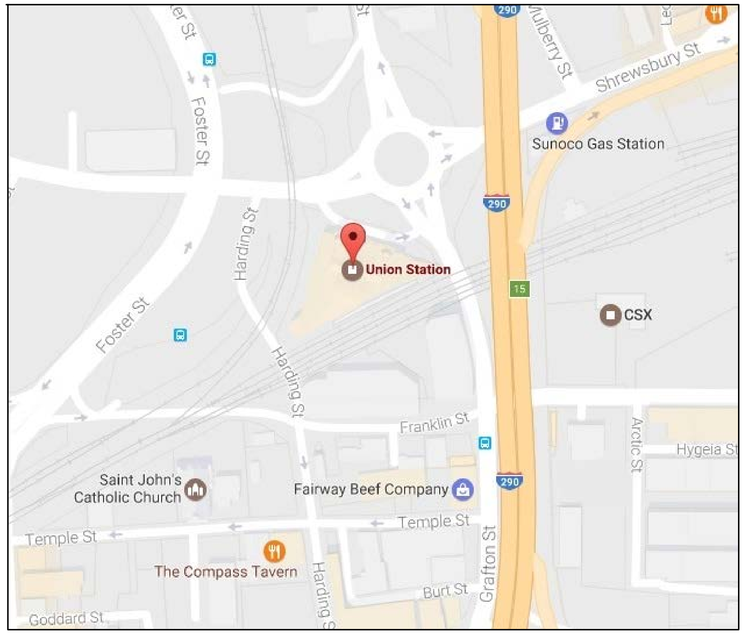
UNION STATION
NEW FIRST FLOOR TOILET ROOM AND SHOWER ROOM

2 WASHINGTON SQUARE, WORCESTER, MA

BID SET
JUNE, 2022

LOCUS PHOTO



LOCUS MAP - NOT TO SCALE

ARCHITECT:

NAULT ARCHITECTS, INC.
71 HOPE AVENUE
WORCESTER, MA 01603
TEL: (508)755-6134
FAX: (508) 754-4661

MECHANICAL ENGINEER:

HallamICS
AN EMPLOYEE OWNED COMPANY

LIST OF DRAWINGS

T1 - COVER SHEET
A1.0 - FIRST FLOOR TOILET AND SHOWER ROOM PLANS, ELEVATIONS AND DETAILS
FP0.0 - FIRE PROTECTION LEGEND AND ABBREVIATIONS
FP1.0 - FIRE PROTECTION NEW WORK PLAN
P0.0 - PLUMBING LEGEND AND ABBREVIATIONS
P1.0 - PLUMBING PLAN
P2.0 - PLUMBING DETAILS AND SCHEDULES
H0.0 - MECHANICAL LEGEND AND ABBREVIATIONS
H1.0 - HVAC DUCTWORK DEMO AND NEW WORK
H2.0 - HVAC SCHEDULE AND DETAILS
E0.1 - ELECTRICAL LEGEND AND NOTES
E1.0 - ELECTRICAL FLOOR PLANS
E5.0 - ELECTRICAL SCHEDULES

DRAWING TITLE
COVER SHEET

JOB NUMBER: 1680
JOB TITLE
MISCELLANEOUS RENOVATIONS
NEW FIRST FLOOR TOILET ROOM
AND SHOWER ROOM
UNION STATION
WORCESTER, MA

CONSULTANT

ARCHITECT
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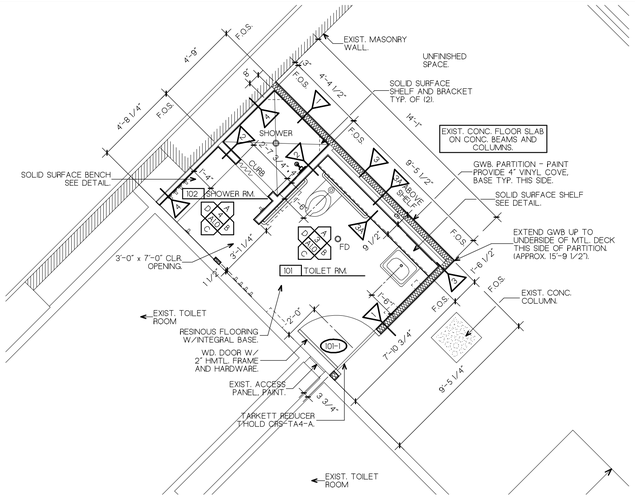
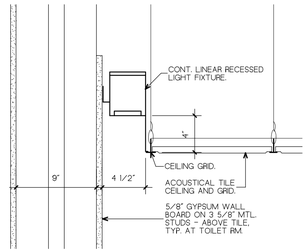
DRAWING NO.
T1

SCALE
AS NOTED

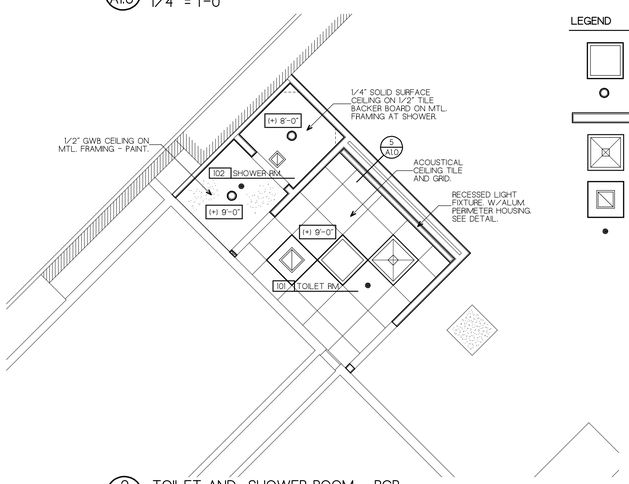
DATE
JUNE 2022



1 A1.0 TOILET AND SHOWER ROOM PLAN
1/4" = 1'-0"



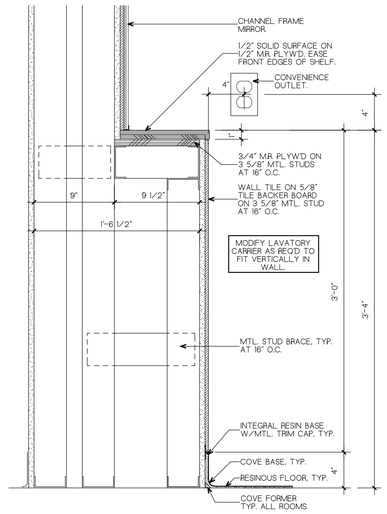
5 A1.0 SECTION DETAIL - RECESSED LIGHT
1 1/2" = 1'-0"



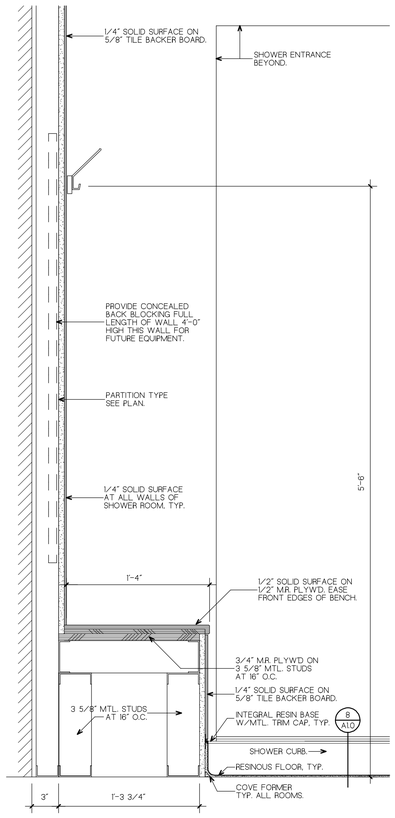
LEGEND

- 2X2 RECESSED LIGHT FIXTURE
- RECESSED DN. LIGHT FIXTURE
- CONT. RECESSED DN. LIGHT FIXTURE
- SUPPLY AIR DIFFUSER
- RETURN AIR DIFFUSER
- FP HEAD

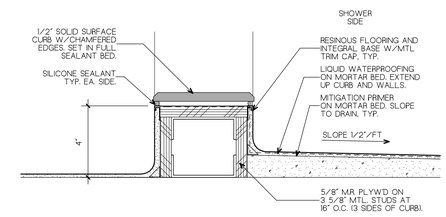
2 A1.0 TOILET AND SHOWER ROOM - RCP
1/4" = 1'-0"



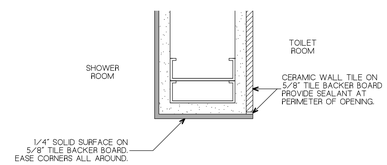
6 A1.0 SECTION DETAIL - SHELF
1 1/2" = 1'-0"



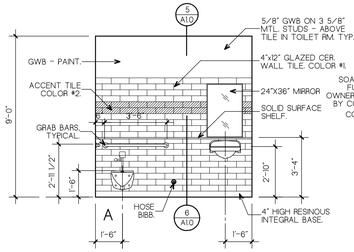
7 A1.0 SECTION DETAIL - BENCH AND CUBBY
1 1/2" = 1'-0"

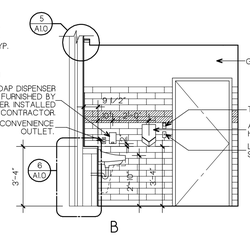


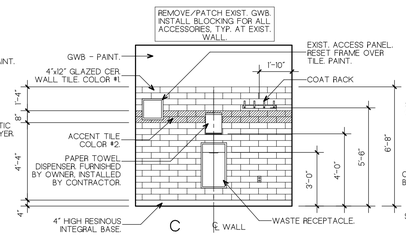
8 A1.0 SECTION DETAIL - SHOWER CURB
3" = 1'-0"

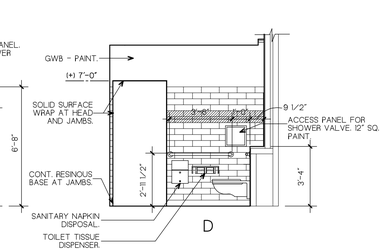


9 A1.0 SECTION DETAIL - JAMB
3" = 1'-0"

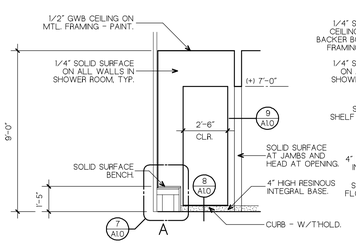


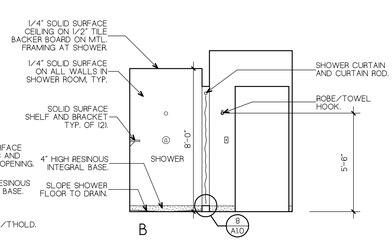


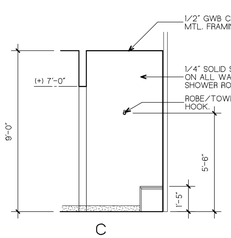


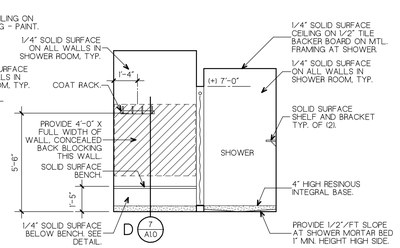


3 A1.0 ELEVATIONS - #101 TOILET ROOM
1/4" = 1'-0"

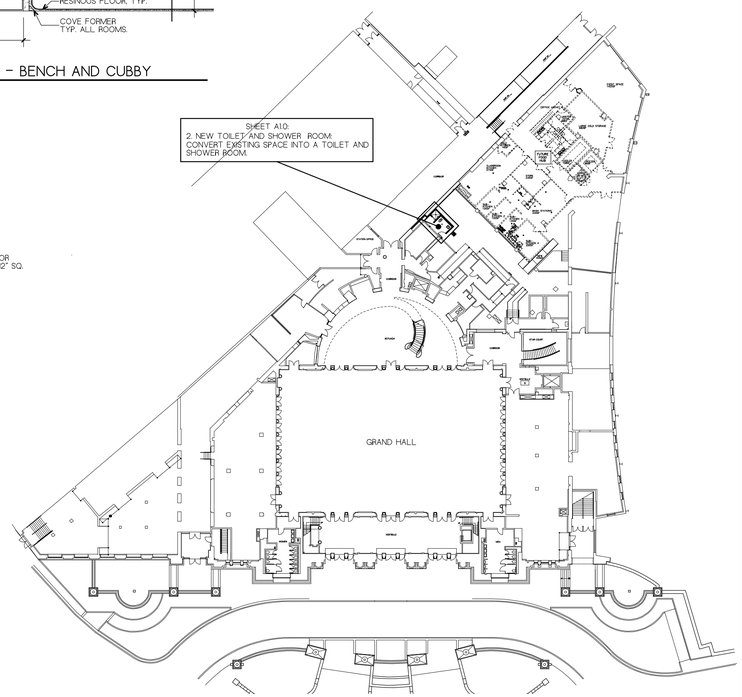








4 A1.0 ELEVATIONS - #102 SHOWER ROOM
1/4" = 1'-0"



LOCUS PLAN
1" = 40'-0"

GENERAL NOTES

1. CONTRACTORS SHALL VERIFY ALL DIMENSIONS IN THE FIELD, PRIOR TO ORDERING MATERIALS. EXISTING DIMENSIONS SHOWN, ARE TAKEN FROM EXISTING RECORD DRAWINGS AND ARE PROVIDED FOR INFORMATIONAL PURPOSES AND ARE APPROXIMATE.

2. CONTRACTORS ARE ADVISED THAT THIS IS AN OPERATIONAL TRANSPORTATION CENTER, AND WILL REMAIN OCCUPIED AND IN OPERATION AT ALL TIMES DURING CONSTRUCTION. CONTRACTORS ARE SOLELY RESPONSIBLE FOR THE PROTECTION OF THE PUBLIC AS THE WORK IS PERFORMED. PHASING OF THE WORK, LOCATION OF LIFTS AND EQUIPMENT OR DUMPSTERS AND CONTAINERS ON SITE, IS SUBJECT TO THE APPROVAL OF THE OWNER.

3. ALL AREAS SHOULD BE CLEANED PRIOR TO ANY FINISH WORK BEGINNING.

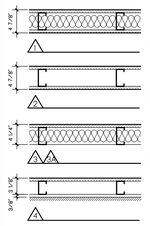
4. PROVIDE CONCEALED BACK-BLOCKING FOR MOUNTING OF ALL WALL MOUNTED EQUIPMENT AND TOILET ACCESSORIES.

5. PATCH BACK ALL EXISTING SURFACES TO REMAIN AFTER DEMOLITION OF ADJACENT SURFACES.

6. REFER TO MECHANICAL AND ELECTRICAL PLANS FOR DEMOLITION AND NEW WORK REQUIREMENTS.

7. PROVIDE TREMCO "TREMSIL 200" SINGLE COMPONENT MILDEW RESISTANT ACID CURING SILICONE SEALANT. TYPE S, GRADE NS, CLASS 25. COLOR TO BE SELECTED.

WALL PARTITION TYPES



NOTE: PARTITIONS EXTEND TO DECK ABOVE, UNLESS NOTED OTHERWISE.

KEY PLAN

DRAWING TITLE

FIRST FLOOR TOILET AND SHOWER ROOM PLANS ELEVATIONS AND DETAILS

JOB NUMBER: 1680
JOB TITLE:
MISCELLANEOUS RENOVATIONS
NEW FIRST FLOOR TOILET ROOM AND SHOWER ROOM
UNION STATION
WORCESTER, MA

CONSULTANT

ARCHITECT

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REGISTERED ARCHITECT
Stephen M. Vandyke
No. 10717
BARRE, MASS.
COMMONWEALTH OF MASSACHUSETTS

DRAWING NO.
A1.0

SCALE
AS NOTED

DATE
JUNE, 2022

FIRE PROTECTION LEGEND & SYMBOLS

ABBREVIATIONS & SYMBOLS

AFF	ABOVE FINISHED FLOOR
AFG	ABOVE FINISHED GRADE
AHU	AIR HANDLING UNIT
AP	ACCESS PANEL
BFF	BELOW FINISHED FLOOR
BFP	BACKFLOW PREVENTER
BHP	BRAKE HORSEPOWER
BOD	BOTTOM OF DUCT
BOP	BOTTOM OF PIPE
BTUH	BTU PER HOUR
CAP	CAPACITY
CL	CENTERLINE
CLG	CEILING
CO	CLEANOUT
CONN	CONNECTION
CTE	CONNECT TO EXISTING
DIA	DIAMETER
DN	DOWN
DWG	DRAWING
ERH	EXTERIOR ROOF HYDRANT
EXIST	EXISTING
ETR	EXISTING TO REMAIN
FCO	FLOOR CLEANOUT
FD	FLOOR DRAIN OR FIRE DAMPER
FDC	FIRE DEPARTMENT CONNECTION
FDV	FIRE DEPARTMENT HOSE VALVE
FLA	FULL LOAD AMPS
FM	FLOW METER OR FACTORY MUTUAL
FMS	FACILITY MANAGEMENT SYSTEM
FP	FIRE PROTECTION
FT	FEET
G	GAS
GC	GENERAL CONTRACTOR
GPH	GALLONS PER HOUR
GPM	GALLONS PER MINUTE
HD	HEAD
HP	HORSEPOWER OR HEAT PUMP
HS	HOSE STATION
HZ	HERTZ
ID	INSIDE DIAMETER
LBS	POUNDS
LWCO	LOW WATER CUT OFF
MC	MECHANICAL CONTRACTOR
MCA	MINIMUM CIRCUIT AMPACITY
MOCP	MAXIMUM OVERCURRENT PROTECTION
MTD	MOUNTED
NC	NORMALLY CLOSED
NEC	NATIONAL ELECTRIC CODE
NG	NATURAL GAS
NIC	NOT IN CONTRACT
NO	NORMALLY OPEN
NTS	NOT TO SCALE
PAV	PRE-ACTION VALVE
PD	PRESSURE DROP
PG	PROPANE GAS OR PROPYLENE GLYCOL
PRV	PRESSURE REDUCING VALVE
PSI	POUNDS PER SQUARE INCH
PSIG	POUND PER SQUARE INCH GAUGE
SPR	SPRINKLER
TYP	TYPICAL
UCD	UNDERCUT DOOR
UG	UNDERGROUND
V	VENT
VFD	VARIABLE FREQUENCY DRIVE
VTR	VENT THROUGH ROOF
WCO	WALL CLEANOUT
WSA	WIRE SIZING AMPS
XP	EXPLOSION PROOF
	POINT OF DEACTIVATION OR NEW CONNECTION TO EXISTING

PIPING

- EXISTING WORK TO REMAIN
- EXISTING WORK TO BE REMOVED ON DEMOLITION DRAWINGS
- NEW WORK ON PROPOSED DRAWINGS
- FP — FIRE PROTECTION PIPING

FITTINGS

- PIPE TURNING DOWN (PIPE DROP)
- PIPE TURNING UP (PIPE RISE)
- TEE UP (OFF TOP)
- TEE DOWN (OFF BOTTOM)
- PIPE DROP IN RUN
- PIPE DROP AND TURN
- TEE OFF TOP
- TEE OFF BOTTOM
- CROSS
- CROSS WITH RISER
- PLAIN ELBOW
- PLAIN TEE (OFF SIDE)
- CONCENTRIC REDUCER
- ECCENTRIC REDUCER
- UNION
- FLANGED JOINT
- PIPE CAP
- THREADED HOSE END WITH CAP
- PIPE GUIDE
- PIPE ANCHOR
- WALL SLEEVE
- FLEX CONNECTION
- PRESSURE GAUGE
- BACKFLOW PREVENTER

VALVES

- CHECK
- GATE
- PRESSURE REGULATING OR REDUCING
- DOUBLE CHECK VALVE ASSEMBLY
- FCVA — FLOW CONTROL VALVE ASSEMBLY

SPRINKLER SYMBOLS

- WET PENDENT, CONCEALED SPRINKLER
- WET PENDENT, SEMI-RECESSED SPRINKLER
- DRY PENDENT, CONCEALED SPRINKLER
- DRY PENDENT, SEMI-RECSSED SPRINKLER
- WET HORIZONTAL SIDEWALL SPRINKLER
- DRY HORIZONTAL SIDEWALL SPRINKLER
- WET UPRIGHT SPRINKLER
- DRY UPRIGHT SPRINKLER

GENERAL NOTES

1. THE SPRINKLER LAYOUT AND PIPE SIZES SHOWN ON THE FIRE PROTECTION DESIGN DOCUMENTS ARE TO DEFINE THE DESIGN INTENT FOR COMPETITIVE BIDDING AND FOR PRELIMINARY SUBMISSION TO THE AUTHORITIES HAVING JURISDICTION.
2. THE WORK OF THE FIRE PROTECTION CONTRACTOR'S CONTRACT SHALL INCLUDE HYDRAULIC CALCULATIONS AND SPRINKLER SYSTEM SHOP DRAWINGS INDICATIVE OF THE ACTUAL FIELD INSTALLED CONDITIONS. SPRINKLER SHOP DRAWINGS SHALL BE PREPARED BY THE FIRE PROTECTION CONTRACTOR AND SUBMITTED TO THE ENGINEER FOR APPROVAL PRIOR TO ANY SPRINKLER WORK BEGINNING IN THE FIELD. IT IS REQUIRED THAT SPRINKLER SYSTEMS BE SIZED HYDRAULICALLY IN ACCORDANCE WITH NFPA STANDARDS. ALL HYDRAULIC CALCULATIONS PREPARED AND SUBMITTED BY THE FIRE PROTECTION CONTRACTOR FOR REVIEW SHALL BEAR THE SEAL AND SIGNATURE OF A REGISTERED PROFESSIONAL ENGINEER.
3. THE FIRE PROTECTION CONTRACTOR SHALL LOCATE SPRINKLERS AS REQUIRED IN THESE DOCUMENTS AND PER THE REFERENCED NFPA 13 STANDARDS UTILIZING ARCHITECT'S REFLECTED CEILING PLAN, AS NECESSARY, FOR LOCATIONS OF LIGHTS, DIFFUSERS, ETC.
4. IT IS NOT THE INTENTION THAT THESE DRAWINGS DEPICT EVERY DEVICE REQUIRED FOR A COMPLETE SYSTEM. ALL SUCH ITEMS SHALL BE PROVIDED AS MAY BE NECESSARY TO PROVIDE A COMPLETE FIRE PROTECTION SYSTEM, TO THE SATISFACTION OF THE ENGINEER AND AUTHORITY HAVING JURISDICTION.
5. NEW WET PIPE SPRINKLER SYSTEM SHALL BE HYDRAULICALLY SIZED TO NFPA 13 (2013) STANDARDS FOR LIGHT HAZARD WITH A DENSITY OF 0.15 GPM/SQ-FT OVER THE MOST REMOTE 1500SQ-FT.

GENERAL NOTES

KEY PLAN

KEY PLAN
NOT TO SCALE

S W E N
CALLED NORTH

DRAWING TITLE

FIRE PROTECTION LEGEND AND ABBREVIATIONS

JOB NUMBER: 1680
JOB TITLE:

MISCELLANEOUS RENOVATIONS
NEW FIRST FLOOR TOILET ROOM
AND SHOWER ROOM
UNION STATION
WORCESTER, MA

CONSULTANT

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COMMONWEALTH OF MASSACHUSETTS
JEFFREY V SPERONI
MECHANICAL
No. 55693
REGISTERED PROFESSIONAL ENGINEER

DRAWING NO.

FP0.0

SCALE
AS NOTED

DATE
JUNE, 2022

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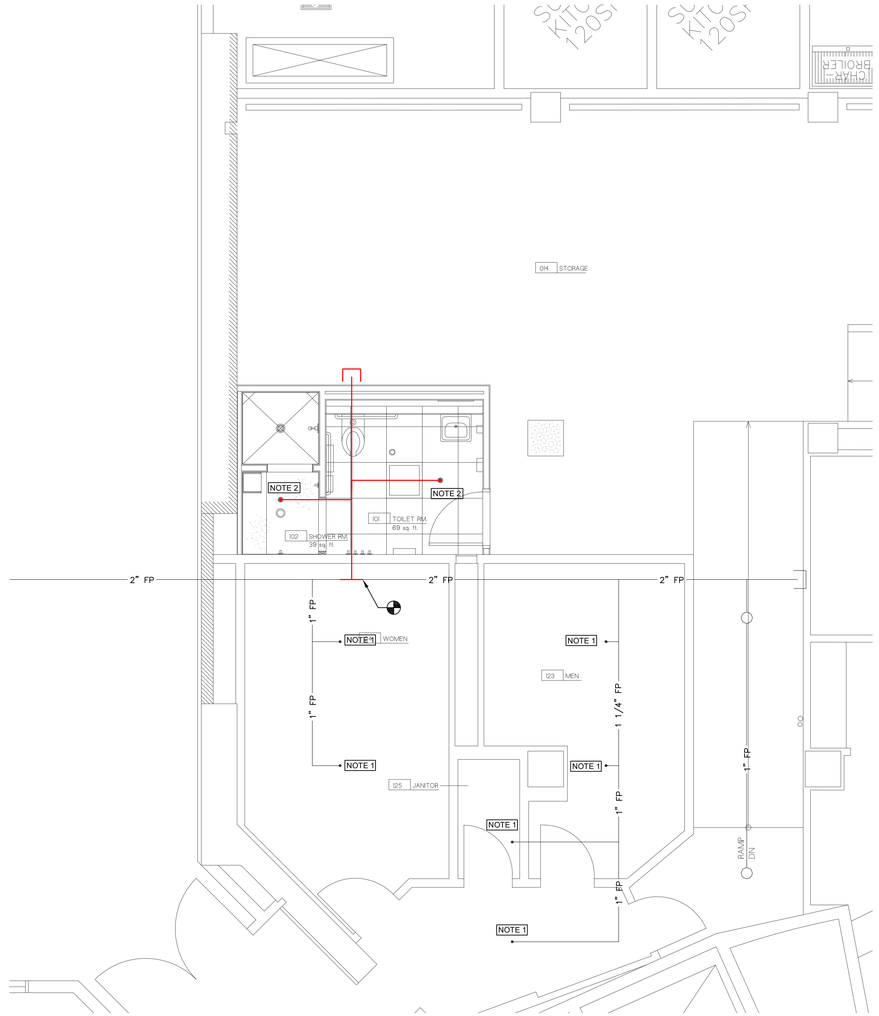

FIRE PROTECTION - NEW WORK

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

GENERAL NOTES

1. NEW WET PIPE SPRINKLER SYSTEM SHALL BE HYDRAULICALLY SIZED TO NFPA 13 (2013) STANDARDS FOR LIGHT HAZARD WITH A DENSITY OF 0.15 GPM/SQ-FT OVER THE MOST REMOTE 1500SQ-FT.
2. SPRINKLER AND PIPING LAYOUT SHOWN SHALL BE USED FOR ESTIMATING PURPOSES ONLY. FINAL SYSTEM DESIGN MUST BE CALCULATED, LAID OUT IN ACCORDANCE WITH THE ABOVE SPECIFICATIONS AND SUBMITTED FOR APPROVAL.
3. COORDINATE SPRINKLER LOCATIONS WITH ELECTRICAL AND MECHANICAL CONTRACTORS. PENDANT TYPE SPRINKLER HEADS SHALL BE INSTALLED IN THE CENTER OF CEILING TILES.

KEYED NOTES:
1 EXISTING SPRINKLER TO REMAIN.

2. NEW CONCEALED PENDANT SPRINKLER WITH WHITE COVER.

KEY PLAN

KEY PLAN
NOT TO SCALE

S W E N
CALLED NORTH

DRAWING TITLE

FIRE PROTECTION NEW WORK PLAN

JOB NUMBER: 1680
JOB TITLE:

MISCELLANEOUS RENOVATIONS
NEW FIRST FLOOR TOILET ROOM
AND SHOWER ROOM
UNION STATION
WORCESTER, MA

CONSULTANT

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COMMONWEALTH OF MASSACHUSETTS
JEFFREY V SPERONI
MECHANICAL
No. 55693
RECORD FILED
NOT FOR CONSTRUCTION

DRAWING NO.

FP1.0

SCALE
AS NOTED

DATE
JUNE, 2022

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ABBREVIATIONS

AAV	AIR ADMITTANCE VALVE
A/C	AIR CONDITIONING
ACH	AIR CHANGES PER HOUR
AD	ACCESS DOOR
AFF	ABOVE FINISHED FLOOR
AFG	ABOVE FINISHED GRADE
AFUE	ANNUAL FUEL UTILIZATION EFFICIENCY
AHU	AIR HANDLING UNIT
AI	ANALOG INPUT
AO	ANALOG OUTPUT
AP	ACCESS PANEL
AS	AIR SEPARATOR
ATC	AUTOMATIC TEMPERATURE CONTROLS
BBD	BOILER BLOWDOWN
BD	BACKDRAFT DAMPER
BF	BOILER FEED
BFF	BELOW FINISHED FLOOR
BFP	BACKFLOW PREVENTER
BG	BLAST GATE
BHP	BRAKE HORSEPOWER
BI	BACKWARD INCLINED
BIA	BACKWARD INCLINED AIRFOIL
BOD	BOTTOM OF DUCT
BOP	BOTTOM OF PIPE
BTU	BRITISH THERMAL UNIT
BTUH	BTU PER HOUR
CAF	COMBUSTION AIR FAN
CAP	CAPACITY
CC	COOLING COIL
CD	CONDENSATE DRAIN
CFM	CUBIC FEET PER MINUTE
CI	CAST IRON
CL	CENTERLINE
CLG	CEILING
CO	CLEANOUT
CONN	CONNECTION
COP	COEFFICIENT OF PERFORMANCE
CU	CONDENSING UNIT OR COPPER
CUH	CABINET UNIT HEATER
CW	COLD WATER OR CLOTHES WASHER
DB	DRY BULB
DDC	DIRECT DIGITAL CONTROL
DF	DRINKING FOUNTAIN
DG	DIGESTER GAS
DI	DIGITAL INPUT
DIA	DIAMETER
DN	DOWN
DO	DIGITAL OUTPUT
DWG	DRAWING
E/A	EXHAUST AIR
EAT	ENTERING AIR TEMPERATURE
EC	ELECTRICAL CONTRACTOR
EE	EMERGENCY EYEWASH
EER	ENERGY EFFICIENCY RATIO
EES	EMERGENCY EYEWASH & SHOWER
EF	EXHAUST FAN
EGT	ENTERING GAS TEMPERATURE
EH	EXHAUST HOOD
ER	EXHAUST REGISTER
ERH	EXTERIOR ROOF HYDRANT
ERU	ENERGY RECOVERY UNIT
ESP	EXTERNAL STATIC PRESSURE
ET	EXPANSION TANK
EWC	ELECTRIC WATER COOLER
EWT	ENTERING WATER TEMPERATURE
EWH	EXTERIOR WALL HYDRANT
EXIST	EXISTING
FA	FREE AREA
FC	FORWARD CURVED OR FLEXIBLE CONNECTION
FCU	FAN COIL UNIT
FCO	FLOOR CLEANOUT
FD	FLOOR DRAIN OR FIRE DAMPER
FDC	FIRE DEPARTMENT CONNECTION
FDV	FIRE DEPARTMENT HOSE VALVE
FFU	FAN FILTER UNIT
FH	FILTER HOUSING
FL	FAIL LAST
FLA	FULL LOAD AMPS
FM	FLOW METER OR FACTORY MUTUAL
FMS	FACILITY MANAGEMENT SYSTEM
FP	FIRE PROTECTION
FPI	FINS PER INCH
FPM	FEET PER MINUTE
FRP	FIBERGLASS REINFORCED PLASTIC
FS	FLOW SWITCH OR FLOOR SINK
FT	FEET
F&T	FLOAT AND THERMOSTATIC
G	GAS
GC	GENERAL CONTRACTOR
GF	GAS FURNACE
GMU	GLYCOL MAKEUP UNIT
GPH	GALLONS PER HOUR
GPM	GALLONS PER MINUTE
GUH	GAS UNIT HEATER
HB	HOSE BIBB
HC	HEATING COIL
HD	HEAD
HP	HORSEPOWER OR HEAT PUMP
HRU	HEAT RECOVERY UNIT
HS	HOSE STATION
HX	HEAT EXCHANGER
HZ	HERTZ
ID	INSIDE DIAMETER
IEER	INTEGRATED ENERGY EFFICIENCY RATIO
IH	INTAKE HOOD
IW	INDIRECT WASTE
IWH	INTERIOR WALL HYDRANT
KS	KITCHEN SINK
L	LAVATORY
LAT	LEAVING AIR TEMPERATURE
LGT	LEAVING GAS TEMPERATURE
LBS	POUNDS
LP	LIQUID PROPANE
LWCO	LOW WATER CUT OFF
LWT	LEAVING WATER TEMPERATURE
MBH	THOUSAND BTUH
MC	MECHANICAL CONTRACTOR
MCA	MINIMUM CIRCUIT AMPACITY
MMBH	MILLION BTUH
MOCP	MAXIMUM OVERCURRENT PROTECTION
MD	MOTORIZED DAMPER
MS	MOP SINK
MTD	MOUNTED
NC	NORMALLY CLOSED
NEC	NATIONAL ELECTRIC CODE
NG	NATURAL GAS
NIC	NOT IN CONTRACT
NO	NORMALLY OPEN
NTS	NOT TO SCALE
OBD	OPPOSED BLADE DAMPER
O/A	OUTSIDE AIR
PD	PRESSURE DROP
PE	POLYETHYLENE
PEX	CROSS LINKED POLYETHYLENE
PF	PROPELLER FAN
PG	PROPANE GAS OR PROPYLENE GLYCOL
PP	POLYPROPYLENE
PRE	POWER ROOF EXHAUST
PRV	PRESSURE REDUCING VALVE
PWE	POWER WALL EXHAUSTER
PSI	POUNDS PER SQUARE INCH
PSIG	POUND PER SQUARE INCH GAUGE
R/A	RETURN AIR
RD	ROOF DRAIN
RH	RELATIVE HUMIDITY
RTU	ROOFTOP UNIT
RR	RETURN REGISTER
S/A	SUPPLY AIR
SD	SMOKE DAMPER OR SUPPLY DIFFUSER
SF	SUPPLY FAN
SH	SHOWER
SIC	SQUARE INLINE CENTRIFUGAL
SP	STATIC PRESSURE
SR	SUPPLY REGISTER
SS	STAINLESS STEEL
T/A	TRANSFER AIR
TAB	TESTING, ADJUSTING & BALANCING
TD	TRENCH DRAIN
TG	TRANSFER GRILLE
TIC	TUBULAR INLINE CENTRIFUGAL
TMX	THERMOSTATIC MIXING VALVE
TOD	TOP OF DUCT
TSP	TOTAL STATIC PRESSURE
TYP	TYPICAL
UCD	UNDERCUT DOOR
UG	UNDERGROUND
UH	UNIT HEATER
UR	URINAL
US	UTILITY SINK
V	VENT
VAV	VARIABLE AIR VOLUME
VB	VACUUM BREAKER
VD	VOLUME DAMPER
VFD	VARIABLE FREQUENCY DRIVE
VTR	VENT THROUGH ROOF
WB	WET BULB
WC	WATER CLOSET OR WATER COLUMN
WCO	WALL CLEANOUT
WG	WATER GAUGE
WH	WATER HEATER
XP	EXPLOSION PROOF

NEW CONNECTION TO EXISTING

VALVES

- AUTOMATIC FLOW CONTROL
- BALL OR BUTTERFLY (SIZE DEPENDENT)
- CHECK
- BALANCING
- GATE
- GLOBE
- PLUG
- PRESSURE REGULATING OR REDUCING
- RELIEF
- ANGLE PATTERN MULTI PURPOSE PUMP DISCHARGE
- STRAIGHT PATTERN MULTI PURPOSE PUMP DISCHARGE
- VALVE IN TEE DROP
- VALVE IN TEE RISE
- VALVE IN ELBOW DROP
- VALVE IN ELBOW RISE
- 2-WAY CONTROL (ELECTRONIC)
- 2-WAY CONTROL (PNEUMATIC)
- 3-WAY CONTROL (ELECTRONIC)
- 3-WAY CONTROL (PNEUMATIC)

FITTINGS

- EXPANSION JOINT
- PIPE TURNING DOWN (PIPE DROP)
- PIPE TURNING UP (PIPE RISE)
- TEE UP (OFF TOP)
- TEE DOWN (OFF BOTTOM)
- PIPE DROP IN RUN
- PIPE DROP AND TURN
- TEE OFF TOP
- TEE OFF BOTTOM
- PLAIN ELBOW
- SANITARY ELBOW
- PLAIN TEE (OFF SIDE)
- SANITARY TEE (OFF SIDE)
- CONCENTRIC REDUCER
- ECCENTRIC REDUCER
- UNION
- FLANGED JOINT
- PIPE CAP
- THREADED HOSE END WITH CAP
- METAL GASKET FACE SEAL
- PIPE GUIDE
- PIPE ANCHOR
- WALL SLEEVE
- FLEX CONNECTION
- PRESSURE GAUGE
- TEMPERATURE GAUGE
- AV — AUTOMATIC AIR VENT
- MV — MANUAL AIR VENT
- PUMP
- DP — DIFFERENTIAL PRESSURE
- TP — TRAP PRIMER
- TEST PLUG
- F L — WATER FILTER HOUSING AND CARTRIDGE
- WYE STRAINER
- WYE STRAINER W/BLOWDOWN
- BASKET STRAINER
- PUMP SUCTION DIFFUSER
- VACUUM BREAKER
- BACKFLOW PREVENTER
- WALL HYDRANT (ELEVATION)
- WALL HYDRANT (PLAN VIEW)
- CLEANOUT END OF LINE
- WCO — WALL CLEANOUT
- FLOOR CLEANOUT
- TRAP

PIPING

- EXISTING WORK TO REMAIN
- EXISTING WORK TO BE REMOVED ON DEMOLITION DRAWINGS
- NEW WORK ON PROPOSED DRAWINGS
- CD — CONDENSATE DRAIN
- G — GAS PIPING
- FOF — FUEL OIL FILL
- FOS — FUEL OIL SUPPLY
- FOR — FUEL OIL RETURN
- FOV — FUEL OIL VENT
- FP — FIRE PROTECTION SPRINKLER
- TW — TEPID WATER
- CW — DOMESTIC COLD WATER
- HW — DOMESTIC HOT WATER
- HWC — DOMESTIC HOT WATER RECIRC.
- S — SANITARY DRAIN
- S — SANITARY DRAIN BELOW FLOOR
- V — SANITARY VENT
- ST — STORM DRAIN
- ST — STORM DRAIN BELOW FLOOR
- ST (SEC) — SECONDARY STORM DRAIN
- D — INDIRECT DRAIN
- NPW — NON POTABLE WATER
- NPHW — NON POTABLE HOT WATER
- DIRECTION OF FLOW
- PITCH PIPE DOWN
- CA — COMPRESSED AIR

GENERAL NOTES

KEY PLAN

KEY PLAN
NOT TO SCALE

S W E N
CALLED NORTH

DRAWING TITLE

PLUMBING LEGEND AND ABBREVIATIONS

JOB NUMBER: 1680
JOB TITLE:

MISCELLANEOUS RENOVATIONS
NEW FIRST FLOOR TOILET ROOM
AND SHOWER ROOM
UNION STATION
WORCESTER, MA

CONSULTANT

Hallam-ICS
AN EMPLOYEE OWNED COMPANY
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COMMONWEALTH OF MASSACHUSETTS
JEFFREY V SPERONI
MECHANICAL
No. 55693
REGISTERED PROFESSIONAL ENGINEER

DRAWING NO.

P0.0

SCALE

AS NOTED

DATE

JUNE, 2022

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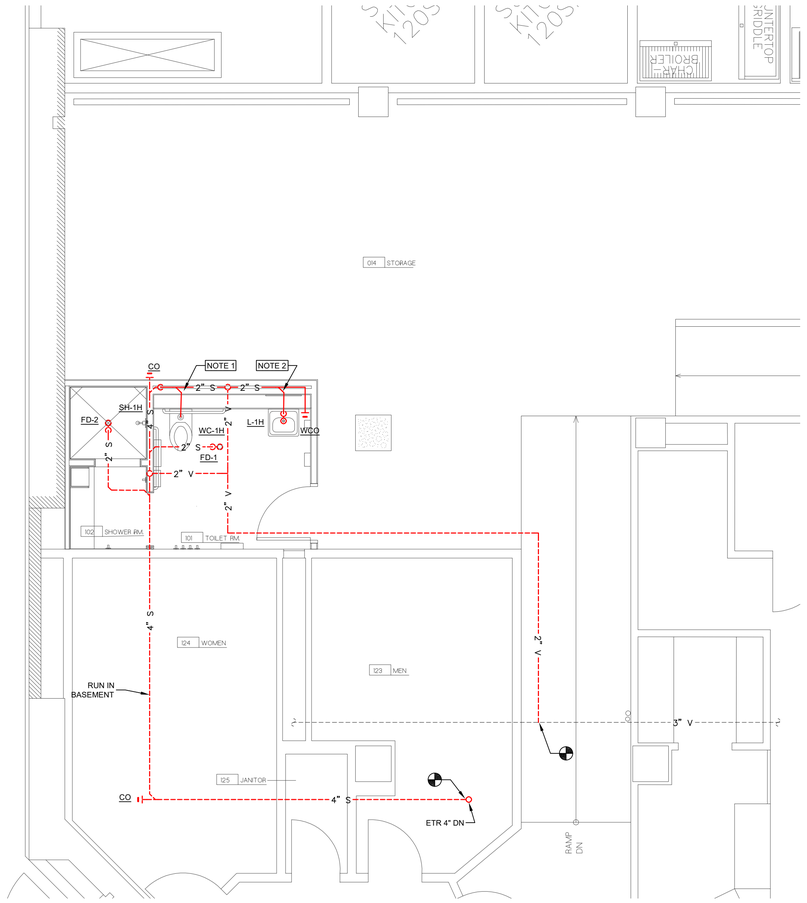
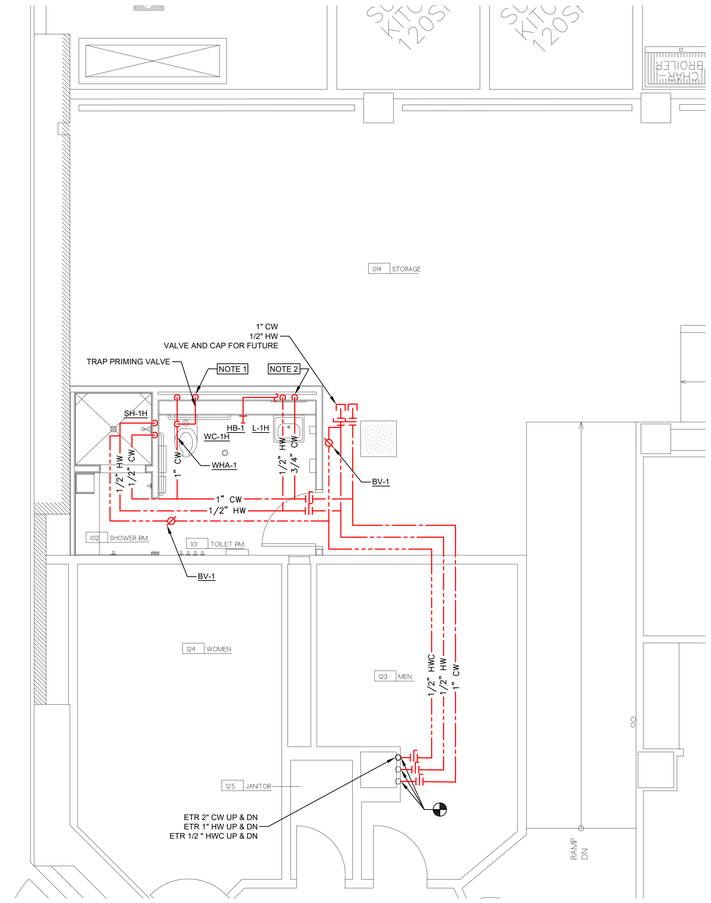


SANITARY PLAN - NEW WORK

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



DOMESTIC WATER PLAN - NEW WORK

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

GENERAL NOTES

1. IF NECESSARY MODIFY WATER CLOSET CARRIER TO FIT BELOW SHELF SEE SECTION 6 ON A1.0.
2. IF NECESSARY MODIFY LAVATORY CARRIER TO FIT BELOW SHELF SEE SECTION 6 ON A1.0.

KEY PLAN

KEY PLAN
NOT TO SCALE

S W E N
CALLED NORTH

DRAWING TITLE

PLUMBING PLAN

JOB NUMBER: 1680
JOB TITLE:

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NEW FIRST FLOOR TOILET ROOM
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PLUMBING FIXTURE SCHEDULE

TAG NO.	DESCRIPTION	DESIGN BASIS	MOUNTING	CONNECTIONS (in)					ACCESSORIES & FEATURES	REMARKS	NOTES
				HW	CW	TW	W	V			
WC-1H	WATER CLOSET, WALL MOUNTED W/ MANUAL FLUSHOMETER	AMERICAN STANDARD AFWALL FLOWISE 3351.128	WALL	-	1"	-	4"	2"	CHURCH #9500 CT OPEN FRONT ELONGATED SEAT, SLOAN ROYAL #111-1.28 MANUAL FLUSH VALVE RATED FOR 1.28 GPF	-	1,2
						-					
L-1H	LAVATORY, ROUND UNDERCOUNTER, SINGLE LEVER MANUAL FAUCET	AMERICAN STANDARD MURRO 0954.OO4EC	WALL	1/2"	1/2"	-	1-1/2"	1-1/2"	SYMMONS #S-60-G METERING FAUCET WITH GRID STRAINER	-	1,2
SH-1	ADA SHOWER	SYMMONS S9608PLRTRM	WALL	1/2"	1/2"		2"	1-1/2"		ENCLOSURE BY ARCHITECT	1,2
FD-1	FLOOR DRAIN	ZURN Z415B	FLOOR	-	-	-	2"	1-1/2"			
FD-2	FLOOR DRAIN	ZURN Z415N	FLOOR	-	-	-	2"	1-1/2"		SHOWER DRAIN	
HB-1	HOSE BIBB	ZURN Z1333	WALL	-	3/4"	-	-	-		INTERIOR WALL INSTALLATION WITH STAINLESS STEEL FACE AND OPERATING KEY.	

NOTES:

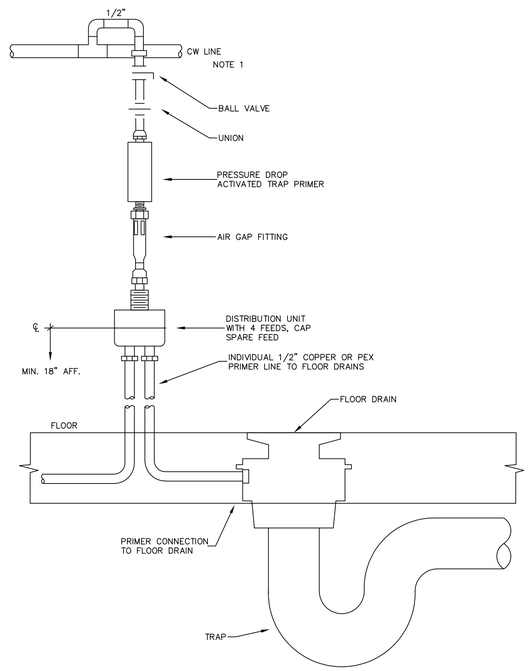
1. REFER TO ARCHITECTURAL DRAWINGS FOR FIXTURE HEIGHTS AND FLUSH VALVE HEIGHTS WHERE APPLICABLE.
2. INSULATE DRAIN AND WATER SUPPLIES PER ADA REQUIREMENTS.

BALANCING VALVE SCHEDULE (THERMOSTATIC FOR DHW SERVICE)

TAG NO.	SIZE (IN.)	CLOSING TEMPERATURE (°F)	DESIGN BASIS		Cv RATING		REMARKS
			MFR	MODEL	OPEN	CLOSED	
BV-1	1/2	120	CIRCUITSOLVER	CSUAS-1/2-120-CV1	1.3	0.2	BALANCING VALVE, STRAINER AND SHUT-OFF VALVE ASSEMBLY

WATER HAMMER ARRESTORS SCHEDULE

TAG NO.	SIZE (IN.)	DESIGN BASIS		FIXTURE UNITS	REMARKS
		MFR	MODEL		
WHA-1	3/4	PPP	SC-750B	11.5	



PRESSURE DROP ACTIVATED TYPE TRAP PRIMER DETAIL

SCALE: NONE

NOTES:

1. CW LINE MUST BE FREQUENTLY USED AND PRODUCING MINIMUM 10 PSI PRESSURE DROP ON USAGE TO ACTIVATE PRIMER.

GENERAL NOTES

KEY PLAN

KEY PLAN
NOT TO SCALE

S W E N
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DRAWING TITLE

PLUMBING DETAILS AND SCHEDULES

JOB NUMBER: 1680
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P2.0

SCALE: AS NOTED

DATE: JUNE, 2022

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ABBREVIATIONS & SYMBOLS

AAV	AIR ADMITTANCE VALVE
A/C	AIR CONDITIONING
ACH	AIR CHANGES PER HOUR
AD	ACCESS DOOR
AFF	ABOVE FINISHED FLOOR
AFG	ABOVE FINISHED GRADE
AFUE	ANNUAL FUEL UTILIZATION EFFICIENCY
AHU	AIR HANDLING UNIT
AI	ANALOG INPUT
AO	ANALOG OUTPUT
AP	ACCESS PANEL
AS	AIR SEPARATOR
ATC	AUTOMATIC TEMPERATURE CONTROLS
BBD	BOILER BLOWDOWN
BD	BACKDRAFT DAMPER
BF	BOILER FEED
BFF	BELOW FINISHED FLOOR
BFP	BACKFLOW PREVENTER
BG	BLAST GATE
BHP	BRAKE HORSEPOWER
BI	BACKWARD INCLINED
BIA	BACKWARD INCLINED AIRFOIL
BOD	BOTTOM OF DUCT
BOP	BOTTOM OF PIPE
BTU	BRITISH THERMAL UNIT
BTUH	BTU PER HOUR
CAF	COMBUSTION AIR FAN
CAP	CAPACITY
CC	COOLING COIL
CD	CONDENSATE DRAIN
CFM	CUBIC FEET PER MINUTE
CI	CAST IRON
CL	CENTERLINE
CLG	CEILING
CO	CLEANOUT
CONN	CONNECTION
COP	COEFFICIENT OF PERFORMANCE
CU	CONDENSING UNIT OR COPPER
CUH	CABINET UNIT HEATER
CW	COLD WATER OR CLOTHES WASHER
DB	DRY BULB
DDC	DIRECT DIGITAL CONTROL
DF	DRINKING FOUNTAIN
DG	DIGESTER GAS
DI	DIGITAL INPUT
DIA	DIAMETER
DN	DOWN
DO	DIGITAL OUTPUT
DWG	DRAWING
E/A	EXHAUST AIR
EAT	ENTERING AIR TEMPERATURE
EC	ELECTRICAL CONTRACTOR
EE	EMERGENCY EYEWASH
EER	ENERGY EFFICIENCY RATIO
EES	EMERGENCY EYEWASH & SHOWER
EF	EXHAUST FAN
EGT	ENTERING GAS TEMPERATURE
EH	EXHAUST HOOD
ER	EXHAUST REGISTER
ERH	EXTERIOR ROOF HYDRANT
ERU	ENERGY RECOVERY UNIT
ESP	EXTERNAL STATIC PRESSURE
ET	EXPANSION TANK
EWC	ELECTRIC WATER COOLER
EWT	ENTERING WATER TEMPERATURE
EWH	EXTERIOR WALL HYDRANT
EXIST	EXISTING
FA	FREE AREA
FC	FORWARD CURVED OR FLEXIBLE CONNECTION
FCU	FAN COIL UNIT
FCO	FLOOR CLEANOUT
FD	FLOOR DRAIN OR FIRE DAMPER
FDC	FIRE DEPARTMENT CONNECTION
FDV	FIRE DEPARTMENT HOSE VALVE
FFU	FAN FILTER UNIT
FH	FILTER HOUSING
FL	FAIL LAST
FLA	FULL LOAD AMPS
FM	FLOW METER OR FACTORY MUTUAL
FMS	FACILITY MANAGEMENT SYSTEM
FP	FIRE PROTECTION
FPI	FINS PER INCH
FPM	FEET PER MINUTE
FRP	FIBERGLASS REINFORCED PLASTIC
FS	FLOW SWITCH OR FLOOR SINK
FT	FEET
F&T	FLOAT AND THERMOSTATIC
G	GAS
GC	GENERAL CONTRACTOR
GF	GAS FURNACE
GMU	GLYCOL MAKEUP UNIT
GPH	GALLONS PER HOUR
GPM	GALLONS PER MINUTE
GUH	GAS UNIT HEATER
HB	HOSE BIBB
HC	HEATING COIL
HD	HEAD
HP	HORSEPOWER OR HEAT PUMP
HRU	HEAT RECOVERY UNIT
HS	HOSE STATION
HX	HEAT EXCHANGER
HZ	HERTZ
ID	INSIDE DIAMETER
IEER	INTEGRATED ENERGY EFFICIENCY RATIO
IH	INTAKE HOOD
IW	INDIRECT WASTE
IWH	INTERIOR WALL HYDRANT
KS	KITCHEN SINK
L	LAVATORY
LAT	LEAVING AIR TEMPERATURE
LGT	LEAVING GAS TEMPERATURE
LBS	POUNDS
LP	LIQUID PROPANE
LWCO	LOW WATER CUT OFF
LWT	LEAVING WATER TEMPERATURE
MBH	THOUSAND BTUH
MC	MECHANICAL CONTRACTOR
MCA	MINIMUM CIRCUIT AMPACITY
MMBH	MILLION BTUH
MOCP	MAXIMUM OVERCURRENT PROTECTION
MD	MOTORIZED DAMPER
MS	MOP SINK
MTD	MOUNTED
NC	NORMALLY CLOSED
NEC	NATIONAL ELECTRIC CODE
NG	NATURAL GAS
NIC	NOT IN CONTRACT
NO	NORMALLY OPEN
NTS	NOT TO SCALE
OBD	OPPOSED BLADE DAMPER
O/A	OUTSIDE AIR
PD	PRESSURE DROP
PE	POLYETHYLENE
PEX	CROSS LINKED POLYETHYLENE
PF	PROPELLER FAN
PG	PROPANE GAS OR PROPYLENE GLYCOL
PP	POLYPROPYLENE
PRE	POWER ROOF EXHAUST
PRV	PRESSURE REDUCING VALVE
PWE	POWER WALL EXHAUSTER
PSI	POUNDS PER SQUARE INCH
PSIG	POUND PER SQUARE INCH GAUGE
R/A	RETURN AIR
RD	ROOF DRAIN
RH	RELATIVE HUMIDITY
RTU	ROOFTOP UNIT
RR	RETURN REGISTER
S/A	SUPPLY AIR
SD	SMOKE DAMPER OR SUPPLY DIFFUSER
SF	SUPPLY FAN
SH	SHOWER
SIC	SQUARE INLINE CENTRIFUGAL
SP	STATIC PRESSURE
SR	SUPPLY REGISTER
SS	STAINLESS STEEL
T/A	TRANSFER AIR
TAB	TESTING, ADJUSTING & BALANCING
TD	TRENCH DRAIN
TG	TRANSFER GRILLE
TIC	TUBULAR INLINE CENTRIFUGAL
TMX	THERMOSTATIC MIXING VALVE
TOD	TOP OF DUCT
TSP	TOTAL STATIC PRESSURE
TYP	TYPICAL
UCD	UNDERCUT DOOR
UG	UNDERGROUND
UH	UNIT HEATER
UR	URINAL
US	UTILITY SINK
V	VENT
VAV	VARIABLE AIR VOLUME
VB	VACUUM BREAKER
VD	VOLUME DAMPER
VFD	VARIABLE FREQUENCY DRIVE
VTR	VENT THROUGH ROOF
WB	WET BULB
WC	WATER CLOSET OR WATER COLUMN
WCO	WALL CLEANOUT
WG	WATER GAUGE
WH	WATER HEATER
XP	EXPLOSION PROOF

POINT OF DEACTIVATION OR NEW CONNECTION TO EXISTING

FTR-1	UNIT TYPE
1.0	FLOW (GPM)
8'-0"	ACTIVE LENGTH
VAV-1	VAV BOX SIZE
800	MAX. FLOW (CFM)
500	MIN. FLOW (CFM)
SD-1	DIFFUSER TYPE
(100)	AIR FLOW

VALVES

- AUTOMATIC FLOW CONTROL
- BALL OR BUTTERFLY (SIZE DEPENDENT)
- CHECK
- BALANCING
- GATE
- GLOBE
- PLUG
- PRESSURE REGULATING OR REDUCING
- RELIEF
- ANGLE PATTERN MULTI PURPOSE PUMP DISCHARGE
- STRAIGHT PATTERN MULTI PURPOSE PUMP DISCHARGE
- VALVE IN TEE DROP
- VALVE IN TEE RISE
- VALVE IN ELBOW DROP
- VALVE IN ELBOW RISE
- 2-WAY CONTROL (ELECTRONIC)
- 2-WAY CONTROL (PNEUMATIC)
- 3-WAY CONTROL (ELECTRONIC)
- 3-WAY CONTROL (PNEUMATIC)

FITTINGS

- EXPANSION LOOP
- EXPANSION JOINT
- PIPE TURNING DOWN (PIPE DROP)
- PIPE TURNING UP (PIPE RISE)
- TEE UP (OFF TOP)
- TEE DOWN (OFF BOTTOM)
- PIPE DROP IN RUN
- PIPE DROP AND TURN
- TEE OFF TOP
- TEE OFF BOTTOM
- CROSS
- CROSS WITH RISER
- PLAIN ELBOW
- SANITARY ELBOW
- PLAIN TEE (OFF SIDE)
- SANITARY TEE (OFF SIDE)
- CONCENTRIC REDUCER
- ECCENTRIC REDUCER
- UNION
- FLANGED JOINT
- PIPE CAP
- THREADED HOSE END WITH CAP
- METAL GASKET FACE SEAL
- PIPE GUIDE
- PIPE ANCHOR
- WALL SLEEVE
- FLEX CONNECTION
- PRESSURE GAUGE
- TEMPERATURE GAUGE
- AV — AUTOMATIC AIR VENT
- MV — MANUAL AIR VENT
- PUMP
- DP — DIFFERENTIAL PRESSURE
- TP — TRAP PRIMER
- TEST PLUG
- F L — WATER FILTER HOUSING AND CARTRIDGE
- WYE STRAINER
- WYE STRAINER W/BLOWDOWN
- BASKET STRAINER
- PUMP SUCTION DIFFUSER
- VB — VACUUM BREAKER
- BACKFLOW PREVENTER
- WALL HYDRANT (ELEVATION)
- WALL HYDRANT (PLAN VIEW)
- CLEANOUT END OF LINE
- FLOOR CLEANOUT
- TRAP

PIPING

- EXISTING WORK TO REMAIN
- EXISTING WORK TO BE REMOVED ON DEMOLITION DRAWINGS
- NEW WORK ON PROPOSED DRAWINGS
- HWS — HOT WATER SUPPLY
- HWR — HOT WATER RETURN
- CHS — CHILLED WATER SUPPLY
- CHR — CHILLED WATER RETURN
- GCHS — GLYCOL CHILLED WATER SUPPLY
- GCHR — GLYCOL CHILLED WATER RETURN
- GHWS — GLYCOL HOT WATER SUPPLY
- GHWR — GLYCOL HOT WATER RETURN
- CDS — CONDENSER WATER SUPPLY
- CDR — CONDENSER WATER RETURN
- RL — REFRIGERANT LIQUID
- RS — REFRIGERANT SUCTION
- LPS — LOW PRESSURE STEAM SUPPLY
- LPR — LOW PRESSURE CONDENSATE RETURN
- MPS — MEDIUM PRESSURE STEAM SUPPLY
- MPR — MEDIUM PRESSURE CONDENSATE RETURN
- HPS — HIGH PRESSURE STEAM SUPPLY
- HPR — HIGH PRESSURE CONDENSATE RETURN
- PC — PUMPED CONDENSATE
- CD — CONDENSATE DRAIN
- G — GAS PIPING
- FOF — FUEL OIL FILL
- FOS — FUEL OIL SUPPLY
- FOR — FUEL OIL RETURN
- FOV — FUEL OIL VENT
- FP — FIRE PROTECTION SPRINKLER
- TW — TEPID WATER
- CW — DOMESTIC COLD WATER
- HW — DOMESTIC HOT WATER
- HWC — DOMESTIC HOT WATER RECIRC.
- W — SANITARY DRAIN
- W — SANITARY DRAIN BELOW FLOOR
- V — SANITARY VENT
- RL — STORM DRAIN
- RL — STORM DRAIN BELOW FLOOR
- ST (SEC) — SECONDARY STORM DRAIN
- D — INDIRECT DRAIN
- DI — DEIONIZED WATER
- DIS — DEIONIZED WATER SUPPLY
- DIR — DEIONIZED WATER RETURN
- LW — ACID WASTE
- LW — ACID WASTE BELOW FLOOR
- LV — ACID VENT
- AR — ARGON
- O2 — OXYGEN

PIPING CONTINUED

- VAC — VACUUM
- CA — COMPRESSED AIR
- H2 — HYDROGEN
- NO2 — NITROUS OXIDE
- N — NITROGEN
- O2 — OXYGEN
- LN — LIQUID NITROGEN
- NPW — NON POTABLE WATER
- NPHW — NON POTABLE HOT WATER
- DIRECTION OF FLOW
- PITCH PIPE DOWN

DUCTWORK

- EXISTING WORK TO REMAIN
- EXISTING WORK TO BE REMOVED ON DEMOLITION DRAWINGS
- NEW WORK ON PROPOSED DRAWINGS
- SUPPLY AIR DUCT/OUTDOOR AIR (RISE UP)
- SUPPLY AIR DUCT/OUTDOOR AIR (DROP DOWN)
- RETURN AIR DUCT (RISE UP)
- RETURN AIR DUCT (DROP DOWN)
- EXHAUST DUCT (RISE UP)
- EXHAUST DUCT (DROP DOWN)
- 6x6 — DUCT SIZE (FIRST DIMENSION SIDE SHOWN)
- R — RISE IN DIRECTION OF FLOW
- D — DROP IN DIRECTION OF FLOW
- ELBOW WITH TURNING VANES
- DUCT WITH ACOUSTICAL LINING
- DOUBLE WALL DUCT
- FLEXIBLE DUCT
- END CAP
- 45° TAKE-OFF (RECTANGULAR)
- TRANSITION (RECTANGLE TO ROUND)
- TRANSITION (ROUND TO RECTANGLE)
- CONCENTRIC REDUCER
- ECCENTRIC REDUCER
- VD — VOLUME DAMPER
- BG — BLAST GATE
- FD — FIRE DAMPER
- MD — MOTOR OPERATED DAMPER
- BD — BACK DRAFT DAMPER
- F/S — FIRE/SMOKE DAMPER
- H — HUMIDIFIER
- SD — SMOKE DAMPER

DUCTWORK CONTINUED

- S — SMOKE DETECTOR
- A/S — ACCESS DOOR (SCHEMATIC)
- AD — ACCESS DOOR (SIDE)
- FC — FLEXIBLE CONNECTION
- FLOW ARROW
- SUPPLY AIR DIFFUSER/REGISTER OR GRILLE
- RETURN AIR REGISTER OR GRILLE
- EXHAUST AIR REGISTER OR GRILLE
- T — THERMOSTAT
- H — HUMIDISTAT
- PS — PRESSURE SWITCH
- FS — FLOW SWITCH
- FMS — FACILITY MANAGEMENT SYSTEM PANEL
- T — TEMPERATURE SENSOR
- $V — VARIABLE SWITCH
- $H/A — HAND/AUTO SWITCH
- $T — TIMER SWITCH

GENERAL NOTES

KEY PLAN

KEY PLAN
NOT TO SCALE

S W E N
CALLED NORTH

DRAWING TITLE

MECHANICAL LEGEND AND ABBREVIATIONS

JOB NUMBER: 1680
JOB TITLE:

MISCELLANEOUS RENOVATIONS
NEW FIRST FLOOR TOILET ROOM
AND SHOWER ROOM
UNION STATION
WORCESTER, MA

CONSULTANT

Hallam-ICS
AN EMPLOYEE OWNED COMPANY
575 West Street, Suite 220
Mansfield, MA 02048
Tel: 508.821.9759 www.Hallam-ICS.com

ARCHITECT

NAULT ARCHITECTS, INC.
71 HOPE AVENUE
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TEL: (508)755-6134
FAX: (508) 754-4661

COMMONWEALTH OF MASSACHUSETTS
JEFFREY V SPERONI
MECHANICAL
No. 55693
REGISTERED PROFESSIONAL ENGINEER

DRAWING NO.

H0.0

SCALE
AS NOTED

DATE
JUNE, 2022

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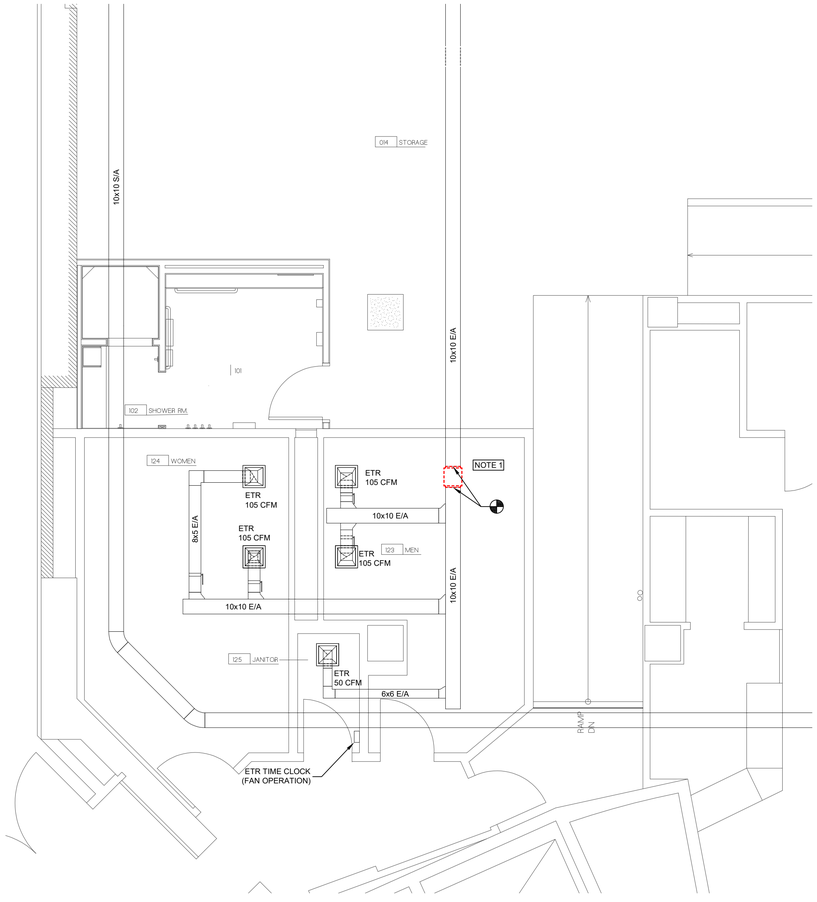
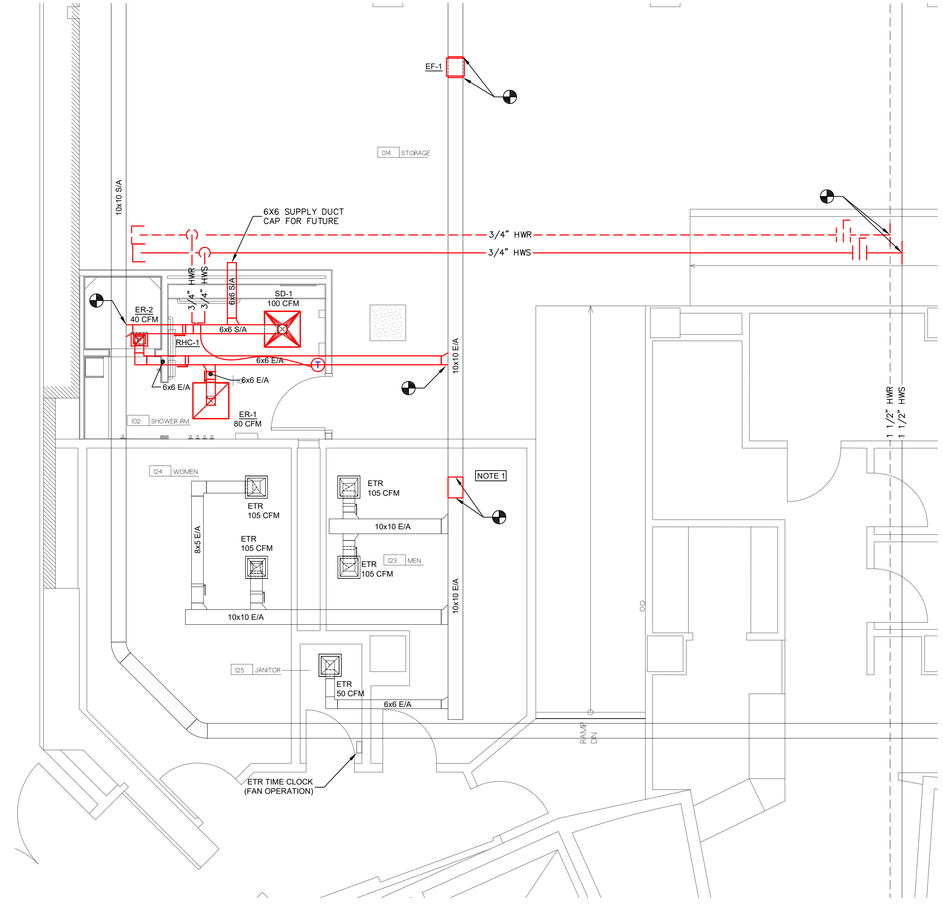


HVAC DUCTWORK - DEMOLITION PLAN

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



HVAC DUCTWORK & PIPING- NEW WORK

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

GENERAL NOTES

KEYED NOTES
1. REMOVE EXISTING FAN AND REPLACE WITH DUCT.

KEY PLAN

KEY PLAN
NOT TO SCALE

DRAWING TITLE

HVAC DUCTWORK DEMO AND NEW WORK

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FAN SCHEDULE

FAN NO.	LOCATION	SERVES	DESIGN BASIS	FAN TYPE	WHEEL SIZE/TYPE	FLOW SETPOINT (CFM)	FUTURE FLOW (CFM)	SP (IN)	RPM	MAX (dBA)	MOTOR			REMARKS
											HP	VOLTS	PH	
EF-1	RN 014	BATHROOMS 101,124,125 &123	GREENHECK SQ-99-VG	INLINE		590	781	0.9	1,932	69	3/4	120	1	DIRECT DRIVE ECM MOTOR

NOTES:
1. AIR FLOW QUANTITIES ARE NOMINAL AND INCLUDE AN ALLOWANCE FOR LEAKAGE. FINAL BALANCING MUST BE BASED ON ACTUAL AIR FLOWS.
2. RPM AND BHP MAY VARY BY NO MORE THAN 10% FROM INDICATED VALUE.

DIFFUSER, REGISTER AND GRILLE SCHEDULE

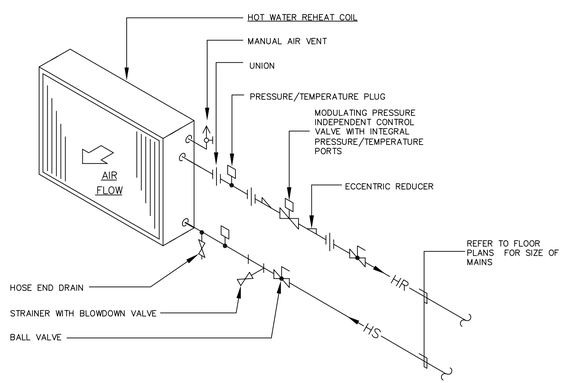
PLAN SYMBOL	DESCRIPTION	DESIGN BASIS	NECK SIZE	CFM RANGE	ACCESSORIES	REMARKS
SD-1	CEILING S/A DIFFUSER (DIRECTIONAL FACE STYLE)	METAL AIRE SERIES 5500 4-WAY BLOW UNLESS OTHERWISE NOTED ON PLAN	6x6	0-125	OBD, 24x24 FACE PANEL, 6"x6" NECK TRANSITION	COLOR AND BORDER TYPE TO BE COORDINATED WITH ARCHITECT PRIOR TO ORDERING
ER-1	CEILING R/A OR E/A REGISTER (CUBE CORE STYLE)	METAL AIRE MODEL CC5D	6x6	0-100	OBD, 24x24 FACE PANEL, 6"x6" NECK TRANSITION	COLOR AND BORDER TYPE TO BE COORDINATED WITH ARCHITECT PRIOR TO ORDERING
ER-2		METAL AIRE MODEL CC5S	6x6	0-100	OBD, 8x6 FACE PANEL, 6"x6" NECK TRANSITION	COLOR AND BORDER TYPE TO BE COORDINATED WITH ARCHITECT PRIOR TO ORDERING

COIL SCHEDULE

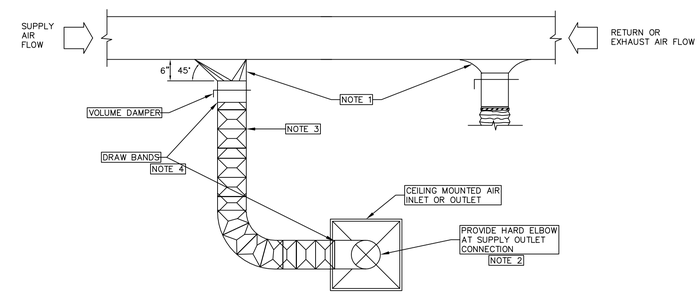
EQUIPMENT NUMBER	LOCATION	SERVICE	AIR SIDE							WATER SIDE						REMARKS
			CAPACITY (CFM)	FUTURE CAPACITY (CFM)	MAX. FACE VELOCITY (FPM)	MAX. AIR PRESS. DROP (IN W.G.)	TOTAL COIL CAPACITY (MBH)	ENTERING AIR TEMP. (°F)	LEAVING AIR TEMP. (°F)	COIL SIZE (IN)	FLUID TYPE	ENTERING WATER TEMP. (°F)	LEAVING WATER TEMP. (°F)	FLOW RATE (GPM)	MAX FLUID PRESS. DROP (FT.)	
RHC-1	RESTROOM 101	101	100	200	400	0.30	9.1	55	95	6x6	HOT WATER	180	160	0.9	0.3	

DUCT MOUNTED HOT WATER COIL SEQUENCE OF OPERATION:

1. THE WALL MOUNTED TEMPERATURE SENSOR MEASURES THE SPACE TEMPERATURE. IF THE SPACE TEMPERATURE IS BELOW SETPOINT OF 70*F (ADJ) THE REHEAT COIL VALVE SHALL MODULATE OPEN. IF THE SPACE TEMPERATURE IS ABOVE SETPOINT, THE VALVE SHALL CLOSE. THE ROOM SHALL HAVE A 2*F DEADBAND. THE BMS SHALL ASSERT AN ALARM WHEN THE SPACE IS ABOVE OR BELOW SETPOINT BY 5*F(ADJ) FOR GREATER THAN 30 MINUTES (ADJ).



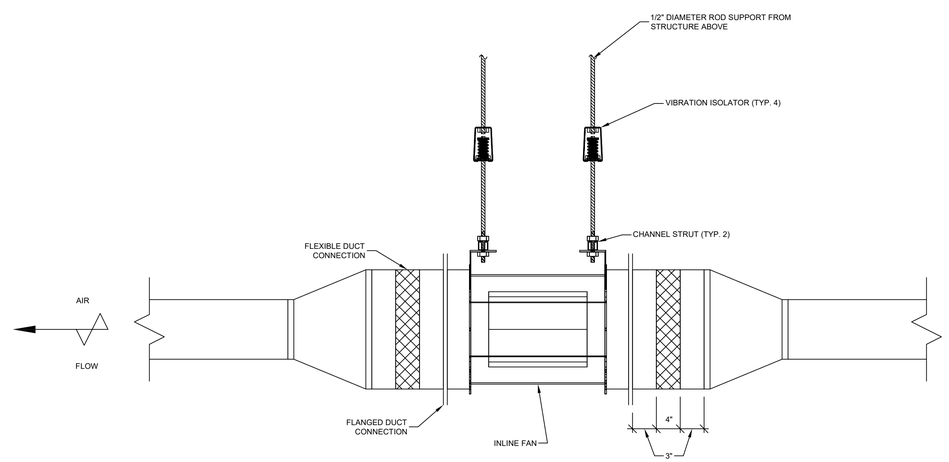
HEATING HOT WATER COIL PIPING DETAIL
SCALE: NONE



CEILING MOUNTED SUPPLY/RETURN/EXHAUST INLET AND OUTLET CONNECTION DETAIL
SCALE: NONE

NOTES:

1. AT CONTRACTORS OPTION, CONTRACTOR MAY USE TRANSITION TYPE TAKE-OFF OR" BELL MOUTH" TYPE TAKEOFF WITH GASKET SEAL.
2. ELBOW MUST BE FULL RADIUS TYPE. WHERE BRANCH DUCT IS 18" OR MORE ABOVE DIFFUSER, USE 45° ELBOW OR MIN. 9" STRAIGHT DUCT AT OUTLET CONNECTION, OTHERWISE PROVIDE 90° ELBOW.
3. PROVIDE FLEXIBLE DUCT ON SUPPLY AND RETURN CONNECTIONS, 6' MAX. LENGTH WITH BEND FOR ADDED SOUND ATTENUATION. EXHAUST CONNECTIONS MUST BE HARD CONNECTED.
4. PROVIDE DRAWBANDS AT BOTH INNER SLEEVE AND OUTER JACKET OF FLEXIBLE DUCTWORK CONNECTIONS.



INLINE FAN MOUNTING DETAIL
SCALE: NONE

GENERAL NOTES

KEY PLAN

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ELECTRICAL SYMBOL LEGEND

REFER TO ELECTRICAL SPECIFICATIONS DIVISION 26000 FOR MORE INFORMATION.

RECEPTACLES

- DUPLEX RECEPTACLE
- QUADRAPLEX RECEPTACLE
- DUPLEX RECEPTACLE, ABOVE COUNTER
- GFI — GROUND FAULT DUPLEX RECEPTACLE
- AF — ARC FAULT
- WP — GROUND FAULT DUPLEX RECEPTACLE, W/ WEATHER PROOF BOX AND COVER
- CR — COIL REEL RECEPTACLE
- X — SPECIAL RECEPTACLE, SUBSCRIPT DENOTES NEMA CONFIGURATION
- CM — FLUSH MOUNT FLOOR OR CEILING BOX WITH RECEPTACLES AS SHOWN "CM" DENOTES CEILING MOUNTED

RACEWAYS

- BRANCH CIRCUIT HOMERUN TO PANELBOARD
- BRANCH CIRCUIT
- BRANCH CIRCUIT BELOW GRADE
- PE — UNDERGROUND PRIMARY
- SE — UNDERGROUND SECONDARY
- COMM — UNDERGROUND COMMUNICATION
- CM — CABLE MANAGEMENT SYSTEM
- POWER/COMM. POLE
- BUSWAY
- CABLETRAY
- WIREWAY
- WM1 — SURFACE MOUNTED RACEWAY FOR POWER. INSTALL DUPLEX RECEPTACLES 18" O.C. STARTING 6" FROM ONE END, FOR THE ENTIRE LENGTH OF RACEWAY. WIREMOLD 3000 SERIES OR APPROVED EQUAL.
- WM2 — SURFACE MOUNTED RACEWAY FOR POWER. INSTALL DUPLEX RECEPTACLES AS SHOWN ON FLOOR PLANS. WIREMOLD 3000 OR APPROVED EQUAL
- WM3 — SURFACE MOUNTED RACEWAY W/ DIVIDER FOR POWER & DATA WIRING. INSTALL DUPLEX RECEPTACLES 18" O.C. AND INSTALL DATA OUTLETS AS SHOWN ON FLOOR PLANS. WIREMOLD 4000 SERIES OR APPROVED EQUAL
- WM4 — SURFACE MOUNTED RACEWAY W/ DIVIDER FOR POWER & DATA WIRING. INSTALL DUPLEX RECEPTACLES AND DATA OUTLETS AS SHOWN ON FLOOR PLANS. WIREMOLD 4000 SERIES OR APPROVED EQUAL
- PB — PULL BOX
- CONDUIT TURN UP
- CONDUIT TURN DOWN
- CONDUIT STUB ABOVE CEILING
- 4" SLEEVE

DISTRIBUTION EQUIPMENT

- SURFACE MOUNTED PANELBOARD
- RECESSED MOUNTED PANELBOARD
- T — TRANSFORMER. REFER TO TRANSFORMER SCHEDULE FOR ADDITIONAL INFORMATION
- ATS — AUTOMATIC TRANSFER SWITCH
- MCC — MOTOR CONTROL CENTER
- CB# — ENCLOSED CIRCUIT BREAKER. NUMBER DENOTES AMPS
- CT — CURRENT TRANSFORMER CABINET AS REQUIRED BY UTILITY COMPANY
- M — METER WITH METER SOCKET. PROVIDE SOCKET AS REQUIRED BY ELECTRIC UTILITY COMPANY

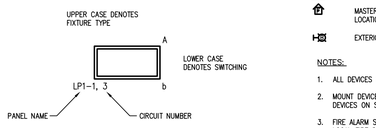
MOTORS & EQUIPMENT

- J — JUNCTION BOX
- M — MOTOR. REFER TO MOTOR CIRCUIT SCHEDULE FOR ADDITIONAL INFORMATION.
- EQUIPMENT CONNECTION
- NON-FUSED DISCONNECT SWITCH
- FUSED DISCONNECT SWITCH
- MOTOR STARTER
- COMBINATION MOTOR STARTER/DISCONNECT
- VFD — VARIABLE FREQUENCY DRIVE, FURNISHED AND INSTALLED BY HVAC CONTRACTOR, WIRED BY ELECTRICAL CONTRACTOR
- MUSHROOM TYPE EMERGENCY SHUTDOWN SWITCH
- AQUASTAT FURNISHED AND INSTALLED BY PLUMBING CONTRACTOR, WIRED BY ELECTRICAL CONTRACTOR
- ATC — HVAC AUTOMATIC TEMPERATURE CONTROL PANEL FURNISHED AND INSTALLED BY HVAC CONTRACTOR, WIRED BY ELECTRICAL CONTRACTOR
- PUSH BUTTON
- FIROMATIC
- MOTOR SENTINEL SWITCH

LIGHTING

- 1X4 SURFACE FIXTURE, LETTER DENOTES TYPE, SMALL LETTER DENOTES SWITCH LOOP
- 2X2 SURFACE FIXTURE, LETTER DENOTES TYPE, SMALL LETTER DENOTES SWITCH LOOP
- 2X4 SURFACE FIXTURE, LETTER DENOTES TYPE, SMALL LETTER DENOTES SWITCH LOOP
- 1X4 RECESSED FIXTURE, LETTER DENOTES TYPE, SMALL LETTER DENOTES SWITCH LOOP
- 2X2 RECESSED FIXTURE, LETTER DENOTES TYPE, SMALL LETTER DENOTES SWITCH LOOP
- 2X4 RECESSED FIXTURE, LETTER DENOTES TYPE, SMALL LETTER DENOTES SWITCH LOOP
- CEILING MOUNTED/RECESSED LIGHT FIXTURE, LETTER DENOTES TYPE, SMALL LETTER DENOTES SWITCH LOOP
- WALL MOUNTED FIXTURE, LETTER DENOTES TYPE, SMALL LETTER DENOTES SWITCH LOOP
- WALL MOUNTED LIGHT FIXTURE, LETTER DENOTES TYPE, SMALL LETTER DENOTES SWITCH LOOP
- STRIP FIXTURE, LETTER DENOTES TYPE, SMALL LETTER DENOTES SWITCH LOOP
- EMERGENCY INDUSTRIAL LIGHT FIXTURE
- EMERGENCY LIGHT FIXTURE, LETTER DENOTES TYPE.
- UNDER CABINET LIGHTING
- EMERGENCY LIGHTS, BATTERY BACKUP
- EMERGENCY LIGHTS, REMOTE BATTERY
- EMERGENCY LIGHTS, REMOTE HEAD
- EXIT LIGHT, WALL MOUNTED, LETTER DENOTES TYPE
- SINGLE FACE EXIT LIGHT, CEILING MOUNTED, LETTER DENOTES TYPE
- DOUBLE FACE EXIT LIGHT, CEILING MOUNTED, LETTER DENOTES TYPE
- TRACK LIGHTING WITH FIXTURE HEAD
- BOLLARD LIGHT FIXTURE
- POLE LIGHT, SINGLE HEAD
- POLE LIGHT, DOUBLE HEAD
- R — EMERGENCY LIGHTING SWITCHING RELAY

LIGHT FIXTURE DESIGNATION DETAIL



LIGHTING CONTROL

- $ — ROOM LIGHTING CONTROL LOCATION, REFER TO LIGHTING CONTROL MATRIX FOR REQUIREMENTS. # DENOTES TYPE, 3=3-WAY, 4=4-WAY
- FAN/LIGHT COMBINATION
- TC — TIME CLOCK
- PC — PHOTOCELL

NOTES:

1. PROVIDE POWER PACKS AS NECESSARY.
2. NEUTRAL CONDUCTOR REQUIRED AT DEVICE PER N.E.C.
3. FOR LED DIMMING, PROVIDE ADDITIONAL 0-10V CONDUCTORS BETWEEN DIMMER AND FIXTURES.

COMBINATION FLOOR BOXES

- FB1 — RECESSED FLUSH, FIRE CLASSIFIED, COMBINATION FLOOR BOX WITH (4) DUPLEX BRACKETS. PROVIDE WITH (2) DUPLEX RECEPTACLES AND PROVISIONS FOR TELECOMMUNICATION AND A/V ON THE OTHER BRACKETS. PROVIDE (1) 1"C. FOR POWER, (1) 1"C. FOR TELECOMMUNICATIONS AND (1) 1 1/4"C. FOR A/V. WIREMOLD #RFB4-4DBRC, OR APPROVED EQUAL. BOX FOR SLAB-ON-GRADE APPLICATION SHALL BE FURNISHED WITH EPOXY COATING. PROVIDE FLANGED COVER
- FB2 — RECESSED FLUSH, FIRE CLASSIFIED, COMBINATION FLOOR BOX FOR POWER AND TELECOMMUNICATION FEED TO FURNITURE SYSTEM. PROVIDE (1) 1"C. FOR POWER, (1) 1 1/4"C. FOR TELECOMMUNICATION WIRING. WIREMOLD #RFB4-4DBFCM OR APPROVED EQUAL. BOX FOR SLAB-ON-GRADE APPLICATION SHALL BE FURNISHED WITH EPOXY COATING. PROVIDE FLANGED FURNITURE FEED COVER ASSEMBLY.
- FP11 — RECESSED 6" FIRE RATED POKE THRU FOR POWER AND TELECOMMUNICATIONS. PROVIDE (2) DUPLEX RECEPTACLES AND MOUNTING PROVISIONS FOR TELECOMMUNICATION. WIREMOLD #6ATCP, OR APPROVED EQUAL
- FP12 — RECESSED 6" FIRE RATED POKE THRU FOR POWER AND TELECOMMUNICATION CONNECTIONS TO FURNITURE SYSTEMS. WIREMOLD #6ATCFT, OR APPROVED EQUAL
- FP13 — RECESSED 6" FIRE RATED POKE THRU FOR POWER, TELECOMMUNICATION AND A/V. WIREMOLD #6ATPAV, OR APPROVED EQUAL
- MB1 — RECESSED WALL TV/MONITOR SERVICE BOX. WIREMOLD #EFSB4, FOUR GANG BOX WITH DUPLEX RECEPTACLE, AND PROVISIONS FOR TELECOMMUNICATIONS AND A/V
- DCB — RECESSED CEILING MOUNTED COMBINATION BOX WITH POWER, TELECOMMUNICATIONS AND A/V WITH PROJECTOR MOUNT. WIREMOLD #CCBS2P, OR APPROVED EQUAL

FIRE ALARM

- F — MANUAL FIRE PULL STATION
- B — BELL
- S — SPEAKER
- SF — STROBE LIGHT/SPEAKER
- H — HORN/LIGHT
- H — HORN
- L — LIGHT
- MH — MAGNETIC HOLD HOLDERS
- RT — REMOTE TEST STATION
- C — CHIME/STROBE LIGHT
- REMOTE ALARM INDICATOR
- S — SMOKE DETECTOR, NO SUBSCRIPT PHOTOELECTRIC, SUBSCRIPT I=IONIZATION SUBSCRIPT H=PHOTOELECTRIC w/135° HEAT DETECTION
- H — HEAT DETECTOR, SUBSCRIPT #=TEMPERTURE, R=RATE OF RISE
- CO — CO DETECTOR
- DUCT MOUNTED SMOKE DETECTOR
- DUCT MOUNTED HEAT DETECTOR
- TS — SPRINKLER TAMPER SWITCH FURNISHED AND INSTALLED BY THE FIRE PROTECTION CONTRACTOR, WIRED BY ELECTRICAL CONTRACTOR
- FS — SPRINKLER FLOW SWITCH FURNISHED AND INSTALLED BY THE FIRE PROTECTION CONTRACTOR, WIRED BY ELECTRICAL CONTRACTOR
- PS — SPRINKLER PRESSURE SWITCH
- FACP — FIRE ALARM CONTROL PANEL
- FAVP — FIRE ALARM VOICE PANEL
- FA — FIRE ALARM ANNUNCIATOR
- CR — FIRE ALARM CONTROL RELAY
- AMM — ADDRESSABLE MONITOR MODULE
- IM — ISOLATION MODULE
- AUX — AUXILIARY STROBE POWER SUPPLY
- KB — KNOX BOX
- MASTER BOX. COORDINATE WITH FIRE DEPARTMENT FOR LOCATION AND REQUIREMENTS.
- EXTERIOR FIRE ALARM BEACON

NOTES:

1. ALL DEVICES 15cd UNLESS NOTED OTHERWISE.
2. MOUNT DEVICES ON COMMON VERTICAL PLANE WITH OTHER DEVICES ON SAME SURFACE.
3. FIRE ALARM SYSTEM SHALL BE INSTALLED IN ACCORDANCE WITH LOCAL FIRE DEPARTMENT STANDARDS. ALL FIRE ALARM WIRING SHALL BE AS REQUIRED BY THE MANUFACTURER AND INSTALLED IN CONDUIT. FIRE ALARM MC CABLE MAY BE USED IF APPROVED BY THE LOCAL FIRE DEPARTMENT.
4. ELECTRICAL CONTRACTOR SHALL ENGAGE THE SERVICES OF THE EXISTING FIRE ALARM SYSTEM MANUFACTURER OR AUTHORIZED REPRESENTATIVE TO ASSIST WITH EXPANSION OF EXISTING SYSTEM AND RECALCULATING BATTERY SIZING.
5. PROVIDE POWER SUPPLY (QUANTITY AS REQUIRED) FOR NEW SPEAKER/STROBE CIRCUITS.
6. LOCATE DUCT SMOKE DETECTOR REMOTE TEST SWITCHES IN CEILING OR ADJACENT WALL NEAREST EQUIPMENT BEING SERVED.
7. THE EXISTING FIRE ALARM SYSTEM SHALL REMAIN FULLY FUNCTIONAL DURING THE ENTIRE DEMOLITION AND CONSTRUCTION PERIOD. RE-USE OF THE EXISTING FIRE ALARM RACEWAYS SHALL NOT BE ALLOWED. ALL REQUIRED SYSTEM SHUTDOWNS SHALL BE COORDINATED WITH AND APPROVED BY THE OWNER'S REPRESENTATIVE AND THE AUTHORITY HAVING JURISDICTION. DEMOLITION OF THE EXISTING SYSTEM SHALL NOT COMMENCE UNTIL THE NEW SYSTEM HAS BEEN COMPLETELY INSTALLED, TESTED AND APPROVED BY THE AUTHORITY HAVING JURISDICTION.
8. FIRE ALARM SHOP DRAWING SUBMITTAL SHALL INCLUDE A RISER DIAGRAM AND COMPLETED BATTERY CALCULATIONS.
9. BEFORE WIRING NEW OR RELOCATED FIRE ALARM DEVICES INTO EXISTING LOOPS, THE ELECTRICAL CONTRACTOR SHALL VERIFY CAPACITY FOR NEW DEVICES AND PROVIDE ANY ADDITIONAL SYSTEM COMPONENTS, WIRING OR PROGRAMMING REQUIRED TO INCORPORATE THE NEW/RELOCATED DEVICES INTO THE EXISTING FIRE ALARM SYSTEM.

DATA/COMM

- DATA OUTLET, SUBSCRIPT DENOTES QUANTITY. 4" SQUARE BACK BOX WITH 1" CONDUIT TO ABOVE NEAREST ACCESSIBLE CORRIDOR CEILING. PROVIDE PULL STRING
- COMBINATION DATA/TELEPHONE OUTLET SUBSCRIPT DENOTES QUANTITY. 4" SQUARE BACK BOX WITH 1" CONDUIT TO ABOVE NEAREST ACCESSIBLE CORRIDOR CEILING. PROVIDE PULL STRING
- TELEPHONE OUTLET, SUBSCRIPT DENOTES QUANTITY. 4" SQUARE BACK BOX WITH 1" CONDUIT TO NEAREST ACCESSIBLE ABOVE CORRIDOR CEILING. PROVIDE PULL STRING
- FLOOR MOUNTED DATA OUTLET
- FLOOR MOUNTED TELEPHONE OUTLET
- ENVIRONMENTAL ALARM POINT
- TELEPHONE BELL
- THERMOSTAT
- WP — WIRELESS ACCESS POINT. PROVIDE 4" SQUARE BACK BOX

SECURITY DEVICES

- CR — CARD READER
- DC — DOOR CONTACT
- DR — DOOR RELEASE
- EL — ELECTRIC LOCK
- ES — ELECTRIC STRIKE
- KP — SYSTEM KEYPAD
- ML — MAGNETIC LOCK
- MS — MOTION SENSOR
- PS — POWER SUPPLY
- SECURITY CAMERA
- PANIC BUTTON

NOTES:

1. ELECTRICAL CONTRACTOR SHALL PROVIDE 4" BACK BOX WITH 1" CONDUIT AT EACH DEVICE LOCATION TO SECURITY MANAGEMENT HEAD END EQUIPMENT.
2. EQUIPMENT, DEVICES AND ALL WIRING BY SYSTEM INTEGRATOR.
3. COORDINATE FINAL BACK-BOX SIZES WITH EQUIPMENT VENDOR PRIOR TO ROUGH IN.

EXISTING EQUIPMENT

- er — EXISTING EQUIPMENT TO REMAIN
- re — EXISTING EQUIPMENT TO BE REMOVED
- rr — EXISTING EQUIPMENT TO BE RELOCATED
- ne — NEW LOCATION OF RELOCATED EXISTING EQUIPMENT
- en — EXISTING EQUIPMENT TO BE REPLACED WITH NEW

GENERAL NOTES

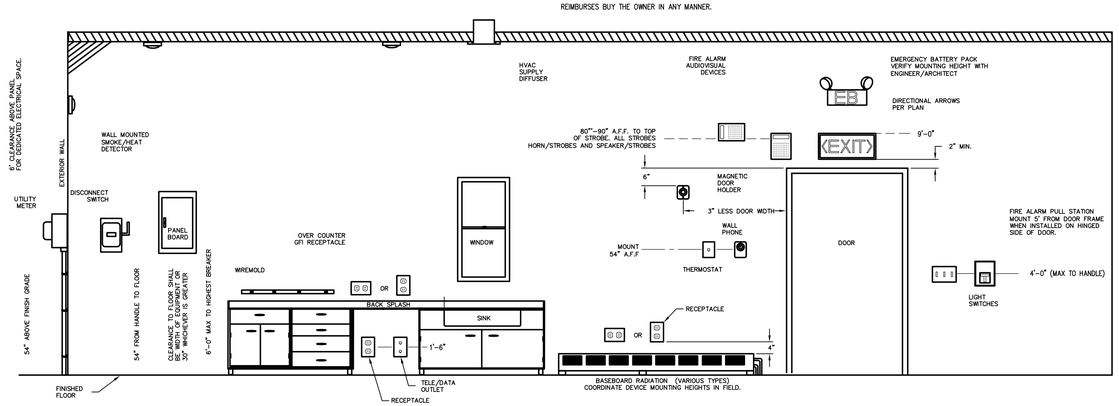
1. THIS IS A STANDARD SYMBOL LIST. ALL DEVICE SYMBOLS AND ABBREVIATIONS MAY NOT NECESSARILY APPEAR ON THE PLANS OR DETAIL SHEET. ONLY THOSE SYMBOLS INDICATED ON THE PLANS ARE USED AND OTHERS SHOULD BE DISREGARDED.
2. WHERE THE REQUIREMENTS OF THESE DRAWINGS CONFLICT WITH OTHER PARTS OF THESE CONTRACT DOCUMENTS, THE MORE STRINGENT REQUIREMENTS SHALL APPLY.
3. THESE CONTRACT DRAWINGS ARE DIAGRAMMATIC ONLY, INTENDING TO SHOW GENERAL RUNS AND LOCATIONS OF CONDUITS, DISTRIBUTION EQUIPMENT, LIGHTING FIXTURES, SYSTEMS EQUIPMENT, ETC., AND NOT NECCESSARILY SHOWING ALL DETAILS, ACCESSORIES AND EQUIPMENT TO BE CONNECTED. THE ELECTRICAL CONTRACTOR SHALL BE FULLY RESPONSIBLE FOR COORDINATING IN THE FIELD THE EXACT LOCATIONS, MOUNTING HEIGHTS OF EQUIPMENT AS WELL AS THE ROUTING OF RACEWAYS TO AVOID EXISTING FIELD CONDITIONS. ALL WORK SHALL BE ACCURATELY LAID OUT WITH OTHER TRADES TO AVOID CONFLICTS AND TO OBTAIN A NEAT AND WORKMANLIKE INSTALLATION WHICH WILL AFFORD MAXIMUM ACCESSIBILITY FOR OPERATION, MAINTENANCE AND HEADROOM.
4. THE ELECTRICAL CONTRACTOR SHALL VISIT THE SITE TO DETERMINE THE EXISTING CONDITIONS AND THE SCOPE OF WORK PRIOR TO SUBMISSION OF BIDS.
5. PERFORM INSTALLATION IN ACCORDANCE WITH CURRENT EDITION OF THE NATIONAL ELECTRICAL CODE THE OCCUPATIONAL SAFETY AND HEALTH ACT (OSHA), AND APPLICABLE DOE ORDERS.
6. EQUIPMENT SHALL BE LISTED BY A NATIONALLY RECOGNIZED TESTING LABORATORY (NRTL).
7. FURNISH ALL LABOR, MATERIALS AND EQUIPMENT NECESSARY TO COMPLETE THE ELECTRICAL WORK AS SHOWN ON THE DRAWINGS. ALL MATERIAL AND EQUIPMENT SHALL BE NEW AND SHALL BE UL LISTED. "PROVIDE" SHALL MEAN "FURNISH AND INSTALL".
8. APPROVED EQUAL, EQUAL OR SIMILAR WORDING SHALL MEAN THAT THE USE OF ALL MATERIALS OR EQUIPMENT SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL, AND SUCH APPROVAL SHALL BE THE SOLE DISCRETION OF THE ENGINEER.
9. OPENINGS THROUGH FIRE RATED FLOORS AND WALLS SHALL BE SEALED WITH U.L. LISTED FIRE SEALS FOR THE SPECIFIC APPLICATION. THE FIRE SEALS SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS, ITS U.L. LISTING AND THE M.E.C. WHILE MAINTAINING THE FULL FIRE RATING OF THE BARRIER IN WHICH IT IS INSTALLED.
10. ALL PLYWOOD MOUNTING BOARDS SHALL BE PAINTED WITH TWO COATS OF FIRE RETARDANT PAINT. (WHITE OR BLACK AS NOTED).
11. PROVIDE TEMPORARY LIGHTS IN THE AREA OF WORK TO PROVIDE ILLUMINATION DURING CONSTRUCTION TO MEET APPLICABLE CODES. TEMPORARY LIGHTING LEVELS SHALL BE AS REQUIRED BY OSHA, CODES, OR STANDARDS AND INSTALLED PER APPLICABLE REQUIREMENTS OF THE SAME.
12. LIGHTING FIXTURES SHALL BE SUPPORTED FROM BUILDING STRUCTURAL ELEMENTS INDEPENDENT OF FURRED OR SUSPENDED CEILINGS. SUPPORTS FOR FLUORESCENT FIXTURES SHALL BE BOW CHAIN OR ROD. MINIMUM OF 2 SUPPORTS PER 4 FT OF FIXTURE SHALL BE PROVIDED. RECESSED FIXTURES SHALL BE CONNECTED BY FLEXIBLE METALLIC CONDUIT TO JUNCTION BOX.
13. BRANCH CIRCUIT PHASE WIRES SHALL BE CONNECTED TO SEPARATE PHASES OF THE SUPPLY SOURCE TO ASSURE A BALANCED CONDITION IN THAT CIRCUIT AND PROPER LOAD BALANCE ON THE PANEL.
14. BOND RACEWAYS AND THE FRAMES AND ENCLOSURES OF MOTORS, BREAKERS, SWITCHES, AND OTHER ELECTRICAL EQUIPMENT TO THE BUILDING GROUNDING SYSTEM. INSTALL AN INSULATED EQUIPMENT GROUND CONDUCTOR IN EACH RACEWAY OR CONDUIT. SIZE EQUIPMENT GROUND CONDUCTOR IN ACCORDANCE WITH NEC.
15. UNLESS NOTED OTHERWISE; USE 12 AWG OR LARGER CONDUCTORS FOR POWER WIRING. USE 14 CONDUCTORS FOR CONTROL WIRING.
16. UNLESS NOTED OTHERWISE; USE ONLY COPPER CONDUCTORS.
17. CONDUCTORS 10 AWG AND SMALLER SHALL BE SOLID CONDUCTORS 8 AWG AND LARGER SHALL BE STRANDED. XHHW INSULATION SHALL BE USED FOR CONDUCTORS 1 AWG AND LARGER.
18. ALL PANELS (NEW OR EXISTING) WHICH ARE MODIFIED AS PART OF THE SCOPE PF THIS PROJECT SHALL BE PROVIDED WITH A TYPE WRITTEN 8 1/2" X 11" CIRCUIT DIRECTORY. THIS DIRECTORY SHALL BE AFFIXED TO THE INSIDE OF THE PANEL ENCLOSURE DOOR AND SHALL CLEARLY IDENTIFY EXISTING AND NEW CIRCUITS.
19. THE ELECTRICAL CONTRACTOR SHALL PROVIDE EXPANSION FITTINGS IN ALL RACEWAYS CROSSING CONSTRUCTION OR EXPANSION JOINTS.
20. WHEN INSTALLING A NEW CIRCUIT BREAKER IN AN EXISTING, PANELBOARD, SWITCHBOARD, SWITCHGEAR, ETC. THE ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING ALL MATERIALS AND LABOR INCLUDING, BUT NOT NECESSARILY LIMITED TO: MOUNTING HARDWARE, BUS MODIFICATION KITS, CONTROLS, METERS, RELAYS, ETC. REQUIRED FOR A FULLY FUNCTIONAL OVER-CURRENT PROTECTION DEVICE.
21. WHEN PROVIDING NEW OVER CURRENT PROTECTIVE DEVICES, DISCONNECT SWITCHES, STARTERS, BUS PLUGS, CONTACTORS, ETC. IN EXISTING PANEL BOARDS, DISTRIBUTION PANELS, MOTOR CONTROL CENTERS, SWITCHBOARDS, SWITCHGEAR, ETC. THE ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE FOR MATCHING THE RATINGS AND CHARACTERISTICS OF THE EXISTING EQUIPMENT INCLUDING (BUT NOT NECESSARILY LIMITED TO) VOLTAGE, PHASING, AMPACITY, WITHSTAND RATING, BASIC IMPULSE LEVEL, INTERRUPTING RATING, ETC. ANY AND ALL COSTS ASSOCIATED WITH ANY WORK NECESSITATED BY THE FAILURE TO ADHERE TO THIS REQUIREMENT SHALL BE THE SOLE RESPONSIBILITY OF THE ELECTRICAL CONTRACTOR. THESE COSTS WILL NOT BE REIMBURSES BUY THE OWNER IN ANY MANNER.

ONE-LINE DIAGRAM

- NON-FUSED DISCONNECT SWITCH
- FUSED DISCONNECT SWITCH
- COMBINATION MOTOR STARTER/DISCONNECT SWITCH
- MOTOR STARTER
- PANELBOARD, MAIN LUG ONLY
- PANELBOARD, MAIN CIRCUIT BREAKER
- AUTOMATIC TRANSFER SWITCH
- CIRCUIT BREAKER
- METER
- GROUND CONNECTION
- GENERATOR
- AM CT — AMMETER W/CONTROL TRANSFORMER
- AM AS — AMMETER W/SELECTOR SWITCH
- VM VS — VOLTMETER W/SELECTOR SWITCH
- FUSE
- CONTACTOR
- VFD — COMBINATION VFD/DISCONNECT SWITCH
- AUTOMATIC TRANSFER SWITCH WITH BYPASS
- MANUAL TRANSFER SWITCH
- FUSED MOTOR CIRCUIT
- PROTECTED MOTOR CIRCUIT
- Y Y — TRANSFORMER (WYE/WYE)
- Y Δ — TRANSFORMER (DELTA/WYE)
- SPLICE
- RACEWAY BREAK SYMBOL, INDICATES CONTINUATION OF RACEWAY AND WIRING
- RACEWAY CAP SYMBOL, INDICATES CAPPED AND SEALED RACEWAY
- CONTACT, NORMALLY OPEN
- CONTACT, NORMALLY CLOSED

ABBREVIATIONS

3R	NEMA 3R RATING
4X	NEMA 4X RATING
A	AMPERES
AC	ALTERNATING CURRENT
ADA	AMERICANS WITH DISABILITES ACT
AFF	ABOVE FINISHED FLOOR
AFG	ABOVE FINISHED GRADE
AHJ	AUTHORITY HAVING JURISDICTION
AIC	AMPERE INTERRUPTING CAPACITY
AL	ALUMINUM
ATS	AUTOMATIC TRANSFER SWITCH
ATC	AUTOMATIC TEMPERATURE CONTROL
AWG	AMERICAN WIRE GAUGE
BFG	BELOW FINISH GRADE
CB	CIRCUIT BREAKER
cd	CANDELA RATING
CDF	CAMPUS DISTRIBUTION FACILITY
CKT	CIRCUIT
CLG	CEILING
C	CONDUIT
CU	COPPER
dB	DECIBEL
DC	DIRECT CURRENT
DIA	DIAMETER
DN	DOWN
DWG	DRAWING
EAS	ENVIRONMENTAL ALARM SYSTEM
E.C.	ELECTRICAL CONTRACTOR
EF	EXHAUST FAN
ELEV	ELEVATION
EMT	ELECTRICAL METALLIC TUBING
EWC	ELECTRIC WATER COOLER
EXIST	EXISTING
F	FUSE
FA	FIRE ALARM
FLA	FULL LOAD AMPERES
FOC	FIBER OPTIC CABLE
FS	FLOAT SWITCH
G	GROUND
G.C.	GENERAL CONTRACTOR
GEN	GENERATOR
GFCI	GROUND-FAULT CIRCUIT INTERRUPTER
GRC	GALVANIZED RIGID METALLIC CONDUIT
IDF	INTERMEDIATE DISTRIBUTION FRAME
IG	ISOLATED GROUND
IMC	INTERMEDIATE METAL CONDUIT
KCMIL	THOUSAND CIRCULAR MILS
KVA	KILOVOLTAMPERES
KW	KILOWATTS
LFMC	LIQUID TIGHT FLEXIBLE METAL
LP	LIGHTING PANEL
LTG	LIGHTING
MC	METAL CLAD CABLE
MCA	MINIMUM CIRCUIT AMPACITY
MCB	MAIN CIRCUIT BREAKER
MCC	MOTOR CONTROL CENTER
MDF	MAIN DISTRIBUTION FACILITY
MIN	MINIMUM
MLO	MAIN LUG ONLY
MOP	MAXIMUM OVERCURRENT PROTECTION
NC	NORMALLY CLOSED
NEMA	NATIONAL ELECTRICAL MANUFACTURES ASSOCIATION
NFPA	NATIONAL FIRE PROTECTION ASSOCIATION
NIC	NOT IN CONTRACT
NO	NORMALLY OPEN
NTS	NOT TO SCALE
ϕ	PHASE
PP	POWER PANEL
P	POLE
PVC	POLYVINYL CHLORIDE
RMC	RIGID METAL CONDUIT
SW	SWITCH
TYP	TYPICAL
UL	UNDERWRITERS LABORATORIES
V	VOLTS
VFD	VARIABLE FREQUENCY DRIVE
W	WIRE
WP	WEATHERPROOF
WW	WIREWAY
XFMR	TRANSFORMER



TYPICAL DEVICE MOUNTING HEIGHTS DETAIL

SCALE: NONE

NOTES:

1. ALL MOUNTING HEIGHTS SHALL BE MEASURED FROM FINISHED FLOOR TO CENTERLINE OF DEVICE, EXCEPT FIRE ALARM AUDIOVISUAL DEVICES AND EXIT SIGNS.
2. DEVICES SHALL BE INSTALLED ON A COMMON VERTICAL CENTERLINE WHEREVER POSSIBLE.
3. ALL DEVICES SHALL BE INSTALLED AT MOUNTING HEIGHTS INDICATED ON THIS DETAIL UNLESS NOTED OTHERWISE. COORDINATE FINAL LOCATIONS OF ALL DEVICES WITH MILLWORK AND ARCHITECTURAL DRAWINGS.
4. VERIFY ORIENTATION (HORIZONTAL OR VERTICAL) OF COUNTER RECEPTACLE WITH ENGINEER/ARCHITECT.
5. ARCHITECTURAL ELEVATIONS AND SECTIONS SHALL SUPERSEDE THIS DETAIL WHEN IN CONFLICT.

GENERAL NOTES

KEY PLAN

KEY PLAN
NOT TO SCALE

S W E N
CALLED NORTH

DRAWING TITLE

ELECTRICAL LEGEND AND NOTES

JOB NUMBER: 1680
JOB TITLE:

MISCELLANEOUS RENOVATIONS
NEW FIRST FLOOR TOILET ROOM
AND SHOWER ROOM
UNION STATION
WORCESTER, MA

CONSULTANT
Hallam-ICS
AN EMPLOYEE OWNED COMPANY
575 West Street, Suite 220
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71 HOPE AVENUE
WORCESTER, MA 01603
TEL: (508)755-6134
FAX: (508) 754-4661

COMMONWEALTH OF MASSACHUSETTS
MARK W. FELGATE
ELECTRICAL
No. 47531
REGISTERED PROFESSIONAL ENGINEER

DRAWING NO.

E0.1

SCALE: AS NOTED

DATE: JUNE, 2022

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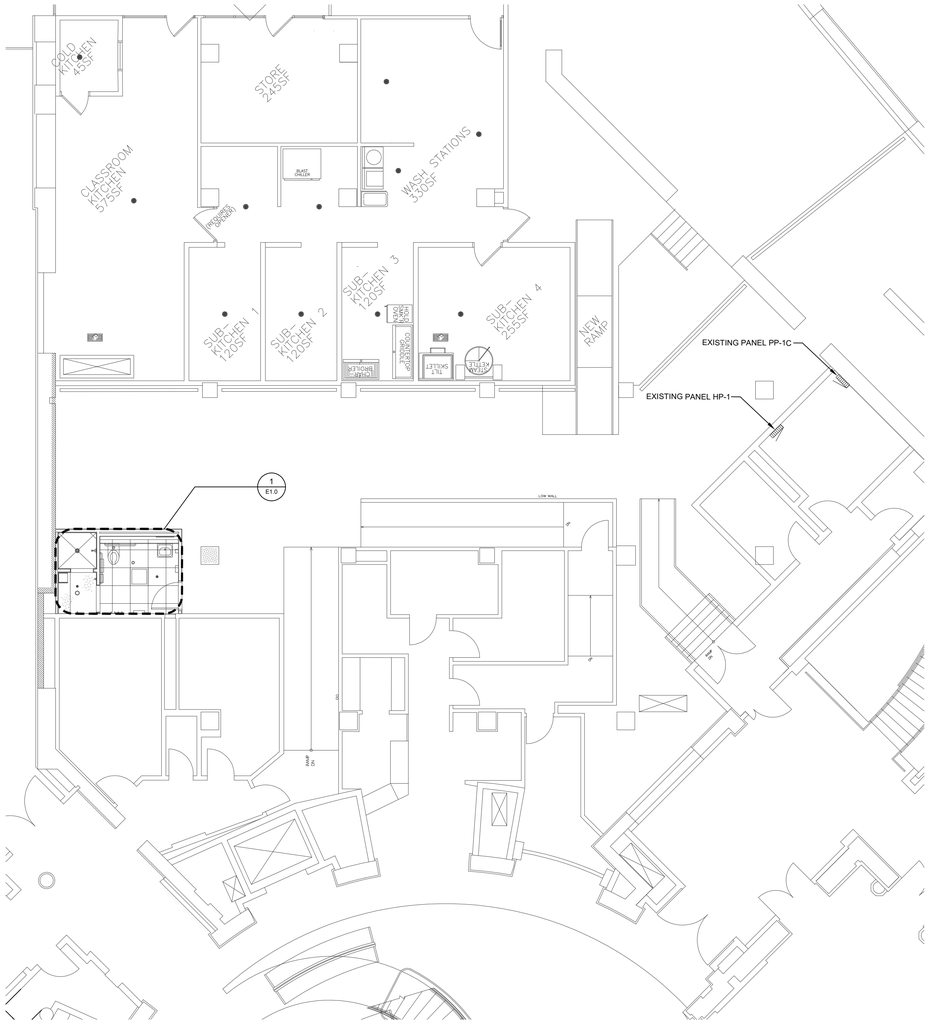
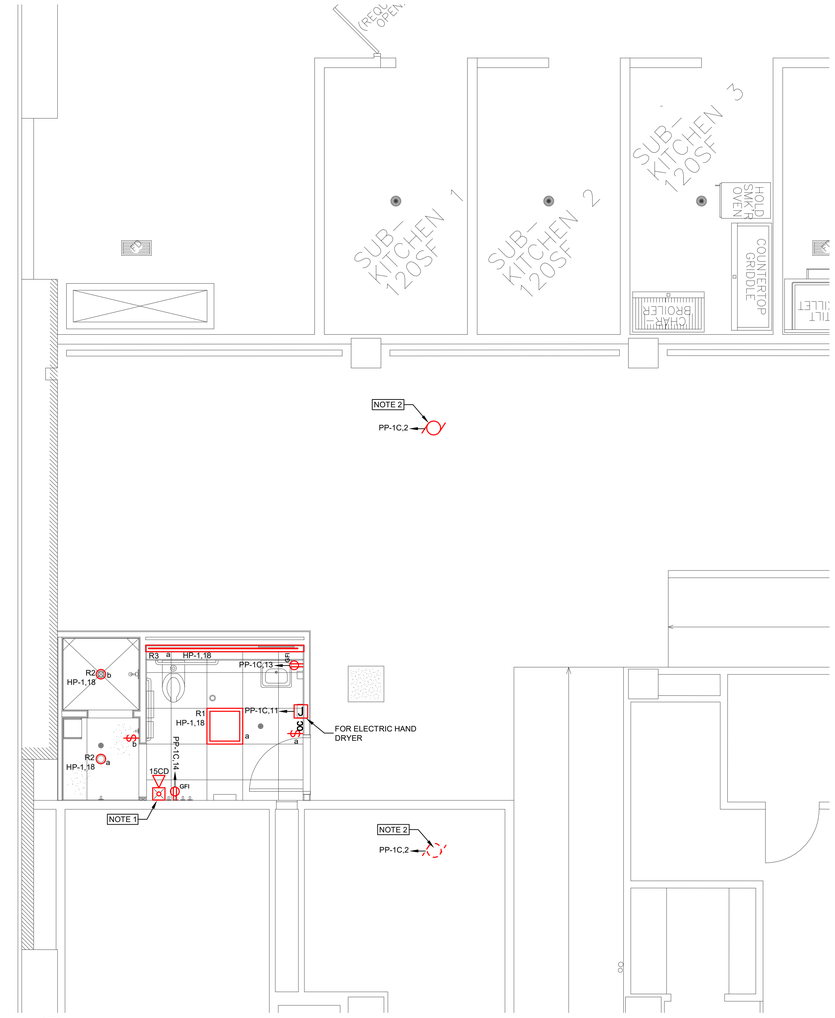


ELECTRICAL FLOOR PLAN
SCALE: 1/8"=1'-0"



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ELECTRICAL FLOOR PLAN - ENLARGED
SCALE: 1/4"=1'-0"

GENERAL NOTES

A. REFER TO ARCHITECTURAL FLOOR PLANS, ELEVATIONS AND REFLECTED CEILING PLANS FOR EXACT LOCATIONS OF LIGHT FIXTURES AND DEVICES.

KEYED NOTES

1. FIRE ALARM DEVICE SHALL BE CONNECTED TO THE EXISTING FIRE ALARM CIRCUIT IN THE AREA.
2. EXISTING FAN TO BE REMOVED AND RELOCATED BY OTHERS.

KEY PLAN

KEY PLAN
NOT TO SCALE

S W E N
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DRAWING TITLE

ELECTRICAL FLOOR PLANS

JOB NUMBER: 1680
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LIGHT FIXTURE SCHEDULE

FIXTURE	MANUFACTURER	MANUFACTURER MODEL NUMBER	VOLTAGE	INPUT WATTS	LAMP TYPE	LUMEN OUTPUT	LAMP COLOR	DIMMING METHOD	MOUNTING	DESCRIPTION
R1	METALUMEN	SCE-2L35K-22-SD-W-L61-T-4-N-N	277	43	LED	3581	3500K	NOT REQUIRED	RECESSED	LED 2X2 SCENE SCE RECESSED
R2	SIGNIFY	4RNU-P4RSL05835WH-Z10U-	277	7	LED	500	3500K	NOT REQUIRED	RECESSED	P4R 4" ROUND DOWNLIGHT & WALL WASH
R3	FOCAL POINT	FSM4PR-ALH-FL4-275LF-35K-IC-UNV-WH-8FT10IN	277	24	LED	2236	3500K	NOT REQUIRED	RECESSED	FULL LENGTH, WALL TO WALL. 4.0" REGRESS. FIXTURE HAS HOUSING TO BE RECESSED MOUNTED UP IN CEILING. THE LENS IS 4" ABOVE THE CEILING GRID.

NOTES:

1. DIMMERS SHALL BE COMPATIBLE WITH LIGHT FIXTURES, LINEAR SLIDE TYPE.
2. REFER TO SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS FOR THE LIGHTING SYSTEM.
3. COORDINATE CEILING GRIDS & SIZE WITH ARCHITECT & MANUFACTURER.

EXISTING PANEL PP-1C

208Y/120 VOLTS, 3 - PHASE, 4 - WIRE
100A MAIN LUG ONLY
MAIN BREAKER
100A BUS RATING
10,000 AIC
BR. BREAKERS - BOLTED
REMARKS:

LOCATION: FED FROM PP-1A
MOUNTING: SURFACE
TYPE:
TOTAL LOAD: 0.0 KVA

CIRC. NO	SIZE	LOAD DESCRIPTION	BRANCH CIRCUIT	KVA	PH	CIRC. NO	SIZE	LOAD DESCRIPTION	BRANCH CIRCUIT	KVA
1	20A-1P	EXISTING	EXISTING		A	2	25A-1P	EXISTING	EXISTING	
3	20A-1P	EXISTING	EXISTING		B	4	20A-1P	EXISTING	EXISTING	
5	20A-1P	EXISTING	EXISTING		C	6	20A-1P	EXISTING	EXISTING	
7	20A-1P	EXISTING	EXISTING		A	8	20A-1P	EXISTING	EXISTING	
9	20A-1P	EXISTING	EXISTING		B	10	20A-1P	EXISTING	EXISTING	
11	**20A-1P**	**BATHROOM HAND DRYER**	**2#12, 1#12G, 3/4"C.**		C	12	20A-1P	EXISTING	EXISTING	
13	**20A-1P**	**BATHROOM RECEPTACLE**	**2#12, 1#12G, 3/4"C.**		A	14	**20A-1P**	**BATHROOM CONVENIENCE RECPT**	**2#12, 1#12G, 3/4"C.**	
15	20A-1P	SPARE			B	16	20A-1P	SPARE		
17	20A-1P	SPARE			C	18	20A-1P	SPARE		
19	20A-1P	SPARE			A	20	20A-1P	SPARE		
21	20A-1P	SPARE			B	22	20A-1P	SPARE		
23	20A-1P	SPARE			C	24	20A-1P	SPARE		
25	20A-1P	SPARE			A	26	20A-1P	SPARE		
27	20A-1P	SPARE			B	28	20A-1P	SPARE		
29	20A-1P	SPARE			C	30	20A-1P	SPARE		

EXISTING PANEL HP-1

480Y/277V VOLTS, 3 - PHASE, 4 - WIRE
MAIN LUG ONLY
125A MAIN BREAKER
250A BUS RATING
14,000 AIC
BR. BREAKERS - BOLTED
REMARKS:

LOCATION:
MOUNTING: SURFACE
TYPE:
TOTAL LOAD: 0.0 KVA

CIRC. NO	SIZE	LOAD DESCRIPTION	BRANCH CIRCUIT	KVA	PH	CIRC. NO	SIZE	LOAD DESCRIPTION	BRANCH CIRCUIT	KVA
1	20A-1P	EXISTING	EXISTING		A	2	25A-1P	EXISTING	EXISTING	
3	20A-1P	EXISTING	EXISTING		B	4	20A-1P	EXISTING	EXISTING	
5	20A-1P	EXISTING	EXISTING		C	6	20A-1P	EXISTING	EXISTING	
7	20A-1P	EXISTING	EXISTING		A	8	20A-1P	EXISTING	EXISTING	
9	20A-1P	EXISTING	EXISTING		B	10	20A-1P	EXISTING	EXISTING	
11	20A-1P	EXISTING	EXISTING		C	12	20A-1P	EXISTING	EXISTING	
13	20A-1P	EXISTING	EXISTING		A	14	20A-1P	EXISTING	EXISTING	
15	20A-1P	EXISTING	EXISTING		B	16	20A-1P	EXISTING	EXISTING	
17	20A-1P	EXISTING	EXISTING		C	18	**20A-1P**	**BATHROOM LIGHTING**	**2#12, 1#12G, 3/4"C.**	
19	20A-1P	EXISTING	EXISTING		A	20	20A-1P	SPARE		
21	20A-1P	SPARE			B	22	20A-1P	SPARE		
23	20A-1P	SPARE			C	24	20A-1P	SPARE		
25	20A-1P	SPARE			A	26				
27	20A-1P	SPARE			B	28	125A-3P	EXISTING MAIN	EXISTING	
29	20A-1P	SPARE			C	30				

GENERAL NOTES

KEY PLAN

KEY PLAN
NOT TO SCALE

DRAWING TITLE

ELECTRICAL SCHEDULES

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