



# CMU WELDING

SEPTEMBER 26, 2024

## BID DOCUMENTS

### VICINITY MAP



#### CODE NOTES:

##### APPLICABLE MESA COUNTY CODES:

- 2021 COLORADO PLUMBING CODE
- 2021 COLORADO FUEL GAS CODE
- 2018 INTERNATIONAL BUILDING CODE
- 2018 INTERNATIONAL RESIDENTIAL CODE
- 2021 INTERNATIONAL FUEL GAS CODE
- 2018 INTERNATIONAL MECHANICAL CODE
- 2021 INTERNATIONAL PLUMBING CODE
- 2018 EXISTING BUILDING CODE
- 2018 INTERNATIONAL ENERGY CONSERVATION CODE
- 2023 NATIONAL ELECTRIC CODE

##### GENERAL CONSTRUCTION NOTES:

1. THE SCOPE OF WORK FOR THIS PROJECT WILL INVOLVE MODIFICATIONS TO THE EXISTING MECHANICAL EQUIPMENT AND PROVISION OF NEW EQUIPMENT FOR THE CMU WELDING TECH LAB.
2. DEMOLITION INCLUDES THE REMOVAL OF THE EXISTING FILTERING AND RE-CIRCULATION WELDING BOOTHS AND OLD PIPED WELDING GAS LINES.
3. COORDINATE STAGING AREA AND PHASING OF CONSTRUCTION WITH THE OWNER.
4. THE CONTRACTOR WILL BE RESPONSIBLE FOR ALL WASTE DISPOSAL FOR THIS PROJECT. COORDINATE THE LOCATION OF WASTE DUMPSTERS WITH THE OWNER.
5. THE CONTRACTOR IS TO VERIFY ALL DIMENSIONS AND ACCESS REQUIREMENTS FOR ALL NEW EQUIPMENT PRIOR TO ORDERING MATERIAL.

##### SCOPE OF NEW WORK:

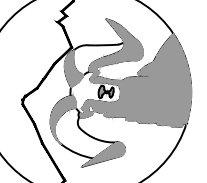
1. REMOVE THE EXISTING WELDING BOOTH STATIONS, PIPED WELDING GASES.
2. PROVIDE AND INSTALL THE FOLLOWING EQUIPMENT:
  - 2.1. (1) NEW UTILITY EXHAUST FANS SERVING WELDING EXHAUST
  - 2.2. ROUTE NEW NATURAL GAS PIPING FROM EXISTING GAS METER LOCATION TO NEW UNIT HEATERS SERVING WELDING SHOP SPACE.
  - 2.3. NEW GAS DETECTION SYSTEM WITH ALARMS AND CONTROLS.
  - 2.4. NEW WELDING GAS MANIFOLDS AND PIPING TO NEW WELDING BOOTHS.
  - 2.5. NEW EXHAUST HOODS AND DUCTED WELDING EXHAUST SYSTEM.
  - 2.6. (2) NEW SEALED COMBUSTION GAS UNIT HEATERS
  - 2.7. (1) NEW RECIRCULATION FILTRATION SYSTEM.
  - 2.8. NEW EQUIPMENT TO HAVE TRANE WEB-BASED DDC CONTROLS TO INTEGRATE INTO THE EXISTING CAMPUS BUILDING AUTOMATION SYSTEM.
  - 2.9. NEW ELECTRICAL SUB-PANEL
  - 2.10. NEW ELECTRICAL SERVICE GEAR
  - 2.11. (1) NEW TRANSFORMER TO SERVE WELDING SPACE
  - 2.12. (1) NEW WELDING BUS GUTTERS
  - 2.13. (14) WELDING BOOTH DISCONNECTS

### SHEET LEGEND

T1-1	TITLE SHEET
S1	STRUCTURAL - WALL PENETRATION STRUCTURAL DETAILS
M0-1	MECHANICAL - COVER SHEET
M2-1	MECHANICAL - WELDING LAB EXHAUST
M2-2	MECHANICAL - WELDING LAB PIPING
M3-1	MECHANICAL - DETAILS #1
M3-2	MECHANICAL - DETAILS #2
E0-1	ELECTRICAL - COVER SHEET
E2-1	ELECTRICAL - WELDING LAB ELECTRICAL
E3-1	ELECTRICAL - ONE-LINE
E3-2	ELECTRICAL - DETAILS

DO NOT REPRODUCE THESE DRAWINGS AND SPECIFICATIONS WITHOUT THE EXPRESSED WRITTEN PERMISSION OF THE DESIGNER. THE DRAWINGS AND SPECIFICATIONS ARE INSTRUMENTS OF THE SERVICE AND SHALL REMAIN THE PROPERTY OF THE DESIGNER. WHETHER THE PROJECT FOR WHICH THEY ARE MADE IS EXECUTED OR NOT. THESE DRAWINGS AND SPECIFICATIONS SHALL NOT BE USED BY ANYONE ON ANY OTHER PROJECTS FOR ADDITIONS TO THIS PROJECT BY OTHERS EXCEPT BY THE EXPRESSED WRITTEN PERMISSION OF THE DESIGNER.

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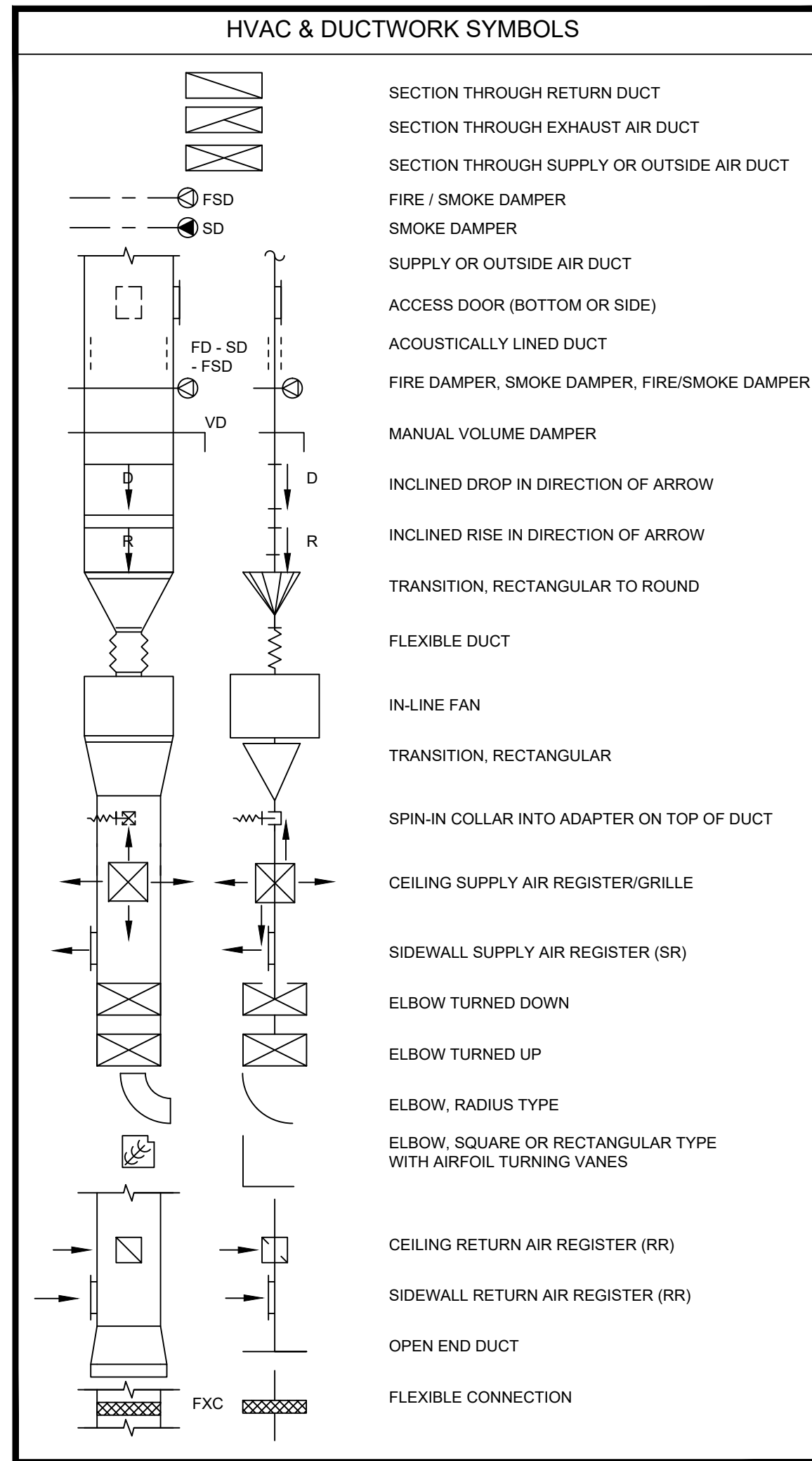
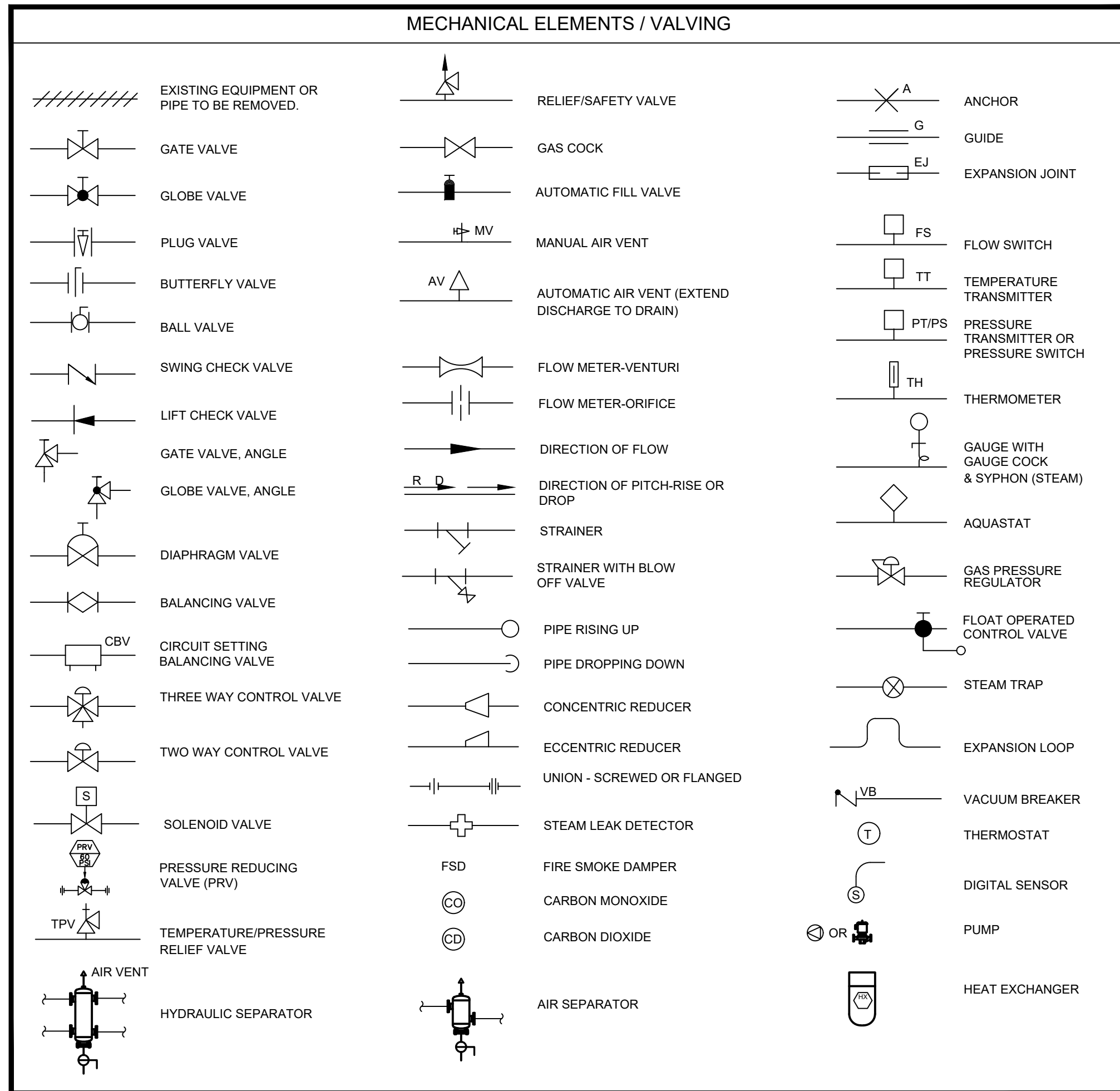
**CMU TECH WELDING**  
MECHANICAL - COVER SHEET  
2508 BLICHMANN AVENUE  
GRAND JUNCTION, COLORADO

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### LINE DESIGNATION SYMBOLS

CHWR	CHILLED WATER RETURN
CHWS	CHILLED WATER SUPPLY
CA	COMPRESSED AIR
CR	CONDENSER WATER RETURN
CS	CONDENSER WATER SUPPLY
D	DRAIN
HPR	HEAT PUMP RETURN
HPS	HEAT PUMP SUPPLY
BOD	BOTTOM OF DUCT
BOP	BOTTOM OF PIPE
BMT	BASEMENT
BTU	BRITISH THERMAL UNIT
C	CHILLER
CAFCI	COMBINATION ARC FAULT CIRCUIT INTERRUPTERS
CAP	CAPACITY
R	REFRIGERANT LIQUID AND VAPOR LINE
RS	REFRIGERANT SUCTION / VAPOR
SMR	SNOWMELT RETURN
SMS	SNOWMELT SUPPLY
V	VENT PIPING
•	POINT OF CONNECTION OF NEW TO EXISTING

#### RESPONSIBLE DIVISION:

UNLESS OTHERWISE INDICATED ALL HEATING, VENTILATING, AIR CONDITIONING, PLUMBING, AND OTHER MECHANICAL EQUIPMENT, MOTORS, AND CONTROLS SHALL BE FURNISHED, SET IN PLACE AND WIRED AS FOLLOWS:

ITEM	FURNISHED	SET	POWER WIRED	CONTROL WIRED
EQUIPMENT	23	23	26	--
COMBINATION MAGNETIC MOTOR STARTERS, MAGNETIC MOTOR STARTERS, VFD'S AND CONTACTORS	23(1)	26	26(2)	23
FUSED AND UNFUSED DISCONNECT SWITCHES, THERMAL OVERLOAD SWITCHES AND HEATERS, MANUAL MOTOR STARTERS	26	26	26	--
MANUAL-OPERATING AND MULTI-SPEED SWITCHES	23	26	26	26
CONTROLS, RELAYS, TRANSFORMERS	23	23	26	23
THERMOSTATS (LOW VOLTAGE) AND TIME SWITCHES	23	23	26	23
THERMOSTATS (LINE VOLTAGE)	23	23	26	26
TEMPERATURE CONTROL PANELS	23	23	26	23
MOTOR AND SOLENOID VALVES, DAMPER MOTORS, PE & EP SWITCHES	23	23(2)	--	23(2)
FUSH-BUTTON STATIONS AND PILOT LIGHTS	23	23(2)	--	23(2)
HEATING, COOLING, VENTILATION AND AIR CONDITIONING CONTROLS	23	23	26	23
EXHAUST FAN SWITCHES	23	26	26	23(2)

#### SUBSCRIPT FOOTNOTES:

- MOTOR STARTER TO INCLUDE CONTROL TRANSFORMER, HOA SWITCH, (1) NO AND (1) NC AUXILIARY CONTACT, AND "ON" AND "OFF" PILOT LIGHTS.
- IF ITEM IS FOR LINE VOLTAGE, SET IN PLACE AND CONNECT UNDER DIVISION 26. WHERE FACTORY MOUNTED ON EQUIPMENT OR ATTACHED TO PIPING OR DUCTS AND USING LINE VOLTAGE FURNISH AND SET UNDER DIVISION 23. CONNECT UNDER DIVISION 26.

#### ABBREVIATIONS:

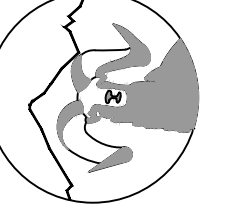
44" MOUNTING HEIGHT ABOVE FINISHED FLOOR TO CENTER OF DEVICE	DIA DIAMETER	HP HORSEPOWER	PTAC PACKAGED TERMINAL AIR CONDITIONER
A AMPS	DIAG DIAGRAM	HR HOUR	PV PLUG VALVE
AD ACCESS DOOR	DIFF DIFFERENTIAL	HT HEIGHT	PVC POLYVINYL CHLORIDE
AV AIR ADMITTANCE VALVE	DISCH DISCHARGE	HTR HEATER	QTY QUANTITY
ABV ABOVE	DIV DIVISION	HWR HEATING WATER RETURN	RA RETURN AIR GRILLE / REGISTER
AC AIR CONDITIONING UNIT	DN DOWN	HWS HEATING WATER SUPPLY	RCR REFLECTED CEILING PLAN
AC ABOVE COUNTER	DS DUCT SILENCER	HX HEAT EXCHANGER	RD ROOF DRAIN
AD AREA DRAIN (SEE SYMBOLS)	DWG DRAWING	HZ HERTZ	REL RELIEF
A.F.C. ABOVE FINISHED CEILING	DX DIRECT EXPANSION	ID INSIDE DIAMETER	REQD REQUIRED
A.F.G. ABOVE FINISHED GRADE	(E) EXISTING	IG ISOLATED GROUND	RF RETURN FAN
AIC AMPERE INTERRUPTING CAPACITY	EA EXHAUST AIR GRILLE/REGISTER	IN INCHES	RH RELATIVE HUMIDITY
AFCI ARC FAULT CIRCUIT INTERRUPTERS	EAT ENTERING AIR TEMPERATURE	INV INVERT	RHC REHEAT COIL
A.F.F. ABOVE FINISHED FLOOR	EC ELECTRICAL CONTRACTOR	JBOX JUNCTION BOX	RLA RATED LOAD AMPS
AHU AIR HANDLING UNIT	ECC ECCENTRIC	K KELVIN	RM ROOM
ALUM ALUMINUM	EFF EXHAUST FAN	KW KILOWATT	RPV REVOLUTIONS PER MINUTE
AP ACCESS PANEL OR DOOR	EFF EFFICIENCY	KVA KVA	SA SUPPLY AIR GRILLE / REGISTER
ATS AUTOMATIC TRANSFER SWITCH	EL ELEVATION	L LENGTH	SC SHORT CIRCUIT
AV AUDIO / VIDEO	ELEC ELECTRIC	LAT LEAVING AIR TEMPERATURE	SCA SHORT CIRCUIT AVAILABLE
AVG AVERAGE	ELEV ELEVATOR	LV LAVATORY	SCCR SHORT CIRCUIT CURRENT RATING
AWG AMERICAN WIRE GAGE	EM EMERGENCY FUNCTION	LB POUND	SCH SCHEDULE
BAS BUILDING AUTOMATION SYSTEM	ENT ENTERING	LD LINEAR DIFFUSER	SD SMOKE DAMPER
BB BASEBOARD	EMT ELECTRIC METALLIC TUBE	LF LINEAR FEET	SEF SMOKE EXHAUST FAN
BD BACK DRAFT DAMPER	EQU EQUIP EQUIPMENT	LN LINEAR	SF SUPPLY FAN
BFP BACK FLOW PREVENTOR	EQUIV EQUIVALENT	LIQ LIQUID	SH SENSIBLE HEAT
BL BOILER	ES END SWITCH	LRA LOCKED ROTOR AMPS	SH SHOWER
BLDG BUILDING	ESP EXTERNAL STATIC PRESSURE	LV LOUVER	SP STATIC PRESSURE
BLW BELOW	ET EXPANSION TANK	LVG LEAVING	SPD SURGE PROTECTION DEVICE
BOB BOTTOM OF BEAM	EWC ELECTRIC WATER COOLER	LWT LEAVING WATER TEMPERATURE	SPEC SPECIFICATION
BOD BOTTOM OF DUCT	EWT ENTERING WATER TEMPERATURE	MBH THOUSANDS OF BTU PER HOUR	SQ SQUARE
BOP BOTTOM OF PIPE	EX EXHAUST	MC MECHANICAL CONTRACTOR	SS STAINLESS STEEL
BMT BASEMENT	EXN EXPANSION	MCA MINIMUM CIRCUIT AMPACITY	SS SAFETY SHOWER
BTU BRITISH THERMAL UNIT	F DEGREES FAHRENHEIT	MCB MAIN CIRCUIT BREAKER	STD STANDARD
C CHILLER	FA FREE AREA	MDP MAIN DISTRIBUTION PANEL	STL STEEL
CAFCI COMBINATION ARC FAULT CIRCUIT INTERRUPTERS	FC FAN COIL UNIT	MED MEDIUM	TEMP TEMPERATURE
CAP CAPACITY	FC FOOTCANDLE	MFR MANUFACTURER	TR TRAMPER RESISTANT
CB CIRCUIT BREAKER	FCV FLOW CONTROL VALVE	MIN MINIMUM	TT TEMPERATURE TRANSMITTER
CBV CIRCUIT BALANCING VALVE	FD FIRE DAMPER	MISC MISCELLANEOUS	TB TELECOMMUNICATIONS TERMINAL BACKBOARD
CCT CORRELATED COLOR TEMPERATURE	FD FLOOR DRAIN	MLO MAIN LUG ONLY	TYP TYPICAL
CKT CIRCUIT	FIN FINISHED	MOCP MAXIMUM OVERCURRENT PROTECTION	TX TRANSFORMER
CFH CUBIC FEET PER HOUR	FLA FULL LOAD AMPS	MTD MOUNTED	UC UNDERCUT DOOR
CFM CUBIC FEET PER MINUTE	FLEX FLEXIBLE	MUA MAKE-UP AIR UNIT	UH UNIT HEATER
CHWR CHILLED WATER RETURN	FLR FLOOR	N NEUTRAL	UNO UNLESS NOTED OTHERWISE
CHWS CHILLED WATER SUPPLY	FOB FLAT ON BOTTOM	NC NORMALLY CLOSED	UNOCC UNOCCUPIED
CI CAST IRON	FP FIRE PROTECTION	NEG NEGATIVE	UR URINAL
CL CENTER LINE	FP FIRE PUMP	NIC NOT IN CONTRACT	V VOLTS
CLG CEILING	FP FIRE PUMP	NL NIGHT / SECURITY LIGHT - DO NOT SWITCH	VA VOLT AMPERE
CMU CONCRETE MASONRY UNIT	FPM FEET PER MINUTE	NO NORMALLY OPEN	VAL VALVE
CO CLEAN OUT	FPS FEET PER SECOND	NOM NOMINAL	VAV VARIABLE AIR VOLUME UNIT
COL COLUMN	FS FLOW SWITCH	NTS NOT TO SCALE	VFD VARIABLE FREQUENCY DRIVE
COMP COMPRESSOR	FSD FIRE/SMOKE DAMPER	OA OUTSIDE AIR	VRF VARIABLE REFRIGERANT FLOW
CONC CONCRETE	FT FEET	OBD OPPOSED BLADE DAMPER	VOLT VOLTAGE
COND CONDENSATE	FXC FLEXIBLE CONNECTION	OCC OCCUPIED	VTR VENT THROUGH ROOF
CONN CONNECTION	GND GROUND	OCP OVER CURRENT PROTECTION	W WIDTH
CONT CONTINUATION	GAL GALLON	OD OUTSIDE DIAMETER	W WATTS
CONTR CONTRACTOR	GALV GALVANIZED	OL OVERLOAD	W WITH
CRI COLOR RENDERING INDEX	GEV GROUND ELECTRODE CONDUCTOR	ORD OVERFLOW ROOF DRAIN	W/O WITHOUT
CT COOLING TOWER	GFCI / GFI GROUND FAULT CIRCUIT INTERRUPTER	OZ OUNCE	WB WET BULB
CT CURRENT TRANSFORMER	GC GENERAL CONTRACTOR	PBD PARALLEL BLADE DAMPER	WC WATER COLUMN
CU CONDENSING UNIT	GCH GALLONS PER HOUR	PD PRESSURE DROP	WC WATER CLOSET
CU COPPER	GPM GALLONS PER MINUTE	PH PHASE	WG WATER GAUGE
CUH CABINET UNIT HEATER	GRSILB GRAINS PER POUND	POS POSITIVE PRESSURE	WP WEATHERPROOF
CVB CONSTANT VOLUME BOX	H2O WATER	POS POINT OF SALES	WPIU WEATHERPROOF IN-SUE
CWR CONDENSER WATER RETURN	HB HOSE BIBB	PRV PRESSURE REDUCING VALVE	WSR WITHSTAND RATING
CWS CONDENSER WATER SUPPLY	HD HEAD (SEE SCHEDULES)	PS PRESSURE SWITCH	XFMR TRANSFORMER
DB DRY BULB	HP HEAT PUMP	PT PRESSURE TRANSMITTER	

#### GENERAL DESIGN NOTES:

- MECHANICAL SYSTEM, MECHANICAL PIPING AND ELECTRICAL SYSTEMS HAVE BEEN DESIGNED BASED ON PROVIDED INFORMATION AND FEEDBACK FROM OWNER. SYSTEM DESIGNS MAY BE ALTERED PENDING FINAL WELDING EQUIPMENT SELECTIONS AND INFORMATION PROVIDED BY WELDING INSTRUCTORS.
- CONTRACTORS SHALL COORDINATE PHASING OF PROJECT WITH OWNER AND WELDING INSTRUCTORS PRIOR TO BEGINNING CONSTRUCTION.

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**MECHANICAL PROVISIONS**

- SCOPE OF WORK
  - THE CONTRACTOR IS RESPONSIBLE FOR ALL WORK, MATERIALS, AND LABOR TO SATISFY A COMPLETE WORKING SYSTEM WHETHER SPECIFIED OR IMPLIED.
  - ALL WORK IS TO BE PERFORMED IN STRICT COMPLIANCE WITH ALL LOCAL CODES AND ALL OTHER REGULATION GOVERNING WORK OF THIS NATURE.
  - THE CONTRACTOR SHALL, BEFORE SUBMITTING ANY PROPOSAL, EXAMINE THE PROPOSED SITE AND SHALL DETERMINE FOR HIMSELF THE CONDITIONS THAT MAY AFFECT THE WORK. NO ALLOWANCE SHALL BE MADE IF THE CONTRACTOR FAILS TO MAKE SUCH EXAMINATIONS.
  - ALL EQUIPMENT AND MATERIALS SHALL BE AS SPECIFIED OR "APPROVED EQUAL" BY THE ENGINEER OR ARCHITECT.
- PERMITS
  - THE CONTRACTOR SHALL SECURE ALL PERMITS OR APPLICATIONS AND PAY ANY AND ALL FEES.
- SHOP DRAWINGS
  - SUBMIT MATERIAL LIST AND SHOP DRAWINGS FOR MAJOR EQUIPMENT TO THE ARCHITECT/ENGINEER FOR APPROVAL. THE CONTRACTOR SHALL SUBMIT FIVE SETS OF SHOP DRAWINGS AND THEY SHALL BE CLEARLY LABELED.
- FLEXIBLE DUCT WORK
  - FLEXIBLE TYPE DUCT SHALL BE OF TWO ELEMENT SPIRAL CONSTRUCTION COMPOSED OF A CORROSION RESISTANT METAL SUPPORTING SPIRAL AND COATED FABRIC WITH A MINERAL BASE. FLEXIBLE DUCT CONNECTORS SHALL BE LISTED BY U.L. CLASS 1 DUCTS, AND SHALL HAVE A FLAME SPREAD RATING NOT EXCEEDING 25 AND A SMOKE DEVELOPED RATING NOT EXCEEDING 50.
  - USE OF FLEXIBLE DUCTWORK SHALL BE LIMITED TO NO MORE THAN 6 LINEAR FEET PER RUN.
  - CONTRACTOR SHALL BE CAREFUL SO AS NOT TO KINK OR COLLAPSE FLEXIBLE DUCT.
- REFRIGERANT
  - PIPING CONTRACTOR SHALL PROVIDE AND INSTALL REFRIGERANT PIPING IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS AND IN SUCH A WAY AS TO BE INCONSPICUOUS AND FREE FROM ANY POSSIBLE CONDENSATION.
  - INSULATE REFRIGERANT LINES WITH ARMOUR-FLEX TYPE INSULATION, SHALL BE TYPE "K" COPPER TUBING, WITH WROUGHT COPPER SOLDER TYPE FITTINGS SUITABLE FOR CONNECTION WITH SILVER SOLDER.
- DUCTWORK
  - THE DUCTWORK SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE "SMACNA" APPLICABLE MANUALS.
  - ALL DUCTWORK SHALL BE THE LOW VELOCITY TYPE, UNLESS SPECIFIED OTHERWISE.
  - CONTRACTOR SHALL PROVIDE AND INSTALL APPROVED FIRE DAMPERS AND ACCESS PANELS IN ANY AND ALL DUCTWORK WHICH PENETRATES A HORIZONTAL OR VERTICAL FIRE PARTITION, OR AS OTHERWISE SHOWN ON DRAWINGS.
  - ALL BRANCH DUCTS TO HAVE VOLUME DAMPERS, SMOOTH TURN RADIUS DUCTWORK OR TURNING VANES SHALL BE USED THROUGHOUT WHERE FLOW EXCEEDS 150 CFM.
  - ALL DUCT JOINTS TO BE SEALED IN ACCORDANCE WITH "SMACNA" STANDARDS AND ACCEPTED GOOD PRACTICE.
  - ALL DUCT DIMENSIONS SHOWN ARE NET INSIDE VALUES DIMENSIONS MAY BE CHANGED SO LONG AS THE NET FACE AREA IS MAINTAINED.
  - ALL CONCEALED DUCTWORK SHALL BE INSULATED WITH 1-1/2" FIBERGLASS INSULATING BLANKET WITH ALUMINUM FOIL FACING.
  - ALL SUPPLY AND RETURN DUCTWORK 15 FEET DOWNSTREAM OF THE HVAC UNIT SHALL BE INTERNALLY LINED WITH A 1/2" ACOUSTICAL DUCT LINER UNLESS OTHERWISE NOTED ON THE DRAWINGS.
- DRAINAGE PIPING
  - (CONDENSATE) SHALL BE SCHEDULE 40 PVC PIPE WITH SOLVENT JOINTS. PITCH HORIZONTAL LINES 1" IN 10'-0". CONDENSATE DRAINS SHALL BE ROUTED TO FLOOR DRAIN, ROOF DRAIN OR INDIRECT WASTE DRAIN.
- HVAC CONTROLS
  - CONTRACTOR TO SUPPLY AND INSTALL ALL CONTROL WIRING AND THERMOSTATS AS REQUIRED.
- ELECTRICAL
  - CONTRACTOR TO COORDINATE WITH ELECTRICAL CONTRACTOR FOR LOCATION OF WIRING FOR EACH HVAC UNIT.
- PIPE SUPPORTS
  - ALL PIPE SHALL BE SUPPORTED FROM THE BUILDING STRUCTURE IN A NEAT AND WORKMANLIKE MANNER. THE USE OF WIRE OR METAL STRAP TOSUPPORT PIPES WILL NOT BE PERMITTED. SPACING OF PIPE SUPPORTS SHALL NOT EXCEED 6 FEET FOR ALL PIPING. PLASTIC PIPING TO BE SUPPORTED EVERY 4 FEET.
- GAS PIPING
  - PIPING SHALL BE SCHEDULE 40 BLACK STEEL PIPE WITH MALLEABLE IRON FITTINGS. WHERE GAS PIPE CONNECTS TO EQUIPMENT, IT SHALL BE PROVIDED WITH A DRIP LEG THE FULL SIZE OF THE RUNOUT. A 100% SHUT-OFF VALVE AND A UNION. GAS PIPING CONTAINING PRESSURE GREATER THAN 9" W.G. SHALL BE SCHEDULE 40 BLACK STEEL PIPE WITH WELDED JOINTS.
- MISCELLANEOUS
  - ALL EXTERIOR OPENINGS TO BE PROPERLY CAULKED AND SEALED WITH A SEALANT OF HIGH QUALITY AND LONG LIFE. TO PREVENT INFILTRATION OF OUTSIDE AIR INTO CONDITIONED SPACE. COORDINATE INSTALLATION OF ALL ROOF FLASHING AT ROOF PENETRATION.
  - DO NOT SCALE THIS DRAWING FOR EXACT DIMENSIONS.
  - VERIFY ALL FIGURES, CONDITIONS, AND DIMENSIONS AT THE JOB SITE.
  - THE MECHANICAL PLANS ARE INTENDED TO BE DIAGRAMMATIC AND ARE BASED ON ONE MANUFACTURER'S EQUIPMENT. THEY ARE NOT INTENDED TO SHOW EVERY ITEM IN ITS EXACT LOCATION, THE EXACT DIMENSIONS, OR ALL THE DETAILS OF THE EQUIPMENT.
  - THE CONTRACTOR SHALL VERIFY THE ACTUAL DIMENSIONS OF THE EQUIPMENT PROPOSED TO ENSURE THAT THE EQUIPMENT WILL FIT IN THE AVAILABLE SPACE.
  - PEX TUBING, IF PEX TUBING IS USED AS AN APPROVED ALTERNATE FOR APPLICATIONS WHERE METALLIC PIPING IS THE BASIS OF DESIGN. THE PEX MANUFACTURER SHALL SUBMIT SHOP DRAWINGS CLEARLY INDICATING THAT THE DESIGN HAS BEEN ANALYZED AND MODIFIED, AS REQUIRED TO MAINTAIN SCHEDULED HYDRONIC SYSTEM PARAMETERS. ANY DESIGN RESULTING IN INCREASED SYSTEM PRESSURE DROP AS A RESULT OF IMPROPER PEX SIZING OR DESIGN SHALL NOT BE PERMITTED.
- TESTING AND BALANCING
  - THE HVAC SYSTEM SHALL BE TESTED AND BALANCED BY AN INDEPENDENT AGENCY, UNDER THE SUPERVISION OF A LICENSED PROFESSIONAL ENGINEER. A SEALED TYPE WRITTEN REPORT SHALL BE SUBMITTED TO THE ARCHITECT/ENGINEER FOR REVIEW AND APPROVAL.
- GUARANTEE
  - MATERIALS, EQUIPMENT AND INSTALLATION SHALL BE GUARANTEED FOR A PERIOD OF ONE(1) YEAR FROM DATE OF ACCEPTANCE. DEFECTS WHICH APPEAR DURING THAT PERIOD SHALL BE CORRECTED AT THIS CONTRACTOR'S EXPENSE.
  - FOR THE SAME PERIOD, THE MECHANICAL CONTRACTOR SHALL BE RESPONSIBLE FOR ANY DAMAGE TO PREMISES CAUSED BY DEFECTS IN WORKMANSHIP OR IN THE WORK OR EQUIPMENT FURNISHED AND/OR INSTALLED BY HIM.

EXISTING AIR HANDLER UNIT INFORMATION SHOWN FOR REFERENCE

(EXISTING) AIR HANDLING UNIT SCHEDULE																
EQUIPMENT NO.	SERVICE	SUPPLY AIR (CFM)	OUTSIDE AIR (CFM)	SUPPLY AIR E.S.P. (IN. W.G.)	COOLING NOM. (TONS)	FAN			FILTERS	EVAP FAN (HP)	ELECTRICAL			UNIT WEIGHT (LBS.)	MANUFACTURER & MODEL	OPTIONS /ACCESSORIES
						SIZE	TYPE	RPM			V./PH./HZ.	MCA	MOCP			
(E)AH-1, 2	SHOP	12,000	12,000	1	EXISTING	20"	FC	760	2" TA	7.5	208/3/60	114	150	-	TRANE CLIMATE CHANGER, SIZE 17A	NOTE-1

NOTES:  
1. 7.5 HP BLOWER MOTOR WITH MAGNETIC COMBINATION MOTOR STARTER, NEW FAN BEARINGS, PULLEYS.

GAS FIRED UNIT HEATER SCHEDULE															
EQUIPMENT NO.	SERVICE	SUPPLY AIR (CFM)	HEATING			GAS CONNECTION SIZE	VENT OUTLET SIZE	AIR INLET SIZE	ELECTRICAL			MANUFACTURER & MODEL	OPTIONS/ACCESSORIES		
			GAS CFH	MBH INPUT	MBH OUTPUT				V./PH./HZ.	MCA (A)	MOCP (A)			MOTOR HP	
GUH-1,2,3,4	CMU TECH WELDING	1,921	187.5	150	124.5	1/2"	5"	6"	115/1/60	3.8	15	1/4	REZTOR UDZ-150	NOTE-1	

NOTES:  
1. SEPARATED COMBUSTION 83% EFFICIENT. PROVIDE WITH AUXILIARY SUMMER WALL SWITCH, 115V/1PH/60HZ TO 24V CONTROL TRANSFORMER, WALL MOUNTED THERMOSTAT, HIGH ALTITUDE KIT SIZED PER LOCATION ELEVATION, 316 SERIES STAINLESS STEEL HEAT EXCHANGER, TWO-STAGE COMBINATION GAS VALVE, TEFC MOTOR, DOWNTURN NOZZLE, THERMOSTAT LOCKING ENCLOSURE, VERTICAL LOUVERS, KIT TO SUSPEND UNIT FROM STRUCTURE.

EXHAUST FAN SCHEDULE															
EQUIPMENT NO.	SERVICE	LOCATION	CFM	EXTERNAL STATIC PRESS (IN. W.G.)	MOTOR			MANUFACTURE R & MODEL	OPTIONS/ACCESSORIES						
					WATTS	HP	RPM			MCA	MOP	VOLT/PH/HZ			
EF-1	WEST WELDING BOOTHS	ROOF	16,800	3.88		20.00	1407	74.2	125	208/3/60	GREENHECK USF-30-81	NOTE-1			
EF-2	EAST WELDING BOOTHS	ROOF	16,800	3.88		20.00	1407	74.2	125	208/3/60	GREENHECK USF-30-81	NOTE-1			

NOTES:  
1. PROVIDE WITH TRANE - TR2000 VFD, POWER DISCONNECT, 4" CONCRETE HOUSE KEEPING PAD OFFSET FROM ALL SIDES OF UNIT BY 6", AND BELT DRIVEN VFD MOTOR.

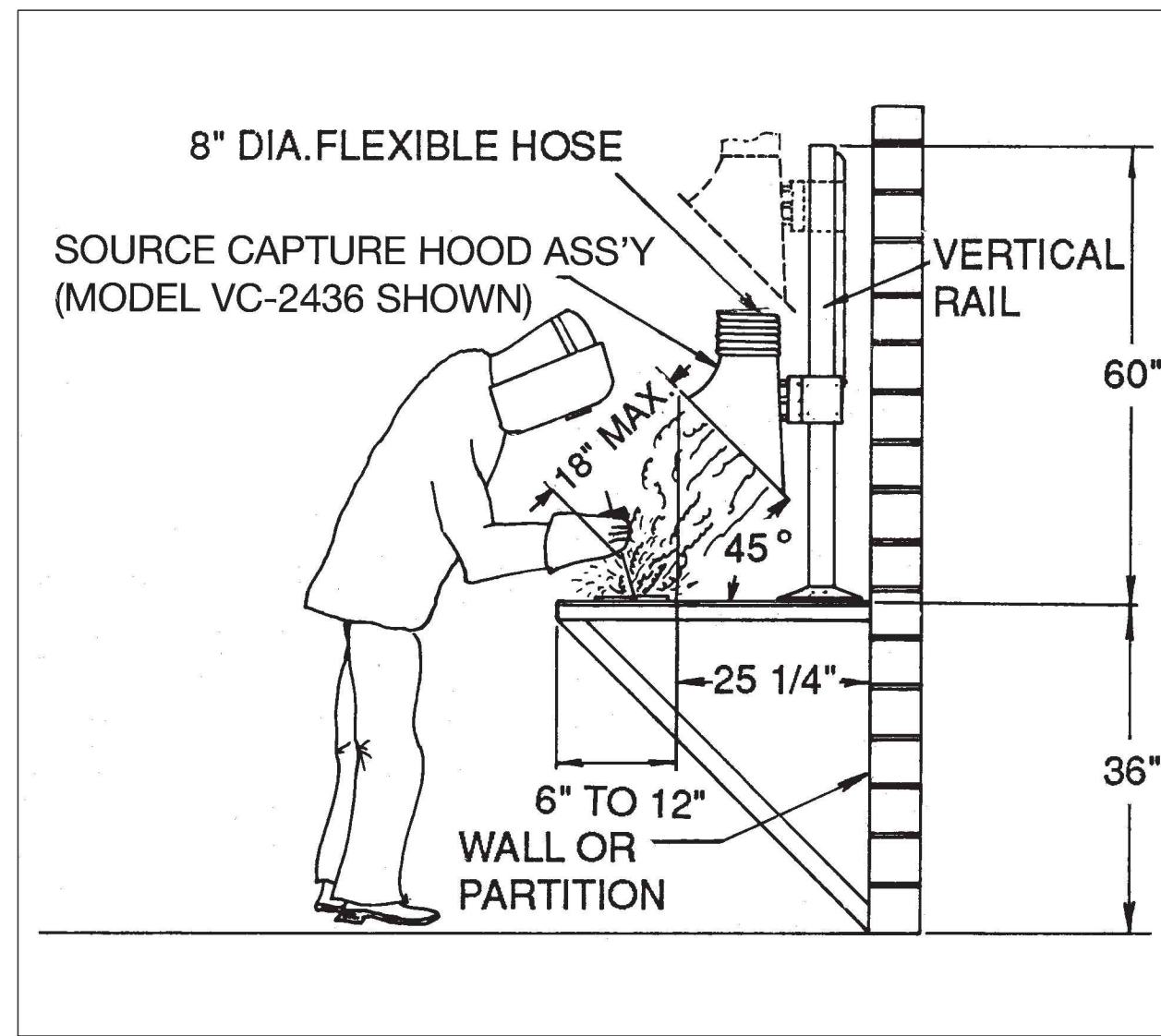
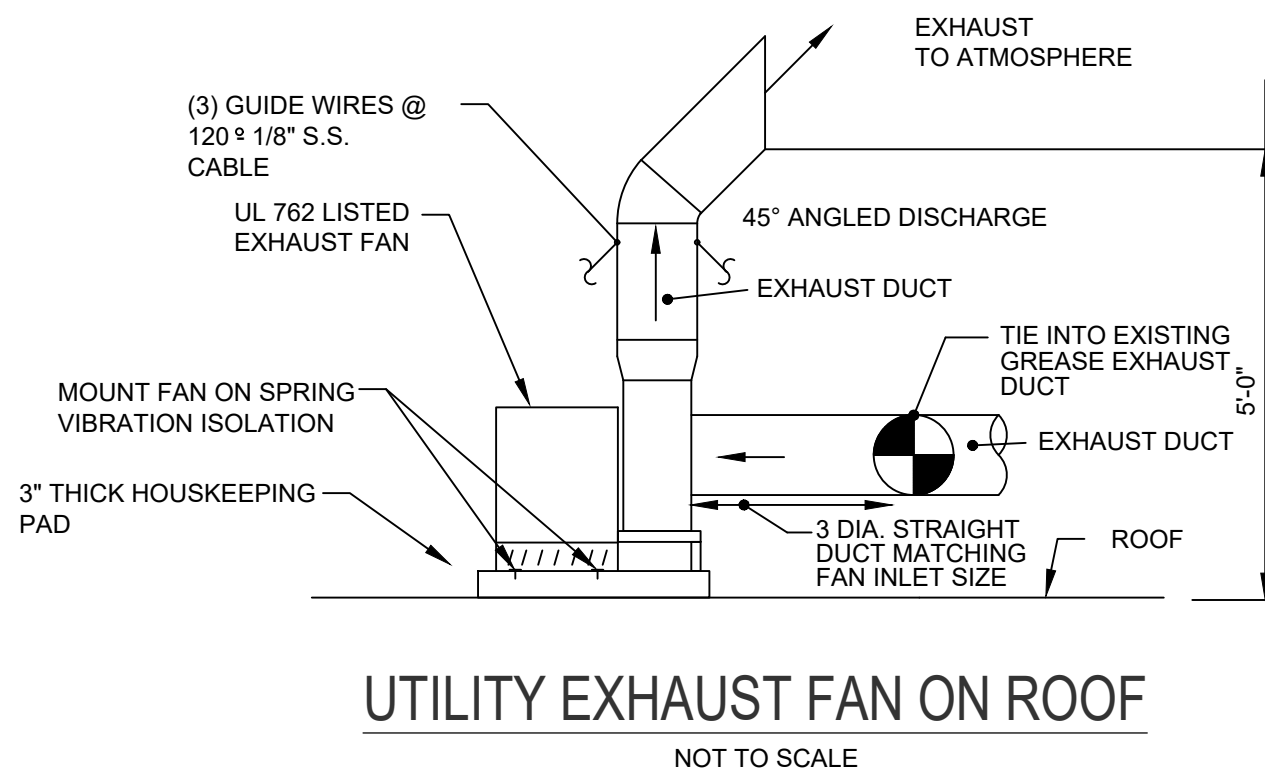
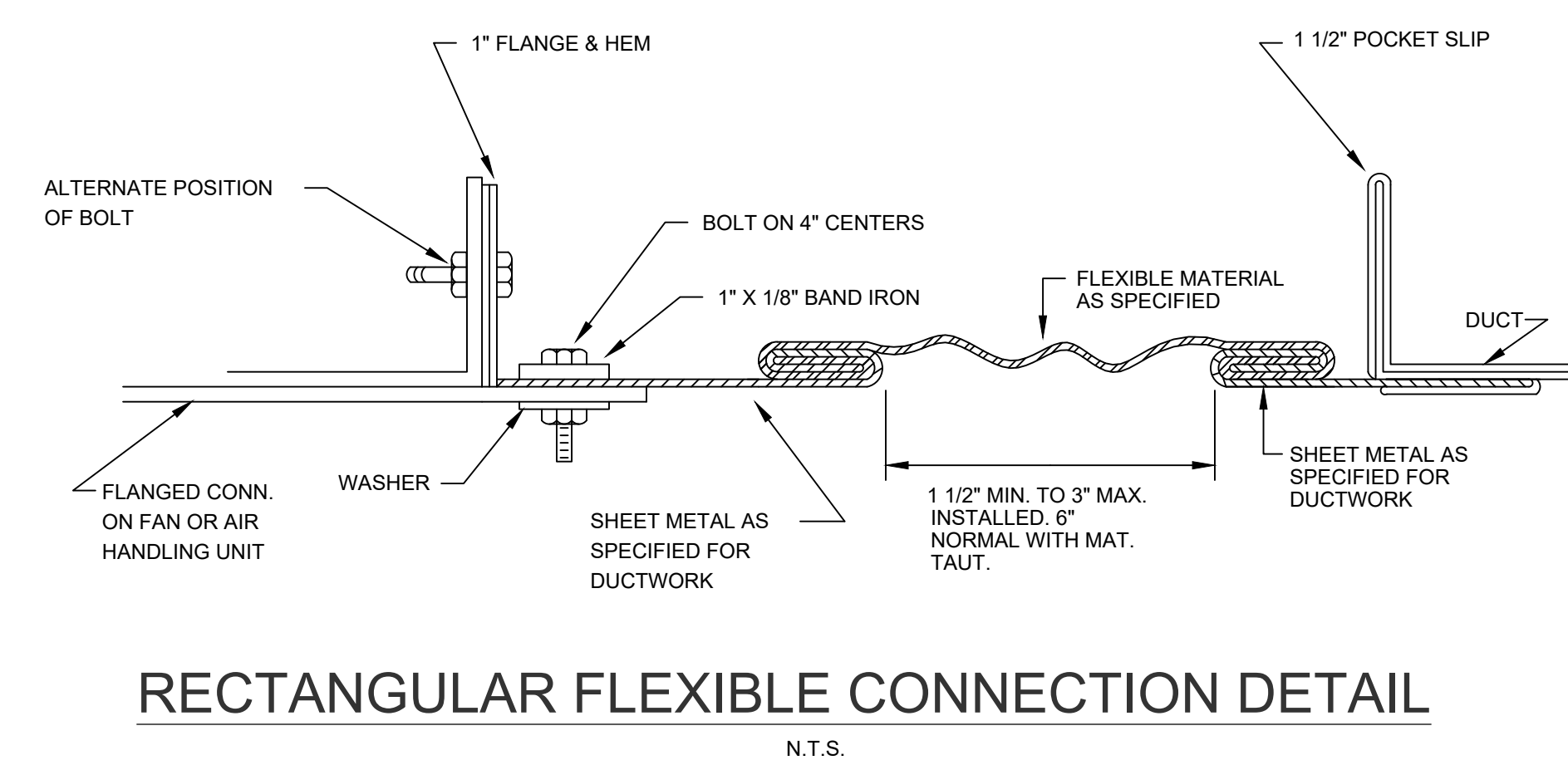


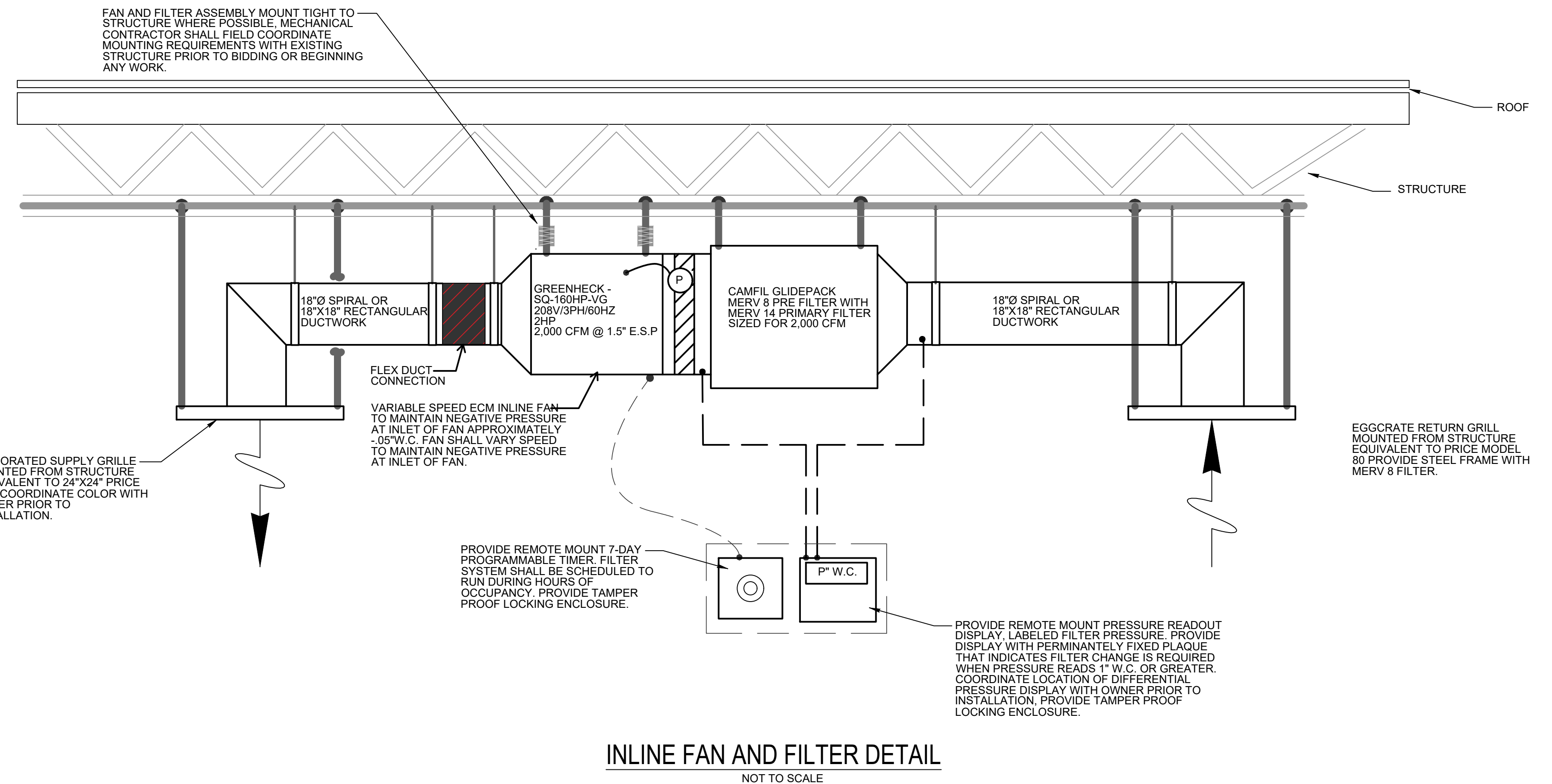
Figure 1. Typical Welding Booth  
**TYPICAL WELDING BOOTH GENERAL DETAIL**



**UTILITY EXHAUST FAN ON ROOF**  
NOT TO SCALE



**RECTANGULAR FLEXIBLE CONNECTION DETAIL**  
N.T.S.

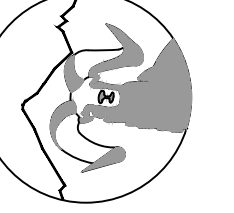


**INLINE FAN AND FILTER DETAIL**  
NOT TO SCALE

DUCT CONSTRUCTION MINIMUM SHEET METAL THICKNESSES			
RECTANGULAR DUCTS			
MAXIMUM SIZE (INCHES)	STEEL (MINIMUM THICKNESS, NOMINAL)	ALUMINUM (MINIMUM THICKNESS, NOMINAL)	
THROUGH 12	0.022 INCH (26 GAGE, GALV.)	0.020 INCH (NO. 24 B&S GAGE)	
13 THROUGH 30	0.028 INCH (24 GAGE, GALV.)	0.025 INCH (NO. 22 B&S GAGE)	
31 THROUGH 54	0.034 INCH (22 GAGE, GALV.)	0.032 INCH (NO. 20 B&S GAGE)	
55 THROUGH 84	0.040 INCH (20 GAGE, GALV.)	0.040 INCH (NO. 18 B&S GAGE)	
OVER 84	0.052 INCH (18 GAGE, GALV.)	0.051 INCH (NO. 16 B&S GAGE)	
ROUND DUCTS			
MAXIMUM SIZE (INCHES)	SPIRAL SEAM DUCT	LONGITUDINAL SEAM DUCT	FITTINGS
	STEEL (MINIMUM THICKNESS, NOMINAL)	STEEL (MINIMUM THICKNESS, NOMINAL)	STEEL (MINIMUM THICKNESS, NOMINAL)
THROUGH 12	0.019 INCH (28 GAGE, GALV.)	0.022 INCH (26 GAGE, GALV.)	0.022 INCH (26 GAGE, GALV.)
13 THROUGH 18	0.022 INCH (26 GAGE, GALV.)	0.028 INCH (24 GAGE, GALV.)	0.028 INCH (24 GAGE, GALV.)
19 THROUGH 28	0.028 INCH (24 GAGE, GALV.)	0.034 INCH (22 GAGE, GALV.)	0.034 INCH (22 GAGE, GALV.)
29 THROUGH 36	0.034 INCH (22 GAGE, GALV.)	0.040 INCH (20 GAGE, GALV.)	0.040 INCH (20 GAGE, GALV.)
37 THROUGH 52	0.040 INCH (20 GAGE, GALV.)	0.052 INCH (18 GAGE, GALV.)	0.052 INCH (18 GAGE, GALV.)

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**CMU TECH WELDING**  
MECHANICAL -DETAILS #1  
2508 BLICHMANN AVENUE  
GRAND JUNCTION, COLORADO

DATE:	ISSUED FOR:
08/23/24	MEP PROGRESS
09/26/24	PHASE I SCOPE



DATE:	7/19/24
JOB NO:	24-150
DRAWN BY:	GB
CHECKED BY:	GB
SCALE:	
SHEET NUMBER:	<b>M3-1</b>



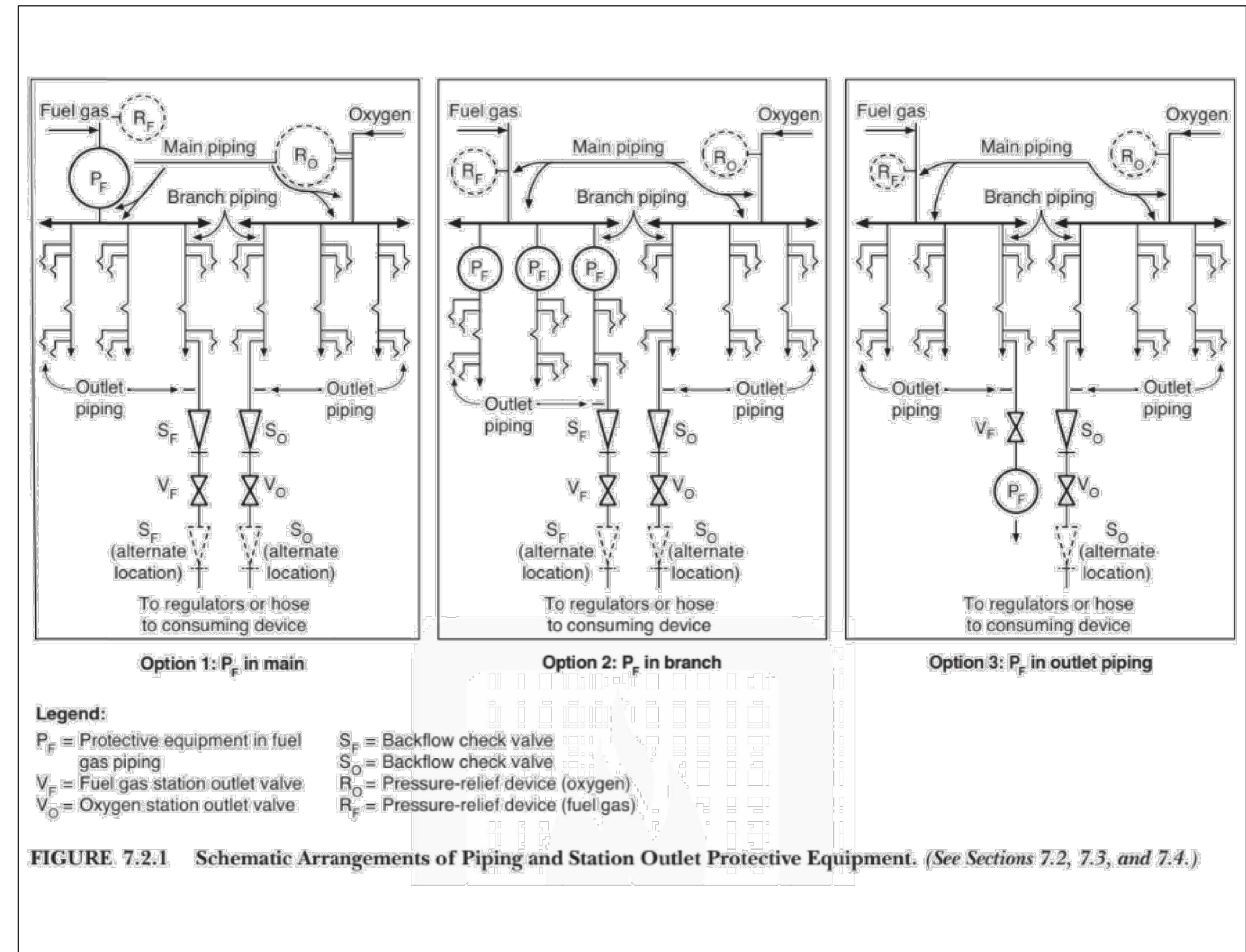
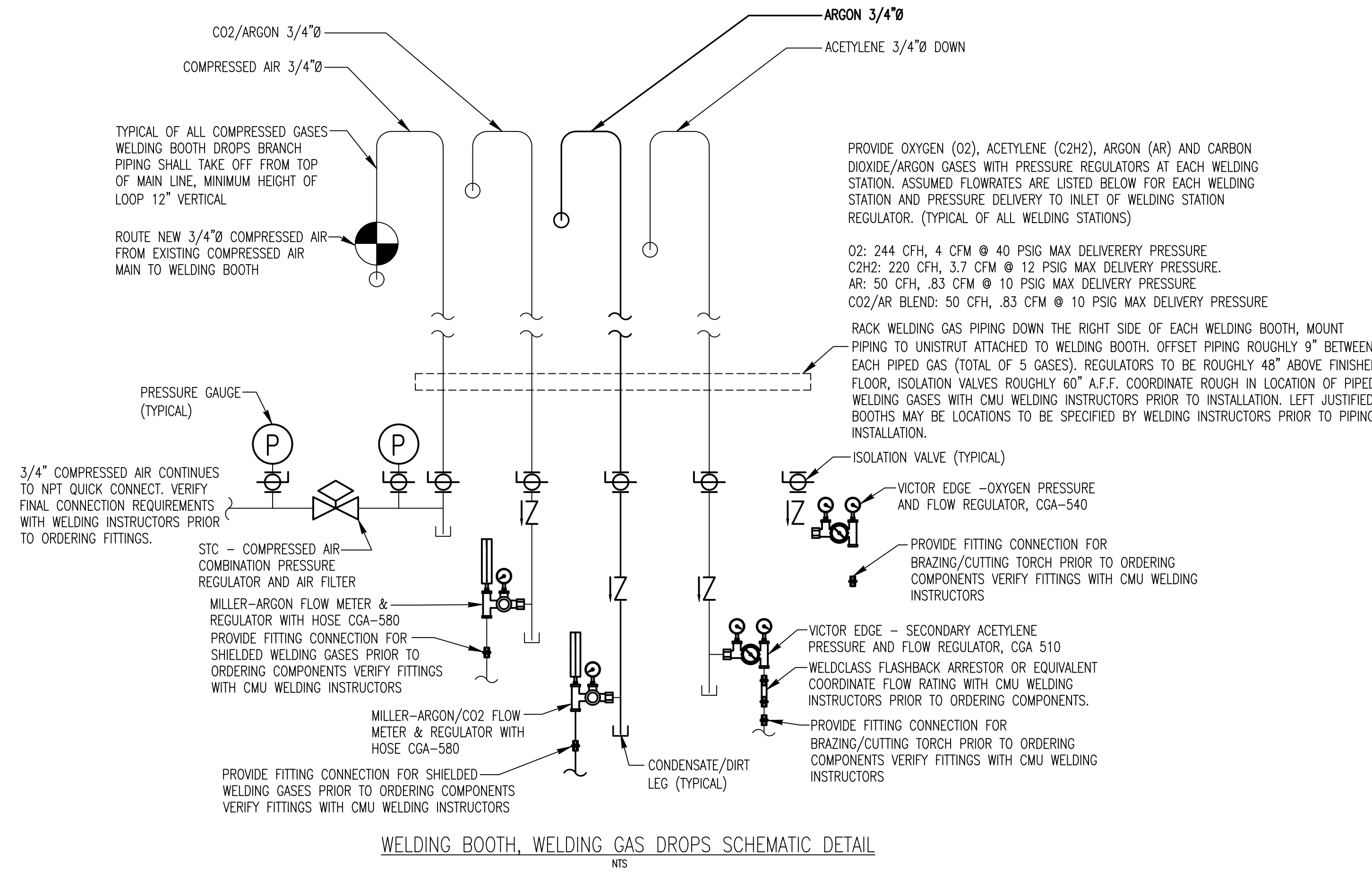
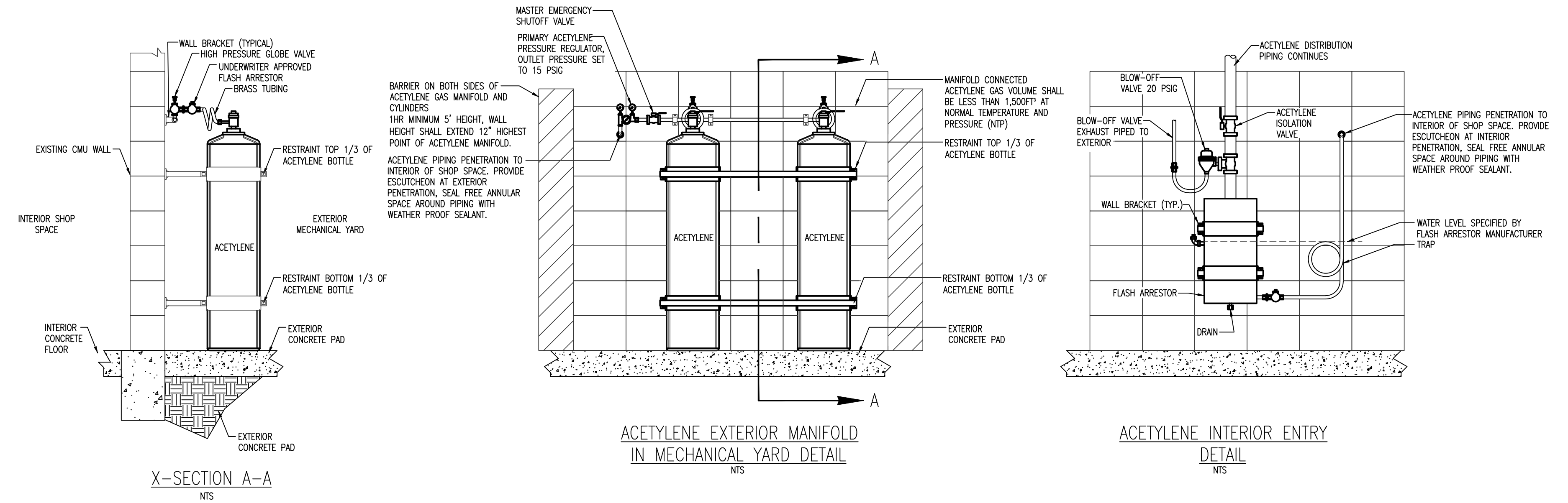


**EXISTING GAS METER NAMEPLATE INFORMATION**

NOT TO SCALE

**WELDING GAS GENERAL NOTES:**

- ALL EXTERIOR METALLIC GAS PIPING SHALL BE TREATED WITH CORROSIVE INHIBITOR COATING. COATING SHALL BE APPLIED PER MANUFACTURER'S RECOMMENDATION SO THAT COATING MAINTAINS INTEGRITY OF GAS PIPING. COATING SHALL BE UV RESISTANT.
- O<sub>2</sub>, CO<sub>2</sub>/ARGON, ARGON AND ACETYLENE PIPING SHALL BE LABELED AND PAINTED IN ACCORDANCE WITH ANSIA/ASME CODES. PIPING SHALL BE FABRICATED, TESTED AND MAINTAINED IN ACCORDANCE WITH ASME B31.3 PROCESS PIPING. PIPING SYSTEM SHALL BE CLEANED AND PURGED. AT EXTERIOR GAS MANIFOLD EACH GAS SHALL BE PROVIDED WITH MASTER GAS PRESSURE REGULATOR VALVE TO REGULATE PRESSURE DELIVERED TO SHOP SPACE. EACH WELDING BOOTH SHALL BE PROVIDED WITH 1" O<sub>2</sub>, 3/4" O<sub>2</sub>, 3/4" ARGON AND 3/4" CO<sub>2</sub>/ARGON PIPING. PROVIDE EACH WELDING BOOTH WITH ISOLATION VALVES, FLOW/PRESSURE REGULATORS RATED FOR RESPECTIVE GAS ON ALL ON GAS LINES SERVING WELDING BOOTH. COORDINATE PIPE TERMINATIONS AT WELDING BOOTH PRIOR TO INSTALLATION. ACETYLENE GAS SHALL BE PROVIDED WITH FLAME ARRESTORS AND ACCESSORY FITTINGS IN ACCORDANCE WITH NFPA 51, 2018 INTERNATIONAL FUEL GAS CODE AND ALL LOCAL APPLICABLE CODES ADOPTED BY THE AUTHORITY HAVING JURISDICTION.
- ACETYLENE OXYGEN MANIFOLDS SHALL BE PROVIDED AND INSTALLED IN COMPLIANCE WITH NFPA 51 STANDARD FOR DESIGN AND INSTALLATION OF OXYGEN-FUEL GAS SYSTEMS FOR WELDING, CUTTING AND ALLIED PROCESSES. REFERENCE NFPA FIGURE 7.2.1 SCHEMATICS SHOWN BELOW FOR PIPING STATION OUTLET PROTECTIVE EQUIPMENT.
- PIPING SYSTEMS, PIPING AND FITTINGS SHALL COMPLY WITH ASME B31.3, PROCESS PIPING, INsofar AS IT DOES NOT CONFLICT WITH SECTION 6.1 OF NFPA 51 AND FOLLOWING EXCEPTIONS: PIPE SHALL BE AT LEAST SCHEDULE 40 AND FITTINGS SHALL BE AT LEAST STANDARD WEIGHT IN SIZES UP TO AND INCLUDING 6" NOMINAL. COPPER TUBING SHALL BE TYPE K OR L, IN ACCORDANCE WITH ASTM B88, STANDARD SPECIFICATION FOR SEAMLESS COPPER TUBE. PIPING SHALL BE STEEL, BRASS, OR COPPER PIPE OR SEAMLESS COPPER, BRASS, OR STAINLESS STEEL TUBING, EXCEPT AS PROVIDED IN 6.1.2 AND 6.1.3 OF NFPA 51. NOTE: ACETYLENE PIPING SHALL BE STEEL, UNALLOYED COPPER SHALL NOT BE USED EXCEPT IN LISTED EQUIPMENT - REFERENCE 6.1.3 OF NFPA 51.
- PIPING JOINTS - JOINTS IN STEEL PIPING SHALL BE WELDED, THREADED, FLANGED OR ASSEMBLED WITH PRESS-CONNECT FITTINGS LISTED TO ANS I LCA/CSA 6.32. PRESS-CONNECT METALLIC FITTINGS FOR USE IN FUEL GAS DISTRIBUTION SYSTEMS, AND INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S INSTALLATION INSTRUCTIONS.
- (ACETYLENE) FUEL GAS EXTERIOR MANIFOLD SHALL BE SEPARATED FROM OXYGEN GAS EXTERIOR MANIFOLD BY 5 FEET AND BE PROVIDED WITH A CMU BLOCK, 1 HOUR RATED NON-COMBUSTIBLE WALL ASSEMBLY MINIMUM OF 5 FEET HIGH. FUEL GAS CYLINDERS CONNECTED TO ONE MANIFOLD HAVING A TOTAL GAS CAPACITY EXCEEDING 3,000 FT<sup>3</sup> OF ACETYLENE OR NONLIQUIFIED GAS OR A TOTAL WATER CAPACITY OF 735 LBS FOR LP-GAS OR MPS SHALL BE LOCATED OUTDOORS OR IN A SEPARATE BUILDING OR ROOM CONSTRUCTED IN ACCORDANCE WITH 8.5.1.6 AND 8.5.1.7. (ACETYLENE MANIFOLD SHALL BE LOCATED OUTDOORS). EXCEPT IN CYLINDER MANIFOLDS, ACETYLENE SHALL NOT BE PIPED OR UTILIZED AT A PRESSURE IN EXCESS OF 15 PSIG (GAUGE PRESSURE) OR 30 PSIA (ABSOLUTE PRESSURE). THIS PROVISION SHALL NOT APPLY TO THE STORAGE OF ACETYLENE IN CYLINDERS MANUFACTURED TO DOT SPECIFICATIONS.
- HIGH PRESSURE OXYGEN MANIFOLDS SHALL COMPLY WITH SECTION 5.2 OF NFPA 51. AN OXYGEN MANIFOLD TO WHICH CYLINDERS HAVE AN AGGREGATE CAPACITY OF MORE THAN 6,500 FT<sup>3</sup> OF OXYGEN ARE CONNECTED SHALL BE LOCATED OUTDOORS. HIGH-PRESSURE OXYGEN MANIFOLDS SHALL BE PROVIDED WITH LISTED PRESSURE-REGULATING DEVICES. LOW-PRESSURE OXYGEN MANIFOLDS SHALL BE USED WITH CYLINDERS HAVING A DOT SERVICE PRESSURE NOT EXCEEDING 350 PSIG. MANIFOLDS SHALL BE CONSTRUCTED OF MATERIALS SUITABLE FOR USE WITH OXYGEN AT A PRESSURE OF 350 PSIG. THEY SHALL HAVE A MINIMUM BURSTING PRESSURE OF 1,400 PSIG AND SHALL BE PROTECTED BY A PRESSURE-RELIEF DEVICE SET TO RELIEVE AT A MAXIMUM PRESSURE OF 700 PSIG. HOSE AND HOSE CONNECTIONS SHALL ONLY BE USED DOWN-STREAM AT PRESSURE REGULATORS AND SHALL COMPLY WITH SECTION 7.5 OF NFPA 51. (7.5 - HOSE AND HOSE CONNECTIONS FOR OXYGEN AND FUEL GAS SERVICE, INCLUDING HOSE USED TO CONNECT PORTABLE OUTLET HEADERS TO PIPING SYSTEMS, SHALL COMPLY WITH CGA E-1, STANDARD FOR RUBBER WELDING HOSE AND HOSE CONNECTIONS FOR GAS WELDING, CUTTING AND ALLIED PROCESSES) HOSE CONFORMING WITH CGA E-1, AS REQUIRED BY SECTION 7.5 SHALL HAVE A MAXIMUM WORKING PRESSURE OF 200 PSIG AND A MINIMUM BURSTING PRESSURE OF 800 PSIG. LISTED OR APPROVED PRESSURE-RELIEF DEVICES SHALL BE INSTALLED DOWNSTREAM OF THE MANIFOLD REGULATOR DISCHARGE IN ACCORDANCE WITH SECTION 7.2 OF NFPA 51. THE ASSEMBLED MANIFOLD, INCLUDING CYLINDER LEADS, SHALL BE TESTED AND PROVEN GAS TIGHT AT A PRESSURE OF 525 PSIG. THE MATERIAL USED FOR TESTING OXYGEN MANIFOLDS SHALL BE OIL-FREE AND NON-FLAMMABLE. A WEATHER-PROOF SIGN SHALL BE CONSPICUOUSLY POSTED AT LOW-PRESSURE OXYGEN MANIFOLDS. THE SIGN SHALL READ AS FOLLOWS "LOW-PRESSURE MANIFOLD - DO NOT CONNECT HIGH-PRESSURE CYLINDERS. MAXIMUM PRESSURE - 350 PSIG."
- CONFIRM FINAL GAS SYSTEM CONNECTION REQUIREMENTS WITH WELDING INSTRUCTOR AND GAS FITTING MANUFACTURER PRIOR TO ORDERING REGULATOR/FLOWMETERS. FITTINGS AND ACCESSORIES SHALL BE LABELED FOR THE APPROPRIATE CGA RATING FOR THE GAS SYSTEM THEY ARE CONNECTED TO.



**FIGURE 7.2.1 Schematic Arrangements of Piping and Station Outlet Protective Equipment. (See Sections 7.2, 7.3, and 7.4.)**

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