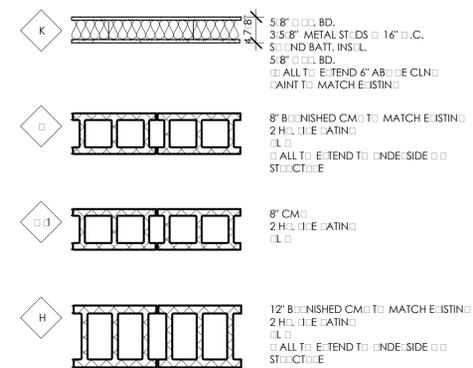


SHEET INDEX	
SHEET NUMBER	SHEET NAME
ARCHITECTURAL	
A1.1	LEVEL 1 CONSTRUCTION PLAN
A1.2	LEVEL 1 FINISH PLAN
A2.1	SCHEDULES INTENTIONS
MECHANICAL	
M1.0	MECHANICAL TITLE SHEET
M2.0	MECHANICAL HVAC AND DUCTWORK DEMOLITION PLAN
M3.0	MECHANICAL DUCTWORK
M3.1	DUCTWORK DEMOLITION PLAN
M4.0	MECHANICAL HVAC PLAN
M5.0	MECHANICAL SCHEDULES AND DETAILS
M6.0	MECHANICAL SPECIFICATIONS
ELECTRICAL	
E1.0	ELECTRICAL SPECIFICATIONS AND TITLE SHEET
E2.0	ELECTRICAL DEMOLITION PLAN
E3.0	ELECTRICAL FINISH PLAN
E4.0	ELECTRICAL SCHEDULES AND DETAILS
E5.0	ELECTRICAL SCHEDULES AND DETAILS



WALL TYPES  
3/4" = 1'-0"

- GENERAL NOTES:
1. CONTRACTOR TO VERIFY ALL EXISTING CONDITIONS.
  2. PATCH TO MATCH AND REPAIR AS REQUIRED.
  3. PROVIDE INSULATION ACCESS PANEL ABOVE CLIN AT ALL BETWEEN CLIN 164 AND IT ROOM 166.
  4. PROVIDE NEW SOUND ISOLATION PANELS IN IT ROOM 166. TOTALS AREA TO BE 64 S.F.

**CODE SUMMARY**

CODE SET: 2006 IBC; 2007 MN STATE BLDG CODE

SCALE: AS SHOWN

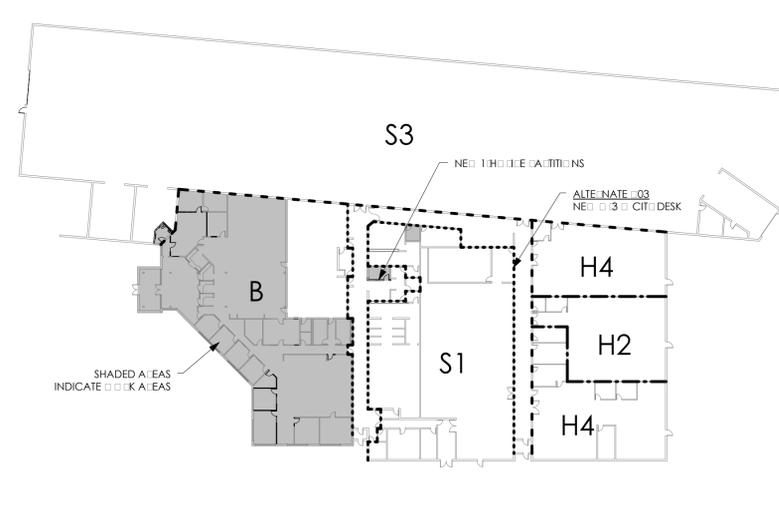
CONSTRUCTION: SEE SCHEDULES

CONSTRUCTION: SEE SCHEDULES

AREA SEPARATION: SEE SCHEDULES

EXISTING BUILDING AREA AND STRUCTURES: 92-445 S. 13TH ST. ADDITIONAL BUILDING AREA: 0 S.F.

TYPE OF CONSTRUCTION: TYPE IIB



2 KEY PLAN  
A1.1 1" = 50'-0"

1 LEVEL 1 CONSTRUCTION PLAN (PARTIAL)  
A1.1 1/8" = 1'-0"

**architecture**  
A D V A N T A G E

a limited liability company  
1434 East Superior Street • Duluth, Minnesota 55805  
Phone: 218.724.5588 • Fax: 218.724.5589 • Email: info@architectureadventure.com

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SHEET TITLE:  
LEVEL 1 CONSTRUCTION PLAN

CITY OF DULUTH  
**Comfort Systems**  
520 Grand Avenue • Duluth, MN  
PROJECT NO: 1411

CHECKED BY: MMJ  
DRAWN BY: SJH

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RELEASE DATE:  
06.30.14

REVISIONS:

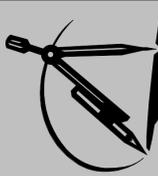
SET NO.

SHEET NO.  
**A1.1**  
1 OF 3



ALL DIMENSIONS SHOWN ARE IN FEET AND INCHES UNLESS OTHERWISE NOTED.

1 LEVEL 1 FURNITURE PLAN (PARTIAL)  
A1.2 1/8" = 1'-0"



STATE OF MINNESOTA  
REGISTERED ARCHITECT  
M. JAMES M. JOHNSON  
No. 063014  
EXPIRES 06/30/14

SHEET TITLE:  
LEVEL 1 FURNITURE PLAN

City of Duluth  
Comfort Systems  
520 1st Avenue North  
Duluth, MN 55812  
PROJECT NO: 1411  
DRAWN BY: SJH  
CHECKED BY: MMJ

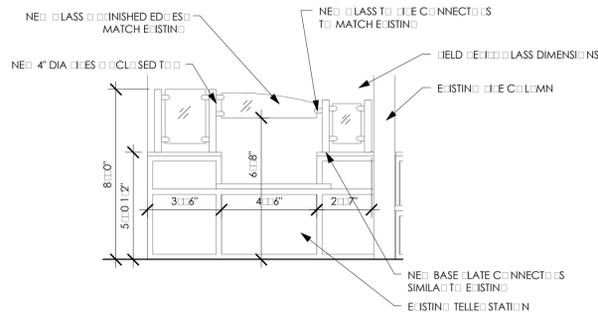
RELEASE DATE:  
06.30.14

REVISIONS:

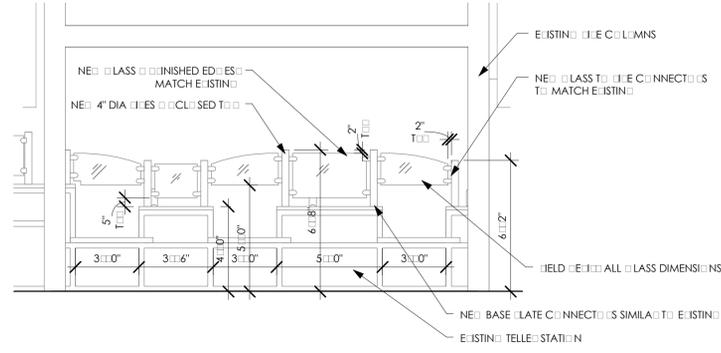
SET NO.

SHEET NO.

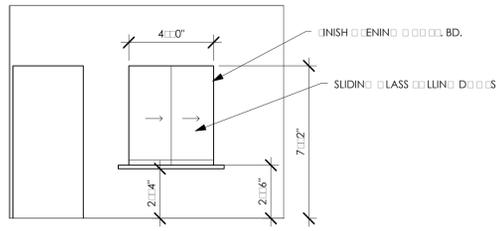
A1.2



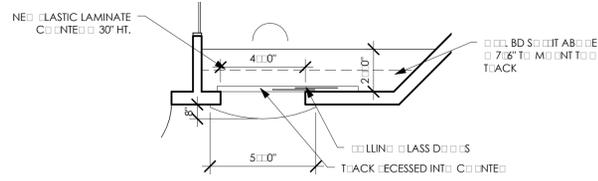
1 LOBBY ELEVATION - PLAN NORTHEAST  
1/4" = 1'-0"



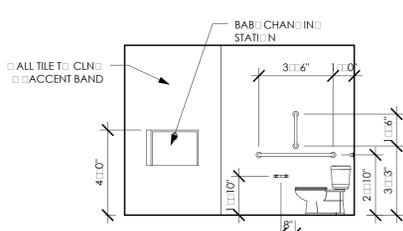
2 LOBBY ELEVATION - PLAN EAST  
1/4" = 1'-0"



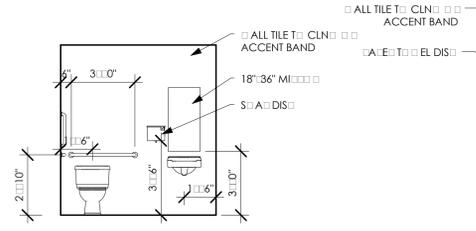
3 LOBBY ELEVATION - PLAN NORTH  
1/4" = 1'-0"



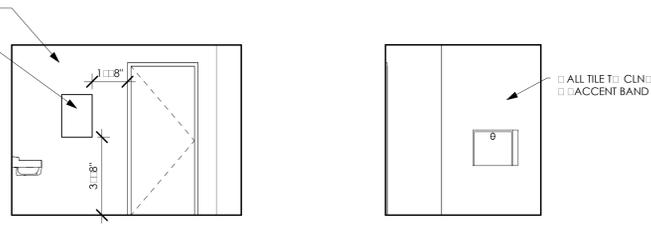
4 TELLER WINDOW PLAN  
1/4" = 1'-0"



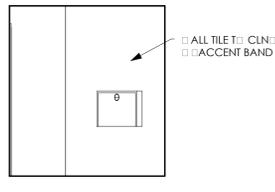
7 UNISEX ELEV - SIDE WALL  
1/4" = 1'-0"



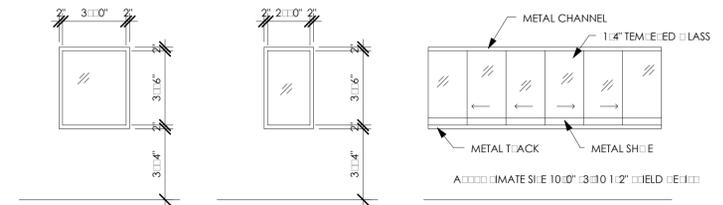
8 UNISEX ELEV - TLT WALL  
1/4" = 1'-0"



9 UNISEX ELEV - DOOR WALL  
1/4" = 1'-0"



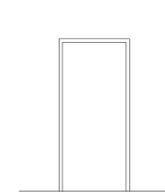
10 UNISEX ELEV - BACK WALL  
1/4" = 1'-0"



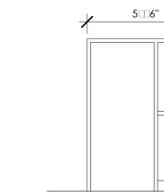
D1 HOLLOW METAL FRAME GLASS

D2 HOLLOW METAL FRAME GLASS

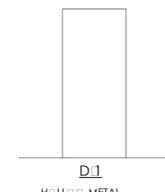
D3 ALTERNATE GLASS AT CITY DESK



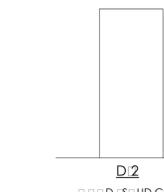
D1 HOLLOW METAL



D2 HOLLOW METAL FRAME GLASS



D1 HOLLOW METAL



D2 HOLLOW METAL FRAME

DOOR, FRAMES AND WINDOW TYPES  
1/4" = 1'-0"

DOOR SCHEDULE

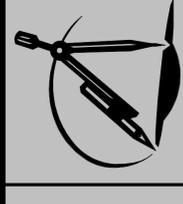
NO.	DESCRIPTION	FRAME	GLASS	FINISH	HAND-RAIL	HEIGHT	COMMENTS
128A	3'-0" x 7'-0"	HM D 1	HM H 1	PAINT H 4	H 4	20 MIN	
133	E.L.	E.L.	E.L.	E.L.	H 4.1	E.L. 20 MIN	CHANGE LOCKSET TO NL
156	E.L.	E.L.	E.L.	E.L.			
157A	E.L.	E.L.	E.L.	E.L.			
157B	3'-0" x 7'-0"	D D 1	HM H 1	PAINT H 1			
157D	E.L.	E.L.	HM H 1	E.L.	H 5		CHANGE LOCKSET TO LATCHSET
158C	3'-0" x 7'-0"	D D 1	HM H 1	PAINT H 1			CARD READER ELECTRIC STRIKE
174	E.L.	E.L.	E.L.	E.L.	H 3		
177A	3'-0" x 7'-0"	D D 1	HM H 1	PAINT H 1			
177C	3'-0" x 7'-0"	D D 2	HM H 2	PAINT H 3			
178A	3'-0" x 7'-0"	HM D 2	HM H 2	PAINT H 2		1.5 H	

DOORS NOT INCLUDED IN THIS SCHEDULE ARE EXISTING AND NOT TO THESE DOORS.

ROOM FINISH SCHEDULE							
ROOM NUMBER	ROOM NAME	FLOOR FINISH	BASE FINISH	WALL FINISH	CEILING		COMMENTS
					MATERIAL	FINISH	
128A	SICK ROOM ADA	C.A.T.E.T.	C.I.N.L.	C.A.I.N.T.	ACT. EXISTING		
133	SICK ROOM	C.A.T.E.T.	C.I.N.L.	EXISTING	ACT.		
157A	STORAGE	C.A.T.E.T. EXISTING	C.I.N.L.	C.A.I.N.T.	ACT. EXISTING		
157B	OFFICE	C.A.T.E.T. EXISTING	C.I.N.L.	C.A.I.N.T.	ACT. EXISTING		
157C	DISPATCH	C.A.T.E.T.	C.I.N.L.	C.A.I.N.T.	ACT. EXISTING		
164	CONFERENCE	C.A.T.E.T.	C.I.N.L.	C.A.I.N.T.	ACT.		
174	OFFICE	C.A.T.E.T. EXISTING	C.I.N.L.	C.A.I.N.T.	ACT. EXISTING		
177A	OFFICE	C.A.T.E.T. EXISTING	C.I.N.L.	C.A.I.N.T.	ACT. EXISTING		
178A	UNISEX	C.CELAIN TILE	C.CELAIN TILE	C.CELAIN TILE	C.B.	C.A.I.N.T.	

TYPICAL NOTES

1. GLASS TO BE PAINT IN ALL NEW GLASS IN AREAS NOT IN SCHEDULE.
2. GLASS TO BE PAINT IN ALL NEW GLASS IN AREAS NOT IN SCHEDULE.
3. MULLION AND FRAME ACT. CEILING AND GLASS TO BE PAINT AT ANGLE TO DEMONSTRATE ALLS.



PROJECT NO. 1411  
SHEET NO. A2.1  
DRAWN BY: SJH  
CHECKED BY: MMJ  
DATE: 06.30.14

SHEET TITLE:  
SCHEDULES  
INIE  
ELEVATIONS

City of Duluth  
Comfort Systems  
520  
PROJECT NO. 1411  
DRAWN BY: SJH  
CHECKED BY: MMJ  
DATE: 06.30.14

RELEASE DATE:  
06.30.14

REVISIONS:

SET NO.

SHEET NO.

A2.1  
3 OF 3

**GENERAL MECHANICAL SYMBOLS**

	REVISION NUMBER - SHOWN ON PLANS
	POINT WHERE NEW CONNECTS TO EXISTING
	NUMBER OF DETAIL ON SHEET
	NUMBER OF SHEET WHERE DETAIL APPEARS
	KEYNOTE
	CONTINUATION SYMBOL
	ROOM NAME AND NUMBER
	MECHANICAL EQUIPMENT TAG
	EXISTING MECHANICAL EQUIPMENT TAG (TYPICAL FOR ALL EXISTING TAGS)
	ITEM TO BE DEMOLISHED
	AREA NOT IN CONTRACT

**HVAC SYMBOLS**

	SQUARE DUCT SIZE TAG (WIDTH x HEIGHT)
	OVAL DUCT SIZE TAG (WIDTH / HEIGHT)
	ROUND DUCT SIZE TAG (DIAMETER)
	EXISTING DUCT TAG
	DUCT BEING DEMOLISHED
	EXHAUST AIR
	OUTSIDE AIR
	RELIEF AIR
	RETURN AIR
	SUPPLY AIR
	TRANSFER AIR

	INLET/OUTLET SIZE
	GRILLES, REGISTERS, AND DIFFUSERS TAG
	CFM TYPE
	NECK SIZE
	SLOT LENGTH
	NUMBER OF SLOTS
	LINEAR DIFFUSER TAG
	CFM TYPE

	FIRE DAMPER
	SMOKE DAMPER
	MOTORIZED DAMPER
	MANUAL BALANCING DAMPER
	BACKDRAFT DAMPER
	COMBINATION FIRE/SMOKE DAMPER
	CARBON DIOXIDE SENSOR
	CARBON MONOXIDE SENSOR
	HUMIDISTAT
	HUMIDITY SENSOR
	NITROGEN DIOXIDE SENSOR
	SENSOR
	TEMPERATURE & HUMIDITY SENSOR
	TEMPERATURE SENSOR
	THERMOSTAT
	SUPPLY OUTLET
	RETURN/EXHAUST INLET
	LINEAR DIFFUSER
	SUPPLY DUCT RISE
	RETURN DUCT RISE
	SUPPLY DUCT DROP
	RETURN DUCT DROP
	VARIABLE AIR VOLUME TERMINAL

**PLUMBING AND PIPING SYMBOLS**

	CHWR	CHILLED WATER RETURN
	CHWS	CHILLED WATER SUPPLY
	CWV	COMBINATION WASTE VENT
	CA	COMPRESSED AIR
	CD	CONDENSATE DRAINAGE
	CDR	CONDENSATE RETURN
	CWR	CONDENSER WATER RETURN
	CWS	CONDENSER WATER SUPPLY
	CW	DOMESTIC COLD WATER
	F-CW	DOMESTIC COLD WATER-FILTERED
	H-CW	DOMESTIC COLD WATER-HARD
	S-CW	DOMESTIC COLD WATER-SOFT
	HW	DOMESTIC HOT WATER
	HW 140°	DOMESTIC HOT WATER 140°
	CHW	DOMESTIC HOT WATER-CIRCULATING
	CHW 140°	DOMESTIC HOT WATER-CIRCULATING 140°
	GV	GREASE VENT
	GW	GREASE WASTE
	HWR	HOT WATER RETURN
	HWS	HOT WATER SUPPLY
	G	NATURAL GAS
	OV	OIL VENT
	OW	OIL WASTE
	PD	PUMP DISCHARGE
	REF-L	REFRIGERANT-LIQUID
	REF-S	REFRIGERANT-SUCTION
	V	SANITARY VENT
	SS	SANITARY SEWER
	SHWR	SOLAR HOT WATER RETURN
	SHWS	SOLAR HOT WATER SUPPLY
	STM	STEAM
	SD	STORM DRAINAGE
	OSD	STORM DRAINAGE-OVERFLOW
	(E)	BELOW GROUND PIPING
	(E)	EXISTING PIPING
	(E)	PIPING BEING DEMOLISHED
		SHUT-OFF VALVE
		FLOW MEASURING AND BALANCING DEVICE
		COMBINATION BALANCING, CHECK AND SHUT-OFF VALVE
		THREE WAY VALVE

**FIRE PROTECTION SYMBOLS**

	FP-D	FIRE PROTECTION DRY
	FP-O	FIRE PROTECTION OTHER
	FP-PA	FIRE PROTECTION PRE-ACTION
	FP-W	FIRE PROTECTION WET

**ABBREVIATIONS**

&	AND	ID	INDIRECT
Ø	ROUND	IN	INCH
A	AIR	INL	INLET
AB	ABOVE BASE	INSUL	INSULATION
ABV	ABOVE	INT	INTERIOR
AC	AIR CONDITIONING	INV	INVERT
ACOUS	ACOUSTICAL	INWG	INCHES WATER GAUGE
AD	AREA DRAIN	JST	JOIST SPACE
ADD	ADDENDUM	JOINT	JOINT
ADDL	ADDITIONAL	LAB	LABORATORY
AFF	ABOVE FINISHED FLOOR	LB	POUND
AFUE	ANNUAL FUEL UTILIZATION EFFICIENCY	LB/HR	POUNDS PER HOUR
AG	ABOVE GROUND	LAT	LEAVING AIR TEMPERATURE
ALT	ALTERNATE	LF	LINEAL FOOT
ALUM	ALUMINUM	LOC	LOCATION
AP	ACCESS PANEL	LP	LOW PRESSURE
APPROX	APPROXIMATE	LPG	LIQUEFIED PETROLEUM GAS
ARCH	ARCHITECT/ARCHITECTURAL	LR	LIQUID REFRIGERANT
AV	ACID RESISTANT VENT	LS	LAWN SPRINKLER
AW	ACID RESISTANT WASTE	LVR	LOUVER
AUTO	AUTOMATIC	LWT	LEAVING WATER TEMPERATURE
BLDG	BUILDING	MA	MIXED AIR
BLW	BELOW	MAN	MANUAL
BM	BEAM	MATL	MATERIAL
BO	BY OTHER	MAV	MANUAL AIR VENT
BOTM	BOTTOM	MB	MAXIMUM
BSMT	BASEMENT	MBD	MOTORIZED BYPASS DAMPER
BTU	BRITISH THERMAL UNITS	MBH	ONE THOUSAND BTU PER HOUR
BTUH	BRITISH THERMAL UNITS PER HOUR	MCF	ONE THOUSAND CUBIC FEET
BTWN	BETWEEN	MCW	MAKE-UP COLD WATER
CAP	CAPACITY	MCD	MOTORIZED DAMPER
CB	CATCH BASIN	MECH	MECHANICAL
CCW	COUNTER CLOCKWISE	MFR	MANUFACTURER
CFCV	CONSTANT FLOW CONTROL VALVE	MH	MANHOLE
CFM	CUBIC FEET PER MINUTE	MIN	MINIMUM
CHW	CIRCULATING HOT WATER	MISC	MISCELLANEOUS
CI	CAST IRON	MTR	MOTOR
CLG	CEILING	MA/UA	MAKE-UP/AIR
CLG	COOLING	NECK	NECK
CO	CLEAN OUT	NC	NOISE CRITERIA
COL	COLUMN	NC	NORMALLY CLOSED
COMB	COMBINATION	NC	NOT IN CONTRACT
CONC	CONCRETE	NO	NUMBER
COND	CONDENSATE	NO	NORMALLY OPEN
CONF	CONFERENCE	NOM	NOMINAL
CONN	CONNECT	NTS	NOT TO SCALE
CONST	CONSTRUCTION	O	OXYGEN
CONTN	CONTINUATION	O/A	ON CENTER
CONTR	CONTRACT/CONTRACTOR	OC	ON CENTER
COORD	COORDINATE	OF	OVERFLOW
CTR	CENTER	OPNG	OPENING
CU	CUBIC FEET	ORIF	ORIFICE
CV	CHECK VALVE	PD	PRESSURE DROP
CW	COLD WATER	PIV	POST INDICATOR VALVE
CW	CLOCKWISE	PLBG	PLUMBING
D	DEGREE	PR	PAIR
DB	DRY BULB	PREL	PRELIMINARY
DET	DETAIL	PRESS	PRESSURE
DIA	DIAMETER	PRIM	PRIMARY
DIAG	DIAGONAL	PRV	PRESSURE REDUCING VALVE
DISCH	DISCHARGE	PSI	POUNDS PER SQUARE INCH
DIV	DIVISION	PSIG	POUNDS PER SQUARE INCH GAUGE
DI	DEIONIZED WATER	PW	POTABLE WATER
DMPR	DAMPER	PWR	POWER
DN	DOWN	DR	DUCT RISER
DWG	DRAWING	R/A	RETURN AIR
DW	DISTILLED WATER	RCP	RADIANT CEILING PANEL
EA	EACH	RD	ROOF DRAIN
EAT	ENTERING AIR TEMPERATURE	REC	RECESSED
EL	ELBOW	RED	REDUCED
ELEC	ELECTRICAL	REFR	REFRIGERATION
ELEV	ELEVATION	RH	RELATIVE HUMIDITY
EP	EXPLOSION PROOF	REQD	REQUIRED
EQU	EQUAL	REV	REVERSE
EQUIP	EQUIPMENT	R/A	RELIEF AIR
EWC	ELECTRIC WATER COOLER	RM	ROOM
EWT	ENTERING WATER TEMPERATURE	RPM	REVOLUTIONS PER MINUTE
EA	EXHAUST AIR	R/W	RAIN WATER
EAH	EXHAUST HOOD	SF	SQUARE FOOT
EXIST	EXISTING	S/A	SUPPLY AIR
EXP	EXPANSION	SAN	SANITARY
EXPT	EXPANSION JOINT	SCHED	SCHEDULE
EXT	EXTERIOR	SECT	SECTION
F	DEGREES FAHRENHEIT	SF	SQUARE FOOT
FCO	FLOOR CLEAN OUT	SD	SMOKE DAMPER
FD	FLOOR DRAIN	SHT	SHEET
FD	FIRE DAMPER	SH	SIMILAR
FDV	FIRE DEPARTMENT VALVE	SLV	SLEEVE
FHC	FIRE HOSE CABINET	SM	SURFACE MOUNT
FL	FLOOR	SP	STANDPIPE
FLEX	FLEXIBLE	SP	STATIC PRESSURE
FLG	FLANGE	SPEC	SPECIFICATION
FO	FUEL OIL	SPS	STATIC PRESSURE STATION
FOV	FUEL OIL VENT	SQ	SQUARE
FOR	FUEL OIL RETURN	SR	SUCTION REFRIGERANT
FOS	FUEL OIL SUPPLY	SSD	SOIL SUBDRAIN
FPM	FEET PER MINUTE	SS	STAINLESS STEEL
FRP	FIBERGLASS REINFORCED PIPE	STD	STANDARD
FS	FULL SIZE	STM	STEAM
FS	FLOOR SINK	STRUCT	STRUCTURAL
FT	FOOT/FEET	SUCT	SUCTION
FTG	FOOTING	SUSP	SUSPENDED
FTR	FIN TUBE RADIATION	T	THERMOSTAT
FUT	FUTURE	TCP	TEMPERATURE CONTROL PANEL
GA	GAGE/GAUGE	TD	TEMPERATURE DROP
GAL	GALLON	TD	TRENCH DRAIN
GALV	GALVANIZED	TEFC	TOTALLY ENCLOSED FAN COOLED
GC	GENERAL CONTRACTOR	TEMP	TEMPERATURE
GEN	GENERATOR	TYP	TYPICAL
GENL	GENERAL	UFD	UNDER FLOOR DUCT
GPH	GALLONS PER MINUTE	UG	UNDERGROUND
GR	GRADE	VAC	VACUUM
GW	GREASE WASTE	V	VENT
HB	HOSE BIB	VAV	VARIABLE AIR VOLUME
HD	HEAD	VEL	VELOCITY
HORZ	HORIZONTAL	VENT	VENTILATION
HP	HORSE POWER	VERT	VERTICAL
HP	HIGH PRESSURE	VOL	VOLUME
HTG	HEATING	VTR	VENT THROUGH ROOF
HTR	HEATER	W	WASTE
HW	HOT WATER	WB	WET BULB
HYD	HYDRANT	WCO	WALL CLEAN OUT
		WH	WALL HYDRANT

**EQUIPMENT ABBREVIATIONS**

AC	AIR CONDITIONING UNIT	FP	FIRE PUMP
ACC	AIR COOLED CONDENSER	GI	GREASE INTERCEPTOR
ACCU	AIR COOLING CONDENSING UNIT	GRV	GRAVITY ROOF VENTILATOR
AFMS	AIR FLOW MEASURING STATION	H	HUMIDIFIER
AHU	AIR HANDLING UNIT	HWP	HEATING WATER PUMP
AS	AIR SEPARATOR	HPU	HEAT EXCHANGER
B	BOILER	HPU	HEAT PUMP UNIT
CF	CABINET FAN	HRU	HEAT RECOVERY UNIT
CF	CHEMICAL FEEDER	ILC	INLINE CENTRIFUGAL
CFP	CHEMICAL FEEDER PUMP	IPF	PROPPELLER FAN
CH	CHILLER	PRV	POWER ROOF VENTILATOR
CRU	CONDENSATE RETURN UNIT	PWF	POWER WALL FAN
CT	COOLING TOWER	RE	RETURN/EXHAUST FAN
CUH	CABINET UNIT HEATER	RTU	ROOFTOP UNIT
CWP	CONDENSER WATER PUMP	SA	SHOCK ABSORBER
CHWP	CHILLED WATER PUMP	SAT	SOUND ATTENUATOR
DBP	DOMESTIC WATER BOOSTER PUMP	SEP	SEWAGE EJECTOR PUMP
DC	DUCT MOUNTED COIL	SF	SUPPLY FAN
DCP	DOMESTIC WATER CIRCULATING PUMP	SP	SUMP PUMP
EF	EXHAUST FAN	UH	UNIT HEATER
EDC	ELECTRIC DUCT COIL	US	UTILITY SET
ET	EXPANSION TANK	UV	UNIT VENTILATOR
EWH	ELECTRIC WATER HEATER	WFMS	WATER FLOW MEASURING STATION
FCU	FAN COIL UNIT	WH	WATER HEATER

**GENERAL NOTES-PROJECT**

- COORDINATE INSTALLATION OF PIPING, DUCTWORK, CONDUIT, LIGHTS, CABLE TRAY, STRUCTURE, AND EQUIPMENT TO PREVENT CONFLICTS.
- THE CONTRACTOR SHALL BE FAMILIAR WITH ALL THE CONDITIONS BOTH EXISTING AND THOSE ILLUSTRATED BY THESE DOCUMENTS AS WELL AS THOSE WHICH CAN BE REASONABLY ANTICIPATED INCLUDING, BUT NOT LIMITED TO ARCHITECTURAL, ELECTRICAL, VENTILATION, PLUMBING, AND OTHER SYSTEMS INVOLVED ON THIS PROJECT.
- FINAL PROJECT SHALL BE A COMPLETE AND FUNCTIONING SYSTEM, AND SHALL CONFORM TO ALL REQUIREMENTS OF APPLICABLE FEDERAL, STATE, AND LOCAL CODES, INCLUDING BUT NOT LIMITED TO THE INTERNATIONAL BUILDING CODE AND INTERNATIONAL MECHANICAL CODE.
- LOCATE EQUIPMENT REQUIRING ACCESS 2'-0" MAXIMUM ABOVE CEILING.
- ALL ROOF MOUNTED EQUIPMENT SHALL BE A MINIMUM 10'-0" FROM EDGE OF ROOF.
- FIRE SEAL AROUND DUCT AND PIPING PENETRATIONS OF FIRE RATED WALLS, REFER TO SPECIFICATION.
- LOCATE DUCTWORK, PIPING AND MECHANICAL EQUIPMENT AWAY FROM THE SPACE ABOVE ELECTRICAL PANELS, TRANSFORMERS AND OTHER ELECTRICAL EQUIPMENT.
- PROVIDE SLEEVES AND/OR OPENINGS TO RUN PIPES AND DUCTS THROUGH FOUNDATIONS, FLOORS, WALLS, AND ROOF.
- ADJUST PIPING AND DUCTWORK SIZES TO PROPERLY CONNECT TO MECHANICAL EQUIPMENT.
- REFER TO PLUMBING SERIES DRAWINGS FOR GAS AND A.C. CONDENSATE DRAIN PIPING.
- PIPE SIZES SHOWN SHALL BE CONTINUED IN THE DIRECTION OF FLOW UNTIL ANOTHER SIZE IS SHOWN.
- FOR DETAILS, EQUIPMENT CONNECTIONS, AND PIPE SIZES NOT SHOWN ON THE SEGMENTS, REFER TO DETAILS, SCHEDULES, AND SPECIFICATIONS.
- INSTALL ALL EQUIPMENT IN ACCORDANCE WITH THE RESPECTIVE MANUFACTURER'S WRITTEN INSTALLATION INSTRUCTIONS, AT A LEVEL OF QUALITY AND WORKMANSHIP CONSISTENT WITH THE SPECIFICATIONS.
- LOCATIONS OF PIPING, DUCTWORK AND EQUIPMENT AS INDICATED ON THE DRAWINGS, ARE APPROXIMATE AND SUBJECT TO MINOR ADJUSTMENTS IN THE FIELD. WORK SHALL BE COORDINATED WITH ALL OTHER TRADES TO AVOID INTERFERENCE IN THE FIELD.
- INSTALL EXPOSED PIPING AND DUCTWORK AS HIGH AS PRACTICAL IN ROOMS WITHOUT CEILINGS.
- REMOVE ALL UNUSED PIPING, DUCTWORK AND ACCESSORIES.
- THE MECHANICAL CONTRACTOR SHALL BE RESPONSIBLE FOR FIELD VERIFYING, PRIOR TO FINAL BID, ALL EXISTING CONDITIONS FOR PLUMBING AND MECHANICAL SYSTEMS WITHIN TENANT SPACE AND WITHIN CLOSE PROXIMITY OF TENANT SPACE.
- THE MECHANICAL CONTRACTOR SHALL PERFORM SERVICE AND REPAIR ON THE EXISTING EQUIPMENT AND ITS ACCESSORIES AS FOLLOWS: CLEAN ALL COILS, REPLACE THE FILTERS AND BELTS, INSPECT, REPAIR, OR REPLACE THE ECONOMIZERS, DRIVES AND FAN BEARINGS, MOTORS, CONTROL COMPONENTS, VALVES AND ANY OTHER ITEM NECESSARY FOR A COMPLETE AND PROPER OPERATING SYSTEM. THIS CONTRACTOR SHALL ALSO VISIT THE SITE, PRIOR TO FINAL BIDDING, AND VERIFY ALL EXISTING SITE CONDITIONS. PROVIDE ALL MATERIAL AND COMPONENTS AS NEEDED TO BRING THE UNITS TO FULL COMPLIANCE OF THE LANDLORD'S CRITERIA AND LOCAL AUTHORITY HAVING JURISDICTION.
- WHERE FLOOR DRAINS OCCUR WITHIN THE LIMITS OF CONSTRUCTION, PREVENT CONSTRUCTION DEBRIS FROM ENTERING DRAIN BODY BY SEALING DRAIN OPENING PRIOR TO START OF WORK.

**GENERAL NOTES-HVAC**

- SUPPLY AND RETURN PIPING TO COILS ARE THE SAME SIZE.
- CONTRACTOR SHALL LOCATE THERMOSTATS AND TEMPERATURE SENSORS AT 5'-0" AFF. A MINIMUM OF 8" FROM LIGHT SWITCH.
- REFER TO PIPING DRAWINGS FOR THERMOSTAT AND TEMPERATURE SENSOR LOCATIONS.
- CONDENSATE DRAINS SHALL BE SUPPLIED FOR ALL COOLING EQUIPMENT. CONTRACTOR SHALL ENSURE PROPER INSTALLATION AND DRAINAGE AS REQUIRED BY FEDERAL, STATE, AND LOCAL CODES. CONDENSATE PIPING SHALL BE TYPE "L" COPPER.
- PROVIDE A 4" HOUSEKEEPING PAD FOR EACH PIECE OF MECHANICAL EQUIPMENT. COORDINATE SIZES WITH MECHANICAL EQUIPMENT SELECTED.
- ALL SUPPLY, RETURN, AND EXHAUST DUCTWORK SHALL BE RATED FOR PRESSURE CLASS OF 2" W.G. UNLESS NOTED OTHERWISE.
- THIS CONTRACTOR SHALL BE REQUIRED TO REPLACE FILTERS ON HVAC EQUIPMENT AFTER ALL DUST PRODUCING CONSTRUCTION HAS BEEN COMPLETED AND PRIOR TO THE FINAL PUNCH.

**GENERAL NOTES-PLUMBING**

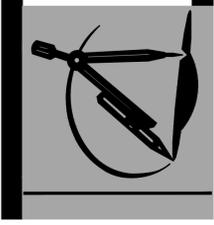
- PITCH UNDERFOOT SANITARY WASTE AND STORM PIPING 3" AND GREATER AT 1/8" PER FOOT, UNLESS NOTED OTHERWISE. PITCH ALL OTHER WASTE PIPING AT 1/4" PER FOOT UNLESS OTHERWISE NOTED.
- FIELD VERIFY LOCATION AND INVERTS OF SITE UTILITIES PRIOR TO INSTALLATION.
- ROUTE DOMESTIC WATER, FIRE PROTECTION, SANITARY SEWER, AND STORM SEWER SERVICES TO SITE UTILITIES 5'-0" FROM BUILDING UNLESS NOTED OTHERWISE. REFER TO CIVIL PLANS.
- WASTE AND VENT PIPING BELOW FLOOR AND THROUGH FLOOR SHALL BE 2" MINIMUM.
- PROVIDE CLEANOUT AT BASE OF ALL PLUMBING RISERS.
- FIELD VERIFY ALL NEW WATER, WASTE, AND VENT PIPING CONNECTIONS AND PROVIDE NEW CONNECTIONS AS REQUIRED FOR PROPERLY OPERATING SYSTEMS.

**GENERAL NOTES-FIRE PROTECTION**

- PROVIDE A COMPLETE WET TYPE FIRE PROTECTION SYSTEM AS REQUIRED TO ACCOMMODATE THE FLOOR PLAN AND CEILING TYPES INCLUDING MAINS, BRANCHES, HEADS, VALVES, AND ACCESSORIES AS REQUIRED. THE SYSTEM SHALL BE INSTALLED ACCORDING TO MANUFACTURER'S SPECIFICATIONS AND RECOMMENDATIONS OF THE STATE BUILDING CODE, LOCAL FIRE DEPARTMENT, AND ALL FEDERAL, STATE, AND LOCAL AUTHORITIES, NFPA, AND FACTORY MUTUAL.
- THIS DRAWING INDICATES A GENERAL PIPING ARRANGEMENT AND SUGGESTED SIZING ONLY. THIS CONTRACTOR SHALL DETERMINE THE ACTUAL PIPE SIZING REQUIRED AND COORDINATE WORK WITH ALL OTHER TRADES TO AVOID CONFLICTS.
- THIS CONTRACTOR SHALL PREPARE HYDRAULIC CALCULATIONS BASED UPON THE CONFIGURATION OF THE ACTUAL SYSTEM DESIGN AS SHOWN ON THIS CONTRACTOR'S SHOP DRAWINGS.
- THE SPRINKLER SYSTEM SHALL BE DESIGNED BASED UPON ACTUAL WATER FLOW TEST DATA OBTAINED AT OR NEAR THE JOB SITE.
- REFER TO REFLECTED CEILING PLANS FOR ADDITIONAL INFORMATION REGARDING SPRINKLER HEAD LOCATION AND PIPE, UNLESS NOTED OTHERWISE.
- DIVISION 21 CONTRACTOR SHALL COORDINATE WITH THE ELECTRICAL CONTRACTOR FOR PROPER INSTALLATION OF THE FIRE PROTECTION SYSTEMS ALARM DEVICES INVOLVED WITH FIRE SPRINKLER SYSTEM.
- ALL SPRINKLER SYSTEM PIPING SHALL BE CONCEALED ABOVE THE SUSPENDED CEILING SYSTEM, UNLESS NOTED OTHERWISE. WRITTEN AUTHORIZATION SHALL BE OBTAINED FROM THE ARCHITECT PRIOR TO EXPOSING ANY PIPING IN ANY ROOM WHICH HAS A SUSPENDED CEILING.
- THIS CONTRACTOR SHALL PROVIDE ALL ADDITIONAL SPRINKLER HEADS AS REQUIRED TO ENSURE AN APPROVED FIRE PROTECTION SYSTEM AT NO ADDITIONAL COST TO THE OWNER.
- AUXILIARY DRAINS SHALL BE EXPOSED WITH 1" DRAIN VALVES. WHEN 5 OR MORE GALLONS ARE TRAPPED, THIS CONTRACTOR SHALL PROVIDE FIXED PIPING TO AN ADEQUATELY SIZED RECEPTOR WHICH IS CAPABLE OF ACCEPTING THE FULL FLOW OF THE DRAIN, WHEN LESS THAN 5 GALLONS ARE TRAPPED, A HOSE BIB SHALL BE PROVIDED AT THE D







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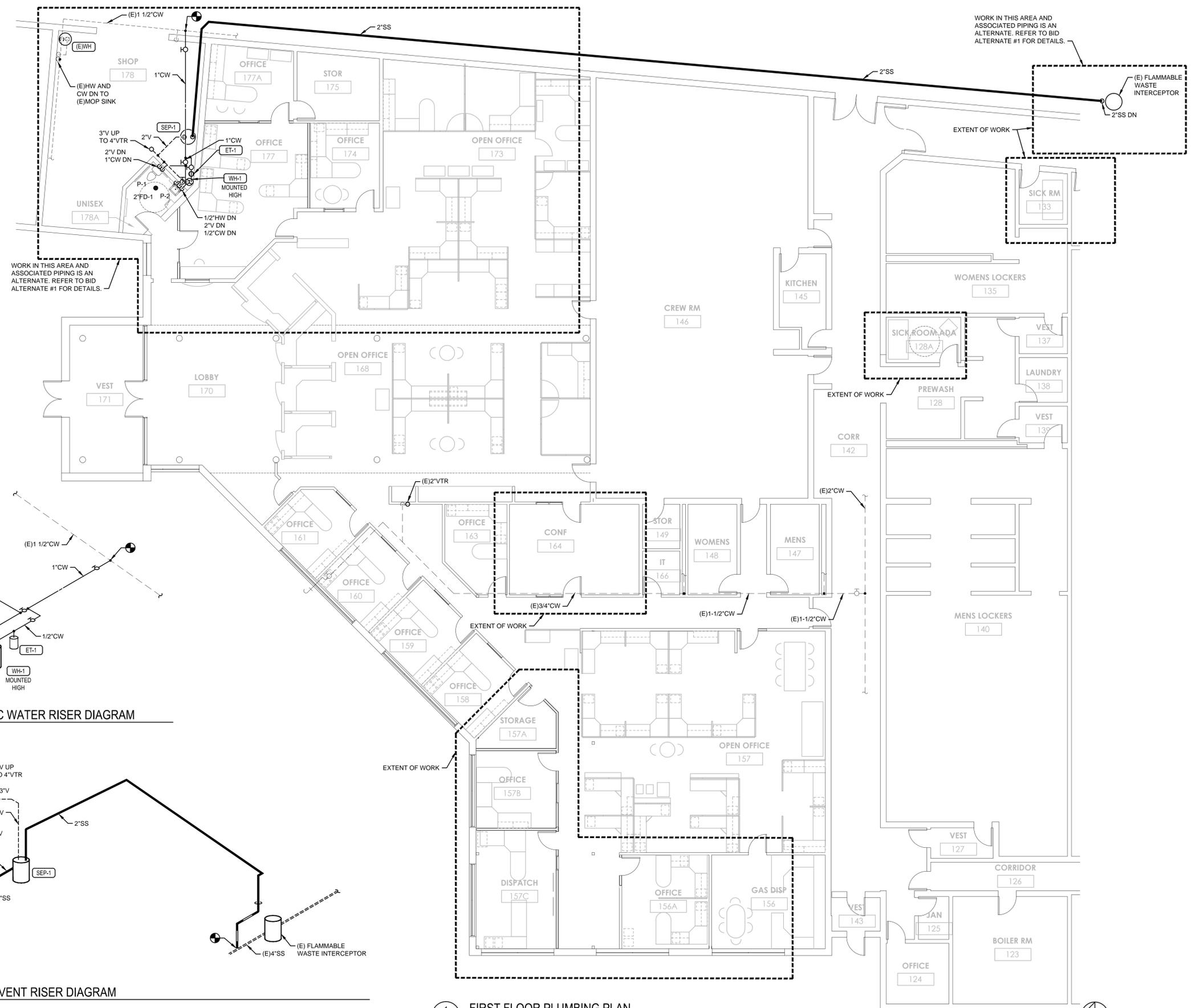
SHEET TITLE:  
FIRST FLOOR PLUMBING PLAN

**City of Duluth**  
**Comfort Systems**

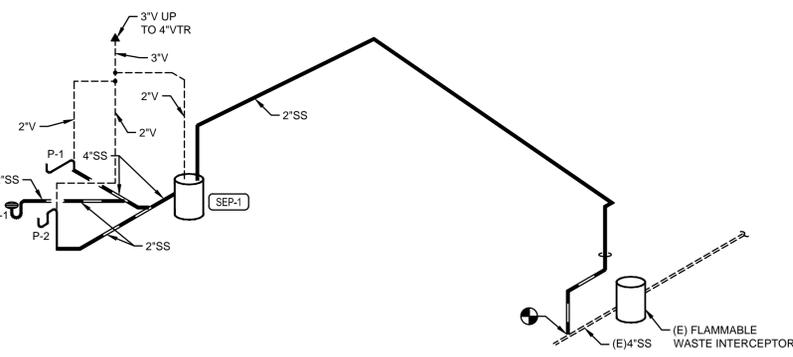
PROJECT NO: 83209  
DRAWN BY: K.D.  
CHECKED BY: L.A.O.

RELEASE DATE:  
REVISIONS:  
SET NO.  
SHEET NO.  
**M3.1**  
OF

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota  
James D. Marmola, III  
Date: 06/30/2014 Reg No: 19261



3 DOMESTIC WATER RISER DIAGRAM  
M3.1 NO SCALE



2 WASTE & VENT RISER DIAGRAM  
M3.1 NO SCALE



1 FIRST FLOOR PLUMBING PLAN  
M3.1 SCALE: 0' 8"





EXHAUST FAN SCHEDULE													
UNIT NO.	LOCATION	AREA SERVED	TYPE	MANUFACTURER	MODEL NO.	CFM	STATIC PRESSURE (IN W.G.)	FAN RPM	DRIVE TYPE	HP	VOLTAGE	PHASE	REMARKS
EF-1	SHOP 178	UNISEX 178A	CEILING	BROAN	L-100	100	0.25	650	DIRECT	FRACTIONAL	120	1	1, 2

1. MOUNT EXHAUST FAN IN GYPSUM SOFIT. 2. PROVIDE INTEGRAL BACKDRAFT DAMPER, INTERLOCK FAN INTO LIGHT SWITCH.

GRILLES, REGISTERS AND DIFFUSERS SCHEDULE									
TYPE	SYSTEM	MANUFACTURER	MODEL NO.	VOLUME DAMPER	FINISH	FRAME AND BORDER TYPE	MATERIAL	DESCRIPTION	
A	CEILING DIFFUSER	TITUS	TMSA	---	WHITE ENAMEL	LAY-IN TYPE	STEEL	24x24 MODULAR FULL-FACE DIFFUSER WITH ROUND NECK	
M	CEILING RETURN/TRANSFER GRILLE	TITUS	50F	---	WHITE ENAMEL	LAY-IN TYPE	ALUMINUM	1/2"x1/2"x1" EGGRATE GRID.	

ELECTRIC WATER HEATER SCHEDULE												
UNIT NO.	LOCATION	MANUFACTURER	MODEL NO.	TYPE	MAX. TEMP. RISE (°F)	RECOVERY (GPH)	STORAGE (GAL)	NO. OF HEATING ELEMENTS	ELEMENT POWER (KW)	VOLTAGE	PHASE	REMARKS
WH-1	SHOP 178	A. O. SMITH	EJC-6	ELECTRIC	90	8	6	1	1.65	120	1	1

1. MOUNT WATER HEATER ABOVE BATHROOM CEILING. PROVIDE DRAIN PAN UNDER WATER HEATER.

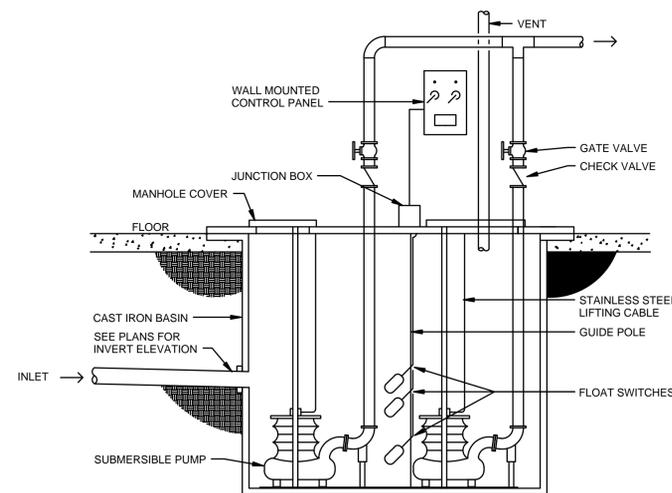
EXPANSION TANK SCHEDULE									
UNIT NO.	LOCATION	SYSTEM	MANUFACTURER	MODEL NO.	TANK VOLUME (GAL)	ACCEPTANCE VOLUME (GAL)	DIAMETER (IN)	HEIGHT (IN)	REMARKS
ET-1	SHOP 178	DOM. WATER	AMTROL	ST-5	2.0	.9	10	10 3/8	

SEWAGE EJECTOR PUMP SCHEDULE											
UNIT NO.	LOCATION	MANUFACTURER	MODEL NO.	FLOW (GPM)	HEAD (FT W.G.)	NO. OF PUMPS	BASIN DEPTH (IN)	BASIN DIAMETER (IN)	VOLTAGE	PHASE	REMARKS
SEP-1	SHOP 178	LIBERTY PUMPS	P682XPRG101	8	24	1	24	29 5/8	120	1	NOTE 1, 2

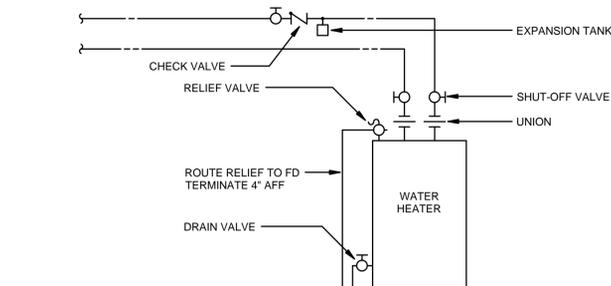
NOTES: 1. PROVIDE DUPLEX CONTROL PANEL WITH ALARM AND AUTO ALTERATION. 2. PUMP SHALL BE GRINDER TYPE SUITABLE FOR SANITARY SEWER APPLICATIONS.

PLUMBING FIXTURE SCHEDULE						
FIXTURE SYMBOL	FIXTURE DESCRIPTION					REMARKS
		WASTE	VENT	CW	HW	
P-1	WATER CLOSET - ADA	4"	2"	1"	-	WALL HUNG, FLUSH TANK TYPE, HANDICAPPED ACCESSIBLE
P-2	LAVATORY	2"	2"	1/2"	1/2"	WALL HUNG, HANDICAPPED ACCESSIBLE

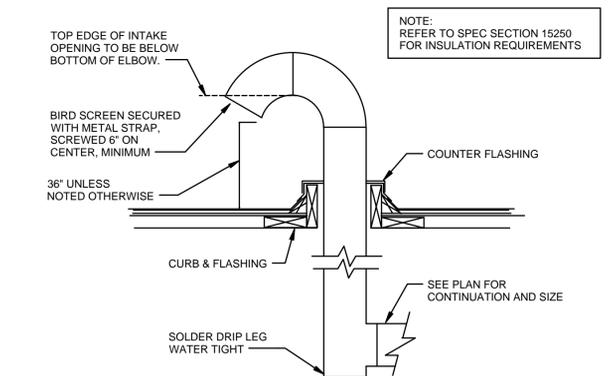
DRAIN SCHEDULE					
FIXTURE SYMBOL	FIXTURE DESCRIPTION			REMARKS	
		WASTE	VENT		
FD-1	FLOOR DRAIN	AS NOTED	AS NOTED	NICKEL BRONZE STRAINER IN FINISHED AREAS. PROVIDE DEEP SEAL TRAP	



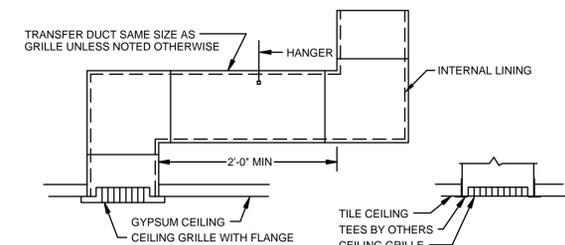
5 SEWAGE EJECTOR PIPING DETAIL - DUPLEX  
M5.0 NO SCALE



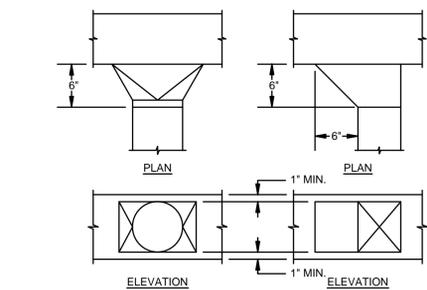
4 WATER HEATER PIPING DETAIL  
M5.0 NO SCALE



3 GOOSENECK DETAIL - EXHAUST  
M5.0 NO SCALE



2 TRANSFER DUCT DETAIL  
M5.0 NO SCALE



1 DUCT TAKE-OFF DETAIL  
M5.0 NO SCALE

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

James D. Manning, III  
Date: 06/30/2014  
Reg No: 18261

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SHEET TITLE:  
MECHANICAL SCHEDULES AND DETAILS

**City of Duluth**  
**Comfort Systems**

CHECKED BY: LAO  
DRAWN BY: KJD  
PROJECT NO: 83209

RELEASE DATE:  
REVISIONS:  
SET NO.  
SHEET NO.  
**M5.0**  
OF

DIVISION 15000 - MECHANICAL SPECIFICATIONS SECTION 15010 - GENERAL

PROVISIONS

A. GENERAL CONDITIONS

1. THE GENERAL CONDITIONS, SPECIAL CONDITIONS, SUPPLEMENTARY CONDITIONS, AND 'GENERAL CONDITIONS OF THE CONTRACT,' CURRENT EDITION, ESTABLISHED IN STANDARD FORM BY THE AMERICAN INSTITUTE OF ARCHITECTS SHALL APPLY TO ALL WORK ON THIS PROJECT EXCEPT AS MODIFIED BELOW. THIS CONTRACTOR SHALL BE FAMILIAR WITH THESE PROVISIONS AND ADHERE TO THESE REQUIREMENTS. THIS CONTRACTOR SHALL COORDINATE MECHANICAL WORK WITH ALL OTHER TRADES, AND BUILDING OWNER PRIOR TO INSTALLATION.

B. RELATED DOCUMENTS

1. THIS CONTRACTOR SHALL REFER TO THE ARCHITECTURAL PLANS, ELECTRICAL PLANS AND SPECIFICATIONS. SUCH PLANS AND SPECIFICATIONS ARE A PART OF THE CONTRACT DOCUMENTS. CONTRACTORS SHALL VISIT THE SITE AND FAMILIARIZE THEMSELVES WITH ALL CONDITIONS SURROUNDING THE WORK.

C. PLANS AND SPECIFICATIONS

1. THROUGHOUT THE COURSE OF THE WORK, THE BUILDING OWNER MAY REQUEST MINOR CHANGES AND ADJUSTMENTS TO THE PLANS AND SPECIFICATIONS. THE CONTRACTOR SHALL MAKE SUCH ADJUSTMENTS WITHOUT ADDITIONAL COST TO THE BUILDING OWNER, WHERE SUCH ADJUSTMENTS ARE NECESSARY FOR THE PROPER INSTALLATION AND OPERATION OF THE SYSTEMS, AND WITHIN THE INTENT OF THE CONTRACT DOCUMENTS.

2. IT IS THE INTENT OF THE PLANS AND SPECIFICATIONS TO FORM A GUIDE FOR A COMPLETE INSTALLATION. EVERYTHING NECESSARY FOR THE COMPLETION AND SUCCESSFUL OPERATION OF THE WORK, WHETHER OR NOT DEFINITELY SPECIFIED OR INDICATED ON THE DRAWINGS SHALL BE PROVIDED AS IF SO SPECIFIED OR INDICATED WITHOUT ADDITIONAL COST TO THE BUILDING OWNER. THE MECHANICAL CONTRACTOR SHALL VERIFY ALL DIMENSIONS PRIOR TO INSTALLATION.

3. NOTWITHSTANDING ANY OTHER PROVISIONS OF THE CONTRACT DOCUMENTS, THE CONTRACTOR BEARS ULTIMATE RESPONSIBILITY FOR COMPLIANCE OF THE INSTALLATION WITH THE REQUIREMENTS OF THE BUILDING OWNER AND OF THE LOCAL AUTHORITY HAVING JURISDICTION.

D. MODIFICATIONS

1. IF ANY ERRORS, DISCREPANCIES OR OMISSIONS APPEAR IN THE DRAWINGS, SPECIFICATIONS OR OTHER CONTRACT DOCUMENTS, THE CONTRACTOR SHALL NOTIFY THE ENGINEER IN WRITING OF SUCH ERROR OR OMISSION, IN THE EVENT OF THE CONTRACTOR FAILING TO GIVE SUCH NOTICE BEFORE CONSTRUCTION AND/OR FABRICATION OF THE WORK, THE CONTRACTOR WILL BE HELD RESPONSIBLE FOR THE RESULTS OF ANY SUCH ERRORS, DISCREPANCIES OR OMISSIONS AND THE ASSOCIATED COST OF RECTIFYING.

E. CODE COMPLIANCE

1. THIS CONTRACTOR SHALL COMPLY WITH THE REQUIREMENTS OF ALL STATE AND LOCAL CODES REGULATING THIS WORK. HOWEVER, THIS SHALL NOT BE CONSTRUED AS RELIEVING THE CONTRACTOR FROM COMPLYING WITH ANY REQUIREMENTS OF THE DRAWINGS AND SPECIFICATIONS THAT MAY BE IN EXCESS OF ANY GOVERNING CODES.

F. PERMITS, FEES, LICENSES

1. THIS CONTRACTOR SHALL PAY ALL FEES AND RELATED CHARGES FOR PERMITS, LICENSES, ETC., REQUIRED FOR INSTALLATION OF THE MECHANICAL SYSTEM.

G. WARRANTY

1. ALL CONSTRUCTION WORK SHALL BE PERFORMED IN A FIRST-CLASS WORKMANLIKE MANNER AND SHALL BE IN GOOD AND USABLE CONDITION AT THE DATE OF COMPLETION. THIS CONTRACTOR SHALL REQUIRE ANY PERSONS PERFORMING ANY SUCH WORK TO GUARANTEE THE SAME TO BE FREE FROM ANY AND ALL DEFECTS IN WORKMANSHIP AND MATERIALS FOR ONE (1) YEAR FROM THE DATE OF COMPLETION THEREOF. THIS CONTRACTOR SHALL ALSO REQUIRE ANY SUCH PERSONS TO BE RESPONSIBLE FOR THE REPLACEMENT OR REPAIR WITHOUT ANY ADDITIONAL COST TO ANY AND ALL WORK DONE OR FURNISHED BY OR THROUGH SUCH PERSONS WHICH SHALL BECOME DEFECTIVE WITHIN ONE (1) YEAR AFTER SUBSTANTIAL COMPLETION OF WORK. THE CORRECTION OF SUCH WORK SHALL INCLUDE WITHOUT ADDITIONAL COST ALL EXPENSES AND DAMAGES IN CONNECTION WITH SUCH REMOVAL, REPLACEMENT OR REPAIR OF ANY PART OF THE WORK WHICH MAY BE DAMAGED OR DISTURBED THEREBY.

H. FIELD QUALITY CONTROL

- 1. UPON COMPLETION OF INSTALLATION OF MECHANICAL EQUIPMENT, START-UP AND OPERATE EQUIPMENT TO DEMONSTRATE CAPABILITY AND COMPLIANCE WITH REQUIREMENTS.
2. REMOVE MALFUNCTIONING EQUIPMENT, REPLACE WITH NEW EQUIPMENT AND RETEST.
3. REMOVE MALFUNCTIONING HVAC UNITS, REPLACE WITH NEW HVAC UNITS AND RETEST. SECTION 15100 - BASIC MATERIALS AND METHODS

A. MECHANICAL RELATED WORK

- 1. MATERIALS AND EQUIPMENT DESIGNED TO BE NEW SHALL BE FREE OF DEFECTS.
2. MATERIALS AND EQUIPMENT DESIGNED TO BE REUSED SHALL BE VERIFIED BY THIS CONTRACTOR TO BE IN GOOD WORKING CONDITION. IF MATERIALS AND EQUIPMENT DO NOT MEET THE DESIGN INTENT, THE MECHANICAL CONTRACTOR SHALL BE RESPONSIBLE FOR REPAIR OR REPLACEMENT OF SAID MATERIALS AND EQUIPMENT.
3. DESIGN AND INSTALL PIPING AND DUCTWORK TO PRESENT A NEAT ORDERLY APPEARANCE, ROUTE PARALLEL WITH BUILDING WALLS AND CONSTRUCTION.
4. PROVIDE VIBRATION ISOLATION AND FLEXIBLE CONNECTIONS ON ALL MOVING EQUIPMENT.
5. PROVIDE ALL CUTTING AND PATCHING NECESSARY FOR INSTALLATION OF NEW SYSTEMS AND EQUIPMENT.
6. ROOF OPENINGS, IF REQUIRED, SHALL BE PERFORMED BY THE BUILDING OWNER'S DESIGNATED ROOFING COMPANY AT THIS CONTRACTOR'S EXPENSE.

B. EQUIPMENT ORDER

1. THE CONTRACTOR SHALL ORDER ALL EQUIPMENT REQUIRED WITHIN TEN DAYS UPON RECEIPT OF CONTRACT IN ORDER TO ENSURE TIMELY RECEIPT OF MATERIAL. SUBSTITUTIONS AFTER THIS DATE DUE TO LACK OF PLACEMENT OF ORDER WILL NOT BE APPROVED.

C. HANGERS, SUPPORTS, AND SLEEVES

- 1. SUPPORT PIPING ADEQUATELY FROM SLABS OR OTHER STRUCTURAL MEMBERS AT INTERVALS IN COMPLIANCE WITH INDUSTRY STANDARDS AND AUTHORITY HAVING JURISDICTION.
2. ALL HORIZONTAL PIPING PENETRATING WALLS SHALL BE FITTED WITH SLEEVES MADE OF STANDARD STEEL PIPE 1 INCH LARGER THAN THE PIPE AND INSULATION DIAMETER. SLEEVES SHALL BE CUT FLUSH WITH THE WALL ON BOTH SIDES. SEAL THE SLEEVE JOINTS WITH NONSHRINKING SEALANT. ALL PENETRATIONS THROUGH FIRE RATED WALLS SHALL BE SEALED IN COMPLIANCE WITH UL.
3. PROVIDE ESCUTCHEON PLATES ON ALL EXPOSED PIPE PENETRATIONS THROUGH WALLS.

D. EQUIPMENT IDENTIFICATION

1. IDENTIFY PIPING, DUCTWORK AND EQUIPMENT IN COMPLIANCE WITH THE BUILDING OWNER'S CRITERIA AND IN COMPLIANCE WITH INDUSTRY STANDARDS.

E. CLEANING AND TESTING

1. CLEAN, DISINFECT, AND TEST ALL PLUMBING AND PIPING SYSTEMS AS REQUIRED BY THE BUILDING OWNER CRITERIA AND GOVERNING CODES.

F. VALVES

1. DOMESTIC WATER SHUT-OFF VALVES SHALL BE APOLLO, OR EQUAL, SOLDER END BALL VALVE.

- 2. SHOCK ABSORBER SHALL BE J.R. SMITH 'HYDROTROL' SERIES 5000; MODEL NO. 5005, OR EQUAL, WATER HAMMER ARRESTORS.
3. THERMOSTATIC MIXING VALVE SHALL BE WATTS MODEL L111, OR EQUAL, UNIT TO HAVE BRASS AND STAINLESS STEEL FLOW CONTROL COMPONENTS WITH STANDARD BRONZE FINISH AND VANDAL RESISTANT ADJUSTMENT HANDLE. UNIT SHALL COMPLY WITH ASSE STANDARD 1016.

SECTION 15200 - INSULATION

A. MECHANICAL INSULATION

- 1. INSULATION SHALL BE OWENS-CORNING, MANVILLE CORPORATION, CERTAIN-TEED, KNAUF, OR EQUAL. ALL INSULATING MATERIALS SHALL HAVE FIRE AND SMOKE HAZARD RATINGS AS TESTED BY PROCEDURE ASTM E-84, NFPA 255 AND UL 723 NOT EXCEEDING FLAME SPREAD 25 AND SMOKE DEVELOPED 50. INSULATION ACCESSORIES SUCH AS ADHESIVES, MASTICS, CEMENT, TAPES AND GLASS CLOTH SHALL HAVE THE SAME COMPONENT RATING AS LISTED ABOVE.
2. INSULATE SUPPLY AIR AND RETURN AIR DUCTWORK WITHIN CONDITIONED SPACE WITH FIBERGLASS BLANKET MINIMUM 1-1/2 INCH THICK, 1 POUND PER CUBIC FOOT DENSITY, VAPOR BARRIER JACKET WITH 2 INCH TAB, GLASS REINFORCED LAMINATED ALUMINUM FOIL AND KRAFT PAPER JACKET. INSULATION THICKNESS SHALL BE IN COMPLIANCE WITH APPLICABLE CODE REQUIREMENTS.
3. INSULATE ALL DOMESTIC COLD AND HOT WATER PIPING WITH ONE OR TWO PIECE MOLDED FIBERGLASS PIPE INSULATION, MINIMUM 1 INCH THICK, 3 LB. PER CU. FT. DENSITY, WITH ALL SERVICE JACKET, SELF-SEALING LAP. INSULATION THICKNESS SHALL BE IN COMPLIANCE WITH APPLICABLE CODE REQUIREMENTS.
4. INSULATE REFRIGERANT SUCTION PIPING WITH A MINIMUM 1 INCH THICK CLOSED CELL FLEXIBLE RUBBER PIPE INSULATION.
5. INSULATE LAVATORY P-T-RAP, HOT/COLD SUPPLY PIPING AND SHUT-OFFS WITH 'LAV GUARD 2" PIPING COVER MANUFACTURED BY TRUEBRO, INC. E-Z SERIES, WHITE. PIPING SHALL BE SECURED WITH SNAP CLIP FLUSH MOUNTED FASTENERS. ANGLE STOP VALVES SHALL BE SECURED WITH LOCKING LID ACCESS COVER. COVER SHALL BE NON-YELLOWING AND FIRE RETARDANT.

SECTION 15300 - FIRE PROTECTION

A. FIRE PROTECTION SYSTEMS

- 1. PROVIDE ALTERATIONS TO THE EXISTING FIRE PROTECTION SYSTEM TO ACCOMMODATE THE NEW FLOOR PLAN AND NEW REFLECTED CEILING PLAN. ALL CHANGES SHALL BE IN COMPLIANCE WITH NFPA, LOCAL FIRE AUTHORITIES AND THE BUILDING OWNER.
2. SPRINKLER HEADS IN FINISHED CEILINGS SHALL BE SEMI-RECESSED TYPE WITH CHROME FINISH. SPRINKLER HEADS IN GYPSUM BOARD CEILINGS SHALL BE CONCEALED TYPE WITH WHITE COVER PLATE TO MATCH ADJACENT CEILING COLOR. SPRINKLER HEADS IN 2 FOOT X 2 FOOT CEILING TILES MUST BE CENTERED, WHERE SPRINKLER HEADS OCCUR IN 2 FOOT X 4 FOOT CEILING TILES, HEADS MUST BE CENTERED IN THE RIGHT OR LEFT HALF OF THE TILE.
3. QUICK RESPONSE TYPE SPRINKLER HEADS TO BE PROVIDED IN ALL AREAS.
4. NOTIFY THE BUILDING OWNER OF THE TIME AND DURATION OF THE FIRE PROTECTION WORK. DO NOT LEAVE THE SYSTEM INOPERABLE OVERNIGHT. THE SPRINKLER SYSTEM SHALL BE FULLY CHARGED AND OPERATIONAL WHEN THE SPRINKLER CONTRACTOR IS OFF SITE.
5. SPRINKLER SYSTEM SHALL COMPLY WITH NFPA 13 AND LOCAL FIRE AUTHORITY. SPRINKLER PRODUCTS TO BE VIKING, ELKHART, OR POTTER ROEMER.

SECTION 15400 - PLUMBING

A. DOMESTIC WATER PIPING SYSTEMS

1. PIPING FOR COLD AND HOT WATER SYSTEMS SHALL BE TYPE 'K' COPPER TUBING ABOVE GRADE, WITH WROUGHT COPPER SOLDER FITTINGS JOINED USING 95-LEAD FREE SOLDER, AND TYPE 'K' COPPER TUBING BELOW GRADE 3 INCHES AND SMALLER. DIELECTRIC COUPLINGS SHALL BE USED BETWEEN STEEL AND COPPER CONNECTIONS.

B. SOIL, WASTE, AND VENT PIPING SYSTEMS

- 1. SOIL, WASTE, AND VENT PIPING SHALL BE SERVICE WEIGHT HUBLESS CAST IRON PIPE AND HUBLESS CAST IRON DRAINAGE FITTINGS.
2. UNDERGROUND AND ABOVE GROUND SANITARY SEWERS SHALL BE SERVICE WEIGHT 'NO-HUB' CAST IRON PIPE.
3. SCHEDULE 40 POLYVINYL CHLORIDE PLASTIC PIPE (PVC) PIPING MAY BE ALLOWED FOR UNDERGROUND WASTE PIPING ONLY PENDING THE APPROVAL OF THE AUTHORITY HAVING JURISDICTION, STATE PLUMBING CODE REVIEW AND WRITTEN ACCEPTANCE BY THE AUTHORITY HAVING JURISDICTION.
4. FLOOR DRAIN: JOSAM SERIES 30000-A, OR EQUAL. PROVIDE FLOOR DRAINS WITH MINIMUM 1/2 INCH TRAP PRIMER CONNECTION WHERE REQUIRED BY CODE OR INDICATED ON CONSTRUCTION DOCUMENTS.
5. FLOOR CLEANOUT: JOSAM SERIES 58360, OR EQUAL, COATED CAST IRON FERRULE AND ADJUSTABLE CAST NIKALOY FLOOR CLEANOUT, INTEGRAL BRONZE COUNTERSUNK PLUG AND SOLID SCORIATED ROUND SATIN NIKALOY TOP WITH 'C.O.' CAST IN. CONTRACTOR TO COORDINATE PIPE FITTINGS AND MATERIAL AND PROVIDE SAME.
6. WALL CLEANOUT: JOSAM SERIES 58790, OR EQUAL, WALL CLEANOUT TEE, RECESSED BRONZE TAPPED PLUG AND STAINLESS STEEL ACCESS COVER WITH SCREW, UNIT SPECIFIED IS WITH NO-HUB CONNECTION. CONTRACTOR TO COORDINATE PIPE FITTINGS AND MATERIAL AND PROVIDE SAME.

C. REFRIGERATION PIPING SYSTEMS

- 1. REFRIGERATION PIPING SHALL BE TYPE ACR HARD DRAWN COPPER TUBING AND WROUGHT COPPER SOLDER JOINT FITTINGS JOINED USING BRAZED JOINTS. PROVIDE SUCTION AND LIQUID PIPE SIZES AS REQUIRED BY THE AIR COOLED CONDENSING UNIT MANUFACTURER BASED ON THE ACTUAL CONDENSING UNIT LOCATION AND THE DEVELOPED PIPING LENGTHS. PITCH AS REQUIRED BY THE MANUFACTURER AND INDUSTRY PRACTICE.
2. PROVIDE ALL SOLENOID VALVES, SHUT-OFF VALVES AND ACCESSORIES REQUIRED BY THE AIR COOLED CONDENSING UNIT MANUFACTURER TO PROVIDE A COMPLETE AND OPERABLE REFRIGERATION PIPING SYSTEM.

D. PLUMBING FIXTURES AND TRIM

- 1. ALL FIXTURES FITTED TO WALL SHALL BE CAULKED WITH WHITE SILICONE CONSTRUCTION SEALANT BETWEEN WALL AND FIXTURE.
2. PROVIDE ALL FIXTURES AND EQUIPMENT WITH INDIVIDUAL WATER SHUT-OFF VALVE AT POINT OF CONNECTION.
3. ITEM P-1 LAVATORY: AMERICAN STANDARD 'LUCERNE' NO. 0365.027, OR EQUAL, WALL HUNG WITH BRACKET, FAUCET HOLES ON 4 INCH CENTERS, 20 INCH X 18 INCH SIZE, WHITE, AMERICAN STANDARD 'COLONY SOFT' SERIES NO. 2175.504 WITH VANDAL RESISTANT SINGLE LEVER HANDLE, 0.5 GPM AERATOR, GRID DRAIN, LOOSE KEY ANGLE STOPS, EXPOSED TALLPIECE AND TRAP PIPING SHALL BE CHROME. INSULATE SUPPLY AND WASTE PIPING IN ACCORDANCE WITH ADA REQUIREMENTS.
4. ITEM P-2 WATER CLOSET: AMERICAN STANDARD 'CADET' NO. 2467.100, OR EQUAL, 1.1 GALLON FLUSH, WHITE, ELONGATED BOWL, 18 INCH HIGH, COMPLETE WITH TANK FITTINGS, BOLT CAPS, 3/8 INCH ANGLE SUPPLY STOP AND WHITE HIGH-GLOSS MOLDED OPEN FRONT SEAT. FIXTURE AND TRIM SHALL BE COMPATIBLE WITH LOCAL CODES AND ADA REQUIREMENTS. SIDE TRIP LEVER SHALL BE LOCATED ON THE WIDE SIDE, AWAY FROM WALL OR OTHER OBSTRUCTIONS. TANK TYPE - ADA COMPLIANT

E. PLUMBING EQUIPMENT

- 1. WATER HEATER: RUUDORHEEM, OR EQUAL, ELECTRIC STORAGE TYPE WATER HEATER. PROVIDE MODEL, CAPACITIES AND ACCESSORIES AS SCHEDULED.
2. THERMAL EXPANSION TANK: AMTROL THERM-X-TROL, OR EQUAL, UNIT SHALL BE PRE-CHARGED HYDRO-PNEUMATIC STEEL EXPANSION TANK RATED FOR 150 PSI WORKING PRESSURE. PROVIDE MODEL, CAPACITIES AND ACCESSORIES AS SCHEDULED.
3. SEWAGE EJECTOR PUMP: LIBERTY OR EQUAL PACKAGED DUPLEX GRINDER SYSTEM. SYSTEM SHALL BE CAPABLE OF UNDER SLAB MOUNTING, PROVIDE DUPLEX CONTROLLER WITH AUTOMATIC LEADLAG SWITCHOVER AND AUDIBLE ALARMS. PROVIDE MODEL, CAPACITIES AND ACCESSORIES AS SCHEDULED.

SECTION 15500 - HEATING, VENTILATING AND AIR CONDITIONING

A. METAL DUCTWORK

- 1. THE AIR DISTRIBUTION SYSTEM SHALL BE FABRICATED AS RECOMMENDED IN THE LATEST EDITION OF THE SMACNA LOW VELOCITY DUCT MANUAL AND INSTALLED WHERE SHOWN ON PLAN. THIS CONTRACTOR SHALL BE RESPONSIBLE FOR FURNISHING ALL REQUIRED DAMPERS, TRANSITIONS AND CONNECTIONS TO AIR TERMINALS NECESSARY FOR A COMPLETE OPERATING SYSTEM.
2. ALL DUCTWORK SHALL BE GALVANIZED STEEL UNLESS OTHERWISE SPECIFIED, WITH GAUGES AND REINFORCING IN ACCORDANCE WITH SMACNA. CONSTRUCT AND SUPPORT NEW DUCTWORK IN ACCORDANCE WITH SMACNA DUCT CONSTRUCTION STANDARDS FOR UP TO 2-INCH WG. SECURELY ATTACH ALL DUCTWORK TO THE BUILDING CONSTRUCTION IN A MANNER TO BE FREE FROM VIBRATION AND SWAYING UNDER OPERATING CONDITIONS. PROVIDE OFFSETS, ELBOWS AND TRANSITIONS IN DUCTWORK AS REQUIRED FOR COMPLETE INSTALLATION. SQUARE TURN ELBOWS SHALL BE FITTED WITH TURNING VANES. VANES SHALL BE DOUBLE THICKNESS, FASTENED TO RUNNERS AND ADEQUATELY BRACED.
3. FLEXIBLE AIR DUCTS: FLEXMASTER TYPE 'M', OR EQUAL, 1 INCH THICK FACTORY PRE-INSULATED UL STANDARD 191, CLASS 1 FLEXIBLE AIR DUCT HAVING A PRESSURE RATING OF NOT LESS THAN 6 INCH W.C. CLAMP ENDS OF FLEXIBLE AIR DUCTS USING SELF-LOCKING DRAW BANDS. CONNECT SUPPLY AIR BRANCH DUCTS AND SUPPLY AIR DIFFUSERS WITH FLEXIBLE AIR DUCTS WITH A MAXIMUM 5 FOOT 0 INCH LENGTH. PROVIDE RIGID ELBOWS WHERE REQUIRED, TO AVOID PINCHING OF FLEX DUCT.
4. LINE RETURN AIR DUCTS WITH FIBERGLASS DUCT LINER MINIMUM 1 INCH THICK, 3 LB. PER CU. FT. DENSITY. INSULATION THICKNESS SHALL BE IN COMPLIANCE WITH APPLICABLE CODE REQUIREMENTS. INCREASE DUCT SIZES SHOWN BY TWO INCHES IN EACH DIRECTION TO ACCOMMODATE THE LINER.
5. SEAL JOINTS IN ALL SUPPLY AIR DUCTS WITH 3M INDUSTRIAL SEALANT 800, OR EQUAL, IN ACCORDANCE WITH SMACNA LOW PRESSURE DUCT CONSTRUCTION STANDARDS TO PRODUCE A LEAKAGE RATE OF NOT MORE THAN 5 PERCENT.
6. MANUAL BALANCING DAMPERS: FACTORY FABRICATED, WITH REQUIRED HARDWARE AND ACCESSORIES. STIFFEN DAMPER BLADES FOR STABILITY. INCLUDE LOCKING DEVICE TO HOLD SINGLE-BLADE DAMPERS IN A FIXED POSITION WITHOUT VIBRATION. CLOSE DUCT PENETRATIONS FOR DAMPER COMPONENTS TO SEAL DUCT CONSISTENT WITH PRESSURE CLASS.
A) PRESSURE CLASSES OF 3-INCH WG OR HIGHER. END BEARINGS OR OTHER SEALS FOR DUCTS WITH AXLES FULL LENGTH OF DAMPER BLADES AND BEARINGS AT BOTH ENDS OF OPERATING SHAFT.
B) STANDARD BALANCING DAMPERS: MULTIPLE OR SINGLE BLADE, PARALLEL OR OPPOSED BLADE DESIGN, STANDARD LEAKAGE RATING, AND SUITABLE FOR HORIZONTAL OR VERTICAL APPLICATIONS.
1) STEEL FRAMES: HAT-SHAPED, GALVANIZED SHEET STEEL CHANNELS, MINIMUM OF 0.064 INCH THICK, WITH MITERED AND WELDED CORNERS; FRAMES WITH FLANGES WHERE INDICATED FOR ATTACHING TO WALLS AND FLANGELESS FRAMES WHERE INDICATED FOR INSTALLING IN DUCTS.
2) ROLL-FORMED STEEL BLADES: 0.064 INCH THICK, GALVANIZED SHEET STEEL.
3) BLADE AXLES: GALVANIZED STEEL.
4) BEARINGS: OIL-IMPREGNATED BRONZE, MOLDED SYNTHETIC, OR STAINLESS-STEEL SLEEVE.
5) TIE BARS AND BRACKETS: GALVANIZED STEEL.
C) JACKSHAFT: 1 INCH DIAMETER, GALVANIZED STEEL PIPE ROTATING WITHIN PIPE BEARING ASSEMBLY MOUNTED ON SUPPORTS AT EACH MULLION AND AT EACH END OF MULTIPLE DAMPER ASSEMBLIES.
1) LENGTH AND NUMBER OF MOUNTINGS: APPROPRIATE TO CONNECT LINKAGE OF EACH DAMPER IN MULTIPLE DAMPER ASSEMBLY.
D) DAMPER HARDWARE: ZINC PLATED, DIE CAST CORE WITH DIAL AND HANDLE MADE OF 3/32 INCH THICK ZINC PLATED STEEL, AND A 3/4 INCH HEXAGON LOCKING NUT. INCLUDE CENTER HOLE TO SUIT DAMPER OPERATING ROD SIZE. INCLUDE ELEVATED PLATFORM FOR INSULATED DUCT MOUNTING.
7. DUCT ACCESS DOORS: PROVIDE ACCESS DOORS IN DUCTWORK ADJACENT TO EACH ITEM OF EQUIPMENT INSTALLED IN DUCTWORK, INCLUDING, BUT NOT LIMITED TO: HYDRONIC COILS, VARIABLE VOLUME TERMINALS, DUCT REHEAT COILS, DUCT THERMOSTATS, STATIC PRESSURE SENSORS, AND CONTROL DAMPERS. ACCESS PANEL SHALL BE OF SUFFICIENT SIZE FOR ACCESS TO EQUIPMENT AND FOR PROPER CLEANING.

- A) CONSTRUCTION: CONSTRUCT OF SAME OR GREATER GAUGE AS DUCTWORK SERVED. PROVIDE INSULATED DOORS FOR INSULATED DUCTWORK. PROVIDE FLUSH FRAMES FOR UNINSULATED DUCTWORK, EXTENDED FRAMES FOR EXTERNALLY INSULATED DUCT. PROVIDE ONE SIDE HINGED, OTHER SIDE WITH ONE HANDLE-TYPE LATCH FOR DOORS 12 INCHES HIGH AND SMALLER, TWO HANDLE-TYPE LATCHES FOR LARGER DOORS.
B) MANUFACTURER: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE DUCT ACCESS DOORS OF ONE OF THE FOLLOWING:
1) AIR BALANCE INC.
2) CESCO.
3) NAILOR.
4) RUSKIN MFG. CO.

B. DIFFUSERS, REGISTERS AND GRILLES

1. DIFFUSERS, REGISTERS AND GRILLES WHERE SHOWN ON DRAWINGS AND AS SCHEDULED SHALL BE TITUS, OR EQUAL.

C. TOILET ROOM EXHAUST FAN

1. CEILING MOUNTED TOILET ROOM EXHAUST FAN SHALL BE BROAN, OR EQUAL. PROVIDE MODEL AND CAPACITIES AS SCHEDULED.

D. TESTING, ADJUSTING AND BALANCING

- 1. TESTING AND BALANCING OF ALL SUPPLY AIR, RETURN AIR, VENTILATION AIR, AND EXHAUST AIR SYSTEMS TO BE PROVIDED BY AN INDEPENDENT NEBB OR AABC CERTIFIED COMPANY. BALANCE AIR SYSTEMS TO THE INDICATED DESIGN AIR FLOWS AT EACH OUTLET AND AS SCHEDULED ON EQUIPMENT.
2. SUBMIT A MINIMUM OF TWO (2) CERTIFIED COPIES OF A COMPLETE AIR BALANCE TEST REPORT TO THE OWNER FOR REVIEW AND COMMENT. REPORTS MUST BE SUBMITTED PRIOR TO RECEIVING FINAL PAYMENT.
3. THESE ARE TO BE 'CERTIFIED' BALANCE REPORTS AND ARE TO INCLUDE THE SPECIFICATIONS OF ALL EQUIPMENT INSTALLED ON THE PROJECT AS WELL AS THE RESULTS OF THE BALANCING. ANY NON-CERTIFIED OR INCOMPLETE REPORTS WILL BE REJECTED.
4. COORDINATE TESTING, ADJUSTING AND BALANCING WITH THE BUILDING OWNER'S FIELD REPRESENTATIVE PRIOR TO FINAL BIDS.

END OF DIVISION 15

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota

James D. Manning, III
Date: 06/30/2014
Reg No. 18261

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Project No. 83209

SHEET TITLE:
MECHANICAL SPECIFICATIONS

City of Duluth
Comfort Systems
DRAWN BY: KJD
CHECKED BY: LAO
PROJECT NO: 83209

RELEASE DATE:
REVISIONS:
SET NO.
SHEET NO.
M6.0
OF





1 ELECTRICAL DEMOLITION PLAN  
 E2.0 SCALE: 0" = 8" N

**GENERAL NOTES:**

- A BID ALTERNATE NO. 01: PROVIDE DEMOLITION OF DEVICES AND/OR EQUIPMENT TO FACILITATE RESTROOM (178A) ADDITION. THIS INCLUDES BUT IS NOT LIMITED TO LIGHTING, LIGHTING CONTROL, RECEPTACLES, LOW VOLTAGE DEVICES, FIRE ALARM, SECURITY, AND MECHANICAL EQUIPMENT. REFER TO BID ALTERNATE NO. 01 ON THE BID FORM.
- B BID ALTERNATE NO. 01: PROVIDE DEMOLITION OF DEVICES AND/OR EQUIPMENT TO FACILITATE SICK ROOMS (128A & 133) MODIFICATIONS. THIS INCLUDES BUT IS NOT LIMITED TO LIGHTING, LIGHTING CONTROL, RECEPTACLES, LOW VOLTAGE DEVICES, FIRE ALARM, SECURITY, AND MECHANICAL EQUIPMENT. REFER TO BID ALTERNATE NO. 02 ON THE BID FORM.

**NUMBERED NOTES:**

1. DISCONNECT AND REMOVE EXISTING LIGHT FIXTURE TO FACILITATE DEMOLITION AND NEW CONSTRUCTION IN THIS AREA. RETAIN FIXTURE FOR RELOCATION AS INDICATED ON SHEET E3.0.
2. DISCONNECT AND REMOVE ELECTRICAL DEVICES COMPLETE ON WALLS AND/OR DOORS TO BE DEMOLISHED IN THIS AREA. THIS INCLUDES BUT IS NOT LIMITED TO RECEPTACLES, VOICE/DATA OUTLETS, FIRE ALARM DEVICES, ELECTRIC BASEBOARD, LIGHTING, LIGHTING CONTROL, AND/OR SECURITY DEVICES. REMOVE BRANCH CIRCUIT(S) BACK TO SOURCE.
3. DISCONNECT POWERED FURNITURE SYSTEM IN THIS AREA TO FACILITATE RELOCATION AND/OR MODIFICATION. REFER TO SHEET E4.0 FOR NEW REQUIREMENTS.
4. EXISTING OWNER SECURITY DEVICES AND/OR EQUIPMENT TO REMAIN.
5. EXISTING DATA RACK AND ASSOCIATED PATCH PANELS TO REMAIN. REMOVE PATCH PANELS AND ASSOCIATED CAT 5 CABLE TO FACILITATE RELOCATION /MODIFICATION OF EXISTING FURNITURE.
6. DISCONNECT AND REMOVE POWER POLE. RETAIN FOR REUSE WITH NEW OFFICE FURNITURE LAYOUT.
7. DISCONNECT ELECTRICAL CONNECTIONS ASSOCIATED WITH A/C UNIT TO BE RELOCATED BY MECHANICAL.
8. DISCONNECT AND REMOVE LIGHTING IN THIS AREA/ROOM TO FACILITATE REMODEL. OWNER RETAINS FIRST RIGHT TO SALVAGE.

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota

*Dave T. Blume*  
 Dave T. Blume  
 Date: 06/30/2014 Reg No: 24671

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 Project No. 83209

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SHEET TITLE:  
 ELECTRICAL DEMOLITION PLAN

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**City of Duluth**  
**Comfort Systems**

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PROJECT NO: 83209  
 DRAWN BY: L. HATTENBERGER  
 CHECKED BY: S. HAEDTKE

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RELEASE DATE:  
 REVISIONS:  
 SET NO.  
 SHEET NO.  
**E2.0**  
 OF



**GENERAL NOTES:**

- A. CONNECT NEW CIRCUITING SHOWN TO PANEL H2 UNLESS OTHERWISE NOTED.
- B. BID ALTERNATE NO. 01: PROVIDE ALL DEVICES AND/OR EQUIPMENT INDICATED ON THIS PLAN ASSOCIATED WITH RESTROOM (178A) ADDITION. THIS INCLUDES BUT IS NOT LIMITED TO LIGHTING AND LIGHTING CONTROL. REFER TO BID ALTERNATE NO. 01 ON THE BID FORM.
- C. BID ALTERNATE NO. 02: PROVIDE ALL DEVICES AND/OR EQUIPMENT INDICATED ON THIS PLAN ASSOCIATED WITH SICK ROOMS 128A AND 133. THIS INCLUDES BUT IS NOT LIMITED TO LIGHTING AND LIGHTING CONTROL. REFER TO BID ALTERNATE NO. 02 ON THIS BID FORM.

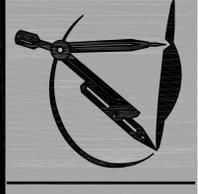
**NUMBERED NOTES:**

- 1. TYPICAL. PROVIDE TYPE 'A' LIGHT FIXTURE AS MANUFACTURED BY DAY-BRITE, MODEL #2-DL-G-49L-835-4-D-UNV-DIM, OR EQUIVALENT.
- 2. TYPICAL. PROVIDE TYPE 'B' LIGHT FIXTURE AS MANUFACTURED BY COOPER, MODEL #SNLED-LD1-44-LW-UNV-EL-L835-CD1-U, OR EQUIVALENT. CONNECT TO NEAREST LIFE SAFETY EMERGENCY LIGHTING CIRCUIT.
- 3. TYPICAL. FIXTURE DESIGNATED WITH 'R' IS EXISTING TO BE RELOCATED.
- 4. TYPICAL. CONNECT NEW/RELOCATED LIGHTING TO EXISTING LIGHTING CIRCUIT AND CONTROL SERVING AREA UNLESS NOTED OTHERWISE. CONNECT LIGHT(S) INDICATED WITH SOLID HATCHING TO EMERGENCY LIFE SAFETY CIRCUIT SERVING AREA.
- 5. TYPICAL. PROVIDE TYPE 'C' LIGHT FIXTURE AS MANUFACTURED BY LITHONIA, MODEL #SNLED-LD1-50-UNV-L835-CD1-U, OR EQUIVALENT.
- 6. PROVIDE WALL MOUNTED OCCUPANCY SENSOR FOR CONTROL OF EXISTING LIGHTING IN ROOM 156A.
- 7. EXISTING LIGHTING CONTROL SWITCH(ES) AND OCCUPANCY SENSOR. UTILIZE TO EXTENT AVAILABLE. PROVIDE BLANK COVERPLATE(S) FOR UNUSED SWITCH(ES).
- 8. CONNECT LIGHT FIXTURE TO EXISTING LOBBY EMERGENCY LIGHTING CIRCUIT AND CONTROL.

1 ELECTRICAL LIGHTING PLAN  
 E3.0 SCALE: 0' 8'  
 N

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota

*Dave T. Blume*  
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 Date: 06/30/2014 Reg No: 24671



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 Project No. 83209

SHEET TITLE:  
 ELECTRICAL LIGHTING PLAN

**City of Duluth**  
**Comfort Systems**

PROJECT NO: 83209  
 DRAWN BY: L. HATTENBERGER  
 CHECKED BY: S. HAEDTKE

RELEASE DATE:  
 REVISIONS:  
 SET NO.  
 SHEET NO.  
**E3.0**  
 OF



1 POWER AND SYSTEMS PLAN  
 SCALE: 0' 8"  
 E4.0

**GENERAL NOTES:**

- A. CONNECT NEW CIRCUITING SHOWN TO PANEL L2 (R & L) UNLESS OTHERWISE NOTED.
- B. BID ALTERNATE NO. 05: PROVIDE CONDUIT STUB WITH J-BOX AND MUD RING BELOW ROOF DECK FOR FUTURE VOICE/DATA DROP AT WAP LOCATIONS AS FOLLOWS: (1) PAINT SHOP, (1) METER SHOP, (1) WELD SHOP, AND (1) WAREHOUSE. COORDINATE EXACT LOCATION WITH OWNER PRIOR TO ROUGH-IN. REFER TO BID ALTERNATE NO. 05 ON THE BID FORM.
- C. BID ALTERNATE NO. 01: PROVIDE ALL DEVICES AND/OR EQUIPMENT INDICATED ON THIS PLAN ASSOCIATED WITH RESTROOM (178A) ADDITION. THIS INCLUDES BUT IS NOT LIMITED TO RECEPTACLES, MECHANICAL EQUIPMENT, AND FIRE ALARM DEVICES. REFER TO BID ALTERNATE NO. 01 ON THE BID FORM.
- D. BID ALTERNATE NO. 04: PROVIDE 120V CONNECTIONS TO MOTORIZED DAMPERS ASSOCIATED WITH SUPPLY DUCT IN OPEN OFFICE 168 PER MECHANICAL PLANS. REFER TO BID ALTERNATE NO. 04 ON THE BID FORM.
- E. BID ALTERNATE NO. 05: PROVIDE CAT 6 CABLE AND ASSOCIATED CAT 6 DEVICE REPLACEMENT FOR ALL VOICE/DATA LOCATIONS NOT INCLUDED IN THE REMODEL AREA. THIS INCLUDES BUT IS NOT LIMITED TO ALL VOICE/DATA OUTLETS INDICATED WITH AN "A" AND ASSOCIATED PATCH PANELS, AND PATCH CORDS. CONTRACTOR TO FIELD VERIFY EXACT QUANTITY PRIOR TO BID. REFER TO ALTERNATE NO. 05 ON THE BID FORM.
- F. BID ALTERNATE NO. 02: PROVIDE ALL DEVICES AND/OR EQUIPMENT INDICATED ON THIS PLAN ASSOCIATED WITH SICK ROOMS 128A AND 133. THIS INCLUDES BUT IS NOT LIMITED TO RECEPTACLES, MECHANICAL EQUIPMENT, AND FIRE ALARM DEVICES. REFER TO BID ALTERNATE NO. 02 ON THE BID FORM.

**NUMBERED NOTES:**

- 1. EXISTING COPY MACHINE LOCATION TO REMAIN.
- 2. UTILIZE EXISTING FLOOR BOXES AND WALL PENETRATIONS TO EXTENT AVAILABLE FOR BRANCH CIRCUIT EXTENSION AND VOICE/DATA CABLE EXTENSION TO FURNITURE AS INDICATED ON PLANS. UTILIZE WHIPS MADE AVAILABLE BY DEMOLITION. PROVIDE NEW AS REQUIRED. PROVIDE COVERPLATE(S) FOR FLOOR BOXES THAT ARE REQUIRED. REFER NOT NUMBERED NOTE 16 FOR ADDITIONAL INFORMATION.
- 3. TYPICAL PROVIDE 2-CHANNEL POWER POLE. SIZE AS REQUIRED. FOR EXTENSION OF POWER AND DATA CABLE TO FURNITURE SYSTEM. REUSE OF EXISTING POWER POLE IS ACCEPTABLE.
- 4. FURNITURE INDICATED IN THIS AREA IS RELOCATED. REFER TO NUMBERED NOTE #5 FOR POWER AND DATA REQUIREMENTS. CIRCUIT NUMBERS ARE SHOWN FOR REFERENCE. FIELD VERIFY PRIOR TO INSTALLATION.
- 5. TYPICAL. PROVIDE (2) TWO RECEPTACLES AND (2) TWO VOICE/DATA OUTLETS (TWO PER BOX) PER DESK/CUBICLE. UTILIZE EXISTING RECEPTACLES AND DATA JACKS PROVIDED WITH FURNITURE TO EXTENT AVAILABLE. LOCATIONS ARE SHOWN FOR REFERENCE ONLY. VERIFY LOCATION WITH OWNER FURNITURE PLAN PRIOR TO INSTALLATION. CONTRACTOR TO FIELD DETERMINE, BASED ON EACH INDIVIDUAL LOCATION, APPROPRIATE METHOD TO EXTEND VOICE/DATA/POWER VIA FLOOR BOX(S), WALL, AND/OR POWER POLE.
- 6. CONNECT RECEPTACLES IN DISPATCH TO NEAREST LIFE SAFETY EMERGENCY PANEL. UTILIZE (2) TWO SPARE 20A/1P CIRCUIT BREAKERS IN PANEL.
- 7. PROVIDE CAT 6 DATA DROP AT LOCATION INDICATED FOR FUTURE SECURITY CAMERA INSTALLATION. IN LAY-IN CEILING PROVIDE LAY-IN J-BOX WITH BLANK COVER PLATE. IN OPEN CEILING STUB CONDUIT BELOW ROOF DECK AND PROVIDE J-BOX WITH MUD RING AND BLANK COVERPLATE. VERIFY EXACT LOCATION(S) WITH OWNER PRIOR TO INSTALLATION.
- 8. PROVIDE CONNECTION TO EXHAUST FAN EF-1 VIA PANEL 'L3' WITH 2 #12 + G IN 1/2" C. UTILIZE SPARE 20A/1P CIRCUIT BREAKER. CONNECT LOCAL LIGHTING CONTROL IN THIS ROOM FOR CONTROL. PROVIDE LOCAL DISCONNECT AS REQUIRED.
- 9. EXISTING RECEPTACLES IN THIS AREA TO REMAIN.
- 10. PROVIDE CONNECTION TO ELECTRIC WATER HEATER WH-1 VIA PANEL 'L3' WITH 2 #12 + G IN 1/2" C. PROVIDE LOCAL DISCONNECT SWITCH MOUNTED ON UNIT.
- 11. PROVIDE FLUSH MOUNTED RECEPTACLE IN NEW CMU WALL. CONNECT TO NEAREST NON-GFI PROTECTED RECEPTACLE CIRCUIT.
- 12. PROVIDE CONDUIT AND WIRE FOR CARD READER FURNISHED BY OWNER. VERIFY EXACT REQUIREMENTS WITH OWNER PRIOR TO ROUGH-IN.
- 13. PROVIDE RECEPTACLE AND VOICE/DATA OUTLET INTEGRAL TO THE FURNITURE SYSTEM FOR COPY MACHINE.
- 14. PROVIDE CONNECTION TO SEWAGE EJECTOR SEP-1 VIA PANEL 'L3' WITH 2 #12 + G, IN 1/2" C. UTILIZE SPARE 20A/1P CIRCUIT BREAKER. PROVIDE DUPLEX RECEPTACLE MOUNTED ON WALL ADJACENT SEWAGE EJECTOR FOR CONTROL PANEL POWER. PROVIDE LOCAL DISCONNECT AS REQUIRED.
- 15. UTILIZE EXISTING WALL MOUNTED RECEPTACLES AND VOICE/DATA OUTLETS IN THIS ROOM/AREA TO FACILITATE WALL CONSTRUCTION AND REVISED FURNITURE LAY-OUT. EXTEND EXISTING CIRCUITING TO NEW RECEPTACLES AS INDICATED.
- 16. PROVIDE JUNCTION BOX AT 18" AFF FOR POWER AND VOICE/DATA CABLE/WHIP EXTENSION TO FURNITURE. COORDINATE LOCATION OF JUNCTION BOX WITH POWERED FURNITURE SPINE TO FACILITATE CABLE/WHIP LENGTH.
- 17. PROVIDE DEDICATED RECEPTACLE AND VOICE/DATA OUTLET FOR EACH COPY MACHINE AND/OR PRINTER.
- 18. PROVIDE CEILING MOUNTED WAP AS MANUFACTURED BY CISCO MODEL 3502 WITH OBERON CEILING MOUNT MODEL 1064-00 OR 1064-T.
- 19. PROVIDE CONNECTIONS TO RELOCATED A/C UNIT AS REQUIRED. COORDINATE EXACT REQUIREMENTS WITH MECHANICAL CONTRACTOR.

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota  
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 Project No: 83209

SHEET TITLE:  
 POWER AND SYSTEMS PLAN

**City of Duluth**  
**Comfort Systems**

CHECKED BY: S. HAEDTKE  
 DRAWN BY: L. HATTENBERGER  
 PROJECT NO: 83209

RELEASE DATE:  
 REVISIONS:  
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 SHEET NO. E4.0 OF

