES OF OPENINGS AS REQUIRED.
7. ALL EQUIPMENT SHALL BE INSTALLED IN STRICT ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS AND PROVIDE PROPER FITS, TRANSITIONS, DAMPERS ETC AS REQUIRED FOR COMPLETE WORKABLE INSTALLATION.
8. DUCTWORK SHALL BE INSULATED OR LINED PER SPECIFICATIONS AND/OR AS NOTED ON ALL DRAWINGS. ALL DUCT JOINTS SHALL BE PROPERLY SEALED.
9. DUCT AND PLENUM SIZES ARE CLEAR INSIDE DIMENSIONS. WHERE DUCTWORK AND PLENUMS ARE INTERNALLY LINED, THEIR SIZES SHALL BE ADJUSTED TO PROVIDE THE SAME CLEAR DIMENSIONS INSIDE.
10. MANUAL BALANCING DAMPERS SHALL BE PROVIDED IN ALL DUCT BRANCHES AND IN ALL BRANCHES TO INDIVIDUAL DIFFUSERS, GRILLES AND REGISTERS, WHETHER SHOWN OR NOT.
11. ALL DUCTWORK LOCATED OUTSIDE THE BUILDING SHALL BE WEATHERPROOFED.
12. CONTRACTOR SHALL INSTALL ANY DUCT MOUNTED SMOKE DETECTORS FURNISHED BY THE LEGAL CONTRACTOR.
13. MINIMUM LENGTHS OF FLEXIBLE DUCT TO 1200mm.
14. COORDINATE LOCATIONS OF WALL MOUNTED SENSORS WITH ARCHITECTURAL DRAWINGS.
15. MINIMUM DUCT SIZE TO DIFFUSERS TO MATCH DIFFUSER NEXT SIZE UNLESS OTHERWISE INDICATED.

F	ISSUED FOR CONSTRUCTION	2021-12-20
E	ISSUED FOR TENDER	2021-08-12
D	ISSUED FOR BUILDING PERMIT	2021-07-27
C	90% CD	2021-05-03
B	SFA	2021-02-12
A	50% CD	2021-02-05

No.	Revision	Date
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The specifications are to be considered as an integral part of these drawings and neither the drawings nor the specifications shall be used alone. Refer to architectural drawings for dimensions. Do not scale.

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For  
City of Brampton Fire & Emergency Services

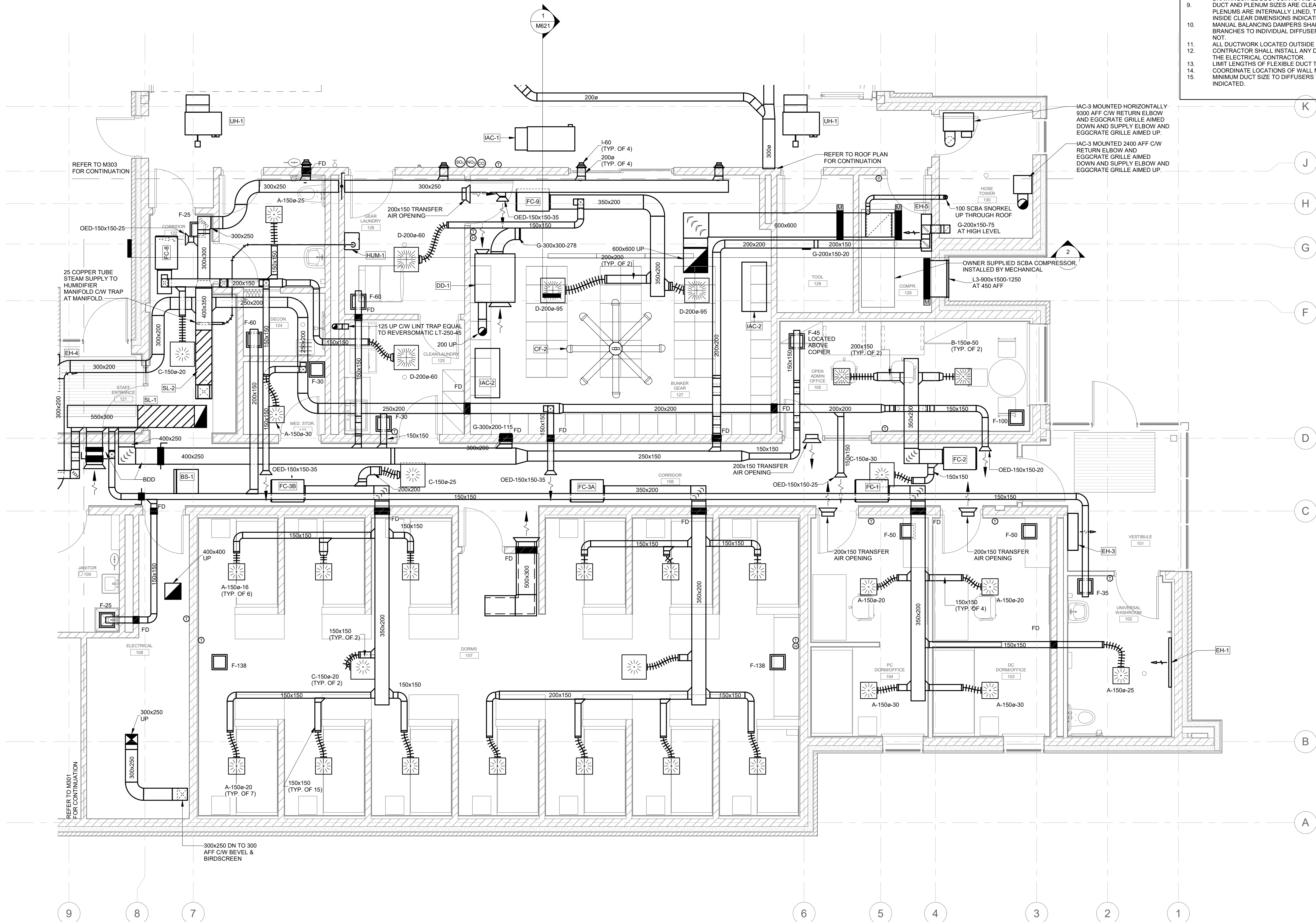
Drawing Title
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LEVEL 1 PART PLAN  
WEST - VENTILATION

Date	2021-12-20	Project No CM-20-063	Drawing No <b>M301</b>
Drawn by	CMW		
Scale	As indicated		



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2021-12-21 2:26:18 PM







1. DRAWINGS ARE DIAGRAMMATIC AND INDICATE GENERAL LOCATIONS OF EQUIPMENT AND CONNECTING SERVICES. DRAWINGS ARE NOT TO BE DIMENSIONED OR SCALED.
2. THAT ANY REFERENCE TO MECHANICAL OR ELECTRICAL WORK IS NOT EXCLUSIVE TO MECHANICAL CONTRACTOR OR ON PARTICULAR SUB-TRADE. IT IS UNDERSTOOD THAT THE PRIME CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATE ALL TRADES WORK AND PROVIDE THE MECHANICAL CONTRACTOR WITH REVIEW OF DOCUMENTS PREPARED BY ALL DISCIPLINES (I.E. MECHANICAL AND ELECTRICAL) AND INCLUDING ALL ASSOCIATED COSTS FOR THE SCOPE OF WORK AS IDENTIFIED IN ALL SUB-PRIME'S DOCUMENTS.
3. ALL WORK TO BE DONE IN ACCORDANCE WITH THE ONTARIO BUILDING CODE AND ALL OTHER REGULATORY REQUIREMENTS.
4. EXCEPT FOR LABOUR AND MATERIALS TO PROVIDE A COMPLETE MECHANICAL INSTALLATION, ITEMS NOT EXPLICITLY ILLUSTRATED ON THE DRAWINGS ARE NOT TO BE EXCLUDED FROM THE SCOPE OF WORK IF REQUIRED AS PART OF A PROPER INSTALLATION, PERFECTING, TUNING, BALANCING, AND OCCUPANT OPERATIONAL TRAINING WILL BE PART OF THE WORK.
5. EXACT LOCATION OF ALL CEILING DIFFUSERS, REGISTERS AND GRILLES ARE DETAILED ON ARCHITECTURAL DRAWINGS. REFLECTED BALANCING SHALL BE PROVIDED.
6. THE LOCATION OF ALL ROOF OPENINGS SHALL BE AS INDICATED ON THE MECHANICAL, STRUCTURAL AND ARCHITECTURAL DRAWINGS. COORDINATE EXACT SIZES OF OPENINGS AS REQUIRED.
7. ALL EQUIPMENT SHALL BE INSTALLED IN STRICT ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS. PROVIDE ALL FITTINGS, TRANSITIONS, DAMPERS ETC AS REQUIRED TO COMPLETE WORK.
8. DUCTWORK SHALL BE INSULATED OR LINED PER SPECIFICATIONS AND/OR AS NOTED ON DRAWINGS. ALL DUCT JOINTS AND SEAMS SHALL BE SEAL PER SPECIFICATIONS.
9. ALL PLenums AND EXHAUSTS SHALL BE INSULATED PER SPECIFICATIONS. PLenums AND PLenums ARE INTERNALLY LINED. THEIR SIZES SHALL BE ADJUSTED TO PROVIDE THE CLEAR DIMENSIONS REQUIRED FOR THE DUCTWORK.
10. MANUAL BALANCING DAMPERS SHALL BE PROVIDED IN ALL DUCT BRANCHES AND IN ALL BRANCHES TO INDIVIDUAL DIFFUSERS, GRILLES AND REGISTERS, WHETHER SHOWN OR NOT.
11. ALL DUCTWORK LOCATED OUTSIDE THE BUILDING SHALL BE WEATHERPROOFED.
12. CONTRACTOR SHALL INSTALL ANY DUCT MOUNTED SMOKE DETECTORS FURNISHED BY THE ELECTRICAL CONTRACTOR.
13. LIMIT LENGTHS OF FLEXIBLE DUCT TO 1200mm
14. COORDINATE LOCATIONS OF WALL MOUNTED SENSORS WITH ARCHITECTURAL DRAWINGS
15. MINIMUM DUCT SIZE TO DIFFUSERS TO MATCH DIFFUSER NEXT SIZE UNLESS OTHERWISE INDICATED.

Date	2021-12-20	Project No CM-20-063	Drawing No M303
Drawn by	CMW		
Scale	As indicated		



SCALE: 1 : 100

(1)

- 1 DRAWINGS ARE DIAGRAMMATIC AND INDICATE GENERAL LOCATIONS OF EQUIPMENT AND
- 2 CONNECTIONS SERVICES. DRAWINGS ARE NOT TO BE DIMENSIONED OR SCALED.
- 3 NOTE THAT ANY REFERENCE TO CONTRACTOR ON MECHANICAL DRAWINGS IS NOT
- 4 EXCLUSIVE TO MECHANICAL CONTRACTOR. THE PRIME CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATE
- 5 ALL TRADES WORK TO BE SHOWN ON THE DRAWINGS. THE PRIME CONTRACTOR SHALL BE RESPONSIBLE FOR REVIEWING ALL
- 6 DRAWINGS PREPARED BY ALL DISCIPLINES (IE. MECHANICAL AND ELECTRICAL) AND
- 7 INCLUDING ALL ASSOCIATED COSTS FOR THE SCOPE OF WORK AS IDENTIFIED IN ALL SUB-
- 8 CONTRACTOR DOCUMENTS.
- 9 ALL WORK TO BE DONE IN ACCORDANCE WITH THE ONTARIO BUILDING CODE AND ALL
- 10 OTHER REGULATORY REQUIREMENTS.
- 11 ALL LABOUR AND MATERIALS TO BE PROVIDED TO PROVIDE A COMPLETE MECHANICAL
- 12 INSTALLATION. ITEMS NOT EXPLICITLY ILLUSTRATED ON THE DRAWINGS ARE NOT TO BE
- 13 EXCLUDED FROM THE SCOPE OF WORK IF REQUIRED AS PART OF A PROPER
- 14 INSTALLATION. PERFECTING, BALANCING, AND OCCUPANT OPERATIONAL TRAINING
- 15 WILL BE PART OF THE WORK.
- 16 EXACT LOCATION OF ALL CEILING DIFFUSERS, REGISTERS AND GRILLES ARE DETAILED ON
- 17 MECHANICAL REFLECTANCE INDEX DRAWINGS.
- 18 THE LOCATION OF ALL ROOF OPENINGS SHALL BE AS INDICATED ON THE MECHANICAL,
- 19 STRUCTURAL AND ARCHITECTURAL DRAWINGS. COORDINATE EXACT SIZES OF OPENINGS
- 20 AS SHOWN ON DRAWINGS.
- 21 ALL EQUIPMENT SHALL BE INSTALLED IN STRICT ACCORDANCE WITH MANUFACTURER'S
- 22 RECOMMENDATIONS. PROVIDE ALL FITTINGS, TRANSITIONS, DAMPERS ETC AS REQUIRED
- 23 TO COMPLETE WORK.
- 24 DUCTWORK SHALL BE INSULATED OR LINED PER SPECIFICATIONS AND/OR AS NOTED ON
- 25 DRAWINGS. ALL DUCT JOINTS AND SEAMS SHALL BE SEAL PER SPECIFICATIONS.
- 26 ALL PLENUM SIZES SHALL BE AS NOTED ON DRAWINGS. WHEN DUCTWORK BRANCHES AND
- 27 PLenums ARE INTERNALLY LINED, THEIR SIZES SHALL BE ADJUSTED TO PROVIDE THE
- 28 INSIDE CLEAR DIMENSIONS INDICATED ON THE DRAWINGS.
- 29 ALL BALANCING AND ADJUSTING SHALL BE DONE ON ALL DUCT BRANCHES AND IN ALL
- 30 BRANCHES TO INDIVIDUAL DIFFUSERS, GRILLES AND REGISTERS, WHETHER SHOWN OR
- 31 NOT.
- 32 ALL DUCTWORK LOCATED OUTSIDE THE BUILDING SHALL BE WEATHERPROOFED.
- 33 CONTRACTOR SHALL INSTALL ANY DUCT MOUNTED SMOKE DETECTORS FURNISHED BY
- 34 THE PROJECT CONTRACTOR.
- 35 LIMIT LENGTHS OF FLEXIBLE DUCT TO 1200mm
- 36 COORDINATE LOCATIONS OF WALL MOUNTED SENSORS WITH ARCHITECTURAL DRAWINGS
- 37 MINIMUM DUCT SIZE TO DIFFUSERS TO MATCH DIFFUSER NEXT SIZE UNLESS OTHERWISE
- 38 INDICATED.

J	ISSUED FOR CONSTRUCTION	2021-12-20
I	REISSUED FOR BUILDING PERMIT	2021-09-15
H	ISSUED FOR TENDER	2021-08-12
G	ISSUED FOR BUILDING PERMIT	2021-07-27
F	90% CD	2021-05-03
E	SPA	2021-02-12
D	50% CD	2021-02-05
C	BUILDING PERMIT	2021-02-05
B	PERMIT/SPA COORDINATION	2021-02-02
A	100% DESIGN DEVELOPMENT	2021-01-19

No.	Revision	Date
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A circular diagram representing a compass rose. It has a vertical axis with an arrow pointing upwards and a horizontal axis. A diagonal line extends from the center towards the top-right. A shaded sector is located in the upper-right quadrant, bounded by the vertical axis and the diagonal line. The text "PROJECT NORTH" is written below the circle.

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BFES Station 201  
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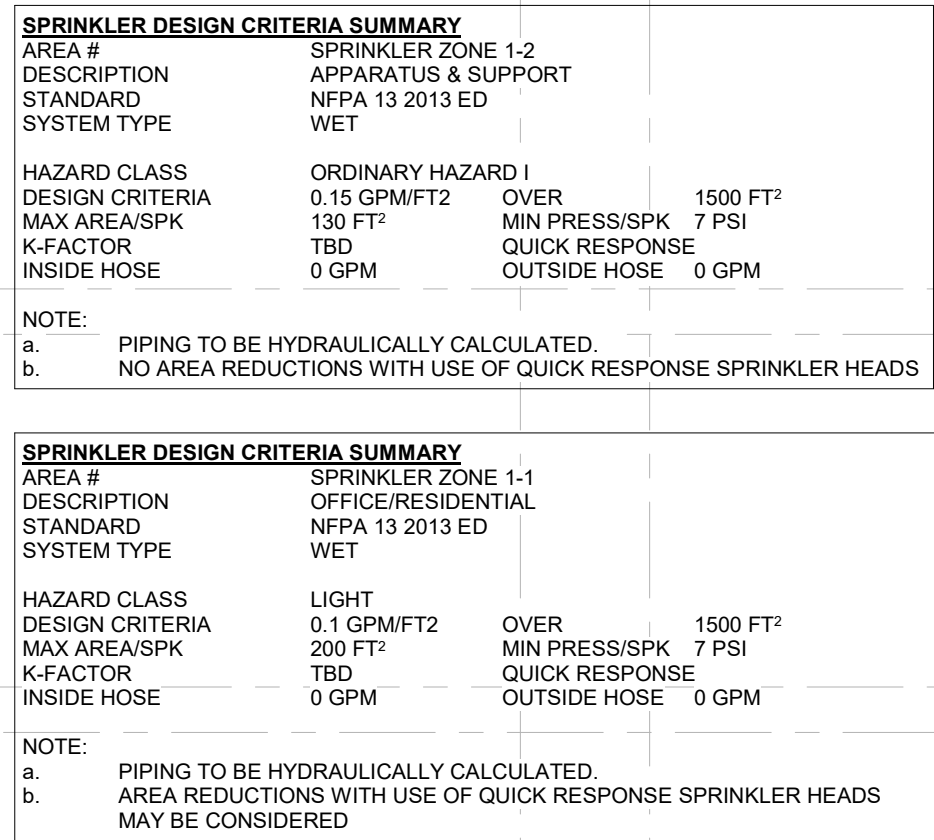
For  
City of Brampton Fire & Emergency Services

Drawing Title
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## ROOF PLAN - VENTILATION

Date	2021-12-20	Project No CM-20-063	Drawing No <b>M304</b>
Drawn by	CMW		
Scale	As indicated		





NOTE: ROOF IN APPARATUS BAY  
SLOPES UP FROM NORTH TO SOUTH.  
REFER TO ARCHITECTURAL  
DRAWINGS FOR DETAILS.

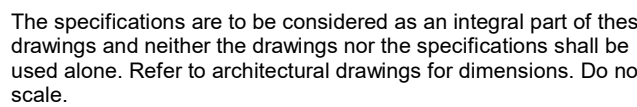
—NON-FREEZE SIDEWALL

1. DRAWINGS ARE DIAGRAMMATIC AND INDICATE GENERAL LOCATIONS OF EQUIPMENT AND  
CONNECTING SERVICES. DRAWINGS ARE NOT TO BE DIMENSIONED OR SCALED.  
2. IN THE EVENT OF ANY DISCREPANCY, THE CONTRACTOR SHALL BE RESPONSIBLE TO  
3. EXCLUSIVE TO MECHANICAL CONTRACTOR OR ON PARTICULAR SUB-TRADE. IT IS  
UNDERSTOOD THAT THE PRIME CONTRACTOR SHALL BE RESPONSIBLE TO COORDINATE  
4. ALL TRADES WORK AND TO PROVIDE THE NECESSARY PERMITS. THE CONTRACTOR SHALL  
DOCUMENTS PREPARED BY ALL DISCIPLINES (I.E. MECHANICAL AND ELECTRICAL) AND  
5. ALL WORK ASSOCIATED COSTS FOR THE SCOPE OF WORK AS IDENTIFIED IN ALL SUB-  
DISCIPLINE'S DOCUMENTS.  
6. ALL WORK TO BE DONE IN ACCORDANCE WITH THE ONTARIO BUILDING CODE AND ALL  
7. APPLICABLE REGULATIONS AND REQUIREMENTS.  
8. THE CONTRACTOR SHALL BE RESPONSIBLE TO PROVIDE ALL MATERIALS AND TO  
9. SUPPLY ALL LABOUR AND MATERIALS TO PROVIDE A COMPLETE MECHANICAL  
INSTALLATION. ITEMS NOT EXPLICITLY ILLUSTRATED ON THE DRAWINGS ARE NOT TO BE  
10. OBTAINED FROM THE CITY FIRE DEPARTMENT. THE CONTRACTOR SHALL OBTAIN ALL  
11. INSTALLATION PERMITS, TESTING, BALANCING, AND OCCUPANT OPERATIONAL TRAINING  
WILL BE PART OF THE WORK.  
12. THE CONTRACTOR SHALL COORDINATION WITH WORK OF OTHER TRADES PRIOR TO FABRICATION  
OR INSTALLATION. PROVIDE ALL FITTINGS, OFFSETS AND TRANSITIONS REQUIRED FOR  
13. THE WORK. THE CONTRACTOR SHALL BE RESPONSIBLE TO OBTAIN ALL NECESSARY  
14. THIS SPRINKLER DRAWING IS PREPARED TO GIVE THE CONTRACTOR THE DESIGN INTENT,  
THE SCOPE OF WORK AND TO ASSIST IN PRICING THE SPRINKLER WORK. THE  
15. CONTRACTOR SHALL BE RESPONSIBLE TO OBTAIN ALL NECESSARY PERMITS, TESTING,  
HYDRAULIC CALCULATIONS AND SUBMIT TO THE CITY FIRE DEPARTMENT AND TO THE  
16. CONSULTANT FOR APPROVAL. CONTRACTOR SHALL OBTAIN COPIES OF CALCULATION  
AND DRAWINGS TO SUBMIT TO THE CITY FIRE DEPARTMENT AND TO THE CONSULTANT  
17. CONTRACTOR IN ORDER TO COMPLETE THIS DESIGN. THE CONTRACTOR SHALL INCLUDE  
FOR ALL NECESSARY REQUIREMENTS TO COMPLETE THE DESIGN IF THE ABOVE  
18. INFORMATION IS NOT AVAILABLE. THE CONTRACTOR SHALL BE RESPONSIBLE TO  
ON COMPLETION OF SPRINKLER WORKS, CONTRACTOR SHALL TEST REVISED  
19. SPRINKLER ZONES TO THE LATEST REQUIREMENTS OF NFPA 13 "INSTALLATION OF  
SPRINKLER SYSTEMS".  
20. CONTRACTOR SHALL COORDINATE WITH MECHANICAL AND ELECTRICAL TRADES FOR  
COORDINATION OF SPRINKLER WORK WITH MECHANICAL AND ELECTRICAL TRADES.  
21. CONTRACTOR SHALL CO-ORDINATE SPRINKLER HEAD LOCATIONS IN AREAS WITH  
SUSPENDED CEILINGS WITH THE LOCATION OF LIGHTING, GRILLS, DIFFUSERS, AND  
22. OTHER ITEMS RELEVANT TO THE DESIGN. CONTRACTOR SHALL BE RESPONSIBLE TO  
IN TILE. CENTRE THE SPRINKLER HEAD BOTH WAYS IN THE LAY-IN TILE.

I	ISSUED FOR CONSTRUCTION	2021-12-20
H	ISSUED FOR TENDER	2021-08-12
G	ISSUED FOR BUILDING PERMIT	2021-07-27
F	90% CD	2021-05-03
E	SPA	2021-02-12
D	50% CD	2021-02-05
C	BUILDING PERMIT	2021-02-05
B	PERMIT/SPA COORDINATION	2021-02-02
A	100% DESIGN DEVELOPMENT	2021-01-19

No.	Revision	Date
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Seal



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250 ROWNTREE DAIRY RD, WOODBRIDGE, ON  
TEL: 905-507-0800  
WEB: [WWW.QUASARCG.COM](http://WWW.QUASARCG.COM)

### Project Information

BFES Station 201  
(SPA-2021-0032)

27 Rutherford Rd. S., Brampton, ON, L6W 3J3

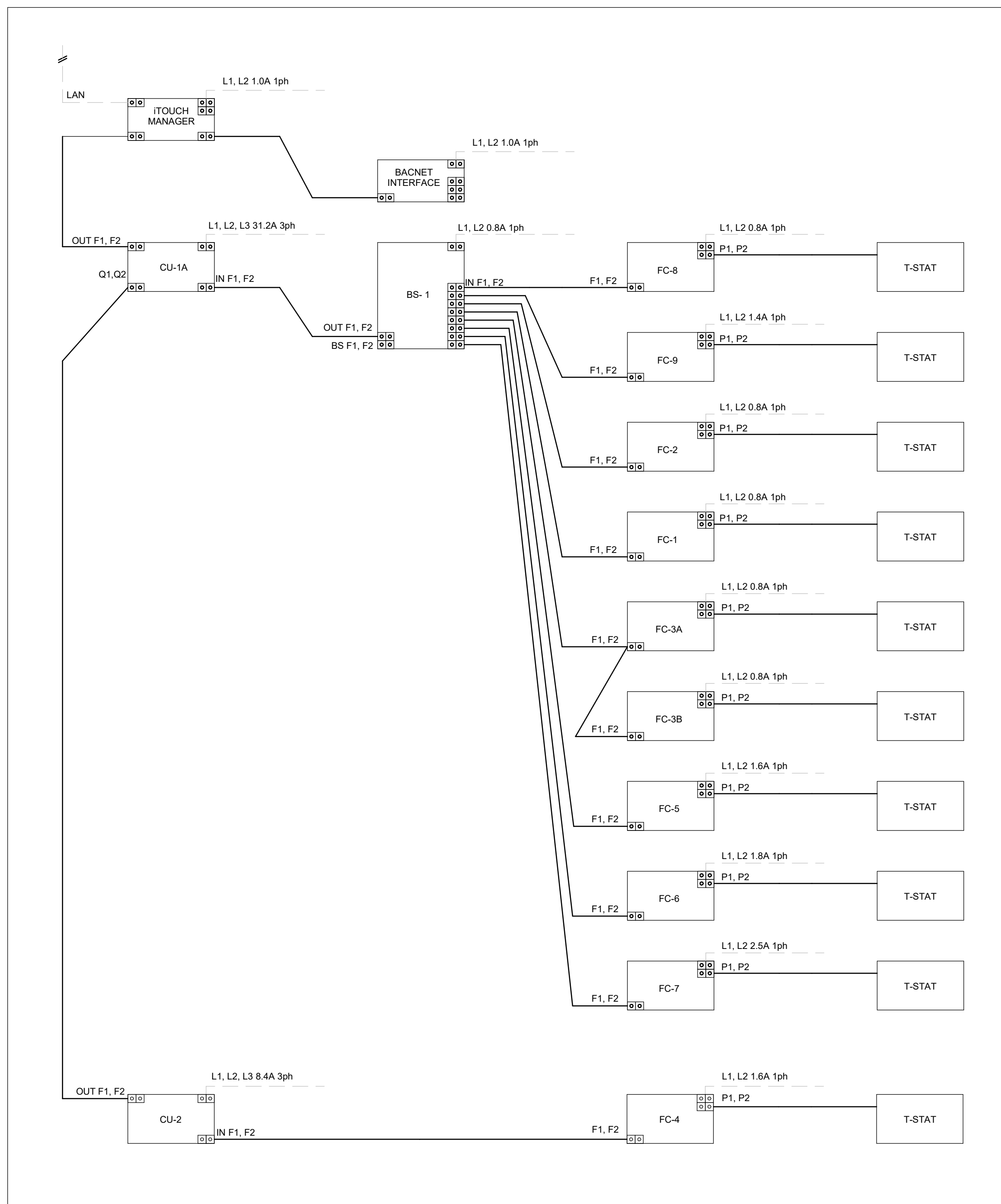
For  
City of Brampton Fire & Emergency Services

Drawing Title

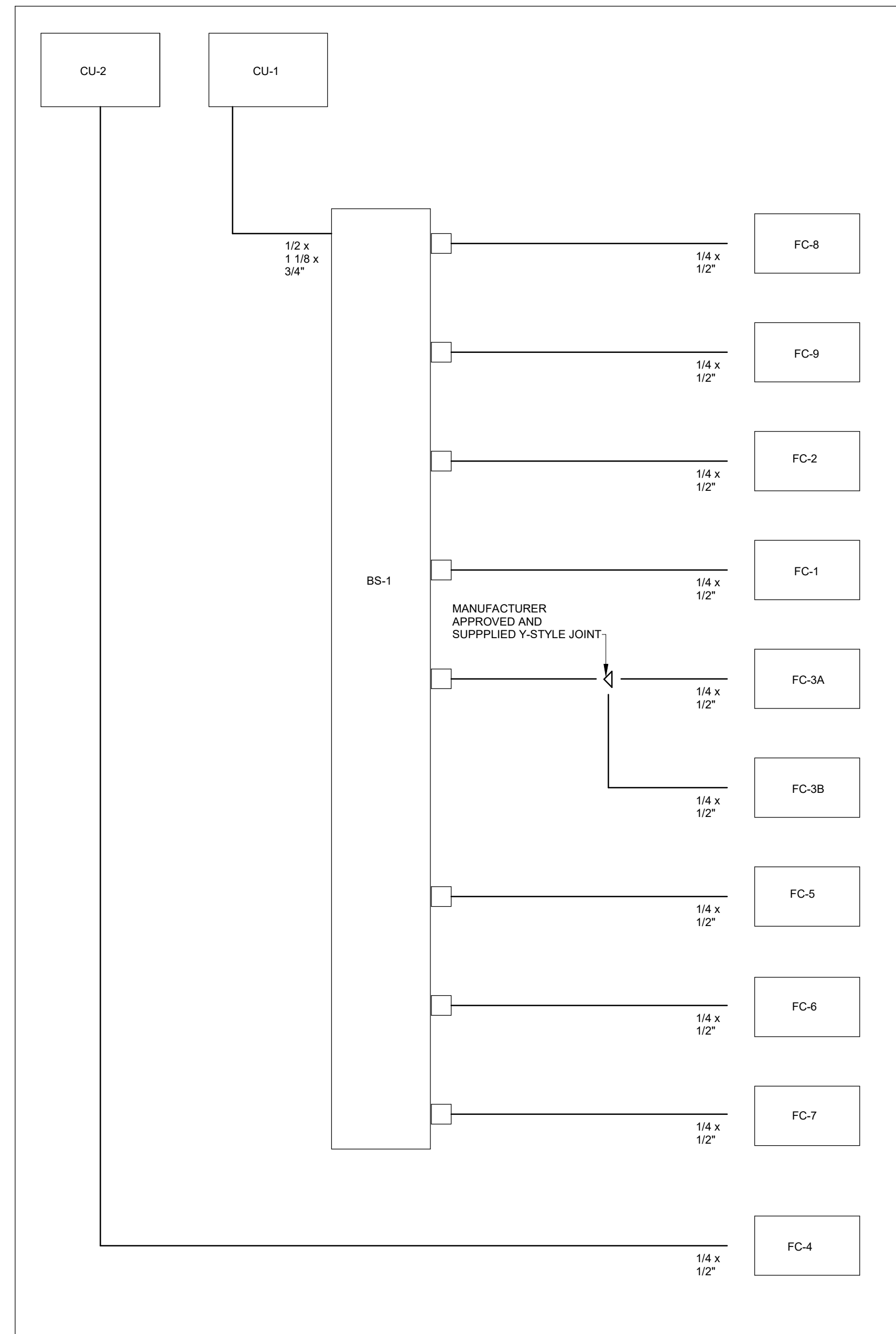
## LEVEL 1 PLAN - FIRE PROTECTION

Date	2021-12-20	Project No CM-20-063	Drawing No <b>M401</b>
Drawn by	CMW		
Scale	As indicated		





2 VRV WIRING SCHEMATIC  
SCALE:N.T.S.




1 VRV PIPING SCHEMATIC  
SCALE:N.T.S.

FOR QUESTIONS REGARDING THIS PROJECT, PLEASE  
EMAIL: CM-20-063@QUASARCG.COM

I	ISSUED FOR CONSTRUCTION	2021-12-20
H	ISSUED FOR TENDER	2021-08-12
G	ISSUED FOR BUILDING PERMIT	2021-07-27
F	90% CD	2021-06-03
E	SPA	2021-02-12
D	50% CD	2021-02-05
C	BUILDING PERMIT	2021-02-05
B	PERMIT/SPA COORDINATION	2021-02-02
A	100% DESIGN DEVELOPMENT	2021-01-19

No.	Revision	Date
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<p>Orientation</p>  <p>A circular diagram with a vertical line passing through its center. A horizontal line also passes through the center, and a diagonal line passes through the center from the bottom-left to the top-right. A shaded sector is located in the upper-right quadrant, bounded by the vertical line and a radial line. The radial line is labeled with the letter 'N'.</p> <p>PROJECT NORTH</p>	<p>Seal</p>
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WEB: [WWW.QUASARCG.COM](http://WWW.QUASARCG.COM)

### Project Information

BFES Station 201  
(SPA-2021-0032)

27 Rutherford Rd. S., Brampton, ON, L6W 3J3

For  
City of Brampton Fire & Emergency Services

Drawing Title
---------------

## VRV SCHEMATIC

Date 2021-12-20	Project No  CM-20-063	Drawing No  <b>M601</b>
Drawn by CMW		
Scale N.T.S.		







ELECTRIC HUMIDIFIER											
TAG	MANUFACTURER	MODEL	AIRFLOW (L/s)	ENTERING AIR DB (°C)	SPACE CONDITIONS		STEAM LOAD (kg/hr)	ELECTRICAL		WEIGHT (kg)	REMARKS
					DB (°C)	% RH		FLA	V/Ph/Hz		
HUM-1	DRISTEEM	XTF-006	610	-15.1	22.0	35	13.6	33.3 A	208/3/60	63	MODULATING C/W RAPIDSORB 1.5" MANIFOLD, RETURN DUCT HUMIDITY SENSOR, CONDENSATE COOLER, CONDENSATE PUMP AT MANIFOLD, PIPING, and BACNet CARD.

SILENCERS																				
TAG	SERVICE	MANUFACTURER	TYPE	MODEL	WIDTH (mm)	HEIGHT (mm)	LENGTH (mm)	AIRFLOW (L/s)	VELOCITY (m/s)	IDEAL DP (Pa)	MAX DP W/ SYS. EFF. (Pa)	MINIMUM DYNAMIC INSERTION LOSS (dB)								REMARKS
												1	2	3	4	5	6	7	8	
SL-1	DOAS RETURN	VIBRO-ACOUSTICS	RED	RED-L27621	550	300	1800	612	4	30	72	9	17	25	34	46	47	34	24	REFER TO NOTE 6.7.8
SL-2	DOAS SUPPLY	VIBRO-ACOUSTICS	RED	RED-L27621	400	350	1800	612	4	33	52	6	11	21	27	39	38	31	25	REFER TO NOTE 6.7.8

NOTES:

- TYPE R - RECTANGULAR E - ELBOW D - DISSIPATIVE
- VELOCITY SHOWN IS + (FORWARD FLOW) OR - (REVERSE FLOW) AS DEFINED BY ASTM E477-13.
- IDEAL PRESSURE DROP AS DETERMINED PER ASTM E477-13 IN A NALAP-ACCREDITED ACOUSTICAL LABORATORY.
- PRESSURE DROP PER ASTM E477-13 PLUS SYSTEM EFFECTS FOR NEARBY DUCT ELEMENTS
- MINIMUM DYNAMIC INSERTION LOSS DETERMINED PER ASTM E477-13 IN A NALAP-ACCREDITED ACOUSTICAL LABORATORY.
- NON-BASIS OF DESIGN SILENCER MANUFACTURER SHALL PROVIDE, FOR APPROVAL, PROFESSIONAL ENGINEER STAMPED ACOUSTICAL CALCULATIONS FOR ALL SYSTEMS WITH SILENCERS TO DEMONSTRATE THAT THE RESULTANT DUCTBORNE FAN SOUND LEVELS, INCLUDING AERODYNAMIC AND BREAKOUT NOISE, MEET NC-30 IN THE OCCUPIED SPACES.
- NON-BASIS OF DESIGN SILENCER MANUFACTURER SHALL PROVIDE, FOR APPROVAL, PROFESSIONAL ENGINEER STAMPED PRESSURE DROP CALCULATIONS FOR ALL SYSTEMS WITH SILENCERS TO DEMONSTRATE THAT THE RESULTANT INSTALLED PRESSURE DROP WITH SYSTEM EFFECTS DOES NOT EXCEED SCHEDULED VALUES.
- FOR NON-BASIS OF DESIGN PRODUCT SUPPLIED, CONTRACTOR IS FINANCIALLY RESPONSIBLE TO ENSURE NOISE CONTROL SOLUTION IS DELIVERED TO MEET NC-30 IN THE OCCUPIED SPACES.

GAS-FIRED UNIT HEATERS												
TAG	TYPE	MANUFACTURER	MODEL	LOCATION	QTY	GAS INPUT (KW)	GAS OUTPUT (KW)	COMBUSTION EFFICIENCY	AIRFLOW (L/S)	ELECTRICAL V/PH/Hz	WEIGHT (kg)	REMARKS
UH-1	CONDENSING	MODINE	PTC 85SS0111S	APPARATUS BAY	4	25 KW	23.2	98%	779	115/160	64	C/W 80 DEGREE HOOD
UH-2	CONDENSING	MODINE	PTC 55SS0111S	APPARATUS BAY	1	16 KW	15.0	98%	518	115/160	45	C/W 80 DEGREE HOOD

PUMPS											
TAG	TYPE	MANUFACTURER	MODEL	LOCATION	FLOW (L/s)	HEAD (kPa)	MAX POWER (W)	FLA (A)	V/Ph/Hz	WEIGHT (kg) (KG)	REMARKS
P-1	DHW RE-CIRC.	ARMSTRONG	ASTRO 225BS	CORRIDOR	0.07	32.8	75	0.64	115/1/60	3	

DESICCANT DEHUMIDIFIER																		
TAG	MANUFACTURER	MODEL	PROCESS FAN		REGEN. FAN		SPACE CONDITIONS		CAPACITY (kg/hr)	SOUND (dB)	ELECTRICAL			HEIGHT (MM)	WIDTH (MM)	DEPTH (MM)	WEIGHT (kg)	REMARKS
			AIRFLOW (L/s)	E.S.P (Pa)	AIRFLOW (L/s)	E.S.P. (Pa)	DB (°C)	% RH			POWER	FLA	V/Ph/Hz					
DD-1	CONDAIR	DA 600	278	303.4	97	200.0	20.0	60	7.1	62	11.90 kW	33.1 A	208/3/60	910	1199	991	195	

ELECTRIC HEATERS								
TAG	TYPE	MANUFACTURER	MODEL	LOCATION	CAPACITY	AIRFLOW (L/S)	ELECTRICAL V/PhHz	REMARKS
EH-1	BASEBOARD HEATER	OUELLET	OCB1006-RT	WASHROOM 102	1 kW	0	208/160	WALL MOUNTED
EH-2	BASEBOARD HEATER	OUELLET	OCB1006-RT	MECHANICAL 111	1 kW	0	208/160	WALL MOUNTED
EH-3	CABINET ELECTRIC HEATER	OUELLET	OLAQ2038-RT	VESTIBULE 101	2 kW	118	208/160	WALL MOUNTED - SEMI RECESSED
EH-4	CABINET ELECTRIC HEATER	OUELLET	OLAQ2038-RT	VESTIBULE 121	2 kW	118	208/160	WALL MOUNTED - SEMI RECESSED
EH-5	CABINET ELECTRIC HEATER	OUELLET	OLAQ2038-RT	COMPRESSOR RM	2 kW	118	208/160	WALL MOUNTED

LOUVRES							
TAG	TYPE	MANUFACTURER	MODEL	LENGTH	HEIGHT	AIRFLOW (L/s)	REMARKS
L1	STORM	E.H. PRICE	DE635	1050	900	900	5.1 SQ.m. FREE AREA MINIMUM
L2	STORM	E.H. PRICE	DE635	1050	900	900	5.1 SQ.m. FREE AREA MINIMUM
L3	STORM	E.H. PRICE	26302635	600	1500	1250	1.8 SQ.m. FREE AREA MINIMUM
L4	GRAVITY RELIEF PENTHOUSE LOUVER	COOK	24X24X4 TRE	610	450	1150	0.67 SQ.m. FREE AREA MINIMUM. WIDTH = LENGTH. PD=2.5Pa
L5	LOUVER PENTHOUSE	COOK	14X16X2 TRE	650	225	285	2.62 SQ.m. FREE AREA MINIMUM. WIDTH = LENGTH. PD=12.5Pa

EXPANSION TANKS								
TAG	LOCATION	SERVICE	BASIS OF DESIGN		VOLUME (L)	TANK ACCEPTANCE (L)	MAX OPERATING PRESSURE (kPa)	REMARKS
			MANUFACTURER	MODEL				
ET-1	MECHANICAL ROOM	DOMESTIC WATER	WATTS	DETA 20	32	20	1034	

INDUSTRIAL AIR CLEANERS								
TAG	SERVICE	MANUFACTURER	MODEL	AIRFLOW (L/SEC)	FAN MOTOR (KW)	ELECTRICAL V/Ph/Hz	WEIGHT (kg)	REMARKS
IAC-1	APPARATUS BAY	AIRMATION	AME320-NDR	1416	0.75	208/3/60	7.5	REFER TO NOTES 1&4
IAC-2	BUNKER GEAR	AIRMATION	MICROCON CD	24	0.23	120/160	2.4	REFER TO NOTES 2 & 4
IAC-3	HOSE TOWER	AIRMATION	MICROCON AS	283	0.75	120/160	2.4	REFER TO NOTES 3 & 4

NOTES:

1. CW/ PRE-FILTER, FINAL FILTER, GAS PHASE FILTER AND TCMMB CONTROLLER.
2. CEILING HUNG UNIT CW VIBRATION ISOLATORS.
3. PORTABLE UNIT TO HAVE WHEELS REMOVED AND SHALL BE WALL MOUNTED OUT OF THE WAY AND CW/ DUCTWORK TO AVOID RECIRCULATION AS INDICATED ON PLANS.
4. INSTALL AS PER MANUFACTURER INSTRUCTION.

PLUMBING FIXTURE SCHEDULE					
FIXTURE TAG	DESCRIPTION	CONNECTION SIZES			REMARKS
		DHW	SAN	VENT/CW	
WC-1WC-2	WC - Flush Valve	25	n/a	100	38
L-1/L-2	Lavatory	12	12	32	32
S-1	Private Single Comp. Sink	12	12	38	32
S-1	Private Two Comp. Sink	12	12	38	32
S-1	Kitchen Single Comp. Sink	12	12	38	32
S-2	Kitchen Two Comp. Sink	12	12	38	32
S-3	Kitchen Three Comp. Sink	12	12	50	38
JS-1	Mop / Janitor's Sink	20	20	75	38
SH-1	Shower	12	12	50	38
DW-1	Dishwasher (Domestic)	n/a	12	38	32
HB-1	Hose Bibb	20	n/a	n/a	n/a
FD-1	4" F.D	n/a	n/a	100	38
FD-1	3" F.D	n/a	n/a	75	38
FD-1	2" F.D	n/a	n/a	50	38
EW-1	Eyewash Station	12	12	38	32

GRILLES AND DIFFUSERS						
TAG	TYPE	MANUFACTURER	MODEL	LENGTH	WIDTH	REMARKS
A	SWIRL DIFFUSER	KAMPMANN	KASWIRL-ED-300	300	300	C/W HIGH INDUCTION ECCENTRIC DRUM
B	SWIRL DIFFUSER	KAMPMANN	KASWIRL-ED-400	400	400	C/W HIGH INDUCTION ECCENTRIC DRUM
D	SWIRL DIFFUSER	KAMPMANN	KASWIRL-ED-300/600	600	600	C/W HIGH INDUCTION ECCENTRIC DRUM
D	SWIRL DIFFUSER	KAMPMANN	KASWIRL-ED-500/600	600	600	C/W HIGH INDUCTION ECCENTRIC DRUM
E	SWIRL DIFFUSER	KAMPMANN	KASWIRL-ED-500/600	600	600	C/W HIGH INDUCTION ECCENTRIC DRUM
F	EGG CRATE GRILLE	EH PRICE	85 DAL	300	300	C/W RETURN AIR CANOPY
G	SIDEWALL		85 DAL			
I	NOZZLE DIFFUSER	E.H. PRICE	ND	0	0	2000 DIAMETER

DESTRATIFICATION FANS											
TAG	LOCATION	QTY	MANUFACTURER	MODEL	DIAMETER (M)	POWER (kW)	MAX RPM	V/Ph/Hz	SPEED CONTROL	WEIGHT (kg)	REMARKS
CF-1	APPARATUS BAY	2	BIG ASS FANS	PFX3-10	3.0	0.75	160	208/3/60	VFD	105	C/W WALL SPEED CONTROL & EXTENSION TUBE TO REACH 10' INSTALL HEIGHT
CF-2	BUNKER GEAR 127	1	BIG ASS FANS	E7	2.1	0.18	198	115/1/60	DIAL	31	

VARIABLE REFRIGERANT FLOW HEAT RECOVERY BRANCH SELECTOR												
TAG	MANUFACTURER	MODEL	ASSOCIATED CONDENSER	MAX CAPACITY (kW)	ELECTRICAL			DIMENSIONS			WEIGHT (kg)	REMARKS
					V/Ph/Hz	MCA	MCCP	W	H	D		
BS-1	DAIKIN	BSF80S47JVJ	CU-1	0.00 kW	208/1/60	0.4	15	579	297	480	33.1 kg	C/W BRANCH SELECTOR CLOSED PIPE KIT

KITCHEN RANGE HOOD										
TAG	LOCATION	MANUFACTURER	MODEL	WIDTH (mm)	DEPTH (mm)	AIRFLOW (L/s)	S.P (Pa)	V/Ph/Hz	WEIGHT (kg)	REMARKS
BH-1	KITCHEN	CAPTIVEAIRE	4824 ND-2	1219	1219	378	-153	120/160	150	430 SS WHERE EXPOSED
NOTES: 1. MAX COOKING TEMPERATURE: 315 DEG. C 2. 430 SS WHERE EXPOSED 3. C/W ANSUL R102 COMMERCIAL SUPPRESSION SYSTEM CONTAINED IN INTEGRATED UTILITY CABINET. 4. C/W GREASE FILTERS AND MINIMUM TWO UL LISTED LIGHT FIXTURES										

GAS FIRED HOT WATER TANK HEATER												
TAG	MANUFACTURER	MODEL	LOCATION	# OF HEATERS	GAS - INPUT CAPACITY	RECOVERY RATE (LPH @ 37.3C)	STORAGE CAPACITY	V/Ph/Hz	DIAMETER (mm)	HEIGHT (mm)	FLUE SIZE (mm)	REMARKS
DHWT-1	BRADFORD WHITE	EF-100T-399E-3N (A)	MECHANICAL ROOM	1	117.0 KW	1707	264.90 L	1201/60	718	1432	76	

EXHAUST FANS																						
TAG	SERVICE	LOCATION	MANUFACTURER	MODEL	AIRFLOW (L/s)	E.S.P. (Pa)	POWER (kW)	BHP (kW)	RPM MOTOR	V/PhHz	SPEED CONTROL	SOUND POWER (dB)								WEIGHT (kg)	REMARKS	
												1	2	3	4	5	6	7	8			dB(A)
EF-1	APPARATUS BAY EXHAUST	WALL	COOK	180W1TD (VF)	900	0.00	0.15	0.20	703	61	60	55	51	48	53	40	REFER TO NOTE 1					
EF-2	APPARATUS BAY EXHAUST	WALL	COOK	180W1TD (VF)	900	0.00	0.15	0.16	703	115/160	ECM	59	69	66	61	60	51	48	53	40	REFER TO NOTE 1	
EF-3	KITCHEN EXHAUST	ROOF	CAPTIVAIRE	DU50/H4	378	250	0.37	0.24	0	115/160	ECM	75	77	83	75	70	68	64	55	67	55	REFER TO NOTE 2
EF-4	TAILPIPE EXHAUST	ROOF	NEDERMAN	NCF-30/20	920	1493	4.10	0.00	0	208/330	VFD	0	0	0	0	0	0	0	88	85	REFER TO NOTE 3	
EF-5	ELECTRICAL ROOM EXHAUST	ROOF	COOK	120C7DDEC	285	75	0.56	0.24	1725	115/160	ECM	58	61	58	53	52	47	42	38	45	14	REFER TO NOTE 2

NOTES:

1. C/W 600mm ROOF CURB, ULT. MOUNTED ADJUSTABLE SPEED CONTROL, REMOTE CONTROL INTERFACE TO CONNECT TO BAS AND APPARATUS BAY GAS DETECTION CONTROLLER.

2. UL715, UL782 & UL919 COMPLIANT, 1000mm HUB, GREASE BOX, 1000mm EXHAUST FAN PROVIDED BY COMMERCIAL KITCHEN SUPPLIES.

3. C/W TAILPIPE EXHAUST RAILS, HOSES, MAGNETIC GRABBERS, AND CONTROLLER. FAN TO BE MOUNTED ON NON-PENETRATING SUPPORT EQUAL TO PORTABLE PIPE HANGERS EQUIPMENT PLATFORM.

FAN COIL CASSETTES																						
TAG	MANUFACTURER	MODEL	NOMINAL TONNAGE	TYPE	ASSOCIATED CONDENSER	REFRIGERANT TYPE	AIR FLOW (L/s)	COOLING				HEATING		ELECTRICAL			DIMENSIONS (m)			WEIGHT (kg)	REMARKS	
								TOTAL	SENSIBLE	EAT (DB)	EAT (WB)	CAPACITY (kW)	EAT (DB)	V/Ph/Hz	MCA	MOPP	W	H	D			
FC-4	DAIKIN	FTX15NMVJU	1.3	WALL MOUNTED UNIT	CU-2	R401A	593	4.4	3.65	26 °C	19 °C	5.36	21 °C	208/1/60	17.0	20	990	295	263	12.0 kg	SEE NOTES	
NOTES: 1. CW/ SMART THERMOSTAT TO MONITOR TEMPERATURE, HUMIDITY, AND OCCUPANCY, AND TO CONTROL ASSOCIATED ERV/DOAS UNIT.																						

AIR-COOLED CONDENSING UNITS																					
TAG	MANUFACTURER	MODEL	NOMINAL TONNAGE	COOLING CAPACITY		HEATING CAPACITY			REFRIGERANT	ELECTRICAL				DIMENSIONS (M)			WEIGHT	EFFICIENCY			REMARKS
				(kW)	OAT (°C)	(kW)	OAT (DB)	OAT (WB)		V/Ph/Hz	MCA	MOCP	RLA	W	D	H		EER	IEER	COP	
CU-2	DAIKIN	RXL15QM/JU	1.25	4.40	35 °C	5.36	-25 °C	-25 °C	R401A	208/1/60	13 A	15	12 A	870	320	735	49.00 kg	13	20	4	

GAS FIRED MAKEUP AIR UNITS																									
TAG	MANUFACTURER	MODEL	SERVICE	NOMINAL COOLING CAPACITY (TONS)	OUTDOOR AIRFLOW (L/s)	SUPPLY FAN			COOLING			HEATING			FILTER	EFFICIENCY		ELECTRICAL		CONDENSING UNIT ELEC.		WEIGHT (kg)	REMARKS		
						AIRFLOW (L/s)	E.S.P (Pa)	SPEED CONTROL	REFRIGERANT	TOTAL	SENSIBLE	GAS TYPE	GAS INPUT (kW)	OUTPUT (kW)		COP	SEER	MCA	MOCP	V/Phz	MCA			MOCP	V/Phz
MAU-1	CAPTIVEAIRE	AH-BT-150-15D-MPU	KITCHEN HOOD	2	378	378	125	ECM	R410A	7.0	4.3	NG	31.7	25.4	MERV 8	3.7	14	19	30	115/1/60	14 A	20 A	208/1/60	680	

DEDICATED OUTSIDE AIR SYSTEMS																																										
TAG	MANUFACTURER	MODEL	SUPPLY FAN				EXHAUST FAN				FILTERS (SUPPLY / RETURN)	PREHEAT COIL CAPACITY (KW)	ENTHALPY WHEEL PERFORMANCE																ELECTRICAL				WEIGHT	REMARKS								
			AIRFLOW (L/s)	E.S.P. (L/s)	POWER (KW)	BHP (W)	AIRFLOW (L/s)	E.S.P. (L/s)	POWER (KW)	BHP (W)			EFFICIENCY (%)								COOLING PERFORMANCE								HEATING PERFORMANCE													
													SENSIBLE				LATENT				O.A.T. (°C)				S.A.T. (°C)				O.A.T. (°C)						S.A.T. (°C)				E.A.T. (°C)			
													DB	WB	DB	WB	DB	WB	DB	WB	DB	WB	DB	WB	DB	WB	DB	WB	DB	WB	DB	WB			DB	WB	DB	WB	DB	WB		
DOAS-1	COOK	ERV-2500	610	165 Pa	0.37	274	610	180	0.56	386	MERV 13	5.0 kW	81.7	79	30.0	23.0	25.0	18.7	25.5	19.2	29.4	22.5	-19.6	-20.2	22.0	12.2	17.6	9.8	-15.3	-15.4	8	10	15	575x60	815 kg	NOTES 1&2						
NOTES: 1. UNIT TO BE COMPLETE WITH VARIABLES PURCHASE DRIVES FOR SUPPLY AND EXHAUST FANS. REFER TO CONTROLS SCHEMATICS FOR OPERATIONAL REQUIREMENTS. PROVIDED REQUIRED INTERFACE CARD FOR VRV BS REMOTE MONITORING AND SETPOINT CONTROL. 2. CURB TO BE MINIMUM 600MM TALL 3. COMPLETE WITH HINGED ACCESS DOOR, PURGE SECTION, DOUBLE WALL CONSTRUCTION, GFCI SERVICE OUTLET, ROTATION SENSOR, DIRTY FILTER SENSOR, ENTHALPY ECONOMIZER MODEL. INSULATED MOTORIZED CENTRE PIVOT INTAKE DAMPER, MOTORIZED CENTRE PIVOT RETURN DAMPER, MOTORIZED EXHAUST DAMPER.																																										

VARIABLE REFRIGERANT FLOW CASSETTES																						
TAG	MANUFACTURER	MODEL	NOMINAL TONNAGE	TYPE	ASSOCIATED CONDENSER	ZONE CHANGE/COVER DEVICE	REFRIGERANT TYPE	AIR		COOLING		HEATING		ELECTRICAL			DIMENSIONS			WEIGHT (kg)	REMARKS	
								AIRFLOW (L/s)	CAPACITY (kW)	TOTAL	SENSIBLE	ED (BT)	EW (BT)	CAPACITY (kW)	EAT (DB)	V/Phz	MCA	MOCP	W			H
FC-1	DAIKIN	FXSQ07TAVJU	0.6	MSP Concealed Ducted Unit	CU-1	Yes	R410A	133	2.07	1.57	26 °C	65 °F	11146.00	19 °C	208/106/0	0.8	15	551	246	800	25.0 kg	c/w NAVIGATION REMOTE CONTROLLER
FC-2	DAIKIN	FXSQ05TAVJU	0.5	MSP Concealed Ducted Unit	CU-1	Yes	R410A	133	1.64	1.31	26 °C	65 °F	14444.00	19 °C	208/106/0	0.8	15	551	246	800	25.0 kg	c/w NAVIGATION REMOTE CONTROLLER
FC-3A	DAIKIN	FXSQ09TAVJU	0.8	MSP Concealed Ducted Unit	CU-1	Yes	R410A	150	2.66	1.91	26 °C	65 °F	11146.00	19 °C	208/106/0	0.8	15	551	246	800	25.0 kg	c/w NAVIGATION REMOTE CONTROLLER
FC-3B	DAIKIN	FXSQ09TAVJU	0.8	MSP Concealed Ducted Unit	CU-1	Yes	R410A	150	2.66	1.91	26 °C	65 °F	11146.00	19 °C	208/106/0	0.8	15	551	246	800	25.0 kg	c/w NAVIGATION REMOTE CONTROLLER
FC-5	DAIKIN	FXSQ16TAVJU	1.5	MSP Concealed Ducted Unit	CU-1	Yes	R410A	284	4.95	3.73	26 °C	65 °F	12.50	19 °C	208/106/0	1.6	15	1001	246	800	55.0 kg	c/w NAVIGATION REMOTE CONTROLLER
FC-6	DAIKIN	FXSQ24TAVJU	2.0	MSP Concealed Ducted Unit	CU-1	Yes	R410A	350	0	0	26 °C	65 °F	12.50	19 °C	208/106/0	1.8	15	0	0	0	0.0 kg	
FC-7	DAIKIN	FXSQ36TAVJU	3.0	MSP Concealed Ducted Unit	CU-1	Yes	R410A	534	9.96	7.09	26 °C	65 °F	42649.00	19 °C	208/106/0	2.5	15	1400	246	800	46.0 kg	c/w NAVIGATION REMOTE CONTROLLER
FC-8	DAIKIN	FXSQ07TAVJU	0.6	MSP Concealed Ducted Unit	CU-1	Yes	R410A	133	2.07	1.57	26 °C	65 °F	14444.00	19 °C	208/106/0	0.8	15	551	246	800	25.0 kg	c/w NAVIGATION REMOTE CONTROLLER
FC-9	DAIKIN	FXSQ15TAVJU	1.3	MSP Concealed Ducted Unit	CU-1	Yes	R410A	250	0	0	26 °C	65 °F	3.27	19 °C	208/106/0	1.4	15	0	0	0	0.0 kg	

VARIABLE REFRIGERANT FLOW AIR-COOLED CONDENSING UNITS																													
TAG	MANUFACTURER	MODEL	NOMINAL TONNAGE	COOLING CAPACITY		HEATING CAPACITY			PEAK COINCIDENT INDOOR UNIT LOAD		REFRIGERANT TYPE	REFRIGERANT		CONNECTION RATIO	ELECTRICAL (PER MODULE)				OVERALL DIMENSIONS			WEIGHT	EFFICIENCY					REMARKS	
				(kW)	OAT (DB)	(kW)	OAT (DB)	OAT (WB)	COOLING (kW)	HEATING (kW)		FACTORY CHARGE	ADD'L CHARGE		V/Ph/Hz	MCA	MOCp	RLA	W	D	H		EER	IEER	COP47	COP17	SCHE		
CU-1	DAIKIN	RELQ120TAYCA	10	35.30	35 °C	33.90	OAT (DB)	-30 °C	-30 °C	35.0	23.1	R410A	25.8 kg	25.5 kg	110.7%	575/3/60	31 A	40	14 A	1241	766	1693	360.00 kg	13.7	23.4	4	2.3	26.7	
<div>NOTES:</div> <div>1. Manufacturer must be certified, listed, and labeled per AHRI 1230.</div> <div>2. Submitted performance data must be fully de-rated for all components and accessories, including but not limited to, line length, vertical separation, connection ratio, design conditions, condenser coil coating.</div> <div>3. Condensing units must have fully modulating INVERTER compressors.</div> <div>4. Condensing units must have auto changeover functions</div> <div>5. Demand limiting relay contact must be provided.</div> <div>6. EEV actuators must be removable from valve body without disturbing the refrigerant system.</div> <div>7. FCU thermostats must provide +/- 1 degree dead-band set-point and control capability.</div> <div>8. System shall be provided with Touch Manager controller with WEB based software for displaying up to 8 DII-Net systems with 128 indoor units per system.PC by others.</div> <div>9. Manufacturers submittal must include refrigerant piping diagram with pipe diameters, lengths, and refrigerant volume.</div> <div>10. Substitute manufacturer shall be responsible for additional piping and refrigerant.</div> <div>11. Contractor to verify piping dimensions.</div> <div>12. Installing contractor must have successfully completed manufacturers certified installation class within past 36 months.</div> <div>13. Contractor to furnish and install insulation on refrigerant piping.</div>																													

FOR QUESTIONS REGARDING THIS PROJECT, PLEASE  
EMAIL: CM-20-063@QUASARCG.COM

J	ISSUED FOR CONSTRUCTION	2021-12-20
I	REISSUED FOR BUILDING PERMIT	2021-09-15
H	ISSUED FOR TENDER	2021-08-12
G	ISSUED FOR BUILDING PERMIT	2021-07-27
F	90% CD	2021-05-03
E	SPA	2021-02-12
D	50% CD	2021-02-05
C	BUILDING PERMIT	2021-02-05
B	PERMIT/SPA COORDINATION	2021-02-02
A	100% DESIGN DEVELOPMENT	2021-01-19

No.	Revision	Date
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Orientation	Seal
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The specifications are to be considered as an integral part of these drawings and neither the drawings nor the specifications shall be used alone. Refer to architectural drawings for dimensions. Do not scale.

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Project Information

**BFES Station 201**  
**(SPA-2021-0032)**

27 Rutherford Rd. S., Brampton, ON, L6W 3J3

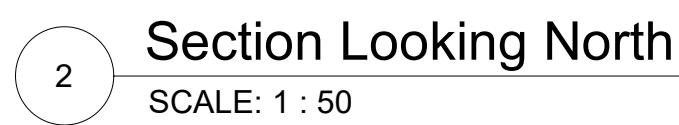
For

Drawing	Title
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## MECHANICAL EQUIPMENT SCHEDULE

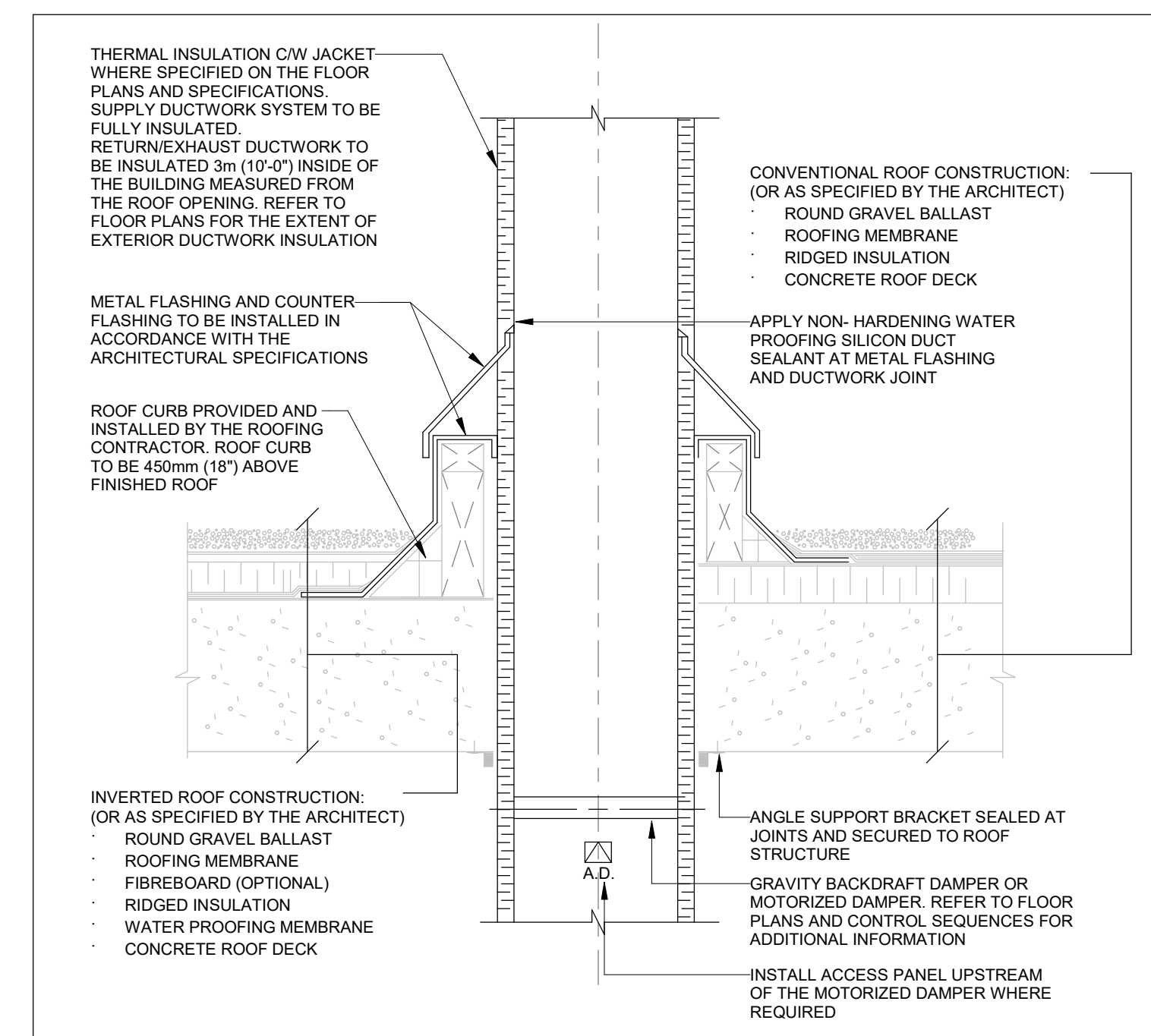
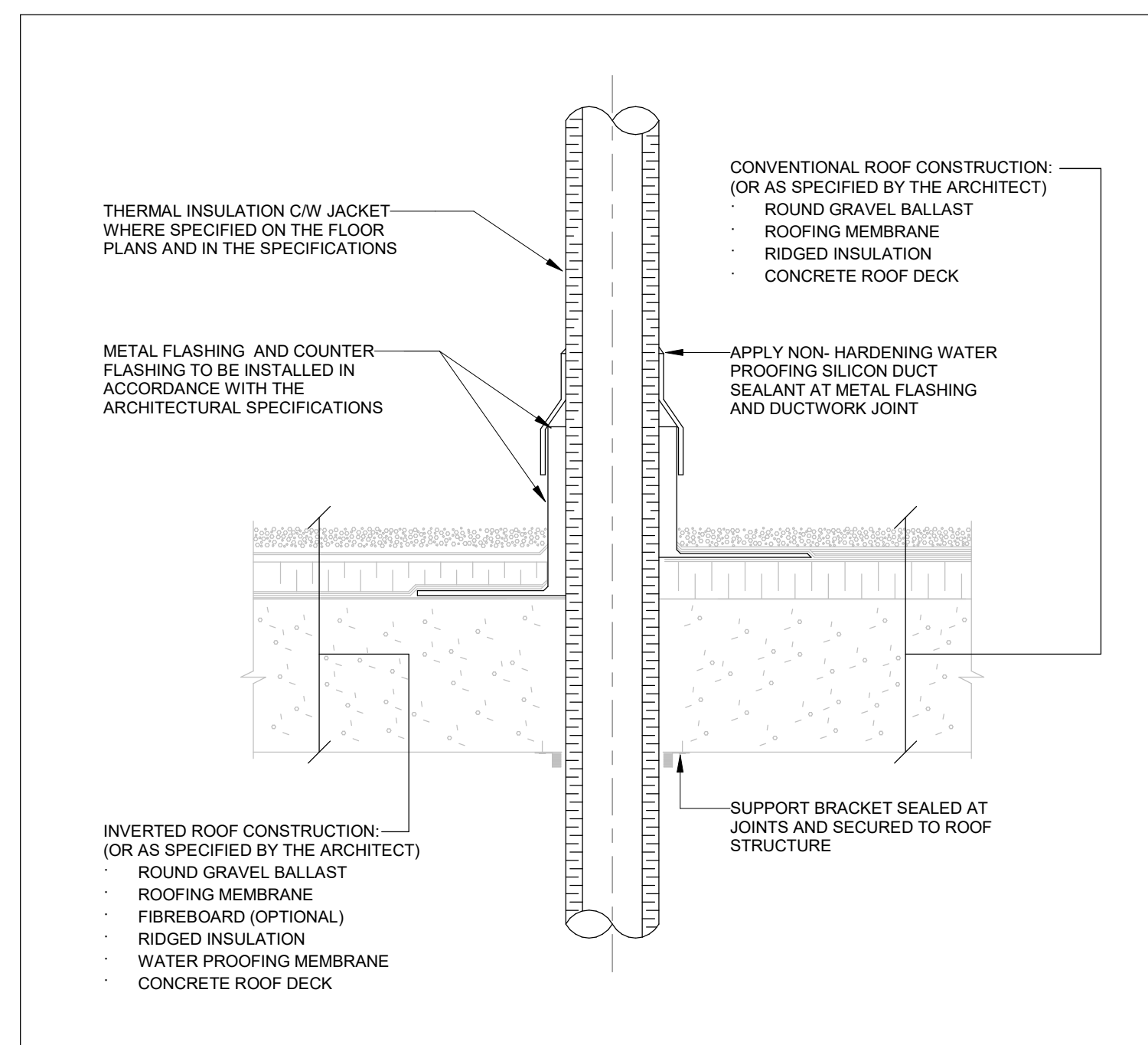
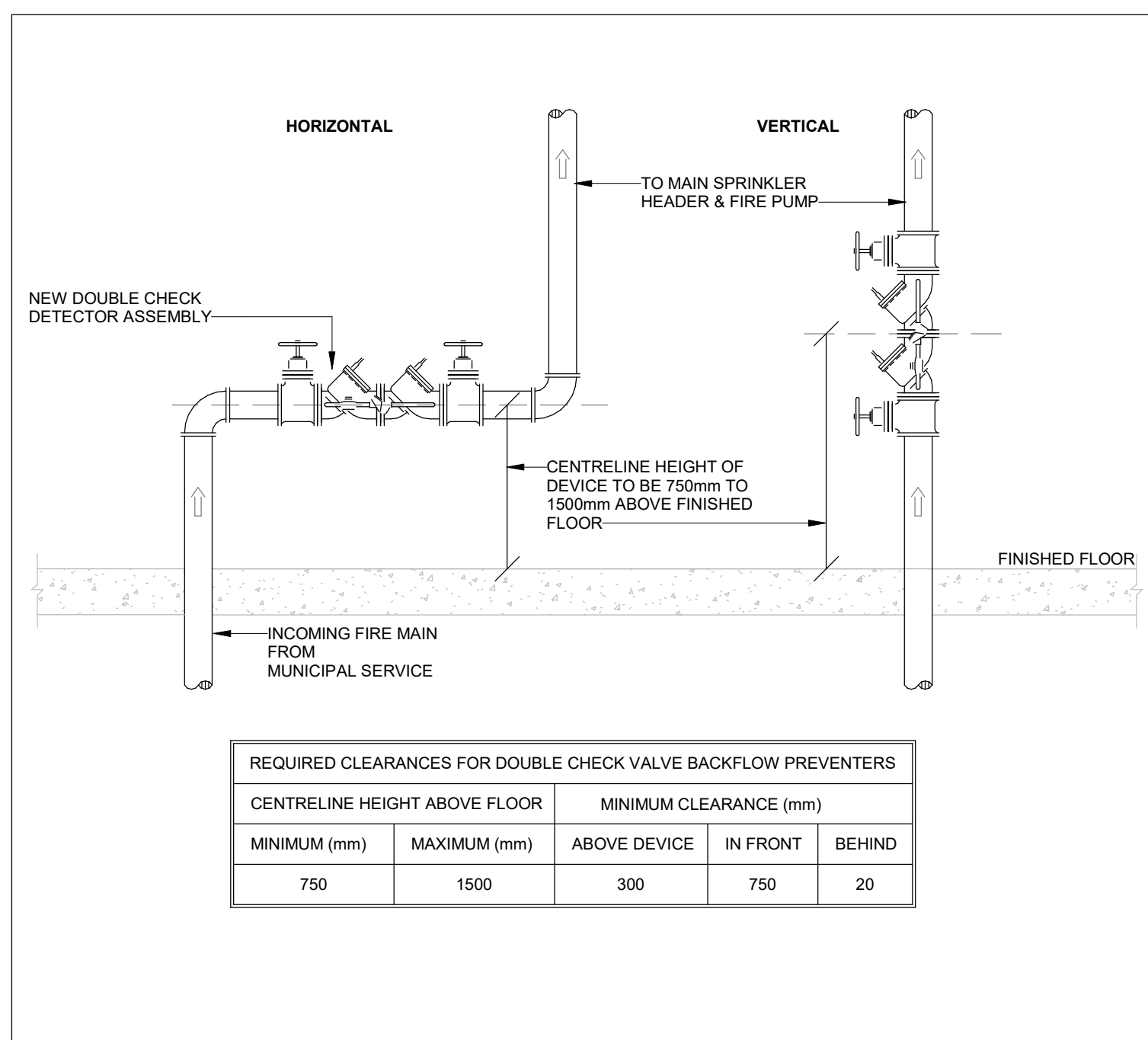
Date	2021-12-20	Project No CM-20-063	Drawing No M610
Drawn by	CMW		
Scale	1 : 1		





Date	2021-12-20	Project No	Drawing No
Drawn by	Author	CM-20-063	M621
Scale	1 : 50		





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I	ISSUED FOR CONSTRUCTION	2021-12-20
H	ISSUED FOR TENDER	2021-08-12
G	ISSUED FOR BUILDING PERMIT	2021-07-27
F	90% CD	2021-05-03
E	SPA	2021-02-12
D	50% CD	2021-02-05
C	BUILDING PERMIT	2021-02-05
B	PERMIT/SPA COORDINATION	2021-02-02
A	100% DESIGN DEVELOPMENT	2021-01-19

No.	Revision	Date
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Orientation	Seal
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Project Information

**BFES Station 201**  
**(SPA-2021-0032)**

27 Rutherford Rd. S., Brampton, ON, L6W 3J3

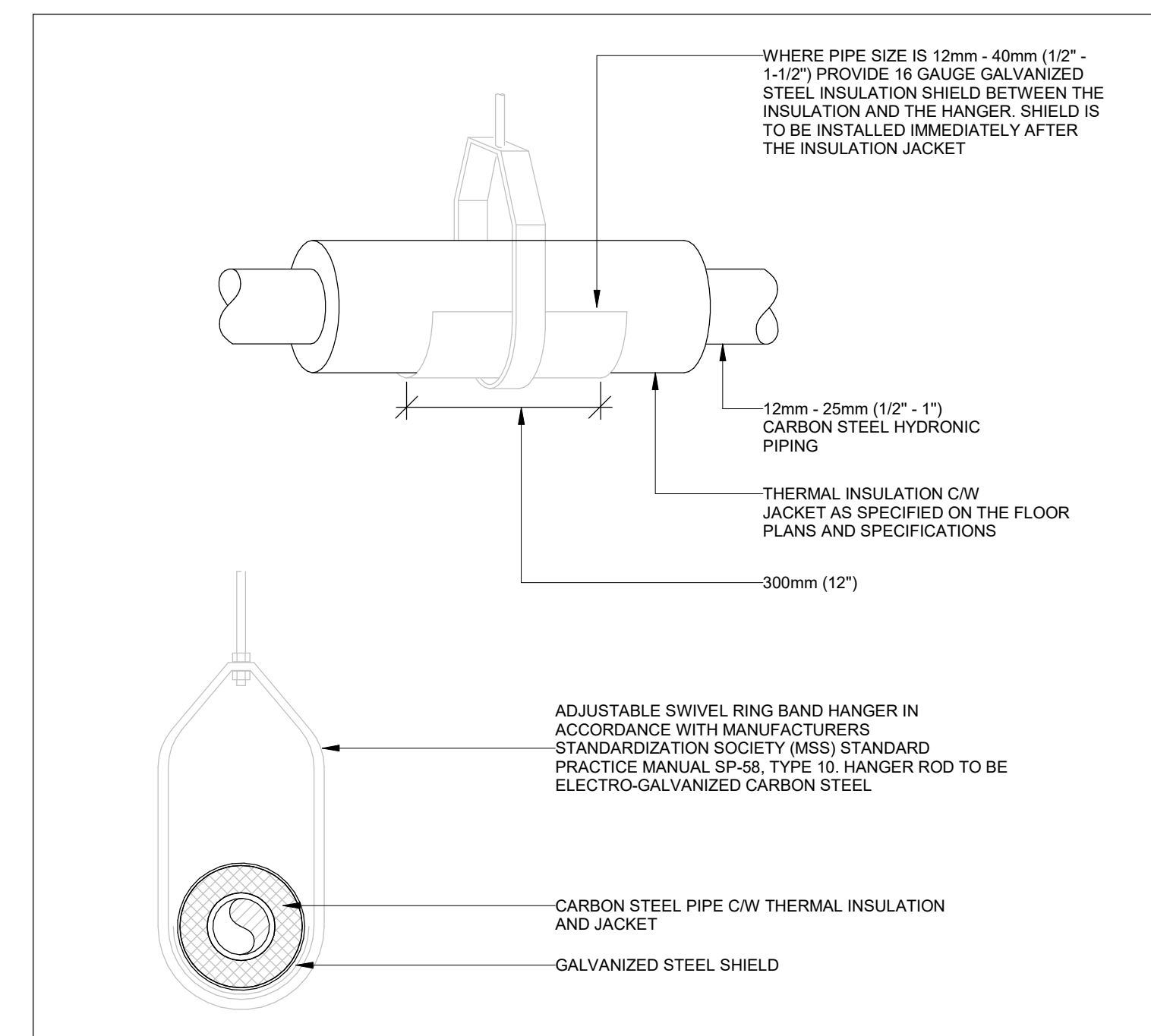
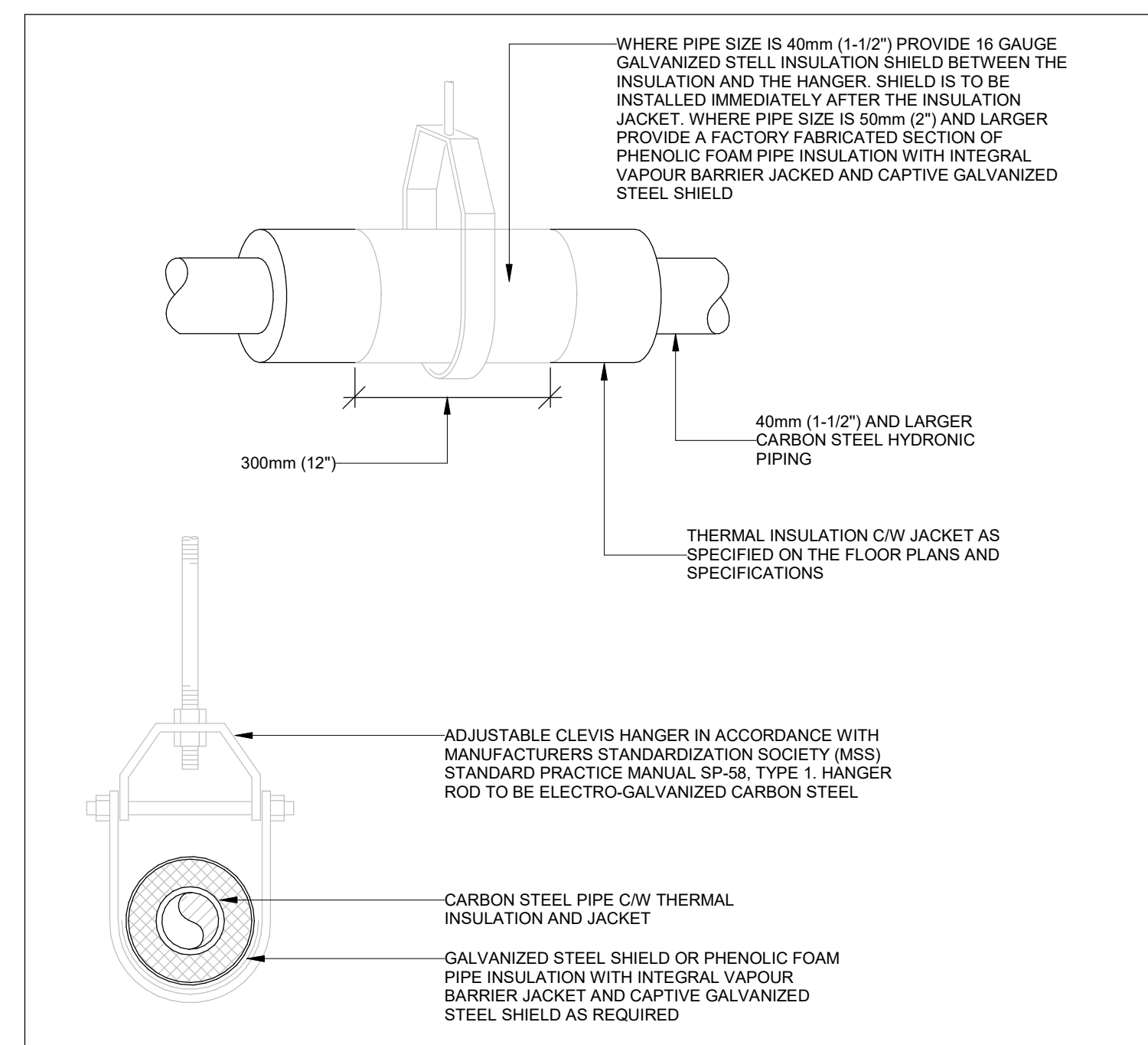
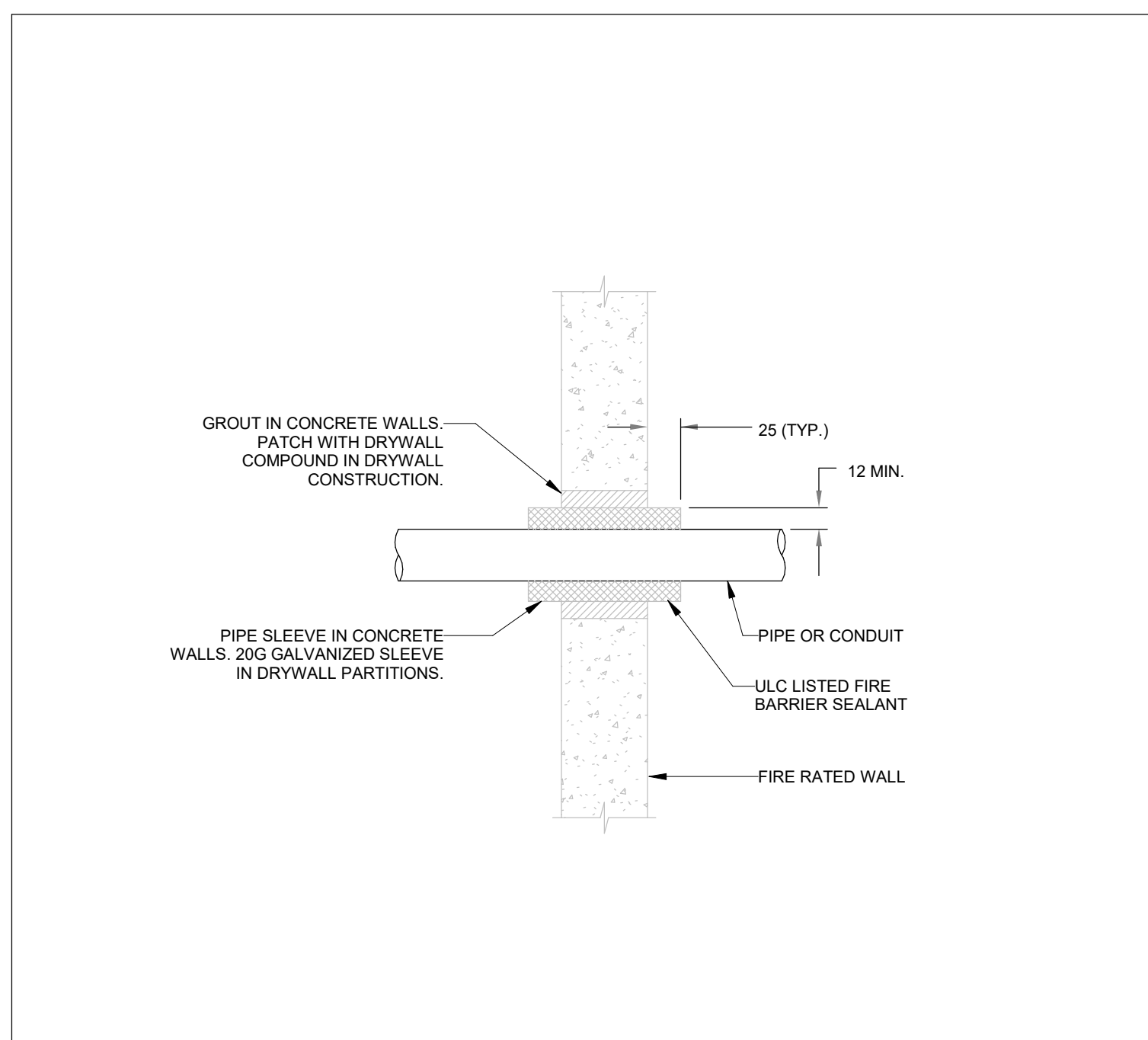
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For  
City of Brampton Fire & Emergency Services

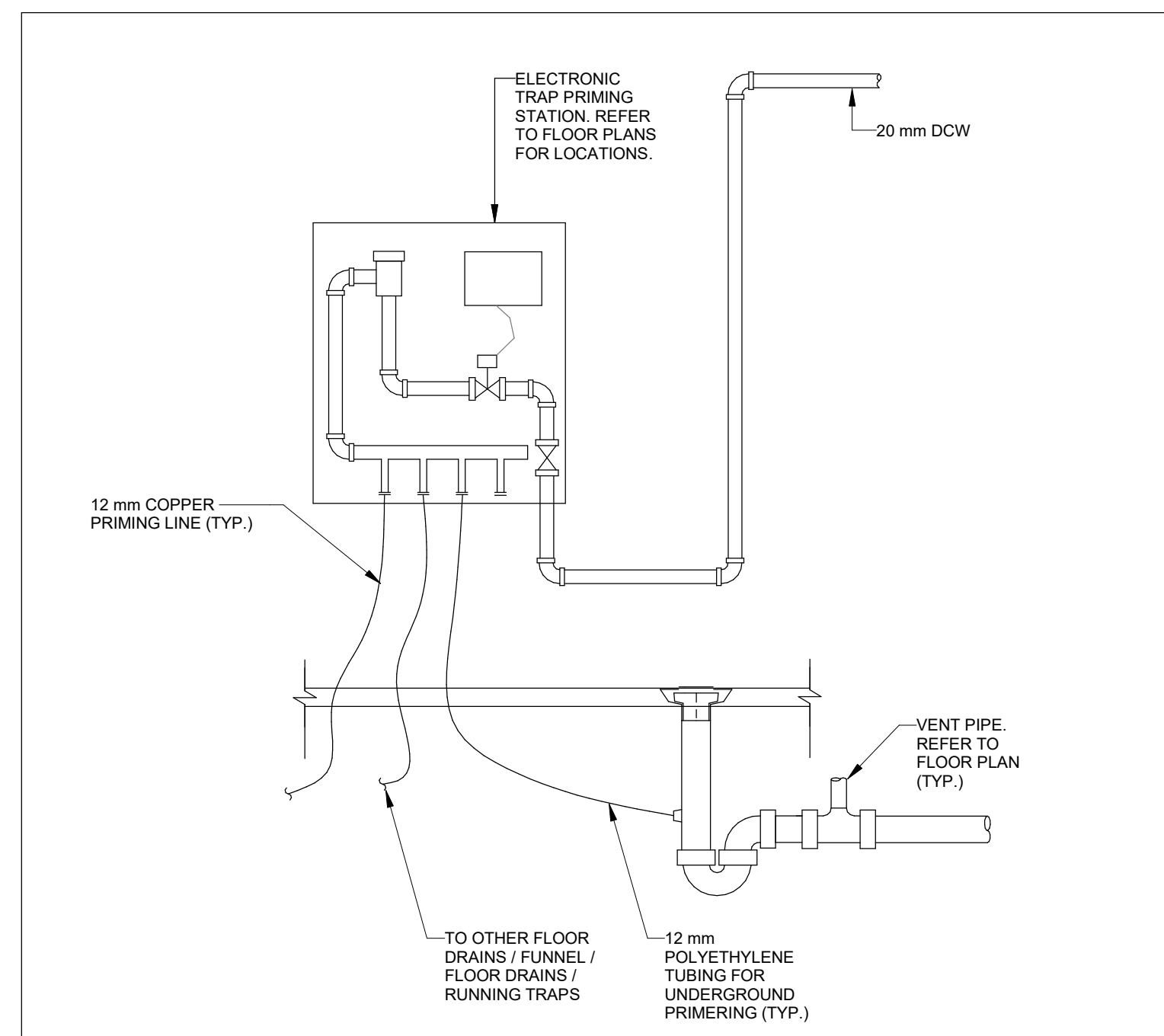
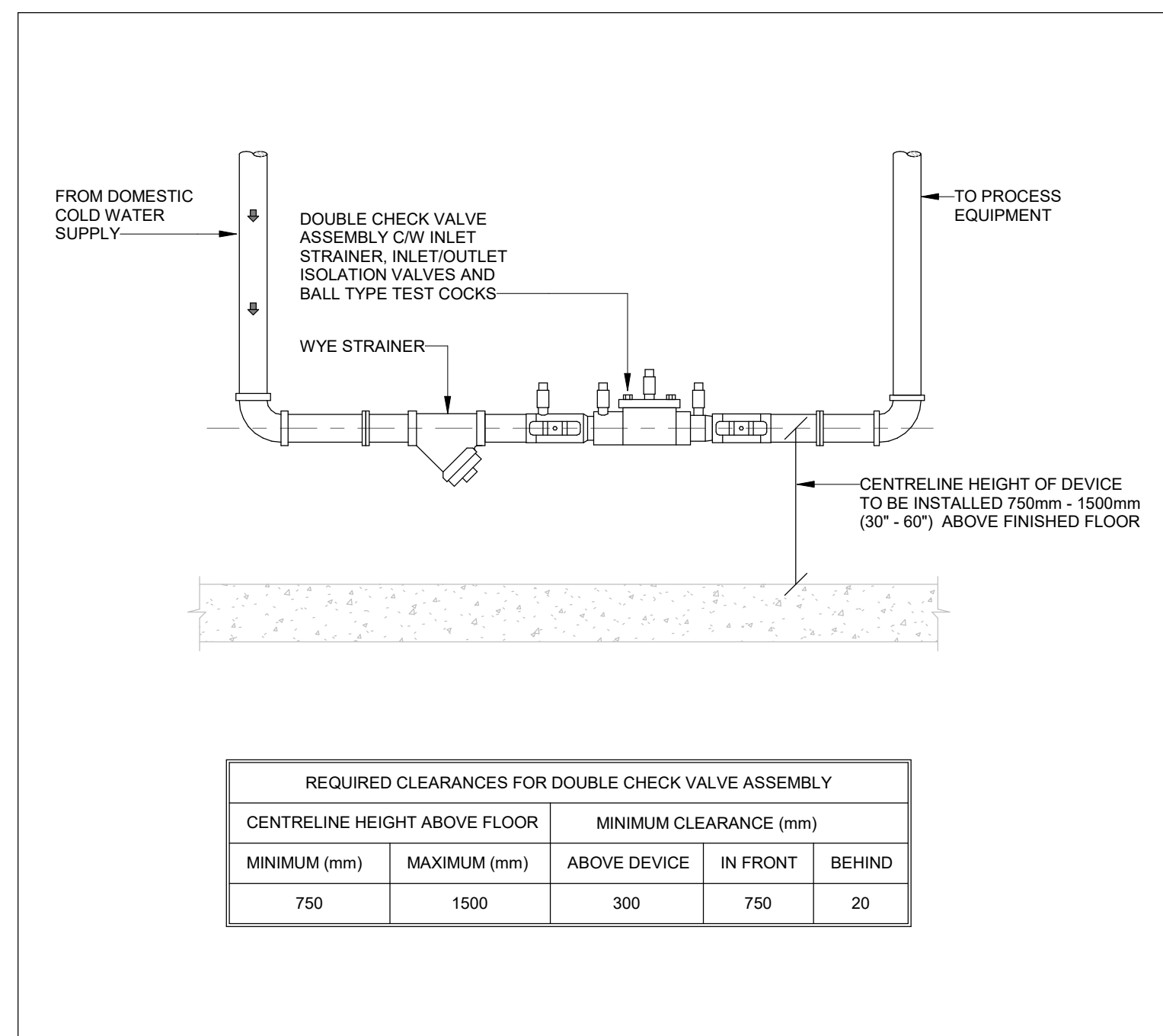
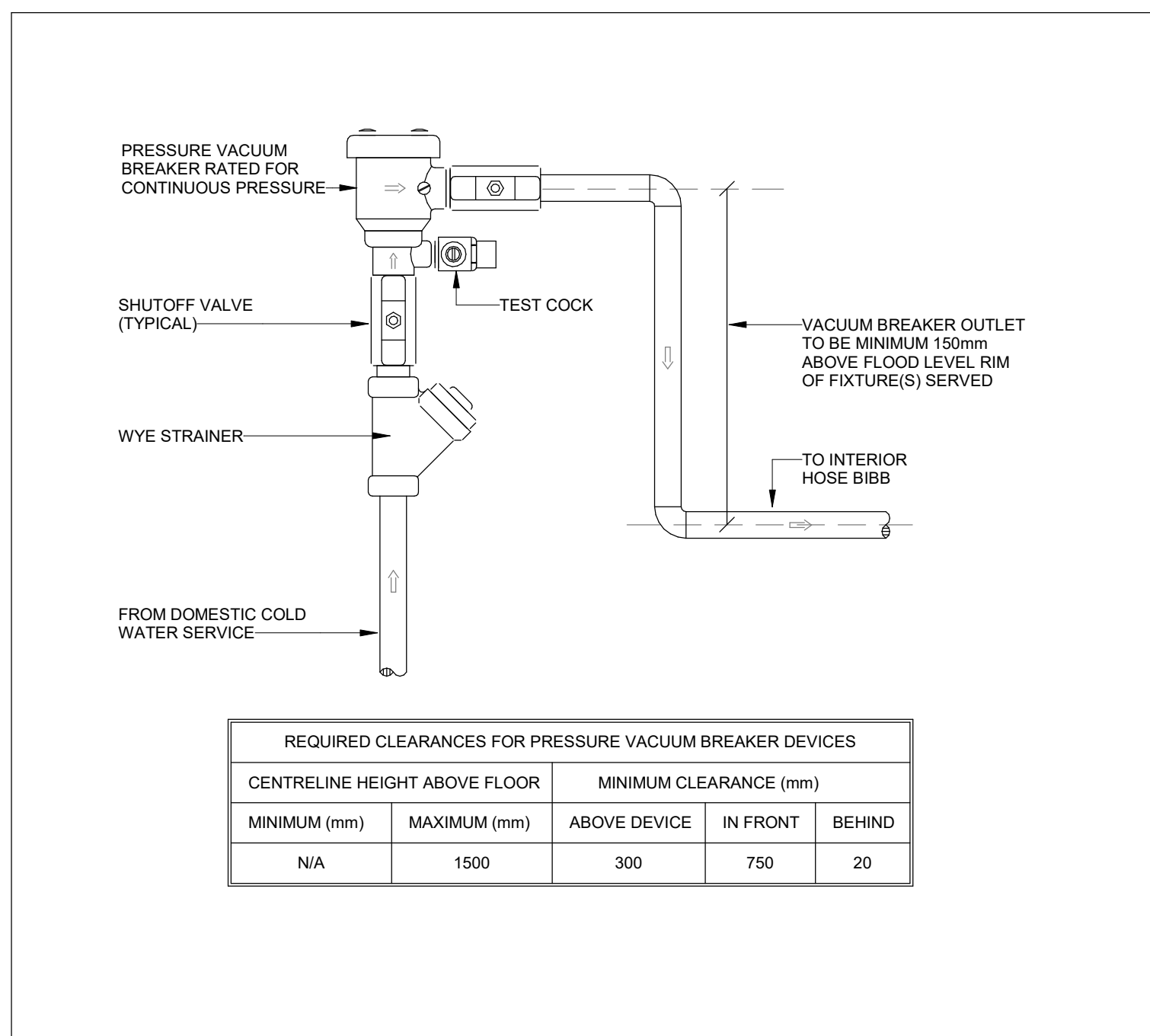
Drawing Title

MECHANICAL DETAILS I

Date	2021-12-20	Project No	Drawing No		
Drawn by	CMW			CM-20-063	M64
Scale	N.T.S.				







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I	ISSUED FOR CONSTRUCTION	2021-12-20
H	ISSUED FOR TENDER	2021-08-12
G	ISSUED FOR BUILDING PERMIT	2021-07-27
F	90% CD	2021-05-03
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D	50% CD	2021-02-05
C	BUILDING PERMIT	2021-03-05
B	PERMIT/SPA COORDINATION	2021-02-02
A	100% DESIGN DEVELOPMENT	2021-01-19

No.	Revision	Date
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Orientation	Seal
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### Project Information

BFES Station 201  
(SPA-2021-0032)

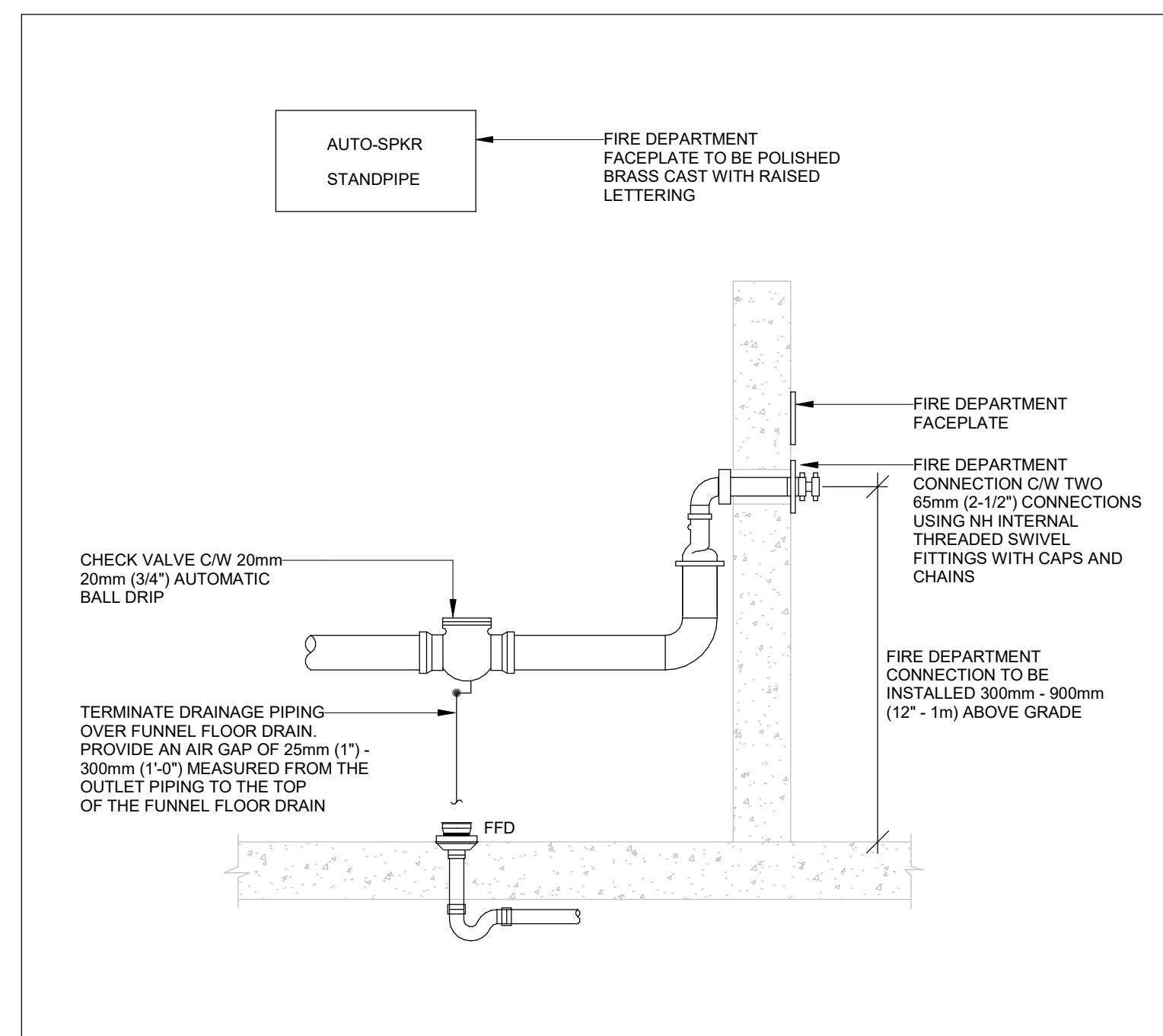
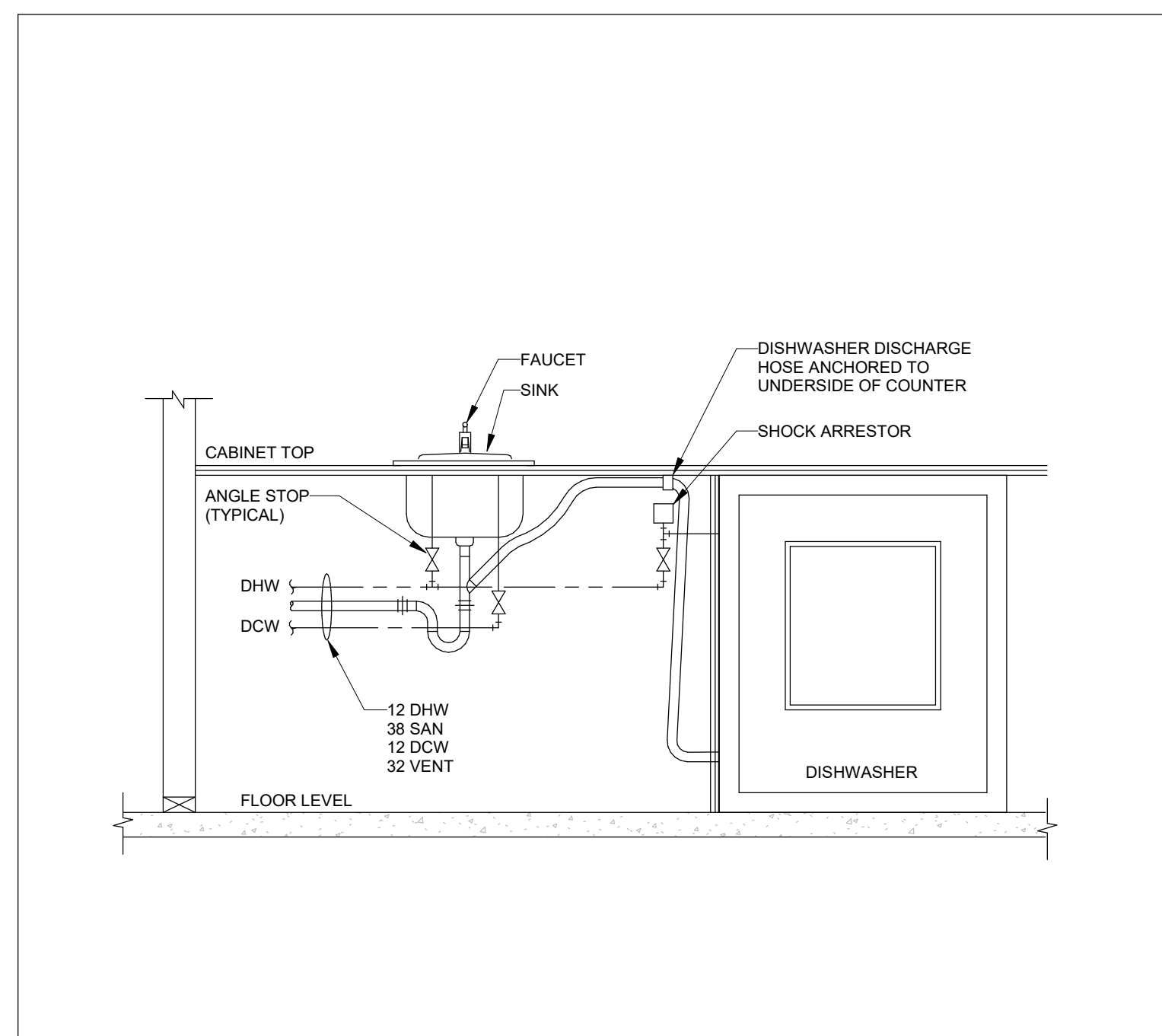
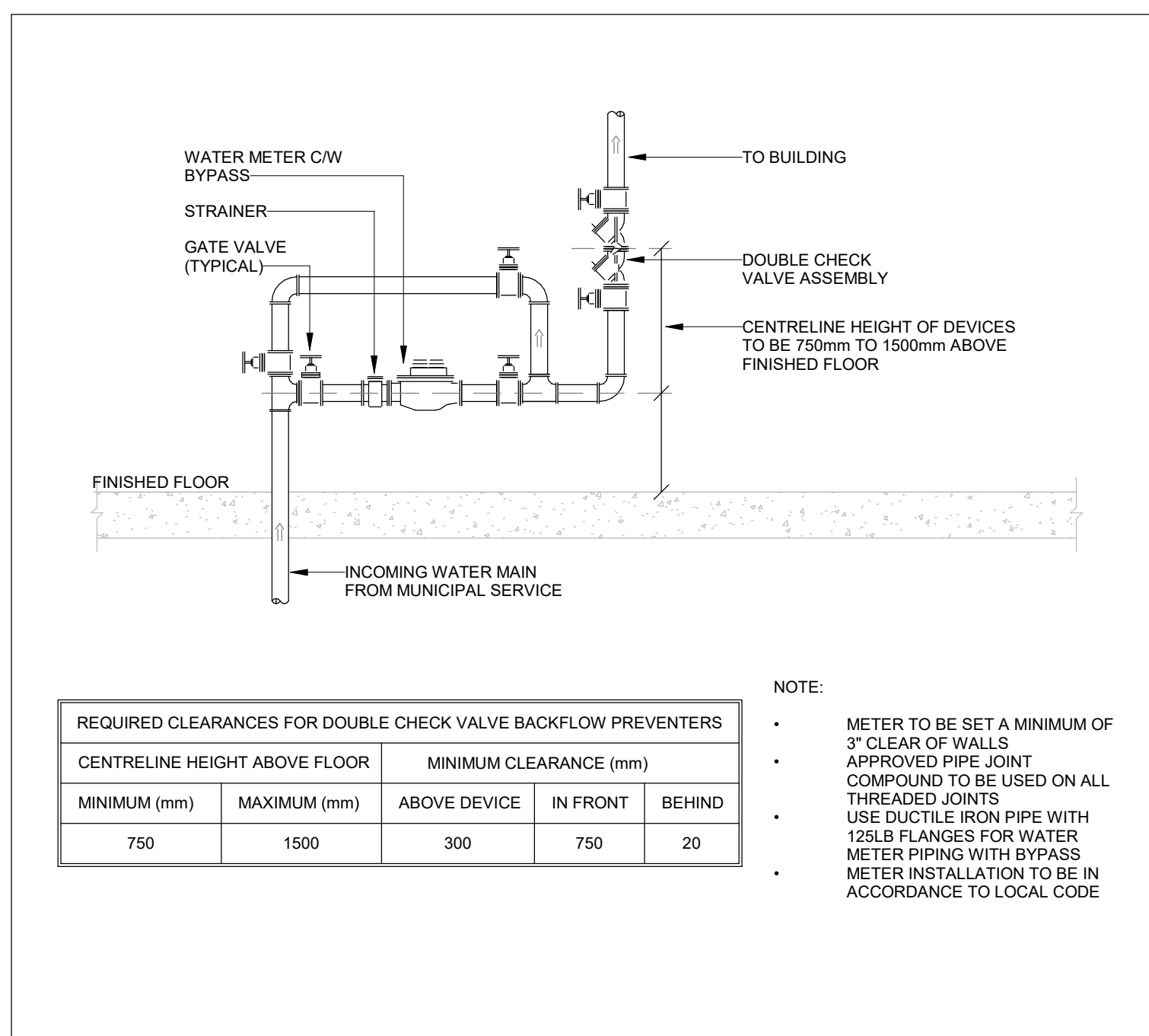
27 Rutherford Rd. S., Brampton, ON, L6W 3J3

For  
City of Brampton Fire & Emergency Services

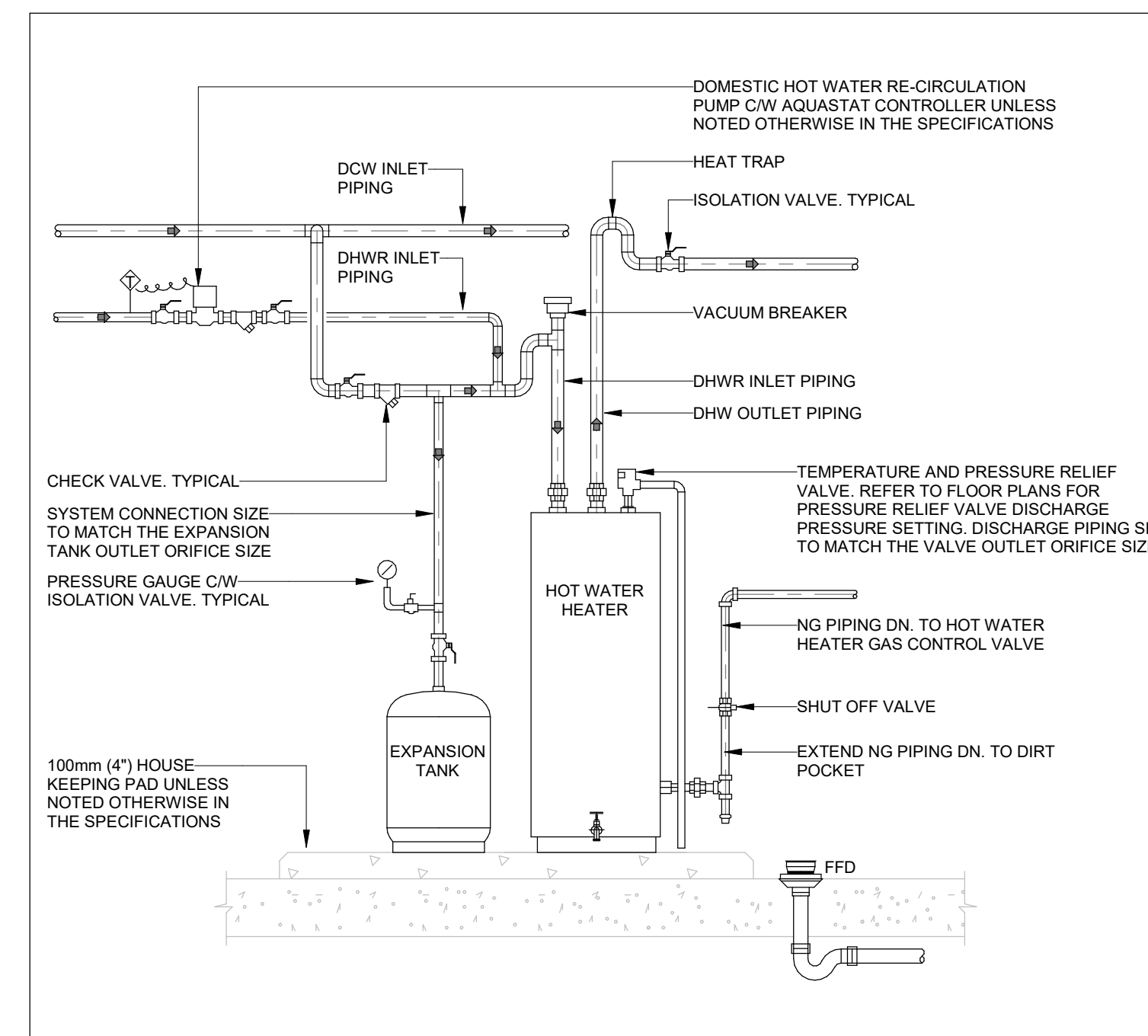
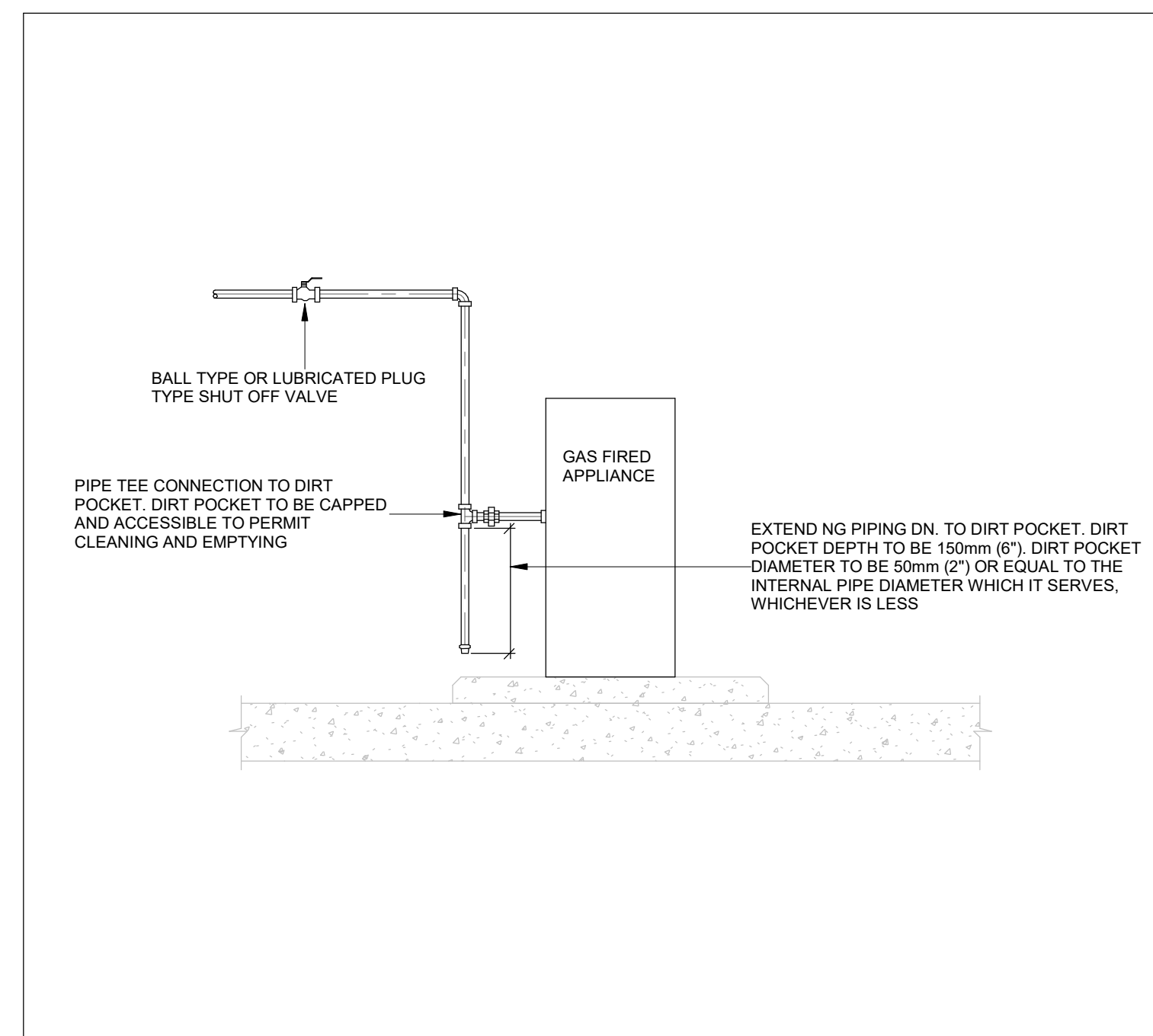
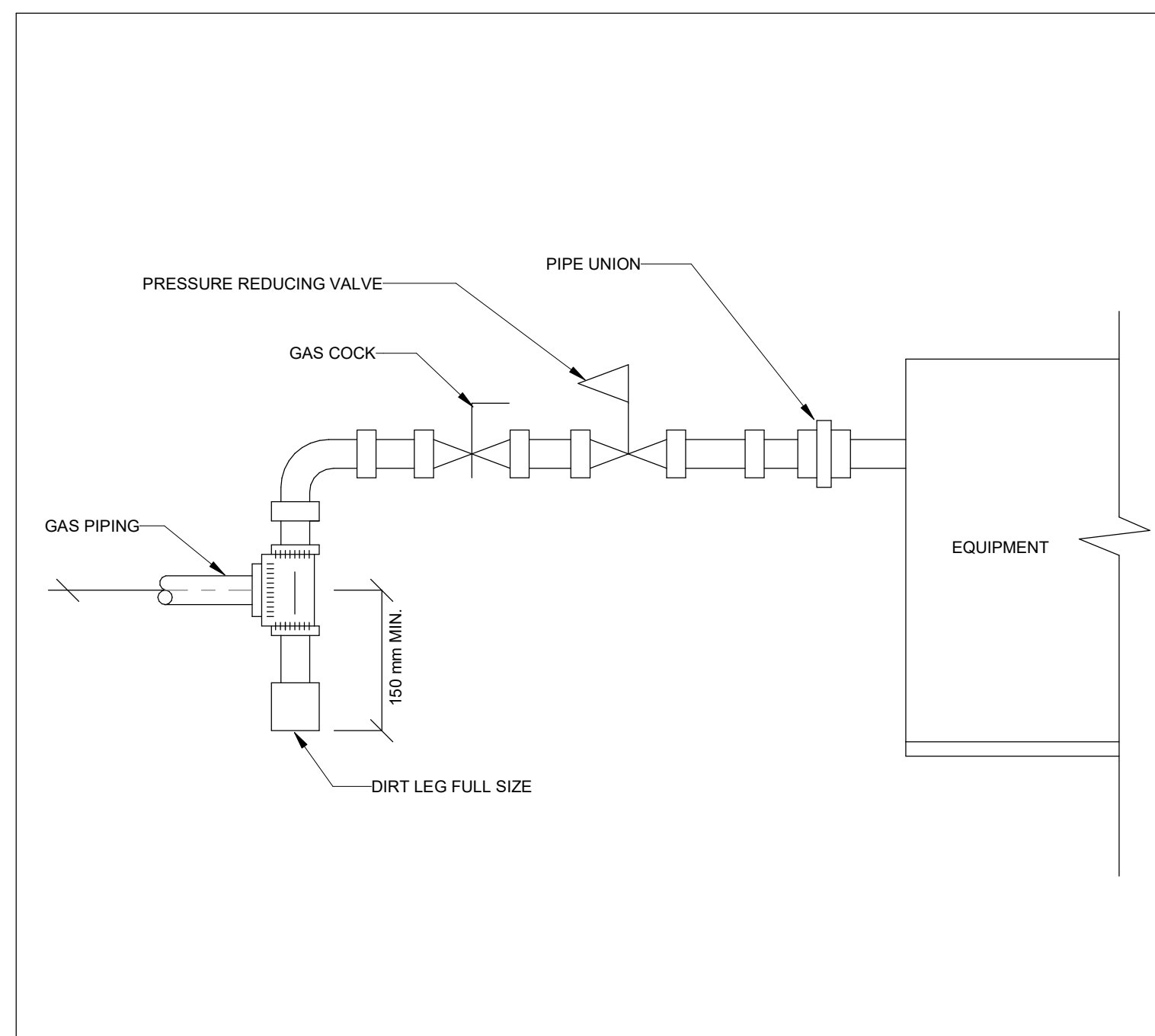
Drawing Title
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MECHANICAL DETAILS II

Date	2021-12-20	Project No CM-20-063	Drawing No <b>M642</b>
Drawn by	CMW		
Scale	N.T.S.		







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I	ISSUED FOR CONSTRUCTION	2021-12-20
H	ISSUED FOR TENDER	2021-08-12
G	ISSUED FOR BUILDING PERMIT	2021-07-27
F	90% CD	2021-05-03
E	SPA	2021-02-12
D	50% CD	2021-02-05
C	BUILDING PERMIT	2021-02-05
B	PERMIT/SPA COORDINATION	2021-02-02
A	100% DESIGN DEVELOPMENT	2021-01-19

No.	Revision	Date
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Orientation	Seal
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Project Information

**BFES Station 201**  
**(SPA-2021-0032)**

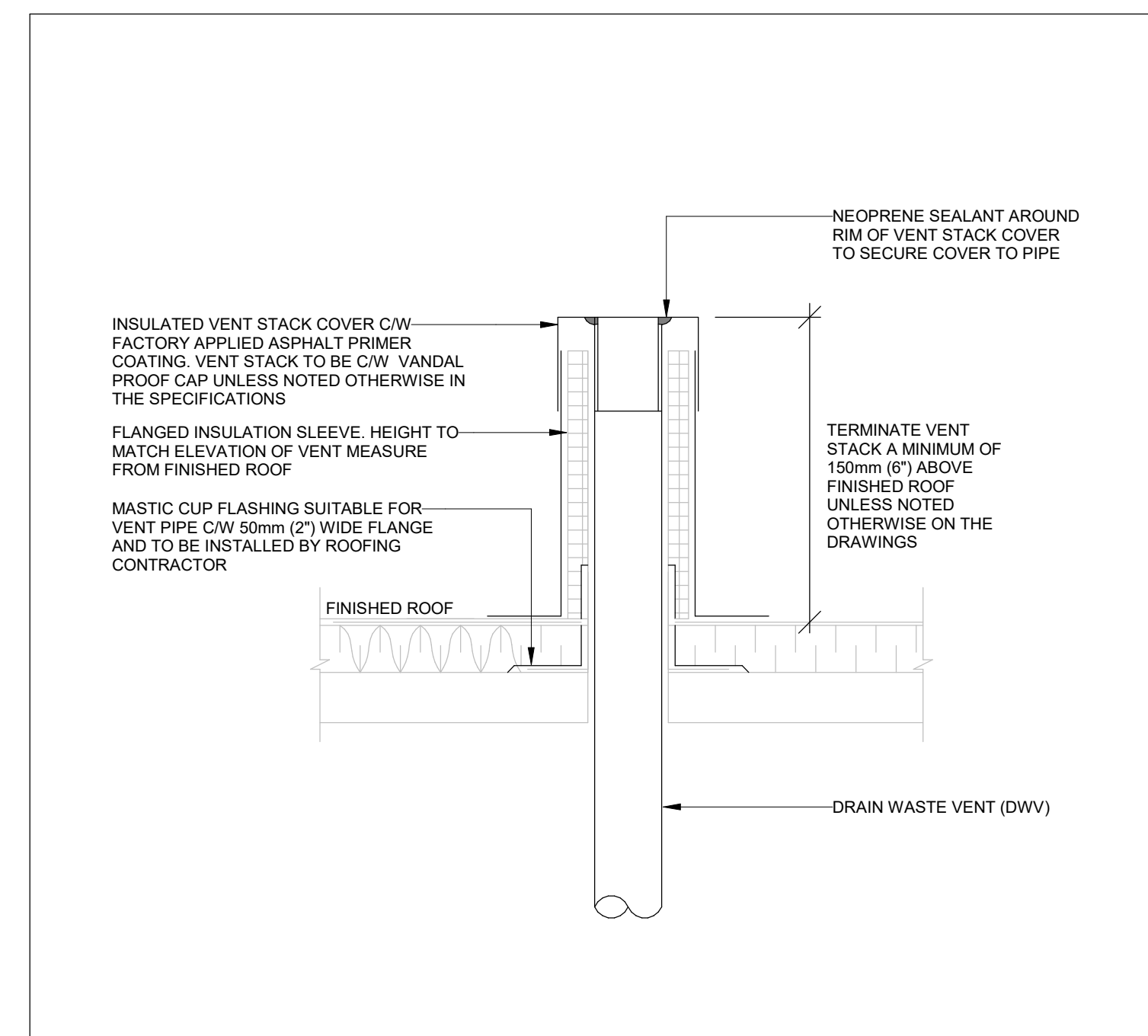
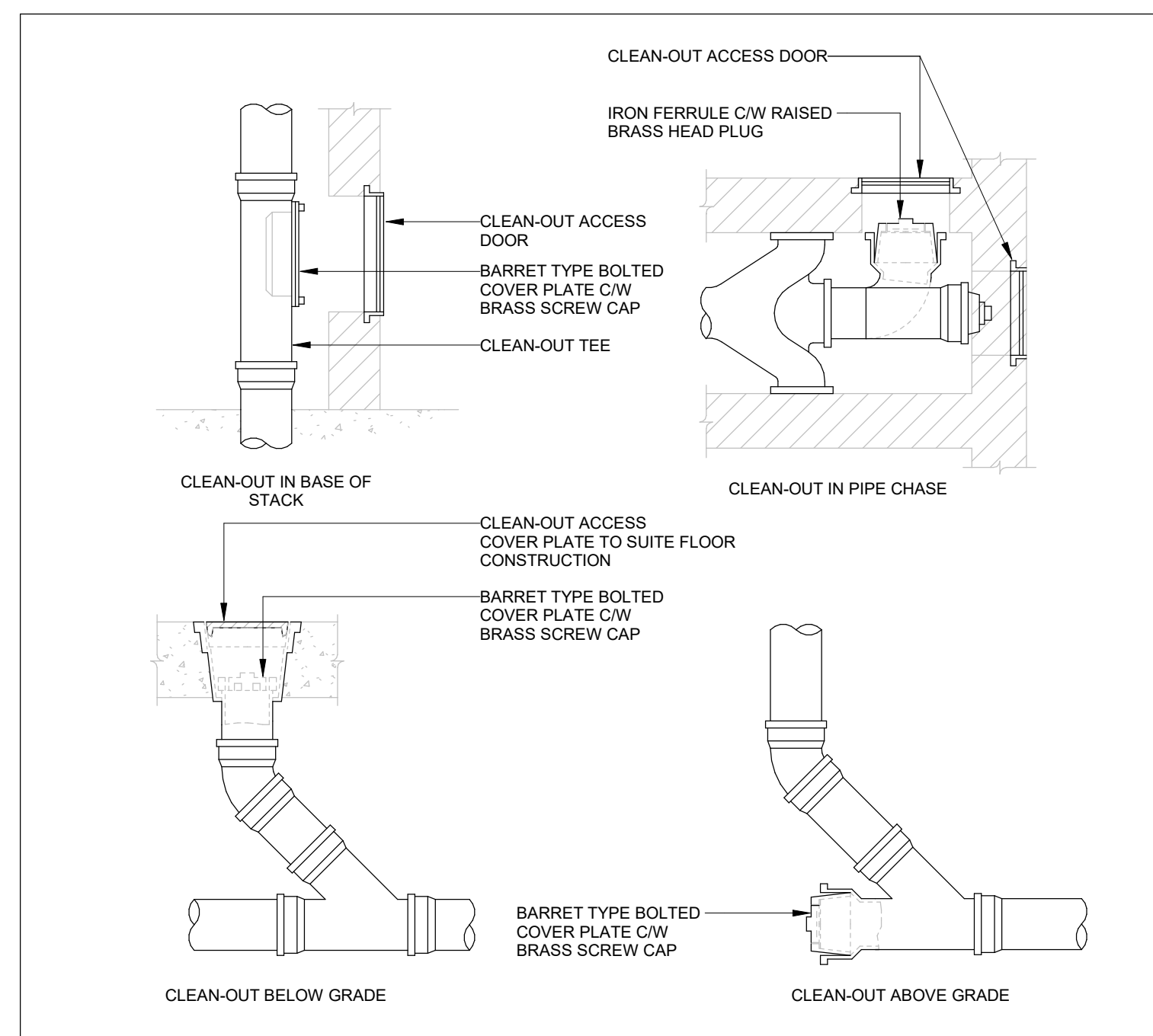
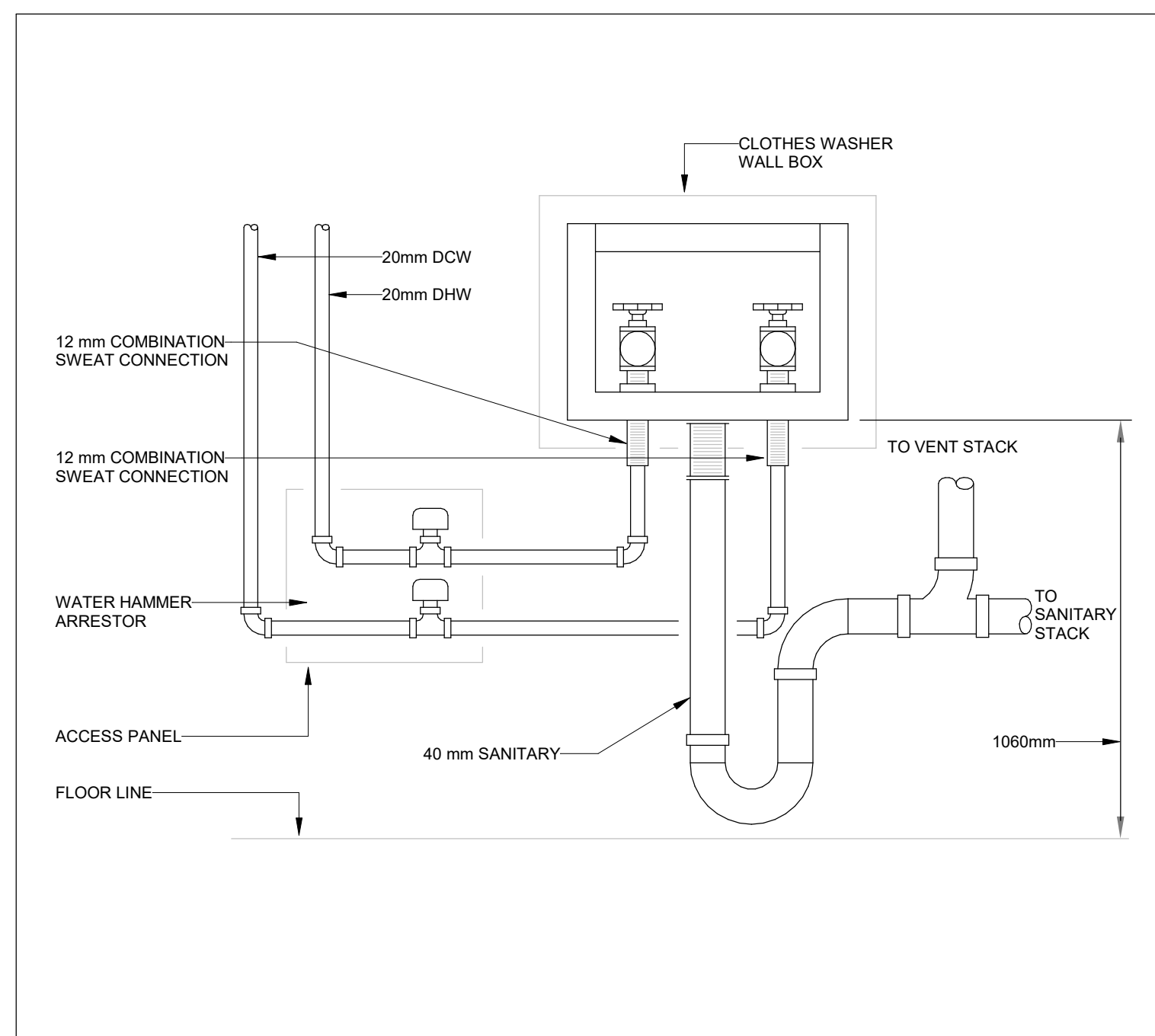
27 Rutherford Rd. S., Brampton, ON, L6W 3J3

For  
City of Brampton Fire & Emergency Services

Drawing Title

MECHANICAL DETAILS III

Date	2021-12-20	Project No	Drawing No
Drawn by	CMW	CM-20-063	M643
Scale	N.T.S.		





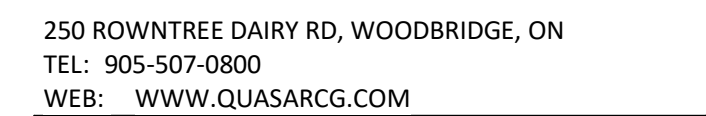
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No.	Revision	Date
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No.	Revision	Date
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Drawing	Title
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SCALE:N.T.S.

T = TOTAL TRAP HEIGHT = X + H\*(1.5'D)

NEGATIVE STATIC PRESSURES:

- X = 0.5'H (MINIMUM)
- H = 25mm (1") + UNIT STATIC PRESSURE IN AIR HANDLING UNIT CABINET SECTION (MINIMUM)
- D = PIPE DIAMETER

POSITIVE STATIC PRESSURES:

- X = 25mm (1") + UNIT STATIC PRESSURE IN AIR HANDLING UNIT CABINET SECTION (MINIMUM)
- H = 25mm (1") (MINIMUM)
- D = PIPE DIAMETER

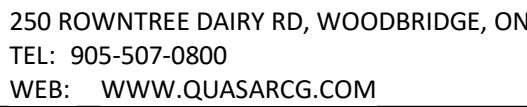


## SCALE:N.T.S.

[illegible]

No.	Revision	Date
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Date	2021-12-20	Project No CM-20-063	Drawing No M646
Drawn by	CMW		
Scale	N.T.S.		

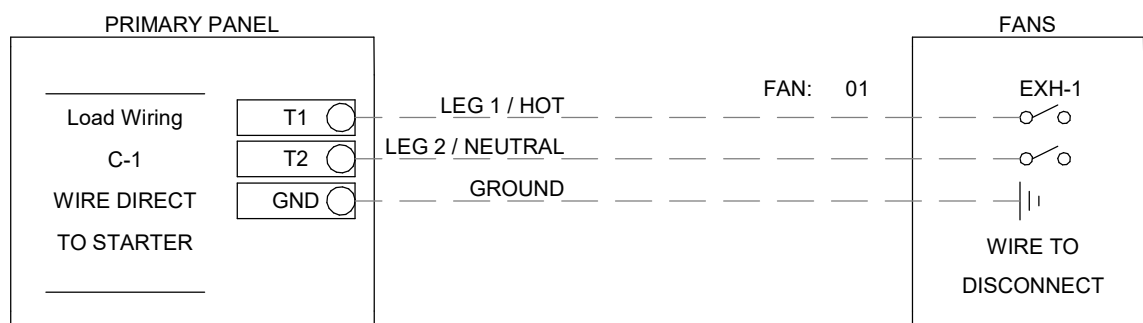


120V 1 Phase w/ control for 1 Exhaust Fan, Exhaust on in Fire, Lights out in Fire.

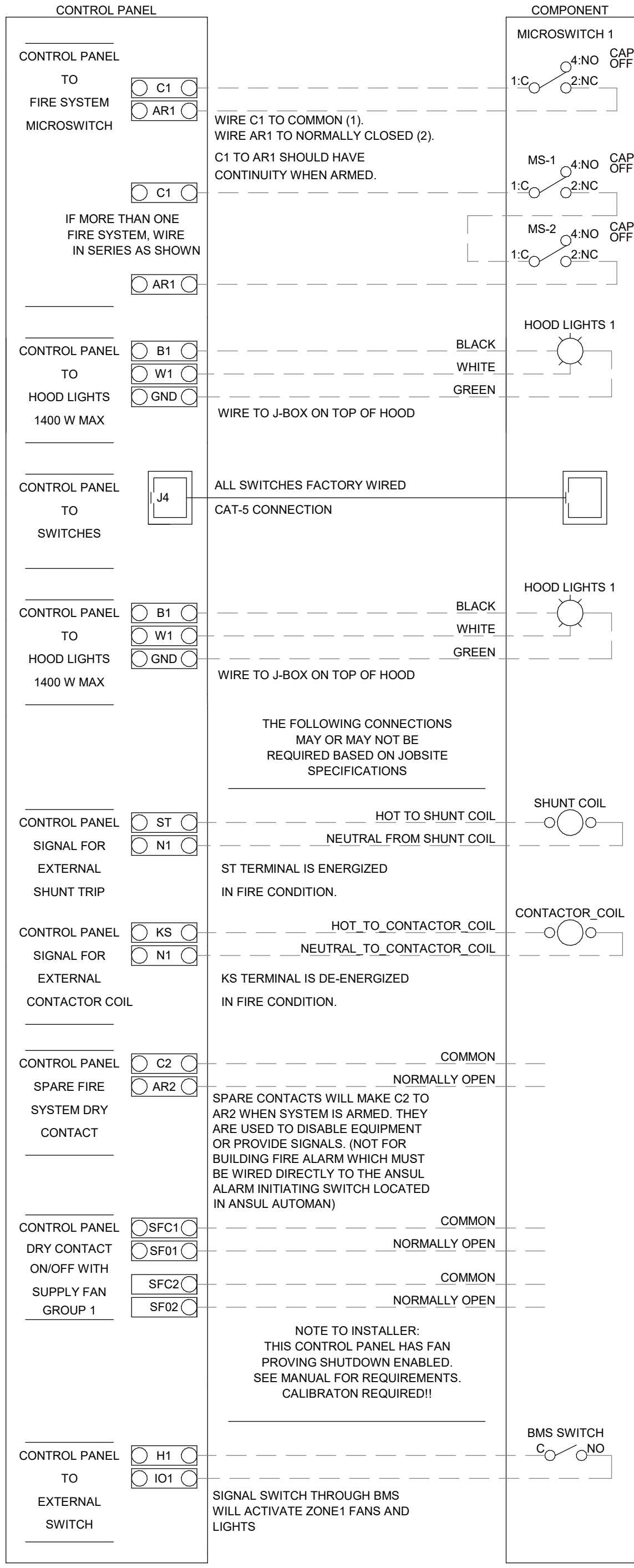
Responsibility: Electrician

BREAKER PANEL		PRIMARY CONTROL PANEL	
BREAKER 1PH	Hot		
120 V	Neutral		
15 A	Ground		
CONTROL POWER. DO NOT WIRE TO GFCI OR SHUNT TRIP BREAKER.			
1ST HOOD LIGHT BREAKER SHARED W/ CONTROL POWER. SWITCH #1			
	Hot		
BREAKER 1PH	Neutral		
115 V	Ground		
MCA: 7.9 A	EXH-1		
MOCP: 15 A			

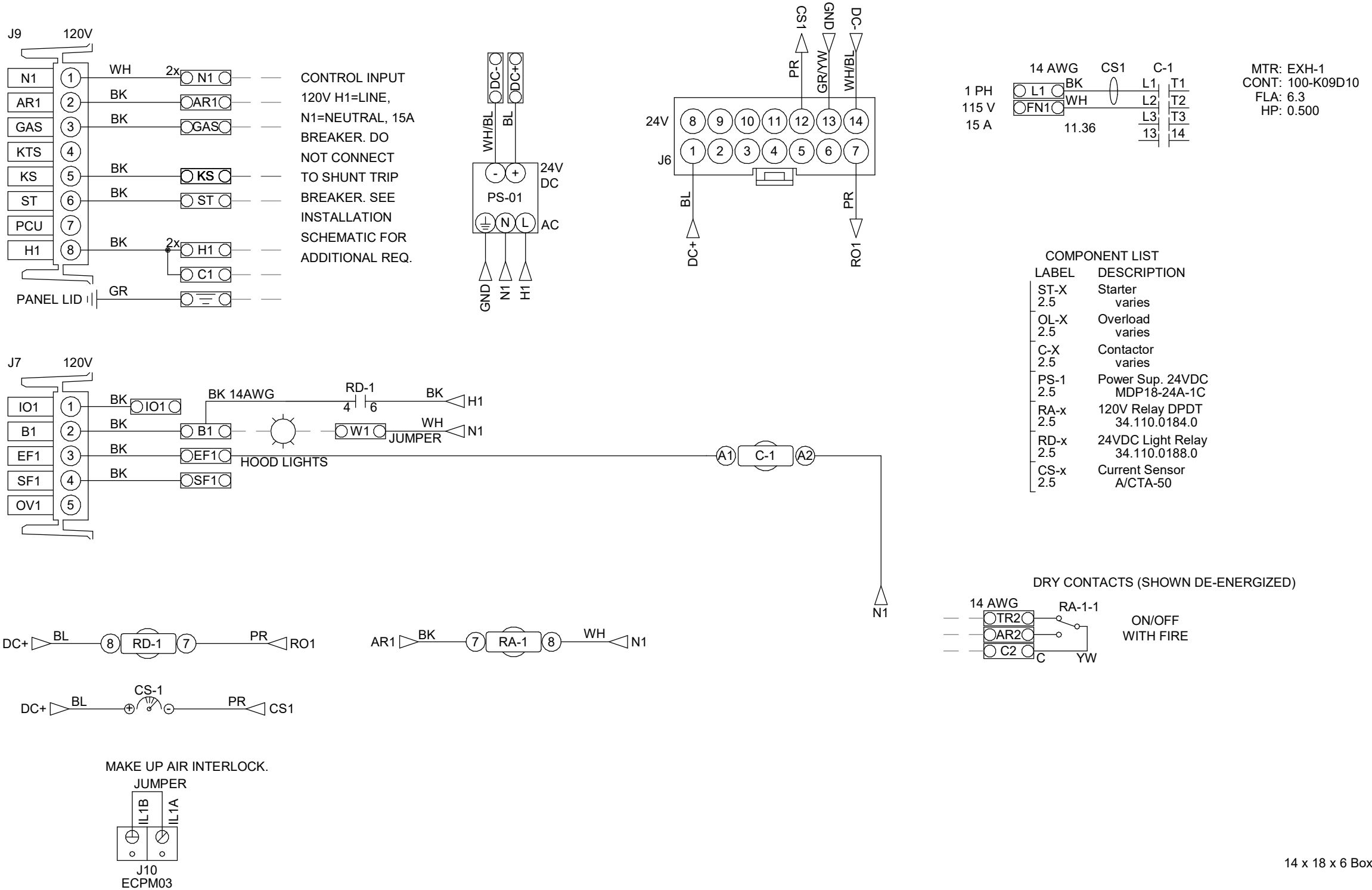
Responsibility: Electrician



Responsibility: Electrician



UNLESS SPECIFIED OTHERWISE, ALL FACTORY AC WIRING 16 AWG. ALL FACTORY DC WIRING 18 AWG

[illegible]

Technical drawing of the hood and fan assembly showing dimensions and ductwork layout. The drawing includes the following dimensions and labels:

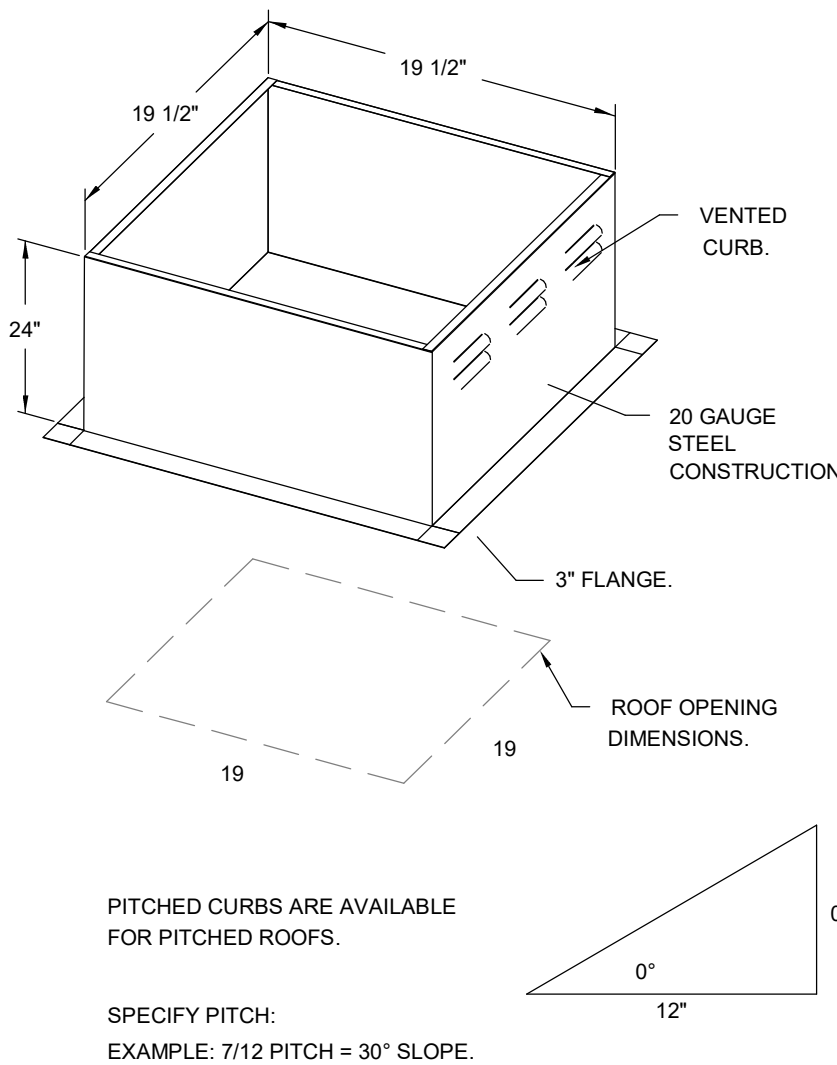
- Top width: 28 7/8
- Left height: 27 1/4
- Right height: 21 1/2
- Bottom width (hood base): 13 1/4
- Bottom width (ductwork): 19
- Bottom width (ductwork): 21
- Label: GREASE DRAIN.
- Label: DUCTWORK BETWEEN EXHAUST RISER ON HOOD AND FAN (BY OTHERS).

- DIRECT DRIVE CONSTRUCTION (NO BELTS/PULLEYS)
- ROOF MOUNTED FANS.
- RESTAURANT MODEL.
- UL705 AND UL762 AND ULC-S645
- VARIABLE SPEED CONTROL.
- INTERNAL WIRING.
- THERMAL OVERLOAD PROTECTION (SINGLE PHASE).
- HIGH HEAT OPERATION 300°F (149°C).
- GREASE CLASSIFICATION TESTING.
- NEMA 3R SAFETY DISCONNECT SWITCH.

NORMAL TEMPERATURE TEST  
EXHAUST FAN MUST OPERATE CONTINUOUSLY  
WHILE EXHAUSTING AIR AT 300°F (149°C)  
UNTIL ALL FAN PARTS HAVE REACHED  
THERMAL EQUILIBRIUM, AND WITHOUT ANY  
DETERIORATING EFFECTS TO THE FAN WHICH  
WOULD CAUSE UNSAFE OPERATION.

**ABNORMAL FLARE-UP TEST**  
EXHAUST FAN MUST OPERATE CONTINUOUSLY WHILE EXHAUSTING BURNING GREASE VAPORS AT 600°F (316°C) FOR A PERIOD OF 15 MINUTES WITHOUT THE FAN BECOMING DAMAGED TO ANY EXTENT THAT COULD CAUSE AN UNSAFE CONDITION.

GREASE BOX.  
ECM WIRING PACKAGE - MANUAL OR  
0-10VDC REFERENCE SPEED CONTROL  
(TELCO MOTOR), CCW ROTATION.



EXHAUST RISER.

HANGING ANGLE.

16" CAPTRATE SOLO FILTER WITH HOOK.

3" INTERNAL STANDOFF.

ENSURE HOOD CLEARANCE FROM LIMITED-COMBUSTIBLE AND COMBUSTIBLE MATERIALS IS IN COMPLIANCE WITH LOCAL CODE REQUIREMENTS.

GREASE DRAIN WITH REMOVABLE CUP.

46"

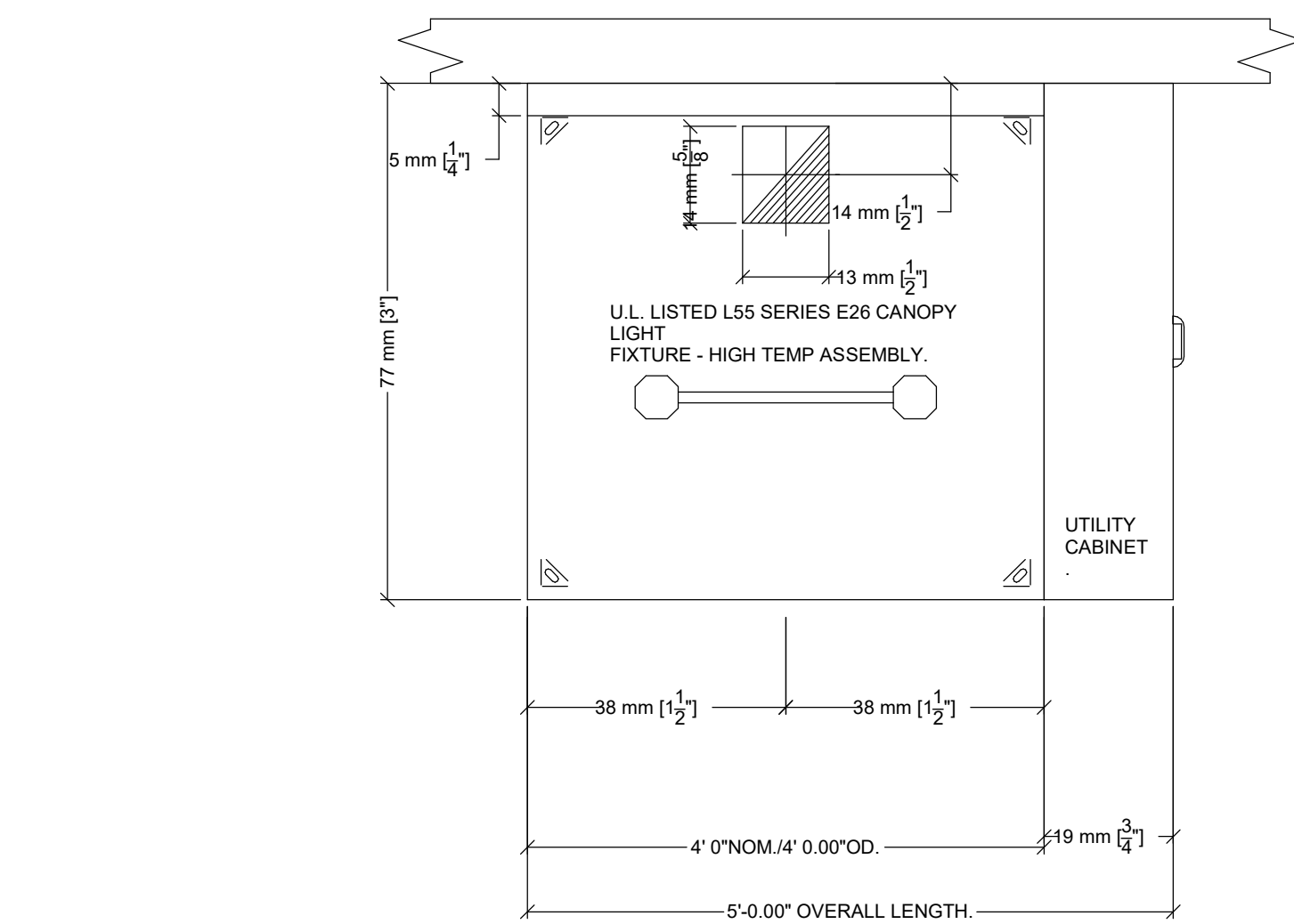
L55 SERIES E26 CANOPY LIGHT FIXTURE - HIGH TEMP ASSEMBLY. INCLUDES CLEAR THERMAL AND SHOCK RESISTANT GLOBE (L55 FIXTURE).

24" NOM.

48 0" MAX.

60"

EQUIPMENT  
BY OTHERS.



### HOOD CORNER HANGING ANGLE

(HARDWARE BY INSTALLER)

1/2" - 13 TPI  
GRADE 5 (MINIMUM)  
STEEL HEX NUTS.

1/2" GRADE 5  
(MINIMUM) STEEL  
FLAT WASHER.

1/2" - 13 TPI  
GRADE 5 (MINIMUM)  
STEEL ALL-THREAD.

1/2" - 13 TPI  
GRADE 5 (MINIMUM)  
STEEL HEX NUT.

1/2" GRADE 5  
(MINIMUM) STEEL  
FLAT WASHER.

HOOD CORNER  
HANGING ANGLE  
(WEIGHT BEARING  
ANCHOR POINT  
FOR HOOD).

1/2" GRADE 5  
(MINIMUM) STEEL  
FLAT WASHER.

1/2" - 13 TPI  
GRADE 5 (MINIMUM)  
STEEL HEX NUTS.

FOR QUESTIONS REGARDING THIS PROJECT, PLEASE  
EMAIL: CM-20-063@QUASARCG.COM

[illegible]

I	ISSUED FOR CONSTRUCTION	2021-12-20
H	ISSUED FOR TENDER	2021-08-12
G	ISSUED FOR BUILDING PERMIT	2021-07-27
F	90% CD	2021-05-03
E	SPA	2021-02-12
D	50% CD	2021-02-05
C	BUILDING PERMIT	2021-02-05
B	PERMIT/SPA COORDINATION	2021-02-02
A	100% DESIGN DEVELOPMENT	2021-01-19

No.	Revision	Date
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Orientation	Seal
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TEL: 905-507-0800  
WEB: [WWW.QUASARCG.COM](http://WWW.QUASARCG.COM)

### Project Information

BFES Station 201  
(SPA-2021-0032)

27 Rutherford Rd. S., Brampton, ON, L6W 3J3

For  
City of Brampton Fire & Emergency Services

Drawing Title
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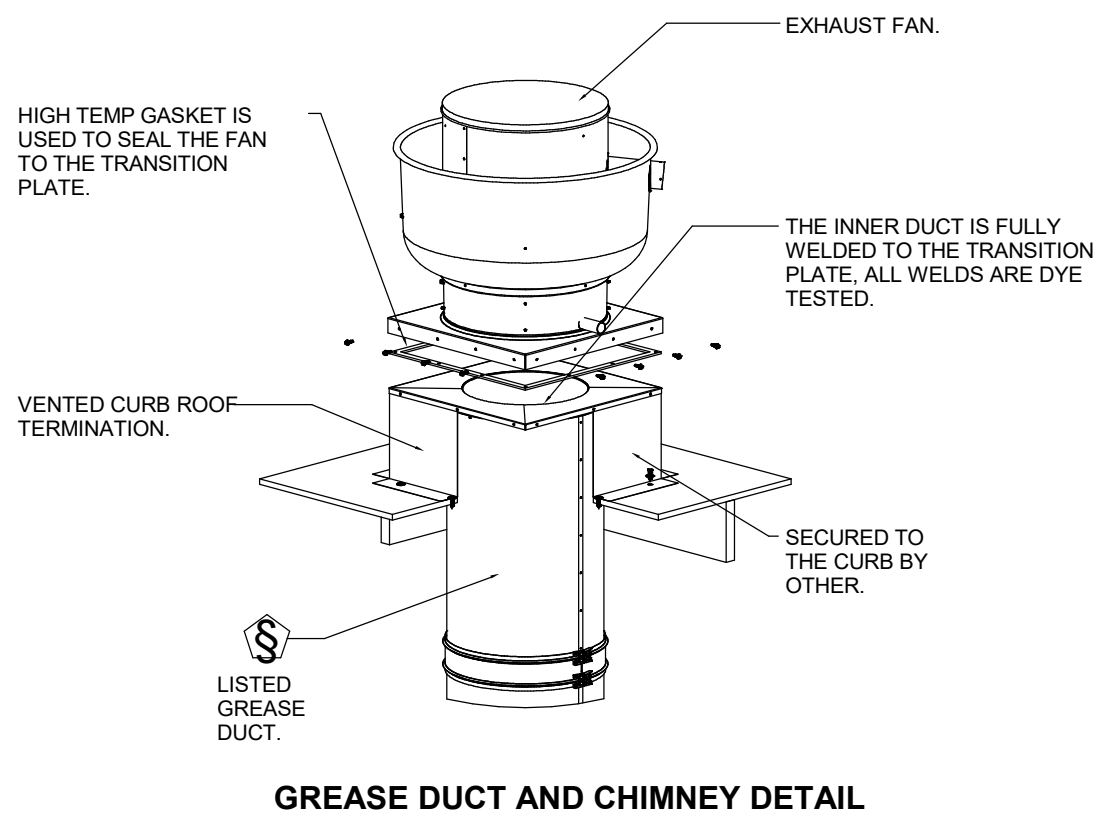
MECHANICAL DETAILS VIB

Date	Project No	Drawing No
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Drawn by	GM 20 063	MO 1
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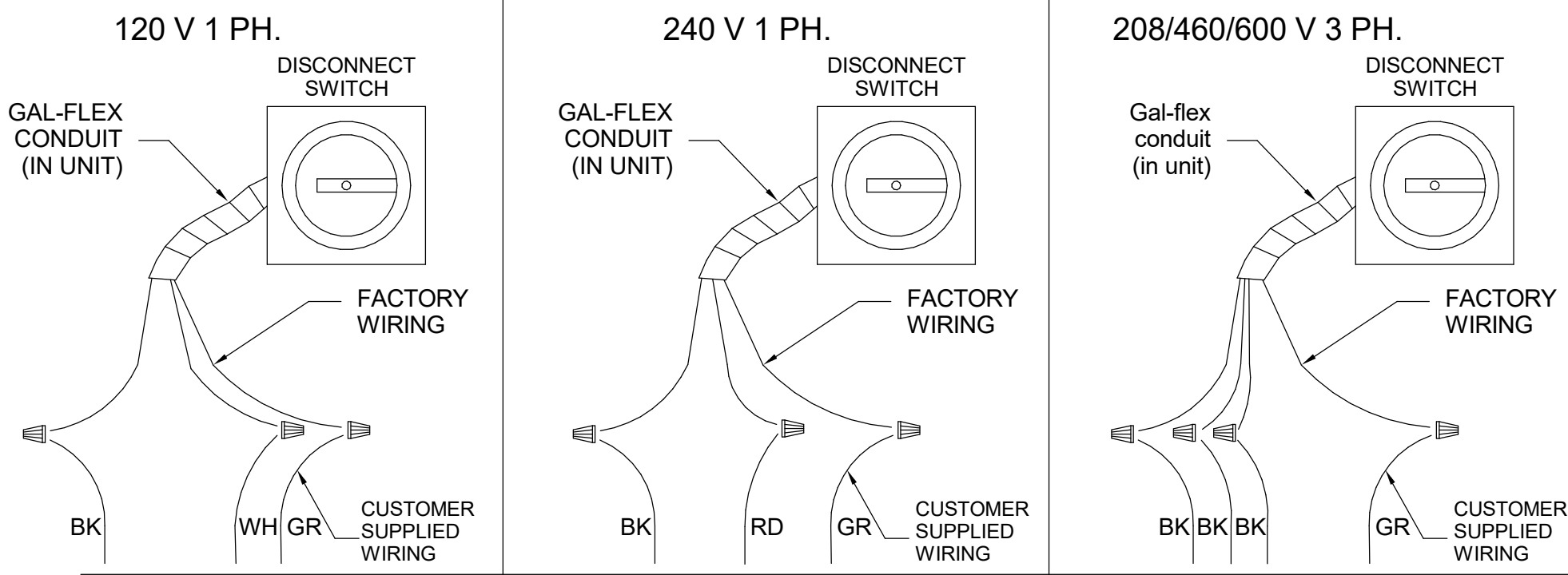
CMW	MI04
Scale	





#### GREASE DUCT & CHIMNEY SPECIFICATIONS:

- PROVIDE GREASE DUCT EQUAL TO CAPTIVEAIRE SYSTEMS MODEL "DW" ROUND 20 GAUGE 430 STAINLESS STEEL DUCTWORK. MODEL "DW" IS LISTED TO UL-1978 AND IS INSTALLED USING "V" CLAMP LOCKING CONNECTIONS SEALED WITH 3M FIRE BARRIER 2000 PLUS. MODEL "DW" DOES NOT REQUIRE WELDING PROVIDING IT HAS BEEN INSTALLED PER THE MANUFACTURES INSTALLATION GUIDE.
- PROVIDE RATED ACCESS DOORS AT EVERY CHANGE IN DIRECTION AND EVERY 12' ON CENTER. PER MANUFACTURES LISTING MODEL "DW" HORIZONTAL RUNS LESS THAN 75 FT. CAN BE SLOPED 1/16" PER 12". HORIZONTAL RUNS MORE THAN 75 FT. CAN BE SLOPED 3/16" PER 12". DUCT SHOULD BE SLOPED AS MUCH AS POSSIBLE TO REDUCE THE CHANCE OF GREASE ACCUMULATION IN HORIZONTAL RUNS.
- IF THE DUCT OR CHIMNEY IS WITHIN 18 INCHES OF COMBUSTIBLE MATERIAL, PROVIDE UL-2221 OR UL-103 HT LISTED DOUBLE WALL GREASE DUCT OR DOUBLE WALL CHIMNEY EQUAL TO CAPTIVEAIRE SYSTEMS MODEL "DW-2R, 2R TYPE HT, 3R, OR 3Z" ROUND 20 GAUGE 430 STAINLESS INNER DUCT INSULATED WITH A 24 GAUGE 430 STAINLESS OUTER SHELL.



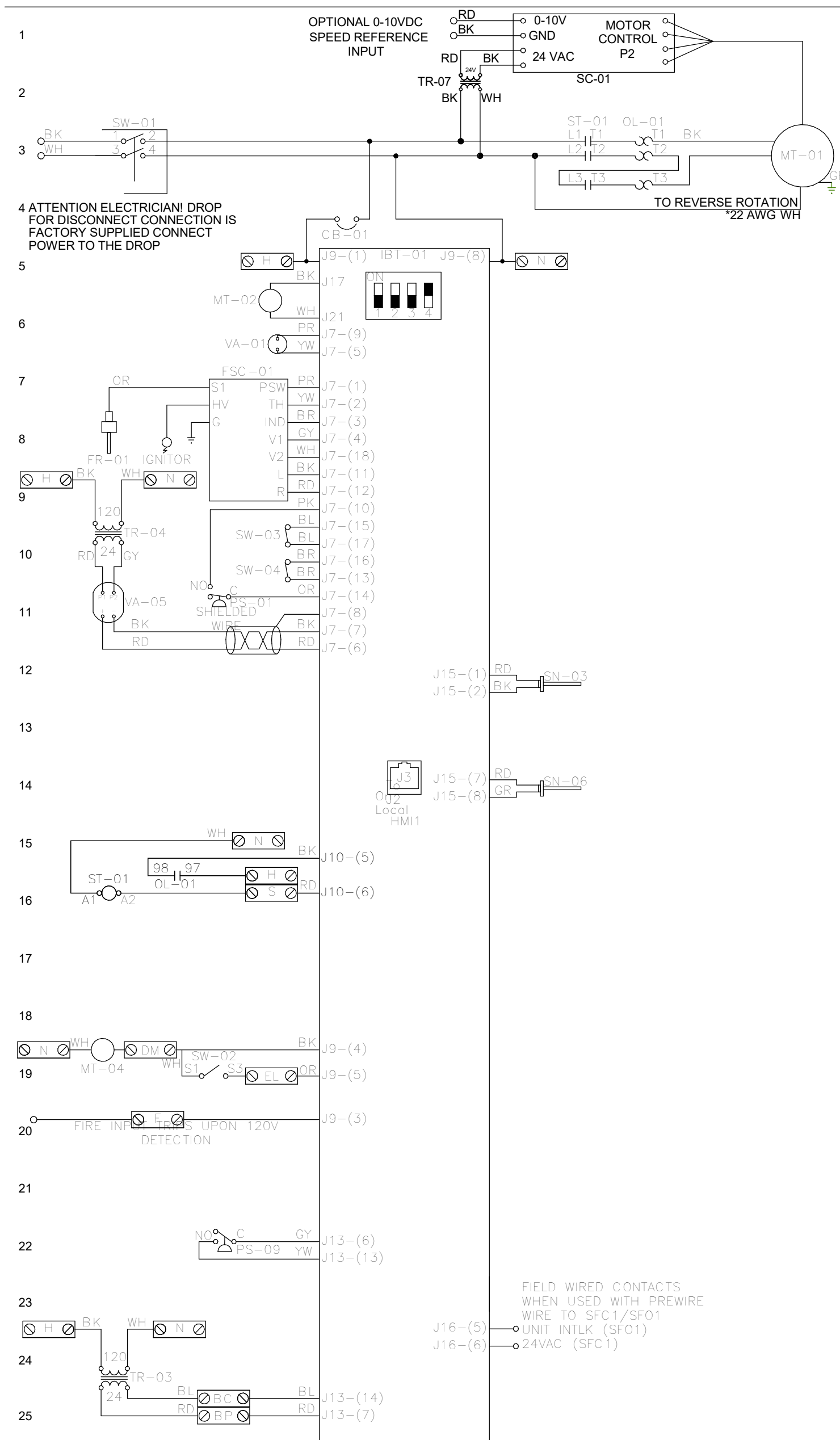
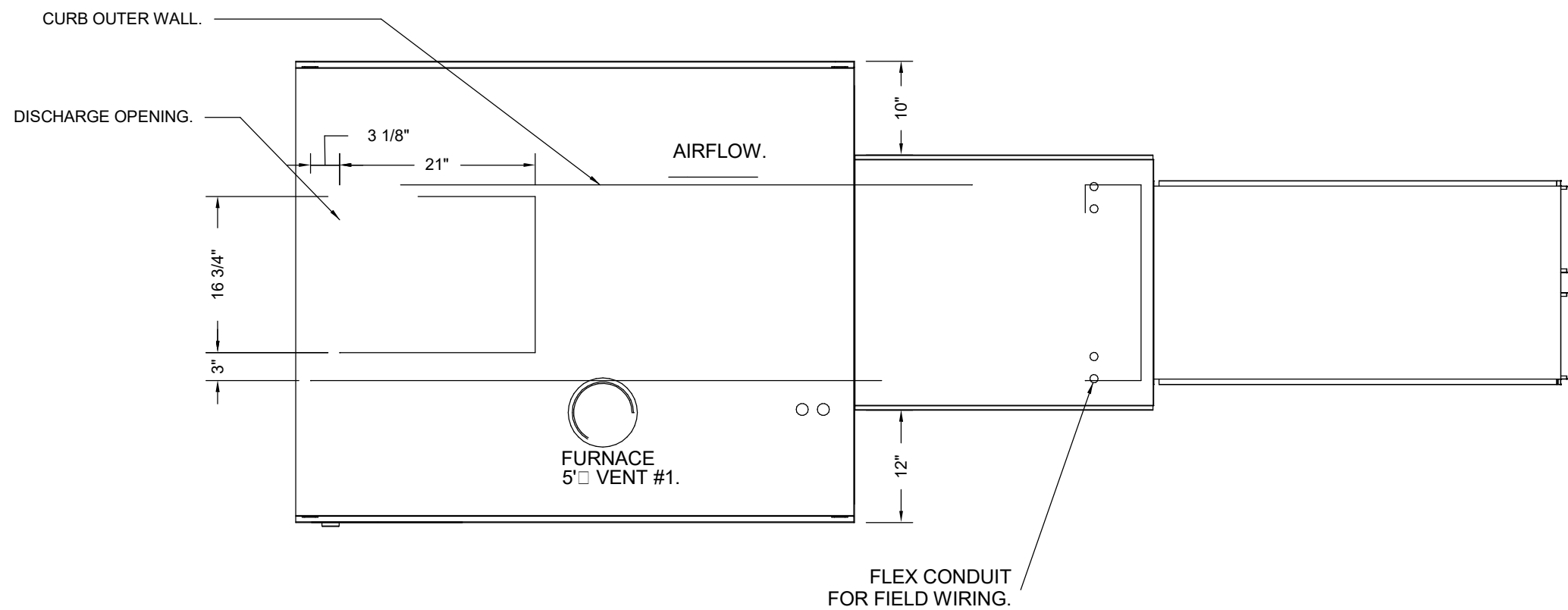
SEE ABOVE DETAILS.

POWER CONNECTION

#### WIRE COLOR LEGEND

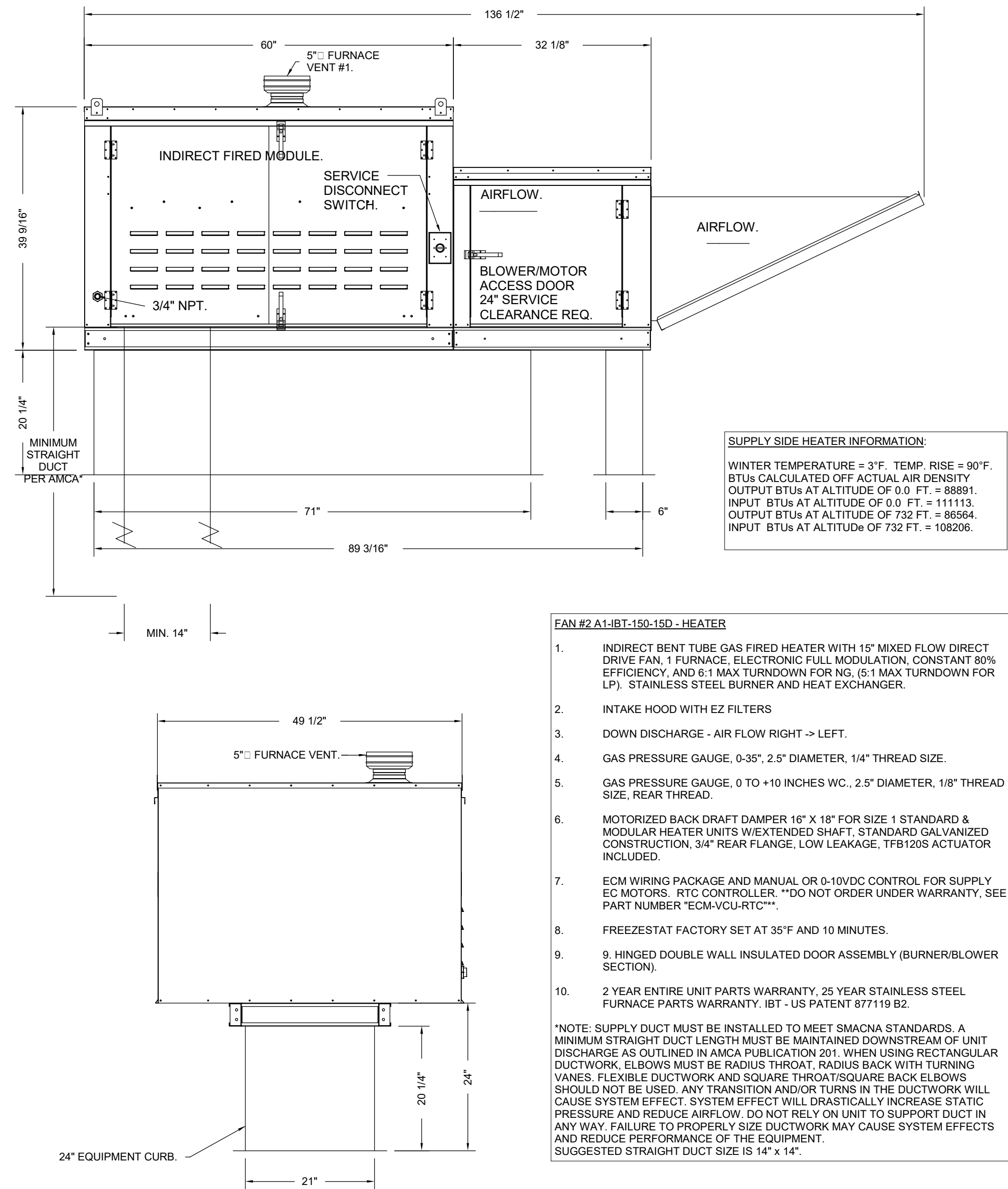
BK - BLACK  
BL - BLUE  
BR - BROWN  
OR - ORANGE  
RD - RED  
WH - WHITE  
YW - YELLOW  
GR - GREEN  
GY - GRAY  
PR - PURPLE  
PK - PINK

#### MAKE-UP AIR INSTALLATION WIRING DETAIL



Installed Options		
Freezestat		
COMPONENT IDENTIFICATION		
LABEL	DESCRIPTION	LOCATION
FR-01	FLAME ROD 1	[8]
FSC-01	FLAME SAFETY CONTROLLER 1	[9]
MT-01	SUPPLY MOTOR	[2]
MT-02	POWER VENT 1	[2]
MT-04	MOTORIZED DAMPER MOTOR	[16]
OL-01	SUPPLY MOTOR OVERLOAD	[9]
PS-01	VENT PROVING 1	[11]
PS-09	AIRFLOW PROVING SWITCH	[22]
SC-01	RTC-FSC-1	[1]
SN-03	INTAKE TEMPERATURE SENSOR	[12]
SN-06	DISCHARGE TEMPERATURE SENSOR	[14]
ST-01	SUPPLY MOTOR STARTER	[3]
SW-01	MAIN DISCONNECT SWITCH	[3]
SW-02	DAMPER END LIMIT SWITCH	[19]
SW-03	ROLL OUT SWITCH 1	[9]
SW-04	HIGH TEMP SWITCH 1	[10]
TR-03	BOARD POWER TRANSFORMER 40VA	[24]
TR-04	MOD VALVE 1 TRANSFORMER	[9]
TR-07	24VAC 20VA TRANSFORMER	[2]
VA-01	MAIN GAS VALVE 1	[9]
VA-05	MODULATING GAS VALVE 1	[10]
MOTOR INFO		
SUPPLY 1HP-115V-1P-11.6FLA		
CONTACTOR: 100-C18D10		
OVERLOAD: 193-T1AC12		
ELECTRICAL INFORMATION		
MOTOR/CTRL CIRCUIT MCA: 18.8A		
MOTOR/CTRL CIRCUIT MOP: 30A		
NOTES		
--- DENOTES FIELD WIRING		
--- DENOTES INTERNAL WIRING		
WIRE COLOR		
BK - BLACK	YW - YELLOW	RD - RED
BL - BLUE	GR - GREEN	WH - WHITE
BR - BROWN	GY - GRAY	PK - PINK
OR - ORANGE	PR - PURPLE	

#### INDIRECT FIRED BENT TUBE HTR WIRING DETAIL



#### MAKE-UP AIR UNIT DETAIL

FOR QUESTIONS REGARDING THIS PROJECT, PLEASE  
EMAIL: CM-20-063@QUASARC.COM

No.	Revision	Date
C	ISSUED FOR CONSTRUCTION	2021-12-20
B	ISSUED FOR TENDER	2021-08-12
A	ISSUED FOR BUILDING PERMIT	2021-07-27

Orientation	Seal
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250 ROWNTREE DAIRY RD, WOODBRIDGE, ON  
TEL: 905-507-0800  
WEB: WWW.QUASARC.COM

Project Information

**BFES Station 201**  
**(SPA-2021-0032)**

27 Rutherford Rd. S., Brampton, ON, L6W 3J3

For  
City of Brampton Fire & Emergency Services

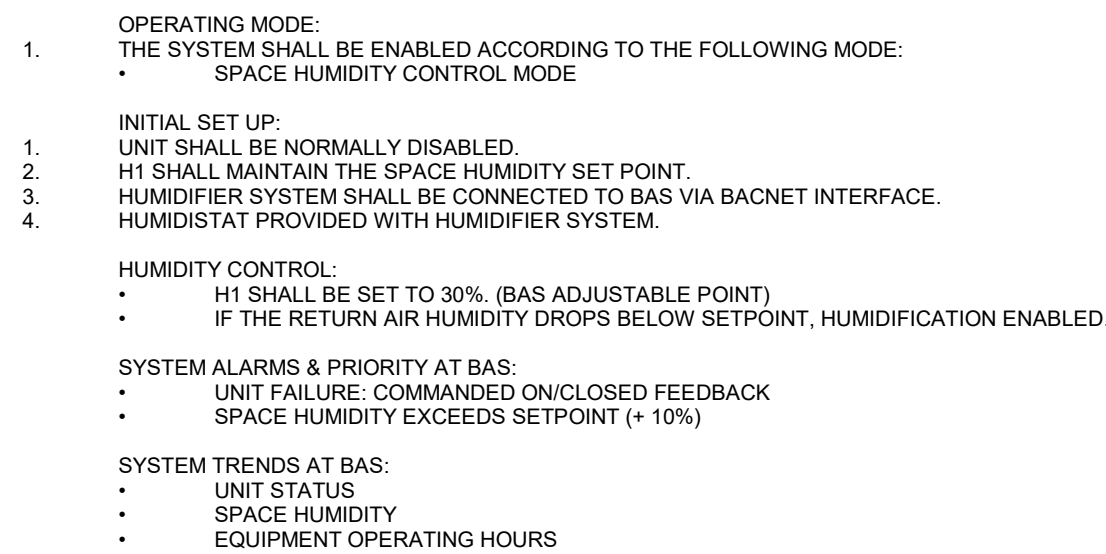
Date	2021-12-20	Project No	CM-20-063	Drawing No	M648
Drawn by	CMW				
Scale	N.T.S.				



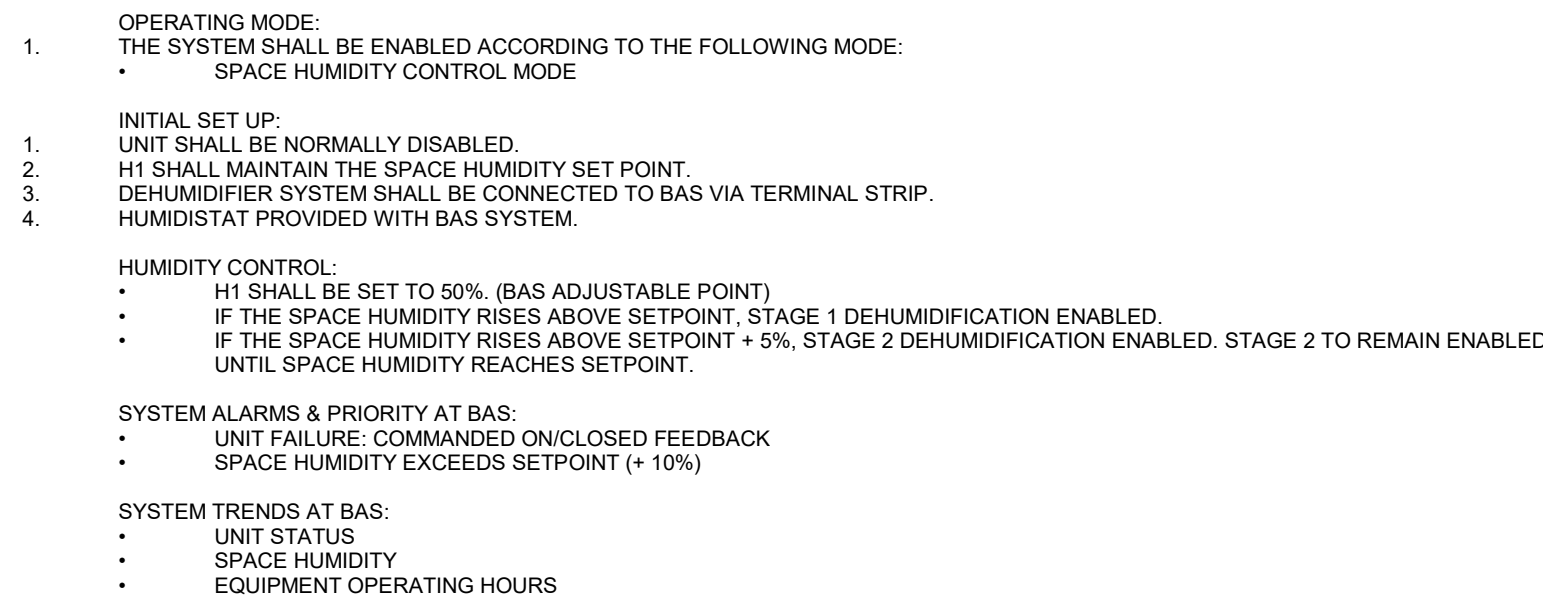


Date	2021-12-20	Project No CM-20-063	Drawing No M650
Drawn by	CMW		
Scale	N.T.S.		

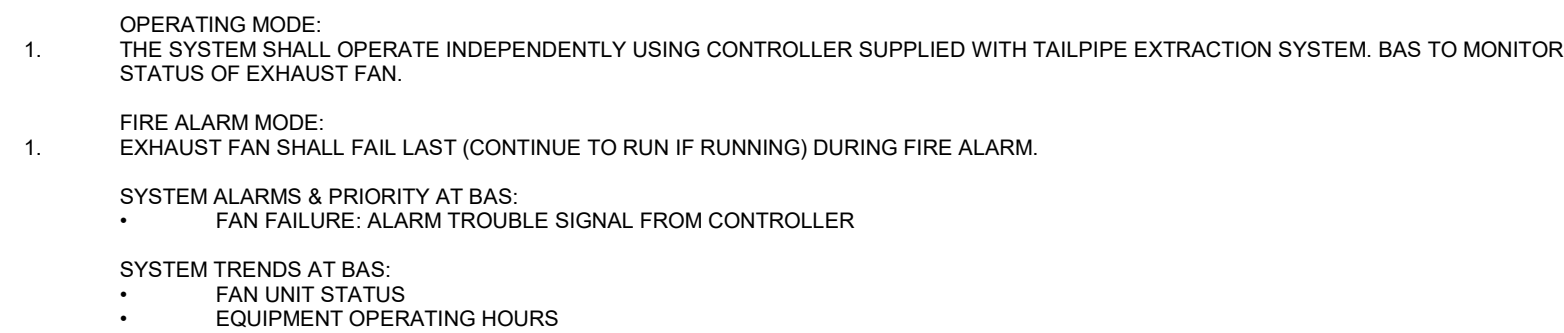




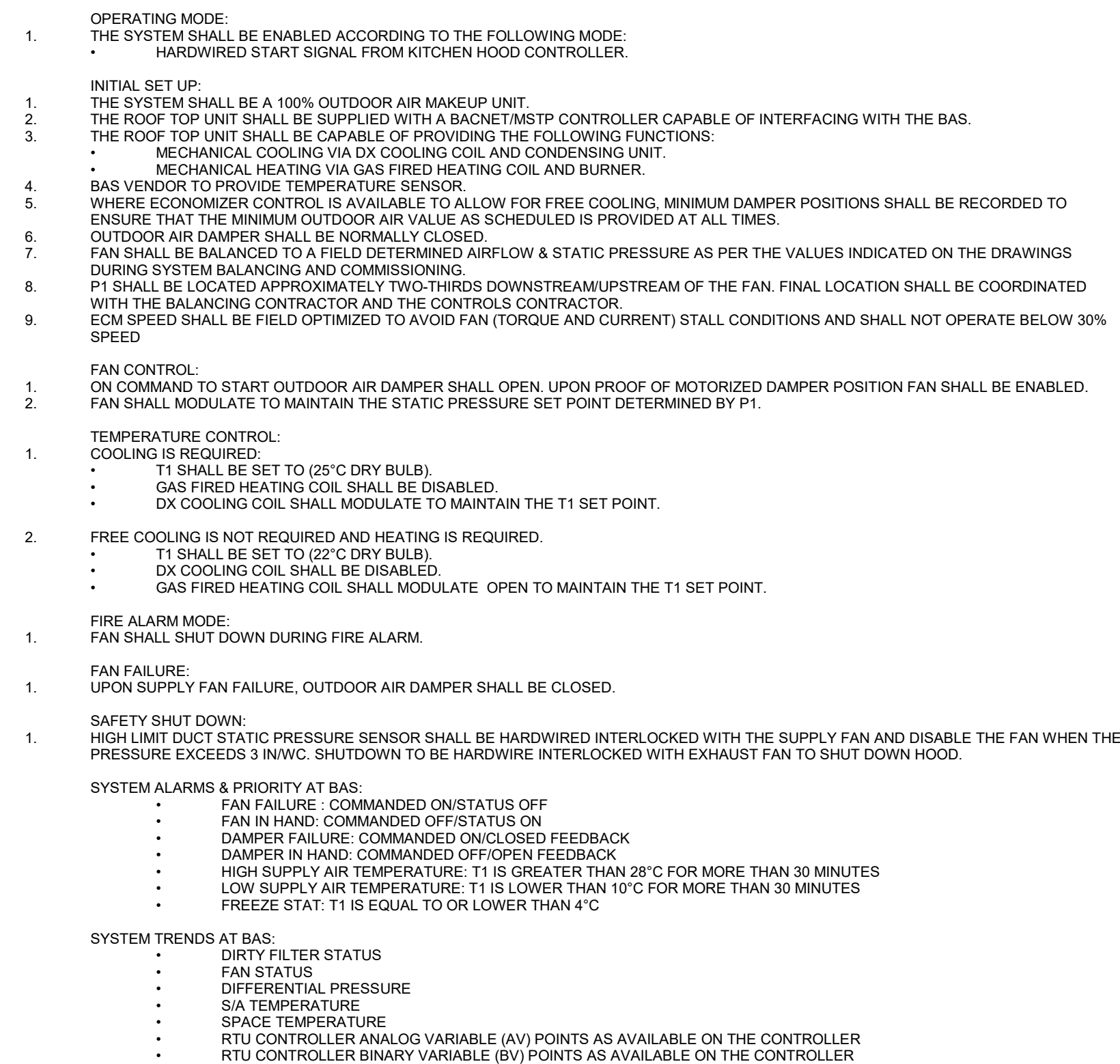
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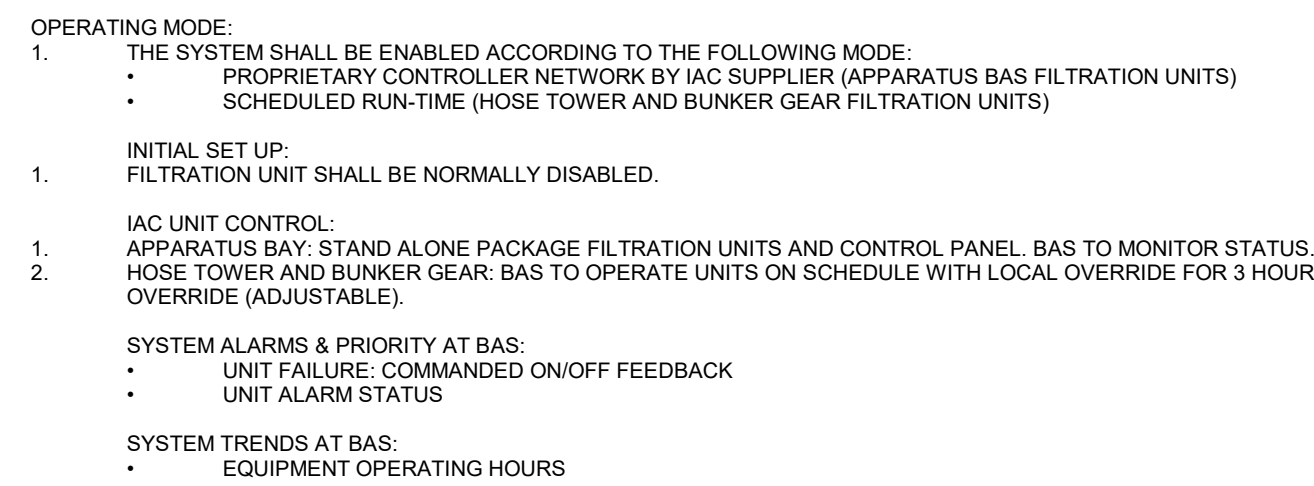
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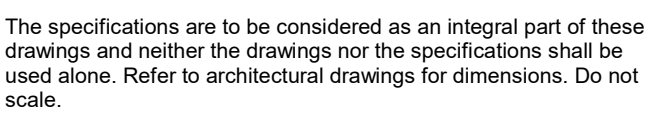
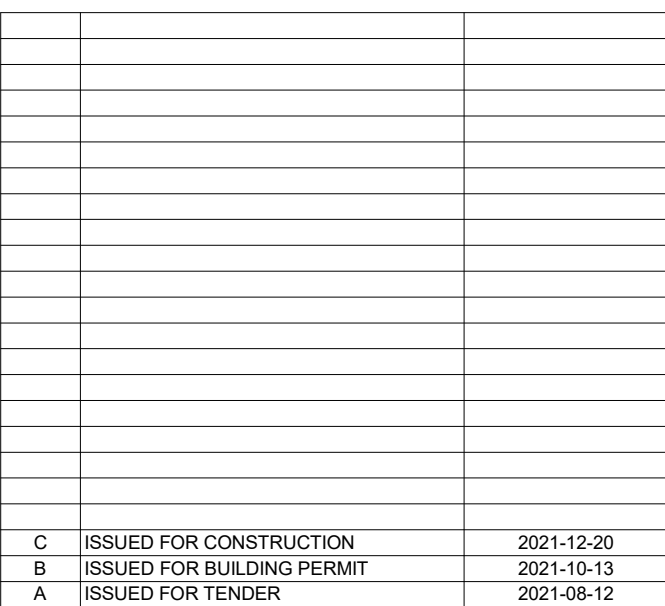
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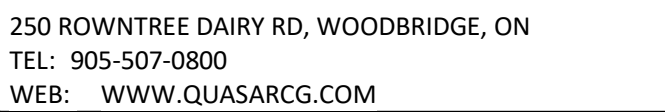
NOT TO SCALE



NOT TO SCALE



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## Project Information

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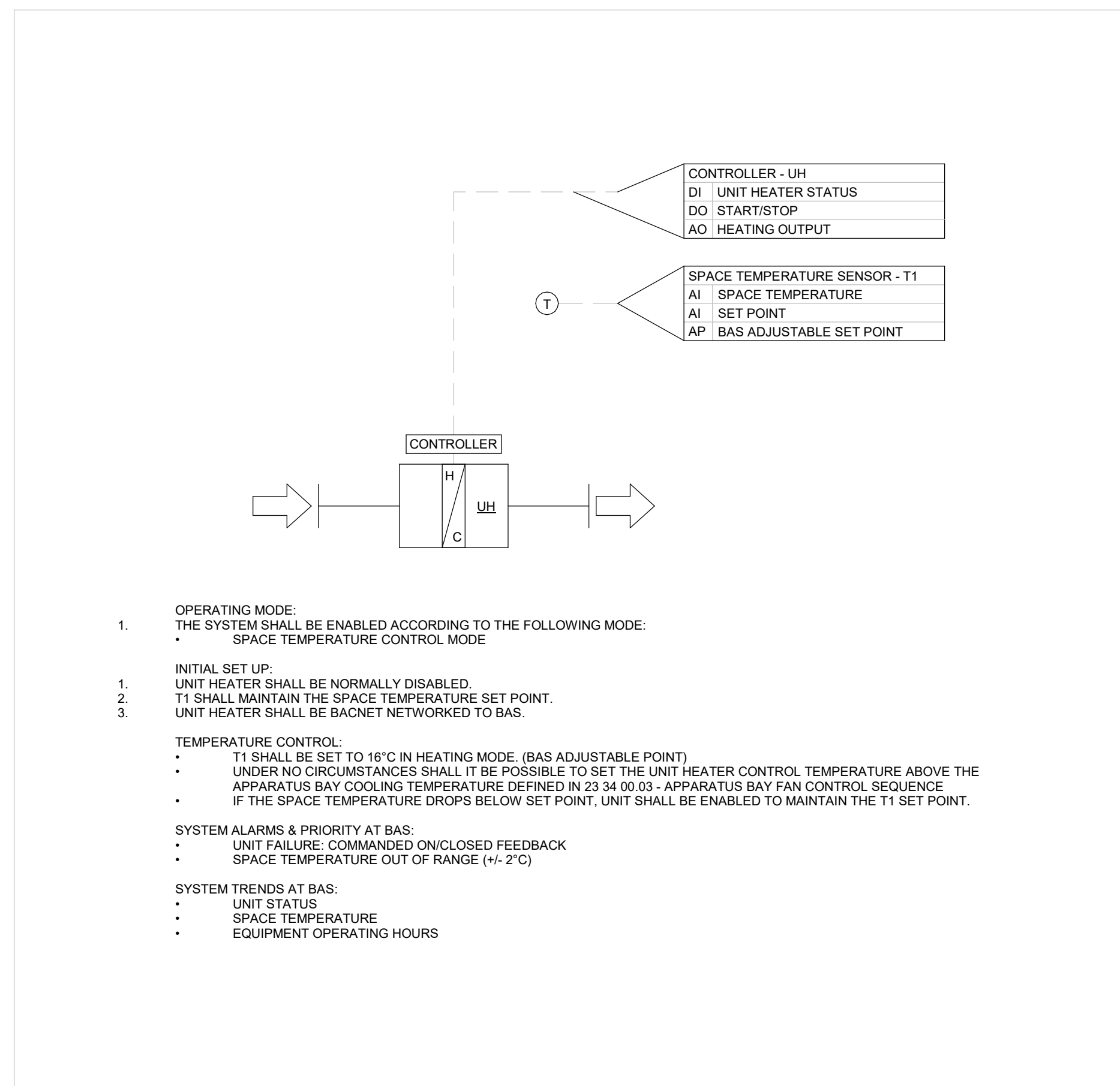
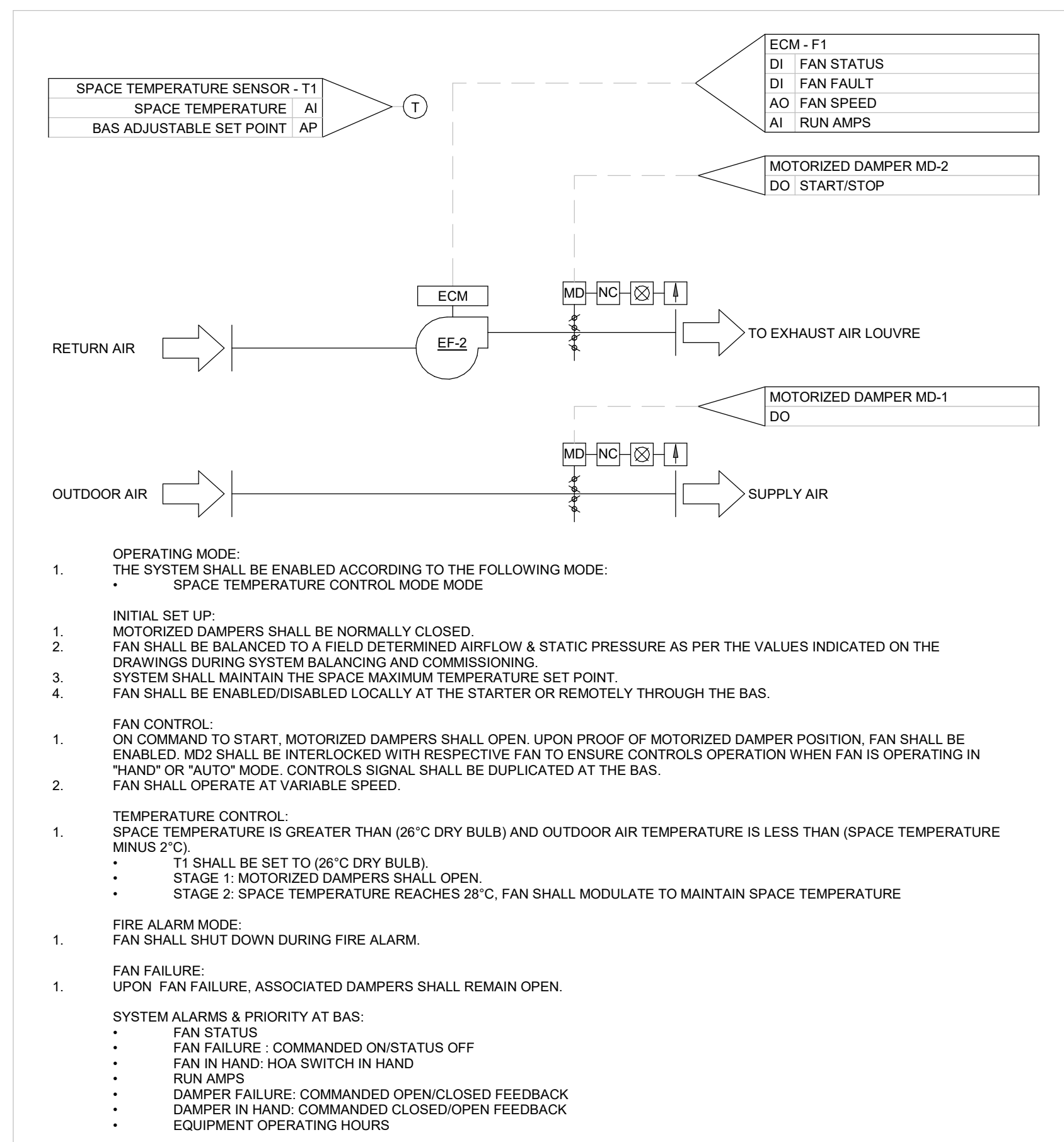
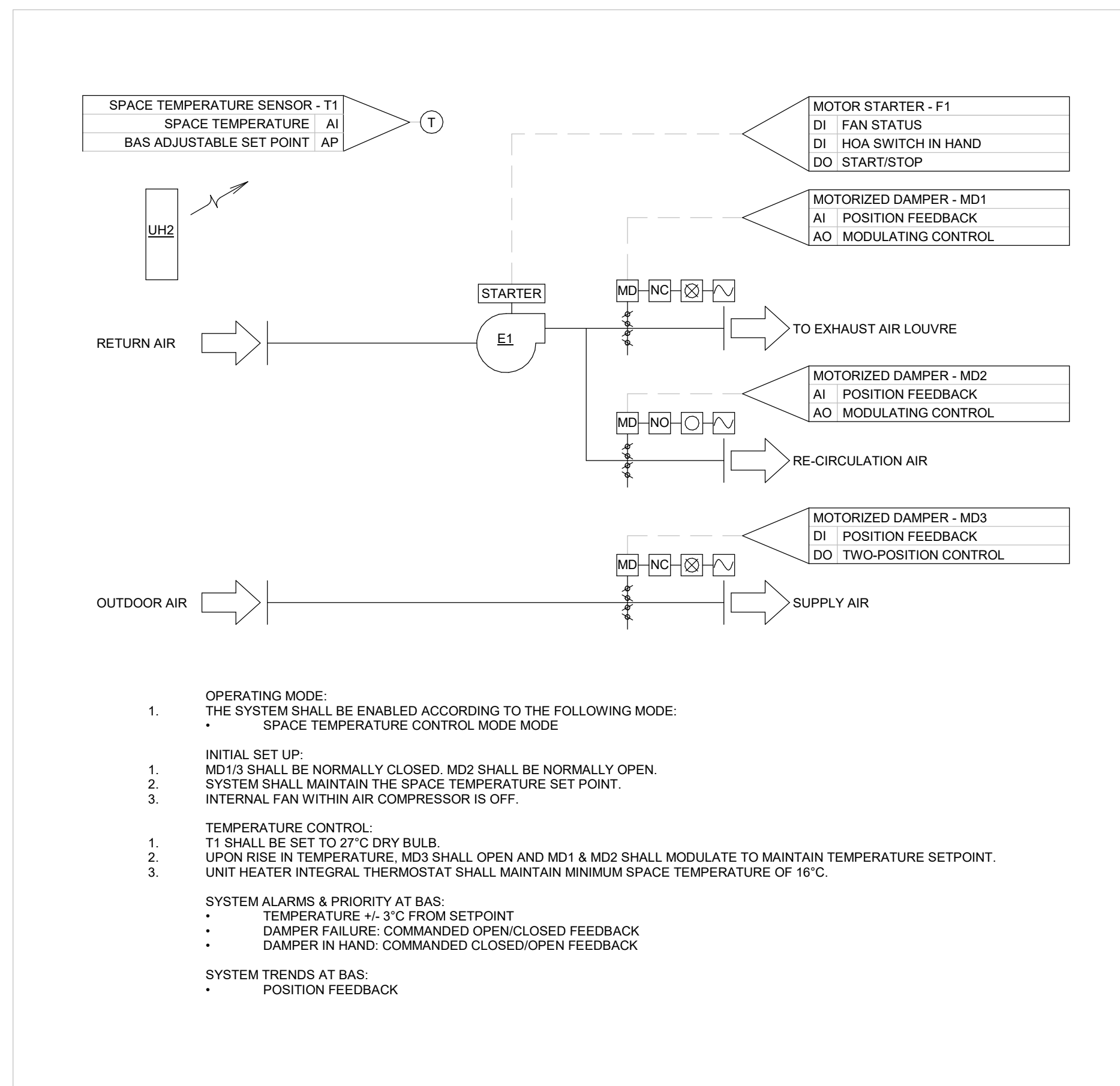
For  
City of Brampton Fire & Emergency Services

Drawing Title

## CONTROL SEQUENCES II

Date	2021-12-20	Project No CM-20-063	Drawing No <b>M65</b>
Drawn by	Author		
Scale	N.T.S.		





FOR QUESTIONS REGARDING THIS PROJECT, PLEASE  
EMAIL: CM-20-063@QUASARCG.COM

D	ISSUED FOR CONSTRUCTION	2021-12-20
C	ADDENDUM M03	2021-10-29
B	REISSUED FOR BUILDING PERMIT	2021-09-15
A	ISSUED FOR TENDER	2021-08-12

No.	Revision	Date
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Orientation	Seal
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Project Information

**BFES Station 201**  
**(SPA-2021-0032)**

27 Rutherford Rd. S., Brampton, ON, L6W 3J3

For  
City of Brampton Fire & Emergency Services

Drawing Title
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Date	2021-12-20	Project No CM-20-063	Drawing No <b>M652</b>
Drawn by	Author		
Scale	1 : 1		