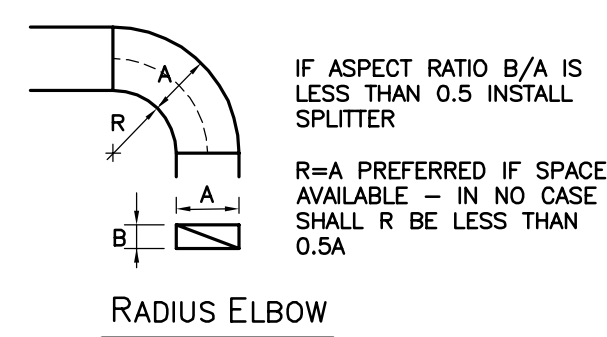


COMPRESSED AIR PIPING SCHEMATIC

NTS



RECTANGULAR SHEET METAL FITTING

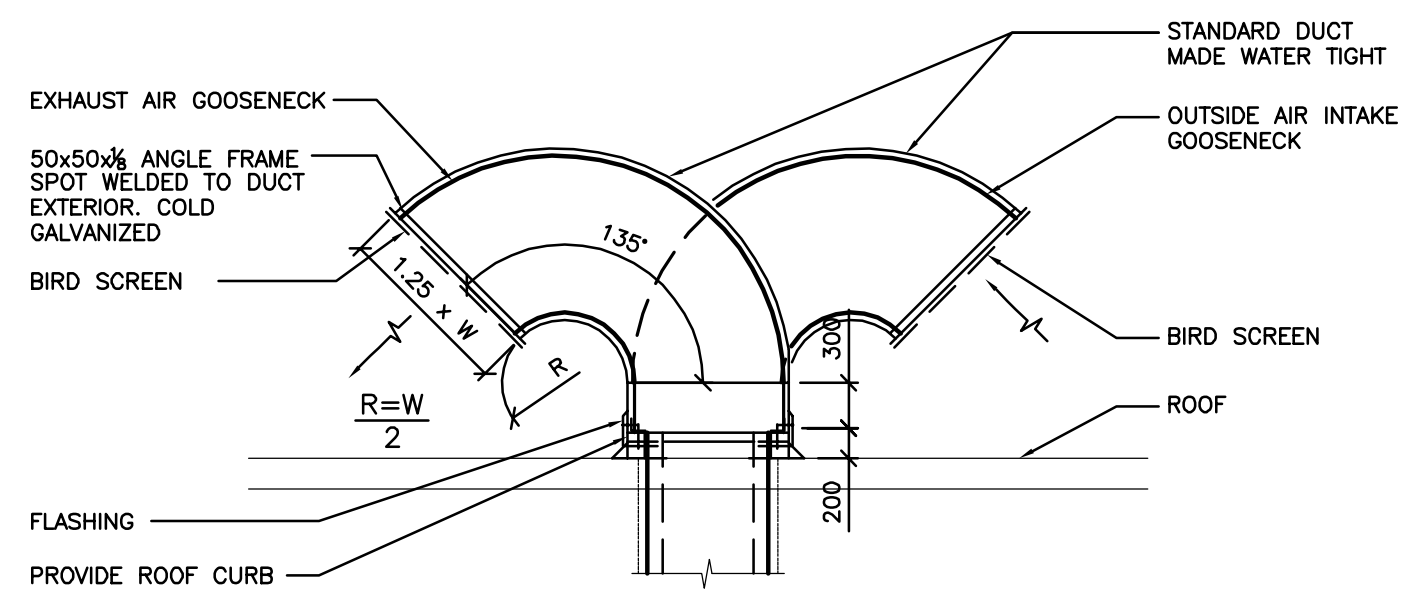
NTS

AC-01 SEQUENCE OF OPERATION

- AC-01 SHALL OPERATE ON A START/STOP BASIS.
 - PRESSURE SETTINGS:
DISCHARGE PRESSURE TARGET @ FLOW CONTROL: 140 psi (ADJUSTABLE)
UNLOAD PRESSURE: 175 psi (ADJUSTABLE)
LOAD PRESSURE: 145 psi (ADJUSTABLE)
 - UNLOAD TIME SET AT 2 MINUTES TO MAXIMIZE ENERGY SAVINGS.
- CONTROLS CONTRACTOR SHALL BE RESPONSIBLE FOR SPECIFYING ALL CONTROL WIRING AND CONTROLS TO MEET THE SEQUENCE OF OPERATION.

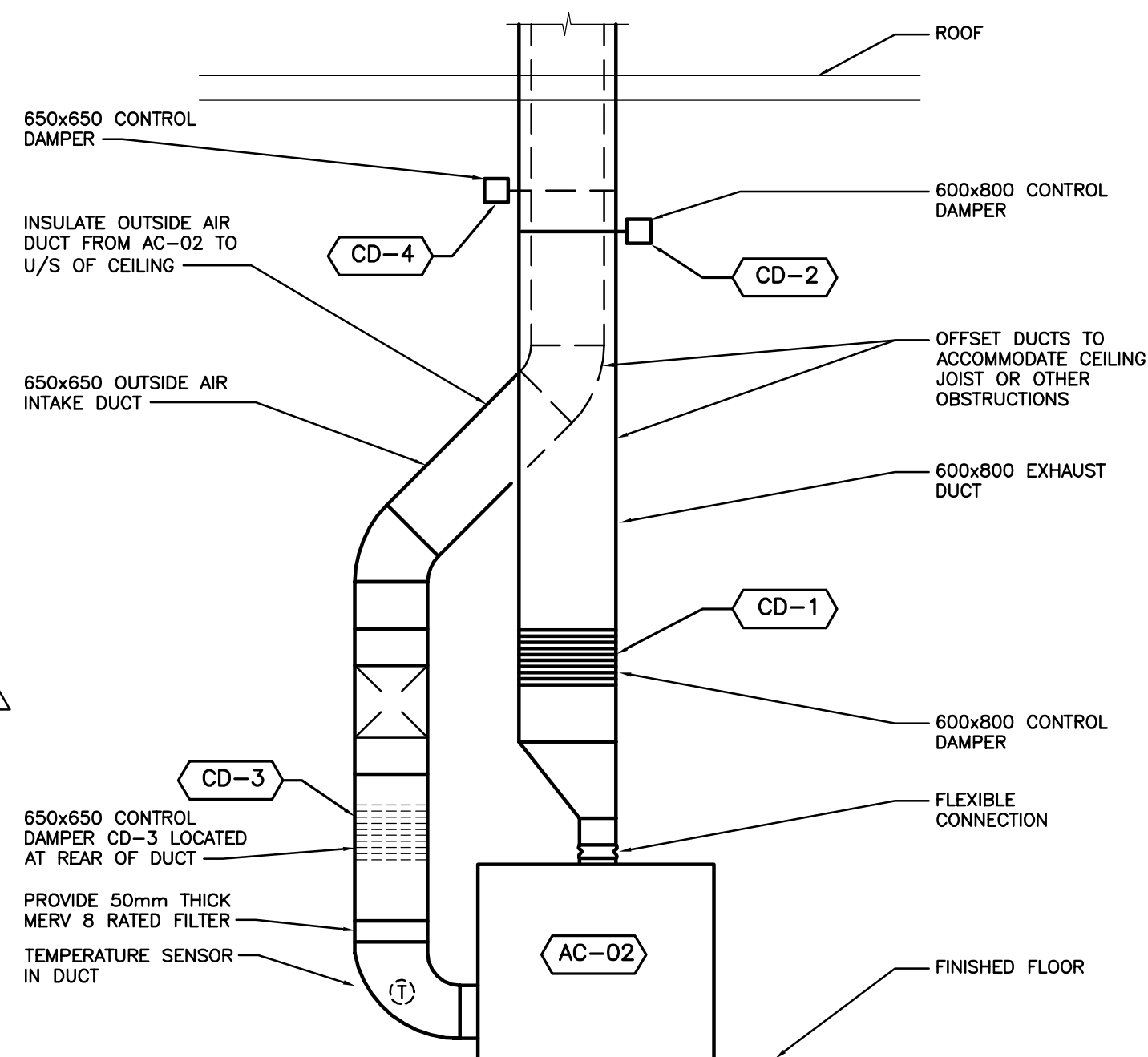
EXISTING COMPRESSED AIR PIPING SCHEMATIC FOR AC-04 & RECEIVER TANK

NTS



DETAIL - GOOSENECK ON ROOF

NTS



AC-02 COOLING SYSTEM DETAIL

1:50

EQUIPMENT SCHEDULE

- AC-01
INGERSOLL RAND MODEL UP6-15C-210 (120 GALLON TANK MOUNT) 210 PSIG RATED DISCHARGE PRESSURE, 15HP ROTARY SCREW AIR COMPRESSOR, 575V/3Ø, C/W XE-145M CONTROLLER. INSTALL AS PER MANUFACTURER'S INSTRUCTIONS.
- AC-02
INGERSOLL RAND MODEL R45N, 261 CFM (MAX. SPEED) 110 PSIG RATED DISCHARGE PRESSURE 60HP VARIABLE SPEED ROTARY SCREW AIR COMPRESSOR, 575V/3Ø, C/W XE-145M CONTROLLER. INSTALL AS PER MANUFACTURER'S INSTRUCTIONS.
- D-1
INGERSOLL RAND MODEL NVC300 CYCLING AIR DRYER, 300 CFM CAPACITY, R-404A REFRIGERANT, 575V/3Ø, 230 PSIG MAX. OPERATING PRESSURE. INSTALL AS PER MANUFACTURER'S INSTRUCTIONS.
- D-2
INGERSOLL RAND MODEL DB5ECA CYCLING AIR DRYER, 50 CFM CAPACITY, R-134A REFRIGERANT, 115V/1Ø. INSTALL AS PER MANUFACTURER'S INSTRUCTIONS.
- F-1
INGERSOLL RAND MODEL F108IG GENERAL PURPOSE LINE FILTER, 64 CFM CAPACITY, 250 PSIG MAX. OPERATING PRESSURE. INSTALL AS PER MANUFACTURER'S INSTRUCTIONS.
- FC-1
PNEUMATECH CONSERVAIR MODEL S-150 INTERMEDIATE CONTROL, MAX. FLOW: 750 CFM, MAX. INLET PRESSURE: 200 PSIG, MAX. OUTLET PRESSURE: 195 PSIG. INSTALL AS PER MANUFACTURER'S INSTRUCTIONS.
- FC-2
PNEUMATECH CONSERVAIR MODEL S-30 INTERMEDIATE CONTROL, MAX. FLOW: 150 CFM, MAX. INLET PRESSURE: 200 PSIG, MAX. OUTLET PRESSURE: 195 PSIG. INSTALL AS PER MANUFACTURER'S INSTRUCTIONS.
- FC-3
PNEUMATECH CONSERVAIR MODEL S-60 INTERMEDIATE CONTROL, MAX. FLOW: 250 CFM, MAX. INLET PRESSURE: 200 PSIG, MAX. OUTLET PRESSURE: 195 PSIG. INSTALL AS PER MANUFACTURER'S INSTRUCTIONS.
- RT-1
PROVIDE A 400 GALLON COMPRESSED AIR RECEIVER TANK C/W PRESSURE RELIEF VALVE & PRESSURE GAUGE. INSTALL AS PER MANUFACTURER'S INSTRUCTIONS.
- AUTOMATIC DRAIN VALVE
MONROE MD-25 ELECTRONIC DRAIN VALVE, ADJUSTABLE 'ON' TIME 0.5-10 SECONDS, ADJUSTABLE 'OFF' TIME 0.5-45 MINUTES, MAXIMUM WORKING PRESSURE 230PSI, SUPPLY VOLTAGE: 120VAC

AC-02 COOLING SYSTEM SEQUENCE OF OPERATION

- WHEN AC-02 IS OFF, CONTROL DAMPER CD-1 & CD-3 ARE FULLY OPENED, AND CONTROL DAMPERS CD-2 & CD-4 ARE FULLY CLOSED. ALL FOUR CONTROL DAMPERS SHALL OPERATE IN UNISON.
 - WHEN AC-02 IS ENABLED, CONFIRM CONTROL DAMPERS CD-1 & CD-3 ARE FULLY OPENED, AND CONTROL DAMPERS CD-2 & CD-4 ARE FULLY CLOSED VIA END SWITCH.
 - MODULATE CONTROL DAMPERS CD-1, CD-2, CD-3 & CD-4 TO MAINTAIN MIXED AIR TEMPERATURE SET POINT ABOVE 20°C (ADJUSTABLE) AND BELOW 25°C (ADJUSTABLE) AS FOLLOWS:
 - WHEN MIXED AIR TEMPERATURE IS ABOVE 25°C, MODULATE CONTROL DAMPERS CD-1 & CD-3 TOWARDS THE CLOSED POSITION, AND MODULATE CONTROL DAMPERS CD-2 & CD-4 TOWARDS THE OPEN POSITION.
 - WHEN MIXED AIR TEMPERATURE IS BELOW 20°C, MODULATE CONTROL DAMPERS CD-1 & CD-3 TOWARDS THE OPEN POSITION, AND MODULATE CONTROL DAMPERS CD-2 & CD-4 TOWARDS THE CLOSE POSITION.
 - PROVIDE MIXED AIR TEMPERATURE LOW TEMPERATURE ALARM SET AT 2°C, ALARM & DISABLE AC-02.
 - PROVIDE MIXED AIR TEMPERATURE HIGH TEMPERATURE ALARM SET AT 38°C (ADJUSTABLE), ALARM & DISABLE AC-02.
- CONTROLS CONTRACTOR SHALL BE RESPONSIBLE FOR SPECIFYING ALL CONTROL WIRING AND CONTROLS TO MEET THE SEQUENCE OF OPERATION.

AC-02 & AC-05 SEQUENCE OF OPERATION

- AC-02 & AC-05 SHALL OPERATE ON A LEAD/LAG BASIS. OPERATE LEAD/LAG ON A WEEKLY BASIS (ADJUSTABLE).
 - WHEN THE LEAD COMPRESSOR CAN NOT KEEP UP WITH COMPRESSED AIR DEMAND, THEN ENERGIZE SECOND COMPRESSOR.
 - IF LEAD COMPRESSOR DOES NOT START, ALARM AND ENERGIZE SECOND COMPRESSOR. IF SECOND COMPRESSOR DOES NOT START, ALARM.
 - PRESSURE SETTINGS:
DISCHARGE PRESSURE TARGET: 110 PSI (ADJUSTABLE)
UNLOAD PRESSURE: 115 PSI (ADJUSTABLE)
LOAD PRESSURE: 95 PSI (ADJUSTABLE)
 - WHEN DISCHARGE PRESSURE EXCEEDS 120 PSI, STOP LEAD COMPRESSOR AND ALARM.
- CONTROLS CONTRACTOR SHALL BE RESPONSIBLE FOR SPECIFYING ALL CONTROL WIRING AND CONTROLS TO MEET THE SEQUENCE OF OPERATION.

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NO.	REVISIONS	DATE	BY
4	ISSUED FOR ADDENDUM #1	APR.24/15	PDT
3	ISSUED FOR CONSTRUCTION	APR.10/15	PDT
2	CLIENT REVIEW 100%	MAR.20/15	PDT
1	CLIENT REVIEW 99%	MAR.9/15	PDT
0	CLIENT REVIEW 66%	FEB.24/15	PDT

DESIGNED BY	EP
DRAWN BY	TKD
CHECKED BY	JVH
APPROVED BY	PDT
HOR. SCALE	NOTED
VERTICAL	NOTED
DATE	2015-02-20



ENGINEER'S SEAL
DRAWING ORIGINALLY SIGNED BY P.D. TATARYN DATED APR. 10, 2015
CONSULTANT PROJECT NO. 149749

THE CITY OF WINNIPEG TRANSIT DEPARTMENT

Winnipeg

FORT ROUGE GARAGE COMPRESSED AIR SYSTEM UPGRADE

COMPRESSED AIR PIPING SCHEMATIC, DETAILS, EQUIPMENT SCHEDULE & SEQUENCE OF OPERATION

CITY DRAWING NUMBER: P-XXXX- ----
SHEET OF: 4 OF 4
CONSULTANT DRAWING NUMBER: M3