GENERAL HVAC NOTES

1. PROVIDE ALL LABOR, MATERIALS AND EQUIPMENT NECESSARY TO EXECUTE THE WORK SHOWN AND DESCRIBED. INSTALLATION OF MATERIALS SHALL MEET ALL APPLICABLE STATE, FEDERAL AND MUNICIPAL REQUIREMENTS.
2. OBTAIN PERMITS AND PAY ALL FEES FOR WORK AND REQUIRED INSPECTIONS.
3. MAINTAIN LIABILITY INSURANCE TO PROTECT OWNER AND THE CONTRACTOR FROM ANY AND ALL CLAIMS UNDER THE WORKER'S COMPENSATION ACT.
4. THE DRAWINGS SHALL CONSIDERED DIAGRAMMATIC ONLY. ALL MEASUREMENTS SHALL BE TAKEN FROM BUILDING SITE AND ARCHITECT'S DRAWINGS.
5. PROVIDE TEMPORARY MATERIAL STORAGE AS REQUIRED AND BE RESPONSIBLE FOR ANY LOSS OR DAMAGE THERETO.
6. SUBMIT 2 COPIES OF SHOP DRAWINGS FOR REVIEW COVERING MAJOR MANUFACTURED ITEMS, SUCH AS AIR HANDLING UNITS, REGISTERS & DIFFUSERS, WIRING DIAGRAMS, ETC.
7. KEEP ACCURATE RECORD OF "AS-BUILT" DRAWINGS AND SUBMIT THESE BEFORE FINAL CERTIFICATE OF COMPLETION.
8. ON COMPLETION OF THE WORK, REMOVE FROM THE PREMISES ALL TOOLS, DEBRIS, SURPLUS AND WASTE MATERIALS RESULTING FROM OPERATIONS UNDER THIS SECTION. CLEAN ALL EQUIPMENT AND LEAVE ALL ITEMS IN PERFECT ORDER READY FOR OPERATION.
9. AFTER ACCEPTANCE, INSTRUCT OWNER IN EQUIPMENT OPERATION AND PROVIDE HIM WITH OPERATING AND MAINTENANCE MANUALS STANDARDS AND EXTENDED WARRANTY DOCUMENTS. INSPECTION CERTIFICATES AND COPIES OF SHOP DRAWINGS OF INSTALLED EQUIPMENT.
10. THE CONTRACTOR SHALL, BEFORE FINAL PAYMENT IS MADE, GUARANTEE ALL MATERIALS AND WORKMANSHIP SUPPLIED BY HIM IN THE PERFORMANCE OF THIS CONTRACT FOR A PERIOD OF ONE YEAR FROM DATE OF FINAL ACCEPTANCE AND SHALL, WHEN CALLED UPON, MAKE GOOD WITHOUT FURTHER COST TO THE OWNER SUCH DEFECTS AS MAY APPEAR WITHIN THIS PERIOD.
11. SUPPLY AND INSTALL DUCTWORK AS INDICATED ON DRAWING. DUCTWORK SHALL BE FABRICATED AND INSTALLED IN STRICT ACCORDANCE WITH LATEST ASHRAE & SMACNA STANDARDS AND SHALL BE MANUFACTURED OF GALVANIZED STEEL UNLESS SPECIFICALLY NOTED OTHERWISE.
12. ADJUST ALL FAN SPEEDS TO DELIVER SHOWN AIR QUANTITIES. BALANCE ALL AIR SYSTEMS AND SUPPLY WRITTEN AIR BALANCING REPORTS IN TRIPLICATE. INCLUDE NECESSARY SPARE BELTS AND PULLEYS FOR FIELD ADJUSTMENT.
13. ALL DUCT CONNECTIONS TO FAN DRIVEN UNITS SHALL BE MADE WITH A FIREPROOF FLEXIBLE DUCT CONNECTOR.
14. THESE DRAWINGS ARE DIAGRAMMATIC. FIELD CONDITIONS SHALL DETERMINE ACTUAL DIMENSIONS AND LOCATION OF ALL NEW PIPING AND DUCTWORK.
15. PROVIDE FLEXIBLE CONNECTIONS AT ALL UNITS' DUCT CONNECTIONS.
16. MAINTAIN ACCESS DOORS AND CODE/MANUFACTURER'S REQUIRED CLEARANCES FOR ALL FILTER REPLACEMENTS, EQUIPMENT REPAIR, AND ELECTRICAL CONTROLS.
17. PRIOR TO ANY INSTALLATION, COORDINATE WITH OTHER TRADES.
18. INSULATE CONDENSATE DRAIN PIPING WITH 1/2" ARMAFLEX.
19. ALL REFRIGERANT PIPING SHALL BE INSULATED AND SUPPORTED ACCORDING TO MANUFACTURER'S REQUIREMENTS.
20. PROVIDE A 4" CONCRETE PAD WITH VIBRATION ISOLATORS FOR OUTDOOR CONDENSING UNITS.
21. ALL DRYER AND BATHROOM EXHAUST DUCTS SHALL BE INSULATED WITH R6 INSULATION.
22. DRYER EXHAUST DUCTS SHALL BE MADE OF ALUMINUM TO PREVENT CORROSION, AND TAPE SHALL BE UL COMPLIANT FOR DRYER EXHAUST CONNECTIONS.

GENERAL NOTES:

THE CONTRACTOR SHALL, BEFORE SUBMITTING THE FINAL BID AND SIGNING THE CONTRACT FOR CONSTRUCTION, NOTIFY THE ARCHITECT AND REQUEST A WRITTEN RESOLUTION AS TO WHICH METHODS OR MATERIALS WILL BE REQUIRED. IN THE EVENT OF CONFLICTING REQUIREMENTS OF STANDARDS , DRAWINGS AND SPECIFICATIONS, THE CONTRACTOR SHALL COMPLY WITH THE MORE STRINGENT REQUIREMENTS. BEFORE SUBMITTING THE FINAL BID AND THE SIGNING THE CONTRACT FOR THE CONSTRUCTION THE CONTRACTOR SHALL OBTAIN A WRITTEN INTERPRETATION FROM THE ARCHITECT. IN NO CASE SHALL THE CONTRACTOR PROCEED WITH THE AFFECTED WORK UNTIL ADVISED BY THE ARCHITECT.

IF THE CONTRACTOR FAILS TO MAKE A REQUEST FOR INTERPRETATION OR RESOLUTION NO EXCUSE WILL BE ACCEPTED FOR FAILURE TO CARRY OUT THE WORK IN A SATISFACTORY MANNER, AS INTERPRETED BY THE ARCHITECT. THIS GENERALLY MEANS THE USE OF THE HIGHEST QUALITY MATERIAL, MOST EXPENSIVE WAY OF PERFORMING WORK AND PROVIDING COMPLETE FUNCTIONING SYSTEM FOR PROPER OPERATION.

EACH AND EVERY TRADE OR SUBCONTRACTOR WILL BE DEEMED TO HAVE FAMILIARIZED THEMSELVES WITH ALL THE CONTRCAT DOCUMENTS OF THIS PROJECT, INCLUDING ARCHITECTURAL, STRUCTURAL, MECHANICAL, ELECTRICAL AND SITE WORK, AND TO HAVE VISITED THE SITE, SO AS TO AVOID ERRORE, OMMISIONS AND MISINTERPRETATIONS. RELATED INFORMATION MAY BE PROVIDED ON CONTRACT DOCUMENTS OTHER THAN THOSE ASSOCIATED WITH THE SUBCONTRACTOR'S TRADE. THE CONTRACTOR IS RESPONSABLE FOR COORDNATING RELATED WORK OF ALL THE CONTRACT DOCUMENTS. NO ADDITIONAL COMPENSATION WIIL BE AUTHORIZED FOR ALLEGED ERRORS, OMMISIONS AND MISINTERPRETATIONS WHETHER THEY ARE A RESULT OF FAILURE TO OBSERVE THIS REQUIREMENT OR NOT.

2. ALL PENETRATIONS OF ASSEMBLIES EXPOSED TO THE EXTERIOR ENVIRONMENT SHALL BE SEALED WITH FOAM SEALANT OR EQUIVALENT SEALER TO PROVIDE NO INFILTRATION COORDINATE WITH FIRE STOPPING REQUIREMENTS.

3. NO COMPONENT OF ANY SYSTEM SHALL RUN THROUGH THE STAIR ENCLOSURE THAT DOES NOT RELATE TO OR SERVE THE STAIR ENCLOSURE

HVAC Ductwork Symbols & Abbreviations

SYMBOL	DESCRIPTION
	SUPPLY/OUTSIDE AIR DUCT UP
	RETURN/EXHAUST DUCT UP
	SUPPLY/OUTSIDE AIR DUCT DOWN
	RETURN/EXHAUST DUCT DOWN
	EXHAUST DUCT UP
	SUPPLY DIFFUSER
	RETURN/EXHAUST REGISTER
FD	FIRE DAMPER
VD	MANUAL VOLUME DAMPER
BBD	BACK DRAFT DAMPER
MD	MOTORIZED DAMPER
S	SWITCH SERVING FAN
T	THERMOSTAT
TR	REMOTE AVERAGING THERMOSTAT
U	UNDER CUT DOOR
BHP	BRAKE HORSEPOWER
BTU	BRITISH THERMAL UNIT
BTUH	BRITISH THERMAL UNIT PER HOUR
CD	CEILING DIFFUSER/CONDENSATE
CFM	CUBIC FEET PER MINUTE
CO	CLEANOUT
CUH	CABINET UNIT HEATER
CWR	CHILLED WATER RETURN
CWS	CHILLED WATER SUPPLY
DB	DRY BULB TEMPERATURE °F
DN	DOWN
EF	EXHAUST FAN
EG	EXHAUST GRILLE
EWT	ENTERING WATER TEMPERATURE
EXH	EXHAUST
ETR	EXISTING TO REMAIN
FLA	FULL LOAD AMPS
FPM	FEET PER MINUTE
GC	GENERAL CONTRACTOR
GPM	GALLONS PER MINUTE
HP	HEAT PUMP/HORSE POWER
HWR	HOT WATER RETURN
HWS	HOT WATER SUPPLY
ID	INSIDE DIAMETER
LAT	LEAVING AIR TEMPERATURE
LD	LINEAR DIFFUSER
LVG	LEAVING
LWT	LEAVING WATER TEMPERATURE
MBH	THOUSAND BTU PER HOUR
MUA	MAKE-UP AIR UNIT
NO	NORMALLY OPEN (FAIL POSITION)
NTS	NOT TO SCALE
OA	OUTSIDE AIR
OBD	OPPOSED BLADE DAMPER
OD	OUTSIDE DIAMETER
PC	PLUMBING CONTRACTOR
PD	PRESSURE DROP
PSI	POUNDS PER SQUARE INCH
RG	RETURN GRILLE
RPM	REVOLUTIONS PER MINUTE
SP	STATIC PRESSURE (INCHES OF WATER)
RTU	ROOFTOP UNIT
TYP	TYPICAL
WB	WET-BULB TEMPERATURE °F

HVAC Piping Symbols

SYMBOL	DESCRIPTION
CD	CONDENSATE DRAIN
	DIRECTION OF DOWNWARD PITCH 1/8"/FOOT
	DIRECTION OF FLOW
	ELBOW TURNED DOWN
	ELBOW TURNED UP
	BUTTERFLY VALVE
	BUTTERFLY VALVE WITH MEMORY STOP
	GLOBE VALVE
	CHECK VALVE
	LUBRICATED PLUG VALVE
T	THERMOSTATIC CONTROL VALVE
T	TWO-WAY AUTOMATIC CONTROL VALVE
T	THREE-WAY AUTOMATIC CONTROL VALVE
	PRESSURE REDUCING VALVE
	MANUAL AIR VENT
	AUTOMATIC AIR VENT WITH ISOLATION VALVE
	THERMOMETER
	PRESSURE GAUGE WITH BALL VALVE
	TEMPERATURE/PRESSURE WELL ("PETE'S PLUG")
	COMBINATION FLOW METER/BALANCE VALVE & SHUT-OFF (CIRCUIT SETTER)
	PIPE GUIDE
	PIPE ANCHOR
	REDUCER (ECCENTRIC-FOB OR FOT)
	REDUCER (CONCENTRIC)
	UNION-SCREWED
	BLIND FLANGE (END OF SYSTEM)
	END CAP-SCREWED
	TOP TAKE-OFF
	BOTTOM TAKE-OFF
	DIRT LEG
	FLEXIBLE CONNECTION (SINGLE LINE PIPING)
	FLEXIBLE CONNECTION (DOUBLE LINE PIPING)
	VIBRATION ISOLATORS FLOOR MOUNTED & HANGING TYPE

HVAC Equipment Designations

SYMBOL	DESCRIPTION
	EQUIPMENT TAG DESIGNATION NOTE: THE HEXAGON SYMBOL SHALL BE USED FOR ALL EQUIPMENT CALLOUTS REQUIRING ELECTRICAL POWER HOOK-UP.
	EQUIPMENT TAG DESIGNATION/ACTIVE LENGTH FOR FIN-TUBE
	EQUIPMENT TAG FRAME SIZE AIR FLOW (CFM) NOTE: THE SQUARE SYMBOL SHALL BE USED FOR ALL EQUIPMENT CALLOUTS THAT DO NOT REQUIRE ELECTRICAL POWER.

AC-1, AC-2, AC-3, AND EF-3 SEQUENCE OF OPERATION.

1. AC UNITS SERVING THE RESTAURANT SPACE SHALL EACH BE CONTROLLED BY ITS OWN THERMOSTAT. THESE THERMOSTAT SHALL HAVE OCCUPIED/UNOCCUPIED MODES WITH NIGHT SET BACK, AS WELL HAVE AUTOMATIC SWITCHING BETWEEN COOLING AND HEATING BASED ON THE DIFFERENCE BETWEEN SET THE SET POINT AND THE SPACE TEMPERATURE.
2. AC UNITS OCCUPIED MODE: THE OUTSIDE AIR INTAKE MOTORIZED DAMPER SHALL OPEN TO A PRESET POSITION SET BY THE BALANCER BASED ON THE OUTSIDE AIR AMOUNT SHOWN ON THE SCHEDULE FOR EACH UNIT RESPECTIVELY. THE RETURN AIR MOTORIZED DAMPER SHALL CLOSE TO A PRESET POSITION SET BY THE BALANCER BY SUBTRACTING THE OUTSIDE AIR AMOUNT FORM THE TOTAL UNIT AIR FLOW. THE UNIT SHALL CYCLE TO MAINTAIN SPACE TEMPERATURE AT SET POINT.
3. AC UNITS UNOCCUPIED MODE: THE OUTSIDE AIR DAMPER SHALL CLOSE, AND THE RETURN AIR DAMPER SHALL OPEN 100%. THE UNIT SHALL CYCLE TO MAINTAIN SET SPACE TEMPERATURE.
4. EF-3 OCCUPIED MODE: THE EXHAUST MOTORIZED DAMPER SHALL OPEN. THE FAN SHALL OPERATE AT HIGH SPEED (800 CFM).
5. EF-3 UNOCCUPIED MODE: THE EXHAUST MOTORIZED DAMPER SHALL OPEN. THE FAN SHALL OPERATE AT LOW SPEED (400 CFM).
6. AC UNITS AND EF-3 NIGHT SETBACK MODE: THE FAN SHALL TURN OFF AND THE EXHAUST MOTORIZED DAMPER SHALL CLOSE. THE AC UNITS SHALL MODULATE TO MAINTAIN AN ADJUSTABLE NIGHT SET POINT.

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PROPOSED BUILDING PLANS
855. MAIN ST BROCKTON, MA

COMMONWEALTH OF MASSACHUSETTS
FOUAD A. ATALLAH
MECHANICAL
No. 47322
REGISTERED PROFESSIONAL ENGINEER

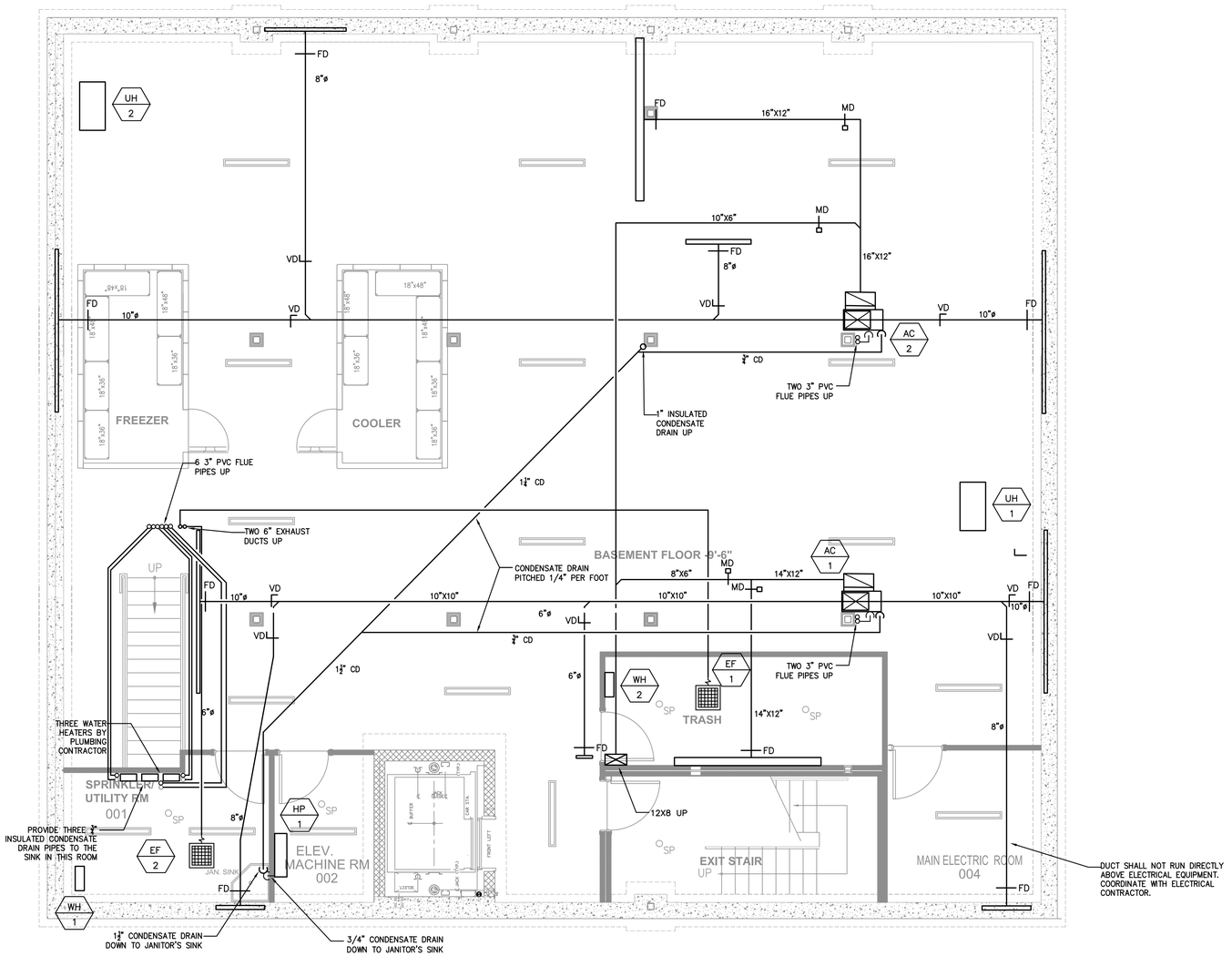
Scale:

Project Number:

Date: 4-30-2021

Sheet Title
HVAC LEGEND & NOTES

Sheet Number
M-0



PROPOSED BASEMENT LEVEL FLOOR PLAN 3,105 s.f.

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

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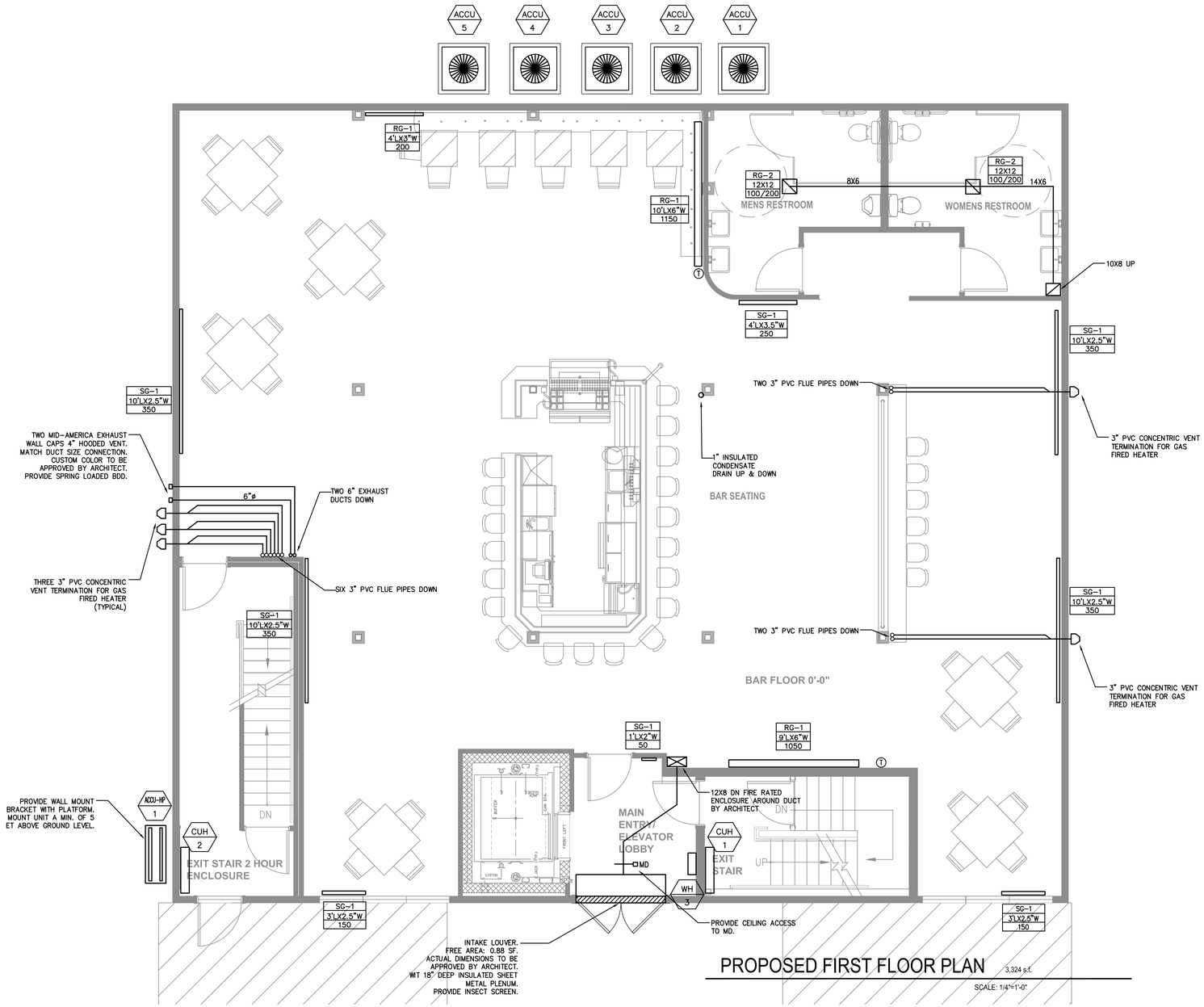
Sheet Title
BASEMENT HVAC PLAN

Sheet Number
M-1



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Project Number:

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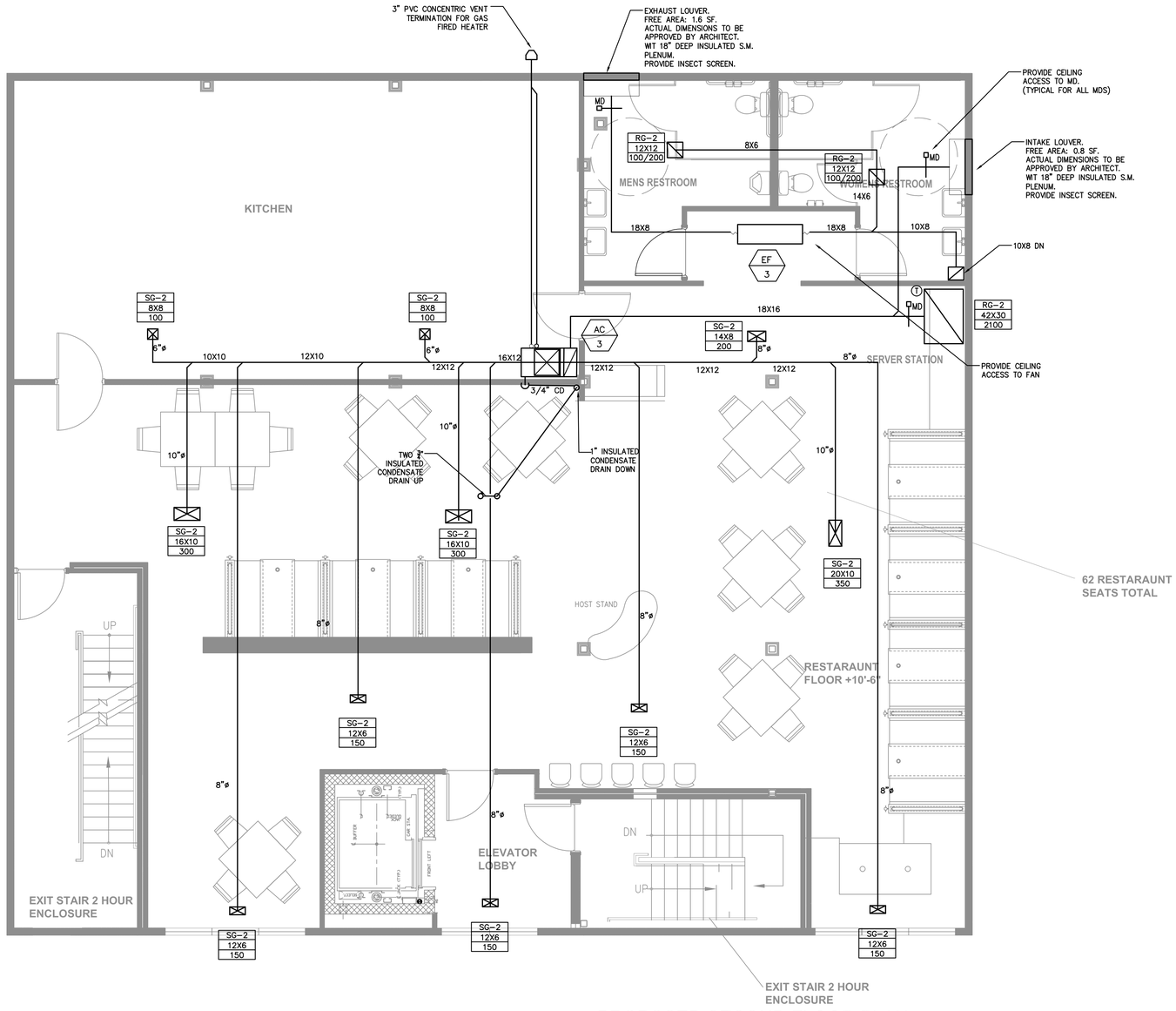
Sheet Title
FIRST FLOOR HVAC PLAN

Sheet Number
M-2



PROPOSED SECOND FLOOR PLAN

3,324 s.f.

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

PROPOSED BUILDING PLANS
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COMMONWEALTH OF MASSACHUSETTS
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Scale: 1/4"=1'-0"

Project Number:

Date: 4-20-2021

Sheet Title
SECOND FLOOR HVAC PLAN

Sheet Number
M-3

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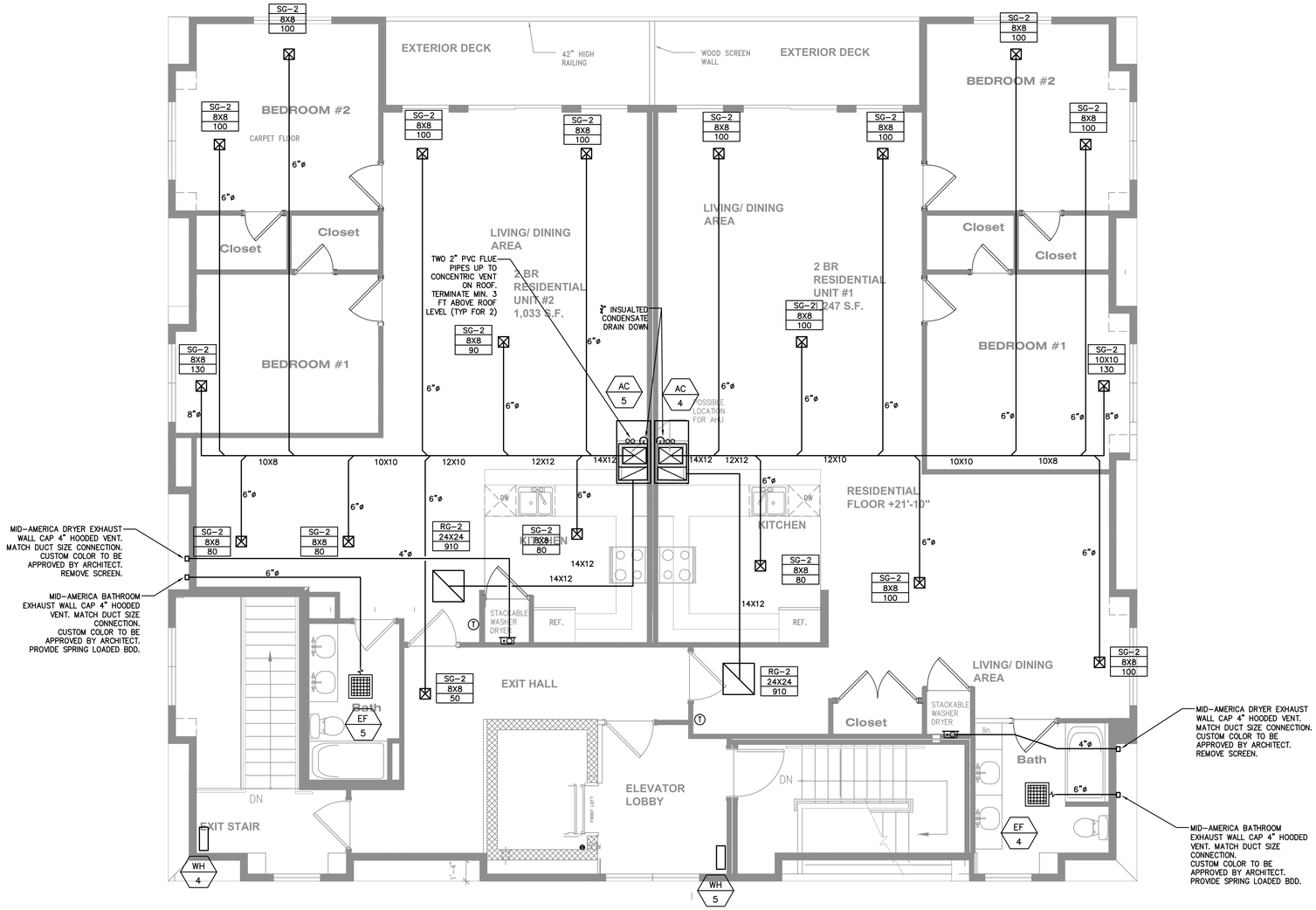

PROPOSED THIRD FLOOR PLAN 2,752 s.f.

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

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

Project Number:

Date: 4-20-2021

Sheet Title
THIRD FLOOR HVAC PLAN

Sheet Number
M-4

INDOOR HEAT PUMP UNIT SCHEDULE

INDOOR UNIT									REMARKS
SYMBOL	SERVICE	SUPPLY FAN CFM	INDOOR TEMP (°F) D.B.	INDOOR TEMP (°F) W.B	V/PH/Hz	MCA	MOCP	MANUFACTURER MODEL #	
HP-1	ELEVATOR MACHINE ROOM	200	80	67	208/1ø/60	0.3125	–	CARRIER 40MAHBQ09XA3	WALL MOUNTED

PROVIDE TWO SETS OF FILTERS.
UNIT IS POWERED BY OUTDOOR UNIT
PROVIDE REMOTE WALL MOUNTED CONTROLLER/THERMOSTAT
PROVIDE 3/4" CONDENSATE DRAIN PIPING TO SINK IN ADAJACENT JANITOR'S CLOSET

AIR COOLED HEAT PUMP CONDENSING UNIT SCHEDULE

SYMBOL	SERVICE	COOLING (MBH) TOTAL	COOLING (MBH) SENSIBLE	HEATING (MBH)	V/PH/Hz	MANUFACTURER MODEL #	AIR TEMP	V/PH/Hz	MCA	MOCP	SEER	REMARKS
ACCU-HP	ELEVATOR MACHINE ROOM	9000	6400	11800	208/1ø/60	CARRIER 38MARBQ09AA3	95	208/1ø/60	15	15	28.1	410A

PROVIDE WITH ALL NECESSARY COMPONENTS FOR A COMPLETE AND WORKING INSTALLATION AS REQUIRED IN THE INSTALLATION MANUAL.
PROVIDE ELECTRIC DISCONNECT.
PROVIDE WALL MOUNTED BRACKET WITH VIBRATION ISOLATORS. UNIT SHALL BE MOUNTED A MIN OF 12" AWAY FROM WALL TO ALLOW FOR AIR FLOW.

EXHAUST FAN SCHEDULE

TAG	LOCATION	TYPE	DRIVE	FAN SPEED	HP/WATT	CFM	SP	V/ø	RPM	ENERGY STAR	NOISE SONES	DIMENSIONS (LXWXH)	MANUFACTURER-GREENHECK	REMARKS	CONTROLS
EF-1	TRASH ROOM	CEILING	DIRECT	FULL	20.1W	106	0.5	120/60	861	YES	2.0	14"X 13"X 7.75"	SP-AP-0511W	RUNNING CONTINUOUSLY	ECM MOTOR
EF-2	JANITOR'S CLOSET	CEILING	DIRECT	FULL	20.1W	106	0.5	120/60	861	YES	2.0	14"X 13"X 7.75"	SP-AP-0511W	WALL SWITCH	ECM MOTOR
EF-3	RESTAURANT BATHROOM	IN-LINE	BELT	VARIABLE (TWO SPEED)	0.17 BHP	400/800	0.6	208/1ø	1150	N/A	9	22"X15"X12"	BDF-80	PROVIDE DISCONNECT	ECM MOTOR WITH VARIABLE SPEED CONTROL
EF-4	APT 1 BATHROOM	CEILING	DIRECT	FULL	17.0 W	80	0.5	120/60	861	YES	2.5	14"X 13"X 7.75"	SP-AP-0511W	WALL SWITCH	ECM MOTOR
EF-5	APT 2 BATHROOM	CEILING	DIRECT	FULL	17.0 W	80	0.5	120/60	861	YES	2.5	14"X 13"X 7.75"	SP-AP-0511W	WALL SWITCH	ECM MOTOR

PROVIDE A WALL SWITCH AND DISCONNECT WITH ALL FANS
PROVIDE HANGING SPRING ISOLATORS WITH EF-3. SEE INSTALLATION DETAIL ON DETAIL SHEET
PROVIDE PROGRAMMABLE CONTROLLER TO SHUT THE UNIT OFF DURING NIGHT SET BACK MODE FOR EF-3. SEE SEQUENCE OF OPERATION M-0
EF-3 SHALL BE WIRED TO GO TO HIGH SPEED IN OCCUPIED MODE.

APARTMENTS VERTICAL FAN-COIL UNIT SCHEDULE/AIR-COOLED CONDENSING UNITS

SYMBOL	SERVICE	SUPPLY FAN CFM	SUPPLY FAN ESP	SUPPLY FAN MOTOR HP	AIR HANDLER MANUFACTURER/MODEL #	ELECTRICAL V	ELECTRICAL PH	ELECTRICAL HZ	ELECTRICAL AMPS	DX COOLING COIL (M BTUs) TOTAL	DX COOLING COIL (M BTUs) SENSIBLE	REFRIGERANT	HOT WATER HEATING AT 140°F MBH	HOT WATER HEATING AT 140°F GPM	GOODMAN AIR-COOLED CONDENSING UNITS SYMBOL	MODEL #	VOLTS	PHASE	HZ	MCA	MOCP	SEER	REMARKS
AC-4	APT 1	910	0.4"	1/2	FIRST COMPANY 31UCQBR	120	1	60	8.1	30	21.6	R-410A	34.7	4	ACCU-4	GSX13030	208	1	60	16.7	25	13	WITH PUMP
AC-4	APT 2	910	0.4"	1/2	FIRST COMPANY 31UCQBR	120	1	60	8.1	30	21.6	R-410A	34.7	4	ACCU-5	GSX13030	208	1	60	16.7	25	13	WITH PUMP

1. UNITS SHALL BE PROVIDED W/ ALL NECESSARY CONTROLS
2. PROVIDE TWO SETS OF FILTERS
3. PROVIDE THERMOSTATS
4. CONSULT MANUFACTURER FOR EXPANSION DEVICE REQUIRED TO ACHIEVE DESIRED SEER.
5. PROVIDE DX COIL, BOTTOM RETURN AIR KIT, CONDENSATE OVERFLOW SWITCH
6. PROVIDE ALL NECESSARY REFRIGERANT LINES.
7. PROVIDE 4" CONCRETE PAD FOR ALL ACCU UNITS WITH VIBRATION ISOLATORS

ELECTRIC CABINET, UNIT & WALL HEATER SCHEDULE

UNIT NO.	LOCATION	KW	OUTPUT (BTUH)	CFM	ELEC. DATA VOLTS	ELEC. DATA PHASE	ELEC. DATA HZ	MANUFACTURER & MODEL NO.	REMARKS
WH-1	SEE PLAN	1.5	5,120	–	208	1	60	BERKO FRA	WITH INTEGRAL THERMOSTAT
WH-2	SEE PLAN	1.5	5,120	–	208	1	60	BERKO FRA	WITH INTEGRAL THERMOSTAT
WH-3	SEE PLAN	1.5	5,120	–	208	1	60	BERKO FRA	WITH INTEGRAL THERMOSTAT
WH-4	SEE PLAN	1.5	5,120	–	208	1	60	BERKO FRA	WITH INTEGRAL THERMOSTAT
WH-5	SEE PLAN	1.5	5,120	–	208	1	60	BERKO FRA	WITH INTEGRAL THERMOSTAT
CUH-1	SEE PLAN	4	13,600	–	208	3	60	BERKO FRA	WITH INTEGRAL THERMOSTAT
CUH-2	SEE PLAN	4	13,600	–	208	3	60	BERKO FRA	WITH INTEGRAL THERMOSTAT
UH-1	SEE PLAN	5	17,000	350	208	1	60	BERKO HUHA	WITH REMOTE THERMOSTAT
UH-2	SEE PLAN	5	17,000	350	208	1	60	BERKO HUHA	WITH REMOTE THERMOSTAT

RESTAURANT GAS FURNACE/AC UNIT SCHEDULE

UNIT NUMBER	LOCATION	OUTSIDE AIR CFM	CFM	EXT. STATIC	DX COOLING COIL SENSIBLE	DX COOLING COIL TOTAL	DX COOLING COIL CARRIER MODEL #	GAS FIRED FURNACE (TWO STAGE) INPUT BTU	OUTPUT BTU	MODEL # (UPLFOW)	MCA	MOCP	V	PH	HZ	AIR COOLED CONDENSING UNIT SYMBOL	MODEL #	ELECTRICAL DATA V	PH	HZ	MCA	MOCP	SEER	TONS	REMARKS
AC-1	BASEMENT	200	1050	0.6"	25120	33900	CNPHP3617ALA	40000/26000	39000/25000	CARRIER 59TP6b040V17-12	7.2	15	120	1	60	ACCU-1	CARRIER 24ABB336ABN3	208	1	60	18.1	30	14	3	(1)(2)(3)(4)(5)(6)
AC-2	BASEMENT	230	1150	0.6"	25120	33900	CNPHP3617ALA	40000/26000	39000/25000	CARRIER 59TP6b040V17-12	7.2	15	120	1	60	ACCU-2	CARRIER 24ABB336ABN3	208	1	60	18.1	30	14	3	(1)(2)(3)(4)(5)(6)
AC-3	SECOND FLOOR	400	1950	0.6"	44580	59500	CNPVP6124ALA	80000/52000	78000/50000	CARRIER 59TP6B080V21-20	14.7	20	120	1	60	ACCU-3	CARRIER 24ABB360A0N3	208	1	60	34.2	50	13	5	(1)(2) (4)(5)(6)(7)

(1) PROVIDE TWO SETS OF FILTERS. (2) PROVIDE OCCUPIED/UNOCCUPIED THERMOSTAT WITH NIGHT SETBACK SEE SEQUENCE ON M-0 (3) PROVIDE CONDENSATE PUMP. (4) PROVIDE 4 YEAR EXTENDED WARRANTY ON THE COMPRESSORS.
(5) PROVIDE FLEXIBLE CONNECTIONS TO UNITS; LINE FIRST TEN FEET OF SUPPLY AND RETURN DUCTWORK WITH ACOUSTICAL LINING. (6) FURNACE VENTING AS PER INSTALLATION MANUAL.
(7) PROVIDE WITH OPTIONAL BASE FOR BOTTOM RETURN OPTION.

GENERAL NOTE: PROVIDE CASED DX(R410A) COIL FOR ALL UNITS' COOLING UNITS AS REQUIRED.
THE COIL SHALL SUIT VERTICAL UNIT CONFIGURATION.
REFRIGERANT PIPING PER MANUFACTURER'S RECOMMENDATIONS.
PROVIDE 4" CONCRETE PAD FOR ALL AC AND ACCU UNITS WITH VIBRATION ISOLATORS..
PROVIDE ACID NEUTRALIZER FOR ALL AC UNITS
ALL GAS FURNACES ARE 90% MIN EFFICIENCY.

DIFFUSER, REGISTER & GRILLE SCHEDULE

BASED ON TITUS

SYMBOL	DESCRIPTION	FRAME	MODEL #	REMARKS
SG-1	FLOOR SUPPLY GRILLE	BORDER TYPE #5	TITUS CT-481	PROVIDE INSULATED SHEET METAL PLENUM BELOW FLOOR TO MATCH GRILLE SIZE AS SHOWN ON PLAN.
RG-1	FLOOR RETURN GRILLE	BORDER TYPE #5	TITUS CT-480	PROVIDE INSULATED SHEET METAL PLENUM BELOW FLOOR TO MATCH GRILLE SIZE AS SHOWN ON PLAN.
SG-2	CEILING SUPPLY GRILLE	BORDER TYPE #1	TITUS 250	PROVIDE WITH OPPOSED BLADE DAMPER FOR BALANCING
RG-2	CEILING RETURN GRILLE	BODER TYPE #1	TITUS 4FL	PROVIDE WITH OPPOSED BLADE DAMPER FOR BALANCING

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COMMONWEALTH OF MASSACHUSETTS
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REGISTERED PROFESSIONAL ENGINEER

PROPOSED BUILDING PLANS
855. MAIN ST BROCKTON, MA

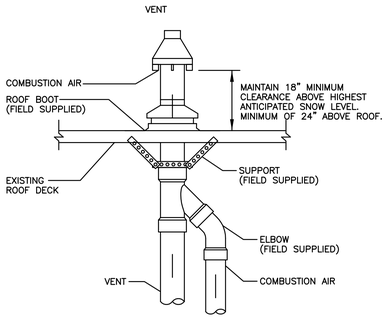
Scale: NTS

Project Number:

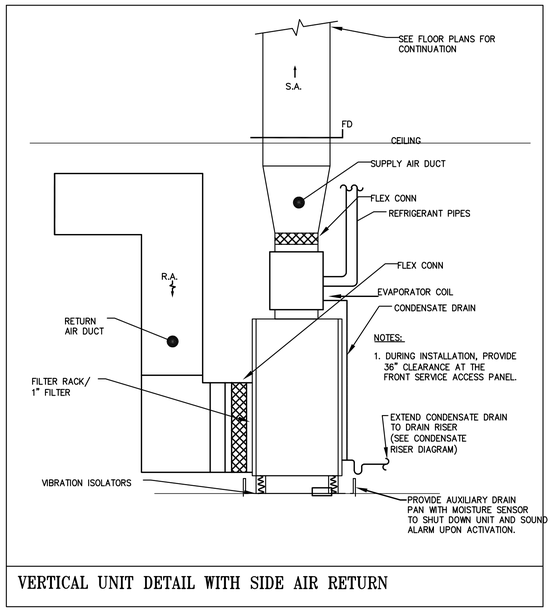
Date: 4-30-2021

Sheet Title
HVAC SCHEDULES

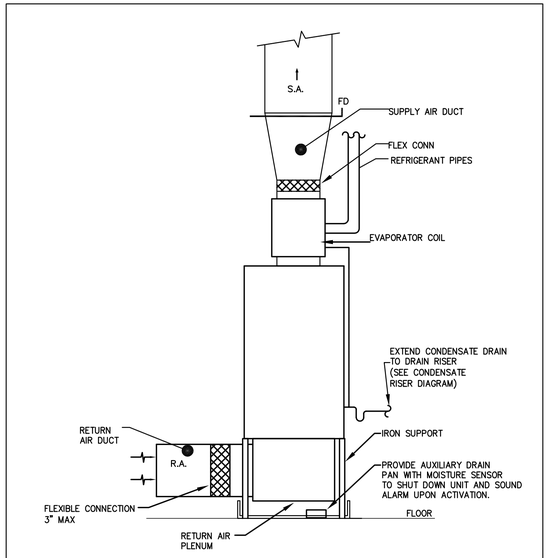
Sheet Number
M5



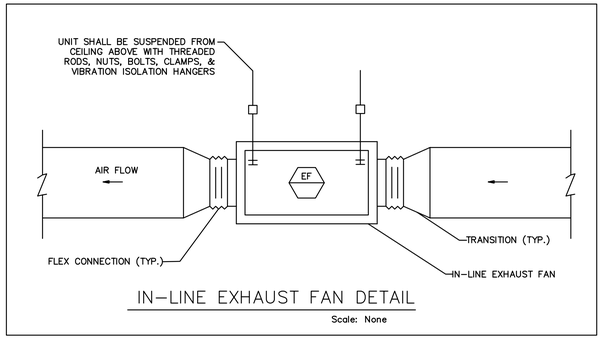
Typical Concentric Vent Termination Detail | NTS



VERTICAL UNIT DETAIL WITH SIDE AIR RETURN

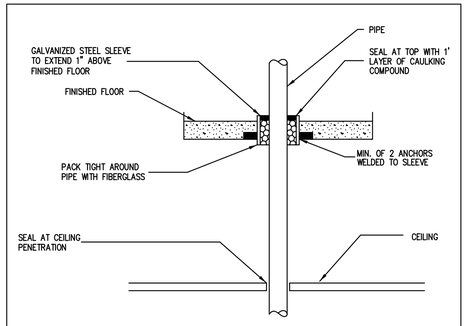


VERTICAL UNIT DETAIL WITH BOTTOM AIR RETURN

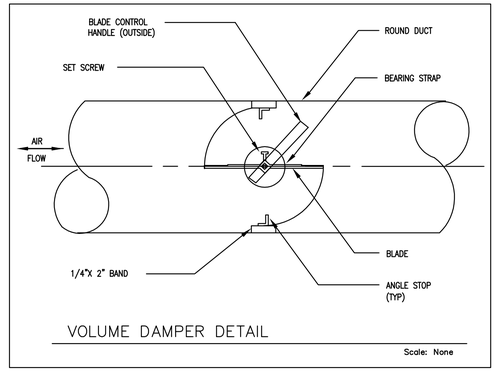


IN-LINE EXHAUST FAN DETAIL

Scale: None

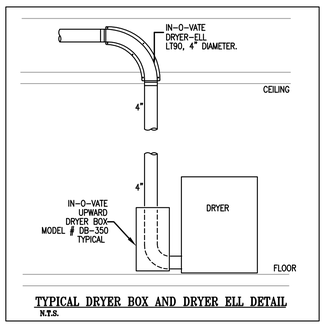


PIPE SLEEVE THRU FLOOR PENTRATION DETAIL | NTS



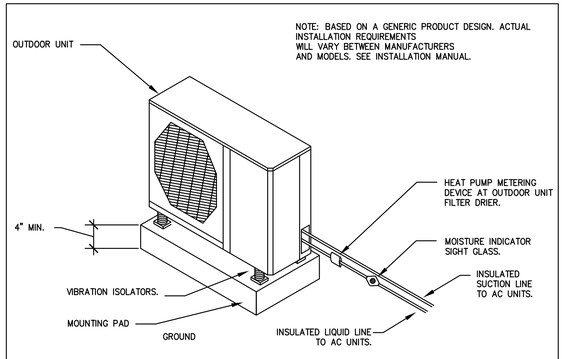
VOLUME DAMPER DETAIL

Scale: None

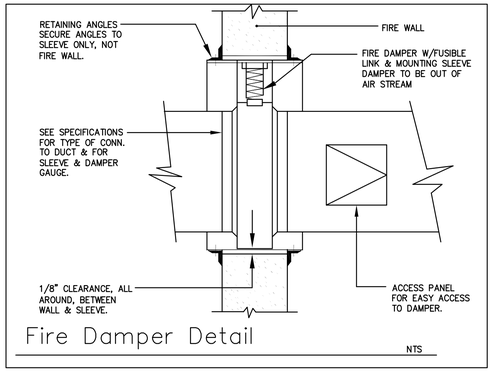


TYPICAL DRYER BOX AND DRYER ELL DETAIL

N.T.S.

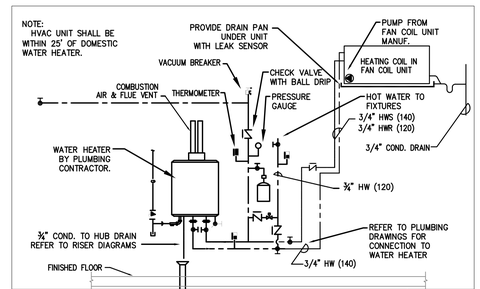


CONDENSING UNIT MOUNTING DETAIL | NTS



Fire Damper Detail

NTS



INSTANTANEOUS WATER HEATER/AC UNIT CONNECTION DETAIL | N.T.S.

PROPOSED BUILDING PLANS
855. MAIN ST BROCKTON, MA

COMMONWEALTH OF MASSACHUSETTS
FOUAD A. ATALLAH
MECHANICAL
No. 47322
REGISTERED
PROFESSIONAL ENGINEER

Scale: NTS

Project Number:

Date: 4-30-2021

Sheet Title
HVAC DETAILS

Sheet Number
M6

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HVAC GENERAL NOTES

1. THE FOLLOWING NOTES ARE GENERAL IN NATURE. IF A CONFLICT OCCURS BETWEEN THESE NOTES AND THE SPECIFICATIONS, THE MORE STRINGENT SHALL APPLY.
2. EXAMINE ALL DRAWINGS AND THE SPECIFICATION FOR THE WORK REQUIREMENTS OF THIS SECTION.
3. HVAC WORK IS INDICATED DIAGRAMMATICALLY. EXACT LOCATIONS OF ALL COMPONENTS SHALL BE DETERMINED IN THE FIELD AND BY ACTUAL BUILDING CONDITIONS. EQUIPMENT OR DUCTS INTERFERING WITH OTHER INSTALLATIONS SHALL BE RELOCATED AS REQUIRED AT NO ADDITIONAL COST TO THE OWNER. THERMOSTAT LOCATIONS SHALL BE APPROVED BY THE ARCHITECT BEFORE THE INSTALLATION.
4. ALL WORK SHALL MEET OR EXCEED THE LATEST REQUIREMENTS OF ALL NATIONAL, STATE, COUNTRY MUNICIPAL AND OTHER AUTHORITIES EXERCISING JURISDICTION OVER CONSTRUCTION WORK OF THE PROJECT. ALL REQUIRED PERMITS SHALL BE OBTAINED, PAID FOR, AND MADE AVAILABLE AT THE COMPLETION OF THE WORK.
5. INSTALLATION PROCEDURES, METHODS, AND CONDITIONS SHALL COMPLY WITH THE LATEST REQUIREMENTS OF THE FEDERAL OCCUPATIONAL SAFETY AND HEALTH ACT (OSHA).
6. THE HVAC CONTRACTOR SHALL GUARANTEE WORK IN WRITING FOR ONE YEAR FROM DATE OF FINAL ACCEPTANCE AGAINST DEFECTS IN MATERIALS, WORKMANSHIP AND INSTALLATION. THE HVAC CONTRACTOR SHALL CORRECT DEFECTIVE WORK AT NO ADDITIONAL COST TO THE OWNER AND PROVIDE EQUIPMENT WARRANTIES TO THE OWNER IN FULL FORCE.
7. PRIOR TO PURCHASING ANY EQUIPMENT OR MATERIALS, THE PRODUCT DATA SHALL BE SUBMITTED FOR REVIEW. ALL EQUIPMENT AND MATERIALS SHALL BE NEW AND WITHOUT BLEMISH OR DEFECT. SUBSTITUTED EQUIPMENT OR OPTIONAL EQUIPMENT WHERE PERMITTED AND APPROVED, MUST CONFORM TO SPACE REQUIREMENTS. ANY SUBSTITUTED EQUIPMENT THAT CANNOT MEET SPACE REQUIREMENTS, WHETHER APPROVED OR NOT, SHALL BE REPLACED AT THE CONTRACTOR'S EXPENSE.
8. THE HEATING, VENTILATING AND AIR CONDITIONING TRADE IS REQUIRED TO SUPPLY ALL NECESSARY SUPERVISION AND COORDINATION INFORMATION TO ANY OTHER TRADES WHO ARE TO SUPPLY WORK TO ACCOMMODATE THE HEATING, VENTILATING AND AIR CONDITIONING INSTALLATIONS. WORK SHALL BE PERFORMED IN COOPERATION WITH OTHER TRADES ON THE PROJECT AND SO SCHEDULED AS TO ALLOW SPEEDY AND EFFICIENT COMPLETION OF THE PROJECT.
9. CUTTING, CORING, DRILLING AND PATCHING OF HOLES AND OPENINGS IN ALL THE STRUCTURAL WALLS FOR THE WORK OF SUB-TRADES SHALL BE PERFORMED BY THE PARTICULAR SUBCONTRACTOR WHEN THE LARGEST DIMENSION OF THE OPENING IS 16 INCHES OR LESS. IF THE LARGEST DIMENSION OF THE OPENING EXCEEDS 16 INCHES, THE GENERAL CONTRACTOR SHALL PERFORM THE CUTTING AND PATCHING FOR THE WORK OF THE SUBCONTRACTOR. ALL SUCH WORK SHALL BE COORDINATED WITH THE G.C.
10. PROVIDE 6-INCH TALL CONCRETE PADS FOR CONDENSING UNITS AND OTHER OUTDOOR EQUIPMENT. PROVIDE STEEL PLATFORMS AND SUPPORTS AS REQUIRED TO COMPLETE SAFE AND CODE-COMPLIANT COMPLETE SYSTEM INSTALLATION.
11. ALL WORK SHALL BE INSTALLED SO THAT PARTS REQUIRING PERIODIC INSPECTION, OPERATION, MAINTENANCE AND REPAIR ARE READILY ACCESSIBLE. MINOR DEVIATION FROM THE DRAWINGS MAY BE MADE TO ACCOMPLISH THIS, BUT CHANGES OF SUBSTANTIAL MAGNITUDE SHALL NOT BE MADE PRIOR TO WRITTEN APPROVAL FROM THE ENGINEER.
12. THE DRAWINGS ARE DIAGRAMMATIC. THE CONTRACTOR SHALL REVIEW EQUIPMENT INSTALLATION MANUAL TO UNDERSTAND THE EQUIPMENT SERVICE SPACE REQUIRED BEFORE WORK IS COMMENCED. THIS CONTRACTOR SHALL COORDINATE LOCATION OF ACCESS PANELS IN CEILINGS, WALLS, FLOORS ETC WITH GC. THE PANELS SHALL BE FURNISHED BY HVAC CONTRACTOR AND INSTALLED BY GC.
13. THIS TRADE SHALL COORDINATE DUCT AND EQUIPMENT INSTALLATION WITH EXISTING EQUIPMENT, DUCTS, AND PIPING. THIS TRADE SHALL COORDINATE ALL CONFLICTS WITH OTHER TRADES IN THE FIELD PRIOR TO INSTALLATION AT NOT EXTRA COST TO THE OWNER.
14. THE AIR HANDLING UNITS SHALL BE PROVIDED WITH SECONDARY CONDENSATE DRAINS AS REQUIRED BY THE INTERNATIONAL MECHANICAL CODE (IMC), SECTION 307. EACH SECONDARY DRAIN PAN SHALL BE PROVIDED WITH A CONDENSATE OVERFLOW SWITCH. THE SWITCH SHALL SHUT OFF THE UNIT IN THE EVENT THAT PRIMARY DRAIN IS BLOCKED.
15. REFER TO ARCHITECTS DRAWINGS FOR THERMOSTAT MOUNTING HEIGHTS.
16. DEMOLISH EXISTING SYSTEMS AS REQUIRED.
17. PIPING

PIPE MATERIALS AND FITTING MATERIALS SHALL BE AS INDICATED IN SCHEDULE OF PIPE AND FITTING MATERIALS.

SCHEDULE OF PIPE AND FITTING MATERIALS

SERVICE	PIPE MATERIAL WEIGHT	FOR TYPE OF JOINTS	FITTING MATERIAL	PRESSURE RATING PSI SWP. OR WEIGHT
HOT WATER/ CHILLED WATER	STEEL SCHEDULE 40	SCREWED	MALLEABLE IRON	150
HOT WATER/ CHILLED WATER	STEEL SCHEDULE 40	WELDED	STEEL	SCHEDULE 40
CONDENSATE DRAIN	COPPER TYPE L	SOLDERED	WROUGHT COPPER	125
COLD WATER	COPPER TYPE L	SOLDERED	WROUGHT COPPER	125
REFRIGERANT	COPPER TYPE ACR	BRAZED	WROUGHT COPPER	200

PROVIDE DIELECTRIC FITTING TO CONNECT DIFFERENT PIPING MATERIALS.
PROVIDE HANGERS AND OTHER PIPING SUPPORTS AS REQUIRED.
PROVIDE AIR VENT AT EACH HIGH POINT AND DRAIN VALVE AT EACH LOW POINT FOR COMPLETE SYSTEM DRAINAGE.
PROVIDE FLOW MEASURING DEVICES, BALANCING COCKS, SHUT-OFF VALVES AT EACH SYSTEM LOOP RETURN AND SHUT-OFF VALVES AT EACH SYSTEM LOOP SUPPLY.
EQUIPMENT CONDENSATE DRAINS SHALL BE TRAPPED AT EQUIPMENT CONNECTION. DRAIN LINES SHALL RUN FULL SIZE OF DRAIN TAPPING TO NEAREST FLOOR DRAIN OR AS SHOWN ON DRAWINGS WITH A PITCH OF 1" IN 20 FEET.
PROVIDE CHEMICAL TREATMENT SYSTEMS FOR THE WATER SYSTEMS SHOWN ON DRAWINGS. DO NOT OPERATE SYSTEMS WITHOUT WATER TREATMENT. PROVIDE PIPING AND EQUIPMENT NECESSARY FOR COMPLETE SYSTEMS.
PIPE SLEEVES - SLEEVES THROUGH FLOORS AND THROUGH EXTERIOR, STRUCTURAL AND FIRE-RATED CONSTRUCTION SHALL BE HOT-DIPPED GALVANIZED SCHEDULE 40 STEEL PIPE. SLEEVES THROUGH PARTITIONS AND NON-FIRE-RATED CONSTRUCTION SHALL BE 26-GAUGE GALVANIZED STEEL WITH LOCK LONGITUDINAL SEAMS, OR APPROVED PLASTIC PIPE. PACKING BETWEEN THE PIPE AND THE SLEEVE (OR WALL OR SLAB OPENING) IN FIRE RATED WALLS OR SLABS SHALL BE A COMBINATION OF FIREPROOF INSULATION AND FIREPROOF CAULK. THE COMBINATION OF MATERIALS SHALL HAVE THE SAME FIRE RATING, IN HOURS, AS THE WALL OR SLAB, AS TESTED IN ACCORDANCE WITH THE LATEST EDITION OF ASTME-119.

REFRIGERATION PIPING SHALL BE SIZED AND ARRANGED AS PER REFRIGERATION SYSTEM RECOMMENDATIONS. INSULATE SUCTION LINES WITH 3/4" ARMAFLEX.

15. PIPING INSULATION

INSULATION SHALL BE FIBROUS GLASS TYPE WITH FACTORY APPLIED FIRE RETARDANT VAPOR BARRIER JACKET AS MADE BY OWENS CORNING, CERTAIN-TEED, MANVILLE OR KNAUF. IT SHALL BE INSTALLED AS REQUIRED BY MANUFACTURER'S INSTRUCTIONS. ASTM E-84 FIRE HAZARD RATINGS SHALL BE 25 FLAME SPREAD, 50 SMOKE DEVELOPED AND 50 FUEL CONTRIBUTED. PROVIDE FIBROUS DUAL TEMPERATURE INSULATION WITH FACTORY APPLIED VAPOR BARRIER JACKET ON OUTDOOR MAKEUP, CONDENSATE, CHILLED WATER, DRAIN, HOT AND COLD WATER PIPING, EXCEPT AS SPECIFIED OTHERWISE.
INSULATION THICKNESS FOR CHILLED WATER, HOT WATER AND COLD WATER PIPING SHALL BE AS FOLLOWS.
INSULATION ON PIPING EXPOSED TO OUTSIDE AIR SHALL BE COVERED WITH WEATHER-PROOF MATERIAL.
INSULATION THICKNESS FOR REFRIGERATION PIPES SHALL BE PER MANUFACTURER'S RECOMMENDATIONS

16. SHEET METAL

MATERIAL, CONSTRUCTION AND INSTALLATION SHALL MEET REQUIREMENTS OF MOST RECENT EDITIONS OF THE FOLLOWING STANDARDS AND REFERENCES, EXCEPT FOR MORE STRINGENT REQUIREMENTS SPECIFIED OR SHOWN ON DRAWINGS:

STANDARD	AS APPLICABLE TO
SMACNA HVAC DUCT CONSTRUCTION STANDARDS (METAL AND FLEXIBLE)	SHEETMETAL DUCTWORK; DUCT LINERS; ADHESIVES; FASTENERS; FLEXIBLE DUCTWORK
SMACNA HVAC AIR DUCT LEAKAGE TEST MANUAL	DUCT LEAKAGE TESTING
1. NFPA 90A	FIRE DAMPERS; FIRE RESISTANCE STANDARDS FOR DUCTS AND LINERS
SMACNA GUIDELINES FOR WELDING SHEET METAL	WELDED GALVANIZED, BLACK IRON AND STAINLESS STEEL DUCTWORK

DIMENSIONS SHOWN ON DRAWINGS FOR LINED DUCTWORK ARE NET INSIDE PIPING INSUALTION.
DIMENSIONS INCREASE DUCTWORK TO ACCOMMODATE LINING REQUIREMENTS.
DUCTWORK SHALL HAVE PRESSURE AND VELOCITY CLASSIFICATIONS AS FOLLOWS FOR THE ALL DUCTWORK:

DUCT CONSTRUCTION CLASS	STATIC PRESSURE RATING	PRESSURE	SMACNA SEAL CLASS	SMACNA LEAKAGE CLASS	VELOCITY
2"	2"	POS. OR NEG	B	12	2500 FPM OR LESS
1"	1"	POS. OR NEG	B	12	2000 FPM OR LESS
1/2"	1/2"	POS. OR NEG	B	12	2500 FPM OR LESS

ALL DUCTWORK JOINTS SHALL BE SEALED. TAPES AND MASTICS USED TO SEAL DUCTWORK SHALL BE LISTED AND LABELED IN ACCORDANCE WITH UL 181A OR UL 181B.
ELBOWS AND BENDS FOR RECTANGULAR DUCTS SHALL HAVE CENTERLINE RADIUS OF 1.5 TIMES DUCT WIDTH WHEREVER POSSIBLE. SQUARE ELBOWS SHALL BE PROVIDED WITH TURNING VANES. VANES ARE NOT ALLOWED ON DRYER EXHAUST SYSTEMS.
ELBOWS FOR GREASE EXHAUST SHALL BE FULL RADIUS. TURNING VANED MITERED ELBOWS ARE NOT ALLOWED IN GREASE DUCTS.
PROVIDE PROPER PRESSURE AND LEAKAGE-RATED, GASKETED, DUCT MOUNTED ACCESS PANELS/DOORS. IN INSULATED DUCTS, ACCESS DOORS SHALL BE INSULATED DOUBLE WALL.
PROVIDE FIRE DAMPERS THROUGHOUT AIR SUPPLY SYSTEM AS SHOWN ON DRAWINGS AND AS REQUIRED BY APPLICABLE CODES, STANDARDS AND AUTHORITIES. PROVIDE ACCESS DOOR FOR EACH FIRE DAMPER OF SUFFICIENT SIZE TO REPAIR INTERNAL LINK. DAMPERS SHALL BE INSTALLED PER MANUFACTURER'S INSTALLATION INSTRUCTIONS.
DAMPERS SHALL BE PROVIDED AS NECESSARY FOR SYSTEM BALANCING AND AS REQUIRED BY THIS SPECIFICATION.
PROVIDE LOW LEAK MOTORIZED DAMPERS WHERE INDICATED ON THE DRAWINGS. DAMPER MAXIMUM LEAKAGE SHALL NOT EXCEED 4 CFM AT 1" STATIC PRESSURE. ACTUATORS PROVIDED BY ATC CONTRACTOR.
PROVIDE DIFFUSERS, REGISTERS AND GRILLES AS INDICATED ON THE DRAWINGS. THE SOUND PRESSURE LEVEL SHALL NOT EXCEED NC 30 OR AS SPECIFIED ON DRAWINGS. FINISH SHALL BE AS DIRECTED BY ARCHITECT.
ALL FAN AND AIR SUPPLY UNIT CONNECTIONS, BOTH AT INLET AND DISCHARGE SHALL BE MADE WITH FLEXIBLE MATERIAL TO PROHIBIT THE TRANSFER OF VIBRATION FROM FANS TO DUCTWORK CONNECTING THERETO, WITHOUT AIR LEAKAGE. THE MATERIAL BETWEEN THE CLAMPS SHALL HAVE SUFFICIENT SLACK SO AS TO PREVENT TEARING DUE TO FAN MOVEMENT. THE FLEXIBLE CONNECTIONS SHALL BE A MAXIMUM OF 12" LONG AND HELD IN PLACE WITH HEAVY METAL BANDS, SECURELY ATTACHED, TO PREVENT ANY LEAKAGE AT THE CONNECTION POINTS.
THE DUCTWORK SHALL BE LINED DOWNSTREAM AND UPSTREAM OF FANS AND AIR HANDLING UNITS FOR A DISTANCE OF 15 FEET OR AS SHOWN ON THE DOCUMENTS (WHATEVER DISTANCE ID GREATER). THE LINER SHALL HAVE A FLAME SPREAD LESS THAN 25 AND SMOKE DENSITY LESS THAN 50 PER ASTM E-84 NFPA 255, UL 723 CLASS 1, AND UL 181. FIBERGLASS DUCTWORK LINING SHALL BE 1" THICK.
DUCT SLEEVES AND OPENINGS - SLEEVES THROUGH FLOORS, THROUGH EXTERIOR STRUCTURE, THROUGH FIRE-RATED CONSTRUCTION AND THROUGH SMOKE PARTITIONS THAT REQUIRE SMOKE DAMPERS SHALL BE SCHEDULE-40 GALVANIZED STEEL PIPE FOR ROUND DUCT AND SHALL MEET SMACNA FIRE DAMPER AND HEAT STOP GUIDE FOR RECTANGULAR AND FLAT OVAL DUCTS. FIREPROOF PACKING SHALL BE APPLIED TO SEAL ANY OPENINGS BETWEEN SLEEVE AND WALL. MATERIALS SHALL MAINTAIN THE FIRE RATING OF THE WALL, AND SHALL BE INSTALLED IN ACCORDANCE WITH THE SMACNA FIRE DAMPER AND HEAT STOP GUIDE.
DUCT INTERIORS VISIBLE THROUGH GRILLES, DIFFUSERS ETC SHALL BE PAINTED BLACK.
FLEXIBLE DUCTWORK CONNECTING GRILLES, DIFFUSERS ETC WITH THE SHEET METAL DUCTWORK SHALL NOT BE LONGER THAN 5 FEET.
PROVIDE VOLUME DAMPERS FOR ALL BRANCH DUCTWORK TO ALLOW FOR AIR SYSTEM BALANCING. VOLUME DAMPERS SHALL BE LOCATED AS FAR AS POSSIBLE FROM AIR OUTLET.

13. ALL CONCEALED SUPPLY, RETURN, AND EXHAUST DUCTWORK LOCATED WITHIN THE BUILDING AND ALL DUCTWORK IN THE BASEMENT SHALL BE EXTERNALLY INSULATED WITH 1 1/2" THICK INSULATION WITH A MINIMUM "R-6" VALUE. THERMAL INSULATION SHALL BE PROVIDED WITH VAPOR BARRIER. ALL SUPPLY AND RETURN DUCTWORK LOCATED OUTSIDE THE BUILDING ENVELOPE SHALL BE FURNISHED WITH 3" THICK INSULATION WITH A MINIMUM "R-8" VALUE. THERMAL INSULATION LOCATED OUTSIDE THE BUILDING ENVELOPE SHALL BE PROVIDED WITH WEATHER-PROOF JACKET.
14. ALL DUCTWORK SHALL BE: 24 GAUGE UP TO 36 INCHES WIDE, 22 GAUGE 31 INCHES WIDE TO 60 INCHES WIDE, ROUND DUCT SHALL BE 24 GAUGE UP TO 10 INCHES DIAMETER, 22 GAUGE 11 TO 20 INCHES DIAMETER, 20 GAUGE ABOVE 20 INCHES DIAMETER; ALL GALVANIZED SHEET METAL. SEAL ALL JOINTS AND SLIPS WITH EC 800 OR OTHER SUITABLE SEALANT. ALL LONGITUDINAL SEAMS SHALL BE PITTSBURGH LOCKING TAPE. ALL SLIPS SHALL BE REINFORCED BAR TYPE. FABRICATE AND INSTALL ALL DUCTS IN COMPLIANCE WITH SMACNA STANDARDS FOR LOW PRESSURE DUCT CONSTRUCTION.

18. ELECTRICAL REQUIREMENTS

PROVIDE MOTORS, DISCONNECTS, CONTROLS, STEP-DOWN TRANSFORMERS, AND STARTERS FOR ALL HVAC EQUIPMENT. PROVIDE CONTROL AND OTHER RELATED WIRING INCLUDING INTERLOCKS. STARTERS THAT REQUIRE INTERLOCKS OR REMOTE CONTROL SHALL BE MAGNETIC WITH HAND-OFF-AUTOMATIC SWITCH IN COVER.

19. DRIVES

PROVIDE DRIVES FOR BELTED MOTORS. THEY SHALL BE ALLIS-CHALMERS, BROWNING OR WOODS V-BELT DRIVES WITH ADJUSTABLE MOTOR SHEAVE. DRIVES SHALL BE AS SHORT AS PRACTICAL AND SHALL HAVE NUMBER OF BELTS NECESSARY TO TRANSMIT REQUIRED HORSEPOWER WITHOUT UNDUE SLIP OR STRAIN.

20. AUTOMATIC TEMPERATURE CONTROL

PROVIDE A COMPLETE AUTOMATIC TEMPERATURE CONTROL SYSTEM. THE SYSTEM SHALL INCLUDE ALL NECESSARY HARDWARE AND SOFTWARE NECESSARY TO PERFORM THE CONTROL SEQUENCES. ALL WORK PERFORMED UNDER THIS SECTION OF THE SPECIFICATIONS SHALL COMPLY WITH ALL BUILDING CODES.
THE CONTRACTOR SHALL PROVIDE A ONE-YEAR WARRANTY ON ALL NEW PARTS AND LABOR FOR THE SYSTEM FROM THE DATE OF SUBSTANTIAL COMPLETION. DURING THE WARRANTY PERIOD, SERVICE WILL BE AVAILABLE DURING NORMAL BUSINESS HOURS FOR EMERGENCY CALLS.
THE CONTRACTOR WILL PROVIDE 12 HOURS OF CUSTOMER TRAINING FOR UP TO FOUR OPERATING PERSONNEL AS PART OF THE PROJECT TO BE SCHEDULED AT THE PROJECT SITE.
PROVIDE CONTROL VALVES, SENSOR WELLS, THERMOMETERS AND AUTOMATIC CONTROL DAMPERS.
REFER TO ARCHITECTS DRAWINGS FOR THERMOSTAT MOUNTING HEIGHTS.
SUBMIT SHOP DRAWINGS. THE DRAWINGS SHALL INCLUDE THE FOLLOWING:

1. CONTROL DIAGRAMS
2. DETAILED NARRATIVE DESCRIPTION OF SEQUENCE OF OPERATION.
3. VALVE AND DAMPER SCHEDULE
4. PROVIDE IDENTIFICATION NUMBERS, LOCATION, AND PERFORMANCE DATA.

SUBMITTAL DOCUMENTS SHALL BE REVISED UPON COMPLETION OF THE PROJECT TO REFLECT THE ACTUAL INSTALLATION. THE DOCUMENTS WILL BE USED AS RECORD DOCUMENTS.

21. TESTING AND BALANCING

THIS TRADE SHALL PROCURE THE SERVICE OF AN INDEPENDENT AIR BALANCE AND TESTING AGENCY, APPROVED BY THE ENGINEER, WHICH SPECIALIZES IN THE BALANCING AND TESTING OF HEATING, VENTILATING, AND AIR CONDITIONING SYSTEMS, TO BALANCE, ADJUST, AND TEST WATER AND AIR SYSTEMS AS HEREIN SPECIFIED.
THE AIR BALANCE AGENCY SHALL PROVIDE PROOF OF HAVING SUCCESSFULLY COMPLETED AT LEAST FIVE PROJECTS OF SIMILAR SIZE AND SCOPE.
ALL INSTRUMENTS USED BY THIS AGENCY SHALL BE ACCURATELY CALIBRATED AND MAINTAINED IN GOOD WORKING ORDER. IF REQUESTED, THE TEST SHALL BE CONDUCTED IN THE PRESENCE OF THE MECHANICAL ENGINEER RESPONSIBLE FOR THE PROJECT AND/OR HIS REPRESENTATIVE.
AIR BALANCE AND TESTING SHALL NOT BEGIN UNTIL SYSTEM HAS BEEN COMPLETED AND IS IN FULL WORKING ORDER.
UPON COMPLETION OF THE INSTALLATION OF THE HVAC SYSTEMS, THE AIR BALANCE AGENCY SHALL PERFORM TESTS AND BALANCE THE SYSTEMS WITHIN +/-5% OF THE DESIGN FLOWS, COMPILE THE TEST DATA, AND SUBMIT COPIES OF THE COMPLETE TEST DATA DIRECTLY TO THE ARCHITECT AND ENGINEER FOR EVALUATION AND APPROVAL.

22. CLEANING AND PROTECTING

IT SHALL BE THIS TRADE'S RESPONSIBILITY TO STORE HIS MATERIALS IN A MANNER THAT WILL MAINTAIN AN ORDERLY CLEAN APPEARANCE. IF STORED ON-SITE IN OPEN OR UNPROTECTED AREAS, ALL EQUIPMENT AND MATERIAL SHALL BE KEPT OFF THE GROUND BY MEANS OF PALLETS OR RACKS, AND COVERED WITH TARPAULINS.

22. VOLUME DAMPERS

1. NOTE: VOLUME DAMPERS SHALL BE PROVIDED AS NECESSARY FOR SYSTEM BALANCING AND AS REQUIRED BY THIS SPECIFICATION.
2. PROVIDE MANUAL ADJUSTABLE VOLUME DAMPERS, WITH EXTENDED MOUNT INDICATING AND LOCKING QUADRANTS:
   a. ON EACH SUPPLY, RETURN AND EXHAUST DUCT TAKE_OFF.
   b. AT EACH TAKE_OFF TO REGISTER, GRILLE OR DIFFUSER (THESE ARE NOT SHOWN ON THE DRAWINGS). VOLUME DAMPER SHALL BE AS FAR AWAY FROM DIFFUSER OR GRILLE AS POSSIBLE FOR SYSTEM BALANCING.
3. DAMPERS SHALL BE ¼" SMALLER IN BOTH DIMENSIONS OR 1" SMALLER DIAMETER THAN SIZE OF DUCT IN WHICH THEY ARE INSTALLED; E.G., USE 23_¼" BY 23_¼" DAMPER FOR 24" SQUARE DUCT.
4. DAMPERS LARGER THAN 12" IN HEIGHT SHALL BE OPPOSED MULTI_BLADE.
5. DAMPER BLADES SHALL BE TWO GAUGES HEAVIER THAN ADJOINING DUCTWORK, AND SHALL BE RIVETED TO SUPPORTING RODS. HEM OVER EDGES PARALLEL TO RODS.
6. BRACKETS SHALL BE GALVANIZED METAL, SECURED TO DUCTWORK WITH SHEET METAL SCREW WITH LOCKING QUADRANT ARMS (SEE SEAL CLASS SECTION FOR ADDITIONAL REQUIREMENTS). PROVIDE 2" HANDLE EXTENSION FOR ALL DAMPERS ON EXTERNALLY INSULATED DUCTWORK.

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Sheet Title
HVAC SCHEDULES

Sheet Number
M7

GENERAL ABBREVIATIONS

AC	AIR CONDITIONING UNIT
AD	ACCESS DOOR
AF	AIR FILTER
AP	ACCESS PANEL
ATC	AUTOMATIC TEMPERATURE CONTROL
AV	AIR VENT
BD	BAROMETRIC DAMPER
BDD	BACKDRAFT DAMPER
BHP	BRAKE HORSEPOWER
BOP	BOTTOM OF PIPE
BTU	BRITISH THERMAL UNITS
BV	BALL VALVE
CC	COOLING COIL
CFM	CUBIC FEET PER MINUTE
CFH	CUBIC FEET PER HOUR
CP	CONTROL PANEL
CO	CLEAN OUT
COP	CENTER OF PIPE
CTE	CONNECT TO EXISTING
CUH	CABINET UNIT HEATER
CU	CONDENSING UNIT
CW	COLD WATER
D	DRAIN
DB	DRY BULB
DIA	DIAMETER
DIFF	DIFFUSER
DN	DOWN
DWG	DRAWING
E	EXISTING
EAT	ENTERING AIR TEMPERATURE
EFF	EFFICIENCY
EF	EXHAUST FAN
ELEC	ELECTRICAL
ELV	ELEVATION
ESP	EXTERNAL STATIC PRESSURE
EUH	ELECTRIC UNIT HEATER
EWH	ELECTRIC WALL HEATER
EWT	ENTERING WATER TEMPERATURE
EXH	EXHAUST
°F	DEGREES FAHRENHEIT
FCO	FLOOR CLEAN OUT
FD	FIRE DRAIN
FLA	FULL LOAD AMPS
FLEX	FLEXIBLE
FMS	FLOW MEASURING STATION
FPM	FEET PER MINUTE
FPHB	FREEZE PROOF HOSE BIBB
FTR	FINNED TUBE RADIATION
FT	FEET
GAL	GALLONS
GC	GENERAL CONTRACTOR
GPM	GALLONS PER MINUTE
GV	GATE VAVLE
HB	HOSE BIBB
HC	HEATING COIL
HP	HORSEPOWER
HP	HEAT PUMP
HVAC	HEATING, VENTILATION, & AIR CONDITIONING
HW	HOT WATER
HWH	HOT WATER HEATER
HZ	HERTZ
IN	INCHES
KW	KILOWATT
LAT	LEAVING AIR TEMPERATURE
LF	LINEAR FEET
LWT	LEAVING WATER TEMPERATURE
MBH	THOUSANDS OF BTU'S PER HOUR
MD	MOTORIZED DAMPER
MECH	MECHANICAL
N/A	NOT APPLICABLE
NC	NORMALLY CLOSED
NO	NORMALLY OPEN
NTS	NOT TO SCALE
OA	OUTSIDE AIR
OAT	OUTSIDE AIR TEMPERATURE
OBD	OPPOSED BLADE DAMPER
OD	OUTSIDE DIAMETER
Ph	PHASE
R	RETURN
RA	RETURN AIR
REF	ROOF EXHAUST FAN
REQ'D	REQUIRED
RD	ROOF DRAIN
RG	RETURN GRILLE
RH	RELATIVE HUMIDITY
RPM	REVOLUTIONS PER MINUTE
RTU	ROOF TOP UNIT
S	SANITARY
SA	SUPPLY AIR
SAT	SUPPLY AIR TEMPERATURE
SqFt	SQUARE FEET
SFD	SMOKE/FIRE DAMPER
SP	STATIC PRESSURE
SQ	SQUARE
SR	SUPPLY REGISTER
ST	STORM
STL	STEEL
T	THERMOSTAT
T.B.D.	TO BE DEMOLISHED
TYP.	TYPICAL
TV	WIND TURBINE VENTILATOR
UC	UNDERCUT DOOR 3/4" (MIN)
UH	UNIT HEATER
V	VENT
VAV	VARIABLE AIR VOLUME
VB	VACUUM BREAKER
VTR	VENT THRU ROOF
W	WASTE
W/	WITH
WCO	WALL CLEANOUT
W/O	WITHOUT
WB	WET BULB TEMPERATURE
WG	WATER GAUGE
WH	WATER HEATER
WHA	WATER HAMMER ARRESTOR

PIPING LEGEND

	-	DOUBLE LINE INDICATES BELOW GRADE
—SAN—	SAN	SANITARY OR WASTE ABOVE GRADE
—GD—	GD	GARAGE DRAIN
—GDV—	GD	GARAGE DRAIN VENT
====V	V	VENT PIPNG BELOW GRADE
- - -V- - -	V	VENT PIPING ABOVE GRADE
—CW—	CW	COLD WATER
—HW—	HW	HOT WATER
—HWR—	HWR	HOT WATER RETURN
—G—	G	NATURAL GAS
—OD—	OD	OVERFLOW DRAIN
	FCO	FLUSH FLOOR CLEANOUT
	CO	CLEANOUT
	WCO	WALL CLEANOUT
	UP	PIPE RISES UP
	DN	PIPE DROPS DOWN
	W&T	WASTE AND TRAP
RD		ROOF DRAIN
	TP	TRAP PRIMER
	SA	SHOCK ABSORBER (WATER HAMMER ARRESTOR (W/ BALL VALVE SHUT OFF VALVE)
	FD	FLOOR DRAIN
		CHECK VALVE
	-	SHUT-OFF VALVE
		GLOBE VALVE
		PUMP STRAINER
	P-	INDICATES PLUMBING FIXTURE (SEE SCHEDULE)
	INV.	INVERT ELEVATION
	VTR	VENT THRU ROOF
	P.C.	PLUMBING CONTRACTOR
	M.C.	MECHANICAL (HVAC) CONTRATOR
	E.C.	ELECTRICAL CONTRACTOR
	G.C.	GENERAL CONTRACTOR
		EXPANSION LOOP W/ PIPE GUIDES
A		PIPE ANCHOR

GENERAL PLUMBING NOTES

1. GENERAL NOTES, SYMBOLS AND DETAILS ARE APPLICABLE TO ALL DRAWINGS WITHIN DIVISION 22. NOTES BELOW ARE NOT INTENDED TO REPLACE SPECIFICATIONS. SEE SPECIFICATIONS IN ADDITION TO GENERAL NOTES. NOT ALL SYMBOLS SHOWN ARE NECESSARILY APPLICABLE TO THIS PROJECT.
2. SCOPE OF WORK SHALL INCLUDE ALL LABOR, MATERIALS, TOOLS, EQUIPMENT, TRANSPORTATION, HOISTING, RIGGING, INSURANCE, REQUIRED PERMITS AND INSPECTIONS, ETC. REQUIRED TO PERFORM THE WORK AS INDICATED ON THE DRAWINGS AND SPECIFICATIONS FOR A COMPLETE INSTALLATION. ALL SHALL BE DONE BY LICENSED WORKMEN IN ACCORDANCE WITH NATIONAL, STATE, AND LOCAL CODES AND ORDINANCES HAVING JURISDICTION.
3. THE DRAWINGS SHOW THE LAYOUT OF THE PLUMBING SYSTEMS AND INDICATE THE APPROXIMATE LOCATIONS OF FIXTURES, PIPING, BRANCHES AND ELBOWS, SPECIALTIES, AND EQUIPMENT. THE DRAWINGS ARE DIAGRAMMATIC AND ARE BASED ON VISIBLE OBSERVABLE CONDITIONS. CAREFULLY REVIEW AND STUDY DRAWINGS. IF ANY DISCREPANCIES EXIST, NOTIFY THE ARCHITECT AND ENGINEER BEFORE ADVANCING TO SUCH A POINT THAT ADDITIONAL COSTS WILL BE INCURRED. THE EXACT LOCATION OF ALL COMPONENTS ARE TO BE DETERMINED IN THE FIELD BY THE ACTUAL BUILDING CONDITIONS. FIXTURES, PIPING, SPECIALTIES, EQUIPMENT, AND PLUMBING COMPONENTS INTERFERING WITH OTHER INSTALLATION OR EXISTING BUILDING CONSTRUCTION, STRUCTURE, OR COMPONENTS, SHALL BE RELOCATED AS REQUIRED AT NO ADDITIONAL COST TO THE OWNER.
4. ALL PLUMBING WORK SHALL BE IN ACCORDANCE WITH THE MASSACHUSETTS PLUMBING CODE, MASSACHUSETTS PLUMBING BOARD, AND ALL APPLICABLE LOCAL CODES AND REGULATIONS.
5. ALL PLUMBING PRODUCTS INSTALLED SHALL BE APPROVED AND RECOGNIZED BY THE MASSACHUSETTS PLUMBING BOARD AND THE APPROVED PLUMBING PRODUCTS DIRECTORY.
6. PRODUCTS REQUIRED BY CONSTRUCTION BUT NOT SPECIFICALLY DESCRIBED HEREIN SHALL BE AS SELECTED BY THE CONTRACTOR SUBJECT TO THE APPROVAL OF THE ARCHITECT AND ENGINEER.
7. PRODUCT INSTALLATION SHALL ADHERE TO MANUFACTURER'S RECOMMENDATIONS AND REQUIREMENTS FOR THE INSTALLATION PROVIDED.
8. PROVIDE ALL REQUIRED MATERIALS, LABOR, EQUIPMENT, AND SERVICES NECESSARY FOR THE INSTALLATION OF THE WORK AS SHOWN ON THESE DRAWINGS OR SPECIFIED BY THE BASE BUILDING DRAWING AND SPECIFICATIONS.
9. CONTRACTOR SHALL VISIT THE SITE AND BECOME INFORMED AS TO THE NATURE AND SCOPE OF WORK REQUIRED BY CONTRACT DOCUMENTS PRIOR TO BIDDING PROJECT.
10. BEFORE SELECTING MATERIAL AND EQUIPMENT, AND PROCESSING THE WORK, INSPECT AREAS WHERE MATERIAL AND EQUIPMENT ARE TO BE INSTALLED TO INSURE SUITABILITY AND CHECK NEEDED SPACE FOR PLACEMENT AND CLEARANCES.
11. NEITHER ACCURACY NOR COMPLETION OF UTILITY LOCATIONS SHOWN ON DRAWINGS IS GUARANTEED. DETERMINE EXACT LOCATIONS OF UTILITIES IN FIELD, WHETHER SHOWN ON DRAWINGS OR NOT. EXERCISE CAUTION AND IDENTIFY LOCATIONS OF UNMARKED UTILITY LINES AS NECESSARY TO PERFORM THE WORK OF THIS SECTION.
12. REFER TO AND CAREFULLY CHECK ARCHITECTURAL, MECHANICAL, ELECTRICAL, AND FIRE PROTECTION DRAWINGS AND DETAILS, NOTES, LOCATIONS WHERE WALLS, PARTITIONS, CEILINGS, AND OTHER SURFACES ARE FURRED, LOCATIONS OF SHAFTS, SOFFITS, AND CONFLICTS WITH WORK OF OTHER TRADES, AND ARRANGE WORK ACCORDINGLY. FURNISH ALL OFFSETS, TRANSITIONS, CONNECTORS, ETC., REQUIRED TO MEET SUCH CONDITIONS.
13. CONTRACTOR SHALL CONFIRM PIPING, EQUIPMENT, FIXTURES, SPECIALTIES, AND PLUMBING COMPONENT LOCATIONS, ELEVATIONS AND SIZES BEFORE ANY WORK IS STARTED. IF ANY DISCREPANCIES OR INTERFERENCES ARE FOUND, NOTIFY ENGINEER BEFORE PROCEEDING WITH WORK.
14. IF MANUFACTURER OF SELECTED EQUIPMENT REQUIRES LARGER CAPACITY, CIRCUITRY, AND/OR EQUIPMENT THE CONTRACTOR SHALL PROVIDE SUCH CAPACITY AND/OR EQUIPMENT UNDER THIS CONTRACT AT NO COST TO THE OWNER.

GENERAL PLUMBING NOTES (CONTINUED)

15. WHERE THE CONTRACTOR PROPOSES TO USE AN ITEM OF EQUIPMENT OTHER THAN THAT SPECIFIED OR DETAILED ON THE DRAWINGS WHICH REQUIRES ANY REDESIGN OF THE STRUCTURE, PARTITIONS, FOUNDATIONS, PIPING, WIRING OR ANY OTHER PART OF THE PLUMBING, MECHANICAL, ELECTRICAL, OR ARCHITECTURAL LAYOUT, ALL SUCH REDESIGN AND ALL NEW DRAWINGS AND DETAILING REQUIRED THEREFORE, SHALL BE PREPARED AT THE CONTRACTOR'S EXPENSE AND ARE SUBJECT TO THE REVIEW AND APPROVAL OF THE OWNER OR HIS AUTHORIZED REPRESENTATIVE. OWNER RESERVES THE RIGHT TO HAVE THE ARCHITECT OR ENGINEER OF HIS CHOICE PREPARE ANY REDESIGN WORK.
16. CONTRACTOR SHALL COORDINATE ELECTRICAL REQUIREMENTS OF PLUMBING EQUIPMENT WITH DIVISION 26.
17. ALL WORK IN INTERIOR FINISHED SPACES EXCEPT INDICATED IS TO BE CONCEALED. PROVIDE ALL NECESSARY CUTTING, PATCHING, REPAINTING AND/OR REPLACEMENT OF FINISHES AS REQUIRED TO PERFORM WORK, COORDINATE WITH OTHER DIVISIONS. ALL EXPOSED COMPONENTS INCLUDING: FIXTURES, PIPE, EQUIPMENT, VALVES, PANELS, AND CONTROLS SHALL BE FULLY COORDINATED WITH ARCHITECTURAL ELEMENTS.
18. BEFORE CUTTING AND DRILLING INTO BUILDING ELEMENTS, INSPECT AND LAYOUT WORK TO AVOID DAMAGING STRUCTURAL ELEMENTS AND BUILDING UTILITIES. NOTIFY THE ARCHITECT AND ENGINEER WHERE EXISTING COMPONENTS AND OR BUILDING UTILITIES OBSTRUCT THE PROPOSED WORK.
19. SUPPORT ALL EQUIPMENT, PIPING, AND OTHER REQUIRED PLUMBING COMPONENTS FROM BUILDING STRUCTURE TO PROVIDE A VIBRATION FREE INSTALLATION. NOTIFY ARCHITECT AND STRUCTURAL ENGINEER OF ALL WEIGHTS AND METHODS OF SUPPORT.
20. ALL PENETRATIONS THRU WALLS, ROOF, AND FLOORS AND ASSOCIATED CUTTING, PATCHING, WATERPROOFING, AND FLASHING SHALL BE COORDINATED WITH THE WORK OF OTHER SECTIONS BEFORE SITE WORK EXECUTION AND WITH THE ARCHITECT AND STRUCTURAL ENGINEER.
21. ALL SLEEVES THROUGH CONCRETE FLOORS AND ALL CORE DRILLING OF CONCRETE FLOORS AND WALLS SHALL BE THE RESPONSIBILITY OF THIS CONTRACTOR.
22. ALL PIPING PENETRATING CEILING AND WALLS SHALL BE INSTALLED WITH CHROME PLATED ESCUTCHEONS AT THE PENETRATION. ALL PIPING PENETRATING EXTERIOR WALLS AND ROOFS SHALL BE FLASHED IN AN APPROVED MANNER AND SHALL BE SEALED WEATHER-TIGHT. PIPING PENETRATING FIRE RATED PARTITIONS SHALL BE PROTECTED AS REQUIRED BY CODE.
23. PROVIDE FLEXIBLE JOINTS ON ALL PIPING WHERE PENETRATION ALL BUILDING EXPANSION JOINTS.
24. PROVIDE SHUTOFF VALVES ON ALL BRANCH PIPING AND ON ALL SUPPLIES TO INDIVIDUAL FIXTURES AND EQUIPMENT. PROVIDE BALL VALVES ON ALL WATER MAIN BRANCHES IN CORRIDORS AND WHERE INDICATED ON DRAWINGS.
25. PROVIDE ACCESS PANELS FOR CONCEALED PLUMBING COMPONENTS AND EQUIPMENT REQUIRING ACCESS FOR OPERATION, SERVICE, INSPECTION, AND MAINTENANCE. COORDINATE LOCATIONS WITH THE ARCHITECT.
26. TOP OF ALL FLOOR DRAINS SHALL BE SET FLUSH WITH FINISHED FLOORING UNLESS OTHERWISE NOTED.
27. INSULATE PIPING AS SPECIFIED. PERFORM REQUIRED TESTS BEFORE INSULATING.
28. TEST AND STERILIZATION:
ENTIRE SANITARY, WASTE, VENT, STORM, AND GAS PIPING SYSTEMS SHALL BE TESTED, FLUSHED, AND/OR STERILIZED BY THE PLUMBING CONTRACTOR IN THE PRESENCE OF THE GC. AND LOCAL AUTHORITIES (PLUMBING INSPECTOR AND GAS FITTING INSPECTOR IF SEPARATE FROM THE PLUMBING INSPECTOR).

PLUMBING FIXTURES & CONNECTION SCHEDULE

TAG	DESCRIPTION	MANUFACTURER & MODEL #	FITTINGS	REMARKS	SOIL/ WASTE	VENT	COLD WATER	HOT WATER
P-1	MOP SINK	MUSTEE MODEL 63M W/ KOHLER MODEL K-8907 FAUCET	24"x24"x10" MOP BASIN. IMPACT RESISTANT DURASTONE MATERIAL. PROVIDE SERVICE SINK FAUCET K-8907, PROVIDE WALL GUARDS, HOSE AND HOSE HOLDER, AND MOP BRACKET ACCESSORIES.	1	2"	1-1/2"	1/2"	1/2"
P-2/2A	WALL HUNG LAVATORY	KOHLER MODEL K-2035 W/ KOHLER MODEL K-97283 FAUCET & TEMPERING VALVE	WALL HUNG LAVATORY SINK. SINGLE HOLE FAUCET. PROVIDE SINGLE LEVER FAUCET, 0.5 GPM WITH OPTIONAL MIXING VALVE. PROVIDE WALL HANGER SUPPORTS. PROVIDE POINT OF USE THERMOSTATIC MIXING VALVE.	1	1-1/2"	1-1/2"	1/2"	1/2"
P-3	URINAL	KOHLER MODEL K-4491-ET	0.5 GPF EXPOSED 3/4" TOP SPUD WALL HUNG WITH MANUAL OPERATED FLUSH VALVE K-13519.	1	2"	2"	3/4"	
P-4/4A	WATER CLOSET	KOHLER MODEL K-2577-SSTR-0	FLOOR MOUNTED, 1.28 GALLONS PER FLUSH, SUPPLY WITH ELONGATED TOILET SEAT COVER K-20110 & K-4650 ELONGATED SEAT COVER.	1	4"	2"	1/2"	-
P-5	KITCHEN SINK	KOHLER MODEL K-3356-HCF	UNDERMOUNT STAINLESS STEEL DOUBLE BOWL SINK WITH K-8801 SINK DRAIN AND STRAINER TAILPIECE (QTY 2). WITH K-596-CP DECKMOUNT PULL-OUT 1.5 GPM FAUCET. PROVIDE DISHWASHER HOSE DRAIN CONNECTION AND 1/2" HW VALVED SUPPLY.	1	2"	1-1/2"	1/2"	1/2"
P-6	BATHROOM SINK	KOHLER MODEL K-2350	UNDERMOUNT OVAL DEVONSHIRE BATHROOM SINK WITH KOHLER K-97283 FAUCET AND TEMPERING VALVE.	1	1-1/2"	1-1/2"	1/2"	1/2"
P-7	WATER CLOSET	KOHLER MODEL K-3999-0	FLOOR MOUNTED, 1.28 GALLONS PER FLUSH, SUPPLY WITH ELONGATED QUIET CLOSE TOILET SEAT COVER K-4636.	1	4"	2"	1/2"	-
P-8	TUB	AQUATIC MODEL 260330	GELCOAT BATHTUB/SHOWER UNIT WITH SLIP RESISTANT FLOOR, 1.5 GPM SYMMONS DIA TUB/ SHOWER TRIM WITH TEMPTROL PRESSURE BALANCING MIXING VALVE. INTEGRAL SERVICE STOPS.	1	2"	1-1/2"	1/2"	1/2"
HB	HOSE BIBB	CHICAGO FAUCET MODEL 387-LEFE27		1			1/2"	
WB-1	WASHER OUTLET BOX	SIOUX CHIEF 696 SERIES	WASHER MACHINE OUTLET BOX WITH WATER HAMMER ARRESTORS. LEAD FREE VALVES.	1	2"	1-1/2"	1/2"	1/2"
FD	FLOOR DRAIN	ZURN Z507	PROVIDE FLOOR DRAIN WITH 1/2" TRAP PRIMER CONNECTION,	2	3"	2"	1/2"	

1. PROVIDE PLUMBING EQUIPMENT AS APPROVED BY ARCHITECT OR OWNER. ALL FIXTURES TO BE APPROVED BY THE MASS PLUMBING BOARD.
2. PROVIDE TRAP PRIMER EQUAL TO PPP,INC.PR-500

WALL MOUNTED WATER HEATER SCHEDULE

TAG	TYPE	GAS INPUT (MBH)	FLOW GPM@ Δ50°F	V/PH/HZ	MANUFACTURER & MODEL #	REMARKS
WH-1	GAS	19-199	7.8	120/1/60	NAVIEN NPE-240S	1,2,3,4
WH-2	GAS	19-199	7.8	120/1/60	NAVIEN NPE-240S	1,2,3,4
WH-3	GAS	19-199	7.8	120/1/60	NAVIEN NPE-240S	1,2,3,4
WH-4	GAS	28.5-199	7.2	120/1/60	IBC SFT-199	1,2,3,5
WH-5	GAS	28.5-199	7.2	120/1/60	IBC SFT-199	1,2,3,5

1. PIPE T&P DISCHARGE PIPE TO NEAREST FLOOR DRAIN.
2. FURNISH CONDENSATE NEUTRALIZER.
3. PROVIDE INTAKE AND EXHAUST VENTS OF APPROVED MATERIALS.
4. PIPE CONDENSATE TO NEAREST FLOOR DRAIN.
5. PIPE CONDENSATE TO CONDENSATE PUMP, SEE MECHANICAL DRAWINGS.

RE-CIRCULATION PUMP SCHEDULE (SP-X)

TAG NO.	MANUFACTURER AND MODEL NO. OR EQUAL	TYPE	FLOW RATE (GPM)	HEAD (FT)	ELECTRICAL DATA				REMARKS
					AMPS	HP	VOLT /PH	RPM	
RP-1	BELL & GOSSET ECOCIRC XL-20-35 OR EQUAL	INLINE	4	15	1.76	1/8	115/ 1	3250	1,2,3

1. BRONZE BODY CONSTRUCTION, LEAD FREE, STAINLESS STEEL IMPELLER, 225°F MAX OPERATING TEMPERATURE, 125 PSI MAX WORKING PRESSURE.
2. PROVIDE AQUASTAT AND AUTOMATIC TIMER KIT.
3. ECM MOTOR

SEWAGE EJECTOR PUMP SCHEDULE (SP-X)

TAG NO.	MANUFACTURER AND MODEL NO. OR EQUAL	SERVICE	FLOW RATE (GPM)	HEAD (FT)	ELECTRICAL DATA		REMARKS
					HP	VOLT	
SEP-1	ZOELLER M267	BASEMENT LEVEL WASTE	50	14	1/2	115	(1) (2) (3) (4)

(1) COORDINATE WITH ELECTRICAL TO PROVIDE DUPLEX RECEPTACLE
(2) FIBERGLASS PIT WITH SPLIT STEEL COVER.
(3) PUMP SYSTEM TO HAVE FLOAT SWITCH A-PAK Z-CONTROL 10-4014 MONITOR AND ALARM.
(4) PUMP TO HAVE AUTOMATIC FLOAT DEPENDENT OPERATION.

ELEVATOR SUMP PUMP-SIMPLEX (SP-X)

TAG NO.	MANUFACTURER AND MODEL NO. OR EQUAL	SERVICE	FLOW RATE (GPM)	HEAD (FT)	ELECTRICAL DATA		REMARKS
					HP	VOLT	
SP-1	ZOELLER M211	ELEVATOR PIT	50	12	4/10	115	(1) (2) (3)

(1) COORDINATE WITH ELECTRICAL TO PROVIDE DUPLEX RECEPTACLE
(2) PUMP TO BE LOCATED IN PIT PROVIDED BY OTHERS.
(3) PUMP TO HAVE AUTOMATIC FLOAT DEPENDENT OPERATION.

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855. MAIN ST BROCKTON, MA

COMMONWEALTH OF MASSACHUSETTS — ANTHONY K. GRAY — MECHANICAL — No. 26771 — REGISTERED PROFESSIONAL ENGINEER

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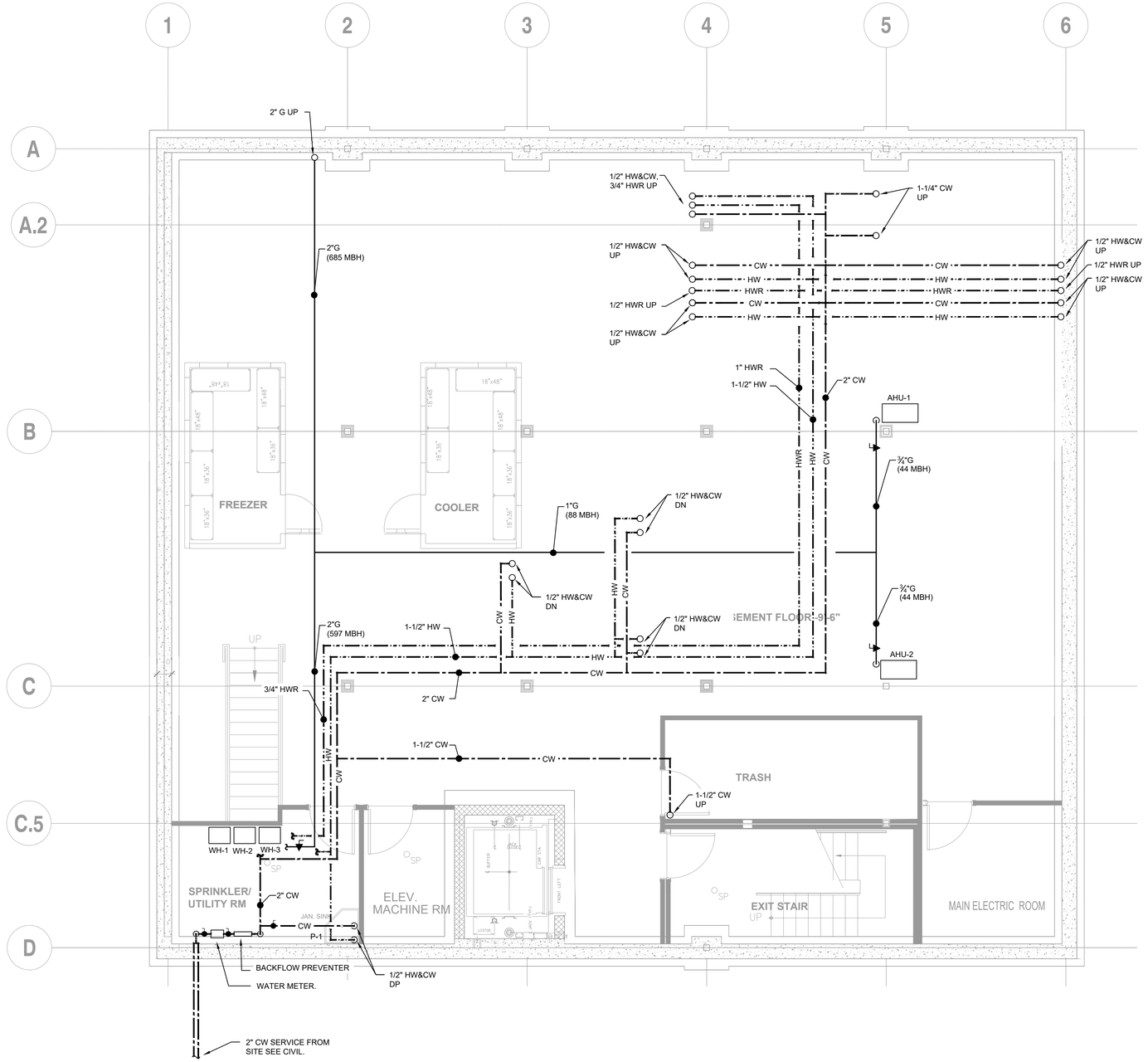
Date: 4-30-2021

Sheet Title PLUMBING - LEGEND, NOTES, SCHEDULES & SPECIFICATION

Sheet Number P-0



PLUMBING- PROPOSED WATER & GAS BASEMENT PLAN

SCALE 1/4" = 1'-0"

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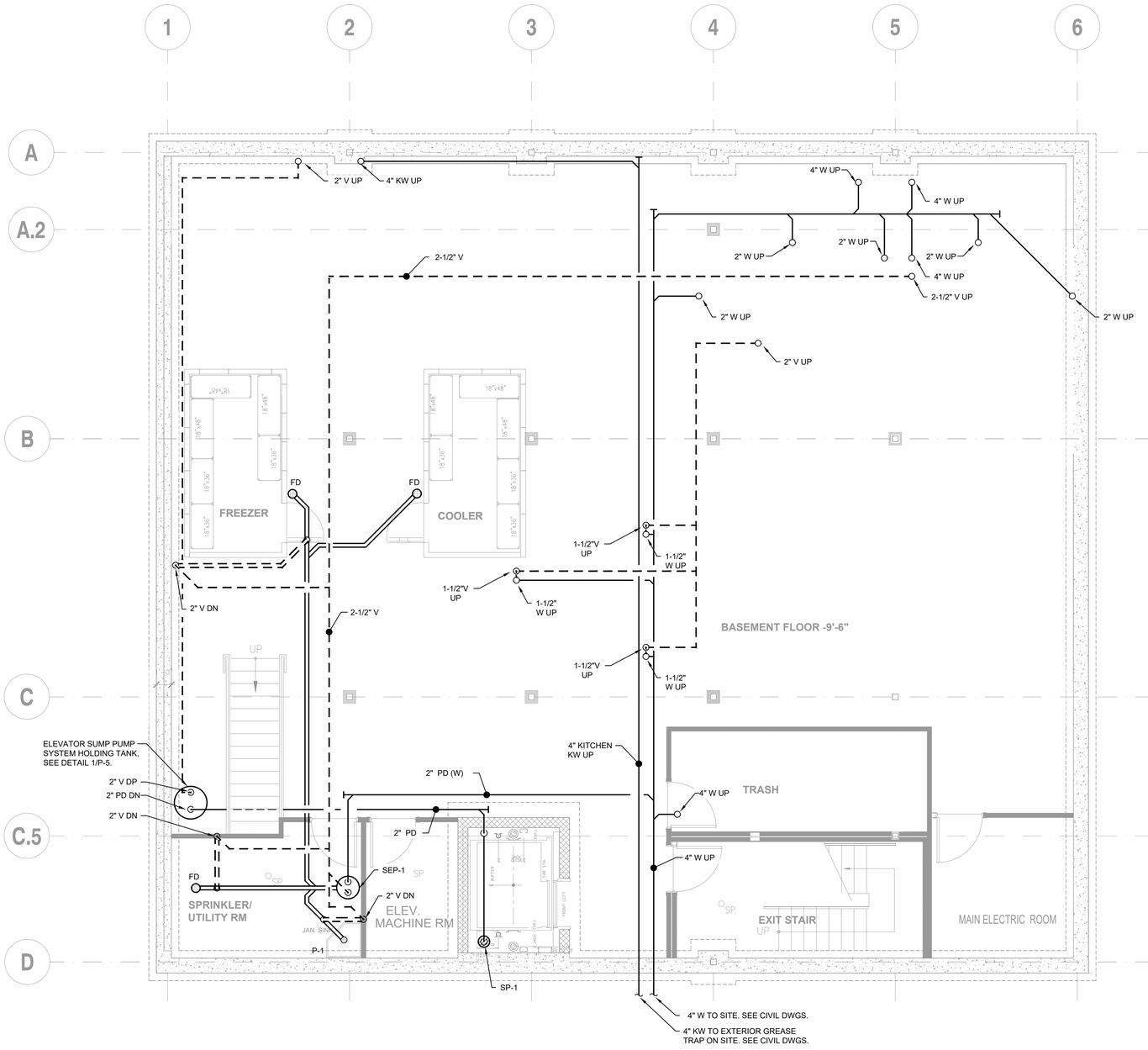
PLUMBING - PROPOSED WATER & GAS BASEMENT PLAN

Sheet Number
P-1.1



PLUMBING- PROPOSED WASTE & VENT BASEMENT PLAN

SCALE 1/4" = 1'-0"

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Sheet Title
PLUMBING - PROPOSED WASTE & VENT BASEMENT PLAN

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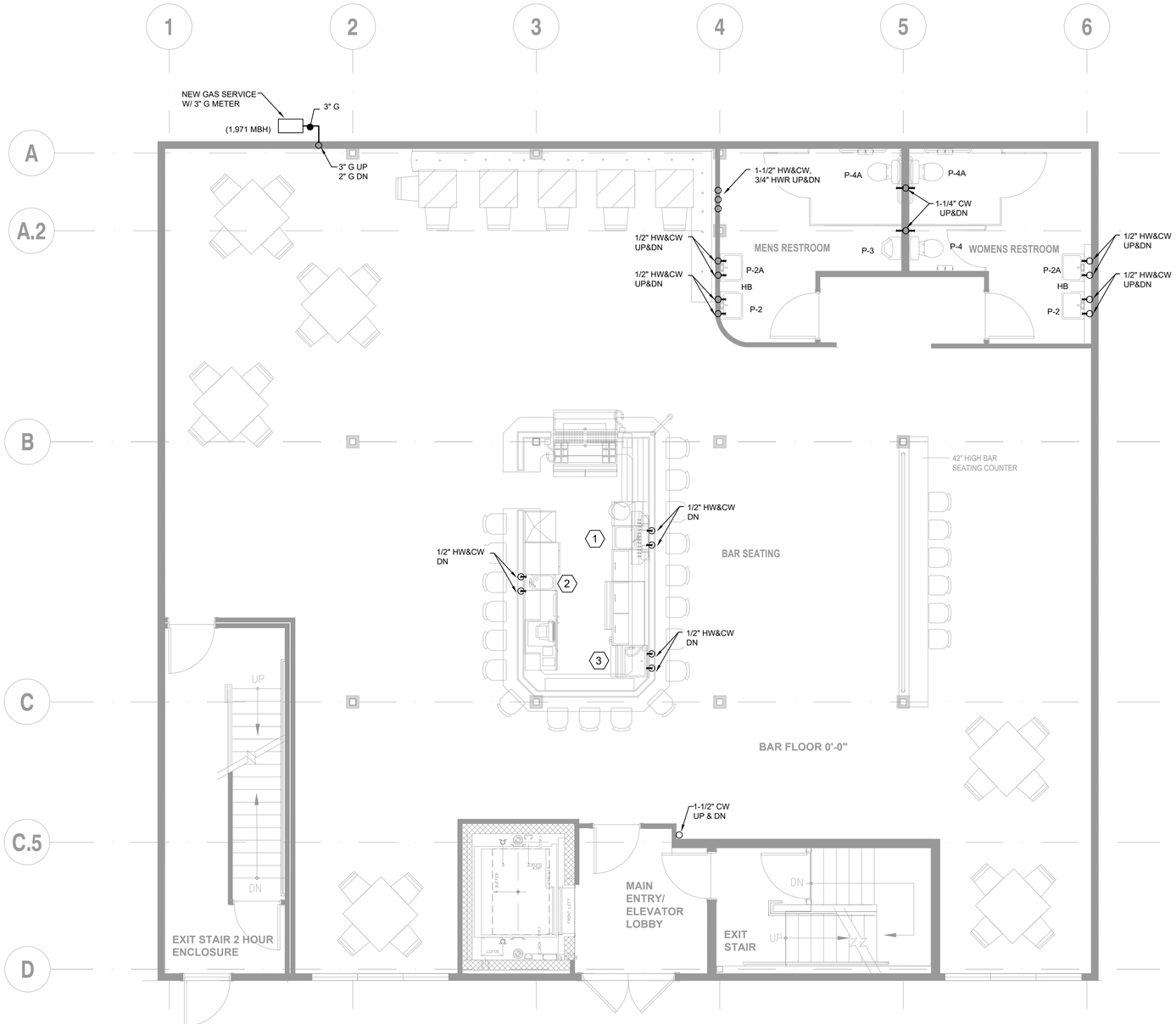
P-1.2



PLUMBING- PROPOSED WATER & GAS FIRST FLOOR PLAN

SCALE 1/4" = 1'-0"

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ANTHONY K. GRAY MECHANICAL No. 52771 REGISTERED PROFESSIONAL ENGINEER COMMONWEALTH OF MASSACHUSETTS

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Sheet Title PLUMBING - PROPOSED WATER & GAS FIRST FLOOR PLAN

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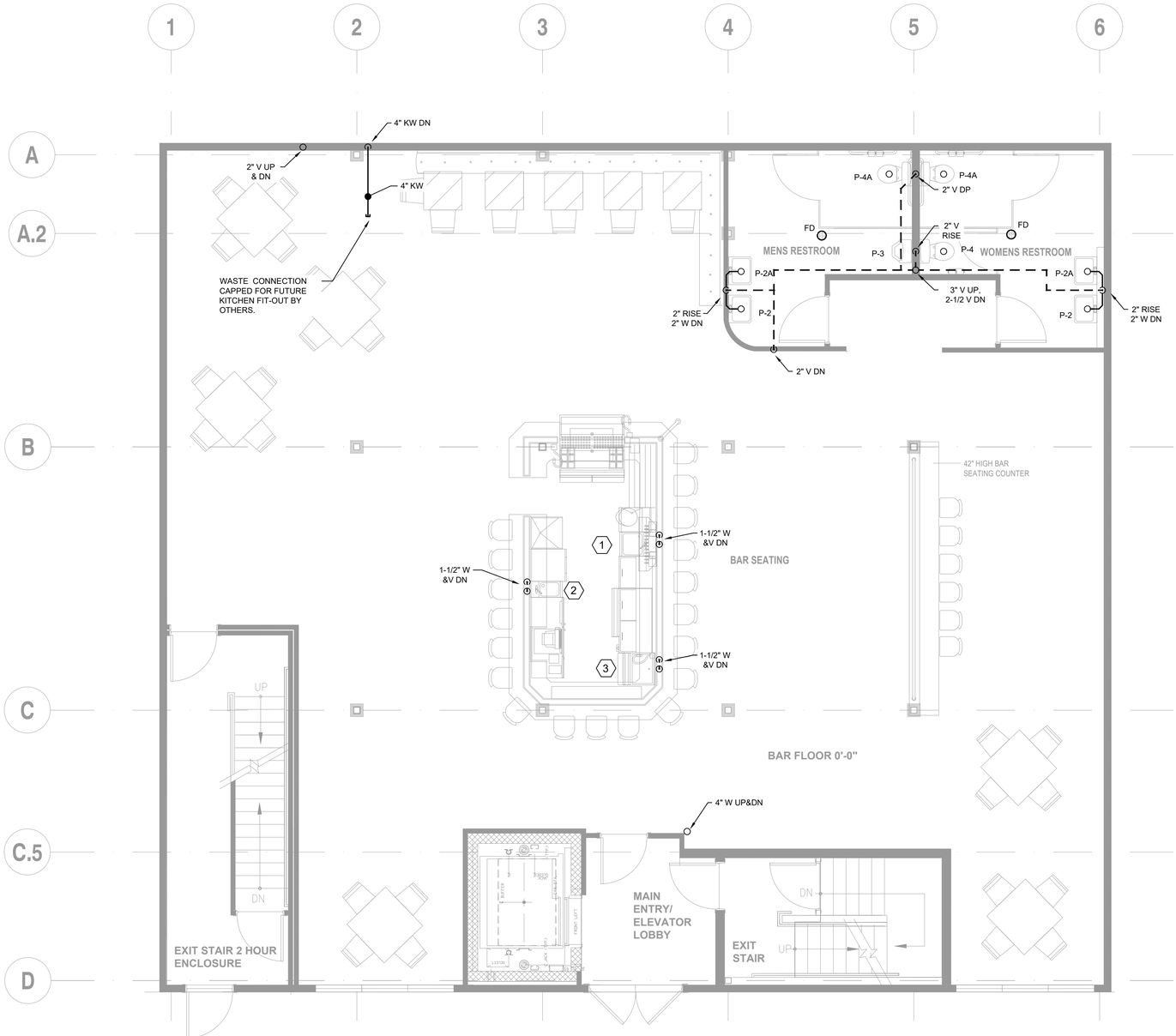

PLUMBING- PROPOSED WASTE & VENT FIRST FLOOR PLAN

SCALE 1/4" = 1'-0"

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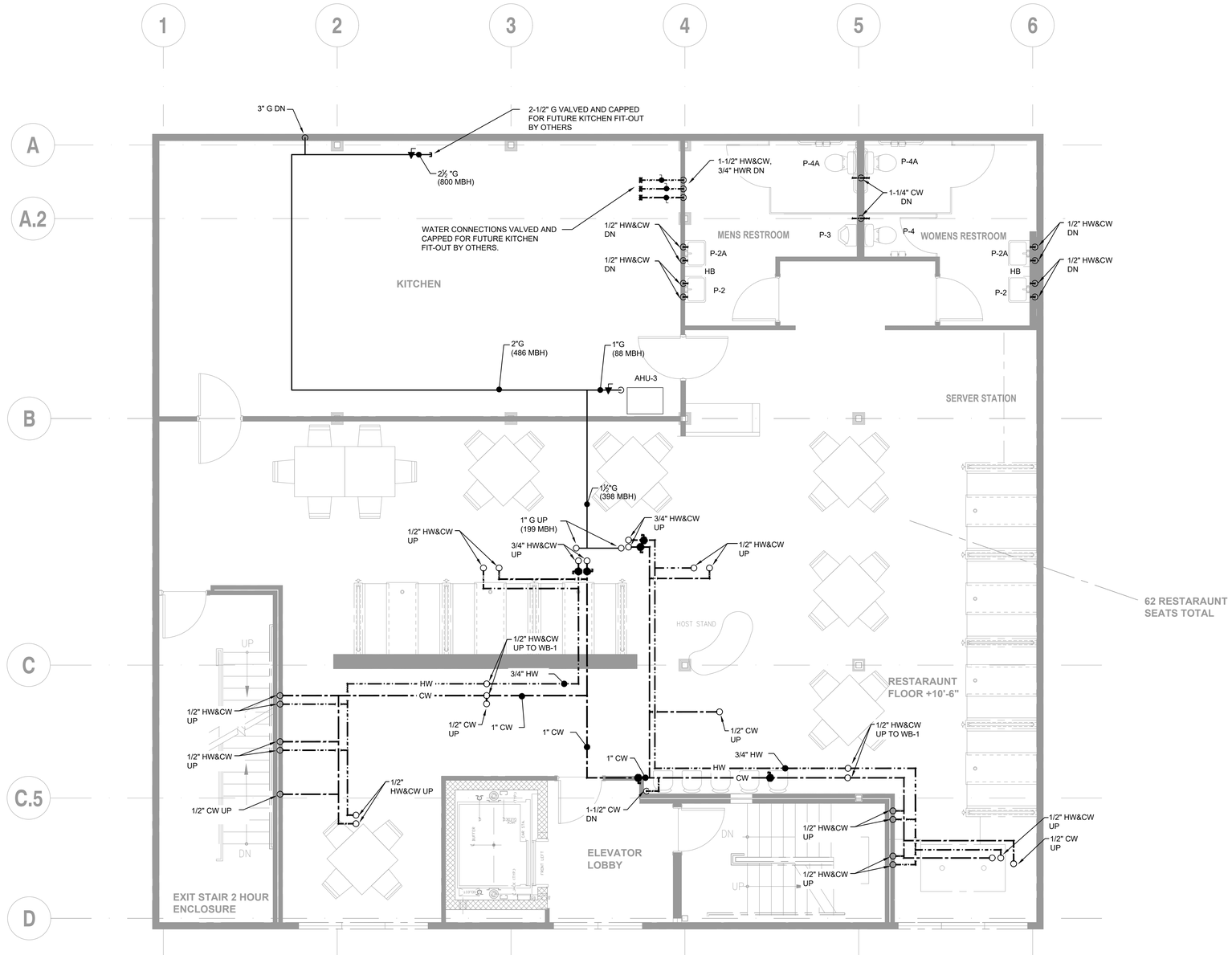
Sheet Title PLUMBING - PROPOSED WASTE & VENT FIRST FLOOR PLAN

Sheet Number P-2.2



PLUMBING- PROPOSED WATER & GAS SECOND FLOOR PLAN

SCALE 1/4" = 1'-0"

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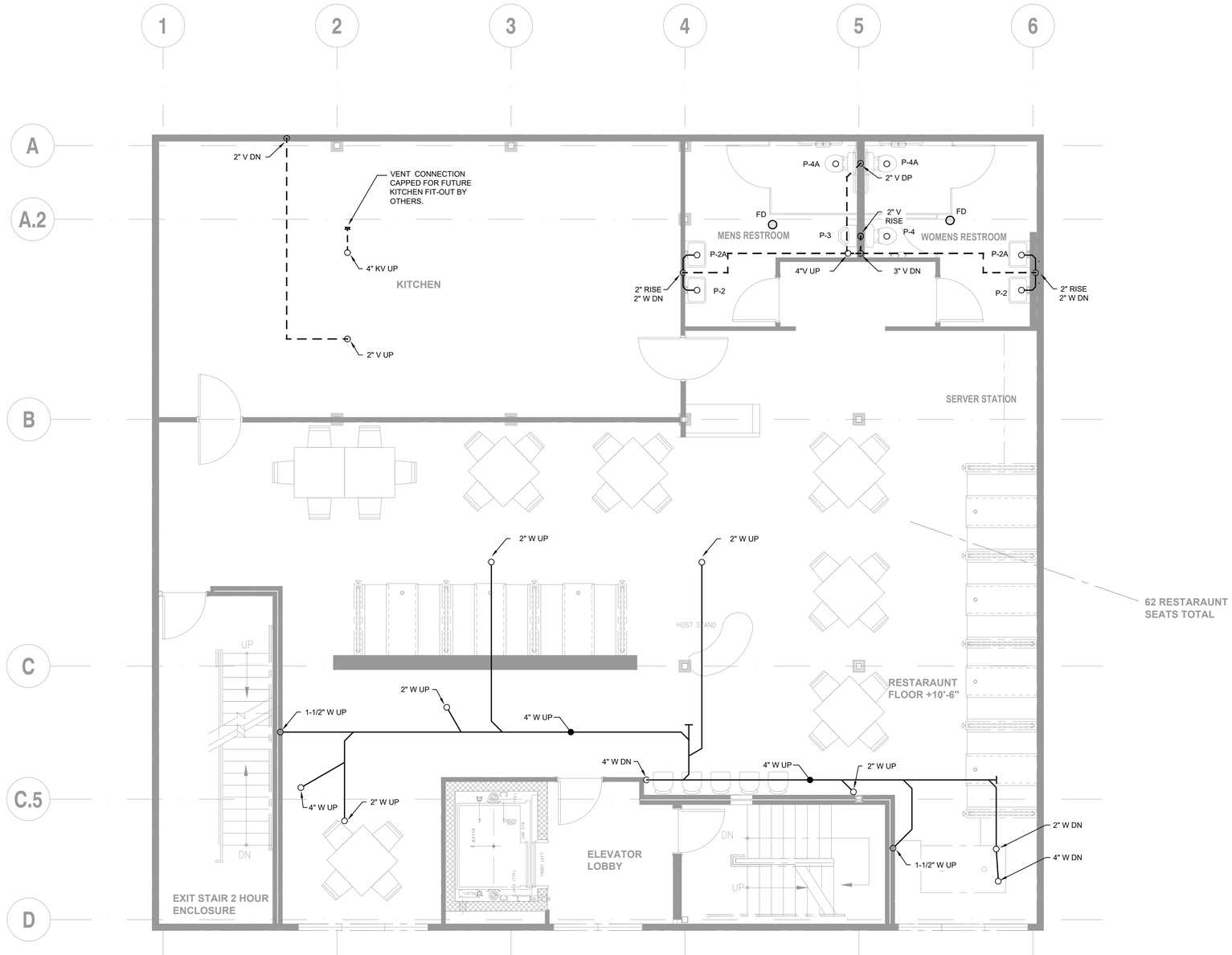
Sheet Title PLUMBING - PROPOSED WATER & GAS SECOND FLOOR PLAN

Sheet Number P-3.1



PLUMBING- PROPOSED WASTE & VENT SECOND FLOOR PLAN

SCALE 1/4" = 1'-0"

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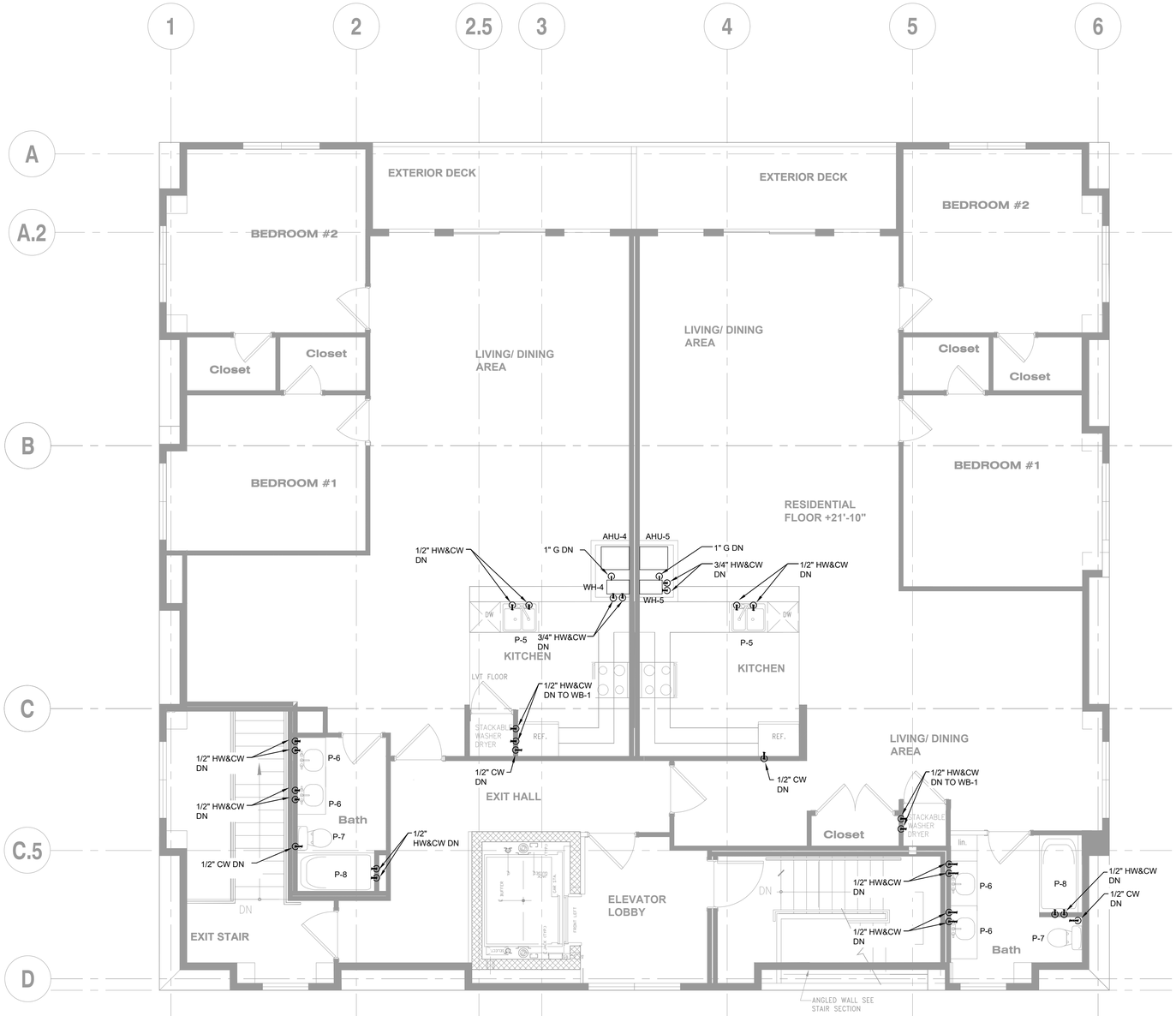
Sheet Title PLUMBING - PROPOSED WASTE & VENT SECOND FLOOR PLAN

Sheet Number P-3.2



PLUMBING- WATER & GAS THIRD FLOOR PLAN

SCALE 1/4" = 1'-0"

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PROPOSED BUILDING PLANS
855. MAIN ST BROCKTON, MA

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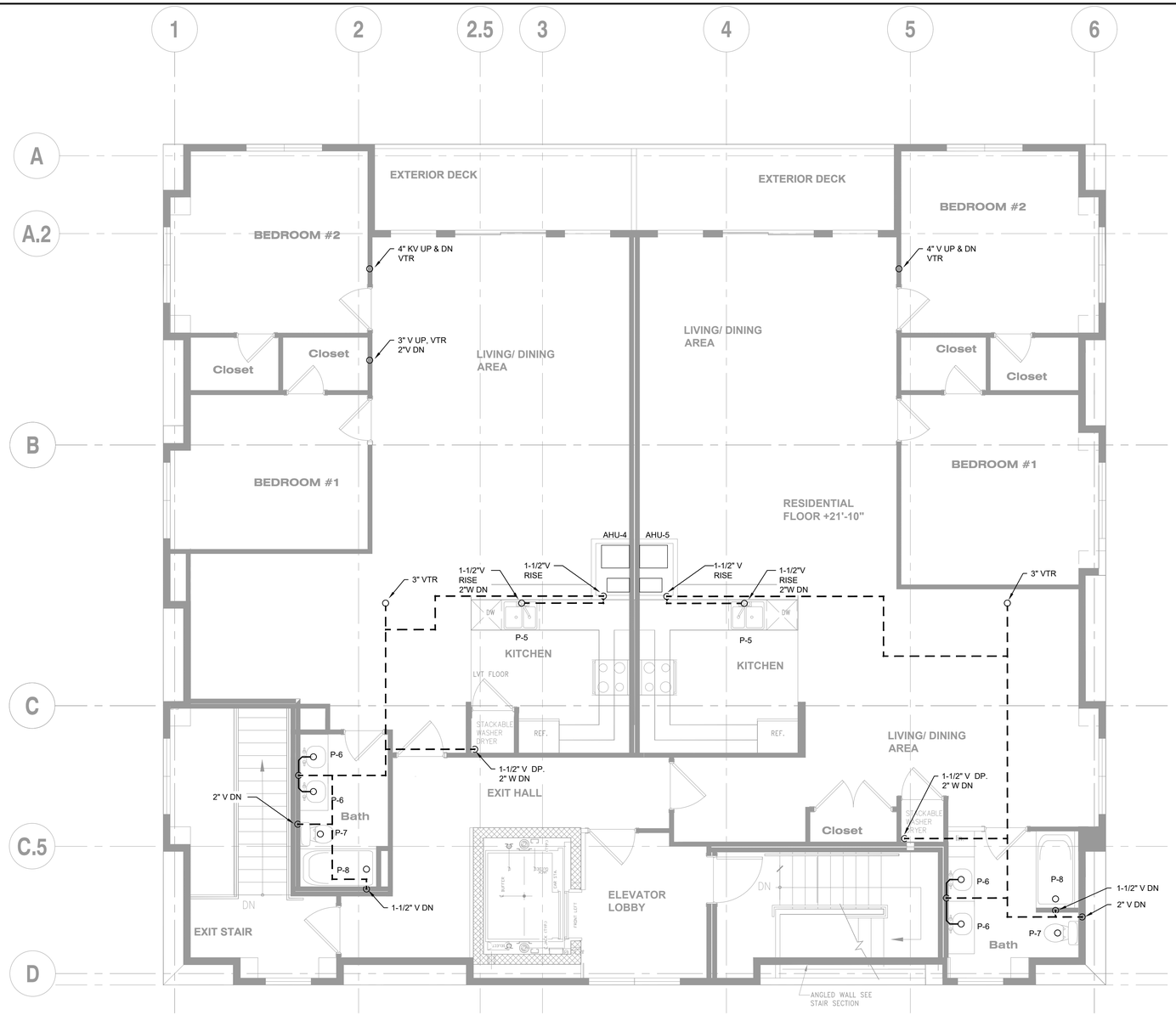
Sheet Title PLUMBING - PROPOSED WATER & GAS THIRD FLOOR PLAN

Sheet Number P-4.1



PLUMBING- WATER & VENT THIRD FLOOR PLAN

SCALE 1/4" = 1'-0"

LTI Engineering
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6 Liberty Square Suite 336
Boston, MA 02109
(617) 383-7071

PROPOSED BUILDING PLANS
855. MAIN ST BROCKTON, MA

COMMONWEALTH OF MASSACHUSETTS
ANTHONY K. GRAY
MECHANICAL
No. 52771
REGISTERED PROFESSIONAL ENGINEER

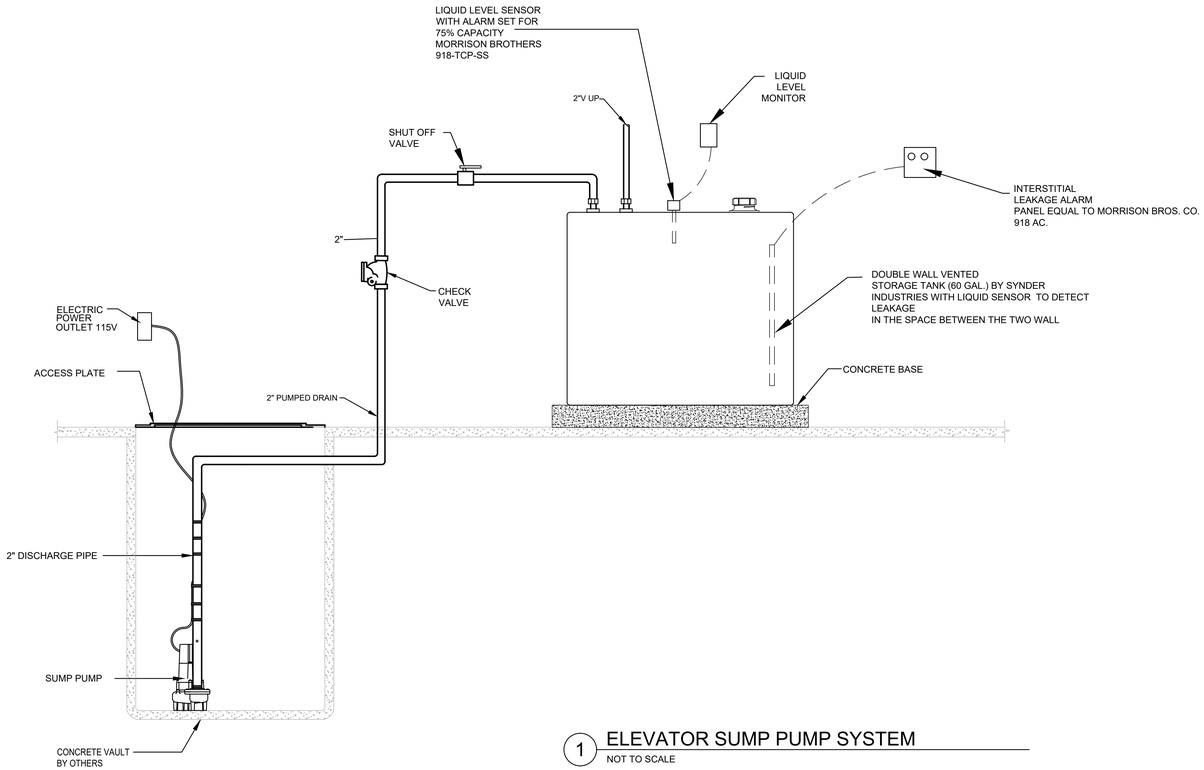
Scale: AS SHOWN

Project Number:

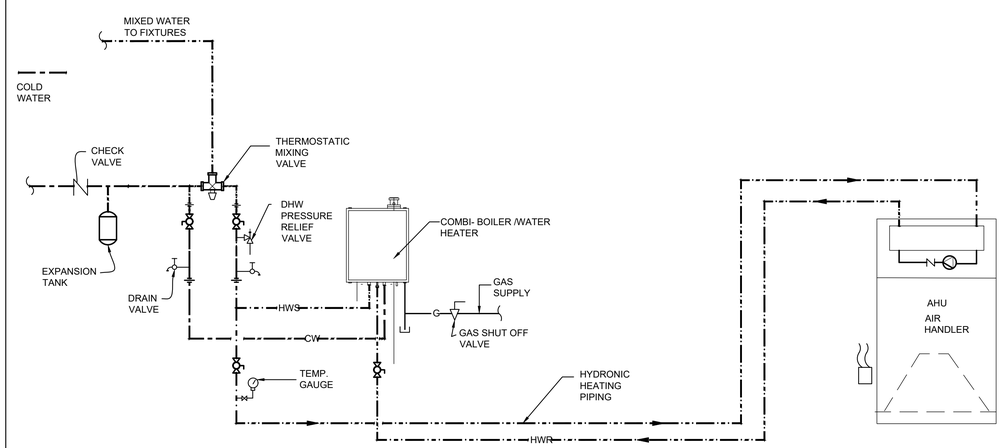
Date: 4-30-2021

Sheet Title PLUMBING - PROPOSED WASTE & VENT THIRD FLOOR PLAN

Sheet Number P-4.2

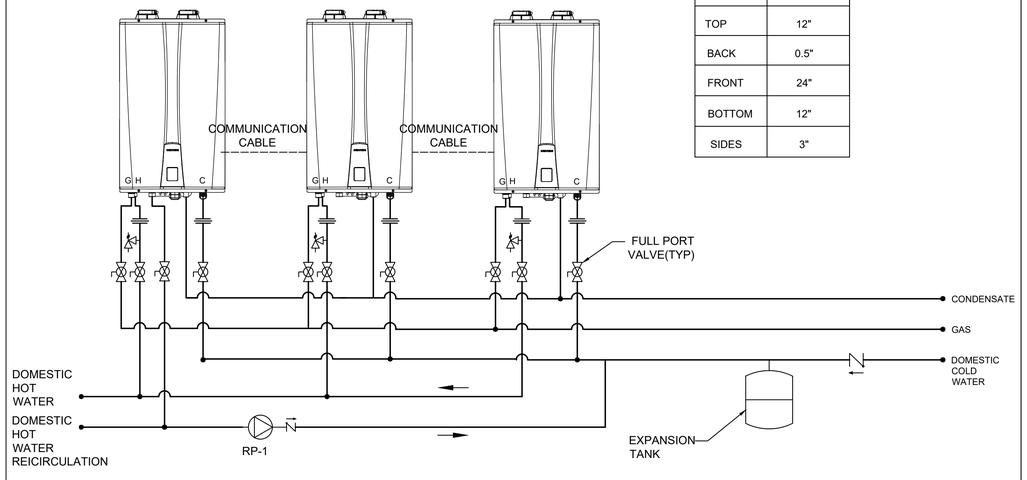


1 ELEVATOR SUMP PUMP SYSTEM
NOT TO SCALE



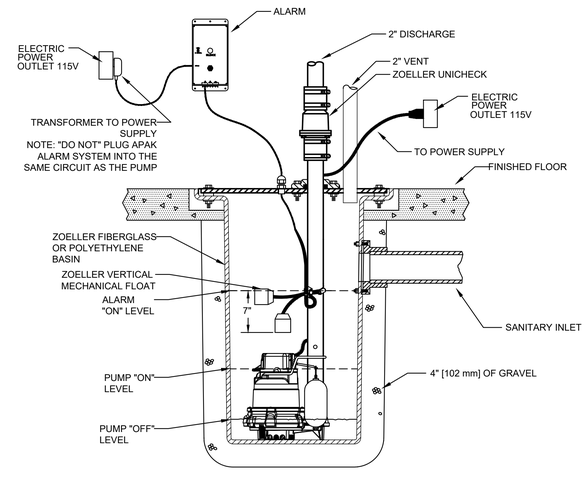
2 DHW PIPING WITH THERMOSTATIC MIXING VALVE (APARTMENTS)
NOT TO SCALE

WATER HEATER PIPING DIAGRAM(N.T.S)



WATER HEATER CLEARANCE

CLEARANCE FROM	INDOOR INSTALLATION
TOP	12"
BACK	0.5"
FRONT	24"
BOTTOM	12"
SIDES	3"



3 EJECTOR PUMP SYSTEM
NOT TO SCALE

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Sheet Title
PLUMBING - DETAILS

Sheet Number
P-5

PART 1 - GENERAL INSTRUCTIONS

1.01 GENERAL REQUIREMENTS

A. SCOPE OF WORK SHALL INCLUDE ALL LABOR, MATERIALS, TOOLS, EQUIPMENT, TRANSPORTATION, HOISTING, RIGGING, INSURANCE, ETC., TO PERFORM THE WORK AS INDICATED ON THE DRAWINGS AND HEREIN SPECIFIED FOR A COMPLETE INSTALLATION. ALL WORK SHALL BE IN ACCORDANCE WITH NATIONAL, STATE AND LOCAL CODES AND ORDINANCES HAVING JURISDICTION.

B. APPLY AND PAY FOR ALL NECESSARY INSPECTION FEES, LICENSES AND PERMITS REQUIRED BY THE PROPER AUTHORITIES HAVING JURISDICTION.

C. SUBMIT SHOP DRAWINGS OF ALL EQUIPMENT AND RECORD DRAWINGS FOR ALL WORK PROVIDED UNDER THIS CONTRACT TO THE ENGINEER/OWNER PRIOR TO ORDERING, FABRICATING OR INSTALLING THE SAME.

D. PROVIDE NEW MATERIAL, EQUIPMENT, AND APPARATUS UNDER THIS CONTRACT UNLESS OTHERWISE STATED HEREIN, OF BEST QUALITY NORMALLY USED FOR THE PURPOSE IN GOOD COMMERCIAL PRACTICE AND FREE FROM DEFECTS.

E. WORK PERFORMED UNDER THIS CONTRACT SHALL RESULT IN A NEAT AND "WORKMANLIKE" APPEARANCE WHEN COMPLETED TO THE SATISFACTION OF THE OWNER AND ENGINEER. WORKMANSHIP SHALL BE THE FINEST POSSIBLE BY EXPERIENCED MECHANICS. INSTALLATIONS SHALL COMPLY WITH APPLICABLE CODES AND LAWS.

F. THE COMPLETE INSTALLATION SHALL FUNCTION AS DESIGNED AND INTENDED WITH RESPECT TO EFFICIENCY, CAPACITY, NOISE LEVEL, ETC. ABNORMAL NOISE CAUSED BY RATTLING EQUIPMENT, PIPING, AND SQUEAKS IN ROTATING COMPONENTS WILL NOT BE ACCEPTABLE. IN GENERAL, MATERIALS AND EQUIPMENT SHALL BE OF COMMERCIAL SPECIFICATION GRADE IN QUALITY. LIGHT DUTY AND RESIDENTIAL TYPE EQUIPMENT WILL NOT BE ACCEPTED.

G. REMOVE FROM THE PREMISES WASTE MATERIAL PRESENT AS A RESULT OF WORK, INCLUDING CARTONS, CRATING, PAPER, STICKERS, AND/OR EXCAVATION MATERIAL NOT USED IN BACKFILLING, ETC. CLEAN EQUIPMENT INSTALLED UNDER THIS CONTRACT TO PRESENT A NEAT AND CLEAN INSTALLATION AT THE TERMINATION OF THE WORK.

H. REPAIR OR REPLACE PUBLIC AND PRIVATE PROPERTY DAMAGED AS A RESULT OF WORK PERFORMED UNDER THIS CONTRACT TO THE SATISFACTION OF AUTHORITIES AND REGULATIONS HAVING JURISDICTION.

I. RECORD DRAWINGS: THE CONTRACTOR SHALL KEEP DAILY UPDATED ACCURATE RECORDS OF ALL DEVIATIONS IN WORK AS ACTUALLY INSTALLED FROM WORK INDICATED ON THE CONTRACT DRAWINGS. WHEN WORK IS COMPLETED THIS CONTRACTOR SHALL PROVIDE TOTHE OWNER ONE COMPLETE SET OF MARKED-UP ORIGINAL PRINTS, UPDATED CAD DRAWINGS AND A CD WITH CAD FILES.

1.02 CONTRACTOR RESPONSIBILITIES

A. THIS CONTRACTOR SHALL BE HELD RESPONSIBLE FOR ANY INJURIES TO PEOPLE, EMPLOYEES, OR DAMAGE DONE TO BUILDING PREMISES OR ADJOINING AREAS OR OTHER WORK RESULTING FROM THE EXECUTION OF THE WORK UNDER THIS CONTRACT.

B. THIS CONTRACTOR SHALL BE RESPONSIBLE FOR PROPER PROTECTION OF HIS WORK, MATERIALS, PEOPLE OR EMPLOYEES FROM INJURY OR LOSS DONE BY OTHERS AND SHALL MAKE GOOD SUCH INJURY AT THE EXPENSE OF THIS CONTRACTOR.

C. DRAWINGS DO NOT INCLUDE NECESSARY COMPONENTS FOR CONSTRUCTION SAFETY.

1.03 COORDINATION AND INTERPRETATION OF DRAWINGS

A. THIS CONTRACTOR, PRIOR TO SUBMITTING BID SHALL VISIT THE PROJECT SITE TO BECOME FAMILIAR WITH ALL EXISTING CONDITIONS AND TO INSPECT THAT ALL PROVISIONS HAVE BEEN MADE FOR ALL ASPECTS OF THIS PROJECT.

B. IF DISCREPANCIES EXIST BETWEEN DRAWINGS AND /OR SITE CONDITIONS, THIS CONTRACTOR SHALL NOTIFY THE OWNER PRIOR TO SIGNING OF CONTRACT. REQUEST FOR COMPENSATION FOR EXTRA WORK, WHICH WOULD HAVE BEEN EVIDENT BY COMPLIANCE WITH THE PREVIOUS STATEMENT, WILL NOT BE CONSIDERED.

C. MECHANICAL EQUIPMENT AND SUCH OTHER APPARATUS AS MAY REQUIRE MAINTENANCE AND OPERATION FROM TIME TO TIME SHALL BE MADE EASILY ACCESSIBLE. ALTHOUGH THE EQUIPMENT MAY BE SHOWN ON THE DRAWINGS IN CERTAIN LOCATIONS, THE CONSTRUCTION MAY DISCLOSE THAT SUCH LOCATIONS DO NOT MAKE ITS POSITION READILY ACCESSIBLE. IN SUCH CASES, THE OWNER OR OWNER'S REPRESENTATIVE SHALL BE NOTIFIED BEFORE ADVANCING THE CONSTRUCTION TO A STAGE WHERE A CHANGE WILL REFLECT ADDITIONAL EXPENSE.

D. IT SHALL BE THE RESPONSIBILITY OF THIS CONTRACTOR TO STUDY ALL DRAWINGS AND DETAILS SO THAT THE INSTALLATION OF ALL NEW WORK CAN BE FULLY COORDINATED. COORDINATE WITH ALL TRADES TO AVOID INTERFERENCE OF EQUIPMENT.

E. THE WORK REFLECTED ON THE DRAWINGS IS DIAGRAMMATICAL. EXACT LOCATION OF ALL COMPONENTS ARE TO BE DETERMINED IN THE FIELD BY THE ACTUAL BUILDING CONDITIONS. EQUIPMENT, DUCTS OR PIPES INTERFERING WITH OTHER INSTALLATIONS SHALL BE RELOCATED AS REQUIRED AT NO ADDITIONAL COST TO THE OWNER.

F. THIS CONTRACTOR SHALL COORDINATE ALL WALL, CEILING, FLOOR, ROOF AND BEAM PENETRATIONS WITH THE OWNER AND STRUCTURAL ENGINEER.

G. IT SHALL BE THE RESPONSIBILITY OF THIS CONTRACTOR TO PROVIDE CHASES AND OPENINGS IN BUILDING CONSTRUCTION REQUIRED FOR INSTALLATION OF THE SYSTEMS SPECIFIED HEREIN.

1.04 EQUIPMENT

A. PRODUCTS REQUIRED BY CONSTRUCTION BUT NOT SPECIFICALLY DESCRIBED HEREIN SHALL BE AS SELECTED BY THE CONTRACTOR SUBJECT TO THE APPROVAL OF THE OWNER AND THE ENGINEER.

B. PROVIDE ALL MATERIALS, LABOR, AND ACCESSORIES FOR A COMPLETE AND OPERABLE SYSTEM(S) AND AS REQUIRED BY THE EQUIPMENT MANUFACTURER'S INSTALLATION INSTRUCTIONS.

C. PROVIDE ALL HANGERS AND SUPPORTS AS REQUIRED TO SUPPORT ALL NEW PIPING AND EQUIPMENT.

D. ALL EXPOSED EQUIPMENT SHALL HAVE COLORS SELECTED BY THE OWNER, UNLESS OTHERWISE NOTED.

1.05 SMOKE AND FIRESTOPPING

A. FIRESTOP ALL PENETRATIONS BETWEEN FLOORS & FIRE RATED WALLS WITH APPROVED FIRESTOPPING ASSEMBLIES AS MANUFACTURED BY 3M INDUSTRY, DOW CORNING, OR HILTI. THE ASSEMBLIES SHALL COMPLY WITH THE LATEST APPLICABLE REQUIREMENTS OF THE BUILDING CODE AND NFPA STANDARDS. PROVIDE UL LISTED DETAIL FOR EACH TYPE OF PROPOSED APPLICABLE ASSEMBLIES WITH THE EQUIPMENT AND SYSTEM SUBMITTALS.

1.06 EQUIPMENT, VALVE, AND PIPE INDENTIFICATION

A. AVAILABLE MANUFACTURERS: SUBJECT TO COMPLIANCE WITH THE REQUIREMENTS, PRODUCTS ARE LIMITED TO SETON, BRADY, OR BRIMAR WHOM HAVE A MINIMUM OF 5 YEARS EXPERIENCE IN THE MANUFACTURING OF MECHANICAL IDENTIFICATION PRODUCTS.

B. EQUIPMENT IDENTIFICATION:

1. USE BLACK LAMINATED PHENOLIC NAMEPLATES 6" LONG X 3" HIGH WITH WHITE INCISED LETTERING 1/2" HIGH. ATTACH TO EQUIPMENT WITH STAINLESS STEEL OR BRASS SCREWS, OR RIVETS.

PART 2 - PRODUCTS

2.01 - GENERAL PIPING

A. WATER PIPING ABOVE SLAB IS BASED ON TYPE "L" COPPER ASTM B88 WITH 100% LEAD FREE 95-5 TIN ANTIMONY SOLDERED JOINTS & WROUGHT FITTINGS. WATER PIPING BELOW SLAB SHALL BE TYPE "K" SOFT COPPER TUBING "ONE PIECE-WITHOUT JOINTS".

B. SANITARY WASTE, STORM, AND VENT PIPING ABOVE GROUND: HUBLESS CAST IRON PIPE & FITTINGS, ASTM A74, MANUFACTURED AND INSTALLED IN ACCORDANCE WITH C.I.S.P.I. STANDARD 301 AND PAMPHLET 100. JOINTS SHALL BE MADE WITH CLAMP RETAINER SLEEVE AND NEOPRENE GASKET. NO-HUB COUPLINGS SHALL BE C.I. 4-BAND COUPLINGS AS MANUFACTURED BY MISSION OR HUSKY "SD 4000" SERIES.

C. SANITARY, WASTE, STORM, AND VENT PIPING BELOW GROUND: SERVICE WEIGHT CAST-IRON HUB AND SPIGOT PATTERN WITH CAULKED JOINTS OR RESILIENT GASKETS.

D. GAS PIPING SHALL BE SCHEDULE 40 SEAMLESS BLACK STEEL, ASTM A53 GRADE A MALLEABLE IRON FITTINGS CONFORMING TO ANSI/ASME B16.3.

E. PROVIDE ALL NECESSARY SUPPORTS, HANGERS, BRACES, ANCHORS, PADS AND ALL ELSE NECESSARY FOR THE ENTIRE INSTALLATION AND TO MEET THE INTENT OF THE SYSTEMS FOR PROPER OPERATION.

F. OPENINGS IN EXTERIOR WALLS OR ROOF SHALL BE KEPT PROPERLY PLUGGED AND CAULKED AT ALL TIMES, EXCEPT WHEN BEING WORKED ON TO PRECLUDE THE POSSIBILITY OF FLOODING DUE TO STORM OR OTHER CAUSES, AFTER COMPLETION OF WORK, OPENINGS SHALL BE PERMANENTLY SEALED AND CAULKED IN A MANNER APPROVED BY THE ENGINEER OR ARCHITECT.

G. INSTALL A 12 INCH LONG, 16 GAUGE METAL PIPE SHIELD BETWEEN PIPE INSULATION AND ALL PIPE HANGERS FOR ALL PIPING . HANGERS SHALL BE AROUND INSULATION SO INSULATION WILL BE BETWEEN PIPE AND HANGER. SHIELDS SHALL BE TACK WELDED TO THE HANGERS.

H. COPPER HANGERS ARE TO BE USED WITH ALL COPPER PIPING.

2.02 - VALVES

A. ALL VALVES SHALL BE 125-LB. STANDARD CONSTRUCTION. VALVES SHALL BE BRONZE OR BRASS LEAD FREE. ALL VALVES SHALL HAVE THE NAME OR TRADEMARK OF THE MANUFACTURER AND GUARANTEED WORKING PRESSURE CAST ON THE BODY OF THE VALVE. ALL EQUIPMENT SHALL HAVE ISOLATION VALVES. ALL VALVES SHALL HAVE EXTENSIONS SUFFICIENT TO CLEAR INSTALLATION.

B. BALL VALVES SHALL BE WATTS #LF-6000 SERIES (FULL PORT) OR APPROVED EQUAL.

C. GAS VALVES:
1" AND SMALLER: GAS COCK LEVER HANDLE ROCKFORD #141 WITH CHECK-PIN OR EQUAL.
1-1/4" TO 3": BRONZE BODY SCREW TYPE BALL VALVE, FULL PORT WATTS B-6000 OR EQUAL.

2.03 - PIPING INSULATION

A. PIPING INSULATION SHALL BE FIBERGLASS PREFORMED PIPE INSULATION WITH FACTORY APPLIED ALL SERVICE JACKET EQUAL TO JOHNS MANVILLE, OWENS CORNING, OR KNAUF INSULATION. PROVIDE PRE-FORMED FITTING COVERS AT JOINTS AND ELBOWS.

B. COLD WATER PIPING 1" AND SMALLER SHALL BE INSULATED WITH MINIMUM 1/2" THICK INSULATION. COLD WATER PIPING BETWEEB 1" AND 4" SHALL BE INSULATED WITH MINIMUM 1" THICK INSULATION.

C. HOT WATER PIPING 1-1/2" AND SMALLER SHALL BE INSULATED WITH MINIMUM 1-1/2" THICK INSULATION. HOT WATER PIPING 2" AND LARGER SHALL BE INSULATED WITH MINIMUM 2" THICK INSULATION.

D. PROVIDE INSULATION UNDER HANDICAP LAVATORIES EQUAL TO TRUEBRO INC. LAV GUARD, 2.

E. STORM PIPING INSULATION: ROOF DRAIN BODY AND STORM WATER PIPING WITHIN 25'-0" OF THE ROOF DRAIN SHALL BE INSULATED WITH MINIMUM 1" THICK INSULATION.

2.05 ELECTRICAL WIRING

A. LINE VOLTAGE WIRING AND CONDUIT SHALL BE PROVIDED BY DIVISION 26 (ELECTRICAL CONTRACTOR). LINE VOLTAGE CONTROL AND INTERLOCK WIRING AND CONDUIT FOR MECHANICAL SYSTEMS SHALL ALSO BE PROVIDED BY DIVISION 26 CONTRACTOR. LOW VOLTAGE CONTROL WIRING AND CONDUIT SHALL BE PROVIDED BY THE DIVISION 23 CONTRACTOR. FURNISH WIRING DIAGRAMS TO THE DIVISION 26 CONTRACTOR AS REQUIRED FOR PROPER EQUIPMENT HOOKUP. COORDINATE WITH THE DIVISION 26 CONTRACTOR THE ACTUAL WIRE SIZING AMPS FOR MECHANICAL EQUIPMENT (FROM THE EQUIPMENT NAMEPLATE) TO ENSURE PROPER INSTALLATION.

PART 3 - EXECUTION

3.01 - GENERAL INSTALLATION

A. PRIOR TO ALL WORK OF THIS CONTRACT, CAREFULLY INSPECT THE INSTALLED WORK OF ALL OTHER TRADES AND VERIFY THAT ALL SUCH WORK IS COMPLETE TO THE POINT WHERE THE WORK OF THIS CONTRACT MAY PROPERLY COMMENCE.

B. VERIFY THAT WORK MAY BE INSTALLED IN STRICT ACCORDANCE WITH ALL PERTINENT CODES AND REGULATIONS AND THE APPROVED SHOP DRAWINGS.

C. STORE AND PROTECT FROM DAMAGE EQUIPMENT AND MATERIALS DELIVERED TO JOB SITE. COVER WITH WATERPROOF, TEAR-RESISTANT, HEAVY TARP OR POLYETHYLENE PLASTIC AS REQUIRED TO PROTECT FROM PLASTER, DIRT, PAINT, WATER. OR PHYSICAL DAMAGE. EQUIPMENT AND MATERIAL THAT HAS BEEN DAMAGED BY CONSTRUCTION ACTIVITIES WILL BE REJECTED, AND CONTRACTOR IS OBLIGATED TO FURNISH NEW EQUIPMENT AND MATERIAL OF A LIKE KIND.

D. KEEP PREMISES BROOM CLEAN FROM FOREIGN MATERIAL CREATED DURING WORK PERFORMED UNDER THIS CONTRACT. PIPING, EQUIPMENT, ETC. SHALL HAVE A NEAT AND CLEAN APPEARANCE AT THE TERMINATION OF THE WORK.

E. PLUG OR CAP OPEN ENDS OF PIPING SYSTEMS WHILE STORED ON SITE OR INSTALLED IN PLACE BUT NOT IN OPERATION TO PREVENT THE ENTRANCE OF DEBRIS OR FOREIGN MATERIALS INTO THE SYSTEMS.

F. LAYOUT THE MECHANICAL SYSTEM DESCRIBED HEREIN AND ON THE CONTRACT DRAWINGS IN CAREFUL COORDINATION WITH THE CONTRACT DRAWINGS, APPROVED SHOP DRAWINGS, AND FIELD CONDITIONS, DETERMINING PROPER ELEVATIONS FOR ALL COMPONENTS OF THE SYSTEM AND USING ONLY THE MINIMUM NUMBER OF BENDS TO PRODUCE A SATISFACTORY FUNCTIONING SYSTEM.

G. FOLLOW THE GENERAL LAYOUT SHOWN ON THE APPROVED SHOP DRAWINGS IN ALL CASES EXCEPT WHERE OTHER WORK MAY INTERFERE.

H. SIZE ANY SECTION OF PIPE FOR WHICH SIZE IS NOT INDICATED OR ANY INTERMEDIATE SECTION THE SAME SIZE AS THE LARGEST PIPE CONNECTING TO IT.

I. LUBRICATE ALL MECHANICAL EQUIPMENT REQUIRING LUBRICATION AS RECOMMENDED BY THE MANUFACTURER BEFORE EQUIPMENT IS OPERATED FOR ANY REASON. MAINTAIN A LOG OF ALL LUBRICANTS USED AND FREQUENCY OF LUBRICATION; INCLUDE THIS INFORMATION IN THE OPERATION AND MAINTENANCE MANUALS.

J. INSTALL ALL EQUIPMENT IN ACCORDANCE WITH THE MANUFACTURER'S INSTALLATION INSTRUCTIONS.

K. EXCEPT WHERE SPECIFICALLY PERMITTED BY THE ENGINEER, LAYOUT ALL DUCTWORK, PIPE, AND CONDUIT TO FALL WITHIN A PARTITION, CEILING, OR ROOF CAVITY AND NOT TO REQUIRE FURRING OTHER THAN THAT SHOWN ON THE CONTRACT DOCUMENTS.

L. INSTALL ALL PIPING, CONDUIT, DUCTWORK, AND ACCESSORIES TO PERMIT ACCESS TO EQUIPMENT FOR MAINTENANCE AND SERVICE. COORDINATE THE EXACT LOCATION OF WALL AND CEILING ACCESS PANELS AND DOORS WITH THE GENERAL CONTRACTOR, MAKING SURE THAT ACCESS IS AVAILABLE FOR ALL EQUIPMENT AND SPECIALTIES. ACCESS DOORS IN GENERAL CONSTRUCTION ARE TO BE FURNISHED BY THIS CONTRACTOR AND INSTALLED BY THE GENERAL CONTRACTOR.

3.02 - PROJECT CLOSE-OUT

A. CLEAN PORTIONS OF THE SITE AFFECTED BY WORK OF THIS CONTRACT. REMOVE WASTE AND SURPLUS MATERIALS FROM THE SITE.

B. SUBMIT A MINIMUM OF THREE (3) COPIES OF OPERATION AND MAINTENANCE DATA BOUND IN THREE-RING BINDERS WITH PROTECTIVE COVERS (I.E., LAMINATE) FOR COPY PAPER. INCLUDE WARRANTIES, SUBMITTALS, DESINFECTING REPORT, AND PROJECT DOCUMENTS AND CERTIFICATES. THE MANUAL SHALL ALSO INCLUDE A SCHEDULE FOR EQUIPMENT MAINTENANCE. SCHEDULE SHALL PROVIDE A GENERAL OUTLINE FOR EQUIPMENT REQUIREMENTS.

C. THIS CONTRACTOR SHALL INSTRUCT OWNER IN USE AND OPERATION FEATURES OF SYSTEM. THE INSTRUCTION SHALL INCLUDE DEMONSTRATION OF ALL SEQUENCES OF CONTROL OPERATION AND INSTRUCTION ON HOW TO ADJUST SETPOINTS OR SEQUENCES TO OWNER'S FACILITY PERSONNEL.

- END OF SECTION

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Sheet Title
PLUMBING - SPECIFICATIONS

Sheet Number
P-6

ELECTRICAL SYMBOLS

46
DUPLEX WALL MTD RECEPTACLE
46 = MOUNTING HEIGHT
USB = USB CHARGING

DUPLEX WALL MTD RECEPTACLE – DEDICATED & GFI

DUPLEX WALL MTD RECEPTACLE – GFI

DUPLEX WALL MTD RECEPTACLE – 20A

DEDICATED & GFI

QUADPLEX WALL MTD RECEPTACLE

DEDICATED DUPLEX WALL MTD RECEPTACLE

SPECIAL PURPOSE RECEPTACLE

W
TELEPHONE JACK COMPLETE W/JACK AND COVER, ('W' WALL MOUNTED @ 4'–0" A.F.F)

TELEPHONE/DATA CEILING MTD RECEPTACLE

RECESSED FLOOR BOX W/ (2) 20A, 120V RCPT. & PROVISIONS FOR (4) RJ45 JACKS SIMILAR TO WIREMOLD EVOLUTION #EFB6–EFB610CTBS (CARPET), EFB610BTBS (SOLID LID) AND COMMUNICATION BRACKET FOR TEL/DATA DEVICES. PROVIDE 1"C FOR TEL/DATA TO NEAREST ACCESSIBLE CEILING SPACE.

COMBINATION TEL/DATA OUTLET BOX, WALL MOUNTED 18"AFF OR AS NOTED, WITH 3/4" CONDUIT STUBBED ABOVE ACCESSIBLE CEILING. PROVIDE PULLSTRING, END BUSHINGS.

TELEPHONE WALL MTD RECEPTACLE
W = WALL MOUNTED

DATA WALL MTD RECEPTACLE

LIGHTING WALL MTD TOGGLE CONTROL SWITCH

S_D LIGHTING WALL MTD DIMMER SWITCH

SAFETY SNAP SWITCH, HP RATED

S_3 LIGHTING WALL MTD 3–WAY TOGGLE CONTROL SWITCH

S_{Lc} LIGHTING RELAY PANEL LOW VOLTAGE OVERRIDE SWITCH

JUNCTION BOX

SYSTEMS FURNITURE WALL WHIP POWER FEED

A1
BRANCH CIRCUIT HOMERUN TO PANELBOARD WITH NO OF CONDUCTORS AND PNLBD CKT NO. NOTED

DOME IP CAMERA

MOTION SENSOR – WALL MOUNTED

WALL MOUNTED CABLE OUTLET. PROVIDE 3/4"C UP TO 6" ABOVE CEILING

CEILING MOUNTED DUAL–TECH OCCUPANCY SENSOR

WALL MOUNT DUAL–TECH VACANCY SENSOR

A A1 a
LIGHTING FIXTURE – RECESSED, SURFACE OR PENDANT CEILING MTD WITH TYPE AND SWITCH NOTED

LIGHTING FIXTURE – WALL MTD WITH TYPE AND SWITCH NOTED

UC AB b
LIGHTING FIXTURE – UNDER COUNTER MOUNTED WITH TYPE, CKT & SW NOTED

R A5 c
LIGHTING FIXTURE – RECESSED CEILING MOUNTED WITH TYPE, CKT & SW NOTED

EXIT LIGHTING FIXTURE – CEILING MTD WITH TYPE AND CIRCUIT NUMBER NOTED

EX
EXIT LIGHTING FIXTURE – WALL MTD WITH TYPE, CKT NUMBER AND DIRECTION OF EXIT NOTED

EXIT LIGHTING FIXTURE & EMERGENCY LIGHT COMBO W/ BATTERY BACK–UP

A
LIGHTING FIXTURE POWERED BY EMERGENCY BATTERY BACK–UP. 90 MINUTE MINIMUM. PROVIDE UN–SWITCHED HOT LEAD TO EMERGENCY BALLAST FROM SAME CIRCUIT AS NORMAL.

WALL WASHER

SPECIAL PENDANT FIXTURE

EMERGENCY EGRESS LIGHTING BATTERY UNIT

EMERGENCY EGRESS LIGHTING REMOTE HEAD

TRACK LIGHTS

MOTOR WITH HORSE POWER NOTED

DM
DOOR MOTOR

DISCONNECT UNFUSED SAFETY SWITCH

DISCONNECT FUSED SAFETY SWITCH

DENOTES ELECTRICAL DEMOLITION WORK

PANELBOARD – SURFACE MTD

PANELBOARD – RECESSED MTD

MS
COMBINATION MOTOR STARTER

TEL/DATA WIRING PANEL, CONDUITS & PLYWOOD BACKBOARD. EC SHALL PROVIDE:
1) 48"Wx96"Hx3/4"T AC GRADE PLYWOOD PAINTED ON ALL SIDES AND EDGES WITH FIRE RETARDANT PAINT.
2) 2–2"C WITH PULL STRING TO BUILDING SERVICE ENTRANCE AS DETERMINED BY TELEPHONE Co. CAP ENDS AND INSTALL ELECTRO MARKERS. COORDINATE ROUTING AND LENGTHS WITH SITE UTILITIES CONTRACTOR, GC & UTILITY Co.
3) GROUND BAR W/ #2 Cu TO BUILDING GROUND.
4) CONDUIT STUB OUTS TO ACCESSIBLE CEILING FOR BRANCH TEL/DATA WIRING DISTRIBUTION.

NOT ALL SYMBOLS AND ABBREVIATIONS ARE USED, PROVIDED FOR GENERAL REFERENCE ONLY.

ELECTRICAL GENERAL NOTES

1) ALL WORK SHALL BE INSTALLED IN FULL ACCORDANCE WITH LOCAL, STATE & FEDERAL CODES, STATE AND LOCAL AUTHORITIES. FILE ALL PLANS, OBTAIN ALL PERMITS, PAY ALL FEES, SCHEDULE ALL INSPECTIONS, MAKE ALL TESTS AND OBTAIN ALL APPROVALS REQUIRED. THE ELECTRICAL WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE LATEST ADOPTED EDITION OF THE NATIONAL ELECTRIC CODE AND LOCAL AUTHORITIES HAVING JURISDICTION. ALL COMPONENTS SHALL BE UL LISTED.

2) ALL ELECTRICAL MATERIAL SHALL BE OF THE HIGHEST QUALITY SPECIFICATION GRADE AND UL LISTED. THE ELECTRICAL SUB–CONTRACTOR SHALL SUBMIT ALL ELECTRICAL MATERIAL SHOP DRAWINGS FOR REVIEW AND ACCEPTABILITY PRIOR TO INSTALLATION.

3) ALL ELECTRICAL INSTALLATIONS SHALL BE IN ACCORDANCE WITH THE LOCAL ELECTRICAL INSPECTOR REQUIREMENTS. ALL PERMIT FEES COSTS PAID BY THE ELECTRICAL SUBCONTRACTOR. THE EC SHALL COORDINATE ALL ELECTRICAL INSPECTOR REQUIREMENTS PRIOR TO ANY ELECTRICAL CONSTRUCTION.

4) ALL NEW ELECTRICAL EQUIPMENT SHALL HAVE ENGRAVED PLASTIC NAMEPLATES. ALL PANELBOARDS CIRCUIT DIRECTORIES SHALL BE TYPED. ALL WIRING SHALL BE IDENTIFIED BY ALPHA–NUMERICAL TAGS.

5) ALL ELECTRICAL CONDUCTORS SHALL BE COPPER WITH TYPE "THHN/THWN" INSULATION. THE MINIMUM CONDUCTOR SIZE FOR POWER CIRCUITS SHALL BE NO 12 AWG. RACEWAYS SHALL BE TERMINATED WITH FLEXIBLE RACEWAYS TO EQUIPMENT FOR BOTH VIBRATION ISOLATION AND MAINTENANCE.

6) ALL MATERIAL AND CONSTRUCTION WORK SHALL BE ROUGH AND FINAL INSPECTED BY THE OWNER, ELECTRICAL ENGINEER AND CITY CODE ENFORCEMENT OFFICIAL PRIOR TO ACCEPTANCE AND PAYMENTS. ALL CIRCUITS AND EQUIPMENT SHALL BE VERIFIED FOR PROPER WIRING AND OPERATION. ELECTRICAL SUB–CONTRACTOR SHALL GUARANTEE ALL WORK AND MATERIAL (PARTS AND LABOR) FOR ONE YEAR AFTER FINAL ACCEPTANCE.

7) CONDUIT RUNS ARE SHOWN DIAGRAMMATICALLY ONLY AND SHALL BE INSTALLED IN A MANNER TO PREVENT CONFLICTS WITH EQUIPMENT AND BUILDING CONDITIONS. ALL "AS–SUPPLIED" ELECTRICAL EQUIPMENT AND WIRING MUST BE FULLY COORDINATED BY THE EC PRIOR TO INSTALLATION.

8) THE EQUIPMENT LAYOUTS, CONDUIT/WIRE SIZES AND WIRING DIAGRAM REPRESENTS A SUGGESTED DESIGN BASED UPON GENERALLY AVAILABLE ELECTRICAL EQUIPMENT SIZES AND WIRING REQUIREMENTS. THIS ALSO APPLIES TO EQUIPMENT PROVIDED BY OTHERS BUT WIRED BY THE ELECTRICAL SUB–CONTRACTOR. MODIFICATIONS ACCEPTABLE TO THE OWNER MAY BE MADE BY THE ELECTRICAL SUB–CONTRACTOR TO ACCOMMODATE ACTUALLY INSTALLED EQUIPMENT. THE BASIC SEQUENCE AND METHOD OF CONTROL MUST BE MAINTAINED AS INDICATED ON THE DRAWINGS AND SPECIFICATIONS. THE ELECTRICAL SUB–CONTRACTOR SHALL COORDINATE ALL EQUIPMENT WIRING REQUIREMENTS, PRIOR TO ANY CONSTRUCTION. DIFFERING EQUIPMENT LOCATIONS OR WIRING DUE TO INCOMPLETE COORDINATION SHALL BE PROVIDED BY THE ELECTRICAL SUB–CONTRACTOR AT NO ADDITIONAL COSTS TO THE OWNER.

9) CONDUIT AND WIRE AS INDICATED BY THE CONDUIT/WIRE SCHEDULE SHALL BE RMC, EMT OR PVC AS SPECIFIED FOR DIFFERENT AREAS. IN ADDITION, ALL CONDUIT AND WIRE NOT SHOWN INTERCONNECTING THE LIGHTING, RECEPTACLES AND EQUIPMENT SHALL BE PROVIDED AS SPECIFIED.

10) CONDUIT AND WIRE NOT SHOWN INTERCONNECTING THE FIRE ALARM, TELEPHONE, DATA ETC SPECIAL ELECTRICAL SYSTEMS SHALL BE PROVIDED AS INDICATED ON THE SYSTEMS RISER DIAGRAMS AND ASSOCIATED WIRING DETAILS.

11) OUTLET BOXES, SWITCHES, RECEPTACLES, PULL/JUNCTION BOXES, TERMINAL BOXES, ETC. SHALL BE PROVIDED WITH NEMA "3R" ENCLOSURES FOR ALL OUTDOOR LOCATIONS.

12) EC'S WORK INCLUDES ALL REQUIRED FIELD TESTING FOR THE FOLLOWING ELECTRICAL SYSTEMS

a) FIRE ALARM
b) POWER DISTRIBUTION

13) IT IS THE INTENT OF THESE SPECIFICATIONS AND DRAWINGS TO CALL FOR AN INSTALLATION THAT IS COMPLETE IN EVERY RESPECT. IT IS NOT THE INTENT T O GIVE EVERY DETAIL ON THE DRAWINGS AND IN THE SPECIFICATION. IF AN ITEM OF WORK IS SHOWN ON THE DRAWINGS, IT SHALL BE CONSIDERED SUFFICIENT FOR INCLUSION IN THE CONTRACT. THE CONTRACTOR SHALL FURNISH AND INSTALL ALL MATERIAL AND EQUIPMENT USUALLY FURNISHED OR NEEDED TO MAKE A COMPLETE INSTALLATION, WHERE SPECIFICALLY MENTIONED OR NOT.

14) THE EC SHALL VISIT THE SITE TO DETERMINE THE CONSTRAINTS OF THE EXISTING AVAILABLE SPACE PERTAINING TO EQUIPMENT SIZE AND CONFIGURATION AND TO EXAMINE THE CONDITIONS UNDDER WHICH THE EQUIPMENT WILL BE INSTALLED. CONTRACTOR SHALL AT THIS TIME REPORT ANY DISCREPANCIES OR QUESTIONS TO THE ARCHITECT/ENGINEER.

ELECTRICAL ABBREVIATIONS LIST

A	AMPERES
AF	AMP FRAME
AFF	ABOVE FINISHED FLOOR
AT	AMP TRIP
C	COUNTER HEIGHT MOUNTED
CLF	CURRENT LIMITING FUSE
CB	CIRCUIT BREAKER
CKT	CIRCUIT
CPT	CONTROL POWER TRANSFORMER
EC	ELECTRICAL CONTRACTOR
EF	EXHAUST FAN
EPO	EMERGENCY POWER OFF
ETR	EXISTING ELECTRICAL EQUIPMENT, CONDUIT AND WIRING TO REMAIN
EM	EXISTING ELECTRICAL EQUIPMENT WITH MODIFIED WIRING/COMPONENTS
EX	EXISTING ELECTRICAL EQUIPMENT, CONDUIT AND WIRING TO BE REMOVED. AT SAME LOCATION INSTALL NEW EQUIPMENT AND WIRING, REUSE EXISTING CONDUIT
ER	EXISTING ELECTRICAL EQUIPMENT SHALL BE REMOVED AND RELOCATED. EXISTING WIRING SHALL REMAIN (TO EXTENT FEASIBLE), EXTENDED TO NEW LOCATION AND RECONNECTED TO EQUIPMENT
FA	FIRE ALARM
G	GROUND FAULT INTERRUPTER
HP	HORSEPOWER
JB	JUNCTION BOX
KVA	KILO–VOLT AMPERES
LC	LOADCENTER
MCB	MAIN CIRCUIT BREAKER
MTD	MOUNTED
NEC	NATIONAL ELECTRICAL CODE
NIC	NOT IN CONTRACT
NO	NUMBER
NTS	NOT TO SCALE
OS	OCCUPANCY SENSOR
P	POLES
PH	PHASE
PNLBD	PANELBOARD
SP	SURGE PROTECTED
TELE	TELEPHONE
UON	UNLESS OTHERWISE NOTED
UOI	UNLESS OTHERWISE INDICATED
V	VOLTS
W	WIRE
WP	WEATHERPROOF
WS	WORKSTATION

ELECTRICAL GENERAL SPECIFICATIONS

1) SCOPE OF WORK –

THE ELECTRICAL CONTRACTOR (EC) SHALL FURNISH ALL LABOR, MATERIAL, SUPPLIES, EQUIPMENT, TOOLS AND SERVICES NECESSARY FOR AND REASONABLY INCIDENTAL TO COMPLETION OF THE ELECTRICAL WORK AS SPECIFIED AND AS SHOWN ON THE ELECTRICAL DRAWINGS. THE ELECTRICAL SYSTEMS SHALL BE FULLY INSTALLED, ADJUSTED, TESTED AND MADE READY FOR USE BY THE OWNER INCLUDING ELEC O&M AND OWNER TRAINING.

THE SCOPE OF WORK SHALL INCLUDE, BUT NOT BE LIMITED TO THE FOLLOWING ITEMS. IN ADDITION, THE EC SHALL PROVIDE ALL MATERIAL AND WORK IN STRICT REQUIREMENTS WITH THE OWNER'S CONSTRUCTION REQUIREMENTS INCLUDING THE PROJECT'S SCHEDULE.

EC'S WORK INCLUDES ALL REQUIRED COORDINATION WITH THE "AS SUPPLIED" PROJECT EQUIPMENT PRIOR TO ANY ELEC EQUIPMENT RELEASE AND/OR ROUGH WIRING. ANY MISCOORDINATION SHALL BE COMPLETED BY THE CONTRACTOR(S) AT NOT COSTS TO THE OWNER.

A) PROVIDE NORMAL, EGRESS AND EXIT LIGHTING FIXTURES INCLUDING NECESSARY NEW BRANCH WIRING AND SWITCHES AS INDICATED ON THE ELEC DRAWINGS. PROVIDE GENERAL TEMPORARY LIGHTING DURING THE CONSTRUCITON PERIOD. LTG WORK INCLUDES ALL LIGHTING CONTROLS. EC'S LTG SUPPLIER'S WORK INCLLUDES ALL START–UP, FIELD TESTING AND OWNER TRAINING.

B) PROVIDE RECEPTACLES AND OTHER WIRING DEVICES INCLUDING NECESSARY NEW BRANCH WIRING. IN GENERAL ALL WIRING SHALL BE MC CABLE WHERE CONCEALED OR IN RIGID OR EMT CONDUIT.

C) EC SHALL ALSO MOUNT AND WIRE EQUIPMENT PANELS, ETC WHICH ARE FURNISHED BY THE GENERAL CONTRACTOR (GC) OR OTHER PROJECT CONTRACTORS. EC MUST INSTALL AND WIRE ALL EQUIPMENT IN STRICT ACCORDANCE WITH EACH MANUFACTURER'S TECHNICAL REQUIREMENTS.

2) CODE REQUIREMENTS –

THE ENTIRE ELECTRICAL INSTALLATION SHALL BE SUPPLIED AND INSTALLED IN STRICT ACCORDANCE WITH ALL APPLICABLE STATE AND LOCAL BUILDING/ELECTRICAL CODES, LAWS, ORDINANCES AND INSURANCE REQUIREMENTS. ALL NEW WORK SHALL BE COORDINATED WITH THE LOCAL BLDG/ELEC/MECH INSPECTORS PRIOR TO RELEASE AND INSTALLATION.

ALL ELECTRICAL WIRING SHALL BE DONE BY LICENSED ELECTRICIANS INCLUDING < 50 VOLT CONTROL WIRING PER SECTION C141:1A OF THE MASSACHUSETTS GENERAL LAWS.

3) INTERPRETATION OF DRAWINGS –

THE DRAWINGS ARE DIAGRAMMATIC ONLY AND ARE NOT INTENDED TO SHOW THE EXACT LOCATIONS OF NEW OR EXISTING UTILITIES AND ARE SUBJECT TO FIELD INSTALLATION ADJUSTMENTS AT THE TIME OF INSTALLATION BY THE ELECTRICAL CONTRACTOR.

4) PERMITS, FEES AND INSPECTIONS –

THE ELECTRICAL CONTRACTOR SHALL OBTAIN AND PAY FOR ALL PERMITS, INSPECTIONS, LICENSES AND CERTIFICATIONS REQUIRED FOR WORK SPECIFIED OR SHOWN ON THE ELECTRICAL DRAWINGS. NO ELECTRICAL WORK SHALL COMMENCE UNTIL ALL ELECTRICAL CONSTRUCTION IS COORDINATED WITH THE LOCAL CITY ELECTRICAL INSPECTOR. ANY DIFFERING INSPECTOR REQUIREMENTS SHALL BE PROVIDED BY THE ELECTRICAL CONTRACTOR WITHOUT ANY ADDITIONAL COMPENSATION.

5) CORING, CUTTING AND PATCHING –

THE ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE FOR ALL CORING, CUTTING, PATCHING AND DRILLING AND ALL NECESSARY "U" CHANNEL FOR SUPPORT AND INSTALLATION OF THE ELECTRICAL MATERIAL AND EQUIPMENT. THIS INCLUDES ANY REQUIRED SCAFFOLDING OR SIMILAR EQUIPMENT FOR THE ELECTRICAL WORK INSTALLATION.

IN ADDITION, ALL PENETRATIONS THRU FIRE RATED OR HAZARDOUS WALLS SHALL BE CAULKED WITH FIRE STOPPING MATERIAL BY THE ELECTRICAL CONTRACTOR.

6) MATERIAL/EQUIPMENT –

A) EXPOSED INTERIOR WIRING SHALL BE "EMT" RACEWAYS. ALL OUTSIDE WIRING MUST BE RIGID GALVANIZED STEEL RACEWAYS. ALL POWER, CONTROL, ALARM, ETC CONDUCTORS SHALL BE TYPE "THWN/ THHN" COPPER CONDUCTORS. ALL CONCEALED WIRING IN THE WALLS AND ABOVE THE CEILINGS SHALL BE TYPE "MC" METAL CLAD CABLE WITH COPPER CONDUCTORS. MINIMUM POWER CONDUCTOR SIZE IS NO. 12 AWG. ALL POWER WIRING SHALL HAVE COPPER GROUNDING CONDUCTORS. ALL JUNCTION BOXES,"U" CHANNELS, HARDWARE, ETC SHALL BE GALVANIZED STEEL.

B) PANELBOARDS, DISCONNECT SWITCHES, SHALL BE MANUFACTURED BY CUTLER HAMMER, GENERAL ELECTRIC, SIEMENS (ITE) OR SQUARE "D". BOLT FREE STANDING EQUIPMENT TO 4" HIGH CONCRETE HOUSEKEEPING PADS.

C) PROVIDE ENGRAVED NAMEPLATES ON PANELBOARDS, DISCONNECT SWITCHES, ETC., INDICATING EQUIPMENT DESIGNATION (OR DESIGNATION OF EQUIPMENT SERVED) AND VOLTAGE.

D) CIRCUIT BREAKERS SHALL BE BOLT–ON TYPE AND FUSES SHALL BE BUSSMANN OR LITTLEFUSE. NEW CIRCUIT BREAKERS SHALL MATCH THE EXISTING PANELBOARD EQUIPMENT MANUFACTURER.

E) ALL WIRING SHALL BE INSTALLED IN LISTED METALLIC RACEWAYS. RACEWAYS IN SLAB–ON–GRADE OR BELOW GRADE SHALL BE SCHEDULE 40 PVC. TRANSITIONS FROM BELOW TO ABOVE GRADE SHALL BE WITH RIGID STEEL ELBOWS WITH PVC JACKET OR APPROVED EQUIVALENT PROTECTION. MET FITTINGS SHALL BE MALLEABLE IRON OR STEEL. CONNECTORS SHALL BE INSULATED THROAT TYPE.

F) CONDUITS PENETRATING THRU ROOF SHALL HAVE FLASHING WITH CAULK TYPE COUNTER FLASHING SLEEVE. INSTALLATION SHALL BE WATERTIGHT.

G) ALL ELECTRICAL SYSTEMS COMPONENTS SHALL BE LISTED OR LABELED BY U.L. OR OTHER RECOGNIZED TESTING FACILITIES.

H) BOXES FOR TELEPHONE, T.V., COMPUTER, WIRING DEVICES, ETC., SHALL BE MINIMUM 4" SQUARE.

I) THE EC SHALL COORDINATE WITH THE TELEPHONE UTILITY FOR PROVIDING THE REQUIRED CONDUIT SIZE AND NUMBER TO THE TENANT SPACE. THE EC SHALL PROVIDE ALL CONDUITS WITH PULL CORDS AND SHALL INSTALL FROM THE LOCAL TELEPHONE BOARD TO THE MAIN POINT OF SERVICE.

J) ALL EMPTY RACEWAY SYSTEMS SHALL HAVE A #12 PULL WIRE OR EQUIVALENT AND SHALL BE IDENTIFIED AT ALL JUNCTION, PULL AND TERMINATION POINTS, USING PERMANENT METALLIC TAGS. TAG SHALL INDICATE INTENDED USE OF CONDUIT, ORIGINATION AND TERMINATION POINTS OF EACH INDIVIDUAL CONDUIT.

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COMMONWEALTH OF MASSACHUSETTS
AULENT TIMKO ELECTRICAL No. 53506
REGISTERED PROFESSIONAL ENGINEER

PROPOSED BUILDING PLANS
855. MAIN ST BROCKTON, MA

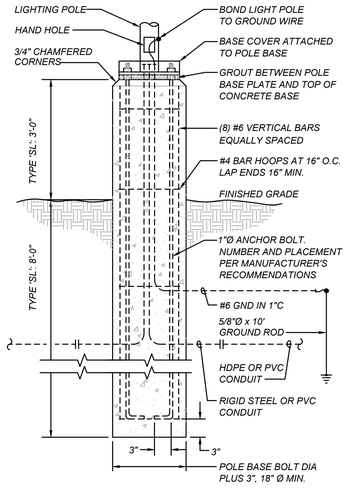
Date: 4-30-2021

Sheet Title
ELECTRICAL RISER, SCHEDULES

Scale:

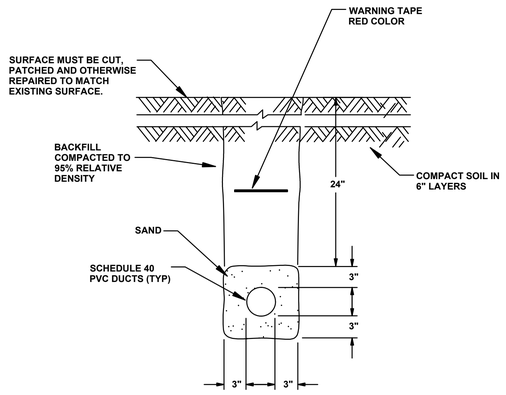
Project Number:

Sheet Number
E1



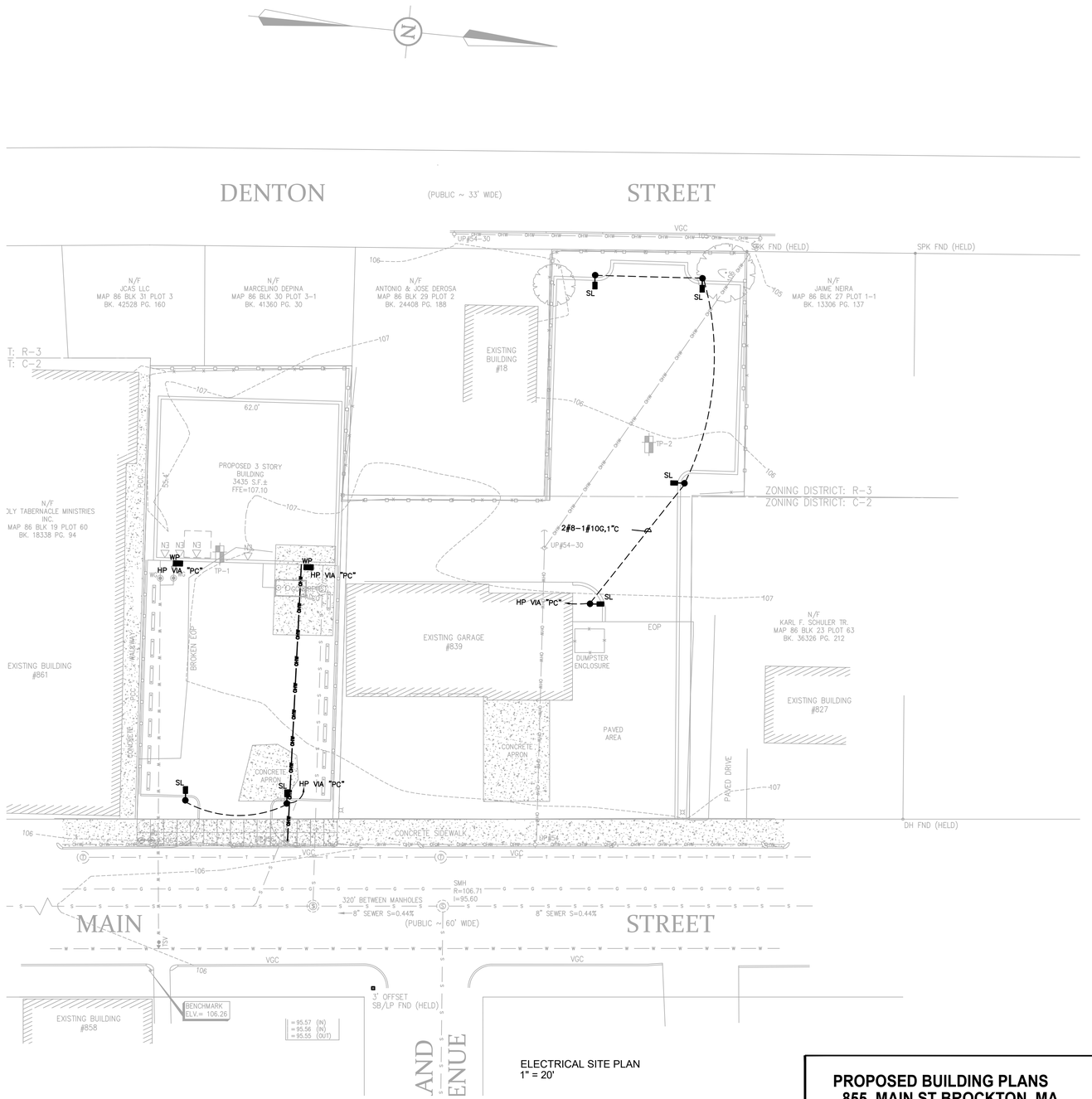
CONCRETE POLE BASE DETAIL

No Scale



SITE LIGHTING DUCTBANK DETAIL

No Scale



ELECTRICAL SITE PLAN
1" = 20'

PROPOSED BUILDING PLANS
855. MAIN ST BROCKTON, MA

Date:	4-30-2021
Sheet Title	SITE PLAN
Scale:	
Project Number:	
Sheet Number	E2

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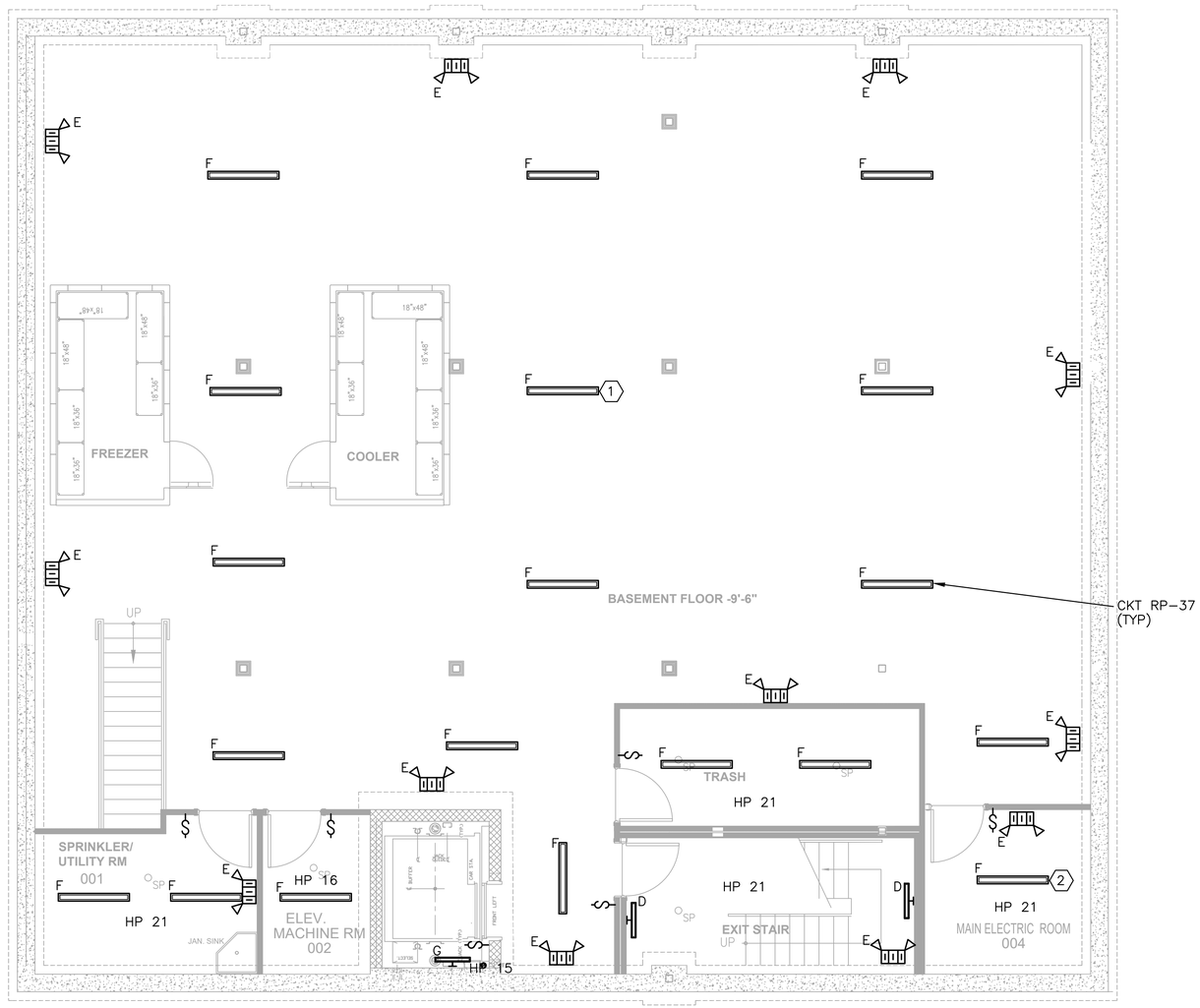
REGISTERED PROFESSIONAL ENGINEER



PROPOSED BASEMENT LEVEL FLOOR PLAN 3,105 s.f.

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

1 PROVIDE WITH INTEGRAL OS. TYPICAL FOR "F" TYPE

2 PROVIDE WITHOUT INTEGRAL OS IN ELECTRICAL ROOM.

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PROPOSED BUILDING PLANS
855. MAIN ST BROCKTON, MA

COMMONWEALTH OF MASSACHUSETTS
AULENT TIMKO ELECTRICAL No. 53506
REGISTERED PROFESSIONAL ENGINEER

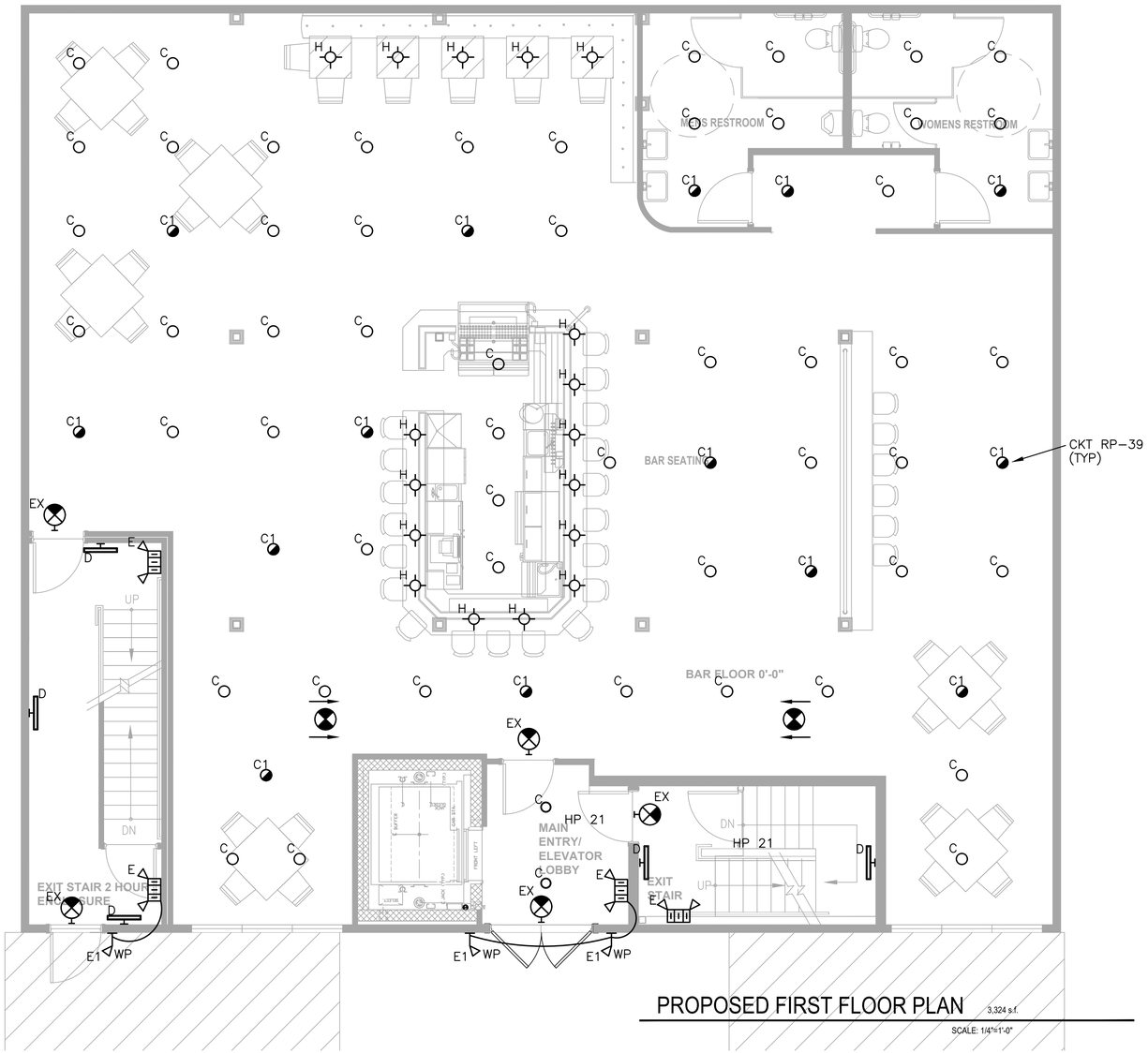
Scale: 1/4"=1'-0"

Project Number:

Date: 4-30-2021

Sheet Title
BASEMENT FLOOR PLAN

Sheet Number
E3



PROPOSED FIRST FLOOR PLAN 3,324 s.f.

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

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PROPOSED BUILDING PLANS
855. MAIN ST BROCKTON, MA

AULENT TIMKO ELECTRICAL No. 53506 REGISTERED PROFESSIONAL ENGINEER COMMONWEALTH OF MASSACHUSETTS

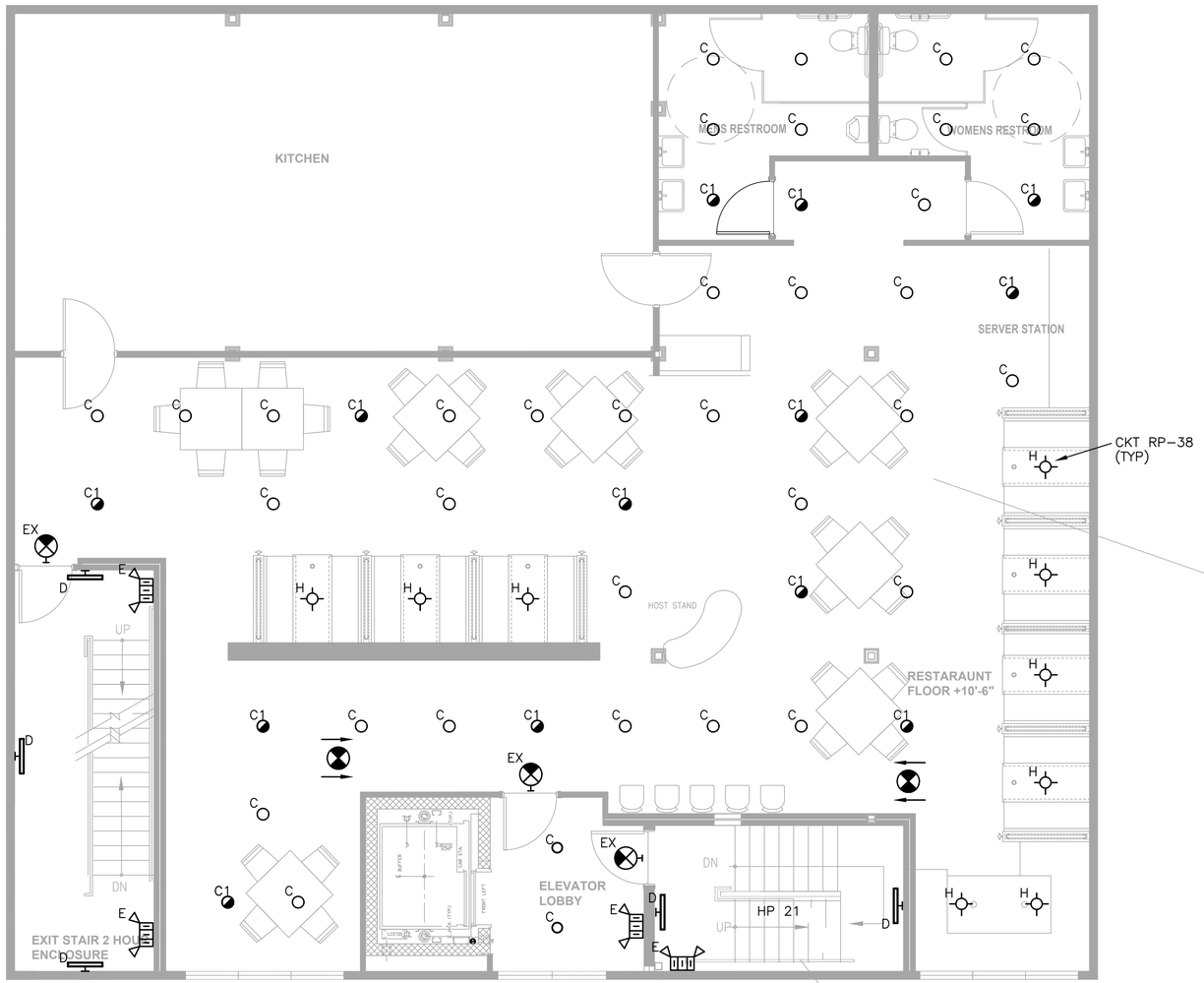
Scale: 1/4"=1'-0"

Project Number:

Date: 4-30-2021

Sheet Title
FIRST FLOOR PLAN

Sheet Number
E4



PROPOSED SECOND FLOOR PLAN

3,324 s.f.

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

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PROPOSED BUILDING PLANS
855. MAIN ST BROCKTON, MA

COMMONWEALTH OF MASSACHUSETTS
AULENT TIMKO ELECTRICAL No. 53506 Registered Professional Engineer

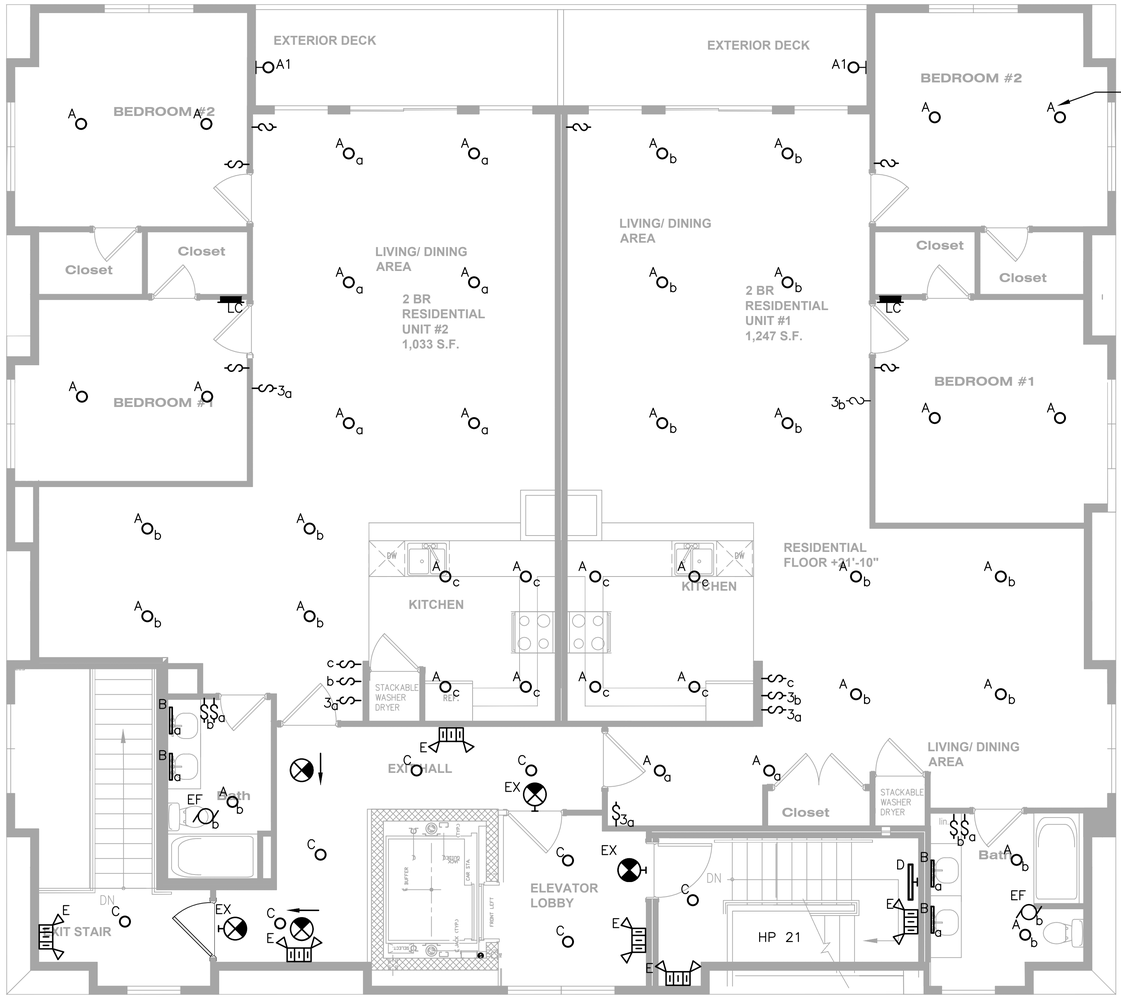
Scale: 1/4"=1'-0"

Project Number:

Date: 4-30-2021

Sheet Title
SECOND FLOOR PLAN

Sheet Number
E5



PROPOSED THIRD FLOOR PLAN 2,752 s.f.

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

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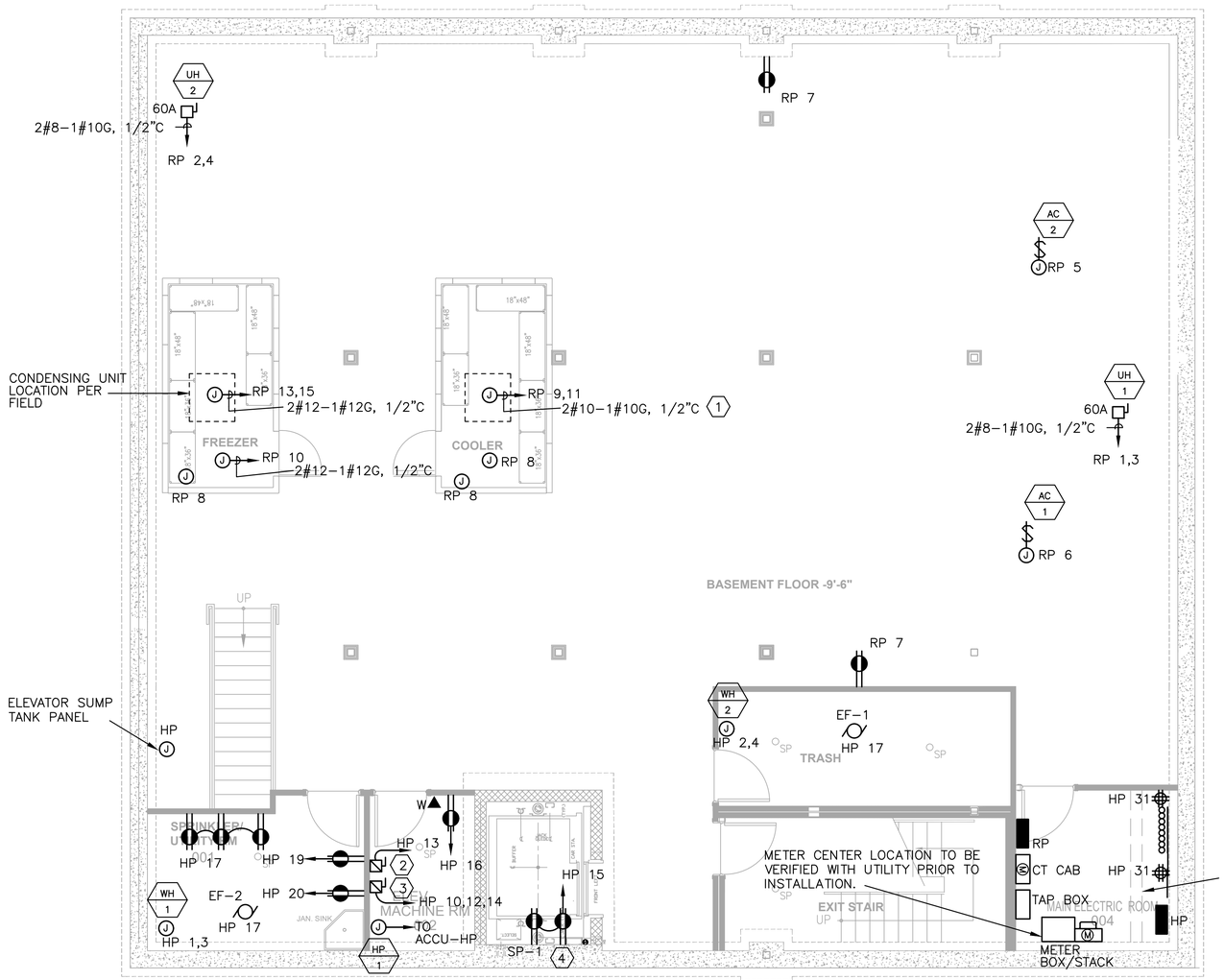
PROPOSED BUILDING PLANS **855. MAIN ST BROCKTON, MA**	**Date:** 4-30-2021
COMMONWEALTH OF MASSACHUSETTS AULENT TIMKO ELECTRICAL No. 53506 REGISTERED PROFESSIONAL ENGINEER	**Scale:** 1/4"=1'-0"
	Project Number:
Sheet Title THIRD FLOOR PLAN	
Sheet Number E6	



PROPOSED BASEMENT LEVEL FLOOR PLAN 3,105 s.f.

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

1. WIRING BASED ON TYPICAL RATINGS. EC SHALL COORDINATE WITH AS–SUPPLIED EQUIPMENT AND ADJUST AS NECESSARY.
2. ELEVATOR CAB DISCONNECT. LOCKED "OFF" CAPABLE. COORDINATE EXACT LOCATION & REQUIREMENTS WITH ELEVATOR VENDOR.
3. ELEVATOR POWER SWITCH: 208V/3P COMPLETE WITH FUSES, CPT, FIRE ALARM INTERFACE RELAY, KEY TEST SWITCH, GREEN PILOT LIGHT, AUX. CONTACTS FOR ELEVATOR RECALL AND VOLTAGE MONITORING RELAY. EQUAL TO BUSSMAN #PS–2–T20
4. ELEVATOR PIT RECEPTACLE. FINAL LOCATION PER ELEVATOR VENDOR.

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PROPOSED BUILDING PLANS
855. MAIN ST BROCKTON, MA

AULENT TIMKO ELECTRICAL No. 53506 REGISTERED PROFESSIONAL ENGINEER COMMONWEALTH OF MASSACHUSETTS

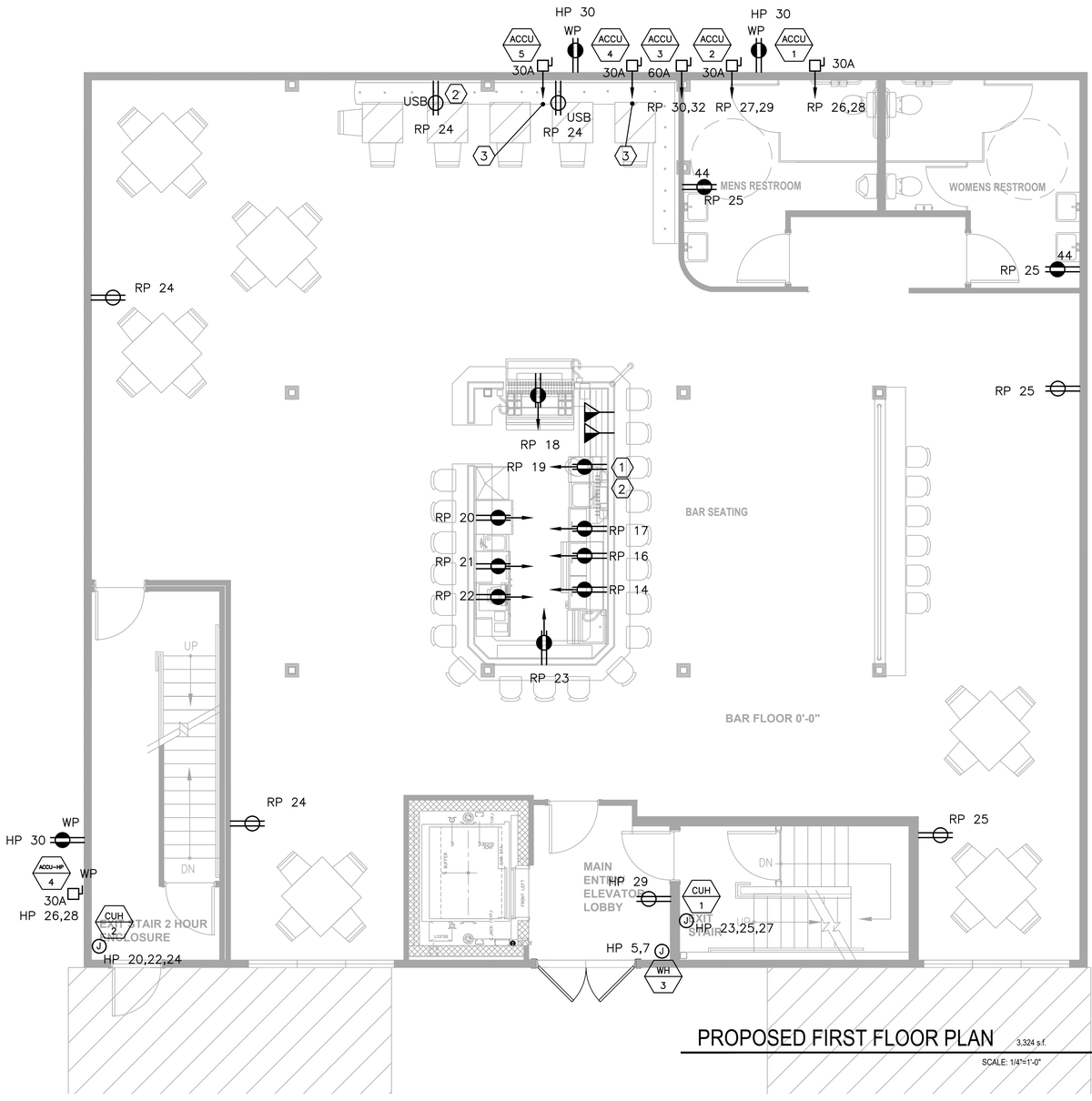
Scale: 1/4"=1'-0"

Project Number:

Date: 4-30-2021

Sheet Title
BASEMENT FLOOR PLAN

Sheet Number
E7



1. TYPICAL LAYOUT. EC SCOPE INCLUDES COORDINATION WITH FINAL AS-SUPPLIED EQUIPMENT.
2. COORDINATE FINAL MOUNTING HEIGHTS WITH OWNER/-ARCHITECT.
3. TO APARTMENT LOADCENTER.

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PROPOSED BUILDING PLANS
855. MAIN ST BROCKTON, MA

COMMONWEALTH OF MASSACHUSETTS
AULENT TIMKO ELECTRICAL No. 53506
REGISTERED PROFESSIONAL ENGINEER

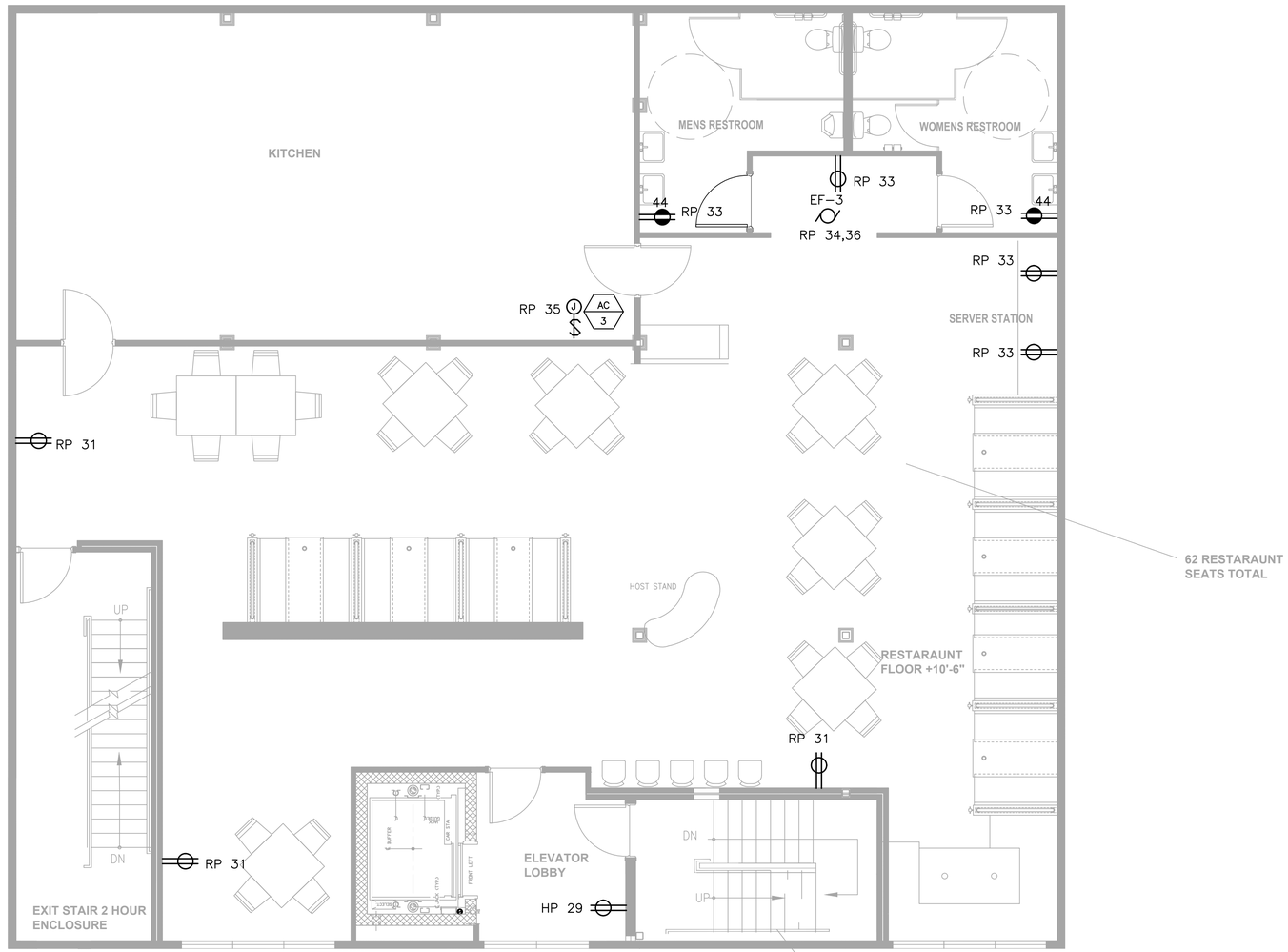
Scale: 1/4"=1'-0"

Project Number:

Date: 4-30-2021

Sheet Title
FIRST FLOOR PLAN

Sheet Number
E8



PROPOSED SECOND FLOOR PLAN

3,324 s.f.

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

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PROPOSED BUILDING PLANS
855. MAIN ST BROCKTON, MA

COMMONWEALTH OF MASSACHUSETTS
AULENT TIMKO ELECTRICAL
No. 53506
REGISTERED PROFESSIONAL ENGINEER

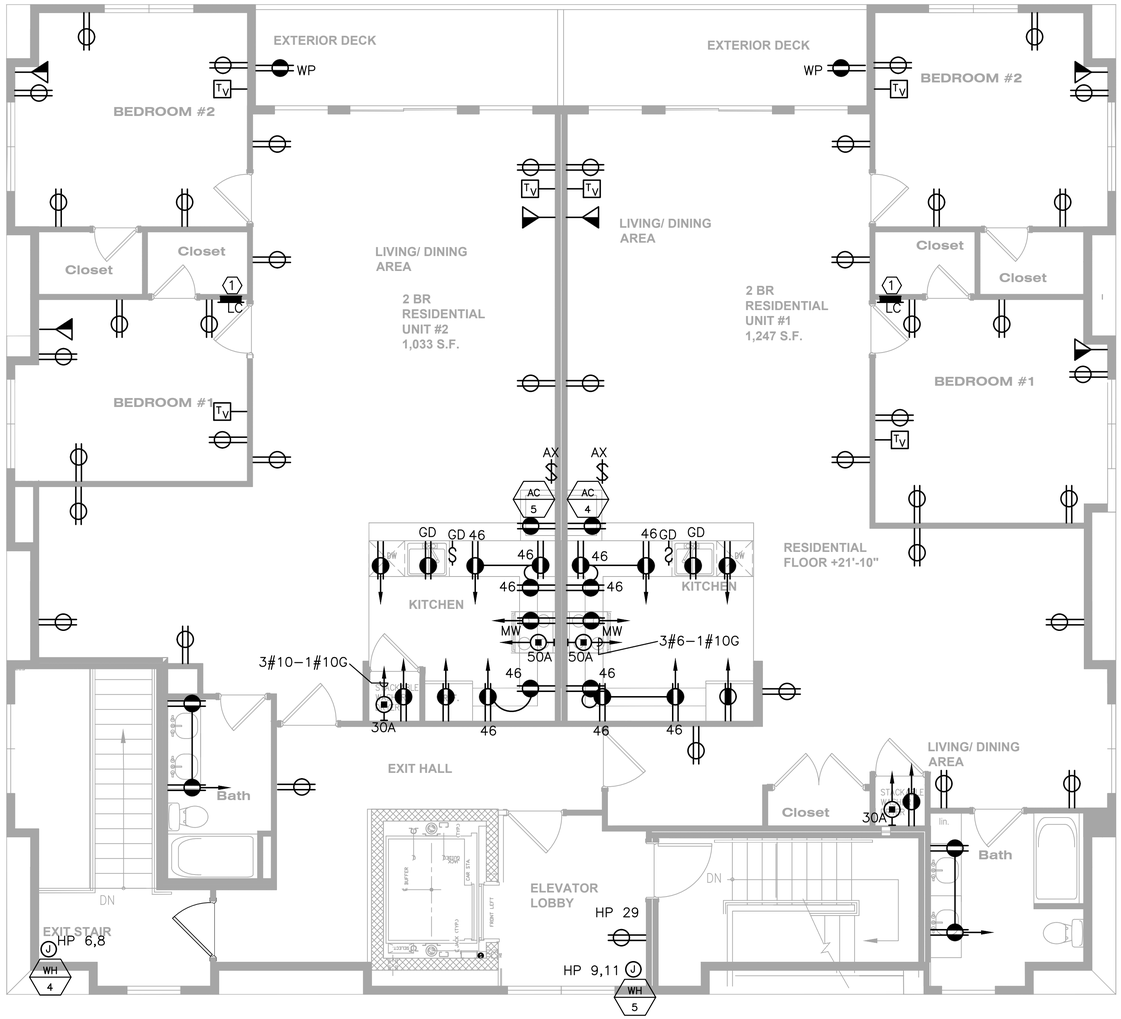
Scale: 1/4"=1'-0"

Project Number:

Date: 4-30-2021

Sheet Title
SECOND FLOOR PLAN

Sheet Number
E9



PROPOSED THIRD FLOOR PLAN 2,752 s.f.

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

(1) DWELLING UNIT AREA AFCI/GFCI CIRCUIT BREAKERS

Location	NEC 2020
Family Rooms	AFCI
Dining Rooms	AFCI
Kitchens – 125V Receptacles	AF/GF
Kitchens – 250V Receptacles	GFCI
Bedrooms	AF/GFCI
Living Rooms	AFCI
Garage – 125V Receptacles	GFCI
Garage – 250V Receptacles	GFCI
Sunrooms	AFCI
Parlors	AFCI
Libraries	AFCI
Dens	AFCI
Recreation Rooms	AFCI
Closets	AFCI
Hallways	AF/GFCI
Laundry Areas – 125V	AF/GF
Laundry Areas – 250V	GFCI
Basements	AF/GF
Bathrooms	GFCI
Dishwasher	AF/GF
Outdoor Outlets (i.e. A/C unit)	GFCI
Sump Pump	GFCI
Outdoor Receptacles – 125V	GFCI
Outdoor Receptacles – 250V	GFCI

TM = Thermal–Magnetic Breaker
AF / AFCI = Arc–Fault Circuit–Interrupter
GF / GFCI = Ground–Fault Circuit–Interrupter

1: GFCI protection required if receptacle outlet is within 6ft of edge of sink (i.e. bedroom bathroom; hallway bathroom, etc.)
2: Unfinished basements
3: Where the receptacle is installed within 6ft of the outside edge of the sink
4: Example of outdoor outlet loads (150V to ground or less; 50A or less; – single–phase) are Air Conditioner unit, Septic Aerator, etc. Refer to the appropriate section of the NEC for further details on the specific requirements.

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PROPOSED BUILDING PLANS
855. MAIN ST BROCKTON, MA

COMMONWEALTH OF MASSACHUSETTS
AULENT TIMKO ELECTRICAL No. 53506 REGISTERED PROFESSIONAL ENGINEER

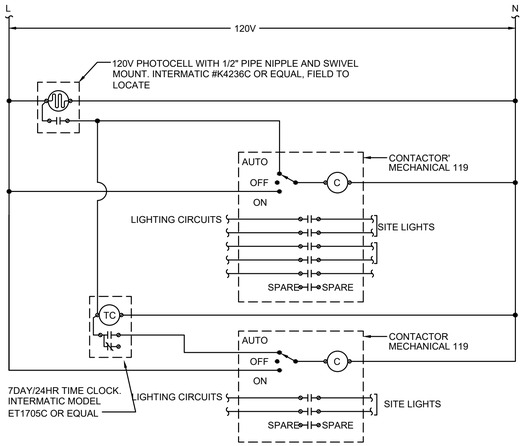
Scale: 1/4"=1'-0"

Project Number:

Date: 4-30-2021

Sheet Title
THIRD FLOOR PLAN

Sheet Number
E10

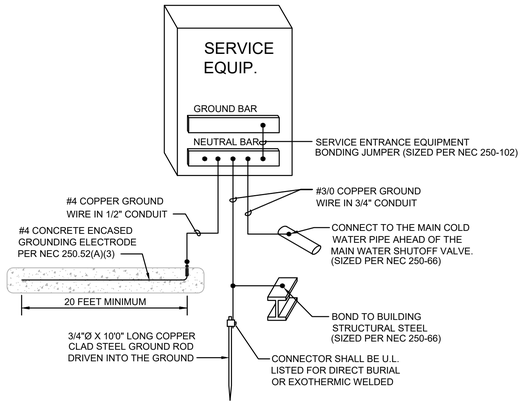


PROVIDE LIGHTING CONTACTORS WITH QUANTITY OF POLES AS REQUIRED,120V COIL, INTEGRAL 3+POSITION MANUAL SELECTOR SWITCH, AND NEMA 1 ENCLOSURE. FIELD TO LOCATE

EXTERIOR LIGHTING CONTROL DIAGRAM

No Scale

COORDINATE PHOTOCELL/TIME CLOCK CONTROLS WITH TENANT/OWNER. PROVIDE AS REQUIRED.

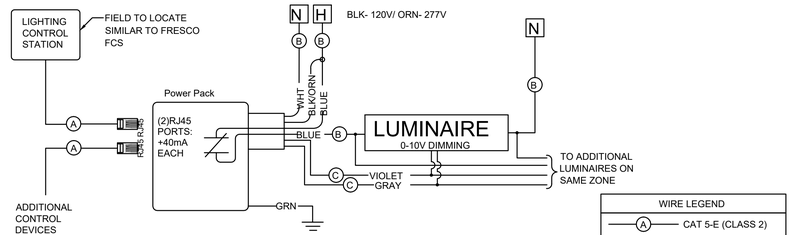


SERVICE GROUNDING ELECTRODE SYSTEM

No Scale

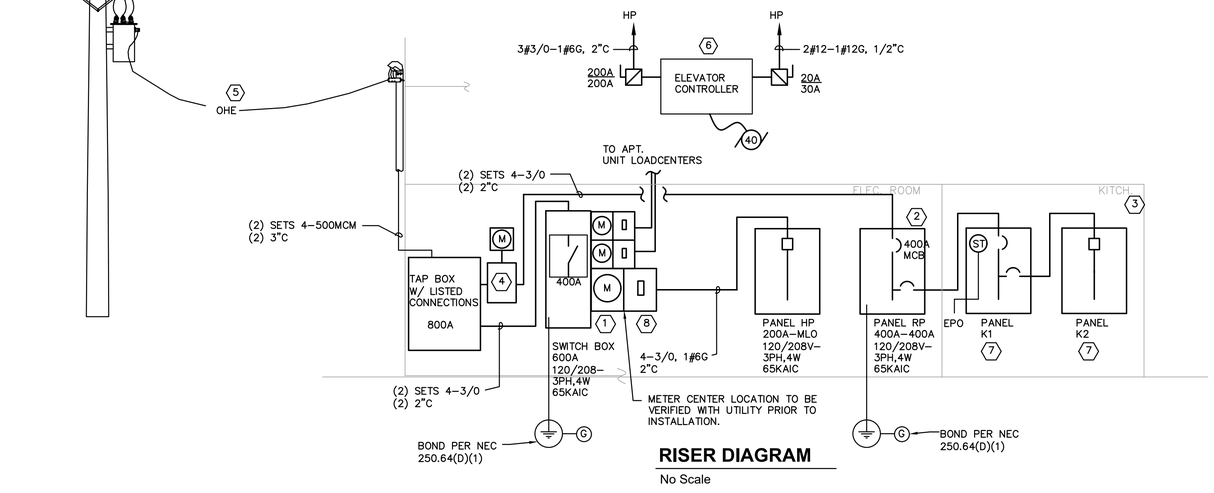
LIGHTING FIXTURE SCHEDULE							
LABEL	MANUFACTURER	CATALOG NUMBER	DESCRIPTION	LAMP	NUMBER LAMPS	LUMENS	WATTAGE
A	JUNO LIGHTING	4BEMW SWW5 90CRI 30K	4" E-SERIES MATTE WHITE BAFFLE 5CCT SWITCHABLE 90CRI 30K	LED	1	757	8.5
A1	HALO LIGHTING	FE0650LPC	OUTDOOR LED WALL LIGHT	LED	1	811	9
B	LITHONIA LIGHTING	FMVTSL 24IN 30K	2' LED TRADITIONAL VANITY SQUARE 3000K	LED	1	1285	17.7
C	LITHONIA LIGHTING	LDN4 ALO1 SWW1 LO4 MVOLT	4" COMMERCIAL DOWNLIGHT	LED	1	750	10
C1	SAME AS "C" WITH EMERGENCY BATTERY PACK						
D	LUMINAIRE LED	TSL9 24IN 25W FAM7 40K OP	LUMINAIRE LED DIM. VANDAL RESISTANT SURFACE MOUNT 1X2'.	LED	-	2741	26.3
E	LITHONIA LIGHTING	ELM6L	EMERGENCY LIGHT	LED	6	1100	5
E1	REMOTE HEAD FOR E						
EX	LITHONIA LIGHTING	LQM S W 3 R 120/277 EL N M6	EXIT SIGN, 120V, BATTERY BACKUP	LED	1		5
EM2	LITHONIA LIGHTING	LHQM-S-W-1-R-H-N	EXIT SIGN/EMERGENCY LIGHT COMBO	LED			5
F	LITHONIA LIGHTING	MRSL L48 3500LM 80CRI 850 XXXX L/LENS	MRSL L48 3500LM 80CRI 850 XXXX L/LENS	LED	1	4199	27.01
G	WILLIAMS	96-2-L29/830-HIAFR-WET/1-DRV-UNV	2' ENCLOSED/GASKETED INDUSTRIAL FIXTURE, IMPACT-RESISTANT	LED	1	3000	25
H	-	-	PENDANT FIXTURE - COORDINATE WITH ARCHITECT/OWNER	-	1	-	-
SL	MCGRAW EDISON	GLEON-AE-03-LED-E1-T4FT	AREA LIGHT, 20' SSS POLE	LED		15,800	157
WP	LITHONIA	WPX1 LED P2 40K MVOLT DDBXD M4	WALL PACK LIGHT. WET LOCATION LISTED	LED		2900	24

1) ALL LAMPS SHALL BE SUPPLIED WITH THE FIXTURES.
2) COORDINATE LIGHTING FIXTURES WITH FIELD CONDITIONS AND PROVIDE ALL REQUIRED MOUNTING ACCESSORIES, HARDWARE, HOUSINGS.
3) LIGHT FIXTURES & FINISHES SHALL BE APPROVED BY ARCHITECT/OWNER. EC/LIGHTING SUPPLIER IS RESPONSIBLE FOR SPECIFIED FIXTURE RATINGS, REGARDLESS OF FIXTURE SELECTED, COORDINATE FINAL FIXTURE SELECTION WITH ARCHITECT. FINAL FINISHES SHALL BE PER ARCHITECT.
4) "SL" FIXTURE SHALL BE "WET LOCATION" LISTED. FIXTURE/POLE ASSEMBLY SHALL BE RATED FOR 100 MPH WIND LOADS. PROVIDE VIBRATION DAMPER PER MFR. RECOMMENDATIONS. PROVIDE FIXTURE WITH 7" ARM, STEEL POLE.



LIGHTING DIAGRAM - RESTAURANT

No Scale



RISER DIAGRAM

No Scale

1. (2) 125A, 120/208-1PH,3W APARTMENT METER/BREAKER SOCKETS (1) 200A, 120/208-3PH,4W HOUSE METER/BREAKER SOCKET
2. COORDINATE RESTAURANT PANELBOARD SPACES WITH NO. OF CIRCUITS REQUIRED AND PROVIDE TO SUIT.
3. EC TO COORDINATE LOCATION WITH FINAL KITCHEN LAYOUT, KITCHEN VENDOR.
4. TRANSFORMER-RATED CT CABINET & METER. PROVIDE PER "NATIONAL GRID – SPECIFICATIONS FOR ELECTRICAL INSTALLATIONS 2021" TABLE 7.2-1 INCLUDING ALL CHAPTER 7 REQUIREMENTS. 400A MINIMUM.
5. NEW OVERHEAD SERVICE. EC SCOPE INCLUDES UTILITY COORDINATION, NEW SERVICE REQUEST, LOAD LETTER, SCHEDULING, SITE VISIT ETC. AS REQUIRED BY THE UTILITY.
6. DEVICE RATINGS BASED ON TYPICAL ELEVATOR EQUIPMENT. EC SHALL COORDINATE WITH ELEVATOR VENDOR AND AS-SUPPLIED EQUIPMENT. ADJUST SIZES/RATINGS PER MFR. REQUIREMENTS.
7. RATINGS PER KITCHEN VENDOR. PANEL "K2" ONLY IF REQUIRED
8. METERING CENTER SHALL BE PROVIDED PER "NATIONAL GRID – SPECIFICATIONS FOR ELECTRICAL INSTALLATIONS 2021" TABLE 7.2-2 AND SHALL MEET ALL SECTION 7 REQUIREMENTS. PROVIDE PAINTED AND/OR TREATED 3/4" PLYWOOD BOARD FOR MOUNTING OF ELECTRICAL EQUIPMENT. NEMA 3R RATED

RISER DIAGRAM NOTES

1. ELECTRICAL CONTRACTOR (EC) SHALL FURNISH/INSTALL NEW ELECTRICAL POWER DISTRIBUTION EQUIPMENT AS INDICATED INCLUDING ALL ASSOCIATED WIRING.
2. EC SHALL FURNISH AND INSTALL NEW POWER PANELBOARDS AND ASSOCIATED CONDUIT/WIRE AS INDICATED. PANELBOARD'S FEEDER WIRING SHALL BE FIELD ROUTED BY EC.
3. EC'S WORK INCLUDES ALL NECESSARY SERVICE CONNECTION EQUIPMENT, WALL/CEILING CORING, SLEEVES, FIRE STOP ETC. AS REQUIRED.
4. EC SHALL FURNISH AND INSTALL ENGRAVED PLASTIC NAMEPLATES FOR THE NEW POWER DISTRIBUTION EQUIPMENT. NAMEPLATES SHALL INDICATE TAG NAME, VOLTAGE/PHASE/WIRE AND POWER SUPPLY SOURCE INFORMATION (TAG AND LOCATION). IN ADDITION, ALL BRANCH CIRCUIT DIRECTORIES SHALL BE UPDATED WITH NEW COMPUTERIZED TYPED SCHEDULES.
5. EC SHALL CONTACT THE POWER UTILITY COMPANY (IN WRITING) WITH ADVISEMENT ON THE NEW TENANT LOADS (BOTH CONNECTED KVA, TYPE OF LOAD, ETC) IN ORDER TO DETERMINE THE ELECTRIC SERVICE TRANSFORMER IS ADEQUATE FOR THE BUILDING LOADS.
6. EC SHALL FURNISH AND INSTALL NEW POWER COMPANY COMPLIANT POWER METERS AND ASSOCIATED POWER METERING CONDUIT/WIRE. EC'S WORK INCLUDES CONTACTING THE POWER UTILITY COMPANY AS SOON AS POSSIBLE AFTER CONTRACT AWARD IN ORDER TO COORDINATE THE NEW TENANT ELECTRICAL SERVICE INCLUDING PROVIDING COPIES OF ALL REQUIRED ENGINEERING DRAWINGS, LOAD CALCULATIONS, SERVICE REQUESTS, ETC. EC MUST ALSO PUBLISH THE REQUIRED ELECTRICAL SERVICE DATE.
7. EC'S WORK INCLUDES FURNISHING ELECTRICAL EQUIPMENT LAYOUT CONSTRUCTION SKETCHES (TO SCALE) WHICH VERIFY THE "PROPOSED" NEW ELECTRICAL POWER EQUIPMENT AND ASSOCIATED COMPONENTS COORDINATE WITH THE PROPOSED NEW CONSTRUCTION PRIOR TO RELEASE AND/OR INSTALLATION.

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PROPOSED BUILDING PLANS
855. MAIN ST BROCKTON, MA

COMMONWEALTH OF MASSACHUSETTS
AULENT TIMKO ELECTRICAL
No. 53506
REGISTERED PROFESSIONAL ENGINEER

Scale:

Project Number:

Date: 4-30-2021

Sheet Title
ELECTRICAL RISER, SCHEDULES

Sheet Number
E11

PANELBOARD "RP" SCHEDULE

120/208V - 400A - 3PH - 4W - 65KAIC

SURFACE MOUNTED : 400A MCB

POLE NO.	LOAD	CONN KVA	CB	POLE NO.	LOAD	CONN KVA	CB
1	UH-1	5	40A-	2	UH-2	5	40A
3	* * * *		2P	4	* * * *		2P
5	AC-2	0.87	15A	6	AC-1	0.87	15A
7	RCP-BSMT	0.36	20A	8	FREEZER/COOLER GNL	0.35	20A
9	COOLER-CU	1.54	20A-	10	FREEZER-EVAP	2	20A-
11	* * * *		2P	12	* * * *		2P
13	FREEZER-CU	2.5	20A-	14	RCP-BAR	0.8	20A
15	* * * *		2P	16	RCP-BAR	0.8	20A
17	RCP-BAR	0.8	20A	18	RCP-BAR	0.8	20A
19	RCP-BAR	0.8	20A	20	RCP-BAR	0.8	20A
21	RCP-BAR	0.8	20A	22	RCP-BAR	0.8	20A
23	RCP-BAR	0.8	20A	24	RCP-1ST FL	0.35	20A
25	RCP-1ST FL	0.35	20A	26	ACCU-1	3.8	30A-
27	ACCU-2	3.8	30A-	28	* * * *		2P
29	* * * *		2P	30	ACCU-3	7.1	50A-
31	RCP-2ND FL	0.5	20A	32	* * * *		2P
33	RCP-2ND FL	0.9	20A	34	EF-2ND FL	0.1	20A-
35	AC-3	1.7	20A	36	* * * *		2P
37	LIGHTS-BSMT	0.6	20A	38	LIGHTS-2ND FL	0.6	20A
39	LIGHTS-1ST FL	0.9	20A	40	①		
41				42			
83				84			

TOTAL CONNECTED LOAD "KVA" = 46.39 DEMAND "KVA" = 45.29 AMPS = 126

NOTES -

① KITCHEN PANELS TO BE FED FROM THIS PANEL "HP". KITCHEN LOADING: =250A. TOTAL RP LOADING: 250+126=376A

2) UNIT SHALL HAVE GROUND BUS, SIDE PIANO HINGE, ENGRAVED NAMEPLATES AND NEC/OSHA COMPLIANT ELEC SHOCK AND ARC FLASH HAZARDS

PANELBOARD "HP" SCHEDULE

120/208V - 200A - 3PH - 4W - 65KAIC

SURFACE MOUNTED : MLO

POLE NO.	LOAD	CONN KVA	CB	POLE NO.	LOAD	CONN KVA	CB
1	WH-1	1.5	20A-	2	WH-2	1.5	20A-
3	* * * *		2P	4	* * * *		2P
5	WH-3	1.5	20A-	6	WH-4	1.5	20A-
7	* * * *		2P	8	* * * *		2P
9	WH-5	1.5	20A-	10	ELEV	29.5	200A-
11	* * * *		2P	12	* * * *		3P
13	ELEV	0.5	20A	14	* * * *		
15	ELEV	0.4	20A	16	ELEV	0.4	20A
17	RCP-SPR RM	0.55	20A	18	RCP-SPR RM	0.8	20A
19	RCP-SPR RM	0.8	20A	20	CUH-2	4	20A-
21	LTS-HOUSE	0.6	20A	22	* * * *		3P
23	CUH-1	4	20A-	24	* * * *		
25	* * * *		3P	26	ACU-HP	3.1	20A-
27	* * * *			28	* * * *		2P
29	RCP-HOUSE	0.7	20A	30	RCP-HOUSE	0.7	20A
31	RCP-ELEC RM	1	20A	32	LTS-SITE VIA PC	1	20A-
33				34	* * * *		2P
35				36			
37				38			
39				40			
41				42			

TOTAL CONNECTED LOAD "KVA" = 55.6 AMPS 154

NOTES -

1)

2) UNIT SHALL HAVE GROUND BUS, SIDE PIANO HINGE, ENGRAVED NAMEPLATES AND NEC/OSHA COMPLIANT ELEC SHOCK AND ARC FLASH HAZARDS

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COMMONWEALTH OF MASSACHUSETTS
AULENT TIMKO ELECTRICAL No. 53506
REGISTERED PROFESSIONAL ENGINEER

PROPOSED BUILDING PLANS
855. MAIN ST BROCKTON, MA

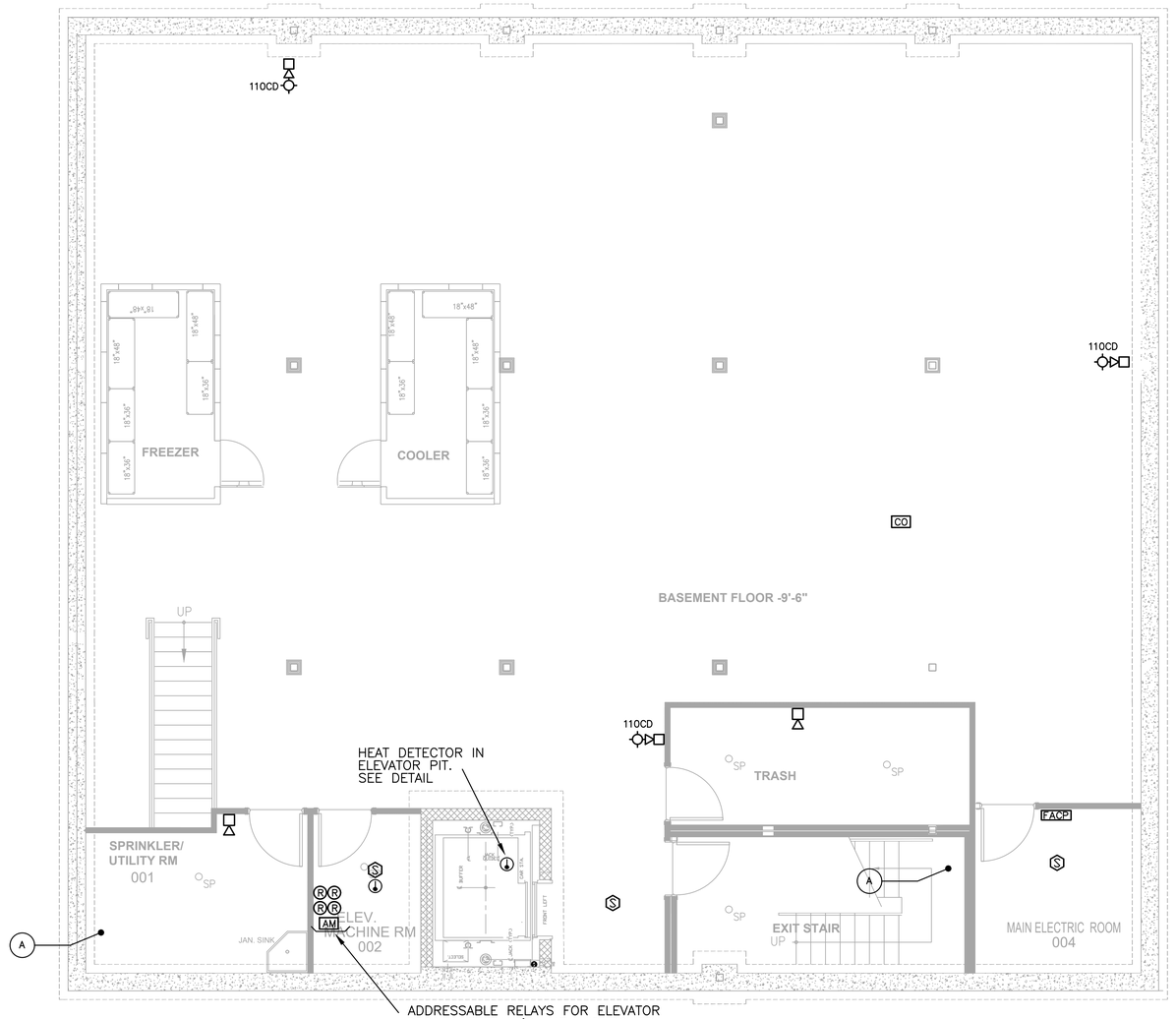
Scale:

Project Number:

Date: 4-30-2021

Sheet Title
ELECTRICAL SCHEDULES

Sheet Number
E12



PROPOSED BASEMENT LEVEL FLOOR PLAN

3,105 s.f.

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

2 SPRINKLERS FLOW & TAMPER SWITCHES WIRING DETAIL

A

NOT TO SCALE

SPRINKLERS FLOW/TAMPER SWITCHES WIRING DETAIL NOTES

1. EC SHALL FURNISH AND INSTALL FIRE ALARM MONITORING MODULES AND FIELD WIRE THE SPRINKLER FLOW, TAMPER AND PRESSURE SWITCHES WHICH ARE FURNISHED AND INSTALLED BY THE SPRINKLER CONTRACTOR.
2. ACTUAL LOCATIONS PER FIRE PROTECTION DRAWINGS AND THE "AS SUPPLIED" SPRINKLER SYSTEM EQUIPMENT LAYOUT.

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PROPOSED BUILDING PLANS
855. MAIN ST BROCKTON, MA

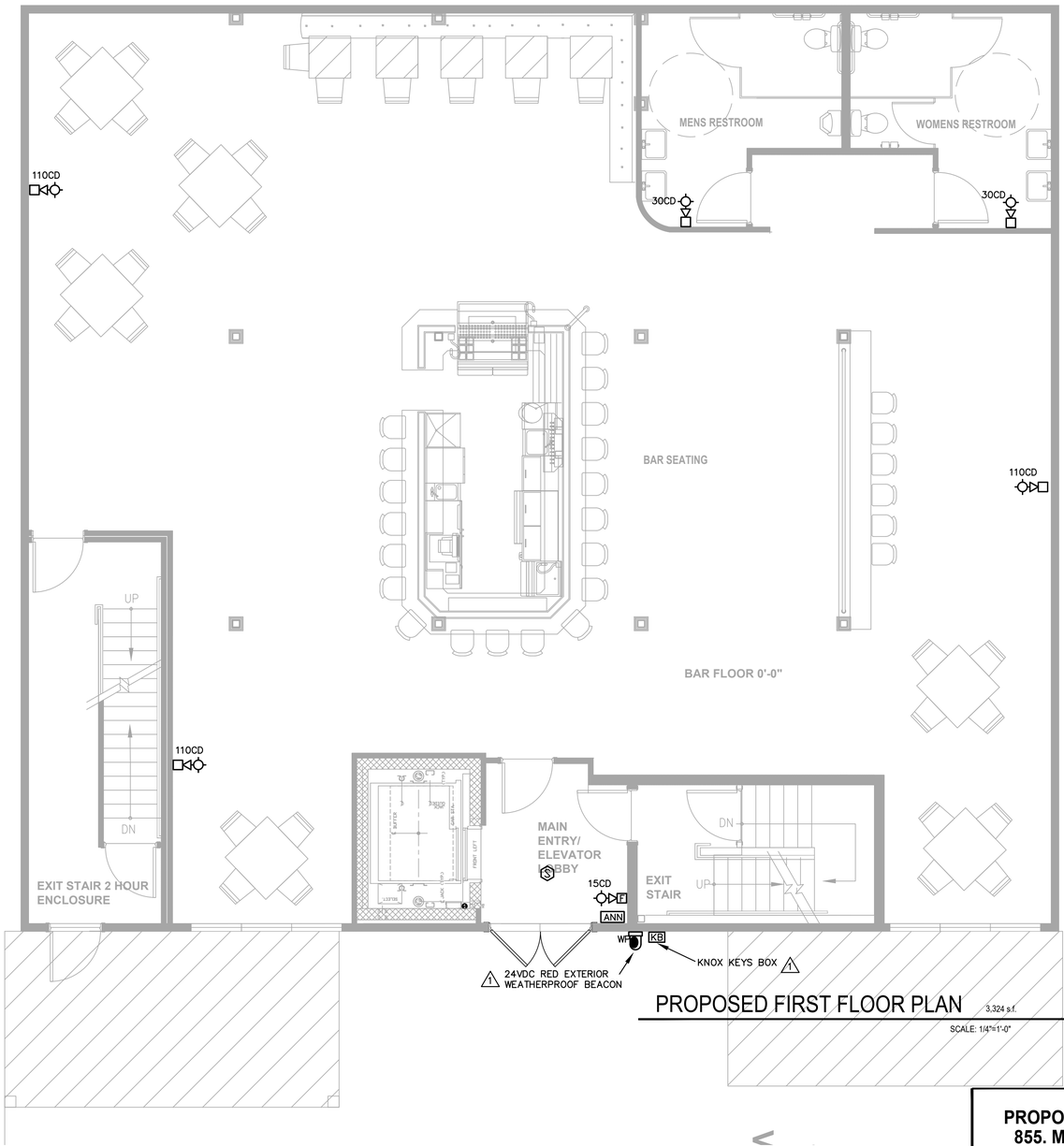
Scale: 1/4"=1'-0"

Project Number:

Date: 4-30-2021

Sheet Title
BASEMENT FLOOR PLAN

Sheet Number
FA1



PROPOSED FIRST FLOOR PLAN 3,324 s.f.

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

1 COORDINATE LOCATION WITH LOCAL FIRE DPT. PRIOR TO ANY WORK DONE

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PROPOSED BUILDING PLANS
855. MAIN ST BROCKTON, MA

COMMONWEALTH OF MASSACHUSETTS
AULENT TIMKO ELECTRICAL No. 53506
REGISTERED PROFESSIONAL ENGINEER

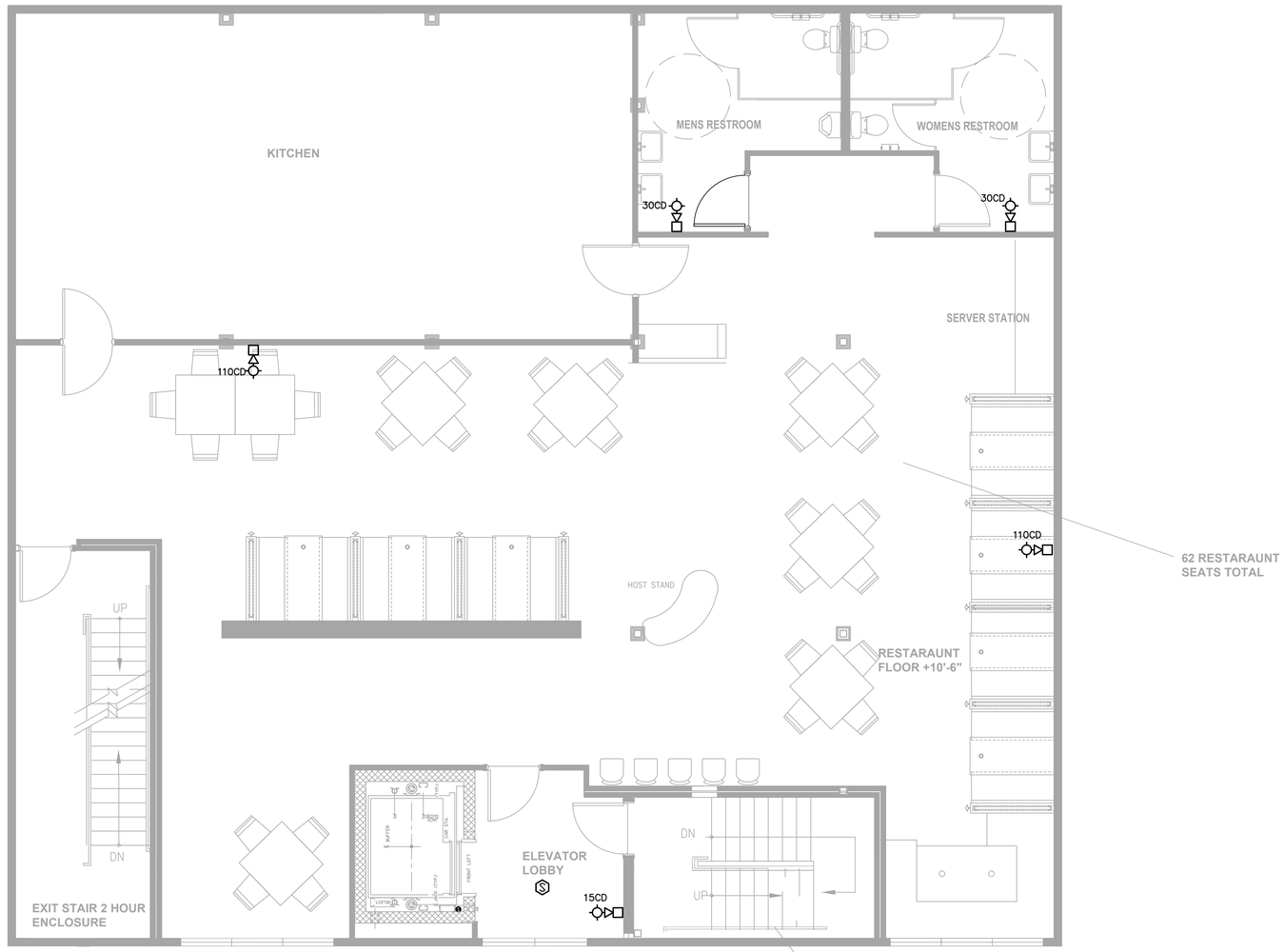
Scale: 1/4"=1'-0"

Project Number:

Date: 4-30-2021

Sheet Title
FIRST FLOOR PLAN

Sheet Number
FA2



PROPOSED SECOND FLOOR PLAN 3,324 s.f.

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

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PROPOSED BUILDING PLANS
855. MAIN ST BROCKTON, MA

COMMONWEALTH OF MASSACHUSETTS
AULENT TIMKO ELECTRICAL No. 53506 REGISTERED PROFESSIONAL ENGINEER

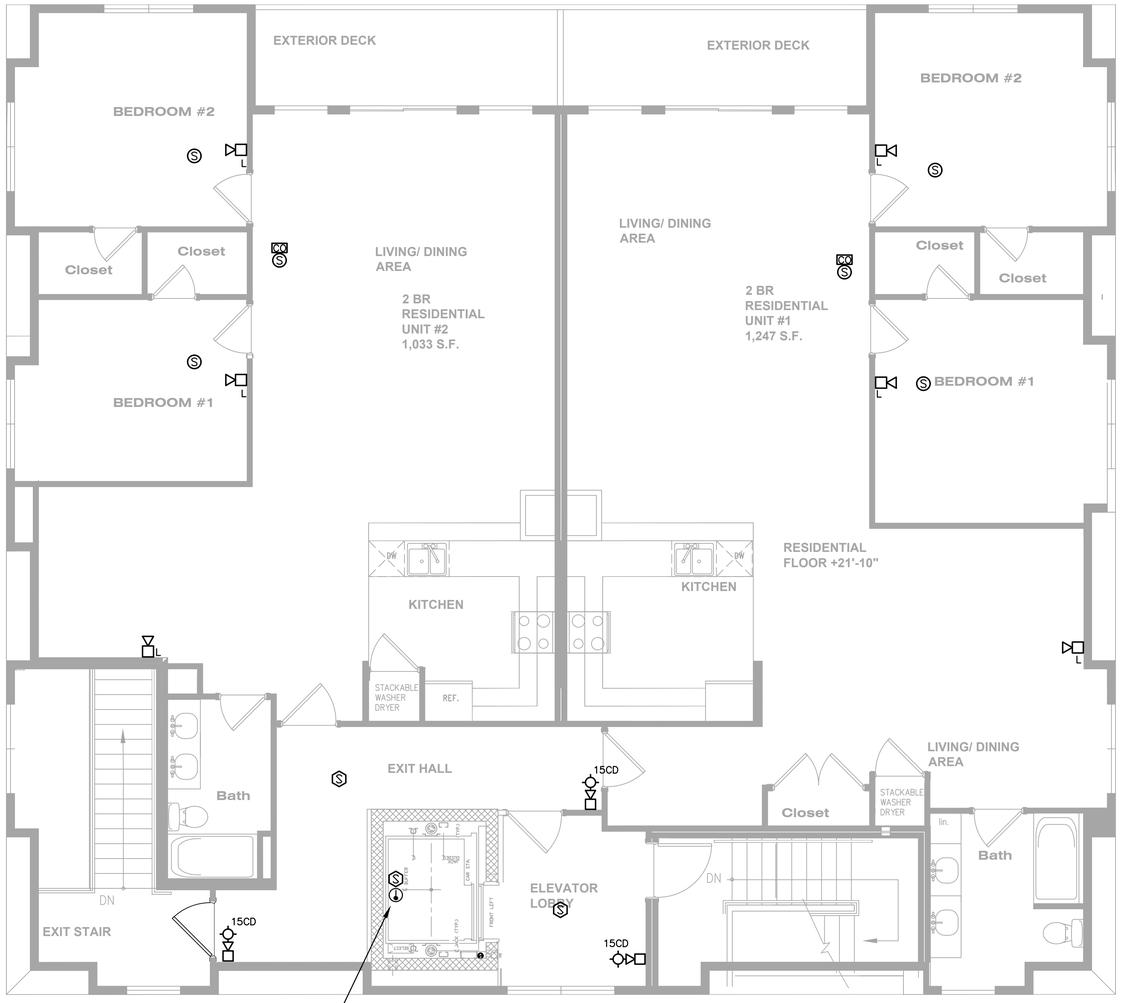
Scale: 1/4"=1'-0"

Project Number:

Date: 4-30-2021

Sheet Title
SECOND FLOOR PLAN

Sheet Number
FA3



PROPOSED THIRD FLOOR PLAN 2,752 s.f.

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

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PROPOSED BUILDING PLANS
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AULENT TIMKO ELECTRICAL No. 53506 REGISTERED PROFESSIONAL ENGINEER

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

Project Number:

Date: 4-30-2021

Sheet Title
THIRD FLOOR PLAN

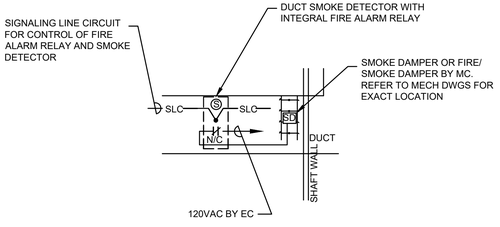
Sheet Number
FA4

FIRE ALARM SYMBOLS

- SYSTEM TYPE SMOKE DETECTOR. ANALOG ADDRESSABLE
- HEAT DETECTOR. ADDRESSABLE TYPE
- FIRE ALARM PULL AND HORN/LIGHT DEVICE. PER NFPA 72/SYCHRONIZED. 15CD IN CORR., 60CD IN COMMON AREAS
- F — FIRE ALARM PULL STATION. ADDRESSABLE, MOUNTED AT 4'–0" AFF.
- FIRE ALARM HORN/LIGHT(SYCHRONIZED). MTD AT 6'–8" AFF 15 CD IN CORRIDORS, 75 CD IN COMMON AREAS
- FIRE ALARM STROBE LIGHT ONLY(SYCHRONIZED).MTD AT 6'–8"AFF 15 CD IN CORRIDORS, 75 CD IN COMMON AREAS
- L — SPEAKER. "L" INDICATES LOW FREQUENCY 520HZ
- PS — SPRINKLER SYSTEM FLOW SWITCH, WIRING ONLY.
- TS — SPRINKLER SYSTEM TAMPER SWITCH, WIRING ONLY.
- PS — LOW PRESSURE SWITCH WIRED AS SUPERVISORY
- FACP — FIRE ALARM CONTROL PANEL
- ANN — FIRE ALARM REMOTE ANNUNCIATOR WITH TROUBLE BUZZER
- DIAL — DIALER BY E.C. WIRED TO UL LISTED ALARM CO.
- S — LOCAL 120V SMOKE ALARM, PHOTOELECTRIC TYPE WITH BATTERY. TANDEM WIRED WITH OTHER LOCAL DETECTORS IN THE UNIT. OPTIONAL, SYSTEM CONNECTED AND PROGRAMMED TO ALARM UNIT ONLY
- CO/S — LOCAL 120V SMOKE/CARBON MONOXIDE DETECTOR COMBO OR INDIVIDUAL (1) SMOKE & (1) CO DETECTOR
- CD — LOCAL/SYSTEM TYPE CO DETECTOR
- MM — FIRE ALARM – MONITORING MODULE
- F — FIRE ALARM – UL LISTED RADIO BOX BY UPLINK NETWORK 4G

BDA SYSTEM

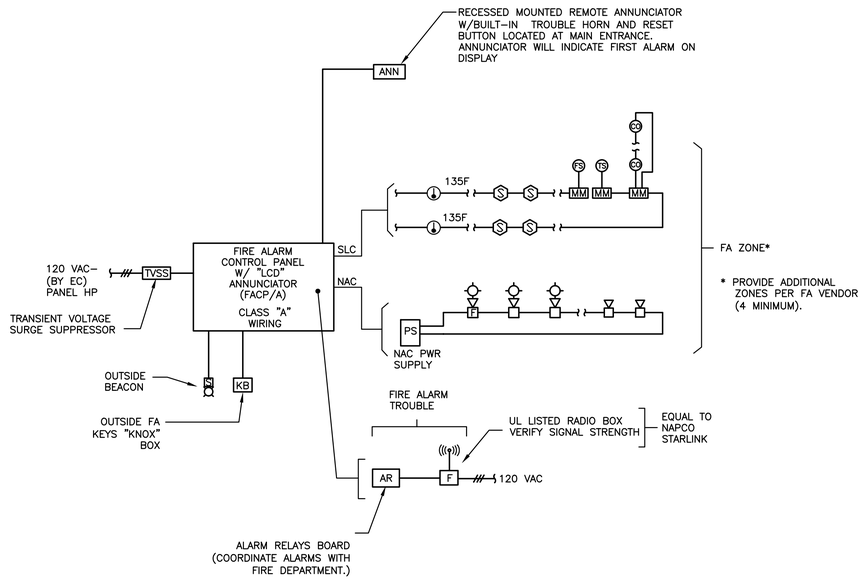
CARRY THE COST OF A BDA SYSTEM AS DEDUCT ALTERNATE BUT IN BASE CONTRACT. PROVIDE ALL NECESSARY STRUCTURE AND RACEWAYS TO BE ABLE TO INSTALL BDA SYSTEM PER IBC 916.1–2&3 UPON COMPLETION OF THE BUILDING AND AFTER ESTABLISHING THE NEED TO INSTALL HEAD END EQUIPMENT OF A BDA SYSTEM TO MEET EMERGENCY SERVICES COMMUNICATION NEEDS AS TO BE DETERMINED BY THE FD.
PROVIDE ADD ALTERNATE COST FOR ALL HARDWARE COMPONENTS AND INSTALLATION OF FOR EACH BUILDING (EACH BUILDING MAY HAVE DIFFERENT NEEDS) RUN CONDUITS IN 2HR RATED ENCLOSURE.
IF EQUIPMENT IS TO BE INSTALLED IT WILL BE HOUSED IN 2HR ENCLOSURE CARRY THE COST OF TESTING NEEDED FOR BDA UPON COMPLETION OF MAJORITY OF THE STRUCTURE



SMOKE DAMPERS

No Scale

SEE MECHANICAL DRAWINGS FOR SMOKE DAMPER LOCATIONS. PROVIDE 120VAC POWER & FA INTERLOCK WIRING. COORDINATE WITH MECHANICAL CONTRACTOR. PROVIDE A CONTROL MODULE FOR EACH UNIT AND INTERLOCK EACH DAMPER SO THAT DAMPER IS POWERED OPEN AND IS SPRING CLOSED. LOCATE CONTROL MODULES ADJACENT TO DAMPERS. CONNECT TO THE NEAREST 120 VOLT BRANCH CIRCUIT.



FIRE ALARM RISER

FIRE ALARM RISER NOTES

1. RISER DIAGRAMS ARE FOR REFERENCE ONLY. EC SHALL USE THE RISER DIAGRAM AND CABLING SCHEME (IE – LOOPS, ZONES ETC.) PROVIDED BY THE FA VENDOR. THE SYSTEM VENDOR SHALL PREPARE RISER DIAGRAM FOR A FULLY FUNCTIONAL SYSTEM.
2. THE FIRE ALARM SYSTEM (IE – EQUIPMENT AND WIRING) MUST BE REVIEWED AND AP–PROVED BY THE FIRE DEPARTMENT PRIOR TO RELEASE AND INSTALLATION.
3. FA WIRING AS RECOMMENDED BY THE FA SUPPLI–ER SHALL BE FURNISHED/INSTALLED BY THE EC. FA CABLING SHALL BE SEGREGATED FROM ALL OTHER WIRING BY A LEAST 12 INCHES.
4. THE FA EQUIPMENT INSTALLATION AND WIRING MUST BE CERTIFIED (IN WRITING) BY THE FA MANUFACTURER'S FACTORY REPRESENTATIVE PRIOR TO SYSTEM START–UP.
5. CIRCUIT BREAKER FOR FIRE ALARM CONTROL UNIT SHALL HAVE RED MARKING WITH A CKT BREAKER LOCK LISTED FOR USE WITH THE CIRCUIT BREAKER.
6. THE ROOM CONTAINING THE FIRE ALARM CTL UNIT MUST BE PROVIDED WITH A SIGN IDENTI–FYING THE EQUIPMENT AND LOCATION.
7. THE FA SYSTEM SHALL BE 100% TESTED BY CONTRACTOR/SUPPLIER PROIR TO WITNESS TESTING BY THE FIRE DEPARTMENT. PROVIDE TEST CERTIFICATE FROM UL LISTED ALARM CO.
8. ALL FA FIELD WIRING SHALL BE CLASS "A" WITH RETURN WIRES TERMINATED AT THE FA CONTROL PANEL.
9. FA WIRING INSTALLED EXPOSED (W/O HUNG CEILINGS) SHALL BE INSTALLED IN "EMT" RACEWAYS FOR MECHANICAL PROTECTION.
10. FA SUPPLIER SHALL AS PART OF THE SHOP DRAWINGS PROVIDE DATA AND SIGNAL CKTS INFORMATION INCLUDING BUT NOT LIMITED TO DATA LOOP IMPEDANCES, SIGNAL CTK LOADS, ETC IN ORDER TO VERIFY ALL CKTS HAVE A MINIMUM 25% FUTURE EXPANSION.
11. FA EQUIPMENT SHALL BE PROVIDED WITH BATTERY BACKUP SIZED AS RECOMMENDED BY THE FA SUPPLIER AND AS APPROVED BY THE FIRE DEPARTMENT. (IE – FULL ALARM OPERA–TION FOR A MINIMUM 30 MINUTES AND 20% SPARE CAPACITY).

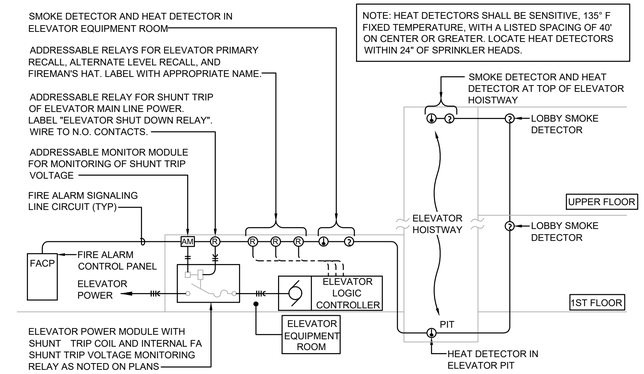
SEQUENCE OF OPERATION

UPON ACTIVATION OF ANY FIRE DETECTOR, MANUAL PULL STATION OR FLOW SWITCH
–FIRE ALARM PANEL WILL TRIP AND CALL FIRE DEPARTMENT
–ALL AUDIO DEVICES WILL INITIATE ALARM SIGNAL TO ALERT ALL OCCUPANTS FOR ALARM CONDITION IN THE BUILDING FOR FULL EVACUATION.
–ALL VISUAL DEVICES WILL ACTIVATE, THEY SHALL BE SYNCHRONIZED TYPE.
–AIR HANDLER UNITS THAT HAS DUCT SMOKE DETECTORS WILL SHUT DOWN UPON ACTIVATION OF THE DUCT SMOKE DETECTOR.

UPON ACTIVATION OF ELEVATOR LOBBY SMOKE DETECTOR
–ELEVATOR RECALL SYSTEM WILL OPERATE. NO OTHER DEVICE WILL ACTIVATE RECALL SYSTEM.

–SYSTEM DETECTORS IN DWELLING UNITS SHALL BE PROGRAMMED TO ALARM ONLY THE ASSOCIATED UNIT.

ALL BEDROOMS AND LIVING ROOMS SHALL BE WIRED FOR FUTURE STROBES. CAPACITY FOR FUTURE EXPANSION SHALL BE PROVIDED AT THE FACP.



ELEVATOR SEQUENCE OF OPERATION: (DURING SMOKE/HEAT ALARM)

1. UPON SENSING SMOKE FROM ONE OR MORE LOBBY, ELEVATOR HOISTWAY OR ELEVATOR EQUIPMENT ROOM, THE SMOKE DETECTOR SHALL SIGNAL THE FACP, WHICH WILL FORWARD THE SIGNAL TO THE ELEVATOR LOGIC CONTROLLER TO RECALL ELEVATOR CAB TO THE DESIGNATED MAIN FLOOR. IF DESIGNATED FLOOR'S LOBBY SMOKE DETECTOR SENSES SMOKE AT THAT FLOOR, THE ELEVATOR CONTROLLER WILL SEND THE ELEVATOR CAB TO THE NEXT FLOOR CLEAR OF SMOKE. ONCE THE ELEVATOR CAB HAS REACHED THE DESIGNATED FLOOR, THE ELEVATOR CAB DOORS WILL OPEN AND THE CONTROLLER WILL LOCK THE ELEVATOR CAB AT THAT FLOOR, DISABLING THE ELEVATOR CAB CONTROLS, UNLESS A FIREMAN'S KEY IS USED TO OVERRIDE AUTOMATIC CONTROLS.
2. ALL SMOKE DETECTORS (LOBBIES, HOISTWAY, MACHINE ROOM) SHALL TRANSMIT A SEPARATE AND DISTINCT VISIBLE ANNUNCIATION AT THE FACP AND ANNUNCIATOR PANEL.
3. HEAT DETECTORS IN THE ELEVATOR HOISTWAY AND ELEVATOR EQUIPMENT ROOM WILL SEND A SIGNAL TO THE SHUNT-TRIP SWITCH POWERING THE ELEVATOR SO AS TO SHUT DOWN POWER TO THAT CIRCUIT. (THIS IS A NON-AUTO RESET SWITCH). WHEN THE SPRINKLER HEAD HAS REACHED ITS CRITICAL TEMPERATURE OF 165° F., THE HEAD WILL BEGIN DISCHARGE OF WATER.

ELEVATOR INTERLOCK WITH FIRE ALARM

No Scale

–ALL SMOKE DETECTOR LOCATIONS SHALL BE COORDINATED WITH REFLECTED CEILING PLANS IN FIELD SO THAT DETECTORS SHALL BE MINIMUM 3FT AWAY FROM A SUPPLY DIFFUSER.
–DUCT SMOKE DETECTORS SHALL BE INSTALLED IN HEATED AREAS AT THE SUPPLY SIDE BEFORE THE FIRST TAKE OFF, MINIMUM 5FT AWAY FROM THE UNIT COIL. REMOTE TEST/INDICATOR LOCATIONS SHALL BE NEXT TO FACP PANEL OR AS DIRECTED BY THE FIRE DEPARTMENT.
–A/V DEVICE LOCATIONS ARE SHOWN BASED ON DISTANCE REQUIREMENTS. CONTRACTOR SHALL COORDINATE PHYSICAL STRUCTURES SO THAT VISIBILTY WILL BE MAINTAINED. PROPOSED CHANGES SHALL BE FORWARDED TO ARCHITECT/ENGINEER FOR APPROVAL.

	CONTROL UNIT AND NOTIFICATION																				FIRE SAFETY SYSTEM CONTROLS																
	ACTUATE COMMON ALARM SIGNAL	ACTUATE AUDIBLE ALARM–GLOBAL	ACTUATE COMMON SUPERVISORY SIGNAL ALARM	ACTUATE AUDIBLE SUPERVISORY ALARM	ACTUATE COMMON SUPERVISORY TROUBLE SIGNAL	ACTUATE AUDIBLE SUPERVISORY TROUBLE SIGNAL	ACTUATE APPROPRIATE LOCAL SIGN INDICATOR	ACTUATE ALL AUDIBLE EVACUATION SIGNALS	ACTUATE ALL VISIBLE ALARM SIGNALS	–	DISPLAY CHANGE OF STATUS	TRANSMIT ALARM SIGNAL TO SUPERVISORY STATION	TRANSMIT TROUBLE SIGNAL TO SUPERVISORY STATION	TRANSMIT SUPERVISORY SIGNAL TO SUPERVISORY STATION	–	MAIN FLOOR ELEVATOR RECALL	ALTERNATE FLOOR ELEVATOR RECALL	ELEVATOR HAT FLASH	ELEVATOR LOBBY RECALL	ACTUATE EXTERIOR BEACON	RELEASE FIRE AND SMOKE DOORS	SHUT DOWN HVAC UNIT	UNLOCK ALL EXIT DOORS													
1 COMMON AREA SMOKE DETECTORS	■	■					■	■	■		■	■	■							■	■	■																1
2 COMMON AREA HEAT DETECTORS	■	■					■	■	■		■	■	■							■	■	■																2
3 COMMON AREA PULL STATIONS	■	■					■	■	■		■	■	■							■	■	■																3
4 ELEVATOR LOBBY SMOKE DETECTOR (EXC MAIN)	■	■					■	■	■		■	■	■			■	■	■	■	■	■	■																4
5 MAIN FLOOR ELEVATOR LOBBY SMOKE DETECTOR	■	■					■	■	■		■	■	■			■	■	■	■	■	■	■																5
6 ELEVATOR MACHINE ROOM SMOKE DETECTOR	■	■					■	■	■		■	■	■			■	■	■	■	■	■	■																6
7 MANUAL PULL STATIONS	■	■					■	■	■		■	■	■							■	■	■																7
8 ANSUL SYSTEM	■	■					■	■	■		■	■	■							■	■	■																8
9																																						9
10 SPRINKLER MAIN FLOW	■	■					■	■	■		■	■	■							■	■	■																10
11 SPRINKLER FLOOR FLOW SWITCH	■	■					■	■	■		■	■	■							■	■	■																11
12 SPRINKLER TAMPER SWITCH ACTUATION														■																								12
13 DUCT SMOKE DETECTORS			■	■							■			■							■	■	■	■														13
14 BDA SYSTEM IF PRESENT			■	■					■		■																											14
15																																						15
16 FIRE ALARM AC POWER FAILURE					■	■			■		■			■							■	■	■															16
17 FIRE ALARM SYSTEM LOW BATTERY					■	■			■		■			■																								17
18 OPEN CIRCUIT OR GROUND FAULT					■	■			■		■			■																								18
19 CLASS A NOTIFICATION OR SHORT					■	■			■		■			■																								19
20																																						20

INPUT/OUTPUT MATRIX

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COMMONWEALTH OF MASSACHUSETTS — AULENT TIMKO ELECTRICAL No. 53506 — REGISTERED PROFESSIONAL ENGINEER

PROPOSED BUILDING PLANS
855. MAIN ST BROCKTON, MA

Scale:

Project Number:

Date: 4-30-2021

Sheet Title
FIRE ALARM RISER & DETAILS

Sheet Number
FA5