PROCUREMENT SERVICES

CITY OF SURREY, SURREY CITY HALL
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ADDENDUM No. 2

REQUEST FOR PROPOSALS No.:	**1220-030-2021-038**
TITLE:	**Strawberry Hill Hall Design Services**
ADDENDUM ISSUE DATE:	**July 29, 2021**
CLOSING DATE AND TIME:	**ON OR BEFORE THE FOLLOWING DATE AND TIME (THE "CLOSING TIME"):** **TIME: 3:00 P.M. (LOCAL TIME)** **DATE: August 12, 2021**

INFORMATION FOR PROPONENTS

Proponents are advised that Addendum No. 2 to 1220-030-2021-038 is hereby issued by the City. This addendum shall form part of the contract documents and is to be read, interpreted and coordinated with all other parts. The following information is provided to answer questions raised by Proponents for the above-named project, to the extent referenced and shall become a part thereof. No consideration will be allowed for extras due to the Proponents or any sub-consultant not being familiar with this addendum. This Addendum No. 2 contains twenty-one (21) pages.

Q1. Will the successful consultant team have access to the CAD files for the previously completed work, e.g., the development permit drawings, including plans? If so, what form will those CAD files be?

A1. PDF files are available at this time.

Q2. Provide a Site Plan that shows services to the building complete with sizes?
- **a. Sanitary drain**
- **b. Storm drain**
- **c. Domestic water**
- **d. Gas line**

A2. Refer to attached mechanical and civil drawings. Note these drawings are for reference only. The new consultant team shall produce their own design based on existing site conditions.

Q3. What is electrical service line capacity that was serving the Old building?

A3. Refer to attached electrical drawings. Note these drawings are for reference only.

Q4. Does the building require air conditioning?

A4. Heating and cooling. Refer to attached mechanical drawings. Note these drawings are for reference only. The new consultant team shall produce their own design.

Q5. Confirm the City will provide existing / recent design package or shop drawing package (including the storm water retention pond and wall) on all disciplines for the winner proponent to verify design to meet the current code?

A5. Original design drawings are attached for refence only.

Q6. Confirm the extent of the civil scopes (utility services, storm water underground storage tank, parking lot)?

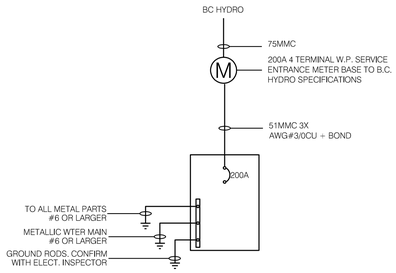
A6. The scope should include, but not necessarily be limited to detailed Civil Engineering design (all design phases as well as procurement), including construction services (construction administration, field inspections, as-built drawings, etc.). Civil consultant to confirm existing site conditions, provide a parking lot design, on-site servicing, lot grading, Building Permit, ESC (if required), etc. Refer to attached original civil drawings.

Q7. RFP does not state that Quantity Surveying services are required nor is there any cost estimates included in the scope of work; however, is this something that the client views as necessary for this project?

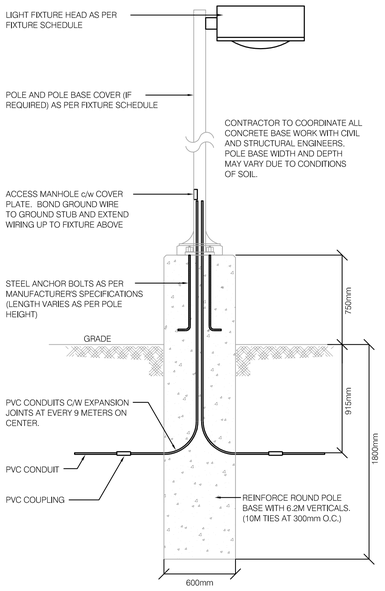
A7. Quantity Surveying services are not required for the purpose of this RFP, however, the City may retain a QS firm during the design phase.

All Addenda will become part of the Contract Documents.

- END OF ADDENDUM -



1 E001 NEW SINGLE LINE DIAGRAM
SCALE: N.T.S.



2 E001 LIGHTING FIXTURE POLE BASE DETAIL
SCALE: N.T.S.

LUMINAIRE SCHEDULE

	General Notes (applies to all luminaires):
A	Electrical Contractor is responsible for receiving, storage and reporting of damage whether luminaires are supplied by Owner or Contractor.
B	Contractor to provide a one hour fire rated enclosure around all recessed luminaires where required by code. All recessed lighting luminaires shall be typically I.C. rated.
C	All exit lights and emergency lighting to be included in base tender quote.
D	All luminaires to be adequately attached directly to the building structure. All t-bar luminaites tc be suspended independently of T-bar. Flastic plugs or anchors are not acceptable.
E	Lot pricing of luminaires by manufacturers, distributors, wholesalers or suppliers will not be accepted.
F	Cost allowances for luminaires shall include all applicable taxes and freight costs only. Markups, installation, offloading, etc. shall be inc uded in base tender quote.
G	All luminaires shop drawings shall be submitted with driver input power information.
	Notes:
1	REQUIRES LAMP, TO BE INCLUDED
2	CONFIRM VOLTAGE
3	CONFIRM VALANCE LEGNTH
4	LEGNTH AS INDICATED ON DRAWINGS, FITTINGS AS REQUIRED
5	COORDINATE TRACK, FIXTURE AND SWITCH- FOR DIMMING
6	RETAIN FIXTURE AND REPLACE EXISTING INCANDESCENT BULB WITH DIMMABLE LED BULB
7	CONFIRM POLE LEGNTH WITH CONSULTANT PRIOR TO ORDERING

Type	Description	Lamp Type	Lamps(engines) / Luminaire	Watts / Lamp (Engine)	Watts/Luminaire	CRI	Delivered Lumens	Color Temperature (K)	Lamp Life (hours)	Ballast/ Driver Voltage	Driver Type	Mounting	Manufacturer	Catalogue Number	Note
A	6" ROUND SURFACE MOUNT DOWNLIGHT	LED	1	15.3	15.3	92	1252	3500	50,000	120V	SMD 120V	SURFACE MOUNT	HALO	SMD6R12-935WH-SMD6RTRMWH	
B	THURMAN 4" FLUSH MOUNT 10" ETCHED FACETED SHADE	LED	1	100	100					120V		SURFACE MOUNT	REJUVINATION	A6510-E26-B0043	1
C	STEP LIGHT	LED	1	6	6		700			120V		SURFACE MOUNT	IPLIGHTING	IP55-616600-A6W5KLVF	
E	LED INTERIOR SCONCE	LED	1	21.5	21.5	90	1124	3500	55,000	120V	ELV	WALL MOUNT	WAC LIGHTING	WS-27610-35-AL	
F	EXISTING ENAMELED METAL SHADE FIXTURE	LED	1	9	9	80	800	3000	15,000	120V	0-10V DIMMING	E26 SOCKET	PHILIPS	8.8W-60W, E26, Dimming [046677462235]	6
G	SUSPENDED 1 X 8	LED	1	66	66	83	8000	3500	75,000	120V	0-10V DIMMING	SURFACE MOUNT	LUMINATION	IS180B2MV-WHITE	
H	WRAPAROUND	LED	1	28	28	80	3200	3500	60,000	120V	0-10V DIMMING	SURFACE MOUNT	METALUX	4WNLED-LD4-32SL-F-UNV-L835-CD1	
H1	WRAPAROUND	LED	1	28	28	80	3200	3500	60,000	120V	0-10V DIMMING	SURFACE MOUNT	METALUX	4WNLED-LD4-32SL-F-UNV-L835-CD1-SCS	
J	SUSTP LENSED	LED	1	41	41	80	4695	3500	50,000	120V	0-10V DIMMING	SURFACE MOUNT	METALUX	4SUSTP40350-D-UNV	
K	DELTA LED Track Fixture	LED	1	9	9	90	624	3000	35,000	120V	TRIAC	SURFACE MOUNT	LITELINE	DA2010-3038-BK	5
K	LITELINE TRACK 4' WHITE									120V		SURFACE MOUNT	LITELINE		5
M	CARSON GOOSENECK WALL SCONCE	E26	1	300	300					120V		WALL MOUNT	REJUVINATION	A2949-B1700-20 in-GX	
M1	CARSON 12" WALL SCONCE	LED	1							120V		SURFACE MOUNT	REJUVINATION	A1292	2
N	DOMUS SERIES LUMINAIRE	LED	1	86	89		9,806	4000	70,000	120V	0-10V DIMMING	POLE MOUNT	PHILIPS	DMS50-90W80LED4K-R-LE4F-120-DMG-SMB-BKTX	
N1	DOMUS SERIES POLE									120V		POLE	PHILIPS	6.0M HEIGHT C/W 8' SINGLE DAVIT ARM SSM8V-DC8-1A	7
P	RECTANGLE STEP LIGHTS 12V	LED	1	2	2	90		3000	60,000	120V		RECESSED	WAC LIGHTING	4011-30BK	
R	LED PUCK LIGHT	LED	1	3	3	80	201.1	3000	50,000	24V	LUTRON DIMMING DRIVER	RECESSED	LITELINE	PRO-1330-BK-PRO-P1-FWH	4
U	FLEXIBLE LED TAPE LIGHT	LED	1	2.8/FT	2.8/FT	80	100	3000	50,000	24V	LUTRON DIMMING DRIVER	SURFACE MOUNT	LITELINE	LED-TP2-12-WW	3,4
W	KEYLESS LAMP HOLDER C/W WIREGUARD AND LED LAMP	LED	1	75	75					120V		SURFACE MOUNT			
	LED PICTOGRAM EXIT SIGN	LED	1					3500		120V		SURFACE MOUNT	READY-LITE	RP - W-SP	2
	EM HEADS	LED	2	6	12					12V		SURFACE MOUNT	READY-LITE	RQ2-12/12	
	BATTERY PACK 100W	LED	2	6	12					12V		SURFACE MOUNT	READY-LITE	LDX12- 2RQ12	

MECHANICAL EQUIPMENT SCHEDULE

PROJECT TITLE: Strawberry Hill | ISSUED FOR: Review | REASON: | DATE:

LEGEND:

E	ELECTRICAL CONTRACTOR	CO	CO/VG GAS SENSOR
M	MECHANICAL CONTRACTOR	T	THERMOSTAT
T-1n	THERMOSTAT - LINE VOLTAGE BUILT IN	MRR	MOTOR RATED RELAY
T-lv	THERMOSTAT - LOW VOLTAGE	TCC	TIME CLOCK CONTROLLER
T-rv	THERMOSTAT - REVERSE ACTING	VSWS	VARIABLE SPEED WALL SWITCH
VFD	VARIABLE FREQUENCY DRIVE	TCL	INTERLOCK WITH LOCAL LIGHT SWITCH OR OCCUPANCY SENSOR
Mag	MAGNETIC STARTER	HOA	HAND/OFF/AUTO
Man	MANUAL STARTER		

GENERAL NOTES:

1. COORDINATE EXACT LOCATION WITH DIV 25 PRIOR TO ROUGH IN.
2. CONFIRM WITH DIV 25 IF THERMOSTATE LINE OR LOW VOLTAGE
3. SEE PANEL SCHEDULE FOR CIRCUIT NUMBER
4. PRIOR TO ROUGH-IN OR ORDER, CONTRACTOR MUST CONFIRM ALL MOTOR NAMEPLATE DATA ON SITE AND ADJUST WIRE AND BREAKER SIZES AS REQUIRED TO MEET THE REQUIREMENTS OF THE CEC, TYPICAL FOR ALL.
5. STARTER TO BE COMPLETE WITH HOA
6. MECHANICAL CONTRACTOR TO SET THERMOSTAT
7.

TOTAL MECHANICAL LOAD: #VALUE! kW
NORMAL POWER LOAD: #VALUE! kW
EMERGENCY LOAD: 0.000 kW

UNIT TAG	DESCRIPTION	LOCATION	POWER REQUIREMENTS HP	KW	FLA	MCA	VOLTAGE	PHASE	PANEL	OVER CURRENT PROTECTION Calculated MCA	BREAKER	TIME DELAY FUSE	# OF POLES	EMERGENCY	FEEDER # OF WIRES	WIRE SIZE	CONDUIT SIZE	EQUIPMENT RESPONSIBILITIES UNIT SUPPLY	UNIT INSTALL	UNIT CONNECTION	DISCONNECT FUSED	DISCONNECT SUPPLY	DISCONNECT INSTALL	DISCONNECT CONNECTION	STARTER TYPE	STARTER SUPPLY	STARTER INSTALL	STARTER CONNECTION	CONTROLS TYPE	CONTROLS SUPPLY	CONTROLS INSTALL	CONTROLS CONNECTION	NOTES
EF-1	EXHAUST FAN	UNIVERSAL W/R	1/6				120	1		0.5	15		1	N	2	#12	1/2"	M	M	E	-	E	E	E	HOA	E	E	E	TCL	E	E	E	
EF-2	EXHAUST FAN	STORAGE		87W			120	1		0.5	15		1	N	2	#12	1/2"	M	M	E	-	E	E	E					TCL	E	E	E	
SF-3	SERVICE FAN	HALL	1/6				120	1		0.5	15		1	N	2	#12	1/2"	M	M	E	-	E	E	E	HOA	M	E	E		M	E	E	INTERLOCK WITH EF-1
RH-1	RANGE HOOD	KITCHEN [103]			2.3		120	1		0.5	15		1	N	2	#12	1/2"	M	M	E	-	E	E	E	HOA			E		M	M	E	
RH-2	RANGE HOOD	KITCHEN [103]			2.3		120	1		0.5	15		1	N	2	#12	1/2"	M	M	E	-	E	E	E	HOA			E		M	M	E	
WH-1	HOT WATER TANK	MECHANICAL ROOM				2	120	1		2.000	15		1	N	2	#12	1/2"	M	M	E		E	E	E						M	M	E	
DH-1	DUCT HEATER			7			240	1		29.160	40		1	N	2	#8	3/4"	M	M	E		E	E	E						M	M	E	
EA-1	ELCTRIC ACTUATOR				2		120	1		2.5	15		1	N	2	#12	1/2"	M	M	E	-	E	E	E		M	M	E		M	E	E	INTERLOCK WITH SF-1
AF-1	GAS FURNACE	ATTIC SPACE	1/2		8.9		120	1		11.125	15		1	N	2	#12	1/2"	M	M	E	-	E	E	E	HOA	M	E	E		M	E	E	SERVICE CU-1
CU-1	CONDENSING UNIT	EXTERIOR				25.7	230	1		25.700	50		2	N	2	#6	3/4"	M	M	E	-	E	E	E	HOA	M	M	M		M	E	E	SERVICE AF-1
FFH-1	FORCE FLOW HEATER	UNIVERSAL W/R		1.5			120	1		0.000	20		1	N	2	#12	1/2"	M	M	E	-	E	E	E					T-in	M	E	E	6
FFH-2	FORCE FLOW HEATER	FOYER		1.5			120	1		0.000	20		1	N	2	#12	1/2"	M	M	E	-	E	E	E					T-in	M	E	E	6
HD-1	HAND DRYER	UNIVERSAL W/R		1.4			120	1		0.000	20		1	N	2	#12	1/2"	M	M	E		E	E	E									
HD-2	HAND DRYER	UNIVERSAL W/R		1.4			120	1		0.000	20		1	N	2	#12	1/2"	M	M	E		E	E	E									
HD-3	HAND DRYER	UNIVERSAL TOILET		1.4			120	1		0.000	20		1	N	2	#12	1/2"	M	M	E		E	E	E									
BB-1	BASEBOARD HEATER	CRAWL SPACE		1.25			230	1		0.000	15		2	N	2	#12	1/2"	E	E	E	-	E	E	E					T-in	E	E	E	6
BB-1	BASEBOARD HEATER	CRAWL SPACE		1.25			230	1		0.000	15		2	N	2	#12	1/2"	E	E	E	-	E	E	E					T-in	E	E	E	6
BB-3	BASEBOARD HEATER	CRAWL SPACE		1.25			230	1		0.000	15		2	N	2	#12	1/2"	E	E	E	-	E	E	E					T-in	E	E	E	6
BB-4	BASEBOARD HEATER	CRAWL SPACE		1.25			230	1		0.000	15		2	N	2	#12	1/2"	E	E	E	-	E	E	E					T-in	E	E	E	6
BB-5	BASEBOARD HEATER	CRAWL SPACE		1.25			230	1		0.000	15		2	N	2	#12	1/2"	E	E	E	-	E	E	E					T-in	E	E	E	6
BB-6	BASEBOARD HEATER	STORAGE		1			230	1		0.000	15		2	N	2	#12	1/2"	E	E	E	-	E	E	E					T-in	E	E	E	6
BB-7	BASEBOARD HEATER	UNIVERSAL W/R		0.3			230	1		0.000	15		2	N	2	#12	1/2"	E	E	E	-	E	E	E					T-in	E	E	E	6

GENERAL NOTES

1. ALL WORK SHALL BE IN FULL COMPLIANCE WITH THE BRITISH COLUMBIA BUILDING CODE, CURRENT EDITION. THE CONTRACTOR SHALL NOTIFY THE ARCHITECT OF ANY EXISTING CONDITIONS THAT MAY AFFECT CODE COMPLIANCE PRIOR TO COMMENCING WORK.
2. THE CONTRACTOR SHALL VERIFY ALL DRAWING DIMENSIONS ON SITE PRIOR TO COMMENCING CONSTRUCTION. ,
3. THE SCOPE OF WORK OF THIS CONTACT INCLUDES BUT NOT LIMITED TO ALL WORK INDICATED ON THESE DRAWINGS WITHIN THE SITE BOUNDARIES, OR WITHIN THE INDICATED BOUNDARIES OF THE AREA OF WORK.
4. DEMOLITION AND DESIGN DRAWINGS ARE BASED ON RANDOM VISUAL OBSERVATIONS, AND/OR EXISTING DOCUMENTS, THEREFORE. THE CONTRACTOR SHALL CONFIRM EXISTING CONDITIONS INCLUDING BUT NOT LIMITED TO ALL LOCATIONS OF EXISTING DEVICES, WIRING, CONDUITS, CIRCUIT NUMBERS AND ALL OTHER PERTINENT INFORMATION. THE CONTRACTOR MUST INCLUDE IN THEIR TENDER FOR THE DISCONNECTION AND REMOVAL OF ALL ELECTRICAL WIRING AND DEVICES, AS REQUIRED TO FACILITATE THE DEMOLITION AND WORK AS DESCRIBED ON ALL OF THE DRAWINGS. ALL REMOVED EQUIPMENT NOT REQUESTED BY THE OWNER SHALL BE DISPOSED OF BY THE CONTRACTOR..
5. DISCONNECT AND REMOVE COMPLETELY, TO THE SOURCE, ALL EXISTING POWER WIRING, RACEWAYS AND DEVICES. REPLACE WITH NEW EXCEPT WHERE INDICATED.
6. PROVIDE TYPEWRITTEN PANEL DIRECTORIES .
7. ALL ELECTRICAL DEVICES SHALL BE SPECIFICATION GRADE, COLOUR WHITE.
8. A MAXIMUM OF 6 CONVENIENCE RECEPTACLES SHALL BE PLACED ON ONE 120V/15A CIRCUIT.
9. EXTERIOR LIGHTING - PROVIDE PHOTOCELL AND ASTRONOMICAL TIMECLOCK CONTROL FOR EXTERIOR LIGHTING CIRCUITS.
10. CONFIRM ALL LIGHT FIXTURE AND DEVICE LOCATIONS AND ELEVATIONS WITH ARCHITECTURAL PRIOR TO INSTALLATION.
11. LIST OF APPROVED FIRE ALARM PANEL SUPPLIERS MIRCOM, SIMPLEX, NOTIFIER.

THE "ELECTRICAL KEY NOTES" THAT WERE ON THIS PAGE HAVE BEEN MOVED TO THE THEIR RESPECTIVE DRAWINGS.

CHECK BEFORE YOU DIG

CONTACT LOCAL GAS, HYDRO AND RELEVANT AUTHORITIES PRIOR TO ANY EXCAVATION WORK ON SITE.

DAMAGING GAS PIPES IS DANGEROUS AND COSTLY.

HYDRO NOTES

CONTRACTOR IS RESPONSIBLE FOR COORDINATING THE FOLLOWING WITH THE B.C. HYDRO:

1 APPROVAL OF ANY UNDERGROUND CONDUIT ROUTE PRIOR TO TO INSTALLATION.

2. B.C. HYDRO INSPECTION AND APPROVAL OF ALL UNDERGROUND CONDUIT INSTALLATION PRIOR TO BACKFILL.

SERVICE NOTES:

1. EXACT LOCATION OF ALL HYDRO AND TELEPHONE ENTRANCE SERVICING BOTH ON SITE AND OFF TO BE CONFIRMED WITH B.C. HYDRO AND TELUS BEFORE ANY INSTALLATION CAN PROCEED.
2. CONTRACTOR TO OBTAIN APPROVED PERMITS FROM LOCAL GAS COMPANY AND CONTACT THEIR INSPECTION DEPARTMENT PRIOR TO UNDER TAKING ANY EXCAVATIONS. FAILURE TO DO SO MAY BE AN OFFENSE UNDER THE PROVINCIAL GAS ACT.

LIGHTING SYMBOL LEGEND

	LUMINAIRE - 1' X 4' - SURFACE
	LUMINAIRE - CEILING MOUNT (RECESSED OR SURFACE)
F	LUMINAIRE - PENDANT
	LUMINAIRE - WALL MOUNT
	LUMINAIRE - STRIP / FLEXIBLE LED TAPE LIGHT
	TRACK LIGHT
	LUMINAIRE - POLE MOUNT
	FAN
$	SINGLE POLE SWITCH
$D	DIMMABLE SWITCH
$3	THREE WAY SWITCH
$V	VARIABLE SPEED MOTOR SWITCH
OCS	OCCUPANCY SENSOR
OCS WP	OCCUPANCY SENSOR (WATERPROOF)
VCS	VACANCY SENSOR
PC	PHOTO CELL
	PULL BOX

FIRE ALARM SYMBOL LEGEND

	FIRE ALARM HORN
	FIRE ALARM MANUAL PULL STATION
FACP	FIRE ALARM CONTROL PANEL
	SMOKE DETECTOR
TS	TAMPER SWITCH
FS	FLOW SWITCH
PS	PRESSURE SWITCH
DACT	DIGITAL ALARM COMMUNICATING TRANSMITTER

EMERGENCY LIGHTING SYMBOL LEGEND

	EMERGENCY LIGHTING FIXTURE
EX	EMERGENCY EXIT SIGN
	EMERGENCY BATTERY UNIT

STRAWBERRY HILLS LOAD DETAILS

BASIC LOAD:						
GROUND FLOOR MAIN AREA = 112M2	=	15.0	WATTS/SQ. MT.	=	1,680	WATTS
SECOND FLOOR MAIN AREA = M2	=	-	WATTS/SQ. MT.	=	-	WATTS
GARAGE AREA = M2	=	-	WATTS/SQ. MT.	=	-	WATTS
BASIC LOAD TOTAL				=	**1,680**	**WATTS**
LOADS:						
RANGE X 1 (ELECTRIC)	=	6,000.0	WATTS	=	6,000.0	WATTS
BASEBOARDS	=	7,550.0	WATTS	=	7,550.0	WATTS
DH-1 WATER HEATER	=	7,000.0	WATTS	=	7,000.0	WATTS
FORCED FLOW HEATERS	=	3,000.0	WATTS	=	3,000.0	WATTS
MOTORS	=	-	WATTS	=	-	WATTS
ROOF TOP UNITS	=	5,900.0	WATTS	=	5,900.0	WATTS
HWT	=	-	WATTS	=	-	WATTS
FUTURE X 25%	=	6,282.0	WATTS	=	6,282.0	WATTS
TOTAL LOAD	=			=	**37,412**	WATTS
	=					
AT 120/240V 1 PH	=	156	AMPS			
AT 125%	=	195	AMPS			

FIRE ALARM SCHEDULE

COMPARTMENT F/A ZONE	DESCRIPTION	DEVICE	SIGNAL TYPE	NOTE
1	Main Level	Pull Stations	Alarm	
2	Main Incoming Fire Line Valve	Tamper Switch	Supervisory	
3	Dry Sprinkler Pressure Switch	Pressure Switch	Supervisory	
4	Dry Spinkler Main Shut off Valve	Tamper Switch	Supervisory	
5	Dry Sprinkler Zone Valve	Flow Switch	Alarm	
7	Compressor Air Low Pressure	Air Pressure Switch	Supervisory	
8	Spare			
9	Spare			
10	Spare			
11	Spare			

NOTES

1. All devices shall be labeled with respective Zone Numbers
2. Fire Alarm written verification shown that system is fully functional shall be provided
3. References: CAN/ULC S524; CAN/ULCS537; CAM/ULC S536

DATA SYMBOL LEGEND

#	TYPICAL DATA WALL OUTLET (NUMERIC PREFIX DESIGNATES QUANTITIES OF CAT 6 CABLES REQUIRED UNLESS OTHERWISE NOTED.)
WAP	WIRELESS ACCESS POINT - CEILING MOUNTED

POWER SYMBOL LEGEND

	DUPLEX RECEPTACLE OUTLET
	ABOVE COUNTER DUPLEX RECEPTACLE OUTLET
	DOUBLE DUPLEX RECEPTACLE OUTLET
	DUPLEX G.F.C.I. RECEPTACLE OUTLET
	WHIP POWER CONNECTION
	RANGE RECEPTACLE OUTLET
	ELECTRICAL PANEL
M	METER
PB	HC DOOR BUTTON FOR POWER OPERATOR
BBH	BASEBOARD HEATER
	ELECTRIC MOTOR
	EXISTING EXHAUST FAN

PROJECT INTENT

INTENT OF THIS TENANT IMPROVEMENT PROJECT IS:

- THE EXISTING BUILDING IS BEING RELOCATED.
- RE-ROUTE EXISTING ELECTRICAL SERVICE DUCTS AND REPLACE EXISTING BC HYDRO SERVICE WITH NEW 200A/120/240V SERVICE.
- REMOVE ALL EXISTING ELECTRICAL WIRING, CONDUIT, BOXES AND EQUIPMENT THROUGHOUT THE BUILDING AND REPLACE WITH NEW.

DRAWING LISTS

E001	ELECTRICAL COVER SHEET & SYMBOL SCHEDULES
E100	ELECTRICAL OVERALL EXISTING SITE PLAN
E100,1	ELECTRICAL OVERALL PROPOSED SITE PLAN
E101	ELECTRICAL POWER PLANS
E101,1	ELECTRICAL CRAWL SPACE POWER PLANS
E102	ELECTRICAL LIGHTING PLANS
E103	ELECTRICAL SPECIFICATIONS

McGinn Engineering & Preservation Ltd.
Barry McGinn Architect.
#803-402 West Pender St.Vancouver, B.C.
Tel: 604-473-9866 Fax: 604-473-9877
Web: www.mcginn-engineering.com

INTEGRAL GROUP
Suite 180 - 200 Granville Street
Vancouver BC Canada V6C 1S4
T 604.687.1800
www.integralgroup.com
Project Reference No: 152262.000

REV.	DESCRIPTION	DATE
7	RE-ISSUED FOR BP	20/09/04
6	ISSUED FOR TENDER R1	20/02/25
5	ISSUED FOR TENDER	20/02/03
4	ISSUED FOR BUILDING PERMIT	19/12/16
3	ISSUED FOR 99% CD REVIEW	19/04/30
2	ISSUED FOR 90% CD REVIEW	19/03/08
1	ISSUED FOR 90% CD REVIEW	18/12/21
0	ISSUED FOR REVIEW ONLY	18/09/21

PROJECT:

STRAWBERRY HILL HALL

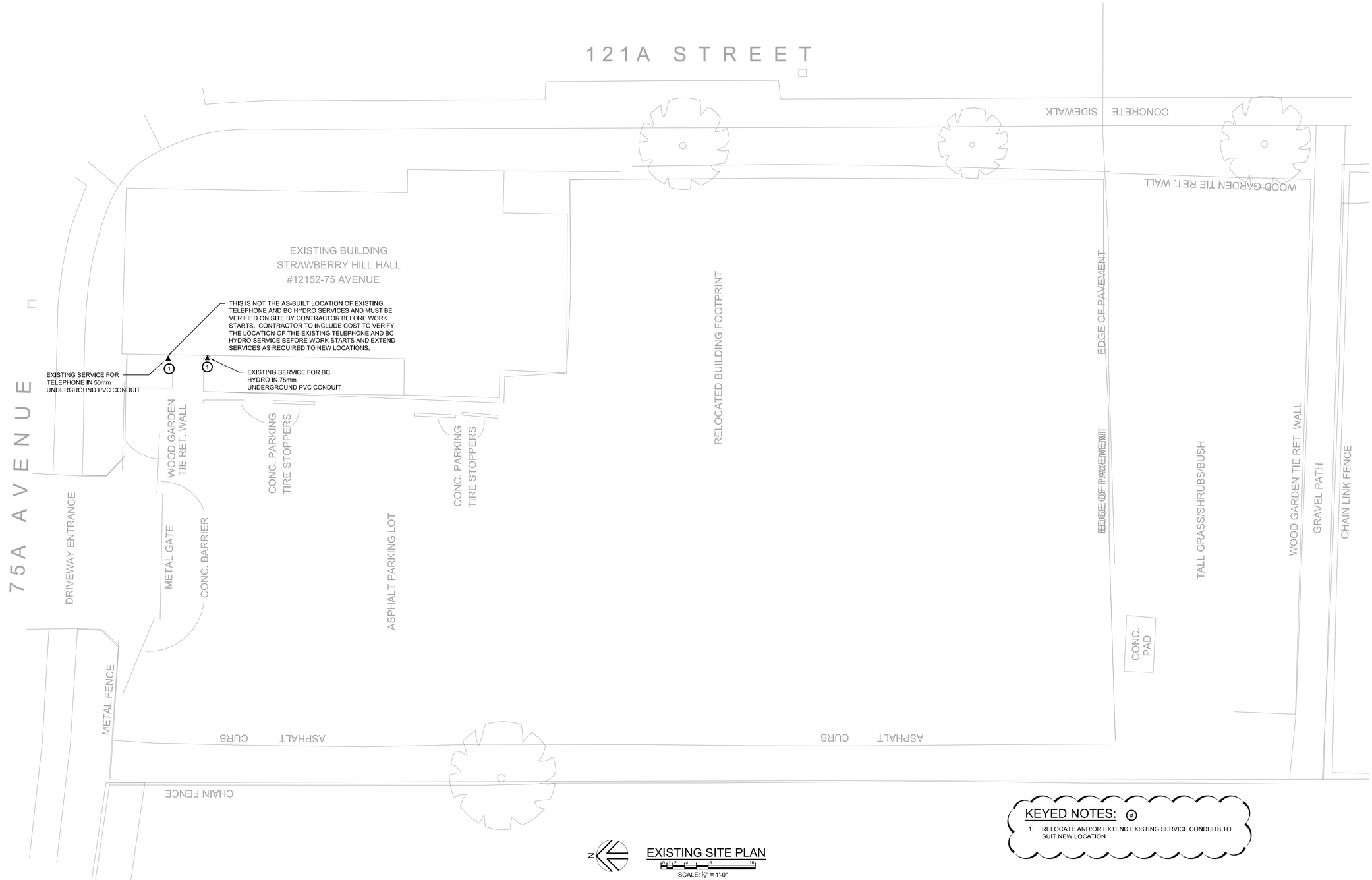
12152 75 AVENUE, SURREY

TITLE: ELECTRICAL COVER SHEET & SYMBOL SCHEDULES

DRAWN BY:	CT
DATE:	Aug 31, 2020
SCALE:	AS NOTED

DWG#: **E001**

FOR REFERENCE ONLY



N

EXISTING SITE PLAN

SCALE: 1/8" = 1'-0"

KEYED NOTES: (#)

1. RELOCATE AND/OR EXTEND EXISTING SERVICE CONDUITS TO SUIT NEW LOCATION.

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Project Reference No: 152262.000

REV.	DESCRIPTION	DATE
7	RE-ISSUED FOR BP	20/09/04
6	ISSUED FOR TENDER R1	20/02/25
5	ISSUED FOR TENDER	20/02/03
4	ISSUED FOR BUILDING PERMIT	19/12/16
3	ISSUED FOR 99% CD REVIEW	19/04/30
2	ISSUED FOR 90% CD REVIEW	19/03/08
1	ISSUED FOR 90% CD REVIEW	18/12/21
0	ISSUED FOR REVIEW ONLY	18/09/21

PROJECT:

STRAWBERRY HILL HALL

12152 75 AVENUE, SURREY

TITLE:

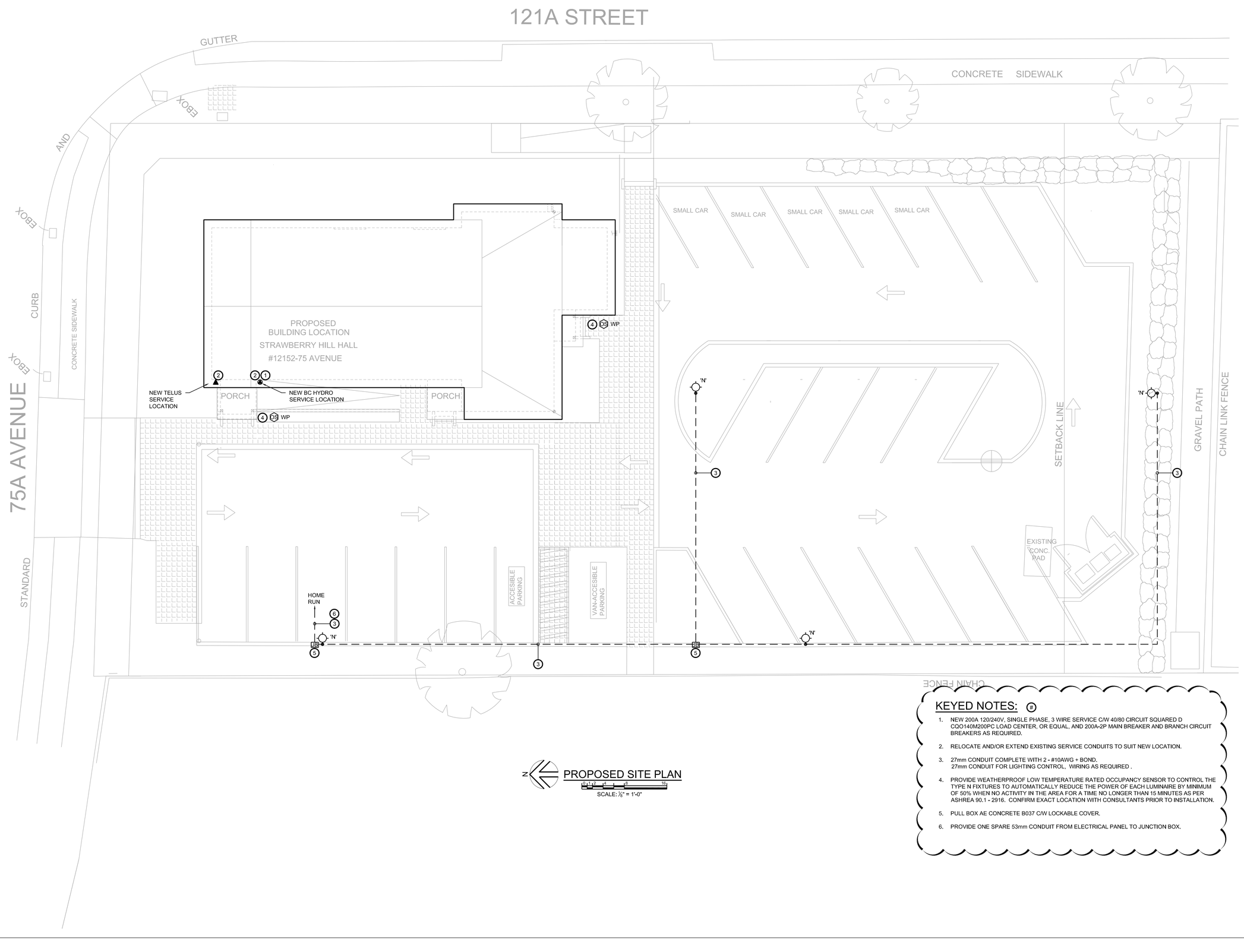
ELECTRICAL OVERALL EXISTING SITE PLAN

DRAWN BY:	**CT**
DATE:	**Aug 31, 2020**
SCALE:	**AS NOTED**

DWG#:

E100

FOR REFERENCE ONLY



PROPOSED SITE PLAN

SCALE: 1/8" = 1'-0"

KEYED NOTES: (#)

1. NEW 200A 120/240V, SINGLE PHASE, 3 WIRE SERVICE C/W 40/80 CIRCUIT SQUARED D CQO140M200PC LOAD CENTER, OR EQUAL, AND 200A-2P MAIN BREAKER AND BRANCH CIRCUIT BREAKERS AS REQUIRED.
2. RELOCATE AND/OR EXTEND EXISTING SERVICE CONDUITS TO SUIT NEW LOCATION.
3. 27mm CONDUIT COMPLETE WITH 2 - #10AWG + BOND.
   27mm CONDUIT FOR LIGHTING CONTROL, WIRING AS REQUIRED .
4. PROVIDE WEATHERPROOF LOW TEMPERATURE RATED OCCUPANCY SENSOR TO CONTROL THE TYPE N FIXTURES TO AUTOMATICALLY REDUCE THE POWER OF EACH LUMINAIRE BY MINIMUM OF 50% WHEN NO ACTIVITY IN THE AREA FOR A TIME NO LONGER THAN 15 MINUTES AS PER ASHREA 90.1 - 2916. CONFIRM EXACT LOCATION WITH CONSULTANTS PRIOR TO INSTALLATION.
5. PULL BOX AE CONCRETE B037 C/W LOCKABLE COVER.
6. PROVIDE ONE SPARE 53mm CONDUIT FROM ELECTRICAL PANEL TO JUNCTION BOX.

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PROJECT:

STRAWBERRY HILL HALL

12152 75 AVENUE, SURREY

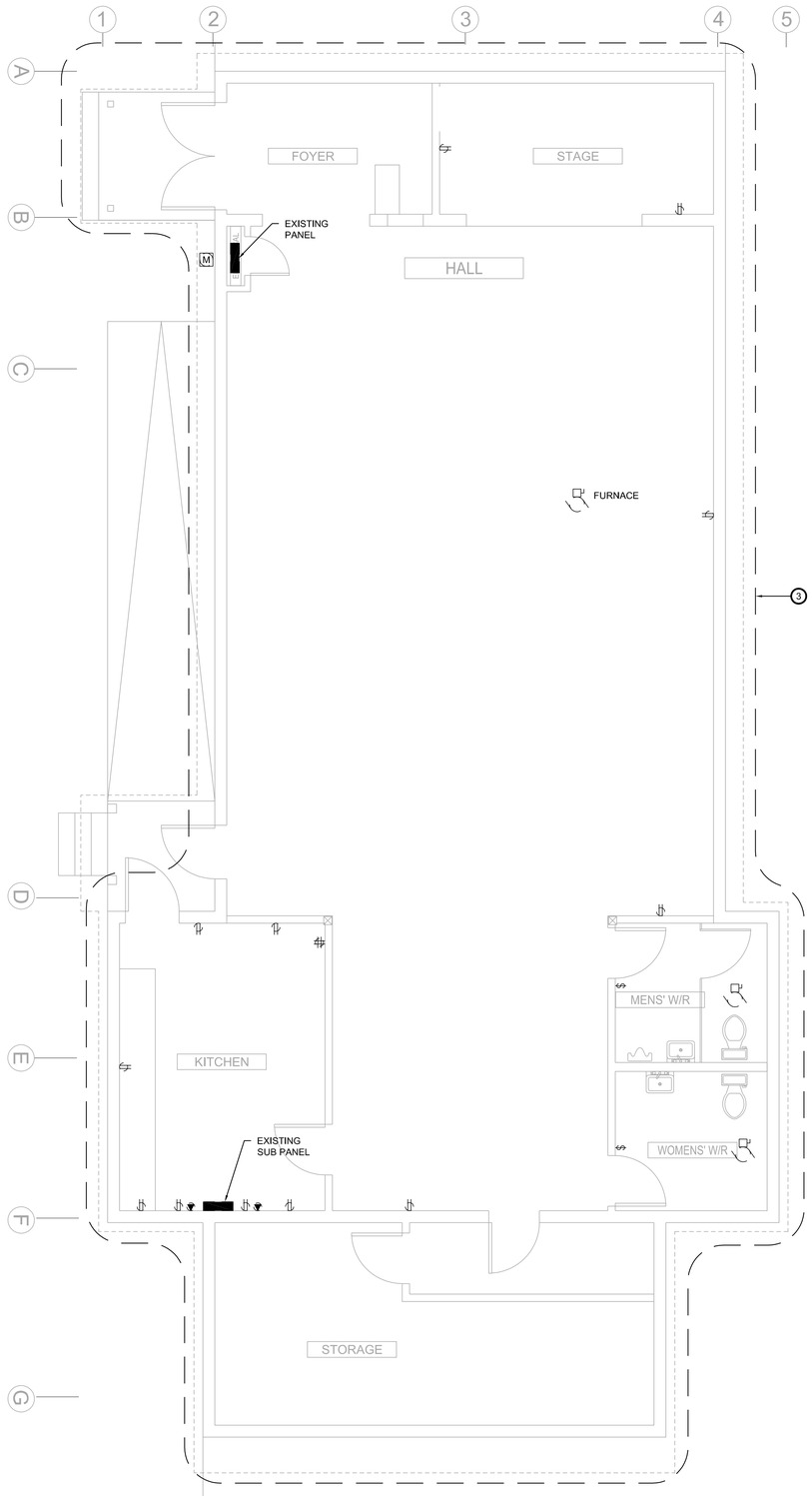
TITLE:

ELECTRICAL OVERALL PROPOSED SITE PLAN

DRAWN BY:	CT
DATE:	Aug 31, 2020
SCALE:	AS NOTED

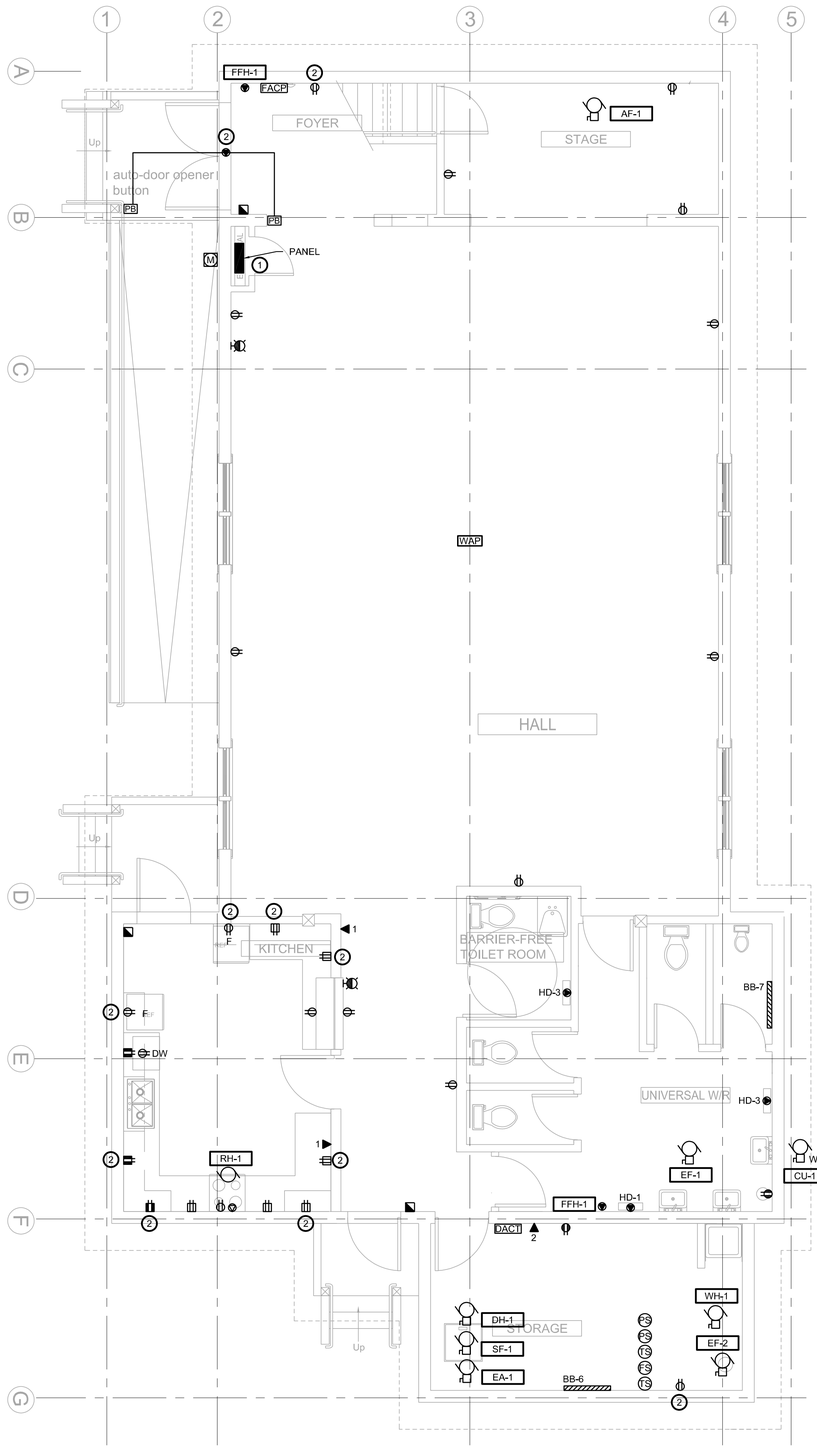
DWG#:

E100.1



POWER PLAN - DEMO

SCALE: ¼" = 1'-0"



POWER PLAN - NEW

SCALE: ¼" = 1'-0"

N

KEYED NOTES: (#)

1. NEW 200A 120/240V, SINGLE PHASE, 3 WIRE SERVICE C/W 40/80 CIRCUIT, SQUARED D CQO140M200PC LOAD CENTER, OR EQUAL, AND A 200A-2P MAIN BREAKER AND BRANCH CIRCUIT BREAKERS AS REQUIRED.
2. DEDICATED CIRCUIT.
3. EXISTING ELECTRICAL EQUIPMENT TO BE REMOVED, INSTALL ALL NEW EQUIPMENT WHERE INDICATED. REMOVE ALL EXISTING WIRING AND REPLACE WITH NEW WIRING.

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PROJECT:

STRAWBERRY HILL HALL

12152 75 AVENUE, SURREY

TITLE:

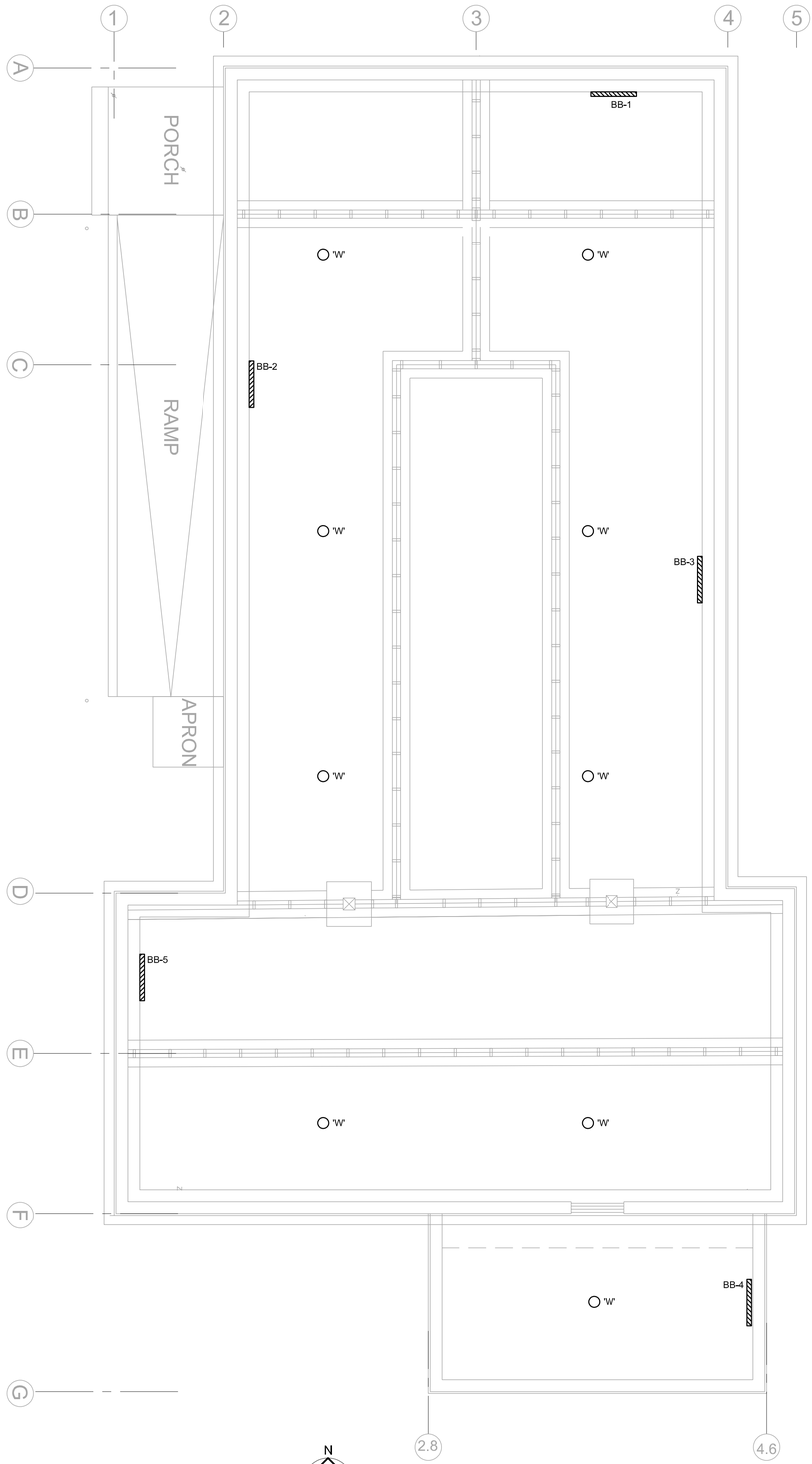
ELECTRICAL POWER PLANS

DRAWN BY:	CT
DATE:	Aug 31, 2020
SCALE:	AS NOTED

DWG#:

E101

FOR REFERENCE ONLY



N

POWER PLAN - NEW

SCALE: ¼" = 1'-0"

NOTE:

PROVIDE TOGGLE SWITCH AT CRAWLSPACE ENTRANCE IN CRAWLSPACE FOR LIGHTING.

PANEL - MAIN
MOUNTING - SURFACE
LOCATION -

VOLTAGE - 120 / 240 V, 1 Φ, 3 W
MAIN BUS - 200 A
MAIN BREAKER -

LOAD	DESCRIPTION	BKR	CIRCUIT		BKR	DESCRIPTION	LOAD
7000	DH-1	40	1	2	40	RANGE	6000
			3	4			
5900	CU-1	50	5	6	20	BBH-1, BBH-2, BBH-3	3750
			7	8			
1300	BBH-6, BBH-7	15	9	10	20	BBH-4, BBH-5	2500
			11	12			
240	HWT	15	13	14	30	HD-1 & HD-2	2800
240	EA-1	15	15	16	15	HD-2	1400
1068	AF-1	15	17	18	15	LIGHTING, EF-1	1200
1500	FFH-1	20	19	20	15	LIGHTING, EF-2	1200
1500	FFH-2	20	21	22	15	CEILING FANS	1200
	SPACE		23	24		SPACE	
(6) 250	FIRE ALARM PANEL	15	25	26	15	EXTERIOR LIGHTING	1200
500	DOOR OPERATOR	15	27	28	15	KITCHEN RECEPTACLE	500
(1) 100	EXIT LIGHTING	15	29	30	15	KITCHEN RECEPTACLE	500
1000	FRIDGE #1	15	31	32	15	KITCHEN RECEPTACLE	500
1000	FRIDGE #2	15	33	34	15	KITCHEN RECEPTACLE	500
1000	DISHWASHER	15	35	36	15	KITCHEN RECEPTACLE	500
	SPACE		37	38		SPACE	
500	GENERAL RECEPTACLES	15	39	40	15	KITCHEN RECEPTACLE	500
500	GENERAL RECEPTACLES	15	41	42	15	KITCHEN RECEPTACLE	500
	SPACE		43	44		SPACE	
	SPACE		45	46		SPACE	
	SPACE		47	48		SPACE	
	SPACE		49	50		SPACE	
	SPACE		51	52		SPACE	

KEYED NOTES: (X)

1. PROVIDE LOCK ON BREAKER.
2. PROVIDE ISOLATED GROUND.
3. PROVIDE GROUND FAULT BREAKER.
4. LOW VOLTAGE LIGHTING CONTROL.
5. ROUGHIN FOR FUTURE.
6. PAINT BREAKER RED.

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1	ISSUED FOR 90% CD REVIEW	18/12/21
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PROJECT:

STRAWBERRY HILL HALL

12152 75 AVENUE, SURREY

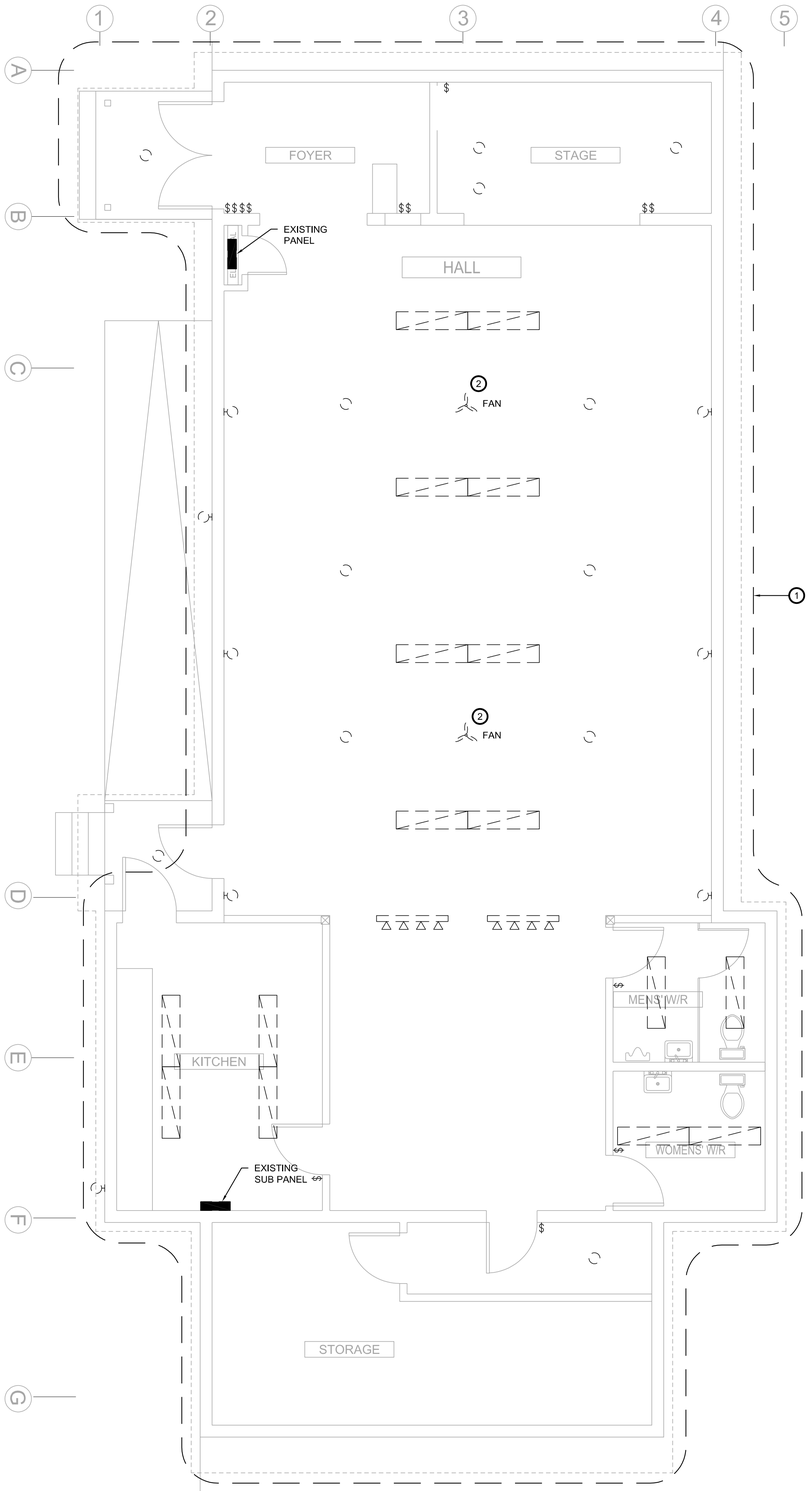
TITLE:

ELECTRICAL
CRAWL SPACE
POWER PLANS

DRAWN BY:	CT
DATE:	Aug 31, 2020
SCALE:	AS NOTED

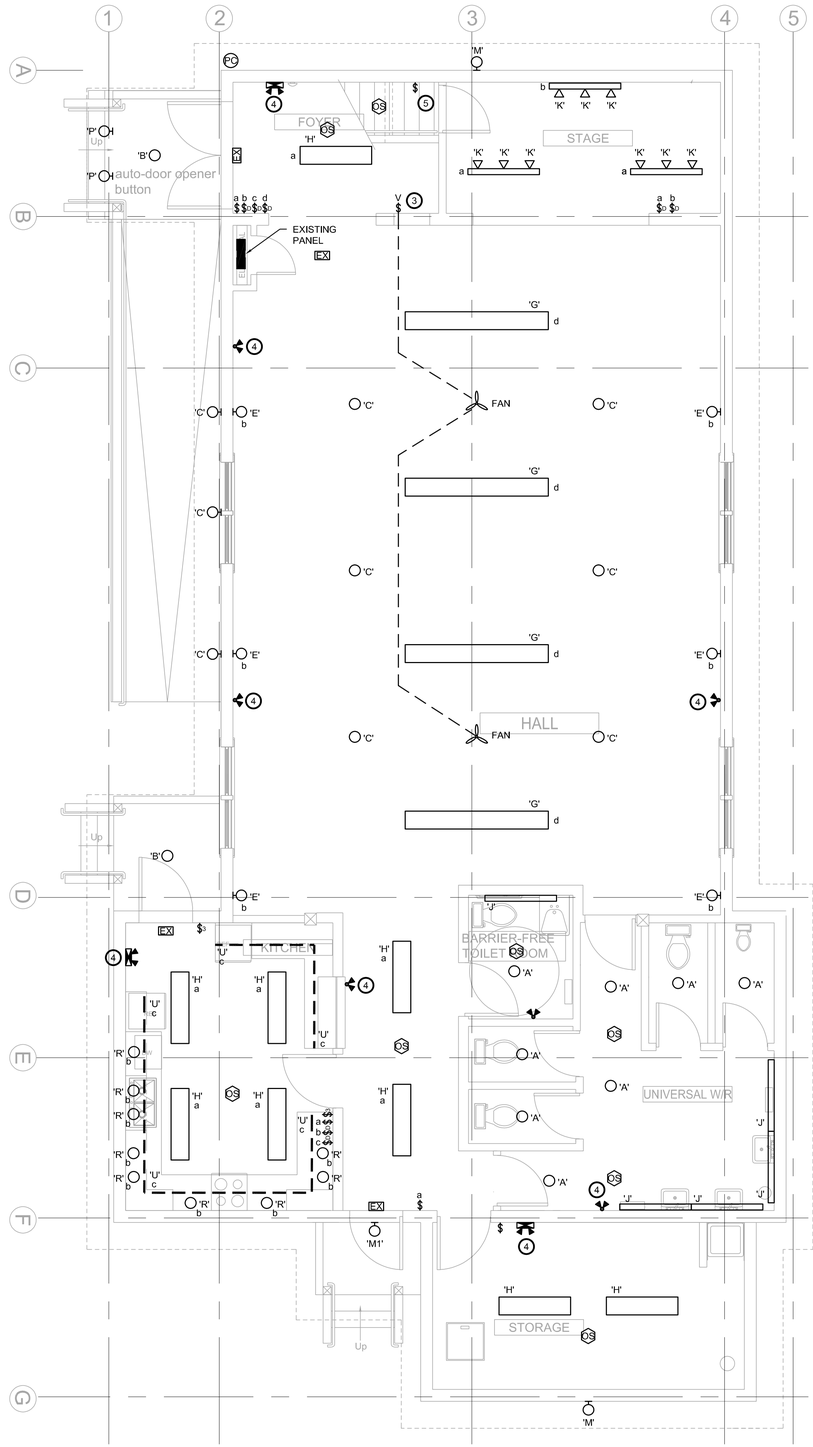
DWG#:

E101.1



LIGHTING PLAN - DEMO

SCALE: ¼" = 1'-0"



LIGHTING PLAN - NEW

SCALE: ¼" = 1'-0"

N

KEYED NOTES: (#)

1. EXISTING ELECTRICAL EQUIPMENT TO BE REMOVED, INSTALL ALL NEW EQUIPMENT WHERE INDICATED. REMOVE ALL EXISTING WIRING AND REPLACE WITH NEW WIRING.
2. EXISTING ELECTRICAL EQUIPMENT TO BE REMOVED, CLEANED, RE-INSTALLED AND REWIRED AS REQUIRED. COORDINATE DRAWINGS WITH ARCHITECTURAL LOCATIONS.
3. DEDICATED CIRCUIT.
4. MINIMUM 30 MINUTES. EMERGENCY LIGHTING TO AUTOMATICALLY ACTUATE WHEN ELECTRIC LIGHTING IN THE AFFECTED AREA IS INTERRUPTED.
5. ALLOW FOR THREE KEYLESS LAMP HOLDERS COMPLETE WITH A21 LED 16W BULBS AND WIRE GUARD IN STAIR AND ATTIC SPACE SWITCHED AT THE BASE OF STAIRS.

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0	ISSUED FOR REVIEW ONLY	18/09/21

PROJECT:

STRAWBERRY HILL HALL

12152 75 AVENUE, SURREY

TITLE:

ELECTRICAL LIGHTING PLANS

DRAWN BY:	CT
DATE:	Aug 31, 2020
SCALE:	AS NOTED

DWG#:

E102

1.0 GENERAL PROVISIONS

1.01 THE GENERAL CONDITIONS OF THE CONTRACT SHALL FORM AN INTEGRAL PART OF THE SPECIFICATION.

1.02 PROVIDE ALL LABOUR AND MATERIALS NECESSARY FOR A COMPLETE AND OPERATING SYSTEM AS INDICATED ON THE DRAWINGS AND/OR SPECIFIED HEREIN. ANY WORK AND MATERIAL, EVEN IF NOT SHOWN OR SPECIFIED THAT IS OBVIOUSLY NECESSARY OR REASONABLY IMPLIED TO COMPLETE THE WORK TO BE PROVIDED AS IF IT WAS BOTH SHOWN AND SPECIFIED.

1.03 ALL ELECTRICAL WORK AND MATERIAL SHALL CONFORM WITH THE CURRENT RELEVANT AND/OR APPLICABLE BUILDING CODE, ELECTRICAL SAFETY ACT OF THE JURISDICTION, CURRENT PURSUANT REGULATION (ELECTRICAL CODE REGULATION, ELECTRICAL SAFETY BULLETINS, ETC) AND TO THE SATISFACTION OF THE AUTHORITY HAVING JURISDICTION AND THE DESIGN PROFESSIONAL. FOR THE PURPOSE OF THIS SPECIFICATION INTERPRETATION OF THE WORD "CODE" SHALL MEAN ALL CODES, REGULATIONS AND REQUIREMENTS AS STATED ABOVE.

1.04 CONTRACTOR TO VISIT THE SITE AND ASCERTAIN CONDITIONS AFFECTING THE WORK BEFORE SUBMITTING A TENDER QUOTE.

1.05 APPLY FOR ALL PERMITS, SERVICES, FEES AND INSPECTIONS AND PAY FOR ALL FEES TO THE AUTHORITIES HAVING JURISDICTION. INCLUDE ALL COST IN TENDER QUOTE.

1.06 OBTAIN APPROVALS FROM THE ELECTRICAL INSPECTION AUTHORITY AND NOTIFY THE ENGINEER OF ANY CHANGES REQUESTED BY THE INSPECTION AUTHORITY.

1.07 WHERE DOUBT EXISTS AS TO THE MEANING OF THE DRAWINGS OR SPECIFICATIONS, OBTAIN CLARIFICATION PRIOR TO TENDER.

1.08 SHOP DRAWINGS FOR ELECTRICAL EQUIPMENT/ MATERIALS SHALL BE SUBMITTED FOR REVIEW BY ENGINEER BEFORE MANUFACTURING AND INSTALLATION CAN PROCEED. CONTRACTOR TO PROVIDE SCHEDULE OF SHOP DRAWINGS TO THE CONSULTANT WITHIN TWO WEEKS OF TENDER AWARD. ALLOW 5 WORKING DAYS FOR CONSULTANT REVIEW OF EACH SHOP DRAWING SUBMISSION PACKAGE.

1.09 INCLUDE ALL FEDERAL, PROVINCIAL AND MUNICIPAL TAXES FOR THE WORK IN THE TENDER PRICE.

1.10 ALL MATERIALS USED SHALL BE: NEW, OF THE TYPE SPECIFIED, APPROVED BY CERTIFICATION AGENCY RECOGNIZED BY THE AUTHORITY HAVING JURISDICTION, AND FREE FROM DEFECTS.

1.11 ALL ELECTRICAL EQUIPMENT INSTALLED OR CONNECTED SHALL BE IDENTIFIED BY MEANS OF BLACK LAMICOID LABELS c/w MINIMUM 3/8" WHITE LETTERING.

1.12 CLEAN ALL EQUIPMENT DURING CONSTRUCTION AND AGAIN ON COMPLETION OF THE CONTRACT.

1.13 REMOVE ALL SURPLUS MATERIALS, CUTTINGS, PACKAGING AND DEBRIS FROM THE SITE DURING THE PROGRESS AND AT FINAL COMPLETION OF THE WORK.

1.14 THE OWNER RESERVES THE RIGHTS OF TRIAL OR TEMPORARY USAGE PRIOR TO ACCEPTING THE INSTALLATION.

1.15 EXECUTE ALL WORK IN A WORKMANLIKE MANNER, TO PRESENT A NEAT MECHANICAL APPEARANCE.

1.16 COORDINATE WITH THE OTHER TRADES AND ARRANGE EQUIPMENT IN PROPER RELATION WITH OTHER APPARATUS, DUCTS, PIPES, ETC. AND WITH BUILDING CONSTRUCTION AND ARCHITECTURAL FINISHES.

1.17 ALL RECEPTACLE COVER PLATES, SWITCH COVER AND EXHAUST FAN SWITCH COVERS TO BE c/w BROTHER PTOUCH LABELS INDICATING PANEL NAME AND CIRCUIT NUMBERS.

1.18 EXCAVATION AND FILL (TO BE PERFORMED OUTSIDE OF DIV. 26 SCOPE OF WORK. SEE SECTION "DIV. 26 EXCLUSIONS").

.1 WHERE REQUIRED, ALL EXCAVATION AND BACK-FILL PERTAINING TO THIS PORTION OF THE CONTRACT WILL BE PERFORMED BY THE CONTRACTOR. FILL MATERIAL SHALL BE EQUIVALENT TO THE SURROUNDING MATERIAL. CONTRACTOR SHALL COORDINATE ALL WORK REQUIRED.

.2 UNDER NO CIRCUMSTANCES SHALL A CONTRACTOR PROCEED WITH DIGGING WITHOUT CHECKING WITH PERTINENT PARTIES AND/OR AUTHORITIES REGARDING THE EXISTING UNDERGROUND SERVICES DUCTS, STRUCTURES, ETC.

.3 WHEN UNDERGROUND SERVICE/INSTALLATION HAS TO BE CONNECTED TO SERVICES SUPPLIED AND/OR INSTALLED BY OTHER PARTIES, CONTRACTOR SHALL FULLY COORDINATE WITH ALL PARTIES TO DETERMINE THE EXACT POINT OF CONNECTION. THIS COORDINATION TO BE PERFORMED BEFORE ANY EXCAVATION OR INSTALLATION.

1.19 BUILDING ENVELOPE PENETRATION OF ANY ELECTRICAL COMPONENT (i.e. CONDUIT, BOXES, CABLES, ETC.) SHALL BE EXECUTED SO INTEGRITY OF ASSEMBLY IS NOT COMPROMISED. PROVIDE FOR ADEQUATE SEALING, COVERS, GASKETS, CAPS, ETC. COORDINATE WORK AND REQUIREMENTS WITH ALL OTHER RELEVANT CONTRACTORS, ARCHITECT, ENVELOPE CONSULTANT AND OTHER RELEVANT CONSULTANTS AND CONTRACTORS.

1.20 LIABILITY AND EXCLUSIONS

.1 ACUMEN ENGINEERING LTD. DRAWINGS, SPECIFICATIONS AND OTHER DOCUMENTS PERTAIN TO ELECTRICAL SCOPE OF WORK ONLY.

.2 TASKS WHICH ARE NOT PART OF ELECTRICAL SCOPE OF WORK EVEN IF MENTIONED IN THESE DOCUMENTS ARE INDICATED ONLY FOR REFERENCE AND COORDINATION PURPOSES ONLY.

.3 WORK PERFORMED BY CONTRACTOR NOT SPECIFICALLY IDENTIFIED AS PART OF THE SCOPE OF WORK SHALL BE PERFORMED WITH A CLEAR UNDERSTANDING THAT ACUMEN ENGINEERING LTD., AND ANY AGENTS OR EMPLOYEES OF ACUMEN ENGINEERING LTD. ARE NOT IN ANY WAY LIABLE NOR RESPONSIBLE FOR THIS WORK.

.4 GENERALLY THE SCOPE OF WORK IS LIMITED TO DIV. 26 OF NATIONAL MASTER SPECIFICATION.

.5 SPECIFICALLY, ACUMEN ENGINEERING LTD. DOES NOT PROVIDE ANY ENGINEERING/CONSULTING SERVICES RELATED TO BUILDING ENVELOPE, WATERPROOFING AND ANY OTHER NON-ELECTRICAL COMPONENTS. THIS APPLIES TO BUT IS NOT LIMITED TO ALL AND ANY ELECTRICAL PENETRATIONS AND INSTALLATIONS THROUGHOUT OR WITHIN BUILDING ENVELOPE.

2.0 CONDUIT, WIRE AND CONNECTIONS

2.01 DRAWINGS ARE SCHEMATIC ONLY. CONDUIT RUNS SHOWN INDICATE POINTS TO BE JOINED. RUNS MAY BE ALTERED BY THE CONTRACTOR TO SUIT ACTUAL FIELD CONDITIONS. ELECTRICAL DRAWINGS ONLY GIVE INDICATION OF FEATURES OF OTHER TRADES. ARCHITECTURAL, STRUCTURAL AND MECHANICAL DRAWINGS GOVERN WHERE THESE ARE INVOLVED.

2.02 WIRING DEVICES IN FINISHED AREAS SHALL BE RECESSED MOUNTED AND FOR ALL UNFINISHED AREAS MAY BE SURFACE MOUNTED.

2.03 A WARNING SIGN SHALL BE PLACED NEAR ALL MOTORS WITH THE FOLLOWING WORDING: "DO NOT SERVICE UNTIL DISCONNECTS ARE LOCKED OFF".

2.04 FINAL CONNECTIONS TO MOTORS SHALL BE WITH MIN. 18" LONG FLEX CONDUIT, PROVIDE DISCONNECTS AS PER CODE REQUIREMENTS.

2.05 UNLESS OTHERWISE NOTED, OUTSIDE LIGHTING, USE MINIMUM #10 RW90 RUN IN 1" RIGID PVC CONDUIT c/w BOND WIRE. INCREASE WIRE GAUGE ACCORDING TO LOAD AND DISTANCE.

2.06 TEST SYSTEM AND RECORD SAME FOR THE ENGINEER'S APPROVAL:
.1 VOLTAGE DROP
.2 PHASE BALANCE
.3 INSULATION RESISTANCE
.4 GROUND RESISTANCE

2.07 UNLESS SPECIFICALLY NOTED OTHERWISE, ALL WIRE AND CABLE SHALL BE COPPER, 98% CONDUCTIVITY, COLOUR CODED, NEW AND MARKED AS PER CODE REQUIREMENTS AND INSTALLED IN RACEWAYS. WIRES SHALL BE RATED MIN. 600V TYPE TWH OR R90X-LINK. RW90 SHALL BE USED FOR UNDERGROUND RACEWAY INSTALLATIONS.

2.08 ALL WIRING SHALL BE SIZED AS PER CODE. MINIMUM ALLOWABLE WIRE SIZE IS #14 AWG. CONDUCTORS #8 AND LARGER TO BE STRANDED. ALL WIRES INSTALLED IN CONDUIT SHALL BE PULLED IN AT THE SAME TIME. ONLY APPROVED PULLING LUBRICANT SHALL BE USED. COLOUR CODE CONDUCTORS WITH DIFFERENT COLOURS FOR EACH PHASE, NEUTRAL, GROUND AND BOND WIRES AS REQUIRED BY CODE.

2.09 MAXIMUM VOLTAGE DROP SHALL BE AS PER CODE REQUIREMENTS.

2.10 ALL CONDUITS, CABLES AND WIRES, ETC., TO BE RATED EITHER FT1 FOR COMBUSTIBLE BUILDINGS, FT4 FOR NON COMBUSTIBLE BUILDINGS AND FT6 FOR PLENUM AND AS REQUIRED BY THE CODE.

2.11 ALL WIRE CONNECTIONS TO BE SECURELY FASTENED BY MEANS OF APPROVED CONNECTORS.

2.12 ALL NON-CURRENT CARRYING METAL PARTS SHALL BE GROUNDED AND/OR BONDED IN ACCORDANCE WITH THE CODE.

2.13 THE BUILDING STRUCTURAL STEEL SHALL BE BONDED TO THE GROUND SYSTEM.

2.14 OPENINGS IN ALL ELECTRICAL METAL BOXES SHALL BE PUNCHED OR CUT. BURNING OF HOLES IS NOT PERMITTED.

2.15 INSTALL ALL CONDUITS, ETC. TO ACCOUNT FOR EXPANSION AND INSTALL APPROVED EXPANSION JOINTS WHERE REQUIRED.

2.16 RACEWAYS SHALL BE RIGID METAL CONDUITS, EMT OR FLEXIBLE CONDUIT AS SHOWN ON THE DRAWINGS. ALL CONDUIT INSTALLED IN CONCRETE FLOOR SHALL BE RIGID P.V.C. OR RIGID GALVANIZED STEEL CONDUIT c/w BOND CONDUCTOR.

2.17 EMT COUPLINGS AND CONNECTORS TO BE T&B STEEL, TAPE ALL JOINTS FOR ALL IN-SLAB INSTALLATIONS. STEEL SHALL BE USED ABOVE GRADE.

2.18 USE OF RUNNING THREADS IS NOT PERMITTED.

2.19 ALL CONDUITS MUST BE SECURELY FASTENED WITH APPROVED CLIPS AND SCREWS IN PARTITIONS AND CADDY CLIPS IN CEILING. NAILS ARE NOT ACCEPTED.

2.20 EXPOSED CONDUITS SHALL RUN PARALLEL TO BUILDING LINES AND BE PAINTED OUT TO MATCH WALL FINISH. WHERE CONDUITS ARE RUN EXPOSED ON EXISTING SURFACES PAINT TO MATCH WALL FINISH.

2.21 CONDUITS MOUNTED EXPOSED UP TO 5'-0" A.F.F. SHALL BE RIGID STEEL GALVANIZED STANDARD WEIGHT WITH GALVANIZED THREADED COUPLINGS.

2.22 PROVIDE OUTLET BOXES FOR CONNECTING TO DEVICES AND EQUIPMENT AS REQUIRED OR AS INDICATED ON DRAWINGS. LOCATIONS OF OUTLETS MAY BE CHANGED UP TO 15'-0" WITHOUT EXTRA CHARGE PROVIDED THAT INSTRUCTIONS FOR CHANGE ARE ISSUED BEFORE INSTALLATION OF THE OUTLET.

2.23 ALL CONDUIT, CONDUCTORS, WIRES, ETC. TO BE LABELED IN INDELIBLE INK AT PANEL AND JUNCTION BOXES INDICATING DEVICE FED, PANEL NAME AND CIRCUIT NUMBER

2.24 ALL ELECTRICAL GROUND BUSES SHALL BE PRE-DRILLED AND SHALL BE CLEARLY LABELED

2.25 PRIOR TO INSTALLATION OF ANY CONDUIT IN CONCRETE SLABS, CONTRACTOR SHALL COORDINATE LAYOUT AND REQUIREMENTS WITH STRUCTURAL ENGINEER.

2.26 ALL EMPTY CONDUITS SHALL BE C/W APPROVED FOR APPLICATION PULL STRINGS.

3.0 DISTRIBUTION EQUIPMENT

3.01 LIGHTING AND POWER PANELS TO BE CIRCUIT BREAKER TYPE AND AS SHOWN ON DRAWINGS: PANELS TO BE OF DEAD FRONT TYPE, CODE GAUGE STEEL ENCLOSURE. FINISHED FACTORY PAINT ASA GRAY 61 ENAMEL. FIT WITH PLASTIC COVERED TYPED DIRECTORY IN FRAME ON INSIDE OF DOOR COVER. DIRECTORY TO INDICATE CIRCUITS SERVED AS PER FINAL WIRING CONNECTIONS. PANELS TO BE WITH BOLT-ON BREAKERS, MULTI-POLE BREAKERS TO HAVE COMMON TRIP (NO TIE HANDLE WILL BE ACCEPTED).

3.02 PROVIDE LOCK ON DEVICES ON BREAKERS FOR THE FOLLOWING SYSTEMS.
.1 FIRE ALARM SYSTEM
.2 EXIT LIGHTS
.3 NIGHT LIGHTS

3.03 MAIN DISTRIBUTION CENTRES SHALL BE AS DETAILED ON THE DRAWINGS.

3.04 ALL ELEMENTS OF ELECTRIC POWER DISTRIBUTION SYSTEM SHALL BE RATED FOR PROPER VOLTAGE AND AVAILABLE FAULT LEVELS. OVER CURRENT PROTECTION DEVICES SHALL BE APPROVED AND MARKED AS BREAKERS OR BREAKER/FUSES COMBINATION IN SERIES. SHOP DRAWINGS SHALL CLEARLY IDENTIFY THE COMPLIANCE WITH THIS REQUIREMENT.

3.05 PROVIDE DRIP SHIELDS TO ADEQUATELY DEFLECT WATER FROM ALL ELECTRICAL EQUIPMENT.

3.06 DISCONNECT SWITCHES SHALL BE SQUARE D HEAVY-DUTY ENCLOSED SAFETY SWITCHES OR EQUAL. DISCONNECT SWITCHES SHALL HAVE THE OPERATING HANDLE INTERLOCKED WITH THE SWITCH COVER, STEEL REINFORCED FUSE CLIPS, A QUICK-MAKE, QUICK-BREAK MECHANISM AND SHALL BE HORSEPOWER RATED FOR 100% LOADING.

3.07 LABEL METER CENTER FUSIBLE DISCONNECTS AND INDICATE THE MAXIMUM PERMISSIBLE RATING OF THE FUSE IN EACH RESPECTIVE DISCONNECT.

3.08 ENSURE THAT THE SERVICE EQUIPMENT BEARS EVIDENCE OF "SUITABLE FOR SERVICE ENTRANCE".

3.09 CONTRACTOR TO PROVIDE COORDINATION, SHORT CIRCUIT, AND ARC-FLASH STUDY AND CORRESPONDING PROTECTION MARKING ON ALL ELECTRICAL EQUIPMENT AS PER C.E.C. RULE 2-306.

4.0 UTILITY SERVICES

4.01 PROVIDE TERMINATION AND CONDUITS FOR INCOMING HYDRO, TELEPHONE AND CATV UNDERGROUND SERVICES. OBTAIN EXACT LOCATION OF ALL DUCTS FROM SUPPLY AUTHORITIES BEFORE INSTALLATION. FOR EMPTY CONDUITS, PROVIDE NYLON PULL CORD FOR HYDRO, TELEPHONE, AND CATV DUCTS. INCLUDE ALL HYDRO UTILITY, TELEPHONE UTILITY AND CATV CHARGES IN THE TENDER PRICE. ALL THE ABOVE SHALL MEET THE REQUIREMENTS OF THE RESPECTIVE UTILITIES.

4.02 THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING THE FOLLOWING WITH THE LOCAL B.C. HYDRO, TELUS AND CATV OFFICES:

.1 APPROVAL OF ANY CHANGES TO THE UNDERGROUND CONDUIT ROUTE PRIOR TO INSTALLATION.

.2 HYDRO INSPECTION AND APPROVAL OF ALL UNDERGROUND CONDUIT AND TRANSFORMER PAD INSTALLATION PRIOR TO POURING OF CONCRETE AND BACKFILL.

.3 SUBMISSION OF THREE COPIES OF THE ARRANGEMENT OF ALL SERVICE ENTRANCE EQUIPMENT PRIOR TO PURCHASE AND INSTALLATION.

4.03 CONFIRM EXACT LOCATION OF ALL HYDRO, TELEPHONE AND CATV ENTRANCES SERVICING BOTH ON AND OFF SITE WITH HYDRO, TELEPHONE, AND CATV UTILITIES DIRECTLY BEFORE ANY INSTALLATION.

4.04 GENERALLY DBII ESII DUCT SHALL BE USED FOR UNDERGROUND ON SITE SERVICES FOR HYDRO, TELEPHONE AND CATV SERVICES.

4.05 OBTAIN APPROVED PERMITS FROM LOCAL GAS COMPANY AND CONTACT THEIR INSPECTION DEPARTMENT PRIOR TO UNDERTAKING ANY EXCAVATIONS. FAILURE TO DO SO MAY BE AN OFFENSE UNDER THE PROVINCIAL GAS ACT.

4.06 COORDINATE WITH GAS, WATER, SANITARY, AND ALL UNDERGROUND SERVICES AND MAINTAIN THE MINIMUM CLEARANCES REQUIRED BY CODE AND THE UTILITIES.

5.0 LUMINAIRES, LAMPS AND BALLAST

5.01 LUMINAIRES SHALL BE AS DETAILED IN FIXTURE SCHEDULE AND INSTALLED AS INDICATED IN LOCATIONS SHOWN. INSTALL COMPLETE WITH LAMPS, BALLAST, DIFFUSERS, HANGERS, GASKETS, CANOPIES AND SUPPORTS FOR A COMPLETE AND FINISHED OPERATION. FINAL LAYOUT OF LUMINAIRES SHALL BE MADE AFTER DUCTING, PIPING, AND SHELVING LAYOUTS ARE FULLY COORDINATED WITH OTHER TRADES. ALL LUMINAIRES TO BE ADEQUATELY ATTACHED DIRECTLY TO THE BUILDING STRUCTURE.

5.02 UNLESS OTHERWISE INDICATED, BALLAST SHALL BE HIGH POWER FACTOR RAPID START SOUND RATING "A" SUITABLE FOR 120V OPERATION.

5.03 PROVIDE LAMPS FOR ALL FIXTURES. LAMPS SHALL BE PROVIDED AS INDICATED IN THE FIXTURE SCHEDULE.

5.04 ALL LIGHT DIFFUSERS AND LENSES SHALL HAVE A FLAME SPREAD RATING AND SMOKE DEVELOPED CLASSIFICATION (WHEN TESTED IN CONFORMANCE WITH CAN/ULC-S102.2-M) MEETING THE REQUIREMENTS OF SECTION 3.1 OF THE CURRENT BUILDING CODE.

5.05 ALL LIGHT DIFFUSERS AND LENSES SHALL FALL TO THE BOTTOM OF THE TEST APPARATUS BEFORE IGNITING WHEN TESTED IN CONFORMANCE WITH ULC-S102.3-M.

5.06 CONTRACTOR SHALL SUPPLY AND INSTALL CONCRETE BASES FOR ALL POLE LIGHTING. PRIOR TO MANUFACTURING AND/OR INSTALLATION CONTRACTOR SHALL COORDINATE ANCHOR BOLT SIZES, LAYOUT AND SPEC, ETC. WITH POLE BASE AND LIGHT FIXTURE SUPPLIERS. CONTRACTOR SHALL GET APPROVAL FOR USAGE OF PROPOSED CONCRETE BASE FROM STRUCTURAL ENGINEER. SHOP DRAWING SIGNED AND SEALED BY STRUCTURAL ENGINEER (ENGAGED BY CONTRACTOR AND/OR BASE MANUFACTURER) SHALL BE SUBMITTED TO ENGINEER AND RECORD. THE DESIGN SHALL TAKE INTO CONSIDERATION THE TYPE OF SOILS TO BE INSTALLED IN. IF REQUIRED BY STRUCTURAL ENGINEER, A SOIL TEST MAY HAVE TO BE PERFORMED TO ALLOW PROPER DESIGN OF BASES. ALL COSTS FOR THE ABOVE SHALL BE INCLUDED IN BASE PRICE. (THIS WORK SHALL BE PERFORMED OUTSIDE OF DIV. 26 SCOPE OF WORK).

5.07 ALL FIRE RESISTANCE RATED ASSEMBLIES (i.e. WALLS, CEILINGS, ETC.) WHICH CONTAIN RECESSED LIGHTING FIXTURES SHALL BE c/w FIRE RATED BACKING TO MAINTAIN THE INTEGRITY OF THE FIRE RESISTANCE. (THIS WORK SHALL BE PERFORMED OUTSIDE DIV. 26 SCOPE OF WORK).

6.0 FIRE STOPPING OF SERVICE PENETRATION AND FIRE RESISTANT ASSEMBLIES

6.01 ALL ELECTRICAL WIRES, CABLES, NONCOMBUSTIBLE RACEWAYS, OUTLET BOXES AND OTHER SIMILAR SERVICES THAT PENETRATE FIRE WALL, FIRE SEPARATION OR ASSEMBLY REQUIRED TO HAVE A FIRE RESISTANCE RATING OR FIRE SEPARATION, SHALL BE SEALED BY FIRE STOP SYSTEM WHICH HAS AN "F" AND/OR "FT" RATING NOT LESS THAN REQUIRED FIRE PROTECTION RATING OF FIRE SEPARATION.

6.02 "F" AND "FT" RATINGS SHALL BE DETERMINED BY FIRE TEST METHOD CAN4-S115-M "STANDARD METHOD OF FIRE TESTS OF FIRE STOP SYSTEMS". SEE CURRENT BUILDING CODE, FIRE STOPPING OF SERVICE PENETRATIONS.

6.03 CONTRACTOR SHALL ONLY USE LISTED MATERIALS AND METHODS AS LISTED AND INDICATED IN "ULC LIST OF EQUIPMENT AND MATERIALS VOLUME 2, BUILDING CONSTRUCTION" (NO. 40U18 FIRE SEPARATION).

6.04 SERVICE PENETRATION AND FIRE STOPPING OF SERVICE PENETRATION IN FIRE SEPARATION AND FIRE RATED ASSEMBLIES SHALL COMPLY WITH THE CURRENT BUILDING CODE.

6.05 PROVIDE FOR FIRE STOPS IN CONCEALED SPACES AS REQUIRED BY THE CURRENT BUILDING CODE.

6.06 ALL FIRE RESISTANCE RATED ASSEMBLIES (i.e. WALLS CEILINGS, ETC.) WHICH CONTAIN PANEL BOARDS, BACK BOXES, ETC. SHALL BE c/w FIRE RATED BACKING TO MAINTAIN THE INTEGRITY OF THE FIRE RESISTANCE.

6.07
.1 CONTRACTOR SHALL EMPLOY QUALIFIED FIRESTOP PROFESSIONAL ENGINEER TO PROVIDE THE DESIGN OF AND REVIEWS FOR FIRESTOP INSTALLATIONS.

.2 CONTRACTOR SHALL PROVIDE FIRESTOP PROFESSIONAL ENGINEER LETTERS; ASSURANCE OF PROFESSIONAL DESIGN AND COMMITMENT OF FIELD REVIEW (SCHEDULE B-1), SUMMARY OF DESIGN AND FIELD REVIEW REQUIREMENTS (SCHEDULE B-2), AT THE INSTALL STAGE OF THE CONSTRUCTION.

.3 BEFORE SUBSTANTIAL PERFORMANCE CAN BE GRANTED CONTRACTOR SHALL PROVIDE FIRESTOP PROFESSIONAL ENGINEER LETTER OF ASSURANCE OF PROFESSIONAL FIELD REVIEW AND COMPLIANCE (SCHEDULE C-B).

.4 ALL COSTS RELATED TO THE ABOVE REQUIREMENTS SHALL BE INCLUDED IN THE CONTRACTOR BASE BID.

7.0 EMERGENCY LIGHTING

7.01 SUPPLY AND INSTALL EMERGENCY BATTERY UNITS AND EMERGENCY LIGHTING FIXTURES AS INDICATED ON THE DRAWINGS AND/OR AS SPECIFIED HEREIN

7.02 UNLESS OTHERWISE NOTED ON THE DRAWINGS, ALL BATTERY UNITS SHALL HAVE THE FOLLOWING FEATURES:
- SEALED 10 YEARS LIFE LEAD BATTERIES
- COMPLETE MAINTENANCE FREE BATTERIES
- VOLTAGE SENSITIVE DEMAND CHARGER
- SEALED DUST-TIGHT TRANSFER RELAY
- LOW VOLTAGE BATTERY DISCONNECT
- DUAL DIAGNOSTIC INDICATOR LIGHTS
- TEST SWITCH
- TEMPERATURE COMPENSATED
- CURRENT REGULATED
- FUSE PROTECTED OUTPUT CIRCUITS
- VOLTAGE REGULATED
- FULLY AUTOMATIC
- SOLID STATE
- 12V DC SECONDARY OPERATION
- 120V AC PRIMARY OPERATION

7.03 UNLESS OTHERWISE NOTED ON THE DRAWINGS, ALL EMERGENCY LIGHT HEADS SHALL BE 12V MIN. 12W AND BE OF MICRO QUARTZ TYPE.

7.04 ALL BATTERY UNITS AND HEADS SHALL BE CERTIFIED TO C.S.A. STANDARD C22.2N0141 AND RECOGNIZED BY SECTION 46, CEC PART I.

7.05 ALL EMERGENCY BATTERIES SHALL BE MOUNTED ON THE SPECIAL BRACKET DESIGNED TO WITHSTAND SEISMIC FORCES.

7.06 UNLESS OTHERWISE NOTED THE TOTAL LOAD (LIGHTING HEADS CONNECTED) CONNECTED TO THE BATTERY WILL OPERATE FOR TIME AS REQUIRED BY ARTICLE 3.2.7.4 OF BUILDING CODE WITH A MIN. OF 87.5% OF THE RATED BATTERY VOLTAGE OUTPUT.

7.07 UNLESS OTHERWISE NOTED, ALL EMERGENCY LIGHTING HEADS ARE TO BE LOCATED ON CEILING AT WALL AND BE COORDINATED WITH WALL AND CEILING DETAILS AND FINISHES. CONTRACTOR TO SUPPLY AND INSTALL ALL WIRING FROM BATTERY PACK TO REMOTE HEADS AS REQUIRED. ENSURE WIRE SIZE IS ADEQUATE FOR VOLTAGE DROP (MAXIMUM 5%).

7.08 ALL EXIT SIGN LIGHTS MUST BE CONNECTED TO BOTH NORMAL POWER SOURCE AND APPROVED EMERGENCY POWER SOURCE. EXIT SIGNAGE TO BE PICTOGRAM 'RUNNING MAN' TYPE.

7.09 EMERGENCY BATTERY UNITS MUST BE CONNECTED TO THE SAME CIRCUIT AS NORMAL LIGHTING TO THAT AREA AS PER CEC SECTION 46-304 (4). EXIT SIGNAGE TO BE SELF POWERED.

8.0 FINAL ACCEPTANCE

8.01 SUBMIT TO THE ENGINEER UPON COMPLETION OF THE CONTRACT, TWO MARKED UP SETS OF RED LINE DRAWINGS AND THREE SETS OF MAINTENANCE MANUALS FOR SERVICE, DISTRIBUTION, PANELS, LIGHT FIXTURES, LAMPS, EXITS, EMERGENCY UNITS, EMERGENCY HEADS, AND FIRE ALARM EQUIPMENT. CONTRACTOR TO INCLUDE IN THEIR PRICE THE COST FOR THE CONSULTANT TO UPDATE THE CONSULTANT'S DIGITAL DRAWING FILES WITH CONTRACTOR'S REDLINE DRAWINGS TO CREATE RECORD DRAWINGS FOR THE OWNER'S USE, ALLOW A LUMP SUM OF $1,500 PAID TO THE CONSULTANT FOR THIS WORK. AT COMMENCEMENT OF CONSTRUCTION, A PO FOR THE ABOVE WORK IN THE AMOUNT INDICATED HEREIN SHALL BE ISSUED FROM THE CONTRACTOR TO ACUMEN ENGINEERING LTD.

8.02 DELIVER TO THE ENGINEER CERTIFICATE OF APPROVAL AND FINAL INSPECTION FROM AUTHORITIES HAVING JURISDICTION PRIOR TO FINAL OCCUPANCY. THESE MUST BE PROVIDED THREE WORKING DAYS BEFORE ENGINEERS FINAL OCCUPANCY REVIEW.

8.03 SUBMIT TO THE ENGINEER A COPY OF SIGNED LETTER VERIFYING THAT EMERGENCY LIGHTING SYSTEM HAS BEEN TESTED UNDER FULL LOAD AS PER CODE REQUIREMENTS.

8.04 AFTER WORK IS COMPLETED, FURNISH TO OWNER A WRITTEN GUARANTEE THAT FOR ONE YEAR FROM DATE OF ACCEPTANCE, ANY DEFECTS IN MATERIALS OR WORKMANSHIP WILL BE CORRECTED AT NO COST TO THE OWNER. SUBMIT COPY OF GUARANTEE TO ENGINEER.

8.05 SUBMIT COPIES OF FIRE ALARM VERIFICATION AND TESTING REPORT TO THE ENGINEER PRIOR TO FINAL ACCEPTANCE. THESE MUST BE PROVIDED THREE WORKING DAYS BEFORE ENGINEERS FINAL OCCUPANCY REVIEW.

8.06 SUBMIT COPY OF SEISMIC ENGINEERS SIGNED SCHEDULE TO THE CONSULTANT PRIOR TO FINAL ACCEPTANCE, THESE MUST BE PROVIDED THREE WORKING DAYS BEFORE ENGINEERS FINAL OCCUPANCY REVIEW.

9.0 FIRE ALARM SYSTEM

9.01 SUPPLY AND INSTALL A COMPLETE AND OPERATIONAL ADDRESSABLE, SINGLE STAGE, FIRE ALARM SYSTEM WITH SUPERVISED FIRE DETECTION AND ALARM CIRCUITS AS SHOWN ON THE DRAWINGS AND/OR AS REQUIRED. THIS INCLUDES, BUT IS NOT LIMITED TO ROUGH-INS, WIRING, ACTIVE AND PASSIVE COMPONENTS, TESTING VERIFICATION AND CERTIFICATES.

9.02 THE FIRE ALARM SYSTEM SHALL COMPLY WITH ULC STANDARDS 524 AND THE APPLICABLE CODES. VERIFICATION SHALL COMPLY WITH ULC STANDARDS 537.

9.03 FIRE ALARM WIRING SHALL BE MINIMUM #18 TYPE RW90 FOR DETECTION CIRCUITS AND MINIMUM #14 RW90 FOR NOTIFICATION CIRCUITS. ALL WIRING SHALL BE FREE OF GROUNDS AND SHORTS. APPROVED FIRE ALARM CABLE CAN BE USED WITH FT RATING AS REQUIRED FOR PARTICULAR TYPE OF CONSTRUCTION.

9.04 ALL FIRE ALARM INTERLOCKS WITH OTHER EQUIPMENT (RECIRCULATING AIR EQUIPMENT, MAGNETIC DOOR HOLDERS, ETC.) AS SHOWN AND/OR REQUIRED SHALL BE TESTED AND CLEARLY INDICATED ON FIRE ALARM VERIFICATION REPORT. VERIFY ALL REQUIRED INTERLOCKS AND SEQUENCE OF OPERATION WITH MECHANICAL ENGINEER BEFORE FINAL PROGRAMMING.

9.05 FIRE ALARM VERIFICATION REPORT AND CERTIFICATE OF VERIFICATION SHALL BE SUBMITTED TO THE ELECTRICAL CONSULTANT FOR REVIEW AND APPROVAL.

9.06 THE FOLLOWING HAS TO BE MET IN ORDER FOR F.A. SYSTEM TO BE CONSIDERED FOR ACCEPTANCE: F.A. SYSTEM IS INSTALLED AS PER ALL

a) F.A. SYSTEM IS INSTALLED AS PER ALL APPLICABLE CODES.
b) F.A. SYSTEM IS INSTALLED AS PER THIS DRAWING AND SPECIFICATION.
c) F.A. SYSTEM IS INSTALLED AS PER MANUFACTURER SPECIFICATIONS.
d) F.A. VERIFICATION REPORT AND CERTIFICATION AS ACCEPTED AND APPROVED BY AUTHORITY HAVING JURISDICTION AND THE ELECTRICAL CONSULTANT.
e) VERIFICATION REPORT SHALL BE COMPLETE AND CERTIFICATE ISSUED ONLY WHEN FIRE ALARM SYSTEM HAS NO DEFICIENCIES.
f) CONFIRMATION OF THE REQUIRED MONITORING FROM REMOTE MONITORING STATION SHALL BE PART OF VERIFICATION REPORT OR PROVIDED AS A SEPARATE LETTER FROM MONITORING COMPANY.
g) VERIFICATION REPORT SHALL INCLUDE IDENTIFIED SENSITIVITY REPORT (CAN/ULC S537)
h) CONFIRMATION OF FIRE ALARM REMOTE MONITORING AND PERFORMANCE SUBMITTED BY REMOTE MONITORING COMPANY.
i) REMOTE MONITORING SIGNALS PRINTOUT SUBMITTED BY REMOTE MONITORING COMPANY.

9.07 NOT WITHSTANDING THE FIRE ALARM VERIFICATION REQUIREMENTS STATED IN CONTRACT DOCUMENTS, CONTRACTOR SHALL OBTAIN WRITTEN CONFIRMATION FROM LOCAL AUTHORITIES AND THE ELECTRICAL CONSULTANT THAT PROPOSED VERIFICATION COMPANY IS APPROVED AND THEIR VERIFICATION WILL BE ACCEPTED.

9.08 F.A. PANEL MUST INCLUDE ALARM, SPRINKLER FLOW, SUPERVISORY, AND TROUBLE RELAYS FOR REMOTE MONITORING CONNECTIONS AND FIRE DEPARTMENT BYPASS SWITCH C/W INDICATOR FOR TROUBLE AT THE PANEL.

9.09 PROVIDE SUPERVISED ANNUNCIATOR INCLUDING AUDIBLE AND VISUAL INDICATION OF FIRE ALARM BY ZONE, AND AUDIBLE AND VISUAL INDICATION OF SYSTEM TROUBLE INSTALL IN WALL MOUNTED ENCLOSURE.

10.0 SEISMIC RESTRAINTS

THIS SECTION APPLIES TO PROJECTS LOCATED IN BRITISH COLUMBIA

10.01

.1 PROVIDE ALL MATERIALS AND LABOUR NECESSARY TO SUPPLY AND INSTALL SEISMIC RESTRAINTS FOR ALL ELECTRICAL EQUIPMENT, LIGHT FIXTURES, BATTERY PACKS, CONDUITS, RACEWAYS, BUS DUCTS, ETC. TO CONFORM WITH BUILDING CODE AND ALL OTHER APPLICABLE REGULATIONS.
.2 CONTRACTOR SHALL RETAIN AND PAY FOR SEISMIC ENGINEER TO DESIGN AND INSPECT THE SEISMIC RESTRAINTS OF THE ELECTRICAL SYSTEM COMPONENTS COVERED UNDER DIVISION 26 FOR THIS CONTRACT.
.3 THE SEISMIC ENGINEER RETAINED BY CONTRACTOR SHALL PROVIDE FOR THE FOLLOWING:
- SIGNED AND SEALED LETTERS OF ASSURANCE OF PROFESSIONAL DESIGN AND COMMITMENT FOR FIELD REVIEW AND SUMMARY OF DESIGN AND FIELD REVIEW AS REQUIRED BY THE BRITISH COLUMBIA BUILDING CODE <u>(SCHEDULE B1 AND B2, POINT 6.5)</u>.
- CERTIFIED DETAILED DRAWINGS OF SEISMIC RESTRAINT.
- DETAILED SPECIFICATION FOR SEISMIC RESTRAINTS.
- WRITTEN REPORTS OF SITE REVIEWS.
- SIGNED AND SEALED LETTER OF ASSURANCE OF PROFESSIONAL FIELD REVIEW AND COMPLIANCE. (SCHEDULE C-B)

.4 SUBSTANTIAL COMPLETION WILL NOT BE CONSIDERED WITHOUT THE SUBMISSION OF THE ABOVE DOCUMENTS.
.5 ALL THE ABOVE DOCUMENTS SHALL BE SUBMITTED TO THE ELECTRICAL ENGINEER FOR FURTHER DISTRIBUTION AND FILES.
.6 IMMEDIATELY AFTER CONTRACT AWARD, CONTRACTOR SHALL SEND A LETTER TO THE ELECTRICAL ENGINEER CONFIRMING RETAINMENT OF SEISMIC ENGINEER FOR THE SERVICES AS DESCRIBED IN THIS SPECIFICATION.
.7 SEISMIC ENGINEER SHALL BE A REGISTERED PROFESSIONAL ENGINEER IN THE ASSOCIATION OF PROFESSIONAL ENGINEERS AND GEOSCIENTISTS OF BRITISH COLUMBIA, AND SHALL HAVE A MINIMUM OF 2 YEARS EXPERIENCE IN THIS FIELD.
.8 SEISMIC ENGINEER SHALL HAVE ENGINEER'S PROFESSIONAL LIABILITY INSURANCE, MINIMUM AS FOLLOWS:
$500,000.00 EACH LOSS
$1,000,000.00 PER POLICY PERMIT.
.9 THE CONTRACTOR SHALL COOPERATE WITH THE SEISMIC ENGINEER AND SHALL PROMPTLY SUPPLY SUCH INFORMATION, INCLUDING WEIGHTS OF EQUIPMENT AND BASE FRAME OR MOUNTING PLATE LAYOUTS, AS REQUESTED BY THE SEISMIC ENGINEER NECESSARY TO SUPPORT THE DESIGN AND DETAILS FOR SEISMIC RESTRAINT.

10.02

.1 THE FOLLOWING REQUIREMENTS ARE MINIMUM BUT ARE NOT EXHAUSTIVE. CONTRACTOR SHALL OBTAIN AND MEET DETAIL SPECIFICATION AND REQUIREMENTS FROM SEISMIC ENGINEER. IN NO CIRCUMSTANCES SHALL SEISMIC RESTRAINTS BE LESS STRINGENT THAN AS REQUIRED BY THE FOLLOWING SPECIFICATION AND SEISMIC ENGINEER.
.2 ACCEPTABLE ANCHOR BOLT MANUFACTURERS ARE HILTI, RAMSET, AND UCAN. OTHER MANUFACTURERS MAY BE USED SUBJECT TO THE APPROVAL BY THE SEISMIC ENGINEER.
.3 SLACK CABLE RESTRAINTS SHALL UTILIZE EITHER GALVANIZED OR STAINLESS STEEL STRANDED CABLE. THE INSTALLATION SHALL USE CLAMPS, THIMBLES, SHACKLES AND OTHER ASSOCIATED HARDWARE CORRECTLY SIZED FOR THE DIAMETER OF THE CABLE SPECIFIED BY THE SEISMIC ENGINEER.
.4 SELECT VIBRATION ISOLATORS TO PROVIDE A NATURAL FREQUENCY NOT GREATER THAN ONE THIRD OF THE EQUIPMENT'S LOWEST FORCING FREQUENCY.
.5 USE "LION" CHAIN, GALVANIZED STEEL WIRES OR AIRCRAFT CABLE FOR LUMINAIRE HANGERS.
.6 ALL SEISMIC RESTRAINT COMPONENTS EXPOSED TO THE WEATHER SHALL BE STAINLESS STEEL CONSTRUCTION OR PROTECTED AGAINST CORROSION EITHER BY HOT-DIPPED GALVANIZING, TWO-COAT EPOXY PAINT SYSTEM, OR OTHER COATING ACCEPTABLE TO THE SEISMIC ENGINEER.
.7 NOTWITHSTANDING THE ABOVE, GAUGES OR SIZES SMALLER THAN INDICATED BELOW WILL NOT BE ACCEPTED FOR SEISMIC RESTRAINTS:
- #14 AWG WIRE
- 1/16" DIA AIRCRAFT CABLE
- #3 LION CHAIN

10.03

.1 PROVIDE SEISMIC RESTRAINTS INCLUDING ANCHOR BOLTS, SLACK CABLE BRACES AND MISCELLANEOUS FRAMING AND CONNECTIONS.
.2 EQUIPMENT MANUFACTURER SHALL BE RESPONSIBLE FOR ENSURING THAT THE EQUIPMENT HAS ADEQUATE STRENGTH FOR SEISMIC RESTRAINT AND ANCHORAGE OF THE EQUIPMENT FRAMING. MANUFACTURERS REPORT CONFIRMING THE ABOVE SHALL BE SUBMITTED TO THE ELECTRICAL ENGINEER.
.4 PROVIDE TRANSVERSE AND LONGITUDINAL SEISMIC RESTRAINT ANCHORAGE OR BRACING TO CABLE TRAYS, CONDUITS AND BUSWAYS. ON VERTICAL BUS WAYS PROVIDE FOR LATERAL RESTRAINT GUIDES AT EACH FLOOR PENETRATION AND SPACED NOT MORE THAN 20' (REFER TO SEISMIC ENGINEER FOR DIRECTIONS).
.5 SEISMIC RESTRAINTS SHALL BE INSTALLED AT LEAST 3" CLEAR FROM OTHER EQUIPMENT, PIPING, DUCTS OR OTHER INSTALLATIONS.
.6 INSTALL SEISMIC RESTRAINT CABLE BRACES SO THAT THEY ARE NOT VISIBLY SLACK. AT STEEL TRUSSES, CONNECT BRACES TO TOP CHORDS AT PANEL POINTS.
.7 FOR TRANSFORMERS, PROVIDE FOR VIBRATION ISOLATORS, AND SEISMICALLY RATED SPRING ISOLATORS, OR USE SNUBBERS WITH RESILIENT BUSHINGS OR OTHER PROVISION, SUCH AS TO MAINTAIN VIBRATION ISOLATION TOGETHER WITH SEISMIC RESTRAINT.
.8 FOR SUSPENDED EQUIPMENT, SUCH AS TRANSFORMERS, PROVIDE CABLE OR RIGID BRACES TO RESTRAIN EQUIPMENT AGAINST SEISMIC LOADS.
.9 PROVIDE SUB-FRAMES WHERE REQUIRED FOR ADEQUATE SUPPORT OF THE EQUIPMENT FOR SEISMIC RESTRAINT AND ANCHORAGE TO THE BUILDING STRUCTURE.
.10 FOR LUMINAIRES INSTALLED IN SUSPENDED ACOUSTICAL, METAL PAN OR COFFER CEILING SYSTEMS, INDEPENDENTLY SUPPORT LIGHT FIXTURES FROM STRUCTURE USING CABLES, WIRES OR CHAINS.
.11 FOR POWER GENERATION SYSTEMS, SEISMIC RESTRAINT SHALL BE INSTALLED ON GENERATOR SET, FUEL DAY TANK, BATTERY BANK, BATTERY CHARGER, MUFFLER, CONTROL PANELS AND CABINETS, AND ANY OTHER COMPONENT WHICH FORMS PART OF THE POWER GENERATION INSTALLATION.
.12 CO-ORDINATE WITH OTHER RELEVANT TRADES OR DIVISIONS FOR THE INSTALLATION OF HOUSEKEEPING PADS AS SPECIFIED OR SHOWN ON THE DRAWINGS.
.13 WHERE DRILLING OF THE STRUCTURE IS REQUIRED FOR ANCHORAGE DETAILS, THE DRILLING SHALL BE SUBJECT TO THE APPROVAL OF THE STRUCTURAL ENGINEER.

11.00 DIV. 26 EXCLUSIONS

11.01 THE FOLLOWING WORK IS EXCLUDED FROM DIV. 26 SCOPE OF WORK BUT HAS TO BE DONE TO FACILITATE THE INSTALLATION OF ELECTRICAL SYSTEMS AND/OR IS AFFECTED BY ELECTRICAL INSTALLATIONS. THIS WORK HAS TO BE PERFORMED UNDER THE DIRECTION OF OTHER RELEVANT PROFESSIONAL SUCH AS AN ARCHITECT, MECHANICAL, CIVIL, BUILDING ENVELOPE, ETC, ENGINEER. THIS WORK SHALL BE PERFORMED UNDER OTHER RELEVANT SPECIFICATION SECTIONS (OTHER THAN DIV. 26). CONTRACTOR SHALL COORDINATE DIV. 26 WORK WITH ALL OTHER RELEVANT WORK. FOR DIRECTIONS, GUIDANCE, SPECIFICATION REGARDING THIS WORK, CONTRACTOR SHALL CONTACT RELEVANT PROFESSIONALS (NOT ELECTRICAL).

11.02 NON-EXHAUSTIVE LIST OF EXCLUSIONS:

.1 WATERPROOFING OF NON-ELECTRICAL COMPONENTS LIKE BUILDING ENVELOPE, WALLS, ROOF, ETC.
.2 X-RAYS FOR CUTTING, CORING, PATCHING.
.3 CONTROL WIRING UNLESS SPECIFIED IN THIS SECTION.
.4 ALL CIVIL CONCRETE, EXCAVATION OR BACKFILL WORK INCLUDING SHORING AND BEDDING.
.5 COVERS FOR PULL PITS.
.6 PRECAST AND/OR CAST IN PLACE CONCRETE PRODUCTS SUCH AS PULLBOXES, LIGHT POLE BASES, TRANSFORMER CONCRETE PADS, ETC.
.7 DUCT DRAINAGE AND ASSOCIATED BACKWATER VALVES.
.8 BACKING.
.9 PAINTING UNLESS SPECIFIED IN THIS SECTION.
.10 FIRE RATED DRYWALL ENCLOSURES FOR PANELBOARD AND LIGHT FIXTURES.
.11 CUTTING, PATCHING OR CORING.
.12 TEMPORARY LIGHTING UNLESS SPECIFICALLY DETAILED AS PART OF DIV. 26 WORK.

12.00 FIELD REVIEW DEFINITION

.01 FIELD REVIEWS ARE :
- CONDUCTED SPECIFICALLY AND ONLY FOR THE SCOPE OF WORK FOR WHICH THE CONSULTANT IS RESPONSIBLE;
- A REVIEW CONDUCTED AT THE SITE OF THE IMPLEMENTATION OR CONSTRUCTION OF THE ENGINEERING WORK;
- CONDUCTED AT INTERVALS APPROPRIATE TO THE STAGE OF THE CONSTRUCTION/IMPLEMENTATION;
- PERFORMED BY THE CONSULTANT WHEN CONSIDERED AT THE CONSULTANT'S PROFESSIONAL DISCRETION TO BE NECESSARY TO BECOME FAMILIAR WITH THE PROGRESS AND QUALITY OF THE WORK;
- TO DETERMINE THAT THE WORK IS IN GENERAL CONFORMITY WITH THE CONSTRUCTION CONTRACT DOCUMENTS; AND
- RECORDED IN WRITING AND COMMUNICATED TO THE CLIENT, AND CONTRACTOR.

.02 FIELD REVIEWS <u>DO NOT:</u>
– PROVIDE SUPERVISION OF THE IMPLEMENTATION OR CONSTRUCTION WORK;
– DIRECT OR HAVE CONTROL OVER THE CONTRACTOR'S WORK;
– HAVE ANY RESPONSIBILITY FOR THE CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES OR PROCEDURES SELECTED BY THE CONTRACTOR NOR FOR THE CONTRACTOR'S SAFETY PRECAUTIONS OR PROGRAMS IN CONNECTION WITH THE WORK. (THESE RIGHTS AND RESPONSIBILITIES ARE SOLELY THOSE OF THE CONTRACTOR IN ACCORDANCE WITH THE CONTRACT DOCUMENTS);
– GUARANTEE THAT THE PERFORMANCE OF THE CONTRACTOR IS IN ACCORDANCE WITH THE CONTRACT DOCUMENTS OR ANY APPLICABLE LAWS, CODES, RULES OR REGULATIONS;
– GUARANTEE THAT ALL DEFICIENT WORK WILL BE IDENTIFIED BY THE FIELD REVIEWER (THE REVIEWER MAY REJECT NON-CONFORMING WORK, BUT WILL LEAVE THE MEANS AND METHODS FOR ACHIEVING WHAT IS REQUIRED TO THE CONTRACTOR OR OTHERS WHO ARE TASKED WITH IMPLEMENTING OR CONSTRUCTING THE WORK); AND,
– INSPECT THE WORK OR SAFETY AT A CONTRACTOR-CONTROLLED SITE OR A SITE MANAGED BY OTHERS, AND DOES NOT REVIEW THE SAFETY PROGRAMS.

13.00 RENOVATION AREA SPECIFICATIONS

.01 CONTRACTOR SHALL REWIRE AND INSTALL NEW FOR ANY RELOCATED ELECTRICAL DEVICES AS SHOWN ON THE DRAWINGS AND/OR AS REQUIRED.
.02 ALL ELECTRICAL DEVICES SHOWN ON THE DRAWINGS AND/OR AS REQUIRED SHALL BE NEW UNLESS OTHERWISE NOTED.
.03 ALL MODIFIED/NEW ELECTRICAL SYSTEMS SHALL BE FULLY OPERATIONAL AFTER RENOVATION IS COMPLETE AND BE ACCEPTED BY THE CONSULTANT AND OWNER.
.04 ANY FIXTURES, WIRING DEVICES, ETC. DAMAGED DURING AND AFTER REMOVAL SHALL BE REPLACED WITH NEW APPROVED EQUIPMENT AT CONTRACTOR'S COST.
.05 CONTRACTOR IS RESPONSIBLE FOR ADEQUATE PROTECTION OF EQUIPMENT, FURNITURE, ETC. (PLASTIC COVERS, MOVEMENT OF OWNER FURNITURE, ETC.) DURING THE EXECUTION OF THE WORK.
.06 CONTRACTOR IS RESPONSIBLE FOR CLEANING UP THE WORK AREA EACH DAY BEFORE LEAVING THE JOB SITE.
.07 ALL MATERIALS SHALL BE SUPPLIED AND INSTALLED AS SPECIFIED AND/OR SHOWN ON THE DRAWINGS.
.08 ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE FOR ALL CUTTING, PATCHING AND PAINT FOR ALL AREAS AFFECTED BY THE RENOVATION. FINAL FINISHES SHALL MATCH EXISTING AND IS SUBJECT TO FINAL APPROVAL BY THE CITY. SHOULD THE CITY ASSESS THAT THE COLORS OR FINISHES DO NOT MATCH, THE CONTRACTOR WILL BE REQUIRED TO PAINT ENTIRE WALL AND/OR CEILING.

DIV. <u>27 SPECIFICATION</u>

1.0 STRUCTURED CABLING SYSTEM

1.01 REMOVE UNUSED VOICE/DATA CABLING FROM THE RENOVATION AREA. CABLES SHALL BE COMPLETELY REMOVED FROM END TO END.

1.02 PROVIDE NEW HORIZONTAL VOICE AND DATA CABLING AS INDICATED ON THE DRAWINGS. OUTLET BOXES SHALL BE 4X4" WITH MUD RINGS TO MATCH THE SIZE OF OUTLET FACE PLATES. CONDUITS SERVING OUTLET BOXES SHALL BE MINIMUM 27MM SIZE WITH PULL STRINGS INSTALLED AND RUN TO THE NEAREST ACCESSIBLE SPACE

1.03 CABLING SHALL BE CATEGORY 6 RATED. EXPOSED CABLES PLACED IN PLENUM AREAS SHALL BE RATED AS PER LOCAL AHJ REQUIREMENTS. ALL HORIZONTAL CABLING SHALL TERMINATE ON CATEGORY 6 PATCH PANELS IN RESPECTIVE TELECOM ROOMS AS SPECIFIED. PROVIDE ADDITIONAL PATCH PANELS (INCLUDING "VOICE" PATCH PANELS AND CONNECTION TO VOICE BACKBONE) TO SUPPORT ALL NEW VOICE/DATA DROPS.

1.04 INSTALLATION SHALL COMPLY WITH APPLICABLE TIA/EIA 568B STANDARD (INCLUDING ALL ADDENDA) AND IEEE STANDARDS FOR CATEGORY 6 PERFORMANCE.

1.06 WHERE IDC (110 OR BIX) BLOCKS ARE USED, CONTRACTOR TO SUPPLY AND INSTALL CROSS CONNECTION WIRES. THE NUMBER OF CROSS CONNECTION WIRES SHALL BE ADEQUATE TO CONNECT ALL VOICE AND/OR DATA RUNS.

1.08 WIRELESS ACCESS POINTS
- PROVIDE 2 CATEGORY 6 DATA CABLES TO EACH CEILING MOUNTED TELECOMMUNICATION OUTLETS AT EACH WIRELESS ACCESS POINT.
- AT WAP LOCATION TERMINATE EACH CATEGORY 6 CABLE WITH A CATEGORY 6 RATED 8-PIN RJ-45 MODULAR JACK. PROVIDE CABLE SUPPORT AND TERMINATE CABLE IN 4X4 JUNCTION BOX WITH PLASTER RING AND BLANK COVER

McGinn Engineering & Preservation Ltd.
Barry McGinn Architect.
#803-402 West Pender St.Vancouver, B.C.
Tel: 604-473-9866 Fax: 604-473-9877
Web: www.mcginn-engineering.com

INTEGRAL GROUP
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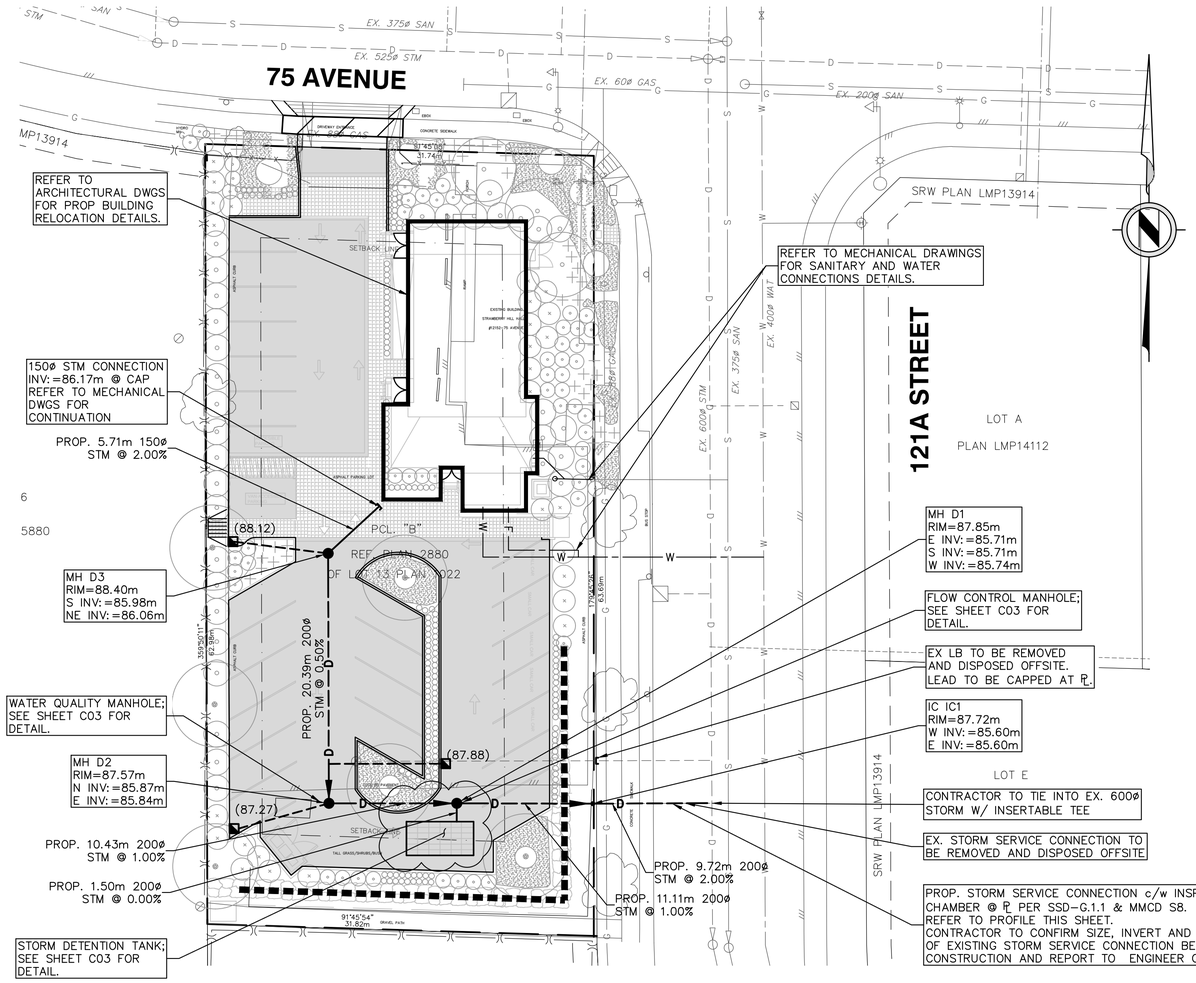
Vancouver BC Canada V6C 1S4
T 604.687.1800
www.integralgroup.com
Project Reference No: 152262.000

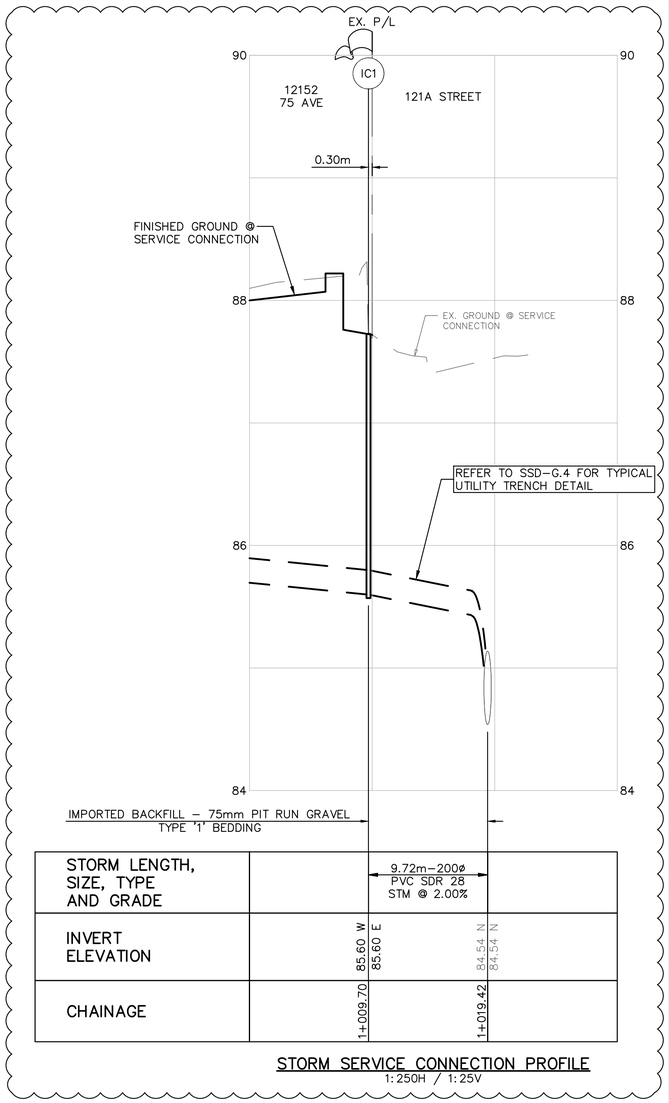
REV.	DESCRIPTION	DATE
7	RE-ISSUED FOR BP	20/09/04
6	ISSUED FOR TENDER R1	20/02/25
5	ISSUED FOR TENDER	20/02/03
4	ISSUED FOR BUILDING PERMIT	19/12/16
3	ISSUED FOR 99% CD REVIEW	19/04/30
2	ISSUED FOR 90% CD REVIEW	19/03/08
1	ISSUED FOR 90% CD REVIEW	18/12/21
0	ISSUED FOR REVIEW ONLY	18/09/21

PROJECT:
STRAWBERRY HILL HALL
12152 75 AVENUE, SURREY

TITLE:
ELECTRICAL SPECIFICATIONS

DRAWN BY: CT
DATE: Aug 31, 2020
SCALE: AS NOTED
DWG#: **E103**





STORM SERVICE CONNECTION PROFILE
1:250H / 1:25V

THE LOCATION OF EXISTING UNDERGROUND UTILITIES ARE SHOWN IN AN APPROXIMATE WAY ONLY & HAVE NOT BEEN INDEPENDENTLY VERIFIED BY THE OWNER OR ITS REPRESENTATIVE. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK, AND AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE OCCASIONED BY THE CONTRACTOR'S FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES.

LEGEND

- STORM SEWER
- SANITARY SEWER
- WATERMAIN (DOMESTIC)
- WATERMAIN (FIRELINE)
- STORM SERVICE CONNECTION
- SANITARY SERVICE CONNECTION C/W INSPECTION CHAMBER
- WATER SERVICE CONNECTION
- SODDED SWALE
- MANHOLE
- CLEANOUT/INSPECTION CHAMBER
- CATCH BASIN C/W ALUMINUM TRAPPING HOOD AS PER MMCD
- 300ø LAWN BASIN (UNLESS OTHERWISE SPECIFIED
- FIRE HYDRANT
- BLOWOFF
- AIR VALVE

REV	DATE	DESCRIPTION	BY	APP
3	2020/08/14	PROP. STORM SERVICE CONNECTION	ML	JJB
2	2020/07/03	REVISED AS PER CITY'S COMMENTS	ML	JJB
1	2020/05/14	ADDED OIL/GRIT SEPARATOR	ML	JJB
0	2020/02/03	ISSUED FOR BUILDING PERMIT & TENDER	GRL	JJB

PLAN OF PARCEL "B" (REF. PLAN 2880) OF LOT 13, SECTION 19, TOWNSHIP 2, NEW WESTMINSTER DISTRICT, PLAN 1022
LEGAL DESCRIPTION

B.M. MONUMENT NO. 0CM 5598
ELEVATION: 89.805m
LOCATED AT 124 ST. & 75 AVE.
BENCHMARK

Aug 14, 2020
ENGINEER STAMP

GENERAL NOTES:

1. CONTRACTOR TO VERIFY THE LOCATION, INVERTS AND SIZE OF EXISTING STORM CONNECTIONS TO SITE. REPORT TO THE ENGINEER ANY DISCREPANCIES PRIOR TO START OF CONSTRUCTION.
2. THE CONTRACTOR MUST CONTACT THE ENGINEER PRIOR TO CONSTRUCTION TO SCHEDULE AN ON-SITE PRE-CONSTRUCTION MEETING DURING WHICH CONSTRUCTION METHODS, TIMING AND INSPECTION WILL BE DISCUSSED.
3. ALL BUILDINGS & ROADS ARE TO LOCATED BY CO-ORDINATES AS CALCULATED BY A B.C. LAND SURVEYOR.
4. ALL WORKS TO BE IN ACCORDANCE WITH THE BC BUILDING CODE 2018, MMCD, MASTER MUNICIPAL CONTRACT DOCUMENTS (MMCD) PLATINUM, AND CITY OF SURREY SUPPLEMENTARY MASTER MUNICIPAL CONSTRUCTION DOCUMENTS.
5. CONSULT GAS CONSULTANT FOR GAS DISTRIBUTION WITHIN THE SITE.
6. CONSULT BC HYDRO DRAWINGS FOR HYDRO DISTRIBUTION WITHIN SITE.
7. CONSULT ELECTRICAL DRAWINGS FOR DISTRIBUTION WITHIN SITE.

SEWER NOTES:

1. ALL STORM SEWER, SANITARY SEWER & BEDDING MATERIALS TO MEET BRITISH COLUMBIA PLUMBING CODE 2018, MASTER MUNICIPAL CONTRACT DOCUMENTS (MMCD) PLATINUM & SURREY SUPPLEMENTARY MASTER MUNICIPAL CONSTRUCTION DOCUMENT REQUIREMENTS.
2. ALL MANHOLES TO BE 1050mmø PRE-CAST REINFORCED CONCRETE TO ASTM C478, OR AS NOTED ON DRAWING.
3. CATCH BASINS ARE TO CONFORM TO MMCD DWG. S11.
4. ALL CATCH BASIN LEADS ARE TO BE 150mmØ AT MINIMUM 0.75% SLOPE UNLESS OTHERWISE NOTED.
5. ALL LAWN BASINS TO BE 300ø OPEN BOTTOM AND SHALL CONFORM TO MMCD STANDARDS.
6. ALL LAWN BASIN LEADS ARE TO BE 100mmø AT MINIMUM 1.00% SLOPE UNLESS OTHERWISE NOTED.
7. CONTRACTOR TO CAP ALL SERVICE CONNECTIONS AT LOCATIONS COORDINATED WITH MECHANICAL DESIGN. STORM AND SANITARY CONNECTIONS TO BE RAISED WITH VERTICAL STAND PIPES TO MINIMUM 1.0m ABOVE GRADE AND MARKED.
8. CONTRACTOR TO CONFIRM LOCATION AND INVERTS OF EXISTING STORM AND SANITARY SEWER CONNECTIONS PRIOR TO CONSTRUCTION.
9. STORM AND SANITARY SEWER PIPES TO BE PVC SDR35 UNLESS OTHERWISE NOTED.
10. STORM AND SANITARY SEWERS TO HAVE 1.0m MINIMUM COVER.
11. SCHEDULE 40 AND/OR SCHEDULE 80 PLASTIC PIPE SHALL NOT BE USED FOR ANY SITE APPLICATION IN THE WORK.
12. STORM SERVICE CONNECTIONS FOR EACH BUILDING TO BE SIZED AS NOTED ON THIS SHEET PVC SDR28 PIPE AT MINIMUM 2% SLOPE UNLESS OTHERWISE NOTED.
13. SANITARY SERVICE CONNECTIONS FOR EACH BUILDING TO BE TO BE SIZED AS NOTED ON THIS SHEET PVC SDR28 PIPE AT MINIMUM 2% SLOPE UNLESS OTHERWISE NOTED.
14. ALL CLEANOUTS TO CONFORM TO MMCD DWG. S6
15. CONTRACTOR SHALL PROVIDE VIDEO INSPECTION OF ALL COMPLETED STORM AND SANITARY WORKS AS PER MMCD PLATINUM SPECIFICATIONS.
16. CONTRACTOR SHALL CLEAN ALL COMPLETED STORM AND SANITARY LINES PRIOR TO TESTING AND VIDEO INSPECTION AS PER MMCD PLATINUM SPECIFICATIONS.

LEGAL REQUIREMENT:

1. REGISTER RESTRICTIVE COVENANT FOR ONSITE SUSTAINABLE DRAINAGE WORKS TO MEET THE COUGAR CREEK ISMP REQUIREMENTS.
   - DETENTION VOLUME = 10.0 m^3
   - RELEASE RATE = 5.0 L/s
2. REGISTER RESTRICTIVE COVENANT TO REQUIRE THE OWNER/OPERATOR TO MAINTAIN AND KEEP FUNCTIONAL THE WATER QUALITY/SEDIMENT CONTROL INLET CHAMBER.

FOR COORDINATION

NOTICE TO CONTRACTOR
IT IS THE RESPONSIBILITY OF THE CONTRACTOR'S SURVEYOR TO VERIFY THAT ALL LEGAL SURVEY DIMENSIONS SHOWN ON THE ENGINEERS DRAWINGS AGREE WITH THOSE ON THE REGISTERED LEGAL SURVEY PLAN. SHOULD THERE BE ANY DISCREPANCIES, THEN IMMEDIATELY NOTIFY THE ENGINEER OF RECORD

APLIN MARTIN
ENGINEERING ARCHITECTURE PLANNING SURVEYING
Aplin & Martin Consultants Ltd.
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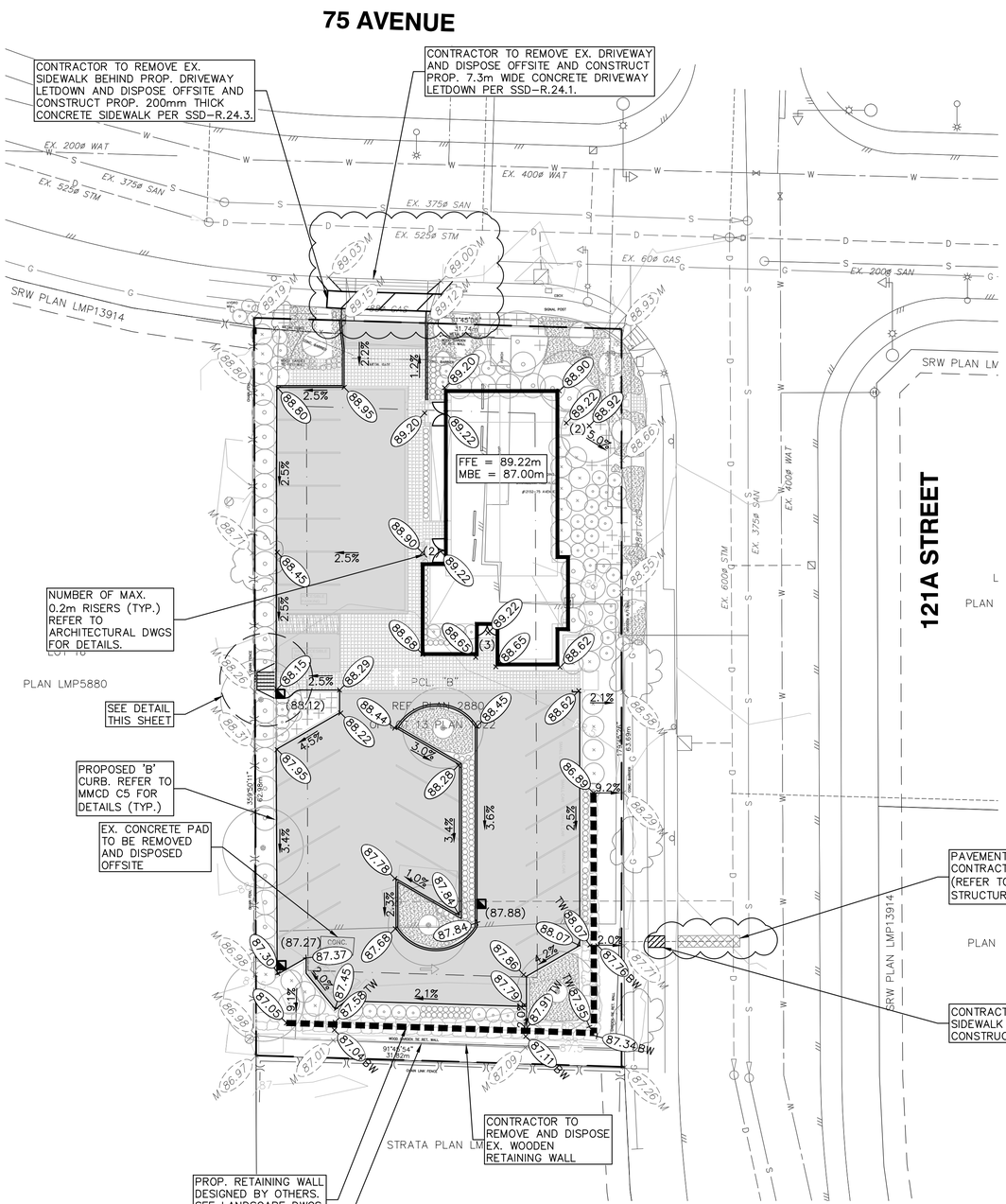
CLIENT
McGINN ENGINEERING & PRESERVATIONS LTD.
803 - 402 W. PENDER STREET,
VANCOUVER, BC V6B 1T6
604-473-9866

PROJECT
STRAWBERRY HILL HALL REHABILITATION
12152 75 AVENUE,
SURREY, BC

DRAWING TITLE
SERVICING PLAN

DESIGN GRL	DATE JANUARY, 2020	SCALE 1:250
DRAWN OA	PROJECT NO. 19-203	
CHECKED ML	DRAWING NO. C01	REV. 3
APPROVED JJB		

0 2 1:250 12m



GENERAL NOTES:

1. CONTRACTOR TO VERIFY THE LOCATION, INVERTS AND SIZE OF EXISTING STORM CONNECTIONS TO SITE. REPORT TO THE ENGINEER ANY DISCREPANCIES PRIOR TO START OF CONSTRUCTION.
2. THE CONTRACTOR MUST CONTACT THE ENGINEER PRIOR TO CONSTRUCTION TO SCHEDULE AN ON–SITE PRE–CONSTRUCTION MEETING DURING WHICH CONSTRUCTION METHODS, TIMING AND INSPECTION WILL BE DISCUSSED.
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5. CONSULT GAS CONSULTANT FOR GAS DISTRIBUTION WITHIN THE SITE.
6. CONSULT BC HYDRO DRAWINGS FOR HYDRO DISTRIBUTION WITHIN SITE.
7. CONSULT ELECTRICAL DRAWINGS FOR DISTRIBUTION WITHIN SITE.

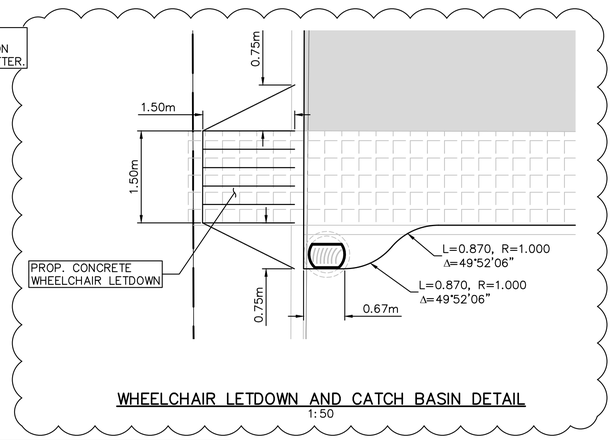
LOT GRADING NOTES:

1. ALL DIMENSIONS AND ELEVATIONS ARE IN METRES AND DECIMALS THEREOF UNLESS OTHERWISE NOTED.
2. ALL ELEVATIONS ARE TO GEODETIC DATUM.
3. ALL CURB RADII TO BE AS SHOWN.
4. ALL CONSTRUCTION IS TO BE IN ACCORDANCE WITH B.C. BUILDING AND PLUMBING CODES AND IS TO BE ACCEPTABLE TO THE CITY OF SURREY BUILDING AND PERMITS DEPARTMENT.
5. ALL EXCAVATION, FILL PLACEMENT AND COMPACTION TO BE IN ACCORDANCE WITH GEOTECHNICAL CONSULTANT'S REPORT.
6. CHANGES TO GRADE SHALL BE FORMED BY SMOOTH CURVES.
7. ALL SUBGRADES AND GRANULAR BASE MATERIALS TO BE COMPACTED AT 100% STANDARD PROCTOR UNDER FOOTINGS AND 95% STANDARD PROCTOR, AT OPTIMUM MOISTURE CONTENT.
8. ALL LOOSE OR ORGANIC MATERIAL TO BE EXCAVATED FROM ROADWAY.
9. CONSULT ELECTRICAL DRAWING FOR AREA LIGHTING AND POWER DISTRIBUTION SYSTEM WITHIN SITE.
10. THE CONTRACTOR SHALL INFORM THE ENGINEER AND CITY OF SURREY A MINIMUM OF 24 HOURS PRIOR TO REQUIRED INSPECTIONS.
11. ALL BUILDINGS EXIT TO GRADE FROM THE LOWER FLOOR.

TYPICAL ONSITE ROAD STRUCTURE

1. MIN. 50mm OF UPPER COURSE #1
2. MIN. 100mm – 19mm MINUS CRUSHED GRANULAR BASE COURSE
3. MIN. 150mm – 75mm MINUS CRUSHED GRANULAR SUB–BASE COURSE
4. COMPETENT SUBGRADE

NOTE: ALL ROADWORKS TO BE CONSTRUCTED IN ACCORDANCE WITH GEOTECHNICAL REPORT COMPLETED BY TETRA TECH CANADA INC. FILE: 704–ENG.VGE003496–01 DATED JANUARY 31, 2020.



WHEELCHAIR LETDOWN AND CATCH BASIN DETAIL
1:50

FOR COORDINATION

NOTICE TO CONTRACTOR

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LEGEND

PROPOSED ELEVATION	+47.95
MEET EXISTING ELEVATION	+46.46 M
EXISTING GROUND CONTOUR	46.5
FFE – FINISHED FLOOR ELEVATION (m)	FFE=XX.XX
CATCH BASIN	
LAWN DRAIN	
GRADE	2.0%
PERMEABLE PAVERS (SEE LANDSCAPE DWGS FOR SPECIFICATIONS)	
CURB & GUTTER	
EDGE OF ASHPALT	

REV	DATE	DESCRIPTION	BY	APP
3	2020/08/14	PROP. STORM SERVICE CONNECTION	ML	JJB
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1	2020/05/14	ADDED OIL/GRIT SEPARATOR	ML	JJB
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PLAN OF PARCEL "B" (REF. PLAN 2880) OF LOT 13, SECTION 19, TOWNSHIP 2, NEW WESTMINSTER DISTRICT, PLAN 1022

LEGAL DESCRIPTION

B.M. MONUMENT NO. OCM 5598
ELEVATION: 89.805m
LOCATED AT 124 ST. & 75 AVE.

BENCHMARK

Aug 14, 2020
ENGINEER STAMP

APLIN MARTIN
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604-473-9866

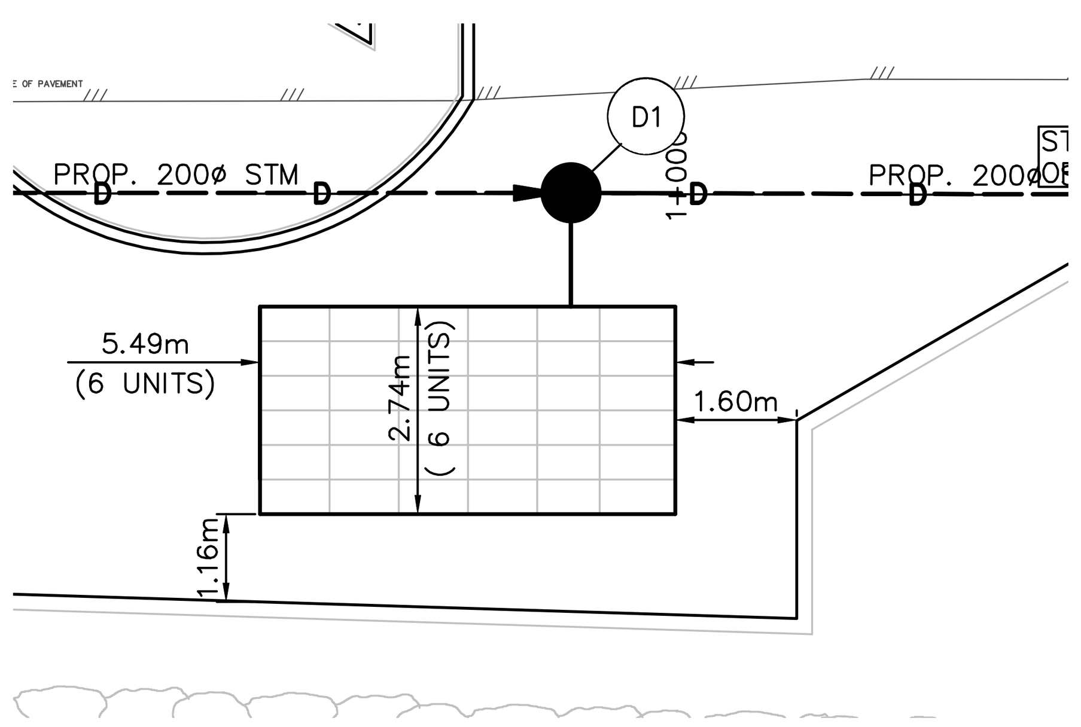
PROJECT
STRAWBERRY HILL HALL REHABILITATION
12152 75 AVENUE,
SURREY, BC

DRAWING TITLE
GRADING & ROADWORKS PLAN

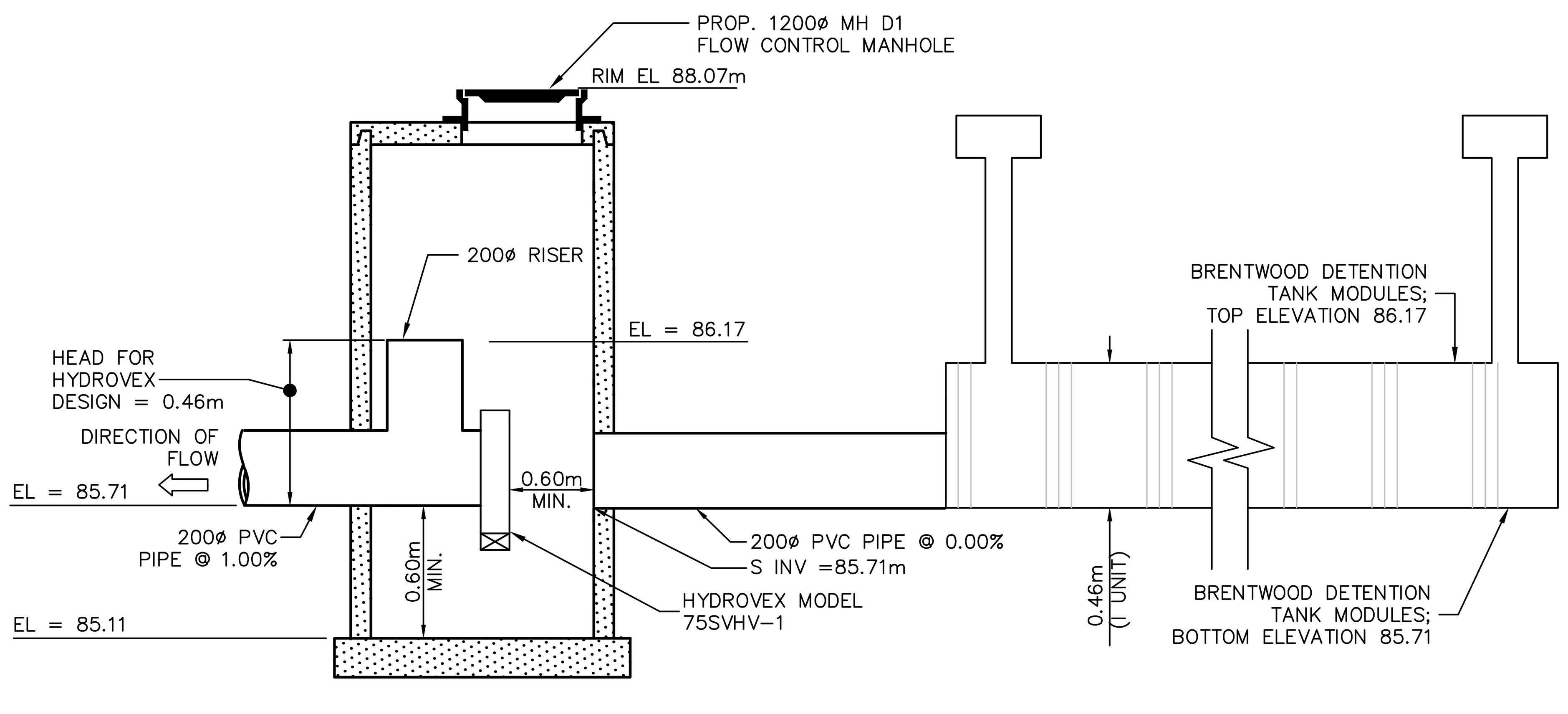
DESIGN: GRL	DATE: JANUARY, 2020	SCALE: 1:250
DRAWN: OA	PROJECT NO.: 19–203	
CHECKED: ML	DRAWING NO.: C02	REV.: 3
APPROVED: JJB		

0 2 1:250 12m

FOR REFERENCE ONLY



STORMWATER DETENTION TANK DETAIL
1:100



FLOW CONTROL MANHOLE D1 DETAIL
N.T.S.

Strawberry Hill Hall Rehabilitation						19-203
12152 75 Ave. Surrey, B.C.						6-Jul-20

5 Year Peak Flow Calculations

	Tc	Runoff coeffecient	Area	Intensity	n	Q
	min	%	Ha	mm		cms
50% of $Q_{post\ (2\ Year)}$	15	0.80	0.2022	24	0.00278	0.005
$Q_{post\ (5\ Year)}$	15	0.80	0.2022	34	0.00278	0.016

Storage Volume Required (Modified Rational Method)

$$\text{Storage Volume} = T_r\,(Q_{p2} - Q_{rel}) + 0.5 \times T_c \times Q_{rel}^2\,(1/Q_{p2} - 1/Q_{p1})$$

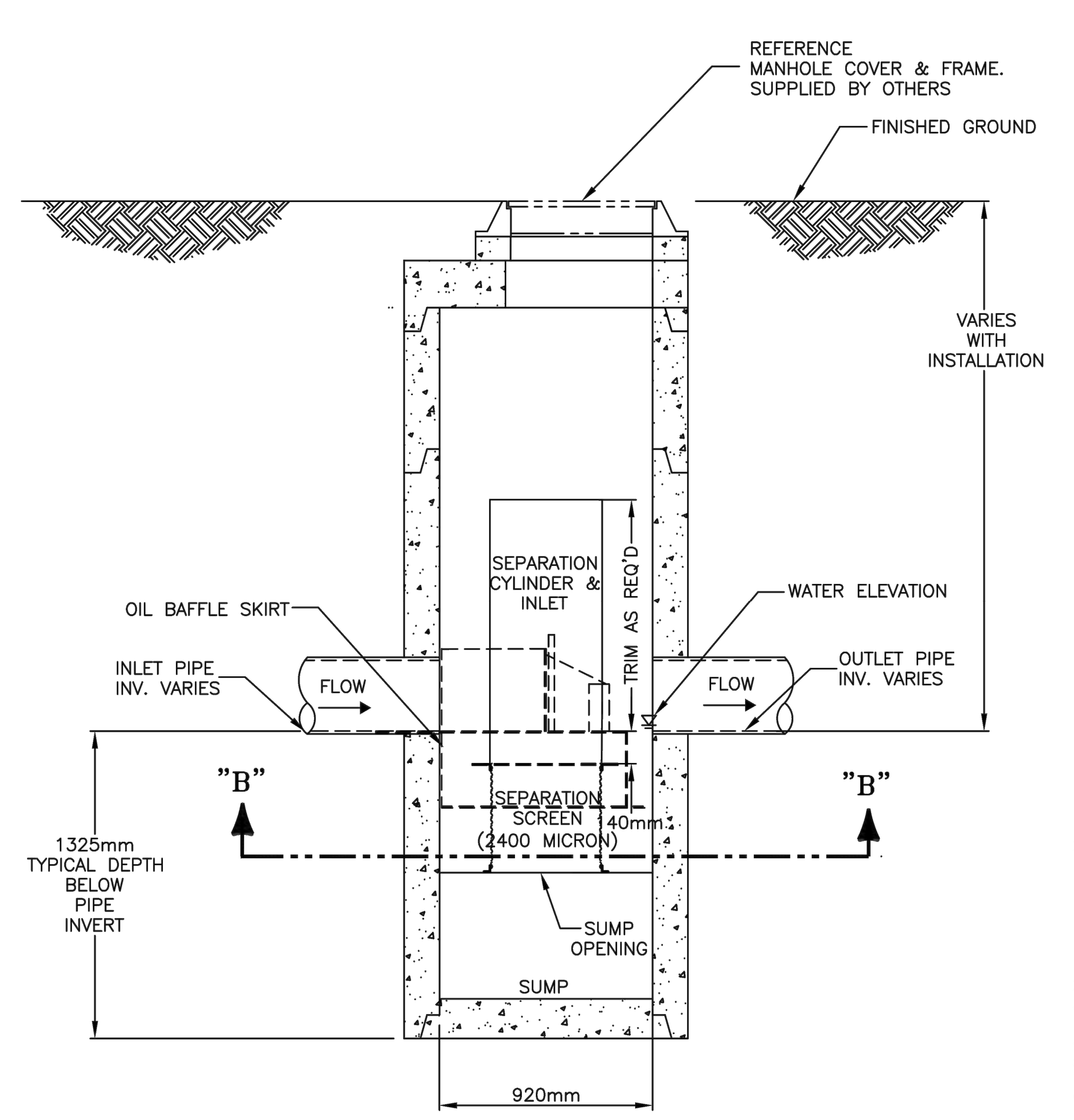
T_r = Duration of storm, in seconds
T_c = Time to concentration, in seconds
Q_{p1} = Peak flow for storm, $T_r = T_c$, cms
Q_{p2} = Peak flow for storm specified, cms
Q_{rel} = Maximum release rate, cms

Maximum Storage Required = 10.0 cm

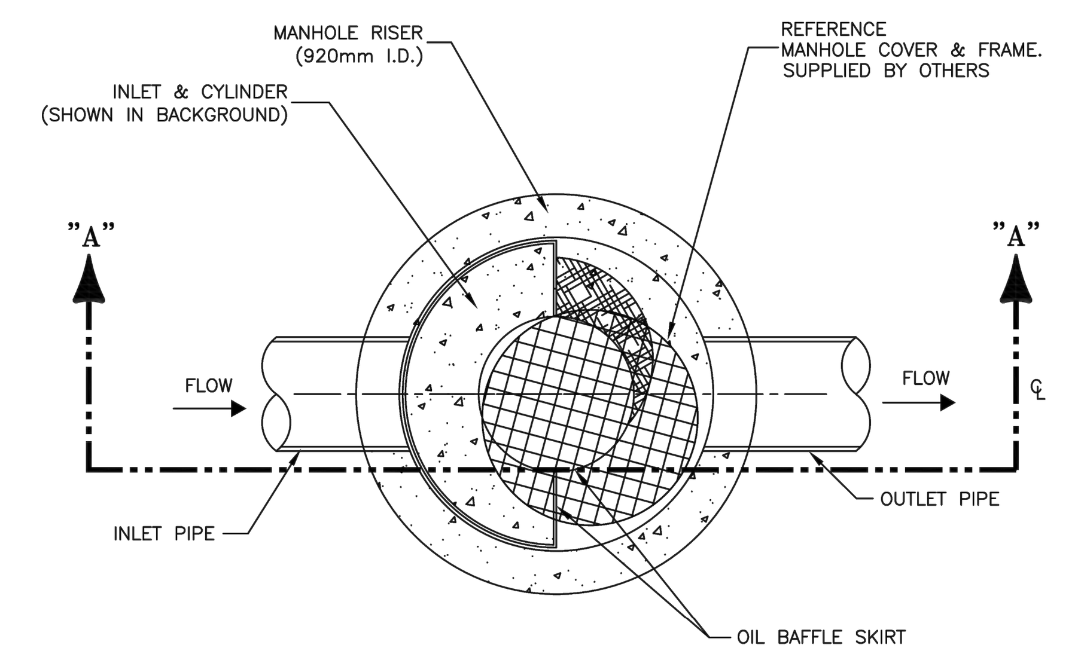
Rainfall Duration Tr	Rainfall Intensity I	Peak Flow Q_{p1}	Peak Flow Q_{p2}	Required Storage
min	mm	cms	cms	cm
5	62	0.016	0.028	6
10	43	0.016	0.019	8
15	34	0.016	0.016	9
20	30	0.016	0.013	10
25	26	0.016	0.012	10
30	24	0.016	0.011	10
35	22	0.016	0.010	10
40	20	0.016	0.009	10
45	19	0.016	0.009	9
50	18	0.016	0.008	9

STORMWATER DETENTION NOTES:

1. STORMWATER DETENTION VOLUME CALCULATED BY MODIFIED RATIONAL METHOD, PER SECTION 5.2.1.C OF ENGINEERING DESIGN CRITERIA MANUAL (CONTROL 5-YEAR POST-DEVELOPMENT TO 50% OF THE 2-YEAR POST-DEVELOPMENT RATE)
2. STORAGE VOLUME REQUIRED = 10.0m³
   STORAGE PROVIDED = 10.1m³
3. BRENTWOOD'S STORMTANK MODULES TO BE SUPPLIED BY:
   EMCO CORPORATION
   JASON DELISLE, EIT
   604-888-5533
   OR APPROVED EQUIVALENT.
4. CONTRACTOR TO SUPPLY SHOP DRAWINGS FOR STORM DETENTION TANK, FLOW CONTROL MANHOLE AND CDS STORM TREATMENT UNIT FOR REVIEW BY ENGINEER.
5. MINIMUM COVER OVER DETENTION TANK:
   * UNDER PAVEMENT = 600mm
   * IN LANDSCAPE AREAS = 300mm
6. STORMTANK MODULE TO BE INSTALLED IN ACCORDANCE WITH MANUFACTURES RECOMMENDATIONS. MANUFACTURE TO SUPPLY CERTIFICATION OF INSTALLATION.
7. TANK TO BE WRAPPED IN PERVIOUS MATERIAL.
8. INSTALL TEE VENT/INSPECTION/CLEANOUT CONNECTION IN 11X18 EMB BOX WITH LID. CONTRACTOR TO COORDINATE LOCATION WITH MANUFACTURER.



ELEVATION VIEW
"A"-"A"
NOT TO SCALE



PLAN VIEW
"B"-"B"
NOT TO SCALE

DESIGN NOTES

1. THE STANDARD RWM1515-3 CONFIGURATION IS SHOWN. ALTERNATE CONFIGURATIONS ARE AVAILABLE, PLEASE CONTACT RAINWATER MANAGEMENT. SOME CONFIGURATIONS MAY BE COMBINED TO SUIT SITE REQUIREMENTS.
2. THE UNIT CAN HANDLE MULTIPLE INLET PIPES, TOP INLET AND CAN ACCOMODATE INLET PIPES AT AN ANGLE TO THE OUTLET.

GENERAL NOTES

1. RAINWATER MANAGEMENT TO PROVIDE ALL MATERIALS UNLESS NOTED OTHERWISE.
2. ALL DIMENSIONS ARE SHOWN IN MILLIMETERS.
3. FOR FABRICATION DRAWINGS WITH DETAILED STRUCTURE DIMENSIONS AND WEIGHTS, PLEASE CONTACT YOUR RAINWATER MANAGEMENT PRODUCTS REPRESENTATIVE. www.rainwatermanagement.ca
4. WATER QUALITY STRUCTURE SHALL BE IN ACCORDANCE WITH ALL DESIGN DATA AND INFORMATION CONTAINED IN THIS DRAWING.
5. STRUCTURE AND CASTINGS SHALL MEET LOAD RATINGS AS REQUIRED, ASSUMING GROUNDWATER ELEVATION AT, OR BELOW THE OUTLET PIPE INVERT ELEVATION. ENGINEER OF RECORD TO CONFIRM ACTUAL GROUNDWATER ELEVATION.
6. MANHOLE MANUFACTURED TO ASTM 478 SPECIFICATIONS.

INSTALLATION NOTES

1. ANY SUB-BASE, BACKFILL DEPTH, AND/OR ANTI-FLOTATION PROVISIONS ARE SITE-SPECIFIC DESIGN CONSIDERATIONS AND SHALL BE SPECIFIED BY THE ENGINEER OF RECORD.
2. CONTRACTOR TO PROVIDE EQUIPMENT WITH SUFFICIENT LIFTING AND REACH CAPACITY TO LIFT AND SET THE MANHOLE STRUCTURE (LIFTING CLUTCHES PROVIDED). HEAVIEST LIFT TO PLAN FOR IS 3000kg.
3. CONTRACTOR TO ADD GASKETS OR JOINT SEALANT BETWEEN ALL STRUCTURE SECTIONS, AND ASSEMBLE STRUCTURE.
4. CONTRACTOR TO PROVIDE, INSTALL, AND GROUT PIPES, MATCH PIPE INVERTS WITH ELEVATIONS SHOWN.
5. CONTRACTOR TO TAKE APPROPRIATE MEASURES TO ASSURE UNIT IS WATER TIGHT, HOLDING WATER TO FLOWLINE INVERT MINIMUM. IT IS SUGGESTED THAT ALL JOINTS BELOW PIPE INVERTS ARE GROUTED.

SITE SPECIFIC DATA REQUIREMENTS FOR RWM1515-3

STRUCTURE ID		PIPE DATA:	I.E.	MATERIAL	DIAMETER	ANIT-FLOTATION BALLAST	WIDTH	HEIGHT
WATER QUALITY FLOW RATE (L/S)	*	INLET PIPE 1	*	*	*		*	*
PEAK FLOW RATE (L/S)	*	INLET PIPE 2	*	*	*	NOTES / SPECIAL REQUIREMENTS		
RETURN PERIOD OF PEAK FLOW (YRS)	*	OUTLET PIPE	*	*	*			
SCREEN APERTURE (2400)	*	RIM ELEVATION			*	* PER ENGINEER OF RECORD		

rainwater MANAGEMENT
www.rainwatermanagement.ca
TEL : 604-944-9265

RWM1515-3
INLINE UNIT
STANDARD DETAIL

Plotted:

FOR COORDINATION

NOTICE TO CONTRACTOR

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LEGEND

- STORM SEWER
- SANITARY SEWER
- WATERMAIN (DOMESTIC)
- WATERMAIN (FIRELINE)
- STORM SERVICE CONNECTION
- SANITARY SERVICE CONNECTION C/W INSPECTION CHAMBER
- WATER SERVICE CONNECTION
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- MANHOLE
- CLEANOUT
- CATCH BASIN C/W ALUMINUM TRAPPING HOOD AS PER MMCD
- 300ø LAWN BASIN (UNLESS OTHERWISE SPECIFIED
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- BLOWOFF
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REV	DATE	DESCRIPTION	BY	APP
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Aug 14, 2020
ENGINEER STAMP

PLAN OF PARCEL "B" (REF. PLAN 2880) OF LOT 13, SECTION 19, TOWNSHIP 2, NEW WESTMINSTER DISTRICT, PLAN 1022
LEGAL DESCRIPTION

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ELEVATION: 89.805m
LOCATED AT 124 ST. & 75 AVE.
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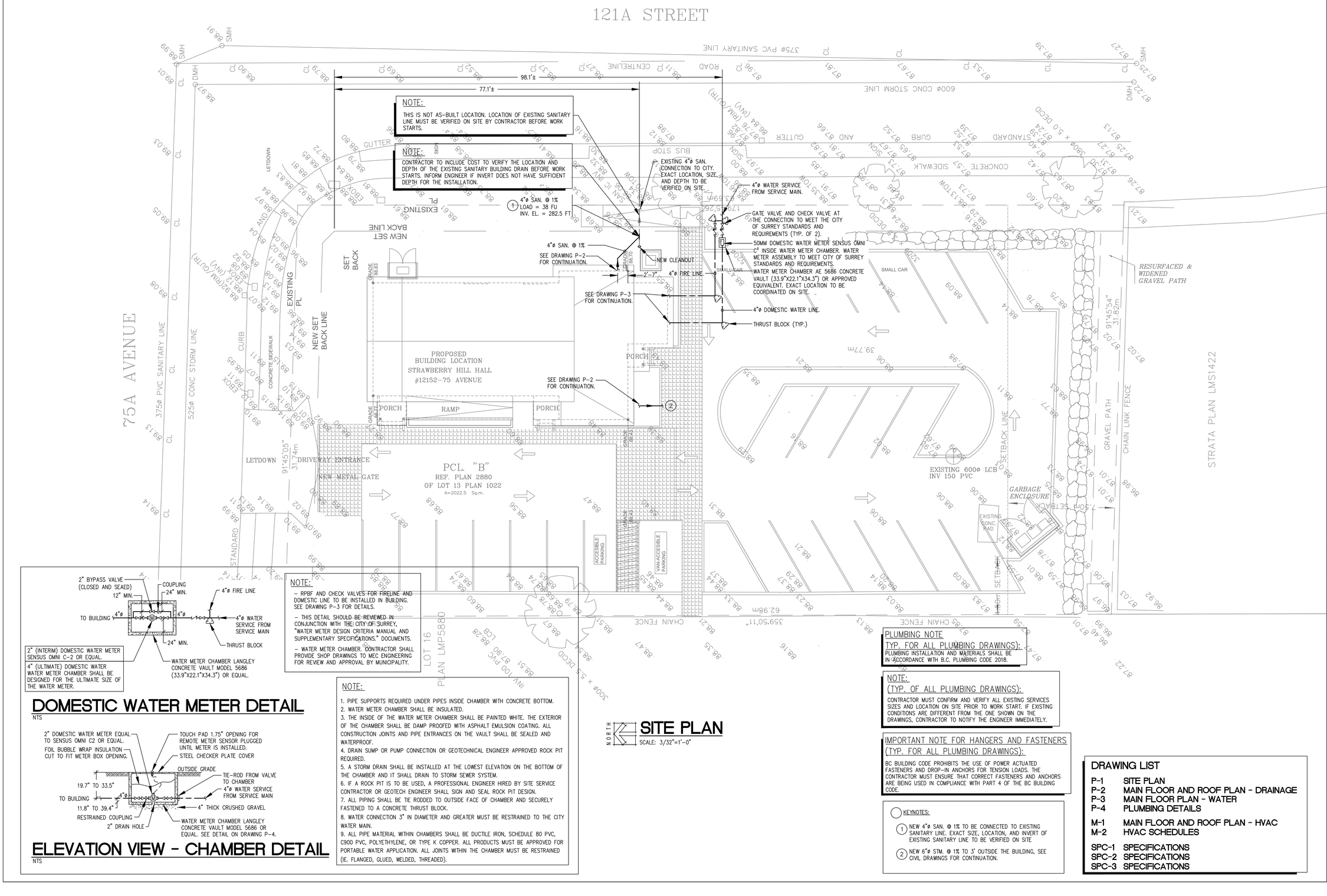
PROJECT
STRAWBERRY HILL HALL REHABILITATION
12152 75 AVENUE,
SURREY, BC

DRAWING TITLE
STORM DETENTION DETAIL

DESIGN	DATE	SCALE
GRL	JANUARY, 2020	N/A
DRAWN: OA	PROJECT NO.: 19-203	
CHECKED: ML	DRAWING NO.: C03	REV.: 3
APPROVED: JJB		

Aug 14 2020 - 12:19pm M:\2019\19-203\DWG\ONSITE PRODUCTION\19-203 - STORM DETENTION DETAIL.dwg/01 Mlegal

FOR REFERENCE ONLY



NORTH

SITE PLAN

SCALE: 3/32"=1'-0"

DOMESTIC WATER METER DETAIL

NTS

ELEVATION VIEW - CHAMBER DETAIL

NTS

NOTE:

- RPBF AND CHECK VALVES FOR FIRELINE AND DOMESTIC LINE TO BE INSTALLED IN BUILDING. SEE DRAWING P-3 FOR DETAILS.
- THIS DETAIL SHOULD BE REVIEWED IN CONJUNCTION WITH THE CITY OF SURREY, "WATER METER DESIGN CRITERIA MANUAL AND SUPPLEMENTARY SPECIFICATIONS." DOCUMENTS.
- WATER METER CHAMBER. CONTRACTOR SHALL PROVIDE SHOP DRAWINGS TO MEC ENGINEERING FOR REVIEW AND APPROVAL BY MUNICIPALITY.

NOTE:

1. PIPE SUPPORTS REQUIRED UNDER PIPES INSIDE CHAMBER WITH CONCRETE BOTTOM.
2. WATER METER CHAMBER SHALL BE INSULATED.
3. THE INSIDE OF THE WATER METER CHAMBER SHALL BE PAINTED WHITE. THE EXTERIOR OF THE CHAMBER SHALL BE DAMP PROOFED WITH ASPHALT EMULSION COATING. ALL CONSTRUCTION JOINTS AND PIPE ENTRANCES ON THE VAULT SHALL BE SEALED AND WATERPROOF.
4. DRAIN SUMP OR PUMP CONNECTION OR GEOTECHNICAL ENGINEER APPROVED ROCK PIT REQUIRED.
5. A STORM DRAIN SHALL BE INSTALLED AT THE LOWEST ELEVATION ON THE BOTTOM OF THE CHAMBER AND IT SHALL DRAIN TO STORM SEWER SYSTEM.
6. IF A ROCK PIT IS TO BE USED, A PROFESSIONAL ENGINEER HIRED BY SITE SERVICE CONTRACTOR OR GEOTECH ENGINEER SHALL SIGN AND SEAL ROCK PIT DESIGN.
7. ALL PIPING SHALL BE TIE RODDED TO OUTSIDE FACE OF CHAMBER AND SECURELY FASTENED TO A CONCRETE THRUST BLOCK.
8. WATER CONNECTION 3" IN DIAMETER AND GREATER MUST BE RESTRAINED TO THE CITY WATER MAIN.
9. ALL PIPE MATERIAL WITHIN CHAMBERS SHALL BE DUCTILE IRON, SCHEDULE 80 PVC, C900 PVC, POLYETHYLENE, OR TYPE K COPPER. ALL PRODUCTS MUST BE APPROVED FOR PORTABLE WATER APPLICATION. ALL JOINTS WITHIN THE CHAMBER MUST BE RESTRAINED (IE. FLANGED, GLUED, WELDED, THREADED).

PLUMBING NOTE
TYP. FOR ALL PLUMBING DRAWINGS):
PLUMBING INSTALLATION AND MATERIALS SHALL BE IN ACCORDANCE WITH B.C. PLUMBING CODE 2018.

NOTE:
(TYP. OF ALL PLUMBING DRAWINGS):
CONTRACTOR MUST CONFIRM AND VERIFY ALL EXISTING SERVICES SIZES AND LOCATION ON SITE PRIOR TO WORK START. IF EXISTING CONDITIONS ARE DIFFERENT FROM THE ONE SHOWN ON THE DRAWINGS, CONTRACTOR TO NOTIFY THE ENGINEER IMMEDIATELY.

IMPORTANT NOTE FOR HANGERS AND FASTENERS
(TYP. FOR ALL PLUMBING DRAWINGS):
BC BUILDING CODE PROHIBITS THE USE OF POWER ACTUATED FASTENERS AND DROP-IN ANCHORS FOR TENSION LOADS. THE CONTRACTOR MUST ENSURE THAT CORRECT FASTENERS AND ANCHORS ARE BEING USED IN COMPLIANCE WITH PART 4 OF THE BC BUILDING CODE.

KEYNOTES:

1. NEW 4"ø SAN. @ 1% TO BE CONNECTED TO EXISTING SANITARY LINE. EXACT SIZE, LOCATION, AND INVERT OF EXISTING SANITARY LINE TO BE VERIFIED ON SITE
2. NEW 6"ø STM. @ 1% TO 3' OUTSIDE THE BUILDING, SEE CIVIL DRAWINGS FOR CONTINUATION.

DRAWING LIST

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Tel: (604) 581-6338 Fax: (604) 581-7448
E-mail: office@mecengineering.ca

CONTRACTOR SHALL VERIFY ALL DIMENSIONS ON SITE. DRAWINGS SHALL NOT BE SCALED.

REV.	DESCRIPTION	DATE
9	ISSUED FOR CONSTRUCTION	2020.08.21
8	REVISED AS PER CITY'S COMMENTS	2020.04.21
7	REVISED AS PER CITY'S COMMENTS	2020.04.14
6	REISSUED FOR TENDER	2020.02.28
5	ISSUED FOR TENDER	2020.02.04
4	ISSUED FOR BPA	2019.12.10
3	ISSUED FOR COORDINATION	2019.02.06
2	ISSUED FOR COORDINATION	2018.12.21
1	ISSUED FOR COORDINATION	2018.11.28

PROJECT:

STRAWBERRY HILL HALL

12152 75A AVENUE, SURREY

TITLE:

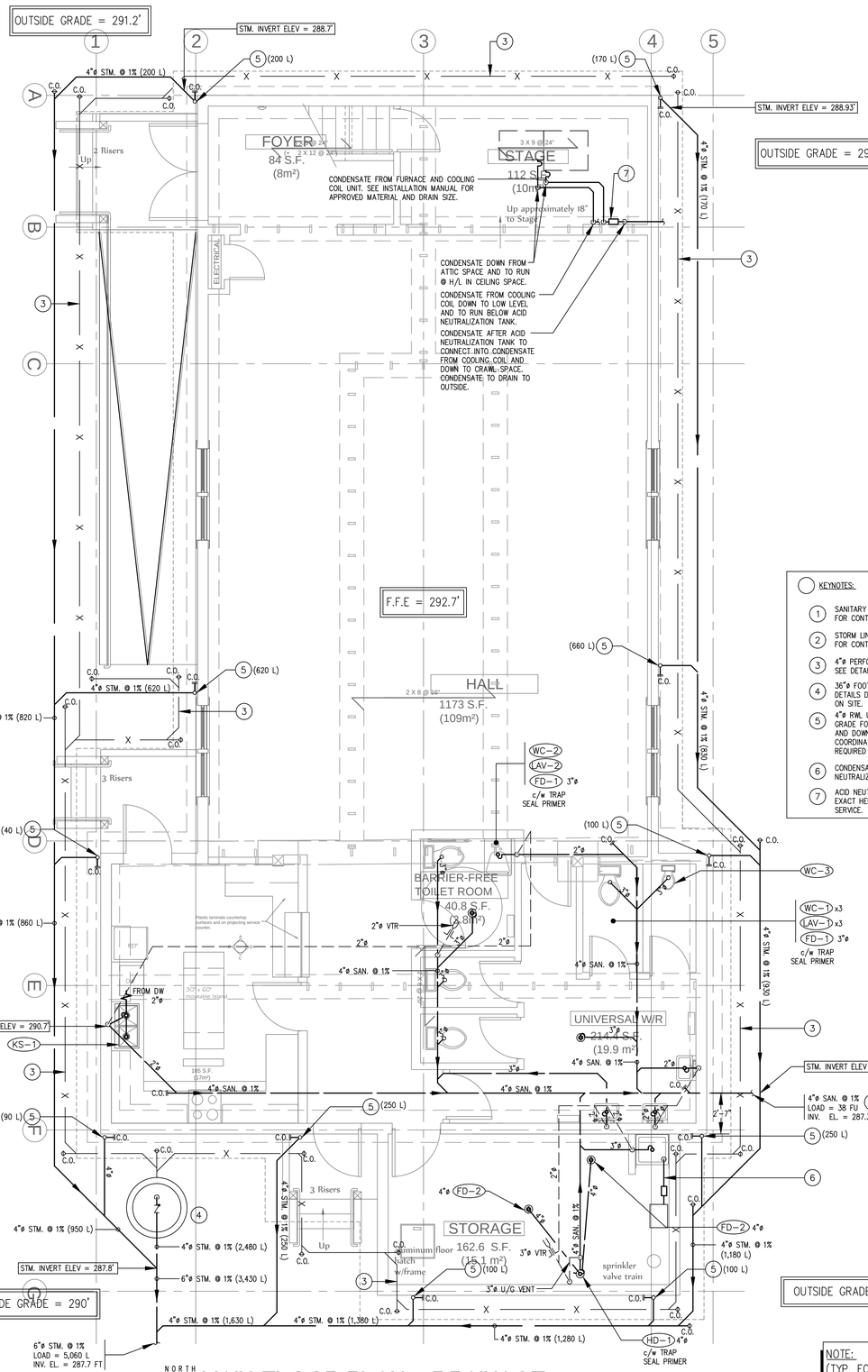
SITE PLAN

DRAWN BY:	DH
DATE:	AUGUST 21, 2020
SCALE:	AS NOTED
PROJECT#:	1850

DWG#:

P-1

FOR REFERENCE ONLY



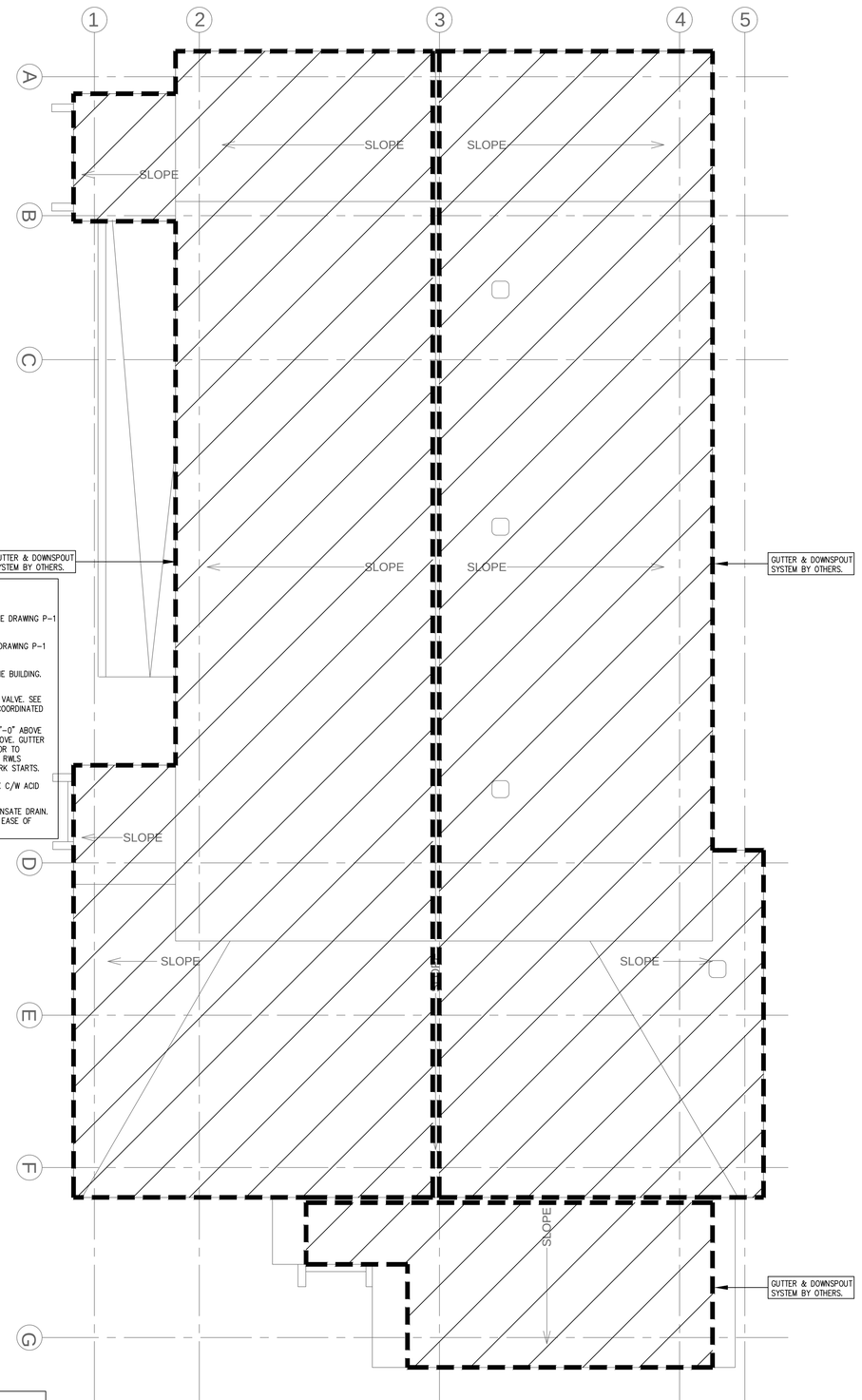
MAIN FLOOR PLAN - DRAINAGE

SCALE: 1/4"=1'-0"

KEYNOTES:

1. SANITARY LINE 3 FEET OUTSIDE THE BUILDING. SEE DRAWING P-1 FOR CONTINUATION.
2. STORM LINE 3 FEET OUTSIDE THE BUILDING. SEE DRAWING P-1 FOR CONTINUATION.
3. 4"ø PERFORATED PVC FOOTING DRAIN AROUND THE BUILDING. SEE DETAIL ON DRAWING P-4.
4. 36"ø FOOTING DRAIN SUMP C/W 4"ø BACKWATER VALVE. SEE DETAILS DRAWING P-4. EXACT LOCATION TO BE COORDINATED ON SITE.
5. 4"ø RWL UPSTAND C/W CLEANOUT AT APPROX. 2'-0" ABOVE GRADE FOR GUTTER AND DOWNSPOUT SYSTEM ABOVE. GUTTER AND DOWNSPOUT SYSTEM BY OTHERS. CONTRACTOR TO COORDINATED EXACT LOCATIONS AND NUMBER OF RWLS REQUIRED ON SITE WITH ARCHITECT PRIOR TO WORK STARTS.
6. CONDENSATE DRAIN FROM WH-1 TO JANITOR SINK C/W ACID NEUTRALIZER KIT.
7. ACID NEUTRALIZATION TANK FOR FURNACE CONDENSATE DRAIN. EXACT HEIGHT TO BE COORDINATED ON SITE FOR EASE OF SERVICE.

NOTE:
(TYP. FOR ALL U/G DRAINAGE PIPES):
ALL SANITARY AND STORM PIPES OUTSIDE THE BUILDING SHALL HAVE MINIMUM 1.5 FEET OF COVER FOR FROST PROTECTION.



ROOF PLAN - DRAINAGE

SCALE: 1/4"=1'-0"

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1	ISSUED FOR COORDINATION	2018.11.28

PROJECT:

STRAWBERRY HILL HALL

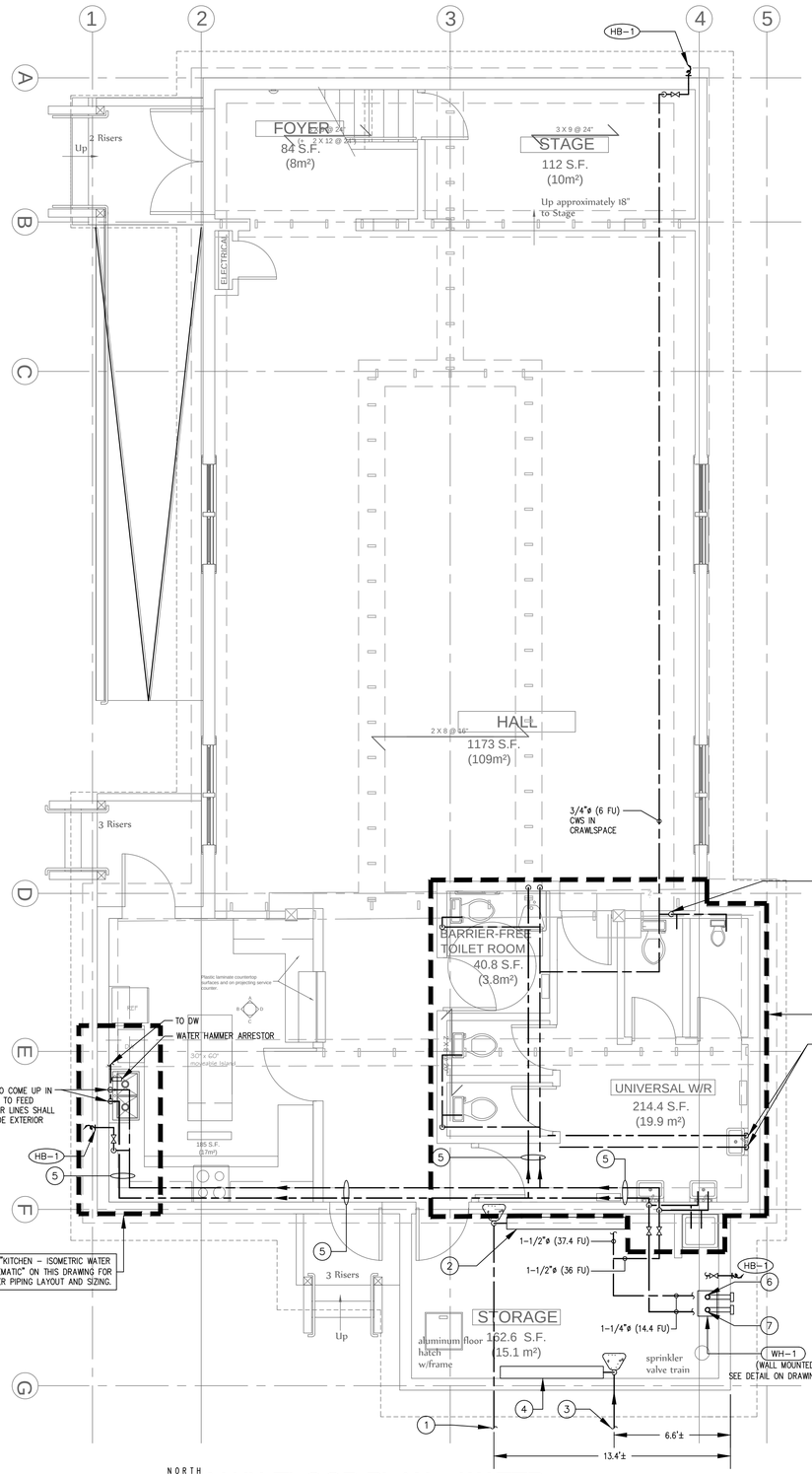
12152 75A AVENUE, SURREY

TITLE:

MAIN FLOOR AND ROOF PLAN - DRAINAGE

DRAWN BY:	DH
DATE:	AUGUST 21, 2020
SCALE:	AS NOTED
PROJECT#:	1850

DWG#: P-2



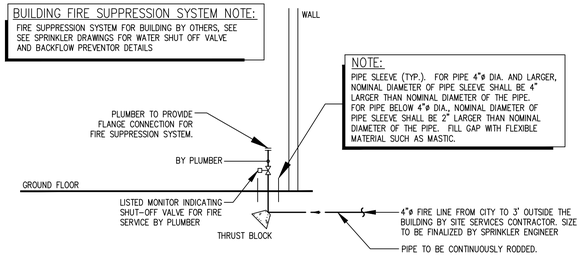
NORTH

MAIN FLOOR PLAN – WATER

SCALE: 1/4"=1'–0"

BUILDING FIRE SUPPRESSION SYSTEM NOTE:
FIRE SUPPRESSION SYSTEM FOR BUILDING BY OTHERS, SEE SEE SPRINKLER DRAWINGS FOR WATER SHUT OFF VALVE AND BACKFLOW PREVENTOR DETAILS

NOTE:
PIPE SLEEVE (TYP.). FOR PIPE 4"ø DIA. AND LARGER, NOMINAL DIAMETER OF PIPE SLEEVE SHALL BE 4" LARGER THAN NOMINAL DIAMETER OF THE PIPE. FOR PIPE BELOW 4"ø DIA., NOMINAL DIAMETER OF PIPE SLEEVE SHALL BE 2" LARGER THAN NOMINAL DIAMETER OF THE PIPE. FILL GAP WITH FLEXIBLE MATERIAL SUCH AS MASTIC.

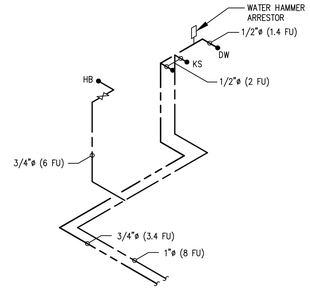


FIRE SYSTEM ENTRY DETAIL

N.T.S.

WATER HAMMER ARRESTOR NOTE:
WATER HAMMER ARRESTOR SHALL BE SIZED ACCORDING TO STANDARD ASSE 1010.

NOTE:
PROVIDE SHUT–OFF VALVE AT EACH FIXTURE CONNECTIONS.



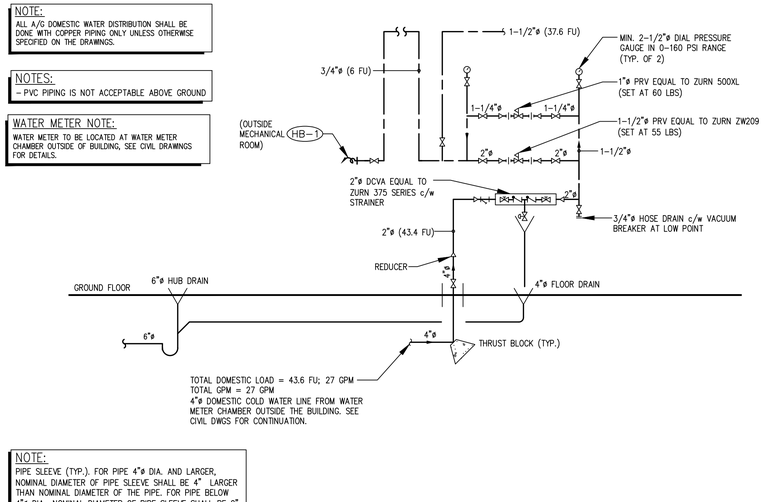
KITCHEN – ISOMETRIC WATER SCHEMATIC

N.T.S

NOTE:
ALL A/G DOMESTIC WATER DISTRIBUTION SHALL BE DONE WITH COPPER PIPING ONLY UNLESS OTHERWISE SPECIFIED ON THE DRAWINGS.

NOTES:
– PVC PIPING IS NOT ACCEPTABLE ABOVE GROUND

WATER METER NOTE:
WATER METER TO BE LOCATED AT WATER METER CHAMBER OUTSIDE OF BUILDING, SEE CIVIL DRAWINGS FOR DETAILS.



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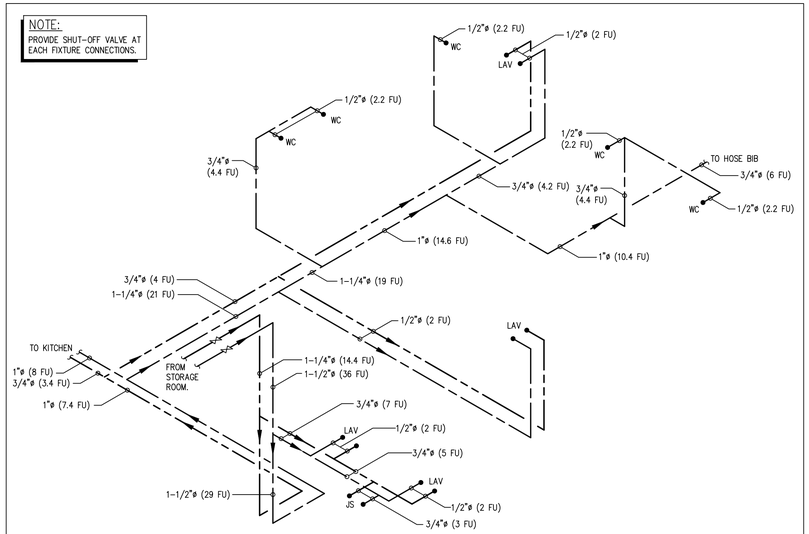
PRV STATION DETAIL

N.T.S.

NOTE:
PROVIDE SHUT–OFF VALVE AT EACH FIXTURE CONNECTIONS.



WASHROOM – ISOMETRIC WATER SCHEMATIC

N.T.S

KEYNOTES:

1. 4"ø DOMESTIC WATER LINE TO 3' OUTSIDE THE BUILDING. SEE CIVIL DRAWINGS FOR CONTINUATION.
2. PRV STATION. SEE DETAILS ON DRAWINGS P–4.
3. 4"ø FIRE LINE TO 3' OUTSIDE THE BUILDING. SIZE TO BE CONFIRMED BY SPRINKLER ENGINEER. CIVIL DRAWINGS FOR CONTINUATION.
4. DOUBLE CHECK DETECTOR ASSEMBLY & SPRINKLER VALVE STATION. SEE DETAILS ON DRAWINGS P–4.
5. CWS & HWS TO RUN IN CRAWLSPACE BELOW.
6. 2"ø PVC AIR INTAKE. TO BE TERMINATED ON THROUGH SIDE WALL AS PER INSTALLATION MANUAL. SEE MANUFACTURER'S INSTALLATION MANUAL FOR DETAILS.
7. 2"ø TYPE BH SPECIAL GAS VENT CLASS IIA (PVC) AIR EXHAUST VENT. TO BE TERMINATED THROUGH SIDE WALL AS PER INSTALLATION MANUAL. SEE MANUFACTURER'S INSTALLATION MANUAL FOR DETAILS.

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1	ISSUED FOR COORDINATION	2018.11.28

PROJECT:

STRAWBERRY HILL HALL

12152 75A AVENUE, SURREY

TITLE:

MAIN FLOOR PLAN – WATER

DRAWN BY:	DH
DATE:	AUGUST 21, 2020
SCALE:	AS NOTED
PROJECT#:	1850

DWG#:

P–3

PROBABLE DOMESTIC DEMAND CALCULATION FOR SIZING DOMESTIC WATER METERS (AWWA)

For City of Surrey

Water Meter Sizing Calculation Sheet
For Non-Fire Service Meters
Methodology:AWWA M22

Customer Name: Strawberry Hill Hall — **PID Number:** -
Address: 12152 75A Avenue, Surrey — **Project Number:** 1850
Building Permit Number: -

Type of Occupancy: ☐ Multifamily ☐ Institutional ☐ Industrial # of Units:
☐ Commercial ☐ Other
Is this a Phased Development: ☐ Yes ☐ No
Calculation Presented below are for: ☐ Phase ☐ Buildout Phase #:

Separate calculations must be provided for both current phase and buildout

Step 1. Calculate Customer Total Fixture Values
Calculation of the demand from the Fixture Values (Figure 4-5, AWWA Manual)

Fixtures / Appliances	Number	Fixture Value (GPM @ 60 psi)	Fixture Value (GPM @ 60 psi)
Toilet (tank)	5	4	20
Toilet (flush valve)		35	0
Urinal (wall or stall)		16	0
Urinal (flush valve)		35	0
Bidet		2	0
Shower (single head)		2.5	0
Faucet (lavatory)	4	1.5	6
Faucet (kitchen sink)	1	2.2	2.2
Faucet (utility sink)	1	4	4
Faucet (wash sink)		4	0
Dishwasher	1	2	2
Bathtub		8	0
Clothes Washer		6	0
Hose connections (with 50 ft of hose)			
1/2 inch		5	0
5/8 inch		9	0
3/4 inch	3	12	36
Miscellaneous			
Bedpan Washers		10	0
Drinking Fountains		2	0
Dental Units		2	0
Other:			
1-1/2" ø cap off		30	0
TOTAL FIXTURE VALUE		70.2	GPM (A)

Step 2. Calculate Probable Peak Demand
Refer to Figure 4-2 or 4-3 — **Probable Peak Demand** 47 **GPM (B)**

Step 3. Apply Pressure Adjustment (Table 4-1, AWWA Manual)

Water System Pressure (not to exeed 80 psi) = 80 psi
Pressure Factor from Table 4-1 = 1.17 (C)

Adjusted Peak Demand (B x C) = **54.99** **GPM (D)**

Step 4. Add Underground Irrigation Demand

Irrigation Demand			Sections *			
Spray system	1.16	X	0	=		0
Rotary System	0.4	X	0	=		0

**100 Ft^2 Area= 1 Section*

Total Irrigation Demand = **0** **GPM (E)**

Larger irrigation areas should be divided into zones, with a maximum irrigation demand of 50 GPM. If the irrigation demand is greater than 50 GOM, the Applicant's Engineer shall provide a detailed irrigation plan with appropriately designed zones

Step 5. Confirm Design Demand

Design Demand (Greater of D & E) = **54.99** **GPM (F)**

Step 6: Size and Select Water Meter

Design Demand * (L/s)	(USGPM)	Meter Size (mm)	(inches)
0 - 1.96	0 - 31	19	3/4
1.96 - 3.09	31 - 49	25	1
3.09 - 11.36	49 - 180	50	2
11.36 - 28.39	180 - 450	75	3

** Based on 90% of operating range of City Approved meters*

Water Meter Make / Model = Sensus OMNI C^2
Water meter Size = 50 mm
Water Service Connection Size (for information only) = 100 mm
Meter Location (outside / Inside) = Outside

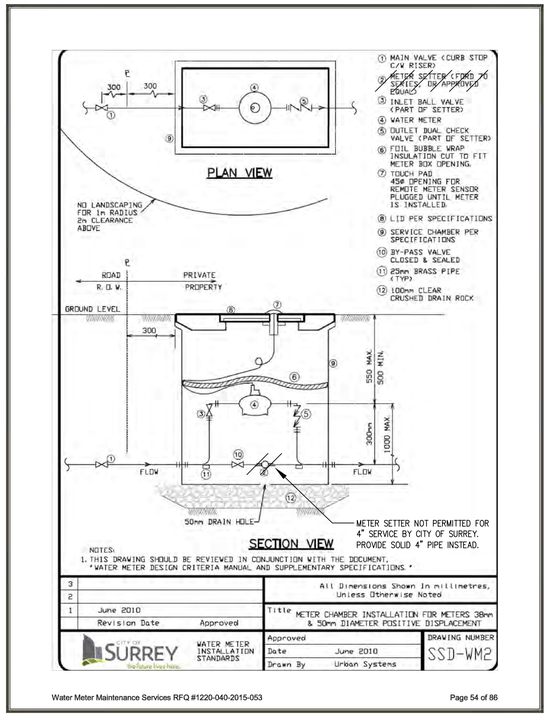
Meters 50mm or smaller must be located outside at property line.

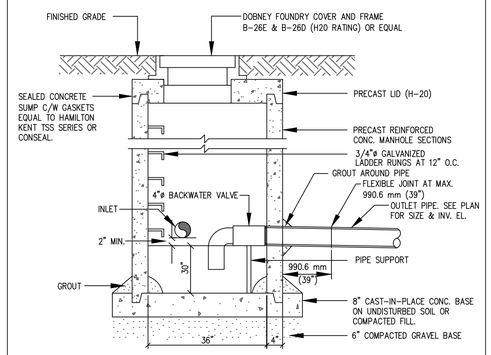
Water Meter Sizing Professional Certification

Professional Certification
Seal

Name: Edmond Cheung
Company: Mec Engineering
Created Date: 14/02/2019 17:20
Revised Date: -

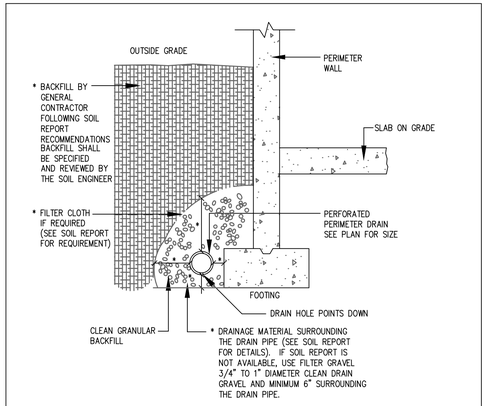
Comments:





FOOTING DRAIN SUMP DETAIL

N.T.S



* SEE SOIL REPORT

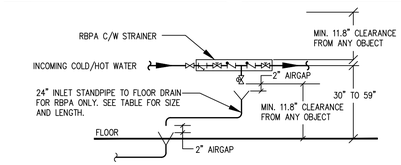
FOOTING DRAIN OUTSIDE BUILDING

N.T.S.

(THIS DETAIL IS NOT A CONSTRUCTION DETAIL FOR WATER PROOFING OR BACKFILL. IT IS FOR THE PURPOSE OF ILLUSTRATING THE FOOTING DRAIN LOCATION ONLY.)

INSTALLATION NOTE:
ALL RBPAs OR DCVAs SHALL BE INSTALLED WITH A CENTERLINE HEIGHT OF BETWEEN 30" & 59" ABOVE FINISHED FLOOR. ANY INSTALLATION WITH A GREATER HEIGHT OF 59" SHALL BE PROVIDED WITH A FIXED PLATFORM. MAINTAIN A MIN. OF 29.5" CLEARANCE IN FRONT OF RBPA & A MIN. OF 0.78" CLEARANCE FROM THE BACK SIDE OF RBPA.

INSTALLATION NOTE:
WATER FLOW DIRECTION SHALL BE FROM LEFT TO RIGHT FOR PROPER BACKFLOW PREVENTER INSTALLATION



RBPA/DCVA INSTALLATION DETAIL

N.T.S.

REDUCED PRESSURE DEVICE	US GPM FLOW RATES (1)	F.D. GRATE OPENING AND OUTLET	HUB DRAIN COMPLETE WITH 24" INLET STANDPIPE	OPEN PIPE TO OUTSIDE COMPLETE WITH 24" VERTICAL DROP AT DEVICE PRIOR TO ANY 90 ° CHANGE OF DIRECTION
1/2"	40	2"	1-1/2"	2"
3/4"	80	3"	2"	2"
1"	80	3"	2"	2"
1-1/4"	160	4"	3"	3"
1-1/2"	195	6"	3"	3"
2"	195	6"	3"	3"
2-1/2"	360	6"	4"	4"
3"	360	6"	4"	4"

MEC Engineering Consulting Ltd.
Unit 4 - 15243 91Ave
Surrey, BC
V3R 8P8

AS PER BCBC 2012 PIPE SIZING PROCEDURE "PRESSURE AVAILABLE FOR FRICTION LOSS METHOD"

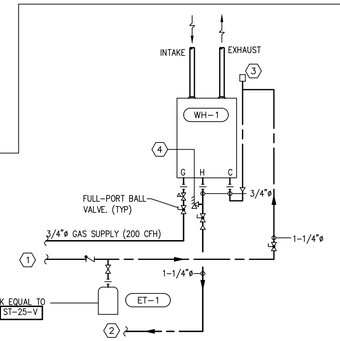
PROJECT: Strawberry Hill Hall
DESIGNER: DH
PROJECT #: 1850
DATE: November 26, 2018

Calculating Pressure Available for Friction Loss

STEP A)		
Water Service Size (Entry to Building)	-	"Ø
Minimum Static Pressure Required at Property Line[1]	N/A	kPa
STEP B)		
Developed Length of System[2]	13	M
x1.5 for fittings and/or losses (Safety Factor)	19.5	M
STEP C)		
Minimum Static Pressure at Property Line[1]	N/A	kPa
Pressure Losses for Service[3]	N/A	kPa
Adjusted Pressure at Water Service Entry to Building	N/A	kPa
STEP D)		
Adjusted Pressure[4]	N/A	kPa
Meter, PRV, BFP and other losses[5]	N/A	kPa
Pressure at Low Pressure Side of PRV	413.69	kPa
Losses for system height	0.00	kPa
Minimum pressure at the fixture for operation	100	kPa
TOTAL pressure available for friction loss	**313.69**	**kPa**
STEP E)		
Total pressure available for friction loss	313.69	kPa
Total developed length x 1.5 for fittings	19.5	M
AVERAGE PRESSURE[6]	**16.09**	**kPa/M**

CONVERSION FACTOR		
HEIGHT	0	FT
PSI	0.433	
PRESSURE LOSS DUE TO HEIGHT	0	PSI
CONVERSION FACTOR	6.895	PSI TO kPa
LOSSES FOR SYSTEM HEIGHT	0.00	kPa

Notes:
1.Call city service department to find out minimum static pressure (at entry of property line)
2.Distance from PRV station to the most remote fixture.
3. Pressure for Step C not required if pressure for PRV Station is available
4. Adjusted Pressure Not Required if Pressure at Low Pressure Side of PRV is available.
5. Meter, PRV, and other losses not required if Pressure at Low Pressure Side of PRV is available.
6. Average Pressure MUST BE GREATER THAN 2.6 KPA/M
Conclusion(Y/N): Y



1. COLD WATER SUPPLY
2. HOT WATER SUPPLY TO FIXTURES @ 120° F
3. VACCUM BREAKER (TYPICAL)
4. TEMPERATURE & PRESSURE RELIEF VALVE (TYPICAL)

NOTE:
– PROVIDE CPVC CONDENSATE DRAIN FROM WH-1 TO APPROVED DRAIN LOCATION.

HOT WATER TANK(S) PIPING DETAIL

N.T.S.

INSTANTANEOUS WATER HEATER SCHEDULE

UNIT	SERVICE	LOCATION	INPUT SEA LEVEL MBH	OUTPUT SEA LEVEL MBH	BOILER FLUE SIZE	FUEL	GAS CONN.	ELECTRICAL SERVICE	AMPS	MAKE	MODEL	SHIP. WT.	ACCES.
WH-1	HOT WATER	MECHANICAL ROOM	120	–	2"ø	N. GAS	3/4"ø	120/1/60	2.0	NAVIEN	NPE-150S	82	2,4,5,6

ACCESSORIES:
1) REMOTE CONTROLLER
2) PLUMB EASY VALVE KIT
3) PRESSURE RELIEF VALVE
4) CONDENSATE NEUTRALIZER
5) READY-LINK COMMUNICATION CABLE.
6) BUILT-IN RECIRC. PUMP

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CONTRACTOR SHALL VERIFY ALL DIMENSIONS ON SITE. DRAWINGS SHALL NOT BE SCALED.

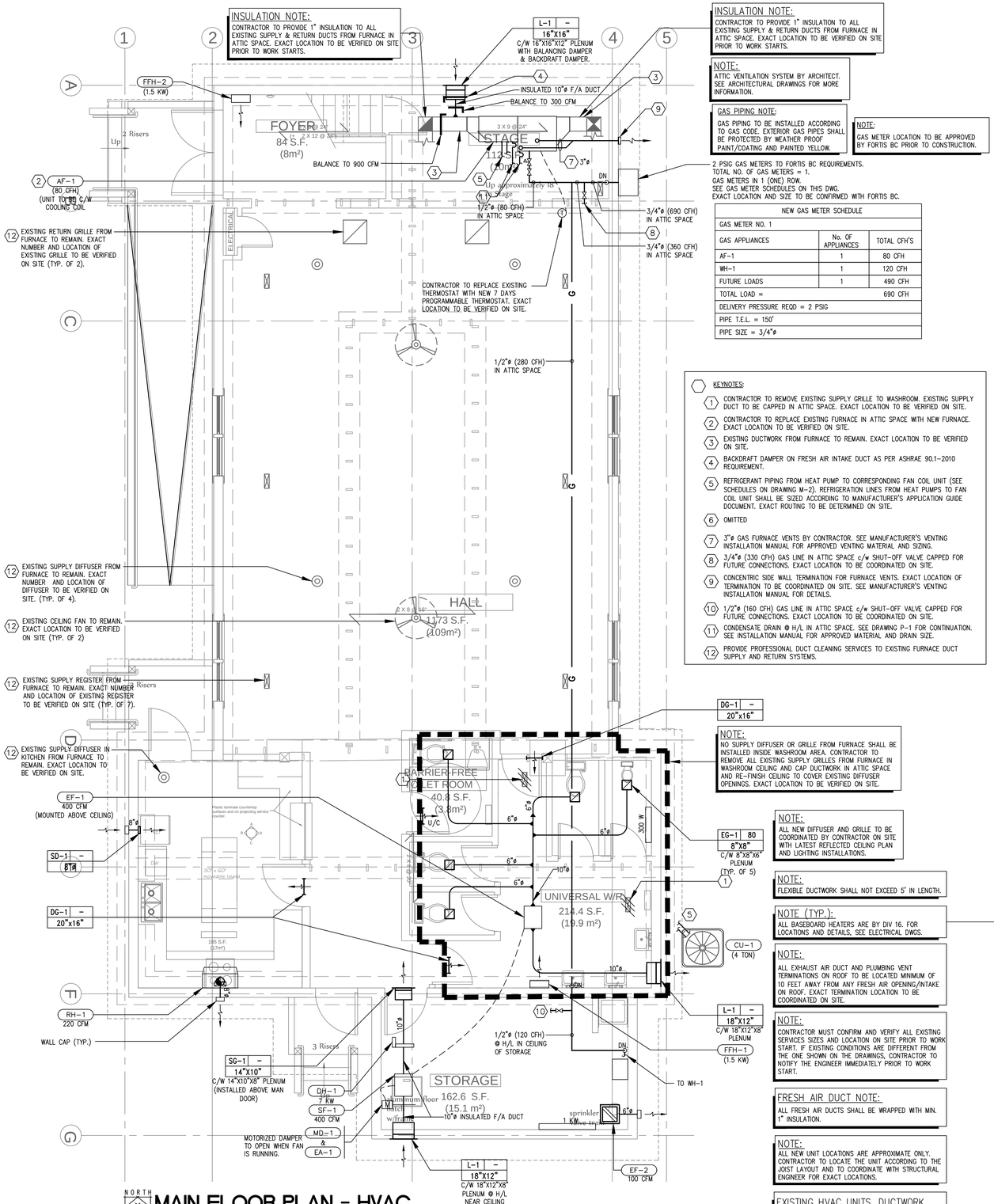
REV.	DESCRIPTION	DATE
9	ISSUED FOR CONSTRUCTION	2020.08.21
8	REVISED AS PER CITY'S COMMENTS	2020.04.21
7	REVISED AS PER CITY'S COMMENTS	2020.04.14
6	REISSUED FOR TENDER	2020.02.28
5	ISSUED FOR TENDER	2020.02.04
4	ISSUED FOR BPA	2019.12.10
3	ISSUED FOR COORDINATION	2019.02.06
2	ISSUED FOR COORDINATION	2018.12.21
1	ISSUED FOR COORDINATION	2018.11.28

PROJECT:
STRAWBERRY HILL HALL
12152 75A AVENUE, SURREY

TITLE:
PLUMBING DETAILS

DRAWN BY:	DH
DATE:	AUGUST 21, 2020
SCALE:	AS NOTED
PROJECT#:	1850
DWG#:	P–4

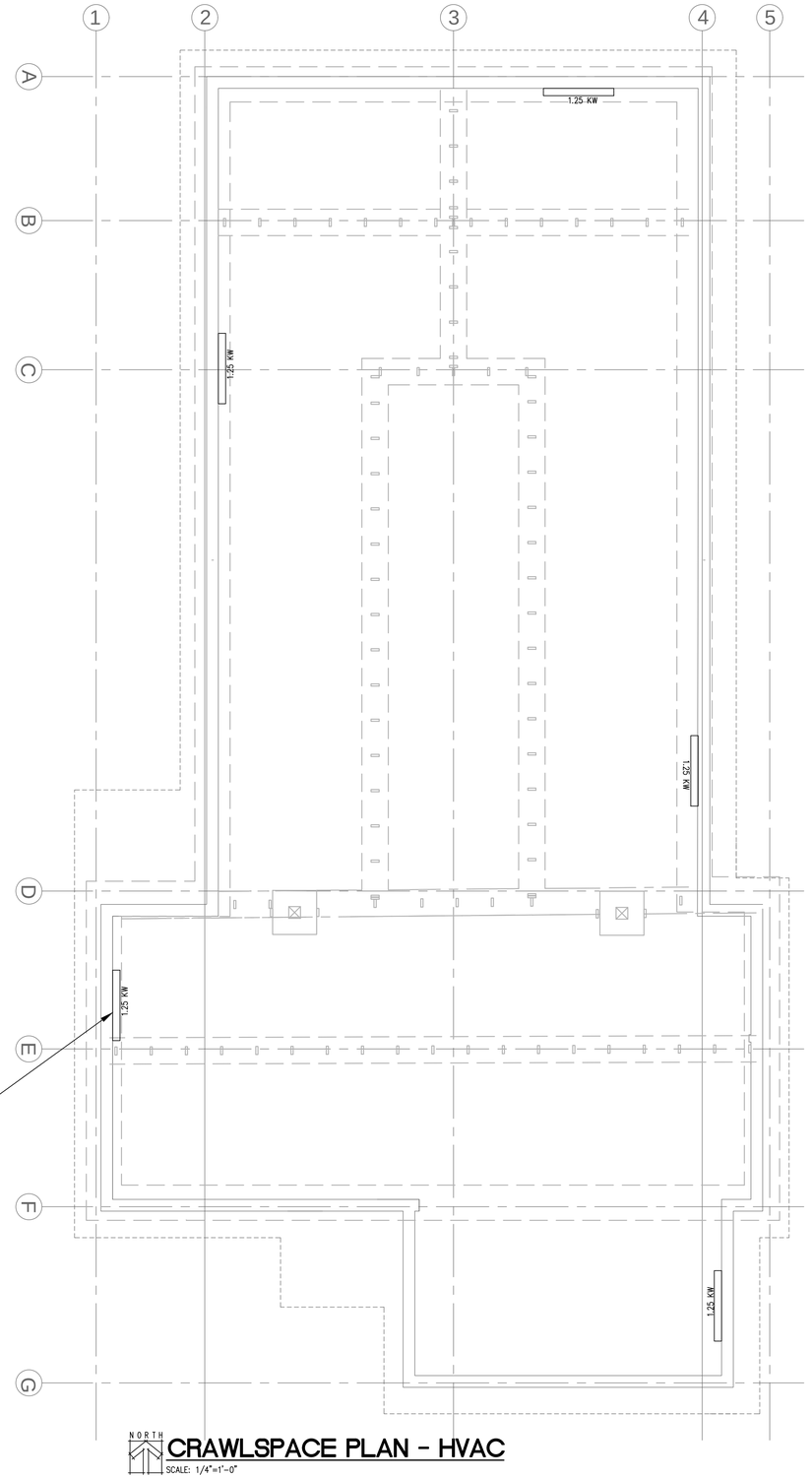
FOR REFERENCE ONLY



NORTH

MAIN FLOOR PLAN - HVAC

SCALE: 1/4"=1'-0"



NORTH

CRAWLSPACE PLAN - HVAC

SCALE: 1/4"=1'-0"

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PROJECT:

STRAWBERRY HILL HALL

12152 75A AVENUE, SURREY

TITLE:

MAIN FLOOR AND CRAWLSPACE PLAN – HVAC

DRAWN BY:	DH
DATE:	AUGUST 21, 2020
SCALE:	AS NOTED
PROJECT#:	1850
DWG#:	M–1

FOR REFERENCE ONLY

MOTORIZED DAMPER EQUIPMENT SCHEDULE

UNIT TAG	LOCATION	BRAND	MODEL	SIZE	AIR CAP. CFM	ACCESS.
MD-1	STORAGE	NAILOR	1090	AS NOTED	400	1 TO 5

ACCESSORIES (SEE ACCESSORIES/NOTES LIST ON SCHEDULE FOR APPLICABLE ITEMS BELOW):
1) RIGID DRIVE SHAFT
2) FACE LINKAGE
3) DUAL HAND DRIVE
4) OILITE BEARINGS
5) INSERT PLATE.
6) LEFT HAND DRIVE
7) RIGHT HAND DRIVE
8) NO JACKSHAFT
9) LOCKING QUADRANT
10) INTERNAL MOTOR MOUNTING BRACKET KIT

FORCED FLOW HEATER SCHEDULE

UNIT TAG	SERVICE	BRAND	MODEL	KW	ELECTRICAL SERVICE	ACCESSORIES
FFH-1	UNIVERSAL W/R	OUELLET	OAC01502	1.5	120/1/60	1
FFH-2	FOYER	OUELLET	OAC01502	1.5	120/1/60	1

1) SURFACE MOUNTING KIT.

DIFFUSER, GRILLE AND LOUVER SCHEDULE

TAG	PURPOSE	MAKE	MODEL	SIZE	MOUNT (NOTE A)	COLOR (NOTE B)	ACCESSORIES
SD-1	ADJUSTABLE AIR DIFFUSER	LIFEBREATH	99-EAG8	8"ø	SURFACE	B12	5
SG-1	SUPPLY GRILLE	PRICE	5200 SERIES	AS NOTED	DUCT	B12	2,5
EG-1	EXHAUST GRILLE	PRICE	80D SERIES	AS NOTED	SURFACE	B12	2,5
DG-1	DOOR GRILLE	PRICE	STGT-8F	AS NOTED	SURFACE	B12	-
L-1	LOUVER	PRICE	DE439	AS NOTED	SURFACE	B12	1,3,4

ACCEPTABLE EQUAL: TITUS

NOTE A: CONFIRM MOUNT WITH THE LATEST REFLECTED CEILING PLANS.
NOTE B: CONFIRM COLOR WITH THE ARCHITECT.
ACCESSORIES:
1) BIRD SCREEN.
2) OPPOSED BLADE DAMPER
3) FLANGE
4) EXACT WALL OPENING SIZE SHALL BE MEASURED ON SITE.
5) STEEL SURFACE MOUNT ADAPTOR FRAME.
6) C/W YOUNG REGULATOR TO DIFFUSER IN DRYWALL AREAS, LOCATION OF CONTROLLER TO BE DETERMINED WITH INTERIOR DESIGNER.
7) PROVIDE SLOPED SHOULDER PLENUM EQUAL TO PRICE SDA100.
8) ONLY FOR AESTHETICS OF THE SERVICE AREA NO AIR IS SUPPLIED
9) EXACT LENGTH TO BE DETERMINE BY THE DRAWING MEASURING DRAWING M-1 AND M-2.
10) PROVIDE MITERED CORNER MODULE AT THE CORNER.
11) PROVIDE BLACK COVER PLATE OVER THE DIFFUSER TO BLANK OF AIR INLET.
12) COMPLETE WITH ADJUSTABLE VANES.
13) ALUMINUM SURFACE MOUNT ADAPTOR FRAME.
14) STEEL SURFACE MOUNT ADAPTOR FRAME FOR DUCT MOUNT.

NOTE:
ALL GRILLE AND DIFFUSER COLOR TO BE CONFIRMED AND APPROVED BY INTERIOR DESIGNER AND OWNER BEFORE ORDERING.

ELECTRIC ACTUATOR SCHEDULE

UNIT TAG	SERVICE	MAKE	MODEL	ELECTRICAL SERVICE	TORQUE (IN-LBS)	SIZE	ACCESSORIES	CONTROL
EA-1	MD-1	BELLIMO	TFB-S SERIES	120 VAC	22	TO MATCH MD-1	1	A

ACCESSORIES (SEE ACCESSORIES/NOTES LIST ON SCHEDULE FOR APPLICABLE ITEMS BELOW):
1) ACTUATOR TO NORMALLY OPEN DAMPER IN THE EVENT OF POWER FAILURE.
2) ACTUATOR TO NORMALLY CLOSE DAMPER IN THE EVENT OF POWER FAILURE.

CONTROL:
A. TO BE INTERLOCKED WITH SF-1. OPEN DAMPER WHEN FAN RUNS.

FAN SCHEDULE

UNIT TAG	SERVICE	TYPE	AIR CAP CFM	S.P.	SONES	MAKE	MODEL	WEIGHT (LBS)	ACCESS.	ELECTRICAL V/PH/HZ	ELECTRICAL HP/AMPS/KW	STARTER (1)	PILOT DEVICE (2)	UNIT S	UNIT I	UNIT W	STARTER S	STARTER I	STARTER W	PILOT DEVICE S	PILOT DEVICE I	PILOT DEVICE W	DISCONNECT S	DISCONNECT I	DISCONNECT W	DESCRIPTION (3)	EMERGENCY POWER (Y/N)
EF-1	UNIVERSAL W/R	IN-LINE	400	0.375	6.8	GREENHECK	SQ-90-VG	50	2,7,9,10	120/1/60	1/6 HP	HOA	TCLOCK	M	M	E	E	E	E	M	E	E	E	E	E		N
EF-2	STORAGE	CEILING	100	0.125	0.9	BROAN	L100	22.8	5	120/1/60	87 W	–	LIGHT	M	M	E	FI	FI	FI	E	E	E	E	E	E		N
SF-3	HALL	IN-LINE	400	0.25	5.5	GREENHECK	SQ-90-VG	50	7,8,9,11	120/1/60	1/6 HP	HOA	INTERLOCK	M	M	E	E	E	E	M	M	M	E	E	E	INTERLOCK WITH EF-1	N
RH-1	KITCHEN [103]	RANGEHOOD	220	0.25	5.0	BROAN	QP1 SERIES	–	–	120/1/60	2.3 AMPS	HOA	–	M	M	E	FI	FI	FI	E	E	E	E	E	E		N

NOTE: MAKE AND MODEL TO BE CONFIRMED WITH OWNER BEFORE PRICING/ORDERING.

ACCEPTABLE EQUAL: ACME, BROAN, CARNES, DELHI, GREENHECK, STERLING, PENNBARRY

ACCESSORIES:

NOTES:
1) FAN SHALL BE CONTROLLED BY A VARIABLE SPEED CONTROLLER PROVIDED BY DIV.15 AND INSTALLED BY DIV.16
2) FAN SHALL BE CONTROLLED BY 7 DAY PROGRAMMABLE TIMER C/W MANUAL OVERRIDE THAT ALLOWS TEMPORARY OPERATION OF SYSTEM FOR UP TO TWO HOURS SUPPLIED BY DIV.15 AND INSTALLED BY DIV.16 EQUAL TO HONEYWELL MODEL RPLS730B SET TO RUN DURING OPERATION HOURS. PROGRAMMABLE TIMER TO BE C/W LOCKBOX.
3) WIRED WALL CONTROL FOR GROUP OF 4 FANS, SUPPLIED BY DIV.15 AND INSTALLED BY DIV.16.
4) FAN SHALL BE CONTROLLED BY REVERSE ACTING THERMOSTAT SUPPLIED BY DIV.15 AND INSTALLED BY DIV.16.
5) FAN SHALL BE INTERLOCKED WITH LIGHT OPERATION BY DIV.16.
6) FAN SHALL BE CONTROLLED BY WALL SWITCH SUPPLIED AND INSTALLED BY DIV.16
7) VIBRATION ISOLATION AND SEISMIC RESTRAINT SYSTEM.
8) 1/2" DIA INTERNAL FIBREGLASS INSULATION
9) C/W VARI-GREEN MOTOR.
10) C/W BACKDRAFT DAMPER.
11) INTERLOCK WITH EF-1. INTERLOCKING BY DIV.15.

NOTE:
UNLESS OTHERWISE SPECIFIED, ALL ROOF MOUNT FANS SHALL BE EQUIPPED WITH ROOF CURB. ALL EXHAUST FANS SHALL HAVE BACKDRAFT DAMPERS. ALL SUSPENDED FAN LARGER THAN 1/4 HP SHALL BE SUSPENDED ON VIBRATION ISOLATORS, PROVIDE FLEXIBLE CONNECTORS ON DUCT/FAN CONNECTIONS.

(1) STARTER DEVICE
MAN = MANUAL STARTER
HOA = MAGNETIC STARTER c/w HAND/OFF/AUTO SWITCH & AUX CONTACTS
MAG = MAGNETIC STARTER c/w AUX CONTACTS

(2) PILOT DEVICE
F = CONTROLLED BY FLOAT SWITCH
G = CONTROLLED BY GAS SENSOR (120V)
CO2 = CONTROLLED BY CO2 SENSOR
CO = CONTROLLED BY CO SENSOR
TCLOCK = CONTROLLED BY PROGRAMMABLE TIMECLOCK
S = CONTROLLED BY WALL SWITCH
VS = CONTROLLED BY VARIABLE SPEED SWITCH (120V)
LIGHT = CONTROLLED BY LIGHT SWITCH
INTERLOCK = INTERLOCKED WITH OTHER DEVICES
CONT = CONTINUOUS OPERATION
LT = CONTROLLED BY LIGHT SWITCH c/w TIME DELAY SWITCHES. SET TO 5 MIN. DELAY AFTER SWITCH TURNS OFF
P = CONTROLLED BY PRESSURE SWITCH
MOTION = CONTROLLED BY MOTION SENSOR (120V)
TSTAT = CONTROLLED BY THERMOSTAT (120V)
LV-TSTAT = CONTROLLED BY 24V THERMOSTAT
R-TSTAT = CONTROLLED BY REVERSE ACTING THERMOSTAT (120V)
D-TSTAT = CONTROLLED BY 24V THERMOSTAT (FACTORY SUPPLIED STEP DOWN TRANSFORMER). INSTALLED IN AIR DUCT
DSTAT = CONTROLLED BY DEHUMIDISTAT

(3) DESCRIPTION

DEFINITIONS
S = SUPPLY
I = INSTALLED
W = WIRE
FI = FACTORY INSTALLED
E = BY ELECTRICAL DIV. 16
M = BY MECHANICAL DIV. 15

ELECTRIC DUCT HEATER SCHEDULE

UNIT TAG	SERVICE	HEATING CAP (KW)	AIR FLOW CFM	TEMP., RISE F	ELECTRICAL V/PH/HZ	NO. OF STAGES	HEIGHT IN.	LENGTH IN.	MAKE	ACCESS. REQ'D
DH-1	SF-1	7	400	55	240/1/60	2	10	10	THERMOLEC	1 TO 3,11,13,17,18

STANDARD BUILT IN CONTROLS:
- HIGH LIMIT CUT-OUTS, MAGNETIC CONTRACORS AS REQUIRED, CONTROL TRANSFORMER AND AIR FLOW SENSOR AS STANDARD COMPONENTS

ACCESSORY NUMBERS (SEE EQUIPMENT SCHEDULE FOR REQUIRED ACCESSORIES):

1) BUILT-IN DISCONNECT SWITCH
2) SCR PROPORTIONAL CONTROLLER
3) LOAD FUSES, HRC TYPE
4) SCREENS BOTH SIDES
5) PNEUMATICALLY CONTROLLED SCR
6) SOLID STATE RELAY (TRIAC)
7) HYBRID CONTROLLER (SCR + STEP CONTROLLER)
8) MERCURY CONTACTORS
9) PRESSURE ELECTRIC SWITCH
10) LOW WATTS DENSITY ELEMENTS
11) PILOT LIGHTS
12) FULL BREAK CONTACTORS
13) NEMA 1 CONTROL BOX
14) NEMA 4 CONTROL BOX
15) WATER PROOF CONSTRUCTION FOR OUTDOOR MOUNTING.
16) ELECTRONIC ROOM THERMOSTAT RT
17) ELECTRONIC DUCT THERMOSTAT DT. (SET DISCHARGE TEMP. AT 68° F.)
18) REMOTE ADJUSTABLE DUCT SENSOR RADS
19) REMOTE ADJUSTABLE ROOM SENSOR RARS

GAS FURNACE

UNIT TAG	SERVICE	LOCATION	MANUFACT.	COOLING COIL MODEL	FURNACE MODEL	CFM (NOMINAL)	S.P. IN.	BTU/H INPUT	BTU/H OUTPUT	A.F.U.E	BLOWER DRIVE ELECT. REQUIRMENTS HP	BLOWER DRIVE ELECT. REQUIRMENTS RPM	COMBUSTION FAN ELECT. REQUIRMENTS HP	COMBUSTION FAN ELECT. REQUIRMENTS FLA	POWER CONNECTION ELECT. REQUIRMENTS V/PH/HZ	POWER CONNECTION ELECT. REQUIRMENTS AMPS	POWER CONNECTION ELECT. REQUIRMENTS MOCP	APPROX. WEIGHT (LBS)	ACCESS.
AF-1	HALL	ATTIC SPACE	YORK	CM48CXA1	TM9Y080C16MP11	1,400	0.7	80,000	77,000	96%	0.5	–	–	–	120/1/60	8.7	15	200	1 TO 11

ACCEPTABLE EQUAL: NONE
ACCESSORIES:
1) HORIZONTAL FURNACE UNIT.
2) C/W MERV 8 FURNACE FILTER.
3) C/W FILTER ACCESS DOOR KIT
4) C/W FILTER RACK KIT
5) DISCONNECT KIT.
6) C/W 7 DAYS PROGRAMMABLE 2 HEAT THERMOSTAT C/W WIRING AND CONDUIT SUPPLIED AND INSTALLED BY DIV.15.
7) MOUNT THERMOSTAT AS SHOWN ON PLANS AT 5 FT ABOVE FLOOR.
8) FURNACE FAN SHALL BE PROGRAMMED BY DIV. 15 TO RUN CONTINUOUSLY DURING OPERATION HOURS.
9) C/W EXHAUST VENT KIT FOR FURNACE. REFER TO VENTING INSTALLATION MANUAL FOR VENTING INSTALLATION DETAIL.
10) C/W 4 TON, MULTI-POSITION CASED, COIL, 21" CABINET WITDTH, MAXALLOY FLEX COILS, ALUMINUM TUBE.
11) C/W BOTTOM RETURN FILTER RACK GALVANIZED (FITS 21" WDE FURNACE).

HEAT PUMP OUTDOOR UNITS

UNIT TAG	SERVICE	LOCATION	MANUFACT.	MODEL	COOLING CAP. TONS	HIGH TEMP. HEATING CAPACITY	WEIGHT LBS	ACCESS.	ELECTRICAL COMPRESSOR RLA	ELECTRICAL COMPRESSOR LRA	ELECTRICAL FAN FLA	ELECTRICAL POWER MCA	ELECTRICAL POWER MOCP	ELECTRICAL POWER V/PH/HZ	STARTER (1)	PILOT DEVICE (2)	UNIT S	UNIT I	UNIT W	STARTER S	STARTER I	STARTER W	PILOT DEVICE S	PILOT DEVICE I	PILOT DEVICE W	DISCONNECT S	DISCONNECT I	DISCONNECT W	DESCRIPTION (3)	EMERGENCY POWER (Y/N)
CU-1	AF-1	ON GRADE	YORK	YFE48B21S	4	–	235	1 TO 7	–	–	–	25.7	45	230/1/60	HOA	TSTAT	M	M	E	FI	FI	FI	M	M	M	E	E	E		N

ACCEPTABLE EQUAL: NONE
ACCESSORIES (SEE ACCESSORIES/NOTES LIST ON SCHEDULE FOR APPLICABLE ITEMS BELOW):
1) BLACK HIGH DENSITY POLYETHYLENE MOUNTING BASE ON WOOD SLEEPERS SECURED ON ROOF STRUCTURE.
2) REFRIGERATION LINE KIT, SUCTION LINE FULLY INSULATED.
3) LOW AMBIENT KIT TO OPERATE UNIT IN COOLING MODE DOWN TO 30F
4) SEISMIC RESTRAINT SECURES UNIT TO STRUCTURE
5) OUTDOOR THERMOSTAT KIT AND MOUNTING BOX.
6) R-410A REFRIGERANT.
7) WIRING INTERCONNECT INDOOR UNIT TO OUTDOOR UNIT BY DIV. 16.
8) LONG LINE APPLICATION ACCESSORIES INCLUDE (CAN BE DELETED IF CONFIRMED BY MANUFACTURER TO BE NOT REQUIRED BASED ON ACTUAL INSTALLATION):
   LIQUID LINE SOLENOID (LLS) AT OUTDOOR;
   TXV ON INDOOR;
   CRANKCASE HEATER;
   START CAPACITOR AND RELAY;
   HEATING PISTON CHANGE;
   VAPOR LINE SHOULD BE SIZED FOR LESS THAN 1% COOLING CAPACITY LOSS.

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PROJECT:
STRAWBERRY HILL HALL
12152 75A AVENUE, SURREY

TITLE:
HVAC SCHEDULES

DRAWN BY:	DH
DATE:	AUGUST 21, 2020
SCALE:	AS NOTED
PROJECT#:	1850

DWG#:
M-2

GENERAL

.1 THE WORD 'PROVIDE' SHALL MEAN 'SUPPLY AND INSTALL'.

.2 CONTRACTOR MUST VISIT THE SITE TO FIELD CHECK AND VERIFY ALL MEASUREMENTS AND EXISTING CONDITIONS DURING TENDERING PERIOD AND ALLOW FOR THE SAME IN THE TENDER. ALLOW FOR ALL NECESSARY WORKS TO PROVIDE A COMPLETE SYSTEM TO SUIT THE SITE CONDITIONS.

.3 EXISTING SITE CONDITIONS GIVEN ON THE DRAWINGS INCLUDING, BUT NOT LIMITED TO, PIPING, DUCTWORK AND EQUIPMENT SIZING, LOCATION, SPECIFICATION AND GENERAL SYSTEM LAYOUT SHOWN ON THE DRAWINGS ARE NOT AS-BUILT RECORDS AND MUST BE VERIFIED BY THE CONTRACTOR ON SITE BEFORE WORK STARTS. REPORT TO THE ENGINEER BEFORE WORK STARTS ON ANY DISCREPANCIES IN ACTUAL SITE CONDITIONS WHICH MAY IMPACT ON THE PROPOSED INSTALLATIONS. CONTRACTOR SHALL NOT GO AHEAD WITH MATERIAL ORDERINGS AND WORKS WITHOUT IDENTIFYING EXISTING SITE CONDITIONS ARE SUITABLE FOR THE PROPOSED WORKS FIRST.

.4 THE BIDDERS ARE TO REVIEW THE MECHANICAL DOCUMENTS AND ARE TO OBTAIN FURTHER INFORMATION FROM THE GENERAL CONTRACTOR ON THE EXACT SCOPE OF WORK THAT IS TO BE INCLUDED IN THE BID.

.5 CONTRACTOR TO PROVIDE A COMPLETE, FULLY OPERATING AND TESTED MECHANICAL SYSTEMS WITH FACILITIES AND SERVICES TO MEET REQUIREMENTS DESCRIBED HEREIN AND IN COMPLETE ACCORDANCE WITH 2018 B.C. BUILDING CODE AND OTHER APPLICABLE CODES AND STANDARDS AND REGULATIONS INCLUDING BUT NOT LIMITED TO THE 2018 B.C. BUILDING CODE, 2018 B.C PLUMBING CODE, ASHRAE STANDARD 90.1 – 2010, THE SMACNA DUCT AND ASHRAE CONSTRUCTION STANDARDS LATEST EDITIONS, THE BC INSULATION CONTRACTORS ASSOCIATION (BCICA) STANDARD MANUAL LATEST EDITION, WORKER'S COMPENSATION BOARD REGULATIONS AND LOCAL BUILDING-BY LAWS ETC. THE WORK TO BE DONE SHALL INCLUDE THE PROVISION OF ALL LABOR, MATERIALS, TOOLS AND EQUIPMENT AS WELL AS THE APPLICATION OF A COMPETENT KNOWLEDGE OF CONSTRUCTION WHETHER OR NOT DIRECTLY SPECIFIED OR SHOWN ON THE PLANS BUT REQUIRED FOR THE INSTALLATION, TESTING AND PUT INTO OPERATION THE COMPLETE MECHANICAL SYSTEMS EXCEPT WHERE IT IS SPECIFICALLY MENTIONED THAT SUCH MATERIALS AND/OR LABOR IS NOT PART OF THE CONTRACT.

.6 THE DRAWINGS AND SPECIFICATIONS ARE NOT A DETAILED SET OF INSTALLATION INSTRUCTIONS BUT A GUIDE TO ESTABLISHING QUALITY OF EQUIPMENT, MATERIALS, WORKMANSHIP AND PERFORMANCE. REFER TO THE ARCHITECTURAL, STRUCTURAL, AND ELECTRICAL DRAWINGS AS WELL AS THE MECHANICAL DRAWINGS FOR DETAILS AFFECTING THE MECHANICAL WORK. DRAWINGS AND SPECIFICATIONS ARE COMPLEMENTARY ONE TO ANOTHER AND THAT WHICH IS SHOWN ON ONE IS AS BINDING AS THAT WHICH IS SHOWN ON BOTH.

.7 NOTIFY THE ARCHITECT/ENGINEER DURING TENDERING PERIOD ANY DISCREPANCIES BETWEEN THE SPECIFICATIONS AND DRAWINGS OR WHERE THE CONTRACT DOCUMENTS DO NOT CONTAIN SUFFICIENT INFORMATION THAT LEAVE THE CONTRACTOR IN DOUBT ABOUT THE TRUE INTENT AND MEANING OF THE DRAWINGS/SPECIFICATIONS. IF CLARIFICATION IS NOT OBTAINABLE, ALLOW FOR THE MOST EXPENSIVE ARRANGEMENT.

.8 THE CONTRACTOR SHALL OBTAIN ALL PERMITS AND PAY ALL PERMIT FEES REQUIRED FOR ALL APPLICABLE SERVCIES INCLUDE BUT NOT LIMITED TO SANITARY, STORM, WATER AND GAS SERVICES AND AFTER COMPLETION OF WORK SHALL FURNISH CERTIFICATIONS OF FINAL INSPECTION AND APPROVAL FROM THE INSPECTION AUTHORITIES. CONTRACTOR SHALL PAY FOR ALL PERMIT AND INSPECTION FEE REQUIRED BY AUTHORITIES.

.9 CHECK OUT AND MAKE DUE ALLOWANCE FOR THE WORK OF OTHER TRADES, STRUCTURE, AND AVAILABLE SPACE. CONTRACTOR SHALL CO-ORDINATE WITH OTHER TRADES AND MAKE, WITHOUT ADDITIONAL CHARGE OR EXPENSE MAKE ANY NECESSARY CHANGES OR ADDITIONS TO THE ROUTING OF PIPING AND DUCT-WORK TO ACCOMMODATE THE STRUCTURAL, ELECTRICAL AND ARCHITECTURAL CONDITIONS TO FACILITATE A SATISFACTORY INSTALLATION.

.10 THE CONTRACTOR SHALL BE RESPONSIBLE FOR DETAILED LAYOUT OF WORK. WHERE HEADROOM OR SPACE CONDITIONS APPEAR INADEQUATE, ADVISE THE ENGINEER BEFORE FABRICATION, OR INSTALLATION OF ANY MATERIAL OR EQUIPMENT.

.11 ALL MATERIALS AND EQUIPMENT MUST BE NEW AND NOT LESS THAN QUALITY SPECIFIED. EQUIPMENT SHALL HAVE ULC, CSA OR ASME NAMEPLATES. ALL EQUIPMENT INSTALLED SHALL BE IN ACCORDANCE WITH THE MANUFACTURER'S PRINTED INSTALLATION MANUALS.

.12 ALL NECESSARY ANCHOR BOLTS, PIPE SLEEVES, HANGER INSERTS, ETC., SHALL BE INSTALLED AT THE PROPER TIME AND WHEN CALLED FOR. ANCHOR BOLTS MUST BE CSA APPROVED AND MEET THE CURRENT BUILDING CODE/BYLAW REQUIREMENTS. DO NOT USE POWER ACTUATED FASTENERS AND DROP IN ANCHORS FOR TENSION LOADS. CONTRACTOR MUST ENSURE THAT CORRECT FASTENERS AND ANCHORS ARE BEING USED IN COMPLIANCE WITH PART 4 OF THE BC BUILDING CODE. DROP IN ANCHORS DOES NOT MEET THE CURRENT BUILDING CODE/BYLAW REQUIREMENTS SHALL NOT BE USED.

.13 ANY WORKS THAT AFFECT THE BUILDING STRUCTURES MUST BE REVIEWED AND APPROVED BY THE STRUCTURAL ENGINEER OF RECORD FOR THE PROJECT AND/OR A QUALIFIED PROFESSIONAL STRUCTURAL ENGINEER.

.14 PROVIDE METAL ACCESS PANELS AT ALL EQUIPMENT, VALVES, CLEANOUTS, ETC. REQUIRING ADJUSTMENTS AND/OR MAINTENANCE. ACCESS PANELS IN FIRE RATED MEMBRANES SHALL BEAR ULC OR WARNOCK-HERSEY LABEL.

.15 THE CONTRACTOR SHALL FLASH, COUNTER FLASH AND PROVIDE SLEEVES FOR ALL PIPING AND DUCT-WORK THROUGH WALL, FLOOR, AND ROOF, AND SHALL SUPPLY AND SET ALL SLEEVES FOR THE PROJECT.

.16 THE CONTRACTOR SHALL PROVIDE FIRE STOPPING AT ALL DUCT, PIPE, WIRING AND CONDUIT PENETRATIONS, OF FIRE RATED WALLS AND FLOORS WHERE SUCH PENETRATIONS ARE THE RESULT OF THE WORK OF THIS DIVISION. FIRE RESISTANCE RATING OF FIRESTOP SYSTEMS SHALL MEET THE REQUIREMENTS OF CURRENT BC BUILDING CODE. AT COMPLETION OF THE PROJECT, PROVIDE CERTIFICATION BY THE FIRE STOPPING CONTRACTOR THAT FIRE TOPPING REQUIRED UNDER THIS DIVISION ARE COMPLETED ACCORDING TO CODE REQUIREMENTS.

.17 OBTAIN CLARIFICATION FOR ANY DISCREPANCIES WHICH LEAVE IN DOUBT THE TRUE INTENT AND MEANING OF THE DRAWINGS/SPECIFICATIONS. FAILURE TO DO SO SHALL RENDER THE CONTRACTOR LIABLE FOR ALL COSTS INVOLVED IN RECTIFICATION.

.18 PERFORM ALL TESTS ON SYSTEMS IN ACCORDANCE WITH CODES AS APPLICABLE. SCHEDULE AND CONDUCT TESTS WITH MINIMUM 48 HOURS NOTICE TO THE ENGINEER BEFORE TESTS. NO SERVICES SHALL BE COVERED WITHOUT APPROVAL FROM THE ENGINEER.

.19 PROVIDE IDENTIFICATION ON ALL PIPING, DUCTWORK, EQUIPMENT AND SYSTEM COMPONENTS. IDENTIFICATION MARKERS AND LABELS SHALL IDENTIFY SERVICE AND DIRECTION OF FLOW; SPACING SHALL BE SUCH TO ALLOW FOR REASONABLE IDENTIFICATION OF COMPONENTS IN ROOMS AND CEILING SPACES. PLASTIC LAMACOID SHALL BE USED ON CONTROL PANELS AND EQUIPMENT. VALVES SHALL HAVE PLASTIC OR BRASS TAGS.

.20 IDENTIFY BY COLOR DOTS ALL ACCESS DOORS, AND T-BAR WITH EQUIPMENT AND COMPONENTS ABOVE.

.21 PROVIDE SEISMIC RESTRAINTS FOR ALL PIPING, DUCTWORK AND EQUIPMENT TO MEET REQUIREMENTS OF THE LOCAL BUILDING CODE/BY LAW AND 'COMMENTARY J, EFFECTS OF EARTHQUAKES' IN THE SUPPLEMENT TO THE NATIONAL BUILDING CODE OF CANADA WITH REGARDING SEISMIC FORCES TRANSMITTED TO PIPING, DUCTING AND EQUIPMENT FROM BUILDING STRUCTURE DURING EARTHQUAKE. THE SEISMIC RESTRAINT MANUAL GUIDELINES FOR MECHANICAL SYSTEMS AS PREPARED BY CURRENT EDITIONS OF SMACNA AND THE ASHRAE HANDBOOK – HVAC APPLICATIONS ARE SUITABLE REFERENCES TO MEET CODE REQUIREMENTS.

.22 THE CONTRACTOR SHALL INCLUDE IN THEIR COST SERVICE OF A SEISMIC RESTRAINT ENGINEER REGISTERED IN PROVINCE OF BRITISH COLUMBIA WHO SPECIALIZED IN DESIGN OF SEISMIC RESTRAINT SYSTEMS TO DESIGN AND REVIEW THE SEISMIC RESTRAINT SYSTEMS (SEISMIC ENGINEERS IE. BELL CONSULTING ENGINEERS LTD. 604-732-0577; LUIZ LEON & ASSOC. LTD., 604-535-7300; NEALE ENGINEERING LTD. 604-534-2118). THE SEISMIC RESTRAINT ENGINEER SHALL BE THE SUPPORTING REGISTERED PROFESSIONAL OF THE PROJECT AND PROVIDE DESIGN AND SUPPORTING DOCUMENTS PREPARED BY HIM/HER IN SUPPORT OF THE PROJECT FOR 1) STRUCTURAL CAPACITY OF MECHANICAL COMPONENTS, INCLUDING ANCHORAGE AND SEISMIC RESTRAINT, AND/OR 2) STRUCTURAL CAPACITY OF PLUMBING COMPONENTS, INCLUDING ANCHORAGE AND SEISMIC RESTRAINT. HE/SHE SHALL INSPECT THE SEISMIC RESTRAINT SYSTEMS AND PROVIDE SCHEDULE S-C AFTER COMPLETION OF WORK. FORWARD COPY OF THE SCHEDULES S-B AND S-C TO MEC ENGINEERING CONSULTING LTD. BEFORE BUILDING FINAL INSPECTION BY THE AUTHORITIES AND THE ISSUANCE OF SCHEDULE C-B BY MEC. OTHER FORMS SUCH AS LETTER OF CERTIFICATION OF THE SEISMIC RESTRAINT INSTALLATION IN LIEU OF SCHEDULES S-B AND S-C WILL NOT BE ACCEPTABLE.

.23 THE SEISMIC RESTRAINT ENGINEER SHALL COORDINATE WITH THE PROJECT STRUCTURAL ENGINEER FOR REVIEW OF CONNECTION POINTS TO BUILDING STRUCTURE.

.24 SHOP DRAWINGS: FURNISH 5 COPIES OF SHOP DRAWINGS TO THE ENGINEER FOR REVIEW PRIOR TO ORDERING OF EQUIPMENT. SHOP DRAWINGS SHALL INCLUDE NAME OF JOB, CONTRACTOR, SUPPLIER, MANUFACTURER AND DATE OF SUBMISSION. ALL SHOP DRAWINGS SHALL BE REVIEWED BY THE CONTRACTOR AND BEAR HIS NAME AND SIGNATURE. ALL UNSIGNED SHOP DRAWINGS SHALL NOT BE REVIEWED BY THE ENGINEER.

.25 IF THE CONTRACTOR USES ALTERNATIVE OR EQUAL MATERIAL OTHER THAN THE SPECIFIED MATERIAL ON THE DRAWINGS, CONTRACTOR SHALL INCLUDE IN THEIR COST OF: ANY REDESIGNS, NEW DRAWINGS, ANY RESULTING WORKS (BOTH UNDER THIS DIVISION AND OTHER DIVISION) RESULTING FROM THE USE OF ALTERNATIVE OR EQUAL MATERIAL. SUBMIT ANY REDESIGN WITH SHOP DRAWINGS FOR APPROVAL BEFORE INSTALLATION. CHANGES MADE WITHOUT APPROVAL MAY SUBJECT TO REJECTION AND TO BE RE-INSTALLED ACCORDING TO THE ORIGINAL DESIGN AND MATERIAL SPECIFIED ON THE DRAWINGS.

.26 IF THE AUTHORITIES HAVE JURISDICTION REQUIRE MEC TO SUBMIT REVISED SKETCHES/DRAWINGS, LETTER AND/OR REPORT TO THE CITY DURING CONSTRUCTION FOR CHANGES MADE BY THE CONTRACTOR DUE TO THE CONTRACTOR USES ALTERNATIVE DESIGN AND/OR MATERIAL OTHER THAN THE SPECIFIED ONES ON THE DRAWINGS, THE CONTRACTOR SHALL PAY FOR THE WORKS REQUIRED FOR THE SUBMISSION DONE BY MEC AT A RATE OF $100 PER HOUR. IF THE CONTRACTOR DOES NOT AGREE TO PAY OR FAIL TO PAY MEC IN FULL FOR THE WORKS REQUIRED, MEC HAS THE RIGHT NOT TO WORK ON THE SUBMISSION AND NOT RESPONSIBLE FOR ANY CONSEQUENCES.

.27 AS BUILT RECORD DRAWINGS: DURING WORK, OBTAIN A SET OF WHITE PRINTS AND NEATLY SHOWING IN BLACK OR COLORED LINES AND SUITABLE NOTATIONS, SERVICE TYPES, ALL SIZES, INVERTS AND ROUTES OF WATER, SEWER, GAS AND DUCTWORK, FIRE DAMPERS, CLEANOUTS, SERVICE VALVES, AND ACCESS DOORS ETC., RELOCATED OR ADAPTED UNDER THIS PROJECT. CONTRACTOR SHALL CERTIFY AND SIGN THAT 'THESE MARKED UP DRAWINGS ACCURATELY REFLECT THE BUILDING 'AS-BUILT' AND WITH DATE, COMPANY, ADDRESS, TELEPHONE INFORMATION ON THE FRONT PAGE. THE CONTRACTOR SHALL SUBMIT TWO COPIES OF THESE RECORD DRAWINGS TO MEC BEFORE SUBSTANTIAL COMPLETION. PHOTOCOPIES ARE ACCEPTABLE.

CONTRACTOR SHALL INCLUDE CASH ALLOWANCE TO ALLOW COST OF TRANSFERRING DATA FROM THE ABOVE SITE 'AS-BUILT' DRAWINGS TO ELECTRONIC DRAWING FILES IN AUTOCAD FORMAT. THE CONTRACTOR MUST RETAIN MEC TO TRANSFER DATA AND PREPARE THE AUTOCAD FORMAT DRAWIING FILES FROM THE SITE MARKED-UP AS-BUILT DRAWINGS. MEC'S FEE TO DO THE ABOVE TRANSFER WILL BE BASED ON A RATE OF $100 PER HOUR UP TO A MAXIMUM OF $500 PER PAGE OF DRAWINGS TO BE UPDATED PLUS TAXES. PAYMENT SHALL BE DUE WHEN ELECTRONIC FILES ARE COMPLETED AND READY TO BE RELEASED.

.28 MAINTENANCE AND OPERATING MANUAL: PROVIDE ONE HARD COPY OF MAINTENANCE AND OPERATING MANUAL AND A PDF COPY OF THE SAME MANUAL IN USB FLASH DRIVE. THE MANUAL SHALL BE IN A 3-RING HARD COVER BINDER; INCLUDE AN INDEX, LIST OF MECHANICAL DRAWINGS, OPERATING DESCRIPTIONS, MAINTENANCE AND LUBRICATION SCHEDULES, EQUIPMENT SUPPLIES AND CONTRACTORS, CERTIFICATES FROM AUTHORITIES, WARRANTY CERTIFICATES, BALANCING REPORTS, SHOP DRAWINGS AND MAINTENANCE BULLETINS, DESCRIPTION OF AUTOMATIC CONTROL SYSTEMS INCLUDING WIRING DIAGRAMS, AND START-UP AND CHECKLISTS. SUBMIT ONE PRELIMARY HARD COPY TO THE ENGINEER FOR REVIEW AND COMMENTS, INCORPORATE ALL COMMENTS FROM THE ENGINEER AND MAKE ALL NECESSARY CHANGES ON THE SUBMITTED/REVIEWED COPY RETURNED FROM THE ENGINEER. AFTER REVISION, SUBMIT THE FINAL HARD COPY AND A PDF COPY OF THE FINAL VERSION IN USB DRIVE TO THE ENGINEER TO BE FORWARDED TO THE OWNER.

.29 FURNISH A WRITTEN GUARANTEE STATING THAT ALL EQUIPMENT SUPPLIED, AND ALL WORK EXECUTED UNDER THIS CONTRACT WILL BE FREE FROM DEFECTS OF MATERIALS AND WORKMANSHIP FOR A PERIOD OF 1 YEAR FROM THE DATE OF SUBSTANTIAL COMPLETION CERTIFICATE. ANY DEFECTIVE MATERIALS THAT BECOME EVIDENT DURING THE GUARANTEE PERIOD WILL BE CORRECTED AT NO ADDITIONAL COST TO THE OWNER. SUBMIT MANUFACTURER'S FORMS FOR EXTENDED WARRANTY ITEMS AS APPLICABLE AND SPECIFIED.

.30 IF THE CONTRACTOR USES ALTERNATIVE OR EQUAL MATERIAL OTHER THAN THE SPECIFIED MATERIAL ON THE DRAWINGS, CONTRACTOR SHALL INCLUDE IN THEIR COST OF: ANY REDESIGNS, NEW DRAWINGS, ANY RESULTING WORKS (BOTH UNDER THIS DIVISION AND OTHER DIVISION) RESULTING FROM THE USE OF ALTERNATIVE OR EQUAL MATERIAL. SUBMIT ANY REDESIGN WITH SHOP DRAWINGS FOR APPROVAL BEFORE INSTALLATION.

PLUMBING

1. GENERAL

1.1. PROVIDE COMPLETE PLUMBING SYSTEMS TO MEET WITH THE CURRENT B.C. PLUMBING CODE, APPLICABLE CODE REQUIREMENTS AND AS OUTLINED IN THE DRAWINGS AND THE SPECIFICATIONS.

1.2. CONTRACTOR SHALL COORDINATE AND INCLUDE COST OF CONFIRMING THE LOCATION AND INVERT OF WATER, STORM AND SANITARY CONNECTIONS AT THE PROPERTY LINES OR AS SHOWN ON THE DRAWINGS PRIOR TO WORK COMMENCING. IF THE CONNECTIONS ARE FOUND TO BE UNSUITABLE (INSUFFICIENT SIZE OR UNACCEPTABLE INVERT) CONTRACTOR SHALL INFORM THE ENGINEER.

1.3. IF THERE IS A DISCREPANCY BETWEEN THE PLUMBING AND THE ARCHITECTURAL DRAWINGS AS TO THE LOCATIONS OF PLUMBING FIXTURES, WALLS, ETC., THE ARCHITECTURAL DRAWINGS SHALL TAKE PRECEDENCE.

1.4. WORK INCLUDED

1.4.1. WORK TO INCLUDE, BUT NOT BE LIMITED TO, THE SUPPLY AND INSTALLATION OF THE FOLLOWING SYSTEMS:

1.4.1.1.UTILITY CONNECTIONS INCLUDING STORM, SANITARY AND WATER TO THE PROPERTY LINES. CONTRACTOR TO VERIFY AND LOCATE THE CITY SERVICE CONNECTIONS ON SITE AND MAKE CONNECTIONS.

1.4.1.2. SANITARY DRAINAGE AND VENT SYSTEM.

1.4.1.3. COLD WATER SERVICE ENTRY STATION AND OUTSIDE WATER METER TO CITY STANDARD, PRV STATION AND APPROVED BACK FLOW PREVENTOR(S).

1.4.1.4. WATER SUPPLY FOR FIRE PROTECTION SYSTEM FROM THE PROPERTY LINE.

1.4.1.5. WATER SUPPLY FOR IRRIGATION SYSTEM WITH SHUT-OFF VALVES AND APPROVED BACKFLOW PREVENTOR.

1.4.1.6. HOT AND COLD WATER DISTRIBUTION SYSTEMS.

1.4.1.7. ACCESS PANELS TO ALL SHUT-OFF VALVES AND CLEAN OUTS IN CONCEALED SPACES WITH PROPER FIRE RESISTANCE RATING

1.4.1.8. PLUMBING FIXTURES AND PLUMBING FIXTURE CONNECTIONS, PROVIDE NEW SUPPLIES C/W WHEEL HANDLE STOPS, HEXAGONAL REDUCER AND ESCUTCHEONS FOR ALL FIXTURES. BOTH FLEXIBLE AND RIGID SUPPLIES ARE ACCEPTABLE. INCLUDE ALL ACCESSORIES REQUIRED FOR A COMPLETE INSTALLATION.

1.4.1.9. BUILDING STORM DRAINAGE SYSTEM.

1.4.1.10.FOOTING DRAIN SYSTEM.

2. PRODUCTS

2.1. STORM AND SANITARY DRAINAGE PIPING

2.1.1. UNDERGROUND GRAVITY STORM AND SANITARY PIPING, BOTH INSIDE AND OUTSIDE THE BUILDING SHALL BE:

2.1.1.1.ABS- SCHEDULE 40 DWV PIPE AND FITTINGS – CAN/CSA B181.1-M, OR

2.1.1.2. PVC-SCHEDULE 40 DWV PIPE AND FITTINGS – CAN/CSA B181.2-M,

DO NOT USE CELLCORE PIPING. CELLCORE PIPING IS NOT ACCEPTABLE UNLESS APPROVED BY THE ENGINEER.

2.1.2. ABOVE GRADE PIPING:

2.1.2.1. SIZES 2 INCHES AND ABOVE SHALL BE CAST IRON DRAINAGE PIPING, VENT PIPING AND FITTING CONFORMING TO CAN3-B70-M WITH MECHANICAL JOINTS WITH SOFT FLEXIBLE NEOPRENE AND STAINLESS STEEL GEAR CLAMP.

2.1.2.2. SIZES UNDER 2 INCHES SHALL BE DWV COPPER DRAINAGE PIPING CONFORMING TO ASTM B306 WITH CAST BRASS OR WROUGHT COPPER FITTING WITH 50/50 SOLDER JOINTS

2.1.2.3. EXEMPTION:

PVC OR ABS – SCHEDULE 40 DWV PIPE AND FITTINGS TO CAN/CSA – B181.2 FOR ABOVE GRADE INSTALLATION ARE ACCEPTABLE IF THEY ARE NOT INSIDE OR PENETRATE FIRE RATED FLOORS, ROOFS AND/OR WALLS ASSEMBLY, AND/OR INSIDE RETURN AIR PLENUM, AND WITH APPROVAL FROM THE ENGINEER.

2.2. WATER SUPPLY PIPING

2.2.1. BURIED PIPE AND FITTINGS:

2.2.1.1. FOR WATER SERVICE 4" DIA. AND ABOVE, 200 LB. CLASS DUCTILE IRON OR CLASS 150 C-900 "BLUE BRUTE" PVC WATERMAIN TO CSA B137.3, TYTON JOINTS, TIE RODS, THRUST BLOCKS ALL TO NFPA-24. UNI-FLANGES IN LIEU OF THRUST BLOCKS AND CONTINUOUS TIE RODS ARE NOT ACCEPTABLE.

2.2.1.2. FOR WATER DISTRIBUTION 4" DIA AND BELOW, PVC SCHEDULE 80 TO CAN/CSA-B137.3-M, FITTINGS TO ASTM D2467.

2.2.2. ABOVE GRADE FOR COLD AND HOT WATER PIPING INSIDE THE BUILDING: DUCTILE IRON OR TYPES L HARD COPPER TUBING TO ASTM B88 WITH CAST BRASS OR WROUGHT COPPER FITTINGS, "SILVABRITE 100" LEAD FREE SOLDER.

2.2.3. ACCEPTABLE EQUAL: FOR PIPING 2" DIAMETR OR SMALLER, WIRSBO AQUAPEX TUBING AND WIRSBO PROPEX FITTING IN CROSS LINKED POLYETHYLENE (PEX) FOR POTABLE WATER PIPING AND FITTING FOR DISTRIBUTION (BUT NOT FOR WATER ENTRY AND PRV STATION), WITH APPROVED FIRE STOPPING SYSTEMS FOR THE FIRE RATED ASSEMBLIES. SEE FOLLOWINGS FOR MORE DETAILS. OTHER FORMS OF PEX TUBING AND FITTING SYSTEMS NOT BY UPONOR ARE NOT ACCEPTED AS EQUAL, AND MUST NOT BE USED WITHOUT PRIOR APPROVAL DURING TENDER/PRICING STAGE.

ALL COMPONENTS OF SYSTEM SHALL BE PROVIDED BY 'UPONOR' INCLUDING TUBING, TUBING FITTINGS, MANIFOLDS, MANIFOLD SUPPORT BRACKETS AND TUBING BEND SUPPORTS.

THE PEX PIPING AND FITTING SYSTEM SHALL CONFORM WITH CSA B137.5 AND SHALL BE APPROVED FOR POTABLE WATER USE.

2.3. FOOTING DRAIN,

2.3.1. CSA APPROVED RIGID PVC PERFORATED SEWER PIPING.

2.4. PIPE SUPPORTS

2.4.1. HANGER SUPPORTS SHALL BE CARBON STEEL CONSTRUCTION (COPPER PLATED FOR COPPER PIPING SYSTEM) AND ADJUSTABLE FOR PROPER GRADING. ACCEPTABLE PRODUCTS: GRINNEL AND MYATT. FOR PIPE UP TO 2", USE ADJUSTABLE RING. FOR PIPE 2-1/2" AND OVER, USE ADJUSTABLE WROUGHT CLEVIS (HEAVY DUTY FOR STEEL PIPING SYSTEM). FOR VERTICAL PIPING, USE STEEL OR WROUGHT IRON PIPE CLAMPS.

2.4.2. HANGERS AND SUPPORTS FOR PLUMBING PIPING SHALL CONFIRM TO THE PART 7 OF THE BC BUILDING CODE 2018. HANGER AND SUPPORTS SHALL SECURE PIPES IN PLACE, PREVENT VIBRATION, MAINTAIN GRADE BY ADJUSTMENT AND PROVIDE FOR EXPANSION AND CONTRACTION OF PIPING INCLUDING PIPING LOOPS, EXPANSION JOINTS, GUIDES AND ANCHORS.

2.4.3. PIPE STRAPPING IE. PERFORATED BAND, WIRE CHAIN OR SOLID RING HANGERS USED IN PLACE OF APPROVED PIPE HANGERS WILL NOT BE ACCEPTED.

2.4.4. ALL HANGERS IN CONTACT WITH COPPER PIPE SHALL BE COPPER COATED OR LEAD DIPPED.

2.4.5. HANGERS FOR WIRSBO PEX TUBING SHALL BE IN ACCORDANCE WITH MANUFACTURER'S INSTALLATION INSTRUCTION. HANGERS FOR HORIZONTAL RUNS SHALL BE EXPOXY-COATED CLEVIS HANGERS. EXPOXY COATING IS NOT REQURIED IF TUBE IS INSULATED. PIPE HANGERS SHALL BE MINIMUM 32 INCHES ON CENTRE IF TUBING IS NOT INSIDE HORIZONTAL ASSEMBLY THAT REQUIRES TO BE OF FIRE RESISTANT CONSTRUCTION. IF TUBE RUNS HORIZONTAL INSIDE FIRE RATED ASSEMBLY, HANGER SPACING MUST NOT EXCEED 24 INCHES FOR 1-1/4 TO TWO INCH TUBING AND 16 INCHES FOR ½ TO ONE-INCH TUBING.

2.4.6. FOR WIRSBO PEX TUBING INSIDE FIRE RATED ASSEMBLY, USE EPOXY COATED METAL CLIPS 16" ON CENTRES FOR PIPES UP TO 1" DIAMETER, EPOXY COATED METAL CLIPS 24" ON CENTRE FOR PIPES OVER 1" DIAMETER. DO NOT USE PLASTIC CLIP WHERE HORIZONTAL TUBING IS SUSPENDED INSIDE FIRE RATED ASSEMBLY.

2.4.7. USE OVERSIZED HANGERS AND PROTECTION SHEILDS FOR INSULATED PIPES. WHERE INSULATION 2-1/2" DIA. AND SMALLER IS VAPOR SEALED, OVERSIZE CLEVIS HANGER TO OUTSIDE DIMENSION OF INSULATION AND PROVIDE 12" LONG 16 GA. SHEET METAL BEARING PAD AT EACH HANGER. PROVIDE HEAVY DENSITY INSULATION INSERT WHERE PIPE HANGER IS AROUND INSULATION ON COLD PIPING OVER 2-1/2".

2.5. SUMPS

2.5.1. SUMP: OCEAN CEMENT 48" DIAMETER (ULESS OTHERWISE SPECIFIED ON THE DRAWING) P/C MANHOLE SECTIONS WITH GALVANIZED LADDER RUNGS AND CONCRETE BOTTOM ON 6" COMPACTED GRAVEL. PRE-CAST LID WITH OPENINGS TO SUIT COVER AND SPACER RINGS. SUITABLE FRAME AND COVER. PROVIDE FLEXIBLE CONNECTORS WITHIN 39" OF THE OUTLETS AND INLETS. SUMP SHALL BE SEALED AND WATER TIGHT.

2.5.2. PROVIDE NECESSARY DRAINAGE FITTINGS, FRAMES, ANCHOR BOLTS AND COVERS.

2.5.3. MANUFACTURERS SANDED ENDS REQUIRED WHERE PLASTIC PIPE INSTALLED AT SUMP.

2.6. VALVES

2.6.1. MINIMUM REQUIREMENTS

VALVES ON COLD, HOT AND RECIRCULATION SERVICE SHALL BE RATED AT 125PSI.

UP TO 2" – BRONZE BODY, BRONZE OR STAINLESS STEEL TRIM WITH SOLDER END OR SCREWED END JOINTS.

2-1/2" PLUS – IRON BODY FLANGED, BRONZE OR STAINLESS STEEL TRIM WITH FLANGED END JOINTS.

PROVIDE VALVES OF SAME MANUFACTURER THROUGHOUT

2.6.2. APPROVED VALVES: M.A. STEWART & SONS, KITZ, RED-WHITE, ARMSTRONG

2.7. PLUMBING SPECIALTIES:

2.7.1. WATER HAMMER ARRESTORS: ANCON SG SERIES SHOK-GARD, P.D.I. WH-201 APPROVED AND CERTIFIED.

2.7.2. TRAP SEAL PRIMERS: PROVIDE PRIMING DEVICE AND PIPING TO THE NEAREST ACCEPTABLE FIXTURE SO THAT DEVICE WILL INTRODUCE REGULATED AMOUNT OF WATER INTO FLOOR DRAIN TRAPS. ANCON MS-810 (WATTS 200) OR EQUAL UNLESS SPECIFIED ON THE PLUMBING FIXTURES LIST BELOW.

2.7.3. PRESSURE REDUCING VALVES: PROVIDE PRESSURE REDUCING PARALLEL VALVES ASSEMBLY ON INCOMING WATER LINE COMPLETE WITH ISOLATING VALVES AND BYPASS; PROVIDE PRESSURE GAUGE ON DOWNSTREAM SIDE OF THE REDUCING VALVE. PRV SHALL BE AS SPECIFIED ON THE DRAWINGS OR WATTS SERIES 223S WITH STRAINER OR EQUAL FOR 1/2" TO 2" AND WATTS SERIES PV-10M WITH STRAINER OR EQUAL FOR 2-1/2" TO 3".

2.7.4. BACKFLOW PREVENTER ASSEMBLIES: PROVIDE APPROVED ASSEMBLIES ACCORDING TO PART 7 OF THE BC BUILDING CODE 2018. USE WATTS SERIES 009 REDUCED PRESSURE BACKFLOW PREVENTER OR EQUAL ON WATER LINES TO IRRIGATION CONNECTION; FIRE PROTECTION CONTRACTOR TO PROVIDE BACK FLOW ASSEMBLY ACCORDING TO PART 7 OF THE BC BUILDING CODE 2018 AND TO CITY'S REQUIREMENT ON WATER LINE SERVING FIRE PROTECTION SYSTEMS. BACKFLOW PREVENTORS SHALL BE TESTED BY A CERTIFIED TRADESMAN AND COMPLETED FORMS SHALL BE INCLUDED IN THE MAINTENANCE MANUAL. ALL BACKFLOW PREVENTERS SHALL BE PROVIDED WITH SUITABLE SIZE DRAIN PIPE FOR TEST AND RELIEF, DRAIN PIPE SHALL BE PIPED TO THE NEAREST APPROVED DRAIN POINT.

2.7.5. TEMPERATURE AND PRESSURE RELIEF VALVES: A.S.M.E. RATED. 'WATTS' OR ACCEPTED EQUAL.

2.8. CLEANOUTS AND ACCESS COVERS:

2.8.1. CLEANOUTS SHALL BE FULL SIZE FOR PIPES OF 4" DIAMETER AND LESS, AND 4" SIZE FOR ALL LARGER PIPES.

2.8.2. IN FINISHED AREAS, COVER SHALL HAVE DEPRESSED CENTER TO ACCEPT FLOOR FINISH BEING PROVIDED. WATTS CO-200-FINISH DEPENDENT.

2.8.3. CLEAN-OUTS ON SUBSURFACE DRAINAGE SYSTEM EXTENSIONS SHALL BE WATTS CO-200RX-4. ENCASED IN 16"X16"X4" THICK CONCRETE PAD IN SOFT LANDSCAPING AND CO-200-RX IN FINISHED CONCRETE AND PAVERS.

2.8.4. WALL CLEANOUTS SHALL HAVE A CHROME PLATED CAP.

2.8.5. WHEN CLEANOUTS ARE LOCATED IN MEMBRANE FLOORS, THEY SHALL BE SUPPLIED WITH WIDE FLASHING FLANGE AND CLAMP DEVICE. WATTS -100- AS DESCRIBED ABOVE.

2.8.6. ACCEPTABLE EQUAL: WATTS, SMITH, OR ZURN.

2.9. PLUMBING FIXTURES

2.9.1. THE PLUMBING FIXTURES LIST BELOW IS A BASE BID LIST ONLY. FIXTURE CUTS AND MANUFACTURERS BROCHURES SHALL BE PRESENTED TO THE OWNER FOR APPROVAL PRIOR TO ORDERING. THESE FIXTURES SHALL INCLUDE ALL TRIM, HANGERS, STOPS, DRIP DRAINS, ESCUTCHEONS, TRAPS, WASTE, WATER CONNECTIONS, FLOOR FLANGES, FLUSH VALVES, ETC., USUALLY CLASSED AS FITTINGS, AND REQUIRED TO MAKE THE FIXTURE UNIT COMPLETE. ALL EXPOSED METAL PARTS OF THE FIXTURES SHALL BE BRASS HEAVILY CHROMIUM PLATED.

2.9.2. PROVIDE SUPPLIES C/W WHEEL HANDLE STOPS, HEXAGONAL REDUCER AND ESCUTCHEONS FOR ALL FIXTURES. BOTH FLEXIBLE AND RIGID SUPPLIES ARE ACCEPTABLE. INCLUDE ALL ACCESSORIES REQUIRED FOR A COMPLETE INSTALLATION. PROVIDE HEAVY CHROMIUM PLATING WHERE EXPOSED.

2.9.3. REVIEW MILLWORK DRAWINGS AND ADVISE THE ENGINEER OF DISCREPANCIES BEFORE ORDERING FIXTURES.

2.9.4. WHERE APPLICALBE, FOR 'NO TOUCH' FIXTURES, ELECTRICAL TRADE TO PROVIDE POWER TO THE WASHROOM/ROOM. PLUMBING TRADE TO PROVIDE TRANSFORMER AND DO ALL WIRING CONNECTIONS TO THE PLUMBING FIXTURES. ELECTRIC/PLUMBING TRADE TO COORDINATE POWER LOCATION BEFORE WORK STARTS.

2.9.5. FIXTURES (ALL WHITE, CHROME PLATED TRIM) INCLUDE:

WC-1 FLOOR MOUNTED TOILET – VITREOUS CHINA – TANK TYPE

AMERICAN STANDARD CADET RIGHT HEIGHT PRESSURE-ASSISTED ELONGATED #2467.600.020 LOW CONSUMPTION TOILET, 3483.001, 4142.600, 419 MM HIGH, VITREOUS CHINA WITH EVERCLEAN ANTIMICROBIAL SURFACE WHICH INHIBITS THE GROWTH OF STAIN AND ODOR CAUSING BACTERIA MOLD AND MILDEW, ELONGATED BOWL, WHITE FINISH, FLOOR MOUNTED, SIPHON JET FLUSH ACTION, 6 L (1.6 US GAL) PER FLUSH, RAISED SANITARY BAR, 305 MM X 254 MM (12" X 10") WATER SURFACE, TWO (2) PIECE, 'SPEED CONNECT' TANK ASSEMBLY, SIPHON JET FLUSH ACTION, RAISED SANITARY BAR, LEFT HAND TRIPLEVER, BOLTED TANK COVER, 305 MM (12") ROUGH-IN, ELONGATED BOWL, 54 MM (2-1/8") FULLY GLAZED INTERNAL TRAPWAY, FLOOR OUTLET, BOLT CAPS, TOILET SEAT NOT INCLUDED. CENTOCO #500STSCC.001 TOILET SEAT, HEAVY DUTY, FOR ELONGATED BOWL, OPEN FRONT, SOLID PLASTIC, LESS COVER, STAINLESS STEEL CHECK HINGES, METAL FLAT WASHERS STAINLESS STEEL POSTS AND NUTS. MCGUIRE #LFH172BV TOILET SUPPLY, CHROME PLATED FINISH POLISHED BRASS, COMMERCIAL DUTY 1/4 TURN BALL VALVE ANGLE STOPS, 13 MM (1/2") I.D. INLET X 127 MM (5") LONG RIGID HORIZONTAL INTEGRAL COPPER SWEAT TUBE NIPPLES, COMBINATION V.P. LOOSE KEY HANDLES, ESCUTCHEON AND FLEXIBLE COPPER RISERS. PROVIDE FLOOR FLANGE, (SAME MATERIAL AS THE CONNECTING PIPE DRAIN), WITH ALL BRASS BOLTS AND WITH RUBBER GASKET.

WC-2 FLOOR MOUNTED TOILET – VITREOUS CHINA – TANK TYPE

AMERICAN STANDARD CADET RIGHT HEIGHT PRESSURE-ASSISTED ELONGATED #2467.600.020 LOW CONSUMPTION TOILET, 3483.001, 4142.600, 419 MM HIGH, VITREOUS CHINA WITH EVERCLEAN ANTIMICROBIAL SURFACE WHICH INHIBITS THE GROWTH OF STAIN AND ODOR CAUSING BACTERIA MOLD AND MILDEW, ELONGATED BOWL, WHITE FINISH, FLOOR MOUNTED, SIPHON JET FLUSH ACTION, 6 L (1.6 US GAL) PER FLUSH, RAISED SANITARY BAR, 305 MM X 254 MM (12" X 10") WATER SURFACE, TWO (2) PIECE, 'SPEED CONNECT' TANK ASSEMBLY, SIPHON JET FLUSH ACTION, RAISED SANITARY BAR, LEFT HAND TRIPLEVER, BOLTED TANK COVER, 305 MM (12") ROUGH-IN, ELONGATED BOWL, 54 MM (2-1/8") FULLY GLAZED INTERNAL TRAPWAY, FLOOR OUTLET, BOLT CAPS, TOILET SEAT NOT INCLUDED. PROVIDE BOLTED TANK COVER IF REQUIRED – TO MEET LOCAL CODES. CENTOCO #500STSCC.001 TOILET SEAT, HEAVY DUTY, FOR ELONGATED BOWL, OPEN FRONT, SOLID PLASTIC, LESS COVER, STAINLESS STEEL CHECK HINGES, METAL FLAT WASHERS STAINLESS STEEL POSTS AND NUTS. MCGUIRE #LFH172BV TOILET SUPPLY, CHROME PLATED FINISH POLISHED BRASS, COMMERCIAL DUTY 1/4 TURN BALL VALVE ANGLE STOPS, 13 MM (1/2") I.D. INLET X 127 MM (5") LONG RIGID HORIZONTAL INTEGRAL COPPER SWEAT TUBE NIPPLES, COMBINATION V.P. LOOSE KEY HANDLES, ESCUTCHEON AND FLEXIBLE COPPER RISERS. PROVIDE FLOOR FLANGE, (SAME MATERIAL AS THE CONNECTING PIPE DRAIN), WITH ALL BRASS BOLTS AND WITH RUBBER GASKET.

WC-3 FLOOR MOUNTED TOILET – VITREOUS CHINA – TANK TYPE

AMERICAN STANDARD BABY DEVORO #2315613.020 HET TOILET, 3128.001, 4019.613, 260 MM HIGH, VITREOUS CHINA, ROUND FRONT BOWL, WHITE FINISH, FLOOR MOUNTED, SIPHON JET FLUSH ACTION, 4.8 L (1.28 US GAL) PER FLUSH, RAISED SANITARY BAR, 254 MM X 229 MM (10" X 9") WATER SURFACE, TWO (2) PIECE, 'SPEED CONNECT' TANK ASSEMBLY, SIPHON JET FLUSH ACTION, RAISED SANITARY BAR, UNLINED TANK, BOLTED TANK COVER, 51 MM (2") FLUSH VALVE WITH FLAPPER, 'PILOT VALVE' WATER CONTROL (WITHOUT FLOAT) FOR QUIET REFILL, 254 MM (10") ROUGH-IN, ROUND FRONT BOWL, 51 MM (2") FULLY GLAZED INTERNAL TRAPWAY, FLOOR OUTLET, BOLT CAPS, TOILET SEAT NOT INCLUDED, DESIGNED FOR CHILDREN.
AMERICAN STANDARD BABY DEVORO #5001G055.020 BABY TOILET SEAT, HEAVY DUTY, FOR ROUND BOWL, OPEN FRONT, WHITE FINISH SOLID POLYPROPYLENE PLASTIC WITH EVERCLEAN SURFACE, LESS COVER, TOP MOUNT HINGES, POST NUTS AND WASHERS. MCGUIRE #LFH172BV TOILET SUPPLY, CHROME PLATED FINISH POLISHED BRASS, COMMERCIAL DUTY 1/4 TURN BALL VALVE ANGLE STOPS, 13 MM (1/2") I.D. INLET X 127 MM (5") LONG RIGID HORIZONTAL INTEGRAL COPPER SWEAT TUBE NIPPLES, COMBINATION V.P. LOOSE KEY HANDLES, ESCUTCHEON AND FLEXIBLE COPPER RISERS. PROVIDE FLOOR FLANGE, (SAME MATERIAL AS THE CONNECTING PIPE DRAIN), WITH ALL BRASS BOLTS AND WITH RUBBER GASKET.

LAV-1 WALL HUNG BASIN ELECTRONIC FAUCET – BELOW DECK MECHANICAL WATER MIXING VALVE

AMERICAN STANDARD LUCERNE #0355.012.020 BASIN, 3 HOLES, 4" (102 MM) CENTER, 521 MM X 464 MM X 308 MM (20-1/2" X 18-1/4" X 12-1/8") HIGH, VITREOUS CHINA, WHITE FINISH, FOR CARRIER WITH CONCEALED ARMS, FRONT OVERFLOW, SELF-DRAINING FAUCET LEDGE, CONTOURED BACK AND SIDE SPLASH SHIELD. SLOAN OPTIMA #ETF-600-LT-CP ELECTRONIC FAUCET, POLISHED CHROME FINISH, CAST BRASS, VANDAL RESISTANT 1.9 LPM (0.5 GPM) MULTI-LAMINAR SPRAY HEAD OUTLET, INFRARED SENSOR WITH SCREW ADJUSTABLE RANGE, UNDER COUNTER FILTERED SOLENOID VALVE WITH SERVICEABLE STRAINER FILTER, MODULE CONTROL ASSEMBLY HOUSED IN SPLASH PROOF JUNCTION BOX, 24VAC 50/60HZ, VANDAL PROOF BOX. PROVIDE TEE, ADAPTORS AND FLEX. COPPER TUBING TO SUIT INSTALLATION. 15 VA POWER REQUIRED PER UNIT. SLOAN #EL-154, BOX MOUNT HARDWIRED TRANSFORMER, 120 VAC/ 24 VAC, 50 VA. LAWLER #TMM-1070, BELOW DECK MECHANICAL WATER MIXING VALVE, BRONZE BODY, TEMPERATURE ADJUSTING DIAL, 10 MM (3/8") INLETS AND OUTLET COMPRESSION FITTINGS, HIGH TEMPERATURE THERMOSTATIC LIMIT STOP, SHUT-OFF WITH AUTOMATIC RESET WHEN TEMPERATURE EXCEEDS 120 °F (48.8 °C), INTEGRAL CHECKS, OFFER TEMPERATURE RANGE FROM FULL COLD THROUGH 46 °C (114.8 °F). PROVIDE TEE, ADAPTORS AND FLEX. COPPER TUBING TO SUIT INSTALLATION. MCGUIRE #155A OPEN GRID DRAIN, CAST BRASS ONE PIECE TOP, 17 GA. (1.5 MM) TUBULAR 32 MM (1-1/4") TAILPIECE. MCGUIRE #LFH170BV FAUCET SUPPLIES, CHROME PLATED FINISH POLISHED BRASS, COMMERCIAL DUTY 1/4 TURN BALL VALVE ANGLE STOPS, 13 MM (1/2") I.D. INLET X 127 MM (5") HORIZONTAL EXTENSION TUBES, CONVERTIBLE 1/4 TURN/LOOSE KEY HANDLES, ESCUTCHEON AND FLEXIBLE COPPER RISERS. MCGUIRE #8872C P-TRAP, HEAVY CAST BRASS ADJUSTABLE BODY, WITH SLIP NUT, 32 MM (1-1/4") SIZE, SHALLOW WALL FLANGE AND SEAMLESS TUBULAR WALL BEND. WATTS #WCA-411 BASIN CARRIER, CONCEALED ARMS, WALL FLANGES TO ATTACH TO BACKING PLATE SECURED IN WALL WITH LOCKING DEVICE AND LEVELLING SCREWS, HEAVY GAUGE STEEL UPRIGHTS WITH INTEGRAL WELDED FEET. FOR ONE UNIT: 102 MM (4") FOR TWO TO SIX UNITS IN A ROW: 152 MM (6") FINISHED METAL STUD WALL TO BACK OF PIPE SPACE.

LAV-2 WALL HUNG BASIN ELECTRONIC FAUCET – BELOW DECK MECHANICAL WATER MIXING VALVE

AMERICAN STANDARD MURRO WITH EVERCLEAN #0954.004EC.020/0059.020EC.020 BASIN, 3 HOLES, 4" (102 MM) CENTER, 540 MM X 520 MM X 165 MM (21-1/4" X 20-1/2" X 6-1/2") HIGH, VITREOUS CHINA, WHITE FINISH, FOR CARRIER WITH CONCEALED ARMS, REAR OVERFLOW, RECESSED SELF-DRAINING FAUCET LEDGE, SEMI-PEDESTAL P-TRAP COVER. SLOAN OPTIMA #ETF-600-LT-CP ELECTRONIC FAUCET, POLISHED CHROME FINISH, CAST BRASS, VANDAL RESISTANT 1.9 LPM (0.5 GPM) MULTI-LAMINAR SPRAY HEAD OUTLET, INFRARED SENSOR WITH SCREW ADJUSTABLE RANGE, UNDER COUNTER FILTERED SOLENOID VALVE WITH SERVICEABLE STRAINER FILTER, MODULE CONTROL ASSEMBLY HOUSED IN SPLASH PROOF JUNCTION BOX, 24VAC 50/60HZ, VANDAL PROOF BOX. PROVIDE TEE, ADAPTORS AND FLEX. COPPER TUBING TO SUIT INSTALLATION. 15 VA POWER REQUIRED PER UNIT. SLOAN #EL-154, BOX MOUNT HARDWIRED TRANSFORMER, 120 VAC/ 24 VAC, 50 VA. LAWLER #TMM-1070, BELOW DECK MECHANICAL WATER MIXING VALVE, BRONZE BODY, TEMPERATURE ADJUSTING DIAL, 10 MM (3/8") INLETS AND OUTLET COMPRESSION FITTINGS, HIGH TEMPERATURE THERMOSTATIC LIMIT STOP, SHUT-OFF WITH AUTOMATIC RESET WHEN TEMPERATURE EXCEEDS 120 °F (48.8 °C), INTEGRAL CHECKS, OFFER TEMPERATURE RANGE FROM FULL COLD THROUGH 46 °C (114.8 °F). PROVIDE TEE, ADAPTORS AND FLEX. COPPER TUBING TO SUIT INSTALLATION. MCGUIRE #155A OPEN GRID DRAIN, CAST BRASS ONE PIECE TOP, 17 GA. (1.5 MM) TUBULAR 32 MM (1-1/4") TAILPIECE. MCGUIRE #LFH170BVRB FAUCET SUPPLIES, CHROME PLATED FINISH POLISHED BRASS, COMMERCIAL DUTY 1/4 TURN BALL VALVE ANGLE STOPS, 13 MM (1/2") I.D. INLET X 127 MM (5") HORIZONTAL EXTENSION TUBES, CONVERTIBLE 1/4 TURN/LOOSE KEY HANDLES, ESCUTCHEON AND STAINLESS STEEL BRAIDED FLEXIBLE RISERS. PROVIDE P-TRAP, CHROME PLATED, ADJUSTABLE ALL METAL CONSTRUCTION, 32 MM (1-1/4") SIZE, AND ESCUTCHEON. WATTS #WCA-411-CA-481 BASIN CARRIER, CONCEALED ARMS, WALL FLANGES TO ATTACH TO BACKING PLATE SECURED IN WALL WITH LOCKING DEVICE AND LEVELLING SCREWS, HEAVY GAUGE STEEL UPRIGHTS WITH INTEGRAL WELDED FEET. FOR ONE UNIT: 102 MM (4") FOR TWO TO SIX UNITS IN A ROW: 152 MM (6") FINISHED METAL STUD WALL TO BACK OF PIPE SPACE.

JS-1 SERVICE / MOP SINK – TWO HANDLES FAUCET

FIAT #MSB2424100 SQUARE SERVICE / MOP SINK, 610 MM (24") WIDE X 610 MM (24") LONG X 254 MM (10") HIGH DEEP, FLOOR MOUNTED, MOLDED STONE, WHITE, PLAIN CURBS, STAINLESS STEEL DRAIN WITH STRAINER, 3" (76 MM) OUTLET.
CHICAGO FAUCETS #897-RCF WALL MOUNTED TWO HANDLES FAUCET, ROUGH CHROME FINISH, SOLID BRASS EXPOSED BODY, CERAMIC 1/4 TURN OPERATING CARTRIDGE, UNRESTRICTED HOSE END OUTLET, 203 MM (8") PROJECTION SPOUT WITH ATMOSPHERIC VACUUM BREAKER AND BUCKET HOOK, 60 MM (2-3/8") METAL VANDAL PROOF LEVER HANDLES WITH BLUE AND RED INDEX BUTTONS, WALL BRACE SUPPORT. FIAT E88AA24000 BUMPER GUARD 610 MM (24") STAINLESS STEEL. FIAT 832AA000 HOSE AND WALL HOOK 30" (762 MM) LONG FLEXIBLE HEAVY DUTY 5/8" RUBBER HOSE, CLOTH REINFORCED WITH 3/4" CHROME COUPLING. BRACKET IS 5"(127 MM) LONG BY 3" (76.2 MM) STAINLESS STEEL RUBBER GRIP. FIAT #889CC000 MOP HANGER, 22 GA. (0.8 MM) TYPE 304 STAINLESS STEEL. FIAT MSG2424000 BACK SPLASH PANEL. PROVIDE P-TRAP, SAME MATERIAL AS THE CONNECTING PIPE DRAIN.

KS-1 COUNTERTOP MOUNT SINK – SINGLE HANDLE FAUCET

FRANKE COMMERCIAL #LBD6408-1/1 DOUBLE BOWL COUNTERTOP MOUNT SINK, 1 HOLE, 794 MM (31-1/4") WIDE X 521 MM (20-1/2") LONG X 203 MM (8") HIGH DEEP, SPILLWAY, COUNTER MOUNTED, BACKLEDGE, GRADE 18-10 20 GA. (0.9 MM) TYPE 302 STAINLESS STEEL, SELF-RIMMING, SATIN FINISH RIM AND BOWLS, MOUNTING KIT PROVIDED, FULLY UNDERCOATED TO REDUCE CONDENSATION AND RESONANCE, FACTORY APPLIED RIM SEAL, 3-1/2" (89 MM) CRUMB CUP WASTE ASSEMBLY WITH 1-1/2" (38 MM) TAILPIECE.
AMERICAN STANDARD RELIANT+ #4205.104.002 SINGLE HANDLE FAUCET, POLISHED CHROME FINISH, CENTER HOLE ONLY, WASHERLESS CERAMIC DISC CARTRIDGE, 8.3 LPM (2.2 GPM) REGULATOR, SWING SPOUT, 232 MM (9-1/8") PROJECTION REACH, LEVER HANDLE, DELUXE PULL-OUT SPRAY WITH ADJUSTABLE SPRAY PATTERN AND LOCK & TURN ACTIVATION BUTTON. MCGUIRE #LFBV170 FAUCET SUPPLIES, CHROME PLATED FINISH POLISHED BRASS, COMMERCIAL DUTY 1/4 TURN BALL VALVE ANGLE STOPS, 13 MM (1/2") I.D. INLET X 127 MM (5") HORIZONTAL EXTENSION TUBES, CONVERTIBLE 1/4 TURN/LOOSE KEY HANDLES, ESCUTCHEON AND FLEXIBLE COPPER RISERS. PROVIDE P-TRAP, ADJUSTABLE ALL METAL CONSTRUCTION, 38 MM (1-1/2") SIZE, AND ESCUTCHEON.

FD-1 FLOOR DRAIN – FINISHED AREA

WATTS #FD-100-C-A5-1-7 FLOOR DRAIN – EPOXY COATED CAST IRON BODY, REVERSIBLE FLASHING CLAMP WITH PRIMARY AND SECONDARY WEEPHOLES, TRAP PRIMER CONNECTION WITH PLUG, NO HUB OUTLET WATTS -A5-1 5" (127 MM) DIAMETER, NICKEL BRONZE, ADJUSTABLE ROUND STRAINER.

FD-2 FLOOR DRAIN – FLOOR DRAIN WITH HEAVY DUTY GRATE

WATTS #FD-320-4 FLOOR DRAIN – EPOXY COATED CAST IRON BODY, BODY COLLAR WITH WEEPHOLES AND MEMBRANE CLAMP, ANCHOR FLANGE, NO HUB OUTLET WATTS -4 7-7/8" (200 MM) DIAMETER EPOXY COATED DUCTILE IRON, HEEL-PROOF ROUND GRATE.

HB-1 HYDRANT – NON-FREEZE WALL HYDRANT WITH INTEGRAL VACUUM BREAKER

WATTS #HY-420 HYDRANT NON-FREEZE HYDRANT, ALL BRONZE HEAD, SEAT CASTING AND INTERNAL WORKING PARTS, WALL MOUNT HYDRANT, BRONZE WALL CASING, CHROME PLATED FACE, INTEGRAL VACUUM BREAKER, LOOSE KEY, 3/4"Ø (19 MM) HOSE CONNECTION, 3/4"Ø (19 MM) FEMALE X 1"Ø (25 MM) MALE PIPE CONNECTION.

HD-1 FLOOR DRAIN – FLOOR DRAIN WITH HEAVY DUTY GRATE

WATTS #FD-320-4-7-F6-1 FLOOR DRAIN – EPOXY COATED CAST IRON BODY, BODY COLLAR WITH WEEPHOLES AND MEMBRANE CLAMP, TRAP PRIMER CONNECTION WITH PLUG, ANCHOR FLANGE, NO HUB OUTLET WATTS -4-F6-1 7-7/8" (200 MM) DIAMETER EPOXY COATED DUCTILE IRON, HEEL-PROOF ROUND GRATE, 6"Ø (152 MM) NICKEL BRONZE FUNNEL.

2.10. FLASHING FOR VENTS, AND FLOOR DRAINS

2.10.1. SUPPLY AND INSTALL 5 POUND PER SQUARE FOOT SHEET LEAD FLASHING FOR ALL CLEANOUTS AND FLOOR DRAINS. LEAD FLASHINGS SHALL BE SECURELY FIXED TO FLASHING CLAMPS AND SHALL EXTEND 12" BEYOND THE EDGE OF THE CAST IRON FITTINGS. FLOOR DRAINS INSTALLED IN SLAB ON GRADE DO NOT REQUIRE FLASHING. FOR SHOWER STALLS TAKE TO A MINIMUM 24" ABOVE FLOOR.

2.10.2. VENT FLASHING MINIMUM 18" X 18" BASE DIMENSION SHALL TERMINATE FLUSH WITH TOP OF 12" HIGH VENT PIPE AND THE GAP BETWEEN THE FLASHING AND PIPE SHALL BE CLOSED TO A 5 POUND PER SQUARE FOOT SEPARATE LEAD CAP 3" HIGH.

2.11. DOMESTIC WATER HEATERS

2.11.1. ELECTRIC WATER HEATERS TO CSA C22-110 AND CSA C191.

2.11.2. EACH HEATER SHALL BE COMPLETED WITH ALL FACTORY INSTALLED CONTROL AND SAFETY DEVICES. INSTALL VACUUM BREAKER ON INCOMING WATER LINE.

2.11.3. A PRESSURE AND TEMPERATURE RELIEF VALVE SHALL BE PROVIDED.

2.11.4. EXPANSION TANK SHALL BE PROVIDED FOR HOT WATER EXPANSION TO SUIT HOT WATER SYSTEM VOLUME SIZE.

2.11.5. PROVIDE GALVANIZED STEEL DRAIN PAN WITH MINIMUM 1-1/4" HIGH LIPS, SEALED WITH MASTIC, COMPLETE WITH 1-1/4" ROUND DRAIN FROM PAN TO LOCAL FLOOR OR HUB DRAIN OR TO OTHER APPROVED LOCATION. PROVIDE TRAP SEAL PRIMER TO THE DRAIN?S TRAP.

2.11.6. PROVIDE SEISMIC RESTRAINT FOR HEATERS.

2.12. SUMPS

2.12.1. OCEAN CEMENT P/C MANHOLE SECTIONS WITH GALVANIZED LADDER RUNGS AND CONCRETE BOTTOM ON 6" COMPACTED GRAVEL. H-20 PRE-CAST LID WITH OPENINGS TO SUIT COVER AND SPACER RINGS. DOBNEY B26-B FRAME AND B26-E COVER. SEALED LID FOR SANITARY. FOOTING DRAIN SUMP SHALL BE COMPLETE WITH 900 BEND AND BACKWATER VALVE. DIAMETER AND DEPTH AS SHOWN ON DRAWINGS.

2.12.2. REINFORCED CONCRETE SUMPS SHALL BE BY THE CONTRACTOR. PROVIDE NECESSARY DRAINAGE FITTINGS, FRAMES, ANCHOR BOLTS AND COVERS. PROVIDE GASKET SEALS ON SANITARY SUMP COVERS. SUMP SHALL BE SEALED AND WATER TIGHT.

2.12.3. PROVIDE STORM WATER INTERCEPTOR SUMP AT PROPERTY LINE AS REQUIRED BY LOCAL AUTHORITIES TO CITY STANDARD.

3. EXECUTION

3.1. PIPING INSTALLATION

3.1.1. ALL PIPING SHALL BE GRADED UNIFORMLY SO THAT THEY CAN BE COMPLETELY DRAINED THROUGH DRAIN COCKS OR FIXTURES. PROVIDE DRAIN COCKS WITH CAPS AT LOW POINT OF SYSTEM WHERE REQUIRED. GRAVITY PIPING SHALL BE GRADED WITH A FALL OF NOT LESS THAN 1:50 UNLESS OTHERWISE STATED ON THE DRAWINGS.

3.1.2. INSTALL PIPING STRAIGHT, PARALLEL AND CLOSE TO WALLS AND CEILINGS. INSTALL GROUPS OF PIPE PARALLEL TO EACH OTHER; SPACED TO PERMIT APPLICATION OF INSULATION, IDENTIFICATION, AND SERVICE ACCESS.

3.1.3. DO NOT INSTALL PIPING IN OUTSIDE WALLS OR ROOF VOIDS UNLESS DIRECTED. SERVICES IN PARTY WALLS BY PRIOR APPROVAL ONLY.

3.1.4. WATER SUPPLY PIPING IN OUTSIDE WALLS IS NOT PERMITTED UNLESS IT IS INSTALLED IN A FURRED-OUT CHASE WITH INSULATION 1.5 TIMES GREATER THAN THE EXTERIOR WALL INSULATION BETWEEN THE PIPE AND THE EXTERIOR WALL. DO NOT EMBED PIPING IN THE WALL INSULATION.

3.1.5. PEX WATE TUBING SHALL BE INSTALLED AND TESTED IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATION.

INSTALLATION SHALL COMPLY WITH THE MANUFACTURER'S SPECIFICATIONS AND BE CARRIED OUT BY A TRAINED INSTALLER, CERTIFIED BY THE MANUFACTURER. REFER TO PLUMBING DESIGN ASSISTANCE MANUAL (PDAM) BY UPONOR FOR INSTALLATION RECOMMENDATIONS, METHODS AND DETAILS.

THE MINIMUM BEND RADIUS FOR COLD BENDING OF THE TUBING SHALL NOT BE LESS THAN EIGHT (8) TIMES THE OUTSIDE DIAMETER. BENDS WITH A RADIUS LESS THAN STATED WILL REQUIRE THE USE OF A BEND SUPPORT AS SUPPLIED BY THE TUBING MANUFACTURER.

PEX PIPING SHALL NOT BE EXPOSED TO UV PRIOR TO OR DURING INSTALLATION AND MUST BE WARRANTED FOR A MINIMUM OF 30 DAYS EXPOSURE.

PROTECT PIPING AND MANIFOLDS FROM ENTRY OF CONTAMINATING MATERIAL BY INSTALLING SUITABLE PLUGS IN ALL OPEN ENDS UNTIL INSTALLATION. WHERE POSSIBLE, CONNECT PIPES TO ASSEMBLED MANIFOLDS TO ELIMINATE POSSIBILITY OF CONTAMINANTS.

3.1.6. ALL SANITARY VENT PIPES SHALL BE GRADED TO DRAIN BACK TO SOIL OR WASTE PIPES.

3.1.7. ALL VENT PIPES SHALL BE GROUPED TOGETHER IN HEADERS IN THE CEILING SPACE OF THE TOP FLOOR AS MUCH AS POSSIBLE SO THAT THEY CAN EXIT THROUGH ROOF AT MINIMUM NUMBER OF LOCATIONS.

3.1.8. PROVIDE ALL EQUIPMENT DRAINAGE LINES TO DISCHARGE INTO HUB OR FUNNEL DRAIN.

3.1.9. HANGERS AND SUPPORTS FOR PLUMBING PIPING SHALL CONFIRM TO THE CURRENT BUILDING BY-LAW OR BUILDING CODE. HANGER AND SUPPORTS SHALL SECURE PIPES IN PLACE, PREVENT VIBRATION, MAINTAIN GRADE BY ADJUSTMENT AND PROVIDE FOR EXPANSION AND CONTRACTION OF PIPING INCLUDING PIPING LOOPS, EXPANSION JOINTS, GUIDES AND ANCHORS. PIPE WITH MECHANICAL JOINTS SHALL BE SUPPORTED BY MEANS OF TWO (2) HANGERS LOCATED ON EACH SIDE OF A JOINT. SEE SECTION 2 FOR MORE INFORMATION ABOUT PIPING SUPPORTS.

3.1.10. REDUCE HORIZONTAL PIPING WITH ECCENTRIC REDUCER FITTINGS INSTALLED TO PROVIDE DRAINAGE AND ELIMIATED AIR POCKETS.

3.1.11. REAM PIPES AND TUBES. CLEAN OFF SCALE AND DIRT BEFORE ASSEMBLY.

3.1.12. JOINTS IN COPPER DRAINAGE TUBE SHALL BE MADE IN ACCORDANCE WITH THE MANUFACTURERS' RECOMMENDATIONS. USING SOFT SOLDER. JOINTS IN BURIED COPPER PRESSURE PIPING SHALL BE FLARED JOINT TYPE. JOINTS IN ABOVE GRADE COPPER PRESSURE PIPE SHALL BE SILVABRITE 100 LEAD FREE SOLDER AND FLUX.

3.1.13. CAST IRON PIPE TO HAVE ANTHES RUBBER GASKET MECHANICAL JOINTS, OR PC4 COLD CAULKING COMPOUND HUB AND SPIGOT JOINTS, OR CAULKED LEAD JOINTS WITH OAKUM AND SOFT PIG LEAD, BY BIBBY BISEAL. CONFINED SPACES TO BE MECHANICAL JOINTS.

3.1.14. WHEREVER DISSIMILAR METALS ARE JOINTED OR SUPPORTED, THE PIPING SHALL HAVE NON-CONDUCTING TYPE CONNECTIONS AND HANGERS TO PREVENT GALVANIC CORROSION OR BE PROTECTED BY PLASTIC TAPE. BRASS ADAPTERS AND VALVES ARE ACCEPTABLE FOR PIPE CONNECTIONS.

3.1.15. UNIONS OR FLANGES SHALL BE INSTALLED AT ALL EQUIPMENT TO ALLOW FOR THEIR REMOVAL WITHOUT DISTURBING PIPE SYSTEM.

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CONTRACTOR SHALL VERIFY ALL DIMENSIONS ON SITE. DRAWINGS SHALL NOT BE SCALED.

REV.	DESCRIPTION	DATE
9	ISSUED FOR CONSTRUCTION	2020.08.21
8	REVISED AS PER CITY'S COMMENTS	2020.04.21
7	REVISED AS PER CITY'S COMMENTS	2020.04.14
6	REISSUED FOR TENDER	2020.02.28
5	ISSUED FOR TENDER	2020.02.04
4	ISSUED FOR BPA	2019.12.10
3	ISSUED FOR COORDINATION	2019.02.06
2	ISSUED FOR COORDINATION	2018.12.21
1	ISSUED FOR COORDINATION	2018.11.28

PROJECT:

STRAWBERRY HILL HALL

12152 75A AVENUE, SURREY

TITLE:

SPECIFICATIONS

DRAWN BY:	DH
DATE:	AUGUST 21, 2020
SCALE:	AS NOTED
PROJECT#:	1850
DWG#:	SPC-1

3.1.16. PROVIDE SHUT-OFF VALVES AS REQUIRED AND AS INDICATED ON DRAWINGS; ALL MAIN BRANCHES AND VERTICAL RISERS SHALL BE VALVED TO PERMIT ISOLATION OF ZONES FOR SERVICING; EACH INDIVIDUAL FIXTURE OR PIECE OF EQUIPMENT SHALL BE PROVIDED WITH A STOP COCK ON BOTH HOT AND COLD WATER SUPPLIES; MOUNT VALVES WITH THE STEMS UPRIGHT OR HORIZONTAL, NOT INVERTED. BALL VALVE IS PERMITTED FOR SHUT-OFF AND THROTTLING SERVICE FOR PIPE SIZE 3" AND LESS.

3.1.17. PROVIDE A SHUT OFF FOR EACH WATER RISER SERVING MORE THAN ONE FLOOR AS PER PLUMBING CODE REQUIREMENTS. VALVES 57 MM (2") AND LESS IN DIAMETER MAY BE BALL VALVES. SHUT OFFS TO BE EASILY ACCESSIBLE.

3.1.18. PROVIDE WATER SHUT-OFF VALVES FOR HOT AND COLD WATER SUPPLIES FOR EACH DWELLING UNIT IN RESIDENTIAL BUILDING OR EACH COMMERCIAL RETAIL UNIT AND/OR OFFICE TENANT UNIT IN COMMERCIAL AND/OR RETAIL BUILDING. SHUT OFFS TO BE EASILY ACCESSIBLE. WHERE RISERS OR MAIN DISTRIBUTION SERVE SUITES ON EACH SIDE, PROVIDE INDIVIDUAL TAKE-OFFS FROM RISER. DO NOT SERVICE TWO SUITES THROUGH SINGLE "T" CONNECTION OFF RISER OR MAIN DISTRIBUTION LINE.

3.1.19. PROVIDE DRAIN VALVES WITH CAP AT LOW POINTS OF SYSTEMS WHERE REQUIRED.

3.1.20. PROVIDE PLASTIC SLEEVES FOR PIPES THROUGH CONCRETE 25 MM (1") LARGER THAN PIPE, PACKED WITH INSULATION AND SMOKE SEAL PER CODE.

3.1.21. PENETRATIONS THROUGH EXTERIOR WALLS MUST BE SEALED TO THE WATER BARRIER OF THE WALL ASSEMBLY USING SELF-ADHESIVE BITUMINOUS MEMBRANE AND/OR EXPANDING FOAM SEALANT SUITABLY APPLIED TO PROTECT FROM WEATHER PENETRATION.

3.1.22. PLUMBING (INCLUDING RWL'S) SHALL BE INSTALLED WITHOUT DIRECT CONTACT TO DRYWALL OR STUDS. POSITION RISER/WASTES IN CENTRE OF WALL CHASE TO MEET THIS REQUIREMENT. WHERE CONCRETE PENETRATIONS (CANS) ARE NOT CENTRED ON PLUMBING CHASE, ADVISE SITE SUPERINTENDENT.

3.1.23. TO AVOID CONTACT WITH STUDS AND DRYWALL, ORIENT ALL PIPE CLAMPS PARALLEL TO WALLS. ONLY USE METAL PIPE CLAMPS ON 13 MM (1/2") DIAMETER SUPPLY PIPING WITH SUITE BEING SERVED. ATTACH WING BACK ELBOWS, SHUT OFF VALVES, FAUCETS, ETC., TO SEPARATE WOOD PLATES IN SEPARATE ROWS OF STUDS IN PARTY WALLS. PROVIDE CLEARANCE AND USE RESILIENT (FIRE) CAULKING WHERE PIPING PASSES THROUGH PARTY WALLS AND FLOORS. THE INTENT OF THESE REQUIREMENTS IS TO MINIMIZE BRIDGING OF WALL BY PLUMBING SYSTEM.

3.1.24. OVERSIZE SLEEVES THROUGH STRUCTURE. USE FIRESTOPPING AND SMOKE SEAL IN ACCORDANCE THE CURRENT BUILDING CODE.

3.1.25. OUTSIDE PIPING SHALL BE BURIED BELOW FROST LINE TO PREVENT FREEZING.

3.1.26. WHEN BURIED LINES ARE WITHIN 45 DEGREE OF FOOTING, ENCASE PIPE WITHIN 1500PSI CONCRETE. DRAIN LINES ARE TO BE WRAPPED IN 6 MIL POLY COVERING OR WITHIN SLEEVE WHEN ENCASED IN CONCRETE. ALL EXCAVATION AND BACKFILL SHALL BE BY THE GENERAL CONTRACTOR; LAY PIPE IN PROPER COMPACTED BEDDING MATERIAL; PROVIDE SUPERVISION DURING BEDDING AND BACKFILLING TO ENSURE PIPES ARE NOT DISTURBED OR DAMAGED.

3.1.27. APPROVAL OF THE PLUMBING SYSTEM IS REQUIRED BEFORE INSULATION AND DRYWALL WORK IS STARTED. DO NOT COMMENCE FINAL BOARDING UNTIL PLUMBING HAS BEEN REVIEWED FOR CLEARANCE.

3.2. PIPE SLEEVE AND ESCUTCHEONS

3.2.1. PROVIDE SUITABLE SIZE SLEEVES FOR PIPING PENETRATING WALLS/FLOORS. CAULK WITH INSULATION ON NON RATED PENETRATIONS, U.L.C. APPROVED SUITABLE FIRE BARRIER OR FIRESTOP SYSTEM TO RATED ASSEMBLIES. SLEEVES SHALL BE CONCENTRIC WITH PIPE AND; EXCEPT AT FIRE SEPARATIONS, SHALL BE SIZED TO ALLOW THE CONTINUITY OF INSULATION.

3.2.2. CONTRACTOR TO ENSURE THAT THE INTEGRITY OF ALL FIRE SEPARATIONS IS MAINTAINED WHERE PIPING SYSTEMS PENETRATE RATED STRUCTURE. CONTRACTOR TO SEAL TIGHT AROUND ALL PIPING WITH APPROVED CAULKING MATERIAL.

3.2.3. INSTALL CHROME PLATED ESCUTCHEON PLATES ON EXPOSED PIPING PASSING THROUGH WALLS, FLOORS AND CEILINGS IN FINISHED AREA.

3.3. PIPING EXPANSION

3.3.1. PROVIDE THERMAL EXPANSION PROTECTION ACCORDING TO PART 7 OF THE BC BUILDING CODE OR LOCAL BUILDING BY-LAW. DIAPHRAGM EXPANSION TANK OR AUXILIARY THERMAL EXPANSION RELIEF VALVE TO CAN/CSA-B125 SET BELOW 80 PSIG IS ACCEPTABLE.

3.3.2. ALL PIPING SYSTEM, INCLUDING ALL TAKE-OFFS SHALL BE SO INSTALLED THAT THE PIPING AND CONNECTED EQUIPMENT WILL IN NO WAY BE DISTORTED BY EXPANSION, CONTRACTION OR SETTING.

3.3.3. WHERE PIPING PASSES THROUGH WALLS OR FLOOR SLABS, THE SLEEVES SHALL BE OF SUFFICIENT SIZE TO ACCOMMODATE THE EXPANSION AND THE PIPE INSULATION WITHOUT BINDING OR CRUSHING THE INSULATION, OR PREVENTING THE EXPANSION OF THE PIPING.

3.3.4. PROVIDE EXPANSION LOOPS AS REQUIRED. THE THREE LEGS OF THE EXPANSION LOOP SHALL BE EQUAL. COLD SPRINGING OF THE EXPANSION LOOP UP TO 50% OF THE EXPANSION CONSIDERED IS PERMITTED.

3.4. ACCESS DOORS

3.4.1. INSTALL ALL WORK TO BE READILY ACCESSIBLE FOR OPERATION AND MAINTENANCE. PROVIDE ACCESS DOORS FOR ALL CONCEALED SERVICEABLE COMPONENTS SUCH AS VALVES AND CLEANOUTS.

3.4.2. PROVIDE KEYED ACCESS PANELS IN PUBLIC AREAS TO PREVENT UNAUTHORIZED ACCESS.

3.4.3. ACCESS PANELS SHALL BE APPROVED FIRE RATED ACCESS PANELS FOR CONCEALED SERVICE COMPONENTS LOCATED INSIDE FIRE RATED ASSEMBLIES. ACCESS DOOR SHALL BE FIRE RATED TO MATCH THE ASSEMBLY REQUIRING ACCESS.

3.5. CLEANOUTS

3.5.1. SUPPLY AND INSTALL CLEANOUTS WHERE REQUIRED BY THE B.C. BUILDING CODE 2018 AND AS INDICATED ON DRAWINGS. EXTEND TO A FINISHED FLOOR OR WALL. OUTSIDE CLEANOUTS SHALL BE BROUGHT TO GRADE AND ANCHORED IN A 16" X 16" X 4" CONCRETE COLLAR. CLEANOUTS SHALL BE SUITABLE FOR TRAFFIC LOADING AND SURFACE FINISH REQUIREMENTS.

3.6. FIXTURES INSTALLATION

3.6.1. UNLESS OTHERWISE SPECIFIED, HOT AND/OR COLD WATER CONNECTIONS TO FIXTURES SHALL BE 3/8" CHROME PLATED FLEXIBLE SUPPLIES WITH STOPS. PROVIDE ESCUTCHEON PLATES FOR ALL SERVICE LINES PENETRATING WALL SURFACES. ALL EXPOSED PLUMBING BRASS AND METAL WORK SHALL BE CHROME PLATED. ENSURE PIPING IS SECURELY ATTACHED PRIOR TO INSTALLATION OF FIXTURES.

3.6.2. CONCEALED WATER SUPPLY PIPING TO PLUMBING FIXTURES SHALL BE INSTALLED USING CAST BRASS 90 DEGREE DROP EAR ELBOWS OR DROP EAR TEES AS THE PIPING DESIGN DICTATES. BLOCKING SHALL BE PROVIDED WITHIN THE CONCEALED SPACE AND THE ELBOWS AND/OR TEES SHALL BE SECURED TO THE BLOCKING USING BRASS SCREWS TO PROVIDE A RIGID INSTALLATION.

3.6.3. CONTRACTOR TO CO-ORDINATE WITH GENERAL CONTRACTOR LOCATIONS AND SIZES OF REQUIRED PLUMBING CHASES AND ANY ADDITIONAL BRACING BETWEEN STUDS FOR WALL HUNG FIXTURES.

3.6.4. SUPPLY AND INSTALL ALL HANGERS, SUPPORTS, BRACKETS, REINFORCEMENT, 14 GAUGE STEEL BACK UP PLATED, ETC. FOR THE PROPER INSTALLATION AND SUPPORT OF SUCH FIXTURES AND THEIR RESPECTIVE SUPPLY FITTINGS.

3.6.5. WHERE PLUMBING FIXTURES COME IN CONTACT WITH WALL AND/OR FLOOR, JOINTS SHALL BE SEALED WITH DOW CORNING 786 BUILDING SEALANT, MADE WATERTIGHT AND BEADED SMOOTH IN A NEAT AND WORKMANLIKE MANNER.

3.6.6. CLEAN PLUMBING FIXTURES AND EQUIPMENT AT COMPLETION.

3.7. WATER HAMMER ARRESTERS

3.7.1. REQUIRED AT BUT NOT LIMITED TO THE FOLLOWING:

-GROUP OF FIXTURES-TOP OF DOMESTIC COLD AND HOT WATER RISERS.
-URINAL(S)
-CLOTHES WASHERS (HOT AND COLD): ½"
-DISHWASHERS: 1/2"
-OTHER DEVICES WITH SOLENOID VALVES.
-END OF EACH HORIZONTAL MAIN 1" AND OVER.
-IRRIGATION SYSTEMS.
-OTHER DEVICES WITH SOLENOID VALVES.
-BRANCH LINES TO FLUSH VALVES, SOLENOID VALVES, SELF-CLOSING FAUCETS, QUICK CLOSING VALVES AND ON REFRIGERATION, KITCHEN AND LAUNDRY EQUIPMENT INCORPORATING SOLENOID VALVES.
-TO EACH FIXTURE WHERE SAME IS LOCATED AND SERVICED BY A LONG BRANCH PIPE.

3.7.2. SIZE ARRESTORS AS PER PLUMBING AND DRAINAGE INSTITUTE STANDARD WH-201.

3.7.3. INSTALL IN PIPE SPACES WHERE POSSIBLE. PROVIDE ACCESS PANELS.

3.7.4. CONTRACTOR SHALL GUARANTEE NO WATER HAMMER FOR ONE YEAR.

3.8. HOSE BIBS

3.8.1. WATER SUPPLY LINE TO OUTSIDE HOSE BIB TO HAVE ISOLATION VALVE WITH DRAIN ON THE INSIDE.

3.8.2. UNLESS OTHERWISE SPECIFIED, HOSE BIB SHALL BE INSTALLED AT 2 FEET ABOVE ADJACENT OUTSIDE GRADE.

3.9. SEISMIC RESTRAINTS

3.9.1. HOT WATER TANKS: PRE-ENGINEERED SEISMIC RESTRAINT KIT SHALL BE USED FOR WATER HEATER UP TO 60 GALLONS. FOR TANK LARGER THAN 60 GALLONS, SEISMIC RESTRAINT SYSTEM MUST BE ENGINEERED BY A SEISMIC ENGINEER.

3.10. FOUNDATION DRAIN

3.10.1. FOUNDATION DRAINS SHALL BE LAID WHERE INDICATED ON DRAWINGS. LAY FOUNDATION DRAIN PIPE SO AS TO PROVIDE SLOPE AT A MINIMUM OF 0.5% TO THE FOOTING DRAIN SUMP, WITH PERFORATIONS DOWNWARD.

3.10.2. THE GENERAL CONTRACTOR SHALL REVIEW THE LOCATION OF ALL FOUNDATION DRAIN LINES WITH THE ARCHITECT, GEOTECHNICAL AND STRUCTURAL ENGINEERS TO CONFIRM THAT THE REQUIREMENTS FOR THE SOIL CONDITIONS HAVE BEEN MET.

3.10.3. PIPE SHALL BE LAID ON 6" DRAIN GRAVEL BEDDING. TOP AND SIDES OF DRAIN PIPE SHALL BE COVERED WITH 12" OR MORE OF DRAIN GRAVEL. DRAIN GRAVEL SHALL BE 100% GRANULAR MATERIAL OF 0.5" TO 3/4" DIAMETER.

3.10.4. CLEANOUT SHALL BE PROVIDED AS INDICATED AND AT CHANGE OF DIRECTIONS AND 50 FT. INTERVALS.

3.10.5. WHERE SILTY SOIL IS EXPERIENCED, FILTER CLOTH SHALL BE PROVIDED BETWEEN SOIL AND DRAIN ROCK ON TOP AND SIDES; FILTER CLOTH TO BE MADE OF 1/12" THICK SYNTHETIC NON-WOVEN FILTER CLOTH, MIRAFI P150 OR EQUAL.

3.10.6. FOLLOW SOIL REPORT, IF AVAILABLE, RECOMMENDATIONS. SOIL REPORT RECOMMENDATIONS SHALL SUPERSEDE THE ABOVE IF THERE IS CONFLICT IN REQUIREMENTS.

3.11. TRENCHING:

3.11.1. ENSURE THAT LOCATIONS OF BURIED UTILITIES AND OTHER SERVICES HAVE BEEN STAKED OUT BEFORE THE START OF WORK. PROTECT AND SUPPORT EXISTING WORK AT ALL TIMES DURING THE EXCAVATION AND CONSTRUCTION.

3.11.2. PROVIDE PROPER TRENCHING, KEEP FREE OF WATER; SIDES SHALL BE ADEQUATELY SUPPORTED AND MEET SAFETY STANDARDS OF THE WORKERS' COMPENSATION BOARD. PIPES TO BE LAID TRUE TO LINE AND GRADE WITH SOLID SUPPORT THROUGHOUT TOTAL LENGTH. CARE TO BE TAKEN TO PROTECT AGAINST ENTRY OF DEBRIS AND WATER; PROVIDE AND PLUGS WHEN PIPE LAYING IS INTERRUPTED. AFTER WORK IS COMPLETED, LINES TO BE FLUSHED OUT. WHERE ROCK IS ENCOUNTERED, REMOVE TO A DEPTH OF 6" (150 MM) BELOW THE BOTTOM OF BARREL TO ALLOW FOR BEDDING MATERIAL.

3.12. BEDDING AND BACKFILL:

3.12.1. ALL PIPE SHALL BE INSTALLED IN CLASS (1) BEDDING AS DEFINED IN ASTM D2321 STANDARDS. THIS IS A NIX OF MATERIAL FROM 1/4" TO 1-1/2" WHICH FOR INSPECTION MUST BE COMPACTED FROM 6" BELOW THE PIPE AND UP TO THE SPRING LINE. AFTER INSPECTION APPROVAL AN ADDITION 6" MUST BE INSTALLED OVER THE PIPE. NOTE: 3/4" CLEAR CRUSH IS PREFERRED AS IT PROVIDES THE BEST PIPE SUPPORT WITH THE LEAST EFFORT.

3.12.2. THE BACKFILL MATERIAL SHALL BE OF GRANULAR MATERIAL FREE FROM CLOG, LUMPS, FROZEN MATERIAL, CEMENTATION, AND ORGANIC MATERIAL. APPROVAL OF BACKFILL MATERIAL SHALL BE OBTAINED FROM THE ENGINEER; BEDDING SHALL EXTEND A MINIMUM OF 6" (150 MM) AROUND PIPE FOR PVC PIPE. THE FILL SHALL BE PLACED IN LAYERS OF NOT MORE THAN 12" (300 MM) COMPACTED THICKNESS.

3.12.3. FILL UNDER CONCRETE OR ASPHALT PAVING SHALL HAVE BACKFILL COMPACTED TO GIVE ONE-HUNDRED PERCENT (100%) STANDARD PROCTOR DENSITY DETERMINED BY ASTM D698 – STANDARD PROCTOR MAXIMUM DRY DENSITY. FOR AREAS NOT PAVED, SUITABLE SUBSOIL MATERIAL MAY BE EMPLOYED WHERE APPROVED BY THE ENGINEER. ROUGH GRADE SITE TO EXISTING GRADES AND FINISH GRADE AS SPECIFIED UNDER THE ARCHITECTURAL SPECIFICATIONS. SETTLEMENT SHALL BE MADE GOOD DURING THE WARRANTY PERIOD.

3.12.4. BACKFILLING SHALL BE DONE ONLY AFTER PIPING HAS BEEN TESTED AND INSPECTED BY THE AUTHORITIES AND ENGINEER.

3.13. THRUST BLOCKS AND SUPPORTS:

3.13.1. FOR UNDERGROUND WATER LINES PROVIDE CEMENT THRUST BLOCKS BETWEEN FITTING ON PIPE AND SOLID GROUND AT EACH CHANGE IN DIRECTION, AND AT ALL TEES, PLUGS, CAPS, BENDS, VALVES, AND HYDRANTS ON THE UNDERGROUND PIPING. PROVIDE ANCHOR RODS WHERE REQUIRED.

3.13.2. ENSURE LINE IS ANCHORED AND SECURED INSIDE CONCRETE WALL. FOR FLOOR ENTRY TO ROOM PROVIDE GALVANIZED SHEET METAL SLEEVE AROUND SERVICE MAIN TO 4"(150 MM) ABOVE FLOOR. FILL SPACE WITH LOOSE FILL INSULATION.

3.13.3. THE DESIGN AND INSTALLATION OF THRUST BLOCKS SHALL BE IN ACCORDANCE WITH N.F.P.A. NO. 24. MINIMUM THRUST BLOCKS FACE BEARING AREAS SHALL BE CALCULATED BASED ON 250 PSI WATER PRESSURE AND A MAXIMUM 1000 LBS PER SQ. FT. SOIL BEARING OR AS PER SOIL BEARING CAPACITY STATED IN THE GEO-TECHNICAL REPORT FOR THE PROJECT.

3.14. SUMP

3.14.1. ENSURE EXCAVATION FREE OF WATER PRIOR TO PLACING OF CONCRETE.

3.14.2. PACE MINIMUM 4" OF A" BEDDING MATERIAL (GRAVEL) COMPACTED TO 95% MPD IN COMPLIANCE WITH ASTM DI557.

3.14.3. CONSTRUCT BASE TO ENSURE FIRST PRE-CAST RISER SECTION IS SET PLUMB.

3.14.4. SET ALL INLET AND OUTLET PIPES TO SPECIFIED ALIGNMENTS AND ELEVATIONS.

3.14.5. CONNECT CONCRETE PIPE INTO MANHOLE USING SPIGOT OR BELL PRE-CAST INTO SUMP WALL OR, ALTERNATELY, GROUT PIPE INTO PRE-FORMED ROUGH CORE IN SUMP WALL USING FAST-SETTING GROUT.

3.14.6. CONNECT PVC PIPE INTO SUMP USING "MANHOLE ADAPTER RING" OR APPROVED EQUAL.

3.14.7. ENSURE PLACEMENT OF CONCRETE DOES NOT DISTURB CONNECTING PIPES.

3.14.8. SET REMAINING RE-CAST RISER SECTIONS PLUMB WITH JOINTS CONSISTING OF CEMENT MORTAR OR GASKETS TO ASTM C443.

3.14.9. SET FRAMES BY FIRMLY EMBEDDING IN MORTAR ON A MIN. OF 1 AND MAX. OF 3 COURSES OF BRICKS OR PRE-CAST CONCRETE RISER RINGS.

3.15. SERVICE CONNECTIONS

3.15.1. BEFORE COMMENCING WORK, CONFIRM INVERT ELEVATIONS REQUIRED FOR SANITARY SEWER, STORM SEWER, AND WATER CONNECTIONS.

3.15.2. DOMESTIC WATER LINES SHALL BE DISINFECTED WITH CHLORINE CONTENT SOLUTION FOR 24 HOURS.

3.16. TESTING AND INSPECTION AND CLEANING

3.16.1. ALL SANITARY STORM AND DOMESTIC PIPING SHALL BE TESTED IN ACCORDANCE WITH THE B.C. BUILDING CODE 2018. WATER PRESSURE TEST FOR WATER PIPING SYSTEM SHALL BE EQUAL TO 200 PSI WITHOUT LEAKING. DWV AND STORM SYSTEM SHALL BE WATER TEST BY A WATER COLUMN OF AT LEAST 3 METER TO ALL JOINTS.

3.16.2. NO PLUMBING SYSTEM OR PART THEREOF SHALL BE COVERED UNTIL IT HAS BEEN INSPECTED AND APPROVED BY THE PLUMBING INSPECTOR AND THE ENGINEER.

3.16.3. FLUSH AND CLEAN OUT PIPING SYSTEMS AFTER TESTING. PORTABLE WATER SYSTEM SHALL BE FLUSHED WITH POTABLE WATER BEFORE THE SYSTEM IS PUT INTO OPERATION.

HEATING, VENTILATING AND AIR CONDITIONING

1. GENERAL

1.1. THE HEATING, AND VENTILATION WORK SHALL BE AS SHOWN ON THE DRAWINGS AND INCLUDE, BUT NOT BE LIMITED TO, THE SUPPLY AND INSTALLATION OF THE FOLLOWING SYSTEMS:

1.1.1. ALL DUCTWORK, DAMPERES AND AIR INLETS/OUTLETS/LOUVERS.

1.1.2. MAKE UP AIR SYSTEM, AND EXHAUST AIR SYSTEMS.

1.1.3. ALL FANS AND AIR INTAKES AND EXHAUST OUTLETS.

1.1.4. FORCED AIR FURNACE TO REPLACE EXISTING FURNACE. PROVIDE PROFESSIONAL DUCT CLEANING SERVICES TO EXISTING FURNACE DUCT SUPPLY AND RETURN SYSTEMS.

1.1.5. ALL CONTROL WORK INCLUDING CONTROL DEVICES, AND MOTORIZED DAMPER(S) AND ACTUATOR(S).

1.1.6. GAS DISTRIBUTION SYSTEM. NATURAL GAS PIPING FROM GAS METERS TO ALL GAS-FIRED EQUIPMENT OR ROUGH-IN FOR FUTURE CONNECTIONS.

1.1.7. PROVIDE DESIGN AND INSPECTION SERVICES, BY AN INDEPENDENT B.C. REGISTERED PROFESSIONAL ENGINEER FOR SEISMIC RESTRAINT DEVICES FOR FANS, SUSPENDED EQUIPMENT AND NEW CEILING DIFFUSERS/GRILLES UNDER THIS PROJECT.

1.1.8. DUCTWORK INSULATION, SEE INSULATION SPEC.

1.1.9. ELECTRIC FORCED FLOW HEATERS.

1.1.10. GAS VENTS AND COMBUSTION AIR SUPPLY FOR GAS FIRED EQUIPMENT.

1.1.11. AIR BALANCING AND COMMISSIONING INCLUDING FIRE DAMPER DROP TEST AND REPORT.

1.2. ALL DUCTWORK SHALL BE OF SIZES AND MATERIALS AS SHOWN ON THE DRAWINGS AND OF GAUGES AND CONSTRUCTION DETAIL AS OUTLINED IN THE SMACNA DUCT AND ASHRAE CONSTRUCTION STANDARDS LATEST EDITIONS.

1.3. RETAIN AN INDEPENDENT FIRM TO BALANCE THE AIR SYSTEMS, AND TO PROVIDE EQUIPMENT PERFORMANCE DATA. INCLUDING FIRE DAMPER DROP TEST AND PROVIDE TWO COPIES OF THE REPORT WITH FIRE DAMPER TEST CERTIFICATE TO THE ENGINEER. CONTRACTOR SHALL INCLUDE THE COST FOR ONE TIME PULLEYS AND BELTS CHANGE IF REQUIRED FOR ACHIEVING THE REQUIRED CFM.

1.4. ELECTRICAL TRADE TO BE RESPONSIBLE FOR EXTERNAL FAN STARTERS AND POWER WIRING FOR 110 VOLTS AND OVER. MECHANICAL CONTRACTOR TO BE RESPONSIBLE FOR ALL CONTROL WIRING (INCLUDING 110 VOLTS AND OVER IF CALLED FOR), CONDUIT FOR LOW VOLTAGE WIRING WHEN REQUIRED, TRANSFORMERS AND DEVICES FOR THE MECHANICAL WORK, INCLUDING ALL NECESSARY INTERLOCKING WIRING. WHERE HIGH VOLTAGE AND CONDUIT ARE REQUIRED FOR THE CONTROL SYSTEM UNDER THE MECHANICAL CONTRACT, THEY SHALL BE INSTALLED BY A QUALIFIED ELECTRICAL TRADES PERSON UNDER THE MECHANICAL CONTRACT.

– EXCEPTION

IF THE ABOVE ARRANGEMENT IS NOT FOLLOWED, THE MECHANICAL CONTRACTOR/ ELECTRICAL CONTRACTOR / GENERAL CONTRACTOR SHALL WORK OUT THE RESPONSIBILITY OF EACH TRADE SO THAT A COMPLETE CONTROL SYSTEM IS PROVIDED WITHOUT ADDITIONAL COST.

2.PRODUCTS

2.1. DUCTWORK FOR GENERAL HVAC SYSTEM: SHALL BE MINIMUM G60 COATED GALVANIZED LFQ STEEL CONFORMING TO ASTM A653NAD A924 STANDARDS AND/OR STAINLESS STEEL WHERE CALLED FOR; ALL TEES, BENDS AND ELBOWS SHALL HAVE A CENTRELINE RADIUS OF 1-1/2 TIMES TO DUCT DIAMETER OR TURNING VANES. PROVIDE BRACING TO PREVENT RATTLING OR BREATHING.

ALL DUCTWORK GREATER THAN 6" SHALL BE CROSS-BROKEN WITH THE EXCEPTION OF INTERNALLY LINED DUCTS.

ALL EXPOSED ROUND DUCTWORK AND MATCHING FITTINGS SHALL BE MACHINE FABRICATED GALVANIZED SPIRAL LOCK SEAM PIPE TO S.M.A.C.N.A. STANDARDS.

ALL DUCTWORK SHALL BE CONSTRUCTED TO A PRESSURE CLASS OF POSITIVE 2" W.G. (THE EXHAUST DUCTS SHALL BE CONSTRUCTED FOR PRESSURE CLASS OF NEGATIVE 4" W.G.) ALL DUCTS SHALL BE CONSTRUCTED IN ACCORDANCE TO APPROPRIATED TABLES IN THE HVAC DUCT CONSTRUCTION STANDARDS METAL AND FLEXIBLE PUBLISHED BY SMACNA, LATEST EDITION.

DUCTWORK SEALER SHALL BE TRANS-CONTINENTAL MP-DUCT SEALER OR EQUIVALENT, ULC RATED WITH FLAME RATING OF 15 AND 0 SMOKE DEVELOPMENT.

2.2. BALANCING DAMPERS: PROVIDE BALANCING DAMPERS (WITH INDICATORS AND TWO GAUGES HEAVIER THAN DUCT) ON ALL BRANCH TAKE-OFFS OF SUPPLY RETURN AND EXHAUST DUCTS. SINGLE BLADE WITH QUADRANT OPERATOR FOR DUCTS 10" DEEP OR LESS. SQUEEZE TYPE DAMPERS WITH QUADRANT OPERATORS FOR DUCTS OVER 10" IN DEPTH.

WHERE BALANCING DAMPERS ARE OVER DRYWALL OR ANY INACCESSIBLE CEILINGS, PROVIDE BOWDEN CABLE SYSTEM MANUFACTURED BY UNITED ENERTECH CORPORATION OR APPROVED EQUAL TO PROVIDE MEANS OF BALANCING AIRFLOW IN DUCTWORK. PROVIDE AND INSTALL MODEL BO-RI IN THE BRANCH DUCT. THE CONTRACTOR SHALL FURNISH AND INSTALL REMOTE OPTIONS OF MODEL BO-300, BO-700, BO-150, BO-896, BO-896-P CONTROLLERS. CABLE IS CAPABLE OF LENGHTS OF UP TO 60 FEET. THE CONTRACTOR SHALL CONNECT BOWDEN CONTROL WIRE FROM THE DAMPER TO THE TERMINAL POINT.

2.3. FIRE DAMPERS, IF APPLIABLE: PROVIDE DYNAMIC CURTAIN TYPE FIRE DAMPERS WHERE REQUIRED BY AUTHORITIES WITH SUITABLE DUCT ACCESS DOORS WITH SASH TYPE LATCHES. PROVIDE STYLE B FIRE DAMPER WTH CURTAIN OUT OF AIR STREAM WHEREVER SPACE PERMITTED. FIRE DAMPERS SHALL BE ULC OR WARNOCK HERSY CERTIFIED WITH SLEEVE, ANGLE FRAME AND SUITABLE DUCT ACCESS DOORS WITH GASKET AND SASH TYPE LATCHES. DAMPERS LESS THAN 10 IN DIMENSION TO HAVE BLADES OUT OF AIR STREAM. FUSIBLE LINKS TO HAVE MELTING POINT 28C ABOVE MAXIMUM OPERATING TEMPERATURE. FIRE DAMPER SHALL BE RATED FOR USE IN 2 HR. FIRE SEPARATION FOR ALL FIRE SEPARATION WITH 2 HR. FIRE RESISTANCE RATING OR LESS. INSTALL FIRE DAMPER ACCORDING TO MANUFACTURE'S INSTRUCTIONS. PROVIDE TYPE X DRYWALL SLEEVE AROUND FIRE DAMPER WALL/FLOOR OPENINGS IN COMBUSTIBLE CONSTRUCTION TO COVER EXPOSED COMBUSTIBLE MATERIAL IN THE OPENINGS. ACCESS DOORS SHALL EQUAL TO 'NAILOR' OR 'MAXAM', SHEET METAL COVER PLATE FOR FIRE DAMPER ACCESS IS NOT ACCEPTABLE.

2.4. HANGERS: CONSTRUCTED FROM GALVANIZED METAL FASTENED TO UNDERSIDE OF THE STRUCTURE. DO NOT USE PERFORATED BAND IRON.

2.5. FLEXIBLE CONNECTIONS: PROVIDE APPROVED FLAME-PROOF FABRIC MINIMUM 4" (100 MM) WIDE WITH METAL EDGE STRIPS ON FANS AND EQUIPMENT. ACCEPTABLE PRODUCT: EQUAL TO DUROLON BY DURO DYNE.

2.6. BACKDRAFT/ RELIEF AIR DAMPERS: PROVIDE BACKDRAFT DAMPERS ON ALL EXHAUST FANS; AUTOMATIC GRAVITY OPERATED MULTI OR SINGLE LEAF WITH SEALED EDGES. DAMPERS ARE TO BE LINKED WITH AN ADJUSTMENT DEVICE TO ALLOW FOR VARYING STATIC PRESSURE.

2.7. AIR OUTLETS: TYPE AS SPECIFIED WITH VOLUME DAMPERS; PROVIDE BAFFLES ON DIFFUSERS AS INDICATED. PAINT VISIBLE SHEET METAL BEHIND OUTLETS WITH MATT BLACK.

2.8. FLUE AND BREECHING, WHERE APPLICABLE: PROVIDE FLUES FOR ALL GAS-FIRED EQUIPMENT. FLUES SHALL BE OF MATERIAL AND SIZED TO MEET CODE REQUIREMENTS. PROVIDE COMBUSTION AIR SUPPLY ACCORDINGLY TO CODE REQUIREMENTS.

2.9. OUTSIDE AIR OPENINGS: AS INDICATED WITH 1/2" MESH BIRDSCREEN AND WEATHERPROOFED.

2.10. MOTORIZED DAMPER ACTUATOR SHALL BE EQUAL TO 'BELIMO', NORMALLY CLOSE WITH NO POWER. LOW VOLTAGE OR LINE VOLTAGE OPERATION TO BE DETERMINED BY THE CONTROL CONTRACTOR. POWER TRANSFORMER REQUIRED FOR LOW VOLTAGE OPERATION TO BE PROVIDED BY MECHANICAL AT LINE VOLTAGE SUPPLY POINT PROVIDED BY DIV. 16. FLOW CONTROL DAMPER SHALL EQUAL TO 'NAILOR'.

2.11. MOTORIZED/ACTUATED DAMPER:

A.FABRICATION:

1. MODEL: RUSKIN CONTROL DAMPERS CDTI-50. (OR EQUIVALENT)

2.FRAME:

a. (127 X 25 X MINIMUM 3.2 MM) 6063-T5 EXTRUDED ALUMINUM HAT-SHAPED CHANNEL.
b. LOW PROFILE (127 X 13 MM) TOP AND BOTTOM FRAMES ON DAMPERS (305 MM) HIGH AND LESS
c. MOUNTING FLANGES: BOTH SIDES OF FLANGE FRAME.

3.BLADES:

a. MATERIAL: EXTRUDED ALUMINUM.
b. WIDTH: 150MM
c. STYLE: AIRFOIL-SHAPED.
d. ACTION: OPPOSED
e. ORIENTATION: HORIZONTAL
f. FOAM ISOLATION: INJECTED WITH HIGH-DENSITY, POLYURETHANE FOAM

4.THERMAL TRANSFER:

a. BOTH SIDES OF BLADE SHALL BE ISOLATED FROM EACH OTHER ELIMINATING THERMAL TRANSFER.
b. NO DOWNSTREAM BLADE SKIN SHALL BE EXPOSED TO UPSTREAM TEMPERATURES OR CONDITIONS.

5.CONTROL SHAFT: REMOVABLE, (13 MM) DIAMETER SHAFT EXTENDS (152 MM) BEYOND FRAME

6.MOUNTING: VERTICAL/HORIZONTAL TO BE DETERMINED ON SITE

7.FINISH: MILL ALUMINUM.

2.1. FANS AND CONTROL: AS INDICATED ON THE DRAWING SCHEDULE. FANS SHALL BE AMCA RATED AND CAPABLE OF 10% VARIATION TO SPECIFIED CAPACITY, V-BELT ADJUSTABLE DRIVE, GUARDS AND MOUNTING DEVICES AS APPLICABLE. PROVIDE BACKDRAFT DAMPERS ON ALL EXHAUST FANS. UNLESS OTHERWISE SPECIFIED, EXHAUST FANS SHALL BE CONTROLLED BY TIMER BY DIV. 16 TO START/STOP FANS ACCORDING TO THE OCCUPIED/UNOCCUPIED SCHEDULE. OBTAIN SCHEDULE FROM THE FACILITY OPERATOR AND PROGRAM TIMER ACCORDINGLY.

2.2. FURNACE AND CONTROL: AS INDICATED ON THE DRAWING SCHEDULE.

2.3. ELECTRIC OPEN COIL DUCT HEATER

2.3.1. OPEN COIL DUCT HEATER SHALL HAVE THE FOLLOWING FEATURES:

2.3.1.1. CSA APPROVED.

2.3.1.2. COILS SHALL BE OF HIGH GRADE NICKEL-CHROME ALLOY AND SHALL BE INSULTED BY FLOATING CERAMIC BUSHINGS FROM THE GALVANIZED STEEL FRAME. COIL TERMINAL PIN SHALL BE STAINLESS STEEL INSULATED BY MEANS OF NON-ROTATING CERAMIC BUSHINGS.

2.3.1.3. SLIP IN TYPE. HEATER SHALL HAVE A FLANGE FOR SECURING IT TO THE DUCT SIDE. MOUNTING FLANGE SHALL BE INDEPENDENT OF THE TERMINAL BOX TO ALLOW INSTALLATION WITHOUT OPENING THE BOX OR DRILLING INTO IT.

2.3.1.4. EQUIPPED WITH FAIL-SAFE, AUTOMATIC RESET AND MANUAL RESET DISC-TYPE THERMAL CUT-OUTS, AS REQUIRED BY CSA.

2.3.1.5. CUT-OUTS SHALL BE SHIELDED FROM ACCIDENTAL IMPACT, AND SHALL DE-ENERGIZE THE HEATER IN CASE OF INSUFFICIENT AIR FLOW.

2.3.1.6. NON-SENSITIVE TO AIR FLOW DIRECTION AND INTERCHANGEABLE FOR HORIZONTAL OR VERTICAL DUCTS. CSA APPROVED FOR ZERO CLEARANCE IN HORIZONTAL DUCTS.

2.3.1.7. EQUIPPED WITH MAGNETIC CONTACTORS AS REQUIRED, 24 VOLTS TRANSFORMER, AIR FLOW SENSOR, DUCT THERMOSTAT AND REFER TO EQUIPMENT SCHEDULE FOR OPTIONAL ITEMS SELECTED.

2.3.1.8. FOR MAINTENANCE AND SAFETY PURPOSES, THE HEATER SHALL BE EQUIPPED WITH BUILT-IN DISCONNECT AND PROTECTIVE SCREENS ON BOTH SIDES.

2.3.1.9. LOAD FUSES SHALL BE SUPPLIED AS REQUIRED BY LOCAL CODES.

2.4. NATURAL GAS PIPING, SCHEDULE 40 BLACK STEEL TO ASTM A-53 AND CSA B-63. MALLEABLE SCREWED OR BUTT WELDED JOINTS. PIPING OVER 2" INSIDE BUILDING OR LOCATED IN CONCEALED SPACES SHALL BE WELDED. BURIED PIPE SHALL BE YELLOW JACKETED WITH CATHODIC PROTECTION.

2.5. GAS REGULATORS

2.5.1. SERVICE REGULATOR: FOR 2 PSI AND/OR 5 PSI NATURAL GAS PIPING SYSTEMS, CSA CERTIFIED, ANSI Z21.80/CSA 6.22 LINE PRESSURE REGULATORS AND ANSI Z21.18/CSA 6.3 GAS APPLIANCE PRESSURE REGULATORS FOR 7" TO 11" W.C. OUTLET PRESSURE RANGE. MAXITROL 325-L SERIES REGULATORS OR EQUAL FOR LINE APPLICATION AND MAXITROL 325 SERIES REGULATORS OR EQUAL FOR APPLIANCE APPLICATION. PROVIDE GAS VENT KIT TO OUTDOOR GAS REGULATORS.

2.5.2. REGULATOR MUST BE PROPERLY SIZED FOR DESIRED PERFORMANCE ACCORDING TO THE MANUFACTURER'S SIZING GUIDE.

2.5.3. SERVICE AND INSTALLATION MUST BE PERFORMED BY A TRAINED/EXPERIENCED SERVICE TECHNICIAN. THE REGULATOR SHALL BE INSTALLED AND OPERATED IN ACCORDANCE WITH THE MANUFACTURER'S SAFETY WARNING INSTRUCTIONS.

2.5.4. PROVIDE VENT PROTECTORS FOR OUTDOOR APPLICATIONS TO ENSURE PROPER VENT PROTECTION.

2.5.5. FOR INDOOR APPLICATION, IF VENT LIMITING DEVICE IS NOT USED, REGULATOR VENT MUST BE PIPED IN ACCORDANCE WITH GOVERNMENT AND LOCAL CODES AND REGULATIONS AND MANUFACTURER'S INSTRUCTIONS.

2.5.6. A FULL SIZE DIRT POCKET SHALL BE INSTALLED AHEAD OF EACH GAS PRESSURE REGULATOR BETWEEN THE VALVE AND THE REGULATOR.

2.5.7. VALVES FOR GAS SERVICE TO BE LUBRICATED PLUG TYPE WITH REMOVABLE SPANNER. ALL VALVES AND UNIONS TO HAVE PROVINCIAL GAS INSPECTION DEPARTMENT APPROVAL.

2.5.8. SERVICE REGULATOR: EQUAL TO 'SENSUS' 243 COMMERCIAL INDUSTRIAL SERVICE REGULATOR.

2.5.9. COMBUSTION REGULATOR: EQUAL TO 'SENSUS' 121 AND 122 INDUSTRIAL COMBUSTION REGULATOR.

2.5.10. 5 LB. SERVICE REGULATOR: EQUAL TO 'SENSUS' R043 (1/2" – 1"), R143 (1" – 1-1/4") AND R243 (1-1/4" TO 2").

2.5.11. 2 LB. SERVICE REGULATOR: EAUAL TO 'OARA' R90 FOR 1/2" OR R95 FOR 3/4". ACCEPTABLE EQUAL: 'MAXITROL'

2.5.12. A FULL SIZE DIRT POCKET SHALL BE INSTALLED AHEAD OF EACH GAS PRESSURE REGULATOR BETWEEN THE VALVE AND THE REGULATOR. A FULL SIZE DIRT POCKET SHALL BE INSTALLED IN EACH REGULATOR VENT LINE AT THE REGULATOR OUTLET.

2.5.13. PROVIDE GAS VENT KIT TO OUTDOOR GAS REGULATORS.

2.6. THERMOSTAT & CONTROL: THERMOSTAT SHALL BE 7 DAYS PROGRAMMABLE AND SHALL BE AS SPECIFIED ON THE DRAWINGS.

3.EXECUTION

3.1. DUCT SIZES SHOWN ARE CLEAR INSIDE DIMENSIONS. CONFIRM CEILING SPACE CLEARANCES BEFORE FABRICATION. SUPPORT DUCTS WITH GALVANIZED HANGERS.

3.2. DUCT WORK SHALL CONFORM TO THE REQUIREMENT OF THE SMACNA 2" W.G. PRESSURE DUCT CONSTRUCTION STANDARDS UNLESS OTHERWISE SPECIFIED. SEAL AND TAPE ALL DUCT JOINTS.

3.3. PROVIDE ACCESS DOORS TO FILTERS, FIRE AND CONTROL DAMPERS, FANS AND OTHER COMPONENTS REQUIRING SERVICING. ACCESS DOORS ON INSULATED DUCTWORK SHALL BE INSULATED. ACCESS DOORS TO COMPONENTS REQUIRING REGULAR SERVICING SHALL HAVE SASH TYPE LATCHES.

3.4. CHANGES IN DUCT SIZES TO BE GRADUAL NOT TO EXCEED 30 DEGREE; SUPPLY AND EXHAUST DUCTWORK SHALL BE CAULKED.

3.5. PROTECT DUCT AND EQUIPMENT OPENINGS WITH POLY TO KEEP CLEAN. ALL DUCTWORK AND EQUIPMENT SHALL BE KEPT CLEAN AT COMPLETION OF WORK TO SATISFACTION OF THE ENGINEER.

3.6. THE DUCTWORK AND EQUIPMENT MUST ABSOLUTELY NOT BE USED FOR TEMPORARY HEATING AND VENTILATION DURING CONSTRUCTION.

3.7. WHOEVER IS FOUND RESPONSIBLE FOR HAVING CONTRAVENED ITEMS 5) & 6) ABOVE WILL BE REQUIRED TO ENGAGE A DUCT CLEANING COMPANY TO CLEAN THE DUCTS AND EQUIPMENT UNITS.

3.8. CONFIRM LOCATION OF ALL AIR OUTLETS WITH OTHER TRADES PRIOR TO START OF WORK. PAINT VISIBLE SHEET METAL BEHIND GRILLES MATTE BLACK. PROVIDE FLEXIBLE DUCT FOR DIFFUSERS MOUNTED IN T-BAR CEILINGS.

3.9. MOUNT FANS ON VIBRATION ISOLATORS AND PROVIDE FLEXIBLE CONNECTOR AT DUCTWORK CONNECTION(S) TO MEET ASHRAE REQUIREMENTS.

3.10. ALL EXHAUST FANS SHALL HAVE BACKDRAFT DAMPERS.

3.11. PROVIDE FIRE DAMPERS WHERE REQUIRED BY CODE AND WITH DUCT ACCESS DOORS TO NFPA 90A AND CODE REQUIREMENTS AND INSTALL TO SMACNA STANDARDS WITH RETAINING ANGLES. CONFIRM LOCATION OF FIRE WALLS AND PARTITIONS WITH THE GENERAL CONTRACTOR.

INSTALLATION OF THE FIRE DAMPERS SHALL BE IN STRICT ACCORDANCE WITH THE MANUFACTURER?S INSTRUCTIONS. DO NOT INSTALL FIRE DAMPERS WITHOUT PROPER DRYWALL AROUND DAMPER SLEEVE IN DRYWALL CONSTRUCTION.

3.12. PROVIDE BALANCING DAMPERS ON ALL SUPPLY, RETURN AND EXHAUST BRANCHES. BRANCH DUCTS TO HAVE 45 DEGREE ENTRY, CONICAL OR SQUARE TO ROUND FITTINGS WHEN CONNECTED TO PLENUMS.

3.13. PROVIDE WEATHER PROOF OPENINGS TO THE OUTSIDE; ENSURE PROPER FLASHING.

3.14. ALL EQUIPMENT SHALL BE INSTALLED ACCORDING TO MANUFACTURER'S INSTALLATION INSTRUCTIONS. MAINTAIN PROPER CLEARANCE FROM COMBUSTIBLE AND FOR FUTURE MAINTENANCE.

3.15. LOCATIONS OF CEILING SUSPENDED EQUIPMENT SHALL BE COORDINATED ON SITE TO SUIT LIGHTING AND SPRINKLER SYSTEM LAYOUT IN ORDER TO AVOID INTERFERENCE AND TO MEET NFPA 13 REQUIREMENTS. CONTRACTOR TO RELOCATE EQUIPMENT TO SUIT IF NECESSARY.

3.16. ALL CONTROL WIRING REGARDLESS OF VOLTAGES SHALL BE SUPPLIED AND INSTALLED BY THE MECHANICAL CONTRACTOR. SEE GENERAL REQUIREMENTS SECTION FOR HVAC.

3.17. ALL EQUIPMENT SHALL BE INSTALLED AS HIGH AS POSSIBLE UNLESS OTHERWISE SPECIFIED.

3.18. GAS SERVICE AND DISTRIBUTION

3.18.1. THE GAS SERVICE SHALL BE INSTALLED AND TESTED IN STRICT COMPLIANCE WITH CSA STANDARD Z184-1968 "GAS TRANSMISSION AND DISTRIBUTION PIPING SYSTEM" AND LOCAL AUTHORITIES.

3.18.2. THE GAS DISTRIBUTION SHALL BE INSTALLED AND TESTED IN STRICT COMPLIANCE WITH NATURAL GAS INSTALLATION CODE CAN/CGA-B149.1-M95 AND LOCAL AUTHORITIES.

3.18.3. METERS, REGULATORS, RELIEF VALVES AND SERVICE PIPING SHALL BE INSTALLED BY THE UTILITY COMPANY FOR THE ANTICIPATED LOAD INDICATED ON THE PLANS. COORDINATE OBTAINING AND ARRANGE FOR PAYMENT OF THE METER INSTALLATION FEE WITH THE GENERAL CONTRACTOR.

3.18.4. EXPOSED GAS PIPING SHALL HAVE TWO COATS OF WEATHER RESISTANT PRIME PAINT AND IDENTIFIED WITH YELLOW BANDS AND SERVICE DESIGNATION.

3.18.5. GAS SYSTEM INSTALLATION AND TEST SHALL BE IN ACCORANCE WITH THE CURRENT GAS CODE REQUIREMENTS. INSTALLATION SHALL BE APPROVED BY THE GAS SAFETY AUTHOURITY. INSTALL GAS PIPING IN OPEN VENTILATED SPACES. PITCH LINES AND PROVIDE DRIP LEGS. AFTER APPROVAL OF THE PIPING INSTALLATION, CONNECT ALL APPLIANCES AND PURGE THE GAS PIPING AND CONDUCT GAS LEAKAGE TESTS. PROVIDE REGULATORS AT ALL APPLIANCES WHERE HIGHER PRESSURE GAS IS USED. PROVIDE SHUT-OFF VALVES, AND DIRT TRAPS AS REQUIRED. PIPING SHALL BE IDENTIFIED WITH YELLOW PAINT (OR BANDS) AND MARKED "GAS" AT SUITABLE INTERVALS.

3.18.6. HANGERS AND SUPPORTS FOR GAS PIPING SHALL BE IN ACCORDANCE WITH THE LOCAL GAS CODE. DO NOT USE ROOF TRUSSES AS PIPE HANGERS.

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CONTRACTOR SHALL VERIFY ALL DIMENSIONS ON SITE. DRAWINGS SHALL NOT BE SCALED.

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9	ISSUED FOR CONSTRUCTION	2020.08.21
8	REVISED AS PER CITY'S COMMENTS	2020.04.21
7	REVISED AS PER CITY'S COMMENTS	2020.04.14
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PROJECT:

STRAWBERRY HILL HALL

12152 75A AVENUE, SURREY

TITLE:

SPECIFICATIONS

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SPC-2

3.19. MECHANICAL CONTRACTOR SHALL PROVIDE SEISMIC RESTRAINTS FOR ALL MECHANICAL EQUIPMENT, SEE MECHANICAL GENERAL REQUIREMENTS:

3.20. INDOOR UNITS: 1/8" AIRCRAFT CABLES AT EACH BOTTOM CORNER AT 45 DEGREE AWAY FROM UNIT ANCHORED TO STRUCTURE.

SUSPENDED DIFFUSERS: TWO 12GA. GALVANIZED STEEL WIRE DIAGONALLY OPPOSED AT 45 DEGREE ATTACHED TO DIFFUSER TOP AND SECURED TO STRUCTURE.

SEISMIC RESTRAINT TO DUCTWORK SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF SMACNA STANDARDS.

SEISMIC DETAILS ARE SHOWN FOR INTENT ONLY. MECHANICAL CONTRACTOR SHALL INSTALL EQUIPMENT IN ACCORDANCE WITH HIS SEISMIC ENGINEER'S APPROVED SHOP DRAWINGS.

3.21. TESTING AND BALANCING OF THE HVAC SYSTEM: THE CONTRACTOR SHALL RETAIN AN INDEPENDENT FIRM TO BALANCE THE AIR SYSTEMS, AND TO PROVIDE EQUIPMENT PERFORMANCE DATA. PROVIDE TWO COPIES OF THE BALANCING REPORT TO THE ENGINEER. AIR BALANCING FOR EACH AIR SYSTEMS SHALL BE IN ACCORDANCE WITH AABC SPECIFICATIONS. INCLUDING ALL CONTROL AND INTERLOCKING VERIFICATION, IN ACCORDANCE WITH THE INTENT OF THE PLANS AND SPECIFICATIONS. THE CONTRACTOR SHALL:

3.21.1. ADJUST FAN DRIVES TO GET REQUIRED AND RATED CFM WITHIN PLUS OR MINUS 10% OF QUANTITIES NOTED ON DRAWINGS OR IN THE EQUIPMENT SCHEDULE.

3.21.2. ADJUST TEMPERATURE AND FAN/EQUIPMENT CONTROL SEQUENCE.

3.21.3. ADJUST THE ENTIRE SYSTEM TO MINIMIZE NOISE AND VIBRATION FROM FANS, DUCTWORK AND EQUIPMENTS.

3.21.4. CHECK FOR AIR LEAKS AND DUCTWORK IS PROPERLY SUPPORTED.

3.21.5. CHECK ALL DUCTWORK CONNECTIONS FOR SECURELY FASTENED TO THEIR RESPECTIVE COLLARS OR OTHER FITTINGS.

3.21.6. PROVIDE FIRE DAMPER DROP TESTS AND CONFIRMATION THAT ALL FIRE DAMPERS ARE OPERATIONAL AND ACCESSIBLE FOR FUTURE INSPECTION AND MAINTENANCE.

3.21.7. PROVIDE A WRITTEN CERTIFCATE STATING THAT DROP TEST HAS BEEN CARRIED OUT FOR ALL FIRE DAMPERS IN THE BUILDING TO CERTIFY THAT THEY ARE IN GOOD WORKING CONDITION.

3.22. START UP AND COMMISSIONING OF ALL EQUIPMENT SHALL BE BY EQUIPMENT MANUFACTURER APPROVED QUALIFIED TECHNICIAN AND COMPLETE MANUFACTURER'S CHECK LIST.

MECHANICAL INSULATION

1 GENERAL

1.1 WORK SHALL BE CARRIED OUT IN ACCORDANCE WITH THE BC INSULATION CONTRACTORS ASSOCIATION (BCICA) STANDARD MANUAL, LATEST EDITION AND BY AN EXPERIENCED INSTALLATION FIRM.

1.2 ALL INSULATION, COVERING ADHESIVES, MASTICS SEALANT AND COATING SHALL BE FIRE RETARDED (ULC RATED) AND MEET MAXIMUM FLAME SPREAD RATING OF 25 AND A MAXIMUM SMOKE DEVELOPED RATING OF 50 IN ACCORDANCE WITH APPLICABLE CODES.

1.3 INSULATION AND THICKNESS AND PERFORMANCE SHALL CONFORM TO REQUIREMENTS OF ASHRAE/IES STANDARD 90.1–2010 (TABLE 6.8.3A FOR MINIMUM PIPE INSULATION THICKNESS AND/OR TABLE 6.8.2B FOR MINIMUM DUCT INSULATION R–VALUE) FOR CLIMATE ZONE 4. IF THE STANDARD IS MORE RESTRICTIVE THAN THE SPECIFICATION BELOW.

2 PRODUCTS

2.1 PIPING: MINERAL FIBRE OR FIBREGLASS PREFORMED WITH INTEGRAL ALL SERVICE JACKET. STANDARD BCICA 1501–A.2. FITTINGS, SHUR–FIT, OVERSIZE PIPE INSULATION, MITERED AND TAPED, PF2 FINISH OR 25/50 RATED PVC FITTING COVERS.

2.2 CONCEALED DUCTWORK: FLEXIBLE MINERAL FIBRE OR FIBREGLASS WITH FACTORY FOIL FACED JACKET, STANDARD 1502–B.2.

2.3 ACOUSTICAL LINING: FIBREGLASS INSULATION WITH NEOPRENE COATED. STANDARD 1502–C.2 FOR DUCTWORK AND 1502–C.1. FOR PLENUMS.

2.4 EXPOSED DUCTWORK: RIGID MINERAL FIBRE OR FIBREGLASS WITH FACTORY FOIL FACED JACKET, STANDARD 1502–A.2. FOR ROUND DUCTWORK SMALLER THAN 24" IN DIAMETER, USE FLEXIBLE INSULATION.

2.5 MINIMUM R VALUE OF DUCT INSULATION SHALL BE R–3.5 (AS DEFINED IN TABLE 6.8.2B OF ASHRAE/IES STANDARD 90.1 – 2010) PER INCH OF INSULATION THICKNESS.

3 EXECUTION

3.1 THE FOLLOWING SHALL BE INSULATED AS SPECIFIED:

ALL DUCTWORK AND PIPING COMPONENTS SUBJECT TO CONDENSATION PROBLEM, AND/OR REQUIRED BY CODE FOR ENERGY CONSERVATION, AND/OR FOR FREEZE PROTECTION, AND /OR FOR OCCUPANT SAFETY, WHETHER OR NOT SPECIFIED ON THE DRAWINGS AND/OR SPECIFICATIONS, SHALL BE INSULATED TO THE THICKNESS BELOW. THESE COMPONENTS INCLUDE, BUT NOT LIMITED TO, THE FOLLOWINGS:

3.1.1 FOR PLUMBING INSTALLATIONS:

3.1.1.1 EXCEPT OTHERWISE SPECIFIED, ABOVE GROUND DOMESTIC WATER LINES (HOT/COLD) INSIDE/OUTSIDE WALL SPACE.1" (25MM)

3.1.1.2 FOR HOT WATER LINES 1–1/2" OR LARGER 1–1/2" (37MM)

3.1.1.3 WATER VALVES, FLANGES, PRV'S, STRAINERS, CHECK VALVES. 1" (25MM)

3.1.1.4 BARRIER FREE PIPING INCLUDING HANDICAP WASTE ARMS, SUPPLIES, OR ANY PIPING OF A TEMPERATURE WHICH MAY CAUSE BURNS OR INJURY UPON CONTACT OR EXPOSURE. 1" (25MM)

– EXCEPTION

a) PEX PIPE FOR COLD OR HOT WATER EXCEPT IN B) ½" (12MM)
b) PEX PIPE FOR HOT WATER 2" OR LARGER 1" (25MM)

3.1.2 FOR HVAC INSTALLATIONS:

3.1.2.1 OUTSIDE AND/OR COMBUSTION/FRESH AIR DUCTS 1" (25MM)

3.1.2.2 EXHAUST DUCTS IN ATTIC SPACE AND/OR 10 FEET FROM OUTDOOR 1" (25MM)

3.1.2.3 SUPPLY AIR DUCTS & RETURN AIR DUCTS FROM FURNACE EQUIPMENT 1" (25MM)

3.2 CLEAN SURFACES AND PERFORM TESTS PRIOR TO INSULATION APPLICATION.

3.3 APPLY IN ACCORDANCE WITH BCICA STANDARD MANUAL.

3.4 FOR PIPING APPLICATION: HOT PIPING 1501–H; COLD PIPING 1501–C.

3.5 PIPING FINISH: WHERE INSULATION IS NOT SUBJECT TO WATER OR VAPOR, PF3 ECONOMY FINISH IS ACCEPTABLE. ALL FINISHES COMPLETE WITH 25/50 RATED PVC FITTING COVERS.

FOR EXPOSED INSULATED PIPING SUBJECT TO WATER OR VAPOR SUCH AS IN COOLER, FOOD FACTORY PRODUCTION AREAS AND REFRIGERATED AREAS, USE 15 MIL PVC JACKET WITH SOLVENT WELDS, WATER TIGHT JOINTS. ALL FINISHES COMPLETE WITH 25/50 RATED PVC FITTING COVERS.

FACTORY FABRICATED, EASILY DISASSEMBLED INSULATION SHALL BE USED FOR ALL FITTINGS, VALVES AND EQUIPMENT REQUIRE ACCESS FOR PERIODIC MAINTENANCE.

OUTDOOR FINISH TO HAVE ALUMINIUM WEATHERPROOF JACKET.

3.6 REFRIGERATION LINE INSULATION ON ROOF SHALL BE PROTECTED FROM DAMAGE, SUCH AS FROM BIRDS, BY WRAPPED INSIDE PROTECTIVE COVER MATERIAL.

3.7 FOR DUCTWORK APPLICATION: A) RIGID INSULATION EXTERNAL APPLICATION IN EXPOSED AREAS, ER/1 FOR HOT DUCT AND PLENUM, ER/2 FOR COLD DUCT AND PLENUM. B) FLEXIBLE INSULATION EXTERNAL APPLICATION IN CONCEALED SPACE, EF/1 FOR CONCEALED HOT DUCT AND PLENUM, EF/2 FOR CONCEALED COLD DUCT AND PLENUM. C) DUCT LINER, SEMI–RIGID 1S/1.

3.8 DUCTWORK FINISH: A) CONCEALED, FACTORY FINISHED WITH NO FURTHER FINISH REQUIRED. B) EXPOSED DUCTWORK AND PLENUMS (IN FINISHED AREA), RECTANGULAR RF/3 PREMIUM/CUSTOM ALTERNATE; ROUND RD/3 PREMIUM/CUSTOM ALTERNATE. C) OUTDOOR, RECTANGULAR RF/5 WEATHERPROOF JACKET; STANDARD 1502–A–RF/6 WEATHERPROOF COATING FOR LINED DUCTWORK, SHEET METAL SHALL BE COMPLETELY WEATHERPROOF. D) ACOUSTIC LINING, ALL BUTTED TRANSVERSE JOINTS AND EXPOSED LEADING EDGES ARE TO BE SEALED.

3.9 SIZES INDICATED FOR ACOUSTICALLY LINED DUCTWORK ARE CLEAR INSIDE DIMENSIONS. OMIT EXTERNAL THERMAL INSULATION ON ACOUSTICALLY LINED DUCTWORK.

3.10 FINISH INSULATION NEATLY AT HANGERS, SUPPORTS AND OTHER PROTRUSIONS. INSULATE FITTINGS AND VALVES. FOR EXPOSED APPLICATION, FINISH ENDS OF INSULATION NEATLY WITH INSULATED MATERIAL TROWELLED ON BEVEL. FOR COLD WATER PIPING, APPLY VAPOUR BARRIER CONTINUOUSLY THROUGHOUT INCLUDING PIPE HANGERS.

3.11 WHERE INSULATION 2–1/2" DIA. AND SMALLER IS VAPOR SEALED, OVERSIZE CLEVIS HANGER TO OUTSIDE DIMENSION OF INSULATION AND PROVIDE 12" LONG 16 GA. SHEET METAL BEARING PAD AT EACH HANGER. PROVIDE HEAVY DENSITY INSULATION INSERT WHERE PIPE HANGER IS AROUND INSULATION ON COLD PIPING OVER 2–1/2". HANGER INSIDE INSULATION IS NOT ACCEPTABLE.

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