GENERAL

SYMBOL	DESCRIPTION
	EXISTING TO REMAIN
	EXISTING TO BE DEMOLISHED
R	EXISTING TO BE REMOVED FOR RELOCATION
R	EXISTING RELOCATED IN NEW WORK
	NEW WORK
CTE	CONNECT TO EXISTING
	AIRFLOW / PIPE FLOW DIRECTION
	PIPE TURNING DOWN
	PIPE TURNING UP
	PRESSURE REDUCING VALVE
	ROOM THERMOSTAT
	ROOM HUMIDISTAT
	PUMP
	CONTROL VALVE - TWO WAY
	CONTROL VALVE - THREE WAY
	ISOLATION VALVE
	BALANCING VALVE
	CHECK VALVE
	STRAINER - OVER 50MM WITH VALVED FLUSHING DRAIN
	PIPE BRANCH OFF TOP
	PIPE BRANCH OFF BOTTOM
	RELIEF VALVE
	PRESSURE GAUGE
	TEMPERATURE GAUGE
CAP	CAP
	SOLENOID VALVE
	FUSIBLE LINK VALVE
	HEAT TRACING

EQUIPMENT ABBREVIATIONS

SYMBOL	DESCRIPTION
AC	AIR COMPRESSOR
ARC	AIR CURTAIN
AHU	AIR HANDLING UNIT
BB	BASEBOARD HEATER
B	BOILER
CUH	CABINET UNIT HEATER
CH	CHILLER
C	CONDENSER
CAV	CONSTANT AIR VOLUME BOX
CC	COOLING COIL
DWH	DOMESTIC WATER HEATER
EF	EXHAUST FAN
FCU	FAN COIL UNIT
FFH	FORCED FLOW HEATER
GSHP	GROUND SOURCE HEAT PUMP
HEX	HEAT EXCHANGER
HP	HEAT PUMP
HC	HEATING COIL
P	PUMP
PHC	PRE-HEAT COIL
RP	RADIANT PANEL
RHC	RE-HEAT COIL
RF	RETURN FAN
RTU	ROOFTOP UNIT
SF	SUPPLY FAN
UH	UNIT HEATER
VAV	VARIABLE AIR VOLUME BOX

NOTE: REFER TO FLOOR PLANS FOR EQUIPMENT PROFILES, DIMENSIONS AND ORIENTATIONS

HEATING & COOLING PIPING

SYMBOL	DESCRIPTION
CNDR	CONDENSATE DRAIN
PC	PUMPED CONDENSATE
REFR	REFRIGERANT GAS
REFS	REFRIGERANT LIQUID
V	VENT
	UNION
	MANUAL AIR VENT
	AUTOMATIC AIR VENT
	EXPANSION COMPENSATOR
	EXPANSION LOOP
	PIPE ANCHOR
	PIPE GUIDE
	PIPE SLEEVE
BBH- #	BASEBOARD HEATER
CUH	CABINET UNIT HEATER
UH	UNIT HEATER

PLUMBING

SYMBOL	DESCRIPTION
SAN	SANITARY DRAINAGE - ABOVE GROUND
SAN	SANITARY DRAINAGE - UNDERGROUND
SAN(AR)	SANITARY DRAINAGE (ACID RESISTANT) - ABOVE GROUND
SAN(AR)	SANITARY DRAINAGE (ACID RESISTANT) - UNDERGROUND
STM	STORM DRAINAGE - ABOVE GROUND
STM	STORM DRAINAGE - UNDERGROUND
PD	PUMPED DISCHARGE
	DOMESTIC COLD WATER SUPPLY
	DOMESTIC HOT WATER SUPPLY
	DOMESTIC HOT WATER RECIRC.
TW	TEMPERED WATER
AWV	ACID RESISTANT VENT
V	VENT
G	GAS
RO	REVERSE OSMOSIS PIPING
ISO	RADIO ISOTOPE DRAIN
CA	COMPRESSED AIR
	RUNNING TRAP
	P-TRAP
ES-1	EMERGENCY SHOWER
EW-1	EYE WASH
CO	CLEANOUT IN FLOOR/BELOW GRADE
CO	CLEANOUT IN CEILING
HB	HOSE BIBB
NFHB	NON FREEZE HOSE BIBB
G	SINGLE GAS OUTLET
G	DOUBLE GAS OUTLET
CA	COMPRESSED AIR OUTLET
RH	ROOF HYDRANT
GH	GROUND HYDRANT
RD	ROOF DRAIN
CFRD	CONTROL FLOW ROOF DRAIN
VTR	VENT THROUGH ROOF
RWL	RAIN WATER LEADER
TSP	TRAP SEAL PRIMER
	SCUPPER DRAIN
MH	MANHOLE
CB	CATCH BASIN
TD	TRENCH GRATE & FRAME
AD	AREA DRAIN
FFD	FUNNEL FLOOR DRAIN
FD	FLOOR DRAIN
HD	HUB DRAIN
FS	FLOOR SINK
FRD	FLOOR DRAIN - FLUSHING RIM
M	WATER METER ASSEMBLY
G	GAS METER
	BACK WATER VALVE
BFP	BACKFLOW PREVENTER
"WC-1"	DENOTES FIXTURE TYPE PER SPECIFICATION

FIRE PROTECTION

SYMBOL	DESCRIPTION
SP	SPRINKLER LINE
FM	FIRE MAIN
F	STANDPIPE
SV	SUPERVISED VALVE
WFA	WATER FLOW ALARM
PS	PRESSURE SWITCH
TH	TEST CONNECTION
	SPRINKLER FIRE DEPARTMENT CONNECTION
	PRESSURE SWITCH WATER FLOW ALARM EXCESS PRESSURE PUMP WET ALARM CHECK VALVE TEST & DRAIN VALVE
	WATER FLOW ALARM PRESSURE SWITCH DRY ALARM CHECK VALVE TEST & DRAIN VALVE
	AIR COMPRESSOR
SVC	SPRINKLER VALVE CABINET
FEC	FIRE EXTINGUISHER CABINET
FHC	FIRE HOSE CABINET
F	FIRE EXTINGUISHER C/W WALL BRACKET
PIV	POST-INDICATOR VALVE
	FIRE HYDRANT C/W SHUT-OFF VALVE
	PENDENT SPRINKLER HEAD
	UPRIGHT SPRINKLER HEAD
	CONCEALED SPRINKLER HEAD
	FIRE SUPPRESSION (CLEAN AGENT) SPRINKLER HEAD
	SIDEWALL SPRINKLER HEAD
	FIRE DEPARTMENT CONNECTION

VENTILATION

SYMBOL	DESCRIPTION
FD	FUSIBLE LINK FIRE DAMPER (DOUBLE LINE)
FD	FUSIBLE LINK FIRE DAMPER (SINGLE LINE)
BDD	BACK DRAFT DAMPER (DOUBLE LINE)
BDD	BACK DRAFT DAMPER (SINGLE LINE)
BD	BALANCING DAMPER (DOUBLE LINE)
BD	BALANCING DAMPER (SINGLE LINE)
M	MOTORIZED DAMPER (DOUBLE LINE)
M	MOTORIZED DAMPER (SINGLE LINE)
600x300	RECTANGULAR DUCTWORK - DIMENSIONS AS SHOWN
600Ø	ROUND DUCTWORK - DIMENSION AS SHOWN
600x300	DUCTWORK (SINGLE LINE) - DIMENSION AS SHOWN
	RECTANGULAR SUPPLY/OUTDOOR AIR DUCT UP
	RECTANGULAR EXHAUST/RETURN AIR DUCT UP
	CIRCULAR SUPPLY/OUTDOOR AIR DUCT UP
	CIRCULAR EXHAUST/RETURN AIR DUCT UP
	RECTANGULAR SUPPLY/OUTDOOR AIR DUCT DOWN
	RECTANGULAR EXHAUST/RETURN AIR DUCT DOWN
	CIRCULAR SUPPLY/OUTDOOR AIR DUCT DOWN
	CIRCULAR EXHAUST/RETURN AIR DUCT DOWN
	MITRED ELBOW WITH TURNING VANES
	DUCT RISE (DOUBLE LINE)
	DUCT RISE (SINGLE LINE)
	SUPPLY GRILLE - DIMENSIONS AS SHOWN ON SCHEDULE
	EXHAUST/RETURN GRILLE - DIMENSIONS AS SHOWN ON SCHEDULE
	CEILING SUPPLY AIR DIFFUSER - DIMENSIONS AS SHOWN ON SCHEDULE
	LINEAR SLOT DIFFUSER - DIMENSIONS AS SHOWN ON SCHEDULE
	CEILING EXHAUST/RETURN GRILLE - DIMENSIONS AS SHOWN ON SCHEDULE
	SUPPLY AIR ROUND DIFFUSER
	BRANCH TAKE-OFF WITH ADJUSTABLE SPLITTER DAMPER IN SUPPLY DUCT (DOUBLE LINE)
	BRANCH TAKE-OFF WITH ADJUSTABLE SPLITTER DAMPER IN SUPPLY DUCT (SINGLE LINE)
O.E.D.	OPEN ENDED DUCT WITH BALANCING DAMPER AND BELLMOUTH. DIRECTION AS SHOWN (DOUBLE LINE)
O.E.D.	OPEN ENDED DUCT WITH BALANCING DAMPER AND BELLMOUTH. DIRECTION AS SHOWN (SINGLE LINE)
	FLEXIBLE DUCT CONNECTION
	ACOUSTICALLY LINED DUCTWORK (DOUBLE LINE)
	DUCT SILENCER
	FLEXIBLE DUCT (DOUBLE LINE) FLEXIBLE DUCT (SINGLE LINE)
	FLEXIBLE DUCT CONNECTION WITH BALANCING DAMPER ON TAKE-OFF
400x400 400Ø	DUCT TRANSITION FROM RECTANGULAR TO ROUND
	RECTANGULAR DUCT BREAK
	ROUND DUCT BREAK
	SINGLE LINE DUCT BREAK
	TRANSFER AIR DUCT
U/C	75mm (3/4") DOOR UNDERCUT

CONTROLS

SYMBOL	DESCRIPTION
SF	SUPPLY FAN
RF	RETURN FAN
EF	EXHAUST FAN
H/C	HEATING COIL
C/C	COOLING COIL
P/C	PRE-HEAT COIL
	FILTERS
	HUMIDIFIER
SA	SUPPLY AIR
EA	EXHAUST AIR
OA	OUTDOOR AIR
RA	RETURN AIR
MD	MOTORIZED DAMPER
MSP	MOTOR STARTER PANEL
MCC	MOTOR CONTROL CENTER
VFD	VARIABLE FREQUENCY DRIVE
NO	NORMALLY OPEN
NC	NORMALLY CLOSED
	NORMALLY CLOSED CONTACT
	NORMALLY OPEN CONTACT
FS	FLOW SWITCH
LS	LEVEL SWITCH
PS	PRESSURE SWITCH
NC	ACTUATOR NORMALLY CLOSED DE-ENERGIZED POSITION
NO	ACTUATOR NORMALLY OPEN DE-ENERGIZED POSITION
	ACTUATOR FAIL OPEN POSITION
	ACTUATOR FAIL CLOSED POSITION
FL	ACTUATOR FAIL LAST POSITION
	TWO-POSITION ACTUATOR
	MODULATING ACTUATOR
P	PRESSURE SENSOR
DP	DIFFERENTIAL PRESSURE SENSOR
VS	VELOCITY SENSOR
	HUMIDITY SENSOR
	TEMPERATURE SENSOR
OS	OCCUPANCY SENSOR
CO	CARBON MONOXIDE SENSOR
NOx	NOX SENSOR
O_2	OXYGEN SENSOR
GDP	GAS DETECTION SYSTEM CONTROL PANEL
	VISUAL INDICATOR ALARM
	AUDIBLE INDICATOR ALARM
BAS	BUILDING AUTOMATION SYSTEM
AI	ANALOG INPUT
AO	ANALOG OUTPUT
DI	DIGITAL INPUT
DO	DIGITAL OUTPUT
AP	BAS ADJUSTABLE SET POINT
BV	BACNET VARIABLE
HOA	HAND-OFF-AUTO
	CONTROL WIRING

MECHANICAL DRAWING LIST

DRAWING #	DRAWING NAME
M001	MECHANICAL LEGEND & DRAWING LIST
M101	MECHANICAL SITE PLAN
M200	FOUNDATION PLAN - PLUMBING & DRAINAGE
M201	LEVEL 1 PLAN - PLUMBING & DRAINAGE
M202	ROOF PLAN - PLUMBING & DRAINAGE
M301	LEVEL 1 PART PLAN WEST - VENTILATION
M302	LEVEL 1 PART PLAN EAST - VENTILATION
M303	LEVEL 1 PART PLAN NORTH - VENTILATION
M304	ROOF PLAN - VENTILATION
M401	LEVEL 1 PLAN - FIRE PROTECTION
M601	VRV SCHEMATIC
M602	FIRE PROTECTION & GAS SCHEMATIC
M610	MECHANICAL EQUIPMENT SCHEDULE
M621	MECHANICAL SECTIONS
M641	MECHANICAL DETAILS I
M642	MECHANICAL DETAILS II
M643	MECHANICAL DETAILS III
M644	MECHANICAL DETAILS IV
M645	MECHANICAL DETAILS V
M646	MECHANICAL DETAILS VI
M647	MECHANICAL DETAILS VII
M648	MECHANICAL DETAILS VIII
M650	CONTROL SEQUENCES I
M651	CONTROL SEQUENCES II
M652	CONTROL SEQUENCES III

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

No.	Revision	Date
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	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

Orientation

Seal

LICENSED PROFESSIONAL ENGINEER
C.M.WATSON
100156459
Aug. 12/21
PROVINCE OF ONTARIO

QUASAR CONSULTING GROUP
250 ROWNTREE DAIRY RD, WOODBRIDGE, ON
TEL: 905-507-0800
WEB: 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

MECHANICAL LEGEND & DRAWING LIST

Date	Project No	Drawing No
2021-08-12	CM-20-063	M001
Drawn by: CMW		
Scale: 1 : 1		

BIM 360://20019 - BFES Station 201/CM-20-063 - QCG ME Model_R20.rvt
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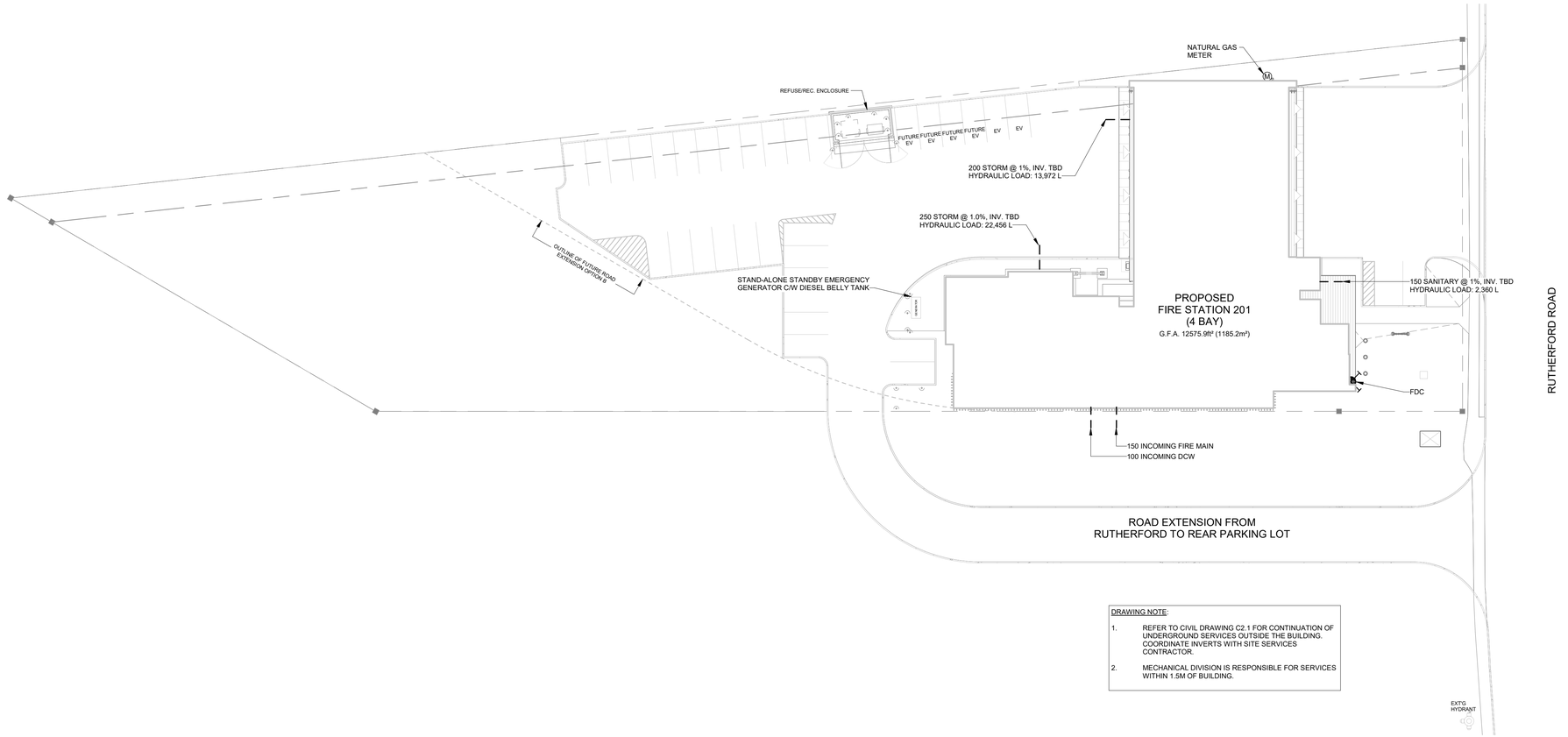

DRAWING NOTE:

1. REFER TO CIVIL DRAWING C2.1 FOR CONTINUATION OF UNDERGROUND SERVICES OUTSIDE THE BUILDING. COORDINATE INVERTS WITH SITE SERVICES CONTRACTOR.
2. MECHANICAL DIVISION IS RESPONSIBLE FOR SERVICES WITHIN 1.5M OF BUILDING.

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

No.	Revision	Date
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	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

Orientation

PROJECT NORTH

Seal

LICENSED PROFESSIONAL ENGINEER
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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 SITE PLAN

Date	Project No	Drawing No
2021-08-12	CM-20-063	M101
Drawn by: CMW		
Scale: 1 : 300		

BIM 360://20019 - BFES Station 201/CM-20-063 - QCG ME Model_R20.rvt
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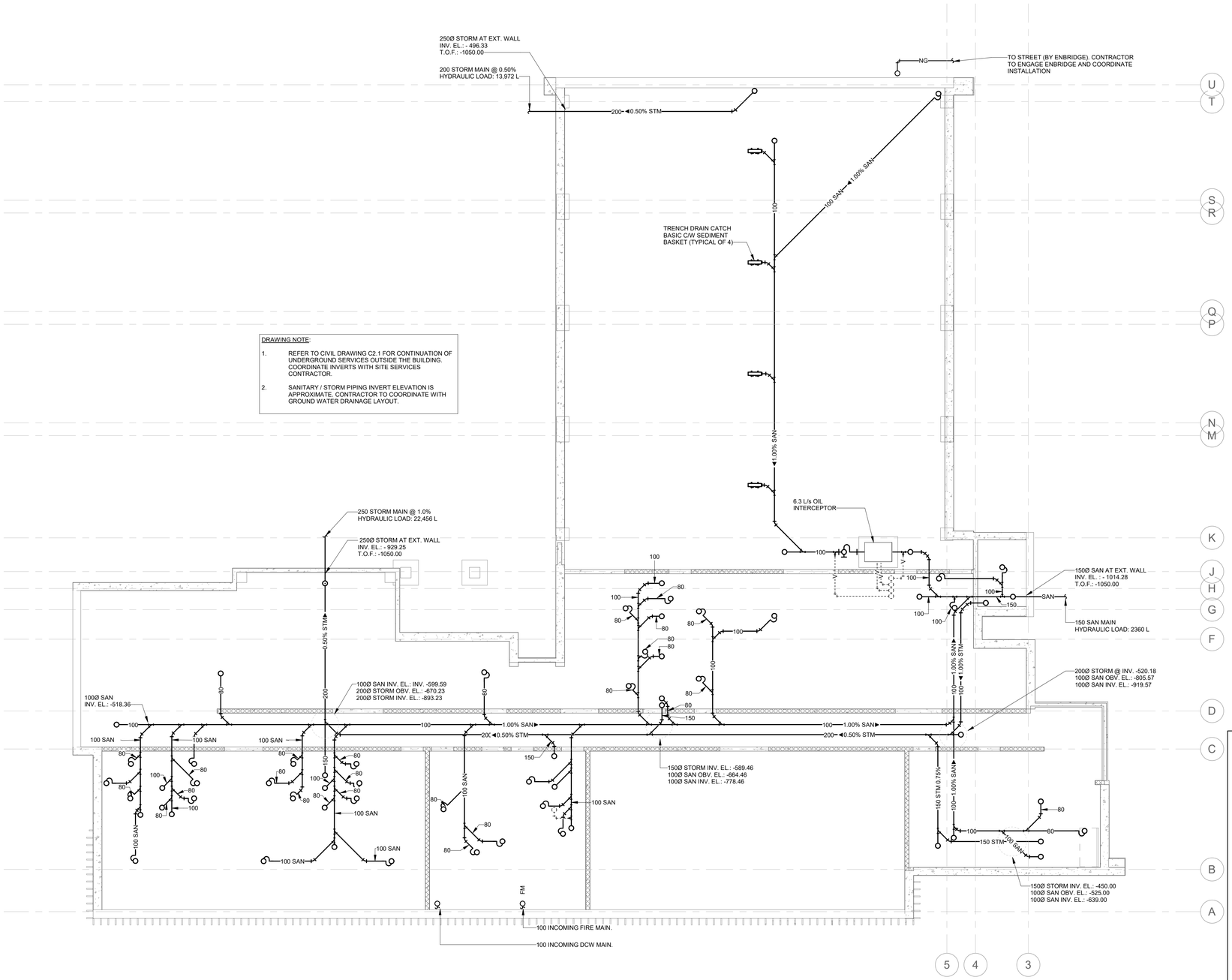

DRAWING NOTE:

1. REFER TO CIVIL DRAWING C2.1 FOR CONTINUATION OF UNDERGROUND SERVICES OUTSIDE THE BUILDING. COORDINATE INVERTS WITH SITE SERVICES CONTRACTOR.
2. SANITARY / STORM PIPING INVERT ELEVATION IS APPROXIMATE. CONTRACTOR TO COORDINATE WITH GROUND WATER DRAINAGE LAYOUT.

GENERAL NOTES:

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 CONTRACTOR OR ON PARTICULAR SUB-TRADE. IT IS UNDERSTOOD THAT THE PRIME CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATE OF ALL TRADES' WORK AND AS SUCH SHALL BE RESPONSIBLE 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-DISCIPLINE'S DOCUMENTS.
3. ALL WORK TO BE DONE IN ACCORDANCE WITH THE ONTARIO BUILDING CODE AND ALL OTHER REGULATORY REQUIREMENTS.
4. SUPPLY ALL 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, BALANCING, AND OCCUPANT OPERATIONAL TRAINING WILL BE PART OF THE WORK.
5. COORDINATE PLUMBING WITH WORK OF OTHER TRADES PRIOR TO FABRICATION OR INSTALLATION. PROVIDE ALL FITTINGS, OFFSETS AND TRANSITIONS REQUIRED FOR COMPLETE WORKABLE INSTALLATION.
6. COORDINATE LOCATIONS OF ALL ROOF OPENINGS WITH STRUCTURAL, MECHANICAL AND ARCHITECTURAL PLANS PRIOR TO ANY INSTALLATION.
7. PROVIDE FULL VENTING SYSTEM IN ACCORDANCE TO PART 7 OF THE OBC. COORDINATE LOCATION OF VTRS WITH AIR INTAKES.
8. ALL EQUIPMENT SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURER'S WRITTEN GUIDELINES. PROVIDE ALL FITTINGS, OFFSETS AND TRANSITIONS AS REQUIRED FOR COMPLETE INSTALLATION.
9. TRAP, PRIME AND VENT ALL FLOOR DRAINS.
10. ALL DRAINAGE PIPING 100Ø AND LARGER TO BE SLOPED AT 1%. ALL DRAINAGE PIPING 75Ø AND LESS TO BE SLOPED AT 2%.
11. MINIMUM PIPE SIZE IS 12Ø UNLESS NOTED OTHERWISE.
12. PROVIDE ISOLATION VALVES AT EACH PLUMBING FIXTURE.
13. ALL JANITOR'S SINKS, WALL HYDRANTS AND HOSE BIBBS TO BE PROVIDED C/W CSA VACUUM BREAKER PER OBC REQUIREMENTS.

1 Below Grade Plan - Plumbing and Drainage

SCALE: 1 : 100

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

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

Orientation

PROJECT NORTH

Seal

LICENSED PROFESSIONAL ENGINEER
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Aug. 12/21
PROVINCE OF ONTARIO

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Project Information

BFES Station 201
(SPA-2021-0032)

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

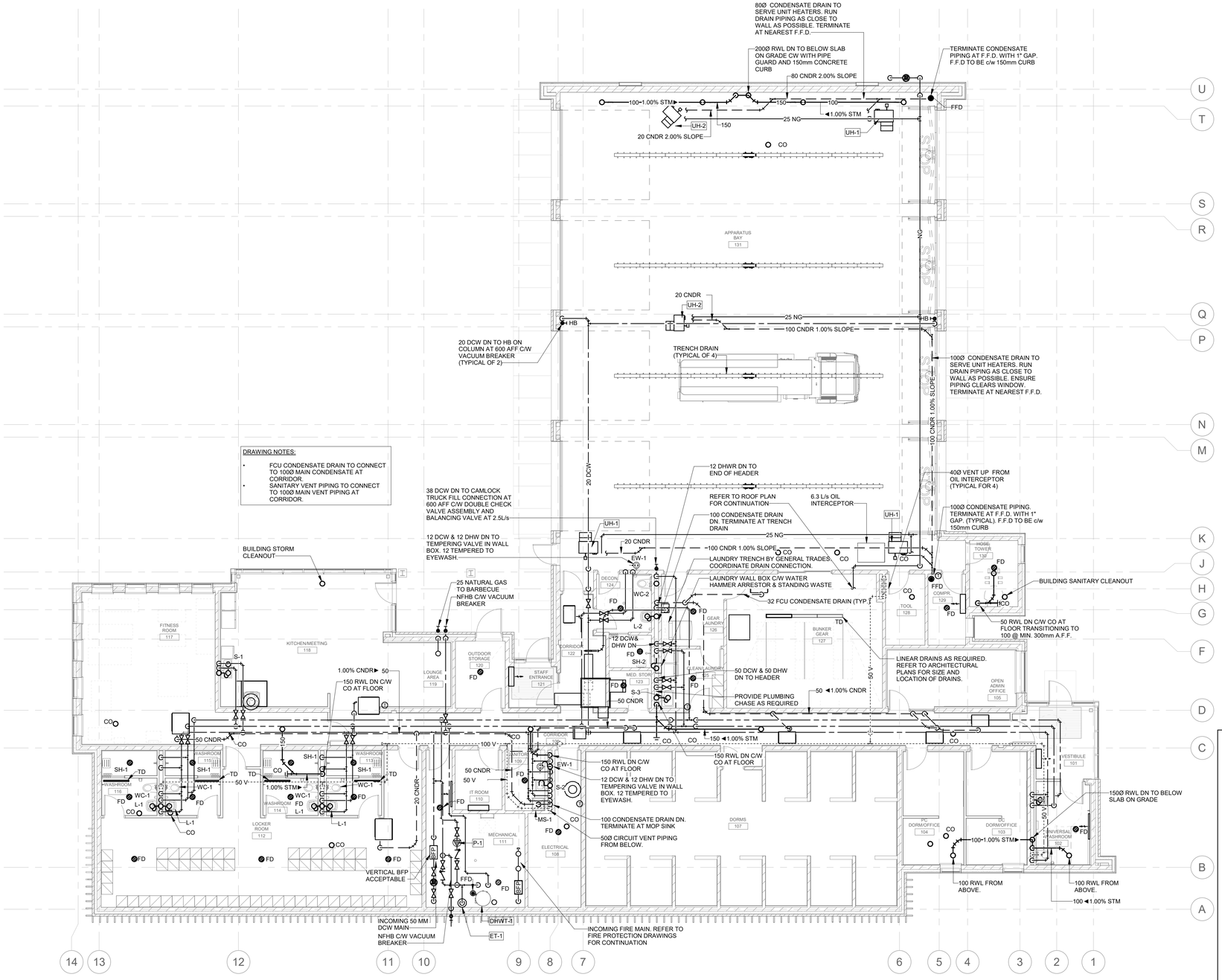
For

City of Brampton Fire & Emergency Services

Drawing Title

FOUNDATION PLAN - PLUMBING & DRAINAGE

Date	Project No	Drawing No
2021-08-12	CM-20-063	M200
Drawn by: CMW		
Scale: As indicated		



1 Level 1 Plan - Plumbing and Drainage

SCALE: 1 : 100

GENERAL NOTES:

1. DRAWINGS ARE DIAGRAMMATIC AND INDICATE GENERAL LOCATIONS OF EQUIPMENT AND CONNECTING SERVICES. DRAWINGS ARE NOT TO BE DIMENSIONED OR SCALED.
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3. ALL WORK TO BE DONE IN ACCORDANCE WITH THE ONTARIO BUILDING CODE AND ALL OTHER REGULATORY REQUIREMENTS.
4. SUPPLY ALL 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, BALANCING, AND OCCUPANT OPERATIONAL TRAINING WILL BE PART OF THE WORK.
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6. COORDINATE LOCATIONS OF ALL ROOF OPENINGS WITH STRUCTURAL, MECHANICAL AND ARCHITECTURAL PLANS PRIOR TO ANY INSTALLATION.
7. PROVIDE FULL VENTING SYSTEM IN ACCORDANCE TO PART 7 OF THE OBC. COORDINATE LOCATION OF VTRS WITH AIR INTAKES.
8. ALL EQUIPMENT SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURER'S WRITTEN GUIDELINES. PROVIDE ALL FITTINGS, OFFSETS AND TRANSITIONS AS REQUIRED FOR COMPLETE INSTALLATION.
9. TRAP, PRIME AND VENT ALL FLOOR DRAINS.
10. ALL DRAINAGE PIPING 100Ø AND LARGER TO BE SLOPED AT 1%. ALL DRAINAGE PIPING 75Ø AND LESS TO BE SLOPED AT 2%.
11. MINIMUM PIPE SIZE IS 12Ø UNLESS NOTED OTHERWISE.
12. PROVIDE ISOLATION VALVES AT EACH PLUMBING FIXTURE.
13. ALL JANITOR'S SINKS, WALL HYDRANTS AND HOSE BIBBS TO BE PROVIDED C/W CSA VACUUM BREAKER PER OBC REQUIREMENTS.

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

No.	Revision	Date
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

Orientation

PROJECT NORTH

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

LEVEL 1 PLAN - PLUMBING & DRAINAGE

Date	Project No	Drawing No
2021-08-12	CM-20-063	M201
Drawn by: CMW		
Scale: As indicated		

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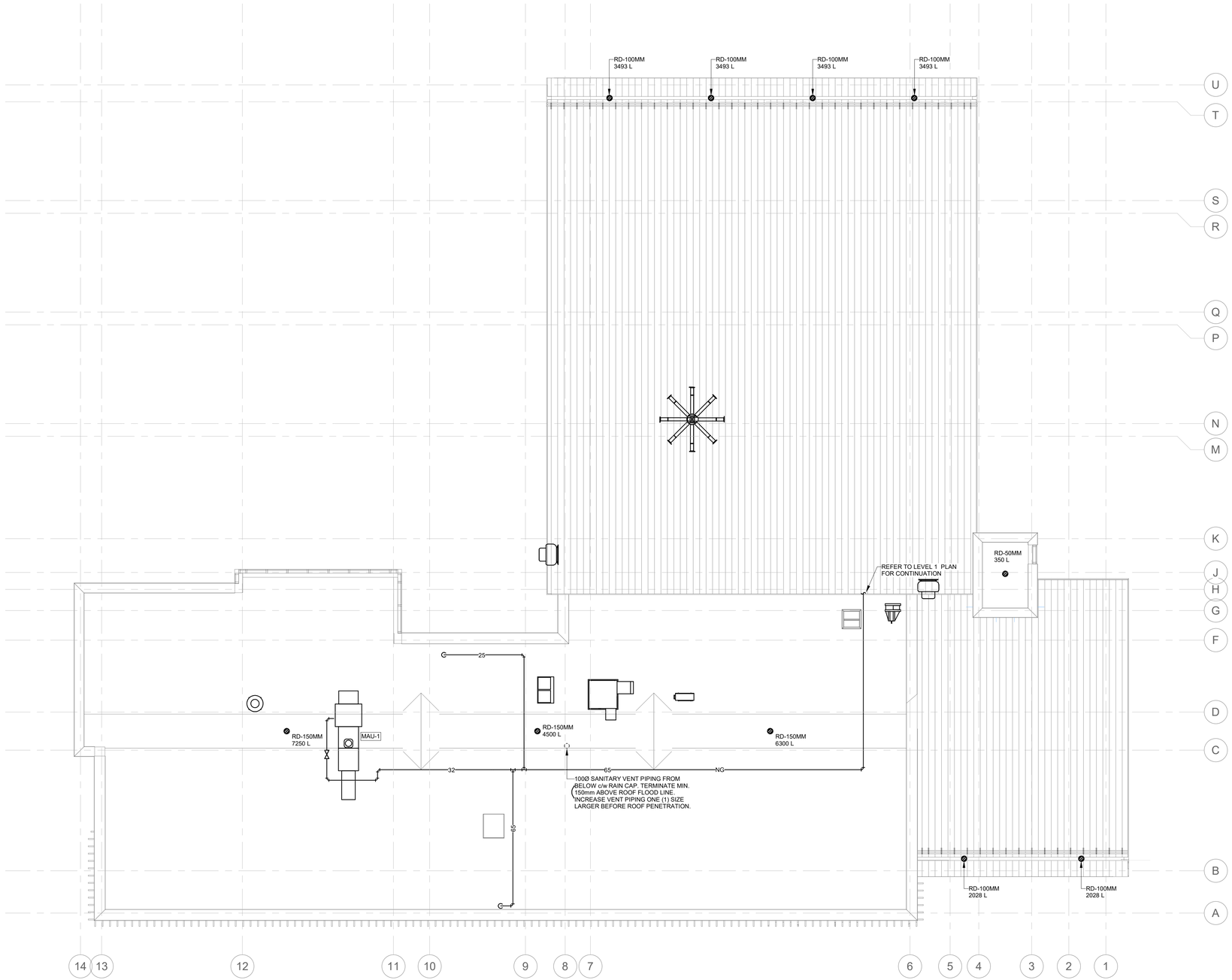

1 Roof Plan - Plumbing and Drainage

SCALE: 1 : 100

GENERAL NOTES:

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5. COORDINATE PLUMBING WITH WORK OF OTHER TRADES PRIOR TO FABRICATION OR INSTALLATION. PROVIDE ALL FITTINGS, OFFSETS AND TRANSITIONS REQUIRED FOR COMPLETE WORKABLE INSTALLATION.
6. COORDINATE LOCATIONS OF ALL ROOF OPENINGS WITH STRUCTURAL, MECHANICAL AND ARCHITECTURAL PLANS PRIOR TO ANY INSTALLATION.
7. PROVIDE FULL VENTING SYSTEM IN ACCORDANCE TO PART 7 OF THE OBC. COORDINATE LOCATION OF VTRS WITH AIR INTAKES.
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13. ALL JANITOR'S SINKS, WALL HYDRANTS AND HOSE BIBBS TO BE PROVIDED C/W CSA VACUUM BREAKER PER OBC REQUIREMENTS.

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

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

Orientation

PROJECT NORTH

Seal

LICENSED PROFESSIONAL ENGINEER
C.M.WATSON
100156459
Aug. 12/21
PROVINCE OF ONTARIO

QUASAR CONSULTING GROUP

250 ROWNTREE DAIRY RD, WOODBRIDGE, ON
TEL: 905-507-0800
WEB: 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

ROOF PLAN - PLUMBING & DRAINAGE

Date	Project No	Drawing No
2021-08-12	CM-20-063	M202
Drawn by: CMW		
Scale: As indicated		

BIM 360://20019 - BFES Station 201/CM-20-063 - QCG ME Model_R20.rvt
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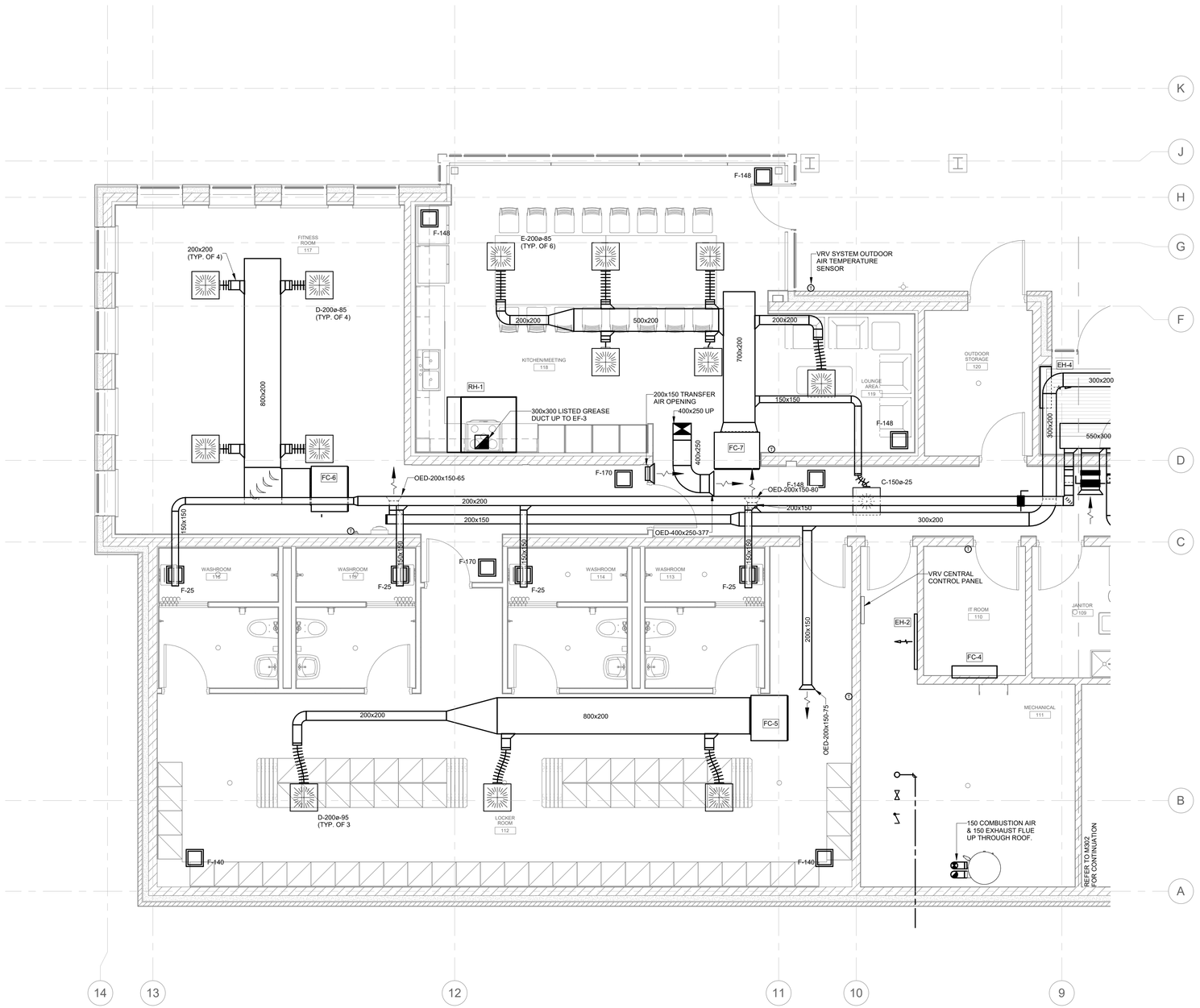

1 Level 1 Part Plan West - HVAC

SCALE: 1 : 50

GENERAL NOTES:

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 CONTRACTOR OR ON PARTICULAR SUB-TRADE. IT IS UNDERSTOOD THAT THE PRIME CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATE OF ALL TRADES' WORK AND AS SUCH SHALL BE RESPONSIBLE 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-DISCIPLINE'S DOCUMENTS.
3. ALL WORK TO BE DONE IN ACCORDANCE WITH THE ONTARIO BUILDING CODE AND ALL OTHER REGULATORY REQUIREMENTS.
4. SUPPLY ALL 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, 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. PROVIDE ALL FITTINGS, TRANSITIONS, DAMPERS ETC AS REQUIRED FOR COMPLETE WORKABLE INSTALLATION.
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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.

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

No.	Revision	Date
E	ISSUED FOR TENDER	2021-08-12
D	ISSUED FOR BUILDING PERMIT	2021-07-27
C	90% CD	2021-05-03
B	SPA	2021-02-12
A	50% CD	2021-02-05

Orientation

PROJECT NORTH

Seal

LICENSED PROFESSIONAL ENGINEER
C.M.WATSON
100156459
Aug. 12/21
PROVINCE OF ONTARIO

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.

QUASAR CONSULTING GROUP
250 ROWNTREE DAIRY RD, WOODBRIDGE, ON
TEL: 905-507-0800
WEB: 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 PART PLAN
WEST - VENTILATION

Date	Project No	Drawing No
2021-08-12	CM-20-063	M301
Drawn by: CMW		
Scale: As indicated		

BIM 360://20019 - BFES Station 201/CM-20-063 - QCG ME Model_R20.rvt
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1 Level 1 Part Plan East - HVAC
SCALE: 1 : 50

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No.	Revision	Date
E	ISSUED FOR TENDER	2021-08-12
D	ISSUED FOR BUILDING PERMIT	2021-07-27
C	90% CD	2021-05-03
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Orientation

PROJECT NORTH

Seal

I CERTIFY THAT I AM A LICENSED PROFESSIONAL ENGINEER IN THE PROVINCE OF ONTARIO
C.M.WATSON
100156459
Aug. 12/21

QUASAR CONSULTING GROUP
250 ROWNTREE DAIRY RD, WOODBRIDGE, ON
TEL: 905-507-0800
WEB: 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 PART PLAN EAST - VENTILATION

Date	Project No	Drawing No
2021-08-12	CM-20-063	M302
Drawn by: CMW		
Scale: As indicated		

BIM 360://20019 - BFES Station 201/CM-20-063 - QCG ME Model_R20.rvt
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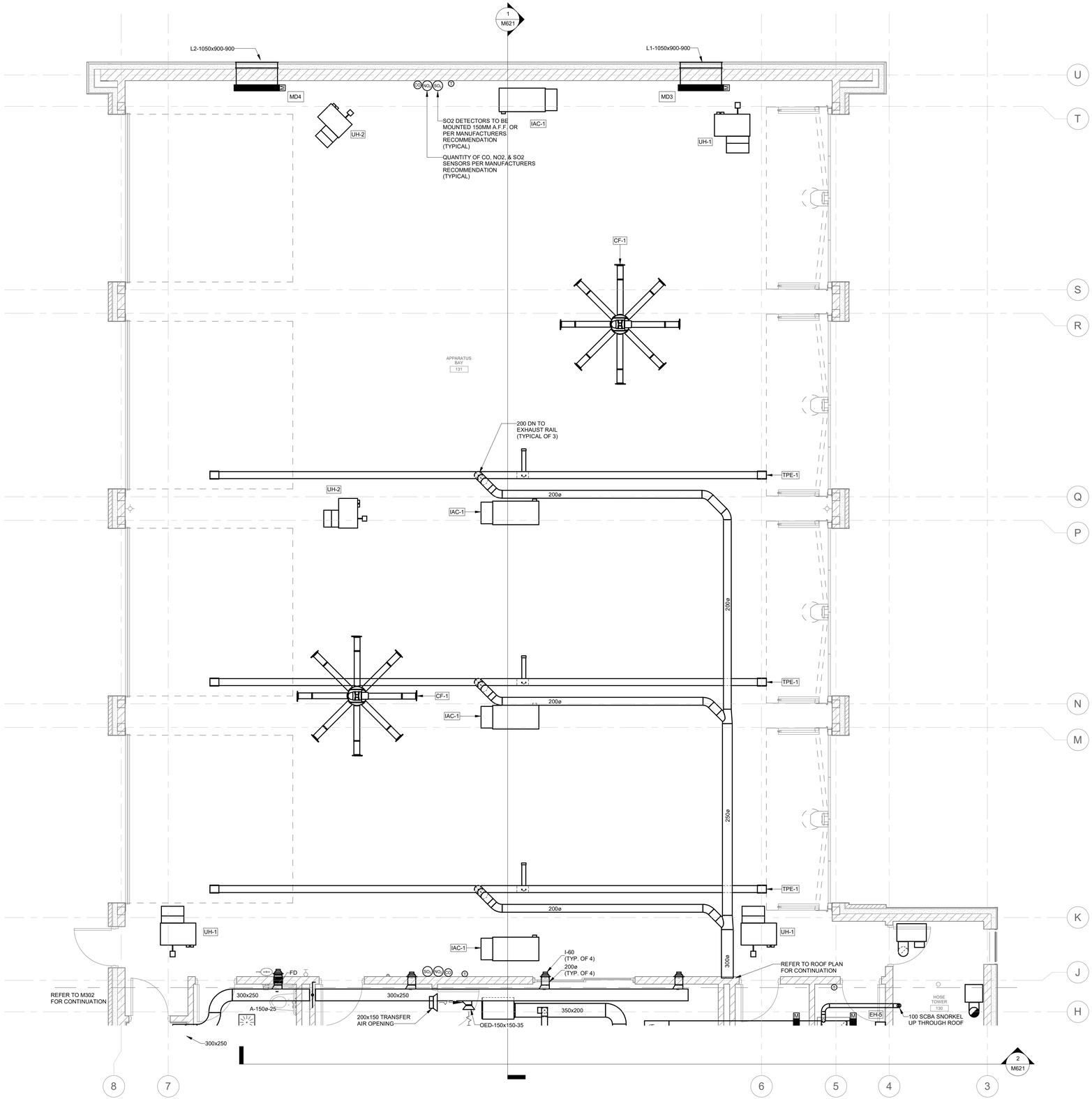

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No.	Revision	Date
E	ISSUED FOR TENDER	2021-08-12
D	ISSUED FOR BUILDING PERMIT	2021-07-27
C	90% CD	2021-05-03
B	SPA	2021-02-12
A	50% CD	2021-02-05

Orientation

PROJECT NORTH

Seal

LICENSED PROFESSIONAL ENGINEER
C.M.WATSON
100156459
Aug. 12/21
PROVINCE OF ONTARIO

QUASAR CONSULTING GROUP
250 ROWNTREE DAIRY RD, WOODBRIDGE, ON
TEL: 905-507-0800
WEB: 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 PART PLAN
NORTH - VENTILATION

Date	Project No	Drawing No
2021-08-12	CM-20-063	M303
Drawn by: CMW		
Scale: As indicated		

1 Level 1 Part Plan North - HVAC
SCALE: 1 : 50

BIM 360://20019 - BFES Station 201/CM-20-063 - QCG ME Model_R20.rvt
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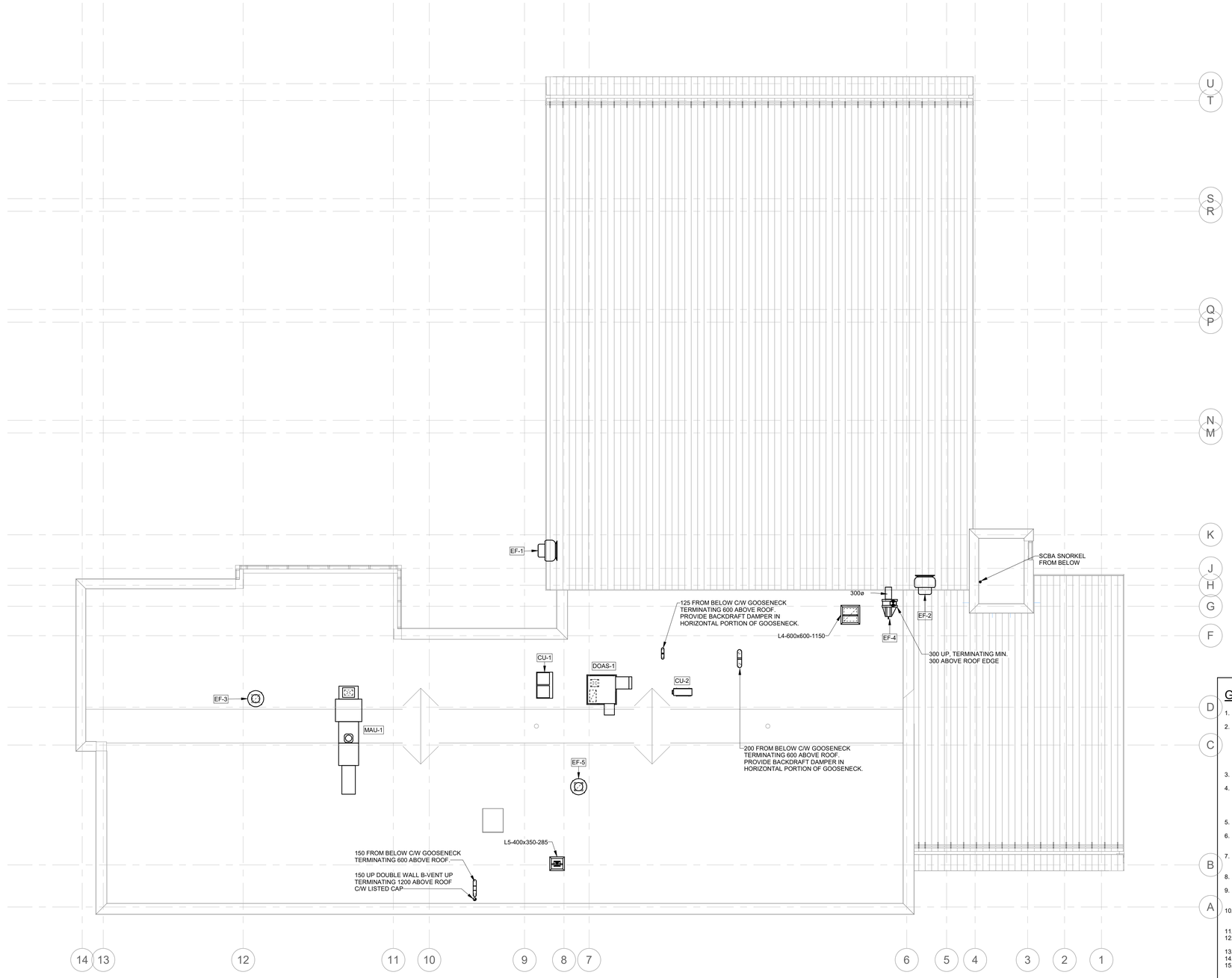

1 Roof Plan - HVAC

SCALE: 1 : 100

GENERAL NOTES:

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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

Orientation

PROJECT NORTH

Seal

LICENSED PROFESSIONAL ENGINEER
C.M.WATSON
100156459
Aug. 12/21
PROVINCE OF ONTARIO

QUASAR CONSULTING GROUP
250 ROWNTREE DAIRY RD, WOODBRIDGE, ON
TEL: 905-507-0800
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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
ROOF PLAN - VENTILATION

Date	Project No	Drawing No
2021-08-12	CM-20-063	M304
Drawn by: CMW		
Scale: As indicated		

BIM 360://20019 - BFES Station 201/CM-20-063 - QCG ME Model_R20.rvt
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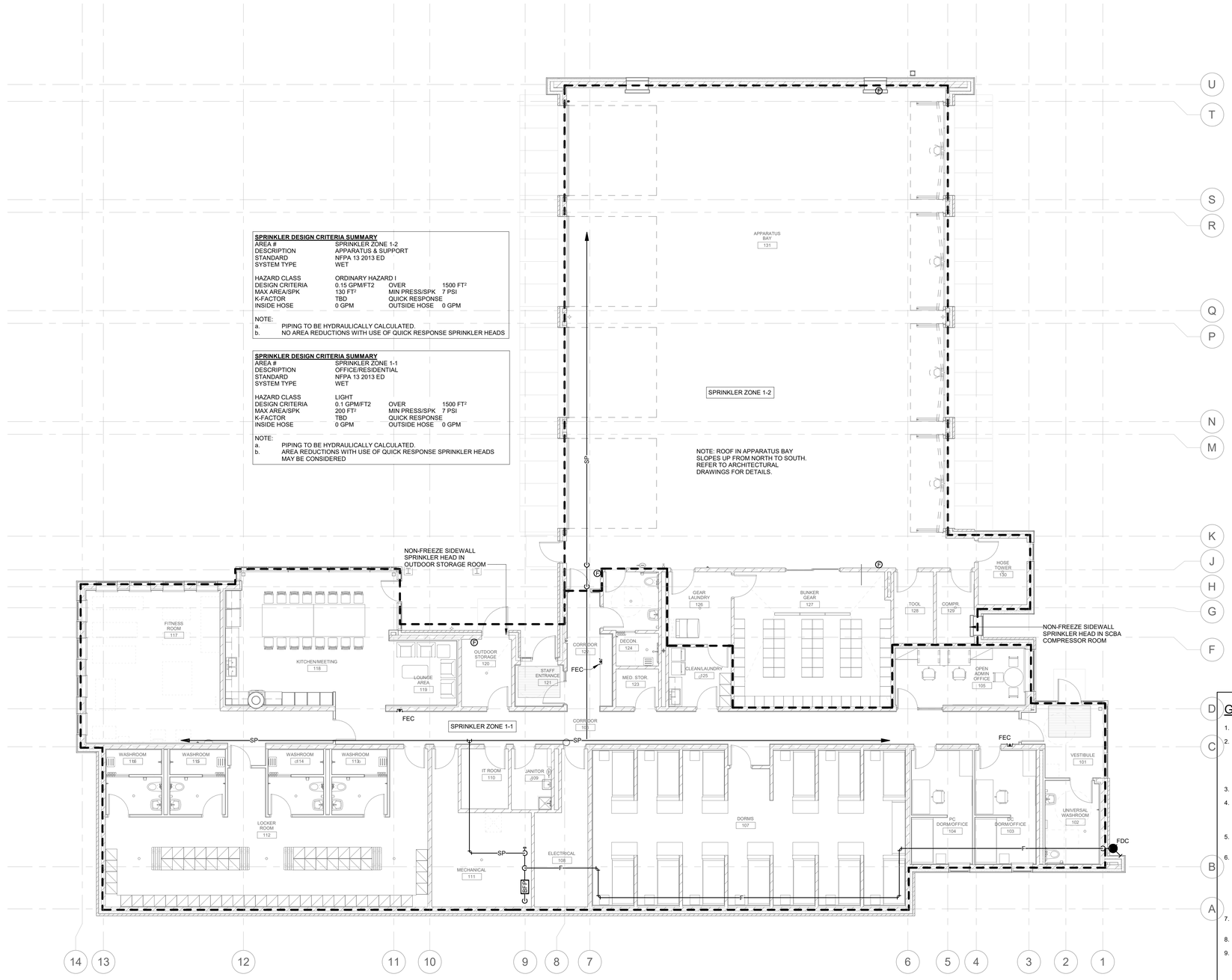

SPRINKLER DESIGN CRITERIA SUMMARY

AREA #	SPRINKLER ZONE 1-2		
DESCRIPTION	APPARATUS & SUPPORT		
STANDARD	NFPA 13 2013 ED		
SYSTEM TYPE	WET		
HAZARD CLASS	ORDINARY HAZARD I		
DESIGN CRITERIA	0.15 GPM/FT2	OVER	1500 FT²
MAX AREA/SPK	130 FT²	MIN PRESS/SPK	7 PSI
K-FACTOR	TBD	QUICK RESPONSE	
INSIDE HOSE	0 GPM	OUTSIDE HOSE	0 GPM

NOTE:
a. PIPING TO BE HYDRAULICALLY CALCULATED.
b. NO AREA REDUCTIONS WITH USE OF QUICK RESPONSE SPRINKLER HEADS

SPRINKLER DESIGN CRITERIA SUMMARY

AREA #	SPRINKLER ZONE 1-1		
DESCRIPTION	OFFICE/RESIDENTIAL		
STANDARD	NFPA 13 2013 ED		
SYSTEM TYPE	WET		
HAZARD CLASS	LIGHT		
DESIGN CRITERIA	0.1 GPM/FT2	OVER	1500 FT²
MAX AREA/SPK	200 FT²	MIN PRESS/SPK	7 PSI
K-FACTOR	TBD	QUICK RESPONSE	
INSIDE HOSE	0 GPM	OUTSIDE HOSE	0 GPM

NOTE:
a. PIPING TO BE HYDRAULICALLY CALCULATED.
b. AREA REDUCTIONS WITH USE OF QUICK RESPONSE SPRINKLER HEADS MAY BE CONSIDERED

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6. 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 SUCCESSFUL SPRINKLER CONTRACTOR SHALL PREPARE SHOP DRAWINGS AND HYDRAULIC CALCULATIONS AND SUBMIT TO THE CITY FIRE DEPARTMENT AND TO THE CONSULTANT FOR APPROVAL. CONTRACTOR SHALL OBTAIN COPIES OF CALCULATIONS AND ANY DRAWINGS REQUIRED FROM THE OWNER AND/OR THE ORIGINAL INSTALLING CONTRACTOR IN ORDER TO COMPLETE THIS DESIGN. THE CONTRACTOR SHALL INCLUDE FOR ALL NECESSARY REQUIREMENTS TO COMPLETE THE DESIGN IF THE ABOVE INFORMATION IS NOT AVAILABLE OR ACCEPTABLE.
7. UPON COMPLETION OF SPRINKLER WORKS, CONTRACTOR SHALL TEST REVISED SPRINKLER ZONES TO THE LATEST REQUIREMENTS OF NFPA 13 "INSTALLATION OF SPRINKLER SYSTEM".
8. CONTRACTOR SHALL COORDINATE WITH MECHANICAL AND ELECTRICAL TRADES FOR FINAL LOCATION OF SPRINKLER HEADS IN ORDER TO PREVENT CONFLICTS.
9. CONTRACTOR SHALL CO-ORDINATE SPRINKLER HEAD LOCATIONS IN AREAS WITH SUSPENDED CEILINGS WITH THE LOCATION OF LIGHTING, GRILLES, DIFFUSERS, AND SIMILAR ITEMS RECESSED IN OR SURFACE MOUNTED ON THE CEILING. IN AREAS WITH LAY-IN TILE, CENTRE THE SPRINKLER HEAD BOTH WAYS IN THE LAY-IN TILE.

1 Level 1 Plan - Fire Protection
SCALE: 1 : 100

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

No.	Revision	Date
H	ISSUED FOR TENDER	2021-08-12
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A	100% DESIGN DEVELOPMENT	2021-01-19

Orientation

PROJECT NORTH

Seal

I CERTIFY THAT I AM A LICENSED PROFESSIONAL ENGINEER IN THE PROVINCE OF ONTARIO
C.M.WATSON
100156459
Aug. 12/21

QUASAR CONSULTING GROUP
250 ROWNTREE DAIRY RD, WOODBRIDGE, ON
TEL: 905-507-0800
WEB: 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 2021-08-12	Project No CM-20-063	Drawing No M401
Drawn by CMW		
Scale As indicated		

BIM 360://20019 - BFES Station 201/CM-20-063 - QCG ME Model_R20.rvt
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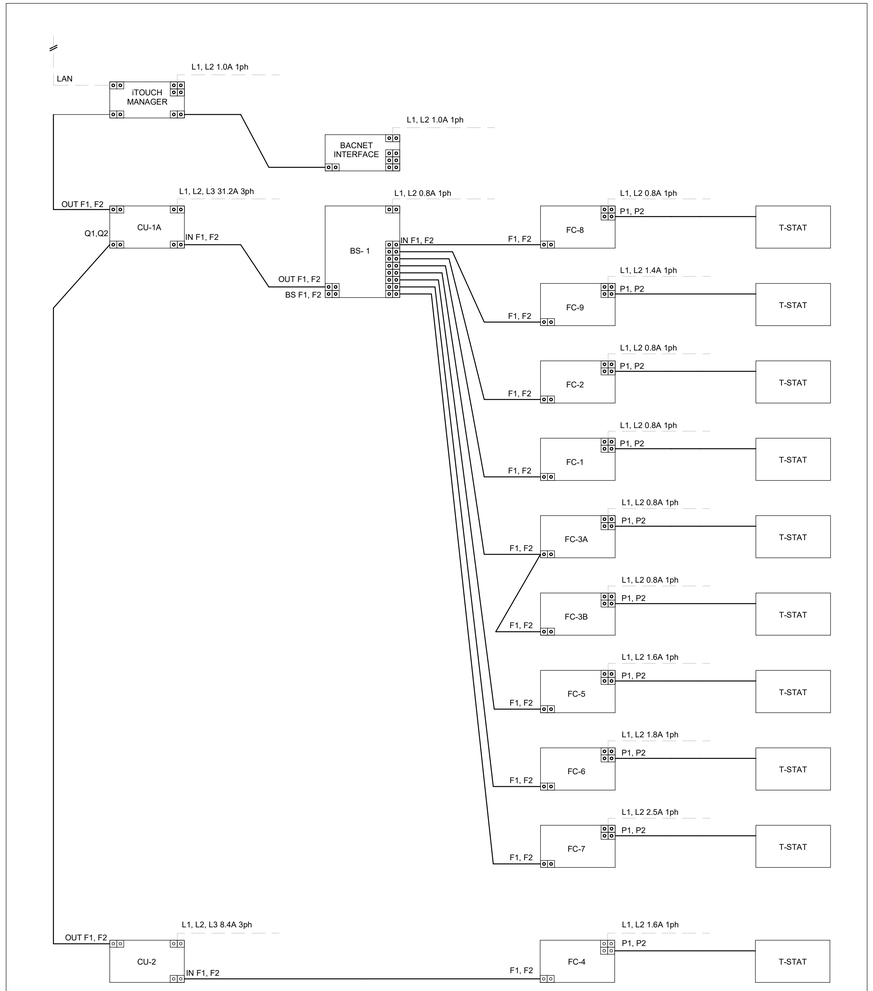
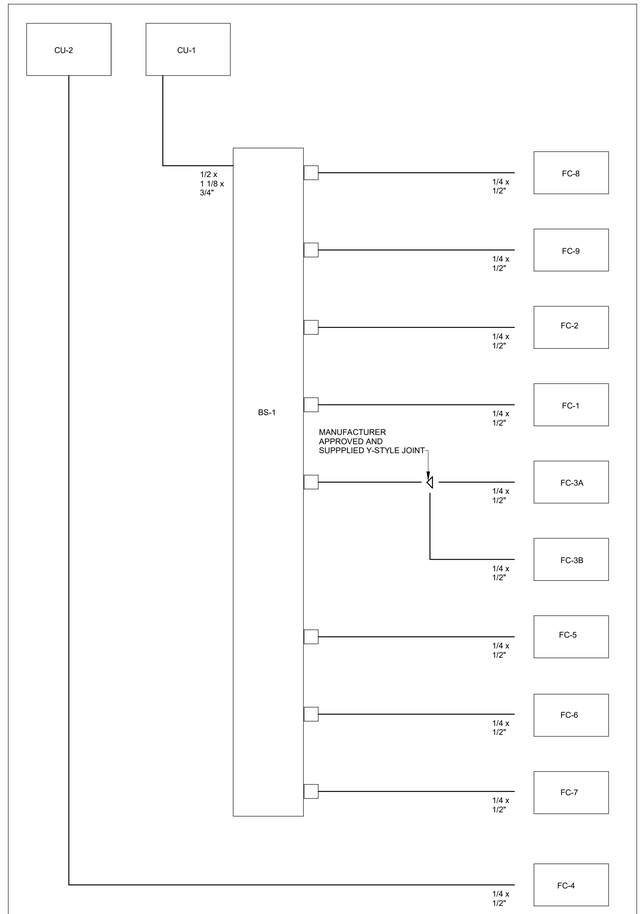


2 VRV WIRING SCHEMATIC

SCALE:N.T.S.



1 VRV PIPING SCHEMATIC

SCALE:N.T.S.

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H	ISSUED FOR TENDER	2021-08-12
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A	100% DESIGN DEVELOPMENT	2021-01-19

No.	Revision	Date

Orientation

PROJECT NORTH

Seal

LICENSED PROFESSIONAL ENGINEER
C.M.WATSON
100156459
Aug. 12/21
PROVINCE OF ONTARIO

QUASAR CONSULTING GROUP

250 ROWNTREE DAIRY RD, WOODBRIDGE, ON
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Project Information

BFES Station 201
(SPA-2021-0032)

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

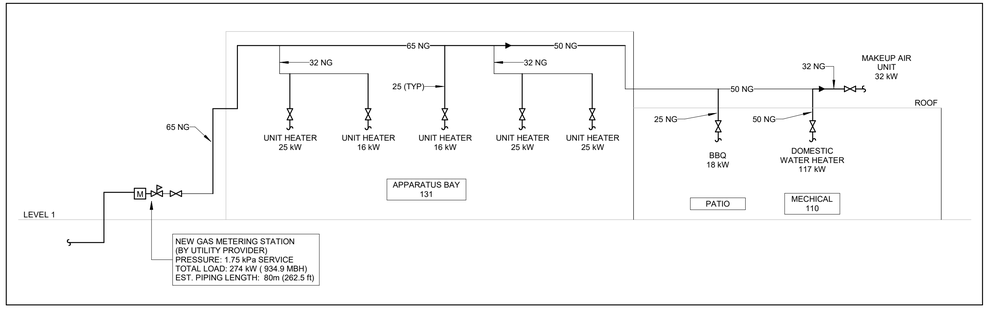
For

City of Brampton Fire & Emergency Services

Drawing Title

VRV SCHEMATIC

Date	Project No	Drawing No
2021-08-12	CM-20-063	M601
Drawn by: CMW		
Scale: N.T.S.		

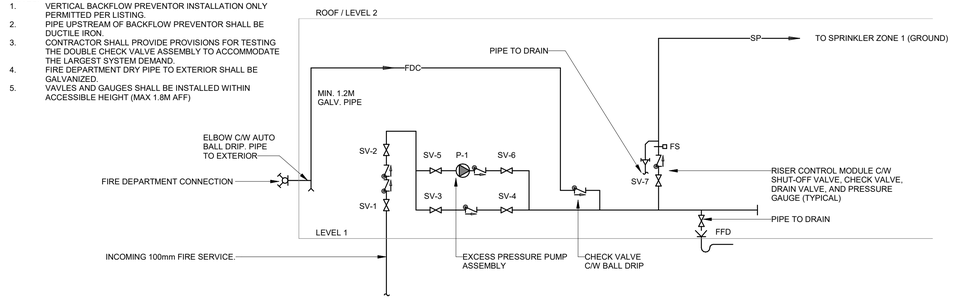


2 NATURAL GAS SCHEMATIC

SCALE:N.T.S.

SUPERVISED VALVE SCHEDULE		
VALVE NO.	VALVE LOCATION	SERVICE
SV-1	INCOMING MECHANICAL & SPRINKLE ROOM	SPRINKLER DOUBLE CHECK ISOLATION
SV-2	INCOMING MECHANICAL & SPRINKLE ROOM	SPRINKLER DOUBLE CHECK ISOLATION
SV-3	INCOMING MECHANICAL & SPRINKLE ROOM	EXCESS PRESSURE PUMP CONTROL VALVE
SV-4	INCOMING MECHANICAL & SPRINKLE ROOM	CHECK ISOLATION
SV-5	INCOMING MECHANICAL & SPRINKLE ROOM	EXCESS PRESSURE PUMP CONTROL VALVE
SV-6	INCOMING MECHANICAL & SPRINKLE ROOM	CHECK ISOLATION
SV-7	GROUND (ZONE 1)	GROUND CONTROL VALVE (WET ZONE 1)

NOTES:
1. VERTICAL BACKFLOW PREVENTOR INSTALLATION ONLY PERMITTED PER LISTING.
2. PIPE UPSTREAM OF BACKFLOW PREVENTOR SHALL BE DUCTILE IRON.
3. CONTRACTOR SHALL PROVIDE PROVISIONS FOR TESTING THE DOUBLE CHECK VALVE ASSEMBLY TO ACCOMMODATE THE LARGEST SYSTEM DEMAND.
4. FIRE DEPARTMENT DRY PIPE TO EXTERIOR SHALL BE GALVANIZED.
5. VAVLES AND GAUGES SHALL BE INSTALLED WITHIN ACCESSIBLE HEIGHT (MAX 1.8M AFF)



1 FIRE PROTECTION SCHEMATIC

SCALE:N.T.S.

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

No.	Revision	Date
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

Orientation

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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

FIRE PROTECTION & GAS SCHEMATIC

Date	Project No	Drawing No
2021-08-12	CM-20-063	M602
Drawn by: CMW		
Scale: N.T.S.		

BIM 360://20019 - BFES Station 201/CM-20-063 - QCG ME Model_R20.rvt
2021-09-15 2:19:48 PM

ELECTRIC HUMIDIFIER

TAG	MANUFACTURER	MODEL	AIRFLOW (L/s)	ENTERING AIR	SPACE CONDITIONS		STEAM LOAD (kg/hr)	ELECTRICAL		WEIGHT (kg)	REMARKS
				DB (°C)	DB (°C)	% RH		FLA	V/Ph/Hz		
HUM-1	DRISTEEM	XTP-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:
1. TYPE R - RECTANGULAR E- ELBOW D -DISSIPATIVE
2. VELOCITY SHOWN IS + (FORWARD FLOW) OR - (REVERSE FLOW) AS DEFINED BY ASTM E477-13.
3. IDEAL PRESSURE DROP AS DETERMINED PER ASTM E477-13 IN A NVLAP-ACCREDITED ACOUSTICAL LABORATORY.
4. PRESSURE DROP PER ASTM E477-13 PLUS SYSTEM EFFECTS FOR NEARBY DUCT ELEMENTS.
5. MINIMUM DYNAMIC INSERTION LOSS DETERMINED PER ASTM E477-13 IN A NVLAP-ACCREDITED ACOUSTICAL LABORATORY.
6. 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 AIRBORNE AND BREAKOUT NOISE, MEET NC-30 IN THE OCCUPIED SPACES.
7. 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.
8. 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	WEIGHT (kg)	REMARKS
										V/Ph/Hz		
UH-1	CONDENSING	MODINE	PTC 85SS0111S	APPARATUS BAY	4	25 kW	23.2	98%	779	115/1/60	64	C/W 60 DEGREE HOOD
UH-2	CONDENSING	MODINE	PTC 55SS0111S	APPARATUS BAY	1	16 kW	15.0	98%	518	115/1/60	45	C/W 60 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/Ph/Hz	REMARKS
EH-1	BASEBOARD HEATER	OUELLET	OCB1008-RT	WASHROOM 102	1 kW	0	208/1/60	WALL MOUNTED
EH-2	BASEBOARD HEATER	OUELLET	OCB1008-RT	MECHANICAL 111	1 kW	0	208/1/60	WALL MOUNTED
EH-3	CABINET ELECTRIC HEATER	OUELLET	OLA02038-RT	VESTIBULE 101	2 kW	118	208/1/60	WALL MOUNTED - SEMI RECESSED
EH-4	CABINET ELECTRIC HEATER	OUELLET	OLA02038-RT	VESTIBULE 121	2 kW	118	208/1/60	WALL MOUNTED - SEMI RECESSED
EH-5	CABINET ELECTRIC HEATER	OUELLET	OLA02038-RT	COMPRESSOR RM	2 kW	118	208/1/60	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	2630/2635	600	1500	1250	1.8 SQ.m. FREE AREA MINIMUM
L4	GRAVITY RELIEF PENTHOUSE	COOK	24X24X4 TRE	610	450	1150	0.67 SQ.m. FREE AREA MINIMUM. WIDTH = LENGTH. PD=25Pa
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/S)	FAN MOTOR (kW)	ELECTRICAL		WEIGHT (kg)	REMARKS
						V/Ph/Hz	FLA		
IAC-1	APPARATUS BAY	AIRMATION	AMB302-NDR	1416	0.75	208/3/60	7.5	108.9	REFER TO NOTES 1&4
IAC-2	BUNKER GEAR	AIRMATION	MICROCON CD	378	0.24	120/1/60	2.4	56.7	REFER TO NOTES 2 & 4
IAC-3	HOSE TOWER	AIRMATION	MICROCON AS	283	0.23	120/1/60	2.4	15.0	REFER TO NOTES 3 & 4

NOTES:
1. C/W PRE-FILTER, FINAL FILTER, GAS PHASE FILTER AND TCMMB CONTROLLER.
2. CEILING HUNG UNIT C/W VIBRATION ISOLATORS.
3. PORTABLE UNIT TO HAVE WHEELS REMOVED AND SHALL BE WALL MOUNTED OUT OF THE WAY AND C/W 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-1/WC-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		INDIRECT CONNECTION TO SINK TAILPIECE
HB-1	Hose Bibb	20	n/a	n/a	n/a		C/W ATMOSPHERIC VACUUM BREAKER
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		TEMPERED WATER FROM T.M.V

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
C	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	E.H. PRICE	85 DAL			
I	NOZZLE DIFFUSER	E.H. PRICE	ND	0	0	200Ø 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	
CF-2	BUNKER GEAR 127	1	BIG ASS FANS	E7	2.1	0.18	198	115/1/60	DIAL	31	C/W WALL SPEED CONTROL & EXTENSION TUBE TO REACH 10' INSTALL HEIGHT

VARIABLE REFRIGERANT FLOW HEAT RECOVERY BRANCH SELECTOR

TAG	MANUFACTURER	MODEL	ASSOCIATED CONDENSER	MAX CAPACITY (kW)	ELECTRICAL			DIMENSIONS			WEIGHT (kg)	REMARKS
					V/Ph/Hz	MCA	MOCP	W	H	D		
BS-1	DAIKIN	BSF8Q54TVJ	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
RH-1	KITCHEN	CAPTIVEAIRE	4824 ND-2	1219	1219	378	-153	120/1/60	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 @ 37.7C)	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	120/1/60	718	1432	76	

EXHAUST FANS

TAG	SERVICE	LOCATION	MANUFACTURER	MODEL	AIRFLOW (L/s)	E.S.P. (Pa)	POWER (kW)	BHP (kW)	MOTOR RPM	V/Ph/Hz	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	180W17D (VF)	900	100	0.19	0.16	703	115/1/60	ECM	59	69	66	61	60	55	51	48 53	40	REFER TO NOTE 1
EF-2	APPARATUS BAY EXHAUST	WALL	COOK	180W17D (VF)	900	100	0.19	0.16	703	115/1/60	ECM	59	69	66	61	60	55	51	48 53	40	REFER TO NOTE 1
EF-3	KITCHEN EXHAUST	ROOF	CAPTIVEAIRE	DU50HFA	378	250	0.37	0.24	0	115/1/60	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	208/3/60	VFD	0	0	0	0	0	0	0	0 88	85	REFER TO NOTE 3
EF-5	ELECTRICAL ROOM EXHAUST	ROOF	COOK	120C17DEC	285	75	0.56	0.24	1725	115/1/60	ECM	58	61	58	53	52	47	42	38 45	14	REFER TO NOTE 2

NOTES:
1. C/W 600mm ROOF CURB, UNIT MOUNTED ADJUSTABLE SPEED CONTROL, REMOTE CONTROL INTERFACE TO CONNECT TO BAS AND APPARATUS BAY GAS DETECTION CONTROLLER.
2. UL705, UL762, & ULC-S645 LISTINGS AND C/W 600mm CURB, GREASE BOX, 0-10V REFERENCE SPEED CONTROL. FAN PROVIDED BY COMMERCIAL HOOD SUPPLIER.
3. C/W TAILPIPE CAPTURE 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	COOLING				HEATING		ELECTRICAL			DIMENSIONS (m)			WEIGHT (kg)	REMARKS
							AIRFLOW (L/s)	CAPACITY (kW)		EAT (DB)	EAT (WB)	CAPACITY (kW)	EAT (DB)	V/Ph/Hz	MCA	MOCP	W	H	D		
								TOTAL	SENSIBLE												
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. C/W 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 TYPE	ELECTRICAL				DIMENSIONS (M)			WEIGHT	EFFICIENCY			REMARKS
				(kW)	OAT (DB)	(kW)	OAT (DB)	OAT (WB)		V/Ph/Hz	MCA	MOCP	RLA	W	D	H		EER	IEER	COP	
CU-2	DAIKIN	RXL15QMVJU	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	CAPACITY (kW)		GAS TYPE	GAS INPUT (kW)	OUTPUT (kW)		COP	SEER	MCA	MOCP	V/Ph/Hz	MCA	MOCP	V/Ph/Hz		
										TOTAL	SENSIBLE														
MAU-1	CAPTIVEAIRE	AI-IBT-150-15D-MPU	KITCHEN HOOD	2	378	378	125	ECM	R410-A	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. (Pa)	POWER (kW)	BHP (W)	AIRFLOW (L/s)	E.S.P. (Pa)	POWER (kW)	BHP (W)			EFFICIENCY (%)		COOLING PERFORMANCE				HEATING PERFORMANCE						FLA	MCA	MOCP	V/Ph/Hz		
													SENSIBLE	LATENT	O.A.T. (°C)		R.A.T. (°C)		S.A.T. (°C)		E.A.T. (°C)		O.A.T. (°C)		R.A.T. (°C)		S.A.T. (°C)		E.A.T. (°C)						
															DB	WB	DB	WB	DB	EB	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	575/3/60	815 kg	NOTES 1&2

NOTES:
1. UNIT TO BE COMPLETE WITH VARIABLES FREQUENCY DRIVES FOR SUPPLY AND EXHAUST FANS. REFER TO CONTROLS SCHEMATICS FOR OPERATIONAL REQUIREMENTS. PROVIDE REQUIRED INTERFACE CARD FOR VRV BAS 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 MODE, 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 CHANGEOVER DEVICE	REFRIGERANT TYPE	AIR	COOLING			HEATING		ELECTRICAL			DIMENSIONS			WEIGHT (kg)	REMARKS
								AIRFLOW (L/s)	CAPACITY (kW)		EAT (DB)	EAT (WB)	CAPACITY (kW)	EAT (DB)	V/Ph/Hz	MCA	MOCP	W	H	D		
									TOTAL	SENSIBLE												
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	208/1/60	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	208/1/60	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	208/1/60	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	208/1/60	0.8	15	551	246	800	25.0 kg	c/w NAVIGATION REMOTE CONTROLLER
FC-5	DAIKIN	FXSQ18TAVJU	1.5	MSP Concealed Ducted Unit	CU-1	Yes	R410A	284	4.95	3.73	26 °C	65 °F	12.50	19 °C	208/1/60	1.6	15	1001	246	800	35.0 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	208/1/60	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	208/1/60	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	208/1/60	0.8	15	551	246	800	25.0 kg	c/w NAVIGATION REMOTE CONTROLLER
FC-9	DAIKIN	FXSQ15TAVJUO	1.3	MSP Concealed Ducted Unit	CU-1	Yes	R410A	250	0	0	26 °C	65 °F	3.27	19 °C	208/1/60	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	-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	

NOTES:
1. Manufacturer must be certified, listed, and labeled per AHRI 1230.
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.
3. Condensing units must have fully modulating INVERTER compressors.
4. Condensing units must have have auto changeover functions
5. Demand limiting relay contact must be provided.
6. EEV actuators must be removable from valve body without disturbing the refrigerant system.
7. FCU thermostats must provide +/- 1 degree dead-band set-point and control capability.
8. System shall be provided with i-Touch Manager controller with WEB based software for displaying up to 8 DIII-Net systems with 128 indoor units per system.PC by others.
9. Manufacturers submittal must include refrigerant piping diagram with pipe diameters, lengths, and refrigerant volume.
10. Substitute manufacturer shall be responsible for additional piping and refrigerant.
11. Contractor to verify piping dimensions.
12. Installing contractor must have successfully completed manufacturers certified installation class within past 36 months.
13. Contractor to furnish and install insulation on refrigerant piping.

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

No.	Revision	Date
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

Orientation

Seal

LICENSED PROFESSIONAL ENGINEER
C.M.WATSON
100156459
Aug. 12/21
PROVINCE OF ONTARIO

QUASAR CONSULTING GROUP
250 ROWNTREE DAIRY RD, WOODBRIDGE, ON
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WEB: 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

MECHANICAL EQUIPMENT SCHEDULE

Date	Project No	Drawing No
2021-08-12	CM-20-063	M610
Drawn by: CMW		
Scale: 1 : 1		

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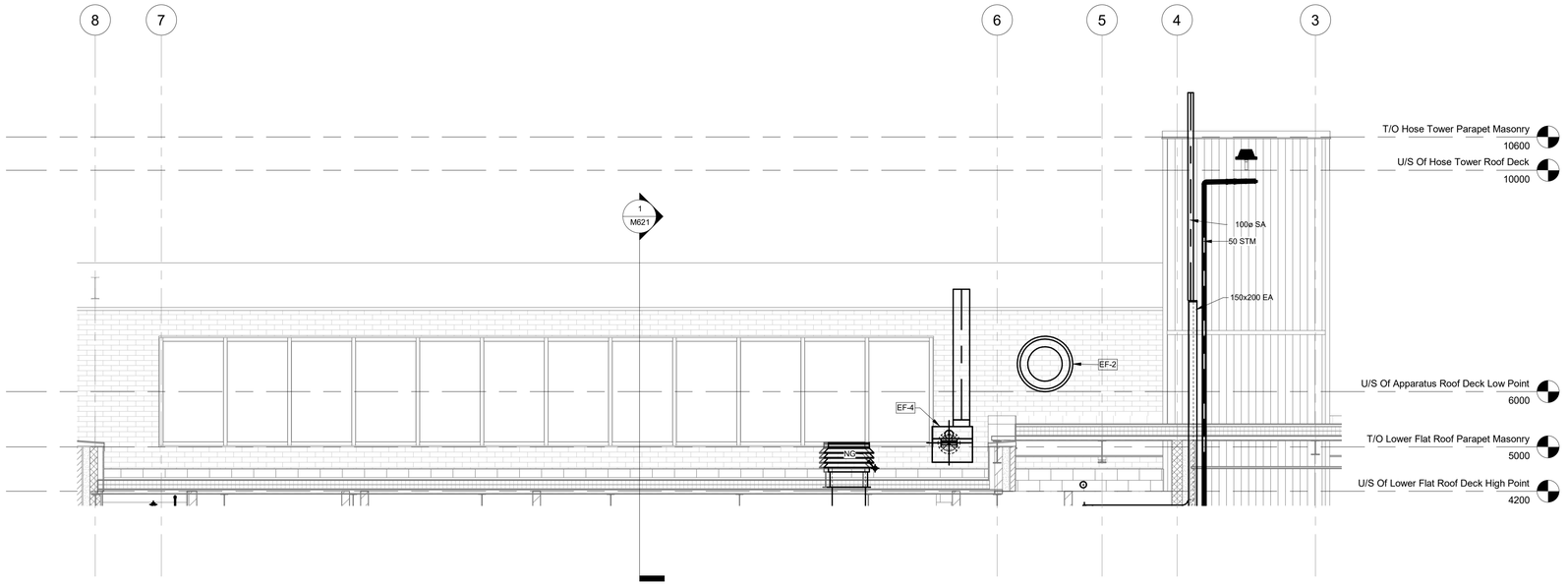
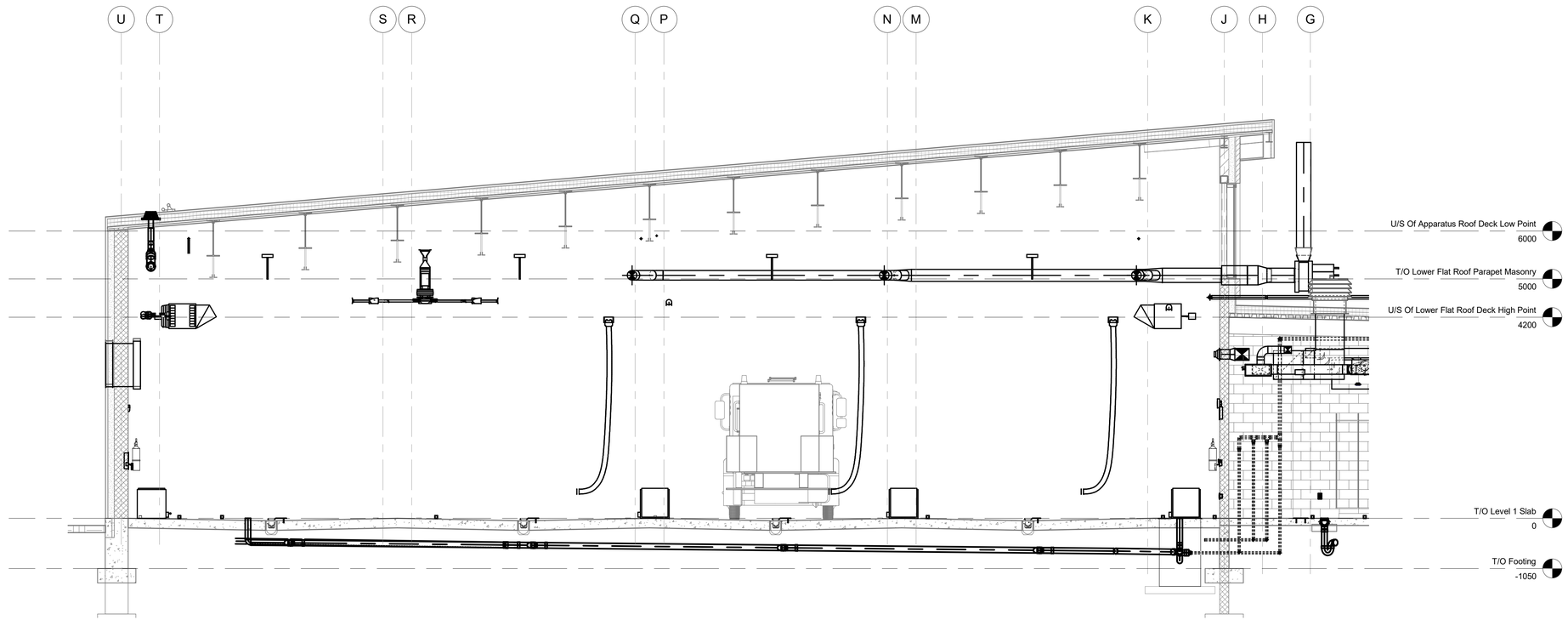


2 Section Looking North

SCALE: 1 : 50



1 East-West Section Through Apparatus Bay

SCALE: 1 : 50

BIM 360://20019 - BFES Station 201/CM-20-063 - QCG ME Model_R20.rvt
2021-09-15 2:20:45 PM

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

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

Orientation

PROJECT NORTH

Seal

LICENSED PROFESSIONAL ENGINEER
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Aug. 12/21
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250 ROWNTREE DAIRY RD, WOODBRIDGE, ON
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Project Information

BFES Station 201
(SPA-2021-0032)

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

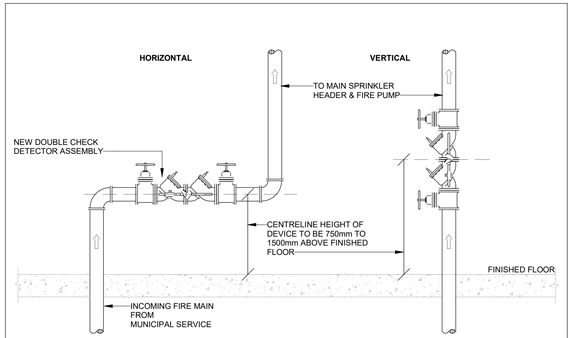
For

City of Brampton Fire & Emergency Services

Drawing Title

MECHANICAL SECTIONS

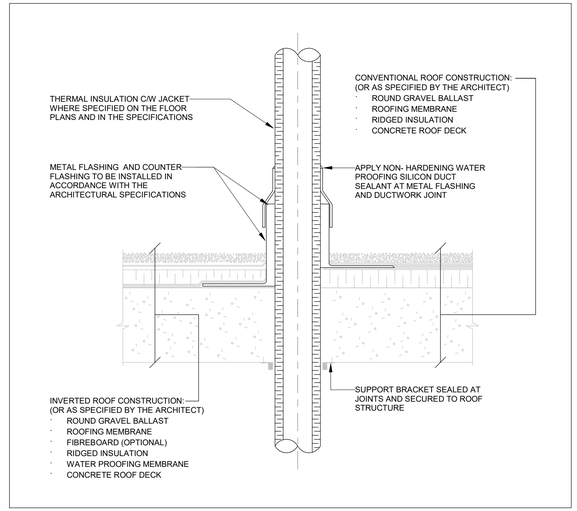
Date	Project No	Drawing No
2021-08-12	CM-20-063	M621
Drawn by: Author		
Scale: 1 : 50		



REQUIRED CLEARANCES FOR DOUBLE CHECK VALVE BACKFLOW PREVENTERS				
CENTRELINE HEIGHT ABOVE FLOOR		MINIMUM CLEARANCE (mm)		
MINIMUM (mm)	MAXIMUM (mm)	ABOVE DEVICE	IN FRONT	BEHIND
750	1500	300	750	20

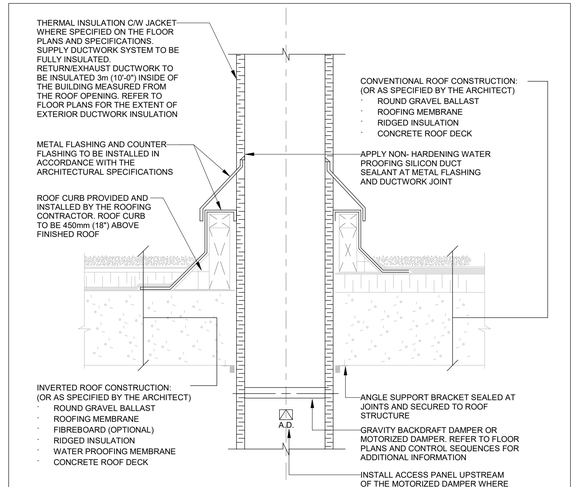
6 21 13 00.01 FIRE DOUBLE CHECK DETECTOR ASSY

SCALE:N.T.S.



5 20 05 27.02 HVAC PIPE ROOF PENETRATION & FLASHING

SCALE:N.T.S.



4 20 05 27.01 DUCTWORK ROOF PENETRATION & FLASHING

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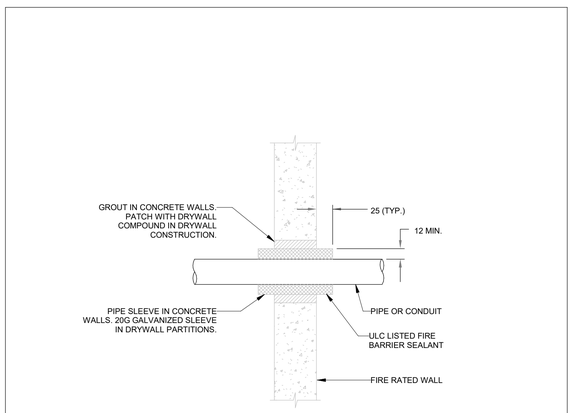
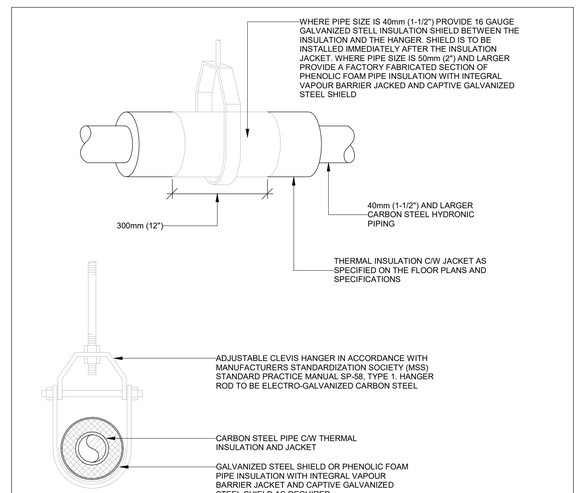


3 20 05 05.08 PIPE PENETRATION THROUGH FIRE RATED WALL

SCALE:N.T.S.



2 20 05 05.02 PIPING HANGERS AND SUPPORTS

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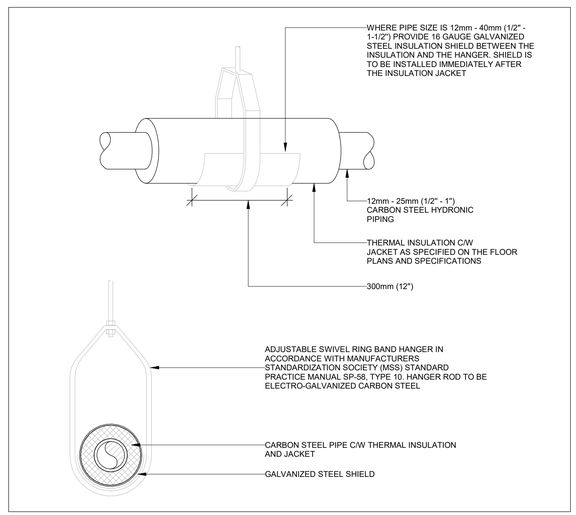

1 20 05 05.01 PIPING HANGERS AND SUPPORTS

SCALE:N.T.S.

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No.	Revision	Date
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

Orientation

Seal

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100156459
Aug. 12/21
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QUASAR CONSULTING GROUP
250 ROWNTREE DAIRY RD, WOODBRIDGE, ON
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WEB: 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

MECHANICAL DETAILS I

Date	Project No	Drawing No
2021-08-12	CM-20-063	M641
Drawn by: CMW		
Scale: N.T.S.		

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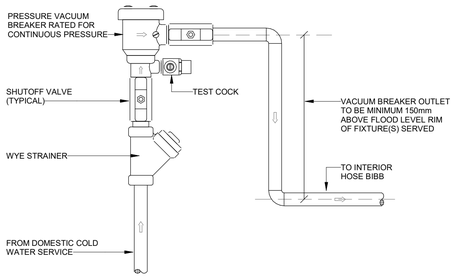
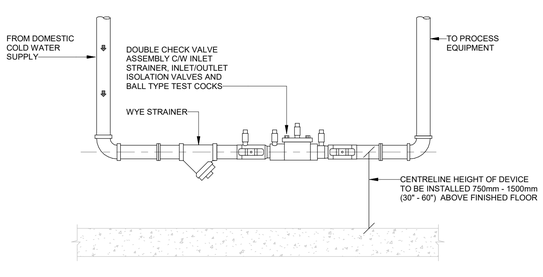


REQUIRED CLEARANCES FOR PRESSURE VACUUM BREAKER DEVICES				
CENTRELINE HEIGHT ABOVE FLOOR		MINIMUM CLEARANCE (mm)		
MINIMUM (mm)	MAXIMUM (mm)	ABOVE DEVICE	IN FRONT	BEHIND
N/A	1500	300	750	20

6 22 11 18.03 INTERIOR HOSE BIBB PRESS. VAC. BREAKER

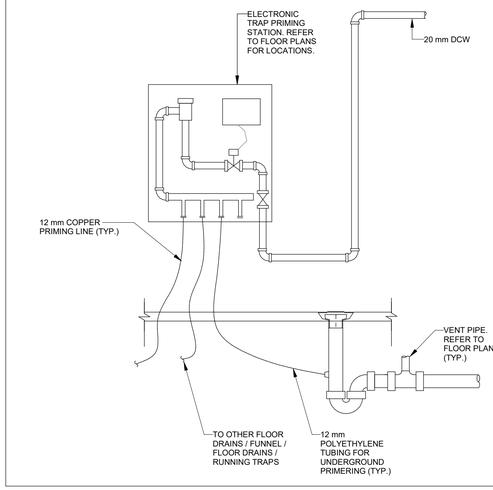
SCALE:N.T.S.



REQUIRED CLEARANCES FOR DOUBLE CHECK VALVE ASSEMBLY				
CENTRELINE HEIGHT ABOVE FLOOR		MINIMUM CLEARANCE (mm)		
MINIMUM (mm)	MAXIMUM (mm)	ABOVE DEVICE	IN FRONT	BEHIND
750	1500	300	750	20

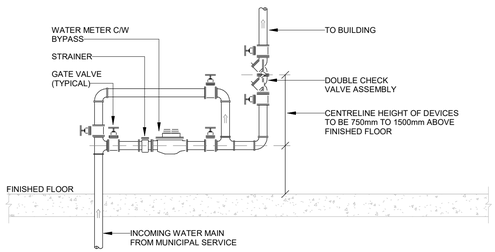
5 22 11 18.02 DOUBLE CHECK VALVE ASSEMBLY

SCALE:N.T.S.



4 22 11 00.02 ELECTRONIC TRAP PRIMING STATION

SCALE:N.T.S.



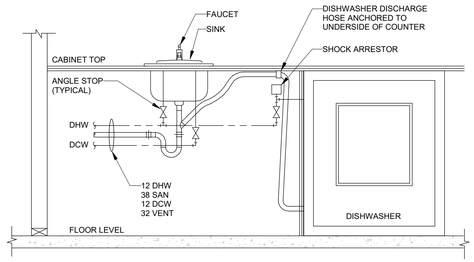
REQUIRED CLEARANCES FOR DOUBLE CHECK VALVE BACKFLOW PREVENTERS				
CENTRELINE HEIGHT ABOVE FLOOR		MINIMUM CLEARANCE (mm)		
MINIMUM (mm)	MAXIMUM (mm)	ABOVE DEVICE	IN FRONT	BEHIND
750	1500	300	750	20

NOTE:

- METER TO BE SET A MINIMUM OF 3" CLEAR OF WALLS
- APPROVED PIPE JOINT COMPOUND TO BE USED ON ALL THREADED JOINTS
- USE DUCTILE IRON PIPE WITH 125LB FLANGES FOR WATER METER PIPING WITH BYPASS
- METER INSTALLATION TO BE IN ACCORDANCE TO LOCAL CODE

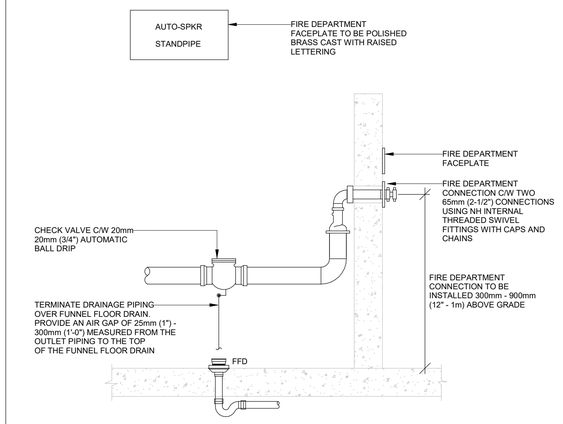
3 22 11 00.01 WATER METER ASSEMBLY

SCALE:N.T.S.



2 22 11 00.01 DISHWASHER PLUMBING

SCALE:N.T.S.



1 21 13 00.02 FIRE DEPARTMENT CONNECTION

SCALE:N.T.S.

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

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

Orientation

Seal

LICENSED PROFESSIONAL ENGINEER
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100156459
Aug. 12/21
PROVINCE OF ONTARIO

QUASAR CONSULTING GROUP

250 ROWNTREE DAIRY RD, WOODBRIDGE, ON
TEL: 905-507-0800
WEB: 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

MECHANICAL DETAILS II

Date	Project No	Drawing No
2021-08-12	CM-20-063	M642
Drawn by: CMW		
Scale: N.T.S.		

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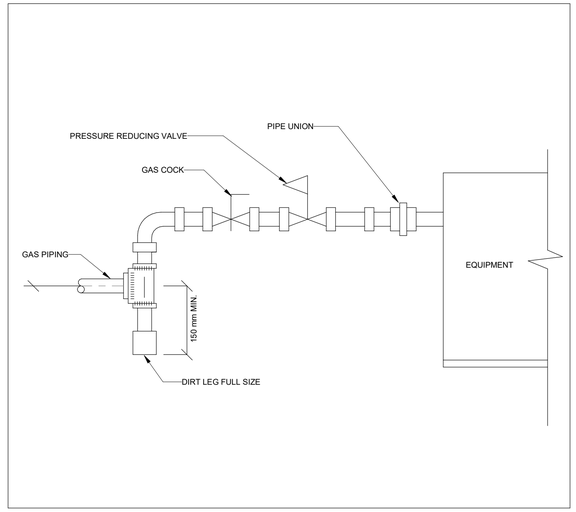
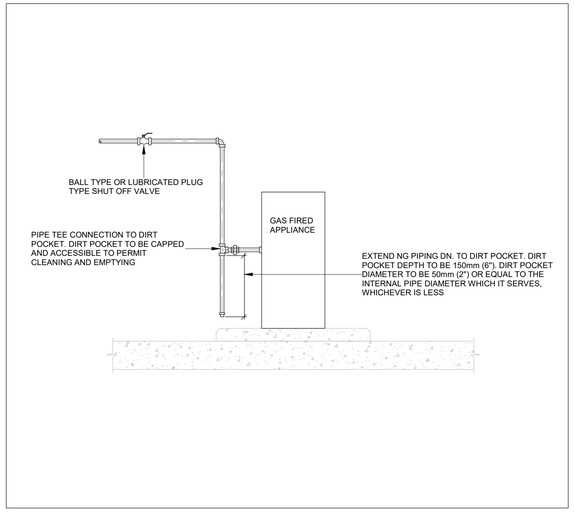


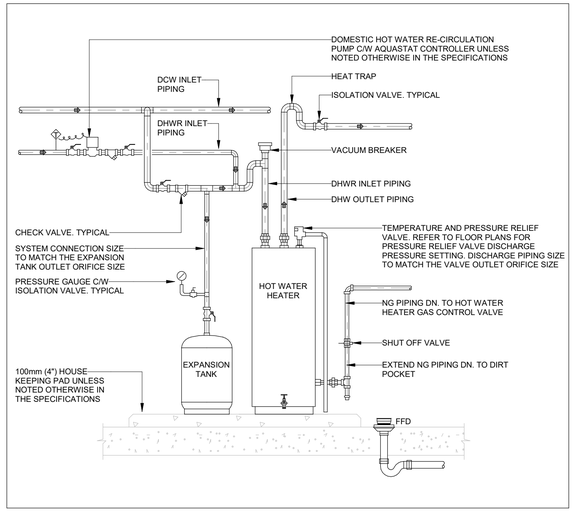
6 23 11 23.02 GAS PIPE CONNECTION TO EQUIPMENT

SCALE:N.T.S.



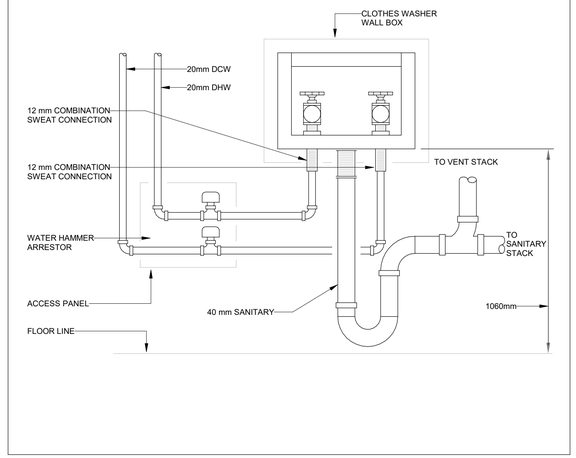
5 23 11 23.01 NATURAL GAS EQUIPMENT CONNECTION

SCALE:N.T.S.



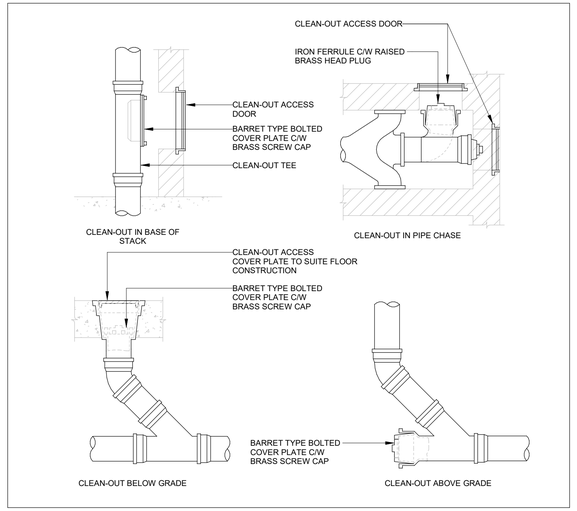
4 22 30 18.01 SEALED COMUSTION HOT WATER HEATER

SCALE:N.T.S.



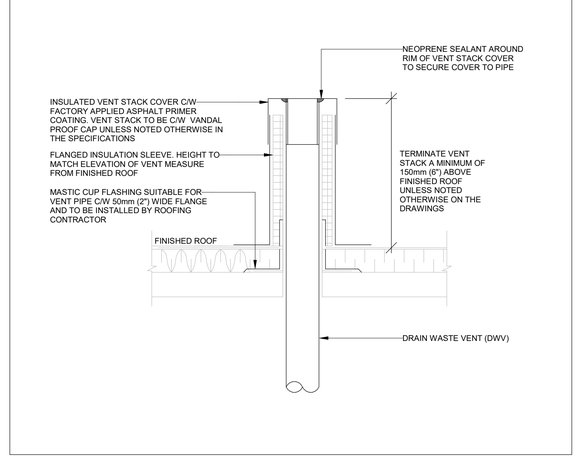
3 22 30 00.01 LAUNDRY BOX

SCALE:N.T.S.



2 22 13 00.02 SANITARY & STORM WATER CLEANOUTS

SCALE:N.T.S.



1 22 13 00.01 DWV ROOF PENETRATION & VENT CAP COVER

SCALE:N.T.S.

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

No.	Revision	Date
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

Orientation

Seal

LICENSED PROFESSIONAL ENGINEER
C.M.WATSON
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Aug. 12/21
PROVINCE OF ONTARIO

QUASAR CONSULTING GROUP
250 ROWNTREE DAIRY RD, WOODBRIDGE, ON
TEL: 905-507-0800
WEB: 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

MECHANICAL DETAILS III

Date	Project No	Drawing No
2021-08-12	CM-20-063	M643
Drawn by CMW		
Scale N.T.S.		

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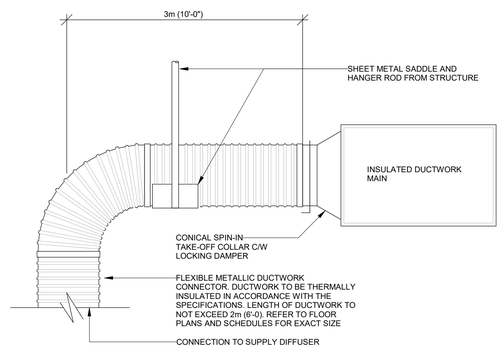
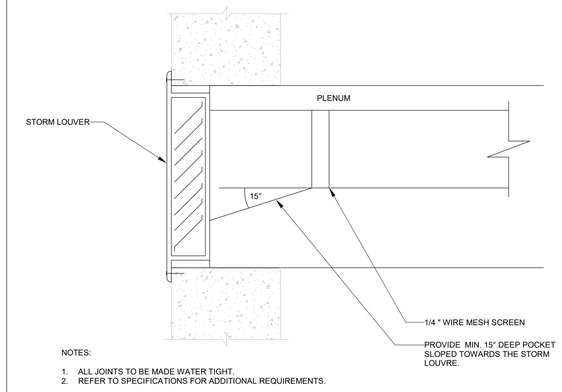


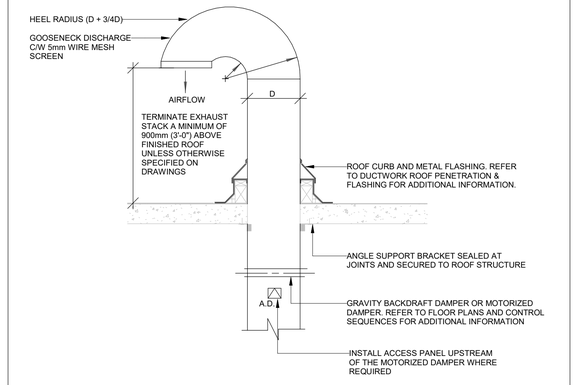
5 23 30 09.01 FLEXIBLE METALLIC DUCTWORK

SCALE:N.T.S.



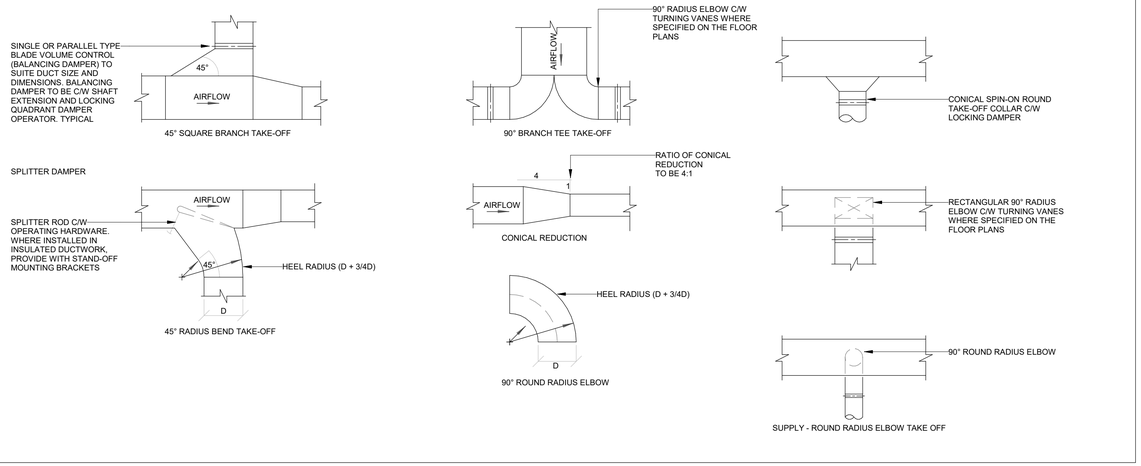
4 23 30 00.02 DUCTWORK CONNECTION TO STORM LOUVRE

SCALE:N.T.S.



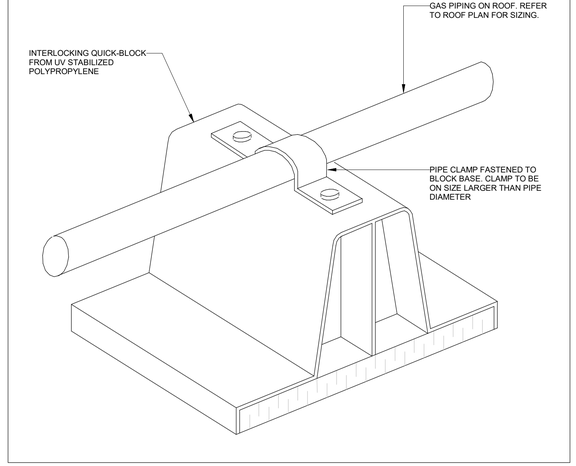
3 23 30 00.02 DUCT THROUGH ROOF PENETRATION & TERM.

SCALE:N.T.S.



2 23 30 00.01 DUCTWORK FITTINGS & TAKE-OFF'S

SCALE:N.T.S.



1 23 11 23.03 GAS PIPING ON ROOF - SUPPORT DETAIL

SCALE:N.T.S.

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

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	2021-02-05
B	PERMIT/SPA COORDINATION	2021-02-02
A	100% DESIGN DEVELOPMENT	2021-01-19

No.	Revision	Date

Orientation

Seal

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Aug. 12/21
PROVINCE OF ONTARIO

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

Project Information

BFES Station 201
(SPA-2021-0032)

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

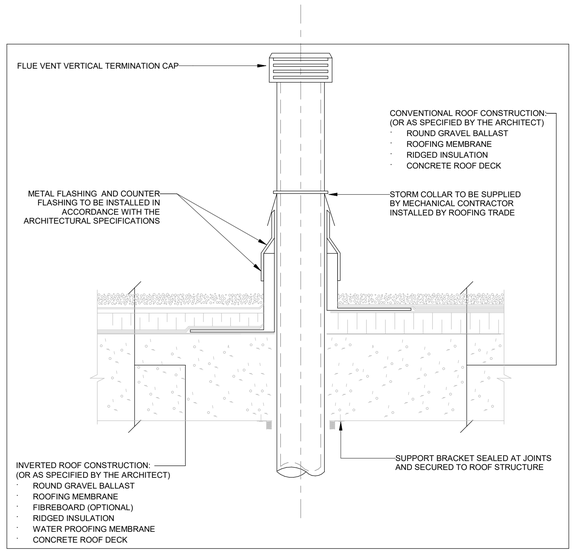
For

City of Brampton Fire & Emergency Services

Drawing Title

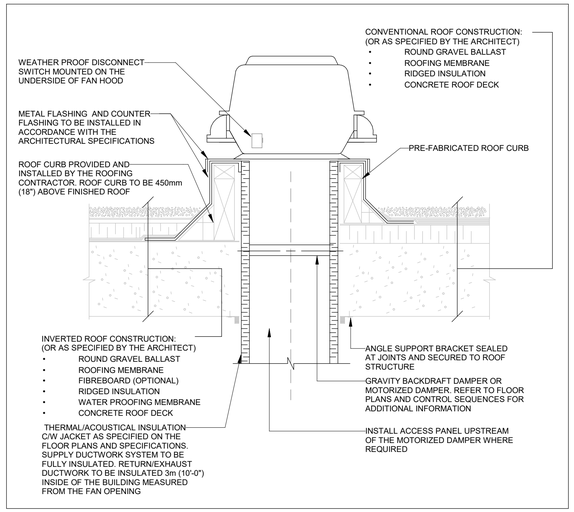
MECHANICAL DETAILS IV

Date	Project No	Drawing No
2021-08-12	CM-20-063	M644
Drawn by: CMW		
Scale: N.T.S.		



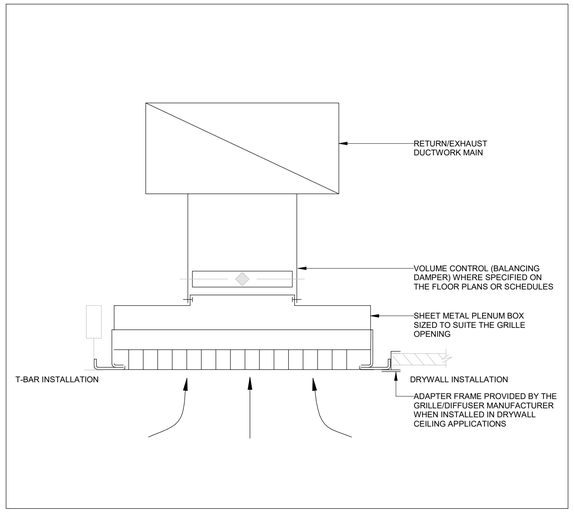
6 23 51 00.01 FLUE ROOF PENETRATION & FLUE VENT CAP

SCALE:N.T.S.



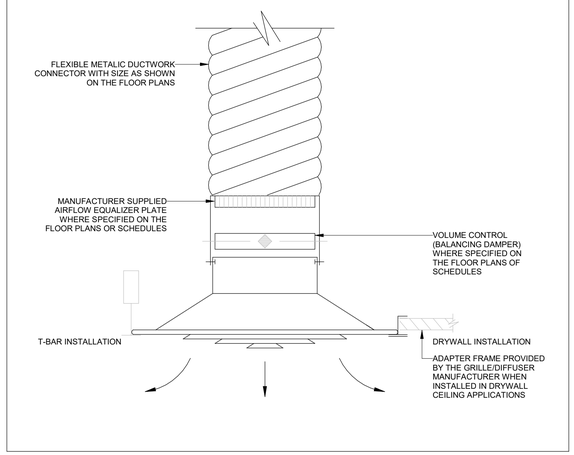
5 23 34 06.01 ROOF MOUNTED EXHAUST FAN

SCALE:N.T.S.



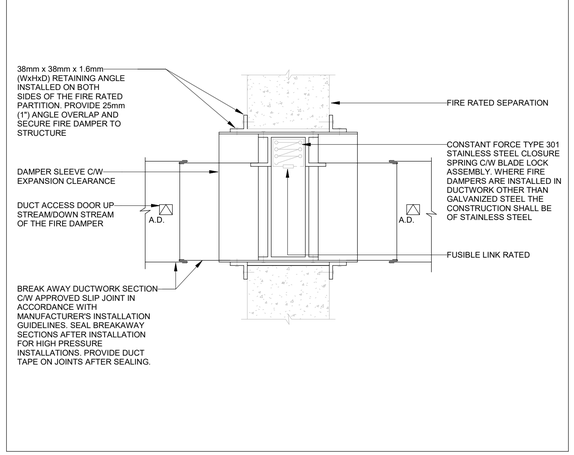
4 23 30 42.02 CEILING MOUNTED GRILLE

SCALE:N.T.S.



3 23 30 42.01 CEILING MOUNTED DIFFUSER

SCALE:N.T.S.



2 23 30 29.01 FUSIBLE LINK DAMPER

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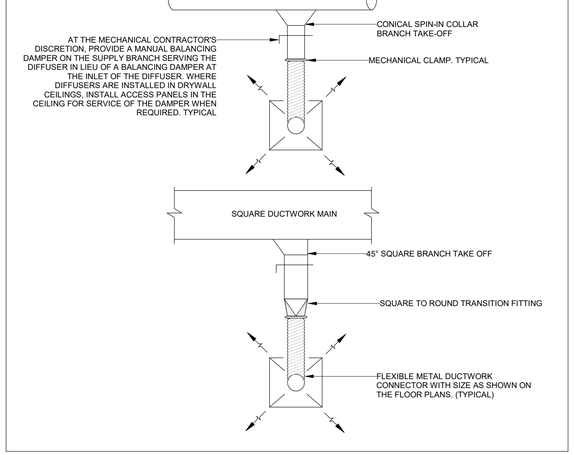

1 23 30 09.02 FLEXIBLE METALLIC DUCTWORK CONNECTION

SCALE:N.T.S.

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

No.	Revision	Date
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

Orientation

Seal

I CERTIFY THAT: C.M.WATSON 100156459 Aug. 12/21 LICENCED PROFESSIONAL ENGINEER PROVINCE OF ONTARIO

QUASAR CONSULTING GROUP
250 ROWNTREE DAIRY RD, WOODBRIDGE, ON
TEL: 905-507-0800
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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 V

Date	Project No	Drawing No
2021-08-12	CM-20-063	M645
Drawn by: CMW		
Scale: N.T.S.		

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

No.	Revision	Date
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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C	BUILDING PERMIT	2021-02-05
B	PERMIT/SPA COORDINATION	2021-02-02
A	100% DESIGN DEVELOPMENT	2021-01-19

Orientation

Seal

LICENSED PROFESSIONAL ENGINEER
C.M.WATSON
100156459
Aug. 12/21
PROVINCE OF ONTARIO

QUASAR CONSULTING GROUP

250 ROWNTREE DAIRY RD, WOODBRIDGE, ON
TEL: 905-507-0800
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Project Information

BFES Station 201
(SPA-2021-0032)

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

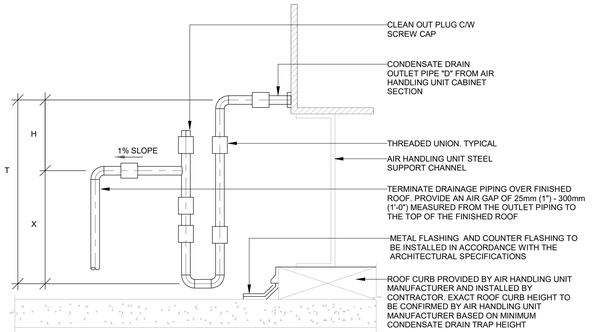
For

City of Brampton Fire & Emergency Services

Drawing Title

MECHANICAL DETAILS VI

Date	Project No	Drawing No
2021-08-12	CM-20-063	M646
Drawn by: CMW		
Scale: N.T.S.		



REQUIRED CONDENSATE DRAIN TRAP HEIGHT				
	NEGATIVE STATIC PRESSURE		POSITIVE STATIC PRESSURE	
DIAMETER "D"	STATIC PRESSURE	T (MINIMUM)	STATIC PRESSURE	T (MINIMUM)
20mm (3/4")	248 Pa (-1" W.C.)	104mm (4.1")	248 Pa (1" W.C.)	104mm (4.1")
	497 Pa (-2" W.C.)	142mm (5.6")	497 Pa (2" W.C.)	129mm (5.1")
25mm (1")	248 Pa (-1" W.C.)	114mm (4.5")	248 Pa (1" W.C.)	114mm (4.5")
	497 Pa (-2" W.C.)	152mm (6.0")	497 Pa (2" W.C.)	140mm (5.5")
	747 Pa (-3" W.C.)	190mm (7.5")	747 Pa (3" W.C.)	165mm (6.5")
32mm (1-1/4")	248 Pa (-1" W.C.)	135mm (5.3")	248 Pa (1" W.C.)	135mm (5.3")
	497 Pa (-2" W.C.)	173mm (6.8")	497 Pa (2" W.C.)	160mm (6.3")
	747 Pa (-3" W.C.)	211mm (8.3")	747 Pa (3" W.C.)	185mm (7.3")

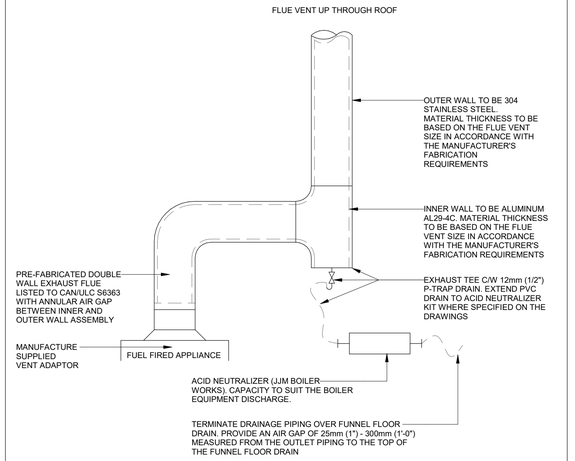
T = TOTAL TRAP HEIGHT = X + H*(1.5*D)

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

2 23 72 00.01 CONENSATE DRAIN TRAP HEIGHT - OUTDOOR AIR HANDLING UNIT

SCALE:N.T.S.



1 23 51 04.01 EXHAUST FLUE VENT - CATEGORY III AND IV1

SCALE:N.T.S.

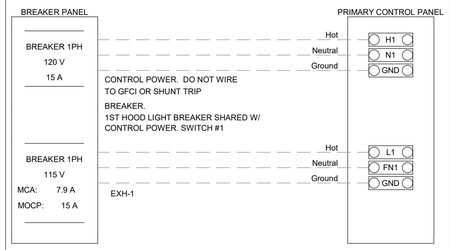
DESCRIPTION OF OPERATION:

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

BREAKER PANEL TO PRIMARY CONTROL PANEL

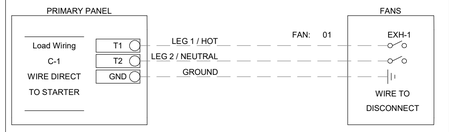
Responsibility: Electrician

BREAKER SIZE SHOWN IS THE MAXIMUM ALLOWED



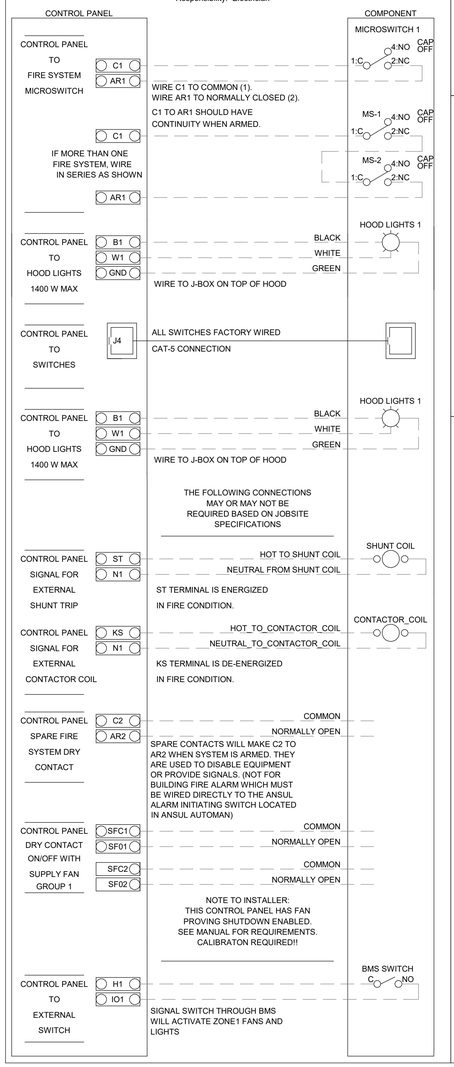
CONTROL PANEL TO FANS

Responsibility: Electrician



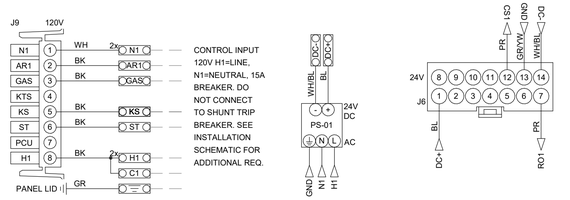
CONTROL PANEL TO ACCESSORY ITEMS

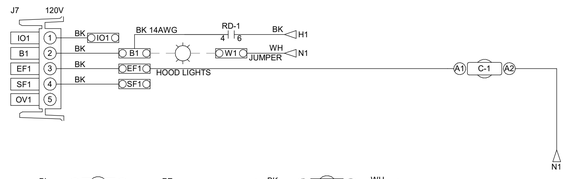
Responsibility: Electrician

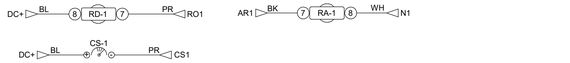


FACTORY WIRING SCHEMATIC - CIRCUIT BOARDS

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

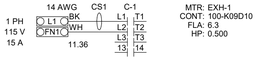






MAKE UP AIR INTERLOCK.

MOTOR POWER CIRCUIT

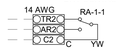


MTR: EXH-1
CONT: 100-K09D10
FLA: 6.3
HP: 0.500

COMPONENT LIST

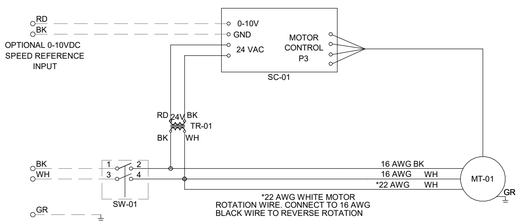
LABEL	DESCRIPTION
ST-X 2.5	Starter varies
OL-X 2.5	Overload varies
C-X 2.5	Contactor varies
PS-1 2.5	Power Sup. 24VDC MDP1B-24A-1C
RA-x 2.5	120V Relay DPDT 34.110.0184.0
RD-x 2.5	24VDC Light Relay 34.110.0188.0
CS-x 2.5	Current Sensor A/CTA-50

DRY CONTACTS (SHOWN DE-ENERGIZED)



14 x 18 x 6 Box

Exhaust Fan Wiring



Component Identification

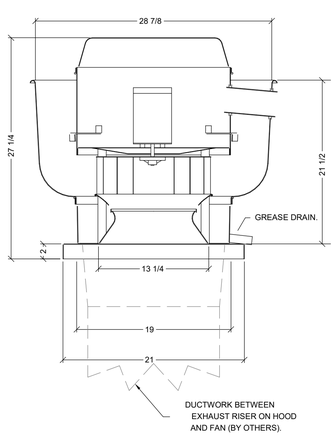
Label	Description	Location
MT-01	Fan Motor	[3]
SC-01	RTC-FSC-1	[1]
SW-01	Main disconnect switch	[3]
TR-01	24VAC 20VA Transformer	[2]

MOTOR INFO
EXHAUST 0.5HP-115V-1P-6.3FLA

ELECTRICAL INFORMATION
MOTOR/CTRL MCA: 7.9A
MOTOR/CTRL MOP: 15A

NOTES
DENOTES FIELD WIRING
DENOTES INTERNAL WIRING

FAN #1 DU50HFA - EXHAUST FAN



FEATURES:

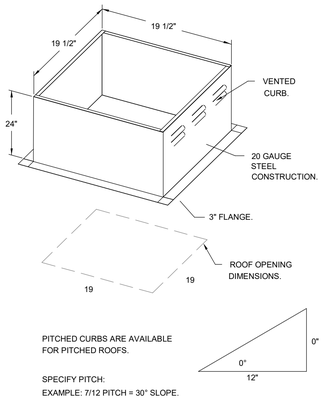
- DIRECT DRIVE CONSTRUCTION (NO BELTS/PULLEYS).
- ROOF MOUNTED FANS.
- RESTAURANT MODEL.
- UL705 AND UL762 AND ULC-S645
- VARIABLE SPEED CONTROL.
- INTERNAL WIRING.
- THERMAL OVERLOAD PROTECTION (SINGLE PHASE).
- HIGH HEAT OPERATION 300°F (149°C).
- GREASE CLASSIFICATION TESTING.
- NEMA 3R SAFETY DISCONNECT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

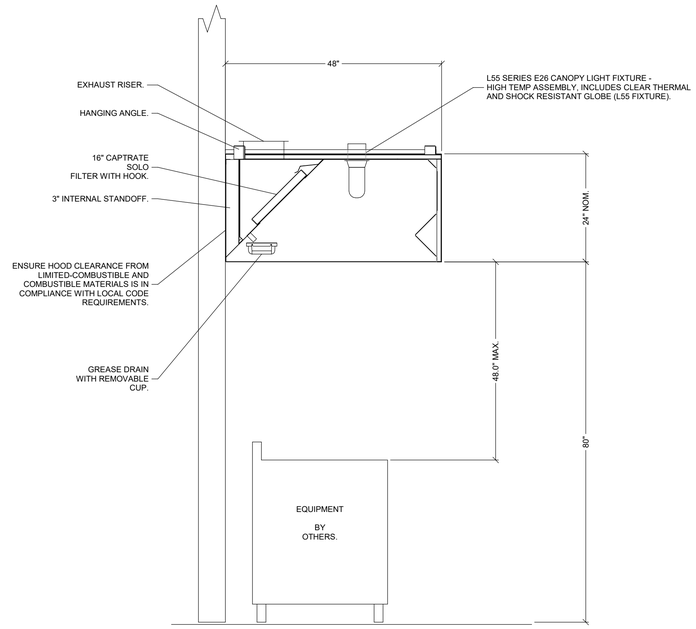
NORMAL TEMPERATURE TEST
EXHAUST FAN MUST OPERATE CONTINUOUSLY WHILE EXHAUSTING AIR AT 300°F (149°C) UNTIL ALL FAN PARTS HAVE REACHED THERMAL EQUILIBRIUM, AND WITHOUT ANY DETERIORATING EFFECTS TO THE FAN WHICH WOULD CAUSE UNSAFE OPERATION.

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.

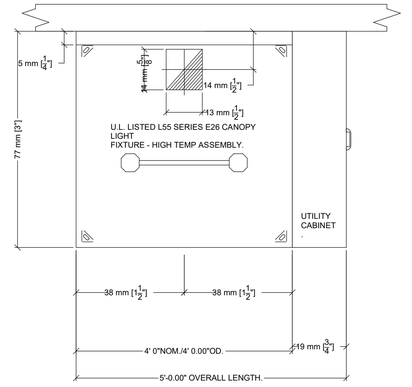
OPTIONS

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



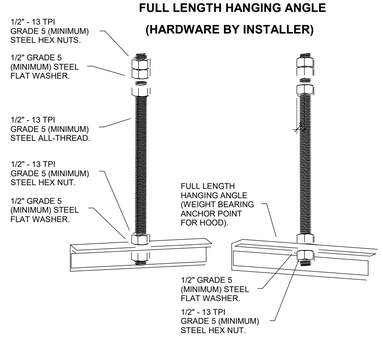


SECTION VIEW - MODEL 4824ND-2
HOOD - #1



PLAN VIEW - HOOD #1
4' 0.00" LONG 4824ND-2

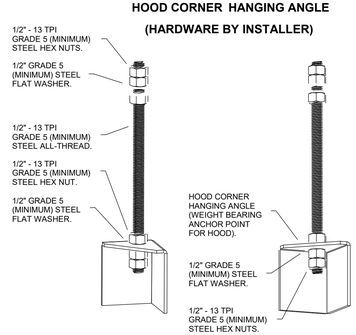
FULL LENGTH HANGING ANGLE
(HARDWARE BY INSTALLER)



ASSEMBLY INSTRUCTIONS

HANGING ANGLE MUST BE SUPPORTED WITH 1/2" - 13 TPI GRADE 5 (MINIMUM) ALL-THREAD. SANDWICH HANGING ANGLES AND CEILING ANCHOR POINTS WITH 1/2" GRADE 5 (MINIMUM) STEEL FLAT WASHERS AND 1/2" - 13 TPI GRADE 5 (MINIMUM) HEX NUTS AS SHOWN. MUST USE DOUBLED HEX NUT CONFIGURATION ABOVE CEILING ANCHORS. SINGLE HEX NUT BENEATH HANGING ANGLE IS ACCEPTABLE FOR FULL LENGTH HANGING ANGLES. MAINTAIN 1/4" OF EXPOSED THREADS BENEATH BOTTOM HEX NUT. TORQUE ALL HEX NUTS TO 57 FT-LBS.

HOOD CORNER HANGING ANGLE
(HARDWARE BY INSTALLER)



ASSEMBLY INSTRUCTIONS

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

No.	Revision	Date
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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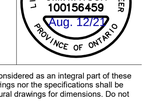
D	50% CD	2021-02-05
C	BUILDING PERMIT	2021-02-05
B	PERMIT/SPA COORDINATION	2021-02-02
A	100% DESIGN DEVELOPMENT	2021-01-19

Orientation

Seal



QUASAR CONSULTING GROUP
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TEL: 905-507-0800
WEB: 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

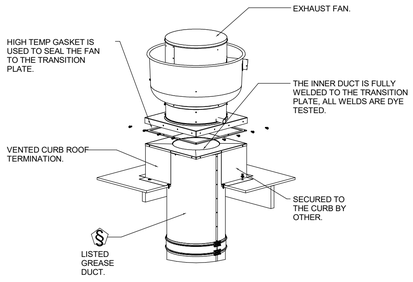
Drawing Title

MECHANICAL DETAILS VII

Date	Project No	Drawing No
2021-08-12	CM-20-063	M647

Drawn by: CMW
Scale: N.T.S.

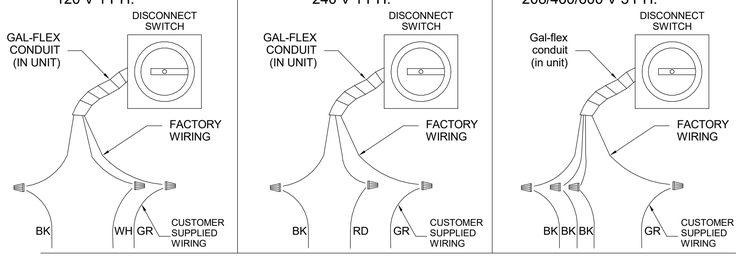
BIM 360://20019 - BFES Station 201/CM-20-063 - QCG ME Model_R20.rvt
2021-09-15 2:20:54 PM

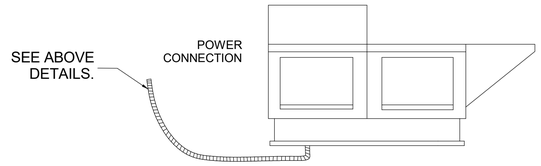


GREASE DUCT AND CHIMNEY DETAIL

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 32" ROUND 20 GAUGE 430 STAINLESS INNER DUCT INSULATED WITH A 24 GAUGE 430 STAINLESS OUTER SHELL.

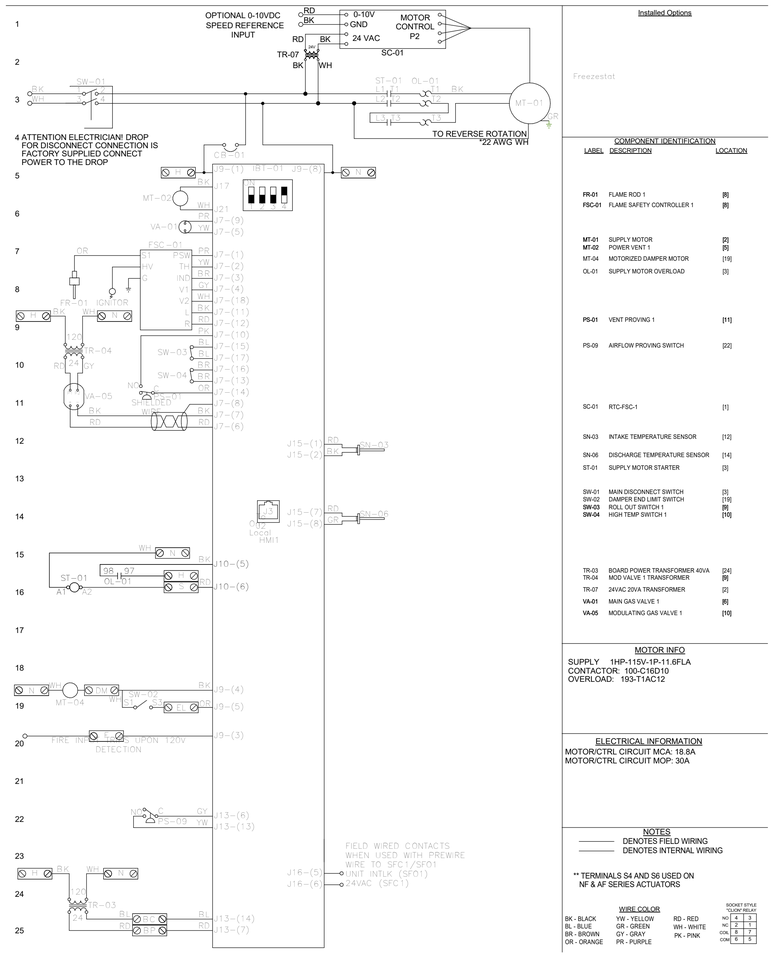




MAKE-UP AIR INSTALLATION WIRING DETAIL

WIRE COLOR LEGEND

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



COMPONENT IDENTIFICATION

LABEL	DESCRIPTION	LOCATION
FR-01	FLAME ROD 1	[8]
FSC-01	FLAME SAFETY CONTROLLER 1	[8]
MT-01	SUPPLY MOTOR	[2]
MT-02	POWER VENT 1	[5]
MT-04	MOTORIZED DAMPER MOTOR	[19]
OL-01	SUPPLY MOTOR OVERLOAD	[3]
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	[8]
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	[6]
VA-05	MODULATING GAS VALVE 1	[10]

MOTOR INFO

SUPPLY 1HP-115V-1P-11.6FLA
CONTACTOR: 100-C16D10
OVERLOAD: 193-T1AC12

ELECTRICAL INFORMATION

MOTOR/CTRL CIRCUIT MCA: 18.8A
MOTOR/CTRL CIRCUIT MOP: 30A

NOTES

——— DENOTES FIELD WIRING
——— DENOTES INTERNAL WIRING

** TERMINALS S4 AND S6 USED ON NF & AF SERIES ACTUATORS

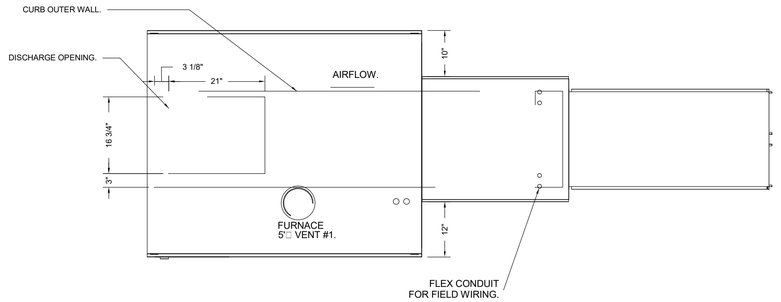
WIRE COLOR

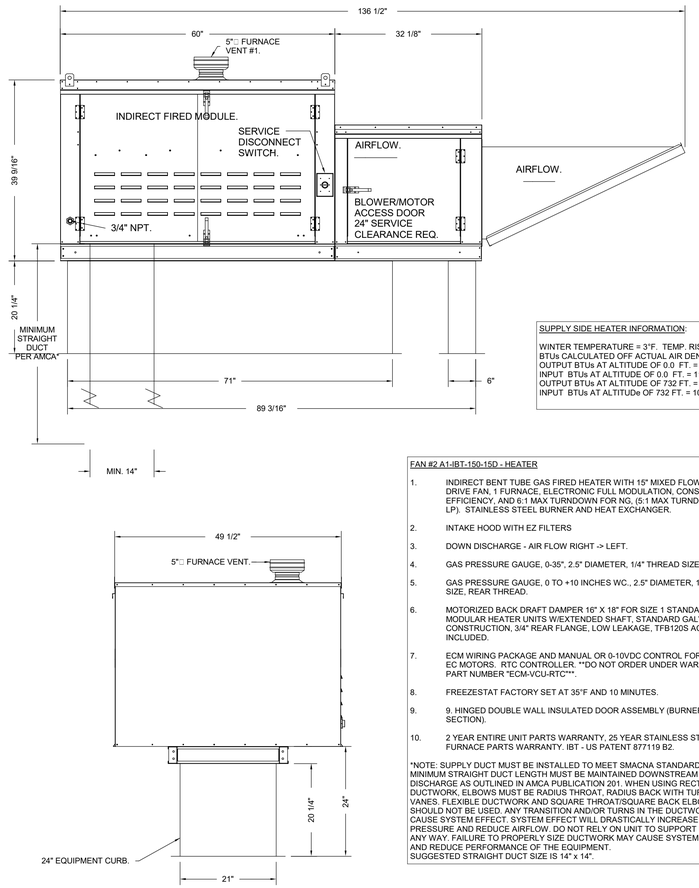
BK - BLACK	YW - YELLOW	RD - RED
BL - BLUE	GR - GREEN	WH - WHITE
BR - BROWN	GY - GRAY	PK - PINK
OR - ORANGE	PR - PURPLE	

ROCKET STYLE TO/OFF RELAY

NO	4	3
NC	2	1
COIL	8	7
COM	6	5

INDIRECT FIRED BENT TUBE HTR WIRING DETAIL





SUPPLY SIDE HEATER INFORMATION:

WINTER TEMPERATURE = 3°F. TEMP. RISE = 90°F.
BTUs CALCULATED OFF ACTUAL AIR DENSITY
OUTPUT BTUs AT ALTITUDE OF 0.0 FT. = 88891.
INPUT BTUs AT ALTITUDE OF 0.0 FT. = 111113.
OUTPUT BTUs AT ALTITUDE OF 732 FT. = 86564.
INPUT BTUs AT ALTITUDe OF 732 FT. = 108206.

FAN #2 A1-IBT-150-15D - HEATER

1. INDIRECT BENT TUBE GAS FIRED HEATER WITH 15" MIXED FLOW DIRECT DRIVE FAN, 1 FURNACE, ELECTRONIC FULL MODULATION, CONSTANT 80% EFFICIENCY, AND 6:1 MAX TURNDOWN FOR NG, (5:1 MAX TURNDOWN FOR LP). STAINLESS STEEL BURNER AND HEAT EXCHANGER.
2. INTAKE HOOD WITH EZ FILTERS
3. DOWN DISCHARGE - AIR FLOW RIGHT -> LEFT.
4. GAS PRESSURE GAUGE, 0-35", 2.5" DIAMETER, 1/4" THREAD SIZE.
5. GAS PRESSURE GAUGE, 0 TO +10 INCHES WC., 2.5" DIAMETER, 1/8" THREAD SIZE, REAR THREAD.
6. MOTORIZED BACK DRAFT DAMPER 16" X 18" FOR SIZE 1 STANDARD & MODULAR HEATER UNITS W/EXTENDED SHAFT, STANDARD GALVANIZED CONSTRUCTION, 3/4" REAR FLANGE, LOW LEAKAGE, TFB120S ACTUATOR INCLUDED.
7. ECM WIRING PACKAGE AND MANUAL OR 0-10VDC CONTROL FOR SUPPLY EC MOTORS. RTC CONTROLLER. **DO NOT ORDER UNDER WARRANTY, SEE PART NUMBER "ECM-VCU-RTC***.
8. FREEZESTAT FACTORY SET AT 35°F AND 10 MINUTES.
9. 9. HINGED DOUBLE WALL INSULATED DOOR ASSEMBLY (BURNER/BLOWER SECTION).
10. 2 YEAR ENTIRE UNIT PARTS WARRANTY, 25 YEAR STAINLESS STEEL FURNACE PARTS WARRANTY. IBT - US PATENT 877119 B2.

*NOTE: SUPPLY DUCT MUST BE INSTALLED TO MEET SMACNA STANDARDS. A MINIMUM STRAIGHT DUCT LENGTH MUST BE MAINTAINED DOWNSTREAM OF UNIT DISCHARGE AS OUTLINED IN AMCA PUBLICATION 201. WHEN USING RECTANGULAR DUCTWORK, ELBOWS MUST BE RADIUS THROAT, RADIUS BACK WITH TURNING VANES. FLEXIBLE DUCTWORK AND SQUARE THROAT/SQUARE BACK ELBOWS SHOULD NOT BE USED. ANY TRANSITION AND/OR TURNS IN THE DUCTWORK WILL CAUSE SYSTEM EFFECT. SYSTEM EFFECT WILL DRASTICALLY INCREASE STATIC PRESSURE AND REDUCE AIRFLOW. DO NOT RELY ON UNIT TO SUPPORT DUCT IN ANY WAY. FAILURE TO PROPERLY SIZE DUCTWORK MAY CAUSE SYSTEM EFFECTS AND REDUCE PERFORMANCE OF THE EQUIPMENT.
SUGGESTED STRAIGHT DUCT SIZE IS 14" x 14".

MAKE-UP AIR UNIT DETAIL

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

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

Orientation

Seal

LICENSED PROFESSIONAL ENGINEER
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100156459
Aug. 12/21
PROVINCE OF ONTARIO

QUASAR CONSULTING GROUP
250 ROWNTREE DAIRY RD, WOODBRIDGE, ON
TEL: 905-507-0800
WEB: WWW.QUASARCG.COM

Project Information

BFES Station 201
(SPA-2021-0032)

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

For

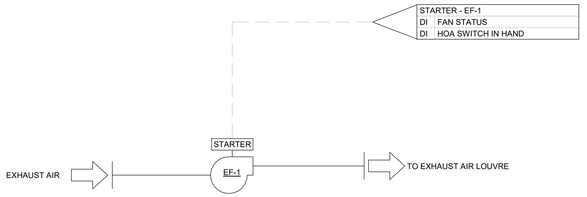
City of Brampton Fire & Emergency Services

Drawing Title

MECHANICAL DETAILS VIII

Date	Project No	Drawing No
2021-08-12	CM-20-063	M648
Drawn by: CMW		
Scale: N.T.S.		

BIM 360://20019 - BFES Station 201r/CM-20-063 - QCG ME Model_R20.rvt
2021-09-15 2:20:55 PM



OPERATING MODE:
1. THE SYSTEM SHALL OPERATE INDEPENDENTLY USING CONTROLLER SUPPLIED WITH HOOD. BAS TO MONITOR STATUS OF EXHAUST FAN.

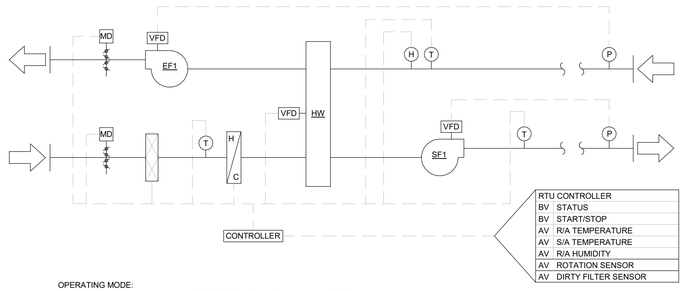
FIRE ALARM MODE:
1. EXHAUST FAN SHALL FAIL LAST (CONTINUE TO RUN IF RUNNING) DURING FIRE ALARM.

SYSTEM ALARMS & PRIORITY AT BAS:
- FAN FAILURE: ALARM TROUBLE SIGNAL FROM CONTROLLER

SYSTEM TRENDS AT BAS:
- FAN UNIT STATUS
- EQUIPMENT OPERATING HOURS

23 34 16.13 - COMMERCIAL KITCHEN EXHAUST FAN CONTROL SEQUENCE

NOT TO SCALE



OPERATING MODE:
1. THE SYSTEM SHALL BE ENABLED ACCORDING TO THE FOLLOWING MODE:
   - SCHEDULED RUN TIME MODE

INITIAL SET UP:
1. DOAS SHALL BE NORMALLY DISABLED.
2. MOTORIZED DAMPERS SHALL BE NORMALLY CLOSED.
3. FANS SHALL BE BALANCED TO A FIELD DETERMINED AIRFLOW & STATIC PRESSURE AS PER THE VALUES INDICATED ON THE DRAWINGS DURING SYSTEM BALANCING AND COMMISSIONING.
4. P1 SHALL BE LOCATED APPROXIMATELY TWO-THIRDS DOWNSTREAM OF SUPPLY FAN. P2 SHALL BE LOCATED APPROXIMATELY TWO-THIRDS UPSTREAM OF EXHAUST FAN. FINAL LOCATION SHALL BE COORDINATED WITH THE BALANCING CONTRACTOR AND THE CONTROLS CONTRACTOR.
5. VFD SPEED SHALL BE FIELD OPTIMIZED TO AVOID FAN (TORQUE AND CURRENT) STALL CONDITIONS AND SHALL NOT OPERATE BELOW 30% SPEED
6. SYSTEM SHALL BE ENABLED BASED ON SCHEDULED RUN TIME AT VRV BAS.
7. FAN SHALL BE ENABLED/DISABLED LOCALLY AT THE UNIT CONTROLLER/VFD OR REMOTELY THROUGH THE BAS.

DOAS MODULE:
1. THE DOAS OA AND EA FANS WILL RUN CONTINUOUSLY WHEN UNIT IS ENABLED.
2. UNIT TO CONTROL PREHEAT TO PREVENT FROST.
3. ENTHALPY WHEEL SHALL RUN WHEN SYSTEM IS ENABLED.

FAN CONTROL:
1. ON COMMAND TO START MOTORIZED DAMPERS SHALL OPEN. UPON PROOF OF MOTORIZED DAMPER POSITION FAN SHALL BE ENABLED. MD1 SHALL BE HARD WIRED INTERLOCKED WITH F1 TO ENSURE CONTROLS OPERATION WHEN FAN IS OPERATING IN "HAND" OR "AUTO" MODE. CONTROLS SIGNAL SHALL BE DUPLICATED AT THE BAS.
2. FANS SHALL MODULATE TO MAINTAIN THE STATIC PRESSURE SET POINT DETERMINED BY P1 AND P2.

FIRE ALARM MODE:
1. FAN SHALL SHUT DOWN DURING FIRE ALARM.

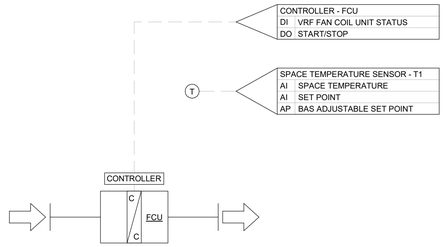
FAN FAILURE:
1. UPON FAN FAILURE, RESPECTIVE DAMPER SHALL REMAIN OPEN.

SYSTEM ALARMS & PRIORITY AT BAS:
- UNIT FAILURE : AS DETERMINED BY CONTROLLER

SYSTEM TRENDS AT BAS:
- UNIT STATUS
- UNIT FAULT
- RUN AMPS
- STATIC PRESSURE
- EQUIPMENT OPERATING HOURS

23 72 00.01 - DEDICATED OUTDOOR AIR SUPPLY UNIT DOAS-1 CONTROL SEQUENCE

NOT TO SCALE



OPERATING MODE:
1. THE SYSTEM SHALL BE ENABLED ACCORDING TO THE FOLLOWING MODE:
   - SPACE TEMPERATURE CONTROL MODE

INITIAL SET UP:
1. VRF FAN COIL UNIT SHALL BE NORMALLY DISABLED.
2. T1 SHALL MAINTAIN THE SPACE TEMPERATURE SET POINT.
3. VRF SYSTEM SHALL BE BACNET NETWORKED TO BAS.
4. VRF FAN COIL THERMOSTAT PROVIDED WITH VRF SYSTEM.

VRF FAN COIL UNIT CONTROL:
1. VRF SHALL PROVIDE DUAL COOLING AND HEATING FUNCTIONS.

TEMPERATURE CONTROL:
- T1 SHALL BE SET TO (24)°C IN COOLING MODE. (BAS ADJUSTABLE POINT)
- T1 SHALL BE SET TO (22)°C IN HEATING MODE. (BAS ADJUSTABLE POINT)
- MODE SELECTION TO BE BAS ADJUSTABLE. FAN SPEED TO RUN IN AUTOMATIC AND STATUS TO BE VISIBLE AT BAS.

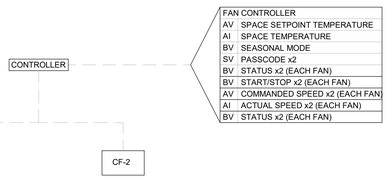
1. WHEN IN COOLING MODE:
   - IF THE SPACE TEMPERATURE RISES ABOVE SET POINT, COOLING MODE WILL BE INITIATED AND VRF FAN COIL UNIT SHALL BE ENABLED TO MAINTAIN THE T1 SET POINT.
2. WHEN IN HEATING MODE:
   - IF THE SPACE TEMPERATURE DROPS BELOW SET POINT, HEATING MODE WILL BE INITIATED AND VRF FAN COIL UNIT SHALL BE ENABLED TO MAINTAIN THE T1 SET POINT.

SYSTEM ALARMS & PRIORITY AT BAS:
- VRF FAN COIL UNIT FAILURE: COMMANDED ON/CLOSED FEEDBACK
- SPACE TEMPERATURE OUT OF RANGE (+/- 2°C)

SYSTEM TRENDS AT BAS:
- VRF FAN COIL UNIT STATUS
- SPACE TEMPERATURE
- EQUIPMENT OPERATING HOURS

23 81 29.00 - VRF FAN COIL UNIT CONTROL SEQUENCE

NOT TO SCALE



OPERATING MODE:
1. THE SYSTEM SHALL OPERATE INDEPENDENTLY USING FACTORY SUPPLIED INTELLIGENT CONTROLLER. THE SYSTEM SHALL OPERATE IN WINTER AND SUMMER MODES.
2. SPACE TEMPERATURE SETPOINT RESET TO BE POSSIBLE THROUGH BAS.

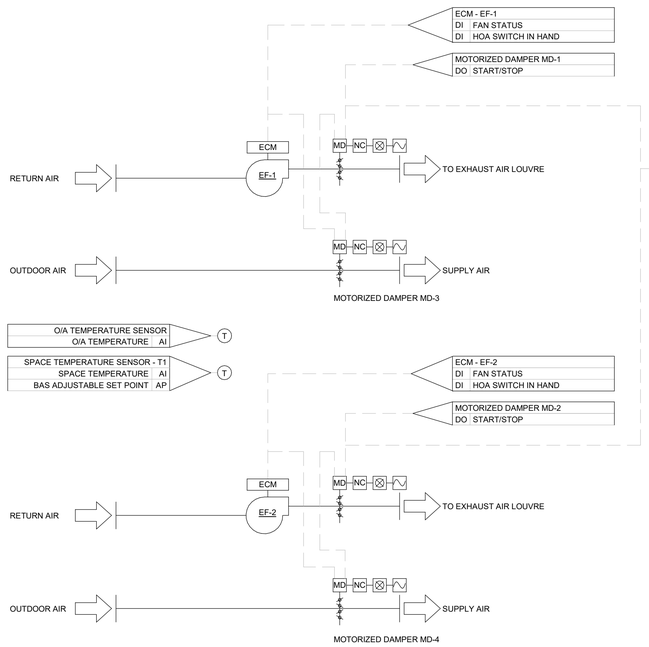
FIRE ALARM MODE:
1. FAN SHALL SHUT DOWN DURING FIRE ALARM.

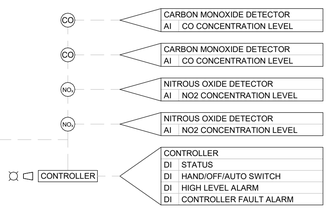
SYSTEM ALARMS & PRIORITY AT BAS:
- FAN FAILURE: ALARM TROUBLE SIGNAL FROM CONTROLLER
- SPACE TEMPERATURE OUT OF RANGE (+/- 2°C)

SYSTEM TRENDS AT BAS:
- FAN UNIT STATUS
- SPACE TEMPERATURE
- EQUIPMENT OPERATING HOURS

23 34 02.01 - CEILING MOUNTED DESTRATIFICATION FAN CONTROL SEQUENCE

NOT TO SCALE





OPERATING MODE:
1. THE SYSTEM SHALL BE ENABLED ACCORDING TO THE FOLLOWING MODE:
   - SPACE TEMPERATURE CONTROL MODE
   - EMERGENCY EXHAUST MODE

INITIAL SET UP:
1. MOTORIZED DAMPERS SHALL BE NORMALLY CLOSED.
2. FANS SHALL BE BALANCED TO A FIELD DETERMINED AIRFLOW & STATIC PRESSURE AS PER THE VALUES INDICATED ON THE DRAWINGS DURING SYSTEM BALANCING AND COMMISSIONING.
3. SYSTEM SHALL MAINTAIN THE SPACE MAXIMUM TEMPERATURE SET POINT AND SHALL BE ENABLED DURING EMERGENCY EXHAUST OF CO AND NO2.
4. FAN SHALL BE ENABLED/DISABLED LOCALLY AT THE STARTER OR REMOTELY THROUGH THE BAS.

FAN CONTROL:
1. FANS SHALL BOTH BE ENABLED AND SHALL RUN IN PARALLEL.
2. ON COMMAND TO START, MOTORIZED DAMPERS SHALL OPEN. UPON PROOF OF MOTORIZED DAMPER POSITION, RESPECTIVE FAN SHALL BE ENABLED. MD2 AND MD4 SHALL BE INTERLOCKED WITH RESPECTIVE FAN TO ENSURE CONTROLS OPERATION WHEN FAN IS OPERATING IN "HAND" OR "AUTO" MODE. CONTROLS SIGNAL SHALL BE DUPLICATED AT THE BAS.
3. FAN SHALL OPERATE AT CONSTANT SPEED.

TEMPERATURE CONTROL:
1. SPACE TEMPERATURE IS GREATER THAN (28°C DRY BULB) AND OUTDOOR AIR TEMPERATURE IS LESS THAN (SPACE TEMPERATURE MINUS 2°C).
   - T1 SHALL BE SET TO (28°C DRY BULB).
   - MOTORIZED DAMPERS SHALL OPEN AND FANS SHALL BE ENABLED.
2. TEMPERATURE CONTROL SHALL BE DISABLED WHEN OUTDOOR AIR TEMPERATURE IS LESS THAN 24°C.

EMERGENCY EXHAUST:
- CO UPPER CONCENTRATION LIMIT SHALL BE SET TO (100 P.P.M.).
- NO2 UPPER CONCENTRATION LIMIT SHALL BE SET TO (3 P.P.M.).
- MD2 SHALL BE CLOSED
- MD1 & MD3 SHALL BE OPEN.
- F1 SHALL BE ENABLED.

FIRE ALARM MODE:
1. FAN SHALL SHUT DOWN DURING FIRE ALARM.

FAN FAILURE:
1. UPON FAN FAILURE, ASSOCIATED DAMPERS SHALL REMAIN OPEN.

SYSTEM ALARMS & PRIORITY AT BAS:
- FAN FAILURE : COMMANDED ON/STATUS OFF
- FAN IN HAND: HOA SWITCH IN HAND
- DAMPER FAILURE: COMMANDED OPEN/CLOSED FEEDBACK
- DAMPER IN HAND: COMMANDED CLOSED/OPEN FEEDBACK

23 34 00.03 - APPARATUS BAY FAN CONTROL SEQUENCE

NOT TO SCALE

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

No.	Revision	Date
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

Orientation

Seal

LICENSED PROFESSIONAL ENGINEER
C.M.WATSON
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Aug. 12/21
PROVINCE OF ONTARIO

QUASAR CONSULTING GROUP
250 ROWNTREE DAIRY RD, WOODBRIDGE, ON
TEL: 905-507-0800
WEB: WWW.QUASARCG.COM

Project Information

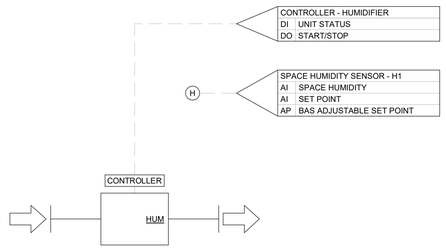
BFES Station 201
(SPA-2021-0032)

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

For
City of Brampton Fire & Emergency Services

Drawing Title
CONTROL SEQUENCES I

Date	Project No	Drawing No
2021-08-12	CM-20-063	M650
Drawn by: CMW		
Scale: N.T.S.		



OPERATING MODE:
1. THE SYSTEM SHALL BE ENABLED ACCORDING TO THE FOLLOWING MODE:
   - SPACE HUMIDITY CONTROL MODE

INITIAL SET UP:
1. UNIT SHALL BE NORMALLY DISABLED.
2. H1 SHALL MAINTAIN THE SPACE HUMIDITY SET POINT.
3. HUMIDIFIER SYSTEM SHALL BE CONNECTED TO BAS VIA BACNET INTERFACE.
4. HUMIDISTAT PROVIDED WITH HUMIDIFIER SYSTEM.

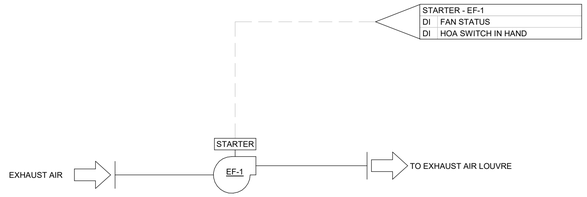
HUMIDITY CONTROL:
- H1 SHALL BE SET TO 30%. (BAS ADJUSTABLE POINT)
- IF THE RETURN AIR HUMIDITY DROPS BELOW SETPOINT, HUMIDIFICATION ENABLED.

SYSTEM ALARMS & PRIORITY AT BAS:
- UNIT FAILURE: COMMANDED ON/CLOSED FEEDBACK
- SPACE HUMIDITY EXCEEDS SETPOINT (+ 10%)

SYSTEM TRENDS AT BAS:
- UNIT STATUS
- SPACE HUMIDITY
- EQUIPMENT OPERATING HOURS

23 84 00.02 - HUMIDIFIER CONTROL SEQUENCE

NOT TO SCALE



OPERATING MODE:
1. THE SYSTEM SHALL OPERATE INDEPENDENTLY USING CONTROLLER SUPPLIED WITH TAILPIPE EXTRACTION SYSTEM. BAS TO MONITOR STATUS OF EXHAUST FAN.

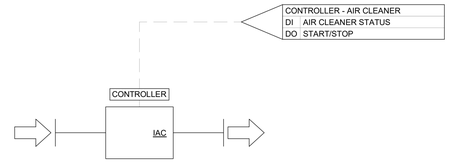
FIRE ALARM MODE:
1. EXHAUST FAN SHALL FAIL LAST (CONTINUE TO RUN IF RUNNING) DURING FIRE ALARM.

SYSTEM ALARMS & PRIORITY AT BAS:
- FAN FAILURE: ALARM TROUBLE SIGNAL FROM CONTROLLER

SYSTEM TRENDS AT BAS:
- FAN UNIT STATUS
- EQUIPMENT OPERATING HOURS

23 35 22.00 - STRAIGHT RAIL VEHICLE EXHAUST CONTROL SEQUENCE

NOT TO SCALE



OPERATING MODE:
1. THE SYSTEM SHALL BE ENABLED ACCORDING TO THE FOLLOWING MODE:
   - PROPRIETARY CONTROLLER NETWORK BY IAC SUPPLIER (APPARATUS BAS FILTRATION UNITS)
   - SCHEDULED RUN-TIME (HOSE TOWER AND BUNKER GEAR FILTRATION UNITS)

INITIAL SET UP:
1. FILTRATION UNIT SHALL BE NORMALLY DISABLED.

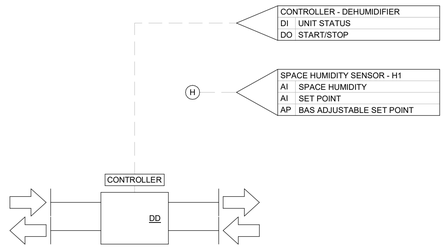
IAC UNIT CONTROL:
1. APPARATUS BAY: STAND ALONE PACKAGE FILTRATION UNITS AND CONTROL PANEL. BAS TO MONITOR STATUS.
2. HOSE TOWER AND BUNKER GEAR: BAS TO OPERATE UNITS ON SCHEDULE WITH LOCAL OVERRIDE FOR 3 HOUR OVERRIDE (ADJUSTABLE).

SYSTEM ALARMS & PRIORITY AT BAS:
- UNIT FAILURE: COMMANDED ON/OFF FEEDBACK
- UNIT ALARM STATUS

SYSTEM TRENDS AT BAS:
- EQUIPMENT OPERATING HOURS

23 35 16.00 - INDOOR AIR CLEANER UNIT CONTROL SEQUENCE

NOT TO SCALE



OPERATING MODE:
1. THE SYSTEM SHALL BE ENABLED ACCORDING TO THE FOLLOWING MODE:
   - SPACE HUMIDITY CONTROL MODE

INITIAL SET UP:
1. UNIT SHALL BE NORMALLY DISABLED.
2. H1 SHALL MAINTAIN THE SPACE HUMIDITY SET POINT.
3. DEHUMIDIFIER SYSTEM SHALL BE CONNECTED TO BAS VIA TERMINAL STRIP.
4. HUMIDISTAT PROVIDED WITH BAS SYSTEM.

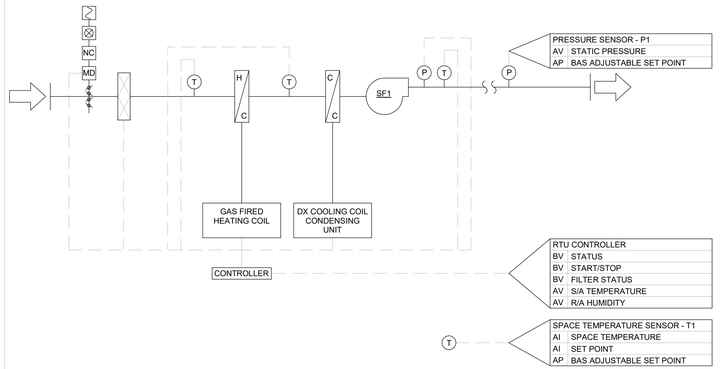
HUMIDITY CONTROL:
- H1 SHALL BE SET TO 50%. (BAS ADJUSTABLE POINT)
- IF THE SPACE HUMIDITY RISES ABOVE SETPOINT, STAGE 1 DEHUMIDIFICATION ENABLED.
- IF THE SPACE HUMIDITY RISES ABOVE SETPOINT + 5%, STAGE 2 DEHUMIDIFICATION ENABLED. STAGE 2 TO REMAIN ENABLED UNTIL SPACE HUMIDITY REACHES SETPOINT.

SYSTEM ALARMS & PRIORITY AT BAS:
- UNIT FAILURE: COMMANDED ON/CLOSED FEEDBACK
- SPACE HUMIDITY EXCEEDS SETPOINT (+ 10%)

SYSTEM TRENDS AT BAS:
- UNIT STATUS
- SPACE HUMIDITY
- EQUIPMENT OPERATING HOURS

23 84 00.01 - DESICCANT DEHUMIDIFIER CONTROL SEQUENCE

NOT TO SCALE



OPERATING MODE:
1. THE SYSTEM SHALL BE ENABLED ACCORDING TO THE FOLLOWING MODE:
   - HARDWIRED START SIGNAL FROM KITCHEN HOOD CONTROLLER.

INITIAL SET UP:
1. THE SYSTEM SHALL BE A 100% OUTDOOR AIR MAKEUP UNIT.
2. THE ROOF TOP UNIT SHALL BE SUPPLIED WITH A BACNET/MSTP CONTROLLER CAPABLE OF INTERFACING WITH THE BAS.
3. THE ROOF TOP UNIT SHALL BE CAPABLE OF PROVIDING THE FOLLOWING FUNCTIONS:
   - MECHANICAL COOLING VIA DX COOLING COIL AND CONDENSING UNIT.
   - MECHANICAL HEATING VIA GAS FIRED HEATING COIL AND BURNER.
4. BAS VENDOR TO PROVIDE TEMPERATURE SENSOR.
5. WHERE ECONOMIZER CONTROL IS AVAILABLE TO ALLOW FOR FREE COOLING, MINIMUM DAMPER POSITIONS SHALL BE RECORDED TO ENSURE THAT THE MINIMUM OUTDOOR AIR VALUE AS SCHEDULED IS PROVIDED AT ALL TIMES.
6. OUTDOOR AIR DAMPER SHALL BE NORMALLY CLOSED.
7. FAN SHALL BE BALANCED TO A FIELD DETERMINED AIRFLOW & STATIC PRESSURE AS PER THE VALUES INDICATED ON THE DRAWINGS DURING SYSTEM BALANCING AND COMMISSIONING.
8. P1 SHALL BE LOCATED APPROXIMATELY TWO-THIRDS DOWNSTREAM/UPSTREAM OF THE FAN. FINAL LOCATION SHALL BE COORDINATED WITH THE BALANCING CONTRACTOR AND THE CONTROLS CONTRACTOR.
9. ECM SPEED SHALL BE FIELD OPTIMIZED TO AVOID FAN (TORQUE AND CURRENT) STALL CONDITIONS AND SHALL NOT OPERATE BELOW 30% SPEED

FAN CONTROL:
1. ON COMMAND TO START OUTDOOR AIR DAMPER SHALL OPEN. UPON PROOF OF MOTORIZED DAMPER POSITION FAN SHALL BE ENABLED.
2. FAN SHALL MODULATE TO MAINTAIN THE STATIC PRESSURE SET POINT DETERMINED BY P1.

TEMPERATURE CONTROL:
1. COOLING IS REQUIRED:
   - T1 SHALL BE SET TO (25°C DRY BULB).
   - GAS FIRED HEATING COIL SHALL BE DISABLED.
   - DX COOLING COIL SHALL MODULATE TO MAINTAIN THE T1 SET POINT.
2. FREE COOLING IS NOT REQUIRED AND HEATING IS REQUIRED.
   - T1 SHALL BE SET TO (22°C DRY BULB).
   - DX COOLING COIL SHALL BE DISABLED.
   - GAS FIRED HEATING COIL SHALL MODULATE OPEN TO MAINTAIN THE T1 SET POINT.

FIRE ALARM MODE:
1. FAN SHALL SHUT DOWN DURING FIRE ALARM.

FAN FAILURE:
1. UPON SUPPLY FAN FAILURE, OUTDOOR AIR DAMPER SHALL BE CLOSED.

SAFETY SHUT DOWN:
1. HIGH LIMIT DUCT STATIC PRESSURE SENSOR SHALL BE HARDWIRED INTERLOCKED WITH THE SUPPLY FAN AND DISABLE THE FAN WHEN THE PRESSURE EXCEEDS 3 IN/WC. SHUTDOWN TO BE HARDWIRE INTERLOCKED WITH EXHAUST FAN TO SHUT DOWN HOOD.

SYSTEM ALARMS & PRIORITY AT BAS:
- FAN FAILURE : COMMANDED ON/STATUS OFF
- FAN IN HAND: COMMANDED OFF/STATUS ON
- DAMPER FAILURE: COMMANDED ON/CLOSED FEEDBACK
- DAMPER IN HAND: COMMANDED OFF/OPEN FEEDBACK
- HIGH SUPPLY AIR TEMPERATURE: T1 IS GREATER THAN 28°C FOR MORE THAN 30 MINUTES
- LOW SUPPLY AIR TEMPERATURE: T1 IS LOWER THAN 10°C FOR MORE THAN 30 MINUTES
- FREEZE STAT: T1 IS EQUAL TO OR LOWER THAN 4°C

SYSTEM TRENDS AT BAS:
- DIRTY FILTER STATUS
- FAN STATUS
- DIFFERENTIAL PRESSURE
- S/A TEMPERATURE
- SPACE TEMPERATURE
- RTU CONTROLLER ANALOG VARIABLE (AV) POINTS AS AVAILABLE ON THE CONTROLLER
- RTU CONTROLLER BINARY VARIABLE (BV) POINTS AS AVAILABLE ON THE CONTROLLER

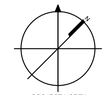
23 74 23.01 - PACKAGED ROOF TOP MAKEUP AIR UNIT CONTROL SEQUENCE

NOT TO SCALE

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

No.	Revision	Date
A	ISSUED FOR TENDER	2021-08-12

Orientation



PROJECT NORTH

Seal

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.

QUASAR CONSULTING GROUP
250 ROWNTREE DAIRY RD, WOODBRIDGE, ON
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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

CONTROL SEQUENCES II

Date	Project No	Drawing No
2021-08-12	CM-20-063	M651
Drawn by: Author		
Scale: N.T.S.		

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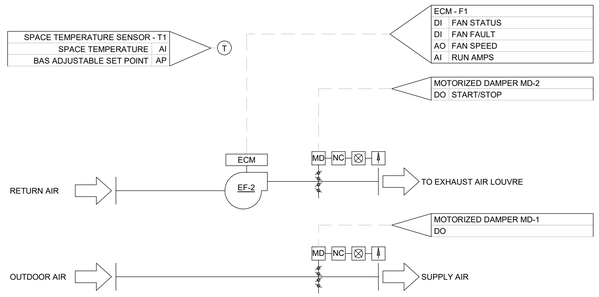


OPERATING MODE:

1. THE SYSTEM SHALL BE ENABLED ACCORDING TO THE FOLLOWING MODE:
   - SPACE TEMPERATURE CONTROL MODE MODE

INITIAL SET UP:

1. MOTORIZED DAMPERS SHALL BE NORMALLY CLOSED.
2. FAN SHALL BE BALANCED TO A FIELD DETERMINED AIRFLOW & STATIC PRESSURE AS PER THE VALUES INDICATED ON THE DRAWINGS DURING SYSTEM BALANCING AND COMMISSIONING.
3. SYSTEM SHALL MAINTAIN THE SPACE MAXIMUM TEMPERATURE SET POINT.
4. FAN SHALL BE ENABLED/DISABLED LOCALLY AT THE STARTER OR REMOTELY THROUGH THE BAS.

FAN CONTROL:

1. ON COMMAND TO START, MOTORIZED DAMPERS SHALL OPEN. UPON PROOF OF MOTORIZED DAMPER POSITION, FAN SHALL BE ENABLED. MD2 SHALL BE INTERLOCKED WITH RESPECTIVE FAN TO ENSURE CONTROLS OPERATION WHEN FAN IS OPERATING IN "HAND" OR "AUTO" MODE. CONTROLS SIGNAL SHALL BE DUPLICATED AT THE BAS.
2. FAN SHALL OPERATE AT VARIABLE SPEED.

TEMPERATURE CONTROL:

1. SPACE TEMPERATURE IS GREATER THAN (26°C DRY BULB) AND OUTDOOR AIR TEMPERATURE IS LESS THAN (SPACE TEMPERATURE MINUS 2°C).
   - T1 SHALL BE SET TO (26°C DRY BULB).
   - STAGE 1: MOTORIZED DAMPERS SHALL OPEN.
   - STAGE 2: SPACE TEMPERATURE REACHES 28°C, FAN SHALL MODULATE TO MAINTAIN SPACE TEMPERATURE

FIRE ALARM MODE:

1. FAN SHALL SHUT DOWN DURING FIRE ALARM.

FAN FAILURE:

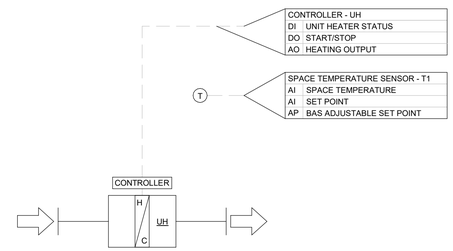
1. UPON FAN FAILURE, ASSOCIATED DAMPERS SHALL REMAIN OPEN.

SYSTEM ALARMS & PRIORITY AT BAS:

- FAN STATUS
- FAN FAILURE : COMMANDED ON/STATUS OFF
- FAN IN HAND: HOA SWITCH IN HAND
- RUN AMPS
- DAMPER FAILURE: COMMANDED OPEN/CLOSED FEEDBACK
- DAMPER IN HAND: COMMANDED CLOSED/OPEN FEEDBACK
- EQUIPMENT OPERATING HOURS

23 34 00.01 - ELECTRICAL ROOM VARIABLE SPEED FAN CONTROL SEQUENCE

NOT TO SCALE



OPERATING MODE:

1. THE SYSTEM SHALL BE ENABLED ACCORDING TO THE FOLLOWING MODE:
   - SPACE TEMPERATURE CONTROL MODE

INITIAL SET UP:

1. UNIT HEATER SHALL BE NORMALLY DISABLED.
2. T1 SHALL MAINTAIN THE SPACE TEMPERATURE SET POINT.
3. UNIT HEATER SHALL BE BACNET NETWORKED TO BAS.

TEMPERATURE CONTROL:

- T1 SHALL BE SET TO 16°C IN HEATING MODE. (BAS ADJUSTABLE POINT)
- UNDER NO CIRCUMSTANCES SHALL IT BE POSSIBLE TO SET THE UNIT HEATER CONTROL TEMPERATURE ABOVE THE APPARATUS BAY COOLING TEMPERATURE DEFINED IN 23 34 00.03 - APPARATUS BAY FAN CONTROL SEQUENCE
- IF THE SPACE TEMPERATURE DROPS BELOW SET POINT, UNIT SHALL BE ENABLED TO MAINTAIN THE T1 SET POINT.

SYSTEM ALARMS & PRIORITY AT BAS:

- UNIT FAILURE: COMMANDED ON/CLOSED FEEDBACK
- SPACE TEMPERATURE OUT OF RANGE (+/- 2°C)

SYSTEM TRENDS AT BAS:

- UNIT STATUS
- SPACE TEMPERATURE
- EQUIPMENT OPERATING HOURS

23 55 00.01 - GAS-FIRED UNIT HEATER CONTROL SEQUENCE

NOT TO SCALE

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

A	ISSUED FOR TENDER	2021-08-12

No.	Revision	Date

Orientation

PROJECT NORTH

Seal

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C.M.WATSON
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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

CONTROL SEQUENCES III

Date	Project No	Drawing No
2021-08-12	CM-20-063	M652
Drawn by: Author		
Scale: N.T.S.		

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