

ANNEX "B"

REFERENCE DRAWINGS – EXISTING BUILDING - MECHANICAL

LEGEND AND SYMBOLS

PLUMBING AND DRAINAGE		PIPING	VALVES, FITTINGS AND SPECIALTIES	HEATING, VENTILATION AND AIR CONDITIONING	CONTROLS - GENERAL SYMBOLS
 SANITARY DRAIN-BELOW GRADE  STORM DRAIN-ABOVE GRADE  DOMESTIC COLD WATER  DOMESTIC HOT WATER  FLOOR DRAIN (LETTER INDICATES TYPE-SEE SPECS.)  ROOF DRAIN (CONVENTIONAL)  HOSE BIB  WALL HYDRANT - NON-FREEZE  PITCH-INDICATES DOWN SLOPE  CLEANOUT - ABOVE GRADE  CLEANOUT - ABOVE GRADE  CLEANOUT - BELOW GRADE  CLEANOUT - BELOW GRADE  WATER CLOSET (WALL MT'D, FLUSH VALVE)  URINAL (WALL HUNG, FLUSH VALVE)  LAVATORY (COUNTER TOP)  SERVICE SINK  DRINKING FOUNTAIN COOLER  EYE WASH		 NATURAL GAS  COMPRESSED AIR  DIRECTION OF FLOW  GLYCOL FIRE PROTECTION  FIRE MAINS  SPRINKLER FEED MAINS  SUPERVISED VALVE  FLOW ALARM CHECK VALVE  FIRE DEPARTMENT CONNECTION  FIRE HOSE CABINET (FHC) RECESSED	 GATE VALVE  GLOBE VALVE  PLUG VALVE  BUTTERFLY VALVE  BALL VALVE  SWING CHECK VALVE  PRESSURE REDUCING VALVE  PUMP  ELBOW TURNED TOWARD  ELBOW TURNED AWAY  TEE TURNED AWAY  TEE TURNED TOWARD  CONCENTRIC REDUCER  ECCENTRIC REDUCER  Y-TYPE STRAINER  UNION  THERMOMETER-STEM TYPE PRESSURE GAUGE AND COCK  QUICK CONNECTION FITTING  WATER METER	 DUCTWORK (RECTANGULAR)  DUCTWORK (ROUND)  ACOUSTIC DUCT INSULATION - INTERNAL  FIRE DAMPER  OPPOSED BLADE DAMPER  PARALLEL BLADE DAMPER  BUTTERFLY DAMPER  TURNING VANES  VOLUME EXTRACTOR  DOOR GRILLE  FLEXIBLE DUCT - SINGLE LINE  BALANCING DAMPER REGISTERS AND GRILLES TYPE SIZE (mm) AIR FLOW L/S SA-300 X 200-450 DEFLECTORS TYPE THROAT SIZE (mm) AIR FLOW L/S DA-1000-450	 THREE-WAY CONTROL VALVE-ELECTRIC  ELECTRIC ACTUATOR  THERMOSTAT
EQUIPMENT IDENTIFICATION					
 AIR CONDITIONING UNIT  HEATING AND VENTILATION UNIT  UNIT HEATER  EXHAUST FAN  AIR COMPRESSOR  WATER HEATER  MAKE UP AIR UNIT ITEM UNIT COUNTER					
ABBREVIATIONS					
B.O.P. EL. BOTTOM OF PIPE ELEVATION B.O.D. EL. BOTTOM OF DUCT ELEVATION INV. EL. INVERT ELEVATION CW DOMESTIC COLD WATER RWL RAIN WATER LEADER C.O. CLEANOUT O.A. OUTSIDE AIR E.A. EXHAUST AIR S.A. SUPPLY AIR R.A. RETURN AIR O.B.B. OPPOSED BLADE BALANCING N.O. NORMALLY OPEN N.C. NORMALLY CLOSED B.F.F. BELOW FINISH FLOOR A.F.F. ABOVE FINISH FLOOR					



Giffels Associates Limited

Consulting Engineers and Architects

GIFFELS PROJECT NO. C91200

REGISTERED PROFESSIONAL ENGINEER

P. C. GINGIBE

DATE OF REGISTRATION

DETAIL NUMBER

LOCATION

SHEET

DETAIL NO.'s

SCALE: ECHELLE

1: 1

PROJECT: CFB BORDEN, BORDEN, ONTARIO.

NEW WELDING SCHOOL BUILDING NO. A-253

CFB BORDEN

BORDEN, ONTARIO.

TRADE: MECHANICAL

DATE: 93-06-01

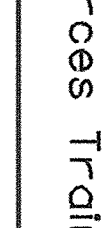
SUBJECT: SUELT

LEGEND AND SYMBOLS

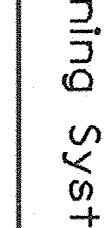
PRODUCTION

CONCURRENCE-ASSENTIMENT

DESIGNED: D. GINGIBE

ETUDE: 

DRAWN: J.S. MAIN

DESIGN: 

CHECKED: D. GINGIBE

VERIFIE: 

5500 GTFSHO

FRANÇOIS G. GINGIBE

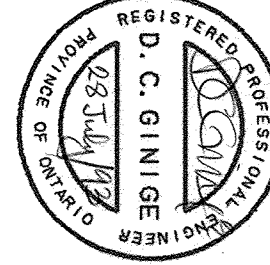
DWG. DESIGN NO. T-8147-8983-401

SHEET NO. OF



FOR
REFERENCE
ONLY

NO.	DATE	REVISION	REVISION	APPROVED



DETAIL SYMBOL
DETAIL NUMBER
LOCATION
SHEET
DETAIL NO.'s

HEAT RECOVERY MAKE-UP AIR UNIT SCHEDULE (MAU) - INDIRECT GAS FIRED															
GENERAL DATA				SUPPLY AIR FAN				HEAT RECOVERY COIL							
MARK NO.	SERVICE	LOCATION	CAPACITY (L/S)	FAN			MOTOR	INDIRECT GAS FIRED SECTION				FILTER			
				E.S.P. (Pa)	BW	RPM		WHEEL DIA (mm)	TYPE	kW	RPM	NAME PLATE V/PH/Hz	VIBRATION ISOLATION	ROWS	FINS PER CM
MAU-1	WELDING BOOTH MAKE UP AIR HEAT RECOVERY	ROOF	15.576	150	26.8	1090	26686	DOUBLE INLET B.I. AIRFOIL	29.84	1750	575/3/60	OPEN SPRING	6	4.4	50% ETHYLENE GLYCOL BY WT
MAU-2	WELDING BOOTH MAKE UP AIR HEAT RECOVERY	ROOF	16.982	150	35.8	1145	26686	DOUBLE INLET B.I. AIRFOIL	37.3	1750	575/3/60	OPEN SPRING	6	4.4	50% ETHYLENE GLYCOL BY WT

EXHAUST FAN SCHEDULE (EF)															
GENERAL DATA				EXHAUST AIR FAN				HEAT RECOVERY COIL							
MARK NO.	SERVICE	LOCATION	CAPACITY (L/S)	FAN			MOTOR	HEAT RECOVERY COIL				FILTER			
				E.S.P. (Pa)	BW	RPM		WHEEL DIA (mm)	TYPE	kW	RPM	NAME PLATE V/PH/Hz	VIBRATION ISOLATION	ROWS	FINS PER CM
EF-1	HEAT RECOVERY EXHAUST	ROOF	15.576	450	16.78	750	927	DOUBLE INLET B.I. AIRFOIL	18.65	1750	575/3/60	OPEN SPRING	6	3	50% ETHYLENE GLYCOL BY WT
EF-2	HEAT RECOVERY EXHAUST	ROOF	16.982	450	22.38	820	1016	DOUBLE INLET B.I. AIRFOIL	29.84	1750	575/3/60	OPEN SPRING	6	3	50% ETHYLENE GLYCOL BY WT
EF-3	HEAT RECOVERY EXHAUST	ROOF	1.416	300	0.63	1558	419	SINGLE INLET CENTRIFUGAL	1.5	1750	575/3/60	OPEN SPRING	-	-	-
EF-4	CARBON DIOXIDE EXHAUST	ROOF	1.180	32	0.38	1440	-	UPBLAST CENTRIFUGAL	0.56	1750	575/3/60	-	-	-	-
EF-5	GENERAL EXHAUST PREP. AREA	ROOF	448	188	0.19	1585	-	CENTRIFUGAL	0.25	1750	120/1/60	-	-	-	-
EF-6	WASHROOM EXHAUST	ROOF	660	63	0.15	1315	-	ROOF CENTRIFUGAL	0.25	1750	120/1/60	-	-	-	-

AIR CONDITIONING UNIT SCHEDULE (AC)															
GENERAL DATA				SUPPLY AIR FAN				COOLING COIL							
MARK NO.	SERVICE	LOCATION	CAPACITY (L/S)	FAN			MOTOR	AIR SIDE				NAT. GAS HEATER SECTION			
				E.S.P. (Pa)	BW	RPM		WHEEL DIA (mm)	kW	RPM	NAME PLATE V/PH/Hz	TOTAL CAPACITY (kW)	COOLING MED. U/W	MINIMUM FLOW (L/S)	EVAP. TEMP. (°C)
AC-1	CLASSROOM 101	ROOF	480	150	0.2	860	-	0.25	1750	575/3/60	10.6	R22	0.39	19.4	35

HEATING AND VENTILATING UNIT SCHEDULE (HV) - INDIRECT GAS FIRED															
GENERAL DATA				SUPPLY AIR FAN				INDIRECT GAS FIRED SECTION							
MARK NO.	SERVICE	LOCATION	CAPACITY (L/S)	FAN			MOTOR	INDIRECT GAS FIRED SECTION				FILTER			
				E.S.P. (Pa)	BW	RPM		WHEEL DIA (mm)	kW	RPM	NAME PLATE V/PH/Hz	VIBRATION ISOLATION	GAS INPUT TEMP. (°C)	ENT. LEAV. TEMP. (°C)	AVERAGE EFF. %
HV-1	CLASSROOM HEATING AND VENT. UNIT	ROOF	1.216	150	0.9	1500	300	2.2	1750	575/3/60	OPEN SPRING	34.5	51.3	41.0	1.7
HV-2	PREPARATION AREA HTG. AND VENT. UNIT	ROOF	4.720	375	7.5	1080	457	11.2	1750	575/3/60	OPEN SPRING	34.5	366	293	-23

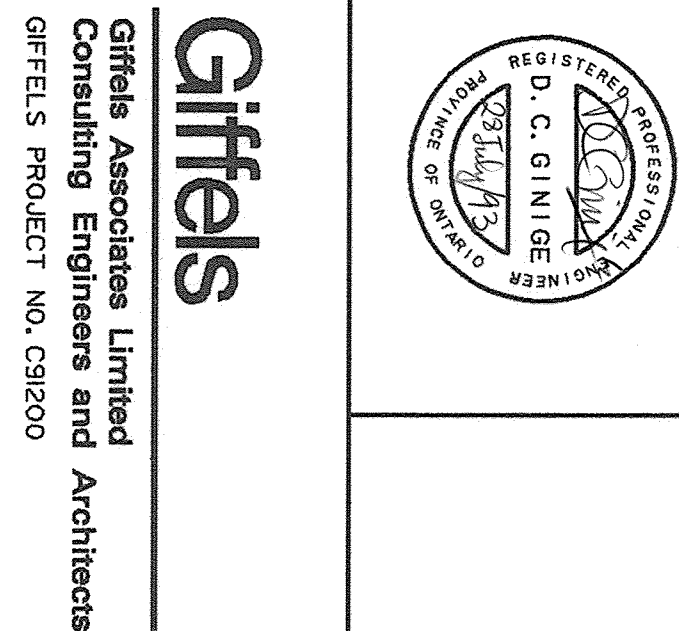
DIFFUSER AND GRILLE SCHEDULE					
GENERAL DATA			AIR FLOW L/S	NECK DIA mm	MODULE SIZE mm
MARK NO.	SERVICE	LOCATION			
DA	SUPPLY	WORKSHOP	650	480	1029
DD	SUPPLY	OFFICE	VARIES	VARIES	600-600
SA	SUPPLY	LOBBY, TOOL CRIB COMPRESSOR ROOM	VARIES	-	F22.30AB-13
RA	EXHAUST/RETURN	WASHROOMS, JANITOR	VARIES	-	F60.30A
RC	RETURN	OFFICE, CLASSROOM	VARIES	-	TR-80

UNIT HEATER SCHEDULE (UH)															
GENERAL DATA				SUPPLY AIR FAN				NAT. GAS HEATER SECTION							
MARK NO.	SERVICE	LOCATION	CAPACITY (L/S)	FAN			MOTOR	NAT. GAS HEATER SECTION				REMARKS			
				E.S.P. (Pa)	BW	RPM		INPUT (kW)	OUTPUT (kW)	TEMP. RISE °C	FLUE DIA (mm)	INLET GAS PRESSURE (kPa)	KEEPERITE MODEL KUHA-45 C/W GAS PRESS. REDUCING VALVE	KEEPERITE MODEL KUHB-100 C/W GAS PRESS. REDUCING VALVE	KEEPERITE MODEL KUHB-100 C/W GAS PRESS. REDUCING VALVE
UH-1	HEATING	ABOVE WELD BOOTH	377.5	25	-	1050	0.03	1050	120/1/60	13.2	10.7	23.3	100	34.5	100
UH-2	DOOR HEATERS	PREP. AREA	566	25	-	0.18	1725	120/1/60	29.3	23.4	34.4	100	34.5	100	100

WATER HEATER SCHEDULE (HT) - GAS FIRED															
GENERAL DATA				CAPACITY				WATER SIDE				GAS SIDE			
MARK NO.	SERVICE	LOCATION	INPUT kW	OUTPUT kW	DESIGN PRESS. (kPa)	TEMP. RISE (°C)	DESIGN PRESS. (kPa)	INPUT (kW)	OUTPUT (kW)	TEMP. RISE °C	FLUE DIA (mm)	INLET GAS PRESSURE (kPa)	KEEPERITE MODEL KUHA-45 C/W GAS PRESS. REDUCING VALVE	KEEPERITE MODEL KUHB-100 C/W GAS PRESS. REDUCING VALVE	KEEPERITE MODEL KUHB-100 C/W GAS PRESS. REDUCING VALVE
HT-1	DOM. WATER HEATERS	MECH. ROOM	45.7	35.0	1034	56	34.5	4.4	PRESSURE REDUCING VALVE						

AIR COMPRESSOR SCHEDULE (C)															
GENERAL DATA				CAPACITY				DISCHARGE				REMARKS			
MARK NO.	SERVICE	LOCATION	DESIGN PRESS. (kPa)	TEMP. RISE (°C)	FLUE DIA (mm)	INLET GAS PRESSURE (kPa)	KEEPERITE MODEL KUHA-45 C/W GAS PRESS. REDUCING VALVE	KEEPERITE MODEL KUHB-100 C/W GAS PRESS. REDUCING VALVE	KEEPERITE MODEL KUHB-100 C/W GAS PRESS. REDUCING VALVE	KEEPERITE MODEL KUHB-100 C/W GAS PRESS. REDUCING VALVE	KEEPERITE MODEL KUHB-100 C/W GAS PRESS. REDUCING VALVE	KEEPERITE MODEL KUHB-100 C/W GAS PRESS. REDUCING VALVE	KEEPERITE MODEL KUHB-100 C/W GAS PRESS. REDUCING VALVE	KEEPERITE MODEL KUHB-100 C/W GAS PRESS. REDUCING VALVE	KEEPERITE MODEL KUHB-100 C/W GAS PRESS. REDUCING VALVE
C-1	COMPRESSED AIR FOR ORTHODONTICS & CUTTERS	COMPRESSOR ROOM	36.3	793	14.9	575/3/60	AIR RECEIVER AND REGENERATED AIR DRYER								

FOR
REFERENCE
ONLY



Giffels Associates Limited
Consulting Engineers and Architects
GIFTELS PROJECT NO. C8000

SCALE: SHEET 1 : 1

PROJECT: PROJECT CFB BORDEN, BORDEN, ONTARIO.

NEW WELDING SCHOOL BUILDING NO. A-253 CFB BORDEN BORDEN, ONTARIO.

TRADE: MECHANICAL DATE: 93-06-01

SUBJECT: EQUIPMENT SCHEDULES

DESIGNED: D. GINJIB

CHECKED: D. GINJIB

PROJECT: PROJECT CFB BORDEN, BORDEN, ONTARIO.

Canada

LOCATION

FOR
REFERENCE
ONLY



DETAIL SYMBOL
LOCATION
SECTION
DETAIL
DETAIL NO.'s

Giffels

Giffels Associates Limited
Consulting Engineers and Architects
GIFTELS PROJECT NO. C9200

SCALE: SHEET
1:100

PROJECT: PROJECT
CFB BORDEN, BORDEN, ONTARIO.

NEW WELDING SCHOOL
BUILDING NO. A-253
CFB BORDEN
BORDEN, ONTARIO.

TRADE-METER	DATE
MECHANICAL	93-06-01

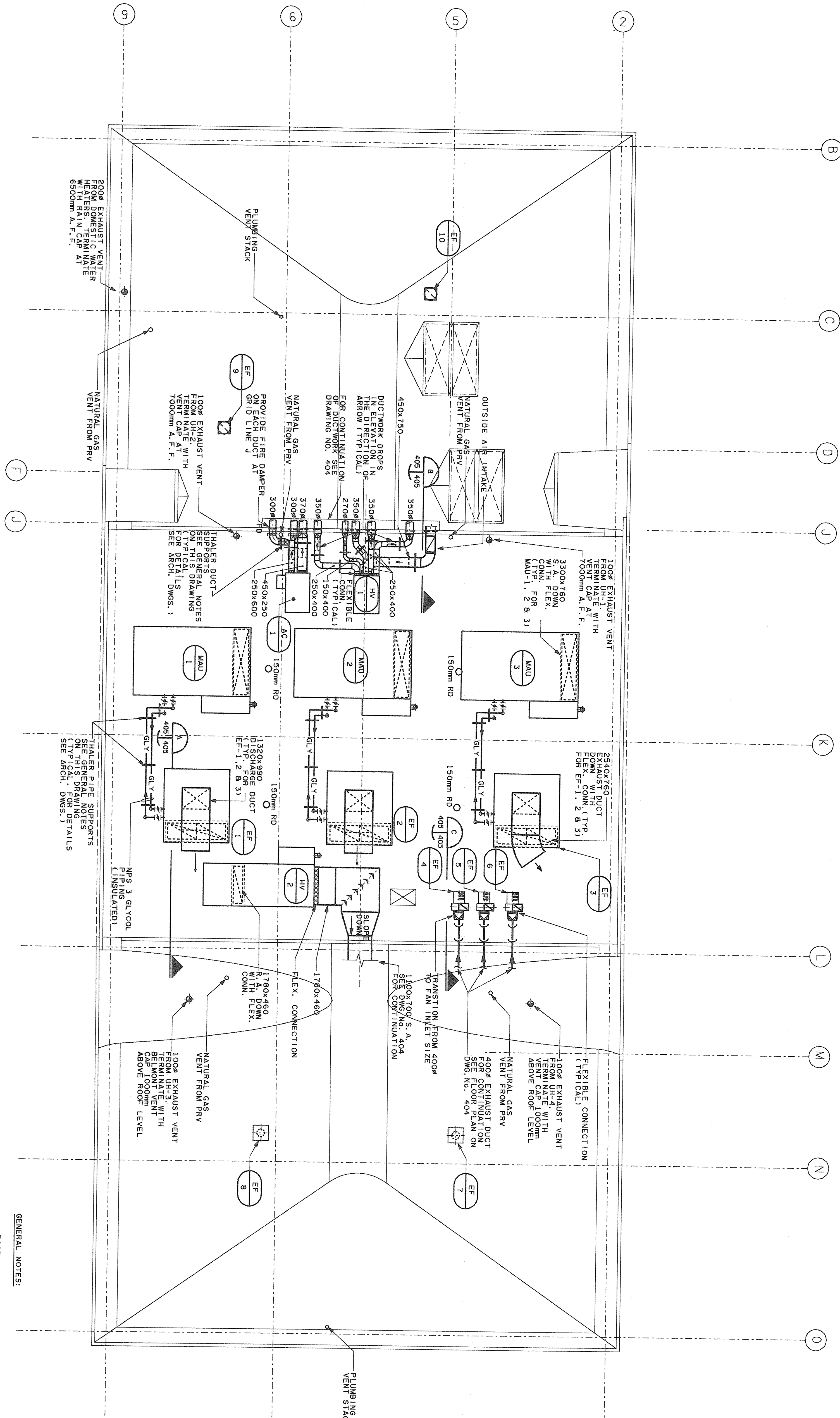
SUBJECT: SUBJECT
ROOF PLAN
PLUMBING AND H. V. A. C.

PRODUCTION

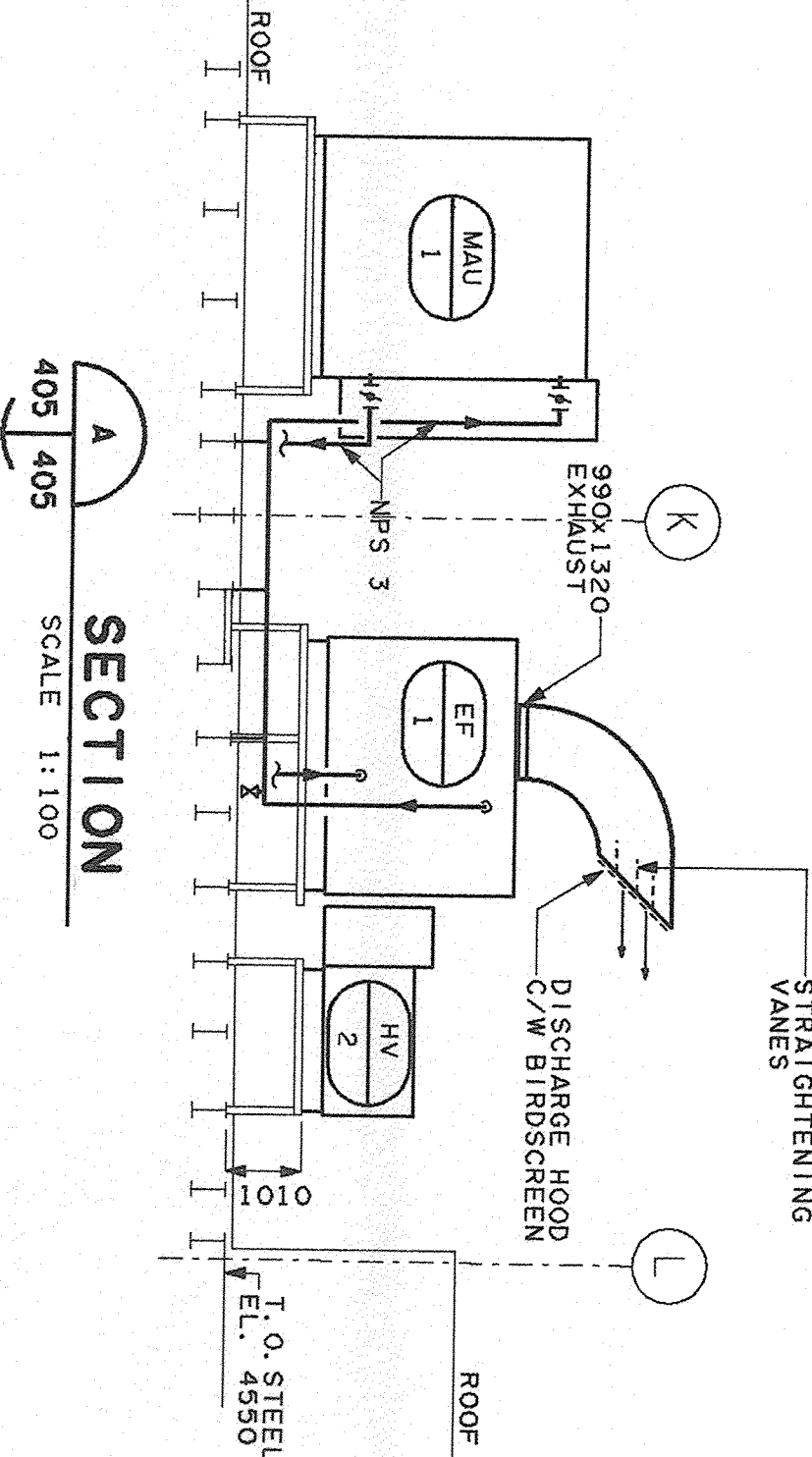
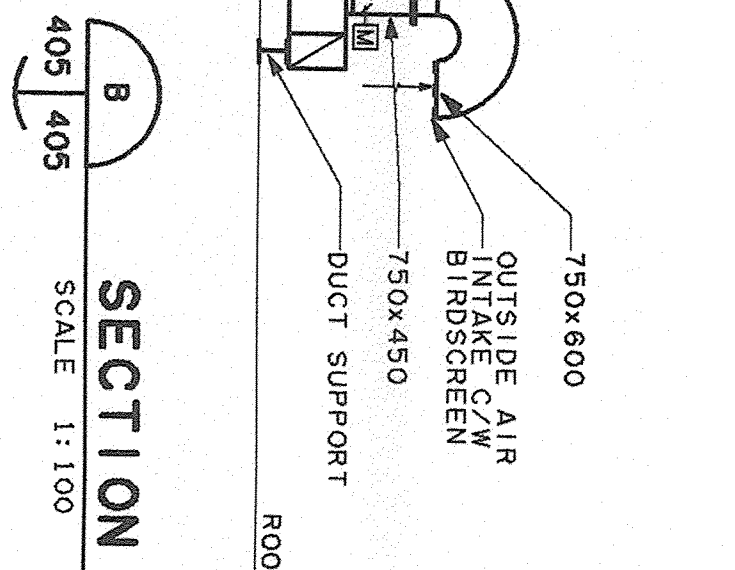
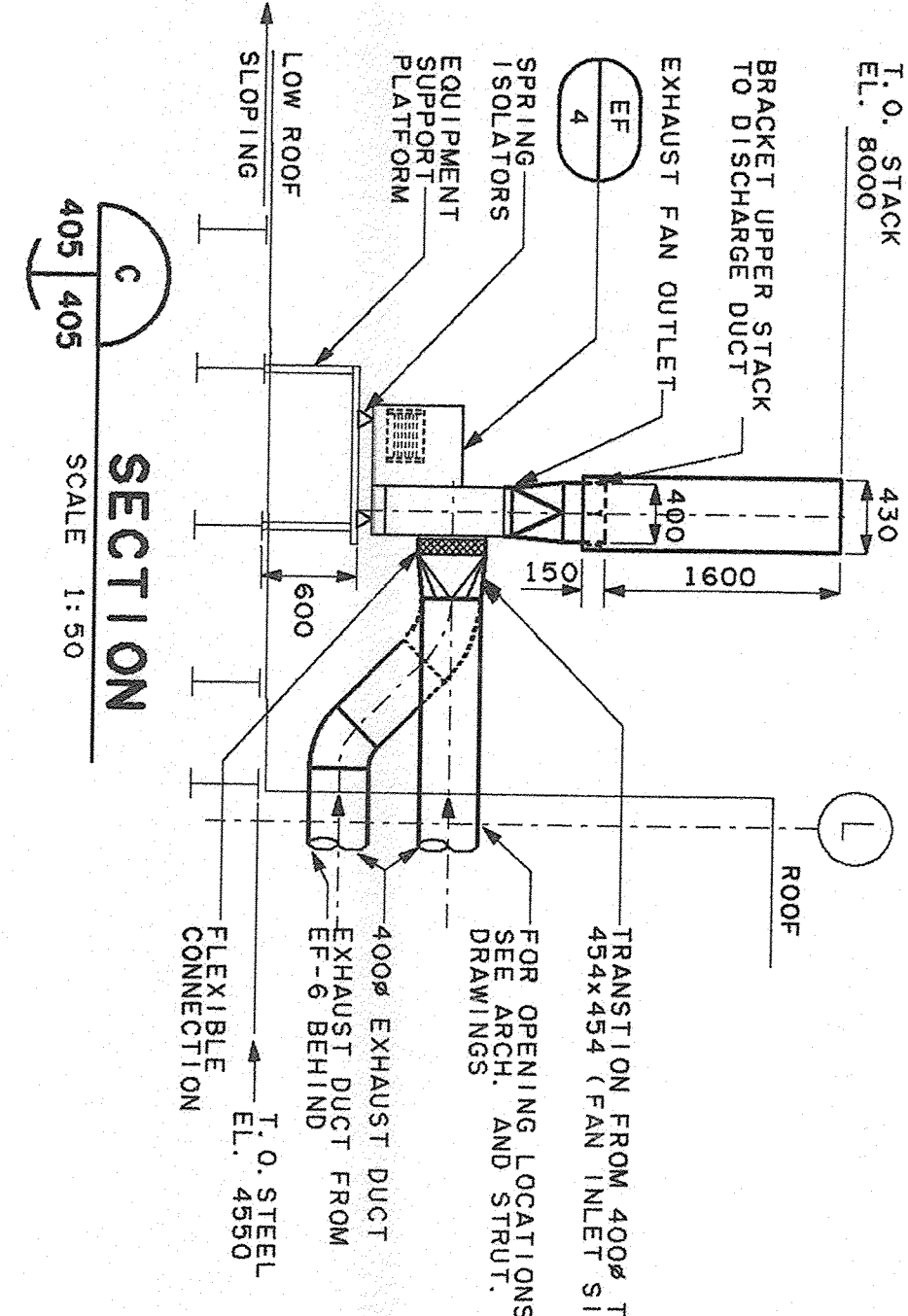
CONCURRENCE-ASSENTMENT

DESIGNED BY: J. ROBERT LUEZ	DATE: 93-06-01
DRAWN BY: J. S. MANN	DATE: 93-06-01
CHECKED BY: D. GINJOE	DATE: 93-06-01
VERIFIED BY: D. GINJOE	DATE: 93-06-01

DWG. DESIGN NO.	SHEET NO.
T-8147-8883-405	OF

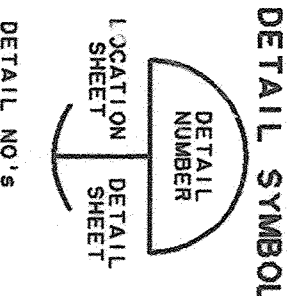
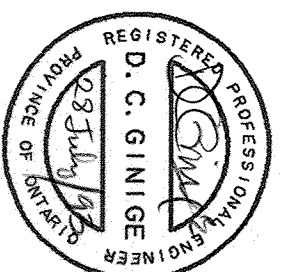


ROOF PLAN - PLUMBING AND H. V. A. C.
SCALE 1:100



FOR
REFERENCE
ONLY

NO.	DATE	REVISION	REVISION	APPROVED



Giffels

Giffels Associates Limited
Consulting Engineers and Architects
GIFFELS PROJECT NO. C9200

SCALE-DETAIL	DATE
1:50	93-06-01

PROJECT-PROJECT
CFB BORDEN, BORDEN, ONTARIO.

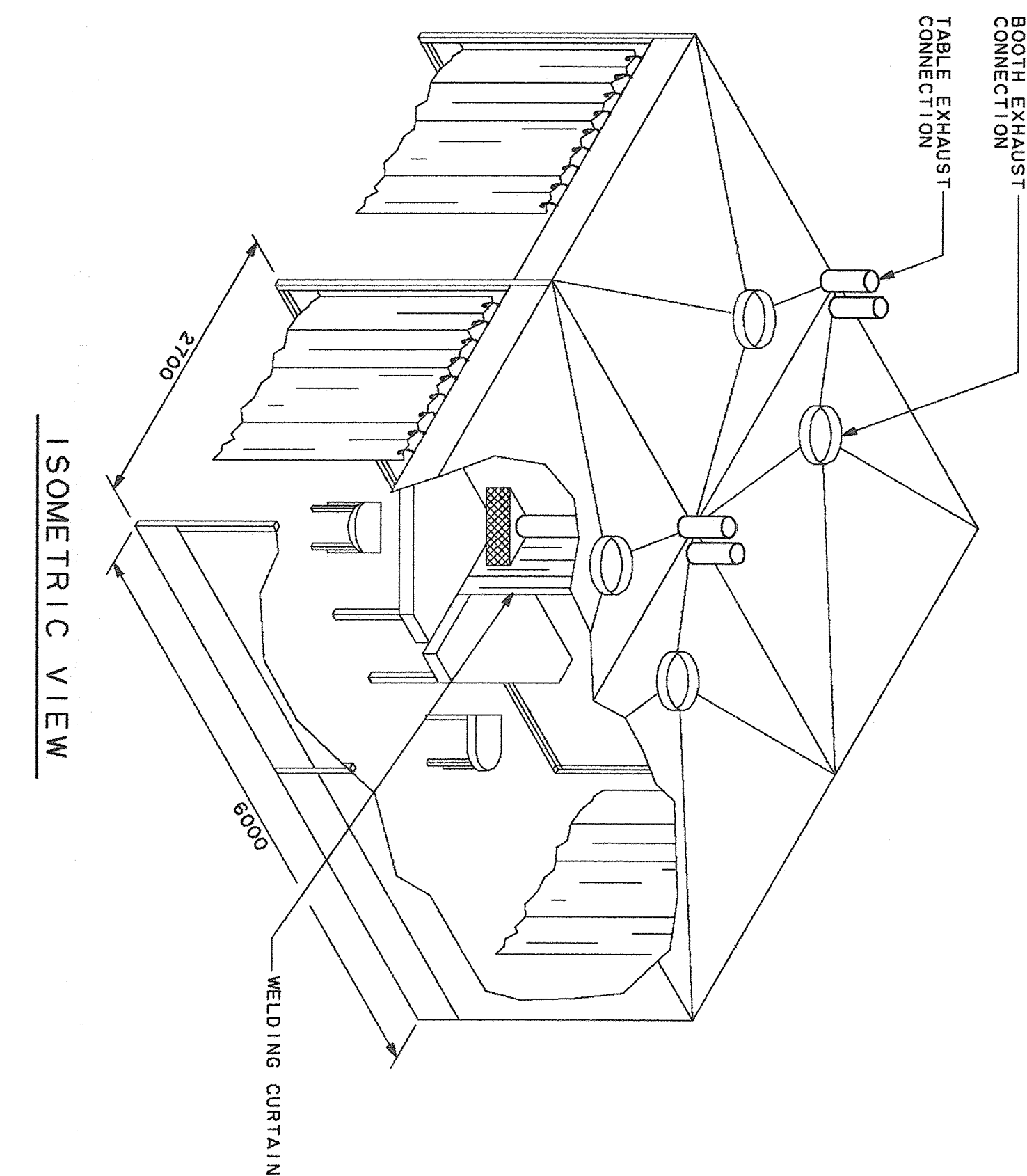
NEW WELDING SCHOOL
BUILDING NO. A-253
CFB BORDEN
BORDEN, ONTARIO.

TRADE-METER	DATE
MECHANICAL	93-06-01

SUBJECT-SUBJECT
WELDING BOOTH LAYOUTS
AND DETAILS

PRODUCTION CONFORMANCE-ASSESSMENT

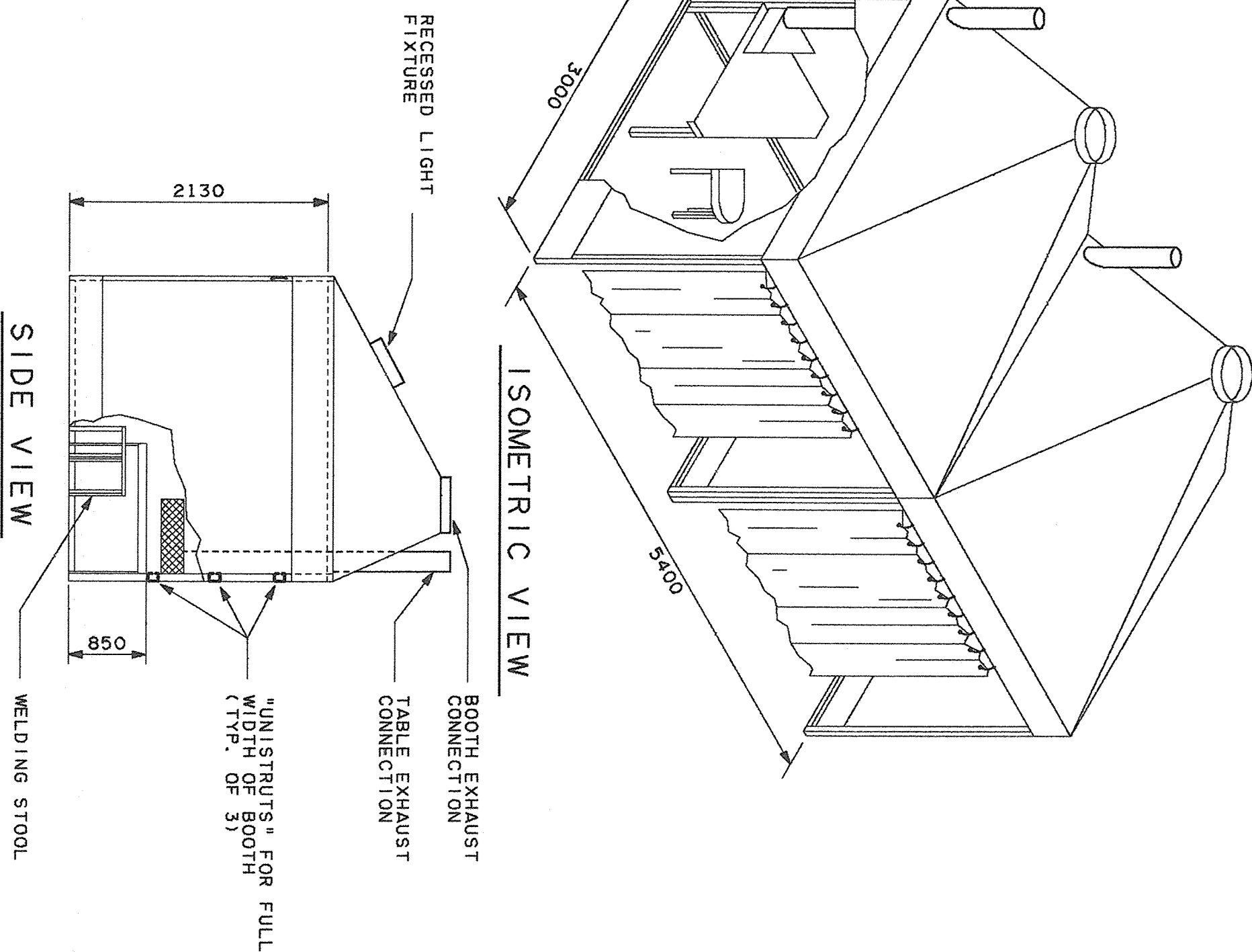
DESIGNED BY: ROBERT GUZ	DATE: 93-06-01
DRAWN BY: J. S. JAHN	DATE: 93-06-01
CHECKED BY: D. GINGIE	DATE: 93-06-01
DATE: 93-06-01	DATE: 93-06-01
DATE: 93-06-01	DATE: 93-06-01



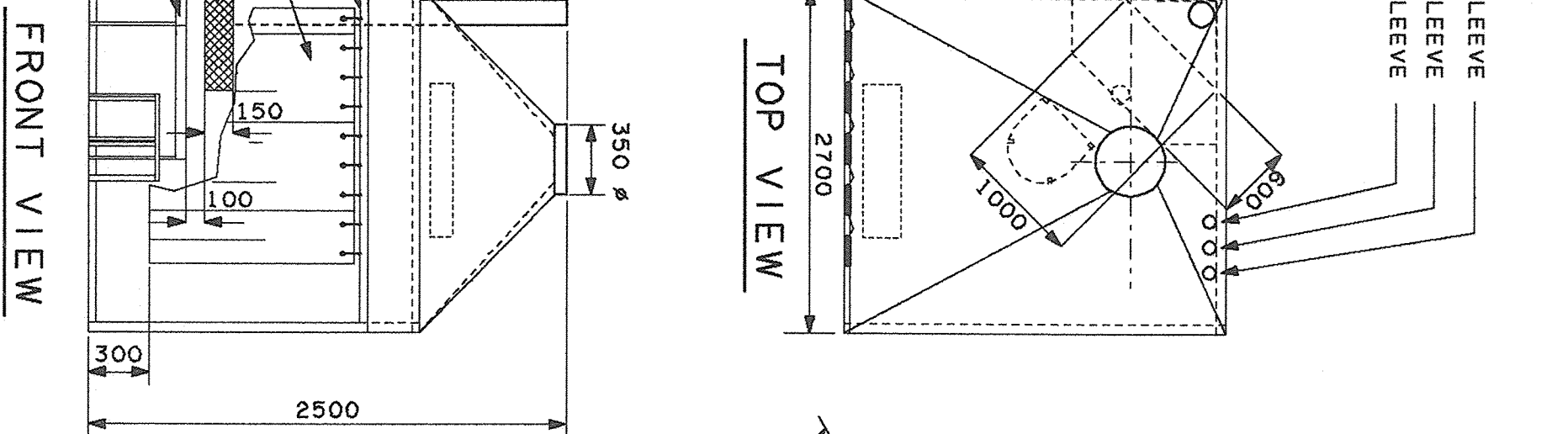
ISOMETRIC VIEW

DEMONSTRATION BOOTH DETAIL

NTS



ISOMETRIC VIEW

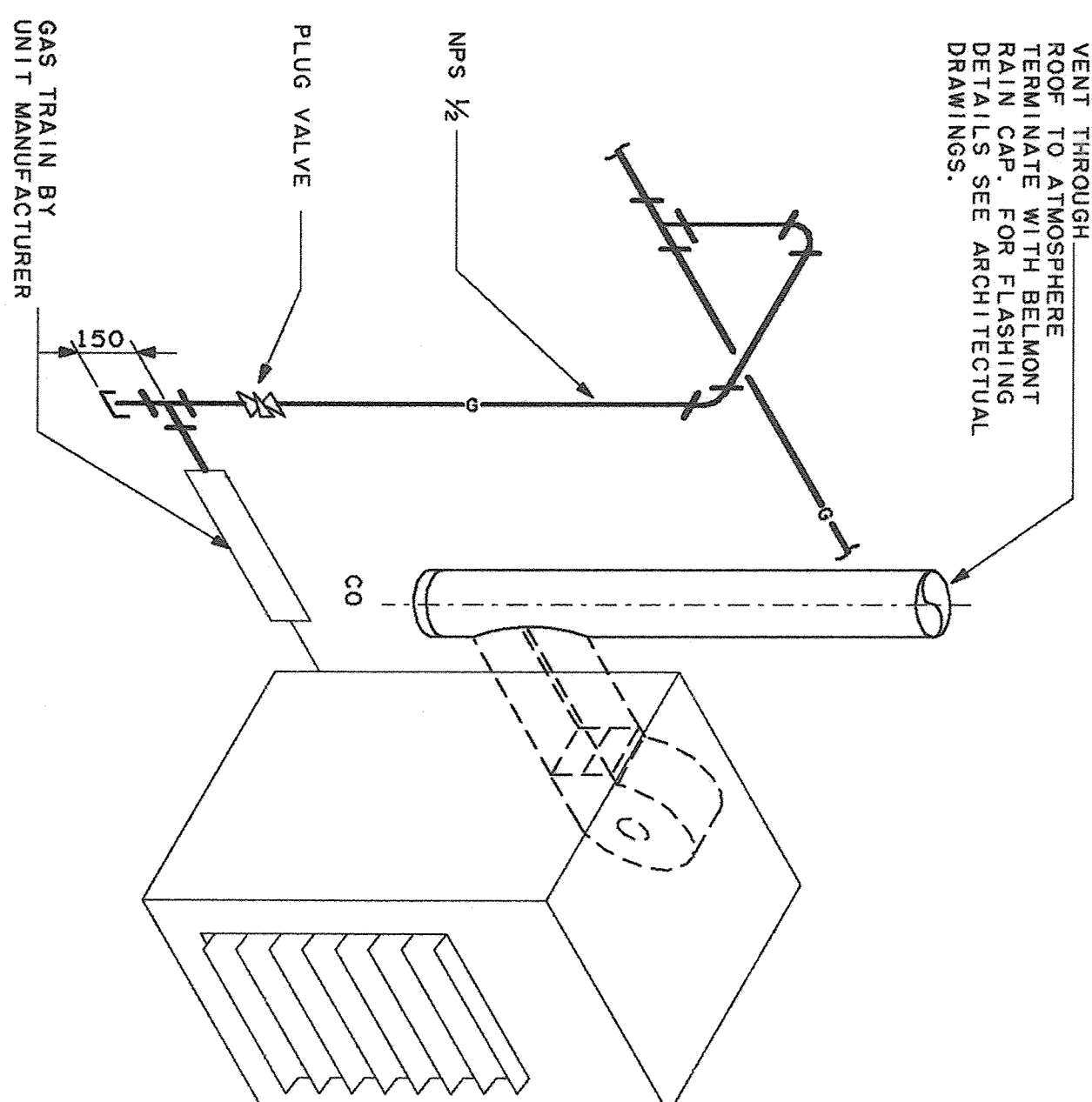


TOP VIEW

FRONT VIEW

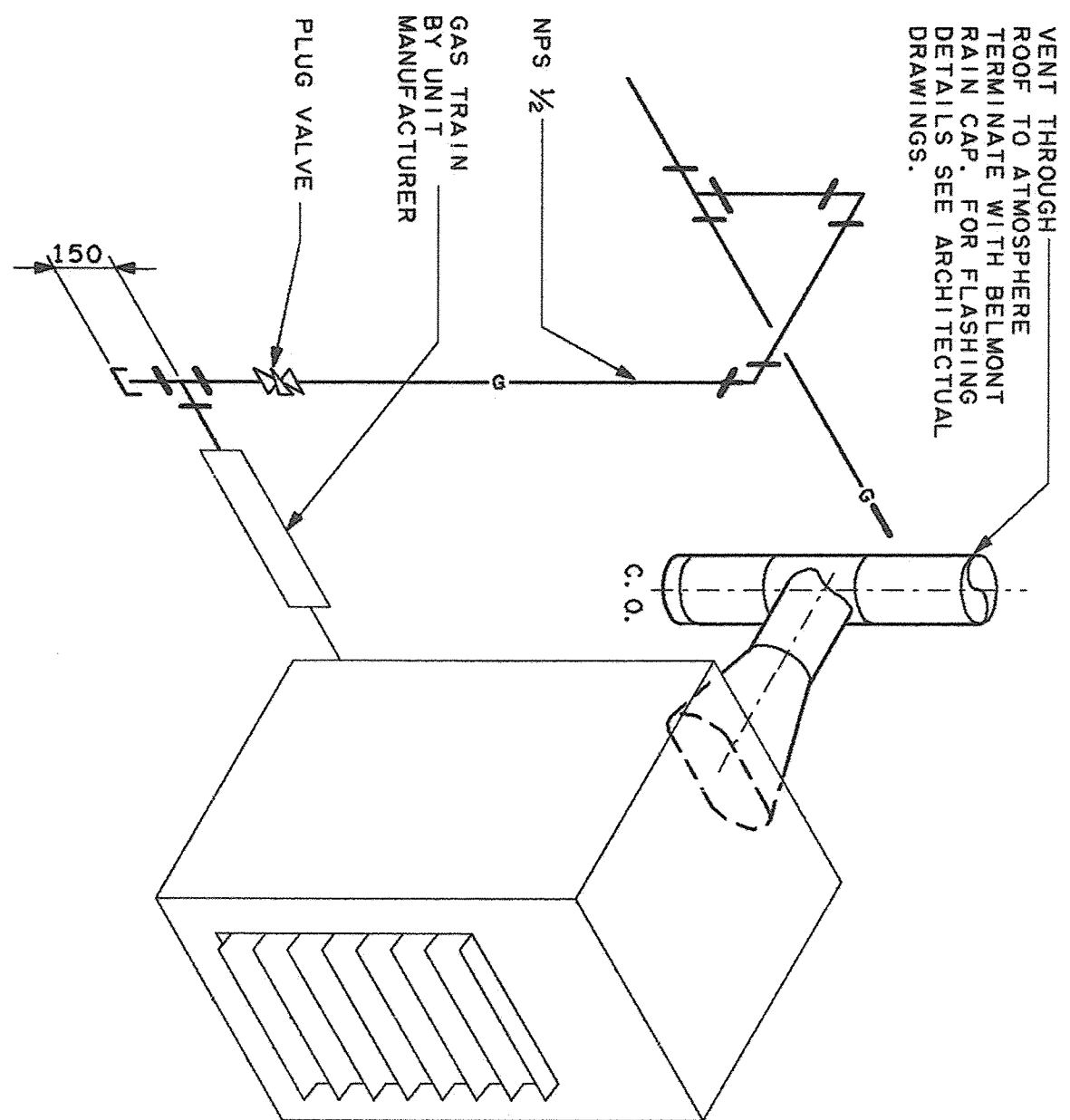
WELDING BOOTH DETAIL

NTS



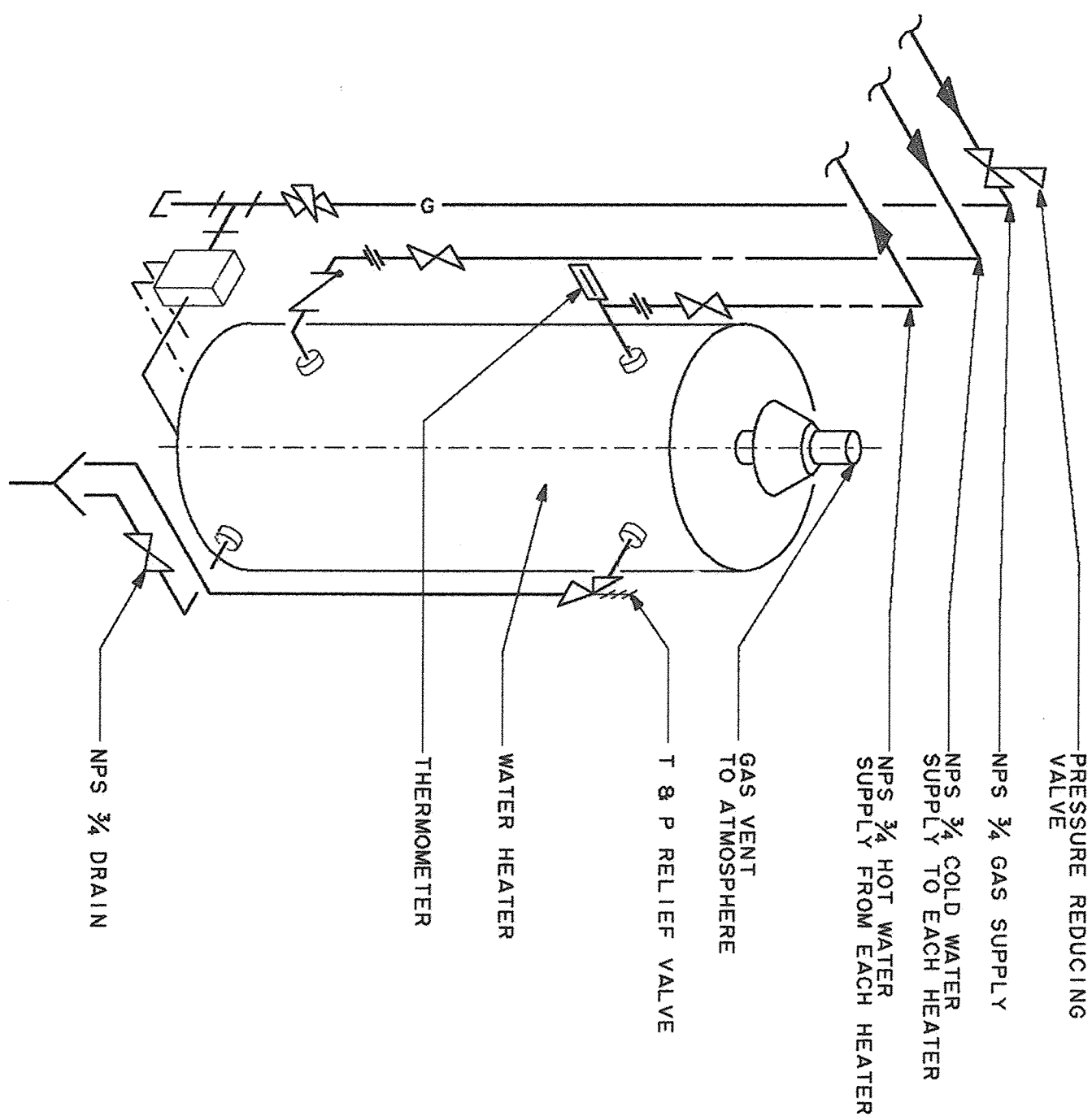
DETAIL 4
404 406
FORCED DRAFT GAS FIRED
UNIT HEATER

NTS



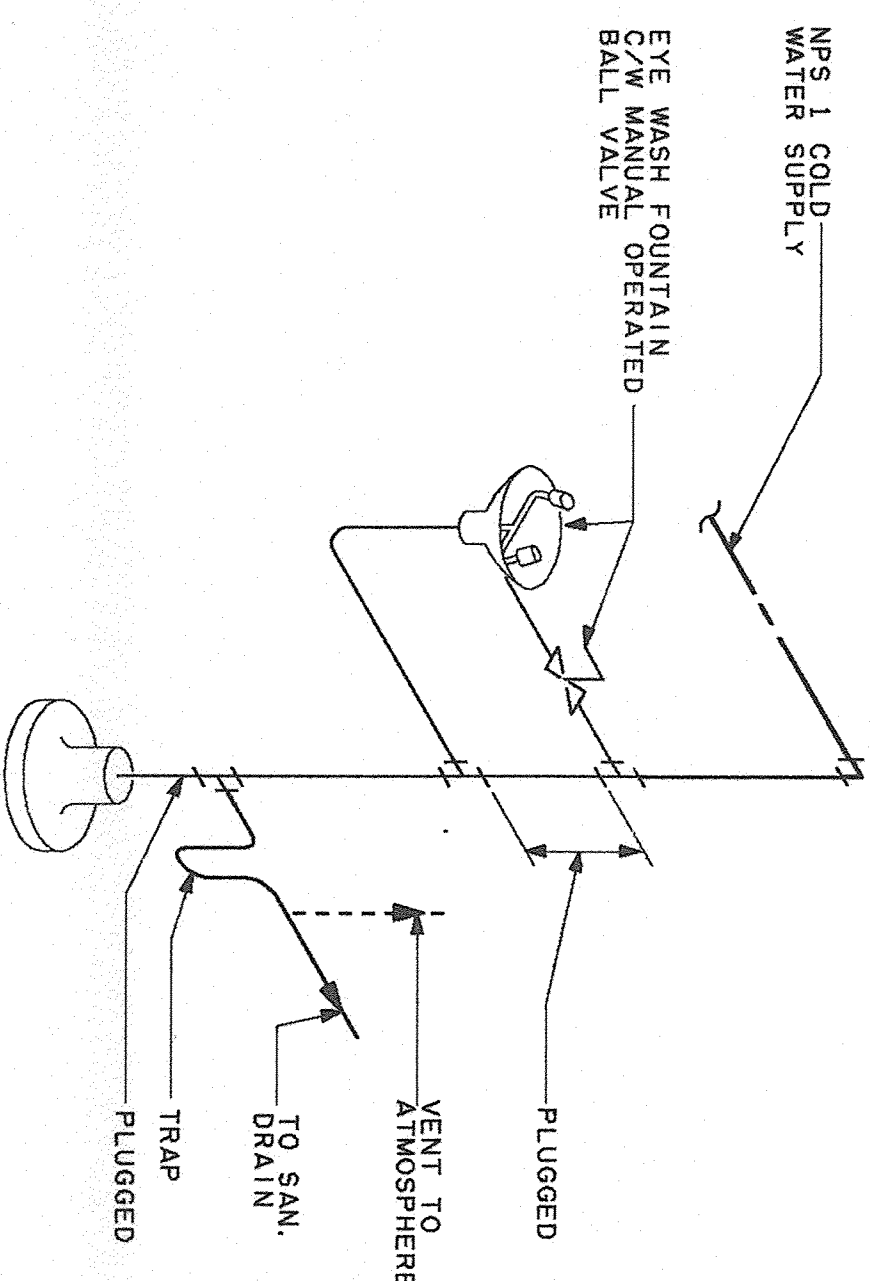
DETAIL 3
404 406
GAS FIRED UNIT HEATER

NTS



DETAIL 1
403 406
DOMESTIC WATER HEATER GAS FIRED
NO RECIRCULATION
(ONLY ONE HEATER SHOWN FOR CLARITY)

NTS

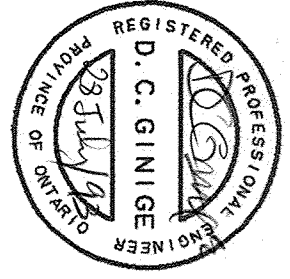


DETAIL 2
403 406
EYE WASH FOUNTAIN

NTS

FOR
REFERENCE
ONLY

NO.	DATE	REVISION	REVISION	APPROVED



DETAIL SYMBOL
DETAIL NUMBER
LOCATION
SHEET
DETAIL NO. 9

Giffels

Giffels Associates Limited
Consulting Engineers and Architects
GIFFELS PROJECT NO. C91200

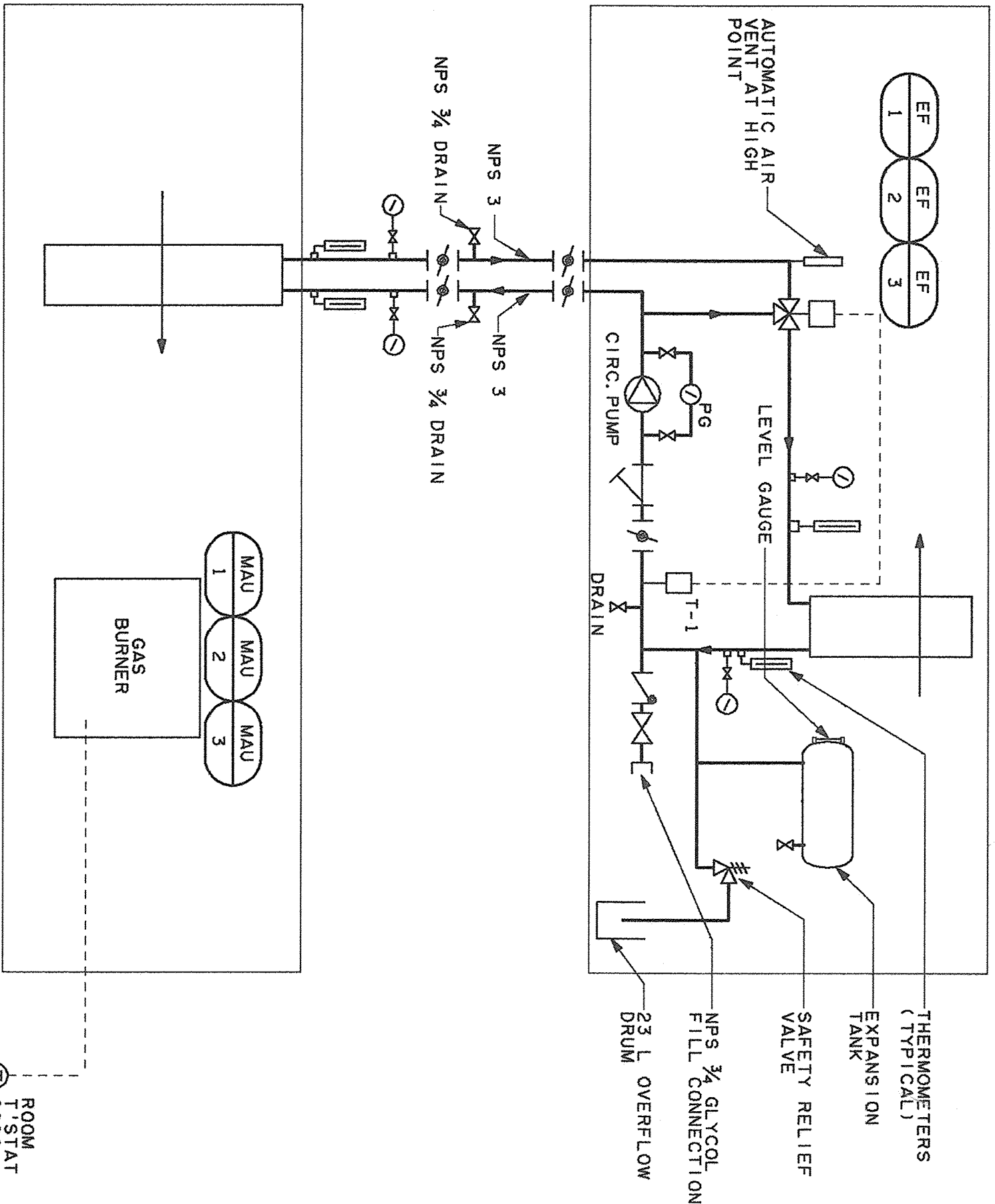
SCALE-RECHILLE
N. T. S.
PROJECT-PROJET
CFB BORDEN, BORDEN, ONTARIO.

NEW WELDING SCHOOL
BUILDING NO. A-253
CFB BORDEN
BORDEN, ONTARIO.

TRADE-METIER MECHANICAL	DATE 93-06-01
SUBJECT-SUJET CONTROL SCHEMATICS	

PRODUCTION CONCURRENCE-ASSENTMENT

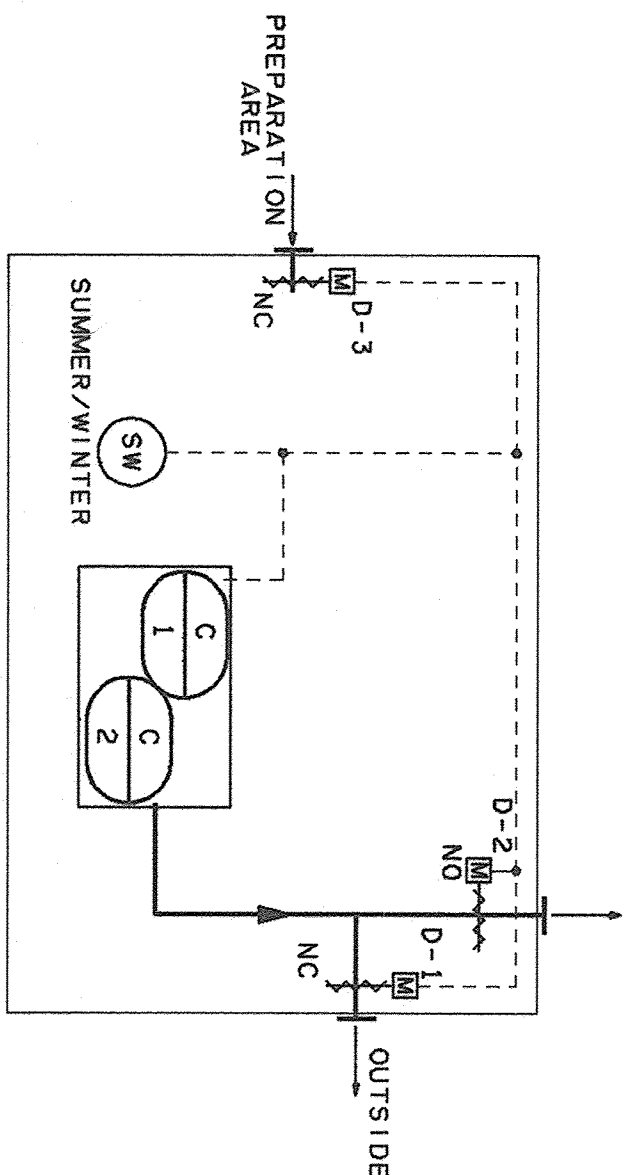
DESIGNED ETUDE T. KORN GUEZ	
DRAWN DESSINE J. S. MANN	
CHECKED VERIFIE D. GINIGER	
3500 CFTSHO T-B147-8883-407	
DWG.-DESSIN NO. T-B147-8883-407	SHEET NO. OF



- SEQUENCE OF OPERATION:
1. STARTING OF A MAKE-UP AIR UNIT AUTOMATICALLY STARTS CORRESPONDING EXHAUST FAN AND ENERGIZES CONTROLS.
 2. IF OUTDOOR AIR TEMPERATURE IS BELOW 10°C, GLYCOL CIRCULATING PUMP IS ENERGIZED.
 3. TEMPERATURE SENSOR T-1 MODULATES 3-WAY CONTROL VALVE TO KEEP LEAVING GLYCOL FROM EXHAUST COIL AT 4°C MINIMUM.
 4. ROOM THERMOSTAT MODULATES GAS BURNER TO MAINTAIN SET TEMPERATURE.

HEAT RECOVERY GLYCOL FLOW DIAGRAM

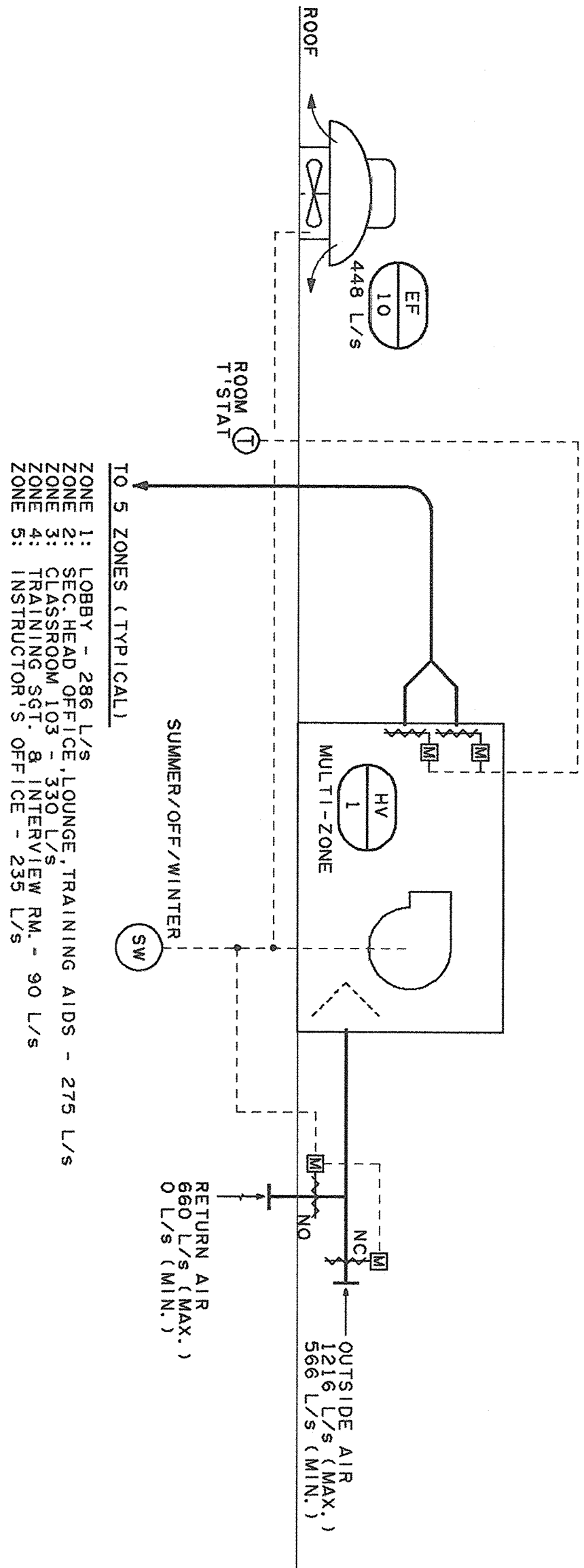
N. T. S.



- SEQUENCE OF OPERATION:
1. STARTING OF COMPRESSORS C-1 OR 2 ENERGIZES CONTROL SYSTEM.
 2. SWITCH IN WINTER POSITION DAMPER D-1 IS CLOSED. DAMPERS D-2 AND 3 ARE OPEN.
 3. SWITCH IN SUMMER POSITION DAMPERS D-1 AND 3 ARE OPEN AND DAMPER D-2 IS CLOSED.

COMPRESSOR ROOM AIR FLOW DIAGRAM

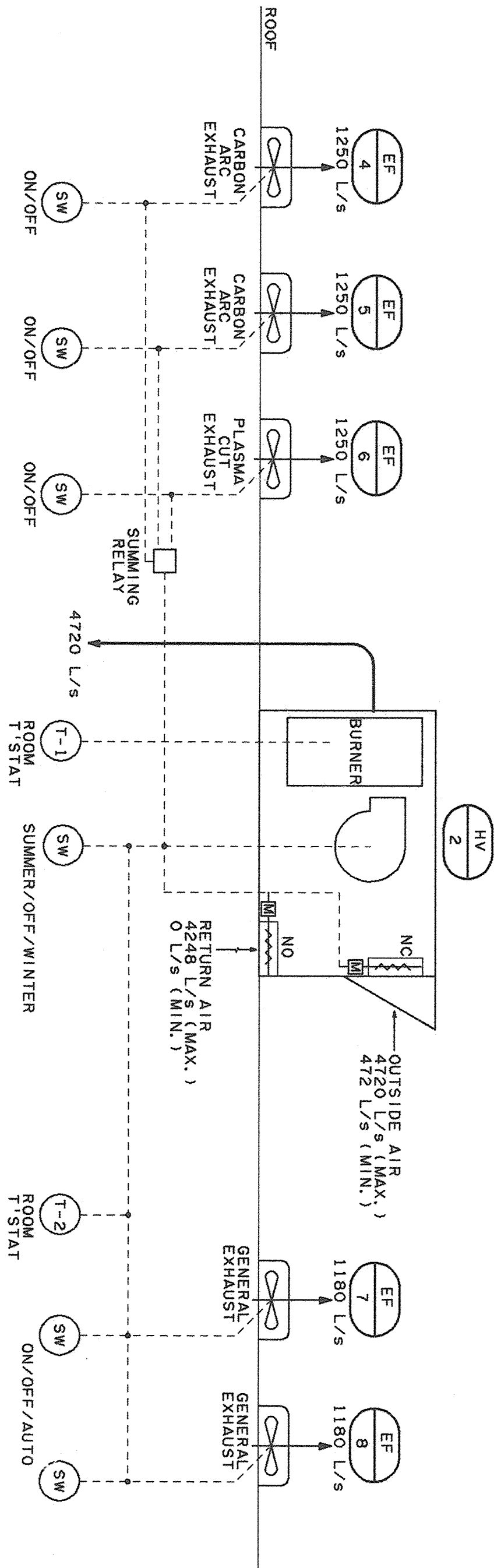
N. T. S.



- SEQUENCE OF OPERATION:
1. SWITCH IN 'OFF' POSITION SUPPLY FAN AND EXHAUST FAN EF-10 ARE DE-ENERGIZED. OUTSIDE AND RETURN AIR DAMPERS ASSUME THEIR NORMAL POSITIONS.
 2. SWITCH IN WINTER POSITION SUPPLY FAN AND BURNER CONTROLS ARE ENERGIZED. EF-10 IS DE-ENERGIZED. OUTSIDE AIR DAMPER OPENS TO ALLOW 650 L/S ROOM THERMOSTAT CONTROL HOT AND COLD DECK DAMPERS TO MAINTAIN ROOM TEMPERATURE.
 3. SWITCH IN SUMMER POSITION SUPPLY FAN AND EF-2, 3 ARE ENERGIZED AND BURNER CONTROL DE-ENERGIZED. OUTSIDE AIR DAMPERS FULLY OPEN AND RETURN AIR DAMPER FULLY CLOSED.

OFFICE AREA HEATING AND VENTILATION SCHEMATIC

N. T. S.



- SEQUENCE OF OPERATION:
1. SWITCH IN 'OFF' POSITION, HV-2 SUPPLY FAN AND CONTROLS ARE DE-ENERGIZED AND DAMPERS ASSUME THEIR NORMAL POSITIONS.
 2. SWITCH IN WINTER POSITION, SUPPLY FAN AND BURNER CONTROLS ARE ENERGIZED. OUTSIDE AND RETURN AIR DAMPERS OPEN TO ALLOW 472 L/S AND 4248 L/S RESPECTIVELY.
 3. ROOM THERMOSTAT T-1 MODULATES BURNER TO MAINTAIN SET TEMPERATURE.
 4. STARTING OF EXHAUST FANS EF-4, 5 OR 6 OPENS OUTSIDE AIR AND CLOSSES RETURN AIR DAMPER. OUTSIDE AIR VOLUME BY A CORRESPONDING AMOUNT THROUGH A SUMMING RELAY.
 5. SWITCH IN SUMMER POSITION BURNER CONTROLS ARE DE-ENERGIZED. ROOM THERMOSTAT T-2 ENERGIZES EXHAUST FANS EF-7 AND 8 OPENS OUTSIDE AIR DAMPERS TO MAINTAIN SET POINT. STARTING OF EF-4, 5 OR 6 WILL OVERRIDE OTHER SETTINGS FOR OUTSIDE AIR.

PREPARATION AREA HEATING AND VENTILATION SCHEMATIC

N. T. S.