

GENERAL NOTES

- REMOVAL & RELOCATION OF CERTAIN EXISTING WORK SHALL BE NECESSARY FOR THE PERFORMANCE OF THE NEW WORK SHOWN HEREIN. ALL EXISTING CONDITIONS ARE NOT COMPLETELY DETAILED ON THE DRAWINGS. THE CONTRACTOR SHALL SURVEY THE SITE & MAKE ALL NECESSARY CHANGES BASED ON EXISTING CONDITIONS AS REQUIRED FOR PROPER DEMOLITION OF EXISTING WORK & SHALL INCLUDE ALL MATERIALS & LABOR FOR SAME IN HIS BID PRICE. NO ALLOWANCE WILL BE MADE FOR FAILURE TO DO SO.
- PRIOR TO SUBMITTING A BID, THE CONTRACTOR SHALL VISIT THE PREMISES OF THE PROPOSED WORK & SHALL CAREFULLY EXAMINE THE ENGINEERING DRAWINGS, EXISTING CONDITIONS & LIMITATIONS THEREOF. VERIFY ACTUAL LOCATIONS WHERE THE NEW PIPING WILL BE ROUTED, COORDINATE WITH NEW & EXISTING WORK & PROVIDE CLEARANCE TO BUILDING STRUCTURE, OTHER SERVICES, ETC. THE CONTRACTOR SHALL INCLUDE ALL COSTS WHATSOEVER WHICH ARE INCURRED AS A RESULT OF LIMITATIONS OF THE EXISTING & NEW CONDITIONS. LATER CLAIMS FOR EXTRA LABOR, EQUIPMENT, MATERIALS, ETC. REQUIRED DUE TO DIFFICULTIES WHICH COULD HAVE BEEN FORESEEN WILL NOT BE CONSIDERED AS EXTRA WORK.
- INSTALL WORK SO AS TO BE READILY ACCESSIBLE FOR OPERATING, MAINTENANCE & REPAIR. MINOR DEVIATIONS FROM DRAWINGS MAY BE MADE TO ACCOMPLISH THIS, BUT CHANGES OF MAGNITUDE WHICH INVOLVE EXTRA COST SHALL NOT BE MADE WITHOUT APPROVAL.
- INVESTIGATE EACH SPACE THROUGH WHICH EQUIPMENT MUST BE MOVED. WHEN NECESSARY, EQUIPMENT SHALL BE SHIPPED FROM MANUFACTURER IN CRATED SECTIONS OF SIZE SUITABLE FOR MOVING THROUGH AREAS AVAILABLE. ASCERTAIN FROM BUILDING OWNER AT WHAT TIMES OF DAY EQUIPMENT MAY BE MOVED THROUGH THE BUILDING.
- COORDINATE THE EXACT SIZE & LOCATION OF NEW OPENINGS WITH EXISTING STRUCTURE. PATCH / INSULATE AS REQUIRED. CONTRACTOR SHALL FIRESTOP ALL PENETRATIONS FROM NEW PIPING, CONDUIT, DUCTWORK, ETC. THROUGH EXISTING OR NEW FIRE / SMOKE BARRIERS. REFER TO SPECIFICATION SECTION 1511 FOR FURTHER DETAILS.
- IT IS THE INTENT OF THIS CONTRACT FOR REMAINING SYSTEMS TO BE LEFT IN GOOD WORKING ORDER, READY FOR OPERATION. COORDINATE ANY REQUIRED SYSTEM SHUTDOWNS WITH OWNER 48 HOURS IN ADVANCE. EXISTING SYSTEM SHUTDOWNS WILL NOT BE PERMITTED IF THEY INTERFERE WITH THE DAILY OPERATIONS OF THE BUILDING. CONTRACTOR WILL BE REQUIRED TO TAKE PROPER PRECAUTIONS AGAINST DAMAGING OR DISRUPTING BUILDING SYSTEMS, WIRING, PIPING OR CONTROL TUBING. ANY DAMAGE TO THESE ITEMS SHALL BE REPAIRED AT THE CONTRACTORS COST AS A PART OF THIS CONTRACT.
- THE CONTRACTOR SHALL REPAIR / RESTORE TO ORIGINAL CONDITION ANY EXISTING EQUIPMENT OR MATERIALS DAMAGED IN THE PROCESS OF INSTALLATION, OR DEMOLITION TO THE SATISFACTION OF THE OWNERS REPRESENTATIVE. CONTRACTOR SHALL MAKE REPAIRS USING THE SAME OR EQUIVALENT MATERIALS. WORK WILL BE PERFORMED AT THE CONTRACTORS COST.
- CONTRACTOR SHALL INCUR ANY COSTS OR BURDENS ASSOCIATED WITH LOST OR STOLEN EQUIPMENT / MATERIALS.
- DURING THE LIFE OF THE CONTRACT PERIOD, CONTRACTOR SHALL REMOVE ALL RUBBISH / EXCESS MATERIAL ACCUMULATED AS A RESULT OF HIS OPERATIONS ON A DAILY BASIS. ALL AREAS / EQUIPMENT AFFECTED UNDER THIS CONTRACT SHALL BE KEPT CLEAN OF DUST / DEBRIS. ALL AREAS SHALL RECEIVE A FINAL CLEANING PRIOR TO FINAL ACCEPTANCE BY THE OWNER.
- PROVIDE FOR LEGAL REMOVAL / DISPOSAL OF ALL RUBBISH / DEBRIS FROM THE BUILDING & SITE. PROTECT ALL WORK NOT SLATED FOR DEMOLITION.
- THIS CONTRACTOR SHALL COORDINATE HIS WORK WITH ALL OTHER TRADES PRIOR TO SCHEDULING THE WORK. WORK SHALL BE PERFORMED IN PROPER SEQUENCE, AS AGREED TO BY ALL TRADES. ANY COSTS INCURRED BY THE OWNER DUE TO IMPROPER SEQUENCING OF WORK WILL BE PAID FOR BY THIS CONTRACTOR.
- CONTRACTOR SHALL OBTAIN ALL PERMITS, PAY ALL FEES, CONNECTION CHARGES, ETC. ASSOCIATED WITH THE WORK UNDER THEIR CONTRACT.
- PAINT / TOUCH UP ALL SURFACES MARRED AS A RESULT OF THE PERFORMANCE OF THE CONTRACT WORK.
- THE MECHANICAL CONTRACTOR SHALL REFER TO / REVIEW ALL OTHER TRADE DRAWINGS IN THE BID PACKAGE & SHALL BE RESPONSIBLE FOR / PERFORM ALL WORK INDICATED AS (M.C.) MECHANICAL WORK AS A PART OF THE BASE BID UNLESS SPECIFICALLY NOTED OTHERWISE.
- SUBSTITUTED EQUIPMENT OF GREATER OR LARGER POWER, DIMENSIONS, CAPACITIES & RATINGS MAY BE FURNISHED PROVIDED THAT SAID EQUIPMENT IS APPROVED IN WRITING PRIOR TO ORDER. ANY CONNECTING MECHANICAL SERVICES, ELECTRICAL SERVICES, BASES, STRUCTURAL APURTANCES, ETC. REQUIRED TO BE INCREASED DUE TO THE USE OF SAID EQUIPMENT WILL BE PAID FOR IN FULL BY THE MECHANICAL CONTRACTOR, INCLUDING ANY ADDITIONAL REQUIRED ENGINEERING FEES.
- EACH PIECE OF EQUIPMENT SHALL BE PROVIDED WITH A PERMANENT TYPE (LAMINATED, BLACK FINISH, WHITE CORE, PHENOLIC NAMEPLATE. NAMEPLATES SHOULD INDICATE THE NAME & NUMBER OF THE UNIT, UNIT VOLTAGE, & ANY INTERLOCK REFERENCE. STARTERS / DISCONNECT SWITCHES SHOULD ALSO BE EQUIPPED WITH AN IDENTICAL NAMEPLATE WITH THE SAME INFORMATION.
- "ATTIC STOCK" - UPON COMPLETION OF THE PROJECT, MECHANICAL CONTRACTOR SHALL COMPLETELY REMOVE / DISPOSE OF FILTERS USED DURING CONSTRUCTION & START-UP PROCEDURES. INSTALL NEW FILTERS IN ALL EQUIPMENT, MERV-8 OR BETTER UPON TURN OVER OF THE PROJECT TO THE OWNER. IN ADDITION, PROVIDE (2) COMPLETE SETS OF FILTERS FOR EACH PIECE OF EQUIPMENT & TURN OVER TO OWNER.
- MECHANICAL CONTRACTOR SHALL PROVIDE (1) SPARE MOTOR FOR EACH SIZE MOTOR USED ON THE PROJECT. IN INSTANCES WHERE MORE THAN TEN OF THE SAME MOTOR ARE USED, MECHANICAL CONTRACTOR SHALL PROVIDE (1) SPARE MOTOR FOR EVERY TEN MOTORS OF A GIVEN SIZE USED ON THE PROJECT.
- MAINTENANCE MANUAL, UPON COMPLETION OF THE PROJECT, THE MECHANICAL CONTRACTOR SHALL PROVIDE A BINDER CONTAINING THE OPERATIONS & MAINTENANCE MANUALS FOR EACH NEW PIECE OF EQUIPMENT INSTALLED UNDER THIS PROJECT. THE FIRST SECTION OF THE MAINTENANCE MANUAL SHALL CONTAIN A LIST OF EACH PIECE OF EQUIPMENT, COMPLETE WITH INFORMATION SHOWING APPROPRIATE REPLACEMENT FILTER SIZES / TYPES, APPROPRIATE REPLACEMENT BELT SPECIFICATIONS, REPLACEMENT MOTOR SPECIFICATIONS, REPLACEMENT BEARING SPECIFICATIONS, VOLTAGES OF UNIT, ETC. THIS SHALL SERVE AS A WRITTEN DATABASE DESCRIBING ALL MAINTENANCE INFORMATION FOR EACH NEW PIECE OF EQUIPMENT USED.

BOILER ROOM and PIPING NOTES

- THE DRAWINGS SHOW THE GENERAL ARRANGEMENT OF ALL PIPING & EQUIPMENT, & INDICATE THE REQUIRED SIZE / POINTS OF TERMINATION OF THE PIPING & SUGGEST PROPER ROUTING OF SAME. IT IS NOT THE INTENTION OF THE DRAWINGS TO SHOW ALL NECESSARY OFFSETS, RISES, DROPS, OBSTRUCTIONS OR STRUCTURAL CONDITIONS. IT SHALL BE THE RESPONSIBILITY OF THIS CONTRACTOR TO INSTALL HIS WORK IN SUCH A MANNER THAT IT WILL CONFORM TO THE STRUCTURE, AVOID OBSTRUCTIONS, PRESERVE HEADROOM & KEEP OPENINGS / PASSAGEWAYS CLEAR WITHOUT FURTHER CONSTRUCTION OR COST.
- ALL FLOOR MOUNTED BOILER ROOM EQUIPMENT SHALL BE INSTALLED ON A LEVEL, REINFORCED CONCRETE HOUSEKEEPING PAD, 4" THICK MIN. UNLESS OTHERWISE NOTED. ALL REINFORCED PADS SHALL BE INSTALLED BY THE MECHANICAL CONTRACTOR. PADS SHALL BE HOUSEKEPT W/ HELDED WIRE MESH & SHALL BE POURED USING 3,000 PSI CONCRETE.
- MECHANICAL CONTRACTOR SHALL PROVIDE & INSTALL ALL REQUIRED STRUCTURAL SUPPORTS FOR ALL PIPING SYSTEMS & EQUIPMENT AS REQUIRED. PIPING SYSTEMS SHALL BE EQUIPPED WITH EXPANSION COMPENSATORS AT THE INTERVALS REQUIRED. PROVIDE PIPING GUIDES / ANCHORS AS REQUIRED.
- MECHANICAL CONTRACTOR SHALL PROPERLY INSULATE ALL NEW PIPING SYSTEMS & EQUIPMENT. REFER TO SPECIFICATION SECTION 15250 FOR FURTHER DETAILS REGARDING INSULATION REQUIREMENTS. UPON COMPLETION OF INSULATION WORK, MECHANICAL CONTRACTOR SHALL PROPERLY LABEL EACH PIPING RUN SHOWING THE TYPE OF FLUID CARRIED & DIRECTION OF FLOW. PIPE IDENTIFICATION MARKERS SHALL BE INSTALLED EVERY 20 FEET IN THE PIPING RUNS.
- ALL VALVES WITHIN PIPING SYSTEMS SHALL BE TAGGED USING A 1/2" DIA. BRASS TAG. PROVIDE A LEGEND LISTING VALVE #, TYPE OF VALVE, SERVICE TYPE, & LOCATION OF VALVE. KEY VALVE #S TO AS-BUILT DRAWINGS UPON COMPLETION OF PROJECT.
- MECHANICAL CONTRACTOR SHALL SUBMIT (3) SETS OF OPERATING MANUALS FOR EACH PIECE / TYPE OF MECHANICAL EQUIPMENT.
- MECHANICAL CONTRACTOR SHALL PROVIDE & INSTALL ALL WIRING & DEVICES AS REQUIRED TO CONTROL THE BOILER ROOM EQUIPMENT AS DESCRIBED IN THE SEQUENCE OF OPERATIONS LISTED IN THE PROJECT MANUAL. REFER TO SPECIFICATION SECTION 15903 FOR FURTHER DETAILS.

FIRESTOPPING NOTES

- ALL PENETRATIONS RELATED TO MECHANICAL WORK THROUGH FIRE RATED WALLS, FLOORS OR OTHER STRUCTURES SHALL BE FIRE STOPPED AS REQUIRED TO MAINTAIN THE RATING OF THE WALL. BY MECHANICAL CONTRACTOR. IT IS ASSUMED THAT ALL WALLS IN THE CONSTRUCTION CARRY A MINIMUM FIRE RATING OF 1 HR. IT SHOULD BE ASSUMED THAT ALL MACHINE ROOM WALLS / BOILER ROOM WALLS / ELECTRIC ROOM WALLS CARRY A RATING OF 2 HR. MECHANICAL CONTRACTOR SHALL BE RESPONSIBLE FOR A COMPLETE REVIEW OF THE ARCHITECTURAL DRAWINGS IN ORDER TO DETERMINE FIRE RATINGS OF ALL WALLS / PARTITIONS RELATED TO WORK UNDER THIS CONTRACT.
- MECHANICAL CONTRACTOR SHALL REVIEW THE COMPLETE ARCHITECTURAL SET OF DRAWINGS IN ORDER TO DETERMINE WHERE DUCT PENETRATIONS THROUGH RATED BARRIERS. DUCTS PENETRATING SAID RATED BARRIERS SHALL BE EQUIPPED WITH A UL LISTED FUSIBLE LINK TYPE FIRE DAMPER, RATED FOR SERVICE FOR WHICH IT IS BEING USED. FIRE DAMPERS SHALL BE PROVIDED & INSTALLED BY THE MECHANICAL CONTRACTOR, COMPLETE W/ DUCT ACCESS DOORS DIRECTLY ADJACENT TO THE DAMPER, POSITIONED FOR EASY REPLACEMENT OF THE LINK.
- MECHANICAL CONTRACTOR SHALL REVIEW THE COMPLETE ARCHITECTURAL SET OF DRAWINGS IN ORDER TO DETERMINE WHERE DUCT PENETRATIONS THROUGH RATED BARRIERS OCCUR BETWEEN SEPARATE SMOKE ZONES. DUCTS PENETRATING SAID FIRE / SMOKE BARRIERS SHALL BE EQUIPPED WITH A UL LISTED COMBINATION FIRE / SMOKE DAMPER, RATED FOR SERVICE FOR WHICH IT IS BEING USED. FIRE / SMOKE DAMPERS SHALL BE PROVIDED & INSTALLED BY THE MECHANICAL CONTRACTOR, COMPLETE W/ DUCT ACCESS DOORS DIRECTLY ADJACENT TO THE DAMPER. DAMPER ACTUATOR & RELATED WIRING SHALL BE PROVIDED & INSTALLED BY THE ELECTRICAL CONTRACTOR. COORDINATE DAMPER INSTALLATIONS W/ E.C. TO VERIFY PROPER CLEARANCES TO ASSURE PROPER DAMPER OPERATION.
- MECHANICAL CONTRACTOR SHALL PROVIDE A FULL SET OF AS-BUILT DRAWINGS, SHOWING EACH DAMPER LOCATION, TYPE OF DAMPER, ACCESS DOOR LOCATIONS, ETC.
- CONTRACTOR SHALL REFER TO SPECIFICATION SECTION 15511 FOR FURTHER DETAILS REGARDING FIRESTOPPING MATERIALS & METHODS.
- CONTRACTOR SHALL SUBMIT SHOP DRAWINGS OF PRODUCTS TO BE USED. FIRESTOP MATERIALS OTHER THAN THE PRODUCTS SPECIFIED SHALL INCLUDE FULL TECHNICAL DATA WITH SHOP DRAWINGS TO DEMONSTRATE EQUALITY WITH THE SPECIFIED FIRESTOPPING MATERIALS.

GENERAL INSTRUMENTATION NOTES

- AT A MINIMUM, PROVIDE THERMOMETERS / WELLS AT THE FOLLOWING LOCATIONS:
 - AT INLETS & OUTLET OF EACH THREE WAY VALVE (UNIT VENTILATORS / CABINET UNIT HEATER INSTALLATIONS EXCEPTED).
 - AT INLET & OUTLET OF EACH HYDRONIC BOILER, CHILLER OR COOLING TOWER.
 - AT INLET & OUTLET OF EACH HYDRONIC COIL IN AIR HANDLING UNITS & BUILT-UP CENTRAL SYSTEMS.
- AT A MINIMUM, PROVIDE LIQUID FILLED PRESSURE GAUGES / WELLS AT THE FOLLOWING LOCATIONS:
 - AT SUCTION & DISCHARGE OF EACH PUMP.
 - FOR EACH MAKEUP WATER LINE.
 - BEFORE & AFTER ALL PRESSURE REDUCING VALVES.
 - AT ACCESSIBLE HIGH POINT OF ALL HYDRONIC PIPING SYSTEMS.
 - AT ALL EXPANSION / COMPRESSION TANKS.

PIPING SYSTEMS and EQUIPMENT VENTING NOTES

- MECHANICAL CONTRACTOR WILL BE RESPONSIBLE FOR THE PROPER VENTING OF ALL NEWLY INSTALLED HYDRONIC PIPING SYSTEMS. AUTOMATIC AIR VENTS SHALL BE INSTALLED AT EVERY HIGH POINT IN THE PIPING SYSTEM WHERE AIR CAN COLLECT. PROVIDE COOK IN RISER PRIOR TO AUTOMATIC AIR VENT. NEW AIR VENTS SHALL BE "TACO" #HY-VENT OR EQUIVALENT.
- MECHANICAL CONTRACTOR SHALL PROVIDE & INSTALL NEW AUTOMATIC AIR VENT FOR EACH AIR HANDLING UNIT COIL OR DUCT MOUNTED COIL. INSTALL SHUT-OFF COCK PRIOR TO VENT TIE-IN.
- MECHANICAL CONTRACTOR SHALL PROVIDE NEW MANUAL AIR VENTS FOR ALL UNIT VENTILATOR COILS, CONNECTORS, FAN COIL UNITS, FIN TUBE RADIATORS, ETC. MANUAL VENTS SHALL BE "TACO" #M17 COIN VENT OR EQUIVALENT. PROVIDE SHUT-OFF COCK PRIOR TO VENT. AIR COIL VENT DISCHARGE IN AN APPROPRIATE MANNER AS TO FACILITATE THE CAPTURE OF BLEED WATER WHILE PERFORMING SYSTEM BLEEDING OPERATIONS.

ELECTRICAL WORK UNDER MECHANICAL CONTRACT

- MECHANICAL CONTRACTOR SHALL PROVIDE ALL STARTERS & DISCONNECT SWITCHES REQUIRED FOR ALL NEW MECHANICAL EQUIPMENT. STARTER / DISCONNECT SWITCH INSTALLATION TO BE PERFORMED UNDER THE ELECTRICAL CONTRACT. COORDINATE WORK W/ ELECTRICAL CONTRACTOR PRIOR TO START OF WORK.
- POWER WIRING REQUIRED FOR CONTROLS SHALL BE PERFORMED UNDER THE MECHANICAL CONTRACT UNLESS SPECIFICALLY NOTED OTHERWISE ON THE ELECTRICAL DRAWINGS. MECHANICAL CONTRACTOR SHALL OBTAIN THE SERVICES OF A LICENSED ELECTRICIAN (PER NEC REQUIREMENTS) TO PERFORM ALL ELECTRICAL WORK.

DUCTWORK NOTES

- PROVIDE ALL NEW DUCTWORK AS SHOWN AND SPECIFIED UNDER SPECIFICATION SECTION 015891, AND IN CONFORMANCE WITH SMACNA SPECIFICATIONS.
- IF A DUCT ELBOW IS SHOWN TO BE RADIUSSED, THEN RADIUSSED ELBOWS SHALL BE INSTALLED. SQUARE ELBOWS MAY NOT BE SUBSTITUTED WHERE RADIUSSED ELBOWS ARE SHOWN. WHERE SQUARE ELBOWS ARE SHOWN, TURNING VANES SHALL BE INSTALLED UPON APPROVAL BY THE ENGINEER.
- PROVIDE DUCT LINING IN ALL DUCTWORK THAT IS CONVEYING BELOW AMBIENT TEMPERATURE AIR & IS NOT INSULATED. PROVIDE LINING IN SUPPLY & RETURN AIR DUCTWORK FROM AIR HANDLING EQUIPMENT TO 20 FEET AWAY FROM THE UNITS). IN ADDITION, INCLUDE LINING IN ANY OTHER DUCT SPECIFICALLY SHOWN OR SPECIFIED TO BE EQUIPPED WITH LINING. REFER TO SPECIFICATION SECTION 15891 & 15290 FOR FURTHER INFORMATION.
- WHERE FLEXIBLE DUCTWORK IS USED, LENGTHS MAY NOT EXCEED 4 FEET TOTAL IN ANY ONE RUN OF FLEXIBLE DUCTWORK. FLEXIBLE DUCTWORK SHALL BE RATED IN ACCORDANCE WITH UL 181, CLASS 1. REFER TO SPECIFICATION SECTION 15891 FOR FURTHER INFORMATION.
- MECHANICAL CONTRACTOR SHALL PROVIDE A BUTTERFLY TYPE VOLUME DAMPER WITH LOCKING QUADRANT HANDLE PRIOR TO EACH AIR OUTLET SHOWN. INSTALL DAMPER AT LEAST 5 FEET AWAY FROM AIR OUTLET WHEREVER POSSIBLE.
- MECHANICAL CONTRACTOR SHALL PROVIDE FLEXIBLE DUCT CONNECTIONS WHERE DUCT SYSTEMS CONNECT TO EQUIPMENT. REFER TO SPECIFICATION SECTION 15891 FOR FURTHER INFORMATION.

TESTING and BALANCING NOTES

- MECHANICAL CONTRACTOR WILL BE REQUIRED TO PERFORM ALL EQUIPMENT & SYSTEM TESTING / BALANCING REQUIRED UNDER THIS CONTRACT. PROVIDE A FULL REPORT DETAILING ALL DESIGN & ACTUAL CONDITIONS FOR ALL AIR & HYDRONIC SYSTEMS SHOWN ON THE DRAWINGS. REFER TO SPECIFICATION SECTIONS 15990 & 15997 FOR FURTHER DETAILS.
- UPON NOTICE OF COMPLETION OF WORK BY THE CONTRACTOR, OWNER WILL OBTAIN THE SERVICES OF AN INDEPENDENT TESTING & BALANCING CONTRACTOR TO VERIFY THE RESULTS OF THE TESTING & BALANCING REPORT SUBMISSION. INDEPENDENT TESTING AGENCY SHALL SELECT A RANDOM NUMBER OF MEASUREMENTS TO BE CHECKED. MEASUREMENTS WILL BE CHECKED IN THE SAME MANNER AS ORIGINALLY MEASURED. NUMBER OF VERIFICATION MEASUREMENTS SHALL BE APPROXIMATELY 25% OF THE TOTAL MEASUREMENTS FOR THE PROJECT.
- IF MORE THAN 10% OF THE VERIFICATION TESTING SHOWS DEVIATIONS OF 10% OR MORE / SOUND LEVEL OF 2dB DIFFERENT THAN THAT ORIGINALLY MEASURED, THE ORIGINAL REPORT WILL BE REJECTED. ALL SYSTEMS WILL THEN BE REQUIRED TO BE COMPLETELY RE-TESTED, WITH A SECOND REPORT SUBMITTED. IN THE EVENT THAT THE ORIGINAL REPORT IS REJECTED, ALL SYSTEMS SHALL BE READJUSTED & TESTED. NEW CERTIFIED REPORTS SUBMITTED, AND NEW VERIFICATION TESTS MADE, AT NO ADDITIONAL COST TO THE OWNER. THE CONTRACTOR WILL BE RESPONSIBLE FOR ALL COSTS INVOLVED WITH THE VERIFICATION TESTS.

ABBREVIATIONS

A.F.F.	ABOVE FINISHED FLOOR
B.D.	BACKDRAFT DAMPER
CWS	COLD WATER SUPPLY
CFM	CUBIC FEET OF AIR PER MINUTE
D.	DEEP / DEPTH
DIA-	DIAMETER
FAT	FLOAT & THERMOSTATIC
FFM	FEET PER MINUTE
FSD	FIRE DAMPER - DUCT MOUNTED
FLEX	FLEXIBLE
FO	FLAT OVAL DUCTWORK
GAL.	GALLONS
GPH	GALLONS PER HOUR
GPM	GALLONS PER MINUTE
H.	HIGH
H.C.	HANDICAPPED
HWS	HEATING SYSTEM HOT WATER SUPPLY
HWR	HEATING SYSTEM HOT WATER RETURN
HP	HORSEPOWER
I.D.	INSIDE DIAMETER
KW	KILOWATT
L	LONG
LAT	LEAVING AIR TEMPERATURE
LPC	LOW PRESSURE STEAM CONDENSATE
LPS	LOW PRESSURE STEAM
LWT	LEAVING WATER TEMPERATURE
MAX.	MAXIMUM
MIN.	MINIMUM
MBH	BTU x 1,000
MFR	MANUFACTURER
M.H.	MANHOLE
MISC.	MISCELLANEOUS
MTD.	MOUNTED
S	NATURAL GAS
N.I.C.	NOT IN CONTRACT
No. / #	NUMBER
NOM.	NOMINAL
N.T.S.	NOT TO SCALE
O.A.	OUTSIDE AIR
O.C.	ON CENTER
O.D.	OUTSIDE DIAMETER
O.S. & Y.	OUTSIDE SCREW & YOKE
O.C.	ON CENTER
PE	PNEUMATIC / ELECTRIC
PRFAB	PREFABRICATED
PRV	PRESSURE REDUCING VALVE
PSI	POUNDS PER SQUARE INCH
R.A.	RETURN AIR
REQD.	REQUIRED
RPM	REVOLUTIONS PER MINUTE
S.A.	SUPPLY AIR
SCH.	SCHEDULE
S.P.	STATIC PRESSURE
STD.	STANDARD
T	TEMPERATURE
TXV	THERMAL EXPANSION VALVE
TYP.	TYPICAL
VOL.	VOLUME
V.D.	VOLUME DAMPER
VOL.	VELOCITY
VFD	VARIABLE FREQUENCY DRIVE
W.	WIDE
W/	WITH
W/O	WITHOUT
WB	WET BULB TEMPERATURE
WTD	WATER TEMPERATURE DROP
WTR	WATER TEMPERATURE RISE
WPD	WATER PRESSURE DROP

MECHANICAL SYMBOL LEGEND

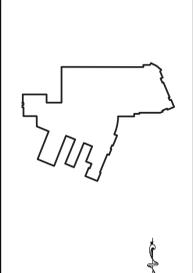
SYMBOL	DESCRIPTION
	RECTANGULAR GALVANIZED DUCTWORK - DIMENSIONS W' x 'H'
	NEW SUPPLY DUCTWORK TO RISE UP
	NEW SUPPLY DUCTWORK TO DROP DOWN
	NEW RETURN DUCTWORK TO RISE UP
	NEW RETURN DUCTWORK TO DROP DOWN
	TRANSITION IN DUCTWORK
	FIRE DAMPER INSTALLED IN DUCTWORK
	VOLUME DAMPER IN DUCT (w/ LOCKING QUADRANT HANDLE)
	ROUND DUCT WORK TO RISE UP
	ROUND DUCTWORK TO DROP DOWN
	FLAT OVAL DUCT WORK
	RECTANGULAR TO ROUND DUCT TRANSITION
	ELBOW IN DUCTWORK w/ TURNING VANES
	ELBOW IN DUCTWORK (RADIUS + 1.5 x D)
	45 DEG. TAKEOFF FITTING
	90 DEG. TAKEOFF w/ BELLMOUTH FITTING
	FLEXIBLE DUCTWORK TO DIFFUSER (4 FT. MAX. RUN)
	4-WAY PATTERN CEILING DIFFUSER
	3-WAY PATTERN CEILING DIFFUSER
	2-WAY PATTERN CEILING DIFFUSER (90 DEG. / OPPOSING PATTERN)
	CEILING RETURN AIR REGISTER
	LINEAR SLOT DIFFUSER
	ROOF MOUNTED EXHAUST FAN

PIPING SYMBOL LEGEND

SYMBOL	DESCRIPTION
	PIPING TO RISE UP (TEE)
	PIPING TO DROP DOWN (TEE)
	PIPING TO RISE UP (ELBOW)
	PIPING TO DROP DOWN (ELBOW)
	PIPING ANCHOR
	PIPING GUIDE
	COLD WATER SUPPLY PIPING
	HEATING SYSTEM SUPPLY PIPING
	HEATING SYSTEM RETURN PIPING
	CHILLED WATER SUPPLY PIPING
	CHILLED WATER RETURN PIPING
	CONDENSER WATER SUPPLY PIPING
	CONDENSER WATER RETURN PIPING
	CONDENSATE DRAINAGE PIPING
	LOW PRESSURE STEAM CONDENSATE PIPING
	LOW PRESSURE STEAM PIPING
	LOW PRESSURE NATURAL GAS PIPING
	ELEVATED PRESSURE NATURAL GAS PIPING
	GAS COCK
	DIRT LEG IN PIPING
	LIQUEFIED PETROLEUM GAS PIPING
	VENT PIPING
	LINEAR EXPANSION COMPENSATOR
	EXPANSION LOOP IN PIPING
	UNION IN PIPING
	PIPING STRAINER (w/ BLOWDOWN VALVE)
	REDUCER / INCREASER FITTINGS IN PIPING
	ECCENTRIC REDUCER IN PIPING
	THERMOMETER
	PRESSURE GAUGE
	FULL PORT BALL VALVE
	GATE VALVE
	SWING CHECK VALVE
	BALANCING VALVE
	3-WAY VALVE (w/ OPERATOR)
	CIRCUIT CUTTER
	TRIPLE DUTY VALVE
	WAFER VALVE
	PLUG / CAP IN PIPING
	PNEUMATIC CONTROL VALVE OPERATOR
	ELECTRIC CONTROL VALVE OPERATOR
	AUTOMATIC AIR VENT
	EXISTING PIPING

REV.	DATE	ITEM

NOTICE
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KEY PLAN
NOT TO SCALE

BRIARCLIFF MANOR U.F.S.D.
PHASE 2 BOND IMPROVEMENTS
TODD ELEMENTARY SCHOOL
 45 INGHAM ROAD, BRIARCLIFF MANOR, NY 10510

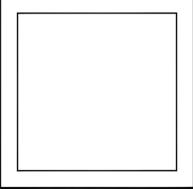
MECHANICAL
GENERAL NOTES, LEGENDS, AND SCHEDULES

DRAWING BY: R.D.P.
 CHECK BY:

NOTICE
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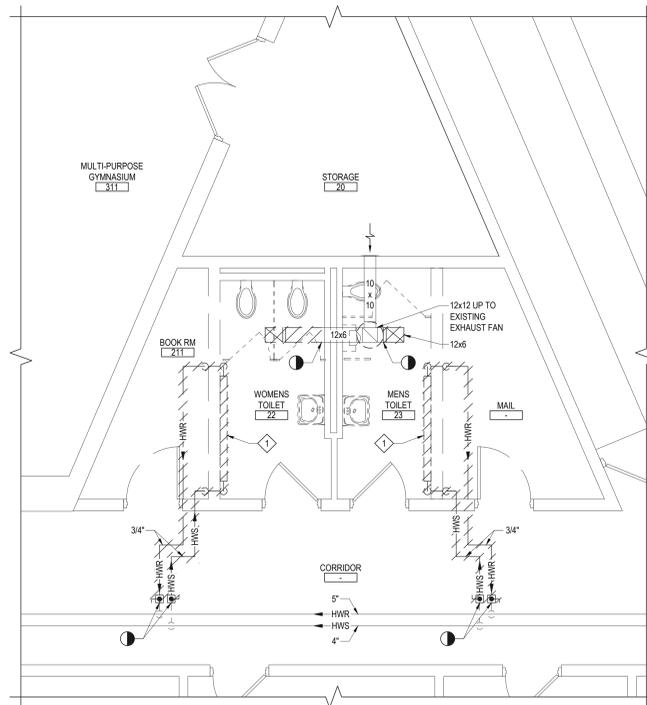


SED No:	66-14-02-02-0-002-021
DISTRICT:	BRIARCLIFF MANOR U.F.S.D. DISTRICT NAME
PROJECT:	PHASE 2 BOND IMPROVEMENTS AT TODD ES
DWG TITLE:	GENERAL NOTES, LEGENDS AND SCHEDULES
SCALE:	AS NOTED
DATE:	NOVEMBER 14, 2022
BID PICK-UP:	NOVEMBER 14, 2022
FILE No:	21-247D

M0.01 HSMS

NOTE - SINGLE PRIME CONTRACT:

1. UNDER BASE BID - GC-2 , ALL GENERAL CONSTRUCTION, MECHANICAL CONSTRUCTION, PLUMBING CONSTRUCTION, AND ELECTRICAL CONSTRUCTION WORK SCOPE SHOWN SHALL BE PROVIDED AND INSTALLED BY THE SINGLE PRIME CONTRACTOR. REFER TO SPECIFICATIONS (INSTRUCTIONS TO BIDDERS and BID PROPOSAL FORM) FOR ADDITIONAL INFORMATION REGARDING SINGLE PRIME CONTRACT.

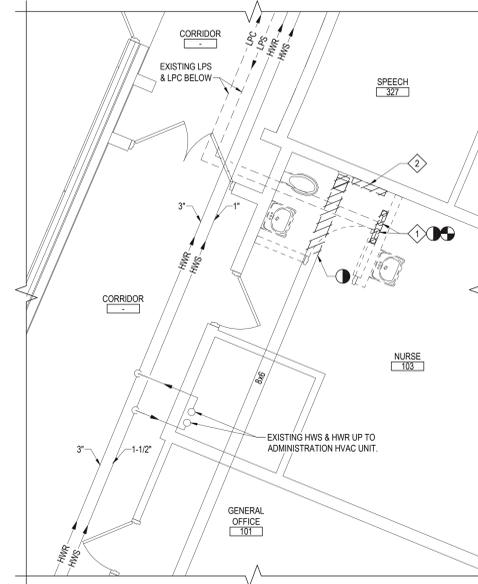


TOILET ROOM HVAC DEMOLITION PLAN

NOTE: SCALE: 1/4" = 1'-0"

DEMOLITION WORK KEYED NOTES:

- M.C. TO DEMO & REMOVE EXISTING HOT WATER FIN TUBE. M.C. TO COORDINATE ANY REQUIRED SHUT-DOWN WITH SCHOOL FACILITIES DEPT. PRIOR TO COMMENCING WORK. M.C. TO COORDINATE ALL WORK WITH G.C.

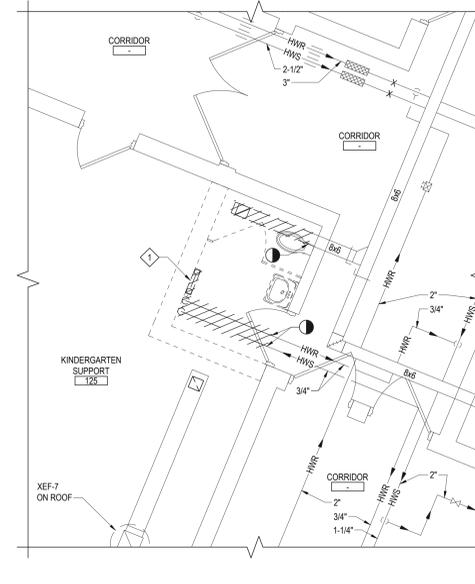


TOILET ROOM HVAC DEMOLITION PLAN

NOTE: SCALE: 1/4" = 1'-0"

DEMOLITION WORK KEYED NOTES:

- M.C. TO DEMO & REMOVE EXISTING STEAM CONVECTOR. M.C. TO HAVE G.C. CHOP FLOOR TO ALLOW M.C. TO ACCESS EXISTING LPS & LPC TO CUT AND CAP PIPES (BELOW FLOOR) FEEDING STEAM CONVECTOR. G.C. TO PATCH FLOOR UPON COMPLETION OF M.C.'S WORK. COORDINATE ANY REQUIRED SHUT-DOWN WITH SCHOOL FACILITIES DEPT. PRIOR TO COMMENCING WORK. M.C. TO COORDINATE ALL WORK WITH G.C.
- M.C. TO DEMO & REMOVE EXISTING ELECTRIC BASEBOARD RADIATOR. M.C. TO COORDINATE WORK WITH E.C. & G.C.

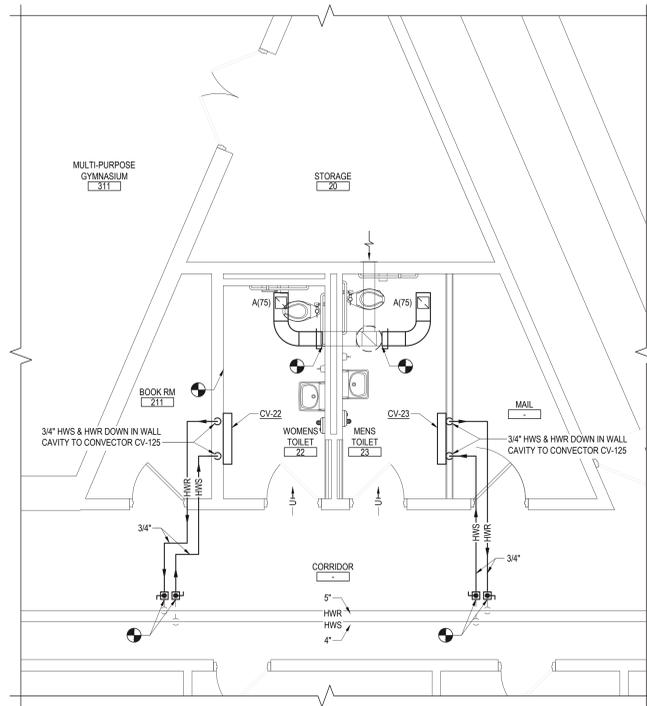


TOILET ROOM HVAC DEMOLITION PLAN

NOTE: SCALE: 1/4" = 1'-0"

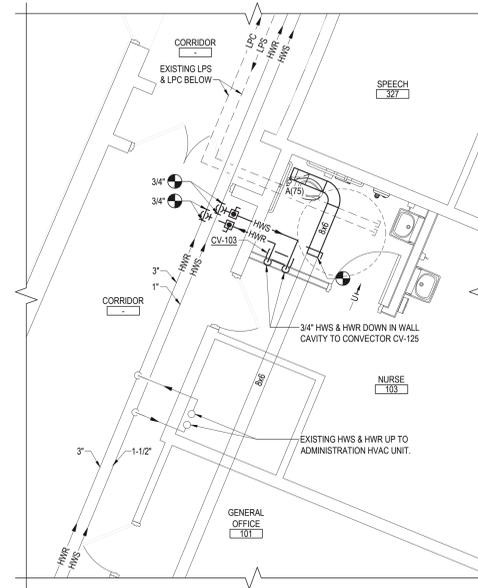
DEMOLITION WORK KEYED NOTES:

- M.C. TO DEMO & REMOVE EXISTING HOT WATER CONVECTOR. M.C. TO COORDINATE ANY REQUIRED SHUT-DOWN WITH SCHOOL FACILITIES DEPT. PRIOR TO COMMENCING WORK. M.C. TO COORDINATE ALL WORK WITH G.C.



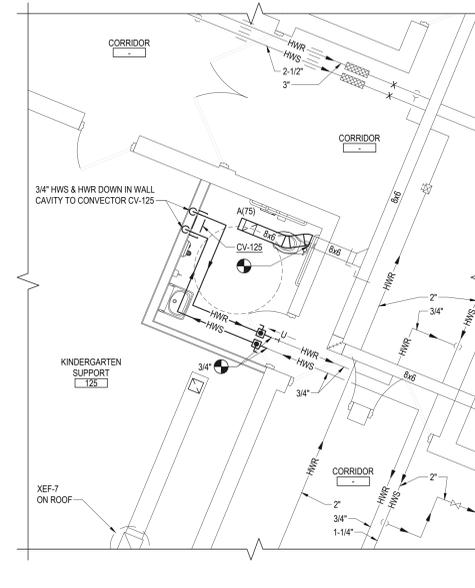
TOILET ROOM HVAC NEW WORK PLAN

NOTE: SCALE: 1/4" = 1'-0"



TOILET ROOM HVAC NEW WORK PLAN

NOTE: SCALE: 1/4" = 1'-0"



TOILET ROOM HVAC NEW WORK PLAN

NOTE: SCALE: 1/4" = 1'-0"

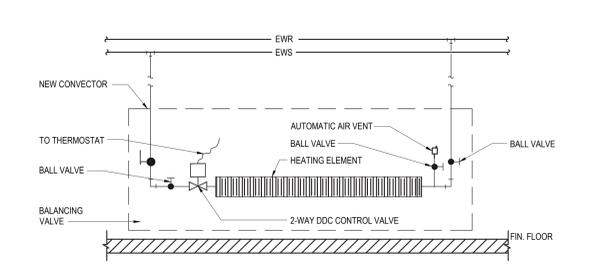
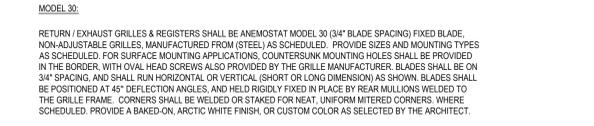
AIR DEVICE SCHEDULE (ANEMOSTAT AS STANDARD)					
MANUFACTURER MODEL NO.	TAG	NECK SIZE	MODULE SIZE	CFM RANGE	SYMBOL & FLOW PATTERN
ANEMOSTAT 30 (SURFACE MTD.) EXHAUST	A	-	8x8	UP TO 150	EXHAUST

NOTES:

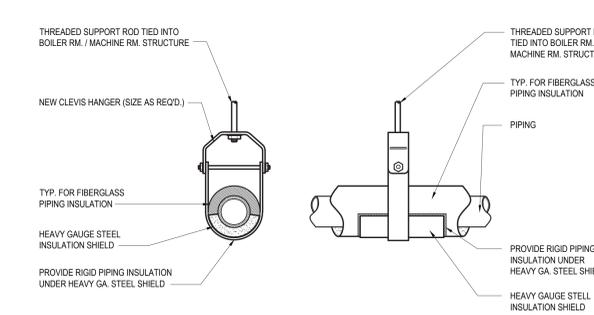
- MECHANICAL CONTRACTOR TO COORDINATE BORDER TYPES WITH CLG. CONSTRUCTION.
- ALL BALANCING TO BE PERFORMED THRU BRANCH DAMPERS.
- EXHAUST GRILLES BASED ON ANEMOSTAT MODEL 30.
- MAXIMUM NC LEVELS ARE <25 FOR ALL EXHAUST.

MODEL 30:

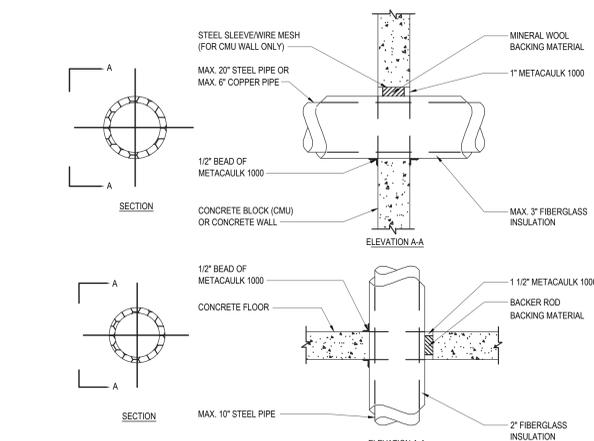
RETURN / EXHAUST GRILLES & REGISTERS SHALL BE ANEMOSTAT MODEL 30 (3/4" BLADE SPACING) FIXED BLADE, NON-ADJUSTABLE GRILLES, MANUFACTURED FROM (STEEL) AS SCHEDULED. PROVIDE SIZES AND MOUNTING TYPES AS SCHEDULED. FOR SURFACE MOUNTING APPLICATIONS, COUNTERSINK MOUNTING HOLES SHALL BE PROVIDED IN THE BORDER, WITH OVAL HEAD SCREWS ALSO PROVIDED BY THE GRILLE MANUFACTURER. BLADES SHALL BE ON 3/4" SPACING, AND SHALL RUN HORIZONTAL OR VERTICAL (SHORT OR LONG DIMENSION) AS SHOWN. BLADES SHALL BE POSITIONED AT 45° DEFLECTION ANGLES, AND HELD RIGIDLY IN PLACE BY REAR MULLIONS WELDED TO THE GRILLE FRAME. CORNERS SHALL BE WELDED OR STAKED FOR NEAT, UNIFORM MITERED CORNERS, WHERE SCHEDULED. PROVIDE A BAKED-ON, ARCTIC WHITE FINISH, OR CUSTOM COLOR AS SELECTED BY THE ARCHITECT.



1 CONVECTORS HEATING ELEMENT PIPING SCALE: N.T.S.



2 CLEVIS HANGER PIPING SUPPORT DETAIL SCALE: N.T.S.



3 PIPING WALL/FLOOR PENETRATION SCALE: N.T.S.

REV.	DATE	ITEM

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KEY PLAN

NOT TO SCALE

PROJECT

BRIARCLIFF MANOR U.F.S.D.
 PHASE 2 BOND IMPROVEMENTS
 TODD ELEMENTARY SCHOOL
 45 INGHAM ROAD, BRIARCLIFF MANOR, NY 10510

DWG TITLE

HVAC
 DEMOLITION & PROPOSED PART PLANS

DRAWING BY: Z.M.Z.

CHECK BY: ...

NOTICE

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SED No: 66-14-02-02-0-002-021

DISTRICT: BRIARCLIFF MANOR U.F.S.D. DISTRICT NAME

PROJECT: PHASE 2 BOND IMPROVEMENTS AT TODD ES

DWG TITLE: HVAC DEMOLITION & PROPOSED PART PLANS

SCALE: AS NOTED

DATE: NOVEMBER 14, 2022

BID PICK-UP: NOVEMBER 14, 2022

FILE No: 21-247D

M1.01

SLOPE TOP, WALL-MOUNTED, HOT WATER CONVECTOR SCHEDULE (CV-22, CV-23, CV-103 & CV-125) (BASIS: ZEHNDER RITTLING)

Model **SL-18-24-04**

Tag: _____

Qty	Coil Config	Inlet/Outlet	End Bracket
1	Hot Water		NONE

General Information

Altitude:	0	Feet
Height:	18" H	
Length:	24" L	
Depth:	4" D	

Hot Water Heat

Capacity:	2.9	MBH
Entering Air Temperature:	63.0	°F
Fluid Flow:	0.5	GPM
Entering Fluid Temperature:	200.0	°F
Leaving Fluid Temperature:	188.0	°F
Average Fluid temperature:	194.0	°F
Fluid ΔT:	12.0	°F
Fluid Pressure Drop:	0.2	ft. H2O
Fluid Type:	Water	
Glycol %:	0	

Unit Information

Unit Length:	24	Inches
Unit Width:	4	Inches
Unit Height:	18	Inches

* Weight is base unit only, does not include any options or accessories selected



Pricing for standard colors varies by product and color, refer to price lists for detailed information.

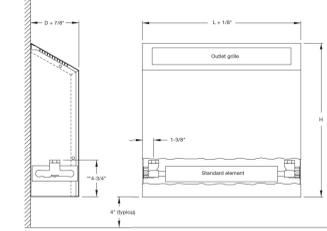
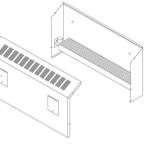
Electronic file is for reference only, subject to the calibration of each individual monitor. It is viewed on, contact the factory for a printed color chart to obtain an accurate representation of standard colors.

Dimensions and data

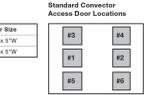
Nominal Height	Nominal Depth	Nominal Depth (H)
24"	4"	4"
28"	20"	6"
36"	36"	8"
40"	32"	
48"		
52"		
60"		
66"		

Any combination of length, height and depth is available.

Model SL; wall hung slope top



Unit Height	Unit Length	# of Doors Available	Available Locations	Door Size
Up to 22"	All lengths	2	1, 2	4 1/4" x 9 3/4"
22" and over	All lengths	3	1, 2	5 1/4" x 9 3/4"

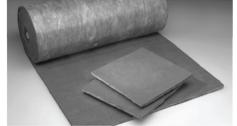


Note:

- Contact factory on heights less than 22"
- The coil is adjustable 2/8" in 7/16" increments.
- For connectors less than 22" long, and products are not offered as standard. Consult factory for availability.

Qty: 3 Tags: Bathroom, Fiberglass insulation

Description
Flexible duct liner insulation is made from strong, glass fibers bonded with a thermosetting resin. The airstream surface is protected with a reinforced coating system, which combines a state-of-the-art acrylic coating with a flexible glass mat reinforcement to provide a smooth airstream surface.



- Advantages**
- Improves indoor environmental quality by helping to control both temperature and sound.
 - The tough, acrylic polymer coating helps guard against the incursion of dust or dirt into the substrate, minimizing the potential for biological growth.
 - Coating is formulated with an immobilized, EPA-registered, protective agent to protect the coating from potential growth of fungus and bacteria. Duct liner meets all requirements for fungi and bacterial resistance. Tests were conducted in accordance with ASTM C 1338 and ASTM G 21 (fungi testing) and ASTM G 22 (bacteria resistance testing). **Note:** As with any type of surface, microbial growth may occur in accumulated duct system dirt, given certain conditions. This risk is minimized with proper design, filtration, maintenance and operation of the HVAC system.
 - The reinforced coating surface provides superior resistance to penetration of incidental water into the fiber glass wool core.
 - GREENGUARD® certification is proof that the product meets the Environmental Institute's indoor air quality standards for VOCs.

- General properties**
- Operating temperature (max.): ASTM C 411 250 °F (121 °C)
 - Air velocity (max.): ASTM C 1071 6,000 fpm (30.5 m/sec)
 - Water repellency: INDA IST 80.6-92
 - Fungi resistance: ASTM C 1338 Does not breed or promote
 - Fungi resistance: ASTM G 21 No growth
 - Bacteria resistance: ASTM G 22 No growth
- Surface burning characteristics**
- Meets the surface burning characteristics and limited combustibility of the following standards: standard/ test method
 - ASTM E 84
 - UL 723
 - NFPA 255
 - NFPA 90A and 90B, FHC 25/50 and limited combustibility
 - NFPA 259
 - CAN/ULC S102-M88
 - Flame spread: not over 25
 - Smoke developed: not over 50

Thermal performance

Thickness	R-value	Conductance
in	ft ² ·h/°F·Btu	m ² ·°C/W
1/2	2.2	0.38
1	4.4	0.46
1 1/2	6.6	0.51

R-value and conductance are calculated from the material thermal conductivity tested in accordance with ASTM C 518 at 75 °F (24 °C) mean temperature.

Sound absorption coefficients (type "A" mounting)

Thickness	Sound absorption coefficient at frequency (cycles per second) of	NRC
in	125 250 500 1000 2000 4000	
1/2	0.07 0.30 0.44 0.66 0.84 0.93	0.55

Coefficients were tested in accordance with Test Method ASTM C 423-90 and ASTM E 795

Warranty

Zehnder Ritting guarantees its products to be free from defects in material and workmanship for a period of one year from date of shipment from our factory.

Should there be any defects in the goods, the purchaser should promptly notify Zehnder Ritting. Upon receipt of written consent from Zehnder Ritting, the purchaser shall return the defective goods to the factory for inspection with freight prepaid. If inspection shows the goods to be defective, Zehnder Ritting will at its discretion repair or replace the said items.

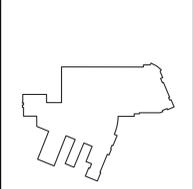
Defects arising from damage due to shipment, improper installation, negligence or misuse by others are not covered by this warranty.

This warranty is extended only to the original purchaser from Zehnder Ritting.

REV.	DATE	ITEM

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KEY PLAN
NOT TO SCALE

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PHASE 2 BOND IMPROVEMENTS
TODD ELEMENTARY SCHOOL
45 INGHAM ROAD, BRIARCLIFF MANOR, NY 10510

DWG TITLE
MECHANICAL
SCHEDULES & DETAILS

DRAWING BY: Z.M.Z.
CHECK BY: ---

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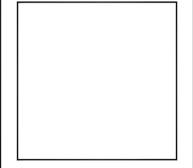
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SED No: 66-14-02-02-0-002-021

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