

ADDENDUM NO.1

CHAMBERS, BELLOW, SIZE ACCORDING TO MANUFACTURER'S RECOMMENDATIONS CHART BELOW TO ELIMINATE WATER HAMMER AND SHOCK FROM PIPING SYSTEM. PROVIDE WATER HAMMER ARRESTORS ON HOT AND COLD WATER SUPPLIES TO ALL QUICK VALVES, SOLENOIDS, AND PLUMBING FIXTURES, AND LOCATE IN AN UPRIGHT POSITION BETWEEN THE LAST TWO FIXTURES ON A LINE, OR HORIZONTALLY AT THE END OF LINE CLOSEST TO SUPPLY SOURCE.

Table with columns: SIZE, FIXTURE UNITS, MODEL NO., CONN. SIZE. Lists various sizes from A to F.

OI-1: OIL INTERCEPTOR
WATTS DRAINAGE OI-700 SERIES RECESSED EPOXY COATED STEEL OIL INTERCEPTOR WITH INTEGRAL STORAGE TANK...

SI-1,2,3: SEDIMENT INTERCEPTOR
STRIFEM SETTLER/CATCH BASIN MODEL CB-125-S SHALL BE LIFETIME GUARANTEED AND MADE IN USA OF SEAMLESS, ROTATIONALLY-MOLDED HIGH DENSITY POLYETHYLENE...

HWT-1: DOMESTIC HOT WATER HEATER
A.O. SMITH BTX-80 OR EQUIVALENT POWER VENTED, CONDENSING NATURAL GAS FIRED DOMESTIC HOT WATER HEATER...

P-1: DOMESTIC HOT WATER RECIRCULATION PUMP
ARMSTRONG ASTRO 50B, 7GPM AT 12' HD. 0.82A, 110W MOTOR 115V 1 PHASE. BRONZE CONSTRUCTION, 3000 RPM. B&G SHALL ALSO BE ACCEPTED.

XT-1: DOMESTIC HOT WATER EXPANSION TANK
AMTROL THERM-X-TROL MODEL ST-12-C, ASME RATED, 6.4 GALLON ACCEPTANCE.

BFP-1: DOMESTIC WATER BACKFLOW PREVENTER
WATTS SERIES 009M2Q2 REDUCED PRESSURE ZONE BACKFLOW PREVENTER. LINE-SIZE UNIT C/W INTERNAL PRESSURE DIFFERENTIAL RELIEF VALVE...

SECTION 15800 - HEATING, VENTILATION & AIR CONDITIONING

11. PROVIDE SUPPLY, RETURN AND EXHAUST AIR DUCT SYSTEMS FROM AIR HANDLING EQUIPMENT AND FANS AS SHOWN.

12. ALL DUCTWORK INSTALLATION SHALL BE PERFORMED IN ACCORDANCE WITH ASHRAE, SMACNA LATEST EDITION DUCT STANDARDS.

13. THIS CONTRACTOR SHALL SUPPLY AND INSTALL ALL DUCTWORK INCLUDING APPURTENANCES, HANGERS, DAMPERS, ETC.

14. DUCT CONSTRUCTION:
14.1. RECTANGULAR DUCTWORK SHALL BE CONSTRUCTED FROM GALVANIZED SHEET METAL OF THE FOLLOWING U.S. STANDARD GAUGES:
14.1.1. DUCTS UP TO 12" ON LONGEST DIMENSION 26 GA.
14.1.2. DUCTS 13" TO 28" ON LONGEST DIMENSION 24 GA.
14.1.3. DUCTS 29" TO 54" ON LONGEST DIMENSION 22 GA.
14.1.4. DUCTS 55" TO 84" ON LONGEST DIMENSION 20 GA.
14.2. ROUND AND OVAL DUCTWORK SHALL BE SPIRAL CONDUIT CONSTRUCTION OF ZINC COATED STEEL OF THE FOLLOWING U.S. GAUGES:

Table with columns: CONDUIT SIZE, GAUGE OF METAL. Lists gauges for 8" and smaller up to 38" to 50".

ALL SEAMS AND JOINTS IN ROUND OR OVAL DUCT FITTINGS SHALL BE CONTINUOUSLY WELDED. RE-COAT ZINC COATING DAMAGED BY WELDING PROCEDURE.

15. BALANCING DAMPERS SHALL BE CONSTRUCTED FROM GALVANIZED STEEL 2 GAUGES HEAVIER THAN THE DUCTWORK IN WHICH THEY ARE INSTALLED C/W LOCKING QUADRANT AND INDICATING DEVICE.

16. TURNING VANES SHALL BE CONSTRUCTED TO THE FOLLOWING REQUIREMENTS:

16.1. USE DUCT ELBOWS WHICH HAVE A THROAT RADIUS OF 1-1/2 TIMES THE DUCT DIAMETER.

16.2. WHERE SPACE IS LIMITED, USE DUCT ELBOWS FABRICATED WITH SPACE THROATS AND BACKS AND FITTED WITH ROVANE TURNING VANES.

17. THE FOLLOWING DUCT JOINING METHODS SHALL BE USED:

17.1. PITTSBURGH LOCK OR DOUBLE SLIDE LOCK HAMMERED FLAT FOR LONGITUDINAL JOINTS ON STRAIGHT DUCTWORK.

17.2. PITTSBURGH LOCK FOR CORNER LOCK OF FITTING.

17.3. FLAT DRIVE CLEAT JOINT ON ALL SIDE JOINTS 18" (450MM) AND UNDER IN LENGTH.

17.4. FLAT SLIP CLEAT JOINT ON ALL TRANSVERSE JOINTS 18" (450MM) AND UNDER IN LENGTH.

17.5. ANGLE "S" OR STANDING DRIVE CLEATS ON ALL SIDE JOINTS 19"(475MM) TO 30"(760MM) ON HEIGHT.

17.6. STANDING "S" OR STANDING DRIVE CLEATS ON ALL TRANSVERSE JOINTS 19"(475MM) TO 30"(760MM) IN LENGTH.

17.7. ANGLE "S" OR STANDING DRIVE CLEATS ON ALL TRANSVERSE AND SIDE JOINTS 31"(785MM) TO 72"(1800MM).

17.8. STANDING "S" OR STANDING DRIVE CLEATS REINFORCED WITH 1 1/2"(38MM) X 4.5MM MILD STEEL BAR ON ALL TRANSVERSE AND SIDE JOINTS 73"(1825MM) AND OVER.

18. PROVIDE FIRE DAMPERS WHICH CONFORM TO NFPA REGULATIONS, BEAR ULC LABEL, AND HAVE APPROVAL OF AUTHORITY HAVING JURISDICTION. DAMPERS TO BE TYPE 'B' AND 'C' (UNLESS OTHERWISE NOTED) AND INSTALLED IN DUCTWORK AT FIRE SEPARATIONS WHETHER SHOWN OR NOT. VERIFY LOCATIONS ON ARCHITECTURAL DRAWINGS.

19. ALL NEW DUCTWORK SHALL BE SEALED USING DUCT BOND II HIGH PRESSURE, NON-TOXIC, DUCT SEALER THROUGHOUT ALL SEAMS AND JOINTS.

20. SUPPORT HORIZONTAL DUCTS ON MAXIMUM 8'-0" (2.4 M) CENTERS BY PERFORATED GALV. STEEL RIVETTED STRAP FOR DUCTWORK 36" (915 MM) (EITHER DIMENSION) OR LESS, AND MINIMUM 1" X 1" X 1/8" (25 X 25 X 2 MM) GALV. IRON UNDER DUCTS OVER 36" (915 MM) (EITHER DIMENSION) WITH 3/8" (6 MM) DIAM. THREADED RODS SUSPENDING ANGLES FROM STRUCTURE.

21. PROVIDE ACCESS DOORS WHERE REQUIRED FOR SERVING OF EQUIPMENT AND FIRE DAMPERS.

22. PROVIDE 4" (100 MM) FLEXIBLE DUCT CONNECTIONS ON BOTH INLET AND OUTLET DISCHARGE SIDES OF EACH FAN.

- 23. PROVIDE ONE SPARE SET OF FILTERS FOR EACH AIR HANDLING UNIT.
24. ALL DUCT MOUNTED MOTORIZED DAMPERS SHALL BE INSULATED LOW LEAKAGE TYPE TO TAMCO 9000 OR EQUAL IN ACCORDANCE WITH B7.
25. PROVIDE VIBRATION ISOLATORS FOR ALL MECHANICAL EQUIPMENT, INCLUDING PUMPS, UTILITY FANS, AND VENT SETS, AIR HANDLERS, ROOF-TOPS UNITS, CONDENSING UNITS, COMPRESSED, ETC. AS APPLICABLE. SUBMIT SHOP DRAWINGS PRIOR TO INSTALLATION.
26. BACK-DRAFT DAMPERS SHALL BE PROVIDED WITH THE FOLLOWING MINIMUM REQUIREMENTS:
26.1. 16 GA. GALVANIZED STEEL OR ALUMINUM CHANNEL FRAME; 16 GA. GALVANIZED BLADES C/W STIFFENERS, FULL BLADE-LENGTH SHAFT; BRASS, BALL OR NYLON BUSHING; FELT OR NEOPRENE ANTI-CHATTER BLADE STRIPS; ADJUSTABLE COUNTER-BALANCE.

- 16. CHIMNEYS AND BREECHING SHALL BE LABORATORY TESTED AND LISTED BY THE UNDERWRITERS LABORATORIES INC. FOR USE WITH BUILDING HEATING EQUIPMENT BURNING NATURAL GAS OR PROPANE GAS, AS DESCRIBED IN NFPA 211, SECTION 60. THE DOUBLE WALL STACK SHALL HAVE AN OUTER JACKET OF GALVANIZED STEEL CONFORMING TO ASTM A525. THERE SHALL BE AN AIR SPACE BETWEEN THE WALLS. THE INNER GAS CONVEYING PIPE SHALL BE AN ALUMINUM ALLOY - JOINTS TO BE SECURED WITH SHEET METAL SCREWS.
17. PROVIDE CHIMNEYS AND/OR BREECHING FOR:
17.1. GAS-FIRED DOMESTIC WATER HEATERS.
17.2. GAS-FIRE UNIT HEATERS.

- 18. PROVIDE BASE TEE WITH CLEANOUT, ROOF FLASHING AND VENT CAP FOR ALL EQUIPMENT AS REQUIRED.
19. ALL AIR AND WATER SYSTEMS SHALL BE BALANCED AND TESTED BY A CERTIFIED A.A.B.C. INDEPENDENT BALANCING AGENCY TO PROVIDE QUANTITIES AS SHOWN. PROVIDE THREE(3) SETS OF BALANCE REPORTS FOR REVIEW BY THE CONTRACT ADMINISTRATOR. ALL BALANCING REPORTS SHALL INCLUDE FIRE DAMPER TESTING AND CERTIFICATION.

15900 - CONTROLS

THE POINTS BELOW DESCRIBE THE CONTROL SEQUENCE OF THE H.V.A.C. EQUIPMENT SPECIFIED IN THE SCHEDULES. ALL CONTROLS TO BE SUPPLIED BY DIV. 15 AND WRED BY DIV.15. CONTROLS CONTRACTOR SHALL BE A SUBCONTRACTOR OF THE MECHANICAL SUB-CONTRACTOR. PROVIDE LOCKABLE COVERS FOR ALL THERMOSTATS, NEW OR EXISTING.

- 1. STORAGE GARAGE VENTILATION CONTROL:
1.1. PROVIDE GAS DETECTOR(S) AND ALARM, DAMPER OPERATOR(S) WITH END SWITCH(ES), DAMPERS, AIR FLOW SWITCHES, RELAYS, DEHUMIDISTAT, ETC.
1.2. UPON SENSING 12.5 PPM CO OR 3.0 PPM NO2:
1.2.1. SENSOR SHALL ENERGIZE OUTDOOR AIR DAMPER OPERATORS TO OPEN.
1.2.2. END SWITCHES SHALL ENERGIZE EXHAUST FAN.
1.2.3. SHOULD AIR FLOW NOT BE PROVEN AT EXHAUST FAN, THE SYSTEM SHALL DE-ENERGIZE AND AN AUDIBLE ALARM SHALL SOUND.
1.3. UPON SENSING ABOVE 25.0 PPM CO OR 5.0 PPM NO2:
1.3.1. SENSOR SHALL SOUND AUDIBLE ALARM.
1.4. UPON SENSING RELATIVE HUMIDITY ABOVE DEHUMIDISTAT SETPOINT:
1.4.1. SENSOR SHALL ENERGIZE OUTDOOR AIR DAMPER OPERATORS TO OPEN.
1.3.2. END SWITCHES SHALL ENERGIZE EXHAUST FAN.
1.3.3. SHOULD AIR FLOW NOT BE PROVEN AT EXHAUST FAN, THE SYSTEM SHALL DE-ENERGIZE AND AN AUDIBLE ALARM SHALL SOUND.
1.4. FAN SHALL DE-ENERGIZE AND MOTORIZED DAMPER SHALL CLOSE AS GAS LEVELS DROP BELOW SETPOINTS AND AS DE-HUMIDISTAT IS SATISFIED.

MECHANICAL EQUIPMENT SCHEDULES:

EQUIPMENT THAT IS SUPPLIED WITH A FACTORY-INSTALLED DISCONNECTING MEANS FOR THE CONNECTION OF THE SUPPLY SIDE FEEDER CONDUCTORS MUST BE CERTIFIED SO THAT THESE CONDUCTORS CAN BE OF EITHER ALUMINUM OR COPPER.

MECHANICAL AND ELECTRICAL SUB-CONTRACTORS ARE RESPONSIBLE FOR THE MUTUAL COORDINATION OF ALL ELECTRICAL REQUIREMENTS OF MECHANICAL EQUIPMENT. COORDINATION IS TO INCLUDE THE COMMUNICATION OF ALL FINAL ELECTRICAL NAMEPLATE INFORMATION FROM THE MECHANICAL SUB-CONTRACTOR TO THE ELECTRICAL SUB-CONTRACTOR, THE COMMUNICATION OF THE DETAILED CONTROL INFORMATION AS WELL AS ANY ANCILLARY INFORMATION REQUIRED FOR THE FINAL SYSTEMS TO OPERATE AS INTENDED BY THE CONTRACT ADMINISTRATOR. THE COORDINATION IS TO OCCUR PRIOR TO THE ORDERING OF EQUIPMENT BY EITHER TRADE. NO EXTRA COMPENSATION WILL BE ALLOWED DUE TO FAILURE TO CARRY OUT THIS COORDINATION. REPORT AT ONCE TO THE CONTRACT ADMINISTRATOR ANY DEFECT, DISCREPANCY, OMISSION OR INTERFERENCE AFFECTING THE SATISFACTORY COMPLETION OF WORK.

1. DIFFUSERS AND GRILLES: (BASED ON E.H. PRICE)

Table with columns: TAG, TYPE, DESCRIPTION, ACCESSORIES. Lists supply and return diffusers with sizes on drawings.

2. EXHAUST FANS (BASED ON GREENHECK):

- EF-1 GREENHECK MODEL CSP-B110 DIRECT DRIVE INLINE CABINET FAN, 75 CFM @ 0.5" S.P., 89 WATTS, 115/60/1 SUPPLY VOLTAGE, 2.5 SONES. COORDINATE ELECTRICAL WITH DIVISION 26.
EF-2 GREENHECK MODEL CSP-A250 DIRECT DRIVE INLINE CABINET FAN, 200 CFM @ 0.5" S.P., 60 WATTS, 115/60/1 SUPPLY VOLTAGE, 3 SONES. COORDINATE ELECTRICAL WITH DIVISION 26.
EF-3 GREENHECK MODEL B50-100-3 BELT DRIVE CENTRIFUGAL INLINE FAN, 1,200 CFM @ 0.5" S.P., 1/3 H.P., 7.2 AMPS, 115/1/60 SUPPLY VOLTAGE, 14.5 SONES. COORDINATE ELECTRICAL WITH DIVISION 26.

3. HEAT RECOVERY VENTILATORS:

- HRV-1 NU-AIR MODEL NU500 (OR EQUIVALENT), 400 CFM SUPPLY AT 0.5" E.S.P., 400 CFM EXHAUST AT 0.5" E.S.P., TWO DIRECT DRIVE BLOWERS (128 WATTS TOTAL), POLYPROPYLENE CORE, C/W 1" PLEATED FILTER SECTION. COORDINATE ELECTRICAL REQUIREMENTS WITH DIVISION 26.

4. PACKAGED ROOFTOP UNITS:

- RTU-1 YORK MODEL Z0G06F1 OR EQUIVALENT (5-TON) PACKAGED GAS HEATING/ELECTRIC COOLING R410A ROOFTOP UNIT, 60 MBH NOMINAL COOLING CAPACITY, 142 MBH INPUT HEATING CAPACITY, 114 MBH OUTPUT HEATING CAPACITY, 14.1 SEER, 12.1 EER, 2000 CFM AT 0.8" E.S.P., 2.4 HP SUPPLY FAN MOTOR, COMPLETE WITH CO2 SENSOR, DOWN DISCHARGE, 100% MODULATING ECONOMIZER, POWER EXHAUST, 14" ROOF CURB, PROGRAMMABLE THERMOSTAT WITH LOCKABLE GUARD. COORDINATE ELECTRICAL REQUIREMENTS WITH DIVISION 26.

5. CARBON MONOXIDE/NITROGEN DIOXIDE GAS DETECTOR:

HONEYWELL ANALYTICS MODEL E35A/E3P, STAND-ALONE MONITOR C/W REMOTE SENSOR. THE MONITOR WILL INCORPORATE AN ELECTROCHEMICAL CELL FOR TOXIC GAS MONITORING. THE MONITOR WILL BE CAPABLE OF TRANSMITTING GAS CONCENTRATIONS TO A DDC SYSTEM THROUGH ITS 4-20 MA OUTPUT. FOR LOCAL ACTIVATION OF FANS OR LOUVERS (OR OTHER EQUIPMENT), TWO ON-BOARD DPDT RELAYS 5 A, 30 VDC OR 250 VAC (RESISTIVE LOAD) WILL BE ACTIVATED AT PROGRAMMABLE SET POINTS (AND PROGRAMMABLE BEFORE AND AFTER TIME DELAYS). AN 8 CHARACTER, 2 LINE BACKLIT

LCD DISPLAY WILL PROVIDE LOCAL GAS CONCENTRATION READINGS. TRANSMITTER WILL BE CAPABLE OF OPERATING WITHIN RELATIVE HUMIDITY RANGES OF 5-95% NON-CONDENSING AND TEMPERATURE RANGES OF -40° F TO 122° F (-40° C TO 50° C). THE TRANSMITTER WILL HAVE A PLUG-IN CAPABILITY FOR A GAS CARTRIDGE WITH A SMART SENSOR TECHNOLOGY WITH SELF-TESTING CAPABILITIES ACCURACY OF +/- 3%OF FULL SCALE @ 25 C. ENCLOSURE WILL BE POLYCARBONATE WITH RUBBERIZED SEALED COVER AND LED VISUAL INDICATORS FOR POWER, ALARM & FAULT CONDITIONS. FOR LOCAL ACTIVATION OF AUDIBLE ALARMS, THE MONITOR SHALL HAVE AN ON-BOARD DEVICE ABLE TO GENERATE AN AUDIBLE OUTPUT OF 85 DBA @ 10 FT (3M). DEVICE TO BE C/W ON-BOARD TRANSFORMER.

MONITOR ALARM LEVELS ARE TO ACTIVATE AND THE UNIT IS TO BE INSTALLED IN ACCORDANCE WITH THE FOLLOWING PARAMETERS:

ALARM PANEL
CARBON MONOXIDE
FIRST ALARM SET POINT: 12.5 PPM
SECOND ALARM SET POINT: 25.0 PPM
SENSOR LOCATION: AS PER MANUFACTURER RECOMMENDATION RADIUS OF COVERAGE: 50'

REMOTE SENSOR
NITROGEN DIOXIDE
FIRST ALARM SET POINT: 3.0 PPM
SECOND ALARM SET POINT: 5.0 PPM
SENSOR LOCATION: AS PER MANUFACTURER RECOMMENDATION RADIUS OF COVERAGE: 50'

3. GAS FIRED UNIT HEATERS:

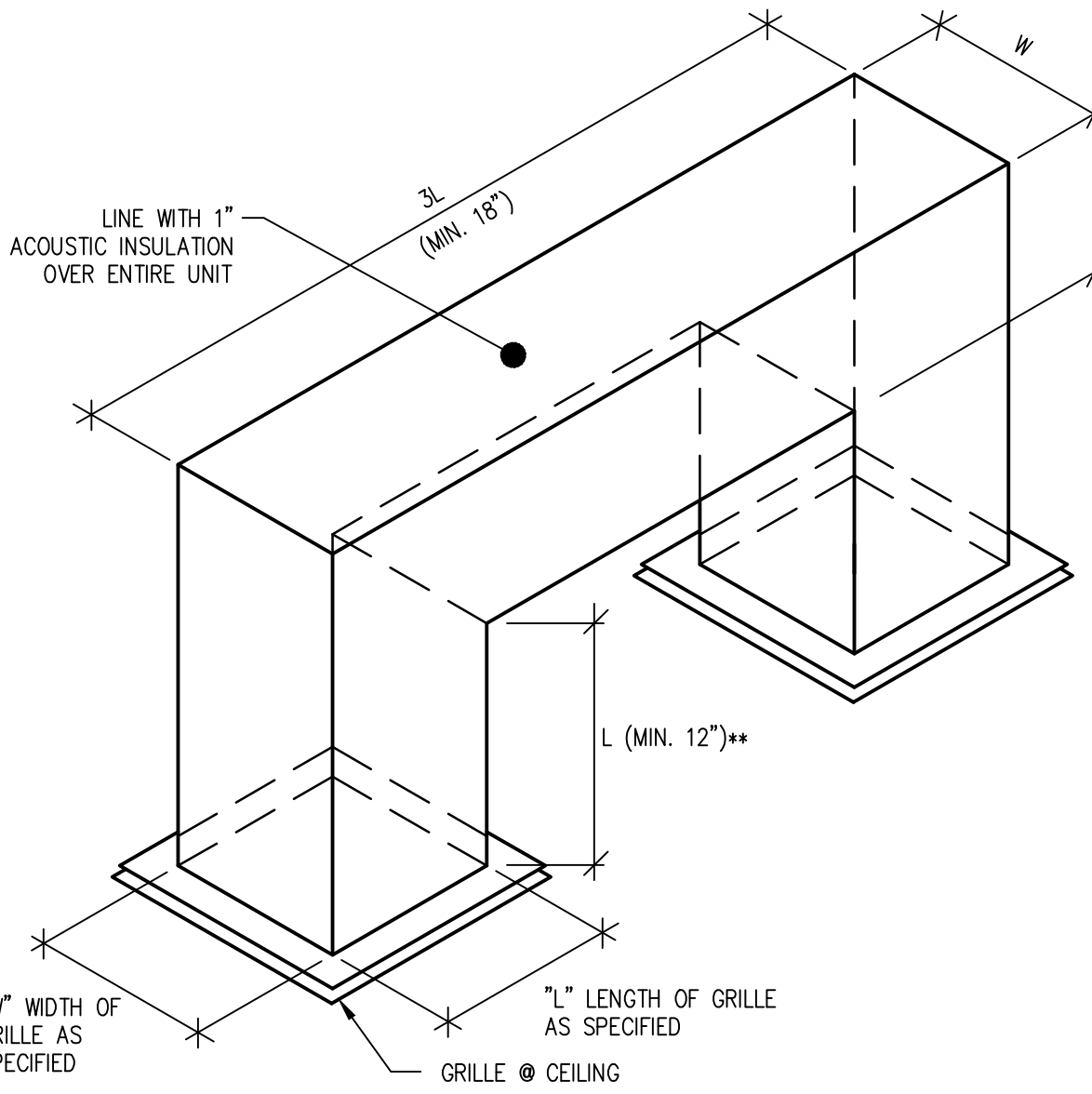
UH-1,2 REZNOV (OR EQUIVALENT) MODEL UDAS-125 DIRECT FIRED, SEPARATED COMBUSTION, NATURAL GAS FIRED UNIT HEATER, 125 MBH INPUT HEATING CAPACITY, 99.6 MBH OUTPUT HEATING CAPACITY, C/W VENT TERMINATION KIT & ISOLATION MOUNTS. COORDINATE ELECTRICAL REQUIREMENTS WITH DIVISION 26.

Ventilation Sizing Summary for RTU-1

Project Name: 36-087 Kildonan Park Front Works Yard
Prepared by: Nova 3 Engineering Ltd.

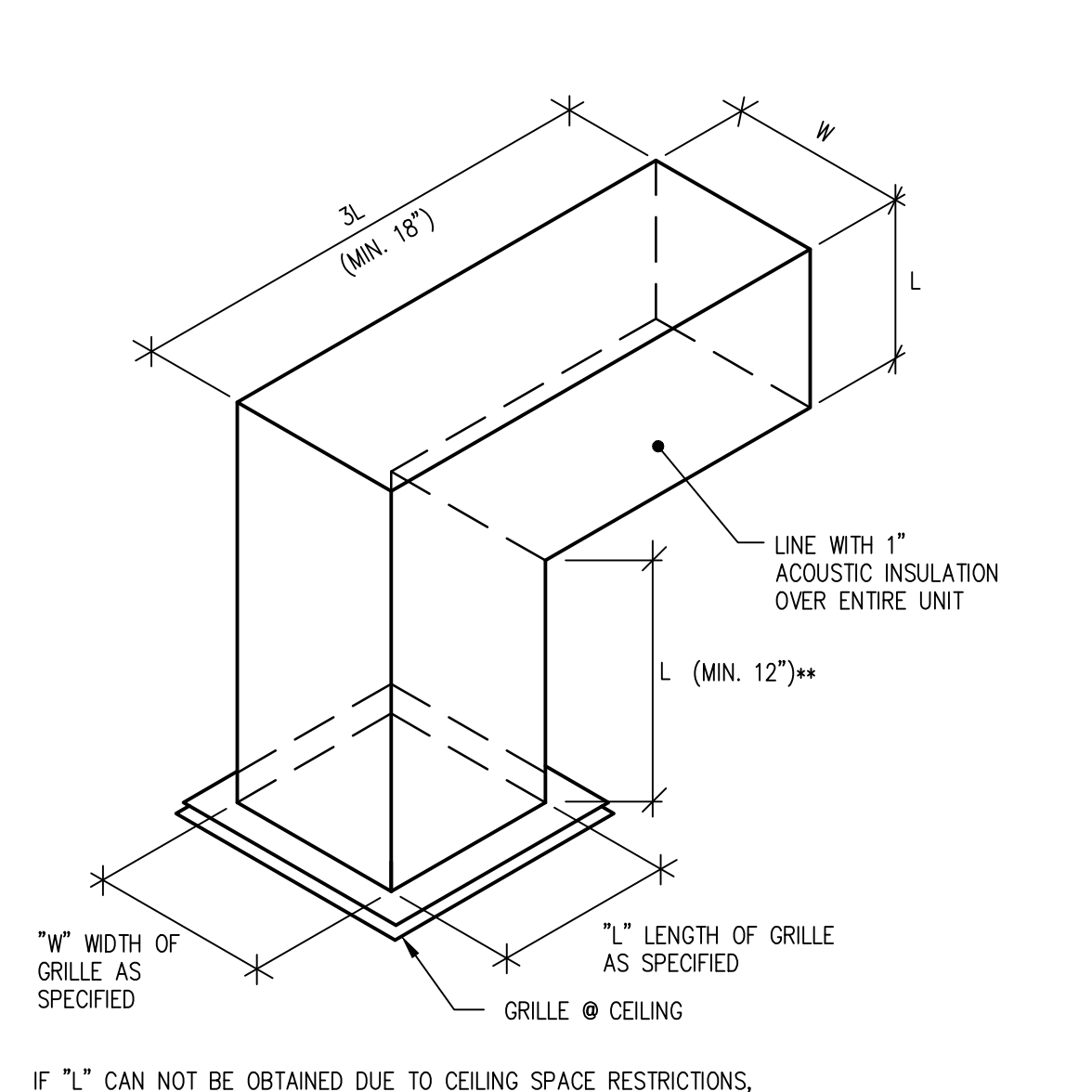
Summary table with columns: Summary, Design Condition, Occupant Diversity, Uncorrected Outdoor Air Intake, System Ventilation Efficiency, Outdoor Air Intake. Values: ASHRAE Std 62.1-2007, Heating operation, 1.000, 352 CFM, 0.176, 2002 CFM.

Table with columns: Zone Name / Space Name, Mult., Supply Air (CFM), Space Floor Area (Sq Ft), Area Outdoor Air Rate (CFM/Sq Ft), Time Averaged Occupancy, People Outdoor Air Rate (CFM/person), Air Distribution Effectiveness, Space Outdoor Air (CFM), Breathing Zone Outdoor Air (CFM), Space Ventilation Efficiency. Lists zones 102 Office, 103 Senior Foreman, 104 Secure Storage, 106 Staff MPR, 107 Service Entrance, 109 Male Washroom, 110 Female Washroom, Corridor.



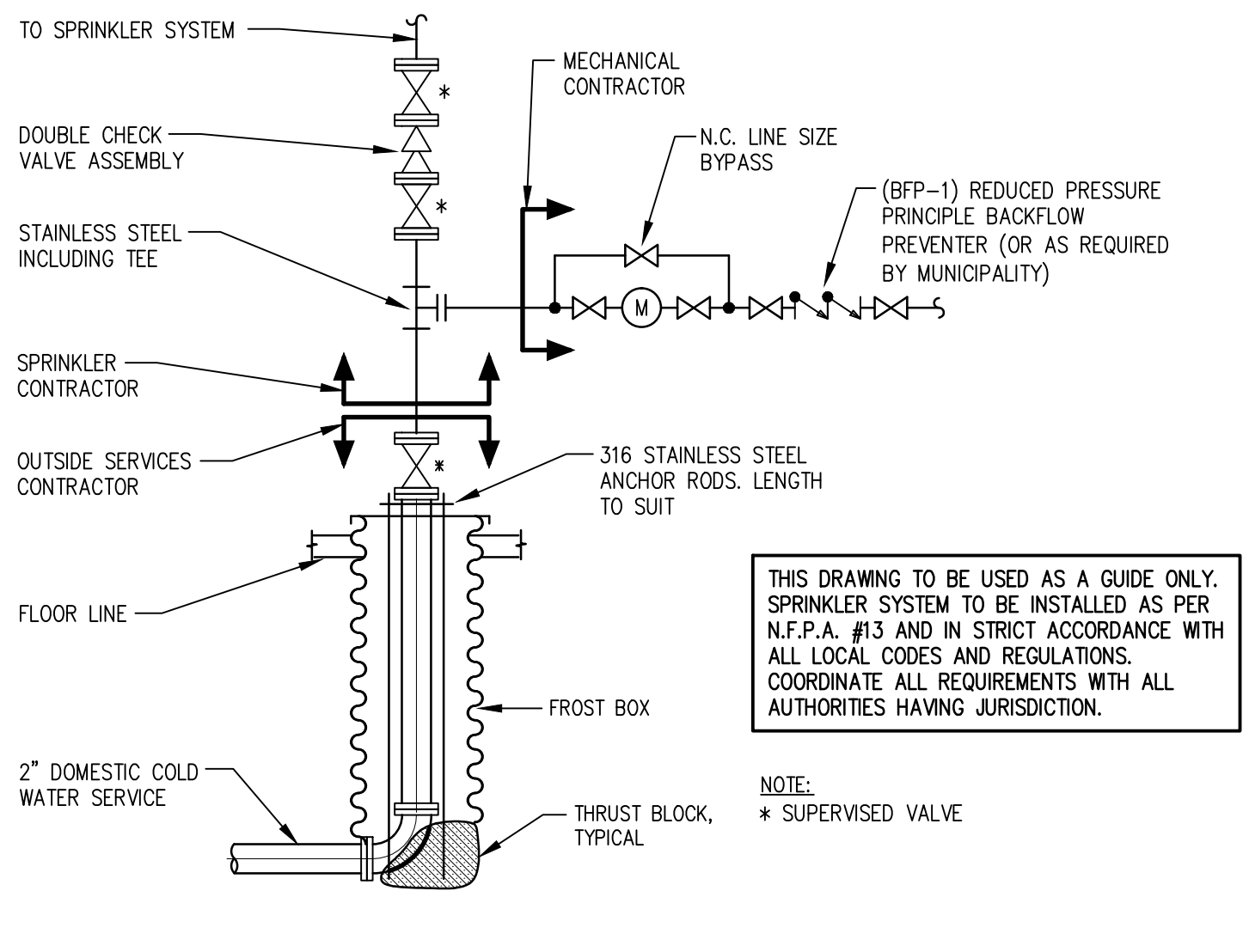
\*IF "L" CAN NOT BE OBTAINED DUE TO CEILING SPACE RESTRICTIONS, INCREASE TOTAL LENGTH (3L) TO COMPENSATE.

180 DEGREE ACOUSTIC AIR TRAFNER ELBOW N.T.S.

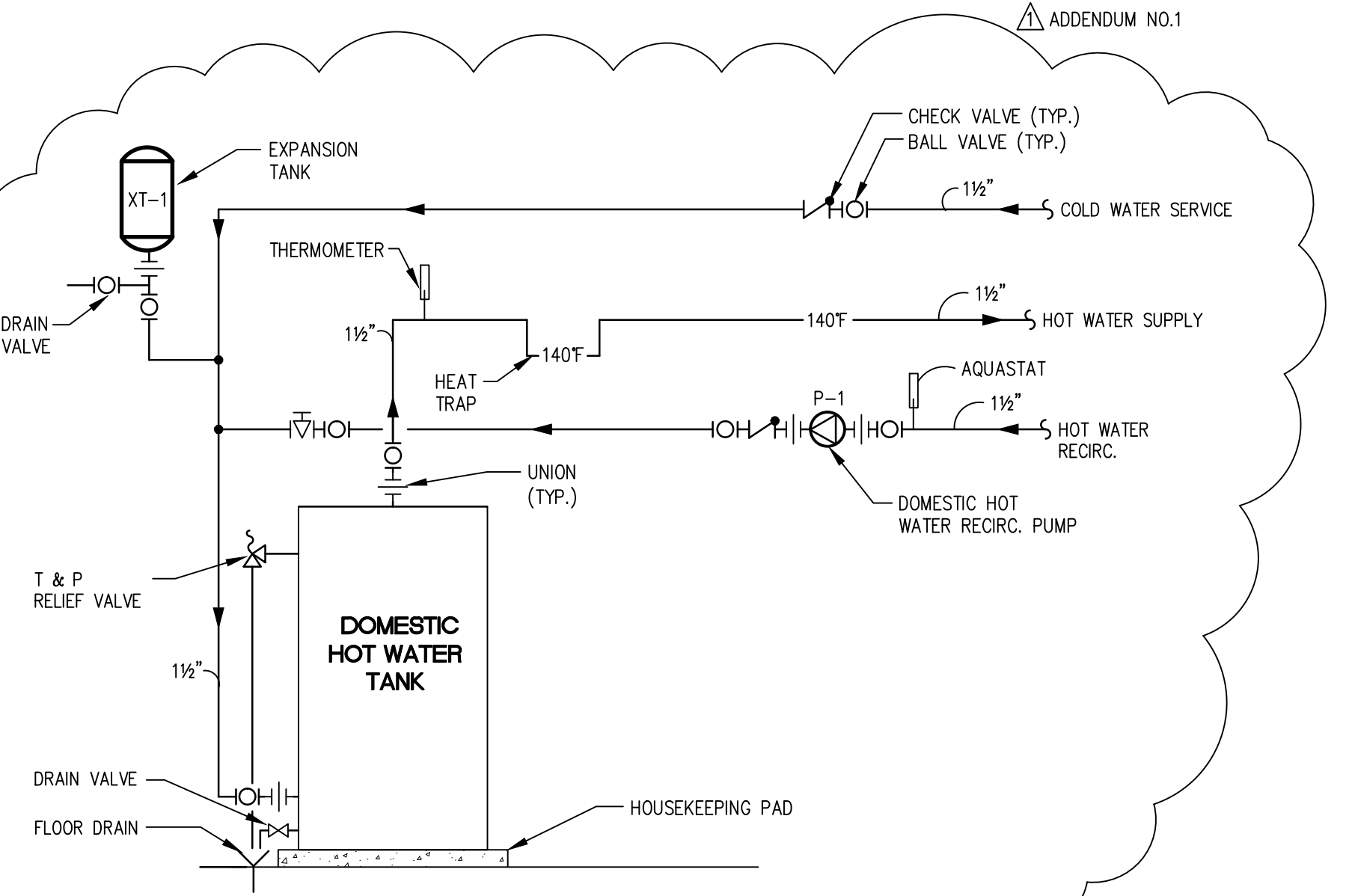


IF "L" CAN NOT BE OBTAINED DUE TO CEILING SPACE RESTRICTIONS, INCREASE TOTAL LENGTH (3L) TO COMPENSATE.

90 DEGREE ACOUSTIC AIR TRAFNER ELBOW N.T.S.



INCOMING WATER SERVICE DETAIL N.T.S.



DOMESTIC HOT WATER TANK/MIXING VALVE SCHEMATIC N.T.S. (ALL PIPING TO BE INSTALLED AS PER MANUFACTURERS RECOMMENDATION)

Revision table with columns: No., DATE, REVISION / ISSUANCE. Lists revisions 1 through 4.

Architecture logo for x architecture inc. and company information for Nova 3 Engineering Ltd. including address, phone, fax, and website.

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