ACCU

ΔFF

AHU

ATC

BG

RHP

BTU

CFM

CG

CR

FDH

ESP

**FPM** 

FSD

GPM

IN WG

KW

ΙΔΤ

ΜΔΧ

MRH

MERV

MCA

MIN

MOP

NTS

 $\cap \Delta$ 

OAD

OAL

OED

OTY

RM/

RPM

RTH

SΔ

SP

SEN

SQ FT

TRR

TYP

VEI

WMS

MV

AFMS

**ABBREVIATIONS** 

AIR CONDITIONER

ABOVE FINISHED FLOOR

BREAK HORSE POWER

BRANCH SELECTOR BOX

BRITISH THERMAL UNIT

CUBIC FEET PER MINUTE

AIR HANDLING UNIT

**BOTTOM GRILLE** 

COOLING COIL

CEILING GRILLE

CLEAN OUT

DRY BULB

EXISTING

EXHAUST AIR

EXHAUST FAN

DEGREE FARENHEIT

FINISHED FLOOR

FEET PER MINUTE

GALLONS PER MINUTE

INCH OF WATER GAUGE

LEAVING AIR TEMPERATURE

THOUSAND BTU'S PER HOUR

MINIMUM CIRCUIT AMPACITY

MINIMUM EFFICIENCY REPORTING VALUES

MAXIMUM OVER CURRENT PROTECTION

NECK (AS RELATED TO DUCT AND DIFFUSER)

OPEN ENDED DUCT WITH WIRE MESH SCREEN

SQUARE FEET (AS RELATED TO SIZES/AREAS)

NOTE: NOT ALL SYMBOLS AND ABBREVIATION ARE USED IN THE DRAWINGS

SOUND TRAP/SOUND ATTENUATOR

GENERAL EXHAUST

HORSE POWER

FINS PER INCH

FFFT

HEIGHT

INCH

KILOWATT

LENGTH

POUNDS

LEAVING

MAXIMUN

MINIMUN

LINEAR DIFFUSER

LINEAR RETURN

MANUAL AIR VENT

NO TO SCALE

QUANTITY

ROOF TOP UNIT

STATIC PRESSURE

TRANSFER DUCT

TRANSFER OPENING

TRANSFER GRILLE

TOILET EXHAUST

VOLUME DAMPER

WIRE MESH SCREEN

TRANSFER REGISTER

TOTAL STATIC PRESSURE

TOP GRILLE

TYPICAL

VELOCITY

WET BULB

WIDTH

TOP REGISTER

SUPPLY AIR

SENSIBLE

ROOM

OUTDOOR AIR

NOT IN THIS CONTRACT

OUTSIDE AIR DAMPER

OUTSIDE AIR INTAKE

PUMPED DISCHARGE

POUNDS PER SQUARE INCH

**REFRIGERANT GAS LINE** 

REFRIGERANT LIQUID LINE

ROOM PRESSURE DISPLAY

**REVOLUTIONS PER MINUTE** 

ROOM PRESSURE INDICATOR

REFRIGERANT SUCTION LINE

FLEXIBLE CONNECTION

ENTERING

DOWN

CEILING DIFFUSER

CONDENSATE PUMP

CEILING REGISTER

DIRECT EXPANSION

ENTERING AIR TEMPERATURE

EXTERNAL STATIC PRESSURE

FIRE DAMPER AND ACCESS DOOR

GENERAL CONSTRUCTION CONTRACTOR

FIRE SMOKE DAMPER WITH ACCESS DOOR AND DETECTOR

ELECTRICAL DUCT HEATER

ACCESS DOOR

**AIR FILTER** 

AIR COOLED CONDENSING UNIT

AIR FLOW MEASURING STATION

AUTOMATIC TEMPERATURE CONTROLS

• 18x12 • • • 18x12 •	DUCT SIZE (FIRST FIGURE IN
	RETURN OR EXHAUST DUCT FAN)
	RETURN OR EXHAUST DUCT FAN)
<b>↓} ↓</b>	ACOUSTIC LINING IN DUCT
ŁЩŢ₽ ↔₩₩₩₩	FLEXIBLE CONNECTION
	ELBOW WITH TURNING VANE
	RADIUS ELBOW WITH TURNI
₽_¦ →_I	WIRE MESH SCREEN
	SUPPLY AIR OUTLET - 3, 2 &
AIHIHIHIHI	REMOVAL WORK (DUCTWOF
<u>}- · - · - · - · -</u> · - · - · - ·	EXISTING WORK TO REMAIN (DUCTWORK/PIPING/EQUIPM
۶ <u>ــــــــــــــــــــــــــــــــــــ</u>	NEW WORK (DUCTWORK/PIP
+ə	ELBOW TURNED DOWN
+0	ELBOW TURNED UP
	ISOLATION VALVE
	CONTROL VALVE
T	THERMOSTAT
$\blacklozenge$	CUT EXISTING DUCT/PIPING AIRTIGHT
$\bullet$	POINT OF DISCONNECTION
•	POINT OF NEW CONNECTION
	MOTORIZED DAMPER W/ AC
₽ 	FIRE DAMPER W/ ACCESS DO
	FIRE/SMOKE DAMPER W/ AC
	VOLUME DAMPER
- <del>L =</del>	DOOR LOUVER
- <del>U -</del>	DOOR UNDERCUT
(XXX)	SUPPLY AIR CFM
[XXX]	RETURN/EXHAUST AIR CFM
<b>_</b>	SUPPLY
_ <b>\</b> _	RETURN/EXHAUST
	AC UNIT
	CONDENSATE PUMP

## GENERAL HVAC SYSTEM CLEANING **REQUIREMENTS:**

- COMPONENT CLEANING: CLEANING METHODS SHALL BE EMPLOYED SUCH THAT ALL HVAC SYSTEM COMPONENTS MUST BE VISIBLY CLEAN AS DEFINED IN APPLICABLE STANDARDS (SEE NATIONAL AIR DUCT CLEANING ASSOCIATION (NADCA) STANDARDS). UPON COMPLETION, ALL COMPONENTS MUST BE RETURNED TO THOSE SETTINGS RECORDED JUST PRIOR TO CLEANING OPERATIONS.
- CONTAINMENT: DEBRIS REMOVED DURING CLEANING SHALL BE COLLECTED AND PRECAUTIONS MUST BE TAKEN TO ENSURE THAT DEBRIS IS NOT OTHERWISE DISPERSED OUTSIDE THE HVAC 29. PROVIDE TEMPORARY WORK, DUCT WITH DAMPERS, CAPS, EQUIPMENT, VALVES, CAPPED PIPE SYSTEM DURING THE CLEANING PROCESS.
- AIR-VOLUME CONTROL DEVISES: DAMPERS ANY AIR-DIRECTIONAL MECHANICAL DEVICES INSIDE THE HVAC SYSTEM MUST HAVE THEIR POSITION MARKED PRIOR TO CLEANING AND, UPON COMPLETION, MUST BE RESTORED TO THEIR MARKED POSITION.
- SERVICE OPENINGS: UTILIZE SERVICE OPENINGS, AS REQUIRED FOR PROPER CLEANING, AT VARIOUS POINTS OF THE HVAC SYSTEM FOR PHYSICAL AND MECHANICAL ENTRY, AND INSPECTION.
- UTILIZE THE EXISTING SERVICE OPENINGS ALREADY INSTALLED IN THE HVAC SYSTEM WHERE POSSIBLE.
- B. OTHER OPENINGS SHALL BE CREATED WHERE NEEDED AND THEY MUST BE CREATED SO THEY CAN BE SEALED IN ACCORDANCE WITH INDUSTRY CODES AND STANDARDS. C. CLOSURES MUST NOT SIGNIFICANTLY HINDER, RESTRICT, OR ALTER THE AIRFLOW WITHIN THE
- SYSTEM D. CLOSURES MUST BE PROPERLY INSULATED TO PREVENT HEAT LOSS/GAIN OR CONDENSATION
- ON SURFACES WITHIN THE SYSTEM W/ NEOPRENE GASKETS. E. OPENINGS MUST NOT COMPROMISE THE STRUCTURAL INTEGRITY OF THE SYSTEM. CONSTRUCTION TECHNIQUES USED IN THE CREATION OF OPENINGS SHOULD CONFORM TO
- REQUIREMENTS OF APPLICABLE BUILDING AND FIRE CODES, AND APPLICABLE NFPA, SMACNA AND NADCA STANDARDS.
- G. CUTTING SERVICE OPENINGS INTO FLEXIBLE DUCT IS NOT PERMITTED. FLEXIBLE DUCT SHALL BE DISCONNECTED AT THE ENDS AS NEEDED FOR PROPER CLEANING AND INSPECTION. H. ALL SERVICE OPENINGS CAPABLE OF BEING RE-OPENED FOR FUTURE INSPECTION OR REMEDIATION SHALL BE CLEARLY MARKED AND SHALL HAVE THEIR LOCATION REPORTED TO

THE OWNER AND MOUNT SINAI REPORT DOCUMENTS.

B

# SYMBOLS DUCT SIZE (FIRST FIGURE INDICATES PLAN SIZE) RETURN OR EXHAUST DUCT UP (SUCTION SIDE OF RETURN OR EXHAUST DUCT UP (SUCTION SIDE OF ACOUSTIC LINING IN DUCT FLEXIBLE CONNECTION ELBOW WITH TURNING VANES RADIUS ELBOW WITH TURNING VANES WIRE MESH SCREEN SUPPLY AIR OUTLET - 3, 2 & 1 WAY THROW REMOVAL WORK (DUCTWORK/PIPING/EQUIPMENT) EXISTING WORK TO REMAIN (DUCTWORK/PIPING/EQUIPMENT) NEW WORK (DUCTWORK/PIPING/EQUIPMENT)

**GENERAL NOTES** 

CONSTRUCTION.

ENERGY CODE.

FIELD CONDITIONS.

VALVES, CAPS, PUMPS, ETC.

REQUIRED

REVIEW

THROUGHOUT WORK.

MECHANICAL WORK SHALL CONFORM TO ALL REQUIREMENTS OF THE LATEST CONSTRUCTION

PROVIDE ALL LABOR, MATERIALS, TOOLS, EQUIPMENTS, AND SERVICES NECESSARY TO FURNISH

AND SAFELY INSTALL THE COMPLETE AND PROPERLY OPERATING MECHANICAL SYSTEMS AS

RESPONSIBLE FOR NOTIFYING THE ARCHITECT OF ANY CONDITIONS WHICH WOULD PREVENT THE

SPECIFIED IN THE CONTRACT DOCUMENTS OR WHICH MAY BE REASONABLY IMPLIED AS

3. CONTRACTOR SHALL SURVEY THE AREA OF THIS WORK BEFORE SUBMITTING THE BID AND BE

4. CONTRACTOR SHALL CHECK AND CORRECT ANY AND ALL DEFICIENCIES IN EXISTING DUCTS AND

ASSOCIATED INSULATION. ALL NEW DUCTWORK SHALL COMPLY WITH THE LATEST SMACNA

NEW DUCT INSULATION SHALL MEET OR EXCEED REQUIREMENTS OF THE LATEST ADOPTED

DESIGN DRAWINGS ARE TO BE CONSIDERED DIAGRAMMATIC. OFFSETS MAY BE REQUIRED TO

CONTRACTOR SHALL COORDINATE ALL NEW UTILITIES, SERVICES, ETC., WITH EXISTING

6. LOCATIONS OF NEW UTILITIES, INCLUDING PIPE RISERS, ARE GENERALLY SCHEMATIC.

8. WHERE PENETRATIONS THROUGH FIRE RATED WALLS ARE NOT FIRE PROOFED, THIS

9. COORDINATE SCHEDULE FOR HOOK-UPS TO EXISTING SYSTEMS AND EQUIPMENTS. ALSO

10. CONTRACTOR IS RESPONSIBLE FOR MAINTAINING AND RESTORING THE CONTINUITY OF ALL

CONTRACTOR SHALL BE RESPONSIBLE TO MAINTAIN THE RATED INTEGRITY.

OWNER. ALL SYSTEM SHUTDOWNS SHALL BE KEPT TO A MINIMUM.

LOST OR STOLEN WITHOUT ADDITIONAL COST TO OWNER.

ANSI, AND ASHRAE STANDARDS AND SPECIFICATIONS.

ENGINEER BEFORE WORK COMMENCES OR ITEMS ARE ORDERED.

ARCHITECTURAL DRAWINGS AND COORDINATE FINAL LOCATIONS.

PUMPS COORDINATED WITH ELECTRICAL, PLUMBING, ATC, ETC.)

22. PROVIDE 6" WIDE 45 DEGREE BRANCH TAKEOFF FOR ALL NEW DUCTS.

BRANCH DUCTWORK IS LOCATED WITHIN AN INACCESSIBLE CEILING.

28. ALL THERMOSTATS SHALL BE PER THE BUILDING AND OWNER STANDARD.

GENERAL CONTRACTOR AND/OR CONSTRUCTION MANAGER.

SUPPORT DUCT FROM PIPE SUPPORT AND VICE VERSA.

PERMITTED ON THE PROJECT.

AT ALL TIMES.

STRUCTURE.

INSTALLATIONS.

OTHER TRADES AND PROVIDE NECESSARY OFFSETS TO AVOID CONFLICTS.

AVOID EXISTING SERVICES, OTHER TRADES, ETC. COORDINATE WORK WITH ALL TRADES AND

STRUCTURAL AND ARCHITECTURAL DRAWINGS. CONTRACTOR SHALL PROVIDE ALL OFFSETS AS

COORDINATE SCHEDULE FOR REMOVAL OR RELOCATIONS WITH THE OWNER AND PERFORM THIS

WORK AT SUCH TIMES TO ENSURE THAT PERIODS OF SHUTDOWN WILL BE ACCEPTABLE TO THE

EXISTING SYSTEMS AFFECTED, INCLUDING BUT NOT LIMITED TO: INSULATION, VAPOR BARRIER,

11. CONTRACTOR SHALL BE RESPONSIBLE FOR THE WORK, INCLUDING ITS COMPLETION AND FINAL

12. PRIOR TO COMMENCEMENT OF ANY WORK, EXISTING SYSTEMS ASSOCIATED WITH THIS WORK

14. ALL NEW DUCTWORK AND PIPING SHALL BE PRESSURE TESTED PER BUILDING, SMACNA, ASME,

16. SUBMIT SHOP DRAWINGS OF ALL WORK WHICH MUST BE APPROVED BY THE ARCHITECT AND

17. ALL DUCTWORK SHALL BE KEPT AS HIGH AS POSSIBLE TO MAINTAIN CEILING HEIGHTS SHOWN ON

18. FOR EXACT LOCATIONS OF DIFFUSERS, REGISTERS, GRILLES, AND LINEAR DIFFUSERS REFER TO

19. COORDINATE ALL EQUIPMENT REQUIREMENTS WITH APPROPRIATE TRADES (I.E. CONDENSATE

20. VERIFY AND COORDINATE ALL EQUIPMENT ACCESS AND CLEARANCES WITH THE ARCHITECT,

21. ALL DUCTWORK AND PIPING SHALL BE SUPPORTED DIRECTLY FROM THE STRUCTURE. DO NOT

23. ALL DUCT BRANCHES, TAKE-OFFS, AND DIFFUSERS SHALL BE EQUIPPED WITH VOLUME DAMPERS.

OPERATED VOLUME DAMPERS WITH THE OPERATOR ACCESSIBLE VIA THE AIR OUTLET WHEN

24. LOCATE ALL DUCT VOLUME DAMPERS ABOVE ACCESSIBLE CEILINGS. PROVIDE REMOTE CABLE

25. ALL CONNECTIONS FROM RETURN, EXHAUST, AND SUPPLY DUCTS, CEILING DIFFUSERS, AND

REGISTERS SHALL BE AIR TIGHT AND SEALED WITH WATER BASED APPROVED SEALANT.

26. ALL DUCTWORK INSIDE BUILDING INCLUDING SUPPLY AND RETURN AIR DUCTS, PLENUMS SHALL

SHALL HAVE A MINIMUM AS INSTALLED RATING OF R-6. INTERNAL LINING SHALL NOT BE

27. THE MECHANICAL CONTRACTOR SHALL PROVIDE CONTROL WIRING AND TRANSFORMERS FOR

LOCATIONS OF DISCONNECT, JUNCTION BOX/SOURCE AND EXTEND WIRING TO DEVICES.

CONNECTIONS, SUPPORTS, AND ACCESSORIES TO KEEP EXISTING BUILDING, SYSTEM IN

30. PROVIDE SUPPLEMENTAL STEEL TO SUPPORT EQUIPMENT, DUCTS, AND PIPING FROM BUILDING

31. PROTECT ALL EXISTING AND NEW WORK FROM DUST, DIRT, DEBRIS. SEAL AND PROTECT ALL

32. CONTRACTOR SHALL PERFORM ALL WORK IN SAFE MANNER. PROTECT WORK, PROPERTY.

33. GUARANTEE ALL WORK AGAINST FAULTY AND IMPROPER MATERIAL AND WORKMANSHIP FOR A

PERIOD OF ONE YEAR FORM THE DATE OF FINAL ACCEPTANCE BY THE OWNER, EXCEPT THAT

NOTIFICATION, CORRECT ANY DEFICIENCIES WHICH OCCUR DURING THE GUARANTEE PERIOD,

PROVIDE 5 YEAR EQUIPMENT MANUFACTURERS WARRANTY FOR COMPRESSOR FROM

WHERE GUARANTEES OR WARRANTIES FOR LONGER TERMS ARE SPECIFIED HEREIN, SUCH

LONGER TERM SHALL APPLY. AT NO ADDITIONAL COST TO OWNER, WITHIN 24 HOURS AFTER

PERSONNEL AND SURROUNDINGS FROM DAMAGE, INJURY.

ALL TO THE SATISFACTION OF THE OWNER AND ARCHITECT.

DATE OF SHIPMENT.

OPEN ENDS OF WORK, DUCT, PIPES FROM DUST, AND DIRT DURING DEMOLITION AND

BE PROVIDED WITH 2" THICK INSULATION UNLESS OTHERWISE NOTED. DUCTWORK INSULATION

ALL THERMOSTATS, ACTUATORS AND CONTROLLERS. TRANSFORMERS SHALL BE ADEQUATELY

SIZED TO SUPPORT THE EQUIPMENT SERVED. COORDINATE WITH ELECTRICAL CONTRACTOR FOR

OPERATION AND MAINTAIN SERVICES, HEATING, AIR CONDITIONING, VENTILATION IN OPERATION

ARCHITECTURAL DRAWINGS. COORDINATE ALL DUCT AND PIPING SYSTEM ELEVATIONS WITH ALL

15. ALL SYSTEMS AND SERVICES THAT SERVE ADJACENT SPACES SHALL BE MAINTAINED

13. DIFFUSERS, REGISTERS, AND GRILLES SHALL HAVE HARD DUCT CONNECTIONS.

ACCEPTANCE. THE CONTRACTOR SHALL REPLACE ANY EQUIPMENT THAT MAY BE DAMAGED,

SHALL BE TESTED IN THE PRESENCE OF BUILDING PERSONNEL. PRE-CONSTRUCTION/DEMOLITION

BALANCING REPORTS SHALL BE SUBMITTED TO ENGINEER AND BUILDING MANAGEMENT FOR

. PROVIDE FIRE STOPPING FOR ALL NEW AND EXISTING DUCT, PIPE, AND CONDUIT PENETRATIONS

GUIDELINES AND CONFORM WITH REQUIREMENTS OF THE LATEST ASHRAE HANDBOOKS. ALL

ESSENTIAL, WHETHER INDICATED ON THE CONTRACT DOCUMENT OR NOT.

INSTALLATION OF THE WORK AS SHOWN ON DRAWINGS.

THROUGH FIRE RATED WALLS, PARTITIONS, AND SLABS.

AND BUILDING MANAGEMENT COMPANY'S STANDARDS FOR DESIGN, ALTERATION, AND

CODE AND LOCAL CODE'S RULES AND REGULATIONS. IT SHOULD ALSO CONFORM TO THE OWNER

# ELBOW TURNED DOWN

ELBOW TURNED UP

THERMOSTAT

CUT EXISTING DUCT/PIPING AND PATCH AND SEAL AIRTIGHT

## POINT OF DISCONNECTION

## POINT OF NEW CONNECTION

MOTORIZED DAMPER W/ ACCESS DOOR

## FIRE DAMPER W/ ACCESS DOOR

FIRE/SMOKE DAMPER W/ ACCESS DOOR

TEMPORARY WORK.

FOR RIGGING HOISTING.

STANDARDS OF GOOD PRACTICE.

SIZING TABLE SHALL BE USED AS A GUIDE:

DUCT SIZE

10x6

12X6

14X6

16X6

20x6

EXECUTION OF THE WORK.

BC-105.

B. PROGRESS INSPECTIONS:

BUILDING CODE.

(OTCR).

CODE OF NEW YORK STATE.

TEMPERATURE OF 70°F (WINTER).

NEW YORK STATE MECHANICAL CODE.

STANDARDS OF SUCH ITEMS.

CFM

0-200

201-230

231-260

261-300

301-360

PRICE.

- 34. CONTRACTOR SHALL BE RESPONSIBLE TO PROVIDE ALL RIGGING, HOISTING TO BRING EQUIPMENT AND INSTALL IN LOCATIONS INDICATED. A. CONTRACTOR SHALL PROVIDE ALL EQUIPMENT, MATERIAL, LABOR, TOOLS ACCESSORIES TO RIG UNITS, WORK IN SPACE. PROVIDE PROTECTION FOR WALLS, ROOF, FLOOR AND
  - EXTERIOR OF BUILDING, PROPERTY.CONTRACTOR SHALL PROVIDE ALL PREPARATION, B. SUBMIT RIGGING AND HOISTING PLAN FOR REVIEW COORDINATED WITH ALL EQUIPMENT WORK TO BE BROUGHT IN AND RIGGED INTO SPACE.
  - C. CONTRACTOR SHALL PREPARE DOCUMENTS, FILE, PROCURE ALL PERMITS, APPROVALS D. CONTRACTOR SHALL FIELD VERIFY EXISTING CONSTRAINTS AND DETERMINE LARGEST SECTION OF UNIT, WORK THAT CAN BE RIGGED INTO SPACE WITHOUT DAMAGE TO
  - EXISTING SPACE OR WORK. CONTRACTOR SHALL BE RESPONSIBLE TO REMOVE ALL PARTITIONS, DOORS, FRAMES, AND OTHER ITEMS AS REQUIRED TO RIG UNITS, WORK INTO SPACE AND REINSTALL ALL ITEMS. ANY DAMAGED ITEMS SHALL BE REPLACED OR NEW ITEMS SHALL BE PROVIDED AS DIRECTED BY ARCHITECT. CONTRACTOR SHALL REMOVE. RELOCATE TEMPORARILY. RECONNECT ALL ITEMS IN APPROVED MANNER CONTRACTOR IS RESPONSIBLE FOR THE MEANS AND METHODS OF RIGGING FOR THIS PROJECT. PROVIDE ALL RELATED WORK TO KEEP EXISTING SYSTEMS IN OPERATION.
- 35. WHERE NEW PIPING IS TO BE CONNECTED TO EXISTING PIPING, CONTRACTOR SHALL INCLUDE DRAINING OF SYSTEM OR SECTIONS OF PIPING, SHUTDOWNS, TEMPORARY VALVES, FLANGES, WET TAPS AND RELATED EQUIPMENT, SETUPS, VALVES, TEES, FITTINGS, AND LABOR IN BID PRICE. FLUSH, CLEAN PIPING SYSTEM, SECTIONS OF PIPING, PROVIDE ISOLATION VALVES, FLANGES, FITTINGS FOR TESTING, AND TEST PIPING. PROVIDE CHEMICAL TREATMENT AND INCLUDE ALL COSTS OF RELATED WORK, MATERIAL EQUIPMENT, CHEMICALS, LABOR IN BID
- ANY ACTIVITIES, DEMOLITION, CONSTRUCTION WORK THAT GENERATES NOISE, FUME, ODOR SHALL BE PREFORMED DURING AFTER NORMAL WORK HOURS PRIOR APPROVAL BY OWNER DURING TIME PERIOD ALLOWED BY OWNER. PROVIDE ALL RELATED PREPARATIONS, WORK TO MINIMIZE INCONVENIENCE TO OCCUPANTS AND ANY DISRUPTION OF SPACE AND ADJACENT OCCUPANTS. PROVIDE FIRE WATCH AS REQUIRED BY BUILDING MANAGEMENT/OWNER, AND INCLUDE ALL RELATED WORK, EQUIPMENT, AND LABOR IN BID PRICE.
- INTERIOR AND EXTERIOR MECHANICAL EQUIPMENT AND SYSTEMS SHALL COMPLY WITH THE PROVISION OF NOISE CONTROL REQUIREMENTS PER CODES, LOCAL RULES, AND REGULATIONS. PROVIDE VOLUME DAMPERS IN ALL LOW-PRESSURE DUCTWORK BRANCH TAKE-OFFS. REFER TO HVAC DETAILS FOR REQUIREMENTS. VOLUME DAMPERS SHALL BE INSTALLED AS CLOSE TO DUCT TAKE OFF AS POSSIBLE UPSTREAM OF DIFFUSER/REGISTER.
- ADEQUATELY BRACE AND PROTECT ALL WORK DURING CONSTRUCTION AGAINST DAMAGE BREAKAGE, COLLAPSE, DISTORTIONS, AND ALL ALIGNMENTS ACCORDING TO CODES AND

## WHERE MANUFACTURER'S NAMES AND PRODUCT NUMBERS ARE INDICATED ON THE DRAWINGS IT SHALL BE CONSTRUED TO MEAN THE ESTABLISHING OF QUALITY AND PERFORMANCE

41. WHERE DUCT SIZES TO INDIVIDUAL AIR OUTLETS ARE NOT INDICATED THE FOLLOWING DUCT

- THE CONTRACTOR SHALL BE HELD TO HAVE EXAMINED THE PREMISES AND COMPARED IT WITH THE DRAWINGS AND SPECIFICATIONS AND TO HAVE SATISFIED HIMSELF OF THE CONDITIONS EXISTING THERE AS TO THE PERFORMANCE OF THE WORK REQUIRED BEFORE SUBMISSION OF HIS BID.
- CONTRACTOR SHALL ASSURE THAT DEMOLITION AND INSTALLATION WORK WILL NOT CAUSE ANY DAMAGE TO EQUIPMENT, DUCTWORK, PIPING, ELECTRICAL, PLUMBING OR ANY OTHER EXISTING SERVICES.
- ALL EQUIPMENT SHOWN TO REMAIN SHALL BE PROTECTED FROM DAMAGE DURING THE CONSTRUCTION AND IF ANY DAMAGE OCCURS IT SHALL BE REPAIRED AT THE EXPENSE OF THIS CONTRACTOR.
- ALL EXISTING SERVICES INCLUDING PIPING, ELECTRIC CONDUITS ETC. WHICH MAY INTERFERE WITH NEW INSTALLATION WORK AND NOT BEING REMOVED SHALL BE TEMPORARILY DISCONNECTED AND PROTECTED FROM DAMAGE PRIOR TO DEMOLITION WORK. THEY SHALL BE RECONNECTED OR RE-ROUTED AS NECESSARY UPON COMPLETION OF THE WORK. NO TUBING OR CONDUIT SHALL BE COVERED BY THERMAL INSULATION. ELECTRICAL WORK SHALL BE IN ACCORDANCE WITH UL NEC CODE (NFPA 70).

MECHANICAL SHEET LIST			
M-001.00	MECHANICAL SYMBOL LIST, NOTES, AND ABBREVIATIONS		
M-002.00	MECHANICAL SPECIFICATIONS SHEET - 1		
M-003.00	MECHANICAL SPECIFICATIONS SHEET - 2		
M-101.00	DEMOLITION PART PLAN, HVAC PIPING AND DUCTWORK		
M-201.00	FIRST FLOOR HVAC PART PLAN, DUCTWORK		
M-202.00	2ND FL AND ROOF HVAC PART PLAN PIPING AND VENT		
M-301.00	HVAC DETAILS AND SCHEDULES SHEET 1 OF 2		
M-302.00	HVAC DETAILS AND SCHEDULES SHEET 2 OF 2		

## **BUILDING DEPARTMENT NOTES:**

 ALL WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE NEW YORK STATE CONSTRUCTION CODE (CC), BUILDING CODE (BC), FIRE CODE (FC) AND MECHANICAL CODE (MC). WORK SHALL BE EXECUTED IN FULL COMPLIANCE WITH THE APPLICABLE PROVISIONS OF ALL LOCAL LAWS, BY LAWS, STATUTES, ORDINANCES, CODES, RULES, REGULATIONS AND LAWFUL ORDERS OF PUBLIC AUTHORITIES BEARING ON THE PERFORMANCE AND

## MATERIALS. OPERATIONS AND EQUIPMENT OF REQUIRED HVAC SYSTEM SHALL BE SUBJECT TO SPECIAL INSPECTION AS REQUIRED IN CC ADMINISTRATIVE PROVISION, ARTICLES 28-115, 28-116, 28-118, BC-105 AND NEW YORK STATE MECHANICAL CODES AS FOLLOWS:

- A. SPECIAL INSPECTIONS AND TESTS THAT ARE REQUIRED:
- 1) MECHANICAL SYSTEMS AS REQUIRED IN SECTION MC-104 AND
- a. AIR CONDITIONING AND VENTILATION SYSTEMS
- 1) ENERGY CODE COMPLIANCE INSPECTIONS BC 105.3
- C. THEY SHALL HAVE BEEN ACCEPTABLE PRIOR TO THE EFFECTIVE DATE OF THE CODE BY THE BOARD OF STANDARDS AND APPEALS.
- D. THEY SHALL HAVE BEEN ACCEPTED FOR USE UNDER THE PRESCRIBED TEST METHODS BY THE COMMISSIONER.
- 3. DUCTS SHALL BE SUBSTANTIALLY SUPPORTED ACCORDING TO CHAPTER 16 OF NEW YORK STATE BUILDING CODE, SEISMIC REQUIREMENTS.
- 4. DUCTS SHALL BE CONSTRUCTED OF APPROVED STANDARD AS SPECIFIED IN NEW YORK STATE MECHANICAL CODE MC-603.
- WHERE DUCTS PASS THROUGH WALLS OR PARTITIONS, THE SPACE AROUND SHALL BE SEALED AS REQUIRED IN CHAPTER 7 OF THE NEW YORK STATE
- 6. ALL WORK SHALL COMPLY WITH ENERGY CONSERVATION CONSTRUCTION
- 7. THE HEATING AND AIR CONDITIONING SYSTEMS HAVE BEEN DESIGNED TO MAINTAIN A MAXIMUM TEMPERATURE OF 78°F (SUMMER) AND A MINIMUM
- 8. ALL MATERIALS AND EQUIPMENT DELIVERED TO THE SITE SHALL BE RECOGNIZED BY THE OFFICE OF TECHNICAL CERTIFICATION AND RESEARCH

## 9. PRODUCTS THAT ARE NOT CODE-PRESCRIBED OR APPROVED ALTERNATIVE SHALL BE REJECTED UNTIL SUCH CERTIFICATES ARE OBTAINED. 10. ALL EQUIPMENT USE PERMITS SHALL BE OBTAINED BY THE CONTRACTOR AS REQUIRED IN NEW YORK STATE CONSTRUCTION CODES, ARTICLE 28-118. 11. ALL NEW AC UNITS AND EQUIPMENT SHALL COMPLY WITH ALL APPLICABLE

- **CRYOGEN VENT NOTES:**
- 1. THE VENT MATERIAL MUST BE OF THE FOLLOWING MATERIAL WITH THE WALL THICKNESS INDICATED
- 1. SS 304: MINIMUM 0.035IN; MAXIMUM 0.125IN WELDED CONSTRUCTION.
- 2. VENT SHALL BE WELDED JOINTS OR BOLTED FLANGED JOINTS WITH FIBERGLASS GASKETS PER MRI VENDOR REQUIREMENTS.
- 3. MATERIALS ACCESSORIES, DETAILS OF QUENCH VENT INSTALLATION MUST BE IN ACCORDANCE WITH MRI VENDORS RECOMMENDATIONS AND REQUIREMENTS. PROVIDE ALL MATERIAL, LABOR, WORK, ACCESSORIES FOR INSTALLATION.
- 4. EITHER TUBES OR PIPES MAY BE USED AND MUST BE SEAMLESS OR HAVE WELDED SEAMS.
- 5. STAINLESS STEEL BELLOWS PIPE LESS THAN 1FT LENGTH MAY BE USED AS A TERMINAL EXPANSION POINT.
- 6. THE VENT PIPE MUST WITHSTAND A MAXIMUM PRESSURE OF 6.5 PSI.
- 7. WAVEGUIDE VENT MATERIAL MUST MATCH THE MAGNET VENT.
- 8. TERMINATION OF VENT SHALL BE PROTECTED WITH STAINLESS STEEL WIRE MESH SCREEN MINIMUM AREA 2.5 TIMES THE CROSS SECTIONAL AREA OF THE QUENCH VENT.
- 9. PROVIDE GALVANIC SEPARATION BETWEEN MAGNET AND QUENCH VENT.
- 10. PROVIDE 12" TO 19" LONG FLEX SECTION.
- 11. PROVIDE MINIMUM 2" THICK HIGH DENSITY FIBERGLASS SECTIONAL PIPE INSULATION THROUGHOUT ALL AROUND QUENCH VENT WITH VAPOR BARRIER ALUMINUM STAINLESS STEEL JACKET. MINIMUM 16 GAUGE, HELD IN PLACE WITH STAINLESS STEEL Z-BANDS AT 12" CENTER.
- 12. CYROGEN VENT SHALL BE FABRICATED BY A SIEMENS APPROVED FABRICATOR.

COPYRIGHT - 2020 ARRAY-ARCHITECTS P.C.

OF DWG This document is a copyright protected instrument of service, property of Array Architects and licensed for use in the title project only. Reproduction or use of this document without written permission of Array Architects is illegal and will be prosecuted under the law.





155 WHITE PLAINS ROAD

# **PROJECT:** NEW MRI

**OWNER:** COLUMBIA DOCTOR'S TARRYTOWN

ESTIMATING COST CONCEPTS, INC. 104 BEDELL PLACE MELVILLE, NY, 11747 PHONE: 631.423.7960

NEW YORK, NY 10001 PHONE: 646.674.6100

LORING CONSULTING ENGINEERS, INC 360 WEST 31ST STREET, 14th FL

MEP ENGINEER

STRUCTURAL ENGINEER

PHONE: 570.496.7020

REUTHER + BOWEN 326 WARD STREET DUNMORE, PA 18512

**ARRAY-ARCHITECTS.COM** 470 PARK AVE SOUTH, 11<sup>th</sup> FLOOR **NEW YORK, NY. 10016** 212-689-3110 **CONSULTANTS:** 

Architect of Record: architects

<u>CODES & STANDARDS</u>

1) BUILDING

HVAC SPECIFICATIONS

OF THE ENTITIES LISTED BELOW.

LESIGN AND PERFORMANCE OF COMPONENTS AND METHODS SPECIFIED HEREIN SHALL COMPLY WITH

BUILDING MANAGEMENT COMPANY STANDARDS

FOR ALTERATIONS AND CONSTRUCTION.

THE APPLICABLE PROVISIONS OF THE CODES, STANDARDS, AND MANUFACTURER'S RECOMMENDATIONS

	3	
	WORK WITH THE WORK OF OTHER TRADES. CONTRACTOR SHALL PREPARE AND FURNISH DUCTWORK LAYOUTS AT 3/8" = 1'-0" SCALE FOR USE BY AND COORDINATION WITH OTHER TRADES. COORDINATION MEETINGS SHALL BE HELD UNDER THE SUPERVISION OF THE CONSTRUCTION MANAGER (CM) OR GENERAL CONTRACTOR (GC). EACH TRADE SHALL HAVE PROPER REPRESENTATION AT ALL COORDINATION MEETINGS FOR THE PURPOSE OF DETAILING, ON THE DRAWINGS MENTIONED ABOVE, TH EXACT LOCATION AND ROUTING OF THEIR WORK. AFTER THE CONCLUSION OF THE COORDINATION MEETINGS, EACH TRADE SHALL SIGN THE COORDINATED DRAWINGS AND COPIES SHALL BE DISTRIBUTED BY THE CM/GC TO ALL PARTIES CONCERNED, INCLUDING THE OWNER. FINAL SHOP DRAWINGS OF ALL TRADES SHALL BE IN ACCORDANCE WITH THE COORDINATED DRAWING, WHICH FINAL SHOP DRAWINGS SHALL BE SUBMITTED FOR FINAL APPROVAL.	HE D
F.	IF THE TRADE CONTRACTOR INSTALLS WORK SO AS TO CAUSE INTERFERENCE WITH WORK OF OTHER TRADES, HE SHALL MAKE NECESSARY CHANGES IN WORK TO CORRECT THE CONDITION WITHOUT EXTR CHARGE.	A
G.	CONTRACTOR SHALL FURNISH ALL NECESSARY TEMPLATES, PATTERNS, ETC., FOR INSTALLING WORK AND FOR THE PURPOSE OF MAKING ADJOINING WORK CONFORM, SUCH AS ACCESS PANELS IN GYPSUM BOARD CEILINGS, ETC. FURNISH SETTING PLANS AND SHOP DETAILS TO OTHER TRADES AS REQUIRED.	I
6.	AS-BUILT DRAWINGS	
A.	CONTRACTOR SHALL KEEP RECORD OF ALL CHANGES, FIELD CONDITIONS, AND SHALL PREPARE AND PROVIDE AS-BUILT DRAWINGS INDICATING ANY DEVIATION FROM THE ORIGINAL MECHANICAL DESIGN. THE DRAWING SHALL BE STAMPED "AS-BUILT" WITH THE DATE AND CONTRACTOR'S SIGNATURE. TWO (2) SET OF PRINTS AND AN ELECTRONIC COPY CONTAINING AUTOCAD/REVIT FILES SHALL BE DELIVERED TO THE ENGINEER BEFORE FINAL PAYMENT IS MADE. AFTER REVIEW AND APPROVAL OF AS-BUILT DRAWING CONTRACTOR SHALL PROVIDE THREE (3) SETS OF PRINTS AND AN ELECTRONIC COPY OF THE AS-BUILT DRAWINGS TO THE OWNER AND BUILDING MANAGEMENT UPON COMPLETION OF WORK.	') ) 3S,
В.	FURNISH TO THE ARCHITECT THREE (3) BOUND AND INDEXED COPIES OF OPERATIONS, MAINTENANCE AND TESTING, ADJUSTING AND BALANCING DATA MANUALS FOR THE INSTALLATION. ALSO PROVIDE ONE (1) ELECTRONIC COPY OF THE ABOVE BOUND COPY.	Ξ
C.	THE MANUAL SHALL PROVIDE COMPREHENSIVE DETAILED INFORMATION ON THE APPROVED INSTALLATION, OPERATION AND USE, MAINTENANCE AND PARTS LIST.	
7.	CUTTING AND PATCHING	
A.	REFER TO THE ARCHITECTURAL SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS AND INFORMATION BEYOND THAT COVERED BELOW.	
В.	CUTTING - REMOVAL OF PORTIONS OR SECTIONS OF STRUCTURAL MEMBERS (AS APPROVED BY A STRUCTURAL ENGINEER), WALLS, FLOORS, CEILINGS, AND THE LIKE, AS REQUIRED TO PERMIT INSTALLATION OF NEW MECHANICAL OR ELECTRICAL MATERIALS OR EQUIPMENT.	
C.	PATCHING - REPAIR OF SUCH CUT MATERIALS, RESTORING TO AS CLOSE TO ORIGINAL CONDITION AS POSSIBLE, OR AS DIRECTED BY THE ENGINEER UNLESS NOTED OTHERWISE ON DRAWINGS OR IN "EXCEPTIONS" BELOW:	
	1) CUTTING AND PATCHING OF EXISTING MATERIALS (I.E. EXISTING PRIOR TO THE AWARD OF THE CONTRACT) SHALL BE PERFORMED BY THE RESPECTIVE CONTRACTOR OR SUBCONTRACTOR REQUIRING SAME.	
	<ol> <li>CUTTING AND PATCHING OF NEW WORK (I.E. EXISTING MATERIALS INSTALLED AFTER THE AWARD OF THE CONTRACT) SHALL BE PERFORMED BY THE GENERAL CONTRACTOR. THIS IS NOT INTENDED TO ELIMINATE FINANCIAL RESPONSIBILITY.</li> </ol>	)
	3) PATCHING OF EXISTING MATERIALS IN SITUATIONS WHERE NEW SURFACE FINISHES ARE TO BE APPLIED AS PART OF THE CONTRACTOR'S WORK SHALL BE PERFORMED BY THE GENERAL CONTRACTOR. IN CASES WHERE UNNECESSARILY EXCESSIVE CUTTING HAS BEEN PERFORMED, THE REQUIRED PATCHING SHALL BE PERFORMED BY THE RESPECTIVE CONTRACTOR WHO PERFORMED THE CUTTING, EXCEPT FOR THE FINAL SURFACE FINISH.	
8.	DIFFUSERS, GRILLES, REGISTERS & DAMPERS	
A.	DIFFUSERS, GRILLES AND REGISTERS SHALL BE FURNISHED AND INSTALLED FOR CAPACITIES AND IN LOCATIONS INDICATED ON THE DRAWINGS. ALL REGISTERS AND DIFFUSERS SHALL BE PRIME COATED STEEL OR EXTRUDED ALUMINUM FINISHED, UNLESS OTHERWISE NOTED, IN BAKED WHITE ENAMEL.	
В.	ALL CEILING DIFFUSERS SHALL BE AS MANUFACTURED BY KRUEGER, TITUS, OR PRICE AND HAVE EQUALIZING GRID AND OPPOSED BLADE DAMPER. OPERATING LEVERS SHALL BE ACCESSIBLE AT THE FACE OF AIR OUTLET.	
C.	ALL DUCTED RETURN REGISTERS SHALL HAVE AN OPPOSED BLADE VOLUME DAMPER.	
D.	INSTALL ALL DIFFUSERS, GRILLES AND REGISTERS FLUSH WITH SURFACE LEVEL OR STRAIGHT WITH OTHER SIMILAR ITEMS. SUPPORT THE REGISTER OR DIFFUSER FROM THE DUCT AT THE PROPER LEVEL TO HOLD IT SNUG AGAINST THE CEILING.	
E.	FINAL LOCATION OF DIFFUSERS, GRILLES AND REGISTERS SHALL BE COORDINATED WITH THE LATEST ARCHITECTURAL PLANS. FINAL LOCATIONS AND FINISHES ARE SUBJECT TO ARCHITECT'S APPROVAL EXACT LOCATION FOR ALL DIFFUSERS, GRILLES AND REGISTERS SHALL BE COORDINATED WITH THE ARCHITECT.	
F.	ALL DUCTWORK AND ACCESSORIES SHALL COMPLY WITH SMACNA STANDARDS.	

- G. ALL LINEAR DIFFUSER LENGTHS NOTED ARE ACTIVE SUPPLY LENGTH AND SHALL BE PROVIDED WITH SHEETMETAL PLENUM. TOTAL LENGTH AS SHOWN, COORDINATE EXACT LENGTH AND LOCATION WITH ARCHITECT. UNUSED PORTIONS OF LINEAR SHALL BE UTILIZED FOR RETURN AIR AND SHALL BE PROVIDED WITH BLACK SCREEN BACKING.
- H. ALL RETURN AIR GRILLES SHALL BE PROVIDED WITH LIGHT SHIELDS. I. UNLESS OTHERWISE SHOWN ON THE CONTRACT DRAWINGS, NOISE CRITERIA FOR ALL AIR TERMINAL DEVICES SHALL NOT EXCEED NOISE CRITERIA (NC) 35, OR SOUND METER READING 40 DBA, MEASURED AT A LOCATION 42 IN. BELOW THE CENTER OF THE DEVICES. MANUFACTURER IS RESPONSIBLE FOR EXAMINING APPLICATION OF EACH OUTLET AND GUARANTEE THAT EACH WILL PROVIDE REQUIRED NC LEVELS AND COMFORT SPACE CONDITIONS WITHOUT DRAFTS THROUGHOUT OPERATING RANGE.
- ALL AIR OUTLETS AND INLETS SHALL BE SUITABLE FOR OPERATION AT 30% EXCESS AND 30% LESS THAN NOTED CAPACITY.
- MARGIN TYPES AND METHODS OF ATTACHMENT FOR ALL DIFFUSERS, GRILLES AND REGISTERS SHALL BE COORDINATED WITH ARCHITECTURAL CEILING DETAILS AND SPECIFICATIONS.
- FURNISH AND INSTALL ALL METAL DIFFUSERS, GRILLES AND REGISTERS AS INDICATED ON THE CONTRACT DRAWINGS. ALL SIZES, AIR DISTRIBUTION PATTERNS AND AIR VOLUME CAPACITIES SHALL BE AS SPECIFIED ON THE CONTRACT DRAWINGS.
- 9. DUCTWORK AND ACCESSORIES
- A. ALL DUCTWORK SHALL COMPLY WITH ASHRAE GUIDE AND SMACNA, LATEST EDITION, FUNDAMENTALS OF DUCT DESIGN.
- B. EXCEPT AS OTHERWISE SHOWN OR NOTED, ALL DUCTS AND OTHER SHEET METAL WORK SHALL BE PRIME SHEETS OF GALVANIZED STEEL AND COMPLIANT WITH CURRENT ADOPTED CODES OF NFPA AND ASTM STANDARDS. ALL DUCTWORK, AIR OUTLETS, DAMPERS, ACCESSORIES IN MRI EXAM ROOM SHALL BE NON FERROUS, ALUMINUM OR STAINLESS STEEL.
- C. FIRE DAMPERS REQUIREMENTS OF THE UNDERWRITERS' LABORATORY 555, AND NFPA. D. ALL DUCTWORK SHALL BE FABRICATED AND INSTALLED IN ACCORDANCE WITH THE LATEST EDITION OF SMACNA DUCT CONSTRUCTION STANDARDS MANUAL.USING PRIME SHEETS OF GALVANIZED STEEL (G90). ALUMINUM DUCTS SHALL BE ASTM B209, ALUMINUM SHEET ALLOY 3003-H14, ALUMINUM CONNECTORS AND BAR STOCK.
- E. ALL DUCTWORK, ACCESSORIES SERVING MRI ROOM SHALL BE ALUMINUM, NON-FERROUS.
- F. ALL SQUARE ELBOWS SHALL BE PROVIDED WITH FULL RADIUS TURNING VANES.
- G. PROVIDE ACCESS DOORS AT ALL FIRE AND AUTOMATIC DAMPERS AND COILS ETC. H. U.S. STANDARD GAUGES FOR DUCTWORK ARE TO CONFORM TO THE FOLLOWING REQUIREMENTS
- 1) UP TO 30" WIDE 24 GAUGE
- 2) 31" TO 48" WIDE 22 GAUGE
- 3) 49" TO 60" WIDE 20 GAUGE
- 4) 61" & OVER 18 GAUGE
- ALL NEW AND EXISTING LOW VELOSITY DUCTWORK SHALL BE SEALED THROUGHOUT INCULDING ALL REQUIREMENTS. LOW PRESSSURE DUCTWORK SHALL BE CONSTRUCTED TO SMACNA 2" W.G. STANDARDS
- THESE SHALL BE OPPOSED BLADE DAMPERS.
- ABOVE AT INTERVALS REQUIRED BY CODES.
- L. ALL GASKETED ACCESS DOORS SHALL BE AS PER LATEST SMACNA STANDARDS.
- M. FLEXIBLE CONNECTIONS TO AIR CONDITIONING UNITS AND FAN SHALL BE FABRICATED FROM 28 OUNCE NEOPRENE CLOTH, MEETING UL-181 CLASS 1.
- NOT EXCEED +/-5%). LARGE OR NOISY LEAKS WILL NOT BE ACCEPTED. TAPE SHALL NOT BE USED TO SEAL JOINTS.

	2)	BC	BUILDING CODE
	3)	MC	MECHANICAL CODE
	4)	ECC	ENERGY CONSERVATION CODE
	5)	ASHRAE	AMERICAN SOCIETY OF HEATING, REFRIGERATION AND AIR CONDITIONING ENGINEERS.
	6)	ASTM	AMERICAN SOCIETY FOR TESTING MATERIALS
	7)	ANSI	AMERICAN NATIONAL STANDARDS INSTITUTE
	8)	UL	UNDERWRITER'S LABORATORIES, INC
	9)	FM	FACTORY MUTUAL.
	10)	FGI	FACILITIES GUIDELINES INSTITUTE
	11)	NFPA	NATIONAL FIRE PROTECTION ASSOCIATION.
	12)	SMACNA	SHEET METAL AND AIR CONDITIONING CONTRACTOR'S NATIONAL ASSOCIATION.
	13)	ASME	AMERICAN SOCIETY OF MECHANICAL ENGINEERS
	14)	AMCA	AIR MOVING AND CONDITIONING ASSOCIATION.
	15) 16)	ARI	AMERICAN REFRIGERATION INSTITUTE.
•	10)		OF THE VALVE AND FITTING INDUSTRY.
2.	<u>SCOPE</u>	<u>OF WORK</u>	
۹.	ALL MI MATER CODES SHALL MANAG CONTR WORK	ECHANICAL ANI RIALS FOR A PE S AS STATED BI BE REPAIRED GER AT NO ADD RACTOR SHALL IN PERFECT CO	D ELECTRICAL WORK SHALL BE FREE FROM DEFECTS IN WORKMANSHIP AND RIOD OF ONE YEAR FROM DATE OF FINAL ACCEPTANCE AND SHALL MEET ALL LOCAL ELOW. ALL DEFECTS, WHICH DEVELOP OR ARE DISCOVERED WITHIN THIS PERIOD BY THE CONTRACTOR TO THE SATISFACTION OF THE ARCHITECT OR BUILDING DITIONAL COST. UPON COMPLETION OF THE WORK UNDER THIS CONTRACT, THE REMOVE ALL TOOLS, APPLIANCES, SURPLUS MATERIAL AND SCRAP LEAVING THIS ONDITION.
В.	THE B PART ( THERE	UILDING MANAO OF THIS SECTIO ETO.	GEMENT AND BUILDING STANDARDS FOR ALTERATIONS AND CONSTRUCTION ARE IN AND CONTRACT. ALL WORK PERFORMED HEREUNDER SHALL BE SUBJECT
C.	THE C HOIST OF ALI ACCOI THE IT FURNI COMP LIMITE	ONTRACTOR SI ING, SCAFFOLD THE HEATING RDANCE WITH T EMS FURNISHE SH, INSTALL, TE LETE THE CON D TO THE FOLL	HALL PROVIDE ALL MATERIALS, LABOR, EQUIPMENT, TOOLS, APPLIANCES, SERVICES, VING, RIGGING, SUPERVISION AND OVERHEAD FOR THE FURNISHING AND INSTALLING VENTILATING AND AIR CONDITIONING, EXHAUST AND RELATED WORK COMPLETE, IN THE DRAWINGS, SCHEDULES AND SPECIFICATIONS. ANY LISTING OR INDICATION OF ED OR WORK PERFORMED SHALL NOT LIMIT THE GENERAL REQUIREMENTS TO EST AND PLACE IN OPERATION ALL WORK, INCLUDING ACCESSORIES REQUIRED TO TRACT IN A COMPLETE MANNER. THE SCOPE OF WORK SHALL INCLUDE, BUT NOT BE JOWING:
	1)	PROVIDE NEW REHEAT AND I INSTALL THE N REFRIGERANT ACCESSORIES	/ SUPPLEMENTAL COMPUTER GRADE SPLIT SYSTEM AIR CONDITIONING UNIT WITH HUMIDIFICATION AND BMS COMPATABLE CONTROLS, EXHAUST FAN, RECEIVE AND NEW MEDICAL GRADE AIR COOLED CHILLER, CHILLED GLYCOL-WATER PIPING, I PIPING, RECEIVE AND INSTALL BY-PASS PANEL, VALVES, FITTINGS, AND S.
	2)	SHEET-METAL	DUCTWORK, DIFFUSERS, GRILLES, HANGERS, SUPPORTS AND VOLUME DAMPERS.
	3)	PROVIDE PIPI	NG, HANGERS, VALVES, ETC.
	4)	INSULATION F	OR NEW AND EXISTING DUCTWORK AND PIPING.
	5)	CUTTING AND	PATCHING, FIRE-STOPPING, EXHAUST.
	6)	TESTING, ADJ	USTING AND BALANCING OF ALL AIR SYSTEMS CEILING DIFFUSERS.
	7)	PAY ALL FEES REQUIRED BY	AND OBTAIN ALL APPROVALS, PERMITS, AND EQUIPMENT USE PERMITS, AS FEDERAL, STATE AND LOCAL AGENCIES HAVING JURISDICTION.
	8)	REMOVAL WO	RK INCLUDES ALL DEMO WORK ON PLAN.
	9)	START-UP.	
	10)	PROVIDE CON	IPLETE CONTROLS INCLUDING CONTROL DEVICES, PANELS, THERMOSTATS, RING, FTC.
	11)	COORDINATIC	N WITH OTHER TRADES.
	12)	TEST & BALAN	ICE EXISTING HVAC SYSTEM (AIR AND WATER).
D.	FINAL DRILLI	PATCHING AND NG, ROUGH PA	PAINTING SHALL BE PERFORMED BY THE GENERAL CONTRACTOR. CUTTING, CORE TCHING AND SHALL BE BY THE CONTRACTOR.
3.	<u>CODE, F</u>	PERMITS AND IN	ISPECTIONS
A.	ALL W CODES AUTHO	ORK SHALL ME S, MECHANICAL DRITIES EXERC	ET OR EXCEED THE LATEST REQUIREMENT OF THE NYS BUILDING CODE, ENERGY . CODE, ELECTRICAL CODE AND THE FIRE PREVENTION CODE AND OTHER ISING JURISDICTION OF THE WORK OF THIS PROJECT.
B.	COMP	LY WITH APPLIC	CABLE UTILITY COMPANY RULES AND REGULATIONS.
C.	COMP	LY WITH OCCUP	PATIONS SAFETY AND HEALTH ACT (OSHA) REQUIREMENTS.
D.	CONTI INSPE	RACTOR SHALL CTION CERTIFIC	PREPARE FILING DOCUMENTS, FILE, SECURE ALL REQUIRED PERMITS AND CATES AND TRANSMIT SAME TO THE OWNER AT THE COMPLETION OF THE WORK.
E.	ALL W DOCUI	ORK IS TO BE D MENT.	OONE IN ACCORDANCE WITH THE LATEST EDITION OF THE BUILDING STANDARDS
4.	NOTICE	TO BIDDERS	
A. B.	THE SI CONTI	PECIFICATIONS RACTOR SHALL CONFLICTS OC	AND DRAWINGS ARE INTENDED TO SERVE JOINTLY AS A BASIS UPON WHICH THE SUBMIT A CONTRACT PRICE FOR THE MATERIAL AND LABOR PROVISIONS. CCUR IN THE SPECIFICATIONS OR ON THE DRAWINGS. OR BETWEEN EITHER. THE
C.	ITEMS THE C	GREATER QUA	NTITY OR HIGHER COST SHALL BE PROVIDED. HALL PROVIDE ALL ITEMS OF LABOR OR MATERIALS SPECIFICALLY INDICATED, OR
_	REQUI	RED TO COMPL	ETE THE INTENDED INSTALLATIONS.
D.	THE C NOT O	ONTRACTOR SH CCUR.	HALL COORDINATE THE WORK IN ORDER THAT CONFLICTS IN SPACE LOCATIONS DO
E.	THE C ACCEI ADDIT	ONTRACTOR SI PTANCE, AND S IONAL COSTS T	HALL BE RESPONSIBLE FOR THE WORK WITH ITS COMPLETION AND FINAL HALL REPLACE ANY OF SAME WHICH MAY BE DAMAGED, LOST OR STOLEN, WITHOUT TO THE OWNER.
F.	ALL W		IED AREAS SHALL BE PERFORMED ON OTHER THAN NORMAL WORKING HOURS OR
G.	SCHEI THE C	ONTRACTOR SI	HALL PRICE THE WORK BASED ON ANY NECESSARY MODIFICATIONS OF THE EXISTING
H.	SYSTE THE C	MS. CONTRAC	TOR SHALL INCLUDE ALL NECESSARY OVERTIME WORK.
	SPECI COND	FICATIONS OF (	OTHER TRADES AND OF GENERAL CONSTRUCTION TRADES TO SATISFY ALL

AND THOROUGHLY BE ACQUAINTED WITH ALL EXISTING CONDITIONS AFFECTING THE PROPER

SHOP DRAWINGS OF DUCTWORK, PIPING LAYOUTS AND ELEVATIONS SHALL BE SUBMITTED FOR

APPROVAL TO THE ENGINEER PRIOR TO ERECTION OR PURCHASE. SUBMIT CATALOG CUTS FOR AIR

AIR BALANCING AND TESTING: SUBMIT AGENT'S QUALIFICATIONS AND REPORT AS SPECIFIED PRIOR TO

CONDITIONING UNITS, PIPE HANGERS, INSULATION, DIFFUSERS, PUMPS, VALVES, MISCELLANEOUS

ACCESSORIES, ETC. INCLUDING CERTIFIED EQUIPMENT MANUFACTURER'S PERFORMANCE DATA.

D. SUBMIT HANGING DETAILS WITH LOADING FOR ALL NEW EQUIPMENT TO STRUCTURAL ENGINEER FOR

E. CONTRACTOR SHALL PREPARE PRELIMINARY SHOP DRAWINGS SUITABLE FOR USE IN COORDINATING THE

INSTALLATION OF THE WORK.

PROCEEDING WITH THE WORK.

C. SHOP DRAWINGS SHALL BE 3/8"=1'-0" SCALE.

5. <u>SUBMITTALS</u>

REVIEW.

В

- O. SEAL ALL COLLAR TAPS TO DIFFUSERS AT DUCT CONNECTION, AT NECK CONNECTION, AND ALL NEW AND EXISTING DUCTS AT TRAVERSE AND LONGITUDINAL JOINTS WITH A WATER BASE SEALER. HARD DUCT CONNECTIONS TO SUPPLY AIR DIFFUSER COLLARS AND DUCTS SHALL BE SEALED WITH 3M CO. 800 SEALANT AND CLAMPED WITH STAINLESS STEEL "IDEAL" TYPE 52 CLAMP.
- P. ALL SEALANTS' VOLATILE ORGANIC COMPOUND (VOC) CONTENT SHALL CONFORM TO THE LIMITS SET BY THE CURRENT BAY AREA AIR QUALITY MANAGEMENT DISTRICT REGULATION 8, RULE 51 AND SHALL BE NO MORE THAN 250 GRAMS PER LITER.
- Q. MATERIALS FOR HANGERS & SUPPORTS, INCLUDING FASTENERS, ANCHORS, RODS, STRAPS TRIM AND ANGLES SHALL MATCH THE DUCT FURNISHED. R. ALL DUCT SIZES SHOWN ON THE CONTRACT DRAWINGS ARE CLEAR INSIDE DIMENSIONS.
- RADIUS ELBOWS SHALL HAVE A CENTER LINE RADIUS EQUAL TO 1-1/2 TIMES DUCT WIDTH. PROVIDE SPLITTER VANES IN RADIUS ELBOWS WHERE FULL RADIUS ELBOWS CAN NOT BE INSTALLED. SQUARE ELBOWS SHALL HAVE DOUBLE THICKNESS TURNING VANES UNLESS SINGLE THICKNESS VANES ARE CLEARLY INDICATED ON THE DRAWINGS.
- T. TRANSITIONS IN DUCTWORK SHALL BE MADE WITH A SLOPE NOT TO EXCEED A RATIO OF 1 TO 5. A 1 TO 7 SLOPE RATIO IS PREFERRED.
- U. HORIZONTAL DUCTS CAN BE SUPPORTED WITH HANGERS SECURED TO THE EXISTING STRUCTURE ABOVE. FOR DUCTS WITH A CROSS-SECTIONAL AREA 4 SQUARE FEET OR LESS, HANGERS SHALL BE NO MORE THAN 8 FEET APART; FOR DUCTS WITH A CROSS SECTIONAL AREA OF MORE THAN 4 SQUARE FEET BUT NOT OVER 10 SQUARE FEET; HANGERS SHALL BE NO MORE THAN 6 FEET APART. V. ALL LOW PRESSURE DUCTWORK SHALL BE CONSTRUCTED WITH 2" WC CLASS IN ACCORDANCE WITH THE
- LATEST SMACNA HVAC DUCT CONSTRUCTION STANDARDS. W. ALL MEDIUM PRESSURE DUCTWORK SHALL BE CONSTRUCTED WITH 4" WC CLASS IN ACCORDANCE WITH THE LATEST SMACNA HVAC DUCT CONSTRUCTION STANDARDS.
- X. ASHRAE GUIDE LATEST EDITION, FUNDAMENTALS AND EQUIPMENT SHALL BE UTILIZED FOR REFERENCE. Y. TRANSVERSE DUCTS IN JOINTS UP TO 40 INCHES SHALL BE OF SLIP TYPE WITH INTERIOR SLIP FACED IN
- THE DIRECTION OF AIR FLOW. JOINTS IN DUCTS OVER 40 INCHES SHALL BE 1-1/2 x 1/8" ANGLE IRONS BOLTED WITH 1/4" MACHINE BOLTS. Z. MOTORIZED DAMPERS SHALL BE CLASS 1 LOW LEAKAGE AND LOW PRESSURE DROP WITH AIRFOIL
- BLADES. LEAK RATE SHALL NOT EXCEED 4 CFM/SF AT 1" W.C. BB. VOLUME DAMPERS CONSTRUCTION SHALL BE QUADRANT TYPE, MINIMUM 16 GAUGE, GALVANIZED STEEL, IN ACCORDANCE WITH THE APPLICABLE REQUIREMENTS OF THE SMACNA MANUAL, EXCEPT PROVIDE BEARING AT ONE END OF DAMPER ROD AND QUADRANT. INCLUDE APPROVED LEVER OPERATING AND LOCKSCREW LOCKING DEVICES, MOUNTED AT OTHER END, AND INSTALLED IN ACCESSIBLE LOCATIONS.
- FOR INSULATED DUCTS, QUADRANTS SHALL BE MOUNTED ON A COLLAR TO CLEAR INSULATION. CC. ALL ACCESS DOORS SHALL BE AS PER SMACNA STANDARDS. PROVIDE ACCESS DOORS IN INSULATED DUCTS OF INSULATED DOUBLE PANEL CONSTRUCTION, NOT LESS THAN 20 GAUGE, And GALVANIZED STEEL. PROVIDE ACCESS DOORS IN UN-INSULATED DUCTS OF SINGLE PANEL CONSTRUCTION NOT LESS THAN 18 GAUGE, GALVANIZED STEEL. PROVIDE ALL ACCESS DOORS WITH SPONGE RUBBER GASKETS AROUND THEIR ENTIRE PERIMETER.
- DD. WIRE MESH SCREEN (WMS): NO. 16 USSG, 3/4" SQUARE MESH, IN ONE IN. WIDE GALVANIZED STEEL ENCLOSING FRAME. FLANGED DUCT OPENING TO RECEIVE FRAME.
- 10. VIBRATION ISOLATION
- A. ALL ROTATING, REVOLVING OR RECIPROCATING EQUIPMENT, DUCTS, AND PIPING, SHALL BE FURNISHED WITH VIBRATION ISOLATORS, TO PREVENT THE TRANSMISSION OF OBJECTIONABLE NOISES, SOUND OR VIBRATIONS TO THE OCCUPIED SPACES AND TO THE BUILDING STRUCTURES.
- B. VIBRATION ISOLATORS FOR CEILING SUPPORTED EQUIPMENT SHALL HAVE A MAXIMUM LATERAL MOTION UNDER EQUIPMENT START-UP OR SHUTDOWN CONDITIONS OF 1/4". MOTIONS IN EXCESS SHALL BE RESTRAINED BY SPRING TYPE MOUNTINGS.
- C. VIBRATION ISOLATOR SHALL BE PROVIDED BY EITHER OF THE FOLLOWING MANUFACTURERS: MASON INDUSTRIES, VIBRATION ISOLATION CO. OR CONSOLIDATED KINETICS CO.
- D. VIBRATION ISOLATORS SHALL BE SELECTED TO ACHIEVE 95% ISOLATION AT THE DESIGN ROTATIONAL SPEED OF THE AC UNITS SPECIFIED. PROVIDE SPRING ISOLATORS FOR EACH AC UNIT.
- E. CEILING-HUNG FANS AND EQUIPMENT: 1) PROVIDE SPRING HANGER ROD ISOLATORS. STEEL COMPRESSION SPRING AND NEOPRENE SOUND PAD WITHIN A STEEL RETAINER BOX. SIMILAR TO MASON INDUSTRIES, INC. TYPE SLE, SLR, OR PCHS.
- 2) ONE (1) IN. MINIMUM STATIC DEFLECTION, 1/2 IN. MINIMUM RESERVE DEFLECTION, FACTORY PRE LOADED TO 75% OF A RATED LOAD.
- 3) PROVIDE SUPPLEMENTAL STEEL AS REQUIRED WHERE EQUIPMENT OR STRUCTURE CANNOT SUPPORT POINT LOADS.

## 11. EQUIPMENT SUPPORTING REQUIREMENTS

- A. L SUPPORTING STEEL SHALL BE DESIGNED AND APPROVED BY A LICENCED STRUCTURAL ENGINEER.
- B. PATCH EXISTING BEAM FIREPROOFING WHERE REMOVED.
- C. ALL NUTS SHALL HAVE LOCK WASHERS.
- D. CONTRACTOR SHALL VERIFY AND FIELD MEASURE EXISTING CONDITIONS. E. PAINT ALL STEEL.

## 12. HVAC INSULATION

## A. GENERAL

- 1) DESIGN AND PERFORMANCE OF COMPONENTS AND METHODS SPECIFIED HEREIN SHALL COMPLY WITH THE APPLICABLE PROVISIONS OF THE CODES, STANDARDS, AND RECOMMENDATIONS OF THE ENTITIES LISTED BELOW:
- a) 2016 NEW YORK STATEENERGY CONSERVATION CODE (NYCECC)
- b) 2014 NEW YORK STATEBUILDING CODE (BC)
- c) 2014 NEW YORK STATEMECHANICAL CODE (MC)
- d) AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)
- e) NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)
- f) UNDERWRITERS LABORATORIES INC. (UL)
- 2) INSULATION SHALL BE APPLIED TO PIPING, DUCT AND EQUIPMENT OF MATERIALS AS SPECIFIED HEREIN AND FOR APPLICABLE SYSTEMS OF THIS PROJECT. 3) ALL INSULATION, INCLUDING JACKETS OR FACINGS, ADHESIVES, MASTICS, CEMENTS, TAPES AND GLASS CLOTH FOR FITTINGS SHALL HAVE COMPOSITE FIRE AND SMOKE HAZARD RATINGS AS
- TESTED BY ASTM E 84, NFPA 225, AND UL 723 PROCEDURES, NOT EXCEEDING A "FLAME SPREAD" OF 25 AND "SMOKE DEVELOPED" OF 50. 4) NOTE THAT EQUIPMENT CASINGS WHICH HAVE INTERNAL AND ACOUSTICAL INSULATION NEED NOT
- BE INSULATED AT THE EXTERIOR SURFACE. 5) VALVES, FITTINGS, STRAINERS, AND OTHER PIPING APPURTENANCES SHALL BE INSULATED TO
- MATCH THOSE OF THE SYSTEMS TO WHICH THEY ARE CONNECTED. 6) ALL NEW AND EXISTING INSULATION AND EXTERIOR JACKETS THAT ARE DAMAGED SHALL BE
- REPLACED WITH NEW MATERIAL AS SPECIFIED, TO THE SATISFACTION OF THE ENGINEER. 7) INSULATION MATERIALS SHALL BE PRODUCTS OF ONE OF THE FOLLOWING MANUFACTURERS:
- a) MANVILLE CORP.
- b) CERTAIN TEED CORP./INSULATION GROUP
- c) OWENS CORNING FIBERGLASS CORP.
- B. DUCT INSULATION
- ALL SUPPLY, RETURN, AND EXHAUST AIR DUCTS INCLUDING EXISTING DUCTS IN WORK AREA SHALL BE EXTERNALLY INSULATED.
- 2) EXTERNAL INSULATION SHALL BE DUCT WRAP WITH A VAPOR-PROOF JACKET OF ALUMINUM FOIL OR FOIL-SCRIM-KRAFT PAPER HAVING UL LABEL. DENSITY OF WRAP SHALL BE 2 LB. /CUBIC FOOT.
- 3) THICKNESS OF THE INSULATION SHALL BE SUFFICIENT TO ACHIEVE R-6 MINIMUM RATING FOR ALL SUPPLY DUCTS. ALL INSULATION SHALL BE UL-LABELED FOR FIRE AND SMOKE RATINGS (NOT TO EXCEED FLAME SPREAD OF 25 AND SMOKE DEVELOPED OF 50), AND ALL ACCESSORIES SHALL ALSO BE LABELED.
- 4) INSULATION SHALL BE THE PRODUCT OF A RECOGNIZED MANUFACTURER OF SUCH MATERIALS, WITH COMPLETE CATALOG LISTING R VALUES, DENSITIES, AND INSTALLATION DETAILS.
- 5) DUCT WRAP SHALL BE INSTALLED IN A NEAT AND SECURE MANNER. WITH ALL EDGES COVERED WITH APPROVED METALLIC DUCT TAPE TO VAPOR-PROOF THE ENTIRE DUCT. LAPS AND JOINTS SHALL BE SECURED WITH INSULATION STAPLES AND THEN COVERED WITH APPROVED TAPE.
- 6) FLEXIBLE FIBERGLASS BLANKET SHALL HAVE FACTORY APPLIED FOIL-SKRIM-KRAFT (FSK) FACING SIMILAR TO MANVILLE MICROLITE. WRAP INSULATION TIGHTLY ON DUCT WITH ALL TRANSVERSE JOINTS BUTTED AND LONGITUDINAL JOINTS OVERLAPPED A MINIMUM OF TWO INCHES.
- 7) PROVIDE DUCT INSULATION IN ACCORDANCE WITH TABLE BELOW:

PIPE SIZE 1/2" TO 1-1/4" 6 FT. O.C. 2-1/2" TO 4" 6 FT. O.C.

SEAMS, JOINTS, TAKE OFFS FOR ALL SUPPLY, RETURN, AND EXHAUST DUCTWORK AND PLENUMS WITH APPROVED DUCT MASTIC SEALANT REGARDLESS OF SMACNA PRESSURE CLASSIFICATIONS AND STANDARDS. ALL DUCTWORK UPSTREAM OF VAV BOXES SHALL BE CONSTRUCTED TO SMACNA 4" W.G.

J. SPACE ALL BRANCHES AND TAKE-OFFS SHALL BE EQUIPPED WITH VOLUME CONTROLLING DEVICES.

K. SUPPORT HORIZONTAL DUCTS WITH HANGERS SECURED TO STRUCTURAL STEEL OR CONCRETE SLAB

N. LOW PRESSURE DUCTWORK AND FITTINGS SHALL BE MADE TIGHT FOR MINIMUM AIR LEAKAGE (SHALL

- MINIMUM DUCT INSULATION R-VALUE UNCONDITIONED SPACE EXTERIOR PLENUM R-6
- 8) INSULATION R-VALUES, MEASURED IN (H·FT2·°F)/BTU, ARE FOR THE INSULATION AS INSTALLED AND DO NOT INCLUDE FILM RESISTANCE. THE REQUIRED MINIMUM THICKNESSES DO NOT CONSIDER WATER VAPOR TRANSMISSION AND POSSIBLE SURFACE CONDENSATION. WHERE EXTERIOR WALLS ARE USED AS PLENUM WALLS, WALL INSULATION SHALL BE AS REQUIRED BY THE MOST RESTRICTIVE CONDITION. INSULATION RESISTANCE MEASURED ON A HORIZONTAL PLANE IN ACCORDANCE WITH ASTM C518 AT A MEAN TEMPERATURE OF 75°F AT THE INSTALLED THICKNESS. C. INSULATION OF PIPES
  - INSULATION FOR ALL PIPING, INCLUDING HOT WATER, STATEWATER, DRAIN, CONDENSATE DRAIN PIPING, CONDENSER WATER SUPPLY/RETURN, AND CHILLED WATER SUPPLY/RETURN PIPING: a) FIBERGLASS INSULATION SIMILAR TO TMC MICRO-LOCK A, 4# DENSITY WITH VAPOR BARRIER LAPPED AND SEALED USING B-F 81-99. PROVIDE THICKNESS AS FOLLOWS: INSULATE STATEWATER, DRAIN, AND CONDENSATE DRAIN PIPES WITH 1" THICK INSULATION; INSULATE ALL HOT WATER, CONDENSER WATER, AND CHILLED WATER PIPES WITH 2" THICK INSULATION.
  - b) INSULATION TO BE INSTALLED PER MANUFACTURER'S RECOMMENDATION.
  - c) AT PIPE SUPPORT POINTS BELOW HANGERS INSTALL SECTION OF RIGID TYPE. d) ALL FITTINGS, FLANGES AND VALVES TO BE COVERED WITH ONE PIECE J-M ZESTON COVERS.
  - e) FLAME SPREAD RATING AND SMOKE DEVELOPED RATING SHALL NOT TO EXCEED 25/50 RESPECTIVELY PER U.L. REQUIREMENTS. 2) ALL ADHESIVES' VOLATILE ORGANIC COMPOUND (VOC) CONTENT SHALL CONFORM TO THE LIMITS
- SET BY THE CURRENT SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT (SCAQMD) RULE #1168 AND SHALL BE NO MORE THAN 250 GRAMS PER LITER. 13. PIPING & ACCESSORIES

A. PIPE:

H. STRAINER:

BRANCHES.

- PIPE SHALL BE NEW, FREE FROM SCALE OR RUST, AND OF MATERIAL AND WEIGHT SPECIFIED. EACH LENGTH OF PIPE SHALL BE PROPERLY MARKED AT THE MILL FOR PROPER IDENTIFICATION WITH NAME OR SYMBOL OF MANUFACTURER. CHILLED WATER PIPING, TERTIARY CHILLED WATER PIPING SYSTEM VALVES, JOINTS, FITTINGS, ACCESSORIES SHALL BE MINIMUM 300 PSI RATED.
- PIPING SHALL BE SEAMLESS STEEL ASTM A-53B AS SPECIFIED OR COPPER PIPING SHALL BE HARD TEMPERED K TYPE WITH WROUGHT COPPER BRAZING FITTINGS, FOR PARTICULAR SERVICE SPECIFIED BELOW, CONFORMING TO ASTM B-88 ANSI/ASME B16.22 AS MANUFACTURED BY CHASE-ANACONDA.
- PIPING MATERIALS AND FITTINGS SHALL BE IN ACCORDANCE WITH THE FOLLOWING:

	PIPING		
SYSTEM	SCHEDULE	FITTINGS	
CONDENSATE DRAIN	TYPE 'L' COPPER	WROUGHT COPPER SOLDER JOINT 95%/ ANTIMONY ANSI B16	2 /5% 5.18
CHW, HW CONDENSER WATER 2 1/2" & DOWN	TYPE K COPPER PIPE CONFORMING TO ASTM B-88	WROUGHT COPPER SILVER BRAZING ANSI B16.22	1
CONDENSER WATER 3" & UP	BLACK STEEL PIPE CONFORMING TO ASTM A53 SCHEDULE 80 GRADE B	WELDED, 300 PSI RA	ATED
VALVES			
TYPE	SIZE		PRESSURI
BALL	21/2" & DOWN		300 PSI
GATE	21/2" & DOWN		300 PSI
CONDENSER WATER 21/2" & DOWN	CONFORMING TO ASTM B-88	SILVER BRAZING ANSI B16.22	
CONDENSER WATER 3" & UP	BLACK STEEL PIPE CONFORMING TO ASTM A53 SCHEDULE 80 GRADE B	WELDED	
<ul><li>B. PROVIDE A CLEANOUT IN</li><li>C. VENT PIPING AT ALL HIGH</li></ul>	CONDENSATE DRAIN LINE PIPING A	IT EVERY CHANGE IN	DIRECTION.

- D. TEST REQUIREMENTS (CONDENSER WATER, CHILLED WATER)
- 1) OPERATING PRESSURE CONDENSER WATER: 250 PSIG
- 2) OPERATING TEMPERATURE CHILLED WATER 45°F TO 55°F
- 3) OPERATING TEMPERATURE CONDENSER: 75°F. TO 85°F.
- 4) HYDROSTATIC TEST PROCEDURE 1.5 x OPERATING PRESSURE DURATION OF TEST: TWO (2) HOURS.
- E. ISOLATE EQUIPMENT, CONTROLS INSTRUMENTS AND VALVES FORM THE PIPING SYSTEM DURING HYDROSTATIC TESTS.
- F. THERMOMETERS:
  - 1) PROVIDE RED READING MERCURY THERMOMETERS IN THE SUPPLY AND RETURN PIPING AS SHOWN ON THE DRAWINGS HAVING A 9" SCALE, ALUMINUM CASE AND SEPARABLE SOCKETS, MOUNTED AS SHOWN ON THE DRAWINGS, SO LOCATED AS TO BE READILY READ FROM THE FLOOR
- 2) THERMOMETERS SHALL HAVE A 30 DEG. F 180 DEG. F RANGE FOR CONDENSER WATER AND SHALL BE AS MANUFACTURED BY WEKSLER INSTRUMENT CO., OR APPROVED EQUAL. PRESSURE GAUGES PRESSURE GAUGES TO BE PROVIDED AS SHOWN ON THE DRAWING SHALL BE OF THE BOURDON TUBE SPRING TYPE WITH 4-1/2" DIAL SIZES. G. PRESSURE GAUGES:
- GAUGES SHALL HAVE BLACK ALUMINUM CASES WITH BLACK NUMBERS ON WHITE BACKGROUND. THE GAUGES SHALL BE AS MANUFACTURED BY WEKSLER INSTRUMENT CO., ASHCROFT OR APPROVED EQUAL.
- 1) STRAINERS SHALL BE SIMILAR AND EQUAL TO THOSE MANUFACTURED BY MUELLER STEAM SPECIALTY CO. SCREWED "Y" STRAINERS FOR CONDENSER WATER PIPING SHALL BE 400 PSIG @ 150°F WOG RATED.
- 2) THE SCREENS FOR THE STRAINERS SHALL BE STAINLESS STEEL.
- 3) STRAINER SHALL BE PROVIDED WITH CAPPED BLOWDOWN VALVES. ARRANGE PIPING TO EQUIPMENT TO PERMIT SERVICING OR REMOVAL WITHOUT DISMANTLING PIPE
- J. NEW PIPING IS TO BE INTERNALLY CLEANED PRIOR TO CONNECTION TO WATER SYSTEM. K. WHERE CHANGES OF SIZE OCCUR IN HORIZONTAL PIPING, PROVIDE ECCENTRIC TYPE REDUCING FITTINGS TO ATTAIN PROPER DRAINAGE AND VENTING OF PIPELINE.
- L. PROVIDE FOR THE EXPANSION AND CONTRACTION OF PIPING SYSTEMS.
- M. PIPE SUPPORTS AND HANGERS 1) ALL SUPPORTS AND PARTS SHALL CONFORM TO THE LATEST REQUIREMENTS OF ANSI B 31.9 AS APPLICABLE FOR PRESSURE PIPING AND MSS STANDARD PRACTICE SP-58 SP-69.
  - 2) DO NOT HANG PIPING FROM OTHER PIPING. IN NO CASE SHALL HANGERS BE SUPPORTED BY MEANS OF VERTICAL EXPANSION BOLTS.
  - 3) IF REMOVAL OF EXISTING FIREPROOFING IS REQUIRED FOR INSTALLATION PURPOSES, SUCH REMOVAL SHALL BE PERFORMED BY THE CONTRACTOR AND SHALL BE KEPT TO A MINIMUM. THE CONTRACTOR SHALL REPLACE ALL REMOVED FIREPROOFING WITH NEW FIREPROOFING TO THE SATISFACTION OF THE ENGINEER AND AT NO ADDITIONAL COST TO THE AUTHORITY.
  - 4) SUPPORT HANGERS FROM BUILDING STEEL FRAMING WITH AN APPROVED TYPE CLAMP INSERT. PROVIDE ANY ADDITIONAL STEEL SUPPORTS BETWEEN EXISTING FRAMING MEMBERS AS MAY BE REQUIRED. NO HANGERS SHALL BE SUPPORTED FROM METAL DECK FLOOR. WELDING TO THE BUILDING STRUCTURE MEMBERS WILL NOT BE PERMITTED UNLESS APPROVED BY THE BUILDING MANAGEMENT.
  - 5) PIPE HANGERS RODS, INSERTS AND CLAMPS SHALL BE UL APPROVED FOR THEIR RESPECTIVE
  - 6) UNLESS OTHERWISE SPECIFICALLY APPROVED, HANGER SIZE AND SPACING SHALL BE AS FOLLOWS:
- MAX. HANGER SPACING MIN. ROD SIZE 3/8" 1-1/4" TO 2-1/2" 6 FT. O.C. 1/2"
  - 3/4"
- 7) THE ABOVE HANGER SPACINGS APPLY TO STRAIGHT RUNS OF PIPE ONLY.

- 8) AT POINTS WHERE VALVES, SPECIALTIES OR BRANCH CONNECTIONS ARE LOCATED, ADDITIONAL HANGERS, OR SUPPORTS SHALL BE USED TO PROPERLY SUPPORT THE LOAD.
- HANGERS AND SUPPORTS SHALL BE MANUFACTURED BY GRINNELL CORP, CARPENTER & PATTERSON INC., MICHIGAN HANGER CO. INC., OR AN APPROVED EQUAL.
- 14. INSTALLATION OF PIPINO
- A. INSTALL ALL PIPING AS SHOWN ON PLANS. PROVIDE DI-ELECTRIC FITTINGS WHERE DIS-SIMLIAR METAL PIPING JOIN, STEEL PIPING TO COPPER PIPING JOIN.
- B. ARRANGE PIPING TO EQUIPMENT TO PERMIT SERVICING OR REMOVAL WITHOUT DISMANTLING PIPE BRANCHES.
- C. FURNISH AND INSTALL PIPING HANGERS, SUPPORTS, ANCHORS AND GUIDES HAVING A BUILT-IN SAFETY FACTOR OF FIVE (5) IN CONFORMANCE TO THE LATEST ANSISME CODE FOR PRESSURE PIPING. ALL HANGER SPECIALTIES SHALL BE FURNISHED WITH ZINC CHROMATE PRIME PAINT FINISH.
- D. PIPE AND VALVE IDENTIFICATION PROVIDE AND AFFIX A SET OF APPROVED ADHESIVE BANDS IDENTIFYING THE SYSTEM AND
- DIRECTION OF FLOW. PROVIDE BANDS EVERY 15'-0", AT EVERY CHANGE IN DIRECTION AND AT EVERY BRANCH TEE.
- 3) EACH SET SHALL CONSIST OF ONE BAND ON WHICH THE NAME OF THE SERVICE AND THE PIPE SIZE ARE PRINTED IN LETTERS NOT LESS THAN ONE (1) INCH HIGH.
- 4) ADHESIVE BANDS SHALL BE W.H. BRADY CO. "QUICK-LABEL", OR AN APPROVED EQUAL.
- 15. SLEEVES AND ESCUTCHEONS FOR PIPING
- A. PROVIDE SLEEVES FOR PIPES PASSING THROUGH WALL PARTITIONS. PIPE SLEEVES THROUGH INTERIOR WALLS AND PARTITIONS #18 GAGE GALVANIZED STEEL.
- B. SPACE BETWEEN PIPE SHALL AND SLEEVE SHALL BE CAULKED WITH INCOMBUSTIBLE ROPE OR MINERAL WOOL TO WITHIN 1/2" OF WALL FACES AND FILLED WITH CAULKING COMPOUND TO WALL FACES. C. FURNISH AND INSTALL ESCUTCHEON PLATES ON ALL EXPOSED PIPING THROUGH WALLS OR FLOORS AND
- HELD IN PLACE WITH SCREWS OR BE INTERNAL SPRING TENSION. D. SLEEVES SHALL HAVE AN INTERNAL DIAMETER OF AT LEAST 1" LARGER THAN THE OUTSIDE PIPE SIZE
- DIAMETER. WHERE PIPES PASS THROUGH CONSTRUCTION REQUIRED TO HAVE A FIRE RESISTANCE RATING, THE SPACE BETWEEN THE PIPE AND ITS SLEEVE SHALL NOT EXCEED 1/2 INCH AND SHALL BE COMPLETELY PACKED WITH MINERAL WOOL OR EQUIVALENT NON-COMBUSTIBLE MATERIAL AND SHALL BE CLOSED OFF BY CLOSE FITTING 16 GAUGE BLACK METAL ESCUTCHEONS ON BOTH SIDES OF THE CONSTRUCTION.
- 16. OVERLFOW DRAIN PANS
- A. DRAIN PANS SHALL BE INSTALLED UNDER ALL CEILING MOUNTED AIR HANDLER UNITS. ALL PIPING AS SHOWN ON PLANS.
- B. MAKE PANS 4" LARGER THAN UNIT AND CONDENSATE PUMP ON ALL FOUR (4) SIDES.
- C. MAKE UPSTANDING SIDES 3" WITH 1/2" HEM TURNED DOWN OUTSIDE OF PAN. D. USE 16 GA. STAINLESS STEEL SHEETMETAL WITH SOLDERED CORNERS FOR WATER TIGHTNESS.
- 17. WATER ALARM SYSTEMS
- A. USE LIEBERT LT-410 OR EQUAL WATER LEAK DETECTING SENSOR.
- B. LOCAL ALARM SHALL SOUND UPON MOISTURE DETECTION, SHUT DOWN AC UNIT AND NOTIFY BMS. C. ALL FIELD WIRING WORK INCLUDING INTERLOCKING WIRING IN CONNECTION WITH THE ELECTRICAL CONTROL SYSTEM SHALL BE PROVIDED BY THE CONTRACTOR.
- 18. SUPPLY AIR TERMINAL UNITS (VAV)
- A. PROVIDE KRUEGER, TITUS, OR PRICE VARIABLE/CONSTANT AIR VOLUME TERMINAL REHEAT UNITS AS SHOWN ON THE PLANS AND SPECIFIED HEREIN WITH FACTORY INSTALLED CONTROLS. ALL BOXES, INSULATION SHALL BE HOSPITAL GRADE.
- B. TERMINALS SHOULD BE CERTIFIED UNDER THE ARI STANDARD 880-94 CERTIFICATION PROGRAM AND CARRY THE ARI SEAL. C. THE TERMINAL CASING SHALL BE MINIMUM TWENTY-TWO (22) GAUGE GALVANIZED STEEL, INTERNALLY
- LINED WITH A NON-POROUS, SEALED LINER WHICH COMPLIES WITH UL 181 AND NFPA 90A. INSULATION SHALL BE ONE-INCH THICK, FOUR (4) POUND PER CUBIC FOOT DENSITY FIBERGLASS OR CLOSED-CELL FLEXIBLE ELASTOMETRIC.
- D. ALL FIBERGLASS EDGES MUST BE SEALED FROM THE AIRSTREAM USING MECHANICALLY BONDED METAL BARRIER STRIPS. LINERS MADE OF MYLAR. TEDLAR. SILANE. OR WOVEN FIBERGLASS CLOTH ARE NOT ACCEPTABLE. INSULATION SHALL BE EQUIVALENT TO TITUS STERI-LOC, ALUMINUM FOIL FACED INSUALTION, OR DOUBLE WALL LINING. THE CASING SHALL BE CONSTRUCTED TO HOLD LEAKAGE TO THE MAXIMUM VALUES SHOWN IN THE
- DAMPER SHALL BE HEAVY GAUGE STEEL WITH SHAFT ROTATING IN DELRIN OR BRONZE OILITE SELF-LUBRICATING BEARINGS. NYLON BEARINGS ARE NOT ACCEPTABLE. SHAFT SHALL BE CLEARLY MARKED ON THE END TO INDICATED DAMPER POSITION. STICKERS OR OTHER REMOVABLE MARKINGS ARE NOT ACCEPTABLE. THE DAMPER SHALL INCORPORATE A MECHANICAL STOP TO PREVENT OVERSTROKING, AND A SYNTHETIC SEAL TO LIMIT CLOSE-OFF LEAKAGE.
- F. ACTUATORS SHALL BE CAPABLE OF SUPPLYING AT LEAST THIRTY-FIVE (35) INCH POUND OF TORQUE TO THE DAMPER SHAFT, AND SHALL BE MOUNTED EXTERNALLY FOR SERVICE ACCESS. TERMINALS WITH INTERNAL ACTUATOR MOUNTING OR LINKAGE CONNECTION MUST INCLUDE GASKETED ACCESS PANEL, REMOVABLE WITHOUT DISTURBING DUCTWORK. CASING WITH ACCESS PANEL SHALL BE CONSTRUCTED TO HOLD CASING LEAKAGE TO THE MAXIMUM VALUES PREVIOUSLY SPECIFIED. PNEUMATIC ACTUATORS SHALL BE PROVIDED AND COORDINATED TO EFFECT SPECIFIED PERFORMANCE AND UNIT INSTALLATION. CONTROL OF TERMINAL UNIT SHALL BE PROVIDED UNDER ANOTHER SECTION OF THE SPECIFICATION. INLET DAMPER AND PNEUMATIC MOTOR OPERATOR SHALL PROVIDE FULL SHUT-OFF OF AIR VOLUME.
- G. AT AN INLET VELOSTATEOF 2000 FEET PER MINUTE, THE DIFFERENTIAL STATIC PRESSURE REQUIRED TO OPERATE ANY TERMINAL SIZE SHALL NOT EXCEED
- 1) EIGHTEEN HUNDREDTHS (0.18) INCH WATER GAUGE FOR THE BASIC TERMINAL, OR 2) TWENTY THREE HUNDREDTHS (0.23) INCH WATER GAUGE FOR THE TERMINAL WITH INTEGRAL ATTENUATOR.
- H. SOUND RATING FOR THE TERMINAL SHALL GENERALLY NOT EXCEED THIRTY (30) NC AT PLUS 1.5 INCH STATIC PRESSURE. SOUND PERFORMANCE SHALL BE ARI CERTIFIED WITH SOUND RATINGS TESTED AT POWER LEVELS 10-12 WATTS AND SHALL NOT EXCEED VALUES SCHEDULED FOR INDIVIDUAL INSTALLED TERMINAL UNITS. THE UNIT MANUFACTURER SHALL FURNISH CERTIFIED SOUND POWER LEVELS FOR BOTH DISCHARGE SOUND AND CASING RADIATED SOUND, TESTED IN ACCORDANCE WITH ASHRAE STANDARD 36-72. CERTIFIED SOUND POWER LEVELS SHALL BE FOR TERMINALS ACTUALLY INSTALLED ON THE PROJECT INCLUDING EFFECTS OF LINING MATERIAL. SOUND DATA BASED ON PRIOR ASHRAE STANDARDS WILL NOT BE ACCEPTABLE. THE TESTS SHALL BE CONDUCTED IN AN ADC APPROVED SOUND FACILITY. THE DATA SHALL INCLUDE THE SECOND THROUGH SIXTH OCTAVE BANDS FOR ALL UNIT SIZES AND INLET STATIC PRESSURES. ALL ATTENUATION FACTORS SHALL BE CLEARLY DEFINED. PROVIDE ADDITIONAL APPROVED ATTENUATORS AS REQUIRED TO ACHIEVE THE DRAWING SCHEDULED VALUES BASED ON THE INSTALLED CONDITION OF THE TERMINALS. MANY OF ATTENUATION FACTORS COMMONLY USED IN THE RATING OF TERMINAL UNITS ARE NOT APPLICABLE AND SHALL NOT BE CONSIDERED.
- EACH TERMINAL UNIT SHALL BE FIELD TESTED AT THE DESIGN AIR VOLUMES. WHERE FIELD TESTS INDICATE VOLUME GREATER THAN PLUS OR MINUS TEN (10) PERCENT OF DESIGN VALUE, THE TERMINAL UNIT SHALL BE READJUSTED OR RECALIBRATED BY THE BALANCING CONTRACTOR TO ACHIEVE THE DESIGN VALVES. UNITS WHICH CAN NOT ACHIEVE THE DESIRED RESULTS SHALL BE REMOVED FROM THE PROJECT AND NEW UNITS PROVIDED AT NO ADDITIONAL EXPENSE TO THE OWNER.
- J. CONTROL SPECIFICATIONS:
- 1) THE TERMINALS SHALL BE EQUIPPED WITH PRESSURE INDEPENDENT PNEUMATIC CONTROLS WHICH CAN BE RESET TO MODULATE AIRFLOW BETWEEN ZERO AND THE MAXIMUM CATALOGED CUBIC FEET PER MINUTE. MAXIMUM AIRFLOW LIMITERS ARE NOT ACCEPTABLE.
- 2) THE TERMINALS SHALL INCORPORATE MULTIPOINT, CENTER-AVERAGING VELOSTATESENSORS. A MINIMUM OF FOUR (4) MEASURING PORTS MUST BE PARALLEL TO THE TAKE-OFF POINT FROM THE SENSOR. SENSORS WITH MEASURING PORTS IN SERIES ARE NOT ACCEPTABLE. THE SENSOR MUST PROVIDE A MINIMUM DIFFERENTIAL PRESSURE SIGNAL OF 0.03 INCH WATER GAUGE AT INLET VELOCITIES OF 500 FEET PER MINUTE. THE SENSOR MUST PROVIDE CONTROL SIGNAL ACCURACY OF PLUS OR MINUS FIVE (5) PERCENT WITH THE SAME SIZE INLET DUCT AT ANY INLET CONDITION.
- VELOSTATECONTROLLERS SHALL HAVE A CONSTANT RESET SPAN REGARDLESS OF MINIMUM AND MAXIMUM CUBIC FEET PER MINUTE SETPOINTS. SPAN MUST BE ADJUSTABLE FROM THREE (3) TO 'EN (10) POUNDS PER SQUARE INCH. RESET START POINT MUST BE ADJUSTABLE FROM THREE (3) TO FIFTEEN (15) POUNDS PER SQUARE INCH. EACH CONTROLLER SHALL BE FIELD CONVERTIBLE FOR DIRECT OR REVERSE ACTING WITHOUT RECALIBRATION. ACCEPTABLE CONTROLLERS ARE KREUTER CSC 3004 OR KREUTER CSC 3011 WITH REVERSING RELAY AND SELECTOR SWITCH. TOTAL AIR CONSUMPTION FOR CONTROLS SHALL NOT EXCEED 1.2 STANDARD CUBIC FEET PER HOUR, SINGLE DUCT AT TWENTY (20) POUNDS PER SQUARE INCH GAUGE. CONTROL DEVICES
- CONTROL DEVICES SHALL BE FACTORY SET FOR THE SCHEDULED MINIMUM AND MAXIMUM FLOW RATES. FLOW MEASURING TAPS AND FLOW CURVES SHALL BE SUPPLIED WITH EACH TERMINAL FOR FIELD BALANCING AIR FLOW. ALL PNEUMATIC TUBING SHALL BE UL LISTED FIRE RETARDANT TYPE. EACH TERMINAL SHALL BE EQUIPPED WITH LABELING SHOWING UNIT LOCATION, SIZE,

SHALL BE PROVIDED BY THE TERMINAL MANUFACTURER.

CCOPYRIGHT - 2020 ARRAY-ARCHITECTS P.C.

DWG OF This document is a copyright protected instrument of service, property of Array Architects and licensed for use in the title project only. Reproduction or use of this document without written permission of Array Architects is illegal and will be prosecuted under the law.

SHEET	NO.	
M-	002	.00

**DATE:** 7/23/2020 CON/REF No. CONTRACT No. SCALE: As indicated **PROJECT No.** 12384 **CHECKED:** Checker DRAWN: LGP

SHEET TITLE: **MECHANICAL** SPECIFICATIONS SHEET - 1

SEAL:

1	CD SUBMISSION	6-18-21	
NO.	DESCRIPTION	DATE	
<b>REVISIONS/ISSUES</b>			



155 WHITE PLAINS ROAD TARRYTOWN, NY 10591

# **PROJECT:** NEW MRI

**OWNER:** COLUMBIA DOCTOR'S TARRYTOWN

COST CONCEPTS, INC. 104 BEDELL PLACE MELVILLE, NY, 11747 PHONE: 631.423.7960

ESTIMATING

PHONE: 646.674.6100

360 WEST 31ST STREET, 14th FL. NEW YORK, NY 10001

## MEP ENGINEER

LORING CONSULTING ENGINEERS, INC.

PHONE: 570.496.7020

REUTHER + BOWEN 326 WARD STREET DUNMORE, PA 18512

STRUCTURAL ENGINEER

**NEW YORK, NY. 10016** 

**CONSULTANTS:** 

212-689-3110



D

J

В





<ul> <li>MINIMUM AND MAXIMUM CUBIC FEET PER MINUTE SETPOINTS, DAMPER FAIL POSITION, AND THERMOSTAT ACTION. PNEUMATIC ACTUATORS SHALL BE PROVIDED BY THE TERMINAL MANUFACTURER.</li> <li>5) BOX CONTROLLERS IN CRITICAL SPACES WITH SELF CALIBRATION SHALL NOT INTERRUPT AIR FLOW.</li> </ul>	<ul> <li>SEALED. NO INTERNAL PIPING, BRAZING, DEHYDRATION OR CHARGII</li> <li>THE CONDENSER COIL SHALL BE CONSTRUCTED OF COPPER TUBE A</li> <li>THE CONDENSING UNIT SHALL BE DESIGNED TO OPERATE AT A SOU</li> <li>EASY ACCESS SHALL BE AFEORDED TO ALL SERVICEABLE PARTS BY</li> </ul>
K. HOT WATER REHEAT COILS SHALL BE ENCLOSED IN A MINIMUM TWENTY (20) GAUGE GALVANIZED STEEL CASING, WITH SLIP AND DRIVE CONSTRUCTION FOR ATTACHMENT TO METAL DUCTWORK. COILS SHALL BE FACTORY INSTALLED ON THE TERMINAL DISCHARGE. FINS SHALL BE RIPPLED AND CORRUGATED HEAVY GAUGE ALUMINUM, MECHANICALLY BONDED TO TUBES. TUBES SHALL BE COPPER WITH MINIMUM WALL THICKNESS OF 0.016 INCH WITH MALE SOLDER HEADER CONNECTIONS. COILS SHALL BE LEAK TESTED TO 300 POUNDS PER SQUARE INCH, WITH MINIMUM BURST PRESSURE OF 2000 POUNDS PER SQUARE INCH AT AMBIENT TEMPERATURE. NUMBER OF COIL ROWS AND CIRCUITS SHALL BE SELECTED TO PROVIDE PERFORMANCE AS SCHEDULED ON THE DRAWINGS. COIL PERFORMANCE DATA SHALL BE BASED ON TESTS RUN IN ACCORDANCE WITH ARI STANDARD 410.	<ul> <li>4) ENDIAGED OF MEEDE AT FONDED TO ALL DETAILS FONDED TO ALL DETAILS FONDED TO ALL DETAILS FONDED TO AND HIGH PRESSOR SHALL BE MOUNTED TO AVOID THE TRANSMISSION OF</li> <li>0. THE CONTROL SYSTEM SHALL BE MICROPROCESSOR-BASED, FACTORY-WIFT TESTED PRIOR TO SHIPMENT. THE CONTROL DISPLAY SHALL BE FIELD-WIRE THE INDOOR UNIT SHALL BE 12 VOLTS, DC. FIELD WIRING SHALL RUN DIRECT TO THE WALL MOUNTED CONTROLLER WITH NO SPLICES.</li> <li>1) THE CONTROL SYSTEM SHALL DREVENT COMPRESSOR SHIPT CYCL.</li> </ul>
<ol> <li><u>TESTING, ADJUSTING &amp; BALANCING</u></li> <li>THE CONTRACTOR SHALL PROVIDE THE SERVICES OF AN AIR BALANCING AND TESTING SPECIALIST WHO SPECIALIZES IN HEATING, VENTILATING AND AIR CONDITIONING SYSTEMS</li> </ol>	<ol> <li>THE CONTROL SYSTEM SHALL PREVENT COMPRESSOR SHIRT-CYCL</li> <li>THE CONTROL SHALL BE USER-CONFIGURABLE TO USE A MANUAL S</li> <li>FOR STARTUP AFTER POWER FAILURE, THE SYSTEM SHALL PROVIDE</li> <li>P. THE CONTROL SYSTEM SHALL MONITOR UNIT OPERATION AND ACTIVATE A</li> </ol>
<ul> <li>ALL INSTRUMENTS USED SHALL BE ACCURATELY CALIBRATED AND MAINTAINED IN GOOD WORKING ORDER.</li> <li>THE TESTING SHALL BE PERFORMED IN THE PRESENCE OF A BUILDING REPRESENTATIVE.</li> </ul>	OF THE FACTORY PRESET ALARM CONDITIONS. Q. FILTRATION 1. THE FILTER CHAMBER SHALL BE AN INTEGRAL PART OF THE SYSTEM, DESIGN EASY FRONT ACCESSIBILITY.
<ul> <li>THE CONTRACTOR SHALL PROVIDE ALL ADDITIONAL BALANCING DAMPERS, PRESSURE TAPS, GAUGES AND OTHER SIMILAR APPURTENANCES AS REQUIRED FOR A PROPERLY BALANCED SYSTEM AND AT NO ADDITIONAL COST TO THE OWNER.</li> <li>ALL BALANCING WORK SHALL BE PERFORMED IN STRICT ACCORDANCE TO THE PROCEDURES AND STANDARDS DESCRIBED IN THE "MANUAL FOR THE BALANCING AND ADJUSTMENT OF THE AIR</li> </ul>	<ol> <li>AN INITIAL SET OF FILTERS SHALL BE FACTORY INSTALLED IN THE UNIT.</li> <li>FILTERS SHALL BE 2-INCH DEEP, DISPOSABLE, PLEATED DESIGN, EXTENDED- REINFORCED COTTON FABRIC; SUPPORTED AND BONDED TO WELDED-WIRE GRI FRAME DESIGN.</li> </ol>
DISTRIBUTION SYSTEMS" AS PUBLISHED BY THE SHEET METAL AND AIR CONDITIONING CONTRACTOR'S NATIONAL ASSOCIATION, INC. F. QUALIFICATION: 1) CONTRACTOR SHALL RETAIN THE SERVICES OF A TESTING AND BALANCING (T&B) CONTRACTOR TO PERFORM ALL AIR AND WATER BALANCING SPECIFIED HEREIN	<ol> <li>RATED NOT LESS THAN MERV 8 PER ASHRAE STD. 52.2.</li> <li>A FILTER DIFFERENTIAL SWITCH FOR ALARM ACTIVATION SHALL BE INCLUDE ENVIRONMENTAL CONTROL, CHILLED WATER COMPUTER ROOM AIR HANDLING E PROVIDED WITH A HIGH SENSIBLE COOLING SYSTEM, FACTORY ASSEMBLED, PIP TESTED PRIOR TO SHIPMENT, UNITS SHALL INCLUDE AN ENCLOSURE/CABINET A</li> </ol>
2) IF THE T&B CONTRACTOR FINDS THAT HE CANNOT BALANCE ANY AIR OR WATER SYSTEM, OR IF HE FINDS ANY POTENTIALLY DETRIMENTAL OPERATING CONDITION, HE SHALL IMMEDIATELY ADVISE THE ARCHITECT IN WRITING AND SHALL STATE THE REASONS WHY BALANCING CANNOT BE ACHIEVED. HE SHALL ALSO MAKE CORRECTIVE RECOMMENDATIONS ON WHAT IS TO BE DONE BY THE CONTRACTOR. AFTER REVIEW OF THESE RECOMMENDATIONS, THE ARCHITECT WILL DIRECT THE CONTRACTOR TO PERFORM ALL NECESSARY WORK TO ALLOW THE BALANCING CONTRACTOR	FILTER SECTION, COOLING COIL, CONTROLS, AND INTERCONNECTING PIPING INT R. ELECTRIC REHEAT 1. THE REHEAT SHALL BE OF THE FINNED ENCLOSED, SHEATH TYPE, FABRICAT SHEATH WITH PLATED FINS TO WITHSTAND MOIST CONDITIONS.
<ul> <li>TO BALANCE THE VARIOUS SYSTEMS ACCORDING TO THE SPECIFICATIONS. CONTRACTOR IS EXPECTED TO DO WITHOUT EXTRA CHARGE, CHANGES TO THE SHEAVES AND FAN BELTS, AS SPECIFIED OR REQUIRED.</li> <li>3) THE T&amp;B CONTRACTOR SHALL COORDINATE THE WORK WITH THE CONTRACTOR THROUGH THE CONSTRUCTION MANAGER. THE T&amp;B CONTRACTOR SHALL HAVE NO BUSINESS AFFILIATION WITH</li> </ul>	<ul><li>THREE (3) STAGES.</li><li>3. THE REHEAT SHALL BE CAPABLE OF MAINTAINING ROOM DRY BULB CONDITIC CALLING FOR DEHUMIDIFICATION.</li><li>4. THE REHEAT SECTION SHALL INCLUDE A SAFETY SWITCHES TO PROTECT TH</li></ul>
<ul> <li>THE SHEETMETAL CONTRACTOR.</li> <li>THE T&amp;B CONTRACTOR SHALL BE A MEMBER OF THE ASSOCIATED AIR BALANCE COUNCIL (AABC) OR NATIONAL ENVIRONMENTAL BALANCING BUREAU (NEBB); MOREOVER, HE MUST HAVE ALL CREDENTIALS AND CAPABILITY REQUIRED FOR AABC OR NEBB MEMBERS AND MUST HAVE AT LEAST 4 YEARS EXPERIENCE IN AIR AND WATER BALANCING ON COMPARABLE PROJECTS IN SIZE</li> </ul>	OVERHEATING. 5. THE ELECTRIC REHEAT REQUIREMENTS SHALL BE AS DETAILED ON THE PRO S. HUMIDIFIER
<ul> <li>AND SCOPE. THE TECHNICIANS MUST BE CERTIFIED THROUGH COMPLETION OF SMACNA OR OTHER SUCH APPROVED SPONSORED TRAINING PROGRAMS FOR AIR OR WATER BALANCING; TECHNICIAN QUALIFICATIONS MUST BE SUBMITTED FOR APPROVAL PRIOR TO COMMENCEMENT OF FIELD WORK.</li> <li>5) THE BALANCING FEFORT SHALL BE DONE UNDER THE DIRECT SUPERVISION OF A REGISTERED</li> </ul>	<ol> <li>THE UNIT SHALL BE PROVIDED WITH A SELF-CONTAINED, MICROPROCESSOR GENERATOR TYPE HUMIDIFIER. THE STEAM GENERATING HUMIDIFIER SHALL US WITH ELECTRONIC CONTROLS.</li> <li>THE HUMIDIFIER SHALL DISCHARGE PURE STEAM WITH NO MATERIAL DUST C SELF-REGULATING AUTOMATIC FLUSH CYCLE. CYLINDERS SHALL BE DISPOSABL</li> </ol>
<ul> <li>PROFESSIONAL ENGINEER WHO WILL CERTIFY THE ACCURACY OF THE FINAL BALANCING DATA AND REPORTS.</li> <li>6) COMPRESSED AIR, REFRIGERANTS, AND CHEMICALS REQUIRED FOR TESTING AND START-UP OF SYSTEMS SHALL BE FURNISHED BY THE CONTRACTOR.</li> </ul>	OR MAINTENANCE. THE HUMIDIFIER FILL LEVEL, WATER CONDUCTIVITY AND FLU AUTOMATICALLY ADAPT, BOTH IN FREQUENCY AND DURATION, TO VARIATIONS I 3. DRAIN DURATION AND DRAIN INTERVAL SHALL BE FIELD-ADJUSTABLE. 4. HUMIDIFIERS USING AN OPEN RESERVOIR IN THE AIR STREAM ARE NOT ACCE
<ul> <li>7) ELECTRIC POWER AND WATER WILL BE MADE AVAILABLE TO THE CONTRACTOR AT SOURCES DIRECTED.</li> <li>G. IN THE EVENT THAT THE EQUIPMENT CANNOT BE PROPERLY BALANCED DUE TO LACK OF FINAL CONNECTION, THE CONTRACTOR SHALL HAVE THE TESTING AND BALANCING SPECIALIST ADVICE THE ENGINEER IN WRITING. OF THE OMISSION PRIOR TO THE SUBMISSION OF THE FINAL BALANCING REPORT.</li> </ul>	<ol> <li>THE CAPACITY AND POWER CONSUMPTION SHALL BE AS DETAILED ON THE P SCHEDULE.</li> <li>T. ELECTRICAL</li> <li>ALL ELECTRICAL COMPONENTS, INCLUDING CONTACTORS, RELAYS AND CON</li> </ol>
<ul> <li>ADJUSTMENT OR REPLACEMENT OF PARTS REQUIRED BY THE RESULTS OF THE TRACE DALAMENT OR BALANCING WORK SHALL BE MADE BY THE CONTRACTOR IN STRICT ACCORDANCE WITH THE RESPECTIVE EQUIPMENT MANUFACTURER'S RECOMMENDATIONS.</li> <li>UPON COMPLETION OF WORK SPECIFIED ABOVE, ALL INFORMATION SHALL BE INSERTED ON A SHEET</li> </ul>	<ul> <li>BE PRE-WIRED AND CONTAINED IN A UNIT-MOUNTED ELECTRICAL ENCLOSURE WITHAT SHALL SWING OUT FOR EASY ACCESS AND SERVICING.</li> <li>2. THE CONTROL CIRCUIT VOLTAGE SHALL BE 24 VOLTS AC.</li> <li>3. THE INPUT ELECTRICAL POWER SHALL BE AS DETAILED ON THE PROJECT PLACE</li> </ul>
<ul> <li>LISTING ALL ITEMS REQUIRED TO BE INCLUDED IN THE COMPLETE TESTING AND BALANCING REPORT. ALL SHEETS SHALL BE NEATLY TYPED. THREE (3) COPIES OF THE BALANCING REPORT MUST BE SUBMITTED TO THE ENGINEER FOR REVIEW.</li> <li>J. ALL OPENING IN DUCTS PLENUMS AND OTHER SIMILAR ITEMS, NECESSARY TO THE BALANCING WORK, SHALL BE REPAIRED BY THE CONTRACTOR IN A SUITABLE MANNER. ALL PATCHING MUST BE SUITABLE TO</li> </ul>	21. <u>CRYOGEN VENT</u>
<ul> <li>THE SERVICE OF THE SYSTEM SUCH AS MAINTAINING VAPOR SEALS IN COLD DUCTWORK AND OTHER SIMILAR SERVICES.</li> <li>K. RECOMMENDATIONS AND RESULTS OF THE TESTING AND BALANCING WORK WHICH ARE NECESSARY FOR THE PROPER OPERATION OF THE SYSTEMS, SHALL BE SUBMITTED IN WRITING TO THE ENGINEER. THE SUBMITTAL SHALL INCLUDE A SCHEMATIC DIAGRAM LOCATING ALL AIR INLETS AND OUTLETS.</li> </ul>	<ul> <li>A. THE VENT MATERIAL MUST BE OF THE FOLLOWING MATERIAL WITH THE WA</li> <li>1. SS 304: MINIMUM 0.035IN; MAXIMUM 0.125IN</li> <li>B. VENT SHALL BE WELDED JOINTS OR BOLTED FLANGED JOINTS WITH FIBERO</li> </ul>
<ul> <li>ALL AIR TERMINAL DEVICES SHALL BE BALANCED TO WITHIN FIVE PERCENT OF THEIR DESIGN REQUIREMENTS.</li> <li>ALL FANS AND AIR HANDLING UNITS SHALL BE BALANCED TO WITHIN TEN PERCENT OF THEIR DESIGN CAPACITIES.</li> </ul>	<ul> <li>VENDOR REQUIREMENTS.</li> <li>C. MATERIALS ACCESSORIES, DETAILS OF QUENCH VENT INSTALLATION MUST VENDORS RECOMMENDATIONS AND REQUIREMENTS. PROVIDE ALL MATERI ACCESSORIES FOR INSTALLATION</li> </ul>
<ul> <li>N. THE TEMPERATURE CONDITIONS, BOTH D.B. AND W.B. AND SOUND LEVELS SHALL BE READ AND RECORDED.</li> <li>O. AFTER TESTING AND BALANCING WORK IS COMPLETE, THE CONTRACTOR SHALL INSTALL A NEW SET OF AIR FILTERS.</li> </ul>	D. EITHER TUBES OR PIPES MAY BE USED AND MUST BE SEAMLESS OR HAVE V
<ul> <li>ALL VAV BOXES SHALL BE BALANCED WITHIN FIVE PERCENT THE DESIGN REQUIREMENTS.</li> <li>ALL WATER SYSTEMS SHALL BE BALANCED WITHIN FIVE PERCENT OF DESIGN REQUIREMENTS.</li> </ul>	<ul> <li>F. THE VENT PIPE MUST WITHSTAND A MAXIMUM PRESSURE OF 6.5 PSI.</li> </ul>
20. <u>AIR COOLED SPLIT SYSTEM_COMPUTER ROOM AIR HANDING UNIT</u> A. THE EVAPORATOR CABINET IS BUILT OF DURABLE PLASTIC, IVORY WHITE COLOR.	<ul> <li>G. WAVEGUIDE VENT MATERIAL MUST MATCH THE MAGNET VENT.</li> <li>H. TERMINATION OF VENT SHALL BE PROTECTED WITH STAINLESS STEEL WIRE</li> </ul>
<ol> <li>THE FAN SECTION IS DESIGNED TO PROVIDE ULTRA-QUIET OPERATION, WITH OPERATING LEVELS OF 40 TO 45 DB.</li> <li>THE EVAPORATOR COILS ARE OF HYDROPHILIC-COATED ALUMINUM SLIT-FINS WITH INNER GROOVED COPPER TUBING, MECHANICALLY EXPANDED TO THE ALUMINUM FINS TO PROVIDE GREATER EFFICIENCY. THE UNITS ARE TO HAVE THREE ROW COILS WITH A FACE AREA OF 2.46 SQUARE FEET WITH 17 FPI.</li> </ol>	<ul> <li>I. PROVIDE GALVANIC SEPARATION BETWEEN MAGNET AND QUENCH VENT.</li> </ul>
<ul> <li>D. THE FAN SECTION SHALL CONTANIN A SINGLE-FAN MOTOR THAT IS THERMALLY PROTECTED.</li> <li>E. THE UNITS ARE TO BE PROVIDED WITH INDIVIDUAL DDC BASED CONTROLS WITH BACNET CAPABILITY.</li> <li>F. UNITS ARE TO BE EQUIPPED WITH A THERMAL EXPANSION VALVE. UNITS ARE PROVIDED WITH A FLARE CONNECTION FOR EASY PIPING CONNECTION AND INSTALLATION.</li> </ul>	<ul> <li>J. PROVIDE 12" TO 19" LONG FLEX SECTION.</li> <li>K. PROVIDE MINIMUM 2" THICK HIGH DENSITY FIBERGLASS SECTIONAL PIPE IN: AROUND QUENCH VENT WITH VAPOR BARRIER. PROVIDE ALUMINUM JACKE THROUGHOUT, MINIMUM 16 GAUGE, HELD IN PLACE WITH STAINLESS STEEL</li> </ul>
<ul> <li>G. UNITS ARE TO BE EQUIPPED WITH PERMANENT, CLEANABLE FILTERS.</li> <li>H. CONDENSING UNIT: THE FAN COIL IS MATCHED TO THE FLEXIBLE INDOOR CONDENSING UNIT WITH A SINGLE-CIRCUIT SPLIT SYSTEM. CONDENSING SECTION IS TO BE AIR-COOLED WITH A CENTRIFUGAL FAN CAPABLE OF UP TO 0.5 INCHES STATIC PRESSURE.</li> <li>THE UNITS ARE TO BE BACKED BY A ONE-YEAR LIMITED WARRANTY, WITH AN OPTIONAL 5-YEAR</li> </ul>	<ul> <li>22. <u>OXYGEN SENSOR AND ALARM PANELS</u></li> <li>A. PROVIDE TWO (2) OXYGEN DEPLETION MONITORING SYSTEM FOR MRI EXAN ROOM. SYSTEM SHALL INCLUDE SAMPLE DRAW PUMP, PLASTIC TUBE THAT</li> </ul>
COMPRESSOR WARRANTY. J. THE CONDENSING SECTION IS TO BE PROVIDED WITH INTERNAL TYPE HOT GAS BYPASS. THE PURPOSE OF THE INTERNAL HOT GAS BYPASS IS TO PROVIDE MODULATED CAPACITY CONTROL AND FREEZE PROTECTION. THE HOT GAS BYPASS VALVE DIRECTS A PORTION OF THE HOT GAS REFRIGERANT FROM THE DISCHARGE OUTLET OF THE COMPRESSOR TO THE SUCTION SIDE OF THE COMPRESSOR	<ul> <li>NEAR OR INSIDE MRI ROOM, REMOTE MONITORING AND ALARM PANEL.</li> <li>B. FOR MRI EXAM ROOM AND MRI EQUIPMENT ROOM PROVIDE PLASTIC TUBE V FILTER HOUSING IN ROOM.</li> </ul>
REFRIGERANT CIRCUIT. THIS CONTROL FEATURE IS PERFORMED TO MAINTAIN A HIGH SUCTION PRESSURE WHEN LOW TEMPERATURES ARE PRESENT OR LOW LOAD CONDITIONS. THE QUENCH VALVE DIVERTS "COOL" REFRIGERANT TAKEN AFTER THE CONDENSER AND MIXES WITH THE HOT GAS TO COOL THE MIXED TEMPERATURES OF THE REFRIGERANT BEFORE IT ENTERS THE COMPRESSOR. THIS OPTION DOES NOT REQUIRE ADDITIONAL EXTERNAL PIPING LINES SINCE ALL PIPING LINES ARE LOCATED IN THE CONDENSING CABINET.	C. REMOTE MONITORING AND ALARM PANEL SHALL BE WITH FOUR DIGIT LED F CONTINUOUSLY DISPLAY GAS CONCENTRATION READINGS, SHALL PROVIDE CAUTION, WARNING, AND ALARM. PANEL SHALL PROVIDE VISUAL PILOT AND SWITCH AND RESET.
K. THE UNIT SHALL HAVE A MODULATING VALVE CONTROLLED BY REFRIGERANT DISCHARGE PRESSURE. A FALL IN AMBIENT TEMPERATURE LOWERS THE DISCHARGE PRESSURE CAUSING AN IMBALANCE IN THE DISCHARGE PRESSURE. THE MODULATING VALVE LOCATED BETWEEN THE CONDENSER AND RECEIVER, REGULATES COMPRESSOR DISCHARGE HOT GAS TO THE RECEIVER. THE HIGHER PRESSURE REDUCES THE FLOW OUT OF THE CONDENSER RESULTING IN A LIQUID REFRIGERANT ACCUMULATION OR "FLOOD"	<ul> <li>D. SYSTEM SHALL BE UL APPROVED, MSA TOXGARD II. PROVIDE ADEQUATE LE WIRING.</li> <li>23. <u>AUTOMATIC CONTROLS</u></li> </ul>
<ul> <li>IN THE CONDENSER.</li> <li>THE SINGLE REFRIGERATION CIRCUIT SHALL INCLUDE A REFRIGERANT STRAINER, AN ELECTRONIC CONTROLLED EXPANSION VALVE HIGH AND LOW SIDE CHARGING PORTS, SERVICES VALVES AND INTERCONNECTING PIPING.</li> <li>THE EVAPORATOR SECTION SHALL INCLUDE EVAPORATOR COLL CONTROL CIRCUIT BOARD, AND FAM.</li> </ul>	<ul> <li>A. GENERAL: PROVIDE COMPLETELY READY FOR OPERATION CONTROL SYSTE THE CONTROL SYSTEMS SHALL BE INSTALLED UNDER THE SUPERVISION OF INSTALLATION SHALL BE TESTED AND CERTIFIED BY THE MANUFACTURER. I</li> <li>1) THE ENTIRE CONTROL SYSTEM SHALL BE COMPLETE WITH ALL NECE</li> </ul>
MOTOR. N. THE OUTDOOR AIR COOLED CENTRIFUGAL FAN CONDENSING UNIT SHALL INCLUDE A CONDENSER COIL, A EAN AN INVERTER DRIVEN COMPRESSORS, ELECTRONIC EXPANSION VALVE, 4 WAY REVERSING VALVE	THERMOSTATS, PRESSURE SENSORS, RELAYS, SWITCHES, TRANSFO CONTROLLERS, UNITARY CONTROLLERS, WIRING, AND TO PROVIDE ALL CONTROLS SHALL BE THE PRODUCT OF ONE MANUFACTURER.

AZING, DEHYDRATION OR CHARGING SHALL BE REQUIRED. CONSTRUCTED OF COPPER TUBE AND ALUMINUM FINS. DESIGNED TO OPERATE AT A SOUND LEVEL LESS THAN 57 dBA. ED TO ALL SERVICEABLE PARTS BY MEANS OF REMOVABLE

AN ACCUMULATOR AND HIGH PRESSURE SAFETY SWITCH. THE D TO AVOID THE TRANSMISSION OF VIBRATION.

PROCESSOR-BASED, FACTORY-WIRED INTO THE SYSTEM AND ROL DISPLAY SHALL BE FIELD-WIRED TO THE CONTROL BOARD. C. FIELD WIRING SHALL RUN DIRECTLY FROM THE INDOOR UNIT TH NO SPLICES.

EVENT COMPRESSOR SHIRT-CYCLING

NFIGURABLE TO USE A MANUAL SETPOINT CONTROL. URE, THE SYSTEM SHALL PROVIDE AUTOMATIC RESTART. JNIT OPERATION AND ACTIVATE A VISUAL ALARM IN THE EVENT IONS.

GRAL PART OF THE SYSTEM, DESIGNED WITHIN THE UNIT FOR

ORY INSTALLED IN THE UNIT. BLE. PLEATED DESIGN, EXTENDED-SURFACE, NONWOVEN, ND BONDED TO WELDED-WIRE GRID; ENCLOSED IN CARDBOARD

RM ACTIVATION SHALL BE INCLUDED. DESCRIPTION: THE COMPUTER ROOM AIR HANDLING EQUIPMENT SHALL BE YSTEM, FACTORY ASSEMBLED, PIPED, WIRED, AND FACTORY CLUDE AN ENCLOSURE/CABINET ASSEMBLY, FAN SECTION, ND INTERCONNECTING PIPING INTERNAL TO UNIT.

CLOSED, SHEATH TYPE, FABRICATED OF STAINLESS STEEL CORE DIST CONDITIONS.

AIR DISCHARGE SIDE OF THE COOLING COIL AND SHALL HAVE AINING ROOM DRY BULB CONDITIONS WHEN THE SYSTEM IS

AFETY SWITCHES TO PROTECT THE SYSTEM FROM

HALL BE AS DETAILED ON THE PROJECT PLANS AND SCHEDULE.

F-CONTAINED, MICROPROCESSOR-CONTROLLED STEAM ENERATING HUMIDIFIER SHALL USE DISPOSABLE CYLINDER TYPE

STEAM WITH NO MATERIAL DUST CARRY-OVER AND HAVE A . CYLINDERS SHALL BE DISPOSABLE NOT REQUIRING CLEANING L, WATER CONDUCTIVITY AND FLUSH RATE SHALL AND DURATION, TO VARIATIONS IN THE INCOMING WATER.

IN THE AIR STREAM ARE NOT ACCEPTABLE.

SHALL BE AS DETAILED ON THE PROJECT PLANS AND

CONTACTORS, RELAYS AND CONTROL TRANSFORMERS SHALL INTED ELECTRICAL ENCLOSURE WITH PIANO-HINGED DOOR ND SERVICING.

AS DETAILED ON THE PROJECT PLANS AND SCHEDULE.

LLOWING MATERIAL WITH THE WALL THICKNESS INDICATED.

TED FLANGED JOINTS WITH FIBERGLASS GASKETS PER MRI

UENCH VENT INSTALLATION MUST BE IN ACCORDANCE WITH MRI JIREMENTS. PROVIDE ALL MATERIAL, LABOR, WORK,

ND MUST BE SEAMLESS OR HAVE WELDED SEAMS.

HAN 1FT LENGTH MAY BE USED AS A TERMINAL EXPANSION

CTED WITH STAINLESS STEEL WIRE MESH SCREEN MINIMUM AREA OF THE QUENCH VENT.

FIBERGLASS SECTIONAL PIPE INSULATION THROUGHOUT ALL RIER. PROVIDE ALUMINUM JACKETING ALL AROUND ) IN PLACE WITH STAINLESS STEEL Z-BANDS AT 12" CENTER.

ONITORING SYSTEM FOR MRI EXAM ROOM AND MRI EQUIPMENT DRAW PUMP, PLASTIC TUBE THAT USES NO METAL COMPONENTS NITORING AND ALARM PANEL.

IT ROOM PROVIDE PLASTIC TUBE WITH PLASTIC PLATE AND

SHALL BE WITH FOUR DIGIT LED READOUT DISPLAY, SHALL RATION READINGS, SHALL PROVIDE 3 ALARM SET POINTS FOR SHALL PROVIDE VISUAL PILOT AND HORN ALARM WITH SILENCE

XGARD II. PROVIDE ADEQUATE LENGTH OF TUBE, POWER AND

FOR OPERATION CONTROL SYSTEMS AS DESCRIBED HEREIN. LLED UNDER THE SUPERVISION OF THE MANUFACTURER. THE RTIFIED BY THE MANUFACTURER. BASIS OF DESIGN TRACER SC. HALL BE COMPLETE WITH ALL NECESSARY CONTROL DEVICES, ORS, RELAYS, SWITCHES, TRANSFORMERS, PANELS, LLERS, WIRING, AND TO PROVIDE THE FUNCTIONS AS SPECIFIED.

INSTALLED COMPLETE IN ALL RESPECTS BY COMPETENT ED BY THE MANUFACTURER OF THE CONTROL SYSTEM. ALL WITH THE CONTROL SYSTEM SHALL BE INSTALLED UNDER THE SECTION.

- 4) SERVICE AFTER COMPLETION OF THE CONTROL SYSTEM INSTALLATION, THE CONTROL CONTRACTOR SHALL REGULATE AND ADJUST THERMOSTAT, CONTROL RELAYS, ETC., AND PLACE THEM IN COMPLETE OPERATING CONDITION SUBJECT TO THE APPROVAL OF THE ENGINEERS. COMPLETE INSTRUCTIONS SHALL BE GIVEN TO THE OWNER.
- 5) ALL FIELD WIRING WORK INCLUDING INTERLOCKING WIRING IN CONNECTION WITH THE ELECTRICAL CONTROL SYSTEM FOR AUTOMATIC CONTROLS SHALL BE PROVIDED BY THE HVAC CONTRACTOR. THE CONTRACTOR SHALL HAVE THE CONTROL MANUFACTURER FURNISH APPROVED DETAIL TERMINAL TO TERMINAL WIRING DIAGRAMS TO FACILITATE THE FIELD WIRING. ALL WORK SHALL BE IN ACCORDANCE WITH THE ELECTRICAL CODE.
- B. DESCRIPTION
  - DIRECT-DIGITAL CONTROL (DDC) SYSTEMS SHALL BE ENGINEERED, MOUNTED, WIRED, AND TESTED BY THE HVAC EQUIPMENT. EACH CONTROL SYSTEM SHALL BE FULLY FUNCTIONAL IN A STAND-ALONE MODE OR MAY BE TIED TO A BUILDING AUTOMATION SYSTEM. ADDITIONALLY, ALL FACTORY-MOUNTED CONTROLS MUST INCLUDE FACTORY-INSTALLED AND ADDRESSED WIRELESS CONNECTIVITY MODULES TO SUPPORT BUILDING AUTOMATION CERTIFIED BACNET COMMUNICATIONS. ALL FACTORY-MOUNTED CONTROLS SHALL BE COVERED BY THE HVAC EQUIPMENT MANUFACTURER'S STANDARD WARRANTY.
- C. THE PROJECT SHALL BE COMPRISED OF A HIGH SPEED ETHERNET NETWORK UTILIZING BACNET/IP COMMUNICATIONS BETWEEN SYSTEM CONTROLLERS AND WORKSTATIONS. COMMUNICATIONS BETWEEN SYSTEM CONTROLLERS AND SUB-NETWORKS OF CUSTOM APPLICATION CONTROLLERS AND/OR APPLICATION SPECIFIC CONTROLLERS SHALL UTILIZE BACNET SELF-HEALING WIRELESS MESH COMMUNICATIONS.
- D. EACH SYSTEM CONTROLLER SHALL PERFORM COMMUNICATIONS TO A NETWORK OF CUSTOM APPLICATION AND APPLICATION SPECIFIC CONTROLLERS USING BACNET SELF-HEALING MESH NETWORK AS SPECIFIED
- E. EACH SYSTEM CONTROLLER SHALL FUNCTION AS A BACNET ROUTER TO EACH UNIT CONTROLLER PROVIDING A UNIQUE BACNET DEVICE ID FOR ALL CONTROLLERS WITHIN THE SYSTEM.
- F. THE OWNER OR DATA CONTRACTOR WILL PROVIDE ALL COMMUNICATION MEDIA, CONNECTORS, REPEATERS, NETWORK SWITCHES, AND ROUTERS NECESSARY FOR THE HIGH SPEED ETHERNET NETWORK. AN ACTIVE ETHERNET PORT WILL BE PROVIDED ADJACENT TO EACH SYSTEM CONTROLLER AND OPERATOR INTERFACE (PC) FOR CONNECTION TO THE HIGH SPEED ETHERNET NETWORK.
- G. ALL VALUES WITHIN THE SYSTEM (I.E. SCHEDULES, DATALOGS, POINTS, SOFTWARE VARIABLES, CUSTOM PROGRAM VARIABLES) SHALL BE READABLE AND CONTROLLABLE (WHERE APPROPRIATE) BY ANY SYSTEM CONTROLLER OR BACNET WORKSTATION ON THE COMMUNICATIONS NETWORK VIA BACNET.
- H. ARCHITECTURE/COMMUNICATION FIELD CONTROL 1) ALL FACTORY AND FIELD-PROVIDED CONTROLLERS SHALL BE BACNET-CERTIFIED PER BACNET TESTING LABORATORIES (BTL) STANDARDS
- I. WALL MOUNTED THERMOSTAT TO BE AS FOLLOWS:
- 1) CONTAIN ALL ADJUSTMENTS FOR TEMPERATURE CONTROL.
- 2) MINIMUM, MAXIMUM, AND AUXILIARY FLOW LIMIT ADJUSTMENTS.
- 3) LIVE VELOCITY READOUT TERMINAL.
- 4) TAMPER PROOF COVER WITH HIDDEN SETPOINT SLIDERS.
- 5) MODERN APPEARANCE.
- 6) THERMOSTATS SHALL BE CAPABLE OF CONTROLLING WITHIN PLUS OR MINUS 1-1/2 DEG. F. CHANGE.
- 7) THERMOSTATS SHALL BE CAPABLE OF CONTROLLING BOTH HEATING AND COOLING.
- 8) LOCKABLE COVERS WHERE REQUIRED BY OWNER/BUILDING MANAGEMENT.
- J. ALARM/EVENT NOTIFICATION
- AN OPERATOR SHALL BE NOTIFIED OF NEW ALARMS/EVENTS AS THEY OCCUR WHILE NAVIGATING THROUGH ANY PART OF THE SYSTEM VIA AN ALARM ICON.
- K. ALARM/EVENT LOG. THE OPERATOR SHALL BE ABLE TO VIEW ALL LOGGED SYSTEM ALARMS/EVENTS FROM ANY OPERATOR INTERFACE.
- 1) THE OPERATOR SHALL BE ABLE TO SORT AND FILTER ALARMS FROM EVENTS. ALARMS SHALL BE SORTED IN A MINIMUM OF 4 CATEGORIES BASED ON SEVERITY.
- 2) ALARM/EVENT MESSAGES SHALL USE FULL LANGUAGE, EASILY RECOGNIZED DESCRIPTORS. 3) AN OPERATOR WITH THE PROPER SECURITY LEVEL MAY ACKNOWLEDGE AND CLEAR
- ALARMS/EVENTS.
- L. SCHEDULING. PROVIDE THE CAPABILITY TO SCHEDULE EACH OBJECT OR GROUP OF OBJECTS IN THE SYSTEM.
- M. ALARM/EVENT LOG
  - ANY OBJECT IN THE SYSTEM SHALL BE CONFIGURABLE TO GENERATE AN ALARM WHEN TRANSITIONING IN AND OUT OF A NORMAL OR FAULT STATE. ROUTE THE ALARM/EVENT TO ONE OR MORE ALARM LOG. THE ALARM MESSAGE SHALL INCLUDE THE NAME OF THE ALARM LOCATION, THE DEVICE THAT GENERATED THE ALARM, AND THE ALARM MESSAGE ITSELF.

## 24. SEQUENCE OF OPERATION

- A. AIR CONDITIONING UNIT AC-5 UNIT CONTROLS
  - a) AC-5 SHALL BE EQUIPPED WITH WALL MOUNTED, STAND-ALONE CONTROLS. CONTROLLERS SHALL HAVE BACNET COMMUNICATION.
  - b) EACH SYSTEM SHALL BE FURNISHED WITH A MICROPROCESSOR BASE PROGRAMMABLE
  - THERMOSTAT PROVIDED BY AC MANUFACTURER.
  - c) EACH SYSTEM SHALL OPERATE BASED ON 100% RECIRCULATION.
  - d) EACH SYSTEM SHALL BE CONTROLLED BY ITS OWN CONTROL THERMOSTAT SET POINTS.
  - 2) SAFETIES:
  - AUTOMATIC OPERATION AC-5: WHEN ALARMED, SMOKE DETECTORS WILL STOP THE SUPPLY AIR (THROUGH SOFTWARE INTERLOCK). WHEN SMOKE CONDITION IS CLEARED AND DETECTORS ARE RESET, THE SYSTEM RESUMES NORMAL OPERATION.
  - STATIC PRESSURE OPERATION: THE SUPPLY FAN SHALL SHUT DOWN UPON A HIGH DISCHARGE PRESSURE OR LOW SUCTION PRESSURE CONDITION. ONCE THE SUPPLY FAN HAVE BEEN SHUT DOWN, MANUAL RESET, THROUGH A PUSH BUTTON LOCATED AT THE DDC PANEL, IS REQUIRED TO RESTART THEM.
  - THE UNIT SHALL BE FURNISHED WITH INTERNAL SAFETIES THAT SHALL SHUT THE UNIT DOWN DURING AN ALARM CONDITION. THE UNIT CONTROLLER SHALL COMMUNICATE THESE ALARM CONDITIONS TO THE BMS FOR REMOTE ALARM. THE UNIT SHALL AT A MINIMUM HAVE THE FOLLOWING AS SAFETIES:
  - FAN OVERLOAD
  - FIRESTAT/ SMOKE CONDITION
  - HIGH REFRIGERANT PRESSURE
  - LOW REFRIGERANT PRESSURE
  - IN ADDITION TO DEVICE CONTROL THE BMS OPERATOR SHALL HAVE THE CAPABILITY TO MODIFY THE FOLLOWING:
  - MODES OF OPERATION
  - SCHEDULES
  - SETPOINT FOR ALL OPERATIONS
  - AMBIENT LOCKOUT SETPOINT
  - SETPOINT BANDS
  - AT NO TIME SHALL THE UNIT CONTROLLER PREVENT THE BMS OPERATOR FROM MANUALLY ADJUSTING POINTS FROM THE BMS TO THE UNIT. THE MANUFACTURER SHALL MAKE PROVISIONS SO THAT THE UNIT CONTROLLER CAN BE ADJUSTED VIA COMMUNICATION FROM THE BMS AT ALL TIMES.
  - 4) UNIT OFF: UPON UNIT SHUTDOWN ON SCHEDULE OR A COMMAND FROM BMS OR A COMMAND TO SHUT DOWN BY FIRE ALARM SYSTEM OR OTHER SHUT DOWN COMMAND, THE FAN MOTORS WILL BE DE-ENERGIZED, THE AIR HANDLING UNIT'S OUTSIDE AIR DAMPERS WILL CLOSE
- 5) SYSTEM OFF: WHENEVER THE AIR HANDLING SYSTEM IS OFF, THE OUTDOOR AIR DAMPERS WILL CLOSE
- 6) SYSTEM START UP: THE DDC SHALL COMMAND THE SUPPLY AIR FAN OF THE UNIT ON AND ENABLE THE OUTDOOR AIR INTAKE AND RETURN DAMPERS. THE SUPPLY AIR FAN WILL START THEIR FANS. THE OUTSIDE AIR DAMPER WILL OPEN. THE RETURN AIR DAMPER WILL OPEN
- 7) UNIT ON: COOLING: TO MAINTAIN DISCHARGE AIR TEMPERATURE IN THE COOLING SEASON, THE DISCHARGE AIR TEMPERATURE SENSOR WILL, THROUGH A THREE MODE (P+I+D), DIRECT ACTING TEMPERATURE SOFTWARE CONTROLLER, AND START COMPRESSOR TO MAINTAIN THE ADJUSTABLE DISCHARGE TEMPERATURE SETPOINT.

B. EXHAUST FAN EF-1

- 1) FAN SHALL BE CONTROLLED BY A WALL MOUNTED SWITCH AND PILOT LIGHT.
- 2) WALL SWITCH SHALL HAVE A LAMINOID PLACK IDENTIFYING IT AS THE PURGE SWITCH FOR THE MRI

POSITIONS.

ROOM.

3) WHEN THE FAN IS ENERGIZED, THE DAMPER ON THE FAN INTAKE SHALL OPEN, THE DAMPER ON THE RETURN VAV BOX SHALL CLOSE, AND THE DAMPER ON THE RELIEF DUCT AT THE CONTROL ROOM SHALL OPEN.

C. OXYGEN DEPLETION SENSOR AND PRESSURE MONITOR IN THE MRI

1) WHEN EITHER THE OXYGEN DEPLETION SENSOR OR THE PRESSURE MONITOR IN THE MRI ROOM EXCEEDS SET POINT (DUE TO A HELIUM RELEASE) AN ALARM SHALL BE SOUNDED IN THE MRI CONTROL ROOM AND AT THE BMS. THE DAMPER ON THE RELIEF VENT AT THE CONTROL ROOM WALL SHALL OPEN, AND THE DAMPER ON THE RETURN VAV BOX SHALL CLOSE.

2) WHEN THE ALARM CONDITION IS RESTORED, THE DAMPERS SHALL RETURN TO THEIR NORMAL

©COPYRIGHT - 2020 ARRAY-ARCHITECTS P.C.

This document is a copyright protected instrument of service, property of Array Architects and licensed for use in the title project only. Reproduction or use of this document without written permission of Array Architects is illegal and will be prosecuted under the law.

CONTRACT No.

SCALE: As indicated

	<b>PROJECT No.</b> 12384
	<b>CHECKED:</b> Checker
	DRAWN: LGP
SHEET NO.	
M-003	3.00
DWG OF	

SHEET - 2 SEAL: **DATE:** 7/23/2020 CON/REF No.

SHEET TITLE: MECHANICAL SPECIFICATIONS

1	CD SUBMISSION	6-18-21	
NO.	DESCRIPTION	DATE	
<b>REVISIONS/ISSUES</b>			



155 WHITE PLAINS ROAD TARRYTOWN, NY 10591

# **PROJECT:** NEW MRI

**OWNER:** COLUMBIA DOCTOR'S TARRYTOWN

ESTIMATING COST CONCEPTS, INC. 104 BEDELL PLACE MELVILLE, NY, 11747 PHONE: 631.423.7960

NEW YORK, NY 10001 PHONE: 646.674.6100

MEP ENGINEER

STRUCTURAL ENGINEER

360 WEST 31ST STREET, 14th FL.

LORING CONSULTING ENGINEERS, INC.

REUTHER + BOWEN 326 WARD STREET DUNMORE, PA 18512 PHONE: 570.496.7020

architects  $\bowtie$ ARRAY-ARCHITECTS.COM 470 PARK AVE SOUTH, 11<sup>th</sup> FLOOR **NEW YORK, NY. 10016** 212-689-3110 **CONSULTANTS:** 







# DEMOLITION PART PLAN, DUCTWORK

## KEY NOTES

- EXISTING 6-INCH SUPPLY AIR VAV BOX TO BE RELOCATED. REFURBISH BOX AS REQUIRED. REMOVE ALL DUCTWORK TO/FROM BOX. REMOVE BRANCH PIPING AS INDICATED.
- 2 EXISTING 10-INCH SUPPLY AIR VAV BOX TO BE RELOCATED. REFURBISH BOX AS REQUIRED. REMOVE ALL DUCTWORK
- TO/FROM BOX. REMOVE BRANCH PIPING AS INDICATED.

   3

   EXISTING 10-INCH RETURN AIR VAV BOX TO BE RELOCATED. REFURBISH BOX AS REQUIRED. REMOVE ALL DUCTWORK
- TO/FROM BOX. (4) EXISTING VAV BOX TO REMAIN

THIS PLAN IS APPROVED ONLY FOR WORK INDICATED ON THE APPLICATION SPECIFICATION SHEET. ALL OTHER MATTERS SHOWN ARE NOT TO BE RELIED UPON, OR TO BE CONSIDERED AS EITHER BEING APPROVED OR IN ACCORDANCE WITH APPLICABLE CODES.

4 8 FEET

©COPYRIGHT - 2020 ARRAY-ARCHITECTS P.C.

DWG OF This document is a copyright protected instrument of service, property of Array Architects and licensed for use in the title project only. Reproduction or use of this document without written permission of Array Architects is illegal and will be prosecuted under the law.

	<b>PROJECT No.</b> 12384
	CHECKED: Checker
	DRAWN: LGP
SHEET NO.	
	$\mathbf{\Omega}\mathbf{\Omega}$
INI-TOT	.00

SHEET TITLE: DEMOLITION PART PLAN, HVAC PIPING AND DUCTWORK

SEAL:

**DATE:** 7/23/2020

**SCALE:** As indicated

CON/REF No. CONTRACT No.

	<b>REVISIONS/ISSUES</b>	
NO.	DESCRIPTION	DATE
1	CD SUBMISSION	6-18-21



155 WHITE PLAINS ROAD TARRYTOWN, NY 10591

# project: NEW MRI

OWNER: COLUMBIA DOCTOR'S TARRYTOWN

COST CONCEPTS, INC. 104 BEDELL PLACE MELVILLE, NY, 11747 PHONE: 631.423.7960

360 WEST 31ST STREET, 14th NEW YORK, NY 10001 PHONE: 646.674.6100

LORING CONSULTING ENGINEERS, INC. 360 WEST 31ST STREET, 14th FL. NEW YORK, NY 10001

MEP ENGINEER

PHONE: 570.496.7020

REUTHER + BOWEN 326 WARD STREET DUNMORE, PA 18512 PHONE: 570.496.7020

STRUCTURAL ENGINEER

NEW YORK, NY. 10016

CONSULTANTS:

212-689-3110







5

VENTILATION TABLE	PER 2018	GUIDEL	INES FO	R DESIGN AND CONSTRUCTION OF HEALT	FGI COMPLIANCE CHE	ск					
					REQUIREMENTS	ACTUAL					
ROOM NAME	ROOM #	AREA	CLG HT	<b>RM ТҮРЕ</b>	PRESSURE RELATIONSHIP TO ADJACENT SPACES	OUTSIDE AIR CHANGE PER HOUR (ACH)	TOTAL ACH	EXHAUST TO OUTSIDE	CFM	PRESS TO ADJ AREA	OUTSIDE A
MRI Room	W189C	495	9	CLASS 1 IMAG.RM. (PLAIN)		2	6		920	Pos	:
MRI Control Room	W204F	210	9	OFFICE (SMALL)			0		855	Pos	
MRI Equipment Room	W204C	140	9	MISC (SEE NOTES)			0		300	Pos	
	AREA	845									



8

## **CONTRACTOR NOTES:**

7

- PROVIDE AN ALTERNATE PRICE TO REPLACE THE VAV BOXES WITH NEW INCLUDING THE COILS, CONTROLS, VALVES AND DUCTWORK.
- 2. PROVIDE FOR A MINIMUM OF FIVE (5) SITE VISITS FOR BALANCING INCLUUDING BALANCING FOR CONFORMANCE TO FGI REQUIREMENTS AND FOR COMFORT.

6

 $\square \cdot \square \cdot \square$ 

 $(- \cdot - \cdot )$ 

L . \_ . \_ \





155 WHITE PLAINS ROAD TARRYTOWN, NY 10591

PROJECT: NEW MRI

OWNER: COLUMBIA DOCTOR'S TARRYTOWN

ESTIMATING COST CONCEPTS, INC. 104 BEDELL PLACE MELVILLE, NY, 11747 PHONE: 631.423.7960

LORING CONSULTING ENGINEERS, INC. 360 WEST 31ST STREET, 14th FL. NEW YORK, NY 10001 PHONE: 646.674.6100

CONSULTANTS:

REUTHER + BOWEN 326 WARD STREET DUNMORE, PA 18512 PHONE: 570.496.7020

MEP ENGINEER

STRUCTURAL ENGINEER

ARRAY-ARCHITECTS.COM 470 PARK AVE SOUTH, 11 th FLOOR NEW YORK, NY. 10016 212-689-3110

 $\bowtie$ 

 $\bowtie$ 

A R R A

Architect of Record:

architects

P.C.









THIS PLAN IS APPROVED ONLY FOR WORK INDICATED ON THE APPLICATION SPECIFICATION SHEET. ALL OTHER MATTERS SHOWN ARE NOT TO BE RELIED UPON, OR TO BE CONSIDERED AS EITHER BEING APPROVED OR IN ACCORDANCE WITH APPLICABLE CODES.

1	CD SUBN	IISSION	6-18-21
NO.	DESCRI	PTION	DATE
	REVISIO	NS/ISSUES	
sнее 2nc PAF CYF	T TITLE: FL AND T PLAN ROGNEI(	) ROOF PIPING C VENT	HVAC AND
SEAL	.:	DATE: 7/2 CON/REF CONTRAC SCALE: As PROJECT CHECKED DRAWN: 1	3/2020 No. T No. indicated No. 12384 Checker _GP
SHEE М	-202	.00	
DWG	OF		
This doc property project c written p prosecut	ument is a copyright p of Array Architects an only. Reproduction or permission of Array An ced under the law.	protected instrument nd licensed for use ir use of this document rchitects is illegal and	of service, h the title without d will be
©COPYI	RIGHT - 2020 ARRAY-	ARCHITECTS P.C.	



155 WHITE PLAINS ROAD TARRYTOWN, NY 10591

# **PROJECT:** NEW MRI

**OWNER:** COLUMBIA DOCTOR'S TARRYTOWN

ESTIMATING COST CONCEPTS, INC. 104 BEDELL PLACE MELVILLE, NY, 11747 PHONE: 631.423.7960

NEW YORK, NY 10001 PHONE: 646.674.6100

## MEP ENGINEER

LORING CONSULTING ENGINEERS, INC. 360 WEST 31ST STREET, 14th FL.

DUNMORE, PA 18512 PHONE: 570.496.7020

REUTHER + BOWEN 326 WARD STREET

STRUCTURAL ENGINEER

**CONSULTANTS:** 

architects  $\square$  $\square$ P.C. ARRAY-ARCHITECTS.COM 470 PARK AVE SOUTH, 11 th FLOOR NEW YORK, NY. 10016 212-689-3110

Architect of Record: ARRAY



![](_page_6_Figure_2.jpeg)

![](_page_6_Figure_3.jpeg)

- 2 1/2"

— 1 1/8"

2 1/4"

2"R

WO2-2-5000

V/PH

120:1

WEIGHT

(LBS)

75

SEE NOTES

**MFG: GREENHECK** 

REMARKS

1, 2, 3, 4

MODEL

NO.

USF-15

DUCT SUPPORT DETAIL NOT TO SCALE

-CONCRETE SLAB

СН	MRI CHILLER SCHEDULE													
	SERVICE		CHILLE	R DATA										
UNIT NO.		CE	TEM	TEMP.°F					MCOR	МСА	kW/TON			
		GPIN	ENT.	LVG.	(PSI)	KW INPUT	VOLI/ PH	FLA/ LRA	MCOP	MCA				
MCH-1	MRI	35	FROM GE	FROM GE	FROM GE	-	460 / 3	67	80	70	0.729			

SF – SUPPLY FAN EF – EXHAUST FAN FAN SCHEDULE											
UNIT		AREA OR SYSTEM	FAN	STATIC PRESS (IN. WG)	CFM	FAN RPM	DRIVE	DISCHARGE	MOTOR DATA		
NO.	LOCATION	SERVED	TYPE						BHP	HP	NO. OF SPEEDS
EF-1	MRI EQUIPMENT RM	MRI ROOM	ROOF UTILITY	0.625	1200	1770	BELT	HOR.	0.19	0.5	1

![](_page_6_Figure_14.jpeg)

![](_page_6_Figure_16.jpeg)

![](_page_6_Figure_17.jpeg)

NO SCALE

THIS PLAN IS APPROVED ONLY FOR WORK INDICATED ON THE APPLICATION SPECIFICATION SHEET. ALL OTHER MATTERS SHOWN ARE NOT TO BE RELIED UPON, OR TO BE CONSIDERED AS EITHER BEING APPROVED OR IN ACCORDANCE WITH APPLICABLE CODES.

CCOPYRIGHT - 2020 ARRAY-ARCHITECTS P.C.

OF DWG This document is a copyright protected instrument of service, property of Array Architects and licensed for use in the title project only. Reproduction or use of this document without written permission of Array Architects is illegal and will be prosecuted under the law.

HVAC DETAILS AND SCHEDULES SHEET 1 OF 2 SEAL: **DATE:** 7/23/2020 CON/REF No. **CONTRACT No. SCALE:** As indicated **PROJECT No.** 12384 **CHECKED:** Checker DRAWN: LGP SHEET NO. M-301.00

![](_page_6_Figure_24.jpeg)

SHEET TITLE:

![](_page_6_Figure_25.jpeg)

155 WHITE PLAINS ROAD TARRYTOWN, NY 10591

# **PROJECT:** NEW MRI

**OWNER:** COLUMBIA DOCTOR'S TARRYTOWN

ESTIMATING COST CONCEPTS, INC. 104 BEDELL PLACE MELVILLE, NY, 11747 PHONE: 631.423.7960

NEW YORK, NY 10001 PHONE: 646.674.6100

LORING CONSULTING ENGINEERS, INC.

360 WEST 31ST STREET, 14th FL.

MEP ENGINEER

REUTHER + BOWEN 326 WARD STREET DUNMORE, PA 18512 PHONE: 570.496.7020

STRUCTURAL ENGINEER

**CONSULTANTS:** 

212-689-3110

ARRAY architects  $\bowtie$ ARRAY-ARCHITECTS.COM 470 PARK AVE SOUTH, 11<sup>th</sup> FLOOR **NEW YORK, NY. 10016** 

![](_page_7_Figure_0.jpeg)

ACCU	ACCU AIR COOLED CONDENSING UNIT SCHEDULE BASIS OF DESIGN: VERTIV											
UNIT NO.	LOCATION		FAN		ELECTRICAL 208/1/60			DIMENSIONS	WEIGHT	MODEL		
		CAPACITY (MBH)	AIR FLOW (CFM)	FAN MOTOR FLA	FLA	OPD	REF.	W X D X H (IN)	(LBS)	NO.	REMARKS	
ACCU-5	ROOF	39.6	3082	3082 NA		35	407C	53X36X18	351	PFH037A-H	1, 2, 3, 4	

ACCU-5 IS TO BE ROOF MOUNTED ON DUNNAGE WITH NEOPRENE ISOLATORS. 2. ALL UNITS SHALL HAVE FIVE YEAR EXTENDED WARRANTY FOR COMPRESSORS.

3. PROVIDE LOW AMBIENT CONTROL KIT FOR OPERATION DOWN TO 0 DEG F AND WIND BAFFLE. 4. PROVIDE WEATHERPROOF DISCONNECT SWITCH FOR OUTDOOR CONDENSING UNITS.

![](_page_7_Figure_9.jpeg)

	A	В		(	2			
PIPE DIAMETER (IN)	MAX DISTANCE FROM JOINT TO 1ST GUIDE OR ANCHOR	APPROXIMATE DISTANCE BETWEEN 1ST AND 2ND GUIDE	APPROXIMATE DISTANCE BET( (FT)					
	(IN) (IN)	(IN)	@ 50 PSIG	@100 PSIG	@15			
8	32 112		87	62				
10	40	140	107	75				

DEDICATED STAND ALONE CLOSED LOOP WATER CHILLER. -2 - VISUAL FLOW METER WITH GAUGE **BALL VALVE** 30°F TO 80°F (LOCATED NEAR HEC) FS WITH A LINE SIZE BYPASS FOR

## PIPING SCHEMATIC FOR MRI CHILLED WATER NO SCALE

AC	AC AIR CONDITIONING UNIT SCHEDULE BASIS OF DESIGN: VERTIV												GN: VERTIV			
UNIT NO.	AREA SERVED	TYPE	TOTAL CFM LOW/HIGH	COOLING CAP. TOTAL (MBH)	COOLING CAP. SENSIBLE (MBH)	HUN LBS. PER HR	IDIFIER KW	ELECT. DATA (VOLT/PH)	LECTRICAL D MAX CIRCUIT AMPS	ATA OPD	WEIGHT (LBS)	PIPING CONNECTIONS (IN.) (LIQUID, SUCTION, DRAIN, HUMIDIFIER)	REFRIGERANT	SCOP	MODEL NO.	REMARKS
AC-5	MRI EQ. ROOM	SPLIT AIR COOLED	1000-1250	30	23	4.3	1.5	208-1	34.2	45	225	0.5-1.125-0.75-0.5	407C	1.88	MMD36E	1, 2, 3, 4, 5

PROVIDE REFRIGERANT PIPING BETWEEN AC UNIT AND CONDENSING UNIT PER MANUFACTURER'S RECOMMENDATIONS.

PROVIDE INTERCONNECTING CONTROL WIRING BETWEEN AC AND CU. PROVIDE SCR ELECTRIC REHEAT (1.5 Kw), FACE GRILLE WITH MERV 8 FILTERS, LIQUID DETECTOR, REMOTE CONTROL PANEL, BMS INTERFACE PANEL. PROVIDE DRIP PANS AND LEAK DETECTORS

MOUNT UNIT IN CEILING WITH MANUFACTURERS RECOMMENDED CLEARANCES.

©COPYRIGHT - 2020 ARRAY-ARCHITECTS P.C.

![](_page_7_Figure_26.jpeg)

6-18-21

![](_page_7_Figure_27.jpeg)

CD SUBMISSION

155 WHITE PLAINS ROAD TARRYTOWN, NY 10591

# **PROJECT:** NEW MRI

**OWNER:** COLUMBIA DOCTOR'S TARRYTOWN

ESTIMATING COST CONCEPTS, INC. 104 BEDELL PLACE MELVILLE, NY, 11747 PHONE: 631.423.7960

PHONE: 646.674.6100

## MEP ENGINEER

REUTHER + BOWEN

326 WARD STREET

NEW YORK, NY 10001

LORING CONSULTING ENGINEERS, INC. 360 WEST 31ST STREET, 14th FL.

DUNMORE, PA 18512 PHONE: 570.496.7020

STRUCTURAL ENGINEER

architects  $\square$ ARRAY-ARCHITECTS.COM 470 PARK AVE SOUTH, 11<sup>th</sup> FLOOR **NEW YORK, NY. 10016** 212-689-3110 **CONSULTANTS:** 

Architect of Record:

ARRAY