1. PROVIDE GRAVITY DRAIN WITH BACKWATER VALVE TO STORM IF POSSIBLE. SHOULD A GRAVITY DRAIN TO STORM NOT BE POSSIBLE, INSTALL A 30"x30"x30" SUMP PIT AND SUMP PUMP (SEE ITEM #2 FOR DETAILS ON SUMP PUMP REQUIREMENTS).

2. SUMP PUMP (IF REQUIRED) SHALL BE ZOELLER Hi-TEMP MODEL M3161 OR WATSON McDaniel PIT BOSS (TYPE OF PUMP TO BE DETERMINED BY DUES DURING DESIGN).

3. PROVIDE LADDER LADDER WITH RUNGS 12" O.C. AND 18" SEPARATION BETWEEN SIDE RAILS. SIDES OF LADDER SHALL BE 3"X3" GALVANIZED FLAT BAR. LADDER RUNG SHALL BE MUNICIPAL TRACTION TREAD TYPE - GALVANIZED, 13 GA, 4 ROW, 2.25" WIDE (ITEM # M3LST4460). LADDER SHALL HAVE INTEGRAL FEET TO BE BOLTED TO THE FLOOR. PRE-PUNCCHED HOLES AT 12" INTERVALS SHALL BE PROVIDED FOR INSTALLING WALL BRACKETS CAPABLE OF BEING BOLTED TO WALL.

4. HIGH PRESSURE DRIP LEG AND STEAM TRAP ASSEMBLY, REFER TO DUKE STANDARD DETAILS FOR VAULT HIGH PRESSURE DRIP TRAP DETAIL.

5. LINKEAL ASSEMBLY MANUFACTURED BY THUNDERLINE CORPORATION OR APPROVED EQUIVALENT. PROVIDE LINK SEAL AT EACH EXTERIOR WALL PENETRATION.

6. BRONZE SWING CHECK VALVE RATED FOR 200 PSIG CWP & 125 SWP.

7. TWO PIECE THREADED BRONZE BALL VALVE RATED FOR 400 PSIG CWP & 125 SWP.

8. 36" MANHOLE ACCESS LID SHALL BE CONSTRUCTED FROM COMPOSITE MATERIAL WITH AN HS20 LOAD RATING. MANHOLE ACCESS SHALL NOT BE OBSTRUCTED BY ANY PIPING OR INSULATION BELOW. "STEAM" SHALL BE STAMPED INTO LID FOR IDENTIFICATION.

9. 24" MANHOLE ACCESS LID SHALL BE CONSTRUCTED FROM COMPOSITE MATERIAL WITH AN HS20 LOAD RATING. MANHOLE ACCESS SHALL NOT BE OBSTRUCTED BY ANY PIPING OR INSULATION BELOW. "STEAM" SHALL BE STAMPED INTO LID FOR IDENTIFICATION.

10. SUMP PIT SHALL BE LOCATED NEAR 24" MH OPENING WITHOUT ENCROACHING WITHIN CIRCUMFERENCE OF MH OPENING. GRATING MATERIAL SHALL BE COMPOSITE, DARK GREY 1.0" THICK WITH 1.5" SQUARE OPENINGS. MATERIAL SHALL BE CAPABLE OF SUPPORTING 500 LBS AT 272°F.

11. SUMP DISCHARGE PIPING SHALL BE HARD PIPED TO STORM SYSTEM. FLEXIBLE FITTINGS WILL NOT BE AN ACCEPTABLE TYPE OF CONNECTION TO STORM SYSTEM PIPING.

12. LOCATE VALVE AS CLOSE TO MAIN TAKE-OFF AS POSSIBLE.

13. LOCATE GFCI RECEPTACLE AS HIGH AS POSSIBLE IN MH CLOSE TO THE LADDER.
GENERAL NOTES FOR STEAM VAULT CONSTRUCTION

1. DETAILS SHOWN IN THIS DRAWING OUTLINE MATERIALS AND METHODS FOR DESIGNING AND CONSTRUCTING STEAM VAULTS FOR PROPER ACCESS AND MAINTENANCE OF STEAM AND CONDENSATE DISTRIBUTION PIPING AT DUKE UNIVERSITY AND DUKE UNIVERSITY MEDICAL CENTER.

2. MINIMUM DIMENSIONS FOR STEAM VAULTS ARE 8'x6'x8'. STEAM VAULT SHALL INCREASE IN SIZE TO PROVIDE ADEQUATE CLEARANCE TO ACCESS VALVES, TRAPS, PUMPS, PIPING, ETC.

3. VALVES AND FITTINGS AS SPECIFIED IN DETAIL DRAWINGS AND KEYED NOTES.

4. STEAM TRAP ASSEMBLY SHALL BE INSTALLED WITH STEAM TRAP AND ISOLATION VALVES EASILY ACCESSIBLE ONCE ENTERING VAULT. TRAP ASSEMBLY SHALL NOT BE INSTALLED WHERE IT COULD BE A TRIP HAZARD DURING VAULT ENTRY.

5. MINIMUM CLEARANCE DIMENSIONS ARE FROM OUTER EDGE OF INSULATION.

6. ALL PIPING TO BE ASTM A53 GRADE B OR ASTM A 106 SEAMLESS PIPE. ALL STEAM PIPING LARGER THAN 2" AND SUMP DISCHARGE PIPING SHALL BE SCHEDULE 40. STEAM PIPING LESS THAN 2" SHALL BE SCHEDULE 80. ALL CONDENSATE PIPING SHALL BE SCHEDULE 80.

7. ALL STEAM AND CONDENSATE VALVES SHALL BE CARBON STEEL OF BUTTWELDED OR SOCKET WELDED CONNECTION TYPE. STEAM VALVES SHALL BE CLASS 300. PUMPED CONDENSATE VALVES SHALL BE CLASS 150. ALL VALVES 2" AND SMALLER SHALL BE CLASS 800.
1. PROVIDE FLOOR DRAIN TO SANITARY IF POSSIBLE. SHOULD A FLOOR DRAIN TO SANITARY NOT BE POSSIBLE, INSTALL A 30"x30"x30" SUMP PIT AND SUMP PUMP (SEE ITEM #2 FOR DETAILS ON SUMP PUMP REQUIREMENTS).

2. SUMP PUMP (IF REQUIRED) SHALL BE ZOELLER HI-TEMP MODEL M3181. PROVIDE HIGH WATER LEVEL ALARM TO BE TIED INTO BUILDING CONTROLS.

3. PROVIDE LADDER LADDER WITH RUNGS 12" O.C. AND 18" SEPARATION BETWEEN SIDE RAILS. SIDES OF LADDER SHALL BE 3"x2" GALVANIZED FLAT BAR. LADDER RUNG SHALL BE McNICHOLS TRACTION TREAD TYPE - GALVANIZED, 13 GA, 4 ROW, 2.25" WIDE (ITEM# M3LRST4460 ) LADDER SHALL HAVE INTEGRAL FEET TO BE BOLTED TO THE FLOOR. PRE-PUNCHEO HOLES AT 12" INTERVALS SHALL BE PROVIDED FOR INSTALLING WALL BRACKETS CAPABLE OF BEING BOLTED TO WALL.

4. HIGH PRESSURE DRIP LEG AND STEAM TRAP ASSEMBLY. REFER TO DUKE STANDARD DETAILS FOR HIGH PRESSURE DRIP TRAP DETAIL.

5. LINKSEAL ASSEMBLY MANUFACTURED BY THUNDERLINE CORPORATION OR APPROVED EQUIVALENT. PROVIDE LINK SEAL AT EACH EXTERIOR WALL PENETRATION.

6. BRONZE SWING CHECK VALVE RATED FOR 200 PSIG CWP & 125 SWP.

7. TWO PIECE THREAD BRONZE BALL VALVE RATED FOR 400 PSIG CWP & 125 SWP.

8. 36"x36" PIT ACCESS CONSTRUCTED FROM STEEL GRATING. PROVIDE HINGES AND HANDLE FOR OPENING HATCH DOOR.

9. PROVIDE STEEL GRATE TO COVER ENTIRE PIT OPENING.

10. PROVIDE HIGH WATER ALARM. ALARM LEVEL SHALL BE SET TO 3" BELOW THE LEVEL OF THE DRIP LEG CAP. ALARM SHALL BE TIED INTO BUILDING CONTROLS.

11. SUMP DISCHARGE PIPING SHALL BE HARD PIPED TO SANITARY SYSTEM. FERNCO TYPE FITTINGS WILL NOT BE AN ACCEPTABLE TYPE OF CONNECTION TO SANITARY SYSTEM.
GENERAL NOTES FOR STEAM PIT CONSTRUCTION

1. DETAILS SHOWN IN THIS DRAWING OUTLINE MATERIALS AND METHODS FOR CONSTRUCTING STEAM ACCEPTANCE PITS FOR PROPER ACCESS AND MAINTENANCE OF STEAM AND CONDENSATE PIPING BUILDING AT DUKE UNIVERSITY AND DUKE UNIVERSITY MEDICAL CENTER.

2. ALL PIPE TO BE ASTM A106 SEAMLESS PIPE. ALL STEAM PIPING 2” AND LARGER AND SUMP PUMP DISCHARGE PIPING SHALL BE SCHEDULE 40. ALL CONDENSATE PIPING AND STEAM SMALLER THAN 2” SHALL BE SCHEDULE 80.

3. VALVES AND FITTINGS AS SPECIFIED IN DETAIL DRAWINGS AND KEYED NOTES.

4. STEAM TRAP ASSEMBLY SHALL BE INSTALLED WITH STEAM TRAP AND ISOLATION VALVES EASILY ACCESSIBLE ONCE ENTERING PIT. TRAP ASSEMBLY SHALL NOT BE INSTALLED WHERE IT COULD BE A TRIP HAZARD DURING PIT ENTRY.

5. MINIMUM CLEARANCE DIMENSIONS ARE FROM OUTER EDGE OF INSULATION.
NOTES

1. ISOLATION VALVE SHALL BE BRONZE BALL VALVE RATED FOR 600 CWP, 150 SWP IF GAUGE IS INSTALLED BETWEEN ISOLATION VALVES ON PRV STATION. REFER TO PRV STATION DETAILS FOR FURTHER CLARIFICATION. ALL OTHER INSTANCES, ISOLATION VALVE SHALL BE CLASS 600 CARBON STEEL GATE VALVE.

KEYED NOTES

1. SPRAX SARCO MODEL FT-36 STEAM TRAP, NPT CONNECTION.
2. TYVEK-STRAINER, NPT CONNECTION, FINE MESH SCREEN.
3. BRONZE BALL VALVE WITH STAINLESS STEEL BALL AND STEM, RATED FOR 600 PSIG CWP AND 150 SWP, FINISH WITH SHOULDER NIPPLE AND CAP.
4. CLASS 800 CAST STEEL GATE VALVE, SOCKET-WELD CONNECTION.
5. BLOWDOWN TEST TEE, FORGED STEEL FITTING, WITH SAME BRONZE BALL VALVE INSTALLED ON WYE STRAINER AND DETAILED IN ITEM #5.
6. DIT MODEL SCV STAINLESS STEEL CHECK VALVE WITH X-780 SPRING, NPT CONNECTION.
7. PIPE UNION, FORGED STEEL, NPT CONNECTION.
8. FULL LINE-SIZE DRIP POCKET UP TO 6" NPS. HALF OF LINE SIZE DRIP POCKET FOR ALL DIA. OVER 6", BUT NEVER LESS THAN 0.5."
GENERAL NOTES FOR STEAM TRAP STATION CONSTRUCTION

1. DETAILS SHOWN IN THIS DRAWING OUTLINE MATERIALS AND METHODS FOR CONSTRUCTING STEAM TRAP STATIONS FOR PROPER STEAM CONDENSATE DRAINAGE AT DUKE UNIVERSITY AND DUKE UNIVERSITY MEDICAL CENTER.

2. ALL PIPE TO BE ASTM AS53-B SEAMLESS PIPE, SCHEDULE 80 WALL THICKNESS.

3. VALVES AND FITTINGS AS SPECIFIED IN DETAIL DRAWINGS AND KEYED NOTES.

4. TRAP STATIONS TO UTILIZE WELD CONNECTIONS ON UPSTREAM AND DOWNSTREAM ISOLATION VALVES. ALL COMPONENTS AND FITTINGS BETWEEN THE ISOLATION VALVES TO UTILIZE NPT (THREADED) CONNECTIONS.

5. LOCATE UPSTREAM ISOLATION VALVE AS CLOSE AS POSSIBLE TO DRIPL LEG.

6. LOCATE DRIPL STEM STEAM TRAP ISOLATION VALVE AS CLOSE AS POSSIBLE TO CONDENSATE RETURN MAIN.

7. INSTALL DRIPL LEG BLOWDOWN VALVES IN DOWNWARD VERTICAL DIRECTION. IF AVAILABLE SPACE DOES NOT ALLOW FOR THIS METHOD, REVIEW POSSIBLE SOLUTIONS WITH DUKE UTILITIES AND ENGINEERING SERVICES.

8. FINISH ALL BLOWDOWN VALVES WITH OUTLET SIDE PIPE NIPPLE AND CAP. TURN ALL BLOWDOWN PIPING AWAY FROM EQUIPMENT AND PIPING COMPONENTS IN SERVICE. EXTEND PIPING TO GRADE AS NECESSARY TO COMPLY.
GENERAL NOTES

1. THIS DRAWING IS INTENDED AS A CONCEPTUAL GUIDE ONLY. MECHANICAL DESIGNER

2. ALL PIPING SHOWN WITHOUT INSULATION FOR ILLUSTRATIVE PURPOSES.

3. DESIGNER RESPONSIBLE FOR PROPER PIPE SIZING, PRESSURE REDUCING VALVE SIZING, AND ANCILLARY COMPONENT SELECTION. DESIGNER AND/OR INSTALLING CONTRACTOR EXPECTED TO PROVIDE FINITE ELEMENT ANALYSIS OF PIPE STRESSES AND THERMAL EXPANSION IN STEAM SYSTEM PRIOR TO INSTALLATION.

4. ROTATE VALVES AND VALVE HANDLES RADIALY AS NEEDED FOR ACCESSIBILITY AND OPERATION.