A/C

AFF

AL

AFG

AMB

AMP

APROX

ARR

ATC

AUTO.

AUX

AVG

BBD

BHP

BOD

BOP

BOT

BSMT BTU

C TO C

CA

CAP.

CI

CL

CO

COL

CONC

CONN

CONT

CTR

CF

DB

DDC

DEG

DET

DIA,Ø

DISC.

DWG

DN

EA EAT

EDR

EER

EFF

EJ

EL ELB

ELEC

ENT

ESP

EVAP

EWT

EXH

EXP

EXST

EXT

F&T

FC

FDW

FLA

FLR

FO

FPM

FPS

FS

FT

GA

GAL

GALV

GND

GPH

GPM

GPS

GR

HD

HG

HGT

HTD

HTR

HMD

HORIZ

HP

Hz

BP

BF

AP

ABBREVIATIONS

2

A	
В	
С	
D	
E	
F	
G	

AIR CONDITIONING	INSUL	INSULATION
	INTL	
ABOVE FINISHED GRADE ALUMINUM	LAT LBS	LEAVING AIR TEMPERATURE POUNDS
AMBIENT	LIN	LINEAL
AMPERE ACCESS PANEL	LP LRA	LOW PRESSURE LOCKED ROTOR AMPS
APPROXIMATE	LVL	LEVEL
ARRANGEMENT	LVR	LOUVER 「LEAVING WATER
CONTROL	LWT	
	MAN.	
AUXILIARY AVERAGE	MAX	MAXIMUM
BOILER BLOW DOWN BOILER FEED	MBH	THOUSAND BRITISH
∫ BOILER HORSEPOWER OR	MU	MAKEUP
ERAKE HORSEPOWER	MIN	MINIMUM
BOTTOM OF PIPE	MOD. MOUNT.	MODEL MOUNTING
BOTTOM	MTD	MOUNTED
BACK PRESSURE BASEMENT	NA NC	NOT APPLICABLE NORMALLY CLOSED
BRITISH THERMAL UNIT	NEG	NEGATIVE
CENTER TO CENTER COMPRESSED AIR	NIC NO	NOT IN CONTRACT NORMALLY OPEN
CAPACITY CHEMICAL FEED	NTS	NOT TO SCALE
FOOT (FEET) PER MINUTE	OA OED	OUTSIDE AIR OPEN END DUCT
CAST IRON	OF	OVERFLOW
CENTER LINE CLEANOUT	OFCI	∫ OWNER FURNISHED ↓ CONTRACTOR INSTALLED
COLUMN	OV	OUTLET VELOCITY
	PCR	∫ PUMPED CONDENSATE } RETURN
CONNECT OR CONNECTION CONTINUATION	PD	PRESSURE DROP
CENTER	PG	PRESSURE GAUGE
CUBIC FOOT (FEET) DRAIN OR DEEP	PL PNEU	PLATE PNEUMATIC
DRY BULB	PRESS.	
∫ DIRECT DIGITAL } CONTROL	PROP.	PROPELLER
DEGREE	PSIG	
DETAIL DIAMETER	QTY RECOV	QUANTITY RECOVERY
DISCONNECT	REF	REFERENCE
DOWN	REQD REV	REQUIRED REVISION
DRAWING EACH	RL	REFRIGERANT LIQUID
	RM	ROOM
∫ EQUIVALENT DIRECT	RS RTN	REFRIGERANT SUCTION RETURN
	S	SWITCH
LRATIO EFFICIENCY	SCH	SCHEDULE
EXPANSION JOINT ELEVATION	SD	
ELBOW	SEC SENS	SECONDARY,SECONDS SENSIBLE
ELECTRICAL ENTERING	SEP	SEPARATE SEQUENCE
EXTERNAL STATIC PRESSURE	SEQ SER	SEQUENCE
	SERV	SERVICE
ENTERING WATER TEMPERATURE EXHAUST	SHT SOL	SHEET SOLENOID
EXPANSION	SP	STATIC PRESSURE
EXISTING EXTERNAL	SS STL	STAINLESS STEEL STEEL
FLOAT & THERMOSTATIC	SUCT	SUCTION
FLEXIBLE CONNECTOR /	SPLY	SUPPLY
FEED WATER	TD	
FULL LOAD AMPS FLOOR	TEMP TH	TEMPERATURE THERMOMETER
FUEL OIL	ТНК	THICK
FOOT (FEET) PER MINUTE FOOT (FEET) PER SECOND	TSP TYP.	TOTAL STATIC PRESSURE TYPICAL
FLOW SWITCH	UON	UNLESS OTHERWISE NOTED
FOOT (FEET) GAUGE	V VAC	VENT OR VOLT VACUUM
GALLONS	VAV	VARIABLE AIR VOLUME
GALVANIZED GROUND	VB VEL	VACUUM BREAKER VELOCITY
GROUND GALLONS PER HOUR	VEL VERT	VERTICAL
GALLONS PER MINUTE	VIB	VIBRATION
GALLONS PER SECOND GRAIN	VOL VSD	VOLUME VARIABLE SPEED DRIVE
HEAD	VTR	VENT THRU ROOF
HOT GAS HEIGHT	W WB	WATT, WIDTH OR WIDE WET BULB
HEATED	WMS	WIRE MESH SCREEN
HEATER HUMIDITY		
HORIZONTAL		
HORSEPOWER HERTZ		
MISCELLANEO	ous si	YMBOLS

T	THERMOSTAT
H	HUMIDISTAT
S	SWITCH
Мh	VFD (VARIABLE FREQUENCY DRIVE)
\bigcirc	POINT OF CONNECTION-NEW TO EXISTING
\Leftrightarrow	POINT OF DEMOLITION CONCLUSION
#	DRAWING NOTE SYMBOL
S*	DESIGNATES SUPPLY DIFFUSER TYPE IN AREA
R*	DESIGNATES RETURN DIFFUSER TYPE IN AREA
E*	DESIGNATES EXHAUST GRILLE TYPE IN AREA
_#	REVISION SYMBOL
	DIRECTION OF VIEW
#	- SECTION NUMBER
$\langle \cdot \rangle$	- DRAWING ON WHICH SECTION
\frown	OR DETAIL IS SHOWN
#-	— DETAIL OR SECTION NUMBER
	DRAWING FROM WHICH SECTION OR
	DETAIL IS TAKEN
S* -	- SUPPLY/RETURN DIFFUSER TYPE
***	- NECK SIZE
***	— CFM

BIM 360://1070119.000_Woodlands_Greystone_Clubhouse_R18/MEP_1070119.000_WoodlandsGreystoneClubhouse_R18.rvt

DOUBLE LINE	DESCRIPTION
	EXISTING TO REMAIN
	EXISTING TO BE REMOVED
	NEW WORK
	SUPPLY AIR UP
	SUPPLY AIR DOWN
	EXHAUST OR RETURN AIR UP
	EXHAUST OR RETURN AIR DOWN
	ROUND DUCT UP
	ROUND DUCT DOWN
24x36	RECTANGULAR DUCT SIZE SHOWN IN INCHES (FIRST FIGURE-SIDE SHOWN)
36x14Ø"	FLAT OVAL DUCT SIZE (FIRST FIGURE-SIDE SHOWN)
	DIRECTION OF FLOW
	DUCT INCLINED RISE OR DROP IN DIRECTION OF FLOW
	90° ELBOW WITH TURNING VANES
	45°ELBOW (NO VANES)
	SUPPLY OR RETURN BRANCH CONNECTION
	SUPPLY BRANCH WITH SPIN COLLAR CONNECTION
	LATERAL CONNECTION ROUND DUCTWORK
	CONICAL TEE ROUND DUCTWORK
(CFM)	4-WAY DIFFUSER (D)
	3-WAY, 2-WAY, OR 1-WAY GRILLE (G)
(CFM)	EXHAUST OR RETURN GRILLE (G)
	MOTORIZED DAMPER
	VOLUME DAMPER
	BYPASS DAMPER
	BACK DRAFT DAMPER
	SMOKE DAMPER WITH ACCESS DOOR
	FIRE DAMPER WITH ACCESS DOOR
	COMBINATION FIRE & SMOKE DAMPER WITH ACCESS DOOR
\$P 	STATIC PRESSURE SENSOR

 \square (CFM) \boxtimes (CFM) (CFM) MD -----_____ BD _____ BDD _____ -----_____ _____ SD. _____ DUCT TEMPERATURE SENSOR -----T DUCT HUMIDITY SENSOR H

SDT

 \sim

NOTE: NOT ALL ABBREVIATIONS AND SYMBOLS INDICATED MAY APPEAR ON THESE CONTRACT DRAWINGS. THIS IS FOR REFERENCE ONLY.

DUCT SMOKE DETECTOR

FLEXIBLE DUCTWORK DUCT

PRESSURE

CLASS

	PIPING SYMBOLS
SYMBOL	DESCRIPTION
	SHUT-OFF VALVE GLOBE VALVE
	CHECK VALVE FLOW SETTER
	ANGLE GATE VALVE
	RELIEF OR SAFETY VALVE
	SOLENOID VALVE
T	THERMAL EXPANSION VALVE
	BACK PRESSURE VALVE
	BUTTERFLY VALVE
	2-WAY CONTROL VALVE 3-WAY CONTROL VALVE
	PRESSURE REDUCING VALVE
	UNION
<u> </u>	STRAINER W/BLOW-OFF & CAP
	FLOW SENSOR
	SIGHT GLASS
X	PIPE ANCHOR FLEXIBLE CONNECTOR
	EXPANSION JOINT
<u> </u>	THERMOMETER
A	PRESSURE GAUGE W/COCK
M	AUTOMATIC AIR VENT
	MANUAL AIR VENT
	ORIFICE PLATE
	FLOAT AND THERMOSTATIC TRAP
	TRAP DIRECTION OF FLOW DIRECTION OF SLOPE
	CONCENTRIC REDUCER
	ECCENTRIC REDUCER PIPE UP
	PIPE DOWN
	PIPE THROUGH TOP TAKE-OFF
	BUCKET TRAP
EMD	END OF MAIN DRIP
	EXISTING TO REMAIN
	EXISTING TO BE REMOVED
BBD	NEW WORK BOILER BLOWDOWN - CONTINUOL
BF	BOILER FEED WATER
CA CF	COMPRESSED AIR CHEMICAL FEED
CHS	CHILLED WATER SUPPLY
CHR CR	CHILLED WATER RETURN CONDENSER WATER RETURN
CS	CONDENSER WATER SUPPLY
D FOR	CONDENSATE DRAIN OR DRAIN FUEL OIL RETURN
FOS	
——FOV—— ——HG——	FUEL OIL TANK VENT HOT GAS
HPR	
——HPS——— ———HR———	HIGH PRESSURE STEAM SUPPLY HEATING RETURN
——HS——	HEATING SUPPLY
LPCS LPR	LOW PRESSURE CLEAN STEAM LOW PRESSURE CONDENSATE RE
LPS	LOW PRESSURE STEAM SUPPLY
———MPR——— ———MPS———	MEDIUM PRESSURE CONDENSATE MEDIUM PRESSURE STEAM SUPPI
MU	MAKE UP WATER
PCR RL	PUMPED CONDENSATE RETURN REFRIGERANT LIQUID
RS	REFRIGERANT SUCTION
V	VENT LINE

3

T

H

SDT

 \int

DUCTWORK SYMBOLS

SINGLE LINE

24x36

36x14Ø"

—

UP DN

____/

 \rightarrow

-

 $\bigcirc ----$

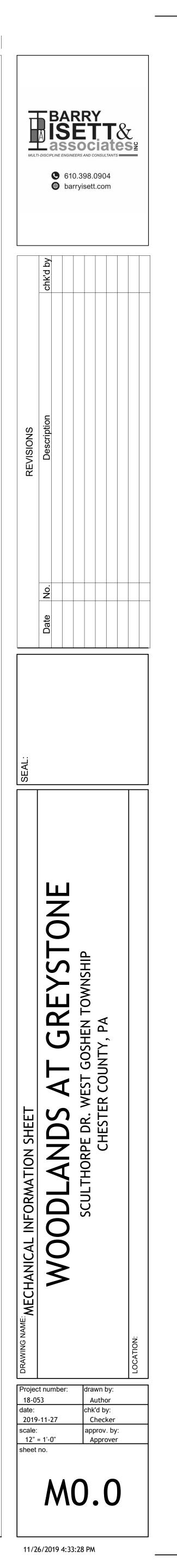
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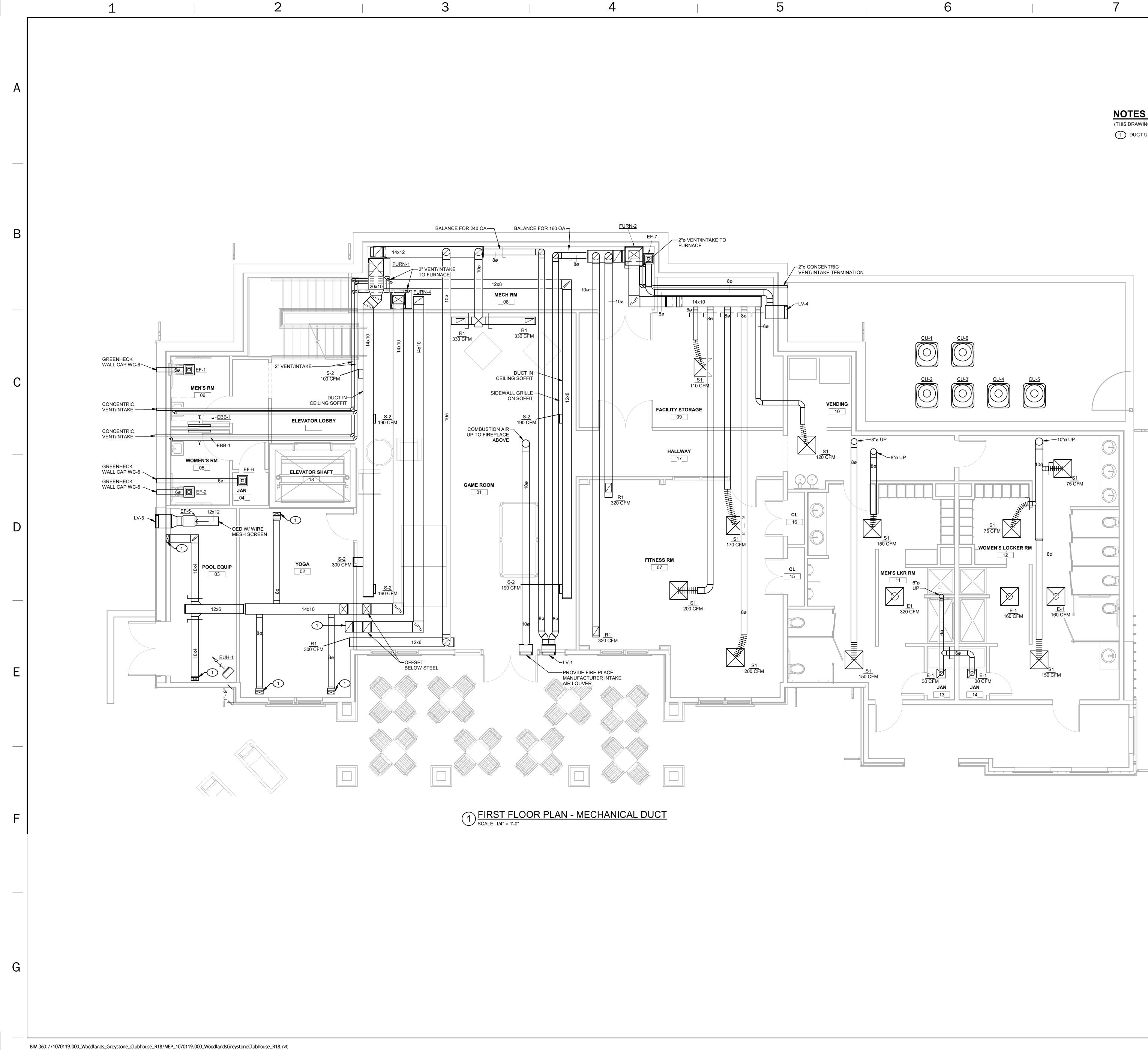
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6		7
	GF	NERAL NOTES
S	<u>UL</u> 1.	CONTRACT DRAWINGS ARE DIAGRAMMATIC AND INDICATE THE RELATION OF PIPING, DUCTWORK, CONNECTIONS, AND EQUIPMENT. THE DRAWINGS DO NOT INDICATE ALL OFFSETS, ELBOWS, AND FITTINGS THAT MAY BE REQUIRED. THEREFORE, THE CONTRACTOR SHALL CAREFULLY INVESTIGATE THE STRUCTURAL AND FINISH CONDITIONS AFFECTING THE WORK AND ACTUAL EQUIPMENT PROVIDED. THE CONTRACTOR SHALL FURNISH ALL OFFSETS, ELBOWS, FITTINGS, HANGERS, AND ACCESSORIES AS MAY BE REQUIRED TO MEET THESE CONDITIONS AT NO ADDITIONAL COST TO THE OWNER
	2.	INSTALL ALL EQUIPMENT AND MATERIALS IN STRICT ACCORDANCE WITH THE CURRENTLY ADOPTED INTERNATIONAL MECHANICAL CODE, ALL PERTINENT CODES, LAWS, ORDINANCES, REGULATIONS, AND RESPECTIVE MANUFACTURER'S WRITTEN
	3.	INSTRUCTIONS. ALL DUCTWORK SHALL BE CONSTRUCTED AND INSTALLED IN STRICT ACCORDANCE
/ALVE FETY VALVE		WITH SMACNA AND ASHRAE STANDARDS.
-VE	4.	COORDINATE HVAC WORK WITH THE WORK OF ALL OTHER CONTRACTORS AND OWNER.
ANSION VALVE	5.	THE HVAC CONTRACTOR SHALL ARRANGE THE PROGRESS OF HIS WORK SO AS TO CONFORM TO THE PROGRESS OF THE TRADES AND SHALL COMPLETE THE ENTIRE INSTALLATION AS SOON AS THE CONDITION OF THE PROJECT WILL PERMIT.
	6.	ALL ITEMS OF LABOR, MATERIAL, AND EQUIPMENT NOT SPECIFICALLLY DESCRIBED HEREIN NOR DETAILED ON THE DRAWINGS BUT INCIDENTAL TO OR NECESSARY FOR THE COMPLETION OF THE WORK, SHALL BE CONSIDERED AS INCLUDED
ALVE	7.	WITHOUT EXTRA COST. COORDINATE EXACT LOCATIONS OF DIFFUSERS/DUCTWORK WITH LIGHTS,
OL VALVE	8.	SPRINKLERS, AND CEILING WITH REFLECTED CEILING PLAN AND ARCHITECT. PROVIDE INDIVIDUAL VOLUME DAMPERS FOR BALANCING ON ALL SUPPLY, RETURN,
	0.	RELIEF, AND EXHAUST MAIN BRANCH AND BRANCH TAKE-OFFS. LOCATE VOLUME DAMPER AS CLOSE AS POSSSIBLE TO TAKE OFF POINTS. PROVIDECABLE CONTROL VOLUME DAMPERS FOR ALL INACCESSIBLE CEILINGS.
	9.	THE CONTRACTOR SHALL PROVIDE ADEQUATE CLEARANCE FOR ALL UNIT CONTROLS.
BLOW-OFF & CAP	10.	MOUNT ALL SPACE SENSING DEVICES AT 48" AFF, COORDINATE ALL LOCATIONSWITH ARCHITECT PRIOR TO ROUGH-IN AND INSTALLATION.
र	11.	PROVIDE PROTECTION FOR ALL PENETRATIONS OF FIRE RESISTANCE RATED ASSEMBLIES IN ACCORDANCE WITH THE REQUIREMENTS OF THE CURRENTLY ADOPTED INTERNATIONAL BUILDING CODE.
NECTOR	12.	REFER TO ARCHITECTURAL REFLECTED CEILING PLANS FOR CEILING TYPES. PROVIDE APPROPRIATE FRAMES AND MOUNTING HARDWARE FOR ALL AIR DEVICES. MECHANICAL CONTRACTOR IS RESPONSIBLE FOR COORDINATING ALL MOUNTING DETAILS AND REQUIREMENTS WITH CEILING CONTRACTOR.
DINT	13.	ROUTE EQUIPMENT DRAIN PIPING TO FLOOR DRAINS TO PREVENT TRIPPING HAZARDS. DO NOT INSTALL PIPING ON FLOOR IN ANY EQUIPMENT ACCESS AISLES.
R NUGE W/COCK	14.	PROVIDE DOUBLE WALL INSULATED ACCESS DOORS IN ALL INSULATED DUCTWORK AND SINGLE WALL ACCESS DOORS IN UN-INSULATED DUCTWORK FOR FIRE DAMPER, SMOKE DAMPER, AND REHEAT COIL INSPECTION AND SERVICE.
R VENT	15.	NO PIPING OR DUCTWORK FOREIGN TO ELECTRICAL, DATA, OR ELEVATOR MACHINE ROOMS IS PERMITTED TO BE INSTALLED IN THESE SPACES.
ENT	16.	ALL INDOOR FLOOR MOUNTED MECHANICAL EQUIPMENT SHALL BE MOUNTED ON 4"
<u>=</u>	17.	MINIMUM HOUSEKEEPING PAD. NO PIPING OR DUCTWORK FOREIGN TO ELECTRICAL, DATA, OR ELEVATOR MACHINE
	18.	ROOMS IS PERMITTED TO BE INSTALLED IN THESE SPACES. PROVIDED ALL PIPING, VALVING & EQUIPMENT SHOWN ON FLOW DIAGRAMS AND
IC F FLOW		DETAILS EVEN IF NOT SHOWN ON FLOOR PLANS.
F SLOPE	19.	PROVIDE PIPING TO ALL EQUIPMENT REQUIRING WATER SERVICE AND DUCTWORK TO EVERY AIR DEVICE EVEN IF NOT SHOWN ON PLANS.
REDUCER REDUCER	20.	PROVIDE ACCESS PANELS FOR ALL VALVES AND DAMPERS ABOVE INACCESSIBLE CEILINGS, ACCESS PANEL TO BE A MINIMUM OF 12"X12", COORDINATE FINAL LOCATION WITH REFLECTED CEILING PLAN.
	21.	HVAC CONTRACTOR TO PROVIDE WOOD BLOCKING FOR ALL ROOF CURBS IN BOTH EXISTING AND NEW CONSTRUCTION; COORDINATE WITH GC.
GH	22.	HVAC CONTRACTOR TO PROVIDE HOUSEKEEPING PADS FOR ALL EQUIPMENT.
F	23.	CONTRACTOR SHALL UNCONDITIONALLY GUARANTEE IN WRITING ALL MATERIALS, EQUIPMENT, AND WORKMANSHIP FOR A PERIOD OF ON YEAR FROM THE DATE OF ACCEPTANCE BY OWNER.
DRIP REMAIN	24.	THE MECHANICAL CONTRACTOR SHALL SUBMIT TO THE ARCHITECT/ENGINEER AS- BUILT DRAWINGS AND OPERATION AND MAINTENANCE MANUALS INCLUDING ALL NAMEPLATE DATA, WIRING DIAGRAMS, MAINTENANCE INSTRUCTIONS, AND PARTS LIST UPON PROJECT COMPLETION.
BE REMOVED	25.	MAINTAIN A CLEAN AND SAFE WORK AREA AT ALL TIMES. ALL SAFETY PROCEDURES AND ENFORCEMENT IS THE RESPONSIBILITY OF THE CONTRACTOR; CONFORM TO ALL OSHA STANDARDS.
WATER D AIR ED TER SUPPLY TER RETURN WATER RETURN		
WATER RETURN		

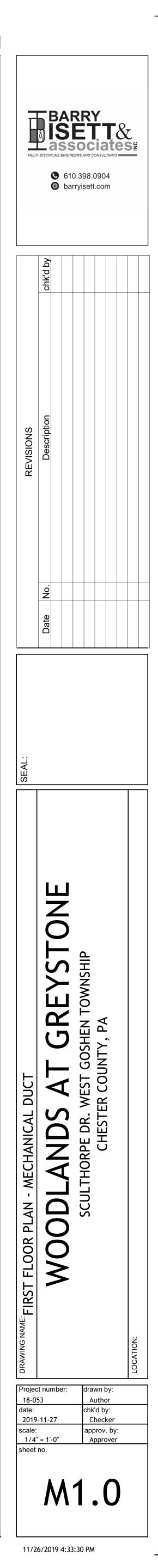
VENT E CONDENSATE RETURN

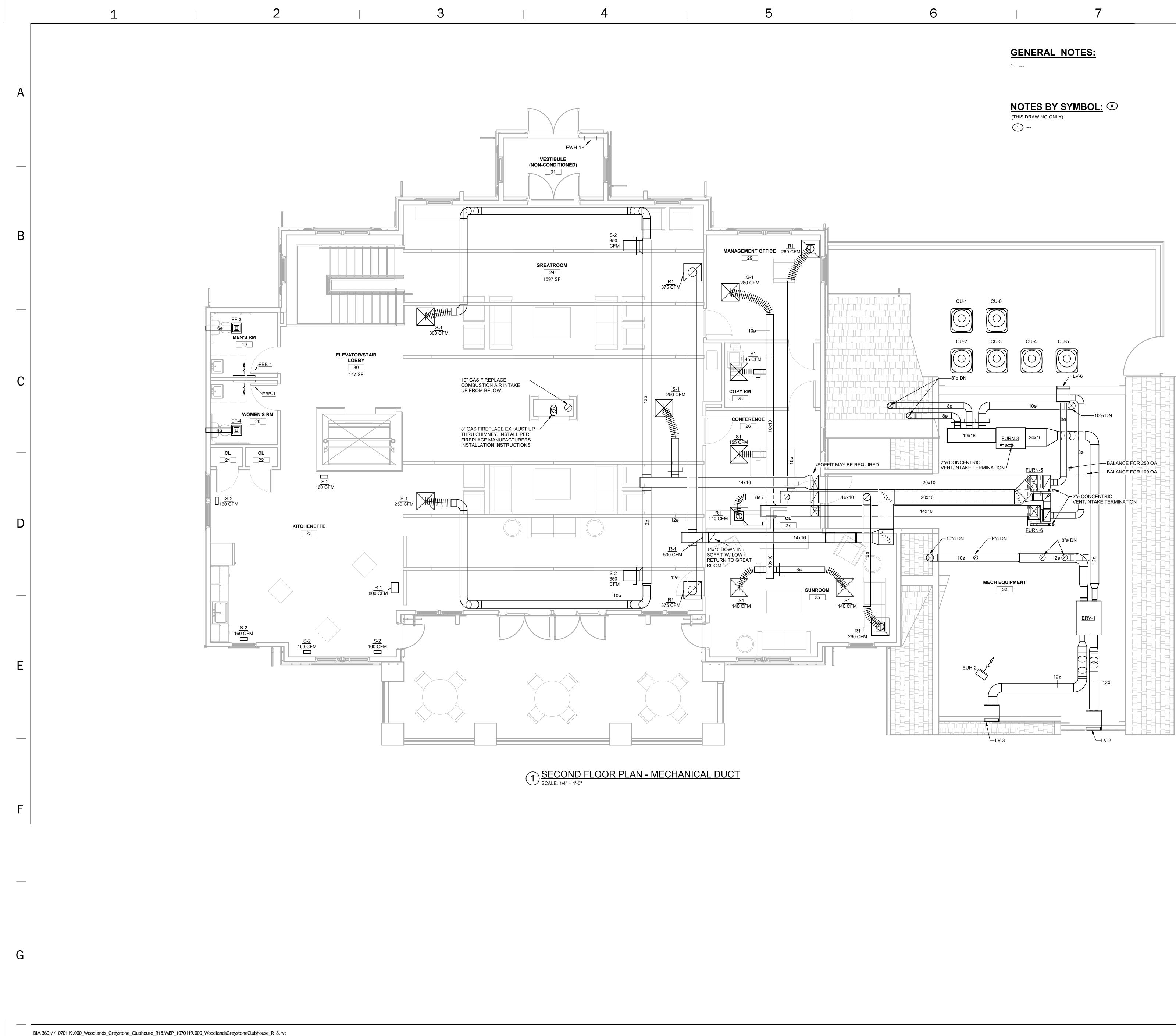
E CLEAN STEAM E CONDENSATE RETURN E STEAM SUPPLY URE CONDENSATE RETURN URE STEAM SUPPLY

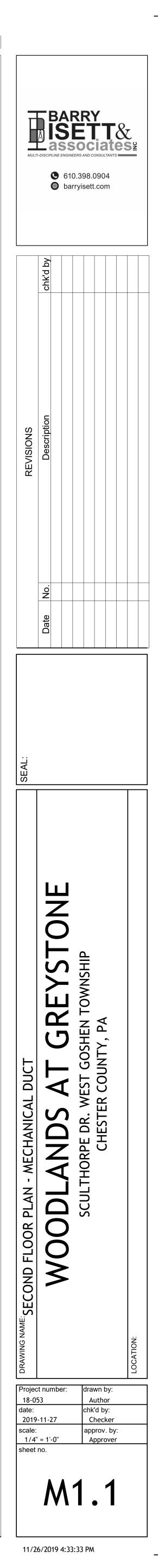


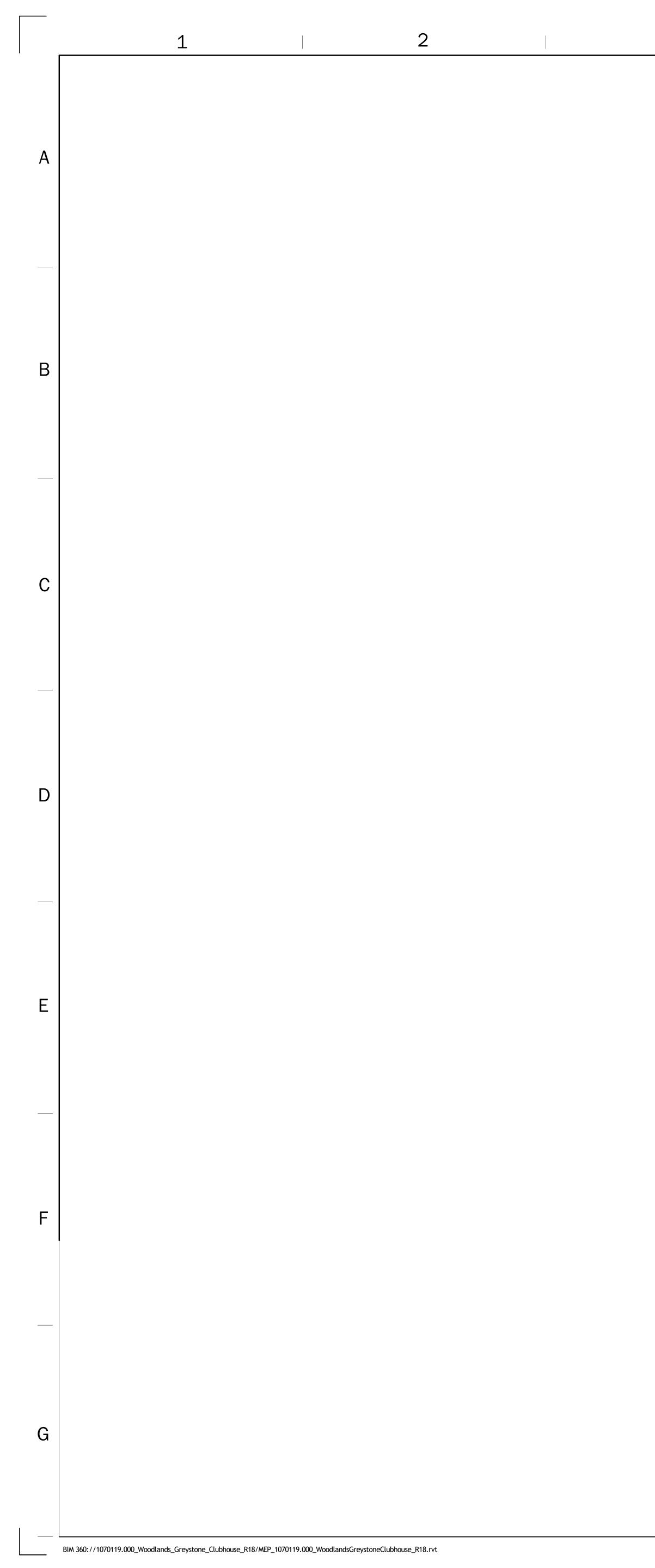


NOTES BY SYMBOL: (#) (THIS DRAWING ONLY) 1 DUCT UP TO FLOOR REGISTER ABOVE (TYP.)









										NATURA	AL GAS HEAT	DX COIL CONDENSING UNIT										
TAG NO.	MANUFACTURER	MODEL NO.	CFM	MIN O/A	ESP	HP	V/P/Hz	MCA	MOCP	INPUT (MBH)	OUTPUT (MBH)	MODEL NO.	TOTAL MBH	TAG NO.	MODEL No.	NOM. TONS	SEER	V/P/Hz	MCA	MOCP	OPER. WT.	REMARKS
FURN-1	TRANE	S9X1B040	1160	240	0.7	1/2	120V	8.8	15	40	38.8	4TXC	36	CU-1	4TTR6036A	3	16	230V/1□/60	18	30	250	1-6
FURN-2	TRANE	S9X1B040	800	160	0.7	1/2	120V	8.8	15	40	38.8	4TXC	24	CU-2	4TTR6024A	2	16	230V/1□/60	13	20	190	1-6
FURN-3	TRANE	S9X1B040	600	600 (ERV)	0.7	1/2	120V	8.8	15	40	38.8	4TXC	18	CU-3	4TTR6018A	1.5	16	230V/1□/60	12	20	190	1-6
FURN-4	TRANE	S9X1B040	800	-	0.7	1/2	120V	8.8	15	40	38.8	4TXC	24	CU-4	4TTR6024A	2	16	230V/1□/60	13	20	190	1-6
FURN-5	TRANE	S9X1B060	1500	250	0.7	3/4	120V	10.3	15	60	58.2	4TXC	48	CU-5	4TTR6048A	4	16	230V/1□/60	24	40	310	1-6
FURN-6	TRANE	S9X1B040	760	100	0.7	1/2	120V	8.8	15	40	38.8	4TXC	24	CU-6	4TTR6024A	2	16	230V/1□/60	13	20	190	1-6

REMARKS: 1. PROVIDE EACH SYSTEM WITH HONEYWELL PRO 8000 WIFI PROGRAMMABLE THERMOSTAT, PROVIDE OCCUPIED/UNOCCUPIED SCHEDULES, NIGHT SETBACK AND CONTACT FOR OUTSIDE AIR DAMPER. 2. PROVIDE INDOOR UNIT WITH 1" FILTER RACK AND MERV 8 FILTER. 3. PROVIDE WITH ROOF OR WALL CONCENTRIC VENT TERMINATION. SIZE PIPING PER MANUFACTURER INSTRUCTIONS. 4. INSTALL INDOOR UNIT IN DRAIN PAN WITH FLOAT SWITCH; INTERLOCK WITH UNIT SHUTDOWN. 5. REFRIGERANT LINE SETS TO BE SIZED AS SPECIFIED BY THE MANUFACTURER. 6. PROVIDE NEW GAS CONDENSATE NEUTRALIZATION SYSTEM AND ALL ASSOCIATED PIPING.

ENERGY	RECOVERY	UNIT S	SCHEDULE

				EN	IERGY	REC	OVER	Y UN	NIT SO	CHEDL	JLΕ								GRILL	E/DIFFUS	ER SCHED	ULE		
					EXHAUST				SUPP	LY		ELECTRIC					SYMBOL	MANUFACTURER	MODEL NO.	MODULE SIZE	FACE/NECK SIZE	PATTERN	PATTERN CFM RANGE	REMARKS
TAG NO. MAI	IANUFACTURER	MODEL NO.	CFM	E.S.P.	AIR TEMP	FAN HI	P CFM	E.S.P.	EAT (dB/wB)F	LAT (dB/wB)F	FAN HP	PREHEAT (KW)	V/P/Hz	MCA	MOP	% EFF.		TITUS	TDC	12"x12"	6"x6" / 6"□	4-WAY	0-100	1,2
ERV-1 G	GREENHECK	ERV-10-20L-VG	700	0.5	70	1/2	600	0.5	94/75.5	78/65.4	1/2	2.5	240/1/60	23.0	25.0	79.4		TITUS	TDC	12"x12"	9"x9" / 8"□	4-WAY	101-130	1,2
REMARKS: 1. PROVIDE WITH FILT POWER.	LTERS, POWERED	SERVICE OUTLE	T, DIRTY	FILTER SE	ENSOR, WHEEL		N SENSOR, '	VARI-GRE	EN EC MOT	ORS, FACTOR		NON-FUSED D	SCONNECT S	WITCH AND	SINGLE POI	NT	S1	TITUS	TDC	24"x24"	12"x12" / 10"□	4-WAY	131-200	1,2
																		TITUS	TDC	24"x24"	18"x18" / 10"□	4-WAY	201-350	1,2
			EX	HAUS	ST FAN	IEQU	JIPME	NT S	SCHE	DULE								TITUS	300RL	8"x6"	8"x6"	2-WAY	100-135	1,2
TAG NO. AF	AREA SERVED	MANUFACTURE	R	MODEL NO	O. CFM	SP	V/P/Hz	WA	ATTS AM	MPS RPI	M S	SONES	WIEGHT	REMAR	KS		S2	TITUS	300RL	10"x6"	10"x6"	2-WAY	136-210	1,2
EF-1 E	BATHROOM	GREENHECK		SP-A50-V0	G 70	0.25	115/1/60	23	3.3 0	0.30 838	В	0.9	12 LB	1				TITUS	300RL	14"x6"	14"x6"	2-WAY	211-350	1,2
EF-2 E	BATHROOM	GREENHECK		SP-A50-V0	G 70	0.25	115/1/60	23	3.3 0	0.30 838	8	0.9	12 LB	1			S3	TITUS	300RL-HD	10"x6"	10"x6"	2-WAY	136-210	1,2
EF-3 E	BATHROOM	GREENHECK		SP-A50-V0	G 70	0.25	115/1/60	23	3.3 0	0.30 838	8	0.9	12 LB	1				TITUS	350RL	6"x6"	6"x6"	R/A	0-110	1,2
EF-4 E	BATHROOM	GREENHECK		SP-A50-V0	G 70	0.25	115/1/60	23	3.3 0	0.30 838	8	0.9	12 LB	1				TITUS	350RL	10"x6"	10"x6"	R/A	111-175	1,2
EF-5	POOL EQ	GREENHECK		SQ-90-G	3 250	0.3	115/1/60	1/ (H	/25 1P)	- 1,19	92	4.8	49 LB	4			R1/E1/T1	TITUS	350RL	12"x8"	12"x8"	R/A	176-335	1,2
EF-6	JANITOR	GREENHECK		SP-A50-V0	'G 70	0.25	115/1/60	23	3.3 0	0.30 838	8	0.9	12 LB	3				TITUS	350RL	12"x12"	12"x12"	R/A	336-500	1,2
EF-7 M	MECH ROOM	GREENHECK		SP-A190) 150	0.375	115/1/60	54	4.2 0	0.45 140	0	1.5	17 LB	4				TITUS	350RL-HD	14"x14"	14"x14"	R/A	501-800	1,2

TITUS TITUS TITUS TITUS TITUS TITUS	MODEL NO. TDC TDC TDC TDC 300RL 300RL	MODULE SIZE 12"x12" 12"x12" 24"x24" 24"x24" 8"x6" 10"x6"	FACE/NECK SIZE 6"x6" / 6"□ 9"x9" / 8"□ 12"x12" / 10"□ 18"x18" / 10"□ 8"x6" 10"x6"	PATTERN 4-WAY 4-WAY 4-WAY 4-WAY 2-WAY	CFM RANGE 0-100 101-130 131-200 201-350 100-135	REMAR 1,2 1,2 1,2 1,2 1,2 1,2 1,2 1,2 1,2 1,2
TITUS TITUS TITUS TITUS	TDC TDC TDC 300RL	12"x12" 24"x24" 24"x24" 8"x6"	9"x9" / 8"□ 12"x12" / 10"□ 18"x18" / 10"□ 8"x6"	4-WAY 4-WAY 4-WAY 2-WAY	101-130 131-200 201-350	1,2 1,2 1,2
TITUS TITUS TITUS	TDC TDC 300RL	24"x24" 24"x24" 8"x6"	12"x12" / 10"□ 18"x18" / 10"□ 8"x6"	4-WAY 4-WAY 2-WAY	131-200 201-350	1,2
TITUS	TDC 300RL	24"x24" 8"x6"	18"x18" / 10"□ 8"x6"	4-WAY 2-WAY	201-350	1,2
TITUS	300RL	8"x6"	8"x6"	2-WAY		
					100-135	1,2
TITUS	300RL	10"x6"	10"x6"			
			10 10	2-WAY	136-210	1,2
TITUS	300RL	14"x6"	14"x6"	2-WAY	211-350	1,2
TITUS 30	300RL-HD	10"x6"	10"x6"	2-WAY	136-210	1,2
TITUS	350RL	6"x6"	6"x6"	R/A	0-110	1,2
TITUS	350RL	10"x6"	10"x6"	R/A	111-175	1,2
TITUS	350RL	12"x8"	12"x8"	R/A	176-335	1,2
TITUS	350RL	12"x12"	12"x12"	R/A	336-500	1,2
TITUS 38	350RL-HD	14"x14"	14"x14"	R/A	501-800	1,2
	TITUS TITUS D MATCH FINISHED	TITUS 350RL TITUS 350RL-HD	TITUS 350RL 12"x12" TITUS 350RL-HD 14"x14" D MATCH FINISHED CEILING/WALL/FLOOR	TITUS 350RL 12"x12" 12"x12" TITUS 350RL-HD 14"x14" 14"x14"	TITUS350RL12"x12"12"x12"R/ATITUS350RL-HD14"x14"14"x14"R/AOMATCH FINISHED CEILING/WALL/FLOOR	TITUS 350RL 12"x12" 12"x12" R/A 336-500 TITUS 350RL-HD 14"x14" 14"x14" R/A 501-800 OMATCH FINISHED CEILING/WALL/FLOOR

4. ON/OFF CONTROL TO BE WALL MOUNTED THERMOSTAT.

									,	
	ELE	ECTRIC	WALL HE	EATER	SCHED	DULE				ELE
TAG NO.	MANUFACTURER	MODEL NO.	AREA SERVED	WATTS	BTUH	V/P/Hz	AMPS	REMARKS	TAG NO	. MANUF
EWH-1	QMARK	AWH3150F	VESTIBULE	1,500	5,160	120/1/60	12.5	1,2,3	EBBR-1	FAHR
2. INTEGRAL T	MI-RECESSED MOUNT HERMOSTAT. E WITH ARCHITECT FC			1	1	1	1	1	REMARKS: 1. PROVIDE	

MOUNTING LOCATION PRIOR TO INSTALLATION. 4. PROVIDE WITH DISCONNECT.

	ELECTRIC UNIT HEATER SCHEDULE													
TAG NO.	MANUFACTURER	MODEL NO.	AREA SERVED	KW	V/P/Hz	AMPS	WEIGHT	REMARKS						
EUH-1	MARLEY	IUH524	POOL EQUIPMENT	5.0	240/1/60	13.8	30	1,2,3						
EUH-2	MARLEY	IUH524	MECH ROOM	5.0	240/1/60	13.8	30	1,2,3						
	H ALL REQUIRED SUP			SUSPEN	D FROM STRU	ICTURE AB	OVE.							

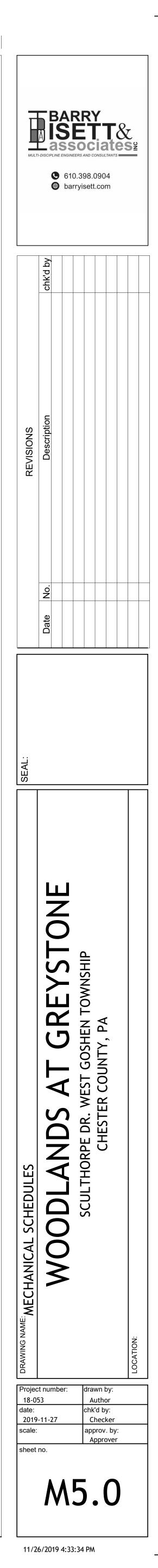
PROVIDE WITH INTEGRAL SINGLE-STAGE THERMOSTAT.
 PROVIDE WITH REMOTE SUMMER FAN SWITCH AND CONTROL TRANSFORMER PER MANUFACTURER'S SPECIFICATIONS.

JFACTU RENHE 1. PROVIDE WITH INTEGRAL THERMOSTAT, D 2. COLOR TO BE SELECTED BY ARCHITECT

TAG NO.	MANUFACTURER	MODEL NO.	SIZE W x H x D	CFM	MAX. PD	SERVICE	REMARKS
LV-1	GREENHECK	EAD-601	21x18x6	500	0.08	FURN-1 & FURN-2	1,3
LV-2	GREENHECK	EAD-601	21x18x6	600	0.08	INTAKE ERV-1	1,3
LV-3	GREENHECK	EAD-601	21x21x6	700	0.08	EXHAUST ERV-1	2,3
LV-4	GREENHECK	EAD-601	18x12x6	250	0.08	EF-7	2,3
LV-5	GREENHECK	EAD-601	18x12x6	250	0.08	EF-5	2,3
LV-6	GREENHECK	EAD-601	21x18x6	500	0.08	FURN-5 & FURN-6	1,3

LECTRIC BASEBOARD RADIATION SCHEDULE

TURER	MODEL NO.	TOTAL		ENCLOSU	RE	V/P/Hz	LOCATION		
	MODEL NO.	WATTS	L	W	Н	V/P/NZ	LUCATION		
IEAT	F2513W	750	3'-0"	2-7/8"	6-3/4"	120/1/60	SEE PLANS		
L THERI	MOSTAT, DISCO	NNECT							



SCOPE OF WORK

CONTRACTOR SHALL VISIT SITE TO DETERMINE EXISTING CONDITIONS. SUBMISSION OF PROPOSAL SHALL CONSIDED AN ACKNOWLEDGEMENT BY THE CONTRACTOR THAT THE CONTRACTOR HAS VISITED AND EXAMINED THE SITE.

FEATURES AS INDICATED ARE BELIEVED TO BE REASONABLY CORRECT BUT ARE NOT GUARENTEED. WHERE CONDITIONS AT PROJECT SITE DO NOT AGREE EXACTLY WITH CONDITIONS AS INDICATED, THE CONTRACTOR SHALL ASSUME ALL RESPONSIBILITY FOR SAID DISCREPANCY.

NO EXTRA PAYMENT WILL BE ALLOWED THE CONTRACTOR FOR EXTRA WORK CAUSED BY FAILURE TO VISIT, EXAMINE AND CLARIFY.

THE SCOPE OF MECHANICAL WORK INCLUDED IN THIS CONTRACT SHALL INCLUDE COMPLETE MECHANICAL SYSTEMS; INCLUDING BUT NOT LIMITED TO BUILDING HVAC SYSTEMS AND RELATED AUTOMATIC TEMPERATURE CONTROLS, AND SUPPORTS, ETC. AS SHOWN ON THE DRAWINGS AND SPECIFIED HEREIN. ANY WORK REASONABLY INFERABLE FROM THE DRAWINGS AND SPECIFICATIONS, AS REQUIRED TO RESULT IN A COMPLETE INSTALLATION AND THE INTENDED OPERATION AND PERFORMANCE OF THE SYSTEMS, SHALL BE INCLUDED IN THE BASE BID EXCEPT WHERE THERE IS SPECIFIC REFERENCE TO EXCLUSION AND INCORPORATION IN OTHER QUOTATIONS.

CONTRACT DRAWINGS

CONTRACT DRAWINGS ARE DIAGRAMMATIC AND INDICATE THE RELATION OF PIPING, DUCTWORK CONNECTIONS, AND EQUIPMENT. THE DRAWINGS DO NOT INDICATE ALL OFFSETS, ELBOWS, AND FITTINGS THAT MAY BE REQUIRED. THEREFORE, THE CONTRACTOR SHALL CAREFULLY INVESTIGATE THE STRUCTURAL AND FINISH CONDITIONS AFFECTING THE WORK AND ACTUAL EQUIPMENT PROVIDED. THE CONTRACTOR SHALL FURNISH ALL OFFSETS, ELBOWS, FITTINGS, HANGERS, AND ACCESSORIES AS MAY BE REQUIRED TO MEET THESE CONDITIONS AT NO ADDITIONAL COST TO THE OWNER.

DO NOT SCALE DRAWINGS. CONTRACTOR SHALL CHECK CONDITIONS AT THE SITE FOR DIMENSIONS AND SIZES PERTAINING TO THE STRUCTURES. DO NOT DEVIATE FROM THE DRAWINGS WITHOUT PRIOR APPROVAL.

GENERAL STANDARDS OF MATERIALS

EQUIPMENT AND MATERIALS, UNLESS SPECIFICALLY INDICATED OTHERWISE, SHALL BE NEW AND OF FIRST QUALITY, PRODUCED BY MANUFACTURERS WHO HAVE BEEN REGULARLY ENGAGED IN THE MANUFACTURE OF THESE PRODUCTS FOR A PERIOD OF NOT LESS THAN FIVE YEARS.

NOTE THAT WHERE SPECIFIC MANUFACTURERS' PRODUCTS ARE INDICATED ON THE DRAWINGS, THE ASSOCIATED SYSTEMS HAVE BEEN DESIGNED ON THE BASIS OF THAT PRODUCT'S PHYSICAL CHARACTERISTICS. WHERE SPECIFIC MANUFACTURERS' PRODUCTS' ARE NOT INDICATED ON THE DRAWINGS AND MORE THAN ONE MANUFACTURER IS NAMED IN THE SPECIFICATIONS, THE ASSOCIATED SYSTEMS HAVE BEEN DESIGNED ON THE BASIS OF THE FIRST-NAMED MANUFACTURER'S PRODUCT. WHEN RELATED TO MODIFICATIONS TO THE SYSTEMS AND/OR STRUCTURE REQUIRED BY THE USE OF THAT PRODUCT SHALL BE PAID BY THE CONTRACTOR.

MATERIALS FURNISHED SHALL BE DETERMINED SAFE BY A NATIONALLY RECOGNIZED TESTING ORGANIZATION, SUCH AS INDERWRITERS' LABORATORIES, INC., OR FACTORY MUTUAL ENGINEERING CORPORATION, AND MATERIALS SHALL BE LABELED, CERTIFIED OR LISTED BY SUCH ORGANIZATIONS

WORKMANSHIP AND MATERIALS SHALL BE GUARENTEED ONE YEAR FROM THE OWNER'S ACCEPTANCE AND START-UP. DURING THIS PERIOD, THIS CONTRACTOR AGREES TO MAKE WHATEVER ADJUSTMENTS ARE NEEDED TO HIS INSTALLATION, OR REPLACE ANY MATERIAL OR EQUIPMENT TAHT PROVES TO BE UNSATISFACTORY. ALL GUARENTEES SHALL BE IN ADDITION TO EXPRESSED GUARANTEES OR STANDARD WARRENTIES OR MANUFACTURER'S AND/OR SUPPLIERS.

INSTALLATION OF HVAC SYSTEMS SHALL BE IN COMPLIANCE WITH THE CURRENT INTERNATIONAL MECHANICAL CODE, NFPA, LOCAL MUNICIPAL CODES, AND AS PER MANUFACTURER'S AND UTILITIES RECOMMENDATIONS.

THE INSTALLATION OF ALL GAS PIPING SHALL BE IN ACCORDANCE WITH NFPA 54, INTERNATIONAL FUEL GAS CODE, AMERICAN GAS ASSOCIATION AND THE LOCAL GAS COMPANY.

CODES, PERMITS AND INSPECTIONS

MATERIALS FURNISHED AND WORK INSTALLED SHALL COMPLY WITH CURRENTLY ADOPTED INTERNATIONAL MECHANICAL CODE. THE NATIONAL FIRE PROTECTION ASSOCIATION STANDARDS. THE REQUIREMENTS OF THE LOCAL UTILITY COMPANIES, AND THE REQUIREMENTS OF GOVERNMENTAL DEPARTMENTS OR AUTHORITIES HAVING JURISDICTION. MATERIALS AND EQUIPMENT FURNISHED FOR THE ELECTRICAL PORTION OF THE MECHANICALSYSTEMS SHALL BEAR THE APPROVAL LABEL OF OR SHALL BE LISTED BY THE UNDERWRITERS' LABORATORIES, INC.

THE CONTRACTOR SHALL PAY ALL FEES AND OBTAIN AND PAY FOR ALL PERMITS AND INSPECTIONS REQUIRED BY ANY AUTHORITY HAVING JURISDICTION IN CONNECTION WITH HIS WORK. CERTIFICATES OF INSPECTION SHALL BE DELIVERED TO THE ARCHITECT. FINAL PAYMENT IS CONTINGENT UPON DELIVERY OF SUCH CERTIFICATES TO ARCHITECT.

QUIET OPERATION AND VIBRATION CONTROL

EQUIPMENT AND ASSOCIATED ITEMS SHALL OPERATE UNDER CONDITIONS OF LOAD WITHOUT SOUND OR VIBRATION DEEMED OBJECTIONABLE BY THE ENGINEER/ARCHITECT/OWNER. IN THE CASE OF MOVING EQUIPMENT, SOUND OR VIBRATION NOTICEABLE OUTSIDE OF THE ROOM IN WHICH IT IS INSTALLED, OR ANNOYINGLY NOTICEABLE WITHIN THE ROOM IN WHICH IT IS INSTALLED, SHALL BE DEEMED OBJECTIONABLE. SOUND OR VIBRATION DEEMED OBJECTIONABLE SHALL BE CORRECTED IN AN APPROVED MANNER AT NO EXTRA COST TO THE OWNER. VIBRATION CONTROL SHALL BE PROVIDED BY MEANS OF APPROVED VIBRATION ISOLATORS AND INSTALLED IN ACCORDANCE WITH THE ISOLATOR MANUFACTURERS' RECOMMENDATIONS.

ALL ROTATING MECHANICAL EQUIPMENT AND ITS ASSOCIATED PIPING AND DUCTWORK SHALL BE PROVIDED WITH VIBRATION ISOLATORS.

COORDINATION

COORDINATE AND FURNISH TO THE OWNER. IN WRITING, ANY INFORMATION NECESSARY TO PERMIT THE WORK TO BE INSTALLED SATISFACTORILY AND WITH THE LEAST POSSIBLE INTERFERENCE OR DELAY.

ACCESSIBILITY

LOCATE EQUIPMENT WHICH MUST BE SERVICED, OPERATED OR MAINTAINED IN FULLY ACCESSIBLE POSITIONS. EQUIPMENT REQUIRING ACCESS SHALL INCLUDE, BUT IS NOT NECESSARILY LIMITED TO, VALVES, VOLUME DAMPERS, TRAPS, CLEAN OUTS, MOTORS, FIRE DAMPERS, CONTROLLERS, AND DRAIN POINTS

DEMOLITION

THIS CONTRACTOR SHALL BE RESPONSIBLE FOR THE REMOVAL OF EXISTING EQUIPMENT, DUCTWORK, PIPING AND CONTROLS IN THE EXISTING BUILDING WHICH IS SHOWN TO BE REMOVED ON THE DRAWINGS OR WHICH IS IN CONFLICT WITH THE NEW WORK. FURNISH ALL LABOR, EQUIPMENT HAULING, RIGGING, SCAFFOLDING, ETC. NECESSARY FOR THE REMOVAL PHASE OF THE PROJECT.

THE DEMOLITION PLAN AS SHOWN IS NOT TO BE CONSIDERED ALL INCLUSIVE BUT IS TO BE A GENERAL GUIDE TO THE SCOPE OF THE DEMOLITION. ALL DEMOLITION MUST BE PERFORMED AS REQUIRED TO BRING THE AREA SHOWN TO A STATE WHERE THE NEW CONSTRUCTION WORK CAN BE ACCOMPLISHED AS SHOWN ON THESE CONSTRUCTION DOCUMENTS.

CONTINUITY OF SERVICES

ALL REMOVAL WORK AND INSTALLATION OF NEW EQUIPMENT REQUIRING SYSTEM SHUTDOWN SHALL BE COORDINATED WITH THE OWNER. PERIODS OF SHUT-DOWN SHALL BE MINIMAL AND ALL NEW WORK SHALL BE PLANNED AND SCHEDULED TO ACCOMPLISH AS SHUT-DOWNS AS POSSIBLE.

ALL CONSTRUCTION AND REMOVAL WORK SHALL BE PERFORMED IN PHASES DETAILED BY THE ARCHITECT AND EXISTING SYSTEMS ARE TO BE KEPT IN OPERATION AS THE WORK PROGRESSES. ALL REMOVED EQUIPMENT SHALL BE THE PROPERTY OF THE OWNER OR DISPOSED OF BY THE CONTRACTOR AS DIRECTED BY THE OWNER.

STORAGE

EACH CONTRACTOR SHALL PROVIDE SUITABLE STORAGE FACILITY IN THE LOCATION ASSIGNED THEM AT THE SITE FOR THEIR MATERIALS. WHERE PARTS OF THE BUILDING ARE USED FOR SUCH STORAGE, THEY SHALL BE LEFT IN CONDITION SATISFACTORY TO THE ENGINEER.

ALL MATERIALS DELIVERED ON THE PREMISES OR MATERIALS STORED AT THE CONTRACTOR'S PLACE OF BUSINESS OR IN WAREHOUSES, WHICH ARE TO FORM A PART OF THE WORK AND FOR WHICH THE CONTRACTOR HAS SUBMITTED AN APPLICATION FOR PAYMENT, SHALL BE CONSIDERED THE PROPERTY OF THE OWNER AND SHALL NOT BE REMOVED, SOLD, OR USED FOR OTHER PURPOSES WITHOUT HIS CONSENT.

THE CONTRACTOR SHALL REMOVE ALL HIS SURPLUS MATERIALS AFTER COMPLETION OF THE WORK.

CUTTING AND PATCHING

IN NEW CONSTRUCTION, THE CONTRACTOR SHALL GIVE THE GENERAL CONTRACTOR COMPLETE INFORMATION AS TO SIZE OF OPENINGS REQUIRED IN FLOORS AND WALLS, ETC., SO THAT SUCH OPENINGS MAY BE PROVIDED AS THE PROJECT PROGRESSES.

IF OPENINGS ARE OMITTED OR ARE INCORRECT THROUGH FAILURE OF THE CONTRACTOR TO FOLLOW THESE INSTRUCTIONS, THE CONTRACTOR SHALL, AT HIS OWN EXPENSE, ENGAGE THE TRADE WHICH ORIGINALLY INSTALLED THE WORK, TO CUT AND PATCH TO THE SATISFACTION OF THE ARCHITECT.

ALL CUTTING AND PATCHING IN CONNECTION WITH THIS CONTRACT SHALL BE DONE BY THE CONTRACTOR WITH MECHANICS EXPERIENCED IN THEIR RESPECTIVE LINES OF WORK. ALL PATCHING SHALL MATCH ADJACENT FINISHES.

CLEANING

AT THE COMPLETION OF THE WORK, ALL PARTS OF THE INSTALLATION SHALL BE THOROUGHLY CLEANED. ALL EQUIPMENT SHALL BE LEFT IN CONDITION FOR USE.

ELECTRICAL

ANY ELECTRICAL WORK SHALL BE IN ACCORDANCE WITH THE NATIONAL ELECTRIC CODE.

THE MECHANICAL CONTRACTOR SHALL ENSURE THAT ALL EQUIPMENT PROVIDED IS COMPATIBLE WITH THE ELECTRICAL SYSTEMS USED. ALL POWER WIRING FROM PANEL TO DISCONNECT SWITCH SHALL BE PROVIDED BY THE ELECTRICAL

CONTRACTOR. PROVIDE TEMPERATURE CONTROL WIRING, INTERLOCKING WIRING, AND EQUIPMENT CONTROL WIRING

FOR THE EQUIPMENT PROVIDED UNDER THIS CONTRACT. ALL CONTROL WIRING SHALL BE 24 VOLT, UNLESS OTHERWISE NOTED. FURNISH FUSES (FOR INSTALLATION BY THE ELECTRICAL CONTRACTOR) FOR EQUIPMENT PURCHASED UNDER THIS DIVISION OF THE SPECIFICATION.

DISCONNECT SWITCHES

PROVIDE DISCONNECT SWITCHES WHERE NOTED ON SCHEDULES.

TESTING, ADJUSTING, AND BALANCING

THE CONTRACTOR SHALL EMPLOY A BALANCING CONTRACTOR SPECIALIZING IN TOTAL SYSTEM AIR BALANCING, TESTING, AND COMMISSIONING. THIS BALANCING CONTRACTOR SHALL BE CERTIFIED BY ASSOCIATED AIR BALANCE COUNCIL (AABC) OR NATIONAL ENVIRONMENT BALANCING BUREAU (NEBB) AND SHALL PROVIDE ALL LABOR, ENGINEERING AND TEST EQUIPMENT REQUIRED TO ADJUST AND BALANCE ALL HEATING, VENTILATING, AIR CONDITIONING, AND EXHAUST SYSTEMS HEREINAFTER SPECIFIED. ALL PERSONNEL INVOLVED IN THE EXECUTION OF THE WORK UNDER THE BALANCING CONTRACT SHALL BE EXPERIENCED AND FACTORY TRAINED SPECIFICALLY IN THE TOTAL BALANCING OF MECHANICAL SYSTEMS, AS WELL AQS BEING REGULAR EMPLOYEES OF THE BALANCING CONTRACTOR

THE BALANCING CONTRACT SHALL INCORPORATE THE FOLLOWING: ADJUST AND BALANCE THE COMPLETE MECHANICAL SYSTEMS INDICATED ON THE DRAWINGS AND SPECIFIED. RECORD ALL TEST DATA AND SUBMIT FIVE COPIES UPON COMPLETION OF THE BALANCING CONTRAST TO THE OWNER OR THEIR REPRESENTATIVE.

INSTALL AT EACH PIECE OF MECHANICAL EQUIPMENT A "DATA REGISTER" SHOWING ALL SIGNIFICANT OPERATING TEMPURATURES, PRESSURES, AMPERES, VOLTAGE, BRAKE HORSEPOWER, ETC, "DATA REGISTER" TO BE ENCLOSED IN VINAFILM HOLDER SECURELY ATTACHED TO THE EQUIPMENT OR WALL IN THE IMMEDIATE AREA.

ALL TEST EQUIPMENT SHALL BE FURNISHED BY THE BALANCING CONTRACTOR AND REMAINS HIS PROPERTY. ALL INSTRUMENTS SHALL HAVE BEEN CALIBRATEDRECENTLY AND VERIFICATION OF CALIBRATION SHALL BE PROVIDED WITH SUBMITTAL DATA. TESTING AND BALANCING SHALL NOT BEGIN UNTIL THE SYSTEM HAS BEEN COMPLETED AND IS IN FULL WORKING ORDER WITH ALL FILTERS INSTALLED IN AIR SYSTEMS AND STRAINERS HAVE BEEN CLEANED IN HYDRONIC SYSTEMS, THE CONTRACTOR SHALL PUT ALL HEATING, VENTILATING, AND AIR CONDITIONING SYSTEMS AND EQUIPMENT INTO FULL OPERATION. CORRECT OPERATION OF EQUIPMENT AND SYSTEM COMPONENTS, ABND CLEANLINESS OF PIPING AND DUCTWORK SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.

ADJUST ALL SYSTEMS TO PLUS OR MINUS 10 PERCENT OF THE FIGURES INDICATED ON THE DRAWINGS.

DUCTWORK

DUCTWORK, FITTINGS, REINFORCEMENT, HANGERS, ETC., SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF SMACNA. SIZES SHOWN ON DRAWINGS SHALL BE CLEAR INSIDE DIMENSIONS. ALL DUCTWORK SHALL BE GALVANIZED STEEL WITH EXTERNAL INSULATION UNLESS NOTED OTHERWISE.

SQUARE ELBOWS SHALL HAVE TURNING VANES. DUCTS SHALL BE SEALED AIR TIGHT TO SMACNA CLASS A. DUCT DEVICES SHALL BE CONSTRUCTED OF THE SAME MATERIAL AS THE DUCT IN WHICH THEY ARE INSTALLED. SUPPLY AIR, OUTSIDE AIR, RETURN AIR, AND EXHAUST AIR DUCTWORK SHALL BE GALVANIZED STEEL. DUCTWORK SHALL BE CONSTRUCTED FOR PRESSURES UP TO 2 INCHES W.G. UNLESS NOTED OTHERWISE.

DUCTWORK SHALL BE MECHANICALLY JOINTED AND SEALED WITH PRECISION No. EZ6010 DUCT DEALANT OR APPROVED EQUIVILANT.

DUCT ACCESSORIES BALANCING DAMPERS:

PROVIDE MANUAL BALANCING DAMPERS AS NOTED ON THE DRAWINGS TO PROPERLY BALANCE THE AIR SYSTEMS. CONSTRUCTION OF DAMPERS SHALL CONFORM TO SMACNA STANDARDS FOR THE INTENDED OPERATING PRESSURE RANGE, DAMPERS SHALL BE RUSKIN MODEL MD35 OR EQUAL, BALANCING DAMPERS SHALL BE OF THE SAME MATERIAL AS THE DUCT IN WHICH THEY ARE INSTALLED. DAMPERS SHALL BE 2 GAGES HEAVIER THAN THE DUCTWORK IN WHICH THEY ARE INSTALLED. DAMPERS IN SQUARE OR RECTANGULAR DUCTS SHALL BE MULTIPLE OPPOSED BLADE TYPE. DAMPERS SHALL BE COMPLETE WITH LOCKING QUADRANTS ON STAND-OFF MOUNTING BRACKETS, BASES, OR ADAPTERS. DAMPERS SHALL BE OPPOSED BLADE TYPE, BLADES SHALL NOT EXCEED 6 INCHES IN WIDTH. DAMPERS SHALL BE COMPLETE FACTORY MANUFACTURED AND ASSEMBLED UNITS. CONTRACTOR FABRICATED DAMPERS ARE NOT ACCEPTABLE.

SPIN COLLARS: SPIN COLLARS SHALL BE FABRICATED OF THE SAME MATERIAL AS THE DUCT IN WHICH THEY ARE INSTALLED. SPIN COLLARS SHALL BE COMPLETE WITH AN AIR EXTRACTOR AND A BALANCING DAMPER WITH A POSITIVE LOCKING DEVICE FOR EASY READJUSTMENT. SPIN COLLARS SHALL INCLUDE STAND-OFF MOUNTING BRACKETS, BASES, OR ADAPTER FOR LOCKING QUADRANT MOUNTING ON EXTERNALLY INSULATED DUCTS.

FLEXIBLE DUCTS:

INSULATED FLEXIBLE DUCTS SHALL BE TWO PLY VINYL FILM SUPPORTED BY HELICAL WOUND SPRING STEEL WIRE; FIBERGLASS INSULATION; POLYETHYLENE VAPOR BARRIER FILM WITH 10 INCHES WG POSITIVE AND 2.0 INCHES WG NEGATIVE PRESSURE RATING . PROVIDE DRAW BANDS AS REQUIRED FOR INSTALLATION. FLEXIBLE DUCTS SHALL BE INSTALLED TO PROVIDE UNOBSTRUCTED PASSAGE FOR AIR FLOW. ELBOWS SHALL BE MADE WITH AN INSIDE RADIUS EQUAL TO THE DUCT DIAMETER. HANGER AND SADDLE MATERIAL IN CONTACT WITH THE FLEXIBLE DUCT SHALL BE OF SUFFICIANT WIDTH TO PREVENT ANY RESTRICTION OF THE INTERNAL DIAMETER OF THE DUCT WHEN THE WEIGHT OF THE SUPPORTED SECTION RESTS ON THE HANGER OR SADDLE MATERIAL, FLEXIBLE DUCTWORK LENGTHS SHALL NOT EXCEED EIGHT FEET IN LENGTH. MATERIAL SHALL BE NFPA APPROVED.

FLEXIBLE CONNECTIONS CONNECTIONS AT FAN AND AIR SUPPLY UNITS. BOTH AT INLET AND DISCHARGE. SHALL BE MADE WITH

FLEXIBLE MATERIAL SO AS TO PROHIBIT THE TRANSFER OF VIBRATION FROM FANS TO CONNECTING DUCTWORK, WITHOUT AIR LEAKAGE. THE FLEXIBLE MATERIAL SHALL HAVE SUFFICIANT SLACK SO AS TO PREVENT TEARING DUE TO FAN MOVEMENT.

MOTORIZED DAMPERS: MOTORIZED DAMPERS SHALL BE RUSKIN MODEL CD35 OR EQUIVALENT WITH BELIMO ACTUATOR MODEL AF 24. END SWITCH SHALL BE 24V.

ACCESS DOORS

FURNISH EACH ACCESS DOOR ASSEMBLY MANUFACTURED AS AN INTEGRAL UNIT, COMPLETE WITH ALL PARTS AND READY FOR INSTALLATION AS REQUIRED. INSTALL ACCESS DOORS WHERE INDICATED AND/OR DETAILED.

EQUIPMENT

INSTALL HVAC EQUIPMENT PER MANUFACTURER'S RECOMMENDATIONS. ALL EQUIPMENT SHALL BE AS SPECIFIED OR NOTED ON DRAWINGS AND SCHEDULES.

EQUIPMENT AND PIPING IDENTIFICATION ALL MECHANICAL EQUIPMENT SHALL BE IDENTIFIED BY THE NAME AND IDENTIFICATION SHOWN IN THE SCHEDULES ON THE DRAWINGS. TAGS SHALL BE 1-1/2 INCHES BY 4 INCHES ENGRAVED ALUMINUM NAMEPLATES WITH BLACK ENAMEL BACKGROUND AND NATURAL ALUMINUM BORDER AND LETTERS. SIZE OF LETTERS SHALL BE SELECTED TO SUIT EACH APPLICATION. NAMEPLATES SHALL BE SECURELY AND PERMINENTLY MOUNTED.

ALL PIPING SHALL BE IDENTIFIED BY TYPE AND DIRECTION OF FLOW. PIPE IDENTIFICATION SHALL BE SELF-ADHERING STRIPS PLACED ON PIPING OR INSULATION AS MANUFACTURED BY SETON CORP. OR APPROVED EQUIVALENT. PIPE IDENTIFICATION SHALL BE PLACED AT MAXIMUM 20 FOOT INTERVALS ON STRAIGHT PIPE, AT EACH EQUIPMENT CONNECTION, AND AT EACH CHANGE IN DIRECTION.

GRILLES/REGISTERS/DIFFUSERS

GRILLES, REGISTERS, AND DIFFUSERS SHALL BE FACTORY FABRICATED AND CONSTRUCTED OF STEEL OR ALUMINUM. DIFFUSERS SHALL HAVE FIXED OR ADJUSTABLE AIR DISCHARGE PATTERN AS SCHEDULED.

GRILLES, REGISTERS, AND DIFFUSERS BORDERS SHALL BE COORDINATED WITH CEILING GRID OR CEILING TYPE TO INSURE FLUSH FIT WITHOUT GAPS AROUND BORDER. COORDINATE ALL GRID COLORS WITH ARCHITECT PRIOR TO RELEASE. GRILLES, REGISTERS, AND DIFFUSERS SHALL BE AS SCHEDULED.

FILTER

HEATING AND AIR CONDITIONING SYSTEMS OF THE CENTRAL TYPE SHALL BE PROVIDED WITH APPROVED AIR FILTERS. FILTERS SHALL BE INSTALLED IN THE RETURN AIR SYSTEM UPSTREAM FROM ANY HEAT EXCHANGER OR COIL IN AN APPROVED CONVENIENT LOCATION. LIQUID ADHESIVE COATINGS USED ON FILTERS SHALL HAVE A FLASH POINT NOT LOWER THAN 25° F.

INSULATION

INSULATION SHALL BE PROVIDED CONTINUOUSLY THROUGH SLEEVES AND OPENINGS. TESTING OF DUCTWORK OR PIPING SHALL BE COMPLETE BEFORE INSULATION ON THE EXTERIOR OF THE DUCT OR PIPE IS APPLIED.

INSULATION OR ACOUSTIC DUCT LINER (SEE BELOW) SHALL STOP AT FIRE DAMPERS AND AT ELECTRIC DUCT HEATERS. ALL EXPOSED ENDS OF INSULATION SHALL BE SEALED OR LAPPED WITH VAPOR BARRIER.

ALL INTERIOR SUPPLY AND RETURN DUCTWORK SHALL BE EXTERNALLY INSULATED WITH 1.5 POUND DENSITY JACKETED FIBERGLASS BATT INSULATION, 1-1/2" THICK, WITH A MINIMUM INSTALLED R-VALUE OF 5.0. ALL DUCTWORK INSULATION SHALL HAVE A FLAME SPREAD RATING OF25 OR LESS, AND A SMOKE DEVELOPED RATING OF 50 OR LESS IN ACCORDANCE WITH ASTM E84.

ALL OUTSIDE AIR DUCTWORK SHALL BE EXTERNALLY INSULATED WITH 3/4 POUND DENSITY JACKETED FIBERGLASS BATT INSULATION, 1-1/2:, THICK WITH A MINIMUM INSTALLED R-VALUE OF 5.6. ALL DUCTWORK INSULATION SHALL HAVE A FLAME SPREAD RATING OF 25 OR LESS, AND SMOKE DEVELOPED RATING OF 50 OR LESS IN ACCORDANCE WITH ASTM E84.

FOR ALL OUTSIDE DUCTWORK OR DUCTWORK EXPOSED TO AMBIENT CONDITIONS IN MECHANICAL ROOMS, PENTHOUSES, ETC., INCREASE INSULATION THICKNESS TO PROVIDE A MINIMUM R-VALUE OF 8.0. PIPE INSULATION SHALL CONFORM TO RECOMMENDATIONS OF THE NFPA AND SHALL HAVE COMPOSITE FIRE AND SMOKE HAZARD RATINGS AS TESTED BY PROCEDURE ASTM-E-84, NFPA 255, OR UL-723, NOT

EXCEEDING FLAME SPREAD 25 AND SMOKE DEVELOPED 50. ALL CONDENSATE PIPING SHALL BE INSULATED WITH ARMAFLEX AP 1/2" CLOSED-CELL FOAM INSULATION

OR APPROVED EQUIVALENT. ALL REFRIGERATION PIPING SHALL BE INSULATED WITH ARMAFLEX AP 1-1/2" CLOSED-CELL FOAM INSULATION OR APPROVED EQUIVALENT.

FOR ALL PIPING EXPOSED TO AMBIENT CONDITIONS IN MECHANICAL ROOMS, PENTHOUSES OR OUTSIDE INCREASE INSULATION THICKNESS BY 1/2" (NOTE: CHILLED WATER PIPING SHALL BE INCREASED BY 1"

WHEN EXPOSED TO AMBIENT CONDITIONS). SEAL ALL BUILDING ENVELOPE PENETRATIONS WITH SHEET METAL FLASHING AND SILICONE CAULKING.

CONTROLS

PROGRAMMABLE THERMOSTATS SHALL BE HONEYWELL TB8220U1003 VISIONPRO 8000 DIGITAL PROGRAMMABLE THERMOSTAT OR EQUAL. THERMOSTATS SHALL PROVIDE AUTOMATIC CHANGEOVER FROM HEATING TO COOLING, AND FROM OCCUPIED TO UNOCCUPIED SETTINGS, THERMOSTATS SHALL BE 7-DAY PROGRAMMABLE. PROVIDE AUXILIARY CONTACT FOR CONTROL OF MOTORIZED OUTSIDE AIR DAMPER. PROVIDE ALL REQUIRED RELAYS AND CONTACTORS REQUIRED FOR SEQUENCE OF OPERATION.

CONTRACTOR TO PROVIDE ALL CONTROLS, SENSORS, THERMOSTATS, CONTRACTORS, RELAYS AND ASSOCIATED WIRING TO PROVIDE A FULL OPERATING CONTROL SYSTEM. THE CONTROL MANUFACTURER SHALL GUARENTEE ALL EQUIPMENT AND SYSTEM FOR A PERIOD OF TWO YEARS AND SHALL KEEP THE CONTROL SYSTEM IN ADJUSTMENT THROUGHOUT THE FIRST COMPLETE HEATING AND COOLING SEASONS, WITHOUT EXPENSE TO THE OWNER.

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PIPES AND ACCESSORIES VALVES 2-1/2" AND SMALLER FOR SHUT-OFF AND BALANCING SERVICE, SHALL BE BALL VALVES. ALL CONDENSATE DRAIN PIPING SHALL BE COPPER ASTM B-88 HARD TEMPER TYPE (L). FITTINGS SHALL

BE WROUGHT COPPER SOLDER JOINT, ANSI B16.18. **REFRIGERANT PIPING:** ALL REFRIGERANT PIPING SHALL BE HARD-DRAWN (TEMPERED) COPPER TUBE, TYPE L ACR. ALL PIPING JOINTS SHALL BE BRAZED WITH SILFOS 15 FILLER METAL AND THE PIPING CHARGED WITH DRY NITROGEN WHILE CONSTRUCTING THE JOINTS. ALL PIPING SHALL BE SUPPORTED WITH CUSH A CLAMPS AND STRUT AS MANUFACTURED BY B-LINE, INC. OR APPROVED EQUAL. ALL SUCTION PIPING SHALL BE INSULATED. ALL REFRIGERANT PIPING SHALL BE INSTALLED IN STRICT ACCORDANCE WITH THE RECOMMENDATIONS OF THE REFRIGERATION EQUIPMENT MANUFACTURER AND SHALL INCLUDE, BUT SHALL NOT BE LIMITED TO, FLEXIBLE CONNECTIONS, VALVES, RELIEF VALVES, EXPANSION VALVES, SOLENOID VALVES, FILTER DRIERS, PIPE INSULATION, FLASHING AND SLEEVES THROUGH WALLS, PROPER SUPPORT OF REFRIGERANT PIPING, AND FULL REFRIGERANT CHARGE. PITCH REFRIGERATION PIPING IN DIRECTION OF OIL RETURN TO COMPRESSOR. PROVIDE TRAPS IN SUCTION LINE RISERS WHERE INDICATED OR REQUIRED. TRAPS SHALL BE FABRICATED FROM SHORT RADIUM STREET ELLS, ALL OTHER ELLS SHALL BE LONG RADIUS TYPE. SOLENOID VALVES SHALL BE INSTALLED WITH STEMS POINTING UP. AFTER THE REFRIGERANT PIPING HAS BEEN COMPLETED, THE SYSTEM SHALL BE PRESSURE TESTED AT PRESSURES SPECIFIED BY THE EQUIPMENT MANUFACTURER. THIS PRESSURE SHALL BE MAINTAINED ON THE SYSTEM FOR 12 CONSECUTIVE HOURS WITH NO APPRECIABLE PRESSURE CHANGE. WHILE THE PRESSURE IS APPLIED, THE SYSTEM SHALL BE CHECKED FOR LEAKS. THE SYSTEM SHALL THEN BE EVACUATED TO A MINIMUM VACUUM EQUIVILANT OF 500 MICRONS AND MAINTAINED FOR 12 HOURS. RELEASE VACUUM WITH NITROGEN AND EVACUATE AGAIN. AFTER EVACUATION, THE SYSTEM SHALL BE CHARGED WITH REFRIGERANT IN STRICT ACCORDANCE WITH THE RECOMMENDATIONS OF THE EQUIPMENT MANUFACTURER.

ALL UNDERGROUND REFRIGERANT PIPING TO BE SLEEVED IN PVC PIPING, INSTALL EACH SET OF RS/RL IN 6" PVC CONDUIT, SEAL ENDS WATERTIGHT.

SHOP DRAWINGS, PRODUCT DATA AND SAMPLES SHOP DRAWING AND SUBMITTAL SHALL BE SUBMITTED TO THE ARCHITECT FOR REVIEW PRIOR TO COMMENCING CONSTRUCTION. CONTRACTOR SHALL SUBMIT SHOP DRAWINGS AND PRODUCT DATA FOR EACH ELEMENT OF CONSTRUCTION AND TYPE OF PRODUCT OR EQUIPMENT. CONTRACTOR SHALL SUBMIT FIVECOPIES OF EACH SHOP DRAWING, PRODUCT DATA AND SAMPLE.

SUBMITTALS SHALL INCLUDE INFORMATION REGARDING PRODUCTS, OPTIONS, MANUFACTURER'S RECCOMENDATIONS, PRODUCT SPECIFICATIONS, CATALOG CUTS, PERFORMANCE DATA, COMPLIANCE WITH SPECIFIED STANDARDS, DIMENSIONS, WIRING DIAGRAMS, AND INSTALLED LOCATIONS.

SHOW SIZES AND LOCATIONS, BY DIMENSIONS, OF DUCTS, EQUIPMENT, AND OTHER ITEMS. IDENTIFY MATERIALS AND EQUIPMENT BY DESCRIPTION AND NUMBER. INCLUDE WIRING DIAGRAMS, HOLE LOCATIONS AND SIZES, AND OTHER DATA THAT COULD AFFECT WORK BY OTHER TRADES. SHOW MANUFACTURERS' NAMES, TRADE NAMES, CATALOG NUMBERS, ACCESSORIES, SPECIAL FEATURES, AND RATING DATA. INDICATE REQUIRED CLEARANCES FOR OPERATING PARTS, FOR REMOVAL AND REINSTALLING, AND FOR SERVICING. SHOW PERFORMANCE DATA, INCLUDING FAN CURVES AND SOUND POWER LEVELS.

ALL SHOP DRAWINGS AND SUBMITTALS WHICH ARE TO BE PREPARED BY THE VARIOUS SUBCONTRACTORS AND EQUIPMENT SUPPLIERS SHALL FIRST BE SENT TO THE CONTRACTOR FOR CHECKING AND EVENTUAL FORMAL SUBMISSION TO THE ENGINEER. THE CONTRACTOR SHALL CHECK ALL OF THESE DRAWINGS AND SUBMITTALS WITH RESPECT TO MEASUREMENTS, MATERIALS, IDENTIFICATIONS AND DETAILS SO AS TO MAKE CERTAIN THAT THEY CONFORM TO THE INTENT OF THE CONTRACT DOCUMENTS. DRAWINGS AND SUBMITTALS WHICH ARE FOUND TO BE INACCURATE OR OTHERWISE IN ERROR SHALL BE RETURNED BY THE CONTRACTOR TO THE ORIGINATING PARTY FOR CORRECTION BEFORE SUBMISSION TO THE ARCHITECT FOR APPROVAL.

SHEET METAL SHOP DRAWINGS SHALL BE SUBMITTED @ 3/8" = 1' SCALE. SHOP DRAWINGS SHALL INDICATE BOTTOM OF DUCT ELEVATIONS, STEEL LOCATIONS, REFLECTED CEILING PLAN, AND OTHER FRADES WORK SUCH AS LIGHTS, ETC.

PROJECT CLOSEOUT DOCUMENTS

DURING CONSTRUCTION, THE CONTRACTOR SHALL MAINTAIN A RECORD SET OF INSTALLATION PRINTS. HE SHALL RECORD ON THESE PRINTS, ALL DEVIATIONS FROM THE CONTRACT DRAWINGS IN DUCT SIZING, ROUTING, LOCATION AND DETAILS.

AT COMPLETION OF THE WORK, THE CONTRACTOR SHALL FORWARD THESE PRINTS TO THE ARCHITECT FOR INCORPORATION INTO THE FINAL AS-BUILT DRAWINGS.

OPERATIONS AND MAINTENANCE DATA INCLUDE INTERCONNECTION WIRING DIAGRAMS. COMPLETE FIELD INSTALLED SYSTEM WITH IDENTIFIED AND NUMBERED SYSTEM COMPONENTS AND DEVICES. INCLUDE INSPECTION PERIOD, CLEANING METHODS, CLEANING MATERIALS RECOMMENDED, AND CALIBRATION TOLERANCES, PROVIDE OPERATIONS AND MAINTENANCE MANUAL.

WARRANTY PROVIDE MANUFACTURER'S STANDARD WARRANTY FOR ALL MATERIALS AND EQUIPMENT INSTALLED UNDER THIS SECTION.

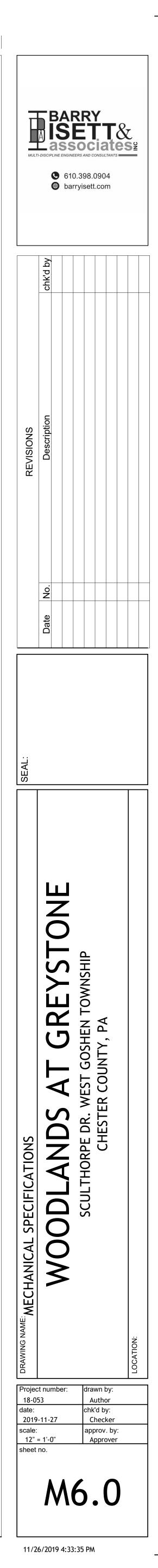
DEMONSRATION DEMONSTRATE COMPLETE AND OPERATING SYSTEM TO OWNER OR THEIR REPRESENTATIVE. INSTRUCT THE OWNER'S PERSONNEL IN THE PROPER OPERATION OF SYSTEMS.

OWNER TRAINING

PROVIDE A MINIMUM OF A FOUR (4) HOUR TRAINING SESSION WITH OWNER'S PERSONNEL AT THE COMPLETION OF THE TESTING, BALANCING, AND ADJUSTING. NOTIFY THE ENGINEER IN WRITING AT LEAST FIVE (5) WORKING DAYS BEFORE SCHEDULING THE TRAINING SESSION.

FINAL ADJUSTMENT OF EQUIPMENT

AFTER COMPLETION OF THE INSTALLATION, ADJUST THERMOSTATS, CONTROL VALVES, MOTORS AND SIMILAR EQUIPMENT PROVIDED AS WORK OF THIS SECTION. FINAL ADJUSTMENT SHALL BE PERFORMED BY SPECIFICALLY TRAINED PERSONNEL IN THE DIRECT EMPLOY OF THE MANUFACTURER OF THE PRIMARY TEMPURATURE CONTROL SYSTEM.



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		LIGHTI	NG FIXTURE SCHEDULE	
Type Mark	Manufacturer & Catalog Number	Mounting Type	Descriptions	Lamp
A	PROGRESS #P300223-009-30 OR SIMILAR	WALL	BATHROOM SCONCE	22W LED
В	PROGRESS #P810015-030-30 OR SIMILAR	SURFACED	SURFACE MOUNT LIGHT	15W LED
С	PRESCOLITE #LC6HL-6LCHL-45L-35K-8	RECESSED	WATERPROOF 6" RECESSED DOWNLIGHT LED	15W LED
C1	PRESCOLITE #LTR-GRD-H-HL-35L-DMI-TRIM-LTR -GRD-T-HL-35K-8	RECESSED	6" DOWNLIGHT LED	43W LED
C2	PRESCOLITE #LTR-GRD-H-HL-40L-DMI-TRIM-LTR -GRD-T-HL-35K-8	RECESSED	6" DOWNLIGHT LED	52W LED
C3	PRESCOLITE #LF6ML-6LFML30L-35K-8-1P65-CL	RECESSED	6" DOWNLIGHT LED	32.7W LED
D	COLUMBIA #CSL4-4040 OR SIMILAR	SURFACED	INDUSTRIAL LED	40.2 LED
Е	DUAL LITE #HCXU RW 031 RC12	SURFACED	EXIT W/ HEADS	LED
E1	DUAL LITE #LZ 25 1 03L	WALL	BATTERY	Led
E2	DUAL LITE #CPRSB0603L	WALL	REMOTE	
E3	DUAL LITE #OCR D 0603L	WALL	EXTERIOR REMOTE	
F	PROGRESS #P350144-020 OR SIMILAR	SURFACED	SURFACED MOUNTED LED	(2) 6W LED E26 BASE
G	COLUMBIA #LXEM-4-35-HL-RFA-EU-ELL14	WALL	ELEVATOR PIT LIGHT	47.3W LED
Н	PROGRESS #P4004-74 OR SIMILAR	SURFACED	CHANDELIER	(8) 20W LED LAMPS
OA	PROGRESS: #P6058-3130K9 OR SIMILAR	WALL	EXTERIOR SCONCE	9W LED
OB	(2 AT EACH LOCATION) PROGRESS #P6342 SERIES	WALL	EXTERIOR FLOOD	(2) 13W LED

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- GENERAL LIGHTING FIXTURE SCHEDULE NOTES:
- 1. PROVIDE CORRECT TRIM FOR ALL FIXTURES INSTALLED IN A HARD CEILING OR SPECIALTY CEILING TYPE. PROVIDE ALL APPROPRIATE MOUNTING HARDWARE. PROVIDE BACK/MOUNTING BOXES AS RECOMMENDED BY MANUFACTURER. COORDINATE LOCATION OF ALL EXIT SIGNS IN THE FIELD WITH OWNER SUPPLIED EQUIPMENT, BULK HEADS AND SIGNAGE TO ENSURE
- VISIBILITY FROM AT LEAST HALFWAY TO NEXT SIGN OR TO THE EXIT. 4. PROVIDE DOUBLE OR SINGLE FACE EXIT SIGNS AS INDICATED ON THE DRAWINGS. PROVIDE ARROWS AS INDICATED.
- 5. ALL FIXTURE FINISHES AND DECORATIVE DETAILS SHALL BE SELECTED BY THE ARCHITECT PRIOR TO FINAL ORDER. COLORS SHALL BE SELECTED FROM FULL COLOR LINE (BOTH STANDARD, CUSTOM, AND PREMIUM).
- 6. FIXTURES INDICATED ARE THE BASIS OF DESIGN AND ARE SUBJECT TO CHANGE BASED ON OWNER'S FINAL SELECTIONS. BASIS FIXTURES ARE NOTED AS A MAXIMUM ALLOWABLE WATTAGE TO COMPLY WITH ENERGY CODE. 7. ALL FIXTURES CONNECTED TO A DIMMERSHALL HAVE DRIVER THAT COORDINATES WITH CONTROLLER.

E1.0 E1.1 E2.0 E2.1 E3.0

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ELECTRICAL DRAWING LIST E0.0 ELECTRICAL INFORMATION SHEET FIRST FLOOR PLAN - LIGHTING SECOND FLOOR PLAN - LIGHTING FIRST FLOOR PLAN - POWER SECOND FLOOR PLAN - POWER ELECTRICAL DETAILS ELECTRICAL SPECIFICATIONS E4.0 E4.1 ELECTRICAL SPECIFICATION AND SCHEDULES

GENERAL NOTES:

PER NEC.

- 1. CONTRACTOR SHALL PROVIDE BRANCH CIRCUIT WIRING TO ALL ITEMS WHICH REQUIRE ELECTRICAL CONNECTIONS. WHERE BRANCH CIRCUIT WIRING IS NOT SHOWN, CONTRACTOR SHALL CONNECT ITEMS TO THE CIRCUITS INDICATED. EXACT ROUTING OF CONDUITS AND WIRING SHALL BE DETERMINED BY THE CONTRACTOR IN ACCORDANCE WITH THE NATIONAL ELECTRICAL CODE AND SPECIFICATIONS. 2. CONTRACTOR SHALL USE ONLY THOSE WIRING METHODS ALLOWED IN THE
- SPECIFICATIONS.
- 3. A MAXIMUM OF 3 CIRCUITS SHALL BE RUN IN ONE CONDUIT, CIRCUITS MUST BE ON SEPARATE PHASES. CIRCUITS SHALL NOT SHARE A COMMON NEUTRAL.
- 4. MINIMUM WIRE SIZE SHALL BE #12AWG. MINIMUM CONDUIT SIZE SHALL BE 3/4". 5. THE ELECTRICAL CONTRACTOR SHALL CHECK AND VERIFY ALL DIMENSIONS AND CONDITIONS AT THE SITE.
- 6. ALLOW CLEAR SPACE IN FRONT OF ALL PANELBOARDS, SWITCHBOARDS, ELECTRICAL EQUIPMENT, ETC., AS REQUIRED BY NEC.
- 7. COORDINATE EXACT LOCATION OF LIGHTING FIXTURES WITH HVAC DUCTWORK, PIPING AND EQUIPMENT.
- 8. ALL LIGHTING FIXTURES TO BE COMPATIBLE WITH THE CEILING CONSTRUCTION. 9. ELECTRICAL CONTRACTOR TO SUPPLY ALL GROUNDING & BONDING REQUIREMENTS
- 10. IN ALL DWELLING UNITS, DORMITORY UNITS, HOTEL SUITES/ROOMS, RESIDENTIAL MEDICAL AND HOSPITAL UNITS, PROVIDE ARC-FAULT CIRCUIT INTERRUPTER PROTECTION ON ALL 120V, 15 AND 20A BRANCH CIRCUITS SUPPLYING RECEPTACLES OR DEVICES INSTALLED IN KITCHENS, FAMILY ROOMS, DINING ROOMS, LIVING ROOMS, PARLORS, LIBRARIES, DENS, BEDROOMS, SUNROOMS, RECREATION ROOMS, CLOSETS, HALLWAYS, LAUNDRY AREAS OR SIMILAR ROOMS BY MEANS PROVIDED IN NEC 210.12.
- 11. IN ALL DWELLING UNITS, GUEST ROOMS AND GUEST SUITES OF HOTELS AND MOTELS, CHILD CARE FACILITIES, AND PEDIATRIC AREAS IN HEALTHCARE FACILITIES, PROVIDE TAMPER-RESISTANT RECEPTACLES. FOR ALL RECEPTACLES NOTED FOR MICROWAVES, HEIGHTS AND PLACEMENT SHALL BE COORDINATED BEFORE ROUGH-IN WITH THE ARCHITECT TO ENSURE PROPER LOCATION.
- 12. SEE FIRE PROTECTION SIGNALING SYSTEM RISER DIAGRAM NOTES AND SPECIFICATIONS FOR INFORMATION ON DUCT DETECTORS AND SMOKE DAMPERS. SEE SPECIFICATIONS FOR ITEMS NEEDING ADDRESSABLE CONNECTIONS WITH SUPERVISED INTERFACE. THESE ITEMS MAY NOT BE QUANTIFIED ON THE ELECTRICAL DRAWINGS, BUT SHALL BE COORDINATED WITH ALL OTHER TRADES AND DRAWINGS CONTRACTOR TO ACCOUNT FOR VOLTAGE DROP WHERE LONG RUNS ARE TO BE PROVIDED.
- 13. ELECTRICAL CONTRACTOR TO PROVIDE ALL CUTTING AND PATCHING IN EXISTING BUILDING RELATED TO THE NEW ELECTRICAL WORK. 14. ELECTRICAL CONTRACTOR SHALL UNCONDITIONALLY GUARANTEE IN WRITING ALL
- MATERIALS EQUIPMENT AND WORKMANSHIP FOR A PERIOD OF ONE YEAR FROM DATE OF ACCEPTANCE BY OWNER 15. THE ELECTRICAL CONTRACTOR SHALL SUBMIT TO THE ARCHITECT & ENGINEER AS-
- BUILT DRAWINGS AND OPERATION AND MAINTENANCE MANUALS INCLUDING ALL NAMEPLATE DATA, WIRING DIAGRAMS, MAINTENANCE INSTRUCTIONS AND PARTS LIST UPON PROJECT COMPLETION.
- 16. ELECTRICAL CONTRACTOR SHALL MAINTAIN A CLEAN AND SAFE WORK AREA AT ALL TIMES. ALL SAFETY PROCEDURES AND ENFORCEMENT IS THE RESPONSIBILITY OF THE CONTRACTOR. THE CONTRACTOR SHALL CONFORM TO ALL OSHA STANDARDS.

		5	6	
		CONTROL EQUIPMENT		SITE WORK
\$ _M		AL MOTOR STARTER - OVERLOADS SIZED TO ACCOMMODATE PR - 4'-0" AFF UNLESS OTHERWISE NOTED	ø	UTILITY POLE
4×		INATION MOTOR STARTER - TYPE/SIZE/NEMA ENCLOSURE AS	•	POLE MOUNTED AREA LIGHTING FIXTURE
FVNR/SIZE1/	/3R > PROV	ATED - MOUNT 4'-6" AFF TO CENTERLINE OF OPERATING HANDLE IDE OVERCURRENT AND OVERLOADS IN ACCORDANCE WITH FACTURERS RECOMMENDATIONS FOR MOTOR HP	MH	MANHOLE
M		R - HORSEPOWER AS INDICATED	\bullet	GROUND ROD
		DNNECT SWITCH - AMPS/POLES/FUSES/NEMA ENCLOSURE AS		
30/3/NF/12		ATED - MOUNT 4'-6" AFF TO CENTERLINE OF OPERATING HANDLE		SIGNAL SYSTEM
Т	TRANS	SFORMER	\$	SMOKE DETECTOR
		STANDARD MOUNTING HEIGHTS	\bigcirc	DUCT MOUNTED SMOKE DETECTOR
9" BELOW		WALL-MOUNTED CLOCKS, PROGRAM BELLS, (OR AS SHOWN	©	CARBON MONOXIDE DETECTOR
FINISHED CEILING		ON ARCHITECTURAL DETAIL)	Ð	HEAT DETECTOR
6" ABOVE DOOR		NURSE CALL DOME LIGHT	 	MANUAL PULL STATION - SHALL BE MOUNTED SUCH THAT THE HANDLE IS NOT LESS THAN 42" AND NOT
6" ABOVE FIRE HOUSE		RED SIGNAL LIGHT		GREATER THAN 54" AFF.
CABINET		BATTERY LIGHTING UNITS AND REMOTE WALL MOUNTED	EK	AUDIO ALARM - SHALL BE MOUNTED WITH THEIR TOPS AFF AT HEIGHTS OF NOT LESS 90" AFF
10'-0"		LIGHT HEADS (OR 1'-0" BELOW FINISHED CEILING OF TOP UNIT).	Edo	AUDIO/VISUAL ALARM - SHALL BE MOUNTED SUCH THAT ENTIRE LENS IN NOT LESS THAN 80" AND NOT GREATER THAN 96" AFF.
8'-6"		PENDANT-HUNG INDUSTRIAL AND STRIP LIGHTING FIXTURES.	Ē¢	VISUAL ALARM - SHALL BE MOUNTED SUCH THAT ENTIRE LENS IS NOT LESS THAN 80" AND NOT
		TELEVISION OUTLET AND SERVICE RECEPTACLE-FOR		GREATER THAN 96" AFF.
7'-8"+		SHELF MOUNTED T.V. IN BEDROOMS.	<u> </u>	AUDIO ALARM - CEILING MOUNTED
7'-6"	Εd	OR 6" BELOW FINISHED CEILING, WHICHEVER IS LOWER.	Ê	AUDIO/VISUAL ALARM - CEILING MOUNTED
CENTER ABOVE DOOR OR WINDOW		WARNING AND SIGNALING FIXTURES/SIGNS.		
OPENING		OR 6" BELOW FINISHED CEILING WHICHEVER IS LOWER.	Ê	VISUAL ALARM - CEILING MOUNTED DOOR HOLDER - PROVIDE CONNECTION TO DOOR
6'-8"	E¢ EK¢		DH	HARDWARE PROVIDE POWER FROM CIRCUIT SHOWN FOR DOOR HARDWARE. PROVIDE CONNECTION TO
6'-6"		TOP OF FLUSH AND SURFACE MOUNTED ELECTRICAL LIGHTING OR POWER PANELBOARDS AND TELEPHONE		FIRE ALARM SYSTEM AND TO SMOKE DETECTORS. PROVIDE CONNECTION TO PANIC BUTTON IN RECEPTION.
		CABINETS. TOP OF BACK-MOUNTED WALL EXIT FIXTURES (NOT	FS	FLOW SWITCH
6'-3"		MOUNTED ABOVE DOORS).	TS	TAMPER SWITCH
6'-0"		TOP OF HIGHEST ELECTRICAL SAFETY DISCONNECT SWITCHES, MAGNETIC STARTERS, CONTACTORS.	PS	PRESSURE SWITCH
		CENTERLINE OF OPERATING HANDLE FOR WALL MOUNTED DISCONNECT SWITCHES AND MOTOR STARTERS; WALL	<u>FS</u> TC	TIME CLOCK
4'-6"	42 4	MOUNTED TELEPHONE AND PAY STATIONS (3'-6" AT HANDICAP LOCATIONS VERIFY EXACT HEIGHT PRIOR TO ROUGH IN)	KP	KEYPAD
3'-10"	Фст \$ \$ ▼	WALL PHONE, ELECTRICAL DEVICE LIGHTING SWITCHES, MANUAL MOTOR STARTERS, SECURITY CARD, AND GFI RECEPTACLES IN		
	\$ _M ▼ _W	TOILET ROOMS OR FOR SEPARATE SINKS NOT IN CASEWORK.	۲	PUSHBUTTON - PROVIDE IN CASEWORK AND PROVIDE WIRING TO SECURITY SYSTEM FOR DOOR LOCKDOWN. COORDINATE WITH CASEWORK AND DISTRICT
3'-6"	Μ	FIRE ALARM PULL STATIONS		SECURITY VENDOR
2'-0"	Φ	ELECTRICAL RECEPTACLES WITHIN MECHANICAL SPACES, ELECTRICAL AND ELEVATOR ROOMS.		FLOOR BOX MOUNTED DATA/TELEPHONE OUTLET
1'-6"	• •	ELECTRICAL RECEPTACLES, TELEPHONE OUTLETS, DATA		VOLUME CONTROL
1-6		OUTLETS, TELEPHONE/DATA OUTLETS		CARD READER - EXTERIOR LOCATIONS - PROVIDE
	⊻# ⊻			
0"		FINISHED FLOOR		SQUARE BACK BOX AND EXTEND 1" CONDUIT WITH APPROPRIATE WIRING TO NEAREST DOOR HARDWARE
0"		FINISHED FLOOR	CR	SQUARE BACK BOX AND EXTEND 1" CONDUIT WITH
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	2'x2' LIGHTING FIXTURE
	2'x4' LIGHTING FIXTURE
	2'x4' LIGHTING FIXTURE-EMERGENCY
	1'x8' LIGHTING FIXTURE
	2'x8' LIGHTING FIXTURE
	1'x4' LIGHTING FIXTURE
	6"X4' LIGHTING FIXTURE
	6"x2' LIGHTING FIXTURE
	STRIP LIGHT
•	WALL WASHER FIXTURE
0	ROUND RECESSED DOWNLIGHT FIXTURE
Ø	NORMAL EMERGENCY FIXTURE
	EMERGENCY BATTERY UNIT
~	REMOTE HEAD
⊦⊗	EXIT SIGN-DOUBLE FACE
↑⊗↑	EXIT SIGN-CEILING MOUNTED WITH DIRECTIONAL
	ARROWS
H⊗	EXIT SIGN-SINGLE FACE
ю	WALL SCONCE
	WIRING DEVICES
	SINGLE POLE SWITCH - 3'-10" AFF UNLESS OTHERWISE
\$	NOTED
\$ 3	3-WAY SWITCH - 3'-10" AFF UNLESS OTHERWISE NOTED
\$ 4	4-WAY SWITCH - 3'-10" AFF UNLESS OTHERWISE NOTED
\$ _K	KEY SWITCH - 3'-10" AFF UNLESS OTHERWISE NOTED
\$ _{T5}	SPRING WOUND TIME SWITCH, 5-MINUTE MAXIMUM
	DURATION - 3'-10" AFF UNLESS OTHERWISE NOTED SPRING WOUND TIME SWITCH, 1-HOUR MAXIMUM
\$ _T	DURATION - 3'-10" AFF UNLESS OTHERWISE NOTED
\$ _D	DIMMER SWITCH - 3'-10" AFF UNLESS OTHERWISE NOTED
\$ _M	MANUAL MOTOR STARTER SWITCH - 3'-10" AFF UNLESS OTHERWISE NOTED
\$ _{3D}	3-WAY DIMMER SWITCH - 3'-10" AFF UNLESS OTHERWISE NOTED
\$ _{OS}	OCCUPANCY SENSOR SWITCH - 3'-10" AFF UNLESS
	OTHERWISE NOTED PILOT LIGHT SWITCH - 3'-10" AFF UNLESS OTHERWISE
\$ _P	NOTED
\$ _{MO}	MANUAL OVERRIDE
\$ _{Dos}	SWITCH WITH OCCUPANCY SENSOR AND DIMMING CAPABILITY 3' 10"AFF UNLESS NOTED OTHERWISE
OS	DUAL TECHNOLOGY OCCUPANCY SENSOR - 360°
 ←(S)→	DUAL TECHNOLOGY OCCUPANCY SENSOR - CORRIDOR
	PATTERN DUAL TECHNOLOGY OCCUPANCY SENSOR - CORNER
	MOUNT
(DS)	CEILING MOUNTED DAYLIGHT SENSOR
\$ _{LC}	MULTIPLE BUTTON DIGITAL CONTROL STATION WITH ON/OFF - 3'-10"AFF UNLESS OTHERWISE NOTED.
Φ	DUPLEX RECEPTACLE - NEMA 5-20R, MOUNT 1'-6"
ФСТ	AFF UNLESS OTHERWISE NOTED COUNTER TOP DUPLEX RECEPTACLE MOUNT 3" ABOVE
	BACKSPLASH OR AT 3'-10" TAMPERPROOF DUPLEX RECEPTACLE - NEMA 5-20R.
ΦΤ	MOUNT 1'-6" AFF UNLESS OTHERWISE NOTED
Φ^{USB}	DUPLEX RECEPTACLE WITH USB PORT - MOUNT AT 1'-6" UNLESS NOTED OTHERWISE
φ	SINGLE RECEPTACLE - MOUNT 1'-6" AFF UNLESS OTHERWISE NOTED
•	GFI DUPLEX RECEPTACLE - MOUNT AT 1'-6" AFF UNLESS
	OTHERWISE NOTED DUPLEX RECEPTACLE WITH TOP SWITCHED - 1'-8" AFF
•	UNLESS NOTED OTHERWISE QUAD RECEPTACLE - NEMA 5-20R, MOUNT 1'-6" AFF
#	UNLESS OTHERWISE NOTED
Ŷ	SINGLE PHASE SPECIAL RECEPTACLE - MOUNT 1'-6" AFF UNLESS OTHERWISE NOTED
Ŷ	THREE PHASE SPECIAL RECEPTACLE - MOUNT 1'-6" AFF UNLESS OTHERWISE NOTED
ї Ф	FLOOR BOX MOUNTED DUPLEX RECEPTACLE
	COMBINATION POWER/COMMUNICATIONS FLOOR
FB	BOX-DEVICES AS INDICATED
R	CORD REEL
	TELEVISION CABLE OUTLET
L	1
[
	PANELBOARDS
	SURFACE MOUNTED PANEL
	FLUSH MOUNTED PANEL
	EXISTING SURFACE MOUNTED PANEL
	EXISTING FLUSH MOUNTED PANEL
·	
	CIRCUITING

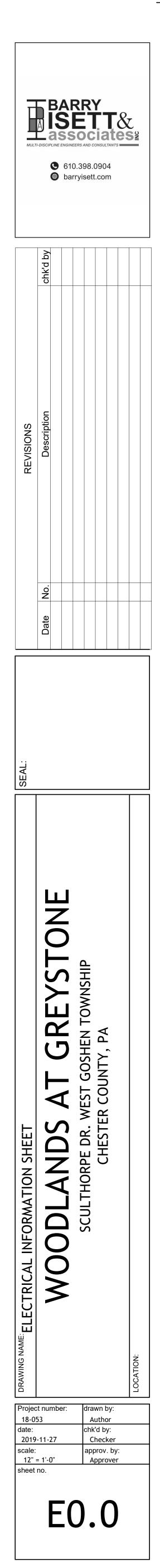
	CIRCUITING								
JB JUNCTION BOX									
ROOM NAME ROOM # P-1	BRANCH CIRCUIT NUMBER FOR ALL ITEMS IN THIS ROOM UNLESS OTHERWISE INDICATED - (*) INDICATES CONNECTION TO CIRCUIT NUMBER SHOWN NEXT TO DEVICE								
DEMO	DLITION DRAWING LINETYPE DESIGNATIONS								
	EXISTING TO REMAIN								
	EXISTING TO BE REMOVED								

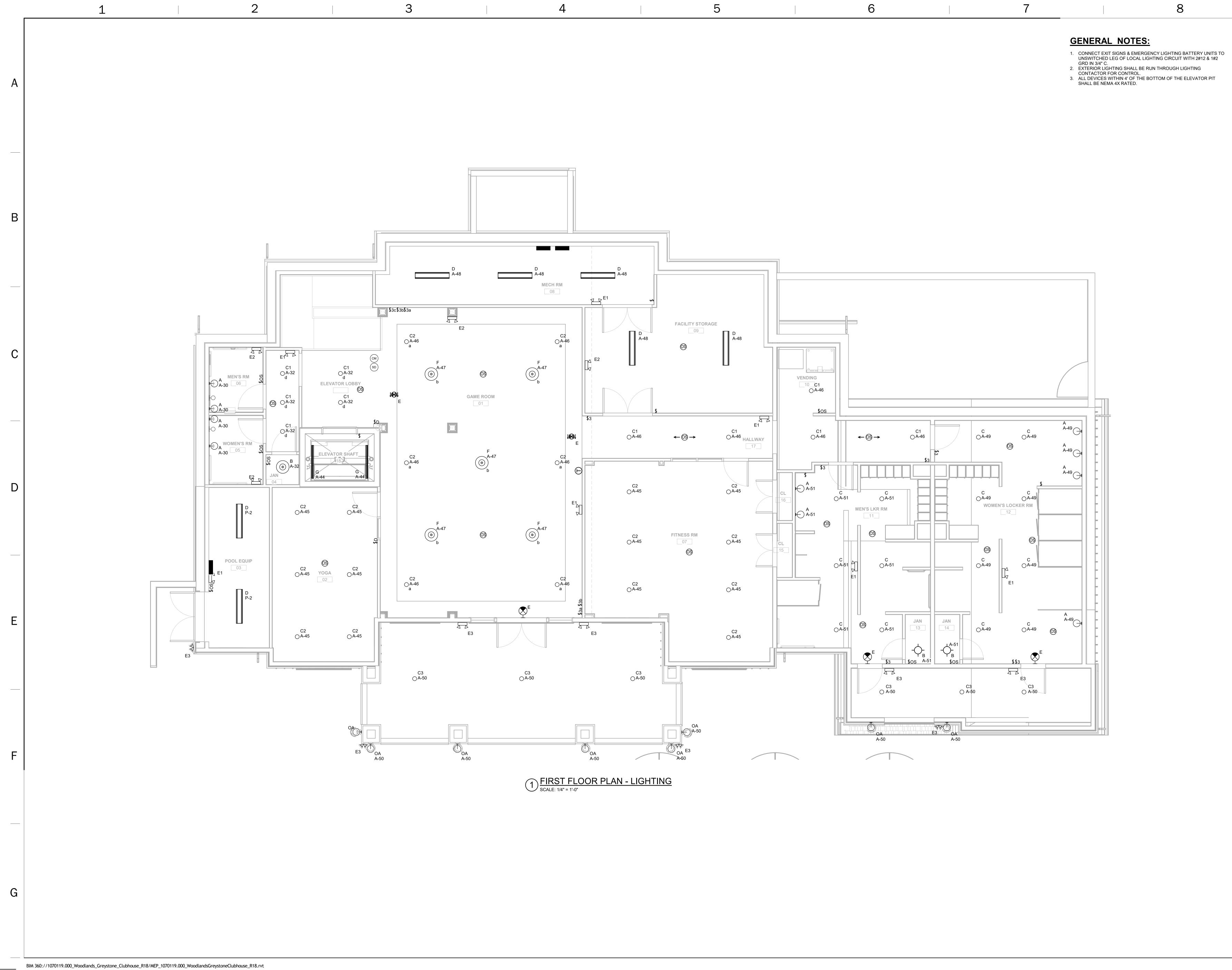
NOTE: NOT ALL ABBREVIATIONS AND SYMBOLS INDICATED MAY APPEAR ON THESE CONTRACT DRAWINGS. THIS IS FOR REFERENCE ONLY.

8

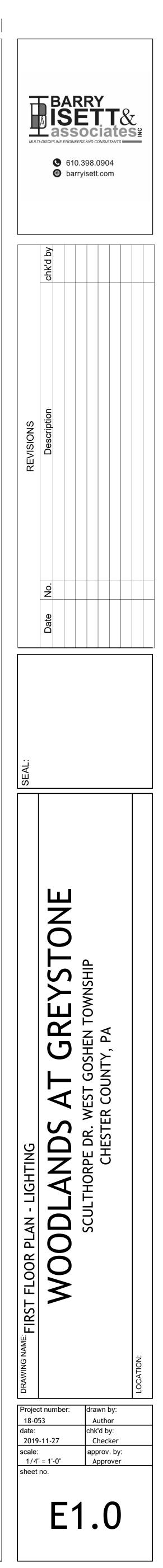
LIGHTING

2'x2' LIGHTING FIXTURE

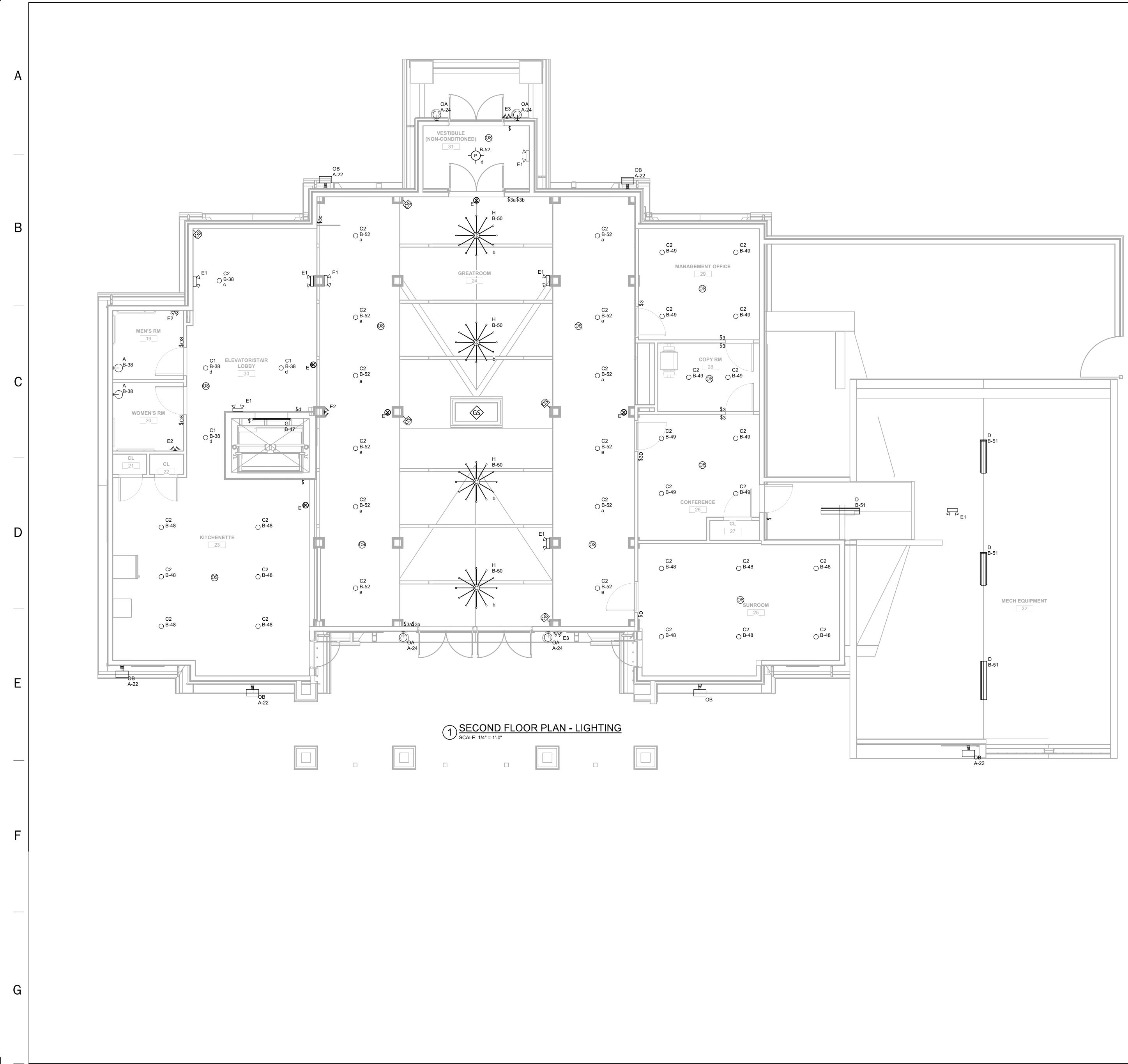




GENERAL NOTES:

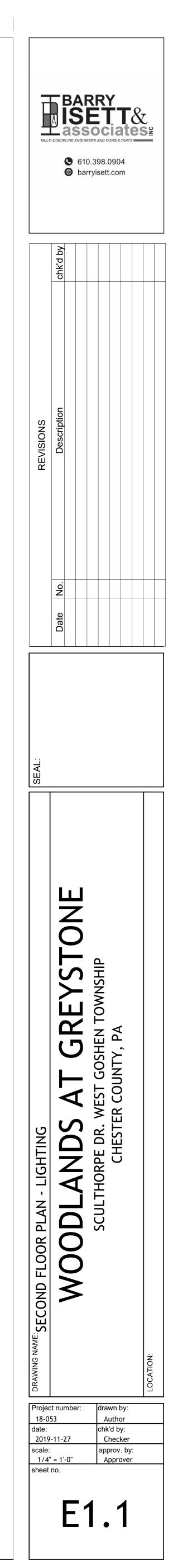


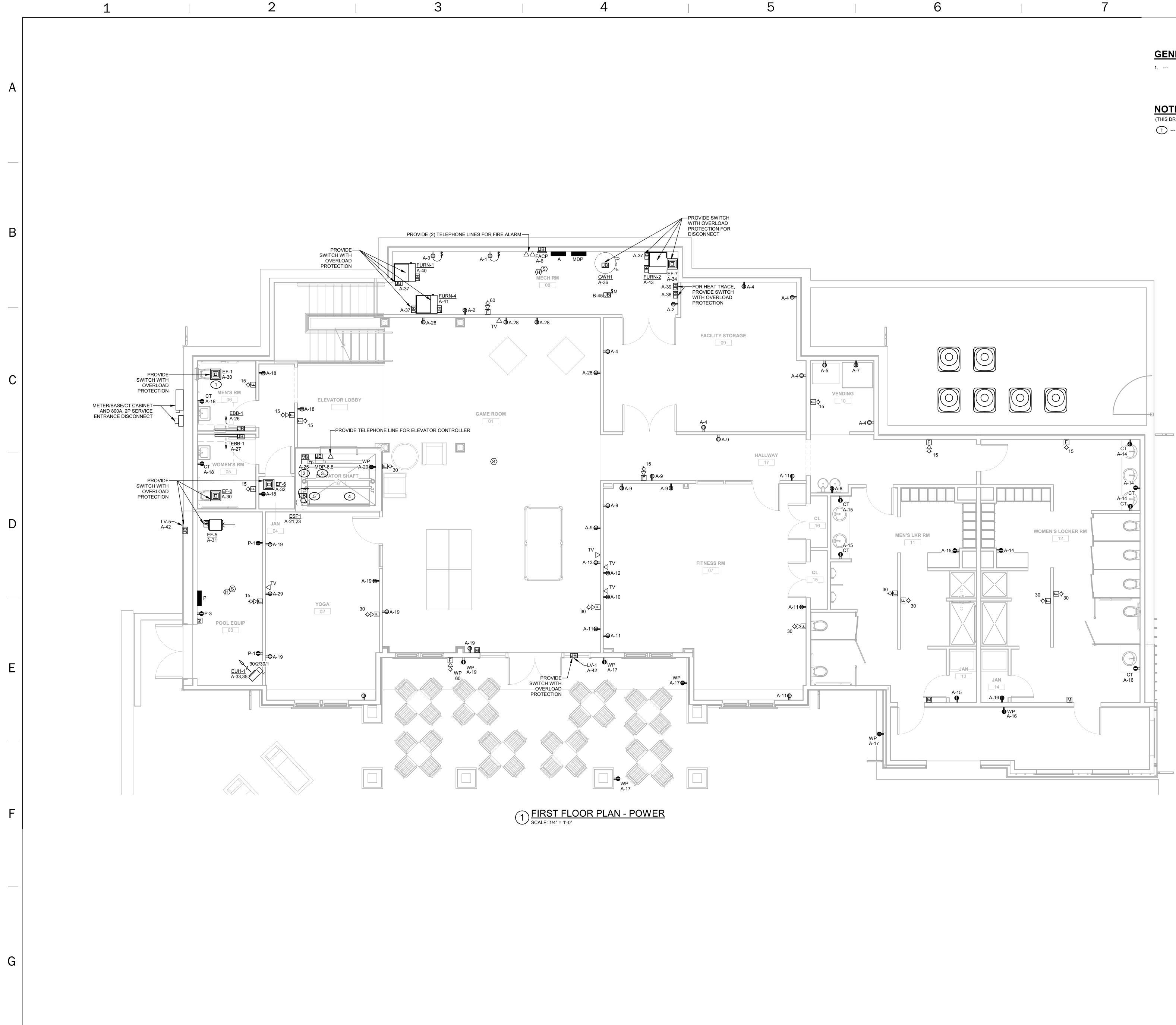
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GENERAL NOTES:

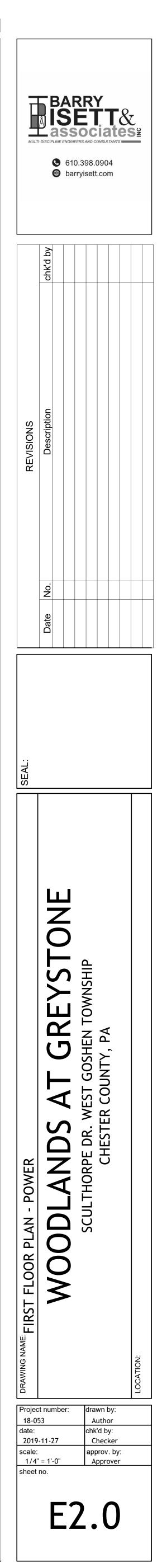
CONNECT EXIT SIGNS & EMERGENCY LIGHTING BATTERY UNITS TO UNSWITCHED LEG OF LOCAL LIGHTING CIRCUIT WITH 2#12 & 1#2 GRD IN 3/4" C.
 EXTERIOR LIGHTING SHALL BE RUN THROUGH LIGHTING CONTACTOR FOR CONTROL.



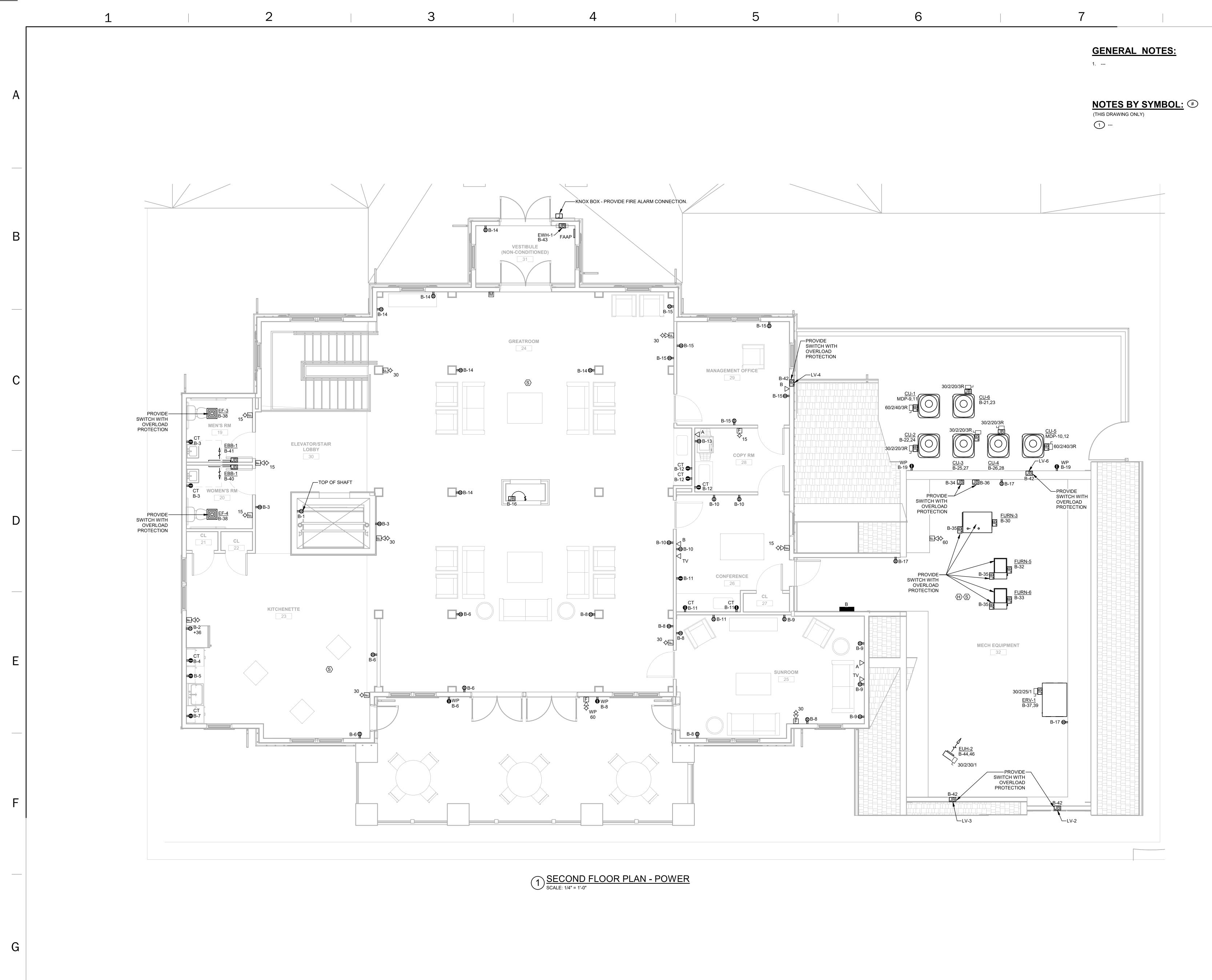


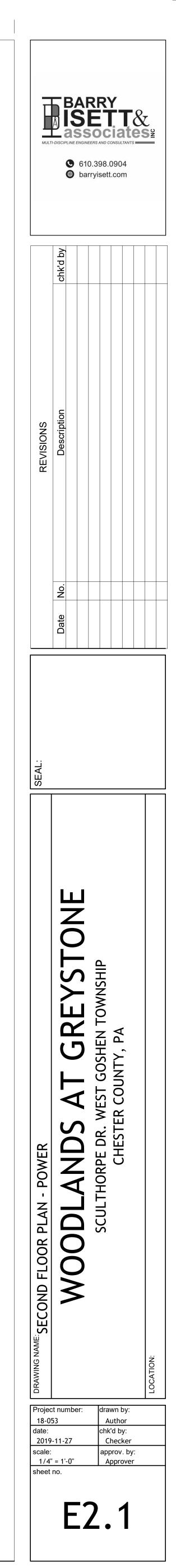
GENERAL NOTES:

NOTES BY SYMBOL: (#) (THIS DRAWING ONLY) 1 ----

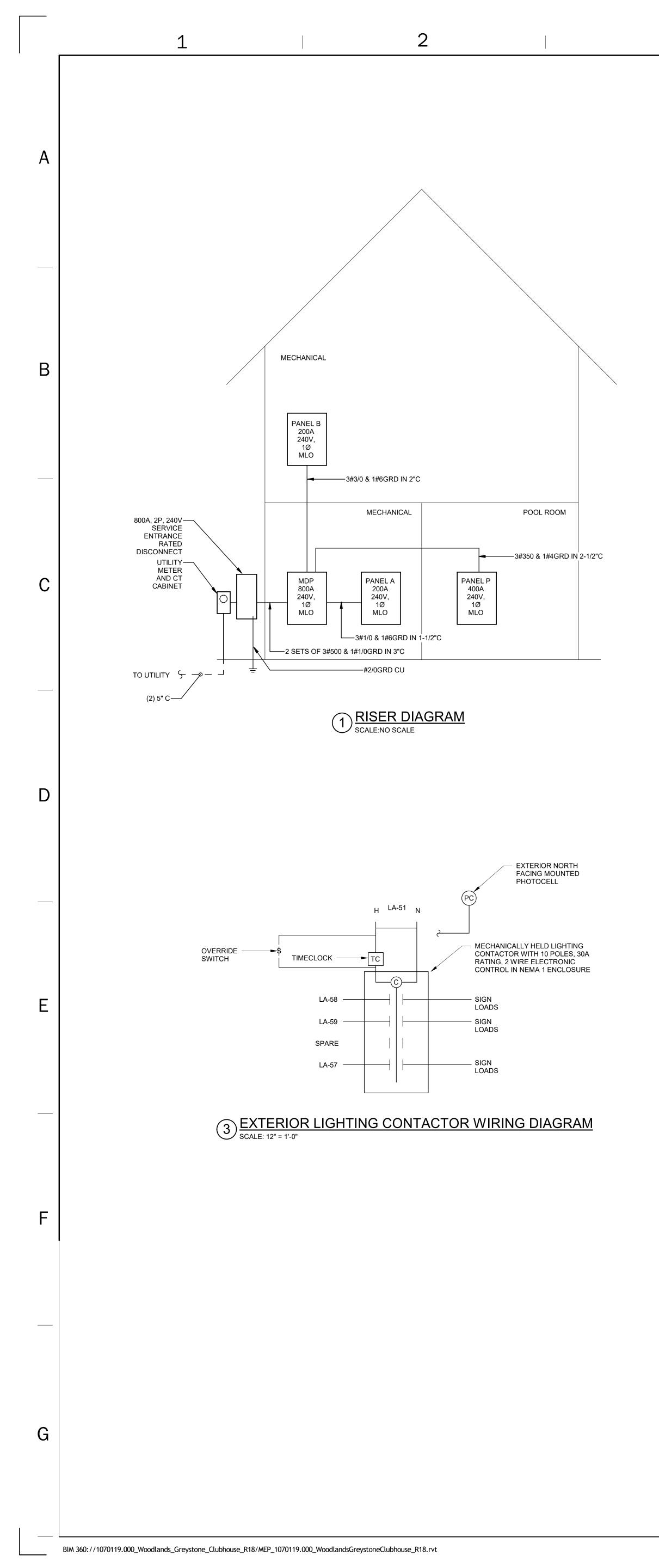


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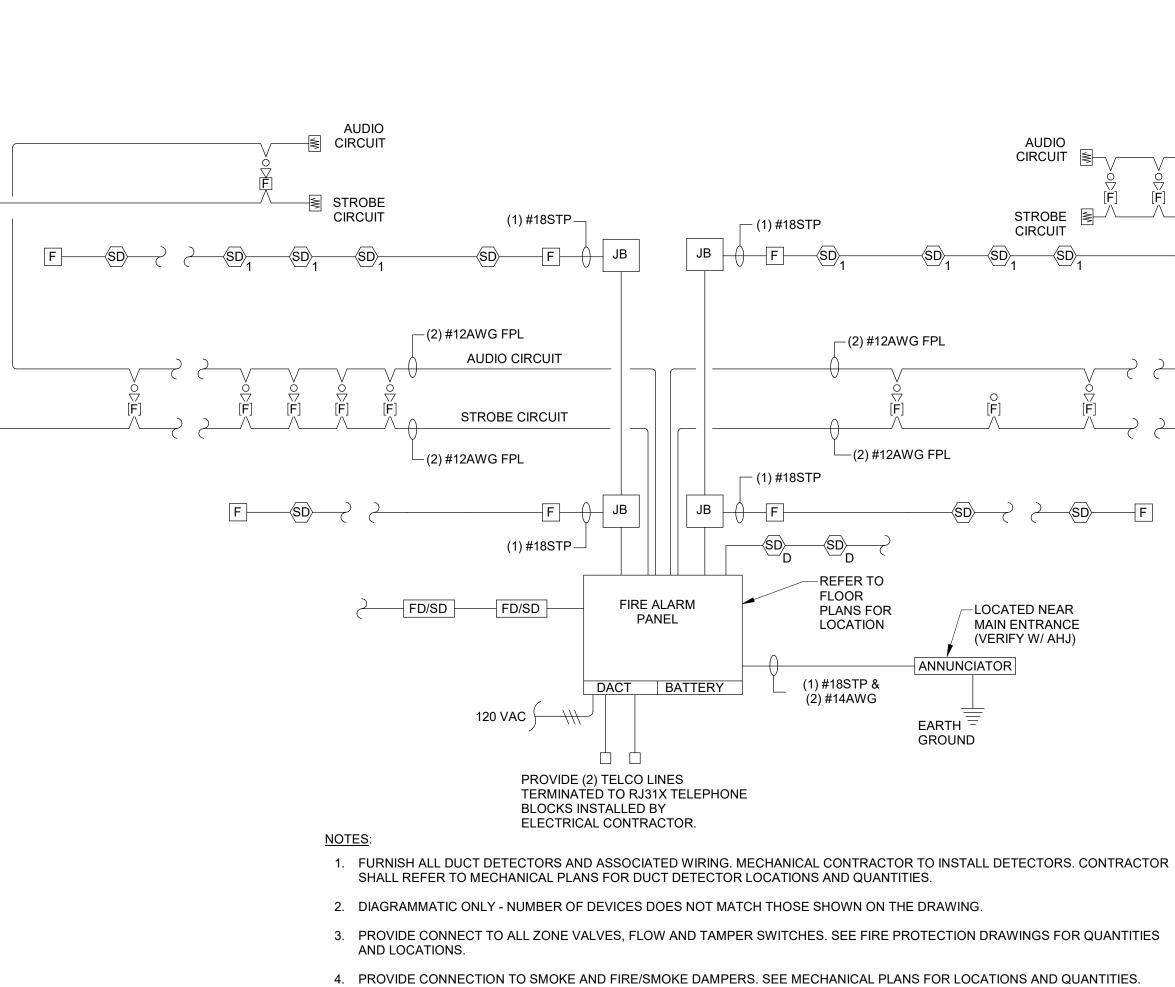




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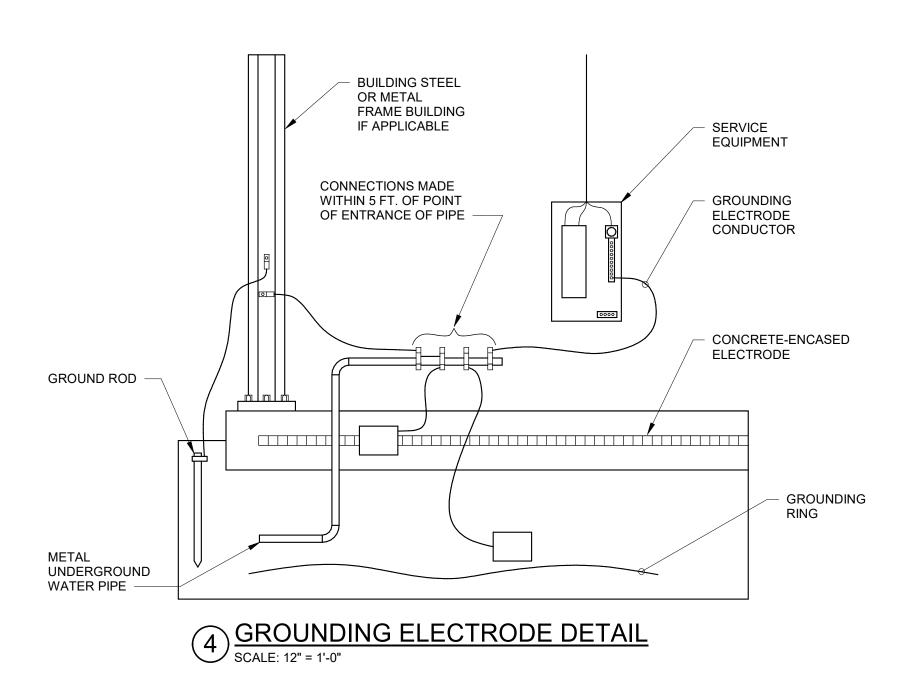


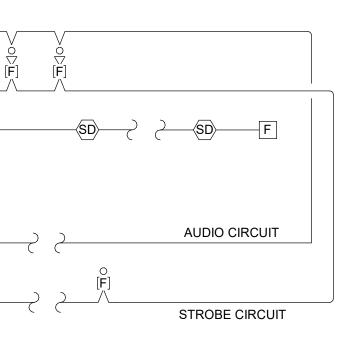
4

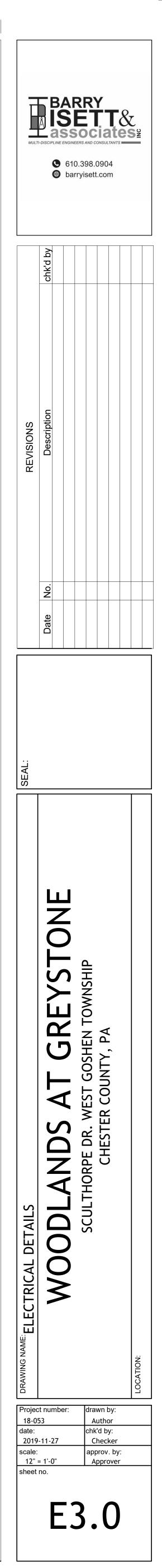


- 5. FOR ALL COMPONENTS INCLUDING THE MAIN FIRE ALARM PANEL AND EXTENDER PANELS THAT REQUIRE POWER, PROVIDE 120V, 20A DEDICATED CIRCUIT FROM NEAREST PANEL WITH SPACE. EXTEND 2#12 & 1#12GRD IN 3/4"C FOR POWER.
- 6. PROVIDE SMOKE DETECTOR AND HEAT DETECTOR ABOVE MAIN FIRE ALARM PANEL.

2 TYPICAL FIRE PROTECTION SIGNALING SYSTEM RISER DIAGRAM SCALE: 12" = 1'-0"







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		OPE OF WORK IT IS THE INTENT OF THESE SPECIFICATIONS AND ACCOMPANYING DRAWINGS TO GENERALLY DESCRIBE THE WORK NECESSARY FOR THE INSTALLATION OF A COMPLETE ELECTRICAL, LIGHTING, AND POWER SYSTEM (INCLUDING FIRE	1.7 STORAGE AND PRE A. EQUIPMENT AN SHALL BE FULL MARRED FINISH
	В	ALARM). THESE DRAWINGS AND SPECIFICATIONS ARE NOT INTENDED TO SHOW THE	ITS ORIGINAL C
		LOCATION OF EVERY WIRE, CONDUIT, FITTING, ETC., BUT IS UNDERSTOOD THAT THE CONTRACTOR SHALL FURNISH AND INSTALL ALL MATERIALS AND LABOR FOR COMPLETE WORKABLE SYSTEMS UNLESS NOTED OTHERWISE IN THIS SPECIFICATION OR ON THE DRAWINGS.	A. SECURE ALL EC B. ELECTRICAL CO
	С	. CONTRACTOR SHALL PROVIDE BUT NOT BE LIMITED TO:	DESIGNED TO F LOCAL ORDINA C. ALL CONDUITS
		 COMPLETE SYSTEM OF WIRING FOR EMERGENCY LIGHTING, LIGHT AND POWER, PLUMBING, HVAC EQUIPMENT, FIRE ALARM ALONG WITH TELEPHONE AND DATA EQUIPMENT INSTALLATION. 	BOX, JUNCTION THE DRAWINGS
		2. ALL PANELS, SWITCHBOARDS, MOTOR CONTROLLERS, TRANSFORMERS, DISCONNECTS, RECEPTACLES, SWITCHES, OUTLETS AND PLATES FOR SAME,	D. SUPPORTS SH/ DRAWINGS.
		FEEDERS FROM PANELS AND RELATED APPURTNENANCES. 3. LIGHTING FIXTURES, LAMPS, BALLASTS AND APPURTENANCES.	E. DO NOT FASTE CONDUIT. 1.9 IDENTIFICATION
	D	DESIGN DRAWINGS ARE DIAGRAMMATIC AND DO NOT SHOW ALL OFFSETS, BENDS, ELBOWS, FITTINGS OR OTHER SPECIFIC ELEMENTS WHICH MAY BE REQUIRED FOR COMPLETE INSTALLATION OF THE WORK. SUCH WORK MAY BE ACCOMPLISHED AT THE SITE. ADDITIONAL BENDS, OFFSETS AND CONDUIT AS REQUIRED BY VERTICAL AND HORIZONTAL EQUIPMENT LOCATIONS OR OTHER JOB CONDITIONS SHALL BE PROVIDED TO COMPLETE THE WORK AT NO ADDITIONAL COST TO THE OWNER.	A. ALL ELECTRICA INDICATED ON NOT BE LIMITEI 1. ELECTRICA
	E	EXCEPT WHERE SHOWN IN DIMENSIONAL DETAIL, THE LOCATIONS OF SWITCHES, RECEPTACLES, LIGHTS AND OTHER EQUIPMENT SHOWN ON PLANS ARE	2. FEEDER CO
		APPROXIMATE. SUCH ITEMS SHALL BE PLACED SO AS TO ELIMINATE INTERFERENCE WITH DUCTS, PIPING AND EQUIPMENT. THE EXACT LOCATION SHALL BE DETERMINED IN THE FIELD. ALL DOOR SWINGS SHALL BE VERIFIED SO	 OUTLET BC PANELBOA
	F	THAT LIGHT SWITCHES ARE PROPERLY LOCATED. FIELD VERIFY EXISTING CONDITIONS AND COORDINATE ALL WORK WITH ALL OTHER TRADES, AND ACTUAL CONDITIONS IN FIELD.	5. DISCONNE 6. FIRE ALAR
1.2	GE	. ALL DEBRIS MATERIAL RESULTING FROM NEW WORK SHALL, UNLESS OTHERWISE INDICATED, BECOME THE PROPERTY OF THE CONTRACTOR AND SHALL BE NERAM 保住取 际 MET INFE PREMISES BY HIM.	B. NAMEPLATES S BACKGROUND LAMINATED PL HIGH. CONDUI SHEET MATER
	A.	PROVIDE (FURNISH AND INSTALL) ALL WORK SPECIFIED OR INDICATED, IN CONFORMANCE WITH THE MANUFACTURER'S PUBLISHED INSTALLATION INSTRUCTIONS, COMPLETE WITH ALL APPURTENANCES, ARRANGED TO MEET JOB CONDITIONS, FOR COMPLETE OPERATING SYSTEMS IN ACCORDANCE WITH THE	C. PROVIDE A TYP
		NATIONAL ELECTRIC CODE (NEC) AND ALL OTHER LOCAL CODES/REGULATIONS. ALL EQUIPMENT AND MATERIALS INSTALLED SHALL BEAR THE LABEL OF THE UNDERWRITER'S LABORATORIES, INC., WHERE SO REQUIRED BY THE NFPA	
1.3	QU	REGULATIONS. IALITY ASSURANCE	2.1 BUILDING WIRE ANI
	Α.	APPROVAL OF MATERIALS AND EQUIPMENT WILL BE BASED ON THE MANUFACTURER'S PUBLISHED DATA. PROOF THAT THE ITEMS FURNISHED CONFORM TO THE SPECIFIED REQUIREMENTS AS INDICATED BELOW SHALL BE	A. WIRE AND CON 1. INSULATEI BE COPPE
	В.	SUBMITTED FOR APPROVAL. WHERE MATERIAL AND EQUIPMENT ARE SPECIFIED TO CONFORM TO THE STANDARDS OF THE UNDERWRITER'S LABORATORIES (UL), INC., THE UL LABEL OR	2. CONDUCTO WIRE. CON
	C	LISTING WILL BE ACCEPTABLE AS SUFFICIENT EVIDENCE THAT THE ITEMS CONFORM TO REQUIREMENTS. EQUIPMENT DESIGN, FABRICATION, TESTING, PERFORMANCE AND INSTALLATION	CONCENTI 3. MULTICON
1.4		SHALL, UNLESS SHOWN OTHERWISE, COMPLY WITH AND MEET ALL THE APPLICABLE REQUIREMENTS OF NFPA 70 (THE NEC), ANSI C2, REFERENCED INDUSTRIAL CODES AND STANDARDS AND LOCAL CODES HAVING JURISDICTION.	(TYPE AC) ALLOWABI FACILITIES FACILITY (I ALL NECES
	A.	ALL MATERIALS SHALL BE NEW. THE CONTRACTOR MAY SELECT DEVICES AS INDICATED ON THESE DRAWINGS. SUBSTITUTES MAY BE SUBMITTED AND USED WITH WRITTEN APPROVAL OF OWNER/ARCHITECT/ENGINEER. SUBMIT SHOP	4. THE CONT CONTROL CONFORM
	В.	DRAWINGS TO OWNER/ARCHITECT/ENGINEER FOR APPROVAL. SHOP DRAWINGS SHALL INCLUDE BUT ARE NOT LIMITED TO:	5. ALL WIRIN WHERE AL
		 LIGHTING FIXTURES RECEPTACLES, BOXES, ENCLOSURES 	6. BUILDING TEMPERA
		3. SERVICE EQUIPMENT	7. A GREEN (8. CONTRAC
		 PANELBOARDS CONDUIT, WIRING, FITTINGS 	LEAD LENG
		6. DISCONNECT SWITCHES	B. INSTALLATION1. RACEWAY
		 SWITCHES, COVER PLATES TIME CLOCKS, PHOTOCELLS AND LIGHTING CONTACTOR 	SHALL NO 2. CONDUCT
	C.	SUBMITTALS SHALL BE MADE FOR THE EQUIPMENT LISTED ABOVE. THE ARCHITECT SHALL MAKE THE ULTIMATE DECISION ON COLOR AND FINISH FOR ALL DEVICES SUCH AS RECEPTACLES, SWITCHES, SWITCH PLATES, AS WELL AS ANY OTHER CONTROL DEVICES. THIS APPROVAL SHALL BE MADE BEFORE ANY ITEMS ARE	NOT OCCL OR THE SA CONTINUC OR PULL B 3. ALL FEEDE
	D.	ORDERED. PRODUCT REQUIREMENTS: MATERIALS AND EQUIPMENT TO BE PROVIDED SHALL BE THE STANDARD CATALOGED PRODUCTS OF MANUFACTURERS REGULARLY	FOLLOWS: <u>CONDU</u>
		ENGAGED IN THE MANUFACTURE OF THE PRODUCTS. MATERIALS AND EQUIPMENT SHALL MEET THE SPECIFIED AND DETAILED REQUIREMENTS INDICATED, BE SUITABLE FOR THE INSTALLATION SHOWN AND SHALL REPRESENT PRODUCTS THAT HAVE BEEN IN SATISFACTORY USE AT LEAST TWO YEARS. PRODUCTS NOT MEETING ALL SPECIFIED REQUIREMENTS WILL NOT BE ACCEPTED.	PHASE PHASE NEUTR GROUN 4. CONDUCT
15		OWNER INSTRUCTION AND OPERATION MANUALS SHALL BE PROVIDED TO INSTRUCT IN THE PROPER OPERATION AND MAINTENANCE OF ALL WORK. PROVIDE A MINIMUM OF (3) THREE OPERATING MANUALS FOR ALL WORK. PROVALS, CODES, ORDINANCES AND REGULATIONS	WITH COLU AWG SHAL OUTLET, P SHALL BE
	A.	ALL WORK AND MATERIALS SHALL CONFORM TO ALL CODES, ORDINANCES, REGULATIONS, STANDARDS AND RULES. ALL PERMITS, UTILITY FEES AND COSTS, INSPECTION CERTIFICATES AND APPROVALS SHALL BE SECURED AND PAID BY THE CONTRACTOR.	5. CONNECT UTILIZING WITH VINY IDENTIFIC/ SPLICE OF CONDUCT
	В.	WORK SHALL NOT BE COVERED UP NOR ENCLOSED UNTIL IT HAS BEEN INSPECTED, TESTED AND APPROVED. ANY WORK THAT IS ENCLOSED OR COVERED UP BEFORE SUCH INSPECTION AND TEST, SHALL BE UNCOVERED. AFTER IT HAS BEEN INSPECTED AND APPROVED, ALL UNCOVERED ITEMS SHALL BE RESTORED TO ITS ORIGINAL COVERED CONDITION AT NO ADDITIONAL COST TO THE OWNER.	6. WHERE SE FEEDERS CHARACTE
		SECURE ELECTRICAL INSPECTION CERTIFICATE FROM AUTHORIZED AGENT.	7. MAXIMUM RECOMME
1.6		NTINUITY OF WORK AND COORDINATION PLAN CONSTRUCTION SCHEDULE TO COORDINATE WITH ALL OTHER TRADES, UNLESS A SCHEDULED CHANGE HAS BEEN ARRANGED WITH THE	8. CIRCUIT C NEUTRAL ON DRAWI
	В.	OWNER/ARCHITECT/ENGINEER. COORDINATION SHALL INCLUDE ADEQUATE CLEARANCES FOR THE INSTALLATION AND MAINTENANCE OF EQUIPMENT AND PHYSICAL AND ELECTRICAL	9. ALL 600V F FLAT-BAR COMPRES
		REQUIREMENTS OF ITEMS OR EQUIPMENT REQUIRING CONNECTIONS.	10. MULTICON OR ABOVE MULTICON STRUCTUF
			11. MULTICON

AND PRESERVATION OF MATERIALS MENT AND MATERIALS STORED AT THE SITE, PRIOR TO FINAL INSTALLATION, BE FULLY PROTECTED FROM DAMAGE, DIRT, DEBRIS, AND WEATHER, DENTS,

- IGINAL CONDITION OR REPLACED. NG DEVICES AND HANGERS
- RE ALL EQUIPMENT, DEVICES AND RACEWAYS. RICAL COMPONENTS AND SYSTEMS AND THEIR ATTACHMENTS SHALL BE
- ORDINANCES HAVING JURISDICTION
- ONDUITS SHALL BE SECURELY FASTENED WITHIN 3 FEET OF EACH OUTLET UNCTION BOX, CABINET, FITTING OR END OF CONDUIT, OR AS SHOWN ON RAWINGS.
- ORTS SHALL BE HOT-DIPPED GALVANIZED STEEL OR AS INDICATED ON THE INGS
- T FASTEN SUPPORTS TO PIPES, DUCTS, MECHANICAL EQUIPMENT OR
- ATION
- ECTRICAL EQUIPMENT SHALL BE IDENTIFIED AS HEREIN SPECIFIED AND TED ON THE DRAWINGS. EQUIPMENT TO BE IDENTIFIED SHALL INCLUDE, BUT E LIMITED TO THE FOLLOWING:
- ECTRICAL POWER AND BRANCH CIRCUIT CONDUCTORS
- EDER CONDUITS
- JTLET BOXES (COVER PLATES)
- NELBOARDS SCONNECTS
- RE ALARM CONTROL PANELS
- PLATES SHALL GENERALLY BE BLACK TYPED LETTERS WITH WHITE GROUND OR WHITE TYPED LETTERS WITH BLACK BACKGROUND ON ATED PLASTIC WITH BEVELED EDGES. LETTERS SHALL BE A MINIMUM OF 1/8" CONDUIT MARKERS SHALL BE STANDARD PRE-PRINTED FLEXIBLE PLASTIC MATERIAL OR SELF-ADHERING VINYL LABELS. WIRE MARKERS SHALL BE ATED PLASTIC NAMEPLATES, SELF-ADHERING VINYL LABELS OR TAPE. 3
- IDE A TYPED DIRECTORY FOR EACH PANELBOARD INDICATING THE TEMS CONTROLLED BY EACH CIRCUIT. THE DIRECTORY SHALL BE LOCATED E INSIDE OF THE HINGED DOOR TO THE PANEL
- 2 PRODUCTS VIRE AND CABLE
- AND CONDUCTORS
- SULATED CURRENT-CARRYING WIRE AND GROUNDING CONDUCTORS SHALL COPPER AND SHALL CONFORM TO NFPA 70 AND ASTM B3 (SOFT OR INEALED COPPER WIRE).
- NDUCTORS NO. 10 AWG AND SMALLER SHALL BE SOLID ROUND COPPER RE. CONDUCTORS NO. 8 AWG AND LARGER SHALL BE STRANDED DNCENTRIC COPPER WIRE.
- JLTICONDUCTOR CABLE: COMPLY WITH NEMA WC 70 FOR ARMORED CABLE YPE AC) AND METAL-CLAD CABLE (TYPE MC) WITH GROUND WIRE (ONLY LOWABLE FOR CIRCUITS 40A OR LESS). WHERE USED IN HEALTH CARE CILITIES, IT SHALL BE RATED PER NEC REQUIREMENTS. HEALTH CARE CILITY (HCF) CABLE SHALL BE OF ALUMINUM ARMOR, AND PROVIDED WITH NECESSARY CONNECTORS. MEET UL STANDARD 4; NEC ARTICLE 517.
- E CONTRACTOR SHALL PROVIDE APPROPRIATELY SIZED FEEDERS, BRANCH, INTROL AND MISCELLANEOUS CONDUCTORS APPROPRIATELY SIZED IN ONFORMANCE WITH THE NATIONAL ELECTRIC CODE.
- WIRING SHALL BE INSTALLED IN CONDUIT OR MULTICONDUCTOR CABLE HERE ALLOWED.
- IILDING WIRE SHALL BE TYPE THW, THHN/THHW OR XHHW WITH A MINIMUM MPERATURE RATING OF 75 DEGREES C.
- GREEN GROUND WIRE SHALL BE RUN WITH ALL CIRCUITS.
- INTRACTOR SHALL ACCOUNT FOR VOLTAGE DROP WHEN PROVIDING LONG AD LENGTHS OF CONDUCTORS.
- LATION
- CEWAYS AND WIRING SHALL BE INSTALLED AS INDICATED AND CIRCUITS IALL NOT BE COMBINED WITHOUT PRIOR APPROVAL.
- R THE SAME ENCLOSURE WITH EACH OTHER. CONDUCTORS SHALL BE R PULL BOXES ONLY.

L FEEDER AND BRANCH CIRCUIT CONDUCTORS SHALL BE COLOR CODED AS LLOWS: CONDUCTOR <u>240/120V</u> PHASE A

BLACK RED WHITE GROUND GREEN

- JTLET, PULL OR JUNCTION BOXES. ALL CONTROL CIRCUIT CONDUCTORS IALL BE IDENTIFIED AT EACH CONNECTION POINT.
- ITH VINYL-PLASTIC ELECTRICAL INSULATING TAPE. CONDUCTOR NDUCTOR.
- HERE SEVERAL FEEDERS PASS THROUGH A COMMON PULLBOX, THE EDERS SHALL BE TAGGED TO CLEARLY INDICATE THE ELECTRICAL
- ARACTERISTICS, CIRCUIT NUMBER AND PANEL DESIGNATION. XIMUM CABLE PULLING TENSION SHALL NOT EXCEED VALUES COMMENDED BY CABLE MANUFACTURER.
- AT-BAR TYPE EQUIPMENT TERMINALS SHALL BE TERMINATED WITH A MPRESSION TYPE LUG.
- R ABOVE ACCESSIBLE CEILINGS IN ACCORDANCE WITH THE NEC. RUCTURE.
- THOUT AN OVERALL NONMETALLIC COVERING.

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2.4 WIRING DEVICES A. WALL SWITCHES 1. SWITCHES SHALL BE SPECIFICATION GRADE, 120/277 VOLTS, IVORY TOGGLE, 20 AMPS, HUBBELL OR APPROVED EQUAL. SWITCH LOCATIONS TO BE CONFIRMED WITH ARCHITECT/OWNER PRIOR TO ROUGHING-IN. 2. SWITCHES TO BE LOCATED IN THE SAME GANGED PLATE WITH DIMMERS. SWITCHES SHALL MATCH THE SAME STYLE AS THE DIMMERS IN THE GANG. B. DIMMER SWITCHES 1. DIMMERS SHALL BE BY LUTRON OR AN APPROVED EQUIVALENT. DIMMERS SHALL MATCH THE HOLE OPENING OF NEARBY NEIGHBORING SWITCHES. THEY SHALL BE SPECIFICATION GRADE, SLIDE TYPE OR BUTTON TYPE FOR RAISE AND LOWER FUNCTIONS. THEY SHALL BE RATED FOR 120 VOLTS OR 277 VOLTS AS APPLICABLE. THE RATED WATTAGE SHALL BE DEPENDENT UPON THE LIGHTING LOAD. DIMMERS TYPE SHALL MATCH THE LOAD TYPE THAT THEY ARE CONTROLLING - FLUORESCENT FOR FLUORESCENT DIMMING, ELECTRONIC LOW VOLTAGE FOR DIMMING ELECTRONIC TRANSFORMERS, VERIFY APPLICATION REQUIREMENTS WITH DIMMER MANUFACTURER. PROVIDE ACCESSORIES AND APPURTENANCES AS NECESSARY TO SUPPORT LARGER LOADS OR THOSE DIMMING APPLICATIONS WHICH REQUIRE INTERFACES. FLUORESCENT DIMMERS SHALL BE COMPATIBLE WITH THE FLUORESCENT DIMMING BALLASTS THEY ARE CONTROLLING. DIMMER LOCATIONS TO BE CONFIRMED WITH OWNER PRIOR TO ROUGHING-IN. C. OCCUPANCY SENSORS 1. OCCUPANCY SENSORS SHALL BE DUAL TECHNOLOGY TYPE. THEY SHALL BE CEILING MOUNT AS INDICATED ON THE DRAWINGS. 2. THE OCCUPANCY SENSOR SHALL BE WHITE. 3. PROVIDE OCCUPANCY SENSOR SWITCH APPROPRIATELY COORDINATED WITH THE CEILING MOUNT OCCUPANCY SENSOR. 4. PROVIDE RELAYS AND APPURTENANCES AS NECESSARY TO CREATE A COMPLETE, OPERABLE SYSTEM. 5. SENSORS SHALL BE SET TO AUTOMATICALLY TURN OFF LIGHTS WITHIN 30 MINUTES OF ALL OCCUPANTS LEAVING THE SPACE. 6. SENSORS SHALL BE SET TO BE MANUAL ON OR CONTROLLED TO AUTOMATICALLY TURN ON THE LIGHTING TO NOT MORE THAN 50% POWER. FULL AUTOMATIC-ON CONTROLS SHALL BE PERMITTED TO CONTROL LIGHTING IN PUBLIC CORRIDORS, STAIRWAYS, RESTROOMS, AND BUILDING ENTERANCE AND LOBBY. 7. COMBINATION WALL BOX 0-10V DIMMER/SWITCH/OCC SENSORS SHALL BE PIR TYPE WITH 180 DEG FIELD OF VIEW AND MINIMUM 1000 SQ FT OF MAJOR MOTION COVERAGE. IT SHALL BE COMPATIBLE WITH 0-10VCD LED/FLR LAMPS AND CAPABLE OF FUNCTIONING IN A 3-WAY SWITCHING ARRANGEMENT. a. BASIS OF DESIGN IS EATON OSW-P-010, OR APPROVED EQUAL. b. DEVICE COLOR SELECTION SHALL BE FROM MANUFACTURER'S FULL RANGE. FINAL SELECTION SHALL BE BY ARCHITECT. THE FOLLOWING BASE COLOR COMBINATIONS SHALL BE UTILIZED: BLACK DEVICE / STAINLESS STEEL PLATE WHITE OUTLET / WHITE PLASTIC PLATE GRAY OUTLET / GRAY PLASTIC WALL PLATE D. SAFTEY SWITCHES 1. SAFETY SWITCHES SHALL BE FUSED OR NON-FUSED AS REQUIRED. THEY SHALL BE THE HEAVY-DUTY TYPE AS MANUFACTURED BY SIEMENS, GENERAL ELECTRIC, SQUARE D OR APPROVED EQUAL. THE SAFETY SWITCHES SHALL HAVE A POSITIVE QUICK MAKE AND QUICK BREAK OPERATING MECHANISM WITH SAFETY INTERLOCKING COVER AND EXTERNAL OPERATING HANDLE. E. RECEPTACLES 1. DUPLEX AND QUADRUPLEX RECEPTACLES SHALL BE FLUSH, HEAVY DUTY, GENERAL USE, 20A, 120V, GROUNDING TYPE, INDUSTRIAL SPECIFICATION GRADE AS MANUFACTURED BY HUBBELL OR APPROVED EQUAL, NEMA 5-20R CONFIGURATION. COLOR SHALL BE IVORY

2. GROUND FAULT CIRCUIT INTERRUPTING RECEPTACLES SHALL BE STRAIGHT BLADE, GENERAL USE, SPECIFICATION GRADE AS MANUFACTURED BY HUBBELL OR APPROVED EQUAL, NEMA 5-20 CONFIGURATION, 120V, COMPLYING WITH UL 498 AND UL 943. GFCI UNITS SHALL BE DESIGNED FOR INSTALLATION IN A 2 3/4" DEEP OUTLET BOX WITHOUT AN ADAPTER. COLOR SHALL BE IVORY.

INSIDE) SHOWING THE CIRCUIT NUMBER.

SURFACES.

ARE GANGED TOGETHER. G. BOXES AND FITTINGS

PULLING OF CABLES.

4. OUTLET BOXES SHALL BE EQUIPPED WITH PLASTER RINGS, EXTENSION RINGS

H. INSTALLATION

WORKING AS INTENDED. 2. CONTRACTOR SHALL TROUBLESHOOT ANY DEVICES NOT FUNCTIONING PROPERLY OR AS INTENDED. CONTRACTOR SHALL EITHER RESTORE THE PROBLEMATIC DEVICE OR REPLACE IT IN LIKE KIND. RETEST UNTIL DEVICES ARE VERIFIED TO BE IN WORKING CONDITION.

REQUIRED PER NEC 406.4(G).

2.2 GROUNDING A. PROVIDE ALL ELECTRICAL SYSTEM GROUNDS AS REQUIRED BY THE NATIONAL ELECTRICAL CODE, AND THE NATIONAL ELECTRICAL SAFETY CODE. ED FINISHES AND OTHERWISE DAMAGED EQUIPMENT SHALL BE REPAIRED TO B. THE FOLLOWING SHALL BE SOLIDLY GROUNDED: 1. CONDUIT SYSTEM (NEC ARTICLE 250) 2. ALL EQUIPMENT WITH ANY ELECTRICAL CONNECTIONS 3. NEUTRAL LEAD OF LOW TENSION SECONDARY SERVICE NED TO RESTRAIN SEISMIC FORCES AS REQUIRED BY ALL AUTHORITIES AND C. A SEPARATE GROUNDING CONDUCTOR SHALL BE FURNISHED AND INSTALLED FOR ALL ELECTRICAL CIRCUITS. ALL ELECTRICAL EQUIPMENT ENCLOSURES AND CONDUCTOR ENCLOSURES SHALL BE GROUNDED. D. ALL FEEDER DISCONNECTS AND BREAKERS RATED 1000 AMPERES AND ABOVE IN A SOLIDLY GROUNDED WYE SYSTEM WITH GREATER THAN 150 VOLTS TO GROUND, BUT NOT EXCEEDING 600 VOLTS PHASE TO PHASE SHALL BE PROVIDED WITH GROUND FAULT PROTECTION. 2.3 RACEWAYS AND BOXES A. RACEWAY 1. ELECTRICAL METALLIC TUBING (EMT) SHALL BE METALLIC CONDUIT OF THE THIN WALL TYPE IN STRAIGHT LENGTHS, ELBOWS, OR BENDS AND SHALL CONFORM TO ANSI C80.3 AND THE REQUIREMENTS OF UL 797. 2. COUPLINGS AND CONNECTORS FOR EMT SHALL BE HEX-NUT EXPANSION-GLAND, COMPRESSION TYPE, ZINC OR CADMIUM-PLATED. CRIMP, SPRING OR SET-SCREW TYPE FITTINGS ARE NOT ACCEPTABLE. WHERE EMT ENTERS OUTLET BOXES, CABINETS OR OTHER ENCLOSURES, CONNECTORS SHALL BE THE INSULATED-THROAT TYPE, WITH LOCKNUTS. FITTINGS SHALL MEET THE REQUIREMENTS OF ANSI/NEMA FBI. 3. FLEXIBLE METALLIC CONDUIT (FMC) SHALL MEET THE REQUIREMENTS OF UL 1. 4. RIGID GALVANIZED STEEL CONDUIT (RMC) SHALL CONFORM TO UL 6 AND ANSI C80.1. CONDUIT FITTINGS SHALL CONFORM TO ANSI/NEMA FBI. 5. INTERMEDIATE METAL CONDUIT (IMC) SHALL MEET THE REQUIREMENTS OF ANSI C80.6. 6. FURNISH AND INSTALL BUSHINGS, AS MANUFACTURED BY O.Z. OR T&B COMPANIES FOR ALL POWER SYSTEM CONDUITS AND LIGHTING CIRCUIT CONDUITS 1-1/4" AND LARGER. 7. LIQUIDTIGHT FLEXIBLE METALLIC CONDUIT (LTFMC): STEEL, CONSTRUCTED OF SINGLE STRAP, FLEXIBLE CONTINUOUS, INTERLOCKED, AND DOUBLE-WRAPPED METAL WITH A LIQUID-TIGHT JACKET OF FLEXIBLE POLYVINYL CHLORIDE (PVC) CONFORMING TO NEMA RN1. 8. RIGID NONMETALLIC CONDUIT (RNC) SHALL COMPLY WITH NEMA TC2, SCHEDULE 40 AND SCHEDULE 80 PVC. RNC FITTINGS SHALL COMPLY WITH NEMA TC3, MATCH TO CONDUIT TYPE AND MATERIAL. B. BOXES 1. JUNCTION BOXES AND PULL BOXES SHALL HAVE SUFFICIENT VOLUME TO ACCOMMODATE THE NUMBER OF CONDUCTORS ENTERING THE BOX IN ACCORDANCE WITH THE REQUIREMENTS OF NFPA 70 ARTICLE 314. BOXES SHALL BE CADMIUM-PLATED OR ZINC-COATED SHEETMETAL. JUNCTION BOXES AND PULL BOXES FOR USE WITH THE CONDUIT SYSTEMS SHALL NOT BE LESS THAN 1 1/2 " DEEP AND 4" BY 4". PULL AND JUNCTION BOXES SHALL BE FURNISHED WITH HINGED OR SCREW-FASTENED COVERS. C. INSTALLATION 1. CONDUIT AND FITTINGS SHALL BE INSTALLED IN ACCORDANCE WITH NFPA 70 AND AS SPECIFIED HEREIN. 2. INSTALL RACEWAYS SQUARE WITH BUILDING WALLS AND FASTENED TO BUILDING STRUCTURE. 3. EMT SHALL BE INSTALLED INDOORS IN DRY LOCATIONS NOT SUBJECT TO MECHANICAL INJURY. ALSO, CONCEALED CIRCUITS AND CIRCUITS LOCATED IN PLENUM SHALL BE EMT UNLESS OTHERWISE NOTED. 4. RMC CONDUIT SHALL BE USED IN ALL OPEN SHOP AREAS TO A MINIMUM ELEVATION OF 15'-0" AFF. RMC AND IMC WITH THREADED FITTINGS SHALL BE INSTALLED OUTDOORS, WHERE UNDERGROUND. OR IN AREAS SUBJECT TO WEATHER AND/OR MECHANICAL INJURY. 6. RNC SHALL BE INSTALLED OUTDOORS, WHERE UNDERGROUND, OR IN AREAS SUBJECT TO WEATHER AND/OR MECHANICAL INJURY. FOR RNC, USE SOLVENT-CEMENTED JOINTS IN DUCTS AND FITTINGS AND MAKE WATERTIGHT ACCORDING TO MANUFACTURER'S WRITTEN INSTRUCTIONS. STAGGER COUPLINGS SO THOSE OF ADJACENT DUCTS DO NOT LIE IN THE SAME PLANE

INDUCTORS OF SPECIAL SERVICE SYSTEMS AND POWER SYSTEMS SHALL TOCCUPY THE SAME ENCLOSURE WITH LIGHT AND POWER CONDUCTORS DNTINUOUS WITH SPLICES AND CONNECTIONS MADE IN OUTLET, JUNCTION

NDUCTORS UP TO AND INCLUDING NO.8 AWG SHALL BE MANUFACTURED TH COLORED INSULATING MATERIALS. CONDUCTORS LARGER THAN NO.8 VG SHALL HAVE ENDS IDENTIFIED WITH COLORED PLASTIC TAPE IN ALL

INNECTIONS AND SPLICES SHALL BE MADE IN APPROVED ENCLOSURES TILIZING SOLDERLESS PRESSURE CONNECTORS AND ADEQUATE INSULATION ENTIFICATION SHALL BE PROVIDED WITHIN EACH ENCLOSURE WHERE A TAP, LICE OR TERMINATION IS MADE AND AT THE EQUIPMENT TERMINAL OF EACH

RCUIT CONDUCTORS SHALL BE SAME AWG SIZE FROM SOURCE TO LOAD. UTRAL WIRES SHALL BE THE SAME SIZE AS PHASE WIRES EXCEPT AS NOTED

L 600V RATED WIRE CONNECTIONS, NO.8 AWG AND LARGER, STUD-TYPE OR

JLTICONDUCTOR CABLE MAY ONLY BE USED WHERE CONCEALED IN WALLS JLTICONDUCTOR CABLE SHALL BE SUPPORTED INDEPENDENT OF CEILING

JLTICONDUCTOR CABLE IN PLENUM SPACES SHALL BE COMPLIANT WITH NEC 0.22 - MC CABLE EMPLOYING A SMOOTH OR CORRUGATED METAL SHEATH

- 7. FMC AND LTFMC WITH SEPARATE GROUND WIRE SHALL BE INSTALLED IN AREAS SUBJECT TO VIBRATION IN MAXIMUM SIX FOOT LENGTHS PROPERLY SUPPORTED.
- 8. WHERE APPLICABLE, CONDUITS SHALL BE FASTENED TO ALL SHEET METAL BOXES, GUTTERS AND CABINETS WITH TWO LOCKNUTS AND A BUSHING.
- 9. THE CONTRACTOR SHALL FURNISH AND INSTALL ABOVE GRADE CONDUIT SYSTEMS AS SPECIFIED, INCLUDING ALL NECESSARY SUPPORTS, HANGERS, AND OTHER HARDWARE. IF THERE ARE ANY MAJOR DISCREPANCIES, CHANGES OR QUESTIONABLE ROUTING, THE CONTRACTOR SHALL NOTIFY THE OWNER'S REPRESENTATIVE FOR RESOLUTION AND/OR APPROVAL.
- 10. EXPOSED CONDUIT SHALL BE NEATLY AND EVENLY SPACED AND SHALL RUN PARALLEL TO CEILING, FLOORS, WALLS OR OTHER PERMANENT STRUCTURES.
- 11. CONDUIT IN FINISHED AREAS SHALL BE INSTALLED CONCEALED.
- 12. CONDUIT SHALL BE SECURELY CLAMPED AND SUPPORTED AT LEAST EVERY 10 FEET VERTICALLY AND 8 FEET HORIZONTALLY. GALVANIZED PIPE STRAPS SHALL BE FASTENED TO STRUCTURE WITH BOLTS, SCREWS AND ANCHORS.
- 13. CONDUIT AND BOXES SHALL NOT BE SUPPORTED FROM T-BAR CEILING WIRES. 14. EXPANSION FITTINGS WITH FLEXIBLE GROUND STRAP SHALL BE PROVIDED IN CONDUIT RUNS CROSSING BUILDING EXPANSION JOINTS.
- 15. CONTRACTOR SHALL AVOID MORE THAN THREE 90 DEGREE BENDS, OR EQUIVALENT, IN A RUN BETWEEN PULL FITTINGS.
- 16. EMERGENCY LIGHTING SYSTEM WIRING SHALL BE IN RIGID CONDUIT, EMT OR SURFACE RACEWAY.

F. WALL SWITCHES, RECEPTACLE AND OTHER MISCELLANEOUS DEVICE PLATES 1. DEVICE PLATES AND RECEPTACLE COVER PLATES SHALL BE LABELED (ON THE

2. FOR LOCATIONS WHERE THERE ARE MULTIPLE DEVICES, THE COVER PLATE SHALL BE ONE SOLID PIECE TO SUIT THE DEVICES INSTALLED. ALL PLATES SHALL FIT SNUGLY AND TIGHTLY AGAINST THE FINISHED BUILDING'S

3. FOR THE CASE OF DIMMERS GANGED TOGETHER, THE CONTRACTOR SHALL APPLY THE APPROPRIATE DERATING FACTORS AS THE MULTIPLE DIMMERS

4. PLATES FOR SURFACE BOXES SHALL BE CADMIUM PLATED OR GALVANIZED.

1. COMPLY WITH UL 514B, FITTINGS FOR CONDUIT AND OUTLET BOXES. 2. JUNCTION AND PULL BOXES SHALL BE INSTALLED WHERE SHOWN ON THE

DRAWINGS, OR AT SUCH LOCATIONS AS MAY BE REQUIRED TO FACILITATE THE

3. PULL BOXES SHALL BE FURNISHED AND INSTALLED ON CONDUIT RUNS LONGER THAN 100 FEET OR WITH MORE THAN THREE RIGHT-ANGLE BENDS.

AND FIXTURE STUDS WHERE REQUIRED. ALL UNUSED OPENINGS IN BOXES SHALL BE CLOSED WITH FACTORY MADE KNOCKOUT SEALS. 5. BOXES AND ENCLOSURES SHALL BE SECURELY MOUNTED TO THE BUILDING

STRUCTURE WITH SUPPORTING FACILITIES INDEPENDENT OF THE CONDUIT ENTERING OR LEAVING THE BOXES.

1. WIRING DEVICES SHALL BE INSTALLED AND TESTED TO VERIFY THE UNITS ARE

3. BARRIERS BETWEEN ADJACENT DEVICES SHALL BE INSTALLED WHERE

2.6 ENCLOSED CIRCUIT BREAKERS AND SWITCHES A. CONTRACTOR SHALL PROVIDE AND INSTALL ENCLOSED BREAKERS AND SWITCHES WITH TRIP RATINGS, REQUIRED POLES AND VOLTAGES AS INDICATED ON THE DRAWINGS.

> B. UNITS SHALL BE MANUFACTURED BY SIEMENS, GENERAL ELECTRIC, SQUARE D OR APPROVED EQUIVALENT.

C. ENCLOSURES SHALL COMPLY WITH NEMA AB 1 AND NEMA KS 1 TO MEET ENVIRONMENTAL CONDITIONS OF THE INSTALLED LOCATION. ENCLOSURES SHARENEMA 250, TYPE I, UNLESS OTHERWISE INDICATED.

D. COMPLY WITH APPLICABLE PORTIONS OF NECA 1, NEMA PB 1.1, AND NEMA PB 2.1 FOR INSTALLATION OF ENCLOSED SWITCHES AND CIRCUIT BREAKERS.

2.8 MOTOR CONTROLLERS

A. MOTOR DISCONNECTING SWITCHES

1. SHOULD ANY MOTORS BE LOCATED OUT OF SIGHT OR GREATER THAN 50 FEET FROM THEIR CONTROLLERS, THE CONTRACTOR SHALL FURNISH AND INSTALL A NON-FUSED SAFETY SWITCH IN CLOSE VICINITY TO THE MOTOR.

2.10 PANELBOARDS A. PANELBOARDS

> 1. PANELBOARDS SHALL UTILIZE BOLT-ON BREAKERS. LOAD CENTERS ARE NOT PERMITTED. VOLTAGE, PHASE, NUMBER OF POLES AND MAIN BREAKER OR LUGS AS SHOWN ON THE CONTRACT DRAWINGS, WITH HINGED COVER, OVERSIZE BACKBOX.

a. THE A.I.C. RATING SHALL BE AS INDICATED ON THE DRAWING OR SHALL BE COORDINATED WITH THE UTILITY. THE PANELBOARD SHORT CIRCUIT RATING SHALL BE NO LESS THAN THE SUM OF THE SERVICE ENTRANCE FAULT CURRENT PLUS 3600A FOR MOTOR SHORT CIRCUIT CONTRIBUTION.

- 2. THE "MDP" SHALL BE SERVICE ENTRANCE RATED.
- PANELBOARDS SHALL BE EQUIPPED WITH COPPER BUS.
- 4. PROVIDE PANELBOARD WITH HINGED DOOR IN DOOR COVER.
- B. CIRCUIT BREAKERS

1. MOLDED-CASE THERMAL-MAGNETIC CIRCUIT BREAKERS SHALL CONFORM TO NEMA AB1 AND COMPATIBLE WITH EXISTING PANELBOARDS.

- 2. CIRCUIT BREAKERS SHALL HAVE A MINIMUM INTERRUPTING RATING TO MATCH THAT OF THE PANELBOARD. CIRCUIT BREAKERS BE FULLY RATED. CIRCUIT BREAKERS MAY NOT BE SERIES RATED. CIRCUIT BREAKERS SHALL HAVE BOLTED CONNECTIONS TO THE BUS.
- C. INSTALLATION
- 1. CONTRACTOR SHALL ADHERE TO ALL CLEARANCE REQUIREMENTS AS STATED IN THE NEC.
- 2. CONTRACTOR SHALL BALANCE PANELBOARD LOADS TO THE BEST OF THEIR
- 3. THE INSIDE OF THE PANEL SHALL BE EQUIPPED WITH A CARD HOLDER AND A

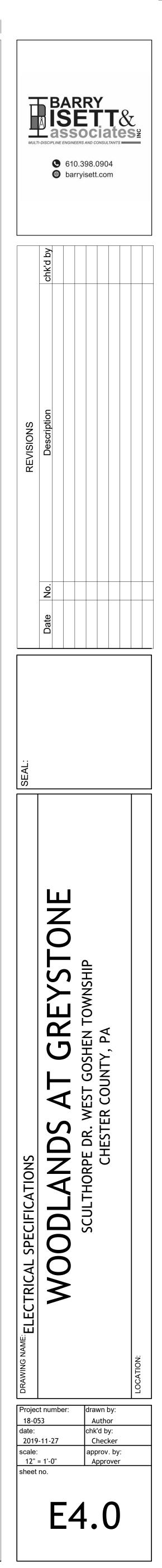
TYPED INDEX CARD IDENTIFYING EACH CIRCUIT INSTALLED. 4. LABEL ALL NEUTRAL WIRES WITH ASSOCIATED CIRCUIT NUMBER

2.15 INTERIOR LUMINAIRES

A. A FIXTURE SHALL BE INSTALLED AT EACH LOCATION INDICATED ON DRAWINGS.

- B. EXIT SIGNS AND EMERGENCY BATTERY PACK FIXTURES SHALL BE CIRCUITED TO AN UNSWITCHED LEG OF THE ROOM CIRCUIT LIGHTING. WHERE EMERGENCY BATTERY PACK FIXTURES ARE NOT PROVIDED, BALLAST BATTERY PACKS SHALL BE INSTALLED IN VARIOUS LOCATIONS INDICATED ON THE DRAWINGS, INSTALLATION OF EXIT SIGNS AND EMERGENCY LIGHT SHALL BE PROVIDED IN ACCORDANCE WITH NFPA 70 AND NFPA 72.
- C. LED LIGHT FIXTURES SHALL BE IN ACCORDANCE WITH IES, NFPA, UL, AS SHOWN ON THE DRAWINGS, AND AS SPECIFIED.
- D. LED LIGHT FIXTURES SHALL BE REDUCTION OF HAZARDOUS SUBSTANCES (ROHS)-COMPLIANT.
- E. LED DRIVERS SHALL INCLUDE THE FOLLOWING FEATURES UNLESS OTHERWISE INDICATED:
- 1. MINIMUM EFFICIENCY: 85% AT FULL LOAD.
- 2. MINIMUM OPERATING AMBIENT TEMPERATURE: -20° C. (-4° F.) 3. INPUT VOLTAGE: 120 - 277V (±10%) AT 60 HZ.
- 4. INTEGRAL SHORT CIRCUIT, OPEN CIRCUIT, AND OVERLOAD PROTECTION. 5. POWER FACTOR: ≥ 0.95.
- 6. TOTAL HARMONIC DISTORTION: ≤ 20%. 7. COMPLY WITH FCC 47 CFR PART 15.
- K. LED MODULES SHALL INCLUDE THE FOLLOWING FEATURES UNLESS OTHERWISE
- INDICATED: 1. COMPLY WITH IES LM-79 AND LM-80 REQUIREMENTS. MINIMUM CRI 80 AND COLOR TEMPERATURE 3500° K UNLESS OTHERWISE SPECIFIED IN LIGHTING FIXTURE SCHEDULE.
- 3. MINIMUM RATED LIFE: 50,000 HOURS PER IES L70.
- 4. LIGHT OUTPUT LUMENS SHALL MATCH BASIS OF DESIGN FIXTURE.

ABILITY AND IN ACCORDANCE WITH NEC.



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2.17 FIRE ALARM SYSTEMS

- A. FIRE ALARM INSTALLATION SHALL BE IN ACCORDANCE WITH NFPA 72. B. MANUFACTURER SHALL BE SIMPLEX, EDWARDS SYSTEM TECHNOLOGY (EST) OR APPROVED EQUAL. SYSTEM SHALL2BYEDC OBTAINED FROM 120V AC SERVICE AND A POWER-SUPPLY MODISHECONDARY POWER SHALL BE SUPPLIED VIA 24V DC SUPPLY SYSTEM INCLUDING BATTERIES, AUTOMATIC BATTERY CHARGER AND AN AUTOMATIC TRANSFER SWITCH. BATTERY BACK-UP SHALL COMPLY WITH NFPA 72
- C. FIRE ALARM SIGNAL INITIATION SHALL BE BY ONE OR MORE OF THE APPLICABLE FOLLOWING DEVICES: MANUAL STATIONS; HEAT DETECTORS; SMOKE DETECTORS; SPRINKLER SYSTEM WATER FLOW; FIRE EXTINGUISHING SYSTEM OPERATION; FIRE STANDPIPE SYSTEM.
- D. FIRE ALARM SIGNAL SHALL INITIATE THE ALL OF THE APPLICABLE FOLLOWING ACTIONS: ALARM NOTIFICATION APPLIANCES SHALL OPERATE CONTINUOUSLY; IDENTIFY ALARM AT THE FACP AND REMOTE ANNUNCIATOR; DE-ENERGIZE ELECTROMAGNETIC DOOR HOLDERS; TRANSMIT AN ALARM SIGNAL TO THE REMOTE ALARM RECEIVING STATION; UNLOCK ELECTRIC DOOR LOCKS IN DESIGNATED EGRESS PATHS; RELEASE FIRE AND SMOKE DOORS HELD OPEN BY MAGNETIC DOOR HOLDERS; SWITCH HEATING, VENTILATING, AND AIR-CONDITIONING EQUIPMENT CONTROLS TO FIRE ALARM MODE; CLOSE SMOKE DAMPERS IN AIR DUCTS OF SYSTEM SERVING ZONE WHERE ALARM WAS INITIATED.
- E. SYSTEM TROUBLE SIGNAL INITIATION SHALL BE BY ONE OR MORE OF THE FOLLOWING DEVICES OR ACTIONS: OPEN CIRCUITS, SHORTS AND GROUNDS OF WIRING FOR INITIATING DEVICE, SIGNALING LINE, AND NOTIFICATION-APPLIANCE CIRCUITS; OPENING, TAMPERING, OR REMOVAL OF ALARM-INITIATING AND SUPERVISORY SIGNAL-INITIATING DEVICES; LOSS OF PRIMARY POWER AT THE FACP; GROUND OR A SINGLE BREAK IN FACP INTERNAL CIRCUITS; ABNORMAL AC VOLTAGE AT THE FACP; A BREAK IN STANDBY BATTERY CIRCUITRY; FAILURE OF BATTERY CHARGING; ABNORMAL POSITION OF ANY SWITCH AT THE FACP OR ANNUNCIATOR; FIRE-PUMP POWER FAILURE, INCLUDING A DEAD-PHASE OR PHASE-REVERSAL CONDITION.
- F. SYSTEM TROUBLE AND SUPERVISORY SIGNAL ACTIONS: RING TROUBLE BELL AND ANNUNCIATE AT THE FACP AND REMOTE ANNUNCIATORS.
- G. MANUAL PULL STATIONS SHALL BE ADDRESSABLE, DOUBLE ACTION, SURFACE MOUNTED WITH MANUFACTURER'S STANDARD BACKBOX.
- ACCORDANCE WITH NFPA 72.
- SMOKE DETECTORS SHALL BE PHOTOELECTRIC TYPE, SOUND BASED, CEILING MOUNT SMOKE DETECTORS WITH ADJUSTABLE SENSITIVITY, AUXILIARY RELAY CONTACT, INTEGRAL THERMAL ELEMENT RATED 135 DEGREES F AND VISUAL INDICATION OF DETECTOR ACTIVATION.
- J. ELECTRICAL CONTRACTOR SHALL PROVIDE DUCT TYPE SMOKE DETECTORS. THEY SHALL BE PHOTOELECTRIC TYPE, WITH AUXILIARY SPDT RELAY CONTACT, KEY-OPERATED NORMAL-RESET-TEST SWITCH, DUCT SAMPLING TUBES EXTENDING WIDTH OF DUCT AND VISUAL INDICATION OF DETECTOR ACTIVATION AND DUCT MOUNTED HOUSING. INSTALLATION OF DEVICE SHALL BE BY HVAC CONTRACTOR. WIRING SHALL BE BY ELECTRICAL CONTRACTOR.
- K. STROBES, HORNS AND HORN/STROBE UNITS SHALL BE PROVIDED AS SHOWN ON DRAWINGS AND IN ACCORDANCE WITH NFPA 72 WITH RATINGS OF 15 OR 75 CANDELA (AS INDICATED ON DRAWINGS). THE STROBES SHALL MEET THE PROVISIONS ALLOWED UNDER THE AMERICANS WITH DISABILITIES ACT.
- M. HEAT DETECTOR FIXED TEMPERATURE SENSING SHALL BE INDEPENDENT OF RATE-OF-RISE 15-DEG F OR 20-DEG F PER MINUTE.
- N. THE ELEVATOR SHAFT HEAT DETECTOR SHALL BE PROGRAMMABLE TO OPERATE AT 15 DEGREES FAHRENHEIT LESS THAN THE SPRINKLER HEAD RATING.
- O. THE KITCHEN HEAT DETECTORS SHALL BE PROGRAMMABLE TO OPERATE AT 200 DEGREES FAHRENHEIT FIXED.
- CONTRACTOR.
- APPROVED PLIABLE FIRE STOPPING.
- FINAL SYSTEM CHECKOUT AND TEST.

	PANEL: B MOUNTING: Surface			IS AMP: <u>200 A</u> PHASE: <u>1</u>	WI	RE: <u>3</u>	-				BREAKER VOLTAGE			AIC:	10,000						
		BR	EAKER	WIRE	GND				KVA	VPH			WIRE GNI		BREAK	ER					
СКТ	CIRCUIT DESCRIPTION	Р	AMP	NO SZ NO SZ		COND		٩	E	3	С	-COND	NO SZ NO SZ	NO SZ	AMP	Р	CIRCUIT DESC				
1	RECEPTACLE	1	20	1-#12, 1-#12,	1-#12	3/4"	0.2	0.2				3/4"	1-#12, 1-#12,	1-#12	20	1	REFRIGERATOR				
3	RECEPTACLE	1	20	1-#12, 1-#12,	1-#12	3/4"			0.7	0.2		3/4"	1-#12, 1-#12,	1-#12	20	1	RECEPTACLE				
5	DISHWASHER	1	20	1-#12, 1-#12,	1-#12	3/4"	0.2	0.9				3/4"	1-#12, 1-#12,	1-#12	20	1	RECEPTACLE				
7	RECEPTACLE	1	20	1-#12, 1-#12,	1-#12	3/4"			0.2	1.1		3/4"	1-#12, 1-#12,	1-#12	20	1	RECEPTACLE				
9	RECEPTACLE	1	20	1-#12, 1-#12,	1-#12	3/4"	0.7	0.7				3/4"	1-#12, 1-#12,		20	1	RECEPTACLE				
11	RECEPTACLE	1	20	1-#12, 1-#12,	1-#12	3/4"			0.7	0.5		3/4"	1-#12, 1-#12,	1-#12	20	1	RECEPTACLE				
13	RECEPTACLE	1	20	1-#12, 1-#12,	1-#12	3/4"	0.2	1.1				3/4"	1-#12, 1-#12,	1-#12	20	1	RECEPTACLE				
15	RECEPTACLE	1	20	1-#12, 1-#12,	1-#12	3/4"			1.1	0.5		3/4"	1-#12, 1-#12,	1-#12	20	1	FIRE PLACE				
17	RECEPTACLE	1	20	1-#12, 1-#12,	1-#12	3/4"	0.5	0.0							20	1	SPARE				
19	RECEPTACLE	1	20	1-#12, 1-#12,	1-#12	3/4"			0.4	0.0					20	1	SPARE				
21							1.6	1.6								+					
23	- CU-6	2	20	2-#12, 1-#12,	1-#12	3/4"			1.6	1.6		3/4"	2-#12, 1-#12,	1-#12	20	2	CU-2				
25							1.6	1.6								+					
27	- CU-3	2	20	2-#12, 1-#12,	1-#12	3/4"			1.6	1.6		- 3/4"	2-#12, 1-#12,	1-#12	20	2	CU-4				
29	SPARE	1	20				0.0	0.6				3/4"	1-#12, 1-#12,	1-#12	15	1	FURN-3				
31	SPARE	1	20						0.0	0.5		3/4"	1-#12, 1-#12,	1-#12	15	1	FURN-5				
33	FURN-6	1	15	1-#12, 1-#12,	1-#12	3/4"	0.5	0.9				3/4"	1-#12, 1-#12,	1-#12	20	1	HEAT TRACE				
35	CONDENSATE PUMPS	1	20	1-#12, 1-#12,	1-#12	3/4"			0.5	0.9		3/4"	1-#12, 1-#12,	1-#12	20	1	HEAT TRACE				
37							2.4	0.5				3/4"	1-#12, 1-#12,	1-#12	20	1	LIGHTING				
39	ERV-1	2	25	2-#10, 1-#10,	1-#10	3/4"			2.4	0.8		3/4"	1-#12, 1-#12,	1-#12	20	1	EBB-1				
	EBB-1	1	20	1-#12, 1-#12,	1-#12	3/4"	0.8	0.4				3/4"	1-#12, 1-#12,	1-#12	20		LOUVERS				
43	EWH-1	1	20	1-#12, 1-#12,	1-#12	3/4"			1.5	2.5						\vdash					
45	RECIRC PUMP	1	15	1-#12, 1-#12,	1-#12	3/4"	0.1	2.5				- 3/4"	2-#10, 1-#10,	1-#10	30	2	EUH-2				
47	LIGHTING	1	20	1-#12, 1-#12,	1-#12	3/4"			0.0	0.2		3/4"	1-#12, 1-#12,	1-#12	20	1	LIGHTING				
	LIGHTING	1	20	1-#12, 1-#12,		3/4"	0.2	0.6	-			3/4"	1-#12, 1-#12,		20		OTHER				
	OTHER	1	20	1-#12, 1-#12,		3/4"			0.3	0.2		3/4"	1-#12, 1-#12,		20		LIGHTING				
	PREPARED SPACE						0.0	0.0									PREPARED SPACE				
55	PREPARED SPACE								0.0	0.0							PREPARED SPACE				
	PREPARED SPACE						0.0	0.0	-								PREPARED SPACE				
	PREPARED SPACE						-	-	0.0	0.0						†	PREPARED SPACE				
					AL KVA/F		20).4		.4	0.0										
	TOTAL KVA PANEL 41.8											-									

2.16 EXTERIOR LUMINAIRES

- A. A FIXTURE SHALL BE INSTALLED AT EACH LOCATION INDICATED ON DRAWINGS. B. NEW LAMPS OF THE PROPER TYPE AND WATTAGE SHALL BE INSTALLED IMMEDIATELY PRIOR TO SUBSTANTIAL COMPLETION OF THE PROJECT.
- CONTRACTOR SHALL REFER TO THE LIGHTING FIXTURE SCHEDULE. LAMPS SHALL BE GENERAL ELECTRIC, OSRAM SYLVANIA, OR VENTURE LIGHTING.
- C. FIXTURE HOUSINGS AND BALLAST ENCLOSURES SHALL BE SUITABLE FOR OUTDOOR USE.
- D. BALLASTS SHALL BE CAPABLE OF FUNCTIONING DESPITE ANY LOW OUTDOOR TEMPERATURES.

E. LIGHTS SHALL BE CONTROLLED VIA CONTACTOR CONNECTED TO AN AUTOMATIC TIME CLOCK WITH DAYLIGHT SAVINGS AND PHOTOCELL.

- 2.14 SYSTEM COMMISSIONING A. PROVIDE COMMISSIONING IN ACCORDANCE WITH IECC REQUIREMENTS. B. FUNCTIONAL TESTING SHALL BE COMPLETED FOR THE FOLLOWING:
- 1. OCCUPANCY SENSORS CERTIFY LOCATION AND AIMING IS AS PER MANUFACTURER'S RECOMMENDATIONS. WHERE THERE ARE SEVEN OR FEWER, EACH SENSOR SHALL BE TESTED. ON PROJECTS WHERE SENSOR COUNT EXCEEDS SEVEN, EACH UNIQUE COMBINATION AND GEOMETRY SHALL BE TEST, WITH NO LESS THAN 10% TESTED. TESTS SHALL INCLUDE: a. VERIFICATION OF STATUS INDICATORS b. FIXTURES IN CONTROLLED AREA TURN OFF OR DOWN WITHIN REQUIRED TIMEFRAME
- c. IN AUTO-ON AREAS, FIXTURES TURN ON WHEN OCCUPANT ENTERS SPACE. d. IN MANUAL-ON AREAS, FIXTURES ONLY TURN ON WITH MANUAL CONTROL. e. FIXTURES ARE NOT TURNED ON DUE TO HVAC SYSTEM OR MOVEMENT OUTSIDE TARGET
- ARFA 2. TIME-SWITCH CONTROLS - ALL AREAS WITH THIS TYPE OF CONTROL SHALL BE TESTED. CERTIFICATION TO INCLUDE: a. VERIFY CONTROLLER IS PROGRAMMED WITH ACCURATE WEEKDAY, WEEKEND, AND
- HOLIDAY SCHEDULES. b. PROVIDE SEQUENCE DOCUMENTATION TO THE OWNER DETAILING PROGRAMMING OF
- WEEKDAY, WEEKEND, AND HOLIDAY SCHEDULES AS WELL AS SET-UP GUIDE AND PREFERENCE PROGRAM SETTINGS. c. VERIFY TIME AND DATE ARE CORRECT IN TIME SWITCH AND DAYLIGHT SAVINGS TIME IS AUTOMATIC.
- d. VERIFY BATTERY BACK-UP IS INSTALLED AND ENERGIZED. e. VERIFY OVERRIDE LIMIT IS SET TO NOT EXCEED TWO HOURS.
- f. VERIFY THAT A SIMULATION OF OCCUPIED CONDITION IS CORRECT. THIS INCLUDES THAT MANUAL DEVICES WILL TURN FIXTURES ON/OFF DURING THIS PERIOD AND THAT THE ONLY FIXTURES CONTROLLED BY THE TIME-SWITCH ARE WITHIN THE TARGET SPACE. g. VERIFY THAT A SIMULATION OF UNOCCUPIED CONDITION IS CORRECT. THIS INCLUDES
- NONEXEMPT LIGHTING TURNING OFF AND MANUAL OVERRIDE SWITCH ONLY CONTROLS LIGHTING WITHIN THE ENCLOSED SPACE THAT CONTAINS THE OVERRIDE. 3. DAYLIGHT RESPONSIVE CONTROLS - ALL AREAS CONTAINING THIS TYPE OF CONTROL SHALL
- BE TESTED. CERTIFICATION TO INCLUDE: a. DEVICES ARE LOCATED AS PER MANUFACTURER'S RECOMMENDATIONS AND FIELD
- CALIBRATED AND SET FOR ACCURATE SET POINTS AND THRESHOLD LIGHT LEVELS. b. CONTROLS ADJUST LIGHTING IN DAYLIGHT ZONE IN RESPONSE TO THE AVAILABLE DAYLIGHT.
- c. CALIBRATION ADJUSTMENT EQUIPMENT IS READILY ACCESSIBLE AND ONLY AVAILABLE TO AUTHORIZED PERSONNEL. 4. DIMMING CONTROLS - CERTIFICATION TO INCLUDE: a. DEVICES ARE LOCATED AS PER THE CONTRACT DOCUMENTS.
- b. DRIVERS AND BALLASTS ARE COMPATIBLE WITH INSTALLED DIMMER/DIMMING SYSTEM. c. FIXTURES DO NOT FLICKER UPON DIMMING. d. EACH TYPE OF DIMMER AND DIMMING LOAD/FIXTURE TYPE SHALL BE TESTED WITH AT LEAST 50% OF THE DIMMED SPACES BEING TESTED.
- C. DOCUMENTATION SHALL INCLUDE DATE AND TIME OF TESTS, LOCATIONS OF ALL DEVICES TESTED, DESCRIPTION OF EACH TEST AND VERIFICATION AND THEIR OUTCOME, LIST AND LOCATION OF DEVICES THAT FAILED, CERTIFICATION OF MEETING IECC REQUIREMENTS AND RECOMMENDATIONS FOR REMEDIATION. D. DOCUMENTS CERTIFYING THE INSTALLED LIGHTING CONTROLS MEET DOCUMENTED
- PERFORMANCE CRITERIA OF IECC SECTION C405 ARE TO BE PROVIDED TO THE BUILDING OWNER WITHIN 90 DAYS OF THE DATE OF RECEIPT OF THE CERTIFICATE OF OCCUPANCY AND COPIED TO THE ENGINEER AND AHJ.

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- H. HORN/STROBE UNITS SHALL BE WALL MOUNTED WHERE SHOWN AND WHERE REQUIRED IN
- L. ADDRESSABLE RELAYS SHALL BE PROVIDED FOR EACH FLOW AND TAMPER SWITCH.

SENSING AND PROGRAMMABLE TO OPERATE AT 135-DEG F OR 155-DEG F. SENSOR RATE-OF-RISE TEMPERATURE DETECTION SHALL BE SELECTABLE AT THE FACP FOR EITHER

- P. ALL WIRING SHALL BE AS RECOMMENDED BY THE FIRE ALARM SYSTEM MANUFACTURER, PER NFPA AND UL LISTED. ALL WIRING SHALL BE PROVIDED AND INSTALLED BY
- Q. CABLING SHALL BE PLENUM RATED FIRE ALARM TYPE "FPLP" IN COMPLIANCE WITH NEC ARTICLE 760. PROVIDE DEDICATED WALL SLEEVES, MINIMUM 3/4" EMT CONDUIT, WITH UL
- R. CONTRACTOR SHALL SUBCONTRACT TO SYSTEM MANUFACTURER FOR PROGRAMMING AND

PART 3 - EXECUTION

3.1 EXECUTION

- A. MATERIALS AND EQUIPMENT SHALL BE INSTALLED IN ACCORDANCE WITH REQUIREMENTS INDICATED, THE APPROVED RECOMMENDATIONS OF THE MANUFACTURERS AND NFPA 70. THE INSTALLATION SHALL BE ACCOMPLISHED BY WORKERS SKILLED IN THIS TYPE OF WORK AND SHALL BE DONE IN ACCORDANCE WITH THE BEST PRACTICE OF THE TRADES.
- B. INSTALLATION SHALL CONFORM TO ALL LOCAL CODES AND INDUSTRY STANDARDS. THE CODE OR STANDARD THAT IS MORE STRINGENT SHALL APPLY.
- C. CONTRACTOR SHALL DELIVER A COMPLETE AND OPERATIONAL SYSTEM. THE CONTRACTOR SHALL EXAMINE THE DESIGN DOCUMENTS AND PROJECT SITE THOROUGHLY. ANY WORK NOT INCLUDED ON THE DRAWINGS, BUT NECESSARY TO DELIVER A COMPLETE SYSTEM SHALL BE PROVIDED BY THE CONTRACTOR WITHOUT ADDITIONAL COST TO OWNER.
- D. CHANGES TO THE ELECTRICAL INSTALLATION SHALL BE APPROVED BY THE FACILITY ENGINEER. CONTRACTOR SHALL BE RESPONSIBLE FOR REVIEWING ARCHITECTURAL AND MECHANICAL DRAWINGS FOR IMPACT ON ELECTRICAL INSTALLATIONS.
- E. CONTRACTOR SHALL DELIVER AN "AS-BUILT" ELECTRICAL DRAWING TO THE FACILITY ENGINEER SHOWING DEVIATIONS FROM ORIGINAL ELECTRICAL DRAWINGS. CONTRACTOR SHALL PROVIDE TO FACILITY ENGINEER A TYPED PANEL SCHEDULE FOR EACH PANEL.
- F. ALL WIRING FOR THE CONNECTION OF MOTORS AND CONTROL EQUIPMENT AS INDICATED ON THE ELECTRICAL DRAWINGS SHALL BE FURNISHED AND INSTALLED UNDER THIS SECTION OF THE SPECIFICATIONS.
- G. CONTRACTOR SHALL COMPLY WITH OSHA 191.150 "LOCKOUT AND TAGOUT PROCEDURE".
- H. INSTALLATIONS ARE NOT COMPLETE UNTIL TESTED AND OPERATIONAL. GREEN CARDS, WHEN REQUIRED, MUST BE SIGNED AND APPROVED. I. FIELD TESTING
- 1. PHASE-ROTATION TESTS SHALL BE CONDUCTED ON ALL THREE-PHASE CIRCUITS USING A PHASE-ROTATION INDICATING INSTRUMENT. THE PHASE ROTATION OF ELECTRICAL CONNECTIONS TO ALL CONNECTED EQUIPMENT SHALL BE CLOCKWISE.
- 2. ELECTRICAL PROTECTIVE DEVICES SHALL BE TESTED TO DEMONSTRATE PROPER CHARACTERISTICS.
- 3. UPON COMPLETION OF THE ELECTRICAL WORK, AND AT SUCH TIME AS THE OWNER'S REPRESENTATIVE MAY DIRECT, AN OPERATING TEST OF THE ELECTRICAL SYSTEMS SHALL BE CONDUCTED. ALL ELECTRICAL EQUIPMENT SHALL BE DEMONSTRATED TO OPERATE IN ACCORDANCE WITH THE REQUIREMENTS SPECIFIED AND INDICATED.

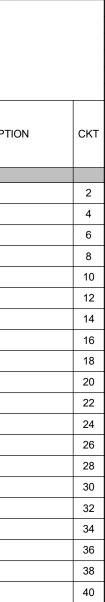
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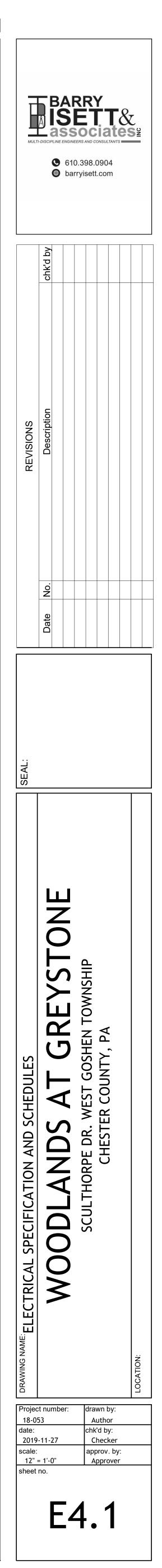
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	MOUNTING: Surface			PHASE: 1	WI	RE: <u>3</u>	-			١	VOLTAGE:	120/24	0	AIC:	10,000	-	-
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	RECEPTACLE	1	20	1-#12, 1-#12,		3/4"	0.4	0.1					1-#12, 1-#12, 1-#	#12	20		OTHER
3	RECEPTACLE	1	20	1-#12, 1-#12,	1-#12	3/4"	0.0	0.0	0.2	0.0					20	1	SPARE
5	SPARE	1	20				0.0	0.0	0.0	0.0					20	1	SPARE
7	SPARE	1	20				0.0	0.0	0.0	0.0					20		SPARE
9	SPARE	1	20				0.0	0.0	0.0	0.0					20		SPARE
11	SPARE		20				0.0	0.0	0.0	0.0					20	1	SPARE PREPARED SPACE
13	PREPARED SPACE						0.0	0.0									
15	PREPARED SPACE								0.0	0.0							PREPARED SPACE
17	PREPARED SPACE						0.0	0.0									PREPARED SPACE
19	PREPARED SPACE								0.0	0.0							PREPARED SPACE
21	PREPARED SPACE						0.0	0.0									PREPARED SPACE
23	PREPARED SPACE								0.0	0.0							PREPARED SPACE
25	PREPARED SPACE						0.0	0.0									PREPARED SPACE
27	PREPARED SPACE								0.0	0.0							PREPARED SPACE
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33	PREPARED SPACE						0.0	0.0									PREPARED SPACE
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37	PREPARED SPACE						0.0	0.0									PREPARED SPACE
39	PREPARED SPACE								0.0	0.0							PREPARED SPACE
41	PREPARED SPACE						0.0	0.0									PREPARED SPACE
					AL KVA/I		0	.5		.2	0.0						
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скт	CIRCUIT DESCRIPTION	вк	EAKER	WIRE	GND	COND			KVA	/PH		COND	WIRE	GND	BREAK	(ER	CIRCUIT DESCRIPTION	скт
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1							13.0	0.5									-	2
3	A	2	150	2-#1/0, 1-#1/0), 1-#6	1-1/2"			13.4	0.2		- 2-1/2"	2-#350, 1-#350	0, 1-#4	300	2	P	4
5 7	В	2	200	2-#3/0, 1-#3/0), 1-#6	2"	20.4	3.4	21.4	3.4		3/4"	2-#8, 1-#8, 1	-#10	40	2	ELEVATOR (5HP)	6 8
9	CU-1	2	40	2-#8, 1-#8, 1	I <i>-</i> #10	3/4"	2.9	2.9				3/4"	2-#8, 1-#8, 1	-#10	40	2	CU-5	10
11 13	PREPARED SPACE						0.0	0.0	2.9	2.9							PREPARED SPACE	12 14
	PREPARED SPACE								0.0	0.0							PREPARED SPACE	16
17	PREPARED SPACE			 TOT	AL KVA	PHASE		0.0	44	 1.1	0.0	 PROV	 IDE WITH INTEG	RAL TV	ss		PREPARED SPACE	18
				TOT	AL KVA	PANEL		2.0	87	7.0	0.0	-						
				ΤΟΤΑ	L AMPS	PANEL	-		3	63								
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1	RECEPTACLE	1	20	1-#12, 1-#12,	1-#12	3/4"	0.2	0.4				3/4"	1-#12, 1-#12, ⁻	1-#12	20	1	RECEPTACLE	2
3	RECEPTACLE	1	20	1-#12, 1-#12,	1-#12	3/4"			0.2	1.1		3/4"	1-#12, 1-#12, ⁻	1-#12	20	1	RECEPTACLE	4
5	RECEPTACLE	1	20	1-#12, 1-#12,	1-#12	3/4"	0.2	0.0				3/4"	1-#12, 1-#12, ⁻	1-#12	20		FACP	6
	RECEPTACLE	1	20	1-#12, 1-#12,	1-#12	3/4"			0.2	0.2		3/4"	1-#12, 1-#12, ⁻	1-#12	20		RECEPTACLE	8
9	RECEPTACLE	1	20	1-#12, 1-#12,	1-#12	3/4"	1.1	0.2				3/4"	1-#12, 1-#12, ⁻	1-#12	20	1	RECEPTACLE	10
11	RECEPTACLE	1	20	1-#12, 1-#12,	1-#12	3/4"			0.9	0.2		3/4"	1-#12, 1-#12, ⁻	1-#12	20	1	RECEPTACLE	12
13	RECEPTACLE	1	20	1-#12, 1-#12,	1-#12	3/4"	0.2	0.7				3/4"	1-#12, 1-#12, 1	1-#12	20	1	RECEPTACLE	14
	RECEPTACLE	1	20	1-#12, 1-#12,		3/4"			0.7	0.5		3/4"	1-#12, 1-#12, ⁻	1-#12	20		RECEPTACLE	16
	RECEPTACLE	1	20	1-#12, 1-#12,		3/4"	0.7	0.9				3/4"	1-#12, 1-#12, 1		20		RECEPTACLE	18
	RECEPTACLE	1	20	1-#12, 1-#12,	1-#12	3/4"			1.1	0.2		3/4"	1-#12, 1-#12, 1		20		RECEPTACLE	20
21	ESP1	2	15	2-#12, 1-#12,	1-#12	3/4"	0.0	0.0	0.0	0.4		3/4" 3/4"	1-#12, 1-#12, 1		20 20		LIGHTING	22 24
23 25	ELEVATOR CAB	1	15	1-#12, 1-#12,	1-#12	3/4"	0.5	0.8	0.0	0.4		3/4	1-#12, 1-#12, ⁻ 1-#12, 1-#12, ⁻		20		EBB-1	24
	EBB-1	1	20	1-#12, 1-#12,		3/4"	0.0	0.0	0.8	07		3/4"	1 <i>#</i> 12, 1 <i>#</i> 12, 1		20		RECEPTACLE	28
	RECEPTACLE	1	20	1-#12, 1-#12,		3/4"	0.2	0.6	0.0	0.1		3/4"	1-#12, 1-#12, ¹		20		LIGHTING	30
	EF-5	1	15	1-#12, 1-#12,		3/4"	-		0.1	0.3		3/4"	1-#12, 1-#12,		20		COOLING	32
33							2.5	0.1				3/4"	1-#12, 1-#12,	1-#12	15	1	EF-7	34
35	EUH-1	2	30	2-#10, 1-#10,	1-#10	3/4"			2.5	0.2		3/4"	1-#12, 1-#12, ⁻	1-#12	20	1	GWH-1	36
37	CONDENSATE PUMPS	1	20	1-#12, 1-#12,	1-#12	3/4"	0.5	0.9				3/4"	1-#12, 1-#12, ⁻	1-#12	20	1	HEAT TRACE	38
39	HEAT TRACE	1	20	1-#12, 1-#12,	1-#12	3/4"			0.9	0.5		3/4"	1-#12, 1-#12, ⁻	1-#12	20	1	FURN-1	40
41	FURN-4	1	20	1-#12, 1-#12,	1-#12	3/4"	0.5	0.1				3/4"	1-#12, 1-#12, ⁻	1-#12	15	1	LOUVERS	42
43	FURN-2	1	20	1-#12, 1-#12,	1-#12	3/4"			0.5	0.1		3/4"	1-#12, 1-#12, ⁻	1-#12	20	1	LIGHTING	44
45	LIGHTING	1	20	1-#12, 1-#12,	1-#12	3/4"	0.3	0.2				3/4"	1-#12, 1-#12, ⁻	1-#12	20	1	LIGHTING	46
	LIGHTING - DWELLING UNIT	1	20	1-#12, 1-#12,		3/4"			0.5	0.3		3/4"	1-#12, 1-#12, 1		20		OTHER	48
	LIGHTING	1	20	1-#12, 1-#12,		3/4"	0.6	0.8				3/4"	1-#12, 1-#12, ⁻	1-#12	20		POWER	50
	POWER	1	20	1-#12, 1-#12,	1-#12	3/4"			0.3	0.0							PREPARED SPACE	52
	SPARE	1	20				0.0	0.0		<u> </u>							PREPARED SPACE	54
	SPARE	1	20				0.0	0.0	0.0	0.0							PREPARED SPACE	56
	SPARE SPARE	1	20 20				0.0	0.0	0.0	0.0							PREPARED SPACE	58 60
	SPARE	1	20				0.0	0.0	0.0	0.0							PREPARED SPACE	60
	SPARE		20				5.0	5.0	0.0	0.0							PREPARED SPACE	64
	SPARE	1	20				0.0	0.0									PREPARED SPACE	66
	SPARE	1	20						0.0	0.0							PREPARED SPACE	68
	SPARE	1	20				0.0	0.0									PREPARED SPACE	70
	SPARE	1	20						0.0	0.0							PREPARED SPACE	72
73	PREPARED SPACE						0.0	0.0									PREPARED SPACE	74
75	PREPARED SPACE								0.0	0.0							PREPARED SPACE	76
77	PREPARED SPACE						0.0	0.0									PREPARED SPACE	78
-	PREPARED SPACE							_	0.0	0.0							PREPARED SPACE	80
	PREPARED SPACE						0.0	0.0	_								PREPARED SPACE	82
83	PREPARED SPACE							0	0.0								PREPARED SPACE	84
	TOTAL KVA/PHASE 13.0 13.4 0.0																	

TOTAL KVA PANEL TOTAL AMPS PANEL 26.3





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	PLUMBING SYMBOLS
	GATE VALVE
	GLOBE VALVE
	CHECK VALVE
	BUTTERFLY VALVE
<u>—ю́—</u>	BALL VALVE
—İVI	PLUG VALVE
<u>— ф _{GPM}</u>	CALIBRATED BALANCING SHUT-OFF VALVE & GPM SETTING
<i>₽</i> —	ANGLE VALVE
—Å—	TWO-WAY CONTROL VALVE
——————————————————————————————————————	THREE-WAY CONTROL VALVE
	SOLENOID VALVE
— '>' —	STRAINER
&	PRESSURE REGULATING VALVE
\$	SAFETY RELIEF VALVE
	VENTURI FLOW MEASURING DEVICE
—[AS]—	AIR SEPARATOR
	UNION
	TEMPERATURE/PRESSURE TEST PLUG
 	PRESSURE GAUGE WITH GAUGE COCK
	THERMOMETER
<u> </u>	WALL HYDRANT (NON-FREEZE)
C-+ <u>NFRH</u>	ROOF HYDRANT (NON-FREEZE)
• <u>HB</u>	HOSE BIBB
	WATER HAMMER ARRESTER
• <u>FD-#</u>	FLOOR DRAIN
• <u>AD-#</u>	AREA DRAIN (STORM WATER)
0 <u>RD-#</u>	ROOF DRAIN
_ X_	PIPE ANCHOR
	PIPE GUIDE
	PIPE TRANSITION
	EXPANSION COMPENSATOR
	FLEXIBLE CONNECTION
c	ELBOW DOWN
0	ELBOW UP
	TEE DOWN
	TEE UP
	FLOW ARROW
O <u>FCO</u>	FLOOR CLEANOUT FLUSH WITH FINISH FLOOR
<u> </u>	YARD CLEANOUT FLUSH IN GRASS OR PAVED AREA
<u>CO</u>	CLEANOUT IN HORIZONTAL RUN
<u> </u>	CLEANOUT IN VERTICAL DROP EXPOSED
<u> </u>	CLEANOUT IN VERTICAL DROP WITH EXTENSION THROUGH WALL
	PIPE CAP
	CONTINUATION BREAK
AD	ACCESS DOOR IN WALL OR CEILING
	CONNECT TO EXISTING
/ 	
	CONCRETE THRUST BLOCK

	EXISTING PIPING SYMBOLS
	EXISTING PIPING TO BE REMOVED
xxx	EXISTING PIPING TO REMAIN - SERVICE IS SAME DESIGNATION AS NEW
	EXISTING PIPING NOTED AS CAPPED AND PORTION REMOVED

NOTE:	
NOT ALL ABBREVIATIONS AND	
SYMBOLS INDICATED MAY APPEAR ON	
THESE CONTRACT DRAWINGS. THIS IS	
FOR REFERENCE ONLY.	

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		1. CONTRACTOR SHALL PROVIDE A COMPLETE AND WORKING SYSTE PERMITS AND APPROVALS FROM AUTHORITIES HAVING JURISDICT
	GENERAL SYMBOLS	2. INSTALL ALL EQUIPMENT AND MATERIALS IN STRICT ACCORDANCE <u>ADOPTED I.P.C. OR CURRENT ADOPTED N.S.P.C.</u> ALL PERTINENT C ORDINANCES, REGULATIONS, AND RESPECTIVE MANUFACTURER'S
X P-X	SECTION MARKER	INSTRUCTIONS. IF A CONFLICT OCCURS, THE MORE STRINGENT RE APPLY.
		3. COORDINATE PLUMBING WORK WITH THE WORK OF ALL OTHER CO AND STRUCTURAL AND ARCHITECTURAL FEATURES.
P-X	PARTIAL PLAN / DETAIL MARKER	4. PLUMBING DRAWINGS ARE DIAGRAMMATIC IN NATURE. THE DRAWI CLOSELY AS CIRCUMSTANCES PERMIT AND ACTUAL LINE LOCATION DETERMINED BY THE P.C. IN THE FIELD. HOWEVER, THE PLUMBING HELD RESPONSIBLE FOR THE PROPER INSTALLATION OF ALL MATE REQUIRED FOR A COMPLETE INSTALLATION WITHIN THE INTENT AN
$\left\langle \begin{array}{c} XX \\ XX \\ XX \end{array} \right\rangle$	RISER TYPE: S:SANITARY/W:WASTE/V:VENT/CW:COLD WATER/HW:HOT WATER RISER NUMBER	CONTRACT DOCUMENTS. 5. THE PLUMBING CONTRACTOR SHALL ARRANGE THE PROGRESS OF CONFORM TO THE PROGRESS OF THE TRADES AND SHALL COMPL
		INSTALLATION AS SOON AS THE CONDITION OF THE PROJECT WILL 6. ALL ITEMS OF LABOR, MATERIAL, AND EQUIPMENT NOT SPECIFICAL NOR DETAILED ON THE DRAWINGS BUT INCIDENTAL TO OR NECESS
		COMPLETION OF THE WORK, SHALL BE CONSIDERED AS INCLUDED UNLESS NOTED OTHERWISE, CONSTRUCTION MATERIAL AND EQUI BECOME PROPERTY OF THE CONTRACTOR AND SHALL BE LEGALLY
		SITE. 7. PROVIDE NECESSARY SUPPORTS, HANGERS AND HARDWARE TO F PIPING AND EQUIPMENT STRUCTURE.
CW	PLUMBING LINE TYPES	8. ALL SANITARY AND VENT <u>AND RAIN WATER</u> PIPING ABOVE AND BEL BE <u>SCH. 40 DWV PVC PLASTIC PIPE WITH SOLVENT WELD JOINTS A</u>
FCW	FILTERED COLD WATER	WEIGHT CAST IRON, BELL AND SPIGOT. MAKE ALL JOINTS WATERT WHEN ROUGHING WORK IS COMPLETED AND BEFORE CONNECTIO GASTIGHT. WHEN ROUGHING WORK IS TO A WATER TEST BY PLUG
HW	DOMESTIC HOT WATER (120° F)	AND FILLING ALL OF THE LINES TO THE ROOF LEVEL. ALL DEFECTS 9. LABEL ALL DOMESTIC COLD WATER, AND DOMESTIC HOT WATER P
HWR	DOMESTIC HOT WATER RETURN (120° F)	WATERPROOF, ALL TEMPERATURE, SELF-ADHERING LABELS AND D MANUFACTURED BY SETON OR EQUAL.
——————————————————————————————————————	DOMESTIC HOT WATER (140° F)	10. FURNISH AND INSTALL ACCESS PANELS WHERE REQUIRED FOR AC CONCEALED VALVES, TRAPS OR EQUIPMENT WHERE NO OTHER MI INSTALL RATED ACCESS PANELS IN THE FIRE RATED CONSTRUCTION COORDINATE ACCESS LOCATIONS WITH ARCHITECT AND CO
140°HWR	DOMESTIC HOT WATER RETURN (140° F)	COORDINATE ACCESS LOCATIONS WITH ARCHITECT AND GC. 11. DO NOT INSTALL PIPING OR ANY OTHER PLUMBING EQUIPMENT OV MAINTAIN A MINIMUM OF 36" CLEAR IN FRONT OF ELECTRICAL PANE
SAN VAC	VACUUM	12. INTERIOR COLD AND HOT WATER PIPING IN THE BUILDING SHALL BI SPEC, B-88-51 WITH A 150 PSI WORKING PRESSURE. EXTERIOR AND
GW	GREASE LADEN WASTE	PIPING SHALL BE TYPE 'K' COPPER OR DUCTILE IRON. FITTINGS SHA COPPER OF WEIGHT CORRESPONDING TO PIPE TO WHICH THEY AF SHALL BE SOLDERED USING LEAD-FREE SOLDER. AFTER ALL PIPING
AW	ACID WASTE	BUT BEFORE ANY EQUIPMENT OF FIXTURES HAVE BEEN CONNECT BE FILLED WITH A MINIMUM PRESSURE OF 150 POUNDS PER SQUAR SHALL BE MAINTAINED FOR A PERIOD OF 60 MINUTES. AFTER SUCC
V	VENT	ALL PIPING TO REMOVE DIRT FROM FOREIGN MATTER , THEN STER SYSTEM WITH A CHLORINE OR HTH SOLUTION. FLUSH WATER PIPE REMOVE CHLORINE SOLUTION. STERILIZATION SHALL BE PERFORM
AV	ACID VENT	WITH AWWA SPECIFICATIONS C601-53T. 13. INSULATE ALL DOMESTIC HOT AND COLD WATER LINES, <u>ALL RAIN V</u>
	RAIN/STORM WATER	FITTINGS AND VALVES. PIPE INSULATION SHALL BE RIGID FIBERGLA BONDED TO ALUMINUM FOIL, K=0.23 @ 75° F., REINFORCED WITH FI SUITABLE FOR PAINTING, MANVILLE MICRO-LOK 650 WITH AP-T JACI
OSD	OVERFLOW (SECONDARY) RAIN/STORM DRAIN SIPHONIC RAIN/STORM DRAIN SYSTEM	EQUAL, FITTINGS AND VALVES SHALL BE INSULATED WITH MOLDED COVERS WITH FIBERGLASS INSULATION, MANVILLE ZESTON 25/50° (
	INDIRECT DRAIN	14. THE PLUMBING CONTRACTOR SHALL PROVIDE INSTRUCTIONS TO T SYSTEM INSTALLED AND THE OPERATION OF ALL EQUIPMENT IN HIS
G	NATURAL GAS	15. CHECK AND VERIFY ALL DIMENSIONS AND EXISTING CONDITIONS S UNDERGROUND UTILITIES AT THE SITE. FAILURE TO VISIT AND INSP CONDITIONS SHALL NOT BE VALID REASON FOR AUTHORIZATION O PLUMBING CONTRACTOR SHALL BE FULLY RESPONSIBLE FOR ALL I
AIR	AIR	OCCUR BY THE FAILURE TO PRECISELY LOCATE AND PRESERVE AN UTILITIES.
IW	INDIRECT WASTE	16. CONTRACTOR SHALL UNCONDITIONALLY GUARANTEE IN WRITING A EQUIPMENT, AND WORKMANSHIP FOR A PERIOD OF ONE YEAR FRO ACCEPTANCE BY OWNER.
	PUMP DISCHARGE SPRINKLER	17. PROVIDE SHOCK ABSORBING DEVICES WHICH WILL PROTECT WAT WATER HAMMER. REFER TO PLUMBING EQUIPMENT SHEDULE FOR
SI KK		ENDS OF ALL BRANCH PIPING RUNS. 18. THE PLUMBING CONTRACTOR SHALL SUBMIT TO THE ARCHITECT/E DRAWINGS AND OPERATION AND MAINTENANCE MANUALS INCLUD DATA, WIRING DIAGRAMS, MAINTENANCE INSTRUCTIONS, AND PAR
		COMPLETION. 19. EXTERIOR BELOW GROUND PIPING SHALL BE BURIED BELOW THE L
	ABBREVIATIONS	20. INTERIOR ABOVE GROUND DRAINAGE AND VENT PIPING SHALL BE (AND ABOVE SUSPENDED CEILINGS WHERE POSSIBLE. VERTICAL ST PROVIDED WITH ACCESSIBLE CLEAN OUTS AT THEIR BASE. MINIMU PIPING BELOW GRADE INSIDE BUILDING SHALL BE 2".
	ISABILITY ACT INV INVERT	21. THE CONTRACTOR SHALL MAINTAIN A CLEAN AND SAFE WORK ARE SAFETY PROCEDURES AND ENFORCEMENT IS THE RESPONSIBILITY THE CONTRACTOR SHALL CONFORM TO ALL OSHA STANDARDS
AFF ABOVE FINIS AMB AMBIENT AMP AMPERE	L LENGTH LB POUND	22. BACK FLOR PREVENTERS AND/OR VACUUM BREAKERS SHALL BE IN REQUIRED TO PREVENT CONTAMINATION OF POTABLE WATER SYS
AV ACID VENT AW ACID WASTE BLDG BUILDING	LF LINEAR FEET LVR LOUVER LWT LEAVING WATER TEMPERATURE	23. SUBMIT (6) SETS OF SHOP DRAWINGS AND PRODUCT DATA GROUP COMPLETE SUBMITTALS OF RELATED SYSTEMS, PRODUCTS, AND A SINGLE SUBMITTAL.
	RMAL UNITS PER HOUR MC MECHANICAL CONTRACTOR	24. CONTRACTOR SHALL PAY FOR AND OBTAIN ALL FEES, PERMITS AN CHARGES BY UTILITY COMPANIES SHALL BE PAIN BY THIS CONTRAC
CA COMPRESSE CAP CAPACITY CD CONDENSAT	MIN MINIMUM E DRAIN MTD MOUNTED	25. ALL ABOVE GROUND GAS PIPING SHALL BE ASTM A53 SCHEDULE 40 MALLEABLE IRON THREADED FITTINGS. INSTALL A SEDIMENT TRAP
CI CAST IRON CLG CEILING CO CLEAN OUT	NC NORMALLY CLOSED NFRH NON-FREEZE ROOF HYDRANT NFWH NON-FREEZE WALL HYDRANT	CONDENSATION MAY COLLECT. ALL EXTERIOR EXPOSED PIPING SH OF PRIMER AND (2) COATS OF GRAY EPOXY PAINT. <u>ALL BELOW GRA</u> ASTM D2513 POLYETHYLENE PIPE WITH ALL NECESSARY FITTINGS
CP CONDENSAT CW COLD WATEF DDC DIRECT DIGIT		MANUFACTURED SPECIFICALLY FOR GAS SERVICE. ALL PIPING SHA STRICT ACCORDANCE WITH 1999 NATIONAL FUEL GAS CODE, NFPA
DIA DIAMETER DN DOWN DWG DRAWING	PC PLUMBING CONTRACTOR PD PRESSURE DROP PLBG PLUMBING	26. EXCEPT WHERE OTHERWISE INDICATED, ALL CUTTING, EXCAVATIO REQUIRED FOR THE PLUMBING WORK SHALL BE BY THE PLUMBING CUT STRUCTURAL MEMBERS.
E.C ELECTRICAL EFF EFFICIENCY EL ELEVATION	CONTRACTORPRESPRESSUREPSIGPOUNDS PER SQUARE INCH GAUGEPVCPOLYVINYL CHLORIDE	27. FOR ALL NEW AND EXISTING PVC, DWV, AND ABS PIPING IN RETURN 3M (OR EQUAL) FIRE BARRIER PLENUM WRAP 5A. INSTALL PER MAN INSTRUCTIONS
EQUIP EQUIPMENT ET EXPANSION T ETR EXISTING TO	RDROOF DRAINTANKRHRELATIVE HUMIDITYREMAINRMROOM	28. WHERE MODIFICATIONS OR ADDITIONS TO EXISTING WORK IS TO B CONTRACTOR, EXISTING EQUIPMENT, FIXTURES, SUPPORTS, PIPIN
EWT ENTERING W EX EXISTING F FAHRENHEIT	ATER TEMPERATURE RPM REVOLUTIONS PER MINUTES RWC RAINWATER CONDUCTOR SRWC SECONDARY ROOF DRAIN	SHALL BE REMOVED AND REINSTALLED TO ACCOMODATE MODIFIC THIS SHALL INCLUDE THE ADDITION OF DOORS, WALLS, STRUCTUR ETC. COORDINATE WITH OTHER CONTRACTORS IN THE FIELD PRIO
FCFLEXIBLE COFCOFLOOR CLEAFDFLOOR DRAIN	INNECTION SAN SANITARY IN OUT SD STORM DRAIN N SHT SHEET	COMMENCING. WHERE THE QUANTITY OF WORK CANNOT BE DETE DUE TO CONCEALED CONDITIONS, PROVIDE \$5,000 ALLOWANCE.
FDC FIRE DEPART FT FEET FPM FEET PER MI	Implication SPEC SPECIFICATIONS TEMP TEMPERATURE NUTE TYP TYPICAL	29. ALL EXPOSED PIPING SHALL BE CLEANED AND HAVE THE SURFACE PAINTED FINISH. PRIME AND PAINT THE EXPOSED PIPING IN COLOR ARCHITECT.
FS FLOOR SINK G GAS GAL GALLON	VEL VELOCITY VFD VARIABLE FREQUENCY DRIVE V VENT	30. SLOPE ALL SOIL, WASTE AND STORM WATER LINES PER CODE.
GC GENERAL CC GR GREASE WAS GPM GALLONS PE	DNTRACTORVTRVENT THROUGH ROOFSTE LINEVCOVERTICAL CLEANOUT	31. SEAL ALL FLOOR AND WALL PENETRATIONS IN FIRE RATED CEILING MAINTAIN FIRE RATING. COORDINATE LOCATIONS WITH ARCHITECT
HB HOSE BIBB HP HORSE POW HR HOUR	WCO WALL CLEANOUT	32. PLUMBING CONTRACTOR IS REQUIRED TO NOTIFY FACILITY OWNEF AND/OR NOT MORE THAN 10 WORKING DAYS PRIOR TO EXCAVATIO WHEN USING POWERED EQUIPMENT ON PUBLIC OR PRIVATE PROP
HT HEIGHT HW HOT WATER HWR HOT WATER	W/ WITH W/O WITHOUT	33. PENNSYLVANIA ONE CALL SYSTEM 1-800-242-1776. 34. PLUMBING CONTRACTOR TO MAKE FINAL CONNECTION TO FOOD S
IN INCH		VERIFY CONNECTION SIZE WITH FOOD SERVICE DRAWINGS.
		PLUMBING DRAWING LIST

P-X	SECTION MARKER				 APPLY. COORDINATE PLUMBING WORK WITH THE WORK OF ALL OTHER CO
				_	AND STRUCTURAL AND ARCHITECTURAL FEATURES.
X P-X	PARTIAL PLAN / DETAIL MA	\RKER			 PLUMBING DRAWINGS ARE DIAGRAMMATIC IN NATURE. THE DRAWING CLOSELY AS CIRCUMSTANCES PERMIT AND ACTUAL LINE LOCATION DETERMINED BY THE P.C. IN THE FIELD. HOWEVER, THE PLUMBING
				_	HELD RESPONSIBLE FOR THE PROPER INSTALLATION OF ALL MATE REQUIRED FOR A COMPLETE INSTALLATION WITHIN THE INTENT AN
$\left\langle \begin{array}{c} xx \\ xx \end{array} \right\rangle$	RISER TYPE: S:SANITARY/\ RISER NUMBER	W:WASTE/V:VE	ENT/CW:COLD WATER/HW:HOT WATER		CONTRACT DOCUMENTS. 5. THE PLUMBING CONTRACTOR SHALL ARRANGE THE PROGRESS OF
					CONFORM TO THE PROGRESS OF THE TRADES AND SHALL COMPL INSTALLATION AS SOON AS THE CONDITION OF THE PROJECT WILL
					6. ALL ITEMS OF LABOR, MATERIAL, AND EQUIPMENT NOT SPECIFICAL NOR DETAILED ON THE DRAWINGS BUT INCIDENTAL TO OR NECESS
					COMPLETION OF THE WORK, SHALL BE CONSIDERED AS INCLUDED UNLESS NOTED OTHERWISE, CONSTRUCTION MATERIAL AND EQUI BECOME PROPERTY OF THE CONTRACTOR AND SHALL BE LEGALLY
					SITE.
	PLUMBING	 3 I INE ⁻	TYPES	7	 PROVIDE NECESSARY SUPPORTS, HANGERS AND HARDWARE TO F PIPING AND EQUIPMENT STRUCTURE.
CW	POTABLE DOMESTIC CC			_	 ALL SANITARY AND VENT <u>AND RAIN WATER</u> PIPING ABOVE AND BEL BE <u>SCH. 40 DWV PVC PLASTIC PIPE WITH SOLVENT WELD JOINTS A</u>
FCW	FILTERED COLD WATER			_	WEIGHT CAST IRON, BELL AND SPIGOT. MAKE ALL JOINTS WATERT WHEN ROUGHING WORK IS COMPLETED AND BEFORE CONNECTIO GASTIGHT. WHEN ROUGHING WORK IS TO A WATER TEST BY PLUG
нw	DOMESTIC HOT WATER (12			_	AND FILLING ALL OF THE LINES TO THE ROOF LEVEL. ALL DEFECTS
	DOMESTIC HOT WATER RE	,)	_	 LABEL ALL DOMESTIC COLD WATER, AND DOMESTIC HOT WATER P WATERPROOF, ALL TEMPERATURE, SELF-ADHERING LABELS AND E MANUFACTURED BY SETON OR EQUAL.
140°HW	DOMESTIC HOT WATER (14		/	_	10. FURNISH AND INSTALL ACCESS PANELS WHERE REQUIRED FOR AC CONCEALED VALVES, TRAPS OR EQUIPMENT WHERE NO OTHER M
	``````````````````````````````````````	,	)	_	INSTALL RATED ACCESS PANELS IN THE FIRE RATED CONSTRUCTION COORDINATE ACCESS LOCATIONS WITH ARCHITECT AND GC.
	DOMESTIC HOT WATER RE SANITARY		)	_	11. DO NOT INSTALL PIPING OR ANY OTHER PLUMBING EQUIPMENT OV MAINTAIN A MINIMUM OF 36" CLEAR IN FRONT OF ELECTRICAL PANE
SAN				_	12. INTERIOR COLD AND HOT WATER PIPING IN THE BUILDING SHALL B
VAC				_	SPEC, B-88-51 WITH A 150 PSI WORKING PRESSURE. EXTERIOR AND PIPING SHALL BE TYPE 'K' COPPER OR DUCTILE IRON. FITTINGS SHA COPPER OF WEIGHT CORRESPONDING TO PIPE TO WHICH THEY AF
GW				-	SHALL BE SOLDERED USING LEAD-FREE SOLDER. AFTER ALL PIPIN BUT BEFORE ANY EQUIPMENT OF FIXTURES HAVE BEEN CONNECT BE FILLED WITH A MINIMUM PRESSURE OF 150 POUNDS PER SQUAI
AW				_	SHALL BE MAINTAINED FOR A PERIOD OF 60 MINUTES. AFTER SUCC ALL PIPING TO REMOVE DIRT FROM FOREIGN MATTER , THEN STER
V				_	SYSTEM WITH A CHLORINE OR HTH SOLUTION. FLUSH WATER PIPE REMOVE CHLORINE SOLUTION. STERILIZATION SHALL BE PERFORM WITH AWWA SPECIFICATIONS C601-53T.
AV				_	<ol> <li>13. INSULATE ALL DOMESTIC HOT AND COLD WATER LINES, <u>ALL RAIN V</u> FITTINGS AND VALVES. PIPE INSULATION SHALL BE RIGID FIBERGLA</li> </ol>
RWC			DDAIN	_	BONDED TO ALUMINUM FOIL, K=0.23 @ 75° F., REINFORCED WITH FI SUITABLE FOR PAINTING, MANVILLE MICRO-LOK 650 WITH AP-T JAC
OSD	OVERFLOW (SECONDARY)	,	DRAIN	_	EQUAL, FITTINGS AND VALVES SHALL BE INSULATED WITH MOLDED COVERS WITH FIBERGLASS INSULATION, MANVILLE ZESTON 25/50°
SSD	SIPHONIC RAIN/STORM DR	AIN SYSTEM		_	14. THE PLUMBING CONTRACTOR SHALL PROVIDE INSTRUCTIONS TO T SYSTEM INSTALLED AND THE OPERATION OF ALL EQUIPMENT IN HI
ID				_	15. CHECK AND VERIFY ALL DIMENSIONS AND EXISTING CONDITIONS S UNDERGROUND UTILITIES AT THE SITE. FAILURE TO VISIT AND INSF
G	NATURAL GAS			_	CONDITIONS SHALL NOT BE VALID REASON FOR AUTHORIZATION O PLUMBING CONTRACTOR SHALL BE FULLY RESPONSIBLE FOR ALL OCCUR BY THE FAILURE TO PRECISELY LOCATE AND PRESERVE AND
AIR	AIR			_	UTILITIES.
IW	INDIRECT WASTE			_	<ol> <li>CONTRACTOR SHALL UNCONDITIONALLY GUARANTEE IN WRITING / EQUIPMENT, AND WORKMANSHIP FOR A PERIOD OF ONE YEAR FRO ACCEPTANCE BY OWNER.</li> </ol>
PD				_	17. PROVIDE SHOCK ABSORBING DEVICES WHICH WILL PROTECT WAT WATER HAMMER. REFER TO PLUMBING EQUIPMENT SHEDULE FOR
SPRK	SPRINKLER				ENDS OF ALL BRANCH PIPING RUNS. 18. THE PLUMBING CONTRACTOR SHALL SUBMIT TO THE ARCHITECT/E
					DRAWINGS AND OPERATION AND MAINTENANCE MANUALS INCLUD DATA, WIRING DIAGRAMS, MAINTENANCE INSTRUCTIONS, AND PAR
					COMPLETION. 19. EXTERIOR BELOW GROUND PIPING SHALL BE BURIED BELOW THE I
					20. INTERIOR ABOVE GROUND DRAINAGE AND VENT PIPING SHALL BE AND ABOVE SUSPENDED CEILINGS WHERE POSSIBLE. VERTICAL S
	ABBR	REVIATI	ONS		PROVIDED WITH ACCESSIBLE CLEAN OUTS AT THEIR BASE. MINIMU PIPING BELOW GRADE INSIDE BUILDING SHALL BE 2".
		IN 1 14/2		-	21. THE CONTRACTOR SHALL MAINTAIN A CLEAN AND SAFE WORK ARE SAFETY PROCEDURES AND ENFORCEMENT IS THE RESPONSIBILITY
AD ACCESS DOC ADA AMERICAN DI AFF ABOVE FINISI	ISABILITY ACT	IN WC INV KEC	INCHES, WATER COLUMN INVERT KITCHEN EQUIPMENT CONTRACTOR		22. BACK FLOR PREVENTERS AND/OR VACUUM BREAKERS SHALL BE IN
AMB AMBIENT AMP AMPERE		L LB	LENGTH POUND		REQUIRED TO PREVENT CONTAMINATION OF POTABLE WATER SYS
AV ACID VENT AW ACID WASTE BLDG BUILDING		LF LVR LWT	LINEAR FEET LOUVER LEAVING WATER TEMPERATURE		23. SUBMIT (6) SETS OF SHOP DRAWINGS AND PRODUCT DATA GROUF COMPLETE SUBMITTALS OF RELATED SYSTEMS, PRODUCTS, AND A SINGLE SUBMITTAL.
BOT BOTTOM BTU BRITISH THEF		MAX MBH	MAXIMUM BTUH x 1000		24. CONTRACTOR SHALL PAY FOR AND OBTAIN ALL FEES, PERMITS AN
CA COMPRESSE CAP CAPACITY		MC MFR MIN	MECHANICAL CONTRACTOR MANUFACTURER MINIMUM		CHARGES BY UTILITY COMPANIES SHALL BE PAIN BY THIS CONTRA 25. ALL ABOVE GROUND GAS PIPING SHALL BE ASTM A53 SCHEDULE 4
CD CONDENSATI CI CAST IRON CLG CEILING	E DRAIN	MTD NC NFRH	MOUNTED NORMALLY CLOSED NON-FREEZE ROOF HYDRANT		MALLEABLE IRON THREADED FITTINGS. INSTALL A SEDIMENT TRAP CONDENSATION MAY COLLECT. ALL EXTERIOR EXPOSED PIPING SH OF PRIMER AND (2) COATS OF GRAY EPOXY PAINT. ALL BELOW GR
CO CLEAN OUT CP CONDENSATI		NFWH NIC	NON-FREEZE WALL HYDRANT NOT IN CONTRACT		ASTM D2513 POLYETHYLENE PIPE WITH ALL NECESSARY FITTINGS MANUFACTURED SPECIFICALLY FOR GAS SERVICE. ALL PIPING SHA
CW COLD WATER DDC DIRECT DIGIT DIA DIAMETER		OC P	ON CENTER PUMP PLUMBING CONTRACTOR		STRICT ACCORDANCE WITH 1999 NATIONAL FUEL GAS CODE, NFPA 26. EXCEPT WHERE OTHERWISE INDICATED, ALL CUTTING, EXCAVATIO
DIA DIAMETER DN DOWN DWG DRAWING		PC PD PLBG	PLUMBING CONTRACTOR PRESSURE DROP PLUMBING		REQUIRED FOR THE PLUMBING WORK SHALL BE BY THE PLUMBING CUT STRUCTURAL MEMBERS.
E.C ELECTRICAL EFF EFFICIENCY	CONTRACTOR	PRES PSIG	PRESSURE POUNDS PER SQUARE INCH GAUGE		27. FOR ALL NEW AND EXISTING PVC, DWV, AND ABS PIPING IN RETURI 3M (OR EQUAL) FIRE BARRIER PLENUM WRAP 5A. INSTALL PER MAI
EL ELEVATION EQUIP EQUIPMENT ET EXPANSION 1	ΓΑΝΚ	PVC RD RH	POLYVINYL CHLORIDE ROOF DRAIN RELATIVE HUMIDITY		INSTRUCTIONS 28. WHERE MODIFICATIONS OR ADDITIONS TO EXISTING WORK IS TO B
ETR EXISTING TO		RM RPM	ROOM REVOLUTIONS PER MINUTES		CONTRACTOR, EXISTING EQUIPMENT, FIXTURES, SUPPORTS, PIPIN SHALL BE REMOVED AND REINSTALLED TO ACCOMODATE MODIFIC
F FAHRENHEIT FC FLEXIBLE CO	NNECTION	RWC SRWC SAN	RAINWATER CONDUCTOR SECONDARY ROOF DRAIN SANITARY		THIS SHALL INCLUDE THE ADDITION OF DOORS, WALLS, STRUCTUR ETC. COORDINATE WITH OTHER CONTRACTORS IN THE FIELD PRIO COMMENCING. WHERE THE QUANTITY OF WORK CANNOT BE DETE
FCO FLOOR CLEA FD FLOOR DRAIN	N OUT N	SD SHT	STORM DRAIN SHEET		DUE TO CONCEALED CONDITIONS, PROVIDE \$5,000 ALLOWANCE.
FDC FIRE DEPART FT FEET FPM FEET PER MI	MENT CONNECTION	SPEC TEMP TYP	SPECIFICATIONS TEMPERATURE TYPICAL		29. ALL EXPOSED PIPING SHALL BE CLEANED AND HAVE THE SURFACE PAINTED FINISH. PRIME AND PAINT THE EXPOSED PIPING IN COLOR ARCHITECT.
FS FLOOR SINK G GAS		VEL VFD	VELOCITY VARIABLE FREQUENCY DRIVE		30. SLOPE ALL SOIL, WASTE AND STORM WATER LINES PER CODE.
GAL GALLON GC GENERAL CO GR GREASE WAS		V VTR VCO	VENT VENT THROUGH ROOF VERTICAL CLEANOUT		31. SEAL ALL FLOOR AND WALL PENETRATIONS IN FIRE RATED CEILING MAINTAIN FIRE RATING. COORDINATE LOCATIONS WITH ARCHITECT
GPM GALLONS PE HB HOSE BIBB	R MINUTE	W WCO	WASTE WALL CLEANOUT		32. PLUMBING CONTRACTOR IS REQUIRED TO NOTIFY FACILITY OWNEI AND/OR NOT MORE THAN 10 WORKING DAYS PRIOR TO EXCAVATIO
HP HORSE POWI HR HOUR HT HEIGHT	EK	WPD WTR W/	WATER PRESSURE DROP WATER WITH		WHEN USING POWERED EQUIPMENT ON PUBLIC OR PRIVATE PROF
HW HOT WATER HWR HOT WATER	RETURN	W/ W/O	WITH WITHOUT		<ul><li>33. PENNSYLVANIA ONE CALL SYSTEM 1-800-242-1776.</li><li>34. PLUMBING CONTRACTOR TO MAKE FINAL CONNECTION TO FOOD S</li></ul>
IN INCH					VERIFY CONNECTION SIZE WITH FOOD SERVICE DRAWINGS.
				PLUMBIN	G DRAWING LIST

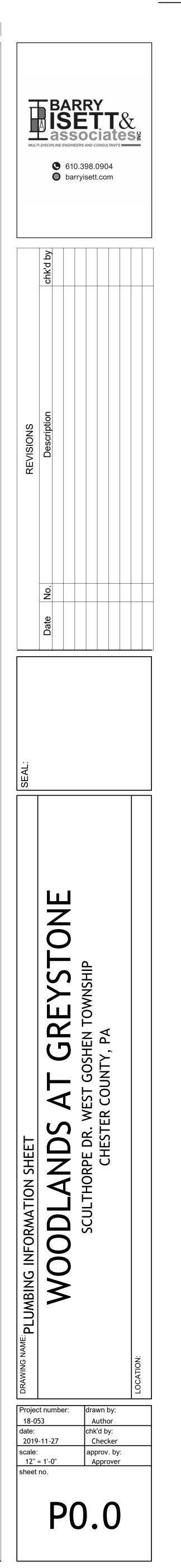
P-X	SECTION MAR	KER			
					3. COORDINATE PLUMBING WORK WITH THE WORK OF ALL OTHER CO AND STRUCTURAL AND ARCHITECTURAL FEATURES.
P-X	PARTIAL PLAN	/ DETAIL MARKER			<ol> <li>PLUMBING DRAWINGS ARE DIAGRAMMATIC IN NATURE. THE DRAW CLOSELY AS CIRCUMSTANCES PERMIT AND ACTUAL LINE LOCATIO DETERMINED BY THE P.C. IN THE FIELD. HOWEVER, THE PLUMBING</li> </ol>
					HELD RESPONSIBLE FOR THE PROPER INSTALLATION OF ALL MATE REQUIRED FOR A COMPLETE INSTALLATION WITHIN THE INTENT AN
$\left  \begin{array}{c} \begin{array}{c} \begin{array}{c} \begin{array}{c} \begin{array}{c} \\ \end{array} \\ \end{array} \\ \end{array} \right  \\ \begin{array}{c} \end{array} \\ \end{array} \\ \begin{array}{c} \end{array} \\ \end{array} \\ \begin{array}{c} \end{array} \\ \end{array} \\ \begin{array}{c} \end{array} \\ \begin{array}{c} \end{array} \\ \end{array} \\ \begin{array}{c} \end{array} \\ \begin{array}{c} \end{array} \\ \end{array} \\ \end{array} \\ \begin{array}{c} \end{array} \\ \end{array} \\ \end{array} \\ \begin{array}{c} \end{array} \\ \end{array} \\ \end{array} \\ \end{array} \\ \begin{array}{c} \end{array} \\ \end{array} $	<b>\</b>		ENT/CW:COLD WATER/HW:HOT WATER		CONTRACT DOCUMENTS. 5. THE PLUMBING CONTRACTOR SHALL ARRANGE THE PROGRESS O
					CONFORM TO THE PROGRESS OF THE TRADES AND SHALL COMPL INSTALLATION AS SOON AS THE CONDITION OF THE PROJECT WILL
					6. ALL ITEMS OF LABOR, MATERIAL, AND EQUIPMENT NOT SPECIFICAL NOR DETAILED ON THE DRAWINGS BUT INCIDENTAL TO OR NECES
					COMPLETION OF THE WORK, SHALL BE CONSIDERED AS INCLUDED UNLESS NOTED OTHERWISE, CONSTRUCTION MATERIAL AND EQU
					BECOME PROPERTY OF THE CONTRACTOR AND SHALL BE LEGALL SITE.
	PLU	MBING LINE	TYPES		<ol> <li>PROVIDE NECESSARY SUPPORTS, HANGERS AND HARDWARE TO F PIPING AND EQUIPMENT STRUCTURE.</li> </ol>
CW-		MESTIC COLD WATER			8. ALL SANITARY AND VENT <u>AND RAIN WATER</u> PIPING ABOVE AND BEI BE <u>SCH. 40 DWV PVC PLASTIC PIPE WITH SOLVENT WELD JOINTS A</u>
FCW-					WEIGHT CAST IRON, BELL AND SPIGOT. MAKE ALL JOINTS WATERT WHEN ROUGHING WORK IS COMPLETED AND BEFORE CONNECTIO GASTIGHT. WHEN ROUGHING WORK IS TO A WATER TEST BY PLUG
		T WATER (120° F)			AND FILLING ALL OF THE LINES TO THE ROOF LEVEL. ALL DEFECTS
		T WATER RETURN (120° F	)		<ol> <li>LABEL ALL DOMESTIC COLD WATER, AND DOMESTIC HOT WATER F WATERPROOF, ALL TEMPERATURE, SELF-ADHERING LABELS AND I MANUFACTURED BY SETON OR EQUAL.</li> </ol>
140°HW		T WATER (140° F)	1		10. FURNISH AND INSTALL ACCESS PANELS WHERE REQUIRED FOR A CONCEALED VALVES, TRAPS OR EQUIPMENT WHERE NO OTHER M
		T WATER RETURN (140° F	)		INSTALL RATED ACCESS PANELS IN THE FIRE RATED CONSTRUCT COORDINATE ACCESS LOCATIONS WITH ARCHITECT AND GC.
			)		11. DO NOT INSTALL PIPING OR ANY OTHER PLUMBING EQUIPMENT OV MAINTAIN A MINIMUM OF 36" CLEAR IN FRONT OF ELECTRICAL PAN
					12. INTERIOR COLD AND HOT WATER PIPING IN THE BUILDING SHALL B SPEC, B-88-51 WITH A 150 PSI WORKING PRESSURE. EXTERIOR ANI
VAC ·					PIPING SHALL BE TYPE 'K' COPPER OR DUCTILE IRON. FITTINGS SH COPPER OF WEIGHT CORRESPONDING TO PIPE TO WHICH THEY A
GW		NWASTE			SHALL BE SOLDERED USING LEAD-FREE SOLDER. AFTER ALL PIPIN BUT BEFORE ANY EQUIPMENT OF FIXTURES HAVE BEEN CONNECT BE FILLED WITH A MINIMUM PRESSURE OF 150 POUNDS PER SQUA
AW					SHALL BE MAINTAINED FOR A PERIOD OF 60 MINUTES. AFTER SUCC ALL PIPING TO REMOVE DIRT FROM FOREIGN MATTER , THEN STEF
V	VENT				SYSTEM WITH A CHLORINE OR HTH SOLUTION. FLUSH WATER PIPE REMOVE CHLORINE SOLUTION. STERILIZATION SHALL BE PERFORM WITH AWWA SPECIFICATIONS C601-53T.
AV	ACID VENT				13. INSULATE ALL DOMESTIC HOT AND COLD WATER LINES, ALL RAIN
	RAIN/STORM V	/ATER			FITTINGS AND VALVES. PIPE INSULATION SHALL BE RIGID FIBERGL/ BONDED TO ALUMINUM FOIL, K=0.23 @ 75° F., REINFORCED WITH F SUITABLE FOR PAINTING, MANVILLE MICRO-LOK 650 WITH AP-T JAC
OSD-	OVERFLOW (S	ECONDARY) RAIN/STORM	DRAIN		EQUAL, FITTINGS AND VALVES SHALL BE INSULATED WITH MOLDED COVERS WITH FIBERGLASS INSULATION, MANVILLE ZESTON 25/50°
SSD-	SIPHONIC RAIN	I/STORM DRAIN SYSTEM			14. THE PLUMBING CONTRACTOR SHALL PROVIDE INSTRUCTIONS TO SYSTEM INSTALLED AND THE OPERATION OF ALL EQUIPMENT IN HI
	INDIRECT DRA	IN			15. CHECK AND VERIFY ALL DIMENSIONS AND EXISTING CONDITIONS S UNDERGROUND UTILITIES AT THE SITE. FAILURE TO VISIT AND INSF
G	NATURAL GAS				CONDITIONS SHALL NOT BE VALID REASON FOR AUTHORIZATION C PLUMBING CONTRACTOR SHALL BE FULLY RESPONSIBLE FOR ALL
AIR	AIR				OCCUR BY THE FAILURE TO PRECISELY LOCATE AND PRESERVE A UTILITIES.
IW	INDIRECT WAS	TE			<ol> <li>CONTRACTOR SHALL UNCONDITIONALLY GUARANTEE IN WRITING EQUIPMENT, AND WORKMANSHIP FOR A PERIOD OF ONE YEAR FRO ACCEPTANCE BY OWNER.</li> </ol>
	PUMP DISCHA	RGE			17. PROVIDE SHOCK ABSORBING DEVICES WHICH WILL PROTECT WAT
SPRK					WATER HAMMER. REFER TO PLUMBING EQUIPMENT SHEDULE FOR ENDS OF ALL BRANCH PIPING RUNS.
					18. THE PLUMBING CONTRACTOR SHALL SUBMIT TO THE ARCHITECT/E DRAWINGS AND OPERATION AND MAINTENANCE MANUALS INCLUD DATA, WIRING DIAGRAMS, MAINTENANCE INSTRUCTIONS, AND PAR
					COMPLETION.
					<ul><li>19. EXTERIOR BELOW GROUND PIPING SHALL BE BURIED BELOW THE</li><li>20. INTERIOR ABOVE GROUND DRAINAGE AND VENT PIPING SHALL BE</li></ul>
		ABBREVIATI			AND ABOVE SUSPENDED CEILINGS WHERE POSSIBLE. VERTICAL S PROVIDED WITH ACCESSIBLE CLEAN OUTS AT THEIR BASE. MINIMU
					PIPING BELOW GRADE INSIDE BUILDING SHALL BE 2". 21. THE CONTRACTOR SHALL MAINTAIN A CLEAN AND SAFE WORK ARI
ADA AN	CCESS DOOR MERICAN DISABILITY ACT	IN WC INV	INCHES, WATER COLUMN INVERT		SAFETY PROCEDURES AND ENFORCEMENT IS THE RESPONSIBILIT THE CONTRACTOR SHALL CONFORM TO ALL OSHA STANDARDS
AMB AN	BOVE FINISH FLOOR MBIENT MPERE	KEC L LB	KITCHEN EQUIPMENT CONTRACTOR LENGTH POUND		22. BACK FLOR PREVENTERS AND/OR VACUUM BREAKERS SHALL BE IN REQUIRED TO PREVENT CONTAMINATION OF POTABLE WATER SYS
AV AC AW AC	CID VENT CID WASTE	LF LVR	LINEAR FEET LOUVER		23. SUBMIT (6) SETS OF SHOP DRAWINGS AND PRODUCT DATA GROUP COMPLETE SUBMITTALS OF RELATED SYSTEMS, PRODUCTS, AND
BOT BO	JILDING OTTOM RITISH THERMAL UNITS	LWT MAX MBH	LEAVING WATER TEMPERATURE MAXIMUM BTUH x 1000		SINGLE SUBMITTAL. 24. CONTRACTOR SHALL PAY FOR AND OBTAIN ALL FEES, PERMITS AN
BTUH BF CA CC	RITISH THERMAL UNITS PER H OMPRESSED AIR	OUR MC MFR	MECHANICAL CONTRACTOR MANUFACTURER		CHARGES BY UTILITY COMPANIES SHALL BE PAIN BY THIS CONTRA
CD CC	APACITY ONDENSATE DRAIN AST IRON	MIN MTD NC	MINIMUM MOUNTED NORMALLY CLOSED		25. ALL ABOVE GROUND GAS PIPING SHALL BE ASTM A53 SCHEDULE 4 MALLEABLE IRON THREADED FITTINGS. INSTALL A SEDIMENT TRAP CONDENSATION MAY COLLECT. ALL EXTERIOR EXPOSED PIPING SI
CLG CE CO CL	EILING LEAN OUT	NFRH NFWH	NON-FREEZE ROOF HYDRANT NON-FREEZE WALL HYDRANT		OF PRIMER AND (2) COATS OF GRAY EPOXY PAINT. ALL BELOW GR ASTM D2513 POLYETHYLENE PIPE WITH ALL NECESSARY FITTINGS
CW CC	ONDENSATE PUMP OLD WATER IRECT DIGITAL CONTROL	NIC OC P	NOT IN CONTRACT ON CENTER PUMP		MANUFACTURED SPECIFICALLY FOR GAS SERVICE. ALL PIPING SH STRICT ACCORDANCE WITH 1999 NATIONAL FUEL GAS CODE, NFPA
DIA DI. DN DO	AMETER OWN	PC PD	PLUMBING CONTRACTOR PRESSURE DROP		26. EXCEPT WHERE OTHERWISE INDICATED, ALL CUTTING, EXCAVATION REQUIRED FOR THE PLUMBING WORK SHALL BE BY THE PLUMBING CUT STRUCTURAL MEMBERS.
E.C EL	RAWING LECTRICAL CONTRACTOR FFICIENCY	PLBG PRES PSIG	PLUMBING PRESSURE POUNDS PER SQUARE INCH GAUGE		27. FOR ALL NEW AND EXISTING PVC, DWV, AND ABS PIPING IN RETUR
EL EL		PVC RD	POLYVINYL CHLORIDE ROOF DRAIN		3M (OR EQUAL) FIRE BARRIER PLENUM WRAP 5A. INSTALL PER MA INSTRUCTIONS
ETR EX	KPANSION TANK KISTING TO REMAIN NTERING WATER TEMPERATU	RH RM RE RPM	RELATIVE HUMIDITY ROOM REVOLUTIONS PER MINUTES		28. WHERE MODIFICATIONS OR ADDITIONS TO EXISTING WORK IS TO E CONTRACTOR, EXISTING EQUIPMENT, FIXTURES, SUPPORTS, PIPIN
EX EX F FA	KISTING AHRENHEIT	RWC SRWC	RAINWATER CONDUCTOR SECONDARY ROOF DRAIN		SHALL BE REMOVED AND REINSTALLED TO ACCOMODATE MODIFIC THIS SHALL INCLUDE THE ADDITION OF DOORS, WALLS, STRUCTUF ETC. COORDINATE WITH OTHER CONTRACTORS IN THE FIELD PRIC
FCO FL	EXIBLE CONNECTION OOR CLEAN OUT OOR DRAIN	SAN SD SHT	SANITARY STORM DRAIN SHEET		COMMENCING. WHERE THE QUANTITY OF WORK CANNOT BE DETE DUE TO CONCEALED CONDITIONS, PROVIDE \$5,000 ALLOWANCE.
FDC FII FT FE	RE DEPARTMENT CONNECTIO		SPECIFICATIONS TEMPERATURE		29. ALL EXPOSED PIPING SHALL BE CLEANED AND HAVE THE SURFACE PAINTED FINISH. PRIME AND PAINT THE EXPOSED PIPING IN COLOF
	EET PER MINUTE LOOR SINK AS	TYP VEL VED	TYPICAL VELOCITY VARIABLE ERECUENCY DRIVE		ARCHITECT. 30. SLOPE ALL SOIL, WASTE AND STORM WATER LINES PER CODE.
GAL GA GC GE	ALLON ENERAL CONTRACTOR	VFD V VTR	VARIABLE FREQUENCY DRIVE VENT VENT THROUGH ROOF		31. SEAL ALL FLOOR AND WALL PENETRATIONS IN FIRE RATED CEILING
GPM GA	REASE WASTE LINE ALLONS PER MINUTE OSE BIBB	VCO W	VERTICAL CLEANOUT WASTE		MAINTAIN FIRE RATING. COORDINATE LOCATIONS WITH ARCHITEC 32. PLUMBING CONTRACTOR IS REQUIRED TO NOTIFY FACILITY OWNE
HP HC HR HC	ORSE POWER OUR	WCO WPD WTR	WALL CLEANOUT WATER PRESSURE DROP WATER		AND/OR NOT MORE THAN 10 WORKING DAYS PRIOR TO EXCAVATION WHEN USING POWERED EQUIPMENT ON PUBLIC OR PRIVATE PROF
HW HC	EIGHT OT WATER OT WATER RETURN	W/ W/O	WITH WITHOUT		33. PENNSYLVANIA ONE CALL SYSTEM 1-800-242-1776.
	CH				34. PLUMBING CONTRACTOR TO MAKE FINAL CONNECTION TO FOOD S VERIFY CONNECTION SIZE WITH FOOD SERVICE DRAWINGS.
				<b></b>	
				PLUMBIN	G DRAWING LIST

	PLUMBING DRAWING LIST
P0.0	PLUMBING INFORMATION SHEET
P1.0	FIRST FLOOR PLAN - DOMESTIC WATER
P1.1	SECOND FLOOR PLAN - DOMESTIC WATER
P2.0	FIRST FLOOR PLAN - SANITARY
P2.1	SECOND FLOOR PLAN - SANITARY
P5.0	PLUMBING DIAGRAMS & SCHEDULES
P6.0	PLUMBING SPECIFICATIONS

## GENERAL NOTES:

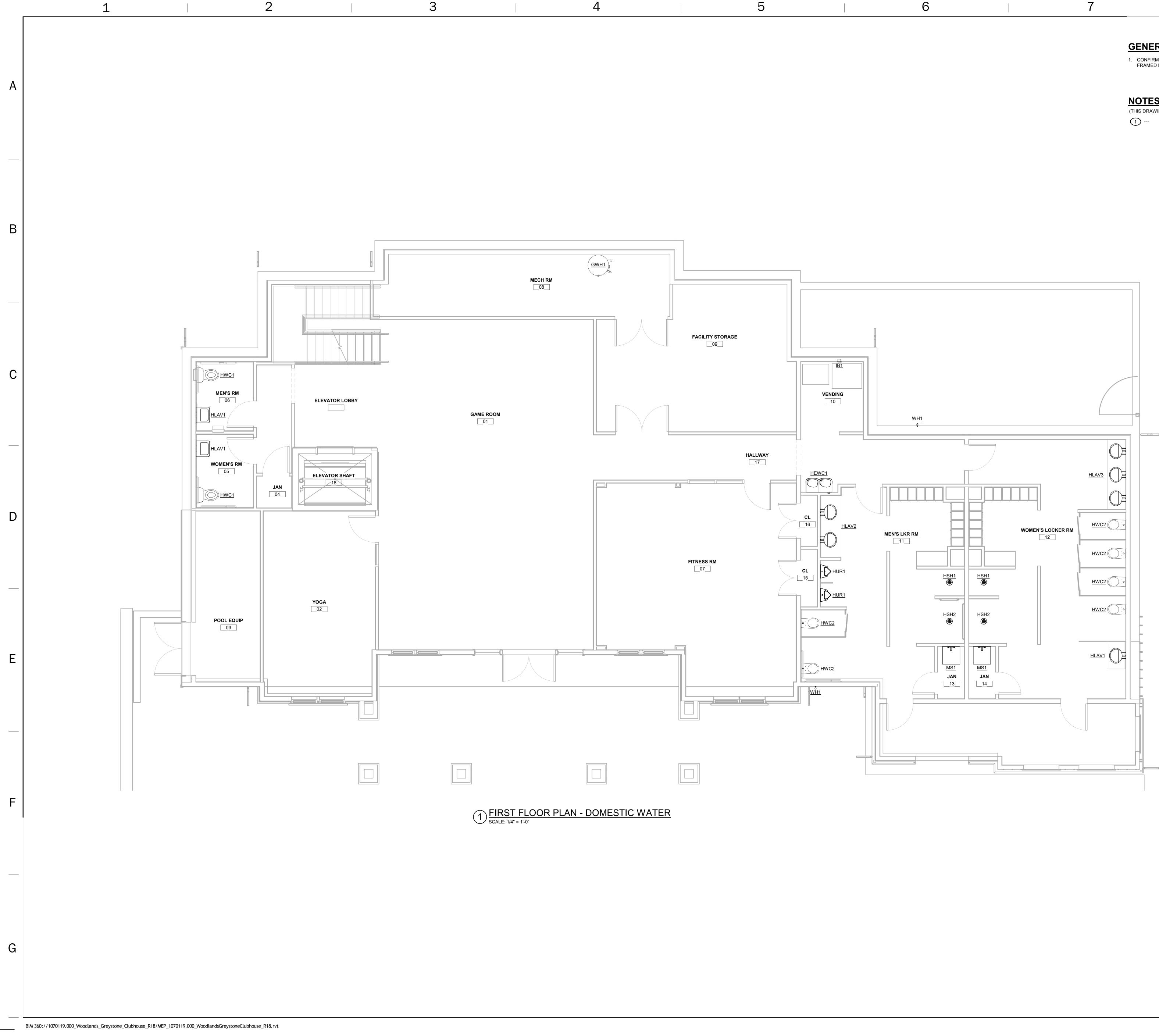
1.	CONTRACTOR SHALL PROVIDE A COMPLETE AND WORKING SYSTEM WITH ALL NECESSARY PERMITS AND APPROVALS FROM AUTHORITIES HAVING JURISDICTION.	
2.	INSTALL ALL EQUIPMENT AND MATERIALS IN STRICT ACCORDANCE WITH CURRENT ADOPTED LP.C. OR CURRENT ADOPTED N.S.P.C. ALL PERTINENT CODES, LAWS,	

- R'S WRITTEN REQUIREMENT SHALL
- CONTRACTORS, OWNER
- AWINGS MUST FOLLOW AS TIONS SHALL BE NG CONTRACTOR WILL BE ATERIALS AND EQUIPMENT AND MEANING OF THE
- OF HIS WORK SO AS TO IPLETE THE ENTIRE /ILL PERMIT.
- ICALLY DESCRIBED HEREIN CESSARY FOR THE DED WITHOUT EXTRA COST. QUIPMENT REMOVED SHALL ALLY DISPOSED OF OFF THE
- O PROPERLY SECURE
- BELOW THE GROUND SHALL TS AND FITTINGS OR SERVICE ERTIGHT AND GASTIGHT. CTION OF FIXTURES OR UGGING UP ALL OPENINGS TS SHALL BE CORRECTED.
- ER PIPING WITH COLORED, ND DIRECTIONAL ARROWS AS
- R ACCESS TO ALL R MEANS IS PROVIDED. CTION TO MAINTAIN RATING.
- OVER ELECTRICAL PANELS. ANELS.
- L BE TYPE 'L' COPPER, ASTM AND/OR UNDERGROUND SHALL BE WROUGHT Y ARE ATTACHED. JOINTS PING HAS BEEN INSTALLED, CTED, THE SYSTEM SHALL UARE INCH. THE PRESSURE JCCESSFUL TESTING, FLUSH FERILIZE THE WATER IPES WITH FRESH WATER TO DRMED IN ACCORDANCE
- AIN WATER PIPING, ALL GLASS WITH WHITE KRAFT H FIBERGLAS YARN. ACKET OR APPROVED DED ONE-PIECE P.V.C. /50° OR EQUAL.
- TO THE OWNER FOR EACH I HIS CONTRACT.
- S SERVICES AND NSPECT THE EXISTING N OF A CHANGE ORDER. LL DAMAGES WHICH MAY E ANY UNDERGROUND
- NG ALL MATERIALS, FROM DATE OF
- ATER SUPPLY PIPING FROM OR TYPES. LOCATE AT THE
- T/ENGINEER AS-BUILT UDING ALL NAME PLATE PARTS LIST UPON PROJECT
- HE LOCAL FROST LINE.
- BE CONCEALED IN WALLS L STACKS SHALL BE IMUM SIZE OF SANITARY
- AREA AT ALL TIMES. ALL LITY OF THE CONTRACTOR.
- E INSTALLED WHERE SYSTEM.
- OUPED TO INCLUDE ID ACCESSORIES IN A
- AND INSPECTIONS. ALL RACTOR.
- E 40 BLACK STEEL PIPE WITH AP AT ALL POINTS WHERE S SHALL RECEIVE (1) COAT **GROUND PIPING SHALL BE NGS AND TRANSITIONS** G SHALL BE INSTALLED IN PA, AGA AND BOCA.
- TION, FILL, AND PATCHING ING CONTRACTOR. DO NOT
- URN AIR PLENUMS, PROVIDE MANUFACTURER'S WRITTEN
- O BE DONE BY ANOTHER PING, AND APPURTENANCES FICATIONS OR ADDITIONS. FURAL SUPPORTS, UNITS, RIOR TO WORK ETERMINED PRIOR TO BID
- ACE PREPARED TO RECEIVE OR AS SELECTED BY THE
- INGS AND PARTITIONS TO ECTURAL DRAWINGS.
- NERS NOT LESS THAN 3 ATION OR DEMOLITION WORK ROPERTY.
- D SERVICE EQUIPMENT.



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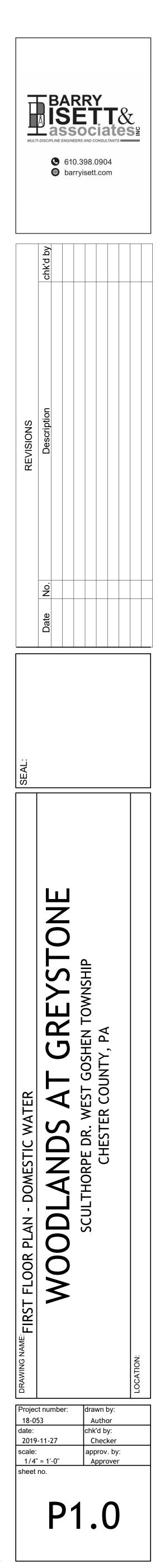
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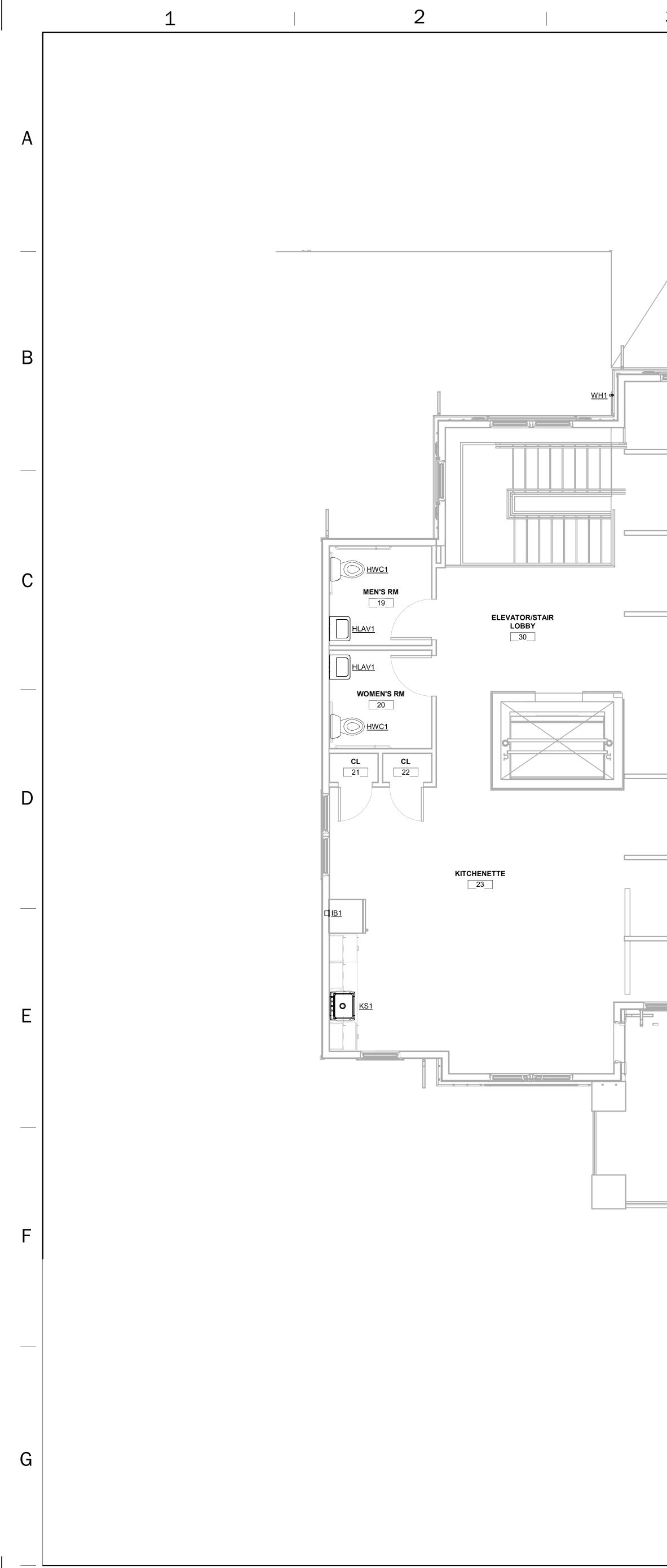
## **GENERAL NOTES:**

1. CONFIRM WALLS WITH MOUNTED WATER CLOSETS/URINALS ARE FRAMED LARGE ENOUGH TO ACCEPT FIXTURE CARRIERS.

NOTES BY SYMBOL: (#) (THIS DRAWING ONLY)



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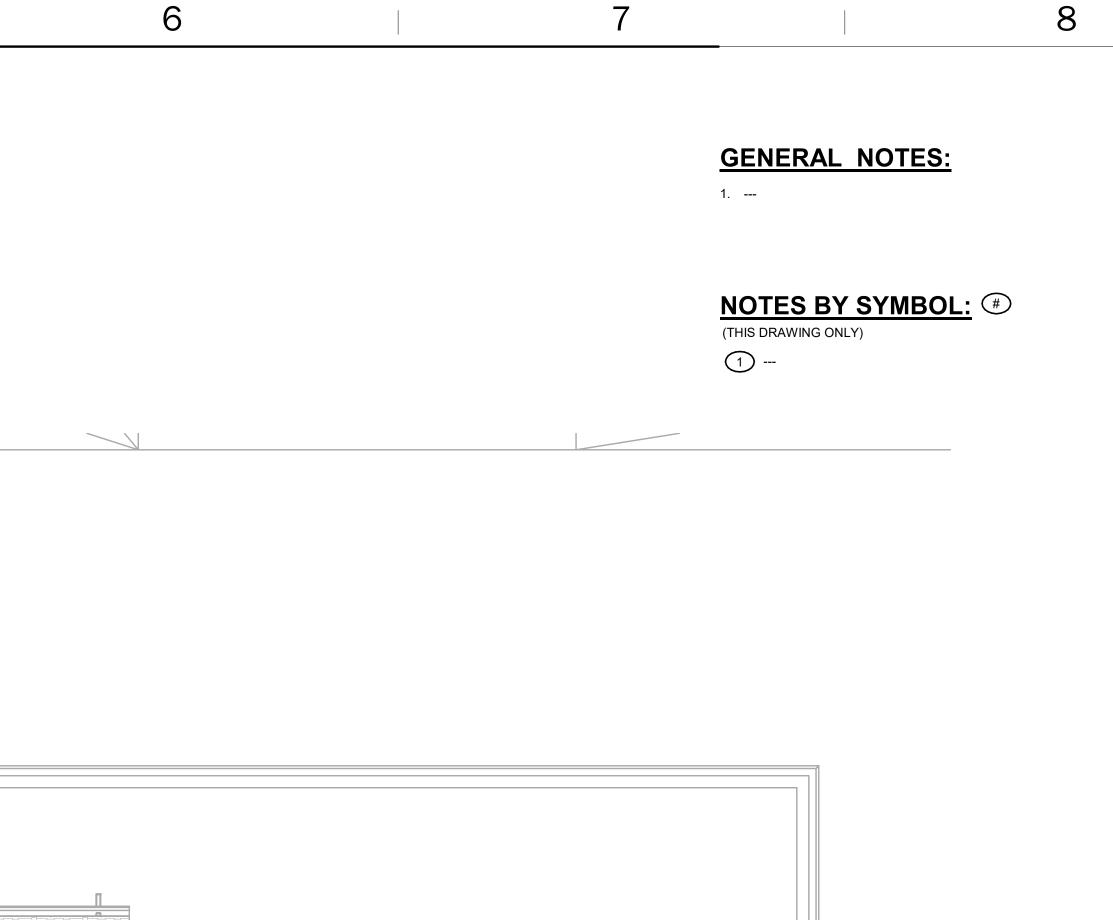
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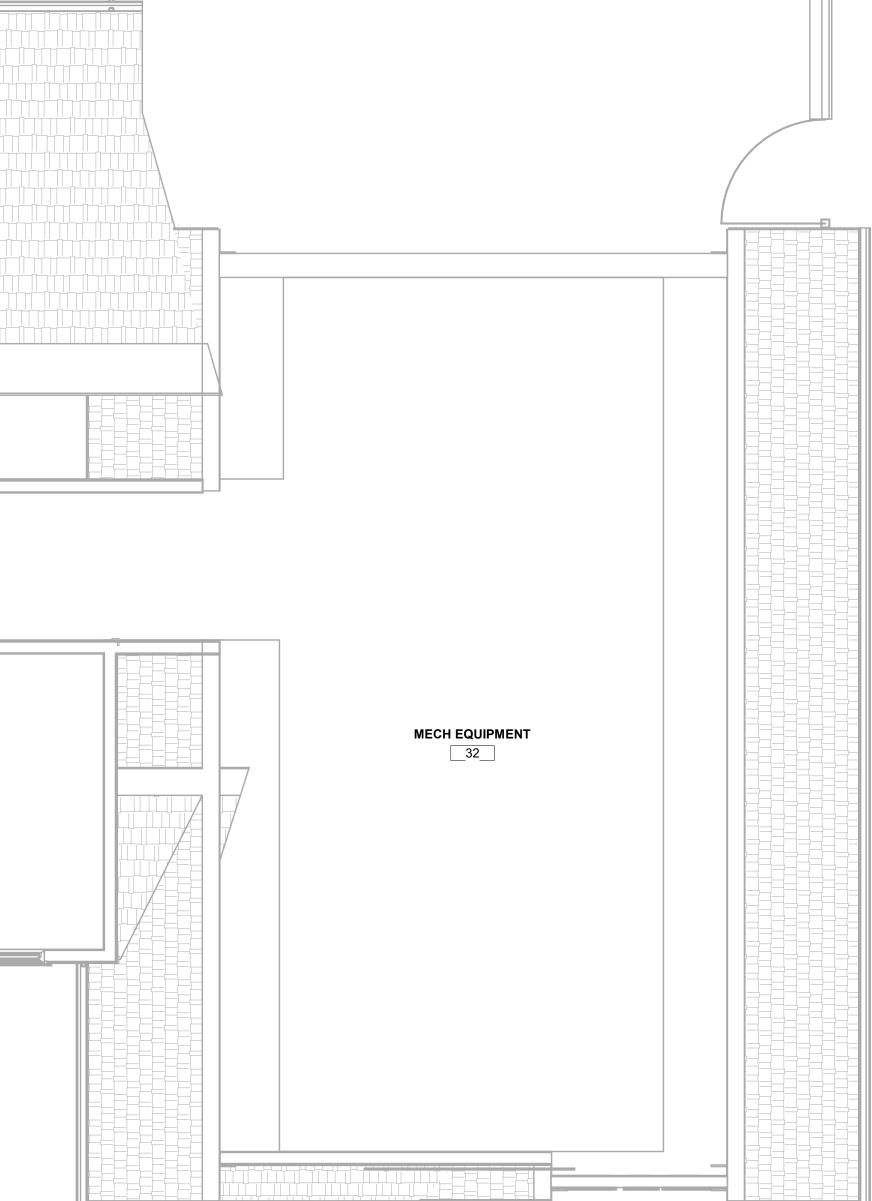
	VESTIBULE (NON-CONDITIONED)		
	GREATROOM 24		MANAGEMENT OFFICE
		I	
I		I	CONFERENCE 26 CL 27 CL 27
3			SUNROOM 25_

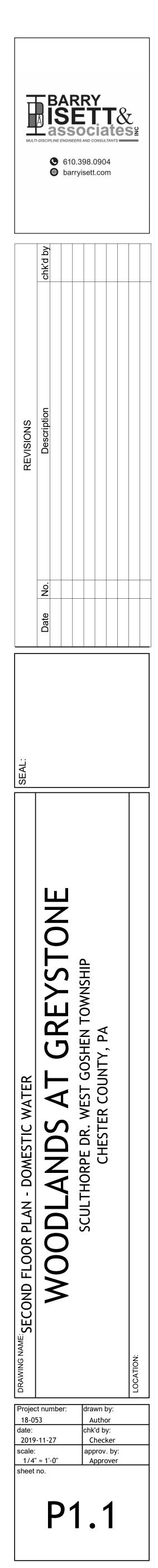
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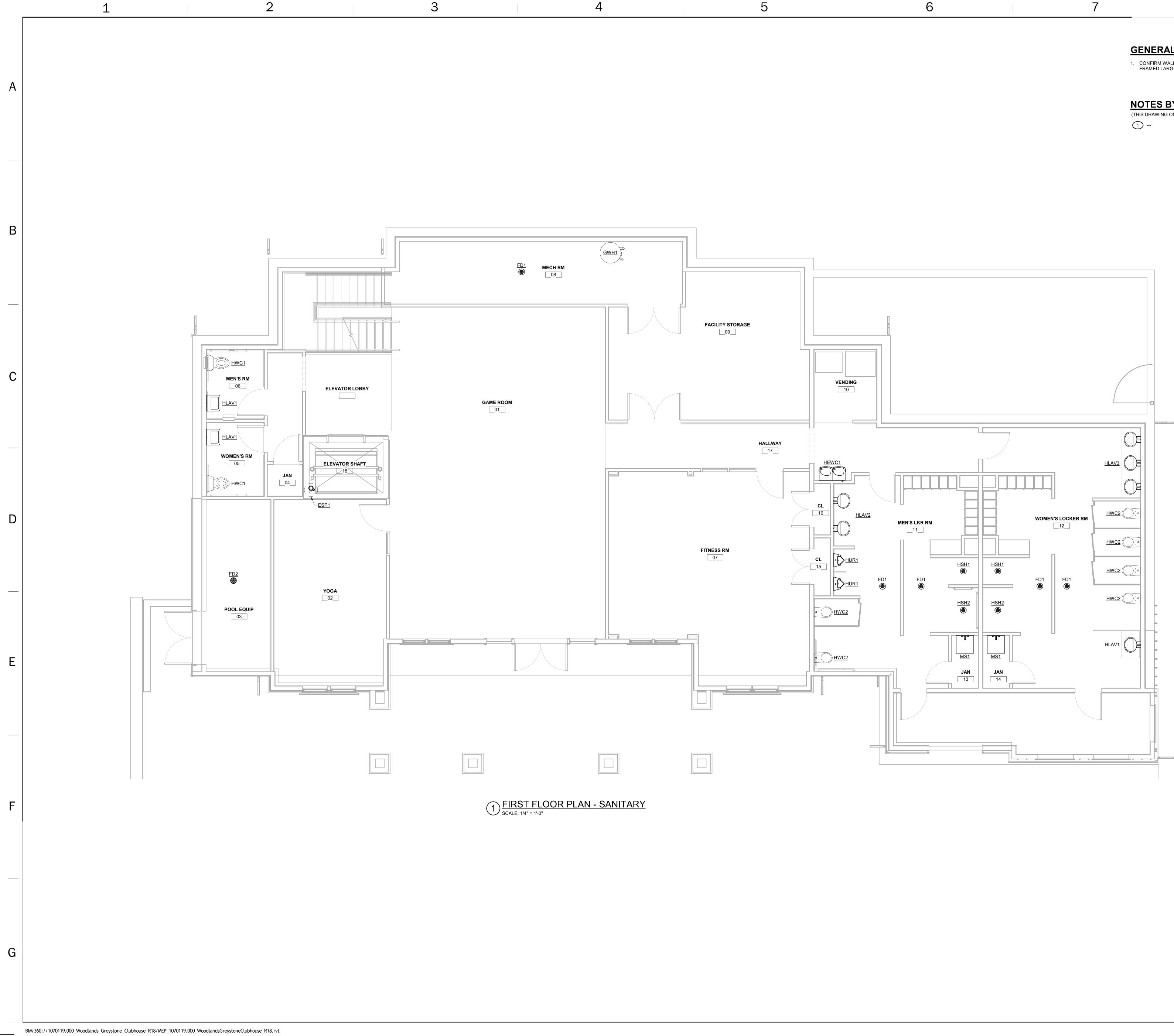
1 SECOND FLOOR PLAN - DOMESTIC WATER SCALE: 1/4" = 1'-0"







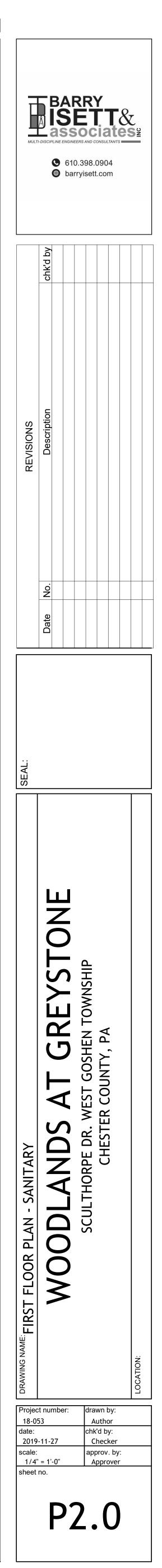
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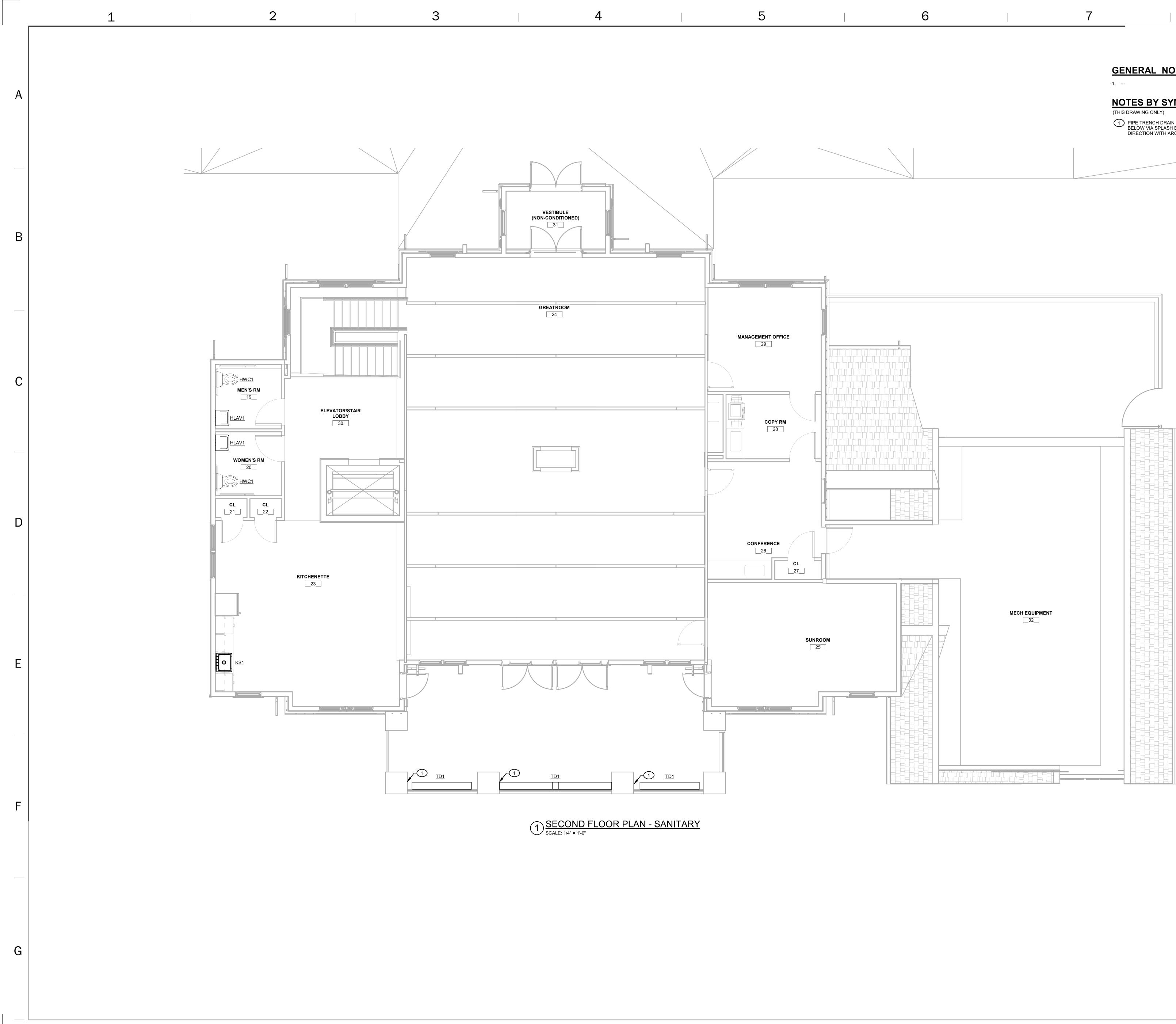
1. CONFIRM WALLS WITH MOUNTED WATER CLOSETS/URINALS ARE FRAMED LARGE ENOUGH TO ACCEPT FIXTURE CARRIERS.

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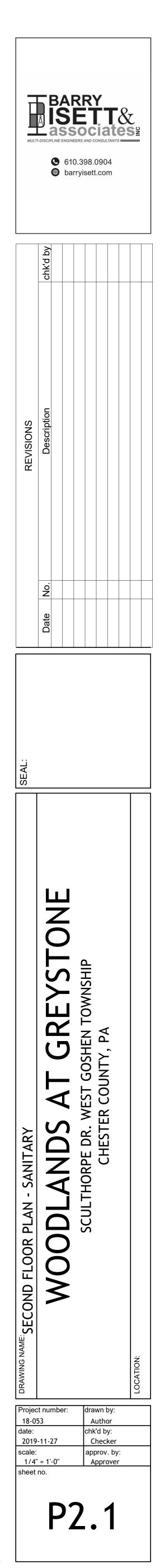


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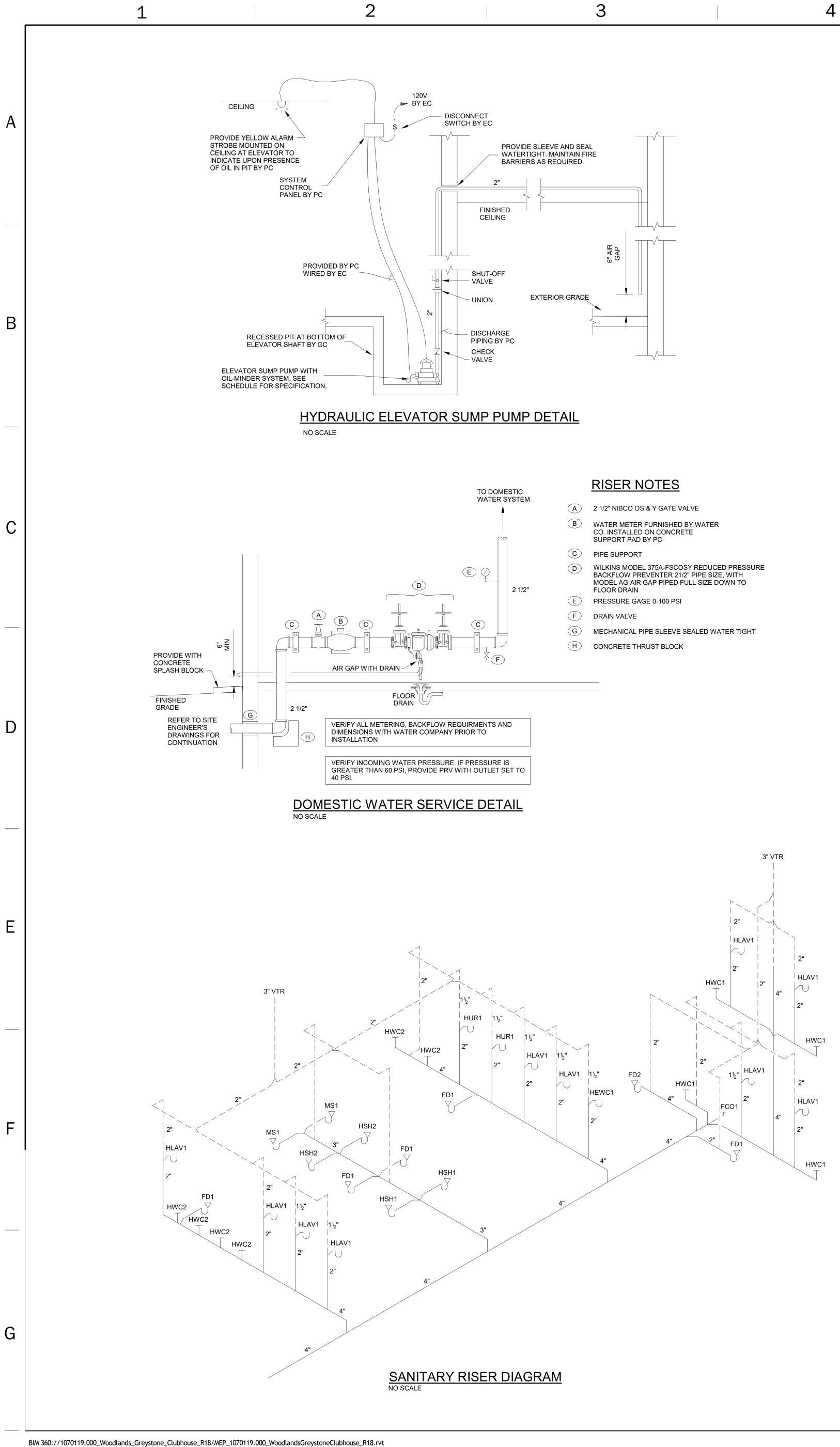
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6	7		8
	GEN	NERAL NOTES:	
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		TES BY SYMBOL: ( DRAWING ONLY)	#
			IN BELOW & DISCHARGE TO DECK DINATE DISCHARGE LOCATION AND



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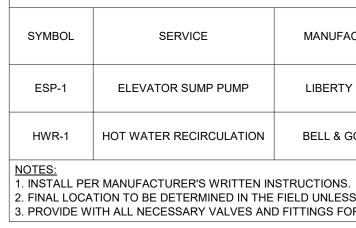
				PL	UMBING	EQUIPMEN	T :	SCHE	EDUL	E					
SYMBOL	FIXTURE TYPE	MANUFACTURER	MODEL NO.	FAUCET/ VALVE	ANSI/ASME APPROVALS	MOUNTING/ SUPPORT	HW	* MINII CW	MUM PIPE	SIZES	VENT	DFU **	WSFU	ELECTRIC	NOTES
ECO1	EXTERIOR CLEAN OUT	ZURN	Z1400	-	A112.21.1M	FINISHED GRADE	-	-	4"	-	-	-	-	-	INSTALL FLUSH AND LEVEL WITH CONCRETE
ESP1	ELEVATOR SUMP PUMP	REFER TO DETAIL		-	-	ELEV PIT	-	-	2"	-	-	-	-	-	PROVIDE WITH ALL NECESSARY FLOAT SWITCH AND CHECK VALVE
FCO1	FLOOR CLEAN OUT	ZURN	ZN1400	-	A112.21.1M	FLOOR	-	-	4"	-	-	-	-	-	INSTALL FLUSH AND LEVEL WITH FLOOR
FD1	FLOOR DRAIN	ZURN	ZN415-B	-	A112.6.3-2001	FLOOR	-	-	2"	2"	1½"	-	-	-	WITH 5" DEEP TRAP, PROVIDE WITH TRAP SEAL PROTECTION
FD2	FLOOR DRAIN	ZURN	ZN415-B	-	A112.6.3-2001	FLOOR	-	-	4"	4"	2"	-	-	-	WITH 5" DEEP TRAP, PROVIDE WITH TRAP SEAL PROTECTION
HEWC1	HANDICAP ELECTRIC WATER COOLER	OASIS	PG8ACSL	-	NSF61 SECTION 9-1997B	WALL BRACKET	-	1/2"	1½"	1½"	1½"	.5	.25	120V, 4.6A ¼ HP	MOUNT 36" AFF TO TOP OF SPOUT, ANTI MICROBIAL SURFACE
HLAV1	HANDICAP LAVATORY	BRADLEY	1-STATION LVSD1	(INTEGRAL)	A112.19.2M/ A117.1	WALL	1/2"	1,2"	1½"	1½"	1½"	1	2	-	1.5 GPM (EACH STATION), POLISHED CHROME. S NOTE 3. PROVIDE ADA TRAP AND POLISHED CHROME GRID STRAINER.
HLAV2	HANDICAP LAVATORY	BRADLEY	2-STATION LVSD2	(INTEGRAL)	A112.19.2M/ A117.1	WALL	1/2"	1,-"	1½"	1½"	1½"	1	2	-	1.5 GPM (EACH STATION), POLISHED CHROME. S NOTE 3. PROVIDE ADA TRAP AND POLISHED CHROME GRID STRAINER.
HLAV3	HANDICAP LAVATORY	BRADLEY	3-STATION LVSD3	(INTEGRAL)	A112.19.2M/ A117.1	WALL	1/2" 1/2	1, <b>"</b>	1½"	1½"	1½"	1	2	-	1.5 GPM (EACH STATION), POLISHED CHROME. S NOTE 3. PROVIDE ADA TRAP AND POLISHED CHROME GRID STRAINER.
HSH1	HANDICAP SHOWER	ZURN	ZN415-B	ZURN Z7301-SS-MT-DV2P- HW11-H3-S9-VB	A117.1/ Z-124-2	SET IN MORTAR BED	¹ /2"	¹ /2"	2"	2"	1½"	2	4	-	DRAIN & SHOWER TRIM ONLY. PITCHED FLOOR & SURROUND BY OTHERS. SEE NOTE 8
HSH2	HANDICAP SHOWER	ZURN	ZN415-B	ZURN Z7301-SS-MT-DV2P- HW11-H3-S9-VB	A117.1/ Z-124-2	SET IN MORTAR BED	1/2"	1 ₂ "	2"	2"	1½"	2	4	-	DRAIN & SHOWER TRIM ONLY. PITCHED FLOOR & SURROUND BY OTHERS. SEE NOTE 8
HUR1	HANDICAP URINAL	ZURN	Z5755-U	ZURN ZTR6203-EWS-LL	A112.19.2M/ A112.19.6M/A117.1	WALL	-	34"	2"	-	1½"	2	5	-	0.5 GPF, MOUNT RIM 17" AFF, CAULK TO WALL,
HWC1	HANDICAP WATER CLOSET	ZURN	Z5555-K	SIPHON JET	A112.19.2	FLOOR	-	1/2"	4"	-	2"	4	5	-	1.28 GPF, SEE NOTE 6, ZURN SEAT Z5950
HWC2	HANDICAP WALL MOUNT WATER CLOSET	ZURN	Z5616-BWL	ZURN ZTR6200EV-LL	A112.19.2M/ A112.19.6M/A117.1	ZURN Z1201, Z1202	-	1"	4"	-	2"	4	10	-	1.28 GPF, SEE NOTE 5, ZURN SEAT Z5950
IB1	ICE MAKER WALL BOX	OATEY	38687	-	A112.18.1	WALL	-	1/2"	-	-	-	-	0.25	-	
KS1	KITCHEN SINK	ELKAY	LRAD2521 25"x21"	ZURN Z7870C-XL	A112.19.3M	COUNTER	½"	1/2"	11/2"	1½"	11/2"	2	1.4	-	1.5 GPM, WITH LK-335 DUO STRAINER AND TAILPIECE
MS1	TERRAZZO MOP SINK	STERN WILLIAMS	MTB-2424 24"x24"		A112.19.3M	FLOOR	3 ₄ "	34"	3"	3"	2"	2	3	-	SEE NOTE 8
TD1	TRENCH DRAIN	ZURN	Z886	-	A112.6.3	FLOOR	-	-	3	-	-	-	-	-	
WCO1	WALL CLEAN OUT	ZURN	Z1441	-	A112.36.2M	WALL	-	-	4"	-	-	-	-	-	
WH1	FREEZE PROOF WALL HYDRANT	ZURN	Z1300-CL	FLUSH WITH LOCK	A112.21.3M	WALL	-	34"	-	-	-	-	-	-	MOUNT MIN 24" AFG, PROVIDE WITH INTERIOR MOUNTED ACCESSIBLE SHUT-OFF VALVE
WHA1	WATER HAMMER ARRESTER	ZURN	Z1700	-	A112.26.1M	ABOVE CEILING/ IN WALL		³₄"−1"	-	-	-	-	-	-	100=1-11; 200=12-32; 300=33-60; 400=61-113; 500=114-154; 600=155-300

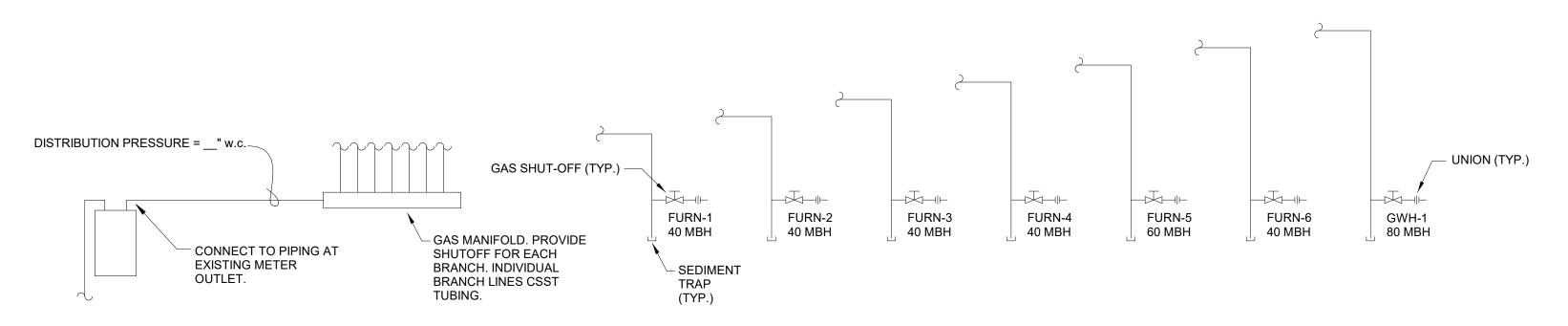
* MINIMUM SANITARY/VENT PIPE SIZE BELOW SLAB IS 2". ** VALUES TAKEN FROM TABLES 709.1 AND E103.3(2) FROM THE CURRENT ADOPTED IPC NOTES:

1. ALL FIXTURES TO BE BY MANUFACTURER NOTED, OR APPROVED EQUAL, AND SUPPLIED WHITE UNLESS NOTED OR DIRECTED BY ARCHITECT. ALL EXPOSED PIPING, P-TRAPS AND STOP VALVES TO BE CHROME PLATED BRASS.
 PROVIDE WITH PRE-FORMED INSULATION KIT, WHITE IN COLOR ON ALL EXPOSED PIPING FOR HANDICAP FIXTURES. 4. PROVIDE STOP VALVES AT EACH FIXTURE.

5. MOUNT FLUSH VALVE HANDLE ON ACCESS SIDE OF WATER CLOSET. 6. MOUNT TRIP LEVER ON ACCESS SIDE OF WATER CLOSET. 9. PROVIDE WITH GRAB BARS, PRESSURE BALANCE MIXING VALVE, HAND HELD SHOWER, FLEXIBLE METAL HOSE, 30" SLIDE BAR, AND VACUUM BREAKER

SYMBOI	L	FIXTU	JRE TYPE					
GWH1		• • • • •	GAS-FIRED WATER HEATER					
2. FINAL L 3. PROVIE 4. PROVIE 5. VENTIN	.OC DE \ DE \ DE \ IG 1	ATION TO WITH ALL N WITH T&P Y TO BE INST	ACTURER'S N BE DETERMIN NECESSARY N VALVE TO DIS TALLED ACCO ATE NEUTRAL					
	ŝ	SYMBOL	SEI					





NOTE: COMMENCING WORK.

NOTE:

6	7	8

7. PROVIDE WITH STAINLESS STEEL BUMPER GUARDS (-BG), WALL GUARDS (-WG) CAULKED, HOSE AND HOSE BRACKET (-HH) AND MOP HANGER BRACKET (-MH) MOUNTED ABOVE SINK. 8. PROVIDE WITH VINYL BUMPER GUARDS (V-70), WALL GUARDS (BP-2) CAULKED), HOSE AND HOSE BRACKET (T-35) AND MOP HANGER BRACKET (T-40) MOUNTED ABOVE SINK. 10. PROVIDE WITH SUMP RECEIVER, UNDER DECK CLAMPS, CAST IRON DOME AND EXTENSION COLLARS AS NECESSARY FOR A COMPLETE INSTALLATION.

	GAS FIRED WATER HEATER SCHEDULE											
	MANUFACTURER	MODEL NO.	MOUNTING/		INLET/OU	TLET CO	NNECTIO	NS	INPUT MBH		NOTES	
	MANOLAOTORER	MODEL NO.	SUPPORT	HW	CW	GAS	INTAKE	EXHAUST			NOTED	
2	BRADFORD WHITE	LG2PDV75H805N	FLOOR	3 ₄ "	3 ₄ "	¹ /2"	3"-4"	3"-4"	80	120V	75 GALLON, 77 GPH RECOVERY @ 100°F TEMP RISE	

S WRITTEN INSTRUCTIONS. MINED IN THE FIELD UNLESS NOTED OTHER WISE.

VALVES AND FITTINGS FOR A COMPLETE INSTALLATION.

DISCHARGE WITH AIR GAP TO MOP SINK OR FLOOR DRAIN. CORDING TO MANUFACTURER'S WRITTEN INSTRUCTIONS AND APPLICABLE FUEL GAS CODE. LIZATION KIT.

PUMP SCHEDULE

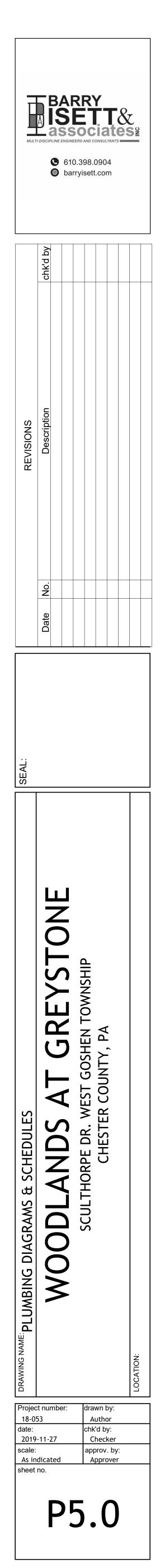
ERVICE	MANUFACTURER	MODEL NO.	GPM	FT. HD.	HP	FLA	LRA	RPM	ELECTRIC	NOTES
OR SUMP PUMP	LIBERTY PUMPS	ELV280	50	15	1/2	8.0	23.0	3,450	115/1/60	INTEGRAL FLOAT OPERATION. DIRECT WIRED, HIGH LEVEL ALARM. MOUNT ALARM IN VISIBLE AND AUDIBLE LOCATION. RECEPTACLE BY E.C.
R RECIRCULATION	BELL & GOSSETT	ECOCIRC 9-16	8	15	4-60 W	-	-	-	115/1/60	STAINLESS STEEL PUMP BODY.

2. FINAL LOCATION TO BE DETERMINED IN THE FIELD UNLESS NOTED OTHER WISE. 3. PROVIDE WITH ALL NECESSARY VALVES AND FITTINGS FOR A COMPLETE INSTALLATION.

VERIFY METER OUTLET PRESSURE PRIOR TO

GAS PIPE SIZING BASED ON 2015 IFGC TABLE 402.4(_) FOR A TOTAL CONNECTED LOAD OF 340 MBH AND DEVELOPED LENGTH OF 125 FT.

GAS RISER DIAGRAM



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#### **PLUMBING SPECIFICATIONS**

THE SCOPE OF PLUMBING WORK INCLUDED IN THIS CONTRACT SHALL INCLUDE COMPLETE PLUMBING SYSTEMS AS SHOWN ON THE DRAWINGS AND SPECIFIED HEREIN. ANY WORK REASONABLY INFERABLE FROM THE DRAWINGS AND SPECIFICATIONS, AS REQUIRED TO RESULT IN A COMPLETE INSTALLATION AND THE INTENDED OPERATION AND PERFORMANCE OF THE SYSTEMS, SHALL BE INCLUDED IN THE BASE BID EXCEPT WHERE THERE IS SPECIFIC REFERENCE TO EXCLUSION AND

EQUIPMENT AND MATERIALS, UNLESS SPECIFICALLY INDICATED OTHERWISE, SHALL BE NEW AND OF FIRST QUALITY, PRODUCED BY MANUFACTURERS WHO HAVE BEEN REGULARLY ENGAGED IN THE MANUFACTURE OF THESE PRODUCTS FOR A PERIOD OF NOT LESS THAN FIVE YEARS.

NOTE THAT WHERE SPECIFIC MANUFACTURERS' PRODUCTS ARE INDICATED ON THE DRAWINGS, THE ASSOCIATED SYSTEMS HAVE BEEN DESIGNED ON THE BASIS OF THAT PRODUCT'S PHYSICAL CHARACTERISTICS. WHERE SPECIFIC MANUFACTURERS' PRODUCTS' ARE NOT INDICATED ON THE DRAWINGS AND MORE THAN ONE MANUFACTURER IS NAMED IN THE SPECIFICATIONS, THE ASSOCIATED SYSTEMS HAVE BEEN DESIGNEDON THE BASIS OF THE FIRST-NAMED MANUFACTURER'S PRODUCT. WHEN PRODUCTS OTHER THAN THOSE USED AS THE BASIS OF DESIGN ARE PROVIDED, ADDITIONAL COSTS RELATED TO MODIFICATIONS TO THE SYSTEMS AND/OR STRUCTURE REQUIRED BY THE USE OF THAT PRODUCT SHALL BE PAID BY THE CONTRACTOR.

ORGANIZATION, SUCH AS UNDERWRITERS' LABORATORIES, INC., OR FACTORY MUTUAL ENGINEERING CORPORATION AND MATERIALS SHALL BE LABELED, CERTIFIED OR LISTED BY SUCH ORGANIZATIONS. WORKMANSHIP AND MATERIALS SHALL BE GUARENTEED ONE YEAR FROM THE OWNER'S

WHATEVER ADJUSTMENTS ARE TO THEIR INSTALLATION, OR REPLACE ANY MATERIAL OR EQUIPMENT THAT PROVES TO BE UNSATISFACTORY. ALL GUARENTEES SHALL BE IN, ADDITIONAL TO EXPRESSED GUARANTEES OF MANUFACTURER'S AND OR SUPPLIERS.

INSTALLATION OF PLUMBING SYSTEMS SHALL BE IN COMPLIANCE WITH THE CURRENT ADOPTED IPC, ALL PERTINENT CODES, LAWS, ORDINANCES, REGULATIONS, UTILITY STANDARDS AND AS PER

THE SPECIFICATIONS AND DRAWINGS ARE INTENDED TO SERVE JOINTLY AS A BASIS UPON WHICH THE CONTRACTOR SHALL SUBMIT A CONTRACT PRICE FOR THE MATERIAL AND LABOR PROVISIONS. WHEN CONFLICTS OCCUR IN THE SPECIFICATIONS OR ON THE DRAWINGS, OR BETWEEN EITHER, THE ITEMS GREATER QUANTITY OR HIGHER COST SHALL BE PROVIDED. THE CONTRACTOR SHALL COORDINATE THEIR WORK IN ORDER THAT CONFLICTS IN SPACE

MATERIALS FURNISHED AND WORK INSTALLED SHALL COMPLY WITH CURRENT ADOPTED IPC, WITH THE NATIONAL FIRE CODES OF THE NATIONAL FIRE PROTECTION ASSOCIATION, WITH THE REQUIREMENTS OF THE LOCAL UTILITY COMPANIES, AND WITH THE REQUIREMENTS OF GOVERNMENTAL DEPARTMENTS OR AUTHORITIES HAVING JURISDICTION. MATERIALS AND EQUIPMENT FURNISHED FOR THE ELECTRICAL PORTION OF THE MECHANICAL SYSTEMS SHALL BEAR THE APPROVAL LABEL OF OR SHALL BE LISTED BY THE UNDERWRITERS' LABORATORIES, INC. ELECTRICAL WORK SHALL COMPLY WITH THE CURRENT NATIONAL ELECTRICAL CODE.

#### QUIET OPERATION AND VIBRATION CONTROL

EQUIPMENT AND ASSOCIATED ITEMS SHALL OPERATE UNDER CONDITIONS OF LOAD WITHOUT SOUND OR VIBRATION DEEMED OBJECTIONABLE BY THE ENGINEER/ARCHITECT/OWNER. IN THE CASE OF MOVING EQUIPMENT, SOUND OR VIBRATION NOTICEABLE OUTSIDE OF THE ROOM IN WHICH IT IS INSTALLED, SHALL BE DEEMED OBJECTIONABLE SHALL BE CORRECTED IN AN APPROVED MANNER AT NO EXTRA COST TO THE OWNER. VIBRATION ISOLATORS AND INSTALLED IN ACCORDANCE WITH THE

ALL ROTATING PLUMBING EQUIPMENT AND ITS ASSOCIATED PIPING SHALL BE PROVIDED WITH VIBRATION ISOLATORS COMBINATION NEOPRENE/SPRING HANGER.

COORDINATE AND FURNISH TO THE OWNER, IN WRITING, ANY INFORMATION NECESSARY TO PERMIT THE WORK TO BE INSTALLED SATISFACTORILT AND WITH THE LEAST POSSIBLE INTERFERENCE OR

LOCATE EQUIPMENT WHICH MUST BE SERVICED, OPERATED OR MAINTAINED IN FULLY ACCESSIBLE POSITIONS. EQUIPMENT REQUIRING ACCESS SHALL INCLUDE, BUT IN NOT NECESSARILY LIMITED TO FILTERS, VALVES, TRAPS, CLEAN OUTS, MOTORS, CONTROLLERS, SWITCH GEAR AND DRAIN POINTS.

THE PLUMBING CONTRACTOR SHALL ENSURE THAT ALL EQUIPMENT PROVIDED IS COMPATIBLE WITH

UNDER THIS CONTRACT. ALL CONTROL WIRING SHALL BE 24 VOLT. CONTRACTOR SHALL PROVIDE ALL

PURCHASED UNDER THIS DIVISION OF THE SPECIFICATIONS.

#### **DISCONNECT SWITCHES**

PRODUCT: WESTINGHOUSE TYPES HF OR HU; GENERAL ELECTRIC TYPE TH; OR SQUARE D TYPE HU.

#### **OWNER TRAINING**

PROVIDE A ONE (1) HOUR TRAINING SESSION WITH OWNERS PERSONNEL AT COMPLETION OF THE JOB. NOTIFY THE OWNER AND ENGINEER IN WRITING AT LEAST FIVE (5) WORKING DAYS BEFORE SCHEDULING THE TRAINING SESSION.

#### PIPING AND ACCESSORIES

PIPING SHALL BE TESTED AS INDICATED. ISOLATE EQUIPMENT, CONTROLS, INSTRUMENTS AND VALVES FROM THE PIPING SYSTEM DURING HYDROSTATIC TESTS.

ALL SANITARY AND VENT PIPING AND RAIN WATER ABOVE AND BELOW THE GROUND SHALL BE SCH. 40 DWV PVC PLASTIC PIPE WITH SOLVENT WELD JOINTS AND FITTINGS OR SERVICE WEIGHT CAST IRON, NO-HUB OR BELL AND SPIGOT. ALL PIPING LOCATED IN RETURN AIR PLENUMS SHALL BE SERVICE WEIGHT CAST IRON. MAKE ALL JOINTS WATERTIGHT AND GASTIGHT. WHEN ROUGH-IN WORK IS COMPLETED AND BEFORE CONNECTION OF FIXTURES OR DRAINS, THE SYSTEM SHALL BE SUBJECTED TO A WATER TEST BY PLUGGING UP ALL OPENINGS AND FILLING ALL OF THE LINES TO THE ROOF LEVEL. ALL DEFECTS SHALL BE CORRECTED.

INTERIOR COLD AND HOT WATER PIPING IN THE BUILDING SHALL BE TYPE 'L' COPPER OR PEX-A. TYPE 'L' COPPER: ASTM SPEC, B-88-51 WITH A 150 PSI WORKING PRESSURE. EXTERIOR AND/OR UNDERGROUND PIPING SHALL BE TYPE 'K' COPPER OR DUCTILE IRON. FITTINGS SHALL BE WROUGHT COPPER OF WEIGHT CORRESPONDING TO PIPE TO WHICH THEY ARE ATTACHED. JOINTS SHALL BE SOLDERED USING

PEX-A ENGEL METHOD CROSSLINKED POLYETHYLENE PIPIN, ASTM F876 AND F877 BY UPONOR OR APPROVED EQUAL. FITTINGS AND TEES SHALL BE POLYSULFONE ASTM D6394 WIHT REINFORCING COLD-EXPANSION RINGS MADE BY SAME MANUFACTURER AS PEX PIPINAND MARKED 'F1960'.

AFTER ALL PIPING HAS BEEN INSTALLED, BUT BEFORE ANY EQUIPMENT OF FIXTURES HAVE BEEN CONNECTED, THE PRESSURESHALL BE MAINTAINED FOR A PERIOD OF (2) HOURS. AFTER SUCCESSFUL TESTING, FLUSH ALL PIPING TO REMOVE DIRT FROM FOREIGN MATTER, THEN STERILIZE THE WATER SYSTEM WITH A CHLORINE OR HTH SOLUTION. FLUSH WATER PIPES WITH FRESH WATER TO REMOVE CHLORINE SOLUTION. STERILIZATION SHALL BE PERFORMED IN ACCORDANCE WITH AWWA SPECIFICATIONS C601-53T.

ALL ABOVE GROUND NATURAL GAS PIPING SHALL BE ASTM A53 SCHEDULE 40 BLACK STEEL PIPE WITH MALLEABLE IRON THREADED FITTINGS OR ASTM 240. TYPE 304 CORRUGATED STAINLESS STEEL TUBING WITH ASTM B16 MECHANICAL FITTINGS AND A CORROSION RESISTANT COATING. INSTALL A SEDIMENT TRAP AT ALL POINTS WHERE CONDENSATION MAY COLLECT. ALL EXTERIOR EXPOSED PIPING SHALL RECIEVE (1) COAT OF PRIMER AND (2) COATS OF GRAY EPOXY PAINT. ALL BELOW GROUND PIPING SHALL BE ASTM D2513 POLYETHYLENE PIPE WITH ALL NECESSARY FITTINGS AND TRANSITIONS MANUFACTURED SPECIFICALLY FOR GAS SERVICE. ALL PIPING SHALL BE INSTALLED AND TESTED IN STRICT ACCORDANCE WITH CURRENT INTERNATIONAL FUEL GAS CODE, NFPA, AGA AND UTILITY STANDARDS.

#### **INSULATION**

LEAD-FREE SODLER.

INSULATION SHALL BE PROVIDED CONTINUOUSLY THROUGH SLEEVES AND OPENINGS.

PIPE INSULATION SHALL CONFORM TO RECOMMENDATIONS OF THE NFPA AND SHALL HAVE COMPOSITE FIRE AND SMOKE HAZARD RATINGS AS TESTED BY PROCEDURE ASTM-E-84, NFPA 255, OR UL-723, NOT EXCEEDING FLAME SPREAD 25 AND SMOKE DEVELOPED 50. SEAL ALL VAPOR BARRIERS CONTINUOUS AND THROUGHOUT AGAINST MOISTURE PENETRATIONS.

PIPE, PIPE FITTINGS, FLANGES AND VALVES SHALL BE INSULATED.

PROTECT PIPE INSULATION AT HANGERS, GUIDE AND ROLLERS BY 16 GAUGE GALVANIZED METRAL SHIELD ON OUTSIDE OF THE INSULATION AND VAPOR BARRIERS. PROVIDE HIGH DENSITY CALCIUM SILICATE INSULATION AT ALL HANGER POINTS.

SEAL ALL BUILDING ENVELOPE PENETRATIONS WITH SHEET METAL FLASHING AND SILICONE CAULKING.

INSULATE ALL DOMESTIC HOT AND COLD WATER LINES, ALL RAIN WATER PIPING. ALL FITTINGS AND VALVES. PIPE INSULATION SHALL BE RIGID FIBERGLASS WITH WHITE KRAFT BONDED TO ALUMINUM FOIL. K=0.23 @ 75° F., REINFORCED WITH FIBERGLASS YARN, SUITABLE FOR PAINTING , JOHNS MANVILLE MICRO-LOK 650 WITH AP-T JACKET OR APPROVED EQUAL, FITTINGS AND VALVES SHALL BE INSULATED WITH MOLDED ONE-PIECE P.V.C. COVERS WITH FIBERGLASS INSULATION, JOHNS MANVILLE ZESTON 25/50° OR EQUAL.

WHERE MANUFACTURED, FACTORY PREMOLDED FITTINGS (OF SAME MATERIAL AND THICKNESS AS THE PIPE INSULATION) SHALL BE USED FOR ALL FITTINGS, FLANGES AND VALVES. VALVES 2 1/2" AND SMALLER FOR SHUT-OFF AND BALANCING SERVICE, SHALL BE BALL VALVES.

WHERE PREMOLDED INSULATION FITTINGS ARE NOT MANUFACTURED, ALL FITTINGS, FLANGES AND VALVES SHALL BE INSULATED WITH MITERED SEGMENTS OF 7 LB. DENSITY FIBERGLASS PIPE COVERING OR THE INSULATION SHALL BE BUILT UP WITH 1 POUND FIBERGLASS AEROC OR WITH FACTORY REINFORCED FOIL VAPOR BARRIER TO A THICKNESS EQUAL TO THE ADJOINING INSULATION. HOT SERVICE FINISH APPLICATIONS SHALL CONSIST OF OPEN WEAVE GLASS MESH ADHERED WITH I.C. 501 (OR BF 30-36). VAPOR SEAL FOR COLD APPLICATIONS SHALL BE I.C. 501 (OR BF 30-35) ADHESIVE WITH OPEN WEAVE GLASS MESH AND OUTER COAT SHALL OVERLAP ADJACENT COVERING BY AT LEAST 2 INCHES.

MINIMUM PIPE INSULATION THICKNESS SHALL BE IN 1".

SHOP DRAWINGS, PRODUCT DATA AND SAMPLES

CONTRACTOR SHALL SUBMIT SHOP DRAWINGS AND PRODUCT DATA FOR EACH ELEMENT OF CONSTRUCTION AND TYPE OF PRODUCT OR EQUIPMENT. CONTRACTOR SHALL SUBMIT SIX (6) COPIES OF EACH DRAWING FOR REVIEW.

SUBMITTALS SHALL INCLUDE INFORMATION REGARDING PRODUCTS, OPTIONS, MANUFACTURER'S RECOMMENDATIONS, PRODUCT SPECIFICATIONS, CATALOG CUTS, PERFORMANCE DATA, COMPLIANCE WITH SPECIFIED STANDARDS, DIMENSIONS, WIRING DIAGRAMS, AND INSTALLED LOCATIONS.

6

#### VALVES

SYSTEM IT SERVES.

FIRE STOPPING

**SLEEVES AND ESCHUSIONS** 

PIPE SUPPORTS AND HANGERS

USES BY THE UNDERWRITERS' LABORATORIES INC.

APPROVED EQUAL.

PIPE SIZES STEEL:

1/2" TO 1 1/4"

1 1/2"

2 1/2"

4" & 5"

6"

3" & 3 1/2"

<u>COPPER:</u> 1/4" TO 3/4"

1" TO 1 1/4"

1 1/2" & 2"

<u>CPVC:</u> 1/4" TO 1 1/4"

1 1/2" & 2"

<u>PEX/PE:</u> 1/4" TO 1'

2 1/2"

3" & 5"

2 12/" AND SMALLER FOR SHUT-OFF SERVICE SHALL BE BALL VALVES.

BALL VALVES SHALL BE FULL PORT, TWO PIECE BRONZE BODY WITH SCREWED ENDS CHROME PLATED STEEL BALL, TFE SEATS AND STEM SEALS WITH T HANDLE. MANUFACTURER SHALL BE

AND SEATS. MANUFACTURER SHALL BE APOLLO, NIBCO OR APPROVED EQUAL.

GATE VALVES SHALL BE OS&Y, FULL PORT, CAST IRON BODY WITH FLANGED ENDS, BRONZE DISCS

CHECK VALVES SHALL BE SILENT LIFT TYPE RATED FOR SAME OPERATING PRESSURE AS THE PIPING

STRAINERS SHALL BE Y-PATTERN WITH BRONZE BODIES AND BRONZE BASKETS AND SHALL BE RATED

FOR SAME OPERATING PRESSURE AS THE PIPING SYSTEM IT SERVES. PROVIDE BLOW-OFF VALVE

ALL PLUMBING ITEMS THAT PASS THROUGH OR TERMINATE WITHIN FIRE SEPARATIONS OR

FIREWALLS SHALL BE FIRE STOPPED IN ACCORDANCE WITH THE IBC. REFER TO ARCHITECTURAL

PLANS FOR EXACT LOCATIONS. FIRE STOPPING PRODUCTS SHALL BE AS TESTED PER ASTM E-814

SLEEVES FOR PIPING THROUGH MASONRY WALLS SHALL BE SCHEDULE 40, STANDARD GALVANIZED

STEEL PIPE; IN FRAMED PARTITIONS SHALL BE 20. GUAR=GE SHEETMETAL. THE SPACE BETWEEN THE

ALL SUPPORTS AND PARTS SHALL CONFORM TO THE LATEST REQUIREMENTS OF THE ANSI CODE FOR

HANGERS SHALL BE MANUFACTURED BY GRINNEL CO., CENTRAL IRON, B-LIKE, BLAWKNOX CO, OR AN

MIN. ROD SIZES:

3/8"

3/8'

3/8'

1/2"

1/2"

5/8"

3/4"

3/8"

3/8"

3/8"

1/2"

1/2"

5/8"

3/8'

3/8"

1/2"

5/8"

3/4"

3/8"

PIPE HANGERS, RODS, INSERTS AND CLAMPS SHALL BE THOSE APPROVED FOR THEIR RESPECTIVE

UNLESS OTHERWISE SPECIFICALLY APPROVED, HANGER SIZE AND SPACING SHALL BE:

MAX. HANGER SPACING:

7 FT. O.C.

9 FT. O.C.

10 FT. O.C

11 FT. O.C.

12 FT. O.C.

12 FT. O.C

12 FT. O.C.

5 FT. O.C.

6 FT. O.C.

9 FT. O.C.

10 FT. O.C.

10 FT. O.C.

3 FT. O.C.

4 FT. O.C.

4 FT. O.C.

4 FT. O.C.

4 FT. O.C.

2 1/2 FT. O.C.

8 FT. O.C

PIPE AND ITS SLEEVE . SHALL NOT EXCEED ONE-HALF INCH. THE SLEEVE SHALL HAVE A SUFFICIENT

EXPOSED PIPING PASSING THROUGH WALLS, FLOORS, OR CEILINGS SHALL BE FITTED WITH

CHROMIUM-PLATED CAST BRASS ESCUTCHEONS WITH FASTENING SET SCREWS.

PRESSURE PIPING B31.9 AND MSS STANDARD PRACTICE SP-58 AND SP-59.

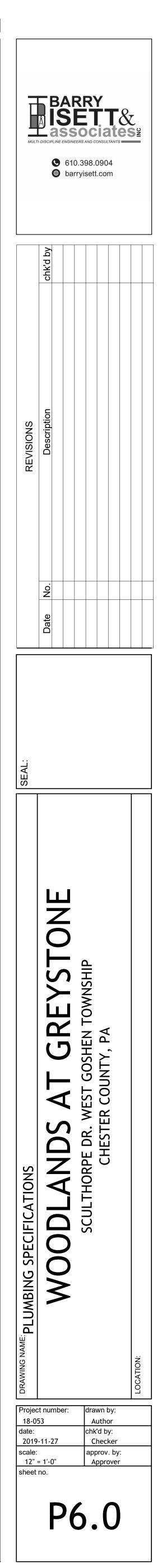
## APOLLO, NIBCO OR APPROVED EQUAL.

EACH Y-TYPE STRAINER. STRAINER PERFORATIONS SHALL BE 1/64 INCH.

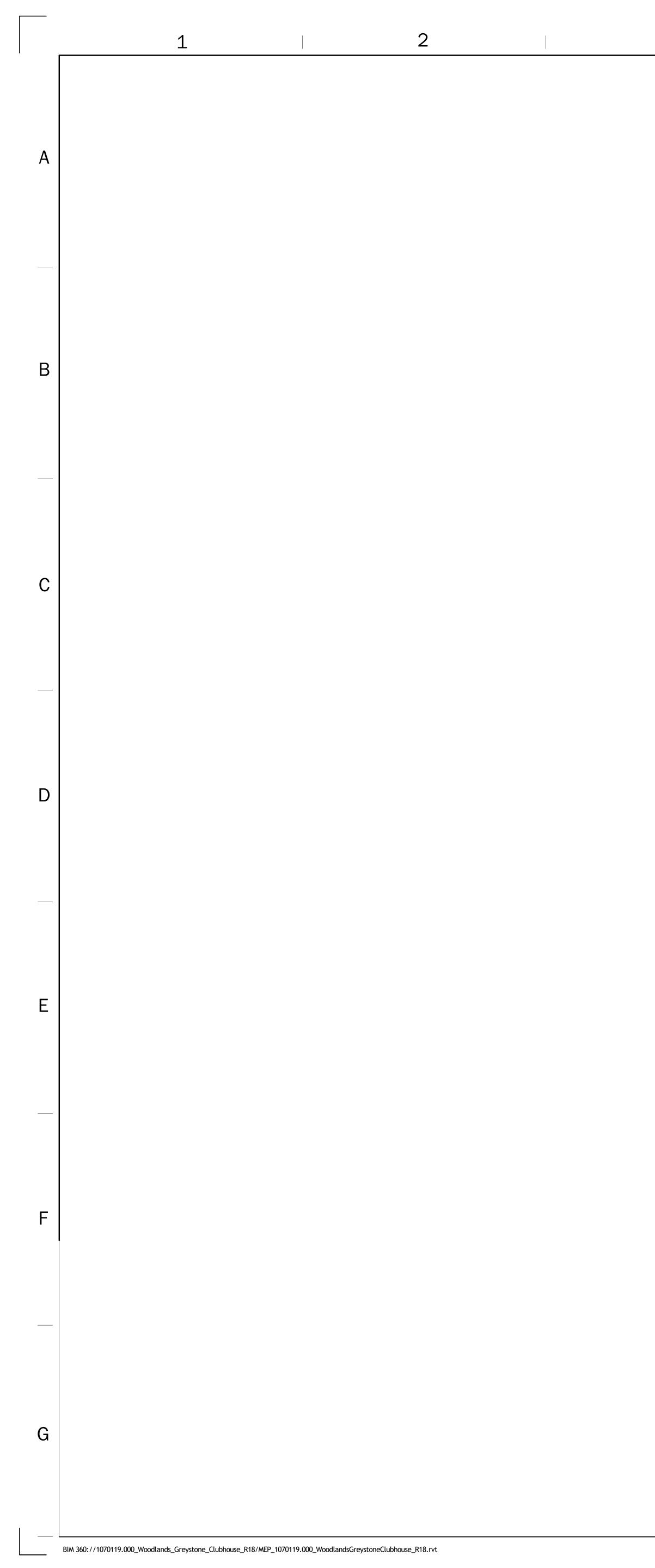
AND UL 1479, 3M FIRE PRODUCTS, HILTI FIRESTOP SYSTEMS OR STI.

LENGTH TO BE FLUSH WITH THE FINISHED WALL SURFACE.

3' AND LARGER FOR SHUT-OFF SERVICE SHALL BE GATE VALVES.



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	FIRE PROTECTION SYMBOLS
TS	TAMPER SWITCH
FS	FLOW SWITCH
PS	PRESSURE SWITCH
	OPEN SCREW AND YOKE VALVE (OS & Y)
	BUTTERFLY VALVE
	CHECK VALVE
	ALARM CHECK VALVE
	DRY PIPE VALVE
0	UPRIGHT SPRINKLER
•	PENDANT SPRINKLER
$\triangleleft$	SIDEWALL SPRINKLER
$\otimes$	SYSTEM RISER
$\sim$	FIRE DEPARTMENT CONNECTION
Ŷ	FREE STANDING FIRE DEPARTMENT CONNECTION
н <del>с</del> н	FIRE HYDRANT
—— F ——	FIRE PROTECTION WATER SUPPLY
SP	AUTOMATIC SPRINKLER SYSTEM
C	ELBOW DOWN

ABBREVIATIONS							
AD ADA AFF AMB AW BLDG BOT BTUH CA CAP CD CI CLG CO CP CDC DIA DWG E.FF ELQUP ETR EX FC CO CDC DIA DWG E.FF ELQUP ETR FS GAL GC MHP HR HV HWR IN WC IN WC IN WC	ACCESS DOOR AMERICAN DISABILITY ACT ABOVE FINISH FLOOR AMBIENT AMPERE ACID VENT ACID WASTE BUILDING BOTTOM BRITISH THERMAL UNITS BRITISH THERMAL UNITS BRITISH THERMAL UNITS PER HOUR COMPRESSED AIR CAPACITY CONDENSATE DRAIN CAST IRON CEILING CLEAN OUT CONDENSATE PUMP COLD WATER DIRECT DIGITAL CONTROL DIAMETER DOWN DRAWING ELECTRICAL CONTRACTOR EFFICIENCY ELEVATION EQUIPMENT EXPANSION TANK EXISTING TO REMAIN ENTERING WATER TEMPERATURE EXISTING FAHRENHEIT FLEXIBLE CONNECTION FLOOR DRAIN FIRE DEPARTMENT CONNECTION FEET FEET PER MINUTE FLOOR SINK GAS GALLON GENERAL CONTRACTOR GALLONS PER MINUTE HOSE BIBB HORSE POWER HOUR HEIGHT HOT WATER RETURN INCH INCHES, WATER COLUMN INVERT	KEC L LB LF LVR LWT MAX MBH MC MFR MIN MTD NC NFRH NFWH NIC OC P D PLBG PRES PSIG PVC RD RH RM RPM RWC SAN SD SHT SPEC TEMP TYP VEL VFDV V VTR VCO WCO WPD WTR W/W/	KITCHEN EQUIPMENT CONTRACTOR LENGTH POUND LINEAR FEET LOUVER LEAVING WATER TEMPERATURE MAXIMUM BTUH x 1000 MECHANICAL CONTRACTOR MANUFACTURER MINIMUM MOUNTED NORMALLY CLOSED NON-FREEZE ROOF HYDRANT NON-FREEZE WALL HYDRANT NOT IN CONTRACT ON CENTER PUMP PLUMBING CONTRACTOR PRESSURE DROP PLUMBING PRESSURE POUNDS PER SQUARE INCH GAUGE POLYVINYL CHLORIDE ROOF DRAIN RELATIVE HUMIDITY ROOM REVOLUTIONS PER MINUTES RAINWATER CONDUCTOR SECONDARY ROOF DRAIN SANITARY STORM DRAIN SHEET SPECIFICATIONS TEMPERATURE TYPICAL VENT THROUGH ROOF VERTICAL CLEANOUT WASTE WALL CLEANOUT WATER PRESSURE DROP WATER WITH WITHOUT				

SPRINKLER ARRANGEMENT IS A GENERAL ORIENTATION. CONTRACTOR SHALL PERFORM HYDRAULIC CALCULATIONS TO DETERMINE REQUIRED PIPE SIZE AND THE QUANTITY OF HEADS REQUIRED FOR THE SPACE. THE CONTRACTOR SHALL COORDINATE INSTALLATION WITH THE ARCHITECT TO ENSURE PROPER PLACEMENT OF THE PIPING AND HEADS. THE CONTRACTOR SHALL ALSO COORDINATE PAINTING OF THE PIPING WITH THE ARCHITECT.

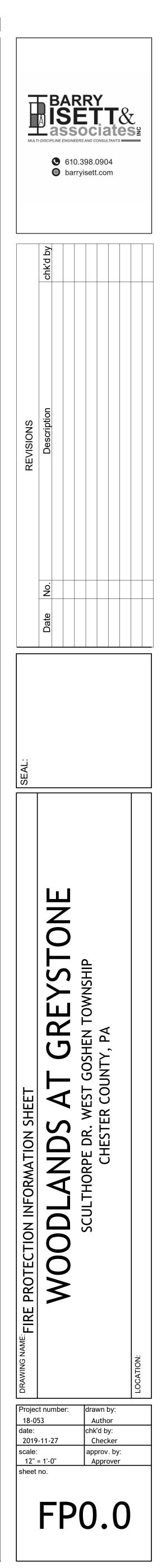
ELBOW UP

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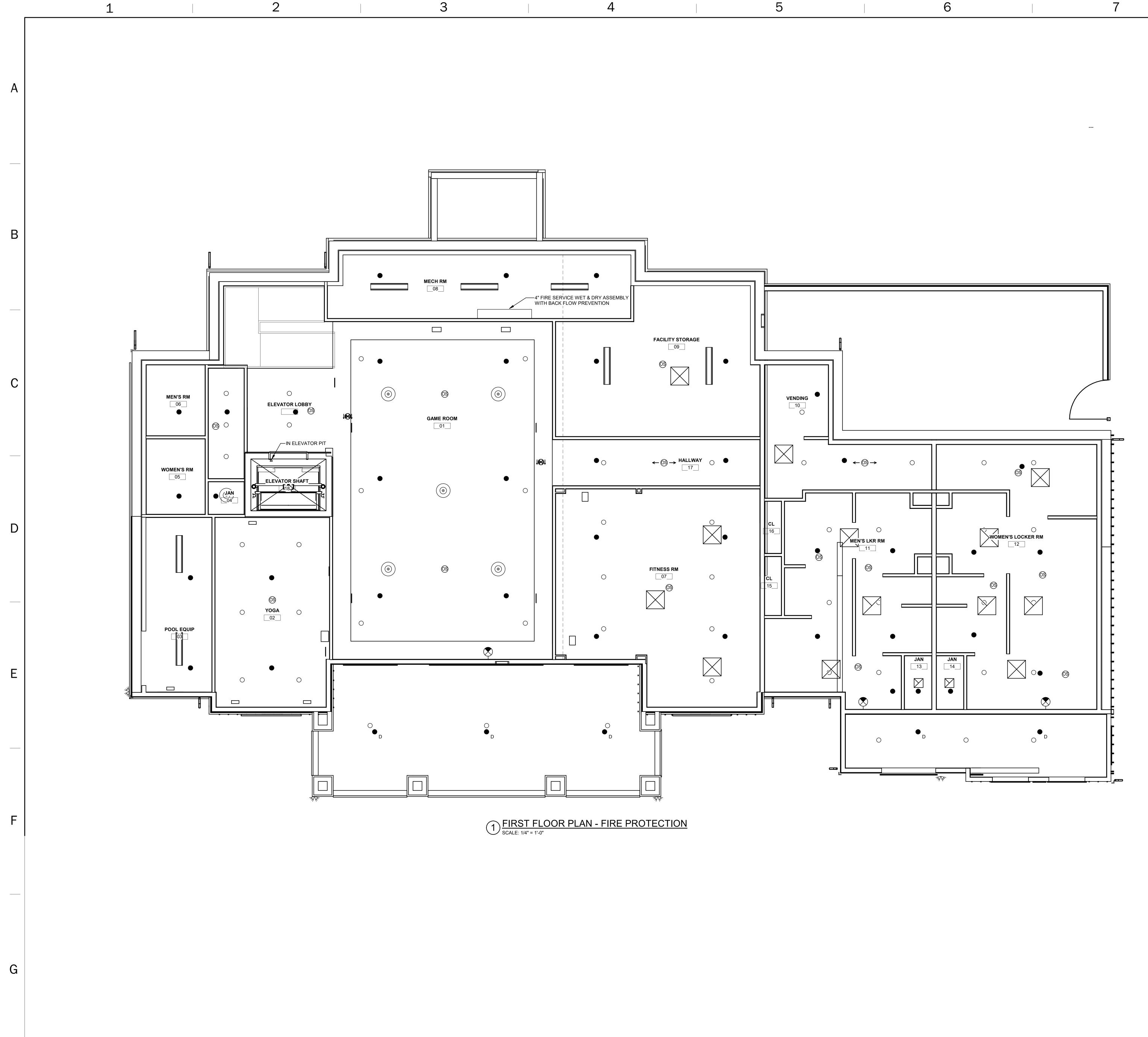
#### FIRE PROTECTION NOTES:

- 1. FURNISH AND INSTALL A COMPLETE WET-PIPE AND DRY PIPE SPRINKLER SYSTEM THROUGHOUT THE ENTIRE BUILDING IN COMPLIANCE WITH NFPA 13 AND NFPA 20.
- 2. THE FIRE PROTECTION SYSTEM FOR THIS BUILDING SHALL CONFORM TO THE LATEST REQUIREMENTS OF THE LOCAL WATER AUTHORITY, NFPA STANDARDS, FACTORY MUTUAL, UNDERWRITERS LABORATORY, BOCA CODES, STATE AND LOCAL CODES, AND THE STATE AND LOCAL AUTHORITY HAVING JURISDICTION.
- 3. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PERFORMING A NEW HYDRANT FLOW TEST ON WHICH TO BASE THE HYDRAULIC CALCULATIONS. INCOMING PRESSURE CALCULATIONS ARE BASED ON ESTIMATED 90PSI.
- 4. 4" INCOMING SERVICE IS SIZED BASED ON ESTIMATED 250GPM FLOW REQUIREMENT. THE CONTRACTOR SHALL BE RESPONSIBLE FOR HYDRAULICALLY CALCULATING AND SIZING ALL PIPING SO THAT THE SYSTEM PERFORMS ACCORDING TO LISTED STANDARDS.
- 5. RUN CONCEALED PIPING, EXCEPT IN MECHANICAL ROOMS OR WHERE NOTED OTHERWISE. RUN CONCEALED PIPING ON ROOM SIDE OF BUILDING INSULATION, UNLESS NOTED OTHERWISE.
- 6. INSTALL ACCESS PANELS WHERE REQUIRED FOR ACCESS TO CONCEALED VALVES, DRAINS OR EQUIPMENT WHERE NO OTHER MEANS IS PROVIDED. INSTALL ACCESS PANELS IN FIRE RATED CONSTRUCTION TO MAINTAIN RATING.
- 7. CHECK AND VERIFY ALL DIMENSIONS AND CONDITIONS AT THE SITE. COORDINATE WORK WITH NEW STRUCTURAL, ARCHITECTURAL, MECHANICAL AND ELECTRICAL FEATURES AND PROVIDE OFFSETS AND FITTINGS AS REQUIRED.
- 8. THE SHOP DRAWINGS HYDRAULIC CALCULATIONS SHALL BE SUBMITTED TO THE OWNER'S INSURANCE COMPANY AND THE AUTHORITY HAVING JURISDICTION. THE APPROVAL OF BOTH OF THESE AGENCIES SHALL BE RECEIVED BEFORE SHOP DRAWINGS AND CALCULATIONS ARE SUBMITTED TO THE ENGINEER. FAILURE TO DO SO WILL RESULT IN REJECTION OF THE SHOP DRAWINGS.
- 9. FURNISH OPERATIONAL, MAINTENANCE, AND EMERGENCY INSTRUCTIONS TO THE RESPONSIBLE DESIGNATED MAINTENANCE STAFF BEFORE ANY PART OF THE SYSTEM IS TURNED OVER TO THE OWNER, AND SUBMIT TO THE ENGINEER AS TO WHAT INFORMATION WAS GIVEN TO WHOM AND WHEN.
- 10. CEILING HEIGHTS FOR THIS PROJECT ARE FINAL. IT IS THE CONTRACTOR'S RESPONSIBILITY TO COORDINATE WITH OTHER PRIME CONTRACTORS TO MAINTAIN THESE CEILING HEIGHTS. PIPING IS TO BE OFFSET AS REQUIRED TO MAINTAIN CEILING HEIGHTS.
- 11. PROVIDE SIGNAGE ABOVE FIRE DEPARTMENT CONNECTION, AND INSPECTION TEST DRAINS.
- 12. THE CONTRACTOR SHALL BE RESPONSIBLE FOR CONFIRMING AREAS OF THE BUILDING CURRENTLY PROTECTED BY AUTOMATIC SPRINKLER SYSTEM. THESE AREA SYSTEMS SHALL BE MODIFIED AS REQUIRED AND CONNECTED TO NEW SYSTEM.

NOTE: NOT ALL ABBREVIATIONS AND SYMBOLS INDICATED MAY APPEAR ON THESE CONTRACT DRAWINGS. THIS IS FOR REFERENCE ONLY.

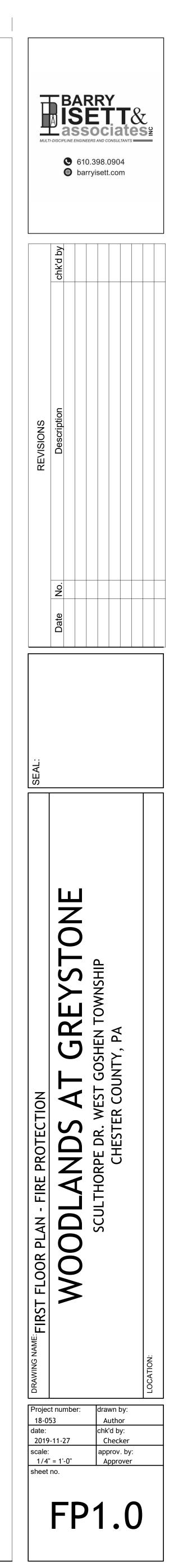


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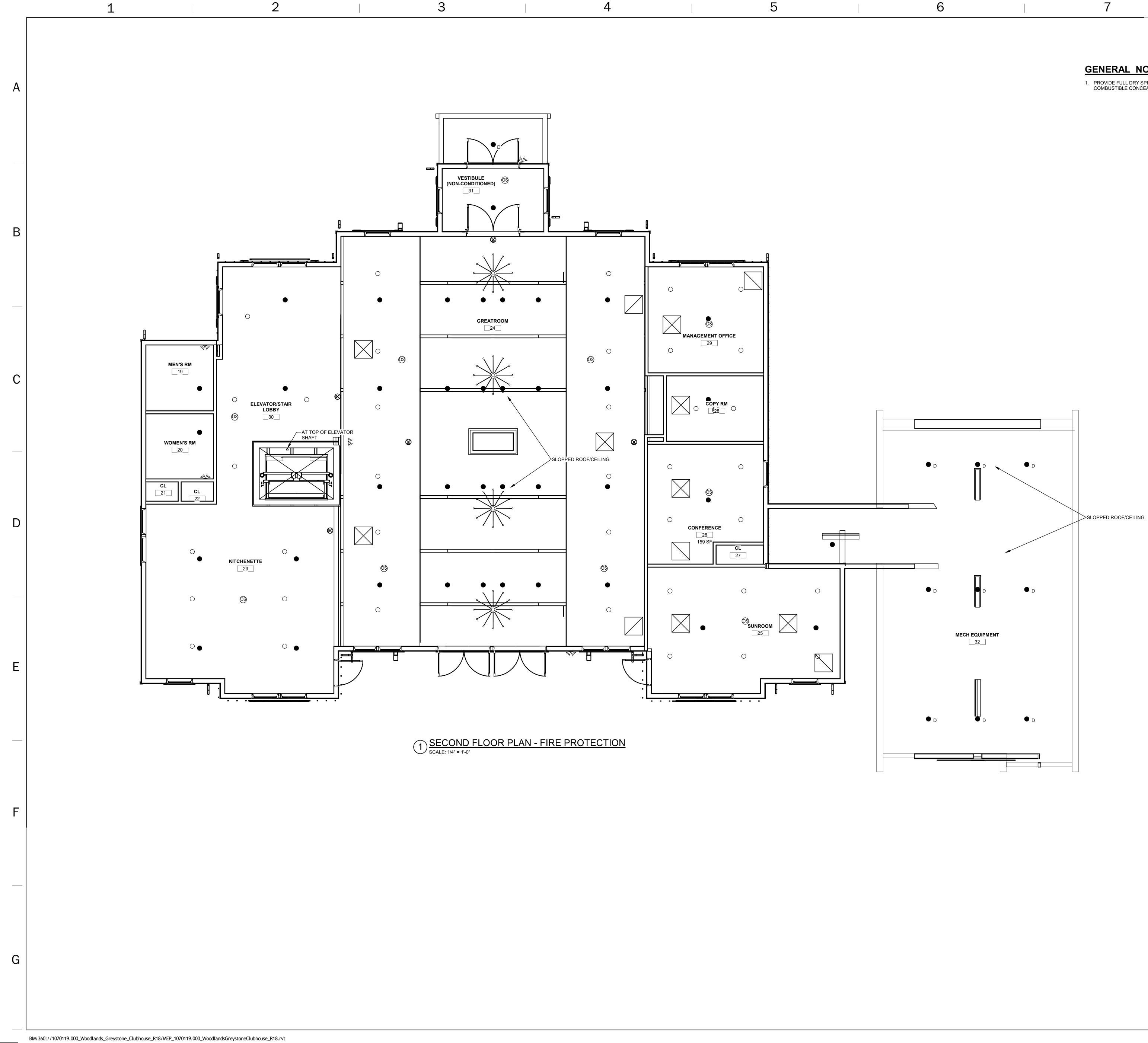


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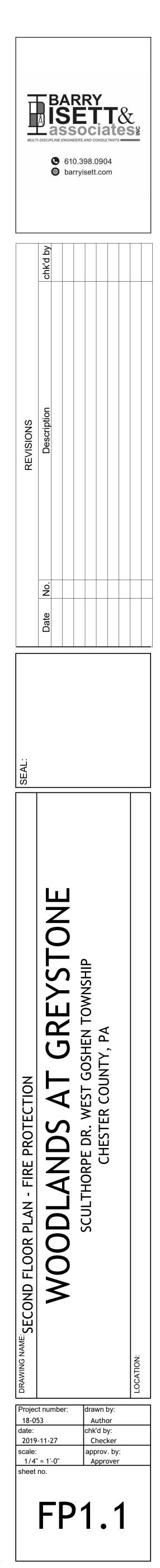


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## **GENERAL NOTES:**

1. PROVIDE FULL DRY SPRINKLER COVERAGE PER NFPA 13 TO ALL COMBUSTIBLE CONCEALED ATTIC SPACE.



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