PLUMBING ABBREVIATIONS

&	AND	HB	HOSE BIBB
∠	ANGLE	HC	HANDICAPPED
@	AT	HD	HEAD
℄	CENTER LINE	HDWE	HARDWARE
℗	PROPERTY LINE	HI.	HIGH
ø	DIAMETER or ROUND	HORIZ	HORIZONTAL
(E)	EXISTING	HP	HIGH PRESSURE
(N)	NEW	HR	HOUR
⊥	PERPENDICULAR	HT	HEIGHT
#	POUND or NUMBER	HVAC	HEATING, VENTILATING, AIR CONDITIONING
A/C	AIR CONDITIONING		
AP	ACCESS PANEL	ID	INSIDE DIAMETER (DIM.)
AD.	AREA DRAIN	INSUL	INSULATION
ADJ	ADJUSTABLE	INT	INTERIOR
ADMIN	ADMINISTRATION	IW	IRRIGATION WATER
AGGR	AGGREGATE		
AL	ALUMINUM		
APPROX	APPROXIMATE	LAV	LAVATORY
APPT	APPOINTMENTS	LPG	LIQUID PETROLEUM GAS
ARCH.	ARCHITECTURAL		
ASB	ASBESTOS		
ASPH	ASPHALT	M	MEN
ASST	ASSISTANT	MACH	MACHINE
AUTO.	AUTOMATIC	MATL	MATERIAL
		MAX.	MAXIMUM
		MECH	MECHANICAL
BD	BOARD	MS	MOP SINK
(BF)	BELOW FINISH FLOOR	MTL	METAL
(BG)	BELOW FINISH GRADE	MFGR	MANUFACTURER
BLDG	BUILDING	MH	MANHOLE
BLKG	BLOCKING	MIN	MINIMUM
BM	BEAM	MISC	MISCELLANEOUS
BOT	BOTTOM	MONIT	MONITOR
BV	BALL VALVE		
		N	NORTH
CB	CATCH BASIN	NIC	NOT IN CONTRACT
CD	CONDENSATE DRAIN	NO. or #	NUMBER
CEM	CEMENT	NOM	NOMINAL
CER	CERAMIC	NTS	NOT TO SCALE
CI	CAST IRON		
CJ	CONTROL JOINT		
CLG	CEILING	OA	OVERALL
CLKG	CAULKING	OAV	OXYGEN, AIR & VACUUM
CLR	CLEAR	OC	ON CENTER
CO	CLEANOUT	OVHD	OVERHEAD
COL	COLUMN	OX.	OXYGEN
COMP	COMPRESSED		
CONC	CONCRETE		
CONF	CONFERENCE	PTN	PARTITION
CONN	CONNECTION	PHYS	PHYSICAL
CONST	CONSTRUCTION	PR	PRESSURE REGULATOR
CONT	CONTINUOUS	PVC	POLY-VINYL CLORIDE PIPE
CORR	CORRIDOR	PLAS	PLASTER
COTG	CLEANOUT TO GRADE	PLYWD	PLYWOOD
CP	CIRCULATING PUMP	POC	POINT OF CONNECTION
CKS	COUNTERSUNK	PREFAB	PREFABRICATED
CTR	CENTER	PREP	PREPARATION
CV	CHECK VALVE	PT	PLUGGED TEE
		PW	PROCESSED WATER
DBL	DOUBLE		
DCW	DOMESTIC COLD WATER	R	RISER
DEPT	DEPARTMENT	RAD.	RADIUS
DET	DETAIL	RD	ROOF DRAIN
DF	DRINKING FOUNTAIN	REF	REFERENCE
DHW	DOMESTIC HOT WATER	REINF	REINFORCED
DHWR	DOMESTIC HOT WATER RETURN	REQD	REQUIRED
DIA or ø	DIAMETER	RM	ROOM
DIR	DIRECTOR	RWL	RAINWATER LEADER
DN	DOWN		
DR	DOOR		
DS	DOWNSPOUT	S	SINK or SOUTH
DSP	DRY STANDPIPE	SA	WATER HAMMER ARRESTER
DTW	DOMESTIC TEMPERED WATER	SB	SPLASH BLOCK
DWG	DRAWING	SCHD	SCHEDULE
		SDL	STORM DRAIN LINE
E	EAST	SECT.	SECTION
EA	EACH	SH	SHOWER
EDF	ELECTRIC DRINKING FOUNTAIN	SHT	SHEET
ELEC	ELECTRICAL	SIM	SIMILAR
ELEV	ELEVATION	SL	SPRINKLER LINE
EMER	EMERGENCY	SPEC	SPECIFICATION
ENCL	ENCLOSURE	SOV	SHUT-OFF VALVE
EO	ELECTRICAL OUTLET	SS	SERVICE SINK
EP	ELECTRICAL PANEL	SST	STAINLESS STEEL
EQ	EQUAL	STD	STANDARD
EQUIP	EQUIPMENT	STL	STEEL
(E)	EXISTING	STOR	STORAGE
EXP	EXPANSION	STRUCT	STRUCTURAL
EXPO.	EXPOSED	SUPV	SUPERVISOR
EXT	EXTERIOR	SUSP	SUSPENDED
		S&W	SOIL & WASTE
FA	FIRE ALARM	TC	TOP OF CURB
FCO	FLOOR CLEANOUT	TEL	TELEPHONE
FD	FLOOR DRAIN	TER	TERRAZZO
FDN	FOUNDATION	THK	THICK
FE	FIRE EXTINGUISHER	TOC	TOP OF CONCRETE
FEC	FIRE EXTINGUISHER CABINET	TP	TRAP PRIMER
FH	FIRE HYDRANT	TRANS	TRANSCRIPTION
FHC	FIRE HOSE CAB.	TREAT.	TREATMENT
FHMS	FLAT HEAD METAL SCREW	TYP	TYPICAL
FIN.	FINISH	TV	TEMPERING VALVE
FL	FLOOR		
FLASH.	FLASHING		
FM	FIRE MAIN	UL	UNDERWRITERS LABORATORIES
FOC	FACE OF CONCRETE	UON	UNLESS OTHERWISE NOTED
FOF	FACE OF FINISH	UR	URINAL
FR	FRAME		
FRPF	FIREPROOFING		
FS	FLOOR SINK	V	VENT
FSH	FIRE SPRINKLER HEAD	VA	VALVE
FSL	FIRE SPRINKLER LINE	VC	VITRIFIED CLAY
FTR	FLUE THRU ROOF	VTR	VENT THRU ROOF
FUNC	FUNCTION	VO	VENT OFFSET
FURR	FURRING		
FUT	FUTURE		
		W	WASTE LINE
		W/	WITH
GA	GAUGE	WC	WATER CLOSET
GALV	GALVANIZED	WCO	WALL CLEANOUT
GC	GAS COCK	WH	WATER HEATER
GEN	GENERAL	WHA	WATER HAMMER ARRESTOR
GI	GALVANIZED IRON	W/O	WITHOUT
GL	GLASS	WMF	WASHING MACHINE FITTING
GR	GRADE	WP	WATERPROOF
GRD	GROUND	WT	WEIGHT
G	GAS LLINE		
		YD	YARD

SYMBOLS

SYMBOL	DESCRIPTION
	BALL VALVE
	BRANCH TOP CONNECTION
	BRANCH BOTTOM CONNECTION
	CAPPED PIPE
	CHECK VALVE
	CLEANOUT
	CLEANOUT TO GRADE
	CIRCULATING PUMP
	CONDENSATE DRAIN
	CONDENSATE "P" TRAP
	DOMESTIC COLD WATER
	DOMESTIC HOT WATER
	DOMESTIC HOT WATER RETURN
	EXISTING WASTE OR SOIL & WASTE
	FIRE HYDRANT
	FLOOR CLEANOUT
	FLOOR SINK
	GAS
	GAS COCK
	GAS PRESSURE REGULATOR
	GATE VALVE
	HOSE BIBB
	PIPE RISER (ELBOW)
	PIPE DROP (ELBOW)
	PIPE DROP OR RISER
	POINT OF CONNECTION
	PROCESS WASTE
	SHUT-OFF VALVE
	SHUT-OFF VALVE IN YARDBOX
	SOIL & WASTE
	TRAP PRIMER
	VENT
	VENT OFFSET
	VENT THRU ROOF
	WALL CLEANOUT
	WASTE
	WATER HAMMER

GENERAL PLUMBING NOTES

SECTION 1

BASIC MECHANICAL MATERIALS AND METHODS

PART 1 – GENERAL

1.1 SUMMARY

A. LABOR, MATERIALS, TOOLS, AND SERVICES FOR A COMPLETE INSTALLATION OF EQUIPMENT AND SYSTEM CONTAINED IN THE CONTRACT DOCUMENTS.

B. PRINCIPAL FEATURES OF THE WORK INCLUDED ARE:

1. PLUMBING SYSTEM AND RELATED PIPING INSULATION.
2. DOMESTIC WATER PIPING, VALVES, CONNECTIONS AND RELATED PIPING INSULATION.
3. LIMITED AREA FIRE PROTECTION (SPRINKLER SYSTEMS)
4. EXCAVATING AND BACKFILLING FOR MECHANICAL WORK; COORDINATE WITH APPROPRIATE TRADE.
5. ANCHOR BOLTS, SLEEVES, SUPPORTS AND SIMILAR ITEMS TO BE BUILT INTO CONCRETE OR MASONRY.
6. PREPARATION AND SUBMITTAL OF SHOP DRAWING AND PRODUCT DATA.
7. MAINTAINING A RECORD SET OF BLUE LINE PRINTS AND MAKING THEM TO INDICATE LOCATIONS OF CONCEALED ITEMS, AND DEVIATIONS MADE TO SUIT CONDITIONS AND PRODUCTION OF MECHANICAL AS-BUILT (RECORD) DRAWINGS.

1.2 JOB CONDITIONS:

A. SUBMITTAL OF BID IMPLIES BIDDER HAS READ APPLICABLE PARAGRAPHS OF THE SPECIFICATIONS AND WILL BE BOUND BY THEIR CONDITIONS.

1.3 LOCAL CONDITIONS

A. CONFORM WITH LOCAL CONDITIONS. COORDINATE WITH LOCAL UTILITIES ON SIZE OF UTILITY SERVICE.

1.4 INTENT

A. THE CONTRACT DOCUMENTS (DRAWINGS AND SPECIFICATIONS) DESCRIBE THE PLUMBING WORK OF THIS PROJECT ANY ITEMS MENTIONED IN ONE PART SHALL BE AS BINDING AS THOUGH MENTIONED IN BOTH.

B. THE CONTRACT DOCUMENTS FORM A GUIDE FOR A COMPLETE PLUMBING INSTALLATION. WHERE AN ITEM IS REASONABLY NECESSARY BUT NOT SPECIFICALLY MENTIONED, SUCH AS PIPING OFFSETS, DRAINS, ETC., FOR A COMPLETE SYSTEM, PROVIDE SAME.

C. PLUMBING LAYOUTS INDICATED ON DRAWINGS ARE DIAGRAMMATIC ONLY. EXACT LOCATIONS OF PIPES, AND EQUIPMENT SHALL BE GOVERNED BY THE DRAWINGS OF RELATED TRADES.

1.5 DEVIATIONS

A. NO DEVIATIONS FROM SPECIFICATIONS AND DRAWINGS SHALL BE MADE WITHOUT FULL KNOWLEDGE AND WRITTEN CONSENT OF CONSTRUCTION MANAGER.

B. SHOULD CONTRACTOR FIND, DURING PROGRESS OF WORK, CONDITIONS WHICH DICTATE A MODIFICATION OF ANY PARTICULAR REQUIREMENTS, REPORT SUCH ITEM PROMPTLY FOR DECISION OF INSTRUCTIONS.

1.6 QUALITY ASSURANCE

A. COMPLY WITH APPLICABLE LOCAL, STATE AND FEDERAL CODES.

B. COMPLY WITH APPLICABLE REQUIREMENTS OF RECOGNIZED INDUSTRY ASSOCIATIONS WITH PROMULGATE STANDARDS FOR THE VARIOUS TRADES. (SEE INDIVIDUAL SECTIONS OF DIVISION 15)

C. EMPLOY ONLY QUALIFIED JOURNEYMEN FOR THIS WORK. EMPLOY COMPETENT, QUALIFIED PLUMBERS TO SUPERVISE THE WORK.

1.7 CODES AND STANDARDS

A. PERFORM WORK SPECIFIED IN DIVISION 15 IN ACCORDANCE WITH THE APPLICABLE CODES AND STANDARDS LISTED BELOW, AND SUCH STANDARDS THAT MAY BE SPECIFIED IN OTHER SECTIONS. WHEN THESE SPECIFICATIONS ARE MORE STRINGENT, THEY TAKE PRECEDENCE. IN CASE OF CONFLICT, OBTAIN A DECISION FROM THE PLUMBING ENGINEER.

1. NFPA 54: NATIONAL FUEL AND GAS CODE.
2. NFPA 101: LIFE SAFETY CODE.
3. APPLICABLE STATE BUILDING CODE.
4. NATIONAL STANDARD PLUMBING CODE (OR APPLICABLE STATE PLUMBING CODE).
5. HANDICAPPED CODE ANSI A117.1 AND ADA
6. APPLICABLE STATE ENERGY CODE.
7. AGA: AMERICAN GAS ASSOCIATION.
8. ANSI: AMERICAN NATIONAL STANDARDS INSTITUTE.
9. ASTM: AMERICAN SOCIETY FOR TESTING AND MATERIALS.
10. MSS: MANUFACTURER'S STANDARDIZATION SOCIETY OF THE VALVE AND FITTING INDUSTRY.
11. NEMA: NATIONAL ELECTRICAL MANUFACTURER'S ASSOCIATION
12. NFPA: NATIONAL FIRE PROTECTION ASSOCIATION.
13. UL: UNDERWRITERS' LABORATORIES. INC.

1.8 COORDINATION

A. CAREFULLY EXAMINE SPECIFICATIONS AND DRAWINGS TO BE THOROUGHLY FAMILIAR WITH ITEMS WHICH REQUIRE PLUMBING AND COORDINATION.

B. COORDINATE WITH OTHER DIVISIONS TO LEAVE PROPER CHASES AND OPENINGS. PLACE OUTLETS, ANCHORS, SLEEVES, AND SUPPORTS PRIOR TO POURING CONCRETE OF INSTALLATION OF MASONRY WORK.

1.9 SUBMITTALS

A. SUBMITTALS ARE ONLY REQUIRED FOR SPECIFIC ITEMS OF EQUIPMENT OR MATERIAL LISTED IN INDIVIDUAL SECTIONS OF THESE SPECIFICATIONS.

B. WITHIN 15 DAYS AFTER AWARD OF CONTRACT FOR THIS WORK, SUBMIT A LIST OF PROPOSED MANUFACTURERS (OF EQUIPMENT OR MATERIAL TO BE USED) FOR APPROVAL. SUBMIT THIS LIST BEFORE SUBMITTAL OF SHOP DRAWINGS AND PRODUCT DATA, AND OBTAIN APPROVAL BEFORE SUBMITTING REQUIRED ITEMS.

C. SHOP DRAWINGS (NOT REQUIRED FOR OWNER FURNISHED EQUIPMENT).

1.10 DELIVERY AND STORAGE

A. INSOFAR AS POSSIBLE, DELIVER ITEMS IN MANUFACTURER'S ORIGINAL UNOPENED PACKAGING. WHERE THAT IS NOT PRACTICAL, COVER ITEMS WITH PROTECTIVE MATERIALS TO KEEP THEM FROM BEING DAMAGED. USE CARE IN LOADING, TRANSPORT, UNLOADING, AND STORAGE TO KEEP ITEMS FROM BEING DAMAGED.

1.11 FIRE RATINGS

A. MATERIALS USED ANYWHERE IN THE WORK MUST HAVE NFPA RATINGS AS FOLLOWING:

1. FLAME SPREAD – NOT OVER 25
2. SMOKE DEVELOPED – NOT OVER 50
3. FUEL CONTRIBUTED – NOT OVER 25

B. MATERIALS SHALL BE "SELF EXTINGUISHING".

1.12 PERMITS AND FEES

A. OBTAIN, PAY FOR, AND DELIVER PERMITS, CERTIFICATION OF INSPECTION, AND OTHER SUCH ITEMS REQUIRED BY THE AUTHORITIES HAVING JURISDICTION. DELIVER CERTIFICATION TO THE CONSTRUCTION MANAGER PRIOR TO FINAL ACCEPTANCE OF THE WORK. AN INSPECTION CERTIFICATE FOR EACH CLASS OF WORK REQUIRING INSPECTION MUST BE SUBMITTED PRIOR TO OR WITH THE FINAL PAYMENT INVOICE. THE RESPONSIBLE TRADE CONTRACTOR MUST MAKE APPLICATION FOR THE INSPECTION, COORDINATE SAME AND PAY THE REQUIRED INSPECTION FEE.

1.13 EXTENDED WARRANTIES

A. WORK FURNISHED UNDER THE CONTRACT SHALL BE WARRANTED AGAINST DEFECTS IN WORKMANSHIP AND (CONTRACTOR FURNISHED) MATERIALS FOR A PERIOD OF NOT LESS THAT ONE (1) YEAR, OR AS OTHERWISE SPECIFIED, FROM THE DATE OF FINAL ACCEPTANCE OF THE INSTALLATION, DEFECTS OF WORKMANSHIP DEVELOPING DURING THIS PERIOD SHALL BE REMEDIED, AND DEFECTIVE MATERIAL REPLACED, WITHOUT ADDITIONAL COST. WHEN DEFECTS IN A TRADE CONTRACTOR'S WORK CAUSES DAMAGE TO THE WORK OF THE OTHER TRADE CONTRACTORS, SUCH DAMAGE SHALL BE REPAIRED BY THE TRADE CONTRACTOR CAUSING DAMAGE AND WORK RESTORED TO ITS ORIGINAL CONDITION, AT THE EXPENSE OF THE TRADE CONTRACTOR THAT CAUSED THE DAMAGE.

PART 2 – PRODUCTS

2.1 MATERIALS AND EQUIPMENT

A. WITHIN THE CONTRACT DOCUMENTS RELATING TO PLUMBING WORK, MANUFACTURER'S NAMES, CATALOG NUMBERS, AND OTHER PROPRIETARY REFERENCES TO MATERIALS AND EQUIPMENT ARE MADE. SUCH REFERENCES ARE MADE TO ESTABLISH THE STANDARDS OF QUALITY AND TYPE REQUIRED, AND NOT TO LIMIT COMPETITION. ACCEPTABLE MANUFACTURER'S OF COMPETITIVE PRODUCTS ARE LISTED IN APPLICABLE SECTIONS AS "APPROVED EQUALS". REASONABLE REQUESTS FOR SUBSTITUTION OR ADDITIONS TO "APPROVED EQUALS" WILL BE CONSIDERED, BUT THE MECHANICAL ENGINEER WILL BE THE SOLE JUDGE OF ACCEPTABILITY OF ITEMS PROPOSED AS SUBSTITUTES.

B. MATERIALS AND EQUIPMENT USED IN CARRYING OUT THESE SPECIFICATIONS SHALL BEAR UL OR OTHER RECOGNIZED TESTING LABORATORY LABEL WHEN SUCH LABELS ARE AVAILABLE.

PART 3 – EXECUTION

3.1 LOCATIONS

A. PLUMBING LAYOUTS INDICATED ON DRAWINGS ARE DIAGRAMMATIC. EXACT LOCATIONS OF PIPES, AND EQUIPMENT MAY VARY BECAUSE OF CONFLICTS WITH WORK OF OTHER TRADES. WORK OUT CONFLICTS WHERE RELOCATION'S WILL NOT AFFECT OPERATION OR APPEARANCE OF SYSTEMS.

B. LOCATE EQUIPMENT REQUIRING PERIODIC SERVICING SO THAT IT IS READILY ACCESSIBLE. DO NOT BACK UP SERVICE SIDES TO WALLS. NOR PLACE IT TOO CLOSE TO OTHER EQUIPMENT TO MAKE SERVICE IMPRACTICAL. EQUIPMENT SERVICE CLEARANCE SHALL MEET MINIMUM ACCEPTABLE DISTANCE AS RECOMMENDED BY EQUIPMENT MANUFACTURER.

3.2 UTILITIES EXCAVATING AND BACKFILLING

A. PERFORM TRENCHING, EXCAVATING, BACKFILLING FOR PLUMBING WORK IN ACCORDANCE WITH THE APPROPRIATE SECTIONS AND AS SET FORTH BELOW

1. PERFORM WORK NECESSARY FOR INSTALLATION OF PLUMBING UTILITIES.
2. DEPTH OF EXCAVATION TO PROVIDE A MINIMUM OF 3' ABOVE TOP OF PIPE. EXCAVATION TO BE CARRIED TO A DEPTH OF AT LEAST 6" BELOW BOTTOM OF PIPE ELEVATION. FILL BELOW PIPE (6"), AROUND PIPE, AND A MINIMUM OF 12" ABOVE PIPE WIT SAND OR CLASS "B" CRUSHED STONE TAMPED FIRM AND EVEN. SEPARATE TOPSOIL DURING EXCAVATION. FINAL LAYER OR DIRT (12" MINIMUM) TO BE TOPSOIL. TRENCHES TO BE AT LEAST 18" WIDER THAN PIPE WITH BATTER BOARDS PLACED EVERY 25'. BACKFILLING SHALL BE DONE TO EXCLUDE USE OF ROCK OR STONE ABOVE SAND OR CRUSHED STONE.

3.3 CUTTING AND PATCHING

A. REPAIR OR REPLACE ROUTINE DAMAGE CAUSED BY CUTTING IN PERFORMANCE OF CONTRACT.

B. PERFORM REPAIRS WITH MATERIALS WHICH MATCH EXISTING AND INSTALL IN ACCORDANCE WITH THE APPROPRIATE SECTION OF THESE SPECIFICATIONS OR THE BEST STANDARDS OF THE INDUSTRY.

3.4 CONNECTION TO EQUIPMENT

A. CONNECT OR INSTALL EQUIPMENT SHOWN ON MECHANICAL DRAWINGS THAT REQUIRE PLUMBING

1. ROUGH – IN PIPING AND CONNECT EQUIPMENT
2. PROVIDE PIPING, SHUTOFF VALVES, AND UNIONS REQUIRED FOR A COMPLETE INSTALLATION,

3.5 SERVICE OF SYSTEM

A. EMPLOY COMPETENT, QUALIFIED PERSONNEL IN OPERATION OF THE EQUIPMENT.

B. PROVIDE FOR PROPER OPERATION AND CLEANLINESS.

END OF SECTION

SECTION 2

PLUMBING

PART 1 – GENERAL

1.1 SCOPE OF WORK

A. FURNISHING OF ALL LABOR, MATERIALS, TOOLS, TRANSPORTATION, SERVICE, AND RELATED ITEMS NECESSARY TO COMPLETE THE INSTALLATION OF THE PLUMBING SYSTEM AS ILLUSTRATED ON THE DRAWING AND AS INCLUDING BUT NOT LIMITED TO THE FOLLOWING:

1. HOT & COLD WATER SYSTEM WITH COMPLETE CONNECTIONS FROM METER TO ALL PLUMBING FIXTURES & EQUIPMENT REEQUIRING WAWTER CONNECTIONS
2. SOIL, WASTE, VENT AND CONDENSATE SYSTEM LINES INSIDE AND OUTSIDE THE BUILDING.
3. TRENCHING AND BACKFILLING.
4. FINAL PLUMBING CONNECTIONS TO HEATING AND AIR CONDITIONING EQUIPMENT.
5. GAS PIPING TO HEATING, WATER HEATERS AND ALL OTHER GAS BURNING EQUIPMENT.

PART 2 – PRODUCTS

2.1 DESCRIPTION

A. SOIL, WASTE, AND VENT PIPING BELOW FLOOR TO 5'–0" OUTSIDE BUILDING: STANDARD WEIGHT COATED CAST IRON SOIL PIPE AND CAST IRON/ NEOPRENE GASKET FITTINGS. YARD PIPING, PIPE AND FITTINGS. A.B.S. OR P.V.C. SCHEDULE 40 PIPE AND FITTINGS MAY BE INSTALLED, AS APPROVED BY LOCAL AUTHORITY IN CONCEALED LOCATIONS ONLY. EXCEPTION: ALL SOIL, WASTE & VENTS LOCATED WITHIN A FIRE RATED WALL SHALL BE METALLICS.(STEEL, CAST IRON ECT., NO PVC) IT SHALL BE THE RESPONIBLITY OF THE PLUMBER TO VERIFY ALL FIRE RATED WALLS & CONSTRUCTION AS SHOWN ON THE ARCHITECTURAL DRAWINGS & COORDINATE WITH THE GENERAL CONTRACTOR

B. SOIL, WASTE AND VENT PIPING ABOVE FLOOR: STANDARD WEIGHT COATED CAST IRON PIPE AND STAINLESS STEEL/ NEOPRENE GASKET FITTING, OR A.B.S. OR P.V.C. SCHEDULE 40, AS APPROVED BY LOCAL AUTHORITY IN CONCEALED LOCATIONS.

C. HOT & COLD WATER PIPING ABOVE FLOOR: TYPE "L" COPPER, HARD DRAWN. BELOW GROUND OUTSIDE OF BUILDING: TYPE "K" SOFT DRAWN COPPER TUBING WITH OUT JOINTS.

NO "TYPE M" COPPER WATER LINES PERMITTED

D. CONDENSATE DRAIN PIPING: TYPE "M" COPPER WITH 95–5 TIN ANTIMONY SOLDER AND WROUGH COPPER FITTINGS OR

E. INDIRECT WASTE PIPING: TYPE "M" COPPER WITH 95–5 TIN ANIMONY SOLDER AND WROUGHT COPPER FITTINGS OR P.V.C. SCHEDULE 40, AS APPROVED BY LOCAL AUTHORITY.

F. UNDERGROUND GAS PIPING: SCHEDULE 40 BLACK STEEL PIPE WITH LONG RADIUS STEEL WELDING FITTINGS INCLUDING CATHODIC PROTECTION OR POLYETHYLENE AS APPROVED BY LOCAL GAS COMPANY AND AUTHORITY HAVING JURISDICTION. INSTALLATION OF GAS SERVICE PIPING IN VENTED CONDUIT AND MEETING WITH THE LOCAL GAS COMPANY'S APPROVAL.

G. GAS PIPING ABOVE GROUND: SCHEDULE 40 BLACK STEEL WITH 125 POUND BLACK MALLEABLE IRON SCREWED FITTINGS. GAS PIPING COMPOUND AT JOINTS IN COMPLIANCE WITH NFPA BULLETIN #45 AND LOCAL APPLICABLE CODES AND SUITABLE FOR NATURAL GAS SERVICE. INSTALL MOISTURE TRAPS ON HVAC UNITS, WATER HEATERS, AND KITCHEN EQUIPMENT

H. STORM PIPING BELOW GROUND: STANDARD WEIGHT COATED CAST IRON PIPE AND STAINLESS STEEL/ NEOPRENE GASKET FITTING, OR A.B.S. OR P.V.C. SCHEDULE 40. AS APPROVED BY LOCAL AUTHORITY IN CONCEALED LOCATIONS.

I. STORM PIPING ABOVE GROUND: STANDARD WEIGHT COATED CAST IRON PIPE AND STAINLESS STEEL/ NEOPRENE GASKET FITTING, OR A.B.S. OR P.V.C. SCHEDULE 40, AS APPROVED BY LOCAL AUTHORITY.

J. TRAPS AND VENTS FOR SERVICE SINK: A.B.S. OR P.V.C. SCHEDULE 40, AS APPROVED BY LOCAL AUTHORITY.

2.2 INSULATION

A. INSULATE ALL HOT AND COLD WATER COPPER PIPING WITH AT LEAST 1/2" THICK FOAM RUBBER OR FOAM PLASTIC TYPE PIPE INSULATION

2.3 FIXTURES

A. ALL FIXTURES: AS INDICATED ON DRAWINGS WITH EQUAL PRODUCTS FURNISHED BY AMERICAN STANDARD, KOHLER, ELJER OR EQUAL

2.4 CLEANOUTS, FLOOR DRAINS, FLOOR SINKS, AND ROOF DRAINS.

A. ALL ACCESSORIES, AS INDICATED ON DRAWING WITH EQUAL PRODUCTS FURNISHED BY WADE, JOSAM, OR ZURN BEING ACCEPTABLE.

2.5 EQUIPMENT

A. SHUTOFF VALVES UNDERNEATH LAVATORIES, TANK TYPE WATER CLOSETS, AND KITCHEN EQUIPMENT WITH CHROME PLATED ANGLE STOP VALVES WITH CHROME PLATED ESCUTCHEON PLATES.

B. HOSE BIBBS – AS SCHEDULED ON DRAWINGS.

C. VACUUM BREAKERS – AS SCHEDULED ON DRAWINGS.

D. BACKFLOW PREVENTERS – AS SCHEDULED ON DRAWINGS.

E. GAS COCK – PLUG VALVE IRON BODY, BRONZE TAPERED PLUG, LUBRICATED, THREADED ENDS. RATED FOR 200 CWP, AGA AND UL LISTED.

PART 3 – INSTALLATION

3.1 PIPING

A. RUN ALL PIPING CONCEALED EXCEPT WHERE OTHERWISE INDICATED ON DRAWINGS.

B. INSTALL VALVES TRAPS CLEANOUT AND OTHER APPARATUS IN AN EASILY ACCESSIBLE LOCATION

C. INSTALL SOIL, WASTE VENT OFFSETS AND CONDENSATE DRAINS WITH A MINIMUM UNIFORM GRADE OF ONE QUARTER INCH TO THE FOOT.

D. MAINTAIN HOT AND COLD WATER LINES AT LEAST 6 INCHES APART WHERE PIPING IS PARALLEL.

E. PROVIDE ESCUTCHEON PLATES WHERE ALL PIPES PASS THROUGH A FINISHED WALL.

3.2 PLUMBING FIXTURES

A. FURNISH AND INSTALL ALL PLUMBING FIXTURES COMPLETE WITH ALL EQUIPMENT FITTINGS, TRIMMING, AND ACCESSORIES.

B. ALL FIXTURES: GRADE A, WHITE.

C. EXPOSED PIPING TO FIXTURES: A PRODUCT OF THE FIXTURE MANUFACTURE.

D. PROVIDE STOPS AS MANUFACTURED BY THE FIXTURE MANUFACTURER, WITH METAL – TO – SEAT FOR ALL FIXTURES AND EQUIPMENT.

3.3 TEST

A. THE PLUMBING SYSTEM AND ASSOCIATED SYSTEM IS SUBJECT TO FINAL APPROVAL OF THE OWNER'S REPRESENTATIVE AND CODE AUTHORITIES HAVING JURDICTION. PERFORM ALL TESTS REQUIRED TO SHOW CODE COMPLIANCE AS DIRECTED.

3.4 CLEANING AND PROTECTION

A. AFTER THE PLUMBING PIPING HAS BEEN INSTALLED, INSPECTED, AND APPROVED, FLUSH THE PIPING SYSTEM TO REMOVED ANY FOREIGN MATTER FROM THE PIPES.

3.5 MAINTENANCE

A. MAINTAIN ALL PARTS OF THE PLUMBING FIXTURES AND ASSOCIATED EQUIPMENT THROUGHOUT THE GUARANTEE

END OF SECTION

WATER SIZING

WATER SUPPLY FIXTURE UNITS	(WSFU)
FLUSH VALVE	(FV)
GRAVITY TANK	(GT)
GALLONS PER MINUTE	(GPM)
POUNDS PER SQUARE INCH	(PSI)
GALLONS PER FLUSH	(GPF)
FLUSH TANK	(FT)

CALCULATIONS IMPLEMENTED AS PER 2010 CPC APPENDIX "A".
NUMERICAL VALUES TO 2 SIGNIFICANT FIGURES

DEMAND BY WSFU

* AS PER TABLE A–2 IN CPC 2010 APPENDIX "A"

FIXTURE	QUANTITY	WSFU	TOTAL COLD WSFU	TOTAL HOT WSFU
FV WATER CLOSET 1.28 GPF	3	5.0	15.0	–
LAVATORY	3	1.0	3.0	1.5
SINK	1	2.0	2.0	1.0
TOTAL:			20.0	2.5

SYSTEM PARAMETERS

AS PER CHART A–3 IN CPC 2010 APPENDIX "A":
CONVERT WATER SUPPLY FIXTURE UNITS TO GALLONS PER MINUTE.

TOTAL: 20.0 COLD WSFU = 35 COLD GPM
1.5 HOT WSFU = 5 HOT GPM

AS PER CHART A–4 IN CPC 2010 APPENDIX "A":
MAIN LINE SIZE TO BE 1–1/2" TYPE "L" COPPER
35 GPM @ 6.5 FPS VELOCITY HAS 4.5 PSI PER 100FT PRESSURE DROP

AS PER CHART A–1 IN CPC 2010 APPENDIX "A":
1" DISK TYPE WATER METER, 35 GPM @ 8 PSI PRESSURE DROP

DEVELOPED LENGTH THRU PATH OF HIGHEST RESISTANCE: 300'–0"

AS PER TABLE A–3 IN CPC 2010 APPENDIX "A":
EQUIVALENT LENGTH OF PIPE FOR VARIOUS FITTINGS TO BE ADDED TO ENVELOPED LENGTH FOR PRESSURE DROP CALCULATIONS. ADD 50'–0" TO ENVELOPED LENGTH

TOTAL ENVELOPED LENGTH: 350'–0"

PIEZOMETRIC PRESSURE LOSS IN SYSTEM

LOSS IN HEAD	(16 FT. x .33 PSI / FT.)	= 5.3 PSI
FRICTION LOSS	(350 FT. x 4.5 PSI / 100 FT)	= 15.75 PS
PRESSURE DROP THRU WATER METER		= 8 PSI
PRESSURE DROP THRU BACK FLOW PREVENTER		= 12 PSI
TOTAL PRESSURE LOSS		= 41 PSI
PRESSURE AVAILABLE AT JOB SITE (PLUMBER TO VERIFY)		= 80 PSI
SET PRESSURE REDUCING VALVE TO		N/A
BOOSTER PUMP NOT REQUIRED		
PRESSURE REDUCING VALVE NOT REQUIRED		
80 PSI – 41 PSI = 39 PSI > 25 PSI NEEDED FOR FV FIXTURES		
THE ALLOWABLE FRICTION LOSS PER 100 FT	(100 x 41 PSI / 350 FT)	= 11.71 PSI

APPROVED

ALL DRAINAGE BRANCH LINES CONNECTING TO MAIN SHALL BE ROLLED UP 45° OR MORE FROM HORIZONTAL.

PASQUINI ENGINEERING INCORPORATED
903 H Street Suite 300
Bakersfield, CA 93304
Telephone: (661) 328-9600
Fax: (661) 328-9630

NO.	DATE

DIANE MIRONOWSKI
OFFICE/ WAREHOUSE
6107 WOODMERE DR.
BAKERSFIELD, CA.

THESE PLANS ARE NOT FOR CONSTRUCTION UNLESS A "WET STAMP & SIGNATURE" FROM BOTH THE ENGINEER OF RECORD AND A APPROVAL STAMP WITH A "WET STAMP & SIGNATURE" FROM THE LOCAL GOVERNING AGENCY ARE PRESENT.

DWG. BY	L.H.
CHK'D BY	
DATE	2-13-12
JOB NO.	6510
FILE NO.	651022

REGISTERED PROFESSIONAL ENGINEER
MARC ADRIAN FOUNTAIN
M40079
EXP. 12/31/13
STATE OF CALIFORNIA

SHEET
P-1
OF SHEET