

GENERAL NOTES OF HVAC WORKS

1. THESE GENERAL NOTES SHALL BE APPLICABLE TO ALL HVAC DRAWINGS THROUGHOUT THE PROJECT.

2. DO NOT SCALE FROM THESE DRAWINGS. DIMENSIONS SHALL BE TAKEN FROM ARCHITECTURAL DRAWINGS.

3. THESE DRAWINGS ARE DIAGRAMMATIC AND ARE INTENDED ONLY TO DEFINE THE BASIC FUNCTIONS REQUIRED. ACCESSORIES REQUIRED FOR PROPER OPERATION OF THE SYSTEMS, EVEN THOUGH NOT SPECIFICALLY INDICATED, SHALL BE INCLUDED AND INSTALLED. SUCH ACCESSORIES MAY INCLUDE, BUT ARE NOT LIMITED TO, MOTOR STARTERS, ETC.

4. THESE DRAWINGS SHALL BE READ IN CONJUNCTION WITH THE CONTRACT TERMS & CONDITIONS, SPECIFICATIONS AND SCHEDULES OF ITEMS OF WORK.

5. ANY DISCREPANCY OR INADEQUACY WITHIN THE BID DOCUMENTS OR BETWEEN THE BID DOCUMENTS AND THE RELATED PLUMBING, FIRE PROTECTION, ELECTRICAL, STRUCTURAL, ARCHITECTURAL, INTERIOR DECOR AND SITE ENGINEERING DRAWINGS OR BETWEEN THE BID DOCUMENTS AND FIELD CONDITIONS MUST BE BROUGHT TO THE ATTENTION OF THE OWNER, CONSULTANT AND ENGINEER-IN-CHARGE PRIOR TO BID SUBMISSION.

6. THE SCOPE OF WORK CONSISTS OF FURNISHING LABOUR, MATERIALS AND EQUIPMENT FOR THE INSTALLATION. IT ALSO INCLUDES PLACING INTO OPERATION COMPLETE AND OPERABLE HEATING, VENTILATING AND AIR CONDITIONING SYSTEMS AS SPECIFIED AND SHOWN. THIS INCLUDES, BUT IS NOT LIMITED TO, HVAC UNITS, EXHAUST FANS, DUCTLESS SPLIT-SYSTEMS, DUCTWORK, AIR DISTRIBUTION, CONTROLS AND ACCESSORIES.

7. ALL REQUIRED OFFSETS, RISES AND DROPS DUE TO POSSIBLE OBSTRUCTIONS OF DUCT AND PIPE RUNS ARE NOT NECESSARILY SHOWN. THE BIDDER SHALL INCLUDE A CONTINGENCY IN HIS BID TO OFFSET ANY COST REQUIRED FOR ADDITIONAL FITTINGS AND LABOR THAT MAY BE REQUIRED, MINOR DEVIATIONS FROM THE DESIGN LAYOUT IN ROUTING OF DUCT AND/OR PIPING ARE ANTICIPATED AND SHALL BE CONSIDERED A PART OF THE WORK INCLUDED. THE BIDDER SHALL VERIFY THE ACTUAL DIMENSIONS OF THE EQUIPMENT PROPOSED TO ENSURE THAT THE EQUIPMENT WILL FIT IN THE AVAILABLE SPACE.

8. THE HVAC LAYOUT IS BASED ON ARCHITECTURAL DRAWINGS AVAILABLE AT THE TIME OF DESIGN. AS STRUCTURAL OR OTHER FIELD CHANGES MAY OCCUR, THE BIDDER SHALL TAKE RESPONSIBILITY FOR VERIFYING THE INTEGRITY OF THE CHANGES WITH THE HVAC CONSULTANT.

9. ALL WORK SHALL BE INSTALLED IN ACCORDANCE WITH THE REQUIREMENTS OF ALL APPLICABLE CODES AND REGULATIONS INCLUDING BUT NOT LIMITED TO NATIONAL, CITY, STATE AND LOCAL ORDINANCES WHICH MAY BE IN EFFECT. ALL HVAC MATERIALS, INSTALLATION PROCEDURES AND SYSTEM LAYOUTS SHALL BE APPROVED BY ALL APPLICABLE CODE ENFORCEMENT AUTHORITIES HAVING JURISDICTION. THE BIDDER SHALL PROVIDE ALL MATERIALS AND LABOUR NECESSARY TO COMPLY WITH THESE RULES, REGULATIONS AND ORDINANCES AT NO ADDITIONAL COST. THESE CODES REPRESENT THE MINIMUM ACCEPTABLE REQUIREMENTS, THEREFORE, WHERE DRAWINGS AND/OR SPECIFICATIONS INDICATE MATERIALS OR CONSTRUCTION IN EXCESS OF THESE CODE REQUIREMENTS, THE DRAWINGS AND/OR SPECIFICATIONS SHALL GOVERN.

10. IT IS THE RESPONSIBILITY OF THE BIDDER TO PAY FOR ALL NECESSARY PERMITS AND APPROVALS FOR THE INSTALLATION.

11. IT IS THE RESPONSIBILITY OF THE BIDDER TO REVIEW THESE DRAWINGS AND SPECIFICATIONS, AS WELL AS THE RELATED FIRE PROTECTION, ELECTRICAL, STRUCTURAL, ARCHITECTURAL, INTERIOR DECOR AND SITE ENGINEERING DRAWINGS TO BECOME FAMILIAR WITH THE FULL PROJECT SCOPE. IN ADDITION, THE BIDDER MUST COORDINATE WITH THE OWNER'S REPRESENTATIVE TO FULLY UNDERSTAND ALL REQUIREMENTS WHICH MAY NOT BE SPECIFIED HEREIN AND WHICH THE OWNER MAY CONSIDER PART OF THIS CONTRACT. DURING THE COURSE OF CONSTRUCTION COORDINATION AND ACTUAL CONSTRUCTION, IT IS A RESPONSIBILITY OF THE BIDDER TO WORK CLOSELY WITH ALL ACCOMPANYING CONTRACTORS AND TRADESMEN IN ORDER TO ENSURE A SMOOTH RUNNING AND CAREFULLY COORDINATED INSTALLATION.

12. THE BIDDER SHALL FURNISH AND INSTALL NEW PRODUCTS OF ESTABLISHED AND REPUTABLE MANUFACTURERS. NO EQUIPMENT SUBSTITUTIONS SHALL BE MADE THAT WOULD LEAVE INADEQUATE OPERATING OR SERVICE SPACE. EQUIPMENT SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDED INSTALLATION PROCEDURES AND IN AN ARRANGEMENT THAT WILL GIVE THE GREATEST PRACTICAL EASE OF OPERATION AND SERVICE TO THE OWNER. MATERIALS AND EQUIPMENT SHALL BE INSTALLED SQUARELY WITH THE BUILDING LINES.

13. CONSTRUCT AND BRACE EQUIPMENT, PIPING, ETC., SO THAT THERE WILL BE NO VIBRATION AND/OR RATTLING WHEN THE SYSTEM IS IN OPERATION.

14. ANY SPECIFIC REFERENCE TO A MANUFACTURER'S PRODUCT IS ONLY TO ESTABLISH TYPE, QUALITY, AND PERFORMANCE REQUIRED. THESE QUALIFICATIONS ARE IN ADDITION TO THE REQUIREMENTS SHOWN ON THE PLANS.

15. FABRICATE, SUPPORT, TEST AND INSTALL ALL DUCTWORK IN STRICT ACCORDANCE WITH IS 655: 2006, THE LATEST EDITION OF THE SMACNA H.V.A.C. DUCT CONSTRUCTION STANDARDS METAL AND FLEXIBLE- SECOND EDITION AND ALL APPLICABLE BUILDING CODES.

16. RETURN AIR DUCT TO HAVE AT LEAST ONE (1) 90° ELBOW BETWEEN THE PLENUM ON THE FAU TO THE PLENUM AT THE RETURN AIR GRILLE. PLENUM BOX AT RETURN AIR GRILLE TO BE A MINIMUM 6" DEEP. RETURN AIR GRILLES TO BE A MINIMUM OF 3' DISTANCE FROM SMOKE DETECTORS.

17. ALL OUTSIDE AIR INTAKES SHALL BE LOCATED A MINIMUM OF 10' FROM ANY PLUMBING VENT, EXHAUST, AND FLUE OUTLETS.

18. EXHAUST DUCTS SHALL TERMINATE THREE (3) FEET FROM ANY BUILDING OPENING AND BE EQUIPPED WITH A BACKDRAFT DAMPER. SCREENS SHALL NOT BE INSTALLED AT THE DUCT TERMINATION.

19. ALLOW 24" TO 36" OF STRAIGHT RUN FROM FAN OUTLET POINT BEFORE ADDING AN ELBOW OR BEND TO EXHAUST DUCTWORK.

20. FLASH AND COUNTER FLASH ALL ROOF PENETRATIONS. COORDINATE INSTALLATION OF ALL ROOF FLASHING AT ROOF PENETRATION.

21. SEAL ALL REFRIGERATION LINE PENETRATIONS AIR AND WATER TIGHT WITH SILICONE SEALANT.

22. THE BIDDER SHALL BE RESPONSIBLE FOR TESTING, ADJUSTING, AND BALANCING (T.A.B.). T.A.B. WORK SHALL INCLUDE THE ENTIRE AIR-SIDE SYSTEM AND BE PERFORMED IN ACCORDANCE WITH NEBB OR AABC REQUIREMENTS. TOLERANCES FOR AIR INLETS AND OUTLETS SHALL BE ±5% UNLESS NOTED OTHERWISE.

23. THE BIDDER SHALL INSPECT ANY EXISTING DUCTWORK FOR DEFECTS AND REPORT TO THE OWNER OR ENGINEER-IN-CHARGE ANY DEFICIENCY PRIOR TO PERFORMING ANY WORK. THE BIDDER SHALL CLEAN ALL EXISTING DUCTWORK, GRILLES, REGISTERS AND DIFFUSERS PRIOR TO INSTALLING THE NEW WORK.

24. THE BIDDER SHALL PAINT BLACK BEHIND ALL GRILLES AND REGISTERS AND INSIDE OF DUCT WHERE VISIBLE.

25. UNLESS NOTED OTHERWISE, DUCTWORK BEYOND SA & RA PLENUMS MAY BE CONSTRUCTED OF METAL, OR FACTORY-MANUFACTURED INSULATED DUCTWORK.

26. ALL BRANCH DUCTS TO HAVE VOLUME DAMPERS WHETHER SHOWN OR NOT.

27. SMOOTH TURN RADIUS DUCTWORK OR TURNING VANES SHALL BE USED THROUGHOUT WHERE FLOW EXCEEDS 150 CFM.

28. ALL DUCT JOINTS TO BE SEALED IN ACCORDANCE WITH "SMACNA" STANDARDS AND ACCEPTED GOOD PRACTICE.

29. HVAC FLEXIBLE DUCT CONNECTIONS SHALL BE MINIMUM OF 6" LONG AND HELD IN PLACE WITH HEAVY METAL BANDS, SECURELY ATTACHED TO PREVENT ANY LEAKAGE AT THE CONNECTION POINTS. FLEXIBLE CONNECTIONS SHALL BE FABRICATED FROM APPROVED FLAME-PROOF FABRIC CONFORMING TO NFPA 90A. ASBESTOS CLOTH IS NOT ACCEPTABLE.

30. THE BIDDER SHALL PROVIDE AND INSTALL REFRIGERANT PIPING IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS AND IN SUCH A WAY AS TO BE INCONSPICUOUS AND FREE FROM ANY POSSIBLE CONDENSATION. INSULATE REFRIGERANT LINES WITH APPROPRIATE INSULATION.

31. REFRIGERANT PIPING OTHER THAN PRE-CHARGED TUBING SETS FURNISHED BY AIR CONDITIONING MANUFACTURER SHALL BE TYPE "ACR" HARD DRAWN COPPER TUBING WITH WROUGHT COPPER FITTINGS. PIPING SHALL BE INSTALLED IN ACCORDANCE WITH ARI STANDARDS. USE EASY-FLO OR SAFETY SILVER BRAZING ALLOY TO MAKE JOINTS. RUN ALL HORIZONTAL LINES DEAD LEVEL TO ENSURE GAS RETURN TO COMPRESSOR.

32. ALL MATERIALS OF INSULATION SHALL BE OF THE TYPE AND QUALITY AS MANUFACTURED BY ARMAFLEX, ARMSTRONG, CERTAINTED, OWENS-CORNING OR MANVILLE. ALL MATERIAL AND EQUIPMENT SPECIFIED TO BE INSULATED SHALL BE THOROUGHLY TESTED AND APPROVED PRIOR TO APPLYING THE INSULATION. THE INSTALLATION OF ALL INSULATION SHALL BE PERFORMED BY AN EXPERIENCED CRAFTSMAN IN A NEAT WORKMANSHIP-LIKE MANNER AND SHALL BE IN ACCORDANCE WITH THE MANUFACTURER'S WRITTEN RECOMMENDATIONS FOR SERVICE INTENDED.

33. WRAPPED INSULATION ON DUCTWORK SHALL BE AS PER SPECIFIED THICKNESS (IN SMACNA) BLACK FLEXIBLE CLOSED-CELL ELASTOMERIC INSULATION WITH UL APPROVED FOIL. SECURE WITH ADHESIVE APPLIED DIRECTLY TO THE DUCT IN 4" WIDE STRIPS AROUND THE DUCT ON 12" CENTERS AND TAPE ALL JOINTS.

34. ACOUSTICAL DUCT LINING SHALL BE AS SPECIFIED THICKNESS OF OPEN CELL ELASTOMERIC FOAM, BASED ON SYNTHETIC RUBBER, COMPLYING WITH FIRE CLASSIFICATION REQUIREMENTS OF NFPA 90A AND 90B. ADHERE LINER TO DUCT WITH FIRE RESISTANT ADHESIVE AND WELDED PIN TYPE MECHANICAL FASTENERS AS INDICATED IN SMACNA STANDARDS.

35. DUCTWORK DIMENSIONS SHOWN ON DRAWINGS ARE CLEAR DIMENSIONS. DIMENSIONS SHALL BE INCREASED TO ACCOMMODATE LINING THICKNESS. ALL DUCT SHOWN ARE NET INSIDE VALUES. DIMENSIONS MAY BE CHANGED SO LONG AS THE NET FREE FACE AREA IS MAINTAINED.

36. THE BIDDER SHALL PROVIDE ALL AIR TEMPERATURE CONTROLS INCLUDING WIRING, TUBING AND THERMOSTATS (WITH LOCKING COVERS) AND ALL MISCELLANEOUS APPURTENANCES TO MEET THE INTENT OF THESE DOCUMENTS.

37. THE BIDDER SHALL FURNISH AND INSTALL UL LISTED DUCT SMOKE DETECTORS WITH AUXILIARY CONTACTS FOR CONNECTION TO THE FIRE ALARM SYSTEM. DETECTORS SHALL DE-ENERGIZE AIR HANDLING UNIT UPON ACTIVATION.

38. VIBRATION ISOLATORS FOR HAVING EQUIPMENT SHALL BE EQUAL TO MASON INDUSTRIAL MODEL 30N, COMBINATION SPRING AND DOUBLE DEFLECTION NEOPRENE HANGER, OR DEFLECTION AS RECOMMENDED BY MANUFACTURER.

39. VIBRATION ISOLATORS FOR BASE MOUNTED EQUIPMENT SHALL BE EQUAL TO MASON INDUSTRIES MODEL SLF, DEFLECTION AS RECOMMENDED BY MANUFACTURER.

40. THE BIDDER SHALL VISIT THE SITE AND VERIFY ALL DIMENSIONS IN THE FIELD, AND SHALL ADVISE TO THE OWNER OR ENGINEER-IN-CHARGE OF ANY DISCREPANCY BEFORE EXECUTION OF THE WORK.

41. THE BIDDER SHALL SCHEDULE ALL SHUTDOWNS THAT AFFECT UTILITIES AND PORTIONS OF THE BUILDING THAT MUST REMAIN IN OPERATION WITH THE OWNER.
42. WHERE CONDUIT, CABLES, DUCTWORK OR PIPING PASSES THROUGH FIRE RATED FLOORS OR WALLS, THE SLEEVES SHALL BE COMPLETELY SEALED WITH A FIRE STOP MATERIAL THAT IS UL LISTED AND ACCEPTED BY THE BUILDING DEPARTMENT AND FIRE DEPARTMENT AS BEING SUITABLE FOR THIS SERVICE SUCH AS DOWN CORNING CORP., SILICONE ELASTOMER, DOW CORNING 3-6548 SILICONE RTV FOAM, OR APPROVED EQUAL. THIS MATERIAL SHALL BE INSTALLED IN ACCORDANCE WITH THE REQUIREMENTS OF THE MANUFACTURER TO MAINTAIN THE FIRE RATING OF THE PENETRATED WALL OR FLOOR.
43. THE BIDDER SHALL PROVIDE AND INSTALL APPROVED FIRE DAMPERS AND ACCESS PANELS IN ANY AND ALL DUCTWORK WHICH PENETRATES A HORIZONTAL OR VERTICAL FIRE PARTITION, OR AS OTHERWISE SHOWN ON DRAWINGS.
44. THE BIDDER SHALL PROVIDE MAINTENANCE INSTRUCTIONS FOR THE EQUIPMENT AND SYSTEM THAT REQUIRE PREVENTIVE MAINTENANCE. INSTRUCTIONS SHALL BE CLEARLY STATED AND INCORPORATED ON A READILY ACCESSIBLE LABEL AND INCLUDE THE TITLE OR PUBLICATION NUMBER FOR THE OPERATION AND MAINTENANCE MANUAL FOR THAT PARTICULAR MODEL AND TYPE OF PRODUCT.

STANDARD ABBREVIATIONS

AC AIR CONDITIONING UNIT

ACH AIR CHANGES PER HOUR

AD ACCESS DOOR

ARV AIR RELEASE VALVE

ADP APPARATUS DEW POINT

AFF ABOVE FINISHED FLOOR

AHU AIR HANDLING UNIT

AMB AMBIENT

APD AIR PRESSURE DROP

APPROX APPROXIMATE

AVG AVERAGE

BAS BUILDING AUTOMATION SYSTEM

BDD BACK DRAFT DAMPER

BHP BRAKE HORSE POWER

BOD BOTTOM OF DUCT

Btu/hr BRITISH THERMAL UNIT/HOUR

CAP CAPACITY

CAV CONSTANT AIR VOLUME

CDD COOLING DEGREE DAYS

CDW CONDENSER WATER

CDWP CONDENSER WATER PUMP

CFM CUBIC FEET PER MINUTE

CH CHILLER

CHW CHILLED WATER

CHWP CHILLED WATER PUMP

CHWR CHILLED WATER RETURN

CHWRT CHILLED WATER RETURN TEMP.

CHWS CHILLED WATER SUPPLY

CHWST CHILLED WATER SUPPLY TEMP.

CLF COOLING LOAD FACTOR

CLTD COOLING LOAD TEMPERATURE DIFF.

CN CONDENSATE DRAIN

CT COOLING TOWER

CUH CABINET UNIT HEATER

DIA DIAMETER

DB DRY BULB

DEG DEGREES

D.L. DUCT LINER

DP DEW POINT

EXIST EXISTING

EXA EXHAUST AIR

EAT ENTERING AIR TEMPERATU

EDB ENTERING DRY BULB TEMPERATURE

EER ENERGY EFFICIENCY RATIO

EF EXHAUST FAN

EFF EFFICIENCY

ELECT ELECTRICAL

ELEV ELEVATION

EMS ENERGY MANAGEMENT SYSTEM

ESP EXTERNAL STATIC PRESSURE

ET EXPANSION TANK

EWB ENTERING WET BULB TEMPERATURE

EWT ENTERING WATER TEMPERATURE

EXH EXHAUST

FMS FACILITY MANAGEMENT SYSTEM

FPM FEET PER MINUTE

FT FEET OR FOOT

FSD FIRE / SMOKE DAMPER

GPM US GALLONS PER MINUTE

HC HEATING COIL

HDD HEATING DEGREE DAYS

HP HORSE POWER

HRU HEAT RECOVERY UNIT

HW HOT WATER

HWP HOT WATER PUMP

HWR HOT WATER RETURN

HWS HOT WATER SUPPLY

HX HEAT EXCHANGER

IN INCHES

INWG INCHES IN WATER GAUGE

INWC INCHES IN WATER COLUMN

LAT LEAVING AIR TEMPERATURE

LWT LEAVING WATER TEMPERATURE

MA MIXED AIR

MAT MIXED AIR TEMPERATURE

MAU MAKEUP AIR UNIT

MAX MAXIMUM

MBH BTU PER HOUR (THOUSAND)

MCC MOTOR CONTROL CENTER

MD MOTORIZED DAMPER

MFR MANUFACTURER

MIN MINIMUM

MVD MANUAL VOLUME DAMPER

MWT MAKEUP WATER TANK

NA NOT APPLICABLE

NIC NOT IN CONTRACT

NC NORMALLY CLOSED

NO NORMALLY OPENED

NOM NORMAL

NPSH NET POSITIVE SUCTION HEAD

NTS NOT TO SCALE

OA OUTSIDE AIR

OAP OUTSIDE AIR PERCENTAGE

OAT OUTSIDE AIR TEMPERATURE

OBD OPPRESSED BLADE DAMPER

PD PRESSURE DROP

PRV PRESSURE RELIEF VALVE

PSI POUNDS PER SQUARE INCH

RA RETURN AIR

RH RELATIVE HUMIDITY

RTU ROOFTOP UNIT

SA SUPPLY AIR

SAT SUPPLY AIR TEMPERATURE

SF SUPPLY FAN

SP STATIC PRESSURE

SPEC SPECIFICATIONS

SL SEA LEVEL

SQ SQUARE

SS STAINLESS STEEL

T.A.B TEST AND BALANCE

TCP TEMP. CONTROL PANEL

TSP TOTAL STATIC PRESSURE

T-STAT THERMOSTAT

TXV THERMOSTATIC EXPANSION VALVE

TYP TYPICAL

UH UNIT HEATER

UV UNIT VENTILATOR

VAV VARIABLE AIR VOLUME

VD VOLUME DAMPER

VCD VOLUME CONTROL DAMPER

VEL VELOCITY

VFD VARIABLE FREQUENCY DRIVE

VSD VARIABLE SPEED DRIVE

VSP VARIABLE SPEED PUMP(ING)


W/ WITH

WB WET BULB

WC WATER COLUMN

WPD WATER PRESSURE DROP

WMS WIRE MESH SCREEN

R0	25-06-2024	ISSUED FOR TENDER	BHAVIK P.
REV. NO.	DATE	DESRIPTION	SIGNATURE
REVISION			
PROJECT			
CONSTRUCTION OF ADMINISTRATIVE OFFICE BUILDING IN PLACE OF P& C BUILDING OUTSIDE CARGO JETTY AREA AT KANDLA, DEENDAYAL PORT AUTHORITY			
TITLE			
GENERAL NOTES OF HVAC WORKS			
			
		REGD. OFFICE	
APPROVED BY		B-10, Krishna Industrial Estate , Opp. BIDD Gonwa, Vadodara- 390016 (Guj.) India. Ph: +91 265 2290222. Email: mep@geogroup.in	
DEPARTMENT	MEP (DESIGN)	DOC. STATUS	FOR TENDER
DGN.	KETUL S.	PROJECT NO.	GDBU23005
DRN.	KARAN B.	DRAWING NO.	SHEET NO.
CHD.	BHAVIK P.		REV.
SCALE	NTS	GDBU23005-MEP-02	01 OF 11
ISSUE DATE	25-06-2024		R0
REF. DRG. NO.			SHT. NO.
		DEENDAYAL PORT AUTHORITY PROJECT DIVISION	
DATE			
JE (E)		AXEN (E)	
		XEN(EN)	