MECHANICAL LEGEND, ABBREVIATIONS & SYMBOLS

ABBREVIATIONS:

AV	AUTOMATIC AIR VENT
AC	AIR CONDITIONING UNIT
AD	ACCESS DOOR
AFF	ABOVE FINISHED FLOOR
AFMS	AIRFLOW MEASURING STATION
AHU	AIR HANDLING UNIT
AP	ACCESS PANEL
B	BOILER
BC	BLOWER COIL
BDD	BACKDRAFT DAMPER
BFW	BOILERFEED WATER
BHP	BRAKE HORSEPOWER
BOD	BOTTOM OF DUCT
BOP	BOTTOM OF PIPE
BTUH	BRITISH TERMAL UNIT PER HOUR
CA	COMPRESSED AIR
CAV	CONSTANT AIR VOLUME
CC	COOLING COIL
CFM	CUBIC FEET PER MINUTE
CH	CHILLER
CHWR	CHILLED WATER RETURN
CHWS	CHILLED WATER SUPPLY
COND	CODENSATE
CONV	CONVECTOR
CP	CONDENSATE PUMP
CT	COOLING TOWER
CU	CONDENSING UNIT
CUH	CABINET UNIT HEATER
CW	COLD WATER (DOMESTIC)
CR	CONDENSER WATER RETURN
CS	CONDENSER WATER SUPPLY
D	DIFFUSER
DB	DRY BULB TEMPERATURE
DC	DUCT COIL
DIA	DIAMETER
DN	DOWN
DP	DIFFERENTIAL PRESSURE
DR	DRAIN
DSA	DUCT SOUND ATTENUATOR
DTR	DUAL TEMPERATURE RETURN
DTS	DUAL TEMPERATURE SUPPLY
EX	EXISTING
EAT	ENTERING AIR TEMPERATURE
EF	EXHAUST FAN
EG	EXHAUST GRILLE
ER	EXHAUST REGISTER
ESP	EXTERNAL STATIC PRESSURE
ET	EXPANSION TANK
ETR	EXISTING TO REMAIN
EWT	ENTERING WATER TEMPERATURE
F	FAN
F & T	FLOAT AND THERMOSTATIC
FCU	FAN COIL UNIT
FCV	FLOW CONTROL VALVE
FD	FLOOR DRAIN OR FIRE DAMPER
FOR	FUEL OIL RETURN
FOS	FUEL OIL SUPPLY
FOV	FUEL OIL VENT
FPM	FEET PER MINUTE
FPS	FEET PER SECOND
FS	FLOW SWITCH
F/SD	COMBINATION FIRE/SMOKE DAMPER
FT	FEET
FTR	FINNED TUBE RADIATION
GPM	GALLONS PER MINUTE
H	HUMIDISTAT
HC	HEATING COIL
HD	HEAD
HW	HOT WATER (DOMESTIC)
HWR	HOT WATER RETURN
HWS	HOT WATER SUPPLY
HP	HORSEPOWER
HPRC	HIGH PRESSURE CONDENSATE RETURN
HPS	HIGH PRESSURE STEAM SUPPLY
HR	HEAT RECOVERY
HRC	HEAT RECOVERY COIL
HX	HEAT EXCHANGER
HZ	HERTZ
H2O	WATER
ID	INSIDE DIAMETER
IN	INCHES
KVA	KILO-VOLT-AMPERES
KW	KILOWATTS
L	LOUVER
LAT	LEAVING AIR TEMPERATURE
LBS	POUNDS
LPCR	LOW PRESSURE CONDENSATE RETURN
LPG	LIQUIFIED PETROLEUM GAS
LPS	LOW PRESSURE STEAM SUPPLY
LWT	LEAVING WATER TEMPERATURE
MAV	MANUAL AIR VENT
MAX	MAXIMUM
MBH	1000 BTU PER HOUR
MCA	MINIMUM CIRCUIT AMPERES
MIN	MINIMUM
MPCR	MEDIUM PRESSURE CONDENSATE RETURN
MPS	MEDIUM PRESSURE STEAM SUPPLY
MU	MAKE-UP WATER
NC	NORMALLY CLOSED
NEG	NEGATIVE
NG	NATURAL GAS
NO	NORMALLY OPEN
NTS	NOT TO SCALE
OA	OUTSIDE AIR
OAI	OUTSIDE AIR INTAKE
OBD	OPPOSED BLADE DAMPER
OD	OUTSIDE DIAMETER
OED	OPEN END DUCT
P	PUMP
PC	PUMPED CONDENSATE RETURN
PH	PHASE PRESS PRESSURE
PRV	PRESSURE REDUCING VALVE
PS	PRESSURE SWITCH
PSIA	POUNDS PER SQUARE INCH, ABSOLUTE
PSIG	POUNDS PER SQUARE INCH, GAUGE
PTAC	PACKAGED TERMINAL AIR CONDITIONING
RAF	RETURN AIR FAN
RCP	RADIANT CEILING PANEL
RF	RELIEF FAN
RG	RETURN GRILLE
RH	RELATIVE HUMIDITY
RL	REFRIGERANT LIQUID
RPM	REVOLUTIONS PER MINUTE
RR	RETURN REGISTER
RS	REFRIGERANT SUCTION
RTU	ROOFTOP UNIT
RV	REFRIGERANT VENT
SAF	SUPPLY AIR FAN
SD	SMOKE DAMPER
SG	SUPPLY GRILLE
SP	STATIC PRESSURE
SR	SUPPLY REGISTER
SRV	SAFETY RELIEF VALVE
SS	SPLIT SYSTEM
ST	STEAM TRAP
STM	STEAM
T	THERMOSTAT
TA	TRANSFER AIR
TAB	TERMINAL AIR BOX
TEMP	TEMPERATURE
TOS	TOP OF STEEL
TSP	TOTAL STATIC PRESSURE
UH	UNIT HEATER
UV	UNIT VENTILATOR
V	VOLTS
VAV	VARIABLE AIR VOLUME
VD	VOLUME DAMPER
VP	VELOCITY PRESSURE
WB	WET BULB TEMPERATURE
WC	WATER COLUMN
WG	WATER GAUGE
WT	WEIGHT

DUCTWORK IDENTIFICATION:

- _x_ SA — SUPPLY AIR DUCT (RECTANGULAR OR SQUARE)
- _x_ RA — RETURN AIR DUCT (RECTANGULAR OR SQUARE)
- _x_ EA — EXHAUST AIR DUCT (RECTANGULAR OR SQUARE)
- _x_ OA — OUTSIDE AIR DUCT (RECTANGULAR OR SQUARE)
- _ ø SA — SUPPLY AIR DUCT (ROUND)
- _ ø RA — RETURN AIR DUCT (ROUND)
- _ ø EA — EXHAUST AIR DUCT (ROUND)
- _ ø OA — OUTSIDE AIR DUCT (ROUND)
- _/_ ø SA — SUPPLY AIR DUCT (FLAT OVAL)
- SUPPLY OR OUTSIDE AIR DUCT UP (RECTANGULAR OR SQUARE)
- RETURN OR EXHAUST AIR DUCT UP (RECTANGULAR OR SQUARE)
- SUPPLY AIR DUCT UP (FLAT OVAL)
- SUPPLY OR OUTSIDE AIR DUCT UP (ROUND)
- RETURN OR EXHAUST AIR DUCT UP (ROUND)
- SUPPLY OR OUTSIDE AIR DUCT DOWN (RECTANGULAR OR SQUARE)
- RETURN OR EXHAUST AIR DUCT DOWN (RECTANGULAR OR SQUARE)
- SUPPLY AIR DUCT DOWN (FLAT OVAL)
- SUPPLY OR OUTSIDE AIR DUCT DOWN (ROUND)
- RETURN OR EXHAUST AIR DUCT DOWN (ROUND)
- END OF DUCT (CAPPED)
- ROUND SUPPLY AIR DIFFUSER OFF BOTTOM OF DUCT
- SIDEWALL SUPPLY AIR GRILLE OR REGISTER
- SQUARE OR RECTANGULAR RETURN OR EXHAUST GRILLE OR REGISTER OFF BOTTOM OF DUCT
- SIDEWALL RETURN OR EXHAUST AIR GRILLE OR REGISTER
- 90° ELBOW WITH TURNING VANES
- 90° ELBOW WITHOUT TURNING VANES
- 90° RADIUS ELBOW
- ECCENTRIC TRANSITION
- CONCENTRIC TRANSITION
- MANUAL VOLUME DAMPER
- RECTANGULAR BRANCH TAKE-OFF
- ROUND BRANCH TAKE-OFF
- DUCT MOUNTED HEATING COIL
- FLEXIBLE CONNECTION
- FLEXIBLE DUCT
- RISE IN DUCT
- DROP IN DUCT
- DUCT WITH INTERNAL LINING
- DUCT WITH ACCESS DOOR

- SUPPLY AIR CEILING DIFFUSER
- LINEAR SUPPLY AIR DIFFUSER
- T — THERMOSTAT (MOUNT 44" AFF TO CENTER)
- H — HUMIDISTAT (MOUNT 44" AFF TO CENTER)
- OC — OCCUPANCY SENSOR
- AIRFLOW MEASURING STATION
- DUCT MOUNTED HUMIDIFIER
- FIRE DAMPER (VERTICAL)
- FIRE DAMPER (HORIZONTAL)
- SMOKE DAMPER (VERTICAL)
- SMOKE DAMPER (HORIZONTAL)
- BACKDRAFT DAMPER
- FLOW SWITCH
- MOTOR OPERATED DAMPER
- DUCT MOUNTED SMOKE DETECTOR
- STATIC PRESSURE SENSOR

PIPING IDENTIFICATION:

- BFW — BOILER FEED WATER
- CHWS — CHILLED WATER SUPPLY
- CHWR — CHILLED WATER RETURN
- CS — CONDENSER WATER SUPPLY
- CR — CONDENER WATER RETURN
- DTS — DUAL TEMPERATURE WATER SUPPLY
- DTR — DUAL TEMPERATURE WATER RETURN
- FOS — FUEL OIL SUPPLY
- FOR — FUEL OIL RETURN
- FOV — FUEL OIL VENT
- NG — NATURAL GAS
- HWS — HOT WATER SUPPLY
- HWR — HOT WATER RETURN
- LPG — LIQUIFIED PETROLEUM GAS
- RS — REFRIGERANT SUCTION
- RL — REFRIGERANT LIQUID
- HPS — HIGH PRESUURE STEAM SUPPLY
- MPS — MEDIUM PRESSURE STEAM SUPPLY
- LPS — LOW PRESSURE STEAM SUPPLY
- HPCR — HIGH PRESSURE CONDENSATE RETURN
- MPCR — MEDIUM PRESSURE CONDENSATE RETURN
- LPCR — LOW PRESSURE CONDENSATE RETURN
- EX. ( ) — EXISTING PIPING TO REMAIN
- EXISTING PIPING TO BE REMOVED
- SHUTOFF VALVE
- THROTTLING VALVE
- CHECK VALVE
- DRAIN VALVE
- PRESSURE REGULATING VALVE
- PRESSURE REDUCING VALVE
- CALIBRATED BALANCING VALVE
- TWO-WAY CONTROL VALVE
- THREE-WAY CONTROL VALVE
- SAFETY RELIEF VALVE
- BASKET STRAINER
- STRAINER
- PRESSURE GAUGE
- THERMOMETER
- ORIFICE PLATE FLOW MEASURING DEVICE
- VENTURI FLOW MEASURING DEVICE
- UNION
- END CAP
- EXPANSION LOOP
- FLEXIBLE CONNECTION
- PIPE ANCHOR
- 90° ELBOW
- 45° ELBOW
- PIPE ALIGNMENT GUIDE
- PIPE ELBOW UP
- PIPE ELBOW DOWN
- AUTOMATIC AIR VENT
- MANUAL AIR VENT
- STEAM TRAP
- CONCENTRIC REDUCER
- ECCENTRIC REDUCER (ON TOP)
- ECCENTRIC REDUCER (ON BOTTOM)
- FS — FLOW SWITCH
- TS — TEMPERATURE SWITCH
- HEAT TRACING ON PIPING
- PUMP
- THERMOMETER WELL

ANNOTATION IDENTIFICATION:

- REVISION AREA
- REVISION NUMBER
- KEYED NOTE
- DEMOLITION KEYED NOTE
- POINT OF CONNECTION TO EXISTING
- POINT OF DEMOLITION
- DETAIL NUMBER / DRAWING NUMBER
- EQUIPMENT ABBREVIATION / EQUIPMENT NUMBER
- SECTION LETTER / DRAWING NUMBER

TimHaahs

Timothy Haahs & Associates, Inc.
550 Township Line Road
Suite 100
Blue Bell, PA 19422
T. 484.342.0200
F. 484.342.0222
www.timhaahs.com

PROFESSIONAL SEAL

CONSULTANT

PROJECT NO.
PHL14119.00

PROJECT

Community Lot

PARKING GARAGE

Allentown, PA

SUBMISSIONS / REVISIONS

ISSUED FOR CONSTRUCTION
1/15/2015

NO.	DESCRIPTION	DATE

NORTH

DRAWN: KJB
REVIEWED: KJB
DATE: 11/24/2014

SHEET TITLE:

MECHANICAL LEGEND, ABBREVIATIONS, SYMBOLS, AND GENERAL NOTES

SHEET NO.

M-0.0

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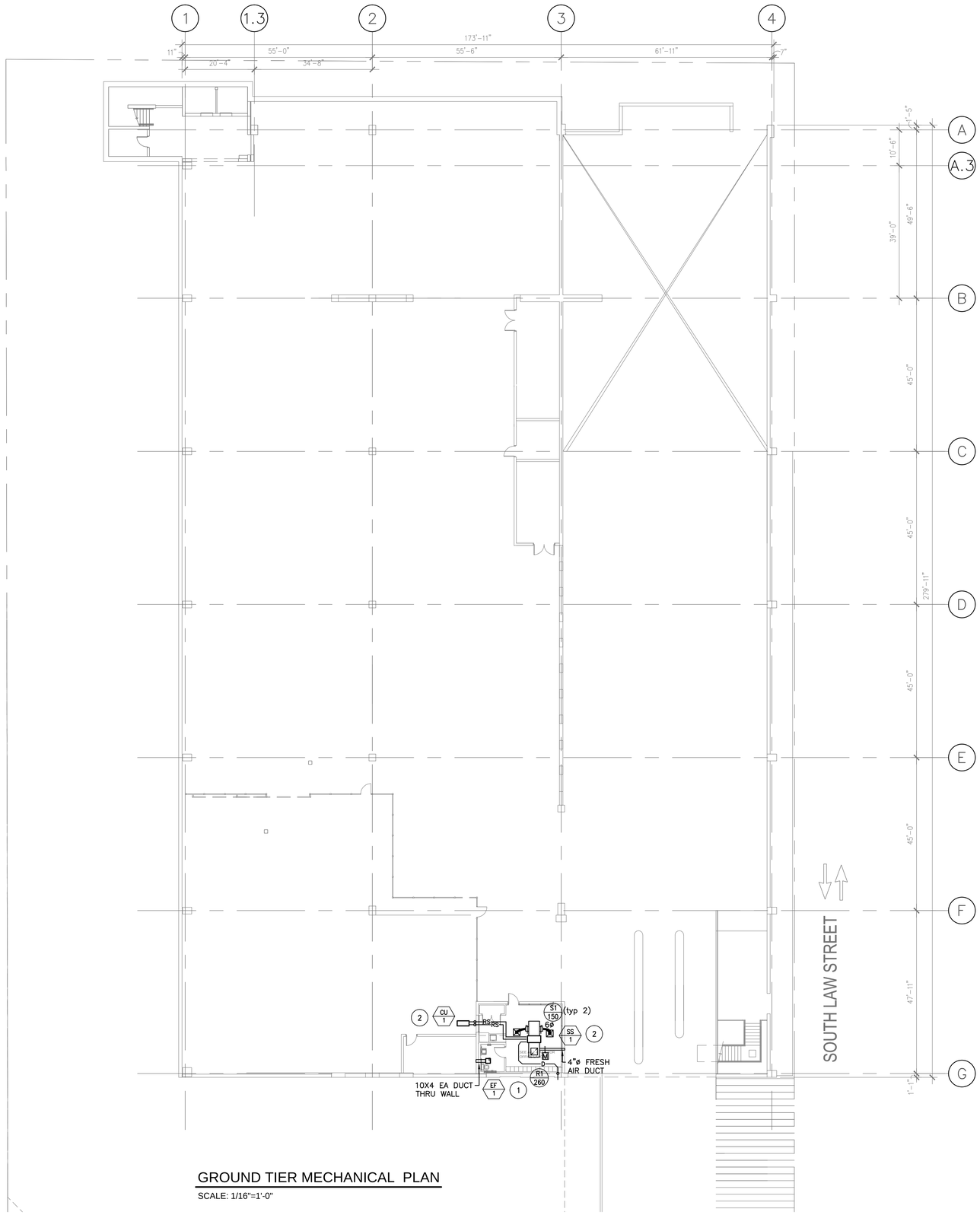
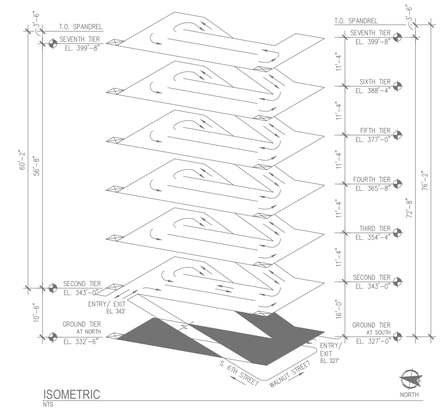


GROUND TIER MECHANICAL PLAN

SCALE: 1/16"=1'-0"



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KEY PLAN

KEYED NOTES:

1. FURNISH AND INSTALL EXHAUST FAN EF-1 FOR TOILET ROOM. EXTEND 10x4 DUCT AND TRANSITION AS REQUIRED TO BRICJ VENT AS SCHEDULED.

2. FURNISH AND INSTALL SPLIT SYSTEM AIR CONDITIONING SYSTEM AS SCHEDULED AND INDICATED. CEILING MOUNT INDOOR UNIT. COORDINATE UNIT LOCATION WITH OTHER TRADES. EXTEND REFRIGERATION PIPING FROM INDOOR UNIT TO OUTDOOR UNIT LOCATED ON GRADE. ALL REFRIGERATION PIPE SIZING, PIPING DETAILS, AND PIPING CONFIGURATION SHALL BE IN STRICT ACCORDANCE WITH THE UNIT MANUFACTURER'S WRITTEN INSTRUCTION. CONCEAL ALL REFRIGERATION PIPING EXPOSED IN GARAGE AREA IN VINYL OR ALUMINUM PAINTED ENCLOSURE TO PROTECT ALL EXPOSED PIPING. EXTEND ENCLOSURE AND PIPING IN NEAT, PLUMB WORKMANSHIP LIKE MANNER. PROVIDE SUPPLY AND RETURN AIR DUCT PLENUMS WITH ASSOCIATED DIFFUSERS AND REGISTER AS INDICATED. EXTEND 4"ø FRESH AIR DUCT WITH MOTORIZED DAMPER TO OUTDOORS AS INDICATED. ONTERLOCK DAMPER WITH UNIT OPERATION. TERMINATE DUCT AT BRICK VENT IN WALL. FURNISH AND INSTALL WALL MOUNTED THERMOSTAT AND ASSOCIATED CONTROL WIRING. EXTEND 1" DRAIN PIPING FROM UNIT THRU OUTSIDE WALL. TERMINATE 18" ABOVE GRADE WITH INSECT SCREEN.

TimHaahs

Timothy Haahs & Associates, Inc.
550 Township Line Road
Suite 100
Blue Bell, PA 19422
T. 484.342.0200
F. 484.342.0222
www.timhaahs.com

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NO.	DESCRIPTION	DATE
1	ADDENDUM #1	12/3/2014

NORTH

DRAWN:
REVIEWED: KJB
DATE: 11/24/2014

SHEET TITLE:
GROUND MECHANICAL PLAN

SHEET NO.
M-1.1

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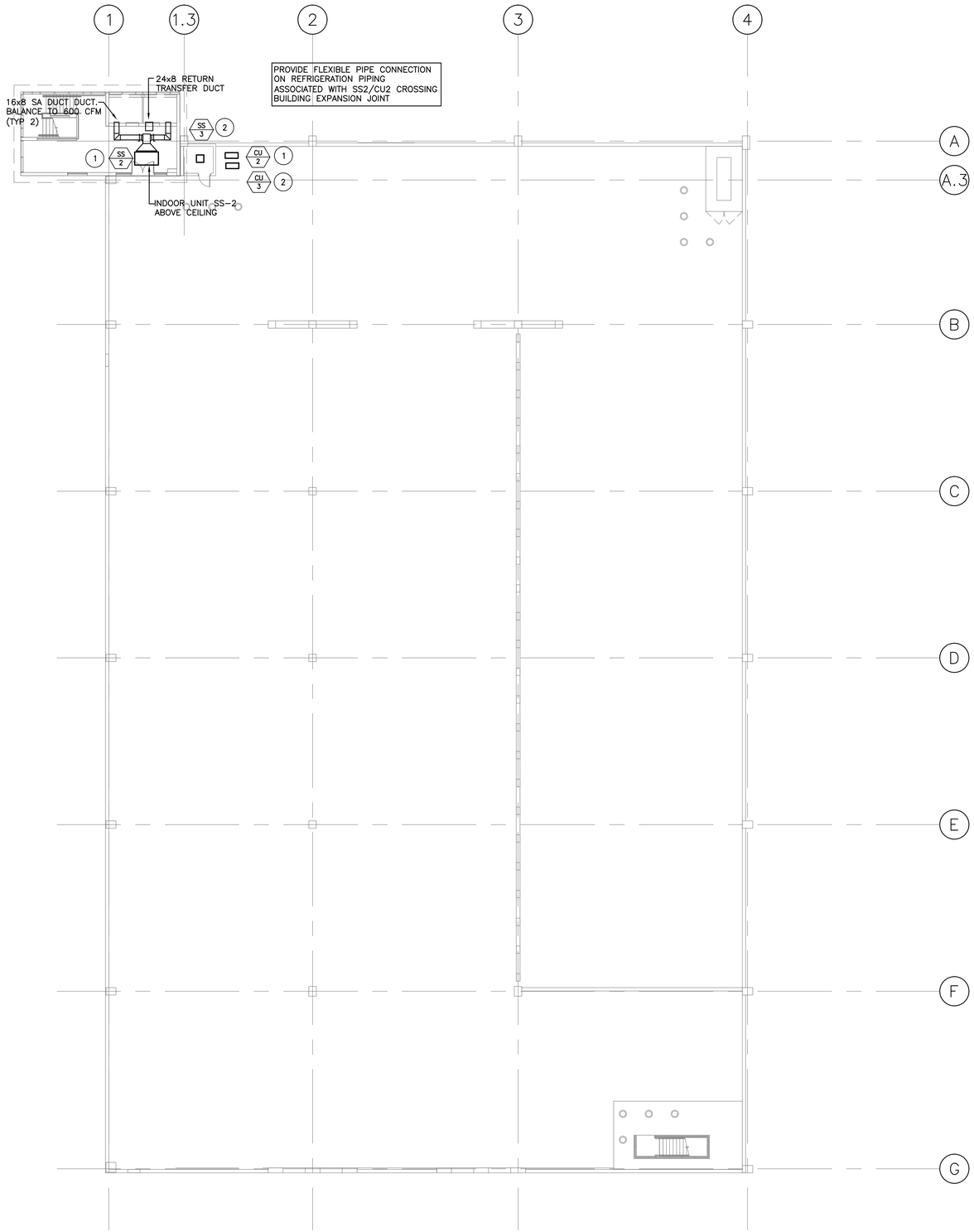
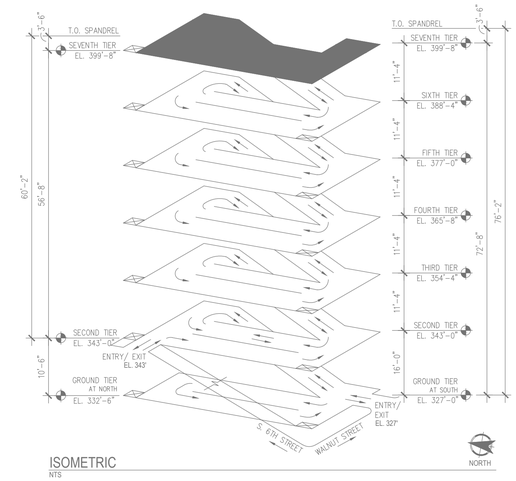


SEVENTH TIER MECHANICAL PLAN

SCALE: 1/16"=1'-0"



ISOMETRIC
NTS

KEY PLAN

KEYED NOTES:

1. FURNISH AND INSTALL SPLIT SYSTEM AIR CONDITIONING SYSTEM AS SCHEDULED AND INDICATED. INSTALL UNIT ABOVE CEILING AND EXTEND (2) 16x8 SA DUCTS AND 24x8 TRANSFER/RETURN AIR DUCT AS INDICATED. TERMINATE DUCT INSED ELEVATOR SHAFT WITH WIRE MESCH SCREEN AND BLANCE TO AIRFLOW S AS INDICATED. PROVIDE FIRE DAMPER AT ALL SHAFT WALL PENETRATIONS. FURNISH WITH REMOTE TEMPERATURE SENSOR WITHIN ELEVATOR SHAFT AND UNIT THERMOSTAT TO BE LOCATED ABOVE CEILING ADJACENT TO INDOOR UNIT. COORDINATE UNIT LOCATION WITH OTHER TRADES. EXTEND REFRIGERATION PIPING FROM INDOOR UNIT TO OUTDOOR UNIT LOCATED ON GRADE. ALL REFRIGERATION PIPE SIZING, PIPING DETAILS, AND PIPING CONFIGURATION SHALL BE IN STRICT ACCORDANCE WITH THE UNIT MANUFACTURER'S WRITTEN INSTRUCTION. CONCEAL ALL REFRIGERATION PIPING EXPOSED IN GARAGE AREA IN VINYL OR ALUMINUM PAINTED ENCLOSURE TO PROTECT ALL EXPOSED PIPING. EXTEND ENCLOSURE AND PIPING IN NEAT, PLUMB WORKMANSHIP LIKE MANNER. FURNISH AND INSTALL WALL MOUNTED THERMOSTAT AND ASSOCIATED CONTROL WIRING. EXTEND 1" DRAIN PIPING FROM UNIT THRU OUTSIDE WALL. TERMINATE 18" ABOVE GRADE WITH INSECT SCREEN.

2. FURNISH AND INSTALL SPLIT SYSTEM AIR CONDITIONING SYSTEM AS SCHEDULED AND INDICATED. SUPPORT INDOOR UNIT FROM DECK ABOVE. COORDINATE UNIT LOCATION WITH OTHER TRADES. EXTEND REFRIGERATION PIPING FROM INDOOR UNIT TO OUTDOOR UNIT LOCATED ON GRADE. ALL REFRIGERATION PIPE SIZING, PIPING DETAILS, AND PIPING CONFIGURATION SHALL BE IN STRICT ACCORDANCE WITH THE UNIT MANUFACTURER'S WRITTEN INSTRUCTION. CONCEAL ALL REFRIGERATION PIPING EXPOSED IN GARAGE AREA IN VINYL OR ALUMINUM PAINTED ENCLOSURE TO PROTECT ALL EXPOSED PIPING. EXTEND ENCLOSURE AND PIPING IN NEAT, PLUMB WORKMANSHIP LIKE MANNER. FURNISH AND INSTALL WALL MOUNTED THERMOSTAT AND ASSOCIATED CONTROL WIRING. EXTEND 1" DRAIN PIPING FROM UNIT THRU OUTSIDE WALL. TERMINATE 18" ABOVE GRADE WITH INSECT SCREEN.

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1/15/2015

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REVIEWED:	KJB
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SHEET TITLE:

SEVENTH TIER MECHANICAL PLAN

SHEET NO.

M-1.7

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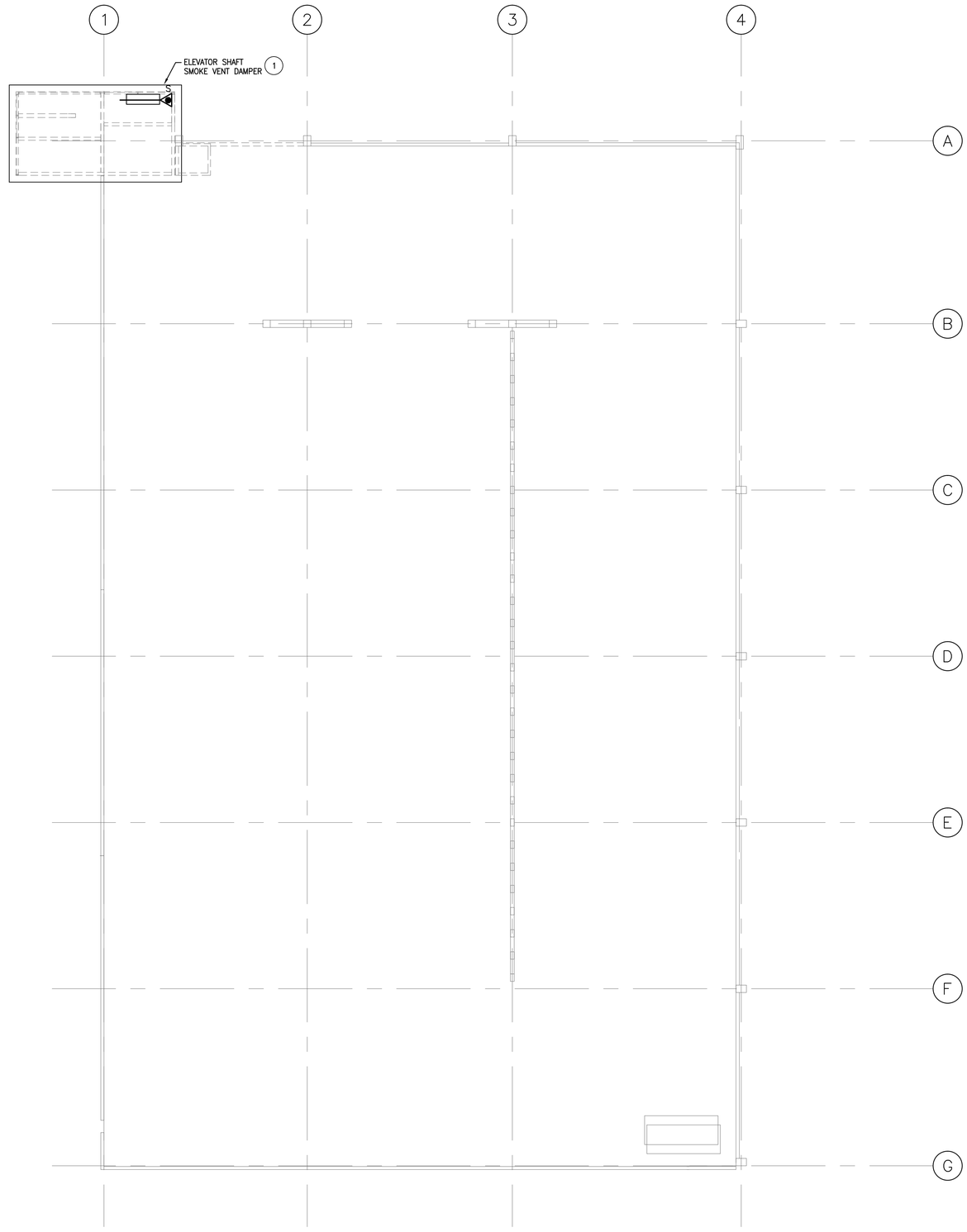
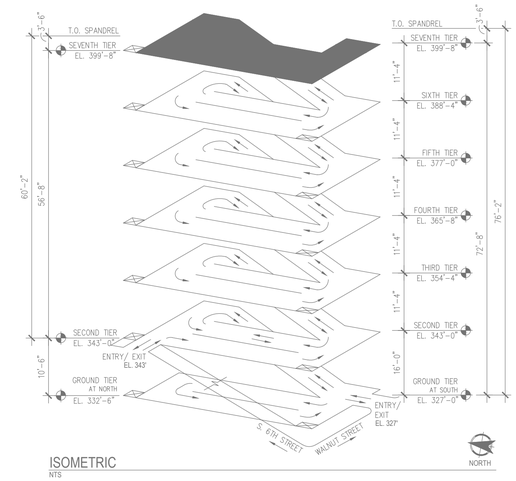


ROOF MECHANICAL PLAN

SCALE: 1/16"=1'-0"



ISOMETRIC

NTS

KEY PLAN

KEYED NOTES:

1. FURNISH AND INSTALL ELEVATOR SHAFT SMOKE DAMPER BEHIND CURTAIN WALL LOUVER. LOUVER SHALL BE BY THE GENERAL CONTRACTOR. COORDINATE EXACT SIZE OF DAMPER WITH LOUVER SIZE. COORDINATE SMOKE DAMPER ACTUATOR VOLTAGE REQUIREMENTS WITH THE ELECTRICAL CONTRACTOR.

TimHaahs

Timothy Haahs & Associates, Inc.
550 Township Line Road
Suite 100
Blue Bell, PA 19422
T. 484.342.0200
F. 484.342.0222
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1/15/2015

NO.	DESCRIPTION	DATE

NORTH

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REVIEWED:	KJB
DATE:	11/24/2014

SHEET TITLE:

ROOF MECHANICAL PLAN

SHEET NO.

M-1.8

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SS — SPLIT SYSTEM AIR CONDITIONING UNIT SCHEDULE

SYMBOL	AREA SERVED	FAN (CFM)	FAN SPEED	ELECTRICAL			COOLING CAPACITY (MBH)	HEATING CAPACITY (MBH)	BASIS OF DESIGN
				FLA	MCA	VOLTAGE / PH.			
SS-1	OFFICE	305	HIGH	–	–	208-230/1ø	11.5	11.5	DAIKIN: FDXS12LVJU
SS-2	ELEV SHAFT	1130	HIGH	2.4	15	208-230/1ø	36.0	40.0	DIAKIN: FBQ36PVJU
SS-3	ELEV CONTROL ROOM	380	HIGH	–	–	208-230/1ø	10.6	15.6	DAIKIN: FTXS09LVJU

REMARKS:
1. INDOOR SPLIT SYSTEM RECEIVES POWER FROM ASSOCIATED OUTDOOR CONDENSING UNIT.
2. UNITS SHALL BE FURNISHED WITH WIRELESS WALL THERMOSTAT.

CU — CONDENSING UNIT SCHEDULE

SYMBOL	COOLING CAPACITY		CONDENSING UNIT DATA			BASIS OF DESIGN
	MBH	SEER	MOP	MCA	VOLTAGE / PH.	
CU-1	11.5	15.5	15	8.75	208-230/1ø	DAIKIN: RXS12LVJU
CU-2	36.0	17.5	30	27	208-230/1ø	DAIKIN: RZQ36PVJU9
CU-3	9.0	24.5	15	8	208-230/1ø	DAIKIN: RXSO9LVJU

REMARKS:
1. UNITS TO BE PROVIDED WITH LOW AMBIENT CONTROL TO 0° F.

EF — EXHAUST FAN SCHEDULE

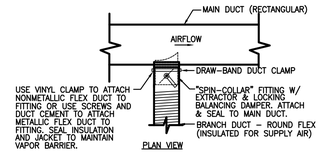
SYMBOL	TYPE	CFM	ESP	RPM	HP WATTS	VOLTAGE / PH.	CONTROL	BASIS OF DESIGN
EF-1	IN-LINE ZEPHYR	125	0.375	1550	77 W.	277 / 1ø	LIGHT SWITCH (BY EC)	PENN-BARRY MODEL NO. Z6H RA

REMARKS:
1. ALL EXHAUST FANS SHALL BE FURNISHED WITH AN ADDITIONAL BELT AND SHEAVE FOR FINAL BALANCING.
2. ALL EXHAUST FANS SHALL BE FURNISHED AND INSTALLED WITH MANUFACTURER'S STANDARD ALUMINUM EXHAUST AIR GRILLE IN UNIT HOUSING.
3. ALL EXHAUST FANS SHALL BE FURNISHED AND INSTALLED WITH MANUFACTURER'S BRICK VENT.

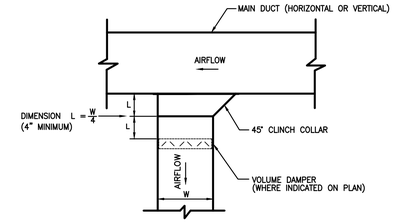
S R E — AIR INLET & OUTLET SCHEDULE

SYMBOL	TYPE	MODULE SIZE	BACK PAN SIZE	NECK SIZE	PATTERN	OPPOSED BLADE DAMPER	FINISH	MATERIAL	BASIS OF DESIGN
S1	CEILING DIFFUSER	24x24	9x9	6ø	4-WAY	YES	BAKED WHITE	STEEL	TITUS MODEL TDCA
							BAKED		
R4	CEILING REGISTER	24x24	———	16x16	———	YES	BAKED WHITE	STEEL	TITUS MODEL 350RL

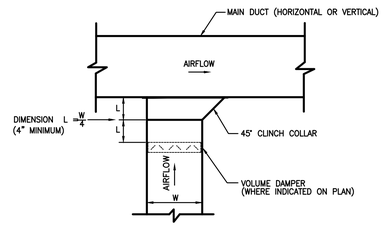
REMARKS:



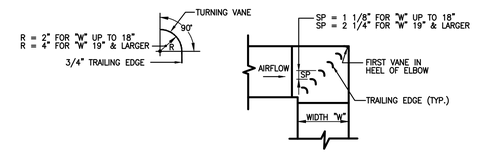
1 FLEXIBLE BRANCH DUCT DETAIL
NO SCALE (TYPICAL FOR ALL FLEX DUCT TAKEOFFS)
• DUCT SIZES AS NOTED ON PLANS



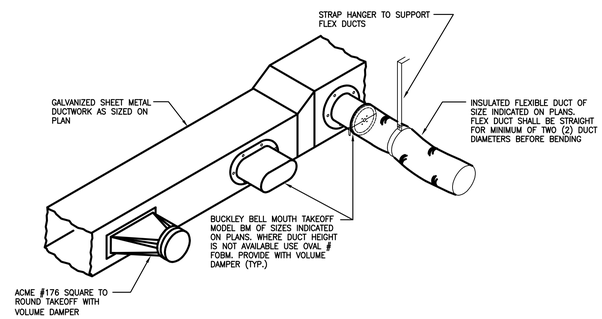
2 BRANCH DUCT DETAIL
NO SCALE (SUPPLY)
• DUCT SIZES NOTED ON PLANS



3 BRANCH DUCT DETAIL
NO SCALE RETURN OR EXHAUST
• DUCT SIZES NOTED ON PLANS



4 TURNING VANE DETAIL
• 90° AND 45° RECTANGULAR ELBOWS NO SCALE
• SUPPLY, RETURN, AND EXHAUST DUCTS
• REFER TO SMACNA DUCT CONSTRUCTION STANDARDS



5 BRANCH DUCT AND TAKEOFF DETAIL
NO SCALE

TimHaahs
Timothy Haahs & Associates, Inc.
550 Township Line Road
Suite 100
Blue Bell, PA 19422
T. 484.342.0200
F. 484.342.0222
www.timhaahs.com

PROFESSIONAL SEAL

CONSULTANT

PROJECT NO.
PHL14119.00

PROJECT
Community Lot

PARKING GARAGE

Allentown, PA

SUBMISSIONS / REVISIONS
ISSUED FOR CONSTRUCTION
1/15/2015

NO.	DESCRIPTION	DATE

NORTH

DRAWN: KJB
REVIEWED: KJB
DATE: 11/24/2014

SHEET TITLE:
MECHANICAL DETAILS AND SCHEDULES

SHEET NO.
M2.0

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