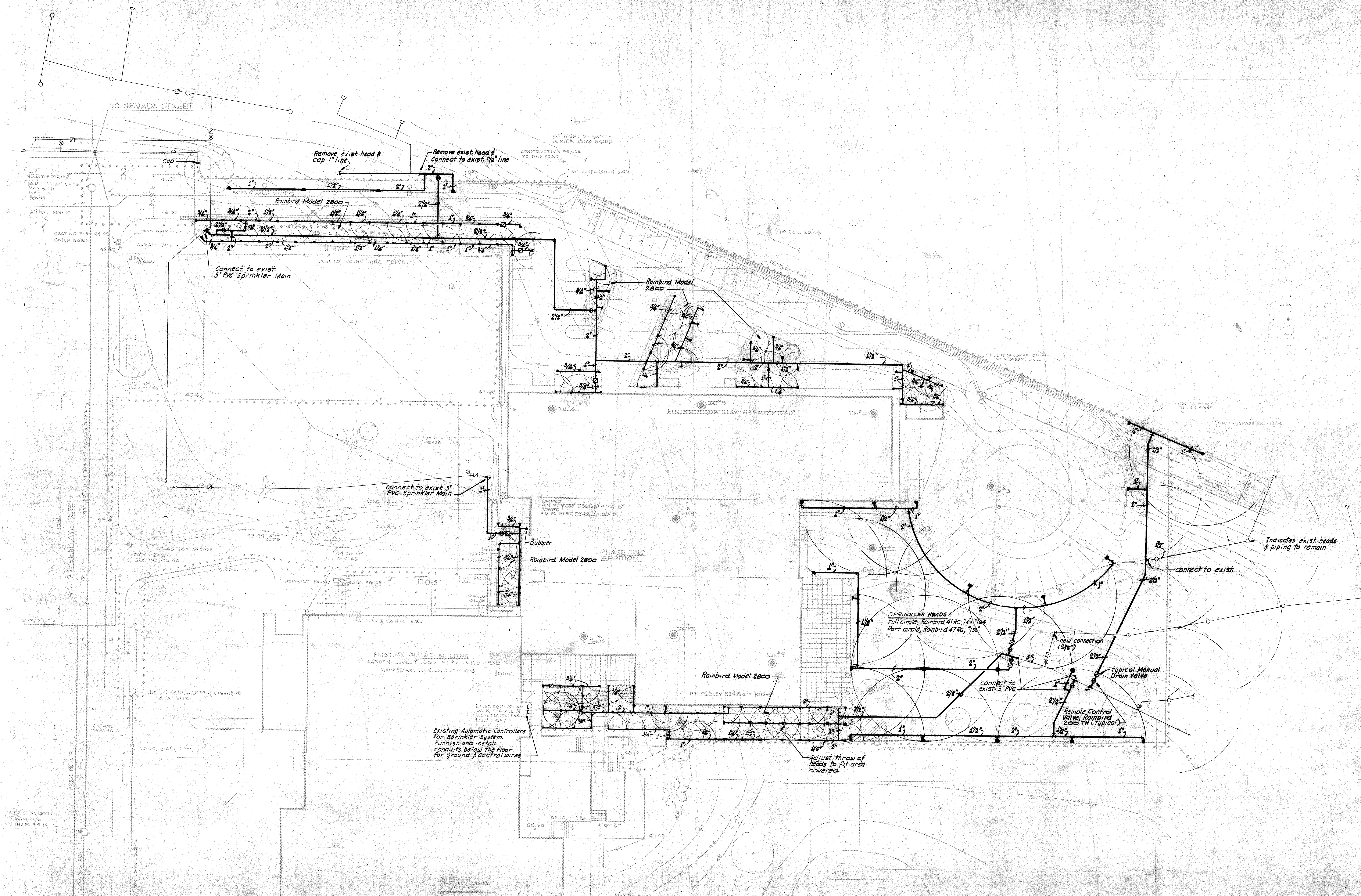

SO. NEVADA STREET
Remove exist. head & cap 1" line
Remove exist. head & connect to exist. 1½" line
cap
Rainbird Model 2800
Connect to exist. 3" PVC Sprinkler Main
30' RIGHT OF WAY DENVER WATER BOARD
CONSTRUCTION FENCE TO THIS POINT
NO TRESPASSING SIGN
45.13 TOP OF CURB
EXIST. STORM DRAIN MANHOLE INV. ELEV. 38.42
ASPHALT PAVING
GRATING ELEV. 44.63 CATCH BASIN
CONC. WALK
ASPHALT WALK
FIRE HYDRANT
EXIST. 6" WATER MAIN
EXIST. 10' WOVEN WIRE FENCE
TOP RAIL 60.45
PROPERTY LINE
LIMIT OF CONSTRUCTION AT PROPERTY LINE
CONSTR. FENCE TO THIS POINT
FINISH FLOOR ELEV. 5350.0' = 102'-0"
Connect to exist. 3" PVC Sprinkler Main
Bubbler
Rainbird Model 2800
PHASE TWO ADDITION
UPPER FIN. FL. ELEV. 5360.67' = 112'-8"
LOWER FIN. FL. ELEV. 5348.0' = 100'-0"
ABERDEEN AVENUE
EXISTING PHASE I BUILDING
GARDEN LEVEL FLOOR ELEV. 5346.0' = 98'-0"
MAIN FLOOR ELEV. 5358.67' = 110'-8"
BALCONY @ MAIN FL. LEVEL
BRIDGE
EXIST. ROOF W/ CONC. WALK SURFACE @ MAIN FLOOR LEVEL ELEV. 58.67
Existing Automatic Controllers for Sprinkler System. Furnish and install conduits below the floor for ground & control wires
Rainbird Model 2800
FIN. FL. ELEV. 5348.0' = 100'-0"
Adjust throw of heads to fit area covered
LIMITS OF CONSTRUCTION
SPRINKLER HEADS
Full circle, Rainbird 41RC, ¼" x 11/64
Part circle, Rainbird 47RC, 9/32"
new connection (2½")
connect to exist. 3" PVC
typical Manual Drain Valve
Remote Control Valve, Rainbird 200 TH (typical)
Indicates exist. heads & piping to remain
connect to exist.
EXIST. SANITARY SEWER MANHOLE INV. EL. 37.17
EXIST. ST. DRAIN MANHOLE INV. EL. 35.16
BENCHMARK

NOTES
1. CONTRACTOR SHALL VERIFY ALL DIMENSIONS & CONDITIONS PRIOR TO COMMENCING WORK, AND SHALL NOTIFY ARCHITECT IMMEDIATELY OF ANY DISCREPANCIES.
2. DURING THE PROJECT, NO ENCROACHMENT ONTO THE D&R.G. R.O.W. WILL BE PERMITTED INCLUDING CONSTRUCTION PERSONNEL & EQUIPMENT.
3. THE CONSTRUCTION FENCE SHOWN ON THIS DRAWING IS THE RESPONSIBILITY OF THE CONSTRUCTION MANAGER & IS TO DEFINE THE MAJOR PORTION OF THE PROJECT. IT IS ALSO THE RESPONSIBILITY OF THE CONSTRUCTION MGR. TO FENCE OR PROTECT OTHER PORTIONS OF CONSTRUCTION IF HE DEEMS IT NECESSARY. THIS NOTE DOES NOT RELIEVE EACH CONTRACTOR OF PROVIDING ALL SAFETY DEVICES REQUIRED BY C.O.S.H. FOR HIS WORK.
4. GATES & OPENINGS IN CONSTRUCTION FENCE WILL BE LOCATED BY THE CONSTRUCTION MANAGER.
5. ALL TREES ARE TO BE CAREFULLY PROTECTED.

MORE
COMBS
BURCH
ArchitectsEngineersPlanners

phase two facilities:
ARAPAHOE COMMUNITY COLLEGE
5900 South Sante Fe Drive, Littleton, Colorado 80120

state project no.
2136

drawing tit
MECHANICAL
SITE
SPRINKLER
PLAN

tracing key

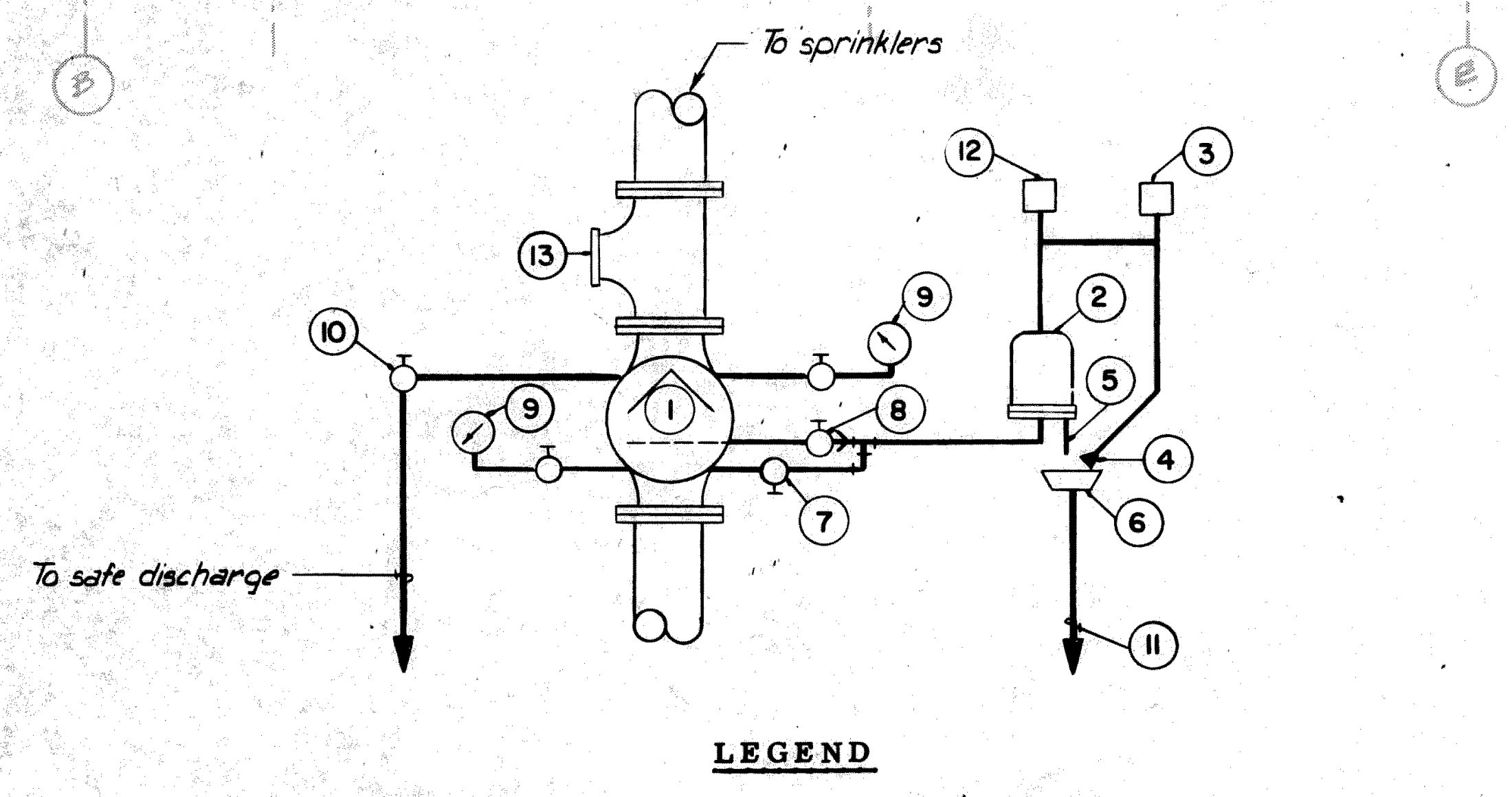
■	A	B	C	D	E	F
1	1A			1D		
2						
3						
4						
5						
6						
7						
8						
9				9D	9E	
10						
11						
12						
21						
22						
23						
24						
25						
26						
31	31A					
32						
33						
34						

ROBIN DAVID ADAIR, JR.
13382

drawn by
RGB
checked by
RGS
date
AUGUST 5, 1976
revisions

m·c·b job no.
7510
sheet
M
3
of
63
she

311'-4" OVERALL
A
B
C
D
E
F
G
H
I
J
K
L
11'-4"
8'-8"
28'-0"
23'-0"
72'-4"
connect to existing 12" storm drain @ Inv. 42.90
connect to existing 6" Fire & 3" CW
Siamese F.D. conn. mark "Auto Sprink"
Sprinkler Alarm Valve, see 1/M-4
to Automatic Sprinkler System, see specs.
Wash down faucet Fiat 830-AA
6" RD leader dn. From 6" RD
Gas Meter & Reg. for 3102 cfh @ 7" w.c.
Air-Oil Control Valve
Rough-in and connect Auto Lift AL-3
AREAS WITH AUTOMATIC SPRINKLER SYSTEM, SEE SPECS.
BUILDING/GROUNDS 210
SECRETARIAL 215
SHIP & RECEIVE 216
HALL 218
STORAGE 214
SUPPLY 212
CORR. 220
ENTRY 221
Rise to roof in Pitch Pan
2" vtr
PAINT STOR. 205
TOOLS 204
KEY RM. 204
SECRETARY 202
INDUSTRIAL MECHANICS I 244
INDUSTRIAL TECH II 243
Sand Trap
3/4" cw up to 7
Connect to exist. san. sewer at Inv. El. 42.26
connect to existing 6" storm drain @ Inv. 45.25
6" Roof Drain leader down from 6" RD
4" vtr
AUTO BODY 241
TOOL STOR. 242
TIEDOWN 241
Rise to roof in Pitch Pan
3/4" CW up to 6
on Roof
OFFICE 225
OFFICE 226
PARTS CLEANING
CLEAN ROOM 239
MACHINE TOOL AREA
OFFICE 234
TOOL ROOM 238
LOCKERS
WOMEN 229
MEN
3" Gas up to roof
see sht. M-6 for continuation
connect to existing 6" storm drain @ Inv. 46.62
6" Roof Drain leader down From 6" Roof Drain
1/2" Rough-in and connect to Align. Sta. O-433
Connect to bottom of trench
AUTO MECHANICS
3/4" cw up to 5
Typical underfloor exhaust system, see 2/M-4
Emergency Shower and Eye wash Haws 8300
up to 20"dia exhaust duct, see Sht. M-11
Wash down faucet Fiat 830-AA
to Waste O see 15/M-1
see sheet M-8 for schematic
FD-2
FD-3
FD-4
fco
hb
G
A
8"

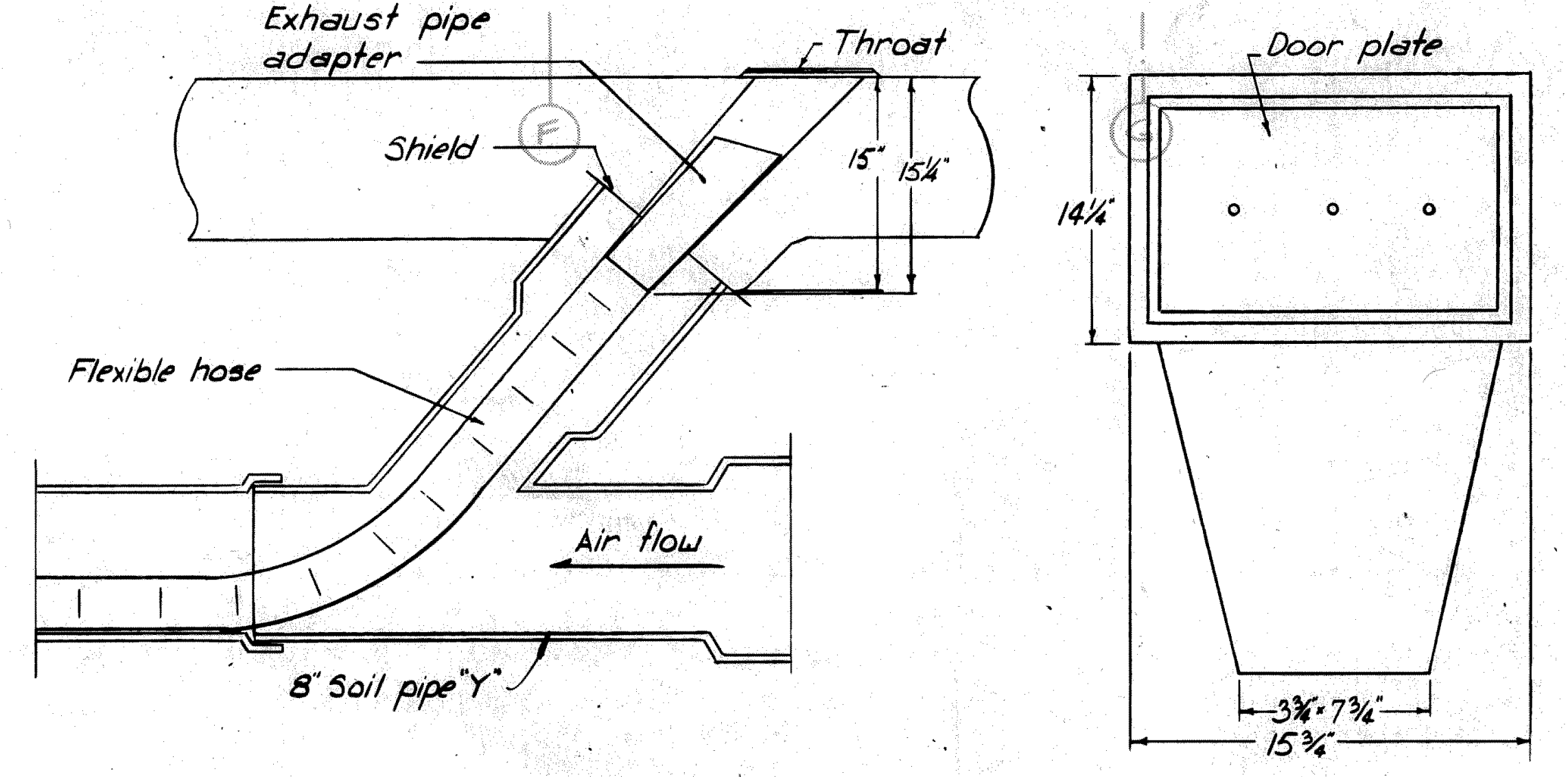

To sprinklers
To safe discharge
1
2
3
4
5
6
7
8
9
10
11
12
13

LEGEND

1	Alarm check valve	8	Alarm shut-off valve and check valve (normally open)
2	Retarding chamber	9	Water-pressure gauges
3	Water motor alarm	10	Main drain valve
4	Restricted vent	11	Drip-cup drain
5	Automatic drip	12	Alarm switch
6	Drip Cup	13	Tee for fire-department connection.
7	Alarm test valve (normally shut)		

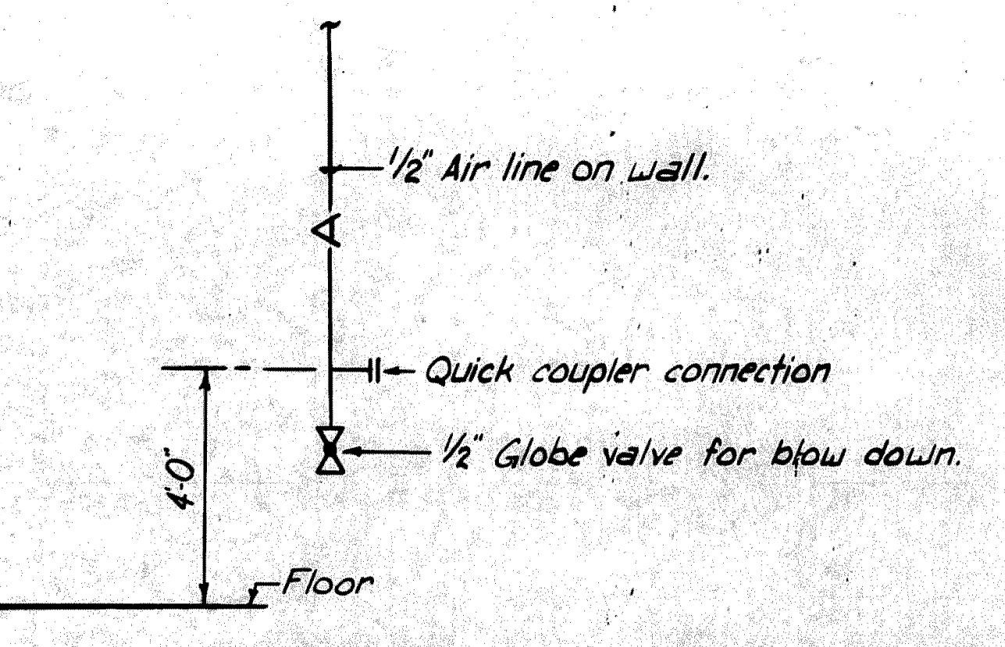
SPRINKLER ALARM VALVE DETAIL 1/M-4

SCALE: NONE


Exhaust pipe adapter
Throat
Shield
15"
15¼"
Flexible hose
Air flow
8" Soil pipe "Y"
Door plate
14¼"
3⅜"-7¾"
15¾"

UNDERFLOOR EXHAUST DETAIL 2/M-4

SCALE: NONE


½" Air line on wall.
A
Quick coupler connection
½" Globe valve for blow down.
4'-0"
Floor

WALL TYPE COMPRESSED AIR DETAIL 4/M-4

SCALE: NONE

KEYED NOTES:

1 1/2" compressed air drop on wall, see 4/M-4

2 Furnish and install compressed air hose drop to 6'-0" above the finished floor and terminate with quick coupler connection.

3 3/4" plugged tees in oxygen and acetylene lines for future connection by the Owner.

4 Rough-in and connect 3/4" compressed air to Paint Spray Booth.

5 2½" compressed air down on wall to below grade.

6 3/4" oxygen and 3/4" acetylene down on wall to below grade.

7 Cap 3/4" acetylene for future connection by Owner.

8 Cap 3/4" oxygen for future connection by Owner.

9 Rough-in and connect Auto Lift (AL-2); obtain rough-in drawings from Equipment Contractor.

10 Rough-in and connect Auto-Lift (AL-1); obtain rough-in drawings from Equipment Contractor.

11 Foot control valves for Auto Lift (furnished with Auto Lifts).

12 Single hose reel, Balcrank Model 2780 with mounting channel, R-3 See Equip Dwgs

13 Double hose reel, Balcrank Model 2780, two required with end panels and mounting channel, R-5 See Equip Dwgs.

14 Rough-in and connect reel bank for chassis oil and gear oil; see equipment specifications.

15 5/8" o.d. x 0.083 wall steel tubing.

16 Air pressure regulator with gauge, Balcrank Model 817760.

17 Air filter, Balcrank Model 32739.

ATTENTION ! ! ! ! ! ! ! ! ! ! ! ! ! !

Clear restrictions are set on how and where precast concrete members may be penetrated without damaging prestressed reinforcing strands. See the following:
- Details 1 and 2, SH. A19
- Specifications "Bid package 'B' instructions to bidders"
- Precast concrete shop drawings and production drawings, by Prestressed Concrete of Colorado, Inc. 303-458-6301

tracing key

	A	B	C	D	E	F
1						
2						
3	3A		3C			
4	4A					
5	5A					
6						
7						
8	8A					
9						9F
10						
11						
12						
21						
22	22A			22D		
23						
24				24D		
25						
26						
31						
32						
33						
34						

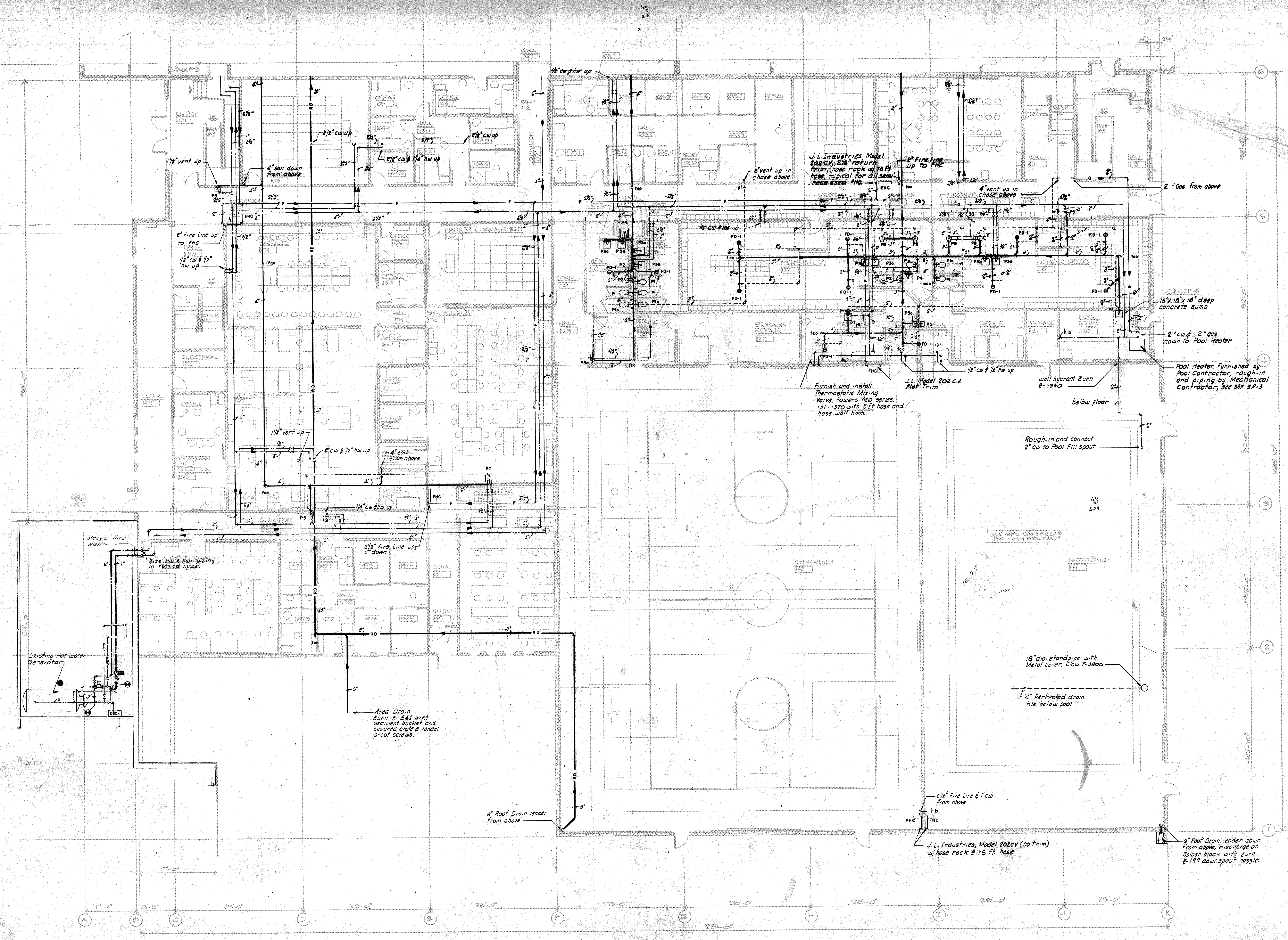
STATE PROJ. 2136

drawing title
EAST
PLUMBING
PLAN

ROBIN DAVID ADAIR, JR.
13382

drawn by
RGB
checked by
RGS
date
AUGUST 5, 1976
revisions

m·c·b job no
7510
sheet
M-4
of
BP (B)
63
sheets


1/2" cw & hw up
1/2" vent up
4" soil down from above
2" Fire Line up to FHC
1/2" cw & 1/2" hw up
2 1/2" cw up
2 1/2" cw & 1 1/4" hw up
J. L. Industries Model 202CV, 2 1/2" return trim, hose rack w/ 75 ft hose, typical for all semi-recessed FHC.
2" Fire line up to FHC
4" vent up in chase above
2 "Gas from above
18" x 18" x 18" deep concrete sump
2 "cw & 2 "gas down to Pool Heater
Pool Heater furnished by Pool Contractor, rough-in and piping by Mechanical Contractor, see sht. SP-3
wall hydrant Zurn Z-1330
below floor
1/2" cw & 1/2" hw up
J. L. Model 202 C.V. Flat Trim
Furnish and install Thermostatic Mixing Valve, Powers 420 series, 131-1370 with 5 ft hose and hose wall hook.
Rough-in and connect 2" cw to Pool Fill spout
1 1/2" vent up
2" cw & 1/2" hw up
4" soil from above
3/4" cw & hw up
2 1/2" Fire Line up, 2" down
Sleeve thru wall
Rise hw & hwr piping in furred space.
Existing Hot Water Generator
HWS
HWR
Area Drain Zurn Z-541 with sediment bucket and secured grate & vandal proof screws.
6" Roof Drain leader from above
SEE SHTS. SP1, SP2 & SP3 FOR SWIM POOL EQUIP.
18" dia. standpipe with Metal Cover, Clow F-3800
4" Perforated drain tile below pool
2 1/2" Fire Line & 1" cw from above
h.b.
FHC
J. L. Industries, Model 202CV (no trim) w/ hose rack & 75 ft. hose
6" Roof Drain leader down from above, discharge on Splash block with Zurn Z-199 downspout nozzle.
GYMNASIUM 142
NATATORIUM 141
MEN'S DRESS 137
WOMEN'S DRESS 115
CHLORINE
POOL EQUIP. 120
STORAGE 121
OFFICE 122
STORAGE & REPAIR 127
MARKET & MANAGEMENT 157
SEC. SCIENCE 158
OFFICE MACHINES 154
OFFICE PROCEDURES 165
ELECTRICAL 152
RECEPTION 150
ENTRY 101
ENTRY 145
RAMP #1
RAMP #2
RAMP #3
STAIR #1
STAIR #2
STAIR #3
STAIR #4
CORR. 247
CORRIDOR 146
AUDIO TUTORIAL
54'-0"
98'-0"
32'-0"
168'-10"
40'-10"
17'-0"
11'-4"
8'-8"
28'-0"
23'-0"
227'-0"
A
B
C
D
E
F
G
H
I
J
K
1
2
3
4
5
6

MOORE COMBS BUR

Architects Engineers Planners

phase two facilities:
ARAPAHOE COMMUNITY COLLEGE
5900 South Santa Fe Drive, Littleton, Colorado 80120

state project no.
2136

drawing title
LOWER
WEST
PLUMBING
PLAN

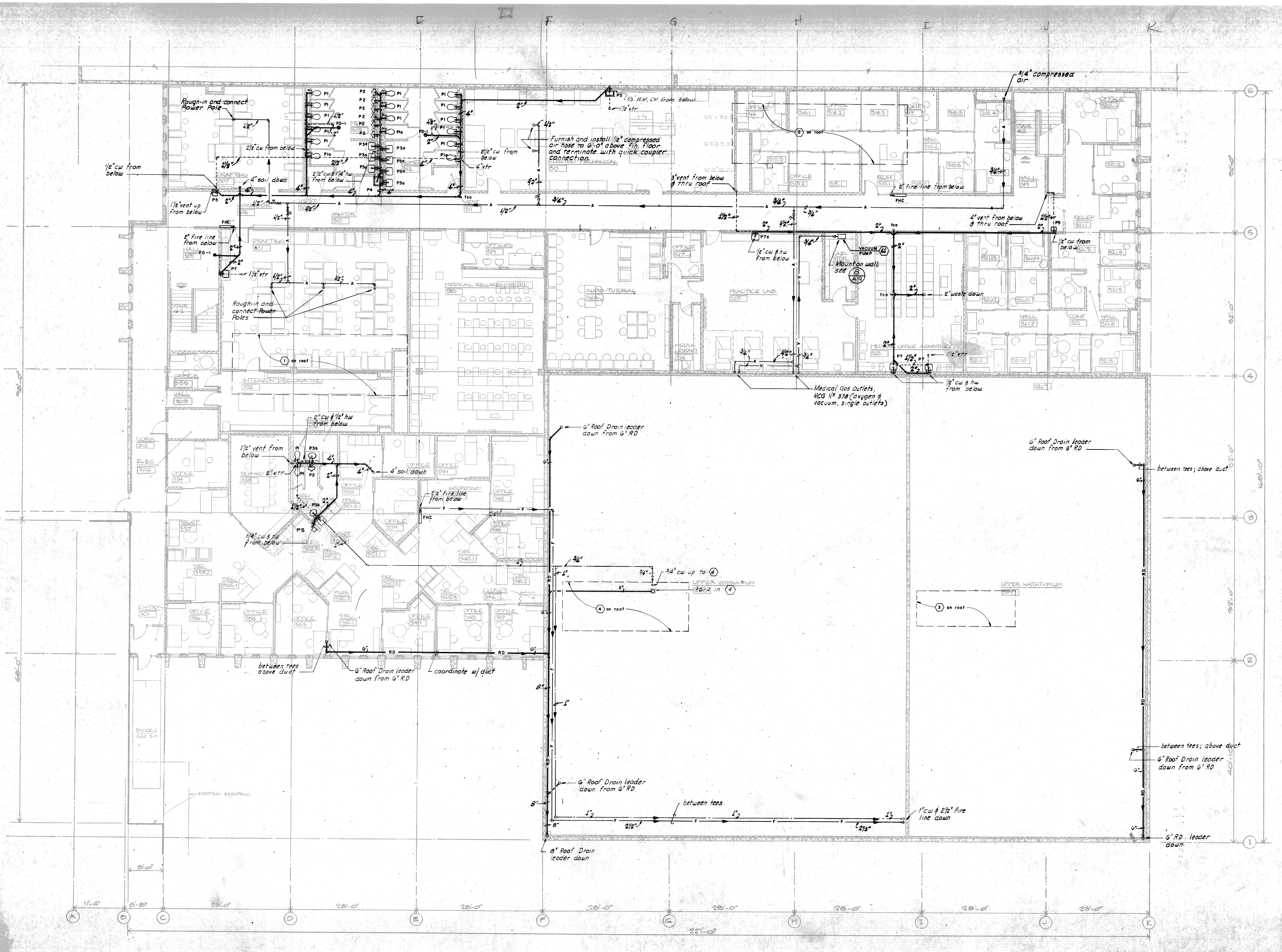
tracing key

	A	B	C	D	E	F
1						
2						
3		3B		3D		
4		4B				
5		5B				
6						
7						
8		8B				
9					9E	
10						
11						
12						
21						
22		22B			22E	
23						
24					24E	
25						
26						
31						
32						
33						
34						

ROBIN DAVID ADAIR
13382

drawn by
RGB
checked by
RGS
date
AUGUST 5, 1976
revisions

m·c·b job no·
7510
sheet
M
5
of
63
sheets


Rough-in and connect Power Pole
2½" cw from below
1½" cw from below
4" soil down
1½" vent up from below
2" Fire line from below
Rough-in and connect Power Poles
Furnish and install ½" compressed air hose to 6'-0" above fin. floor and terminate with quick coupler connection.
1½" H.W., CW from below
1½" vtr
2½" cw from below
4" vtr
3" vent from below & thru roof
2 on roof
3/4" compressed air
2" Fire line from below
4" vent from below & thru roof
1½" cw from below
1½" cw & hw from below
VACUUM PUMP
Mount on wall, see 6 A19
2" waste down
Medical Gas Outlets, NCG ½" 378 (oxygen & vacuum, single outlets)
½" cw & hw from below
1 on roof
2" cw & ½" hw from below
1½" vent from below
2" vtr
4" soil down
2½" Fire line from below
3/4" cw & hw from below
3/4" cw up to 4
FD-4 in 4
4 on roof
3 on roof
6" Roof Drain leader down from 6" RD
between tees above duct
coordinate w/ duct
between tees; above duct
between tees
1" cw & 2½" Fire line down
8" Roof Drain leader down
6" RD leader down
EXISTING BUILDING
DRAFTING
JANITOR
OFFICES
MEDICAL RECORDS-TECH
AUDIO TUTORIAL
PRACTICE LAB
MEDIA LIBRARY
INTERIOR DECORATING
UPPER GYMNASIUM
UPPER NATATORIUM
HALL
RECEP
CONF
OFFICE
SEC
ENTRY
STAIR
ELEC
CORR
A B C D E F G H I J K
1 2 3 4 5 6
11'-4" 8'-8" 28'-0" 23'-0" 227'-0" 168'-10"

MORE COMBS BURCH

ArchitectsEngineersPlanners

phase two facilities:

ARAPAHOE COMMUNITY COLLEGE

5900 South Santa Fe Drive, Littleton, Colorado 80120

state project no. 2136

drawing title

UPPER PLUMBING PLAN

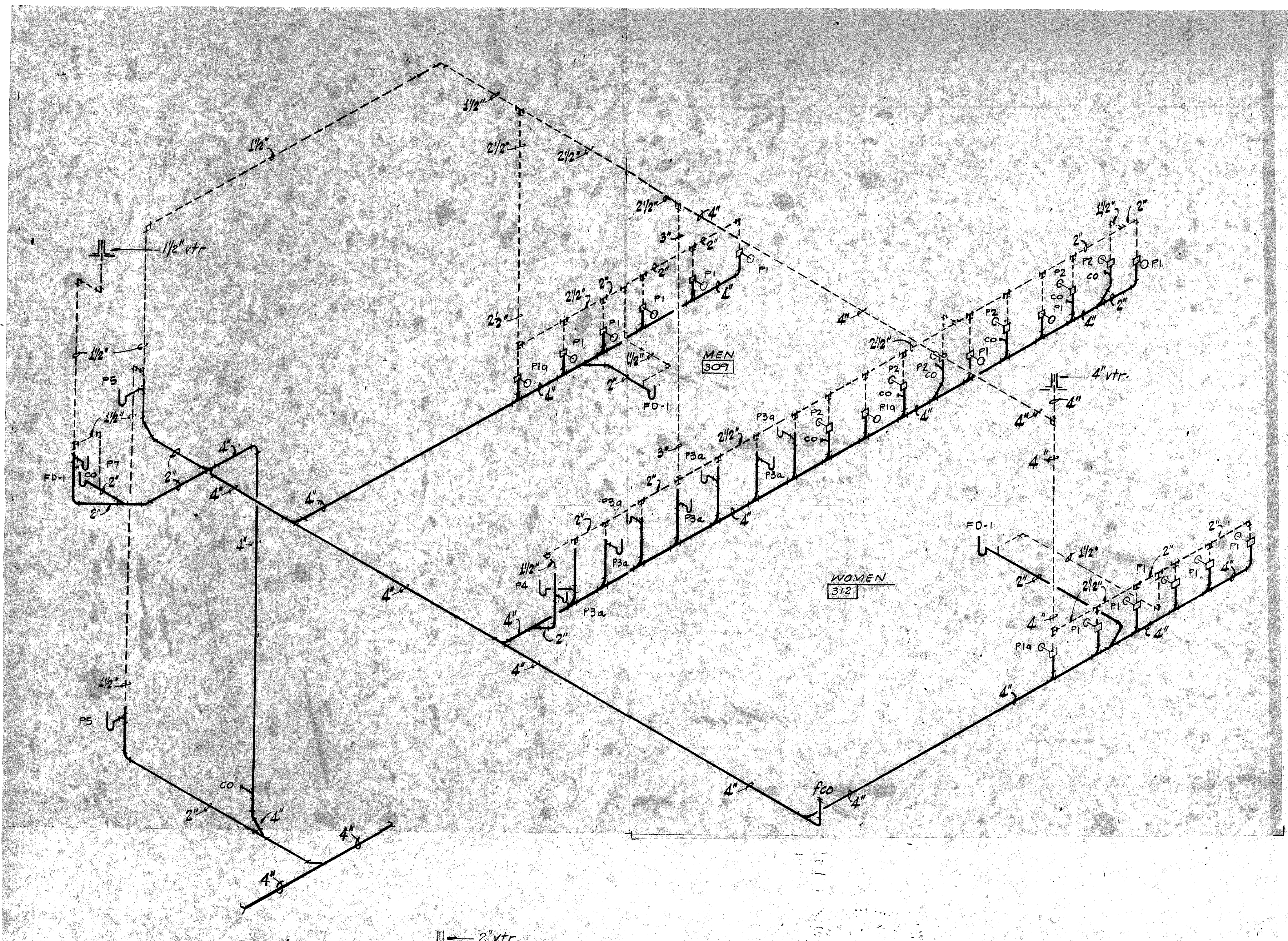
tracing key

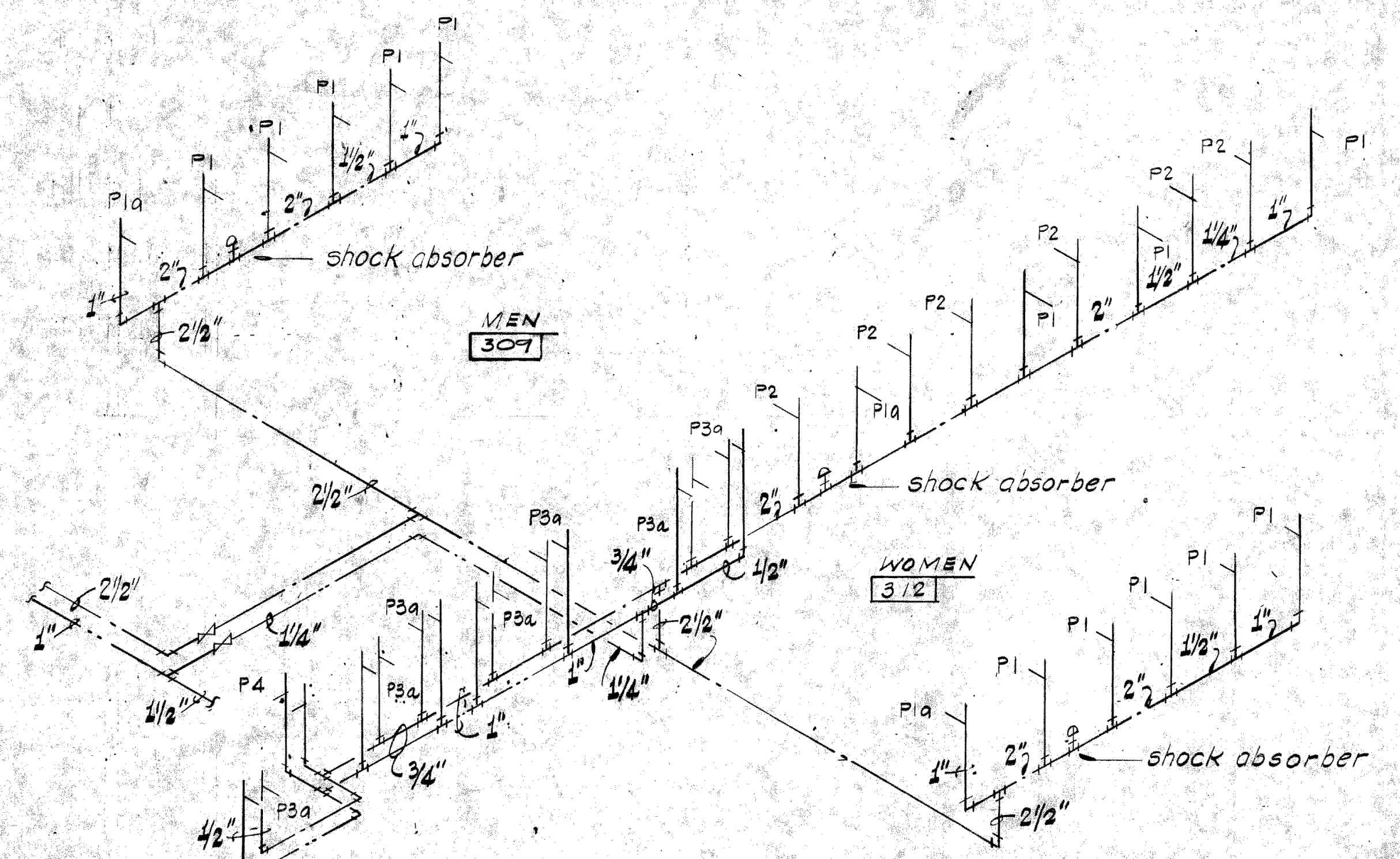
13382

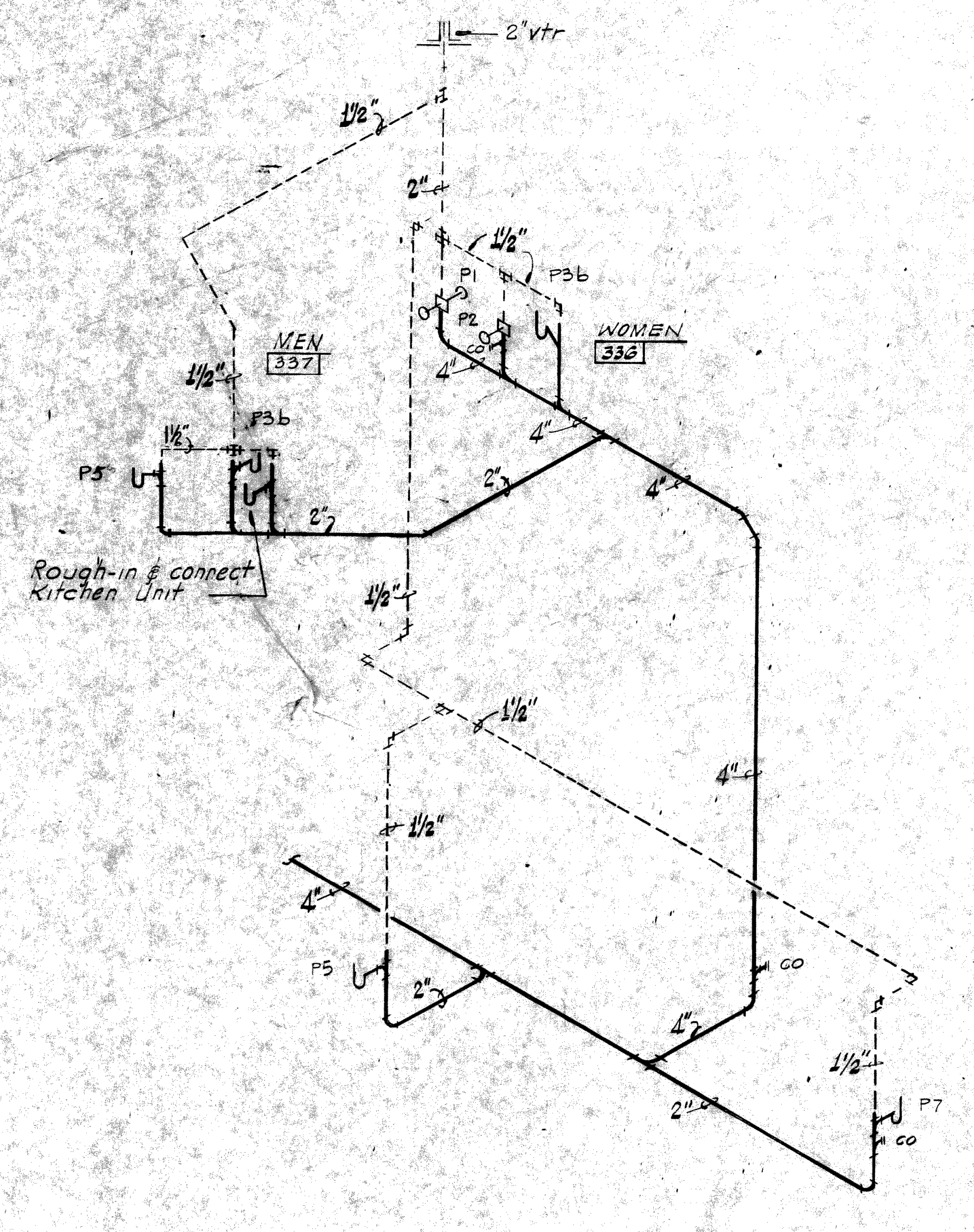
drawn by RGB
checked by RGS
date AUGUST 5, 1976
revisions

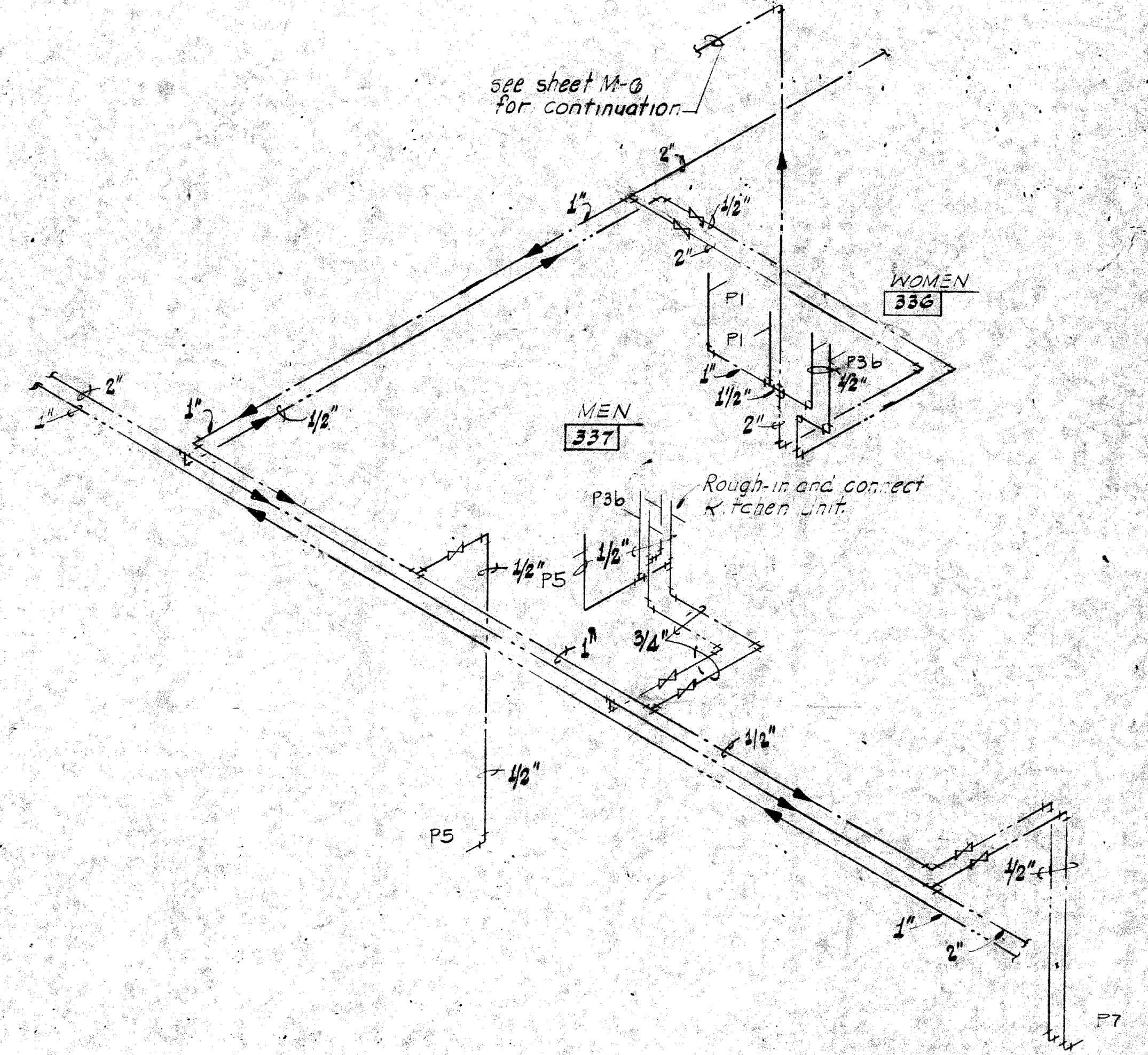
ATTENTION ! ! ! ! ! ! ! ! ! ! ! ! ! !
Clear restrictions are set on how and where precast concrete members may be penetrated without damaging prestressed reinforcing strands.
See the following:
- Details 1 and 2, SH.A19
- Specifications "Bid package 'B' instructions to bidders"
- Precast concrete shop drawings and production drawings, by Prestressed Concrete of Colorado, Inc. 303-458-6301

m·c·b job no. 7510
sheet M6
of BP(B) 63 sheets








see sheet M-a for continuation
WOMEN
336
MEN
337
Rough-in and connect Kitchen Unit
P1
P3b
P5
P7

PLUMBING FIXTURE SPECIFICATIONS

SYMBOL	DESCRIPTION
P-1	WATER CLOSET: American Standard "Afwall" No. 2477.016, siphon jet action, elongated bowl, wall hung on adjustable carrier by Zurn, Wade, Josam or Smith, flush valve Sloan Royal No. 110 and open front white plastic seat with stainless steel check hinge 5320.114.
P-1a	WATER CLOSET: Same as P-1 except mount 18" high for the handicapped.
P-2	URINAL: American Standard "Washbrook" No. 6500.011, vitreous china, wall hung on carrier by Zurn, Wade or Josam, flush valve Sloan Royal 186-11.
P-3	LAVATORY: American Standard "Scotian" No. 0360.057, vitreous china, 20" x 18", wall hung on concealed arms by Zurn, Wade or Josam, faucet with pop-up drain 2248.433, 3/8" chrome-plated supplies with wheel handle stops and 1-1/4" x 1-1/2" chrome-plated P-trap.
P-3a	LAVATORY: American Standard "Merrilyn" No. 0140.012, vitreous china, counter-mounted with stainless steel mounting frame, faucet with pop-up drain 2248.433, 3/8" chrome-plated supplies with wheel handle stops and 1-1/4" x 1-1/2" chrome-plated P-trap.
P-3b	LAVATORY: American Standard "Aqualyn" No. 0475.020, counter-mounted, self-rimming, vitreous china, 20" x 17", faucet with pop-up drain 2248.433, 3/8" chrome-plated supplies with wheel handle stops and 1-1/4" x 1-1/2" chrome-plated P-trap.
P-4	SERVICE SINK: Fiat Model MSB-2424, Molded stone, 24" x 24" x 10" deep, with removable stainless steel combination dome strainer and lint basket, faucet with vacuum breaker, hose end, wall brace, stops in shank 830-AA and 3" cast iron P-trap.
P-4a	SERVICE SINK: American Standard "Lakewell" No. 7692.023 with rim guard 8379.018, enameled cast iron, 3" trap standard 7798.176 and faucet 8344.111.
P-5	ELECTRIC WATER COOLER: Elkay Model EH-8, wall hung, color as selected by the Architect, 3/8" supply with wheel handle stop and 1-1/4" x 1-1/2" chrome-plated P-trap.
P-5a	DRINKING FOUNTAIN AND CUSPIDOR: Halsey Taylor Model 5801 and 5803 cuspidor, fountain to have cuspidor connection for bypass to cuspidor, stainless steel, semi-recessed, 3/8" supply with stop valve and 1-1/2" chrome-plated P-trap.
P-6	WASH FOUNTAIN: Bradley Type CFC, Bradglas bowl, 54" semi-circular, foot-operated, liquid soap dispenser, strainer, mechanical mixing valve, volume control, combination stop-strainer and check valves, and 2" P-trap.
P-6a	WASH FOUNTAIN: Bradley Type KCF, foot operated, 54" corner type, liquid soap dispenser, strainer, mechanical mixing valve, volume control, combination stop-strainer and check valve and 2" P-trap.
P-7	COUNTER SINK: Elkay Model LR 2219, 18 gauge stainless steel, self-rimming, 22" x 19" x 7-1/2" deep, basket strainer LK-35, faucet Bradley 2020L, 3/8" supplies with stops and 1-1/2" chrome-plated P-trap.
P-7a	COUNTER SINK: Elkay Model DLR-2222-12, 18 ga. stainless steel, 22" x 22" x 12" deep, basket strainer LK-35, faucet with gooseneck-spout and 4" wrist blade handles, American Standard 2238.129, 3/8" supplies with wheel handle stops and 1-1/2" chrome-plated P-trap.
P-8	SHOWER: Bradley 5-person column shower Type 5CB, stainless steel, supplies and vent through column, stainless steel shroud secured to structure, 6'-0" height in Men and 5'-6" height in Women, pressure balancing mixing valve, liquid soap container in column with valve for each user and vandal-proof shower heads.
P-9	EYE WASH FOUNTAIN: Bradley Model S1923-SB-SCE-SR, wall hung, stainless steel bowl, self-closing valve, face spray ring, 1/2" supply and 1-1/4" x 1-1/2" chrome-plated P-trap.

FIXTURE SCHEDULE

SYMBOL	DESCRIPTION	TRAP	VENT	CW	HW
P1	WATER CLOSET	3"	2"	1"	—
P1a	WATER CLOSET	3"	2"	1"	—
P2	URINAL	2"	11/2"	1"	—
P3	LAVATORY	11/2"	11/2"	1/2"	1/2"
P3a	LAVATORY	11/2"	11/2"	1/2"	1/2"
P3b	LAVATORY	11/2"	11/2"	1/2"	1/2"
P4	SERVICE SINK	3"	2"	1/2"	1/2"
P4a	SERVICE SINK	3"	2"	1/2"	1/2"
P5	ELECTRIC WATER COOLER	11/2"	11/2"	1/2"	—
P5a	DRINK. FOUNT. & CUSPIDOR	11/2"	11/2"	1/2"	—
P6	WASH FOUNTAIN	2"	11/2"	1"	1"
P6a	WASH FOUNTAIN	2"	11/2"	1"	1"
P7, P7a	COUNTER SINK	11/2"	11/2"	1/2"	1/2"
P8	COLUMN SHOWERS	3"	11/2"	1"	1"
P9	EYE WASH FOUNTAIN	11/2"	11/2"	3/4"	—

LEGEND

SYMBOL	DESCRIPTION
━━━	SOIL
- - - - -	VENT
—·—	COLD WATER
—··—	HOT WATER
—···—	HOT WATER RECIRCULATING
—RD—	ROOF DRAIN
—G—	GAS
—O—	OXYGEN
—ac—	ACETLYENE
—V—	VACUUM
—F—	FIRE LINE
—A—	COMPRESSED AIR
⋈	GATE VALVE
⋈	GLOBE VALVE
⋈	PRESSURE REDUCING VALVE
↘	CHECK VALVE
‖	UNION
▽	PLUG COCK
▷	VALVE IN RISE
Vtr	VENT THRU ROOF
FHC	FIRE HOSE CABINET
FCO	FLOOR CLEANOUT
CO	WALL CLEANOUT

MORE
COMBS
BURCH

ArchitectsEngineersPlanners
A PROFESSIONAL CORPORATION
3911 EastExpositionAvenue
DenverColorado80209
Area303 744-3157

phase two facilities:
ARAPAHOE
COMMUNITY
COLLEGE
5900 South Sante Fe Drive, Littleton, Colorado 80120

state project no.
2136

drawing title
PLUMBING
SCHEDULE
&
SCHEMATIC

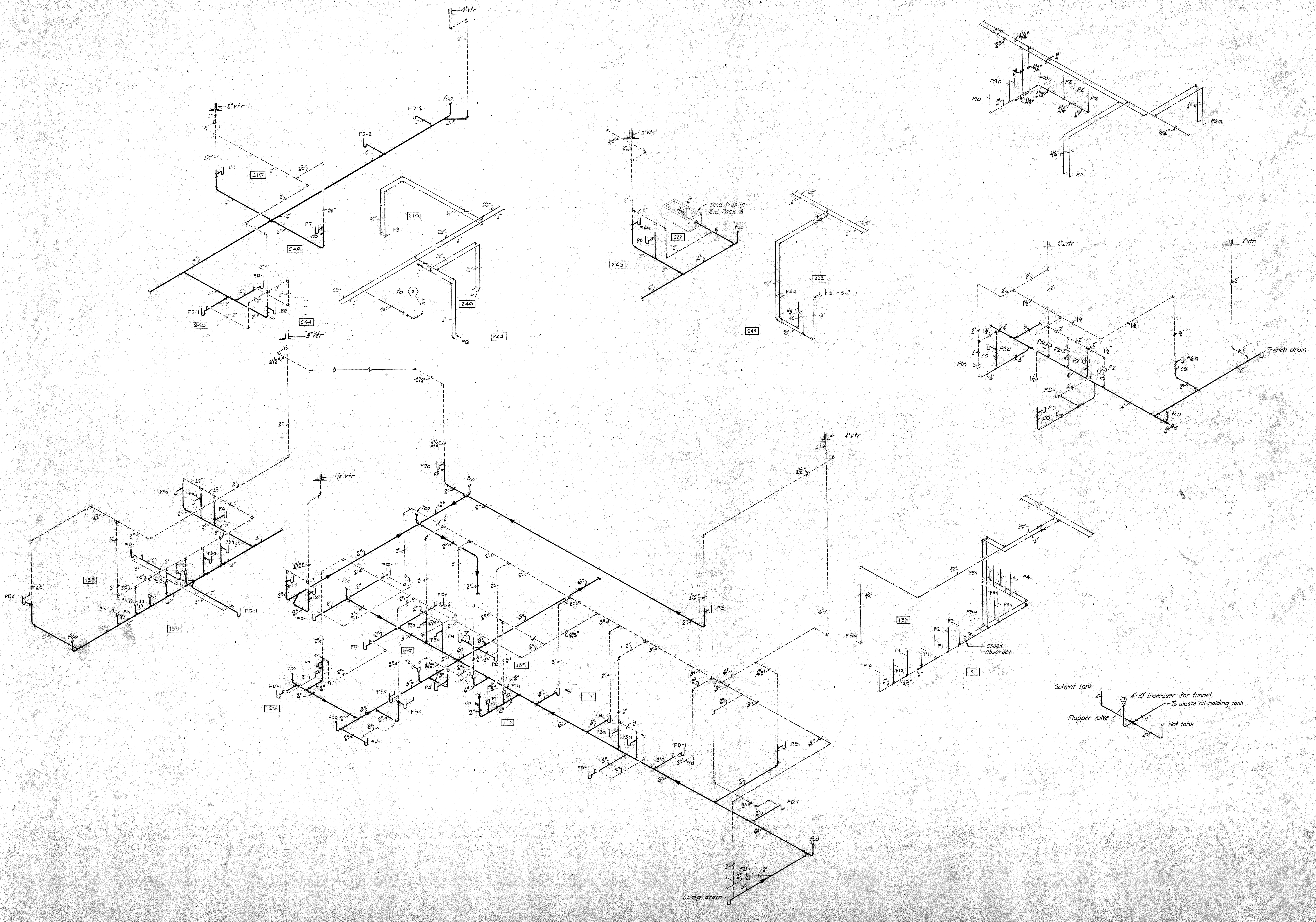
tracing key

☐	A	B	C	D	E	F
1	/	/	/	/	/	/
2	/	/	/	/	/	/
3	/	/	/	/	/	/
4	/	/	/	/	/	/
5	/	/	/	/	/	/
6	/	/	/	/	/	/
7	/	/	/	/	/	/
8	/	/	/	/	/	/
9	/	/	/	/	/	/
10	/	/	/	/	/	/
11	/	/	/	/	/	/
12	/	/	/	/	/	/
21	/	/	/	/	/	/
22	/	/	/	/	/	/
23	/	/	/	/	/	/
24	/	/	/	/	/	/
25	/	/	/	/	/	/
26	/	/	/	/	/	/
31	/	/	/	/	/	/
32	/	/	/	/	/	/
33	/	/	/	/	/	/
34	/	/	/	/	/	/

ROBIN DAVID ADAIR, JR.
12382

drawn by
RGB
checked by
RGS.
date
AUGUST 5, 1976
revisions

m·c·b job no.
7510
sheet
M
7
of
B
P
(B)
63
sheets



4" vtr
2" vtr
2" vtr
3" vtr
1½" vtr
2½" vtr
fco
co
FD-1
FD-2
P1
P1a
P2
P3
P3a
P4
P4a
P5
P5a
P6
P6a
P7
P7a
P8
210
244
245
246
243
222
132
135
126
140
137
117
116
sand trap in Bid Pack A
h.b. +54"
to 7
Trench drain
shock absorber
sump drain
Solvent tank
4"x10' Increaser for funnel
To waste oil holding tank
Flapper valve
Hot tank

MORE
COMBS
BURC

ArchitectsEngineersPlanners
A PROFESSIONAL CORPORATION
3911 East Exposition Avenue
Denver Colorado 80209
Area 303 744-3157

phase two facilities:
ARAPAHOE COMMUNITY COLLEGE
5900 South Sante Fe Drive, Littleton, Colorado 80120

state project no.
2136

drawing title
PLUMBING SCHEMATICS

tracing key	A	B	C	D	E	F
1	/	/	/	/	/	/
2	/	/	/	/	/	/
3	/	/	/	/	/	/
4	/	/	/	/	/	/
5	/	/	/	/	/	/
6	/	/	/	/	/	/
7	/	/	/	/	/	/
8	/	/	/	/	/	/
9	/	/	/	/	/	/
10	/	/	/	/	/	/
11	/	/	/	/	/	/
12	/	/	/	/	/	/
21	/	/	/	/	/	/
22	/	/	/	/	/	/
23	/	/	/	/	/	/
24	/	/	/	/	/	/
25	/	/	/	/	/	/
26	/	/	/	/	/	/
31	/	/	/	/	/	/
32	/	/	/	/	/	/
33	/	/	/	/	/	/
34	/	/	/	/	/	/

ROBIN DAVID ADAIR, JR.
13382

drawn by
RGB
checked by
RGS
date
AUGUST 5, 1976
revisions

m·c·b job no.
7510
sheet
M
8
of
B
P. (B)
63
sh

EQUIPMENT SCHEDULE

SYMBOL	DESCRIPTION

13 And 14 — SUCTION DIFFUSERS: Suction diffusers shall be mounted on the pump inlets of all end suction pumps. Suction diffusers shall be designed to provide a smooth flow of water into the pump inlet and shall be complete with strainer, adjustable support leg, and start-up strainer. Start-up strainer shall be removed at the final testing and balance phase or after four weeks of operation, whichever is longer. Suction diffusers shall be furnished for suction pumps, Symbols 10 and 11. Bell and Gossett, Taco, Armstrong, or equal.

15 — IN-LINE PUMP: In-line booster type, bronze fitted, mechanical seal, 10 gpm at 15 ft., 1/6 horsepower, 1750 rpm, 115 volt, 60 Hz, single phase, 1" size. Bell and Gossett 1"PR.

16 — MONOXIVENT FITTINGS: Furnish and install an automotive tail pipe exhaust system in the Auto Mechanics Shop consisting of 9 cast aluminum double floor inlets for tail pipe with self-closing covers. Tail pipe adapters and 8 ft. hoses shall be furnished by the Owner who is to verify compatibility of the floor inlets with their flexible tubing. See Symbol 26 for exhaust fan. See Plans.

17 — REFRIGERATED AIR DRYER: Self-contained air-cooled for use with shop air compressor, Symbol 18, dryer to have capacity to cool air supplied by compressor from 100° F. saturated to 40° F. pressure dewpoint. Furnish with automatic drain valve, air-to-air heat exchanger, self-regulating hot gas bypass valve, and separator. Unit to operate on 460 volt, 60 Hz, three phase. Capacity 375 scfm with 1-1/2 hp compressor. Unit to be fully wired with only three phase power requirement in the field. Ingersol Rand 50T375.

18 — CENTRAL AIR COMPRESSOR: Furnish and install two base mounted two-stage air cooled compressors with common vertical receiver with regulators set for 175 psig. Units shall be completely automatic and furnished with fully wired panels to include magnetic motor starters for use with 460/60/3 power. Each compressor shall be V-belt driven with 70 cfm free air capacity at 175 psig with 20 horsepower motors and shall start unloaded. Furnish oil bath intake filters, water cooled aftercoolers, intercoolers, discharge manifolds, check valves, service valves, safety valves, pressure switches, automatic tank drain, belt guards and interconnecting piping. Receiver with mounting legs shall be 120 gallon capacity, 24" diameter x 68" high and shall be constructed in accordance with ASME standards. Kellogg American 2-462-30718, Quincy, Saylor Beal, or approved equal.

19 Thru 33 — GENERAL PURPOSE FANS: Centrifugal SISW design in arrangement ten with: weatherproof motor and drive enclosure, access door in scroll on fans 30" and above, constant pitch v-belt drives, adjustable motor bases, backward inclined (BI) wheel, or forward curved (FC) wheel as scheduled, and AMCA rated. The maximum unbalance at each bearing is not to excced three mils in either the vertical or horizontal plane. All fans are to have spring vibration isolators sized for 70 percent isolation efficiency and shall be HS, MN, or MS as shown on the drawings. Furnish heavy duty ball bearings with grease fittings. Single phase, 115 volt, 1750 rpm motors shall be used for 1/3 hp or less. Three phase, 1750 rpm motors shall be suitable for continuous operation at 5,300 ft. and for use with 480 volt, 60 Hz, three phase current. New York Blower, Barry, Pace, Buffalo, Twin City, Ilg, Peerless, or approved equal. Fan 26 shall be class 2 construction.

Symbol	CFM	Static Press., In. W.G.	RPM	BHP	Motor HP	Service or Location	Trane Size
19	2000	3/8	1160	.3	1/2	Hot Tank Exhaust, Room Wash 236	15 BI
20	1000	1.0	1050	.3	1/3	Tail Pipe Exhaust - Roof	10 FC
21	Deleted						
22	Deleted						
23	600	3/8	1380	.14	1/4(115v.)	Chlorine Room Exhaust (On Roof) All Aluminum Construction	7-1/2 FC
24	3600	1.1	1299	1.1	1-1/2	O. A. Auto Mechanics - Roof	18 BI
25	3000	1.1	1189	.8	1-1/2	O. A. Auto Body - Roof	18 BI
26	3600	3.6	2631	3.4	5	Exhaust - Auto Mechanics - Roof	15 BI
27	3000	1.1	1189	.8	1-1/2	Exhaust - Auto Body - Roof	18 BI
28	1500	0.3	1520	.2	1/3(115v)	Exhaust Hood - Plbg./Elect. (Roof)	12 BI
29	1800	0.3	1041	.2	1/3(115v)	Exhaust SK Hood in Chem Area (Roof)	15 BI
30	3600	1.1	1299	1.1	1-1/2	Outside Air - P/E Roof 7	18 BI
31	2000	0.3	1129	.3	1/3(115v)	Hood - Civil Tech. (Roof)	15 BI
32	3600	1.1	1299	1.1	1-1/2	Exhaust 7	18 BI
33	500	0.3	1360	.1	1/3(115v exp. proof)	Paint Stg. - Fan on Roof	7-1/2 FC

34-39 Deleted

40 — WASTE OIL STORAGE TANK: 500 gallon capacity, 4 ft. diameter x 6 ft. long, with 4" inlet connection, 1-1/2" vent connection, 20" dia. manhole, 4" pumpout connection, and four hold down clips on each side, all as detailed on the drawings. Coat outside of tank with shop coat of enamel and encase entire tank in "polytube" plastic (heavy duty resins) tank enclosure. Construct tank of 7 gauge black steel. Kohlhass, Eaton Metal Mfg., or approved equal.

41 — CENTRAL EVACUATION SYSTEM: Furnish and install one duplex wet vacuum system capable of serving two vacuum outlets at a vacuum of 10" H.G. at 5,000 ft. elevation, with water sealed impeller, 3/4 hp, 3450 rpm motors, for use with 208 volt, 60 Hz, single phase current. Furnish automatic pressure switch to shut off pumps in event of supply water pressure dropping below 15 psig, and continuous automatic flushing trap. Dentsply MVS, Airmac, or approved equal.

42 Thru 48 — TIME CLOCKS: For use with 115 volt line and control circuit. Unit shall be 7-day design with easy to read dial graduated into seven days with each day divided into day and night divisions in 30-minute increments. The dial shall be able to be set by the time of day by turning the dial without removing nuts. Unit shall have 4-pole switching contacts suitable for line voltage with action as shown on the control diagrams. Unit shall have manual override capability without disturbing the preset schedules. Unit shall incorporate a spring wound carryover for power outage up to 10 hours. Paragon No. 7207-0, or approved equal.

49 And 50 — UNIT HEATERS: Horizontal propeller arrangement, hot water entering at 190° and leaving at 150° F. Symbol 49 shall be Class 2, Group D, explosion proof and non-sparking construction (Paint Storage Room). Both units shall, with 1.25 gpm of hot water, have 25,000 Btuh capacity at 500 cfm with 1/25 hp, 1550 rpm, 115 volt, 60 Hz, single phase motors. Furnish one electric line voltage thermostat located in air compressor room to cycle both the motors. McQuay Model UHH 028A, AAF, Modine, Carrier, Buffalo, ITT, Dunham Bush, or Trane.

51 — RELIEF VENT: All aluminum housing with backdraft damper and 1/2" x 1/2" galvanized steel mesh bird guard. Jenn-Air RV-161, or approved equal.

VIBRATION ISOLATOR SCHEDULE:

TYPE MS: Floor mounted open spring type without housings or snubbers equipped with leveling bolts and with two layers of ribbed or waffled neoprene pad separated by a 1/16" galvanized steel plate under the base plate. The design static deflection under load shall be as scheduled.

TYPE HS: Suspension type hangers having a steel frame and spring element in series with a neoprene pad or washer. The design static deflection under load shall be as scheduled. The isolator shall be designed so hanger rod may be misaligned 15° relative to the vertical without touching hanger box frame.

TYPE MN: Neoprene isolator unit having a minimum static deflection of 1/4"

	Amber/Booth	Consolidated Kinetics	Mason	Sausse
Type MS	SW	FDS w/NPD Pad	SLF	RMS
Type HS	-	SHC	30	-
Type MN	RV	R	N	FH

Symbol	Type Isolator - Deflection	Supplementary Snubber Isolators	Type Base
1A & 2A	MS - 1"	Yes	Integral Steel Motor and Fan Base
1D1&2 and 2D1&2	MS - 1/2"	Yes	Integral Steel Motor and Fan Base
3A thru 7A	MS - 1"	Yes	Integral Steel Motor and Fan Base
3HI thru 7HI	MS - 1/2"	Yes	Integral Steel Motor and Fan Base
19, 28, 29, 31	MS - 1/4"	NA	Utility Set
20, 23, 33	MN	NA	Utility Set
24, 25, 26, 27, 30, 32	MS - 1/2"	NA	Utility Set

FOR EQUIPMENT SCHEDULE CONT. SEE M-10

SYMBOL	DESCRIPTION

SYMBOLS 1 THROUGH 7 CONTINUED:

AIR WASHERS: Class 4 with single bank of centrifugal spray nozzles. Casings are to be constructed of zinc coated steel sheets fastened by close center spot welding and sealed with mastic. Tanks are to be fabricated of steel with all joints welded complete with factory piping, connections, spray headers, eliminators, and inlet louvers. The entire tank assembly is to be painted after fabrication with bitumastic paint. Tanks are to be 18 inches high with water level set at 14 inches. Furnish suction strainer, overflow trap, makeup connection and float valve, quick fill connection, dilution connection and access door on aisle side. Line bottom tank with 1" rigid insulation under entire tank surface.

Symbol	CFM	Face Area	GPM	Operating Weight, Lbs.	Dimensions, Inches	Service
3B	No Air Washer Included					Pool
4B	12,000	22.2 Sq. Ft.	53	3,400	59 x 83 x 48	Gym
5B	11,130	22.2 Sq. Ft.	53	3,400	59 x 83 x 48	Auto Mechanics
6B	11,000	22.2 Sq. Ft.	53	3,400	59 x 83 x 48	Auto Body
7B	10,000	22.2 Sq. Ft.	53	3,400	59 x 83 x 48	Physical/Industrial

SPRAY PUMPS: Centrifugal, end suction, close coupled, mechanical seal, bronze fitted, single suction enclosed type impeller of bronze construction with performance as specified. Allis Chalmers, Bell and Gossett, Aurora, or Weinman.

Symbol	GPM	Head	RPM	Weinman Pump Size	HP	Current	Service
3C	No Spray Pump Required						Pool
4C	53	64 Ft.	1750	1-1/2K	1-1/2	460/3	Gym
5C	53	64 Ft.	1750	1-1/2K	1-1/2	460/3	Auto Mechanics
6C	53	64 Ft.	1750	1-1/2K	1-1/2	460/3	Auto Body
7C	53	64 Ft.	1750	1-1/2K	1-1/2	460/3	Physical/Industrial

GAS FIRED DUCT HEATERS: Natural gas-fired at 7-11" w.g., aluminized steel corrosion resistant burners: stainless steel heat exchangers; automatic electric gas valve, pressure regulator, limit control, fan control, transformers (115/24V.), manual reset pilot, 100 percent shutoff, (Reznor Model RX); top flue collar outlet and metalbestos flue up through enclosure to vent cap; with 115 volt controls, and capable of the performance scheduled. Duct heaters are to be enclosed with insulated (1" - 1-1/2 lb.) panels so that combustion air can circulate within the heater enclosure. External bypass ducts with dampers are required. Furnish condensate drain connections and extend to floor drain.

Symbol	Required Output	Total Input, Btuh(S.L.)	Reznor Furnaces	Bypass Duct	Service
3D	187,000 Btuh(20%O.A.)	400,000	Two at 200	9" x 36"	Pool
4D	150,000 Btuh	250,000	Two at 125	9" x 36"	Gym
5D	186,000 Btuh	300,000	Two at 150	9" x 36"	Auto Mechanics
6D	152,000 Btuh	250,000	Two at 125	9" x 36"	Auto Body
7D	472,000 Btuh	800,000	Two at 400	9" x 36"	Physical/Industrial

FILTERS: Replaceable media filters with frames arranged in flat bank equal to Continental WT99-2.

Symbol		CFM	Filter Area, Gross	Filter Bank Dimensions	Filter Size
3E	4 wide x 2 high	7,500	22.2 Sq. Ft.	6' x 4'	6-24 x 24 x 2
4E	4 wide x 3 high	12,000	33.3 Sq. Ft.	6'-8" x 5'-0"	12-20 x 20 x 2
5E	4 wide x 3 high	11,130	33.3 Sq. Ft.	6'-8" x 5'-0"	12-20 x 20 x 2
6E	4 wide x 3 high	11,000	33.3 Sq. Ft.	6'-8" x 5'-0"	12-20 x 20 x 2
7E	4 wide x 3 high	10,000	33.3 Sq. Ft.	6'-8" x 5'-0"	12-20 x 20 x 2

OUTSIDE RELIEF AND RETURN AIR DAMPERS: All dampers to be constructed of aluminum with bulb vinyl stripping on edges and ends for minimum leakage, equal to Arrow Mfg. Co.

Symbol	Nominal CFM	Outside Damper Size	Return Air Damper Size	Relief Damper Size
3F - G	7,500	Two-2' x 4'	6' x 1-1/2'	6' x 1-1/2'
4F - G	12,000	Two-2-1/2' x 4-1/2'	9' x 1-1/2'	9' x 1-1/2'
5F - G	11,130	Two-34" x 48"	9' x 1-1/2'	9' x 1-1/2'
6F - G	11,000	Two-34" x 48"	9' x 1-1/2'	9' x 1-1/2'
7F - G	10,000	Two-34" x 48"	9' x 1-1/2'	9' x 1-1/2'

RETURN-RELIEF FANS: Double inlet-double width centrifugal forward curve Class I fans, each with integral fan and motor base suspended on open spring isolators having one inch deflection. Motors shall be 1140 rpm, 115 volt, 60 Hz, single phase open ball bearing type. Interior and exterior of fans 4 through 7 shall be coated with Eiseneiss or equal.

Symbol	Relief CFM	S.P., In. W.G.	RPM	BHP	HP	Wheel Diameter	O.V., FPM
3H - I	3,750 Each	0.4"	454	.5	3/4	16" DIDW	1324
4H - I	6,000 Each	0.4"	427	.96	1	18" DIDW	1754
5H - I	3,750 Each	0.4"	454	.5	3/4	16" DIDW	1334
6H - I	4,000 Each	0.4"	463	.53	3/4	16" DIDW	1424
7H - I	3,200 Each	0.4"	437	.39	1/2	16" DIDW	1139

HEAT RECOVERY UNITS: Shell and tube type air to air design arranged for counterflow air paths with exhaust air in shell and outside air in tubes. Unit constructed of 20 gauge galvanized steel with 0.051 aluminum tube sheets and 0.025 embossed aluminum tubes. Furnish condensate drain on shell. TempAir Products Co., or Temp-X-Changer.

Symbol	Tube Side CFM	Tube Side EAT	Tube Side LAT(Winter)	Tube Side P.D., In.	Shell Side CFM	Shell Side EAT	Shell Side P.D., In.	Location	Eff. %	Model - Length, Ft.
3J	Not Required									
4J	Not Required									
5J	3,600	-10	46	0.55"	3,600	75	0.60"	Unit 5	66	TB-36-8
6J	3,000	-10	48	0.40"	3,000	75	0.40"	Unit 6	68	TB-36-8
7J	3,600	-10	46	0.55"	3,600	75	0.60"	Unit 7	66	TB-36-8

8 — CONTROL AIR COMPRESSOR: Duplex compressor, unit, each compressor sized to supply air for the pneumatic control system while operating 25 percent of the time. Approximately 3 hp each, for use with 460 volt, 60 Hz, three phase current, complete with belt guard, intake filter and muffler, automatic tank drain and shut-off, pressure relief valve, pressure switch, pressure reducing station, and mechanical sequence control. Powers Honeywell or Johnson.

9 — REFRIGERATED AIR DRYER: Self-contained air cooled, capacity to cool air supplied by controls air compressor from 95° F. saturated to -10° dewpoint (atmospheric), with automatic drain valve. Approximately 1/5 hp, 115 volt, single phase, with factory wired pressure switch to cycle compressor. Hankison Series E, or approved equal.

10 And 11 — END SUCTION PUMPS: Horizontal, end suction, close coupled cast-iron bronze fitted with mechanical seals. Casings shall be for 125 psig working pressure and flat faced flanges with 1/4" gauge taps in both suction and discharge nozzles or taps may be installed in piping. Impeller shall be the single suction enclosed type of bronze construction. Shaft shall be high strength carbon steel. Each pump shall deliver the capacity specified below. Bell and Gossett, Pacific, Weinman, or Allis-Chalmers.

Symbol	GPM	Head, Ft.	HP	Motor Speed	Current	Weinman Model No.	Service	Location
10	222	50	5	1750	460/3	2-1/2K	Chilled Water	Exist. Equip. Room
11	61	50	2	1750	460/3	1-1/2K	Hot Water	Exist. Equip. Room

12 — PACKAGED ROOFTOP HEAT RECOVERY UNIT:. For 100 percent outside air makeup with the capability of recovering 62 percent of the sensible heat in the spray booth exhaust with the Unitary exhaust fan replacing the spray booth exhaust fan. Unit to contain plate type heat recovery units, exhaust fan, backdraft damper, outside air louvers with bird screen, outside air dampers, exhaust air filters designed to capture paint particles that have passed through the paint arrestor pads in the booths, permanent washable type outside air filters, fully insulated cabinet with epoxy coated steel construction or aluminum sandwich construction, sidewall access doors with locking handles, structural steel frame, factory fabricated channel iron subbase and gasket, supply and exhaust fan spring vibration isolators, motorized outside air louver-damper to close whenever supply fan is off, exhaust air bypass damper to permit bypassing the heat recovery wheels when heat recovery is not desired (controlled by supply air thermostat), and hot water reheat coils with two-way modulating control valves (total water friction not to exceed 12 ft.), designed to heat 12,000 cfm from 50° F. (235,000 Btuh) using 12 gpm of hot water entering at 190° F. and leaving at 150° F. Furnish electric preheat coils to prevent heat exchanger freezeup. All wiring, controls, or any other electrical component in the exhaust air path shall be Class 2 Group D explosion proof with the exhaust fan having a 10 hp, 1750 rpm, 460 volt, 60 Hz, three phase explosion proof motor and sized for 12,000 cfm at 0.4" external static pressure. Exhaust fan shall be DIDW centrifugal airfoil design with non-sparking construction (non-ferrous parts) and shall be equipped with static free belts. Outside air supply fans shall be DIDW centrifugal FC design with capacity to supply 12,000 cfm at 0.35" external static pressure with 15 hp supply fan motor. Electric preheat coils to have 130 KW capacity with factory wired 8-step controller. Only one electrical three phase power feed is provided for the entire unit.

Control Sequence:

A wall-mounted remote push button station (Class 2 Group D) shall be located in the spray booth to energize the packaged rooftop supply and exhaust fans and to open a solenoid valve in the compressed air supply so that it is impossible to paint without air movement. The unit mounted thermostat with bulb in the supply air stream shall be set to provide a minimum of 72° F. supply air when the outside air temperature is -10° F. As the outdoor air temperature increases, a proportionate amount of exhaust air is bypassed around the heat recovery units to maintain the 72° F. supply air temperature. As the outside air temperature rises above 72° F., all of the exhaust air is bypassed around the wheels. No recirculating air path will be allowed. A switch shall be available for "Exhaust Fan Only" operation whenever the outdoor temperature is within the temperature limits of the painting materials. Heat Recovery Corp. TXP-2, Wing, or Miller Picking. Total unit weight not to exceed 5,000 pounds. DesChamps Laboratories PV-10, Southwest Standard, Pace, Buensod, or Governaire. Unit shall comply with NFPA-33, 1973 and NFPA 91. Unit manufacturer to furnish separate roof mounting frame with counter-flashing designed to have top level (sloping tees) with counter-flashing similar to details on Units 1-7.

SYMBOL	DESCRIPTION (All capacities, static pressure, etc., are at 5,300 ft. elevation.)

1 Thru 7 — CENTRAL ROOF-MOUNTED PACKAGED UNITS: Factory fabricated and custom engineered multizone (Symbols 1 and 2) assemblies and evaporative cooling-gas fired heating (Symbols 3 through 7) assemblies furnished completely weatherproofed for outdoor installation, fabricated of steel (or aluminum "Sandwich" panels provided that the specified smoke development ratings are furnished) with 2-inch thick, 3 pound density rigid interior insulation. Floor panels are to be insulated with two-inch thick rigid three pound density interior insulation below the walking surface. Condensate drain pans are to be double surface with two-inch rigid three pound density insulation between two steel surfaces. Unit components shall be arranged as shown on the Roof-Mounted Packaged Unit Details. Any AMCA approved fan manufacturer may be used without submitting for prior approval provided that the size, wheel type, class, and arrangement is as scheduled below. Maximum allowable vibration amplitude shall not exceed three mils at the bearing pillow blocks in any plane. Furnish OSHA belt guards on all drives. Any ARI approved coil manufacturer may be used without submitting for prior approval provided that the size, rows, fins per inch, face area, coil connections, circuiting, and air and water pressure drops are as scheduled below.

V-belt drives shall be sized for 200 percent of the motor nameplate horsepower and shall be constant pitch with adjustable motor base. Fan and motor bases shall be steel with integral motor base. Integral steel bases shall be supported on type MS steel spring isolators having one inch spring deflection with snubber isolators to prevent undesired base movement on start-up. Fans shall be blocked for shipment to prevent damage. All fans will be cycled frequently by time schedule and/or by temperature conditions. Symbols 1 and 2 incorporate bag filters having a minimum NBS efficiency of 40 percent; with side access and with complete enclosure frames of galvanized steel construction with seals provided between modules, between filter cells and in the filter slide racks. Renewable media prefilters shall be furnished ahead of the bag filters in the same enclosure. Bag filter manufacturers shall be limited to AAF, Continental or Farr. Symbols 3 through 7 incorporate renewable media filters with frame sizes as scheduled complete with media retaining grids on both sides with filter media having a minimum NBS efficiency of 25 percent. Outside, return, and relief air dampers are to be of the 1 percent leakage type (3" upstream pressure) with neoprene seals on all four blade surfaces. Outside combustion air and relief louvers are to be of aluminum or steel construction of "J" blade design and no more than four inches thick.

Units shall mount directly on top of bare concrete tees. All condensing, condensate, and piping leakage water shall be contained, collected, and piped to a suitable drain. Exterior surfaces shall be flat and suitable for field painting. Exterior casing shall mount flush on a 20 inch high channel base which encloses the assembly. A flashing shall be furnished integral between the enclosure and the channel base to receive exterior counter flashing by the roofing subcontractor. Steel channel angle, or I beam cross members shall support all of the interior components including integral steel fan and motor bases. Exterior access doors shall be as sized on the drawings and shall be double surfaced air tight design with quality gaskets, door hardware equal to Ventlok 310 latches, piano hinges, and locking hasp. Whether shown or not, furnish (internal) access hatches (fixed) to all internal compartments as large as possible to service all internal components, wiring, controls, etc. Pneumatic controls shall be field installed. Electric power and control wiring shall be field installed. Provide space for electrical components where shown with a smooth steel external surface for field mounting of starters, switches, etc. All electrical, control, piping, and duct penetrations through the tees shall be within the confines of the base channel. Flexible connections are to be used on the intake and discharge of all fans connecting to ductwork or bulkheads. Supply fans and return fans for systems 4 through 7 shall be coated inside and outside to protect against moisture damage. Marine lights with vapor proof globes and with 115 volt outlets shall be furnished as indicated. Wiring of lights and furnishing and wiring of switches will be by the Electrical Subcontractor. Each unit shall be furnished with an external sheet metal electrical compartment 11" deep x 36" x 36", with drip lip top, full doors with piano type hinge, hasp for lock, dust-tight construction. Consulting Engineer shall inspect these units at the plant prior to shipment. Southwest Standard, Buensod, Governair or Pace.

SYMBOLS 1 AND 2:

CASING DETAILS:

Symbol	Outside Dimensions Height	Outside Dimensions Width	Outside Dimensions Length	Total Operating Weight, Lbs.	Overhead Lights/Outlet	Louver Dimen. Outside	Louver Dimen. Relief	(HRU) Outside	Access Doors Count	Access Doors Size
1	8'-0"	13'-6"	39'-0"	17,000	4	2-4-1/2'x6'	1-12'x4'	1-2-1/2'x3'	4	24"x36" 30"x42" 30"x60" 36"x60"
2	8'-0"	13'-6"	39'-0"	17,000	4	2-4-1/2'x6'	1-12'x4'	1-2-1/2'x3'	4	

SUPPLY FAN: Motors are 1750 rpm, open ball bearing, 460/60/3, with NEMA slide base.

Symbol	CFM	S.P. In. W.G.	O.V. FPM	RPM	BHP	Motor HP	Fan Size	Wheel Type	Construction Class	Arrgt./R/D	Position
1A	26,000	2.9"	1886	897	15.0	20	36"DIDW	Airfoil	2	3/CW/THD	W
2A	23,000	2.7"	1669	854	12.4	20	36"DIDW	Airfoil	2	3/CW/THD	W

CHILLED WATER COILS: 45° EWT, 55° LWT, 1/2" or 5/8" tubes, ARI certified, same end coil connections.

Sym.	CFM	DB In	WB In	DB Out	WB Out	GPM	Sens. Ht. Btuh	Total Btuh	Face Area Sq. Ft.	Min. Rows	Fins per In. (min.)	Air Frict.	Water Frict.	Ckt'g.	"W" Height	Length
1B	26,000	76.8	61	55	52.3	118	504,000	589,000	48.4	4	12	.85	8 ft.	St'd.	54	129
2B	23,000	76.8	61	55	52.3	104	447,000	522,000	48.4	4	12	.70	7 ft.	St'd.	54	129

HOT DECK HOT WATER COILS: 190° EWT, 150° LWT, 1/2" or 5/8" tubes, ARI certified, same end connections.

Sym.	CFM	EAT	LAT	GPM	Total Heat Btuh	Face Area	Min. Rows	Fins per Inch(Min.)	Air Frict.	Water Frict.	Ckt'g.	"W" Height	Length
1C	18,200	60	84	20	388,700	26 Sq. Ft.	2	8	.53	3	1/2	27	129
2C	16,100	60	84	17	344,000	26 Sq. Ft.	2	8	.42	3	1/2	27	129

RETURN-RELIEF FANS: Motors are 1140 rpm, open ball bearing, 460/60/3 with NEMA slide base.

Symbol	CFM	S.P. In. W.G.	O.V. FPM	RPM	BHP	Motor HP	Fan Size	Wheel Type	Class	Arrangement/R/D	Motor Position
1D1	11,200	0.4"	1803	875	1.8	3	24DIDW	FC	1	3/CW/UBD	Z
1D2	11,200	0.4"	1803	875	1.8	3	24DIDW	FC	1	3/CCW/UBD	W
2D1	9,700	0.4"	1562	781	1.3	2	24DIDW	FC	1	3/CW/UBD	Z
2D2	9,700	0.4"	1562	781	1.3	2	24DIDW	FC	1	3/CCW/UBD	W

HEAT RECOVERY UNITS: Aluminum construction, air-to-air cross flow design, Temp-Air or Temp-X-Changer

Symbol	Efficiency	Tube Side (Outside Air) CFM	Tube Side (Outside Air) EAT	Tube Side (Outside Air) LAT	Tube Side (Outside Air) P.D., In. W.G.	Shell Side (Exhaust Air) CFM	Shell Side (Exhaust Air) EAT	Shell Side (Exhaust Air) P.D., In. W.G.	Shell Drain	Bypass	Southwest Standard Model
1E	66	3,600	-10	46	0.55"	3,600	75	0.6"	Yes	No	TB-36-8
2E	66	3,600	-10	46	0.55"	3,600	75	0.6"	Yes	No	TB-36-8

OUTSIDE AIR AND EXHAUST FANS: Utility sets in arrangement 10, with 1750 rpm, 460/60/3, open ball bearing motors.

Symbol	CFM	S.P., In. W.G.	O.V., FPM	RPM	BHP	Motor HP	Fan Size	Wheel Type	R/D
1F	3,600	1.2"	1894	703	1.4	1-1/2	18SW	Backward Inclined	CCW/BHD
1G	3,600	0.8"	1894	627	1.1	1-1/2	18SW	Backward Inclined	CW/DBD
2F	3,600	1.2"	1894	703	1.4	1-1/2	18SW	Backward Inclined	CCW/BHD
2G	3,600	0.8"	1894	627	1.1	1-1/2	18SW	Backward Inclined	CW/DBD

FILTERS: Side access modular construction with 25 percent renewable media prefilters and 40 percent bag filters.

Symbol	CFM	Height	Thickness	Width	Initial Resistance	Chageout	Filter Manometer	Continental Model
1H	26,000	77"	18"	118"	0.35"	1.0	0-1"Dwyer Magnehelic	10P61/40
2H	23,000	77"	18"	118"	0.35"	1.0	0-1"Dwyer Magnehelic	10P61/40

MISCELLANEOUS COMPONENTS:

Symbol	Zone Dampers (6-1/2"Segments)	No. of Zones	Symbol	Outside Air Dampers	Symbol	Return - Relief Dampers
1I	12-1/2'x5'(2-2-1/2')	10	1J	2-4-1/2'x 6'	1K	13' x 2' 10' x 2'
2I	12-1/2'x5'(2-2-1/2')	12	2J	2-4-1/2'x 6'	2K	13' x 2' 10' x 2'

SYMBOLS 3 THROUGH 7:

CASING DETAILS:

Symbol	Outside Dimensions Height	Outside Dimensions Width	Outside Dimensions Length	Total Operating Weight, Lbs.	Overhead Lights/Outlet	Louver Dimensions Outside	Louver Dimensions C.A.	Louver Dimensions Relief	Access Doors Count	Access Doors Size
3	6'-0"	8'-0"	22'-0"	8,000	3	2-2' x 4'	2-2'x2'	7'x2-1/2'	2	2' x 4'
4	6'-6"	11'-0"	28'-0"	14,000	3	2-2-1/2'x 4-1/2'	2-2'x2'	9-1/2'x2-1/2'	2	2-1/2'x4-1/2'
5	6'-6"	11'-0"	29'-0"	15,000	3	34" x 48"	2-2'x2'	9-1/2'x2-1/2'	4	2-1/2' x 4'
6	6'-6"	11'-0"	29'-0"	15,000	3	34" x 48"	2-2'x2'	9-1/2'x2-1/2'	4	2-1/2' x 4'
7	6'-6"	11'-0"	29'-0"	15,000	3	34" x 48"	2-2'x2'	9-1/2'x2-1/2'	4	2-1/2' x 4'

SUPPLY FAN: DIDW Class I, backward inclined wheel, with integral steel fan and motor base arranged for downblast discharge with open type spring vibration isolators having a deflection of one-inch and supported on channels welded across the roof frame. Fans 4 through 7 shall be coated inside and out with Eisenheiss or equal. Motors shall be open, 1140 rpm, 460 volt, 60 Hz, three phase.

Symbol	CFM	S.P., In.	O.V. FPM	RPM	BHP	Motor HP	Fan Size/Wheel	Arrg't/R/D	Motor
3A	7,500	1.06"	1814	1137	2.2	3	20" DIDW BI	3/CW/DBD	X
4A	12,000	1.20"	1595	885	3.2	5	27" DIDW BI	3/CW/DBD	X
5A	11,110	1.20"	1476	853	2.8	5	27" DIDW BI	3/CW/DBD	X
6A	11,000	1.20"	1462	849	2.8	5	27" DIDW BI	3/CW/DBD	X
7A	10,000	1.10"	1329	796	2.3	3	27" DIDW BI	3/CW/DBD	X

MORE
COMBS
BURCH
Architects Engineers Planners
3911 East Exposition Avenue
Denver Colorado 80209
Area 303 744-31

phase two facilities:
ARAPAHOE
COMMUNITY
COLLEGE
5900 South Sante Fe Drive, Littleton, Colorado 80120

state project no.
2136

drawing title
MECHANICAL
EQUIPMENT
SCHEDULE

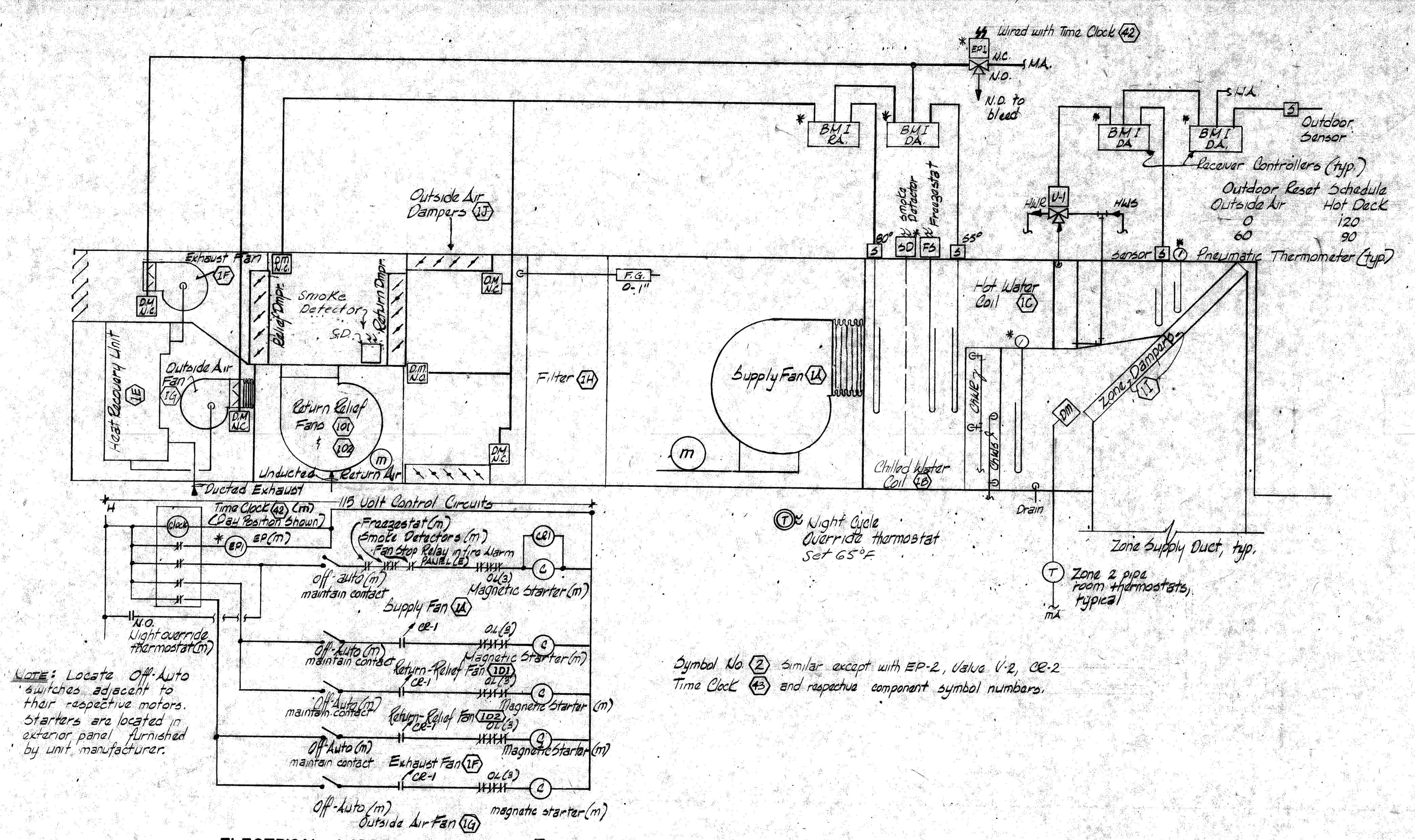
tracing key

drawn by
B&P
checked by
RGS
date
5 AUG., 1976
revisions

m-c-b job no.
7510
sheet of
M
9
63

SYMBOL LEGEND

SYMBOL	DESCRIPTION
	Ceiling diffuser (arrows denote throw pattern, 4-way, 3-way, etc.).
	Ceiling return air grille.
	Ceiling exhaust register.
	Ceiling return air grille (ducted return).
	Supply duct (cross section):.
	Return air or exhaust air duct (cross section).
	Hand damper in duct.
FD	Fire damper in duct.
SD	Smoke damper in duct.
	Opposed blade motorized damper.
	Parallel blade motorized damper.
	Air proportioning vanes.
F. B.	Duct transition with flat bottom.
F. T.	Duct transition with flat top.
S. D.	Smoke damper.
F. D.	Fire damper.
H. D.	Hand damper.
A. D.	Access door.
ChWS	Chilled water supply.
ChWR	Chilled water return.
HWS	Hot water supply.
HWR	Hot water return.
D	Drain line.
	Butterfly valve.
	Gate valve.
	Check valve.
	Plug, balancing, gas or gage cock.
	Pressure reducing valve (P.R.V.).
	Safety or relief valve.
	Valve in rise.
	Two-way control valve.
	Three-way control or mixing valve.
	Gage with gage cock (note pressure range).
	Thermometer
	Union
	Strainer
	Eccentric reducer.
	Concentric reducer.
	Universal temperature/pressure test fitting.
Ⓣ	Pneumatic room thermostat.
Ⓣ	Electric room thermostat.
DM	Damper motor.
PE	Pneumatic-electric relay.
EP	Electric-pneumatic relay.
N. O.	Normally open.
N. C.	Normally closed.
M. A.	Main air (from controls air compressor).
S	Temperature sensor
R	Relay
⊗	New connection to existing piping.

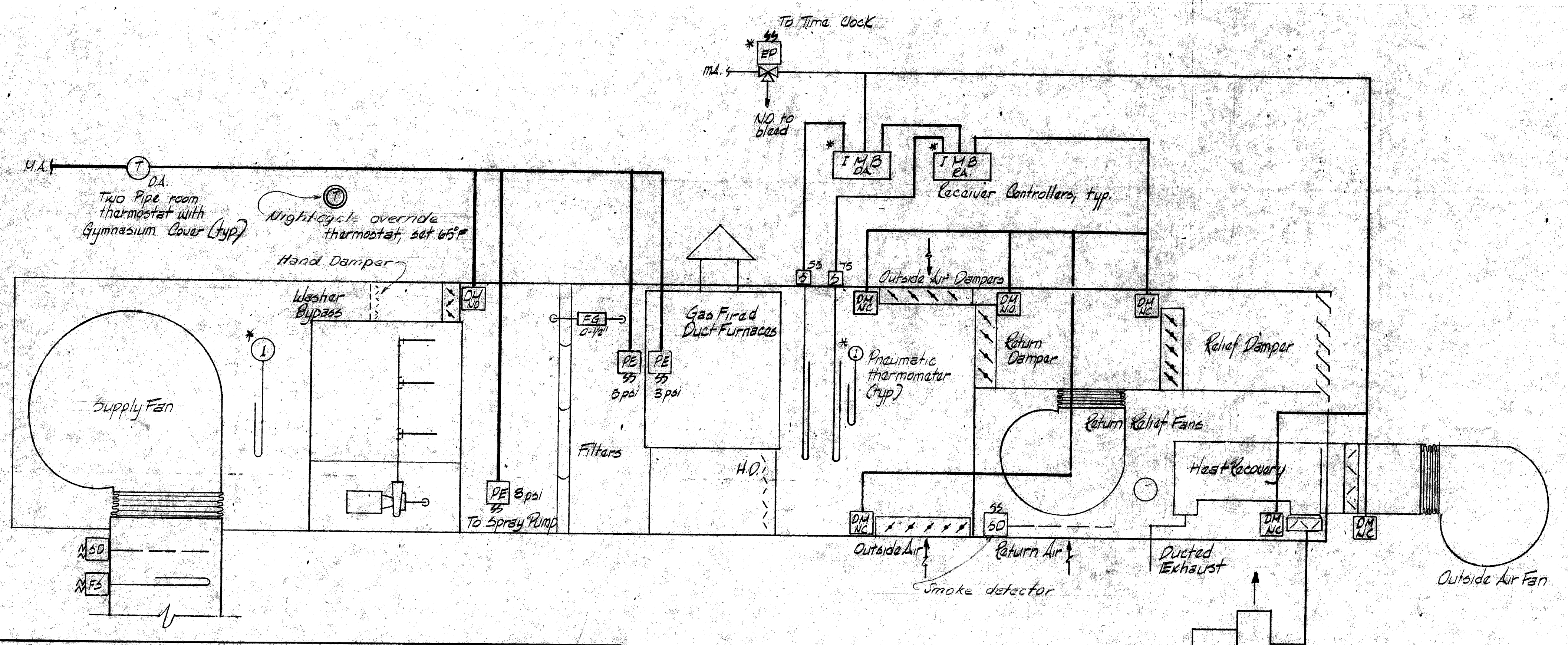

Wired with Time Clock ㊷
EP1
N.C.
M.A.
N.O.
N.O. to bleed
BMI RA.
BMI DA.
BMI DA
BMI DA.
S.M.A.
Outdoor Sensor
Receiver Controllers (typ.)
Outdoor Reset Schedule
Outside Air 0 60
Hot Deck 120 90
HWR
V-1
HWS
Sensor
Pneumatic Thermometer (typ.)
80°
Smoke Detector
Freezestat
SD
FS
55°
Outside Air Dampers 1J
Exhaust Fan 1F
D.M. N.C.
Relief Dmpr.
Smoke Detector
S.D.
Return Dmpr.
F.G. 0-1"
Heat Recovery Unit 1E
Outside Air Fan 1G
D.M. N.O.
Return Relief Fans 1D1 & 1D2
Filter 1H
Supply Fan 1A
m
Hot Water Coil 1C
Chilled Water Coil 1B
Drain
Zone Dampers 1I
DM
Zone Supply Duct, typ.
Unducted Return Air
Ducted Exhaust
Night Cycle Override thermostat Set 65°F
Zone 2 pipe room thermostats, typical
M.A.
H
Time Clock ㊷ (m) (Day Position Shown)
115 Volt Control Circuits
Clock
EP1
EP(m)
Freezestat (m)
Smoke Detectors (m)
Fan Stop Relay in Fire Alarm Panel (E)
CR1
C
Off-auto (m) maintain contact
OL(3)
Magnetic Starter (m)
Supply Fan 1A
N.O. Night override thermostat (m)
CR-1
Off-Auto (m) maintain contact
Return-Relief Fan 1D1
Magnetic Starter (m)
Off-Auto (m) maintain contact
Return-Relief Fan 1D2
Magnetic Starter (m)
Off-Auto (m) maintain contact
Exhaust Fan 1F
Magnetic Starter (m)
Off-Auto (m)
Outside Air Fan 1G
magnetic starter (m)

Note: Locate Off-Auto switches adjacent to their respective motors. Starters are located in exterior panel furnished by unit manufacturer.

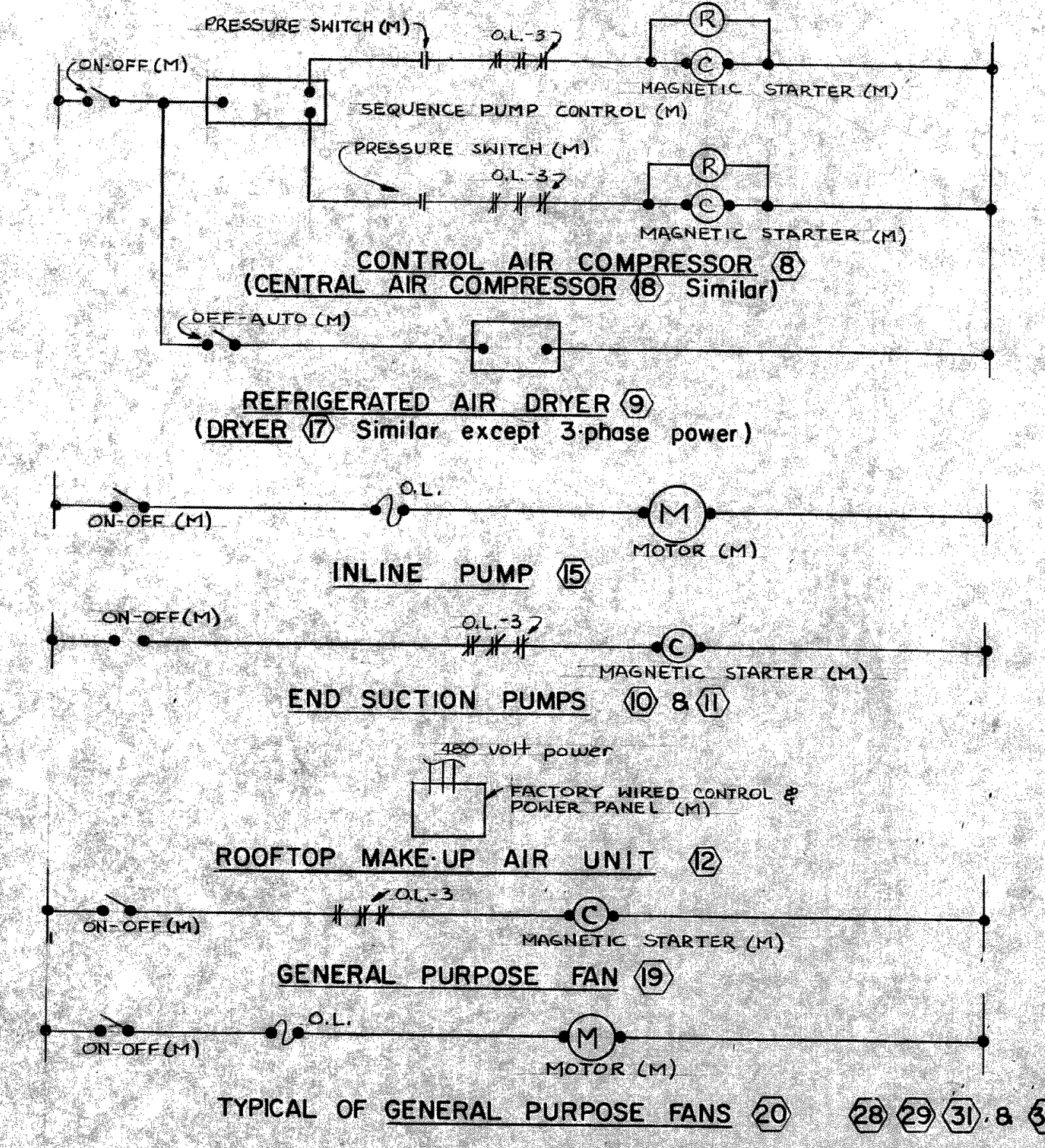
Symbol No. ② similar except with EP-2, Valve V-2, CR-2 Time Clock ㊸ and respective component symbol numbers.

ELECTRICAL LADDER DIAGRAM for ① (② similar)

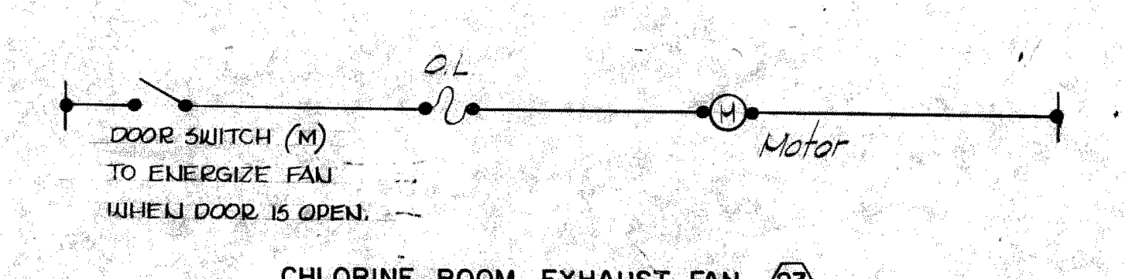
CENTRAL ROOF MOUNTED PACKAGED UNITS ① & ② CONTROL


To Time Clock
EP
M.A.
N.O. to bleed
IMB DA.
IMB RA.
Receiver Controllers, typ.
M.A.
T
O.A.
Two Pipe room thermostat with Gymnasium Cover (typ)
Night-cycle override thermostat, set 65°F
Hand Damper
Washer Bypass
DM N.O.
FG 0-1/2"
PE 5 psi
PE 3 psi
Gas Fired Duct Furnaces
S 55
S 75
Outside Air Dampers
DM NC
DM N.O.
Return Damper
Relief Damper
Pneumatic thermometer (typ)
Supply Fan
Filters
PE 8 psi To Spray Pump
H.O.
Return Relief Fans
Heat Recovery
SD
FS
DM NC
Outside Air
SD
Return Air
Smoke detector
Ducted Exhaust
Outside Air Fan
Exhaust Fan

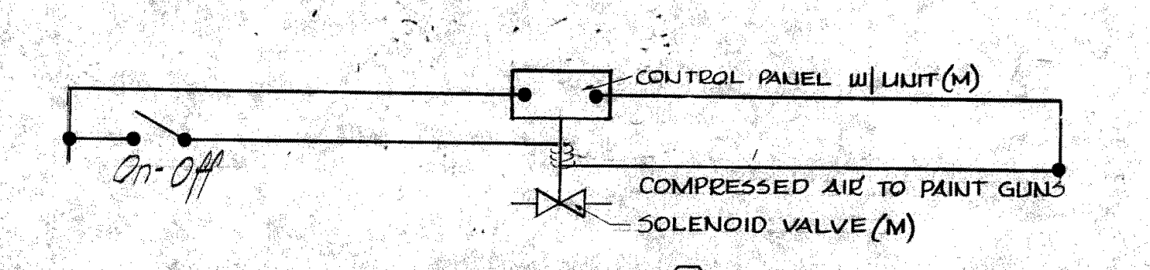
SYSTEM	TIME CLOCK	EP-TIME CLOCK	CONTROL RELAY No	SUPPLY FAN	AIR WASHER	PE-AIR WASHER	SPRAY PUMP	PE-DUCT HEATER	DUCT HEATER	FILTER	RET-REL. FAN	HEAT RECOV.	O.A. FAN	EXHAUST FAN
S C H E D U L E O F C O M P O N E N T S														
③	㊹	EP·3	CR·3	3A	NA	NA	NA	PE·5&6	3D	3E	3H 3I	NA	NA	NA
④	㊺	EP·4	CR·4	4A	4B	PE·1	4C	PE·7&8	4D	4E	4H 4I	NA	NA	NA
⑤	㊻	EP·5	CR·5	5A	5B	PE·2	5C	PE-9&10	5D	5E	5H 5I	5J	㉔	㉖
⑥	㊼	EP·6	CR·6	6A	6B	PE·3	6C	PE·11&12	6D	6E	6H 6I	6J	㉕	㉗
⑦	㊽	EP·7	CR·7	7A	7B	PE·4	7C	PE·13&14	7D	7E	7H 7I	7J	㉚	㉜


PRESSURE SWITCH (M)
O.L.-3
R
C
ON-OFF (M)
MAGNETIC STARTER (M)
SEQUENCE PUMP CONTROL (M)
PRESSURE SWITCH (M)
O.L.-3
MAGNETIC STARTER (M)
CONTROL AIR COMPRESSOR ⑧
(CENTRAL AIR COMPRESSOR ⑱ Similar)
OFF-AUTO (M)
REFRIGERATED AIR DRYER ⑨
(DRYER ⑰ Similar except 3-phase power)
ON-OFF (M)
O.L.
M
MOTOR (M)
INLINE PUMP ⑮
ON-OFF (M)
O.L.-3
MAGNETIC STARTER (M)
END SUCTION PUMPS ⑩ & ⑪
480 volt power
FACTORY WIRED CONTROL & POWER PANEL (M)
ROOFTOP MAKE-UP AIR UNIT ⑫
ON-OFF (M)
O.L.-3
MAGNETIC STARTER (M)
GENERAL PURPOSE FAN ⑲
ON-OFF (M)
O.L.
MOTOR (M)
TYPICAL OF GENERAL PURPOSE FANS ⑳ ㉘ ㉙ ㉛ & ㉝

ELECTRICAL LADDER DIAGRAMS

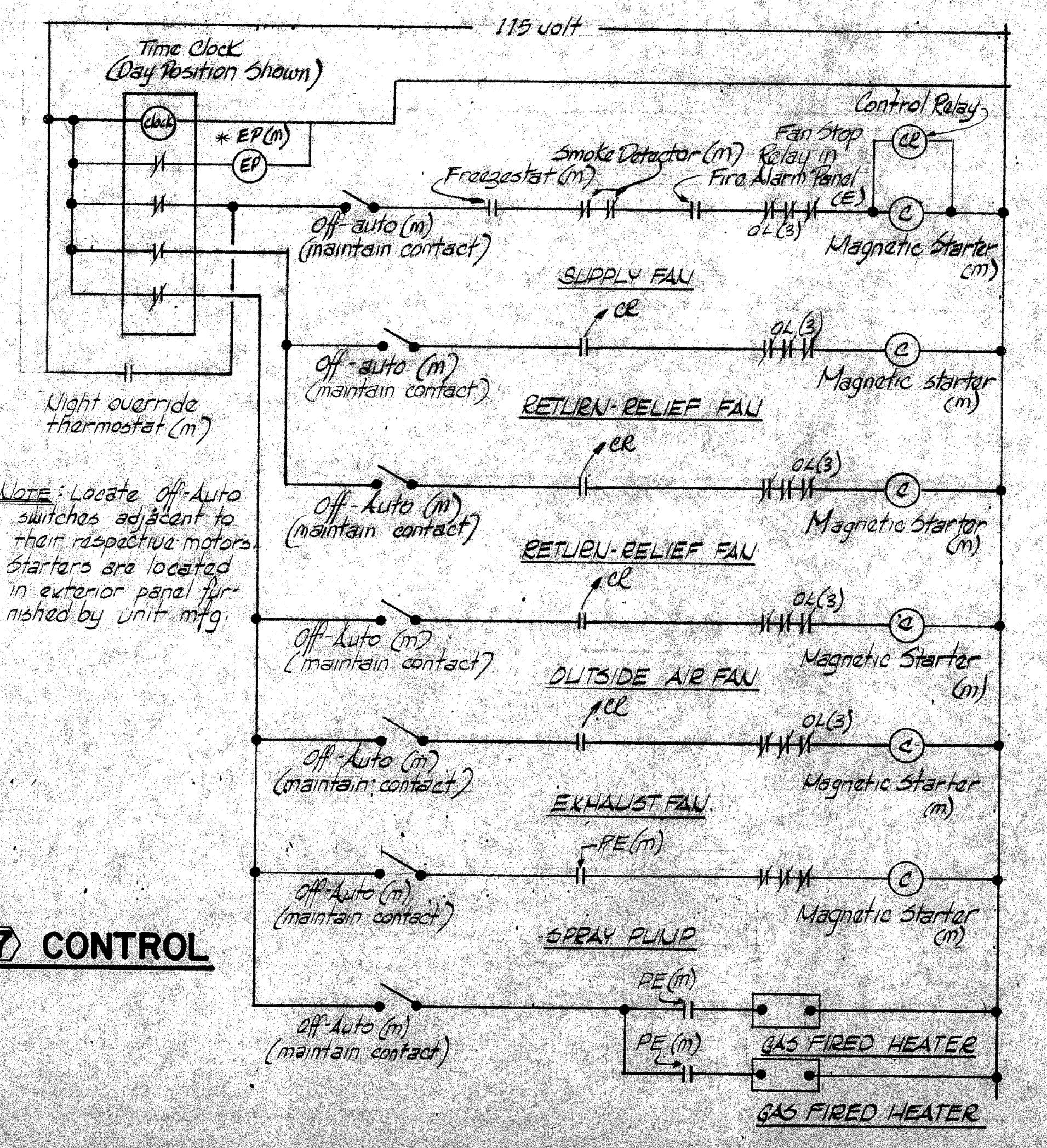

O.L.
DOOR SWITCH (M)
TO ENERGIZE FAN
WHEN DOOR IS OPEN.
M
Motor

CHLORINE ROOM EXHAUST FAN ㉓


CONTROL PANEL W/ UNIT (M)
On-Off
COMPRESSED AIR TO PAINT GUNS
SOLENOID VALVE (M)

ROOFTOP UNIT ⑫

CENTRAL ROOF MOUNTED PACKAGED UNITS ③ THRU ⑦ CONTROL


115 volt
Time Clock (Day Position Shown)
clock
EP(m)
EP
Control Relay
Fan Stop Relay in Fire Alarm Panel
Smoke Detector (m)
Freezestat (m)
CR
Off-Auto (m) (maintain contact)
OL(3)
Magnetic Starter (m)
SUPPLY FAN
Night override thermostat (m)
Off-Auto (m) (maintain contact)
RETURN-RELIEF FAN
Magnetic Starter (m)
Off-Auto (m) (maintain contact)
RETURN-RELIEF FAN
Magnetic Starter (m)
Off-Auto (m) (maintain contact)
OUTSIDE AIR FAN
Magnetic Starter (m)
Off-Auto (m) (maintain contact)
EXHAUST FAN
Magnetic Starter (m)
Off-Auto (m) (maintain contact)
SPRAY PUMP
Magnetic Starter (m)
PE(m)
Off-Auto (m) (maintain contact)
GAS FIRED HEATER
GAS FIRED HEATER

Note: Locate Off-Auto switches adjacent to their respective motors. Starters are located in exterior panel furnished by unit mfg.

ELECTRICAL LADDER DIAGRAM

EQUIPMENT SCHEDULE CONT.

GRILLE AND DIFFUSER SCHEDULE

SYMBOL	DESCRIPTION
	GENERAL NOTES: Grilles and register shall be fabricated of steel or aluminum unless the material is specifically called out in the schedule below. Only aluminum materials shall be used on supply, exhaust or return registers where heavy concentrations of moisture are present such as the pool and shower rooms. Steel grilles and registers shall receive a zinc phosphate prime coat and a baked white enamel finish. Aluminum grilles and registers shall also be finished in baked white enamel unless a natural anodized aluminum finish is called out below. The type of grille or register is shown by symbol number on the plans. Should a symbol number be missing, the appropriate device shall be furnished after referring to the Architectural Room Finish Schedule. The Architectural Room Finish Schedule shall take precedence over the symbol designation; discrepancies shall be clearly noted on the submittals. Ceiling Sub-Contractor shall furnish additional T-bars or splines as required to support and finish around ceiling mounted diffusers and grilles. Equipment manufactured by Carnes, Anemostat/Waterloo, Krueger, Barber Colman, Environmental Air Products Co., Titus, and Tuttle and Bailey will be acceptable if equal in quality, appearance, and noise levels to that specified.
A	CEILING DIFFUSER: Lay-in type for T-bar ceiling with outside frame dimensions as scheduled below, baked white enamel finish, adjustable pattern.

CFM Range	Outside Frame Dimensions	Min. Neck Size	Carnes	Titus	Tuttle and Bailey
- 80	11-3/4" x 11-3/4"	5"	SAAT	TMS-A-3	DA
81-139	11-3/4" x 11-3/4"	6	SAAT	TMS-A-3	DA
140-245	23-3/4" x 23-3/4"	8"	SAAT	TMS-A-3	DA
246-350	23-3/4" x 23-3/4"	10"	SAAT	TMS-A-3	DA
351-500	23-3/4" x 23-3/4"	12"	SAAT	TMS-A-3	DA
501-610	23-3/4" x 23-3/4"	14"	SAAT	TMS-A-3	DA

SYMBOL	DESCRIPTION
B	CEILING DIFFUSER: Similar to A with frame suitable for mounting in concealed spline ceiling grid and with opposed blade damper for volume control, Carnes SAA24C.
C	CEILING DIFFUSER: For use with plaster ceiling, neck sizes as scheduled below, aluminum or steel construction, adjustable pattern, volume control, and baked white enamel finish.

CFM Range	Nominal Outside Frame Dimensions	Min. Neck Size	Carnes	Titus	Tuttle and Bailey
-139	12" x 12"	6"	SAAE	TMSA	DAE
140-245	24" x 24"	8"	SAAE	TMSA	DAE
246-350	24" x 24"	10"	SAAE	TMSA	DAE
351-500	24" x 24"	12"	SAAE	TMSA	DAE
501-610	24" x 24"	14"	SAAE	TMSA	DAE

SYMBOL	DESCRIPTION
D	CEILING RETURN GRILLE: 1/2" x 1/2" x 1/2" egg crate lay-in type for T-bar ceiling, baked white enamel finish, and sized as scheduled.

Maximum CFM	Nom. Size, In.	Carnes	Titus	Tuttle and Bailey
250	12" x 12"	6495	50-MFR	CR-500U
530	24" x 12"	6495	50-MFR	CR-500U
1,200	24" x 24"	6495	50-MFR	CR-500U

SYMBOL	DESCRIPTION
E	CEILING EXHAUST REGISTER: 1/2" x 1/2" x 1/2" egg crate lay-in type for T-bar ceiling, baked white enamel finish, opposed blade damper, and sized as scheduled.

Maximum CFM	Nom. Size, In.	Carnes	Agitair	Titus	Tuttle and Bailey
250	12" x 12"	6495	EC-55	50-MFR	CR-500U
530	24" x 12"	6495	EC-55	50-MFR	CR-500U
1,200	24" x 24"	6495	EC-55	50-MFR	CR-500U

SYMBOL	DESCRIPTION
F	CEILING RETURN GRILLE: Similar to D with frame suitable for mounting in concealed spline ceiling grid.
G	CEILING EXHAUST REGISTER: Similar to F with opposed blade damper.
H	DRUM PUNKAH: Drun type with 60° angular adjustment of drum and vane. Finish is standard anodized aluminum. Sized as shown on drawings. Agitair or Krueger.
I	CEILING EXHAUST REGISTER: For plaster ceiling, 1/2" x 1/2" x 1/2", fabricated of aluminum with frame, baked white enamel finish, and sized as scheduled with opposed blade damper.

Maximum CFM	Nom. Size, In.	Carnes	Titus	Tuttle and Bailey
250	12" x 12"	6295	50-F-115	CRE500
530	24" x 12"	6295	50-F-115	CRE500

SYMBOL	DESCRIPTION
J	SIDEWALL SUPPLY REGISTER: Heavy duty steel construction, baked white enamel finish, vertical front bars, horizontal rear bars, double deflection, opposed blade damper, baked white enamel finish, and sized as shown on the drawings. Tuttle and Bailey NT647.
K	SIDEWALL RETURN AIR GRILLE: Similar to J with horizontal front bars and without opposed blade damper.
L	SIDEWALL EXHAUST REGISTER: Similar to J with horizontal front bars.
M	SUPPLY DIFFUSER: For exposed duct installation with fully adjustable air pattern, O.B.D., and equalizing deflectors. Carnes KEA-40.

SOUND TRAP SCHEDULE: Perforated inner and outer casings shall not be less than 22 gauge galvanized sheet steel. Acoustical fill material shall be inorganic glass fiber not less than four pounds per cubic foot density. Each trap is identified by Symbol Number as scheduled and as shown on the drawings. Acceptable manufacturers and their model numbers are:

	Industrial Acoustics	Koppers Company	Rink Corporation
Model No. (3 ft. Length):	3L	3LR	D36

Symbol	Nominal CFM	Trap Length, Ft.	Trap Face Dimensions, In.	P. D., In.	DB "Class" (3rd Band)	Rink Model
ST 1	455	3	6 x 12	.04	9	D-36
ST 2	1370	3	12 x 18	.04	9	D-36
ST 3	1600	3	12 x 21	.04	9	D-36
ST 4	2280	3	15 x 24	.04	9	D-36
ST 5	3420	3	15 x 36	.04	9	D-36
ST 6	4560	3	15 x 48	.04	9	D-36
ST 7	2740	3	18 x 24	.04	9	D-36
ST 8	4100	3	18 x 36	.04	9	D-36

GENERAL NOTES:

1. All sensors and/or controllers are to have averaging bulbs.
2. Pneumatic thermostats shall be two pipe design.
3. Smoke detectors shall be of the ionization type.
4. Thermostats serving more than two rooms shall have locking covers.
5. Pneumatic control pressure gauges shall be located as described in the specifications.
6. Filter gauges are specified in the section entitled,
7. All duct thermostats are to have averaging bulbs.
8. Pilot positioners are to be provided for all fresh air, relief air, and return air damper motors.
9. Major fan system controls are to be installed in a surface mounted control panel within the Central Units.
10. Flow switches on all systems are to be of the pressure actuated type.
11. See Symbol Legend on drawing M-10
12. All pneumatic control lines, components, etc., are to be located within the Central Roof Mounted Packaged Unit enclosures. Pneumatic piping is to be accomplished in the field.
13. All electrical control wiring, auto-off (maintain contact) switches, E-P's, P-E's, control relays, are to be field wired within the Central Roof Mounted Packaged Unit enclosures.

MORE
COMB

ArchitectsEngineersPlanners
3911 East Exposition Avenue
Denver Colorado

phase two facilities:
ARAPAHOE
COMMUNITY
COLLEGE
5900 South Sante Fe Drive, Littleton, Colorado 80120

state project no.
2136

drawing title
MECHANICAL
EQUIPMENT
SCHEDULE
&
CONTROL
DIAGRAMS

tracing key

	A	B	C	D	E	F

13382

drawn by
GW
checked by
RGS
date
AUGUST 5, 1976
revisions

m·c·b job no·
7510
sheet M 10
of
BP Ⓑ
63
she

311'-4" OVERALL
A
B
C
D
E
F
G
H
I
J
K
L
7
11'-4"
8'-8"
28'-0"
28'-0"
28'-0"
28'-0"
28'-0"
28'-0"
23'-0"
72'-4"
COMPRESSOR 602
PAINT STORAGE 601
Refrigerated Air Dryer (17)
Unit Heater (49)
(18) Central Air Compressor
Unit Heater (50)
1" HWS & HWR underground in "Z-crete"
1" HWR & 1" HWS down
OXYGEN STORAGE 502
ACET. STORAGE 501
OFFICE 214
OFFICE 215
MAIL 217
ENTRY 221
SHIP. & REC. 216
SEC. 213
HALL 218
14"x3"
140 A
200 A
190 A
400 A
150 A
400 A w/F.D.
12"x12"
10"x14"
10"x10" J 100
16"x10" J 240
18"x14" w/1" A.L. open at ends to c'l'g space
24"x12" K Bottom of grille at 14'-0" above floor Typ. of 3 this room.
SUPPLY 212
BULK STORAGE 219
CUSTODIAL STOR. 211
BUILDING / GROUNDS 210
ROOF TOP SUPPLY UNIT
ART GALLERY
6/18 Drum Punkah H 300 cfm (Typ. of 3)
6/18 Drum Punkah H 500 cfm (Typ. of 4)
CHEM. AREA 246
14"x14" from exhaust hood up through structure to Exhaust Fan (28) on roof.
B.O.D. @ 116'-7"
16"x16"
16"x9"
16"x9"
F.B.
F.D.
46"x28" From (7) on roof.
28"x16"
26"x16"
20"x12" J 400
16"x14"
14"x10" K
20"x12" K
TOOLS 209
PAINT STOR. 208
200 A
14"x10" K
10"x10" w/1" A.L. open to c'l'g space
16"x10" J 200
HALL 202
14"x34" up through structure to heat recovery unit in (7) on roof.
34"x30" w/1" A.L. up to (7) on roof
34"x30" w/1" A.L. open to c'l'g space
275 A
400 A
HEAT TREATMENT 245
28"x26"
24"x26"
WARM
COOL
24"x18"
24"x14"
16"x14"
28"x16"
52"
380 A
210 A
16"x14" w/1" A.L. open at ends to ceiling space
8"x7"
OFFICE 206
MEETING 207
100 A
80 A
14"x12"
12"x12"
18"x14"
14"x16"
14"x16" down to exhaust hood.
300 A
OFFICE 205
to zone 2-12
HALL 201
For cont., see Upper HVAC Plan, M-13
to Unit (7) on roof
Night over-ride thermostat to Unit (7)
INDUSTRIAL MECHANICS I 244
CORRIDOR 247
CIVIL TECH. 222
12"x12" neck M 375 cfm (Typ. of 4)
18"x12"
Maintain bottom of duct even with bottom of Tee stem
CORRIDOR 220
32"x18" w/1" A.L. open at ends to c'l'g space
18"x14" w/1" A.L. open at ends to c'l'g space
333 A
18"x14"
24"x24" up through structure to (12) on roof
(2) w/F.D.
INDUSTRIAL MECHANICS II 243
AUTO BODY PAINT 223
48"x18" K both sides of the wall. w/F.D.
6/24 Drum Punkah H 800 cfm (Typ. of 7)
6/18 Drum Punkah H 340 cfm (Typ. of 6)
6/24 Drum Punkah H 523 cfm w/FD (Typical of 6)
30"x14"
30"x18"
30"x28"
B.O.D. @ 115'-10"
10/35 Drum Punkah H 2000 cfm (Typ. of 6)
48"x24"
48"x24"
48"x12" K both sides of wall w/F.D.
46"x28"
46"x28"
Hold tight to structure between Tee stems.
34"φ
34"x34" from exhaust connection on paint spray booth up through structure to (12) on roof
6/9 Drum Punkah H 240 cfm w/F.D.
TIE DOWN 241
HWS
HWR
TOOL BOX RM. 242
AUTO BODY 224
OFFICE 226
OFFICE 225
8"x10"
OFFICE 231
RECEPTION 232
WAITING 233
140 A
245 A
50
to zone 2-10
PARTS ORDERING 227
Night over-ride thermostat to Unit (6)
CLEAN ROOM 239
340 A
12"x10"
14"x12"
MACHINE TOOL 237
400 C
24"x24" K (Typ. of 7)
30"x14"
30"x20"
30"x30"
OFFICE 234
80 A
B.O.D. @ 113'-2"
14"x6" open to ceiling space
TOOL ROOM 238
12"x10" K
20"x14" w/1" A.L.
10"x10" neck M 230 cfm
20"x15"
34"x30" up through structure to (6) on roof
14"x34" up through structure to heat recovery unit in (6) on roof
14"x30"
24"x12" L 500 cfm (Typical of 6)
14"x20"
14"x12"
18"x14" w/1" A.L. R.A. duct open to c'l'g space
20"x15"
LOCKERS 240
265 A
24"x12" E 530
B.O.D. @ 112'-0"
14"x8"
WOMEN 229
MEN 230
HALL 228
160 A
B.O.D. @ 118'-10"
14"x12" Exhaust
18"x14" w/1" A.L. R.A. duct.
20"x15"
For cont. see Upper HVAC Plan, M-13
to Unit (5) on roof
Night over-ride thermostat to Unit (5)
Maintain bottom of duct even with bottom of Tee stem.
AUTO MECHANICS
10/25 Drum Punkah H 925 cfm (Typ. of 12)
B.O.D. @ 115'-10"
26"x12"
26"x18"
26"x24"
26"x24"
26"x18"
26"x12"
46"x26"
Hold tight to structure between Tee stems
46"x28" up through structure to (5) on roof
14"x34" up through structure to heat recovery unit in (5) on roof.
32"x34" w/1" A.L. up through structure to (5) on roof
34"x32" w/1" A.L.
Removeable 1/2"x1/2" wire mesh screen w/frame
20"φ
20"φ down to Exhaust system under floor.
16"x16" down to Exhaust Hood
WASH 236
16"x16" up through structure to Exhaust Fan (19)
86'-8"

EAST HVAC PLAN

SCALE: 1/8" = 1'-0"

KEYED NOTES:

① 12"x 12" D
② 12"x 24" D
③ 24"x 24" D
④ Exhaust hood, see Detail 13/M-18
⑤ 15"x 15" from hood, offset and up through structure to Exhaust Fan (29) on roof. Ductwork to be constructed of stainless steel with all welded seams & joints.
⑥ 18"x 14" from hood, offset and up through structure to Exhaust Fan (31)
⑦ 34"φ connection to exhaust on "Owner supplied" paint spray booth. Verify connection size in field.
⑧ 14"x 14" up through structure to Exhaust Fan (33) on roof. Terminate duct at bottom of Tee stems with 14"x 14" L, 500 cfm.
⑨ 10"φ up from ceramic paint spray hood (not by mechanical contractor) to Exhaust Penthouse on roof.
⑩ 8"φ up from 24"x 24"x 12" plenum (with two 6"φ spin-in fittings w/hand dampers) between Tee stems through structure to Exhaust Fan (20) on roof.
⑪ 26"x 18" w/1" A.L. open at both ends to ceiling space.

GENERAL NOTES:

1. All round run-outs and drops to diffusers are the same nominal size as the scheduled diffuser neck size.
2. For equipment on the roof, see Mech. East Roof Plan, M-14.
3. All duct sizes shown on the drawings are net inside dimensions unless the duct has acoustical lining. Duct sizes shown on the drawings "w/1" A.L." are outside dimensions, net inside dimensions are two inches smaller each dimension.
4. Provide turning vanes in all square (90°) rectangular elbows.

ATTENTION ! ! ! ! ! ! ! ! ! ! ! ! ! !

Clear restrictions are set on how and where precast concrete members may be penetrated without damaging prestressed reinforcing strands.
See the following:
-Details 1 and 2, SH.A19
-Specifications "Bid package 'B' instructions to bidders"
-Precast concrete shop drawings and production drawings, by Prestressed Concrete of Colorado, Inc. 303-458-6301

tracing key

	A	B	C	D	E	F
1						
2						
3						
4						
5						
6						
7						
8						
9						9F
10						
11						
12						
21						
22						
23	23A			23D		
24	24A					
25						
26						
31						
32						
33						
34						

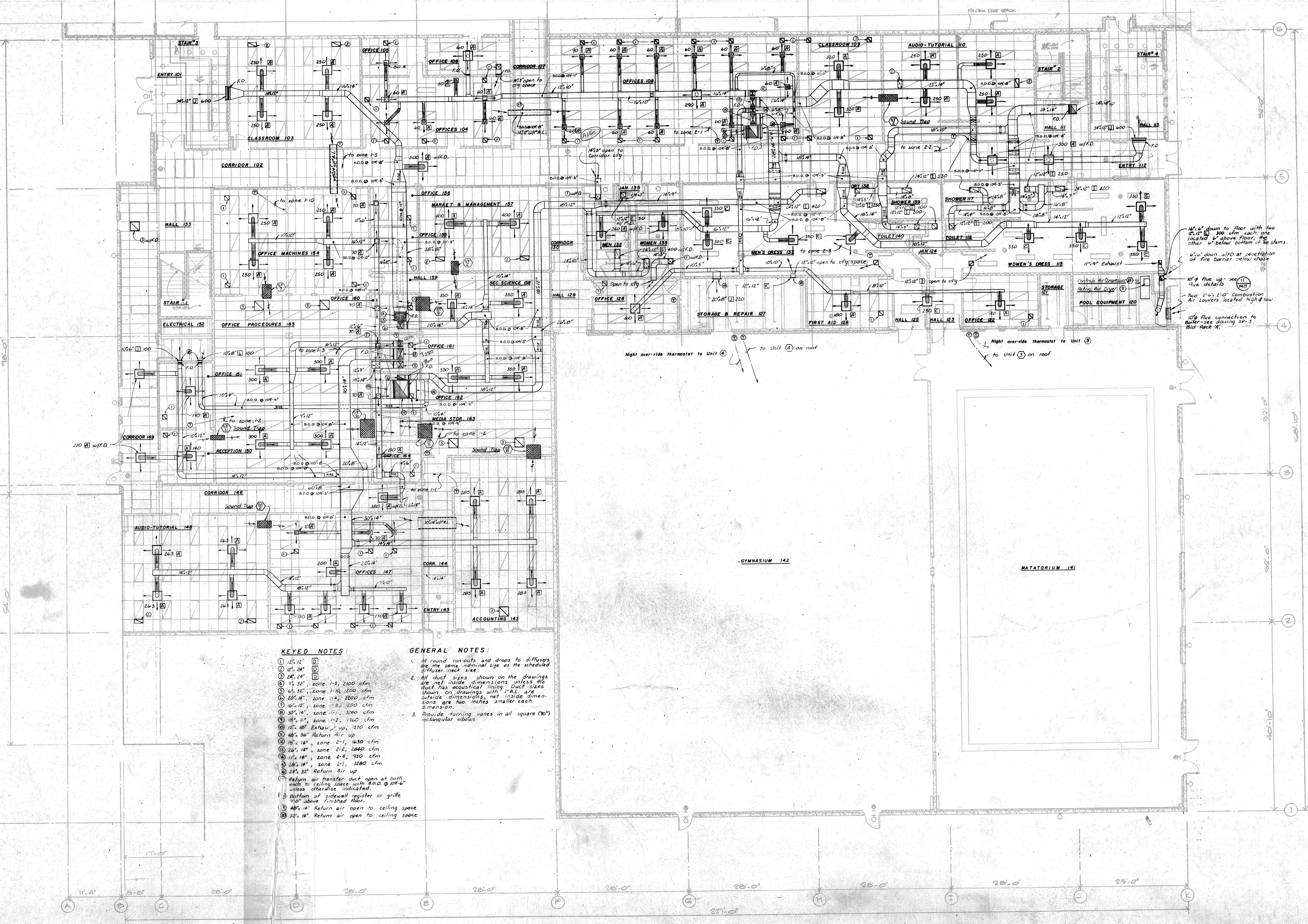
STATE PROJ. 2136

drawing title
EAST
HVAC
PLAN

ROBIN DAVID
13382

drawn by
GW
checked by
RGS
date
AUGUST 5, 1976
revisions

m-c-b job no.
7510
sheet
M
11
of
BP(B)
63
sh


STAIR 3
ENTRY 101
CLASSROOM 103
OFFICE 105
OFFICE 106
CORRIDOR 107
OFFICES 104
OFFICES 108
CLASSROOM 109
AUDIO-TUTORIAL 110
STAIR 2
STAIR 4
HALL 111
HALL 113
ENTRY 112
CORRIDOR 102
HALL 153
OFFICE 156
MARKET & MANAGEMENT 157
OFFICE 155
OFFICE MACHINES 154
JAN 135
MEN 132
WOMEN 133
DRY 138
SHOWER 139
SHOWER 117
TOILET 140
TOILET 116
MEN'S DRESS 131
JAN 124
WOMEN'S DRESS 115
CORRIDOR 130
HALL 159
SEC. SCIENCE 158
HALL 129
OFFICE 128
STORAGE & REPAIR 127
FIRST AID 126
HALL 125
HALL 123
OFFICE 122
STORAGE 121
POOL EQUIPMENT 120
STAIR 1
ELECTRICAL 152
OFFICE PROCEDURES 165
OFFICE 160
OFFICE 161
OFFICE 151
OFFICE 162
MEDIA STOR. 163
CORRIDOR 149
RECEPTION 150
OFFICE 164
CORRIDOR 146
AUDIO-TUTORIAL 148
OFFICES 147
CORR 144
ENTRY 145
ACCOUNTING 143
GYMNASIUM 142
NATATORIUM 141
Sound Trap
Night over-ride thermostat to Unit 4
to Unit 4 on roof
Night over-ride thermostat to Unit 3
to Unit 3 on roof
12"x9" Exhaust
Controls Air Compressor 8
Refrig. Air Dryer 9
16"x6" down to floor with two 12"x12" L 300 cfm each, one located 6" above floor, the other 6" below bottom of Tee stems.
6"x6" down w/FD at penetration of fire barrier below chase
10"ϕ flue up - see flue details 11 M-17
Two 2'-6"x 2'-0" Combustion Air Louvers located high & low.
10"ϕ flue connection to Boiler - see drawing SP-3, Bid Pack 'A'.
A
B
C
D
E
F
G
H
I
J
K
1
2
3
4
5
6
11'-4"
8'-8"
28'-0"
23'-0"
227'-0"
17'-0"
98'-0"
54'-0"
168'-10"
32'-0"
40'-10"

KEYED NOTES:

① 12"x 12" D
② 12"x 24" D
③ 24"x 24" D
④ 9"x 32", zone 1-5, 2100 cfm
⑤ 6"x 32", zone 1-10, 1200 cfm
⑥ 20"x 14", zone 1-4, 2200 cfm
⑦ 16"x 12", zone 1-3, 1200 cfm
⑧ 30"x 14", zone 1-1, 3280 cfm
⑨ 18"x 4", zone 1-2, 1760 cfm
⑩ 12"x 18" Exhaust up, 1370 cfm
⑪ 48"x 36" Return Air up
⑫ 16"x 14", zone 2-1, 1630 cfm
⑬ 26"x 14", zone 2-2, 2840 cfm
⑭ 11"x 14", zone 2-4, 930 cfm
⑮ 28"x 14", zone 2-3, 3280 cfm
⑯ 24"x 32" Return Air up
[illegible] Return air transfer duct open at both ends to ceiling space with B.O.D. @ 109'-6" unless otherwise indicated.
⑱ Bottom of sidewall register or grille 9'-8" above finished floor.
⑲ 48"x 14" Return air open to ceiling space
⑳ 32"x 14". Return air open to ceiling space

GENERAL NOTES:

1. All round run-outs and drops to diffusers are the same nominal size as the scheduled diffuser neck size.
2. All duct sizes shown on the drawings are net inside dimensions unless the duct has acoustical lining. Duct sizes shown on drawings with 1" A.L. are outside dimensions, net inside dimensions are two inches smaller each dimension.
3. Provide turning vanes in all square (90°) rectangular elbows.

LOWER WEST HVAC PLAN

SCALE: 1/8" = 1'-0"

N

ATTENTION
Clear restrictions are set on how and where precast concrete members may be penetrated without damaging prestressed reinforcing strands.
See the following:
-Details 1 and 2, SH.A19
-Specifications "Bid package 'B' instructions to bidders"
-Precast concrete shop drawings and production drawings, by Prestressed Concrete of Colorado, Inc. 303-458-6301

MORE
COMBS
BURCH
ArchitectsEngineersPlanners

phase two facilities:
ARAPAHOE
COMMUNITY
COLLEGE
5900 South Sante Fe Drive, Littleton, Colorado 80120

state project no.
2136

drawing title
LOWER
WEST
HVAC
PLAN

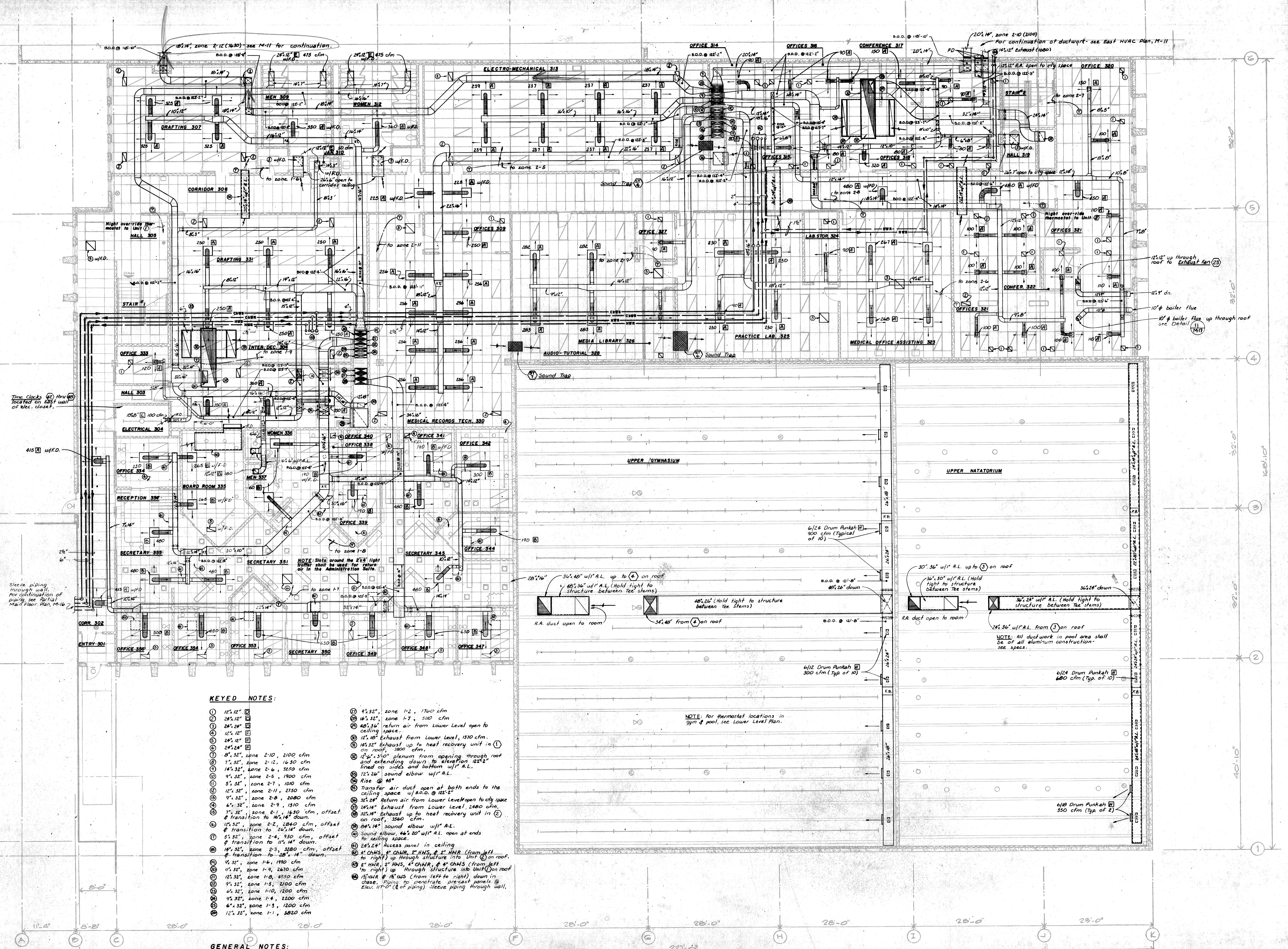
tracing key

	A	B	C	D	E	F
1						
2						
3		3B		3C		
4		4B				
5						
6						
7						
8						
9					9E	
10						

ROBIN DAVID ADAIR, JR.
13382

drawn by
G.W.
checked by
RGS
date
AUGUST 5, 1976
revisions

m·c·b job no.
7510
sheet
M
12
of
BP (B)
63
sheet


ELECTRO-MECHANICAL 313
MEN 309
WOMEN 312
DRAFTING 307
JAN 310
CORRIDOR 306
HALL 305
DRAFTING 331
STAIR
INTER. DEC. 332
OFFICE 333
HALL 303
ELECTRICAL 304
OFFICE 334
RECEPTION 358
SECRETARY 355
BOARD ROOM 335
WOMEN 336
MEN 337
OFFICE 338
OFFICE 339
OFFICE 340
OFFICE 341
OFFICE 342
SECRETARY 351
SECRETARY 345
OFFICE 344
CORR 302
ENTRY 301
OFFICE 356
OFFICE 354
OFFICE 353
SECRETARY 350
OFFICE 349
OFFICE 348
OFFICE 347
MEDICAL RECORDS TECH. 330
OFFICES 309
AUDIO-TUTORIAL 328
MEDIA LIBRARY 326
OFFICE 327
PRACTICE LAB 325
LAB STOR 324
MEDICAL OFFICE ASSISTING 323
OFFICE 314
OFFICES 316
CONFERENCE 317
OFFICES 315
OFFICES 318
OFFICE 320
STAIR 2
HALL 319
OFFICES 321
CONFER 322
UPPER GYMNASIUM
UPPER NATATORIUM
18"x 14", zone 2-12 (1630) - see M-11 for continuation.
20"x 14", zone 2-10 (2100) For continuation of ductwork - see East HVAC Plan, M-11
Night over-ride thermostat to Unit ①
Time Clocks ㊷ thru ㊻ located on East wall of elec. closet.
Sleeve piping through wall. For continuation of piping, see Partial Main Floor Plan, M-16
NOTE: Slots around the 2'x4' light troffer shall be used for return air in the Administration Suite.
12"x 12" up through roof to Exhaust Fan ㉕
10" ϕ boiler flue up through roof see Detail 11/M-17
6/24 Drum Punkah 900 cfm (Typical of 10)
6/12 Drum Punkah 300 cfm (Typ of 10)
6/24 Drum Punkah 680 cfm (Typ. of 10)
6/18 Drum Punkah 550 cfm (Typ. of 2)
R.A. duct open to room
NOTE: All ductwork in pool area shall be of all aluminum construction - see specs.
NOTE: for thermostat locations in gym & pool, see Lower Level Plan.
Sound Trap
227'-0"
168'-10"

KEYED NOTES:

① 12"x 12" D
② 24"x 12" D
③ 24"x 24" D
④ 12"x 12" F
⑤ 24"x 12" F
⑥ 24"x 24" F
⑦ 8"x 32", zone 2-10, 2100 cfm
⑧ 7"x 32", zone 2-12, 1630 cfm
⑨ 14"x 32", zone 2-6, 3250 cfm
⑩ 9"x 32", zone 2-5, 1900 cfm
⑪ 5"x 32", zone 2-7, 1010 cfm
⑫ 12"x 32", zone 2-11, 2750 cfm
⑬ 9"x 32", zone 2-8, 2080 cfm
⑭ 6"x 32", zone 2-9, 1310 cfm
⑮ 7"x 32", zone 2-1, 1630 cfm, offset & transition to 16"x 14" down.
⑯ 12"x 32", zone 2-2, 2840 cfm, offset & transition to 26"x 14" down.
⑰ 5"x 32", zone 2-4, 930 cfm, offset & transition to 11"x 14" down.
⑱ 14"x 32", zone 2-3, 3280 cfm, offset & transition to 28"x 14" down.
⑲ 9"x 32", zone 1-6, 1990 cfm
⑳ 11"x 32", zone 1-9, 2670 cfm
㉑ 12"x 32", zone 1-8, 4550 cfm
㉒ 9"x 32", zone 1-5, 2100 cfm
㉓ 6"x 32", zone 1-10, 1200 cfm
㉔ 9"x 32", zone 1-4, 2200 cfm
㉕ 6"x 32", zone 1-3, 1200 cfm
㉖ 12"x 32", zone 1-1, 3820 cfm
㉗ 9"x 32", zone 1-2, 1760 cfm
㉘ 16"x 32", zone 1-7, 5110 cfm
㉙ 48"x 36" return air from Lower Level open to ceiling space.
㉚ 12"x 18" Exhaust from Lower Level, 1370 cfm.
㉛ 14"x 32" Exhaust up to heat recovery unit in ① on roof, 3800 cfm.
㉜ 12'-6" x 3'-0" plenum from opening through roof and extending down to elevation 122'-2" lined on sides and bottom w/1" A.L.
㉝ 72"x 26" sound elbow w/1" A.L.
㉞ Rise @ 45°
㉟ Transfer air duct open at both ends to the ceiling space w/ B.O.D. @ 122'-2"
㊱ 32"x 24" Return air from Lower Level open to clg space
㊲ 24"x 14" Exhaust from Lower Level, 2480 cfm.
㊳ 32"x 14" Exhaust up to heat recovery unit in ② on roof, 3560 cfm.
㊴ 84"x 14" sound elbow w/1" A.L.
㊵ Sound elbow, 46"x 20" w/1" A.L. open at ends to ceiling space.
㊶ 24"x 24" Access panel in ceiling
㊷ 4" ChWS, 4" ChWR, 2" HWS, & 2" HWR (from left to right) up through structure into Unit ② on roof.
㊸ 2" HWR, 2" HWS, 4" ChWR, & 4" ChWS (from left to right) up through structure into Unit ① on roof
㊹ 1½" HWR & 1½" HWS (from left to right) down in chase. Piping to penetrate pre-cast panels @ Elev. 117'-0" (℄ of piping) Sleeve piping through wall.

GENERAL NOTES:

1. All round run-outs and drops to diffusers are the same nominal size as the scheduled diffuser neck size.
2. For equipment on the roof, see Mech. West Roof Plan, M-15.
3. All duct sizes shown on the drawings are net inside dimensions unless the duct has acoustical lining. Duct sizes shown on drawings with 1" A.L. are outside dimensions, net inside dimensions are two inches smaller each dimension.
4. Provide turning vanes in all square (90°) rectangular elbows.
5. Provide manual air vents at all high points of piping system.

UPPER HVAC PLAN

SCALE: 1/8" = 1'-0"

N

ATTENTION ! ! ! ! ! ! ! ! ! ! ! ! !

Clear restrictions are set on how and where precast concrete members may be penetrated without damaging prestressed reinforcing strands.
See the following:
-Details 1 and 2, SH.A19
-Specifications "Bid package 'B' instructions to bidders"
-Precast concrete shop drawings and production drawings, by Prestressed Concrete of Colorado, Inc. 303-458-6301

MORE
COMBS
BURCH

ArchitectsEngineersPlanners

phase two facilities:
**ARAPAHOE
COMMUNITY
COLLEGE**
5900 South Santa Fe Drive, Littleton, Colorado 80120

state project no.
2136

drawing title
UPPER
HVAC
PLAN

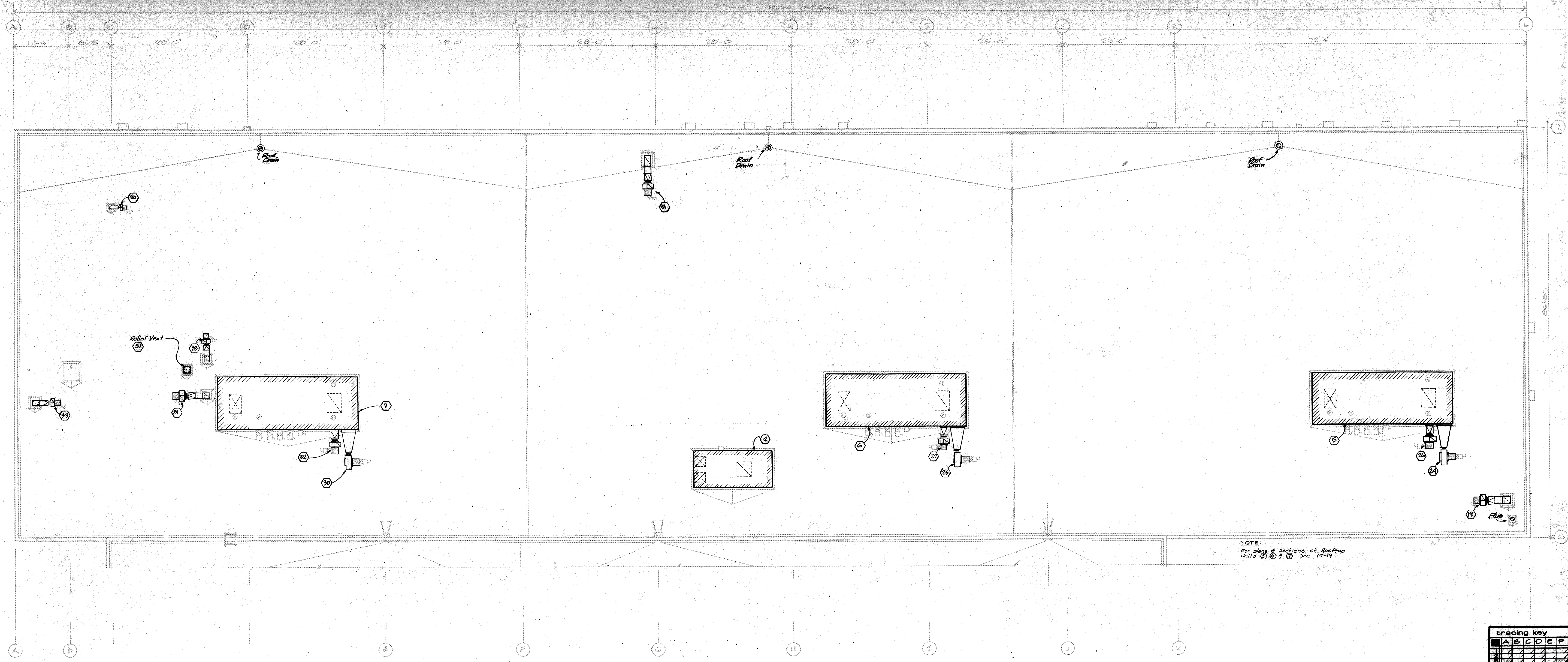
tracing key

	A	B	C	D	E	F
1						
2						
3		3B			3E	
4			4C			
5						
6						
7						
8						
9					9E	
10						
11						
12						
21						
22			22C			
23			23C			23F
24			24C			
25						
26						
31						
32						
33			33C			
34			34C			

ROBIN DAVID ADAIR, JR.
13382

drawn by
G.W.
checked by
R.G.S.
date
AUGUST 5, 1976
revisions

m·c·b job no.
7510
sheet
M 13
of
BP Ⓑ
63
sheets


311'-4" OVERALL
A
B
C
D
E
F
G
H
I
J
K
L
11'-4"
8'-8"
28'-0"
28'-0"
28'-0"
28'-0"
28'-0"
28'-0"
28'-0"
23'-0"
72'-4"
86'-8"
7
6
Roof Drain
Roof Drain
Roof Drain
20
31
Relief Vent
51
28
29
33
7
32
30
12
6
27
25
5
26
24
19
Flue

NOTE:
For plans & Sections of Rooftop Units ⑤ ⑥ & ⑦ See M-19

ATTENTION ! ! ! ! ! ! ! ! ! ! ! ! !
Clear restrictions are set on how and where precast concrete members may be penetrated without damaging prestressed reinforcing strands. See the following:
- Details 1 and 2, SH.A19
- Specifications "Bid package 'B' instructions to bidders"
- Precast concrete shop drawings and production drawings, by Prestressed Concrete of Colorado, Inc. 303-458-6301

tracing key

	A	B	C	D	E	F
1						
2						
3	3A					3F
4						
5						
6						
7						
8						
9						9F
10						
11						
12						
21				21D	21E	
22						
23						
24						
25						
26						
31			31C			
32						
33						
34						

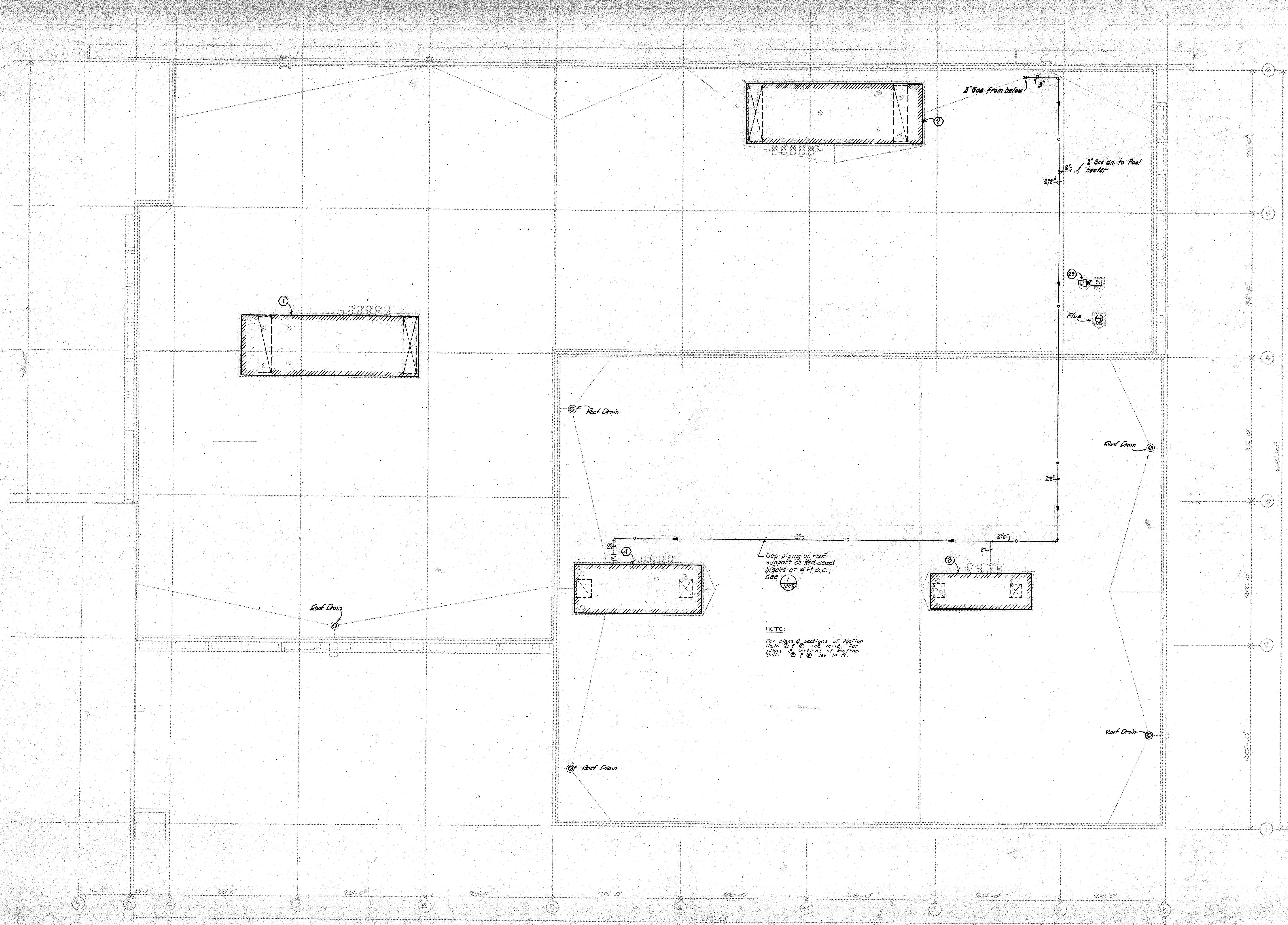
STATE PROJ. 2136

drawing title
MECHANICAL
EAST
ROOF
PLAN

ROBIN DAVID ADAIR JR.
13382

drawn by
B&P / TW
checked by
RGS
date
AUGUST 5, 1976
revisions

m·c·b job no·
7510
sheet
M
14
of
BP Ⓑ
63
sheets


3" Gas from below
3"
2
2" Gas dn. to Pool heater
2"
2 1/2"
23
Flue
1
Roof Drain
Roof Drain
Roof Drain
Roof Drain
Roof Drain
2 1/2"
2 1/2"
2"
2"
2"
G
G
4
3
Gas piping on roof support on Red wood blocks at 4 ft o.c., see 1/M-15
11'-4"
8'-8"
28'-0"
28'-0"
28'-0"
28'-0"
28'-0"
28'-0"
28'-0"
23'-0"
227'-0"
98'-0"
32'-0"
32'-0"
32'-0"
40'-10"
168'-10"
A
B
C
D
E
F
G
H
I
J
K
1
2
3
4
5
6

NOTE:

For plans & sections of Rooftop Units ① & ② see M-18. For plans & sections of Rooftop Units ③ & ④ see M-19.

ATTENTION ! ! ! ! ! ! ! ! ! ! ! !

Clear restrictions are set on how and where precast concrete members may be penetrated without damaging prestressed reinforcing strands. See the following:

- Details 1 and 2, SH.A19
- Specifications "Bid package 'B' Instructions to bidders"
- Precast concrete shop drawings and production drawings, by Prestressed Concrete of Colorado, Inc. 303-458-6301

MORE
COMBS
BURCH

ArchitectsEngineersPlanners

phase two facilities:
ARAPAHOE COMMUNITY COLLEGE
5900 South Sante Fe Drive, Littleton, Colorado 80120

state project no.
2136

drawing title
MECHANICAL
WEST
ROOF
PLAN

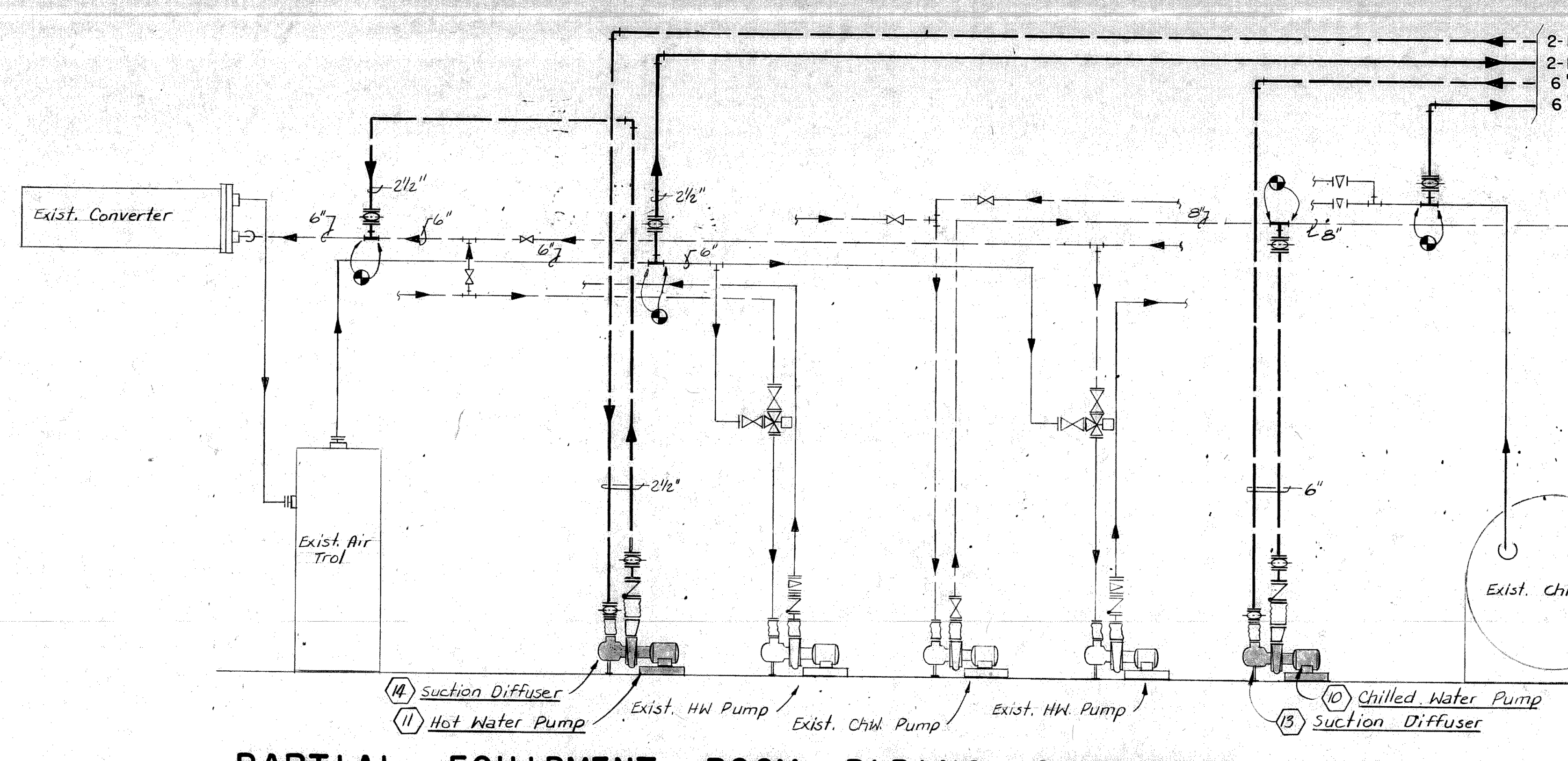
tracing key

	A	B	C	D	E	F
1						
2						
3		3B				
4						
5						
6						
7						
8						
9					9E	
10	10A					
11						
12						
21						
22						
23						
24						
25	25A	25B				
26						
31			◢		31E	
32						
33						
34						

ROBIN DAVID ADAIR, JR.
13382

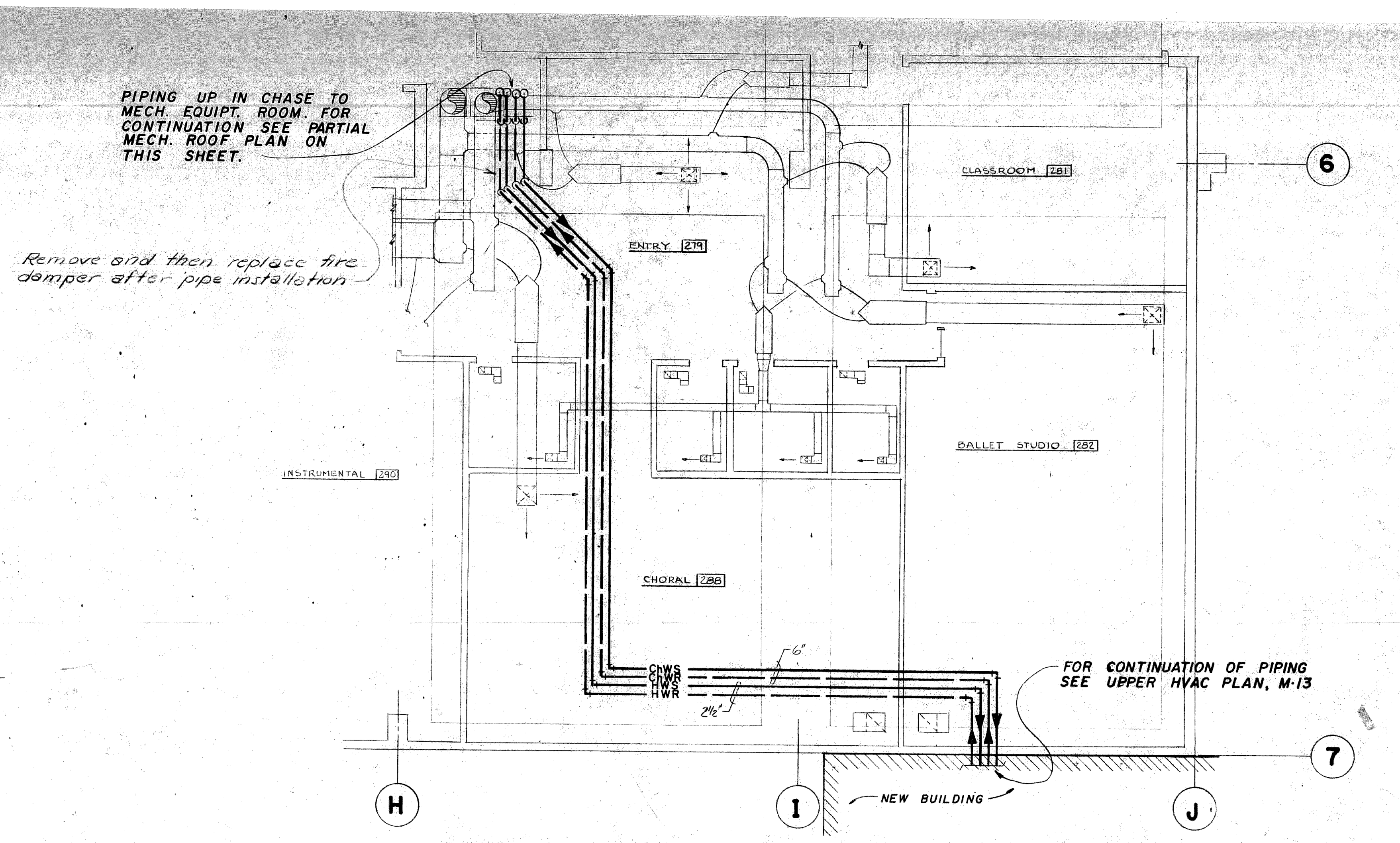
drawn by
B&P/TW
checked by
RGS
date
AUGUST 5, 1976
revisions

m·c·b job no.
7510
sheet
M
15
of


2-1/2" HWR
2-1/2" HWS
6" ChWR
6" ChWS
Exist. Converter
Exist. Air Trol
Exist. Chiller
2½"
6"
8"
14 Suction Diffuser
11 Hot Water Pump
Exist. HW Pump
Exist. ChW. Pump
Exist. HW. Pump
10 Chilled Water Pump
13 Suction Diffuser

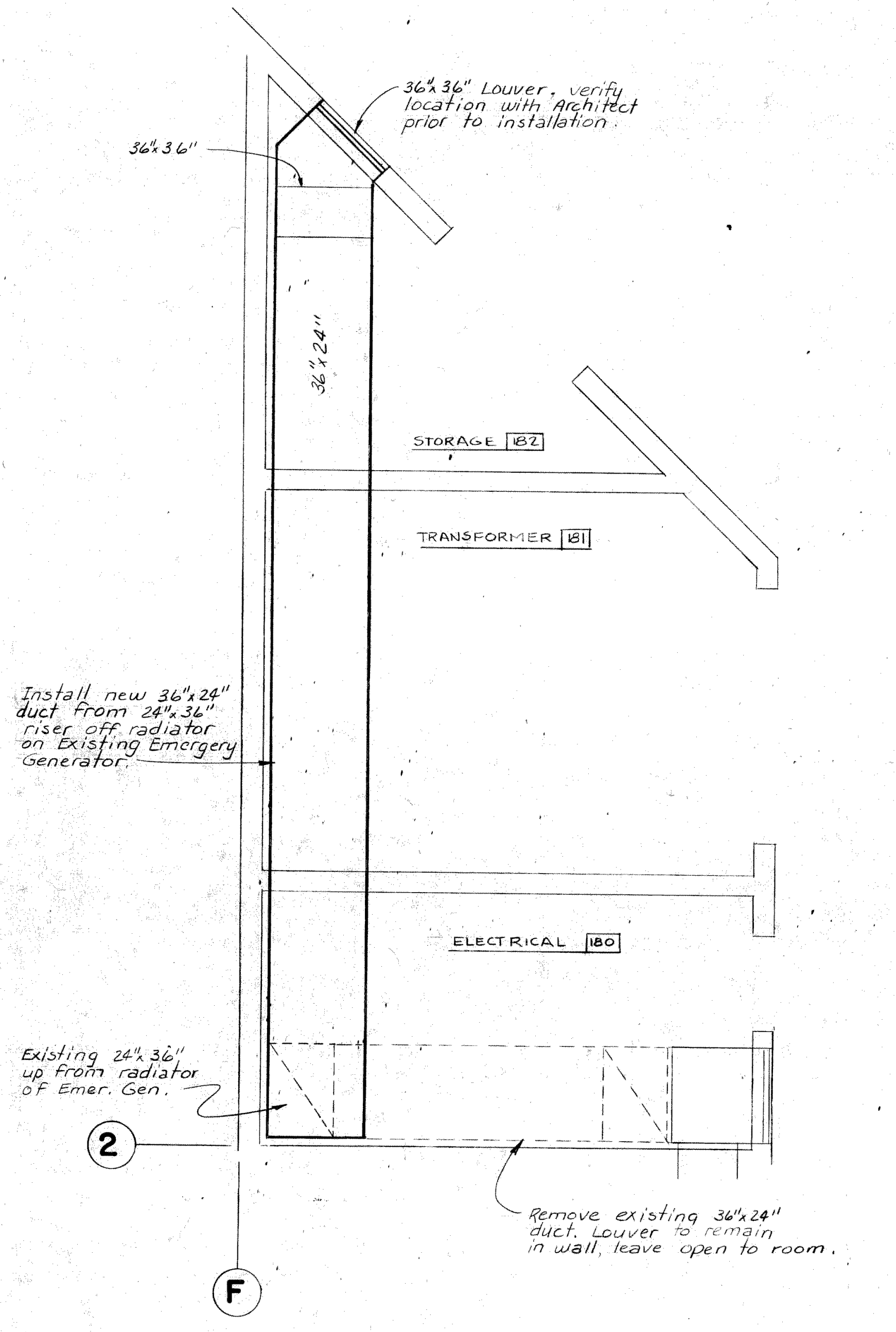
PARTIAL EQUIPMENT ROOM PIPING SCHEMATIC - EXISTING BLDG.

SCALE: NONE


PIPING UP IN CHASE TO MECH. EQUIPT. ROOM. FOR CONTINUATION SEE PARTIAL MECH. ROOF PLAN ON THIS SHEET.
Remove and then replace fire damper after pipe installation
CLASSROOM 281
ENTRY 279
BALLET STUDIO 282
INSTRUMENTAL 290
CHORAL 288
ChWS
ChWR
HWS
HWR
6"
2½"
FOR CONTINUATION OF PIPING SEE UPPER HVAC PLAN, M-13
NEW BUILDING
6
7
H
I
J

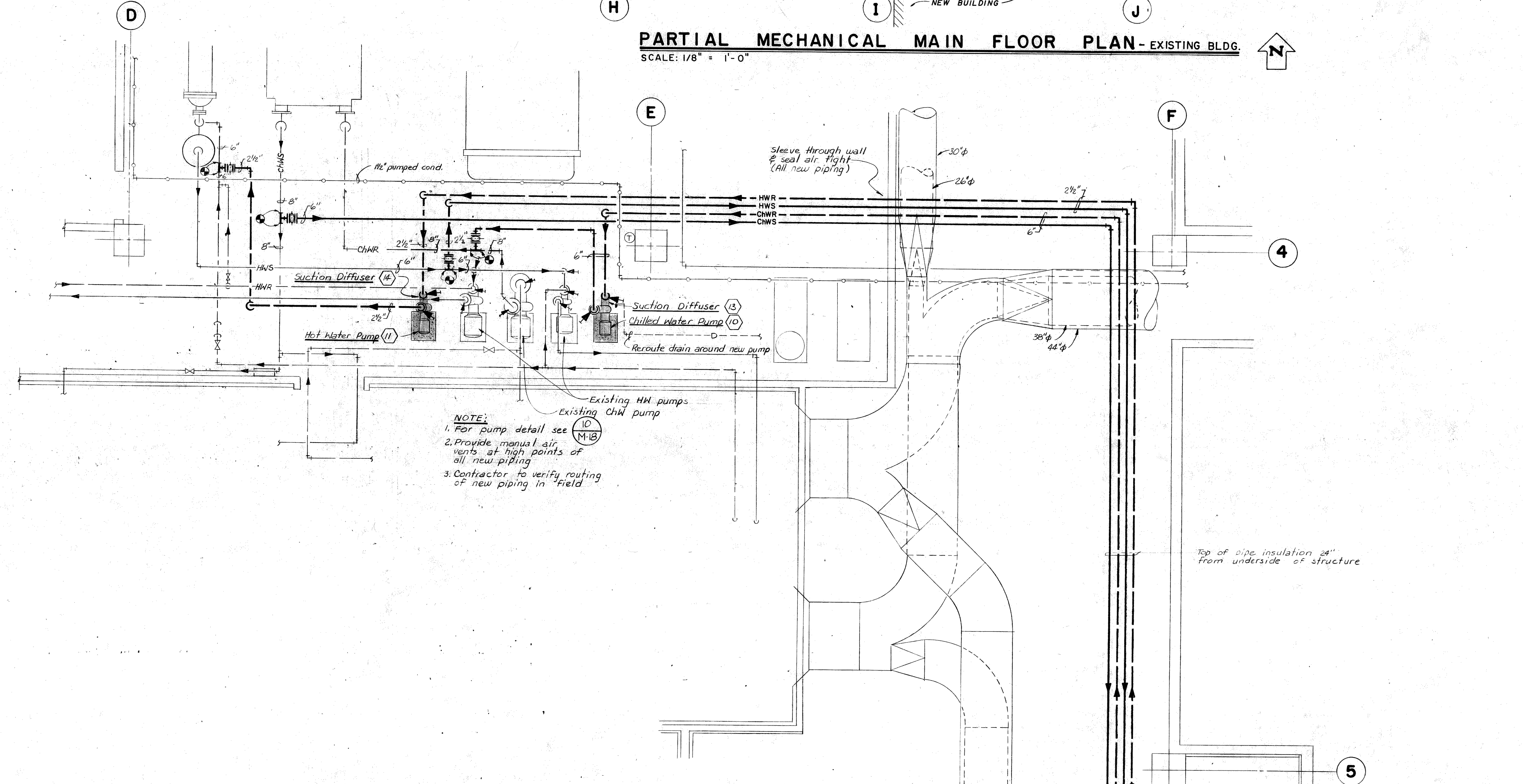
PARTIAL MECHANICAL MAIN FLOOR PLAN - EXISTING BLDG.

SCALE: 1/8" = 1'-0"


36"x36" Louver, verify location with Architect prior to installation.
36"x36"
36"x24"
STORAGE 182
TRANSFORMER 181
Install new 36"x24" duct from 24"x36" riser off radiator on Existing Emergery Generator.
ELECTRICAL 180
Existing 24"x36" up from radiator of Emer. Gen.
Remove existing 36"x24" duct. Louver to remain in wall, leave open to room.
2
F

PARTIAL MECHANICAL GARDEN LEVEL FLOOR PLAN: EXISTING BUILDING

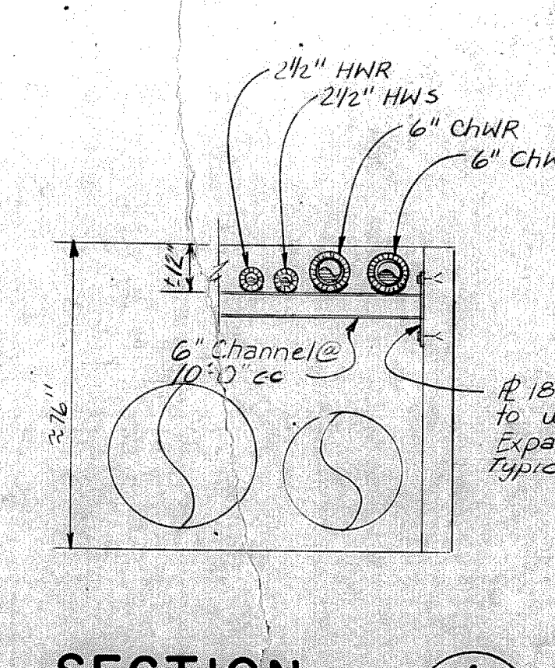
SCALE: 1/4" = 1'-0"


D
E
F
4
5
1½" pumped cond.
ChWS
ChWR
HWS
HWR
6"
8"
2½"
Suction Diffuser 14
Hot Water Pump 11
Suction Diffuser 13
Chilled Water Pump 10
Reroute drain around new pump
Existing HW pumps
Existing ChW pump
Sleeve through wall & seal air tight (All new piping)
30"ϕ
26"ϕ
38"ϕ
44"ϕ
Top of pipe insulation 24" from underside of structure

NOTE:
1. For pump detail see 10/M-18
2. Provide manual air vents at high points of all new piping
3. Contractor to verify routing of new piping in field

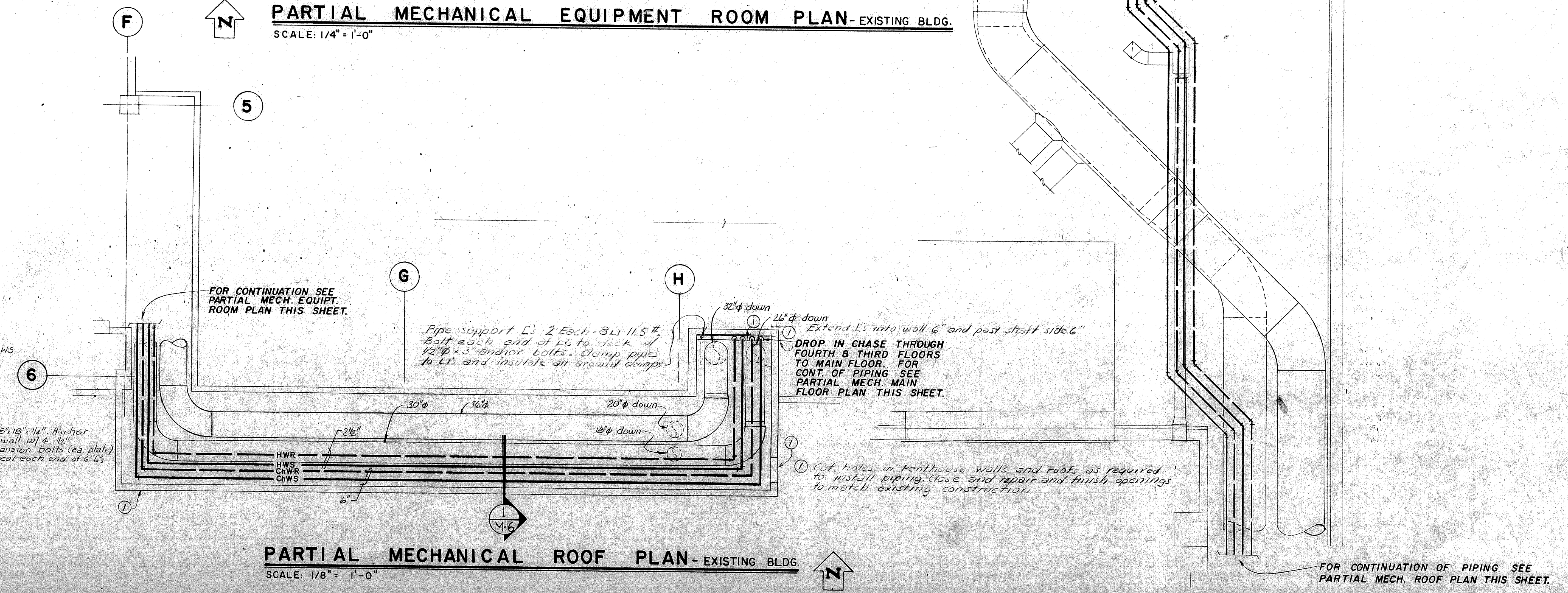
PARTIAL MECHANICAL EQUIPMENT ROOM PLAN - EXISTING BLDG.

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


2½" HWR
2½" HWS
6" ChWR
6" ChWS
6" Channel @ 10'-0" cc
PL 18"x18"x¼". Anchor to wall w/ 4 ½" Expansion bolts (ea. plate) Typical each end of 6" [s
2'-6"

SECTION 1/M-16

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


F
5
6
G
H
FOR CONTINUATION SEE PARTIAL MECH. EQUIPT. ROOM PLAN THIS SHEET.
Pipe support [s 2 Each-8 [11.5#. Bolt each end of [s to deck w/ ½"ϕ x 3" anchor bolts. Clamp pipes to [s and insulate all around clamps
32"ϕ down
26"ϕ down
Extend [s into wall 6" and past shaft side 6"
DROP IN CHASE THROUGH FOURTH & THIRD FLOORS TO MAIN FLOOR. FOR CONT. OF PIPING SEE PARTIAL MECH. MAIN FLOOR PLAN THIS SHEET.
30"ϕ
36"ϕ
20"ϕ down
18"ϕ down
2½"
6"
HWR
HWS
ChWR
ChWS
1/M-16
FOR CONTINUATION OF PIPING SEE PARTIAL MECH. ROOF PLAN THIS SHEET.

① Cut holes in Penthouse walls and roofs as required to install piping. Close and repair and finish openings to match existing construction.

PARTIAL MECHANICAL ROOF PLAN - EXISTING BLDG.

SCALE: 1/8" = 1'-0"

MORE
COMBS
BURCH

ArchitectsEngineersPlanners
A PROFESSIONAL CORPORATION
3911 East Exposition Avenue
Denver Colorado 80209
Area 303 744-3157

phase two facilities:
ARAPAHOE COMMUNITY COLLEGE
5900 South Sante Fe Drive, Littleton, Colorado 80120

state project no.
2136

drawing title
PARTIAL
FLOOR
PLANS
EXISTING
BUILDING

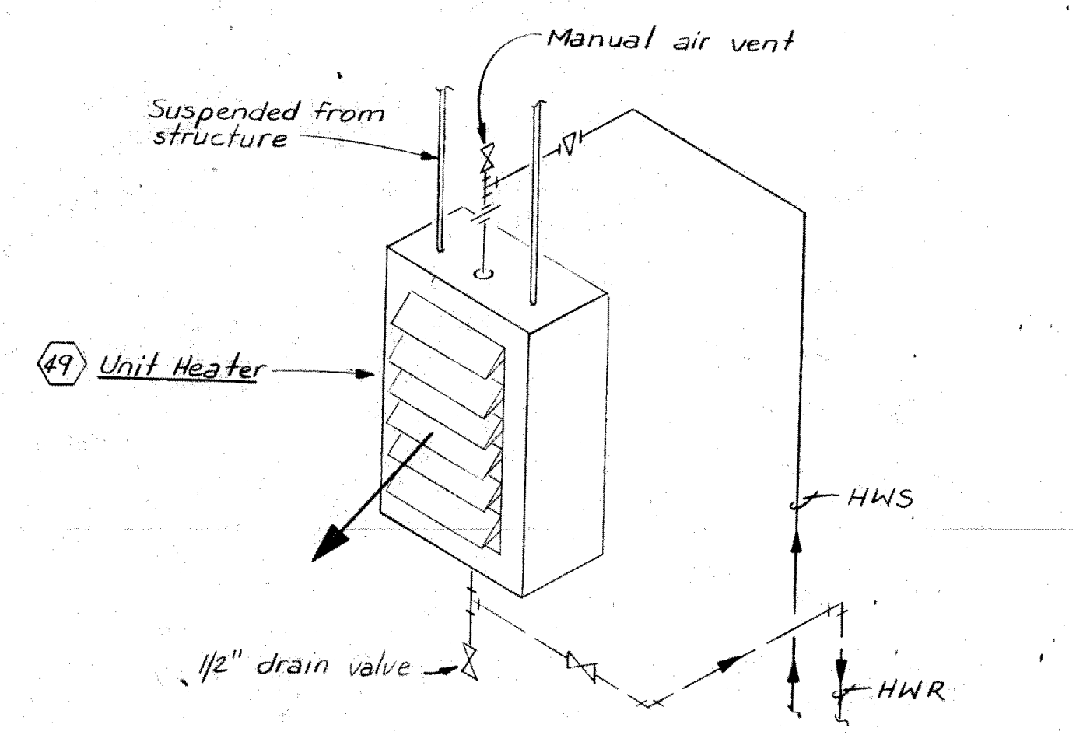
tracing key

☐	A	B	C	D	E	F
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
21						
22						
23						
24						
25						
26						
31						
32						
33						
34						

ROBIN DAVID ADAIR
13382

drawn by
GW
checked by
RGS
date
5 AUG., 1976
revisions

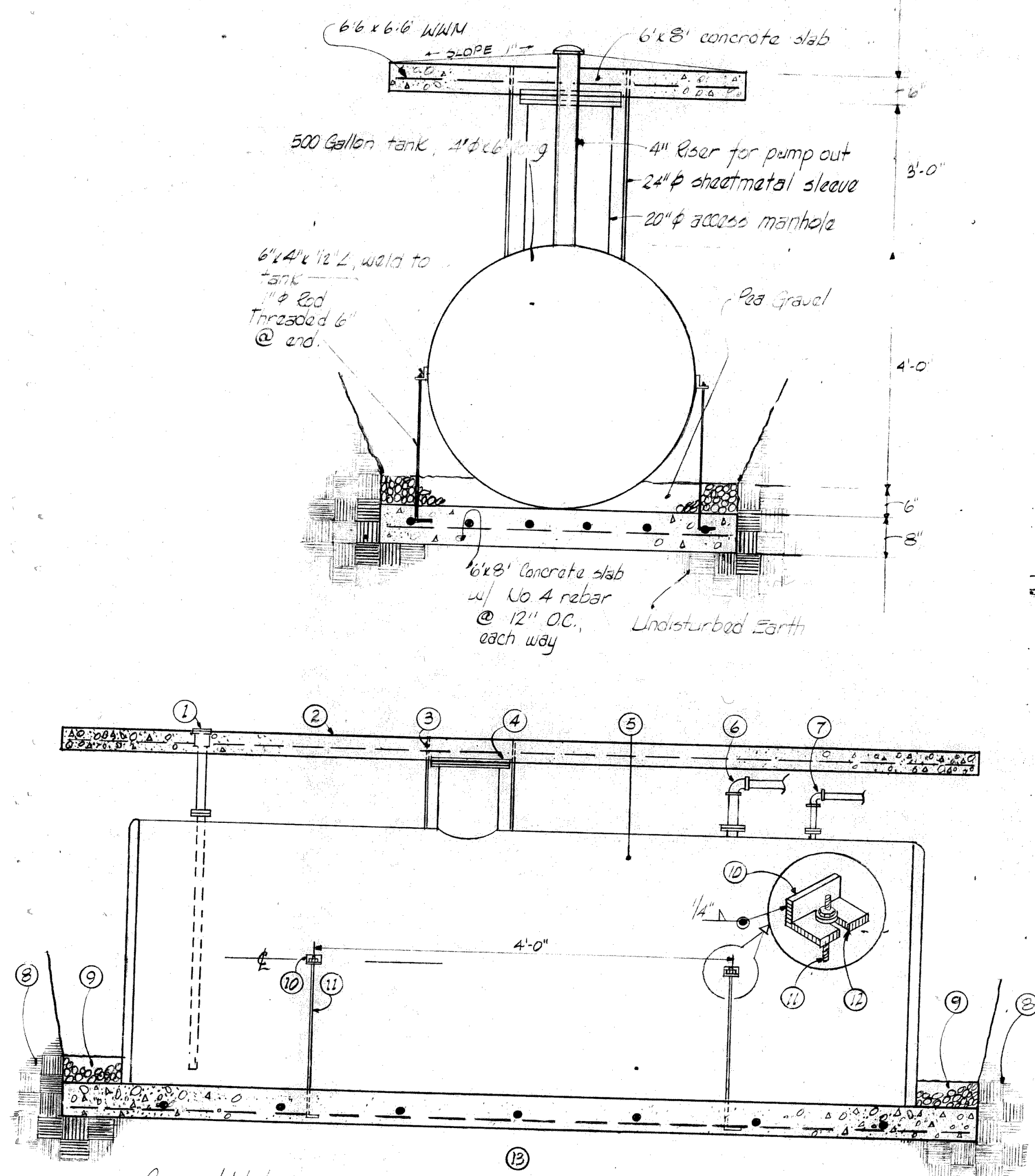
m-c-b job no.
7510
sheet of
M
16
BP (B)
63
sheet


Manual air vent
Suspended from structure
49 Unit Heater
HWS
1/2" drain valve
HWR

UNIT HEATER DETAIL

SCALE: NONE

14/M-17


6·6 x 6·6 WWM
SLOPE 1"
6'x8' concrete slab
500 Gallon tank, 4'φ x 6' long
4" Riser for pump out
24"φ sheetmetal sleeve
20"φ access manhole
6"x4"x1/2" ∠, weld to tank
1"φ Rod Threaded 6" @ end.
Pea Gravel
6"
3'-0"
4'-0"
8"
6'x8' Concrete slab w/ No. 4 rebar @ 12" O.C. each way
Undisturbed Earth
①
②
③
④
⑤
⑥
⑦
⑧
⑨
⑩
⑪
⑫
⑬
4'-0"

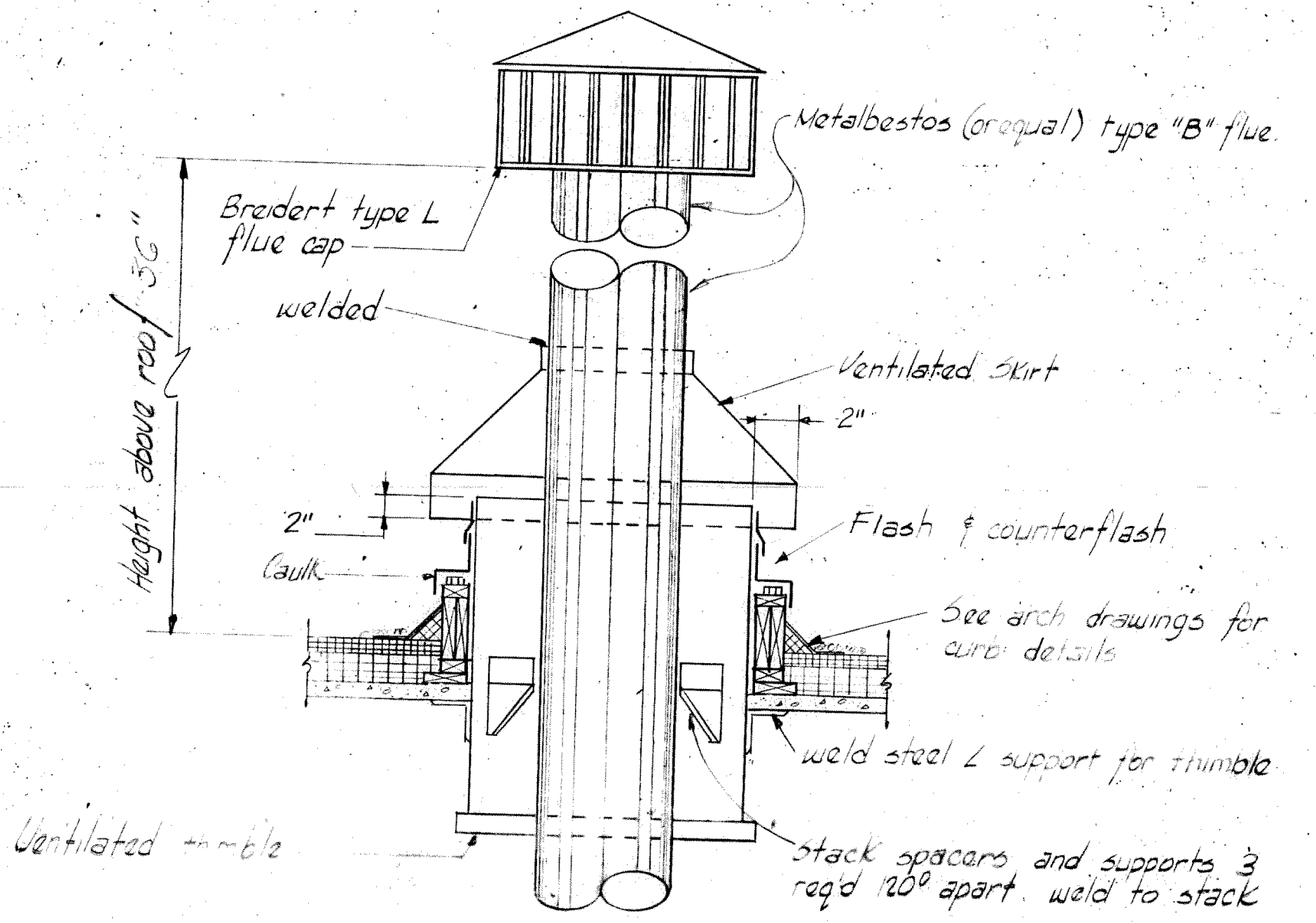
General Notes:

① Locking type weatherproof cap set in conc. slab "Pumpout". 4" Riser.
② 6" thick conc. slab w/ 6·6 x 6·6 WWM.
③ 24"φ sheet metal sleeve.
④ 20"φ access manhole w/ bolted cover.
⑤ 500 Gallon Tank 4'φ x 6' long
⑥ 4" inlet connection to building
⑦ 1 1/2" Vent to building
⑧ Undisturbed Earth
⑨ Pea Gravel
⑩ 6"x 4"x 1/2" ∠, 8" long weld to tank.
⑪ 1"φ Rod threaded 6" at end. Zinc coated.
⑫ 1 1/8"x 3 1/2" slot
⑬ 8 thick concrete slab 6'x8' w/ No. 4 rebar @ 12" o.c., each way

WASTE OIL STORAGE TANK DETAIL

NO SCALE

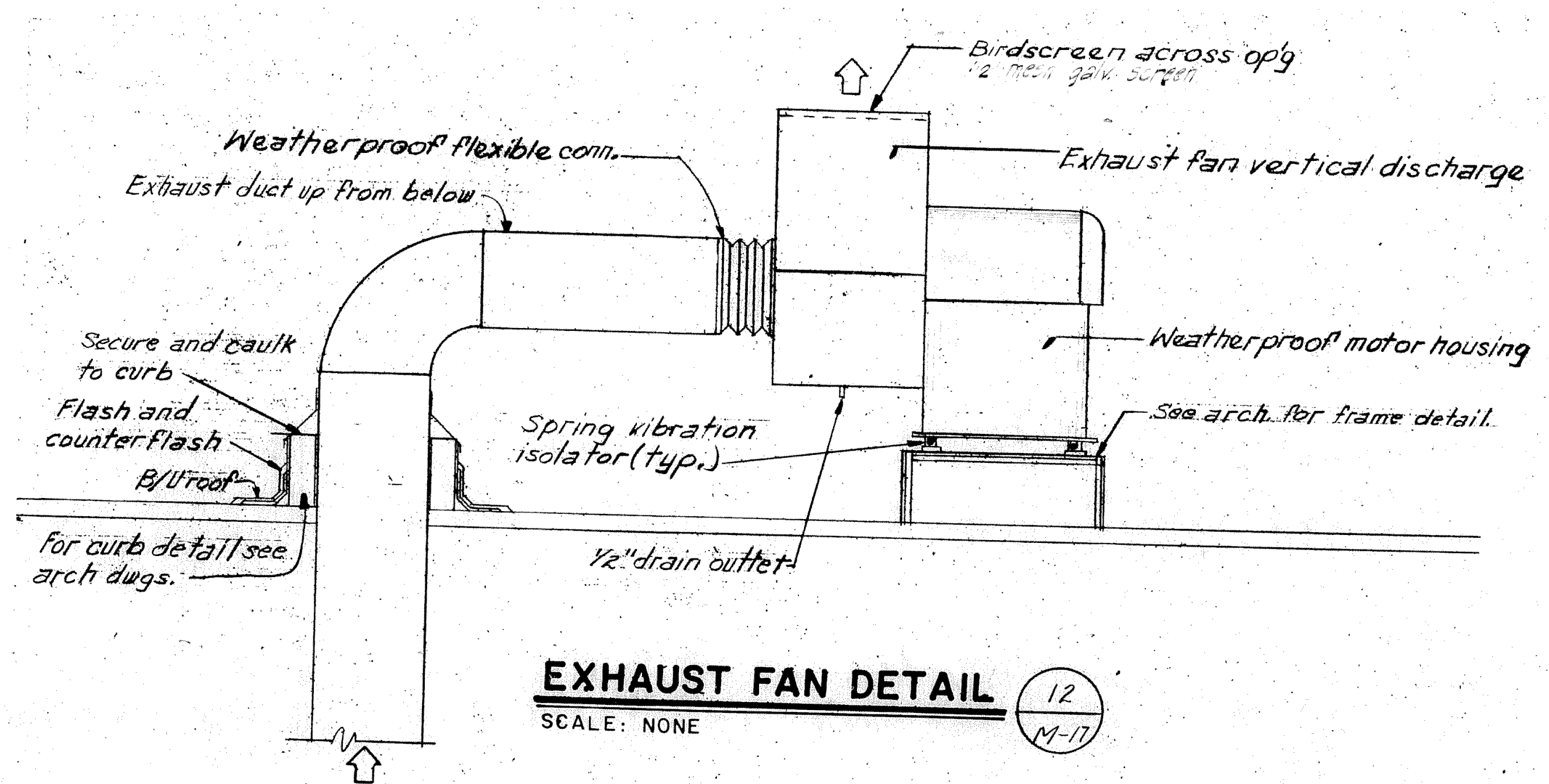
15/M-17


Metalbestos (or equal) type "B" flue
Breidert type L flue cap
welded
Height above roof 36"
Ventilated skirt
2"
2"
Caulk
Flash & counterflash
See arch drawings for curb details
weld steel ∠ support for thimble
Ventilated thimble
stack spacers and supports 3 req'd 120° apart. weld to stack

FLUE DETAIL

SCALE: NONE

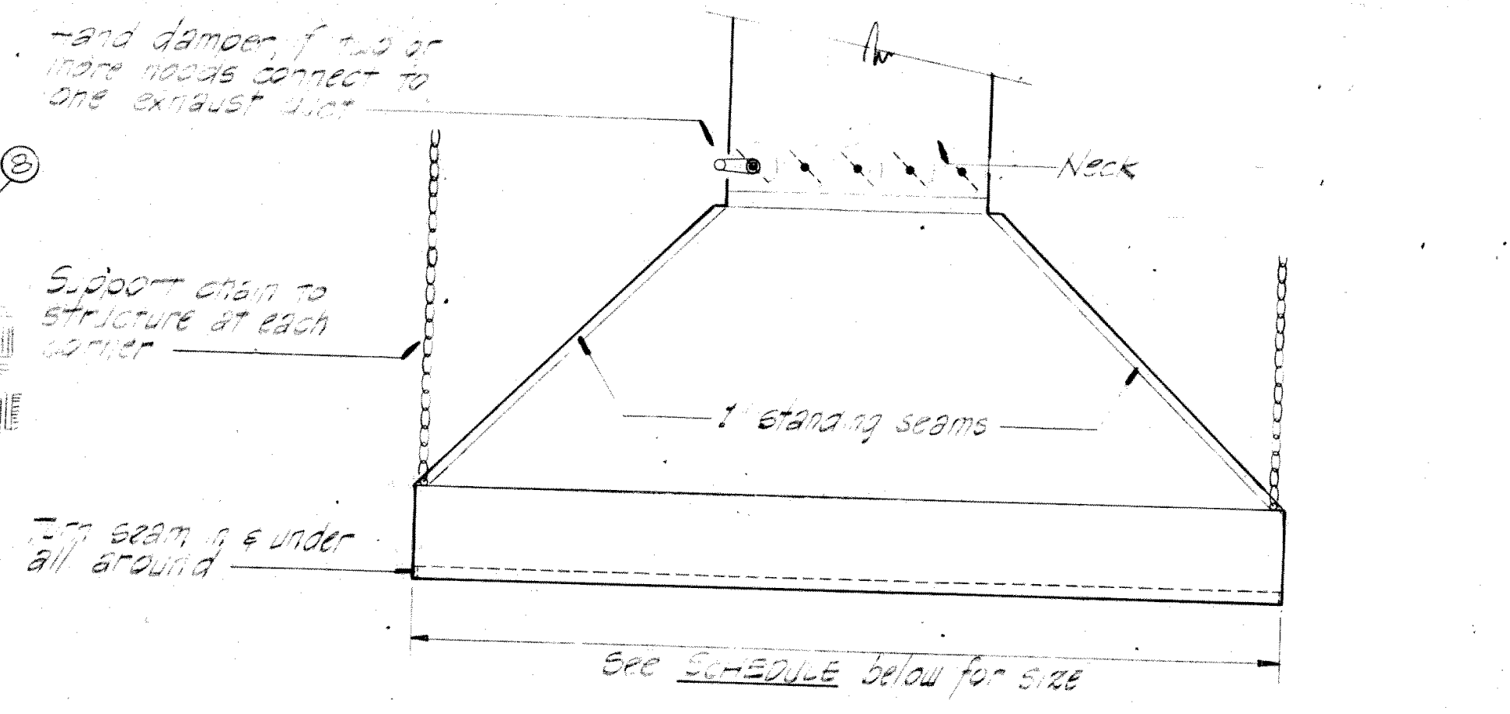
11/M-17


Birdscreen across op'g 1/2 mesh galv. screen
Weatherproof flexible conn.
Exhaust duct up from below
Exhaust fan vertical discharge
Secure and caulk to curb
Flash and counterflash
B/U roof
Spring vibration isolator (typ.)
Weatherproof motor housing
See arch. for frame detail.
For curb detail see arch dwgs.
1/2" drain outlet

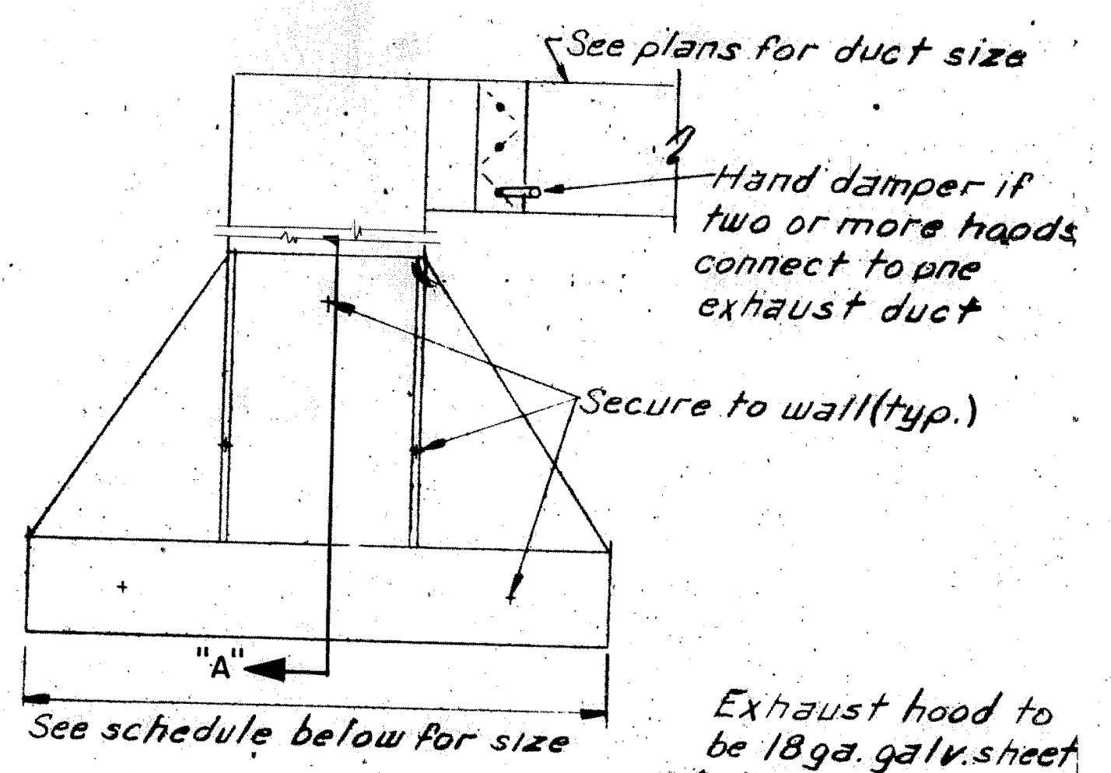
EXHAUST FAN DETAIL

SCALE: NONE

12/M-17


Hand damper if two or more hoods connect to one exhaust duct
Neck
Support chain to structure at each corner
1" standing seams
Turn seam in & under all around
See SCHEDULE below for size

ELEVATION - TYPE 1

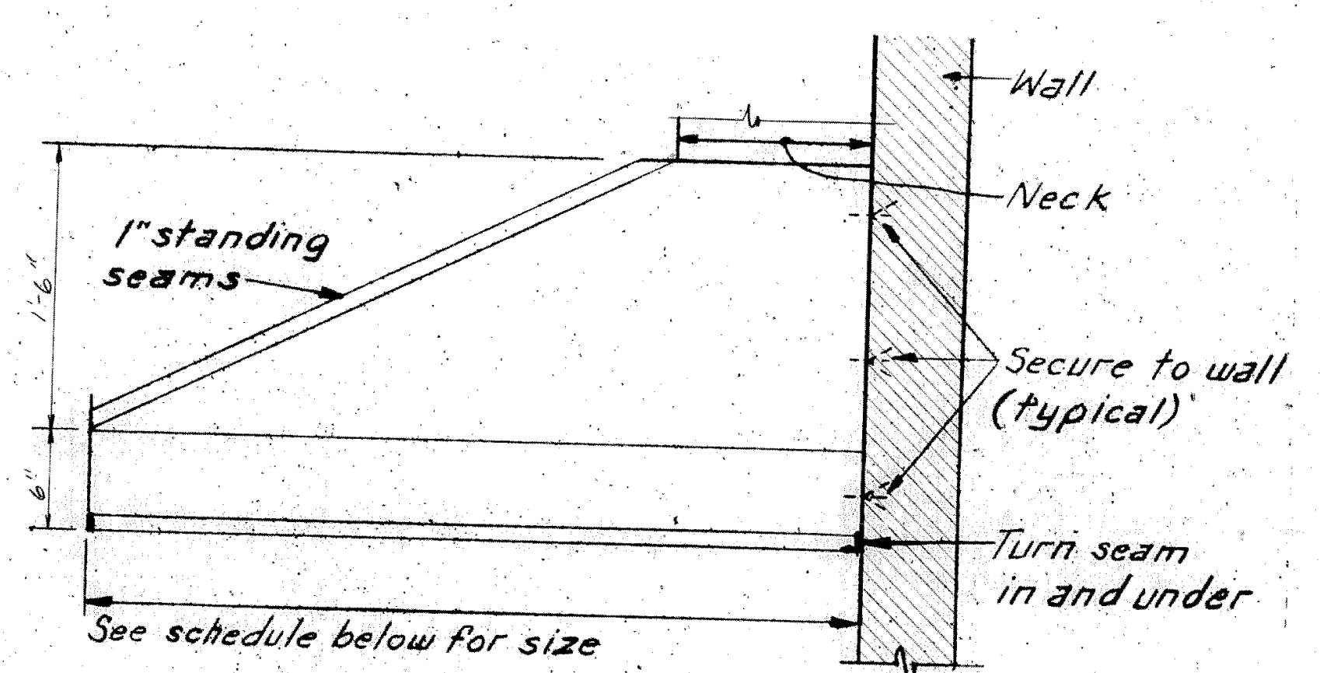

See plans for duct size
Hand damper if two or more hoods connect to one exhaust duct
Secure to wall (typ.)
"A"
See schedule below for size

ELEVATION - TYPE 2

Exhaust hood to be 18 ga. galv. sheet metal construction.

HOOD SCHEDULE							
ROOM NAME	RM. Nº	TYPE	LENGTH x WIDTH	CFM	NECK SIZE	Ht. fr. FLOOR	SERVICE
Bldg./Grounds	210	2	4'-0"x2'-0"	1500	14"x 14"	6'-6"	Welding Table
Chem. Area	246	2 ✱	6'-0"x2'-0"	1800	15"x 15"	6'-6"	Portable Sinks
Heat Treatment	245	2	6'-0"x 2'-0"	1800	16"x 14"	6'-6"	Triple Treat Furnace
Indus. Mech. I	244	1	4'-0"x2'-6"	1800	16"x 14"	6'-6"	Forge Furnace
Civil Tech	222	2	7'-0" x 4'-0"	2000	18"x 14"	6'-6"	Capping Metal Table
Wash	236	2	5'-0" x 3'-0"	2000	16" x 16"	6'-6"	Solvent Tank

✱ Stainless steel hood & ductwork


1" standing seams
1'-6"
6"
Wall
Neck
Secure to wall (typical)
Turn seam in and under
See schedule below for size

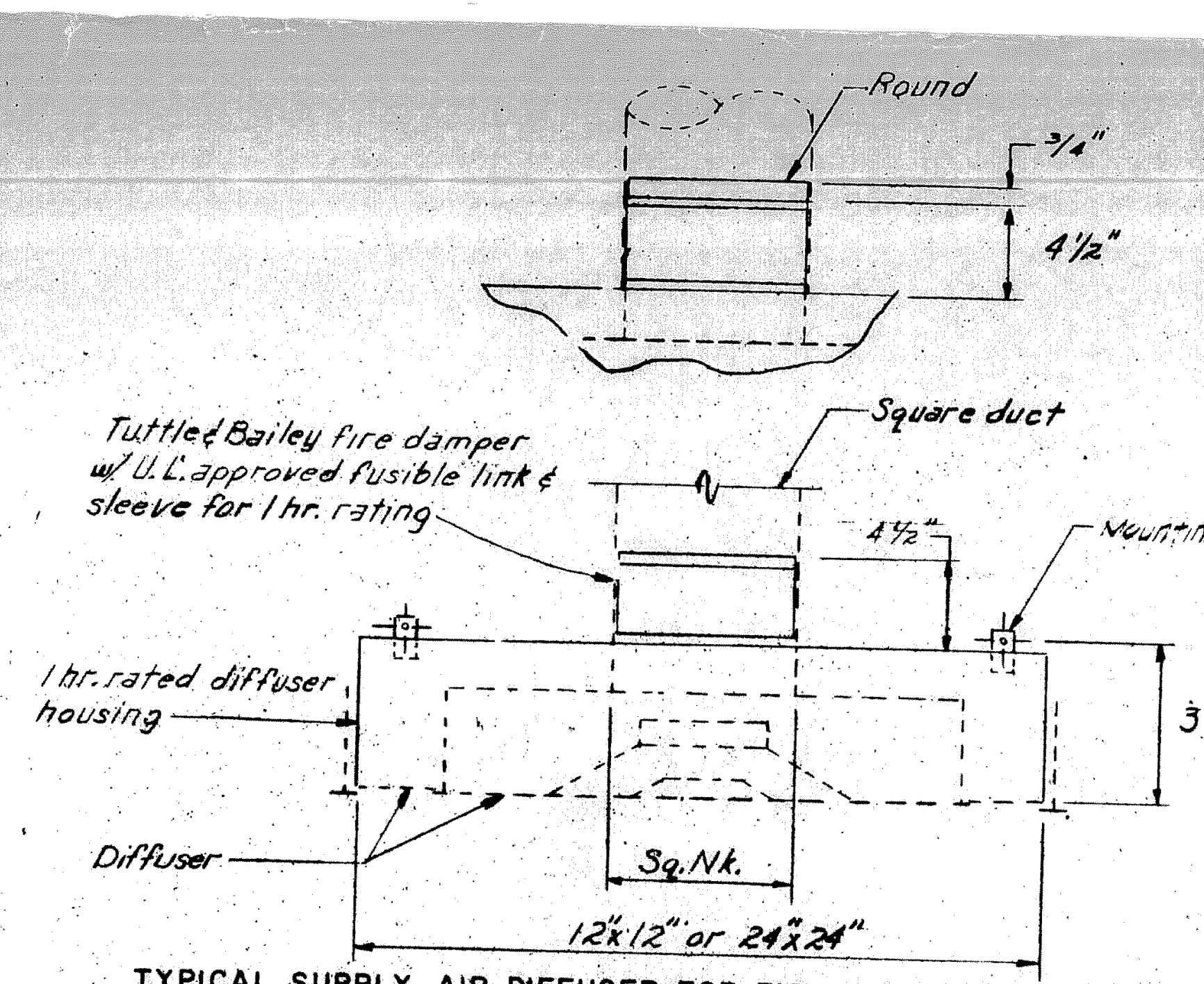
SECTION "A"

HOOD DETAIL

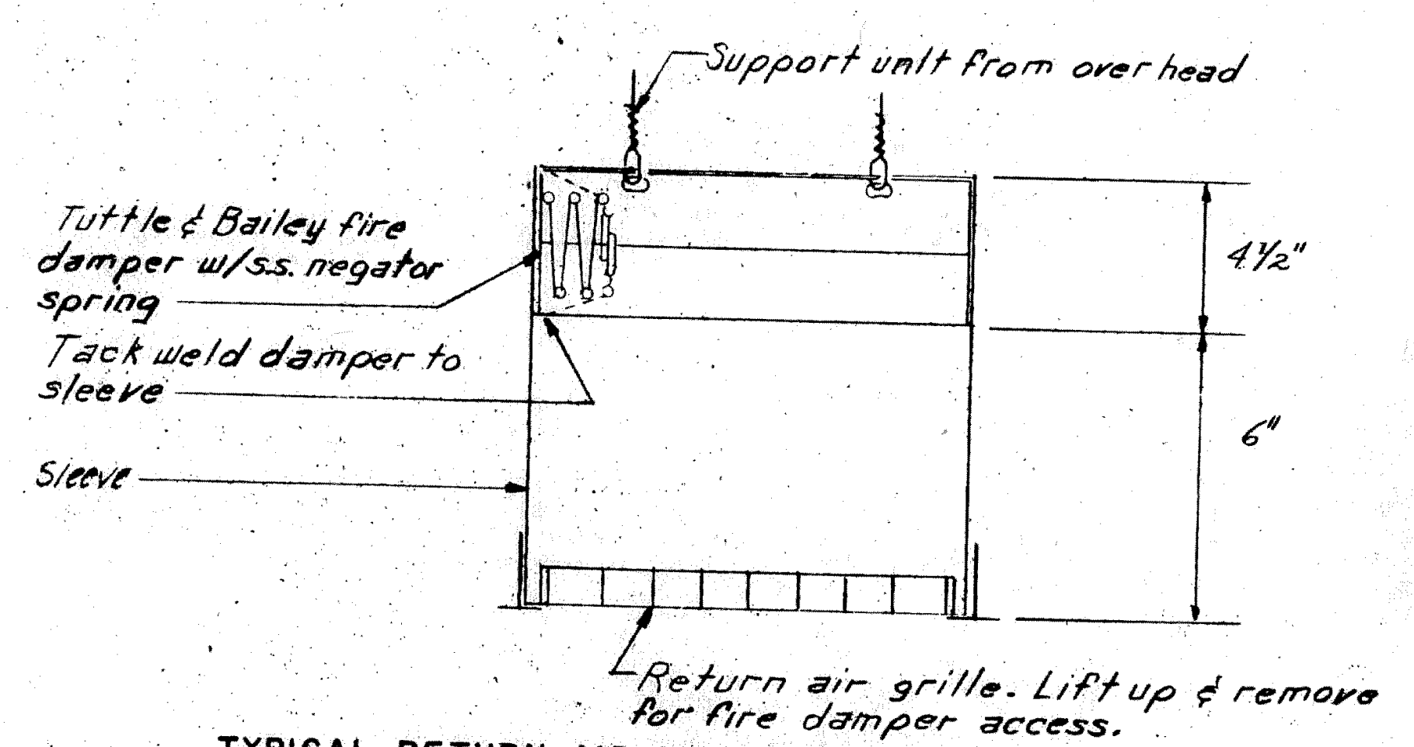
SCALE: NONE

13/M-17

ATTENTION ! ! ! ! ! ! ! ! ! ! ! ! !
Clear restrictions are set on how and where precast concrete members may be penetrated without damaging prestressed reinforcing strands.
See the following:
-Details 1 and 2, SH.A19
-Specifications "Bid package 'B' instructions to bidders"
-Precast concrete shop drawings and production drawings, by Prestressed Concrete of Colorado, Inc. 303-458-6301


Round
3/4"
4 1/2"
Square duct
Tuttle & Bailey fire damper w/ U.L. approved fusible link & sleeve for 1 hr. rating
4 1/2"
Mounting brackets
1 hr. rated diffuser housing
3 3/8"
Diffuser
Sq. Nk.
12"x12" or 24"x24"

TYPICAL SUPPLY AIR DIFFUSER FOR FIRE RATED CEILING

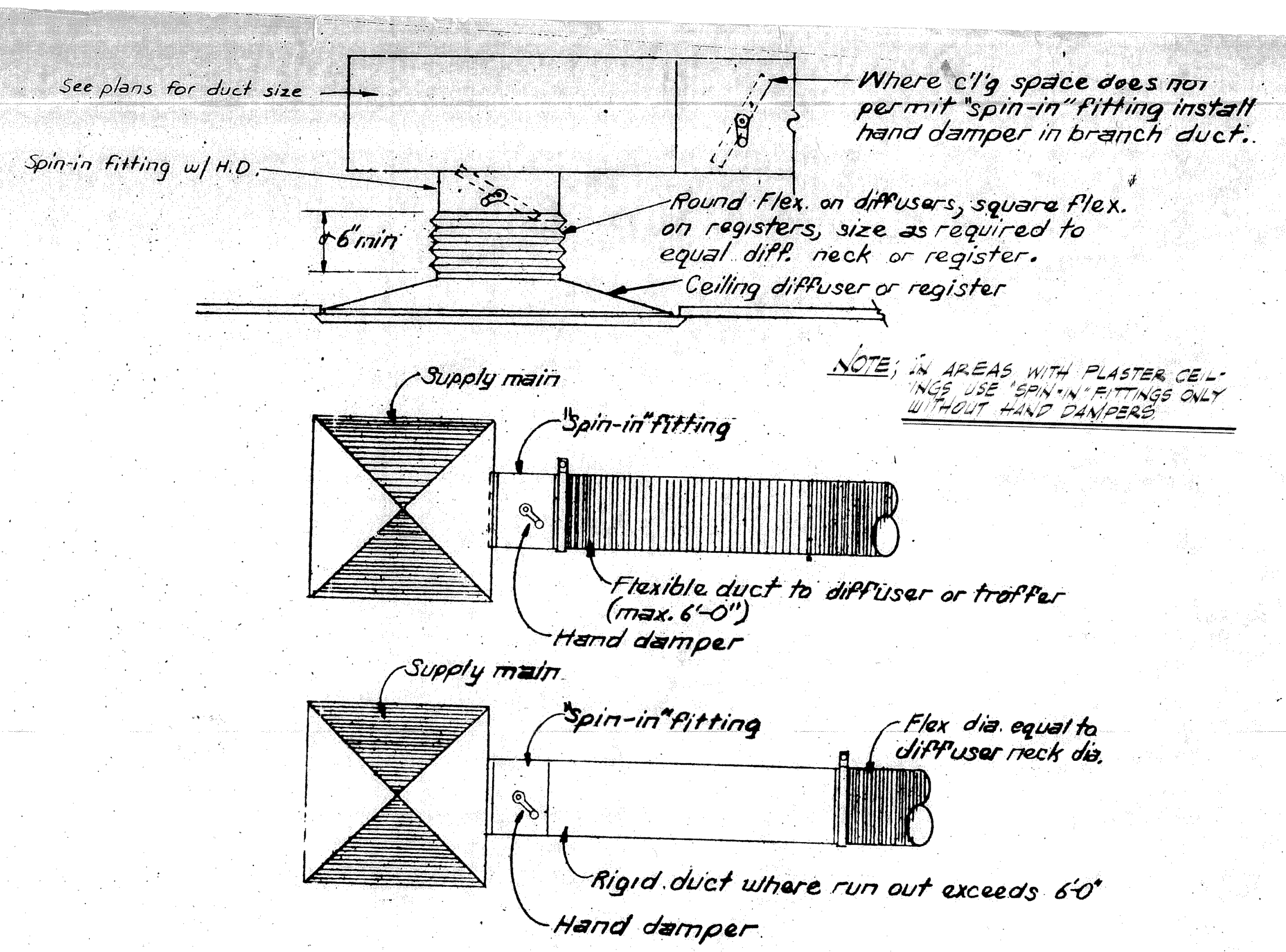

Support unit from over head
Tuttle & Bailey fire damper w/ s.s. negator spring
Tack weld damper to sleeve
Sleeve
4 1/2"
6"
Return air grille. Lift up & remove for fire damper access.

TYPICAL RETURN AIR GRILLE FOR FIRE RATED CEILING

LAY-IN CEILING DIFFUSER FIRE DAMPER DETAIL

SCALE: NONE

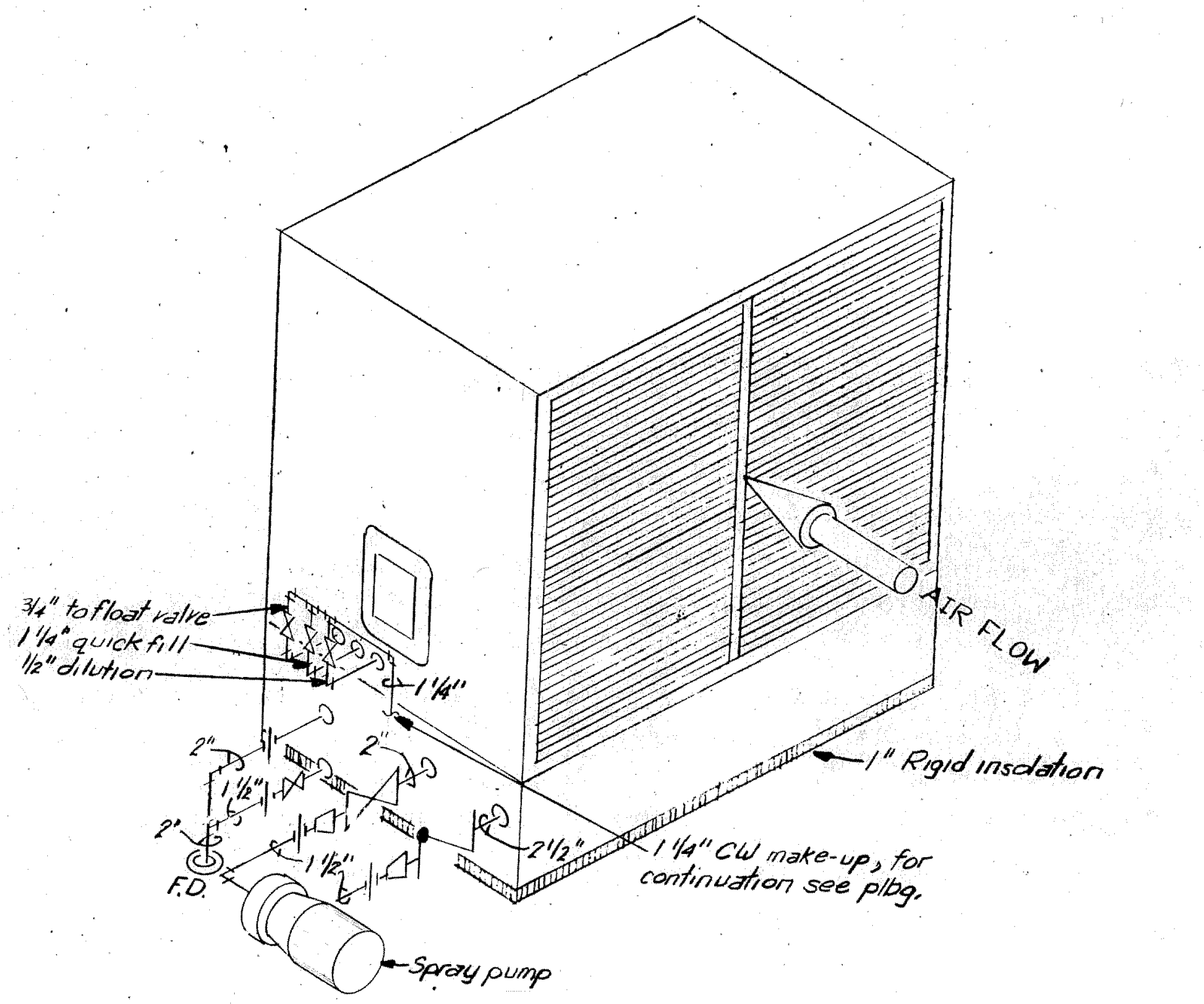
7/M-17


See plans for duct size
Where c'l'g space does not permit "spin-in" fitting install hand damper in branch duct.
Spin-in fitting w/ H.D.
6" min
Round Flex. on diffusers, square flex. on registers, size as required to equal diff. neck or register.
Ceiling diffuser or register
NOTE; IN AREAS WITH PLASTER CEILINGS USE "SPIN-IN" FITTINGS ONLY WITHOUT HAND DAMPERS
Supply main
"Spin-in" fitting
Flexible duct to diffuser or troffer (max. 6'-0")
Hand damper
Supply main
"Spin-in" fitting
Flex dia. equal to diffuser neck dia.
Rigid duct where run out exceeds 6'-0"
Hand damper

DIFFUSER CONNECTION DETAIL

SCALE: NONE

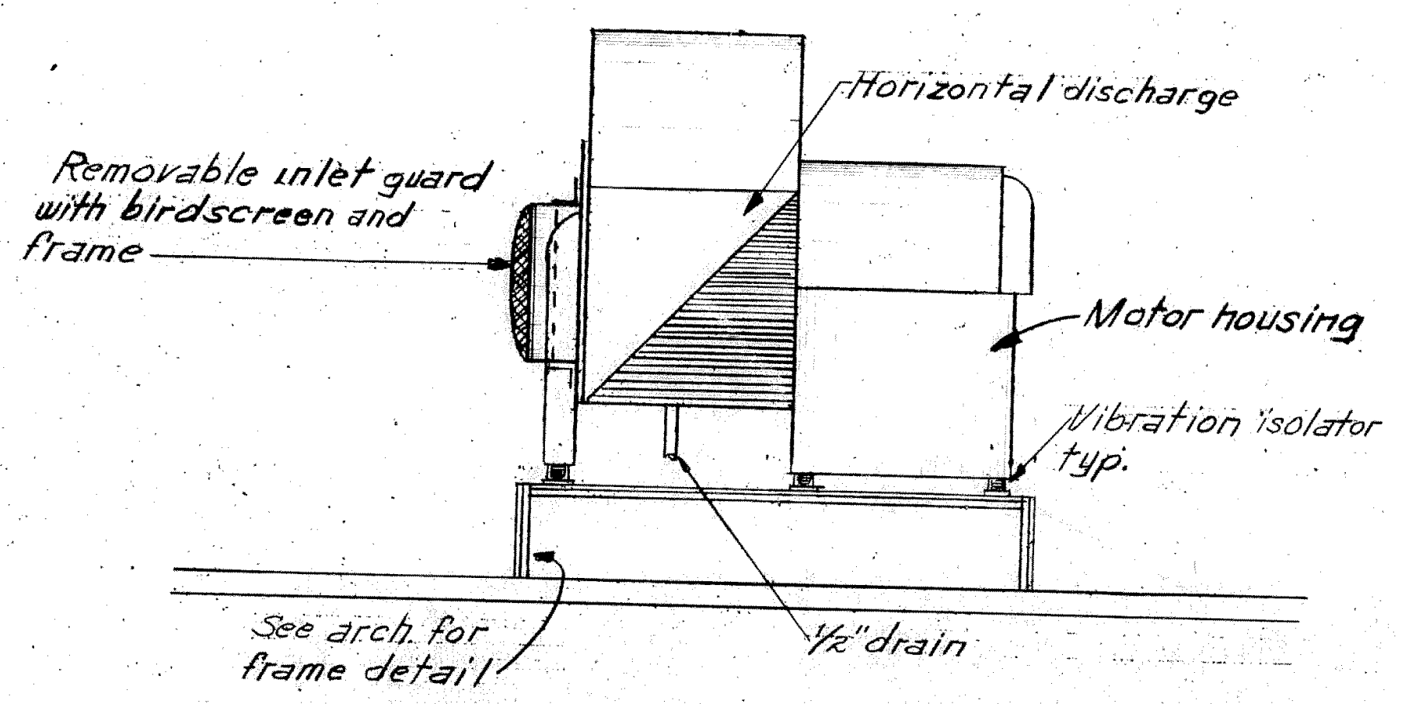
1/M-17


3/4" to float valve
1 1/4" quick fill
1/2" dilution
1 1/4"
2"
2"
1 1/2"
2"
1 1/2"
2 1/2"
F.D.
AIR FLOW
1" Rigid insulation
1 1/4" CW make-up, for continuation see plbg.
Spray pump

AIR WASHER SCHEMATIC

SCALE: NONE

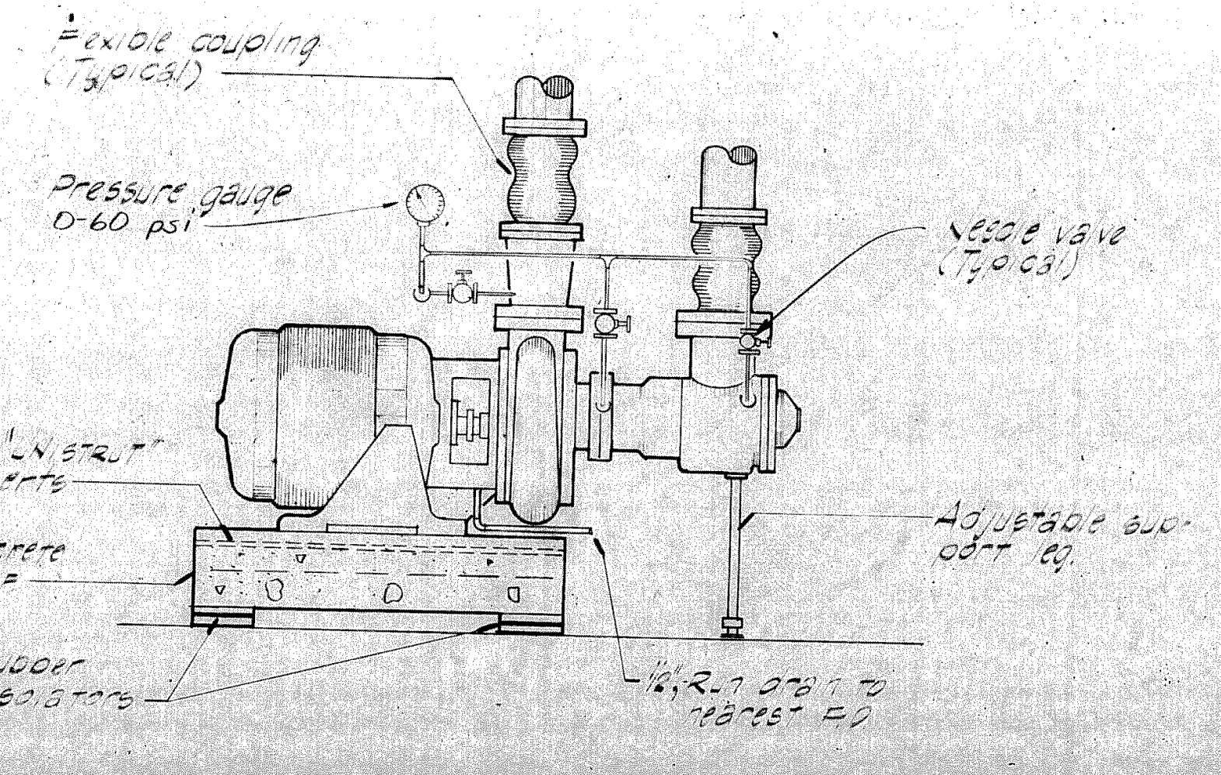
8/M-17


Horizontal discharge
Removable inlet guard with birdscreen and frame
Motor housing
Vibration isolator typ.
See arch. for frame detail
1/2" drain

OUTSIDE AIR FAN DETAIL

SCALE: NONE

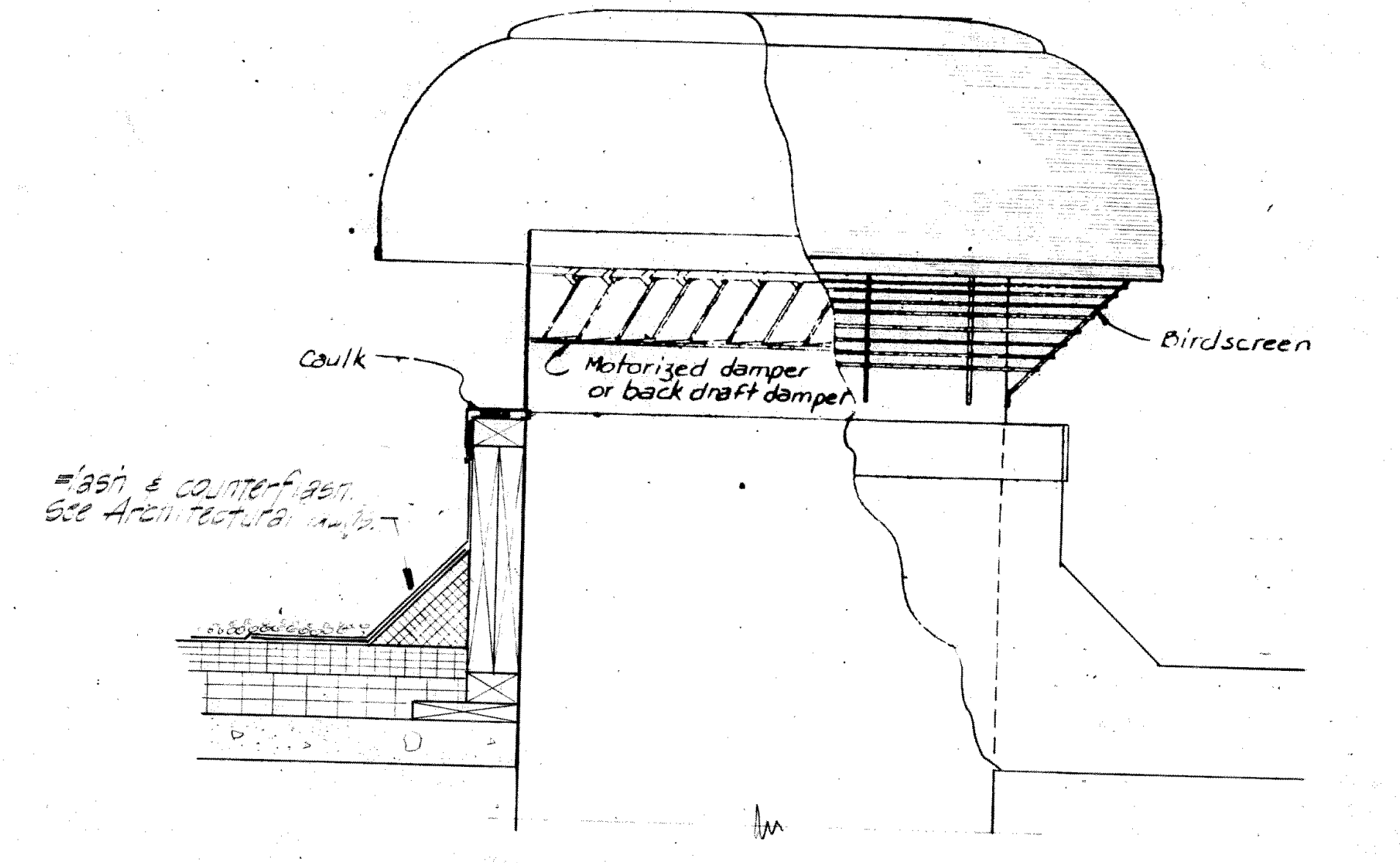
9/M-17


Flexible coupling (Typical)
Pressure gauge 0-60 psi
Needle valve (Typical)
Full length "Unistrut" P-3200 inserts
4" thick concrete pad w/ 4" WWF
Adjustable support leg
1" cork & rubber vibration isolators
1/2" drain to nearest FD

PUMP AND SUPPORT DETAIL

SCALE: NONE

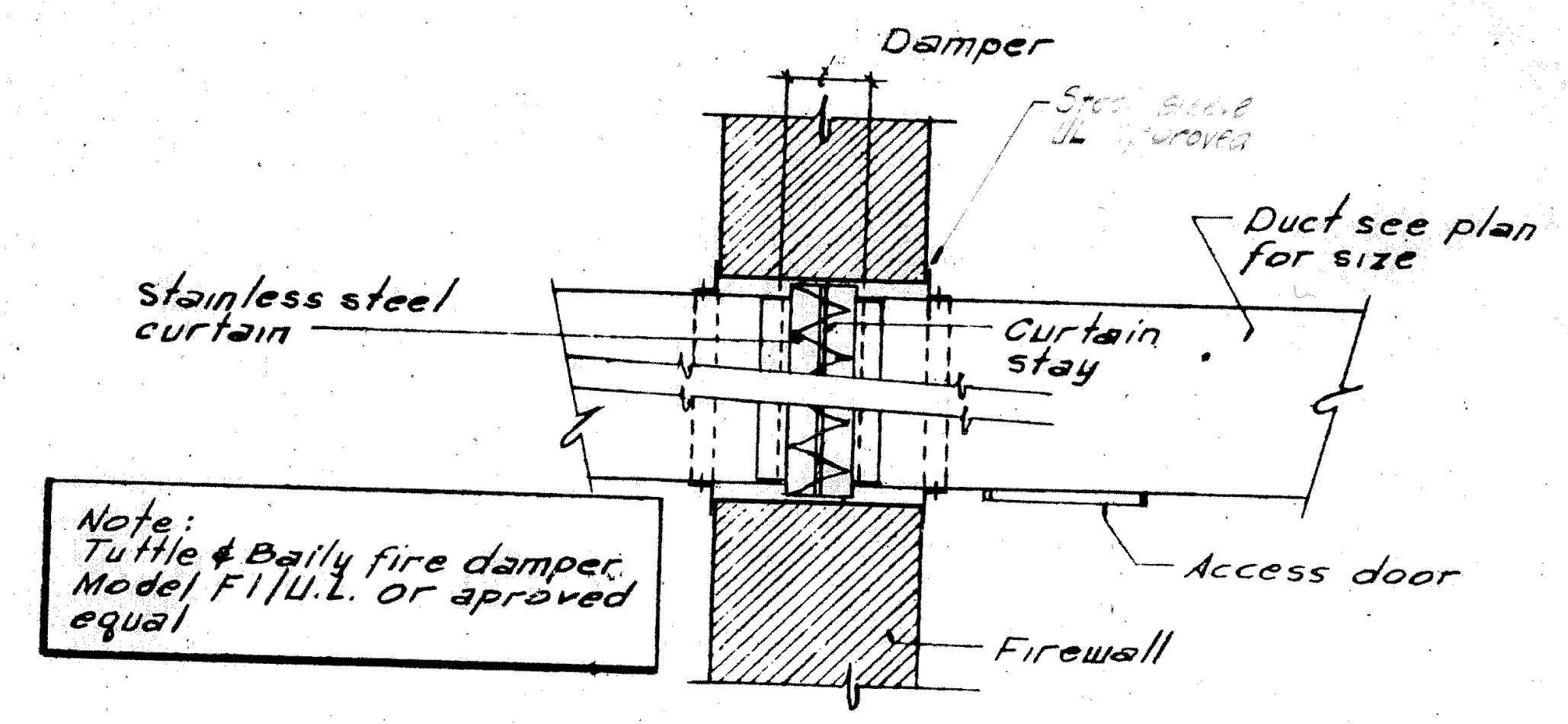
10/M-17


Caulk
Motorized damper or back draft damper
Birdscreen
Flash & counterflash See Architectural dwgs.

RELIEF VENT DETAIL

SCALE: NONE

2/V-17

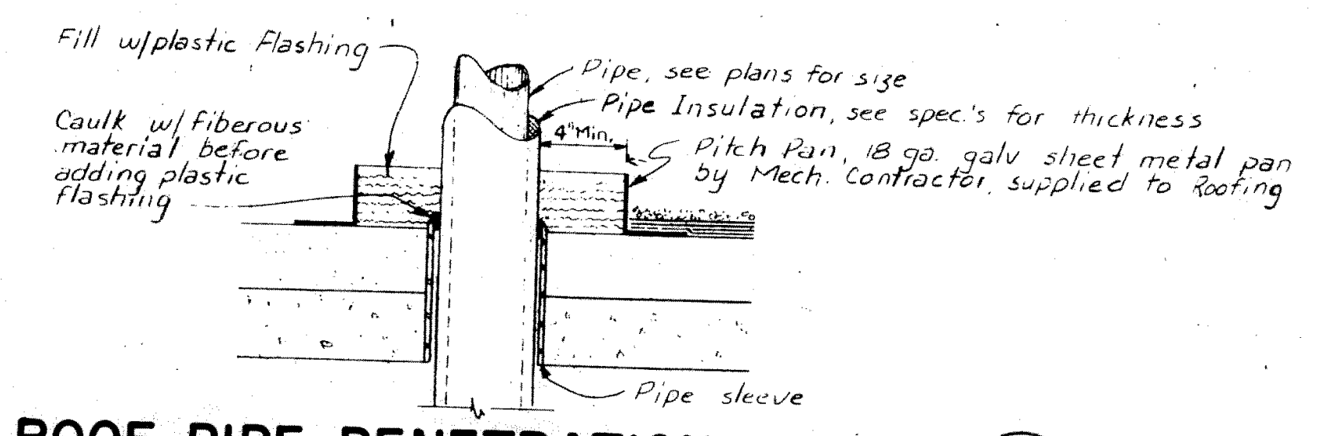

Damper
Steel sleeve UL approved
Duct see plan for size
Stainless steel curtain
Curtain stay
Access door
Firewall

Note:
Tuttle & Baily fire damper Model F1/U.L. or aproved equal

FIRE DAMPER DETAIL

SCALE: NONE

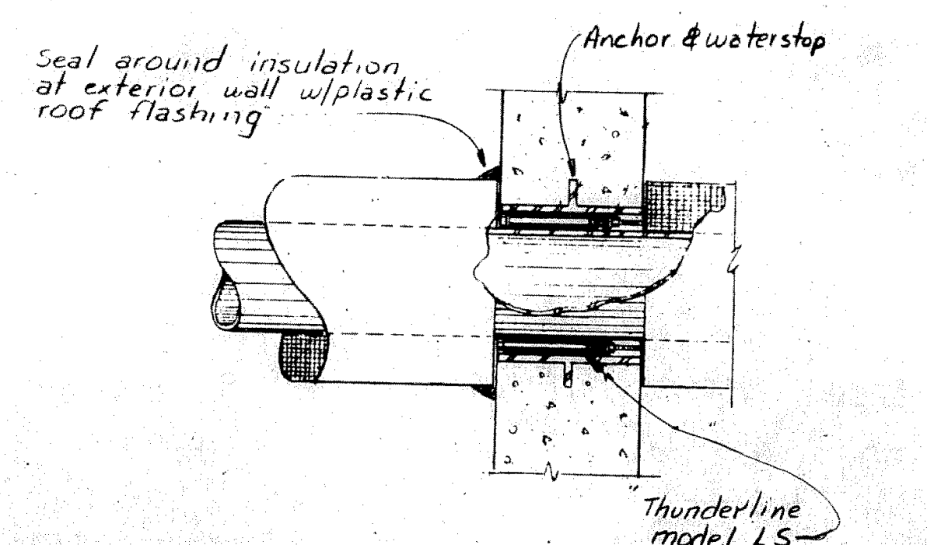
3/M-17


Fill w/ plastic Flashing
Pipe, see plans for size
Pipe Insulation, see spec.'s for thickness
Caulk w/ fiberous material before adding plastic flashing
4" Min.
Pitch Pan, 18 ga. galv sheet metal pan by Mech. Contractor, supplied to Roofing
Pipe sleeve

ROOF PIPE PENETRATION DETAIL

SCALE: NONE

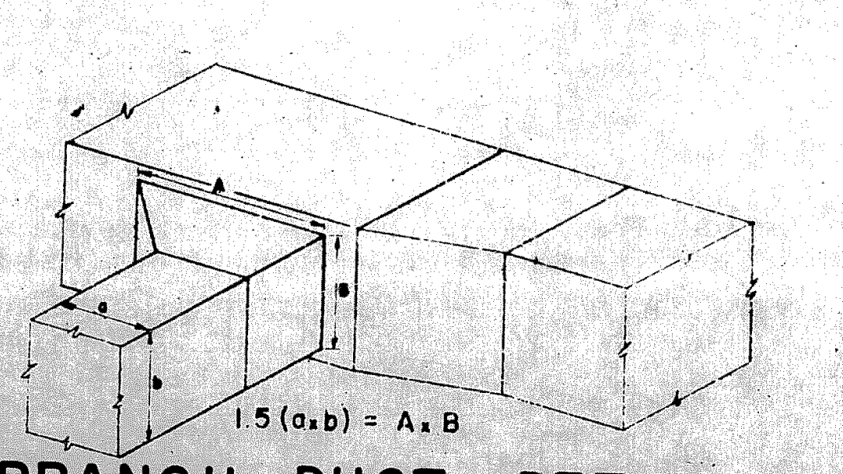
4/M-17


Seal around insulation at exterior wall w/ plastic roof flashing
Anchor & waterstop
Thunderline model LS

WALL PENETRATION DETAIL

SCALE: NONE

5/M-17


A
B
a
b
1.5 (a x b) = A x B

BRANCH DUCT DETAIL

SCALE: NONE

6/M-17

MORE
COMBS
BURCH

ArchitectsEngineersPlanners
A PROFESSIONAL CORPORATION
3911 East Exposition Avenue
Denver Colorado 80209
Area 303 744-3157

phase two facilities:
ARAPAHOE COMMUNITY COLLEGE
5900 South Sante Fe Drive, Littleton, Colorado 80120

state project no.
2136

drawing title
DETAILS

drawn by
B & P

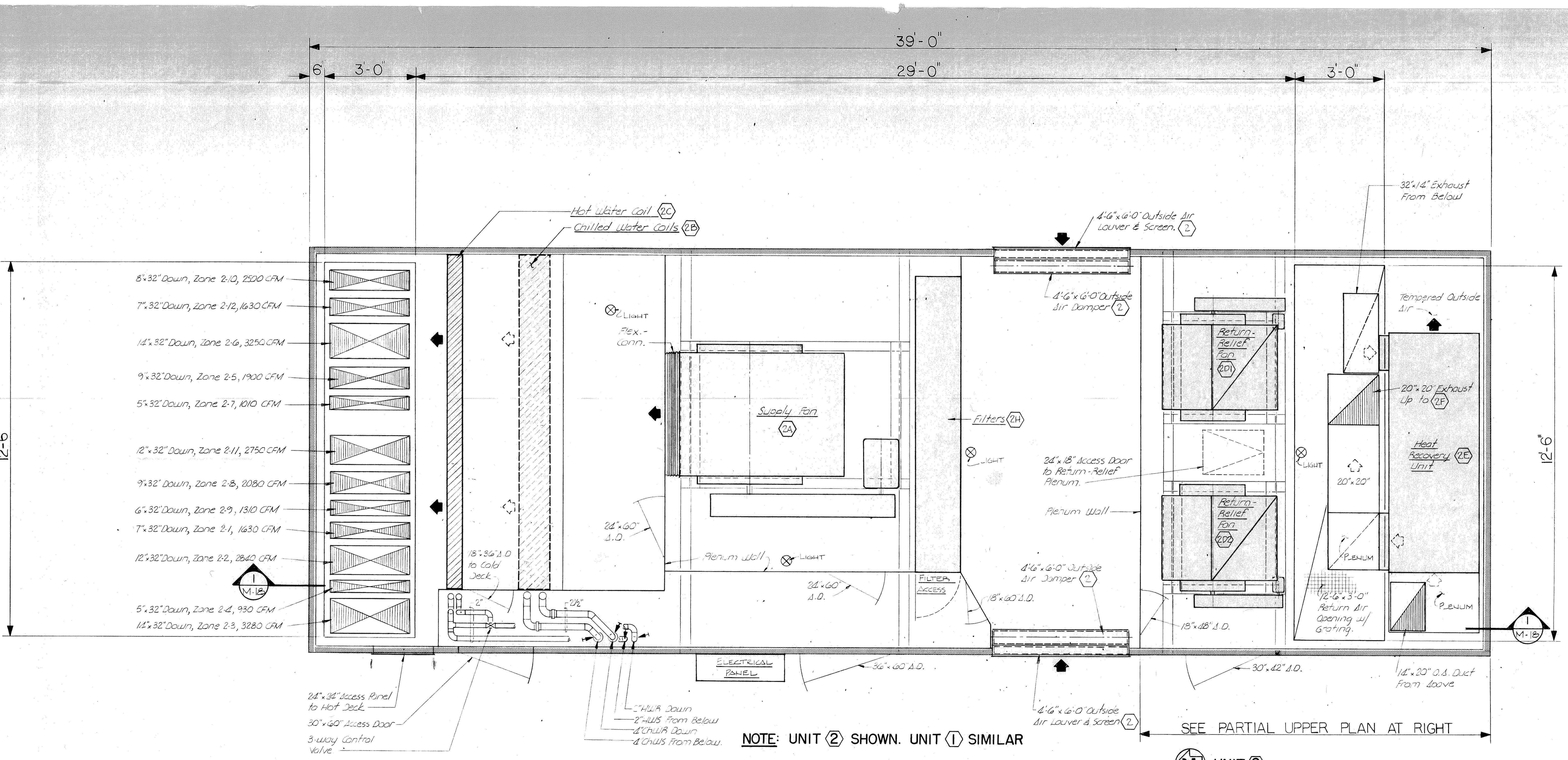
checked by
R.G.S.

date
5 AUG., 1976

revisions

m·c·b job no.
7510

sheet M 17 of
B P (B)


39'-0"
6
3-0
29'-0"
3'-0"
12'-6"
12'-6"
8"x32" Down, Zone 2-10, 2500 CFM
7"x32" Down, Zone 2-12, 1630 CFM
14"x32" Down, Zone 2-6, 3250 CFM
9"x32" Down, Zone 2-5, 1900 CFM
5"x32" Down, Zone 2-7, 1010 CFM
12"x32" Down, Zone 2-11, 2750 CFM
9"x32" Down, Zone 2-8, 2080 CFM
6"x32" Down, Zone 2-9, 1310 CFM
7"x32" Down, Zone 2-1, 1630 CFM
12"x32" Down, Zone 2-2, 2840 CFM
5"x32" Down, Zone 2-4, 930 CFM
14"x32" Down, Zone 2-3, 3280 CFM
1
M-18
Hot Water Coil 2C
Chilled Water Coils 2B
Light
Flex.-Conn.
24"x60" A.D.
18"x36" A.D to Cold Deck
2"
2½"
24"x24" Access Panel to Hot Deck
30"x60" Access Door
3-way Control Valve
2"HWR Down
2"HWS From Below
4"ChWR Down
4"ChWS From Below.
Supply Fan 2A
Plenum Wall
Light
Electrical Panel
36"x60" A.D.
Filter Access
Filters 2H
4'-6"x6'-0" Outside Air Louver & Screen. 2
4'-6"x6'-0" Outside Air Damper 2
Light
24"x18" Access Door to Return-Relief Plenum.
Plenum Wall
4'-6"x6'-0" Outside Air Damper 2
18"x60" A.D.
4'-6"x6'-0" Outside Air Louver & Screen 2
Return-Relief Fan 2D1
Return-Relief Fan 2D2
18"x48" A.D.
30"x42" A.D.
32"x14" Exhaust From Below
Tempered Outside Air
20"x20" Exhaust Up to 2F
Light
20"x20"
Heat Recovery Unit 2E
Plenum
Plenum
12'-6"x3'-0" Return Air Opening w/ Grating.
14"x20" O.A. Duct From Above
1
M-18
SEE PARTIAL UPPER PLAN AT RIGHT

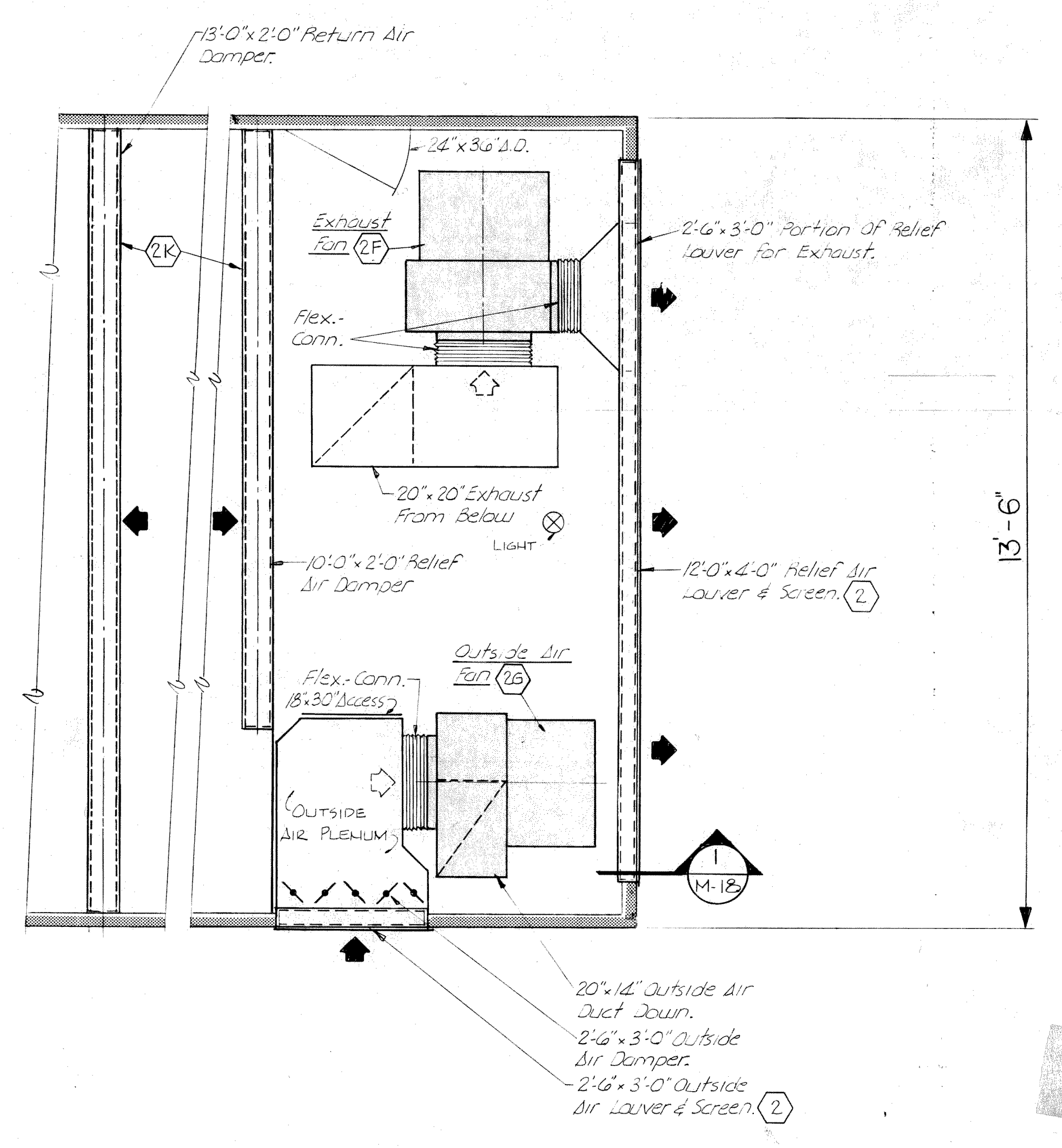
NOTE: UNIT 2 SHOWN. UNIT 1 SIMILAR

CENTRAL ROOF-MOUNTED PACKAGED UNITS 1 & 2

SCALE: 1/2" =1'-0"

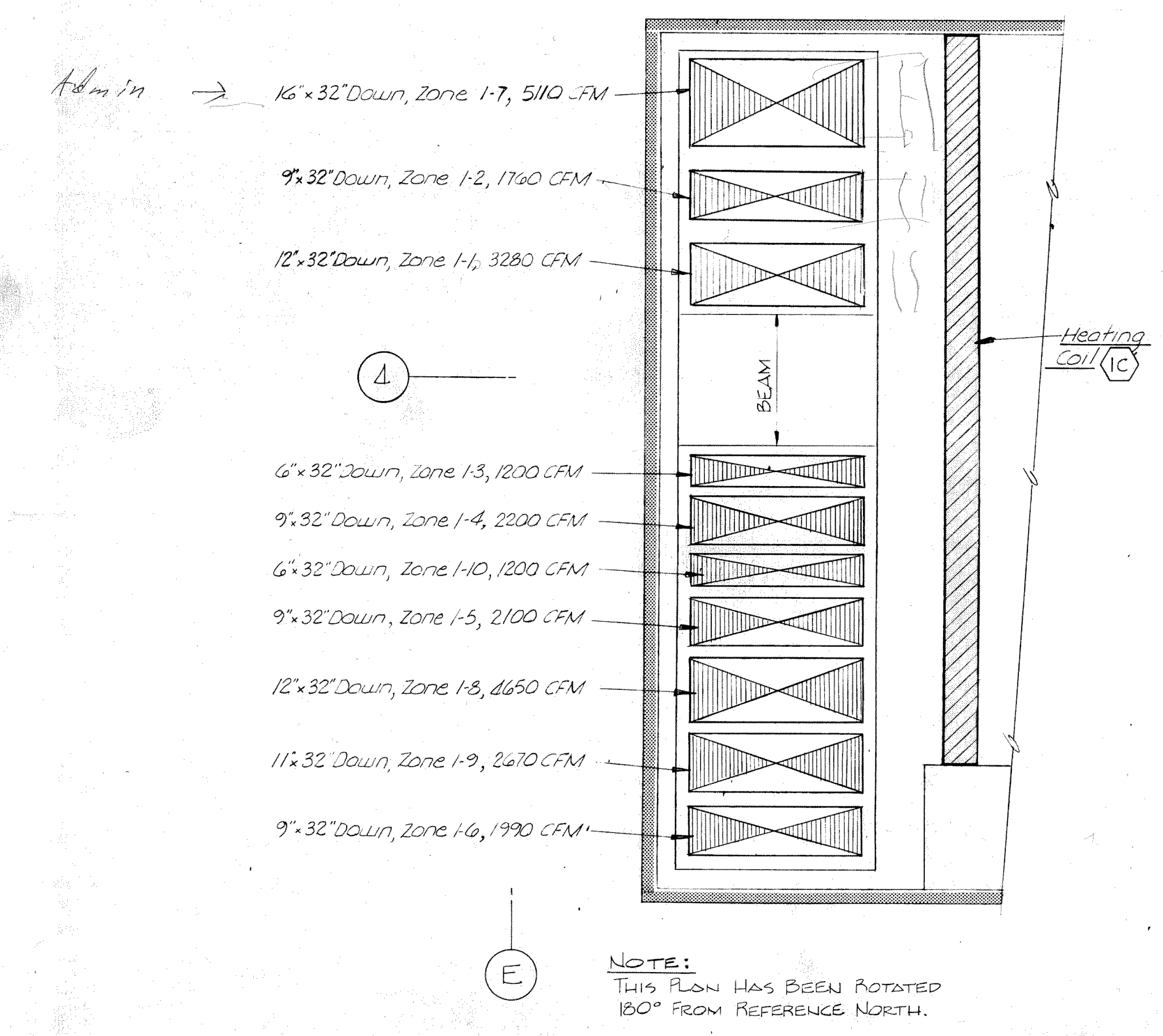
N -UNIT 2

N -UNIT 1


13'-0"x2'-0" Return Air Damper.
12'-6"
2K
24"x36" A.D.
Exhaust Fan 2F
2'-6"x3'-0" Portion Of Relief Louver for Exhaust.
Flex.-Conn.
20"x20" Exhaust From Below
Light
10'-0"x2'-0" Relief Air Damper
12'-0"x4'-0" Relief Air Louver & Screen. 2
13'-6"
Outside Air Fan 2G
Flex.-Conn.
18"x30" Access
Outside Air Plenum
1
M-18
20"x14" Outside Air Duct Down.
2'-6"x3'-0" Outside Air Damper.
2'-6"x3'-0" Outside Air Louver & Screen. 2

PARTIAL UPPER PLAN

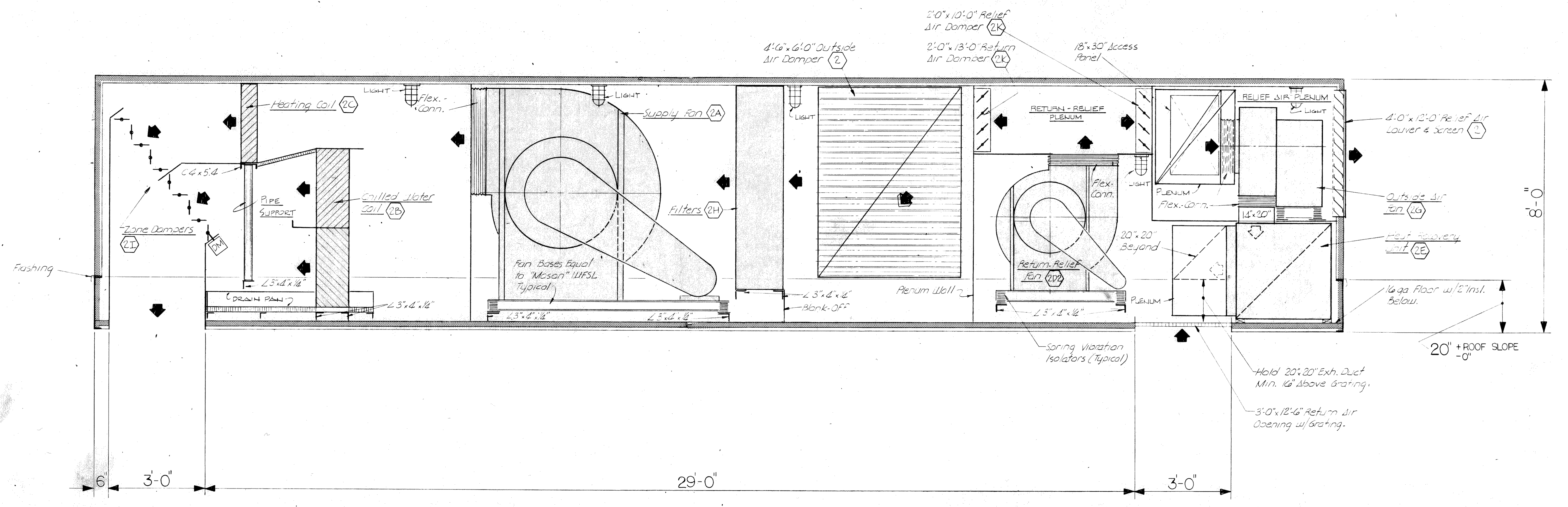
SCALE: 1/2"=1'-0"


Admin →
16"x32" Down, Zone 1-7, 5110 CFM
9"x32" Down, Zone 1-2, 1760 CFM
12"x32" Down, Zone 1-1, 3280 CFM
4
BEAM
Heating Coil 1C
6"x32" Down, Zone 1-3, 1200 CFM
9"x32" Down, Zone 1-4, 2200 CFM
6"x32" Down, Zone 1-10, 1200 CFM
9"x32" Down, Zone 1-5, 2100 CFM
12"x32" Down, Zone 1-8, 4650 CFM
11"x32" Down, Zone 1-9, 2670 CFM
9"x32" Down, Zone 1-6, 1990 CFM
E

NOTE:
THIS PLAN HAS BEEN ROTATED
180° FROM REFERENCE NORTH.

PARTIAL PLAN-UNIT 1 ZONE LAYOUT

SCALE: 1/2"=1'-0"


Light
Flex.-Conn.
Light
Heating Coil 2C
Supply Fan 2A
C4x5.4
Pipe Support
Chilled Water Coil 2B
Zone Dampers 2I
DM
Flashing
∠3"x4"x¼"
Drain Pan
∠3"x4"x¼"
Fan Bases Equal to "Mason" WFSL Typical
∠3"x4"x¼"
∠3"x4"x¼"
Filters 2H
∠3"x4"x¼"
Blank-Off
4'-6"x6'-0" Outside Air Damper 2
Light
2'-0"x10'-0" Relief Air Damper 2K
2'-0"x13'-0" Return Air Damper 2K
18"x30" Access Panel
Return - Relief Plenum
Plenum Wall
Flex-Conn.
Return-Relief Fan 2D2
∠3"x4"x¼"
Spring Vibration Isolators (Typical)
Light
Plenum
Flex.-Conn.
14"x20"
20"x20" Beyond
Plenum
Relief Air Plenum
Light
4'-0"x12'-0" Relief Air Louver & Screen 2
Outside Air Fan 2G
Heat Recovery Unit 2E
8'-0"
16 ga Floor w/2" Insl. Below.
20" +Roof Slope -0"
Hold 20"x20" Exh. Duct Min. 16" Above Grating.
3'-0"x12'-6" Return Air Opening w/Grating.
6"
3'-0"
29'-0"
3'-0"

NOTE:
MINIMUM HEIGHT OF CURB
BASE FOR ROOF-TOP UNITS
1 2 3 4 5 6 7 & 12 SHALL BE 20"
AND TOP OF CURB BASE SHALL
BE LEVEL WHEN INSTALLED ON ROOF.

SECTION 1/M-18

SCALE: 1/2"=1'-0"

GENERAL NOTES:

1. Each individual chamber shall be sealed air-tight from all other chambers except at designated air entry and discharge points.
2. Each chamber shall have a floor of 16 gauge galvanized steel over two inch thick rigid insulation and shall be sealed watertight. The floor may slope with roof or be level.
3. Flash around all interior partitions at the floor to provide a watertight seal between chambers.
4. Top of nominal 20" high equipment base shall be level. (20" min. height)
5. Provide 3" x 3", 16-gauge galvanized steel angle around supply, exhaust, and return air ducts at floor penetrations and seal watertight. Attach to floor and duct with sheetmetal screws at 12"o. c.

MORE
COMBS
BURC

ArchitectsEngineersPlanners
A PROFESSIONAL CORPORATION
3911 EastExpositionAvenue
DenverColorado80209
Area303 744-3157

phase two facilities:
ARAPAHOE
COMMUNITY
COLLEGE
5900 South Sante Fe Drive, Littleton, Colorado 80120

state project no.
2136

drawing title
ROOFTOP
UNIT
PLANS
AND
SECTIONS

tracing key

☐	A	B	C	D	E	F
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
21						
22						
23						
24						
25						
26						
31						
32						
33						
34						

drawn by
M.S.
checked by
RGS
date
5 AUG., 197
revisions

mcb jo
7510
sheet
M
18