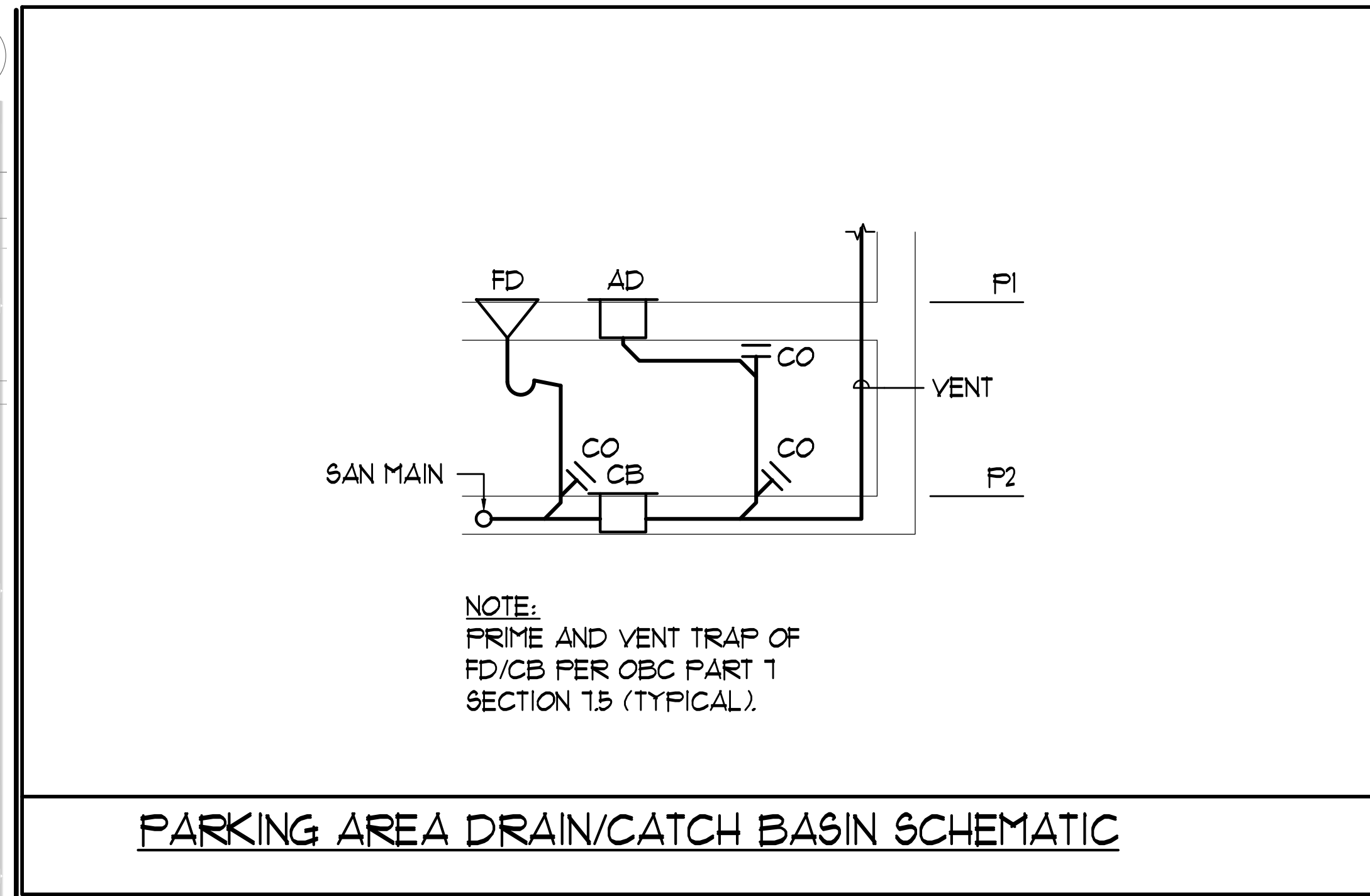
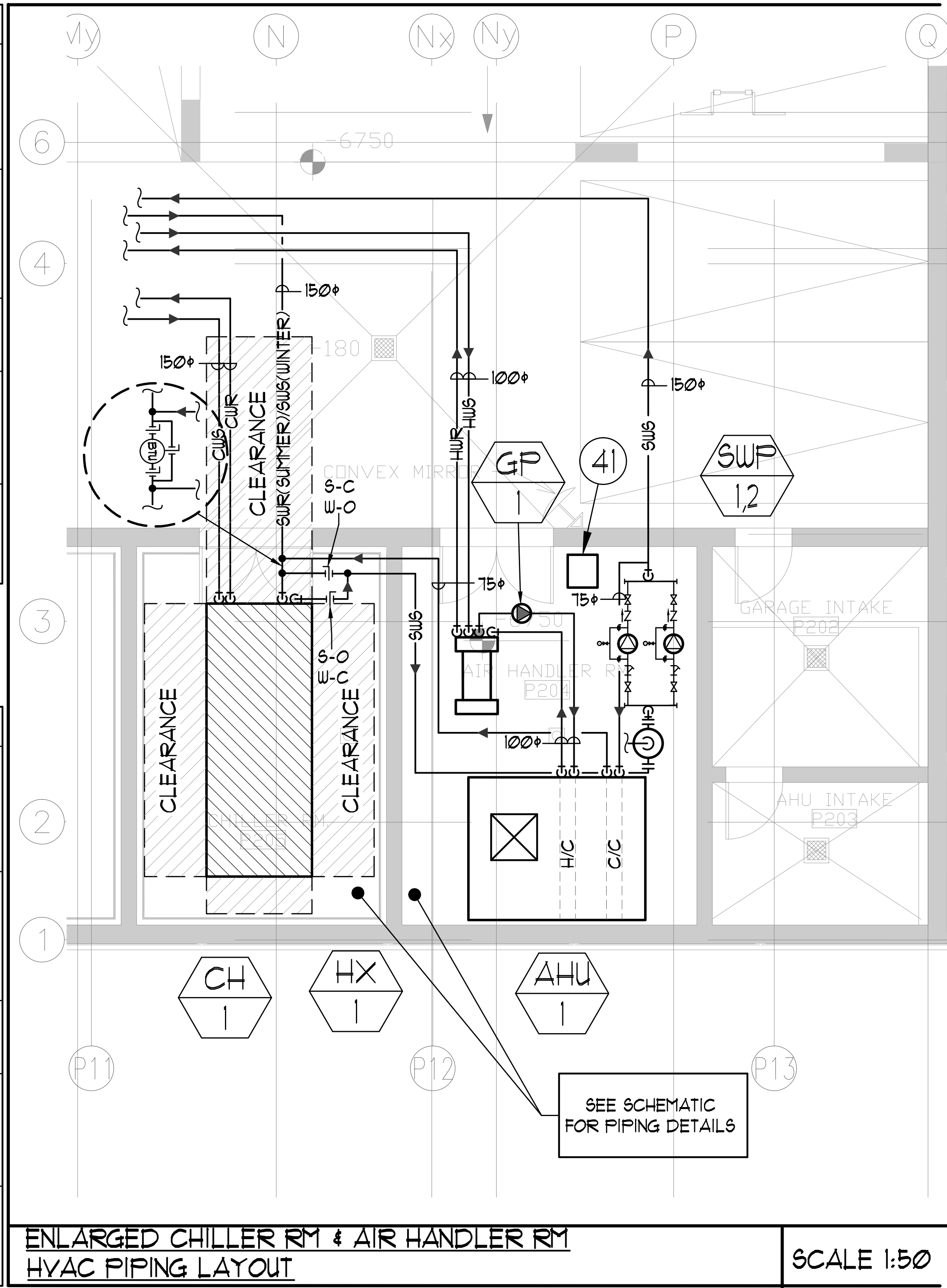


QTY.	DESCRIPTION
2	BARNES 2SE-554L SUBMERSIBLE PUMPS INSIDE A 300MM ϕ SUMP PIT, EACH C/W 1/2 HP, 575 VOLT, 3 PHASE, 60 CYCLE MOTOR WITH 30 FT POWER CORD, 2" N.P.T. DISCHARGE, HANDLES 2" DIAMETER SOLIDS AND DELIVERS 35 U.S. G.P.M. AT 22 FT TOTAL HEAD.
1	LDP 515 DUPLEX ELECTRICAL ALTERNATOR, STARTER AND CONTROL PANEL, WITH LOCKABLE DEAD-FRONT, 575 VOLT, 3 PHASE, 60 CYCLE C/W H.O.A. SELECTOR SWITCHES, RUN LIGHTS, THERMAL OVERLOAD HEATERS TO SUIT PUMP MOTORS WITH RESET BUTTON, AND CIRCUIT BREAKERS IN EEMAC 3R ENCLOSURE.
4	LS 20 MECHANICAL LEVEL SENSORS, 1 FOR PUMP "ON", 1 FOR PUMP "OFF", 1 FOR BOTH PUMPS "ON", AND 1 FOR ALARM LEVEL.
1	LHW 115 HIGH WATER ALARM PANEL, 115 VOLT, 1 PHASE WITH PILOT LIGHT, ON-OFF-TEST SWITCH, BUZZER AND EXTRA RELAY FOR REMOTE SIGNALING, IN EEMAC 1 ENCLOSURE.
1	TRIM BAR CURB FRAME C/W CHECKERED COVER PLATE IN 2 SECTIONS, FOR INSPECTION AND ACCESS.

QTY.	DESCRIPTION
2	BARNES 5GVF-2052L SUBMERSIBLE GRINDER PUMPS INSIDE A 300MM ϕ SUMP PIT, EACH C/W 2 HP, 575 VOLT, 3 PHASE, 60 CYCLE MOTOR WITH 30 FT POWER CORD, 125" N.P.T. DISCHARGE, AND DELIVERS 50 U.S. G.P.M. AT 30 FT TOTAL HEAD.
1	LDP 515 DUPLEX ELECTRICAL ALTERNATOR, STARTER AND CONTROL PANEL, WITH LOCKABLE DEAD-FRONT, 575 VOLT, 3 PHASE, 60 CYCLE C/W H.O.A. SELECTOR SWITCHES, RUN LIGHTS, THERMAL OVERLOAD HEATERS TO SUIT PUMP MOTORS WITH RESET BUTTON, AND CIRCUIT BREAKERS IN EEMAC 3R ENCLOSURE.
4	LS 20 MECHANICAL LEVEL SENSORS, 1 FOR PUMP "ON", 1 FOR PUMP "OFF", 1 FOR BOTH PUMPS "ON", AND 1 FOR ALARM LEVEL.
1	LHW 115 HIGH WATER ALARM PANEL, 115 VOLT, 1 PHASE WITH PILOT LIGHT, ON-OFF-TEST SWITCH, Buzzer AND EXTRA RELAY FOR REMOTE SIGNALING, IN EEMAC 1 ENCLOSURE.
1	TRIM BAR CURB FRAME C/W CHECKERED COVER PLATE IN 2 SECTIONS, FOR INSPECTION AND ACCESS.



- 1) ALL PIPES 50 MM AND LARGER SHALL BE ISOLATED USING 12 MM RUBBER PADS IN THE SADDLES OF CLEVIS HANGERS.
- 2) ALL MAIN VERTICAL PIPE RISERS REQUIRE VIBRATION ISOLATION. NONE OF THESE RISERS MAY TOUCH THE SLAB OR ANY PENETRATED PARTITION. ALL RISER ANCHORS MUST INCLUDE 1-INCH THICK NBN ISOLATION PADS, TO BE HELD IN PLACE WITH HORIZONTAL STEEL PLATES WELDED TO BRACKETS THAT ARE IN TURN WELDED TO THE RISER. BOLTING THROUGH THE PADS IS NOT ACCEPTABLE.
- 3) FOR THE MAIN RISERS, ANY PIPE GUIDES USED IN CONNECTION WITH EXPANSION JOINTS OR LOOPS MUST BE ISOLATED WITH RUBBER PADS AND SLEEVES THERE FASTENED TO THE BUILDING STRUCTURE.
- 4) IN-LINE AND CABINET FANS SHOULD BE ISOLATED WITH SPRINGS OR NEOPRENE-IN-SHEAR MOUNTS. SIDEWALL FANS SHOULD BE ISOLATED USING NEOPRENE MOUNTS OR PADS. ALL FANS SUSPENDED ON PI LEVEL SHALL BE WELL ISOLATED USING ISOLATORS INCORPORATING BOTH A SPRING ELEMENT AND A SECONDARY NEOPRENE-IN-SHEAR ELEMENT IN SERIES. DUCTWORK SHALL BE DE-COUPLED FROM FAN BY FLEXIBLE CONNECTORS.
- 5) ALL RUBBER PADS OR MOUNTS USED TO ISOLATE PIPES SHOULD BE 45 DUROMETER OR LOWER.
- 6) SPLIT HEAT PUMP OR SPLIT AC SYSTEM CONDENSERS SHOULD BE MOUNTED WITH RUBBER PADS. REFRIGERANT PIPING BETWEEN THE TWO SHOULD BE ISOLATED AT POINTS OF SUPPORT OUTSIDE OF THE ARMAFLEX WRAP AROUND THE PIPE, OR A SECTION OF SUCH WRAP SHOULD BE INCLUDED AT ANY POINT OF SUSPENSION.
- 7) DOMESTIC COLD WATER BOOSTER PUMP SHALL BE ISOLATED FROM THE SLAB WITH 2" THICK RUBBER PADS(NBN) AND A TUN-SPHERE RUBBER EXPANSION JOINT, WITH HIGH PRESSURE RATINGS (MASON SPEC) HIGH PRESSURE OR (VALVE)T WELDS ON BOTH INLET AND DISCHARGE PIPING CONNECTIONS TO THE BOOSTER SET. RUBBER EXPANSION JOINT TO BE RATED FOR POTABLE/DRINKING WATER USE. DOWSP VPD SHALL BE MOUNTED ON RUBBER PADS.
- 8) ALL PIPE HANGERS FOR THE MAIN DOW LINE SHALL BE ISOLATED USING NEOPRENE-IN-SHEAR HANGERS FOR THE FIRST 10 POINTS OF SUPPORT FROM THE PUMPS, AND USING 12 MM RUBBER PADS IN THE SADDLES OF CLEVIS HANGERS IN ALL OTHER POINTS OF SUPPORT TO THE MAIN VERTICAL RISER LOCATION.
- 9) ALL PIPES 50 MM AND BELOW SUPPORTED FROM WITHIN MECHANICAL ROOMS SHOULD BE ISOLATED WITH THICK RUBBER PADS, OR FOAM RUBBER SLEEVES IN PIPE CLAMPS, POT FEEDERS, FRYS AND OTHER ANCILLARY EQUIPMENT MUST BE SIMILARLY ISOLATED.

- 1) AT THE MECHANICAL ROOM, IF ANY H/C PIPES MUST BE SUSPENDED FROM ABOVE USING AN ISOLATED PIPE GRID, THIS PIPE GRID SHOULD BE SUPPORTED FROM THE WALLS (NOT THE G/F SLAB) AND ACOUSTIC CEILINGS ARE NOT TO BE PENETRATED. THE PIPES SHOULD BE SUSPENDED USING UPGRADED VIBRATION ISOLATION HANGERS INCLUDING SPRINGS WITH AT LEAST 38MM STATIC DEFLECTION, NEOPRENE-IN-SHEAR ELEMENTS IN SERIES (ADDITIONAL 6MM DEFLECTION), AND RUBBER PADS IN HANGER SADDLES (6MM THICK MINIMUM). REFER TO ASCII DRAWING D/46600 FOR DETAILS.
 - 2) SUP. SHAFT BE DECOUPLED FROM THE ATTACHED PIPING USING TWIN-SPHERE RUBBER EXPANSION JOINTS ON BOTH THE SUCTION AND DISCHARGE SIDES. SECONDARY TWIN-SPHERE JOINTS SHOULD ALSO BE USED FOR SUP PIPING, WHERE THEY EXIT THE MECHANICAL ROOM. FOR VIL PIPES, THESE EXPANSION JOINTS ARE TYPICALLY LOCATED IN THE VERTICAL SECTION ABOVE THE SUCTION STRAINER AND SHUT-OFF VALVE. FOR PUMPS AND DIRECTLY ATTACHED PIPING (UP TO THE TWIN-SPHERE JOINT) SHALL BE MOUNTED ON CONCRETE INERTIA BASES, AND ISOLATED FROM THE STRUCTURAL SLAB BELOW USING SPRING ISOLATORS WITH MINIMUM 38 MM STATIC DEFLECTION AND 25 MM THICK NBN PADS UNDER THE SPRING BASE, PROPERLY LOADED.
 - 3) SMALL PUMPS SHALL BE ISOLATED USING NEOPRENE-IN-SHEAR ISOLATORS FOR THE FIRST 3 POINTS OF SUPPORT ON EITHER SIDE OF THE PUMP.
 - 4) ALL PUMPS (OTHER THAN THE DQUBP) SHALL BE MOUNTED ON ND MOUNTS FROM MASON INDUSTRIES OR EQUIVALENT. STANDARD WAFFLE PADS WILL NOT BE SUFFICIENT.
 - 5) ALL AHU/AHU/MAU SHALL BE MOUNTED ON DOUBLE LAYER (NBN) PADS BETWEEN UNIT CASING AND HOUSEKEEPING PAD, ALL UNIT DUCTWORK WITHIN THE MECHANICAL ROOM SHALL BE C/W 25MM INTERNAL ACOUSTIC LINING, 25MM INSULATION AND JACKETING. ALL ASSOCIATED DUCTWORK SHALL BE HUNG BY HANGERS WITH NEOPRENE PADS.
 - 6) MAIN VERTICAL AIR SHAFT TO BE C/W 25MM THICK INTERNAL ACOUSTIC DUCT LINER STARTING FROM THE AHU ROOM AND UP THREE FLOORS.
 - 7) CHILLER ROOM IS TO BE CONSTRUCTED WITH A MINIMUM 100MM FLOATING CONCRETE FLOOR ON 50 MM THICK ISOLATORS, DESIGNED FOR A FUNDAMENTAL FREQUENCY OF 10 HZ OR LESS, WITH BATT INSULATION IN THE CAVITY.
- THE CHILLER BODY SHALL BE ISOLATED FROM THE PIERS USING MULTIPLE COIL SPRING ISOLATORS HAVING A STATIC DEFLECTION OF APPROXIMATELY 2". PLUS A THICK NOISE PAD UNDER THE SPRING BASE. THE NOISE PAD SHALL CONSIST OF MULTIPLE LAYERS OF RUBBER, MAXIMUM 45 DUROMETER, SEPARATED BY STEEL SHIMS AND TOPPED BY A STEEL LOAD PLATE. THE NOISE PAD SHALL BE SIZED TO ACHIEVE A STATIC DEFLECTION OF APPROXIMATELY $\phi 3^\circ$ AT A LOAD EQUAL TO 2/3 OF THE MAXIMUM EXPECTED POINT LOAD OF THE CHILLER.
- CHILLER SHALL BE COMPLETE WITH ACOUSTIC BLANKET.
- 8) ALL CONNECTIONS BETWEEN THE CHILLER AND THE ATTACHED PIPING SHALL INCLUDE TWIN-SPHERE RUBBER EXPANSION JOINTS.

- 1) CONTRACTOR SHALL CO-ORDINATE ARCHITECTURAL, STRUCTURAL, LIGHTING, HVAC, SPRINKLER DRAWINGS TO AVOID AREAS OF CONFLICT AND TO MAINTAIN CEILING HEIGHTS.
- 2) CONTRACTOR SHALL REPORT ALL DISCREPANCIES AND AREAS OF CONFLICT TO THE ENGINEER PRIOR TO BEGINNING WORK.
- 3) MINIMUM HEAD ROOM IS 2100 mm ABOVE FINISH FLOOR LEVEL.
- 4) WHERE THERE IS A DROPPED CEILING, GAS PIPING SHALL BE HUNG BELOW AND TIGHT TO CEILING.
- 5) ALL EQUIPMENT TO BE INSTALLED PER SPECIFICATION AND MANUFACTURER'S INSTALLATION MANUAL. PROVIDE ACCESS PANEL FOR CONCEALED EQUIPMENT VALVES, ETC.
- 6) ALLOW 3M SEPARATION BETWEEN THE CONNECTION OF THE MAIN SANITARY RISER AND ITS AUXILIARY RISER.
- 7) ALL SANITARY PIPE OUTSIDE OF HEATED CEILING SPACE SHALL BE INSULATED, CANVASSED AND PAINTED.
- 8) ALL VENTS SHALL COMPLY WITH O.B.C. AND PLUMBING CODE.
- 9) FOR STORAGE ROOM VENTILATION SYSTEM, DIV.16 TO PROVIDE CONDUIT, WIRING AND SWITCH TO START 1 STOP FAN 4 DAMPER, FAN AND 110V ACTUATOR TO BE SUPPLIED AND INSTALLED BY DIV. 15.
- 10) FOR UTILITY ROOM VENTILATION SYSTEM, DIV.15 WILL PROVIDE LINE VOLTAGE THERMOSTAT TO DIV.16. DIV.16 TO PROVIDE CONDUIT 4 WIRING TO START/STOP FAN 4 DAMPER VIA THERMOSTAT. FAN AND 110V ACTUATOR TO BE SUPPLIED AND INSTALLED BY DIV. 15.
- 11) FOR UNIT HEATER, DIV. 15 TO PROVIDE LINE VOLTAGE THERMOSTAT TO DIV. 16. DIV. 16 TO PROVIDE CONDUIT 4 WIRING TO START/STOP UNIT HEATER.
- 12) FIRE DAMPERS ARE REQUIRED TO BE LISTED AND ARE TO HAVE FIRE-PROTECTION RATING OF THE PENETRATED FIRE SEPARATION.
- 13) THE PIPING PENETRATING THE VARIOUS FIRE SEPARATION IS REQUIRED TO BE FIRESTOPPED WITH A LISTED FIRESTOPPING MATERIAL IN ACCORDANCE WITH OBC ARTICLE 3.1.81.
- 14) DIV. 16 TO PROVIDE START/STOP FOR ALL THE MAIN GARAGE EXHAUST FANS INSIDE CACF ROOM.
- 15) ALL TRAPS 4 PRIMERS TO BE HEAT TRACED BY DIV.16, INSULATED 4 JACKETED BY THIS CONTRACTOR.

- (1) 3,300x3,600 (12.26 M², 132 FT²) FRESH AIR INTAKE SHAFT FOR P-2 LEVEL.
- (2) 3,300x1,300 (1.8 M², 84 FT²) FRESH AIR INTAKE SHAFT FOR MAU.
- (3) 2,250x1,300 (2.93 M², 315 FT²) FRESH AIR SHAFT FOR P-2 LEVEL.
- (4) 5,500x2,000 (11.61 M², 125 FT²) EXHAUST AIR SHAFT FOR P-1 & P-2 LEVEL.
- (5) 3,100x2,000 WEATHERPROOF INTAKE LOUVRE C/W BIRDSCREEN. (16,300 CFM)
- (6) 2,000x1,500 WEATHERPROOF INTAKE LOUVRE C/W BIRDSCREEN. (18,000 CFM)
- (7) 200x200 FRESH AIR DUCT FROM ABOVE C/W FIRE DAMPER AT SLAB.
- (8) 400x200 INTAKE LOUVRE C/W MOTORIZED DAMPER, FIRE DAMPER & WIRE MESH.
- (9) 800x400 INTAKE LOUVRE C/W MOTORIZED DAMPER, FIRE DAMPER & WIRE MESH.
- (10) 800x800 INTAKE LOUVRE C/W MOTORIZED DAMPER, FIRE DAMPER & WIRE MESH.
- (11) 800x400 INTAKE LOUVRE C/W FIRE DAMPER & WIRE MESH.
- (12) 600x400 EXHAUST LOUVRE C/W FIRE DAMPER & WIRE MESH.
- (13) 1,200x800 INTAKE LOUVRE C/W MOTORIZED DAMPER, FIRE DAMPER & WIRE MESH.
- (14) 700x350 STAIR PRESSURIZATION DUCT FROM ABOVE C/W FIRE RATED ENCLOSURE, FIRE RATED ENCLOSURE BY OTHERS.
- (15) 750x400 DUCT DOWN TO 450 mm AFFL C/W OPEN END AND WIRE MESH.
- (16) REFRIGERANT MONITORING MASTER 4 SLAVE PANELS AND SENSOR SLAVE PANEL SHOWING STATUS OF REFRIGERATION MONITORING SYSTEM TO BE MOUNTED OUTSIDE OF CHILLER ROOM UPON SENSING OF REFRIGERANT LEAKAGE CHILLER WILL BE SHUT DOWN AND EF-10 LOCATED IN 2/F (LOADING) TO BE ACTIVATED TO RUN IN HIGH SPEED.
- (17) ALARM! STROBE LIGHT SUPPLIED AND WIRED TO THE REFRIGERANT MONITORING SYSTEM BY MECHANICAL CONTRACTOR.

- (18) 150x100 FRESH AIR DUCT FROM ABOVE c/w FIRE DAMPER AT SLAB.
- (19) 100* SAN FROM ABOVE AND DOWN c/w CLEANOUT AT BASE.
- (20) 100* SAN @ 1%.
- (21) 150* SAN @ 1%.
- (22) SANITARY SUMP FIT. SEE DETAIL ON THIS DRAWING.
- (23) 75* PUMPED SAN UP c/w HEAT TRACING. HEAT TRACING BY DIV. 16. INSULATION AND JACKET BY THIS CONTRACTOR.
- (24) SCOFFER DRAIN.
- (25) BACKWATER VALVE AND CLEANOUT FRIMED & VENTED INSIDE 900* MANHOLE c/w COVER SEE DETAIL ON THIS DRAWING.
- (26) ELEVATOR SUMP FIT. SEE DETAIL ON DRAWING M-40.
- (27) 100* SAN DOWN c/w CLEANOUT AT BASE.
- (28) DRAIN TRAP TO BE HEAT TRACED BY DIV. 16. THIS CONTRACTOR TO INSULATE & JACKET (TYPICAL.)
- (29) 150x150 F/A DUCT FROM AHJ AND TRANSITION TO 2,000x650 F/A DUCT IN VERTICAL RUN & UP.
- (30) 2,000x650 DUCT BELOW RAMP AND ENTER RESIDENTIAL STORAGE ROOM AT HIGH LEVEL IN F-1 c/w FIRE DAMPER FOR CONTINUATION SEE DRAWING M-4.

[illegible]