# KELLEY ENGINEERING CENTER PARTIAL REMODEL

# OREGON STATE UNIVERSITY

ISSUED FOR PERMIT AND BID / 07/27/2023 19-0016 OSU PROJECT NUMBER: 2214-20





707 SW Washington Street | Suite 1200 | Portland, OR 97205 t 503 221 0150 f 503 295 0840



## 



LOCATION MAP

SITE ADDRESS: 110 SW PARK TERRACE



AND ANGLE AT 0 CENTERLI CL DIAMETER Ø PLUS OR N DEGREE POUND OF (E) EXISTING AB ANCHOR A/C AIR COND ACST ACOUSTIC ACM ALUMINUN ACT ACOUSTIC ACW ALUMINUN AD AREA DRA ADJ ADJUSTAE AF ACCESS F AFF ABOVE FI AGGR AGGREGA AHU AIR HANDI ALUM ALUMINUN APPROX APPROXIM ARCH ARCHITEC ASF ALUMINUN ASPH ASPHALT ACOUSTIC AWP BCS BABY CHA BD BOARD BLDG BUILDING BLKG BLOCKING ΒM BEAM BOT BOTTOM CAB CABINET CB CATCH BA CBB CEMENT E CEM CEMENT CER CERAMIC CFCI CONTRAC CG CORNER ( CI CAST IRO CIP CAST-IN-P CJ CONSTRU CLG CEILING CLO CLOSET CLR CLEAR CMP COMPOSI CMU CONCRET CNTR COUNTER CO CLEANOU COL COLUMN CONC CONCRETE CONN CONNECT CONSTR CONSTRU CONT CONTINUC CORR CORRIDO CPT CARPET C CSK COUNTER СТ CERAMIC CTR CENTER CV CONDOM ' DBL DOUBLE DEPT DEPARTM DET DETAIL DRINKING DF DIA DIAMETER DIM DIMENSIO DISP DISPENSE DIV DIVISION ( DN DOWN DR DOOR DS DOWNSPO DWG DRAWING DWR DRAWER EA EACH EF EACH FAC EJ EXPANSIC ELEVATIO EL ELECTRIC ELEC ELEV ELEVATOR EOS EDGE OF \$ EP ELECTRIC EQ EQUAL EQUIP EQUIPMEN ESCAL ESCALATO EST ESTIMATE EWC ELECTRIC ELECTRIC EWH EXH EXHAUST EXISTING EXIST EXP EXPOSED EXT EXTERIOR FA FIRE ALAF FLAT BAR FB FD FLOOR DF FDTN FOUNDAT FE FIRE EXTIN FIRE EXTII FEC FHC FIRE HOSE FIN FINISH FIN FLR FINISH FLO FLR FLOOR FLOUR FLUORES FMT FORMED N FACE OF ( FOC FACE OF FOF FOS FACE OF S FIREPROC FP FOOT OR FT FOOTING FTG FUS FOLDING ( GROUND G GA GAGE GALV GALVANIZ GB GRAB BAF GLASS GL GL BLK GLASS BL GLZ CMU GLAZED C GR GRADE GWB GYPSUM GWB-AR GYPSUM V GWB-IR GYPSUM V GWB-WR GYPSUM V HB HOSE BIBB HOLLOW CORE HC HD HAND DRYER HDWD HARDWOOD HGT HEIGHT

## ABBREVIATIONS

V	IA		<u> </u>	2	

## ABBREVIATIONS

ID

INSUL

INT

JS

JT

LAB

LAM

LAV

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LKR

LS

LT

MATL

MECH

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CAL M COMPOSITE MATERIAL PANELS CAL CEILING TILE M CURTAIN WALL
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FLOOR NISHED FLOOR
LING UNIT
MATE CTURAL MISTORFERONT
CAL WALL PANEL
ANGING STATION
3
ASIN OR CHALKBOARD BACKER BOARD
TOR FURNISHED CONTRACTOR INSTALLED
PLACE ICTION OR CONTROL JOINT
TE METAL PANEL E MASONRY UNIT
Т
DUS R
DR CARPET TILE SUNK TILE
VENDOR
ENT
N R
OR DIVIDE
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N AL
R SLAB AL PANEL
NT
WATER HEATER
OR EXPANSION R RM
RAIN
ION NGUISHER
E CABINET
OOR
CONCRETE OR CURB FINISH
DF FEFT
UTILITY SHELF
ZED
OCK
WALL BOARD WALL BOARD - ABUSE RESISTANT WALL BOARD - IMPACT RESISTANT WALL BOARD - WATER RESISTANT
В

HOLLOW METAL HORIZ HORIZONTAL

HM

HR

HOUR HVAC HEATING, VENTILATION, AIR CONDITIONING

INSIDE DIAMETER INSULATION INTERIOR JOINT SEALANT JOINT LABORATORY LAMINATE LAVATORY LINOLEUM LOCKER INTERIOR LIGHT SHELF ASSEMBLY LIGHT MATERIAL MAXIMUM MARKER BOARD MECHANICAL MEMBRANE MANUFACTURER MANHOLE MINIMUM MIRROR MISCELLANEOUS MASONRY OPENING MOUNTED METAL MIRROR UNIT MULLION NOT IN CONTRACT NUMBER NOMINAL NOT TO SCALE OVERALL ON CENTER OUTSIDE DIAMETER OWNER FURNISHED CONTRACTOR INSTALLED OVER FLOW DRAIN OFFICE OWNER FURNISHED OWNER INSTALLED OPNG OPENING OPPOSITE PAINT COLOR PARTICLEBOARD PRECAST CONCRETE PERFORATED PROPERTY LINE PLASTIC LAMINATE PLAM PLAS PLASTER PLYWD PLYWOOD PANEL PAIR PROJECTION SCREEN POINT PAPER TOWEL DISPENSER PARTITION QUARRY TILE RADIUS OR RISER RETURN AIR RESILIENT BASE ROBE HOOK RB HK ROOF DRAIN **REFRIGERATOR - FREEZER** REINF REINFORCED REQD REQUIRED RESIL RESILIENT ROOM ROUGH OPENING REVERSED RAIN WATER LEADER SOLID CORE SEAT COVER DISPENSER SCHED SCHEDULE STORM DRAIN OR SOAP DISPENSER SECTION SHOWER SHEET SIMILAR SKYLIGHT SANITARY NAPKIN DISPOSAL UNIT SANITARY NAPKIN VENDOR SPECIFICATION SQUARE EXTERIOR SUNSCREEN ASSEMBLY STAINLESS STEEL STONE STATION STANDARD STEEL STOR STORAGE STRUCT STRUCTURAL SUSP SUSPEND SYMMETRICAL SYMM TREAD **TONGUE & GROOVE** TACK BOARD TELEPHONE THICKNESS THRU THROUGH TOP OF TOP OF CURB TOLERANCE TOP OF STEEL TOP OF WALL TOILET PAPER DISPENSER TOILET PARTITION TYPICAL UNFINISHED UNFIN UNLESS OTHERWISE INDICATED URINAL UTILITY SHELF VERTICAL VESTIBULE VERIFY IN FIELD WITH WATER CLOSET or WOOD CEILING WOOD WOOD FLOORING WOOD VENEER FACED PANELING WIRE MESH WASTE RECEPTACLE WITHOUT WALK OFF MAT WATERPROOF WINDOW SHADE WSCT WAINSCOT WWF WELDED WIRE FABRIC

## **TEAM DIRECTORY**

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### PROJECT DESCRIPTION

MINOR REMODEL ON THE SECOND FLOOR, ADDING A DRY LAB. MINOR REMODEL ON THE FIRST FLOOR, ADDING A SINGLE-USER TOILET ROOM.

## **GENERAL NOTES**

DESIGN AND DOCUMENTS BASED ON OSU DESIGN AND CONSTRUCTION STANDARDS



### **ARCHITECT:**

INTEGRUS ARCHITECTURE

707 SW Washington St, Suite 1200 Portland, OR. 97205 USA Tel: 503-221-0150 Contact: Steve Neiger

### MEP ENGINEER

GLUMAC ENGINEERS 900 SW Fifth Ave. Suite 1600 Portland, OR. 97204 USA Tel: 503-227-5280 Contact: Phillip Cunningham

## **DRAWING LIST**

GENERAL							
G0.00	COVER SHEET						
G0.10	DRAWING INDEX, SYMBOLS, ABBREVIATIONS						
GENERAL:	2						
ARCHITEC	TURAL						
A0.02	PARTIAL 2ND FLOOR LIFE SAFETY PLAN						
A1.02	PARTIAL 2ND FLOOR DEMO PLAN						
A2.02	PARTIAL 2ND FLOOR PLAN						
A5.01	SINGLE-USER RESTROOM						
A7.02	PARTIAL 2ND FLOOR CEILING PLAN						
A9.01	DETAILS, ELEVATIONS, SCHEDULES						
A9.02	DETAILS						
A9.03	EXISTING PHOTOS						
ARCHITEC	TURAL: 8						
MECHANIC	AL						
M0.0	MECHANICAL LEGEND AND ABBREVIATIONS						
M0.1	MECHANICAL SPECIFICATIONS						
M1.1	FIRST FLOOR MECHANICAL PLAN						
M2.2	SECOND FLOOR MECHANICAL PLAN						
M3.2	SECOND FLOOR MECHANICAL CEILING PLAN						
MECHANICAL: 5							
ELECTRICA	AL CONTRACTOR OF A CONTRACTOR OF						
E0.0	ELECTRICAL LEGEND AND ABBREVIATIONS						
E0.1	BASIS OF DESIGN, GENERAL NOTES, AND SCHEDULES						
E0.2	ELECTRICAL SPECIFICATIONS						
E2.1	FIRST FLOOR POWER & LIGHTING PLAN						
E2.2	SECOND FLOOR LIGHTING PLAN						
E3.2	SECOND FLOOR POWER PLAN						
E5.3	PANELBOARD SCHEDULES						
E9.1	ELECTRICAL DETAILS						
ED2.2	ELECTRICAL DEMOLITION PLAN						
ELECTRICA	ÁL: 9						
PLUMBING							
P0.0	PLUMBING LEGEND AND ABBREVIATIONS						
P6.1	FIRST FLOOR ENLARGED PLAN						
	2						

GRAND TOTAL: 26





















## SHEET NOTES

- 1. ALL WOOD BLOCKING SHALL BE FIRE RETARDANT TREATED. 2. PROVIDE BIDDER-DESIGNED BLOCKING AND BACKING AS NECESSARY TO SUPPORT WALL AND CEILING MOUNTED EQUIPMENT, BOTH CFCI AND OFCI. APPLICATIONS INCLUDING, BUT NOT LIMITED TO, VIDEO DISPLAYS, AND OTHER WALL MOUNTED FIXTURES. 3. PROVIDE CONTINUOUS ACOUSTICAL SEALANT, ACOUSTICAL INSULATION AND/OR SOUND ATTENUATION BLANKETS AROUND ALL PENETRATIONS IN GYPSUM BOARD ASSEMBLIES, AT BOTH SIDES, INCLUDING BUT NOT LIMITED TO PENETRATIONS FOR CONDUIT, DUCTWORK, PIPING AND STRUCTURAL MEMBERS. 4. PAINT ALL GWB SURFACES THROUGHOUT SCOPE OF WORK. COLORS AND FINISHES ARE AS SPECIFIED ON FINISH SCHEDULE OR IN DRAWINGS. 5. PROVIDE PRODUCT DATA AND SHOP DRAWINGS FOR ALL
- NEW FINISHES, MATERIALS AND ASSEMBLIES PRIOR TO PROCUREMENT INCLUDING, BUT NOT LIMITED TO: CARPET, RUBBER BASE, PAINT, ACOUSTICAL CEILING TILE, SIGNAGE, LIGHTING, ETC.
  NEW EQUIPMENT ITEMS ARE TO MATCH EXISTING ITEM COLOR SCHEMES: SWITCHES, RECEPTACLES, COVER PLATES, PULL-STATIONS, EXIT SIGNS, ROOM SIGNAGE,
- SPRINKLER HEADS, MECHANICAL FLOOR GRILLES, OCCUPANCY SENSORS, ACCESS CONTROL PADS, FIRE ALARM STROBES, ETC.
  7. OWNER FURNISHED/OWNER INSTALLED: MOVABLE FURNITURE.
- OWNER FURNISHED/CONTRACTOR INSTALLED: WALL-MOUNTED VIDEO MONITORS, MONITOR MOUNTING BRACKETS, AV BACK BOXES BEHIND MONITORS.

FINISHES CARPET TILE: USE SALVAGED CARPET TILE TO PATCH AROUND NEW WALL LOCATIONS ON HALLWAY SIDE. INSTALL NEW CPT-1 IN LAB-DRY 2026 ONLY. TRANSITION CARPET UNDER CENTER OF CLOSED DOOR.

RUBBER BASE RB-1: CONTINUOUS ROLL GOODS TO MATCH EXISTING JOHNSONITE 4" THERMOSET RUBBER TOELESS BASE - BURNT UMBER COLOR. UTILIZE FIELD-MADE INSIDE AND OUTSIDE CORNERS PER MANUFACTURERS INSTALLATION INSTRUCTIONS.

ACOUSTICAL CEILING TILE AND GRID: MATCH EXISTING PRELUDE 15/16 GRID. USE EXISTING RECLAIMED DUNE SECOND-LOOK II ANGLED TEGULAR TILE 2712 TO INFILL AROUND NEW WALLS ON HALLWAY SIDE OF LAB-DRY 2026. INSIDE LAB-DRY 2026, PROVIDE NEW ACT-1. ULTIMA HIGH NRC 15/16" BEVELED TEGULAR 1944 24x48x7/8" OR EQUAL. NRC OF 0.80 OR BETTER. OVERSTOCK: PROVIDE 5% ADDITIONAL CEILING TILE FOR OWNER'S STOCK.

PAINT: ALL PAINT TO BE ZERO VOC P-1 TO MATCH EXISTING "NATURAL ECHO" W/ EGGSHELL FINISH. P-2: ACCENT PAINT COLOR.

SOLID WOOD DOORS: TWO EXISTING DOORS CAN BE REMOVED AND REINSTALLED IN NEW LOCATIONS. NEW SOLID WOOD DOOR TO HAVE EASTERN HARD MAPLE VENEER TO MATCH EXISTING DOORS. NEW DOOR TO CONTAIN NO ADDED UREA-FORMADEHYDE.

PAINTED HOLLOW METAL DOOR FRAMES: P-1 TO MATCH EXISTING "NATURAL ECHO" W/ SEMI-GLOSS FINISH. PAINTED HOLLOW METAL WINDOW FRAME: P-1 TO MATCH EXISTING "NATURAL ECHO" W/SEMI-GLASS FINISH.

FIRE EXTINGUISHER CABINET: SEMI-RECESSED TO MATCH EXISTING. WHITE STEEL CABINET WITH NARROW VERTICAL GLASS DOOR, NON-LOCKING, WITH VERTICAL RED "FIRE EXTINGUISHER" TEXT. PHOTO OF EXISTING CABINET SHOWN ON SHEET A9.02

WALL INSULATION: 4" OF ROCKWOOL AFB SEMI-RIGID BATT. MANUAL ROLLER SHADE: MECHOSHADE BRAND

ISSUED FOR PERMIT AND BID

### TARDANT AND BACKING AS ILING MOUNTED ICATIONS DISPLAYS, AND ALANT, D ATTENUATION IN GYPSUM CLUDING BUT NOT T, DUCTWORK, IT SCOPE OF SPECIFIED ON AWINGS FOR ALL LIES PRIOR TO ATTED TO: CAL CEILING TILE, EXISTING ITEM CLES, COVER DOM SIGNAGE, GRILLES, OL PADS, FIRE MOVABLE ALLED: WALL-MOVABLE ALLE

STE OF ORE S JR 97205 295 0840 503 503 R 200 / D gite and the second second ς Γ OREGON UNIVERSI **V** Ŕ 4 Ω Ŷ ш Ζ Ш  $\mathbf{O}$ C ERIN Ш Project KELLEY ENGINE REMODEL ⊢் ark OR 2 5 - O MARK DATE DESCRIPTION Sheet Title PARTIAL 2ND FLOOR PLAN Drawing No. A2.02 1/4" = 1'-0" Scale 07/27/2023 Date **Project No.** 19-0016

REDARC

THOMAS ROBBINS

Portland, OR

6448

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LEGEND	
PTD	PAPER TOWEL DISPENSER
SNV	SANITARY NAPKIN DIPENSER
SD	SOAP DISPENSER
GB-1	GRAB BAR 36"
GB-2	GRAB BAR 42"
GB-3	GRAB BAR 18"
BCS	BABY CHANGING STATION
FLM	FULL LENGTH MIRROR
SCD	SEAT COVER DISPENSER
SND	SANITARY NAPKIN DISPOSAL
TPD	TOILET PAPER DISPENSER
AP	12"x12" SST ACCESS PANEL
WCO	WALL CLEAN OUT (SEE PLUMBING DWGS) (SST OR CHROME)
WH	WATER HEATER (SEE PLUMBING DWGS)
СН	CLOTHES HOOK

![](_page_5_Figure_4.jpeg)

![](_page_5_Figure_6.jpeg)

- AUTO DOOR OPERATOR STICKER - "SINGLE-USER RESTROOM" ROOM SIGNAGE - "CHANGING TABLE INSIDE" SIGNAGE (48" MIN TO BASE OF RAISED TEXT AND BRAILLE. - CAMDEN ROOM OCCUPANY INDICATOR (RED OR GREEN) - HANDS-FREE "WAVE TO OPEN" DOOR ACTUATOR

![](_page_5_Figure_11.jpeg)

![](_page_6_Figure_0.jpeg)

EXISTING GYPSUM WALLBOARD CEILING

![](_page_6_Picture_12.jpeg)

![](_page_7_Figure_0.jpeg)

					FIN	ISH S	CHE	DULE
NTITY				WALL				
NAME	FLOOR	BASE	NORTH	EAST	SOUTH	WEST	CEILING	COMMENTS
E-USER ROOM	EXISTING TILE	TILE	TILE	P-1	P-1	TILE	P-1	
1	-	-	-	-	-	-	-	THERE ARE NO MODIFICATIONS IN THIS SPACE
ERV	-	-	-	-	-	-	-	THERE ARE NO MODIFICATIONS IN THIS SPACE
	-	-	-	-	-	-	-	THERE ARE NO MODIFICATIONS IN THIS SPACE
_AB-DRY	EXISTING CPT	RB-1 / EXISTING	P-1 / EXISTING	EXISTING	EXISTING	P-1	EXISTING	REMOVE AND REINSTALL EXISTING CARPET AND CEILING WHERE NEW WALLS ARE EXISTING RUBBER BASE
TY	-	-	-	-	-	-	-	THERE ARE NO MODIFICATIONS IN THIS SPACE
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LAB-DRY	EXISTING CPT	RB-1 / EXISTING	EXISTING	P-2	EXISTING	EXISTING	EXISTING	REMOVE AND REINSTALL EXISTING CARPET AND CEILING WHERE NEW WALLS ARE EXISTING RUBBER BASE
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RY	CPT-1	RB-1	P-1	P-1	P-1	P-2	ACT-1	
TY	-	-	-	-	-	-	-	THERE ARE NO MODIFICATIONS IN THIS SPACE
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TY	-	-	-	-	-	-	-	THERE ARE NO MODIFICATIONS IN THIS SPACE
ERV	-	-	-	-	-		-	THERE ARE NO MODIFICATIONS IN THIS SPACE
	EXISTING CPT	RB-1 / EXISTING	EXISTING	EXISTING	P-1 / EXISTING	P-1 / EXISTING	EXISTING	REMOVE AND REINSTALL EXISTING CARPET AND CEILING WHERE NEW WALLS ARE EXISTING RUBBER BASE
	EXISTING CPT	RB-1 / EXISTING	EXISTING	P-1 / EXISTING	P-1 / EXISTING	EXISTING	EXISTING	REMOVE AND REINSTALL EXISTING CARPET AND CEILING WHERE NEW WALLS ARE EXISTING RUBBER BASE
	EXISTING CPT	RB-1 / EXISTING	P-1	EXISTING	EXISTING	EXISTING	EXISTING	REMOVE AND REINSTALL EXISTING CARPET AND CEILING WHERE NEW WALLS ARE EXISTING RUBBER BASE

			[	DOOR S	SCH	EDULE		
	DOOR					FRA	ME	
ΗT	MATERIAL	FINISH	RATING	HARDWARE	TYPE	MATERIAL	FINISH	COMMENTS
)"	WD	EXISTING CLEAR FINISH	NR	E-05	F1	HM	EXISTING	EXISTING DOOR AND FRAME. ADD NEW AUTO DOOR OPERATOR. F CARD ACCESS AND ADD NEW CAMDEN ENTRY SYSTEM.
	· ·							
)"	WD EXISTING	EXISTING CLEAR FINISH	-	E-01	-	HM	EXISTING	EXISTING DOOR AND FRAME, ADD NEW MAGNETIC HOLD OPEN AND
)"	WD	CLEAR FINISH	NR	E-02	F1	HM	PAINT TO MATCH EXISTING	NEW WOOD DOOR AND HOLLOW METAL FRAME TO MATCH EXISTIN
)"	WD	CLEAR FINISH	NR	E-04	F1	HM	PAINT TO MATCH EXISTING	NEW WOOD DOOR AND HOLLOW METAL FRAME TO MATCH EXISTIN
)"	WD	CLEAR FINISH	NR	E-03	F1	HM	PAINT TO MATCH	NEW WOOD DOOR AND HOLLOW METAL FRAME TO MATCH EXISTIN

 $\odot$ 

![](_page_8_Figure_3.jpeg)

## 1 LAB-DRY 2026 - MONITOR WALL

![](_page_8_Figure_5.jpeg)

![](_page_8_Figure_10.jpeg)

### NOTE:

THIS SHEET CONTAINS PHOTOS OF THE EXISTING SPACE THAT ARE BEING PROVIDED AS REFERENCE ONLY AND ARE NOT FOR CONSTRUCTION. THE PURPOSE OF THESE PHOTOS IS TO CLARIFY EXISTING CONDITIONS AND TO SHOW EXISTING ACCESSORIES FOR THE PURPOSE OF MATCHING NEW ACCESSORIES.

![](_page_9_Picture_3.jpeg)

## 4 EXISTING ELECTRICAL PANEL 3" = 1'-0"

![](_page_9_Picture_5.jpeg)

![](_page_9_Picture_6.jpeg)

8 EXISTING FLOOR VENT

![](_page_9_Picture_9.jpeg)

3 EXISTING FIRE EXTINGUISHER CABINET

![](_page_9_Picture_12.jpeg)

![](_page_9_Picture_13.jpeg)

7 EXISTING FLOOR GRATE AND RECEPTACLE

![](_page_9_Picture_15.jpeg)

6 EXISTING COLUMN CONNECTION 2

![](_page_9_Picture_17.jpeg)

![](_page_9_Picture_18.jpeg)

![](_page_9_Picture_19.jpeg)

![](_page_9_Picture_20.jpeg)

![](_page_9_Picture_21.jpeg)

![](_page_9_Picture_22.jpeg)

5 EXISTING COLUMN CONNECTION 1

![](_page_9_Picture_25.jpeg)

![](_page_9_Picture_26.jpeg)

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## ABBREVIATIONS

AAV ABV	AUTOMATIC AIR VENT
AC	AIR CONDITIONING
ACCEPT ACU	ACCEPTANCE AIR CONDITIONING LINIT
AD	ACCESS DOOR
ADD AF	ADDITION AFTER FILTER
AFF	ABOVE FINISHED FLOOR
AFMS AFUE	AIR FLOW MEASURING STATION ANNUAL FUEL UTILIZATION EFFICIENCY
AG	AIR GAP
AHJ AHU	AUTHORITY HAVING JURISDICTION AIR HANDLING UNIT
AMB	AMBIENT
A AP	AMPERE ACCESS PANEL
APPROX	APPROXIMATELY
ARCH ARI	ARCHITECT AMERICAN REFIRGERATION INSTITUTE
AS	AIR SEPARATOR
AUTO AUX	AUTOMATIC AUXILIARY
В	BOILER
BAS BDD	BUILDING MANAGEMENT SYSTEM BACKDRAFT DAMPER
BEL	BELOW
BHP BOD	BRAKE HORSEPOWER BOTTOM OF DUCT
BOP	BOTTOM OF PIPE
BFP BSMT	BACKFLOW PREVENTER BASEMENT
BTU	BRITISH THERMAL UNIT
BTUH BV	BTU PER HOUR BALL VALVE OR BALANCING VALVE
BYV	BUTTERFLY VALVE
C CA	COMMON, CONDENSATE OR CONDUIT
CAP	CAPACITY
CAV	CONSTANT AIR VOLUME
CC	COOLING COIL OR CONTROLS CONTRACTOR
CEG	CEILING EXHAUST GRILLE
CFF	CAP FOR FUTURE
CFM	
CHWP	CHILLED WATER PUMP
CHWR	
CHWS	CHILLER
CHV	
CLG	CENTERLINE CEILING
CO	CLEANOUT
COL COMP	COLUMN COMPRESSOR
CONC	CONCRETE
COND	CONDENSATE
CONT	CONTINUATION
CONTR COP	CONTRACTOR COFFEICIENT OF PERFORMANCE
CP	CONTROL PANEL OR CONDENSATE PUMP
CR CRG	CONDENSATE RETURN CEILING RETURN GRILLE
CRR	CEILING RETURN REGISTER
CSD CTE	CEILING SUPPLY DIFFUSER CONNECT TO EXISTING
CUFT	
CUIN CV	COBIC INCHES CONSTANT VOLUME OR CONTROL VALVE
CW	
CWP CWR	CONDENSER WATER POMP CONDENSER WATER RETURN
CWS	CONDENSER WATER SUPPLY
D DBT	DROP OR DRAIN DRY BULB TEMPERATURE
DDC	DIRECT DIGITAL CONTROL
DEFL DIA	DIAMETER
DIFF	DIFFERENCE
DN DP	DOWN DIFFERENTIAL PRESSURE
DPT	
DSD DV	DIGT SMOKE DETECTOR DIAPHRAGM VALVE
DWG(S)	DRAWINGS(S)
DX (E)	EXISTING
ÈÁ	EXHAUST AIR OR EACH
EAD EAT	EXHAUST AIR DAMPER ENTERING AIR TEMPERATURE
EC	ELECTRICAL CONTRACTOR
ECON EDB	ECONOMIZER ENTERING DRY BULB TEMPERATURE
EWT	ENTERING WATER TEMPERATURE
EEK EF	ENERGI EFFICIENCY KATING EXHAUST FAN
EFF	
EL	ELEVATION
ELEC	
EQUIP (ER)	EXISTING RELOCATED
ÈSP	EXTERNAL STATIC PRESSURE
⊏ I EWB	EAFAINSION TAINK ENTERING WET BULB TEMPERATURE
EXH	EXHAUST
F	FAHRENHEIT
FPB	FAN POWERED BOX
FC FCU	FAN COIL UNIT
FD	
FFA/FFB	FROM FLOOR ABOVE/BELOW
FLR	
FPI	FINS PER INCH
FPM FPS	FEET PER MINUTE
FSD	FIRE/SMOKE DAMPER
FT G	FOOT OR FEET
GA	GAUGE, GAGE
GAL GALV	GALLONS GLAVANIZED
GC	GAS COCK OR GENERAL CONTRACTOR
GLV GN	GLOBE VALVE GENERAL NOTE
GPM	GALLONS PER MINUTE
GND GV	GROUND GATE VALVF
H	HEIGHT
HB HC	HOSE BIBB HEATING COII
HD	HEAD
HOR HP	HORIZONTAL HIGH PRESSURE
HP	HORSEPOWER
HP HPC	HEAT PUMP HIGH PRESSURE CONDENSATE
HPS	HIGH PRESSURE STEAM
HR HRU	HOUR(S) HEAT RECOVERY LINIT
HS	HUMIDITY SENSOR
HTR HV	HEATER HOSE VALVE
HVAC	HEATING, VENTILATING AND AIR CONDITIONING
HW	HEATING WATER

VIAI	IUNS
HWP HWR	HEATING WATER PUMP HEATING WATER RETURN
HWS	HEATING WATER SUPPLY HEAT EXCHANGER
HZ	FREQUENCY (HERTZ)
IN INDLV	INGIDE DIAMETER INCH(ES)
JB	JUNCTION BOX
KWH	KILOWATT HOUR
L LAT	LEAVING AIR TEMPERATURE
LDB	LEAVING DRY BULB
LF LP	LINEAR FEET LOW PRESSURE
LPC	LOW PRESSURE CONDENSATE LOW PRESSURE STEAM
LWB	LEAVING WET BULB LEAVING WATER TEMPERATURE
M MA	MOTOR MIXED AIR
MAD MAX	MIXED AIR DAMPER MAXIMUM
MC	MECHANICAL CONTRACTOR
MCA MCC	MINIMUM CIRCUIT AMPACITY MOTORIZED CONTROL CENTER
MD MECH	MOTORIZED DAMPER MECHANICAL
MERV	MINIMUM EFFICIENCY RATING VALUE MANUFACTURER
MIN MOCP	MINIMUM MINIMUM OVER CURRENT PROTECTION
MPC MPS	MEDIUM PRESSURE CONDENSATE MEDIUM PRESSURE STEAM
MV (N)	NEW
N/A NC	NOT APPLICABLE NORMALLY CLOSED
NO	NOT IN CONTRACT NORMALLY OPEN OR NUMBER
NOM NPSH	NOMINAL NET POSITIVE SUCTION HEAD
OA	OUTSIDE AIR
OAD OAT	
OC ORD	OPPOSED BLADE DAMPER ON CENTER
OD OFCI	OWNER FURNISHED CONTRACTOR INSTALLED
OPER	OWNER FURNISHED OWNER INSTALLED OPERATING
OV P	PUMP OR PRESSURE OR POLE
PC PD	PUMPED CONDENSATE PRESSURE DROP
PF PG	PREFILTER PIPE GUIDE OR PRESSURE GAUGE
PH PHC	PHASE (ELECTRICAL) PREHEAT COIL
PLBG POC	PLUMBING POINT OF CONNECTION
POD PRESS	POINT OF DISCONNECTION PRESSURE
PRV PS	PRESSURE REDUCING VALVE PRESSURE SENSOR
PSI PSIA	POUNDS PER SQUARE INCH PSI ABSOLUTE
PSIG QTY	PSI GAUGE QUANTITY
R RA	RELOCATE, RISE, RISER RETURN AIR
RAD RD	RETURN AIR DAMPER REFRIGERANT DISCHARGE OR ROOF DRAIN
REF REFRIG	ROOFTOP EXHAUST FAN REFRIGERATION
REJ REQ'D	REJECTION REQUIRED
REV RF	REVISE, REVISION OR REVOLUTIONS RETURN FAN
RH RHC	RELATIVE HUMIDITY REHEAT COIL
RHT RM	RADIANT HEATER ROOM
RPM RS	REVOLUTIONS PER MINUTE REFRIGERANT SUCTION
RTU S	ROOFTOP UNIT SUPPLY OR SLOPE
SA SCFM	SUPPLY AIR CFM, STANDARD CONDITIONS
SD SEER	SMOKE DAMPER SEASONAL ENERGY EFFICIENCY RATING
SEN SF	SENSIBLE SUPPLY FAN OR SQUARE FEET
SHC	SQUARE HEAD COCK SPLIT INDOOR UNIT
SOU SP	SPLIT OUTDOOR UNIT STATIC PRESSURE
SPD SPEC	SPECIFICATIONS
SQ IN ST	SQUARE INCH STRAINER OR SOUND TRAP
STRUCT	STANDARD STRUCTURAL
SV T	THERMOSTAT OR THERMOMETER
TDH	TOTAL DYNAMIC HEAD
TEMP TFA/TFB	TO FLOOR ABOVE/BELOW
TRG	
TSP	TOTAL STATIC PRESSURE
TXV	THERMAL EXPANSION VALVE
U U	HEAT TRANSFER COEFFICIENT
UG	
UON	UNLESS OTHERWISE NOTED
V VAV	VARIABLE AIR VOLUME
VD VEI	VOLUME DAMPER VELOCITY
VERT	
VFM	VENTURI FLOW METER
VTR W	VENT THROUGH ROOF WASTE OR WIDTH OR WATTS
W/ W/O	WITH WITHOUT
WB WC	WET BULB TEMPERATURE WATER COLUMN
WEG WG	WALL EXHAUST GRILLE WATER GAUGE
WP WPD	WORKING PRESSURE WATER PRESSURE DROP
WRR WSHP	WALL RETURN REGISTER WATER-SOURCE HEAT PUMP
WSR WT	WALL SUPPLY REGISTER WEIGHT
XFMR Z	TRANSFORMER ZONE
ZD	ZONE DAMPER

57 12  $\sim$ 8/1

		HVA	AC LEGEND	NOTE: NOT ALL SYMBOLS OR ABBREVIATIONS ARE APPLICABLE TO THIS PROJECT. REFER TO DETAILS AND NOTES FOR MOUNTING HEIGHTS.	BASIS OF DESIGN
	GENERAL	DL	ICTWORK	GENERAL NOTES	MECHANICAL BASIS OF DESIGN
SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	A. GENERAL NOTES APPLY TO ALL SHEETS. B. CONTRACTOR SHALL VISIT SITE AND VERIEY ALL CONNECTIONS TO EXISTING WORK PRIOR	A. THIS PROJECT INVOLVES A PARTIAL RENOVATION OF THE FIRST AND SECOND FLOORS OF THE KELLEY ENGINEERIN CENTER ON THE CAMPUS OF OREGON STATE UNIVERSITY. THE RENOVATION INCLUDES: 1 REPROGRAMMING OF 114 SE OF SPACE FROM SHARED OFFICE TO AN ENCLOSED SPACE WITH FUNCTION OF ALL
	NEW WORK	AD/AP	ACCESS DOOR / ACCESS PANEL	TO BIDDING AND CONSTRUCTION. THE CONTRACTOR SHALL PAY FOR AND REPAIR ALL DAMAGES CAUSED BY FAILURE TO EXACTLY LOCATE AND PRESERVE ANY UNDERGROUND	TOILET ROOM. SHARED OFFICE REDUCED TO 215 SF. 2. REPROGRAMMING OF 940 SF OF OPEN SPACE FROM ROOM 2012 TO AN ENCLOSED SPACE WITH THE FUNCTION (
	(E) EXISTING WORK TO REMAIN		FLEXIBLE CONNECTION	UTILITIES UNLESS OTHERWISE INDICATED. C. PROVIDE ALL MATERIALS AND EQUIPMENT AND PERFORM ALL LABOR REQUIRED TO	DRY LAB.
	— — (D) EXISTING WORK TO BE REMOVED			INSTALL COMPLETE AND OPERABLE MECHANICAL SYSTEMS AS INDICATED ON THE DRAWINGS, AS SPECIFIED AND AS REQUIRED BY CODE.	<ul> <li>B. CODES AND STANDARDS (LATEST EDITIONS UNLESS OTHERWISE REQUIRED BY AHJ)</li> <li>1. AMERICANS WITH DISABILITIES ACT (ADA).</li> </ul>
			FLEXIBLE DUCT RUNOUT TO DIFFUSER	D. CONTRACT DOCUMENT DRAWINGS FOR MECHANICAL WORK (HVAC, PLUMBING, AND FIRE PROTECTION) ARE DIAGRAMMATIC AND ARE INTENDED TO CONVEY SCOPE AND GENERAL	<ol> <li>NFPA 90A: STANDARD FOR THE INSTALLATION OF AIR-CONDITIONING AND VENTILATING SYSTEMS.</li> <li>NFPA 90B: STANDARD FOR THE INSTALLATION OF WARM AIR HEATING AND AIR-CONDITIONING SYSTEMS.</li> </ol>
۲ (ER) ۲		<u> 12x6</u> →	(WIDTH x DEPTH IN INCHES)	ARRANGEMENT ONLY.     E. INSTALL ALL MECHANICAL EQUIPMENT AND APPURTENANCES IN ACCORDANCE WITH     MANUFACTURERS' RECOMMENDATIONS CONTRACT DOCUMENTS AND APPLICABLE CODES	<ol> <li>NEPA 101: LIFE SAFETY CODE.</li> <li>ASHRAE 2022 HANDBOOK, REFRIGERATION.</li> <li>ASHRAE 2021 HANDBOOK, EUNDAMENTALS</li> </ol>
۲ ۹	POINT OF CONNECTION OR	< <u>18ø</u>	ROUND DUCT SIZE (DIAMETER IN INCHES)	AND REGULATIONS. F. COORDINATE CONSTRUCTION OF ALL MECHANICAL WORK WITH ARCHITECTURAL.	<ol> <li>ASHRAE 2021 HANDBOOK, FUNDAMENTALS.</li> <li>ASHRAE 2022 HANDBOOK, HVAC SYSTEMS AND EQUIPMENT.</li> <li>ASHRAE 2019 HANDBOOK, HVAC APPLICATIONS</li> </ol>
	POINT OF DISCONNECTION	24/212	OVAL DUCT SIZE	STRUCTURAL, CIVIL, ELECTRICAL WORK, ETC., SHOWN ON OTHER CONTRACT DOCUMENT DRAWINGS.	<ol> <li>ASHRAE 55-2020THERMAL ENVIRONMENTAL CONDITIONS FOR HUMAN OCCUPANCY.</li> <li>ASHRAE 62.1-2022VENTILATION FOR ACCEPTABLE INDOOR AIR QUALITY.</li> </ol>
M-1	DETAIL 1, DRAWING M-1		(WIDTH x DEPTH IN INCHES)	G. ALL TESTS SHALL BE COMPLETED BEFORE ANY MECHANICAL EQUIPMENT OR PIPING INSULATION IS APPLIED.	<ol> <li>ASHRAE 90.1-2019ENERGY STANDARD FOR BUILDINGS EXCEPT LOW-RISE RESIDENTIAL BUILDINGS.</li> <li>OREGON BUILDING CODES ENFORCED BY THE AUTHORITY HAVING JURISDICTION (AHJ):</li> </ol>
			DUCT THROUGH BEAM PENETRATION	H. LOCATE ALL TEMPERATURE, PRESSURE, AND FLOW MEASURING DEVICES IN ACCESSIBLE LOCATIONS WITH STRAIGHT SECTION OF PIPE OR DUCT UP- AND DOWNSTREAM AS	<ul> <li>A. 2022 OREGON STRUCTURAL SPECIALTY CODE (OSSC) BASED ON THE 2021 INTERNATIONAL BUILDING CODE (</li> <li>B. 2022 OREGON MECHANICAL SPECIALTY CODE (OMSC) BASED ON THE 2021 INTERNATIONAL MECHANICAL CO</li> </ul>
A M-1	SECTION A, DRAWING M-1			I. TESTING, ADJUSTING, AND BALANCING AGENCY SHALL BE A MEMBER OF THE ASSOCIATED	(IMC) AND THE 2021 INTERNATIONAL FUEL GAS CODE (IFGC) WITH STATE AMENDMENTS. C. 2021 OREGON PLUMBING SPECIALTY CODE (OPSC) BASED ON THE 2021 UNIFORM PLUMBING CODE (UPC).
			VOLUME DAMPER OR REMOTE VOLUME DAMPER	(NEBB). TESTING, ADJUSTING, AND BALANCING SHALL BE PERFORMED IN ACCORDANCE	D. 2021 OREGON ELECTRIC SPECIALTY CODE (BASED ON THE 2020NATIONAL ELECTRIC CODE (NEC) WITH STAT AMENDMENTS. E 2021 OREGON ENERGY EFEICIENCY SPECIALTY CODE (OFESC)
			FIRE SMOKE OR FIRE/SMOKE DAMPER	J. WHERE TWO OR MORE ITEMS OF THE SAME TYPE OF EQUIPMENT ARE REQUIRED, THE PRODUCT OF ONE MANUFACTURER SHALL BE USED.	<ul> <li>13. IN ADDITION TO ALL STATUTORY CODES ENFORCED BY THE AUTHORITY HAVING JURISDICTION, PROJECT SHALL</li> <li>COMPLY WITH LATEST EDITION OF THE OSLI DESIGN AND CONSTRUCTION STANDARDS</li> </ul>
1 M-1	ELEVATION 1, DRAWING M-1		SUPPLY DUCT UP	K. COORDINATE ALL EQUIPMENT CONNECTIONS WITH MANUFACTURERS' CERTIFIED DRAWINGS. COORDINATE AND PROVIDE ALL DUCT AND PIPING TRANSITIONS REQUIRED	C. EXISTING EQUIPMENT AND CONDITIONS ASSUMPTIONS BASED ON:
			SUPPLY DUCT DOWN	FOR FINAL EQUIPMENT CONNECTIONS TO FURNISHED EQUIPMENT. FIELD VERIFY AND COORDINATE ALL DUCT AND PIPING DIMENSIONS BEFORE FABRICATION.	<ol> <li>PROJECT 76601, 07.01.03, KELLEY ENGINEERING CENTER, GLUMAC CONSTRUCTION DRAWINGS</li> <li>2019-09-25 OSU KELLEY ENG 2ND FL REMODEL FP_REV00.DOCX</li> </ol>
EXH 1	RISER IDENTIFICATION EXHAUST #1		EXHAUST DUCT UP	L. ALL CONTROL WIRE AND CONDUIT SHALL COMPLY WITH THE NATIONAL ELECTRIC CODE AND DIVISION 16 OF THE SPECIFICATION.	3. SITE VISIT PHOTOS 01.10.2020
			EXHAUST DUCT DOWN	M. WHEN MECHANICAL WORK (HVAC, PLUMBING, SHEET METAL, FIRE PROTECTION, ETC.) IS SUBCONTRACTED, IT SHALL BE THE MECHANICAL CONTRACTOR'S RESPONSIBILITY TO	D. OUTDOOR DESIGN CONDITIONS: 1. LOCATION: CORVALLIS, OR (WMO:726945)
$\left\langle \begin{array}{c} HP \\ 1 \end{array} \right\rangle$	HEAT PUMP UNIT #1		RETURN DUCT UP	DISCREPANCIES ARISE PERTAINING TO WHICH CONTRACTOR PROVIDES A PARTICULAR	<ol> <li>SUMMER: 96°F DB/67°F WB</li> <li>WINTER: 17°F</li> <li>ELEVATION: 050 FEET ADOVE 054 LEVEL</li> </ol>
	KITCHEN FOUIPMENT TAG		RETURN DUCT DOWN	CONNECTIONS FOR A PARTICULAR ITEM OF THE MECHANICAL CONTRACTOR PROVIDES FINAL BROUGHT TO THE ATTENTION OF THE MECHANICAL CONTRACTOR, WHOSE DECISION	<ol> <li>ELEVATION: 250 FEET ABOVE SEA LEVEL.</li> <li>CLIMATE ZONE: 4C</li> </ol>
(#)	KEYED NOTE		CROSS SECTION OF SUPPLY DUCT	SHALL BE FINAL. N. THE LOCATIONS OF ALL ITEMS SHOWN ON THE DRAWINGS OR CALLED FOR IN THE	E. INDOOR DESIGN CONDITIONS
	DIRECTION OF TRANSFER AIRFLOW (150 CFM)		CROSS SECTION OF EXHAUST AIR DUCT	SPECIFICATIONS THAT ARE NOT DEFINITELY FIXED BY DIMENSIONS ARE APPROXIMATE ONLY. THE EXACT LOCATIONS NECESSARY TO SECURE THE BEST CONDITIONS AND	A. COOLING: 76°F B. HEATING: 68°F
78°F	78 DEGREES FAHRENHEIT		CROSS SECTION OF RETURN AIR DUCT	RESULTS MUST BE DETERMINED BY THE PROJECT SITE CONDITIONS AND SHALL HAVE THE APPROVAL OF THE ENGINEER BEFORE BEING INSTALLED. DO NOT SCALE DRAWINGS.	2. HUMIDITY CONTROL A. ALL AREAS, UNLESS OTHERWISE NOTED: NONE
			CROSS SECTION OF ROUND DUCT	0. PROVIDE ACCESS PANELS FOR INSTALLATION IN WALLS AND CEILINGS, WHERE REQUIRED, TO SERVICE DAMPERS, VALVES, SMOKE DETECTORS, AND OTHER CONCEALED	F. OREGON VENTILATION CRITERIA:
			DUCT ELBOW WITH TURNING VANES	MECHANICAL EQUIPMENT. ACCESS PANELS SHALL BE TURNED OVER TO GENERAL CONTRACTOR FOR INSTALLATION.	1. COMPLY WITH CHAPTER 4 OF OMSC/IMC OR ASHRAE 62.1.
	CONTROLS			AND REQUIRED TO PROVIDE A VIBRATION FREE INSTALLATION.	G. BUILDING ENVELOPE (EXISTING CONDITIONS): 1. GLAZING: GLASS/FRAME COMBINATION:
SYMBOL	DESCRIPTION		SMOOTH RADIUS DUCT ELBOW WITHOUT TURNING VANES	METAL DECK. R. LOCATIONS AND SIZES OF ALL FLOOR, WALL, AND ROOF OPENINGS SHALL BE	A. TTFICAL VERTICAL. 1) $U= 0.42 / SC = 0.4$ B. TYPICAL OVERHEAD
	TEMPERATURE SENSOR			COORDINATED WITH ALL OTHER TRADES INVOLVED. S. ALL OPENINGS IN FIRE WALLS DUE TO DUCTWORK, PIPING, CONDUIT, ETC., SHALL BE FIRE	1) $U= 0.5 / SC = 0.31$ 2. WALL CONSTRUCTION:
			CONICAL BRANCH FITTING	STOPPED WITH A PRODUCT SIMILAR TO 3M OR APPROVED EQUAL. T. REFER TO TYPICAL DETAILS FOR DUCTWORK, PIPING, AND EQUIPMENT INSTALLATION.	<ul><li>A. FACE BRICK WITH R-19 INSULATION</li><li>3. ROOF CONSTRUCTION:</li></ul>
			45 DEGREE BOOT LO-LOSS BRANCH FITTING	U. EXISITNG EQUIPMENT, LOCATION, AND SIZE ARE APPROXIMATE. CONTRACTOR TO VERIFY FIELD CONDITIONS	A. LIGHT COLORED MEMBRANE WITH R-30 INSULATION
	HUMIDITY SENSOR OR HUMIDISTAT			V. RESTORE ALL DAMAGE RESULTING FROM YOUR WORK AND LEAVE PREMISES IN CLEAN CONDITION	H. INTERNAL HEAT GAINS: 1. LIGHTING: : 0.85 W/SQ.FT.
	STATIC PRESSURE SENSOR			OF EACH DIFFUSER/GRILLE. PROVIDE EXTENDED REGULATORS, WITH CONCEALED COVER PLATES TO OPERATE DAMPERS LOCATED ABOVE INACCESSIBLE CELLINGS	2. RECEPTACLE POWER A. ROOM 2012: 2.0 W/SQ.FT. 3. OCCURANCY CRITERIA IN OREGON:
	REFRIGERANT SENSOR	12x6	(DIMENSION IS INSIDE DIMENSION)	<ul> <li>X. INDIVIDUAL RUNS OF FLEXIBLE DUCT SHALL NOT EXCEED 5 FEET.</li> <li>Y. EXISTING DUCTWORK TO REMAIN SHALL BE INTERNALLY CLEANED AND PRESSURE TESTED.</li> </ul>	A. OCCUPANT: 245 BTUH SENSIBLE/200 BTUH LATENT B. OCCUPANTS <sup>1</sup>
60	CARBON MONOXIDE SENSOR		MOTORIZED DAMPER INSIDE DUCT	REFER TO TAB SPEC. Z. CONTRACTOR TO PRETEST ENTIRE FLOOR AND REPORT BACK EXISTING CONDITIONS.	<ol> <li>CONTROL ROOM: 9 PERSONS. (NUMBER OF CHAIRS)</li> <li>ZONING CRITERIA:</li> </ol>
Э	HYDROGEN SENSOR		TRANSFER DUCT (WITH LINER)	AA. COORDINATE ALL CEILING MOUNTED EQUIPMENT AND APPURTENANCES (GRILLES, REGISTERS, LIGHTS, AREA DETECTORS, LIGHTING CONTROLS, ETC) WITH THE CEILING	A. ONE ZONE (TEMPERATURE SENSORS) PER ROOM
DSD	DUCT SMOKE DETECTOR		INDICATES 8'11" TO BOTTOM OF DUCT	GRID, SUPPORTS, STRUCTURAL ELEMENTS, AND SPRINKLER HEADS. ANY MODIFICATIONS TO SPRINKLER HEAD LAYOUT, IF REQUIRD, SHALL BE PERFORMED BY A QUALIFIED DESIGN	<ol> <li>DUCTWORK DESIGN CRITERIA:</li> <li>DESIGN DUCTWORK TO PROVIDE HIGH EFFICIENCY OPERATION WITH MINIMAL ACOUSTICAL NOISE. DUCT STATI</li> </ol>
TS	TEMPERATURE SENSOR	<b>8</b> ' - 11" BOD		BUILD CONTRACTOR.	PRESSURE FRICTION LOSS SHALL NOT EXCEED 0.2" PER 100 FEET IN MECHANICAL ROOMS AND SHAFTS. LOW PRESSURE SUPPLY DUCT STATIC PRESSURE FRICTION LOSS BASED ON A MAXIMUM OF 0.08" PER 100 FEET. LOW
SP	STATIC PRESSURE SENSOR	TAG NECK SIZE-CFM	RECTANGULAR OR ROUND SUPPLY DIFFUSER		FRESSURE RETURN AND EXHAUST DUCT STATIC PRESSURE FRICTION LOSS BASED ON A MAXIMUM OF 0.06" PER FEET. MEDIUM PRESSURE DUCTWORK SHALL NOT EXCEED A DUCT STATIC PRESSURE FRICTION LOSS BASED O MAXIMUM OF 0.1" REP. 100 FEET.
	PRESSURE SENSOR OR SWITCH		UNLESS INDICATED OTHERWISE. EXAMPLE: SB12X12-400 REFERS TO TAG SB WITH		<ol> <li>MAXIMUM SUPPLY, RETURN AND EXHAUST DUCT AIR FLOW VELOCITIES, REGARDLESS OF PRESSURE DROP, SHA NOT EXCEED THE FOLLOWING CRITERIA:</li> </ol>
	DIFFERENTIAL PRESSURE SENSOR		12"X12" NECK AND 400 CFM		<ul><li>A. MAINS ABOVE CEILING: 1750 FPM</li><li>B. MAINS ABOVE OPEN OCCUPIED SPACES: 1450 FPM</li></ul>
		TAG NECK SIZE-CFM	RECTANGULAR OR ROUND EXHAUST GRILLE OR REGISTER (SEE SCHEDULE)		C. BRANCHES ABOVE CEILING: 1400 FPM D. BRANCHES ABOVE OPEN OCCUPIED SPACES: 1150 FPM
		TAG NECK SIZE-CFM	RECTANGULAR OR ROUND RETURN GRILLE OR		E. SUPPLY RUN-OUTS TO DIFFUSERS: 500 FPM F. RETURN OR EXHAUST RUN-OUTS: 600 FPM
S/S/S/J	FLOW METER				G. IN MECHANICAL ROOMS OR SHAFTS: 2000 FPM
	CURRENT SENSOR		WALL SUPPLY GRILLE OR REGISTER (SEE SCHEDULE)		<ul> <li>J. ACOUSTICAL:</li> <li>1. THE FOLLOWING NOISE NC/RC CRITERIA LEVELS WILL BE ACHIEVED AND AS DEFINED IN THE ASHRAE HVAC</li> <li>APPLICATIONS HANDROOK, THESE LEVELS ADDRESS THE MECHANICAL SYSTEMS ONLY, ACTUAL SOUND</li> </ul>
	MOTOR		SCHEDULE)		PERFORMANCE REQUIREMENTS FOR EACH SPACE MUST BE VERIFIED WITH ACOUSTICAL CONSULTANT. A. OPEN OFFICES: 30-40
A	ACTUATOR		LINEAR SLOT DIFFUSER (SEE SCHEDULE FOR NUMBER OF SLOTS ). 2-WAY THROW UNLESS NOTED		<ul><li>B. CONFERENCE ROOMS: 25-30</li><li>C. PRIVATE OFFICES: 25-35</li></ul>
HM	HYDROGEN MONITOR	TAG NECK SIZE-LENGTH-CFM	OTHERWISE. EXAMPLES: SN10-48-250 REFERS TO TAG SN WITH 10" ROUND NECK, 48" SLOT LENGTH AND 250		D. CORRIDORS AND LOBBIES: 40 E. TOILET AND STORAGE ROOMS: 45
RM	REFRIGERANT MONITOR				F. CLASSROOMS: 35
AI AO	ANALOG INPUT ANALOG OUTPUT				N. AIR FILTERS: 1. OUTSIDE AIR PRE-FILTERS: MERV-8 (MINIMUM) 2. FINAL FILTERS: MERV-13 (MINIMUM): 2. FINAL FILTERS: MERV-13 (MINIMUM):
DI DO	DIGITAL INPUT DIGITAL OUTPUT				
BAS PI	BUILDING AUTOMATION SYSTEM PULSING INPUT		FAN POWERED TERMINAL UNIT		<ol> <li>ANCHORAGE AND RESTRAINTS MUST BE COORDINATED WITH STRUCTURAL ENGINEER AND AUTHORITY HAVING JURISDICTION.</li> </ol>
	I				
			FAN POWERED TERMINAL UNIT W/ REHEAT		
					HVAC DRAWING LIST

SHEET NAME

MECHANICAL LEGEND AND ABBREVIATIONS

SECOND FLOOR MECHANICAL CEILING PLAN

MECHANICAL SPECIFICATIONS

FIRST FLOOR MECHANICAL PLAN

SECOND FLOOR MECHANICAL PLAN

SHEET NUMBER

M0.0

M0.1

M1.1

M2.2

M3.2

![](_page_10_Figure_9.jpeg)

![](_page_10_Figure_10.jpeg)

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### **MECHANICAL SPECIFICATIONS**

PART 1 - GENERAL

### 1.1 GENERAL REQUIREMENTS

A. Definitions- "Contractor" means "Mechanical Contractor" when referenced anywhere in the mechanical construction documents unless work and equipment has been coordinated between mechanical and General Contractors to be provided by others. "Needed," "Provide," and "install" means all items called out in the contract documents and any additional items not called out but required to make a complete and operational system.

C. Contractor shall visit site and verify all connections to existing work prior to bidding.

G. Codes – All work shall be performed in strict accordance with all applicable local codes and ordinances, in case of conflict between the drawings and the specifications and the codes and ordinances, the highest standard shall apply. The Mechanical Contractor shall satisfy code requirements as a minimum standard without extra cost.

D. Coordinate all cutting and patching with general contractor and other disciplines. Contractor shall be responsible for all cutting and patching related to his work.

### not cut roof framing.

these standards.

# drain

J. Contractor shall report any equipment deficiencies found to the Owner's Representative within five (5) days of discovery.

## 1.3 MECHANICAL - GENERAL

### where exposed. or ceiling supports.

B. Plans are diagrammatic. Do not scale for material quantities. All scaling should be referenced to architectural plans only. Furnish and install all components needed whether indicated or not to provide a complete and operating system.

D. Scope – The intent of the specifications and the drawings is to provide a complete and fully operational mechanical system. The Mechanical Contractor shall furnish and install all labor, material and equipment necessary to complete the mechanical work. The Contractor shall be responsible for the proper fitting of material into the building as indicated on drawings, without interference with other work, and shall make reasonable modifications in the layouts needed to prevent conflict with other trades, to provide access and for the proper execution of the work.

E. Permits and Fees – The Mechanical Contractor shall procure and pay for all permits, fees and inspections necessary to complete the mechanical scope of work.

F. Warranty – The Mechanical Contractor shall unconditionally warrant all work to be free of defects in material and workmanship for a period of one (1) year from the date of final acceptance by Owner's Representative and will repair or replace any defective work promptly and without charge and restore any other existing work damaged in the course of repairing defective materials and workmanship.

H. Standards – Equipment and materials shall conform with appropriate provisions of CSA, ULC, ARL, ASME, ASTM, UL, NEMA, ANSI SMACNA, ASHRAE, and NFPA, as applicable to each individual unit or assembly.

I. LEED – The work, materials and equipment are to be provided to meet specific LEED credit requirements as stated on schedules and plans.

J. Substitutions – All proposed substitutions shall be submitted prior to bidding and preapproved in writing. All coordination associated with substituted materials or equipment is the responsibility of the contractor.

K. Submittals – The contractor shall submit shop drawings and technical data for all equipment and materials scheduled and specified including air distribution and piping systems.

L. Operating and Maintenance Instructions – At the conclusion of the project, the contractor shall provide three (3) copies of operating and maintenance instructions for each piece of equipment requiring periodic service.

1.2 COORDINATION WITH EXISTING CONDITIONS AND OTHER TRADES

A. This project involves construction inside an existing structure. Contractors, by submitting a bid are deemed to be completely familiar with the existing conditions of the building as it influences the work described. No claims for extra compensation will be considered for existing conditions visible or reasonably inferable from a careful examination of the existing building conditions.

B. Contractor shall inspect the existing field conditions at the site and the "as built" contract documents prior to the start of any work to determine what affect the existing conditions will have on the work potential. Problem areas shall be brought to the attention of the Owner's Representative immediately.

C. Contractor shall connect their work to the existing piping, ductwork, and control systems. New work shall be compatible with the existing system materials, and construction methods. Coordinate all work with other trades and install all work in coordination with architectural and structural members. Except for necessary connections to associated equipment, no piping or ductwork is to be in contact with equipment.

E. Obtain written permission of structural engineer before proceeding with any cutting or patching of structural systems. Do

F. Care shall be taken during installation of the work to not damage or interrupt the existing building systems and services installed. Damage to existing systems and equipment caused by Contractor during the installation of their work shall be repaired and/or replaced at Contractor's expense to the satisfaction of the building owner.

G. Notifications and Compliance with Building Standards and Rules:

1. Obtain a copy of any applicable building tenant development and building construction standards and comply with

2. Shutdown of existing systems for connection to existing services shall be coordinated with the Owner's Representative. Contractor shall submit requests where they affect the operation of the building systems at least one (1) week in advance of any required shutdown. The actual shutdown period shall be as short as possible and at a time agreed to by the Owner's Representative.

H. Demolition shall be coordinated with Owner's Representative, Architect and General Contractor.

I. Contractor shall provide the following services as applicable, on all existing HVAC equipment indicated to remain: filter changes; balancing; lubrication of applicable moving components; clean all coils; calibrate unit control components; verify fan rotation and operation; verify controls operation; clean condensate pan and trap; and verify pitch of condensate

A. All materials and equipment are to be new unless otherwise designated in these documents.

B. The Mechanical Contractor shall coordinate HVAC work with other trades. The architectural drawings shall take precedence over all other drawings. See architectural drawings for dimensioned diffuser locations and mounting heights

C. All HVAC ductwork and equipment shall be supported from structure (confirm) and not from other ducts, piping, conduits

1.4 TESTING, ADJUSTING, BALANCING

A. Independent air balance contractor or qualified Mechanical Contractor shall accurately balance the air (supply, return, ventilation air, and exhaust air) and hydronic systems (heating water, chilled water, condenser water), where applicable, to provide air and water quantities indicated on the drawings and in this specification. Balancer shall be qualified for TAB work per NEBB or AABC standards. Operate automatic controls system and verify set points. Submit two (2) copies of the balance report to the Owner's Representative for review and approval.

PART 2 - PRODUCTS AND EXECUTION

2.1 DUCTWORK AND ACCESSORIES

- A. Sheetmetal Ductwork All ductwork shall be rigid sheetmetal constructed from galvanized sheet steel in accordance with SMACNA Low Velocity Duct Construction Standards. Fiberglass ductboard is not allowed. All exposed ductwork shall be round, flat, oval, spiral, or rectangular lock-seam type, as shown on HVAC plan. Assemble and install ductwork in accordance with recognized industry practice for achieving air tight (5% leakage) and noiseless (no objectionable noise) systems, capable of performing each indicated service. Furnish all required dampers, transitions, connections to air terminals, and other accessories necessary for a complete operating system. No variation of duct configuration or sizes will be permitted except by permission from the engineer.
- 1. All medium pressure supply ductwork upstream of air terminal devices shall be 4-inch w.g. pressure class.
- 2. All low pressure supply ductwork distribution shall be 2-inch w.g. pressure class.
- 3. All return and exhaust ductwork shall be 2-inch pressure class.
- 4. Ductwork crossing over corridors shall be not less than 26-gauge.
- 5. Commercial kitchen grease hood exhaust duct shall be a minimum of 16-gauge carbon steel with continuous

external welded joints fabricated in accordance with SMACNA and ASTM A569.

- 7. Ductwork carrying moisture laden air including dishwasher and shower rooms shall be aluminum or A304 stainless steel where concealed and 316 stainless steel where exposed. Ductwork shall be sealed watertight and sloped to point of origin.
- B. Flexible Ductwork Flexible ductwork shall only be installed as shown in plan and not above hard lid ceilings. Flexible ductwork shall not exceed 5' in length with one elbow. Flexible ductwork shall be pulled taut and appropriately fastened to rigid branch duct and diffuser. Bends shall be minimized and where needed be a full, radius bend. Support bands shall be installed so as to not crimp flex duct. Flexible ductwork shall be UL 181 listed as a Class 1 air duct.
- C. Duct Sealant Seal longitudinal and transverse joints with non-hardening, non-mitigating mastic or liquid elastic sealant, with VOC content no greater than 250G/L and of a type recommended by the manufacturer for sealing joints and seams in sheet metal ductwork. Cover all field joints, joints around spin-in fittings and fastening screws with mastic.
- D. Supports Provide hot-dipped galvanized steel, fasteners, anchors, rods, straps, trim and angles for support of ductwork.
- E. Dampers Furnish and install opposed-blade, multi-leaf volume control dampers where indicated on drawings. Provide manual volume dampers where branches are taken from larger ducts and in all branch ducts to individual diffusers, grilles, and registers. Provide UL listed fire dampers and/or combination fire smoke dampers where needed and in accordance with NFPA and local codes. Coordinate with General Contractor and electrical for fire alarm interface and power. Provide conveniently located access doors of ample size and quantity for servicing the dampers. Where required by code or AHJ, F&I motorized campers for OSA (not necessarily shown).
- F. Grilles, Registers and Diffusers Grilles, registers and diffusers shall be indicated on the drawings and schedules. Provide all miscellaneous items necessary for a complete and proper installation in the type of walls and ceilings used in this project.
- G. Thermal Insulation Provide external thermal insulation with an integral vapor barrier facing of sufficient thickness to meet local energy code requirements and ASHRAE 90.1, whichever is more stringent. Provide insulation on exhaust and outside air ducts, and on concealed portions of supply and return air ducts. Do not externally insulate exposed ductwork and portions of ductwork that are internally lined with code required thickness. Thermal insulation to comply with an NFPA flame spread of 25 or less, and smoke developed to greater than 50. Internally insulate exterior ductwork per code.
- H. Access Provisions Provide access doors in hard walls and ceilings for all equipment and ductwork requiring service. Provide access doors in ductwork as required access.
- 2.2 INSULATION
- A. Insulate ductwork and piping systems to meet local energy code requirements. Insulation materials to meet flame spread and smoke development rating of 25/50 or less. Where systems are exposed to damage the insulation shall be protected with a sheet metal or plastic cover. Where ductwork is installed exposed to the outside, insulation is to be executed using lined ductwork.

![](_page_11_Figure_94.jpeg)

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N( 1. 2. 3. 4. 5. 6.	DTES: MAXIM MAXIM ALL VIS COORI NECK S PROVI	UM TO UM NC SIBLE S DINATE SIZE AN DE REC
	T No 1. 2. 3. 4. 5. 6.	TAG E S NOTES: 1. MAXIM 2. MAXIM 3. ALL VIS 4. COORI 5. NECK S 6. PROVI

![](_page_12_Figure_2.jpeg)

![](_page_12_Picture_3.jpeg)

13

\_ \_ \_ \_ \_ \_ \_

	DIFFUSER AND GRILLE SCHEDULE												
NUFACTURER	MODEL	DESCRIPTION	FACE TYPE	FACE SIZE	COLOR	MATERIAL	OBD	NOTES					
TITUS	PAR-AA	SQUARE CEILING EXHAUST	PERFORATED	12"x12"	WHITE	ALUMINUM	NO	ALL					
TITUS	PAS-AA	SQUARE CEILING SUPPLY	PERFORATED MODULAR CORE	12"x12"	WHITE	ALUMINUM	NO	ALL					

TAL PRESSURE DROP SHALL NOT EXCEED 0.1" WG WITH DUCT TRANSITION. CLEVEL SHALL BE 30.

SURFACES AND DUCTWORK BEHIND FACE SHALL BE PAINTED FLAT BLACK. E WITH ARCHITECTURAL REFLECTED CEILING PLANS FOR BORDER TYPES.

ND CFM SHOWN ARE ON PLANS (EXAMPLE: SA12x12-400 REFERS TO TAG "SA" WITH 12x12 NECK AND 400 CFM). CTANGULAR/SQUARE TO ROUND TRANSITION AS REQUIRED AND SIZED FOR MAXIMUM 0.01" WG TOTAL PRESSURE DROP.

![](_page_12_Figure_8.jpeg)

- 2. PROVIDE HANGERS AND SEISMIC BRACING PER SMACNA AND BUILDING CODE.
- 3. LOCATE MANUAL BALANCING DAMPERS IMMEDIATELY DOWNSTREAM OF EACH DUCT TAP. MAINTAIN MINIMUM 36" CLEARANCE BETWEEN LEADING OR TRAILING ELBOW JOINT AND DUCT TAP FITTINGS.
- 5. TURNING VANES REQUIRED ON RECTANGULAR DUCT SYSTEM ELBOWS. SINGLE THICKNESS VANES UP TO 25" HEIGHT AND DOUBLE THICKNESS VANES IN DUCTS GREATER THAN 25" HEIGHT. RADIUSED ELBOWS MAY BE
- USED AS AN ALTERNATE. 6. NO TURNING VANES REQUIRED ON DUCT SIZES LESS THAN 180 SQ. IN. IF DUCT VELOCITY IS LESS THAN 1500
- FPM.

![](_page_12_Figure_14.jpeg)

**1** 

![](_page_12_Figure_15.jpeg)

![](_page_12_Figure_16.jpeg)

![](_page_12_Figure_18.jpeg)

- 1. RELOCATE EXISTING SUPPLY DIFFUSER AND DEMO DUCT BACK TO SOUND LINED SECTION. PROVIDE END CAP.
- 2. PROVIDE NEW SUPPLY TAPS AS SHOWN. REBALANCE TERMINAL UNIT TO 290 CFM.
- 3. POINT OF NEW CONNECTION INTO EXISTING EXHAUST DUCT.
- 4. EXHAUST UP TO EF-1 ON ROOF. REBALANCE FAN TO 1375 CFM.

![](_page_12_Figure_23.jpeg)

- NOTES: 1. PROVIDE DUCT LINER AND/OR EXTERNAL DUCT INSULATION AS NOTED ON PLANS OR IN SPECIFICATIONS. PROVIDE HANGERS AND SEISMIC BRACING PER SMACNA AND BUILDING CODE REQUIREMENTS.
- B. LOCATE MANUAL BALANCING DAMPERS IMMEDIATELY DOWNSTREAM OF EACH DUCT TAP. 4. CUSHION HEADS OR BULLHEAD TEES ARE NOT ALLOWED.
- 5. MAINTAIN MINIMUM 36" CLEARANCE BETWEEN LEADING OR TRAILING ELBOW JOINT AND DUCT TAP
- FITTINGS. 6. RADIUSED ELBOWS OR TURNING VANES REQUIRED ON RECTANGULAR DUCT SYSTEM ELBOWS. SINGLE THICKNESS VANES UP TO 25" HEIGHT AND DOUBLE THICKNESS VANES IN DUCTS GREATER THAN 25" HEIGHT.

## 3 SUPPLY DUCT FITTINGS SCALE: NONE

**LEVEL 1 - CEILING PLAN - MECHANICAL** SCALE: 1/4" = 1'-0"

2' 4'

### ISSUED FOR PERMIT AND BID

![](_page_12_Figure_34.jpeg)

![](_page_12_Figure_35.jpeg)

![](_page_13_Figure_0.jpeg)

## KEYED NOTES (#)

- 1 BALANCE FLOOR GRILLE TO 855 CFM (TYP 3) 2 RELOCATE EXISTING GRILLE NORTH TO LOCATION SHOWN
- WITHIN CONTROL ROOM
- 3 RELOCATE EXISTING GRILLE SOUTH TO LOCATION SHOWN WITHIN CONTROL ROOM
- 4 GRILLE TO BE THOROUGHLY CLEANED PRIOR TO RELOCATION.
- 5 CAP AND SEAL EXISTING PENETRATION AIRTIGHT. COVER INFILL WITH SALVAGED EXISTING CARPET.
- 6 RELOCATE EXISTING TEMPERATURE SENSOR SERVING VAV
- 26A & VAV 26B.
- 7 BALANCE EXISTING VAV BOX TO 1280 CFM MAX, 480 CFM MIN.

![](_page_13_Figure_10.jpeg)

![](_page_13_Figure_15.jpeg)

![](_page_14_Figure_0.jpeg)

![](_page_14_Figure_10.jpeg)

	LIGHTING	DISTF	<b>RIBUTION &amp; EQUIPMEN</b>
SYMBOL	DESCRIPTION RECESSED 2X4 LUMINAIRE	SYMBOL	DESCRIPTION BRANCH CIRCUIT PANELBOARDS, SURFACE AND RECESS
0	SURFACE MOUNTED 2X4 LUMINAIRE		MOUNTED
	RECESSED 1X4 LUMINAIRE		MOTOR CONTROL CENTER WITH CODE CLEARANCES SHOWN DASHED EQUIP. = FUTURE
<u> </u>	SURFACE MOUNTED 1X4 LUMINAIRE		TRANSFORMER WITH CODE CLEARANCES SHOWN
$\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ $	RECESSED 2X2 LUMINAIRE		SERVICE AND/OR DISTRIBUTION EQUIPMENT WITH CODE
•	SURFACE MOUNTED 2X2 LUMINAIRE		CONNECTION TO MOTOR PROVIDED BY OTHERS
•	SHADING OF ANY LUMINAIRE INDICATES CONNECTION TO ALTERNATE POWER SOURCE (EMERGENCY, UPS, STANDBY, ETC.) PER CIRCUITING INDICATED		CONNECTION TO VARIABLE FREQUENCY DRIVE WITH INTEGR
	SUSPENDED LINEAR LUMINAIRE (SIZE VARIES)		DISCONNECT SWITCH, SIZE AS NOTED OR IF NOT SHOWN SIZE
	WALL MOUNTED LINEAR LUMINAIRE (SIZE VARIES)		SCHEDULE
Ø	SUSPENDED PENDANT LUMINAIRE (SIZE VARIES)	F	FUSED DISCONNECT SWITCH, SIZE AS NOTED. SIZE FUSE PE MANUFACTURER'S RECOMMENDATIONS
	RECESSED DOWNLIGHT, CEILING MOUNTED		ENCLOSED CIRCUIT BREAKER DISCONNECT SWITCH, TRIP SI
	SURFACE DOWNLIGHT, CEILING MOUNTED		
WW DIRECTION→	SURFACE WALLWASH		CONTACTOR. SIZE PER LOAD SERVED. NEMA SIZE #1 MINIMU
	RECESSED LINEAR WALLWASH		MAGNETIC MOTOR STARTER (CONTROLLER) OR CONTACTOR SIZE PER LOAD SERVED. NEMA SIZE #1 MINIMUM.
	SURFACE LINEAR WALLWASH		CONNECTION TO EQUIPMENT PROVIDED BY OTHERS. SHADE
	RECESSED WALL MOUNTED LUMINAIRE		ON ALT. POWER SOURCE NOTED
	TRACK LIGHTING WITH HEADS AS INDICATED.		PROVIDED BY OTHERS. SHADED = ON ALTERNATE POWER
	RECESSED CEILING ADJUSTABLE POINT SOURCE		EQUIPMENT OR TERMINAL ENCLOSURE AS NOTED. SURFACE
Ø	SURFACE CEILING ADJUSTABLE POINT SOURCE		RECESS MOUNTED
Q ^	WALL MOUNTED LUMINAIRE		DAMPER MOTOR
			BUSWAY RISER
HO	THROUGH SECTION. LENGTH AS SHOWN.	«C – «F –	SIZE AS NOTED.
⊨g=	WALL MOUNTED FLUORESCENT STRIPLIGHT		
	UNDERCABINET FLUORESCENT STRIPLIGHT		DIAGRAMS
	CONTINUOUS LINEAR SOURCE (LED, COLD CATHODE, NEON, FIBER OPTIC, ETC)	SYMBOL	DESCRIPTION
4-4-4-4	BATTERY POWER EMERGENCY UNIT EQUIPMENT (SEE LUMINAIRE	٩	AUTOMATIC TRANSFER SWITCH (ATS)
	SCHEDULE FOR QUANTITY OF HEADS) - WALL, CEILING MOUNTED.		AUTOMATIC TRANSFER SWITCH WITH MAINTENANCE
♥∞	ARROWS AS SHOWN		BYPASS(BIATS)
Ø	BOLLARD		
	POLE MOUNTED LUMINAIRE- SINGLE OR DUAL HEAD		NORMALLY CLOSED CONTACTOR OR RELAY CONTACTS
			BUS DUCT
			BUS BAR
	GARAGE LIGHTING LUMINAIRE WITH CUTOFF LOUVERS		BATTERY GENERAL
HA	LUMINAIRE MARKING CONVENTION LEGEND:		RESISTOR
	HA = LUMINAIRE TYPE IDENTIFICATION. SEE LUMINAIRE SCHEDULE.	$\longrightarrow$	CONNECTOR, FEMALE AND MALE RESPECTIVELY
HA	3c = CIRCUIT NUMBER VIA LOCAL SWITCH (LOWERCASE LETTER) THAT SERVES THE LUMINAIRE.		PIPE GROUND
3A	INDICATES LOW VOLTAGE RELAY OR LIGHTING		CONTACTOR COIL
SV	ITCHING CONTROLS		I = INTERMEDIATE CLASS
SYMBOL	DESCRIPTION	SPD	SURGE PROTECTION DEVICE
Sª	SINGLE POLE SWITCH (SUPERSCRIPT DENOTES SIMILARLY MARKED LUMINAIRES CONTROLLED TOGETHER)		CURRENT TRANSFORMER
S₂	TWO POLE SWITCH		POTENTIAL TRANSFORMER
S <sub>3</sub>	THREE WAY SWITCH		NORMALLY OPEN PUSH BUTTON
S <sub>4</sub>	FOUR WAY SWITCH		FUSED VOLTAGE SENSE LEADS
Sκ	KEY OPERATED SWITCH	(PF)	METER: POWER FACTOR
D	DIMMER SWITCH. NUMBER INDICATES WATTAGE RATING. IF NOT		
D	DIMMER SWITCH UNDER SEPARATE COVERPLATE	(KWH)	METER: KILOWATT HOUR
Ð	LOW-VOLTAGE DIMMER SWITCH	M	UTILITY CO. APPROVED SOCKET WITH METER INSTALLED. SQUARE = REMOTE MOUNTED
S <sub>PL</sub>	SWITCH WITH PILOT LIGHT (PILOT IS "ON WHEN SWITCH IS "OFF").	DMU	DIGITAL METER UNIT. REFER TO SPECIFICATIONS.
S <sub>TS</sub>	TIMER SWITCH	STB	CURRENT TRANSFORMER SHORTING TERMINAL BLOCK.
\$ <sup>5A</sup>	LOW VOLTAGE MOMENTARY CONTACT SWITCH, UPPER CASE	$\oslash$	TERMINAL FOR FIELD CONNECT, SIZE & TYPE SUITABLE FOR CONDUCTOR INSTALLED.
	VOLTAGE RELAY CONTROLLING SIMILARLY MARKED LUMINAIRES.	X	LED INDICATOR LIGHT, PUSH TO TEST, R=RED, G= GREEN, B=
S <sub>WP</sub>	WEATHERPROOF SWITCH		BLUE, Y= YELLOW, W= WHITE
S <sub>v</sub>	LINE VOLTAGE, VARIABLE SPEED FAN CONTROL SWITCH. LOCATE ADJACENT TO ADJACENT TO LIGHT SWITCHES.		GROUNDED WYE CONNECTION
S <sub>T</sub>	MOTOR-RATED THERMAL OVERLOAD SWITCH		CONNECTION TO GROUND
S <sub>OR1</sub>	LIGHTING CONTROL OVERRIDE SWITCH. NUMBER = ZONE CONTROLLED	_ 100AT <sup>ل</sup> م	CIRCUIT BREAKER, WITH TRIP & FRAME AMPERE RATING
PC	PHOTOCELL	225AF ,/	
	EQUIPMENT OPERATOR PUSH BUTTON STATION. PROVIDED WITH	225AF 400AS	FUSED SWITCH, WITH FUSE AND SWITCH AMPERE RATING
	EQUIPMENT, INSTALLED AND CONNECTED BY ELECTRICAL, UON.		INDIVIDUALLY MOUNTED CIRCUIT BREAKER
	TIME CLOCK	-<52->>>	CIRCUIT BREAKER, MEDIUM VOLTAGE, DRAWOUT
	LIGHT SWITCH W/ INTEGRAL OCC SENSOR - WALL MOUNTED		
	360 DEGREE OCCUPANCY SENSOR - CEILING MTD.		
OS⇒	180 DEGREE OCCUPANCY SENSOR - CEILING MTD.	LEA L	SHUNT TRIP UNIT 1201/AC OR VOI TAGE AS NOTED
←OS→	CORRIDOR/AISLE OCCUPANCY SENSOR - CEILING MOUNTED	AM	INTEGRAL AMMETER DISPLAY
	COMBINATION OCCUPANCY SENSOR & SWITCH GANGED UNDER	(K)	KEY INTERLOCK
S <sup>a</sup> [OS] b	LUMINAIRES W/ SWITCH-CONTROLLED 1/2 LIGHT REDUCTION.		CAPACITOR, POWER FACTOR CORRECTION, SIZE IN KVAR
T T	THERMOSTAT - WALL, CEILING.		GENERATOR
S <sub>EPO</sub> EPO	EMERGENCY POWER OFF, HEAVY-DUTY, OIL-TIGHT RED MUSHROOM-HEAD PUSHBUTTON WITH GUARD.		FUSE, HOLDER & PULLER
	LIGHTING CONTROL PANEL AND ASSOCIATED COMPONENTS.	C	CONNECTION TO CHILLER
	FRUVIDE CONTROL POWER AS REQUIRED OR AS INDICATED.		

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T		POWER DEVICES	RE	FERE	NCE SYMBOLS	
	SYMBOL	DESCRIPTION	SYMBOL		DESCRIPTION	
		SIMPLEX RECEPTACLE - WALL, CEILING, ON ALT.	XX	KEYED NOTE RE	FERENCE	
WN,		DUPLEX RECEPTACLE - WALL, CEILING, ON ALT.	125.4	AND FEEDER SC	IT OR FEEDER TAG; REFER TO BRANCH CHEDULE FOR WIRE AND CONDUIT SIZE	S &
	-0 X -0 X	SPECIAL PURPOSE RECEPTACLE -WALL, CEILING ON ALT. POWER; NEMA CONFIGURATION AS NOTED	1 E4.1	REFER TO DETA	NIL ON DRAWING INDICATED	
	₩ AB	RECEPTACLE TYPE SHOWN -WALL -ABOVE COUNTER BACKSPLASH. SEE ARCHITECTURAL DRAWINGS.	2	ELEVATION TAG	: REFER TO ELEVATION NUMBER ON D	RAWING
GRAL	"ON ALT."	SHADED RECEPTACLES NOTED "ON ALT." ABOVE ARE CONNECTED TO ALTERNATE POWER SOURCE (EMERG., STANDBY,	E4.1			
IZE	-	UPS, ETC.) PER CIRCUITING INDICATED DUPLEX RECEPTACLE - WALL - HALF SWITCHED	A M-1			
	tation = table = tabl	CONTROLLED DUPLEX / DOUBLE DUPLEX RECEPTACLE	K112	SCHEDULE	MENT TAG, REFER TO KITCHEN EQUIPN	
ER	₩ ₩ ₩	COMBINATION SWITCH/DUPLEX RECEPTACLE DUPLEX RECEPTACLE - WALL - WITH INTEGRAL GROUND FAULT		MECHANICAL EC	QUIPMENT IDENTIFICATION TAG	
SIZE AS	E WE	CIRCUIT INTERRUPTER RECEPTACLE TYPE SHOWN W/ WEATHERPROOF COVER AND		EQUIPMENT BY	OTHERS IDENTIFICATION TAG	
R) OR UM.		INTEGRAL GROUND FAULT CIRCUIT INTERRUPTER		V	VIRING	
)R.		WALL MOUNTED ELECTRICAL CONNECTION TO ELECTRIFIED		NEW WORK	DESCRIPTION	
ED =	<u>ح</u>	FURNITURE. PROVIDE 8 WIRES (4 HOTS, 1 DEDICATED NEUTRAL, 1 COMMON NEUTRAL, 1 IG) NEUTRALS TO BE #10 AWG. USE LIQUID- TIGHT FLEX.		WIRING CONCE OR ROUTED IN	ALED IN FLOOR OR UNDER GRADE CEILING SPACE OF FLOOR BELOW.	
r		CLOCK HANGER RECEPTACLE	(E)	EXISTING WORI	K TO REMAIN	
		FLUSH FLOOR BOX DEVICE - DEVICE TYPE PER SYMBOLS ABOVE	(ER)	EXISTING RELO		н
E AND		PEDESTAL FLOOR DEVICE - DEVICE TYPE PER SYMBOLS ABOVE POKE THRU UNIT WITH DUPLEX RECEPTACLE - FLUSH, PEDESTAL	(D)	EXISTING WORI	K TO BE REMOVED	
			T	TELEPHONE SY	STEM CONDUIT	
NECT.		PEDESTAL MOUNTED.	MV	MEDIUM VOLTA	GE CONDUIT	H
		COMBO POKE THRU UNIT WITH DUPLEX RECEPTACLE AND TELEPHONE OUTLET - FLUSH, PEDESTAL MOUNTED.	G	BARE GROUND	ING GRID OR CONDUCTORS, UON.	
		MULTI-SERVICE FLOOR BOX CAST IN CONC. OR IN RAISED FLOOR - SEE ARCH DWGS <sup>,</sup> WITH RECEPTACLES & SIGNAL OUTLETS AS	GC	GROUNDING CO UON.	DNDUCTOR(S) ROUTED IN CODE SIZED	CONDUIT,
		NOTED.		STROKES INDIC NOTE: WIRING S	ATE QUANTITY OF #12 AWG. CONDUCT STROKES FOR 20A BRANCH CIRCUITS A AWINGS, CONTRACTOR SHALL USE INFO	ORS, UON. RE NOT
		RC-700 SERIES.		IN PANEL AND E REQUIRED CIRC	BRANCH CIRCUIT SCHEDULES TO PROV	IDE
		TELE/POWER POLE, POWER POLE		GROUND		
		FURNITURE		НОТ		
	<u>()</u> ====	TWO-PIECE SURFACE METAL RACEWAY WITH RECEPTACLES AS NOTED, BACK LENGTH AS INDICATED ON THE DRAWINGS AND WITH ALL FITTINGS AS REQUIRED.		NEUTRAL	ING TO INDICATED DESTINATION, 3/4"C	. MIN. OR AS
	$\bigcirc \mathbb{Q} \ \bigcirc \mathbb{Q}$	TWO OR THREE COMPARTMENT SURFACE METAL RACEWAY WITH RECEPTACLES AND OUTLETS AS INDICATED, LENGTH AS	L1A-1,3	OTHERWISE NO NOTED IN RESP FEEDER AND BI	DTED. CONTRACTOR SHALL USE CIRCU PECTIVE SCHEDULES AND INFORMATION RANCH CIRCUIT SCHEDULES.	IT SIZES N IN THE
		INDICATED ON THE DRAWINGS. PROVIDE ALL FITTINGS AS REQUIRED.	HD1AO	CONDUIT RUN T	FURNED UP THROUGH FLOOR OR CEILI REQUIRED.	NG. CORE &
	TX	REMOTE MOUNTED LINE TO LOW-VOLTAGE FUSED TRANSFORMER. CONCEAL FROM VIEW.	· · · · · · · · · · · · · · · · · · ·	CONDUIT RUN T CORE & FIREPR	FURNED DOWN THROUGH FLOOR OR C	EILING.
			]		BED OUT AT LOCATION SHOWN.	
	SYMBOL		[]	TELEPHONE/DA	TA SLEEVE THROUGH WALL, ABOVE CE	EILING.
		TERMINAL/MOUNTING BOARD, 8' HIGH, 3/4"x4'x WIDTH AS SHOWN, FIRE RETARDANT TREATED PLYWOOD.		EXTEND TO ACC BUSHINGS. (1) 1 CABLE INSTALL	CESSIBLE TILE CLG. BOTH SIDES. TERM 1.25" CO UON. COORDINATE LOCATIONS ER(S) PRIOR TO ROUGH-IN.	IINATE WITH S WITH
		SIGNAL SYSTEM EQUIPMENT ENCLOSURES AS NOTED- SURFACE, RECESSED MOUNTED		BASKET TYPE C	CABLE TRAY WITH 90 DEGREE ELBOW S	HOWN
		COMBO TELEPHONE/DATA OUTLET - WALL		LADDER TYPE (	CABLE TRAY WITH 90 DEGREE ELBOW S	HOWN
		TELEPHONE OUTLET - WALL, W = USE HIGHER MOUNTING HEIGHT PER MOUNTING HEIGHT DETAIL.	⊢JJ J	JUNCTION BOX 4" SQ. BOX MIN.	es, wall, ceiling and flush floor i , larger if required	MOUNTED.
		X = INDICATES QUANTITY OF CABLE/JACKS. (2) UON.		WIRING EXTENS	SION POINT - CONDUIT TO MC CABLE OF D WIRING SYSTEM J-BOX ABOVE ACCE	
		X = INDICATES QUANTITY OF CABLE/JACKS. (2) UON.		"HARD" CEILING (EMERG,UPS,ET	G AREAS. SHADED= ON ALT. POWER SO C.)	
		SPEAKER - WALL, CEILING VOLUME CONTROL - WALL	PB	PULL BOX, MIN.	SIZE PER NEC., UON.	
		BELL	<del>ⅢŢ<b>╷╹╻</b>Ţ╷</del>	UNDERFLOOR	RACEWAY	
		BUZZER			OUIT CONNECTION	REEER TO
		CHIME		FSD CONNECTI	ON DETAIL IF NOT SHOWN	
		SYSTEM CLOCK - WALL, CEILING INTERCOM STATION - WALL, DESK, M = MASTER STATION	G	ROUNI	DING SYSTEM	
	$  \qquad \qquad$	MICROPHONE JACK - WALL, FLOOR	SYMBOL		DESCRIPTION	
2		PUSHBUTTON OR PUSHBUTTONS	G	BARE GROUND		
;=	<b>↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓</b>	RF COAX CABLE OUTLET (TV, VCR, ETC.)	GC	UON.	JNDUCTOR(S) ROUTED IN CODE SIZED	
		COMBINATION RF COAX CABLE AND DATA OUTLET	•	GROUND GRID	BOND POINT	
	S⊲ PA	PAGING SYSTEM HORN (OUTDOOR)	•	GROUND GRID	BOND POINT - MECHANICAL CONNECTION	
	-AV>	AV INPUT OUTLET, 1"C WITH 3-GANG BOX. CONDUIT STUBBED		GROUND BAR, S	SEE PLANS AND SPECIFICATIONS FOR I	DIMENSIONS
		ASSISTIVE LISTENING INFRARED TRANSMITTER PANEL, 1"C WITH	•	GROUND ROD I	.OCATION	
		2-GANG BOX. CONDUIT STUBBED ABOVE ACCESSIBLE TILE CEILING.		GROUND ROD I	N TEST WELL	
		RF COAX CABLE DISTRIBUTION AMPLIFIER. PROVIDE 120V POWER AS REQUIRED OR AS INDICATED. SEE RISER DIAGRAM.	٢	LIGHTNING PRO	DTECTION PARAPET MOUNTED AIR TER	MINAL
		FLUSH FLOOR DEVICE - DEVICE TYPE PER SYMBOLS ABOVE				RMINAL
		PEDESTAL FLOOR DEVICE - DEVICE TYPE PER SYMBOLS ABOVE		LIGH I NING PRO		J
		DUAL COIL SPEAKER - SURFACE CEILING, RECESSED CEILING.	<b>-</b> →	LIGHTNING PRO	TECTION BOND PLATE	•
	S <sub>D</sub> S <sub>D</sub>			LIGHTNING PRO	DTECTION BIMETAL CONNECTION	
	S ■ S ■ S	ACOUSTIC TILE CEILING.	X			
	S S S S	ACOUSTIC TILE CEILING.	EQUIP	MENT		/ENTIO
	SD SD SD EXAM MCC-	ACOUSTIC TILE CEILING. ELECTRICAL PLES/LEGEND H 1 N A ATS - AUTOMATIC TRANSFER SWI	EQUIP ENT TYPE TCH SUB - UNIT SU	MENT	NAMING CONV POWER SYSTEMS BLANK - NORMAL LOADS	<b>VOLTAG</b> H - 480/277 VOLT
	SDD SD SDD SDD SDD SDD SDD SDD SDD SDD S	ACOUSTIC TILE CEILING.         ELECTRICAL         PLES/LEGEND       EQUIPME         H       1       N       A         L       1       E       A         H       1       S       A         H       1       S       A         H       1       S       A         H       1       S       A         H       1       W       A         XER - TRANSFORMER       S       S	EQUIP ENT TYPE TCH SUB - UNIT SU SWBD - SWITC H SWGR - SWITC DP - DISTRIBUT	<b>MENT</b> IBSTATION CHBOARD CHGEAR ITION PANFI	<b>NAMING CONV</b> <b>POWER SYSTEMS</b> BLANK - NORMAL LOADS M - MAIN UTILITY SERVICE E - EMERGENCY POWER (Life Safety) S - STANDBY POWFR	<b>VOLTAG</b> H - 480/277 VOLT L - 208/120 VOLT MV - MEDIUM VC
	SD SD SD SD SD SD SD SD SD SD SD SD SD SD SD SD S	ACOUSTIC TILE CEILING.         ELECTRICAL         PLES/LEGEND       EQUIPME         H       1       N       A         L       1       E       A         H       1       S       A         H       1       S       A         H       1       S       A         H       1       S       A         H       1       S       A         H       1       W       A         H       1       W       A         H       1       W       A         H       2       B       UTX - UTILITY MAIN TRANSFORMER         UTX - UTILITY MAIN TRANSFORMER       MCC - MOTOR CONTROL CENTER	EQUIP ENT TYPE TCH SUB - UNIT SU SWBD - SWITC H SWGR - SWITC DP - DISTRIBU R PNL - BRANCH	MENT IBSTATION CHBOARD CHGEAR ITION PANEL I PANEL	<b>NAMING CONV</b> <b>POWER SYSTEMS</b> BLANK - NORMAL LOADS M - MAIN UTILITY SERVICE E - EMERGENCY POWER (Life Safety) S - STANDBY POWER U - UNINTERRUPTIBLE POWER (UPS) C - CRITICAL POWER (Hospital)	<b>VOLTAG</b> H - 480/277 VOLT L - 208/120 VOLT MV - MEDIUM VC

NOTE PROJ	E: NOT ALL SYMBOLS OR ABBREVIATIONS ARE APPLICABLE TO THIS ECT. REFER TO DETAILS AND NOTES FOR MOUNTING HEIGHTS.	ABBREVIATIONS								
FI	RE ALARM SYSTEM	(E)	EXISTING TO REMAIN	IMC						
MBOI	DESCRIPTION	(F) (R)	EXISTING TO BE REMOVED	KOMIL	KEYED NOTE					
		(RL) AB	EXISTING TO BE RELOCATED ABOVE COUNTER BACKSPLASH	KO KW	KNOCK OUT KILOWATTS					
FACP	PROVIDE 120V POWER AS REQUIRED OR AS INDICATED.	ACU	AIR CONDITIONING UNIT	KVA	KILOVOLT-AMPERES					
FAA	FIRE ALARM ANNUNCIATOR	AC A, AMF	ALTERNATING CURRENT P AMPERES	LTG LCP	LIGHTING LIGHTING CONTROL PANEL					
		ADJ		MAX						
	FIRE ALARM SYSTEM MANUAL PULL STATION, WALL MOUNTED	AF	AMPERE (RATED) FUSE OR CB FRAME ABOVE FINISHED FLOOR	MCA	MAIN CIRCUIT AMPERES					
£	ALARM BELL OR GONG	AFG AH I		MFR MIN						
- <sup>6</sup>	STROBE LIGHT - WALL, CEILING MOUNTED	AIC	EQUIPMENT SHORT CIRCUIT INTERRUPT	MISC	MISCELLANEOUS					
$\prec$	(# = CANDELA RATING)	AL	RATING (RMS SYM. AMPS) ALUMINUM (ALLOY)	MLO MO	MAIN LUGS ONLY MANUAL OPERATOR					
v ⊿	SPEAKER - WALL, CEILING MOUNTED	ALC		MTD MTP	MOUNTED					
₽X E	COMBINATION SPEAKER/STROBE, WALL MOUNTED (# = CANDELA RATING)	AT ATS	AMPERE (RATED) SWITCH CIRCUIT BRKR TRIP SETTING (AMPS) AUTOMATIC TRANSFER SWITCH	N NC	NEUTRAL (GROUNDED CONDUCTOR) NORMALLY CLOSED					
ΞÞ	HORN - CEILING, WALL MOUNTED	AUTO AUX AWG	AUTOMATIC AUXILIARY AMERICAN WIRE GAUGE	NEC -,NEG NFMA	NATIONAL ELECTRICAL CODE NEGATIVE NATIONAL ELECTRICAL MEGR'S ASSOC					
∃X A	COMBINATION HORN/STROBE - WALL, CEILING MOUNTED (# = CANDELA RATING)	BATT BC	BATTERY BARE COPPER	NL NO	NIGHT LIGHT (UNSWITCHED) NORMALLY OPEN					
⊐≻ᢑ	COMBINATION MINI HORN/STROBE - WALL, CEILING MOUNTED (# =	BG BRKR	BELOW GRADE CIRCUIT BREAKER	NTS NP	NOTTO SCALE NAMEPLATE					
ΞΥX≈	CANDELA RATING)	С	CONDUIT (CIRCULAR RACEWAY)							
Å	SPRINKLER VALVE TAMPER SWITCH CONNECTION	CAB	CIRCUIT BREAKER	OFCI	OWNER FURNISHED CONTRACTOR INSTALLED					
$\diamond$	SPRINKLER FLOW SWITCH CONNECTION	CFM CKT	CUBIC FEET PER MINUTE CIRCUIT	ODOI OS	OWNER FURNISHED, OWNER INSTALLED					
~		CLG	CEILING	P	POLE					
-()) BR,BT	LIGHT BEAM TYPE SMOKE DETECTOR (BR=BEAM RECEIVER, BT=BEAM TRANSMITTER)	CO	CONDUIT ONLY CONTROL POWER TRANSFORMER	РВ PH,Ø	PUSHBUTTON PHASE					
, ,		CT	CURRENT TRANSFORMER	PNL + POS						
E)	TUBES. PHOTOELECTRIC TYPE UON.	DC	DIRECT CURRENT	PRI	PRIMARY					
$\mathbb{O}_{D}$	SMOKE DETECTOR, LOW AIR VELOCITY IN DUCT MOUNTED PHOTOELECTRIC TYPE UON.	DISC DIA DIV	DISCONNECT DIAMETER DIVISION	REQD RL RNC	REQUIRED RELOCATED RIGID NON-METALLIC CONDUIT (PVC)					
Æ	SMOKE DETECTOR - WALL, CEILING MOUNTED (P=PLENUM	DP DPDT	DISTRIBUTION PANEL DOUBLE POLE DOUBLE THROW	RS RST	RAPID START REMOTE STATION TRANSMITTER					
() P,B,R,C	MOUNTED, B=W/RELAY BASE, R=ELEVATOR RECALL, C=INTEGRAL	DPST	DOUBLE POLE SINGLE THROW	SAD	SEE ARCHITECTURAL DRAWINGS					
	TO DOOR CLOSURE)	E,EME	R EMERGENCY	SEC	SECONDARY SHEET NOTE					
$\bigcirc$	SMOKE DETECTOR MOUNTED BELOW RAISED FLOOR	EF	EXHAUST FAN	SOL	SOLENOID					
$\bigcirc \bigcirc$	ELECTROMAGNETIC DOOR HOLDER - WALL, FLOOR, DOOR	ENCL	ENCLOSURE	SPDT	SINGLE POLE DOUBLE THROW					
C C	CLOSURE MOUNTED. COORDINATE WITH DOOR INSTALLER.	EO EOL	ELECTRICALLY OPERATED END OF LINE	SPST SUB	SINGLE POLE SINGLE THROW SUBSTATION					
LM	DATA LOOP ISOLATION MODULE	EWC	ELECTRIC WATER COOLER	SWBD	SWITCHBOARD					
СМ	ADDRESSABLE CONTROL MODULE	FA	FIRE ALARM	TB	TERMINAL BOARD					
MM	ADDRESSABLE MONITOR MODULE	FAA FACP	FIRE ALARM ANNUNCIATOR	TDC TDO	TIME DELAY CLOSING					
		FBO	FURNISHED BY OTHERS	TEL	TELEPHONE					
	END OF LINE RESISTOR (MAY NOT BE SHOWN ON PLANS)	FC FF	FOOT CANDLES FLUSH FLOOR MOUNTED	I YP UF	UNDERFLOOR					
<b>[</b> ["	FIREMAN'S PHONE JACK, WALL MOUNTED	FLA	FULL LOAD AMPERES	UG						
J [["]	FIREMAN'S PHONE HANDSET, WALL MOUNTED	FPB	FAN POWERED BOX	UON	UNLESS OTHERWISE NOTED					
P	FIRE/SMOKE DAMPER BY DIV 15 WIDTH OF SYMBOL WILL VARY	FSD FW	FIRE/SMOKE DAMPER FLUSH WALL MOUNTED	UPS UTX	UNINTERRUPTIBLE POWER SUPPLY UTILITY TRANSFORMER					
	WITH DUCT WIDTH. PROVIDE POWER AND MONITORING AS	FU	FUSE	V	VOLTS					
	INDICATED. REFER TO FSD CONNECTION DETAIL.	GEN	GROUND FAULT CIRCUIT INTERRUPTER	VA VFD	VOLT-AMPERES VARIABLE FREQUENCY DRIVE					
$\bigcirc$	FLAME DETECTOR (FLICKER DETECTOR)	GRAP	GENERATOR REMOTE ANNUNCIATOR PANEL	W W/	WATT WITH					
	HEAT DETECTOR, CEILING MOUNTED. RATE OF RISE AND FIXED TEMPERATURE TYPE, UON.	GRC	GALVANIZED RIGID STEEL CONDUIT HANDLE LOCK-ON(OFF)	W/O WP	WITHOUT WEATHERPROOF					
$\bigcirc$	HEAT DETECTOR (R/C=RATE OF COMBUSTION, F=FIXED TEMP.	HP HPF	HORSEPOWER HIGH POWER FACTOR	XFR XP	EXPLOSION PROOF					
<sup>()</sup> R/C,F,R	ONLY, R=RATE OF RISE ONLY)	HTR		Z " INI	ZONE					
WSD	EARLY WARNING SMOKE DETECTION SYSTEM - INCLUDES ALL	IES	ILLUMINATING ENGINEERING SOCIETY	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	FEET					
	SAMPLING TUBING	IBC ID	INDIVIDUAL BRANCH CIRCUIT INSIDE DIAMETER	Ø >	PHASE GREATER THAN					
Ì	LIGHT (LAMP, SIGNAL LIGHT, INDICATOR LAMP, STROBE)	IG	ISOLATED GROUND	< >	LESS THAN GREATER THAN OR EQUAL TO					
-A	TO SPECIFICATIONS AND DETAILS.									
	AGENT RELEASE INITIATING VALVE		ELECIRICAL	DKA	AWING LIST					
		Sł								
-12	AGENT DISCHARGE SWITCH									

	E0.0	ELECTRICAL LEGEND AND ABBREVIATIONS
	E0.1	BASIS OF DESIGN, GENERAL NOTES, AND SCHEDULES
	E0.2	ELECTRICAL SPECIFICATIONS
	E2.1	FIRST FLOOR POWER & LIGHTING PLAN
	E2.2	SECOND FLOOR LIGHTING PLAN
TFM	E3.2	SECOND FLOOR POWER PLAN
• • • • • • • • • • • • • • • • • • • •	E5.3	PANELBOARD SCHEDULES
TION	E9.1	ELECTRICAL DETAILS
	ED2.2	ELECTRICAL DEMOLITION PLAN

## SECURITY SYST

IBO	L		DESCRIPTION											
		CCTV SECURITY FIXED CAMERA - WALL, CEILING												
DI		CCTV SECURITY INDOOR DOME CAMERA												
TZ		CCTV SECURITY PA	CCTV SECURITY PAN/TILT/ZOOM CAMERA											
rib>		INTELLIGENT CARD	INTELLIGENT CARD READER INTERFACE											
10>		ROLL-UP DOOR MOTOR CONTROL OUTPUT												
D>		DOOR POSITION MONITOR SWITCH												
⟨R≯ ⊥	$\langle \rangle$	REQUEST TO EXIT DEVICE WALL, MULLION MOUNTED												
$\langle \hat{I} \rangle$	> M	INTERCOM STATION - WALL, DESK MOUNTED. M = MASTER STATION												
)S>		DURESS PUSHBUTTON STATION												
⊢CR	2	CARD READER- WALL MOUNTED/MULLION MOUNTED												
R		EMERGENCY DOOR RELEASE BREAK-GLASS STATION												
Ň		LOCAL DOOR MONI	TOR WARNING NOISE DE	EVICE										
B		ELECTRIC BOLT												
EL>		ELECTRIC LOCK/LATCH												
S		ELECTRIC STRIKE												
/L>		MAGNETIC LOCK												
€B		GLASS BREAK SEN	SOR											
H>		ELECTRIC POWER	TRANSFER HINGE											
$\overline{}$		SECURITY ELECTR	ONIC MOTION SENSOR											
L	EG	GEND												
		ADDITIONAL D	ESIGNATION	FLOOR										
GE	ADDITIONAL DESIGNATIONFLOOR(1st letter)(2nd letter)B - BASEMENT/PITBLANK - PANELBLANK - NOT USED1 - FIRST FLOORD - DISTRIBUTION PNLN - NORTH WINGM - MEZZANINES - SWITCHBOARDS - SOUTH WINGR - ROOFM - MCCE - EAST WINGW - WEST WINGK - KITCHENP - PROCESS FOULIP													

![](_page_15_Figure_11.jpeg)

![](_page_16_Figure_1.jpeg)

### **ELECTRICAL GENERAL NOTES - POWER**

A WHERE POSSIBLE, BOXES SHALL BE IN SEPARATE STUD SPACES FROM BOXES SERVING OTHER ROOMS TO MINIMIZE SOUND TRANSFFR B COORDINATE EXACT MECHANICAL EQUIPMENT LOCATIONS AND REQUIREMENTS WITH MECHANICAL CONTRACTOR PRIOR TO

ROUGH-IN. COORDINATE CONDUIT REQUIREMENTS FOR ALL HVAC EQUIPMENT WITH CONTROLS CONTRACTOR. C REFER TO DETAIL DRAWINGS FOR ADDITIONAL INFORMATION. ALL DETAILS APPLY FOR ALL APPLICABLE SITUATIONS WHETHER REFERENCED OR NOT, UON. D REFER TO ARCHITECTURAL FLOOR PLANS, INTERIOR ELEVATIONS AND DETAIL DRAWINGS PRIOR TO ROUGH-IN FOR EXACT

LOCATION OF RECEPTACLES, FLOOR BOXES AND OUTLETS, INFORM ENGINEER OF CONFLICTS. E CONTRACTOR IS RESPONSIBLE TO REVIEW ARCHITECTURAL DRAWINGS TO CONFIRM CEILING TYPES IN ALL ROOMS (ACCESSIBLE, EXPOSED, OR "HARD") AND TO USE THE APPROPRIATE WIRING METHOD FOR EACH TYPE. INSURE ALL J-BOXES ARE ACCESSIBLE AFTER ALL OTHER TRADE'S WORK IS COMPLETED. DO NOT LOCATE ANY J-BOXES ON "HARD" CEILINGS; ALL WIRING MUST BE ACCESSIBLE THROUGH DEVICE ONLY IN "DAISEY-CHAIN" METHOD OR WITH DEDICATED HOMERUNS TO EACH DEVICE. J-BOXES MAY BE LOCATED ABOVE OTHER TRADE'S ACCESS DOORS IF FEASIBLE AND DOES NOT INTERFERE WITH ACCESS. F CIRCUIT SIZES ARE NOT SHOWN ON THE PLANS. CONTRACTOR SHALL USE CIRCUIT SIZES INDICATED IN NOTES OR RESPECTIVE SCHEDULES (PNL, MCC, ETC.) AND INFORMATION IN THE FEEDER AND BRANCH CIRCUIT SCHEDULES. G INSTALL ALL EQUIPMENT PER MANUFACTURER'S RECOMMENDATIONS AND INSTRUCTIONS. THESE DRAWINGS ARE

H ALL NEW RACEWAYS AND CONDUCTORS SHALL BE INSTALLED CONCEALED; CUT AND PATCH EXISTING WALLS TO ACCOMODATE NEW RACEWAY INSTALLATION. ALL CONDUITS TO BE INSTALLED 90° TO BUILDING LINES. FOR ELECTRICAL CONNECTIONS AND CIRCUITING TO MECHANICAL EQUIPMENT SHOWN ON THIS SHEET, REFER TO

MECHANICAL-ELECTRICAL EQUIPMENT SCHEDULE. J THE EXISTING BUILDING INCLUDING PORTIONS OF THE RENOVATED AREA SHALL REMAIN IN SERVICE DURING THE CONSTRUCTION PHASE OF THIS PROJECT. ANY MODIFICATIONS TO THE EXISTING ELECTRICAL SYSTEMS THAT MAY REQUIRE THE TEMPORARY INTERRUPTION OF EXISTING SERVICES SHALL BE COMPLETED AFTER NORMAL WORKING HOURS. PRE-SCHEDULE ANY SERVICE INTERRRUPTIONS WITH THE OWNER PRIOR TO STARTING ANY WORK. DO NOT DISTURB THE EXISTING DEPARTMENTS IN THE EXISTING BUILDING COMPLEX.

K UTILITY OUTAGES: NOT LESS THAN TEN (10) WORKING DAYS PRIOR TO A REQUIRED UTILITY (POWER, TELE, NET) OUTAGE, NOTIFY AND OBTAIN APPROVAL IN WRITING OF SAID OUTAGE FROM THE FACILITY. NO OUTAGE SHALL BE ACCOMPLISHED PRIOR TO THE RECEIPT OF APPROVAL. CONTRACTOR SHALL LOCK-OUT AND RED-TAG THE APPROPRIATE CIRCUIT BREAKER, SWITCH, ETC. RED-TAG SHALL INDICATE WHEN THE OUTAGE WILL BE TERMINATED. AND A TELEPHONE NUMBER TO CONTACT REGARDING THIS OUTAGE. THE TAG SHALL ALSO WARN PEOPLE NOT TO RE-ENERGIZE THE CIRCUIT SYSTEM BECAUSE OF POTENTIAL DANGER TO PERSONNEL AND EQUIPMENT. ALL WORK ASSOCIATED WITH ANY POWER OUTAGES SHALL BE COMPLETED AFTER NORMAL WORKING HOURS.

L EXISTING WIRING WHERE SHOWN ON THE DRAWINGS IS BASED ON AVAILABLE AS-BUILT DRAWINGS AND FIELD INFORMATION. CONTRACTOR SHALL VERIFY EXISTING INSTALLATIONS AND THE TIME FOR DOING SO SHALL BE INCLUDED IN THIS BID. M WHERE NOTED AS OWNER-SUPPLIED ON DRAWINGS, CONTRACTOR SHALL RECEIVE, INSTALL, AND CONNECT EQUIPMENT PER MANUFACTURER'S REQUIREMENTS. PRIOR TO INSTALLATION OF OWNER-SUPPLIED EQUIPMENT, CONTRACTOR SHALL INSPECT/TEST EQUIPMENT AND INFORM PROJECT MANAGER OF ANY DEFECTS. FAILURE TO DO SO SHALL MEAN THAT THE EQUIPMENT IS IN GOOD WORKING CONDITION. CONTRACTOR SHALL BE RESPONSIBLE FOR INSTALLATION AND TESTING OF SUCH EQUIPMENT.

N IN ADDITION TO ALL STATUTORY CODES ENFORCED BY THE AUTHORITY HAVING JURISDICTION, PROJECT SHALL COMPLY WITH LATEST EDITION OF OSU CONSTRUCTION STANDARDS.

	BRANCH CIRCUIT SCHEDULE													
CIRCUIT	C	ONDUIT	S	CONDUCTORS PE	ER SET	WIRING	NOTES							
TAG	MET	SETS	RNC	PHASE/NEUTRAL	GROUND	CONFIG.	NOTED							
60.2N	0.75"	1	1.00"	(2) #6, (1) #6N	#10	1,2W,N	_							
60.2	0.75"	1	1.00"	(2) #6	#10	1Ø,2W	_							
60.1	0.75"	1	1.00"	(1) #6, (1) #6N	#10	1Ø,1W,N	_							
50.2N	0.75"	1	1.00"	(2) #6, (1) #6N	#10	1Ø,2W,N	_							
50.2	0.75"	1	1.00"	(2) #6	#10	1Ø,2W	_							
50.1	0.75"	1	1.00"	(1) #6, (1) #6N	#10	1Ø,1W,N	_							
40.2N	0.75"	1	1.00"	(2) #8, (1) #8N	#10	1Ø,2W,N	_							
40.2	0.75"	1	1.00"	(2) #8	#10	1Ø,2W	_							
40.1	0.75"	1	1.00"	(1) #8, (1) #8N	#10	1Ø,1W,N	_							
30.2N	0.75"	1	1.00"	(2) #10, (1) #10N	#10	1Ø,2W,N	_							
30.2	0.75"	1	1.00"	(2) #10	#10	1Ø,2W	_							
30.1	0.75"	1	1.00"	(1) #10, (1) #10N	#10	1Ø,1W,N	_							
20.2N	0.50"	1	1.00"	(2) #12, (1) #12N	#12	1Ø,2W,N	7,8							
20.2	0.50"	1	1.00"	(2) #12	#12	1Ø,2W	7,8							
20.1	0.50"	1	1.00"	(1) #12, (1) #12N	#12	1Ø,1W,N	7,8							
NOTES														

CONDUCTORS AND CONDUITS SHOWN IN THIS SCHEDULE ARE BASED ON COPPER CONDUCTORS WITH THHN/THWN INSULATION.

THIS SCHEDULE SHALL BE USED ON ALL BRANCH CIRCUITS SERVING LOADS WHERE THE CIRCUIT BREAKER SIZE MATCHES THE AMPACITY OF ITS FEEDER. USE THE "MOTOR CIRCUIT SCHEDULE" FOR LOADS, SUCH AS MOTORS, PUMPS, FANS, CHILLERS, ETC., WHERE THE CIRCUIT BREAKER SIZE IS LARGER THAN THE AMPACITY OF ITS FEEDER.

PROVIDE GROUND WIRE NOTED ABOVE IN ALL BRANCH CIRCUITS. NOT ALL BRANCH CIRCUITS SHOWN ABOVE ARE NECESSARILY USED ON THIS PROJECT.

"MET"= EMT, IMC, GRC, RAC, OR PVC COATED GRC TYPE CONDUITS. "RNC"= PVC 40, PVC 80 OR FIBERGLASS TYPE CONDUITS ROUTED UNDERGROUND. REFER TO SIZING ON DRAWINGS IF "RNC" CONDUITS ARE ROUTED ABOVEGROUND. CONDUIT SIZES NOTED ON SINGLE-LINE DIAGRAM OR ON

PLANS SUPERSEDE SIZES NOTED ABOVE IF LARGER. THIS SCHEDULE APPLIES TO STANDARD LENGTH CIRCUITS ONLY. CONTRACTOR TO UPSIZE WIRING AS REQUIRED TO MEET MINIMUM VOLTAGE DROP REQUIREMENTS INDICATED IN SPECIFICATIONS. GROUND CONDUCTOR WILL ALSO NEED TO BE INCREASED PROPORTIONATELY AS REQUIRED BY NEC.

THESE BRANCH CIRCUITS TAGS ARE TYPICALLY NOT SHOWN ON PLANS FOR CLARITY REASONS. CONTRACTOR SHALL USE THIS INFORMATION AS IT APPLIES FOR ALL CONDUITS CONTAINING ONE OR MORE 20A/1P CIRCUITS.

CONTRACTOR MAY COMBINE 20A 1 AND 2-POLE CIRCUITS, UP TO A MAXIMUM OF (3) PHASE CONDUCTORS, IN ONE CONDUIT. ALL 3-PHASE AND CIRCUITS LARGER THAN 20A SHALL BE IN

DEDICATED CONDUITS, UON. PROVIDE DEDICATED NEUTRALS FOR EACH 1-POLE CIRCUIT. ALL HOMERUNS SHALL USE 0.75" CONDUIT SIZE MINIMUM.

MECHANICAL AND PLU													
TAG				LC	DAD								
NAME	#	DESCRIPTION	HP	KVA	FLA	LOAD CLASS	VOLTS						
DWH	1	DOMESTIC WATER HEATER	0 hp	3.21 kVA	15 A	Ν	208 V						

### LUMINAIRE SCHEDULE

G	DESCRIPTION	FINISH		LAMP			MANUFACTURER	MODEL	DIMMING	VOLTAGE		MOUNTING		
			TYPE	LUMENS	CRI	ССТ			TYPE		LOAD	TYPE	HEIGHT	COMMENTS
34 3-INC	CH NOMINAL BY 4-FOOT LED INDIRECT/DIRECT AIRCRAFT CABLE	MATTE	LED	500 LM/FT DIRECT,	90	4000K	LUMENWERX	VIA3PDI-HLO-WIO-LED-90-500-750-35-4-UNV-D1-1-53WAC36-W	0-10V	277 V	54.5 W	PENDANT	8'6" AFF	
PEN	DANT-HUNG LINEAR WITH WIDESPREAD INDIRECT OPTICS	WHITE		750 LM/FT INDIRECT										
2 4" RE	ECESSED DOWNLIGHT	MATTE	LED	2000 LM	80	4000K	COOPER LIGHTING	LDS4B-20-D010-EU4B-8035-4LBS-0-MW	0-10V	120 V	21.2 W	RECESSED	10'0" AFF	
		WHITE					SOLUTIONS							

A. PROVIDE DOCUMENTATION ON DRIVER USED. MODULES ARE TO BE REPLACED WITH ONE FROM SAME MANUFACTURER ONLY

				CO	PPER I	-EED		CH	EDI	JLE			
FEEDER	C	ONDUI	TS	CONDUCTORS	B PER SET	NOTES	FEEDER	C	ONDUI	TS	CONDUCTORS	PER SET	NOT
TAG	MET	SETS	RNC	PHASE/NEUTRAL	GROUND	NOTES	TAG	MET	SETS	RNC	PHASE/NEUTRAL	GROUND	
(4000.4)	3.50"	11	4.00"	(4) 500 KCMIL	500 KCMIL	-	250.4	2.50"	1	3.00"	(4) 250 KCMIL	#4	-
4000.3	3.00"	11	4.00"	(3) 500 KCMIL	500 KCMIL	-	250.3	2.50"	1	3.00"	(3) 250 KCMIL	#4	-
3500.4	3.50"	10	4.00"	(4) 500 KCMIL	500 KCMIL	-	225.4	2.50"	1	3.00"	(4) #4/0	#4	-
3500.3	3.00"	10	4.00"	(3) 500 KCMIL	500 KCMIL	-	225.3	2.00"	1	2.50"	(3) #4/0	#4	-
3000.4	3.50"	8	4.00"	(4) 500 KCMIL	400 KCMIL	-	200.4	2.00"	1	2.50"	(4) #3/0	#6	-
3000.3	3.00"	8	4.00"	(3) 500 KCMIL	400 KCMIL	-	200.3	2.00"	1	2.50"	(3) #3/0	#6	-
2500.4	3.50"	7	4.00"	(4) 500 KCMIL	350 KCMIL	-	175.4	2.00"	1	2.50"	(4) #2/0	#6	-
2500.3	3.00"	7	4.00"	(3) 500 KCMIL	350 KCMIL	-	175.3	1.50"	1	2.00"	(3) #2/0	#6	-
2000.4	3.00"	6	4.00"	(4) 400 KCMIL	250 KCMIL	-	150.4	2.00"	1	2.00"	(4) #1/0	#6	-
2000.3	3.00"	6	4.00"	(3) 400 KCMIL	250 KCMIL	-	150.3	1.50"	1	2.00"	(3) #1/0	#6	-
1600.4	3.00"	5	4.00"	(4) 400 KCMIL	#4/0	-	125.4	1.50"	1	1.50"	(4) #1	#6	-
(1600.3)	3.00"	5	4.00"	(3) 400 KCMIL	#4/0	-	125.3	1.25"	1	1.50"	(3) #1	#6	-
(1200.4)	3.00"	4	4.00"	(4) 350 KCMIL	#3/0	-	(110.4)	1.25"	1	1.50"	(4) #2	#6	-
(1200.3)	3.00"	4	3.00"	(3) 350 KCMIL	#3/0	-	110.3	1.25"	1	1.50"	(3) #2	#6	-
(1000.4)	3.00"	3	4.00"	(4) 400 KCMIL	#2/0	-	100.4	1.25"	1	1.50"	(4) #2	#8	-
1000.3	3.00"	3	4.00"	(3) 400 KCMIL	#2/0	-	100.3	1.25"	1	1.50"	(3) #2	#8	-
800.4	3.00"	3	3.00"	(4) 300 KCMIL	#1/0	-	90.4	1.25"	1	1.50"	(4) #2	#8	-
800.3	2.50"	3	3.00"	(3) 300 KCMIL	#1/0	-	90.3	1.25"	1	1.50"	(3) #2	#8	-
700.4	3.50"	2	4.00"	(4) 500 KCMIL	#1/0	-	80.4	1.25"	1	1.50"	(4) #4	#8	-
700.3	3.00"	2	4.00"	(3) 500 KCMIL	#1/0	-	80.3	1.00"	1	1.50"	(3) #4	#8	-
600.4	3.00"	2	4.00"	(4) 350 KCMIL	#1	-	70.4	1.25"	1	1.50"	(4) #4	#8	-
600.3	2.50"	2	3.00"	(3) 350 KCMIL	#1	-	70.3	1.00"	1	1.50"	(3) #4	#8	-
500.4	2.50"	2	3.00"	(4) 250 KCMIL	#2	-	60.4	1.00"	1	1.00"	(4) #6	#10	-
500.3	2.50"	2	2.50"	(3) 250 KCMIL	#2	-	60.3	0.75"	1	1.00"	(3) #6	#10	-
450.4	2.50"	2	3.00"	(4) #4/0	#2	-	50.4	1.00"	1	1.00"	(4) #6	#10	-
450.3	2.00"	2	2.50"	(3) #4/0	#2	-	50.3	0.75"	1	1.00"	(3) #6	#10	-
400.4	2.00"	2	2.50"	(4) #3/0	#2	-	40.4	0.75"	1	1.00"	(4) #8	#10	-
400.3	2.00"	2	2.50"	(3) 3/0	#2	-	40.3	0.75"	1	1.00"	(3) #8	#10	-
350.4	3.50"	1	4.00"	(4) 500 KCMIL	#2	-	30.4	0.75"	1	1.00"	(4) #10	#10	-
350.3	2.50"	1	4.00"	(3) 500 KCMIL	#2	-	30.3	0.75"	1	1.00"	(3) #10	#10	-
300.4	3.00"	1	3.00"	(4) 350 KCMIL	#4	-	20.4	0.75"	1	1.00"	(4) #12	#12	-
300.3	2.50"	1	3.00"	(3) 350 KCMIL	#4	-	20.3	0.75"	1	1.00"	(3) #12	#12	-
							(K)						7
							XFR						8
							SCHD						9

NOTES:

CONDUCTORS AND CONDUITS SHOWN IN THIS SCHEDULE ARE BASED ON COPPER CONDUCTORS WITH THHN/THWN INSULATION.

THIS SCHEDULE SHALL BE USED ON ALL FEEDERS SERVING LOADS WHERE THE CIRCUIT BREAKER SIZE MATCHES THE AMPACITY OF ITS FEEDER. USE THE "MOTOR CIRCUIT SCHEDULE" FOR LOADS, SUCH AS MOTORS, PUMPS, FANS, CHILLERS, ETC., WHERE THE CIRCUIT BREAKER SIZE IS LARGER THAN THE AMPACITY OF ITS FEEDER.

PROVIDE GROUND WIRE NOTED ABOVE IN ALL FEEDERS AND BRANCH CIRCUITS. WHERE MULTIPLE CONDUITS ARE INDICATED PROVIDE NOTED GROUND WIRE IN EACH CONDUIT. NOT ALL FEEDERS ARE NECESSARILY USED ON THIS PROJECT

NOMINAL AMPACITIES GREATER THAN 100 AMPS ARE FOR 75 DEG..C TERMINALS.

"MET"= EMT, IMC, GRC, RAC, OR PVC COATED GRC TYPE CONDUITS. "RNC"= PVC 40, PVC 80 OR FIBERGLASS TYPE CONDUITS ROUTED UNDERGROUND. REFER TO SIZING ON DRAWINGS IF "RNC" CONDUITS ARE ROUTED ABOVEGROUND. CONDUIT SIZES NOTED ON SINGLE-LINE DIAGRAM OR ON PLANS SUPERSEDE SIZES NOTED ABOVE IF LARGER.

OVERSIZED (173% MIN.) NEUTRAL FOR FEEDERS CONNECTED TO A K-4 OR HIGHER RATED TRANSFORMER. REFER TO TRANSFORMER SCHEDULE FOR STANDARD PRIMARY AND SECONDARY FEEDER SIZES.

REFER TO MCC OR PANEL SCHEDULES FOR FEEDER SIZES TO EQUIPMENT NOTED WITH THIS TAG

![](_page_16_Figure_36.jpeg)

### **IBING EQUIPMENT - ELECTRICAL CONNECTION SCHEDULE**

		CIRCUITING	S INFORMA	TION		DISCO	DNNECT	STAF	RTER	LOCATION	
Ø	PANEL	CIRCUIT	OCP	POLES	FEEDER	DIV.	TYPE	DIV	TYPE	LEVEL	NOTES
1	NL1NA	10,12	20 A	2	20.2	DIV. 26	FUSED	NA	NA	LEVEL 1	

![](_page_16_Figure_40.jpeg)

### **ELECTRICAL SPECIFICATIONS**

A. GENERAL

- 1. THE "GENERAL CONDITIONS" AND "GENERAL REQUIREMENTS" OF THE ARCHITECTURAL SPECIFICATIONS GOVERN WORK UNDER ELECTRICAL.
- 2. ALL WORK SHALL BE IN COMPLIANCE WITH THE OREGON STATE UNIVERISTY DESIGN & CONSTRUCTION STANDARDS.
- 3. PROVIDE ALL LABOR, MATERIALS, EQUIPMENT AND SERVICES TO CONSTRUCT AND INSTALL COMPLETE NEW ELECTRICAL SYSTEMS AND SERVICE AS DESCRIBED HEREIN AND SHOWN ON THE DRAWINGS.
- 4. ANY APPARATUS, APPLIANCE, MATERIAL OR WORK NOT SHOWN ON DRAWINGS BUT MENTIONED IN THE SPECIFICATIONS, OR VICE VERSA, OR ACCESSORIES NECESSARY TO MAKE THE WORK COMPLETE IN ALL RESPECTS AND READY FOR OPERATION, EVEN IF NOT PARTICULARLY SPECIFIED, SHALL BE FURNISHED AND INSTALLED BY THE CONTRACTOR WITHOUT ADDITIONAL EXPENSE TO THE OWNER.
- 5. DESIGN DRAWINGS ARE DIAGRAMMATIC AND DO NOT SHOW ALL OFFSETS. BENDS. ELBOWS OR OTHER SPECIFIC ELEMENTS WHICH MAY BE REQUIRED FOR PROPER INSTALLATION OF WORK. SUCH WORK SHALL BE VERIFIED AT THE JOB SITE AND THE REQUIRED ACCESSORIES AND ROUTING SHALL BE PROVIDED TO COMPLETE THE WORK AT NO ADDITIONAL COST TO THE OWNER. THE RIGHT IS RESERVED TO MAKE ANY REASONABLE CHANGES IN OUTLET, LIGHTING OR EQUIPMENT LOCATIONS, PRIOR TO ROUGH-IN WITHOUT ANY ADDITIONAL COST TO THE OWNER. "REASONABLE CHANGE" SHALL BE INTERPRETED AS INCLUDING ANY CHANGES OF UP TO SIX FEET FROM THE LOCATIONS INDICATED ON THE DRAWINGS.
- 6. CONTRACTOR SHALL GIVE ALL NECESSARY NOTICES, OBTAIN ALL PERMITS AND PAY ALL TAXES, FEES AND OTHER COSTS IN CONNECTION WITH THIS WORK. CONTRACTOR SHALL OBTAIN ALL REQUIRED CERTIFICATES OF INSPECTION FOR THIS WORK AND DELIVER SAME TO THE OWNER BEFORE REQUEST FOR ACCEPTANCE AND FINAL PAYMENT FOR THE WORK.
- 7. WORKS AND MATERIALS SHALL CONFORM TO THE LATEST RULES OF THE NATIONAL BOARD OF FIRE UNDERWRITERS' CODE, REGULATIONS OF THE STATE FIRE MARSHAL, AND WITH APPLICABLE LOCAL AND STATE CODES. NOTHING IN THESE SPECIFICATIONS SHALL BE CONSTRUED TO PERMIT WORK NOT CONFORMING TO THE MOST STRINGENT APPLICABLE CODES.
- 8. THE NATIONAL ELECTRICAL CODE, UNIFORM BUILDING CODE PLUS ANY APPLICABLE LOCAL AMENDMENTS TO THE FOREGOING CODES, AND ELECTRICAL REQUIREMENTS ESTABLISHED BY THE STATE AND LOCAL FIRE MARSHALS ARE HEREBY MADE PART OF THESE SPECIFICATIONS. THE CONTRACTOR SHALL NOTIFY THE OWNER OF ANY PART OF THE WORK BELIEVED TO BE IN CONFLICT WITH THESE CODES AND REGULATIONS.
- 9. ELECTRICAL DRAWINGS ARE ARRANGED FOR CONVENIENCE ONLY AND DO NOT NECESSARILY DETERMINE WHICH TRADE PERFORMS THE VARIOUS PORTIONS OF THE WORK. THE CONTRACTOR SHALL PERFORM ALL NECESSARY WORK TO JOIN WITH OR RECEIVE WORK OF OTHER TRADES. WORK SHALL BE COORDINATED WITH ALL TRADES TO PROVIDE ADEQUATE CLEARANCE AND ELIMINATE CONFLICTS.
- 10. THE CONTRACTOR SHALL VISIT THE JOB SITE PRIOR TO SUBMITTING PROPOSAL AND BE FAMILIAR WITH EXISTING SITE CONDITIONS. INFORMATION ON DRAWINGS RELATIVE TO EXISTING SITE CONDITIONS IS APPROXIMATE. DURING THE PROGRESS OF CONSTRUCTION, DEVIATIONS FOUND NECESSARY TO CONFORM TO ACTUAL CONDITIONS SHALL BE REPORTED TO THE OWNER. CONTRACTOR IS RESPONSIBLE FOR ANY DAMAGE CAUSED TO EXISTING UTILITIES. BY SUBMITTING THE BID IT IS UNDERSTOOD THAT THE CONTRACTOR HAS REVIEWED THE DOCUMENTS, UNDERSTANDS THE INTENT AND HAS INCLUDED ALL SITE CONSTRAINTS IN THE BID ACCORDINGLY.
- 11. SHOP DRAWINGS SHALL BE SUBMITTED TO OWNER ON ALL MAJOR PIECES OF ELECTRICAL EQUIPMENT, INCLUDING LIGHT FIXTURES, STARTERS, CIRCUIT BREAKERS, PANELBOARDS AND DEVICES. EACH ITEM OF THE SHOP DRAWINGS SHALL BE PROPERLY LABELED, INDICATING THE INTENDED SERVICE OF THE MATERIAL, THE PROJECT NAME AND THE ELECTRICAL CONTRACTOR'S NAME. WHEN AN ERROR IN THE SHOP DRAWINGS IS NOT DETECTED IN THE REVIEW. THIS DOES NOT GRANT THE CONTRACTOR PERMISSION TO PROCEED IN ERROR. REGARDLESS OF ANY INFORMATION CONTAINED IN THE SHOP DRAWINGS, THE REQUIREMENTS OF THE DRAWINGS AND SPECIFICATIONS MUST BE FOLLOWED AND ARE NOT WAIVED OR SUPERSEDED IN ANY WAY BY THE SHOP DRAWING REVIEW.
- 12. THE ELECTRICAL CONTRACTOR SHALL MAINTAIN A SET OF DRAWINGS AT THE JOB SITE FOR THE EXCLUSIVE PURPOSE OF MAINTAINING A RECORD OF ALL WORK INSTALLED AND TO SHOW ANY DEVIATIONS FROM THE WORK INDICATED ON THE DRAWINGS. ONE SET OF REPRODUCIBLE DRAWINGS, SHOWING ALL AS-BUILT CONDITIONS, SHALL BE DELIVERED TO THE OWNER FOR ACCEPTANCE PRIOR TO FINAL PAYMENT AT THE COMPLETION OF THE PROJECT.
- 13. THE RIGHT IS RESERVED TO INSPECT AND TEST ANY PORTION OF THE EQUIPMENT AND/OR MATERIALS DURING THE PROGRESS OF ITS INSTALLATION. THE CONTRACTOR SHALL TEST ALL WIRING AND CONNECTIONS FOR CONTINUITY AND GROUNDS BEFORE CONNECTING ANY FIXTURES OR EQUIPMENT. A FULL-SCALE WORKING TEST WITH ALL LIGHTS, EQUIPMENT, SPEAKERS, APPLIANCES, ETC., IN OPERATION SHALL BE MADE, IN THE PRESENCE OF THE BUILDING ENGINEER OR REPRESENTATIVE. AND THE ELECTRICAL SYSTEMS PROVEN SATISFACTORY FOR OPERATION AND FREE FROM DEFECTS. ANY DEFECTS FOUND SHALL BE REMEDIED IMMEDIATELY BY THE CONTRACTOR.
- 14. THE CONTRACTOR SHALL PARTICIPATE IN AND PROVIDE STANDBY LABOR FOR REQUIRED LIFE SAFETY TESTS INCLUDING AFTER HOUR TESTING IF REQUIRED BY LANDLORD OR AUTHORITIES HAVING JURISDICTION.
- 15. ON COMPLETION OF THE ENTIRE INSTALLATION. THE APPROVAL OF THE OWNER SHALL BE SECURED. THE CONTRACTOR SHALL OBTAIN AND PAY FOR A CERTIFICATE OF APPROVAL FROM THE PUBLIC AUTHORITIES HAVING JURISDICTION. A FINAL INSPECTION CERTIFICATE SHALL BE SUBMITTED TO THE OWNER PRIOR TO FINAL PAYMENT. ANY AND ALL COST INCURRED FOR FEES SHALL BE PAID FOR BY THE CONTRACTOR.
- 16. COORDINATE ALL OUTAGES AND CUT-OVERS WITH THE LANDLORD. POWER SHALL NOT BE INTERRUPTED TO THE OCCUPIED PORTIONS OF THE BUILDING DURING BUSINESS HOURS, EXCEPT BY PERMISSION OF THE OWNER.
- 17. PROVIDE UNDERWRITERS' LABORATORIES, INC. OR ETL TESTING LABORATORIES, INC. LISTED AND LABELED EQUIPMENT FOR ALL ITEMS FOR WHICH U.L CARRIES A LISTING OR LABELING, UNLESS ITEMS ARE SPECIFICALLY EXEMPTED.
- **B. RACEWAYS AND FITTINGS**
- 1. APPLY RACEWAY PRODUCTS FOR OUTDOOR LOCATIONS AS SPECIFIED BELOW UNLESS OTHERWISE INDICATED. A. EXPOSED CONDUIT: GRC OR IMC. B. ABOVE GROUND CONCEALED CONDUIT: GRC, IMC, OR EMT.
  - C. CONNECTION TO VIBRATING EQUIPMENT, INCLUDING TRANSFORMERS, SOLENOIDS, OR MOTOR-DRIVEN EQUIPMENT: LFMC.
- 2. APPLY RACEWAY PRODUCTS FOR INDOOR LOCATIONS AS SPECIFIED BELOW UNLESS OTHERWISE INDICATED. A. EXPOSED CONDUIT, NOT SUBJECT TO PHYSICAL DAMAGE: EMT.
  - B. EXPOSED CONDUIT, NOT SUBJECT TO SEVERE PHYSICAL DAMAGE: EMT. C. EXPOSED CONDUIT, SUBJECT TO SEVERE PHYSICAL DAMAGE: GRC OR IMC.
  - D. CONCEALED CONDUIT IN CEILINGS AND INTERIOR WALLS AND PARTITIONS: EMT. E. CONNECTION TO LIGHTING FIXTURES AND VIBRATING EQUIPMENT, INCLUDING TRANFORMERS, SOLENOIDS, OR MOTOR-DRIVEN EQUIPMENT: FMC, EXCEPT USE LFMC IN DAMP OR WET LOCATIONS. MAX.
  - 6' LENGTH. F. CONDUIT IN DAMP OR WET LOCATIONS: GRC OR IMC.
  - G. BOXES AND ENCLOSURES: NEMA 250, TYPE 1. USE NEMA 250, TYPE 4 STAINLESS STEEL OR NONMETALLIC IN INSTITUTIONAL AND COMMERCIAL KITCHENS AND DAMP OR WET LOCATIONS.
- 3. RIGID CONDUIT SHALL BE OF THREADED TYPE, HOT DIP GALVANIZED STEEL OR ALUMINUM. ELECTRICAL METALLIC TUBING SHALL BE GALVANIZED STEEL. ALL STEEL CONDUIT SHALL BE PROTECTED BY AN OVERALL ZINC COATING. FLEXIBLE CONDUIT SHALL BE STEEL, MINIMUM 3/4" SIZE.
- 4. EMT CONNECTORS AND COUPLINGS SHALL BE STEEL SET SCREW OR COMPRESSION TYPE; CRIMP-ON TYPE IS NOT ACCEPTABLE. CONNECTORS IN PLENUMS SHALL BE COMPRESSION TYPE. TERMINATE THREADED CONDUITS INTO THREADED HUBS OR WITH LOCKNUTS ON INSIDE AND OUTSIDE OF BOXES OR CABINETS. INSULATING BUSHING AND INSULATED THROAT FITTINGS SHALL BE USED THROUGHOUT EMT INSTALLATION.
- 5. CONCEAL ALL CONDUIT WHEREVER POSSIBLE EXCEPT IN MECHANICAL OR ELECTRICAL EQUIPMENT AREAS. EXPOSED CONDUIT SHALL BE RUN PARALLEL OR AT RIGHT ANGLES TO THE LINES OF THE BUILDING. CONDUIT CONCEALED IN CEILING SPACES SHALL BE RUN PARALLEL TO BUILDING LINES WHERE POSSIBLE.
- 6. CONDUIT SHALL BE SUPPORTED FROM THE BUILDING STRUCTURE; SUPPORTS FROM AIR CONDITIONING DUCTS OR PIPING SHALL NOT BE PERMITTED. REAM CONDUITS AFTER THREADS ARE CUT; ENDS SHALL BE CUT SQUARE AND SHALL BUTT SOLIDLY INTO COUPLINGS AND CONNECTORS.
- 7. VERTICAL CONDUIT RUNS SHALL BE SUPPORTED AT EVERY FLOOR WITH SUPPORT INTERVALS NOT EXCEEDING 10 FEET. ALL HORIZONTAL CONDUIT AND BOXES SHALL BE SECURELY SUPPORTED BY MEANS OF CLAMPS, HANGERS, TRAPEZE SUPPORTS OR WALL BRACKETS.
- 8. ANNULAR SPACE IN AND AROUND SLEEVES THAT PASS THROUGH FIRE RESISTIVE OR FIRE RATED PARTITIONS. FLOORS. OR CEILINGS SHALL BE CLOSED BY PACKING WITH A FIRE RESISTIVE MATERIAL THAT WILL MAINTAIN THE RATING OF THE BARRIER PENETRATED.
- 9. CONDUITS SHALL BE CONTINUOUS FROM OUTLET TO OUTLET AND FROM OUTLETS TO CABINETS, JUNCTION OR PULL BOXES, AND SHALL ENTER AND BE SECURED AT ALL BOXES SO THAT EACH SYSTEM SHALL BE ELECTRICALLY CONTINUOUS THROUGHOUT.
- 10. A NYLON PULL CORD SHALL BE LEFT IN ALL CONDUITS IN WHICH PERMANENT WIRING IS NOT INSTALLED.
- 11. PROVIDE SLEEVES FOR ALL TELECOM CABLING WHICH PENETRATES SLABS AND FULL HEIGHT PARTITIONS.
- 12. MINIMUM CONDUIT SIZE FOR POWER AND LIGHTING CIRCUITS SHALL BE 3/4-INCH FOR HOME-RUNS. MINIMUM CONDUIT SIZED FOR CONTROL WIRING SHALL BE 1/2-INCH.

### C. WIRE AND CABLE

1. CONDUCTORS SHALL BE COPPER AND RATED AT NOT LESS THAN 600 VOLTS, EXCEPT FOR SIGNAL CABLE SPECIFICALLY RATED LOWER. POWER AND LIGHTING CONDUCTORS SHALL BE MINIMUM #12 AWG. SIGNAL CABLE QUANTITY AND SIZE SHALL BE AS INDICATED. ALL WIRE #12 AWG OR LARGER SHALL BE STRANDED.

2. FIXTURE EXTENSIONS SHALL BE #12 AWG EXCEPT THOSE INDIVIDUAL FIXTURE EXTENSIONS THAT DO NOT EXCEED 4 FEET IN LENGTH MAY BE #14 AWG. FIXTURE EXTENSIONS SHALL HAVE TEMPERATURE RATING TO CONFORM TO INDIVIDUAL FIXTURE REQUIREMENTS.

3. WIRING SHALL BE TYPE THWN OR THHN, MINIMUM 75 DEGREE C INSULATION. FEEDERS SIZED #2 AWG AND ABOVE SHALL BE TYPE THW, 75 DEGREE C INSULATION, OR THHN, 90 DEGREE C INSULATION.

4. SPECIAL PRE-MANUFACTURED CABLING SYSTEMS, SUCH AS MODULAR WIRING AND MC TYPE CABLE MAY BE USED FOR FINAL TERMINATIONS TO FIXTURES AND DEVICES WITHIN THE ROOM WHERE PERMITTED BY BUILDING OWNER. ALL HOMERUNS SHALL BE IN EMT OR RIGID.

5. LIFE SAFETY SYSTEM WIRING SHALL BE COLOR CODED TO MATCH BASE BUILDING SYSTEM WIRING.

6. ALL WIRING SHALL BE COLOR CODED AS FOLLOWS: 120/208 VOLT SYSTEM PHASE "A" - BLACK; PHASE "B" - RED; PHASE "C" - BLUE; NEUTRAL - WHITE; GROUNDING CONDUCTOR - GREEN. 277/480 VOLT SYSTEM PHASE "A" -BROWN; PHASE "B" - ORANGE; PHASE "C" - YELLOW; NEUTRAL - GRAY WITH BROWN OR BLACK STRIPES.

7. ALL WIRE AND CABLE SHALL BE INSTALLED IN RACEWAY EXCEPT AS SPECIFICALLY PERMITTED OTHERWISE. VERTICAL RUNS OF CABLE SHALL BE SUPPORTED AT JUNCTION AND PULL BOXES PER CODE REQUIREMENTS.

8. ALL LIFE SAFETY (FIRE ALARM, PUBLIC ADDRESS) SYSTEM WIRING SHALL BE INSTALLED IN RACEWAY. RACEWAY AND J-BOX COVERS SHALL BE RED.

9. AT EACH FIXTURE OUTLET A LOOP OR END OF WIRE NOT LESS THAN 8" LONG SHALL BE LEFT FOR CONNECTION TO FIXTURES.

### D. SPLICES AND INSULATION

1. JOINTS IN BRANCH CIRCUITS SHALL OCCUR ONLY WHERE SUCH CIRCUITS DIVIDE AND SHALL CONSIST OF ONE THROUGH CIRCUIT TO WHICH SHALL BE SPLICED THE BRANCH FROM THE CIRCUIT. NO SPLICES SHALL BE MADE IN CONDUCTORS EXCEPT AT OUTLET BOXES, JUNCTION BOXES AND SPLICE BOXES.

2. ALL JOINTS FOR POWER WIRING #10 AWG OR SMALLER SHALL BE MADE WITH WIRE NUTS. JOINTS IN SIGNAL CABLES SHALL BE MADE ONLY WITH COMPRESSION TYPE CONNECTORS.

3. ALL JOINTS OR SPLICES FOR #8 AWG OR LARGER SHALL BE MADE WITH A MECHANICAL COMPRESSION CONNECTOR. AFTER THE CONDUCTORS HAVE BEEN MADE MECHANICALLY AND ELECTRICALLY SECURE, THE ENTIRE JOINT OR SPLICE SHALL BE COVERED WITH TAPE TO MAKE THE INSULATION OF THE JOINT OR SPLICE EQUAL TO THE INSULATION OF THE CONDUCTORS.

### E. WIRING DEVICES AND OUTLET BOXES

1. WALL RECEPTACLE OUTLETS SHALL BE NEMA 5-20R, SPECIFICATION GRADE UNLESS OTHERWISE NOTED.

2. SWITCHES PROVIDED FOR ALL USES SHALL BE 20A SPECIFICATION GRADE. COLOR SCHEME SHALL MATCH RECEPTACLES.

3. ALL WIRING DEVICES COLOR SHALL MATCH THE EXISITING COLOR SCHEME THAT IS PREVALENT THROUGHOUT THE BUILDING.

4. COVER PLATES SHALL MATCH THE MAJORITY OF THE EXISITING DEVICES. COVER PLATES SHALL BE IDENTIFIED AS TO SOURCE (PANEL AND CIRCUIT NUMBER).

5. OUTLET BOXES FOR CONCEALED WORK SHALL BE ONE PIECE, PRESSED STEEL, KNOCKOUT TYPE WITH ZINC OR CADMIUM COATING. BOXES SHALL NOT BE SMALLER THAN 4" SQUARE NOMINAL SIZE EXCEPT WHERE INDICATED. PROVIDE EXTENSION RINGS. PLASTER RINGS AND COVERS NECESSARY FOR FLUSH FINISH.

6. PROVIDE 3/4" CONDUIT FROM ALL DATA OUTLETS STUBBED UP INTO ACCESSIBLE CEILING SPACE, UNLESS OTHERWISE NOTED.

7. MOUNT DEVICES IN APPROVED OUTLET BOXES AT MOUNTING HEIGHTS DETERMINED BY ARCHITECTS. WHERE MORE THAN ONE WALL SWITCH IS INDICATED AT ONE LOCATION, SWITCHES SHALL BE GANGED UNDER A COMMON WALL PLATE. MORE THAN 6 SWITCHES AT ONE LOCATION SHALL BE GANGED IN TWO ROWS, ONE ABOVE THE OTHER.

8. BEFORE LOCATING OUTLET BOXES, CHECK ALL ARCHITECTURAL DRAWINGS FOR TYPE OF CONSTRUCTION AND TO MAKE SURE THAT THERE ARE NO CONFLICTS WITH OTHER EQUIPMENT.

9. BAR HANGERS SHALL BE USED TO SUPPORT OUTLET BOXES IN STUD OR FURRED PARTITIONS AND CEILINGS. SCREWS SHALL BE USED WITH EXPANSION SHIELDS FOR FASTENING TO CONCRETE OR MASONRY. PROVIDE APPROVED KNOCKOUT SEALS ON UNUSED OPEN KNOCKOUT HOLES.

### F. CIRCUIT BREAKERS

1. MOLDED CASE CIRCUIT BREAKERS SHALL BE BY PANELBOARD MANUFACTURER TO MATCH EXISTING WITH FRAME, TRIP AND SHORT CIRCUIT RATING AS INDICATED ON THE DRAWINGS.

2. CIRCUIT BREAKERS SHALL BE OF THE BOLT-ON TYPE MOUNTING. MULTI-POLE BREAKERS SHALL BE SINGLE

3. MINIMUM RMS SYMMETRICAL RATING OF CIRCUIT BREAKERS SHALL MATCH PANEL RATING.

DEVICES, IN ONE ENCLOSURE, WITH ONE OPERATING HANDLE AND COMMON TRIP.

CIRCUIT BREAKER TERMINATIONS SHALL NOT BE DOUBLE LUGGED TO TAP OFF FOR ADDITIONAL CIRCUIT RUNS.

PROVIDE FULLY RATED ELECTRICAL EQUIPMENT. SERIES RATED EQUIPMENT IS NOT ALLOWED.

ALL BRANCH CIRCUIT TAPS SHALL BE MADE OUTSIDE OF PANELS IN APPROPRIATE JUNCTION BOXES.

### G. GROUNDING

1. PROVIDE ALL GROUNDING FOR ELECTRICAL SYSTEMS AND EQUIPMENT IN ACCORDANCE WITH ARTICLE 250 OF THE N.E.C. GROUNDING LUGS MAY BE USED WHERE PROVIDED AS STANDARD MANUFACTURER'S ITEMS ON EQUIPMENT FURNISHED.

2. PROVIDE SEPARATE GREEN INSULATED EQUIPMENT GROUND CONDUCTOR IN ALL NON-METALLIC AND FLEXIBLE ELECTRICAL RACEWAYS. EFFECTIVELY GROUND ALL FIXTURES, PANELS, CONTROLS, MOTORS, DISCONNECT SWITCHES, AND NON-CURRENT CARRYING METALLIC ENCLOSURES. USE BONDING JUMPERS, GROUNDING BUSHINGS, LUGS, BUSES, ETC., FOR THIS PURPOSE. PROVIDE GROUNDING BUSHINGS ON ALL FEEDER CONDUIT ENTRANCES TO PANELS AND EQUIPMENT ENCLOSURES AND BOND BUSHINGS TO ENCLOSURES WITH MINIMUM # 10 AWG CONDUCTOR. CONNECT THE EQUIPMENT GROUND TO THE BUILDING SYSTEM GROUND. USE THE SAME SIZE EQUIPMENT GROUND CONDUCTORS AS PHASE CONDUCTORS, UP THROUGH #10 AWG. USE N.E.C. TABLE 250-95 FOR CONDUCTOR SIZE WITH PHASE CONDUCTORS #8 AND LARGER, IF NOT SHOWN ON THE DRAWINGS.

3. RECEPTACLES: PERMANENTLY CONNECT THE GROUND TERMINAL ON EACH RECEPTACLE TO THE GREEN GROUND CONDUCTOR OR GROUNDED METAL RACEWAY SYSTEM WITH A GROUND WIRE.

4. MOTORS: CONNECT THE GROUND CONDUCTOR TO THE CONDUIT WITH AN APPROVED GROUNDING BUSHING, AND TO THE METAL FRAME WITH A BOLTED SOLDERLESS LUG. BOLTS, SCREWS AND WASHERS SHALL BE BRONZE OR CADMIUM PLATED STEEL.

5. GROUND CONDUCTORS SHALL BE 600 VOLT - #12 AWG STRANDED COPPER MINIMUM, WITH GREEN INSULATION; AND SHALL BE CONTINUOUS FROM TERMINAL TO TERMINAL WITHOUT SPLICE.

### H. JUNCTION AND PULL BOXES

1. DRAWINGS DO NOT NECESSARILY SHOW EVERY PULL BOX REQUIRED. ADDITIONAL BOXES MAY BE ADDED WHEN DESIRABLE TO SAVE LABOR AND AVOID DIFFICULTIES; AND WHEN CODE REQUIREMENTS LIMIT THE NUMBER OF BENDS BETWEEN BOXES. ADDITIONAL BOXES SHALL BE PROVIDED WITHOUT ADDED COST TO THE OWNER. BOXES SHALL BE SIZED ACCORDING TO CODE AND SHALL BE UNDERWRITERS' LABORATORIES LISTED. BOXES SHALL BE ACCESSIBLE AT THE TIME OF COMPLETION AND IN FINISHED AREAS SHALL BE LOCATED ONLY AFTER APPROVAL OF ARCHITECT DUE TO APPEARANCE CONSIDERATIONS.

2. ALL JUNCTION BOXES IN CEILING SPACES SHALL BE MARKED WITH BLACK MARKING PEN AS TO THE PANEL AND CIRCUITS PASSING THROUGH THE BOX.

### I. LABELS

1. WHITE CORE BLACK ENGRAVED PLASTIC NAMEPLATES SHALL BE ATTACHED TO ALL NEW EQUIPMENT (PANELBOARDS, TRANSFORMERS, STARTERS, ETC.) INDICATING EQUIPMENT, DESIGNATION AND VOLTAGES.

2. SELF-ADHESIVE COMPUTER-GENERATED TYPE LABELS WITH BLACK LETTERING ON CLEAR BACKGROUND SHALL BE PROVIDED FOR EACH LIGHT SWITCH, POWER AND SIGNAL OUTLET COVER PLATE. LABEL TO INDICATE PANEL AND BRANCH CIRCUIT OR DATA CABLE(S) NUMBER SERVING THE RECEPTACLES/OUTLET. CONTROLS WITH FLIP UP COVER SHALL BE LABELED UNDER THE COVER.

### G. LIGHTING FIXTURES

1. VERIFY ALL CEILING TYPES AND COORDINATE FIXTURE TRIM AND ACCESSORIES BEFORE ORDERING FIXTURES. COORDINATE WITH CEILING INSTALLER.

2. ALL NEW LIGHT FIXTURES SHALL BE SECURELY FASTENED TO EITHER SLAB, CEILING OR WALL. RECESSED FIXTURES IN SUSPENDED CEILING SHALL BE INDEPENDENTLY SUPPORTED FROM BUILDING STRUCTURE WITH MINIMUM 2 #12 WIRES AT DIAGONAL CORNERS AND CLIPPED TO CEILING GRID FOR BRACING.

3. ALL FIXTURES WITH LAMP POSITION, SHUTTERS, ROTATION OR OTHER TYPES OF ADJUSTMENTS SHALL BE ROUGH-ADJUSTED BY THE CONTRACTOR AT THE TIME OF INSTALLATION. ARCHITECT WILL DETERMINE FINAL AIMING AND/OR ADJUSTMENT DURING FINAL INSPECTION.

4. ALL LED LIGHT FIXTURES SHALL HAVE A 10-YEAR WARRANTY.

### K. FIRE ALARM

- 1. THE FIRE ALARM SYSTEM SHALL BE DESIGN / BUILD BY THE FIRE ALARM SYSTEM VENDOR.
- 2. FIRE ALARM SYSTEM DESIGN SHALL BE SUBMITTED SEPARATELY FOR DEFERRED PLAN CHECK AND PERMITTING.
- PROVIDE FIRE ALARM INITIATION AND NOTIFICATION DEVICES AND CONNECT TO EXISTING FIRE ALARM SYSTEM.
- 4. ALL FIRE ALARM DEVICES SHALL MATCH BUILDING STANDARD DEVICES.
- 5. SCHEDULE AND COORDINATE ALL LIFE SAFETY WORK WITH THE BUILDING ENGINEER.
- CONTRACTOR SHALL PROVIDE CERTIFICATION OF THE LIFE SAFETY SYSTEM COMPLETION AND VERIFY PROPER

![](_page_17_Figure_101.jpeg)

![](_page_18_Figure_1.jpeg)

![](_page_18_Figure_2.jpeg)

### KEYED NOTES (#)

- 1. REUSE EXISTING CIRCUIT MADE AVAILABEL DURING
- DEMOLITION. 2. REPLACE EXISITNG (2) 120V, 1P BREAKER MADE SPARE DURING
- DEMOLITION WITH (1) 208V, 2P, 20A BREAKER AND FEED DWH-1. THE NEW CIRCUITS TO BE USED IS NL1NA-10,12.
- 3. REMOVE EXISITNG RECEPTACLES AS INDICATED. RETAIN AND REUSED EXISITNG CIRCUIT FOR NEW WORK.
- 4. REMOVE EXISTING RECEPTACLE AS INDICATED. REMOVE EXISITNG CONDUIT AND WIRING TO SOURCE OF SUPPLY OR
- LAST DEVICE ON CIRCUIT TO REMAIN. 5. REMOVE EXISITNG LIGHT FIXTURE AS INDICATED. RETAIN AND REUSE EXISTING CIRCUIT FOR NEW WORK.

### SHEET NOTES A. EXISTING DEVICES OUTSIDE OF SCOPE OF WORK AREA ARE

- NOT SHOWN. B. REFER TO SHEET E0.1 FOR DEMOLITION NOTES AND GENERAL NOTES.
- C. NEW LIGHTING CONTROL DEVICES TO MATCH EXISTING. IF MATCHING EXISTING SYSTEM IS NOT POSSIBLE, USE PRODUCTS FROM COOPER LIGHTING CONTROLS.

![](_page_18_Figure_14.jpeg)

![](_page_18_Figure_19.jpeg)

![](_page_19_Figure_0.jpeg)

![](_page_19_Figure_1.jpeg)

## **GENERAL NOTES**

A. COORDINATE ALL CEILING MOUNTED EQUIPMENT AND APPURTENANCES (GRILLES, REGISTERS, LIGHTS, AREA DETECTORS, LIGHTING CONTROLS, ETC) WITH THE CEILING GRID, SUPPORTS, STRUCTURAL ELEMENTS, AND SPRINKLER HEADS. ANY MODIFICATIONS TO SPRINKLER HEAD LAYOUT, IF REQUIRED, SHALL BE PERFORMED BY A QUALIFIED DESIGN BUILD CONTRACTOR.

### SHEET NOTES

- A REUSE AND RELOCATE EXISTING LIGHT FIXTURES IN REMODELED SPACE, UNLESS OTHERWISE NOTED. LUMINAIRES TO REMAIN ON CIRCUIT 3 IN PANEL NH2WB.
   B CONTRACTOR TO VERIFY PLACEMENT OF RELOCATED
- OCCUPANCY SENSORS SATISFIES SENSOR COVERAGE RANGE. ADDITIONAL SENSORS TO BE ADDED AND WIRED INTO SAME SENSOR SYSTEM IF UPDATED COVERAGE IS INSUFFICIENT. C REFER TO ARCHITECTURAL DRAWINGS FOR EXACT LOCATIONS AND MOUNTING HEIGHTS OF ALL LUMINAIRES. INFORM
- ENGINEER OF CONFLICTS. D CEILING SENSOR SWITCHES IN SAME SPACE WITH SAME SWITCH DESIGNATION ARE TO BE WIRED IN PARALLEL SUCH THAT EITHER SENSOR WILL ACTIVATE ALL DESIGNATED
- LIGHTS. E TOGGLE SWITCHES SERVING SAME AREA AS OCCUPANCY SENSORS SHALL PROVIDE MANUAL OFF CONTROL OF LIGHTING.
- F TWO LIGHT SWITCHES SHOWN TOGETHER SERVING A SPACE INDICATE DUAL LEVEL SWITCHING OF EACH SWITCHED LIGHTING FIXTURE IN THE SPACE. REFER TO LIGHTING FIXTURE SCHEDULE NOTES FOR ADDITIONAL INFORMATION.
- G CONTRACTOR IS RESPONSIBLE TO REVIEW ARCHITECTURAL DRAWINGS TO CONFIRM CEILING TYPES IN ALL ROOMS (ACCESSIBLE, EXPOSED, OR "HARD") AND TO USE THE APPROPRIATE WIRING METHOD FOR EACH TYPE. INSURE ALL J-BOXES ARE ACCESSIBLE AFTER ALL OTHER TRADE'S WORK IS COMPLETED. DO NOT LOCATE ANY J-BOXES ON "HARD" CEILINGS; ALL WIRING MUST BE ACCESSIBLE THROUGH LUMINAIRE ONLY IN "DAISEY-CHAIN" METHOD OR WITH DEDICATED HOMERUNS TO EACH LUMINIARE. J-BOXES MAY BE LOCATED ABOVE OTHER TRADE'S ACCESS DOORS IF FEASIBLE AND DOES NOT INTERFERE WITH ACCESS.
- H CONTRACTOR SHALL USE CIRCUIT SIZES INDICATED IN NOTES OR RESPECTIVE SCHEDULES (PNL, MCC, ETC.) AND INFORMATION IN THE FEEDER AND BRANCH CIRCUIT SCHEDULES. IN ACCESSIBLE CEILING AREAS ONLY; THE CONTRACTOR HAS THE OPTION TO USE EITHER MANUFACTURED (MODULAR SOFT-WIRED) WIRING SYSTEM AS DESCRIBED IN THE NATIONAL ELECTRICAL CODE-ARTICLE 604, OR MC CABLE. MANUFACTURED WIRING SYSTEM SUPPLIER SHALL PROVIDE SHOP DRAWINGS OF WIRING SYSTEM LAYOUT FOR REVIEW.
- J ALL LOW VOLTAGE CABLING TO LIGHTING FIXTURES AND CONTROL DEVICES SHALL BE PLENUM RATED.
- K NEW LIGHTING CONTROL DEVICES (DIMMERS, OCCUPANCY SENSORS, SWITCHES) TO MATCH EXISTING.

## KEYED NOTES (#)

- 1 EXISTING 4-ZONE DIMMER TO BE REUSED TO CONTROL LIGHTING IN REMODELED CONTROL ROOM SPACE. EXISTING CONTROLLER PROGRAMMED WITH (4) ZONE/SCENE PRESETS. (2) ZONES REQUIRED IN REMODELED SPACE.
- 2 REPLACE DEMOLISHED F2B8 FIXTURES IN REMODELED HALLWAY SPACE WITH VIA 3 LED DIRECT/INDRECT LINEAR PENDANTS, 4' LENGTH OPTION, 0.5" DROP CROSS-SECTION, IF NO OTHER FIXTURES ARE SELECTED. TIE INTO EXISTING CORRIDOR CIRCUIT ON PANEL NH2WB-2. CONTROL THROUGH LCP 2W-7.
- 3 CONTRACTOR TO CONFIRM EXISTING LUMINAIRE BULB TYPE. IF EXISTING BULBS ARE NOT LED OR OTHERWISE COMPLIANT WITH CURRENT OREGON ENERGY EFFICIENCY SPECIALTY CODE, CONTRACTOR IS TO REPLACE EXISTING LUMINAIRES WITH LED-BASED EQUIVALENTS. CONFIRM SELECTION WITH OWNER AND ARCHITECT.
- 4 CIRCUIT EMERGENCY LIGHTING FIXTURES TO PANEL EH2WA, VIA PANEL LCP-2W.EMERGENY FIXTURE TO BE CONTROLLED TOGETHER WITH FIXTURE ON NORMAL CIRCUIT VIA UL924 RELAY.
- 5 RELOCATE PREVIOUSLY REMOVED FIRE ALARM STROBE/HORN DEVICE.6 RELOCATE PREVIOUSLY REMOVED LIGHT FIXTURE.

GRAPHIC SCALE: 1/4" = 1'-0" 0' 2' 4' 8'

**ISSUED FOR PERMIT** 

![](_page_19_Figure_22.jpeg)

![](_page_19_Figure_23.jpeg)

![](_page_19_Figure_24.jpeg)

![](_page_20_Figure_0.jpeg)

![](_page_20_Figure_1.jpeg)

## SHEET NOTES

- A. ALL EQUIPMENT CIRCUITED TO PANEL CL2WC, UNLESS OTHERWISE NOTED. REUSE EXISTING 20A/1P BREAKERS WHERE POSSIBLE. OTHERWISE, CIRCUIT TO NEXT AVAILABLE 20A/1P SPARE BREAKER.
- B. BASIS OF DESIGN FOR FLOOR BOXES IS LEGRAND CAF3 SHALLOW THREE-GANG RAISED FLOOR BOX.
- PROVIDED FURNITURE SELECTION AND PLACEMENT. D. FIRE ALARM IS DESIGN-BUILD BY ELECTRICAL CONTRACTOR. DEVICES SHOWN FOR COORDINATION
- ONLY. E. IT SCOPE IS LIMITED TO PATHWAYS, CABLING, AND POWER. ACTIVE NETWORK EQUIPMENT (SWITCHES, ROUTERS, ETC.) SHALL BE SPECIFIED BY OWNER'S I.T. REPRESENTATIVE.
- F. CONTRACTOR TO MATCH EXISTING CARD READER HARDWARE. EXISTING SYSTEM TO BE EXPANDED AS NECESSARY TO INTEGRATE ADDITIONAL CARD READERS.
- G. CONTRACTOR TO VERIFY AVAILABILITY SPACE WITHIN (E) IDF FOR ADDITION OF DOOR CONTROLLER AND ADDITIONAL DATA CABLING.
- H. FOR HALF-SWITCHED RECEPTACLES AND FLOOR BOXES, REFER TO WIRING DIAGRAM DETAILS ON SHEET E9.2.
- I. LAB-DRY 2026 PROVIDED WITH RAISED FLOOR GROUNDING. CONTRACTOR TO VERIFY PRESENCE OF GROUND RING AROUND THE ROOM PERIMETER.
- J. EXISTING DEVICES OUTSIDE OF SCOPE OF WORK AREA ARE NOT SHOWN.
- K. COORDINATE ALL CEILING MOUNTED EQUIPMENT AND APPURTENANCES (GRILLES, REGISTERS, LIGHTS, AREA DETECTORS, LIGHTING CONTROLS, ETC) WITH THE CEILING GRID, SUPPORTS, STRUCTURAL ELEMENTS, AND SPRINKLER HEADS. ANY MODIFICATIONS TO SPRINKLER HEAD LAYOUT, IF REQUIRED, SHALL BE PERFORMED BY A QUALIFIED DESIGN BUILD CONTRACTOR.
- L. REFER TO SHEET E0.1 FOR GENERAL NOTES.
- M. RECEPTACLES TO BE LEVATON, LEGRAND, OR APPROVED EQUAL.

## KEYED NOTES (#)

- 1 PROVIDE NEW POWER AND DATA FLOOR BOXES. LEGRAND 3-GANG. 2 PROVIDE 120V/1P, 20A CIRCUIT FROM PANEL CL2WC FOR
- MAGNETIC HOLD-OPEN FOR EXISTING DOOR. USE FLOOR-MOUNTED VARIETY DUE TO DISTANCE FROM WALL (SEM 7820, OR APPROVED OTHER). 3 REFER TO DETAIL 5/E9.1 FOR FLOOR BOX AND J-BOX
- CONNECTION DETAILS. 4 WIRELESS ACCESS POINT LAYOUT SHOWN FOR SCOPE OF PATHWAYS ONLY. FINAL LAYOUT SHALL BE PROVIDED BY
- THE OWNER'S IT REPRESENTATIVE. 5 REPURPOSE EXISTING JUNCTION BOXES BENEATH THE FLOOR AS NEEDED FOR NEW CIRCUITING.
- 6 SEE 4/E9.1 FOR SINGLE DOOR ACCESS CONTROL DETAIL. 7 PROVIDE 1" CONDUIT FROM THE TV BACK BOX TO ACCESS FLOOR. PROVIDE 1-1/2" CONDUIT BETWEEN TV BACK BOX AND HDMI
- BACK BOX. 8 REFER TO ARCHITECTURAL ELEVATION PLAN FOR MOUNTING HEIGHT AND CONDUIT ROUTING. PROVIDE 1-1/2" CONDUIT BETWEEN TV BACK BOX AND HDMI
- BACK BOX. 9 RECEPTACLES TO BE CONTROLLED VIA THE OCCUPANCY SENSORS FOR LIGHT FIXTURES.

0' 2' 4'

## **ISSUED FOR PERMIT**

![](_page_20_Figure_25.jpeg)

EXPIRE: 12/31/2024

78483

Paul Leonetti

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900 SW Fifth Portland, OR www.glumac

3F2169E1EC204E8... TUNE 2, 20

C. COORDINATE LOCATIONS OF FLOOR BOXES WITH OWNER-

![](_page_20_Figure_41.jpeg)

![](_page_20_Figure_42.jpeg)

1/4" = 1'-0"

07/27/2023

**Project No.** 19-0016

Scale

Date

P/	ANE	EL:	(E) C	CL2WC												
ļ	VO	LTAGE:	208Y/120	V, 3PH, 4W			Ν	IEMA R	ATING	: Туре	1					
l	MOL	JNTING	SURFAC	E			IN	ITEGRA	L SPD	: No						
	BUS F	RATING	225 A				ISOL (	L GROUND BAR: No								
	MAIN	AMPS:	225 A ML	0			FEED	D-THRU	LUGS	No				LOCATION	N: LAB-DRY 20	26
	AIC F	RATING	10 kAIC				D	OUBLE	-LUGS	No				SUPPLY FROM	Л:	
скт	TRIP	POLE		DESCRIPTION		TYPE	A (ł	(VA)	B (k	(VA)	C (k	(VA)	TYPE	DESCRIPTIO	N	POLE
1	20 A	1	{NL} TV'S	- WEST WALL		С	0.9	0.72					N	{NL} FLOOR QUAD - DRY-L	AB 2026	1
3	20 A	1	{NL} CON	V RECEPTS - SOUTH	WALL	R			0.72	0.72			N	{NL} FLOOR QUAD - DRY-L	AB 2026	1
5	20 A	1	{NL} CON	V RECEPTS - EAST W	R					0.9	0.72	N	{NL} FLOOR QUAD - DRY-L	AB 2026	1	
7	20 A	1	{NL} CON	V RECEPTS - NORTH	WALL	R	0.54	0.72					N	{NL} FLOOR QUAD - DRY-L	AB 2026	1
9	20 A	1	{NL} CON	V RECEPTS - WEST W	/ALL	R			0.72	0.72			N	{NL} FLOOR QUAD - DRY-L	AB 2026	1
11	20 A	1	{NI } OPFI	NARFA WORKSTATIO	)N	N				•=	0.72	1 4 4	N	{NI } FI OOR QUAD - DRY-I	AB 2026	1
13	20 A	1		AREA WORKSTATIO	)N	N	0.72	0.72			0.1.2		N		AB 2026	1
15	20 A	1		AREA WORKSTATIO	)N	N	0.72	0.12	0.72	0.72			N		AB 2026	
17	20 A	1			V 2012	D			0.72	0.72	0.36	0.72			AB 2020	1
11	20 A	1			1 2012	Γ.	0	0.70			0.50	0.72			AD 2020	
19	20 A	1					0	0.72	0	0.70					AD 2020	1
	20 A	1	(RL) OPAR						0	0.72	0	0.00			AB 2020	
23	20 A		(RL) SPAF	KE			0			0	0.36	N		AB 2026		
25	20 A	1	SPARE				0	0						SPARE		1
27	20 A	1	SPARE						0	0				SPARE		1
29	20 A	1	SPARE							0	0		SPARE		1	
31		1	SPACE											SPACE		1
33		1	SPACE											SPACE		1
35		1	SPACE											SPACE		1
37		1	SPACE											SPACE		1
39		1	SPACE											SPACE		1
41		1	SPACE											SPACE		1
SPEC	IAL PA	ANEL FI	EATURES				5.04	kVA	5.04	kVA	5.22	kVA	CIRCL	IIT NOTES		
1						1					1		{NL} =	NEW LOAD ON EXISTING E	BREAKER	
1													{NB} =	NEW BREAKER		
													{RL} =	LOAD REMOVED		
ľ													( )			
LOAD	) TYPE		NECTED	DEMAND FACTOR	DEMA	ND LO	AD		LOAD	) TYPE	KEY		1	PANEL	TOTALS	
	С	0.	9 kVA	125%	1.1	3 kVA			C = C	ONTIN	JOUS				KVA	
	N	11	16 kVA	100%	11.	16 kVA			E = 1	ELEVA	TOR		Т	OTAL CONNECTED LOAD:	15.3 kVA	
	R	3	24 k\/Δ	100%	3.2	$\frac{10}{k}$			K =	KITCH	FN				15 53 k\/A	
		0.4		10070	0.2				I –						25%	
											טאי חר		-			
														DESIGNED CAPACITY:	19.41 KVA	_
								MO		ARGE	SIMO	IUK				
						N = NON-CONTINUOUS						S				
									R = R	ECEPT	ACLE					

![](_page_21_Figure_6.jpeg)

![](_page_21_Figure_7.jpeg)

![](_page_22_Figure_1.jpeg)

![](_page_22_Figure_4.jpeg)

![](_page_22_Picture_5.jpeg)

-2

KEYED NOTES: XX

![](_page_22_Picture_6.jpeg)

SENSOR

OCCUPANCY

SENSOR

—3#18 AWG, POWER LIMITED CIRCUIT

PLENUM RATED CABLE, TYPICAL FOR

4

II

SENSOR WIRING, 24VDC 15MA NOMINAL

![](_page_22_Figure_43.jpeg)

277V OR 120V

CIRCUIT

LIGHTING BRANCH

TO SWITCH "a" LUMINAIRES TO SWITCH "b ONTROLLED UMINAIRES O SWITCH "c" ONTROLLED NORMAL LUMINAIRES, INCLUDING UNDERCABINET LUMINAIRES -LOCATE ABOVE ACCESSIBLE CEILING. OCCUPANCY

SINGLE OR MULTIPLE

PLANS. CONNECT EACH

ROOM INDEPENDENTLY.

UNITS AS SHOWN ON

-LOCAL LIGHT SWITCHES AS

SHOWN ON PLANS

![](_page_22_Picture_45.jpeg)

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(1) -

![](_page_22_Figure_46.jpeg)

![](_page_23_Figure_0.jpeg)

![](_page_23_Figure_1.jpeg)

## SHEET NOTES

- A. NOT ALL EXISTING DEVICES OUTSIDE OF SCOPE OF WORK AREA ARE SHOWN.
- B. REFER TO SHEET E0.1 FOR GENERAL NOTES

## KEYED NOTES (#)

- 1. DISCONNECT AND REMOVE EXISITNG LIGHT FIXTURES AS INDICATED.
- 2. DISCONNECT EXISITNG FIXTURES. EXISTING FIXTURES TO REMAIN IN PLACE TO BE CIRCUITED TO EMERGENCY CIRCUIT UNDER NEW WORK..
- 3. DISCONNECT AND RELOCATE EXISITNG FIRE ALARM STROBE/HORN. REFER TO NEW WORK PLAN FOR NEW LOCATION.
- 4. DISCONNECT AND RELOCATE EXISTING LIGHT FIXTURE. REFER TO NEW OWKR PLAN FOR NEW LOCATION.
- 5. DISCONNECT AND REMOVE EXISTING FLOOR BOXES AS INDICATED.

![](_page_23_Figure_20.jpeg)

A	BBREVIATIONS		
ABV	ABOVE	SYMBOL	DESCRIPTION
AD ADA	ACCESS DOOR AMERICANS WITH DISABILITIES ACT	<b>●</b>	
AFF	ABOVE FINISHED FLOOR ABOVE FINISHED GRADE	φφ	BALL VALVE
AP	ACCESS PANEL		BUTTERFLY VALVE
ARCH	AUTO FIRE SPRINKLER RISER	⋈	GATE VALVE
BAS BFV	BUILDING AUTOMATION SYSTEM BUTTERFLY VALVE	<u> </u>	BALANCING VALVE
BHP	BRAKE HORSEPOWER		
BV	BALL VALVE	φ	SHUT OFF VALVE IN CONCRETE YARD BOX
BWV CA	BACKWATER VALVE COMPRESSED AIR	<b>↓</b>	ANGLE GATE VALVE
CD	CONDENSATE DRAIN	⋈	SOLENOID VALVE
CFF	CAP FOR FUTURE	N	CHECK VALVE
CFH CFM	CUBIC FEET PER HOUR CUBIC FEET PER MINUTE		PRESSURE REDUCING VALVE
CFS	CUBIC FEET PER SECOND	· · · · · · · · · · · · · · · · · · ·	
CLG	CEILING		
CONC	CONCRETE		PLUG VALVE / GAS COCK
CV CW	CHECK VALVE DOMESTIC COLD WATER		RELIEE VALVE
CWFU	COLD WATER FIXTURE UNIT	+ _	
DCVA	DOUBLE CHECK VALVE ASSEMBLY	r	
DDCVA	DOUBLE DETECTOR CHECK VALVE ASSEMBLY		PRESSURE & TEMPERATURE RELIEF VALVE
	DRAINAGE FIXTURE UNIT		AUTOMATIC AIR VENT
DSN	DOWNSPOUT NOZZLE		BACKWATER VALVE
DWG DWV	DRAWING DRAINAGE WASTE AND VENT	 	REDUCED - PRESSURE PRINCIPLE BACKFLOW
E ELEC	EXISTING ELECTRICAL	ψ <sup>*</sup> <sup>*</sup> <sup>*</sup> <sup>*</sup> <sup>*</sup> <sup>*</sup>	PREVENTION ASSEMBLY (RP)
FA			UNION
FCO	FLEAIDLE COININECTION FLOOR CLEANOUT	║ ─────<	STRAINER
FDV FDVC	FIRE DEPARTMENT VALVE FIRE DEPARTMENT VALVE CABINET		STRAINER WITH BLOW OFF HOSE BIBB
FFA/FFB			
FH	FIRE HYDRANT		
FIN	FIRE HOSE VALVE FINISHED		PIPE ALIGNMENT GUIDE
FO FPS	FUEL OIL FEET PER SECOND	[] — <del>[ ]</del>	EXPANSION JOINT
FT	FEET		FLEXIBLE CONNECTOR
FU	FIXTURE UNIT	]]	CAP OR PLUG
FV G	FLUSH VALVE GAS		BLIND FLANGE
GAL GC	GALLONS GAS COCK	Ŋ	CONCENTRIC REDUCER
GPH	GALLONS PER HOUR	$\land$	
GPM	GATE VALVE	T	
HD HP	HUB DRAIN HORSEPOWER	Ц VHA	WATER HAMMER ARRESTOR
HW HWC	DOMESTIC HOT WATER DOMESTIC HOT WATER RECIRCULATION	(⊉ PG ♥	PRESSURE GAUGE WITH COCK
	HOT WATER FIXTURE UNIT	<b>■</b> T	THERMOMETER
	PLUMBING AND MECHANICAL OFFICIALS		CLEANOUT / WALL CLEANOUT
ICBO	BUILDING OFFICIALS		FLOOR CLEANOUT / CLEANOUT TO GRADE
IE IRR	INVERT ELEVATION IRRIGATION	∳ YCO/COTG	YARD CLEANOUT / CLEANOUT TO GRADE
LAV	LAVATORY POLINIDS (LINIT OF FORCE)	Тутт	TEST TEE
MAX			
MECH	MECHANICAL	<u>−</u> t₁ wh	WALL HYDRANT
MFR MIN	MANUFACTURER MINIMUM	-++ HB	HOSE BIBB
MH	MANHOLE NORMALLY CLOSED	□YH	YARD HYDRANT
NFPA			THRUST BLOCK
NIC		∭	FLOOR DRAIN
OFCI	OWNER FURNISHED CONTRACTOR		FLOOR SINK W/ GRATE AS SHOWN
OW	OIL WASTE POINT OF CONNECTION		
POD			
PRV PS	PRESSURE SWITCH		
PSI RI&C	POUNDS PER SQUARE INCH ROUGH IN AND CONNECT		STORM DRAIN
RWH	RAIN HARVESTED WATER		OVERFLOW DRAIN
RP	REDUCED-PRESSURE PRINCIPLE BACKFLOW		DECK DRAIN, PLANTER DRAIN
RPM	PREVENTION ASSEMBLY REVOLUTIONS PER MINUTE	→	DOWN SPOUT NOZZLE
SD SF	STORM DRAIN SQUARE FEET	(M)	SUB-METER
SHWR	SOLAR HOT WATER RETURN		
SOV	SHUT-OFF VALVE		
SPR SS	SPRINKLER SANITARY SEWER		
TFA/TFB TP	TO FLOOR ABOVE/BELOW TRAP PRIMER		
TS			
TYP	TYPICAL		
U VB	URINAL VACUUM BREAKER		
V VTD			
W	WASTE		
WC	WATER GLOSET WATER HAMMER ARRESTOR		
WCO W/	WALL CLEANOUT WITH		
YB	YARD BOX		

8/1

		NOTE: NOT ALL SYMBOLS OR ABBREVIATIONS ARE APPLICABLE TO THIS PROJECT. REFER TO DETAILS AND NOTES FOR MOUNTING HEIGHTS.	PLUMBING
		DESCRIPTION	220000 PLUMBING SHEET SPECIFICATIONS PART 1 - GENERAL
		DIRECTION OF SLOPE DIRECTION OF FLOW	1.1 GENERAL REQUIREMENTS
		PIPE UP OR UP & DN PIPE DOWN PIPE DROP	A. DEFINITIONS- "CONTRACTOR" MEANS "PLUMBING CONTRACTOR" WHEN REFERENCED ANYWHERE IN THE PLUMBING CONSTRUCTION DOCUMENTS UNLESS WORK AND EQUIPMENT HAS BEEN COORDINATED BETWEEN PLUMBIN
		TOP CONNECTION - BRANCH LINE BOTTOM CONNECTION - BRANCH LINE COLD WATER	"PROVIDE," AND "INSTALL" MEANS ALL ITEMS CALLED OUT IN THE CONTRACT DOCUMENTS AND ANY ADDITIONAL ITEMS NOT CALLED OUT BUT REQUIRED TO MAKE A COMPLETE AND OPERATIONAL SYSTEM.
	·140	HOT WATER HOT WATER RECIRCULATION HOT WATER (140°F) VENT PIPING BELOW GRADE OR FLOOR	B. PLANS ARE DIAGRAMMATIC. DO NOT SCALE FOR MATERIAL QUANTITIES. ALL SCALING SHOULD BE REFERENCED TO ARCHITECTURAL PLANS ONLY. FURNIS AND INSTALL ALL COMPONENTS NEEDED WHETHER INDICATED OR NOT TO PROVIDE A COMPLETE AND OPERATING SYSTEM.
	SS SD	PIPING ABOVE GRADE OR FLOOR SANITARY SEWER, WASTE OR SOIL STORM DRAIN, RAINWATER DRAIN PIPING	C. CONTRACTOR SHALL VISIT SITE AND VERIFY ALL CONNECTIONS TO EXISTING WORK PRIOR TO BIDDING.
	OD PD D IW GW G- G- MG LG CA (E)	OVERFLOW STORM DRAIN PIPING PUMPED DISCHARGE DRAIN LINE INDIRECT WASTE GREASE WASTE NATURAL GAS (7"W.C.) MEDIUM PRESSURE GAS (2 PSIG TO 5 PSIG) LOW PRESSURE GAS COMPRESSED AIR EXISTING PIPE	D. SCOPE – THE INTENT OF THE SPECIFICATIONS AND THE DRAWINGS IS TO PRO A COMPLETE AND FULLY OPERATIONAL PLUMBING SYSTEM. THE PLUMBING CONTRACTOR SHALL FURNISH AND INSTALL ALL LABOR, MATERIAL AND EQUIPMENT NECESSARY TO COMPLETE THE PLUMBING WORK. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROPER FITTING OF MATERI/ INTO THE BUILDING AS INDICATED ON DRAWINGS, WITHOUT INTERFERENCE W OTHER WORK, AND SHALL MAKE REASONABLE MODIFICATIONS IN THE LAYOU NEEDED TO PREVENT CONFLICT WITH OTHER TRADES, TO PROVIDE ACCESS AND FOR THE PROPER EXECUTION OF THE WORK.
	TŴ TWR 6"	TEMPERED WATER TEMPERED WATER RETURN PIPE SIZE (DIAMETER IN INCHES)	E. PERMITS AND FEES – THE PLUMBING CONTRACTOR SHALL PROCURE AND PAY FOR ALL PERMITS, FEES AND INSPECTIONS NECESSARY TO COMPLETE THE PLUMBING SCOPE OF WORK.
N	(E) (E) (D) (F)	EXISTING WORK TO REMAIN EXISTING WORK TO BE REMOVED FUTURE WORK	F. WARRANTY – THE PLUMBING CONTRACTOR SHALL UNCONDITIONALLY WARRA ALL WORK TO BE FREE OF DEFECTS IN MATERIAL AND WORKMANSHIP FOR A PERIOD OF ONE (1) YEAR FROM THE DATE OF FINAL ACCEPTANCE BY OWNER' DEPRESENTATIVE AND WILL BERAID OF PERI ACE ANY DEFECTIVE WORK
	<ul> <li>∠ (ER) </li> <li></li> </ul>	CENTER LINE	PROMPTLY AND WITHOUT CHARGE AND REPLACE ANY DEFECTIVE WORK PROMPTLY AND WITHOUT CHARGE AND RESTORE ANY OTHER EXISTING WOR DAMAGED IN THE COURSE OF REPAIRING DEFECTIVE MATERIALS AND WORKMANSHIP.
	SS	POINT OF CONNECTION OR POINT OF DISCONNECTION SANITARY SEWER STACK	G. CODES: ALL WORK SHALL BE PERFORMED IN STRICT ACCORDANCE WITH ALL APPLICABLE LOCAL CODES AND ORDINANCES, IN CASE OF CONFLICT BETWEE THE DRAWINGS AND THE SPECIFICATIONS AND THE CODES AND ORDINANCES THE HIGHEST STANDARD SHALL APPLY. THE PLUMBING CONTRACTOR SHALL SATISEY CODE REQUIREMENTS AS A MINIMUM STANDARD WITHOUT EXTRA CO
	CW	VENT STACKS	H. STANDARDS: EQUIPMENT AND MATERIALS SHALL CONFORM WITH APPROPRIA PROVISIONS OF UPC, CPC, CSA, ULC, ARL, ASME, ASTM, UL, NEMA, ANSI SMACH ASHRAF, AND NEPA, AS APPLICABLE TO FACH INDIVIDUAL UNIT OR ASSEMBLY
	HW	HOT WATER RISER	I. THE WORK, MATERIALS AND EQUIPMENT ARE TO BE PROVIDED TO MEET SPEC LEED CREDIT REQUIREMENTS AS STATED ON SCHEDULES AND PLANS.
	HWC	HOT WATER RECIRC. RISER	J. ALL PROPOSED SUBSTITUTIONS SHALL BE SUBMITTED PRIOR TO BIDDING AND PREAPPROVED IN WRITING. ALL COORDINATION ASSOCIATED WITH SUBSTITU MATERIALS OR EQUIPMENT IS THE RESPONSIBILITY OF THE CONTRACTOR.
	G	GAS RISER	K. THE CONTRACTOR SHALL SUBMIT SHOP DRAWINGS AND TECHNICAL DATA FO ALL EQUIPMENT AND MATERIALS SCHEDULED AND SPECIFIED INCLUDING AIR
	SD	STORM DRAIN RISER	L. OPERATING AND MAINTENANCE INSTRUCTIONS – AT THE CONCLUSION OF THE PROJECT, THE CONTRACTOR SHALL PROVIDE THREE (3) COPIES OF OPERATI
		OVERFLOW DRAIN RISER	AND MAINTENANCE INSTRUCTIONS FOR EACH PIECE OF EQUIPMENT REQUIRING PERIODIC SERVICE.
		COMPRESSED AIR RISER	A THIS PROJECT INVOLVES CONSTRUCTION INSIDE AN EXISTING STRUCTURE
	XX X XXX	PLUMBING EQUIPMENT MISCELLANEOUS EQUIPMENT	CONTRACTORS, BY SUBMITTING A BID ARE DEEMED TO BE COMPLETELY FAMI WITH THE EXISTING CONDITIONS OF THE BUILDING AS IT INFLUENCES THE W DESCRIBED. NO CLAIMS FOR EXTRA COMPENSATION WILL BE CONSIDERED FO EXISTING CONDITIONS VISIBLE OR REASONABLY INFERABLE FROM A CAREFUL EXAMINATION OF THE EXISTING BUILDING CONDITIONS
		KEYED NOTE DETAIL NO.	<ul> <li>B. CONTRACTOR SHALL INSPECT THE EXISTING FIELD CONDITIONS AT THE SITE A</li> <li>THE "AS BUILT" CONTRACT DOCUMENTS PRIOR TO THE START OF ANY WORK</li> <li>DETERMINE WHAT AFFECT THE EXISTING CONDITIONS WILL HAVE ON THE WO</li> <li>PODELEM AREAS SHALL BE BROUGHT TO THE ATTENTION OF THE</li> </ul>
	#	POUNDS OR NUMBER	ARCHITECT IMMEDIATELY. C. CONTRACTOR SHALL CONNECT THEIR WORK TO THE EXISTING PIPING SYSTEM
			NEW WORK SHALL BE COMPATIBLE WITH THE EXISTING SYSTEM MATERIALS, A CONSTRUCTION METHODS. COORDINATE ALL WORK WITH OTHER TRADES AN INSTALL ALL WORK IN COORDINATION WITH ARCHITECTURAL AND STRUCTURA MEMBERS. EXCEPT FOR NECESSARY CONNECTIONS TO ASSOCIATED EQUIPM NO PIPING OR DUCTWORK IS TO BE IN CONTACT WITH EQUIPMENT.
			D. COORDINATE ALL CUTTING AND PATCHING WITH GENERAL CONTRACTOR AND OTHER DISCIPLINES. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL CUTTING AND PATCHING RELATED TO HIS WORK.
			E. OBTAIN WRITTEN PERMISSION OF STRUCTURAL ENGINEER BEFORE PROCEED WITH ANY CUTTING OR PATCHING OF STRUCTURAL SYSTEMS. DO NOT CUT RE FRAMING.
			F. CARE SHALL BE TAKEN DURING INSTALLATION OF THE WORK TO NOT DAMAGE INTERRUPT THE EXISTING BUILDING SYSTEMS AND SERVICES INSTALLED. DAMAGE TO EXISTING SYSTEMS AND EQUIPMENT CAUSED BYCONTRACTOR DURING THE INSTALLATION OF THEIR WORK SHALL BE REPAIRED AND/OR REPLACED AT CONTRACTOR'S EXPENSE TO THE SATISFACTION OF THE BUILD OWNER.
			<ul> <li>G. NOTIFICATIONS AND COMPLIANCE WITH BUILDING STANDARDS AND RULES:</li> <li>1. OBTAIN A COPY OF ANY APPLICABLE BUILDING TENANT DEVELOPMENT AN BUILDING CONSTRUCTION STANDARDS AND COMPLY WITH THESE STANDARDS.</li> <li>2. SHUTDOWN OF EXISTING SYSTEMS FOR CONNECTION TO EXISTING SERVI</li> </ul>
			SHALL BE COORDINATED WITH THE OWNER. CONTRACTOR SHALL SUBMIT REQUESTS WHERE THEY AFFECT THE OPERATION OF THE BUILDING SYSTEMS AT LEAST ONE (1) WEEK IN ADVANCE OF ANY REQUIRED SHUTDOWN. THE ACTUAL SHUTDOWN PERIOD SHALL BE AS SHORT AS POSSIBLE AND AT A TIME AGREED TO BY THE OWNER.
			H. DEMOLITION SHALL BE COORDINATED WITH OWNER'S REPRESENTATIVE, ARCHITECT AND GENERAL CONTRACTOR.
			I. CONTRACTOR SHALL REPORT ANY EQUIPMENT DEFICIENCIES FOUND TO THE ARCHITECT WITHIN FIVE (5) DAYS OF DISCOVERY.

PART 2 - PRODUCTS AND EXECUTION

- 2.1 BASIC MATERIALS AND METHODS
  - A. ALL MATERIALS AND EQUIPMENT ARE TO BE NEW UNLESS OTHERWISE DESIGNATED IN THESE DOCUMENTS.
  - B. CUTTING, CORING AND FITTING PERFORM REPAIRING AND FINISHING OF THE WORK NECESSARY FOR THE INSTALLATION OF THE FIXTURE. HOWEVER, NO CUTTING OF THE WORK OF OTHER TRADES OR ANY STRUCTURAL MEMBER SH BE DONE WITHOUT THE CONSENT OF THE ARCHITECT, CONSTRUCTION MANAGER, GENERAL CONTRACTOR, AND/OR OWNER. PROPERLY FILL, SEAL, FIREPROOF, AND WATERPROOF ALL OPENINGS, SLEEVES AND HOLES IN SLAB WALLS, AND CASEWORK.
  - C. HANGERS AND SUPPORTS THE PLUMBING CONTRACTOR SHALL FURNISH AND INSTALL ALL SUPPORTS NEEDED FOR EQUIPMENT AND MATERIAL. PROVIDE HANGERS FOR INSULATED PIPE SIZES 1/2" TO 1-1/2" OF THE ADJUSTABLE STEEL BAND TYPE. HANGERS FOR INSULATED PIPE SIZES 2" AND OVER SHALL BE ADJUSTABLE STEEL CLEVIS TYPE. SHIELDS SHALL BE USED WHERE HANGER SUPPORTS INSULATED PIPE. HANGERS AND PIPE ATTACHMENTS TO BE FACTORY FABRICATED WITH GALVANIZED COATINGS; NONMETALLIC COATED FOR HANGERS IN DIRECT CONTACT WITH COPPER TUBING. HANGERS SHALL BE LOCATED 12" MAXIMUM FROM ANY CHANGE IN DIRECTION AND SPACES AS FOLLOWS FOR STRAIGHT RUNS. MAXIMUM SPACING BETWEEN HANGERS SHALL COMPLY WITH

G - SF	PECIFICATIONS	PLUME	SING BASIS OF DESI
	LOCAL CODE REQUIREMENTS WITH ADDITIONAL SUPPORTS WHERE REQUIRED TO PROPERLY SUPPORT EACH PIPE.	1.1 PLUMBING BASIS O	FDESIGN
	D. CONNECTIONS – INSTALL UNIONS ADJACENT TO EACH VALVE AND AT FINAL CONNECTION TO EACH PIECE OF EQUIPMENT. INSTALL DIELECTRIC COUPLINGS TO CONNECT PIPING MATERIALS OF DISSIMILAR METALS. SCREW JOINT STEEL	A. CODES AND STAND AHJ) 1. OREGON BUILD JURISDICTION (	ARDS (LATEST EDITIONS UNLESS OTHERWISE REQUI ING CODES ENFORCED BY THE AUTHORITY HAVING AHJ):
s MBING	PIPING UP TO AND INCLUDING 1-1/2". WELD PIPING USE NON-LEAD, NON- ANTIMONY SOLDER FOR SOLDERING DOMESTIC WATER COPPER PIPE.	A) 2022 OREG INTERNATIO	ON ŚTRUCTURAL SPECIALTY CODE (OSSC) BASED ON DNAL BUILDING CODE WITH STATE AMENDMENTS.
ACT ED TO	E. INSTALLATION – INSTALL PIPING FREE OF SAGS AND BENDS, PROVIDE BRACKET STANDOFFS FROM MOUNTING SURFACES SUFFICIENT TO ALLOW 1" CLEANING SPACE AROUND ALL PIPING, INCLUDING ANY ADDED PIPING INSULATION. INSTALL FITTINGS FOR CHANGES IN DIRECTION AND BRANCH CONNECTIONS. INSTALL	B) 2021 OREG UNIFORM P C) 2022 OREG INTERNATIO	ON PLUMBING SPECIALTY CODE (OPSC) BASED ON TH LUMBING CODE WITH STATE AMENDMENTS. ON MECHANICAL SPECIALTY CODE (OMSC) BASED ON DNAL MECHANICAL CODE AND THE 2021INTERNATION (IMC)
ALL RNISH O	SLEEVES FOR PIPES PASSING THROUGH CONCRETE AND MASONRY WALLS, GYPSUM-BOARD PARTITIONS, CONCRETE FLOOR, AND ROOF SLABS/STRUCTURE. SEAL PIPE PENETRATIONS THROUGH RATED CONSTRUCTION WITH FIRE- STOPPING SEALANT MATERIAL MEETING CODE, AHJ, AND ARCHITECT'S	2. AMERICANS WI B. WATER SUPPLY: 1. THE EXISTING S	TH DISABILITIES ACT (ADA) SERVICES ARE ASSUMED TO BE SUFFICIENT FOR ALL
	REQUIREMENTS. UNDERGROUND WATER AND SEWER LINES SHALL BE LAID IN SEPARATE TRENCHES WITH A MINIMUM HORIZONTAL SPACING AS REQUIRED BY CODE, EXCAVATED TO THE PROPER DEPTH AND GRADED TO PRODUCE THE REQUIRED FALL.	TOILET ROOM 1 A) A NEW 1-1/2 LAVATORY,	174: 2" COLD WATER LINE IS TO BE PROVIDED TO SERVICE HOSE BIBB, INSTANT HOT WATER HEATER, AND WATI
NG	F. ALL PLUMBING AND PLUMBING EQUIPMENT SHALL BE SUPPORTED FROM STRUCTURE (CONFIRM) AND NOT FROM OTHER EQUIPMENT, PIPING, CONDUITS OR CEILING SUPPORTS.	C. DOMESTIC HOT WA 1. A NEW INSTAN ROOM 1174. A) INSTANT HO LIMITED TO	TER: THOT WATER HEATER WILL BE PROVIDED FOR ALL US DT WATER HEATER OUTLET TEMPERATURE SHALL BE 110°E PER ADA REOUREMENTS
CE WITH AYOUTS	2.2 PLUMBING EQUIPMENT	D. SANITARY SEWER:	
ESS D PAY	A. EQUIPMENT – THE PLUMBING CONTRACTOR SHALL VERIFY ANY EQUIPMENT LOCATION AND SIZES REQUIRING PLUMBING CONNECTION(S) WITH THE TRADE AND VENDOR SUPPLYING THE EQUIPMENT PRIOR TO ROUGH-IN.	<ol> <li>ALL USER TOILI AN EXISTING 6" FURTHER INFO</li> <li>THE EXISTING 2</li> </ol>	ET ROOM 1174 SANITARY SEWER PIPING SHALL CONN SANITARY LINE THAT IS NEARBY. SEE SHEET 1/P6.1 F RMATION. " SANITARY VENT, PREVIOUSLY USED FOR A DEMOLIS
	B. CLEANOUTS – F&I J.R. SMITH OR EQUIVALENT FLOOR AND WALL CLEANOUTS AS INDICATED ON THE DRAWINGS AND WHERE NEEDED IN ALL SOIL, WASTE, AND DRAIN LINES. IN AREAS WITH CERAMIC TILE OR CARPETED FLOORING, PROVIDE CLEANOUTS WITH SQUARE, ADJUSTABLE, NICKEL BRONZE TOP. IN AREAS WITH	FLOOR SINK SH FOR FURTHER E. SEISMIC:	IALL BE REUSED TO SUPPORT THE RESTROOM. SEE S INFORMATION.
NER'S WORK	RESILIENT FLOORING, PROVIDE CLEANOUTS WITH SQUARE, ADJUSTABLE, NICKEL BRONZE TOP WITH TILE RECESS. CLEANOUTS SHALL BE SAME SIZE AS PIPE EXCEPT THAT CLEANOUTS LARGER THAN 4" WILL NOT BE REQUIRED. WHERE CLEANOUTS OCCUR IN WALLS OF FINISHED AREAS, THEY SHALL BE CONCEALED BEHIND CHROME PLATED ACCESS COVERS.	1. ANCHORAGE A ENGINEER AND	ND RESTRAINTS MUST BE COORDINATED WITH STRUC AUTHORITY HAVING JURISDICTION.
ALL TWEEN NCES,	C. TESTING – ALL PIPES SHALL BE TESTED BY AN APPROVED METHOD BEFORE THEY ARE BACKFILLED OR CONCEALED. AFTER TESTING IS COMPLETE, THE PLUMBING CONTRACTOR SHALL DISINFECT THE POTABLE WATER SYSTEM AS REQUIRED BY AHJ. TEST WATER PURITY ACCORDING TO AHJ AND SUBMIT CERTIFIED TEST	PLUN	IBING DRAWING LIS
1ALL RA COST.	RESULTS TO AHJ FOR REVIEW AND APPROVAL.	SHEET NUMBER	SHEET NAME
PRIATE MACNA, IBLY.	A. INSTALL NO-SCALD SAFETY COVERS WIT INSULATED FOAM LINER AND TAMPER PROOF STRAP AT EXPOSED PIPING UNDER ADA SINKS AS FURNISHED BY STARBUCKS.	P0.0 PLU P6.1 FIR	IMBING LEGEND AND ABBREVIATIONS ST FLOOR ENLARGED PLAN
SPECIFIC	2.4 PIPING		
G AND	A. SOIL, WASTE AND VENT PIPING 1 SOIL WASTE AND VENT PIPING 10" AND SMALLER SHALL BE SERVICE WEIGHT		
A FOR AIR	HUBLESS, CAST IRON PIPE AND FITTINGS WITH NEOPRENE GASKET AND STAINLESS STEEL SHIELD AND CLAMP. PROVIDE HUB-TYPE PIPE AND FITTINGS BELOW GRADE WHERE REQUIRED BY LOCAL CODES OR AHJ. HORIZONTAL RUNS SHALL DRAIN AT A GRADE OF 1/4" PER FOOT. IF SLOPE OF		
	1/4" IS NOT POSSIBLE, APPLY TO BUILDING DEPARTMENT FOR VARIANCE IF 1/8" IS NEEDED.		
f The Rating Quiring	B. DOMESTIC WATER PIPING – 2" AND SMALLER SHALL BE COPPER TUBE WITH WROUGHT COPPER SWEAT FITTINGS JOINED WITH LEAD FREE SOLDER. PROVIDE TYPE "L" COPPER TUBE ABOVE GROUND TYPE "K" BELOW GROUND.		
	2.5 VALVES		
RE. FAMILIAR E WORK ED FOR EFUL SITE AND	A. GENERAL – PLUMBING CONTRACTOR TO PROVIDE VALVES WHERE INDICATED ON PLANS AND AS NECESSARY FOR PROPER SYSTEM OPERATION AND COMPONENT ISOLATION. INSTALL VALVES FOR EACH FIXTURE AND ITEM OF EQUIPMENT. PROVIDE BRAIDED STAINLESS STEEL HOSE (UNLESS OTHERWISE NOTED) BETWEEN VALVE AND EQUIPMENT IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS. LOCATE SHUT-OFF VALVES WITHOUT MOVING EQUIPMENT. PROVIDE STOP VALVES FOR ALL EQUIPMENT WHETHER SHOWN ON THE DRAWINGS OR NOT. VALVES SHALL BE LISTED/APPROVED FOR USE BY AHJ AND		
/ORK TO E WORK	CODE REQUIREMENTS.		
F THE	<ul> <li>B. VALVES – PROVIDE VALVES FOR WORKING PRESSURE IN WATER PIPING OF 125 PSI OR GREATER. UNLESS NOTED OTHERWISE VALVES SHALL MEET THE FOLLOWING MINIMUM REQUIREMENTS:</li> <li>1. VALVE TYPE: DESCRIPTION</li> </ul>		
ALS, AND ES AND ETURAL	<ul> <li>A) BALL VALVE (UP TO 3"): BRASS, FULL PORT, QUARTER TURN.</li> <li>2 WATER HAMMER ARRESTOR: PRE-CHARGED SEALED CHAMBER</li> </ul>		
UIPMENT,	<ol> <li>PRESSURE REDUCING VALVE: BRONZE, 25 TO 75 PSI REDUCED PRESSURE RANGE AND UPSTREAM/DOWNSTREAM PRESSURE GAUGES.</li> <li>TRAP SEAL PRIMER: BRONZE, PRESSURE BASED AUTOMATIC PRIMING.</li> </ol>		
TTING	C. SUPPLY WATER SERVICE – IF WATER PRESSURE SUPPLIED TO STORE IS GREATER THAN 65 PSI, THEN PROVIDE A PRESSURE REGULATOR IN MAIN SUPPLY TO REDUCE WATER PRESSURE. PROVIDE BACKFLOW PREVENTION ONWATER SERVICE IF REQUIRED BY LOCAL CODE.		
UT ROOF	D. THERMOSTATIC MIXING VALVE		
MAGE OR	1. PROVIDE A SINGLE THERMOSTATIC MIXING VALVE (TMV) SETFOR 110°F (OR AS REQUIRED BY AHJ) TO SERVE LAVATORY. MIXING VALVE TO BE INSTALLED PER MANUEACTURER'S REQUIREMENTS WITH CHECK VALVES AT SUPPLY		
OR SR	INLETS.		
	<ul> <li>2.6 TESTING</li> <li>1. WATER DISTRIBUTION PIPING TEST: BEFORE FIXTURES ARE SET, SUBJECT THE HOT AND COLD WATER PIPING SYSTEMS TO A HYDROSTATIC PRESSURE TEST OF 150 POUNDS PER SQUARE INCH WITH WATER FOR NOT LESS THAN 8</li> </ul>		
	OF LEAKAGE. WHERE A PORTION OF THE WATER DISTRIBUTION PIPING IS TO BE CONCEALED BEFORE COMPLETION, TEST THIS PORTION SEPARATELY AS SPECIFIED FOR THE ENTIRE SYSTEM.		
AS	2. SANITARY WASTE AND VENT PIPING TEST. BEFORE THE INSTALLATION OF ANY FIXTURES OR DRAINS, CAP THE ENDS OF THE SYSTEM AND FILL ALL LINES WITH WATER AND ALLOW TO STAND FOR AT LEAST 30 MINUTES WITHOUT LEAKAGE. MAKE TESTS WITHIN BUILDING WITH PIPING EXPOSED. IF THE SYSTEM IS TESTED IN SECTIONS, TICKET Y LUC EACH OPENING, EXCEPT THE		
	HIGHEST OPENING OF THE SECTION UNDER TEST, AND FILL EACH SECTION WITH WATER AND TEST WITH AT LEAST A 10 FEET HEAD OF WATER FOR WASTE PIPING AND UP TO THE TOP OF VENT TERMINAL FOR VENT PIPING. PERFORM FINAL TEST FOR SANITARY DRAINAGE VENT AND FIXTURE SYSTEM		
THE			
		DEFI	ERRED SUBMITTALS
		<ol> <li>FIRE SPRINKLER DES</li> <li>SEISMIC BRACING FO PIPING, AND DUCKWO</li> <li>PIPING SYSTEM OF D</li> </ol>	SIGN. DR MECHANICAL AND PLUMBING SYSTEMS, INCLUDE E DRK. TIFICATION AND ANALYSIS'
F THE		A. DESIGN: DESIGN PIPING SYSTEMS	AND CALCULATE REQUIREMENTS FOR THERMAL EXP AND FOR THE SELECTING AND DESIGNING EXPANSIO
NO ER SHALL		AND LOOPS. B. ANCHOR DETAILS	S: DETAIL FABRICATION OF EACH ANCHOR. SHOW DIM
EAL,		AND METHODS C SUPPORTS, ANC	H ASSEMBLY AND ATTACHMENT TO BUILDING STRUC HORS, AND GUIDES SHALL BE DESIGNED FOR COMBIN JRE AND THERMALL OADS
SLABS,		C. ALIGNMENTS GU BUILDING STRUC	IDE DETAILS: DETAIL FIELD ASSEMBLY AND ATTACHMI TURE.
SH AND IDE		D. SCHEDULE: EACH TYPE, MATERIAL	HEXPANSION JOINT SHALL BE SCHEDULED WITH MAN SIZE, PRESSURE RATING, END CONNECTIONS, AND L
STEEL F		E. FULLY COORDIN	ATE WITH DESIGN OF SEISMIC RESTRAINT AND ANCHO

\*FOR ALL ITEMS LISTED ABOVE, THE PLUMBING AND/OR MECHANICAL CONTRACTOR SHALL PROVIDE A DELEGATED DESIGN SUBMITTAL WITH THE DOCUMENTATION AND ENGINEERING REQUIRED TO SATISFY REQUIREMENTS OF THE AUTHORITY HAVING JURISDICTION (AHJ). THE DELEGRATED DESIGN SUBMITTAL SHALL INCLUDE, BUT NOT BE LIMITED TO: ANALYSIS DATA SIGNED AND SEALED BY A QUALIFIED PROFESSIONAL ENGINEER RESPONSIBLE FOR THEIR PREPARATION.

![](_page_24_Figure_13.jpeg)

![](_page_24_Figure_14.jpeg)

![](_page_25_Figure_0.jpeg)

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![](_page_25_Figure_1.jpeg)

![](_page_25_Figure_3.jpeg)

PLUMBING FIXTURE SCHEDULE												
			ADA	FLOW	CONN			ZE OW				
FIXIURE	MANUFACTURER	MODEL	(Y/N)	(GPF/GPM)	VV	V	HW	CW	REMARKS			
HOSE BIBB	J.R. SMITH	5609QT		5				3/4"	WALL FAUCET WITH VACUUM BREAKER, CHROME FINISH, TEE-KEY HANDLE 24" AFG.			
Tory - Wall Hung	AMERICAN STANDARD	0356.041	YES	0.35	2"	2"	1/2"	1/2"	VITREOUS CHINA, WALL MOUNTED, 20-1/2"X18-1/4". AMERICAN STANDARD 6 LEVER FAUCET WITH AMERICAN STANDARD 605XTMV1070 THERMOSTATIC VALVE, OR EQUAL. PROVIDE K-7131-A OFFSET DRAIN WITH FIXED GRID STR PROVIDE PLUMBEREX "PRO-EXTREME" P-TRAP AND SUPPLY PROTECTION.			
CLOSET, WALL HUNG	AMERICAN STANDARD	3351.101	YES	1.28	4"	2"		1 1/4"	VITREOUS CHINA, WALL MOUNT, ELONGATED BOWL, FLUSH VALVE, 1.28 GP AMERICAN STANDARD 6047121.002 MANUAL FLUSH VALVE. VALVE HANDLE RIGHT SIDE OF BOWL FOR EASE OF ADA ACCESS. PROVIDE OLSONITE #95S FRONT SEAT. MOUNT RIM AT 17" AFF. COORDINATE FLUSH VALVE MOUNTIN WITH GRAB BAR MOUNTING AND ADJUST FLUSH VALVE AS REQUIRED, PRO OFFSET OUTLET TUBE ON FLUSH VALVE. COORDINATE WITH ARCHITECTUR FIXTURE RATED FOR 1000-LBS STATIC WEIGHT.			
FLOOR DRAIN	JR SMITH	2005-B			2"	0"		1/2"	9" DIAMETER CAST IRON BODY, 5"x5" NICKEL BRONZE STRAINER HEAD, TRA			
TRAP PRIMER	PPP	PR-500						1/2"	PRESSURE DROP ACTIVATED AT 10 PSI.			

E. HOT WATER SHALL BE LIMITED TO ALL FIXTURES IN ACCORDANCE WITH ASSE STANDARDS: PUBLIC LAVATORIES SHALL BE LIMITED TO 110 F (ASSE 1070)

INSTANT HOT DOMESTIC WATER HEATER SCHEDULE														_				
						CONNECTION SIZE		NATURAL GAS		ELECTRICAL								
		VOL	RECOV	EWT	LWT			NG	FLUE	INPUT	EFF					<b>UNIT SIZE</b>	OPER. WT.	
MODEL	LOCATION	(GAL)	(GPH)	(°F)	(°F)	CW (IN)	HW (IN)	(IN)	(IN)	(MBH)	(AFUE%)	KW	VOLTS	PH	MCA	(L"xW"xH")	(LBS)	
CM-15L/208	ALL USER TOILET ROOM 1174	-	-	50	110	3/8"	3/8"	-	-	-	-	3.21	208	1	15	9-5/8x2-3/4x6-1/4	5	

2. INSTANTANEOUS ELECTRIC TANKLESS, THERMOSTATIC CONTROL, LOW PRESSURE MODEL, 0.2 GMP ACTIVATION FLOW RATE, 61°F RISE AT 0.35 GPM FLOW RATE. MOUNT BELOW LAVATORY. MAXIMUM ALLOWABLE TEMPERATURE: 110°F.

### **SHEET NOTES**

- A. ALL EXISTING PIPING IS BASED OFF OWNER PROVIDED AS-BUILT DRAWINGS. CONTRACTOR IS RESPONSIBLE FOR IN-FIELD VERIFICATION AND INSPECTION OF SITE. REPORT ANY DISCREPANCIES TO ARCHITECT AND ENIGNEER OF RECORD UPON
- DISCOVERY. B. NO WORK SHALL BE APPROVED OR BEGIN UNTIL CONTRACTOR HAS
- IN-FIELD VERIFIED THE SITE.
- C. COORDINATE ALL UTILITY SHUT-OFFS WITH OWNER SO AS NOT TO DISRUPT NORMAL BUSINESS HOURS.

![](_page_25_Figure_16.jpeg)

![](_page_25_Figure_17.jpeg)

![](_page_25_Figure_18.jpeg)

![](_page_25_Figure_19.jpeg)