PLUMBING SPECIFICATIONS

PART 1 – GENERAL

SCOPE

FURNISH, INSTALL, TEST, PLACE INTO OPERATION AND GUARANTEE, COMPLETE, OPERABLE, AND APPROVED MECHANICAL AND PLUMBING WORK. SECURE AND PAY FOR ALL MATERIALS, EQUIPMENT, LABOR, SUPERVISION, FEES, TESTS, PERMITS, AND ALL OTHER COSTS REQUIRED.

REGULATIONS IN EFFECT

NATIONAL, STATE, AND CITY CODES, ORDINANCES, ETC., HAVING JURISDICTION. RULES AND REQUIREMENTS OF UTILITY SERVING AGENCIES.

NO ADDITIONAL FUNDS WILL BE ALLOCATED FOR WORK REQUIRED TO CONFORM TO REGULATIONS AND REQUIREMENTS.

QUALIFICATIONS OF WORKMEN

USE SUFFICIENT JOURNEYMEN CRAFTSMEN AND COMPETENT SUPERVISORS, TO ENSURE PROMPT, PROPER, AND SAFE EXECUTION OF WORK.

DESIGN DRAWINGS

DESIGN DRAWINGS ARE DIAGRAMMATIC AND ONLY DEFINE BASIC FUNCTIONS REQUIRED. PROVIDE ALL WORK, MATERIAL, ETC., TO ACCOMPLISH THESE REQUIREMENTS. MINOR DEVIATIONS FROM DESIGN LAYOUT ARE ANTICIPATED AND ARE A PART OF WORK INCLUDED, HOWEVER, MAKE NO CHANGES THAT ALTER CHARACTER OF WORK. DO NOT SCALE DESIGN DRAWINGS.

SHOP DRAWINGS

INDEXED BROCHURE COMPLETELY DESCRIBING MAJOR PRODUCTS AND SYSTEMS (SEVEN HARD BOUND COPIES, OR ONE ELECTRONIC PDF FILE).

FOR INFORMATION AND COORDINATION ONLY. PROVIDE SUFFICIENT DATA TO CLEARLY DEFINE THE WORK REQUIRED OF OTHER TRADES FOR PROPER INSTALLATION, OPERATION, AND SERVICE OF EQUIPMENT.

SHOP DRAWINGS ARE NOT A FORUM FOR CHANGES IN PROJECT SCOPE OR REQUIREMENTS.

PRIOR TO SUBMISSION OF SHOP DRAWINGS TO ARCHITECT, CONTRACTOR SHALL REVIEW SUBMITTALS AND BE SATISFIED THAT THEY ARE REPRESENTATIVE AND DESCRIPTIVE OF THE EQUIPMENT AND MATERIAL TO WHICH THEY PERTAIN. ALL SUBMITTED EQUIPMENT WILL BE CHECKED BY THE CONTRACTOR TO MAKE CERTAIN THE EQUIPMENT WILL PROPERLY FIT THE SPACE ALLOCATED.

PART 2 – PRODUCTS

GENERAL

NEW AND UNUSED PRODUCTS OF ESTABLISHED AND REPUTABLE AMERICAN MANUFACTURERS. SIMILAR ITEMS SHALL BE OF SAME MANUFACTURER.

COMPLETE AND OPERABLE SYSTEMS. INCLUDE ANY AND ALL ACCESSORIES REQUIRED FOR PROPER OPERATION AS THOUGH SPECIFICALLY INDICATED. SUCH AS: FILTERS, CONDENSATE DRAINS WITH VENTED TRAPS, RELIEF VALVES, SERVICE VALVES AND STOPS, THERMOSTATS, LOW VOLTAGE WIRING, VIBRATION ISOLATORS, AND ITEMS SPECIFICALLY RECOMMENDED BY MANUFACTURER.

REFERENCE TO A MANUFACTURER'S PRODUCT IS TO ESTABLISH TYPE, QUALITY, AND PERFORMANCE REQUIRED. THESE QUALIFICATIONS ARE IN ADDITION TO REQUIREMENTS SHOWN ELSEWHERE.

PIPING

SANITARY AND STORM: MECHANICAL JOINT CAST IRON AND FITTING FOR EXPOSED PIPING. IAPMO APPROVED ABS OR PVC, WITH SOLVENT WELDED FITTINGS FOR CONCEALED PIPING AND PIPING BELOW GRADE. ALL UNDERGROUND NON-METALLIC SANITARY DRAINAGE LARGER THAN 2" SHALL BE INSTALLED WITH INSULATED COPPER TRACER WIRE OR OTHER APPROVED CONDUCTOR LOCATED ADJACENT TO THE PIPING. ACCESS SHALL BE PROVIDED TO THE TRACER WIRE OR THE TRACER WIRE SHALL TERMINATE ABOVE GROUND AT EACH END OF THE NON-METALLIC PIPING. THE TRACER WIRE SHALL BE NOT LESS THAN 18 AWG AND THE INSULATION TYPE SHALL BE SUITABLE FOR UNDERGROUND BURIAL.

POTABLE WATER: TYPE "L" HARD COPPER. 0.2% MAX LEAD SOLDER. IAPMO APPROVED SCHEDULE 40 PVC MAY BE UTILIZED FOR BURIED COLD WATER LINES, NOT UNDER STRUCTURE, IN ACCORDANCE WITH IAPMO STANDARDS. PROVIDE DIELECTRIC INSULATOR ON ALL DISSIMILAR METALS.

RELIEF VALVE AND MISCELLANEOUS DRAINS: TYPE "M" HARD COPPER.

CONDENSATE DRAINS: TYPE "M" HARD COPPER OUTDOORS. SLOPE 1/8"/FT AND PROVIDE CLEANOUTS AT EVERY 90° TURN.

GAS PIPING; STANDARD WEIGHT STEEL WITH TREADED JOINTS.
BLACK PIPE INDOORS
GALVANIZED PIPE OUTDOORS

AIR: COPPER. NO LEAD SOLDER.

VACUUM: SCHEDULE 40 PVC.

PIPING ACCESSORIES

FLASH PIPING THROUGH ROOF WITH 26 GA GALVANIZED STEEL EXTENDED 6" INTO ROOFING.

PROVIDE CLEANOUTS IN HORIZONTAL DRAINAGE PIPING. PROVIDE APPROPRIATE WALL OR FLOOR COVERS FOR CLEANOUTS IN CONCEALED PIPING. BRING CLEANOUTS IN OUTDOOR PIPING TO GRADE AND SECURE WITH TRAFFIC WEIGHT CLEANOUT BOX AND COVER.

WATER HAMMER ARRESTERS TO BE PROVIDED AS REQUIRED AT DISHWASHERS, CLOTHES WASTERS, FLUSH VALVES AND OTHER QUICK CLOSING VALVES.

125# BRONZE GATE VALVES OR BALL VALVES.

BRASS-CRAFT OR FROST 1/4 TURN STOPS ON WATER SERVICES TO FIXTURE WITH FLEXIBLE BRAIDED STAINLESS STEEL SUPPLIES.

BACKFLOW PREVENTION DEVICE: ALL DEVICES, APPURTENANCES, APPLIANCES, ETC INTENDED TO SERVE SOME SPECIAL FUNCTION SUCH AS STERILIZATION, DISTILLATION, PROCESSING, COOLING FOR STORAGE OF ICE OR FOODS, AND THAT CONNECT TO EITHER THE WATER SUPPLY OR DRAINAGE SYSTEM SHALL BE PROVIDED WITH PROTECTION AGAINST BACKFLOW, FLOODING OR CONTAMINATION OF THE WATER SUPPLY SYSTEM AND STOPPAGE OF THE DRAIN.

PIPE INSULATION

MINIMUM INSULATION REQUIRED ON CONDENSATE PIPING, HOT WATER PIPING, HOT WATER RECIRC PIPING AND 1ST 8 FT OF COLD WATER PIPING AT WATER HEATERS:
1/2" ON PIPES UP TO 1.25"
1" ON PIPING SIZED BETWEEN 1.5" AND 2"
1-1/2" ON PIPING OVER 2"
(CONDUCTIVITY NOT EXCEEDING 0.27 BTU PER INCH/H).
HOT WATER PIPING TO REQUIRE A MINIMUM OF 1" INSULATION

WATER HEATER

UL APPROVED, STORAGE TYPE WITH GLASS LINED TANK. FIBERGLASS INSULATION WITH DECORATIVE METAL JACKET. MAGNESIUM ANODE RODS. ONE YEAR GUARANTEE AGAINST TANK FAILURE. ASME TEMPERATURE AND PRESSURE RELIEF VALVE, WITH WATER RATING (NOT STEAM RATING) EQUAL TO HEATING CAPACITY. EXTEND FULL SIZE DISCHARGE LINE TO GRADE OR APPROVED RECEPTOR.

PART 3 – EXECUTION

GENERAL

PERFORM ALL WORK IN BEST TRADE PRACTICE. ARRANGE FOR GREATEST PRACTICAL EASE OF OPERATION AND SERVICE. INSTALL SQUARELY WITH BUILDING LINES. PROVIDE RIGID, PERMANENT, LEVEL, BASES AND SUPPORTS. ELIMINATE VIBRATION AND RATTLING.

FOLLOW THESE SPECIFICATIONS AND MANUFACTURER'S RECOMMENDED INSTALLATION PROCEDURES.

COVER AND PROTECT ALL EQUIPMENT AND MATERIALS FROM WEATHER, THEFT, ETC.. PLUG OR CAP ALL OPEN ENDS OF INSTALLED PIPING AND DUCTWORK.

EXCAVATION AND BACKFILL

ACCURATELY GRADE BOTTOM OF TRENCHES TO PROVIDE UNIFORM CONTINUOUS BEARING AND SUPPORT FOR PIPE. BACKFILL IN SIX INCH (6") MECHANICALLY COMPACTED LAYERS, FREE OF ROCKS, WOOD, AND DEBRIS. JETTING IS NOT AN ACCEPTABLE MEANS OF COMPACTION.

ROUGH-IN AND FINAL CONNECTIONS

THE DRAWINGS INDICATE GENERAL ARRANGEMENTS ONLY. PROVIDE ROUGH-IN AND FINAL CONNECTIONS FOR FIXTURES AND EQUIPMENT IN ACCORDANCE WITH MANUFACTURER'S SUGGESTIONS AND PRODUCT REQUIREMENTS.

PIPING

INSTALL EXPOSED PIPING CLOSE TO BUILDING CONSTRUCTION TO MINIMIZE INTRUSION INTO USABLE BUILDING SPACE. UTILIZE FITTINGS FOR ALL JOINTS, OFFSETS AND TURNS.

VERIFY DIMENSIONS AND REQUIREMENTS. BENDING OR OFFSETTING OF PIPING AND "COCKING" OF FITTINGS WILL NOT BE ACCEPTABLE.

SUPPORT HORIZONTAL PIPING WITH PIPE HANGERS OR BRACKETS. DO NOT USE PERFORATED METAL TAPE. DO NOT SUPPORT PIPING FROM EQUIPMENT.

SANITARY AND STORM: LAY AT A UNIFORM GRADE. MAKE ALL JOINTS CLOSE AND SQUARE.

PIPE INSULATION

SLIP INSULATION OVER PIPING PRIOR TO ASSEMBLY. DO NOT SLIT INSULATION LENGTHWISE. SOLVENT WELD ALL JOINTS. DO NOT USE TAPE TO SECURE INSULATION.

COMMISSIONING

VERIFY PROPER POWER TO ELECTRIC MOTORS AND CONTROLS. TEST AND ADJUST CONTROLS AND SYSTEMS AND CONFIRM PROPER OPERATION.

STERILIZE AND FLUSH DOMESTIC WATER SYSTEM.

AT COMPLETION OF WORK, THOROUGHLY CLEAN EQUIPMENT, PIPING, AND APPARATUS. REMOVE GREASE, DIRT, RUST, CEMENT, AND PLASTER, AND LEAVE SURFACES SMOOTH AND CLEAN. LEAVE PREMISES IN A NEAT, CLEAN AND USABLE CONDITION.

UPON REQUEST OF OWNER, AND AT HIS CONVENIENCE, PROVIDE SUFFICIENT QUALIFIED PERSONNEL AND TIME, TO INSTRUCT OWNER OR HIS REPRESENTATIVE IN THE SAFE AND PROPER OPERATION OF SYSTEMS PROVIDED.

WATER HEATER SCHEDULE - ELECTRIC

TAG	MANUFACTURER MODEL NO.	STORAGE CAPACITY	INPUT	RECOVERY GPH	TEMP RISE	REMARKS
WH-1	RHEEM PROE15 1 RH POU	15 GALLON	2 KW	9	90°F	

NOTES:
1. SINGLE ELEMENTS
2. VERIFY ALL ELECTRICAL REQUIREMENTS WITH ELECTRICAL CONTRACTOR

RECIRC PUMP SCHEDULE

TAG	BELL & GOSSETT MODEL	HP	REMARKS
RP	BH1005	1/12	SEE NOTES BELOW

NOTES:
1. ALL BRONZE BODY
2. VERIFY ALL ELECTRICAL REQUIREMENTS WITH ELECTRICAL CONTRACTOR

PLUMBING FIXTURE SCHEDULE

ITEM	FIXTURE	DESCRIPTION
(HWC)	WATER CLOSET	GERBER TANK EF-21-318 ELONGATED BOWL & TANK. 'ULTRA FLUSH' 1.1 PRESSURE-ASSIST TOILET, FLOOR MOUNTED, ELONGATED BOWL, WATER SAVER, COMPLETE WITH OPEN SEAT BEMIS 1955SC, OR EQUAL. TO BE ADA COMPLIANT
(LAV)	LAVATORY	GERBER 12-654 'MONTICELLO' LEDGE TYPE' 20" X 18" WALL HUNG, WITH AMERICAN STANDARD 1340225.002 METERING FAUCET. TO BE ADA COMPLIANT. PROVIDE POWERS LFE480-10 LEAD FREE THERMOSTATIC LAV TEMPERING VALVE. SET OUTLET TEMP NOT TO EXCEED 110 DEGREES F. (ASSE 1070)
(SK)	SINK	DOUBLE COMPARTMENT STAINLESS STEEL SINK FHP DS804 WITH DELTA 140-DST, SELF-RIMMING, 19" X 36" X 6-1/2 DEEP
(BS)	HAND SINK	STAINLESS STEEL SINK FHP BS602 W/ DELTA 1903-DST, SELF-RIMMING, 16" X 15" X 6-1/2 DEEP
(AW)	WASHER BOX	GUY GRAY NO. BB-200, OR EQUAL. RECESSED BOX UNIT, COMPLETED WITH 1/2" HOT AND COLD WATER VALVES WITH VACUUM BREAKERS, 2" DRAIN CONNECTION AND P-TRAP IN WALL
(FS)	FLOOR SINK	ZURN NO. Z-1910-NH-2, CAST IRON W / 1" AIR GAP ABOVE RIM OF SINK
(PT)	PLASTER TRAP	GLECO TRAP SYSTEM GT-64, COMPLETE WITH REMOVABLE PVC SEDIMENT BUCKET WITH STAINLESS SCREEN AND GASKETED COVER. PROVIDE 3" BETWEEN BOTTOM OF BOTTLE AND CABINET BASE PANEL. (PROVIDED BY OTHERS)
(TP)	TRAP PRIMER	PRECISION PRODUCTS PR500
(BV)	BALL VALVE	RWV ¾" BRASS BALL VALVE #5595F (WATER TIE IN AT VACUUM)
(RPBP)	BACKFLOW PREVENTER	WATTS 009QT -3/4" BACK FLOW PREVENTER
(WHA)	WATER HAMMER ARRESTER	"JAY R. SMITH" PDI TYPE 'A' (FIGURE 5005) WITH BALL VALVE, IN WALL WITH ACCESS DOOR, AS REQUIRED FOR CLOTHES WASHER. NOTE: INSTALL AS PER MANUFACTURER'S INSTALLATION INSTRUCTIONS.
(WCO)	WALL CLEANOUT	ZURN NO. Z-1446-NH-Z-VP, OR EQUAL, COMPLETE WITH SMOOTH VANDAL PROOF POLISHED STAINLESS STEEL COVER
(AM)	AMALGAM SEPARATOR	SOLMETEX HG5-HV TYPE 2, INSTALL PER MANUFACTURE SPECIFICATIONS IN EQUIPMENT ROOM.
(VAC)	DENTAL VACUUM	VACSTAR MODEL 80, 25" H X 28"W X 16"D AIR TECHNIQUES 40A 2" AIR EXHAUST
(AIR)	DENTAL AIR COMPRESSOR	AIRSTAR MODEL 50, 29"H X 33"W X 21"D AIR TECHNIQUES 8 AMP, ¾" TYPE 'L' COPPER PIPING DISTRIBUTION, 2" FRESH AIR INTAKE.

WATER CALCULATIONS

(PER 2009 IPC)

FIXTURE UNITS THIS PROJECT	36 FU
FIXTURE UNITS AVAILABLE FOR FUTURE	164 FU
TOTAL FIXTURE UNITS	200 FU
GPM	65 GPM
METER SIZE	1-1/2"
TOTAL DEVELOPED LENGTH	335 ft
(WITH 20% FOR FITTINGS)	402
PRESSURE AT METER	60 PSI
METER LOSS	-11.3 PSI
RPBP LOSS	-10 PSI
STATIC LOSS (10 X 0.434) =	-4.3 PSI
PRESSURE AT MOST REMOTE FIXTURE	-20 PSI
NET	14 PSI
FRICTION FACTOR (ALLOWABLE)	
(14.4 PSI / 402 ft) X 100 =	3.6 PSI/100'

FIXTURE UNITS THIS PROJECT:

(1)	(E) HB	X	5	=	5
(2)	HWC (TANK)	X	5	=	10
(2)	LAV	X	2	=	4
(1)	SK	X	4	=	4
(3)	BS	X	2	=	6
(1)	AW	X	4	=	4
(12)	DENT CHAIR	X	0.25	=	3
	TOTAL THIS PERMIT			=	36

ASSUMED WATER PRESSURE. CONTRACTOR SHALL VERIFY ACTUAL WATER PRESSURE PRIOR TO CONSTRUCTION. IF PRESSURE IS LESS THAN 50 PSI, CONTRACTOR SHALL CONTACT ENGINEER FOR PIPE SIZING EVALUATION. IF PRESSURE EXCEEDS 80 PSI, A PRESSURE REDUCING VALVE SHALL BE PROVIDED AND SET TO 80 PSI. PIPING VELOCITY NOT TO EXCEED 8 FEET PER SECOND.

PIPE SIZING BASED ON 3.6 PSI/100'

PIPE SIZE	GPM	FU TANK	FU VALVE
1/2"	0-2	0-1	
3/4"	3-5	2-6	
1"	6-11	7-15	
1-1/4"	12-19	16-29	
1-1/2"	20-30	30-55	0-13
2"	33-66	56-205	14-95
2-1/2"	67-115	206-460	96-336

ENERGY COMPLIANCE PER 2006 IECC:

HEAT TRAPS:
NOT REQUIRED WITH A HOT WATER RECIRC SYSTEM.

WATER HEATERS NOT SUPPLIED WITH INTEGRAL HEAT TRAPS AND SERVING NON-CIRCULATING SYSTEMS SHALL BE PROVIDED WITH HEAT TRAPS ON THE SUPPLY AND DISCHARGE PIPING ASSOCIATED WITH THE EQUIPMENT. REFERENCE WATER HEATER SCHEDULE.

AUTOMATIC SHUTOFF:
AUTOMATIC CIRCULATING HOT WATER SYSTEM PUMPS SHALL BE ARRANGED TO BE CONVENIENTLY TURNED OFF AUTOMATICALLY OR MANUALLY WHEN HOT WATER IS NOT IN OPERATION.

TEMPERATURE CONTROLS:
PROVIDE WH CONTROLS TO SHOW A SET POINT OF 110° FOR DWELLING UNITS AND 90° FOR EQUIPMENT SERVING OTHER OCCUPANCIES.

HOT WATER SYSTEM CONTROLS:
AUTOMATIC CIRCULATION SYSTEM SHALL BE ARRANGED TO TURN OFF WHEN HOT WATER SYSTEM IS NOT IN USE.

PIPING INSULATION:
THE PIPING INSULATION CALLED OUT FOR IN THE PLUMBING SPECIFICATIONS MEETS OR EXCEEDS THE VALUES REQUIRED PER IECC 504.5. FOR AUTOMATIC-CIRCULATING HOT WATER SYSTEMS, THE FIRST 8 FT OF COLD WATER AND ALL HOT WATER PIPING SHALL BE INSULATED WITH 1" (25 MM).

INVESTIGATION OF PLBG CONDITIONS

PLUMBING CONTRACTOR SHALL EXAMINE THE CONTRACT DRAWINGS AND ALL AVAILABLE INFORMATION CONCERNING EXISTING INSTALLATION, STRUCTURE, AND LOCAL CONDITIONS. VISIT THE SITE PRIOR TO BID TO UNDERSTAND THE NATURE AND SCOPE OF ALL WORK TO BE PERFORMED AND VERIFY EXISTING CONDITIONS. THE SUBMISSION OF A BID WILL BE TAKEN AS EVIDENCE THAT SUCH AN EXAMINATION HAS BEEN MADE AND THAT ALL EXISTING CONDITIONS HAVE BEEN CONSIDERED. NO ALLOWANCES WILL BE MADE AFTER THE PROJECT HAS STARTED FOR FAILURE TO IDENTIFY THE EXISTING CONDITIONS. ITEMS TO BE VERIFIED MAY INCLUDE, BUT NOT LIMITED TO THE FOLLOWING:

1. SIZE AND LOCATION OF ALL EXISTING PIPING IN THE SCOPE OF WORK. THIS INCLUDES, BUT NOT LIMITED TO: COLD WATER MAIN SIZES, SEWER INVERT DEPTH, SEWER AND WATER SERVICE ENTRANCE LOCATIONS.
2. SPECIFIC CONDITION AND LOCATION OF ALL PLUMBING FIXTURES UNDER THIS SCOPE OF WORK. ANY REPAIRS NEEDED TO EXISTING EQUIPMENT SHALL BE RELAYED TO OWNER FOR REPAIR/REPLACEMENT.

NOTIFY ENGINEER IF ANY DISCREPANCIES OR CONFLICTS ARE OBSERVED. THE EXISTING PLUMBING EQUIPMENT AND PIPING SHOWN IN THESE DRAWINGS ARE FOR REFERENCE ONLY, THEREFORE IT IS THE RESPONSIBILITY OF THE PLUMBING CONTRACTOR TO VERIFY THESE CONDITIONS AND TAKE THEM IN TO ACCOUNT IN THEIR BID.

NOTE:

THERE WILL BE NO SURGERY, ANESTHESIA NOR MEDICAL GASES ON THE PREMISES.

THERE WILL BE NO STORAGE OF OXYGEN AND/OR NITROUS OXIDE.

CONSTRUCTION CODES

2009 IBC
2009 IFGC
2006 IECC
2009 IMC
2009 IPC

AKRIBIS
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FOR QUESTIONS PLEASE CALL: DAN RAMIREZ

OFFICE 851

DRAWING ISSUANCE DATES

BID SET -

FOR CONSTRUCTION -

DATE:	REVISIONS:

ENGINEER:

Date Signed: Sep 08, 2016

PROJECT NAME:
DENTAL OFFICE -
TENANT IMPROVEMENT

1222 Tiny Town Rd., Suite tbd
Clarksville, Tennessee 37042

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SHEET TITLE
PLUMBING SPECIFICATIONS

DRAWN BY:	TE/BW/JAM
1st SUB DATE:	XX-XX-16
2nd SUB DATE:	-
START DATE:	8-23-16
PROJECT NO.	CLA_2_TN/#851

SHEET NO.
P1.0