

PLUMBING SPECIFICATIONS

PART I - GENERAL

- A. SCOPE
Provide labor, materials, equipment and incidentals necessary or required for the completion, testing, inspection and adjusting, to provide the plumbing systems operable and complete in all your respects.
- B. Drawings and Specifications
Examine and become familiar with all project drawings and specifications, and coordinate the plumbing work accordingly. Make reasonable modifications in the layout and installation as needed to prevent conflict with work without additional cost.
- C. Materials
Materials furnished under this contract shall be new, free from defects and shall conform with the standards of the U.L. Inc. where such a standard has been established, and shall be so labeled. Materials not specified here in that are required to complete the plumbing system installation shall be of first class quality for use intended. Manufacturer's names and catalog numbers are used to designate the item of material or equipment as a means of establishing grade and quality. Manufacturer's of a similar quality product will be considered.
- D. Installation
The entire plumbing sprinkler system installation shall be made in a neat, workmanship-like finished and safe manner. Conceal all piping in finished areas, unless otherwise noted. The entire installation shall be subject to the Architect's approval.
- E. Codes, Permits, and fees
The drawings and specifications take precedence when they are more stringent than codes, ordinances, standards and statutes. Codes, ordinances, standards and statutes take precedence where they are more stringent than the drawings and specifications. Secure and pay for permits, test, Certificates of inspection, and all other costs incidental to the work.
- F. Guarantees
All work shall be guaranteed to be free from defects in materials and workmanship for a period of one year from date of final acceptance of the work. Replace at no additional cost any such defects or the correction of defects.

PART II - PRODUCTS

A. Materials and Equipment list

- Water Piping: Type "L" copper (hard overhead, soft underground) with wrought copper fittings (no joints underground). Use lead free silver bearing solder for joints.
- Drain, Waste and Vent Piping: Standard weight, cast iron pipe and fittings. "No-hub" type with neoprene sleeve seal and stainless steel clamp for joints. ABS approved equal as install in accordance with local code, except for plenum use.
- Hot Water Pipe Installation: Owens Corning or equal 1" thick, 3.5" cu. ft. density, premoled fiberglass insulation with all service lap sealed jacket (ASJ).
- Surface Cleanout (SCO): Mifab C1300-MF with heavy duty ductile iron access cover. Set in 18" x 18" x 6" min. conc. ring (below surface in asphalt areas).
- Wall Cleanout (WCO): Mifab C1430 cast bronze cleanout plug with s.s. access cover.
- Plumbing Fixtures to be selected by the Owner, installed by the Plumbing Contractor.
- Water Heater: ASME P & T relief valve, all standard features UL label and three year warranties.

PART III - EXECUTION

A. Test

- Test water piping at building operating pressure for 4 hours.
- Test waste and vent piping by filling with water to the highest point in the new system.
- Repair all leaks until systems are water tight as required.

WATER SUPPLY CALCULATION

UTILITY COMPANY: CITY OF CHANDLER, AZ.
STATIC PRESSURE: 60 P.S.I. (REDUCED IF REQUIRED, PROVIDE PRV).
TOTAL F.U.: 24 F.U. = 25 GPM, USE NEW 1" METER AND R.P.B.P.
60.0 P.S.I. PRESSURE IN MAIN
- 5.0 P.S.I. LOSS THROUGH METER
- 20.0 P.S.I. FIXTURE LOSS
- 6.8 P.S.I. DROP FOR ELEVATION (16 FT. x 0.43)

28.2 P.S.I. AVAILABLE

ALLOWABLE FRICTION LOSS:

PIPE LENGTH (TAP TO METER) = 20 FT.
PIPE LENGTH (METER TO LAST FIXTURE) = 300 FT.
VERTICAL LENGTH = 16 FT.
EQUIVALENT LENGTH OF FITTINGS = 85 FT.
TOTAL DEVELOPED LENGTH = 421 FT.

P.S.I. AVAILABLE 28.2
----- X 100 = 6.7 P.S.I./100 FT.
TOTAL LENGTH 421 FT.

MAXIMUM ALLOWABLE LOSS PER 100 FT. OF PIPE = 6.7 P.S.I.

NOTES:

- PLUMBING CONTRACTOR TO VERIFY AND COORDINATE EXACT STREET PRESSURE AND NOTIFY ENGINEER OF ANY DISCREPANCIES.

FIXTURE UNIT COUNT (WATER)

FIXTURE	QTY	F.U. EA	TOTAL F.U.
WATER CLOSET	10	2.5	25.0
LAVATORY	10	1.0	10.0
SHOWER	3	2.0	6.0
TUB	2	4.0	4.0
TUB/SHWR	3	4.0	12.0
WASHER	4	4.0	16.0
DISHWASHER	2	1.5	3.0
DOUBLE SINK	1	1.5	1.5
VEGGIE SINK	1	1.5	1.5
KITCHEN SINK	1	1.5	1.5
BIDET	1	1.0	1.0
URINAL	1	3.0	3.0
JACUZZI	1	4.0	4.0
BAR SINK	3	1.5	4.5
REF. ICE MAKER	2	1.0	2.0
POT FILLER	1	1.5	1.5
LAUNDRY TUB SINK	1	1.5	1.5
TRAP PRIMER	5	1.0	5.0
HOSE BIBB	2	2.5	5.0
			108.0 TOTAL F.U.

108.0 F.U. = 46 GPM

PIPE SIZES CALCULATION

PIPE SIZE	GPM	F.U.
1/2"	3	3
3/4"	8	9
1"	16	23
1-1/4"	27	47
1-1/2"	42	97
2"	92	343

6.7 P.S.I./100 FT
SIZED IN ACCORDANCE WITH U.P.C. APPENDIX A

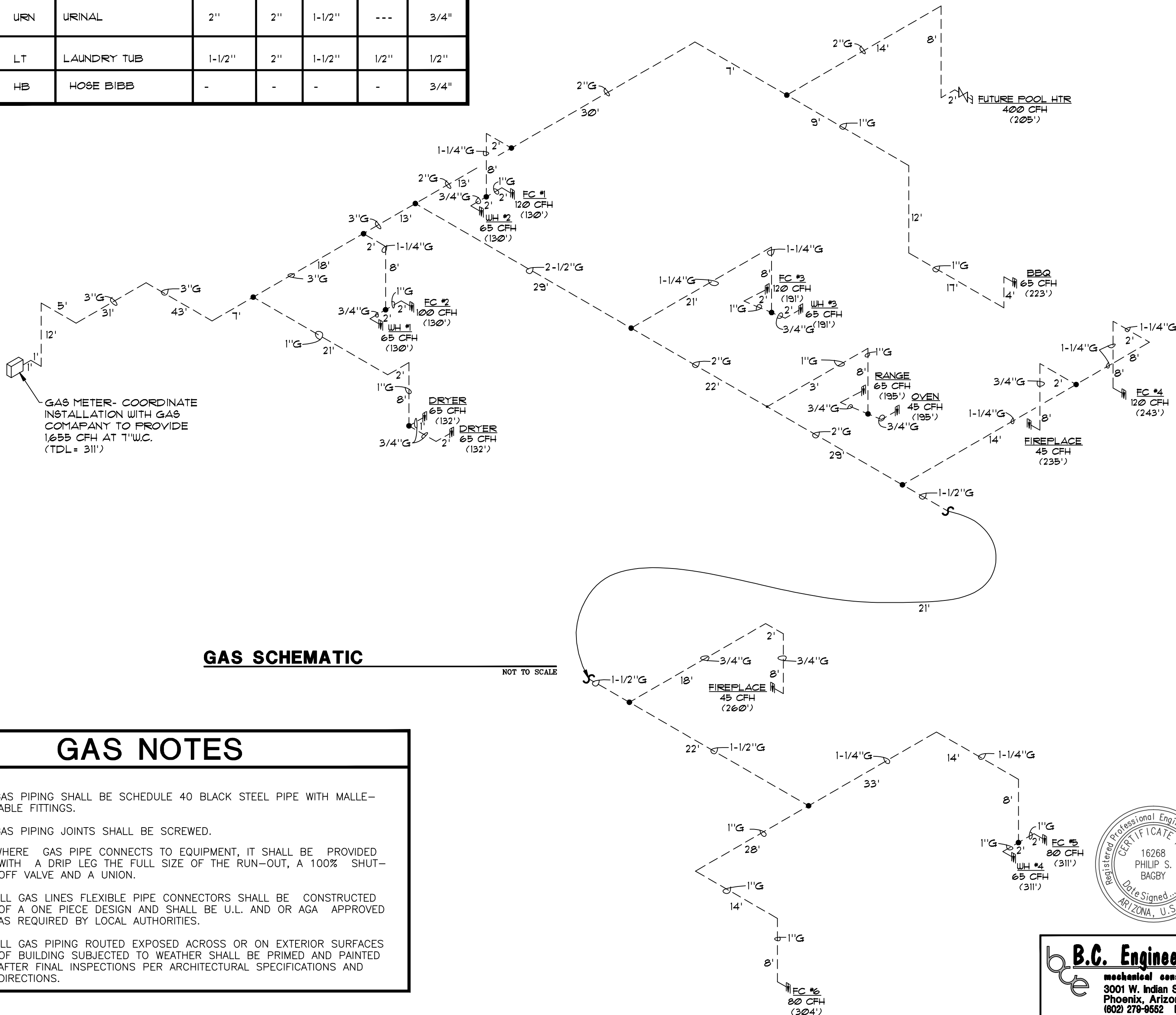
PLUMBING FIXTURE FLOW RATES AND CONSUMPTION SCHEDULE

PLUMBING FIXTURE OR FIXTURE FITTING	MAXIMUM FLOW RATE OR QUANTITY
LAVATORY, PRIVATE	2.2 GPM AT 60 PSI
LAVATORY, PLUBIC (METERING)	0.25 GALLON PER METERING CYCLE
LAVATORY, PLUBIC (OTHER THAN METERING)	0.5 GPM AT 60 PSI
SHOWER HEAD ^a	2.5 GPM AT 80 PSI
SINK FAUCET	2.2 GPM AT 60 PSI
URINAL	1.0 GALLON PER FLUSHING CYCLE
WATER CLOSET	1.6 GALLON PER FLUSHING CYCLE

- a. A HAND-HELD SHOWER SPRAY IS A SHOWER HEAD
b. CONSUMPTION TOLERANCES SHALL BE DETERMINED FROM REFERENCED STANDARDS

FIXTURE CONNECTION SCHEDULE

SYMBOL	DESCRIPTION	TRAP SIZE	WASTE	VENT	HOT WATER	COLD WATER
WC	WATER CLOSET, FLOOR MOUNTED TANK TYPE	INTEGRAL	3"	2"	-	1/2"
LAV	LAVATORY, COUNTER MOUNTED	1-1/4"- 1-1/2"	2"	1-1/2"	1/2"	1/2"
LAV-1	PEDESTAL LAVATORY	1-1/4"- 1-1/2"	2"	1-1/2"	1/2"	1/2"
SHWR	SHOWER	2"	2"	1-1/2"	1/2"	1/2"
JACUZZI	JACUZZI	2"	2"	1-1/2"	3/4"	3/4"
TUB/SHWR	BATHTUB SHOWER	1-1/2"	2"	1-1/2"	1/2"	1/2"
WASHER	CLOTHES WASHER	2"	2"	1-1/2"	1/2"	1/2"
K-SK	KITCHEN SINK	1-1/2"	2"	1-1/2"	1/2"	1/2"
V-SK	VEGGIE SINK	1-1/2"	2"	1-1/2"	1/2"	1/2"
D-SK	DOUBLE SINK	1-1/2"	2"	1-1/2"	1/2"	1/2"
DW	DISHWASHER	---	3/4"	---	1/2"	---
BS	BAR SINK	1-1/2"	2"	1-1/2"	1/2"	1/2"
LT	LAUNDRY TUB	1-1/2"	2"	1-1/2"	1/2"	1/2"
B-1	BIDET	2"	2"	1-1/2"	1/2"	1/2"
URN	URINAL	2"	2"	1-1/2"	---	3/4"
LT	LAUNDRY TUB	1-1/2"	2"	1-1/2"	1/2"	1/2"
HB	HOSE BIBB	-	-	-	-	3/4"



GAS SCHEMATIC

NOT TO SCALE

GAS NOTES

- GAS PIPING SHALL BE SCHEDULE 40 BLACK STEEL PIPE WITH MALLE-ABLE FITTINGS.
- GAS PIPING JOINTS SHALL BE SCREWED.
- WHERE GAS PIPE CONNECTS TO EQUIPMENT, IT SHALL BE PROVIDED WITH A DRIP LEG THE FULL SIZE OF THE RUN-OUT, A 100% SHUT-OFF VALVE AND A UNION.
- ALL GAS LINES FLEXIBLE PIPE CONNECTORS SHALL BE CONSTRUCTED OF A ONE PIECE DESIGN AND SHALL BE U.L. AND OR AGA APPROVED AS REQUIRED BY LOCAL AUTHORITIES.
- ALL GAS PIPING ROUTED EXPOSED ACROSS OR ON EXTERIOR SURFACES OF BUILDING SUBJECT TO WEATHER SHALL BE PRIMED AND PAINTED AFTER FINAL INSPECTIONS PER ARCHITECTURAL SPECIFICATIONS AND DIRECTIONS.

PLUMBING SYMBOL LIST

SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
---	SOIL WASTE LINE (W)	---	SHUT OFF VALVE (GATE)
----	VENT LINE (V)	---	CHECK VALVE
---	COLD WATER (C.W.)	---	UNION
---	HOT WATER (H.W.)	---	LUBRICATED PLUG VALVE
---	HOT WATER RETURN	---	HOSE BIBB (H.B.)
G	GAS LINE	---	BRANCH RISE OFF MAIN
TW	TEMPERED WATER	---	SURFACE CLEANOUT
D	DRAIN LINE	---	FLOOR CLEANOUT
+	BUILDING SEWER	---	GLOBE VALVE
+	FLOOR DRAIN (F.D.)	---	R.O. LINE
+	FLOOR SINK (F.S.)	---	BALL VALVE W/GARDEN HOSE CONN.
+	ROOF DRAIN (R.D.)	---	OVERFLOW DRAIN LEADER
+	OVER FLOW DRAIN	---	CONDENSATE DRAIN LINE
+	WALL CLEANOUT	---	INDIRECT WASTE VENT
+	POINT OF CONNECTION		

NOTE: ONLY THOSE SYMBOLS SHOWN ON THE DRAWING APPLY

GAS CALCULATION

GAS LOAD		
FC-#1	=	120 CFH
FC-#2	=	120 CFH
FC-#3	=	120 CFH
FC-#4	=	120 CFH
FC-#5	=	80 CFH
FC-#6	=	80 CFH
DRYER (2 x 65)	=	130 CFH
BBQ	=	65 CFH
WATER HEATER (4 x 65)	=	260 CFH
OVEN	=	45 CFH
FIREPLACE (2 x 45)	=	90 CFH
RANGE	=	65 CFH
FUTURE POOL HTR	=	400 CFH
TOTAL	=	1655 CFH

TOTAL DEVELOPE LENGHT
REMOTE FIXTURE = 311'
SIZED PER IFGC 2006 TABLE 402.2

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JOB

DATE

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