

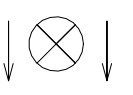


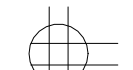
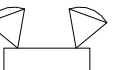
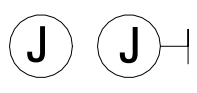

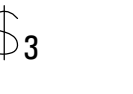




ELECTRICAL SPECIFICATION

- A. GENERAL
 - 1. APPLICABLE CODES: ALL WORK SHALL BE DONE IN ACCORDANCE WITH THE REQUIREMENTS OF THE FOLLOWING:
 - 2014 NATIONAL ELECTRICAL CODE
 - VIRGINIA CONSTRUCTION CODE 2015
 - REGULATIONS FOR LOCAL AUTHORITIES HAVING JURISDICTION
 - OSHA REGULATIONS
 - VIRGINIA ENERGY CONSERVATION CODE 2015
- B. SHOP DRAWINGS
 - 1. PROVIDE SHOP DRAWINGS FOR THE FOLLOWING ITEMS: LIGHTING FIXTURES, OCCUPANCY SENSORS, RECEPTACLES AND FIRE ALARM DEVICES
- C. EQUIPMENT AND DEFINITIONS
 - 1. ALL ELECTRICAL EQUIPMENT SHALL BEAR THE UNDERWRITER'S LABORATORIES LABEL.
 - 2. UNLESS SPECIFICALLY NOTED ON THE PLANS ALL CIRCUITRY, EQUIPMENT, DEVICES, ETC., NOT NOTED EXISTING TO REMAIN OR TO BE RELOCATED SHALL BE NEW.
- D. JUNCTION BOXES LABELING REQUIREMENTS
 - 1. ALL JUNCTION BOXES FOR BRANCH CIRCUITRY SHALL BE CLEARLY LABELED WITH PANEL DESIGNATION AND CIRCUIT NUMBERS.
- E. PANELBOARDS
 - 1. PROVIDE A TYPED CIRCUIT DIRECTORY FOR THE ENTIRE PANELBOARD REVISED UNDER THIS CONTRACT.
 - 2. CONTRACTOR SHALL PHASE BALANCE ALL PANELBOARDS AS NECESSARY.
 - 3. THE BRANCH CIRCUITS SHOWN FOR ITEMS SERVED AS INDICATED. CONTRACTOR SHALL FIELD COORDINATE ALL BRANCH CIRCUITS ACCORDINGLY.
 - 4. BRANCH CIRCUITRY SHOWN ON FLOOR PLAN CONNECTED TO A DESIGNATED CIRCUIT EXACT POSITION OF CIRCUIT BREAKER SHALL BE AFTER REMOVAL OF OUTLETS UNDER DEMOLITION. CONTRACTOR SHALL UTILIZE ALL C/B'S BECOMING SPARE
- F. CIRCUIT BREAKERS
 - 1. ALL NEW CIRCUIT BREAKERS TO BE INSTALLED IN NEW PANELS SHALL BE BOLT-ON TYPE.
- G. SWITCHES, RECEPTACLES, TELEPHONE OUTLETS AND DATA OUTLETS
 - 1. WHERE TWO OR MORE DEVICES OF THE SAME VOLTAGE ARE SHOWN TOGETHER ON THE PLANS, A GANGED PLATE SHALL BE USED. DEVICES OF DIFFERENT VOLTAGES SHALL BE SEPARATED HORIZONTALLY BY 6" BUT SHALL BE HORIZONTALLY OR VERTICALLY ALIGNED.
 - 2. ALL RECEPTACLES, TELEPHONE, AND DATA OUTLETS SHOWN ON A WALL BACK TO BACK SHALL BE OFFSET A MINIMUM OF 6" HORIZONTALLY.
- H. LIGHTING FIXTURES
 - 1. COORDINATE ALL LIGHTING FIXTURES WITH SPRINKLERS, MECHANICAL EQUIPMENT AND ARCHITECTURAL CEILING PLAN TO AVOID CONFLICT. GRID LAYOUT ON PLANS IS APPROXIMATE, ADJUST AND COORDINATE LIGHTING FIXTURES IN FIELD PER ARCHITECTS REFLECTED CEILING PLAN.
 - 2. PROVIDE FINISHED FRAMES FOR ALL RECESSED LIGHTING FIXTURES, TYPE TO BE COORDINATE ALL FIXTURE TYPES WITH CEILING SYSTEM BEFORE ORDERING FIXTURES. PROVIDE ALL MOUNTING ATTACHMENTS FOR A COMPLETE INSTALLATION. LIGHTING FIXTURES SHALL BE SUPPORTED PER LOCAL CODE REQUIREMENTS.
 - 3. ALL NEW LIGHTING FIXTURES SHALL BE INSTALLED COMPLETE WITH LAMPS. SEE LIGHTING FIXTURE SCHEDULE FOR LAMPS AND TYPE OF BALLASTS REQUIREMENTS AND/OR PLANS.
 - 4. COLOR OF LIGHTING FIXTURES SHALL BE AS SELECTED BY THE ARCHITECT.



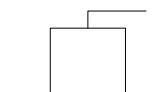
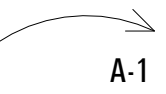


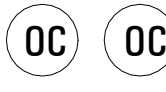
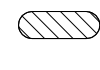
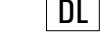
- I. BRANCH CIRCUITRY AND FEEDER
 - 1. ALL CONDUCTORS SHALL BE COPPER.
 - 2. ALL BRANCH CIRCUITRY AND FEEDER SHALL COMPLY WITH THE UTTEST NATIONAL ELECTRICAL CODE (N.E.C.) LOCAL JURISDICTION AND LOCAL STATE CODE REQUIREMENTS. THE FOLLOWING ARE SOME ACCEPTABLE WIRING METHOD REQUIREMENTS.
- J. INDOOR USE BRANCH CIRCUITRY
 - 1. METAL CLAD CABLE (MC CABLE) IS PERMITTED TO SERVE RECEPTACLES/LIGHTING AND OTHER EQUIPMENT LOAD. METAL CLAD CABLE MC IS PERMITTED TO RUN CONCEALED AREA SUCH AS CEILING SPACE AND FINISHED WALL AREA ONLY. CONTRACTOR SHALL FOLLOW E LECTRICAL SYMBOLS LIST ALL HOMERUN BRANCH CIRCUITRY FOR THE INDOOR EQUIPMENT SHALL BE INSTALLED IN EMT
- K. GENERAL NOTES IN REGARDS TO BRANCH CIRCUITRY AND FEEDER
 - 1. USE OF ALUMINUM CONDUIT SHALL NOT BE PERMITTED.
 - 2. ALL BRANCH CIRCUITRY AND FEEDERS SHALL BE RUN CONCEALED.
 - 3. ALL CIRCUITRY RUNS ARE DIAGRAMMATIC. THE CONTRACTOR SHALL DETERMINE IN FIELD THE MOST SUITABLE ROUTES.
 - 4. MINIMUM SIZE EMT OR CONDUIT SHALL BE 3/4". UNLESS MULTIPLE HOMERUN CIRCUITS REQUIRES URGER SIZE CONDUIT.
 - 5. NO NONMETALLIC CONDUIT SHALL BE USED FOR BRANCH CIRCUIT WORK ABOVE GRADE
- L. WIRE AND CABLE
 - 1. FEEDERS: FEEDER SHALL BE ALUMINUM . INSULATION SHALL BE THW OR THHN/THWN.
 - 2. COLOR CODE: ALL WIRING SHALL BE COLOR CODED THROUGHOUT AS PER N.E.C. REQUIREMENTS.
 - 3. ALL CONDUCTORS SHALL BE COPPER, MINIMUM #2 AWG.
 - 4. ALL RECEPTACLES, LIGHTING FIXTURES, MOTORS, ETC.. SHALL BE GROUNDED PER N.E.C. ALL RECEPTACLE CIRCUITS SHALL CONTAIN A #12 INSULATED GROUND CONDUCTORS
 - 5. RUN MULTIPLE HOMERUNS TO ALTERNATELY NUMBERED PANELBOARD CIRCUITS (I.E., 1,3,5) SERVING LIGHTING, GENERAL RECEPTACLES, AND MOTORS. ANY CIRCUITS SERVING, ISOLATED GROUND RECEPTACLES OR RECEPTACLES SERVING COMPUTER EQUIPMENT, WHEN THE CONTRACTOR RUN CIRCUITRY IN MULTIPLE HOMERUNS. CONTRACTOR SHALL OVERSIZE THE NEUTRAL CONDUCTOR TO A MINIMUM 200% OF THE CAPACITY OF PHASE CONDUCTORS SIZE THE EMT/CONDUIT ACCORDINGLY WHERE NECESSARY.
 - 6. ALL EMPTY RACEWAYS SHALL CONTAIN A DRAG WIRE. EMPTY RACEWAYS 2" OR LARGER IN SIZE SHALL HAVE A MAXIMUM OR 2 - 90 DEGREES BENDS PER RUN. WHERE REQUIRED, PROVIDE PULL BOXES PER N.E.C. REQUIREMENTS.
 - 7. FINAL CONNECTION TO ALL MOTORS OR VIBRATING EQUIPMENT SHALL BE WITH FLEXIBLE CONDUIT OR LIQUID-TIGHT FLEXIBLE CONDUIT FOR OUTDOOR.
 - 8. ALL 120 VOLT CIRCUIT HOMERUNS WHICH ARE OVER 100 LINEAR FEET SHALL BE A MINIMUM OF #10 CONDUCTORS OR AS SHOWN ON THE PLANS.
 - 9. EXPOSED AND CONCEALED CIRCUITRY SHALL BE RUN TIGHT TO CEILING SLAB IN A NEAT WORKMANLIKE MANNER. ALL RUNS SHALL BE PARALLEL OR PERPENDICULAR TO BUILDING WALL.

- M. GROUNDING
 - 1. PROVIDE GROUND TO ALL DEVICES PER N.E.C. REQUIREMENTS.
 - 2. PROVIDE SERVICE GROUND CONDUCTORS SIZE PER NEC REQUIREMENTS.
 - 3. PROVIDE EQUIPMENT GROUND CONDUCTORS SIZE PER NEC REQUIREMENTS.
- N. FIRE SEALANT MATERIALS
 - 1. ANY PENETRATION TO THE FIRE WALLS. CONTRACTOR SHALL PROVIDE FIRE SEALANT MATERIALS AT EVERY POINT WHERE OCCURRED. FIRE SEALANT MATERIALS MANUFACTURER SHALL BE SUBMITTED TO THE ARCHITECT FOR APPROVAL PRIOR TO APPLICATION.
- O. WORK SCHEDULE
 - 1. COORDINATE WITH ARCHITECT AND/OR OWNER'S REPRESENTATIVE FOR WORK SCHEDULE R EQUIREMENTS
- P. FINAL TESTING
 - 1. AT THE TIME OF FINAL INSPECTION AND TEST, ALL CONNECTIONS AND TERMINATIONS AT PANELBOARDS, DEVICES, EQUIPMENT, AS WELL ALL SPLICES MUST BE ALL COMPLETED. EACH BRANCH CIRCUIT AND ITS RESPECTIVE CONNECTED EQUIPMENT MUST TEST FREE OF SHORT CIRCUIT COMPLETION OF THE WORK, CLEAN AND POLISH ALL EXPOSED SURFACES IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.

ELECTRICAL SYMBOLS

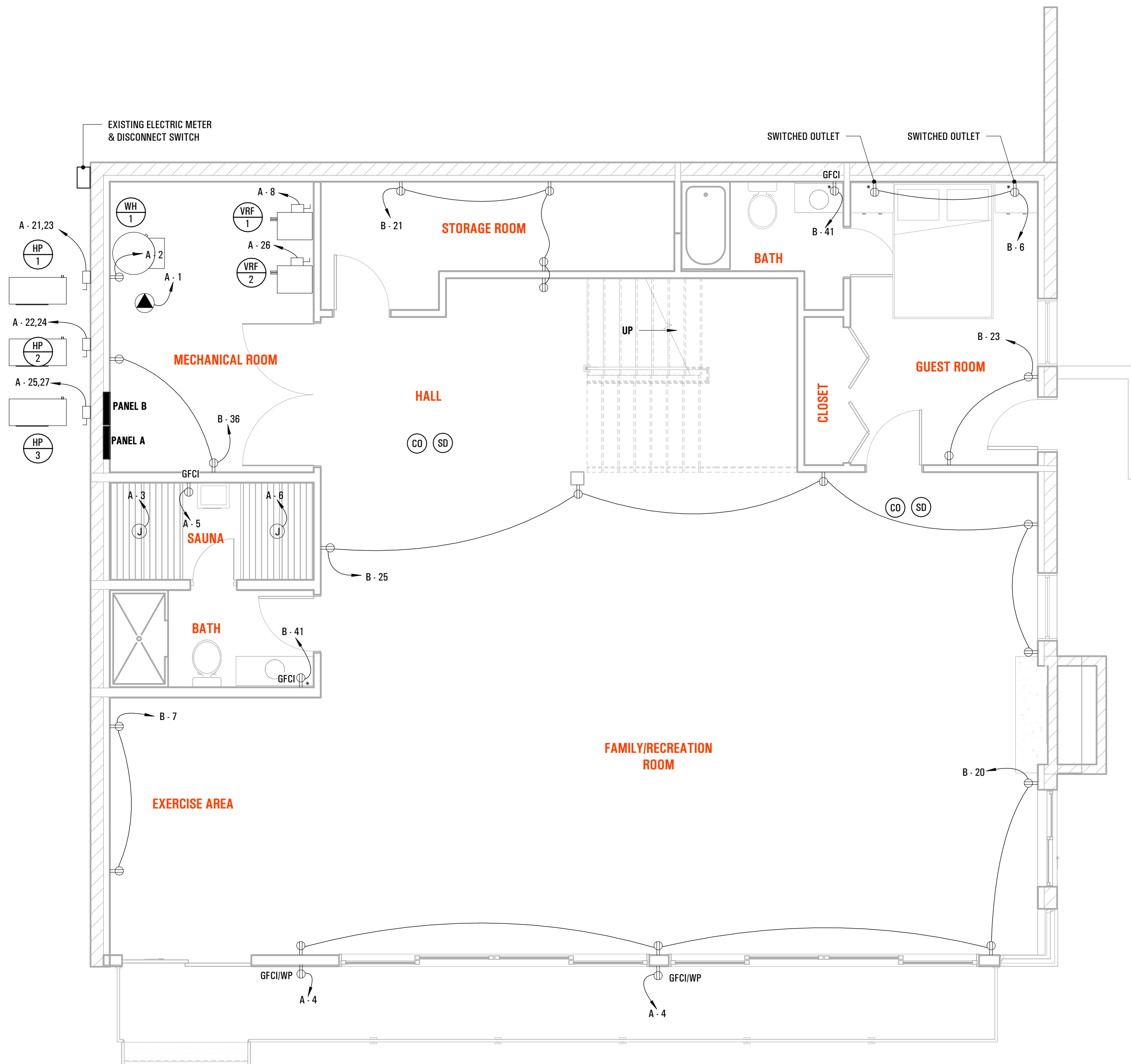
-  EXIT LIGHTING FIXTURE ON EMERGENCY CIRCUITRY ARROWS AS INDICATED. FIXTURES TO COMPLY WITH LOCAL JURISDICTION REQUIREMENTS - SEE SCHEDULE
-  MOTOR RATED SWITCH WITH THERMAL OVERLOAD
-  WALL MOUNTED DUPLEX RECEPTACLE - 2P, 3W, 20A, 125V, GROUNDED (HUBBELL #5362). COLOR OF DEVICE AND FACE PLATE SHALL BE AS SELECTED BY THE ARCHITECT. MOUNTING HEIGHT TO CENTERLINE ABOVE FINISHED FLOOR 18" UON.
-  WALL MOUNTED DOUBLE DUPLEX RECEPTACLE - 2P, 3W, 20A, 125V, GROUNDED (HUBBELL #5362). COLOR OF DEVICE AND FACE PLATE SHALL BE AS SELECTED BY THE ARCHITECT. MOUNTING HEIGHT TO CENTERLINE ABOVE FINISHED FLOOR 18" UON.
-  2-HEAD BATTERY LIGHTING UNIT
-  JUNCTION BOX - CEILING OR WALL MOUNTED
-  SINGLE POLE SWITCH - ARROW HART #1991. COLOR OF DEVICE AND FACE PLATE SHALL BE WHITE. MOUNTING HEIGHT TO CENTERLINE ABOVE FINISHED FLOOR 4' - 0" .
-  THREE WAY SWITCH . COLOR OF DEVICE AND FACE SHALL BE WHITE MOUNTING HEIGHT TO CENTERLINE ABOVE FINISHED FLOOR 4' - 0" .
-  DIMMER SWITCH MOUNTING HEIGHT TO CENTERLINE ABOVE FINISHED FLOOR 4' - 0" .
-  SMOKE DETECTOR
-  CARBON MONOXIDE DETECTOR
-  SPECIAL OUTLET. COORDINATE EXACT NEMA CONFIGURATIONS OF OUTLET WITH OWNER'S REPRESENTATIVE AND EXACT MOUNTING HEIGHT PRIOR TO ROUGH-IN.

ELECTRICAL SYMBOLS

-  PANELBOARD - SEE SCHEDULE. MOUNTING HEIGHT TO CENTERLINE ABOVE FINISHED FLOOR 6' - 0" TO TOP.
-  MOTOR CONNECTION - HORSEPOWER AS INDICATED, FRACTIONAL IF NO NOTED.
-  DISCONNECT SWITCH - SEE DRAWING FOR VOLTAGE, POLES AND AMPERAGE RATING.
-  HOMERUN TO PANELBOARD. NUMBER OF ARROWHEADS INDICATE NUMBER OF CIRCUITS. NUMERALS AND LETTERS ADJACENT TO ARROWHEADS INDICATE ASSIGNED PANEL AND CIRCUIT NUMBERS. SEE PANEL SCHEDULE FOR AMPERAGE RATING OF EACH CIRCUIT BREAKER AND CONDUCTOR SIZES
-  CIRCUITRY INSTALLED CONCEALED IN WALL OR ABOVE CEILING. NUMBER OF TICKS INDICATE NUMBER OF CONDUCTORS. IF NO TICKS MARK INDICATE 2 (TWO) CONDUCTORS IN RACEWAY. SEE PANEL SCHEDULE FOR CONDUCTOR SIZES.
-  SWITCH WITH OCCUPANCY SENSOR, +48" A.F.F. MOTION SENSOR SHALL BE AS MANUF. BY WATTSTOPPER WITH TIME DELAY SHALL BE SET @ LESS THAN 15 MINUTES WATTSTOPPER CAT# DW-100 COLOR TO BE SELECTED BY THE ARCHITECT.
-  OCCUPANCY SENSOR - CEILING OR WALL MOUNTED
-  SWITCH BANK
-  DAYLIGHT SENSOR

ABBREVIATIONS

- A AMPERE
- AFF ABOVE FINISHED FLOOR
- AIC AMPERES INTERRUPTING CAPACITY C CONDUIT/EMT
- C/B CIRCUIT BREAKER
- EC EMPTY CONDUIT/EMT. PROVIDE PULL WIRE
- EMT ELECTRICAL METALLIC TUBING
- G GROUND
- HP HORSEPOWER
- MCB MAIN CIRCUIT BREAKER
- MTD MOUNTED
- NIC NOT IN CONTRACT
- KW KILOWATTS
- P POLE
- PNL PANEL
- R RECESSED
- LF LINEAR FEET
- S SURFACE
- UON UNLESS OTHERWISE NOTED
- V VOLT
- W WIRE
- MTD MOUNTED
- OC ON CEILING
- EG EQUIPMENT GROUND
- IG ISOLATED GROUND
- FACP FIRE ALARM CONTROL PANEL
- WP WEATHER PROOF
- GFCI GROUND FAULT CIRCUIT INTERRUPTER
- CO CARBON MONOXIDE DETECTOR



1

BASEMENT POWER PLAN

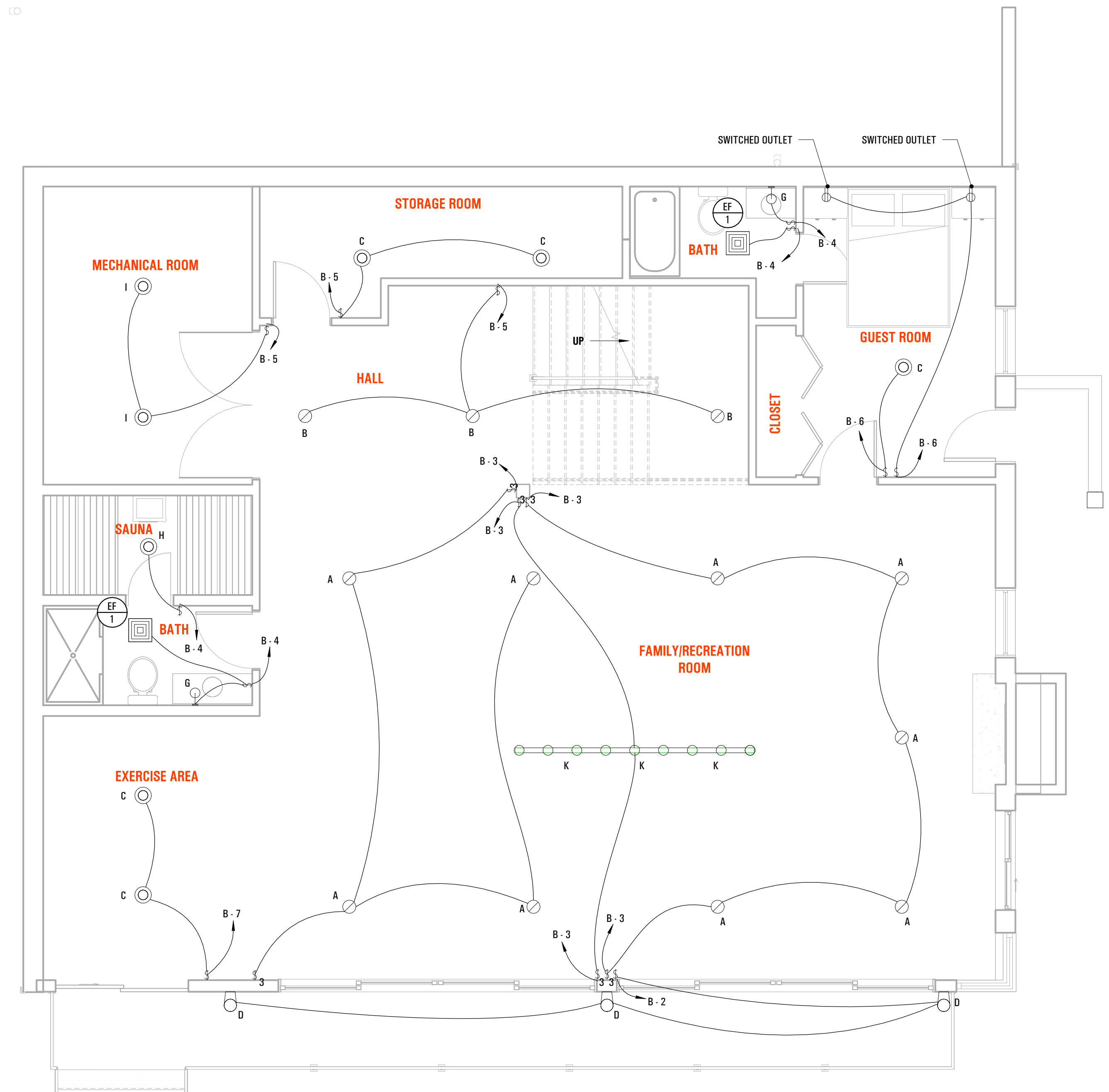
SCALE: 1/4" = 1'-0"

PLAN NOTES

- NON-LOCKING 125V 15A/20A RECEPTACLES IN THE UNIT IDENTIFIED BY NEC 210.52 SHALL COMPLY WITH NEC-2014 ARTICLE 406.12 (RECEPTACLES SHALL BE LISTED AS TAMPER-RESISTANT)
- RECEPTACLE OUTLETS IN HABITABLE SPACES SHALL BE AFCI-PROTECTED
- DISHWASHER TO BE HARD-WIRED WITH DISCONNECT. PLUG-IN WITH A RECEPTACLE LOCATED IN AN ACCESSIBLE LOCATION UNDER SINK IS ACCEPTABLE
- FOR OUTLETS INSTALLED ON EXTERIOR WALLS USE ACOUSTICAL JUNCTION BOX WITH PUFFY PADS AROUND THEM TO LIMIT AIR AND SOUND INFILTRATION.
- REFER TO MECHANICAL DRAWINGS FOR EXACT LOCATION AND TYPE OF MECHANICAL EQUIPMENT. IN KITCHEN WITH A CORNER PROVIDE AT LEAST ONE OUTLET PLACED WITHIN 36" (MIN) FROM THE CORNER. IN CORNER SITUATIONS WHERE 36" OF WALL IS NOT AVAILABLE, OUTLETS SHALL BE PLACED AS FAR FROM THE CORNER AS POSSIBLE CONSIDERING OTHER LIMITATION OR OTHER CODE REQUIREMENTS.

POWER PLAN LEGEND

	120V 20A DUPLEX RECEPTACLE @ 15" AFF
	120V 20A DUPLEX RECEPTACLE @ ABOVE COUNTER/TABLE
	240V 40A SPECIAL PURPOSE RECEPTACLE



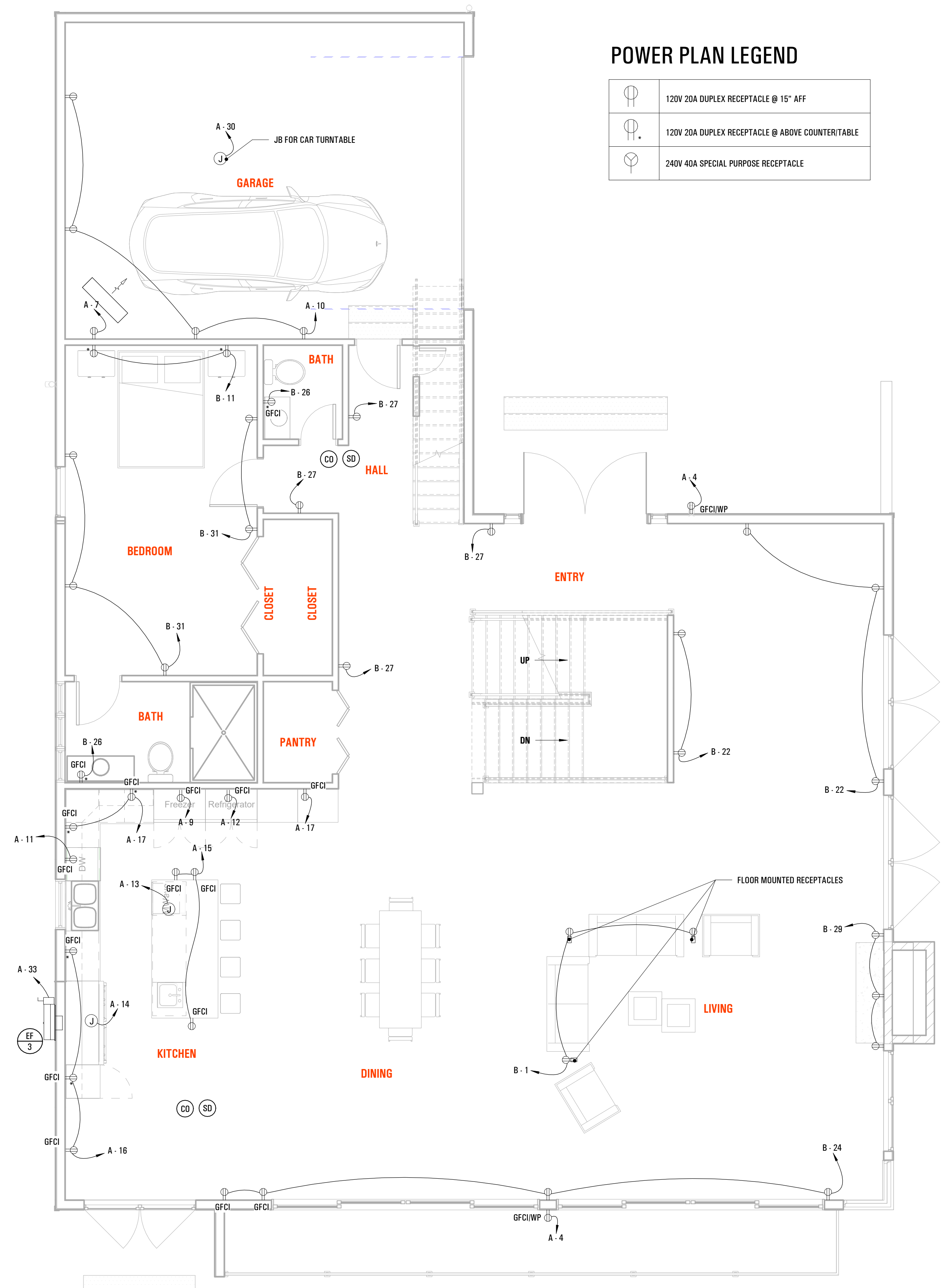
2

BASEMENT LIGHTING PLAN

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

LIGHTING FIXTURES LEGEND

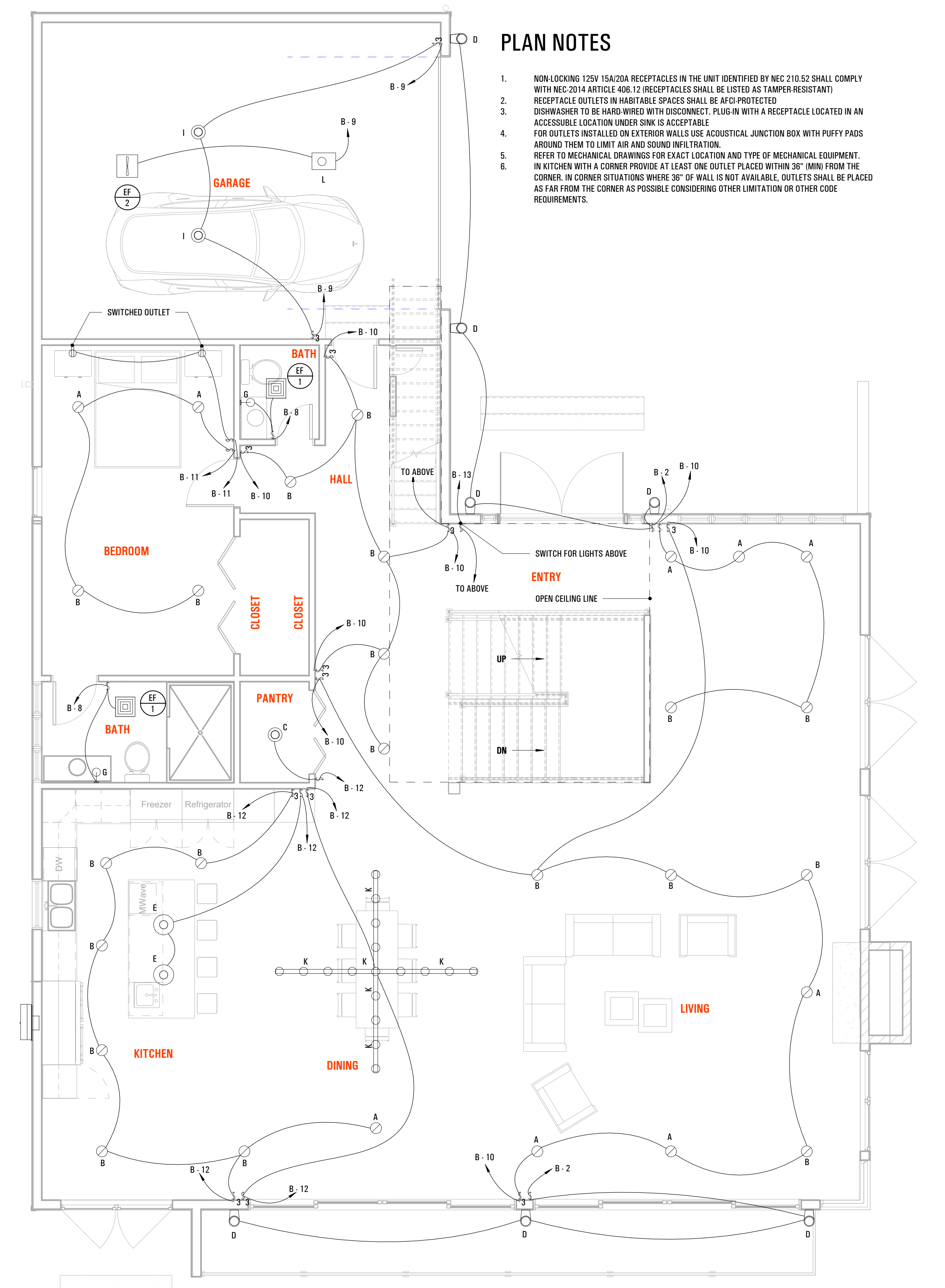
MARK	SYMBOL	SPECIFICATIONS	QTY	TYPE	WATTS	VOLTS	LUMENS	MANUFACTURER	MODEL
A		DOWNLIGHT	24	LED	15	120	1500	LIGHTOLIER	CALCULITE 6" ROUND C6L-R-DL-W-WW
B		DOWNLIGHT	40	LED	15	120	1500	LIGHTOLIER	CALCULITE 6CL-R-DL-W
C		SURFACE MOUNTED FIXTURE	12	LED	15.6	120	900	LIGHTOLIER	SDR7099-301W
D		WALL MOUNTED LIGHT	13	LED	10	120	1000	TBD	TBD
E		PENDANT LIGHT	2	LED	20	120	1500	TBD	TBD
F		WALL SCONCE LIGHT	9	LED	15.6	120	900	TBD	TBD
G		VANITY LIGHT	9	LED	10	120	1000	TBD	TBD
H		SURFACE MOUNTED FIXTURE	1	LED	15.6	120	900	TBD	TBD
I		SURFACE MOUNTED FIXTURE	4	LED	20	120	2500	TBD	TBD
L		GARAGE OPENER W/LIGHT	1	LED	40	120	3000	TBD	TBD
K		TRACK LIGHT	13	LED	81 / TRACK	120	600	LIGHTOLIER	LITE TRACK 4 FT TRACK 3 LAMP PER 4 FT OF TRACK
EF		EXHAUST FAN WITH LIGHT	1	LED	15	120	900	TBD	TBD



POWER PLAN LEGEND

	120V 20A DUPLEX RECEPTACLE @ 15" AFF
	120V 20A DUPLEX RECEPTACLE @ ABOVE COUNTER/TABLE
	240V 40A SPECIAL PURPOSE RECEPTACLE

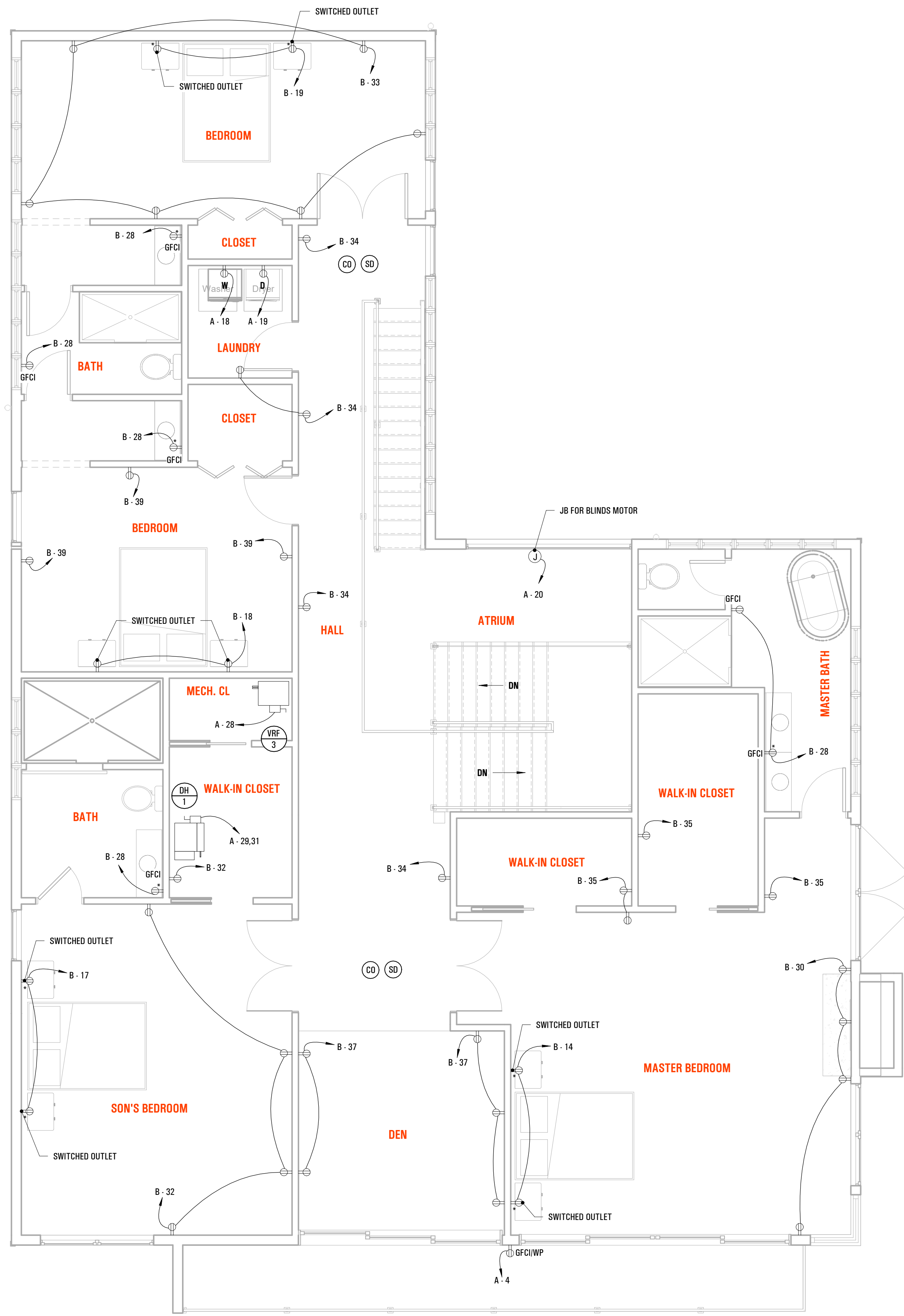
1 FIRST FLOOR POWER PLAN
SCALE: 1/4" = 1'-0"



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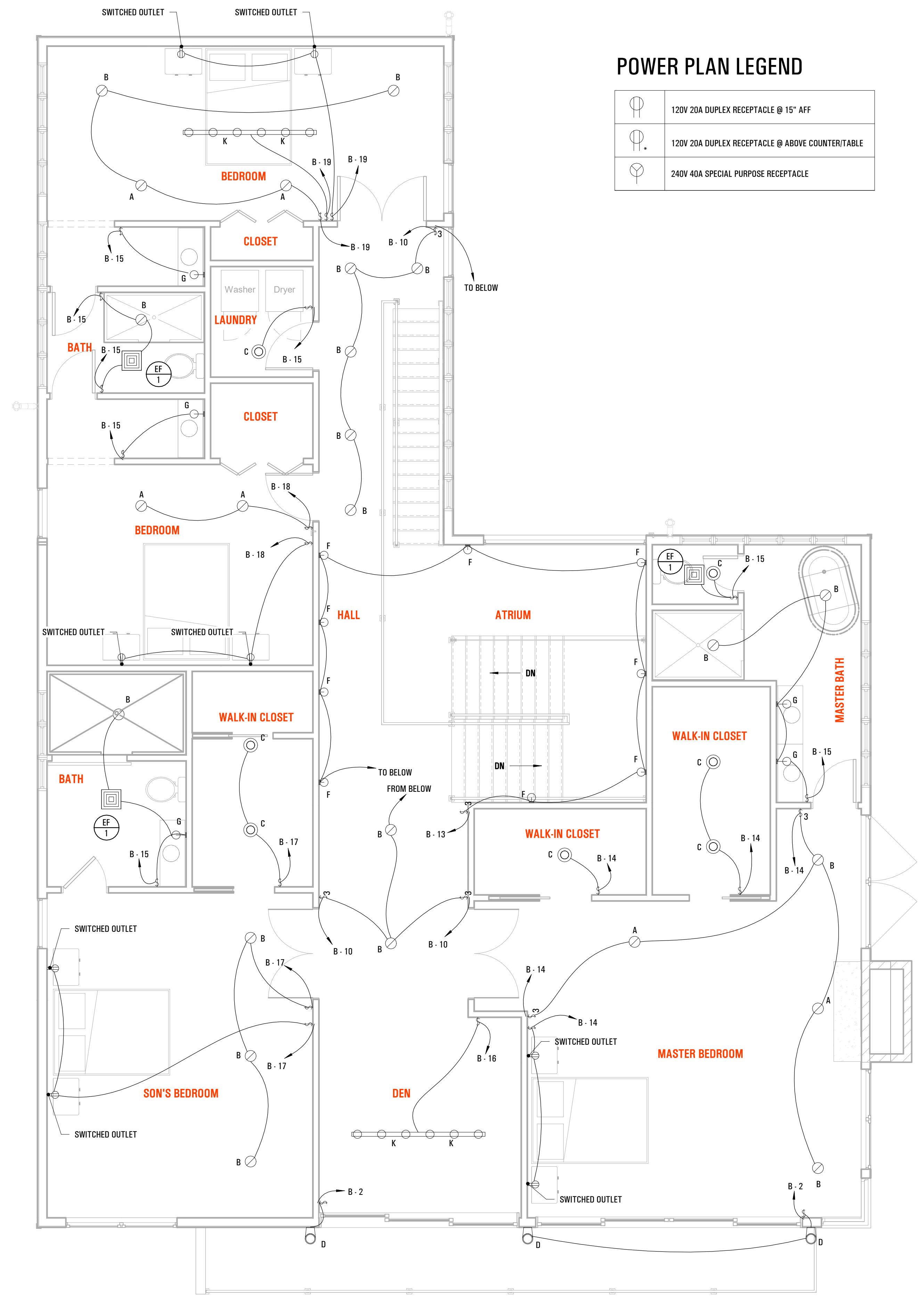
2 FIRST FLOOR LIGHTING PLAN
SCALE: 1/4" = 1'-0"



1

SECOND FLOOR POWER PLAN

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



POWER PLAN LEGEND

	120V 20A DUPLEX RECEPTACLE @ 15" AFF
	120V 20A DUPLEX RECEPTACLE @ ABOVE COUNTER/TABLE
	240V 40A SPECIAL PURPOSE RECEPTACLE



2

SECOND FLOOR LIGHTING PLAN

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

PANEL TAG A	
PANEL LOCATION MECHANICAL ROOM	
VOLTAGE 120/240 Single	
PHASE 1	WIRE 3
RATED AMPS 400 A	AIC 25K
MCB 400 A	MOUNTING Recessed

CIRCUIT	DESCRIPTION	NEW/ EXIST.	LOAD TYPE	BREAKER SIZE	POLES	WIRE SIZE	A	B	A	B	WIRE SIZE	POLES	BREAKER SIZE	LOAD TYPE	NEW/ EXIST.	DESCRIPTION	CIRCUIT
1	HOT WATER RECIRCULATION PUMP (CP-1)		M	20 A	1	1-#12, 1-#12, 1-#12	0.1		0.3		1-#12, 1-#12, 1-#12	1	20 A	WH		WATER HEATER	2
3	SAUNA EQUIPMENT		R	20 A	1	1-#12, 1-#12, 1-#12		1.8		0.9	1-#10, 1-#10, 1-#10	1	20 A	R		OUTDOOR LIGHTS & OUTLETS	4
5	SAUNA OUTLET		R	20 A	1	1-#12, 1-#12, 1-#12	0.3		1.8		1-#12, 1-#12, 1-#12	1	20 A	R		SAUNA EQUIPMENT	6
7	GARAGE HEATER		R	20 A	1	1-#12, 1-#12, 1-#12		0.5		0.5	1-#14, 1-#14, 1-#14	1	15 A	M		AIR HANDLER (VRF-1)	8
9	KITCHEN FREEZER		K	20 A	1	1-#12, 1-#12, 1-#12	1.2		1.2		1-#10, 1-#10, 1-#10	1	20 A	R		GARAGE OUTLETS	10
11	KITCHEN DISHWASHER		R	20 A	1	1-#12, 1-#12, 1-#12		1.2		1.2	1-#12, 1-#12, 1-#12	1	20 A	K		KITCHEN REFRIGERATOR	12
13	JB FOR KITCHEN MICROVAWE		K	20 A	1	1-#12, 1-#12, 1-#12	1.5		0.5		1-#12, 1-#12, 1-#12	1	20 A	K		JB FOR KITCHEN HOOD&GAS RANGE	14
15	KITCHEN OUTLETS		K	20 A	1	1-#12, 1-#12, 1-#12		0.9		0.7	1-#12, 1-#12, 1-#12	1	20 A	K		KITCHEN OUTLETS	16
17	KITCHEN OUTLETS		K	20 A	1	1-#12, 1-#12, 1-#12	1.8		1.5		1-#10, 1-#10, 1-#10	1	20 A	R		WASHER RECEPTACLE	18
19	DRYER RECEPTACLE		R	20 A	1	1-#10, 1-#10, 1-#10		1.5		0.5	1-#12, 1-#12, 1-#12	1	20 A	R		JB FOR SHADE	20
21	HEAT PUMP (HP-1)		M	40 A	2	2-#8, 1-#8, 1-#10	3.5		4.3		2-#6, 1-#6, 1-#10	2	45 A	M		HEAT PUMP (HP-2)	22
23	--		--	--	--	--		3.5		4.3	--	--	--	--	--	--	24
25	HEAT PUMP (HP-3)		M	60 A	2	2-#4, 1-#4, 1-#10	5.5		0.5		1-#14, 1-#14, 1-#14	1	15 A	M		AIR HANDLER (VRF-2)	26
27	--		--	--	--	--		5.5		0.7	1-#14, 1-#14, 1-#14	1	15 A	M		AIR HANDLER (VRF-3)	28
29	DUCT HEATER (DH-1)		M	80 A	2	2-#3, 1-#3, 1-#8	7.5		1.8		1-#8, 1-#8, 1-#8	1	20 A	R		GARAGE CAR TURNTABLE	30
31	--		--	--	--	--		7.5			--	--	--	--	--	--	32
33	KITCHEN EXHAUST FAN (EF-3)		M	20 A	1	1-#12, 1-#12, 1-#12	0.4										34
35	SUB PANEL "B"		R; M; L	100 A	2	3-#3, 1-#3, 1-#8			10.4								36
37	--		--	--	--	--			9.1								38
39																	40
41																	42

	A	B	TOTAL
CONNECTED LOAD	42.7	41.6	84.3
CONNECTED AMPS	355.8	346.3	351.1 A

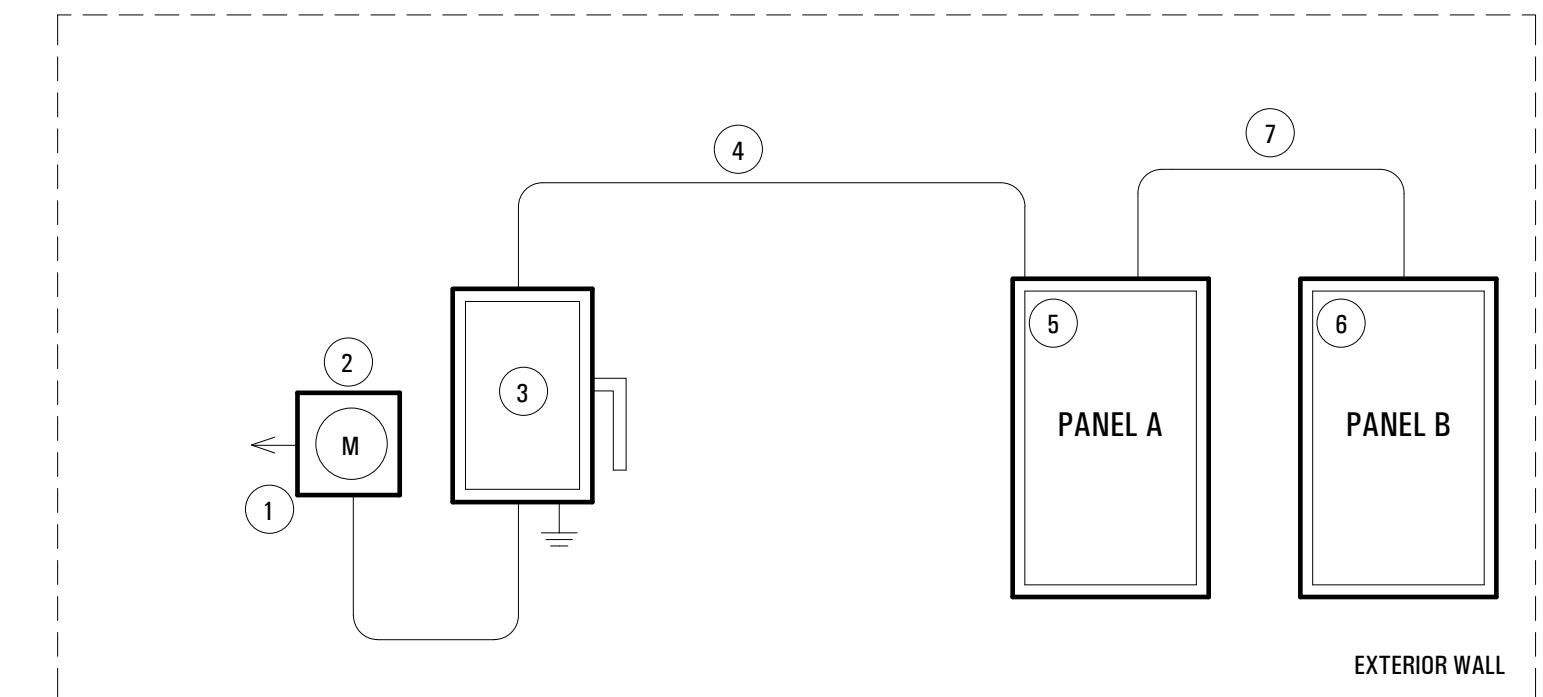
DEMAND LOAD CALCULATION	FACTOR	CONNECTED LOAD	DEMAND LOAD
CONTINUOUS LOADS (C)			
NON CONTINUOUS LOAD (NC)			
LIGHTING (L)	125%	1.9	2.4
RECEPTACLES (R) - UNDER / OVER 10KVA	66.5%	30.3	20.2
MOTOR LOADS (M)	100%	43.9	43.9
KITCHEN (K)	65%	7.8	5.0
WATER HEATER (WH)	100%	0.3	0.3
SUB PANEL (SP)			
DEMAND LOAD			71.9
DEMAND AMPS			299.5 A

PANEL TAG B	
PANEL LOCATION MECHANICAL ROOM	
VOLTAGE 120/240 Single	
PHASE 1	WIRE 3
RATED AMPS 100 A	AIC 25K
MCB 100 A	MOUNTING Recessed

CIRCUIT	DESCRIPTION	NEW/ EXIST.	LOAD TYPE	BREAKER SIZE	POLES	WIRE SIZE	A	B	A	B	WIRE SIZE	POLES	BREAKER SIZE	LOAD TYPE	NEW/ EXIST.	DESCRIPTION	CIRCUIT
1	LIVING OUTLETS		R	20 A	1	1-#12, 1-#12, 1-#12	0.5		0.1		1-#12, 1-#12, 1-#12	1	20 A	L		OUTDOOR LIGHTING	2
3	BASEMENT FAMILY ROOM LIGHTING		L	20 A	1	1-#12, 1-#12, 1-#12		0.2		0.1	1-#12, 1-#12, 1-#12	1	20 A	M; L		BASEMENT BATH FANS/LIGHTS	4
5	MECH ROOM/STORAGE/HALL LIGHTS BASEMENT		L	20 A	1	1-#12, 1-#12, 1-#12	0.1		0.4		1-#12, 1-#12, 1-#12	1	20 A	R; L		BASEMENT GUEST ROOM LIGHTS/OUTLETS	6
7	EXERCISE AREA LIGHTS/OUTLETS		R; L	20 A	1	1-#12, 1-#12, 1-#12		0.4		0.1	1-#12, 1-#12, 1-#12	1	20 A	M; L		1ST FLOOR BATH LIGHTS/FANS	8
9	GARAGE LIGHTING/DOOR OPENER/FAN		M; L	20 A	1	1-#12, 1-#12, 1-#12	0.1		0.4		1-#12, 1-#12, 1-#12	1	20 A	L		1ST FLOOR LIVING/ 1ST&2ND HALL LIGHTS	10
11	1ST FLOOR BEDROOM LIGHTS/OUTLETS		R; L	20 A	1	1-#12, 1-#12, 1-#12		0.4		0.3	1-#12, 1-#12, 1-#12	1	20 A	L		KITCHEN/PANTRY LIGHTS	12
13	2ND FLOOR SCENCE LIGHTS		L	20 A	1	1-#12, 1-#12, 1-#12	0.1		0.5		1-#12, 1-#12, 1-#12	1	20 A	R; L		MASTER BEDROOM LIGHTS/OUTLETS	14
15	2ND FLOOR BATH LIGHTS/FANS		M; L	20 A	1	1-#12, 1-#12, 1-#12		0.2		0.1	1-#12, 1-#12, 1-#12	1	20 A	L		DEN LIGHTS	16
17	SON'S BEDROOM LIGHTS/OUTLETS		R; L	20 A	1	1-#12, 1-#12, 1-#12	0.4		0.4		1-#12, 1-#12, 1-#12	1	20 A	R; L		2ND FLOOR BEDROOM LIGHTS/OUTLETS	18
19	2ND FLOOR BEDROOM LIGHTS/OUTLETS		R; L	20 A	1	1-#12, 1-#12, 1-#12		0.5		0.7	1-#12, 1-#12, 1-#12	1	20 A	R		FAMILY/RECREATION OUTLETS	20
21	STORAGE ROOM OUTLETS		R	20 A	1	1-#12, 1-#12, 1-#12	0.7		0.9		1-#12, 1-#12, 1-#12	1	20 A	R		LIVING OUTLETS	22
23	GUEST ROOM OUTLETS		R	20 A	1	1-#12, 1-#12, 1-#12		0.2		0.7	1-#12, 1-#12, 1-#12	1	20 A	R		LIVING OUTLETS	24
25	FAMILY/RECREATION OUTLETS		R	20 A	1	1-#12, 1-#12, 1-#12	0.9		0.4		1-#12, 1-#12, 1-#12	1	20 A	R		1ST FL BATH OUTLETS	26
27	HALL&ENTRY OUTLETS		R	20 A	1	1-#12, 1-#12, 1-#12		0.7		1.1	1-#10, 1-#10, 1-#10	1	20 A	R		2ND FLOOR BATHROOM OUTLETS	28
29	LIVING OUTLETS		R	20 A	1	1-#12, 1-#12, 1-#12	0.5		0.7		1-#10, 1-#10, 1-#10	1	20 A	R		MASTER BEDROOM OUTLETS	30
31	1ST FL. BEDROOM OUTLETS		R	20 A	1	1-#12, 1-#12, 1-#12		0.9		0.9	1-#12, 1-#12, 1-#12	1	20 A	R		SON'S BEDROOM OUTLETS	32
33	2ND FLOOR SOUTH BEDROOM OUTLETS		R	20 A	1	1-#10, 1-#10, 1-#10	1.1		0.9		1-#12, 1-#12, 1-#12	1	20 A	R		2ND FLOOR HALL OUTLETS	34
35	MASTER BEDROOM OUTLETS		R	20 A	1	1-#12, 1-#12, 1-#12		0.7		0.4	1-#12, 1-#12, 1-#12	1	20 A	R		MECHANICAL ROOM OUTLETS	36
37	DEN OUTLETS		R	20 A	1	1-#10, 1-#10, 1-#10	0.9										38
39	2ND FLOOR BEDROOM OUTLETS		R	20 A	1	1-#12, 1-#12, 1-#12		0.5									40
41	BASEMENT BATH OUTLETS		R	20 A	1	1-#12, 1-#12, 1-#12	0.4										42

	A	B	TOTAL
CONNECTED LOAD	10.4	9.1	19.5
CONNECTED AMPS	86.5	76.0	81.2 A

DEMAND LOAD CALCULATION	FACTOR	CONNECTED LOAD	DEMAND LOAD
CONTINUOUS LOADS (C)			
NON CONTINUOUS LOAD (NC)			
LIGHTING (L)	125%	1.9	2.4
RECEPTACLES (R) - UNDER / OVER 10KVA	78.9%	17.3	13.7
MOTOR LOADS (M)	100%	0.3	0.3
KITCHEN (K)			
WATER HEATER (WH)			
SUB PANEL (SP)			
DEMAND LOAD			16.3
DEMAND AMPS			68.1 A



ELECTRICAL RISER DIAGRAM
NOT TO SCALE

FEEDER AND EQUIPMENT NOTES

1. INCOMING EXISTING ELECTRICAL FROM POWER COMPANY 120/240V 1PH
2. NEW SOCKET METER 120/240V 1PH
3. NEW MAIN SWITCH 400A
4. NEW COPPER FEEDERS 3 MCM600+ 1 #3 GND IN 3" EMT CONDUIT
5. NEW PANEL "A" 400A, 120/240 V, 1PH, 3 W - SEE PANEL SCHEDULE
6. NEW SUB PANEL "B" 100A, 120/240 V, 1PH, 3 W - SEE PANEL SCHEDULE
7. NEW COPPER FEEDERS 3 #3+ 1 #8 GND IN 1" EMT CONDUIT

MECHANICAL GENERAL NOTES

1. GENERAL

1.1 THE MECHANICAL WORK SHALL CONFORM TO APPLICABLE STATE AND LOCAL CODES AND THE REQUIREMENTS OF THE AUTHORITIES HAVING JURISDICTION.

1.2 THE CONTRACTOR SHALL MAKE ALL NECESSARY ARRANGEMENTS AND PAY FOR ALL PERMITS, FEES, CHARGES AND INSPECTIONS REQUIRED, AS WELL AS HAULING, RIGGING AND TRANSPORTATION CHARGES APPLICABLE TO HIS WORK.

1.3 THE PROJECT SHALL BE BID ON THE BASIS OF SPECIFIED PRODUCT(S) WHICH ESTABLISH MINIMUM QUALITY REQUIREMENTS. WHERE MORE THAN ONE PRODUCT NAME IS INDICATED, BIDS SHALL BE BASED ON ONE OF THE NAMED PRODUCTS. ALL MECHANICAL EQUIPMENT SHOWN ON CONTRACT DOCUMENTS SHALL BE NEW, SHALL BE ALL LISTED AND SHALL BE PROVIDED BY THE MECHANICAL CONTRACTOR UNLESS OTHERWISE NOTED.

A). WHERE USE OF AN 'ACCEPTABLE EQUAL' PRODUCT REQUIRES CHANGES TO THE BASE DESIGN IN ORDER TO INCORPORATE THE PRODUCT INTO THE PROJECT, THE CONTRACTOR SHALL SUBMIT A LAYOUT SHOWING ALL CHANGES TO ARCHITECTURAL, STRUCTURAL, ELECTRICAL, PLUMBING AND MECHANICAL REQUIREMENTS. CHANGES DUE TO USE OF 'ACCEPTABLE EQUAL' PRODUCTS SHALL BE PROVIDED AT NO ADDITIONAL COST TO THE OWNER AND THE COST OF CHANCES SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR LAYOUT SHALL ACCOMPANY PRODUCT SUBMITTAL DATA.

B). SUBSTITUTIONS FOR 'ACCEPTABLE EQUAL' PRODUCTS NOT SPECIFIED WILL BE CONSIDERED WHEN INCLUDED WITH SUBMISSION OF THE BID AND SHALL BE SUBJECT TO ACCEPTANCE BY THE ENGINEER. PROPOSALS FOR SUBSTITUTIONS SHALL INCLUDE, BUT NOT BE LIMITED TO: (1) ANY ADDED CREDIT OR COST. (2) PRODUCT IDENTIFICATION. (3) CODE COMPLIANCE. (4) REFERENCED STANDARD COMPLIANCE. (5) DESCRIPTION OF ALL CHANGES INCLUDING ARCHITECTURAL, STRUCTURAL, ELECTRICAL, PLUMBING AND MECHANICAL, REQUIRED TO INCORPORATE SUBSTITUTED PRODUCT INTO THE PROJECT. THE OWNER/ENGINEER RESERVES THE RIGHT TO REJECT PROPOSED SUBSTITUTIONS.

C). WHERE 'OR EQUAL' PRODUCTS ARE INDICATED, THE CONTRACTOR SHALL SUBMIT A LIST OF PROPOSED EQUAL SUBSTITUTE PRODUCTS WITH THE BID. THE LIST SHALL INCLUDE ADEQUATE SUPPORTING INFORMATION AS PROOF OF EQUALITY IN ORDER TO BE CONSIDERED ACCEPTABLE. NO LATER SUBSTITUTES WILL BE CONSIDERED.

D). SUBSTITUTIONS SHALL PROVIDE THE SAME GUARANTEE AS SPECIFIED FOR BASE BID PRODUCTS.

1.4 THE CONTRACTOR SHALL VERIFY FIELD CONDITIONS FOR POINTS OF CONNECTIONS, CAPACITIES, AND LOCATIONS OF SYSTEMS. IN ALL AREAS AFFECTED BY THE PROJECT, CUT, PATCH, REPAIR, AND/OR REPLACE ALL MATERIALS DAMAGED AS A RESULT OF WORK. ALL REPAIRED FINISHES SHALL MATCH APPROPRIATE ADJACENT FINISHES. FILL VOIDS AROUND DUCTWORK PENETRATING WALLS WITH FIRE STOPPING MATERIAL.

1.5 MECHANICAL EQUIPMENT AND PRODUCTS SHALL BE LISTED AND/OR LABELED BY AN APPROVED TESTING OR INSPECTION AGENCY IN ACCORDANCE WITH LOCAL AND GOVERNING CODE REQUIREMENTS.

1.6 THE DRAWINGS ARE DIAGRAMMATIC AND INDICATE THE GENERAL ARRANGEMENT OF WORK INCLUDED IN THE PROJECT. DO NOT SCALE THE DRAWING. THE CONTRACTOR SHALL ESTABLISH FINAL DIMENSIONS FROM FIELD MEASUREMENTS, PRIOR TO STARTING WORK.

1.7 MECHANICAL WORK SHALL BE COORDINATED WITH THE WORK OF ALL OTHER TRADES PRIOR TO INSTALLATION, TO AVOID CONFLICTS AND ALLOCATE SPACE REQUIREMENTS.

1.8 MATERIALS SHALL BE RATES FOR THE OPERATING TEMPERATURE AND PRESSURE OF THE HYDRONIC SYSTEM. MATERIALS SHALL BE SUITABLE FOR THE TYPE OF FLUID IN THE HYDRONIC SYSTEM.

1.9 PROJECT PREMISES SHALL BE THOROUGHLY CLEANED AND READY FOR OCCUPANCY INCLUDING ALL FINISHES OF EQUIPMENT PROVIDED AS PART OF THE CONTRACTOR'S WORK. PROVIDE ONE NEW SET OF CLEAN AIR FILTERS FOR ALL AIR MOVING EQUIPMENT AT PROJECT CLOSEOUT.

1.10 THE WORD 'PROVIDE' AS USED IN THE PROJECT SHALL BE DEFINED AS "FURNISH AND INSTALL"

2. PIPING

2.1 PIPING SHOWN IS SCHEMATIC AND DOES NOT INDICATE EVERY OFFSET, ELBOW, UNION, VALVE, TRAP, ACCESS PANEL, ETC., THAT IS REQUIRED FOR A COMPUTE WORKING SYSTEM. PROVIDE ITEMS AND FITTINGS THAT ARE REQUIRED TO INSTALL THE PIPING SYSTEM WITHIN THE SPACE PROVIDED AND THAT ARE REQUIRED FOR A COMPUTE SYSTEM. PIPING SHALL BE PROPERLY SECURED IN ACCORDANCE WITH MSS STANDARD SP-69.

2.2 MATERIALS SHALL BE RATED FOR THE OPERATING TEMPERATURE AND PRESSURE OF DOMESTIC SYSTEM. MATERIALS SHALL BE SUITABLE FOR THE TYPE OF FLUID IN THE DOMESTIC SYSTEM.

2.3 PIPE SUPPORTS SHALL BE SELECTED AND INSTALLED IN ACCORDANCE WITH THE MSS SP-69 OR LOCAL CODES, WHICHEVER IS MORE STRINGENT. UTILIZE TRAPEZE HANGERS FOR PARALLEL RUNS OR PIPING, OTHER THAN SPRINKLER AND WASTE PIPING. COPPER PIPING SYSTEMS SHALL BE SUPPORTED ON COPPER OR COPPER-PLATED SUPPORTS. HANG PIPE FROM SUBSTANTIAL BUILDING STRUCTURE. PIPING SHALL NOT BE HUNG FROM OTHER PIPING, ALL RIGID HANGERS SHALL PROVIDED A MEANS OF VERTICAL ADJUSTMENT AFTER ERECTION. SHIELD SHALL BE PROVIDED BETWEEN HANGERS AND INSULATION.

2.4 WELDING SHALL CONFORM TO CURRENT STANDARDS AND RECOMMENDATIONS OF THE NATIONAL CERTIFIED PIPE WELDING BUREAU, NFPA 51B, STANDARD FOR FIRE PROTECTION; AND NFPA 241, STANDARD FOR SAFEGUARDING CONSTRUCTION, ALTERATION, AND DEMOLITION OPERATIONS.

3. EQUIPMENT

3.1 ALL MECHANICAL EQUIPMENT SHOWN ON CONTRACT DOCUMENTS SHALL BE NEW, AND SHALL BE PROVIDED BY THE MECHANICAL CONTRACTOR UNLESS OTHERWISE NOTED.

3.2 EQUIPMENT AND PRODUCT MANUFACTURER'S RECOMMENDATIONS AND INSTRUCTIONS FOR INSTALLATION AND OPERATION SHALL BE FOLLOWED IN PERFORMING MECHANICAL WORK, UNLESS OTHERWISE INDICATED OR DIRECTED. MATERIALS AND METHODS USED IN THE WORK SHALL BE COMPATIBLE WITH BUILDING CONDITIONS AND COMPLY WITH THE BUILDING CODE REQUIREMENTS, WHICH SHALL BE THE BASIS FOR MINIMUM PRODUCT QUALITY. ALL WORK SHALL BE PERFORMED IN A NEAT AND WORKMANLIKE MANNER BY SKILLED WORKMEN EXPERIENCED IN THEIR TRADE. THE WORK SHALL BE SUBJECT TO THE ACCEPTANCE OF THE OWNER OR THE DULY AUTHORIZED REPRESENTATIVE.

4. DUCTWORK

4.1 DUCTWORK SHALL BE FABRICATED OF GALVANIZED SHEET METAL WITH CONSTRUCTION AND INSTALLATION IN ACCORDANCE WITH SMACNA STANDARDS AND SYSTEM REQUIREMENTS. SHEET METAL GAUGES SHALL CONFORM TO THE INTERNATIONAL MECHANICAL CODE (IMC), ASHRAE STANDARDS, AND UL LISTED FIRE RESISTANCE DIRECTORY REQUIREMENTS AS APPLICABLE.

4.2 DUCT COVERINGS, DUCT LININGS, TAPES, AND CORE MATERIAL SHALL HAVE A FLAME SPREAD RATING NOT OVER 25, AND SMOKE DEVELOPMENT NOT OVER 50.

4.3 EXPOSED DUCTWORK TO BE FABRIC DUCT W/ INTERNAL FRAME.

4.4 ALL NECESSARY ALLOWANCES AND PROVISIONS SHALL BE MADE BY CONTRACTOR FOR BEAMS, COLUMNS OR OTHER OBSTRUCTIONS OF THE BUILDING OR THE WORK OF OTHER CONTRACTORS. WHETHER OR NOT SAME IS INDICATED. WHERE NECESSARY TO AVOID OBSTRUCTIONS, THE DUCTS SHALL BE TRANSFORMED, DIVIDED OFFSET, RAISED OR LOWERED WITH THE REQUIRED FREE AREA BEING MAINTAINED IN ACCORDANCE WITH SMACNA STANDARDS.

4.5 ALL RECTANGULAR DUCTWORK ELBOWS 30 DEGREE OR GREATER SHALL BE PROVIDED WITH DOUBLE THICKNESS RADIUS TURNING VANES.

4.6 DUCTWORK SIZES SHOWN ARE NET CLEAR INSIDE DIMENSIONS. FOR INTERNALLY LINED DUCTS, FABRICATE SHEET METAL TO ALLOW FOR THICKNESS OF INSULATION AND MAINTAIN NET CLEAR DIMENSIONS.

4.7 DUCTWORK SHALL BE SEALED WITH AN APPROVED DUCT MASTIC OR LIQUID SEALANT AS MANUFACTURED BY UNITED MCGILL CORP., OR APPROVED EQUAL. DUCT SYSTEM LEAKAGE SHALL CONFORM TO SMACNA "HVAC DUCT LEAKAGE TEST MANUAL" FOR CLASS 2" W.C. SEAL CLASS A, LEAKAGE CLASS 24 FOR RECTANGULAR DUCTS AND CLASS 12 FOR ROUND DUCTWORK.

4.8 COORDINATE SPECIFIC FIRE RESISTIVE CONSTRUCTION REQUIREMENTS WITH THE FIRE RATED ASSEMBLIES INDICATED ON ARCHITECTURAL DRAWINGS. THROUGH PENETRATIONS FIRESTOP SYSTEMS SHALL CONFORM TO UL LISTED FIRE RESISTANCE DIRECTORY OR OTHER METHODS ACCEPTABLE TO LOCAL GOVERNING CODE AUTHORITIES.

4.9 PROVIDE FLEXIBLE CONNECTIONS IN ALL DUCTWORK SYSTEMS (SUPPLY, RETURN AND EXHAUST) CONNECTED TO AIR HANDLING UNITS, FANS AND OTHER EQUIPMENT WHICH REQUIRE VIBRATION ISOLATION. FLEXIBLE CONNECTIONS SHALL BE PROVIDED AT THE POINT OF CONNECTION TO THE EQUIPMENT UNLESS OTHERWISE INDICATED.

4.10 PROVIDE ACCESS DOORS IN DUCTWORK TO PROVIDE ACCESS FOR ALL SMOKE DETECTORS, FIRE DAMPERS, SMOKE DAMPERS, VOLUME DAMPERS, COILS, AND OTHER ITEMS LOCATED IN THE DUCTWORK WHICH REQUIRE SERVICE AND/ OR INSPECTION. LABEL ACCESS WITH 1/2" LETTERING.

5. AIR DUCT ACCESSORIES (233300)

5.1 GRAVITY BACKDRAFT DAMPERS SHALL HAVE THE FOLLOWING CHARACTERISTICS:

5.1.1 FRAME SHALL BE HAT-SHAPED, MINIMUM 0.05-INCH THICK, GALVANIZED SHEET STEEL WITH WELDED OR MECHANICALLY ATTACHED CORNERS.

5.1.2 BLADES SHALL BE MULTIPLE, SINGLE-PIECE, PARALLEL BLADES, CENTER PIVOTED, MAXIMUM 6-INCH WIDTH, MINIMUM 0.025 INCH THICK, ROLL-FORMED ALUMINUM WITH NEOPRENE, MECHANICALLY LOCKING EDGES. BLADE RETURN SPRING SHALL HAVE ADJUSTABLE TENSION.

5.1.3 BEARINGS SHALL BE STEEL BALL OR SYNTHETIC PIVOT BUSHINGS.

5.1.4 PROVIDE ADJUSTMENT DEVICE TO PERMIT SETTING DIFFERENTIAL STATIC PRESSURE, AND COUNTERWEIGHTS FOR VERTICAL AIRFLOW INSTALLATIONS AND GALVANIZED STEEL INSECT SCREEN.

5.2 STANDARD, STEEL, MANUAL VOLUME DAMPERS:

5.2.1 MANUAL BALANCING DAMPERS SHALL BE REINFORCED TO PREVENT VIBRATION AND PROVIDED WITH LOCKING QUADRANT LEVERS WHICH ARE CLEARLY MARKED FOR POSITION AND DAMPERS BOLTED, RIVETED OR OTHERWISE SECURED TO QUADRANT TO REFLECT THEIR TRUE POSITION.

5.2.2 MANUAL BALANCING DAMPERS SHALL BE OPPOSED BLADE TYPE WITH BLADES 8 INCHES WIDE MAXIMUM AND 48 INCHES LONG MAXIMUM.

5.2.3 CONSTRUCTION SHALL BE IN ACCORDANCE WITH SMACNA LOW VELOCITY DUCT CONSTRUCTION STANDARDS.

6. INSULATION

6.1 INSULATION MATERIALS SHALL BE CERTAIN-TEED OR APPROVED EQUAL INSULATION MATERIALS SHALL HAVE A FLAME SPREAD RATING NOT MORE THAN 25 AND A SMOKE DEVELOPED RATING OF NOT MORE THAN 50. PROVIDE IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS AND AS FOLLOWS:

7. DUCT INSULATION

1. SUPPLY/RETURN AIR DUCTWORK (CONCEALED): INSULATE WITH NOMINAL 1-INCH THICK TYPE 75 STANDARD DUCTWRAP WITH FSK FACING VAPOR BARRIER. MINIMUM 3/4-INCH INSTALLED THICKNESS WITH A 5.6 R VALUE.

2. SUPPLY/RETURN AIR DUCTWORK (INTERIOR EXPOSED WHERE INDICATED): INSULATE WITH 1-INCH THICK TYPE 200 ULTRA-LITE ACOUSTICAL DUCT LINER WITH 100 PERCENT ADHESIVE COVERAGE AND MECHANICAL FASTENERS. MINIMUM INSTALLED R VALUE OF 3.1.

3. OUTSIDE AIR DUCTS (OA DUCTWORK & DUCTWORK EXPOSED TO WEATHER CONDITIONS): INSULATE DUCTWORK EXTERIOR WITH SEMI-RIGID FIBERGLASS BOARD INSULATION, TYPE 1B300, 3.0 LBS/CU. FT. DENSITY, MINIMUM 2-INCH INSTALLED THICKNESS WITH 8.5 R VALUE. PROVIDE WEATHERPROOF FINISH AS MANUFACTURED BY FOSTERS MONOLAR 80 -95 COATINGS (MINIMUM OF 3 COATS) OR APPROVED EQUAL.

4. PROVIDE ALL NECESSARY FOUNDATIONS, SUPPORTS, PADS AND BASES AS REQUIRED FOR MECHANICAL EQUIPMENT, PIPING, AND DUCTWORK AS PER INTERNATIONAL BUILDING AND MECHANICAL CODES. INSTALL EQUIPMENT, PIPING, AND DUCTWORK SO AS TO BE FREE FROM OBJECTIONABLE NOISE AND VIBRATIONS. CONTRACTOR SHALL COORDINATE WORK WITH STRUCTURAL AND ARCHITECTURAL DRAWINGS PRIOR TO ACTUAL WORK.

8. ELECTRICAL WORK

8.1 ELECTRIC MOTORS FOR MECHANICAL EQUIPMENT SHALL BE PROVIDED UNDER THE MECHANICAL WORK UNLESS OTHERWISE NOTED. ALL MOTORS SHALL BE NEMA STANDARD DESIGN FOR QUIET OPERATION AND SIZED TO PROPERLY OPERATE EQUIPMENT AT RATED LOAD. MOTORS WITH BELT DRIVES SHALL BE PROVIDED WITH ADJUSTABLE PULLEYS AND SHAFTS. ELECTRICAL POWER CONNECTIONS FOR MECHANICAL EQUIPMENT SHALL BE PROVIDED UNDER THE ELECTRICAL WORK.

8.2 MOTOR STARTERS, RELAYS, AND CONTACTORS SHALL BE FURNISHED UNDER THE MECHANICAL WORK AND INSTALLED AND POWERED UNDER THE ELECTRICAL WORK. STARTERS, RELAYS, AND CONTACTORS SHALL BE COMPUTE WITH LUGS SIZED FOR SPECIFIED CONDUCTORS AND INCLUDE REQUIRED ACCESSORIES (I.E. START-STOP PUSH BUTTON, PILOT LIGHTS, H.O.A. SWITCH, AUXILIARY CONTACTS AND OVERLOAD PROTECTION), GENERAL PURPOSE NEMA TYPE 1 ENCLOSURES INDOORS, NEMA TYPE 3R ENCLOSURES OUTDOORS. SINGLE PHASE MOTOR STARTERS SHALL BE MANUAL TYPE WITH OVERLOAD PROTECTION, UNLESS OTHERWISE NOTED. THREE PHASE STARTERS SHALL BE MAGNETIC FULL VOLTAGE, NON-REVERSING, UNLESS OTHERWISE NOTED. STARTERS FOR MECHANICAL SYSTEMS SHALL BE AS MANUFACTURED BY SQUARE-D, GENERAL ELECTRIC, OR CUTLER HAMMER. STARTERS SHALL CONFORM TO NEMA STANDARDS AND NATIONAL ELECTRICAL CODE (NEC) REQUIREMENTS. STARTER CONTROL AND INTERLOCK WIRING SHALL BE PROVIDED UNDER THE MECHANICAL WORK. ALL EQUIPMENT SHALL BE FURNISHED W/ MANUFACTURER PROVIDED DISCONNECT SWITCH.

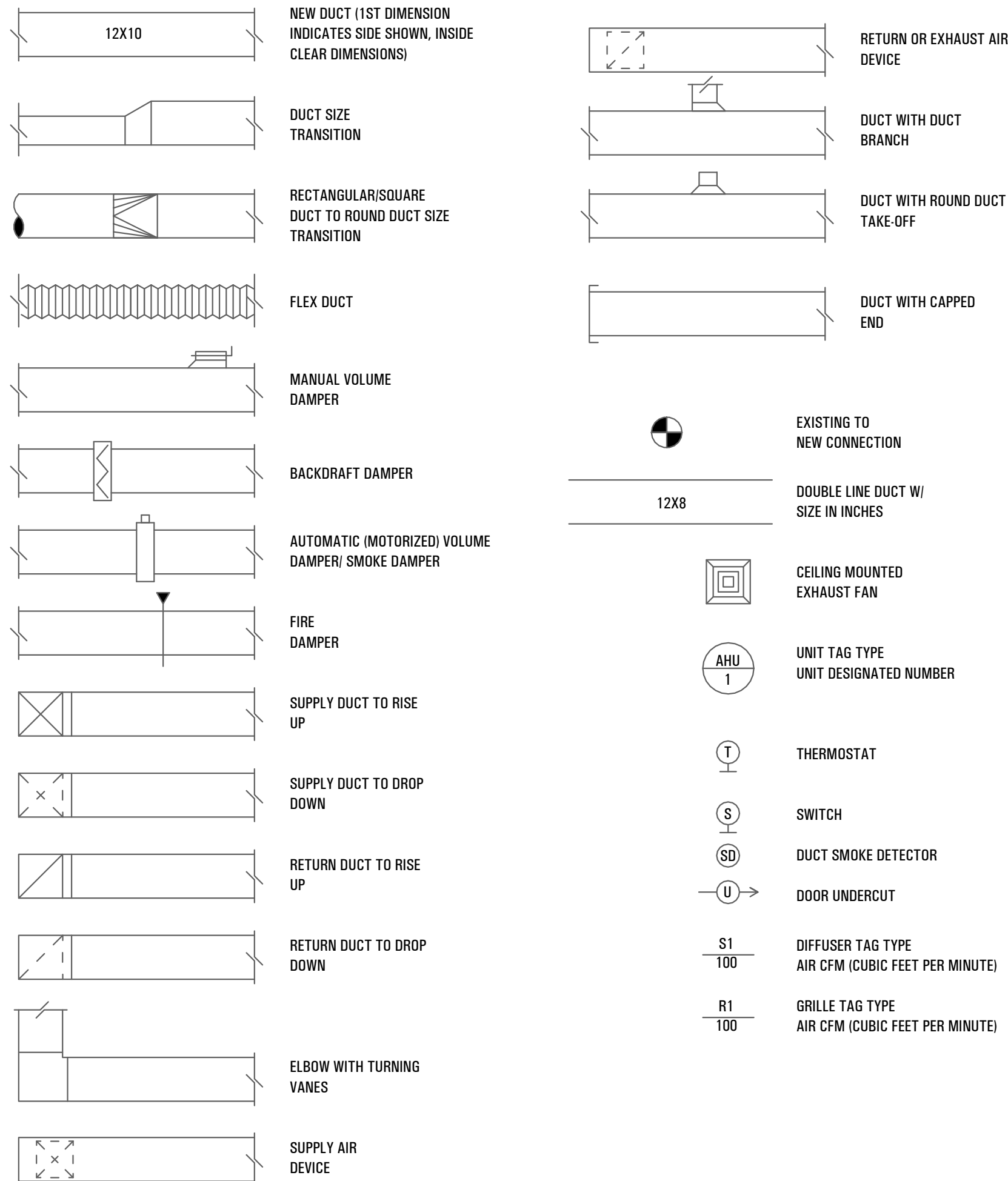
8.3 DUCT SMOKE DETECTORS SHALL BE INSTALLED IN ALL AIR DISTRIBUTION SYSTEMS WITH A DESIGN CAPACITY OF 2000 CFM OR GREATER IN ACCORDANCE WITH THE INTERNATIONAL MECHANICAL CODE SECTION 606 AND NATIONAL FIRE PREVENTION CODE NFPA 72 AND 90A. DUCT SMOKE DETECTORS SHALL BE "DUAL CONTACT" TYPE (FOR TIE-IN TO FIRE ALARM SYSTEM AND FOR FAN SHUT-DOWN). COMPLETE WITH SAMPLING TUBE, REMOTE RESET, REMOTE PILOT INDICATOR (FOR CONCEALED APPLICATIONS), UL LISTED FOR INTENDED USE AND COMPLETELY COMPATIBLE WITH FIRE ALARM SYSTEM. DUCT SMOKE DETECTORS SHALL BE FURNISHED AND INSTALLED UNDER THE MECHANICAL WORK AND WIRED AND POWERED UNDER THE ELECTRICAL WORK.

9. CONTROLS

9.1 PROVIDE AUTOMATIC TEMPERATURE CONTROL SYSTEM(S) FOR HVAC EQUIPMENT UNDER MECHANICAL WORK. CONTROL DEVICES SHALL BE PROVIDED BY UNIT MANUFACTURER, UNLESS OTHERWISE NOTED. HVAC EQUIPMENT NOT PROVIDED WITH CONTROL DEVICES SHALL BE PROVIDED WITH DEVICES AS MANUFACTURED TO MATCH BASE BUILDING CONTROLS OR APPROVED EQUAL. AIR HANDLER SHALL HAVE NIGHT SET BACK CONTROLLED BY A PROGRAMMABLE THERMOSTAT. DEVICE(S) SHALL BE FULLY COMPATIBLE AND SUITABLE FOR INTENDED USE. CONTROL WIRING SHALL BE PROVIDED IN ACCORDANCE WITH THE NEC FOR 24-VOLT CONTROL SYSTEM(S). WIRING SHALL BE A MINIMUM 22 AWG, COLOR CODED AND INSTALLED IN CONDUIT WHERE SUBJECT TO PHYSICAL DAMAGE OR WHERE REQUIRED TO AVOID PLENUM SPACES. EXTEND ALL LOW VOLTAGE WIRING UNBROKEN BETWEEN EACH CONTROL DEVICE AND EQUIPMENT TERMINAL STRIP. INSTALLATION OF CONTROL SYSTEM(S), WRING, AND DEVICES SHALL BE BY A CERTIFIED CONTROLS CONTRACTOR WITH A MINIMUM OF FIVE (5) YEARS EXPERIENCE IN THE INSTALLATION AND SERVICING OF CONTROLS.

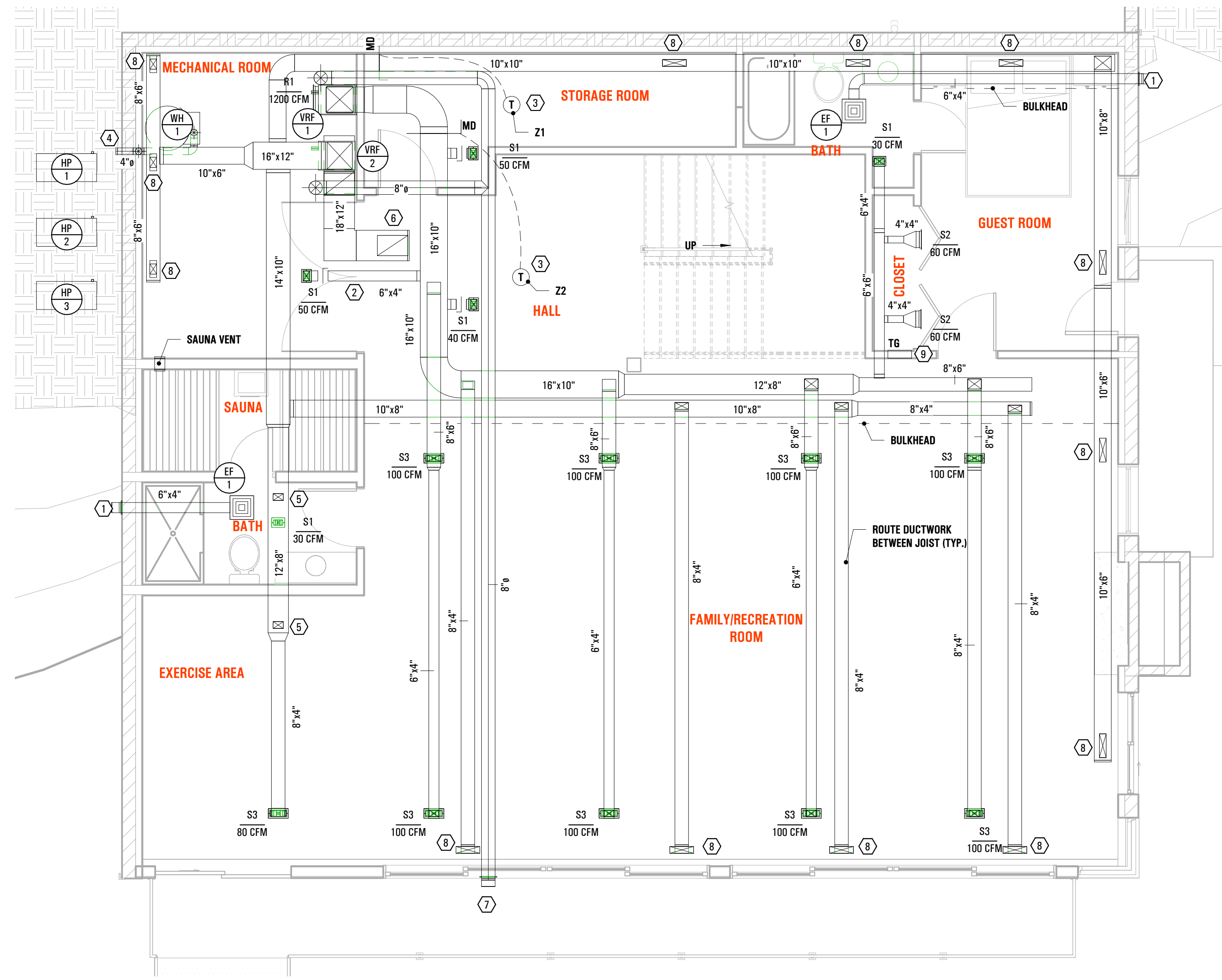
9.2 UNLESS OTHERWISE INDICATED, ALL THERMOSTATS SHALL BE MOUNTED IN ACCORDANCE WITH ADA REQUIREMENTS.

SYMBOLS



ABBREVIATIONS

AF	AIR FILTER	EQUIP	EQUIPMENT	NO	NORMALLY OPEN
AFF	ABOVE FINISHED FLOOR	ESP	EXTERNAL STATIC PRESSURE	NOM	NOMINAL
ACU	AIR CONDITIONING UNIT	EXT	EXTERNAL	No.	NUMBER
AHU	AIR HANDLING UNIT	F	DEGREE FAHRENHEIT	O.A.	OUTSIDE AIR
APD	AIR PRESSURE DROP	FD	FIRE DAMPER	OAT	OUTSIDE AIR TEMPERATURE
ARCH	ARCHITECTURAL	FL	FLOOR	OED	OPEN END DUCT
BDD	BACKDRAFT DAMPER	FFM	FEET PER MINUTE	PD	PRESSURE DROP
BPD	BYPASS DAMPER	FT	FEET	PS	PRESSURE SENSOR
BLW	BELOW			PSI	POUND PER SQUARE INCH
BTUH	BRITISH THERMAL UNIT PER HOUR	GALV	GALVANIZED	RA	RETURN AIR
		HC	HEATING COIL	RAT	RETURN AIR TEMPERATURE
		HP	HEAT PUMP	REFRIG	REFRIGERANT
		HW	HOT WATER	RLA	RUNNING LOAD AMPERE
				RPM	REVOLUTION PER MINUTE
		IN	INCH	SA	SUPPLY AIR
		IN. WG.	INCH WATER GAUGE	SAT	SUPPLY AIR TEMPERATURE
		KW	KILOWATT	SD	SMOKE DETECTOR
				SF	SUPPLY FAN
		LAT	LEAVING AIR TEMPERATURE	STRUC	STRUCTURAL
		LB	POUNDS		
		LF	LINEAR FEET		
				TD	TRANSFER DUCT
		MAX	MAXIMUM	TS	TEMPERATURE SENSOR
		MBH	1000 BTUH	TYP	TYPICAL
		MECH	MECHANICAL		
		MER	MECHANICAL EQUIPMENT ROOM	UNO	UNLESS NOTED OTHERWISE
		MIN	MINIMUM		
		MOT	MOTORIZED	W	WATT
(E)	EXISTING			WB	WET BULB
EA	EACH	NC	NOISE CRITERIA	WC	WATER COLUMN
EAT	ENTERING AIR TEMPERATURE	NC	NORMALLY CLOSED	WMC	WIRE MESH SCREEN
EF	EXHAUST FAN	NIC	NOT IN CONTRACT	WPD	WATER PRESSURE DROP



KEY NOTES

- ① 6"x4" BATHROOM EXHAUST THRU EXTERIOR WALL WITH VENT CAP & BACKDRAFT DAMPER
- ② DOOR LOUVER
- ③ TEMPERATURE ZONE SENSOR ON GROUND FLOOR
- ④ 4" VENT CONCENTRIC KIT THRU EXTERIOR WALL
- ⑤ 6"x4" DUCT UP TO KITCHEN ISLAND DIFFUSERS
- ⑥ 16"x12" RETURN AIR DUCT UP
- ⑦ 8" OUTDOOR AIR INTAKE FOR VRF-1 & VRF-2
- ⑧ DUCT UP TO FLOOR DIFFUSERS
- ⑨ 14"x8" TRANSFER GRILLE

PLAN NOTES

- 1. EXHAUST OPENINGS TERMINATING TO THE OUTDOORS SHALL BE COVERED WITH A CORROSION-RESISTANT SCREEN HAVING NOT LESS THAN 1/4" OPENINGS, AND SHALL HAVE NOT MORE THAN 1/2" OPENINGS.
- 2. EXHAUST DUCT SHALL TERMINATE NOT LESS THAN 3 FEET FROM A PROPERTY LINE, 10 FEET FROM A FORCED AIR INLET, AND 3 FEET FROM OPENINGS INTO THE BUILDING.

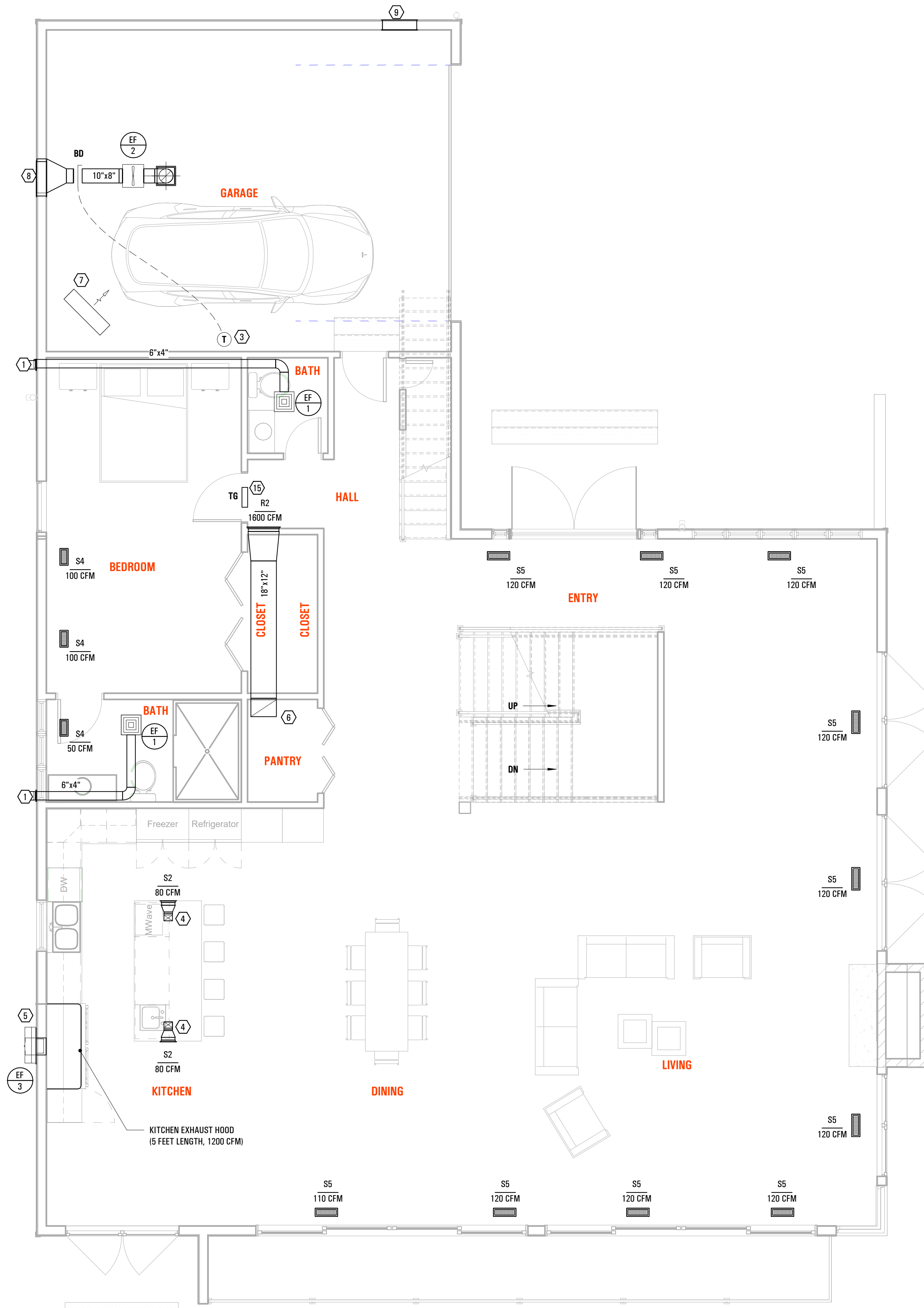
1 **BASEMENT MECHANICAL PLAN**
SCALE: 1/4" = 1'-0"

KEY NOTES

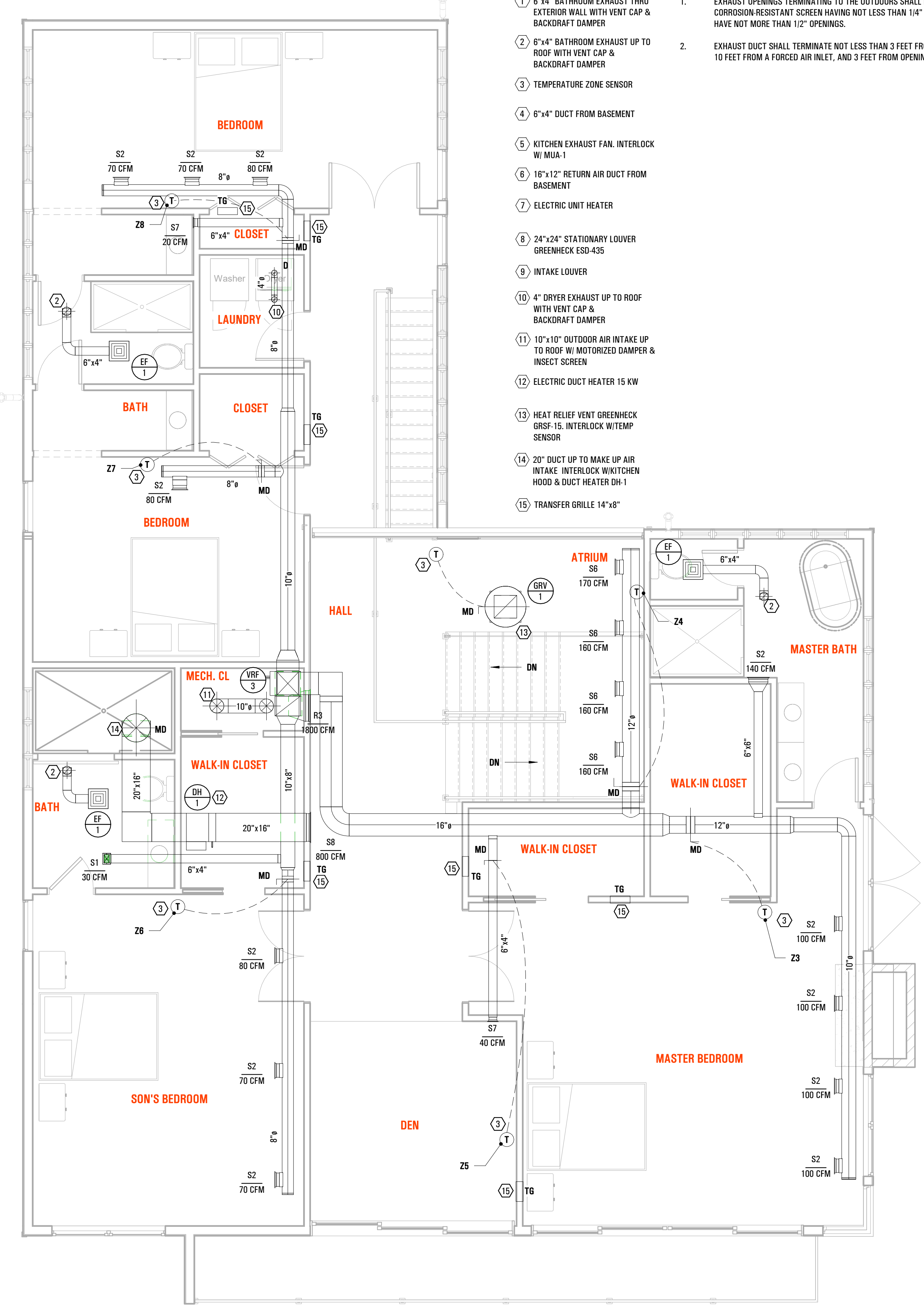
PLAN NOTES

- ① 6"x4" BATHROOM EXHAUST THRU EXTERIOR WALL WITH VENT CAP & BACKDRAFT DAMPER
- ② 6"x4" BATHROOM EXHAUST UP TO ROOF WITH VENT CAP & BACKDRAFT DAMPER
- ③ TEMPERATURE ZONE SENSOR
- ④ 6"x4" DUCT FROM BASEMENT
- ⑤ KITCHEN EXHAUST FAN, INTERLOCK W/ MUA-1
- ⑥ 16"x12" RETURN AIR DUCT FROM BASEMENT
- ⑦ ELECTRIC UNIT HEATER
- ⑧ 24"x24" STATIONARY LOUVER GREENHECK ESD-435
- ⑨ INTAKE LOUVER
- ⑩ 4" DRYER EXHAUST UP TO ROOF WITH VENT CAP & BACKDRAFT DAMPER
- ⑪ 10"x10" OUTDOOR AIR INTAKE UP TO ROOF W/ MOTORIZED DAMPER & INSECT SCREEN
- ⑫ ELECTRIC DUCT HEATER 15 KW
- ⑬ HEAT RELIEF VENT GREENHECK GRF-15, INTERLOCK W/TEMP SENSOR
- ⑭ 20" DUCT UP TO MAKE UP AIR INTAKE INTERLOCK W/ KITCHEN HOOD & DUCT HEATER DH-1
- ⑮ TRANSFER GRILLE 14"x8"

- 1. EXHAUST OPENINGS TERMINATING TO THE OUTDOORS SHALL BE COVERED WITH A CORROSION-RESISTANT SCREEN HAVING NOT LESS THAN 1/4" OPENINGS, AND SHALL HAVE NOT MORE THAN 1/2" OPENINGS.
- 2. EXHAUST DUCT SHALL TERMINATE NOT LESS THAN 3 FEET FROM A PROPERTY LINE, 10 FEET FROM A FORCED AIR INLET, AND 3 FEET FROM OPENINGS INTO THE BUILDING.



1 FIRST FLOOR MECHANICAL PLAN
SCALE: 1/4" = 1'-0"



2 SECOND FLOOR MECHANICAL PLAN
SCALE: 1/4" = 1'-0"

SPLIT TYPE UNIT SCHEDULE

INDOOR UNIT NUMBER	SERVES	MOUNTING	TOTAL CFM	OA CFM	FAN DATA		COOLING					HEAT DATA			ELECTRICAL DATA					OUTDOOR UNIT NUMBER	MOUNTING	POWER SUPPLY					MFCR AND MODEL	REMARKS		
					ESP (IN WG)	HP	TOTAL BTUH	SENSIBLE BTUH	EAT °F		LAT °F		SEER	BTUH	EAT °F	LAT °F	MCA	MOCP	VOLTS			PHASE	CYCLE	MCA	MOCP	VOLTS			PHASE	CYCLE
									DB	WB	DB	WB																		
VRF-1	BASEMENT	FLOOR	1200	110	0.5	3/4	33000	23200	80	67	55	54	18	32800	50	100	4.1	15	120	1	60	HP-1	OUTDOOR	29	40	230	1	60	VRF-1: TRANE TPVY P036AM141A HP-1: H0361AK40NA	VRF NOTES 1-4,7-9 HP NOTES 1,2,5,8,10,11
VRF-2	1ST FL	FLOOR	1600	150	0.5	3/4	38000	26200	80	67	55	54	18	38600	50	100	4.1	15	120	1	60	HP-2	OUTDOOR	36	40	230	1	60	VRF-2: TRANE TPVY P048AM141A HP-2: H0481AK40NA	VRF NOTES 1-4,7-9 HP NOTES 1,2,5,8,10,11
VRF-3	2ND FLOOR	FLOOR	1800	170	0.5	3/4	51000	35700	80	67	55	54	18	50700	50	100	5.6	15	120	1	60	HP-3	OUTDOOR	46	60	230	1	60	VRF-3: TRANE TPVY P054AM141A HP-3: H0601AK42NA	VRF NOTES 1-4,7-9 HP NOTES 1,2,5,8,10,11

NOTES:
 1. COMPLY WITH ASHRAE 90.1-2010 PER IECC-2015 SECTION C101.5
 2. PROVIDE ZONE CONTROL WALL-MOUNTED MICROPROCESSOR-BASED PROGRAMMABLE THERMOSTAT
 3. PROVIDE FAN COIL AIR LEAKAGE RATE TO DEMONSTRATE COMPLIANCE WITH IECC 403.1.1 (< 2%)
 4. COOLING SET POINT > 75F HEATING SETPOINT < 70F
 5. PROVIDE EQUIPMENT PAD
 6. SIZE REFRIGERANT PIPING PER MANUFACTURER'S RECOMMENDATIONS.
 7. PROVIDE COOLING COIL AS REQUIRED TO MATCH CONDENSER.
 8. PROVIDE AIRCYCLER G1 FOR AUTOMATIC VENTILATION TIME CONTROL.
 9. PROVIDE TRANE AIRZONE ZBS CONTROL WITH ASSOCIATED USER INTERFACE, ZONE DAMPERS, CONTROL AND SENSORS.
 10. PROVIDE WIND BAFFLES.
 11. UNIT TO HAVE 100% HEATING CAPACITY AT 5° F (HYPER-HEATING INVENTER TECHNOLOGY)

MECHANICAL CALCULATION

2015 IMC TABLE 403.3

AREA	6570 SF
VOLUME	65000 CF
VENTILATION RATE	0.35 AC/CF
OUTSIDE AIR	380 CFM
NO. BEDROOMS	6
OCCUPANCY	7
VENTILATION RATE	15 CFM/PERSON
OUTSIDE AIR	105 CFM
RUN TIME PERCENTAGE	25%
VENTILATION RATE FACTOR	4
VENTILATION RATE	420 CFM

FAN SCHEDULE

UNIT NO.	LOCATION	SERVICE	CFM	HP (WATTS)	ELECTRICAL DATA			METHOD OF CONTROL	MANUFACTURER	MODEL	REMARKS
					VOLTS	PHASE	CYCLE				
EF-1	CEILING	RESTROOMS	70	33	120	1	60	INTERLOCK W/ SWITCH	PANASONIC	FV-0511V01	NOTES 1-4, 6
EF-2	CEILING	GARAGE	450	72	120	1	60	INTERLOCK W/GARAGE VENT CONTROLLER	GREENHECK	CSP-A510	NOTES 5, 6
EF-3	WALL	KITCHEN HOOD	1200	360	120	1	60	INTERLOCK W/ KITCHEN HOOD	WOLF	801642	NOTES 2, 6, 7

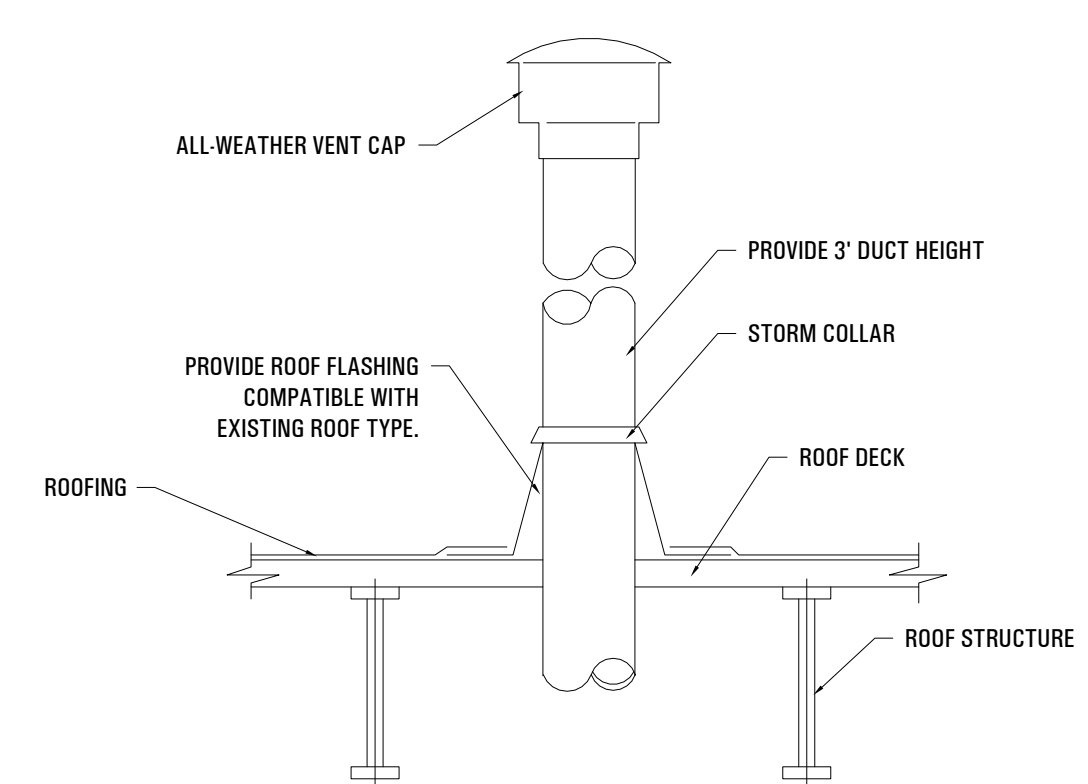
NOTES:
 1. PROVIDE FAN WITH BACKDRAFT DAMPER.
 2. SWITCH-OPERATED CONTROL.
 3. PROVIDE BATHROOM DOORS WITH 3/4" UNDERCUT FOR RETURN PATH.
 5. PROVIDE AIRCYCLER GARAGE VENT CONTROLLER WITH DOOR SWITCH, THERMOSTAT AND TIMER CONTROL.
 6. PROVIDE FAN WITH WALL-MOUNT, BIRD SCREEN AND BACKDRAFT DAMPER.
 7. PROVIDE AIRCYCLER MODEL ACRR HOOD PRESSURE RELIEF CONTROL SWITCH TO INTERLOCK WITH MUA DAMPER.

AIR DEVICE SCHEDULE

TYPE	SERVICE	CFM RANGE	MAX SP (IN WG)	MAX NC	NECK SIZE (IN)	DEVICE TYPE	REMARKS
S1	SUPPLY	30-50	.1	30	6"x4"	6"x4" CEILING DIFFUSER	
S2	SUPPLY	60-100	.1	30	10"x4"	10"x4" SIDEWALL DIFFUSER	
S3	SUPPLY	80-100	.1	30	10"x4"	10"x4" CEILING DIFFUSER	
S4	SUPPLY	50-100	.1	30	10"x4"	10"x4" FLOOR DIFFUSER	
S5	SUPPLY	110-120	.1	30	14"x4"	14"x4" FLOOR DIFFUSER	
S6	SUPPLY	160-170	.1	30	14"x4"	14"x4" SIDEWALL DIFFUSER	
S7	SUPPLY	20-40	.1	30	6"x4"	6"x4" SIDEWALL DIFFUSER	
S8	SUPPLY	800	.1	30	20"x16"	20"x16" SIDEWALL GRILLE	
R1	RETURN	1200	.1	30	30"x20"	30"x20" RETURN GRILLE	
R2	RETURN	1600	.1	30	36"x22"	26"x14" RETURN GRILLE	
R3	RETURN	1800	.1	30	40"x22"	40"x22" RETURN GRILLE	
TG	TRANSFER GRILLE	-	-	-	14"x8"	14"x8" TRANSFER GRILLE	TAMARACK TECHNOLOGIES RAP 14.8 IN

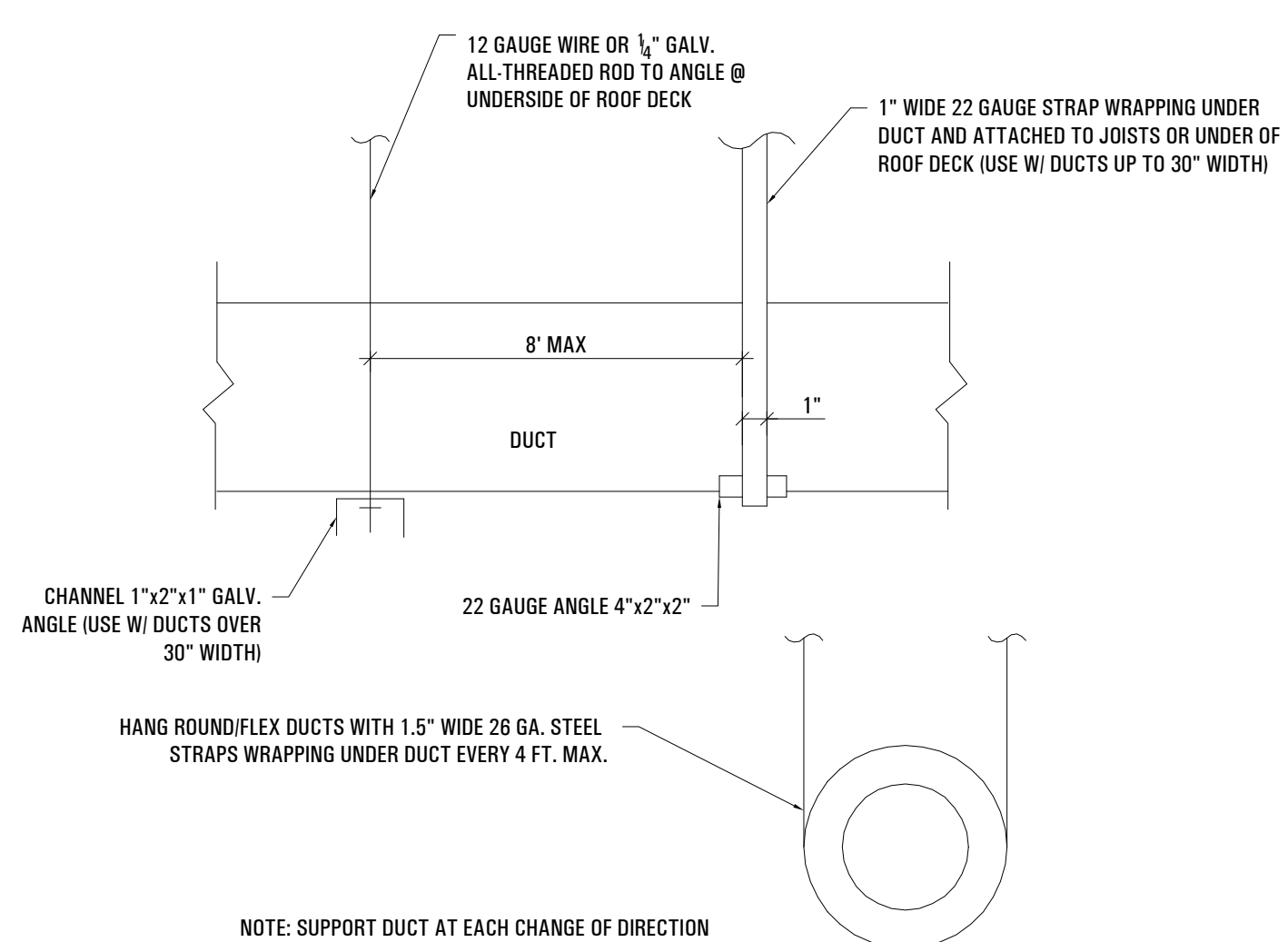
ZONE CONTROL SYSTEM

SYSTEM	ZONE	SENSOR TYPE	DAMPERS QTY.	SIZE
VRF-2	1	USER INTERFACE	1	10x10
VRF-1	2	SMART SENSOR	1	16x10
VRF-3	3	SMART SENSOR	1	12
VRF-3	4	SMART SENSOR	1	12
VRF-3	5	USER INTERFACE	1	6x4
VRF-3	6	SMART SENSOR	1	8
VRF-3	7	SMART SENSOR	1	8
VRF-3	8	SMART SENSOR	1	8



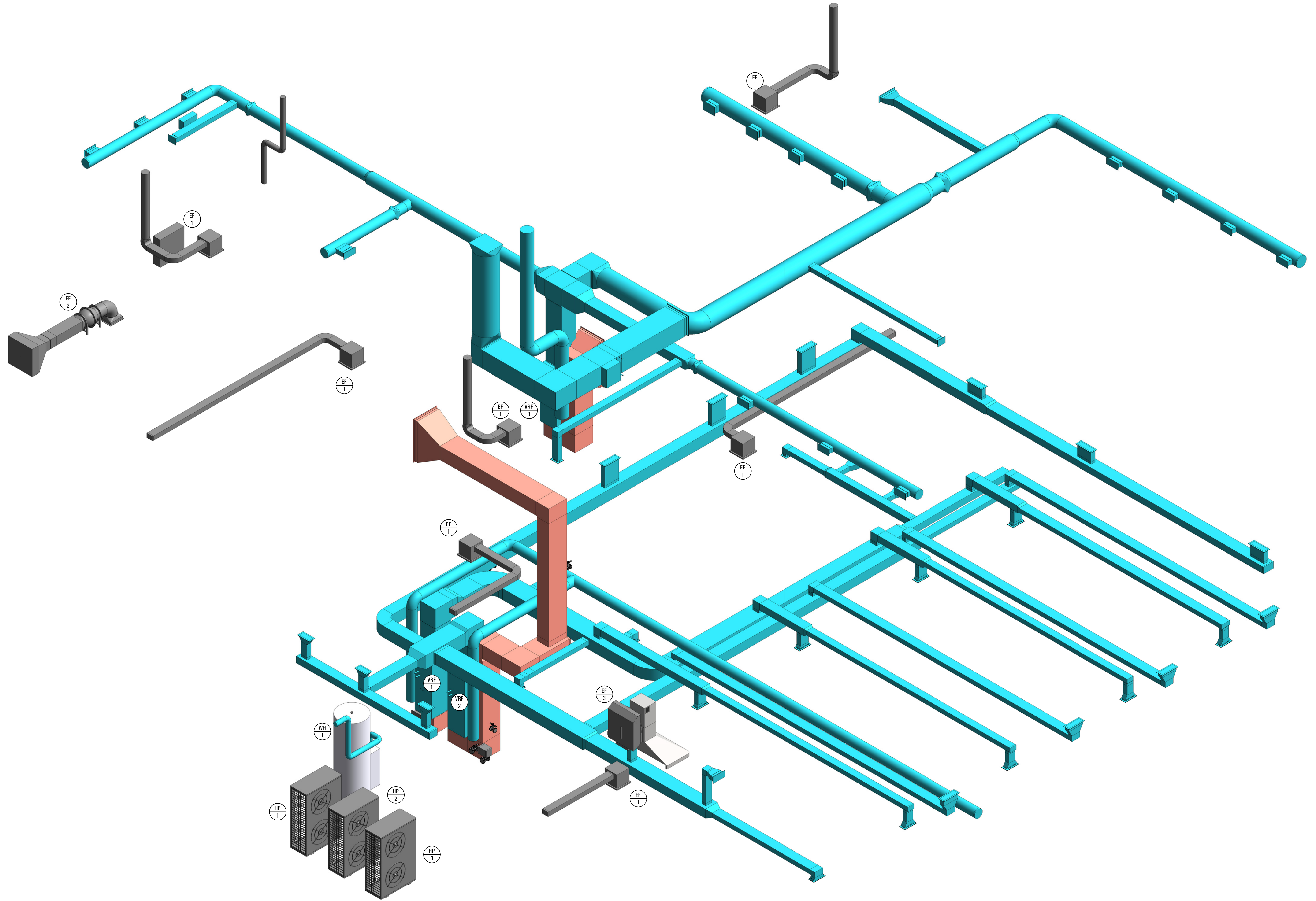
- NOTES:
 1) LOCATE ROOF PENETRATION A MINIMUM OF 10'-0" FROM ANY OUTSIDE AIR INTAKES.
 2) PROVIDE ROOF ACCESSORIES THAT ARE COMPATIBLE WITH EXISTING ROOFING MATERIALS.

1 EXHAUST ROOF PENETRATION DETAIL
 SCALE: N.T.S.



NOTE: SUPPORT DUCT AT EACH CHANGE OF DIRECTION

2 DUCT SUPPORT DETAIL
 SCALE: N.T.S.



1 MECHANICAL VIEW 3D
SCALE:

PLUMBING SPECIFICATIONS

1. CODES AND PERMITS: COMPLY WITH VIRGINIA PLUMBING CODE 2015, LAWS AND ORDINANCES IN FORCE AT BUILDING. SECURE AND PAY FOR PERMITS AND INSPECTIONS FEES REQUIRED FOR FULFILLING REQUIREMENTS OF THESE SPECIFICATIONS.
2. CONTRACTOR SHALL BE RESPONSIBLE FOR VISITING THE SITE AND VERIFYING ALL EXISTING FIELD CONDITIONS PRIOR TO SUBMISSION OF BID.
3. CONTRACTOR IS RESPONSIBLE FOR COORDINATING WORK WITH THE WORK OF ALL OTHER TRADES AND MAKING ANY NECESSARY MODIFICATIONS TO WORK AT NO ADDITIONAL COST, INCLUDING ALL OFFSETS.
4. CONTRACTOR SHALL BE RESPONSIBLE FOR RELOCATION OF ANY EXISTING MINOR INTERFERENCES. INCLUDING CONDUIT, HANGERS, ETC., AT NO ADDITIONAL COST.
5. CONTRACTOR SHALL REMOVE EXISTING EQUIPMENT AND MATERIALS PERTAINING TO CONTRACT AS SPECIFIED OR AS REQUIRED WHETHER SHOWN ON THE DRAWINGS OR NOT TO PREPARE FOR THE NEW WORK.
6. ALL PERMITS. FEES. LICENSES. APPROVALS AND OTHER ARRANGEMENTS FOR WORK SHALL BE OBTAINED BY THE CONTRACTOR AT HIS OWN EXPENSE.
7. SUBMIT ASSEMBLED PRINTED INSTRUCTIONS FOR THE OPERATION AND MAINTENANCE OF EACH ITEM INSTALLED ALONG WITH EQUIPMENT CUTS AND CONTROL WIRING DIAGRAMS.
8. SUBMIT COORDINATED SHOP DRAWINGS FOR REVIEW. THE SHOP DRAWINGS SHALL INDICATE WORK OF OTHER TRADES AND MUST BE SUBMITTED PRIOR TO FABRICATION AND INSTALLATION.
9. SUBMIT EQUIPMENT SPECIFICATIONS FOR REVIEW BEFORE PURCHASE.
10. CONTRACTOR SHALL GUARANTEE ALL WORK AND MATERIAL FOR ONE YEAR AFTER COMPLETION AGAINST ALL DEFECTS OF MATERIAL, EQUIPMENT, AND WORKMANSHIP.
11. PROVIDE COMPETENT OPERATING TECHNICIAN TO INSTRUCT THE OWNER IN THE OPERATION AND MAINTENANCE OF THE INSTALLED EQUIPMENT.
12. PROVIDE ACCESS PANELS FOR ALL VALVES OR ANY PIECE OF EQUIPMENT WHEN NECESSARY TO LOCATE ABOVE NON-ACCESSIBLE CEILINGS. PROVIDE SUBMITTAL DRAWINGS FOR APPROVAL OF THE ARCHITECT. NO EQUIPMENT SHALL BE LOCATED DIRECTLY ABOVE WALLS.
13. PROVIDE ALL HOLES, SLEEVES, AND CAULKING FOR INSTALLATION OF THIS WORK. CAULKING TO CONFORM TO FIRE RATING OF WALLS.
14. PIPING SHALL BE ABOVE CEILING AND CLEAR ANY EXISTING PIPING, LIGHTING FIXTURES, DUCTS, ETC.
15. RUN NEW WASTE PIPES AS CLOSE AS POSSIBLE TO UNDERSIDE OF FLOOR SLAB AND VENT PIPING AS CLOSE AS POSSIBLE TO SLAB ABOVE.
16. RUN ALL PIPING OCTAGONAL & PARALLEL TO CLOSEST WALL OR PRIMARY STRUCTURAL ELEMENTS.
17. CONTRACTOR SHALL SUBMIT SKETCH TO THE STRUCTURAL ENGINEER FOR APPROVAL, PRIOR TO MAKING REQUIRED BEAM PENETRATIONS.
18. DISRUPTION OF ANY EXISTING SERVICE SHALL BE COORDINATED WITH THE OWNER AND SHALL BE PERFORMED AT A TIME AND MANNER SO AS TO CAUSE THE OWNER A MINIMUM OF INCONVENIENCE.
19. FOR EXACT LOCATION OF PLUMBING FIXTURES, REFER TO ARCHITECTURAL PLANS AND ELEVATIONS.
20. INSULATION: DOMESTIC HOT AND COLD WATER PIPING SHALL BE INSULATED WITH 1" THICK 4# DENSITY, GLASS FIBER PRE-FORMED, ALL PURPOSE FLAME RETARDANT JACKET WITH BUILT-IN VAPOR BARRIER. PROVIDE INSULATION PIPE HANGERS WHEN NECESSARY, ARMACELL OR ARMAFIX IPH
21. MATERIALS SHALL BE RATED FOR THE OPERATING TEMPERATURE AND PRESSURE OF THE HYDRONIC SYSTEM. MATERIALS SHALL BE SUITABLE FOR THE TYPE OF FLUID IN THE HYDRONIC SYSTEM.
22. PROJECT PREMISES SHALL BE THOROUGHLY CLEANED AND READY FOR OCCUPANCY INCLUDING ALL FINISHES OF EQUIPMENT PROVIDED AS PART OF THE CONTRACTOR'S WORK.
23. THE CONTRACTOR SHALL GUARANTEE ALL MATERIALS AND WORKMANSHIP FOR A PERIOD OF ONE (1) YEAR FROM THE DATE OF ACCEPTANCE BY THE OWNER AND SHALL REPAIR OR REPLACE AT NO ADDITIONAL COST TO THE OWNER ANY PART THEREOF WHICH MAY BECOME DEFECTIVE DURING THE PERIOD OF GUARANTEE, ORDINARY WEAR AND TEAR EXCEPTED. THE CONTRACTOR SHALL BE RESPONSIBLE FOR AND PAY FOR ANY DAMAGES RESULTING FROM OR CAUSED BY DEFECTS IN HIS/HER WORK.

PIPE MATERIAL SCHEDULE	
SANITARY	3" AND SMALLER SERVICE WT. C L. NO-HUB PIPE AND FITTINGS. 4" PIPE AND LARGER SERVICE WT. C.L HUB AND SPIGOT PIPE AND FITTINGS.
VENT	SCHD 40 PVC
WATER	SCHD 40 PVC
GAS	BLACK STEEL ASTM A53 SCHEDULE 40. FITTINGS, ASME B16.3. MALLEABLE IRON, 150 PSIG. JOINTS;THREADED FOR PIPE 2 INCH AND SMALLER, WELDED FOR PIPE 2 1/2" AND LARGER

24. PIPING SHOWN IS SCHEMATIC AND DOES NOT INDICATE EVERY OFFSET. ELBOW, UNION, VALVE, TRAP. ACCESS PANEL. ETC., THAT IS REQUIRED FOR A COMPLETE WORKING SYSTEM. PROVIDE ITEMS AND FITTINGS THAT ARE REQUIRED TO INSTALL THE PIPING SYSTEM WITHIN THE SPACE PROVIDED AND THAT ARE REQUIRED FOR A COMPLETE SYSTEM. PIPING SHALL BE PROPERLY SECURED IN ACCORDANCE WITH MSS STANDARD SP-69.
25. MATERIALS SHALL BE RATED FOR THE OPERATING TEMPERATURE AND PRESSURE OF DOMESTIC SYSTEM. MATERIALS SHALL BE SUITABLE FOR THE TYPE OF FLUID IN THE DOMESTIC SYSTEM.
26. PIPE SUPPORTS SHALL BE SELECTED AND INSTALLED IN ACCORDANCE WITH THE MSS SP-69 OR LOCAL CODES, WHICHEVER IS MORE STRINGENT. UTILIZE TRAPEZE HANGERS FOR PARALLEL RUNS OR PIPING. OTHER THAN SPRINKLER AND WASTE PIPING. COPPER PIPING SYSTEMS SHALL BE SUPPORTED ON COPPER OR COPPER-PLATED SUPPORTS. HANG PIPE FROM SUBSTANTIAL BUILDING STRUCTURE, PIPING SHALL NOT BE HUNG FROM OTHER PIPING. ALL RIGID HANGERS SHALL PROVIDE A MEANS OF VERTICAL ADJUSTMENT AFTER ERECTION. SHIELD SHALL BE PROVIDED BETWEEN HANGERS AND INSULATION.
27. PLUMBING FIXTURES:
 - A. FURNISH AND INSTALL PLUMBING FIXTURES INDICATED. FIXTURES TO BE FIRST QUALITY, CONNECTED, CLEANED, AND READY FOR USE. PIPING TO BE PROPERLY SECURED TO WALLS AND STUDS.
 - B. PROVIDE TRAPS AND SUPPLIES WITH STOPS. MAKE ALL FINAL CONNECTIONS TO EACH FIXTURE.
28. HANGERS:
 - A. PIPE HANGERS ON HOT PIPING TO BE ON INSIDE OF INSULATION. PROVIDE WITH SADDLES AND/OR SHIELDS AS REQUIRED.
 - B. PIPE HANGERS ON COLD PIPING TO BE ON OUTSIDE OF INSULATION. PROVIDE WITH SADDLES AND/OR SHIELDS AS REQUIRED.
29. PROVIDE ANY AND ALL ITEMS NECESSARY TO COMPLETE THE PLUMBING SYSTEM. THE PLUMBING DRAWINGS ARE DIAGRAMMATIC AND DO NOT NECESSARILY SHOW ALL VALVES, FITTINGS, TRAPS, CONTROL DEVICE METHODS.
30. INSTALL ALL ADA FIXTURES IN AN ADA COMPLIANT MANNER.
31. INSTALL SKAL + GARD #SC-100B ON SINKS SUPPLIES AND TRAPS FOR HANDICAPPED USE.
32. PLUMBING PIPING ACCESSORIES:
 - 32.1. DOMESTIC HOT WATER EXPANSION TANK: AMTROL ST-5 TANK OR APPROVED EQUAL; HEAVY DUTY BUTYL DIAPHRAGM NATIONAL SANITATION FOUNDATION (NSF) AND ANSI 61 APPROVED; TOP STAINLESS STEEL PIPING SYSTEM CONNECTION; SIDE CHARGING VALVE; MINIMUM 2.1 GALLONS TOTAL TANK VOLUME; COMPLIES WITH NO LEAD PLUMBING LAW; POLYPROPYLENE LINEAR MATERIAL; STEEL SHELL; 200°F OPERATING PRESSURE; 150 PSIG WORKING PRESSURE.
 - 32.2. TRAP PRIMER VALVE, TPV: MIFAB MR-500 PRESSURE DROP ACTIVATED TRAP SEAL PRIMER WITH LEAD FREE MATERIAL OR APPROVED EQUAL. 1/2" INLET, SCREEN, OPERATES ON INCOMING WATER PRESSURE RANGE 20-125 PSI. CAPABLE OF BEING FULLY DISASSEMBLED AND REPAIRED IN THE FIELD INCLUDING STRAINER SCREEN. OPERATES ON MAXIMUM 3 PSI PRESSURE DROP.
 - 32.3. WATER HAMMER ARRESTOR, WHA: MIFAB OR APPROVED EQUAL PISTON OPERATED TYPE, SEAMLESS HARD DRAWN TYPE K COPPER BODY, RIBBED PISTON DESIGN ASSEMBLED WITH TWO O-RINGS AND LUBRICATED WITH APPROVED SILICONE COMPOUND, LARGE AIR CHAMBER VOLUME, CERTIFIED TO ASSE 1010-1996.
33. TUB/SHOWER PRESSURE BALANCE VALVE, SYMMONS "TEMPTR0L", SHOWER HEAD AND TUB SPOUT. (1.8 GPM).
34. REF-1REFRIGERATOR WALL BOX: OATEY MODEL NO. 39140 ICE MAKER OUTLET BOX.

GENERAL NOTES:

THE DRAWINGS PREPARED FOR THIS PROJECT ARE AN OUTLINE TO SHOW WHERE PIPES, DUCTS AND APPARATUSSES MUST GO IN ORDER TO HARMONIZE WITH THE BUILDING AND INSTALLATION OF THE VARIOUS TRADES. WORK MUST BE INSTALLED IN ACCORDANCE WITH THE DRAWINGS AS MUCH AS POSSIBLE. DRAWINGS SHALL BE CAREFULLY CHECKED DURING THE COURSE OF BIDDING AND CONSTRUCTION. IF DISCREPANCIES, ERRORS OR OMISSIONS ARE DISCOVERED PRIOR TO OR DURING CONSTRUCTION PHASE, NOTIFY THE ENGINEER IMMEDIATELY FOR INTERPRETATION OR CORRECTION. TAKE NECESSARY MEASUREMENTS AND RESPONSIBLE FOR SAME, INCLUDING CLEARANCES FOR EQUIPMENT THAT ARE TO BE FURNISHED. THE ARCHITECT /ENGINEER RESERVE THE RIGHT TO MAKE MINOR LOCATION CHANGES OF PIPING AND EQUIPMENT WHERE SUCH ADJUSTMENTS ARE DEEMED DESIRABLE FROM AN APPEARANCE OR OPERATIONAL STANDPOINT. SUCH CHANGES WILL BE ANTICIPATED SUFFICIENTLY IN ADVANCE OR AVOID EXTRA WORK OR DELAY THE PROGRESS OF THE PROJECT.

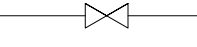
























EXAMINATION OF EXISTING CONDITIONS:

35. VISIT AND CAREFULLY EXAMINE BUILDING AFFECTED BY THIS WORK SO AS TO BECOME FAMILIAR WITH EXISTING CONDITIONS AND DIFFICULTIES THAT WILL ATTEND THE EXECUTION OF THE WORK BEFORE SUBMITTING PROPOSALS.
36. SUBMISSION OF A PROPOSAL WILL BE CONSTRUCTED AS EVIDENCE THAT SUCH EXAMINATION HAS BEEN MADE AND LATER CLAIMS FOR LABOR, EQUIPMENT OR MATERIALS REQUIRED BECAUSE DIFFICULTIES ENCOUNTERED, WHICH COULD HAVE BEEN FORESEEN HAD SUCH AN EXAMINATION HAD BEEN MADE, WILL NOT BE RECOGNIZED.

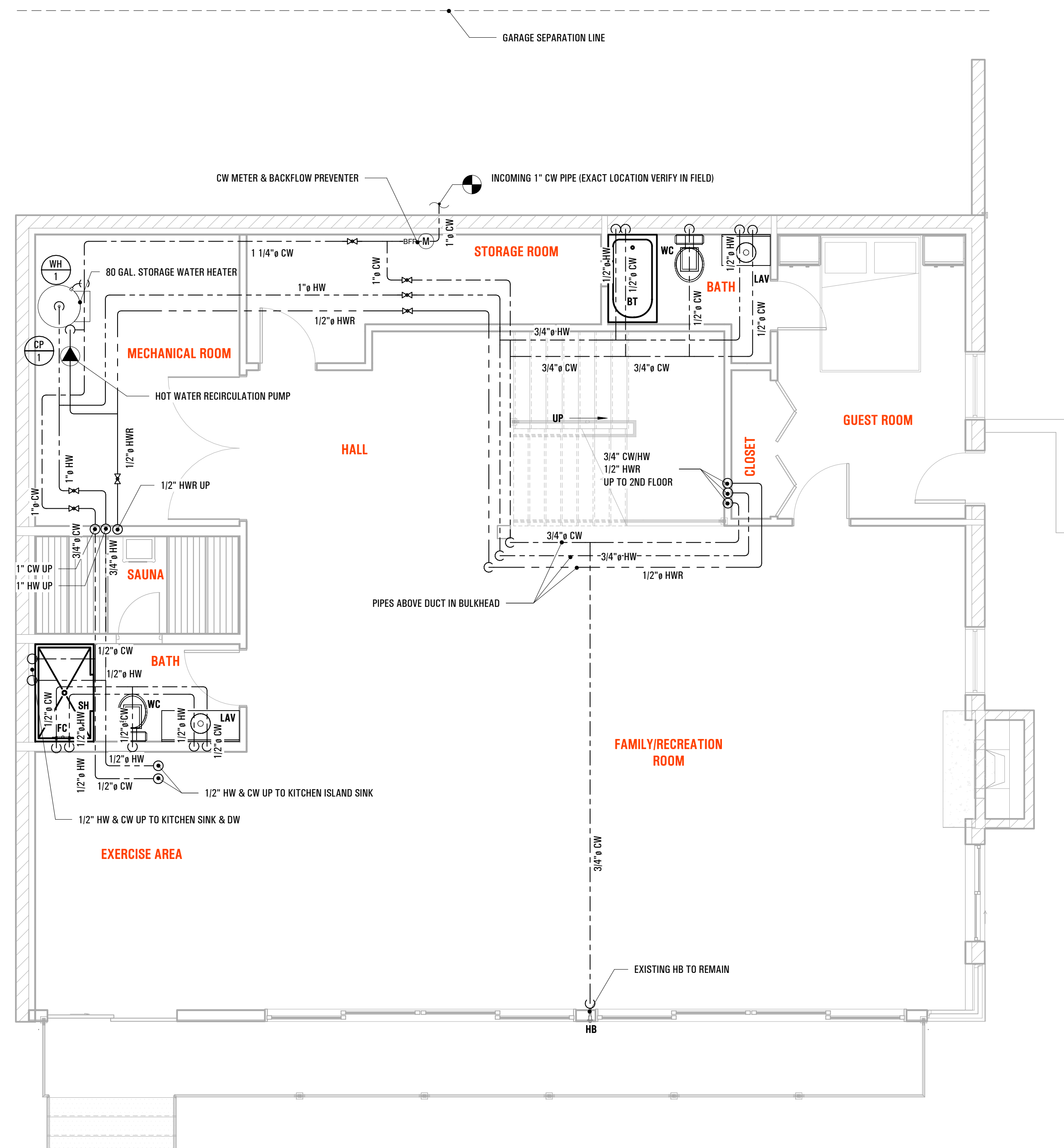
CONNECTIONS TO EXISTING WORK:

37. CONTRACTOR TO FIELD VERIFY LOCATION OF EXISTING PIPING.
38. PROJECT PREMISES SHALL BE THOROUGHLY CLEANED AND READY FOR OCCUPANCY INCLUDING ALL FINISHES OF EQUIPMENT PROVIDED AS PART OF THE CONTRACTOR'S WORK AT PROJECT CLOSEOUT.

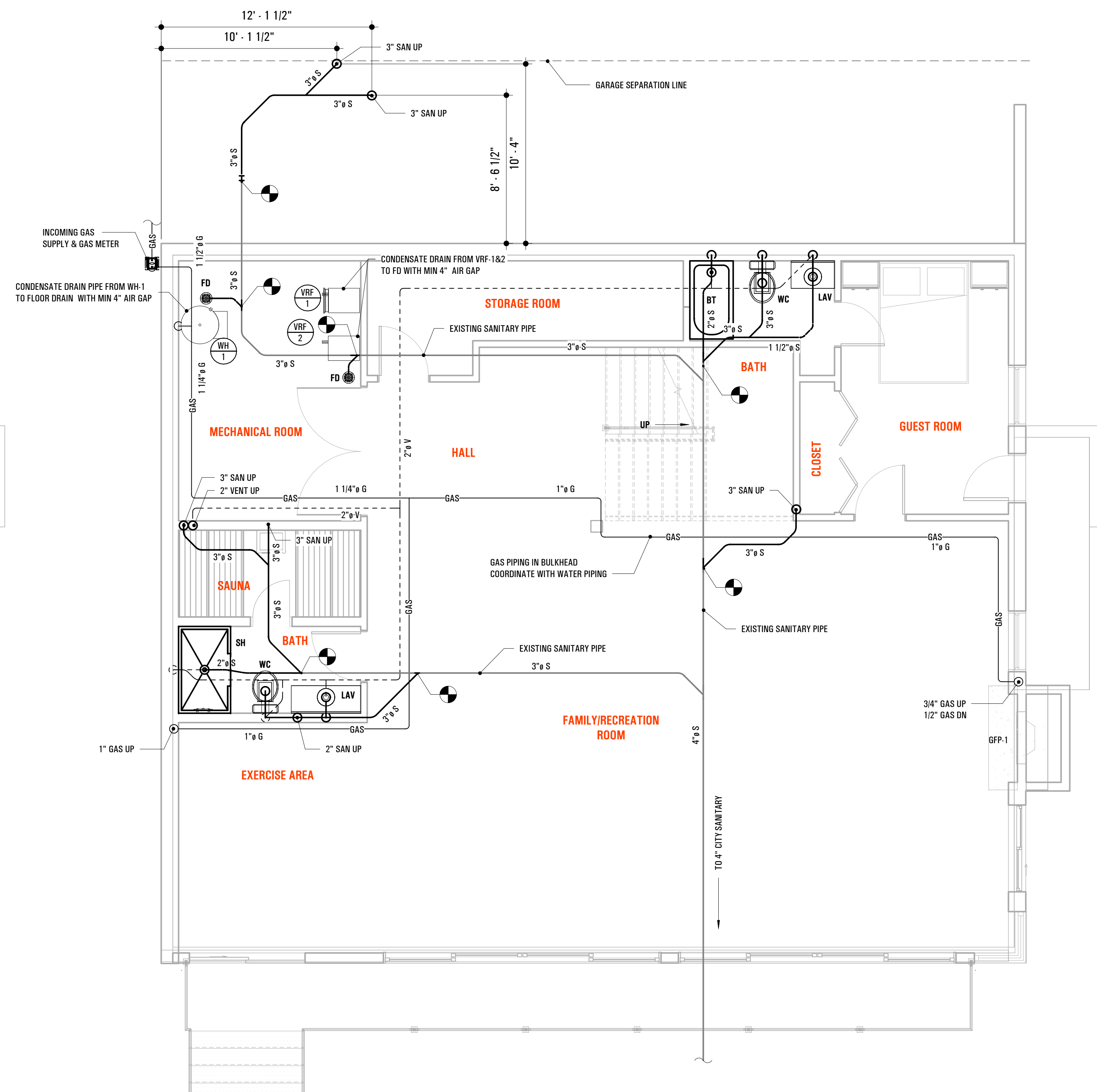
PLUMBING SYMBOL LIST

- | | |
|--|---|
|  | GATE VALVE |
|  | PIPE UP |
|  | PIPE DOWN |
| AP | ACCESS PANEL |
| BFP | BACKFLOW PREVENTER |
| C.O.P | CLEAN OUT PLUG |
| CW | COLD WATER |
| DW | DISHWASHER MACHINE |
| EX. | EXISTING |
| HW | HOT WATER |
| LAV | LAVATORY |
| OSD | OPEN SITE DRAIN |
| TPV | TRAP PRIMER VALVE |
| TV | TEMPERING VALVE |
| S.A. | SHOCK ABSORBER (WATER HAMMER) |
| SK | SINK |
| V | VENT |
| VTR | VENT THROUGH ROOF |
| W | WASTE |
| WC | WATER CLOSET |
| WCO | WALL CLEAN OUT |
|  | POND OF CONNECTION OF NEW WORK TO EXISTING WORK |
|  | END OF DEMOLITION |
|  | NEW WORK KEYED NOTES |
|  | REFERENCE WATER RISER TAG NUMBER |
| CO  | FLOOR CLEANOUT |
| FD  | FLOOR DRAIN |
|  | EQUIPMENT NUMBER |
|  | NEW VENT |
|  | EXISTING VENT |
|  | DEMOLISHED VENT |
|  | NEW SANITARY |
|  | EXISTING SANITARY |
|  | DEMOLISHED SANITARY |
|  | NEW HOT WATER |
|  | EXISTING HOT WATER |
|  | DEMOLISHED HOT WATER |
|  | NEW COLD WATER |
|  | EXISTING COLD WATER |
|  | DEMOLISHED COLD WATER |
|  | GAS |
|  | DEMOLISHED GAS |
|  | REMOTE MANUAL PULL STATION |

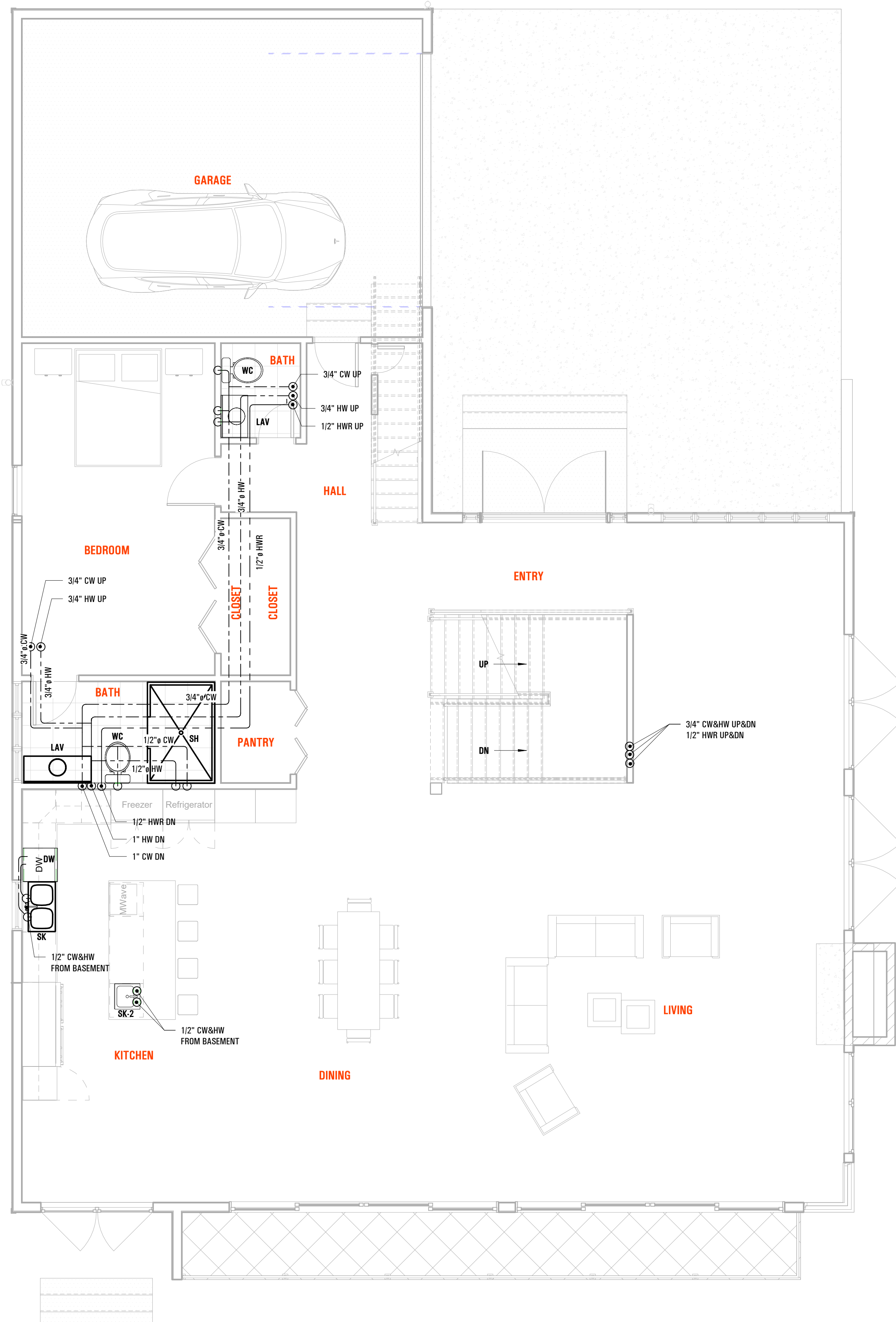
DISREGARD SYMBOLS WHICH ARE NOT APPLICABLE TO THIS PROJECT



1 BASEMENT WATER SUPPLY PLAN
SCALE: 1/4" = 1'-0"



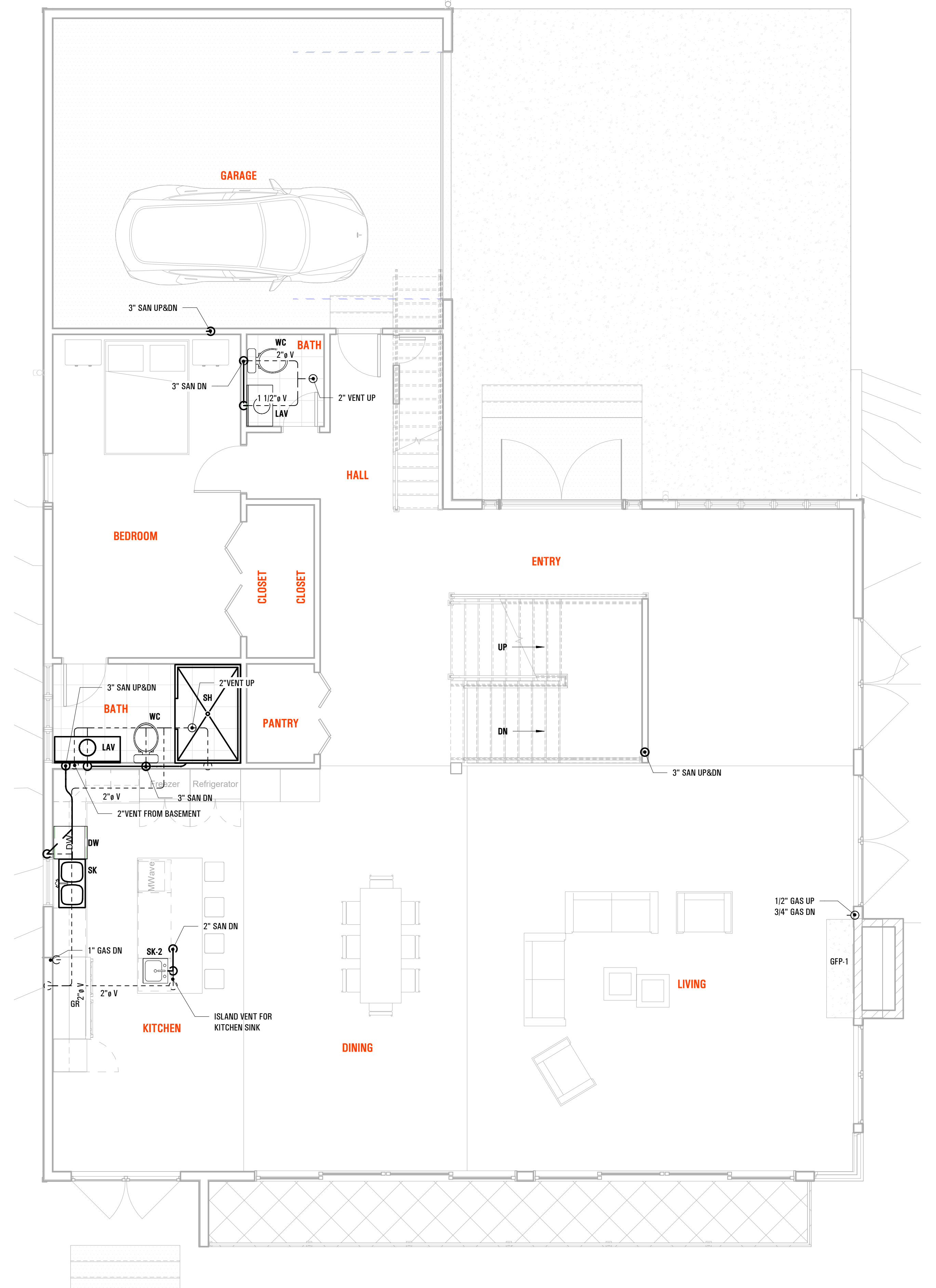
2 BASEMENT SANITARY, VENT & GAS
SCALE: 1/4" = 1'-0"



1

FIRST FLOOR WATER SUPPLY PLAN

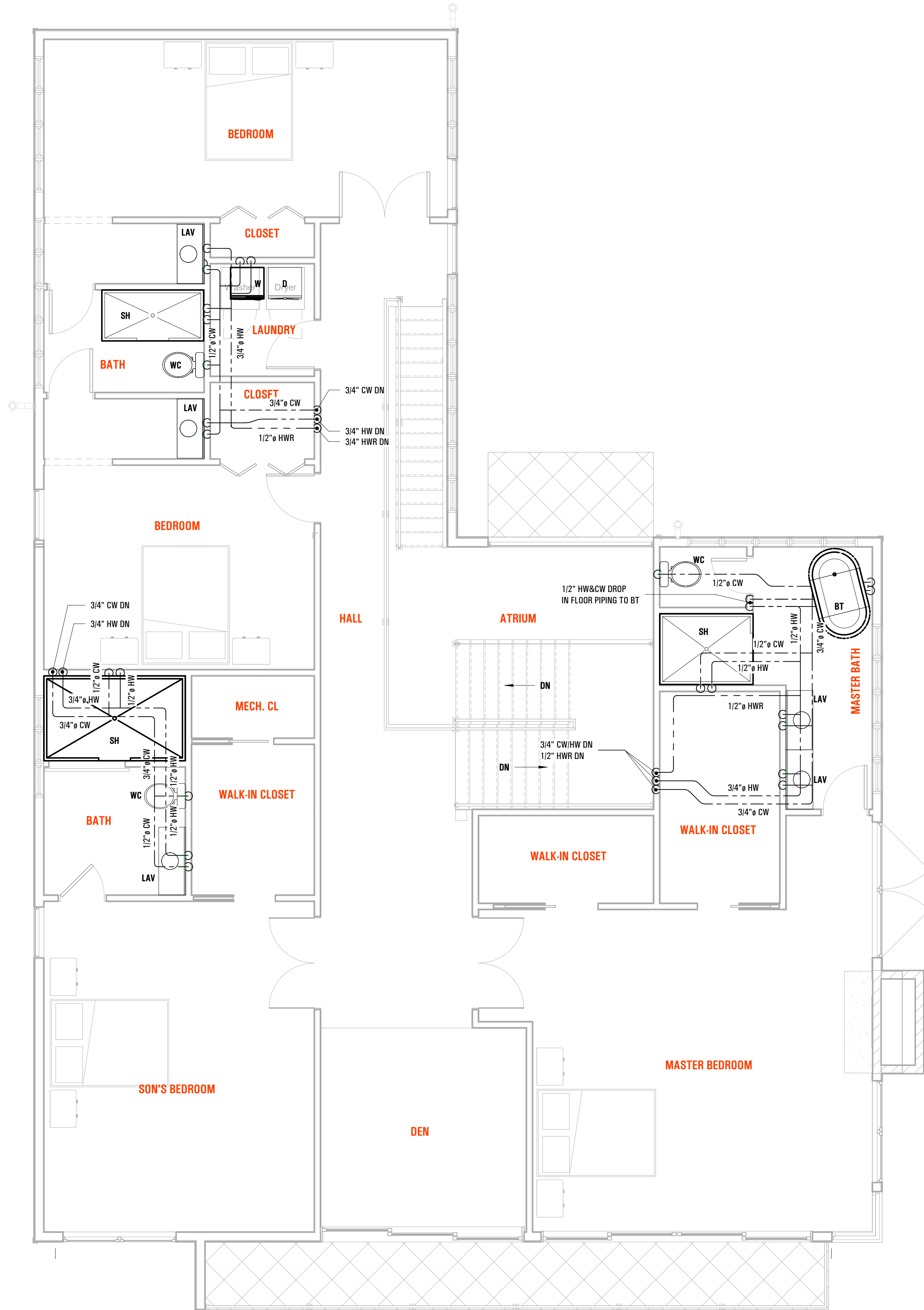
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2

FIRST FLOOR SANITARY, VENT & GAS

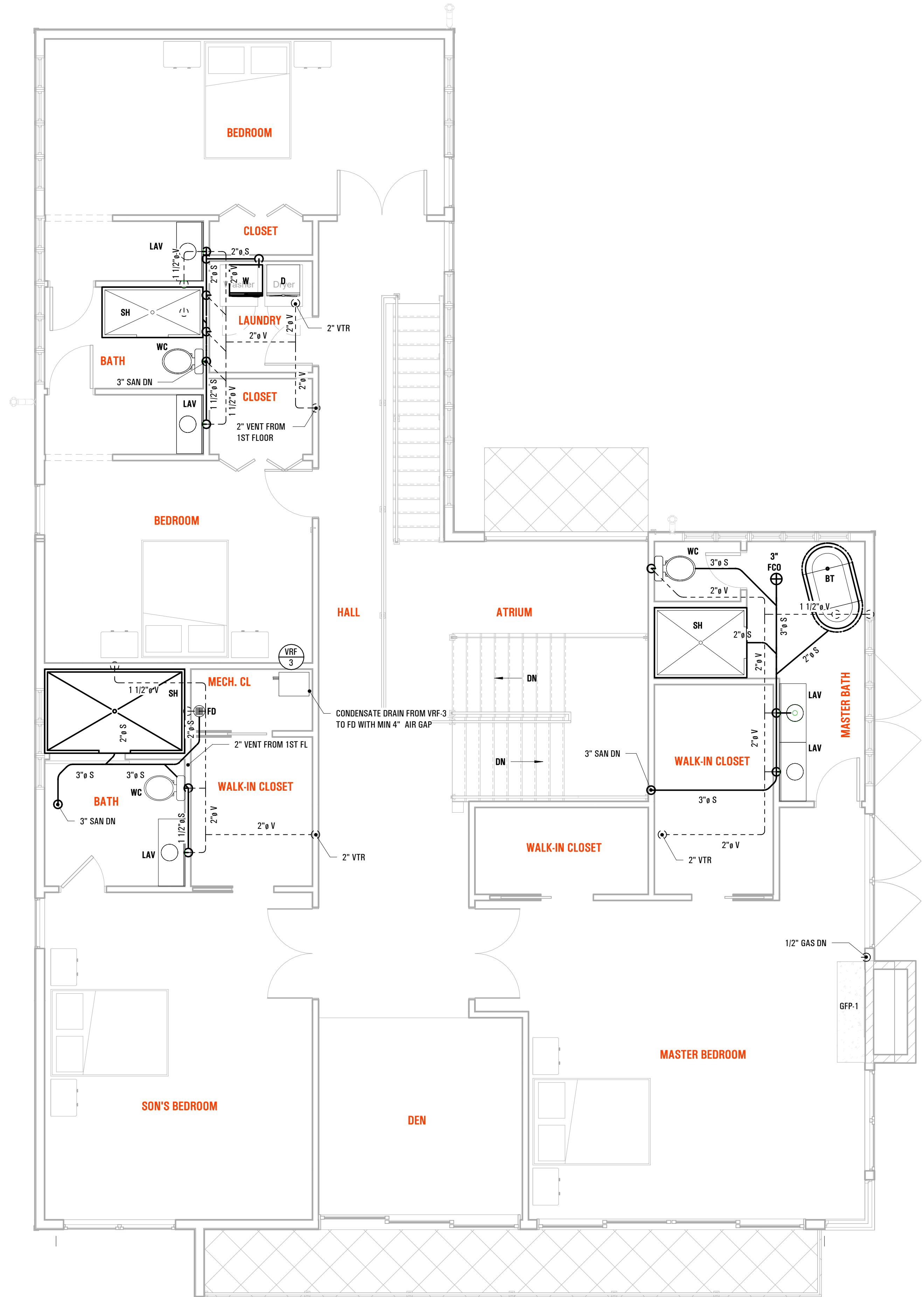
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1

SECOND FLOOR WATER SUPPLY PLAN

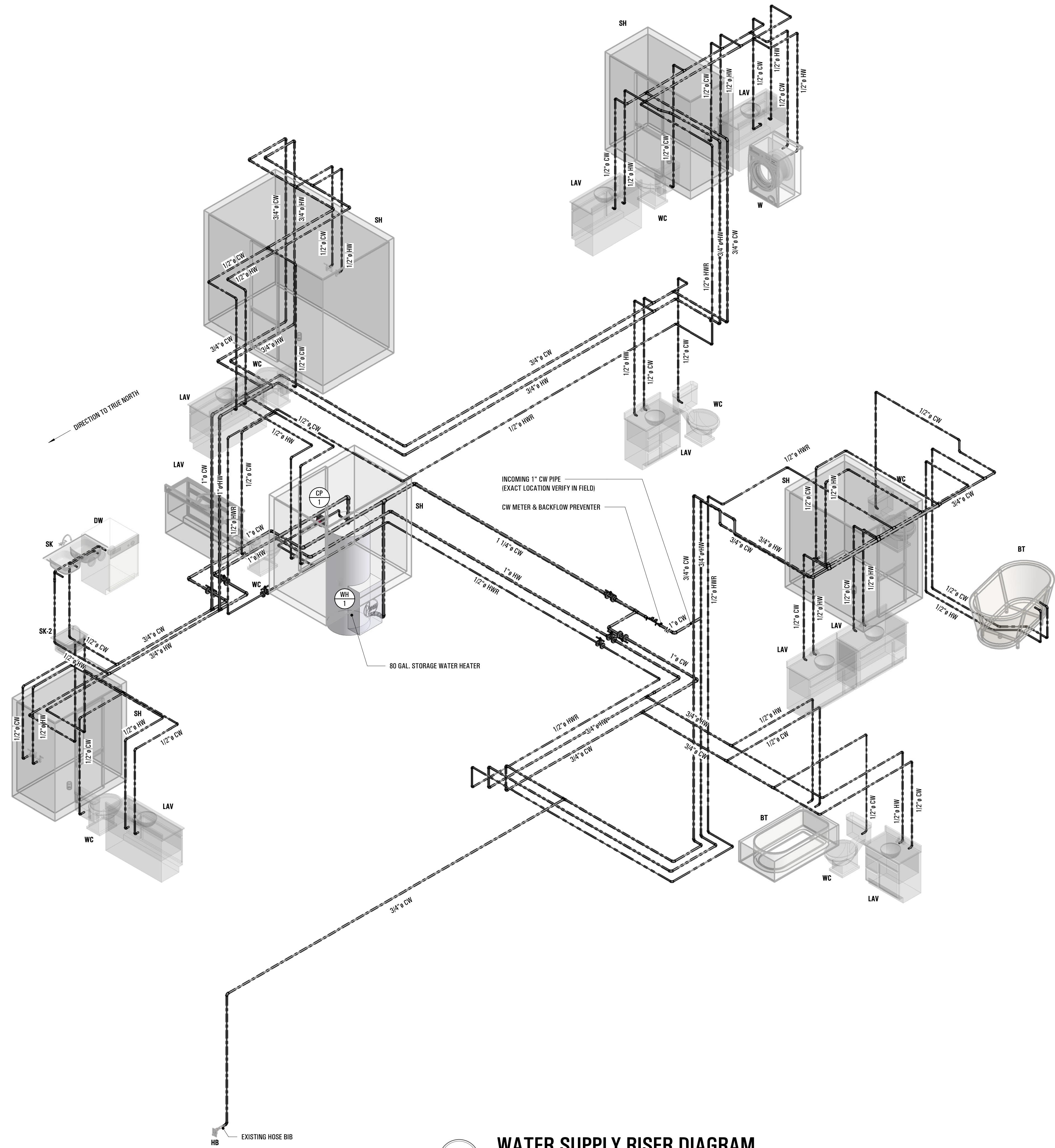
SCALE: 1/4" = 1'-0"



2

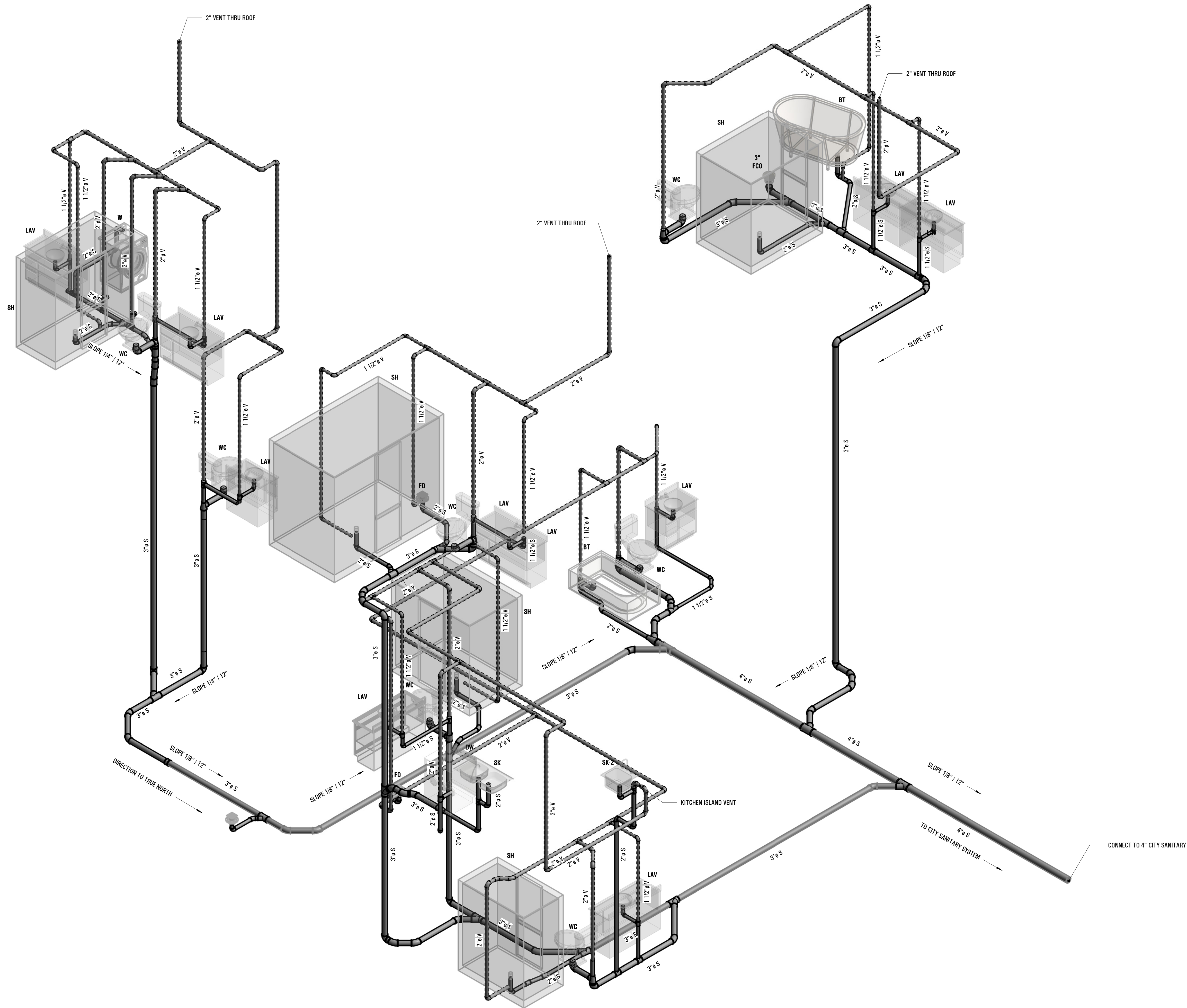
SECOND FLOOR SANITARY, VENT & GAS

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



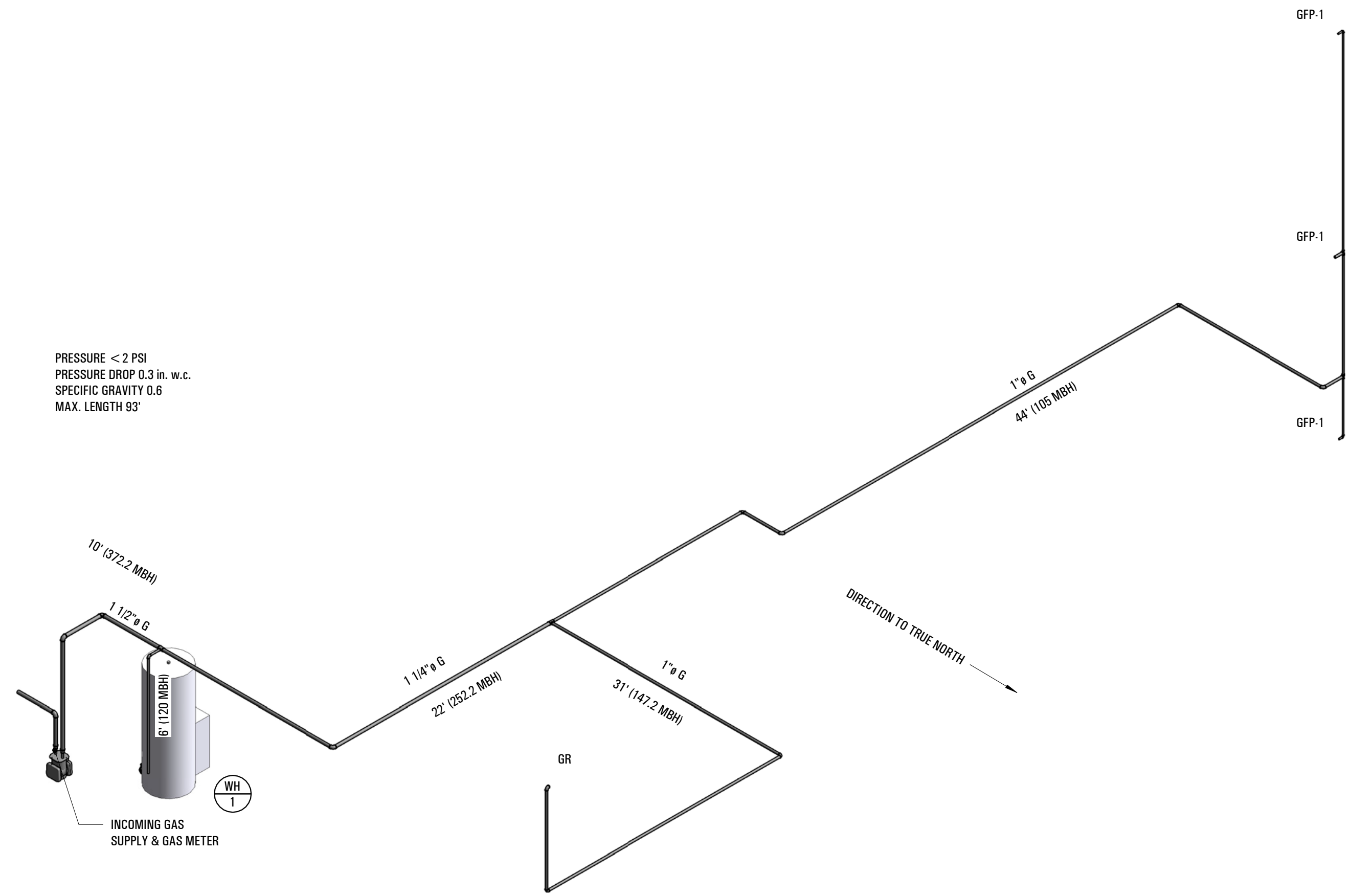
1 WATER SUPPLY RISER DIAGRAM

SCALE:



1 SANITARY RISER DIAGRAM
SCALE:

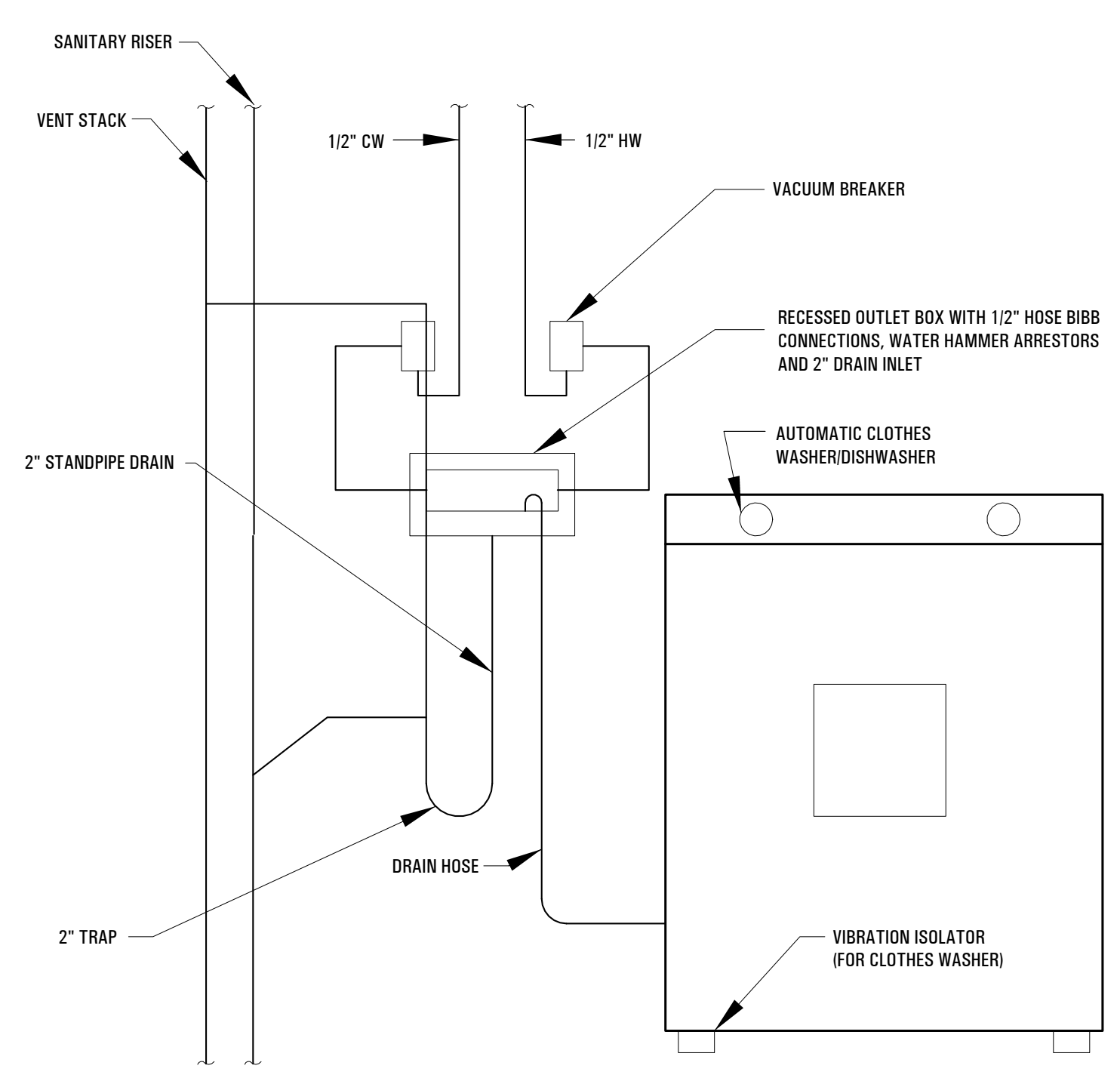
PRESSURE < 2 PSI
 PRESSURE DROP 0.3 in. w.c.
 SPECIFIC GRAVITY 0.6
 MAX. LENGTH 93'



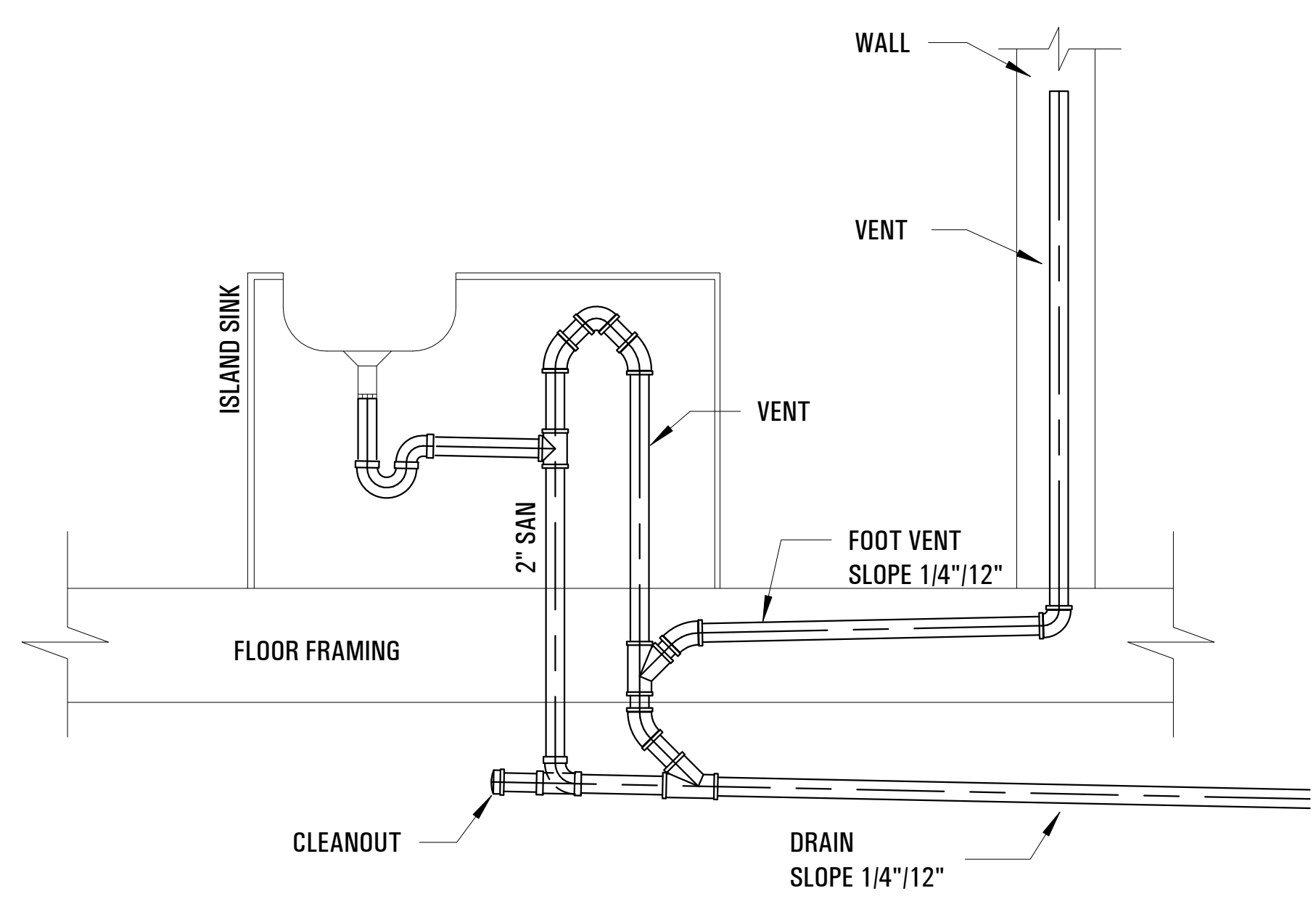
1 GAS RISER DIAGRAM
 SCALE:

PLUMBING FIXTURES SCHEDULE												
ITEM #	QTY	DESCRIPTION	MANUFACTURER	MODEL	HOT WATER	COLD WATER	DIRECT DRAIN	INDIRECT DRAIN	VENT	GAS	BTUS	REMARKS
WC	7	WATER CLOSET	BY ARCHITECT	BY ARCHITECT		1/2"	3"		2"			
LAV	9	LAVATORY	BY ARCHITECT	BY ARCHITECT	1/2"	1/2"	1 1/2"		1 1/2"			NOTE 1
SK	1	KITCHEN DOUBLE SINK	BY ARCHITECT	BY ARCHITECT	1/2"	1/2"	2"		1 1/2"			NOTE 1
SH	5	SHOWER	BY ARCHITECT	BY ARCHITECT	1/2"	1/2"	2"		1 1/2"			NOTE 1
BT	2	BATHTUB	BY ARCHITECT	BY ARCHITECT	1/2"	1/2"	2"		1 1/2"			NOTE 1
SK-2	1	KITCHEN ISLAND SINK	BY ARCHITECT	BY ARCHITECT	1/2"	1/2"	2"		1 1/2"			NOTE 1
FD	3	FLOOR DRAIN	BY ARCHITECT	BY ARCHITECT			2"		1 1/2"			
FCO	1	FLOOR CLEANOUT	BY ARCHITECT	BY ARCHITECT			3"					
W	1	WASHER	BY ARCHITECT	BY ARCHITECT	1/2"	1/2"	2"		1 1/2"			NOTE 2
DW	1	DISHWASHER	BY ARCHITECT	BY ARCHITECT	1/2"	1/2"	2"		1 1/2"			NOTE 2,4
GFP-1	3	GAS FIREPLACE	BY ARCHITECT	BY ARCHITECT						3/4"	35,000	
CP-1	1	HW RECIRCULATION PUMP	BELL & GOSSET	NBF-18S OR EQUAL 2 GPM	1/2"							NOTE 5
WH-1	1	GAS WATER HEATER	A.O SMITH	GAS 80 GAL	1 1/2"	1 1/2"				3/4"	120,000	NOTE 3
GR	1	GAS RANGE	48" WIDE	BY ARCHITECT						3/4"	147,200	

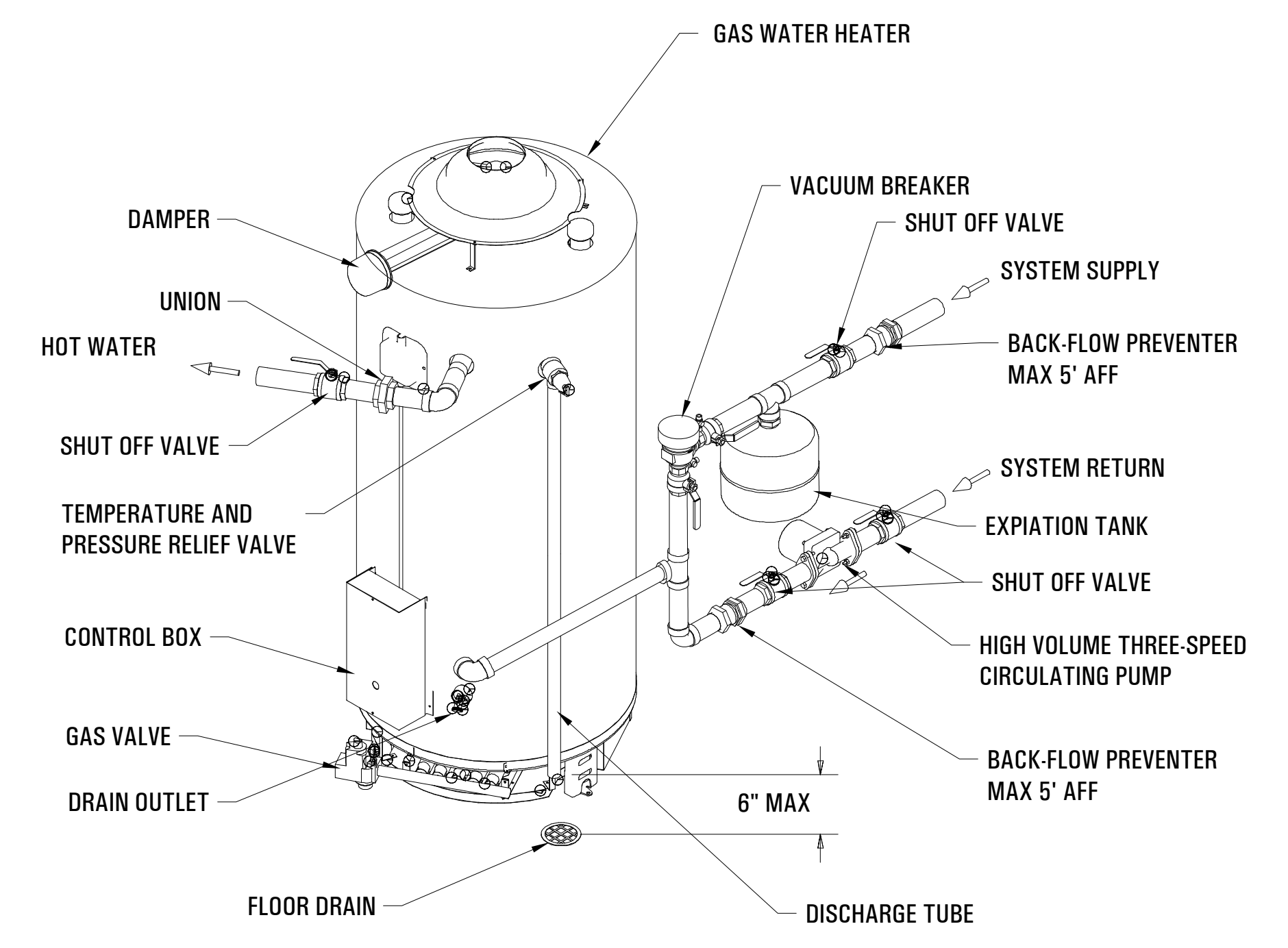
- NOTES:
 1. PROVIDE WITH THERMOSTATIC MIXING VALVE, SET 110°F
 2. PROVIDE WITH BACKFLOW PREVENTION
 3. PROVIDE WITH INDIRECT AND INDEPENDENT HARD PLUMBING (COPPER/PVC) TO A FLOOR DRAIN/SINK
 4. PROVIDE WITH WATER HAMMER ARRESTOR
 5. PROVIDE TC-1 AUTOMATIC TIMER KIT INSTALL PUMP AT 66" AFF



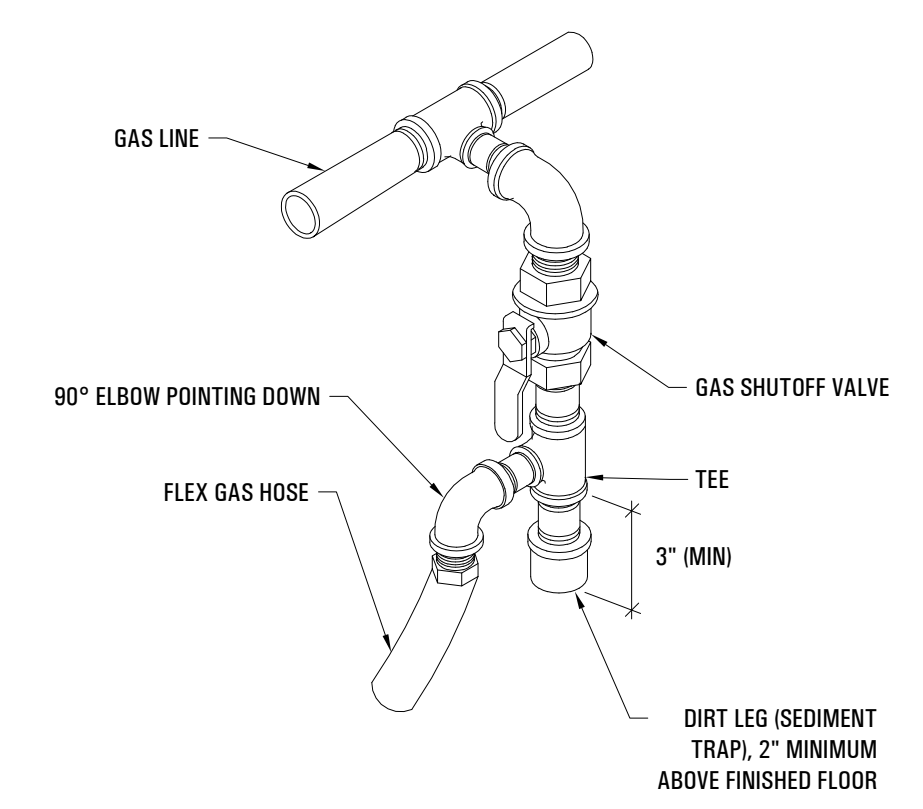
2 CLOTHES WASHER/DISHWASHER CONNECTION
 SCALE: N.T.S



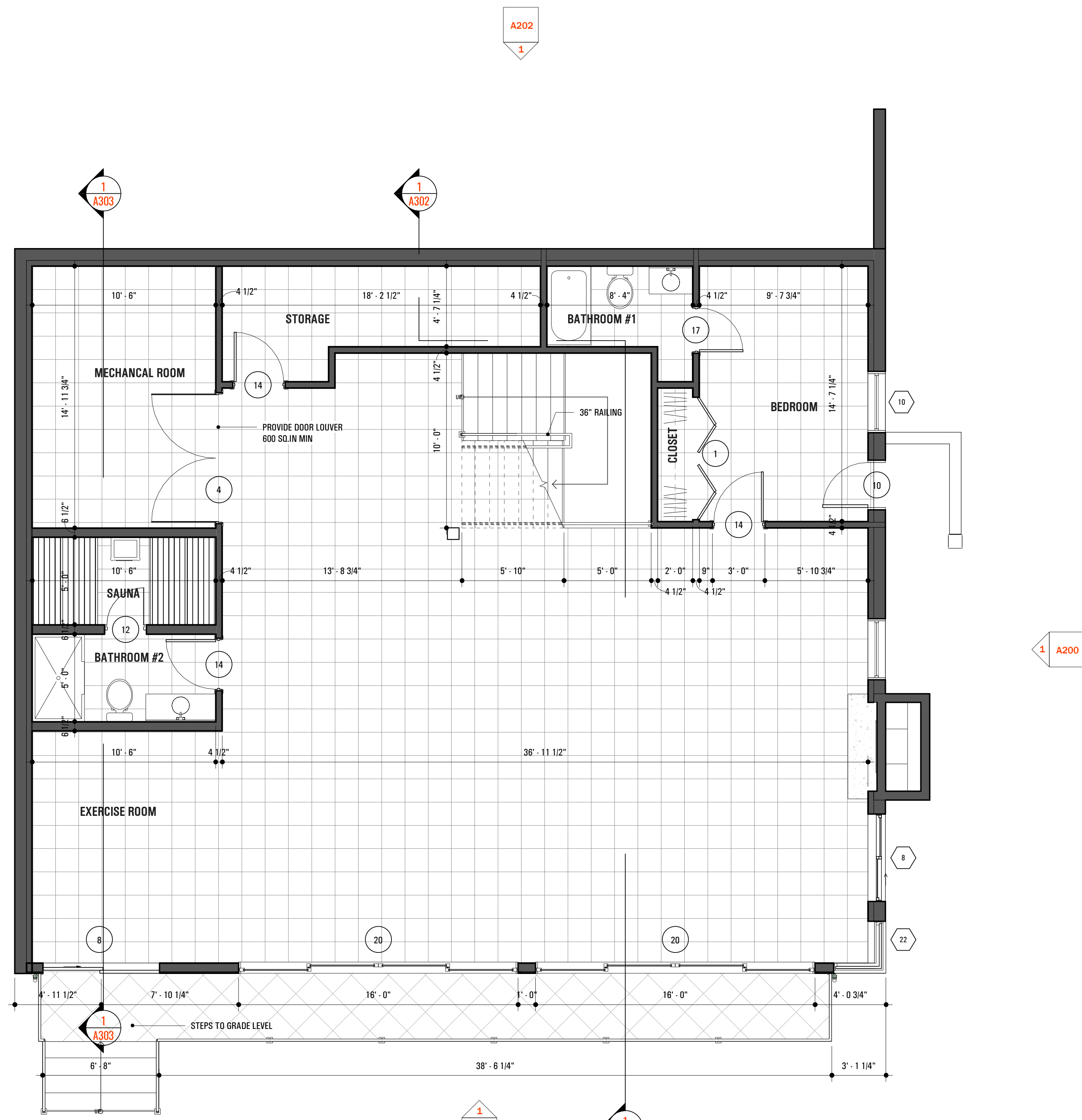
3 ISLAND VENT DETAIL
 SCALE: N.T.S



4 GAS WATER HEATER DETAIL
 SCALE: N.T.S



5 GAS CONNECTION DETAIL
 SCALE: N.T.S



1 **BASEMENT FLOOR PLAN**

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

A201 1

A202 1

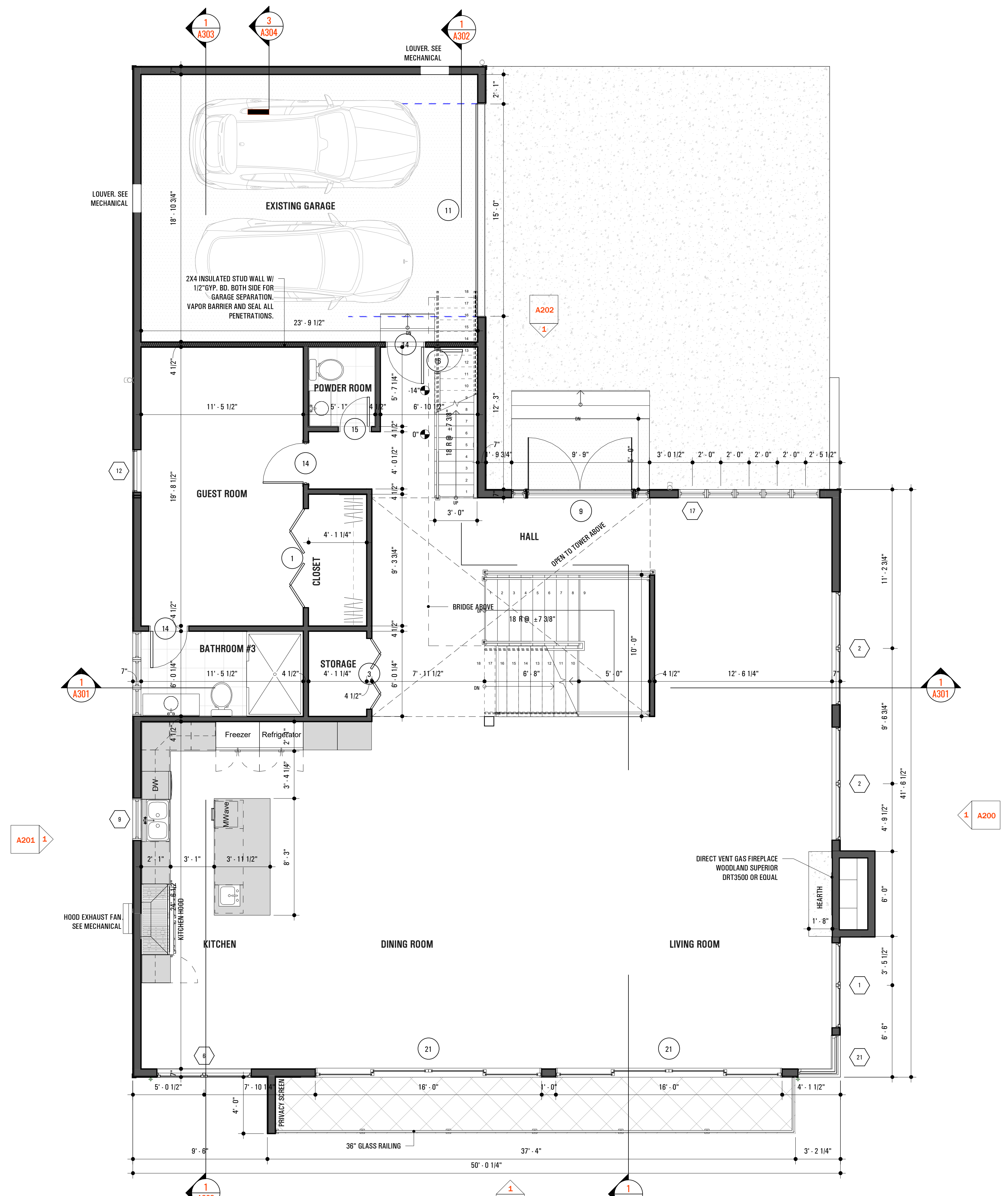
1
A303

1
A302

1 A200

1
A203

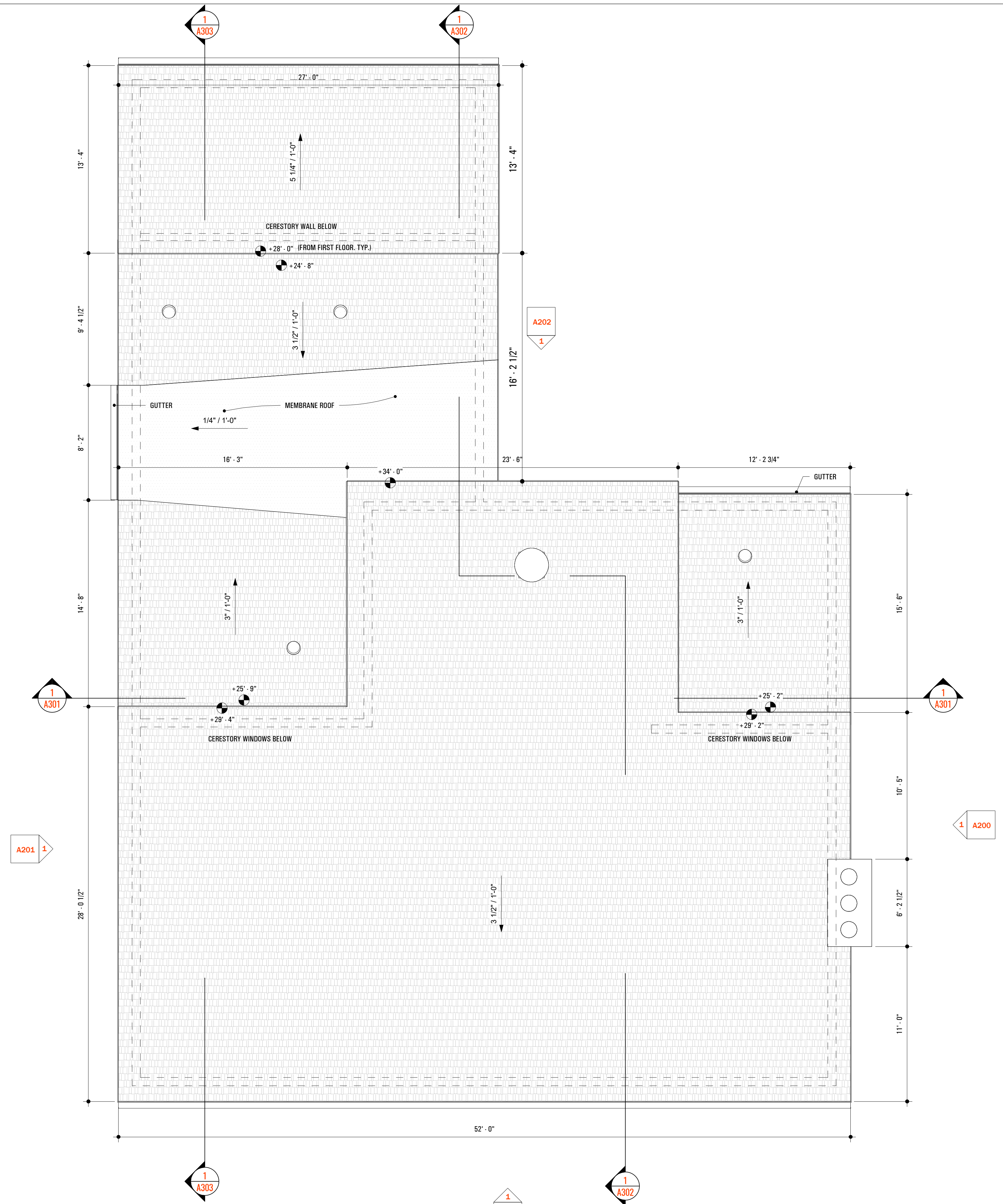
1
A302



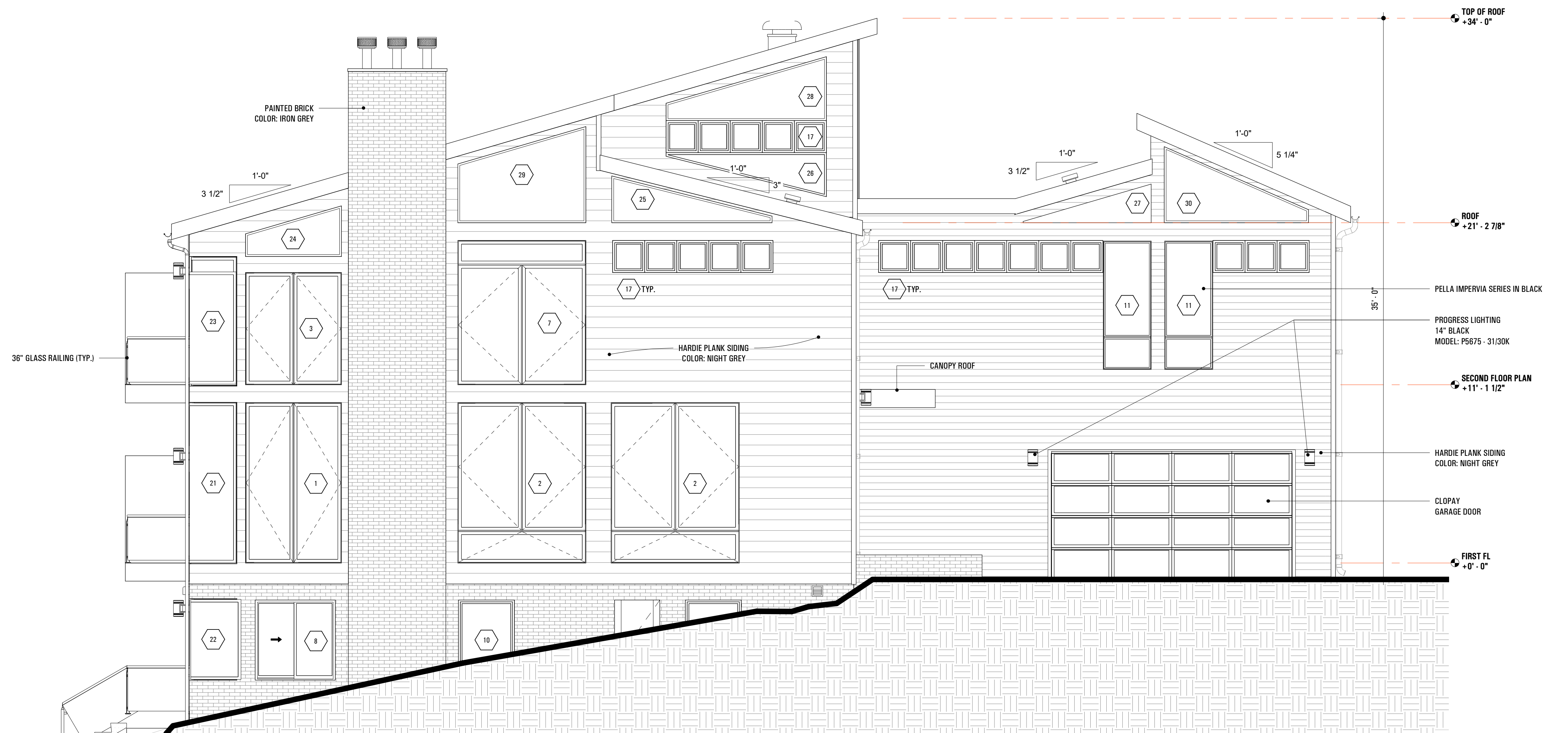
FIRST FLOOR PLAN

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

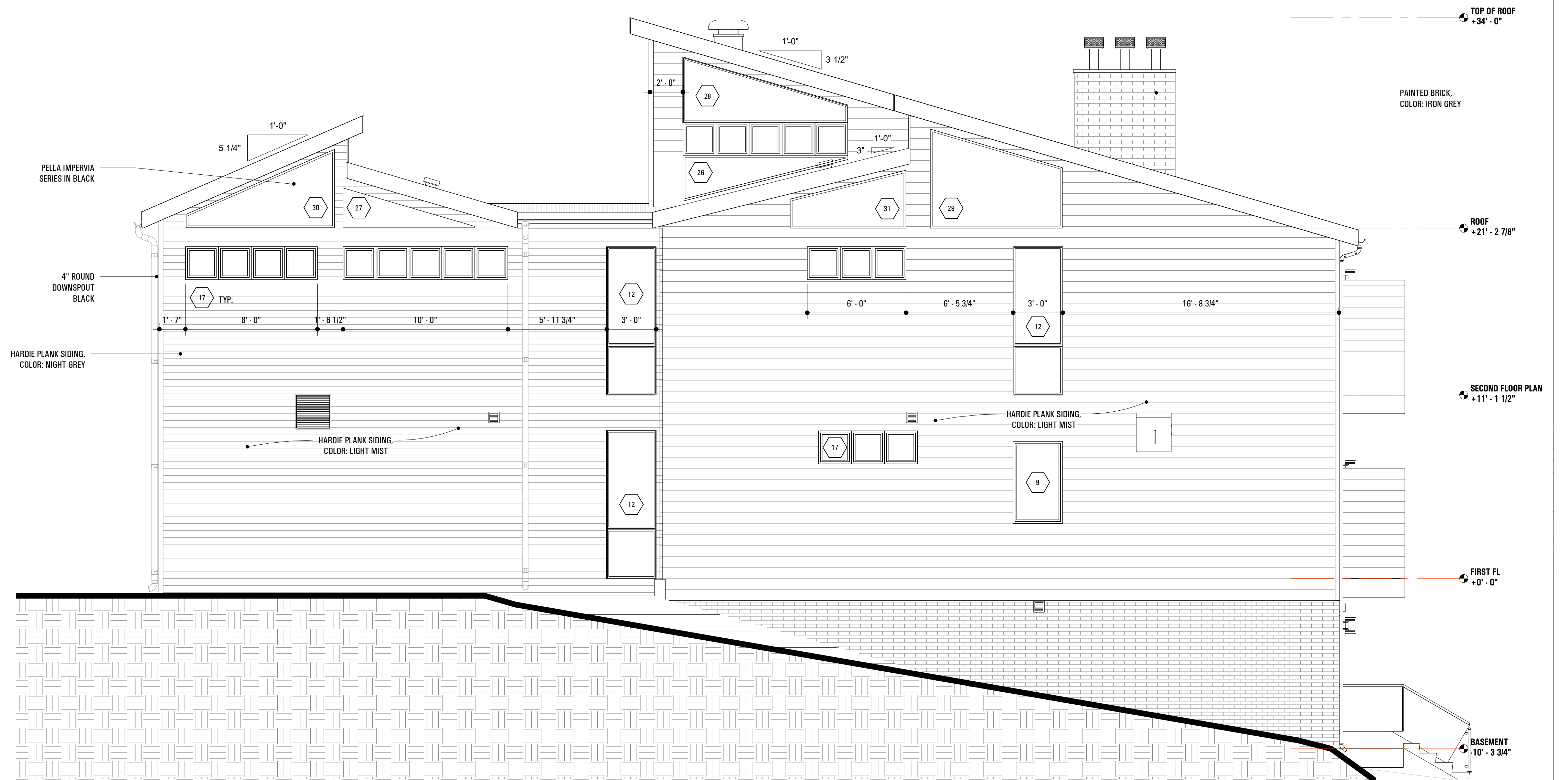
1



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



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



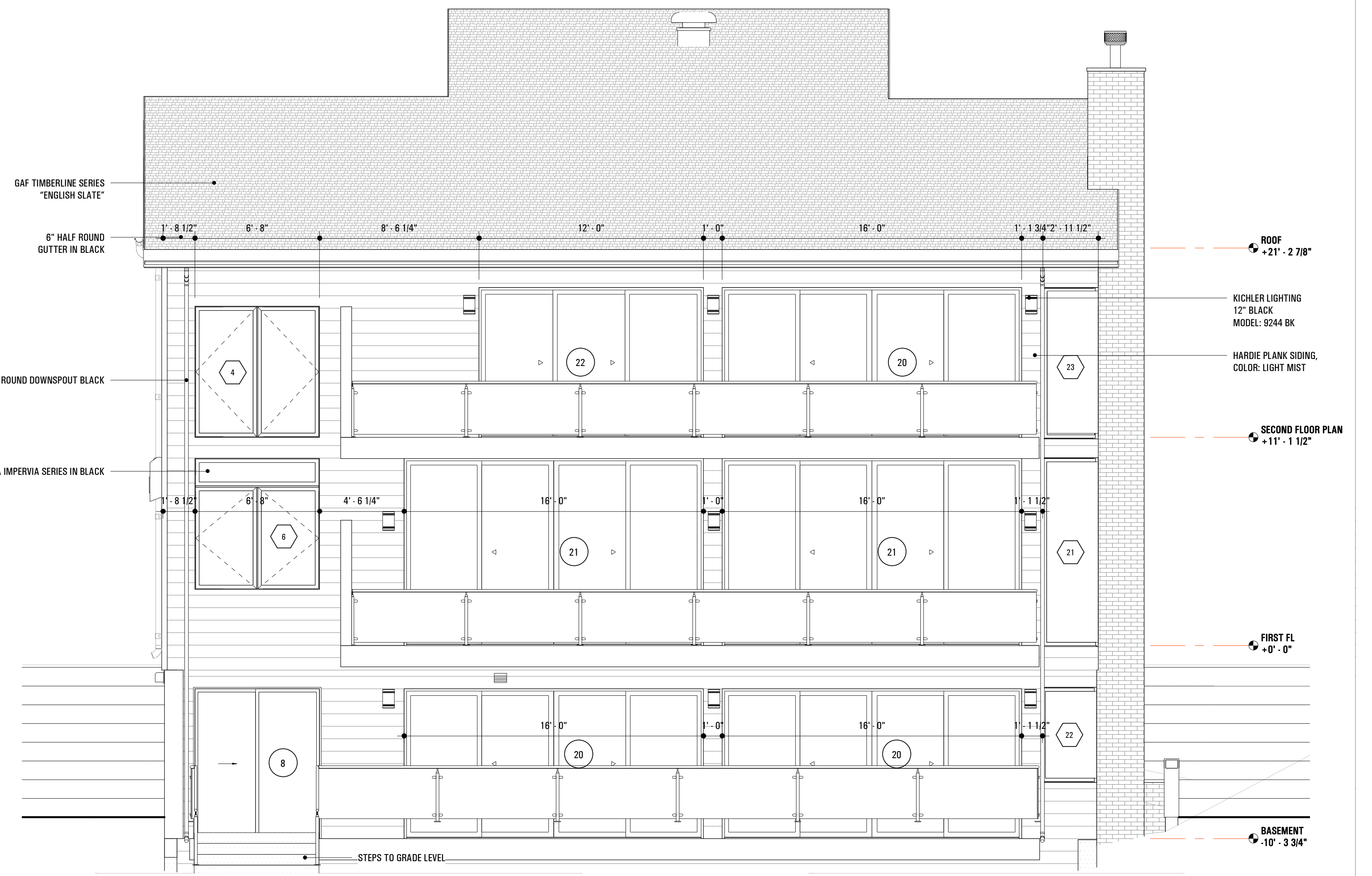
1 EAST ELEVATION
 SCALE: 1/4" = 1'-0"



1

SOUTH ELEVATION

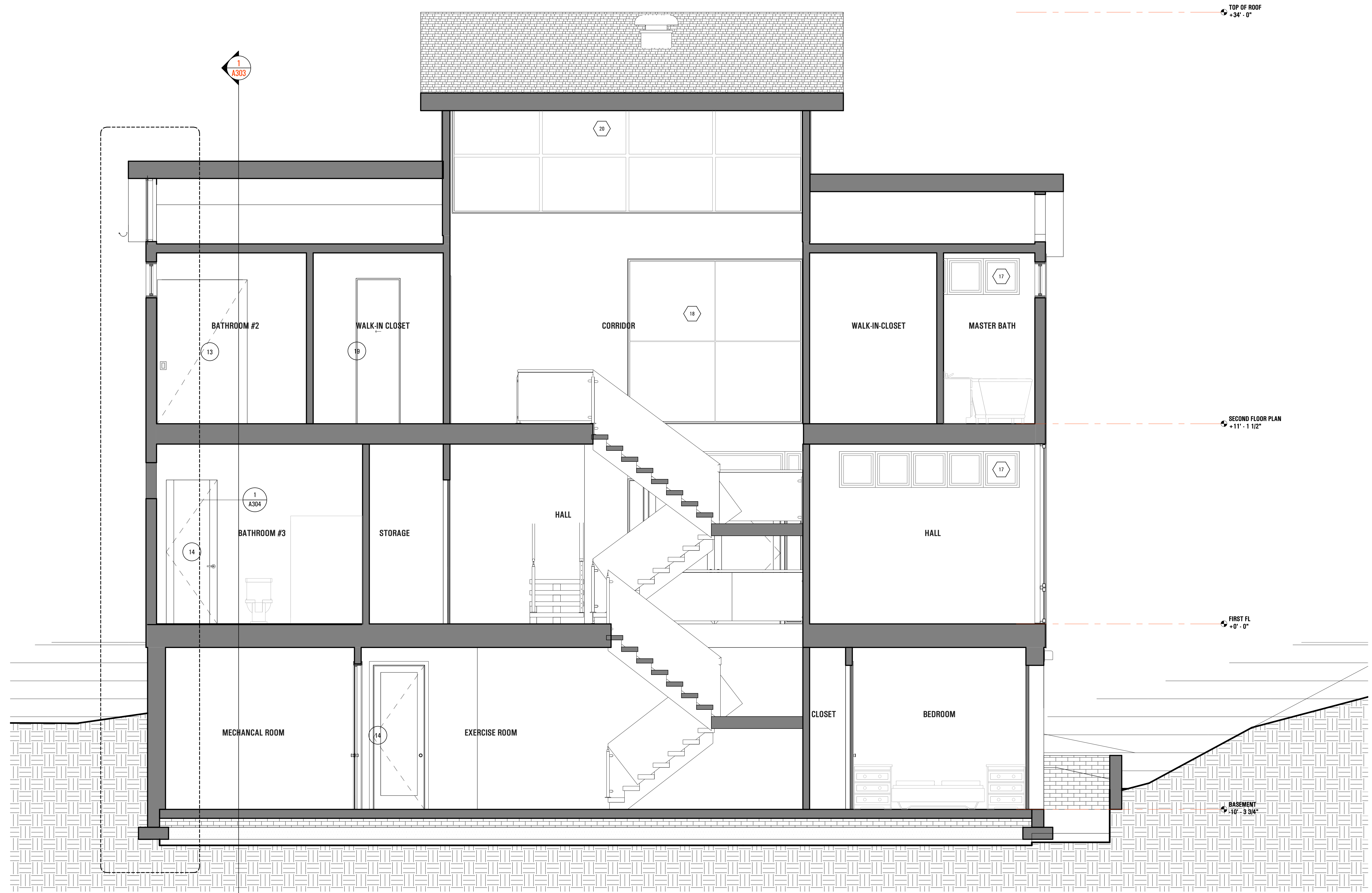
SCALE: 1/4" = 1'-0"



1

NORTH ELEVATION

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



1
A303

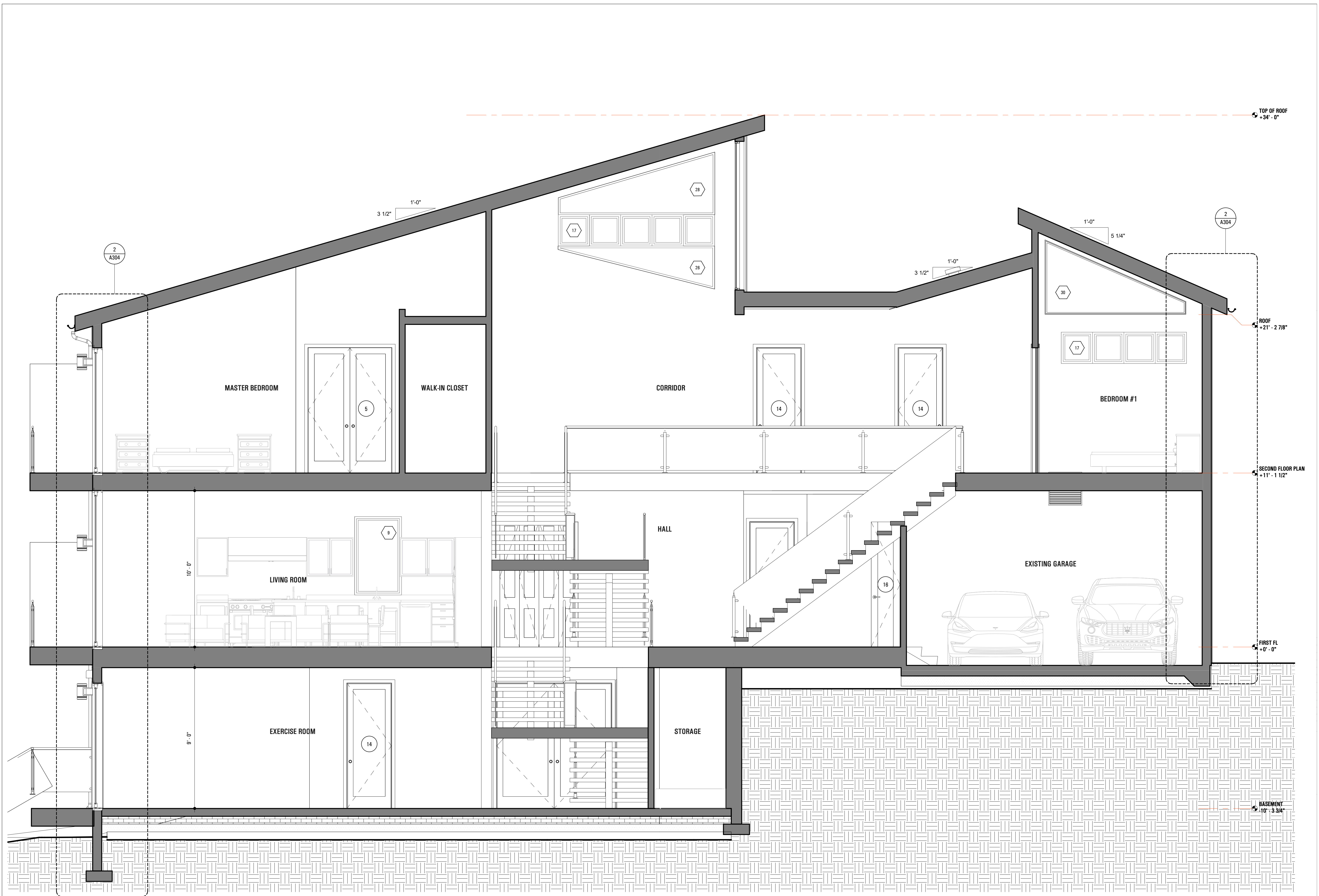
TOP OF ROOF
+34'-0"

SECOND FLOOR PLAN
+11'-1 1/2"

FIRST FL
+0'-0"

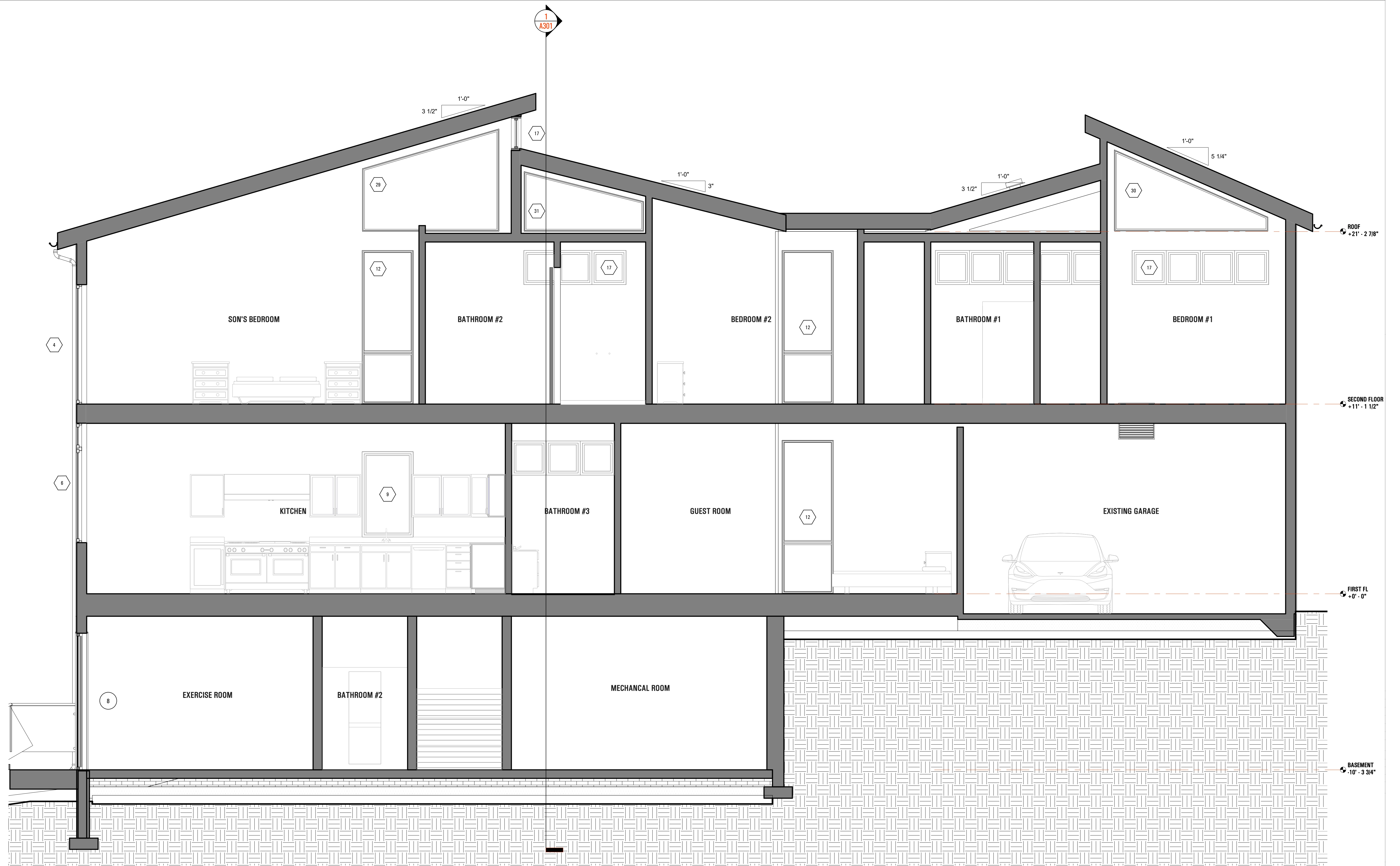
BASEMENT
-10'-3 3/4"

1 SECTION
SCALE: 3/8" = 1'-0"

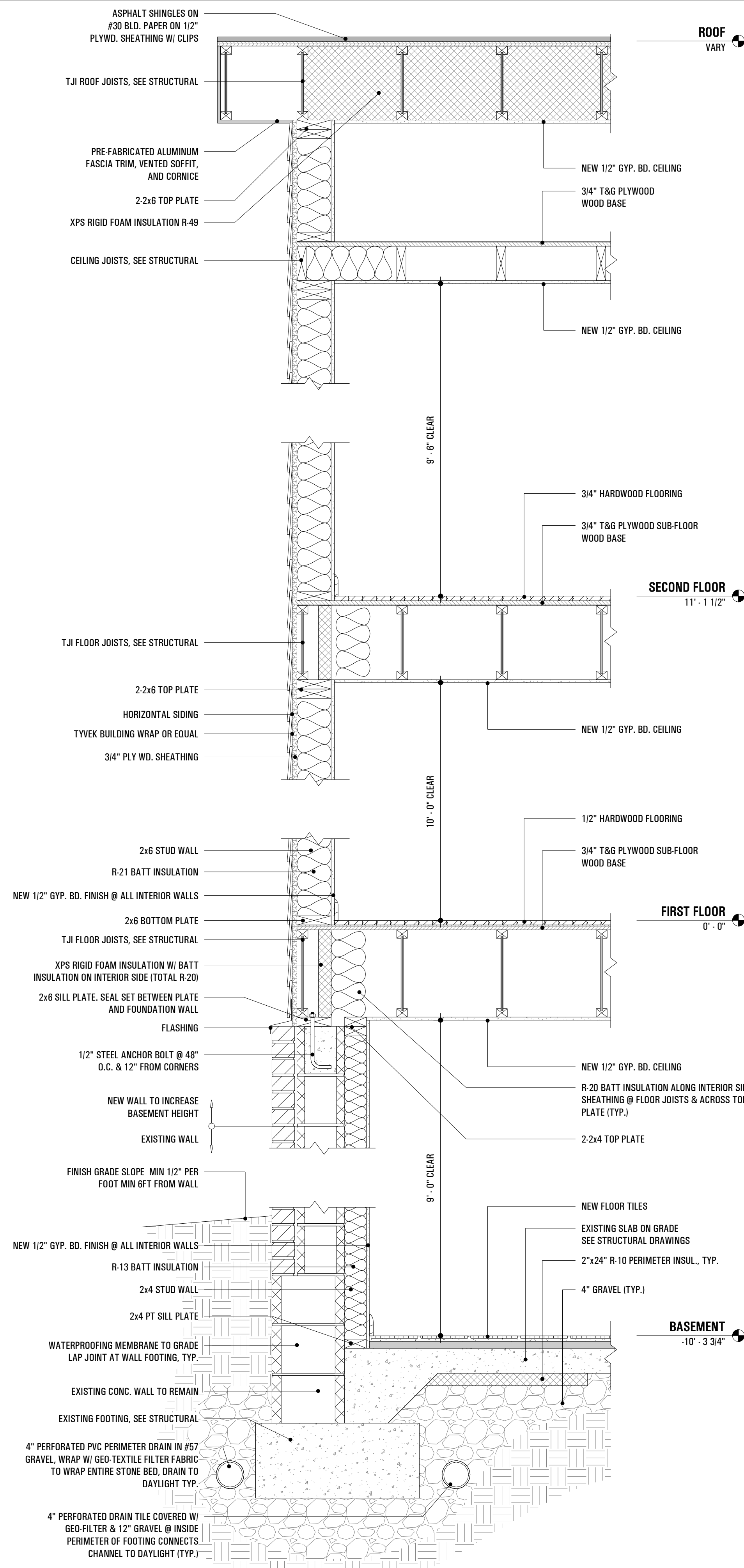


1 SECTION

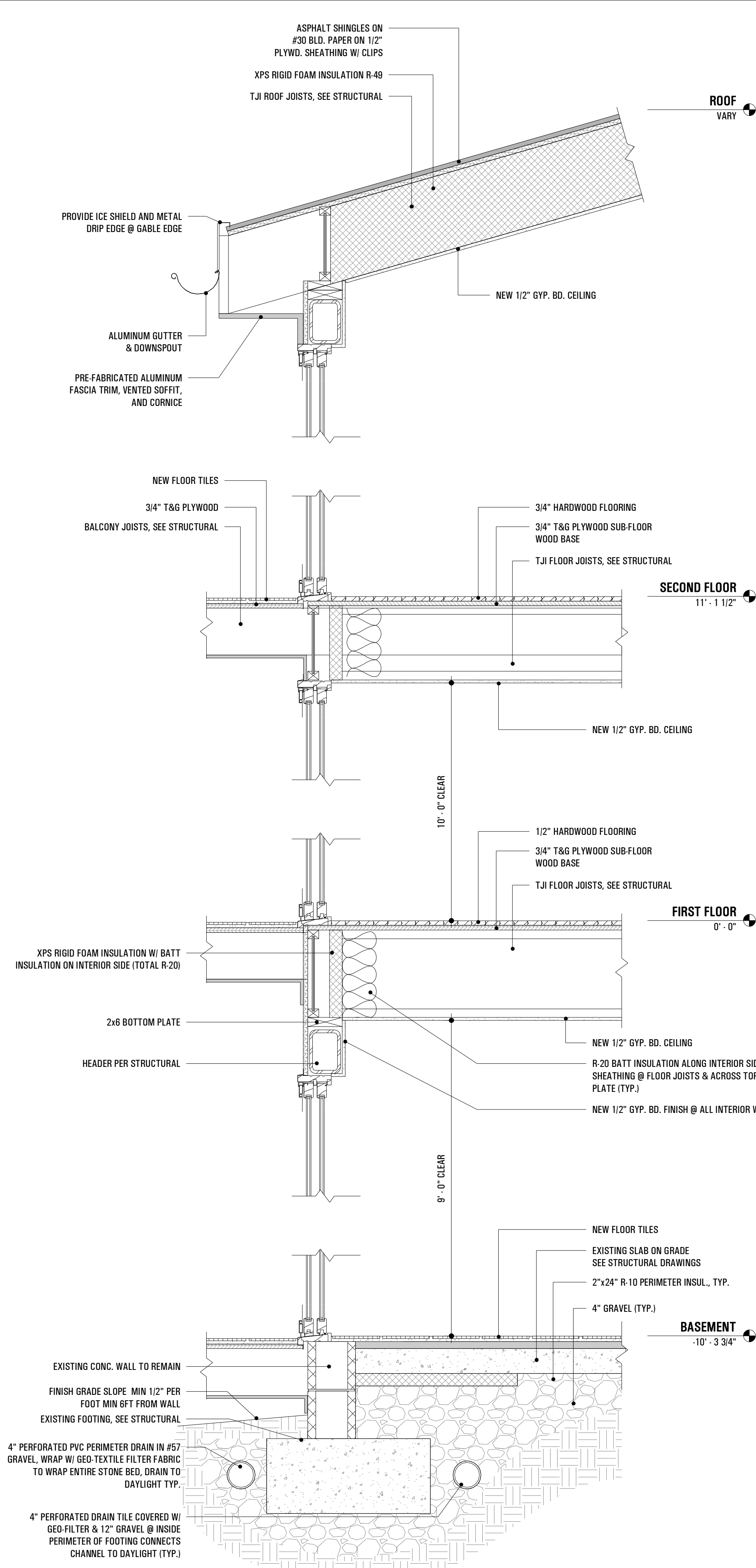
SCALE: 3/8" = 1'-0"



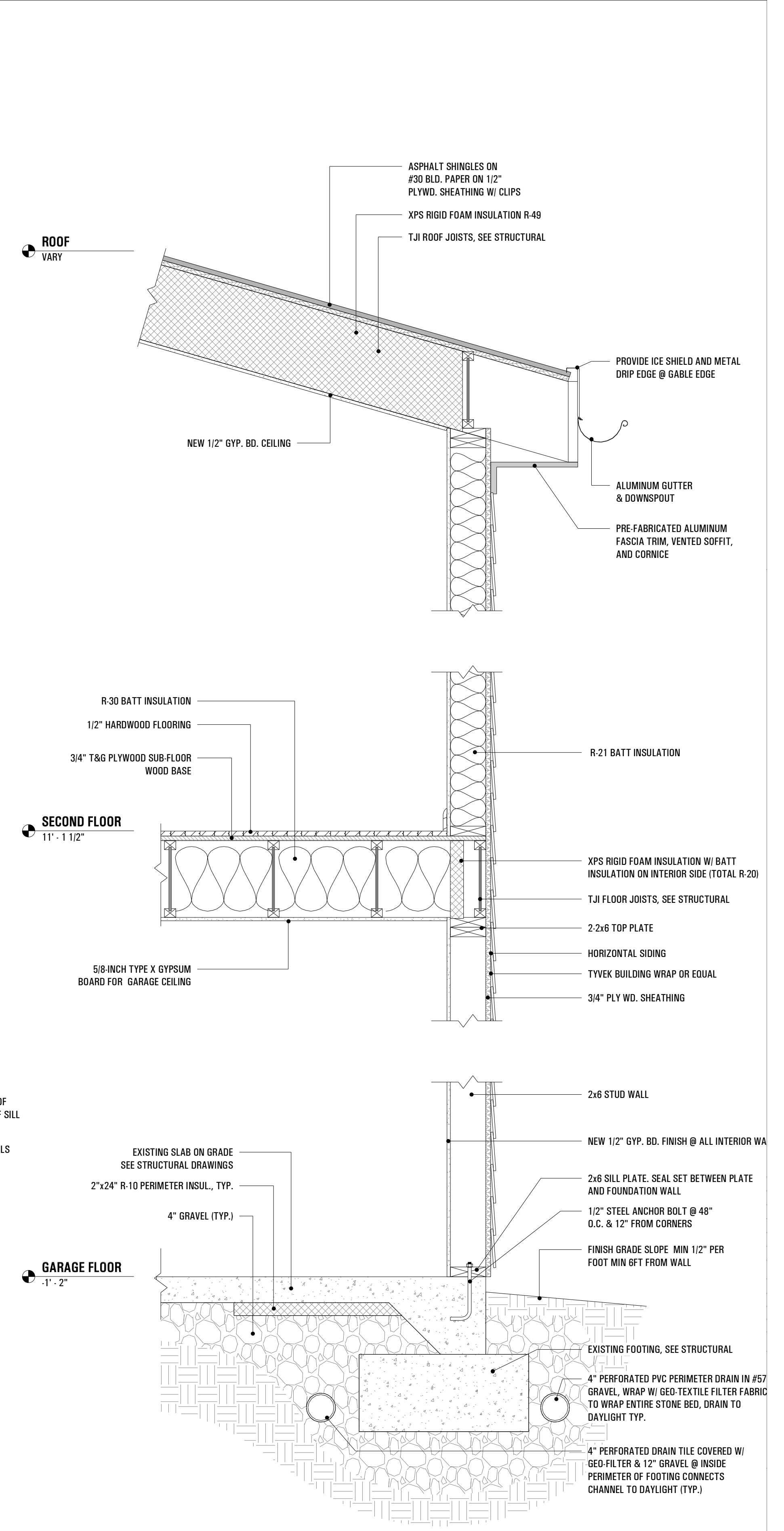
1 SECTION
SCALE: 3/8" = 1'-0"



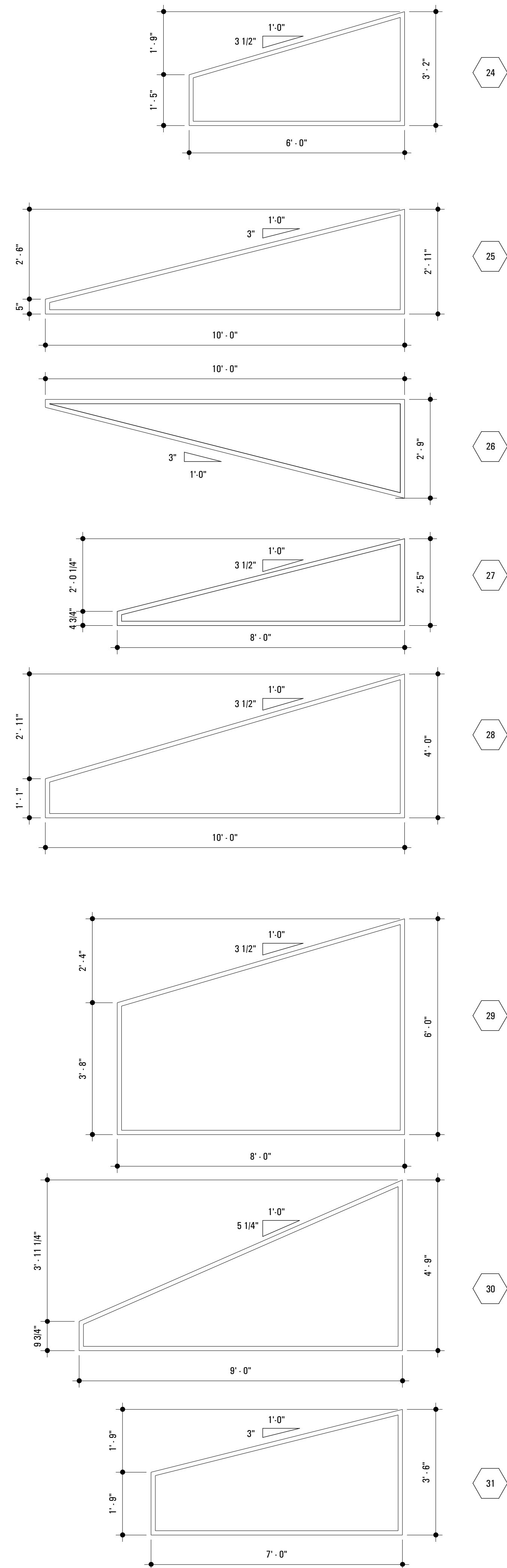
1 WALL SECTION
SCALE: 1" = 1'-0"



2 WALL SECTION
SCALE: 1" = 1'-0"

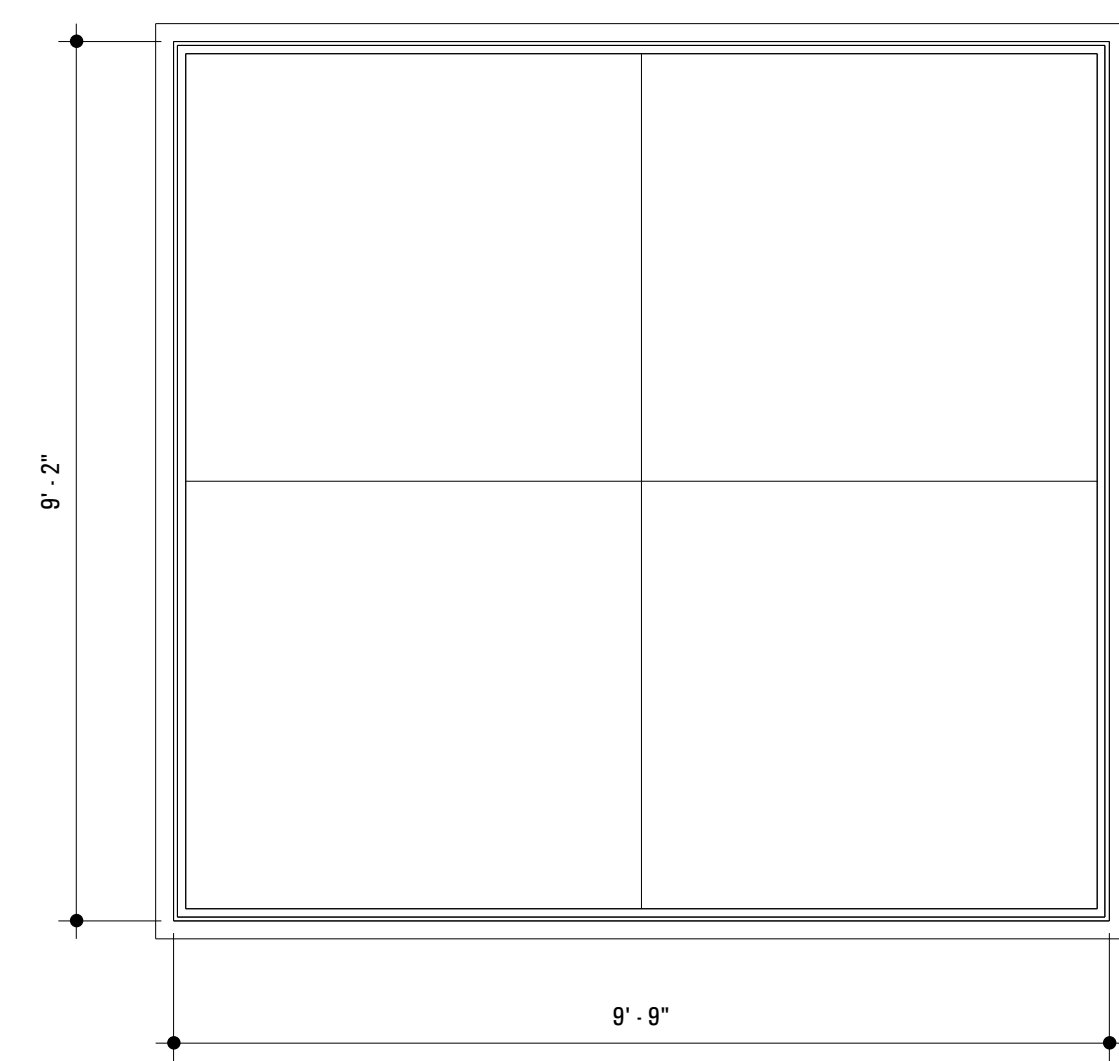


3 WALL SECTION
SCALE: 1" = 1'-0"

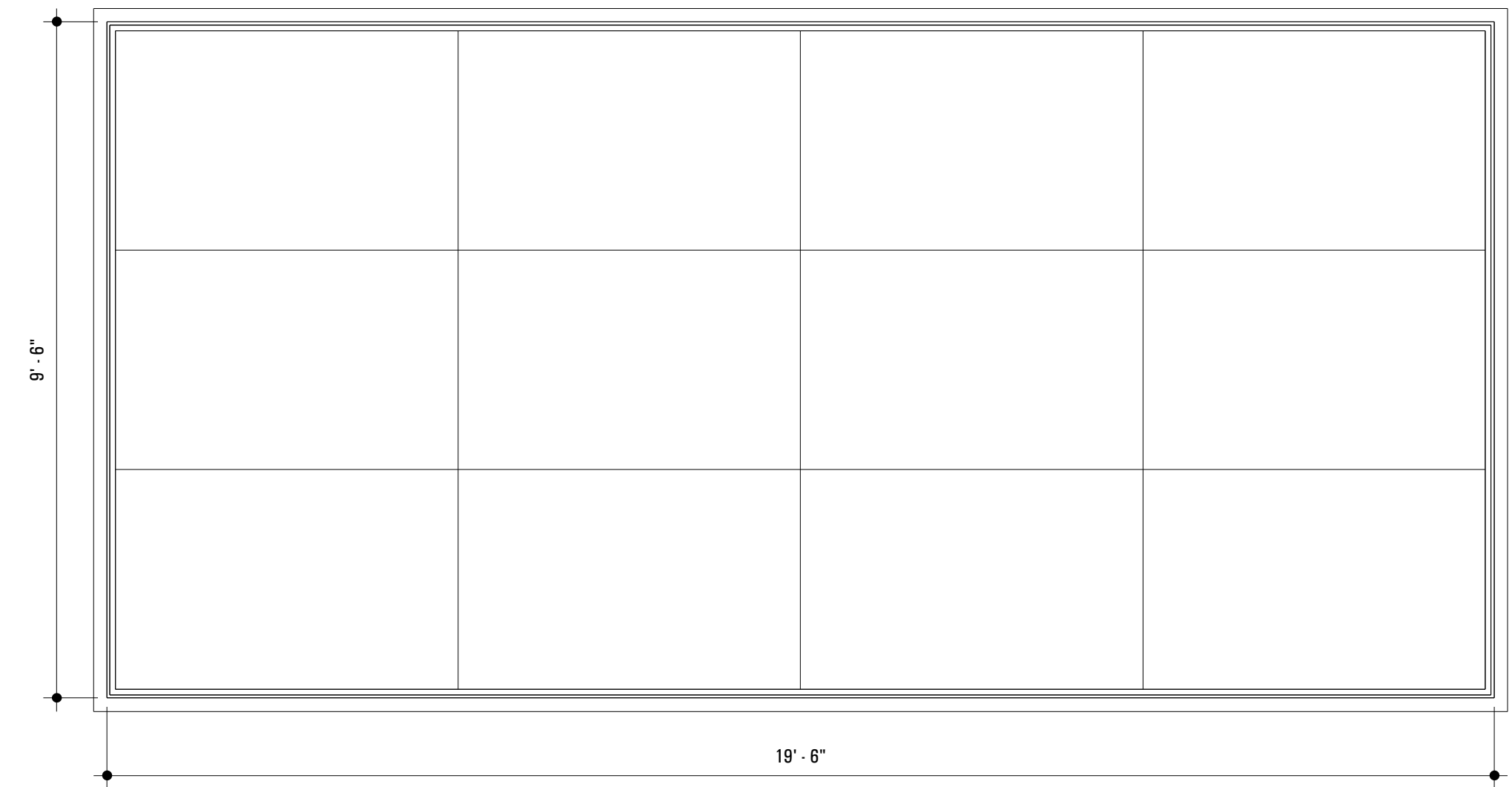


24
25
26
27
28
29
30
31

18



20



Window Schedule

MARK	SIZE			OPERATION STATUS	QUANTITY	"U" VALUE
	WIDTH	HEIGHT	SLOPE			
1	6'-0"	10'-0"		AWNING	1	0.32
2	8'-0"	10'-0"		AWNING	2	0.32
3	6'-0"	7'-0"		AWNING DOUBLE	1	0.32
4	6'-8"	7'-0"		AWNING DOUBLE W/ LOUVER	1	0.32
6	6'-8"	7'-0"		CASEMENT DOUBLE	1	0.32
7	8'-0"	9'-0"		CASEMENT DOUBLE	1	0.32
8	5'-0"	5'-0"		CASEMENT DOUBLE	1	0.32
9	3'-0"	5'-0"		CASEMENT SINGLE	1	0.32
10	3'-6"	5'-0"		CASEMENT SINGLE	2	0.32
11	3'-0"	8'-0"		FIXED	2	0.32
12	3'-0"	9'-0"		FIXED	3	0.32
13	1'-0"	8'-1"		FIXED	2	0.32
15	1'-0"	1'-6"		FIXED	2	0.32
16	7'-9"	1'-6"		FIXED	1	0.32
17	2'-0"	2'-0"		FIXED	60	0.32
18	9'-9"	9'-2"		FIXED	1	0.32
20	19'-6"	9'-6"		FIXED	1	0.32
21	3'-0"	10'-0"		FIXED CORNER	1	0.32
22	3'-0"	5'-0"		FIXED CORNER	1	0.32
23	3'-0"	8'-0"		FIXED CORNER	1	0.32
24	6'-0"	3'-2"	3 1/2" / 1'-0"	FIXED TRAPEZOID	1	0.32
25	10'-0"	2'-11"	3" / 1'-0"	FIXED TRAPEZOID	1	0.32
26	10'-0"	2'-9"	3" / 1'-0"	FIXED TRAPEZOID	2	0.32
27	8'-0"	2'-5"	3 1/2" / 1'-0"	FIXED TRAPEZOID	2	0.32
28	10'-0"	4'-0"	3 1/2" / 1'-0"	FIXED TRAPEZOID	2	0.32
29	8'-0"	6'-0"	3 1/2" / 1'-0"	FIXED TRAPEZOID	2	0.32
30	9'-0"	4'-9"	5 1/4" / 1'-0"	FIXED TRAPEZOID	2	0.32
31	7'-0"	3'-6"	3" / 1'-0"	FIXED TRAPEZOID	1	0.32

NOTES:
1. CONTRACTOR TO VERIFY IN FIELD OPENINGS PRIOR TO ORDERING.
2. ALL NEW WINDOWS ARE REQUIRED TO BE TESTED AND LABELED AS HAVING MET NFRC REQUIREMENTS FOR U FACTOR AND SHGC RATINGS AND AIR LEAKAGE.

Door Schedule

MARK	WIDTH	HEIGHT	TYPE	"U" VALUE	QUANTITY
1	7'-0"	8'-0"	BIFOLD		2
2	5'-0"	8'-0"	BIFOLD		2
3	5'-0"	8'-0"	BIFOLD		1
4	7'-4"	8'-0"	DOUBLE INTERIOR DOOR		1
5	5'-4"	8'-0"	DOUBLE INTERIOR DOOR		3
8	6'-8"	8'-0"	DOUBLE SLIDING	0.32	1
9	7'-4"	8'-0"	ENTRANCE DOOR		1
10	2'-10"	8'-0"	EXTERIOR WOOD DOOR		1
11	15'-0"	8'-0"	GARAGE		1
12	2'-4"	6'-0"	GLASS SAUNA DOOR		1
13	4'-6"	8'-0"	GLASS SHOWER DOOR		1
14	2'-10"	8'-0"	INTERIOR WOOD DOOR		12
15	2'-4"	8'-0"	INTERIOR WOOD DOOR		2
16	1'-10"	8'-0"	INTERIOR WOOD DOOR		1
17	2'-6"	8'-0"	INTERIOR WOOD DOOR		1
18	3'-0"	8'-0"	POCKET		1
19	2'-4"	8'-0"	POCKET		3
20	16'-0"	8'-0"	4 PANEL GLASS SLIDING DOOR	0.32	3
21	16'-0"	10'-0"	4 PANEL GLASS SLIDING DOOR	0.32	2
22	12'-0"	8'-0"	3 PANEL GLASS SLIDING DOOR	0.32	1

NOTES:
1. VERIFY IN FIELD OPENINGS PRIOR TO ORDERING.