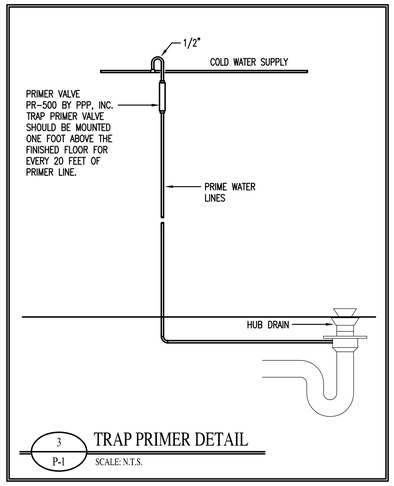


3 P-1 TRAP PRIMER DETAIL

SCALE: N.T.S.

PIPING LEGEND	
SYMBOL	DESCRIPTION
———	SEWER PIPING
- - - - - - - - - - - -	VENT PIPING

PLUMBING FIXTURE SCHEDULE

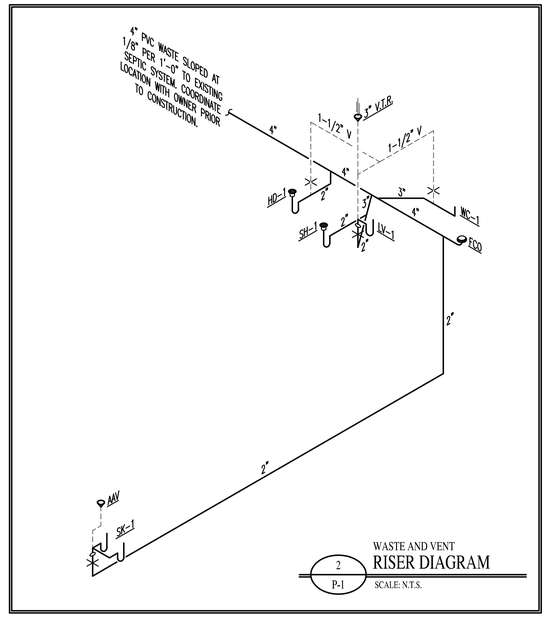
ITEM NO.	FIXTURE DESCRIPTION	MANUFACTURER	* MODEL NO.	CONNECTION SIZES				REMARKS
				C.W.	H.W.	WASTE**	VENT	
WC-1	WATER CLOSET - TANK TYPE - H.C.	AMER. STD.	270AA.001	1/2"	--	3"	2"	FLOOR MTD. 1.28 GAL/FLUSH, H.C. HEIGHT
LV-1	WALL HUNG LAVATORY	AMER. STD.	0356.028	1/2"	1/2"	1-1/2"	1-1/2"	SINGLE LEVER FAUCET, TRUEBRO PIPING COVERS
SK-1	DOUBLE COMPARTMENT SINK - H.C.	STERLING	14633-3-NA	1/2"	1/2"	1-1/2"	1-1/2"	SINGLE LEVER FAUCET, TRUEBRO PIPING COVERS
IB-1	ICE MAKER BOX	PPP	MM-500-MIMB	1/2"	--	--	--	MIP VALVE WITH SHOCK ARRESTOR
FCO	FLOOR CLEAN OUT	ZURN	Z-1400	--	--	--	--	SIZE DETERMINED UPON WASTE PIPE
SH-1	SHOWER	LAUREL MOUNTAIN	LUTTRELL, LM6032SH1S	1/2"	1/2"	1-1/2"	1-1/2"	COORDINATE CONTROLS WITH OWNER
HD-1	HUB DRAIN	CHARLOTTE PLASTICS	4"x2"	--	--	2"	1-1/2"	-
FD-1	FLOOR DRAIN	ZURN	Z-415-B	--	--	3"	1-1/2"	BODY ASSEMBLY WITH "TYPE B" STRAINER AND TRAP PRIMER
AAV	AIR ADMITTANCE VALVE	STUDOR	MINI-VENT	--	--	--	1-1/2"	-

* FIXTURE MODEL NUMBERS LISTED ARE FOR DESCRIPTION ONLY.
** SEE NOTE 5

Waste and Water Calculations

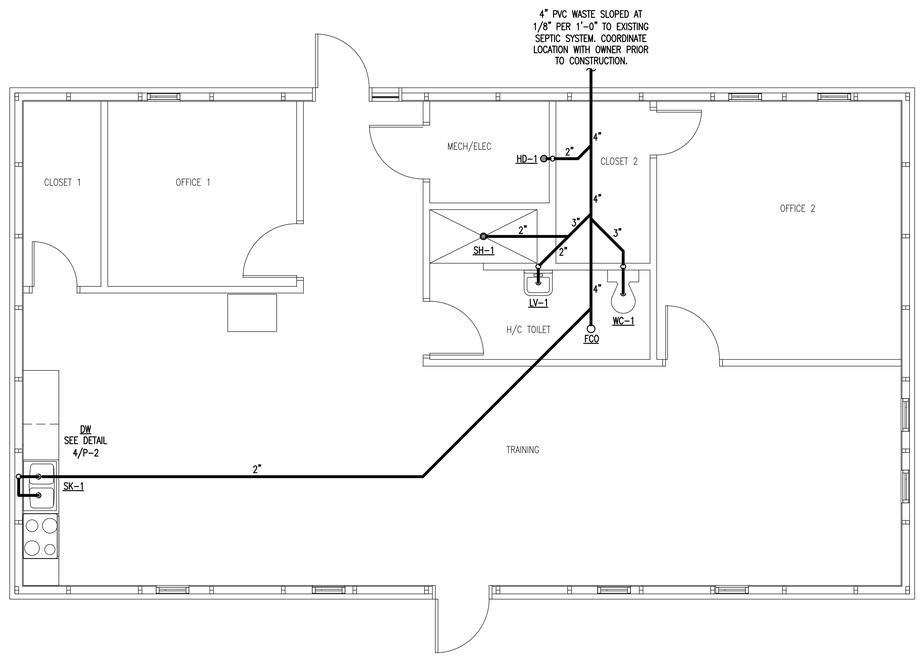
Fixture Type	Quantity	Waste Fixture Units		Hot Water Fixture Units		Cold Water Fixture Units		Total Water Fixture Units	
		Per Unit	Total	Per Unit	Total	Per Unit	Total	Per Unit	Total
Water Closet - Tank	1	4	4	0	0	5	5	5	5
Lavatory	1	1	1	1.5	1.5	1.5	1.5	2	2
Hub Drain	1	3	3	0	0	0	0	0	0
Dishwasher	1	2	2	1.4	1.4	0	0	1.4	1.4
Sink	1	2	2	1	1	1	1	1.4	1.4
Shower	1	2	2	1	1	1	1	1.4	1.4
Hose Bibb	0	0	0	0	0	0.5	0	0.5	0
Ice Maker Box	1	0	0	0	0	0.25	0.25	0.25	0.25
Total			**14**		**4.9**		**8.75**		**11.45**

Note 1 - 4" waste line sloped at 1/8" per foot is adequate for 180 fixture Units (NCPC Table 710.1(1))
Note 2 - Total GPM = 16 (NCPC Table E103.3(3). 1" Water line adequate for 22 GPM (NCPC Figure E103.3(5))



2 P-1 WASTE AND VENT RISER DIAGRAM

SCALE: N.T.S.



1 P-1 PLUMBING PLAN

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

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Graham, NC 27253

GROOMS EQUIPMENT TRAINING BUILDING
Graham, North Carolina

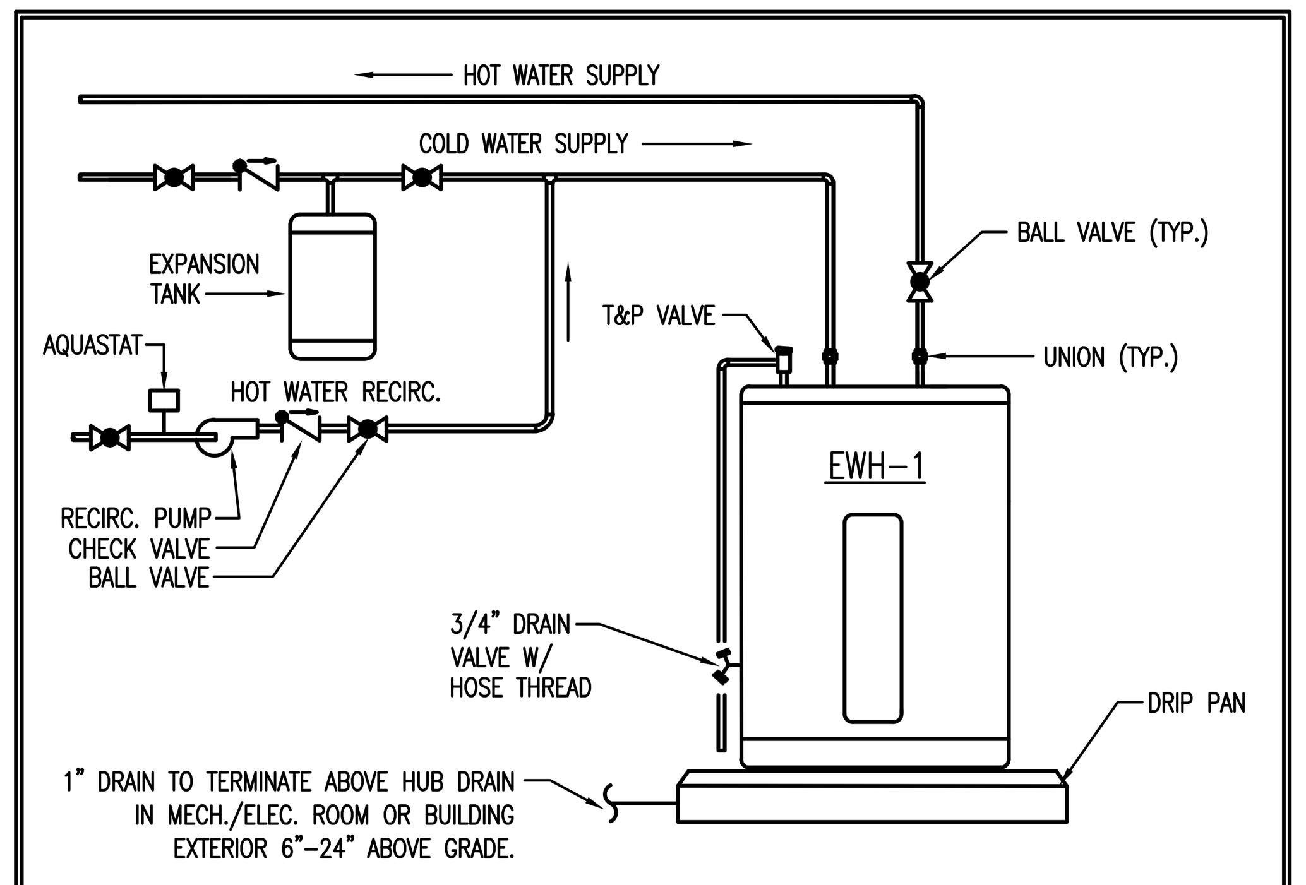
DRAWING NAME
PLUMBING PLAN

NORTH CAROLINA PROFESSIONAL SEAL 050989 ENGINEER
8/24/22

DRAWN: JNK
CHECKED: SJB
DATE: 8/24/22
SCALE: AS NOTED
JOB NO.: 22052
SHEET: P-1

PLUMBING NOTES:

1. PLUMBING TO BE INSTALLED IN ACCORDANCE WITH ALL STATE AND LOCAL CODES.
2. PLUMBING CONTRACTOR TO COORDINATE ALL WORK WITH OTHER TRADES.
3. ALL WASTE AND VENT PIPING TO BE SCHEDULE 40 P.V.C.
4. WATER LINES TO BE COPPER TYPE K (SOFT DRAWN) BELOW SLAB, AND TYPE L HARD COPPER ABOVE SLAB. CROSSLINKED POLYETHYLENE OR CPVC MAY BE USED WHERE CONCEALED.
5. ALL P.V.C. UNDER SLAB SHALL BE A MINIMUM OF 2" NPS.
6. COPPER PIPING TO BE INSULATED WHERE IT PASSES THROUGH CONCRETE.
7. INSULATE HOT AND COLD WATER LINES IN ACCORDANCE WITH NC PLUMBING AND ENERGY CODES. INSULATE COLD WATER LINES WHERE SWEATING WOULD RESULT IN STRUCTURAL DAMAGE TO BUILDING DUE TO ROTTING OF WOOD OR STAINING OF CEILING TILES.
8. TRAP PRIMER SHALL BE INSTALLED ON HUB DRAIN UNLESS OTHERWISE INDICATED.
9. LAVATORIES ARE TO BE EQUIPPED WITH CLEAN-OUT TEES BELOW.
10. ALL FIXTURES ARE TO BE EQUIPPED WITH SHUT-OFF VALVES ON SUPPLY LINES.
11. INSTALL TEMPERING VALVE AND ADJUST HOT WATER TEMPERATURE TO 110°F AHEAD OF LAVATORIES AND HAND SINKS.
12. THE CONTRACTOR SHALL COORDINATE THE LOCATION OF ALL PIPING AND EQUIPMENT WITH ALL OTHER TRADES PRIOR TO BEGINNING INSTALLATION TO AVOID CONFLICTS AND INTERFERENCE WITH OTHER TRADES.
13. FINAL UTILITY CONNECTIONS (GAS, ELECTRIC, WATER ETC.) TO EQUIPMENT SHALL BE MADE BY THE CONTRACTOR INSTALLING THE EQUIPMENT REQUIRING THE UTILITIES.
14. PLANS AND ISOMETRICS ARE DIAGRAMMATIC. THERE IS NO INTENT TO INDICATE ALL FITTINGS REQUIRED. GENERALLY, PIPING SHALL BE INSTALLED PARALLEL OR PERPENDICULAR TO AND PLUMB WITH WALL CONSTRUCTION.
15. SOIL AND WASTE PIPING SHALL BE LAID ON MINIMUM 1/4" PER FT. SLOPE FOR PIPE SIZES LESS THAN 3", AND MINIMUM 1/8" PER FT. FOR PIPE 3" AND LARGER UNLESS OTHERWISE NOTED.
16. UNLESS OTHERWISE NOTED, PLUMBING CONTRACT SHALL TERMINATE AT A POINT FIVE (5) FEET OUTSIDE THE BUILDING. FOR WORK BY OTHER CONTRACTORS OUTSIDE THE 5 FOOT TERMINATION, REFER TO SITE UTILITY DRAWINGS.
17. VALVES AND DEVICES INSIDE CHASES OR WALLS OR ABOVE NON-ACCESIBLE CEILINGS SHALL BE PROVIDED WITH APPROPRIATELY SIZED ACCESS PANEL COMPATIBLE WITH SURROUNDING FINISHES. SUCH ACCESS PANELS SHALL BE FURNISHED BY THE PLUMBING CONTRACTOR FOR INSTALLATION BY THE GENERAL CONTRACTOR.
18. PLUMBING VENT PIPING PENETRATING ROOF SHALL BE INSTALLED BY THE PLUMBING CONTRACTOR. CUTTING OF HOLES AND FLASHING OF PENETRATIONS SHALL BE BY THE GENERAL CONTRACTOR.
19. REFER TO ARCHITECTURAL DRAWINGS FOR DIMENSIONED LOCATIONS OF WALLS AND PARTITIONS AND FOR PARTITION THICKNESS AND CONSTRUCTION MATERIALS.
20. ALL KITCHEN EQUIPMENT WITH WATER SUPPLY TO BE EQUIPPED WITH A VACUUM BREAKER ON EACH SUPPLY LINE.
21. FOR PLASTIC SEWER PIPING, AN INSULATED COPPER TRACER WIRE OR OTHER APPROVED CONDUCTOR SHALL BE INSTALLED ADJACENT TO AND OVER THE FULL LENGTH OF THE PIPING. ACCESS SHALL BE PROVIDED TO THE TRACER WIRE OR THE TRACER WIRE SHALL TERMINATE AT THE CLEANOUT BETWEEN THE BUILDING DRAIN AND SEWER. THE TRACER WIRE SIZE SHALL BE NOT LESS THAN 14 AWG AND THE INSULATION TYPE SHALL BE LISTED FOR DIRECT BURIAL.



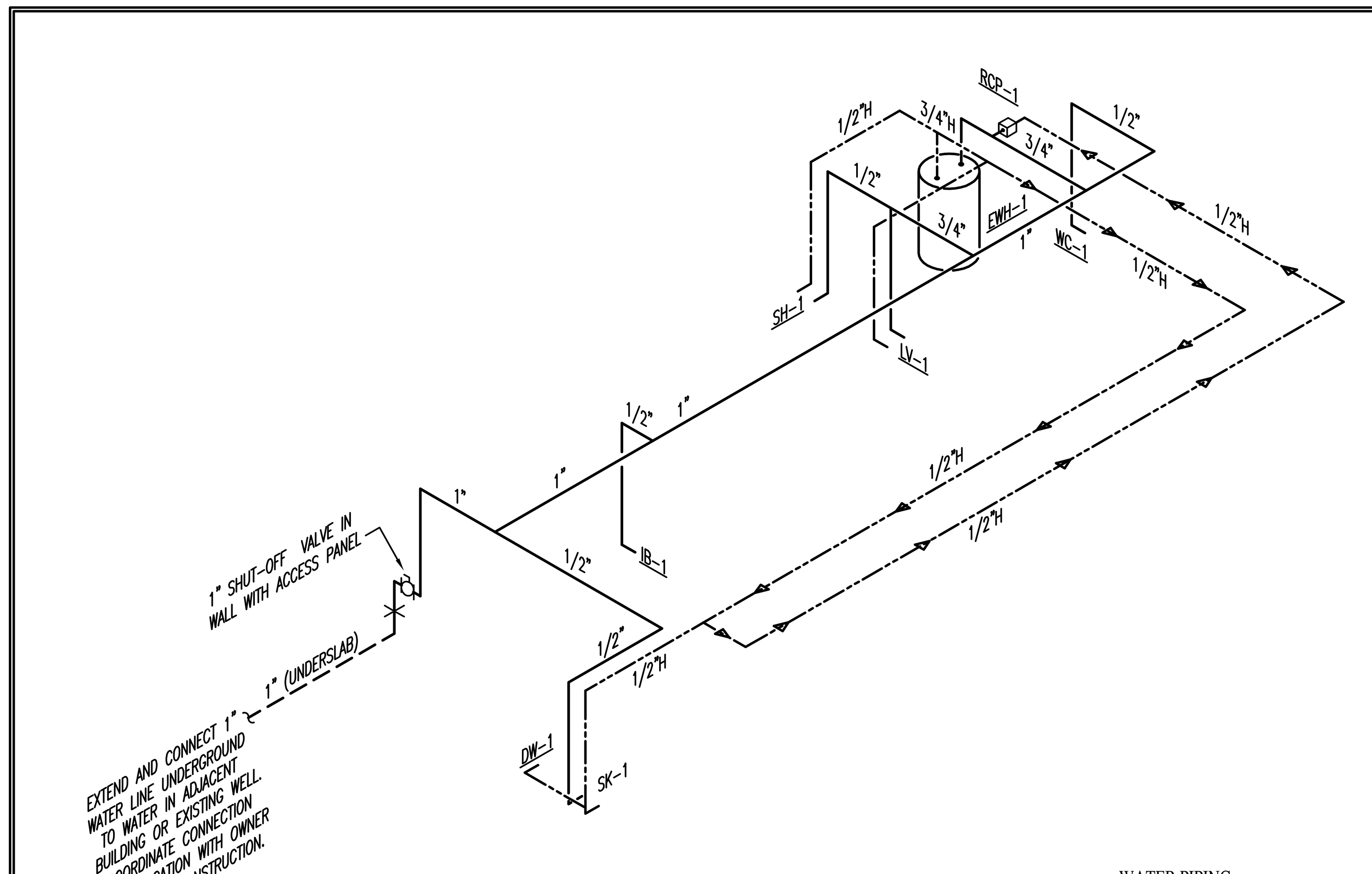
3 / P-2 ELECTRIC WATER HEATER DETAIL

SCALE: N.T.S.

WATER HEATER SCHEDULE							
MARK	TANK VOLUME	RECOVERY	TEMPERATURE RISE	ELEMENT SIZE	POWER	MANUFACTURER	MODEL
EWH-1	30 GAL.	23 GPH	80°	4.5 KW	208V/1ø	RHEEM	PROE30 T2 RH95

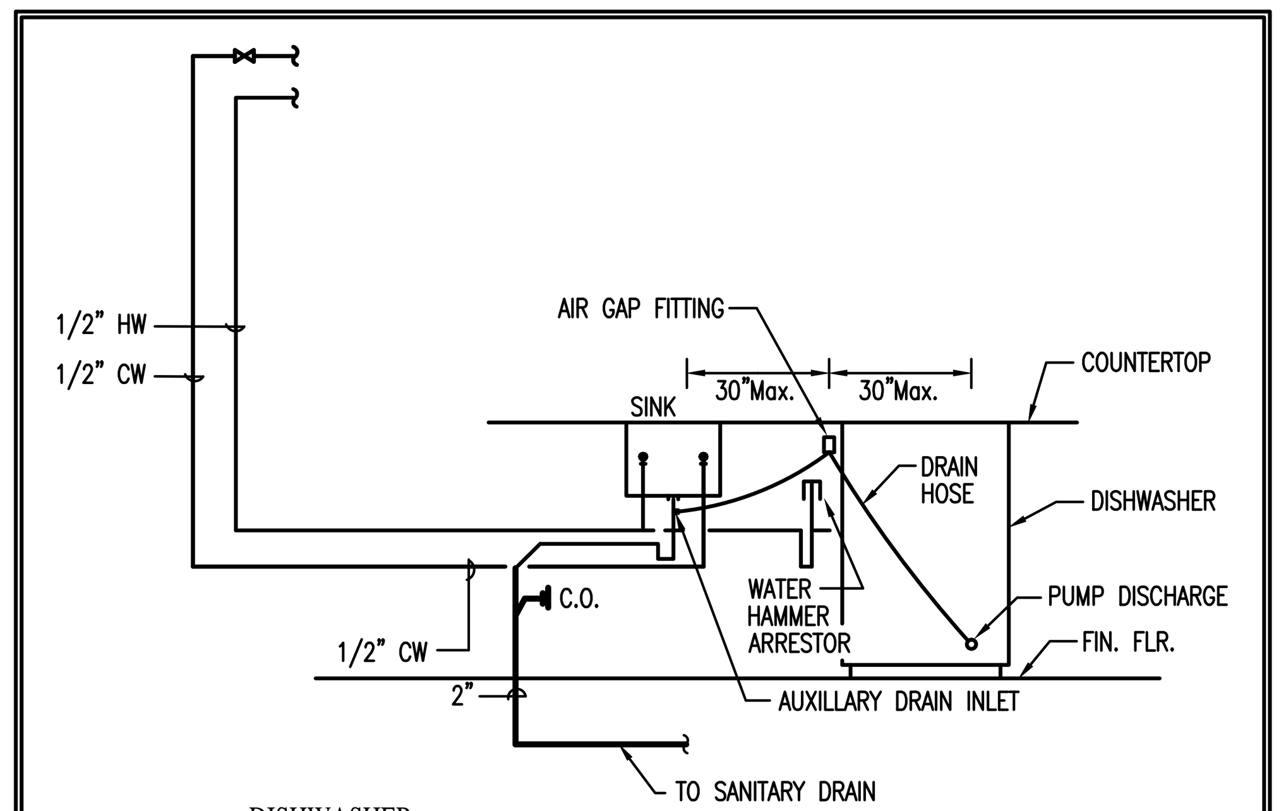
PUMP SCHEDULE						
MARK	MANUFACTURER	MODEL NO.	GPM	HEAD (FT.)	HP	VOLTAGE
RCP-1	B & G	PL-30	4	17	1/12	115V/1ø

PIPING LEGEND	
SYMBOL	DESCRIPTION
————————	COLD WATER
— - - — - - —	HOT WATER



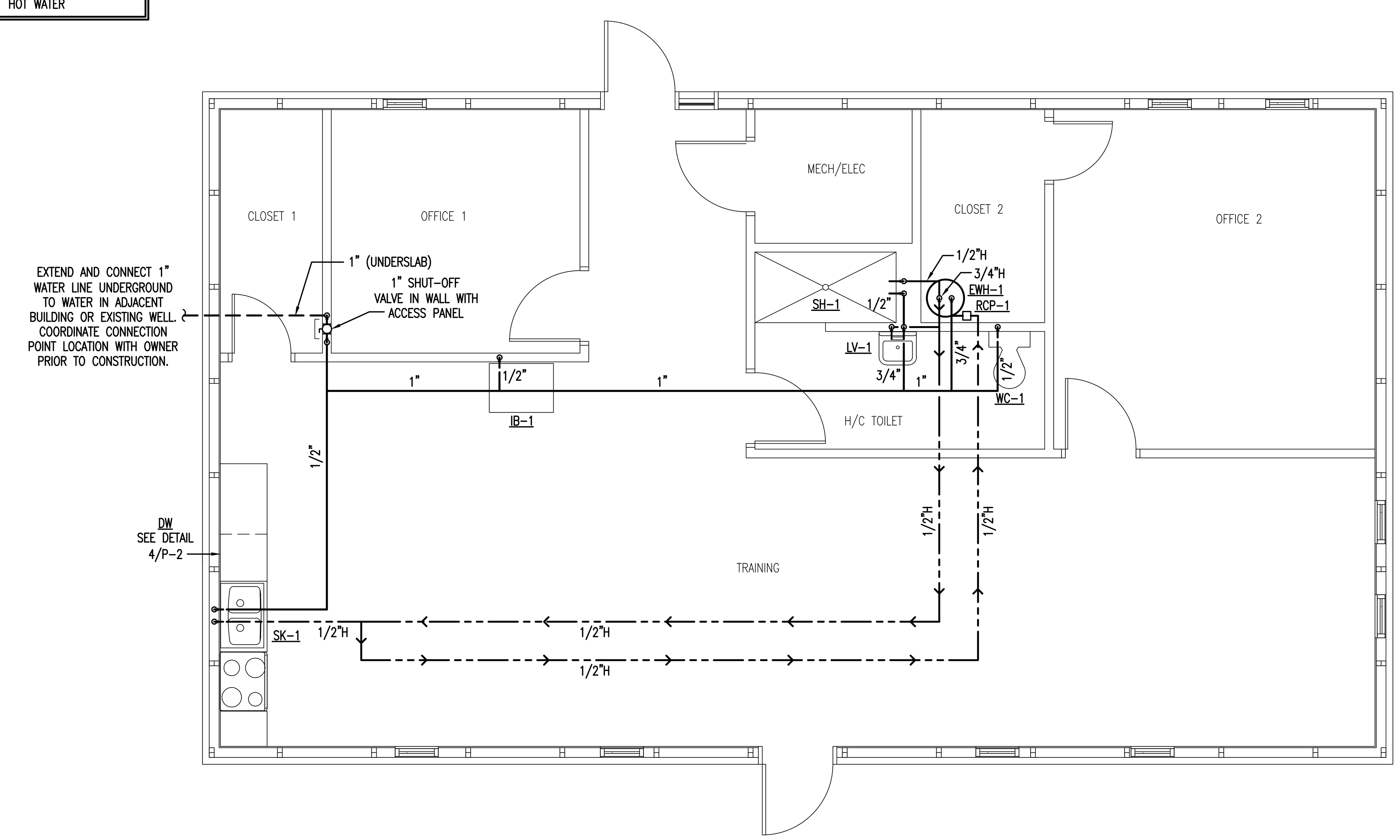
2 / P-2 WATER PIPING RISER DIAGRAM

SCALE: N.T.S.



4 / P-2 DISHWASHER PLUMBING DETAIL

SCALE: N.T.S.



1 / P-2 WATER PIPING PLAN

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

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GROOMS EQUIPMENT TRAINING BUILDING
Graham, North Carolina

DRAWING NAME: WATER PIPING PLAN

NORTH CAROLINA PROFESSIONAL SEAL 050989
8/24/22

DRAWN: JNK
CHECKED: SJB
DATE: 8/24/22
SCALE: AS NOTED
JOB NO.: 22052
SHEET: P-2

MECHANICAL NOTES:

1. ALL HVAC EQUIPMENT AND DUCTWORK TO BE INSTALLED IN ACCORDANCE WITH STATE AND LOCAL CODES.
2. THE CONTRACTOR SHALL COORDINATE THE LOCATION OF ALL DUCTWORK, PIPING, AND ELECTRICAL REQUIREMENTS WITH ALL OTHER TRADES PRIOR TO BEGINNING INSTALLATION TO AVOID CONFLICTS AND INTERFERENCE WITH OTHER TRADES.
3. ALL EQUIPMENT TO BE INSTALLED AS SUGGESTED BY MANUFACTURER.
4. INSULATE SUPPLY AND RETURN DUCTWORK LOCATED ABOVE LAY-IN CEILINGS BY WRAPPING WITH INSULATION WITH A MINIMUM INSTALLED R-VALUE OF 6.0. DIMENSIONS SHOWN ARE INSIDE CLEAR AREA DIMENSIONS.
5. EXTERIOR HVAC DUCTWORK AND DUCTWORK LOCATED IN UNCONDITIONED SPACES MUST BE INSULATED WITH INSULATION OF R-VALUE OF 8.0 OR GREATER.
6. EQUIP AIR HANDLER WITH RETURN AIR FILTER RACK.
7. PROGRAMMABLE THERMOSTAT SHALL BE CAPABLE OF CONTROLLING BOTH HEATING AND COOLING, SET POINT OVERLAP RESTRICTION (DEADBAND OF AT LEAST 5°F), OFF HOURS CONTROL AND SET BACK CAPABILITIES AS REQUIRED BY SECTION C403.2.4 OF THE NC ECC.
8. COORDINATE EXACT LOCATION OF THERMOSTAT WITH OWNER.
9. EXHAUST FAN TO BE FURNISHED, INSTALLED AND DUCTED TO OUTDOORS BY THE MECHANICAL CONTRACTOR. EXHAUST FAN TO BE WIRED BY THE ELECTRICAL CONTRACTOR.
10. EXHAUST FAN DISCHARGE TO BE AT LEAST TEN FEET AWAY FROM HVAC FRESH AIR IN-TAKE.
11. FINAL UTILITY CONNECTIONS (GAS, ELECTRIC, ETC.) TO EQUIPMENT SHALL BE MADE BY THE CONTRACTOR INSTALLING THE EQUIPMENT REQUIRING THE UTILITIES.
12. DUCT DRAWINGS ARE DIAGRAMMATIC AND ARE INTENDED TO SHOW THE INTENT OF THE ENGINEER. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING ANY ADDITIONAL TRANSITIONS, OFFSETS, OR TURNS, IN THE DUCTWORK AND/OR PIPING, NOT SHOWN BUT REQUIRED FOR A COMPLETE AND OPERATING SYSTEM.
13. ALL DUCTWORK SHALL BE INSTALLED TIGHT AGAINST THE STRUCTURE UNLESS OTHERWISE NOTED OR SHOWN.
14. AIR DISTRIBUTION LOCATIONS SHOWN ON MECHANICAL PLANS ARE APPROXIMATE. SEE ARCHITECTURAL REFLECTED CEILING PLANS FOR ACTUAL LOCATIONS.
15. REFER TO ARCHITECTURAL DRAWINGS FOR DIMENSIONED LOCATIONS OF WALLS AND PARTITIONS AND FOR PARTITION THICKNESS AND CONSTRUCTION MATERIALS.
16. ELECTRICAL POWER REQUIREMENTS ARE BASED ON MANUFACTURER'S PUBLISHED DATA. IF ACTUAL UNIT IS A DIFFERENT MANUFACTURER OR THE ACTUAL PURCHASED UNIT(S) OTHERWISE HAVE DIFFERENT ELECTRICAL LOAD (MCA) OR CIRCUIT BREAKER (MCB) REQUIREMENTS THAN WHAT IS PUBLISHED ON THE DRAWING SCHEDULE, THE MECHANICAL CONTRACTOR MUST SUBMIT THE CORRECT DATA IN WRITING TO THE GENERAL CONTRACTOR AND ELECTRICAL CONTRACTOR (IF KNOWN). IT IS THE MECHANICAL CONTRACTOR'S RESPONSIBILITY TO ENSURE THAT THE GC AND ELECTRICAL CONTRACTOR ARE NOTIFIED OF CHANGES IN THE MECHANICAL EQUIPMENT, WHICH WILL CHANGE THE ELECTRICAL WIRING, BREAKER SIZES OR QUANTITY OF CIRCUITS.
17. PRIMARY CONDENSATE DRAIN TO BE ROUTED TO OUTDOORS OR HUB DRAIN. VERIFY TERMINATION LOCATION WITH MECHANICAL INSPECTOR PRIOR TO INSTALLATION. THE PIPING FROM THE SECONDARY DRAIN PAN SHALL BE CONFIGURED SUCH THAT THE SAFETY FLOAT SWITCH WILL SHUT THE UNIT DOWN YET PREVENT THE PAN FROM OVERFLOWING SHOULD THE SAFETY SWITCH FAIL.
18. INSULATE REFRIGERANT LINES WITH 1-1/2" INSULATION WITH A THERMAL CONDUCTIVITY OF 0.27 BTU PER INCH/H.FT2.°F. ALTERNATE THICKNESS CAN BE USED IF ADJUSTED IN ACCORDANCE WITH TABLE C403.2.10 NOTE B OF THE NC ENERGY CONSERVATION CODE (NC ECC).
19. HEAT PUMPS SHALL HAVE CONTROLS THAT, EXCEPT DURING DEFROST, PREVENT SUPPLEMENTAL HEAT OPERATION WHEN THE HEAT PUMP COMPRESSOR CAN MEET THE HEATING LOAD. A HEAT STRIP OUTDOOR TEMPERATURE LOCKOUT SHALL BE PROVIDED TO PREVENT SUPPLEMENTAL HEAT OPERATION IN RESPONSE TO THE THERMOSTAT BEING CHANGE TO A WARMER SETTING. THE LOCKOUT SHALL BE SET NO LOWER THAN 35°F AND NO HIGHER THAN 40°F. SEE SECTION C403.2.4 OF THE NC ECC.
20. ALL DUCTS, AIR HANDLERS, AND FILTER BOXES SHALL BE SEALED. JOINTS AND SEAMS SHALL COMPLY WITH SECTION 603.9 OF THE NC MECHANICAL CODE.
21. SYSTEM SHALL BE BALANCED BY THE HVAC CONTRACTOR IN ACCORDANCE WITH SECTION C408.2.2 OF THE NC ECC. A CERTIFIED AIR BALANCE REPORT IS NOT REQUIRED BY CODE, BUT MAY BE DESIRED BY THE OWNER OR GC. VERIFY WITH GC PRIOR TO PRICING.
22. AN OPERATING AND MAINTENANCE MANUAL FOR EACH HVAC SYSTEM SHALL BE PROVIDED BY THE MECHANICAL CONTRACTOR TO THE OWNER IN ACCORDANCE WITH SECTION C408.2.5.2 OF THE NC ECC.
23. FLEX DUCT LENGTHS SHOULD NOT EXCEED 15' IN LENGTH UNLESS PHYSICAL CONSTRAINTS PROHIBIT INSTALLATION OF ADDITIONAL HARD DUCT.
24. FLEX DUCT SUPPORTS SHOULD BE AT LEAST 1-1/2" WIDE. SPACE SUPPORTS NO MORE THAN 4 FEET APART (A CONNECTION TO A RIGID DUCT OR TO EQUIPMENT COUNTS AS A SUPPORT POINT). IN LONG HORIZONTAL RUNS WITH BENDS, USE EXTRA SUPPORTS BEFORE AND AFTER THE BENDS. SUPPORT STRAPS SHOULD NOT COMPRESS THE INNER CORE OR CONSTRICT AIRFLOW. SUPPORTS SHOULD NOT CONSTRICT THE INSULATION.
25. FLEX DUCTS SHOULD NOT SAG MORE THAN 1/2" PER 1'-0" BETWEEN SUPPORTS; MAXIMUM SAG SHOULDN'T EXCEED 2-1/2".

SPLIT SYSTEM A/C WITH HEAT PUMP

MARK	TONS	MANUFACTURER	INDOOR UNIT					OUTDOOR UNIT				FAN DATA					COOLING CAPACITY				HEATING CAPACITY AT 47 °F (BTUH)	MINIMUM HEATING EFFICIENCY	ACTUAL HEATING EFFICIENCY
			* MODEL NO.	STRIP HEAT	POWER	MCA	MCB	MODEL NO.	POWER	MCA	MCB	AIR FLOW (CFM)	R.A. FLOW (CFM)	O.A. FLOW (CFM)	E.S.P. (IN. W.G.)	MOTOR SIZE (H.P.)	SENSIBLE (BTUH)	TOTAL (BTUH)	MIN. EFF.	ACTUAL EFF.			
AHU-1/HP-1	3	TRANE	TAM9A0C36V31	7.68 KW	240V/1ø	44	45	4TWR5036H1	230V/1ø	18	30	1,200	1,020	180	0.25	1/2	27,005	36,104	14 SEER	15 SEER	33,800	8.2 HSPF	9.5 HSPF

* AIR HANDLER SHALL HAVE AUTOMATIC OR GRAVITY DAMPER ON THE OUTSIDE AIR INTAKE THAT CLOSE WHEN THE FAN IS NOT OPERATING.

Ventilation Calculations

Occupancy Classification (Per Table 403.3.1.1)	NET Square Footage, Az	Occupancy Persons per 1,000 S.F.	Calculated # of People, Pz	People CFM Per Person, Rp	People CFM Total, Rp x Pz	Area CFM Per S.F., Ra	Area CFM Total, Ra x Az	Outside Air CFM Required, Vbz*	Outside Air CFM Provided	Exhaust Air Required (CFM)	Exhaust Air Provided, CFM
Office - 1	82	5	1	5.0	5	0.06	5	10	10	0	0
Office - 2	148	5	1	5.0	5	0.06	9	14	15	0	0
Corridor	54	0	0	0.0	0	0.06	3	3	5	0	0
Training Room	520	35	18	7.5	135	0	0	135	135	0	0
Closet - 1	34	0	0	0.0	0	0.12	4	4	5	0	0
Closet - 2	36	0	0	0.0	0	0.12	4	4	5	0	0
Mech / Elec	29	0	0	0.0	0	0.12	3	3	5	0	0
Toilet	61	0	0	0.0	0	0	0	0	0	120	120
							Total	163	**180**	120	**120**

* Vbz = (Rp x Pz) + (Ra x Az)

EXHAUST FAN SCHEDULE

MARK	MANUFACTURER	MODEL	TYPE	CFM	SP	MOTOR	POWER	SONES	WATTS	CONTROL
EF-1	GREENHECK	SP-A125	CEILING EXHAUST	120	0.25" W.G.	FHP	120V/1ø	0.6	23	OCC. SENSOR

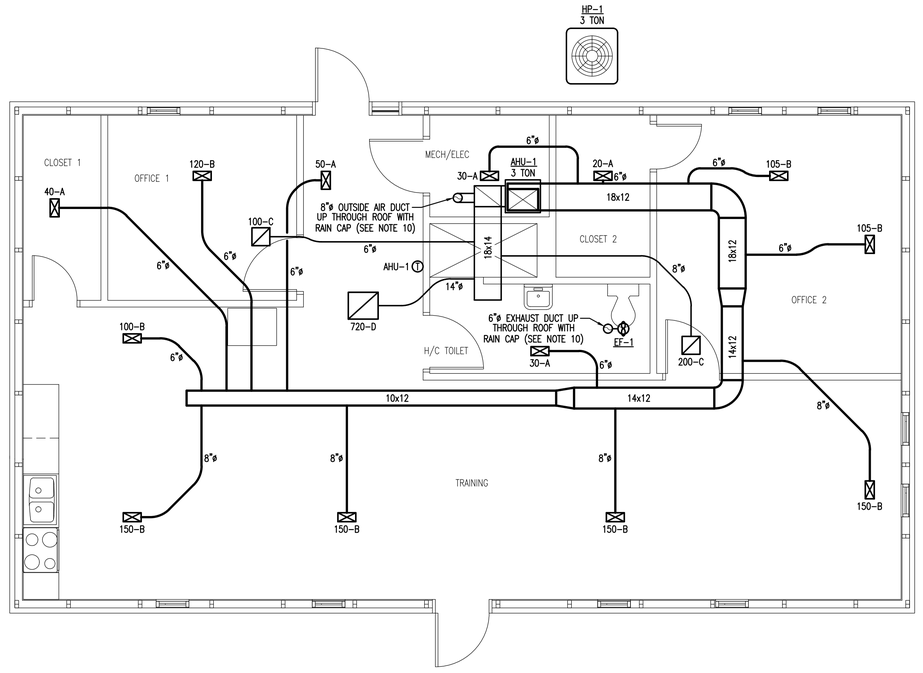
* EXHAUST FAN SHALL HAVE AUTOMATIC OR GRAVITY DAMPER THAT CLOSES WHEN THE FAN IS NOT OPERATING.

AIR DISTRIBUTION SCHEDULE

MARK	MANUFACTURER	NECK SIZE	PANEL SIZE	CFM RANGE	USE	TYPE	MODEL	MATERIAL	REMARKS
A	E.H. PRICE	–	9x6	0-180	SUPPLY	LOUVERED FACE DIRECTIONAL DIFFUSER	SMD-6	STEEL	–
B	E.H. PRICE	–	12x6	181-250	SUPPLY	LOUVERED FACE DIRECTIONAL DIFFUSER	SMD-6	STEEL	–
C	E.H. PRICE	–	12x12	0-300	RETURN	NON-FILTERED RETURN GRILLE	530	STEEL	–
D	E.H. PRICE	–	20x18	0-900	RETURN	NON-FILTERED RETURN GRILLE	530	STEEL	–

SYMBOLS & ABBREVIATIONS LEGEND

SYMBOL	DESCRIPTION
T	PROGRAMMABLE THERMOSTAT (SEE NOTE 7)
	CEILING SUPPLY DIFFUSER
	CEILING RETURN GRILLE
	SUPPLY DUCT SECTION
	RETURN DUCT SECTION
ø	DIAMETER OR POWER PHASE
O.A.	OUTSIDE AIR
R.A.	RETURN AIR
S.A.	SUPPLY AIR
A.F.F.	ABOVE FINISHED FLOOR
EF	EXHAUST FAN



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

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GROOMS EQUIPMENT TRAINING BUILDING
Graham, North Carolina

DRAWING NAME: MECHANICAL PLAN

NORTH CAROLINA PROFESSIONAL SEAL 050989 ENGINEER
8/24/22

DRAWN	JNK
CHECKED	SJB
DATE	8/24/22
SCALE	AS NOTED
JOB NO.	22052
SHEET	M-1

MECHANICAL SYSTEMS, SERVICE SYSTEMS AND EQUIPMENT METHOD OF COMPLIANCE

PRESCRIPTIVE ☒ ENERGY COST BUDGET ☐

THERMAL ZONE 4A

EXTERIOR DESIGN CONDITIONS
- WINTER DRY BULB 15 °F
- SUMMER DRY BULB 90 °F

INTERIOR DESIGN CONDITIONS
- WINTER DRY BULB 70 °F
- SUMMER DRY BULB 75 °F
- RELATIVE HUMIDITY 50 %

BUILDING HEATING LOAD 29,478 BTU/HR

BUILDING COOLING LOAD 2.97 TONS

MECHANICAL CONDITIONING SYSTEM

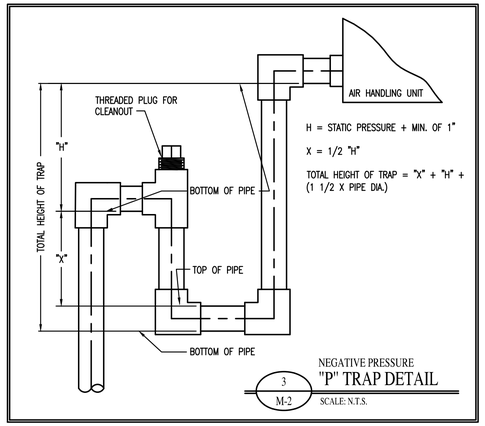
DESCRIPTION OF UNIT SPLIT SYSTEM HEAT PUMP

- HEATING EFFICIENCY 9.5 HSPF
- COOLING EFFICIENCY 15 SEER
- HEATING OUTPUT OF UNIT 33,800 BTU/HR
- COOLING OUTPUT OF UNIT 3 TONS

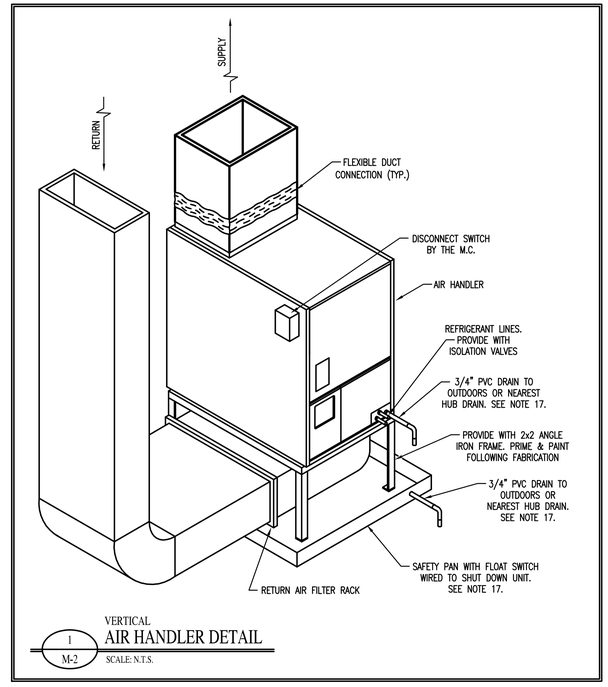
LIST EQUIPMENT EFFICIENCIES

EQUIPMENT SCHEDULES WITH MOTORS (MECHANICAL SYSTEM)
- MOTOR HORSEPOWER HP
- NUMBER OF PHASES ø
- MINIMUM EFFICIENCY %
- MOTOR TYPE
- #OF POLES

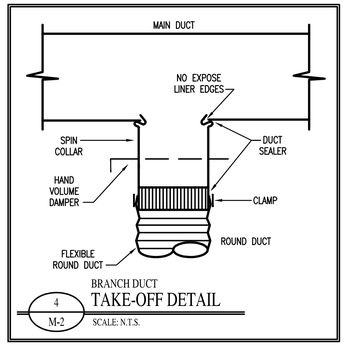
DESIGNER STATEMENT:
TO THE BEST OF MY KNOWLEDGE AND BELIEF, THE DESIGN OF THIS BUILDING COMPLIES WITH THE MECHANICAL SYSTEMS, SERVICE SYSTEMS AND EQUIPMENT REQUIREMENTS OF NORTH CAROLINA STATE BUILDING CODES.



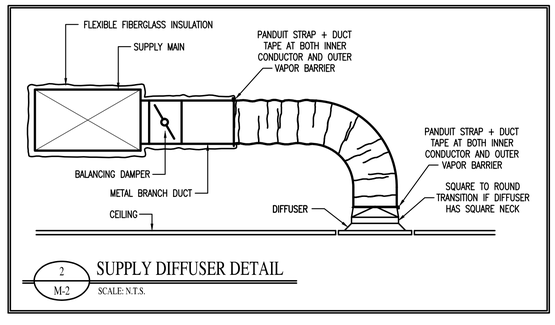
3 M-2 NEGATIVE PRESSURE "P" TRAP DETAIL
SCALE: N.T.S.



1 M-2 VERTICAL AIR HANDLER DETAIL
SCALE: N.T.S.



4 M-2 BRANCH DUCT TAKE-OFF DETAIL
SCALE: N.T.S.



2 M-2 SUPPLY DIFFUSER DETAIL
SCALE: N.T.S.

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GROOMS EQUIPMENT
3254 Boywood Rd.
Graham, NC 27253

GROOMS EQUIPMENT TRAINING BUILDING
Graham, North Carolina

DRAWING NAME
MECHANICAL DETAILS

NORTH CAROLINA PROFESSIONAL SEAL 050989 ENGINEER
8/24/22

DRAWN JNK
CHECKED SJB
DATE 8/24/22
SCALE AS NOTED
JOB NO. 22052
SHEET M-2

COMcheck Software Version 4.1.5.3

Interior Lighting Compliance Certificate

Project Information

Energy Code: 90.1 (2013) Standard
Project Title: Grooms Equipment
Project Type: New Construction

Construction Site: Graham, NC
Owner/Agent:
Designer/Contractor: ACE

Allowed Interior Lighting Power

A Area Category	B Floor Area (ft2)	C Allowed Watts / ft2	D Allowed Watts (B X C)
1-Closet 1 (Common Space Types:Storage <50 sq.ft.)	45	1.24	56
2-Office 1 (Common Space Types:Office - Enclosed)	109	1.11	121
3-Mech / Elec (Common Space Types:Storage <50 sq.ft.)	38	1.24	47
4-Closet 2 (Common Space Types:Storage <50 sq.ft.)	48	1.24	60
5-H/C Toilet (Common Space Types:Restrooms)	81	0.98	79
6-Office 2 (Common Space Types:Office - Enclosed)	197	1.11	219
7-Training Rm. (Common Space Types:Classroom/Lecture/Training)	765	1.24	949
		Total Allowed Watts =	1530

Proposed Interior Lighting Power

A Fixture ID : Description / Lamp / Wattage Per Lamp / Ballast	B Lamps/ Fixture	C # of Fixtures	D Fixture Watt.	E (C X D)
1-Closet 1 (Common Space Types:Storage <50 sq.ft.)				
LED 1: A: Can Light: LED PAR 20W:	1	2	20	40
2-Office 1 (Common Space Types:Office - Enclosed)				
LED 2: A: Can Light: LED PAR 20W:	1	4	20	80
LED 10: CF: Ceiling Fan: LED Other Fixture Unit 103W:	1	1	100	100
3-Mech / Elec (Common Space Types:Storage <50 sq.ft.)				
LED 3: A: Can Light: LED PAR 20W:	1	1	20	20
4-Closet 2 (Common Space Types:Storage <50 sq.ft.)				
LED 4: A: Can Light: LED PAR 20W:	1	2	20	40
5-H/C Toilet (Common Space Types:Restrooms)				
LED 5: A: Can Light: LED PAR 20W:	1	2	20	40
LED 6: A1: Can Light: LED PAR 20W:	1	1	20	20
LED 7: B: Vanity Light: LED PAR 20W:	2	1	20	20
6-Office 2 (Common Space Types:Office - Enclosed)				
LED 8: A: Can Light: LED PAR 20W:	1	4	20	80
LED 9: CF: Ceiling Fan: LED Other Fixture Unit 95W:	1	1	100	100
7-Training Rm. (Common Space Types:Classroom/Lecture/Training)				
Incandescent 3: C: Chandelier: Incandescent 300W:	6	3	150	450
LED 11: CF: Ceiling Fan: LED Other Fixture Unit 103W:	1	1	100	100
LED 1: A: Can Light: LED PAR 20W:	1	19	20	380
		Total Proposed Watts =		1470

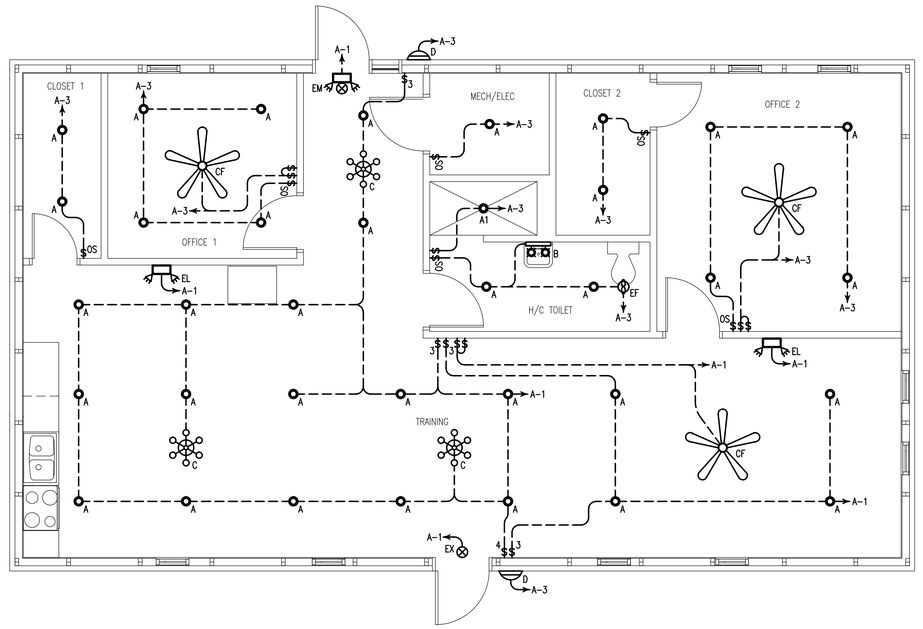
Interior Lighting PASSES: Design 4% better than code

Interior Lighting Compliance Statement

Compliance Statement: The proposed interior lighting design represented in this document is consistent with the building plans, specifications, and other calculations submitted with this permit application. The proposed interior lighting systems have been designed to meet the 90.1 (2013) Standard requirements in COM*check* Version 4.1.5.3 and to comply with any applicable mandatory requirements listed in the Inspection Checklist.

LIGHTING LEGEND

MARK	SYMBOL	DESCRIPTION
A		RECESSED MOUNTED LED CAN LIGHT, 20W
A1		RECESSED MOUNTED LED CAN LIGHT, WET LOCATION RATED, 20W
B		WALL MOUNTED LED VANITY LIGHT, 20W
C		LED CHANDELIER, 150W MAX.
CF		52" CEILING FAN W/LED LIGHT KIT, 100W MAX.
D		DECORATIVE EXTERIOR LED EMERGENCY LIGHT, W/HIGH-TEMPERATURE NICKEL-CADMIUM BATTERY, LITHONIA #AFF-OEL
EF		BATHROOM EXHAUST FAN, SEE EXHAUST FAN SCHEDULE FOR SPECIFICATIONS
EM		LED EMERGENCY/EXIT LIGHT WITH BATTERY BACK-UP
EL		LED EMERGENCY LIGHT WITH BATTERY BACK-UP
EX		LED EXIT SIGN WITH BATTERY BACK-UP
--	$	SINGLE POLE WALL SWITCH
--	$OS	LINE VOLTAGE WALL MOUNTED PIR OCCUPANCY SENSOR WITH MANUAL OVERRIDE. (30 MIN. MAX. OVERRIDE)
--	$$	SINGLE POLE WALL SWITCHES (CEILING FAN) 1 SWITCH – FAN 1 SWITCH – LIGHT KIT



1 / E-1 LIGHTING PLAN
SCALE: 1/4" = 1'-0"

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ELECTRICAL NOTES:

1. BREAKERS SHALL HAVE "AIC" RATING GREATER THAN THE FAULT CURRENT. ELECTRICAL CONTRACTOR IS TO CONTACT POWER COMPANY FOR AVAILABLE FAULT CURRENT. SERIES RATING IS PERMISSIBLE. ALL PANELS ARE TO BE MARKED WITH AVAILABLE FAULT CURRENT VALUES IN ACCORDANCE WITH NEC ARTICLE 110.24.
2. FUSES IN SERVICE DISCONNECTS SHALL BE CURRENT LIMITING TYPE.
3. COORDINATE ALL HVAC WIRING WITH MECHANICAL CONTRACTOR.
4. EMERGENCY LIGHTING AND EXIT SIGNS TO BE CONNECTED AHEAD OF ANY SWITCHING.
5. WIRE TO BE COPPER TYPE THWN (EXTERIOR) AND COPPER TYPE THHN (INTERIOR) OR APPROVED EQUAL UNLESS NOTED OTHERWISE.
6. COORDINATE LOCATION OF ALL DEVICES AND MOUNTING HEIGHTS OF RECEPTACLES WITH OWNER.
7. ALL ELECTRICAL COMPONENTS ARE TO BE UL LISTED.
8. EQUIPMENT GROUND CONDUCTOR TO BE PROVIDED IN ACCORDANCE WITH NEC SECTION 250.
9. ALL INTERIOR WIRING TO BE RUN IN EMT OR MC CABLE EXCEPT WHERE PROHIBITED BY THE NATIONAL ELECTRIC CODE.
10. EXHAUST FANS ARE TO BE FURNISHED AND INSTALLED BY MECHANICAL CONTRACTOR. FANS TO BE WIRED BY ELECTRICAL CONTRACTOR.
11. ALL EXTERIOR LIGHTING TO BE WIRED THROUGH A LIGHTING CONTACTOR AND CONTROLLED BY A PHOTOCELL AND TIMECLOCK.
12. THE CONTRACTOR SHALL COORDINATE THE LOCATION OF ALL CONDUIT AND EQUIPMENT WITH ALL OTHER TRADES PRIOR TO BEGINNING INSTALLATION TO AVOID CONFLICTS AND INTERFERENCE WITH OTHER TRADES.
13. FINAL UTILITY CONNECTIONS (GAS, ELECTRIC, WATER, ETC.) TO EQUIPMENT SHALL BE MADE BY THE CONTRACTOR INSTALLING THE EQUIPMENT REQUIRING THE UTILITIES.
14. ELECTRICAL DRAWINGS ARE DIAGRAMMATIC. THERE IS NO INTENT TO INDICATE ALL FITTINGS REQUIRED. GENERALLY, CONDUIT SHALL BE INSTALLED PARALLEL OR PERPENDICULAR TO AND PLUMB WITH WALL CONSTRUCTION.
15. REFER TO ARCHITECTURAL DRAWINGS FOR DIMENSIONED LOCATIONS OF WALL AND PARTITIONS AND FOR PARTITION THICKNESS AND CONSTRUCTION MATERIALS.
16. ELECTRICAL POWER REQUIREMENTS FOR HVAC EQUIPMENT ARE BASED ON MANUFACTURER'S PUBLISHED DATA. ELECTRICAL CONTRACTOR SHALL COORDINATE WITH GENERAL CONTRACTOR AND/OR MECHANICAL CONTRACTOR TO CONFIRM ELECTRICAL REQUIREMENTS HAVE NOT CHANGED DUE TO EQUIPMENT SUBSTITUTIONS OR OTHER CHANGES PRIOR TO PROVIDING FINAL BID AND PRIOR TO PURCHASING PANELS, CIRCUIT WIRING AND CIRCUIT BREAKERS SERVING HVAC EQUIPMENT.
17. ALL RECEPTACLES 18" A.F.F. TO BOTTOM OF BOX UNLESS OTHERWISE NOTED.
18. ALL NEW AND/OR ALTERED WIRING IS REQUIRED TO BE PERMITTED AND INSPECTED FOR COMPLIANCE WITH CURRENT NEC
19. ALL PRE-WIRED EQUIPMENT SHALL BE LISTED BY STATE OF NC APPROVED 3RD PARTY AGENCY, [NEC 90.7; 110.3(B)].
20. ALL WIRING, INCLUDING LOW VOLTAGE, DATA, PHONE, FIRE ALARM, SECURITY, HVAC CONTROLS, AND POWER SHALL BE PERMITTED AND INSPECTED PER NC GENERAL STATUES.
21. CLEARANCE REQUIRED AT ELECTRICAL EQUIPMENT, (NEC 110.26).
22. SERVICE EQUIPMENT SHALL BE LEGIBLY MARKED IN THE FIELD WITH THE MAXIMUM AVAILABLE FAULT CURRENT. THE FIELD MARKING(S) SHALL INCLUDE THE DATE THE FAULT CURRENT CALCULATION WAS PERFORMED AND BE OF SUFFICIENT DURABILITY TO WITHSTAND THE ENVIRONMENT INVOLVED. NEC 110.24(A)
23. ALL ELECTRICAL TO BE INSTALLED IN ACCORDANCE WITH LATEST ADOPTED NEC.

FEEDER TABLE

OVERCURRENT PROTECTION	TYPE			
	COPPER		ALUMINUM	
	WIRE*	CONDUIT*	WIRE*	CONDUIT*
15	#14	1/2"	#12	1/2"
20	#12	1/2"	#10	1/2"
25	#10	1/2"	#10	1/2"
30	#10	1/2"	#8	3/4"
35	#8	1/2"	#8	3/4"
40	#8	3/4"	#8	3/4"
45	#8	3/4"	#6	1"
50	#8	3/4"	#6	1"
55	#6	1"	#4	1-1/4"
60	#6	1"	#4	1-1/4"
70	#4	1-1/4"	#3	1-1/4"
80	#4	1-1/4"	#2	1-1/4"
90	#3	1-1/4"	#2	1-1/4"
100	#3	1-1/4"	#1	1-1/2"
110	#2	1-1/4"	#1/0	2"
125	#1	1-1/2"	#2/0	2"
150	#1/0	2"	#3/0	2"
175	#2/0	2"	#4/0	2-1/2"
200	#3/0	2"	#250	2-1/2"
225	#4/0	2"-1/2"	#300	2"-1/2"

*UNLESS OTHERWISE NOTED

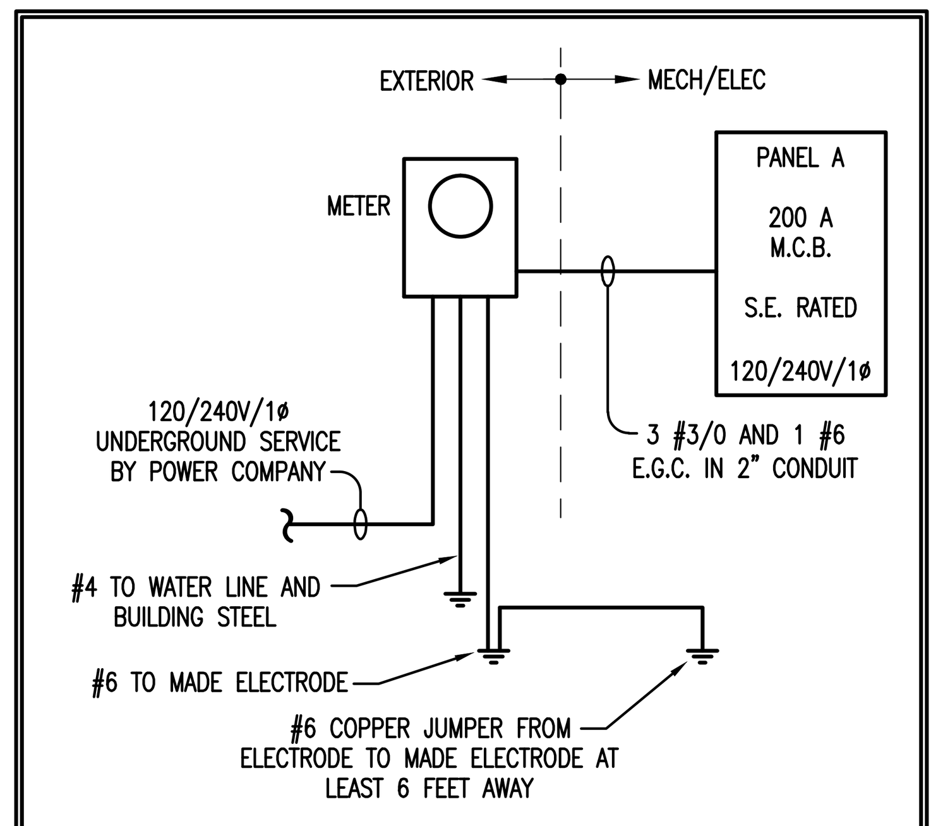
ELECTRICAL LEGEND

SYMBOL	DESCRIPTION
	120V DUPLEX RECEPTACLE
	120V DUPLEX RECEPTACLE, GROUND FAULT INTERRUPTER
WP	120V DUPLEX RECEPTACLE, GROUND FAULT INTERRUPTER, WEATHER PROOF
	240V RECEPTACLE
	FLOOR MOUNTED 120V QUAD RECEPTACLE
	UNFUSED DISCONNECT
	TELE/DATA OUTLET
TV	TV CABLE OUTLET
J	JUNCTION BOX
	ELECTRICAL PANEL
AC	DENOTES RECEPTACLES TO BE MOUNTED ABOVE COUNTER AT 42" AFF

PANEL A - LOAD CALCULATION SUMMARY

ITEM	TOTAL VA	(X) D.F.	VA
LIGHTING	1,583	125 (%)	1,979
EXTERIOR LIGHTING	0	125 (%)	0
RECEPTS. (FIRST 10 KVA)	9,330	100 (%)	9,330
RECEPTS. (REMAINING KVA @50%)	0	50 (%)	0
HVAC	14,700	100 (%)	14,700
SHOW WINDOWS	0	125 (%)	0
WATER HEATER	4,500	125 (%)	5,625
SIGN	0	125 (%)	0
MOTORS	0	125 (%)	0
EQUIPMENT	8,000	100 (%)	8,000
KITCHEN EQUIPMENT	0	70 (%)	0
TOTAL	38,113		39,634
		TOTAL AMPS = VA/240 =	165

NOTES:
* RECEPTACLES ARE CALCULATED PER NEC TABLE 220.44
* HVAC NAME PLATE RATING INCLUDES 125% DIVERSITY FACTOR



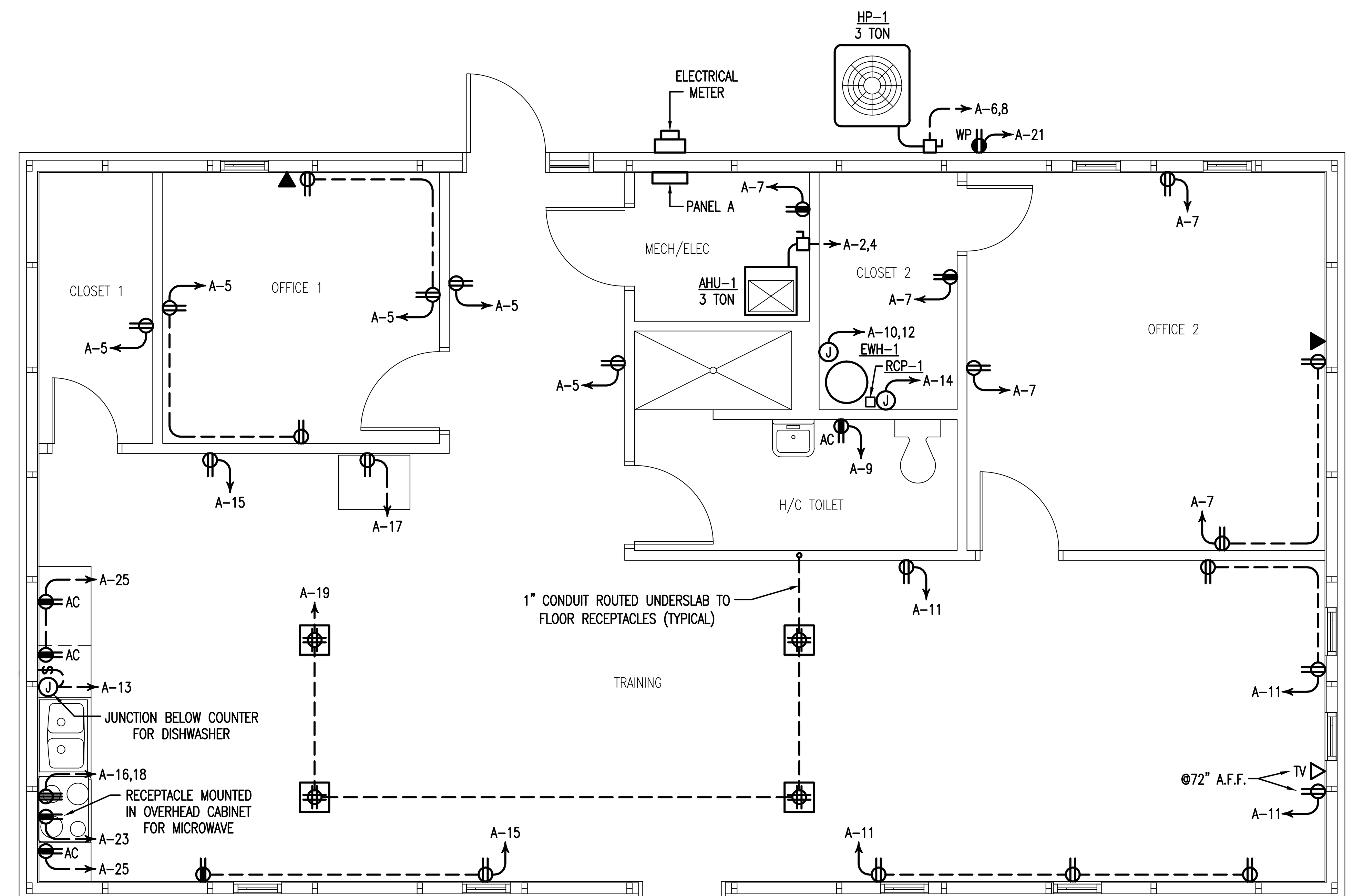
2 / E-2 ELECTRICAL RISER DIAGRAM
SCALE: N.T.S.

PANELBOARD SCHEDULE

PANEL: A | VOLTS: 240V/120 | MOUNT: SURFACE
MAIN: MCB | AMPS: 200 | AIC: (SEE NOTE 1)
S.E. RATED | PH/WIRE: 1/3 | LOC.: MECH/ELECT

CIR.	AMPS/ POLES	DESCRIPTION OF LOAD	LOAD VA	LOAD BY PHASE, VA A	LOAD BY PHASE, VA B	LOAD VA	DESCRIPTION OF LOAD	AMPS/ POLES	CIR.
1	20/1	LIGHTING	980	6,260		5,280	AIR HANDLER (AHU-1)	45/2	2
3	20/1	LIGHTING	603		5,883	5,280			4
5	20/1	RECEPTS. - CLS. 1/OFF. 1	1,260	3,330		2,070	HEAT PUMP (HP-1)	30/2	6
7	20/1	RECEPTS. - MECH./OFF. 2	1,080		3,150	2,070			8
9	20/1	RECEPT. - TOILET	180	2,430		2,250	WTR. HTR. (EWH-1) (LO)	30/2	10
11	20/1	RECEPTS. - TRAINING	1,260		3,510	2,250			12
13	20/1	DISHWASHER	1,500	1,600		100	REC. PUMP (RCP) (LO)	20/1	14
15	20/1	RECEPTS. - TRAINING	540		4,540	4,000	RANGE	50/2	16
17	20/1	RECEPT. - REFRIG.	500	4,500		4,000			18
19	20/1	RECEPTS. - TRAIN. FLR.	1,440		1,440				20
21	20/1	RECEPT. - EXTERIOR	180	180					22
23	20/1	RECEPT. - MICROWAVE	750		750				24
25	20/1	RECEPTS. - COUNTER	540	540					26
27					0				28
29				0					30
31					0				32
33				0					34
35					0				36
37				0					38
39					0				40
41				0					42
		CONNECTED V.A. PER PHASE		18,840	19,273				
		TOTAL AMPERES PER PHASE		157	161				

(LO) - DENOTES BREAKER LOCK-OUT



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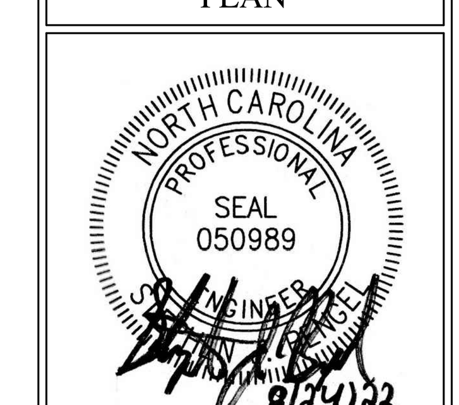

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