# PANEL 3-BED

SUPPLY FROM: METER STACKS | VOLTS: 120/240 Single | A.I.C. RATING: SEE ONE LINE
MOUNTING: RECESSED | PHASES: 1 | MAINS TYPE: MLO
ENCLOSURE: NEMA 1 | WIRES: 3 | MAINS RATINGS: 225 A

| CIRCUIT DESCRIPTION | LT | TRIP | P | BT | | A | | B | | | BT | P | TRIP | LT | CIRCUIT DESCRIPTION |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| BEDROOM #1 RECEPTS | ND | 15 | 1 | A | 1 | 0 | 0 | | | 2 | AG | 1 | 15 | ND | KITCHEN RECEPTS |
| BEDROOM #2 RECEPTS | ND | 15 | 1 | A | 3 | | | 0 | 0 | 4 | AG | 1 | 15 | ND | KITCHEN RECEPTS |
| BEDROOM #3 RECEPTS | ND | 15 | 1 | A | 5 | 0 | 0 | | | 6 | AG | 1 | 15 | ND | DISH / DISPOSAL |
| SPARE | -- | 15 | 1 | A | 7 | | | 0 | 0 | 8 | A | 1 | 15 | ND | MICRO / HOOD |
| LIVING RM RECEPTS | ND | 15 | 1 | A | 9 | 0 | 0 | | | 10 | AG | 1 | 15 | ND | REFRIG / ISLAND RECEPTS |
| LIVING RM RECEPTS/SPARE | ND | 15 | 1 | A | 11 | | | 0 | 0 | 12 | AG | 1 | 15 | ND | WASHING MACHINE |
| BATHROOM GFCI | ND | 15 | 1 | AG | 13 | 0 | 0 | | | 14 | A | 1 | 15 | ND | DATA/TELECOM |
| LIGHTING, EF | ND | 15 | 1 | A | 15 | | | 0 | 0 | 16 | S | 2 | 50 | ND | RANGE |
| EXTERIOR GFCI | ND | 15 | 1 | AG | 17 | 0 | 0 | | | 18 | | | | | |
| DRYER | ND | 30 | 2 | S | 19 | | | 0 | 0 | 20 | S | 2 | 25 | ND | CU # |
| | | | | | 21 | 0 | 0 | | | 22 | | | | | |
| EV CHARGER | ND | 40 | 2 | S | 23 | | | 0 | 0 | 24 | A | 1 | 20 | ND | FC # |
| | | | | | 25 | 0 | 0 | | | 26 | | | | | |
| GARAGE DOOR OPENER | ND | 15 | 1 | S | 27 | | | 0 | 0 | 28 | S | 2 | 20 | ND | UH1 |
| DEN RECEPS | ND | 15 | 1 | A | 29 | 0 | 0 | | | 30 | | | | | |
| GWH RECEPT | ND | 15 | 1 | A | 31 | | | 0 | 0 | 32 | S | 2 | 15 | ND | BH1 / SPARE |
| FACP | ND | 20 | 1 | S | 33 | 0 | 0 | | | 34 | A | 1 | 15 | -- | SPARE |
| SPARE | -- | 15 | 1 | A | 35 | | | 0 | 0 | 36 | A | 1 | 15 | -- | SPARE |
| SPARE | -- | 15 | 1 | A | 37 | 0 | 0 | | | 38 | A | 1 | 15 | -- | SPARE |
| SPARE | -- | 15 | 1 | A | 39 | | | 0 | 0 | 40 | A | 1 | 15 | -- | SPARE |
| SPARE | -- | 15 | 1 | A | 41 | 0 | 0 | | | 42 | A | 1 | 15 | -- | SPARE |

TOTAL LOAD: 0 kVA 0 kVA
TOTAL AMPS: 0 A 0 A

| LOAD TYPE | | CONN.LOAD | DEMAND FACT. | EST. DEMAND | BREAKER TYPE | | PANEL TOTALS |
|---|---|---|---|---|---|---|---|
| LIGHTING / EV - | L | 0 kVA | 0% | 0 kVA | AFCI - | A | |
| RECEPTACLE - | R | 0 kVA | 0% | 0 kVA | GFCI - | G | TOTAL CONN. LOAD: 0 kVA |
| MOTOR - | M | 0 kVA | 0% | 0 kVA | COMBO AFCI/G... | ... | TOTAL EST. DEMAND: 0 kVA |
| KITCHEN - | K | 0 kVA | 0% | 0 kVA | HANDLE TIE - | T | TOTAL CONN.: 0 A |
| OTHER - | O | 0 kVA | 0% | 0 kVA | HANDLE BLOCK - | H | TOTAL EST. DEMAND: 0 A |
| EXISTING - | E | 0 kVA | 0% | 0 kVA | STANDARD - | S | |
| NEC-220.82- | ND | 0 kVA | 0% | 0 kVA | LOCKOUT - | L | |

NOTES: THE INDIVIDUAL LOADS ARE NOT SHOWN AND BREAKERS ARE FOR SIZING AND CIRCUITING PURPOSES. THE DEMAND LOAD SHOWN IS PER NEC 220.82. 10KW + 40% OF (1) LAUNDRY CIRCUIT, (2) APPLIANCE CIRCUITS, 3W/SF FOR GENERAL LIGHT & RECEPTACLES, FIXED APPLIANCE & OTHER MOTOR LOADS. PLUS 100% OF LARGEST OF HEATING / COOLING LOADS.

# PANEL 4-BED

SUPPLY FROM: METER STACKS | VOLTS: 120/240 Single | A.I.C. RATING: SEE ONE LINE
MOUNTING: RECESSED | PHASES: 1 | MAINS TYPE: MLO
ENCLOSURE: NEMA 1 | WIRES: 3 | MAINS RATINGS: 225 A

| CIRCUIT DESCRIPTION | LT | TRIP | P | BT | | A | | B | | | BT | P | TRIP | LT | CIRCUIT DESCRIPTION |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| BEDROOM #1 RECEPTS | ND | 15 | 1 | A | 1 | 0 | 0 | | | 2 | AG | 1 | 15 | ND | KITCHEN RECEPTS |
| BEDROOM #2 RECEPTS | ND | 15 | 1 | A | 3 | | | 0 | 0 | 4 | AG | 1 | 15 | ND | KITCHEN RECEPTS |
| BEDROOM #3 RECEPTS | ND | 15 | 1 | A | 5 | 0 | 0 | | | 6 | AG | 1 | 15 | ND | DISH / DISPOSAL |
| BEDROOM #4 RECEPTS | ND | 15 | 1 | A | 7 | | | 0 | 0 | 8 | A | 1 | 15 | ND | MICRO / HOOD |
| LIVING RM RECEPTS | ND | 15 | 1 | A | 9 | 0 | 0 | | | 10 | AG | 1 | 15 | ND | REFRIG / ISLAND RECEPTS |
| LIVING RM RECEPTS/SPARE | ND | 15 | 1 | A | 11 | | | 0 | 0 | 12 | AG | 1 | 15 | ND | WASHING MACHINE |
| BATHROOM GFCI | ND | 15 | 1 | AG | 13 | 0 | 0 | | | 14 | A | 1 | 15 | ND | DATA/TELECOM |
| LIGHTING, EF | ND | 15 | 1 | A | 15 | | | 0 | 0 | 16 | S | 2 | 50 | ND | RANGE |
| GARAGE / VESTIBULE GFCI | ND | 15 | 1 | A | 17 | 0 | 0 | | | 18 | | | | | |
| DRYER | ND | 30 | 2 | S | 19 | | | 0 | 0 | 20 | S | 2 | 25 | ND | CU # |
| | | | | | 21 | 0 | 0 | | | 22 | | | | | |
| EV CHARGER | ND | 40 | 2 | S | 23 | | | 0 | 0 | 24 | A | 1 | 20 | ND | FC # |
| | | | | | 25 | 0 | 0 | | | 26 | | | | | |
| GARAGE DOOR OPENER | ND | 15 | 1 | A | 27 | | | 0 | 0 | 28 | S | 2 | 20 | ND | UH1 |
| DEN RECEPTS | ND | 15 | 1 | A | 29 | 0 | 0 | | | 30 | A | 1 | 20 | ND | ATTIC RADON FAN |
| GWH RECEPT | ND | 15 | 1 | A | 31 | | | 0 | 0 | 32 | A | 1 | 15 | -- | SPARE |
| FACP | ND | 20 | 1 | S | 33 | 0 | 0 | | | 34 | A | 1 | 15 | -- | SPARE |
| SPARE | -- | 15 | 1 | A | 35 | | | 0 | 0 | 36 | A | 1 | 15 | -- | SPARE |
| SPARE | -- | 15 | 1 | A | 37 | 0 | 0 | | | 38 | A | 1 | 15 | -- | SPARE |
| SPARE | -- | 15 | 1 | A | 39 | | | 0 | 0 | 40 | A | 1 | 15 | -- | SPARE |
| SPARE | -- | 15 | 1 | A | 41 | 0 | 0 | | | 42 | A | 1 | 15 | -- | SPARE |

TOTAL LOAD: 0 kVA 0 kVA
TOTAL AMPS: 0 A 0 A

| LOAD TYPE | | CONN.LOAD | DEMAND FACT. | EST. DEMAND | BREAKER TYPE | | PANEL TOTALS |
|---|---|---|---|---|---|---|---|
| LIGHTING / EV - | L | 0 kVA | 0% | 0 kVA | AFCI - | A | |
| RECEPTACLE - | R | 0 kVA | 0% | 0 kVA | GFCI - | G | TOTAL CONN. LOAD: 0 kVA |
| MOTOR - | M | 0 kVA | 0% | 0 kVA | COMBO AFCI/G... | ... | TOTAL EST. DEMAND: 0 kVA |
| KITCHEN - | K | 0 kVA | 0% | 0 kVA | HANDLE TIE - | T | TOTAL CONN.: 0 A |
| OTHER - | O | 0 kVA | 0% | 0 kVA | HANDLE BLOCK - | H | TOTAL EST. DEMAND: 0 A |
| EXISTING - | E | 0 kVA | 0% | 0 kVA | STANDARD - | S | |
| NEC-220.82- | ND | 0 kVA | 0% | 0 kVA | LOCKOUT - | L | |

NOTES: THE INDIVIDUAL LOADS ARE NOT SHOWN AND BREAKERS ARE FOR SIZING AND CIRCUITING PURPOSES. THE DEMAND LOAD SHOWN IS PER NEC 220.82. 10KW + 40% OF (1) LAUNDRY CIRCUIT, (2) APPLIANCE CIRCUITS, 3W/SF FOR GENERAL LIGHT & RECEPTACLES, FIXED APPLIANCE & OTHER MOTOR LOADS. PLUS 100% OF LARGEST OF HEATING / COOLING LOADS.

# PLUMBING GENERAL NOTES - UNITS

A. WATER, SEWER, GAS AND ELECTRICAL CONDUITS MUST FIT WITHIN WALLS. CONFLICTS WITH OTHER TRADES MUST BE COORDINATED OR WORK WILL BE REDONE.

B. COORDINATE ALL EQUIPMENT LOCATIONS, PIPE ROUTING, AND EXACT LOCATIONS WITH LIGHTS, HVAC, STRUCTURE, AND ALL OTHER TRADES PRIOR TO BEGINNING WORK.

C. REFER TO SCHEDULES, DIAGRAMS, AND ISOMETRIC DIAGRAMS FOR ALL PIPE SIZES NOT SHOWN ON PLANS.

D. COORDIANATE EXACT FIXTURE ROUGH-IN LOCATIONS , DIMENSIONS AND ELEVATIONS WITH ARCHITECTURAL DRAWINGS.

E. ACCESIBLE AND ADAPTABLE UNITS SHALL HAVE ADA FIXTURES AND MEET ALL APPLICABLE ADA STANDARDS AND REQUIREMENTS. COORDINATE FIXTURE SELECTION AND ROUGH-IN LOCATIONS WITH ARCHITECT / OWNER / GC.

# PLUMBING DETAIL NOTES - UNITS

NOTE: THESE NOTES ARE TYPICAL FOR ALL UNIT PLANS, NOT ALL NOTES MAY APPEAR ON EVERY UNIT TYPE.

1. DOMESTIC COLD AND HOT WATER SHUTOFF VALVE LOCATED IN WATER HEATER CLOSET. ALL PIPING TO UNIT PLUMBING FIXTURES TO BE DOWNSTREAM OF UNIT SHUTOFF, PROVIDE VALVE IDENTIFICATION ON SHUTOFF.

2. ROUTE 1/2" DOMESTIC HOT WATER IN CASEWORK FROM SINK TO DISHWASHER CONNECTION. PROVIDE DEDICATED ISOLATION VALVE WITH SHOCK ARRESTOR ON WATER SUPPLY. ROUTE WASTE PIPING FROM DISHWASHER TO 2" HD IN CASEWORK, CONNECT VIA 1" AIRGAP AND SECURE DISHWASHER DISCHARGE HOSE TO HUB DRAIN. PROVIDE DEDUCT ALTERNATE PRICING TO CONNECT VIA DISHWASHER KNOCK OUT ON GARBAGE DISPOSAL, COORDINATE ACCEPTANCE WITH OWNER. INSTALLATION OF DISHWASHER SHALL BE PER IPC 409.4.

3. WALLBOX FOR REFRIGERATOR ICE MAKER CONNECTION, PROVIDE WITH SHUTOFF VALVE AND SHOCK ARRESTOR. PROVIDE FIRE RATED ICE MAKER BOX WHERE LOCATED WITHIN FIRE RATED WALL, COORDINATE WITH ARCH. MAKE CONNECTION TO REFRIGERATOR PER MANUFACTURERS INSTRUCTIONS.

4. ROUTE CONDENSATE PIPING FROM MECHANICAL UNIT TO FLOOR DRAIN IN CLOSET. MECHANICAL EQUIPMENT TO BE EQUIPPED WITH UNIT SHUTOFF FOR HIGH CONDENSATE AS SECONDARY, RE: MECHANICAL. (BASIS OF DESIGN RECTORSEAL SAFE-T-SWITCH).

5. NO PIPING SHALL BE ROUTED OVER ELECTRICAL PANEL, COORDINATE EXACT PIPE ROUTING IN FIELD TO AVOID ROUTING PIPING OVER PANEL.

6. ROUTE CPVC FLUE AND COMBUSTION AIR PIPING FROM WATER HEATER UP THRU STRUCTURE TO EXTERIOR WALL AS INDICATED. TERMINATE IN MANUFACTURER APPROVED CONCENTRIC VENT AT WALL, PIPING LENGTH NOT TO EXCEED (X) LINEAR FEET WITH (Y) # OF 90° ELBOWS AS INDICATED AT TERMINATION POINT.

7. STACKED WASHER/DRYER TO HAVE TWO BOX SETUP WITH SEPARATE WALL BOX FOR SUPPLIES AND DRAIN. PROVIDE WATER HAMMER ARRESTORS ON SUPPLY VALVES, LOCATE DRAIN BOX IN ADJACENT WALL FROM SUPPLY BOX, FIELD COORDINATE EXACT LOCATION AND WASHER BOX REQUIREMENTS WITH GENERAL CONTRACTOR. COORDINATE WASHER BOX LOCATIONS WITH DRYER DUCT VENT (IN WALL STYLE). RE: DIAGRAM FOR ADDITIONAL INFORMATION.

| PLUMBING FIXTURE PIPE SIZES | | |
|---|---|---|
| KEY | WASTE SIZE | VENT SIZE |
| WC | 3" | 2" |
| L-1 | 1-1/2" | 1-1/2" |
| BT | 2" | 1-1/2" |
| SH | 2" | 1-1/2" |
| KS | 2" | 1-1/2" |
| WU | 2" | 1-1/2" |
| 2" FD/S | 2" | 1-1/2" |
| 3" FD/S | 3" | 2" |
| 4" FD/S | 4" | 2" |

ALL PIPE SIZES AS INDICATED EXCEPT WHERE NOTED. FOR BACK TO BACK CONDITIONS, LARGEST DRAIN & VENT SIZE APPLIES.

| PLUMBING FIXTURE PIPE SIZES | | |
|---|---|---|
| KEY | HW SIZE | CW SIZE |
| WC | - | 1/2" |
| L-1 | 1/2" | 1/2" |
| BT | 1/2" | 1/2" |
| SH | 1/2" | 1/2" |
| KS | 1/2" | 1/2" |
| DW | 1/2" | - |
| RB | - | 1/2" |
| WU | 1/2" | 1/2" |
| WH | - | 1/2" |

ALL PIPE SIZES AS INDICATED EXCEPT WHERE NOTED.

# MECHANICAL GENERAL NOTES - UNITS

A. FLEX DUCT MAY NOT BE USED IN EXPOSED LOCATIONS. WHERE CONCEALED, FLEX DUCT RUNS NO LONGER THAN 2', REFER TO SPECIFICATIONS.

B. GRILLES, REGISTERS & DIFFUSERS & EXPOSED DUCTWORK TO MATCH ADJACENT CEILING/STRUCTURE COLOR. WHERE CEILING IS LIGHT COLOR, MAINTAIN WHITE GRDS. WHERE CEILING/STRUCTURE IS METAL FINISH OR DARK, PAINT GRDS TO MATCH. REFER TO ARCH PLANS FOR FINISHES.

C. ROUTE ALL SUPPLY DUCTWORK ABOVE FIRE-RATED CEILING BETWEEN AND THRU TRUSSES UNLESS OTHERWISE NOTED. AVOID SOLID STRUCTURAL BEAMS. IN ATTIC SPACE, INSULATE PER SPECIFICATIONS.

D. INSTALL RADIATION DAMPER AT ALL CEILING PENETRATIONS. DAMPER TO BE UL-LISTED FOR RATED ASSEMBLY BEING PENETRATED.

E. VERIFY LOCATIONS AND RATING OF ALL RATED ASSEMBLIES WITH GC AND ARCHITECT DURING CONSTRUCTION. PROTECT PENETRATIONS PER UL INSTRUCTIONS.

F. RANGE HOOD IS RECIRCULATING AND BY ARCHITECT. PROVIDE ACCESSIBLE CONTROLS IN ADA TYPE-A RANGE HOOD.

G. PROVIDE 1.25" UNDERCUT AT ALL BEDROOM DOORS.

H. EXHAUST DUCTS MUST BE ROUTED BENEATH SUPPLY TRUNK MAIN TO MAINTAIN 3' SEPARATION BETWEEN EXHAUST VENTS AND OPERABLE WINDOW OPENINGS ABOVE. SEE ARCHITECTURAL ELEVATIONS.

I. EACH UNIT TO BE VENTILATED FOR A MINIMUM OF 72 HOURS PRIOR TO OCCUPANCY. ALL FILTERS TO BE REPLACED AT END OF VENTILATION PERIOD PRIOR TO TENANT OCCUPANCY.

# MECHANICAL DETAIL NOTES - UNITS

NOTE: THESE NOTES ARE TYPICAL FOR ALL UNIT PLANS, NOT ALL NOTES MAY APPEAR ON EVERY UNIT TYPE.

1. MOUNT BATHROOM VENTILATION FAN IN WALL. ROUTE 4" OVAL EXHAUST DUCT UP THRU TOP PLATE AND THRU OPEN WEB TRUSSES. PROVIDE ROOF CAP WHERE EXHAUST DUCTWORK IS ROUTED UP THRU ROOF (TOP FLOOR), PROVIDE BACKDRAFT DAMPER ON ROOF CAP. SET FAN VENTILATION TIMER PER TABLE FOR UNIT TYPE, VENTILATION SWITCH TO BE AIR CYCLER SMART EXHAUST, COORDINATE WIRING WITH E.C.

2. MOUNT KITCHEN VENTILATION FAN IN CEILING, ROUTE EXHAUST DUCT THRU OPEN WEB TRUSSES AND TERMINATE IN WALL CAP WITH BACKDRAFT DAMPER. FAN TO OPERATE VIA MANUAL SWITCH IN KITCHEN, COORDINATE WIRING WITH E.C.

3. 4'Ø DRYER VENT FROM DRYER BOX (IN-O-VATE TECH OR EQUIV.) ROUTE BEHIND DRYER IN WALL UP THRU TOP PLATE AND THRU OPEN WEB TRUSSES TO EXTERIOR WALL. INSTALL BACKDRAFT DAMPER AT TERMINATION. ALL HORIZONTAL TURNS TO BE 'LONG TURN' ELL'S (IN-O-VATE TECHNOLOGIES OR EQUIV.) INSTALL VENT PER MANUFACTURER'S REQUIREMENTS. VENT NOT TO EXCEED X' TOTAL LENGTH W/ (Y) 90° ELBOWS. REFER TO PLANS FOR LENGTH AND ELBOW QUANTITIES FOR EACH UNIT. PROVIDE PERMANENT LABEL 'DRYER MUST BE APPROVED FOR X W/ (Y) ELBOW BY MANUFACTURER.' WHERE THRU ROOF, INSULATE WITH R-8 DUCTWRAP AND TERMINATE IN ROOF BACK WITH BACKDRAFT DAMPER (TOP FLOOR). DESIGN BASED ON GE LONG VENT DRYER MODEL GTD42EASJ.

4. PROVIDE 1" DOOR UNDERCUT AND 16X8 'R2' TRANSFER GRILLE ABOVE LAUNDRY ROOM DOOR FOR A MINIMUM TOTAL OF 120 SQ.IN. FREE AREA. COMPLY WITH WASHER AND DRYER MANUFACTURERS INSTALLATION REQUIREMENTS. COORDINATE WITH ARCHITECT PRIOR TO INSTALLATION. PROVIDE (2) GRILLES AT WALK-IN LAUNDRY ROOMS - ONE GRILLE ON EITHER SIDE OF WALL.

5. ROUTE COMBINED BATH/KITCHEN EXHAUST AND DRYER EXHAUST DUCTWORK THRU TRUSSES TO EXTERIOR WALL AND TERMINATE IN WALL CAP. EACH FAN TO HAVE BUILT-IN BACKDRAFT DAMPER. MAINTAIN MINIMUM 3'O FROM BUILDING OPENINGS AND AIR INTAKES. COORDINATE OPERABLE WINDOW ORIENTATION/CONFIGURATION WITH ARCHITECT AND G.C.

6. REFER TO PLUMBING PLANS FOR PRIMARY CONDENSATE ROUTING, PROVIDE SECONDARY CONDENSATE OVERFLOW SWITCH (RECTORSEAL SAFE-T-SWITCH) ON OVERFLOW CONNECTION. OVERFLOW SAFETY TO STOP COOLING COMPRESSOR IN EVENT OF PRIMARY CONDENSATE DRAIN BLOCKAGE.

7. PROVIDE FIRE DAMPER AT RATED ASSEMBLY PENETRATION, UL RATING OF ASSEMBLY TO BE MAINTAINED WITH APPROVED UL LISTED PRODUCTS FOR APPLICATION. REFER TO ARCHITECTURAL PLANS FOR ADDITIONAL INFORMATION ON RATED ASSEMBLIES AND PENETRATION REQUIREMENTS.

8. PROVIDE ADD-ALTERNATE PRICING FOR FIREPLACE UPGRADE OPTION AND ASSOCIATED 5'Ø EXHAUST BY 8'Ø AIR INTAKE CO-AXIAL VENT PIPE SYSTEM, SELKIRK (OR APPROVED ALTERNATE). MAINTAIN MINIMUM 9" CLEARANCE TO OPERABLE WINDOWS AND DOORS. BASIS OF DESIGN IS KOZY HEAT FIREPLACES CARLTON 46. FIRE PLACE TO BE INSTALLED PER MANUFACTURERS INSTRUCTIONS.

RESIDENTIAL UNIT VENTILATION CALCULATION
(FOR BUILDINGS OVER 3 STORIES)

| UNIT TYPE | UNIT AREA (SF) | UNIT BEDRM QTY | CEILING HEIGHT (FT) | VENTILATION ASHRAE 62.2 | RATE (CFM) IAC 0.35 ACH | IMC 15 CFM/P | VF-1 QTY PER UNIT | VF-1 RUN TIME PER FAN (MIN/HR) |
|---|---|---|---|---|---|---|---|---|
| AV | 2677 | 4 | 10.32 | 116 | 162 | 75 | 6 | 33 |
| AN | 2680 | 4 | 10.32 | 116 | 162 | 75 | 5 | 39 |
| BN | 2087 | 3 | 10.32 | 93 | 126 | 60 | 4 | 38 |
| BV | 2084 | 4 | 10.32 | 101 | 126 | 75 | 5 | 31 |
| BN TH2 | 2082 | 3 | 10.32 | 93 | 126 | 60 | 4 | 38 |
| BV TH2 | 2092 | 4 | 10.32 | 101 | 126 | 75 | 5 | 31 |

NOTES:
1. BASED ON VF-1 AIRFLOW RATE OF 50 CFM
2. ASHRAE CALCULATION BASED ON ASHRAE 62.2-2013 EQUATION BELOW.
VENTILATION RATE = 0.03 X AREA + 7.5(BEDROOMS +1)

# ELECTRICAL GENERAL NOTES - UNITS

A. REPLACE MINI-HORN WITH HORN/STROBE IN ACCESSIBLE UNITS.

B. PROVIDE ARC-FAULT CIRCUIT INTERRUPTER PROTECTION FOR RECEPTACLES, LIGHTS, SMOKE DETECTORS, ETC. IN RESIDENCE PER NEC 210.12.

C. ALL DWELLING UNIT RECEPTACLES LISTED PER NEC 406.12 SHALL BE TAMPER RESISTANT TYPE.

D. ELECTRICAL BOXES INSTALLED IN FIRE-RATED WALLS AND PARTITIONS MUST COMPLY WITH THE REQUIREMENTS OF IBC 714.3.2. IF STEEL BOXES ARE USED IN FIRE RATED WALLS, BOX OPENINGS SHALL NOT BE LARGER THAN 16 SQ. IN. WITH A TOTAL AREA OF SUCH OPENINGS IN THE WALL NOT EXCEEDING 100 SQ. IN. FOR ANY 100 SQ. FT. OF WALL AREA.

E. OUTLET BOXES ON THE OPPOSITE SIDES OF THE FIRE RATED WALLS SHALL BE SEPARATED BY A MINIMUM OF 24" HORIZONTALLY, UNLESS FIRE BLOCKING METHODS LISTED IN IBC 714.3.2 ARE EMPLOYED.

F. CIRCUITS SHOWN ON THE ELECTRICAL UNIT PLANS SHALL BE WIRED TO THE TYPICAL UNIT PANEL UNLESS OTHERWISE STATED ON THE PLANS.

G. ELECTRICAL FIXTURES AND DEVICES MAY BE OFFSET ON THE PLANS FOR GRAPHICAL CLARITY. COORDINATE EXACT LOCATIONS WITH THE ARCHITECT/OWNER PRIOR TO ROUGH-IN.

H. ALL ABOVE COUNTER RECEPTACLES ARE TO BE INSTALLED AT 42" A.F.F.. RECEPTACLES INSTALLED ON THE SIDE OF FLAT PENINSULAR OR ISLAND COUNTERTOPS ARE TO BE INSTALLED NOT MORE THAN 12" BELOW THE COUNTERTOP.

I. GFCI PROTECTION TO BE PROVIDED AT PANEL, UNLESS SPECIFICALLY NOTED TO BE PROTECTED LOCALLY ON DRAWINGS.

# ELECTRICAL DETAIL NOTES - UNITS

NOTE: THESE NOTES ARE TYPICAL FOR ALL UNIT PLANS, NOT ALL NOTES MAY APPEAR ON EVERY UNIT TYPE.

1. UNIT TELEPHONE/CABLE TERMINAL; FIELD VERIFY LOCATION AND MOUNTING HEIGHT ON WALL WITH TELECOM SERVICE PROVIDER. COORDINATE LOCATION WITH CLOSET SHELVING, LOCATE DUPLEX RECEPTACLE BELOW TERMINAL FOR CONNECTION OF TELECOM EQUIPMENT. RE: TELEPHONE/CABLE DETAIL FOR ADDITIONAL INFORMATION.

2. TYPICAL UNIT ELECTRICAL PANEL, COORDINATE PANEL MOUNTING HEIGHT WITH ADA REQUIREMENTS (IN ACCESSIBLE UNITS). MAINTAIN MINIMUM CLEARANCE TO FRONT OF PANEL AS REQUIRED PER NEC, NO PIPING, DUCTWORK OR OTHER TRADES WORK TO BE ROUTED OVER PANEL. ALL WORK IN THIS AREA TO BE COORDINATED WITH G.C. AND E.C.

3. PROVIDE COMBINATION RECEPTACLE WITH HALF SWITCHED PORT. TOP RECEPTACLE IS TO BE SWITCHED PORTION FOR GARBAGE DISPOSAL OPERATION.

4. EXTERIOR LUMINAIRE, SWITCH AND EXTERIOR WEATHER PROOF RECEPTACLE TO BE PROVIDED AT BALCONY.

5. POWER CONNECTION FOR DISHWASER, DISPOSAL AND DISPOSAL SWITCH LOCATED BELOW COUNTERTOP IN BASE CABINET. FIELD VERIFY DISPOSAL SWITCH LOCATION WITH OWNER PRIOR TO ROUGH-IN.

6. RADON EXHAUST FAN RECEPTACLE TO BE LOCATED IN ATTIC. COORDINATE AND FIELD VERIFY EXACT LOCATION WITH OWNER.

RESIDENTIAL ELECTRICAL LEGEND

| | |
|---|---|
| ⬡ | MECHANICAL EQUIPMENT; WIRE TO PANEL PER MECHANICAL EQUIPMENT SCHEDULE ON SCHEDULES AND DETAILS SHEET. |
| MICRO/ HOOD | (2-#12) COORDINATE HOOD REQUIREMENTS W/ ARCHITECT. (COMBINATION HOOD MICROWAVE UNIT) |
| RANGE | 208/1, (2-#8) SPECIAL PURPOSE OUTLET. COORDINATE CONFIGURATION W/ ARCHITECT. |
| DRYER | 208/1, (2-#10) SPECIAL PURPOSE OUTLET. COORDINATE CONFIGURATION W/ ARCHITECT. |
| ▽ | DATA & TELEPHONE |
| ▽ | CABLE TELEVISION |
| ● | SMOKE DETECTOR (LOCAL ONLY); INTERWIRED W/BATTERY BACKUP |
| ◉ | COMBINATION CARBON MONOXIDE / SMOKE DETECTOR (LOCAL ONLY); INTERWIRED W/BATTERY BACKUP |
| M | MINI HORN |
| S | HORN/STROBE |
| ⊡ | DOOR BELL (NUTONE PB-18LWH, 101T, LB-12WW) |

APPROVAL STAMPS:

REVIEWED FOR CODE COMPLIANCE
12/27/2023

| No. | Date | Description |
|---|---|---|
| 1 | 10.18.23 | ISSUED FOR PERMIT |

SUBMISSIONS & REVISIONS

OWNER
**MAY RIEGLER PROPERTIES**
2201 WISCONSIN AVE NW
SUITE 200
WASHINGTON, DC 20007

ARCHITECT
K A S A
KEVIN & ASAKO SPERRY ARCHITECTURE
3318 N. Columbus Street
Arlington, VA 22207
T.312.636.3248 / 312.636.4252
www.kasa-arch.com

GENERAL CONTRACTOR

CIVIL ENGINEER
**LANDMARK CONSULTANTS, INC.**
141 9TH STREET
PO BOX 774943
STEAMBOAT SPRINGS, CO 80477

LANDSCAPE ARCHITECT
**NVISION DESIGN STUDIO, INC.**
677 25 ROAD
GRAND JUNCTION, CO 81505

STRUCTURAL ENGINEER
**ANTHEM STRUCTURAL ENGINEERS**
430 YAMPA STREET
STEAMBOAT SPRINGS, CO 80487

M.E.P. & F.P. ENGINEERS
**BOULDER ENGINEERING**
1717 15TH STREET
BOULDER, CO 80302

INTERIOR DESIGNER:

PROJECT LOCATION
**BASECAMP ROW TOWNHOMES**
1950 CURVE COURT
STEAMBOAT SPRINGS, CO 80487

DRAWING TITLE
UNIT PLAN NOTES AND DETAILS

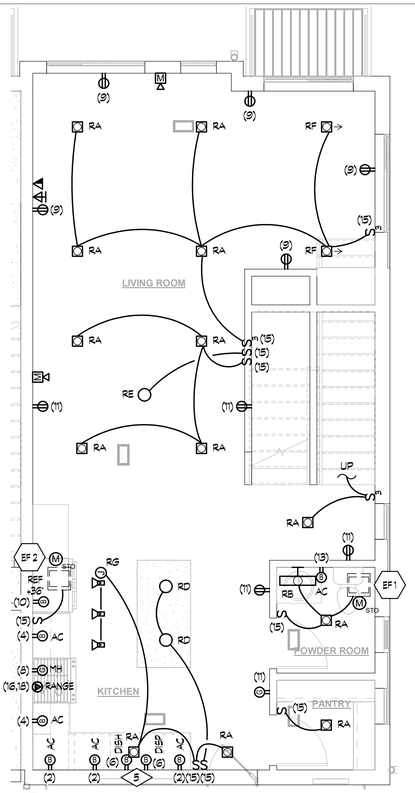
SEAL
COLORADO LICENSED PROFESSIONAL ENGINEER
38983
10/18/2023

DATE: 10.18.2023
DRAWN BY: TB, FS & GU
CHECKED BY: MV
PROJECT NO: 22082

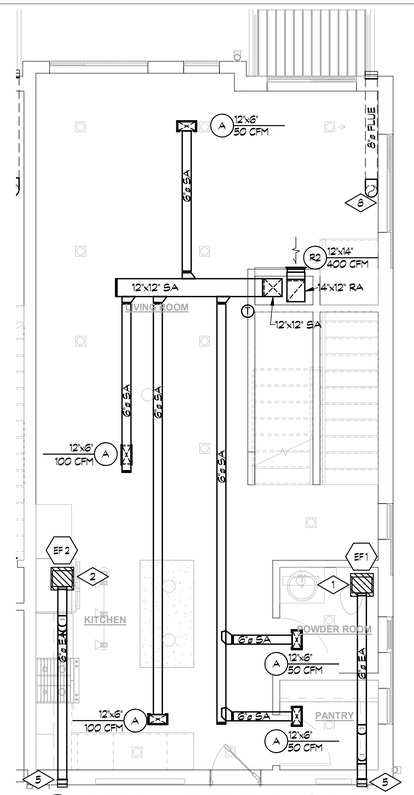
DRAWING NO:
**MEP0400**



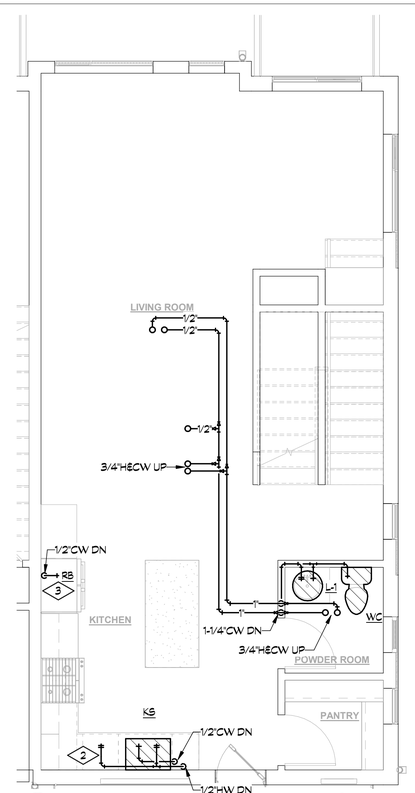
10/18/2023 9:59:42 AM



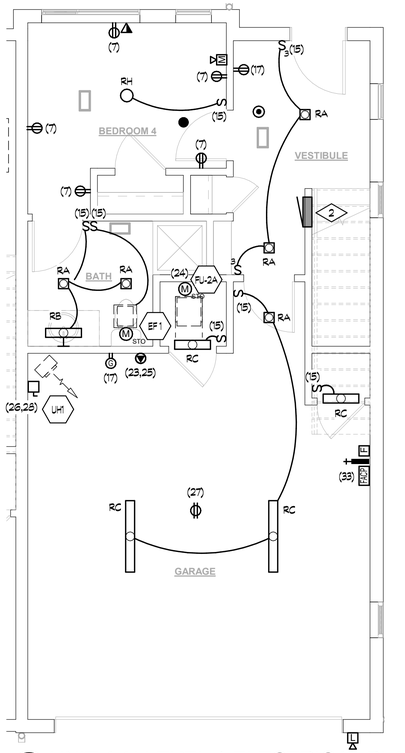

6 UNIT A-V LEVEL 2 ELECTRICAL PLAN
1/4" = 1'-0"



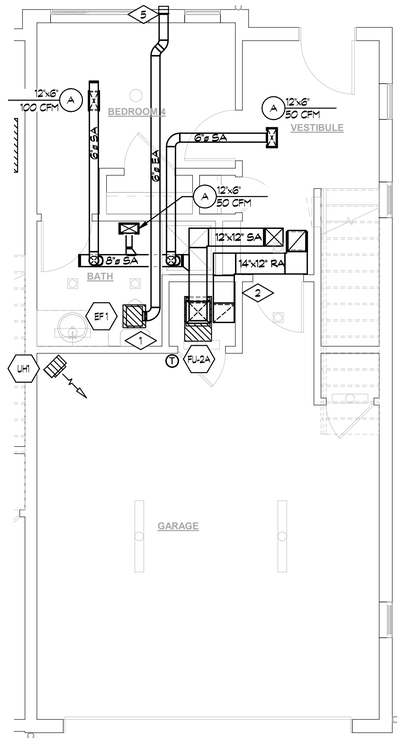

5 UNIT A-V LEVEL 2 HVAC PLAN
1/4" = 1'-0"



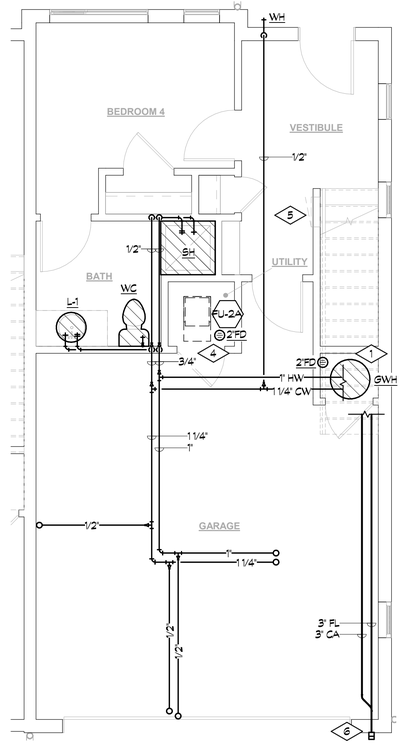

4 UNIT A-V LEVEL 2 PLUMBING PLAN
1/4" = 1'-0"




3 UNIT A-V LEVEL 1 ELECTRICAL PLAN
1/4" = 1'-0"




2 UNIT A-V LEVEL 1 HVAC PLAN
1/4" = 1'-0"




1 UNIT A-V LEVEL 1 PLUMBING PLAN
1/4" = 1'-0"

10/18/2023 9:59:43 AM

APPROVAL STAMPS:

REVIEWED FOR CODE COMPLIANCE
12/27/2023

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| 1 | 10.18.23 | ISSUED FOR PERMIT |

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CIVIL ENGINEER

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PO BOX 774943
STEAMBOAT SPRINGS, CO 80477

LANDSCAPE ARCHITECT

**NVISION DESIGN STUDIO, INC.**
677 25 ROAD
GRAND JUNCTION, CO 81505

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**ANTHEM STRUCTURAL ENGINEERS**
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STEAMBOAT SPRINGS, CO 80487

M.E.P. & F.P. ENGINEERS

**BOULDER ENGINEERING**
1717 15TH STREET
BOULDER, CO 80302

INTERIOR DESIGNER:

PROJECT LOCATION

**BASECAMP ROW TOWNHOMES**
1950 CURVE COURT
STEAMBOAT SPRINGS, CO 80487

DRAWING TITLE

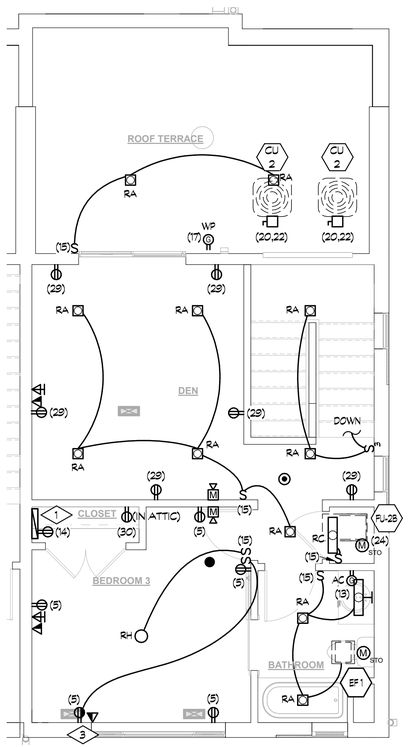
UNIT A-V ENLARGED MEP PLANS

SEAL

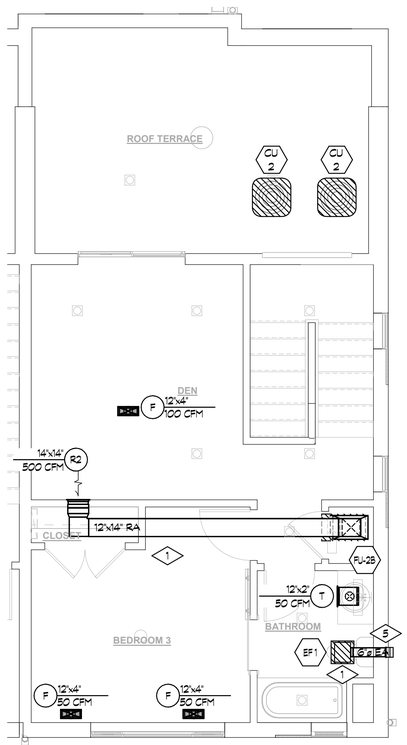
COLORADO LICENSED
MATTHEW VANDERWARD
38983
10/18/2023
PROFESSIONAL ENGINEER

DATE: 10.18.2023
DRAWN BY: TB, FS & GU
CHECKED BY: MV
PROJECT NO: 22082

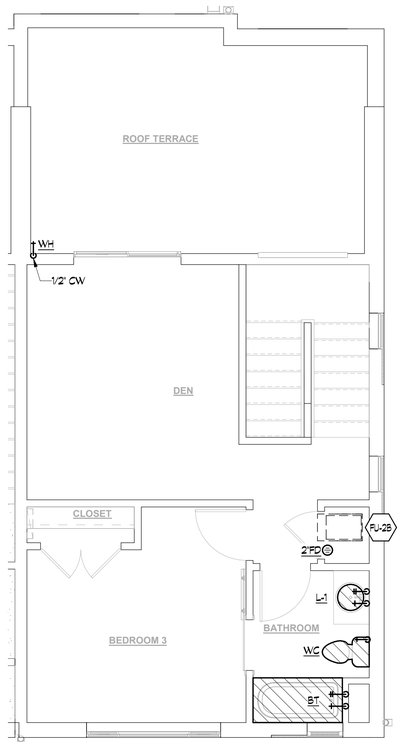
DRAWING NO:
**MEP0401**



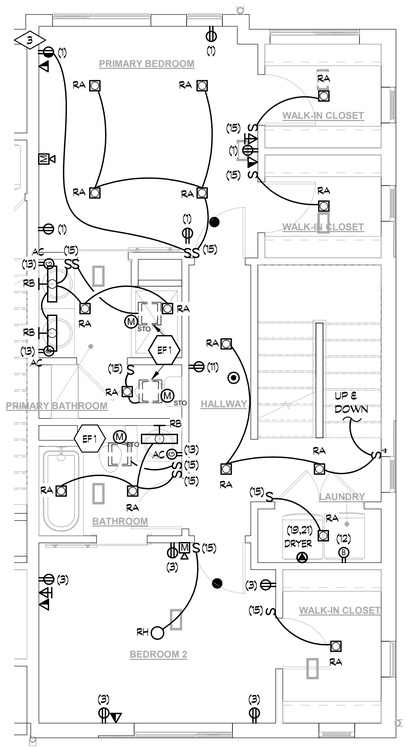

6 UNIT A-V LEVEL 4 ELECTRICAL PLAN
1/4" = 1'-0"



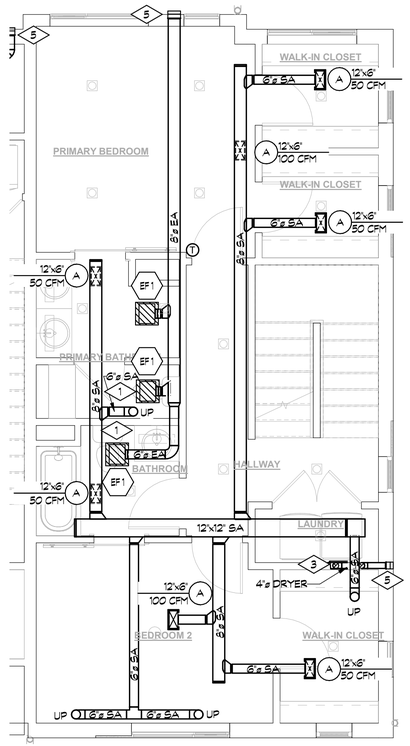

5 UNIT A-V LEVEL 4 HVAC PLAN
1/4" = 1'-0"



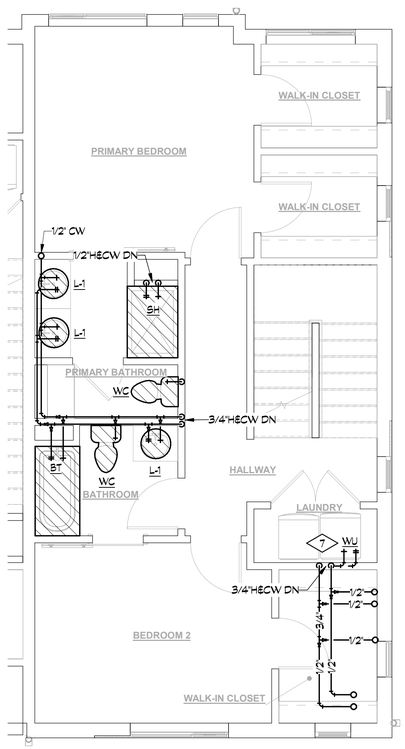

4 UNIT A-V LEVEL 4 PLUMBING PLAN
1/4" = 1'-0"




3 UNIT A-V LEVEL 3 ELECTRICAL PLAN
1/4" = 1'-0"




2 UNIT A-V LEVEL 3 HVAC PLAN
1/4" = 1'-0"




1 UNIT A-V LEVEL 3 PLUMBING PLAN
1/4" = 1'-0"

10/18/2023 9:59:44 AM

APPROVAL STAMPS:

REVIEWED FOR CODE COMPLIANCE
12/27/2023

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**NVISION DESIGN STUDIO, INC.**
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GRAND JUNCTION, CO 81505

STRUCTURAL ENGINEER

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430 YAMPA STREET
STEAMBOAT SPRINGS, CO 80487

M.E.P. & F.P. ENGINEERS

**BOULDER ENGINEERING**
1717 15TH STREET
BOULDER, CO 80302

INTERIOR DESIGNER:

PROJECT LOCATION

**BASECAMP ROW TOWNHOMES**
1950 CURVE COURT
STEAMBOAT SPRINGS, CO 80487

DRAWING TITLE

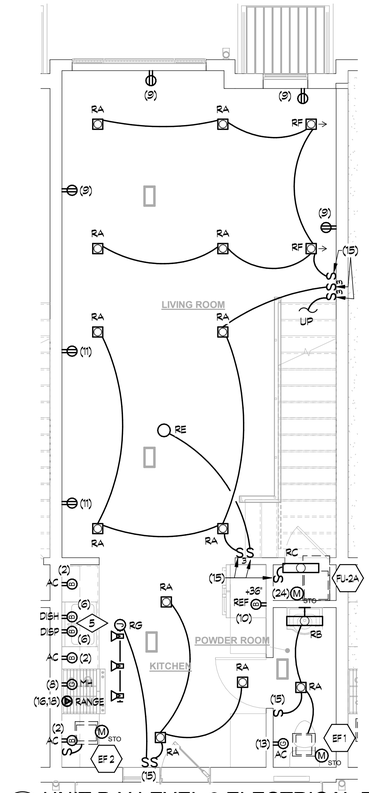
UNIT A-V ENLARGED MEP PLANS

SEAL

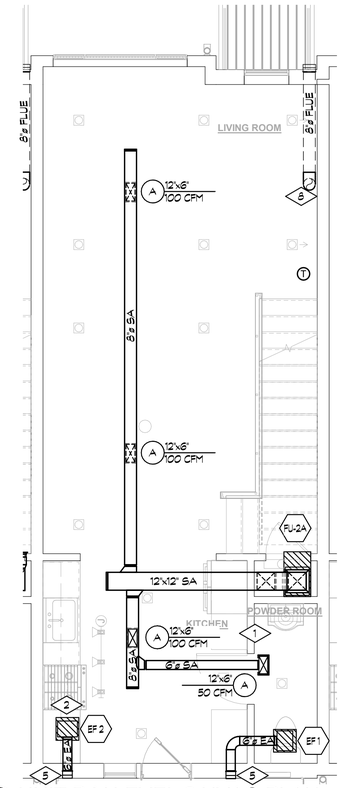
COLORADO LICENSED PROFESSIONAL ENGINEER
38983
10/18/2023

DATE: 10.18.2023
DRAWN BY: TB, FS & GU
CHECKED BY: MV
PROJECT NO: 22082

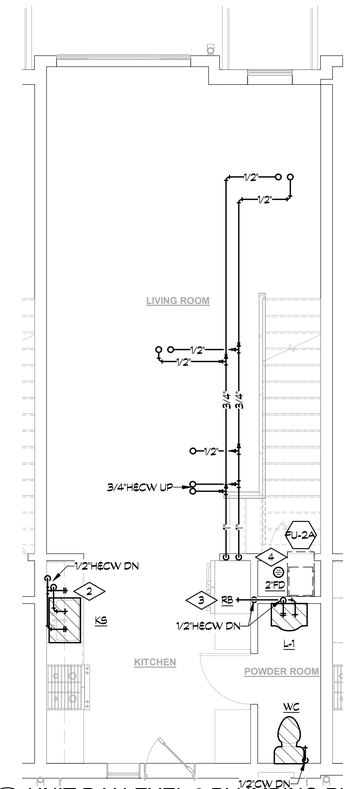
DRAWING NO:
**MEP0402**



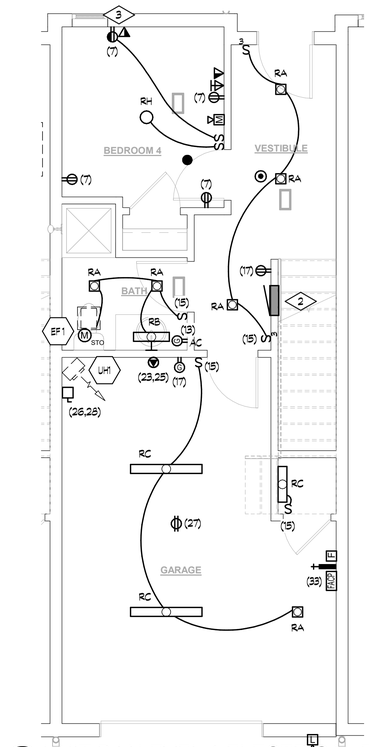

6 UNIT B-V LEVEL 2 ELECTRICAL PLAN
1/4" = 1'-0"



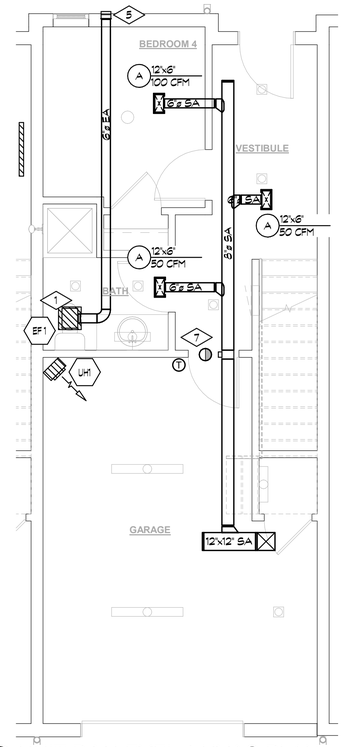

5 UNIT B-V LEVEL 2 HVAC PLAN
1/4" = 1'-0"



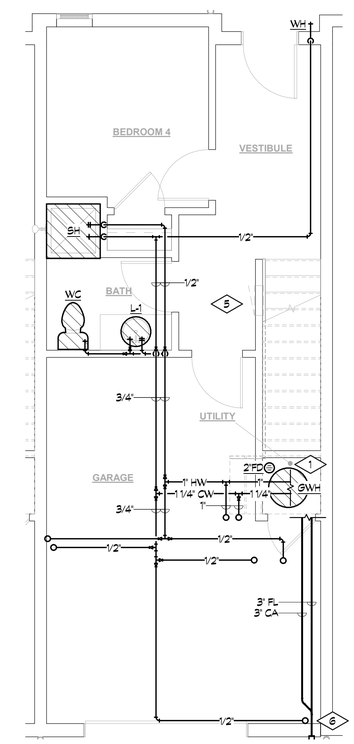

4 UNIT B-V LEVEL 2 PLUMBING PLAN
1/4" = 1'-0"




3 UNIT B-V LEVEL 1 ELECTRICAL PLAN
1/4" = 1'-0"




2 UNIT B-V LEVEL 1 HVAC PLAN
1/4" = 1'-0"




1 UNIT B-V LEVEL 1 PLUMBING PLAN
1/4" = 1'-0"

10/18/2023 9:59:48 AM

APPROVAL STAMPS:

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STRUCTURAL ENGINEER

**ANTHEM STRUCTURAL ENGINEERS**
430 YAMPA STREET
STEAMBOAT SPRINGS, CO 80487

M.E.P. & F.P. ENGINEERS

**BOULDER ENGINEERING**
1717 15TH STREET
BOULDER, CO 80302

INTERIOR DESIGNER:

PROJECT LOCATION

**BASECAMP ROW TOWNHOMES**
1950 CURVE COURT
STEAMBOAT SPRINGS, CO 80487

DRAWING TITLE

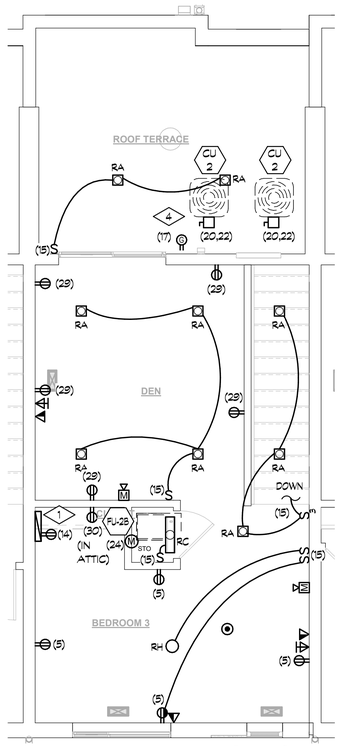
UNIT B-V ENLARGED MEP PLANS

SEAL

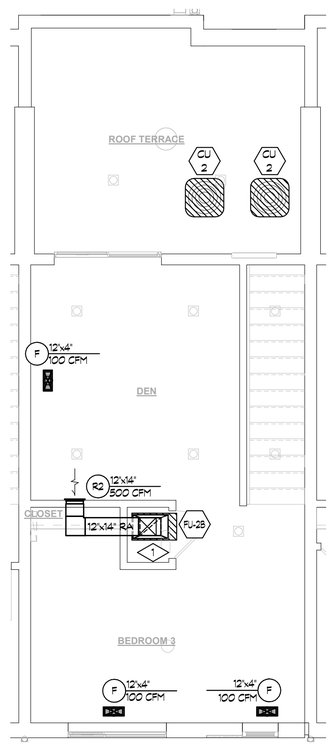
COLORADO LICENSED PROFESSIONAL ENGINEER
38983
10/18/2023

DATE: 10.18.2023
DRAWN BY: TB, FS & GU
CHECKED BY: MV
PROJECT NO: 22082

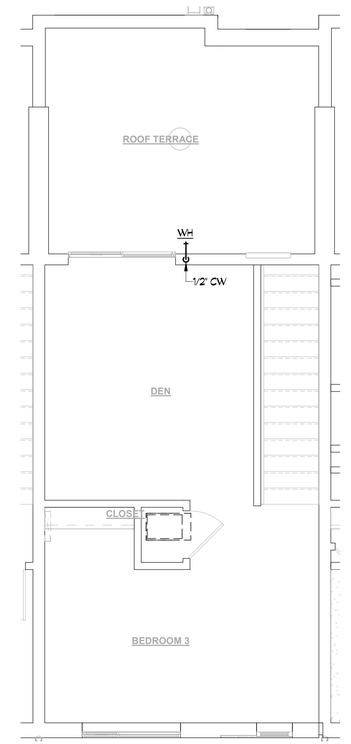
DRAWING NO:
**MEP0405**



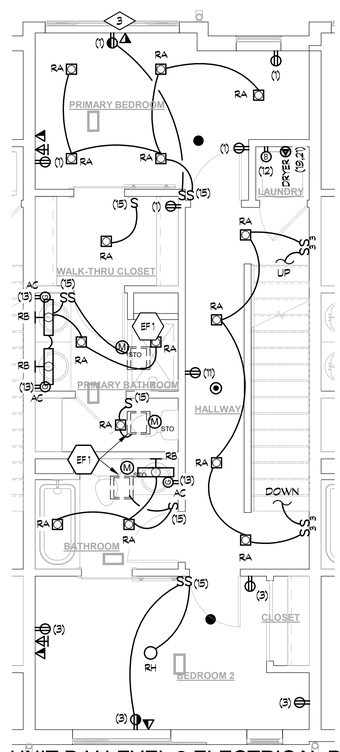

6 UNIT B-V LEVEL 4 ELECTRICAL PLAN
1/4" = 1'-0"



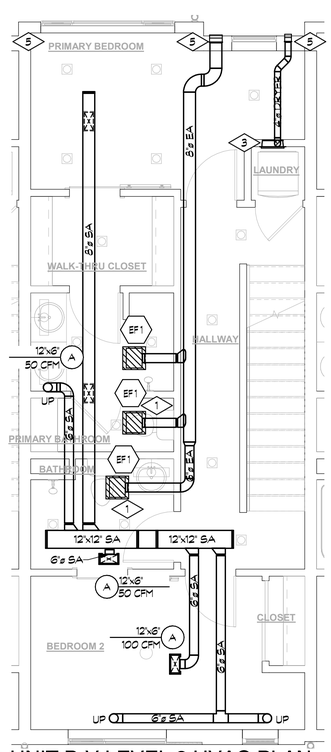

5 UNIT B-V LEVEL 4 HVAC PLAN
1/4" = 1'-0"



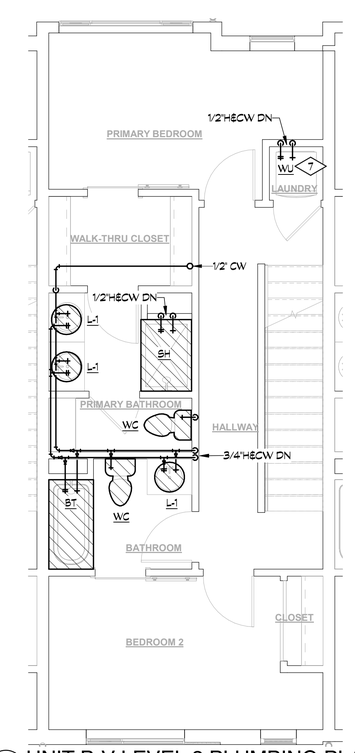

4 UNIT B-V LEVEL 4 PLUMBING PLAN
1/4" = 1'-0"




3 UNIT B-V LEVEL 3 ELECTRICAL PLAN
1/4" = 1'-0"




2 UNIT B-V LEVEL 3 HVAC PLAN
1/4" = 1'-0"




1 UNIT B-V LEVEL 3 PLUMBING PLAN
1/4" = 1'-0"

APPROVAL STAMPS:

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CIVIL ENGINEER

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STEAMBOAT SPRINGS, CO 80477

LANDSCAPE ARCHITECT

**NVISION DESIGN STUDIO, INC.**
677 25 ROAD
GRAND JUNCTION, CO 81505

STRUCTURAL ENGINEER

**ANTHEM STRUCTURAL ENGINEERS**
430 YAMPA STREET
STEAMBOAT SPRINGS, CO 80487

M.E.P. & F.P. ENGINEERS

**BOULDER ENGINEERING**
1717 15TH STREET
BOULDER, CO 80302

INTERIOR DESIGNER:

PROJECT LOCATION

**BASECAMP ROW TOWNHOMES**
1950 CURVE COURT
STEAMBOAT SPRINGS, CO 80487

DRAWING TITLE

UNIT B-V ENLARGED MEP PLANS

SEAL

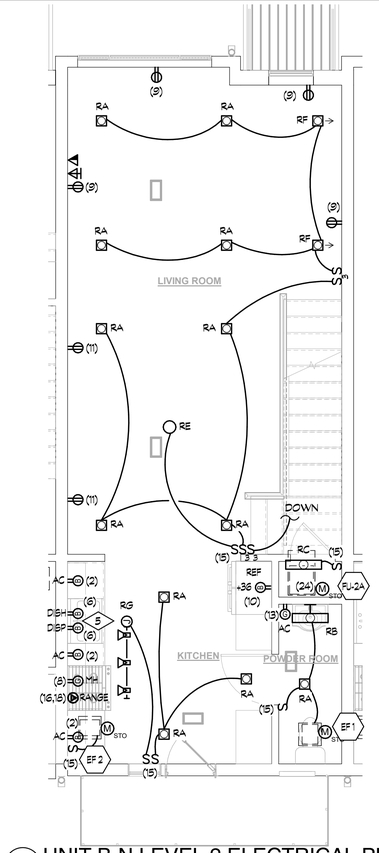
COLORADO LICENSED PROFESSIONAL ENGINEER
38983
10/18/2023
PROFESSIONAL ENGINEER

DATE: 10.18.2023
DRAWN BY: TB, FS & GU
CHECKED BY: MV
PROJECT NO: 22082

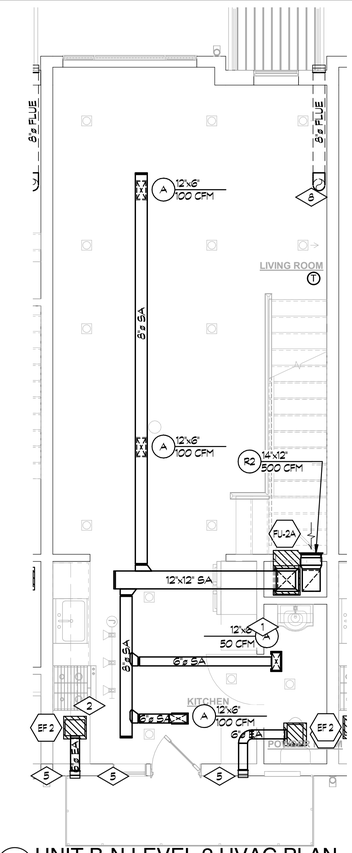
DRAWING NO: **MEP0406**



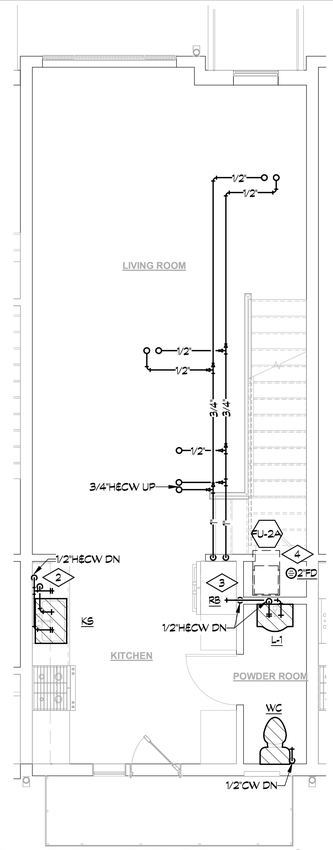
10/18/2023 9:59:53 AM



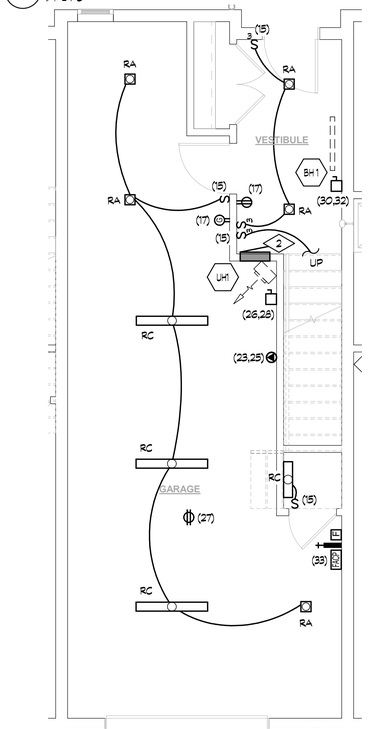

6 UNIT B-N LEVEL 2 ELECTRICAL PLAN
1/4" = 1'-0"



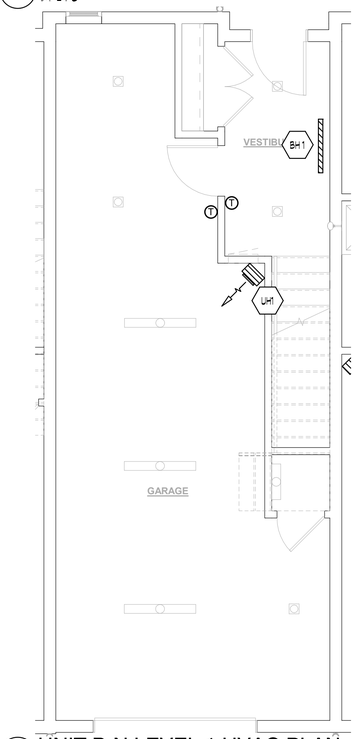

5 UNIT B-N LEVEL 2 HVAC PLAN
1/4" = 1'-0"



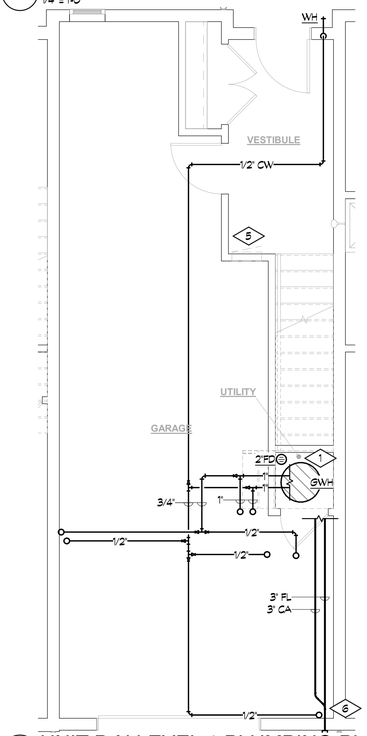

4 UNIT B-N LEVEL 2 PLUMBING PLAN
1/4" = 1'-0"




3 UNIT B-N LEVEL 1 ELECTRICAL PLAN
1/4" = 1'-0"




2 UNIT B-N LEVEL 1 HVAC PLAN
1/4" = 1'-0"




1 UNIT B-N LEVEL 1 PLUMBING PLAN
1/4" = 1'-0"

10/18/2023 9:59:58 AM

APPROVAL STAMPS:

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677 25 ROAD
GRAND JUNCTION, CO 81505

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STEAMBOAT SPRINGS, CO 80487

M.E.P. & F.P. ENGINEERS

**BOULDER ENGINEERING**
1717 15TH STREET
BOULDER, CO 80302

INTERIOR DESIGNER:

PROJECT LOCATION

**BASECAMP ROW TOWNHOMES**
1950 CURVE COURT
STEAMBOAT SPRINGS, CO 80487

DRAWING TITLE

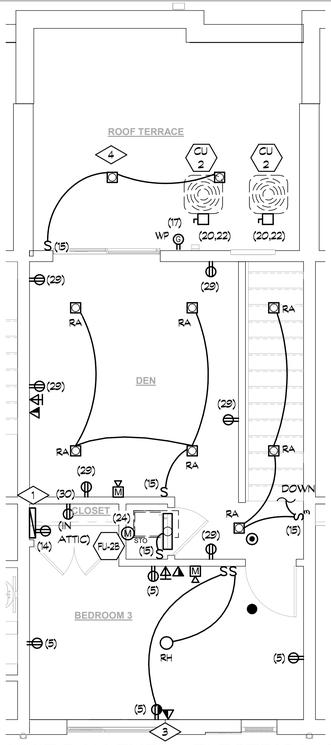
UNIT B-N ENLARGED MEP PLANS

SEAL

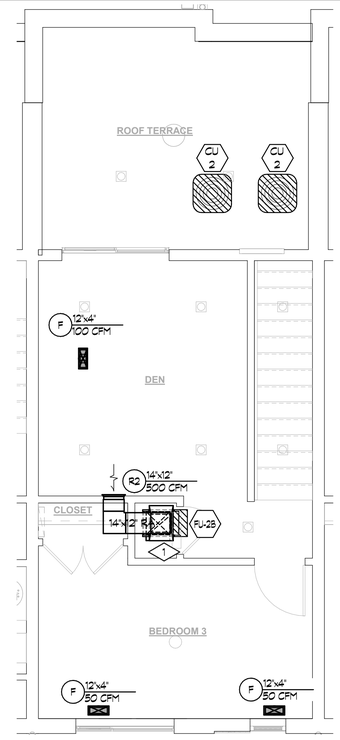
COLORADO LICENSED PROFESSIONAL ENGINEER
38983
10/18/2023

DATE: 10.18.2023
DRAWN BY: TB, FS & GU
CHECKED BY: MV
PROJECT NO: 22082

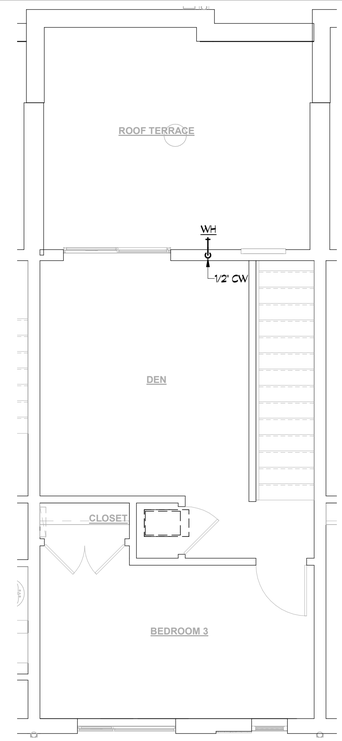
DRAWING NO: **MEP0407**



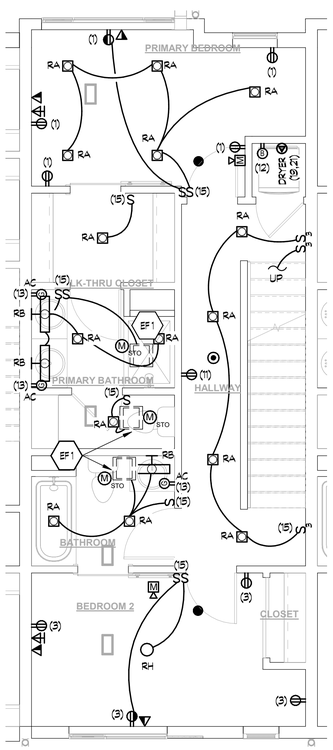

6 UNIT B-N LEVEL 4 ELECTRICAL PLAN
1/4" = 1'-0"



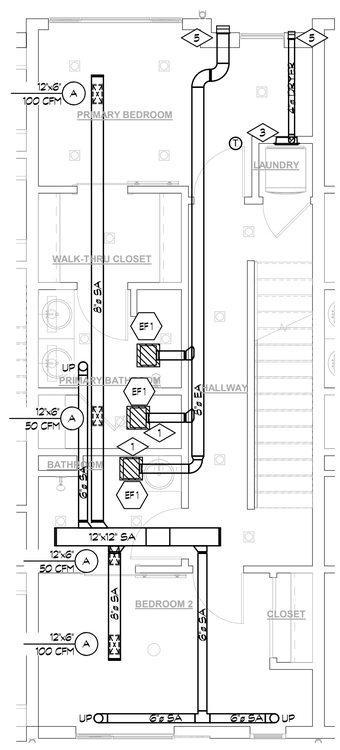

5 UNIT B-N LEVEL 4 HVAC PLAN
1/4" = 1'-0"



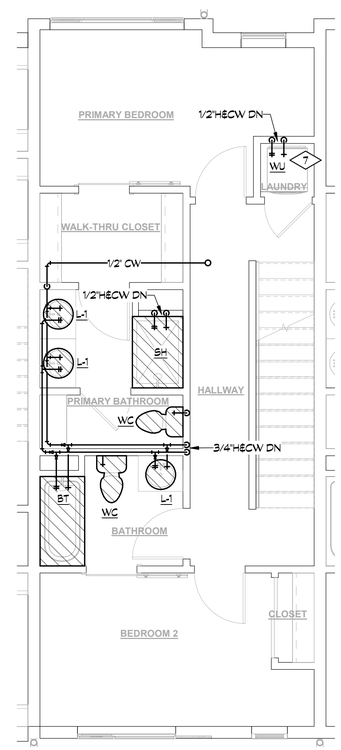

4 UNIT B-N LEVEL 4 PLUMBING PLAN
1/4" = 1'-0"




3 UNIT B-N LEVEL 3 ELECTRICAL PLAN
1/4" = 1'-0"




2 UNIT B-N LEVEL 3 HVAC PLAN
1/4" = 1'-0"




1 UNIT B-N LEVEL 3 PLUMBING PLAN
1/4" = 1'-0"

10/18/2023 10:00:03 AM

APPROVAL STAMPS:

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12/27/2023

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SUBMISSIONS & REVISIONS

OWNER

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GENERAL CONTRACTOR

CIVIL ENGINEER

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LANDSCAPE ARCHITECT

**NVISION DESIGN STUDIO, INC.**
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GRAND JUNCTION, CO 81505

STRUCTURAL ENGINEER

**ANTHEM STRUCTURAL ENGINEERS**
430 YAMPA STREET
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M.E.P. & F.P. ENGINEERS

**BOULDER ENGINEERING**
1717 15TH STREET
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INTERIOR DESIGNER:

PROJECT LOCATION

**BASECAMP ROW TOWNHOMES**
1950 CURVE COURT
STEAMBOAT SPRINGS, CO 80487

DRAWING TITLE

UNIT B-N ENLARGED MEP PLANS

SEAL

COLORADO LICENSED PROFESSIONAL ENGINEER
38983
10/18/2023

DATE: 10.18.2023
DRAWN BY: TB, FS & GU
CHECKED BY: MV
PROJECT NO: 22082

DRAWING NO:
**MEP0408**

**DIVISION 21 - FIRE SUPPRESSION**

**SECTION 21 00 00 - COMMON WORK RESULTS FOR FIRE SUPPRESSION**

1.01 WORK INCLUDED

A. The work included by this division of the specifications includes furnishing all labor, materials, equipment, and services, including minor items omitted but necessary to construct and install the complete systems described by the Contract Documents and specified below. "Contractor" refers to the Fire Sprinkler Contractor. The general conditions of the specifications apply and are included in this part of this section.

1. Fire sprinkler systems

1.02 SEE SECTION 22 05 00 FOR BASIC MATERIALS AND METHODS

**SECTION 21 13 00 - FIRE SUPPRESSION SPRINKLER SYSTEM**

2.01 WORK INCLUDED

A. Provide complete automatic fire protection systems, including but not limited to inside piping, sprinkler heads, valves, hangers and supports, sleeves, fire department connections and accessories, fire hose cabinets, valves. Entire installation shall be as required by the local authorities. Consult with local authorities to determine all local requirements before submitting a bid.
   1. The sprinkler system(s) shall be as follows: Wet system throughout.

B. Secure and pay for all necessary permits and certificates of inspection, and present to Owner with the signed certificates of final inspection.

C. Coordinate this work with all other trades so as to have a minimum of interference. INSTALLATION SHALL NOT BEGIN UNTIL DUCTWORK IS INSTALLED OR WRITTEN AUTHORIZATION IS MADE BY THE OWNER.

D. Accomplish all necessary cutting and patching for installation of piping and equipment, and provide all cutting as directed by Architect. Where necessary to cut chases in walls, reinforce walls as directed. After work is installed, patch holes to match original finish.

E. The system design including pipe sizing and location, configuration of branches and head connections, shall accommodate the installation of up/down heads in all areas which may or may not have a dropped ceiling.

F. RELATED WORK: Basic materials and methods: Section 22 05 00.

2.02 QUALITY ASSURANCE

A. Sprinkler equipment and installation to be approved by local fire authority.

B. Provide a complete automatic fire protection system as required. System shall be complete in all respects and in accordance with all applicable codes, ordinances, International Building Code, and NFPA Volume 2, Section 13 and NFPA Volume 2, Section 14.

C. The system shall be installed by a firm regularly engaged in the design and installation of automatic sprinkler systems in accordance with the requirements of the National Board of Fire Underwriters. Architect may require evidence to support the above qualifications and may reject any proposed installer who cannot show suitable experience.

D. All materials and equipment used in the installation of the sprinkler system shall be as approved in the Underwriters' Laboratories' list of inspected fire protection equipment and materials, or the Factory Mutual Laboratories' list of approved equipment and fire protection devices involving fire hazard, and shall be the latest product of the manufacturer.

2.03 SUBMITTALS

A. Submit shop drawings showing proposed layout of Fire Protection System, showing actual equipment to be used, complete with such dimensions as are required to accurately install the system, drawn to a minimum scale of 1/8" equals 1'0". Drawings shall be approved by Underwriters and local authority before submission to Architect and Engineer (four copies).

B. Shop drawings shall show all proposed routing of piping. Piping shall be installed to clear all other items of equipment and Architectural and Structural components within the building. Show all details required to make a complete installation from the shop drawings. After approval of drawings has been obtained, install the system exactly as shown. Obtain approval from Architect/Engineer to make any changes from shop drawings.

C. Shop drawings shall clearly show any piping that will not be concealed in the building structure

3.01 ACCEPTABLE MANUFACTURER'S

A. Equipment shall be by Grinnell, Viking, Star, Reliable, Globe, Crocker-Standards, Central, Potter-Roemer, or approved substitute.

3.02 INTERIOR FIRE SERVICE PLUMBING

A. Pipe shall be schedule 40, black seamless steel, ASTM A120, ASTM 53. Pipe 1-1/2" or larger may be schedule 10, grooved black steel pipe. Fittings may be style 74 or 75 "Victaulic" mechanical coupling system for 300 PSI working pressure.

B. Fittings and joints shall be as follows:
   1. 2-1/2" and larger : Welded with standard weight fittings or "Victaulic" fittings.
   2. 2" and smaller : Screwed with 150 lb. malleable iron fittings.

3.03 FIRE DEPARTMENT SIAMESE CONNECTION

A. Provide a cast brass flush wall mounted fire department connection, adequately sized for the application with threads, fittings, etc acceptable to the local fire department. Connection shall include drop clapper, pin lug hose thread swivels, pin lug plugs and chain. The connection shall be labelled as directed by the local Fire Department. All components shall be chrome-plated.

3.04 WATER FLOW ALARMS

A. Water flow indicator shall be electric, vane-type detector with two sets of normally open contacts and a time retard to prevent false alarms.

3.05 AUTOMATIC SPRINKLERS

A. Sprinklers shall have temperature ratings as required by NFPA Standard No. 13 for the sprinkler location. Verify exact head types in finished areas with Architect. Provide specific head types as follows. The following are catalog numbers of Grinnell.
   1. Finished areas (ceiling): Semi-recessed, polished chrome pendant heads. Heads shall be Model A with recessed closure.
   2. Finished areas (wall):Exposed sidewall (Universal Model A).
   3. Unfinished areas (ceiling): Exposed pendant or upright head, as required by the application (Universal Model A).
   4. Areas exposed to freezing temperatures: Dry pendant (Model F 960).

B. Provide steel sprinkler guards on heads, which are exposed to physical damage.

3.06 TAMPER SWITCH

A. Provide an electric supervisory monitor switch at the required valves. Grinnell Model F640 or as required.

3.07 HORN/LIGHT

A. Provide an electric combination horn/light, suitable for exterior application, rated for the appropriate voltage.

3.08 PIPING INSTALLATION

A. All piping shall be concealed wherever possible. Exceptions must be clearly marked on shop drawings and shall not be installed until approved by Architect.

B. If exposed, piping shall be installed in the most direct, straight, and least obtrusive manner possible, and as close to walls and ceilings as is consistent with good workmanship.

C. Install piping graded to low points and in manner to make it possible to test and empty entire system.

D. Pipe and fittings shall be inspected for soundness and cleaned of all dirt and other foreign matter prior to being installed. All damaged pipe and fittings shall be rejected. Heads shall be covered, and system shall be ready for painting.

E. Protect open pipe ends whenever work is suspended during construction, to prevent foreign bodies entering and lodging therein. Use cast iron or malleable iron caps, or other methods as approved by the Architect

3.09 VALVE IDENTIFICATION

A. Drain valves, test valves, and control valves shall be identified with a stamped metal tag indicating their use.

3.10 TESTING

A. A 1" inspector's test connection shall be installed at the farthest and most remote location in the system with discharge running to the exterior of the building.

B. All piping and equipment shall be tested and proved tight under a hydrostatic pressure of 150% of the main pressure or 200 psig, whichever is larger. The test shall be conducted for a six-hour continuous period, with not be more than 2 pounds of pressure loss during this period in any part of the system. Any leaks found shall be repaired and the pressure test repeated.

C. All tests shall be performed in the presence of the Architect or authorized representative of the Owner.

3.11 FLUSHING

A. Flush piping system thoroughly with clear water to placing automatic sprinkler system in operation.

3.12 SPRINKLER CABINET

A. Provide a reserve sprinkler cabinet with six spare sprinkler heads of each type used. Cabinet shall be equipped with two special sprinkler wrenches. Cabinet shall be a labeled, metal, wall-mounted type with red enamel finish and a rigid hinged and locked door. Two keys shall be provided.

**DIVISION 22 - PLUMBING**

**SECTION 22 05 00 - COMMON WORK RESULTS FOR PLUMBING**

1.01 WORK INCLUDED

A. The work included by this division of the specifications includes furnishing all labor, materials, equipment, and services, including minor items omitted but necessary to construct and install the complete systems described by the Contract Documents and specified below. "Contractor" refers to the Mechanical Contractor. The general conditions of the specifications apply and are included in this part of this section.
   1. Gas piping system
   2. Domestic hot and cold water systems
   3. Interior sanitary sewer system
   4. Interior storm sewer system and discharge

1.02 CODES AND REGULATIONS

A. Comply with state and local codes, and utility company regulations. Final interpretations will be made by the local inspection authority. The Contractor to verify the governance of the following Codes, including any local amendments and supplementary codes such as the Codes of the National Fire Protection Association:
   1. Building Code: 2018 International Building Code
   2. Plumbing Code: 2018 International Plumbing Code
   3. Mechanical Code: 2018 International Mechanical Code
   4. Fire Code: 2018 International Fire Code
   5. Gas Code: 2018 International Fuel Gas Code
   6. Energy Code: 2018 International Energy Conservation Code
   7. Electrical Code 2020 National Electrical Code

1.03 EQUIPMENT AND MATERIALS STANDARDS

A. Equipment and materials shall be new, UL-listed for the use intended, and free from damage or defect. They shall comply with the latest industry standards.

1.04 CONTRACT DRAWINGS

A. Illustrate the general design and extent of performance required. All dimensions and locations shall be taken from the Architectural drawings. Consult with Architectural plans and locate all ceiling equipment where indicated on reflected ceiling plans

1.05 SHOP DRAWINGS

A. Submit products data and/or shop drawings as required by the Architect for the following:
   1. Insulation
   2. Valves
   3. Plumbing fixtures and appurtenances.
   4. Pumps

B. Quality of specific equipment is established by manufacturer's catalog number. Alterations caused by any Substitution shall be accomplished at no additional expense to the Owner.

C. Manufacturers not listed may submit for acceptance as an "approved equivalent." Requests for an "equivalent" means "approved equivalent". Four copies of such submittal must be received by the Engineer seven (7) working days prior to bid date.

1.06 WARRANTY

A. The Contractor shall be responsible for the successful operation of mechanical systems, equipment, and materials installed under this Contract for a period of one year from the date of final acceptance. Defective equipment or materials shall be repaired or replaced at no expense to the Owner. Provide four complete service and maintenance calls spaced at equal intervals during the warranty period.

1.07 PRODUCT HANDLING AND CLEAN UP

A. Equipment shall be left clean and undamaged, to the satisfaction of the Owner. The General Conditions take precedence.

1.08 CUTTING AND REPAIRING

A. The contractor shall be responsible for all cutting, drilling, welding, and repair required for his portion of the work. Coordinate with the Architect. The General Conditions take precedence.

1.09 OPERATING AND MAINTENANCE DATA

A. Provide the Owner with operating and maintenance instructions (four copies) required for operation of all mechanical systems. Bind the written instructions in a notebook. The General Conditions take precedence. The manuals shall include the following items:
   1. Operating manual and spare parts list for each piece of equipment.
   2. Preventive maintenance schedule for lubricating and checking each piece of equipment.
   3. Instructions on who to call for service during the warranty period.

1.10 PERMITS

A. The contractor shall pay for all fees, taxes, secure permits, licenses, and inspections required for the project.

1.11 TEMPORARY SERVICES

A. Provide temporary water service for construction, as required by the General Contractor.

1.12 COORDINATION

A. Coordinate outlet device and equipment locations with the Architectural Plans and work of other trades. Locate on horizontal and vertical lines to avoid interference and to provide functional use of all equipment. Verify electrical power characteristics before ordering equipment.

B. Electrical work performed by this contractor will conform to the standards of Division 26-28. Mechanical equipment motors and controls shall be furnished, set in place, and wired according with the following schedule unless otherwise noted or specified. MC = Division 21-23 EC = Division 26-28

| Item | Furn By | Set By | Power Wiring | Control Wiring |
|---|---|---|---|---|
| Combination starters | MC | EC | EC | MC |
| Equipment motors | MC | MC | EC | -- |
| Motor starters & O.L. relays | MC | EC | EC | MC |
| Disconnect switches | EC | EC | EC | MC |
| Thermal overload heaters (1) | EC | EC | EC | -- |
| Variable Speed Drives | MC | EC | EC | MC |
| Control relays/transformers | MC | MC | EC | MC |
| Temperature control panels | MC | MC | EC | MC |
| Temp. Controls conduit/wiring | MC | MC | -- | MC |
| Actuator and solenoid wiring | MC | MC | -- | MC |
| Pushbuttons & pilot lights | MC | MC | -- | MC |
| Room thermostats | MC | MC | -- | MC |
| Thermostats: line voltage | EC | EC | EC | -- |

C. The general guideline for the division between control (by MC) wiring and power wiring (by EC) is that power wiring carries the current which energizes a motor, control wiring does not. Control wiring may be 120V, which would be the responsibility of the MC. Control motors are wired by the MC.

D. Examine the site and become aware of existing conditions, utilities, and other issues affecting the satisfactory completion of the project.

1.13 DELIVERY, STORAGE, HANDLING

A. Provide necessary hauling and hoisting equipment. Protect the materials of this Division before, during, and after installation.

1.14 AS-BUILT DRAWINGS

A. Keep a current set of "as-built" drawings on site. Upon completion of the work, furnish engineer with a reproducible prints showing the "as-built" installation.

1.15 PROJECT SITE CONDITIONS

A. Visit the site to become familiar with location and the various conditions affecting the work, including existing utilities.

1.16 PLAN VERIFICATION

A. After completion of the bidding and selection process, prior to awarding the contract, the contractor must review and verify the contract documents in their entirety, including those of other trades. At this time, discrepancies, conflicts, omissions, etc in the contract documents must be documented. Alterations to the contract will be made at that time to include such items, as well other modifications which might be made by the Owner. After award of the contract, change orders caused by discrepancies, conflicts, omissions in the contract documents will not be allowed.

2.01 EXPANSION JOINTS, GUIDES, AND ANCHORS

A. Provide expansion joints or loops, guides, and anchors in piping to allow for expansion and contractions. Expansion joints shall be bellows type.

2.02 VALVES

A. Gate valves 2" and smaller shall be cast bronze, rising stem, solid disc, 200 PSI WOG

B. Ball valves 2" and smaller shall be cast bronze, full port, stainless steel ball, teflon sets, 400 PSI WOG.

C. Butterfly valves 2" and smaller shall be cast bronze, stainless steel disc, surrounding fluoroelastomer seal, 350 PSI WOG.

D. Check valves shall be horizontal, swing-cast bronze, bronze disc, 200 PSI WOG.

E. Valves shall be domestically manufactured by Milwaukee, Powell, Nibco, or equivalent.

2.03 RELIEF VALVES

A. Relief valves shall be all-bronze A.S.M.E. rated valves with external test levers, sized in accordance with the instructions of the appropriate manufacturer. Pipe discharge outside or to floor drain where possible and per code. Valves shall be manufactured by Watts or equivalent.

2.04 FLEXIBLE CONNECTORS

A. Connectors in piping shall be made with molded teflon or neoprene and nylon bellows, metal reinforcing rings, flanged ends and control rods, suitable for 40F to 200F temperature range and 125 lbs. pressure. Alternative shall be stainless steel inner hose with braided exterior sleeve for steel pipe or bronze inner hose with braided exterior sleeve for copper piping. Metra-flex Company, or equivalent.

2.05 SPECIALTIES

A. P/T Plugs: 1/4" diameter, brass with Nordel core, Sisco or equivalent.

B. Pressure Gauges: 4 1/2" dial type, aluminum housing. Ashcroft 1010 or equivalent.

C. Thermometers: 7" red reading mercury type. Palmer Instruments or equivalent.

2.06 ELECTRICAL

A. Lugs: Lugs for wiring connections shall be rated for copper and aluminum, and shall have a minimum rating of 75C.

B. Electric motors shall be rated for the appropriate application: wet location (TEFC); submersible; explosion proof, VFD's, etc.

2.07 ACCESS PANELS

A. The Mechanical Contractor shall furnish and install access panels where required for access to equipment. Access panels shall be adequately sized, of a type approved by the Architect and shall be fire or smoke-rated as required.

2.08 EXCAVATION AND BACKFILLING

A. Provide excavating and backfilling for Mechanical Work. Backfill in 12" layers, mechanically tamp to 95% proctor standards. Protect according to OSHA standards. The General Conditions take precedence. Verify the location of underground utilities before excavation; the contractor is responsible for any damage to underground utilities. Restore existing paving, curbs, sod, bushes, etc to match surroundings.

2.09 START-UP PROCEDURES

A. Follow manufacturer's recommended procedures in starting up the equipment; damage caused during start-up shall be replaced at no expense to the owner.

2.10 PIPING INSTALLATION

A. Install piping plumb and straight, parallel with walls and partitions. Conceal piping within structure whenever practical. Provide drain valves at all low points, vents at all high points, to allow complete drainage.

B. Material and methods per ASME, ASTM, ASA, AWS, and National Plumbing Code Handbook

C. Provide unions or flanges in piping connections to each valve, device, or item of equipment. Install each union or flange to permit the removal of parts and equipment for inspection or cleaning, without disconnecting any piping, except unions or flanges. Provide dielectric unions at locations with dissimilar materials.

D. Piping on the roof will be supported above the roof on roof pads. The pads shall be approximately 6"Wide by 6" high by the length as required. They shall be made of recycled rubber, rated for 500lbs/ft loading each. The pads will have galvanized steel "C" channel attached to the top, which can accommodate pipe clamps to secure the piping. This configuration of individual piping pads may be expanded to include two pads supporting a trapeze style support where multiple pipes are racked together. The pads are C-series manufactured by Cooper B-line, Erico, or approved equivalent.

2.11 HANGERS AND SUPPORTS

A. Support piping and equipment from the structure to prevent sagging, pocketing, swaying, and vibrations, and arranged to provide for expansion and contraction. Brackets, clamps, and hangers shall be steel, except copper hangers will be used with copper piping. Hangers supporting vibrating equipment shall be provided with spring isolators. Chain, perforated iron or wire hangers are not permitted. Hangers will be of a type acceptable to the Engineer, and shall have a capacity and spacing as required by code.

2.12 SLEEVES AND PLATES

A. Provide sleeves and inserts for all mechanical piping. The contractor shall be responsible for the cost of cutting and patching required for piping where sleeves and inserts were not installed or where incorrectly located. Sheetrock joint compound may be used to seal openings in non-rated walls(insulation to be continuous through walls.

B. Drill holes as required for the installation of hangers required for the mechanical work.

C. Where sleeves are placed in exterior walls below grade, the space between the pipe or conduit and the sleeves shall be made completely water-tight.

D. Seal all piping passing through fire-rated construction with approved material to maintain air-tight, fire-rated integrity, with a U.L. listed assembly compatible with the wall or floor assembly being penetrated.

2.13 PIPING TESTING

A. All piping systems shall be tested and witnessed by the Owner prior to concealment. Protect equipment and fixtures or equipment, isolating them during the test. DWV system shall be sealed and hold water without leaks for 24 hours. Domestic water and hydronic piping shall be air tested at 150 PSIG; natural gas piping shall be air tested at 30 PSIG. Air tests shall be held for one hour without loss of pressure.

2.14 CLEANING AND STERILIZATION

A. After testing, water piping systems shall be filled, operated for a sufficient length of time to completely remove all foreign material, and flushed.

B. Sterilize the domestic hot and cold water piping in accordance with the local health authority standards. Flush the systems with clear water until the residual chlorine content is equal to that of clear water.

C. Where there is no water treatment contractor sterilize piping system with chlorine for 24 hours to 50 PPM. Completely flush to less than 1 PPM. Local health authority standards take precedence.

2.15 FLEXIBLE PIPE CONNECTIONS

A. Provide flexible pipe connection suitable to connect to adjoining piping as specified for pipe joints. Use sized pipe units. Install flexible pipe connectors on pipes connected to equipment supported by vibration isolation.

2.16 PIPE IDENTIFICATION

A. After completion of the piping or insulation, paint stenciled descriptive abbreviations, including directional arrows, on piping at equipment and approximately every 25'.

**SECTION 22 07 00 - PLUMBING INSULATION**

1.01 QUALITY ASSURANCE

A. All insulation shall have a composite rating (insulation, jacket and adhesives) not exceeding flame spread 25 and smoke developed 50.

2.01 PIPE INSULATION FOR PIPING ABOVE GRADE

A. Insulation shall be closed-cell, elastomeric pipe insulation having a conductivity of 0.27 at 75 °F mean, with thicknesses as follows:

| Pipe Sizes | <1" | 1" to 1½" | > 1½" |
|---|---|---|---|
| Dom. cold piping | 1/2" | 1/2" | 1" |
| Roof drain sumps, & horiz. leaders | 1/2" | 1/2" | 1" |
| Dom. hot & recirc. Piping | 1-1/2" | 1-1/2" | 1-1/2" |

B. Insulation shall be Armacell "Armaflex" or equivalent by Johns-Mansville, Owens-Corning.

C. Exterior piping insulation will be painted with a white solvent based alkyd finish (Armaflex AB or equivalent), including all fittings, valves, etc. Jacket and insulation will be sealed weathertight and installed per manufacturers instructions. Where exposed to physical damage, exterior piping insulation will be covered with aluminum jacket, including all fittings, valves, etc. Jacket and insulation will be sealed weathertight and installed per manufacturers instructions.

D. All interior underground water (domestic and hydronic) piping shall be insulated with 1" Armaflex, except where noted.

2.02 PIPE INSULATION FOR PIPING BELOW GRADE

A. Insulation shall be closed-cell, elastomeric pipe insulation having a conductivity of 0.27 at 75F mean, with thicknesses as follows:

| Pipe Sizes | <1" | 1" to 1½" | > 1½" |
|---|---|---|---|
| Dom. cold piping | 1/2" | 1/2" | 1" |
| Dom. hot & recirc. Piping | 1" | 1" | 1" |

B. Insulation shall be Armacell "Armaflex" or equivalent by Johns-Mansville, Owens-Corning.

C. Exterior piping insulation will be painted with a white solvent based alkyd finish (Armaflex AB or equivalent), including all fittings, valves, etc. Jacket and insulation will be sealed weathertight and installed per manufacturers instructions. Where exposed to physical damage, exterior piping insulation will be covered with aluminum jacket, including all fittings, valves, etc. Jacket and insulation will be sealed weathertight and installed per manufacturers instructions.

D. All interior underground water (domestic and hydronic) piping shall be insulated with 1" Armaflex, except where noted.

3.01 PIPE(ELASTOMERIC)

A. Insulation shall be solid slip-on installed prior to connection. Butt joints shall be sealed with manufacturer's adhesive. Where slit seams must be installed, seal the seam with manufacturer's adhesive. Fittings shall be insulated with meter-cut pieces of insulation according to manufacturer's instructions, or insulated with similar sheet insulation installed according to manufacturer's instructions.

B. Provide wood blocks and metal hanger shields at support strap locations on horizontal pipe runs. Insulation will not be interrupted for supports, etc.

**SECTION 22 10 00 - PLUMBING**

1.01 WATER SERVICE

A. Consult with local authorities to provide water service. Provide meter pit, meter yokes, valves, RPZ valves, PRV valves, etc. for complete installation. Connect to a point 5' from building. Coordinate exact point of connection with site contractor before bidding.

1.02 SANITARY SEWER CONNECTION

A. Consult with local authorities and connect to sewer main as required. Connect to a point 5' from building. Coordinate exact point of connection with site contractor before bidding.

2.01 DOMESTIC WATER SYSTEM PIPING

A. Domestic cold, hot, and recirculating hot water piping may be either copper, or PEX, as noted below:
   1. Copper piping:
      a. Above grade, piping shall be Type L, hard-drawn copper tubing with wrought copper fittings. Solder shall be lead-free.
      b. Below grade, piping shall be Type K, soft-drawn copper tubing with fittings only where specifically allowed by the architect. Where required, the fittings will be wrought copper. Solder shall be 95/5 tin/antimony, except underground, where it will be silver solder.
   2. PEX Tubing:
      a. Tubing shall be cross-linked polyethylene using the Engel method of cross-linking. The tubing shall be rated for 80PSI at 200F, and shall be manufactured according to ASTM F 876 and ASTM F 877.
      b. Fittings shall be APR(brass) "Pro-pex" style or equivalent. Manifolds may be copper, brass, or plastic, with balancing controls.
      c. Stub outs to be copper with brass shutoff valves. Stub outs to be properly secured to wall.
      d. Tubing in return air plenums, or other areas designed as air handling plenums, shall be installed to a flame rating of 25/50 according to ASTM E84, whether by spacing, insulation or other approved method.
      e. Tubing shall be as manufactured by Wirsbo or equivalent.

2.02 SOIL, WASTE, AND STORM PIPING

A. Soil, waste, and vent piping, and storm piping shall be schedule 40 solid core PVC conforming to ASTM D2665 and ASTM D1785 with solvent joints conforming to ASTMD2855, except as noted below. PVC buried below slab shall be installed in conformance with ASTM D2321:
   1. Hubless(No Hub), cast iron soil pipe conforming to CISPI 301 with stainless steel no-hub couplings conforming to CISPI 310 shall be used in return air plenums and other areas designed as air handling plenums, or where specifically required by local code. All cast iron soil pipe and fittings shall be marked with the collective trademark of the Cast Iron Soil Pipe Institute and be listed by the NSF International.

B. Soil, waste, and storm piping below grade 5' beyond the building may be PVC SDR 35, installed in conformance with ASTM 3034 and utilizing push-on joints.

C. Storm water piping shall be same as soil and waste piping when concealed and galvanized schedule 40 steel pipe when exposed to physical damage. Fittings shall be cast iron, drainage type.

2.03 PLUMBING FIXTURES AND TRIM

A. Provide plumbing fixtures as specified on the plans. Provide carriers, trim, bolts, caps, etc according to the manufacturer's instructions and as required for a complete installation. All fittings and appurtenances (p-traps, connections, etc) shall be brass; chrome plated brass where visible.

B. Provide carriers for wall hung or mounted fixtures such as water closets, lavatories, urinals, sinks, etc. The carriers shall be designed to fit in the wall structure available, and shall transmit the load to the floor. Fixtures will not be supported by the wall structure unless specifically indicated.

2.04 GAS PIPING

A. Above grade in accessible locations, gas piping shall be schedule 40, black iron pipe with threaded fittings. Fittings shall be made of malleable iron. Gas piping run in return plenums, where allowed by local code, shall have welded joints.

B. Regulators shall be Maxitrol, or equivalent, of size and capacity as required.

2.05 GAS WATER HEATER(SEALED COMBUSTION)

A. Water heater shall be as specified on the plans. Heaters shall be approved and listed by the American Gas Association as self-contained, vented water heaters. The tank shall be heavy-gauge, welded steel, glass-lined, foam insulated to conform to ASHRAE 90.1b-1992. The heater shall be rated for 150 PSI and shall have a five-year warranty. The power burner shall be sealed combustion, submerged with spiral internal flue. The controls shall be electronic microprocessor based with digital display and shall include high-limit control and safety shut off. The heater shall include two (2) magnesium anodes and a pressure and temperature relief valve. The heater will be furnished with integral heat traps. Where required by local code, provide ASME certification.

B. Water heater shall be provided with R 14 insulation. Where factory insulation does not meet insulation requirements, provide aftermarket insulated jacket as required to meet requirements.

C. Where flue is run thru uninsulated, unconditioned spaces (attics, crawlspaces, etc.), insulate the flue with R8 equivalent insulation.

D. The water heaters shall be manufactured by A.O. Smith, State, Polaris, Ruud or Bradford-White.

2.06 CONDENSATE NEUTRALIZER

A. Neutralizer shall be inline type made from corrosion resistant material with replaceable neutralization media. Neutralizer shall be of appropriate size and type for appliance served.

B. Manufacturer shall be Dayton, Axiom, or equivalent.

2.07 DOMESTIC RECIRCULATING PUMP

A. Pump shall be 2800 rpm, in-line, centrifugal oil-lubricated, sleeve-bearing pump with flanged piping connections, bronze body, plastic impeller, and having mechanical seals. Motors shall be non-overloading, open drip-proof type.

B. The pump shall be furnished with an automatic timer kit.

C. Manufacturer shall be Bell and Gossett, Paco, Taco, or approved equivalent.

3.01 DOMESTIC WATER SYSTEM

A. Provide drip cocks so that the entire system may be drained. Provide manual air vents at high points in the system where air may be trapped. Provide stops for all fixtures and appliances. Provide a full size ball valve on each branch serving a hose bib.

B. Provide swing or swivel joints on connections as required to prevent noise or vibration of the piping. Provide fixture stops at all fixtures, hose bibbs, wall hydrants, and Owner-furnished fixtures. Run all piping on warm side of building insulation. Pipe insulation is not considered freeze protection. Provide water hammer arrestors where required. Locate to be accessible or provide access panel.

3.02 SOIL, WASTE, AND STORM WATER PIPING

A. Lay piping true to line and grade so that sewer will have smooth and uniform invert throughout its length. Verify elevations of existing sewer before starting work.

B. Install a clean-out at the base of each soil stack, at the base of each interior rain-water conductor, at each change in direction, at intervals not over 50 feet interior of building, and every 100 feet exterior to building and elsewhere as shown on the drawings or required by Code. Make clean-outs same size as pipe service, except they need be no larger than 4". Set tops and covers flush with floors and walls. Wall covers shall be round polished stainless steel with centered stainless steel securing screw (Josam 58710). Floor cleanouts shall be flush, cast iron, ABS plug with Nikalloy cover(Josam 56000). Provide floor clamps at each floor for uniform support of stacks.

C. The entire drain waste and vent, and storm sewer systems shall be watertight and odorproof, including sealing of floor drains and sinks, closet rings, etc.

3.03 WATER HEATER INSTALLATION

A. Install water heaters per manufacturer's instructions. Provide 24 gauge, galvanized steel drain pan, piped with minimum ¾" drain, piped to an approved receptor with indirect waste connection per code.

B. Route the P/T relief valve full sized to approved receptor and discharge per code. Provide expansion device, tank or valve, as required by code, and allowed by the local jurisdiction.

C. Flue and combustion air ducts shall be provided by the mechanical contractor, unless otherwise noted. Where sealed combustion water heaters are used, the Plumbing Contractor shall install PVC flue and combustion air piping. This piping will be of the size and type recommended by the manufacturer, and use factory recommended discharge/intake fittings as shown on the plans.

D. Condensing water heaters shall utilize an inline condensate neutralizer. Provide PVC drain from water heater and/or flue with a minimum ½" drain, piped to an approved receptor with indirect waste connection per code. Verify installation details with manufacturer.

3.04 PLUMBING FIXTURES AND TRIM

A. Furnish and install a vacuum breaker at each hot and cold water service outlet to which a hose can be attached, including janitor's faucets.

B. Provide chrome-plated rigid or flexible supplies to fixtures with stops, reducers, and escutcheons. Insulate stops and supplies at handicapped sinks with Truebro lav guard or equivalent. Bag type covers are not allowed.

C. Provide chrome plated brass P-traps with slip fittings for all exposed drains. Insulate P-traps at handicapped sinks with Truebro lav guard or equivalent. Bag type covers are not allowed.

D. Flush valve handles, and flush tank handles, on handicapped water closets shall be located on the wide side of the stall for convenient access and as required by code.

E. Provide a flexible elastomeric sheet for flashing around all shower drains, roof drains, floor drains, floor sinks, etc except for slabs on grade. The membrane shall be a minimum 0.40 inch thick, made of chlorinated polyethylene, installed per manufacturer's instructions. The flashing membrane for roof drains, floor drains, etc shall be a minimum of 2'x2'. The flashing membrane for shower pans, service sink pans, etc shall have "pigs ear" folds in the corners, extending the membrane up at least 3" above the drain. The membranes shall be manufactured by Chloralloy or equivalent.

F. Mount fixtures the following heights above finished floor:
   1. Water closet : 14"-15" to top of bowl rim; Handicapped, 18" to top of bowl rim.
   2. Lavatory: 31" to top of basin rim; Handicapped : 32" to top of basin rim.
   3. Floor drains : In finished areas, ¼" - ½" below finished floor. In mechanical rooms and other unfinished areas, install at least 1" below floor, except where it would be a stumble hazard.

G. Rough-in fixture piping connections in accordance with the following table of minimum sizes or as required for particular fixtures.

| | HW | CW | Waste | Vent |
|---|---|---|---|---|
| Lavatories | 1/2" | 1/2" | 1-1/2" | 1-1/4" |
| Water Closet (tank) | -- | 1/2" | 3" | 2" |
| Floor drains | -- | -- | 2" | 1-1/2" |
| Hose bibs | -- | 3/4" | -- | -- |
| Wash Mach Unit | 1/2" | 1/2" | 2" | 1-1/2" |

3.05 GAS PIPING

A. Gas distribution system is based on a 6" W.C. natural gas pressure except where noted on plans. Provide all gas-fired equipment with gas pressure regulators or special orifices as required to operate at 5000 ft. elevation. Provide a gas cock and drip leg at each appliance.

B. Gas piping on roof shall be secured to uv resistant Polyethylene foam block; Erico "Pipe Pier". Provide rubberized sheet under pipe support.

C. Piping exposed outside shall be painted with an exterior type latex paint which matches the adjacent roof or wall.

D. Appliance connection piping to be per plans or same as appliance size, whichever is larger. Transition downstream of all shutoffs and regulators as close to appliance as possible when plans call for larger than appliance.

3.06 KITCHEN

A. Provide final connections to all kitchen equipment in accordance with manufacturer's instructions. Provide stops or shut-off valves for hot and cold water connection; plug cocks or quick- connect couplings for gas appliances. Indirect wastes shall be DWV copper, except at soda machines where plastic pipe shall be used.

APPROVAL STAMPS:

REVIEWED FOR CODE COMPLIANCE
12/27/2023

| No. | Date | Description |
|---|---|---|
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| 1 | 10.18.23 | ISSUED FOR PERMIT |

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CIVIL ENGINEER

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LANDSCAPE ARCHITECT

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STEAMBOAT SPRINGS, CO 80487

M.E.P. & F.P. ENGINEERS

**BOULDER ENGINEERING**
1717 15TH STREET
BOULDER, CO 80302

INTERIOR DESIGNER:

PROJECT LOCATION

**BASECAMP ROW TOWNHOMES**
1950 CURVE COURT
STEAMBOAT SPRINGS, CO 80487

DRAWING TITLE

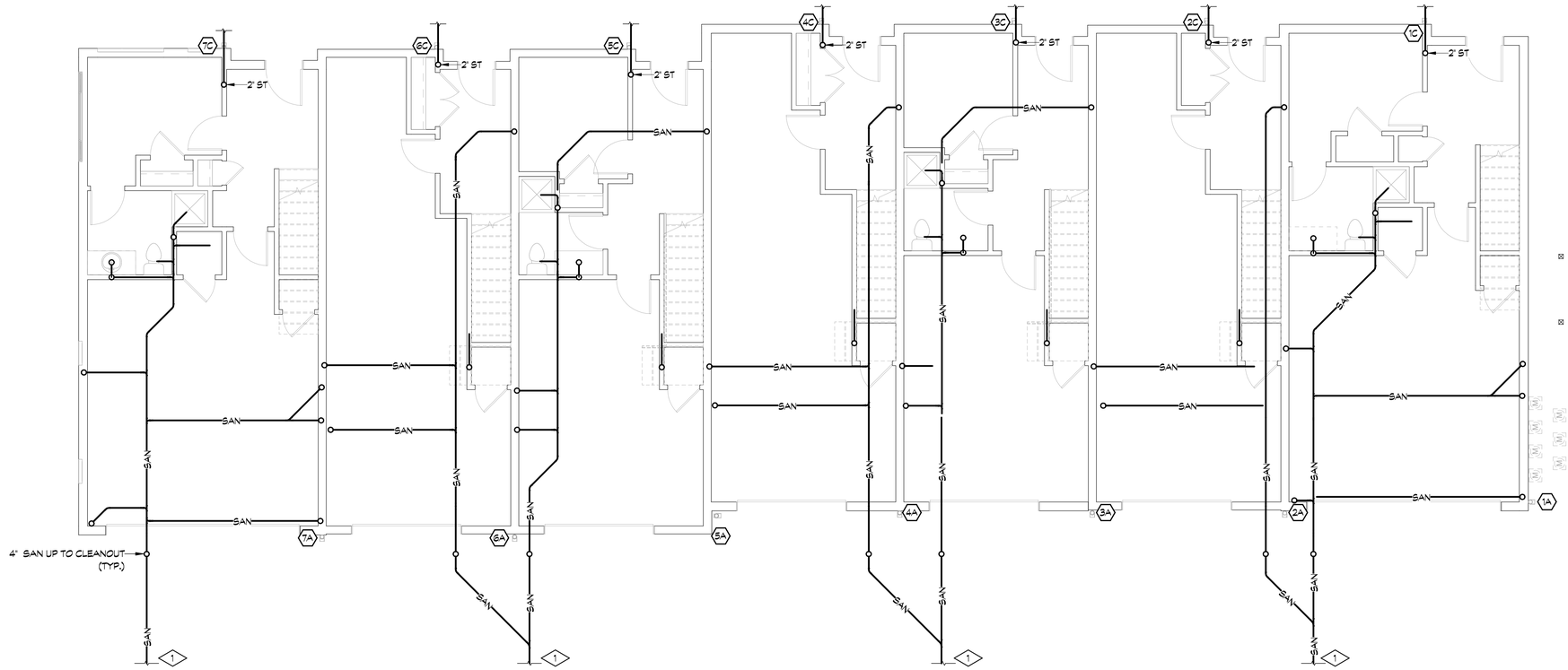
PLUMBING SPECIFICATIONS

SEAL

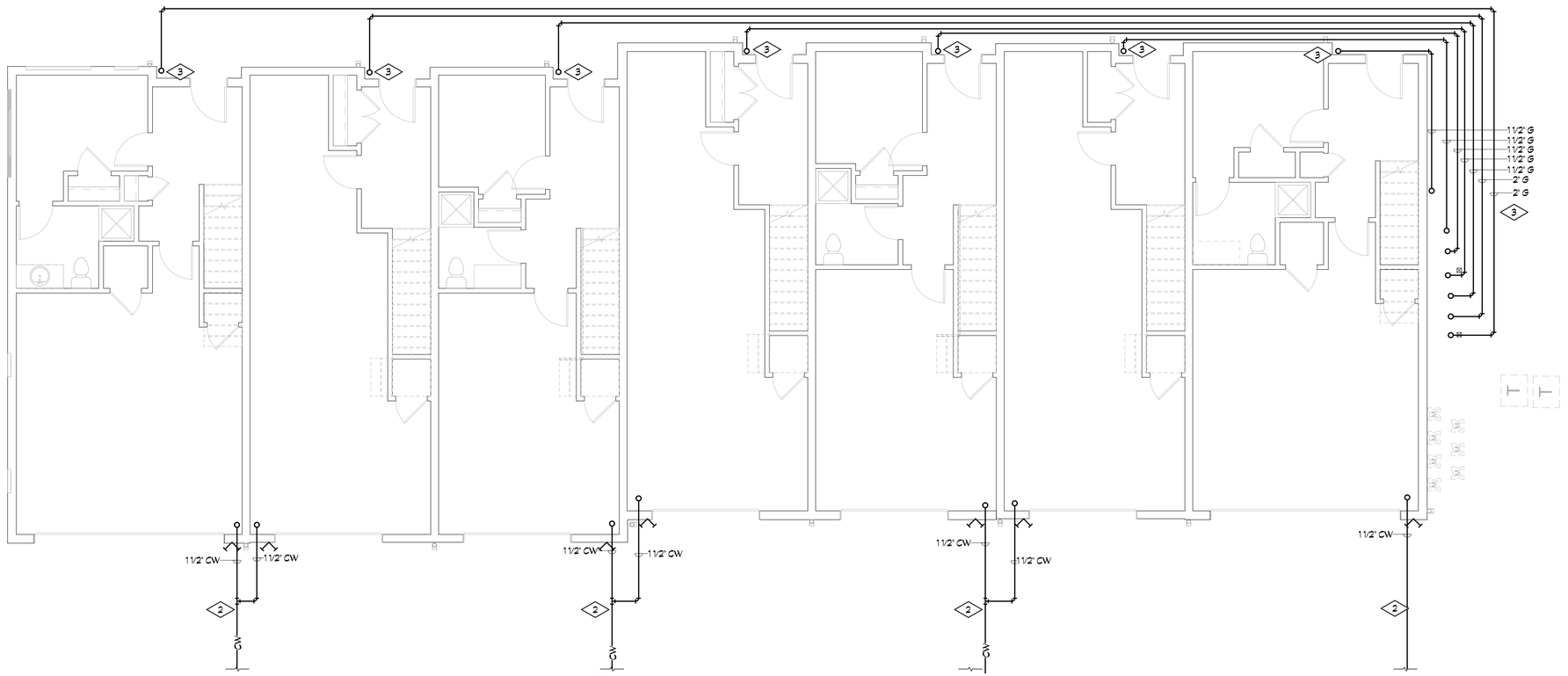
COLORADO LICENSED MECHANICAL ENGINEER 38983 10/18/2023 PROFESSIONAL ENGINEER

DATE: 10.18.2023
DRAWN BY: TB
CHECKED BY: MV
PROJECT NO: 22082

DRAWING NO:
**P0100-TH1**




TH1 UNDERGROUND SEWER PLAN
3/16" = 1'-0"




TH1 UNDERGROUND PIPING PLAN
3/16" = 1'-0"

## PLUMBING RISER LEGEND

REFER TO NOTED SHEETS FOR ADDITIONAL INFORMATION

(#) STORM RISER [SEE SHEET P0401-TH#]

## GENERAL NOTES

A. REFER TO UNIT PLANS, SHEETS MEP0400 - MEP0408 FOR DETAILS WITHIN EACH RESIDENTIAL UNIT.

B. DRAWINGS ARE DIAGRAMMATIC IN NATURE. FIELD VERIFY EXACT EQUIPMENT LOCATIONS, PIPE ROUTING, ROUGH-IN LOCATIONS AND DIMENSIONS WITH ALL OTHER BUILDING TRADES PRIOR TO BEGINNING WORK. COORDINATE ALL WORK REQUIRING OTHER TRADES FOR PROPER OPERATION OF EQUIPMENT.

C. GC TO FIELD VERIFY CONDITIONS PRIOR TO BUILDING AND COORDINATE BETWEEN TRADES TO AVOID CONFLICTS IN THE FIELD.

D. NOT ALL CLEANOUTS ARE SHOWN ON PLANS. PROVIDE CLEANOUTS AT BASE OF VERTICAL STACKS AND AT CODE REQUIRED INTERVALS. FLOOR CLEANOUTS SHALL BE FLUSH WITH SURROUNDING FLOOR WITH CARPET MARKERS IN CARPETED AREAS.

E. NOT ALL ISOLATION VALVES ARE SHOWN ON PLANS. PROVIDE ISOLATION VALVES AT BASE OF VERTICAL STACKS AND AT EACH UNIT WATER ENTRY. COORDINATE ANY AND ALL ACCESS PANELS WITH ARCHITECT.

F. REFER TO SCHEDULES, DIAGRAMS AND ISOMETRIC DIAGRAMS FOR ALL PIPE SIZES NOT SHOWN ON PLAN.

G. COORDINATE ALL PENETRATIONS THROUGH ROOF AND EXTERIOR WALLS WITH GENERAL CONTRACTOR.

## DETAIL NOTES THIS SHEET

1. EXTEND 4"SANITARY SERVICE APPROXIMATELY 5'-0" FROM BUILDING AND CONNECT TO CIVIL POINT OF CONNECTION. FIELD VERIFY EXACT LOCATION, PIPE ROUTING AND INVERT ELEVATION AT POINT OF CONNECTION.

2. EXTEND 1-1/2"COMBINED FIRE SPRINKLER & DOMESTIC SERVICE APPROXIMATELY 5'-0" FROM BUILDING AND CONNECT TO CIVIL POINT OF CONNECTION. FIELD VERIFY EXACT LOCATION, PIPE ROUTING AND INVERT ELEVATION AT POINT OF CONNECTION.

3. ROUTE GAS PIPING UNDERGROUND AROUND BUILDING FOOTPRINT TO UNIT ENTRY DOORS. **NO GAS PIPING TO BE ROUTED UNDER BUILDING SLAB.**

APPROVAL STAMPS:

**REVIEWED FOR CODE COMPLIANCE**
12/27/2023

| No. | Date | Description |
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BOULDER, CO 80302

INTERIOR DESIGNER:

PROJECT LOCATION

**BASECAMP ROW TOWNHOMES**
1950 CURVE COURT
STEAMBOAT SPRINGS, CO 80487

DRAWING TITLE

TH1 UNDERGROUND PLUMBING PLAN

SEAL

COLORADO LICENSED PROFESSIONAL ENGINEER 38983 10/18/2023

| | |
|---|---|
| DATE: | 10.18.2023 |
| DRAWN BY: | TB |
| CHECKED BY: | MV |
| PROJECT NO: | 22082 |

DRAWING NO:

**P0200-TH1**



10/18/2023 10:00:07 AM

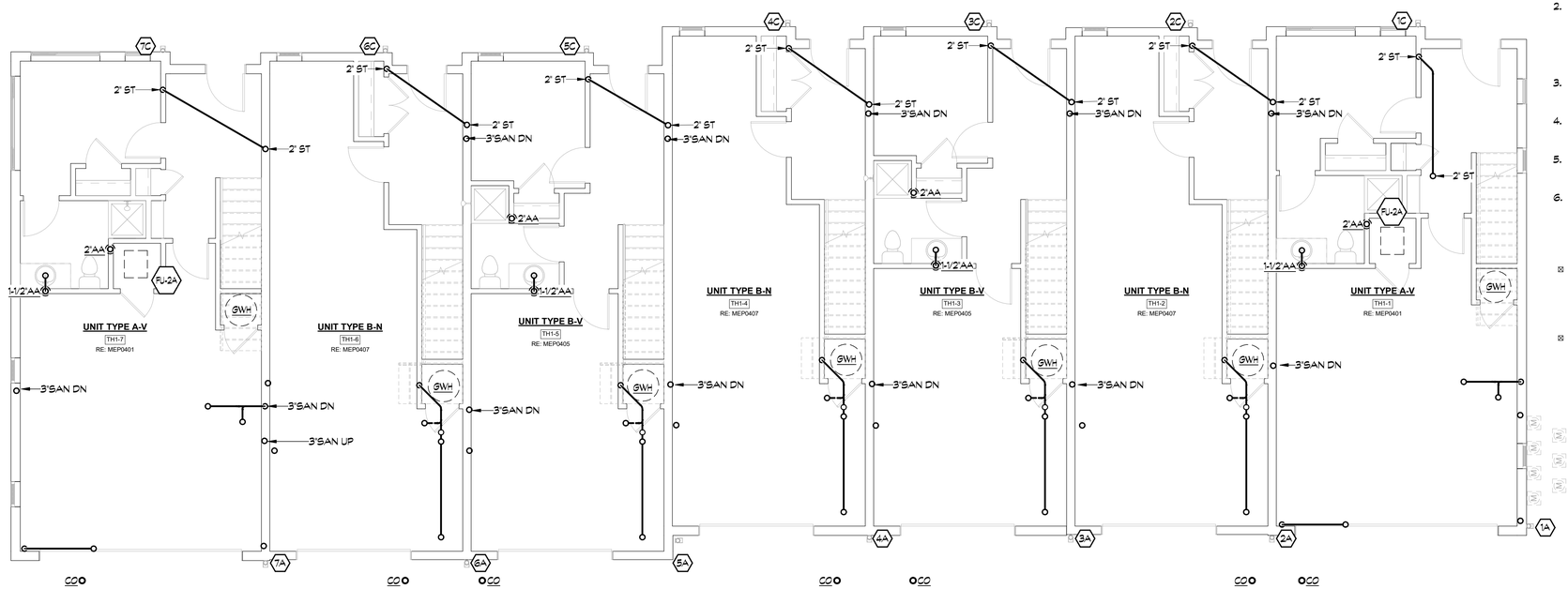
## PLUMBING RISER LEGEND

REFER TO NOTED SHEETS FOR ADDITIONAL INFORMATION

(#) STORM RISER [SEE SHEET P0401-TH#]

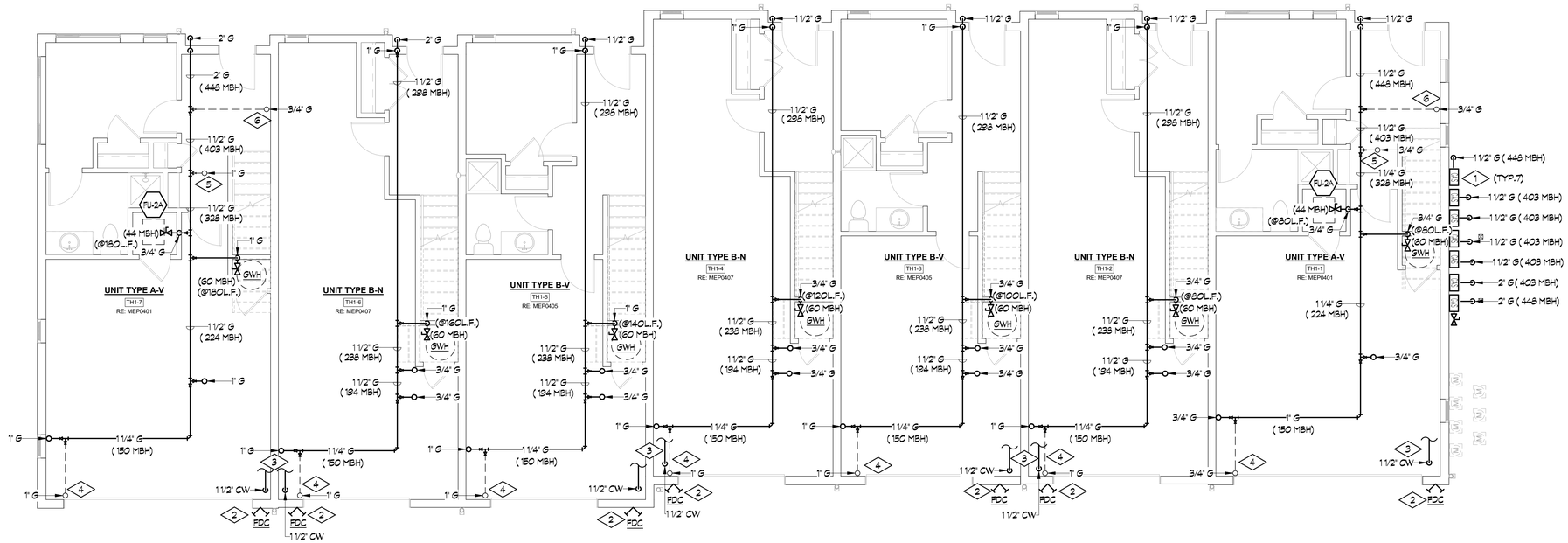
## DETAIL NOTES THIS SHEET

1. COORDINATE WITH LOCAL UTILITY COMPANY (ATMOS ENERGY) FOR NEW 7"W.C. GAS SERVICE FOR NOTED LOADS. COORDINATE EXACT METER LOCATION AND METER REQUIREMENTS WITH UTILITY COMPANY.
2. PRELIMINARY FDC LOCATION, FINAL LOCATION TO BE COORDINATED WITH LOCAL AHJ AND FIRE SPRINKLER CONTRACTOR. COORDINATE RELOCATION OF HORN/STROBE WITH FIRE ALARM CONTRACTOR IF REQUIRED.
3. COMBINED FIRE SPRINKER/DOMESTIC SERVICE BACKFLOW IN THIS AREA. SEE DETAIL ON SHEET P0401-TH1.
4. PROVIDE ADD-ALTERNATE FOR DASHED GAS PIPING TO SERVE OWNER UPGRADE 2ND FLOOR TERRACE OPTION.
5. PROVIDE ADD-ALTERNATE FOR DASHED GAS PIPING TO SERVE OWNER UPGRADE ROOF TERRACE OPTION.
6. PROVIDE ADD-ALTERNATE FOR DASHED GAS PIPING TO SERVE OWNER UPGRADE FIREPLACE OPTION.




## TH 1 LEVEL 1 SEWER PLAN

3/16" = 1'-0"




## TH 1 LEVEL 1 PIPING PLAN

3/16" = 1'-0"

10/18/2023 10:00:11 AM

APPROVAL STAMPS:

**REVIEWED FOR CODE COMPLIANCE**
12/27/2023

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BOULDER, CO 80302

INTERIOR DESIGNER:

PROJECT LOCATION

**BASECAMP ROW TOWNHOMES**
1950 CURVE COURT
STEAMBOAT SPRINGS, CO 80487

DRAWING TITLE

TH1 LEVEL 1 PLUMBING PLAN

SEAL

COLORADO LICENSED PROFESSIONAL ENGINEER 38983 10/18/2023

DATE: 10.18.2023
DRAWN BY: TB
CHECKED BY: MV
PROJECT NO: 22082

DRAWING NO:
**P0201-TH1**

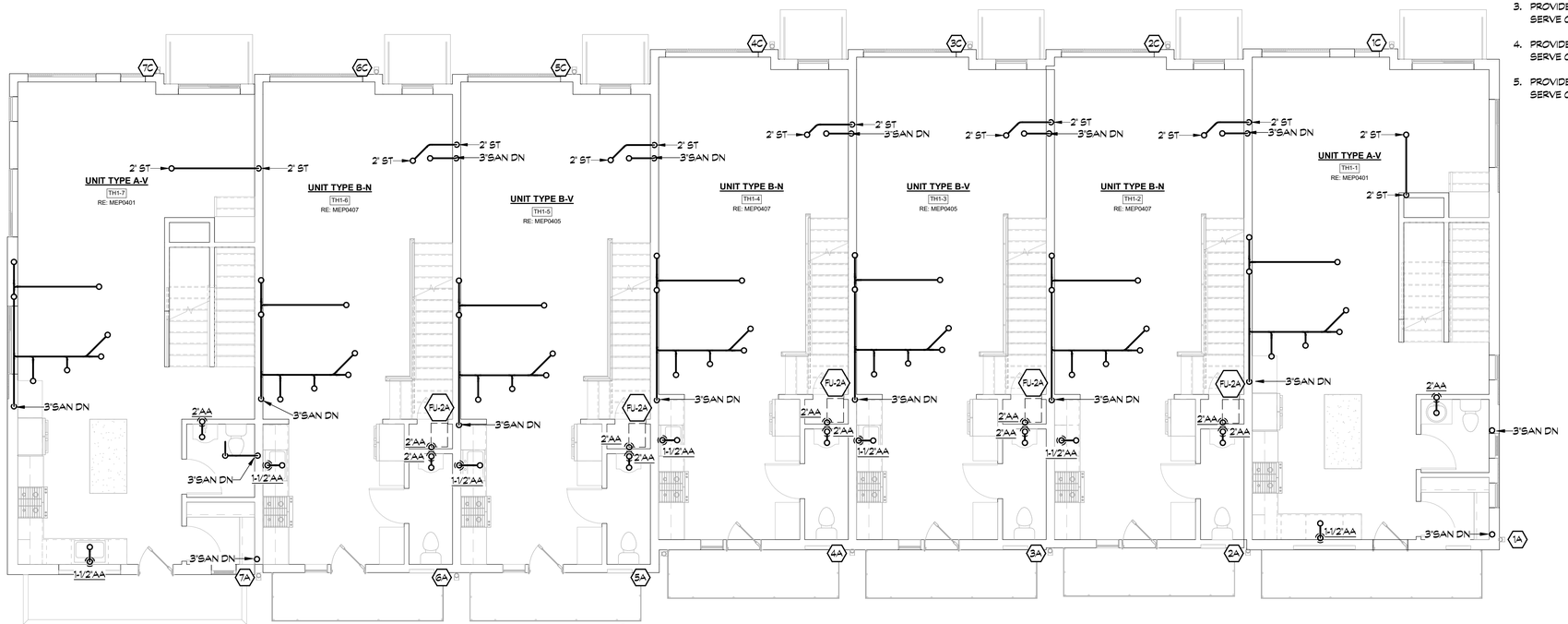
## PLUMBING RISER LEGEND

REFER TO NOTED SHEETS FOR ADDITIONAL INFORMATION

(#) STORM RISER [SEE SHEET P0401-TH#]

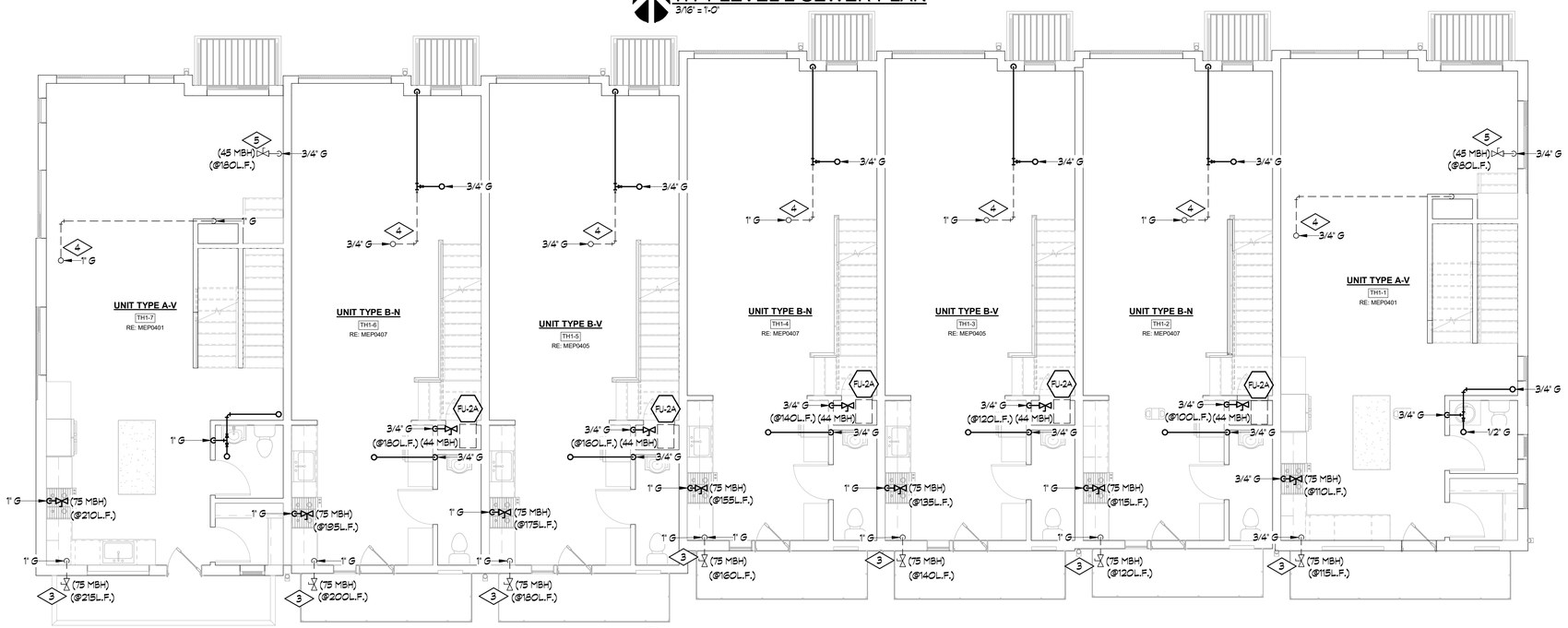
## DETAIL NOTES THIS SHEET

1. SEWER PIPING FOR FIXTURES ABOVE.
2. VENT PIPING UP TO LEVEL ABOVE.
3. PROVIDE ADD-ALTERNATE FOR DASHED GAS PIPING TO SERVE OWNER UPGRADE 2ND FLOOR TERRACE OPTION.
4. PROVIDE ADD-ALTERNATE FOR DASHED GAS PIPING TO SERVE OWNER UPGRADE ROOF TERRACE OPTION.
5. PROVIDE ADD-ALTERNATE FOR DASHED GAS PIPING TO SERVE OWNER UPGRADE FIREPLACE OPTION.




TH 1 LEVEL 2 SEWER PLAN

3/16" = 1'-0"




TH 1 LEVEL 2 PIPING PLAN

3/16" = 1'-0"

APPROVAL STAMPS:

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12/27/2023

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**NVISION DESIGN STUDIO, INC.**
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GRAND JUNCTION, CO 81505

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STEAMBOAT SPRINGS, CO 80487

M.E.P. & F.P. ENGINEERS

**BOULDER ENGINEERING**
1717 15TH STREET
BOULDER, CO 80302

INTERIOR DESIGNER:

PROJECT LOCATION

**BASECAMP ROW TOWNHOMES**
1950 CURVE COURT
STEAMBOAT SPRINGS, CO 80487

DRAWING TITLE

TH1 LEVEL 2
PLUMBING PLAN

SEAL

COLORADO LICENSED
MICHAEL VANDEN
38983
10/18/2023
PROFESSIONAL ENGINEER

DATE: 10.18.2023
DRAWN BY: TB
CHECKED BY: MV
PROJECT NO: 22082

DRAWING NO:
**P0202-TH1**



10/18/2023 10:00:15 AM

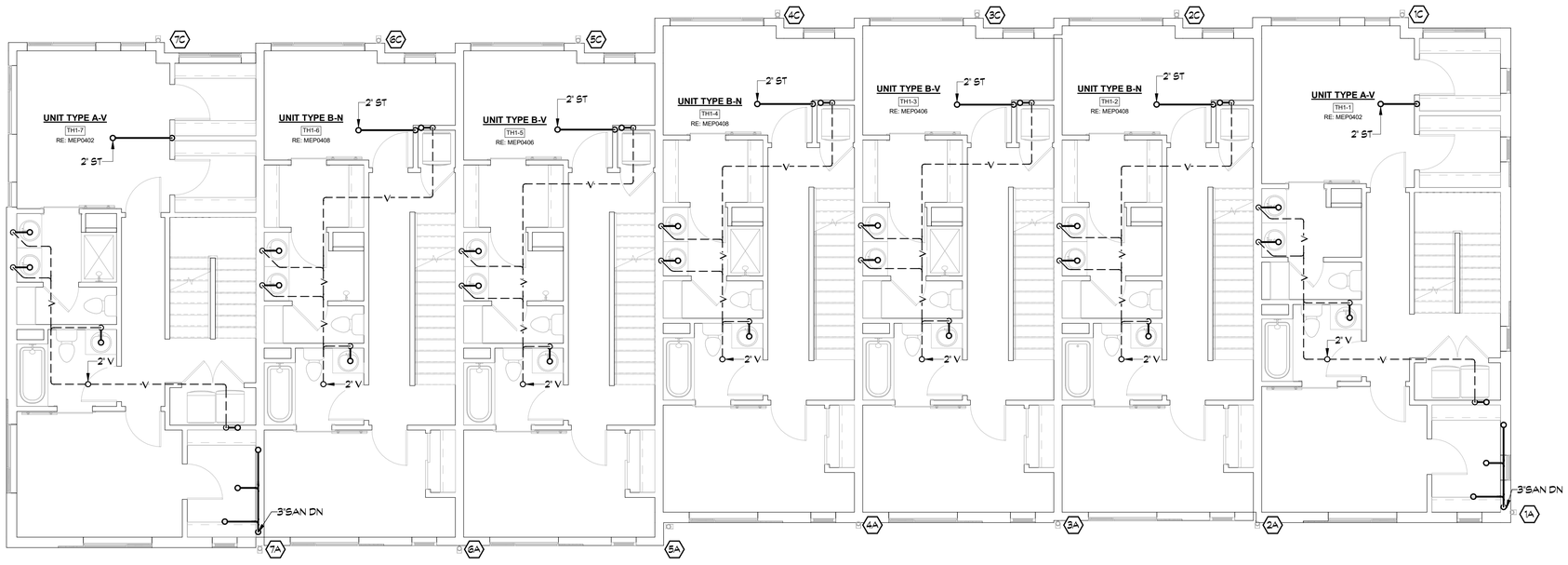
## PLUMBING RISER LEGEND

REFER TO NOTED SHEETS FOR ADDITIONAL INFORMATION

(#) STORM RISER [SEE SHEET P0401-TH#]

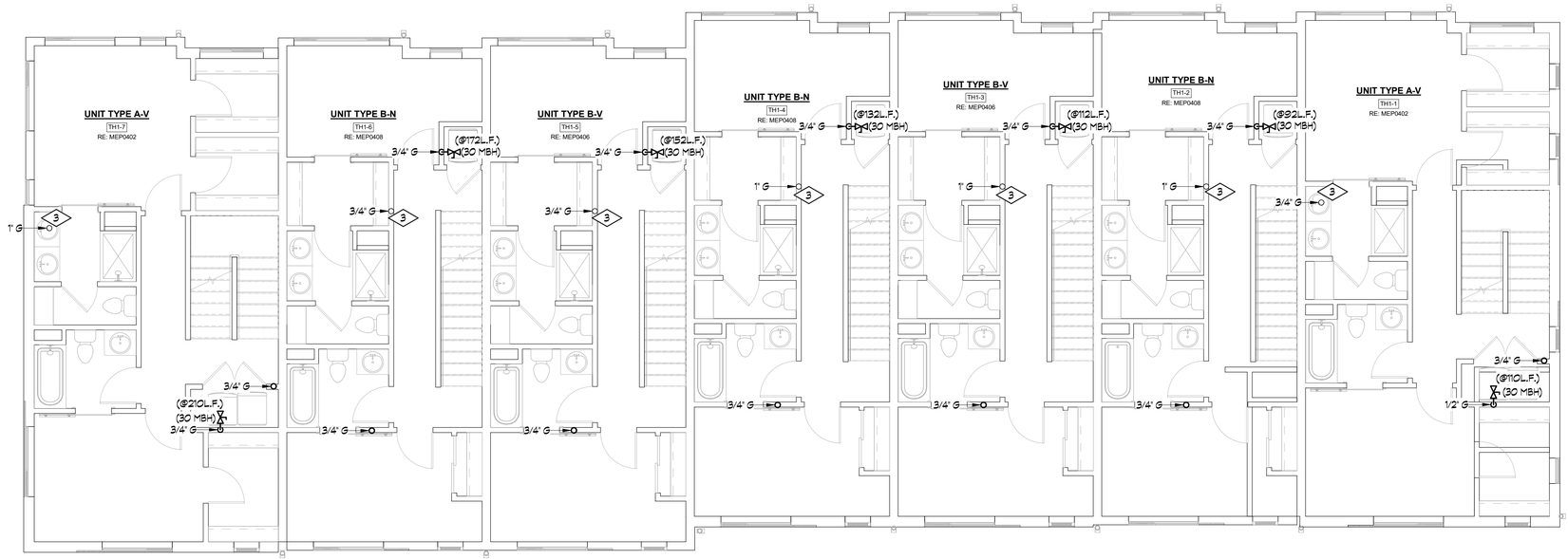
## DETAIL NOTES THIS SHEET

1. SEWER PIPING FOR FIXTURES ABOVE.
2. VENT PIPING UP TO LEVEL ABOVE.
3. PROVIDE ADD-ALTERNATE FOR DASHED GAS PIPING TO SERVE OWNER UPGRADE ROOF TERRACE OPTION.




## TH1 LEVEL 3 SEWER PLAN

3/16" = 1'-0"




## TH1 LEVEL 3 PIPING PLAN

3/16" = 1'-0"

10/18/2023 10:00:18 AM

APPROVAL STAMPS:

**REVIEWED FOR CODE COMPLIANCE**
12/27/2023

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**NVISION DESIGN STUDIO, INC.**
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GRAND JUNCTION, CO 81505

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STEAMBOAT SPRINGS, CO 80487

M.E.P. & F.P. ENGINEERS

**BOULDER ENGINEERING**
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BOULDER, CO 80302

INTERIOR DESIGNER:

PROJECT LOCATION

**BASECAMP ROW TOWNHOMES**
1950 CURVE COURT
STEAMBOAT SPRINGS, CO 80487

DRAWING TITLE

TH1 LEVEL 3 PLUMBING PLAN

SEAL

COLORADO LICENSED
38983
10/18/2023
PROFESSIONAL ENGINEER

DATE: 10.18.2023
DRAWN BY: TB
CHECKED BY: MV
PROJECT NO: 22082

DRAWING NO:
**P0203-TH1**

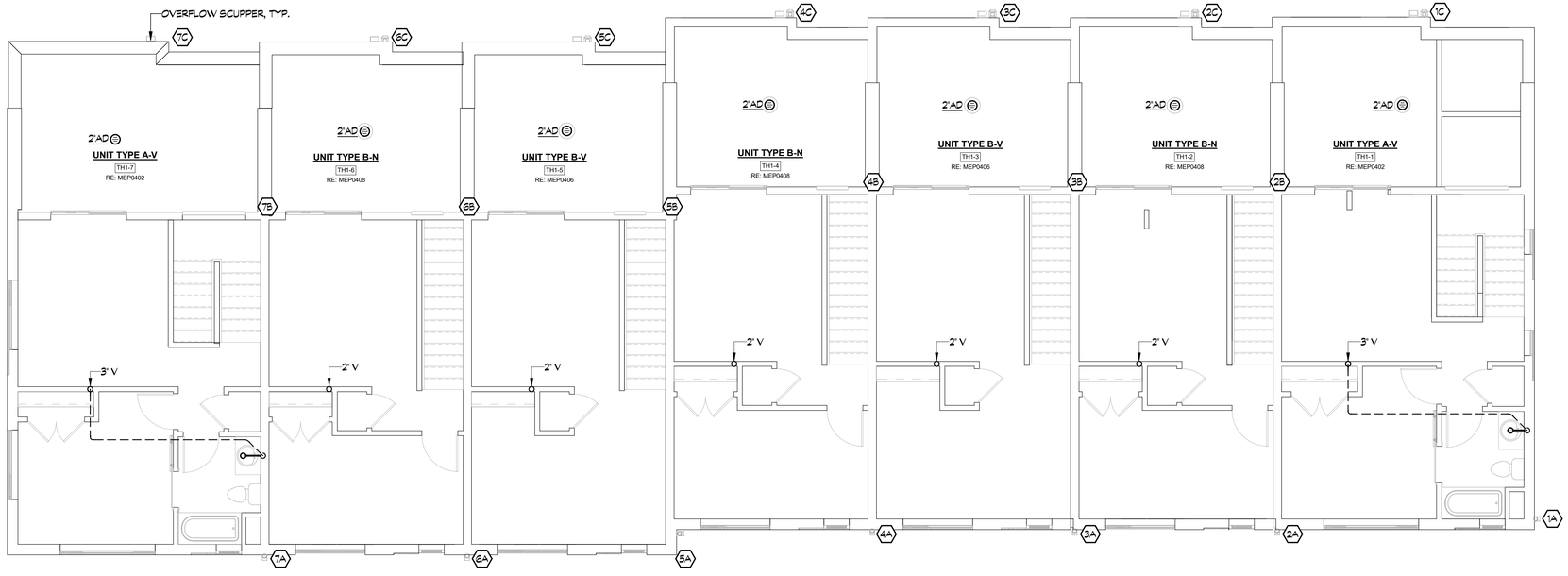
## PLUMBING RISER LEGEND

REFER TO NOTED SHEETS FOR ADDITIONAL INFORMATION

(#) STORM RISER [SEE SHEET P0401-TH#]

## DETAIL NOTES THIS SHEET

1. VTR TO BE LOCATED A MINIMUM OF 10'-0" FROM ANY BUILDING OPENING OR MECHANICAL EQUIPMENT AIR INTAKE. FIELD COORDINATE EXACT LOCATION AND ROOF PENETRATION WITH G.C.
2. PROVIDE ADD-ALTERNATE FOR DASHED GAS PIPING TO SERVE OWNER UPGRADE ROOF TERRACE OPTION.




## TH1 LEVEL 4 SEWER PLAN

3/16" = 1'-0"


## TH1 LEVEL 4 PIPING PLAN

3/16" = 1'-0"

10/18/2023 10:00:21 AM

APPROVAL STAMPS:

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12/27/2023

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M.E.P. & F.P. ENGINEERS

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BOULDER, CO 80302

INTERIOR DESIGNER:

PROJECT LOCATION

**BASECAMP ROW TOWNHOMES**
1950 CURVE COURT
STEAMBOAT SPRINGS, CO 80487

DRAWING TITLE

TH1 LEVEL 4
PLUMBING PLAN

SEAL

COLORADO LICENSED
MICHAEL DEAN VIVERO
38983
10/18/2023
PROFESSIONAL ENGINEER

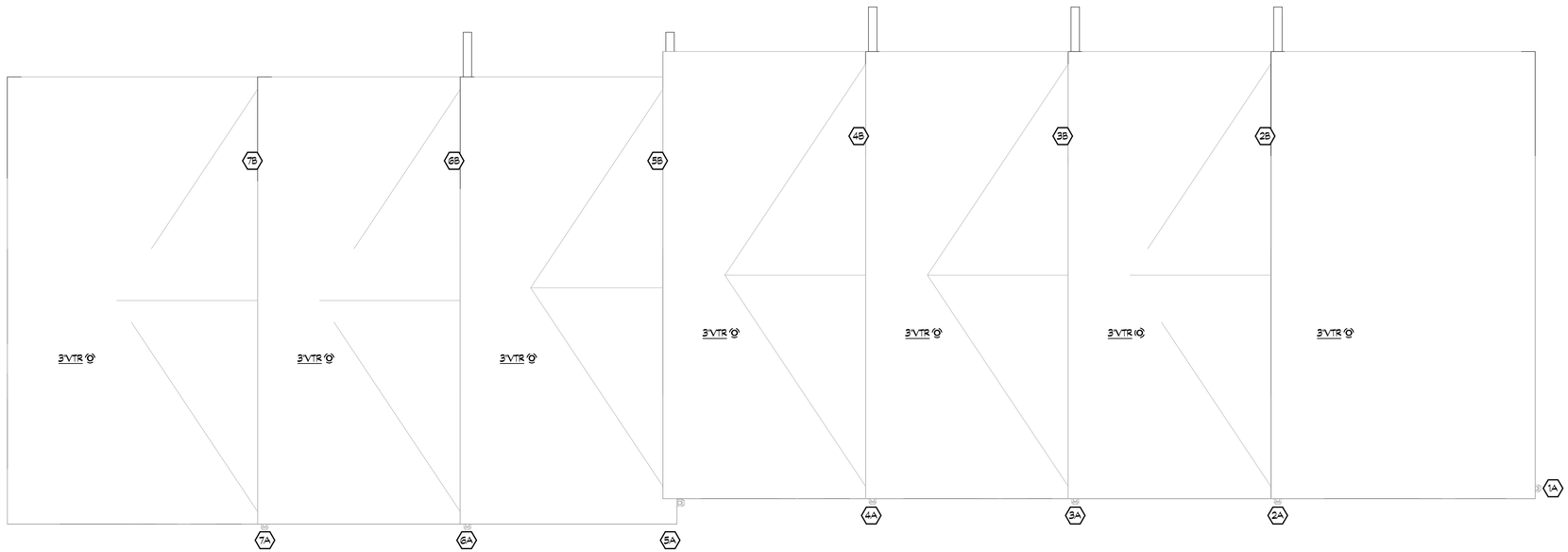
DATE: 10.18.2023
DRAWN BY: TB
CHECKED BY: MV
PROJECT NO: 22082

DRAWING NO:
**P0204-TH1**

## PLUMBING RISER LEGEND

REFER TO NOTED SHEETS FOR ADDITIONAL INFORMATION

(#) STORM RISER [SEE SHEET P0401-TH#]




## TH1 ROOF PLUMBING PLAN

3/16" = 1'-0"

APPROVAL STAMPS:

REVIEWED FOR CODE COMPLIANCE
12/27/2023

| No. | Date | Description |
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STEAMBOAT SPRINGS, CO 80487

M.E.P. & F.P. ENGINEERS

**BOULDER ENGINEERING**
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BOULDER, CO 80302

INTERIOR DESIGNER:

PROJECT LOCATION

**BASECAMP ROW TOWNHOMES**
1950 CURVE COURT
STEAMBOAT SPRINGS, CO 80487

DRAWING TITLE

TH1 ROOF LEVEL PLUMBING PLAN

SEAL

COLORADO LICENSED
38983
10/18/2023
PROFESSIONAL ENGINEER

DATE: 10.18.2023
DRAWN BY: TB
CHECKED BY: MV
PROJECT NO: 22082

DRAWING NO:

**P0205-TH1**

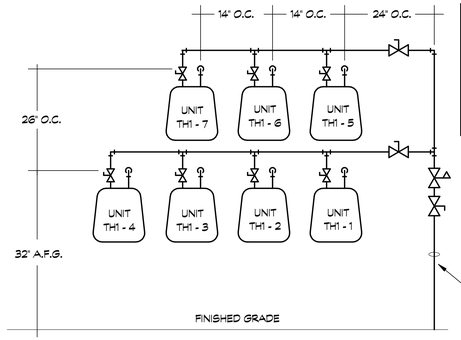
10/18/2023 10:00:22 AM

## LEGEND

- STORM - ABOVE FLOOR
- STORM - BELOW FLOOR
- SANITARY - ABOVE FLOOR
- SANITARY - BELOW FLOOR
- CV — CIRCUIT VENT
- CWV — COMBINATION WASTE AND VENT
- WV — WET VENT
- V — SANITARY VENT
- DOMESTIC COLD WATER
- DOMESTIC HOT WATER
- DOM. HOT WATER, RECIRCULATING
- G — GAS
- FS — FIRE SPRINKLER
- C — CONDENSATE
- S — STEAM
- PLUMBING POINT OF CONNECTION
- RISER UP
- RISER DOWN
- BALL VALVE
- BUTTERFLY VALVE
- GATE VALVE
- GAS COCK (GAS ONLY)
- BALANCING COCK
- CIRCUIT SETTER
- CHECK VALVE
- PRESSURE REDUCING VALVE
- HOSE BIBB/SILL COCK
- FLOOR DRAIN
- FLOOR SINK
- ROOF DRAIN
- UNION
- FLEXIBLE CONNECTOR
- THERMOMETER
- PRESSURE GAUGE
- STRAINER
- FIRE DEPARTMENT CONNECTION
- WATER METER
- GAS — GAS METER
- MECHANICAL EQUIPMENT
- DETAIL NOTE

FUEL LINES SHALL BE PLUMB, LEVEL AND ON 14' CENTERS, FIRST FUEL LINE SHALL BE LOCTED 24" FROM CENTER OF SERVICE RISER. FUEL LINES TO EXTEND 4" FROM FINISHED WALL FOR METER CONNECTION BY UTILITY COMPANY

METER BANK NOT TO EXCEED 9 METERS IN LENGTH, 2 TIERS IN HEIGHT




GAS METER BANK SHOWN FOR COORDINATION PURPOSES. CONFIRM EXACT METER PLACEMENT AND INSTALLATION REQUIREMENTS WITH LOCAL GAS UTILITY COMPANY. METERS TO BE INSTALLED PER UTILITY COMPANY STANDARDS AND REQUIREMENTS

GAS SERVICE; COORDINATE EXACT LOCATION WITH LOCAL UTILITY COMPANY

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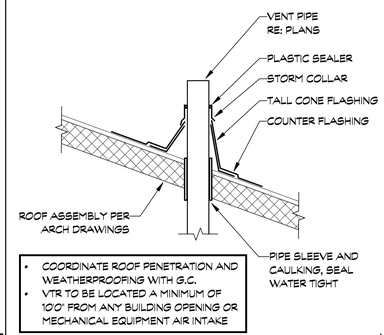
### MULTIPLE GAS METER BANK DIAGRAM — 9

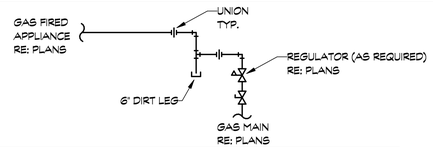



- COORDINATE ROOF PENETRATION AND WEATHERPROOFING WITH G.C.
- VTR TO BE LOCATED A MINIMUM OF 10'-0" FROM ANY BUILDING OPENING OR MECHANICAL EQUIPMENT AIR INTAKE

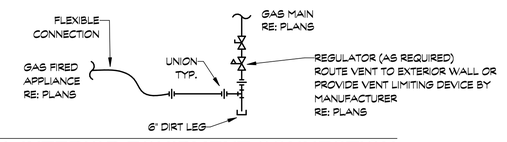
NTS

### VENT THRU ROOF (VTR) DIAGRAM — 8

- REFER TO PLANS FOR PIPE SIZES NOT SHOWN
- REDUCE AT APPLIANCE CONNECTION AS REQUIRED



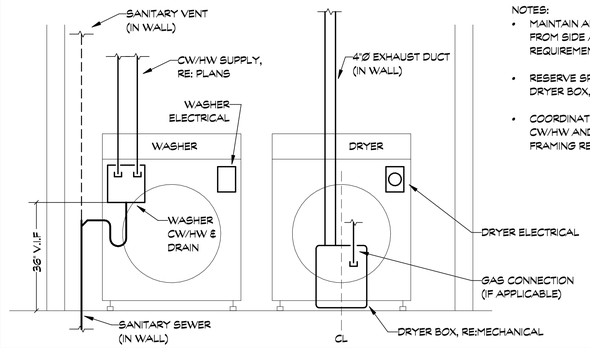

TYPICAL EXTERIOR EQUIPMENT CONNECTION




TYPICAL INTERIOR EQUIPMENT CONNECTION

NTS

### GAS EQUIPMENT CONNECTION DIAGRAM — 7




NOTES:
- MAINTAIN ALL MANUFACTURER CLEARANCES FROM SIDE AND BACK, COORDINATE FRAMING REQUIREMENTS WITH ARCH.
- RESERVE SPACE BEHIND CENTER OF DRYER FOR DRYER BOX, RE: MECHANICAL.
- COORDINATE EXACT LOCATION OF WASHER BOX, CW/HW AND WASTE PIPING. COORDINATE FRAMING REQUIREMENTS WITH G.C.

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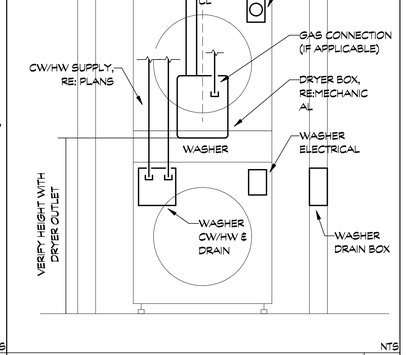
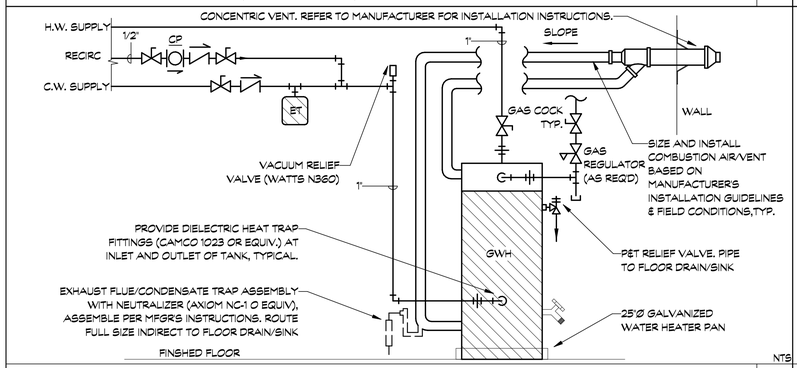
### WASHER/DRYER DIAGRAM (SIDE BY SIDE) — 6




NOTES:
- MAINTAIN ALL MANUFACTURER CLEARANCES FROM SIDE AND BACK, COORDINATE FRAMING REQUIREMENTS WITH ARCH.
- RESERVE SPACE BEHIND CENTER OF DRYER FOR DRYER BOX, RE: MECHANICAL.
- COORDINATE EXACT LOCATION OF WASHER BOX, CW/HW AND WASTE PIPING. COORDINATE FRAMING REQUIREMENTS WITH G.C.
- WASHER DRAIN BOX LOCATED IN ADJACENT WALL SEPERATE FROM CW/HW SUPPLY BOX, RE: PLANS

NTS

### WASHER/DRYER DIAGRAM (STACKED) — 5

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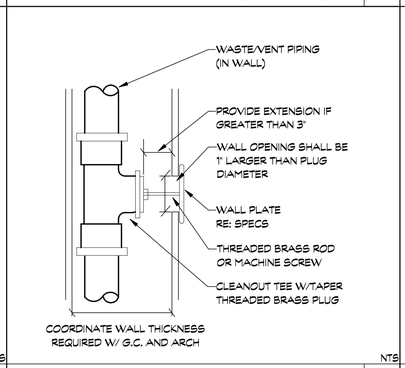
### GAS FIRED WATER HEATER DIAGRAM — 4

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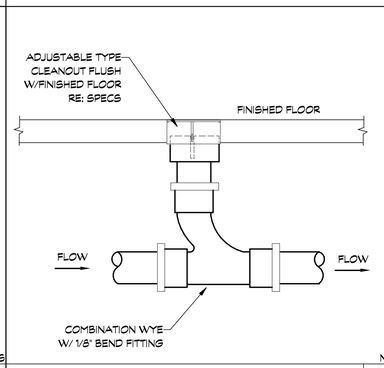
### WALL CLEANOUT DIAGRAM — 3

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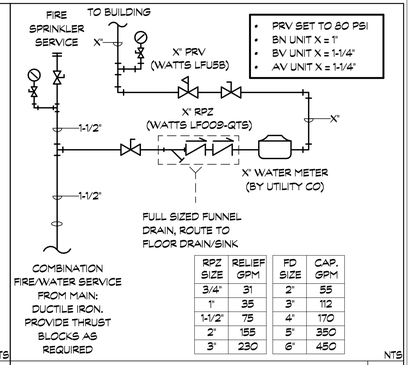
### FLOOR CLEANOUT DIAGRAM — 2




| RPZ SIZE | RELIEF GPM | FD SIZE | CAP. GPM |
|---|---|---|---|
| 3/4" | 31 | 2" | 55 |
| 1" | 35 | 3" | 112 |
| 1-1/2" | 75 | 4" | 170 |
| 2" | 155 | 5" | 350 |
| 3" | 230 | 6" | 450 |

NTS

### COLD WATER PIPING DIAGRAM — 1

## TH1 PLUMBING FIXTURE SCHEDULE

| KEY | DESCRIPTION | FITTINGS/ACCESSORIES | MANUFACTURER/CATALOG # |
|---|---|---|---|
| WC | WATER CLOSET, TANK TYPE, FLOOR MOUNTED, ELONGATED BOWL, 1.28 GALLON | EXTRA HEAVY DUTY, SOLID PLASTIC SEAT W/COVER, CHECK HINGE | RE: ARCHITECTURAL FIXTURE PACKAGE |
| L-1 | COUNTERTOP LAVATORY, OVAL, VITREOUS CHINA, 4" O.C. WHITE, SELF RIMMING, 0.5 GPM AERATOR | POP-UP DRAIN, LEVER HANDLES | RE: ARCHITECTURAL FIXTURE PACKAGE |
| BT | BATHTUB, LEFT/RIGHT HAND PER PLANS, WALLS AND CEILING BY G.C; COORDINATE FINISH WITH OWNER/ARCHITECT, 1.75 GPM | TUB/SHOWER COMBINATION WITH SINGLE LEVER HANDLE CONTROL AND PRESSURE BALANCING VALVE WITH SCALD PROTECTION, SERVICE STOPS AT VALVE | RE: ARCHITECTURAL FIXTURE PACKAGE |
| SH | SHOWER, LEFT/RIGHT HAND PER PLANS, WALLS AND CEILING BY G.C; COORDINATE FINISH WITH OWNER/ARCHITECT, 1.75 GPM | SINGLE LEVER HANDLE CONTROL AND PRESSURE BALANCING VALVE WITH SCALD PROTECTION, SERVICE STOPS AT VALVE | RE: ARCHITECTURAL FIXTURE PACKAGE |
| KS | SINGLE COMPARTMENT KITCHEN SINK, SELF RIMMING, 22 GA SST, 30" X 21" X 8"D, 3-1/2" DRAIN, 3/4 HP DISPOSAL, DISH MACH. AIR GAP | 8" SWIVEL GOOSENECK W/ WRIST BLADE LEVERS, SINGLE DECK FAUCET, BADGER PRO 750 3/4 HP DISPOSAL | RE: ARCHITECTURAL FIXTURE PACKAGE |
| RB | REFRIGERATOR ICE MAKER WALL BOX | SHOCK ARRESTOR, QUARTER TURN VALVE | SIOUX CHIEF 696-G1010WF |
| WU | SUPPLY & DRAIN UNIT FOR AUTOMATIC WASHER TOP OR BOTTOM SUPPLY AS REQUIRED | INLINE HOSE WATER HAMMER ARRESTOR | SIOUX CHIEF 696-2313WF |
| FD | FLOOR DRAIN, ADJUSTABLE CAST IRON SUMP | ROUND NIKALOY STRAINER, INLINE TRAP SEAL | JOSAM 30000A SURE SEAL |
| HD | HUB DRAIN, FUNNEL INLET, CAST IRON | CAST IRON P TRAP | |
| RPZ | REDUCED PRESSURE BACKFLOW PREVENTER | STRAINER, SHUTOFF VALVES, AIR GAP | WATTS 009QTS, 909AG |
| AA | AIR ADMITANCE VALVE | PROVIDE WITH LOUVERED ACCESS DOOR WITH FIRE RATED BOX WHERE REQUIRED | SIOUX CHIEF 250-6996122P |
| SA | SHOCK ABSORBER | | JOSAM 7500-S |
| WCO | WALL CLEANOUT | STAINLESS STEEL ACCESS COVER (JOSAM 58600) | JOSAM 58910-19 |
| WH | FREEZE PROOF WALL HYDRANT , TEE KEY HANDLE W/ HINGED DOOR | VACUUM BREAKER | WOODFORD MODEL B65 |
| GWH | GAS FIRED WATER HEATER, POWER/DIRECT VENT 60MBH, 48 GAL CAPACITY, 58 GPH @ 100F, FOAM INSULATION | PET RELIEF | BRADFORD WHITE PDX-50S-60B-3N |
| ET | DIAPHRAGM EXPANSION TANK, 3.2 GALLONS | | AMTROL ST-8 |
| CP | HIGH EFFICIENCY HOT WATER RECIRC PUMP, IN-LINE, 13FT MAXIMUM HEAD, 11 GPM MAXIMUM FLOW RATE, 44W ECM MOTOR | SMARTPLUS-6 SMART CONTROL PLUG WITH SENSOR, CONNECTORS AND STRAP(S) | TACO SP6-1 (TACO 006e3LC PUMP) |
| NOTES: | PC IS RESPONSIBLE FOR ALL ANCILLARY EQUIPMENT AND FITTINGS (STOPS, FLEXIBLE TUBING, ESCUTCHEONS, ETC.) NEEDED TO CONNECT FIXTURES | | |

## TH1 ROOF DRAIN SIZING TABLE

| KEY | UNIT SERVED | AREA SERVED (SQFT) | FLOW RATE (GPM) | DRAIN+DOWNSPOUT DIMENSIONS |
|---|---|---|---|---|
| 1A | TH1 - 1 | 580 | 11.6 | 2'Ø |
| 1C | TH1 - 1 | 250 | 5.2 | 2'Ø |
| 2A | TH1 - 2 | 220 | 4.6 | 2'Ø |
| 2B | TH1 - 2 | 220 | 4.6 | 2'Ø |
| 2C | TH1 - 2 | 410 | 8.5 | 2'Ø |
| 3A | TH1 - 3 | 220 | 4.6 | 2'Ø |
| 3B | TH1 - 3 | 220 | 4.6 | 2'Ø |
| 3C | TH1 - 3 | 410 | 8.5 | 2'Ø |
| 4A | TH1 - 4 | 220 | 4.6 | 2'Ø |
| 4B | TH1 - 4 | 220 | 4.6 | 2'Ø |
| 4C | TH1 - 4 | 410 | 8.5 | 2'Ø |
| 5A | TH1 - 5 | 220 | 4.6 | 2'Ø |
| 5B | TH1 - 5 | 220 | 4.6 | 2'Ø |
| 5C | TH1 - 5 | 410 | 8.5 | 2'Ø |
| 6A | TH1 - 6 | 220 | 4.6 | 2'Ø |
| 6B | TH1 - 6 | 220 | 4.6 | 2'Ø |
| 6C | TH1 - 6 | 410 | 8.5 | 2'Ø |
| 7A | TH1 - 7 | 270 | 5.6 | 2'Ø |
| 7B | TH1 - 7 | 270 | 5.6 | 2'Ø |
| 7C | TH1 - 7 | 520 | 10.8 | 2'Ø |
| NOTES: | RAINFALL RATE = 2" PER HOUR PER IPC FOR STEAMBOAT COLORADO | | | |

APPROVAL STAMPS:

**REVIEWED FOR CODE COMPLIANCE**
12/27/2023

| No. | Date | Description |
|---|---|---|
| 1 | 10.18.23 | ISSUED FOR PERMIT |

SUBMISSIONS & REVISIONS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CIVIL ENGINEER
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141 6TH STREET
PO BOX 774943
STEAMBOAT SPRINGS, CO 80477

LANDSCAPE ARCHITECT
**NVISION DESIGN STUDIO, INC.**
677 25 ROAD
GRAND JUNCTION, CO 81505

STRUCTURAL ENGINEER
**ANTHEM STRUCTURAL ENGINEERS**
430 YAMPA STREET
STEAMBOAT SPRINGS, CO 80487

M.E.P. & F.P. ENGINEERS
**BOULDER ENGINEERING**
1717 15TH STREET
BOULDER, CO 80302

INTERIOR DESIGNER:


PROJECT LOCATION
**BASECAMP ROW TOWNHOMES**
1950 CURVE COURT
STEAMBOAT SPRINGS, CO 80487

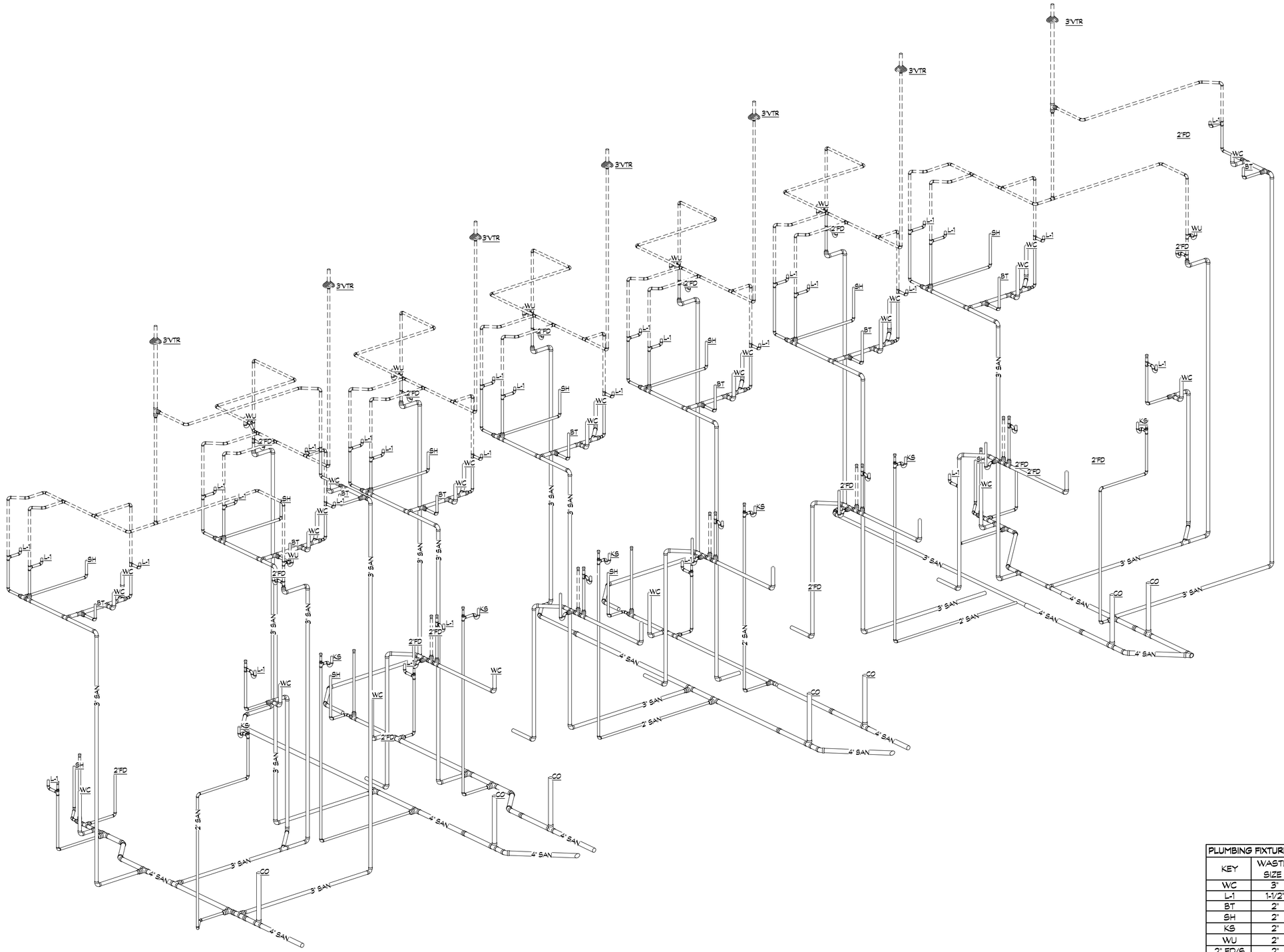
DRAWING TITLE
PLUMBING DETAILS & SCHEDULES

SEAL
COLORADO LICENSED — MICHAEL VIVIAN — 38983 — 10/18/2023 — PROFESSIONAL ENGINEER

DATE: 10.18.2023
DRAWN BY: TB
CHECKED BY: MV
PROJECT NO: 22082

DRAWING NO: **P0401-TH1**

10/18/2023 10:00:24 AM




| PLUMBING FIXTURE PIPE SIZES | | |
|---|---|---|
| KEY | WASTE SIZE | VENT SIZE |
| WC | 3" | 2" |
| L-1 | 1-1/2" | 1-1/2" |
| BT | 2" | 1-1/2" |
| SH | 2" | 1-1/2" |
| KS | 2" | 1-1/2" |
| WU | 2" | 1-1/2" |
| 2" FD/S | 2" | 1-1/2" |
| 3" FD/S | 3" | 2" |
| 4" FD/S | 4" | 2" |

ALL PIPE SIZES AS INDICATED EXCEPT WHERE NOTED. FOR BACK TO BACK CONDITIONS, LARGEST DRAIN & VENT SIZE APPLIES.

10/18/2023 10:00:28 AM

APPROVAL STAMPS:

REVIEWED FOR CODE COMPLIANCE
12/27/2023

| No. | Date | Description |
|---|---|---|
| 1 | 10.18.23 | ISSUED FOR PERMIT |

SUBMISSIONS & REVISIONS

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**MAY RIEGLER PROPERTIES**
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LANDSCAPE ARCHITECT

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M.E.P. & F.P. ENGINEERS

**BOULDER ENGINEERING**
1717 15TH STREET
BOULDER, CO 80302

INTERIOR DESIGNER:

PROJECT LOCATION

**BASECAMP ROW TOWNHOMES**
1950 CURVE COURT
STEAMBOAT SPRINGS, CO 80487

DRAWING TITLE

DWV ISOMETRIC OVERALL

SEAL

COLORADO LICENSED
MICHAEL VIGIL
38983
10/18/2023
PROFESSIONAL ENGINEER

DATE: 10.18.2023
DRAWN BY: TB
CHECKED BY: MV
PROJECT NO: 22082

DRAWING NO:
**P0402-TH1**

**DIVISION 23 - HEATING, VENTILATING, AND AIR-CONDITIONING**

**SECTION 23 05 00 - COMMON WORK RESULTS FOR HVAC**

1.01 WORK INCLUDED

A. The work included by this division of the specifications includes furnishing all labor, materials, equipment, and services, including minor items omitted but necessary to construct and install the complete systems described by the Contract Documents and specified below. "Contractor" refers to the Mechanical Contractor. The general conditions of the specifications apply and are included in this part of this section.

1. Heating, ventilating and air conditioning systems
2. Temperature control system

1.02 CODES AND REGULATIONS

A. Comply with state and local codes, and utility company regulations. Final interpretations will be made by the local inspection authority. The Contractor to verify the governance of the following Codes, including any local amendments and supplementary codes such as the Codes of the National Fire Protection Association:

1. Building Code: 2018 International Building Code
2. Plumbing Code: 2018 International Plumbing Code
3. Mechanical Code: 2018 International Mechanical Code
4. Fire Code: 2018 International Fire Code
5. Gas Code: 2018 International Fuel Gas Code
6. Energy Code: 2018 International Energy Conservation Code
7. Electrical Code 2020 National Electrical Code

1.03 EQUIPMENT AND MATERIALS STANDARDS

A. Equipment and materials shall be new, UL-listed for the use intended, and free from damage or defect. They shall comply with the latest industry standards.

1.04 CONTRACT DRAWINGS

A. Illustrate the general design and extent of performance required. All dimensions and locations shall be taken from the Architectural drawings. Consult with Architectural plans and locate all ceiling equipment where indicated on reflected ceiling plans

1.05 SHOP DRAWINGS

A. Submit products data and/or shop drawings as required by the Architect for the following:

1. Insulation
2. Air handling equipment
3. Grilles, registers, diffusers, louvers
4. Fire dampers
5. Temperature controls, systems, and components

B. Quality of specific equipment is established by manufacturer's catalog number. Alterations caused by any Substitution shall be accomplished at no additional expense to the Owner.

C. Manufacturers not listed may submit for acceptance as an "approved equivalent." Requests for an "equivalent" means "approved equivalent". Four copies of such submittal must be received by the Engineer seven (7) working days prior to bid date.

1.06 WARRANTY

A. The Contractor shall be responsible for the successful operation of mechanical systems, equipment, and materials installed under this Contract for a period of one year from the date of final acceptance. Defective equipment or materials shall be repaired or replaced at no expense to the Owner. Provide four complete service and maintenance calls spaced at equal intervals during the warranty period.

1.07 PRODUCT HANDLING AND CLEAN UP

A. Equipment shall be left clean and undamaged, to the satisfaction of the Owner. The General Conditions take precedence.

B. HVAC equipment shall not be used during construction as a means to heat or cool the space, unless specific approval is given by the owner. If such equipment is used, it must be completely cleaned and repaired as necessary. Cleaning involves replacing all filters; cleaning all coils and heat exchangers; inspecting fans, plenums, and ductwork and cleaning as directed by the owner.

1.08 CUTTING AND REPAIRING

A. The contractor shall be responsible for all cutting, drilling, welding, and repair required for his portion of the work. Coordinate with the Architect. The General Conditions take precedence.

1.09 OPERATING AND MAINTENANCE DATA

A. Provide the Owner with operating and maintenance instructions (four copies) required for operation of all mechanical systems. Bind the written instructions in a notebook. The General Conditions take precedence. The manuals shall include the following items:

1. Operating manual and spare parts list for each piece of equipment.
2. Preventive maintenance schedule for lubricating and checking each piece of equipment.
3. Instructions on who to call for service during the warranty period.

1.10 PERMITS

A. The contractor shall pay for all fees, taxes, secure permits, licenses, and inspections required for the project.

1.11 TEMPORARY SERVICES

A. Provide temporary water service for construction, as required by the General Contractor.

1.12 COORDINATION

A. Coordinate outlet device and equipment locations with the Architectural Plans and work of other trades. Locate on horizontal and vertical lines to avoid interference and to provide functional use of all equipment. Verify electrical power characteristics before ordering equipment.

B. Electrical work performed by this contractor will conform to the standards of Division 26-28. Mechanical equipment motors and controls shall be furnished, set in place, and wired according with the following schedule unless otherwise noted or specified. MC = Division 21-23 EC = Division 26-28

| Item | Furn By | Set By | Power Wiring | Control Wiring |
|---|---|---|---|---|
| Combination starters | MC | EC | EC | MC |
| Equipment motors | MC | MC | EC | -- |
| Motor starters & O.L. relays | MC | EC | EC | MC |
| Disconnect switches | EC | EC | EC | MC |
| Thermal overload heaters (1) | EC | EC | EC | -- |
| Variable Speed Drives | MC | EC | EC | MC |
| Control relays/transformers | MC | MC | EC | MC |
| Temperature control panels | MC | MC | EC | MC |
| Temp. Controls conduit/wiring | MC | MC | -- | MC |
| Actuator and solenoid wiring | MC | MC | -- | MC |
| Pushbuttons & pilot lights | MC | MC | -- | MC |
| Room thermostats | MC | MC | -- | MC |
| Thermostats: line voltage | EC | EC | EC | -- |

C. The general guideline for the division between control (by MC) wiring and power wiring (by EC) is that power wiring carries the current which energizes a motor, control wiring does not. Control wiring may be 120V, which would be the responsibility of the MC. Control motors are wired by the MC.

D. Examine the site and become aware of existing conditions, utilities, and other issues affecting the satisfactory completion of the project.

1.13 DELIVERY, STORAGE, HANDLING

A. Provide necessary hauling and hoisting equipment. Protect the materials of this Division before, during, and after installation.

1.14 AS-BUILT DRAWINGS

A. Keep a current set of "as-built" drawings on site. Upon completion of the work, furnish engineer with a reproducible prints showing the "as-built" installation.

1.15 PROJECT/SITE CONDITIONS

A. Visit the site to become familiar with location and the various conditions affecting the work, including existing utilities.

1.16 PLAN VERIFICATION

A. After completion of the bidding and selection process, prior to awarding the contract, the contractor must review and verify the contract documents in their entirety, including those of other trades. At this time, discrepancies, conflicts, omissions, etc in the contract documents must be documented. Alterations to the contract will be made at that time to include such items, as well other modifications which might be made by the Owner. After award of the contract, change orders caused by discrepancies, conflicts, omissions in the contract documents will not be allowed.

2.01 EXPANSION JOINTS, GUIDES, AND ANCHORS

A. Provide expansion joints or loops, guides, and anchors in piping to allow for expansion and contractions. Expansion joints shall be bellows type.

2.02 ELECTRICAL

A. Lugs: Lugs for wiring connections shall be rated for copper and aluminum, nad shall have a minimum rating of 75C.

B. Electric motors shall be rated for the appropriate application: wet location (TEFC); submersible; explosion proof, VFD's, etc.

2.03 ACCESS PANELS

A. The Mechanical Contractor shall furnish and General Contractor shall install access panels where required for access to equipment. The Mechanical Contractor shall include the cost of installation in his bid. Access panels shall be adequately sized, of a type approved by the Architect and shall be fire or smoke-rated as required.

3.01 START-UP PROCEDURES

A. Follow manufacturer's recommended procedures in starting up the equipment; damage caused during start-up shall be replaced at no expense to the owner.

3.02 HANGERS AND SUPPORTS

A. Support equipment from the structure to prevent sagging, pocketing, swaying, and vibrations, and arranged to provide for expansion and contraction. Brackets, clamps, and hangers shall be steel, except copper hangers will be used with copper piping. Hangers supporting vibrating equipment shall be provided with spring isolators. Chain, perforated iron or wire hangers are not permitted. Hangers will be of a type acceptable to the Engineer, and shall have a capacity and spacing as required by code.

3.03 LOW EMITTING MATERIALS

A. All sealants & adhesives required for the installation of mechanical & plumbing system within the building envelope shall meet the requirements for low emitting materials as set for in the South Coast Air Quality Management District (SCAQMD) Rule #1168 (or LEED new construction requirements), which includes but is not limited to:

1. Metal to Metal adhesive: VOC limit of 30g/L.
2. Fiberglass adhesive: VOC limit of 80g/L.
3. Multipurpose construction adhesive: VOC limit of 70 g/L.

**SECTION 23 05 93-TESTING, ADJUSTING, AND BALANCING**

1.01 GENERAL

A. Balancing shall be done by an independent firm specializing solely in the discipline of balancing air and water systems, and a member of NEBB.. Firms desiring to furnish services for this project shall submit for written approval during bidding. All air and hydronic systems shall be balanced using applicable proportionate procedure.

2.01 TESTING CONDITIONS

A. (Air) Before adjustments are made, check the system for such items as dirty filters, duct and damper leakage, vibrations, etc. All diffusers, duct sections, etc shall be adjusted to deliver design quantities within 5%. Air quantities shall be tested simulating filters being 50% loaded. Adjust/replace sheaves and belts as required to achieve design air quantities. Replace thermal motor overloads as required.

2.02 REPORT

A. After all adjustments are made, a detail written report shall be prepared and submitted for approval. Final acceptance of the project will not be made until a satisfactory report is received and field verified. The report shall detail the test equipment and balancing procedures being used; the general status of the system being tested including equipment details; provide data sheets indicating the required and actual CFM of all outlets and inlets.

**SECTION 23 07 00 - INSULATION**

1.01 QUALITY ASSURANCE

A. All insulation shall have a composite rating (insulation, jacket and adhesives) not exceeding flame spread 25 and smoke developed 50.

2.01 PIPE INSULATION FOR PIPING ABOVE GRADE

A. Insulation shall be closed-cell, elastomeric pipe insulation having a conductivity of 0.27 at 75 °F mean, with thicknesses as follows:

| Pipe Sizes | 1/2" - 1-1/2" | >1-1/2" |
|---|---|---|
| Refrigeration (Suction Lines) | 1" | 1" |

B. Insulation shall be Armacell "Armaflex" or equivalent by Johns-Mansville, Owens-Corning.

C. Exterior piping insulation will be painted with a white solvent based alkyd finish(Armaflex AB or equivalent), including all fittings, valves, etc. Jacket and insulation will be sealed weathertight and installed per manufacturers instructions. Where exposed to physical damage, exterior piping insulation will be covered with aluminum jacket, including all fittings, valves, etc. Jacket and insulation will be sealed weathertight and installed per manufacturers instructions.

D. All interior underground water(domestic and hydronic) piping shall be insulated with 1" Armaflex, except where noted.

2.02 REFRIGERANT PIPE INSULATION

A. Insulation shall be 1" thick, closed-cell, elastomeric pipe insulation having a conductivity of 0.27 at 75 °F mean:

B. Exterior piping insulation will be painted with a white solvent based alkyd finish(Armaflex AB or equivalent), including all fittings, valves, etc. Jacket and insulation will be sealed weathertight and installed per manufacturers instructions. Where exposed to physical damage, exterior piping insulation will be covered with aluminum jacket, including all fittings, valves, etc. Jacket and insulation will be sealed weathertight and installed per manufacturers instructions.

C. Insulation shall be Armacell "Armaflex" or equivalent by Johns-Mansville, Owens-Corning.

2.03 DUCT LINER

A. Duct liner shall be 1-1/2 lb density (3.0lb for exterior ducts), constructed of glass fiber liner. The air stream surface is coated with black-coated mat surface. Liner shall have a "K" value of 0.24/inch at 75F mean.

B. Duct liner shall be installed as follows or as shown on the plans:

1. Supply air ducts: 1",
2. Exterior supply, return, or make up air ducts: 3"
3. Return air ducts(within 15' of fan): 1/2"
4. Outside air intakes within space: 1"
5. Treated make up air within space: (not insulated)

C. Liner shall be Johns-Manville "Linacoustic" or equivalent by Owens-Corning, Certainteed or Knauf.

2.04 PIPE/ELASTOMERIC)

A. Insulation shall be solid slip-on installed prior to connection. Butt joints shall be sealed with manufacturer's adhesive. Where slit seams must be installed, seal the seam with manufacturer's adhesive. Fittings shall be insulated with meter-cut pieces of insulation according to manufacturer's instructions, or insulated with similar sheet insulation installed according to manufacturer's instructions.

B. Provide wood blocks and metal hanger shields at support strap locations on horizontal pipe runs. Insulation will not be interrupted for supports, etc.

2.05 DUCT WRAP

A. Wrap the fiberglass blanket around the ductwork with 2" overlapping flanges stapled at 6" on center. Strip the lap of insulation and staple the facing directly to the overlapped foil. Secure the insulation to the ductwork with 18-gauge galvanized wire at 12" on center. On ducts larger than 48", use mechanical fasteners on the bottom of the duct.

B. Tape all joints with 3" wide foil reinforced kraft tape. Tape all pin penetrations or punctures in the facing.

2.06 ACOUSTIC DUCT LINER

A. Liner shall be secured to all duct surfaces by pressing into wet adhesive, applied to 100% of the duct surface. In addition, liner shall be held in place with insulpins welded to duct and with clips slipped over the pins. Insulpins shall be located per SMACNA Standards. Liner shall be lapped and compressed in all four corners of the duct. Both upstream and downstream transverse edges shall be coated with adhesive, coated a minimum of 1" over the edge in all places.

**SECTION 23 09 00 - AUTOMATIC TEMPERATURE CONTROLS**

1.01 SCOPE

A. Furnish, install, and place in operation a complete system of automatic temperature controls. The temperature control contractor may be the mechanical contractor or approved sub-contractor.

B. Acceptable automatic temperature control equipment manufacturer's shall be Honeywell, Johnson Controls, or controls furnished by the specific equipment manufacturer.

C. The control system shall include all components and appurtenances necessary to provide a complete system. All wiring for automatic temperature controls, regardless of voltage shall be the responsibility of the ATC Contractor. 120VAC work shall be installed in conformance with requirements of Division 16. The Temperature Control Contractor shall coordinate all electrical work associated with his installation with the Electrical Contractor. Power wiring for all equipment, shall be the responsibility of the Electrical Contractor.

1.02 QUALITY ASSURANCE

A. Upon completion of the work, instruct the building operating personnel and provide two (2) complete sets of operating and maintenance instruction booklets.

B. Submit copies of complete temperature control diagrams with written "sequence of control" and factory-printed specification data sheets covering each control device proposed to be used, prior to installation of any equipment or part or system.

1.03 SERVICE AND GUARANTEE

A. The Contractor shall guarantee the control system installed under this section of the specification to be free from defects in workmanship and material under normal use, and agrees to provide service for one (1) year after acceptance by the Engineer or of beneficial occupancy of the building. Any defects in workmanship or material during this time shall be corrected at no charge to the Owner.

2.01 THERMOSTATS

A. HVAC unit thermostats shall be low-voltage, programmable, heating/cooling type with fan on-auto switch. Units shall be Honeywell TH6000 or equivalent.

3.01 SEQUENCE OF OPERATION

A. HVAC units shall each be controlled by a heating/cooling thermostat.

B. Toilet exhaust fans shall be controlled with wall switch.

**SECTION 23 30 00 - HVAC AIR DISTRIBUTION SYSTEMS**

1.01 DUCTWORK

A. General All ductwork shall be constructed strictly according to the latest ASHRAE, SMACNA, and IMC standards. Duct sizes shown are inside clear dimensions; maintain sizes inside lining for lined ducts.

B. Sheet Metal:

1. Sheet metal shall be constructed of coated galvanized steel of lock-forming grade conforming to ASTM Standards A-653/A653M and A-924. Reinforcement shall be constructed of galvanized steel.
2. Duct thickness shall conform to the above standards. Where there is a discrepancy, the greater thickness shall apply. Reinforcement, joint type, spacing and thicknesses may be varied at the contractors discretion, in conformance with the above standards, except where specifically noted. Transfer ducts across rated corridors shall be 26 gauge, or as required by Code.
3. Round ductwork exposed to the public will be galvanized steel, spiral wound, maintaining in a clean, shiny appearance, and not utilizing visible sealing material. Concealed round ductwork may spiral wound, or snap lock type galvanized steel ductwork.
4. Sealing: All longitudinal and transverse joints in ductwork shall be sealed with Mon-Eco Industries Eco Duct Seal 44-50 or equivalent as follows:
   a. Main supply ductwork shall be sealed to SMACNA Class B Standards(3"W.G. or less).
   b. Return, exhaust, and supply ductwork shall be sealed to SMACNA Class B Standards(3"W.G. or less).
   c. Return, exhaust, and supply ductwork downstream of coils and VAV boxes shall be sealed to SMACNA Class C. (2"W.G. or less).
5. Location: Sheet metal may be used throughout the project.

C. Flexible Ductwork (Polymer Liner):

1. Flexible ductwork shall be constructed of a spring steel helix supporting a plastic core. It shall be insulated with 1" fiberglass having a density of 1 lb./cu.ft. The insulation is sheathed in an copolymer vapor barrier jacket.
2. The duct shall be rated at 10" w.g., and a maximum velocity of 4000 fpm. The duct shall be listed in conformance with UL Standard 181, Class 1.
3. Flexible duct shall be limited to a maximum length of 2', as a means of connecting boxes, diffusers, etc. to the duct system. Uninsulated flexduct may be used where the adjacent ductwork is uninsulated or unlined.
4. Flexduct shall be manufactured by Hart & Cooley, Clevaflex or equivalent.

1.02 DUCT ACCESS DOORS

A. Where motorized dampers, fire dampers, control equipment, etc. are installed in ducts, and for cleaning ductwork, access doors shall be provided in the ducts, made air-tight with gasketed edges. Use Ventlok, or equal, sponge rubber or felt gasketing material. The doors shall be double-wall construction with 1" of rigid insulation fill and shall be attached to the duct with cam latches. Omit access door insulation and double-wall construction if ducts are not specified to be insulated. Access doors shall be constructed of the same materials as the ductwork.

B. Provide access panels where required for access to the "Duct Access Doors." If these access panels are placed in fire-rated walls or ceiling or floor, then the access panel shall have the same rating.

1.03 FLEXIBLE CONNECTIONS

A. All supply and exhaust fans and other air handling units with inlet and outlet duct or casing connections shall have a flexible connector in each connection. Connector shall be made of at least one layer of Ventglas, two-side, neoprene-coated, heavy glass fabric, Underwriters' approved and labeled as manufactured by Ventfabrics, Inc.

2.01 GRILLES, REGISTERS, AND DIFFUSERS

A. Provide grilles, registers, and diffusers of the size and type shown on the plans. Grilles, registers, and diffusers shall be made of steel with a baked white enamel finish, or extruded aluminum with clear finish, as indicated for each grille, register, or diffuser. Secure GRD's to structure where connected by flex ductwork, or where required by local code. Paint ductwork visible behind GRD's flat black. G R D's shall be manufactured by Titus, Price, Metallaire, or equivalent.

2.02 EXHAUST FAN, CEILING

A. The ceiling exhaust fan shall have a steel housing with a galvanized or baked enamel finish. An automatic back-draft damper shall be located within the duct connector and have cushioned stops. The fan wheels shall be balanced centrifugal and shall operate at less than 1200 rpm. Fans shall bear the AMCA certified rating seal and the U.L. label. The entire fan, motor, and wheel assembly shall be removable without disturbing the housing. Fan motors shall be grounded and mounted on vibration isolators. Fans shall be Penn Zephyr, Greenheck, Cook Gemini, or approved equivalent.

2.03 AIR INTAKE AND DISCHARGE LOUVERS

A. Exterior stationary louvers shall be anodized galvanized steel 4" blades on 2-7/8" centers at 30 deg with return bends. Louvers shall be weatherproof. Set in frame, secure, and caulk into opening. Provide galvanized steel 1/2", 19-guage wire mesh behind louver. Size per the plans.

B. Approved manufacturer's shall be Louvers and Dampers, Airstream, Dowco, Ruskin, or Titus.

2.04 AIR FILTERS

A. Provide air filters where shown on the drawings. Filters shall be rigid, throw-away type, constructed of pleated fiber materials with metal mesh support maze across both faces of the media. Thickness will be 2", unless 1" is the maximum thickness allowable. Filters shall have a UL listing of Class II and an average 30%(MERV 8) efficiency rating of ASHRAE Std. 52-76. Filters shall be Farr 30-30 or approved equivalent by Air Filters, Inc., Eco-Air, Cambridge, or American Air Filter.

2.05 FURNACE(SEALED COMBUSTION)

A. Furnish and install a sealed combustion direct vent gas furnace with provision for DX cooling coil as shown on the drawings. The furnace shall be suitable for use in the required configuration (upflow, downflow, horizontal). The cabinet shall be 20 gauge galvanized with 1/2" thick 1-1/2 lb. density foil faced insulation and baked acrylic enamel finish. The heating section shall be furnished with an aluminized steel gas furnace and insulated cabinet, and limit controls. Electronic hot surface ignition shall be used. The gas valve shall have 100% shutoff, with roll out safety control. The furnace shall be configured for use at altitudes above 5,000'.

B. The furnace will use a two stage heat exchanger, the second stage will be SS, with high/low fire with two stage gas control valve and two speed combustion air inducer.

C. The unit will be furnished with factory furnished termination kit(s), suitable for roof or wall mounting. Concentric configuration would be preferred where possible. Exact flue/combustion air piping shall be sized per manufacturer's instructions, based on the exact field measured distances and number of elbows.

D. Controls shall be digital and shall include:

- flame sensor safety and ignition controls.
- LED display for diagnostics.
- DIP switch settings for motor speed controls.
- Capability of two stage compressor control.
- Capability of economizer controls
- Capability of outdoor sensor input.

E. The DX coil shall be furnished by the same manufacturer, designed to be compatible with the furnace and condensing unit. The system will utilize a thermal expansion valve.

F. Provide condensate drain(for both heating and cooling), routed per manufacturer's instructions to an approved receptor.

G. The blower shall be a direct drive centrifugal blower with variable speed ECM motor. Blower controls shall be through a time delay blower relay. Single stage heating and cooling shall be available by means of the necessary controls, valves, and relays. Provide PVC trap on condensate drain, routed full size to an approved receptor.

H. Provide factory furnished filter rack for the configuration(s) shown, including door and gasketing. Field built filter racks will be allowed where necessary by field conditions. The configuration must allow for filter replacement without distortion of the filter

I. The unit will be provided with 1" thick throw-away pleated filters.

J. The furnace shall be mounted on neoprene isolation pads, or hung using spring isolators.

K. Unit shall be manufactured by Lennox, Trane, Carrier, or York. Alternate manufacturer's will be accepted if heating efficiencies meet or exceed that of the specified product.

2.06 CONDENSING UNIT

A. Provide a DX cooling coil and condensing unit to be used in conjunction with the furnace(s) specified above, and as shown on the drawings. SEER shall be 15.0 or greater. The condenser shall consist of a hermetic scroll compressor(s) with five year warranty, vertical discharge direct drive condenser fan and motor, and copper condenser coil with aluminum fins.

B. The compressor shall have high-low pressure control, 5 minute anti-short circuit timer, and crankcase heat. The unit shall be furnished with an R-410A operating charge, Hi-Low pressure control, filter-dryer and all necessary relays and starters. The cabinet shall be 18 gauge galvanized with baked acrylic enamel finish. The compressor shall be pre-charged.

C. Single stage cooling shall be available by means of the necessary controls, valves, and relays. Refrigeration system shall use an expansion valve for refrigerant flow control.

D. Provide a factory furnished hail guard.

E. Provide a low ambient kit for operation down to 30F.

F. Provide lockable refrigerant caps on all access ports.

G. Unit shall be manufactured by Lennox, Trane, Carrier, or York. Alternate manufacturer's will be accepted if heating and cooling efficiencies meet or exceed that of the specified product.

3.01 DUCTWORK

A. Provide duct system, connections, air balancing dampers (opposed blade dampers where the take-off is in inaccessible ceiling), dampers, duct turns, housing, hinged sheet metal doors, and necessary removable access doors for the complete supply, return, and exhaust systems. Provide access doors in ductwork wherever required for observation and maintenance of dampers.

B. Duct workmanship. Ductwork shall be constructed and erected in a workmanlike manner. Ducts shall be straight and smooth on the inside with neatly finished joints, air-tight, and free from vibration. The internal ends of slip joints shall be made in the direction of the air flow. The ducts shall be securely attached to the building construction in an approved manner. Changes in dimensions and shape of the ducts shall be gradual. Duct sizes fall within the limiting dimensions indicated on the drawings unless otherwise approved.

C. Duct turns. 90° elbows up to 18" wide and 45° elbows shall consist of an inside radius of not less than half the width of the duct, or be furnished with air foil type duct vanes with 2-1/4" blade spacing. Shop fabricated duct vanes shall conform to details of the Sheet Metal and Air Conditioning Contractors National Association manual.

D. All dimensions shown on drawing are inside dimensions. Contractor shall make allowances for internal lining where called for on drawings or elsewhere in this specification.

E. All junctions, bends, turns, or elbows in all ducts shall have a large radius (centerline radius equal to 1-1/2 times duct width) in the throat in order to minimize the frictional resistance. No short radius turn or junction will be allowed unless turning blades of approved design are provided. Single vane-turning vanes shall be provided for all square turns.

F. Galvanized or aluminum angle iron strips shall be installed at points where ducts penetrate walls to close off the space between the wall opening and the duct.

G. All fittings shall be tack welded on 3" centers and sealed with neoprene sealer to ensure that they do not leak more than 1% when transverse joints are sealed. Areas where galvanize has been burned off shall be painted. Branch takeoffs of main shall be 45 degree "wye" type where possible. Conical takeoffs allowed where "wye" won't fit. Paint the inside of ducts flat black, where visible through grilles, registers or diffusers.

H. Fittings for round or oval spiral wound ductwork shall be installed per the manufacturer's instructions.

3.02 AIR FILTERS

A. Provide three complete sets of pleated, 30% efficient filters: construction phase, replacement just prior to balancing, and replacement set to the Owner.

B. Air handlers are not intended to be used during construction for heating or cooling. The construction set is intended to protect the equipment during initial startup and preliminary testing.

C. Filters shall be installed in factory-assembled filter banks. Enclosure shall be provided with access doors, gaskets to provide air-tight seal, and duct or equipment connections.

D. Filters shall be manufactured by Farr or American Air Filter.

3.03 CONDENSATE DRAIN

A. Provide condensate drain & overflow piping or provide condensate drain piping & overflow float in condensate pan, interlocked with the blower. Size condensate piping as noted on plans, or to match equipment drain outlet size, whichever is larger.

3.04 DUCTWORK TESTING

A. If leakage in excess of 5% of the system design flow is indicated after a balance and adjustment, reseal to eliminate excess leakage. Replace defective material or workmanship at the Contractor's expense and test until the same has met the approval of the Engineer.

B. All ductwork operating at static pressure in excess of 3" W.G. and exterior ductwork shall be leak-tested per SMACNA standards. A minimum 25% of all ductwork shall be tested and the maximum permitted leakage shall be LMAX = CLP0.65.

APPROVAL STAMPS:

REVIEWED FOR CODE COMPLIANCE
12/27/2023

| No. | Date | Description |
|---|---|---|
| 1 | 10.18.23 | ISSUED FOR PERMIT |

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INTERIOR DESIGNER:

PROJECT LOCATION

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DRAWING TITLE

MECHANICAL SPECIFICATIONS

SEAL

COLORADO LICENSED MECHANICAL ENGINEER 38983 10/18/2023 PROFESSIONAL ENGINEER

DATE: 10.18.2023
DRAWN BY: FS
CHECKED BY: MV
PROJECT NO: 22082

DRAWING NO:
**M0100-TH1**



10/18/2023 10:00:29 AM

## GENERAL NOTES

A. FIELD VERIFY EXISTING SIZE AND LOCATION OF DUCTS & TERMINAL BOXES PRIOR TO BEGINNING WORK.

B. REMOVE EXISTING LOW PRESSURE DUCTWORK/ AIR TERMINAL DEVICES THROUGHOUT SPACE EXCEPT WHERE SPECIFICALLY SHOWN.

C. INSPECT EXISTING DUCT MAINS & SEAL ANY AUDIBLE AIR LEAKS AS REQUIRED TO ACHIEVE AIR FLOW WITHIN 5% OF NOTED TOTALS. REMOVE ANY DUCT WRAP ON EXPOSED DUCTWORK.

D. FLEX DUCT MAY NOT BE USED IN EXPOSED LOCATIONS. WHERE CONCEALED, FLEX DUCT RUNS NO LONGER THAN 2', REFER TO SPECIFICATIONS.

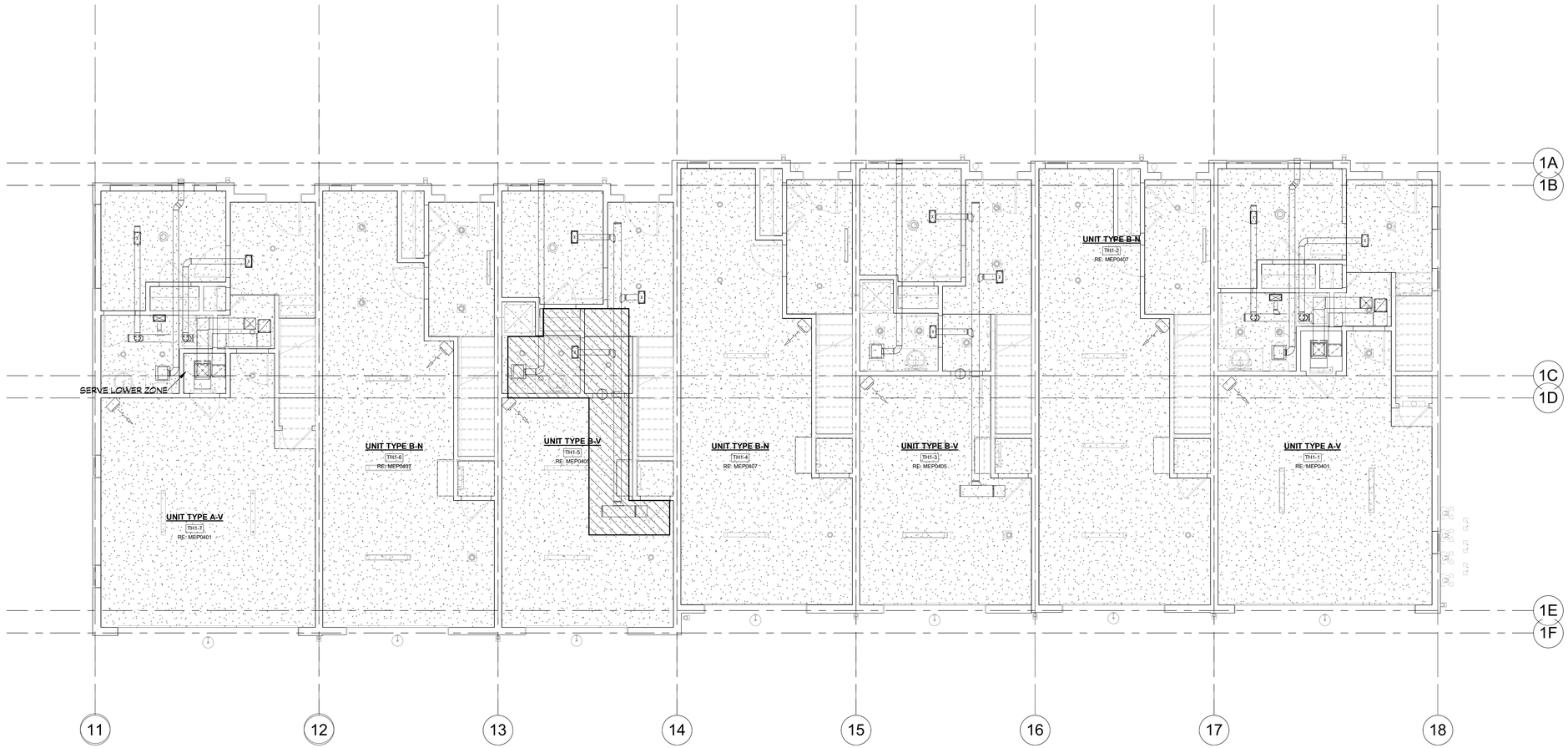
E. GRILLES, REGISTERS & DIFFUSERS & EXPOSED DUCTWORK TO MATCH ADJACENT CEILING/STRUCTURE COLOR. WHERE CEILING IS LIGHT COLOR, MAINTAIN WHITE GRDS. WHERE CEILING/STRUCTURE IS METAL FINISH OR DARK, PAINT GRDS TO MATCH. REFER TO ARCH PLANS FOR FINISHES.

F. FIELD VERIFY EXISTING DUCT MAINS ARE TIGHT TO STRUCTURE. NOTIFY ENGINEER OF ANY DUCTS NOT TIGHT TO STRUCTURE.

G. MECHANICAL SYSTEM IS LESS THAN 480,000 BTU/H COOLING AND 600,000 BTU/H HEATING AND IS THEREFORE NOT REQUIRED TO BE COMMISSIONED PER IECC C408.2.

## DETAIL NOTES THIS SHEET

1. DUCTS TO BE ROUTED BELOW STRUCTURAL SPACE.




TH1 LEVEL 1 HVAC PLAN
3/16" = 1'-0"

APPROVAL STAMPS:

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12/27/2023

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DRAWING TITLE

TH1 LEVEL 1 HVAC PLAN

SEAL

COLORADO LICENSED 38983 10/18/2023 PROFESSIONAL ENGINEER

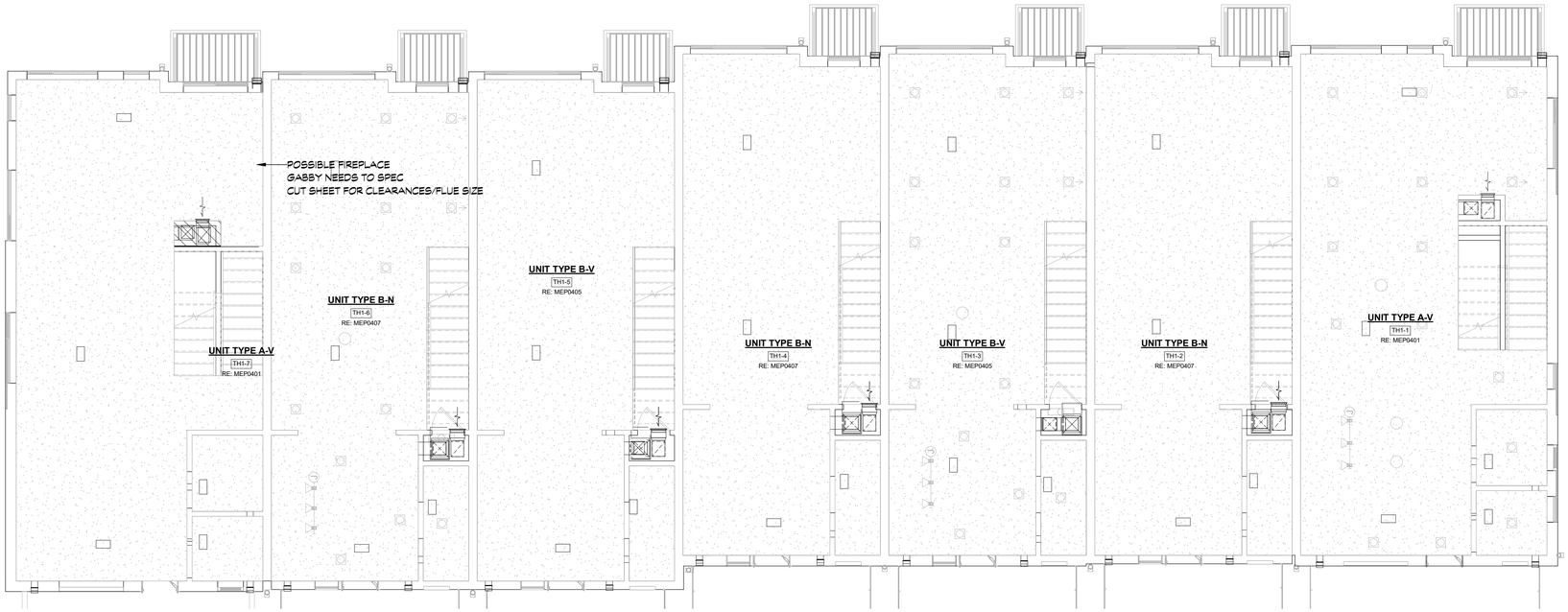
DATE: 10.18.2023
DRAWN BY: FS
CHECKED BY: MV
PROJECT NO: 22082

DRAWING NO:
**M0201-TH1**



10/18/2023 10:00:30 AM

DETAIL NOTES THIS SHEET




TH1 LEVEL 2 HVAC PLAN
3/16" = 1'-0"

10/18/2023 10:00:32 AM

APPROVAL STAMPS:

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12/27/2023

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DRAWING TITLE

TH1 LEVEL 2 HVAC PLAN

SEAL

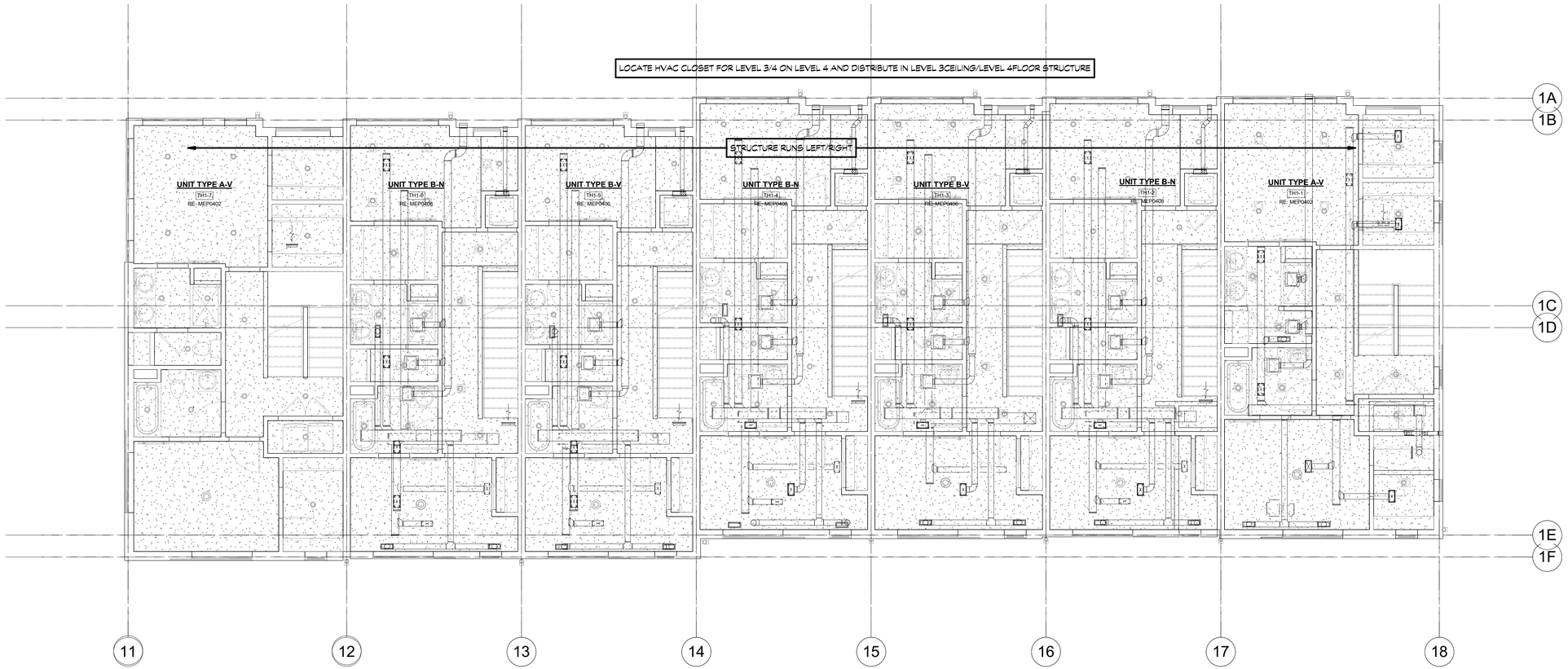
COLORADO LICENSED PROFESSIONAL ENGINEER
38983
10/18/2023
STATE OF COLORADO

DATE: 10.18.2023
DRAWN BY: FS
CHECKED BY: MV
PROJECT NO: 22082

DRAWING NO:
**M0202-TH1**

## DETAIL NOTES THIS SHEET

1. M3.1 DETAIL NOTES
2. XX
3. XX




## TH1 LEVEL 3 HVAC PLAN

3/16" = 1'-0"

10/18/2023 10:00:35 AM

APPROVAL STAMPS:

**REVIEWED FOR CODE COMPLIANCE**
12/27/2023

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PROJECT LOCATION

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DRAWING TITLE

TH1 LEVEL 3 HVAC PLAN

SEAL

COLORADO LICENSED PROFESSIONAL ENGINEER
38983
10/18/2023

DATE: 10.18.2023
DRAWN BY: FS
CHECKED BY: MV
PROJECT NO: 22082

DRAWING NO:
**M0203-TH1**

## DETAIL NOTES THIS SHEET

1. FURNACE TO BE IN DOWNDRAFT CONFIGURATION.


TH1 LEVEL 4 HVAC PLAN
3/16" = 1'-0"

10/18/2023 10:00:37 AM

APPROVAL STAMPS:

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12/27/2023

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GENERAL CONTRACTOR

CIVIL ENGINEER

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141 9TH STREET
PO BOX 774943
STEAMBOAT SPRINGS, CO 80477

LANDSCAPE ARCHITECT

**NVISION DESIGN STUDIO, INC.**
677 25 ROAD
GRAND JUNCTION, CO 81505

STRUCTURAL ENGINEER

**ANTHEM STRUCTURAL ENGINEERS**
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M.E.P. & F.P. ENGINEERS

**BOULDER ENGINEERING**
1717 15TH STREET
BOULDER, CO 80302

INTERIOR DESIGNER:

PROJECT LOCATION

**BASECAMP ROW TOWNHOMES**
1950 CURVE COURT
STEAMBOAT SPRINGS, CO 80487

DRAWING TITLE

TH1 LEVEL 4 HVAC PLAN

SEAL

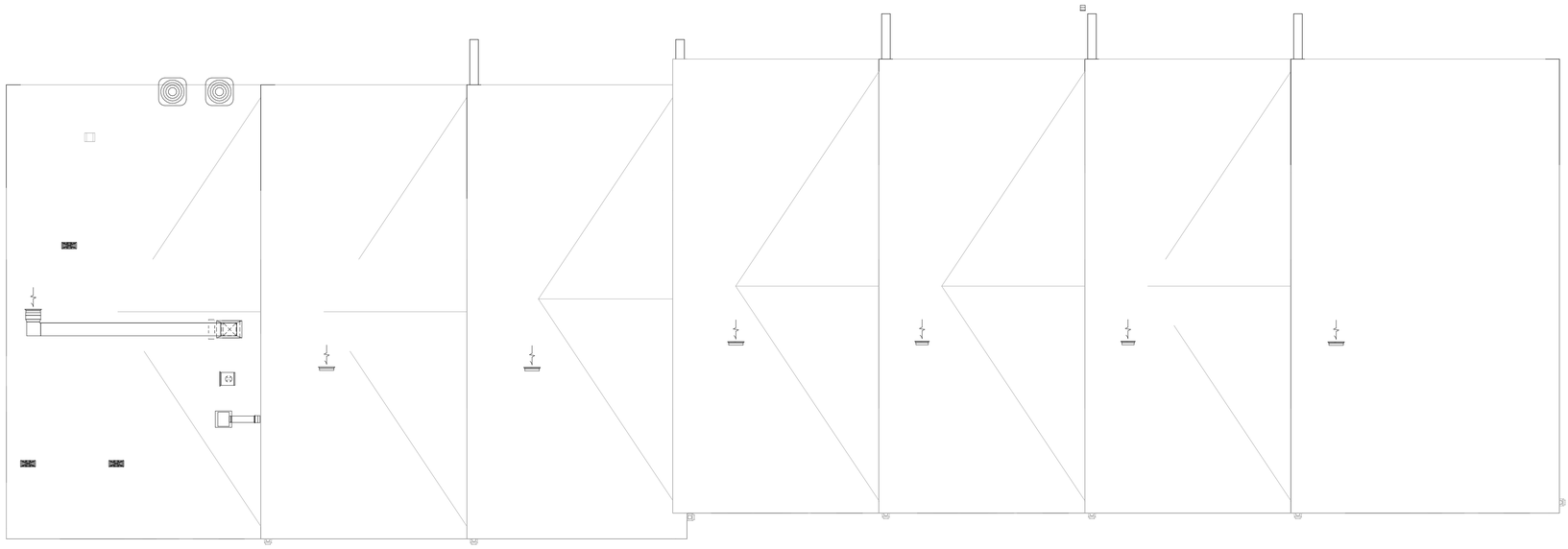
COLORADO LICENSED
38983
10/18/2023
PROFESSIONAL ENGINEER

DATE: 10.18.2023
DRAWN BY: FS
CHECKED BY: MV
PROJECT NO: 22082

DRAWING NO:
**M0204-TH1**

## DETAIL NOTES THIS SHEET

1. ME3.1 DETAIL NOTES
2. XX
3. XX



## TH1 ROOF MECHANICAL PLAN

3/16" = 1'-0"

10/18/2023 10:00:38 AM

APPROVAL STAMPS:

**REVIEWED FOR CODE COMPLIANCE**
12/27/2023

| No. | Date | Description |
|---|---|---|
| 1 | 10.18.23 | ISSUED FOR PERMIT |

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SEAL

COLORADO LICENSED
38983
10/18/2023
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DATE: 10.18.2023
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DRAWING NO:

**M0205-TH1**

## GRILLE REGISTER DIFFUSER SCHEDULE

| KEY | DESCRIPTION | CEIL'G | ACCESSORIES | MANUFACTURER/CAT # |
|---|---|---|---|---|
| A | CEILING DIFFUSER; 2-WAY, LOUVERED FACE, ADJUSTABLE BLADES, SQUARE NECK, WHITE | GYP | OB DAMPER | HART & COOLEY AG12 |
| F | STEEL FLOOR DIFFUSER, WHITE | FLR | OB DAMPER | HART & COOLEY 411 |
| T | STEEL TOE-SPACE DIFFUSER, WHITE | | OB DAMPER | HART & COOLEY 420 |
| R2 | FILTERED RETURN GRILLE, 30 DEGREE FIXED BLADE, WHITE PARALLEL TO LONG DIMENSION | GYP | | HART & COOLEY 658 |
| NOTES: COORDINATE DIFFUSER LOCATIONS WITH LIGHTS AND OTHER CEILING ELEMENTS | | | | |

## HVAC SCHEDULE

| KEY | UNIT TYPE | DESCRIPTION | HEAT'G | COOL'G | FLOW | PRES. | WEIGHT | PWR | VOLT | MANUFACTURER/CAT. # |
|---|---|---|---|---|---|---|---|---|---|---|
| FU 2 | GAS FIRE FURNACE | 95% EFF SEALED COMBUSTION, DIRECT VENT, UPLFLOW UNLESS OTHERWISE NOTED CONCENTRIC WALL VENT KIT. | 44 MBH | 2 TON (NOM) | 800 | 0.5" | 220 LBS | 6.8 A | 120/1 | LENNOX EL195-UH-45X-36B |
| CU 2 | CONDENSING UNIT | AIR COOLED , SCROLL COMPRESSOR, 14.0 SEER, HAIL GUARD | | 2 TON (NOM) | | | 150 LBS | 15 MCA | 240/1 | LENNOX 14ACX-024 |
| BH 1 | ELECTRIC BASEBOARD HEATER | ELECTRIC BASEBOARD HEATER W/ INTERGRAL LINE VOLTAGE STAT | 2.6 MBH | | | | | 750 W | 240/1 | QMARK HBB754 |
| EF 1 | CEILING EXHAUST FAN | 2-SPEED VENTILATION/ EXHAUST FAN, BACKDRAFT DAMPER, INT. CONTROLS, ENERGY STAR | | | 50 CFM | 0.25" | | 11 W | 120/1 | PANASONIC FV-05-11VK2 |
| EF 2 | KITCHEN EXHAUST FAN | SINGLE SPEED VENTILATION/ EXHAUST FAN, BACKDRAFT DAMPER, DC MOTOR, ENERGY STAR, HORIZONTAL | | | 50 CFM | 0.25" | | 9.9 W | 120/1 | PANASONIC FV-05-11VK2 |
| NOTES: | * M.C. IS RESPONSIBLE FOR ALL ANCILLARY EQUIPMENT AND DUCTWORK NEEDED TO CONNECT EQUIPMENT. IT IS THE CONTRACTORS RESPONSIBILITY TO COORDINATE ELECTRICAL CHANGES DUE TO EQUIPMENT SUBSTITUTIONS WITH EC. | | | | | | | | | |

10/18/2023 10:00:39 AM

APPROVAL STAMPS:

REVIEWED FOR CODE COMPLIANCE
12/27/2023

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SUBMISSIONS & REVISIONS

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BOULDER, CO 80302

INTERIOR DESIGNER:

PROJECT LOCATION

**BASECAMP ROW TOWNHOMES**

1950 CURVE COURT
STEAMBOAT SPRINGS, CO 80487

DRAWING TITLE

MECHANICAL DETAILS & SCHEDULES

SEAL

COLORADO LICENSED PROFESSIONAL ENGINEER
38983
10/18/2023

DATE: 10.18.2023
DRAWN BY: FS
CHECKED BY: MV
PROJECT NO: 22082

DRAWING NO:

**M0401-TH1**

## DIVISION 26 - ELECTRICAL

## SECTION 26 01 00 - GENERAL PROVISIONS

1.01 WORK INCLUDED:

A. The work included by this division of the specifications includes furnishing all labor, materials, equipment, and services, including minor items omitted but necessary to construct and install the complete systems described by the Contract Documents and specified below. "Contractor" refers to the Electrical Contractor. The general conditions of the specifications apply and are included in this part of this section.

1. Power Distribution System
2. Interior and Exterior Lighting System
3. Telephone Raceway System
4. Data Raceway System
5. Fire Alarm System
6. Emergency Lighting System
7. Electric Heating System

1.02 CODES AND REGULATIONS:

A. Comply with state and local codes, and utility company regulations. Final interpretations will be made by the local inspection authority. The Contractor to verify the governance of the following Codes, including any local amendments and supplementary codes such as the Codes of the National Fire Protection Association:

1. Building Code: 2018 International Building Code
2. Plumbing Code: 2018 International Plumbing Code
3. Mechanical Code: 2018 International Mechanical Code
4. Fire Code: 2018 International Fire Code
5. Gas Code: 2018 International Fuel Gas Code
6. Energy Code: 2018 International Energy Conservation Code
7. Electrical Code 2020 National Electrical Code

1.03 EQUIPMENT AND MATERIALS STANDARDS:

A. Equipment and materials shall be new, UL-listed for the use intended, and free from damage or defect. They shall comply with the latest industry standards.

1.04 CONTRACT DRAWINGS:

A. Illustrate the general design and extent of performance required. All dimensions and locations shall be taken from the Architectural drawings. Consult with Architectural plans and locate all ceiling equipment where indicated on reflected ceiling plans.

1.05 SHOP DRAWINGS

A. Submit products data and/or shop drawings as required by the Architect for the following:

1. Switches, dimmers, receptacles and coverplates
2. Switchboards, Loadcenters
3. Disconnect switches
4. Fuses
5. Light fixtures
6. Fire alarm system and equipment

B. Quality of specific equipment is established by manufacturer's catalog number. Alternations caused by any Substitution shall be accomplished at no additional expense to the Owner

C. Manufacturers not listed may submit for acceptance as an "approved equivalent." Requests for an "equivalent" means "approved equivalent". Four copies of such submittal must be received by the Engineer seven (7) working days prior to bid date.

1.06 WARRANTY:

A. The contractor shall be responsible for the successful operation of electrical systems, equipment, and materials installed under this Contract for a period of one year from the date of final acceptance. Defective equipment or materials shall be repaired or replaced at no expense to the Owner.

1.07 PRODUCT HANDLING AND CLEAN UP:

A. Equipment shall be left clean and undamaged, to the satisfaction of the Owner. The General Conditions take precedence.

1.08 CUTTING AND REPAIRING:

A. The contractor shall be responsible for all cutting, drilling, welding, and repair required for his portion of the work. Coordinate with the Architect. The General Conditions take precedence.

1.09 OPERATING AND MAINTENANCE DATA:

A. Provide the Owner with operating and maintenance instructions(four copies) required for operation of all electrical systems. Bind the written instructions in a notebook. The General Conditions take precedence.

1.10 PERMITS:

A. The contractor shall pay for all fees, taxes, secure permits, licenses, and inspections required for the project.

1.11 TEMPORARY SERVICES:

A. Provide temporary power and lighting as required by the General Contractor, in accordance with OSHA and N.E.C. standards.

1.12 COORDINATION

A. Coordinate outlet device and equipment locations with the Architectural Plans and work of other trades. Locate on horizontal and vertical lines to avoid interference and to provide functional use of all equipment. Verify electrical power characteristics before ordering fixtures, equipment, etc.

B. Mechanical work performed by this contractor will conform to the standards of Division 21-23. Mechanical equipment motors and controls shall be furnished, set in place, and wired according with the following schedule unless otherwise noted or specified. MC = Division 21-23 EC = Division 26-28

| Item | Furn By | Set By | Power Wiring | Control Wiring |
|---|---|---|---|---|
| Combination starters | MC | EC | EC | MC |
| Equipment motors | MC | MC | EC | -- |
| Motor starters & O.L. relays | MC | EC | EC | MC |
| Disconnect switches | EC | EC | EC | MC |
| Thermal overload heaters (1) | EC | EC | EC | -- |
| Variable Speed Drives | MC | EC | EC | MC |
| Control relays/transformers | MC | MC | EC | MC |
| Temperature control panels | MC | MC | EC | MC |
| Temp. Controls conduit/wiring | MC | MC | -- | MC |
| Actuator and solenoid wiring | MC | MC | -- | MC |
| Pushbuttons & pilot lights | MC | MC | -- | MC |
| Room thermostats | MC | MC | -- | MC |
| Thermostats: line voltage | EC | EC | EC | -- |

C. The general guideline for the division between control(by MC) wiring and power wiring(by EC) is that power wiring carries the current which energizes a motor, control wiring does not. Control wiring may be 120V, which would be the responsibility of the MC. Control motors are wired by the MC.

D. Examine the site and become aware of existing conditions, utilities, and other issues affecting the satisfactory completion of the project.

1.13 DELIVERY, STORAGE, HANDLING:

A. Provide necessary hauling and hoisting equipment. Protect the materials of this Division before, during, and after installation.

1.14 AS-BUILT DRAWINGS:

A. Keep a current set of "as-built" drawings on site. Upon completion of the work, furnish engineer with a reproducible prints showing the "as-built" installation.

1.15 PROJECT/SITE CONDITIONS:

A. Visit the site to become familiar with location and the various conditions affecting the work, including existing utilities.

2.01 ACCESS PANELS:

A. The electrical Contractor shall furnish and General Contractor shall install access panels where required for access to equipment. The electrical Contractor shall include the cost of installation in his bid. Access panels shall be adequately sized, of a type approved by the Architect and shall be fire or smoke-rated as required.

3.01 EXCAVATION AND BACKFILLING:

A. Verify the location of underground utilities before excavation; the contractor is responsible for any damage to underground utilities. Provide excavating and backfilling for electrical work. Backfill in 12" layers, mechanically tamp to 95% proctor standards. Protect according to OSHA standards. The General Conditions take preecdence.

B. Provide marker tape 12" above exterior underground service conduits(power, telephone, television).

3.02 START-UP PROCEDURES:

A. Follow manufacturer's recommended procedures in starting up the equipment; damage caused during start-up shall be replaced at no expense to the owner.

3.03 HANGERS AND SUPPORTS:

A. Support conduit and equipment from the structure to prevent sagging, pocketing, swaying, and vibrations, and arranged to provide for expansion and contraction. Brackets, clamps, and hangers shall be steel or copper of a type, acceptable to the Engineer. Chain, perforated iron or wire hangers are not permitted.

B. Conduit on the roof will be supported above the roof on roof pads. The pads shall be approximately 6"Wide by 6" high by the length as required. They shall be made of recycled rubber, rated for 500lbs/ft loading each. The pads will have galvanized steel "C" channel attached to the top, which can accommodate pipe clamps to secure the conduit. This configuration of individual piping pads may be expanded to include two pads supporting a trapeze style support where multiple conduits are racked together. The pads are C-series manufactured by Cooper B-line or approved equivalent.

3.04 SLEEVES AND PLATES

A. Provide sleeves and inserts for all conduit. The contractor shall be responsible for the cost of cutting and patching required for piping where sleeves and inserts were not installed or where incorrectly located. Sheetrock joint compound may be used to seal openings in non-rated walls(insulation to be continuous through walls.

B. Drill holes as required for the installation of hangers required for the mechanical work.

C. Where sleeves are placed in exterior walls below grade, the space between the pipe or conduit and the sleeves shall be made completely water-tight.

D. Seal all piping passing through fire-rated construction with approved material to maintain air-tight, fire-rated integrity, with a U.L. listed assembly compatible with the wall or floor assembly being penetrated.

## SECTION 26 05 00 - COMMON WORK RESULTS FOR ELECTRICAL

2.01 GENERAL:

A. Provide complete systems of conductors and raceways using conduit and/or cable assemblies appropriate to the function and location, and specifically approved in chapter three of the N.E.C..

2.01 CONDUIT:

A. The following raceways are approved for use on this project, where approved by the N.E.C.:

1. EMT: Electrical metallic tubing, galvanized
2. GRC: Rigid steel conduit, galvanized
3. PVC: Polyvinyl chloride conduit, schedule 40
4. IMC: Intermediate metal conduit, galvanized

2.02 CABLE ASSEMBLIES:

A. The following cable assemblies may be used in the power distribution system in concealed locations, where approved by the N.E.C.:

1. MC: Metal clad cable
2. NM/NMC: Non-metallic sheathed cable
3. SE/SER: Service entrance cable (From MDC to residences)

2.03 BOXES:

A. Provide galvanized steel outlet and junction boxes, except where otherwise indicated. Boxes shall be a minimum 4" square or octagonal, depth as required. Provide weather-proof type cast boxes with gasket and cast coverplate for exterior outlets or wet locations. Outlet boxes shall be of the proper type and design for the fixture or device to be installed. Through the wall boxes are not permitted. Provide plaster or tile rings for all flush outlets installed where required. Boxes shall be manufactured by Raco, Steel City, National or equivalent.

B. Interior floor boxes shall be non-metallic or cast steel in concrete or slab on grade installations, and shall be rated for the use. Floor boxes above grade shall be non-metallic or stamped steel, rated for the use. Multi-gang boxes shall be used where specified. Coverplates shall be polished brass with 'flip lids' for receptacles and connectors. Provide carpet flanges where appropriate.

2.04 CONDUCTORS:

A. Provide a complete set of power conductors, rated 600 volts, of the quantity, size and type required for the function.

1. Conductors shall be copper, except where specifically noted. Conductors shall be solid for wire sizes No. 10 AWG and smaller; stranded for No. 8 AWG and larger.
2. Aluminum conductors will be accepted only where specifically indicated by the Contract Documents. Aluminum conductors must be terminated according to the manufacturers instructions, including use of proper joint compound, use with aluminum rated lugs, and proper torqueing of the lugs.

2.05 INSULATION:

A. Provide wire with the following minimum insulation standards:

1. Branch circuits, panelboard feeders, service entrance conductors: THWN-2, XHHW(90C). The conductors shall be applied using the 75C rating.
2. Connections to fixture ballasts, and wiring runs in or through fixture wiring channels: Insulations listed in table 402.5 of the N.E.C., except for wiring made with asbestos.
3. Cord connections: Cords listed in table 400.4 of the N.E.C., except for wiring made with asbestos.

2.06 LUGS:

A. Lugs for all equipment will be rated for the use. Lugs will be suitable for copper or aluminum conductors, rated for 75C.

2.07 SWITCHES AND RECEPTACLES:

A. Provide specification grade devices throughout. Switches and duplex receptacles may be grade. Devices shall be manufactured by Hubbell, Leviton, General Electric, Bryant, Slater, Pass & Seymour, Inc., Sierra, or Arrow-Hart.

B. Except where noted, plates shall be plastic, color to match the devices with matching screws for receptacles, switches, telephone, and TV outlets. Provide blank coverplates for unused outlets. Coverplates for multi-gang boxes shall be sized for the box it covers.

C. Devices and their coverplates colors shall be coordinated with Architect and Owner. In mechanical rooms, etc, the coverplates may be galvanized steel

2.08 DIMMERS:

A. Incandescent dimmers shall be the linear slide-type with aluminum fins. Dimmers shall be Lutron Nova series or equivalent.

B. Fluorescent dimmers shall be the linear slide-type with aluminum fins. The dimmers shall be closely coordinated with the ballast type of the specific fixture being controlled and must be field coordinated before ordering. Dimmers shall be Lutron Nova series or equivalent.

C. LED dimmers must be selected by, or specifically approved by, the specific fixture manufacturer or supplier. Slide type dimmers are preferred where available.

D. When switches and dimmers are located side by side, switches shall have identical appearance as dimmers. Dimmers shall in no case have heat fins removed or modified.

E. Dimmers shall be manufactured by Lutron, Hunt, Prescolite, or equivalent

3.01 WIRING:

A. The drawings are schematic in nature; alternative wiring paths, different conduit fill, etc, installed in conformance with the N.E.C. are allowed. Conductors must be derated per code.

B. Branch circuits shall use minimum No. 12 AWG wiring for branch circuits, protected by 20 ampere circuit breakers. Control wiring may be No. 14 minimum. If distance from panel to first outlet is 75 feet or greater (for 120-volt circuits) or 150 feet or greater (for 277-volt circuits), provide No. 10 AWG.

C. Use PVC in earth or in slabs in contact with earth. Outside the building, install a minimum of 30" below finished grade.

D. Where mechanical damage occur, use galvanized rigid steel or intermediate metal conduit.

E. Electric metallic tubing may be used in all applications, except where prohibited by code or otherwise noted.

F. Do not install exposed conduit in areas open to the public. Exposed conduit may be installed at surface-mounted equipment and other locations acceptable to the Architect. Run exposed conduit parallel to, and at right angles with, the building lines.

G. Direct burial wiring shall not be used.

H. Use flexible metallic conduit for connections to motors, fixtures, or other equipment where vibration is encountered. Provide sealtite flexible metallic conduit in wet areas such as kitchens, equipment rooms, on roofs, etc.

I. Provide a ground wire in non-metallic conduit and flexible conduit. Ground wires shall be increased in size where circuit wiring is increased for voltage drop.

J. Circuits fed through AFCI breakers shall have separate neutrals with no cross or ground connections; wiring shall be installed per the breaker manufacturers instructions.

K. Multi-wire branch circuits shall utilize handle ties on breakers, or other grouped disconnecting means per NEC 210.4(B).

3.02 OUTLET BOXES, DEVICES AND FITTINGS:

A. Install receptacle and telephone outlets 18" to center-line above floor in general locations; install at switch height where shown in combination; install 46"to center-line in mechanical equipment rooms.

B. Install receptacles vertically, ground pole down.

C. Install switch outlets 46" to center-line above floor on latch side of door. Verify door swing prior to installation. Use gang boxes for multiple-device installation as required.

D. Install outlets shown on the drawings "back-to-back" with a minimum of 6" lateral separation between them.

## SECTION 26 20 00 - SERVICE AND DISTRIBUTION

1.01 SERVICE ENTRANCE:

A. Power will be available from the secondary side of transformer(s) provided by the utility company. This service shall be 120/240 volt, 1 phase, 3 wire, 60 hertz A.C. for normal power and lighting requirements. General arrangement of the service equipment is shown on the drawings. Load balance the entire system to within 15% per phase.

1.02 GROUNDING:

A. Provide a complete grounding system in accordance with Section 250 of the N.E.C.

B. Supplemental electrode to be installed unless resistance of 25 ohms to earth can be documented.

2.01 LOADCENTERS:

A. Provide circuit breaker-type loadcenters as detailed on the drawings. Provide separate ground bus. Provide fronts with door and latch with looks keyed alike. Install panels 6'6" above finished floor to top of trim. Where panels are mounted side by side, align tops of panels. Mount a typed directory, identifying each circuit, in a directory frame. Provide typed source label identifying source of power for each panel. Install trims and doors with primer coats in finished areas. Provide one spare 3/4" conduit for each 3 unused poles in flush-mounted loadcenters; extend from to an accessible point above a hung ceiling; cap and identify.

B. Breakers shall be full width, thermal magnetic, plug-in type. Provide multi-pole breakers with common trip and single operating handle; handle ties are acceptable for multi-wire branch circuits.

1. Breakers serving residential projects shall be AFCI breakers per NEC 210.12.
2. Breakers serving restaurant kitchens and bars, or where required by code, shall be GFCI breakers. GFCI receptacles may be used only where the receptacles are not located behind equipment.
3. HACR breakers shall be used for HVAC equipment in accordance with the equipment manufacturer.
4. HID breakers shall be used where HID or fluorescent fixtures are normally panel switched.

C. Lugs on mains and branch breakers shall be rated for 75C or 60C, copper or aluminum wiring.

D. Load centers shall be Square D type QO or equivalent by I.T.E., G.E., or Cutler Hammer.

2.02 FUSIBLE DISTRIBUTION SWITCHGEAR:

A. Provide free-standing, floor-mounted, fusible type switchboard as shown on the plans.

B. Switchboard shall be 90" high, depth as indicated, constructed so rear sections align, with internal components removable from the front.

C. Buses shall be copper or tin-plated aluminum, braced for short- circuit currents of 100,000 RMS symmetrical amperes. Horizontal bars shall be tape-wrapped and insulated. Maximum temperature rise shall be 55C over 25C ambient. Provide full length and sized horizontal busses, including neutral and ground. Vertical sections shall be fully bussed. All lugs shall be rated for 75C or 60C copper or aluminum wiring.

D. Manufacturers shall be General Electric "AV line" with QMR construction or equivalent by Square D, I.T.E., or Westinghouse.

2.03 METER STACK:

A. Provide wall mounted modular meter stacks where shown on the plans. The unit shall be NEMA 3(NEMA 1), made of galvanized steel. The incoming section shall use a fused switch.

B. The busses shall be copper or tin-plated aluminum, braced for short-circuit currents of 65,000AIC symmetrical amperes. Vertical sections shall be fully bussed top to bottom. Provide full length and sized horizontal busses, including neutral and ground. All lugs shall be rated for 75C or 60C copper or aluminum wiring.

C. Meter stack shall accommodate both single phase and three phase, 100Amp and 200Amp meters and breakers. Additional sections shall be capable of simple connection.

D. The meter stack shall be manufactured by American Midwest Power (AMP), Square D, G.E., Westinghouse ITE or equivalent.

2.04 SAFETY SWITCHES:

A. Provide normal duty, enclosed, fusible and non-fusible safety switches as indicated on the plans. All lugs shall be rated for 75C or 60C copper or aluminum wiring. Provide enclosures suitable for the surrounding area and conditions. Label switches for feeder or motor supplied. The switches shall be manufactured by Square D, I.T.E., G.E., Cutler Hammer, or equivalent.

2.05 FUSES:

A. Provide power fuses of the time-delay type unless otherwise indicated. Fuses shall be manufactured by Bussman, Gould Shawmut, or equivalent. Provide one (1) complete set of fuses for fuse-holding devices, sized according to the motor and/or conductor to be protected. Provide a hinged cover cabinet for storage of spare fuses: three spare fuses of each fuse size.

3.01 WIRING FOR EQUIPMENT:

A. Provide branch circuits, feeders, junction boxes, disconnect switches, etc as required for a complete system; make power connections to motors and controls for heating, ventilating, air conditioning, plumbing, owner furnished and fire protection equipment as required.

B. Kitchen equipment. Refer to the Kitchen Equipment Contractor's drawings for final sizing, locations, and rough-in heights. The Electrical Contractor shall provide final circuits and connections to kitchen electrical equipment. Sealtite conduit and fittings shall be used on runs inside refrigerated bases and at dish tables.

C. Provide connections to hood fire suppression system(s). The electrical contractor is responsible for wiring the interlock controls for hood related air handling equipment, including low voltage interlocks, and interlocks within building HVAC equipment where required.

## SECTION 26 50 00 - LIGHTING

1.01 RECESSED LED:

A. Recessed LED luminaires shall be pre-wired. Openings shall be neatly made so they are completely concealed after the trim is installed. Luminaires installed in a grid ceiling shall be supported by the framing system, not by ceiling panels. Install metal plaster frames in plaster ceilings. Fixtures shall have thermal protection where required by the N.E.C. and local codes.

1.02 EXTERIOR LIGHTING FIXTURES:

A. Provide weather-proof luminaires for mounting as shown. Provide lamps of size and wattage as indicated on the drawings. Provide underground wiring to exterior lighting as shown on the drawings.

2.01 INTERIOR LIGHTING FIXTURES:

A. Securely support and anchor fixtures and outlet boxes. Where lighting fixtures are installed in a lay-in grid ceiling system, secure fixtures to tees by installing earthquake clips at each corner of the fixture. Provide supports required, including structural members if needed. Provide separate junction boxes and wire to recessed fixtures in flexible conduit with Type AF wire, unless acceptable pre-wired fixtures are used. Conceal openings cut in ceilings for recessed fixtures with fixture trim installed. Coordinate installation of recessed fixtures with ceiling installer.

2.02 EXTERIOR LIGHTING FIXTURES:

A. Exterior lighting fixtures, raceways, equipment, etc. shall be weather-proof and suitable for temperatures down to -20F.

B. Ballast type, lamp wattage, and rated voltage shall be as indicated on the plans. Each ballast shall be of the separate- component type, capable of reliable lamp starting down to -20F, and shall have a minimum power factor of .90.

2.03 LAMPS:

A. Incandescent and LED replacement lamps shall be rated at 130V. H.I.D. and fluorescent lamps shall be as specified on plans with ballasts as specified in the following specifications. Lamp codes listed are ANSI. All lamps shall be Sylvania, General Electric, or approved equivalent.

B. In porcelain keyless fixtures, provide medium base, self ballasted, A-line shape, fluorescent lamps, GE FLE15/2/A21 or equivalent.

2.04 DRIVERS:

A. LED drivers shall be electronic-type, labeled as compliant with radio frequency interference (RFI) requirements of FCC Title 47 Part 15, and comply with NEMA SSL 1 "Electronic Drivers for LED Devices, Arrays, or Systems". LED drivers shall have a sound rating of "A", have a minimum efficiency of 85%, and be rated for a THD of less than 20 percent at all input voltages.

B. Dimmable LED drivers shall be 0-10V type. Dimmable LED drivers shall be capable of dimming without LED strobing or flicker across their full dimming range.

C. Ballasts and drivers shall be rated for the ambient temperatures in which they are located. Outdoor fixtures shall be equipped with ballasts or drivers rated for reliable starting to -20 degrees F. Indoor fixtures located in areas with direct sunlight or above normal ambient temperatures shall have ballasts or drivers rated at 65 degrees C minimum.

2.05 OUTDOOR LIGHTING CONTROLS:

A. Provide astronomical time switch, lighting control system as shown on drawings. Include contactors, time switches, transformers, selector switches, relays, wiring, etc. as required.

B. Set time clock(s) to operate contacts as scheduled hours by Owner.

C. Time clock shall be astronomical seven day programable type. Provide contacts as shown on plans. Time clock shall be readily adjustable

## DIVISION 27 - COMMUNICATIONS

## SECTION 27 20 00 - COMPUTER SYSTEM

1.01 DESCRIPTION:

A. Provide a complete system of raceways, pull boxes, outlet boxes, and terminals. Raceways shall form a complete path up walls and across inaccessible ceilings. Computer wiring may be run wild above accessible ceiling.

2.01 CONDUIT:

A. Conduit in the building shall be galvanized EMT, with plastic bushings on ends which are not terminated in a box.

2.02 WALL OUTLETS:

A. Wall outlets shall be 4" square pressed steel boxes, with single gang plaster ring. Connectors and coverplates are to be provided by the computer system installer.

B. Provide an alternate price for plaster rings at outlet location, and pullstrings in wall up to accessible ceiling, in lieu of conduit and boxes.

2.03 WIRING:

A. Wiring shall be provided by the computer system installer. Wiring run wild in air plenums shall be teflon coated or similarly rated for the application.

3.01 EXECUTION:

A. Provide pull strings in all conduit.

B. Field verify all computer outlet locations. Final locations and heights shall be as designated by the Architect or Owner's representative.

## SECTION 27 30 00 - TELEPHONE SYSTEM

1.01 DESCRIPTION:

A. Provide a complete system of raceways, pull boxes, outlet boxes, and terminals. Raceways shall form a complete path up walls and across inaccessible ceilings. Telephone wiring may be run wild above accessible ceiling.

B. System will include exterior underground conduit routed to a point of connection(usually a pedestal or a power pole) as directed by the telephone company. Exterior conduit shall be sized and installed as directed by the telephone company.

2.01 CONDUIT:

A. Conduit in the building shall be galvanized EMT, with plastic bushings on ends which are not terminated in a box. Exterior underground conduit shall be schedule 40 PVC with solvent joints.

B. Wall outlets shall be 4" square pressed steel boxes, with single gang plaster ring. Connectors and coverplates are to be provided by the telephone system installer.

C. Provide an alternate price for plaster rings at outlet location, and pullstrings in wall up to accessible ceiling, in lieu of conduit and boxes.

2.02 TERMINALS:

A. Telephone terminals shall be constructed of 1/2" thick, fire resistant, interior finish plywood, painted white, sized as shown or required. Provide power and ground connection as required or shown on the plans.

2.03 WIRING:

A. Wiring shall be provided by the telephone system installer. Wiring run in air plenums shall be teflon coated or similarly rated for the application.

3.01 EXECUTION:

A. Provide pull strings in all conduit.

B. Exterior underground conduit shall use long radius, sweep ells. These elbows shall be schedule 80 PVC, or PVC coated GRC conduit.

C. Field verify all telephone outlet locations. Final locations and heights shall be as designated by the Architect or Owner's representative.

## SECTION 27 40 00 - VIDEO SYSTEM

1.01 DESCRIPTION:

A. Provide a complete system of raceways, pull boxes, outlet boxes, and terminals. Raceways shall form a complete path up walls and across inaccessible ceilings. Video wiring may be run wild above accessible ceiling.

2.01 CONDUIT:

A. Conduit in the building shall be galvanized EMT, with plastic bushings on ends which are not terminated in a box. Exterior underground conduit shall be schedule 40 PVC (schedule 80 PVC radius elbows) with solvent joints.

2.02 WALL OUTLETS:

A. Wall outlets shall be 4" square pressed steel boxes, with single gang plaster ring. Connectors and coverplates are to be provided by the video system installer. Provide an alternate price for plaster rings at outlet location, and pullstrings in wall up to accessible ceiling, in lieu of conduit and boxes.

B. Terminal shall contain one type F connector mounted on a brushed aluminum plate. "CATV" will be engraved on plate above each connector in 1/"4 high black letters.

2.03 WIRING:

A. Wiring shall be provided by the video system installer. Wiring run in air plenums shall be teflon coated or similarly rated for the application.

3.01 EXECUTION:

A. Provide pull strings in all conduit.

B. Exterior underground conduit shall use long radius, sweep ells. These elbows shall be schedule 80 PVC conduit.

C. Field verify all television outlet locations. Final locations and heights shall be as designated by the Architect or Owner's representative.

## DIVISION 28 - ELECTRONIC SAFETY AND SECURITY

## SECTION 28 10 00 - SECURITY ALARM SYSTEM

1.01 DESCRIPTION:

A. Provide a complete door security alarm system to audibly and visually annunciate door entry/exit at a master control panel. The door alarms may be individually reset at the master control panel as well as by-passed during certain hours of the day.

2.01 ANNUNCIATOR PANEL:

A. The annunciator panel shall be comprised of (3) 4 door modules each with individual door reset/bypass pushbuttons with associated LED's. The annunciator shall contain a common call placed LED, and alarm tone speaker, momentary action tone silencing push button. The tone silencing circuitry shall automatically reset after the alarm is reset. Each button cap shall be marked with the door identity. The panel shall be constructed of anodized aluminum, supplied with a recessed mounting frame.

2.02 CONTROL UNIT:

A. The control unit shall include a volume control and be configured for pulsating alarm signal. A power supply shall be provided in conjunction with the control unit.

2.03 DOOR CONTACTS:

A. Door contacts shall be normally closed mechanical door contacts.

2.04 WIRING:

A. Wiring shall be low voltage 18 AWG, run per the manufacturers instructions. Wiring may be run wild above accessible ceilings, in raceways in inaccessible locations.

2.05 MANUFACTURER:

A. The equipment shall be manufactured by Auth-Florence, Dukane or approved equivalent.

3.01 EXECUTION:

A. Install the security alarm system in accordance with the manufacturers instructions.

## SECTION 28 30 00 - FIRE ALARM SYSTEM

1.01 GENERAL:

A. Provide an electronically-operated, double-supervised, closed-circuit, addressable type fire alarm system consisting of a control unit, manual-pull stations, alarm signals, automatic smoke and heat detectors, sprinkler monitor modules, and control relays as required, located as shown on the drawings and wired in accordance with the manufacturer's instructions to make a complete and workable system as hereinafter described.

B. Add, remove, move or change devices as required to provide a fire alarm system meeting the requirements of the authority having jurisdiction.

C. Provide equipment manufactured by Simplex Time Recorder Company (System 4000), or equivalent by Fire Lite, Notifier, or Silent Knight.

1.02 CODES AND REGULATIONS:

A. Fire Alarm system shall comply with NFPA 72(2013 edition).

2.01 CONTROL PANEL:

A. The control panel shall be modular with solid state, microprocessor based electronics. Panel shall contain an 80-character LCD display to indicate panel status. The panel shall include intiation device circuits, alarm indicating appliance circuit, supervised annunciator circuits, automatic battery charger and standby batteries.

B. The fire alarm control panel shall be Simplex Series 4010 or equivalent.

2.02 ANNUNCIATOR:

A. The annunciator shall be flush mounted and back lit using LED lights for power on, trouble and alarm indication. Remote annunciator shall have an 80-character LCD display. Units may be stacked within one enclosure to accommodate the proper number of zones. The annunciator shall include trouble silence, alarm silence, and system reset switches. The remote annunciator shall be electrically supervised from the control panel.

B. The annunciator shall be Simplex 4602 Series or equivalent.

2.03 MANUAL PULL STATIONS:

A. Manual pull stations shall be double action type made of red lexan with raised white letter; activation shall require two separate and distinct actions. Reset shall require a key common to the control panel.

B. Pull stations shall be Simplex 4099-series or equivalent.

2.04 SMOKE DETECTORS:

A. Smoke Detectors shall be a dual-chamber, photoelectric type detectors, complete with flashing status-indicating LED for visual supervision. When the detector is actuated, the flashing LED will latch on steady and at full brilliance. The detector may be reset by actuating the control panel reset switch.

B. The detectors shall be Simplex 4098 Series or equivalent.

2.05 AUTOMATIC HEAT DETECTORS:

A. Automatic heat detectors shall be combination rate-of-rise and fixed-temperature type. When the fixed temperature portion is activated, the units shall be non-restorable and give visual evidence of the operation.

B. The detectors shall be Simplex 4098 Series or equivalent.

2.06 DUCT SMOKE DETECTORS:

A. Duct smoke detectors shall be solid-state photoelectric type and shall operate on the light scattering principle. Detector construction shall be of the split type, a mounting base with twist-lock detecting head. Removal of the detector head shall interrupt the supervisory circuit. Detector shall be compatible with normally open fire alarm detection devices. Detector shall have an alarm LED visible through a transparent front cover.

B. The detectors shall be Simplex 4098 Series or equivalent.

2.07 ALARM HORN/ STROBE:

A. Alarm horn/ strobe shall be combination devices. They shall be polarized and operated by 24VDC. Each horn shall include separate wire lead for in/out wiring. The strobe shall be a xenon flashtube. The lexan lens shall be pyramidal in shape. The units shall have panel module and wiring installed to operate strobes independently when horns are turned off.

B. The alarms shall be Simplex 4903 Series or equivalent.

2.08 ALARM STROBE:

A. Alarm strobe shall be a xenon flashtube. The lexan lens shall be pyramidal in shape.

B. The alarms shall be Simplex 4904 Series or equivalent.

2.09 REMOTE ALARM INDICATORS:

A. Remote alarm indicators shall be provided for detectors, which are concealed above ceilings or in locked rooms. The indicators shall include test station switch for detectors above ceilings or in areas difficult to access. The remote alarm or remote alarm/test stations shall be Simplex series 2098 or equivalent.

2.10 AUTODIALER:

A. Install and wire an auto dialer unit for communication to a central station over leased phone wires. Field coordinate exact details with the Owner or Owner's representative.

2.11 MONITOR MODULE:

A. Provide an addressable monitor module for supervision of waterflow and tamper switches.

B. Simplex IAM or equivalent.

2.12 WIRING:

A. Provide a complete system of raceways, pull boxes, and outlet boxes. Raceways shall form a complete path up walls and across inaccessible ceilings. Wiring may be run wild above accessible ceilings.

3.01 INITIATION:

A. Upon the operation of any manual pull station or automatic initiating device (smoke detector, sprinkler flow switch, etc.):

1. Sound a continuous, audible and visible alarm in the entire building
2. Provide description of alarm condition via LCD display at FACP and remote annunciator.
3. In addition, provide controls and wiring required for the following functions:
   a. Shut down all air handling units, except exhaust fans.
   b. Send a signal to a remote monitoring station.

3.02 SYSTEM REPRESENTATIVE:

A. All system representative shall be an authorized engineered systems distributor located within a 50 mile radius of the project.

3.03 REMOTE INDICATING LIGHTS:

A. Remote indicating lights shall be provided for existing detectors obscured from view in locked rooms.

3.04 COMPONENT PROTECTION:

A. Provide a wire guard over any detector or horn in an area susceptible to physical damage.

3.05 FLOW AND TAMPER SWITCHES:

A. Wire all flow switches and tamper switches installed by the fire sprinkler contractor to monitor modules. Determine exact quantity and location before bidding and include the costs of any wiring and conduit.

3.06 HORN LIGHT:

A. Wire the exterior fire protection horn light where shown on the plans or as required by the Fire Department.

10/18/2023 10:00:39 AM

APPROVAL STAMPS:

REVIEWED FOR CODE COMPLIANCE 12/27/2023

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| 1 | 10.18.23 | ISSUED FOR PERMIT |

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INTERIOR DESIGNER:

PROJECT LOCATION

**BASECAMP ROW TOWNHOMES**
1950 CURVE COURT
STEAMBOAT SPRINGS, CO 80487

DRAWING TITLE

ELECTRICAL SPECIFICATIONS

SEAL

COLORADO LICENSED MICHAEL D. VANDER WERF 38983 10/18/2023 PROFESSIONAL ENGINEER

DATE: 10.18.2023

DRAWN BY: GU

CHECKED BY: MV

PROJECT NO: 22082

DRAWING NO:

**E0100-TH1**

# GENERAL NOTES

A. ELECTRICAL CONDUITS, WATER, SEWER AND GAS LINES MUST FIT WITHIN WALLS. CONFLICTS WITH OTHER TRADES MUST BE COORDINATED OR WORK WILL BE REDONE.

B. GFCI PROTECTION:

120V RECEPTACLES MARKED 'G' = GFCI RECEPTACLE
120V RECEPTACLES MARKED 'B' = GFCI BREAKER

NOTE: WHERE POSSIBLE AND WHERE PERMITTED BY CODE THE ELECTRICIAN SHALL PROVIDE DOWNSTREAM GFCI PROTECTION OF DEVICES WITH A SINGLE GFCI RECEPTACLE. (DEDICATED NEUTRAL SHALL BE PROVIDED FOR GFCI BREAKERS)

C. COORDINATE ALL DEVICE AND FIXTURE LOCATIONS WITH FURNITURE, EQUIPMENT, MILLWORK AND MECHANICAL SYSTEM (DUCTWORK) LAYOUT PRIOR TO ROUGH-IN.

D. ALL RECEPTACLES TO BE LABELED WITH PANEL CIRCUIT ID.

E. E.C. SHALL VERIFY THE EXACT LOCATION,MOUNTING HEIGHTS AND QUANTITY OF ALL FIXTURES AND DEVICES WITH THE ARCHITECTURAL DRAWINGS.

F. SOME LIGHTING FIXTURES AND DEVICES ARE SHOWN OFFSET ON THE PLAN FOR GRAPHIC PURPOSES. E.C. SHALL COORDINATE THE EXACT LOCATION AND ROUGH-IN HEIGHT OF ALL FIXTURES AND DEVICES.

G. ALL EMERGENCY EGRESS LIGHTING SHALL COMPLY WITH IBC 1003.2.11

H. ALL EXTERIOR LIGHTING FIXTURES SHALL BE INSTALLED, SHIELDED AND/OR CONTROLLED IN COMPLIANCE WITH LOCAL ORDINANCES.

I. ALL EXTERIOR ELECTRICAL COMPONENTS SHALL MEET ALL NEC INSTALLATION AND LABELING REQUIREMENTS FOR WET LOCATIONS.

J. LIGHTING SYSTEM FUNCTIONALITY TESTING/COMMISSIONING SHALL BE PERFORMED IN ACCORDANCE WITH IECC 408.3, ADDITIONAL LOCAL JURISDICTIONAL REQUIREMENTS TO BE CONFIRMED WITH BUILDING OFFICIAL PRIOR TO COMPLETION OF PROJECT.


TH1 LEVEL 1 ELECTRICAL PLAN
3/16" = 1'-0"

APPROVAL STAMPS:

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12/27/2023

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INTERIOR DESIGNER:

PROJECT LOCATION

**BASECAMP ROW TOWNHOMES**
1950 CURVE COURT
STEAMBOAT SPRINGS, CO 80487

DRAWING TITLE

TH1 LEVEL 1
ELECTRICAL PLAN

SEAL

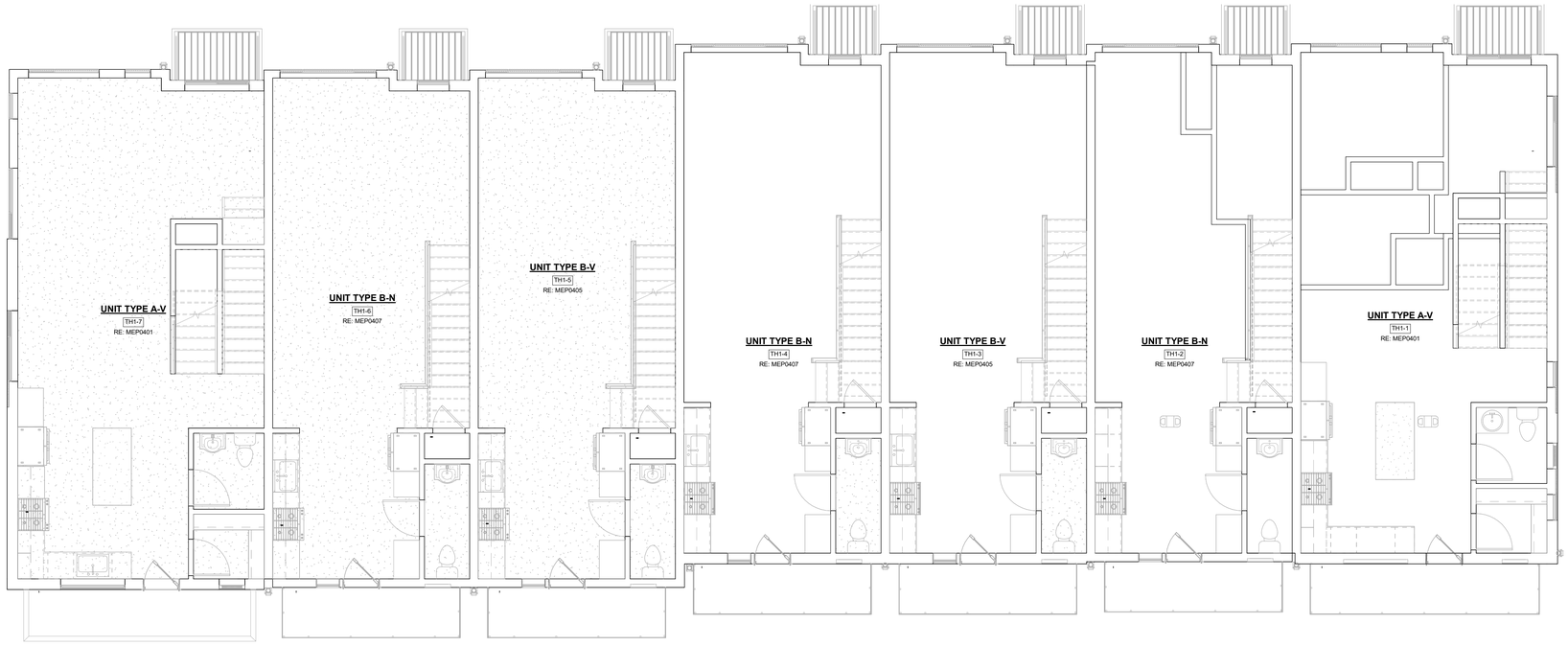
COLORADO LICENSED
MICHAEL VERED
38983
10/18/2023
PROFESSIONAL ENGINEER

DATE: 10.18.2023
DRAWN BY: GU
CHECKED BY: MV
PROJECT NO: 22082

DRAWING NO:
**E0201-TH1**



10/18/2023 10:00:42 AM




## TH1 LEVEL 2 ELECTRICAL PLAN

3/16" = 1'-0"

APPROVAL STAMPS:

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12/27/2023

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INTERIOR DESIGNER:

PROJECT LOCATION

**BASECAMP ROW TOWNHOMES**
1950 CURVE COURT
STEAMBOAT SPRINGS, CO 80487

DRAWING TITLE

TH1 LEVEL 2 ELECTRICAL PLAN

SEAL

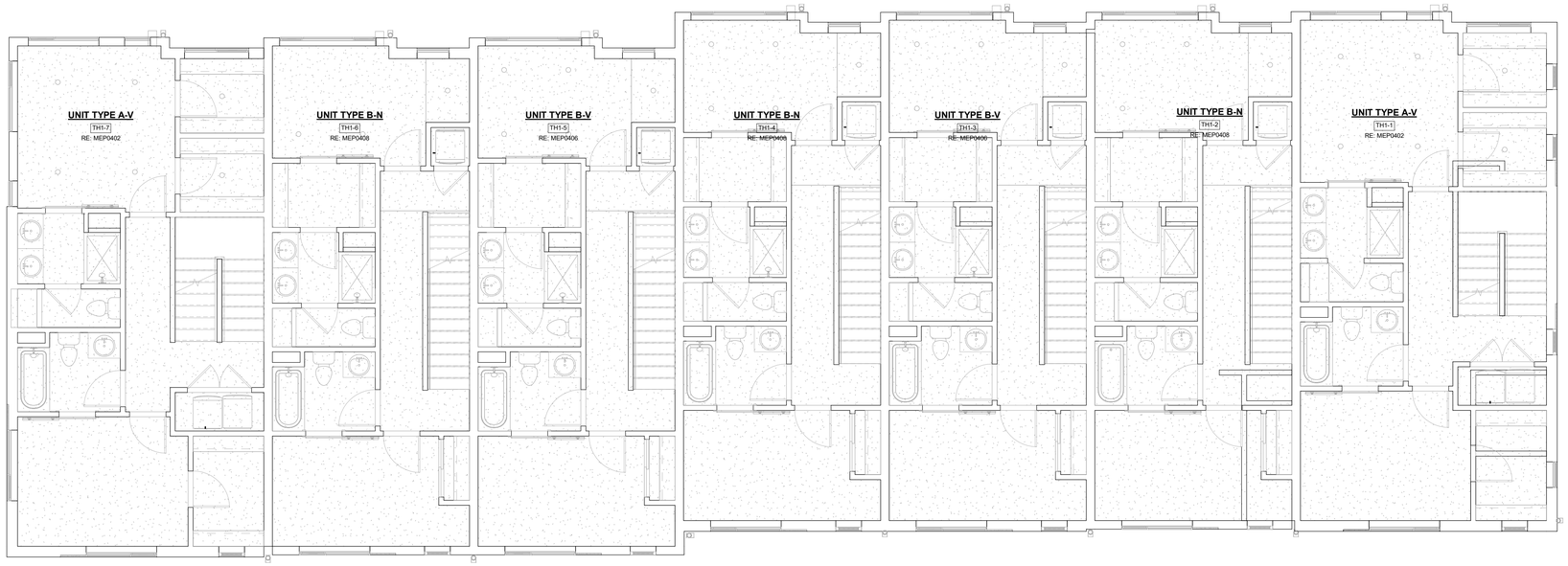
COLORADO LICENSED PROFESSIONAL ENGINEER 38983 10/18/2023

DATE: 10.18.2023
DRAWN BY: GU
CHECKED BY: MV
PROJECT NO: 22082

DRAWING NO:
**E0202-TH1**



10/18/2023 10:00:44 AM




TH1 LEVEL 3 ELECTRICAL PLAN
3/16" = 1'-0"

10/18/2023 10:00:45 AM

APPROVAL STAMPS:

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12/27/2023

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BOULDER, CO 80302

INTERIOR DESIGNER:

PROJECT LOCATION

**BASECAMP ROW TOWNHOMES**

1950 CURVE COURT
STEAMBOAT SPRINGS, CO 80487

DRAWING TITLE

TH1 LEVEL 3 ELECTRICAL PLAN

SEAL

COLORADO LICENSED
38983
10/18/2023
PROFESSIONAL ENGINEER

DATE: 10.18.2023
DRAWN BY: GU
CHECKED BY: MV
PROJECT NO: 22082

DRAWING NO:
**E0203-TH1**


## TH1 LEVEL 4 ELECTRICAL PLAN

3/16" = 1'-0"

10/18/2023 10:00:47 AM

APPROVAL STAMPS:

**REVIEWED FOR CODE COMPLIANCE**
12/27/2023

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BOULDER, CO 80302

INTERIOR DESIGNER:

PROJECT LOCATION

**BASECAMP ROW TOWNHOMES**
1950 CURVE COURT
STEAMBOAT SPRINGS, CO 80487

DRAWING TITLE

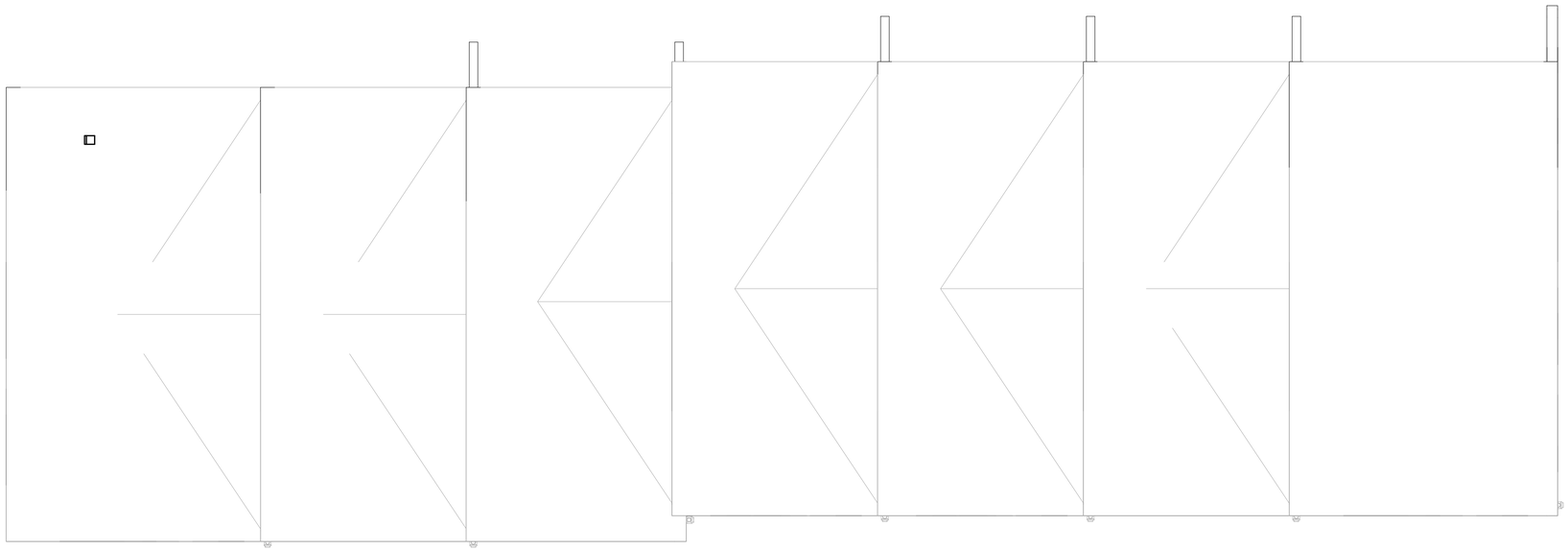
TH1 LEVEL 4
ELECTRICAL PLAN

SEAL

COLORADO LICENSED
MICHAEL VIVERO
38983
10/18/2023
PROFESSIONAL ENGINEER

DATE: 10.18.2023
DRAWN BY: GU
CHECKED BY: MV
PROJECT NO: 22082

DRAWING NO:
**E0204-TH1**



TH1 ROOF ELECTRICAL PLAN
3/16" = 1'-0"

APPROVAL STAMPS:

REVIEWED FOR CODE COMPLIANCE
12/27/2023

| No. | Date | Description |
|---|---|---|
| 1 | 10.18.23 | ISSUED FOR PERMIT |

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M.E.P. & F.P. ENGINEERS

**BOULDER ENGINEERING**
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BOULDER, CO 80302

INTERIOR DESIGNER:

PROJECT LOCATION

**BASECAMP ROW TOWNHOMES**
1950 CURVE COURT
STEAMBOAT SPRINGS, CO 80487

DRAWING TITLE

TH1 ROOF LEVEL ELECTRICAL PLAN

SEAL

COLORADO LICENSED
MICHAEL DEAN VOS
38983
10/18/2023
PROFESSIONAL ENGINEER

DATE: 10.18.2023
DRAWN BY: GU
CHECKED BY: MV
PROJECT NO: 22082

DRAWING NO:
**E0205-TH1**



10/18/2023 10:00:47 AM

## LEGEND

- MAIN DISTRIBUTION CENTER
- PANELBOARD
- ELECTRIC SERVICE METER
- CT — CURRENT TRANSFORMER
- T — TRANSFORMER
- CONCEALED CIRCUIT
- UNDERFLOOR / UNDERGROUND CIRCUIT
- EXPOSED CIRCUIT
- WM — WIREMOLD (SURFACE WIREWAY)
- PM — PLUGMOLD
- P-3 — HOMERUN TO PANELBOARD (ONE ARROW / CKT, PNL & CKT #'S SHOWN)
- (44,46) — CIRCUIT NUMBER(S) FOR SPECIFIED PANEL
- CONDUIT TURNS UP
- CONDUIT TURNS DOWN
- J J — JUNCTION BOX / CARD READER
- K — PORCELAIN LAMP HOLDER (PC: PULL CHAIN)
- LIGHT FIXTURE: SURFACE MOUNTED
- RECESSED LIGHT FIXTURE
- WALL MOUNTED LIGHT FIXTURE
- EXIT LIGHT; DIRECTIONAL ARROW
- BATTERY PACK
- SURFACE FLUORESCENT FIXTURE
- RECESSED FLUORESCENT FIXTURE
- SINGLE OUTLET; C-CLOCK (+70')
- DUPLEX RECEPTACLE (G: ISOLATED GROUND)
- CEILING DUPLEX RECEPTACLE
- DUPLEX RECEPTACLE - GFCI
- DUPLEX RECEPTACLE - GFCI BREAKER
- DUPLEX RECEPTACLE - TAMPER RESIST
- SPLIT WIRE DUPLEX
- QUADRAPLEX (DOUBLE DUPLEX)
- COMB. SWITCH / RECEPTACLE
- FLOOR MOUNTED RECEPTACLE
- SPECIAL PURPOSE (AS NOTED)
- TELEVISION OUTLET
- MOTOR OUTLET (mt - switched thermal overload)
- TELEPHONE TERMINAL
- TELEPHONE OUTLET
- FLOOR MTD. TELEPHONE OUTLET
- $\nabla_C$ — COMPUTER OUTLET
- COMB. TELE/COMPUTER OUTLET
- S — TOGGLE SWITCH (a-switching, 2-2 pole, 3-3 way, 4-4 way; p-pilot light, k-keyed, to-thermal overload, t-timer)
- # — WALL MOUNTED LIGHTING CONTROL DEVICE RE: LIGHTING CONTROL DEVICE SCHEDULE
- (P) — CEILING MOUNTED LIGHTING CONTROL DEVICE RE: LIGHTING CONTROL DEVICE SCHEDULE
- T — THERMOSTAT
- TS — TIME SWITCH
- PE — PHOTOCELL
- PUSH-BUTTON STATION
- SAFETY SWITCH
- MOTOR STARTER / LIGHTING CONTACTOR
- COMBINATION MOTOR STARTER
- R — RELAY
- FACP — FIRE ALARM CONTROL PANEL
- ANNUNCIATOR
- PULL STATION
- HORN
- L — HORN / LIGHT COMBINATION
- S — HORN / STROBE
- S — STROBE
- BELL
- OS & Y VALVE
- F — FLOW SWITCH
- ROOM DETECTOR (SMOKE)
- $\bullet_T$ — ROOM DETECTOR (THERMAL)
- DUCT DETECTOR
- REMOTE INDICATING LIGHT / TEST SWITCH
- DOOR HOLDER
- CHIME
- FUSED SWITCH
- CIRCUIT BREAKER
- GROUND CONNECTOR
- MECHANICAL EQUIPMENT
- DETAIL NOTE
- KITCHEN / MEDICAL EQUIPMENT
- (E) — EXISTING TO REMAIN
- (ER) — EXISTING TO BE RELOCATED
- (ED) — EXISTING TO BE DEMOLISHED

## MECHANICAL EQUIPMENT

| KEY | DESCRIPTION | LOAD | VOLT | CIRCUIT | CONNECTION | REMARKS |
|---|---|---|---|---|---|---|
| FU 2 | GAS FIRE FURNACE | 6.8 A | 120/1 | (2-#12,#12G) 1/2"C | THERMAL O.L. | |
| CU 2 | CONDENSING UNIT | 15 MCA | 240/1 | (2-#12,#12G) 1/2"C | 30/2; 15 FRN | |
| BH 1 | ELECTRIC BASEBOARD HEATER | 750 W | 240/1 | (2-#12,#12G) 1/2"C | 30/2; NF | |
| EF 1 | CEILING EXHAUST FAN | 11 W | 120/1 | (2-#12,#12G) 1/2"C | THERMAL O.L. | |
| EF 2 | KITCHEN EXHAUST FAN | 9.9 W | 120/1 | (2-#12,#12G) 1/2"C | THERMAL O.L. | |

NOTES: *TEMPERATURE RATING OF ALL DEVICES COULD NOT BE VERIFIED, THEREFORE WIRE IS SIZED BASED ON 60C PER NEC 110.14(C)(1)(a)
*COORDINATE ALL ROUGH-IN HEIGHTS AND LOCATIONS WITH KITCHEN VENDOR AND/OR OWNER.

## LUMINAIRE SCHEDULE

| KEY | LAMP | DESCRIPTION | CEIL'G (DEPTH) | MANUFACTURER/# | VOLT |
|---|---|---|---|---|---|
| RA | TBD | UNIT DOWNLIGHT | RECESSED | TBD | 120 |
| RB | TBD | UNIT VANITY | WALL | TBD | 120 |
| RC | TBD | UNIT CLOSET / STORAGE LIGHT | SURFACE | TBD | 120 |
| RD | TBD | UNIT PENDANT - KITCHEN | SUSPENDED | TBD | 120 |
| RE | TBD | UNIT PENDANT - LIVING ROOM | SUSPENDED | TBD | 120 |
| RF | TBD | UNIT WALL WASH | RECESSED | TBD | 120 |
| RG | TBD | UNIT TRACK FIXTURE W/ 1/2-AMP CURRENT LIMTING DEVICE | SURFACE | TBD | 120 |
| RH | TBD | UNIT BEDROOM DOWNLIGHT | SURFACE | TBD | 120 |

NOTES: *NOTIFY ENGINEER OF ANY DISCREPANCIES BETWEEN MODEL NUMBERS AND DESCRIPTIONS PRIOR TO ORDERING
*VERIFY CEILING INSULATION W/ GC AND NOTIFY ENGINEER OF ANY IC RATING CONFLICTS PRIOR TO ORDERING

### BUILDING RESIDENTIAL LOAD CALCS BASED UPON NEC 220.84

Number of Units 7
Total square footage 14,320

| | | | | | | |
|---|---|---|---|---|---|---|
| (1) | Appliance and Laundry Circuits | | | | | |
| | 14 | Appliance Circuits | @ | 1,500 VA | = | 21,000 VA |
| | 7 | Laundry Circuits | @ | 1,500 VA | = | 10,500 VA |
| | SUB-TOTAL | | | | = | 31,500 VA |
| (2) | Gen Lighting and Gen Use Receptacles | | | | | |
| | 14320 | Sq Ft @ 3 Watts/sq ft | | | = | 42,960 VA |
| (3) | Appliances | | | | | |
| | 7 | Clothes Dryer | @ | 5,000 VA | = | 35,000 VA |
| | 7 | Range | @ | 8,000 VA | = | 56,000 VA |
| | 7 | Dishwasher | @ | 1,200 VA | = | 8,400 VA |
| | 7 | Disposer | @ | 1,180 VA | = | 8,260 VA |
| | 7 | Hybrid Water Heater | @ | 7,200 VA | = | 50,400 VA |
| | 7 | Range Hood/ Microwave | @ | 1,200 VA | = | 8,400 VA |
| | 7 | Refrigerator/Freezer | @ | 500 VA | = | 3,500 VA |
| | 27 | Bath Exhaust Fan | @ | 50 VA | = | 1,350 VA |
| | SUB-TOTAL | | | | = | 225,070 VA |
| (4) | Other Motor or Low P. F. Loads | | | | | |
| | 7 | Garage Door openers | @ | 1,100 VA | = | 7,700 VA |
| | 7 | Crawlspace EF | @ | 108 VA | = | 756 VA |
| | SUB-TOTAL | | | | = | 46,776 VA |
| (5) | Plus 100% Larger of Heating/Cooling Load | | | | | |
| | 14 | Furnace | @ | 1,200 VA | = | 16,800 VA |
| | 0 | 3 Tons | @ | 3,840 VA | = | - |
| | 0 | 3.5 Tons | @ | 4,395 VA | = | - |
| | SUB-TOTAL | | | | = | 53,550 VA |
| | TOTAL OF ALL LOADS | | | | | |
| | Total Load | | | | = | 401,856 VA |
| | Multy Family Demand Factor (220-84) | | | | | 0.44 |
| | GRAND TOTAL LOAD | | | | = | 176,817 VA |
| | | | | | ($/240/1) | 736.7 A |

### LARGEST UNIT RESIDENTIAL LOAD CALCS BASED UPON NEC 220.82

Total square footage 2,475

| | | | | | | |
|---|---|---|---|---|---|---|
| (1) | Appliance and Laundry Circuits | | | | | |
| | 2 | Appliance Circuits | @ | 1,500 VA | = | 3,000 VA |
| | 1 | Laundry Circuits | @ | 1,500 VA | = | 1,500 VA |
| | SUB-TOTAL | | | | = | 4,500 VA |
| (2) | Gen Lighting and Gen Use Receptacles | | | | | |
| | 2475 | Sq Ft @ 3 Watts/sq ft | | | = | 7,425 VA |
| (3) | Appliances | | | | | |
| | 1 | Clothes Dryer | @ | 5,000 VA | = | 5,000 VA |
| | 1 | Range | @ | 8,000 VA | = | 8,000 VA |
| | 1 | Dishwasher | @ | 1,200 VA | = | 1,200 VA |
| | 1 | Disposer | @ | 1,180 VA | = | 1,180 VA |
| | 1 | Hybrid Water Heater | @ | 7,200 VA | = | 7,200 VA |
| | 1 | Range Hood/ Microwave | @ | 1,200 VA | = | 1,200 VA |
| | 1 | Refrigerator/Freezer | @ | 500 VA | = | 500 VA |
| | 1 | EV Charger, 240V | @ | 7,680 VA | = | 7,680 VA |
| | 5 | Bath Exhaust Fan | @ | 50 VA | = | 250 VA |
| | SUB-TOTAL | | | | = | 32,210 VA |
| (4) | Other Motor or Low P. F. Loads | | | | | |
| | 1 | Garage Door openers | @ | 1,100 VA | = | 1,100 VA |
| | 1 | Crawlspace EF | @ | 108 VA | = | 108 VA |
| | 1 | Elevator | @ | 5,760 VA | = | 5,760 VA |
| | SUB-TOTAL | | | | = | 6,968 VA |
| (5) | Total of 'General' Loads [(1)+(2)+(3)+(4)] | | | | = | 51,103 VA |
| | First | 10,000 | @ | 100% | = | 10,000 VA |
| | Remainder | 41,103 | @ | 40% | = | 16,441 VA |
| | SUB-TOTAL | | | | = | 26,441 VA |
| (C) | Plus 100% Larger of Heating/Cooling Load | | | | | |
| | 2 | Furnace | @ | 1,200 VA | = | 2,400 VA |
| | 1 | 2 Tons | @ | 2,630 VA | = | 2,630 VA |
| | 1 | 2.5 Tons | @ | 3,360 VA | = | 3,360 VA |
| | SUB-TOTAL | | | | = | 8,390 VA |
| | TOTAL OF ALL LOADS | | | | | |
| | 'Other' Loads | | | | = | 26,441 VA |
| | Heating / Cooling Load | | | | = | 8,390 VA |
| | GRAND TOTAL LOAD | | | | = | 34,831 VA |
| | | | | | ($/240/1) | 145.1 A |

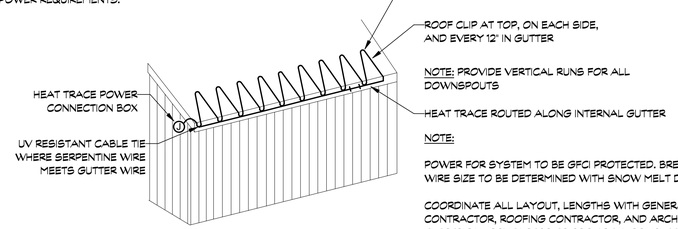



NTS

## TELEPHONE ONE LINE 4

NOTE:

SNOWMELT SYSTEM TO BE DESIGN BUILD. CONTRACTOR TO SUBMIT DESIGN TO ELECTRICAL ENGINEER FOR COORDINATION OF POWER REQUIREMENTS.




NOTE:

POWER FOR SYSTEM TO BE GFCI PROTECTED. BREAKER AND WIRE SIZE TO BE DETERMINED WITH SNOW MELT DESIGN.

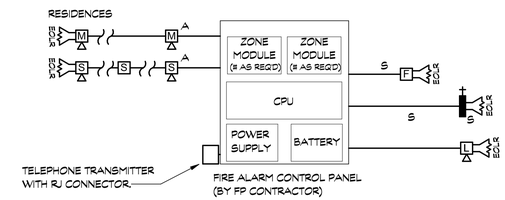
COORDINATE ALL LAYOUT, LENGTHS WITH GENERAL CONTRACTOR, ROOFING CONTRACTOR, AND ARCHITECT. ELECTRICAL CONTACTOR TO PROVIDE A COMPLETE SYSTEM INCLUDING CONTROLLERS AND SENSORS AS SHOWN, SYSTEM TO BE RAYCHEM OR EQUIVALENT.

NTS

## SNOW MELT SYSTEM DIAGRAM 3

### FIRE ALARM NOTES

1. FIRE ALARM PANEL WITH AUTO DIALER, BATTERIES, ETC BY ELECTRICAL CONTRACTOR. WIRE UP ANCILLARY EQUIPMENT TO THIS PANEL AS REQUIRED BY LOCAL CODE.




### FIRE ALARM WIRING LEGEND

- I INITIATING CIRCUIT
- A ALARM CIRCUIT
- S SUPERVISORY CIRCUIT

### FIRE ALARM ZONE SCHEDULE

1. SPRINKLER
2. TAMPER SWITCH, TROUBLE ALARM
3. SPARE

NTS

## FIRE ALARM ONE LINE DIAGRAM 2

### TH1 SHORT CIRCUIT CALCULATION

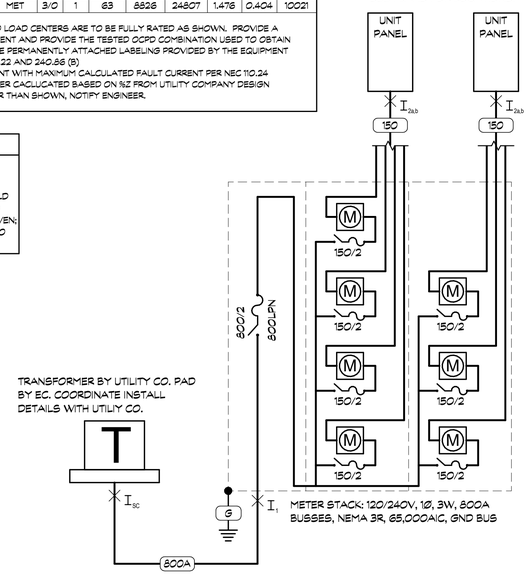
| LOCATION | | SECONDARY VOLTAGE | | | | Ø | KVA | %Z* | Isc AVAIL. | | "M" | Isc FAULT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TRANS | $I_{sc}$ | 240 | | | | 1 | 100 | 1.4 | 417 | | 71.4 | 29800 |
| LOCATION | | VOLT. | Ø | WIRE TYPE | CONDUIT TYPE | WIRE SIZE | #OF RUNS | LENGTH | 'C' VALUE | Isc AVAIL. | "F" | "M" | Isc FAULT |
| METER STACK | $I_1$ | 240 | 1 | AL | NON | 400 | 3 | 45 | 18505 | 29800 | 0.201 | 0.832 | 24807 |
| UNIT PANEL < 10A | $I_{2a}$ | 240 | 1 | AL | MET | 3/0 | 1 | 64 | 8826 | 24807 | 1.493 | 0.400 | 9927 |
| UNIT PANEL > 10A | $I_{2b}$ | 240 | 1 | AL | MET | 3/0 | 1 | 63 | 8826 | 24807 | 1.476 | 0.404 | 10021 |

NOTES: SWITCHBOARDS, PANELBOARDS AND LOAD CENTERS ARE TO BE FULLY RATED AS SHOWN. PROVIDE A DEDUCT PRICE TO USE SERIES RATED EQUIPMENT AND PROVIDE THE TESTED OCPD COMBINATION USED TO OBTAIN THE SERIES RATING. ALL EQUIPMENT TO HAVE PERMANENTLY ATTACHED LABELING PROVIDED BY THE EQUIPMENT MANUFACTURER AND INSTALLER PER NEC 110.22 AND 240.86 (B)
PROVIDE MARKING ON ALL SERVICE EQUIPMENT WITH MAXIMUM CALCULATED FAULT CURRENT PER NEC 110.24
*AVAILABLE FAULT CURRENT AT TRANSFORMER CALCULATED BASED ON NZ FROM UTILITY COMPANY DESIGN STANDARDS. IF TRANSFORMER SIZE IS OTHER THAN SHOWN, NOTIFY ENGINEER.

### WIRING LEGEND

| | |
|---|---|
| 150 | (3-3/0 AL, #6 CU G)2"C |
| 800A | 3[(3-400MCM AL)4"C] |
| G | (2/0 CU)3/4"C TO BLDG STEEL, COLD WATER PIPE, CONCRETE ENCASED ELECTRODE; 2[(#6CU)1/2"C] TO DRIVEN; GROUND RODS NOT LESS THAN 6O APART |

LOADCENTER: 120/240V, 1Ø, 150 MLO 30 POLE, 10,000AIC TYPICAL FOR PANELS. NO HALF WIDTH BREAKERS ALLOWED. SEE PLANS FOR LOCATIONS.




NTS

## ELECTRICAL ONE LINE DIAGRAM 1

10/18/2023 10:00:50 AM

APPROVAL STAMPS:

REVIEWED FOR CODE COMPLIANCE
12/27/2023

| No. | Date | Description |
|---|---|---|
| 1 | 10.18.23 | ISSUED FOR PERMIT |

SUBMISSIONS & REVISIONS

OWNER

**MAY RIEGLER PROPERTIES**
2201 WISCONSIN AVE NW
SUITE 200
WASHINGTON, DC 20007

ARCHITECT

KEVIN & ASAKO SPERRY ARCHITECTURE
3318 N. Columbus Street
Arlington, VA 22207
T.312.636.3248 / 312.636.4252
www.kasa-arch.com

GENERAL CONTRACTOR

CIVIL ENGINEER

**LANDMARK CONSULTANTS, INC.**
141 9TH STREET
PO BOX 774943
STEAMBOAT SPRINGS, CO 80477

LANDSCAPE ARCHITECT

**NVISION DESIGN STUDIO, INC.**
677 25 ROAD
GRAND JUNCTION, CO 81505

STRUCTURAL ENGINEER

**ANTHEM STRUCTURAL ENGINEERS**
430 YAMPA STREET
STEAMBOAT SPRINGS, CO 80487

M.E.P. & F.P. ENGINEERS

**BOULDER ENGINEERING**
1717 15TH STREET
BOULDER, CO 80302

INTERIOR DESIGNER:

PROJECT LOCATION

**BASECAMP ROW TOWNHOMES**
1950 CURVE COURT
STEAMBOAT SPRINGS, CO 80487

DRAWING TITLE

ELECTRICAL DETAILS & SCHEDULES

SEAL

COLORADO LICENSED ELECTRICAL ENGINEER 38983 10/18/2023 PROFESSIONAL ENGINEER

DATE: 10.18.2023
DRAWN BY: GU
CHECKED BY: MV
PROJECT NO: 22082

DRAWING NO:

**E0401-TH1**