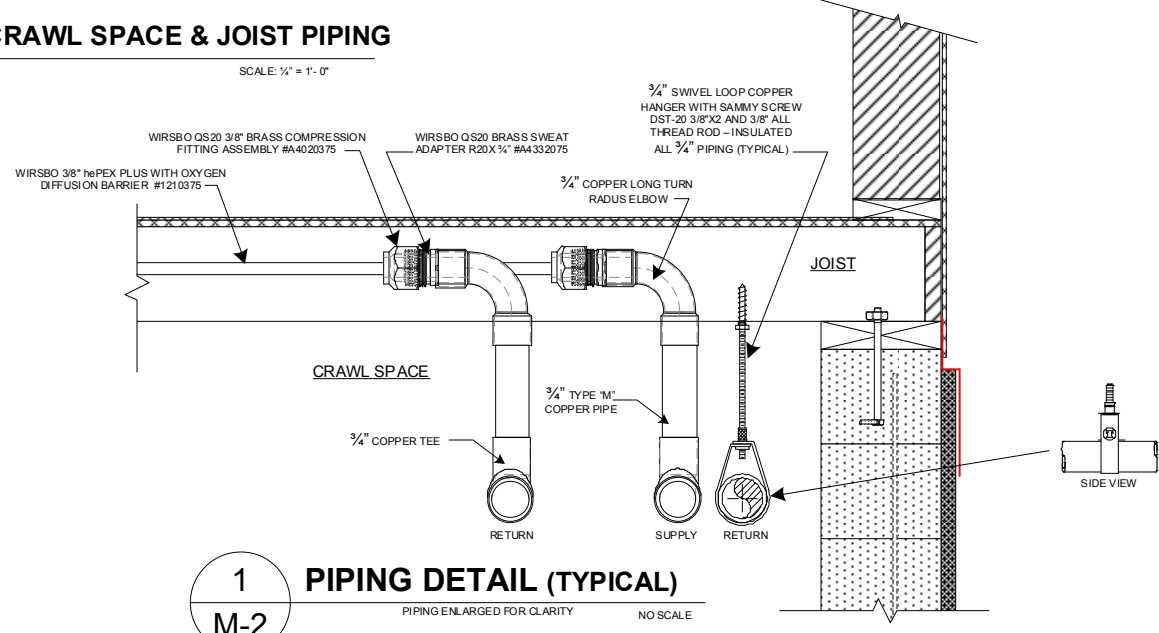


**2 JOIST SPACE DETAIL**  
NO SCALE

- SYMBOL**
- 1 EXISTING T-STAT INSTALL NEW HONEYWELL TO ACCOMMODATE FAMILY ROOM BASEBOARD AND RADIANT HEAT
  - 2 NEW HONEYWELL T-STAT TO ACCOMMODATE LIVING ROOM BASEBOARD AND RADIANT HEAT

**3/4" TYPE M COPPER TWO PIPE REVERSE RETURN DISTRIBUTION SYSTEM (TYPICAL)**  
"FIRST ONE IN; LAST ONE TO RETURN TO BOILER"

**3 CRAWL SPACE & JOIST PIPING**  
SCALE: 1/2" = 1'-0"



**1 PIPING DETAIL (TYPICAL)**  
PIPING ENLARGED FOR CLARITY NO SCALE

**LEGEND**  
FAMILY ROOM ZONE (Red line)  
LIVING ROOM ZONE (Blue line)

**GARAGE**

- NOTES:**
- Existing first floor = living area 924 square foot x 60 BTU= 55,440 heat loss
  - Radiant Pex pipe sizing and lengths performed by using RadiantWorks Pro software by Watts Radiant
  - The existing baseboard on the first floor is one continuous loop controlled by one t-stat. Separate the loop and divide it at the family room and tie it into the family zone as delineated on M-1 drawing.
  - Due to insulating of the joist space for radiant heating, a unit heater may have to be installed in the crawl space to provide sufficient heat during cold weather.

**PROJECT** REVERSE RETURN RADIANT HEATING  
**OWNER** DAVID and SHARON  
**SYSTEM** RADIANT PIPING DRAWING  
**REVISION** ANCHORAGE, ALASKA

**DESIGN CONSULTANT**

NUSHAGAK CONSULTANTS  
225 EAST FIREWEEED  
ANCHORAGE, ALASKA  
907 277 1864  
jerry@nushagak.com

Scale: NO SCALE  
Drawn by: jn  
Date: 4/5/13  
Job No. D2012  
DRAWING COMPLETE 4/5/13  
Category Sheet  
**M 2 OF 2**



**\*\*\* NOTICE - See AHRI Press Release** AHRI, the independent ratings association for the Heating and Cooling industry, is in the process of modifying their industry testing parameters for residential modulating condensing boilers sold in North America. As such, Weil-McLain has temporarily defaulted our AFUE ratings to 90% (as requested by AHRI) until such time that a new rating and test procedure can be established and approved by the Department of Energy. We anticipate new published ratings by the end of the December. Please note that this does not affect any changes or reliability of the products themselves, only the published ratings.

## Efficiency Calculator

This energy savings calculator is based on one that was developed by the U.S. EPA and U.S. DOE and is provided for estimating purposes only. Actual energy savings may vary based on use and other factors.

**Instructions:** Please select your fuel type, number of boilers in your home, the rate you pay for gas or oil, and your geographic region.

Please select country of residence:

Current boiler fuel type:

Would you like to compare gas and oil?:

Cost of gas in \$/therm:

City:

How large is your home (in square feet)?

When was your home built?:

When was your boiler installed?:

**NOTE: ALL CALCULATIONS TAKEN FROM WEIL-MCLAIN'S WEBSITE WHICH ARE BASED ON:**

WAS 94%

	Current Boiler (obtain the efficiency and capacity from your boiler rating plate, or use default.)	Gas Boiler CGa-5	Gas Boiler GV90+5	Gas Boiler Ultra-155
Annual Fuel Utilization Efficiency (AFUE)	59%	83.5%	91.4%	90%
Initial Cost per Unit (estimated retail price)		\$6,930	\$9,728	\$10,258
Use with programmable thermostat?	no	no	no	no

THE CGA BOILER'S NORMAL LIFE SPAN IS 25-30 YEARS OR MORE WITH PROPER MAINTENANCE. THE CAST IRON BOILER HAS MINIMUM PARTS AND PIECES THAT MAKES FOR LESS MAINTENANCE AND HAS BEEN AND STILL IS A PROVEN WORK HORSE FOR A HOME OWNER

Calculate Now

### Annual and Life Cycle Cost Comparisons

	Current Boiler	CGa-5	GV90+5	Ultra-155
<b>Annual Operating Costs</b>				
Energy Cost	\$1,783.50	\$1,261.50	\$1,148.40	\$1,165.80
Energy Consumption	2050 Therms	1450 Therms	1320 Therms	1340 Therms
<b>Life Cycle Costs</b>				
Energy Costs	\$24,238.35	\$17,144.20	\$15,607.13	\$15,843.60
Purchase price for one (1) unit		\$6,930	\$9,728	\$10,258
Total	\$24,238.35	\$24,074.20	\$25,335.13	\$26,101.60
<b>Annual Savings</b>		\$522.00	\$635.10	\$617.70
<b>Simple payback of initial cost (years)</b>		13.3	15.3	16.6

EFFICIENCY OF OLD BOILER 59%  
2012 GAS BILL \$1,990

DEDUCT HOT WATER HEATER GAS CONSUMPTION \$206.  
TOTAL BOILER GAS CONSUMPTION \$1,784.

HIGH EFFICIENCY BOILERS ARE POTENTIALLY HIGH MAINTENANCE DUE TO THE EXTRA PARTS AND PIECES TO MAKE THEM OPERATE, e.g. EXTRA CIRCULATORS AND MICROPROCESSORS/MICRO CONTROLLERS. THERE ARE QUESTIONS TO THE LONGEVITY OF MODULATING CONDENSING BOILERS

ESTIMATED  
NEW CGA-5 BOILER GAS  
CONSUMPTION ANNUAL \$1,261.50  
ADD OUTDOOR RESET CONTROL  
AND CONSERVATIVELY 10% SAVING  
CAN BE REALIZED

WITH OUTDOOR RESET CONTROL  
PAYBACK IS NOW 11.9 YEARS

VERSUS 15.3 AND 16.6 YEARS PAYBACKS

CGa-5

93%

\$7,780

---

CGa-5

\$1,131.00

1300 Therms

\$15,370.66

\$7,780

\$23,150.66

\$652.50

11.9

DOES NOT CHANGE THE AFUE RATING BUT DOES CHANGE THE AMOUNT OF FUEL CONSUMED