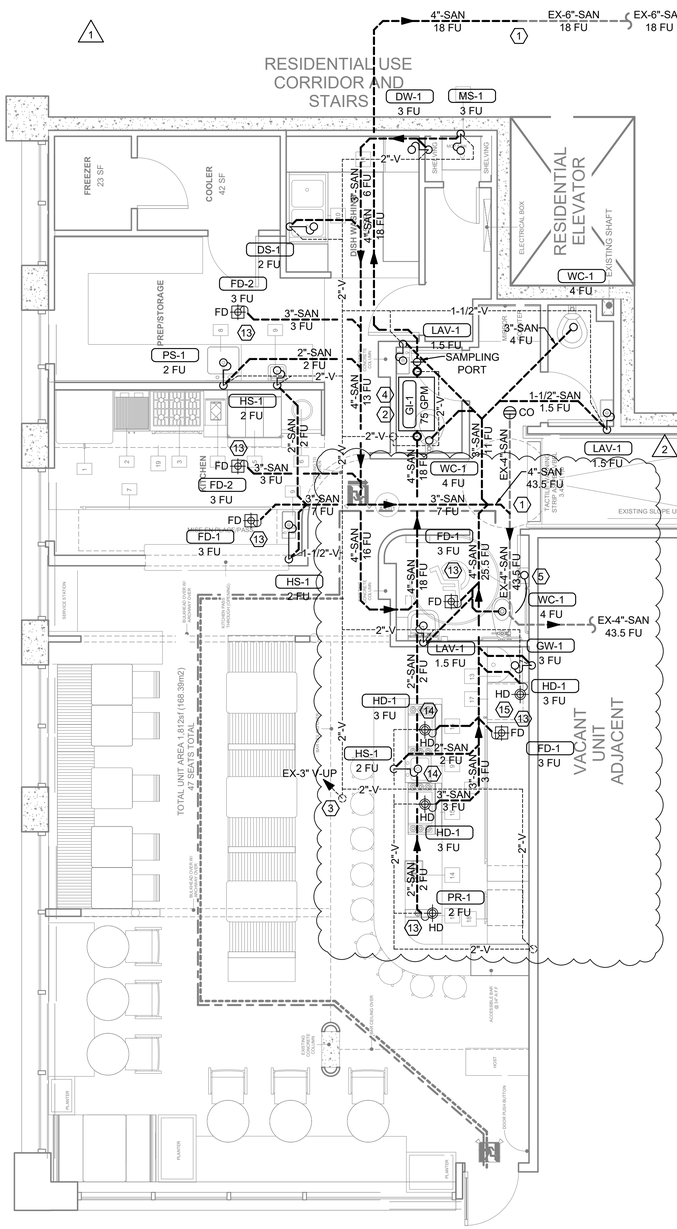

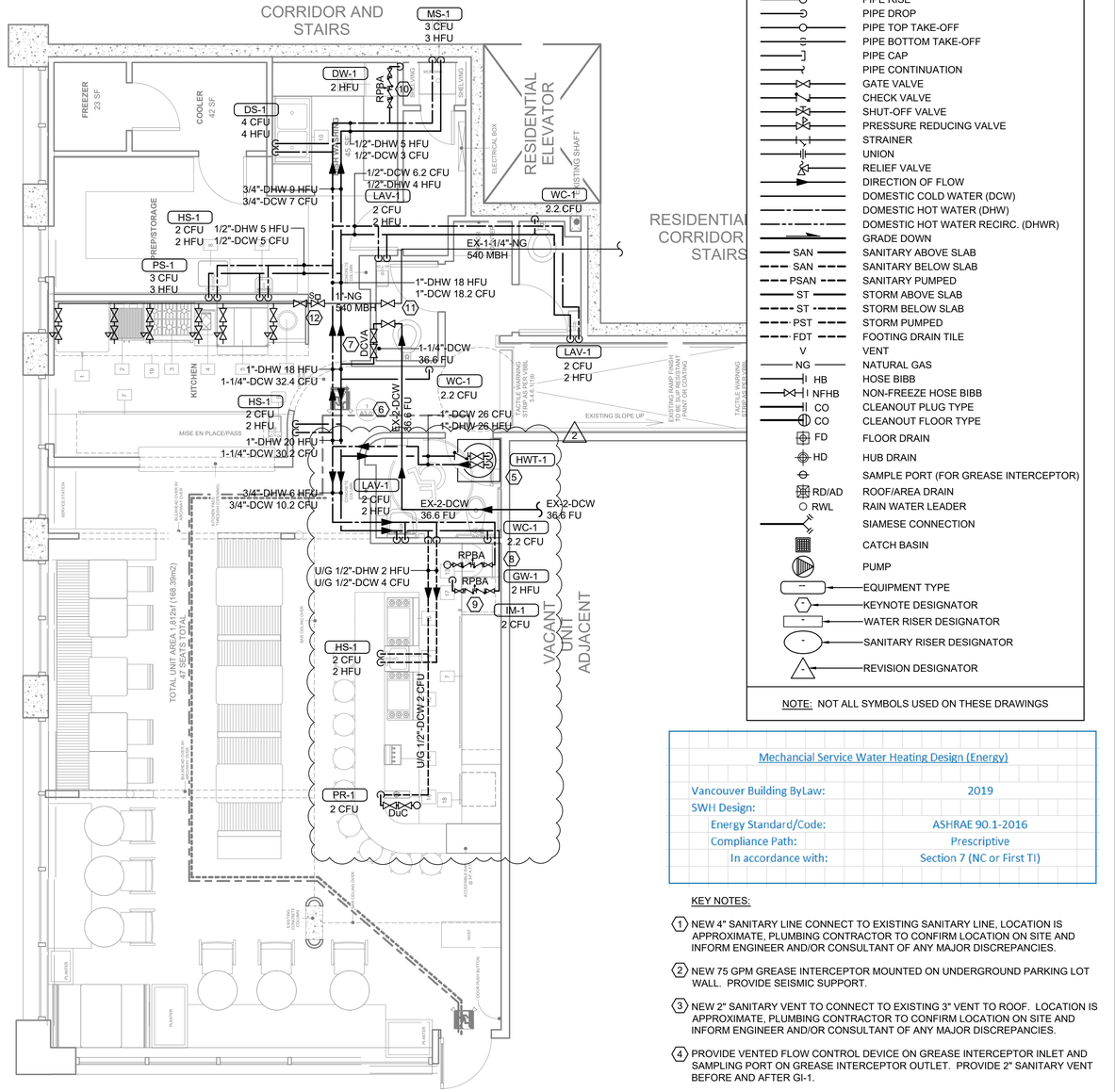

EQUIPMENT LIST	
TAG	EQUIPMENT TYPE
1	OVEN
2	GRILL (CHAR ROCK BROILER)
3	COOKTOP (36" RANGE)
4	FRYER
5	HOTTOP (GRIDDLE)
6	TANDOORI OVEN
7	UNDER COUNTER COOLER
8	PREP SINK
9	HAND WASH
10	DISH PIT SINK
11	DISHWASHER
12	MOP SINK
13	GLASS WASHER
14	BEER FRIDGE
15	ICE WELL
16	RINSER
17	UNDER COUNTER ICE MACHINE
18	UNDER COUNTER FREEZER

PLUMBING LEGEND

SYMBOLS	DESCRIPTION
M	WATER METER
	PIPE RISE
	PIPE DROP
	PIPE TOP TAKE-OFF
	PIPE BOTTOM TAKE-OFF
	PIPE CAP
	PIPE CONTINUATION
	GATE VALVE
	CHECK VALVE
	SHUT-OFF VALVE
	PRESSURE REDUCING VALVE
	STRAINER
	UNION
	RELIEF VALVE
	DIRECTION OF FLOW
	DOMESTIC COLD WATER (DCW)
	DOMESTIC HOT WATER (DHW)
	DOMESTIC HOT WATER RECIRC. (DHWR)
	GRADE DOWN
SAN	SANITARY ABOVE SLAB
SAN	SANITARY BELOW SLAB
PSAN	SANITARY PUMPED
ST	STORM ABOVE SLAB
ST	STORM BELOW SLAB
PST	STORM PUMPED
FDT	FOOTING DRAIN TILE
V	VENT
NG	NATURAL GAS
HB	HOSE BIBB
NFHB	NON-FREEZE HOSE BIBB
CO	CLEANOUT PLUG TYPE
CO	CLEANOUT FLOOR TYPE
FD	FLOOR DRAIN
HD	HUB DRAIN
	SAMPLE PORT (FOR GREASE INTERCEPTOR)
RD/AD	ROOF/AREA DRAIN
RWL	RAIN WATER LEADER
	SIAMESE CONNECTION
	CATCH BASIN
	PUMP
--	EQUIPMENT TYPE
*	KEYNOTE DESIGNATOR
-	WATER RISER DESIGNATOR
-	SANITARY RISER DESIGNATOR
-	REVISION DESIGNATOR

NOTE: NOT ALL SYMBOLS USED ON THESE DRAWINGS

Mechanical Service Water Heating Design (Energy)	
Vancouver Building ByLaw:	2019
SWH Design:	
Energy Standard/Code:	ASHRAE 90.1-2016
Compliance Path:	Prescriptive
In accordance with:	Section 7 (NC or First TI)

1 PLUMBING FLOOR PLAN - DWV PIPE

SCALE: 1/4"=1'

2 PLUMBING FLOOR PLAN - WATER PIPE

SCALE: 1/4"=1'

GENERAL NOTES:

1. ALL NEW PLUMBING WORKS WILL BE AS PER VANCOUVER BUILDING BYLAW 2019 AND VANCOUVER PLUMBING CODE 2019.
2. ALL SANITARY SEWERS TO BE CAST IRON PIPES OR XFR WITH MECHANICAL JOINTS. ABS OR SYSTEM 15 PIPES ARE NOT ALLOWED TO BE USED.
3. ALL WATER PIPES (COLD & HOT) TO BE PEX PIPE, AND USING AVERAGE PRESSURE LOSS METHOD FOR SIZING BASED ON 8 FT/S FOR BOTH HOT AND COLD.
4. INSULATE ALL HOT AND COLD WATER PIPES AT CEILING WITH 1" RIGID FIBERGLASS INSULATION C/W VAPOR BARRIER, PRE-MOULDED TYPE AND JOINTS SEALED.
5. SHUT-OFF VALVES REQUIRED AT ALL EQUIPMENT LOCATIONS CONNECTED TO WATER LINES (TYPICAL).
6. NO COMBUSTIBLE PLASTIC PIPES WITHIN FIRE SEPARATION WALLS.
7. FIRESTOP ALL PENETRATIONS THROUGH FIRE-RATED SEPARATIONS.
8. NO PENETRATIONS THROUGH FLOOR SLABS PERMITTED WITHOUT X-RAYS AND LANDLORD PRIOR APPROVAL.
9. INSTALL PEX PIPE SUPPORTS, ANCHORS, AND EXPANSION LOOPS AS PER MANUFACTURE'S RECOMMENDATIONS.
10. NEW PIPE CONNECTION LOCATION IS APPROXIMATE. CONTRACTOR SHALL VERIFY EXISTING PIPE LOCATION AFTER EXCAVATION. REPORT TO ENGINEER IF UNDERGROUND PIPE ROUTINE IS SIGNIFICANT FROM DESIGN.

SCOPE OF WORK:

1. NEW SANITARY LINES AND WATER LINES.
2. INSTALL NEW HOT WATER TANK AND GREASE INTERCEPTORS.
3. PROVIDE NEW GAS LINES.
4. INSTALL NEW PLUMBING FIXTURES.

KEY NOTES:

1. NEW 4" SANITARY LINE CONNECT TO EXISTING SANITARY LINE, LOCATION IS APPROXIMATE, PLUMBING CONTRACTOR TO CONFIRM LOCATION ON SITE AND INFORM ENGINEER AND/OR CONSULTANT OF ANY MAJOR DISCREPANCIES.
2. NEW 75 GPM GREASE INTERCEPTOR MOUNTED ON UNDERGROUND PARKING LOT WALL. PROVIDE SEISMIC SUPPORT.
3. NEW 2" SANITARY VENT TO CONNECT TO EXISTING 3" VENT TO ROOF. LOCATION IS APPROXIMATE, PLUMBING CONTRACTOR TO CONFIRM LOCATION ON SITE AND INFORM ENGINEER AND/OR CONSULTANT OF ANY MAJOR DISCREPANCIES.
4. PROVIDE VENTED FLOW CONTROL DEVICE ON GREASE INTERCEPTOR INLET AND SAMPLING PORT ON GREASE INTERCEPTOR OUTLET. PROVIDE 2" SANITARY VENT BEFORE AND AFTER GI-1.
5. HWT-1 TANK PAN TO DRAIN TO LAVATORY SINK P-TRAP.
6. EXISTING 2" DOMESTIC COLD WATER, LOCATION IS APPROXIMATE, PLUMBING CONTRACTOR TO CONFIRM LOCATION ON SITE AND INFORM ENGINEER AND/OR CONSULTANT OF ANY MAJOR DISCREPANCIES.
7. NEW 1-1/4" WATER LINE (32.6 FU) TIE INTO EXISTING DOMESTIC COLD WATER LINE WITH EXISTING SHUT-OFF VALVE. PROVIDE NEW DOUBLE CHECK VALVE ASSEMBLY WATTS 007 AT LOWER HEIGHT.
8. PROVIDE REDUCED PRESSURE BACKFLOW ASSEMBLY FOR NEW 1/2" DHW LINE FOR GLASSES WASHER. DRAIN TO GLASSES WASHER DRAIN.
9. PROVIDE REDUCED PRESSURE BACKFLOW ASSEMBLY FOR NEW 1/2" DHW LINE FOR ICE MAKER. DRAIN TO ICE MAKER HUB DRAIN.
10. PROVIDE REDUCED PRESSURE BACKFLOW ASSEMBLY FOR NEW 1/2" DHW LINE FOR DISHWASHER. DRAIN TO DISHWASHER DRAIN.
11. NEW 1-1/4" GAS LINE (753 MBH) @ 2 PSI AT HIGH LEVEL IN SPACE CONNECT FROM EXISTING 1-1/4" GAS LINE. EXISTING SHUT-OFF VALVE. LOCATION IS APPROXIMATE, CONTRACTOR TO CONFIRM LOCATION ON SITE AND INFORM ENGINEER AND/OR CONSULTANT OF ANY MAJOR DISCREPANCIES.
12. INSTALL SOLENOID GAS VALVE FOR 1" GAS LINE TO KITCHEN EQUIPMENT.
13. PROVIDE TRAP PRIMER FOR ALL FLOOR DRAINS AND HUB DRAINS, TYPICAL.
14. 3" HUB DRAIN FOR ICE WELLS WITH 1-1/2" VENT.
15. 3" HUB DRAIN FOR ICE MAKER WITH 1-1/2" VENT.

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EGBC PERMIT TO PRACTICE NO: 1000162

Permit to Practice No.: 1000162
PROFESSIONAL ENGINEER
PROVINCE OF BRITISH COLUMBIA
X. TAN
36565
2023-07-12

CITY OF VANCOUVER BRITISH COLUMBIA
INCORPORATED A.D. 1886

Branch: BUILDING REVIEW BRANCH
Date: AUG 9, 2023
Permit #: DB-2023-00887
Page #: 1 OF 6
Staff: KRISTA BIRCHAM

ACCEPTED

THE RESPONSIBILITY TO COMPLY WITH THE BY-LAWS AND THE CONDITIONS OF THE PERMIT REMAINS WITH THE OWNER, CONTRACTOR AND DEVELOPER AT ALL TIMES.

REVISION 2 FOR BUILDING PERMIT, THE FOLLOWING CHANGES ARE AS SUCH:

1. UPDATED ARCHITECTURAL BACKGROUNDS.
2. UPDATED UNIVERSAL WASHROOM PLUMBING.
3. REVISED BAR AREA PLUMBING.

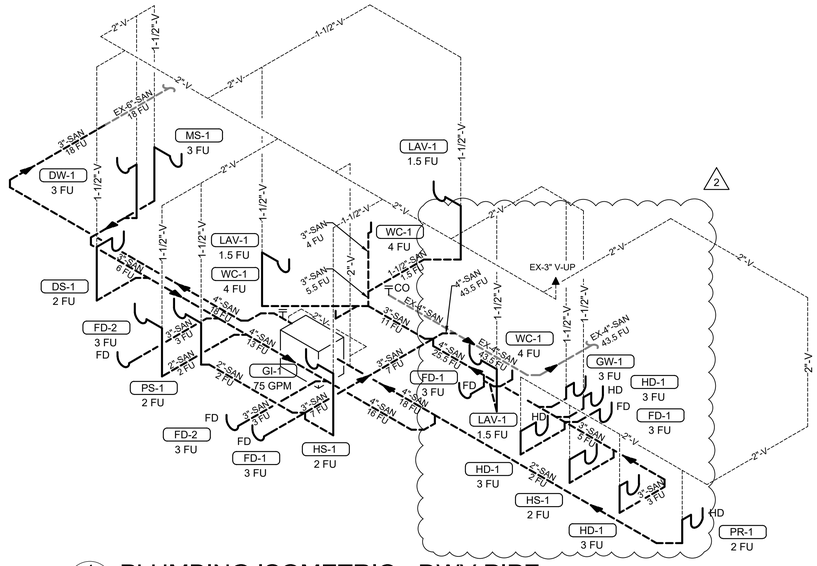
REVISION NO.	DATE	DESCRIPTION
6	JUL. 10, 2023	REV2 FOR BUILDING PERMIT
5	APR. 10, 2023	REV1 FOR BUILDING PERMIT
4	FEB. 14, 2023	ISSUED FOR BUILDING PERMIT
3	JAN. 13, 2023	ISSUED FOR REVIEW
2	JAN. 06, 2023	ISSUED FOR REVIEW
1	DEC. 21, 2022	ISSUED FOR REVIEW

PROJECT
RESTAURANT - TENANT IMPROVEMENT

SHEET TITLE
PLUMBING PLAN
- DWV PIPE
- WATER PIPE

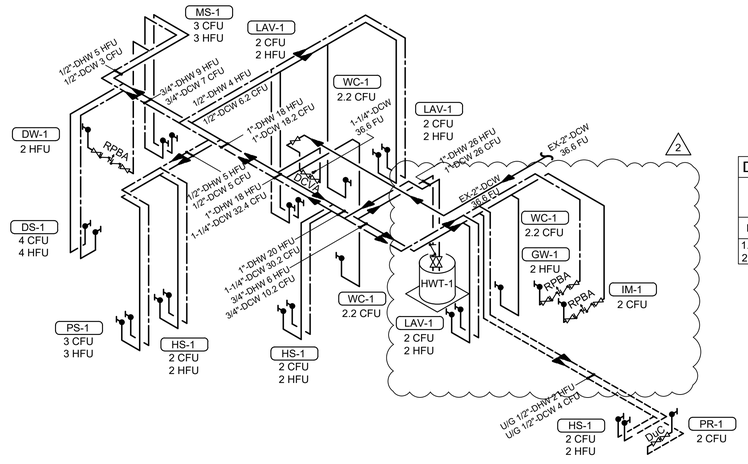
ADDRESS
2101 E HASTINGS STREET, VANCOUVER, BC

SCALE AS INDICATED	SHEET NO. P-1
DATE OCT. 31, 2022	
DESIGNED BY J.S.	
CHECKED BY X.T.	
PROJECT NO. x22118	



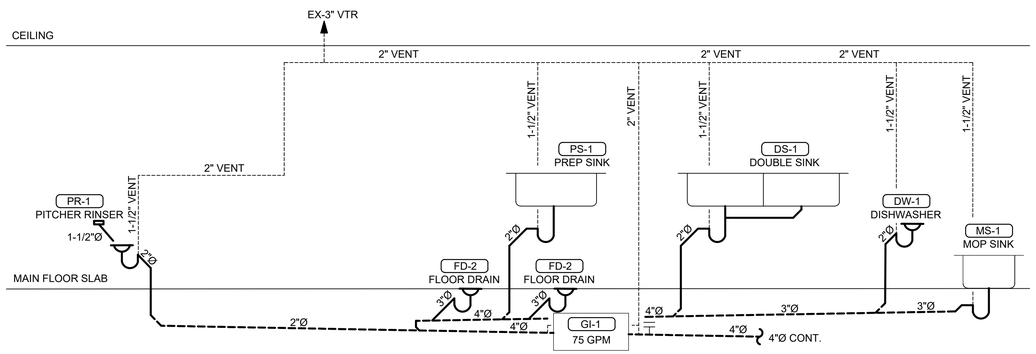
1 PLUMBING ISOMETRIC - DWV PIPE

SCALE: N.T.S.



2 PLUMBING ISOMETRIC - WATER PIPE

SCALE: N.T.S.



3 GREASE INTERCEPTOR INSTALLATION SCHEMATIC

SCALE: N.T.S.

GREASE INTERCEPTOR (GI-1) SIZING CALCULATION

TAG	FIXTURE	LENGTH (in)	WIDTH (in)	DEPTH (in)	CAPACITY FACTOR	CAPACITY (GPM)	AMOUNT	TOTAL (GPM)
DS-1	DOUBLE SINK	2 X 18	18	12	0.75	25.2	1	25.2
DW-1	DISHWASHER	--	--	--	--	8	1	8
PR-1	PITCHER RINSER	--	--	--	--	15.0	1	15.0
PS-1	PREP SINK	18	20	12	0.75	14.0	1	14.0
					DRAIN LOAD FOR ONE MINUTE DISCHARGE			62.2
MS-1	MOP SINK	20	16	11	0.75	15.2	1	15.2
FD-2	FLOOR DRAIN	--	--	--	--	37.5	2	37.5
					DRAIN LOAD FOR ONE MINUTE DISCHARGE			52.7
					SELECTED GREASE INTERCEPTOR (GI-1) SIZE			75

NOTES:
1. FLOOR DRAIN DISCHARGE RATE IS CALCULATED PER LINE, NOT PER AMOUNT.
2. MOP SINKS AND FLOOR DRAINS AND CONSIDERED NON-SIMULTANEOUS FOR THE CALCULATION AND MUST NOT EXCEED THE RATED FLOW OF SELECTED GREASE INTERCEPTOR.
3. TENANT SHALL SUBMIT A REGULAR PLAN FOR GREASE INTERCEPTOR CLEANING TO ENSURE SANITARY DISCHARGED DOES NOT EXCEED CITY'S BYLAW REQUIREMENTS.

PROPOSED SANITARY LOAD CALCULATION TABLE

TAG	FIXTURE	OUTLET PIPE SIZE	AMOUNT	EACH FIXTURE	TOTAL LOAD	REMARKS
DS-1	DOUBLE SINK	2"	1	2	2	NEW, TO GI-1
DW-1	DISHWASHER STANDPIPE W/ P-TRAP	2"	1	3	3	NEW, TO GI-1
MS-1	MOP SINK	3"	1	3	3	NEW, TO GI-1
PS-1	PREP SINK	2"	1	2	2	NEW, TO GI-1
PR-1	DRAIN FOR PITCHER RINSER	2"	1	2	2	NEW, TO GI-1
FD-2	FLOOR DRAIN (KITCHEN)	3"	2	3	6	NEW, TO GI-1
GW-1	GLASS WASHER STANDPIPE W/ P-TRAP	2"	1	3	3	NEW
HD-1	HUB DRAIN FOR ICE MAKER AND ICE WELLS	3"	3	3	9	NEW
HS-1	HAND SINK	2"	3	2	6	NEW
FD-1	FLOOR DRAIN (WASHROOM & COOLERS)	3"	3	3	9	NEW
LAV-1	LAVATORY	1-1/2"	3	1.5	4.5	NEW
WC-1	WATER CLOSET	3"	3	4	12	NEW
				TOTAL	61.5	

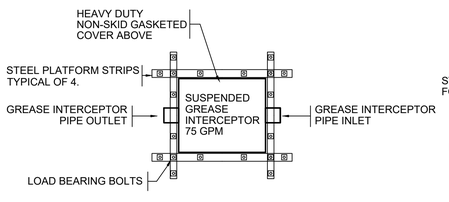
2

DOMESTIC WATER LOAD CALCULATION TABLE

TAG	FIXTURE	SUPPLY PIPE SIZE	AMOUNT	EACH FIXTURE			TOTAL LOAD			REMARKS
				COLD	HOT	TOTAL	COLD	HOT	TOTAL	
DS-1	DOUBLE SINK	1/2"	1	4	4	4	4	4	4	NEW
DW-1	DISHWASHER	1/2"	1	0	2	2	0	2	2	PROVIDE RPBA, NEW
GW-1	GLASS WASHER	1/2"	1	0	2	2	0	2	2	PROVIDE RPBA, NEW
HS-1	HAND SINK	1/2"	3	2	2	2	6	6	6	NEW
PS-1	PREP SINK	1/2"	1	3	3	3	3	3	3	NEW
IM-1	ICE MAKER	1/2"	1	2	0	2	2	0	2	PROVIDE RPBA, NEW
PR-1	PITCHER RINSER	1/2"	1	2	2	2	2	0	2	PROVIDE DuC, NEW
MS-1	MOP SINK	1/2"	1	3	3	3	3	3	3	NEW
LAV-1	LAVATORY	1/2"	3	2	2	2	6	6	6	NEW
WC-1	WATER CLOSET	1/2"	3	2.2	--	2.2	6.6	--	6.6	NEW
						TOTAL	32.6	26	36.6	

DOMESTIC HOT WATER TANK SCHEDULE

TAG	MANUFACTURER	MODEL	TYPE	LOCATION	NOMINAL CAPACITY (gal)	DIMENSIONS		LOWER ELEMENT SIZE (W)	UPPER ELEMENT SIZE (W)	RECOVERY RATE (gal/hr)	ELECTRICAL (V/ph/Hz)	SHIPPING WEIGHT (lbs)	REMARKS
						HEIGHT (in)	DIAMETER (in)						
HWT-1	BRADFORD	LE250L3	ELECTRIC	CEILING	47	34	26	6,000	6,000	18	208/1/60	140	NEW
1. PROVIDE BACKFLOW PREVENTOR ASSEMBLY VALVE, ISOLATION VALVE ON INLET LINE. PROVIDE PRESSURE RELIEF VALVE, AND DRAIN VALVE ON THE TANK.													
2. CONTRACTOR TO PROVIDE SEISMIC SUPPORT TO FIRMLY MOUNT THE TANK.													



5 SUSPENDED BELOW FLOOR GREASE INTERCEPTOR

SCALE: N.T.S.

GREASE INTERCEPTOR SCHEDULE

TAG	MANUFACTURER	MODEL	FLOW RATE (gpm)	GREASE CAP. (lbs)	OUTLET / INLET SIZE (in)	DIMENSIONS (L" x W" x H")	REMARKS
GI-1	WATTS	WD-175	75	150	4	36 x 24 x 24.5	MOUNTED ON U/G PARKING WALL

NOTES:
1. REFER TO DWGS AND INSTALLATION MANUAL FOR DRAIN AND VENT PIPE CONNECTIONS.
2. OWNER SHALL CLEAN GREASE INTERCEPTOR AT REGULAR BASE. TREAT THE WASTE AS PER CITY BYLAW.
3. C/W GASKETED EPOXY COATED HEAVY DUTY STEEL COVER.

GAS CHART

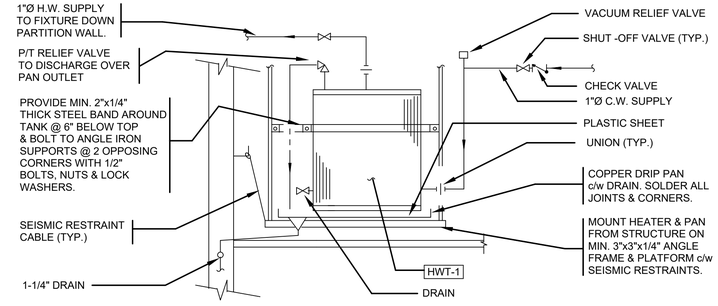
TAG	EQUIPMENT	MANUFACTURER	PIPE SIZE	GAS LOAD	
				MBH	kW
1	CONVECTION OVEN	GARLAND	3/4"	53	15.5
2	CHAR ROCK BROILER	EFI SALES LTD	3/4"	70	20.5
3	36 IN RANGE	EFI SALES LTD	3/4"	177	51.9
4	FRYER	EFI SALES LTD	3/4"	102	29.9
5	GRIDDLE	EFI SALES LTD	3/4"	90	26.4
6	TANDOORI OVEN	OMCAN	3/4"	48	14.1
	TOTAL			540	158.3
	REQUIRED GAS PRESSURE AFTER METER			<2.0 psi	

DOMESTIC WATER PIPE SIZING

WATER PRESSURE AVAILABLE FOR FRICTION LOSS		
	psi	kPa
AVAILABLE STATIC PRESSURE	50	345
SERVICE LOSS	0	0
FOR FUTURE	0	0
METER AND BACKFLOW PREVENTOR	-10	-69
ELEVATION PRESSURE REQUIRED	-5	-34
PRESSURE REQUIRED AT FIXTURE	-20	-138
BOOSTER	0	0
PRESSURE FOR FRICTION LOSS	15	103
	ft	m
TOTAL EQUIVALENT PIPE LENGTH	100	30
	psi/ft	kPa/m
PRESSURE FRICTION LOSS PER LENGTH	0.15	3.39
AVAILABLE PRESSURE FRICTION LOSS PER METER OF 3.39 kPa/m IS GREATER THAN 2.6 kPa/m. THEREFORE, AVERAGE PRESSURE LOSS METHOD WILL BE USED.		

WATER PIPE SIZING CHART

PIPE MATERIAL	COPPER		PEX	
WATER VELOCITY	@ 1.5 m/s (5 ft/s)		@ 2.4 m/s (8 ft/s)	
PIPE SIZE (in)	FLOW RATE (L/s)	FIXTURE UNIT (FU)	FLOW RATE (L/s)	FIXTURE UNIT (FU)
1/2	0.23	3.5	0.36	7
5/8	0.34	6.5	0.54	11
3/4	0.48	9	0.77	17
1	0.81	18	1.26	30
1-1/4	1.24	29	1.80	54
1-1/2	1.75	46	2.80	102
2	3.04	120	4.92	265
3	6.70	400	7.89	500
4	11.78	850	10.73	750
Vancouver Building Bylaw 2019				



4 DOMESTIC HOT WATER TANK SCHEMATIC

SCALE: N.T.S.

ARCHITECT:
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MECHANICAL ENGINEER:
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XT ENGINEERING LTD.
EGBC PERMIT TO PRACTICE NO: 1000162

Permit to Practice No.: 1000162
PROFESSIONAL ENGINEER
PROVINCE OF BRITISH COLUMBIA
X. TAN
36565
2023-07-12

CITY OF VANCOUVER
BRITISH COLUMBIA
BUILDING
Branch: BUILDING REVIEW BRANCH
Date: AUG 9, 2023
Permit #: DB-2023-00887
Page #: 2 OF 6
Staff: KRISTA BIRCHAM
ACCEPTED
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1. UPDATED ARCHITECTURAL BACKGROUNDS.
2. UPDATED UNIVERSAL WASHROOM PLUMBING.
3. REVISED BAR AREA PLUMBING.

REVISION

NO.	DATE	DESCRIPTION
6	JUL. 10, 2023	REV2 FOR BUILDING PERMIT
5	APR. 10, 2023	REV1 FOR BUILDING PERMIT
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1	DEC. 21, 2022	ISSUED FOR REVIEW

PROJECT

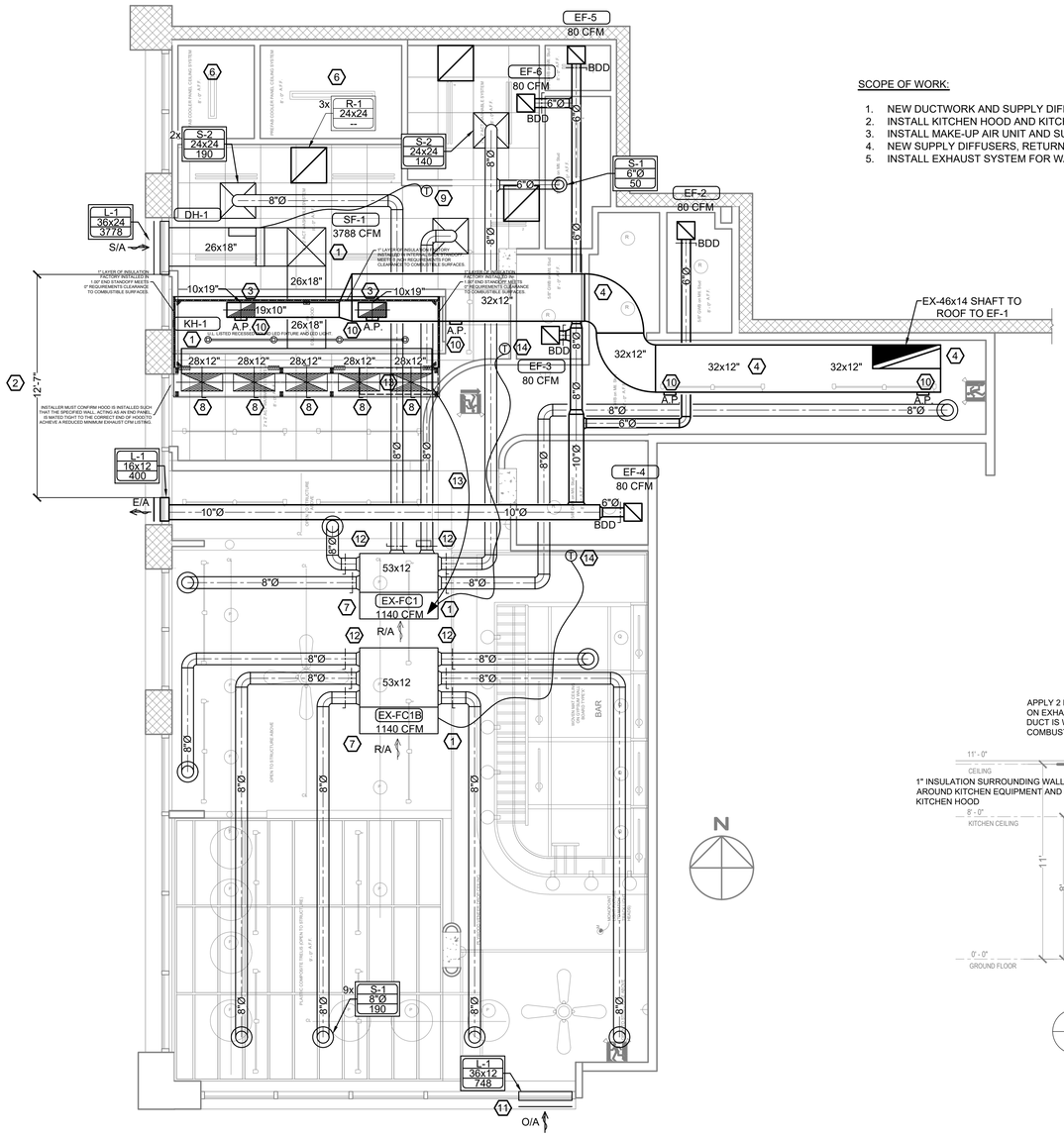
RESTAURANT - TENANT IMPROVEMENT

SHEET TITLE

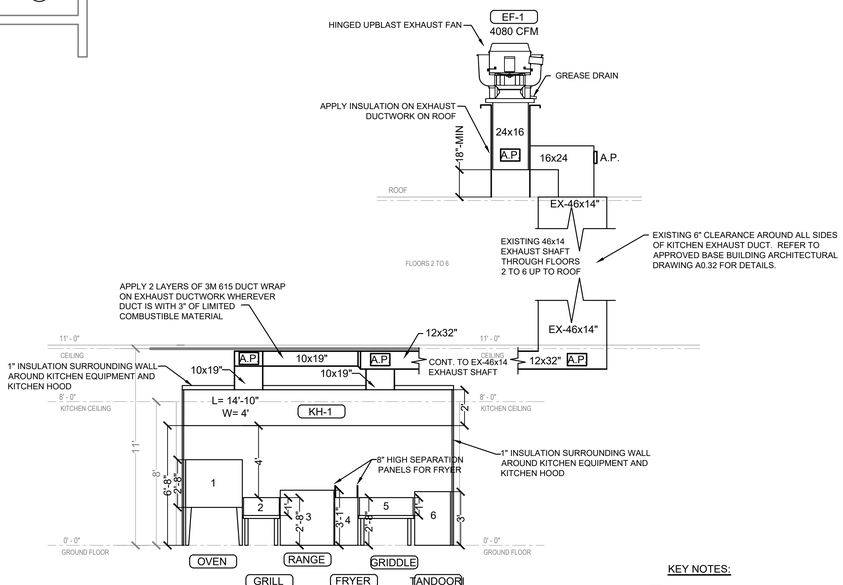
PLUMBING PLAN
- ISOMETRICS
- SCHEMATICS
- SCHEDULES

ADDRESS
2101 E HASTINGS STREET,
VANCOUVER, BC

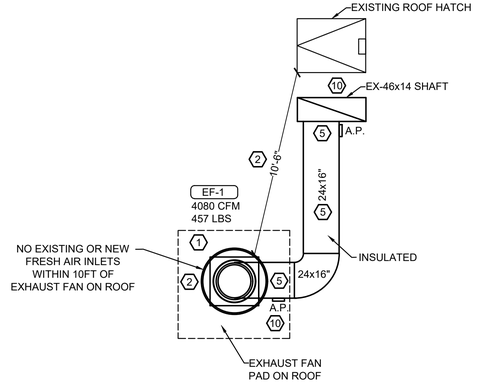
SCALE	SHEET NO.
AS INDICATED	P-2
DATE: OCT. 31, 2022	
DESIGNED BY: J.S.	
CHECKED BY: X.T.	
PROJECT NO.: x22118	



1 HVAC FLOOR PLAN
SCALE: 1/4"=1'



2 KITCHEN HOOD SECTION
SCALE: 1/4"=1'



3 EXHAUST ROOF PLAN
SCALE: 1/4"=1'

Mechancial HVAC Design (Energy)	
Vancouver Building ByLaw:	2019
HVAC Design:	
Energy Standard/Code:	ASHRAE 90.1-2016
Compliance Path:	Prescriptive
Design Method:	HVAC Simplified
In accordance with:	Section 6 (NC or First TI)
Climate Zone:	4C
Ventilation:	Res: 62-2001 (except addendum n)
If Mixed Use:	N/A

SCOPE OF WORK:

1. NEW DUCTWORK AND SUPPLY DIFFUSERS FOR EXISTING FAN COIL UNITS. RELOCATED EXISTING FC1.
2. INSTALL KITCHEN HOOD AND KITCHEN EXHAUST DUCTWORK.
3. INSTALL MAKE-UP AIR UNIT AND SUPPLY DUCTWORK.
4. NEW SUPPLY DIFFUSERS, RETURN GRILLES, AND LOUVRES.
5. INSTALL EXHAUST SYSTEM FOR WASHROOMS, MOP ROOM, AND DISHWASHING ROOM.

HVAC SYSTEM CONTROL SEQUENCE

1. NORMAL MODE:
 1.1. UNDER NORMAL OPERATION CONDITION
  1.1.1. SEQUENCE OF OPERATION NON-FIRE CONDITIONS. THE FOLLOWING ARE INTERLOCKED: SF-1 AND EF-1 SO THAT THEY OPERATE TOGETHER. IF APPLICABLE, INTERLOCK SF-1 AND EF-1 SO THE HEATER CAN ONLY OPERATE IF THE EXHAUST IS ON [ULC-S647-05 6.5, B149.1-05 7.20.3 (B)]. INTERLOCK EF-1 AND COOKING APPLIANCES SO EXHAUST TURNS ON WHEN COOKING EQUIPMENT IS TURNED ON. START-UP SEQUENCE WILL BE AS FOLLOWS, WITH SHUT-DOWN IN REVERSE ORDER: I) SUPPLY (MAKE-UP) AIR UNIT FAN, II) EXHAUST FAN, III) SUPPLY (MAKE-UP) AIR UNIT HEATER, IV) COOKING EQUIPMENT.
  1.1.2. HOOD EXHAUST FAN EF-1 IS INTERLOCKED WITH SUPPLY AIR UNIT SF-1. WHEN EF-1 IS ON/OFF, SF-1 IS TURNED ON/OFF.
  1.1.3. EF-1 FAN IS ACTIVATED WHEN DUCT-MOUNTED TEMPERATURE SENSOR EXCEEDS 50°C (ADJUSTABLE) MANUALLY OVERRIDE BY OPERATOR.
  1.1.4. SF-1 FAN IS TURNED ON WHEN EF-1 IS ON. DH-1 HEATER IS TURNED ON WHEN OUTDOOR AIR TEMPERATURE IS LOWER THAN 15°C (ADJUSTABLE). MANUALLY OVERRIDE BY OPERATOR.

2. FIRE MODE:
 2.1. WHEN FIRE ALARM IS ACTIVATED, EITHER MANUALLY TRIGGERED OR BY LOCAL FIRE ALARM SYSTEM.
  2.1.1. SHUT DOWN ROOFTOP UNIT
  2.1.2. HOOD EXHAUST FAN EF-1 KEEPS RUNNING.
  2.1.3. SHUT OFF ELECTRICAL POWER TO HOOD LIGHTINGS.
  2.1.4. SHUT OFF SUPPLY (MAKE-UP) AIR UNIT SF-1.

HVAC LEGEND

SYMBOLS	DESCRIPTION
/	SUPPLY OR OUTSIDE AIR DUCT UP / DOWN
/	RETURN DUCT UP / DOWN
/	EXHAUST DUCT UP / DOWN
	TURNING VANES
	FLEXIBLE DUCT CONNECTION
	ACOUSTICALLY INSULATED DUCT
	BALANCING DAMPER
BDD	BACKDRAFT DAMPER
FD	FIRE DAMPER
6"Ø	ROUND DUCT
6x12"	RECTANGULAR DUCT (6 IS VISIBLE DIM.)
S/A	SUPPLY AIR
R/A	RETURN AIR
E/A	EXHAUST AIR
O/A	OUTSIDE AIR
T	THERMOSTAT
R	REVERSE ACTING THERMOSTAT
S	SWITCH
-	GRILLE/DIFFUSER TYPE
-	SIZE OR NECK SIZE (IN.)
-	AIR VOLUME (CFM)
--	EQUIPMENT TYPE
-	KEYNOTE DESIGNATOR
-	REVISION DESIGNATOR

NOTE: NOT ALL SYMBOLS USED ON THESE DRAWINGS

KEY NOTES:

1. a. CONTRACTOR RETAINED STRUCTURAL ENGINEER SHALL PROVIDE DETAILS FOR SEISMIC CONSTRAINT FOR ALL MECHANICAL EQUIPMENT INCLUDING ROOF TOP UNIT, ROOF MOUNTED FANS, CEILING MOUNTED EQUIPMENT, EXHAUST HOOD, DUCTWORK, AND WATER TANK INSTALLATION. TYPICAL.
   b. CONTRACTOR SHALL OBTAIN STRUCTURAL WRITTEN APPROVAL PRIOR TO CUTTING ANY OPENINGS ON EXISTING ROOF OR WALL. TYPICAL.
   c. STRUCTURAL ENGINEER SHALL ALSO PROVIDE WRITTEN APPROVAL FOR ALL CEILING-HUNG EQUIPMENT INSTALLATION. TYPICAL.
2. ENSURE EXHAUST AIR DISCHARGE IS 10 FT AWAY FROM ANY EXISTING/NEW FRESH AIR INLETS OR PROPERTY LINE. ALL ROOFTOP EQUIPMENT TO BE MINIMUM 6FT AWAY FROM ROOF EDGE.
3. 19x10" EXHAUST RISERS FROM KH-1.
4. 32x12" EXHAUST DUCT TO EXISTING EXHAUST SHAFT TO ROOF, WRAP DUCT WITH TWO LAYERS OF 3M 615+ FIRE DUCT WRAP WHEREVER DUCT IS WITH 3" OF LIMITED COMBUSTIBLE MATERIAL.
5. 24x16" INSULATED EXHAUST DUCT ON ROOF. INSTALL EXHAUST FAN ON EXHAUST PAD ON ROOF.
6. WALK-IN FREEZER AND COOLER DESIGN BY OTHERS.
7. HVAC CONTRACTOR TO RETAIN EXISTING FANCOIL UNITS. PROVIDE NEW DUCTWORK, DIFFUSERS AND GRILLES. REFER TO BASE BUILDING MECHANICAL DRAWING FOR EQUIPMENT DETAILS.
8. FIVE INDIVIDUAL 28x12" SUPPLY DUCTS FOR KITCHEN MAKE-UP AIR. AIR BALANCING DAMPERS FOR EACH OF 28x12" DUCTS FOR MAKE-UP AIR.
9. INSTALL NEW THERMOSTAT FOR SF-1.
10. PROVIDE ACCESS PANELS FOR EXHAUST DUCT, MAXIMUM 10' APART.
11. PROVIDE NEW 36x12" DRAINABLE LOUVRE FOR NEW OUTSIDE AIR SUPPLY, MINIMUM 748 CFM. OUTDOOR AIR RATE CALCULATED BASED ON ASHRAE 62.1 - 2007.
12. PROVIDE 12 AIR BALANCING DAMPERS FOR FANCOIL UNITS BRANCH DUCTS.
13. RELOCATE EX-FC1 TO NEW LOCATION TO AVOID CONFLICT WITH KITCHEN HOOD. PROVIDE CONDENSATE DRAIN.
14. INSTALL THERMOSTATS FOR FAN COIL UNITS.

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EGBC PERMIT TO PRACTICE NO:
1000162

Permit to Practice No.: 1000162
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36565
2023-07-12

CITY OF VANCOUVER
BRITISH COLUMBIA
BUILDING REVIEW BRANCH

Branch: BUILDING REVIEW BRANCH
Date: AUG 9, 2023
Permit #: DB-2023-00887
Page #: 3 OF 6
Staff: KRISTA BIRCHAM

ACCEPTED

THE RESPONSIBILITY TO COMPLY WITH THE BY-LAWS AND THE CONDITIONS OF THE PERMIT REMAINS WITH THE OWNER, CONTRACTOR AND DEVELOPER AT ALL TIMES.

REVISION 2 FOR BUILDING PERMIT, THE FOLLOWING CHANGES ARE AS SUCH:

1. UPDATED ARCHITECTURAL BACKGROUNDS.
2. UPDATED UNIVERSAL WASHROOM PLUMBING.
3. REVISED BAR AREA PLUMBING.

REVISION

NO.	DATE	DESCRIPTION
6	JUL. 10, 2023	REV2 FOR BUILDING PERMIT
5	APR. 10, 2023	REV1 FOR BUILDING PERMIT
4	FEB. 14, 2023	ISSUED FOR BUILDING PERMIT
3	JAN. 13, 2023	ISSUED FOR REVIEW
2	JAN. 06, 2023	ISSUED FOR REVIEW
1	DEC. 21, 2022	ISSUED FOR REVIEW

PROJECT

RESTAURANT - TENANT IMPROVEMENT

SHEET TITLE

HVAC PLAN
- FLOOR
- SECTION

ADDRESS
2101 E HASTINGS STREET,
VANCOUVER, BC

SCALE AS INDICATED	SHEET NO. M-1
DATE OCT. 31, 2022	
DESIGNED BY J.S.	
CHECKED BY X.T.	
PROJECT NO. x22118	

KITCHEN HOOD SCHEDULE

TAG	MANUFACTURER	MODEL	LENGTH (ft-in)	DEPTH (ft-in)	EXHAUST (cfm)	EXHAUST PLENUM RISERS (in x in)	EXHAUST PLENUM HEIGHT (in)	SERVICE	REMARKS
KH-1	CAPTIVEAIRE	4824 ND-2-PSP-F	14'-10"	4'-0"	4080	10" x 19"	4"	KITCHEN COOKING EQUIP.	NEW

REMARKS:
1. MADE OF 18-GAUGE STAINLESS STEEL, C/W WASHABLE BAFFLE FILTER, ULC710 LISTED
2. CONTRACTOR RETAINED STRUCTURAL ENGINEER TO PROVIDE THE WALL MOUNTING SUPPORT DETAIL
3. PROVIDE ELECTRICAL JUNCTION BOX AND LIGHTING SYSTEM
4. PROVIDE CONTROL PANEL FOR STAGING CONTROL OF EXHAUST FAN, MAKEUP AIR FAN AND LIGHTING SYSTEM
5. PROVIDE 1" STANLESS STEEL PROTECTION ON SIDES OF WALL SURROUNDING KITCHEN HOOD

SUPPLY (MAKE-UP) AIR FAN SCHEDULE

TAG	MANUFACTURER	MODEL	SERVICE	TYPE	LOCATION	AIR FLOW (CFM)	SIZE in. (HxWxL)	ESP (in. wg)	MOTOR (HP)	ELECTRICAL (V/ph/Hz)	SOUND PRESS. (sone)	WEIGHT (lbs)	NOTES
SF-1	GREENHECK	SQ-160	MAKE-UP AIR	INLINE WITH SIDE DISCHARGE	KITCHEN	3788	26x26x26	0.0	1	115/60/1	16.8	160	NEW

NOTES:
1. INTERLOCK SF-1 WITH DH-1, INTERLOCK SF-1 WITH EF-1
2. PROVIDE SPEED CONTROL FOR VARI-GREEN MOTOR

KITCHEN EXHAUST FAN SCHEDULE

FAN UNIT NO	TAG	QTY	FAN UNIT MODEL #	MANUFACTURER	CFM	ESP	RPM	MOTOR ENCL	HP	BHP	PHASE	VOLT	FLA	WEIGHT (LBS)	SONES
2	EF-1	1	AM-SIF20DD	AQUAMATIC	4079	1.600	1426	TEFC,PREMIUM	3.000	1.8230	3	208	9.4	457	17.8

WASHROOM FAN SCHEDULE

TAG	LOCATION	AREA SERVED	MODEL	AIR FLOW	ESP (in. wg)	SOUND	MOTOR SIZE	WEIGHT	V/C/P	NOTES
EF-2	CEILING	WASHROOM	BROAN XB80	80 CFM	0.25	<0.3 SONE	5.8 WATTS	12.5 LBS	120/60/1	NEW
EF-3	CEILING	WASHROOM	BROAN XB80	80 CFM	0.25	<0.3 SONE	5.8 WATTS	12.5 LBS	120/60/1	NEW
EF-4	CEILING	WASHROOM	BROAN XB80	80 CFM	0.25	<0.3 SONE	5.8 WATTS	12.5 LBS	120/60/1	NEW
EF-5	CEILING	MOP ROOM	BROAN XB80	80 CFM	0.25	<0.3 SONE	5.8 WATTS	12.5 LBS	120/60/1	NEW
EF-6	CEILING	DISHWASHING	BROAN XB80	80 CFM	0.25	<0.3 SONE	5.8 WATTS	12.5 LBS	120/60/1	NEW

NOTES:
1. PROVIDE DISCONNECT SWITCH, FACTORY MOUNTED, NEMA 3R DISCONNECT.
2. PROVIDE BACKDRAFT DAMPER.
3. PROVIDE WALL MOUNTED SWITCH. CONTINUOUSLY RUNNING.

ELECTRIC DUCT HEATER SCHEDULE

TAG	MANUFACTURER	MODEL	DIMENSION (L" x W")	AIR DATA FLOW (cfm)	AIR DATA EAT (°F)	AIR DATA LAT (°F)	CAPACITY (kW)	ELECTRICAL (V/ph/Hz)	NOTES
DH-1	GREENHECK	IDHB	26" X 18"	3788	18	58	20	208/3/60	NEW

NOTES:
1. INTERLOCK DH-1 WITH SF-1

EXISTING FAN COIL UNITS (FOR REFERENCE ONLY, REFER TO BASE BUILDING DRAWING FOR DETAILS)

FAN COIL UNITS (SPLIT SYSTEMS)

1. SINGLE FT. POWER SOURCE CONTROL BOX
2. 30% FARR 30/30 FILTERS
3. COOLING ONLY THERMOSTAT
4. HONEYWELL PROGRAMMABLE THERMOSTAT
5. SUSPENSION KIT
6. 3-PHASE ELECTRIC COIL
7. DISCONNECT KIT
8. CONDENSER DRAIN TRAP KIT
9. REVERSE ACTING TSTAT

unit	service	type	manuf	model	cfm	esp	fan rpm	motor hp	motor elect	fan accessory	vibr'n isol'n	disch arrgt	heating capacity	cooling capacity	rated amps	remarks
L1-FC1	CRU	SPLIT	LG	ARNU363BG	1141	0.3"	-	450W	208/1	1,2,4,5,7,8	SEE SPEC	HORIZ.	40.6 MBH	36.2 MBH	3.31	DIMENSION: 53"x18"x12"
L1-FC1B	CRU	SPLIT	LG	ARNU363BG	1141	0.3"	-	450W	208/1	1,2,4,5,7,8	SEE SPEC	HORIZ.	40.6 MBH	36.2 MBH	3.31	DIMENSION: 53"x18"x12"

KITCHEN HOOD (KH-1) CAPACITY VERIFICATION

METHOD 1: VERTICAL AREA OF HOOD

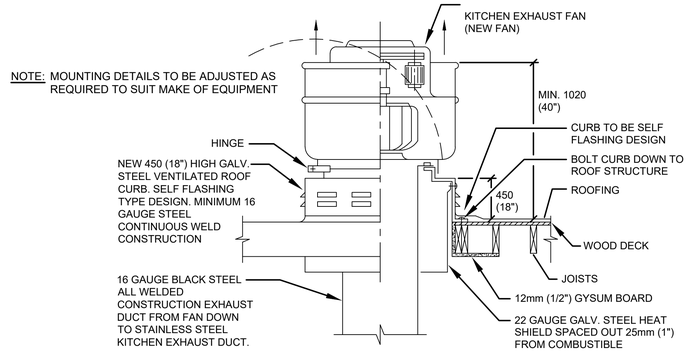
LENGTH (ft)	WIDTH 1 (ft)	WIDTH 2 (ft)	HEIGHT (ft)	(cfm/sq.ft)	EXHAUST AIR FLOW (cfm)	
14.8	1.0	0	4	50	(14.8+1)*4*50	3,160
TOTAL EXHAUST AIR FLOW					3160 CFM	

METHOD 2: HOOD SPECIFICATION REQUIREMENTS

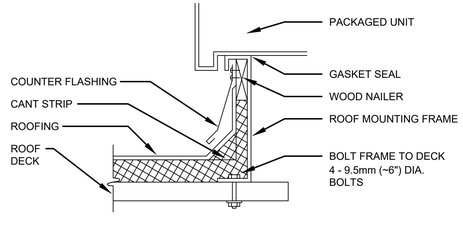
LENGTH (ft)	WIDTH 1 (ft)	WIDTH 2 (ft)	HEIGHT (ft)	(cfm/sq.ft)	EXHAUST AIR FLOW (cfm)	
14.8	0.0	0	4	275	14.8*275	4,080
TOTAL EXHAUST AIR FLOW					4080 CFM	

GRILLE AND DIFFUSER SCHEDULE

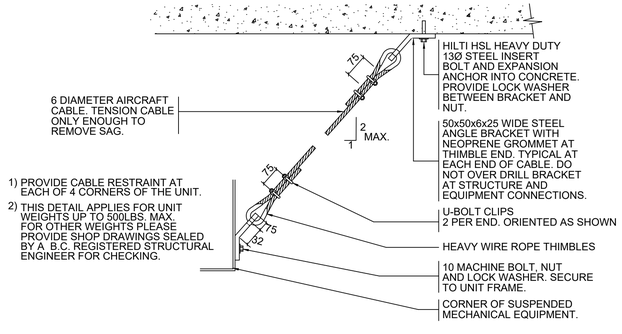
TAG	MANUFACTURER	MODEL	FUNCTION	FACE SIZE	NECK SIZE	FINISH	REMARKS
L-1	E.H. PRICE	DE635	EXTRUDED ALUMINUM DRAINABLE LOUVRE	SEE DWG	--	PRIME COATED	NEW, FLANGE MOUNT C/W SCREENS
R-1	E.H. PRICE	500	RETURN GRILLE	24 x 24	--	BY ARCH	NEW
S-1	E.H. PRICE	RCD	ROUND CONE DIFFUSER	--	8"Ø, 6"Ø	BY ARCH	NEW, FOR OPEN CEILING & ELECTRICAL CLOSET
S-2	E.H. PRICE	SPD	SQUARE PLAQUE DIFFUSER	24 x 24	8"Ø	BY ARCH	NEW, FOR KITCHEN CEILING



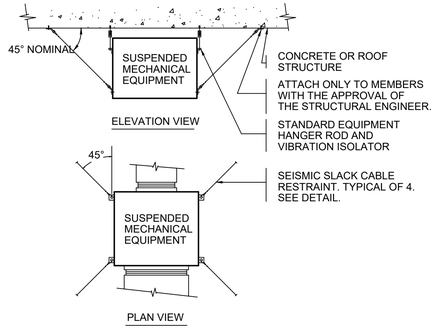
1 -- DETAIL OF KITCHEN HOOD EXHAUST FAN INSTALLATION
SCALE: N.T.S.



2 -- DETAIL OF HVAC ROOF CURB
SCALE: N.T.S.



3 -- SEISMIC SLACK CABLE CONNECTION DETAIL
SCALE: N.T.S.



4 -- SEISMIC RESTRAINT DETAIL FOR SUSPENDED EQUIPMENT
SCALE: N.T.S.

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CITY OF VANCOUVER BRITISH COLUMBIA
Branch: BUILDING REVIEW BRANCH
Date: AUG 9, 2023
Permit #: DB-2023-00887
Page #: 4 OF 6
Staff: KRISTA BIRCHAM
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REVISION

NO.	DATE	DESCRIPTION
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PROJECT
RESTAURANT - TENANT IMPROVEMENT

SHEET TITLE
HVAC PLAN
- SCHEDULES
- DETAILS

ADDRESS
2101 E HASTINGS STREET,
VANCOUVER, BC

SCALE: AS INDICATED
DATE: OCT. 31, 2022
DESIGNED BY: J.S.
CHECKED BY: X.T.
PROJECT NO.: x22118
SHEET NO.: M-2

MECHANICAL SPECIFICATIONS (HVAC and PLUMBING)

1. GENERAL

1.1 INTENT

.1 The intent of this specification and the drawings is to provide a complete and fully operating mechanical system in complete accord with applicable codes. The Mechanical Contractor shall make provisions for labour, material, and equipment necessary to complete the mechanical work.

.2 Drawings and specifications are complementary to each other and what is called for in one is binding as if called for by both. Should any discrepancy appear between drawings and specifications that leaves doubt as to the true intent and meaning, obtain a ruling from the Engineer ten (10) days before submitting tender. Failing this, allow for most expensive alternative.

.3 Contract documents are diagrammatic only. They are to establish scope, material and quality. They are not detailed installation drawings. Minor details usually not shown or specified and any incidental accessories required for proper installation of the system are to be included in the work.

.4 Contractor is to ensure that all intended equipment will fit within given spaces. Make reference to the electrical, mechanical, architectural and structural drawings, when setting out work and before ordering equipment.

.5 The Contractor shall visit the site prior to tender and verify existing conditions. New piping, ductwork and insulation standards shall at least match the existing installation or be higher if specified herein.

1.2 CODE COMPLIANCE

.1 All work shall conform to current edition of Vancouver Building Bylaw 2019 and ASHRAE 90.1 - 2016; and will meet the requirements of Authorities Having jurisdiction.

1.3 LIABILITY

.1 Assume responsibility for layout of work; and for any damage caused to the Owner or other Tenants by improper execution of work.

.2 Protect finished and unfinished work from damage.

.3 Take responsibility for condition of materials and equipment supplied and protect until work is completed and accepted. Coordinate deliveries with the general contractor.

1.4 CERTIFICATES

.1 Give notices, obtain permits and approvals, and pay fees so work specified may be carried out. Furnish certificates if requested, as evidence that work conforms with laws and regulations of the authorities having jurisdiction.

1.5 CUTTING AND PATCHING

.1 All work shall be coordinated with other trades especially that related to cutting and patching of required openings; and locations and installation of sleeves, inserts, support, curbs, frames and access doors.

.2 Obtain approval from structural and electrical engineers before drilling and coring of existing structure.

.3 Provide X-ray of all required penetrations of the floor. X-ray use for locating in floor rebar and conduit to be done after normal working hours. Take necessary precautions to protect computer equipment when X-raying floors. Coordinate with Owner.

1.6 ALTERNATIVE MATERIALS AND EQUIPMENT

.1 Contract price shall be based on materials and equipment specified. Approval by Engineer of equipment submitted by the mechanical trade as equal to that specified does not relieve the mechanical trade of any responsibility.

.2 Revisions required to adapt accepted equals and alternatives shall be included in the contract price. No increase in the contract price will be considered to accommodate the use of equipment other than that specified.

.3 Certain items of equipment and items of work (such as balancing, water treatment) may not have an approved equal due to the need to have a consistent type or source of maintenance. Refer to specific clauses in this specification.

1.7 SHOP DRAWINGS

.1 Submit shop drawings in PDF format to Engineer for all equipment specified in the specification or drawings for Engineer's review. Do not order equipment or materials until Engineer has reviewed shop drawings.

1.8 GUARANTEE

.1 Provide the Owner with a written guarantee that the equipment installed and work performed shall remain in serviceable condition for a period of one (1) year from the date of final acceptance by the Owner. The warranty shall cover material as well as labour.

1.9 STANDARD OF MATERIALS AND WORKMANSHIP

.1 Make and quality of materials used are subject to approval by the Engineer. Remove unacceptable materials and install suitable materials in their place.

.2 Materials shall be new and of uniform pattern throughout, unless noted otherwise.

.3 Employ only tradesmen properly licensed to perform the specific work.

1.10 NOT IN USE

1.11 RECORD DRAWINGS

.1 Keep on site an extra set of white prints and specifications, recording changes and deviations daily.

.2 Upon completion of work, submit final record drawings to the Engineer. These must be submitted within two (2) weeks after acceptance of work. Failure to submit drawings will result in the work being done by the Owner and the cost deducted from the final payment.

.3 At substantial completion, employ a competent (CAD) drafts person to transfer all deviations, including those called up by addenda, revisions, clarifications, shop drawings, and change orders, on a copy of tender CAD files. From these files plot a set of as-built drawings. Drafting quality shall be same as original drawings.

.4 The CAD files may be borrowed from the Engineer. Each "as-built" drawings shall bear the Contractor's identification, the date of record and the notation "We hereby certify that these drawings represent the As-Built Record of Construction." The Contractor's signature and company seal shall be placed below that notation.

1.12 SUBSTANTIAL COMPLETION INSPECTION

.1 Advise Engineer five (5) days prior to the date inspection is desired. All systems to be fully operational and any deficiencies should be noted to the Engineer.

.2 All deficiencies shall be completed within two (2) weeks after substantial completion and letter submitted to Engineer within that time advising that the work is complete. Failure to complete work will result in work being done by the Owner and the costs deducted from final payment.

1.13 EXAMINATION OF WORK

.1 This project involves renovations to existing building, therefore, examine the site and local conditions to determine the difficulties in carrying out the work indicated and specified prior to submitting final price. Extras will not be considered based on the grounds of differences on site.

1.14 COORDINATION WITH ELECTRICAL DIVISION

.1 Contractor shall review all equipment requiring electrical hook-up with Electrical Contractor and electrical drawings prior to ordering equipment. Ensure proper electrical characteristics are determined for all affected and related work.

1.15 COORDINATION OF SERVICES

.1 Coordinate with proper utilities for services such as water, sewer, natural gas, and assume all charges.

1.16 PERFORMANCE TESTS

.1 Operate each mechanical system after mechanical and electrical work has been completed, to demonstrate that each system fulfils the requirements of the contract and operates satisfactorily. These are performance tests and must be completed before work can be finally accepted.

1.17 OPERATION AND MAINTENANCE MANUALS

.1 Provide four (4) copies of manuals prepared by qualified and experienced personnel for use by Owner. Manuals form part of the contract and must be delivered to the Engineer before work will be considered complete. Each manual shall provide the following:

a) Layman's description of all mechanical systems including operating maintenance and lubrication instructions,

b) Certification of all equipment where required by local codes and authorities,

c) Shop drawings and maintenance bulletins,

d) List address and telephone numbers of all equipment suppliers and contractors.

e) Performance details for all equipment including curves for fans and pumps with actual operating points noted.

1.18 BALANCING

.1 Balance terminal boxes, exhaust fans, and air outlets to air quantities indicated on the drawings and in this specification. Where outlet quantities are not indicated, divide box capacity equally among all outlets.

.2 Completely balance the hot water recirculation system including pump.

.3 Submit two (2) copies of the report to Engineer within two (2) weeks after substantial completion. Failure to submit the report within the specified time will result in the work being done by the Owner and the costs deducted from final payment.

.4 Balancing shall be performed to the following accuracies:

a) Air-Terminal Outlets ±10%

b) Air-Central Equipment ± 5%

c) Hydronic-Terminals ±10%

d) Hydronic-Pumps and Central Equipment ± 5%

1.19 COOPERATE WITH THE BALANCING AGENCY AS FOLLOWS

.1 Make corrections as required by Balancing Agency.

.2 Allow Balancing Agency free access to site during construction phase. Inform Balancing Agency of any major changes made to systems during construction and provide a complete set of record drawings for their use.

.3 Operate automatic control system and verify set points during balancing.

.4 Provide Balancing Agency a complete set of mechanical drawings and specifications.

1.20 BALANCING VALVES AND DAMPERS

.1 Provide and install balancing valves, dampers, and other materials requested by the Balancing Agency and/or necessary to properly adjust or correct the systems to design flows, without additional cost to Owner.

1.21 SYSTEM CLEANING

.1 Flush and disinfect all domestic cold, hot and re-circulation water systems.

1.22 PAINTING AND IDENTIFICATION

.1 Paint all exposed ducts and pipes with colors to match interior finishes or in colors to match existing piping and ductwork systems.

.2 Wrap-Around Plastic Identification:

a) All plumbing/mechanical piping identification shall adhere to ANSI A13.1 latest edition.

b) Exterior piping in exposed locations such as manholes/tunnels, at pad mounted chillers etc., shall utilize Seton “Ultra-Mark” or equal pipe markers.

c) All pipe markers shall be snap around whenever possible. Markers shall be located at each wall, floor or ceiling penetration, whether exterior or interior, and every 50 ft. thereafter.

d) Markers shall be fully legible from floor level showing medium contained in pipe, and directional arrows. Provide 3/4" diameter brass tags, secure to valve stems with key chain. Provide typed valve directories.

e) Identify electric starting switches, thermostats controlling motors and equipment supplied under this division with lamacoid plates having 1/4" minimum letter size.

1.23 FIRE-STOPPING

.1 Fire-stop all pipe and duct penetrations through floors and walls, designated as fire and/or smoke separations.

.2 Fire-stopping materials to meet ULC CAN 2S115. Acceptable Materials: by "Tremco" or "National Firestopping".

.3 Preparation of surfaces and installation of fire-stopping materials shall be carried out as per manufacturer's instructions.

1.24 SEISMIC CONTROL

.1 Provide seismic restraint on all piping, ductwork and equipment to satisfy all codes and authorities having jurisdiction.

.2 Submit shop drawings of all seismic restraint details prepared and sealed by a professional engineer. Prior to substantial completion, this professional engineer for seismic design shall visit the site to verify seismic restraint installation and provide a letter of conformance in accordance with the applicable Building Code.

.3 Piping ductwork and equipment shall be restrained in accordance with the latest edition of the Seismic Restraints Manual for Mechanical Systems produced by SMACNA, and the latest edition of the ASHRAE Application Handbook Chapter 49, Seismic Restraints.

.4 The contractor shall obtain approval for the location of all restraint fixing points from the structural engineer, on site, prior to installation.

.5 Where equipment is mounted on spring or R.I.S. mounts for vibration isolation it shall be the responsibility of the manufacturer of the mount to incorporate seismic restraint.

a) These restraints shall be multi-directional as described in the guidelines specified above.

b) Provide steel frame bases where necessary to achieve this and also avoid overturning.

c) The manufacturer shall supply certificates, signed by a Professional Engineer registered within the jurisdiction, verifying the design of the seismic restraints in accordance with this section.

.6 Where equipment is located without vibration isolation fittings all such equipment shall be rigidly fixed with holding down bolts of sufficient strength to restrain seismic action.

a) Holding down bolts shall be packed within slots to prevent movement prior to restraint commencing.

.7 Bolts shall be of sufficient strength to withstand overturning of the equipment during seismic disturbance.

1. DUCTWORK AND ACCESSORIES

2.1 GENERAL

.1 Fabricate ductwork in accordance with SMACNA Duct Manual and ASHRAE Handbooks. Ductwork shall meet the requirements of NFPA 90A and 90B and conform to applicable codes. Kitchen exhaust ductwork shall conform to NFPA 96.

.2 Prior to fabrication of ductwork, check all ceiling spaces and heights and conflicts with other trades.

.3 Duct sizes indicated are inside clear dimensions. For acoustically lined or internally insulated ducts maintains size inside ducts.

.4 Provide fire dampers where ducts cross fire separations. Fire dampers shall be ULC listed and constructed in accordance with ULC Standard S112 "Fire Dampers". Fusible links shall be constructed to ULC Standard S505.

.5 Provide balancing dampers where indicated on drawings and at points on low pressure supply, return and exhaust ducts where branches are taken from larger ducts.

.6 Provide adequately sized access panels for dampers, equipment, fire dampers, valves, radiation valves, and any other equipment requiring servicing.

.7 Provide return air openings and/or insulated sound traps where indicated.

.8 Provide acoustical seal around ducts and sound traps at penetration through sound baffles.

.9 Modify ceiling system where required to accommodate grilles and diffusers.

.10 Size round ducts, installed in place of rectangular ducts, from ASHRAE table of equivalent rectangular and round ducts. No variation of duct configuration or sizes permitted except by permission from Engineer.

.11 Exposed round ductwork to be spiral lock seam type only.

.12 Provide duct hangers and supports in accordance with SMACNA manuals.

.13 Identify ductwork as per the base building standards. Confirm these prior to submitting tender.

2.2 LOW VELOCITY DUCTWORK

.1 Ductwork shall be galvanized steel. The minimum sheet metal thickness for ducts including fittings, access doors, and other accessories shall be as per SMACNA duct manual for Low Velocity Ductwork.

.2 Low velocity insulated flexible ductwork shall be equal to Thermaflex Type M-KC.

.3 Connect diffusers or troffer boots to low pressure ducts with 36" 900 mm maximum length of stretched flexible duct. Hold in place with caulking compound and strap or clamp. Do not use flexible duct to change directions.

.4 Where low pressure ducts are connected to fan equipment, terminal boxes or any other apparatus, a screwed or bolted flexible gasketed joint shall be provided between the ductwork and the equipment.

2.3 KITCHEN EXHAUST DUCTS

.1 Kitchen Exhaust: Minimum 16 gauge carbon steel, welded at seams and joints or Minimum 18 gauge stainless steel, welded at seams and joints.

.2 Protect ductwork exposed to outside elements by painting or coating with suitable weather resistant material or by aluminum cladding.

.3 Provide residue traps at base of vertical risers with provisions for cleanout. Provide access doors for duct cleaning at every change of direction and every 12 ft. of duct run.

.4 Ductwork shall comply with NFPA 96.1

2.4 DUCT SEALING

.1 All supply, return and exhaust duct joints, longitudinal as well as transverse, shall be sealed using, Slip Joints: Apply heavy brush-on high-pressure duct sealant. Apply second application after the first application has completely dried out. Where metal clearance exceeds 1/16" use heavy mastic type sealant.

.2 Duct tapes as sealing method are not permitted.

.3 Surfaces to receive sealant should be free from oil, dust, dirt, moisture, rust and other substances that inhibit or prevent bonding.

.4 Do not insulate any section of the ductwork until it has been inspected and approved of duct sealant application, by the Engineer.

3. PIPING

3.1 PIPE MATERIAL

.1 Sanitary and Storm Drainage, and Vent (above grade) Material: Cast Iron.

.2 Domestic Water Material: All domestic water shall be WIRSBRO PEX pipe.

.3 Natural Gas; Propane (above ground): Steel Schedule 40, A53 Grade B.

.4 Service: Refrigerant: Material: ACR Copper

3.2 PIPE HANGERS AND SUPPORTS

.1 All piping shall be firmly supported and securely braced. Provide copper plated hangers and supports for copper piping and galvanized hangers and supports for galvanized piping.

.2 Use of perforated straps is not permitted for pipe hangers.

.3 Provide ring type hangers for piping up to 1½" and clevis type hangers for piping over 1½".

3.3 PIPE SUPPORT SPACING

PIPE SUPPORT SPACING				
PIPE SIZE (INCH)	FOR BARE PEX PIPE	FOR PEX PIPE W/ PIPE SUPPORT	FOR COPPER PIPE	FOR PP-R (AQUATHERMAL) PIPE
1/2	2'-8"	6'-0"	6'-0"	4'-0"
3/4	2'-8"	6'-0"	6'-0"	4'-0"
1	2'-8"	8'-0"	8'-0"	4'-0"
1 1/4	2'-8"	8'-0"	8'-0"	4'-0"
1 1/2	2'-8"	8'-0"	8'-0"	4'-0"
2	2'-8"	8'-0"	8'-0"	4'-6"
3	2'-8"	8'-0"	10'-0"	5'-2"
4	NA	NA	12'-0"	6'-6"

4. VALVES

4.1 DOMESTIC HOT AND COLD WATER SYSTEM VALVES

.1 Ball valves up to 2"; bronze body, chrome plated, bronze ball, threaded or solder ends, TFE seat and packing. 600 psi non shock W.O.G. rating, Jenkins Fig. 901A, 902A.

.2 Globe valves up to 2" shall be bronze composition disc type fitted with No. 294-S disc for cold water; and No. 110 disc for hot water service. Jenkins Fig. 106B for threaded ends; and Fig. 106BP for solder ends.

5. HOT WATER SPECIALITIES

5.1 MANUAL AIR VENTS

.1 Provide manual air vents from short vertical section of line diameter pipe to form air chamber. Provide 1/8" brass needle valve at top of chamber.

5.2 RELIEF VALVES

.1 Provide ASME rated direct spring-loaded type, lever operated non-adjustable factory set, discharge pressure as indicated.

6. INSULATION

6.1 DUCT AND BREECHING INSULATION

.1 All insulation on ductwork shall comply with ASHRAE 90.1-2013 standard.

Minimum Duct Insulation	R value and Thckness
Supply Duct and Return Duct	R-3.5 1.0 Inch
Outside Air intake	R-3.5 1.0 Inch
Exhaust duct with 10 feet of exterior wall or opening	R-3.5 1.0 Inch
Acoustic Lining	1.0 Inch

6.2 PIPING INSULATION

.1 All cold piping to be insulated with fine fibrous glass insulation with factory applied vapour barrier jacket, moulded to conform to piping, "K" value at 75°F maximum 0.24 btu.in/ft² hr.°F. Recover with ULC labeled thermocanvas or Equivalent insulation material approved by Engineer.

.2 All hot piping to be insulated with fine fibrous glass insulation with factory applied general purpose jacket, moulded to conform to piping, "K" value at 75°F maximum 0.24 btu.in/ft² hr°F. Recover with ULC labeled thermocanvas or Equivalent insulation material approved by Engineer

Piping to be Insulated	Pipe Size	Insulation Thickness (in)
Domestic Cold Water	to 40 mm 1½"	1/2
	50mm 2" & Over	1
Domestic Hot and Recirc.	40mm 1½"	1
	50mm 2" & Over	1½

7. PLUMBING

7.1 PLUMBING GENERAL

.1 Install vacuum breakers, trap primers and backflow preventers on plumbing lines as required by code.

.2 Check invert elevations prior to sanitary and drainage connections.

.3 Grade drainage lines 2% per foot, unless noted otherwise.

.4 Plumbing fixtures shall be specified by the tenant. These specified plumbing fixture shall have CSA certificate and meeting water saving requirement as per building code.

8. CONTROLS

Mechanical contractor tender shall include pricing of controls of HVAC units.

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MECHANICAL ENGINEER:
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100 - 10551 SHELLBRIDGE WAY,
RICHMOND, BC
WEBSITE: www.xtengineering.com
PHONE: 778-706-5858
EMAIL: tan@xtengineering.com
XT ENGINEERING LTD.
EGBC PERMIT TO PRACTICE NO: 1000162

Permit to Practice No.: 1000162
PROFESSIONAL ENGINEER
PROVINCE OF BRITISH COLUMBIA
X. TAN
36565
2023-07-12

CITY OF VANCOUVER BRITISH COLUMBIA INCORPORATED 6 JULY 1886

Branch: BUILDING REVIEW BRANCH
Date: AUG 9, 2023
Permit #: DB-2023-00887
Page #: 5 OF 6
Staff: KRISTA BIRCHAM

ACCEPTED

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1. UPDATED ARCHITECTURAL BACKGROUNDS.

2. UPDATED UNIVERSAL WASHROOM PLUMBING.

3. REVISED BAR AREA PLUMBING.

REVISION

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1	DEC. 21, 2022	ISSUED FOR REVIEW

PROJECT

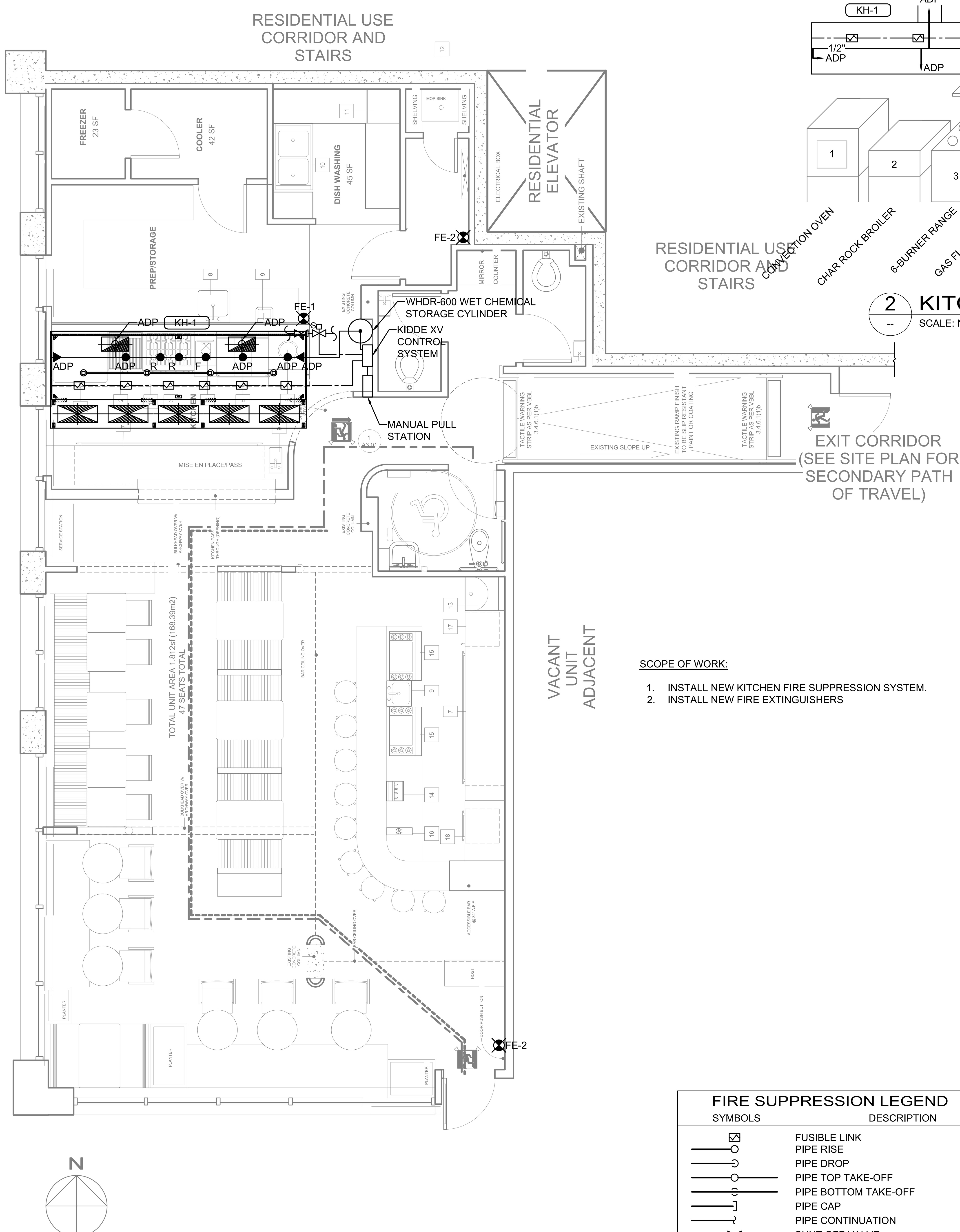
RESTAURANT - TENANT IMPROVEMENT

SHEET TITLE

MECHANICAL SPECIFICATION (HVAC AND PLUMBING)

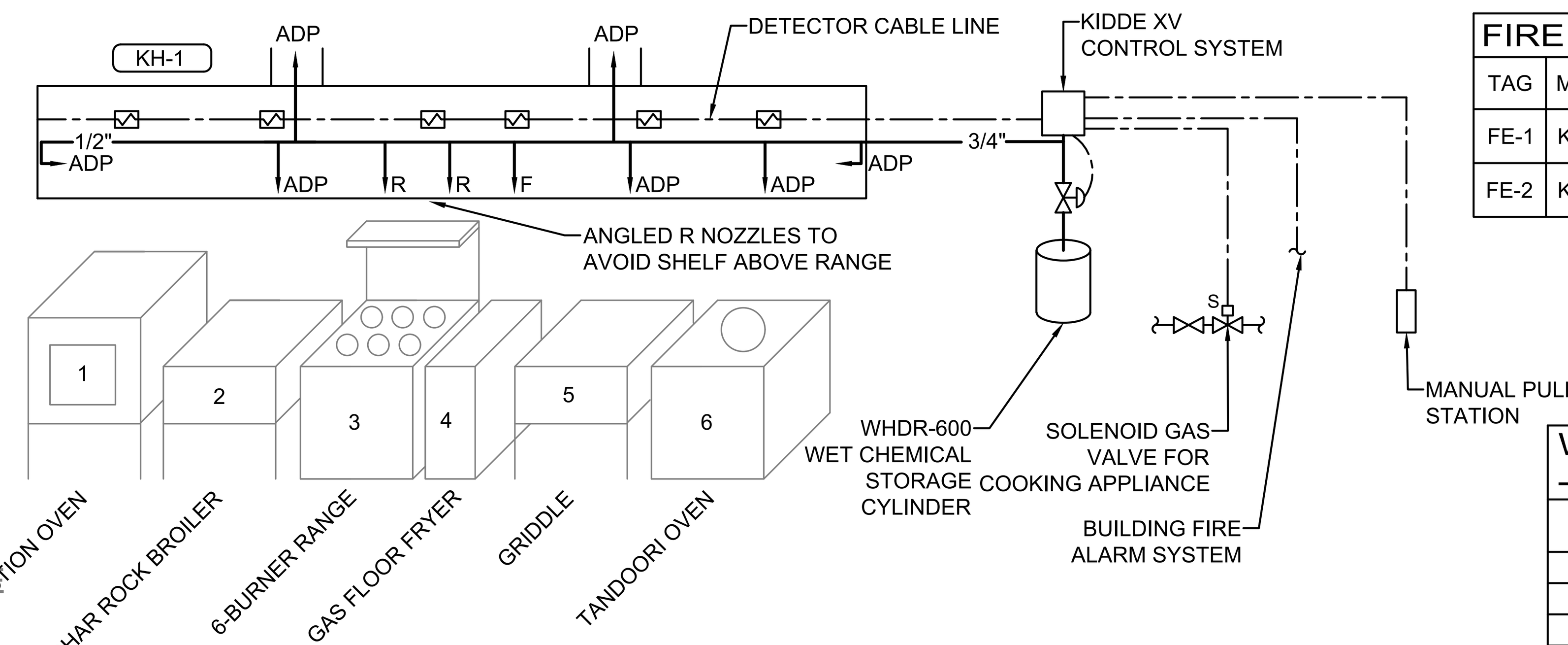
ADDRESS
2101 E HASTINGS STREET,
VANCOUVER, BC

SCALE AS INDICATED	SHEET NO. M-3
DATE OCT. 31, 2022	
DESIGNED BY J.S.	
CHECKED BY X.T.	
PROJECT NO. x22118	



1 KITCHEN FIRE SUPPRESSION PLAN

SCALE: 1/4"=1'



2 KITCHEN FIRE SUPPRESSION SCHEMATIC

SCALE: N.T.S.

SCOPE OF WORK:

1. INSTALL NEW KITCHEN FIRE SUPPRESSION SYSTEM.
2. INSTALL NEW FIRE EXTINGUISHERS

FIRE EXTINGUISHER SCHEDULE

TAG	MANU.	APPLICATION	CAPACITY	REMARKS
FE-1	KIDDE	CLASS K - COMMERCIAL KITCHEN	6 L (1.6 GAL.)	ULC LISTED, MEET NFPA-96 AND NFPA-10 REQUIREMENTS
FE-2	KIDDE	CLASS ABC - COMMERCIAL CUSTOMER AREA	5.5 LBS	ULC LISTED, MEET NFPA-10 REQUIREMENTS

WET CHEMICAL FIRE SUPPRESSION SYSTEM COMPONENT SCHEDULE - CONTROL

HOOD	EQUIPMENT	MANUFACTURER	REMARKS
KH-1	REMOTE MANUAL PULL STATION	KIDDE	MOUNTED 48" ABOVE FINISHED FLOOR

WET CHEMICAL FIRE SUPPRESSION SYSTEM COMPONENT SCHEDULE - NOZZLES

HOOD	COVERED EQUIPMENT	NOZZLE TYPE	MANU.	AMT.	FLOW NUMBER	REMARKS
KH-1	EXHAUST PLENUM	ADP	KIDDE	2	2	
KH-1	EXHAUST DUCT	ADP	KIDDE	2	2	
KH-1	CHAR ROCK BROILER	ADP	KIDDE	1	1	
KH-1	36 IN RANGE	R	KIDDE	2	2	ANGLED TO AVOID SHELF ABOVE RANGE
KH-1	FRYER	F	KIDDE	1	2	
KH-1	GRIDDLE	ADP	KIDDE	1	1	
KH-1	TANDOORI OVEN	ADP	KIDDE	1	1	
			TOTAL	10	11	

WET CHEMICAL FIRE SUPPRESSION SYSTEM COMPONENT SCHEDULE - STORAGE

HOOD	TANK TYPE	MANUFACTURER	MODEL	CYLINDER AMOUNT	FIRE SUPPRESSION AGENT	FLOW DEMAND	FLOW TOTAL	APC WET CHEMICAL AGENT FILL QTY	PRESSURE (psi)	REMARKS
KH-1	WHDR APC STORAGE CYLINDER	KIDDE	WHDR-600	1	APC WET CHEMICAL AGENT	11	18	6.0 GAL./EACH	175	INCLUDE AUTOMATIC SHUTOFF VALVE WITH MANUAL RESET, C/W APPROVED BRACKET MOUNTED ON WALL IN KITCHEN

FIRE SUPPRESSION LEGEND

SYMBOLS	DESCRIPTION
	FUSIBLE LINK
	PIPE RISE
	PIPE DROP
	PIPE TOP TAKE-OFF
	PIPE BOTTOM TAKE-OFF
	PIPE CAP
	PIPE CONTINUATION
	SHUT OFF VALVE
	SOLENOID VALVE
	DIRECTION OF FLOW
NG	WET CHEMICAL LINE LINE
FE	FIRE EXTINGUISHER
	UP DISCHARGE NOZZLE
	DOWN DISCHARGE NOZZLE
	SIDE DISCHARGE NOZZLE
	EQUIPMENT TYPE
	KEYNOTE DESIGNATOR
	REVISION DESIGNATOR

ABBREVIATIONS

R	RANGE
ADP	APPLIANCE DUCT PLENUM
GRW	GAS RADIANT/WOK
F	FRYER

NOTE: NOT ALL SYMBOLS USED ON THESE DRAWINGS

WET CHEMICAL FIRE SUPPRESSION SYSTEM SEQUENCE OF OPERATIONS

TAG	COVERED EQUIPMENT	DETECTOR	ACTION UNDER FIRE (OR)	ACTION AFTER FIRE IS DETECTED
3	CONVECTION OVEN	ALLOY FUSIBLE LINK	BREAK LINK	1. DISCHARGE EXTINGUISHING AGENT 2. SHUT OFF GAS VALVE TO APPLIANCES 3. SHUT OFF ELECTRICAL APPLIANCES 4. INITIATE BUILDING FIRE ALARM SYSTEM 5. KEEP EXHAUST AIR FAN ON 6. TURN OFF MAKE-UP AIR UNIT
4	CHAR ROCK BROILER	ALLOY FUSIBLE LINK	BREAK LINK	
5	36 IN RANGE	ALLOY FUSIBLE LINK	BREAK LINK	
6	FRYER	ALLOY FUSIBLE LINK	BREAK LINK	
7	GRIDDLE	ALLOY FUSIBLE LINK	BREAK LINK	
8	TANDOORI OVEN	ALLOY FUSIBLE LINK	BREAK LINK	
DUCT AND HOOD				
OR				
	SYSTEM CONTROL HEAD	MANUAL OPERATION	PULL OFF	
	MANUAL PULL STATION	MANUAL OPERATION	PULL OFF	

KIDDE WHDR WET CHEMICAL FIRE SUPPRESSION SYSTEM FOR COOKING OPERATIONS

1. GENERAL

1.1 The system shall be a pre-engineered, fixed pipe, automatic wet chemical agent fire suppression system for protection of all hazard areas associated with cooking operations, including exhaust hoods, plenums, ductwork and cooking appliances.

1.2 The system shall be a Kidde Fire Systems, Model WHDR Wet Chemical Fire Suppression System, manufactured by Kidde Fire Systems, 400 Main Street, Ashland, Massachusetts. The manufacturer shall be ISO 9001:2015 certified.

1.3 All requirements outlined in this specification shall be completed in their entirety. These requirements, combined with good engineering practices must be followed in order to produce a safe and effective fire protection and suppression system.

2. CODES & STANDARDS COMPLIANCE

2.1 The design, installation, testing and maintenance of the system shall be in accordance with the following codes and standards as applicable:

A. UL 300, Standard for Fire Testing of Fire Extinguishing Systems for Protection of Commercial Cooking Equipment
B. UL1254, Standard for Pre-Engineered Dry Chemical Extinguishing System Units
C. ULC/ORD-C1254.6, Fire Testing of Restaurant Cooking Area Fire Extinguishing System Units
D. NFPA 17A: Standard for Wet Chemical Extinguishing Systems
E. NFPA 70: National Electrical Code®/ (NEC)
F. NFPA 72: National Fire Alarm and Signaling Code
G. NFPA 96: Standard for Ventilation Control and Fire Protection of Commercial Cooking Operations
H. Kidde Fire Systems WHDR Wet Chemical Fire Suppression System Design, Installation, Operation and Maintenance (DIOM) Manual, part number 87-122000-001 and all applicable addenda & technical bulletins, as identified by Underwriters Laboratories and Underwriters Laboratories Canada, File No. EX3559
I. All applicable insurance company requirements
J. All applicable local and state codes and standards
K. Requirements of the Local Authorities Having Jurisdiction (AHJ)

2.2 The wet chemical system shall have the following listings and approvals as applicable:

A. Underwriters Laboratories (UL), per Test Standard UL 300
B. Underwriters Laboratories Canada (ULC), per Standard ULC/ORD-C1254.6
C. Fire Department, City of New York, Certificate of Approval

2.3 The manufacturer shall meet ISO 9001 requirements for the design, production and distribution of the wet chemical fire suppressions systems for cooking operations.

3. SYSTEM DESCRIPTION

3.1 All wet chemical fire suppression equipment and accessories must be manufactured and/or supplied by Kidde Fire Systems, 400 Main Street, Ashland, MA 01721, USA, Telephone 508.881.2000, www.kiddefiresystems.com.

3.2 The manufacturer shall warranty all WHDR Wet Chemical Fire Suppression System products for three (3) years from the date of purchase.

3.3 The system shall be supplied and installed by factory authorized, Kidde Fire Systems distributor. The organization and installer shall be trained by the manufacturer to design, install, test and maintain the WHDR Wet Chemical Fire Suppression System and shall be able to produce a certificate stating such upon request.

3.4 The wet chemical fire suppression system for the cooking appliances and ventilation shall be a pre-engineered modular Kidde model WHDR.

3.5 The system shall consist of Kidde WHDR Series Cylinder & Valve Assemblies, Kidde actuation hardware and Kidde distribution nozzles attached to a fixed pipe network.

3.6 The system shall use Kidde APC wet chemical agent, a potassium salt solution fire suppression agent. This agent works by producing a synthetic cellular mass (saponification) on the surface of hot or burning grease. This foam layer acts to smother a fire, and serves to prevent re-flash until the grease cools.

4. COMPONENTS

4.1 WHDR Series Cylinder & Valve Assembly

A. Kidde APC wet chemical agent shall be contained in one or more stored pressure DOT/TC rated steel cylinder and valve assemblies. Cylinders requiring an external source to pressurize the cylinder shall not be acceptable.

B. Sufficient cylinder quantities and sizes to protect the entire hazard area shall be provided in accordance with the Kidde WHDR DIOM Manual and filled with the required amount of APC wet chemical agent.

C. The cylinder(s) shall have a tin-nickel alloy plated brass valve, with visual pressure gauge. Agent cylinders without pressure gauges shall not be acceptable. The valve shall contain a check stem which is operated by the stroke of the actuating assembly. Agent cylinders utilizing a burst disc as a means of sealing the discharge outlet shall not be acceptable.

D. The cylinder(s) shall have a separately mounted shield to protect the pressure gauge.

E. The cylinder and valve assemblies shall be factory pressurized with dry nitrogen to 175 PSIG at 70°F (1207 kPa at 21°C). The cylinder and valve assemblies shall be capable of being stored and operated at temperatures from 0°F to 120°F (-18°C to 49°C).

F. Kidde bracketing shall be provided to mount the cylinders securely to the intended mounting surface.

4.2 Control Equipment

A. The system control equipment shall be capable of all functions associated with automatically and manually discharging the wet chemical agent from all cylinder and valve assemblies, including automatic shutdown of the fuel and heat source(s), and electrical power to all protected and other required areas upon system discharge.

B. The system control equipment shall be either cylinder or wall mounted, whichever is applicable. A System Valve Actuator shall be supplied for each cylinder valve. All mechanical components of the control heads shall be enclosed. No exposed levers, except for a local manual actuation handle, shall be permitted.

C. The system shall be capable of automatic and manual actuation, either by electrical or mechanical means. The control head shall be equipped with microswitch contacts for audible alarm and/or equipment shutdown. All cylinders protecting a single-hazard area must be connected for simultaneous discharge by all methods of system actuation.

D. When automatic electric actuation is utilized, the electric solenoid shall be actuated by a tested and listed compatible control panel. The detectors shall be Fenwal Detect-A-Fire rate-compensated thermostat fire detectors. All detection and releasing circuits shall be supervised and the system shall provide for a secondary power supply calculated, at minimum, according to NFPA and UL standards. Fenwal thermostats shall be chosen with a rating suitable to their expected normal exposure temperature(s).

E. For automatic mechanical actuation, the system control head shall be activated by Kidde Fire Systems thermo-bulb link or fusible metal alloy link fire detectors per the Kidde WHDR DIOM Manual. The thermo-bulb or fusible link system shall require no outside source of power for operation. Detector links used for mechanical system actuation shall be located in accordance with the Kidde WHDR DIOM Manual and all applicable NFPA and UL standards. The heat detector links shall be chosen with a rating suitable for their expected normal exposure temperature(s).

4.3 Distribution Nozzles

A. Nozzles shall be located to protect the exhaust ducts, plenums, and all cooking appliances requiring protection. Nozzle type(s), quantity, coverage and location shall be in accordance with the Kidde WHDR DIOM Manual.

B. All nozzles shall be equipped with strainers to prevent foreign matter in the agent distribution piping or tubing from clogging the nozzle orifice. All nozzles shall be equipped with caps with replaceable foil seals to prevent entry of grease and foreign matter into the nozzles and piping. The foil seals are to be ruptured by pressure at system discharge. Nozzles utilizing a separate blow-off cap shall not be acceptable.

C. All nozzles shall incorporate a ring identification system to easily identify nozzle type. Rings are to be machined into the nozzle body by the manufacturer.

4.4 Distribution System

A. The APC wet chemical agent distribution system shall be designed and installed in accordance with the Kidde WHDR DIOM Manual.

B. The distribution system shall consist of Schedule 40 black steel pipe or stainless steel tubing. Chrome plated piping is permissible. Galvanized piping shall not be used. Pipe thread compound or tape shall not be used.

C. All fittings for Schedule 40 pipe shall be standard weight steel, malleable iron, ductile iron or cast iron. Galvanized fittings shall not be used.

D. Fittings for stainless steel tubing shall be compression or flare type. Bending of tubing is permissible. All bending radii shall be in accordance with the Kidde WHDR DIOM Manual using commercially available bending jigs.

5. SYSTEM INSTALLATION AND COMMISSIONING

5.1 Kidde WHDR Wet Chemical Fire Suppression System Equipment
A factory authorized Kidde Fire Systems distributor shall install and commission the system in accordance with the Kidde WHDR DIOM Manual.

5.2 Training Requirements

The installer shall be trained and certified by Kidde Fire Systems on design, installation, testing and maintenance of the Kidde WHDR Wet Chemical Fire Suppression System.

5.3 Routine Maintenance

Routine maintenance shall be performed by an authorized Kidde Fire Systems distributor, and in accordance with the Kidde WHDR DIOM Manual, NFPA 96, NFPA 17A, all applicable local codes and standards, and requirements of the local Authority Having Jurisdiction.

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WEBSITE: www.xtengineering.com
PHONE: 778-706-5858
EMAIL: tan@xtengineering.com
XT ENGINEERING LTD.

EGBC PERMIT TO PRACTICE NO:
1000162

Permit to Practice No.: 1000152
PROFESSIONAL ENGINEER PROVINCE OF BRITISH COLUMBIA
X. TAN
36565
2023-07-12

CITY OF VANCOUVER BRITISH COLUMBIA
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PROJECT
RESTAURANT - TENANT IMPROVEMENT

SHEET TITLE
WET CHEMICAL KITCHEN FIRE SUPPRESSION PLAN

ADDRESS
2101 E HASTINGS STREET, VANCOUVER, BC

SCALE: AS INDICATED	SHEET NO.
DATE: OCT. 31, 2022	F-1
DESIGNED BY: J.S.	
CHECKED BY: X.T.	
PROJECT NO.: x22118	