

2ND FLOOR ELE DESIGN

2ND FLOOR \$ ELE CALC

3/16=1'

NOTE: ALL RECEPTACLES SPECIFIED IN 210.52 THAT ARE NON-LOOKING SHALL BE TAMPER-RESISTANT RECEPTACLES NEC406.12.

NOTE: A MINIMUM OF SIX OF PERMANENTLY INSTALLED LIGHTING FIXTURES SHALL BE HIGH-EFFICACY LAMPS 2018 NEC 410.1. 2018 CODE

NOTE: ALL 120-VOLT, SINGLE PHASE, 15- AND 20-AMPERE BRANCH CIRCUITS SUPPLYING OUTLETS INSTALLED IN DWELLING UNIT FAMILY ROOMS, DINING ROOMS, LIVING ROOMS, PARLORS, LIBRARIES, BEDS, BEDROOMS, SUNROOMS, RECREATION ROOMS, CLOSETS, HALLWAYS OR SIMILAR ROOMS OR AREAS SHALL BE PROTECTED BY A LISTED ARC-FAULT CIRCUIT INTERRUPTER, COMBINATION TYPE, INSTALLED TO PROVIDE PROTECTION OF THE BRANCH CIRCUIT. (NEC ARTICLE 210.12(A)).

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ATTIC ACCESS
IN ROOM
COORDINATE
WITH AC LOCATION

ELEC. FIXTURES SCHEDULE

110	110 VOLT DUPLEX OUTLET
110a	110 VOLT DUPLEX OUTLET PROTECTED BY AN ARC-FAULT CIRCUIT INTERRUPTER
110b	110 VOLT DUPLEX GROUND FAULT INTERRUPT OUT
200	200 VOLT OUTLET
110c	110 VOLT SPLIT WIRE DUPLEX OUTLET (1/2) NOTE
110d	110 VOLT RECESSED PROOF OUTLET
200a	200VAMPERE OUTLET
110e	OUTLET DISPOSAL OUTLET
110f	CEILING LIGHT - CHANDELLER
110g	CEILING LIGHT - PENDANT
110h	CEILING LIGHT - FLUSH MOUNT
110i	WALL MOUNT SCORCE
110j	RECESSED CEILING TANK LIGHT
110k	RECESSED CEILING TANK LIGHT (MT IN ALL BEDROOMS & CLOSETS & BEDS)
110l	RECESSED CEILING TANK LIGHT (WATERPROOF)
110m	LOW VOLT FAN SPOT LIGHT
110n	RECESSED CEILING TANK LIGHT (OPTIONAL)
110o	3 LIGHT SW
110p	3 LIGHT SW
110q	2 LIGHT 24" FLUORESCENT FIXTURE
110r	2 LIGHT 40" FLUORESCENT FIXTURE
110s	CEILING FAN WITH LIGHT
110t	CEILING FAN ONLY (NO LIGHT)
110u	CEILING EXHAUST FAN
110v	CEILING MOUNTED WELDED - SHANK/CLAMP MOUNTING DETECTOR
110w	SWITCH
110x	3-WAY SWITCH
110y	4-WAY SWITCH
110z	SWITCH
110aa	FAN SWITCH
110ab	TELEPHONE JACK WITH OR DATA LINE (CAT-5 OR CAT-6) SEE OWNER/PLUMBER FOR LOCATION
110ac	TELEPHONE JACK (CABLE READY)
110ad	JUNCTION BOX
110ae	TERMINAL
110af	ELECTRICAL PANEL
110ag	CHANGE OPERATOR BUTTON
110ah	CAS VALUE
110ai	CHANGE BODY REMOVAL-IT
110aj	CHANGE BODY REMOVAL-IT

RESIDENTIAL ELECTRICAL LOAD CALCULATIONS

Owner Custom Residence Date 12/10/2017
 Address Athens Prepared by JB

General Lighting Load Sq Ft 4618 X 3 Volt Amps = 13854 VA
 Small Appliance Circuits at 1500 VA each x 2 (min. of two) = 3000 VA
 Laundry (Washing Machine) Circuit 1500 VA x 1 (min. of one) = 1500 VA
Sub-Total = 18354 VA

First 3,000 VA of Lighting, Small Appliance, Laundry Load at 100% = 3,000 VA
 From 3,001 to 120,000 VA at 35% 15354 X .35 = 5373 VA
 Over 120,000 VA use 25% 1 X .25 = 250 VA

Electrical Cooking Appliances, Use NEC Table 220-51
 (Number of Appliances) 1 Demand 100 % x Total KW 8 (Column A) x 1,000 = 8000 VA
 (Number of Appliances) 1 Demand 100 % x Total KW 8 (Column B) x 1,000 = 8000 VA
 (Number of Appliances) 1 Demand 100 % x Total KW 8 (Column C) x 1,000 = 8000 VA

Dryer Load NEC Table 220-54 = 5000 VA
(1) Sub-Total = 21373 VA

Heating/Air Conditioning - List type and VA at 100%
 (H) Heat Pump (G) Gas + Cool (S) Heat Strip (A) Oil Fams
 1. 18000 () 1 () 1 () 1 () 18000
 2. 18000 () 1 () 1 () 1 () 18000
 3. 18000 () 1 () 1 () 1 () 18000
(2) Sub-Total = 99000 VA

Fixed Appliances - If fewer than four units, use 100%. If four or more, use 75% of the nameplate rating.
 Microwave 1200 VA x 1 = 1200 VA
 Dishwasher 1200 VA x 1 = 1200 VA
 Disposal 600 VA x 1 = 600 VA
 Cent Vacuum 1800 VA x 1 = 1800 VA
(3) Sub-Total = 15975 VA

Appliance Subtotal 21,300 x 100% OR 75% = 15975 VA
 Add 25% of the largest motor (typical AC compressor)
2880 X 25% LM 720
(4) Sub-Total = 720 VA

5) Spare 20amps x 240 volts Sub-Total = 4,800 VA
GRAND TOTAL (Add Sub-Totals (1), (2), (3), (4), (5)) = 52768 VA

Total Volt Amps 52768 Divide by 240 Volts = 219.8 Amps
 Service Size 400 Grounding Electrode Conductor #3
 BFPPE-0200
 Rev: (4/15/08)

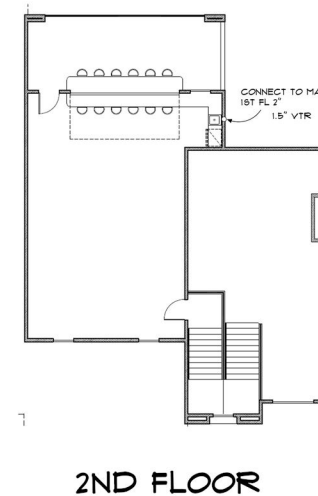
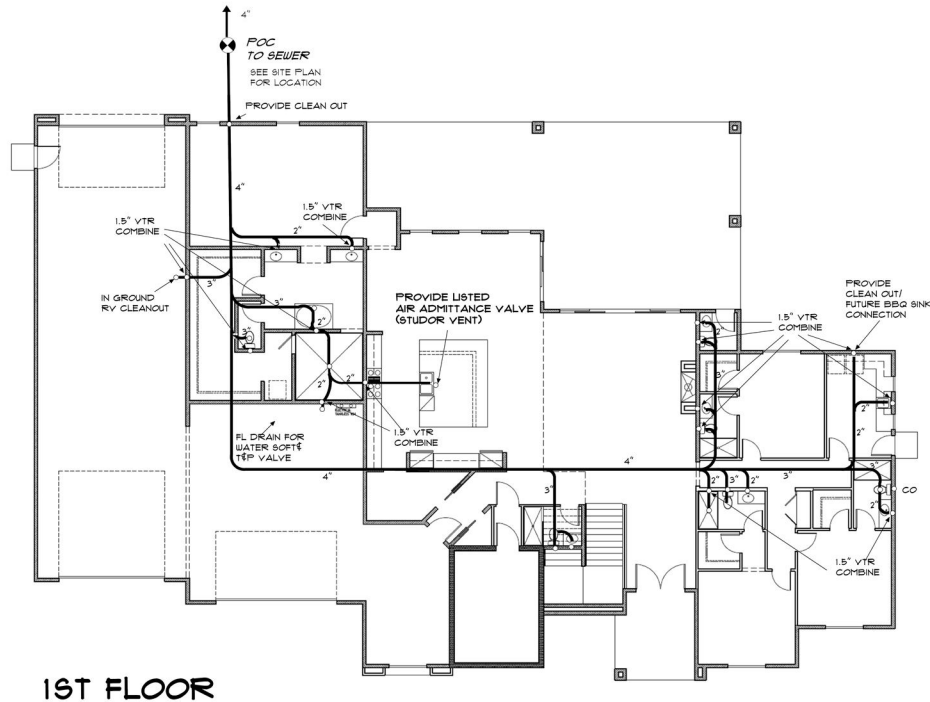
PROJECT TITLE
Reynolds Residence
 Address: 1 arcel No. 179-04-210-001
 744 N. Maple St.
 Henderson, NV 89015

SHEET TITLE
2ND FL & ELE CALC

ISSUE DATE
 DRAWN BY
 DELTA REVISIONS

JUST IN TIME
 NY LIC 18231
Justin Baca

E-2



PLUMBING GENERAL NOTES

- DRAWINGS ARE DIAGNOSTIC. MINOR DEVIATIONS TO PIPE MAY BE NECESSARY DUE TO STRUCTURAL CONDITIONS. ANY DEVIATIONS TO PIPE SHALL BE TRANSMITTED TO ENGINEER FOR REVIEW BEFORE STARTING ANY WORK.
- ALL WORK SHALL BE DONE IN ACCORDANCE WITH THE 2018 UPC PLUMBING CODE AND THE LATEST EDITION OF THE APPLICABLE INTERNATIONAL RESIDENTIAL CODES, MECHANICAL CODES AND FEDERAL, STATE AND LOCAL REGULATIONS.
- PERFORM ALL UNITS TO BE LABELED WITH THEIR INPUT RATING AND EFFICIENCY. ALL EQUIPMENT SHALL BE BALANCED, ADJUSTED AND TESTED TO PROVIDE SAFE, STABLE AND QUIET OPERATION.
- CONTRACTOR SHALL:
 - PROVIDE PRESSURE REGULATOR AND STRAINER, NOT TO EXCEED 80 P.S.I.
 - PROVIDE A MEANS FOR HW EXPANSION WHEN ANY DEVICE IS INSTALLED PROMOTING EXPANSION THRU ROOF'S SUPPLY, UPC 608.3.5.1.
 - BE RESPONSIBLE TO VERIFY THAT WATER PRESSURE AND METER STATED ON PLANS, ARE THE MINIMUMS AVAILABLE IN FIELD.
- WATER HEATERS W/ PIPE RISERS SHALL HAVE HEAT TRAPS ON BOTH THE INLET AND OUTLET OF THE WATER HEATER UNLESS THE WATER HEATER HAS INTEGRAL HEAT TRAPS OR IS PART OF A CIRCULATING SYSTEM.
- DOMESTIC WATER PIPING:
 - HOT WATER SYSTEMS: INSTALL R-2 INSULATION ON THE HOT WATER SERVICES OF THE RE-CIRCULATING SYSTEMS AND NON-CIRCULATING HOT WATER LINES IN UNCONDITIONED SPACES, PER AMENED 2018 IECC.
 - ADVISE GROUND: TYPE "M" COPPER (DAPMO IS 2-2003), BROUGHT FITTINGS, LEAD FREE SOLDERED.
 - BELOW SLAB: TYPE "L" COPPER (DAPMO IS 2-2003), TUBING SLEEVED THRU SLAB, ALL JOINTS SILVER BRAZED OR "WROST" OF EQUAL CROSS-JOINED POLYETHYLENE (DAPMO IS 1-2003).
 - TYPE "A" PIPING W/ BRASS FITTINGS, SUITABLE FOR POTABLE WATER, WHEN INSTALLED BY A PRODUCT CERTIFIED TECHNICIAN. NOTE: DIELECTRIC FITTINGS SHALL BE USED WHENEVER DISSIMILAR METALS ARE JOINED.
- SANITARY WASTE AND VENT PIPING:
 - ALL DAPMO IS 11-2003) OR PVC (DAPMO IS 9-2003) PAINT WITH LATEX PAINT WHERE EXPOSED.
 - CONDENSATE DRAIN PIPING:
 - TYPE "M" (DAPMO IS 3-2003), BROUGHT FITTINGS PVC, OR A CODE APPROVED MATERIAL.
 - GAS PIPING:
 - INSIDE SCHEDULE 40 BLACK IRON, THREADED WALKABLE FITTINGS OUTSIDE/EXPOSED, USE GALVANIZED FITTINGS AND PIPE, JOINT COMPOUND AND PROVIDE PROTECTION THAT IS CODE APPROVED. CAN USE CORRUGATED STAINLESS STEEL TUBING PROVIDED IT IS LISTED W/ AN APPROVED AGENCY. PROVIDE A SHUTOFF VALVE THAT IS ACCESSIBLE, IN THE SAME ROOM AND WITHIN 3 FEET FROM THE EQUIPMENT BEING SERVED.
 - SUSPENDED PIPING SHALL BE SUPPORTED AT THE FOLLOWING INTERVALS: 6 FEET FOR 1/2", 8 FEET FOR 3/4" AND 1", 10 FEET FOR 1-1/4" AND LARGER.
- PLUMBING FIXTURES:
 - PROVIDE CP ANGLE STEPS TO FINISH PLUMBING FIXTURES.
 - PROVIDE PRESSURE BALANCED MING VALVES AND 2.5 GAL/MIN MAX FLOW RATES AT ALL BATHROOMS AND SHOWERS, PER IECC.
 - PROVIDE SHUT OFF VALVES WITH UNIONS TO ALL OTHER PLUMBING FIXTURES (I.E. WATER HEATERS) TO FACILITATE ISOLATION FOR REPAIR.
 - ALL PLUMBING FIXTURES SHALL COMPLY WITH LOCAL AUTHORITIES CURRENT WATER CONSERVATION CODES.

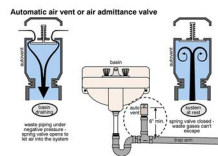
NOTES:
DEVELOPED LENGTH TO FURTHEST FIXTURE #130'
32" OF FALL REQUIRED

ALL DWY MATERIALS TO BE ABS OR PVC SCH 40

POINT OF CONNECTION TO SEWER AT REAR OF HOUSE,

PLUMBER TO PROVIDE ATTACHMENT POINT AT REAR OF HOME FOR FUTURE ADDITION.

WHERE NOTED ON DWY PLAN
PROVIDE LISTED OATEY MODEL# 33016
SURE-VENT AIR ADMITTANCE VALVE OR
EQUIVALENT
COMPLIES TO ANSI 1051 A1B



DFU CALC
TBL 102.1 UPC

WASTE FIXTURES			
FIXTURE	QTY	FU EA	TOTAL
WATER CLOSET	6	3	18
LAV	1	1	1
BATH TUB	1	2	2
SHOWERS	5	2	10
KIT SINK	1	2	2
WASHER	1	3	3
UTILITY SINK	2	2	4
TOTAL DFU'S			46
4IN SEWER 216 FU ALLOWED AT 1/4" PR/FT			

DWY PLAN_{NTS}
3/16=1'

PROJECT TITLE
Reynolds Residence
Assessor Parcel No: 179-04-910-001
744 N Maple St
Henderson, NV 89015

SHEET TITLE
DRAIN WASTE & VENT

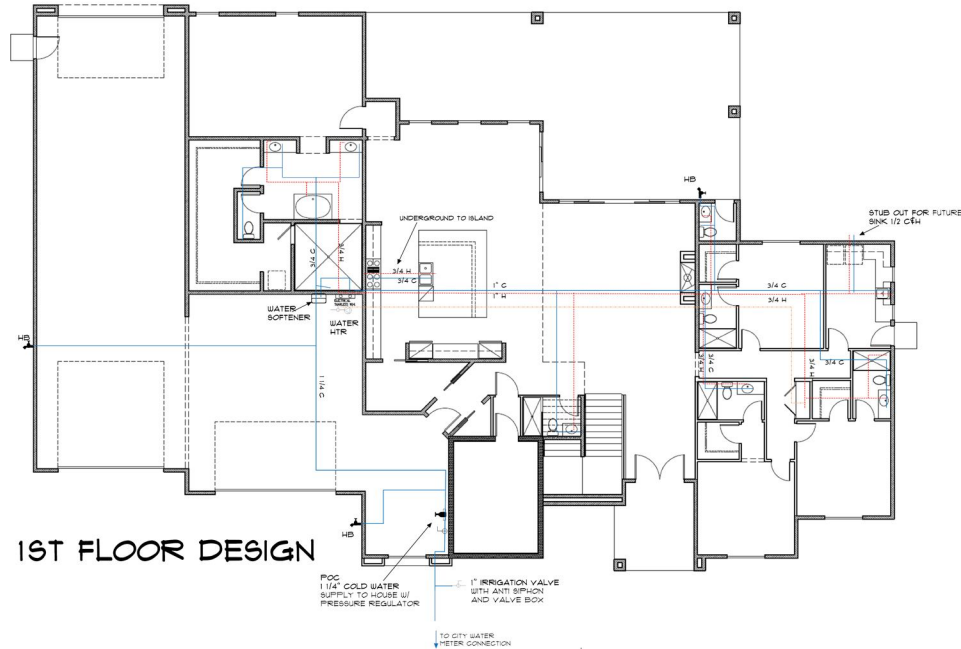
ISSUE DATE
DRAIN BY
PROJECT #

JUST IN TIME
NV LIC 18995
Justin Baca

P-1

WATER PLAN_{NTS}

NOTE: ALL WATER LINES TO BE 1/2" UNO



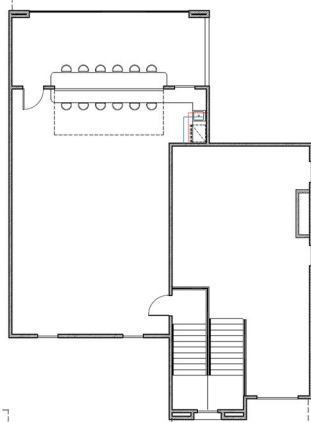
PLBG MATERIAL LEGEND

COLD WATER (WIRBBO OR COPPER)

HOT WATER (WIRBBO OR COPPER)

HOT CIRCULATION (WIRBBO OR COPPER)

NAT GAS (BLACK IRON)



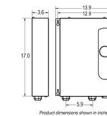
WSFU CALC

TBL 610.3 UPC

WATER FIXTURES			
FIXTURE	QTY	FU EA	TOTAL
WATER CLOSET	6	2.5	15
LAV	1	1	1
BATH TUB	1	4	4
SHOWERS	5	2	10
KIT SINK	1	1.5	1.5
WASHER	1	4	4
UTILITY SINK	2	1	2
HOSE BIB	3	2.5(0)	4.5
TOTAL WSFU (TBL 610.3)			50
METER & PIPE SIZE-UPC 610.4			
STREET PRESSURE	MAX LENGTH	# FIXTURES/FU'S	METER/SUPPLY
20	150	26/50	MIN 1" METER 1 1/4" BLDG SUPPLY

WATER HEATER

SEE P4 FOR DETAILS



Specifications

SPECIFICATION	ECO 18
kW	18
Voltage	240V
Phase	Single
Element	(2) 9kW @ 240V
Amperage Draw	75.4
Required Breaker	(2) 40 A
Required Wire	(2) 8 AWG
Weight	11.7 lb
Heat Exchanger	Copper
Protection	Thermal Auto
Certification	ETL Listed to UL 499 and CAN/CSA-C22.2 No. 64
Warranty	Limited Lifetime



ECO 18
Uses two (2) 9kW
at 240V elements.

Operating Pressure	
Minimum	Maximum
25 PSI	150 PSI

Note: Flow Adjustment at 120 GPM

PROJECT TITLE
Reynolds Residence
Assessor Parcel No.: 179-04-310-001
744 N. Napa St.
Henderson, NV 89015

SHEET TITLE
WATER

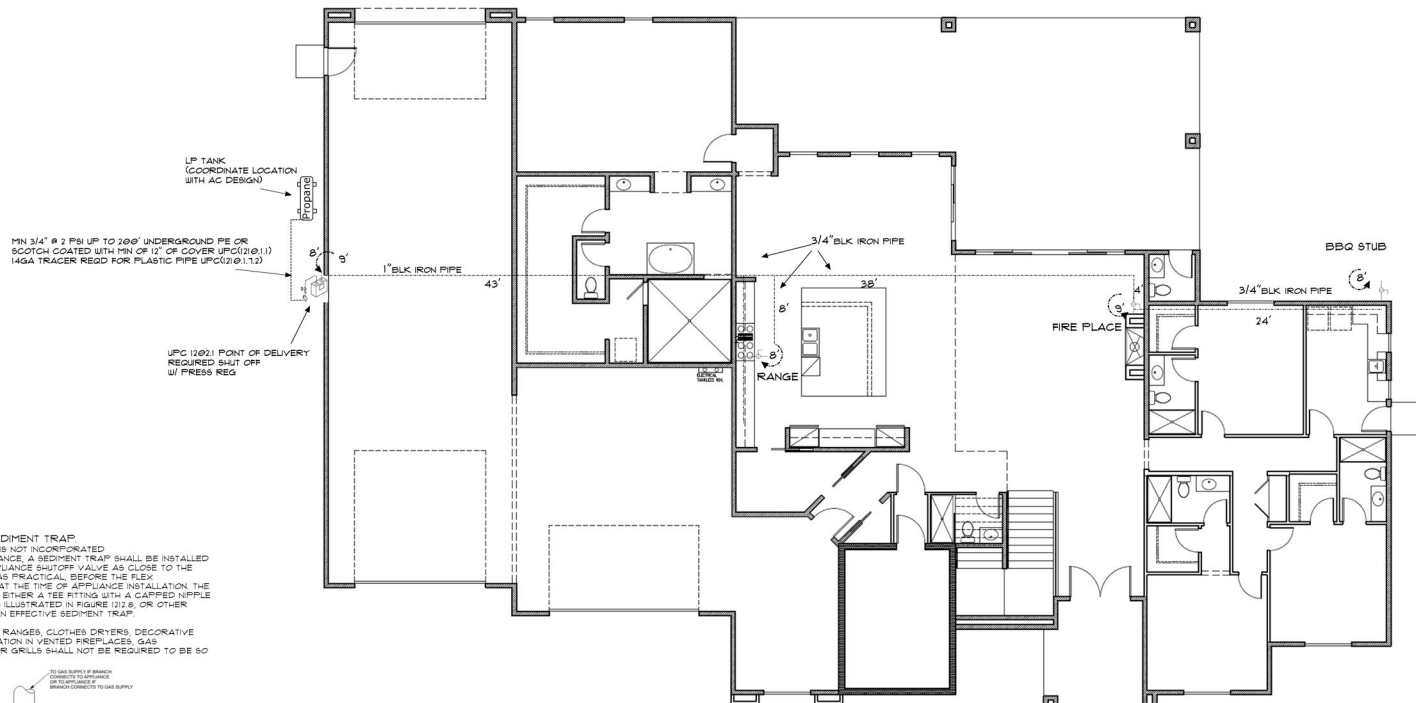
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P-2

FLBG MATERIAL LEGEND	
LP GAS (UNDERGROUND)
LP GAS (BLACK IRON)

NOTES:
 ⤵ DENOTES VERTICAL DROP LENGTH
 ALL BRANCH SIZES 1/2" UNLESS NOTED OTHERWISE ON DRAWING

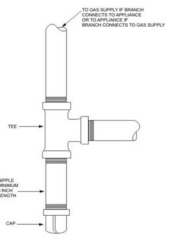


MIN 3/4" # 2 PSI UP TO 200' UNDERGROUND PE OR SCOTCH COATED WITH MIN OF 12" OF COVER UPC(212.1.1) 14GA TRACER REQD FOR PLASTIC PIPE UPC(212.1.1.2)

UPC 1202.1 POINT OF DELIVERY REQUIRED SHUT OFF W/ PRESS REG

NOTE 2 UPC 1212.8 SEDIMENT TRAP
 WHERE A SEDIMENT TRAP IS NOT INCORPORATED AS A PART OF THE APPLIANCE, A SEDIMENT TRAP SHALL BE INSTALLED DOWNSTREAM OF THE APPLIANCE SHUTOFF VALVE AS CLOSE TO THE INLET OF THE APPLIANCE AS PRACTICAL, BEFORE THE FLEX CONNECTOR WHERE USED AT THE TIME OF APPLIANCE INSTALLATION. THE SEDIMENT TRAP SHALL BE EITHER A TEE FITTING WITH A CAPPED NIPPLE IN THE BOTTOM OUTLET, AS ILLUSTRATED IN FIGURE 1212.8, OR OTHER DEVICE RECOGNIZED AS AN EFFECTIVE SEDIMENT TRAP.

ILLUMINATING APPLIANCES, RANGES, CLOTHES DRYERS, DECORATIVE APPLIANCES FOR INSTALLATION IN VENTED FIREPLACES, GAS FIREPLACES, AND OUTDOOR GRILLS SHALL NOT BE REQUIRED TO BE SO EQUIPPED.



GAS CALC

NOTE
 ALL GAS PIPING TO BE IRON PIPE (UNO)

GAS EQUIP LIST (LP GAS)					
ITEM	DEVELOPED LENGTH IN FT	QTY	BTU	CU FT PRIOR	MIN CONNECTION PS
RANGE	53	1	65,000	NA	1/2
GAS FIRE PLACE	94	2	40,000	NA	1/2
DINING ROOM	118	1	40,000	NA	1/2
BBQ STUB					
TOTAL			145,000		

118 FT TOTAL DEVELOPED LENGTH TO FURTHEST FIXTURE
 LP GAS SG -1.50 @ 11" WC / @.5" PRESSURE DROP
 IRON PIPE NFPA 54 TBL 6.3(D)

PROJECT TITLE
Reynolds Residence
 Accession Parcel No. 179-04-910-001
 744 N Naples St.
 Henderson, NV 89015

GAS PLAN

ISSUE DATE _____
 DRAWN BY _____
 PROJECT # _____

JUST IN TIME
 NV LIC 18995
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Electric Tankless Water Heater

MODEL	KW	VOLTS	BREAKER	REQUIRED WIRE	WATER CONNECTIONS
ECO 18	18	240	(2) 40 A	(2) 8 AWG	3/4" NPT



Tested and certified by the Water Quality Association against NSF/ANSI 372 for lead free compliance.

Temperature Rise

The ECO 18 is a mid-range EcoSmart tankless water heater capable of heating multiple fixtures simultaneously. In colder areas, with an inlet water temperature around 37°F, the ECO 18 can heat water for a water-saving shower head. Two showers can be run at the same time in warmer climates when incoming water temperature is above 67°F. This model is equipped with patented, self-modulating technology so that it will only consume the energy necessary for the current demand. Below is a chart showing the flow rate capacity of each model, measured in gallons per minute for various inlet water temperatures and calculated for a set output temperature of 105°F.

Flow Rate Capacity Chart (GPM)

MODEL	37°F	42°F	47°F	52°F	57°F	62°F	67°F	72°F	77°F
ECO 18	1.8	2.0	2.1	2.3	2.6	2.9	3.2	3.7	4.4

Flow rate shown in GPM based on outlet temperature of 105°F. Inlet temperature varies by region and seasonal changes.

Applications

Standard Hand Sink	0.5 GPM
Water-Saver Showerhead	1.5 GPM
Standard Showerhead	2.0 GPM
Bath Tub	≥ 4.0 GPM

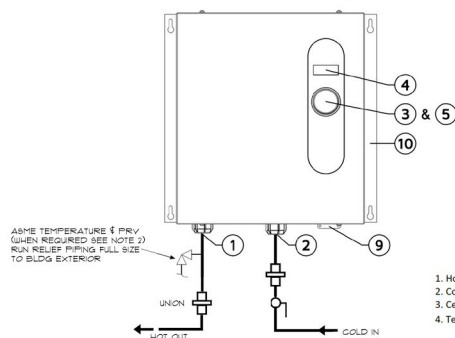
Average Gallons Per Minute (GPM) based on 2010 Plumbing Standards

Product Attributes

- On-demand, consistent and endless hot water
- Compact, durable and stylish
- Digital display with temperature control in increments of 1°F
- Dimensions: 17" x 14" x 3.75"
- Simple Installation
- Copper heating elements with brass top increase durability and are threaded for easy replacement
- 3/4" NPT water connectors for easy flex hose installation
- Limited lifetime warranty for residential use when registered properly and installed within 30 days of purchase by a licensed professional

HOT WATER DETAIL

ECO 18 – ECO 24 – ECO 27 – ECO 36



- Hot Water Outlet
- Cold Water Inlet
- Celsius/Fahrenheit Conversion (Press & Hold 3 sec.)
- Temperature Set Point Display

- Adjustment Knob & Temperature Control
- Wire Connection
- Brass Compression Nut
- Brass Compression Ferrule

- Electrical Strain Relief
- Mounting Bracket (1")

4- PLUMBING INSTALLATION

Please follow all plumbing instructions carefully. We recommend that this product be installed by a licensed and qualified plumber in accordance with all applicable national, state, provincial, and local plumbing codes.

Installation Instructions

- STEP 1:** Connect the HOT WATER line to the water heater OUTLET located on the left side of the heater when facing unit. Connect the COLD WATER line to the water heater marked INLET on the right side when facing unit.
- STEP 2:** After tightening both fittings at the water heater, open several hot water faucets and allow water to run through the water heater for at least 2 to 3 minutes. This process purges all the air from the water lines and MUST be performed prior to turning on the power at the unit. FAILURE TO FOLLOW THIS STEP CAN CAUSE PERMANENT DAMAGE TO THE HEATING ELEMENTS. If any maintenance is performed on the water heater or the home's plumbing system that may introduce air into the plumbing pipes, it is important to turn the power off to the water heater and purge the air out of the lines before allowing the unit to power up.
- STEP 3:** Carefully inspect all connections, unions, and the pressure relief valve (if installed) for leaks.

IMPORTANT NOTES:

- Do not solder any pipes with unit connected to pipes – heat from soldering may damage the flow sensor. Doing so will void the warranty.
- This automatic tankless water heater is equipped with both computer-controlled and electro-mechanical auto resetting thermostat switches for high-limited temperature protection. Since this product does not use a storage tank, the use of a temperature pressure relief valve (T&P) is not required for most installations. UL Standard 499 does NOT require that a pressure relief valve be used. However, a T&P valve may be required to meet installation codes in your area. If one is required, install the pressure relief valve in accordance with local codes and ensure that it operates correctly and that air is purged from the valve prior to installing the water heater. When connecting to Flex or High Temperature CPVC pipe, we recommend that a T&P valve be used for added safety.
Please note: Installations in the Commonwealth of Massachusetts and State of Kentucky require a pressure relief valve. Please check your local installation codes for any special requirements.
- The maximum operating water pressure is 150 PSI. If the water pressure is higher, a pressure reducing valve must be installed on the main incoming water supply line prior to installing the electric tankless water heater.
- Flexible water heater hoses are recommended to be used with your water heater as part of the installation. When connecting the inlet water pipe to the unit, make sure to use a wrench to hold the unit's connection, and another wrench to tighten, so that the flow sensor on the unit will not be loosened or damaged. Serious internal damage to the water heater can occur if the inlet or outlet connections are over tightened or if solder connections were made.
- We recommend that a manual shut-off valve (ball valve) be installed on the inlet and outlet of the water heater so that there is a convenient shut-off point available in the event that future maintenance or servicing is required. It is extremely important to flush the lines to eliminate all plumbing paste or residue in the lines caused by any welding or soldering before connecting pipes to the water heater.

We recommend that all the water pipes or hoses within 3 feet of the inlet and outlet connections be rated for high temperature applications with a 150°F minimum.

PROJECT TITLE
Reynolds Residence
Assessor Parcel No.: 17504-910-001
744 N. Naples St.
Henderson, NV 89015

SHEET TITLE
HW DETAILS

Issue Date _____
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P-4