SCOPE OF WORK

APN: 093-290-017

THIS IS A NEW SINGLE-FAMILY HOME 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 3'0"

HANGER TYPE: FIG.28 RESIDENTIAL AND FIG.29 FOR CPVC PIPE.

THE SYSTEM IS BASED ON AN NFPA 13D-2016 EDITION OF THAT CODE GUIDELINE.

JOB:
NEW SINGLE-FAMILY HOME
OWNER: TIM ALVARADO
JOB SITE: LONG HOLLOW DRIVE
COARSEGOLD, CA 93614
CONTRACTOR:
JKM FIRE PROTECTION
27173 SAN JOSE AVE.
MADERA CA 93637
LIC. # 915819 TYPE C-16

FIRE SPRINKLER RISER WARNING REQUIREMENT:

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.

MASTER TITLE BLOCK RESIDENTIAL FIRE SPRINLER:
Auto Sprinkler Riser
Hydraulic Node Point
Hanger Typical Tolco Fig. 28
CPVC Pipe Spears Blazemaster
13 Senju Pendant Sprinkler: SSB464 162 degree
5 Senju Pendant Sprinkler: SSB464 205 degree
1 Senju Pendant Sprinkler: SSB464 212 degree

AREAS WITH SINGLE SPRINKLERS AND 9' 0" SPACING ARE CALCULATED AS A SINGLE SPRINKLER AT 17 GPM (SEE SINGLE SPRINKLER CALCULATION)

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 ORDNANCES 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-D/R Fire System
¾ " 5.5 ft. spacing
1"6.0 ft. spacing
1 1/4 " 6.5 ft. spacing
1 ½ " 7.0 ft. spacing
2"= 8.0 ft. spacing

Hanger Spacing 13-D Fire System End of line distance
¾ "09"+100 psi = 06"
1"= 12"+100 psi = 09"
1 ¼ " 16"=100 psi = 12"
1 ½ " 24"=100 psi = 12"

Hanger Spacing 13-D Fire System Inline sprinkler distance to head drop
¾ "04"+100 psi = 03"
1"= 05"+100 psi = 04"
1 ¼ " 06"+100 psi = 05"
1 ½ "07"+100 psi = 07"

THIS PROJECT IS TO HAVE AN AUTOMATIC FIRE SUPPRESSION SYSTEM INSTALLED AND WILL BE COMPLIANT TO NFPA-13D STANDARDS 2016 EDITION. SENJU FIRE SPRINKLERS WILL BE USED WITH A 4.9 K-FACTOR AND ½ INCH DIAMETER SPRINKLER. THE SIN. # IS SSB464 ALL INSTALLATION SHALL COMPLY WITH FACTORY GUIDELINES.
THE FIRE SYSTEM WILL BE A COMBINATION SYSTEM.
THE PIPING WILL BE CPVC PIPE AND COMPLY WITH FACTORY INSTALLATION PRACTICES.
INSPECTION REQUESTS WILL BE PHONED IN ADVANCE. JOB SITE CONDITIONS WILL BE READY FOR ROUGH INSPECTION AND FINAL INSPECTIONS ACCORDINGLY. ANY REINSPECTIONS WILL BE PAID PRIOR TO ANY NEEDED REINSPECTIONS.

ALL RESIDUAL FLUX MUST BE REMOVED FROM THE INTERIOR AND EXTERIOR OF THE COPPER PIPING BY THOROUGHLY FLUSHING BEFORE INSTALLATION OF THE SPRINKLER HEADS. OTHERWISE, RESIDUES OF FLUX MAY CAUSE CORROSION AND/OR LEAKAGE IN THE SPRINKLER SYSTEM.

IN ATTICS, CRAWL SPACES AND NORMALLY UNOCCUPIED CONCEALED SPACES THAT CONTAIN FUEL-FIRED EQUIPMENT, A SPRINKLER SHALL BE INSTALLED ABOVE THE EQUIPMENT: HOWEVER, SPRINKLERS SHALL NOT BE REQUIRED IN THE REMAINDER OF THE SPACE. 2019 CRC 313.3.1.2

Pipe sizing note
Nodes 0-1 = 1" Type K Copper pipe and fittings.
Nodes 1-2 = 1" Type K Copper pipe and fittings.
Node 2-20 = 1.5" PVC Sch. pipe and fittings.
Node 20-3 Rise up section above grade is Sch.40 Galv. Pipe and fittings.
Node 3-4 = ___" Type L Copper pipe and fittings. Alternate option: Galv. Pipe and fittings.
Nodes 4 and beyond is 1" CPVC pipe and fittings.
CPVC pipe begins inside interior wall and transitions from copper to CPVC within wall.

## SHEET INDEX



BUILDING AREAS

| | | |
|---|---|---|
| LIVING AREA: | 1840 | S.F. |
| GARAGE AREA: | 529 | S.F. |
| PORCH AREA: | 117 | S.F. |
| TOTAL AREA: | 2486 | S.F. |

RESIDENCE: 1840 S.F.
GARAGE: 529 S.F.
TOTAL AREA OF SPRINKLER COVERAGE: 2239 S.F.


JKM Fire Protection
27173 San Jose Ave. Madera CA 93637
559-665-4283
Lic. # 915819 Type C-16


REVISIONS

| ITEM | DATE | COMMENTS |
|---|---|---|
| | | |

STANDARD PLAN: 1840-21

DRAWN BY: A.G.
CHECKED BY:
DATE:
SCALE: as noted
JOB NO.
SHEET
OF SHEETS

# TITLE PAGE

**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 ½" 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. $Q = K\sqrt{P}$
b. $P = (QK)2$
c. $K = Q \div \sqrt{P}$ 9. Hazen Williams Formula
P = 4.52 Q 1.85
C1.85D4.87

*see site plan for more

**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. 2019 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. 2019 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. 2019 CRC R106.1.1
7. Note on the fire sprinkler plan that modifications are prohibited. Sprinklers that have been painted, caulked, modified, or damaged must be replaced. 2019 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. 2019 CRC R313.3.3.2
9. Note on the fire sprinkler plan that an owners manual must be provided to the homeowner. 2019 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" 2019 CRC R313.3.7
11. Show an alternate point of connection for the water service on the opposite side of the residence. 2019 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 designers signature on the plans and the calculations.

**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 2016 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.

**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 ¼ inch = 1.38"
1 ½ inch = 1.61"
2" inch = 2.067"
2 inch = 2.003"

**CPVC tubing inside diameter:**
¾ inch = .874"
1 inch = 1.101"
1 ¼ inch = 1.394"
1 ½ inch = 1.598"

**Type K Copper tubing inside diameter:**
1 inch = .995"
1 ¼ inch = 1.245"
1 ½ inch = 1.481"
2" inch = 1.959"
2" inch = 1.65"

**PEX tubing inside diameter:**
¾ inch = 0.68"
1 inch = 0.88"
1 ¼ inch = 1.07"
1 ½ inch = 1.26"

**Galvanized tubing inside diameter:**
1 inch = 1.049"
1 ¼ inch = 1.38"
1 ½ inch = 1.6.61"
2" inch = 2.067"

**Table G1**

**Allowance for Friction Loss in Fittings**

| Fitting Size | ¾ | 1 | 1-1/4 | 1-1/2 | 2 | 2-1/2 | 3 |
|---|---|---|---|---|---|---|---|
| ANSI Inches | | | | | | | |
| Tee Branch=Ft. | 3 | 5 | 6 | 8 | 10 | 12 | 15 |
| Elbow 90**-Ft. | 4 | 5 | 6 | 7 | 9 | 12 | 13 |
| Elbow 45*-Ft. | 1 | 1 | 2 | 2 | 2 | 3 | 4 |
| Coupling-Ft. | 1 | 1 | 1 | 1 | 1 | 2 | 2 |
| Tee Run**-Ft. | 1 | 1 | 1 | 1 | 1 | 2 | 2 |


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STANDARD PLAN: 1840-21

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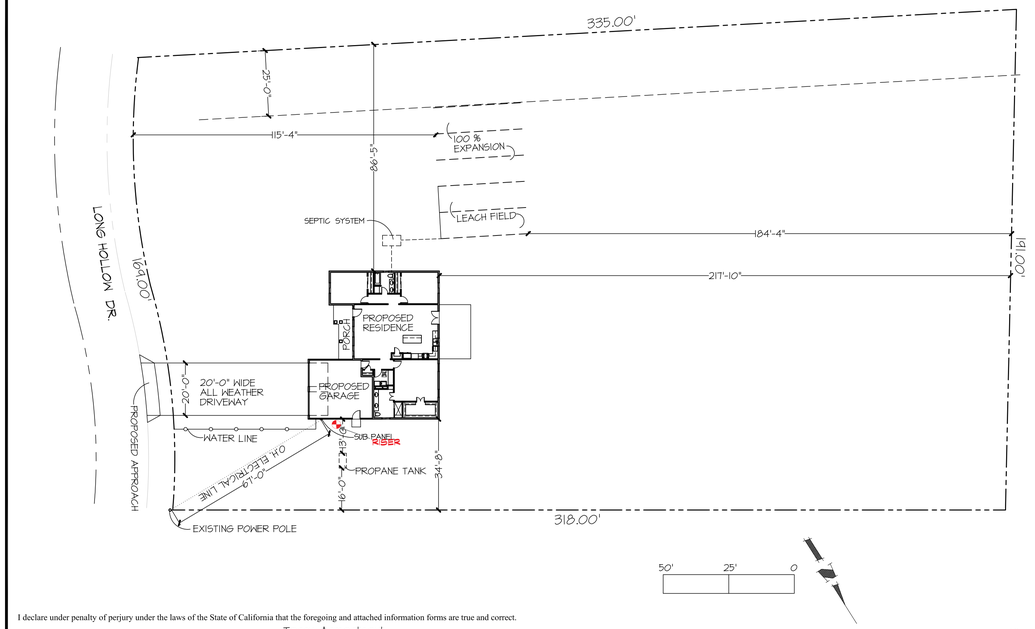
# TITLE PAGE_2

Project Page 2 of 6

APN 093 - 290 - 017

# Madera County Plot Plan




I declare under penalty of perjury under the laws of the State of California that the foregoing and attached information forms are true and correct.

Signature _____ Print Name Terry Armentrout Date _____

Approx. Scale 1" = 20'-0"

## SITE PLAN

Project Page 3 of 6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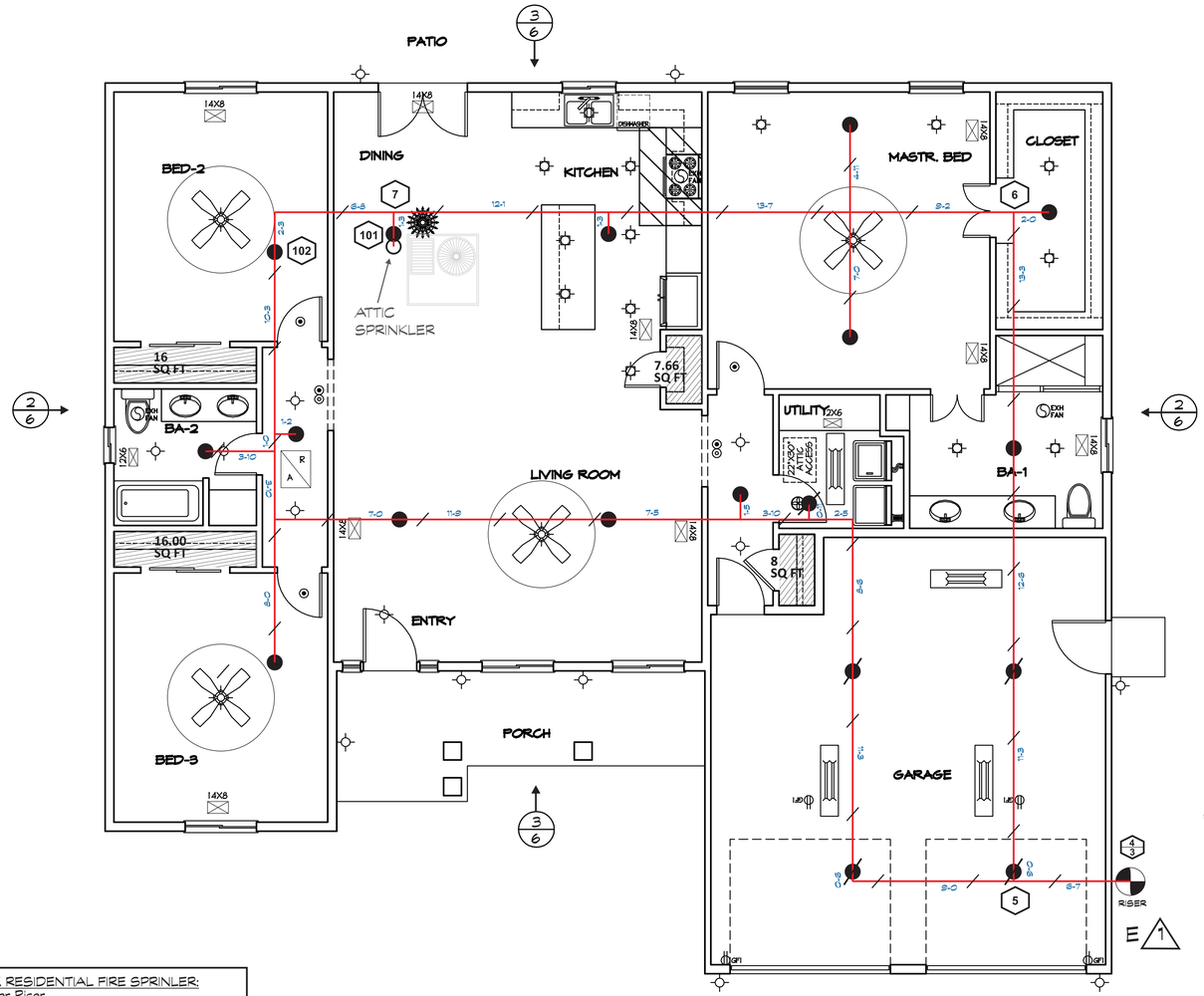


ALL GARAGE PIPE TO BE INSULATED.
THE INSULATION WILL TRAVEL INTO
THE INTERIOR AT LEAST 06 INCHES

ALL GARAGE AND FURNACE PIPE ABOVE
INSULATION LINES WILL BE INSULATED

MASTER TITLE BLOCK RESIDENTIAL FIRE SPRINLER:

- Auto Sprinkler Riser
- Hydraulic Node Point
- Hanger Typical Tolco Fig. 28
- CPVC Pipe Spears Blazemaster
- 13 — Senju Pendant Sprinkler: SS8464 162 degree
- 5 — Senju Pendant Sprinkler: SS8464 205 degree
- 1 — Senju Pendant Sprinkler: SS8464 212 degree

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.

1

# FIRE SPRINKLER PLAN

Project Page 4 of 6

SCALE 1/4" = 1'


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STANDARD PLAN: 1840-21

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| CHECKED BY | |
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# FIRE SPRINKLER PLAN (DIMENSION ONLY - NO PIPE)

Project Page 5 of 6

SCALE 1/4" = 1'


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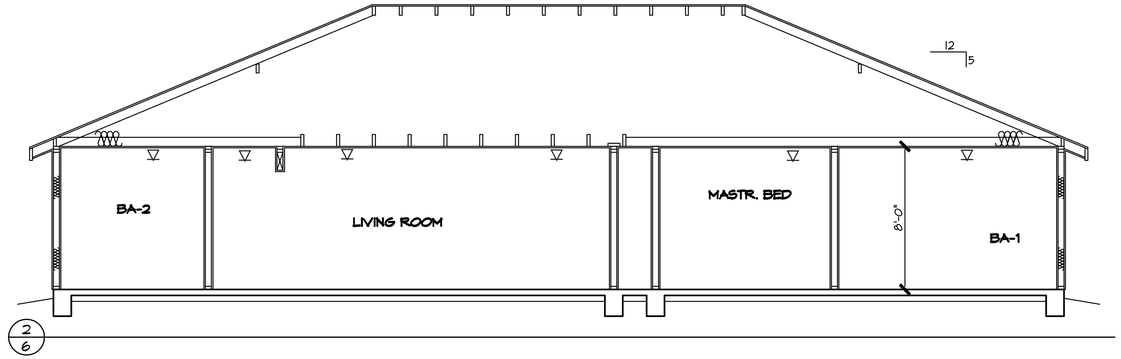


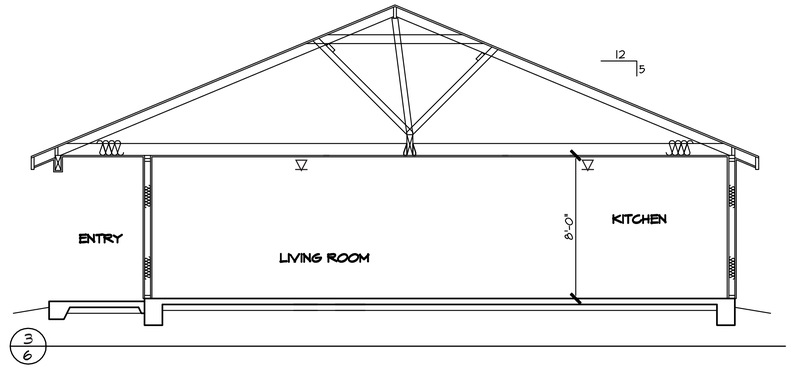


# SECTIONAL VIEW

Project Page 6 of 6


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