

SCOPE OF WORK
APN: 002-102-005
THIS IS A NEW MULTI FAMILY APARTMENTS BEING BUILT IN THE COUNTY OF MADERA, CA
THE STATIC PSI RESIDUAL PSI AND GPM AS A BASIS, SUPPLY IS FROM AN EXISTING WELL AND PRESSURES ABOVE TO COMPLY WITH THIS DEMAND.
SPRINKLER COVERAGE BASIS: RESIDENTIAL ABOVE UNITS IS 16 X 16 COVERAGE. ATTIC SPRINKLER = QUICK RESPONSE INTERMEDIATE SPRINKLER, (REQUIRED WITH ATTIC FURNACE) SPRINKLER INSTALLED 12" BELOW ROOF DECK AND ABOVE FURNACE.
NO SPRINKLERS TO BE INSTALLED IN PATIO, BATHROOMS LESS THAN 55 SQ. FT. CLOSETS UNDER 24 SQ.FT. LEAST DIMENSION NOT EXCEEDING 30"
HANGER TYPE: FIG.28 RESIDENTIAL AND FIG.29 FOR CPVC PIPE.
THE SYSTEM IS BASED ON AN NFPA 13R-2022 EDITION OF THAT CODE GUIDELINE.
<b>JOB:</b> NEW MULTI FAMILY APARTMENTS OWNER: SAM ALVARADO JOB SITE: 600 ALAMEDA AVE. CHOWCHILLA, CA 93610 <b>CONTRACTOR:</b> JKM FIRE PROTECTION 27173 SAN JOSE AVE. MADERA CA 93637 LIC. # 915819 TYPE C-16
<b>FIRE SPRINKLER RISER WARNING REQUIREMENT:</b>
THE WATER SYSTEM FOR THIS HOME SUPPLIES FIRE SPRINKLERS THAT RESTRICT THE FLOW OR DECREASE THE PRESSURE OR AUTOMATICALLY SHUT OFF THE WATER TO FIRE SPRINKLER SYSTEM SUCH AS WATER SOFTENERS, FILTRATION SYSTEMS, AND AUTOMATIC SHUTOFF VALVES, SHALL NOT BE ADDED TO THIS SYSTEM WITHOUT A REVIEW OF THE FIRE SPRINKLER SYSTEM BY A FIRE PROTECTION SPECIALIST.
DO NOT REMOVE THIS SIGN.
<b>MASTER TITLE BLOCK RESIDENTIAL FIRE SPRINKLER:</b>

THE SPRINKLER RISER DETAIL INDICATES (E) OR (I) THE "E" IS EXTERNAL RISER. THE "I" IS INTERNAL RISER. FOR EXTERNAL RISER THE PIPE WILL BE EITHER GALV. SCH. 40 OR TYPE M COPPER. FOR CALCULATION PURPOSES WE USE THE MOST DEMANDING PIPE AS A PROOF CALC. FOR THE INTERNAL RISER WE INSTALL A CPVC CHECK VALVE, AN X X X WITH A 1/2 OUTLET TEE. FROM THE 1/2' OUTLET WE INSTALL GALVANIZED NIPPLE TO A GALVANIZED TEE. ON THE UPPER SIDE OF THE TEE WE INSERT A GAUGE AND ON THE LOWER SIDE OF THE TEE IS A 1/2" BALL VALVE AS THE DRAIN. THE DRAIN PIPE IS RUN TO THE EXTERIOR OF THE GARAGE.
IF THE WATER SUPPLY IS PROVIDED BY AN EXISTING OR NEW WELL (SEE SITE PLAN) THEN THE FOLLOW SHALL APPLY. PROVIDE WATER STORAGE AS REQUIRED IN NFPA 13D. A 10 MINUTES OF WATER STORAGE IS REQUIRED. ANY LOCAL BUILDING DEPARTMENT ORDINANCES SUCH AS A 2,500 GAL. TANK WITH FIRE OUTLETS WILL BE PROVIDED BY OTHERS. VERIFY THE WATER SUPPLY FROM THE EXISTING WELL WILL PROVIDE THE PRESSURE AND GPM NEEDED TO SUPPLY THE FIRE SPRINKLER SYSTEM FOR AT LEAST A TEN-MINUTE DURATION. ADD U.L. LISTED TANK AND BOOSTER PUMP AS NEEDED TO ACHIEVE THIS OBJECTIVE.

Hanger Spacing 13-R Fire System
<u>¾" 5.5 ft. spacing</u>
<u>1" 6.0 ft. spacing</u>
<u>1 1/4" 6.5 ft. spacing</u>
<u>1 1/2" 7.0 ft. spacing</u>
<u>2" 8.0 ft. spacing</u>
Hanger Spacing 13-R Fire System End of line distance
<u>¾" 09"+100 psi = 06"</u>
<u>1" 12"+100 psi = 09"</u>
<u>1 1/4" 16"+100 psi = 12"</u>
<u>1 1/2" 24"+100 psi = 12"</u>
Hanger Spacing 13-R Fire System Inline sprinkler distance to head drop
<u>¾" 04"+100 psi = 03"</u>
<u>1" 05"+100 psi = 04"</u>
<u>1 1/4" 06"+100 psi = 05"</u>
<u>1 1/2" 07"+100 psi = 07"</u>

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### Proposed Multi-Family Project

UNITS PROPOSED 4 - BUILDINGS W/ 4 UNITS EA. = 16 UNITS (4721 SQ. FT. / BLDG.)

PROPOSED PARKING SPACES 3 - HC. & 22 REGULAR SPACES = 25 TOTAL SPACES  
(32 SPACES REQUIRED - 7 STREET PARKING)  
LANDSCAPING ALONG ALAMEDA AVE.

LOT AREA 28,000 SQ.FT.

PROPOSED OPEN SPACE 1400 SQ. FT. MIN. (5% OF LOT AREA) - 183 SQ.FT. / UNIT REQUIRED  
6692 SQ.FT. PROVIDED (418 SQ. FT. / UNIT)

PATIO'S ONLY	= 3151 SQ.FT.
QUALIFYING LANDSCAPED AREA'S	= 3541 SQ.FT.
TOTAL OPEN SPACE	= 6692 SQ. FT.





**Hydraulic Calculations**  
 1. For hydraulic design purposes, indicate 45 psi static, 35 psi residual, and a flow of 1800 gallons per minute in hydraulic calculations.  
 2\*. All standard plans, include a minimum of 40' 1" type K copper pipe (C factor of 150) with an interior diameter of .995 from the city main to the meter.  
 3\*. Include an additional 10'6" of pipe lengths for the fittings for the meter in the underground in the hydraulic calculations for standard plans and custom homes. This should be added to the 40'1" type K copper pipe for a total of 50'1".  
 4\*. For all standard plans, indicate a minimum of 70' of pipe from the meter to the riser and specify the pipes type and size. For cottage homes, indicate a minimum of 250' of 1 1/2" from the meter to the riser.  
 5. Include an equivalent length chart with calculations. (note for plan checker-some designers add tee runs into the pipe lengths because the software they use does not allow them to enter it as a fitting)  
 6. All calculations for custom homes must indicate the actual length of pipe from the city main to the meter using 1" type K copper pipe (C factor of 150) with an interior diameter of .995 and the type and length of the pipe after the meter.  
 7. Indicate a minimum 3-pound friction loss for the meter.  
 8. Include a 5-gallon domestic water demand in all hydraulic calculations for 13D systems.  
 Flow (Q), K factor (K), Pressure (P)  
 a.  $Q = KV/P$   
 b.  $P = (QK)^2$   
 c.  $K = Q \cdot V/P$  9. Hazen Williams Formula  
 $P = 4.52 Q \cdot 1.85$   
 $C1.85D4.87$

\*see site plan for more

**Installation Requirements**  
 1. Provide a full flow quarter turn shut off valve.  
 2. All piping in the attic is required to be covered by insulation.  
 3. The garage must have fire sprinklers installed. For garages with finished ceilings, 175-degree residential sprinklers shall be used. Overhead door position may be ignored relative to sprinkler placement.  
 4. Note that all uninsulated attic areas, such as the garage attic, require that the sprinkler piping be insulated.  
 5. Provide a domestic water line drop from the sprinkler piping to a remote toilet fixture.  
 6. Steel pipe used in the system riser shall be galvanized.  
 7. Ceiling sprinklers shall be located a minimum of 36" from the centerline of all electrical boxes.  
 8. In bedrooms, sprinklers shall be installed a minimum of 36" from the center of the room to accommodate the future installation of ceiling fans or light fixtures.  
 9. Shadow areas are permitted in the protection area of a sprinkler as long as the cumulative dry area does not exceed 15 square feet.  
 10. The small closet rule NFPA 13D section 8.3. does not apply to closets containing laundry or other appliances. Closets 24 square feet or less are not required to be fire sprinklered. The provision to sprinkler closets where the least dimension exceeds 3' has been removed from the 2022 Edition of NFPA 13D.  
 11. Provide a spare fire sprinkler headbox that includes at least one sprinkler head of each type used in this residence (normally two spare sprinkler heads). The spare headbox is to be located in the laundry room or in the garage adjacent to the door leading into the house. A wrench is not required in the spare head kit.

Table G1							
Allowance for Friction Loss in Fittings							
Fitting Size	3	1	1-1/4	1-1/2	2	2-1/2	3
<b>ANSI Inches</b>							
<b>Tee Branch=Ft.</b>	3	5	6	8	10	12	15
<b>Elbow 90**-Ft.</b>	4	5	6	7	9	12	13
<b>Elbow 45*-Ft.</b>	1	1	2	2	2	3	4
<b>Coupling-Ft.</b>	1	1	1	1	1	2	2
<b>Tee Run**-Ft.</b>	1	1	1	1	1	2	2

**Standard Notes**  
 1. Provide a legend on the cover sheet of the fire sprinkler plan that includes each of the different head types for this residence.  
 2. A complete & separate sprinkler plan is required for each floor plan option. 2022 CRC R106.1.1  
 3. Indicate maximum head spacing on plans.  
 4. Note on the fire sprinkler plan that the system used must comply with NFPA 13D, or R313.3, which is considered to be equivalent. 2022 CRC R313.  
 5. Note on the residential Fire Sprinkler Plan that, effective 1/1/10, all piping, fixtures, fittings, and sprinkler heads must comply with the lead-free requirements of AB1953. Note that all of the above-noted items are not permitted to exceed 0.25% lead content.  
 6. Provide table R313.3.2.2 regarding the location of intermediate sprinkler heads on the fire sprinkler plan. 2022 CRC R106.11  
 7. Note on the fire sprinkler plan that modifications are prohibited. Sprinklers that have been painted, caulked, modified, or damaged must be replaced. 2022 CRC R313.3.2.6  
 8. Note on the fire sprinkler plan that a separate shut off valve is not permitted for the fire sprinkler system. 2022 CRC R313.3.3.2  
 9. Note on the fire sprinkler plan that an owners manual must be provided to the homeowner. 2022 CRC R313.3.7  
 10. Note on the fire sprinkler plan at the main shut-off valve, a tag or a sign stating the following is required; "Warning, the water system for this home supplies fire sprinklers that require certain flows and pressures to fight a fire. Devices that restrict the flow or decrease the pressure or automatically shut off the water to the fire sprinkler system, such as water softeners, filtration systems, and automatic shut-off valves, SHALL NOT be added to this system without a review of the fire sprinkler system by a fire protection specialist. DO NOT REMOVE THIS SIGN" 2022 CRC R313.3.7  
 11. Show an alternate point of connection for the water service on the opposite side of the residence. 2022 CRC R106.1.1  
 12. Note the ceiling height of all rooms in the residence that require fire sprinklers, including the garage on the fire sprinkler plan.  
 13. Provide the designer's signature on the plans and the calculations.

**Pipe Diameters to be used in Calculations**  
**Pipe Diameters:** The City of Clovis Water Division specifies Type K copper tubing for single-family home domestic water services to the meter from the public water main. The interior diameter of Type K copper tubing for hydraulic calculations purposes is:  
Nominal Size   Actual Internal Diameter

1" .995"  
 1-1/4" 1.24" (only for greater than 40' of pipe between the city main and meter)

**Fittings in the City Service:** There are two valves between the city water main and the water meter that must be included in hydraulic calculations. The total equivalent pipe lengths for the corp. stop and angle meter stop are as follows:

1" = 10.6 feet  
 1-1/4" = 13.8 feet

**Water meter friction loss:** A meter loss must be included, even if an existing house does not currently have a water meter. Water meters will be added to all existing house domestic services in the near future. Neptune T-10 friction loss charts for 1" 1-1/2", and 2" services are attached.

**Water meter transition:** Two elbows must be added to the calculations for the transition from the meter to the PVC underground piping run to the house.

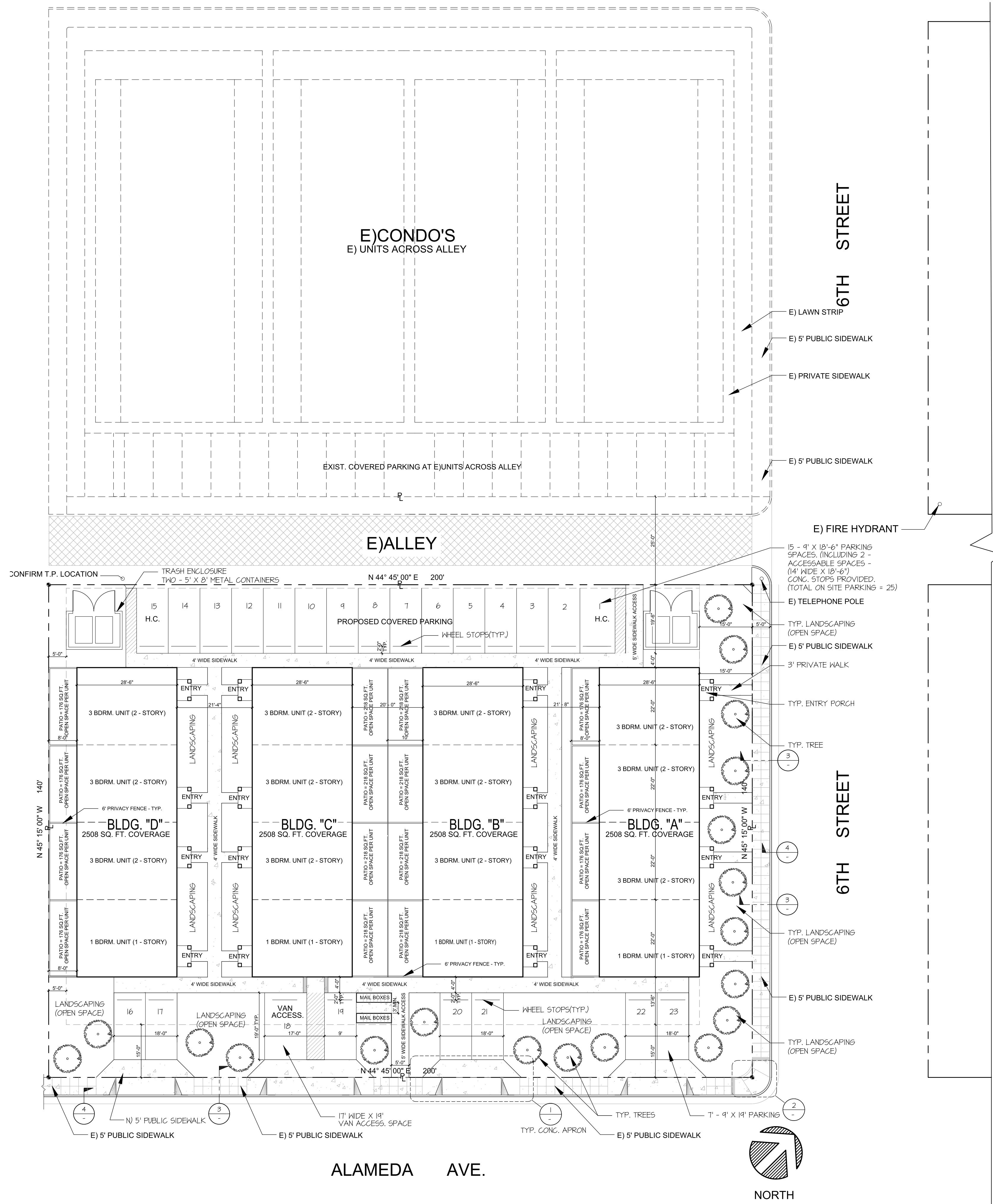
**PVC tubing inside diameter:**  
 1 inch = 1.049"  
 1 1/4 inch = 1.38"  
 1 1/2 inch = 1.61"  
 2" inch = 2.067"  
 2" inch = 2.003"

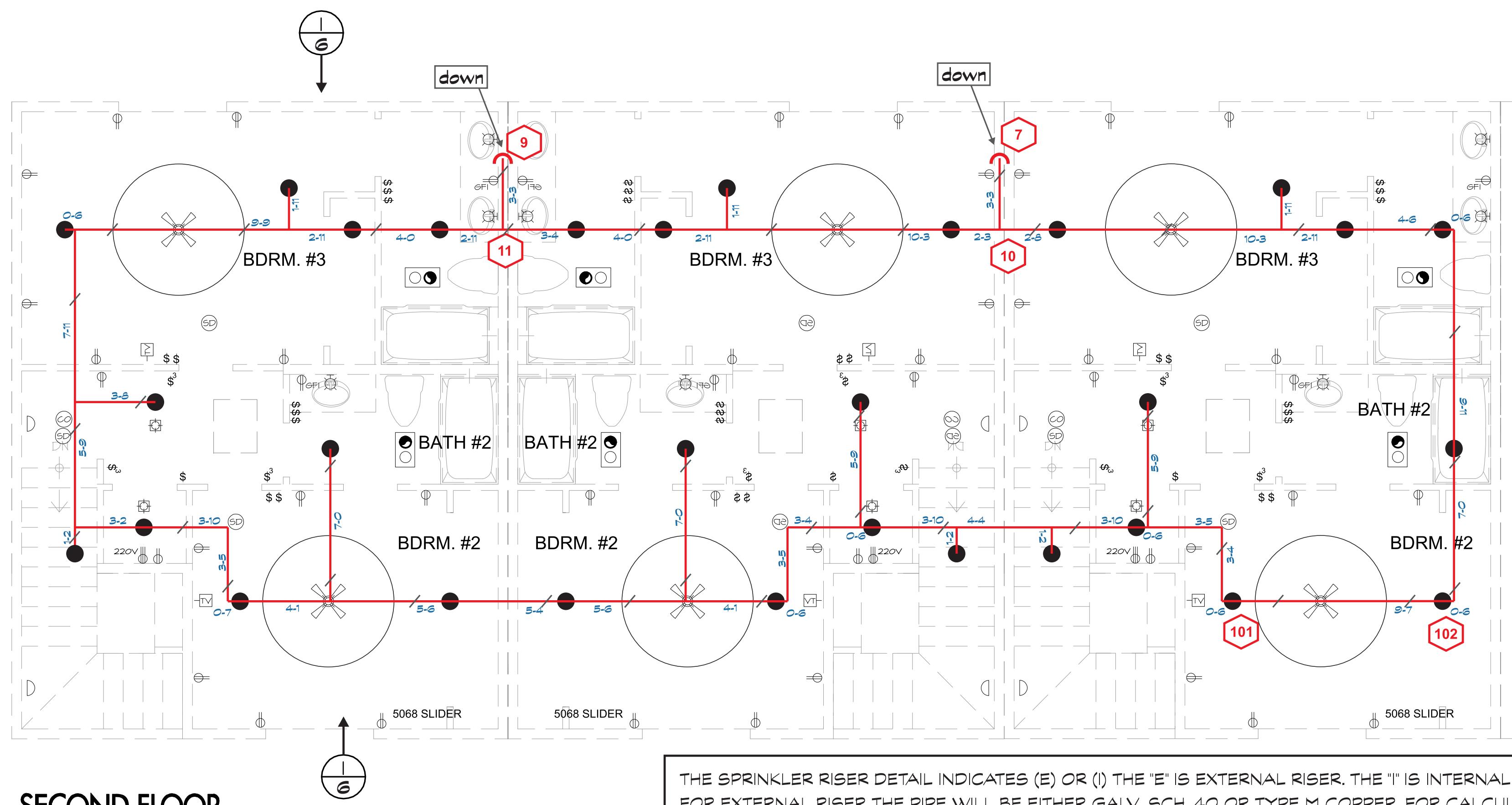
**CPVC tubing inside diameter:**  
 3/4 inch = .874"  
 1 inch = 1.10"  
 1 1/4 inch = 1.394"  
 1 1/2 inch = 1.598"

**Type K Copper tubing inside diameter:**  
 1 inch = .995"  
 1 1/4 inch = 1.245"  
 1 1/2 inch = 1.481"  
 2" inch = 1.959"  
 2" inch = 2.067"

**PEX tubing inside diameter:**  
 3/4 inch = 0.68"  
 1 inch = 0.88"  
 1 1/4 inch = 1.07"  
 1 1/2 inch = 1.26"

**Galvanized tubing inside diameter:**  
 1 inch = 1.049"  
 1 1/4 inch = 1.38"  
 1 1/2 inch = 1.61"  
 2" inch = 2.067"





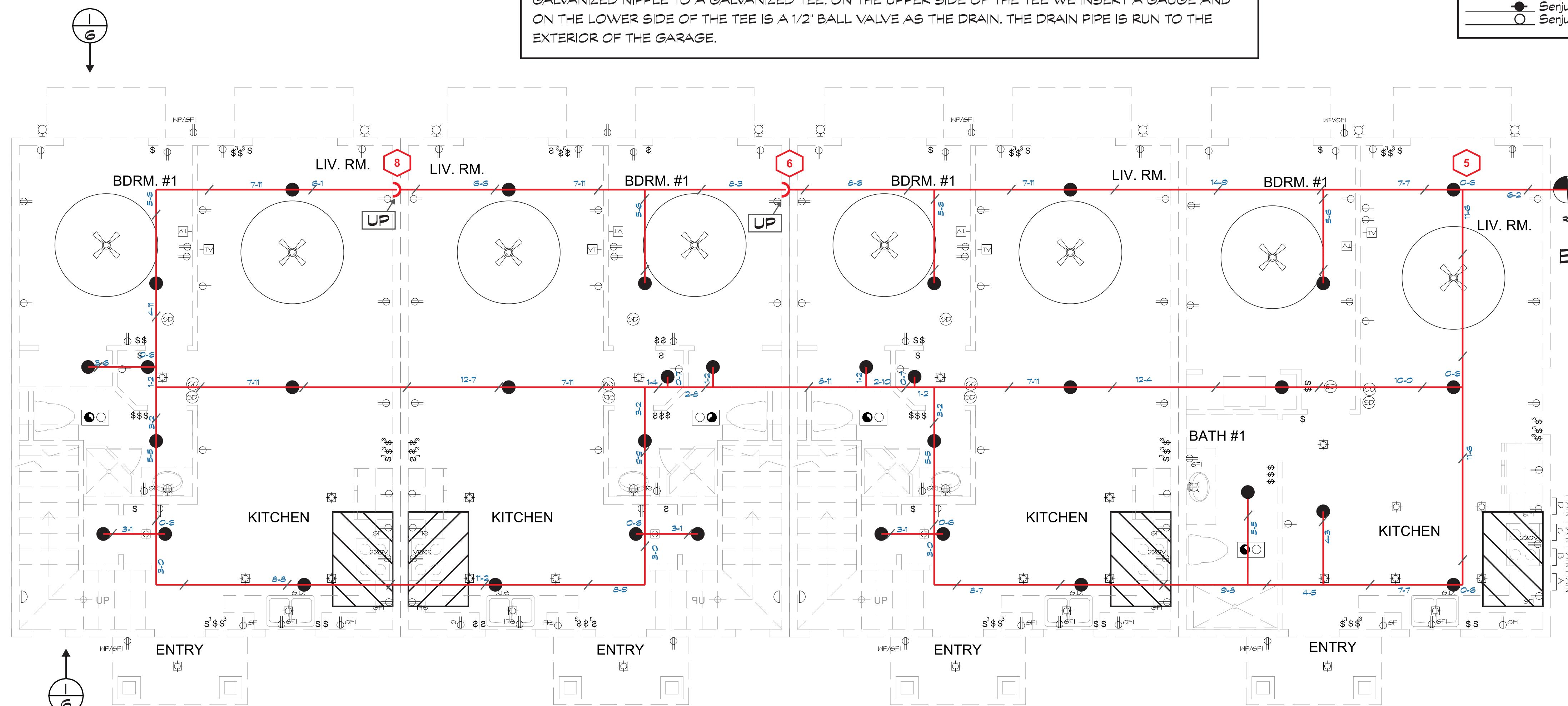
SECOND FLOOR

678.5 SQ.FT./UNIT - 678.5 X 3 = 2036 SQ.FT.

THE SPRINKLER RISER DETAIL INDICATES (E) OR (I) THE 'E' IS EXTERNAL RISER. THE 'I' IS INTERNAL RISER. FOR EXTERNAL RISER THE PIPE WILL BE EITHER GALV. SCH. 40 OR TYPE M COPPER. FOR CALCULATION PURPOSES WE USE THE MOST DEMANDING PIPE AS A PROOF CALC. FOR THE INTERNAL RISER WE INSTALL A CPVC CHECK VALVE, AN X X X WITH A 1/2 OUTLET TEE. FROM THE 1/2 OUTLET WE INSTALL GALVANIZED NIPPLE TO A GALVANIZED TEE. ON THE UPPER SIDE OF THE TEE WE INSERT A GAUGE AND ON THE LOWER SIDE OF THE TEE IS A 1/2' BALL VALVE AS THE DRAIN. THE DRAIN PIPE IS RUN TO THE EXTERIOR OF THE GARAGE.

MASTER TITLE BLOCK RESIDENTIAL FIRE SPRINKLER:

- Auto Sprinkler Riser
- Hydraulic Node Point
- Hanger Typical Tolco Fig. 28
- CPVC Pipe Spears Blazemaster
- 64 ● Serju Pendant Sprinkler: SS8464 162 degree
- 64 ● Serju Pendant Sprinkler: SS8464 205 degree
- 64 ● Serju Pendant Sprinkler: SS8464 212 degree



UNIT A  
FIRST FLOOR (TWO STORY)

678.5 SQ.FT./UNIT - 3X 678.5 S.F. = 2036 S.F.

1/4" = 1'-0"

UNIT D  
FIRST FLOOR (SINGLE STORY) 649 SQ.FT.

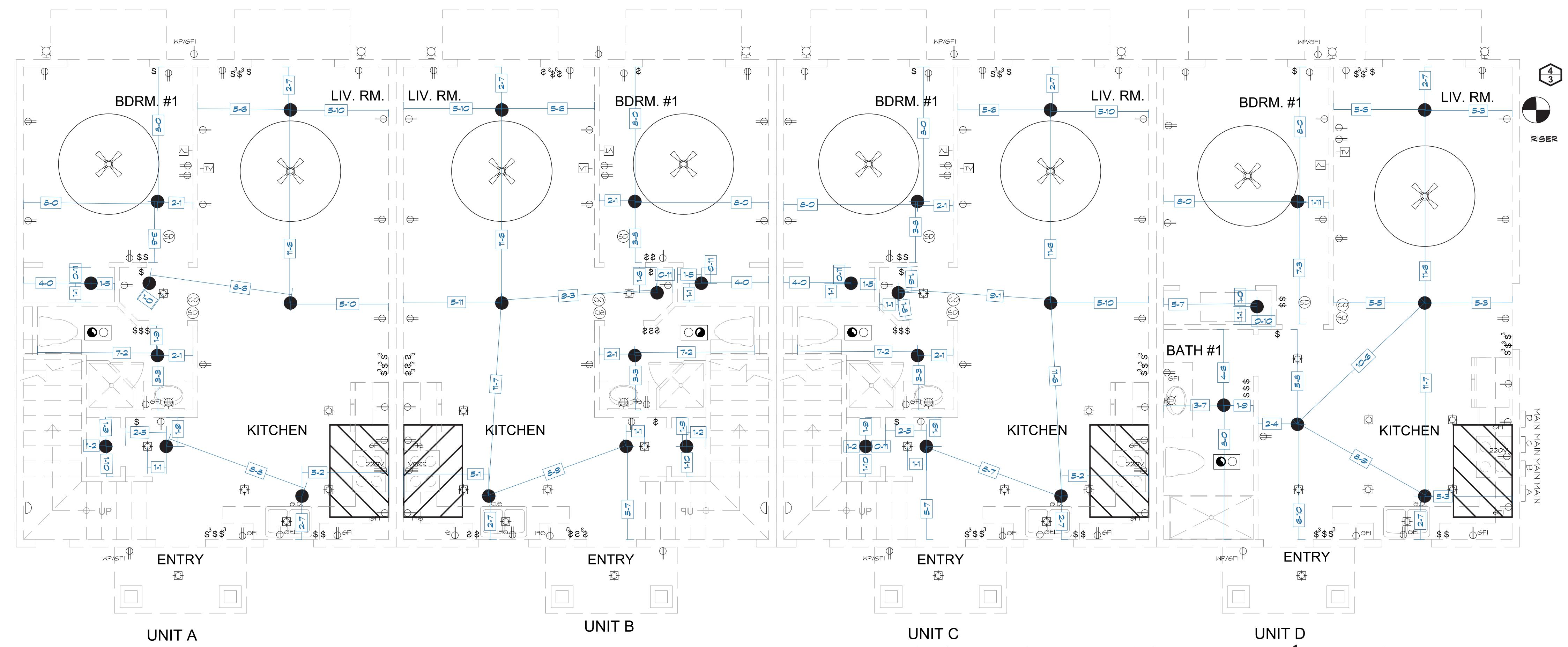
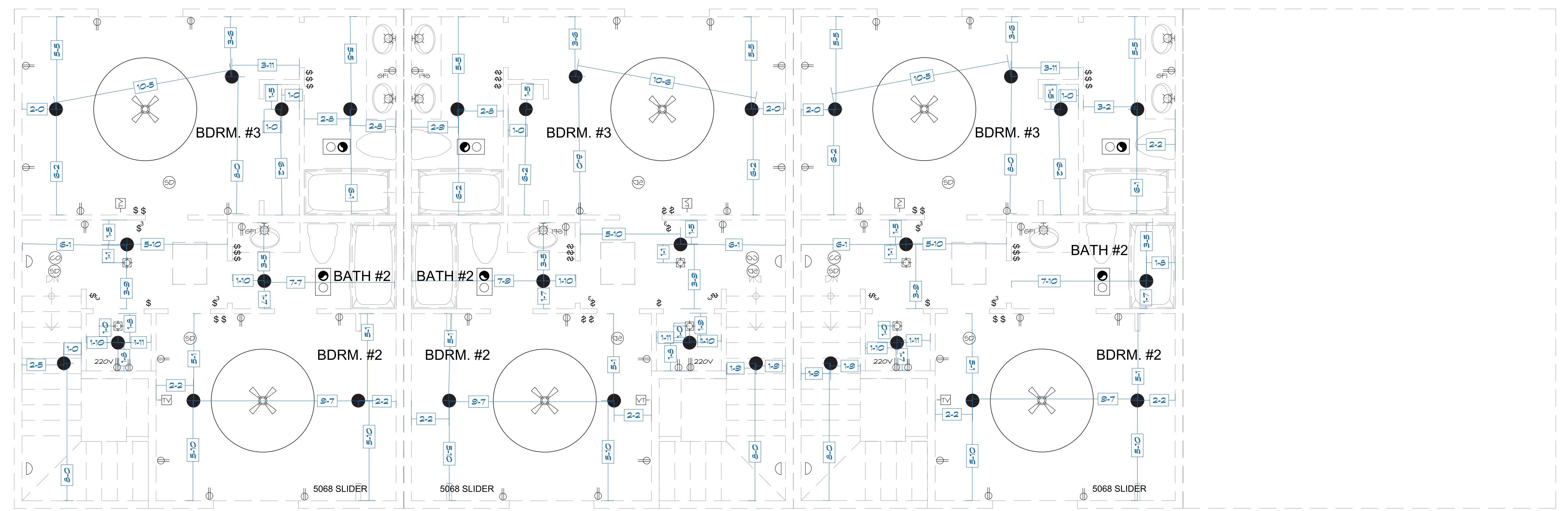
1/4" = 1'-0"

FIRE SPRINKLER PLAN

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SCALE 1/4" = 1'

OF SHEETS



## FIRE SPRINKLER PLAN (DIMENSION ONLY - NO PIPE)

Project Page 5 of 6

SCALE 1/4" = 1'

DRAWN BY	A.G.
CHECKED BY	
DATE	
SCALE	1/4" = 1'
JOB NO.	
SHEET	