Bryant Development and Review Committee Meeting

Boswell Municipal Complex - City Hall Conference Room

210 SW 3rd Street

Date: November 17, 2022 - **Time:** 9:00 AM

Call to Order

Old Business

New Business

1. Saline Dental - 3001 Horizon Street - Parking Lot Changes

Charlie Best - Requesting Approval for Changes to Site Plan

- 0622-PLN-01.pdf

2. Domino's - 3415 HWY 5 - Facade Changes

Tom Whitehead - Requesting Approval for Facade Changes

- 0623-PLN-01.pdf

Staff Approved

3. The Office - 205 Progress Way Ste 200 - Sign Permit

L Graphics - Requesting Sign Permit Approval - STAFF APPROVED

- 0620-APP-01.pdf

4. The Office - 205 Progress Way Ste 500 - Sign Permit

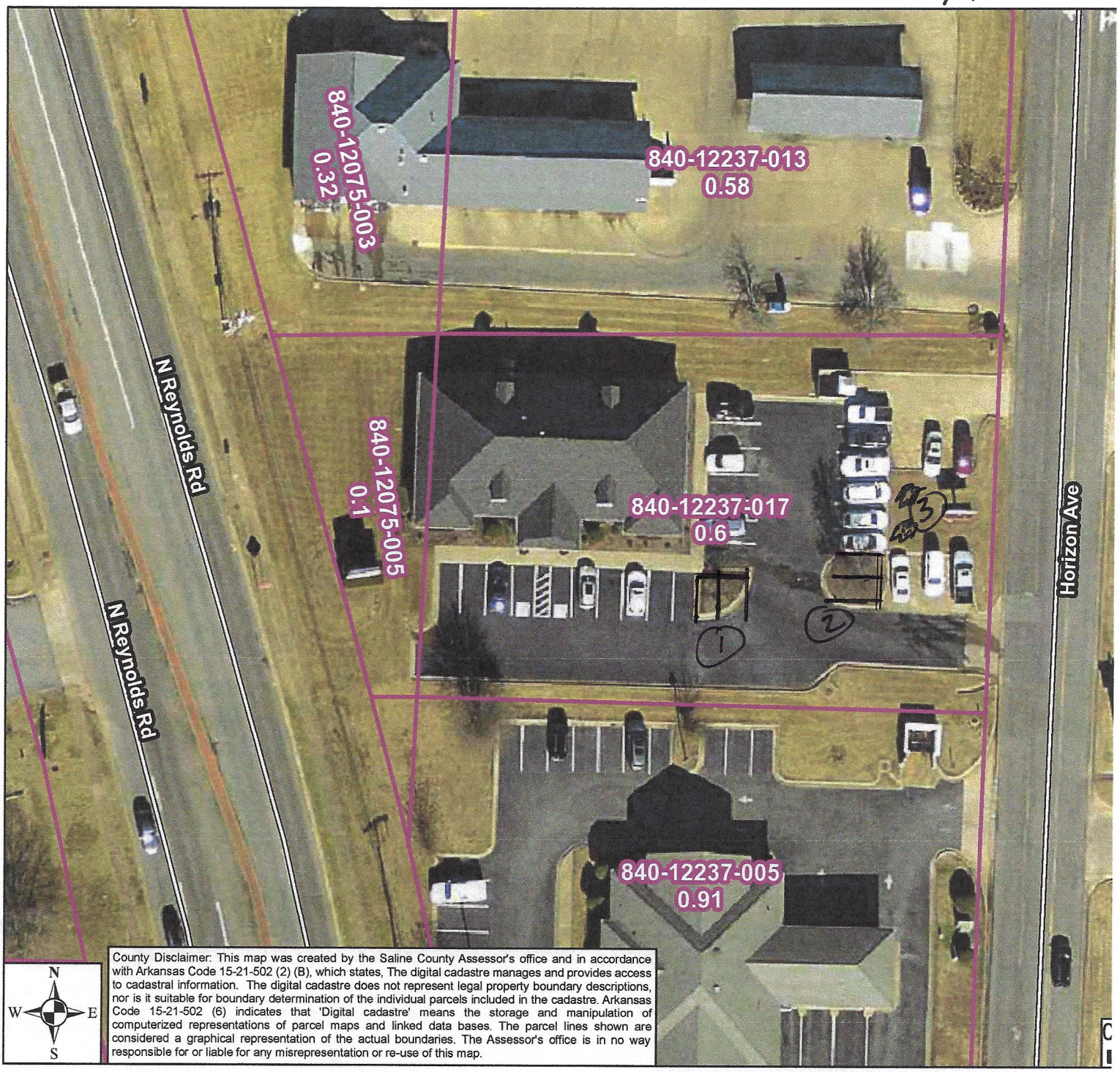
L Graphics - Requesting Sign Permit Approval - STAFF APPROVED

- 0621-APP-01.pdf

Permit Report

Adjournments

Saline Dental 11/9/22



(1) Remove trees, curb and create 2- Conc. Pavers Parking Spaces

(2) Remove trees, curb and create 2- Conc. Pavers Parking Spaces.

(3) Plant 2- new trees.

DOMINOS BRYANT

3415 W. HWY 5

BRYANT, AR

GENERAL NOTES:

1. CONTRACTOR IS TO INSPECT EXISTING CONDITIONS INCLUDING BUT NOT LIMITED TO, UNDERGROUND WATER MAINS, SEWER, TELEPHONE, AND ELECTRIC. WORK HERE UNDER ARE INDICATED ON DRAWINGS FOR DIAGRAMMATIC PURPOSES. NO GUARANTEE AS TO THE ACCURACY OR COMPLETENESS OF SUCH INFORMATION. RESPONSIBILITY FOR SUCH ACCURACY AND COMPLETENESS IS DISCLAIMED. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR LOCATING UNDERGROUND INSTALLATIONS PRIOR TO EXCAVATING.
2. ALL DIMENSIONS ARE FROM FACE OF STUD, FACE OF CONC. OR CENTER LINE UNLESS NOTED OTHERWISE. DRAWINGS ARE NOT TO BE SCALED, DIMENSIONS SHALL BE IN WRITTEN INFORMATION ONLY. VERIFY DIMENSIONS PRIOR TO WORK. ALTERATIONS IN DIMENSIONS AFFECTING THE DESIGN SHALL BE BROUGHT TO THE ATTENTION OF THE ARCHITECT PROMPTLY FOR A RESOLUTION.
3. NOT ALL MATERIALS AND ASSEMBLIES HAVE BEEN SPECIFIED. CONTRACTOR IS TO VERIFY ALL NON-SPECIFIED ITEMS WITH OWNER & ARCHITECT PRIOR TO EXECUTING ANY WORK INVOLVING THESE ITEMS.
4. IT IS THE CONTRACTORS RESPONSIBILITY TO SUBMIT SUBSTITUTIONS OR DEVIATIONS FROM THE CONTRACT DOCUMENTS TO THE ARCHITECT FOR APPROVAL, NON-APPROVED DEVIATIONS WILL HOLD THE ARCHITECTS AND CONSULTING ENGINEERS HARMLESS FOR SUCH ITEMS.
5. ALL WORK TO CONFORM TO APPLICABLE CODES. THE MOST STRINGENT CODE SHALL APPLY. DISCREPANCIES IN CODE AND CONTRACT DOCUMENTS SHALL BE BROUGHT TO THE ARCHITECTS ATTENTION IMMEDIATELY AND RESOLVED BEFORE PROCEEDING.
6. ALL MATERIALS ARE TO BE INSTALLED IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS AND AS SUCH ALL SUBCONTRACTORS ARE TO INSURE THAT ALL MANUFACTURER'S WARRANTIES WILL BE HONORED.
7. ALL SUBCONTRACTORS ARE RESPONSIBLE FOR INSURING THEIR SAFETY AND OF THEIR PERSONNEL ON THE JOB SITE AT ALL TIMES. THEY SHALL CARRY WORKMAN'S COMPENSATION AND LIABILITY INSURANCE FOR THEMSELVES AND THEIR EMPLOYEES. SUBCONTRACTORS AND THEIR EMPLOYEES SHALL BE PERSONALLY RESPONSIBLE TO FOLLOW ALL OSHA RULES AND REGULATIONS.
8. GENERAL CONTRACTOR IS TO COORDINATE ALL MECH. ELECT. AND PLUMBING AND PROVIDE NECESSARY CONSTRUCTION TO FACILITATE SUCH WORK INCLUDING SUPPORTS, BLOCKING, ROUGH OPENING ETC.
9. IT IS THE RESPONSIBILITY OF THE GENERAL CONTRACTOR TO REVIEW ARCHITECTURAL DRAWINGS BEFORE INSTALLATION OF MECH, ELECT OR SYSTEMS INSTALLATION, AND SHALL NOTIFY ARCHITECT IMMEDIATELY FOR ANY DISCREPANCIES. ANDY WORK INSTALLED IN CONFLICT WITH THE CONTRACT DOCUMENTS SHALL BE CORRECTED BY THE GENERAL CONTRACTOR AT NO EXPENSE TO THE OWNER OR ARCHITECT.
10. ALL DRAWINGS, SPECIFICATIONS AND DESIGN OF THE FOLLOWING SYSTEMS ARE TO BE PROVIDED BY OTHERS AS REQUIRED. OWNER SHALL CONTRACT WITH OTHERS UNDER SEPARATE CONTRACTS.

    A. CIVIL ENGINEERING B MECHANICAL ENGINEERING C. ELECTRICAL ENGINEERING

SHEET INDEX

#	SHEET NAME	ISSUE DATE	Current Revision Description	REVISION
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E3.1	ELECTRICAL SPECIFICATIONS	10-31-22		
E3.2	ELECTRICAL SPECIFICATIONS	10-31-22		
E3.3	ELECTRICAL SPECIFICATIONS	10-31-22		

PROJECT TEAM

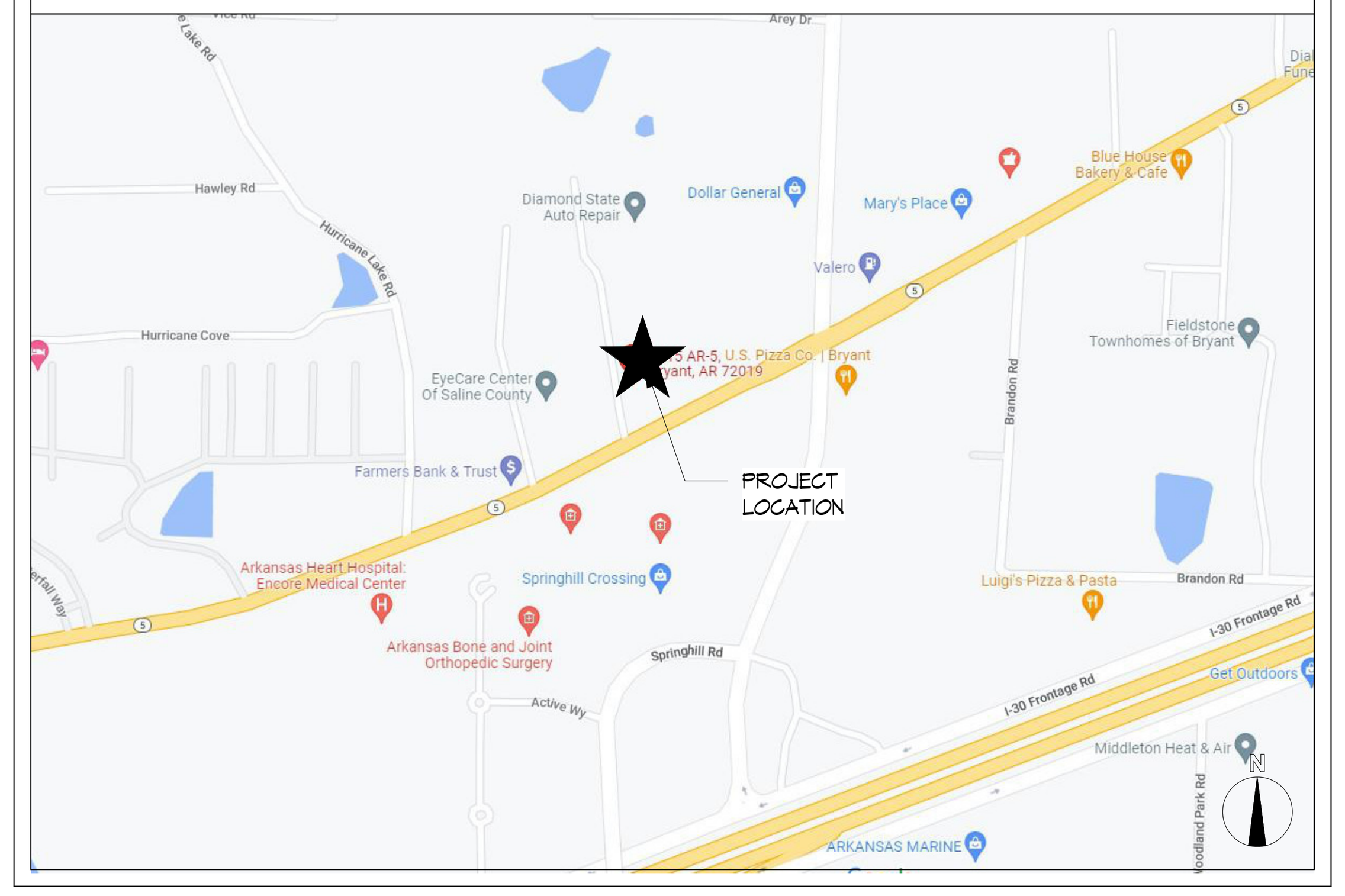
Burris Architecture
820 Tiger Blvd, Suite 4, Bentonville, Ar 72712
479-319-6045

I HEREBY CERTIFY THAT THESE PLANS AND SPECIFICATION HAVE BEEN PREPARED BY ME, OR UNDER MY SUPERVISION. I FURTHER CERTIFY THAT TO THE BEST OF MY KNOWLEDGE THESE PLANS AND SPECIFICATIONS ARE AS REQUIRED BY LAW AND IN COMPLIANCE WITH THE ARKANSAS FIRE PREVENTION CODE FOR THE STATE OF ARKANSAS.

MEP

HP ENGINEERING
5214 W. VILLAGE PKWY
SUITE 120
ROGERS, AR 72758
(479) 899-6370

LOCATION MAP



Registered Architect
David Paul Burris
No. 4116
Arkansas

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479-319-6045

DOMINOS BRYANT
3415 W. HWY 5
BRYANT, AR

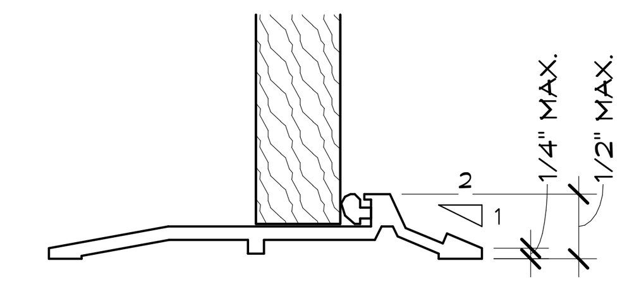
DATE 10-31-22
JOB NO. 22151
REVISIONS

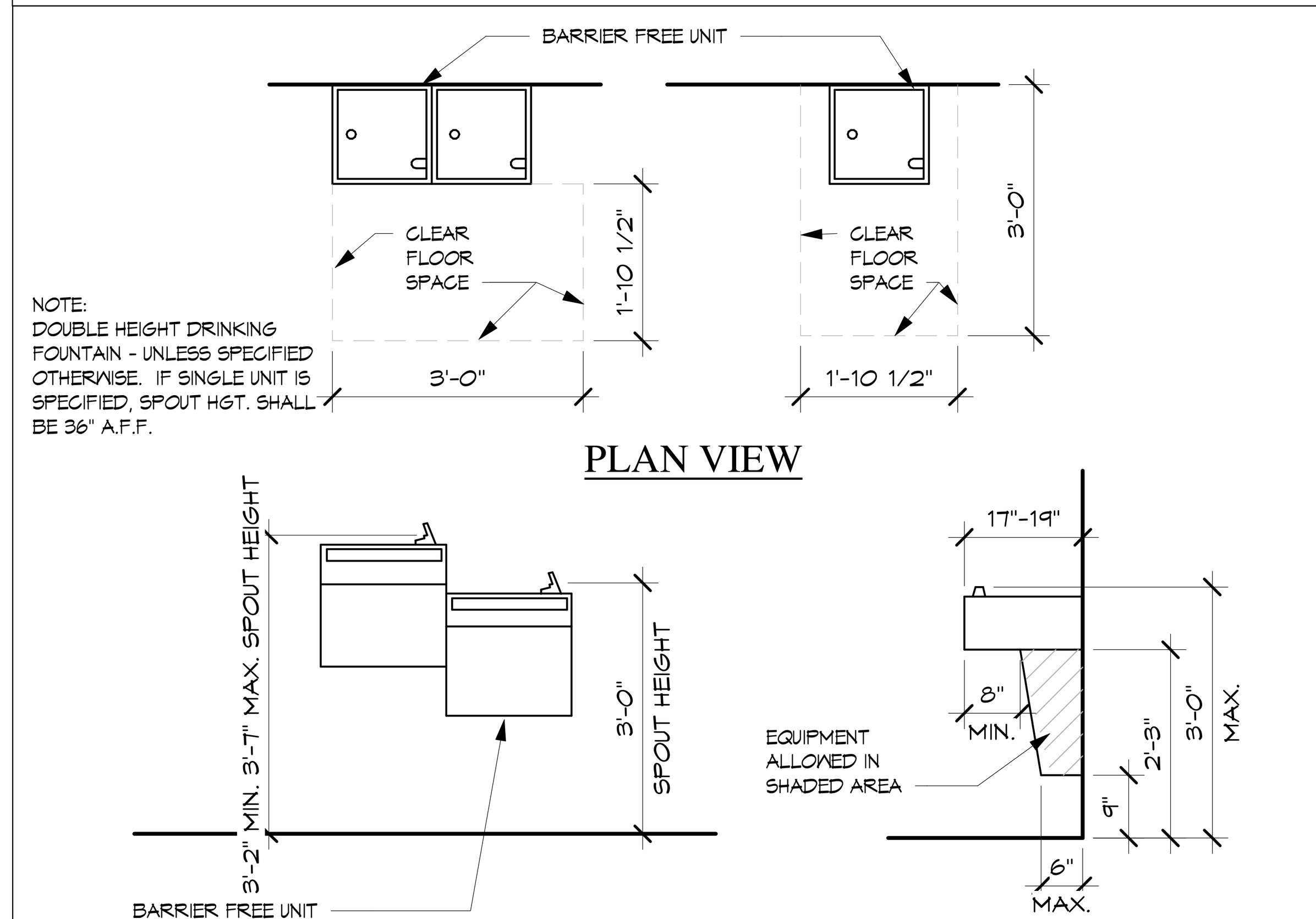
A0.0
COVER SHEET

MISC MOUNTING HEIGHTS

FIRE EXTINGUISHERS:	48" TO CENTERLINE OF CONTROLS
MARKER/TACK BOARDS:	36" TO BOTTOM
WALL MOUNTED TELEPHONES:	54" TO TOP OF PHONE
CLOSET/SHELF ROD:	54" TO TOP OF SHELF

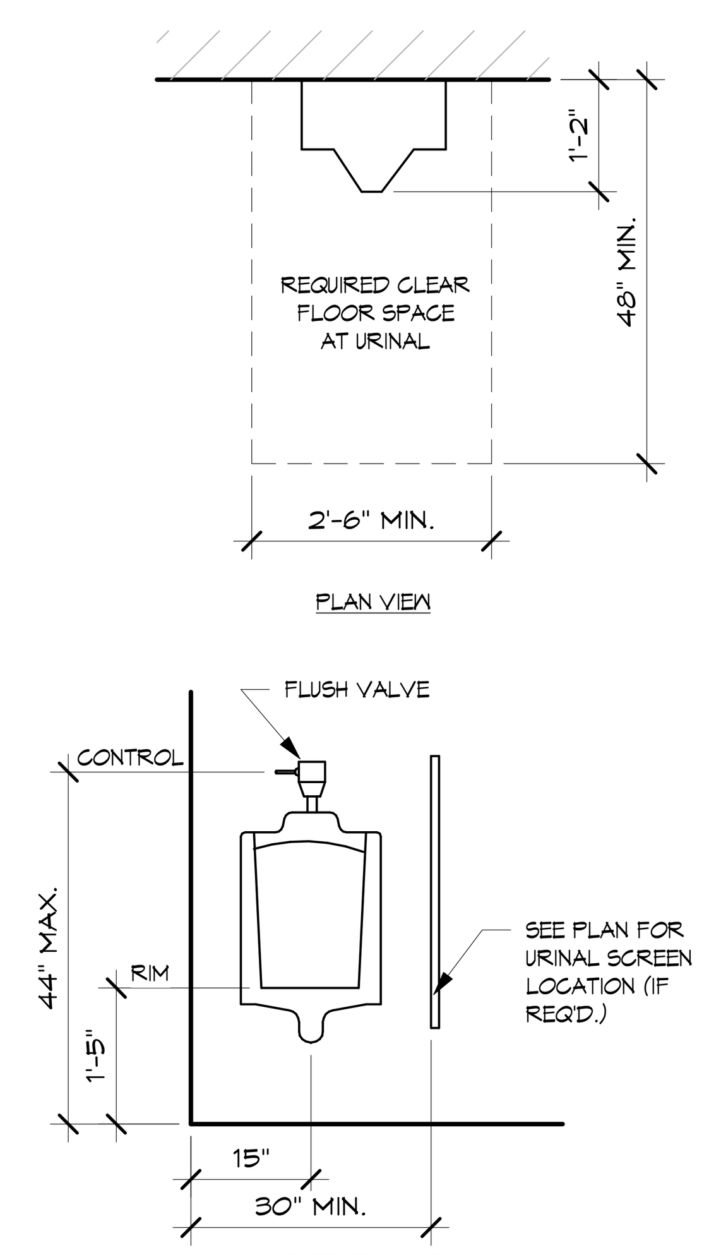
THRESHOLDS



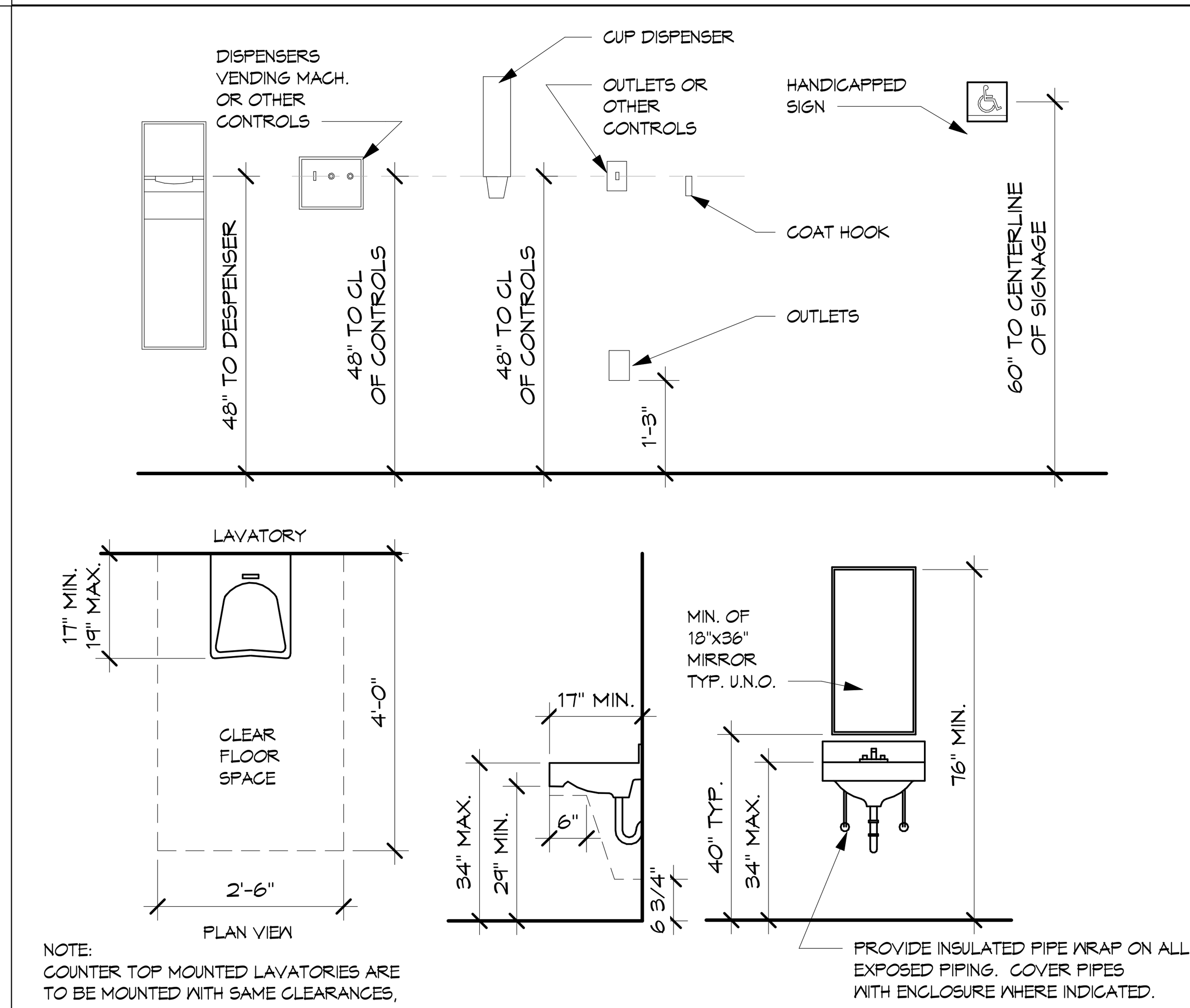


BARRIER FREE UNIT
CLEAR FLOOR SPACE
1'-10 1/2"
3'-0"
CLEAR FLOOR SPACE
3'-0"
1'-10 1/2"
NOTE:
DOUBLE HEIGHT DRINKING FOUNTAIN - UNLESS SPECIFIED OTHERWISE. IF SINGLE UNIT IS SPECIFIED, SPOUT HGT. SHALL BE 36" A.F.F.
PLAN VIEW
3'-2" MIN. 3'-7" MAX. SPOUT HEIGHT
3'-0" SPOUT HEIGHT
EQUIPMENT ALLOWED IN SHADED AREA
BARRIER FREE UNIT
17"-19"
8" MIN.
2'-3"
3'-0" MAX.
9"
6" MAX.

DRINKING FOUNTAIN REQUIREMENTS

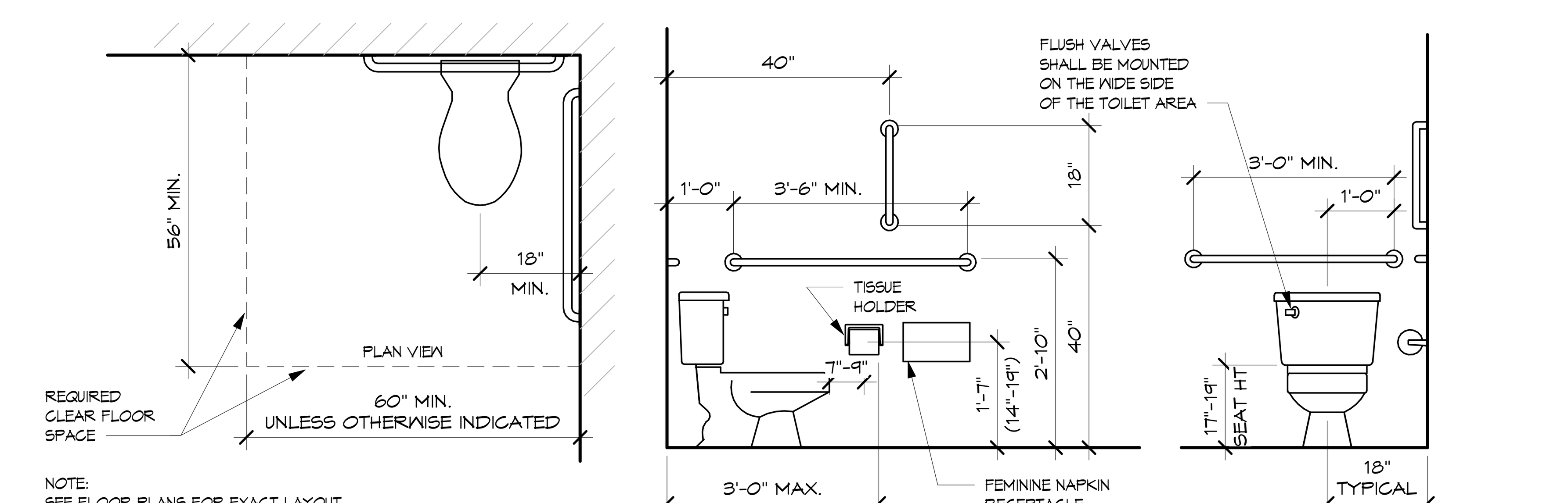


URINAL REQUIREMENTS



DISPENSERS VENDING MACH. OR OTHER CONTROLS
CUP DISPENSER
OUTLETS OR OTHER CONTROLS
HANDICAPPED SIGN
COAT HOOK
OUTLETS
48" TO DISPENSER
48" TO CL OF CONTROLS
48" TO CL OF CONTROLS
1'-3"
60" TO CENTERLINE OF SIGNAGE
LAVATORY
17" MIN.
19" MAX.
CLEAR FLOOR SPACE
4'-0"
2'-6"
PLAN VIEW
NOTE:
COUNTER TOP MOUNTED LAVATORIES ARE TO BE MOUNTED WITH SAME CLEARANCES, REQUIREMENTS, ETC.
17" MIN.
34" MAX.
29" MIN.
6"
6 3/4"
MIN. OF 18"x36" MIRROR TYP. U.N.O.
40" TYP.
34" MAX.
76" MIN.
PROVIDE INSULATED PIPE WRAP ON ALL EXPOSED PIPING. COVER PIPES WITH ENCLOSURE WHERE INDICATED.

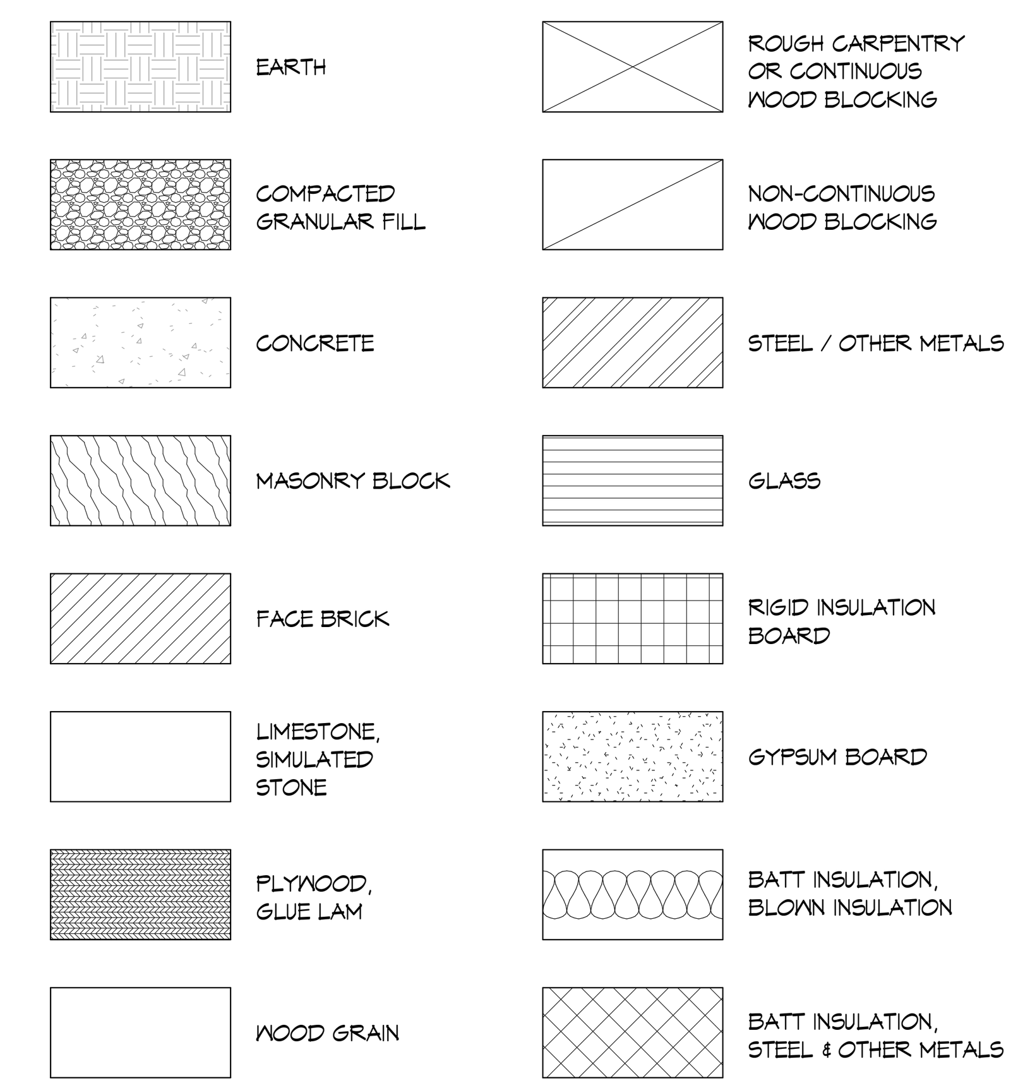
LAVATORY & EQUIPMENT REQUIREMENTS



56" MIN.
18" MIN.
PLAN VIEW
REQUIRED CLEAR FLOOR SPACE
60" MIN. UNLESS OTHERWISE INDICATED
NOTE:
SEE FLOOR PLANS FOR EXACT LAYOUT OF TOILET ROOMS OR ANY REQUIRED TOILET ROOM STALLS.
40"
1'-0"
3'-6" MIN.
FLUSH VALVES SHALL BE MOUNTED ON THE WIDE SIDE OF THE TOILET AREA
18"
TISSUE HOLDER
7"-9"
1'-7"
(14"-19")
2'-10"
40"
3'-0" MAX.
FEMININE NAPKIN RECEPTACLE
3'-0" MIN.
1'-0"
17"-19" SEAT HT.
18" TYPICAL

WATER CLOSETS & EQUIPMENT REQUIREMENTS

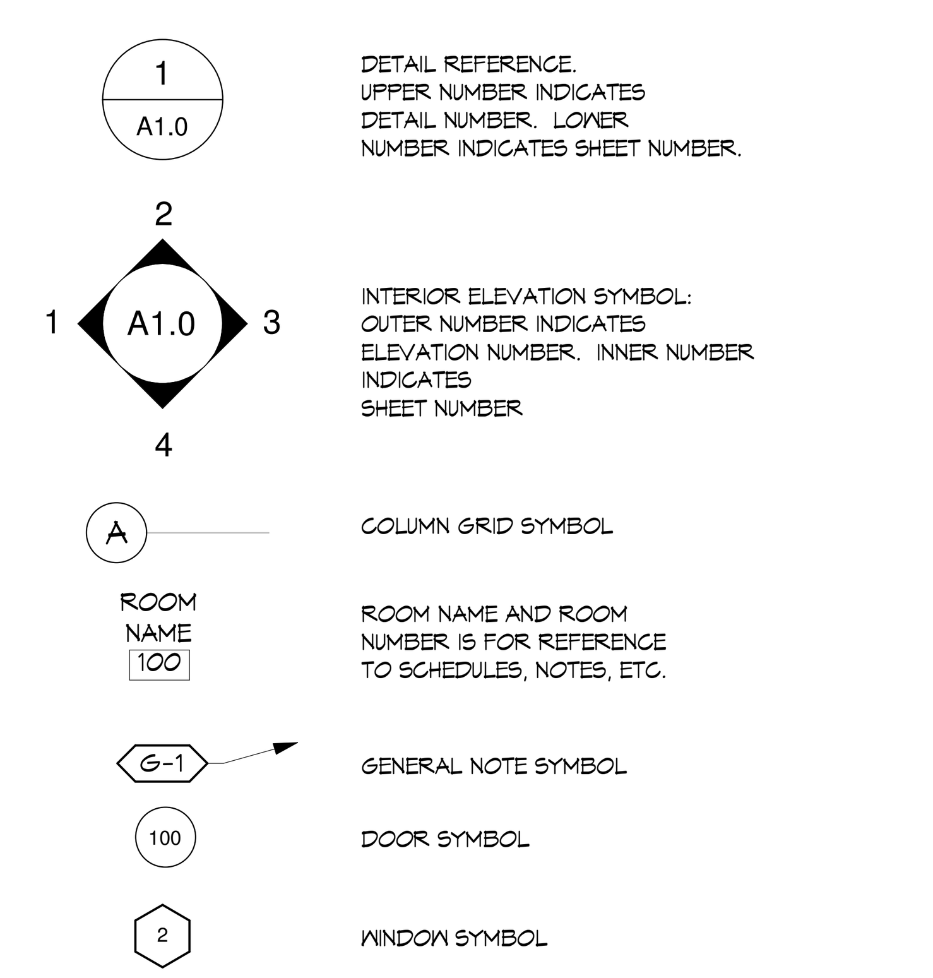
MATERIALS LEGEND



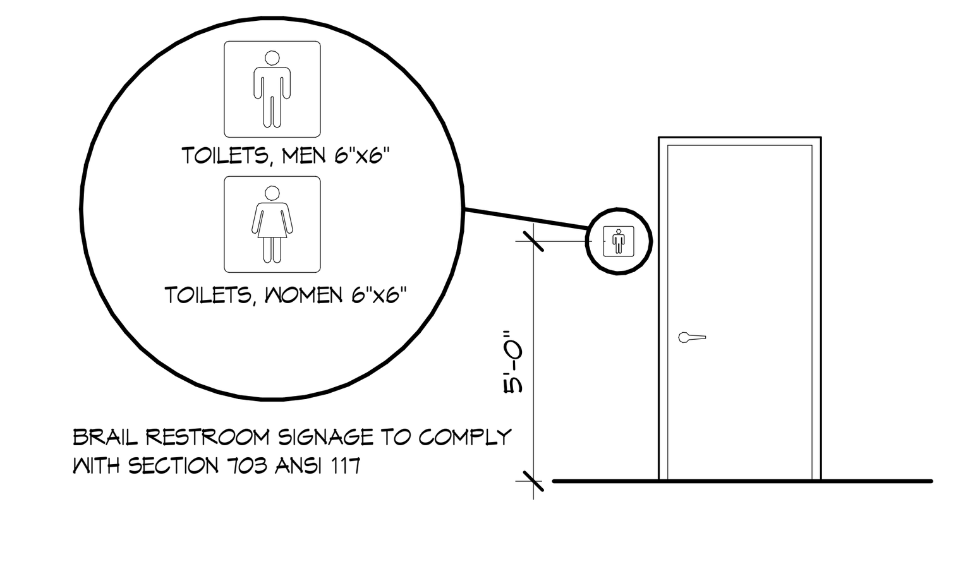
EARTH
COMPACTED GRANULAR FILL
CONCRETE
MASONRY BLOCK
FACE BRICK
LIMESTONE, SIMULATED STONE
PLYWOOD, GLUE LAM
WOOD GRAIN
ROUGH CARPENTRY OR CONTINUOUS WOOD BLOCKING
NON-CONTINUOUS WOOD BLOCKING
STEEL / OTHER METALS
GLASS
RIGID INSULATION BOARD
GYPSUM BOARD
BATT INSULATION, BLOWN INSULATION
BATT INSULATION, STEEL & OTHER METALS

SYMBOLS LEGEND

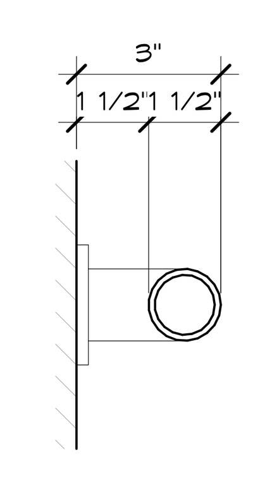
NOTE: SYMBOLS SHOWN IN LEGENDS ARE TYPICAL AND ALL SYMBOLS MAY NOT OCCUR ON THIS PROJECT



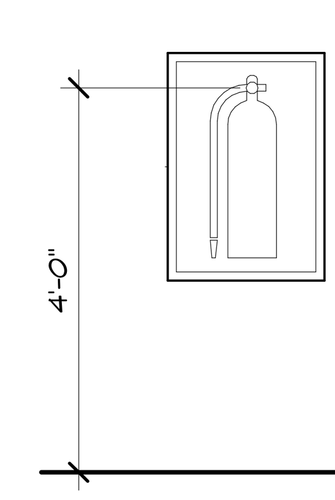
1
A1.0
DETAIL REFERENCE. UPPER NUMBER INDICATES DETAIL NUMBER. LOWER NUMBER INDICATES SHEET NUMBER.
2
1
A1.0
3
4
INTERIOR ELEVATION SYMBOL: OUTER NUMBER INDICATES ELEVATION NUMBER. INNER NUMBER INDICATES SHEET NUMBER
A
COLUMN GRID SYMBOL
ROOM NAME
100
ROOM NAME AND ROOM NUMBER IS FOR REFERENCE TO SCHEDULES, NOTES, ETC.
G-1
GENERAL NOTE SYMBOL
100
DOOR SYMBOL
2
WINDOW SYMBOL



SIGNAGE ELEVATION



HANDRAIL (TYP)



FIRE EXTINGUISHER CABINETS

ABBREVIATIONS

A.B.	ANCHOR BOLT
A/C	AIR CONDITIONING
AC.T.	ACOUSTICAL TILE
ADH	ADHESIVE
A.F.F.	ABOVE FINISH FLOOR
AGG	AGGREGATE
ANOD	ANODIZED
ADJ	ADJUSTABLE
ALUM.	ALUMINUM
ALT	ALTERNATE
ARCH.	ARCHITECT
AD	AREA DRAIN
ASPH.	ASPHALT
@	AT
BSMT.	BASEMENT
BRG.	BEARING
BD.	BOARD
BIT	BITUMINOUS
BLDG.	BUILDING
BLK.	BLOCK
BLK'G.	BLOCKING
BM.	BEAM
B.M.	BENCH MARK
BOT.	BOTTOM
BS	BOTH SIDES
BRK	BREAK
BRZ	BRONZE
B.U.	BUILT-UP
CPT	CARPET
CAB.	CABINET
CB	CATCH BASIN
CEM.	CEMENT
CER(T)	CERAMIC (TILE)
CIR	CIRCLE
CLG.	CEILING
C.O.	CLEAN OUT
EXIST.	EXISTING
EXP.	EXPOSED
EJ	EXPANSION JOINT
EXT.	EXTERIOR/EXTENSION
EB	EXPANSION BOLT
EQ	EQUAL
ELEC.	ELECTRIC(AL)
EP	ELECTRICAL PANELBOARD
EMER.	EMERGENCY
EIFS	EXTERIOR INSULATION FINISH SYSTEM
FLR.	FLOOR
FIN	FINISH(ED)
FND	FOUNDATION
FFE	FINISHED FLOOR ELEVATION
FE	FIRE EXTINGUISHER
FEC	FIRE EXTINGUISHER CABINET
FTG.	FOOTING
FLASH.	FLASHING
F.CO.	FLOOR CLEAN OUT
FD	FLOOR DRAIN
FLUOR.	FLUORESCENT
GA.	
GB	GRAB BAR
GALV.	GALVANIZED
G.C.	GENERAL CONTRACTOR
G.I.	GALVANIZED IRON
GL.	
GYP	GYPSUM
GWB	GYPSUM WALL BOARD
G.S.	GRAVEL STOP
HDW	HARDWARE
HBD	HARDBOARD
HDF	HANDICAPPED DRINKING
HM	HOLLOW METAL
IHM	INSULATED HOLLOW METAL
MANUF.	MANUFACTURED(ER)
MSNT.	MASONITE
MO	MASONRY OPENING
MECH.	MECHANIC(AL)
MTL.	METAL
MISC.	MISCELLANEOUS
MOD BIT	MODIFIED BITUMEN
MP	METAL PANEL(S)
MIN.	MINIMUM
MB	MOISTURE BARRIER
MTD.	MOUNTED
MULL	MULLION
MEP.	MECHANICAL, ELECTRICAL & PLUMBING
MK.	
NOM.	NOMINAL
N.T.S.	NOT TO SCALE
NIC.	NOT IN CONTRACT
O.C.	ON CENTER
O.D.	OUTSIDE DIAMETER
OHE	OVER HEAD ELECTRIC
OPNG.	OPENING
PNL.	PANEL
PVMT	PAVEMENT
PERF.	PERFORATE(D)
PLAS. LAM.	PLASTIC LAMINATE
PL.	PLATE/PROPERTY LINE
PLBG.	PLUMBING
PLYW'D.	PLYWOOD
P.P.	POWER POLE
PR.	PAIR
P.V.C.	POLYVINYL CHLORIDE
PSF	POUNDS PER SQUARE FOOT
PSI	POUNDS PER SQUARE INCH
PREFAB	PREFABRICATE(D)
PRE FIN	PRE FINISHED
COL.	COLUMN
CONC.	CONCRETE
CLR	CLEAR(ANCE)
COMP	COMPOSITION
CONST.	CONSTRUCTION
CMU	CONC. MASONRY UNIT
CONT'R.	CONTRACTOR
CONT.	CONTINUOUS OR CONTINUE
CTR	COUNTER
CJ	CONTROL JOINT
CT	CURTAIN TRACK
C	CENTER LINE
CW	COLD WATER
CMP	CORRUGATED METAL PIPE
CPP	CORRUGATED PLASTIC PIPE
DP	DAMP PROOFING
DIAG	DIAGONAL
DISP	DISPENSER
DF	DRINKING FOUNTAIN
DIV	DIVISION
DIA.	DIAMETER
DN	DOWN
DIM.	DIMENSION
DS	DOWN SPOUT
DTL.	DETAIL
DR.	DOOR
DWR	DRAWER
DWG	DRAWING
D	DEPTH
EA	EACH
EW	EACH WAY
EL.	ELEVATION
E.W.C.	ELECTRIC WATER COOLER
EQUIP.	EQUIPMENT
ELEV.	ELEVATOR
HORIZ.	HORIZONTAL
H	HIGH
HT.	HEIGHT
HTG.	HEATING
HTR.	HEATER
HW	HOT WATER
HD	HEAD
HDR	HEADER
HC	HOLLOW CORE
HM	HOLLOW METAL
HB	HOSE BIBB
HVAC	HEATING, VENTILARTION & AIR CONDITIONING
I.D.	DIAMETER
INSUL.	
INT.	INTERIOR
INV.	INVERT
IHM	INSULATED HOLLOW METAL
JT	JOINT
JST	JOIST
KO	KNOCKOUT
LAM	LAMINATE(D)
LAV	LAVATORY
LH	LEFT HAND
LT	
LWC	LIGHTWEIGHT CONCRETE
LTL	LINTEL
LVR	LOUVER
L	LENGTH
LP	LIGHT POLE
MAS	MASONRY
MATL	MATERIAL
MAX.	MAXIMUM
MH	MAN HOLE
MSNT.	MASONITE
PP	POWER POLE
Q.T.	QUARRY TILE
R.	RADIUS
REF.	REFERENCE
REINF.	REINFORCE
RCP	REINFORCED CONC. PIPE
REQ'D.	REQ'D. REQUIRED
RA	RETURN AIR
RM.	
REV	REVISION(S)
RH	RIGHT HAND
ROW	RIGHT OF WAY
RD	ROOF DRAIN
RO	ROUGH OPENING
SAN.	SANITARY
SCHED.	SCHEDULE
S.C.	SOLID CORE
SECT.	SECTION
SHT.	SHEET
SIM.	SIMILAR
SPEC.	SPECIFICATION
STD.	STANDARD
STL.	STEEL
STOR.	STORAGE
STRUCT.	STRUCTURE
SQ	SQUARE
SUSP.	SUSPENDED
SS	STAINLESS STEEL
STA	STATION
SD	STORM DRAIN
SYM	SYMMETRY(ICAL)
TEMP.	TEMPERATURE/TEMPORARY
TEL	TELEPHONE
TEMP	TEMPERED
TH.	THICKNESS
TLT.	TOILET
T & G	TONGUE AND GROOVE
TOW	TOP OF WALL
TOS	TOP OF STEEL
TOM	TOP OF MASONRY
TYP.	TYPICAL
UNFIN.	UNFINISHED
U.O.N.	UNLESS OTHERWISE NOTED
UGE	UNDERGROUND ELECTRIC
V.C.P.	VITRIFIED-CLAY-PIPE
VEST.	VESTIBULE
VERT.	VERTICAL
VOL.	VOLUME
V.T.R.	VENT-THRU-ROOF
VCT	VINYL COMPOSITION TILE
VB.	VINYL BASE
VWC	VINYL WALL COVERING
WSCT	AINSCOT
WH	WALL HUNG
WC	WATER CLOSET
WIN.	WINDOW
W.W.F.	WELDED WIRE FABRIC
W.P.	WEATHER PROOF
WT.	WEIGHT
WS	WATER STOP
W/	WITH
W/O	WITHOUT
WD	WOOD
W	WIDTH

GENERAL NOTES

1. FIXTURE AND ACCESSORIES MOUNTING DETAILS AND REQUIREMENTS ARE TYPICAL AND APPLY TO REQUIRED ACCESSIBLE INSTALLATIONS ONLY. REFER TO PLANS FOR LOCATIONS AND TYPES OF LAYOUTS. EQUIPMENT SHOWN MAY OR MAY NOT APPEAR ON THIS PROJECT.
2. PROVIDE SOLID BLOCKING FOR ALL ACCESSORIES WHICH IS CAPABLE OF WITHSTANDING 250 LB. FORCE. (SHEAR AND BENDING). GRAB BARS SHALL NOT ROTATE. FASTENERS SHALL BE OF A TYPE TO WITHSTAND REQUIRED FORCE AND TO BE APPROPRIATE FOR WALL TYPE.
3. ALL EXTERIOR RAMPS SHALL HAVE A NONSKID FINISH AS SPECIFIED. ALL INTERIOR RAMPS SHALL HAVE FLOORING OF NONSKID MATERIAL. IF NO FINISH IS INDICATED ON THE DRAWINGS - PROVIDE RUBBER RADIAL TILE ON FINISH FLOOR SURFACE OF INTERIOR RAMPS.
4. ANY METAL FLOOR GRATINGS OR DRAINAGE GRATINGS IN AN ACCESSIBLE PATH SHALL HAVE SPACES NO GREATER THAN 1/2" WIDE IN ONE DIRECTION. LONG DIMENSION SHALL BE PERPENDICULAR TO THE DOMINANT DIRECTION OF TRAVEL.

10-31-22 Registered Architect David Paul Burris No. 4116 Arkansas

Burris Architecture
820 Tiger Blvd, Suite 4, Bentonville, Ar 72712
479-319-6045

DOMINOS BRYANT
3415 W. HWY 5
BRYANT, AR

DATE 10-31-22
JOB NO. 22151
REVISIONS

A0.1
STANDARDS

CODE SUMMARY

APPLICABLE CODES:
INCLUDED BUT NOT LIMITED TO, THE LATEST ADOPTED ADDITIONS OF THESE CODES AS AMENDED BY THE CITY OF BRYANT AND THE STATE OF ARKANSAS

2007 Arkansas Fire Prevention Code
2006 Arkansas State Plumbing Code
2006 Arkansas State Gas and Fuel Code
2008 National Electric Code

THIS PROJECT IS A REMODEL TO AN EXISTING BUILDING.

THE BUILDING IS NOT SPRINKLERED.

REMODELED TENANT DATA:
PROPOSED USE: TAKE-OUT RESTAURANT
OCCUPANCY TYPE: BUSINESS

CONSTRUCTION TYPE: 3B
ALLOWABLE AREA = 17,500 SF
ALLOWABLE HT/STORIES = 55' AND 3 STORY

ACTUAL AREA : 1,855 SF
ACTUAL HT/STORIES = 22' AND 1 STORY

OCCUPANCY = SEE CODE DIAGRAM

LEGEND

FE = RECESSED FIRE EXTINGUISHER CABINET

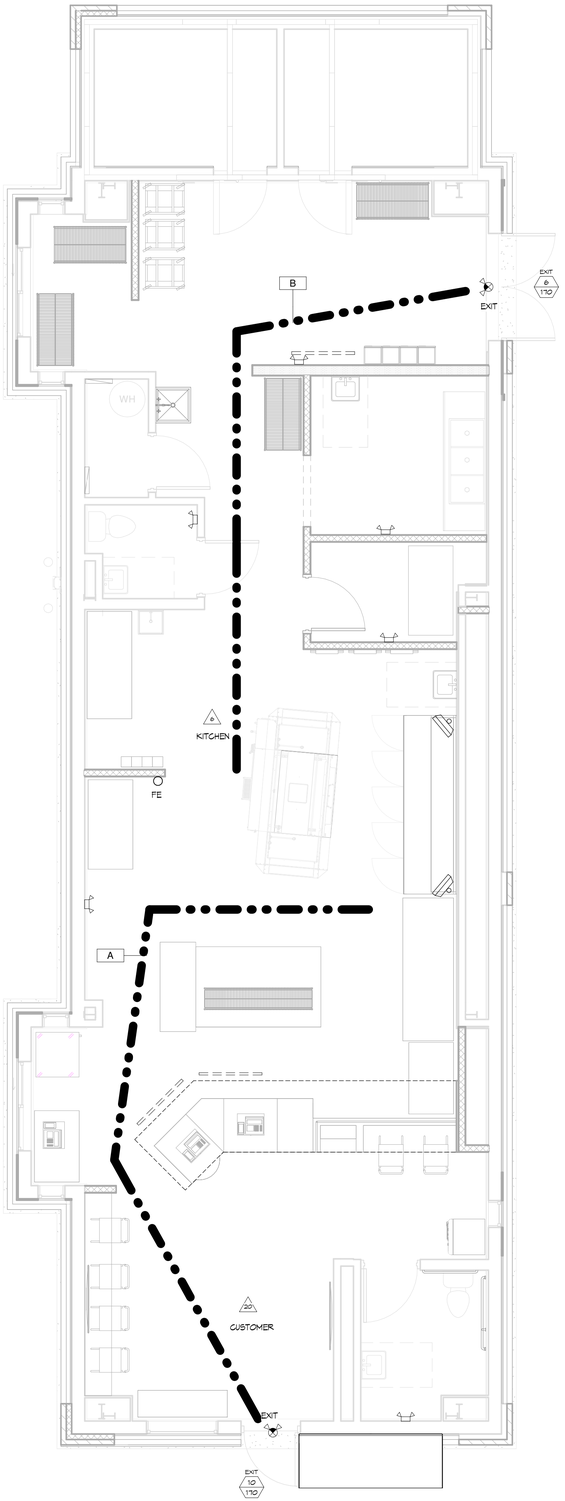
20 ROOM OCCUPANT LOAD PER TABLE - 1003.23

DOOR EGRESS:
OCCUPANTS ACTUAL
OCCUPANTS ALLOWABLE

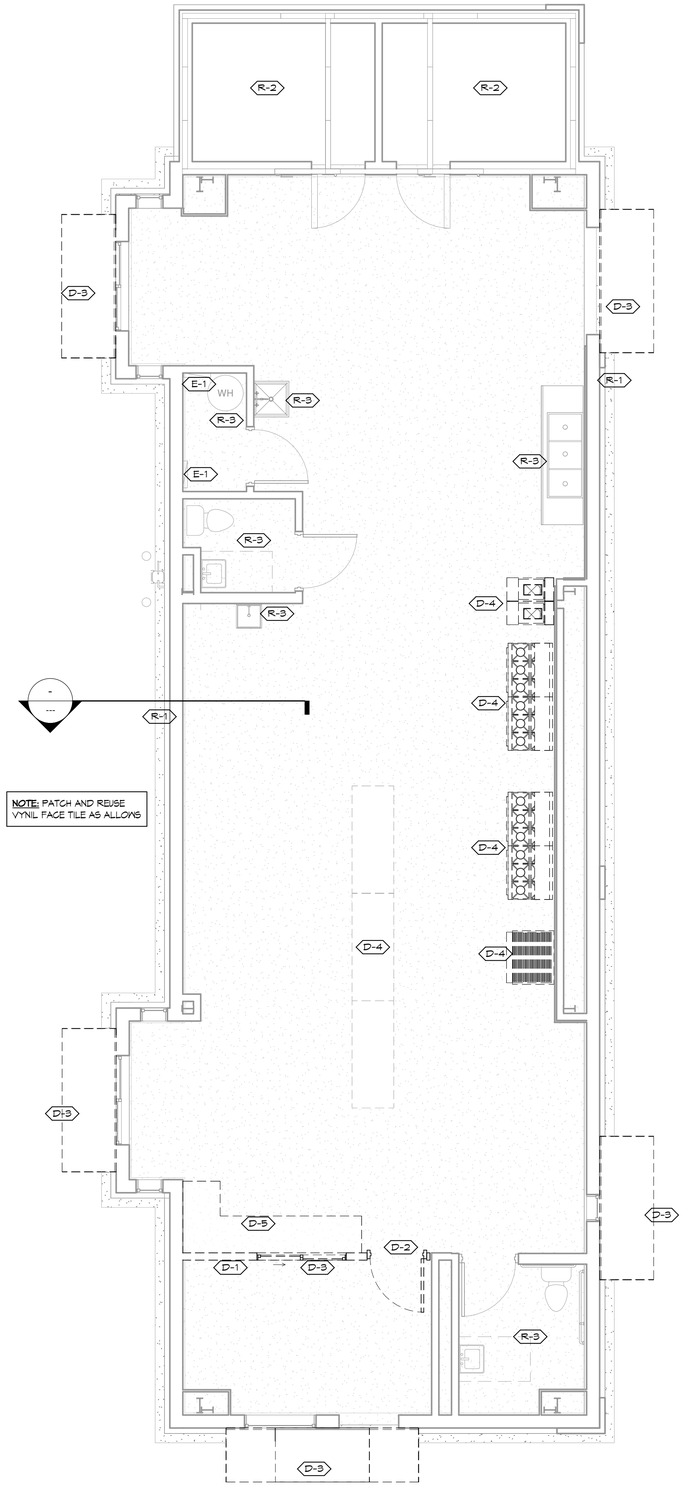
LIGHTING LEGEND

MK.	LAMP	DESCRIPTION	NOTES
EMI	INCLUDED	EMERGENCY LIGHT	
EXI		EXIT / EMERGENCY LIGHT WITH REMOTE HEAD	

EGRESS DISTANCES	
Exit Path	Exit Path Distance
A	43' - 0"
B	37' - 6"



2 *FIRST FLOOR LIFE SAFETY PLAN*
1/4" = 1'-0"



1 *FIRST FLOOR DEMO PLAN*
1/4" = 1'-0"

GENERAL DEMO NOTES

1. NOT ALL DEMOLITION IS DETAILED ON THIS SHEET. COORDINATE W/ ARCHITECT AND CONTACT UPON DISCOVERY OF EXISTING FEATURES NEEDING REMOVAL PRIOR TO BUILD BACK
2. CUT AND PATCH WITH CARE TO AVOID DAMAGE TO WORK, SAFETY HAZARDS, VIOLATION OF WARRANTY REQUIREMENTS, BUILDING CODE VIOLATIONS, OR MAINTENANCE PROBLEMS
3. SUB-CONTRACTORS TO INSPECT FIELD CONDITIONS TO IDENTIFY ALL WORK REQUIRED.
4. COORDINATE REMOVAL OF ITEMS WITH BUILD BACK PLAN FOR ALL DIMENSIONS AND LAYOUTS.
5. GC TO INSPECT ROOF, AND CAP FLASHING, AND TO MAKE REPAIRS AS REQ'D, PROVIDE WRITTEN DESCRIPTION OF WORK TO OWNER PRIOR TO COMMENCING THE REPAIRS.
6. GC TO REMOVE ALL GRAVITY ROOF EXHAUST. PATCH ROOF, & PREPARE FOR NEW INSULATION.

DEMO KEYNOTES

R-1	EXISTING BUILDING SHELL
R-2	EXISTING COOLER TO REMAIN
R-3	EXISTING PLUMBING TO REMAIN
D-1	DEMO PORTION OF EXISTING WALL AS REQUIRED
D-2	REMOVE EXISTING DOOR
D-3	EXISTING CANOPY TO BE RECOVERED OR REPLACED W/ NEW DOMINOS RED
D-4	REMOVE EXISTING EQUIPMENT, CAP AS REQUIRED
D-5	REMOVE EXISTING CASEWORK
E-1	EXISTING POWER/ DATA TO REMAIN

LEGEND

EXISTING TO REMAIN

TO BE MOVED OR RELOCATED

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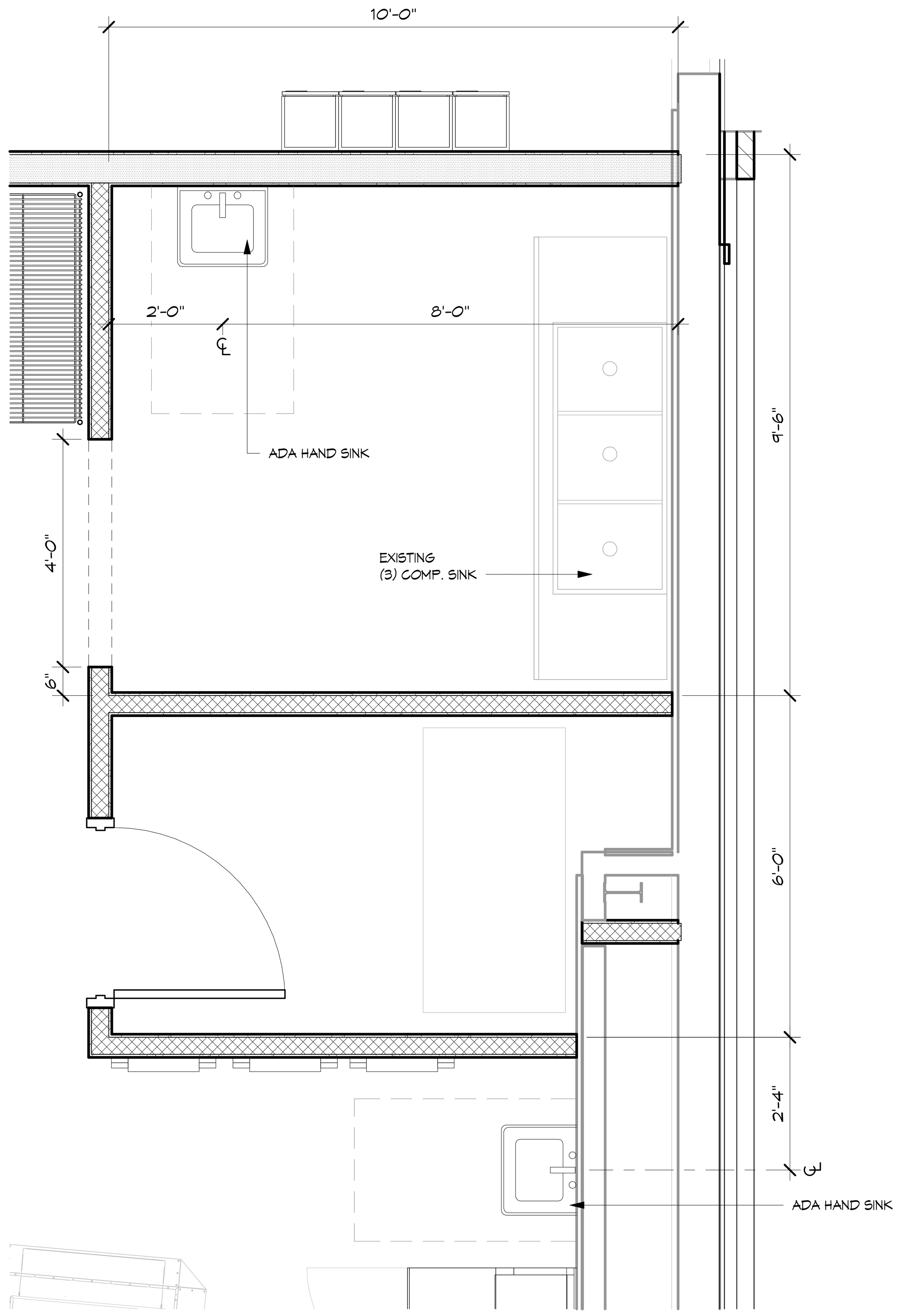
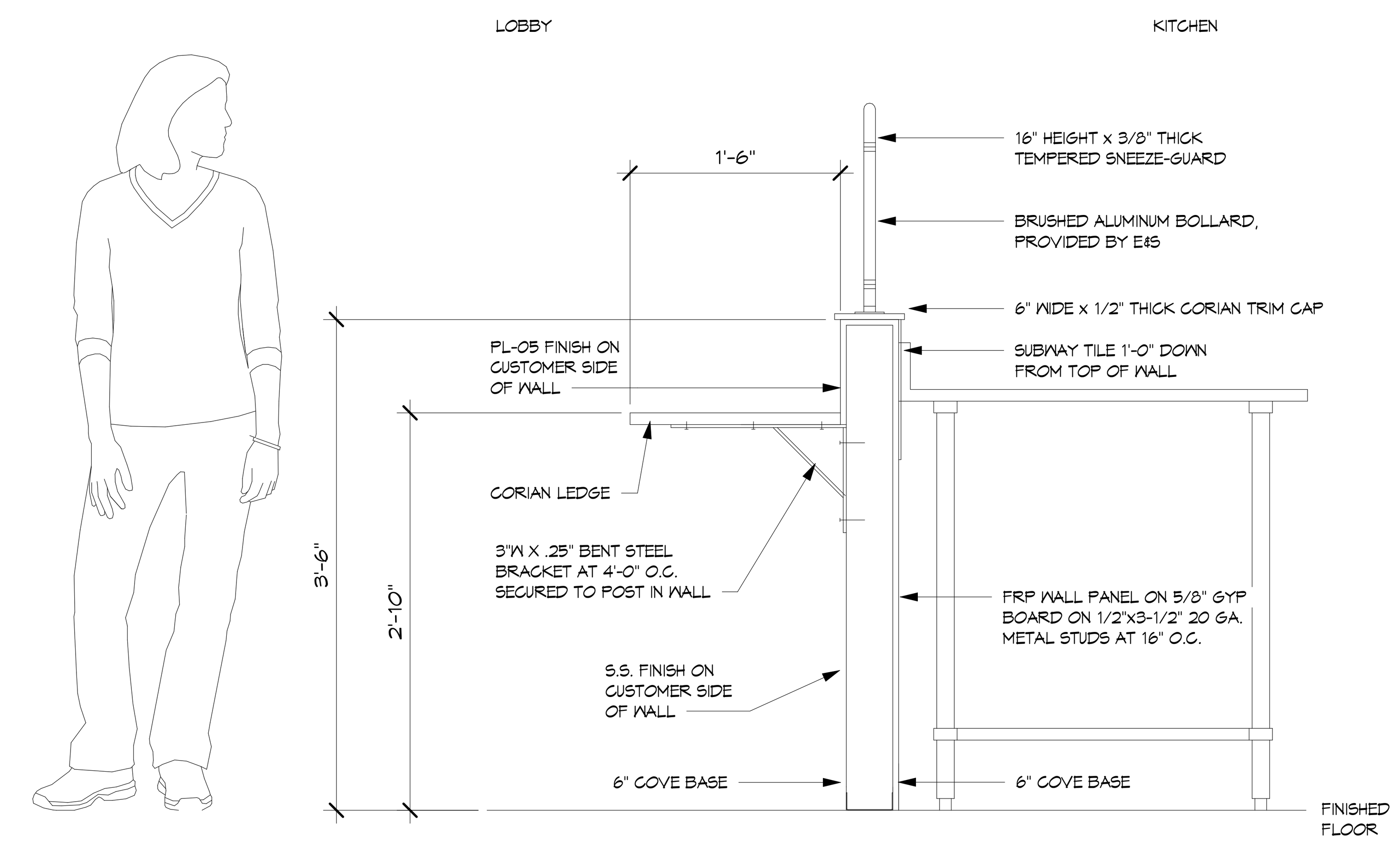
BRYANT, AR

DATE 10-31-22
JOB NO. 22151
REVISIONS

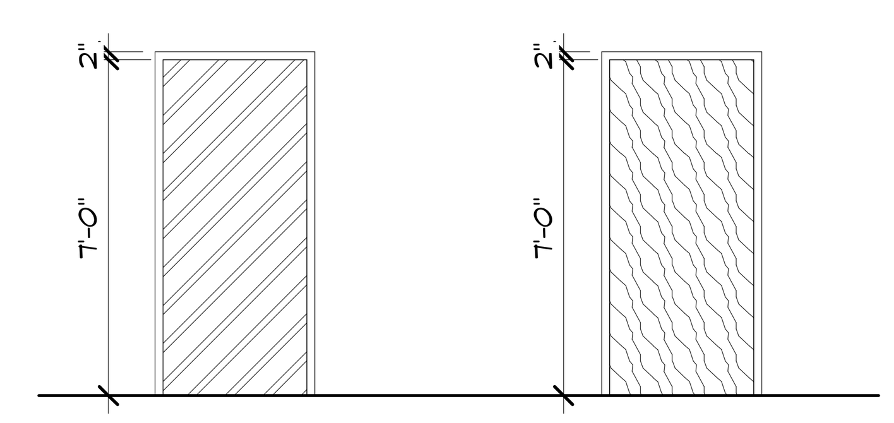
A0.2
CODE & DEMO PLAN



2 ENLARGED PLUMBING PLAN
1/2" = 1'-0"



3 PARTITION WALL WITH COUNTER 1
1" = 1'-0"



Door Type 1
INSULATED HOLLOW METAL DOOR IN HOLLOW METAL FRAME

Door Type 2
PAINT GRADE SOLID CORE WOOD DOOR IN HM FRAME. SEE A1.5 FOR FINISHES

5 DOOR ELEVATIONS1
1/4" = 1'-0"

LOCK SETS:

SET 1 - KEYED, PUSH PAD EXIT DEVICE, CLOSER, HC ALUM. THRESHOLD

SET 2 - KEYED

SET 3 - PRIVACY

SET 4 - PASSAGE

SET 5 - OHD HARDWARE PROVIDED BY OHD MANUFACTURER

SET 6 - KEYED, PUSH PAD EXIT DEVICE, 1 LEAF. TOP & BOTTOM INSET BOLT W/ NO HARDWARE 2ND LEAF. CLOSER.

SET 7 - KEYED, DEADBOLT

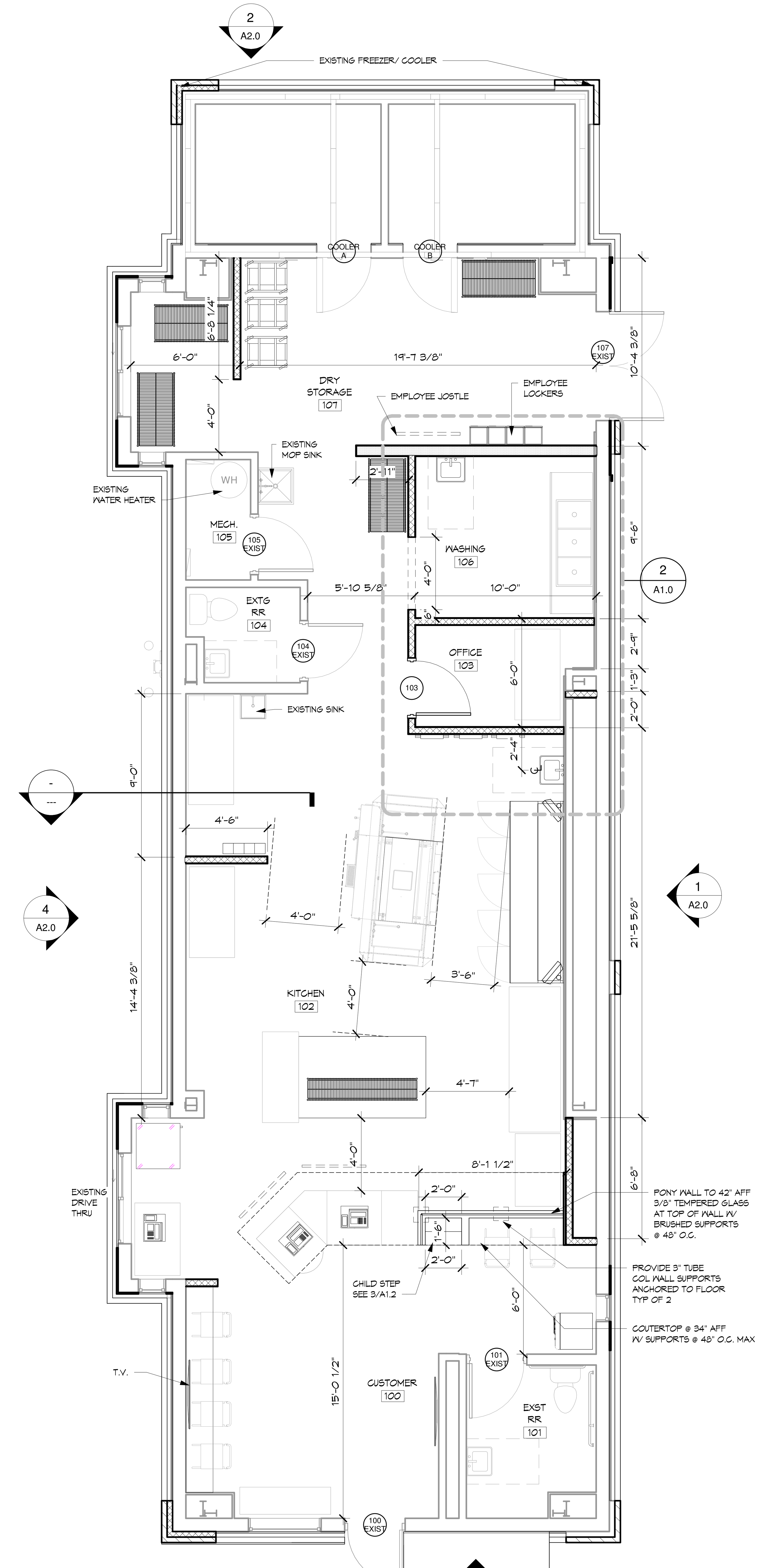
NOTES:

1. ALL HARDWARE TO BE LEVER ACTION W/ A BRUSHED CHROME FINISH -
2. ALL CLOSERS TO MEET ADA REQUIREMENTS
3. ALL ALUM. DOOR FRAMES ARE TO BE ANODIZED ALUM. FINISH

NOTE: COMPLETE ALL HARDWARE WITH NECESSARY HARDWARE INCLUDING HINGES AND DOOR STOPS

Door Schedule

	DOOR			DOOR			
MARK	DOOR WIDTH	DOOR HEIGHT	ELEVATION	FRAME TYPE	DOOR TYPE	HARDWARE SET	NOTES
100 EXIST	3'-0"	7'-0"					
101 EXIST	3'-0"	7'-0"					
103	3'-0"	7'-0"					
104 EXIST	3'-0"	7'-0"					
105 EXIST	3'-0"	7'-0"					
107 EXIST	6'-0"	7'-0"			---		
COOLER A	3'-0"	7'-0"					
COOLER B	3'-0"	7'-0"					



1 FIRST FLOOR PLAN
1/4" = 1'-0"

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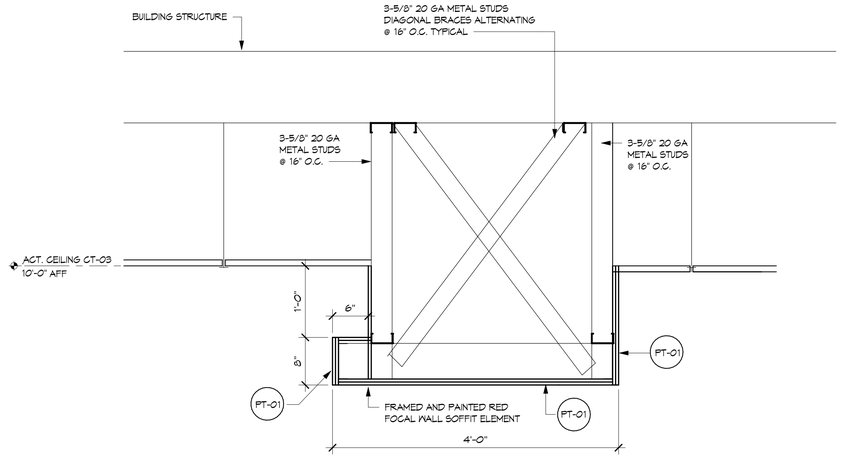
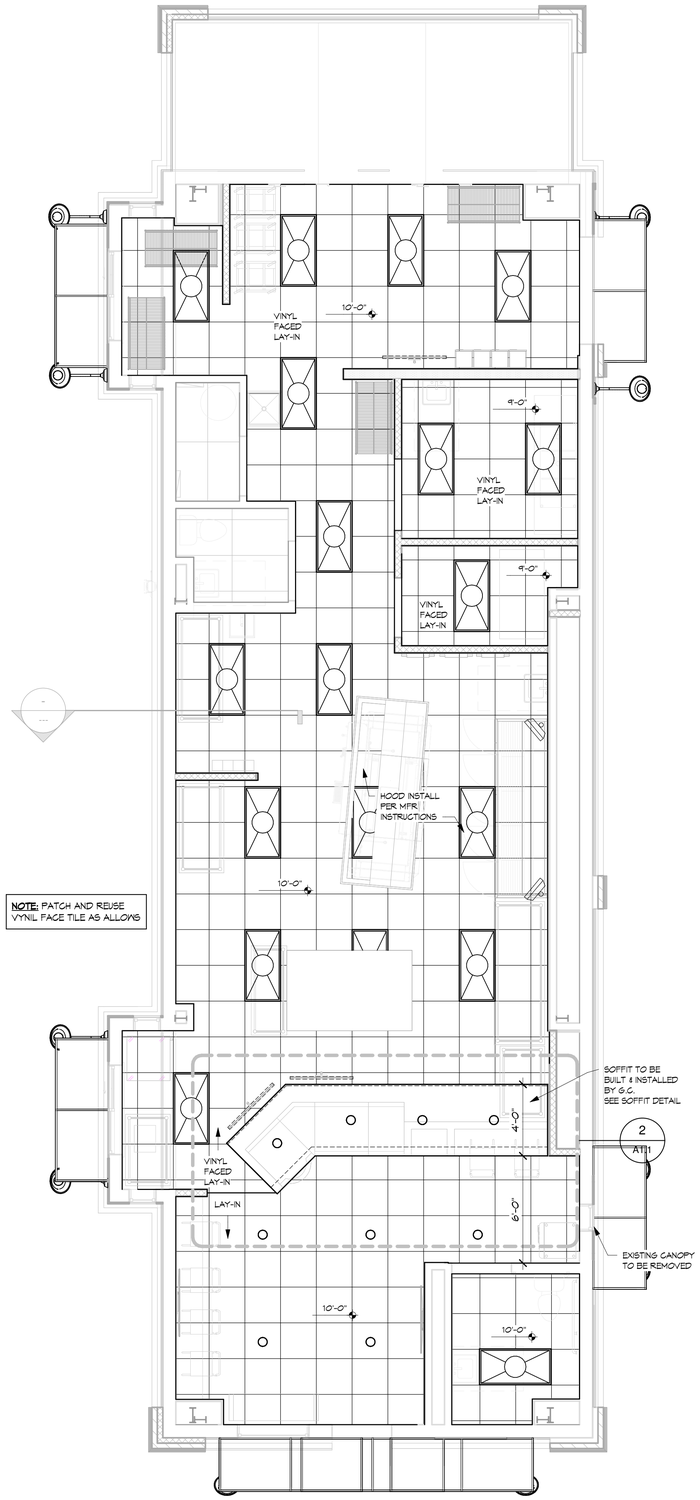
A1.0
FIRST FLOOR PLAN



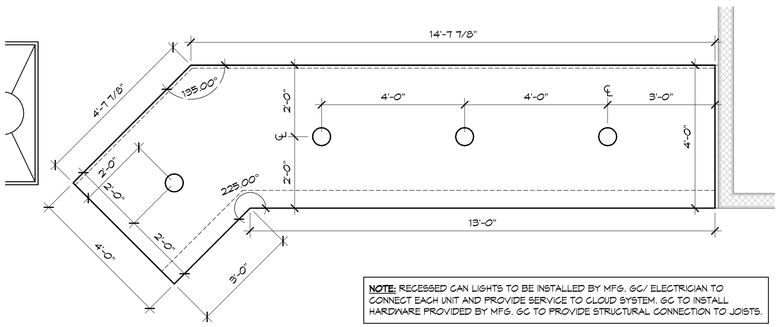
3 *SOFFIT DETAIL*
1" = 1'-0"

CEILING LEGEND

- 2 X 2 LAYIN CEILING
- 2 X 4 LAY-IN CEILING
- GWB
- METAL SOFFIT



1 *FIRST FLOOR RCP*
1/4" = 1'-0"



NOTE: RECESSED CAN LIGHTS TO BE INSTALLED BY MFG. GC/ ELECTRICIAN TO CONNECT EACH UNIT AND PROVIDE SERVICE TO CLOUD SYSTEM. GC TO INSTALL HARDWARE PROVIDED BY MFG. GC TO PROVIDE STRUCTURAL CONNECTION TO JOISTS.

2 *ENLARGED RED SOFFIT PLAN*
1/2" = 1'-0"

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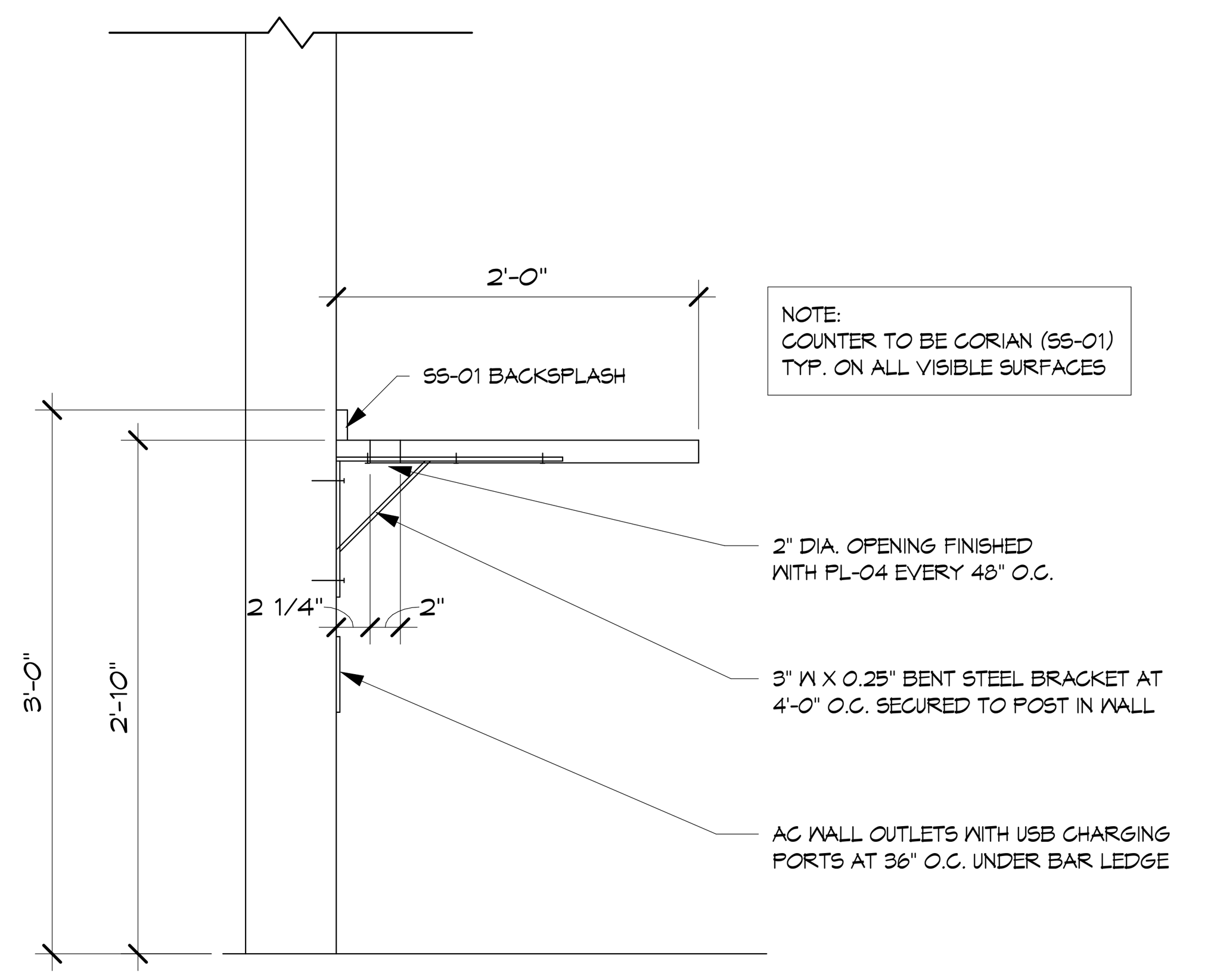
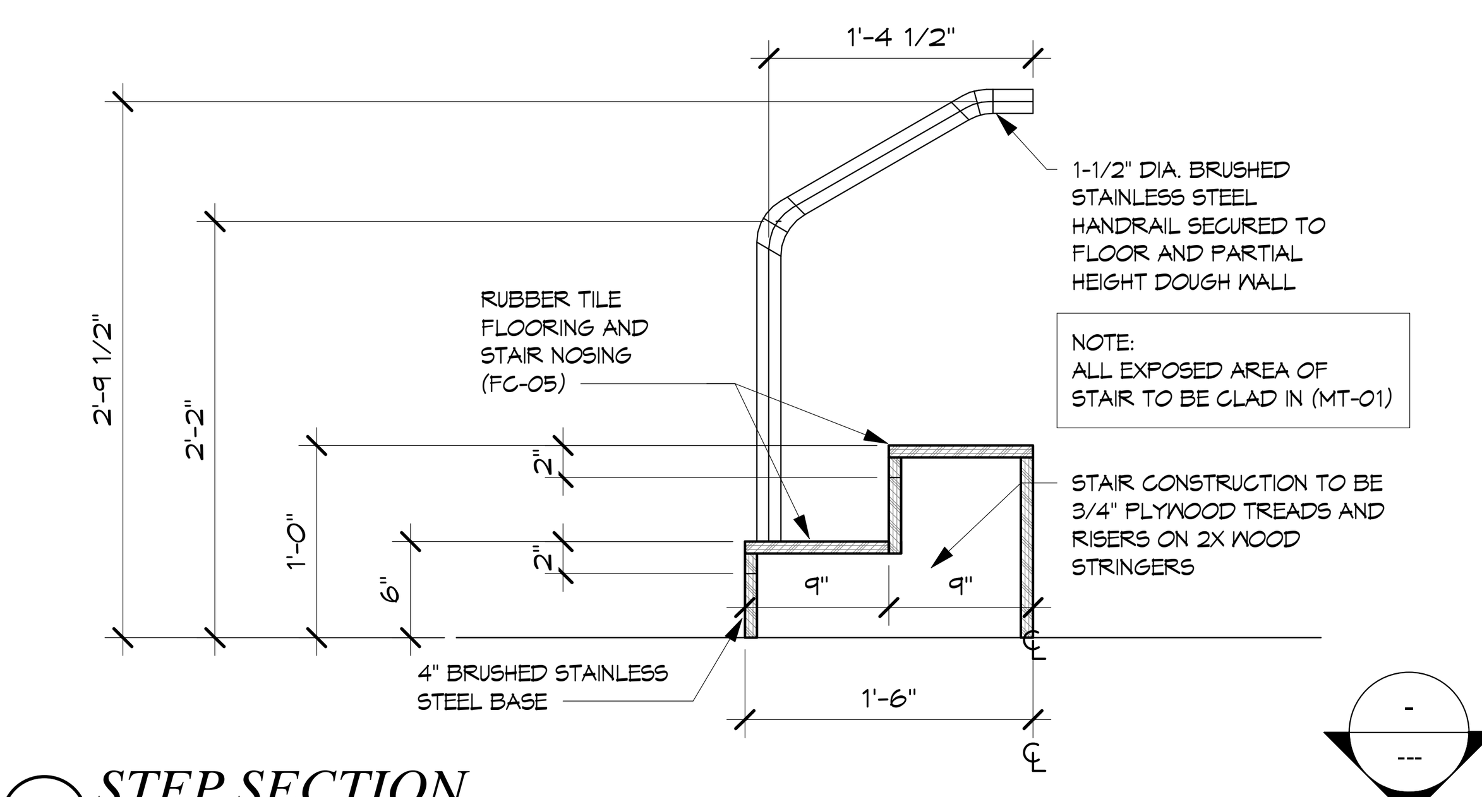
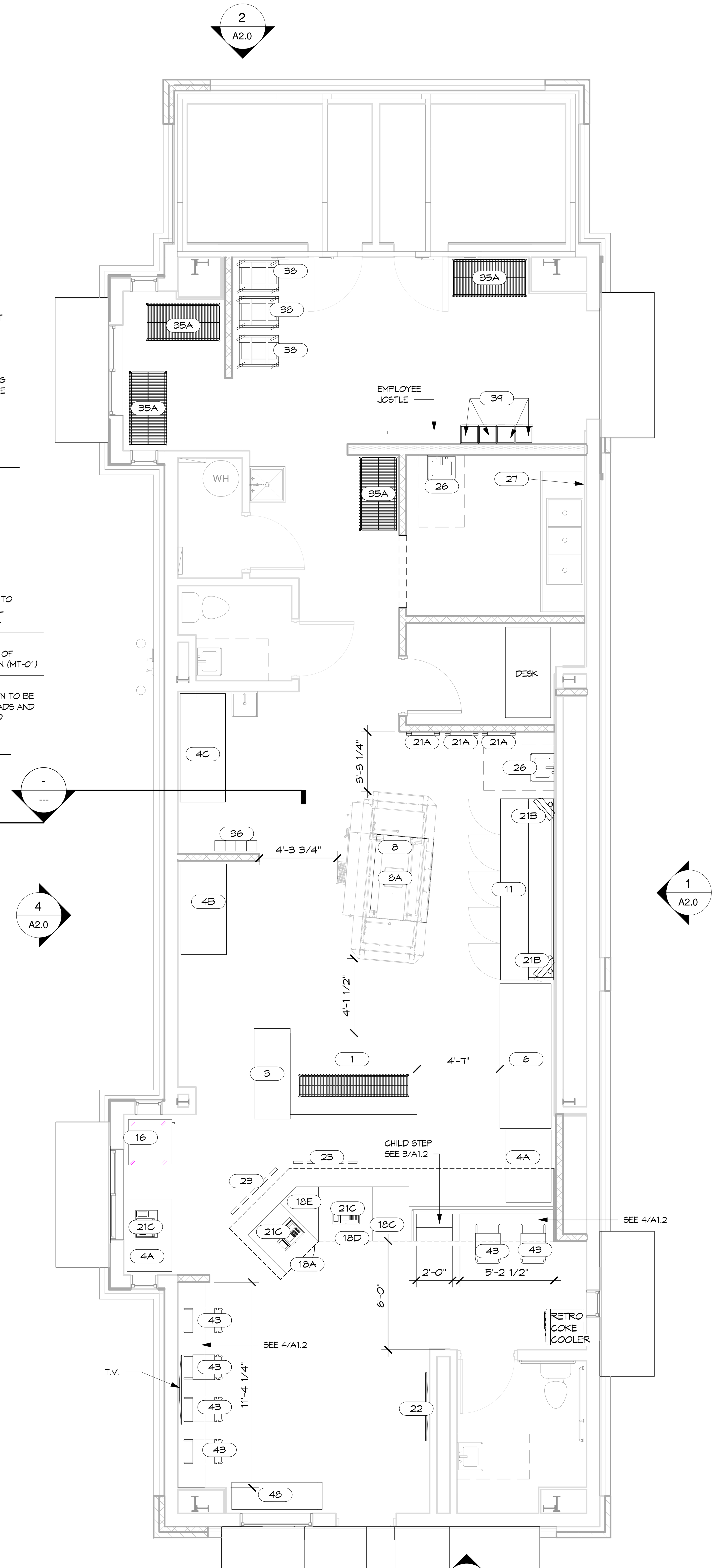
A1.1
FIRST FLOOR REFLECTED CEILING PLAN



4 HIGH TOP BAR SECTION
1" = 1'-0"



3 STEP SECTION
1" = 1'-0"



1 EQUIPMENT PLAN
1/4" = 1'-0"

EQUIPMENT SCHEDULE ◯ INDICATES EQUIPMENT CALLOUT

ITEM NUMBER	ITEM QUANTITY	DESCRIPTION	DIMENSIONS	MODEL NO.	FURNISHED BY	INSTALLED BY	RELOCATED EXISTING	ELECTRICAL REQUIREMENTS: AMPS (NOT BREAKER SIZE)	WATTS	HP	VOLTS	POLE	DIRECT	PLUG	PLUMBING REQUIREMENTS: WATER HOT	WATER COLD	DRAIN DIRECT	DRAIN IND.	GAS BTU'S	COMMENTS
TABLE SCHEDULE																				
1	1	7' CUSTOM CUT TABLE W/ OVERSHELF	84"L x 32"D x 36"H	312-25SS, TDSS-MOD	E&S	GC														
2A	-	CUSTOM CUT TABLE ACCESSORY CABINET	36"L x 16"D x 36"H	309-25SS	E&S	GC														
2B	-	CUSTOM CUT TABLE ACCESSORY CABINET	24"L x 16"D x 36"H	308-25SS																
3	1	48" ROUTE STAND W/ (3) 54" HEAT LAMPS	48"L x 18"D x 86"H	PC320-810	E&S	GC														
4A	2	48" STAINLESS STEEL WORK TABLE	48"L x 30"D x 35 1/2"H	PC326031																
4B	1	60" STAINLESS STEEL WORK TABLE	60"L x 30"D x 35 1/2"H	PC22289	E&S	GC														
4C	1	72" STAINLESS STEEL WORK TABLE	72"L x 30"D x 35 1/2"H	SEE E&S																
5	-	45 DEGREE S.S. DOUGH ROLLTABLE		SEE E&S	E&S	GC														
5A	-	CORNER S.S. DOUGH COUNTER W/ LEGS	34"W x 34"D x 36"H	PC22139N	E&S	GC														
6	1	STRETCH TABLE	96"L x 36"D x 36"H	SEE E&S	E&S	GC														
7A	-	48" x 24" DRIVERS TABLE	48"L x 24"D x -"H	PC345310																
7B	-	36" x 24" DRIVERS TABLE	36"L x 24"D x -"H	PC345310																
OVEN AND REFRIGERATION SCHEDULE																				
8	1	BOFI-GAS CONVEYOR OVEN [3 DECK]		XLT-3270-TS3	E&S	GC		12	1440		120V	1								12 AMPS & 160,000 BTUH PER DECK
8A	1	HOOD SYSTEM [XLT-3270-TS3]	THREE DECK																	HIGH HEAT SUPPLY FAN
9	-	HATCO FLAV-R-SAVOR HEATED DISPLAY CASE	34 1/2"W x 27 3/4"D x 31 3/4"H	FSCD-2PD	E&S	GC		15	1.8		120V	1		14-20P						184 LBS.
10	EXIST	10' x14' NOMINAL WALK-IN COOLER W/O FLOOR	10' W x 14' D x 7'-9" H		E&S	GC		25	5904	1.5	208/240	3	X					3/4"		
	EXIST	WALK-IN COOLER LIGHT				GC			100											
11	1	RANDELL 120" MAKELINE (RIGHT SIDE COMP.)	120"W x 34"D x 51 1/2"H	PC338615	E&S	GC		13		3/4	120V	1		5-20P						(3) 27" DOORS
12	-	RANDELL GRAB-N-GO REFRIGERATED DISP.	36"W x 34"D x 46 1/2"H	SSAC-36SSC	E&S	GC		8.6		3/8	120V	1		5-15P						STAINLESS STEEL, 20 OZ. R-134A
13	-	RANDELL LOW REFRIGERATOR UNIT	48"W x 32 1/2"D x 36"H	9301-7				5.5		1/4	120V	1		5-15P						DOUBLE SIDE DOORS
14	-	DELFIELD SINGLE DOOR SS REFRIGERATOR	25 1/2"W x 32 1/2"D x 79 1/2"H	PC345310				12			120V									
15	-	SINGLE DOOR VISI COOLER	30"W x 29"D x 78 1/4"H	GMD-41	COKE	GC		7.2		1/3	120V	1		5-15P						
16	1	COKE COOLER GDM-7	24"W x 24"D x 39 3/4"H	GDM-7	E&S	GC														
17	-	SS NARROW BODY FULL HT. HOLDING CAB.																		
FRONT COUNTER SCHEDULE																				
18A	1	TRANSACTION COUNTER	30"W x 39 3/16"D x 34"H	S13-0608-POS18 LA	E&S	GC														RELOC. ELECTRICAL
18B	-	18" POS FILLER CABINET	18"W x 33 1/2"D x 34"H	S13-0608-POS18 LA	E&S	GC														RELOC. ELECTRICAL
18C	1	24" POS FILLER CABINET	24"W x 33 1/2"D x 34"H	S13-0608-POS24 LA	E&S	GC														RELOC. ELECTRICAL
18D	1	36" POS FILLER CABINET	36"W x 33 1/2"D x 34"H	S13-0608-POS36 LA	E&S	GC														RELOC. ELECTRICAL
18E	1	WEDGE CABINET	W (varies) x 33 1/2"D x 34"H	S13-0608-WDG LA	E&S	GC														RELOC. ELECTRICAL
18F	-	HOT HOLD CABINET	36"W x 33 1/4"D x 24"H	S13-0608-HHC LA	E&S	GC														RELOC. ELECTRICAL
19	1	METAL CASH DRAWER W/ REMOVABLE TILL	19 1/2"W x 16 3/8"D x 4"H	PC312661	E&S	GC														MTL. BRACKET KIT REQ'D.-PC312662
20	1	CALIFORNIA SAFE W/ DIGITAL LOCK/TIME DEL.	19"W x 22"D x 20"H	PC381811	E&S	GC														290 LBS., 1/2" STEEL BODY AND DOOR
TECHNOLOGY SCHEDULE																				
21A	3	PULSE TEL./ORDER STATION-WALL MOUNTED			PULSE	PULSE														
21B	2	PULSE TEL./ORDER STATION-MAKELINE WALL																		
21C	3	PULSE TEL./ORDER STATION-POS COUNTER			PULSE	PULSE														
	3	MOUNTING POST		PC273114	E&S	GC														
21D	-	PULSE TEL./ORDER STATION-SUSPENDED AB.			PULSE	PULSE														
22	1	PIZZA TRACKER 37" MONITOR		SEE PULSE	PULSE	GC														
23	2	PULSE DIGITAL 42" MENU BOARDS		SEE PULSE	PULSE	GC								PULSE						
24	-	PULSE TELEPHONE EQUIPMENT BOX	48"W x 18"D x 48"H	SEE E&S	E&S	GC														PWD W/ WHITE P.LAM
SOFFIT SYSTEM SCHEDULE																				
25A	-	60" SOFFIT UNIT	60"W x 48"D x 8"H		E&S	GC														RELOC. ELECTRICAL
25B	-	48" SOFFIT UNIT	48"W x 48"D x 8"H		E&S	GC														RELOC. ELECTRICAL
25C	-	36" SOFFIT UNIT	60"W x 48"D x 8"H		E&S	GC														RELOC. ELECTRICAL
25D	-	24" SOFFIT UNIT	24"W x 48"D x 8"H		E&S	GC														RELOC. ELECTRICAL
25E	-	WEDGE UNIT	W (varies) x 48"D x 8"H		E&S	GC														RELOC. ELECTRICAL
25F	-	48" CORNER UNIT	48"W x 48"D x 8"H		E&S	GC														RELOC. ELECTRICAL
25G	-	48" CORNER UNIT	48"W x 48"D x 8"H		E&S	GC														RELOC. ELECTRICAL
PLUMBING SCHEDULE																				
26	2	STAINLESS STEEL HAND SINK	14"L x 10"D x 5"H	PC383101	E&S	GC									1/2"	1/2"	X			TWO WRIST HANDLES/ BACKSPLASH
	3	LIQUID SOAP DISPENSERS	ACCESSORY	PC244006	E&S	GC														
	3	HAND SANITIZER DISPENSERS	ACCESSORY	PC244004	E&S	GC														
	3	C FOLD PAPER TOWEL DISPENSERS	ACCESSORY	PC277647	E&S	GC														
27	1	SINK WALL STORAGE UNIT	36"L x 30"H	PC411956	E&S	GC														
28	-	S.S. THREE COMPARTMENT SINK	87 1/4"L x 27 1/2"D x 39 1/2"H	PC28102	E&S	GC														
	-	3 COMPARTMENT SINK, WASTE LEVER	ACCESSORY	PC383050	E&S	GC														
	-	ECONOMY SPRAYER W/ ADD-ON FAUCET	ACCESSORY	PC383011	E&S	GC														
	-	WALL BRACKET FOR ECONOMY SPRAYER	ACCESSORY	PC28108	E&S	GC														
29	-	MOLDED STONE MOP SINK	24"L x 24"D x 10"H	PC28096	E&S	GC									1/2"	1/2"	X			
30	-	RINNI WALL MOUNTED WATER-HEATER		R94LSi	GC	GC									1"	1"		X		
31A	-	ALL IN ONE WASHER/DRYER	27"L x 25 1/2"D x 43"H	PC27006											1/2"	1/2"	X			SEARS KENMORE
31B	-	SIDE BY SIDE GAS DRYER	27"L x 25 1/2"D x 43"H	PC26995	E&S	GC														
SHELVING AND STORAGE SCHEDULE																				
32	-	24" x 24" WIRE SHELF SYSTEM		SEE E&S																
33	-	24" x 24" CHEMICAL RACK		SEE E&S																
34	-	18" x 48" CLEAN SMALL WARES RACK		SEE E&S																
35A	4	24" x 48" HEAVY DUTY DUNNAGE RACK	24"L x 48"D x 12"H	PC462451	E&S	GC														
35B	-	24" x 36" HEAVY DUTY DUNNAGE RACK	24"L x 36"D x 12"H	PC462450	E&S	GC														
35C	-	18" x 48" HD DUNN. RACK W/ 6" BACKSPLASH	18"L x 48"D x 6"H	SEE E&S																
35D	-	24" x 48" HEAVY DUTY DUNNAGE RACK	24"L x 80"D x 12"H	SEE E&S																
36	4	MODULAR METAL DROPBOX	7"W x 7"D x 23"H	PC8610A	E&S	GC														4 BAYS TO BE ATTACHED TOGETHER
37	-	27 GALLON CORNMEAL BIN W/ LID (PC0.0287)	27 1/2"H	PC203699	E&S	GC														
38	3	STEEL DOUGH DOLLY W/ 3" SWIVEL CASTER	25 7/8"W x 17 7/8"D x -"H	PC460005	E&S	GC														900 LB. CAPACITY
		DOUGH TRAYS (SET OF 100)	-"W x -"D x -"H	PC258050	E&S	GC														
39	4	12" x 12" EMPLOYEE LOCKER - TRIPLE TIER	A=3 WIDE B=1 WIDE	SEE E&S																
40	-	16 COMPARTMENT LOCKER	72"W x 18"D x 78"H	PC26610																
41	-	WALL MOUNTED BIKE RACK		SEE E&S																
	-	TRASH CAN W/ LID (PC3071)	ACCESSORY	PC7030	E&S	GC														

FURNITURE SCHEDULE ◯ INDICATES EQUIPMENT CALLOUT

ITEM	QTY.	DESCRIPTION	DIMENSIONS	MANUFACTURER				MODEL NO.	COLOR	COMMENTS
42	-	DINING CHAIR	31.5"H x 16.25"W x 15"D x 18.25"SH	PROVIDED BY E&S	E&S	GC		PC318022	APPLE RED W/ CHROME LEGS	DINING ROOM
43	6	COUNTER STOOL	30"H x 16.25"W x 15"D x 24"SH	PROVIDED BY E&S	E&S	GC		PC318023	APPLE RED W/ CHROME LEGS	DOUGH BUMP-OUT
44	-	DINING TABLE TOP-(TOP ONLY)	24" x 36"	PROVIDED BY E&S	E&S	GC		PC318206	TOP: PL-04	DINING ROOM
45	-	DINING TABLE BASE	FOR 24" x 36" TOP & 36" RND. TOP	PROVIDED BY E&S	E&S	GC		PC318027	BASE: CAST IRON	DINING ROOM
46	-	DINING TABLE TOP-(TOP ONLY)	36" x 48"	PROVIDED BY E&S	E&S	GC		PC318028	TOP: PL-04	DINING ROOM
47	-	DINING TABLE BASE	FOR 36" x 48" TOP	PROVIDED BY E&S	E&S	GC		PC318029	BASE: CAST IRON	DINING ROOM
48	1	BENCH	E&S TO PROVIDE	PROVIDED BY E&S	E&S	GC		E&S TO PROVIDE	E&S TO PROVIDE	E&S TO PROVIDE
49	-	BOOTH SEATING	36" HIGH BACK WALL BENCH	PROVIDED BY E&S	E&S	GC		PC318025 MENLO PARK BOOTH	VINYL-AM. BTY. SPALDING PATRIOT PLUS II PA 8528	INTERIOR SEATING AREA
50	-	INTERIOR TRASH CAN- 40 GALLON	38"H x 19"W x 19"D	TRASHCANSANDMORE.COM	E&S	GC		T1940xx	WHITE POWDER COAT	INTERIOR DINING AREA

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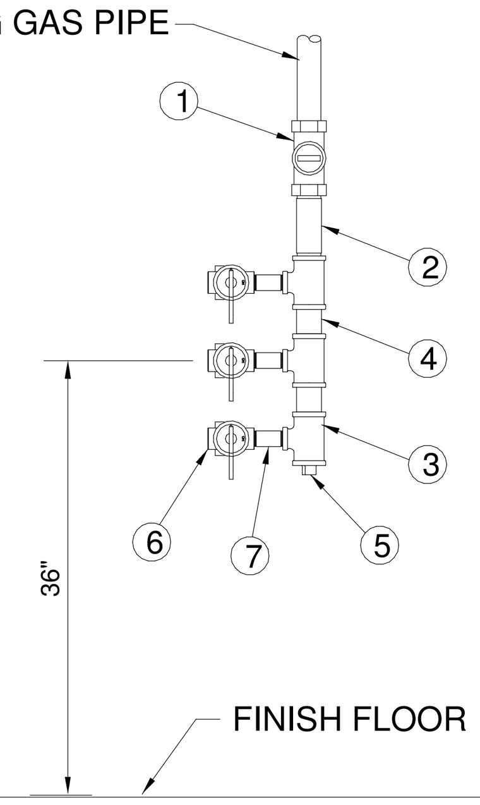
A1.2
EQUIPMENT PLAN



NOTE:
ALWAYS PROVIDE UTILITIES FOR A TRIPLE STACK OVEN, THIS ALLOWS FOR AN EASY THIRD DECK ADDITION.

Item No.	Description
1	1-1/2 Shut-Off Valve (1)
2	1-1/2 x 5 Pipe Nipple (1)
3	1-1/2 x 3/4 1-1/2 Reducing Tee (3)
4	1-1/2 x 3 Pipe Nipple (2)
5	1-1/2 Pipe Plug (1)
6	3/4 Shut-Off Valve
7	3/4 Pipe Nipple

NOTES:
GAS OVEN ELECTRICAL CONTROL BOX INTEGRATED INTO HOOD

GAS CONNECTIONS & PIPING TO BE SECURED TO WALL.

CAUTION: DO NOT USE TEFLON TAP ON GAS LINE CONNECTIONS AS THIS CAN POSSIBLY CAUSE GAS VALVE MALFUNCTION OR PLUGGING OF ORIFICES FROM SHREDS OF TAPE. USE OF TEFLON TAPE MAY AFFECT WARRANTY.

THE GAS & ELECTRICAL SUPPLY ARE TO BE PROVIDED BY THE CUSTOMER PRIOR TO INSTALLATION. THE DETAILS ON THIS SHEET SHOW A TYPICAL UTILITY ROUGH-IN FOR A TRIPLE STACK OVEN. PREPARING THE UTILITIES THIS WAY ALLOWS FOR AN EASY THIRD DECK ADDITION IF A DOUBLE STACK OVEN IS INITIALLY INSTALLED.

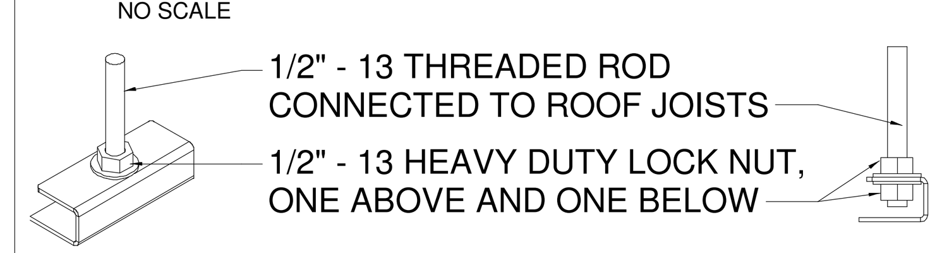
THE GAS SUPPLY PRESSURE MUST BE A MINIMUM OF 1.13 kPa FOR NATURAL GAS & MINIMUM OF 2.75 kPa FOR LP GAS, MEASURED WITH APPLIANCES OPERATING. (SEE GENERAL NOTES SHEET FOR SUPPLY REQUIREMENTS)

BOFI #XLT 3270-TS: 3 DECK NATURAL GAS 480,000 BTUH (160,000 BTUH EACH), 8 - 14 INCHES WATER COLUMN, 6 AMPS SINGLE PHASE EACH DECK.
OR 3 DECK L.P. GAS 480,000 BTUH (160,000 BTUH EACH), 11.5 - 14 INCHES WATER COLUMN, 6 AMPS SINGLE PHASE EACH DECK.

GAS OVEN UTILITY DETAIL FOR BOFI GAS OVENS N.T.S.

HANGER BRACKET DETAIL

NO SCALE



THREADED ROD AND LOCK NUTS TO BE SUPPLIED AND CONNECTED TO ROOF JOISTS AND HOOD BY INSTALLING CONTRACTOR.

HOOD DESIGN, ENGINEERED AND MANUFACTURED BY:
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316-943-2769 E.T.L. LISTED

OVEN DESIGN, ENGINEERED AND MANUFACTURED BY: BOFI
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316-943-2769 E.T.L. LISTED

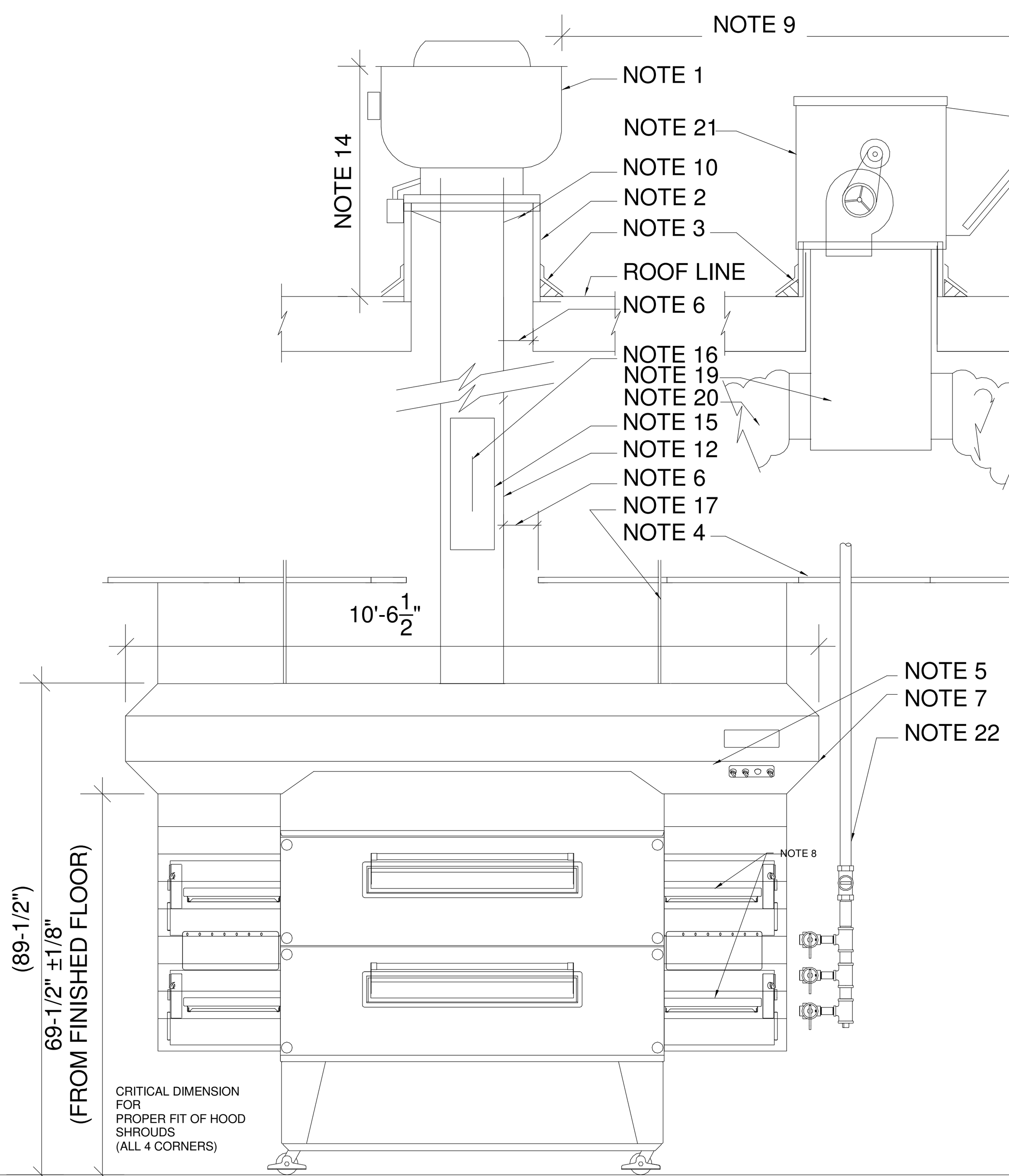
EXHAUST INFORMATION

OVEN TYPE	DESIGN CFM	LISTING MIN CFM
SINGLE DECK OVEN	500	402
DOUBLE DECK OVEN	900	828
TRIPLE DECK OVEN	1400	1254

HOOD GENERAL NOTES

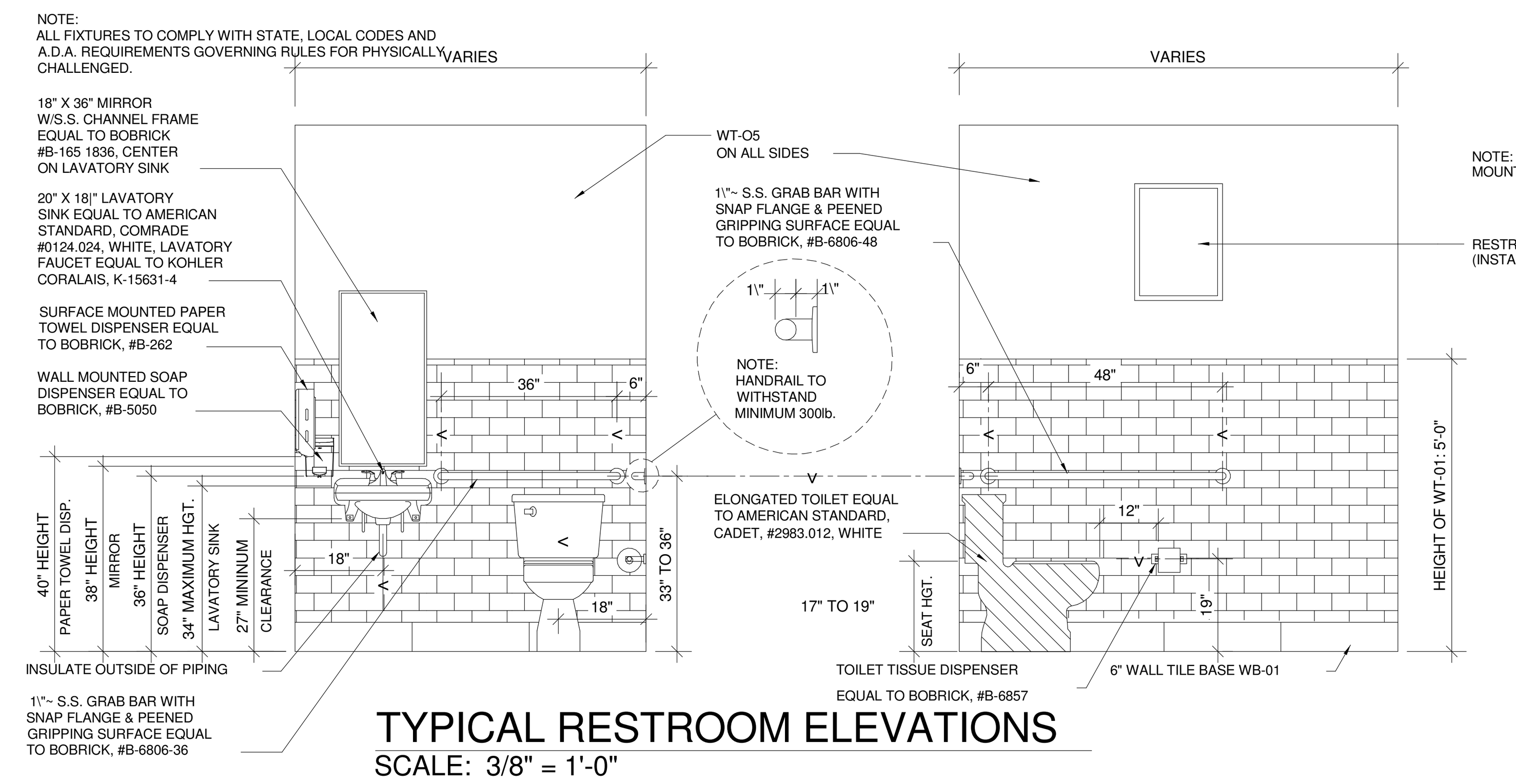
1. ROOF EXHAUST FAN RATED AT 900 CFM @ .80 S.P. FOR 2 DECK OVEN.
2. ROOF EXH. FAN ROOF CURB
3. FLASHING & COUNTERFLASHING, MINIMUM 26 GA. GALV.
4. T-BAR SUSPENDED CEILING WITH FIRE RATED TILE, US. GYPSUM VINYL STIPPLE SHELL.
5. (1) 12" HIGH X 16" WIDE & (1) 12" HIGH X 20" WIDE ALUM. REMOVABLE GREASE FILTERS, PAIR FOR EACH EXH. OPENING.
6. 6" MIN. CLEARANCE FROM ANY LIMITED-COMBUSTIBLE MATERIAL.
7. HOOD, 18 GA. S.S. CONSTRUCTION. COMPLIES WITH N.F.P.A. 96 STANDARDS, NSF LISTED, E.T.L. LISTED HOOD ASSEMBLY.
8. BAKING SURFACES SERVICED BY HOOD.
9. EXHAUST FAN TO BE A MINIMUM OF 10'-0" FROM ADJACENT BUILDINGS, PROPERTY LINES OR INTAKE OPENINGS.
10. 15 DEGREE MINIMUM INWARD INCLINE AT TOP OF DUCT.
11. DIRECTION OF OVEN TRAVEL DETERMINED BY STORE LAYOUT.
12. 16 GA. STEEL CONTINUOUS WELD DUCT.
13. MECHANICAL EQUIPMENT ON ROOF SHALL BE FIXED IN POSITION AND ANCHORED AS PER MANUFACTORS SPECIFICATIONS.
14. 40" MINIMUM DISTANCE FROM ROOF LINE TO DISCHARGE POINT OF FAN.
15. 8" X 24" CLEAN-OUT AS REQUIRED BY N.F.P.A., DO NOT OBSTRUCT.
16. BAFFLE LOCATED AT CENTER OF 11.5" X 11.5" DUCT OPENING.
17. ROD HANGERS, EACH CORNER OF HOOD. CONTRACTOR TO TO SUPPLY ROD IN FIELD TO SUPPORT 1500 LBS EACH ROD.
18. EXHAUST FAN AND MAKE-UP AIR FAN TO BE ELECTRICALLY INTERLOCKED.
19. 12" X 12" 18 GA. GALVINIZED DUCT.
20. 10" DIAMETER DUCT CONNECTED TO 10" DIAMETER GALVINIZED COLLAR FOR MAKE-UP AIR.
21. FILTERED MAKE-UP AIR UNIT & ROOF CURB, SEE EQUIPMENT SCHEDULE FOR UNIT SPECIFIED.
22. 2" GAS LINE FOR SUPPLYING GAS OVENS.
23. PROVIDE ROOF EDGE 42" HIGH GUARD RAIL WHERE HVAC OR MAKE-UP AIR UNIT IS 10' OR CLOSER TO ROOF EDGE.

NOTES:
DETAIL OF DUCTWORK FOR SUGGESTION ONLY. ACTUAL DUCT BY INSTALLER, MUST MEET ALL LOCAL CODE REQUIREMENTS.
EXHAUST FAN AND DUCTWORK SHOULD BE PLACED DIRECTLY OVER OVEN HOOD WITH AS FEW AS POSSIBLE BENDS FROM HOOD TO ROOF.



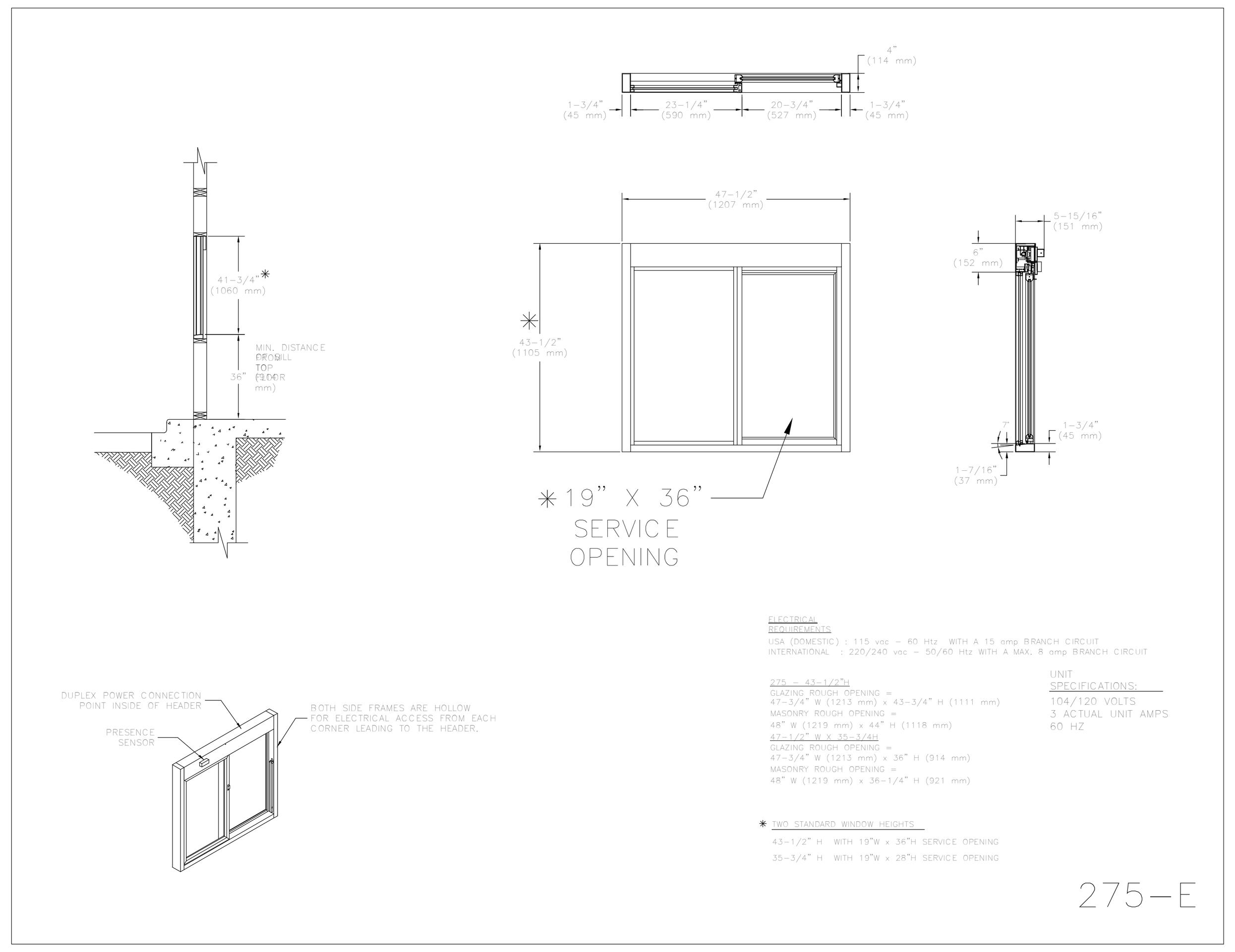
OVEN & HOOD FRONT VIEW
N.T.S.

OVEN , HOOD, AND EXHAUST INFORMATION (BOFI 3270 OVEN - AVI HOOD)



TYPICAL RESTROOM ELEVATIONS

SCALE: 3/8" = 1'-0"



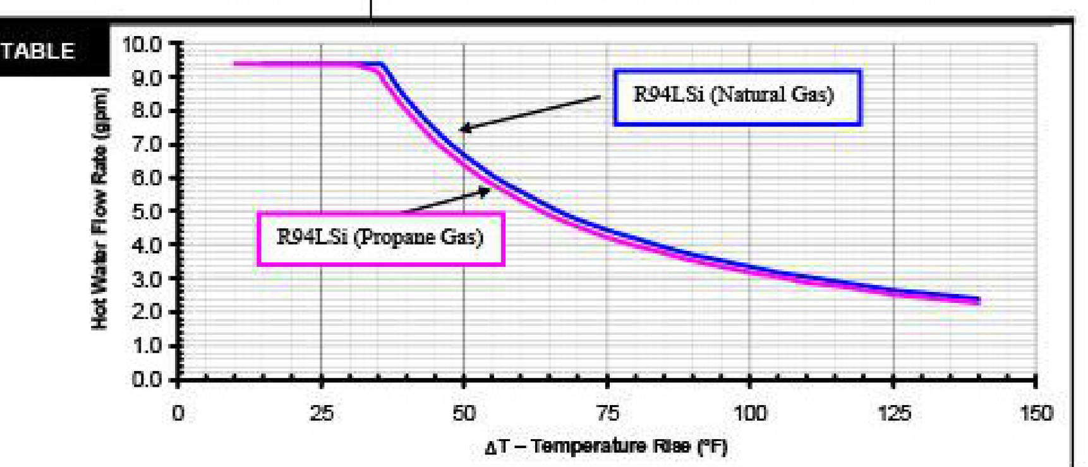
DRIVE-THRU WINDOW DETAIL: READY ACCESS (MODEL 275 ELECTRIC)
CONTACT: (800) 621-5045

Rinnai.

R94LSi (VA2535FFUD)

Type of Appliance	Temperature controlled, continuous flow, gas hot water system
Rinnai Model Number	REU-VA2535FFUD-UC
Operation / Exhaust System	Forced combustion / Direct vent
Minimum/Maximum Gas Rate (Input)	15,000 - 199,000 BTU/h (Natural Gas) 15,000 - 190,000 BTU/h (Propane)
Electrical	Appliance: AC 120 Volts - 60 Hz Controller: DC 12 Volts
Electrical Consumption	Normal 79 watts Standby 2.0 watts Anti-frost protection 100 watts
Ignition System	Direct electronic ignition
Hot Water Capacity	0.6 to 9.4 GPM (35° F rise)
Temperature	98° - 120° F (factory default) Maximum temperature is selectable at 120° F or at 140° F; 98° - 185° F available with the MCC-91 controller for commercial and hydronic applications
Temperature (without remote)	120° F (factory default)
Approved Gas Types	Natural or Propane (ensure unit matches gas type)
Installation	Indoor only
Energy Factor	Natural Gas: 0.82 Propane: 0.82
Thermal Efficiency	Natural Gas: 84% Propane: 84%
Service Connections	Gas supply: 3/4 inch MNPT Cold water inlet: 3/4 inch MNPT Hot water outlet: 3/4 inch MNPT
Water Flow Control	Water flow sensor, electronic water control and by-pass control
Minimum/Maximum Water Supply Pressure	20 - 150 PSI (recommended 30-80 PSI for maximum performance)

FLOW TABLE



© 2008 Rinnai Corporation R94LSi SP 8/2008

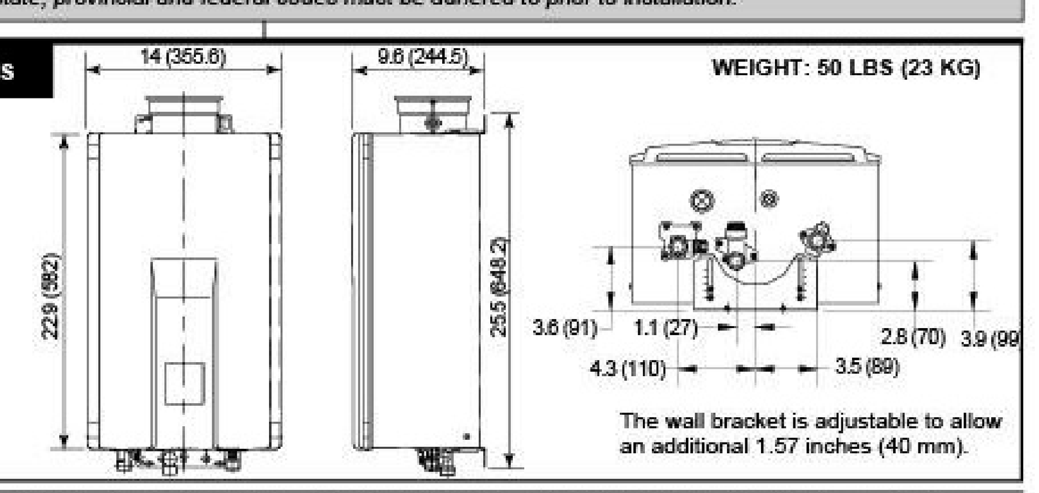
Rinnai.

R94LSi (VA2535FFUD)

Water Temperature Control	Simulation feed forward and feedback
Controller	MC-91-1US (part of the front panel) Deluxe controller: MC-100V-1US (optional) Bathroom controller: BC-100V-1US (optional) Wireless controller: MC-502RC-1US-MS (optional) MCC-91-1US (for commercial applications)
Controller Cable	Non-polarized two-core cable, minimum 22 AWG
Safety Devices	• Flame failure - Flame Rod • Boiling protection • Combustion fan rpm check • Over current - glass fuse (3 amp) • Remaining flame (OHS) • Thermal fuse • Automatic frost protection
Clearances from Combustibles (suitable for closet, attic, and crawl space installations)	• Top of heater - 6 inches • Front of heater - 6 inches • Sides of heater - 2 inches • Back of heater - 0 inches • Bottom of heater - 12 inches • From vent pipe - 0 inches
Clearances from Non-combustibles	• Top of heater - 2 inches • Front of heater - 6 inches • Sides of heater - 1/2 inch • Back of heater - 0 inches • Bottom of heater - 12 inches • From vent pipe - 0 inches
Min. / Max. Gas Supply Pressure	Natural Gas: min 5" W.C. max 10.5" W.C. Propane Gas: min 8" W.C. max 13.5" W.C.
Manifold Gas Pressure (inches W.C.)	Natural Gas: high fire 3.3" W.C. low fire 0.52" W.C. Propane Gas: high fire 5.0" W.C. low fire 0.92" W.C.
NOx	Meets California and Texas NOx Emission Rules
Warranty	Heat exchanger: 12 years* for residential and 5 years* for commercial and hydronic applications; (10 years* if used with the Rinnai Hydronic Air Handler); all other parts 5 years*; labor 1 year; (* 3 years if used as a circulating water heater within a circulation loop, when the water heater is in series with a circulation system and all circulating water flows through the water heater)

Rinnai is continually updating and improving products; therefore, specifications are subject to change without prior notice. Local, state, provincial and federal codes must be adhered to prior to installation.

DIMENSIONS in (mm) WEIGHT: 50 LBS (23 KG)



Rinnai Corporation • 103 International Drive • Peachtree City, GA 30269 • Toll-Free: 1-800-621-9419 • Fax: 678-364-8643 • www.rinnai.us

WATER HEATER INFORMATION

CONTACT RINNAI AT 866-383-0707 FOR NATIONAL DISCOUNT PRICING

NOTICE: Attention Domino's Pizza franchisees, franchisee architects and contractors. These design intent drawings represent the approved layout of equipment and finishes for this Domino's Pizza location. Any reconfiguration or modification requires written approval from Domino's Store Development Department. Modification without such approval may result in reconstruction or default.

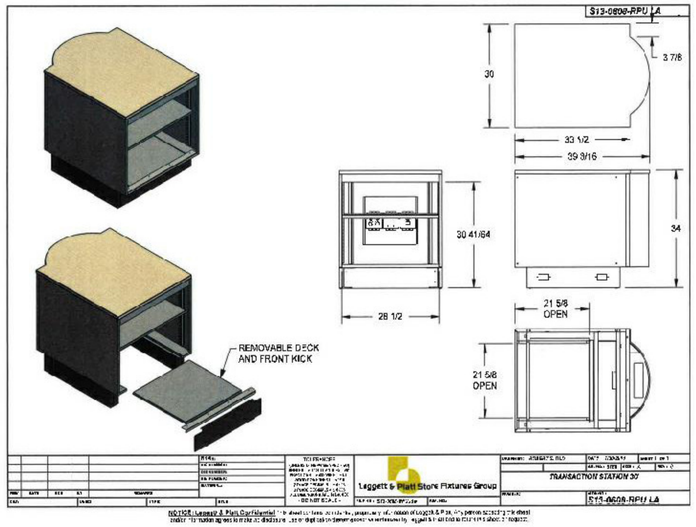
Registered Architect David Paul Burris No. 4116 Arkansas

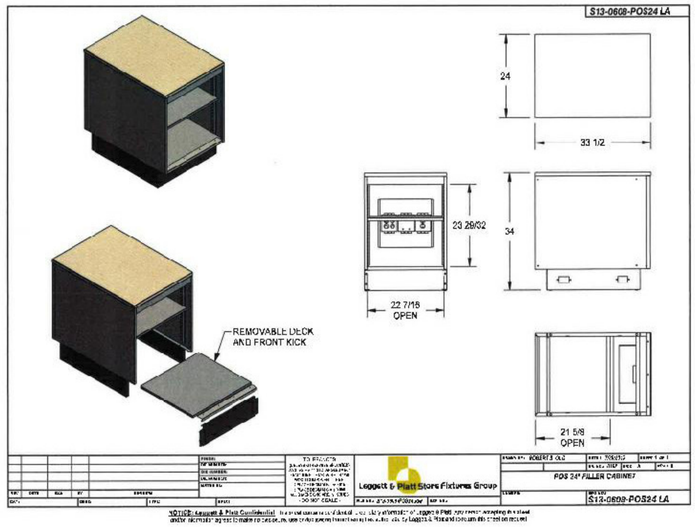
Burris Architecture
820 Tiger Blvd, Suite 4, Bentonville, Ar 72712
479-319-6045

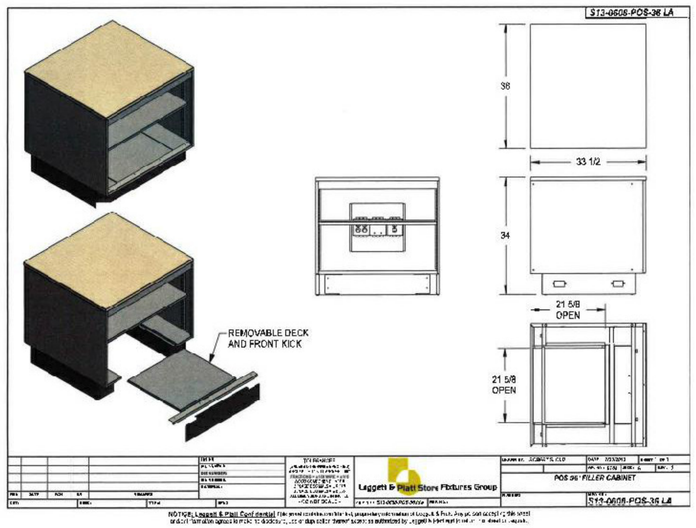
DOMINOS BRYANT
3415 W. HWY 5
BRYANT, AR

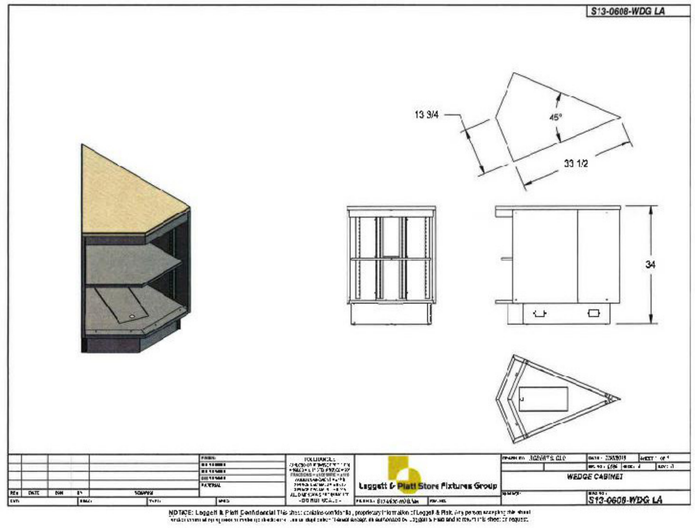
DATE 10-31-22
JOB NO. 22151
REVISIONS

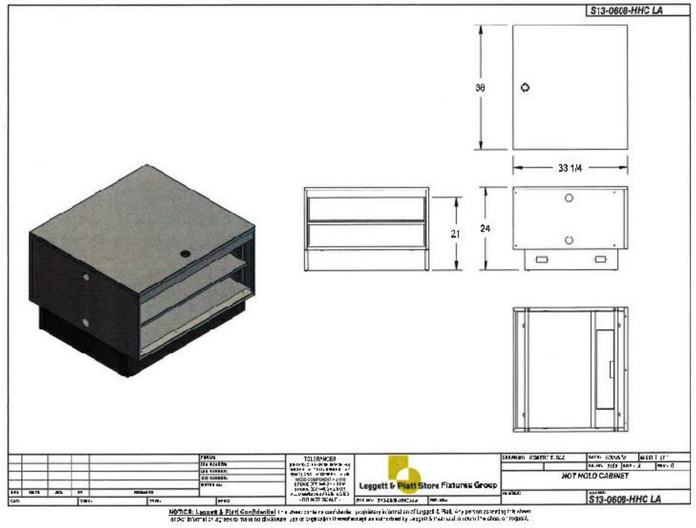
A1.3
DETAILS











CASHWRAP STATIONS W/ RELOC ELECTRICAL

CONTACT E&S FOR INSTALL MANUALS

NOTICE: Attention Domino's Pizza franchisees, franchisee architects and contractors. These design intent drawings represent the approved layout of equipment and finishes for this Domino's Pizza location. Any reconfiguration or modification requires written approval from Domino's Store Development Department. Modification without such approval may result in reconstruction or default.

ELECTRICAL CONNECTION S TO BUILDING WIRING NOTE:

Each Cabinet that contains 120 volt electrical outlets has a manufactured wiring Power Tee (PT) connected to each receptacle assembly (orange or white). The cabinets are electrically connected by plugging PTs together for adjoining cabinets, or Cable Extenders (CE) for passing through non-powered cabinets. Provided Circuit Distributor (CD) cables plug into a PT or CE to connect the cabinets to a junction box that is part of the building wiring (see Site Architectural Electrical Plan). White receptacles are intended for general purpose use and are to be connected via CD cables to a typical 120 volt AC circuit with overcurrent protection of no more than 20 amperes. Connect Black wire to the Hot conductor, White wire to Neutral, and Bare or Green to Ground. There may also be an unused Red Spare wire to be capped off. Orange receptacles are intended for electronic component use and are to be connected via CD cables to an *Isolated Ground Wire* 120 volt AC circuit with overcurrent protection of no more than 20 amperes. Connect Black wire to the Hot conductor, White to Neutral, Bare or Green to Ground and the Green with Yellow Stripe to the *Isolated Ground Wire* conductor. There may also be an unused Red Spare wire to be capped off. Manufactured wiring components used for the White receptacles are different than the Orange receptacles. The connection points are keyed and mechanically cannot be interconnected. Open side of Power Tees must be sealed with supplied Cover Caps.

Registered Architect
David Paul Burris
No. 4116
Arkansas

Burris Architecture
820 Tiger Blvd, Suite 4, Bentonville, Ar 72712
479-315-6045

DOMINOS BRYANT
3415 W. HWY 5
BRYANT, AR

DATE 10-31-22
JOB NO. 22151
REVISIONS

A1.4
DETAILS

DOMINO'S PIZZA THEATER FINISH SCHEDULE

FLOOR COVERING

FC-01 RETAIL FLOOR AND RESTROOMS
6" X 24" PORCELAIN TILE ON ⅓ OFFSET,
OLYMPIA TILE ARBOR SELECTION "MOKA" OL.AR.MKA.0624
3/16" GROUT JOINT: CUSTOM BUILDING PRODUCT #60 CHARCOAL.
CONTACT: KURT von KOSS (248) 790-2197 KURT@BEAVERTILE.COM

FC-02 ALTERNATE RETAIL FLOOR AND RESTROOMS
6" X 24" PORCELAIN TILE ON ⅓ OFFSET,
DALTILE YACHT CLUB PORCELAIN "COCKPIT" YCOL
3/16" GROUT JOINT: CUSTOM BUILDING PRODUCT #60 CHARCOAL.
CONTACT: KURT von KOSS (248) 790-2197 KURT@BEAVERTILE.COM

FC-03 KITCHEN/ BACK OF HOUSE
6" X 6" QUARRY TILE
QUARRY BASICS "507 PURITAN GRAY"
3/16" GROUT JOINT: CUSTOM BUILDING PRODUCT #60 CHARCOAL.
CONTACT: KURT von KOSS (248) 790-2197 KURT@BEAVERTILE.COM

FC-04 ALTERNATE KITCHEN/ BACK OF HOUSE
8" X 8" QUARRY TILE
DALTILE QUARRY TEXTURES "0T03 ASHEN GRAY"
3/16" GROUT JOINT: CUSTOM BUILDING PRODUCT #60 CHARCOAL.
CONTACT: 877-556-5728 (ASK FOR DPZ NATIONAL PRICING PROGRAM)

FC-05 CHILD "STEP-UP" AT DOUGH FEATURE
24" X 24" X ⅛" RUBBER TILE FLOOR (VINYL STAR NOSING: #VIRCN-20-B)
JOHNSONITE (RUBBER TILE FLOORING-TEXTURES)
"RT RAISED ROUND" (COLOR: 20 CHARCOAL)
CONTACT: LAURIE BAATZ (440) 313-8238 LAURIE.BAATZ@JOHNSONITE.COM

FC-06 ENTRY
INSET ENTRY FLOOR WALK-OFF MAT
ULTRA ENTRY SYSTEM (RECYCLED BLACK VINYL W/ NYLON INSETS)
NEW YORK COLLECTION-BROWN (SIZE: CUSTOM PER LOCATION) USE W/ T-2
CONTACT: MARK SADAUSKAS (614) 743-7146 MSADAUSKAS@MATSINC.COM
NOTE: MAT CAN BE LOCALLY SOURCED IF IT IS AN "AS EQUAL" PRODUCT

WALL BASE AND FLOOR ACCESSORIES

WB-01 RETAIL FLOOR AND RESTROOMS
6" X 24" PORCELAIN TILE ,
OLYMPIA TILE ARBOR SELECTION "MOKA" OL.AR.MKA.0624 W/
3/16" GROUT JOINT: CUSTOM BUILDING PRODUCT #52 TOBACCO BROWN.
CONTACT: KURT von KOSS (248) 790-2197 KURT@BEAVERTILE.COM

WB-02 ALTERNATE RETAIL FLOOR AND RESTROOMS
6" X 24" PORCELAIN TILE ON ⅓ OFFSET,
DALTILE YACHT CLUB PORCELAIN "COCKPIT" YCOL
3/16" GROUT JOINT: CUSTOM BUILDING PRODUCT #52 TOBACCO BROWN.
CONTACT: KURT von KOSS (248) 790-2197 KURT@BEAVERTILE.COM

TS-01 TRANSITION STRIP: PORCELAIN TILE TO QUARRY TILE
TRANSITION STRIP FROM FRONT OF HOUSE TO BACK OF HOUSE
JOHNSONITE "CE-76-C WITH METAL TRACK (TRACK:MT-00-A)
TRANSITION (76 CINNAMON) FROM ⅜" THICK RETAIL PORCELAIN AREA TILE
TO ½ " THICK QUARRY KITCHEN TILE
CONTACT: LAURIE BAATZ (440) 313-8238 LAURIE.BAATZ@JOHNSONITE.COM

TS-02 TRANSITION STRIP FROM ENTRY WALK-OFF MAT TO PORCELAIN TILE
SCHLUTER "SCHIENE" STAINLESS STEEL
CONTACT: (800) 667-8746 WWW.SCHLUTER.COM

CEILINGS

CT-01 KITCHEN/ BACK OF HOUSE
24" X 24" SCRUBBABLE CEILING TILE
USG CEILINGS SHEETROCK LAY-IN CEILING PANEL (CLIMAPLUS, VINYL) "3260"
COLOR: WHITE/ EDGE: SQUARE
CONTACT: ERIN GOSENDE (513) 828-9686 EGOSENDE@USG.COM

CT-02 AS REQUIRED: CAN BE PAINTED WITH PT-04 WHEN CT-03 IS NOT ALLOWED
24" X 24" X ⅝" ACOUSTICAL CEILING TILE
USG CEILINGS (OLYMPIA MICRO CLIMAPLUS) "4211"
COLOR: WHITE/ EDGE:SQUARE/ PROFILE: EDGE GRID PROFILE DONN CX
CONTACT: ERIN GOSENDE (513) 828-9686 EGOSENDE@USG.COM

CT-03 RETAIL AREA CEILING
24" X 24" X ¾" ACOUSTICAL CEILING TILE
USG CEILINGS (FROST CLIMAPLUS) "4211"
COLOR: 565 SIENNA/ EDGE:SQUARE/ PROFILE: EDGE GRID PROFILE DONN CX-COLOR TO MATCH 565 SIENNA
CONTACT: ERIN GOSENDE (513) 828-9686 EGOSENDE@USG.COM

PAINT

PT-01 SHERWIN-WILLIAMS "REAL RED" PMS 186C (SW6868)
FINISH: EGGSHELL (INTERIOR WALLS), SATIN (EXTERIOR TRIM, RESTROOM DOOR AND FRAME/ INTERIOR WALLS AS NOTED)
CONTACT: (800) 321-8194 WWW.SHERWIN-WILLIAMS.COM

PT-02 BENJAMIN MOORE "CALIFORNIA BLUE" PMS 7692C (2060-20)
FINISH: EGGSHELL (INTERIOR WALLS), SATIN (EXTERIOR AND TRIM)
CONTACT: (866) 708-9181 WWW.BENJAMINMOORE.COM

PT-03 SHERWIN-WILLIAMS "CRUST PAINT" PMS 465C (SW6123)
FINISH: EGGSHELL (INTERIOR WALLS), SATIN (EXTERIOR TRIM, STOREFRONT AND BUILDING SIDES)
CONTACT: (800) 321-8194 WWW.SHERWIN-WILLIAMS.COM

PT-04 SHERWIN-WILLIAMS "JAVA" PMS 7582C (SW6090)
FINISH: MATTE CEILING PAINT
CONTACT: (800) 321-8194 WWW.SHERWIN-WILLIAMS.COM

PT-05 BENJAMIN MOORE "GREY CHALKBOARD PAINT" (307-80)
FINISH: USE A PRIMER WITH A HARDENER ADDITIVE
CONTACT: (866) 708-9181 WWW.BENJAMINMOORE.COM

PT-06 IFS COATINGS, INC. POWDER COATED PAINT (SILVER SPARKLE "PRSS 90708"
LOCATION: DINING LEDGE LEGS AND BASE PLATE, POS FASCIA
CONTACT: BRANDON PHILLIPS (866) 437-2864 BPHILLIPS@IFSCOS.COM

INTERIOR AND EXTERIOR FABRICS

FB-01 SUNBRELLA
EXTERIOR AWNING FABRIC
COLOR: LOGO RED
STYLE: 4666/ SIZE:46"/ 100% SOLUTION DYED ACRYLIC
CONTACT: GLEN RAVEN CUSTOM FABRICS LLC. (336) 221-2211

FB-02 ALTERNATE: COOLEY SIGN AND AWNING PRODUCTS
EXTERIOR AWNING FABRIC
COLOR: #0132 BRIGHT RED
PRODUCT: COOLEY BRITE
CONTACT: (800) 992-0072 WWW.COOLEYGROUP.COM

WALL TILE

WT-01 WT-01: WHITE SUBWAY TILE
INTERCERAMIC "100 ULTRA WHITE" 3 X 6 W/ WHITE GROUT
LOCATION: KITCHEN VISIBLE TO CUSTOMER
CONTACT: MEES DISTRIBUTORS (614) 844-5830 WWW.INTERCERAMIC.COM

WT-02 FRP WALL PANEL (LOCATION: KITCHEN AREA NOT VISIBLE TO CUSTOMER)
MARLITE "P-100"/ TEXTURE: PEBBLE SURFACE/ COLOR: WHITE
CONTACT: TOM PINNOW (330) 260-7631 TPINNOW@MARLITE.COM

WT-03 FRP WALL PANEL
MARLITE "P-106"/ TEXTURE: PEBBLE SURFACE/ COLOR: BEIGE
LOCATION: AS REQUIRED, REIMAGE CHAIR RAIL, VESTIBULE)
CONTACT: TOM PINNOW (330) 260-7631 TPINNOW@MARLITE.COM

WT-04 FRP WALL PANEL
CRANE COMPOSITES "STC"/ TEXTURE:SANDSTONE/ COLOR: 731 RED
LOCATION: AS REQUIRED, REIMAGE CHAIR RAIL, VESTIBULE)
CONTACT: TOM PINNOW (330) 260-7631 TPINNOW@MARLITE.COM

WT-05 WT-05: BLUE SUBWAY TILE
RITTENHOUSE SQUARE "COBALT" 3 X 6 SKU#DM1436MOD1P2
LOCATION: RESTROOM WALLS ABOVE 5' AFF
CONTACT: DALTILE (CAN ALSO BE SOURCED FROM BEAVER TILE)

WT-06 WT-06: RED SUBWAY TILE

MISCELLANEOUS INTERIOR FINISHES

WS-01 SOLAR WINDOW SHADES
MECHO SHADES "THERMOVEIL BASKET WEAVES" FOR WINDOWS
PRODUCT#: 1304/ COLOR: BLACK/BROWN/ OPENNESS: 5%/ STOCKED: 63" & 96"
NOTE: SINGLE BRACKET, MANUAL DRIVE SYSTEM
CONTACT: KMA & ASSOCIATES/ DEB MAK :(614) 563-0569 DMAK@KMA.BZ

WS-02 SOLAR WINDOW SHADES
MECHO SHADES "THERMOVEIL BASKET WEAVES" FOR WINDOWS
PRODUCT#: 1317/ COLOR: STRAW/ OPENNESS: 5%/ STOCKED: 63" AND 96"
NOTE: SINGLE BRACKET, MANUAL DRIVE SYSTEM
CONTACT: KMA & ASSOCIATES/ DEB MAK :(614) 563-0569 DMAK@KMA.BZ

CG-01 INTERIOR WALL CORNER GUARDS
TO BE PROVIDED BY GENERAL CONTRACTOR OR EQUAL
2" X 2" FLANGE STAINLESS STEEL CORNER GUARDS/ HEIGHT: 48"
FINISH: BRUSHED STAINLESS STEEL/ LOCATE AT HIGH TRAFFIC CORNERS

SS-01 RETAIL COUNTERTOPS
CORIAN BY DUPONT
TEM: SOLID SURFACE/ "COTTAGE LANE" ¾" THICKNESS
LOCATE: DOUGH COUNTERTOPS AND CUSTOMER LEDGE AT DOUGH FEATURE, POS COUNTERTOPS
CONTACT: DAVE GREENING (614) 975-6700 DAVE.GREENING@OVSCO.COM

PLASTIC FINISHES

PL-01 WILSONART LAMINATE
COLOR: FROSTY WHITE/ NUMBER: 1573-60
FINISH: MATTE/ LOCATION: AS REQUIRED
CONTACT: LESLIE HUMPHREY (614) 893-6853 HUMPHRL@WILSONART.COM

PL-02 NEVAMAR LAMINATE
COLOR: LIBERTY RED/ NUMBER: S1027T
FINISH: TEXTURED/ LOCATION: RED ELEMENT, AS REQUIRED, REIMAGE CHAIR RAIL, VESTIBULE
CONTACT: TOM CARTWRIGHT (937) 477-7837 TOM_CARTWRIGHT@PANOLAM.COM

PL-03 FORMICA LAMINATE
COLOR: CAFE/ NUMBER: 1903-58
FINISH: MATTE/ LOCATION: AS REQUIRED, REIMAGE CHAIR RAIL, VEATIBULE
CONTACT: (800) 367-6422

PL-04 WILSONART LAMINATE
COLOR: TAN ECHO/ NUMBER: 7941K-18
FINISH: LINEARITY/ LOCATION: STANDING/ DINING LEDGES, TABLETOPS
CONTACT: LESLIE HUMPHREY (614) 893-6853 HUMPHRL@WILSONART.COM

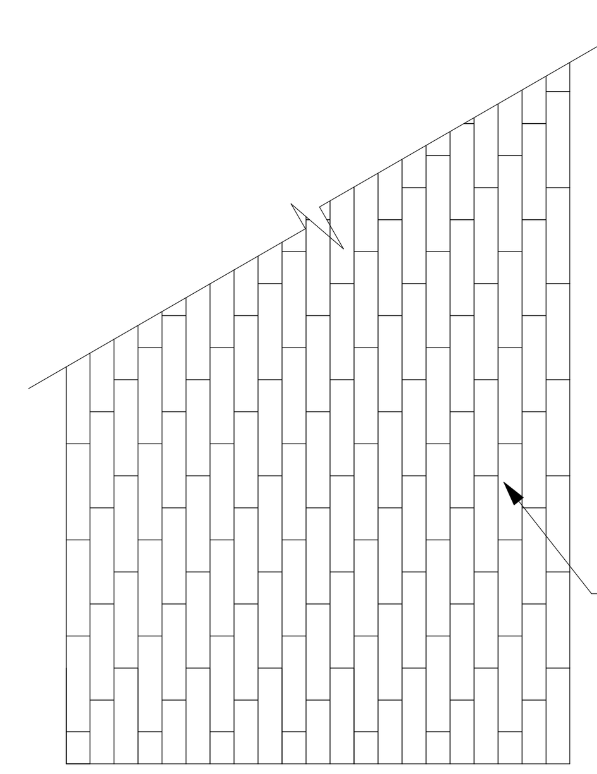
PL-05 WILSONART LAMINATE
COLOR: SATIN STAINLESS/ NUMBER: 4830K-18
FINISH: (18) LINEARITY/ LOCATION: MAKELINE/ DOUGH WALLS FASCIA ON CUSTOMER SIDE.
CONTACT: LESLIE HUMPHREY (614) 893-6853 HUMPHRL@WILSONART.COM

MISCELLANEOUS NOTES

CORION WINDOW SILLS

GENERAL NOTES

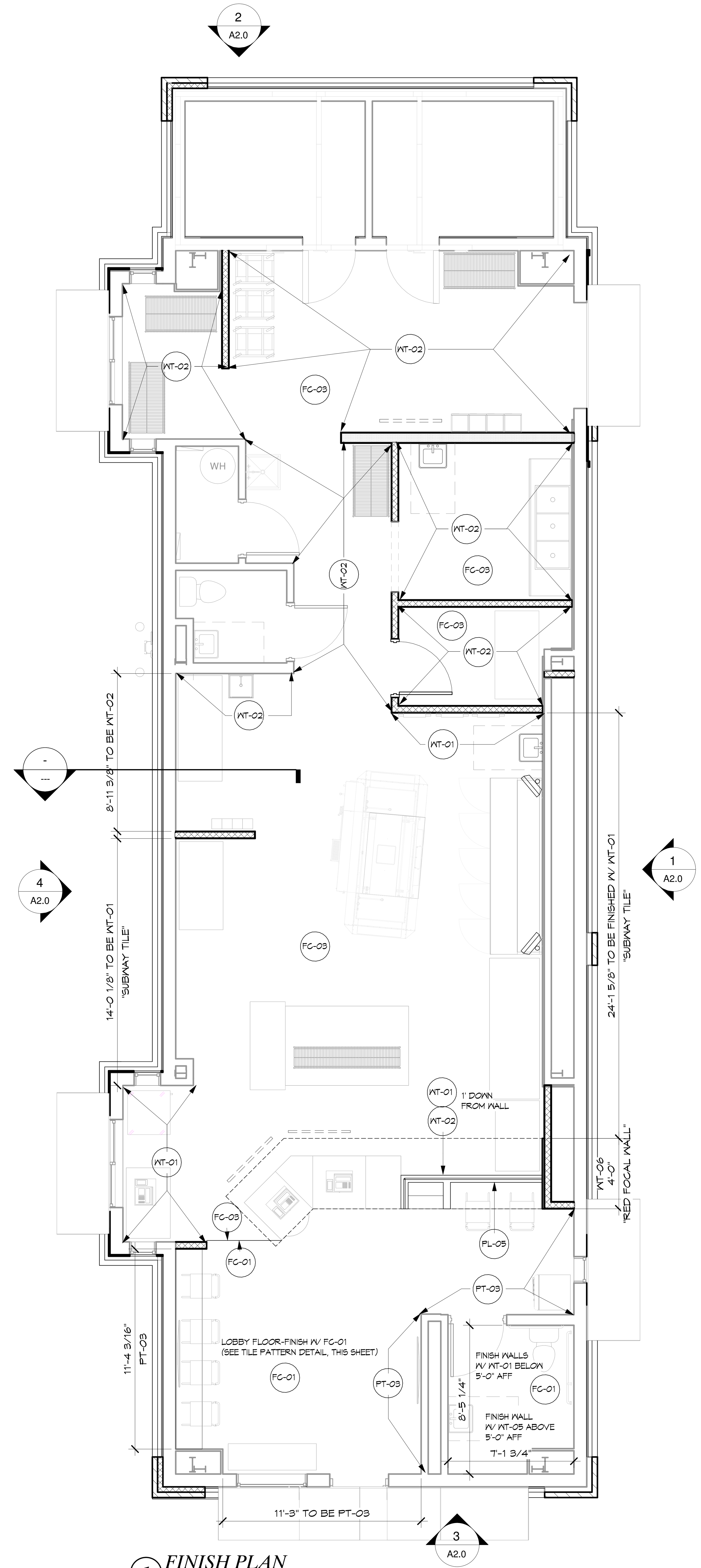
1. ALL WORK SHALL CONFORM TO ALL FEDERAL, STATE AND MUNICIPAL CODES HAVING JURISDICTION OVER THIS PROJECT.
2. CONTRACTOR SHALL VISIT THE SITE PRIOR TO CONTRACT TO VERIFY EXISTING FIELD CONDITIONS. ALL EXISTING DIMENSIONS SHALL BE VERIFIED AND/OR GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR SAME.
3. ANY VARIATIONS OF THE DRAWINGS TO BE APPROVED BY DOMINO'S STORE DEVELOPMENT DEPARTMENT.
4. FRANCHISEE TO RECEIVE, UNLOAD AND INSTALL ALL KITCHEN EQUIPMENT, SIGNAGE AND OPERATIONAL EQUIPMENT.
5. GENERAL CONTRACTOR TO PROVIDE A MINIMUM OF ONE FIRE EXTINGUISHER IN COMPLIANCE WITH THE LOCAL FIRE MARSHAL. LOCATION & QUANTITY OF FIRE EXTINGUISHER(S) TO BE DETERMINED BY THE FIRE MARSHAL.
6. PROVIDE NON COMBUSTIBLE PLYWOOD BACKING IN LIEU OF GYPSUM BOARD AS BACKING FOR WALL MOUNTED WIRE SHELVES FROM 42" A.F.F. TO 90" A.F.F. SEE FLOOR/EQUIPMENT PLAN FOR SHELF LOCATIONS & WALL FINISH.
7. OVEN TO BE SET IN PLACE PRIOR TO INSTALLATION OF COUNTERS.
9. WALL PARTITION KEY:
   - TYP. INTERIOR PARTITION WALL, 1/2" GYPSUM BOARD EACH SIDE OF 1 1/2" x 3 1/2" 20 GA. METAL STUDS AT 16" O.C. WITH INDICATED FINISH.
   - EXISTING WALL
   - EXISTING WALL TO BE REMOVED [SHOWN DASHED]
   - HALF HEIGHT WALL [42" AFF]
   - HALF HEIGHT WALL [54" AFF]
10. EQUIPMENT INDICATOR
11. ▽ INDICATES PHONE LOCATION ON FLOOR/EQUIPMENT PLAN.



NOTE:
INSTALLER TO MAINTAIN 8" INCREMENT W/ TILE INSTALLATION

CONTRACTOR TO CLEAN & SEAL PORCELAIN FLOORING WHERE MANDATED BY CODE.

OLYMPIA TILE/ ARBOR COLLECTION, MOKA OL.AR.MKA.0624 W/ 3/16" GROUT LINES
-
CUSTOM BUILDING PRODUCTS- #60 CHARCOAL, LAY TILE W/ 8" OFFSET



1 FINISH PLAN
1/4" = 1'-0"

Registered Architect
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JOB NO. 22151
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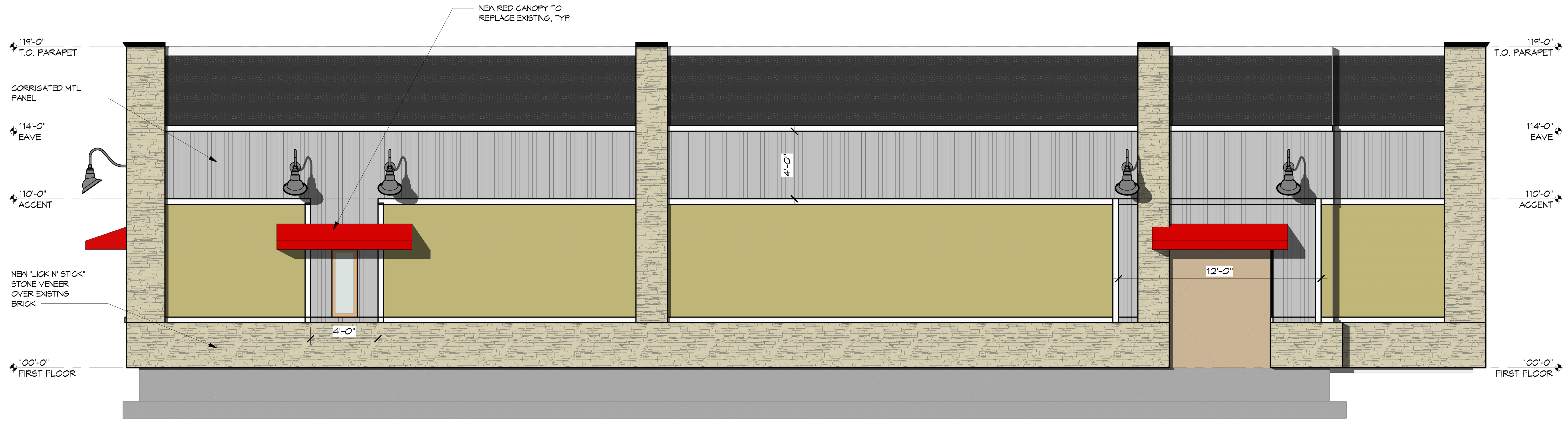
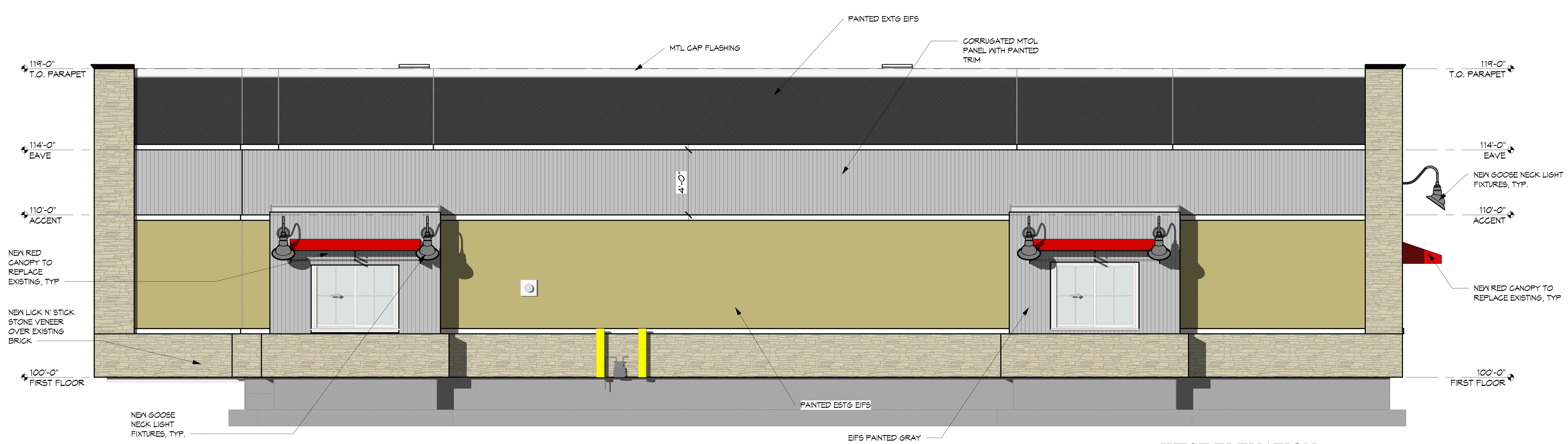
A1.5
FINISH PLAN



1 EAST ELEVATION
1/4" = 1'-0"

3 SOUTH ELEVATION
1/4" = 1'-0"

2 NORTH ELEVATION
1/4" = 1'-0"



4 WEST ELEVATION
1/4" = 1'-0"

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A2.0
EXTERIOR ELEVATIONS

PIPING MATERIAL SCHEDULE

DESCRIPTION	MATERIAL
ABOVE GROUND GAS	SCHEDULE 40 BLACK STEEL WITH MALLEABLE IRON FITTINGS OR WELDED JOINTS WITH BUTT WELD FITTINGS. PROVIDE CORROSION-RESISTANT MATERIAL ON PIPING EXPOSED TO ATMOSPHERE OR IN CONTACT WITH MATERIAL EXERTING A CORROSIVE ACTION
ABOVE GROUND SANITARY SEWER AND VENT	PVC SCHEDULE 40 PIPE AND FITTINGS EXCEPT IN PLENUM RETURN AREAS. IN PLENUM RETURN AREAS WRAP PVC WITH 1" FIRE WRAP.
FLEXIBLE GAS PIPING INSIDE BUILDING	FOR FINAL CONNECTION TO EQUIPMENT ONLY. CORRUGATED STAINLESS STEEL GAS LINE WITH POLYETHYLENE JACKET AND FITTINGS BY MFG. MUST MEET ANSI, NFPA, FACTORY MUTUAL CODE AND LISTINGS AS AN ACCEPTABLE GAS PIPING MATERIAL, ALL STATE AND LOCAL CODE APPROVALS. PROVIDE PIPING EQUAL TO TRACPIPE BY OMEGA FLEX. SIZE PER MANUFACTURER'S INSTALLATION INSTRUCTIONS.
UNDERGROUND SANITARY SEWER AND VENT PIPING INSIDE BUILDING AND OUTSIDE BUILDING	PVC SCHEDULE 40 PIPE AND FITTINGS.
WATER DISTRIBUTION PIPE	WATER DISTRIBUTION PIPE SHALL CONFORM TO NSF 61 AND SHALL BE COPPER AND CONFORM TO THE STANDARDS LISTED IN TABLE 605.4 OF THE I.P.C

ROUGH-IN AND MOUNTING HEIGHT SCHEDULE

NOTES:
1. ALL VENT LINE SIZES SHOWN ARE MINIMUM UNLESS SHOWN LARGER ON RISER DIAGRAMS.
2. SIZES SHOWN FOR WASTE ARE FOR RISERS ONLY.
3. ALL DRAIN AND VENT LINES BELOW SLAB SHALL BE 2" OR LARGER.
4. VENT LINES SHALL RISE 6" ABOVE FLOOD LEVEL RIM BEFORE OFFSETTING HORIZONTALLY, EXCEPT FOR INTERCEPTORS LOCATED OUTDOORS.
5. SIZES SHOWN APPLY UNLESS NOTED DIFFERENTLY ON PLANS.

FIXTURE	WASTE	VENT	COLD WATER	HOT WATER	HEIGHT OF INSTALLATION
FLOOR DRAINS/SINKS	3"	1-1/2"			
LAVATORIES AND SINKS, WALL MOUNTED	(1-1/2")	1-1/4"	1/2"	1/2"	NON-ADA 31" TO TOP OF RIM ADA 34" TO TOP OF RIM

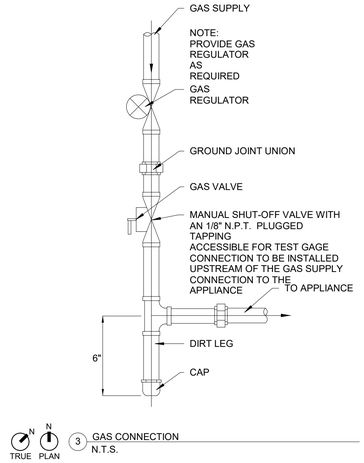
NOTES:
( ) INDICATE INDIRECT WASTE.

PLUMBING PIPING INSULATION SCHEDULE

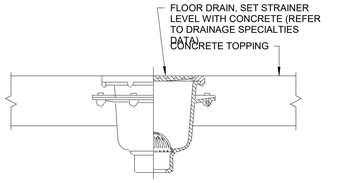
		INSULATION THICKNESS NOMINAL PIPE SIZE				
DESCRIPTION	INSULATION TYPE	<1	1 TO <1-1/2	1-1/2 TO <4	4 TO <8	≥8
DOMESTIC COLD WATER, HOT WATER, AND HOT WATER RETURN PIPING ABOVE GRADE	ELASTOMERIC, ADD ASTM E84 COMPLIANT JACKET IN AIR PLENUM SPACES	1	1	1.5	1.5	1.5

PLUMBING EQUIPMENT SCHEDULE

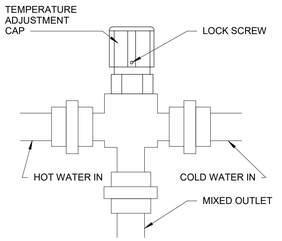
FIXTURE TAG	DESCRIPTION	MANUFACTURER	TRIM	ELECTRICAL REQUIREMENTS
BV-1	BALL VALVE	APOLLO INTERNATIONAL 94ALF-A	LEAD FREE BALL VALVE, FULL PORT, BLOWOUT-PROOF, PRESSURE RETAINING, ADJUSTABLE STEM PACKING NUT	
FS-1	FLOOR SINK 12-1/2" CAST IRON RECEPTOR, 8" DEEP	J. R. SMITH 3150	CAST IRON FLANGED RECEPTOR, SEEPAGE HOLES, ACID RESISTANT COATED INTERIOR, NICKEL BRONZE RIM, LOOSE GRATE, ALUMINUM DOME BOTTOM STRAINER, GRATE, MIFAB TRAP GUARD	
S-1	SINK- COMMERCIAL, SINGLE COMPARTMENT, WALL MOUNT	ADVANCE TABCO 7-PS-60	FAUCET INCLUDED, 3-1/2" OPENING DRAIN, McGUIRE 151M HEAVY DUTY BRASS BASKET & STRAINER, 1 1/2", CHROME PLATED TAILPIECE, McGUIRE 8912 1 1/2" x 1 1/2" HEAVY DUTY CHROME PLATED CAST BRASS P-TRAP W/ CLEANOUT PLUG, McGUIRE 170LK CHROME PLATED SOLID BRASS ANGLE STOPS W/ 5" CHROME PLATED COPPER EXTENSION TUBE & LOOSE KEYS, FLEXIBLE CHROME PLATED COPPER RISERS, McGUIRE 111C SERIES 1 1/2" END OUTLET CONTINUOUS WASTE, PROVIDE TWO FAUCET HOLES ON DECK	
TMV-1	THERMOSTATIC MIXING VALVE - POINT OF USE	LEONARD 270-LF	LEAD FREE, INTEGRAL CHECK VALVE AND STRAINER, PROVIDE, TEMPERATURE CONTROL SET AT 110°	



N TRUE N PLAN (3) GAS CONNECTION
N.T.S.



N TRUE N PLAN (2) FLOOR SINK
N.T.S.



N TRUE N PLAN (4) POINT OF USE - THERMOSTATIC MIXING VALVE
N.T.S.

MECHANICAL PIPING LEGEND

	ISOLATION VALVE
	PRESSURE RELIEF VALVE
	BALL VALVE
	CALIBRATED BALANCING VALVE
	BUTTERFLY VALVE
	3-WAY CONTROL VALVE
	2-WAY CONTROL VALVE
	MANUAL SYSTEM BYPASS VALVE
	PRESSURE GAUGE PORT
P	PRESSURE GAUGE
	CONTINUATION SYMBOL
N.C.	NORMALLY CLOSED
ADJ.	ADJUSTABLE

	COMPRESSED AIR
	COLD WATER
	CONDENSATE
	FILTERED WATER
	FIRE
	FORCED MAIN
	GAS
	GREASE
	HOT WATER
	HOT WATER RETURN
	IRRIGATION
	MEDICAL AIR
	MEDICAL NITROUS
	MEDICAL OXYGEN
	MEDICAL VACUUM
	MEDIUM PRESSURE GAS
	OVERFLOW DRAIN
	RO WATER
	ROOF DRAIN
	SANITARY SEWER
	VENT
	CONNECT TO EXISTING
M	WATER/GAS METER
R	REGULATOR
	LINE CAP
	PRESSURE REDUCING VALVE
	DISCONNECT
	UNION
	BALL VALVE
	MIXING VALVE
	CALIBRATED MIXING VALVE
UB-1/ SB-1	UTILITY BOX/ SUPPLY BOX
	CIRCULATION PUMP
	FROST PROOF HOSE BIBB (FPHB-1)
	HOSE BIBB (HB-1)
	ROOF DRAIN
	ROOF OVERFLOW DRAIN
	DOWNSPOUT NOZZLE
FD-1	FLOOR DRAIN
SWD-1	SAFE WASTE DRAIN
	FLOOR SINK
WCO-1/ SCO-1	WALL CLEAN OUT/ STACK CLEAN OUT
FCO	FLOOR CLEANOUT
COTG-1/ TWCO-1	CLEAN OUT TO GRADE/ TWO-WAY CLEAN OUT
X X	INDICATES DETAIL NUMBER INDICATES SHEET NUMBER
HOR. OR VERT.	BACKFLOW PREVENTER (RPZ-1)

GENERAL PLUMBING NOTES

1	THE ENTIRE PLUMBING SYSTEM SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF THE INTERNATIONAL/ARKANSAS PLUMBING CODE REGULATIONS AND LOCAL PLUMBING INSPECTOR.
2	IT IS THE PLUMBING CONTRACTOR'S RESPONSIBILITY TO CORRDINATE WITH THE SITE CONTRACTOR TO CONFIRM THAT THE INVERT AND LOCATION OF THE SANITARY SERVICE IS COMPATIBLE WITH THE SITE UTILITIES PRIOR TO BEGINNING WORK.
3	THE PIPING INDICATED ON THESE PLANS ARE DIAGRAMMATICAL. ALL WORK SHALL BE COORDINATED WITH ALL OTHER TRADES PRIOR TO INSTALLATION. CONTRACTOR SHALL COORDINATE ROUTING OF ALL PIPING WITH EXISTING CONDITIONS AND SHALL PROVIDE ANY NECESSARY OFFSETS, REROUTING, TEES, ELBOWS, ETC. REQUIRED FOR A COMPLETE AND COORDINATED INSTALLATION.
4	THE CONTRACTOR SHALL OBTAIN AND PAY ALL FEES RELATED TO PERMITTING, INSPECTIONS, TAP-ON FEES, ETC.
5	THE CONTRACTOR SHALL COORDINATE ANY PLUMBING OR PIPING SYSTEM SHUTDOWN WITH THE OWNER 48 HOURS IN ADVANCE.
6	CONTRACTOR SHALL COORDINATE AND PROVIDE ALL NECESSARY PIPING & PLUMBING FITTINGS, PIPING, MISCELLANEOUS ITEMS REQUIRED FOR A COMPLETE INSTALLATION OF ALL PLUMBING RELATED ITEMS.
7	DOMESTIC WATER AND SEWER LOCATED OUTSIDE OF FOOTING SHALL MAINTAIN A MINIMUM OF 10' SEPARATION UNLESS WRITTEN PERMISSION IS OBTAINED FROM LOCAL AUTHORITIES AND/OR PROPER CONTAMINATION PROVISIONS PER LOCAL CODE HAVE BEEN MET.
8	ALL DOMESTIC WATER, NATURAL GAS, DEIONIZED WATER, CARBON DIOXIDE, COMPRESSED AIR, AND NITROGEN PIPING SHOWN IS ABOVE CEILING, EXPOSED OVERHEAD, AND WITHIN WALLS UNLESS OTHERWISE NOTED. WATER HAMMER ARRESTORS SHALL BE INSTALLED AT DISHWASHERS, WASHING MACHINES, SUPPLY BOXES, AND QUICK CLOSING VALVES NOT LISTED. INSTALL WHA-1 AS CLOSE TO QUICK CLOSING VALVE AS POSSIBLE PER MANUFACTURER'S RECOMMENDATIONS. ISOLATION VALVES SHALL BE INSTALLED ON ALL SUPPLY FIXTURE GROUPS AND HOT WATER BALANCING VALVES.
9	ALL SANITARY, GREASE, LAB, AND ACID WASTE PIPING SHOWN IS BELOW SLAB, BELOW FLOOR, OR WITHIN WALLS UNLESS OTHERWISE NOTED. ALL SANITARY VENT PIPING SHOWN IS ABOVE CEILING, EXPOSED OVERHEAD, OR WITHIN WALLS UNLESS OTHERWISE NOTED.
10	FROST PROOF HOSE BIBBS AND SUPPLY PIPING SHALL BE INSTALLED ON THE INSIDE OF THE INSULATION. SEAL SHEATHING PENETRATION TO PREVENT AIR FROM REACHING THE VALVE.
11	FLOOR DRAIN CONNECTION SIZE TO BE THE SAME SIZE AS THE DRAIN LINE IT CONNECTS UNLESS NOTED OTHERWISE. IF SIZE IS NOT INDICATED ON DRAWINGS REFER TO PLUMBING ROUGH-IN SCHEDULE FOR PROPER SIZE.
12	FLUSH CONTROLS FOR HANDICAPPED WATER CLOSETS ARE TO BE MOUNTED TO THE OPEN SIDE OF THE TOILET AREAS.
13	THE CONTRACTOR SHALL COORDINATE THE INSTALLATION OF ALL UNDER SLAB PIPING WITH EXISTING STRUCTURAL FOUNDATIONS. UNDERGROUND UTILITY LOCATIONS SHALL BE VERIFIED PRIOR TO ANY WORK BEING PERFORMED. CONTRACTOR SHALL REPAIR OR REPLACE ALL PIPING NOT IN PROPER WORKING ORDER OR DAMAGED DURING INSTALLATION OF THE NEW UNDERGROUND PIPING.
14	ALL PIPING PENETRATIONS THROUGH NEW, EXISTING WALL, OR FLOOR SHALL BE SEALED TO EQUAL THE RATING OF THE NEW, EXISTING WALL OR FLOOR.
15	THE PLUMBING SYSTEM SHALL BE TESTED AS REQUIRED BY LOCAL CODE OR BY THE REQUIREMENTS OF THE LOCAL PLUMBING INSPECTOR.
16	THE ENTIRE DOMESTIC WATER SYSTEM (EXISTING/NEW) SHALL BE DISINFECTED IN ACCORDANCE TO THE LOCAL CODE & HEALTH DEPARTMENT REQUIREMENTS.
17	FINISHED FLOOR ELEVATION (F.F.E.) SHALL BE 0.00' FOR CALCULATION PURPOSES ONLY, UNLESS NOTED OTHERWISE.
18	THE BACKFLOW PREVENTION DEVICE SHALL BE INSTALLED PER LOCAL CODE & PER AUTHORITY HAVING JURISDICTION REQUIREMENTS. NON-LEAD TYPE ONLY.
19	ALL PIPING ON ROOF SHALL BE ANCHORED TO STEEL RIB FASTENERS APPROVED BY THE ROOF MANUFACTURER. INSTALL ANCHORS PER MANUFACTURERS RECOMMENDATION.
20	ALL PLUMBING & PIPING SYSTEMS SHALL BE SUPPORTED AS REQUIRED BY THE LOCAL CODE REQUIREMENTS AND PER MANUFACTURER'S RECOMMENDATIONS.
21	ALL VENT THRU ROOF (VTR'S) PENETRATIONS INDICATED ON PLANS ARE PRELIMINARY. FINAL LOCATIONS SHALL BE COORDINATED WITH ALL TRADES. ALL VTR'S SHALL BE A MINIMUM OF 10'-0" FROM ALL FRESH AIR INTAKE OPENINGS.
22	ANY PVC PIPE PENETRATING A FIRE RATED ASSEMBLY SHALL BE EXTERNALLY SLEEVED WITH STEEL, FERROUS, OR COPPER MATERIALS, SECURELY FASTENED TO THE FIRE RATED ASSEMBLY. ANY SPACE BETWEEN THE SLEEVE AND THE FIRE RATED ASSEMBLY PENETRATED SHALL BE PROTECTED USING MATERIAL THAT CONFORMS TO ASTM E 814 OR UL 1479, SUCH AS FIRE STOP FS-1900 OR FLAME STOPPER 5000.
23	CONTRACTOR SHALL MAKE ALL FINAL CONNECTIONS FOR DISHWASHER, WASHING MACHINE, REFRIGERATOR, ETC.
24	PROVIDE SHUT-OFF VALVES FOR PROPER OPERATION AND SERVICING OF DOMESTIC WATER DISTRIBUTION SYSTEM. LOCATION SHALL INCLUDE BUT NOT BE LIMITED TO THE FOLLOWING: AT EACH FIXTURE GROUP, AT EACH BRANCH TAKE-OFF FROM MAINS AND AT THE BASE OF EACH RISER. COORDINATE WITH ARCHITECTURAL PLAN FOR ACCESS DOOR LOCATIONS.
26	VALVES SHALL BE LOCATED 6" ABOVE ACCESSIBLE CEILING WHEN AT ALL POSSIBLE AND SHALL BE CLEAR OF ANY OBSTRUCTIONS FROM OTHER TRADES. MAINTENANCE SHALL BE ABLE TO ACCESS VALVES WITH STANDARD LADDER. SHOULD LOCATION NOT BE APPLICABLE CONTRACTOR SHALL PROVIDE A CONTROL CHAIN AND/OR ARM.
28	REGULATORS INSTALLED ON THE INTERIOR OF THE BUILDING SHALL BE VENTED TO THE EXTERIOR PER LOCAL AND STATE CODES.
29	IT IS THE PLUMBING CONTRACTOR'S RESPONSIBILITY TO COORDINATE WITH THE SITE CONTRACTOR TO CONFIRM THAT THE INVERTS AND LOCATIONS OF THE BUILDING UTILITIES ARE COMPATABLE WITH THE SITE UTILITIES PRIOR TO BEGINNING WORK.
30	CONTRACTOR SHALL PROVIDE A PRESSURE REDUCING VALVE (PRV-1) SHOULD THE WATER PRESSURE EXCEED 75 PSI. CONTRACTOR SHALL CONFIRM WITH ON SITE CONDITIONS AND LOCAL UTILITY.
32	PROVIDE AUTOMATIC SHUT-OFF VALVE ON GAS LINE FEEDING KITCHEN EQUIPMENT BELOW TYPE-1 HOOD PRIOR TO ANY TAKE OFF. VALVE SHALL BE CONNECTED TO FIRE ALARM SYSTEM.
35	ANY LINE VOLTAGE WIRING THAT IS RUN BY THE PLUMBING CONTRACTOR SHALL BE INSTALLED IN ACCORDANCE WITH THE ELECTRICAL PLANS, NOTES, AND SPECIFICATIONS.
36	INSULATION JACKET SHALL BE PROVIDED WHEN PIPING INSULATION IS EXPOSED.
37	THE PLUMBING CONTRACTOR SHALL INSPECT EXISTING CONDITIONS PRIOR TO BEGINNING WORK. FIELD VERIFY SIZE AND LOCATION OF ALL EXISTING SERVICES TO BE TIED INTO.
38	CAMERA SURVEY ALL EXISTING SANITARY SEWER LOCATIONS AND INVERTS BELOW SLAB OR GRADE. NOTIFY GENERAL CONTRACTOR OF ANY POTENTIAL CONFLICTS WITH WORK PRIOR TO BEGINNING CONSTRUCTION.
39	THE EXISTING PIPING INDICATED ON THESE PLANS SHALL BE VERIFIED IN THE FIELD FOR EXACT LOCATIONS, QUANTITY, AND PIPE SIZES.

HP ENGINEERING

PROJECT NO. 221261R
100 % COMPLETE

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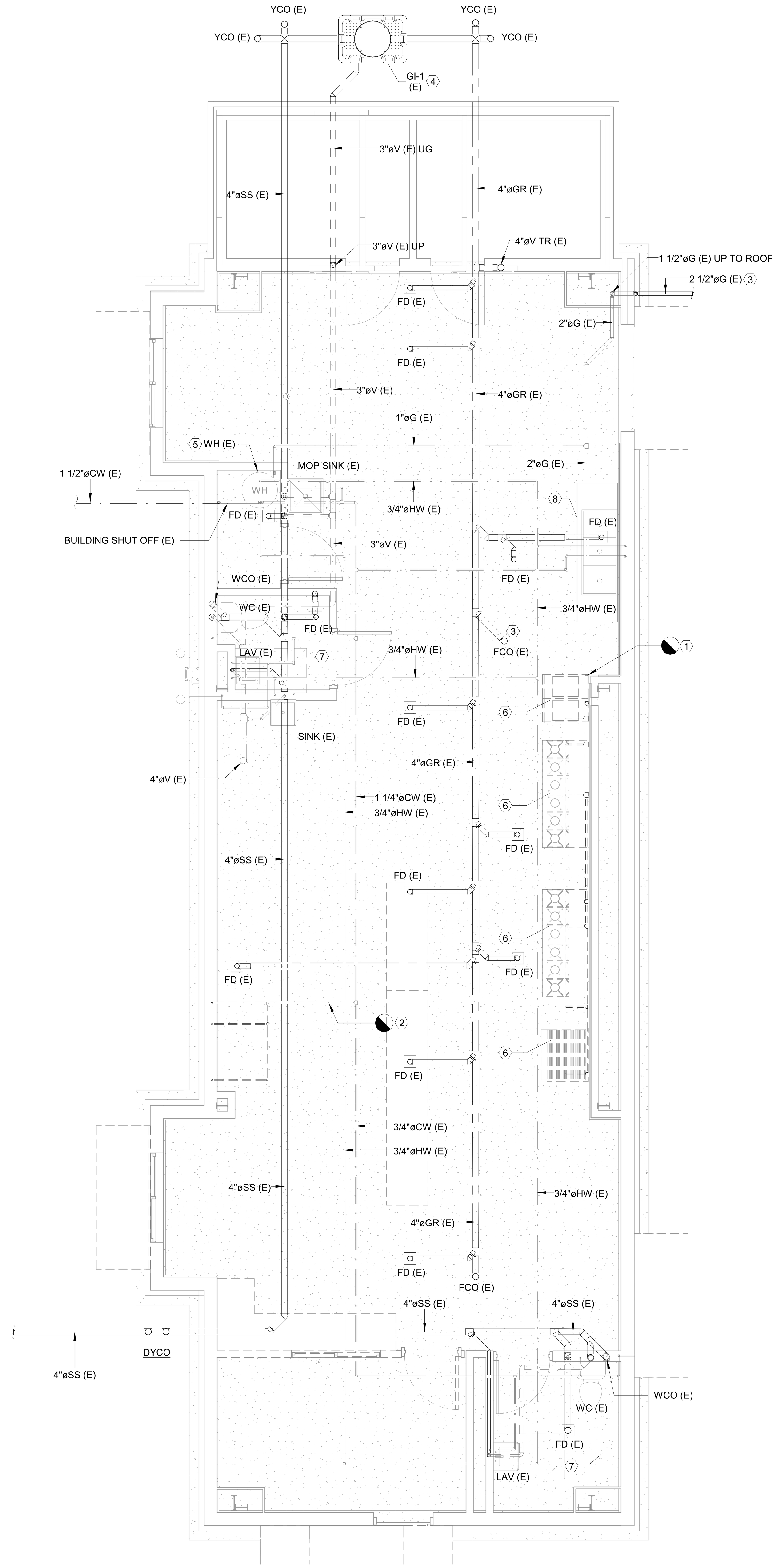
P1.0
PLUMBING LEGENDS, NOTES AND SCHEDULES



1 EXISTING PLUMBING PLAN

1/4" = 1'-0"

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SHEET NOTES:

1. DEMO EXISTING 2" NATURAL GAS LINE DOWNSTREAM OF EXISTING SOLENOID VALVE. CONTRACTOR TO FIELD VERIFY EXISTING PIPE LOCATION, SIZE AND WORKING CONDITION.
2. DEMO EXISTING 1/2" CW LINE BACK TO MAIN AND CAP.
3. EXISTING BUILDING GAS SHUT OFF AND REGULATOR. INLET PRESSURE @ 5 PSI, OUTLET PRESSURE @ 11 IN. WC. ESTIMATED EXISTING LOAD 1,939 MBH.
4. EXISTING GREASE INTERCEPTOR SCHIER GB-250 @ 100 GPM. CONTRACTOR VERIFY LOCATION AND EXISTING WORKING CONDITIONS.
5. EXISTING GAS WATER HEATER. A.O. SMITH BTH-199. CONTRACTOR TO VERIFY LOCATION AND WORKING CONDITIONS.
6. DEMO EXISTING EQUIPMENT AND ASSOCIATED PIPING AND CAP BEFORE SOLENOID VALVE.
7. EXISTING PLUMBING FIXTURES AND PIPING TO REMAIN. CONTRACTOR TO FIELD VERIFY EXISTING FIXTURES AND PLUMBING PIPING WORKING CONDITIONS.
8. EXISTING 3-COMP. SINK TO REMAIN. CONTRACTOR TO FIELD VERIFY EXISTING FIXTURES AND PLUMBING PIPING WORKING CONDITIONS.

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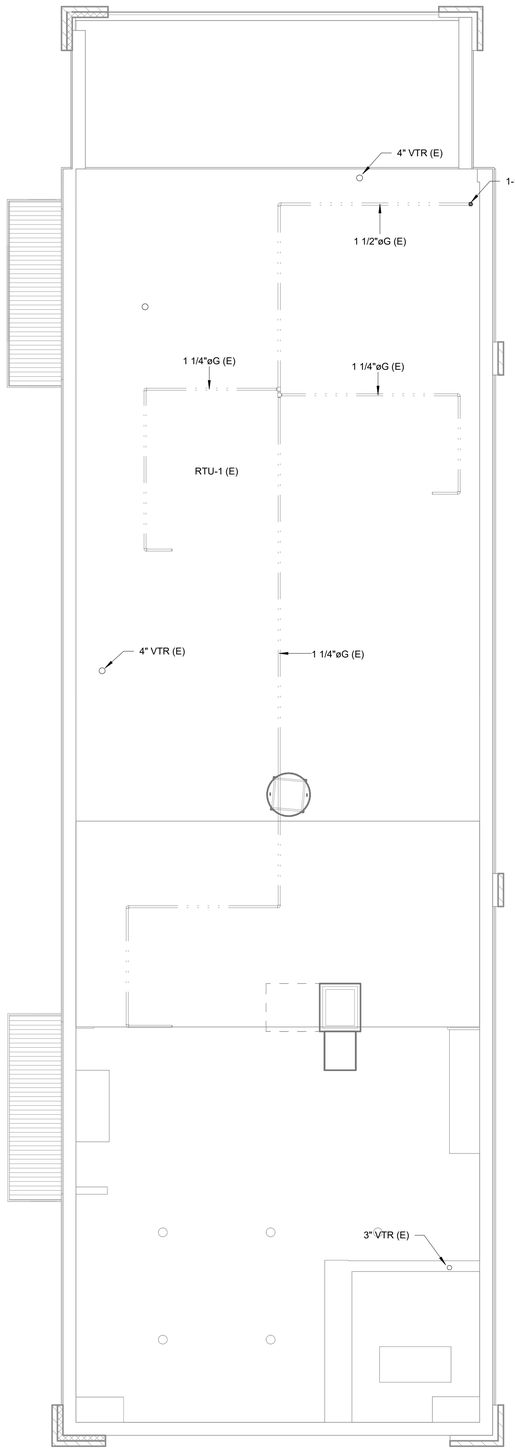
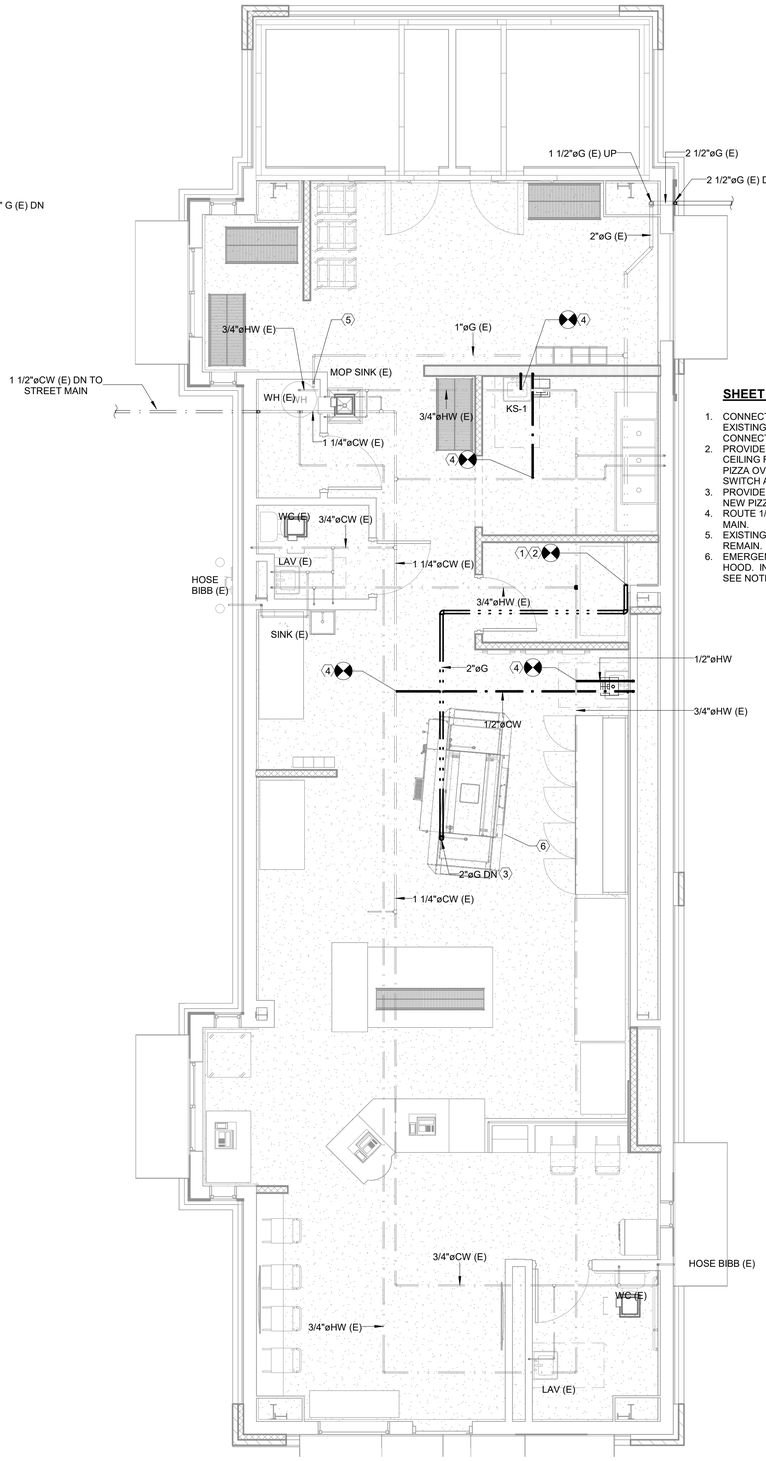
EXISTING PLUMBING PLAN



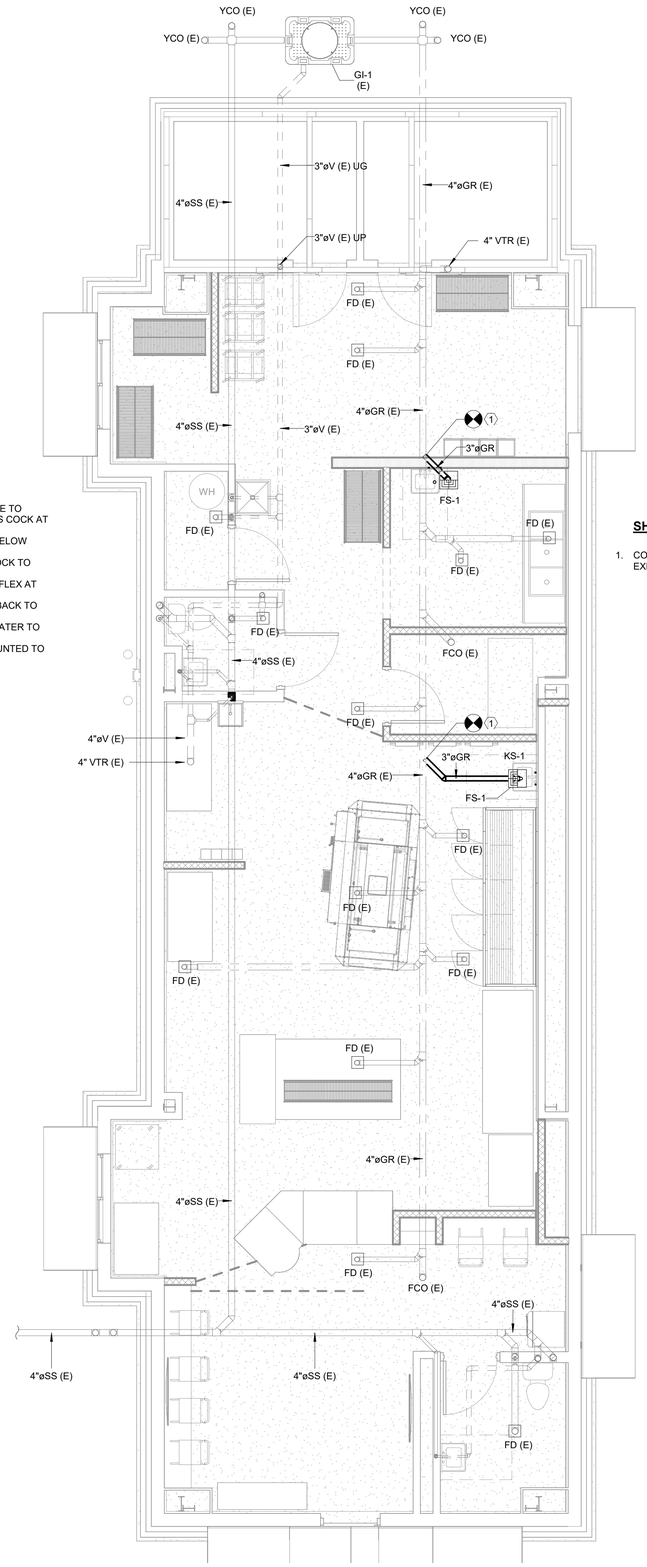
3 *PLUMBING ROOF PLAN*
1/4" = 1'-0"



2 *PLUMBING SUPPLY PLAN*
1/4" = 1'-0"

SHEET NOTES:

1. CONNECT NEW 2" NATURAL GAS PIPE TO EXISTING 2" GAS MAIN. PROVIDE GAS COCK AT CONNECTION TO MAIN.
2. PROVIDE 2" GAS SOLENOID VALVE BELOW CEILING FOR GAS PIPING SERVING PIZZA OVEN UNDER HOOD. INTERLOCK TO SWITCH AT HOOD. (NFPA 96).
3. PROVIDE GAS COCK, DIRT LEG AND FLEX AT NEW PIZZA OVENS.
4. ROUTE 1/2" COLD AND HOT WATER BACK TO MAIN.
5. EXISTING GAS PIPING TO WATER HEATER TO REMAIN.
6. EMERGENCY SHUTOFF SWITCH MOUNTED TO HOOD. INTERLOCK WITH SOLENOID. SEE NOTE 2.



SHEET NOTES:

1. CONNECT NEW 3" GREASE WASTE TO 4" EXISTING GREASE WASTE MAIN.

1 *PLUMBING DRAIN PLAN*
1/4" = 1'-0"

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P3.0
NEW PLUMBING PLAN

22A PLUMBING
rev – 20150529

22A 1 GENERAL INSTRUCTIONS

22A 1-1 GENERAL REQUIREMENTS

Requirements under Division 1 and the general and supplementary conditions of these specifications apply to this section and division. Where the requirements of this section and division exceed those of Division 1, this section and division take precedence. Become thoroughly familiar with all their contents as to requirements that affect this division, section or both. The work required under this section includes material, equipment, appliances, transportation, services, and labor required to complete the entire system as required by the drawings and specifications, or reasonably inferred to be necessary to facilitate each system's functioning as implied by the design and the equipment specified.

The specifications and drawings for the project are complementary, and portions of the work described in one, shall be provided as if described in both. In the event of discrepancies, notify the engineer and request clarification prior to proceeding with the work involved.

Drawings are graphic representations of the work upon which the contract is based. They show the materials and their relationship to one another, including sizes, shapes, locations, and connections. They also convey the scope of work, indicating the intended general arrangement of the equipment and other materials without showing all of the exact details as to elevations, offsets, control lines, and other installation requirements. Use the drawings as a guide when laying out the work and to verify that materials and equipment will fit into the designated spaces, and which, when installed per manufacturers' requirements, will ensure a complete, coordinated, satisfactory and properly operating system. Determine exact locations by job measurements, by checking the requirements of other trades, and by reviewing all contract documents. Correct errors that could have been avoided by proper checking and inspection, at no additional cost to the owner.

Specifications define the qualitative requirements for products, materials, and workmanship upon which the contract is based.

22A 1-2 DEFINITIONS

Whenever used in these specifications or drawings, the following terms shall have the indicated meanings:

Furnish: "to supply and deliver to the project site, ready for unloading, unpacking, assembling, installing, and similar operations."

Install: "to perform all operations at the project site, including, but not limited to, and as required: unloading, unpacking, assembling, erecting, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning, testing, commissioning, starting up and similar operations, complete, and ready for the intended use."

Provide: "to furnish and install complete, and ready for the intended use."

Furnished by owner (or owner-furnished) or furnished by others: "an item furnished by the owner or under other divisions or contracts, and installed under the requirements of this division, complete, and ready for the intended use, including all items and services incidental to the work necessary for proper installation and operation. Include the installation under the warranty required by this division.

Engineer: where referenced in this division, "engineer" is the engineer of record and the design professional for the work under this division, and is a consultant to, and an authorized representative of, the architect, as defined in the general and/or supplementary conditions. When used in this division, it means increased involvement by, and obligations to, the engineer, in addition to involvement by, and obligations to, the "architect".

AHJ: the local code and/or inspection agency (authority) having jurisdiction over the work.

NRTL: nationally recognized testing laboratory, as defined and listed by OSHA in 29 CFR 1910.7 (e.g., UL, ETL, CSA), and acceptable to the AHJ over this project.

The terms "equivalent", "equivalent", or "equal" are used synonymously and shall mean "accepted by or acceptable to the engineer as equivalent to the item or manufacturer specified". The term "approved" shall mean labeled, listed, certified, or all three, by an NRTL, and acceptable to the AHJ over this project.

22A 1-3 PRE-BID SITE VISIT

Prior to submitting bid, visit the site of the proposed work and become fully informed as to the conditions under which the work is to be done. Failure to do so will not be considered sufficient justification to request or obtain extra compensation over and above the contract price.

22A 1-4 MATERIAL AND WORKMANSHIP

Provide all material and equipment new and in first class condition. Provide markings or a nameplate for all material and equipment identifying the manufacturer and providing sufficient reference to establish quality, size and capacity. In general, provide the following quality grade(s) for all materials and equipment:

Commercial Specification Grade

Pipe, pipe fittings, pipe specialties and valves shall be manufactured in plants located in the United States.

Work performed under this contract shall provide a neat and "workmanlike" appearance when completed, to the satisfaction of the architect and engineer. Workmanship shall be the finest possible by experienced mechanics of the proper trade.

The complete installation shall function as designed and intended with respect to efficiency, capacity, noise level, etc. Abnormal or excessive noise from equipment, devices or other system components will not be acceptable.

Remove from the premises waste material present as a result of work. Clean equipment installed under this contract to present a neat and clean installation at the termination of the work.

Repair or replace public and private property damaged as a result of work performed under this contract to the satisfaction of authorities and regulations having jurisdiction.

22A 1-5 MANUFACTURERS

In other articles where lists of manufacturers are introduced, subject to compliance with requirements, provide products by one of the manufacturers specified.

Where a list is provided, manufacturers listed are not in accordance with any ranking or preference.

Where manufacturers are not listed, provide products subject to compliance with requirements from manufacturers that have been actively involved in manufacturing the specified product for no less than 5 years.

22A 1-6 COORDINATION

Coordinate all work with other divisions and trades so that the various components of the systems will be installed at the proper time, fit the available space, and will allow proper service access to those items requiring maintenance. Refer to all other division's drawings, and to relevant equipment submittals and shop drawings to determine the extent of clear spaces. Components which are installed without regard to the above shall be relocated at no additional cost to the owner.

Unless otherwise indicated, the general contractor will provide chases and openings in building construction required for installation of the systems specified herein. Contractor shall furnish the general contractor with information where chases and openings are required. Make all offsets required to clear equipment, beams and other structural members, and to facilitate concealing system components in the manner anticipated in the design. Keep informed as to the work of other trades engaged in the construction of the project, and execute work in a manner as to not interfere with or delay the work of other trades.

Figured dimensions shall be taken in preference to scale dimensions. Contractor shall take his own measurements at the building, as variations may occur. Contractor will be held responsible for errors that could have been avoided by proper checking and inspection

Provide materials with trim that will properly fit the types of ceiling, wall, or floor finishes actually installed. Model numbers listed in the construction documents are not necessarily intended to designate the required trim.

22A 1-7 ORDINANCES, CODES, AND STANDARDS

Work performed under this contract shall, at a minimum, be in conformance with applicable national, state and local codes having jurisdiction. Equipment furnished and associated installation work performed under this contract shall be in strict compliance with current applicable codes adopted by the local AHJ including any amendments and standards as set forth by the National Fire Protection Association (NFPA), Underwriters Laboratories (UL), Occupational Safety and Health Administration (OSHA), American Society of Mechanical Engineers (ASME), American Society of Heating, Refrigeration, and Air Conditioning Engineers (ASHRAE), American National Standards Institute (ANSI), American Society of Testing Materials (ASTM) and other national standards and codes where applicable. Additionally, comply with rules and regulations of public utilities and municipal departments affected by connection of services.
Where the contract documents exceed the requirements of the referenced codes, standards, etc., the contract documents shall take precedence.

Promptly bring all conflicts observed between codes, ordinances, rules, regulations, referenced standards, and these documents to the engineer's attention for final resolution. Contractor will be held responsible for any violation of the law.

Procure and pay for permits and licenses required for the accomplishment of the work herein described. Where required, obtain, pay for and furnish certificates of inspection to owner. Contractor will be held responsible for violations of the law.

22A 1-8 PROTECTION OF EQUIPMENT AND MATERIAL

Store and protect from damage equipment and materials delivered to job site, in accordance with manufacturers' recommendations. For materials and equipment susceptible to changing weather conditions, dampness, or temperature variations, store inside in conditioned spaces. For materials and equipment not susceptible to these conditions, cover with waterproof, tear-resistant, heavy tarp or polyethylene plastic as required to protect from plaster, dirt, paint, water, or physical damage. Equipment and material that has been damaged by construction activities will be rejected, and contractor shall furnish new equipment and material as required at no additional cost to the owner.

Keep premises broom clean from foreign material created during work performed under this contract. Piping, equipment, etc. shall have a neat and clean appearance at the termination of the work.

Plug or cap open ends of piping systems while stored and installed during construction when not in use to prevent the entrance of debris into the systems. Keep the manufacturer-provided protective coverings on floor drains, floor sinks and trench drains during construction. Remove coverings at the termination of the work and polish exposed surfaces

22A 1-9 SUBSTITUTIONS

Include in the base bid the products specifically named in these specifications or on the drawings. Submit, in the form of alternates, with bid, products of any other manufacturers for similar use, provided the differences in cost, if any, are included for each proposed alternate.

No substitutions will be considered with receipt of Bids, unless the Architect and Engineer have received from the Bidder a written request for approval to bid a substitution at least ten calendar days prior to the date for receipt of Bids, and have approved the substitution request. Include, with each such request, the name of the material or equipment for which substitution is being requested, and a complete description of the proposed substitution, including drawings, cut sheets, performance and test data, and all other information necessary for an evaluation. Include also a statement setting forth changes in other materials, equipment or other work that would be required to incorporate the substitution. The burden of proof of the merit of the proposed substitute is upon the proposer. The proposer of any substitutions shall compensate the Engineer at a rate of $150.00 per hour for time spent evaluating proposed substitutions and or the subsequent revisions to the design required to utilize the substitution.

The Architect's or Engineer's decision to approve or disapprove a substitution in a Bid is final.

If the proposed substitution is approved prior to receipt of Bids, such approval will be stated in an Addendum. Bidders shall not rely upon approvals made in any other manner, including verbal.

No substitutions will be considered after receipt of Bids and before award of the Contract.

No substitutions will be considered after the Contract is awarded unless specifically provided in the Contract Documents.

22A 1-10 SUBMITTALS

Assemble and submit to the architect, for engineer's review, manufacturers' product literature for material and equipment to be furnished, installed, or both, under this division, including shop drawings, manufacturers' product data and performance sheets, samples, and other submittals required by this division. Highlight, mark, list or indicate the materials, performance criteria and accessories that are being proposed. Provide the number of submittals required by division 1; however, at a minimum, submit two (2) sets. Before submitting, verify that all materials and equipment submitted are mutually compatible and suitable for the intended use, fit the available spaces, and allow ample and code-required room for access and maintenance. Submittals shall contain the following information. Submittals not so identified will be returned to the contractor without action:

The project name.
The applicable specification section and paragraph.
The submittal date.
The contractor's stamp, which shall certify that the stamped drawings have been checked by the contractor, comply with the drawings and specifications, and have been coordinated with other trades.

Submittals and shop drawings shall not contain HP Engineering's firm name or logo, nor shall it contain the HP Engineering's engineers' seal and signature. They shall not be copies of HP Engineering's work product.

Transmit submittals as early as required to support the project schedule. Allow for two weeks engineer review time, plus mailing time, plus a duplication of this time for re-submittals, if required. The engineer's submittal reviews will not relieve the contractor from responsibility for errors in dimensions, details, size of members, or quantities; or for omitting components or fittings; or for not coordinating items with actual building conditions.

Refer to division 1 for acceptance of electronic submittals for this project. For electronic submittals, contractor shall submit the documents in accordance with the procedures specified in division 1. Contractor shall notify the architect and engineer that the shop drawings have been posted. If electronic submittal procedures are not defined in division 1, contractor shall include the website, user name and password information needed to access the submittals. For submittals sent by e-mail, contractor shall copy the architect and engineer's designated representatives. Contractor shall allow the engineer review time as specified above in the construction schedule. Contractor shall submit only the documents required to purchase the materials and/or equipment in the electronic submittal and shall clearly indicate the materials, performance criteria and accessories being proposed. General product catalog data not specifically noted to be part of the specified product will be rejected and returned without review.

22A 1-11 ELECTRONIC DRAWINGS

In preparation of shop drawings or record drawings, contractor may, as an option, obtain electronic drawing files in Revit, AutoCAD, or DXF format from the engineer for a fee of $200 for the first sheet and $100 per sheet for each additional sheet. Contact the architect for written authorization; and, contact the engineer to obtain the necessary release agreement form and to indicate the desired shipping method and drawing format. In addition to payment, architect's written authorization and engineer's release agreement form must be received before electronic drawing files will be sent.

22A 1-12 OPERATION AND MAINTENANCE INSTRUCTIONS

Submit to the architect, for engineer's review, copies each of operations and maintenance instruction manuals, appropriately bound into manual form including approved copies of the following, revised if necessary to show system and equipment as actually installed. Paper clips, staples, rubber bands, and mailing envelopes are not considered approved binders. Provide the number of submittals required by Division 1; however, at a minimum, submit two (2) sets, and include, at a minimum, the following information:

Cover sheet that lists the project name, date, owner, architect, consulting engineer, general contractor, sub-contractor, and an index of contents.
Manufacturers' catalogs and product data sheets
Wiring diagrams
Operation and Maintenance instructions
Parts lists
Approved shop drawings
Test reports as defined for the systems and equipment provided or furnished or installed under this contract.
Names, addresses, telephone numbers, and e-mail addresses of local contacts for warranty services and spare parts.

Submit manuals prior to requesting the final punch list and before any requests for substantial completion. Final approval of this division's systems installed under this contract will be withheld until this equipment brochure is received and deemed complete by the architect and engineer.

Provide "as-built" drawings (see Division 1 and general conditions).

22A 1-13 TRAINING

At a time mutually agreed upon between the owner and contractor, provide the services of a factory trained and authorized representative to train owner's designated personnel on the operation and maintenance of the equipment provided for this project.

Provide training to include but not be limited to an overview of the system and/or equipment as it relates to the facility as a whole; operation and maintenance procedures and schedules related to startup and shutdown, troubleshooting, servicing, preventive maintenance and appropriate operator intervention; and review of data included in the operation and maintenance manuals.

Submit a certification letter to the architect stating that the owner's designated representative has been trained as specified herein. Letter shall include date, time, attendees and subject of training. The contractor and the owner's representative shall sign the certification letter indicating agreement that the training has been provided.

Schedule owner training with at least 7 days' advance notice.

22A 1-14 WARRANTIES

Warrant each system and each element thereof against all defects due to faulty workmanship, design or material for a period of 12 months from date of substantial completion, unless specific items are noted to carry a longer warranty in the construction documents or manufacturer's standard warranty exceeds this duration. Warranties shall include labor and material. Remedy all defects, occurring within the warranty period(s), as stated in the general conditions and Division 1 without any additional costs to the owner.

Perform any required remedial work promptly, upon written notice from the engineer or owner.

At the time of substantial completion, deliver to the owner all warranties, in writing and properly executed, including term limits for warranties extending beyond the required period, each warranty instrument being addressed to the owner and stating the commencement date and term.

22A 1-15 EXCAVATION AND BACKFILLING

Perform excavation and backfill required for installation of underground work under this contract. Trenches shall be of sufficient width. Crib or brace trenches to prevent cave-in or settlement. Do not excavate trenches close to columns and walls of building without prior consultation with the architect. Use pumping equipment if required to keep trenches free of water. Backfill trenches in maximum 6" layers of well-tamped dry earth in a manner to prevent future settlement.

Excavation as herein specified shall be classified as common excavation. Common excavation shall comprise the satisfactory removal and disposition of material of whatever substances and of every description encountered, including rock, if any, within the limits of the work as specified and shown on the drawings. Excavation shall be performed to the lines and grades indicated on the drawings. Excavated materials which are considered unsuitable for backfill, and surplus of excavated material which is not required for backfill, shall be disposed of by the contractor at his own expense and responsibility, and to the satisfaction of the architect.

22A 1-16 COINCIDENTAL DAMAGE

Repair all streets, sidewalks, drives, paving, walls, finishes, and other facilities damaged in the course of this work. Repair materials shall match existing construction. All backfilling and repairing shall meet all requirements of the owner, city and others having jurisdiction. Repair work shall be thoroughly first class. Conform to all requirements of Division 2 of these specifications.

22A 1-17 CUTTING AND PATCHING

Following the requirements in Division 1, cut walls, floors, ceilings, and other portions of the facility as required to perform work under this division. Obtain permission of the architect, owner, or both, before doing any cutting. Cut all holes as small as possible. Patch walls, floors, and other portions of the facility as required by work under this division. All patching shall be thoroughly first class and shall match the original material and construction, including fire ratings if applicable in a manner satisfactory to the architect.

22A 1-18 ROUGH-IN

Coordinate without delay all roughing-in with other divisions. Conceal all piping and rough-in except in unfinished areas and where otherwise indicated in the construction documents.

22A 1-19 CONCRETE BASES

Provide concrete bases for equipment where indicated on the drawings. Concrete bases shall have chamfered edges. Size of pad shall be a minimum of 4" greater than the footprint of the equipment that it is supporting.

Construct equipment bases and housekeeping pads of a minimum 28 day, 4000 psi concrete conforming to American Concrete Institute standard building code for reinforced concrete (ACI 318-99) and the latest applicable recommendations of the ACI standard practice manual. Concrete shall be composed of cement conforming to ASTM C 150 Type I, aggregate conforming to ASTM C33, and potable water. Exposed exterior concrete shall contain 5 to 7 percent air entrainment.

Unless otherwise specified or shown on the structural drawings, reinforce equipment bases and housekeeping pads with No. 4 reinforcing bars conforming to ASTM A 615 or 6x6 – W2.9 x W2.9 welded wire mesh conforming to ASTM A185. Place reinforcing bars 24" on center with a minimum of two bars each direction.

Provide galvanized anchor bolts for equipment placed on concrete equipment bases and housekeeping pads or on concrete slabs. Anchor bolts size, number and placement shall be as recommended by the manufacturer of the equipment.

Concrete equipment bases shall have minimum heights in accordance with the following: for water heaters, water softeners and other equipment not listed, minimum height is 4". For water heaters over 200 gallons capacity and domestic water booster pumps, minimum height is 6". Height of equipment bases applies to equipment installed on slab-on-grade. For equipment installed on floors above grade and on the roof, refer to the drawings.

22A 1-20 STRUCTURAL STEEL

Structural steel used for pipe supports, equipment supports, etc., shall be new and clean, and shall conform to ASTM designation A-36.

Support plumbing equipment and piping from the building structure. Do not support plumbing equipment and piping from ceilings, other mechanical or electrical components, and other non-structural elements.

22A 1-21 ACCESS DOORS

Provide access doors in ceilings and walls where indicated or required for access to concealed valves and equipment installed under this section. Provide concealed hinges, screwdriver-type lock, anchor straps; manufactured by Milcor, Zurn, Titus, or equal. Obtain architect's approval of type, size, location, and color before ordering.

22A 1-22 PENETRATIONS

Provide sleeves for pipes passing through above grade concrete or masonry walls, concrete floor or roof slabs. Sleeves are not required for core drilled holes in existing masonry walls, concrete floors or roofs. Provide 10 gauge galvanized steel sleeves for sleeves 6" and smaller. Provide galvanized sheet metal sleeves for larger than 6". Schedule 40 PVC sleeves are acceptable for installation in areas without return air plenums.

Seal elevated floor, exterior wall and roof penetrations watertight and weathertight with non-shrink, non-hardening commercial sealant. Pack with mineral wool and seal both ends with minimum of ½" of sealant.

Seal around penetrations of fire rated assemblies. Coordinate fire ratings and locations with the architectural drawings. Refer to architectural specifications for fire stoppings. Provide a product schedule for UL listing, location, wall or floor rating and installation drawing for each penetration fire stop system.

Extend pipe insulation for insulated pipe through floor, wall and roof penetrations, including fire rated walls and floors. The vapor barrier shall be maintained. Size sleeve for a minimum of 1" annular clear space between inside of sleeve and outside of insulation.

Seal concrete or masonry exterior wall penetrations below grade with "wall pipes" and mechanical sleeve seals. Provide cast iron "wall pipes" with integral waterstop ring manufactured by Josam, Jay R. Smith, Wade, Watts or Zurn. Provide modular mechanical sleeve seals, manufactured by Thunderline / Link Seal, Calpico, Inc., and Metraflex.

Seal elevated concrete slab with water proof membrane penetrations with "wall pipes" and water proof sealant. Secure waterproof membrane flashing between "wall pipe" clamping flange and clamping ring. Provide cast iron "wall pipes" with integral waterstop ring manufactured by Josam, Jay R. Smith, Wade, Watts or Zurn.

Provide sleeves for horizontal pipe passing through or under foundation. Sleeves shall be cast iron soil pipe two nominal pipe sizes larger than the pipe served.

Provide Schedule 40 PVC pipe sleeves for vertical pressure pipe passing through concrete slab on grade. Sleeves shall be one nominal pipe size larger than the pipe served and two pipe sizes larger than pipe served for ductile iron pipes with restraining rods. Seal water-tight with silicone caulk.

Provide 1/2" thick cellular foam insulation around perimeter of non-pressure pipe passing thru concrete slab on grade. Insulation shall extend to 2" above and below the concrete slab.

22A 1-24 ELECTRICAL WIRING

Line Voltage control and interlock wiring shall be provided by the Division 26 contractor. Low Voltage control wiring shall be provided by the Division 23 contractor. Required conduit and rough-ins for low Voltage control wiring shall be provided by the Division 26 contractor. Furnish wiring diagrams to the Division 26 contractor as required for proper equipment hookup. Coordinate with the Division 26 contractor the actual wire sizing amps for the equipment (from the equipment nameplate) to ensure proper installation.

22A 1-25 EQUIPMENT FURNISHED BY OTHERS

Furnish and install roughed-in wastes, vents and water services. Provide final connection to kitchen equipment, furnished by others, in locations as indicated on the drawings. Provide accessory items that are required but not furnished with the equipment, including traps, stop valves, PRV's, indirect drain from equipment to floor drains, and accessory items indicated or required for the proper operation of the complete system at the termination of the work.

Contractor shall be responsible for correct rough-in dimensions, and shall verify same with architect and/or equipment supplier prior to service installations.

22A 1-26 ALTERNATES

Refer to the architectural portion of the specification for list of alternates. Applicable sections of the base specifications shall apply to all work required by the alternate unless otherwise specified. Determine whether or not and how each alternate affects work. Include labor, materials, equipment and transportation services necessary for and incidental to the completion of work under each particular alternate. Furnish separate bid for each alternate applicable to work, stating the amount to be added or deducted from the base bid.

22A 1-27 EXTERIOR UTILITY CONNECTIONS
Terminate domestic water, storm, and sewer lines at a point approximately five feet from the building wall, or as shown on the drawings. Make connection to the various services provided by others and coordinate connection requirements with civil engineer. Verify that installation will tie into the various services provided by others at the indicated invert elevation point prior to installation. If the installation will not tie into the indicated invert elevation point while maintaining proper fall, notify architect and civil engineer so that an alternative may be determined.

Provide service piping and accessories required to complete utility connections that are not furnished by the serving utility.

Coordinate with the local gas service company to provide a new gas service, including gas meter, shut-off valves, and regulator as indicated on the drawings. Installation shall be in complete conformance with the requirements of the local gas service company.

22A 1-29 BUILDING OPERATION

Comply with the schedule of operations as outlined in the architectural portions of this specification. Building shall be in continuous operation. Accomplish work that requires interruption of building operation at a time when the building is not in operation, and only with written approval of building owner and/or tenant. Coordinate interruption of building operation with the owner and/or tenant a minimum of 7 days in advance of work.

22A 1-30 SYSTEM TESTING AND ADJUSTING

Upon completion of each phase of the installation, test each system in conformance with local code requirements and as noted below. Furnish labor and equipment required to test plumbing work installed under this contract, and assume costs involved in making the tests, and repairing and/or replacing damage resulting therefrom.

Notify the architect and the authority having jurisdiction, three (3) working days prior to making plumbing system tests. Leave concealed work uncovered until the required tests have been completed, but if necessary due to construction procedure, tests on portions of the work may be made, and when satisfactory, the work may be concealed. Test piping before insulation is installed, and before backfill. Pipes, joints, flanges, valve stems, etc., shall be leak tight. Repair or replace system defects with new materials. Caulking of defective joints, cracks or holes will not be permitted. Repeat tests after defects have been eliminated. Make tests in the presence of the administrative authority and/or the owner's authorized representative.

Upon completion of the systems installation, and prior to acceptance by the architect and engineer, make general operating tests to demonstrate that equipment and systems are in proper working order, and are functioning in conformance with the intent of the drawings and specifications. As a part of these tests, open every water outlet to ensure complete system flushing, remove and clean faucet aerators, clean strainers, light pilot lights, and operate every piece of equipment furnished under this contract to demonstrate proper functioning.

Test the drainage and vent system by plugging openings with test plugs, except those at the top of the stacks. Fill the system with water; test results will be satisfactory if the water level remains stationary for not less than one (1) hour. Subject the drainage and vent system to a pressure of at least ten (10) feet of water. If leaks develop, repair them and repeat the test.

Test the domestic water system by filling it with water and then isolating the system from its source. Keep the system closed for a period of twenty-four hours, with no fixture being used. The pressure differential for this test period shall not exceed 10 psig. Test water piping to a 125 psi hydrostatic pressure.

For low pressure natural gas systems, subject the pipe to 10 psig air pressure for a period of one hour. The resultant pressure differential for this period shall be 0 psig. Test per gas company requirements where required.

22A 2 PLUMBING PIPING

22A 2-1 PIPING MATERIALS

Materials specified or noted on the drawings are subject to the approval of local code authorities. Verify approval before installing any material or joining method.

Domestic Water (cold, hot and hot water recirculation): Domestic water piping installed above the floor slab inside the building shall be type "L" hard temper copper tube with wrought copper fittings and soldered connections made up with 95/5 solder. Brazed mechanically formed tee connections (T-drill) may be used in copper lines where approved by code; connection shall be made with brazed silver solder (Silfos) joints in conformance with manufacturer's instructions.

Underground domestic water piping 2" and smaller shall be type "K" soft temper copper tubing with flared copper alloy fittings and connections, or type "K" hard temper copper tubing with conventional wrought copper fittings and silver solder (Silfos) joints. Install as few underground copper piping joints as possible. At building service entrance, no joints shall be installed under or within 5 feet of the building. Install domestic water piping below grade outside building at adequate depth to prevent freezing.

Underground domestic water piping 3" and larger shall be Class 52 ductile iron meeting the requirements of ANSI / AWWA Standard C151/A21.51. Piping shall be double cement lined in accordance with ANSI / AWWA Standard C104/A21.4. Fittings shall have mechanical joints. At contractor's option, pipe joints in straight runs (not at fittings) and not installed under or within 5 feet of the building slab may be push-on joints. Joints shall conform to the requirements of ANSI 21.11.

Interior Waste and Vent Below Slab: Waste and vent pipe below slab inside building shall be service weight cast iron soil pipe with hub and spigot fittings with neoprene gasket joints, meeting ASTM A74, manufactured by AB & I Foundry, Charlotte or Tyler Pipe and bearing the trademark of the CISPI and NSF. Hubless waste and vent pipe is not permitted below base slab. PVC Schedule 40 DWV ASTM D2665 pipe with PVC meeting ASTM B1784, "solid wall" cell Class 12454-B with ASTM 2665 socket fittings with solvent weld joints is also permitted where approved by code.

Interior Waste and Vent Above Slab: Waste and vent pipe above slab inside building shall be hubless cast iron soil pipe and fittings, meeting ASTM A888 and CISPI 301, manufactured by AB & I Foundry, Charlotte or Tyler Pipe and bearing the trademark of the CISPI and NSF. PVC Schedule 40 DWV ASTM D2665 pipe with PVC meeting ASTM B1784, "solid wall" cell class 12454-B with ASTM 2665 socket fittings with solvent weld joints is also permitted where approved by code,

Natural Gas: Gas piping above ground shall be Schedule 40 black steel with malleable iron screwed fittings, or standard welded fittings.

Connections To Plumbing Fixtures And Equipment: 1-1/4" and larger waste connections from fixture traps to cast iron pipe shall be "DWV" copper with wrought copper drainage pattern fittings with copper sweat or compression joints at fixture trap connections and threaded joints at connections to cast iron pipe.

Indirect and Condensate Drain Inside Building: Indirect and condensate drain pipe installed inside the building shall be Type "M" hard copper with wrought copper fittings for 1" and smaller and "DWV" copper with wrought copper drainage pattern fittings for 1-1/4" and larger Install cleanouts at elbows greater than 45 degrees.

Indirect and Condensate Drain Outside Building: Indirect and condensate drain pipe installed outside the building above ground shall be Type "M" for 1" and smaller and "DWV" for 1-1/4" and larger Terminate at nearest roof drain, gutter or other location as shown drawings. Install cleanouts at elbows greater than 45 degrees.

HP ENGINEERING

PROJECT NO. 221261R

100 % COMPLETE

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REVISION

P5.0
PLUMBING SPECIFICATIONS

22A 2-2 PIPING AND EQUIPMENT INSULATION

Domestic cold water, hot water, indirect and condensate drain pipe (within building)

Refer to pipe insulation schedule on drawings for insulation details. Provide with self-sealing lap to provide a continuous vapor barrier by Certainteed, Owens-Corning or Armstrong. For hot piping, provide pipe hangers and riser clamps sized for the outside diameter of piping. Butt insulation to hanger or riser clamp for vertical pipe. Seal exposed insulation with insulation sealer. Exception for vertical piping: provide clamps sized for the outside diameter of the vertical pipe and extend clamp through insulation. Seal penetrations of insulation and vapor barrier with wet coat of vapor barrier lap cement. For cold piping at hangers provide 8" long sections of high density, high temperature calcium silicate by Johns-Manville, fiberglass by Knauf, or 8" long styrofoam billets by Dow or flexible unicellular piping insulation meeting ASTM C 534-01, Type I with integral high density pipe supports and encased in steel insulation shield by Cooper B-Line / Armacell or equivalent. Insulation shall be continuous along the pipe surface, except at valves, unions, and where piping is exposed at fixtures. Provide insulation on vent piping within six feet of vent through the roof. Provide insulation on domestic cold and hot water pipes installed in walls and chases.

Provide insulation protection shield at each hanger for insulated piping.

Cover fittings with Zeston, Knauf, or equal one-piece PVC pre-molded insulating covers. Fitting covers, jackets and adhesives shall not exceed flame spread rating of 25 and smoke development rating of 50 per ASTM E84. At all elbows and tees, fill voids between covers and piping with fiberglass insulation and tape joints. Install pipe insulation in compliance with manufacturer's recommendations. Where pre-molded insulating fittings are not approved by local authorities, miter insulation at fittings.

Provide 2" fiberglass thick insulation for water, sanitary, waste or grease waste piping in unheated spaces where indicated on the drawings.

22A 2-3 PIPING JOINTS

Copper Tubing: Joints in hard temper tubing shall be soldered joints using lead-free 95/5 solder except where tubing is installed below grade or below the base slab, in which case joints shall be soldered with silver solder (Silfos). Joints in soft temper copper tubing shall be of the flared type installed in compliance with the fitting manufacturer's recommendations.

Threaded Steel Pipe: Threaded joints shall be full and clean, cut with not more than three (3) threads exposed beyond the fittings. Make joints tight with graphite base pipe joint compound and paint exposed threads of ferrous pipe with acid-resisting paint after piping has been tested and proven tight. No caulking, lamp-wick or other material will be permitted for correction of defective joints.

Welded Steel Pipe: Welded joints shall be of the butt welded single "vee" type. Bevel pipe at a 45 degree angle to within 1/16" of the inside wall, and build up the weld to one fourth greater depth than the pipe wall thickness. Welding shall be either electric or oxy-acetylene, performed in conformance with the ASME code for pressure pipe welding, and only by experienced certified welders.

Cast Iron Pipe Below Grade: Joints in bell and spigot cast iron waste and vent pipe shall be neoprene compression gaskets, Tyseal or equal.

Cast Iron Pipe Above Grade: Joints in hubless pipe shall be standard CISPI 310 domestically manufactured by Anaco, AB & I Foundry, Charlotte, Husky, Ideal, Tyler, Mission or Fernco.

PVC Pipe: Clean joints free from debris and moisture. Apply PVC primer meeting ASTM F656 to each joint. Apply solvent cement meeting ASTM D2564 and make joint while wet and in accordance with ASTM D2855.

Pipe Adapters: Make connection of new waste pipe to new or existing dissimilar waste pipe using adapter couplings. Provide Fernco, Proflex 3000 series or Mission Flexseal MR56 series with neoprene adapter gasket with stainless steel shield and hose clamps for connecting dissimilar pipes above grade. Provide Fernco, 1056 series or Mission sewer couplings with neoprene adapter gasket and hose clamps for connecting dissimilar pipes below grade and coat stainless steel bands with mastic

22A 2-4 PIPING INSTALLATION

General: Clean pipe thoroughly prior to installation. Ream ends of pipe to remove burrs. Cut pipe accurately to measurements taken on the job. Install with adequate clearance for installation of coverings where required. Pipe shall not be sprung or bent. Neatly align pipe, connect it securely, and support it from the building structure with hangers as specified below. Provide chrome-plated escutcheons on pipes passing through ceilings, floors or walls of finished spaces. Run pipes freely through floor and wall penetrations using pipe sleeves. Do not grout in place unless required for structural fire integrity. Install pipe concealed in finished spaces wherever possible. Use a dielectric union where ferrous and copper pipe connect. Dielectric union shall have a zinc-plated steel body, a threaded nylon insert, and insulating pressure gasket. No ferrous metal-to-copper connection made without insulating unions will be allowed.

Hanger & Supports: Pipe hangers shall be as described in the specifications by B-Line or equal by Anvil, Michigan, Truscon, or Unistrut. Connect hangers to the structure with side beam connectors and all thread hanger rods. Provide engineered support struts between joists and other structural members as required to provide a rigid hanging installation. Do not hang pipes from other pipes, conduit or ductwork. Provide hanger rods and space hangers at intervals as specified in "hanger spacing". Provide support within 1' of each elbow and tee. Provide supports within 1' of each equipment connection. Provide two nuts on threaded supports to securely fasten the support. Install hanger types or supports for various piping as follows:

Copper Tube: Adjustable band hangers for bare copper tube 3" and smaller shall be B-Line #B3170 CT copper plated adjustable band swivel ring type. Adjustable band hangers for insulated copper tube and 3" smaller shall be B-Line #B3170 NF adjustable band swivel ring type. Clevis hangers for insulated copper tube 4" and larger shall be B-Line #B3100 galvanized steel clevis type. Support exposed copper tube 2" and smaller to walls or in chases with B-Line #B3198 RCT copper coated extension split ring pipe clamps, 3/8" threaded rod and B-Line #B3199 CT ceiling flanges. Support copper tube in chases and walls at plumbing fixtures with plastic or copper brackets secured to structure and u-bolts sized to bare on the pipe. Riser clamps to support vertical copper tube shall be B-Line #B3373 CT copper coated steel, cut insulation, seal vapor barrier, and attach to bare tube.

Steel Pipe: Adjustable band hangers for 2" and smaller shall be B-Line #B3170 NF adjustable band swivel ring type. Clevis hangers for 2-1/2" and larger shall be B-Line #B3100 galvanized steel clevis type. Riser clamps to support vertical pipe shall be B-Line #B3373 galvanized steel.

Cast Iron Pipe: Adjustable band hangers for 2" and smaller shall be B-Line #B3170 NF adjustable band swivel ring type. Clevis hangers for 3" and larger shall be B-Line #B3100 galvanized steel clevis type. Riser clamps to support vertical pipe shall be B-Line #B3373 galvanized steel.

PVC Pipe: Adjustable band hangers for 3" and smaller shall be B-Line #B3170 NF adjustable band swivel ring type. Clevis hangers for 4" and larger shall be B-Line #B3100 galvanized steel clevis type. Riser clamps to support vertical pipe shall be B-Line #B3373 galvanized steel.

Insulation Protection Shields: B-Line #B3151 of 18 gauge galvanized sheet metal. Shield shall cover half of the circumference of the pipe and shall be of length indicated by manufacturer for pipe size and thickness of insulation.

Hanger Spacing, Rod Sizes & Connectors: Connect rods to steel beams or joists with B-Line #B3031 or #B3033 beam clamps as required. Connect rods to concrete with B-Line #B3014 malleable iron single type inserts with malleable iron nut. Connect rods in wood construction with B-Line #B3058 side beam connectors. Hang and support piping with spacing and rod sizes as follows:

Copper Tube; 1-1/2" and smaller - every 6' with 3/8"hanger rods; 2" every 10' with 3/8"hanger rods; 2-1/2" every 10' with 3/8" hanger rods; 3" every 10' with ½" rods; 4" every 10' with 5/8" hanger rods. Support vertical copper tube every 10'.

Steel Pipe: 1" and smaller - every 8' with 3/8" hanger rods; 1-1/4" to 2" every 10' with 3/8" hanger rods; 2-1/2" and 3" every 10' with ½" hanger rods; 4" every 10' with 5/8" hanger rods. Support vertical steel pipe every 10'.

Cast Iron Pipe: Every 10' and within 1' of each joint. 2" and smaller with 3/8" hanger rods; 3" with 1/2" hanger rods; 4" with 5/8" hanger rods; 6" with 3/4" hanger rods; 8" and larger with 7/8" hanger rods. Support vertical cast iron pipe every 15'.

PVC Pipe: Support all pipes sizes every 4'. 1-1/2" and smaller with 3/8" hanger rods; 2" with 1/2"hanger rods; 2-1/2" and 3" with 1/2" hanger rods; 4" and larger with 5/8" hanger rods. Support vertical PVC pipe every 4'.

Supports on roof: Support piping on roof with 4" x 4" x 12" long CCA rot-proof wood blocks. Set wood blocks on 18" x 18" x 3/16" thick roof walkway material. Connect pipe to wood blocks with galvanized steel pipe clamp and 1/4" x 1-1/2" long cadmium plated lag screws. Stack blocks and nail them together as required and support pipe as required to change pipe elevation. Support pipe with spacing as described above at a minimum 7" above the roof. Set blocks on 18" x 18" x 3/16" thick roof walkway material compatible with actual roof material.

Supports On Floor: Support piping from the floor where required for ferrous pipe or insulated copper tube, shall be B-Line #B3093 galvanized steel with pipe saddle, threaded shank for height adjustment and floor stand secured to the floor.

Below Ground Installation For Soil, Waste And Storm: Install soil and waste piping to a uniform slope of not less than 1/8" per foot for piping 3" or larger, and not less than 1/4" per foot for piping 2-1/2" or smaller.

Above Ground Installation For Soil, Waste And Storm: Install piping to a uniform slope of not less than 1/8" per foot for piping 3" or larger, and not less than 1/4" per foot for piping 2-1/2" or smaller. Lay pipe at uniform slope free from sags. Support pipe within 12" of each joint. Make changes in direction from horizontal to vertical, at fixture branches and other branch connections with sanitary "tees" or short sweep "ells". Make changes in direction from vertical to horizontal or horizontal to horizontal with long radius fittings, long sweeping "ells", combination "y and 1/8 bend" fittings, or 45 degree "ells" (1/8 bend fittings), 1/6 bend or 1/16 bend and "y" fittings. Provide a smooth and uniform invert in the system. Drilling or tapping of soil and waste lines, and saddle hubs and bands are not permitted. Locate and install soil and waste lines as indicated on the drawings. Determine exact locations in such a manner as to maintain proper clearance.

PLUMBING VENT: Connect plumbing vent pipes to fixture drain pipes as indicated on the drawings or as required by the installation practices adopted and enforced by local codes official, and extend vent pipes full size through the roof line. Grade pipe to a uniform slope so as to drain back by gravity to the drainage piping system. Vents passing through the roof shall be minimum 3" size except in tropical climates, per local codes. Turn flashing down into stacks at least 2", and extend flashing 24" in all directions from the pipe at the roof line. Apply white lead pipe dope on male steel pipe threads. Vent lines shall be air and water tight. Vent floor drains individually or connect them to a horizontally vented line as shown on the drawings.

DOMESTIC WATER: Arrange cold, hot, and hot water recirculation piping to drain at the lowest point in each system. Install at least one pipe union adjacent to all shutoff valves, at connection points of each piece of equipment, and elsewhere in the system where required to allow proper maintenance. Provide unions of the ground joint type. Make allowance for expansion and contraction where required by the installation. Where water piping occurs in exterior walls, hold pipe as close as possible to the interior face of wall and install insulation batt or other insulation (minimum R-8) between piping and the exterior wall face.

NATURAL GAS: Pitch natural gas piping, and provide accessible dirt legs at the low points. Take branch pipes off the top or sides of main pipes, to prevent accumulation of water in the branches. Install gas piping valves and unions only in accessible locations. Do not install gas pipe below the base slab.

22A 2-5 PIPING SANITIZATION

Sanitize the entire domestic water piping system (cold, hot, and hot water return) with a solution containing not less than 50 ppm available chlorine. Keep solution in the system for a minimum of 24 hours, with each valve being operated several times during the period. After completion, flush system with city water until chlorine residual is lowered to incoming city water level.

22A 2-6 PIPE AND VALVE MARKERS

Provide manufacturer's standard pre-printed, semi-rigid snap-on or permanent adhesive, pressure-sensitive vinyl pipe markers. Pipe markers shall be color-coded complying with ANSI A13.1.

Install pipe markers on each plumbing piping system and include arrows to show normal direction of flow.

Locate pipe markers and color bands wherever piping is exposed to view in occupied spaces, machine rooms, accessible maintenance spaces (shafts, tunnels, plenums) and exterior non-concealed locations.

Provide plastic laminate or brass valve tag on every valve, cock and control device in each plumbing piping system; exclude check valves, valves within factory-fabricated equipment units, plumbing fixture faucets, convenience and lawn-watering hose bibbs, and shut-off valves at plumbing fixtures and similar rough-in connections of end-use fixtures and units.

22A 2-9 AIR ADMITTANCE VALVES

Provide air admittance valves where indicated on drawings. Air admittance valves shall meet ASSE 1050 or 1051 where applicable by Studor or equal, by Oatey, Proset, or Rectorseal. Install per code and manufacturer requirements.

22A 3 PLUMBING SPECIALTIES

22A 3-1 WATER HAMMER ARRESTORS, AND TRAPSProvide water hammer arrestors at valves or batteries of fixtures as indicated on the drawings to prevent water hammer. Arrestors shall be Josam, Jay R. Smith, Precision Plumbing Products, Proflo, Sioux Chief, Wade, Watts, or Zurn, stainless steel bellows type, or o-ring sealed and lubricated acetal piston. Install water hammer arrestors per the Plumbing and Drainage Institute PDI WH-201 installation instructions. Installation of arrestors at batteries of fixtures precludes the requirement for individual air chambers at each battery fixture. Air chambers are not acceptable as a substitute for water hammer arrestors.

Provide water-seal traps on floor drains, fixtures and equipment with drain connections, including traps not furnished in combination with fixtures and equipment. Place trap as close to the fixture or drain as possible. Exposed traps in finished spaces shall be chrome-plated brass.

Provide conventional "p" type trap, water-sealed self-cleaning design. Full "s" traps or trap standards shall be used only where specifically called for on the drawings or elsewhere in this specification. Trap water seals shall not be less than 2", and deep seal traps shall be provided where specified or indicated. Each trap not integral with the fixture or floor drain or installed below the base slab shall be provided with an accessible cleanout of adequate size. Provide trap primers where required by code and where indicated on the drawings.

22A 3-2 CLEANOUTS, FLOOR DRAINS AND ROOF DRAINS

Cleanouts, floor drains and roof drains shall be by one manufacturer if possible. Acceptable manufacturers are Josam, Jay R. Smith, Wade, Watts, Mifab, and Zurn.

Provide long sweep fittings for cleanout extensions; short sweeps at start of runs or change in direction and combination wye and eighth bend fittings in horizontal runs. Install cleanouts with a minimum of 18" clear all around, consult local codes for other requirements, for easy system maintenance. Install plug with teflon joint compound.

FLOOR DRAINS: Shall be as scheduled on the drawings, manufactured by Zurn or equivalent by ABT, Inc., Polydrain, Quazite, Mifab, Jay R. Smith – ACO or NDS.

TRENCH DRAINS: Shall be as scheduled on the drawings, manufactured by Zurn or equivalent by ABT, Inc., Polydrain, Quazite, Mifab, Jay R. Smith – ACO or NDS.

FLOOR CLEANOUTS: Shall be as scheduled on the drawings. Install cleanouts at points as noted on the drawings, at the building exit; at a minimum of every 50 feet in horizontal soil and waste lines; and at turns of pipe greater than 45 degrees cleanouts shall be full size of the pipe up to 4", and 4" size for pipes larger than 4". Determine the type of floor covering to be used at each floor cleanout location and provide top with variations suitable for floor covering (carpet markers, recessed for tile and scoriated for unfinished floor). Rough-in and install each floor cleanout flush with the finished floor construction.

EXTERIOR CLEANOUTS: Shall be as scheduled on the drawings. Install cleanouts at points as noted on the drawings, at the building exit; at a minimum of every 100 feet in horizontal soil, waste and storm service lines. Embed each exterior cleanout in a block of concrete, flush with finished grade. Coordinate size of block with construction documents.

WALL CLEANOUTS: Shall be as scheduled on the drawings. Install wall cleanouts at points as noted on the drawings; at the foot of each soil, waste or interior downspout stack; at horizontal soil and waste branches longer than five feet not served by a floor cleanout; consult local codes for installation at specific fixture types. Install wall cleanouts above the flood rim of the fixture served within four feet of the floor and install extensions from the cleanout tee to the wall to locate the plug within 2" of the wall where required. Install cleanouts on urinals and sinks where required by code.

ROOF DRAINS: Shall be as scheduled on the drawings. Provide with roof sump receiver, extension, secondary flashing clamps and underdeck clamp as required, provide expansion joints where required. Provide overflow roof drains where indicated on the drawings with inlet flow line 2" above the primary roof drain inlet.

BACKWATER VALVES – removable flapper type: Shall be as scheduled on the drawings by Cleancheck or equal, by Mainline Backflow Products or Spears.

22A 3-3 VALVES, STRAINERS, HOSE BIBBS, AND UNIONS

Plumbing system valves shall be Crane Company or Nibco of models herein specified, or equivalent by Hammond, Milwaukee, Stockham or Mueller Valves. Valves shall be of the best quality, designed for 125 psi steam working pressure. Install valves on the hot and cold water lines at the water heater connections and other items of equipment, at branches from mains serving groups of fixtures, and at other places indicated or required by the installation to allow ease of future maintenance

GATE VALVES: Class 125, size 2" and smaller shall be Nibco #S-113-LF non-rising stem, soldered lead free bronze body and parts, with wedge disc. Gate valves 2-1/2" and larger shall be Crane #465-1/2 or Nibco #617-0, OS&Y, iron body flanged wedge gate with brass seats and stem.

BALL VALVES (may be used in lieu of gate valves up to 2"): 2" and smaller, Nibco #S-685-80-LF; two piece lead free bronze body, with soldered ends, chrome plated bronze ball with conventional port, 600 psi, blow-out proof stem.

GLOBE VALVES: Globe valves shall be Class 125. Globe valves 2" and smaller shall be Milwaukee #UP1502, screwed lead free bronze body and brass disc. Globe valves 2-1/2" and larger shall be Crane #351 iron body flanged valve with brass trim.

CHECK VALVES: Check valves shall be Class 125. Check valves for installation in horizontal pipe runs shall be of the "swing disc" design. Horizontal check valves 2" and smaller shall be Milwaukee #UP1509 or Nibco #S-413-Y-LF with soldered lead free bronze body and bronze disc. Horizontal check valves 2-1/2" and larger shall be Crane #373 or Nibco F-918 iron body flanged valve with brass trim. Check valves for installation in vertical pipe runs shall be of the "vertical lift" spring loaded design. Vertical check valves 2" and smaller shall be Milwaukee #UP154BT or Nibco #S-480-Y-LF with soldered lead free bronze body and bronze disc. Vertical check valves 3" and larger shall be center guided.

GAS COCKS: Gas cocks 2" and smaller shall be Homestead #611, screwed iron body with brass trim and flat head. Gas cocks 2-1/2" and larger shall be Homestead #612 flanged semi-steel body with iron trim and square head. Equivalent are Flowserve-Nordstrom or RM Energy Systems "Hercules".

THERMOSTATIC MIXING VALVES: Thermostatic mixing valves shall be Powers as described on the drawings or equal Armstrong, Bradley, Leonard, Lawler, Symmons or Watts meeting ASSE 1070 with brass body, non-corrosive internal parts, tamper resistant temperature adjustment, union inlets and check stops with strainers. Set temperature at 110 deg. F for hand washing.

GAS LINE PRESSURE REGULATORS: Gas line pressure regulators shall be by American Meter Company, Fisher, Itron, Maxitrol or Sensus with capacities as scheduled on the drawings. Regulators shall be single stage, steel jacketed, corrosion-resistant type with interstitial relief valve with atmospheric vent, elevation compensator; with threaded ends, for inlet and outlet.

STRAINERS: Strainers 2" and smaller shall be Watts #S777SI or Watts #LFS777SI with soldered lead free bronze, brass cap and Monel 40 mesh screen. Strainers 2-1/2" and larger shall be Watts #77F-DI-FDA-125 with flanged iron body with fused FDA epoxy coating, bolted iron cap and stainless steel screen with 1/16" perforations. Strainers size 2-1/2" and larger shall have a 1" blow-off line with a 1" gate valve connected to the blow-off connection and shall be extended to the nearest floor drain.

22A 3-5 WATER SERVICE ENTRANCE: PRESSURE REDUCING VALVE AND BACKFLOW PREVENTER

Provide a backflow preventer (BFP) of type required by local code, and a pressure reducing valve (PRV) if required by water pressure greater than 80 psi, on the domestic water service immediately downstream of the BFP at the water service entry. Set the PRV as indicated on the drawings. Provide a pressure gauge and hose bibb with isolation valve downstream of the BFP and/or PRV for system drain down.
For water services 2" and smaller provide a Type "K" soft copper tube that runs continuously from five feet outside the building with sweeping bend to 12" above the floor slab. Provide a shutoff valve at 12" above the floor. There shall be no fittings under the floor slab. Provide a PVC sleeve two pipe sizes larger than the water pipe served and seal with caulk.
For water services 3" and larger provide ductile iron pipe and fittings from five feet outside the building to 12" above the floor. Provide a shutoff valve at 12" above the floor. Provide a PVC sleeve two pipe sizes larger than the water pipe served and seal with caulk.

22A 4 PLUMBING FIXTURES AND EQUIPMENT

22A 4-1 PLUMBING FIXTURES

Provide china fixtures as scheduled by American-Standard or equivalent by Crane, Eljer, Gerber, Kohler, Toto-kiki or Zurn. Provide stainless steel sinks as scheduled by Elkay or equal by Just. Provide electric water coolers as scheduled by Elkay or equivalent by Acorn / Aqua, Halsey Taylor or Haws. Provide mop sinks as scheduled by Stern-Williams or equal by Acorn Engineering Co., Fiat or Florestone. Provide fixtures of same manufacturer where possible.

Fixtures shown on the drawings or specified herein shall be furnished and installed, set firm and true, connected to required piping services, thoroughly cleaned, left clean and ready for use. Exposed fittings and piping at the fixtures shall be chrome-plated, and water supply piping shall be valved at each fixture.

Vitreous china fixtures shall be of the best grade vitreous ware, without pit holes or blemishes, and the outlines shall be generally true. The engineer reserves the right to reject any pieces which, in his opinion, are faulty. Fixtures set against walls shall have ground backs and shall be caulked with silicone sealant of a matching color.

22A 4-2 PLUMBING FIXTURE TRIM

Faucets and trim in contact with drinking water shall meet or exceed the safe water drinking act (SWDA) lead-free standards of ANSI/NSF Standard 61, Section 9.

Provide faucets as scheduled on drawings.

Provide single lever handle faucets as scheduled on drawings.

Fixture p-traps shall be 17 gauge brass body with cleanout, 17 gauge seamless tubular wall bend with cast brass slip nut, shallow steel flange, all chrome plated.

Lavatory, sink and water closet supplies shall be solid brass angle or straight type with full turn brass stem, wheel handle or loose key types as noted on drawings, shallow steel flange, 3/8" copper riser flange, all chrome plated, final connection as required.

Lavatory drains shall be grid type chrome plated 17 gauge brass open grid with 1-1/4" x 6" long seamless brass tailpiece and brass locknut with heavy rubber basin washer and fiber friction washer.

Provide shower valves as scheduled on drawings.

Sink drains shall be basket type with chrome plated forged brass basket strainer and strainer body with 1-1/2" x 4" long seamless brass tailpiece and cast brass lock and coupling nuts.

Provide handicap insulation kits for lavatories and sinks on exposed water and waste pipes and fittings, including offset drain and continuous waste covers where required.

Provide flush valves as specified on drawings: Sloan or equivalent with chrome plated brass body, chloramine resistant diaphragm with protected orifice, screw driver angle stop, non-hold open feature and sweat adapter kit. Provide ADA handles on ADA compliant fixtures. Provide solid pipe ring supports for urinal flush tubes anchored securely to wall where indicated on the drawings. Provide low consumption type valves with 1.28 gallons per flush for water closets and 0.125 gallons per flush for urinals.

22A 4-3 WATER HEATER

Instantaneous gas water heater shall be of capacity as scheduled on the drawings by Navien, Noritz, Rinnai, Rheem, Takagi or equivalent. Furnish with pressure relief valve. Water heater shall be UL listed and meet ASHRAE 90.1B standards for thermal efficiency and standby heat loss. Provide factory start-up of water heating system installation by a trained factory representative. Provide the architect with a certificate of a properly installed and functioning water heating system.

END OF SECTION 22A

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P5.1
PLUMBING SPECIFICATIONS

EXHAUST FAN SCHEDULE

MARK	DESCRIPTION	MFR	MODEL	DRIVE	FLOW	ESP	MOTOR HP	RPM	VOLTS / PH	SONES	CONTROL TYPE	ACCESSORIES
EF-1	CEILING FAN	GREENHECK	SP-110-VG		110 CFM	.2	0.125	920	120 / 1	1.4	WALL SWITCH	A B C D
EF-2	CEILING FAN	GREENHECK	SP-110-VG		110 CFM	.2	0.125	920	120 / 1	1.4	WALL SWITCH	A B C D
EF-3	CEILING FAN	GREENHECK	SP-110-VG		110 CFM	.2	0.125	920	120 / 1	1.4	CONTINUOUS OPERATION	A B C D
EF-4	UPBLAST EXHAUST FAN	GREENHECK	CUBE-160	BELT	1500 CFM	1	0.75	1500	120 / 1	11.6	SWITCH ON HOOD	A E

GENERAL NOTES APPLICABLE TO ALL UNITS:
1. PROVIDE PRE-WIRED FACTORY MOUNTED INTEGRAL DISCONNECT DEVICE (NEMA 3R FOR EXTERIOR).
2. PROVIDE VARIABLE SPEED CONTROLLER (FACTORY INSTALLED IF AVAILABLE) ON ALL DIRECT DRIVE FANS FOR FAN BALANCING.
3. PROVIDE BELT TENSIONER ON ALL BELT DRIVE FANS.
4. PROVIDE WALL SLEEVE, FAN GUARD, EXTERIOR WEATHER HOOD AND MOTORIZED DAMPER WITH TIME DELAY CONTROLS ON ALL WALL MOUNTED PROPELLER FANS.
5. MOUNT FAN SPEED CONTROLLER IN ACCESSIBLE LOCATION ABOVE CEILING UNLESS OTHERWISE NOTED.
6. PROVIDE ROOF CURB TO MATCH ROOF TYPE AND SLOPE AT ALL ROOF MOUNTED FANS.

NOTES
A PROVIDE BACKDRAFT DAMPER.
B PROVIDE MANUFACTURER'S WALL CAP.
C PROVIDE MANUFACTURER'S WHITE ALUMINUM GRILLE.
D PROVIDE ISOLATOR KIT.
E PROVIDE GREASE COLLECTION CUP.

AIR DEVICE SCHEDULE

TAG	DESCRIPTION	MFR	MODEL	FACE SIZE	FRAME SIZE	NECK SIZE	MATERIAL/ FINISH
RG-1	EGGCRATE RETURN GRILLE	TITUS	50F				
SD-1	PLAQUE FACE DIFFUSER	TITUS	OMNI-AA				

GENERAL NOTE:
DUCT DIMENSIONS LISTED ON DRAWINGS REPRESENT THE AIRFLOW FREE AREAS AND DO NOT HAVE ALLOWANCES FOR INSULATION LINER, WHERE APPLICABLE, INSIDE THE DUCTS, OR DUAL WALL DIMENSIONS. DUCTS SHALL BE CONSTRUCTED TO INCLUDE INSULATION REQUIREMENTS AND MAINTAIN AIRFLOW DIMENSIONS INDICATED ON PLANS.

NOTE: NO LINED DUCT IN KITCHEN

MECHANICAL DUCTWORK & INSULATION SCHEDULE

SERVICE	DUCT TYPE	INSULATION TYPE	INSULATION THICKNESS
ALL LOW PRESSURE CONSTANT VOLUME SUPPLY AIR DUCT FROM AIR HANDLER OR PACKAGED UNIT	ROUND OR RECTANGULAR, AS INDICATED ON PLANS.	FIBERGLASS WRAP	2" WRAP, R VALUE=6.0
ALL LOW PRESSURE RETURN AIR DUCT FROM AIR HANDLER OR PACKAGED UNIT	ROUND OR RECTANGULAR, AS INDICATED ON PLANS.	FIBERGLASS WRAP	2" WRAP, R VALUE=6.0
ALL RUNOUTS TO SUPPLY DIFFUSERS AND RETURN GRILLES CONCEALED ABOVE CEILINGS	ROUND OR RECTANGULAR, AS INDICATED ON PLANS.	FIBERGLASS WRAP	2" WRAP, R VALUE=6.0
ALL SUPPLY AIR DIFFUSERS (BACKSIDE, NOT EXPOSED TO SPACE)	N/A	FIBERGLASS WRAP	2" WRAP, R VALUE=6.0
FRESH AIR EXHAUST DUCT	ROUND OR RECTANGULAR, AS INDICATED ON PLANS.	FIBERGLASS WRAP OR MATTE FACED FIBERGLASS LINER, AS INDICATED ON PLANS. N/A IF IN UNCONDITIONED SPACE	2" WRAP OR 1-1/2" LINER, R VALUE=6.0
FRESH AIR SUPPLY DUCT	ROUND OR RECTANGULAR, AS INDICATED ON PLANS.	FIBERGLASS WRAP OR MATTE FACED FIBERGLASS LINER, AS INDICATED ON PLANS. N/A IF IN UNCONDITIONED SPACE	2" WRAP OR 1-1/2" LINER, R VALUE=6.0
GREASE DUCT	16 GAUGE, CARBON STEEL WELDED AIR TIGHT AT ALL JOINTS AND SEAMS. MECHANICAL FASTENERS SHALL NOT PENETRATE DUCT WALL	THERMAL CERAMICS FIREMASTER. UL LISTED FOR ZERO CLEARANCE TO COMBUSTIBLES	3"
RESTROOM EXHAUST DUCT	ROUND OR RECTANGULAR, AS INDICATED ON PLANS.	FIBERGLASS WRAP OR MATTE FACED FIBERGLASS LINER, AS INDICATED ON PLANS	2" WRAP OR 1-1/2" LINER, R VALUE=6.0

MAKE-UP AIR UNIT SCHEDULE

TAG	MFR	MODEL	FAN			VOLTS / PHASE	AMPS	WATTS	WEIGHT (LBS)	NOTES
			DRIVE	CFM	ESP					
MUA-1	GREENHECK	KSFD-80-H08		1400	0.5	115 / 1	8.32	830	887	A

GENERAL NOTES APPLICABLE TO ALL UNITS:
1. PROVIDE INTAKE HOOD WITH MERV 8 FILTER
2. PROVIDE GRAVITY BACKDRAFT DAMPER
3. DOWN DISCHARGE; 12" ROOF CURB
4. INTEGRAL DISCONNECT SWITCH

NOTES
A MAKEUP AIR UNIT IS TO BE INTERLOCKED WITH KITCHEN HOOD

CONTRACTOR TO COORDINATE EQUPMENT SIZE AND ORIENTATION WITH SPACE REQUIREMENTS PRIOR TO ORDERING EQUIPMENT.

GENERAL MECHANICAL NOTES

1. SUBMISSION OF PROPOSAL IN CONNECTION WITH THIS WORK SHALL IMPLY THAT THE BIDDER HAS EXAMINED THE JOB SITE UNDER WHICH HE WILL BE OBLIGATED TO OPERATE SHOULD HE BE AWARDED THE WORK UNDER THIS CONTRACT. NO EXTRA CHARGE WILL BE ALLOWED FOR FAILURE OF ANY BIDDER TO EXAMINE THE SITE PRIOR TO BID.
2. DUCT DIMENSIONS LISTED ON DRAWINGS REPRESENT THE AIRFLOW FREE AREAS AND DO NOT HAVE ALLOWANCES FOR INSULATION LINER, WHERE APPLICABLE, INSIDE THE DUCTS, OR DUAL WALL DIMENSIONS. DUCTS SHALL BE CONSTRUCTED TO INCLUDE INSULATION REQUIREMENTS AND MAINTAIN AIRFLOW DIMENSIONS INDICATED ON PLANS. FOR CLASH COORDINATION INCLUDE INSULATION THICKNESS PER SCHEDULE.
3. ALL WORK SHALL CONFORM TO STATE AND LOCAL CODES, RULES, REGULATIONS, AND ORDINANCES WHICH SHALL TAKE PRECEDENCE OVER THE PLANS IF CONFLICTS EXIST BETWEEN THEM.
4. THE DRAWINGS INDICATE THE GENERAL LAYOUT REQUIREMENTS FOR EQUIPMENT, FIXTURES, PIPING, DUCTWORK, ETC. FINAL LAYOUT SHALL BE MODIFIED TO FIT ACTUAL SITE CONDITIONS, ALL REQUIRED REVISIONS SHALL BE RECORDED ON A DESIGNATED HARD COPY SET OF REDLINE PLANS TO BE KEPT CURRENT TO JOBSITE PROGRESS. AT MINIMUM, THIS DOCUMENT SHALL BE UPDATED WEEKLY AND REDLY AVAILABLE FOR REVIEW AND REFERENCE.
5. COORDINATE ALL WORK WITH THE OWNER AND ALL OTHER CONTRACTORS. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL RIGGING, HANDLING, AND PROTECTION OF MATERIALS. PROVIDE LABOR TO RECEIVE UNLOAD, STORE, PROTECT, AND TRANSFER TO POINT OF INSTALLATION OF ANY OWNER-FURNISHED ITEMS.
6. IN CASES OF EQUIPMENT SUBSTITUTION, CONTRACTOR IS RESPONSIBLE FOR VERIFYING THAT ALL SYSTEMS AND COMPONENTS WILL FIT PROPERLY PRIOR TO FABRICATION OR ORDERING. INSTALLED DUCTS MAY BE RESIZED BY THE CONTRACTOR TO FIT FIELD CONDITIONS AS LONG AS THE INSTALLED DUCTS SHALL HAVE EQUAL FRICTION LOSS TO THOSE SHOWN. RECTANGULAR DUCTS SHALL NOT BE CHANGED TO ROUND DUCTS. PROVIDE COMPLETE SHEET METAL SHOP DRAWINGS TO ENGINEER SHOWING ACTUAL DUCT SIZES, ARRANGEMENTS, AND UNIT LOCATIONS TO BE INSTALLED. THIS SHALL BE DONE PRIOR TO FABRICATION OR INSTALLATION.
7. INSTALL ACOUSTIC TURNING VANES IN ELBOWS IN RECTANGULAR DUCTS 20" AND LARGER. INSTALL RADIUS TYPE ELBOWS IN RECTANGULAR DUCTS SMALLER THAN 20".
8. USE 45 DEGREE TAKE-OFF FITTINGS AT ALL ROUND SUPPLY BRANCH TAKEOFFS. PROVIDE BALANCE DAMPERS AT ALL SUPPLY DUCT RUNOUTS TO GRILLES. LOCATE AS FAR AS POSSIBLE FROM GRILLES IN AN ACCESSIBLE LOCATION. PROVIDE ACCESS PANELS IN SOLID WALLS AND CEILINGS FOR BALANCING DAMPERS.
9. USE FLEX DUCTS FOR FINAL CONNECTION TO ALL CEILING DIFFUSERS, AND WHERE NECESSARY, SIDEWALL DIFFUSERS, AND LIMIT TO 6' MAX. LENGTHS.
10. PROVIDE A COMPLETE AND OPERATING MECHANICAL SYSTEM, INCLUDING ALL INCIDENTAL ITEMS AND CONNECTIONS NECESSARY FOR PROPER OPERATION OR CUSTOMARILY INCLUDED, EVEN THOUGH EACH AND EVERY ITEM MAY NOT BE INDICATED.
11. THE MECHANICAL INSTALLATION SHALL BE SAFE, RELIABLE, ENERGY EFFICIENT AND EASILY MAINTAINED WITH ADEQUATE PROVISIONS ALLOWED FOR ACCESS TO EQUIPMENT.
12. THE MECHANICAL SYSTEM SHALL OPERATE QUIETLY WITH NOISE LEVELS BELOW THE CRITERIA RECOMMENDED FOR THE APPLICATION BY ASHRAE. PROVIDE CORRECTIVE ACTION AS REQUIRED TO REDUCE OBJECTIONABLE NOISE OR VIBRATION.
13. UNDERCUT DOORS 3/4 INCH WHERE NO RETURN NOR EXHAUST GRILLE IS SHOWN TO ALLOW FOR AIR TRANSFER (DO NOT UNDERCUT FIREDOORS.)
14. REFER TO ARCH. PLANS AND DETAILS FOR EXACT LOCATION OF ALL WALL AND CEILING MOUNTED DEVICES. ADJUST LOCATION OF SIDEWALL DEVICES AS NECESSARY TO AVOID INTERFERENCE WITH MOLDING OR OTHER ELECTRICAL DEVICES.
15. WHERE CONDUIT, CABLES, DUCTWORK OR PIPING PASSES THROUGH FIRE-RATED FLOORS OR WALLS, THE SLEEVES SHALL BE COMPLETELY SEALED WITH A FIRE STOP MATERIAL THAT IS UL LISTED AND ACCEPTED BY LOCAL AUTHORITIES HAVING JURISDICTION (AHJ) AS BEING SUITABLE FOR THIS SERVICE SUCH AS DOWN CORNING CORP "SILICONE ELASTOMER, RTV FOAM, OR SIMILAR MATERIAL TO MAINTAIN FIRE RATING OF THE WALL OR FLOOR.
16. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL CORING AND BEAM PENETRATIONS AS IT RELATES TO HIS WORK.
17. CONTRACTOR SHALL NOT INSTALL ANY MAINTENANCE ITEMS ABOVE HARD CEILINGS. THIS SHALL INCLUDE VALVES, DAMPERS, OR ANY OTHER ITEMS THAT REQUIRE ACCESS AFTER CONSTRUCTION IS COMPLETED. IF INSTALLATION ABOVE A HARD CEILING OF THESE ITEMS CANNOT BE AVOIDED, THEN PROVIDE CEILING ACCESS DOORS EQUAL TO ACUDOR MODEL FW-505 WHERE REQUIRED. AT FIRE-RATED WALLS, USE EQUIVALENT OF ACUDOR MODEL FB-5060. MINIMUM SIZE SHALL BE 12"x12". USE 18"x18" WHEN PERSONNEL ACCESS IS REQUIRED.
18. PROVIDE AN INSULATED BACK ON ALL THERMOSTATS AND TEMPERATURE SENSORS THAT ARE MOUNTED ON CMU OR HOLLOW WALLS. PROVIDE SHALLOW DEVICE EXTENSION BOX BEHIND T-STATS AND SENSORS ON MASONRY WALLS IN COMMERCIAL / RETAIL SPACES.
19. PROVIDE FIRE DAMPERS AT ALL FIRE-RATED WALLS AND FLOOR PENETRATIONS. REFER TO ARCHITECTURAL DRAWINGS FOR FIRE BARRIER WALLS AND CEILINGS.
20. IF A CENTRAL FIRE ALARM SYSTEM IS REQUIRED FOR THIS PROJECT, MECHANICAL CONTRACTOR SHALL INSTALL DUCT MOUNTED SMOKE DETECTORS PROVIDED BY FIRE ALARM CONTRACTOR. REFER TO ELECTRICAL NOTES FOR EXACT REQUIREMENTS. MECHANICAL CONTRACTOR SHALL IDENTIFY A SET OF TERMINALS FOR EQUIPMENT SHUTDOWN ON ALL FAN POWERED EQUIPMENT REQUIRING SHUTDOWN CONTROLS. FIRE ALARM CONTRACTOR SHALL WIRE FROM DUCT MOUNTED SMOKE DETECTOR TO SHUTDOWN TERMINALS TO SHUT DOWN FAN OPERATION WHEN SMOKE IS DETECTED.
21. AT PENETRATIONS THROUGH FIRE WALLS, ANY NON-METALLIC PIPE OR DUCT SHOULD BE EXTERNALLY SLEEVED WITH STEEL, FERROUS, OR COPPER MATERIALS, SECURELY FASTENED TO THE FIRE RATED ASSEMBLY, AND ANY SPACE BETWEEN THE SLEEVE AND THE ASSEMBLY PENETRATED SHALL BE PROTECTED USING MATERIAL THAT CONFORMS TO ASTM E 814 OR UL 1479, SUCH AS FIRE STOP FS-1900, OR FLAME STOPPER 5000.
22. REFER TO ELECTRICAL DRAWINGS FOR SMOKE DAMPER AND FIRE/SMOKE DAMPER DETAIL. MECHANICAL CONTRACTOR SHALL PROVIDE AND INSTALL ALL DAMPERS WITH MOTORIZED ACTUATORS AND INSTALL SMOKE DETECTORS AND PROVIDE WIRING FOR FAN SHUTDOWN CONTROLS. COORDINATE WITH ELECTRICAL CONTRACTOR AND PROVIDE DAMPER ACTUATOR COMPATIBLE WITH ELECTRICAL WIRING PROVIDED. PROVIDE ANY WIRING OR COMPONENTS NOT PROVIDED BY THE ELECTRICAL CONTRACTOR THAT ARE REQUIRED TO PROVIDE A COMPLETE AND OPERATIONAL SYSTEM.
27. ANY LINE VOLTAGE WIRING THAT IS RUN BY THE MECHANICAL CONTRACTOR SHALL BE INSTALLED IN ACCORDANCE WITH THE ELECTRICAL PLANS, NOTES, AND SPECIFICATIONS.

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DAT 10-31-22
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M1.0
MECHANICAL SCHEDULES AND NOTES

MECHANICAL LEGEND

(T)	THERMOSTAT (MOUNTED AT 48" A.F.F)		EXHAUST GRILLE (CEILING MOUNTED)
(S)	TEMPERATURE SENSOR (MOUNTED AT 48" A.F.F)		SUPPLY DIFFUSER (CEILING MOUNTED)
(F)	REMOTE MANUAL PULL STATION (MOUNTED AT 48" A.F.F)		RETURN GRILLE (CEILING MOUNTED)
CO2	CARBON DIOXIDE DETECTOR (MOUNTED AT 48" A.F.F)	CD-2 225 CFM	DIFFUSER CALLOUT TAG
(D)	DUCT MOUNTED SMOKE DETECTOR		MANUAL BALANCE DAMPER
UCD	WHERE SHOWN, UNDERCUT DOOR 1/2"		VERTICAL DUCT TAKE-OFF WITH BALANCE DAMPER
AHU-1	EQUIPMENT OR DEVICE TAG		SIDEWALL AIR DEVICE
CFM	STANDARD CUBIC FEET PER MINUTE	M	MOTORIZED 3-POSITION ACTUATOR EQUAL TO BELIMO MODEL 'LF24-SR-E'
FD	FIRE DAMPER	24x12	RECTANGULAR DUCT (FIRST DIMENSION, SIDE SHOWN)
FSD	COMBINATION FIRE/SMOKE DAMPER	16"	ROUND DUCT
B.O.D.	BOTTOM OF DUCT		INTERNALLY LINED DUCT
B.O.B.	BOTTOM OF BEAM		AIR FLOW ARROW
A.F.F.	ABOVE FINISHED FLOOR	(ROUND) (RECTANGULAR)	DUCT CONTINUATION SYMBOLS
	CONNECT TO EXISTING	C	CONDENSATE PIPE
		R	REFRIGERANT PIPE

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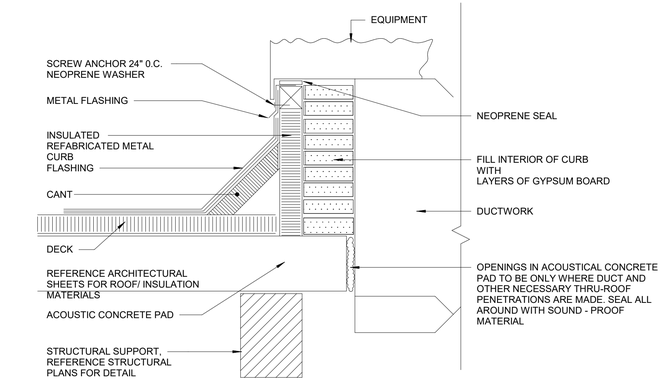
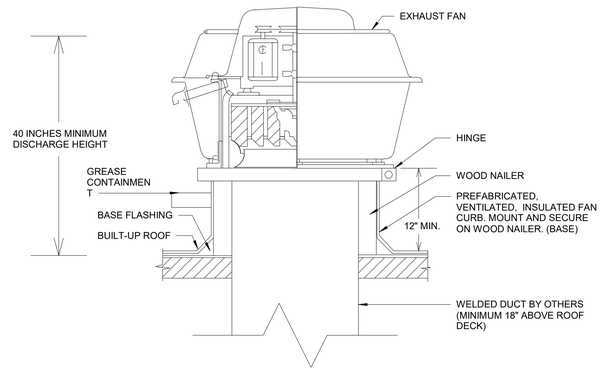
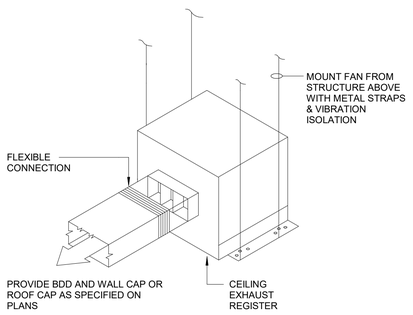
6 *CONDENSATE DRAIN DETAIL*
SCALE: N.T.S.



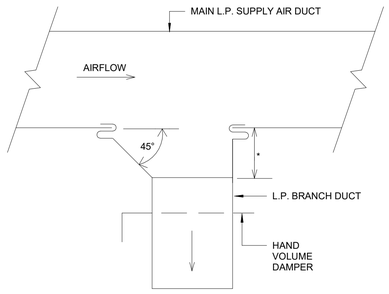
5 *ROOF TOP EQUIPMENT CURB DETAIL*
SCALE: N.T.S.



4 *ROOF MOUNTED GREASE EXHAUST FAN*
SCALE: N.T.S.

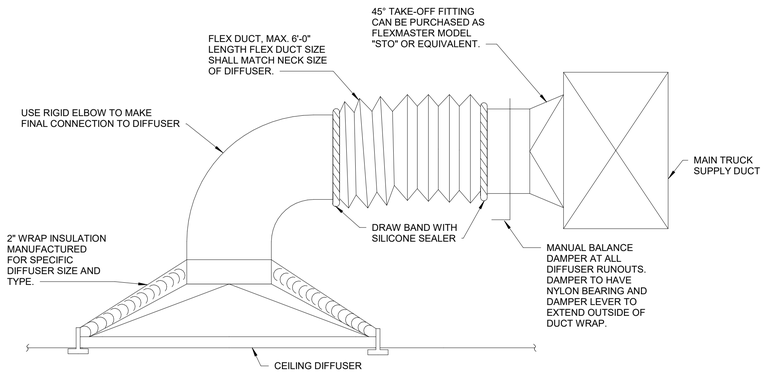


3 *CEILING EXHAUST FAN DETAIL*
SCALE: N.T.S.



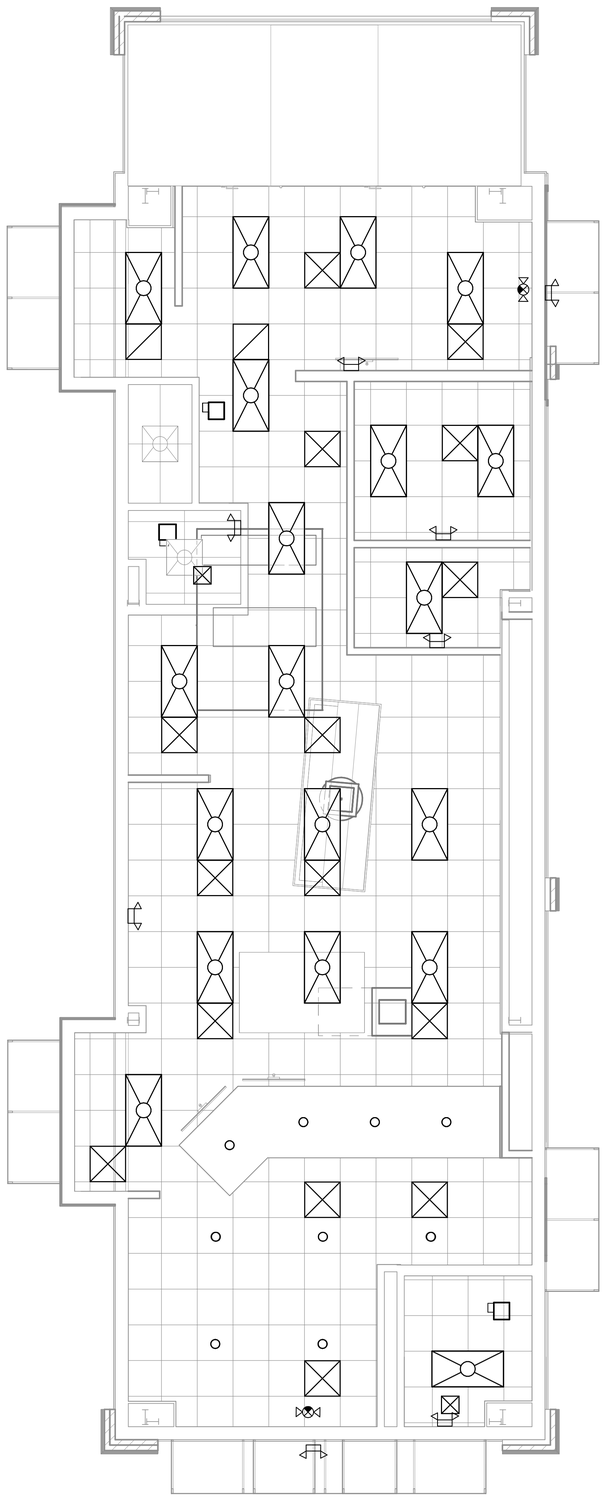
* - EQUALS WIDTH OF BRANCH DUCT UP TO 12", 12" FOR ALL BRANCH DUCTS LARGER THAN 12".

2 *TYPICAL SUPPLY AIR BRANCH DUCT TAKE-OFF*
SCALE: N.T.S.

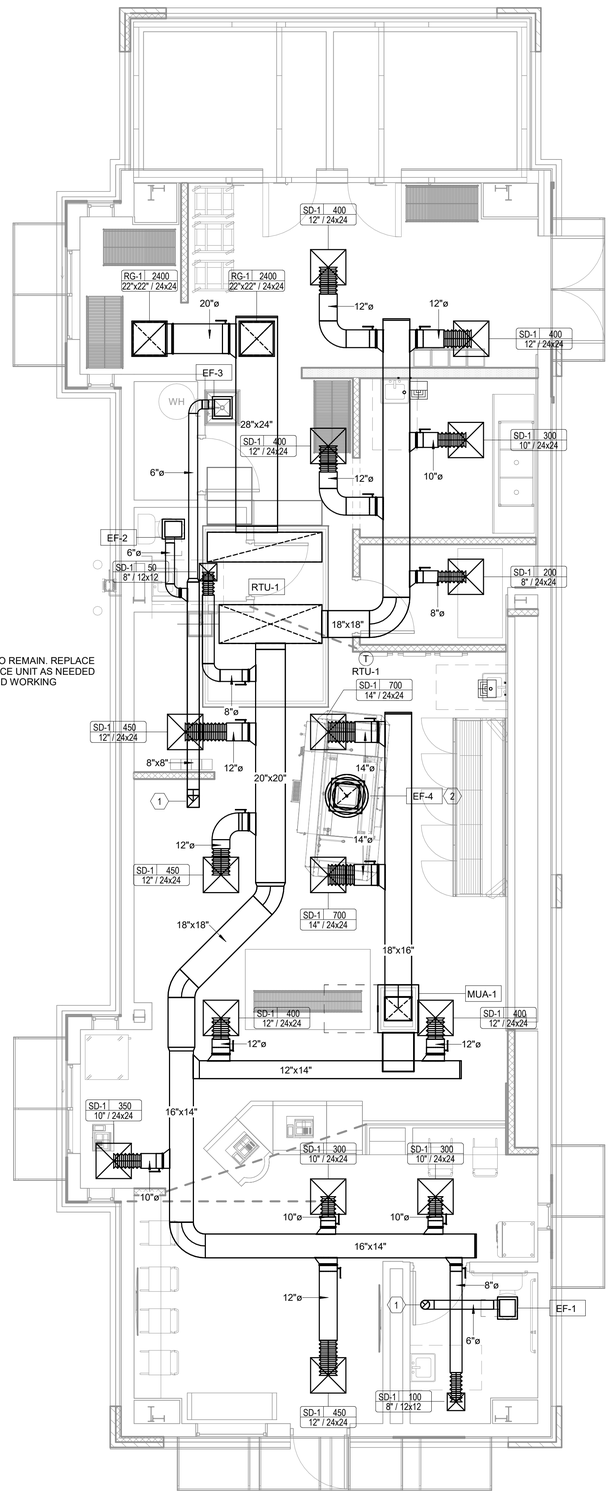


1 *TYPICAL DIFFUSER CONNECTION WITH INSULATION*
SCALE: N.T.S.

M1.1
MECHANICAL LEGEND AND DETAILS



2 *MECHANICAL REFLECTED CEILING PLAN*
1/4" = 1'-0"



EXISTING 12.5 TON RTU-1 TO REMAIN. REPLACE BELTS, FILTERS AND SERVICE UNIT AS NEEDED TO ENSURE UNIT IS IN GOOD WORKING CONDITION.

1 *HVAC PLAN*
1/4" = 1'-0"

KEYNOTES

1	EXHAUST DUCT UP TO GREENHECK MODEL "GR" ROOF CAP. PROVIDE BACKDRAFT DAMPERS FOR EXHAUST FANS.
2	NEW EF-4 SIZED FOR AVI HOOD MODEL 3270 ONLY. PROVIDE ROOF CURB WITH VENTILATED CURB EXTENSION. CONNECT TO OWNER PROVIDED KITCHEN HOOD.

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M2.0
MECHANICAL PLANS

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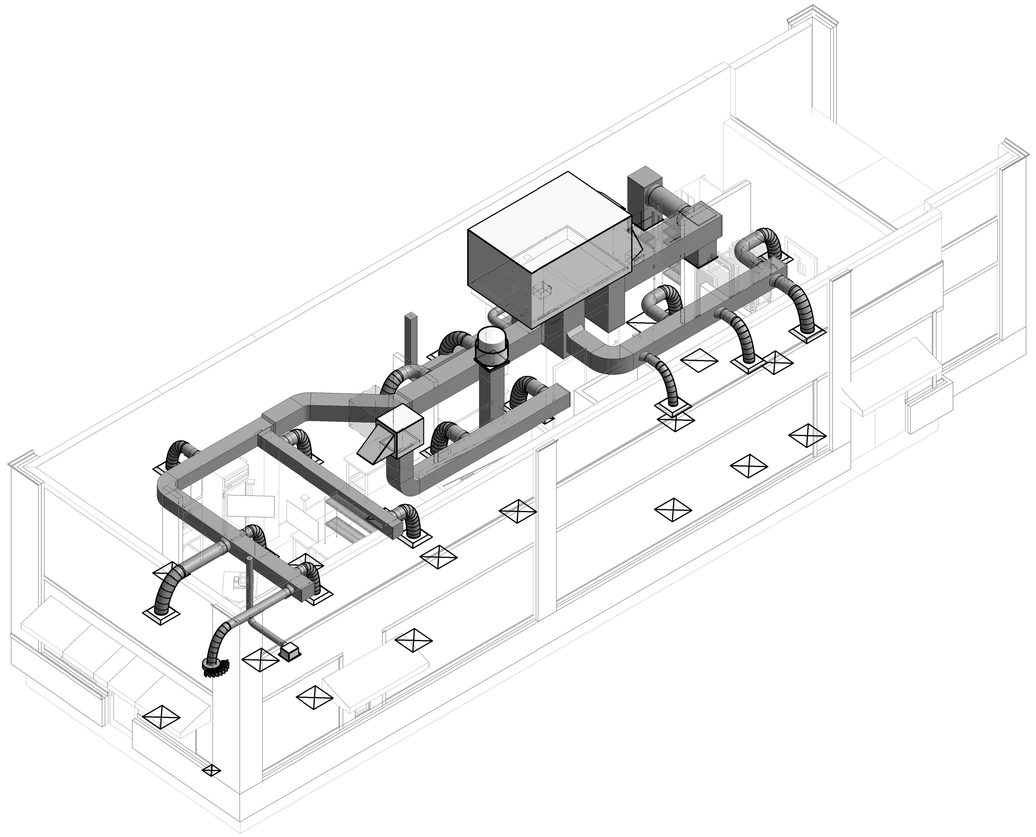

1 *MECHANICAL ANXONOMETRICS PLAN*

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M2.1
MECHANICAL AXONOMETRIC PLAN

23A HEATING, VENTILATING, AND AIR CONDITIONING
rev – 20150529

23A 1 GENERAL INSTRUCTIONS

23A 1-1 GENERAL REQUIREMENTS

Requirements under Division 1 and the general and supplementary conditions of these specifications apply to this section and division. Where the requirements of this section and division exceed those of Division 1, this section and division take precedence. Become thoroughly familiar with all their contents as to requirements that affect this division, section or both. The work required under this section includes material, equipment, appliances, transportation, services, and labor required to complete the entire system as required by the drawings and specifications, or reasonably inferred to be necessary to facilitate each system's functioning as implied by the design and the equipment specified.

The specifications and drawings for the project are complementary, and portions of the work described in one, shall be provided as if described in both. In the event of discrepancies, notify the engineer and request clarification prior to proceeding with the work involved.

Drawings are graphic representations of the work upon which the contract is based. They show the materials and their relationship to one another, including sizes, shapes, locations, and connections. They also convey the scope of work, indicating the intended general arrangement of the equipment and other materials without showing all of the exact details as to elevations, offsets, control lines, and other installation requirements. Use the drawings as a guide when laying out the work and to verify that materials and equipment will fit into the designated spaces, and which, when installed per manufacturers' requirements, will ensure a complete, coordinated, satisfactory and properly operating system. Determine exact locations by job measurements, by checking the requirements of other trades, and by reviewing all contract documents. Correct errors that could have been avoided by proper checking and inspection, at no additional cost to the owner.

Specifications define the qualitative requirements for products, materials, and workmanship upon which the contract is based.

23A 1-2 DEFINITIONS

Whenever used in these specifications or drawings, the following terms shall have the indicated meanings:

Furnish: "to supply and deliver to the project site, ready for unloading, unpacking, assembling, installing, and similar operations."

Install: "to perform all operations at the project site, including, but not limited to, and as required: unloading, unpacking, assembling, erecting, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning, testing, commissioning, starting up and similar operations, complete, and ready for the intended use."

Provide: "to furnish and install complete, and ready for the intended use."

Furnished by owner (or owner-furnished) or furnished by others: "an item furnished by the owner or under other divisions or contracts, and installed under the requirements of this division, complete, and ready for the intended use, including all items and services incidental to the work necessary for proper installation and operation. Include the installation under the warranty required by this division.

Engineer: where referenced in this division, "engineer" is the engineer of record and the design professional for the work under this division, and is a consultant to, and an authorized representative of, the architect, as defined in the general and/or supplementary conditions. When used in this division, it means increased involvement by, and obligations to, the engineer, in addition to involvement by, and obligations to, the "architect".

AHJ: the local code and/or inspection agency (authority) having jurisdiction over the work.

NRTL: nationally recognized testing laboratory, as defined and listed by OSHA in 29 CFR 1910.7 (e.g., UL, ETL, CSA), and acceptable to the AHJ over this project.

The terms "approved equal", "equivalent", or "equal" are used synonymously and shall mean "accepted by or acceptable to the engineer as equivalent to the item or manufacturer specified". The term "approved" shall mean labeled, listed, certified, or all three, by an NRTL, and acceptable to the AHJ over this project.

23A 1-3 PRE-BID SITE VISIT

Prior to submitting bid, visit the site of the proposed work and become fully informed as to the conditions under which the work is to be done. Failure to do so will not be considered sufficient justification to request or obtain extra compensation over and above the contract price.

23A 1-4 MATERIAL AND WORKMANSHIP

Provide all material and equipment new and in first class condition. Provide markings or a nameplate for all material and equipment identifying the manufacturer and providing sufficient reference to establish quality, size and capacity. In general, provide the following quality grade(s) for all materials and equipment:

Commercial Specification Grade
Light Duty and Residential Grade
Pipe, pipe fittings, pipe specialties and valves shall be manufactured in plants located in the United States.

Work performed under this contract shall provide a neat and "workmanlike" appearance when completed, to the satisfaction of the architect and engineer. Workmanship shall be the finest possible by experienced mechanics of the proper trade.

The complete installation shall function as designed and intended with respect to efficiency, capacity, noise level, etc. Abnormal or excessive noise from equipment, devices or other system components will not be acceptable.

Remove from the premises waste material present as a result of work. Clean equipment installed under this contract to present a neat and clean installation at the termination of the work.

Repair or replace public and private property damaged as a result of work performed under this contract to the satisfaction of authorities and regulations having jurisdiction.

23A 1-5 MANUFACTURERS

In other articles where lists of manufacturers are introduced, subject to compliance with requirements, provide products by one of the manufacturers specified.

Where a list is provided, manufacturers listed are not in accordance with any ranking or preference.

Where manufacturers are not listed, provide products subject to compliance with requirements from manufacturers that have been actively involved in manufacturing the specified product for no less than 5 years.

23A 1-6 COORDINATION

Coordinate all work with other divisions and trades so that the various components of the systems will be installed at the proper time, fit the available space, and will allow proper service access to those items requiring maintenance. Refer to all other division's drawings, and to relevant equipment submittals and shop drawings to determine the extent of clear spaces. Components which are installed without regard to the above shall be relocated at no additional cost to the owner.

Unless otherwise indicated, the general contractor will provide chases and openings in building construction required for installation of the systems specified herein. Contractor shall furnish the general contractor with information where chases and openings are required. Make all offsets required to clear equipment, beams and other structural members, and to facilitate concealing system components in the manner anticipated in the design. Keep informed as to the work of other trades engaged in the construction of the project, and execute work in a manner as to not interfere with or delay the work of other trades.

Figured dimensions shall be taken in preference to scale dimensions. Contractor shall take his own measurements at the building, as variations may occur. Contractor will be held responsible for errors that could have been avoided by proper checking and inspection

Provide materials with trim that will properly fit the types of ceiling, wall, or floor finishes actually installed. Model numbers listed in the construction documents are not necessarily intended to designate the required trim.

23A 1-7 ORDINANCES, CODES, AND STANDARDS

Work performed under this contract shall, at a minimum, be in conformance with applicable national, state and local codes having jurisdiction. Equipment furnished and associated installation work performed under this contract shall be in strict compliance with current applicable codes adopted by the local AHJ including any amendments and standards as set forth by the National Fire Protection Association (NFPA), Underwriters Laboratories (UL), Occupational Safety and Health Administration (OSHA), American Society of Mechanical Engineers (ASME), American Society of Heating, Refrigeration, and Air Conditioning Engineers (ASHRAE), American National Standards Institute (ANSI), American Society of Testing Materials (ASTM) and other national standards and codes where applicable. Additionally, comply with rules and regulations of public utilities and municipal departments affected by connection of services.
Where the contract documents exceed the requirements of the referenced codes, standards, etc., the contract documents shall take precedence.

Promptly bring all conflicts observed between codes, ordinances, rules, regulations, referenced standards, and these documents to the engineer's attention for final resolution. Contractor will be held responsible for any violation of the law.

Procure and pay for permits and licenses required for the accomplishment of the work herein described. Where required, obtain, pay for and furnish certificates of inspection to owner. Contractor will be held responsible for violations of the law.

23A 1-8 PROTECTION OF EQUIPMENT AND MATERIALS

Store and protect from damage equipment and materials delivered to job site, in accordance with manufacturers' recommendations. For materials and equipment susceptible to changing weather conditions, dampness, or temperature variations, store inside in conditioned spaces. For materials and equipment not susceptible to these conditions, cover with waterproof, tear-resistant, heavy tarp or polyethylene plastic as required to protect from plaster, dirt, paint, water, or physical damage. Equipment and material that has been damaged by construction activities will be rejected, and contractor shall furnish new equipment and material as required at no additional cost to the owner.

Keep premises broom clean from foreign material created during work performed under this contract. Piping, equipment, etc. shall have a neat and clean appearance at the termination of the work.

Plug or cap open ends of ductwork and piping systems while stored and installed during construction when not in use to prevent the entrance of debris into the systems.

23A 1-9 SUBSTITUTIONS

Include in the base bid the products specifically named in these specifications or on the drawings. Submit, in the form of alternates, with bid, products of any other manufacturers for similar use, provided the differences in cost, if any, are included for each proposed alternate.

No substitutions will be considered with receipt of Bids, unless the Architect and Engineer have received from the Bidder a written request for approval to bid a substitution at least ten calendar days prior to the date for receipt of Bids, and have approved the substitution request. Include, with each such request, the name of the material or equipment for which substitution is being requested, and a complete description of the proposed substitution, including drawings, cut sheets, performance and test data, and all other information necessary for an evaluation. Include also a statement setting forth changes in other materials, equipment or other work that would be required to incorporate the substitution. The burden of proof of the merit of the proposed substitute is upon the proposer. The proposer of any substitutions shall compensate the Engineer at a rate of $150.00 per hour for time spent evaluating proposed substitutions and or the subsequent revisions to the design required to utilize the substitution.

The Architect's or Engineer's decision to approve or disapprove a substitution in a Bid is final.

If the proposed substitution is approved prior to receipt of Bids, such approval will be stated in an Addendum. Bidders shall not rely upon approvals made in any other manner, including verbal.

No substitutions will be considered after receipt of Bids and before award of the Contract.

No substitutions will be considered after the Contract is awarded unless specifically provided in the Contract Documents.

23A 1-10 SUBMITTALS

Assemble and submit to the architect, for engineer's review, manufacturers' product literature for material and equipment to be furnished, installed, or both, under this division, including shop drawings, manufacturers' product data and performance sheets, samples, and other submittals required by this division. Highlight, mark, list or indicate the materials, performance criteria and accessories that are being proposed. Provide the number of submittals required by division 1; however, at a minimum, submit two (2) sets. Before submitting, verify that all materials and equipment submitted are mutually compatible and suitable for the intended use, fit the available spaces, and allow ample and code-required room for access and maintenance. Submittals shall contain the following information. Submittals not so identified will be returned to the contractor without action:

The project name.
The applicable specification section and paragraph.
The submittal date.
The contractor's stamp, which shall certify that the stamped drawings have been checked by the contractor, comply with the drawings and specifications, and have been coordinated with other trades.

Submittals and shop drawings shall not contain HP Engineering's firm name or logo, nor shall it contain the HP Engineering's engineers' seal and signature. They shall not be copies of HP Engineering's work product.

Transmit submittals as early as required to support the project schedule. Allow for two weeks engineer review time, plus mailing time, plus a duplication of this time for re-submittals, if required. The engineer's submittal reviews will not relieve the contractor from responsibility for errors in dimensions, details, size of members, or quantities; or for omitting components or fittings; or for not coordinating items with actual building conditions.

Refer to division 1 for acceptance of electronic submittals for this project. For electronic submittals, contractor shall submit the documents in accordance with the procedures specified in division 1. Contractor shall notify the architect and engineer that the shop drawings have been posted. If electronic submittal procedures are not defined in division 1, contractor shall include the website, user name and password information needed to access the submittals. For submittals sent by e-mail, contractor shall copy the architect and engineer's designated representatives. Contractor shall allow the engineer review time as specified above in the construction schedule. Contractor shall submit only the documents required to purchase the materials and/or equipment in the electronic submittal and shall clearly indicate the materials, performance criteria and accessories being proposed. General product catalog data not specifically noted to be part of the specified product will be rejected and returned without review.

23A 1-11 ELECTRONIC DRAWING FILES

In preparation of shop drawings or record drawings, contractor may, as an option, obtain electronic drawing files in Revit, AutoCAD, or DXF format from the engineer for a fee of $200 for the first sheet and $100 per sheet for each additional sheet. Contact the architect for written authorization; and, contact the engineer to obtain the necessary release agreement form and to indicate the desired shipping method and drawing format. In addition to payment, architect's written authorization and engineer's release agreement form must be received before electronic drawing files will be sent.

23A 1-12 OPERATION AND MAINTENANCE MANUALS

Submit to the architect, for engineer's review, copies each of operations and maintenance instruction manuals, appropriately bound into manual form including approved copies of the following, revised if necessary to show system and equipment as actually installed. Paper clips, staples, rubber bands, and mailing envelopes are not considered approved binders. Provide the number of submittals required by Division 1; however, at a minimum, submit two (2) sets, and include, at a minimum, the following information:

Cover sheet that lists the project name, date, owner, architect, consulting engineer, general contractor, sub-contractor, and an index of contents.
Manufacturers' catalogs and product data sheets
Wiring diagrams
Operation and Maintenance instructions
Parts lists
Approved shop drawings
Test reports as defined for the systems and equipment provided or furnished or installed under this contract.
Names, addresses, telephone numbers, and e-mail addresses of local contacts for warranty services and spare parts.

Submit manuals prior to requesting the final punch list and before any requests for substantial completion. Final approval of this division's systems installed under this contract will be withheld until this equipment brochure is received and deemed complete by the architect and engineer.

Provide "as-built" drawings (see Division 1 and general conditions).

23A 1-13 TRAINING

At a time mutually agreed upon between the owner and contractor, provide the services of a factory trained and authorized representative to train owner's designated personnel on the operation and maintenance of the equipment provided for this project.

Provide training to include but not be limited to an overview of the system and/or equipment as it relates to the facility as a whole; operation and maintenance procedures and schedules related to startup and shutdown, troubleshooting, servicing, preventive maintenance and appropriate operator intervention; and review of data included in the operation and maintenance manuals.

Submit a certification letter to the architect stating that the owner's designated representative has been trained as specified herein. Letter shall include date, time, attendees and subject of training. The contractor and the owner's representative shall sign the certification letter indicating agreement that the training has been provided.

Schedule owner training with at least 7 days' advance notice.

23A 1-14 WARRANTIES

Warrant each system and each element thereof against all defects due to faulty workmanship, design or material for a period of 12 months from date of substantial completion, unless specific items are noted to carry a longer warranty in the construction documents or manufacturer's standard warranty exceeds this duration. Warranties shall include labor and material. Remedy all defects, occurring within the warranty period(s), as stated in the general conditions and Division 1 without any additional costs to the owner.

Perform any required remedial work promptly, upon written notice from the engineer or owner.

At the time of substantial completion, deliver to the owner all warranties, in writing and properly executed, including term limits for warranties extending beyond the required period, each warranty instrument being addressed to the owner and stating the commencement date and term.

23A 1-15 CUTTING AND PATCHING

Perform cutting of walls, floors, ceilings, etc. as required to install work under this section. Obtain permission from the architect prior to cutting. Do not cut or disturb structural members without prior approval from the architect. Cut holes as small as possible. General contractor shall patch walls, floors, etc. as required by work under this section. Patching shall match the original material and construction. Repair and refinish areas disturbed by work to the condition of adjoining surfaces in a manner satisfactory to the architect.

23A 1-16 ROUGH-IN

Coordinate without delay roughing-in with general construction. Conceal piping and conduit rough-in except in unfinished areas and where otherwise shown.

23A 1-17 CONCRETE BASES

Provide concrete bases for equipment where indicated on the drawings and as specified herein. Concrete bases shall have chamfered edges. Size of pad shall be a minimum of 4" greater than the footprint of the equipment that it is supporting and shall have a minimum height of 3-1/2".

Construct equipment bases and housekeeping pads shall be of a minimum 28 day, 4000 psi concrete conforming to American Concrete Institute standard building code for reinforced concrete (ACI 318-99) and the latest applicable recommendations of the ACI standard practice manual. Concrete shall be composed of cement conforming to ASTM C 150 Type I, aggregate conforming to ASTM C33, and potable water. Exposed exterior concrete shall contain 5 to 7 percent air entrainment.

Unless otherwise specified or shown on the structural drawings, reinforce equipment bases and housekeeping pads with No. 4 reinforcing bars conforming to ASTM A 615 or 6x6 - W2.9 x W2.9 welded wire mesh conforming to ASTM A185. Place reinforcing bars 24" on center with a minimum of two bars each direction.

Provide galvanized anchor bolts for equipment placed on concrete equipment bases and housekeeping pads or on concrete slabs. Anchor bolts size, number and placement shall be as recommended by the manufacturer of the equipment.

23A 1-18 STRUCTURAL STEEL

Structural steel used for support of equipment, ductwork and piping shall be new, clean, and conform to ASTM designation A-36.

Support mechanical components from the building structure. Do not support mechanical components from ceilings, other mechanical or electrical components, and other non-structural elements.

23A 1-19 ACCESS DOORS

Provide access doors in ceilings, walls, etc. where indicated or required for access or maintenance to concealed valves and equipment installed under this section. Provide concealed hinges, screwdriver-type lock, anchor straps; manufactured by Milcor, Zurn, Titus, or equal. Obtain architect's approval of type, size, location and color before ordering.

23A 1-20 PENETRATIONS

Provide sleeves for pipes passing through above grade concrete or masonry walls, concrete floor or roof slabs. Sleeves are not required for core drilled holes in existing masonry walls, concrete floors or roofs. Provide 10 gauge galvanized steel sleeves for sleeves 6" and smaller. Provide galvanized sheet metal sleeves for larger than 6". Schedule 40 PVC sleeves are acceptable for installation in areas without return air plenums.

Seal elevated floor, exterior wall and roof penetrations watertight and weathertight with non-shrink, non-hardening commercial sealant. Pack with mineral wool and seal both ends with minimum of 1/2" of sealant.

Seal around penetrations of fire rated assemblies. Coordinate fire ratings and locations with the architectural drawings. Refer to architectural specifications for fire stoppings. Provide a product schedule for UL listing, location, wall or floor rating and installation drawing for each penetration fire stop system.

Extend pipe insulation for insulated pipe through floor, wall and roof penetrations, including fire rated walls and floors. The vapor barrier shall be maintained. Size sleeve for a minimum of 1" annular clear space between inside of sleeve and outside of insulation.

Provide prefabricated roof curbs manufactured by Custom Curb, Inc., Pate Company, Thycurb or approved equal. Provide roof curb with factory installed wood nailer; welded, 18 gauge galvanized steel shell, base plate and flashing; 1-1/2" thick, 3 pound rigid insulation; fully mitered 3-inch raised cant; cover of weather-resistant, weather-proof material and pipe collar of weather-resistant material with stainless steel pipe clamps.

Provide box frames for rectangular openings welded 12 gauge galvanized steel attached to forms and of a maximum dimension established by the architect. Notify the general contractor or architect before installing any box openings not shown on the architectural or structural drawings.

Seal concrete or masonry exterior wall penetrations below grade with "wall pipes" and mechanical sleeve seals. Provide cast iron "wall pipes" with integral waterstop ring manufactured by Josam, Jay R. Smith, Wade, Watts or Zurn. Provide modular mechanical sleeve seals, manufactured by Thunderline / Link Seal, Calpico, Inc. and Metraflex.

Seal elevated concrete slab with water proof membrane penetrations with "wall pipes" and water proof sealant. Secure waterproof membrane flashing between "wall pipe" clamping flange and clamping ring. Provide cast iron "wall pipes" with integral waterstop ring manufactured by Josam, Jay R. Smith, Wade, Watts or Zurn.

Provide sleeves for horizontal pipe passing through or under foundation. Sleeves shall be cast iron soil pipe two nominal pipe sizes larger than the pipe served.

Provide Schedule 40 PVC pipe sleeves for vertical pressure pipe passing through concrete slab on grade. Sleeves shall be one nominal pipe size larger than the pipe served and two pipe sizes larger than pipe served for ductile iron pipes with restraining rods. Seal water-tight with silicone caulk.

Provide 1/2" thick cellular foam insulation around perimeter of non-pressure pipe passing thru concrete slab on grade. Insulation shall extend to 2" above and below the concrete slab.

23A 1-21 AIR FILTERS

Provide MERV 8 pleated, throwaway type filters, unless otherwise indicated. Air units shall have new filters installed when they are operated before final acceptance. Filters shall be manufactured by American Air Filter, Farr, Flanders, or approved equal.

If HVAC equipment is used during the construction period, contractor shall provide one set of filters when the unit is started and replace filters when needed, but not less than every month. Install new filters prior to testing, adjusting, and balancing work. On the day of substantial completion, the contractor shall clean the unit and provide a new set of filters in the unit before turning system over to owner.

Furnish to owner, with receipt, One set of spare filters of each type required for each unit.

23A 1-22 MOTORS AND STARTERS

Provide motors and starting equipment where not furnished with the equipment package. Motors shall have copper windings, Class B insulation, and be standard squirrel cage with starting torque characteristics suitable for the equipment served. Motors for air handling equipment shall be selected for quiet operation. Each motor shall be checked for proper rotation after electrical connection has been completed. Provide drip-proof enclosure for locations protected from weather and not in air stream of fan; and totally enclosed fan cooled enclosure for motors exposed to weather. Motors shall be manufactured by Century, General Electric, Westinghouse, Louis Allis, or approved equal.

Furnish to owner, with receipt, one complete set of belts for each relative motor utilizing a belt drive.

Provide every motor, except fractional horsepower single phase motors with an approved type of "built-in" thermal overload protection, with a motor starter. Each starter shall be provided with overload heaters sized to the motor rating, and every three phase motor starter shall have overload heaters in each phase. Ambient compensated heaters shall be installed wherever necessary. Unless noted otherwise, motor starters shall be furnished by this Divisions contractor for installation and connection by the Division 26 contractor. Starters shall be Allen-Bradley, Clark, Furnas, Square D, or approved equal.

23A 1-23 ELECTRICAL WIRING

Line Voltage control and interlock wiring shall be provided by the Division 26 contractor. Low Voltage control wiring shall be provided by the Division 23 contractor. Required conduit and rough-ins for low Voltage control wiring shall be provided by the Division 26 contractor. Furnish wiring diagrams to the Division 26 contractor as required for proper equipment hookup. Coordinate with the Division 26 contractor the actual wire sizing amps for the equipment (from the equipment nameplate) to ensure proper installation.

23A 1-24 REFRIGERANT AND OIL

Provide full refrigerant and oil charge in new air conditioning refrigeration systems, and maintain it for full term of the guarantee.

23A 1-25 FINAL TESTING AND ADJUSTMENTS

Final system testing, balancing and adjustments shall be performed by a contractor certified by the National Environmental Balancing Bureau (NEBB), Associated Air Balance Council (AABC) or other approved agency.

Perform test readings on fans, units, coils, etc. and adjust equipment to deliver specified amounts of air.

Prepare testing and balancing report log showing air supply quantities, air entering and leaving temperatures and pressures,

fan and unit test readings, motor voltage and amp draws, etc., and submit six copies of the final compilation of data to the architect for evaluation and approval before final inspection of the project. Balance air systems to within plus or minus 10 percent for terminal devices and branch lines and plus or minus 5 percent for main ducts and air handling equipment of the amount of air shown on the drawings. Further adjustments shall be made to obtain uniform temperature in spaces.

Adjust equipment to operate as intended by the specification. Align bearings and replace bearings that have dirt or foreign material in them with new bearings without additional cost to the owner. Balance contractor shall include in the report any improperly installed or missing balancing devices that would negatively impact the system operation.

Adjust thermostats and control devices to operate as intended. Adjust burners, pumps, fans, etc. for proper and efficient operation. Certify to architect that adjustments have been made and that system is operating satisfactorily. Further adjustments shall be made to obtain uniform temperature in spaces. Calibrate, set, and adjust automatic temperature controls. Check proper sequencing of interlock systems, and operation of safety controls.

23A 1-26 EQUIPMENT FURNISHED BY OTHERS

Provide necessary equipment and accessories that are not provided by the equipment supplier or owner to complete installation of cooking equipment, washing equipment, etc., furnished by others, in locations as indicated on the drawings and/or described in the general notes to this contractor. Equipment and accessories not provided by the equipment supplier may include flues, vents, intakes, associated roof jacks and caps to outdoors, dampers, in-line fans, roof fans, control interlocks, etc. as required for proper operation of the complete system in accordance with the manufacturer's instructions.

Contractor shall be responsible for correct rough-in dimensions, and shall verify same with architect and/or equipment supplier prior to service installations.

23A 1-28 BUILDING OPERATION

Comply with the schedule of operations as outlined in the architectural portions of this specification. Building shall be in continuous operation. Accomplish work requiring interruption of building operation at a time when the building is not in operation, and only with written approval of building owner and/or tenant. Coordinate interruption of building operation with the owner and/or tenant a minimum of seven days in advance of work.

23A 1-29 VIBRATION ISOLATION

Manufacturers: Provide vibration isolation equipment and materials by a single manufacturer. Approved manufacturers provided their systems are in compliance with the specified design and performance requirements include Amber Booth, Kinetics Noise Control, Mason Industries, Inc., Vibration Eliminator Co., Inc., and Vibration Mounting and Controls.

General requirements: Select vibration isolators by the weight distribution to produce uniform deflection. Vibration isolators shall have either known un-deflected heights or calibration markings so that, after adjustment, the static deflection can be verified, thus determining that the load is within the proper range of the isolator. Isolators shall operate in the linear portion of their load versus deflection curves. Spring isolators shall have 50 percent excess capacity without becoming coil bound. Coat vibration isolators with factory-applied paint. Coat vibration isolators exposed to weather and other corrosive environments with factory-applied corrosion resistance protection. Install and adjust vibration isolators in accordance with manufacturers written instructions.

Pipe connections: Provide flexible connectors for piping system connections on equipment side of shutoff valves for all pumps, mechanical equipment supported or suspended by spring isolators, and where indicated on drawings. Fabricate flexible piping connectors from stainless steel, bronze or rubber materials as suitable for system fluid. Flexible piping connectors shall be bellows, spherical or braided hose type as recommended by the manufacturer for the application.

Isolator types:

Type WP (waffle pads): Provide 5/16" thick neoprene pads ribbed or waffled on both sides. Manufacture pads with bridge bearing quality neoprene, and select for a maximum durometer of 50 and designed for 15 percent strain. Incorporate steel load-spreading plates where required between the equipment and the neoprene pad. If the isolator is bolted to the structure, install a neoprene vibration isolation washer and sleeve (Uniroyal Type 620/660 or as approved) shall be installed under the bolt head between the steel washer and the base plate. Provide Mason Industries Type W or equal.

Type SPNH (spring and neoprene hangers): Provide a steel spring in series with a neoprene isolating element. The spring shall have a minimum additional travel to solid equal to 50 percent of the specified deflection. The neoprene element shall have a static deflection of not less than 0.3" with a strain not exceeding 15 percent. Unless otherwise specified, the static deflection of SPNH hangers shall be 2". Spring diameter and hanger box hole size shall be large enough to permit the hanger rod to swing through a 30 degree arc. Provide neoprene sleeve where the lower hanger rod passes through the steel hanger box, such that the hanger rod cannot contact the steel hanger. The diameter of the clear hole in the hanger box shall be at least 3/4 inch larger than the diameter of the hanger rod. When installed, do not cock the spring element and do not allow the hanger box to rotate through a full 360 degree arc without encountering obstructions. Provide Mason Industries Type 30N or equal.

Type SPNM (spring and neoprene mounts): Provide free-standing and laterally stable steel spring without a housing. Design springs so the ratio of the horizontal to vertical spring constant is between one and two. The spring diameter shall be not less than 80% of the compressed height of the spring at rated load. Loaded springs shall have a minimum additional travel to solid equal to 50% of the specified static deflection. Unless otherwise specified, the minimum static deflection of SPNM isolators for equipment mounted on grade slabs shall be 1", and the minimum static deflection for equipment mounted above grade level shall be 2". Bond two Type WP isolation pads sandwiching a 16 gauge stainless or galvanized steel separator plate to the isolator baseplate. Unless otherwise specified, isolators need not be bolted to the floor for indoor installations. If the base plates are bolted to the structure, install a neoprene vibration isolation washer and sleeve (Uniroyal Type 620/660 or as approved) under the bolt head between the steel washer and the base plate. Provide Mason Industries Type SLFH or equal.

Type CMB (curb mounted base): Curb mounted base for roof-mounted equipment shall be a structural steel base mounted directly to the structure with an upper floating section on adjustable steel springs. The upper frame shall provide continuous support for the equipment. Steel springs shall rest on 1/4" min. thickness neoprene pads and shall have a minimum static deflection of 2" unless otherwise specified. All-directional snubber bushings shall be 1/4" minimum thickness neoprene. All hardware shall be cadmium or zinc electroplated to provide a rust resistant finish. Weather proofing shall consist of a continuous galvanized flexible counterflashing nailed over the lower curb's waterproofing and joined at the corners by EPDM bellows. All spring locations shall have access ports with removable waterproof covers to allow for adjustment or replacement of springs. Lower curbs shall have provision for 2" insulation. Duct connections shall be made using a length of flexible duct dimensioned to match the equipment opening, using a foam rubber gasket to seal against the unit bottom. Provide Mason Industries Type RSC or equal.

23A 1-30 MECHANICAL IDENTIFICATION

Provide manufacturer's standard pre-printed, semi-rigid snap-on or permanent adhesive, pressure-sensitive vinyl pipe markers. Color code pipe markers to comply with ANSI A13.1.

Install pipe markers on each HVAC piping system and include arrows to show normal direction of flow.

Locate pipe markers and color bands wherever piping is exposed to view in occupied spaces, machine rooms, accessible maintenance spaces (shafts, tunnels, plenums) and exterior non-concealed locations.

Provide plastic laminate or brass valve tag on every valve, cock and control device in each HVAC piping system; exclude check valves, valves within factory fabricated equipment units, and shut-off valves at HVAC terminal devices and similar rough-in connections of end-use fixtures and units.

Provide manufacturer's standard laminated plastic, color coded equipment markers. Conform to the following color code: green for cooling; yellow for heating; yellow/green for combination cooling and heating; brown for energy reclamation; blue for other equipment types. Conform to ANSI A13.1 for hazardous equipment.

Provide stenciled signs for equipment identification at contractor's option or where distance of required identification requires lettering larger than 1" height. Stencil paint shall be exterior type, oil-based, alkyd enamel, minimum 1-1/4" height or greater as required for long distance identification, white or black color for best contrast.

Provide duct markers or provide stenciled signs and arrows indicating ductwork service and flow direction in black or white lettering for best contrast with duct or insulation color. Locate markers maximum 50 feet along each duct side and within 5 feet of all control and balancing dampers or branch ducts more than 25 feet length and within 5 feet on each side of wall, floor, and ceiling penetrations. Provide additional markers in congested areas or at multiple duct runs as required for clarity.

23A 1-31 SEISMIC REQUIREMENTS

Seismic protection for seismic concerns of all building systems including but not limited to mechanical, plumbing, and electrical must meet minimum requirements of all applicable codes for buildings' classified seismic use group and seismic design category. Any requirements for seismic protection measures to be applied shall be installed in strict accordance with all applicable local, state, and/or federal codes and with manufacturer's requirements, the most stringent shall apply.

The contractor shall be responsible for determining the type and location of seismic restraints required for the various system's elements contained in the construction documents based on the related seismic code criteria, the size and weight of the supported element and the distance from structure that the element will be installed. If required by local, state, federal codes and/or other authority having jurisdiction the contractor shall submit descriptive catalog data of seismic restraints, shop drawings showing the types, locations and installation details of seismic restraints and calculations showing that the seismic restraints meet the seismic requirements to the local authority having jurisdiction for review and approval. Calculations shall be signed and sealed by a registered professional engineer, licensed in the state of the project location and employed by the manufacturer of the seismic restraint products. Calculations shall include dead loads, static seismic loads and capacity of materials utilized for connections to equipment and structure.

Seismic restraints, isolators, and isolation materials shall be of the same manufacturer, and shall be certified by the manufacturer. Restraining devices shall have a pre-approval number from California OSHPD or other recognized government agency showing maximum restraint ratings.

23A 2 INSULATION AND SHEET METAL WORK

23A 2-1 DUCT INSULATION

Cover concealed rigid round supply and return air ductwork, round and rectangular outside air ductwork, and round and rectangular exhaust and relief air ductwork in unconditioned spaces and within 10 feet of exterior discharge outlets with 2 1/4" thick, 3/4 pound density, minimum R-6.0 duct wrap, Certainteed or equivalent Owens-Corning or Knauf with heavy-duty foil-scrim-kraft facing, and with joints taped with 3" wide foil tape.

Where contractor has the option to provide duct liner, in lieu of duct wrap, in rectangular supply and return air ductwork. Liner shall be 2-pound density fiberglass, minimum R-6.0 CertainTeed Corp. "ToughGard" or equivalent Owens-Corning or Knauf long textile fiber duct liner. Liner surface shall serve as a barrier against infiltration of dust and dirt, shall meet ASTM C 1338 for fungi resistance and shall be cleanable using duct cleaning methods and equipment outlined by North American Insulation Manufacturers Association (NAIMA) duct cleaning guide. Install with liner adhesive and mechanical fasteners in accordance with manufacturer's instructions and recommendations. Duct dimensions listed on drawings represent the airflow free areas and do not have allowances for insulation liner, where applicable, inside the ducts, or dual wall dimensions. Ducts shall be constructed to include insulation requirements and maintain airflow dimensions indicated on plans.

Insulating materials, adhesives, coatings, etc., shall not exceed flame spread rating of 25 and smoke developed rating of 50 per ASTM E 84. Containers for mastics and adhesives shall have UL label.

For ductwork that is located exterior to the building, insulate with 2" (minimum R-8.0) thick fibrous board insulation and provide minimum 20 gauge aluminum jacket sealed with approved weatherproof sealant.
Insulating materials, adhesives, coatings, etc., shall not exceed flame spread rating of 25 and smoke developed rating of 50 per ASTM E 84. Containers for mastics and adhesives shall have UL label.

For ductwork that is located exterior to the building, insulate with 2" (minimum R-8.0) thick fibrous board insulation and provide minimum 20 gauge aluminum jacket sealed with approved weatherproof sealant.

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M3.0
MECHANICAL SPECIFICATIONS

23A 2-2 DUCTWORK

Provide galvanized steel ductwork and housings as shown on drawings. Construct ductwork including fittings and transitions in conformance with current SMACNA standards relative to gauge, bracing, joints, etc. Minimum thickness of duct shall be 26-gauge sheet metal. Reinforce housings and ductwork over 30" with 1-1/4" angles not less than 5'-6" on centers, and closer if required for sufficient rigidity to prevent vibration. Support horizontal runs of duct from strap iron hangers on centers not to exceed 8'-0". Do not support ceiling grid, conduits, pipes, equipment, etc. from ductwork. Coordinate routing of ductwork with other contractors such that piping, electrical conduit, and associated supports are not routed through the ductwork.

Construct supply ducts to meet SMACNA positive pressure of 3" w.g. Construct return, outdoor and exhaust ductwork upstream of fans to meet SMACNA negative pressure of 2" w.g. Construct exhaust ductwork downstream of fans to meet SMACNA positive pressure of 2" w.g.

Provide mill phosphatized or galvanealed finish for exposed ductwork to be field painted. Shop treated sheet metal shall have galvanized metal primer applied in the shop after fabrication and prior to shipping.

Ductwork above roof or otherwise exterior to building shall be minimum #18 gauge with longitudinal and transverse joints welded.

Seal ductwork with heavy liquid sealant, Hardcast Irongrip 601, Design Polymer DP 1010, United McGill duct sealer or approved equal, applied according to sealant manufacturer's instructions. For ducts with pressure classification of 2" w.g. and greater seal longitudinal and transverse ductwork joints airtight to meet SMACNA Class B. For ducts with pressure classification less than 2" w.g. seal transverse joints airtight to meet SMACNA Class C. Tapes and mastics shall be listed and labeled in accordance with UL 181A.

Provide radius elbows, turns, and offsets with a minimum centerline radius of 1-1/2 times the duct width. Where space does not permit full radius elbows, provide short radius elbows with a minimum of two continuous splitter vanes. Vanes shall be the entire length of the bend. Provide mitered elbows where space does not permit radius elbows, where shown on the drawings, or at the option of the contractor with the engineer's approval. Mitered elbows less than 45 degrees shall not require turning vanes. Mitered elbows 45-degrees and greater shall have single thickness turning vanes of same gauge as ductwork, rigidly fastened with guide strips in ductwork. Vanes for mitered elbows shall be provided in all supply and exhaust ductwork and in return and outside air ductwork that has an air velocity exceeding 1000 fpm. Do not install vanes in grease ductwork.

Ducts shall be connected to fans, fan casings and fan plenums by means of flexible connectors. Flexible connectors shall be neoprene coated glass cloth canvas connections, Duro-Dyne, Elgen, Ventfabric or equal. Flexible connectors shall have a flame spread of 25 or less and smoke developed rating not higher than 50. Make airtight joints and install with minimum 1-1/2" slack.

Provide balancing dampers, manufactured by Ruskin, Greenheck, Nailor Industries, Cesco, Louvers & Dampers, Pottorff or approved equal, where shown on drawings and wherever necessary for complete control of air flow. Splitter dampers shall be controlled by locking quadrants; provide Young's Regulator or Ventlok end bearings for the damper rod. Rectangular volume dampers shall be opposed blade interlocking type. Round volume dampers shall be butterfly type consisting of circular blade mounted to a solid shaft. Damper leakage for outside air dampers shall not exceed 6.5 cfm/square foot in full closed position at 4" wg pressure differential across damper. Reference manufacturer and model number for outside air dampers is Ruskin model CD-50.

Provide Flexmaster model STO or equal 45 degree rectangular/round side takeoff fitting with model SLBO double bearing damper with insulation build out for round ductwork branch takeoffs to individual air devices. Omit damper at takeoff fitting when damper is located downstream of takeoff.

Where access to dampers through a hard ceiling is required, provide a Metropolitan Air Technology model RT-250 or equal by Young's Regulator concealed, cable operated volume damper with remote operator. Damper shall be adjustable through the diffuser face or frame with standard 1/4" nutdriver or flat screwdriver. Cable assembly shall attach to damper as one piece with no linkage adjustment. Positive, direct, two-way damper control shall be provided with no sleeves, springs or screw adjustments to come loose after installation. Support cable assembly to avoid bends and kinks in cable.

Where approved by architect, a ceiling cup with cover plate can be used for access to cable operator.

Round or oval ductwork shall be Semco, United, Wesco or equal, sheetmetal, with smooth interior surface, with low pressure (duct pressure class up to and including 2" w.g.) round ductwork gauges per the following table (reference SMACNA HVAC duct construction standards for gauges when pressures exceed 2" w.g.):

Size	Duct gauge	Fitting gauge
14" & under	26	24
15" thru 26"	24	22
28" thru 36"	22	20
38" thru 50"	20	20
52" thru 60"	18	18

Provide double wall insulated round ductwork where exposed or as otherwise indicated. Fabricate double-wall insulated ducts and fittings with an outer shell, insulation, and an inner liner as specified below. At dual wall ducts, the dimension shown is the outside metal duct size and already has allowances for the insulation thickness.
Outer shell shall be 2" longer than inner shell and insulation and shall be gauge as specified for single wall duct.
nside dimensions. Outer shell shall be 2" longer than inner shell and insulation and shall be gauge as specified for single wall duct.

Insulation shall be fiberglass with thickness as required for thermal resistance of R-6.

Perforated inner liner shall be 24 gauge up to 34 inches, 22 gauge from 35 to 58 inches, and 20 gauge above 60 inches. Provide 3/32" perforations with an overall open area of 23 percent.

Maintain concentricity of liner to outer shell by mechanical means. Retain insulation from dislocation by mechanical means.

Lindab Spirosafe, Lewis & Lambert or approved equal factory manufactured round ductwork and fittings may be substituted for specified round branch ductwork, at contractor's option. Heavy liquid joint sealant may be omitted on factory-manufactured round ductwork.

Low pressure (duct pressure class up to and including 2" w.g.) fittings 24" in diameter and less shall be prefabricated, spotwelded and internally sealed. Continuously weld fittings larger than 24" in diameter. Fitting gauge shall be 22 gauge for 36" fittings and under, 20 gauge for larger sizes. 90 degree tee's shall be conical type. Seal longitudinal and transverse ductwork joints airtight with heavy liquid sealant applied according to manufacturer's instructions. Provide gauge thickness in medium pressure (duct pressure class 3" to 6" w.g.) Ductwork as recommended by SMACNA.

At contractor's option, provide Ductmate, Gripple, or approved equal wire rope duct hanging system. Provide Ductmate WR10 through WR40 or gripple No. 1 through No. 5 wire rope using 7x7 or 7x19 aircraft quality zinc coated cable or galvanized steel wire rope. Secure wire rope to duct using Ductmate Clutcher or Gripple Hang Fast adjustable rope attachment. Where applicable for upper attachment, provide Ductmate EZ-Lock wire rope beam clamp with locking nut adjustment or Gripple ceiling, beam, or purlin clips. Wire rope, adjustable duct attachment, and upper attachment to structure shall each have minimum 5 to 1 load safety factor.

23A 2-3 FLEXIBLE DUCT

Low pressure (duct pressure class up to and including 2" w.g.) and medium pressure (duct pressure class 3" to 6" w.g.) flexible duct shall be Flexmaster Type 8B, Thermaflex Type G-KM, M-KE, or equal (fire retardant polyethylene) protective vapor barrier, UL181 Class 1,

acoustical insulated duct, R-6.0 fiberglass insulation. Provide CPE liner with steel wire helix mechanically locked or permanently bonded to the liner.

High pressure (duct pressure class over 6" w.g.) flexible duct shall be Flexmaster Type 4B, Thermaflex Type M-KC, or equal (fire retardant polyethylene) protective vapor barrier, UL181 Class 1, acoustical insulated duct, steel wire helix core, mechanical lock construction, R-6.0 fiberglass insulation. Connect each end with stainless steel screw operated metal draw bands.

Flexible duct runs shall not exceed 5 feet in length, and shall be installed fully extended and straight as possible avoiding tight turns. Install flexible duct in accordance with manufacturer's instructions. Support flexible duct at maximum 5 feet on center and within 6 inches of bends. Bends shall not exceed a centerline radius of one duct diameter. Duct sag shall not exceed 1/2". Supporting material in direct contact with the duct shall not be less than 1-1/2" in width.

Connect flexible duct to rigid metal duct or air devices as recommended by the manufacturer. At a minimum, install two wraps of duct tape around the inner core connection and a metallic or non-metallic clamp over the tape and two wraps of duct tape or a clamp over the outer jacket. Duct clamps shall be labeled in accordance with UL-181b and marked 181b-c. Duct tape shall be labeled in accordance with UL 181b and marked 181b-fx.

23A 2-4 FLUES

Where flues are indicated on the drawings, provide Selkirk Metalbestos model QC or RV or equal by Metal-Fab, Simpson or Van-Packer, Type "B" double wall gas vent flues from the various items of gas-fired equipment up to flue caps above the roof. Single wall flues are unacceptable. Flues shall be complete with necessary fittings, connectors, flashing cone, storm collar, thimble supports, guy wires, and other accessories, and shall be installed as recommended by the manufacturer, and in conformance with applicable codes. Flash flues watertight at the roof line.

23A 2-5 SPECIAL GAS FLUES

Where special gas flues are indicated on the drawings, provide Selkirk Metalbestos model DCV double wall or equal by Heat-Fab Type 29-4c stainless steel special gas vent. Flues shall be complete with necessary fittings, connectors, flashing cone, storm collar, thimble supports, guy wire, and other accessories, and shall be installed as recommended by the manufacturer, and in compliance with applicable codes.

23A 2-6 CONDENSING GAS FURNACE AND APPLIANCE VENT

Vents and combustion air ducts for condensing type appliances shall be Schedule 40 PVC, DWV, meeting ASTM D1784 Grade 1, Type 1, with dimensions meeting ASTM D2665. Fittings shall be DWV, PVC meeting ASTM D2665 with solvent cement socket joints. Solvent used for joints shall meet ASTM D2564.

23A 2-7 AIR DEVICES

Provide air devices as scheduled on drawings, manufactured by Carnes, Price, Krueger, Nailor Industries, Titus, or Tuttle & Bailey. Select air devices to limit room noise level to no higher than NC-30 unless otherwise shown. Provide devices with a soft plastic gasket to make an airtight seal against the mounting surface. Coordinate final location, frame, and mounting type of air devices with architectural reflected ceiling plans.

Submit complete shop drawings including information on noise level, pressure drop, throw, cfm for each air device, styles, borders, etc. clearly marked with specified equipment number. Submit samples of each air device as requested by the engineer.

Provide wall supply air registers with double deflection blades and opposed blade dampers unless indicated otherwise. Provide wall return air grilles and exhaust air registers with horizontal 35 or 45 degree angle vision-proof bars. Provide concealed fasteners for wall mounted registers and grilles.

Provide ceiling supply air registers of aluminum curved blade type with blades parallel to long dimension and with throw pattern as indicated on drawings.

Provide opposed blade dampers for supply air registers and exhaust air registers unless indicated otherwise.

Provide ceiling supply air diffusers and return air grilles of lay-in or surface mounted type as required to be compatible with ceiling construction. Provide ceiling diffusers and grilles with white enamel finish unless noted otherwise.

Provide linear slot diffusers of standard one-piece lengths up to 6-feet and furnish in multiple sections greater than 6-feet. Join multiple sections together end-to-end with alignment pins to form a continuous slot appearance. Provide alignment components by the manufacturer. Provide plenums by the slot diffuser manufacturer.

Provide drop box diffusers with minimum 22 gauge galvanized steel construction, factory assembled and welded, and provided with standard duct connections and mounting brackets for field installation. Diffusers shall have double deflection grilles or drum louvers that are individually adjustable to customize horizontal and vertical throws and factory installed air diverters or turning vanes. Insulate diffusers with 1" thick, 1.5 lb duct liner insulation.

Provide factory primed and painted diffusers, color as selected by the architect.

Provide drop box diffusers as manufactured by AES Industries, Can Fab, Custom Curb, Inc. or Plenums, Inc.

23A 2-8 FIRE DAMPERS

Provide fire dampers where shown on drawings, and as required by code enforcing authority. Damper ratings shall be as required to maintain the fire and/or smoke ratings noted on the architectural drawings. Provide fire dampers conforming to NFPA-90a and UBC standard 43-7 with recommended steel sleeves of length as required to meet the installed location, 165 degrees Fahrenheit fusible link, spring catches and non-corrosive bearings. Dampers shall be UL listed, manufactured by Ruskin, Greenheck, Air Balance, Cesco, United Air or Nailor Industries.

Provide access door, sized per SMACNA with minimum size of 10" by 10", in duct for inspection and service to fire damper and fusible link. Provide duct access door(s) within 12 inches of the device to allow for testing and maintenance. Label each door (with minimum 1" lettering) indicating which damper type is served. Door should be capable of being fully opened or provide removable door. Provide removable section of duct where duct size is too small for 10" by 10" access door. Provide access door in ceiling or wall as required to access damper.

23A 2-9 COMBINATION FIRE/SMOKE DAMPERS

Provide combination fire/smoke dampers where shown on drawings and as required by code enforcing authority with fire/smoke ratings as required to maintain the fire rating noted on the architectural drawings. Dampers shall meet UL 555 classification for fire rating and UL 555s classification of leakage class ii smoke damper; damper shall bear a UL label attesting to these classifications.

Provide fire damper with a 165 degrees Fahrenheit resettable temperature device. Rate fire/smoke dampers for a minimum velocity of 2,000 fpm and pressure of 4" w.g. Provide manufacturer recommended steel sleeve of length as required to meet the installed location.

Provide a qualified 24 volt electric actuator installed by the manufacturer at time of damper fabrication. Actuators shall be rated for a minimum of 20,000 cycles of operation, shall comply with the locally adopted building code and shall open in 15 seconds or less and close in 15 seconds or less after alarm or smoke detection has occurred. Provide stainless steel spring loaded leakage seals in sides of casing, and

Damper shall be manufactured by Ruskin, Air Balance, Greenheck, Cesco, United Air or Nailor Industries.

Provide access door, sized per SMACNA with minimum size of 10" by 10", in duct for inspection and service to fire damper and fusible link. Provide duct access door(s) within 12 inches of the device to allow for testing and maintenance. Label each door (with minimum 1" lettering) indicating which damper type is served. Door should be capable of being fully opened or provide removable door. Provide removable section of duct where duct size is too small for 10" by 10" access door. Provide access door in ceiling or wall as required to access damper.

23A 2-10 LOUVERS, PLENUMS, SCREENS

Provide intake and exhaust air louvers by Ruskin model ELF375DX or equal Greenheck, American Warming & Ventilating, Cesco, Industrial Louvers or Louvers & Dampers as scheduled on the drawings. Coordinate exact size and location with architectural drawings. Louvers shall be stationary, with mill finish. Louvers shall have extruded aluminum blades, 0.080" wall thickness, 45 degree blade angle, blades on 5" centers; frame shall be extruded aluminum, 0.080" wall thickness; with expanded flattened aluminum insect screen. Provide louvers with a minimum free area of 45 percent, with a maximum air pressure drop of 0.1" at scheduled airflow.

Construct plenums with galvanized steel framing members and galvanized sheetmetal, braced with galvanized angles. Gauges and bracing shall conform to SMACNA recommendations for ductwork of like sizes. Where access doors are shown, provide hinged doors with #202 Ventlok latch. Make watertight connections to louvers, sloping bottom of plenum to drain water to weepholes in bottom of louver.

Provide screens on louvers, ducts, hoods, fans, and openings to the outdoors as scheduled and/or noted on the drawings. Insect screens shall be 0.009 thickness, 1/4" mesh, stainless steel wire. Bird screens shall be 0.047-inch, 1/2" mesh stainless steel wire.

23A 2-11 DUCT SILENCERS

Provide duct silencers as scheduled on drawings, manufactured by I.A.C., Aerosonics, Dynasonics or Vibro-Acoustics. Silencers shall be rated for low frequency attenuation and low air pressure drop.

23A 2-12 ROOF MOUNTED INTAKE AIR AND RELIEF AIR HOODS

Provide air intake and relief hoods as scheduled on drawings. Hoods shall be low silhouette, aluminum, square curb cap, with birdscreen, roof curb, and barometric or motorized backdraft damper as scheduled. Manufactured by Cook, Greenheck, Acme, Carnes, Cesco or equal.

23A 2-13 EXHAUST AIR SYSTEMS

Provide roof mounted exhaust fans as scheduled on the drawings, or equal manufactured by Cook, Greenheck, Carnes, Twin City Fans, Acme or Penn-Barry complete with aluminum housing, aluminum centrifugal wheel, motor with integral thermal overload protection, disconnect switch mounted inside the housing, birdscreen, backdraft damper, and pate prefabricated roof curb with minimum height of 12" inches for roofs with no insulation, 15" for roofs with insulation or as scheduled on the drawings. Three phase fans shall be furnished with magnetic starters with push button station.

Provide roof mounted upblast exhaust fans as scheduled on the drawings, or equal manufactured by Cook, Greenheck, Carnes, Twin City Fans, Acme or Penn-Barry complete with aluminum housing, aluminum centrifugal wheel, motor with integral thermal overload protection, disconnect switch mounted inside the housing, drain trough, birdscreen and pate prefabricated roof curb with minimum height of 12" inches for roofs with no insulation, 15" for roofs with insulation or as scheduled on the drawings. Exhaust fans serving Type I kitchen exhaust hoods shall discharge a minimum of 40" above the roof surface, shall have hinged access including access for blade inspection and cleaning per NFPA 96, grease drain trough with cup and insulated curb, and shall be installed in accordance with NFPA 96 and local codes.

Provide wall mounted exhaust fans as scheduled on the drawings, or equal manufactured by Cook, Greenheck, Carnes, Twin City Fans, Acme or Penn-Barry heavy-duty wall-mounted propeller fans, complete with belt drive with minimum of two belts, ball bearing supported fan shaft, ball bearing motor, magnetic starter, inlet screen, and motor-operated shutter. Inlet louvers shall be Ruskin ELF81 with heavy duty motor operated damper, Ruskin CD35 with parallel blades and Honeywell M-445 damper motor. Provide transformer for damper motors if different voltage.

Provide ceiling mounted exhaust fans as scheduled on the drawings, or equal manufactured by Cook, Greenheck, Carnes, Twin City Fans, Acme or Penn-Barry complete with isolated blower unit and ceiling grille. Provide disconnect switch, backdraft damper, discharge duct,

wall louver, and neoprene vibration isolators with all-thread hanging rods.

Provide in-line (duct) mounted exhaust fans as scheduled on the drawings, or equal manufactured by Cook, Greenheck, Carnes, Twin City Fans, Acme or Penn-Barry complete with isolated blower unit and ceiling grille. Provide backdraft damper, discharge duct,

wall louver, and vibration isolation as scheduled or shown on the drawings.

23A 3 HVAC EQUIPMENT

Provide UL listed smoke detectors as required by code to shut down rooftop unit upon detection of smoke. Division 28 contractor shall provide and wire UL listed duct type smoke detectors as required by code to shut down rooftop unit upon detection of smoke

23A 4 TEMPERATURE CONTROLS

23A 4-1 GENERAL REQUIREMENTS

Provide a system of temperature controls including thermostats, control panels, time switches, override timers, damper motors, and relays required to provide the desired sequence of operation. Contract with Building Owner's Building Automation System contractor for new devices, programming, and interconnection with the existing BAS system. Provide integrated wiring diagrams showing interconnections between field installed equipment and package wiring furnished with the HVAC equipment.

Provide supervision and on-job checkout service as required to ensure that installation meets requirements of the specification. The system shall be guaranteed for a period of one year following the acceptance of the system by the architect/engineer. Correct defects occurring during this period at no additional cost to the owner.

23A 4-2 EQUIPMENT

Manufacturers and model numbers are listed for reference as to quality and features required for the control devices. Provide control devices by Barber-Colman, Alerton, Honeywell, Johnson Controls, Carrier, Trane or White Rodgers with quality and features as indicated.

Low voltage type non-programmable heating and cooling thermostats shall be Honeywell series T FocusPro 5000 or equal with integral subbase.

23A 6 ALTERNATES

23A 6-1 DESCRIPTION

Provide all work contemplated under the different alternates to include labor, materials, equipment and services necessary for and incidental to the completion of work under each particular alternate. Furnish separate bids for each alternate applicable to contractor's proposal, stating the amount to be added or deducted from the base bid in case the alternate is accepted. Comply with applicable sections of the base specifications for work required by the alternate unless otherwise specified. Refer to the architectural portion of the specification.

END OF SECTION 23A

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JOB 22151
REVISION

M3.1
MECHANICAL SPECIFICATIONS

GENERAL POWER NOTES

1	ALL RECEPTACLES SHALL BE GROUNDING TYPE.
2	ALL RECEPTACLES INSTALLED IN BATHROOMS, OUTDOORS AND KITCHENS SHALL HAVE GROUND-FAULT CIRCUIT INTERRUPTER PROTECTION AS REQUIRED BY THE NATIONAL ELECTRIC CODE.
3	COORDINATE MECHANICAL EQUIPMENT CONNECTION REQUIREMENTS WITH MECHANICAL CONTRACTOR PRIOR TO ROUGH-IN. LOCATE FEEDERS, DISCONNECTS AND MAINTENANCE RECEPTACLES SO THAT THEY WILL NOT INTERFERE WITH OPERATION OR MAINTENANCE OF MECHANICAL EQUIPMENT.
4	PROVIDE POWER TO MECHANICAL, PLUMBING, AND ALL OTHER EQUIPMENT AS REQUIRED FOR PROPER OPERATION. COORDINATE AND VERIFY EACH PIECE OF EQUIPMENTS POWER/CONTROL REQUIRMENTS PRIOR TO ORDERING RELATED ELECTRICAL EQUIPMENT. REFER TO RELATED MECHANICAL, PLUMBING, AND OTHER RELATED DOCUMENTS FOR LOCATIONS OF EQUIPMENT AND REQUIRED CLEARANCES AROUND EQUIPMENT.
5	COORDINATE EXACT MOUNTING HEIGHT OF EACH ABOVE COUNTER RECEPTACLE WITH ARCHITECT AND OWNER PRIOR TO ROUGH-IN.
6	ALL OUTLETS LOCATED IN AREAS REQUIRING GROUND-FAULT CIRCUIT INTERRUPTER PROTECTION PER NEC-210 SHALL CONSIST OF A GFCI PROTECTED DEVICE, EVEN IF NOT SPECIFICALLY INDICATED IN THE DRAWINGS. THE GROUND-FAULT CIRCUIT INTERRUPTER SHALL BE INSTALLED IN A READILY ACCESSIBLE LOCATION AS DEFINED IN THE NEC. ALL RECEPTACLES SUPPLIED THROUGH A GROUND-FAULT CIRCUIT INTERRUPTER SHALL BE MARKED "GFCI PROTECTED."
7	COORDINATE EXACT LOCATION OF ALL FLOOR BOXES WITH ARCHITECT AND OWNER PRIOR TO ROUGH-IN. VERIFY EACH TYPE OF FLOOR BOX WITH INTENDED USE AND INSTALLATION, COORDINATE THIS WITH THE CONSTRUCTION OF FLOOR TYPE TO BE INSTALLED IN PRIOR TO ROUGH-IN SO AS TO ENSURE A CLEAN AND PROPER INSTALLATION. FOR INSTALLATIONS IN CONTRETE SLAB WITH OVERLAY OF CARPET, WOOD, AND/OR OTHER SIMILAR MATERIALS. LEAVE A 48"X48" BLOCK OUT WHEN FLOOR IS POURED SO THAT FINAL LOCATION OF FLOOR BOX MAY BE DETERMINED IN THE FIELD.
8	PROVIDE TAMPER RESISTANT RECEPTACLES AS REQUIRED BY THE 2014 NEC. PROVIDE AFCI PROTECTION AND COMBINATION-TYPE ARC/GFI PROTECTION AS REQUIRED BY 2014 NEC INCLUDING KITCHEN AND LAUNDRY AREAS.

GENERAL LIGHTING NOTES

1	WHERE RECESSED LIGHTING FIXTURES ARE INDICATED IN A FIRE RATED CEILING, PROVIDE A ONE HOUR RATED "TENT" FOR FIXTURE
2	PROVIDE ALL MOUNTING AND SUPPORT HARDWARE FOR LIGHT FIXTURES TO MEET SPECIFIED MOUNTING HEIGHTS, REFER TO ARCHITECTURAL ELEVATIONS FOR EXACT MOUNTING HEIGHTS OF FIXTURES.
3	CONNECT "UN-SWITCHED" HOT CONDUCTOR FROM CIRCUIT SERVING SPACE LIGHTING TO EACH EXIT SIGN, EMERGENCY LIGHT, AND ANY FIXTURE DESIGNATED AS NIGHT LIGHT SERVING THE SPACE.
4	COORDINATE ALL DEVICES AND WALL-MOUNTED LIGHT FIXTURE LOCATIONS WITH THE ARCHITECTURAL WALL FINISHES AND ELEVATIONS. SPECIAL ATTENTION AND COORDINATION OF WALL TYPES AND FINISHES IS REQUIRED PRIOR TO ROUGH-IN. EXACT LOCATION OF DEVICES SHALL BE COORDINATED WITH THE ARCHITECT PRIOR TO ROUGH-IN TO AVOID INSTALLATION ON SPECIAL ARCHITCTURAL WALL FINISHES. DEVICES NOT PROPERLY COORDINATED WITH THE SPECIAL WALL FINISHES INDICATED IN THE CONSTRUCTION DOCUMENTS PRIOR TO ROUGH-IN SHALL BE RELOCATED AT NO ADDITIONAL COST TO THE OWNER.
5	ELECTRICAL CONTRACTOR SHALL VERIFY CHEVRON DIRECTIONS OF ALL EXIT SIGNS PRIOR TO ORDERING.
6	FOR BATTERY FED EMERGENCY LIGHTS: PROVIDE EMERGENCY BALLAST. PROVIDE "HOT" WIRE TO EMERGENCY BALLAST. SWITCH FIXTURE AS INDICATED ON PLANS.
7	COORDINATE AND PROVIDE DIMMER SWITCHES RATED FOR AND COMPATABLE WITH INTENDED LIGHT FIXTURE(S) TO BE CONTROLLED. CIRCUITS CONTROLLED WITH LINE-VOLTAGE DIMMER SWITCHES SHALL NOT SHARE NEUTRAL CONDUCTORS.

GENERAL LOW VOLTAGE NOTES

1	PROVIDE 4'WIDE X 4'TALL X 3/4" FIRE RATED, PAINTED CDX PLYWOOD BACKBOARD WHERE SHOWN ON DRAWINGS OR AS REQUIRED FOR TELEPHONE, CATV, ALARM SYSTEM EQUIPMENT, ECT. COORDINATE EXACT LOCATION(S) WITH RESPONSIBLE CONTRACTOR(S).
2	PROVIDE (1) 1/2" CONDUIT, AND 4" SQUARE BOX WITH SINGLE GANG DEVICE RING FOR ALL THERMOSTAT LOCATIONS INDICATED ON THE MECHANICAL DRAWINGS. ROUTE CONDUIT FROM BOX TO ACCESSIBLE CEILING CAVITY. PROVIDE PLASTIC BUSHINGS ON EXPOSED CONDUIT ENDS. PROVIDE PULL STRING IN ALL EMPTY CONDUIT SYSTEMS. COORDINATE EXACT LOCATIONS AND MOUNTING HEIGHTS WITH MECHANICAL CONTRACTOR PRIOR TO ROUGH-IN.
3	PROVIDE CABLE HOOKS ABOVE CEILING ON 6' CENTERS IN ALL CORRIDORS. MOUNT 6 INCHES ABOVE CEILING.
4	PROVIDE ROUGH-IN OF ALL BACK BOXES, CONDUITS (WITH BUSHINGS AND PULL STRINGS) AND OTHER WIRE WAYS AS REQUIRED FOR LOW VOLTAGE SYSTEMS, COORDINATE ALL REQUIRED LOCATIONS WITH OWNER AND RESPONSIBLE CONTRACTOR(S).
5	FURNISH AND INSTALL A TELEPHONE SERVICE CONDUIT(S) PER TELEHONE SERVICE PROVIDER SPECIFICATIONS. STUB UP AT DESIGNATED EQUIPMENT BOARD.
6	FURNISH AND INSTALL ONE #6 COPPER INSULATED GROUND WIRE FROM THE ELECTRICAL SERVICE GROUND TO THE TELEPHONE EQUIPMENT BOARD. LEAVE 36" EXTRA WIRE AT FREE END.
7	FURNISH AND INSTALL A CABLE TV SERVICE PER CABLE TV PROVIDER SPECIFICATIONS. STUB UP AT DESIGNATED LOCATION.
8	PROVIDE BACK BOX AND CONDUIT TO ABOVE THE ACCESSIBLE CEILING AS REQUIRED FOR THE HVAC BUILDING AUTOMATION SYSTEM DEVICES. COORDINATE EXACT LOCATIONS AND OTHER REQUIREMENTS WITH RELATIVE MEP DRAWINGS AND THE CONTROLS CONTRACTOR PRIOR TO ROUGH-IN. THERMOSTATS, TEMPERATURE SENSORS, STATIC PRESSURE SENSORS, HUMIDISTATS, ETC. SHALL BE INSTALLED AT THE SAME ELEVATION AS THE LIGHT SWITCHES UNLESS REQUIRED OTHERWISE.

GENERAL ELECTRICAL NOTES

1	DRAWINGS ARE DIAGRAMMATIC ONLY AND REPRESENT THE GENERAL SCOPE OF THE WORK. REVIEW ALL GENERAL NOTES, SPECIFICATIONS AND PLANS FOR ADDITIONAL REQUIREMENTS THAT MAY NOT BE SPECIFICALLY CALLED OUT IN THIS PORTION OF THE CONSTRUCTION DOCUMENTS.
2	SPECIAL ATTENTION SHALL BE GIVEN TO ALL RACEWAYS WITHIN FINISHED AREAS WITHOUT CEILINGS AND EXPOSED TO STRUCTURE. IN GENERAL, ALL RACEWAYS SHALL BE CONCEALED WITHIN WALLS, ABOVE STRUCTURE FINISH, OR BELOW FLOOR SLABS WHEN SPECIFIED. WHERE EXPOSED CONDITIONS ARE NECESSARY OR UNAVOIDABLE DUE TO OTHER CONDITIONS, THE BID SHALL INCLUDE ANY REASONABLE MEANS TO MINIMIZE THE AMOUNT OF SURFACE MOUNTED EQUIPMENT. PRIOR TO ROUGH-IN, COORDINATE ALL EXPOSED RACEWAY AND BOX CONDITIONS WITH ARCHITECT PRIOR TO CONSTRUCTION OF WALLS, ROOF DECK, OR FLOOR SLABS. ATTACHMENT TO ROOF DECK OR JOIST WEBBINGS IS NOT ALLOWED, MAINTAIN A MINIMUM SPACING OF 1-1/2" FROM CONDUIT TO ROOF DECK. IN AREAS WHERE EXPOSED RACEWAYS ARE REQUIRED, INSTALL SYSTEMS SQUARE AND TIGHT TO STRUCTURE AND PAINT TO MATCH THE STRUCTURE PER ARCHITECT AND/OR OWNER SPECIFICATIONS. FAILURE TO PROPERLY COORDINATE THE ROUTING OF EXPOSED RACEWAYS MAY RESULT IN RELOCATION OF SUCH RACEWAYS AT NO ADDITIONAL COST TO THE OWNER.
3	OPENINGS AROUND ELECTRICAL PENETRATIONS THROUGH FIRE-RESISTANT-RATED WALLS, PARTITIONS, FLOORS OR CEILINGS SHALL BE FIRESTOPPED USING APPROVED METHODS TO MAINTAIN THE FIRE RESISTANCE RATING. PROVIDE PENETRATION FIRE STOPPING WITH RATINGS DETERMINED PER ASTM E 814 OR UL 1479. FIRE STOPPING SHALL NOT BE LESS THAN FIRE RESISTANCE RATING OF CONSTRUCTED PENETRATIONS.
4	FIELD MOUNTED DEVICES SUCH AS SWITCHES, MOTOR STARTERS, RECEPTACLES, ETC., ARE SHOWN IN THEIR APPROXIMATE LOCATION. SWITCH MOUNTING HEIGHT SHALL BE 48" ABOVE FINISHED FLOOR AND RECEPTACLE MOUNTING HEIGHT SHALL BE 18" ABOVE FINISHED FLOOR UON. REFER TO THE TYPICAL MOUNTING HEIGHT DETAIL.
5	INSTALL EQUIPMENT IN A MANNER TO REMAIN ACCESSIBLE WITH REASONABLE MEANS BY THE OWNER FOLLOWING COMPLETION OF WORK. SPECIAL ATTENTION AND ADDITIONAL COORDINATION IS EXPECTED IN AREAS OF THE BUILDING WHERE THE CEILING AND STRUCTURE HEIGHTS HAVE SIGNIFICANT DIFFERENT ELEVATIONS. EQUIPMENT REQUIRING POSSIBLE FUTURE ACCESS SHALL BE INSTALLED SUCH THAT IT MAY BE SAFELY ACCESSED FROM A STANDARD STEP LADDER OR PERSONNEL LIFT SUITABLE FOR THE LOCATION AND CEILING HEIGHT, WITHOUT REMOVING OR DAMAGING THE CEILING GRID STRUCTURE.
6	COORDINATE ALL CEILING MOUNTED ELECTRICAL ITEMS WITH OTHER DISCIPLINES, WITH CEILING, AND STRUCTURE. REFER TO ARCHITECTURAL REFLECTED CEILING PLAN.
7	FIELD VERIFY LOCATIONS OF EXISTING ELECTRICAL EQUIPMENT, INCLUDING POWER POLES, TELEPHONE PEDESTALS, OVERHEAD AND UNDERGROUND FEEDERS, METERS, PANELS, DEVICES, ETC. PROVIDE FOR COORDINATION WITH EXISTING EQUIPMENT.
8	ROOM NAMES/NUMBERS SHOWN IN PANELBOARD SCHEDULES ARE PER ARCHITECTURAL FLOOR PLANS. CONTRACTOR SHALL PROVIDE FINALIZED PANELBOARD SCHEDULES AT COMPLETION OF PROJECT WITH OWNER PROVIDED ROOM NAMES/NUMBERS.
9	CONDUCTORS FOR BRANCH CIRCUITS AS DEFINED IN ARTICLE 100, SHALL BE SIZED TO PREVENT A VOLTAGE DROP EXCEEDING 3% AT THE FARTHEST LOAD, AND WHERE THE MAXIMUM TOTAL VOLTAGE DROP ON BOTH FEEDERS AND BRANCH CIRCUITS TO THE FARTHEST LOAD DOES NOT EXCEED 5%.
10	ALL WORK IS TO BE PERFORMED IN STRICT COMPLIANCE WITH THE NATIONAL ELECTRICAL CODE, STATE LAWS, ALL AUTHORITIES HAVING JUISDICTION, AND ALL OTHER REGULATIONS GOVERNING WORK OF THIS NATURE.
11	THE CONTRACTOR IS RESPONSIBLE FOR ALL WORK, MATERIAL, AND LABOR TO SATISFY A COMPLETE AND WORKING SYSTEM WHETHER SPECIFIED OR IMPLIED.
12	CONTRACTOR TO CONFIRM EXACT LOCATION OF EXISTING AND NEW EQUIPMENT.
13	THE CONTRACTOR SHALL FURNISH AND INSTALL ALL GROUNDING SYSTEMS (AS REQUIRED) IN ACCORDANCE WITH THE NATIONAL ELECTRIC CODE.
14	ALL ELECTRIC MATERIALS AND EQUIPMENT FOR THE PROJECT SHALL BE NEW AND U.L. OR EQUALLY LISTED.
15	SUBMIT TO THE OWNER CERTIFICATES OF INSPECTIONS IN DUPLICATE FROM AN APPROVED INSPECTION AGENCY UPON COMPLETION.
16	THE CONTRACTOR SHALL SECURE ALL PERMITS OR APPLICATIONS AND PAY ANY AND ALL FEES AS REQUIRED,
17	THE CONTRACTOR SHALL FURNISH ALL INSTRUMENTS AND QUALIFIED PERSONNEL OR FIRM TO PERFORM ALL REQUIRED TESTS.

GENERAL ELECTRICAL NOTES

18	NO EQUIPMENT SHALL BE ENERGIZED UNTIL ALL TEST AND ADJUSTMENTS HAVE BEEN MADE. THREE COPIES OF ALL TEST RESULTS SHALL BE DELIVERED TO THE OWNER
19	ALL ELECTRICAL WORK SHALL BE COORDINATED WITH THE MECHANICAL WORK AS CALLED FOR IN MECHANICAL SPECIFICATIONS AND PLANS.
20	JUNCTION BOXES LOCATED ABOVE GRID CEILINGS SHALL BE LOCATED NO GREATER THAN 4-FEET ABOVE THE CEILING IN A LOCATION ACCESSIBLE VIA A LADDER FROM THE ROOM BELOW.
21	ALL WIRING DEVICE COVERPLATES SHALL INDICATE PANELBOARD AND CIRCUIT SERVING THE DEVICE. UTILIZE CLEAR VINYL (BLACK LETTERING) IDENTIFICATION LABLES MANUFACTURED BY 3M COMPANY (OR APPROVED EQUIVALENT).
22	THE TYPE OF CONDUIT SHALL BE AS FOLLOWS FOR ALL FEEDERS AND DISTRIBUTION CIRCUITS, UNLESS OTHERWISE SPECIFIED. APPLICATION - TYPE OF CONDUIT BURIED IN CONCRETE OR OUTDOORS - PVC WITH RIGID GALVANIZED STEEL ELBOWS SERVICE ENTRANCE - GALVANIZED RIGID STEEL OR SERVICE UTILITY SPECIFICATIONS.
23	UNLESS NOTED OTHERWISE PROVIDE MINIMUM #8 AWG CONDUCTORS IN 1" CONDUIT(S) FOR ALL UNDERGROUND SITE POWER AND LIGHTING CIRCUITS. INCREASE CONDUCTOR AND RELATED CONDUIT SIZE AS NOTED OR OTHERWISE REQUIRED TO LIMIT VOLTAGE DROP TO LESS THAN 5% FOR THE ENTIRE LENGTH OF SYSTEM.
24	UNDERGROUND UTILITIES/FEEDERS/BRANCH CIRCUITS/ETC. SHALL NOT BE ROUTED THROUGH OR WITHIN 25 FEET OF ANY AREAS DEDICATED FOR FUTURE BUILDING ADDITION.
25	DESIGNIATED SPARE CIRCUIT BREAKERS SHALL BE PLACED IN THE OFF POSITION
26	PROVIDE SPD AS REQUIRED FOR OWNER PROVIDED EQUIPMENT, INCLUDING BUT NOT LIMITED TO THE FOLLOWING: ACCESS CONTROL SYSTEM, COMMUNICATION SYSTEM, DATA SYSTEM, SECURITY SYSTEM.

EXISTING ELECTRICAL AND DEMOLITION NOTES

1	PRIOR TO SUBMITTING BID, VISIT THE JOB SITE AND BECOME FULLY ACQUAINTED WITH THE EXISTING CONDITIONS OF THE FACILITY AND RELATED SITE. REVIEW THE GENERAL NOTES AND ALL OTHER TRADE DRAWINGS FOR ADDITIONAL REQUIREMENTS THAT MAY NOT BE CALLED OUT IN THIS PORTION OF THE CONSTRUCTION DOCUMENTS. NOTIFY ARCHITECT, ENGINEER OR OWNER, AS SPECIFIED, OF ANY CONFLICTS OR DISCREPANCIES PRIOR TO SUBMITTING BID.
2	ANY EXISTING CONDITIONS REFLECTED WERE TAKEN FROM ORIGINAL DRAWINGS AND SITE VISITS AND MAY NOT REFLECT EXACT "AS-BUILT" CONDITIONS. FIELD VERIFY ALL EXISTING CONDITIONS AND CAREFULLY COORDINATE NEW WORK AND DEMOLITION WITH ALL OTHER DISCIPLINES AND EXISTING CONDITIONS.
3	PROVIDE ALL DEMOLITION OF EXISTING ELECTRICAL SYSTEMS AND NEW ELECTRICAL SYSTEM MODIFICATIONS REQUIRED BECAUSE OF BUILDING REMODELING, AS NOTED ON THE DRAWINGS, OR NECESSARY FOR PROPER OPERATION AND NEW CONSTRUCTION. REMOVE ALL ABANDONED CABLES AND WIRING ABOVE ACCESSIBLE CEILINGS AND VENTILATION SHAFTS.
4	COORDINATE INTERUPTION OF ALL BUILDING SERVICES INCLUDING BUT NOT LIMITED TO BRANCH CIRCUITS, DATA, TELEPHONE, ETC WITH BUILDING OWNER PRIOR TO INTERUPTION. PROVIDE LABOR AND MATERIALS AS REQUIRED TO REDUCE INTERUPTIONS IN ORDER TO MAINTAIN EXISTING OPERATION.
5	PAY SPECIAL ATTENTION NOT TO DAMAGE THE FINISH OF EXISTING WALLS AND CEILINGS THAT ARE TO REMAIN WHEN REMOVING OR REPLACING LIGHT FIXTURES AND OTHER ELECTRICAL DEVICES. REPAIR ANY DAMAGE CAUSED DURING WORK AT NO EXTRA COST TO THE OWNER. REFER TO ARCHITECTURAL DRAWINGS FOR ADDITIONAL INFORMATION.
6	RELOCATE ALL EXISTING ELECTRICAL, FIRE ALARM, AND OTHER LOW-VOLTAGE SYSTEMS REQUIRED TO BE IN OPERATION AT SUBSTANTIAL COMPLETION OF THE CONTRACT, IF REQUIRED, AS A RESULT OF WORK INCLUDED UNDER THIS CONTRACT, EVEN IF NOT SPECIFICALLY INDICATED IN THE DRAWINGS OR SPECIFICATIONS.
7	SEAL ALL PENETRATIONS THROUGH FLOORS, WALLS, CEILINGS, AND ROOF WHERE ELECTRICAL COMPONENTS ARE REMOVED AND WHERE THE EXISTING PENETRATION IS NOT USED FOR THE NEW INSTALLATION. REPAIR DAMAGED SURFACES TO MATCH ADJACENT AREAS OR AS DIRECTED BY THE OWNER.
8	UNLESS NOTED OTHERWISE, ABANDONED CONDUIT ASSEMBLIES SERVING DEMOLISHED DEVICES SHALL BE REMOVED BACK TO NEAREST JUNCTION BOX OUTSIDE OF AREA OF DEMOLITION AND LABLED AS REQUIRED FOR FUTURE USE. ASSOCIATED WIRING SHALL BE REMOVED BACK TO SERVING PANELBOARD, UPDATE PANELBOARD CIRCUIT DIRECTORY AS REQUIRED TO INDICATE RELATED CIRCUIT(S) AS "SPARE".
9	ANY PANELBOARD CIRCUIT DISCRIPTIONS SHOWN AS "existing" OR IN OTHER LOWER CASE LETTERING IS INTENDED TO REFLECT AN EXISTING CIRCUIT TO REMAIN UNLESS OTHERWISE IDENTIFIED DIFFERENTLY THRU THE COURSE OF CONSTRUCTION.
10	ALL CIRCUIT BREAKERS SERVING BRANCH CIRCUITS TO BE REMOVED SHALL REMAIN IN RESPECTIVE PANELBOARD FOR FUTURE USE UNLESS NOTED OTHERWISE.
11	EXISTING DEVICES ARE SHOWN LIGHT. NEW DEVICES ARE SHOWN BOLD.

ABBREVIATIONS

AC	ABOVE COUNTER	IG	ISOLATED GROUND
AFF	ABOVE FINISHED FLOOR	MCC	MOTOR CONTROL CENTER
CB	CIRCUIT BREAKER	NEC	NATIONAL ELECTRICAL CODE
E	EXISTING	NEMA	NATIONAL ELECTRICAL MANUFACTURERS ASSOC.
EC	ELECTRICAL CONTRACTOR	NIC	NOT IN CONTRACT
EP	EXPLOSION PROOF	NL	NIGHT LIGHT
GFI	GROUND FAULT CIRCUIT INTERRUPTER	UG	UNDERGROUND
GR	GROUND	UON	UNLESS OTHERWISE NOTED
HP	HORSE POWER	WP	WEATHERPROOF
		WR	WEATHER RESISTANT

WIRING

- WIRING CONCEALED IN CEILING OR WALLS UON. ALL WIRE IS NUMBER #12 AWG MINIMUM.
- EXPOSED RACEWAY.
- UNDERGROUND RACEWAY; TYPE, SIZE, CONDUCTORS, AND ARRANGEMENT BY NOTATION OR SCHEDULE.

SWITCHES

$* SWITCH MOUNTED AT +48"; SINGLE POLE UON. LOWER CASE LETTER, WHEN PRESENT, INDICATES FIXTURES CONTROLLED.

* ABBREVIATIONS FOR SWITCH

2	DOUBLE POLE SWITCH
3	3-WAY SWITCH
4	4-WAY SWITCH
D	DIMMER SWITCH (SHALL BE COMPATABLE WITH FIXTURE BEING DIMMED)
F	FAN SWITCH: DUAL OPERATION WITH DIMMER
K	KEYED SWITCH
M	MOTOR RATED SWITCH
OS	DUAL TECHNOLOGY OCCUPANCY SENSOR
V	VOLUME CONTROL SWITCH

◇OS CEILING MOUNTED DUAL TECHNOLOGY OCCUPANCY SENSOR WITH SPARE DRY CONTACTS. HUBBELL OMNIDIARP SERIES

RECEPTACLES

- DUPLEX RECEPTACLE (NEMA 5-20R)
- DUPLEX RECEPTACLE (NEMA 5-20R); MOUNTED 8" ABOVE COUNTERTOP.
- U (ALL RECEPTACLE TYPES) WITH USB CHARGING PORTS
- GFI DUPLEX RECEPTACLE (NEMA 5-20R), SELF-TEST TYPE
- GFI DUPLEX RECEPTACLE (NEMA 5-20R), SELF-TEST TYPE; MOUNTED 8" ABOVE COUNTERTOP.
- QUADRUPLEX RECEPTACLE (TWO NEMA 5-20R)
- SPECIAL RECEPTACLE: VERIFY NEMA TYPE WITH MANUFACTURER
- TV TELEVISION: PROVIDE HUBBELL NSAV62M JUNCTION BOX (OR EQUAL) WITH 1/2" CONDUIT FOR POWER AND 1" CONDUIT (WITH PULL STRINGS) FOR A/V ROUTED TO ACCESSIBLE CEILING SPACE. PROVIDE CONNECTIONS FOR POWER, DATA, COAX, AND HDMI. MOUNT AT +60" AFF UNO. CONFRIM HEIGHTS WITH ARCHITECT PRIOR TO ROUGH-IN.
- SINGLE RECEPTACLE (NEMA 5-20R)
- SPLIT WIRED DUPLEX RECEPTACLE (NEMA 5-20R)
- DIRECT EQUIPMENT CONNECTION: VERIFY CONNECTION DETAILS WITH MANUFACTURER
- FLOOR BOX: HUBBEL 3SFBSS WITH 3SFBC COVER. ON FLOOR LEVELS WITH ACCESSIBLE SPACE BELOW, USE POKE-THRU STYLE FLOOR BOXES: HUBBELL PT2X2 SERIES. SEE ARCHITECTURAL PLANS FOR LOCATION UON.
- CEILING MOUNTED RECEPTACLE(NEMA 5-20R)

PANELS AND MISC.

- LIGHT OR POWER PANEL
- J 4x4 JUNCTION BOX.
- EQUIPMENT DISCONNECT: INTERIOR DISCONNECTS SHALL BE NEMA 1 TYPE. EXTERIOR DISCONNECTS SHALL BE NEMA 3R TYPE. SIZE AS INDICATED IN THE PLANS AND PER NAMEPLATE RATING.
- PHONE/DATA: PROVIDE 4"X4", 30-1/4 CUBIC INCH OUTLET BOX AT 8" ABOVE COUNTER (UON) WITH (2) 3/4" CONDUITS (WITH PULL STRINGS) ROUTED TO ACCESSIBLE CEILING SPACE. PROVIDE SINGLE GANG MUD RING WITH BLANK COVER. PROVIDE PLASTIC BUSHINGS ON EXPOSED CONDUIT ENDS. WIRING BY OTHERS.
- PHONE/DATA: PROVIDE 4"X4", 30-1/4 CUBIC INCH OUTLET BOX AT +18" (UON) WITH (2) 3/4" CONDUITS (WITH PULL STRINGS) ROUTED TO ACCESSIBLE CEILING SPACE. PROVIDE SINGLE GANG MUD RING WITH BLANK COVER. PROVIDE PLASTIC BUSHINGS ON EXPOSED CONDUIT ENDS. WIRING BY OTHERS.
- PHONE/DATA: PROVIDE 4"X4", 30-1/4 CUBIC INCH OUTLET BOX IN CEILING. PROVIDE SINGLE GANG MUD RING WITH BLANK COVER. WIRING BY OTHERS.
- TV TELEVISION: PROVIDE 4X4 JUNCTION BOX WITH (2) 3/4" CONDUITS (WITH PULL STRINGS) ROUTED TO ACCESSIBLE CEILING SPACE. PROVIDE SINGLE GANG MUD RING WITH BLANK COVER. CONFRIM HEIGHTS WITH ARCHITECT PRIOR TO ROUGH-IN.
- S CEILING MOUNTED SPEAKER
- CR CARD READER: REFER TO SYSTEM PLANS AND SPECIFICATIONS. AT EACH DOOR WITH A CARD READER PROVIDE ALL ELECTRICAL CONNECTIONS FOR DOOR HARDWARE SYSTEMS AS REQUIRED TO MAKE A COMPLETE OPERATIONAL SYSTEM. WHERE REQUIRED, BACK TO BACK 2"X4" BOXES ARE ALLOWED FOR CARD READER AND PUSH TO EXIT SWITCH. PROVIDE POWER TO THE LOCK SYSTEM IN THE I.T. ROOM WHERE NEEDED BY CONTRACTOR INSTALLING SYSTEM.

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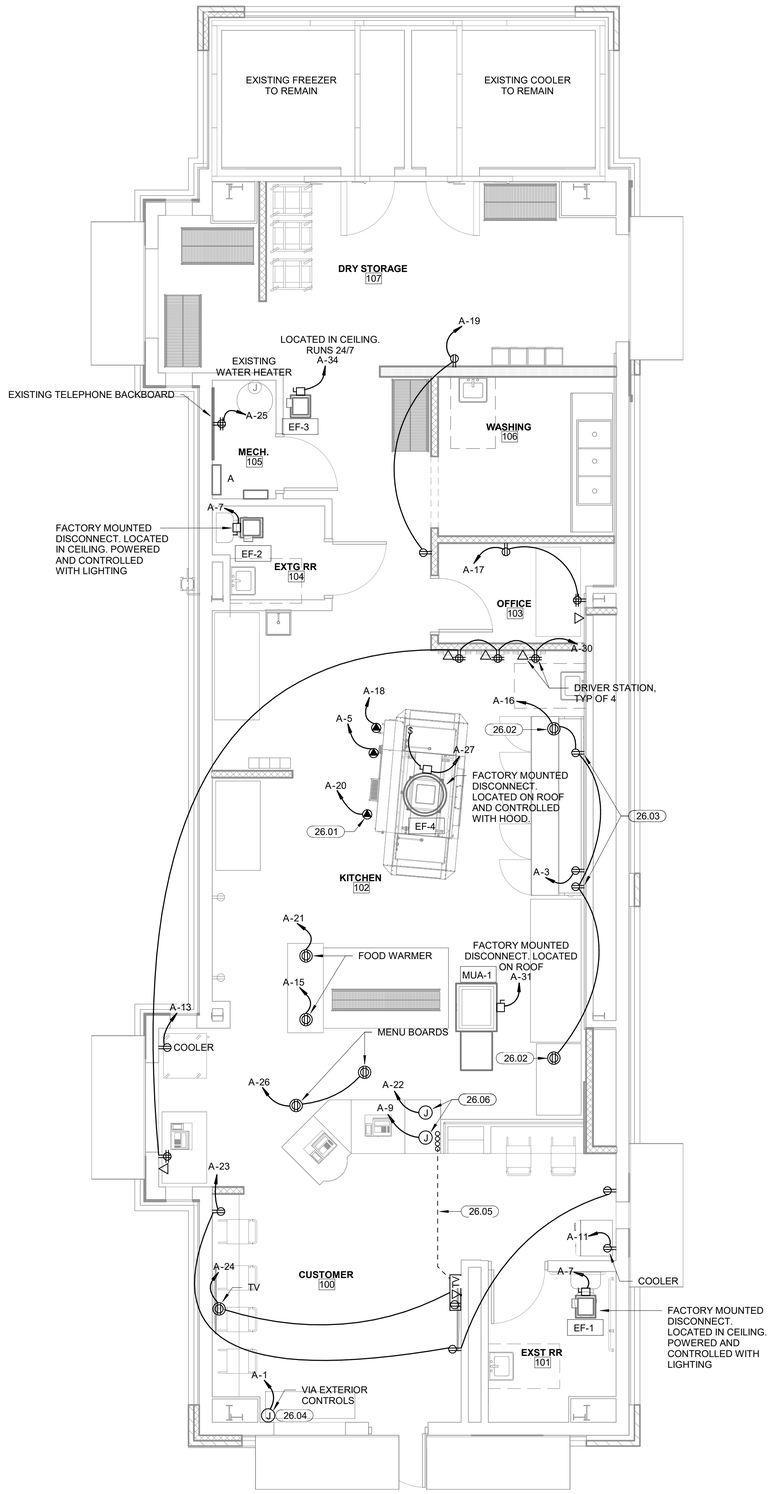
E1.0

ELECTRICAL NOTES AND LEGEND



1 *POWER PLAN*
1/4" = 1'-0"

Branch Panel: A — EXISTING

Location: ELECTRICAL ROOM
Supply From: UTILITY
Mounting: SURFACE
Enclosure: NEMA 1

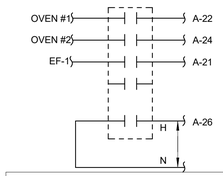
Volts: 120/208 Wye
Phases: 3
Wires: 4

A.I.C. Rating: FULLY RATED
Mains Type: MLO
Mains Rating: 400 A

Notes:

CKT	Load Name	CB	P	Wire	A		B		C		Wire	P	CB	Load Name	CKT
1	SIGN (2,10,11)	20	1		1200	1140					--	2	20	walk-in freezer compressor	2
3	MAKE LINE COOLER (4,11)	20	1				1560	1140							4
5	OVEN CONVEYOR (2,11)	20	1						500	1140	--	2	20	walk-in cooler compressor	6
7	LIGHTING (11)	20	1		1589	1140									8
9	ORDER STATION (4,11)	20	1				800	480			--	1	20	walk-in freezer evap	10
11	COOLER (4,11)	20	1						360	480	--	1	20	walk-in cooler evap	12
13	COKE COOLER (4,11)	20	1		900	900					--	1	20	r & l walk in coolers	14
15	FOOD WARMER (4,11)	20	1				925	1720				1	20	MAKE LINE RECEPTACLES (4,11)	16
17	OFFICE RECEPTACLES (11)	20	1						720	1440		1	20	OVEN CONVEYOR (2,11)	18
19	GENERAL RECEPTACLE (11)	20	1		720	500						1	20	HOOD CONTROL PANEL (3,11)	20
21	FOOD WARMER (4,11)	20	1				925	800				1	20	ORDER STATION (4,11)	22
23	LOBBY RECEPTACLES (11)	20	1						1080	860		1	20	TV & CEILING RECEPTACLE (4,11)	24
25	TELEPHONE BOARD	20	1		360	1000						1	20	MENU BOARD/COUNTER (4,11)	26
27	EF-4 (11)	20	1				559	180				1	20	r: kitchen	28
29	EXTERIOR LIGHTING (10,11)	20	1						560	1440		1	20	DRIVER STATIONS (4,11)	30
31	MAU-1 (11)	25	1	10	1828	180						1	20	r: kitchen	32
33	SPACE	--	1	--			--	94				1	20	EF-3 (11)	34
35	SPACE	--	1	--					--	100	--	1	20	facp	36
37					0	0					--	1	20	SPARE	38
39	SPD (11)	30	3	--			0	0			--	1	20	SPARE	40
41									0	0	--	1	20	SPARE	42
43	SPACE	--	1	--	--	10920									44
45	SPACE	--	1	--			--	10920			--	3	20	rtu-1	46
47	SPACE	--	1	--					--	10920					48
49	SPACE	--	1	--	--	--					--	1	--	SPACE	50
51	SPACE	--	1	--			--	--			--	1	--	SPACE	52
53	SPACE	--	1	--					--	--	--	1	--	SPACE	54
55	SPACE	--	1	--	--	--					--	1	--	SPACE	56
57	SPACE	--	1	--			--	--			--	1	--	SPACE	58
59	SPACE	--	1	--					--	--	--	1	--	SPACE	60
61	r:rtu-1	20	1	--	180	--					--	1	--	SPACE	62
63	SPACE	--	1	--			--	--			--	1	--	SPACE	64
65	SPACE	--	1	--					--	1800	--	1	20	w/h	66
67	SPACE	--	1	--	--	--					--	1	--	SPACE	68
69	SPACE	--	1	--			--	--			--	1	--	SPACE	70
71	SPACE	--	1	--					--	--	--	1	--	SPACE	72
73	SPACE	--	1	--	--	--					--	1	--	SPACE	74
75	SPACE	--	1	--			--	--			--	1	--	SPACE	76
77	SPACE	--	1	--					--	--	--	1	--	SPACE	78
79	SPACE	--	1	--	--	--					--	1	--	SPACE	80
81	SPACE	--	1	--			--	--			--	1	--	SPACE	82
83	SPACE	--	1	--					--	--	--	1	--	SPACE	84
					Total Load:		22558 VA		20103 VA		21400 VA				
					Total Amps:		190 A		168 A		180 A				

Load Classification	Connected Load	Demand Factor	Estimated Demand	Panel Totals	
Lighting	1962 VA	125.00%	2453 VA		
Power	7908 VA	100.00%	7908 VA	**Total Conn. Load:**	64060 VA
Receptacle	12930 VA	88.67%	11465 VA	**Total Est. Demand:**	63086 VA
				Total Conn. Current:	178 A
				Total Est. Demand...	175 A



NOTE: HOOD CONTROLS SHALL OPERATE SUCH THAT AUTOMATIC HEAT SENSOR OR THE MANUAL EVACUATION BUTTON WILL ENERGIZE THE EXHAUST FAN AND DE-ENERGIZE THE EQUIPMENT UNDER THE HOOD AS WELL AS THE GAS SERVING THE PIZZA OVEN. CONTRACTOR SHALL PROVIDE ALL LABOR AND MATERIALS AS REQUIRED FOR A COMPLETE FUNCTIONAL SYSTYEM.

3 *HOOD CONTROL PANEL DETAIL*
12" = 1'-0"

KEYNOTES

26.01	HOOD CONTROL PANEL. REFER TO DETAIL ON THIS SHEET FOR ADDITIONAL INFORMATION.
26.02	E.C. TO PROVIDE DEVICE SHOWN. MOUNT DEVICE ABOVE SOFFIT. COORDINATE REQUIREMENTS AND EXACT LOCATION IN FIELD.
26.03	PROVIDE RECESSED CLOCK DUPLEX RECEPTACLE AT 36" AFF.
26.04	E.C. SHALL PROVIDE JUNCTION BOX FOR EXTERIOR BUILDING MOUNTED SIGN. COORDINATE EXACT LOCATION PRIOR TO INSTALLATION.
26.05	E.C. SHALL PROVIDE (4) 1" CONDUITS UNDER SLAB. (2) FOR POWER TO P.O.S. AND (2) FOR VOICE/DATA AT P.O.S. ROUTE UP WALL AS NECESSARY.
26.06	CONNECT TO PRE-INSTALLED DEVICE IN MILLWORK.

POWER PLAN NOTES

VERIFY LOCATION AND ELECTRICAL REQUIREMENTS OF ALL KITCHEN EQUIPMENT WITH OWNER AND EQUIPMENT NAMEPLATE INFORMATION PRIOR TO ROUGH-IN.

AHU AND MAU PROVIDED WITH FACTORY MOUNTED DISCONNECT.

OPENINGS AROUND ELECTRICAL PENETRATIONS THROUGH FIRE-RESISTANT-RATED WALLS, PARTITIONS, FLOORS OR CEILING SHALL BE FIRESTOPPED USING APPROVED METHODS TO MAINTAIN THE FIRE RESISTANCE RATING. PROVIDE PENETRATION FIRE STOPPING WITH RATINGS DETERMINED PER ASTM E 814 OR UL 1479. FIRE STOPPING SHALL NOT BE LESS THAN FIRE RESISTANCE RATING OF CONSTRUCTED PENETRATIONS.

COORDINATE MOUNTING HEIGHTS FOR POWER ASSOCIATED WITH TV OUTLETS WITH ARCHITECT PRIOR TO ROUGH-IN.

ALL RECEPTACLES PER NEC 210.8(B)(2) IN KITCHEN/FOOD AND BEVERAGE AREAS SHALL BE GFCI PROTECTED. FOR ANY RECEPTACLE NOT ACCESSIBLE DUE TO EQUIPMENT LOCATION, PROVIDE GFCI PROTECTION AT THE CIRCUIT BREAKER.

E.C. TO COORDINATE FINAL MOUTING HEIGHT OF DRIVER STATION PRIOR TO ROUGH-IN.

EXHAUST FANS HAVE FACTORY INSTALLED DISCONNECT. REFER TO MECHANICAL PLANS FOR EXHAUST FAN CONTROLS.

PANELBOARD NOTES (#)

1. TERMINATE GROUND ON ISOLATED GROUND BUS.
2. INSTALL LOCKING DEVICE FURNISHED WITH PANELBOARD (LOCK-OFF FOR MAINTENANCE).
3. INSTALL LOCKING DEVICE FURNISHED WITH PANELBOARD (LOCK-ON FOR CRITICAL LOAD).
4. GFI BREAKER FOR PERSONNEL PROTECTION (5mA).
5. GFI BREAKER FOR EQUIPMENT PROTECTION (30mA).
6. CONDUCTOR SIZE SHOWN IN PANEL SCHEDULE HAS BEEN INCREASED FOR VOLTAGE DROP. SIZE EQUIPMENT GROUND PROPORTIONALLY PER NEC. REFERENCE GROUND WIRE SIZING CHART.
7. REFER TO FAULT CURRENT SCHEDULE FOR AVAILABLE FAULT CURRENT FOR INTERRUPT RATINGS.
8. REFER TO ONE-LINE DIAGRAM FOR WIRE SIZES.
9. FACTORY WIRED TO LOAD.
10. THRU CONTROLLER. REFER TO LIGHTING CONTROLLER DETAIL.
11. ADD NEW CIRCUIT BREAKER TO EXISTING PANEL. NEW CIRCUIT BREAKER SHALL MATCH AIC RATING, MANUFACTURER, AND TYPE OF EXISTING CIRCUIT BREAKERS.
12. MATCH AIC RATING OF SERVICING DEVICE.

EQUIPMENT GROUNDING CONDUCTOR SIZING CHART

BRKR AMPS		WIRE SIZE				
15-20	PHASE	12	10	8	6	4
	GROUND	12	10	8	6	4
25-30	PHASE	10	8	6	4	3
	GROUND	10	8	6	4	3
35-50	PHASE	8	6	4	3	2
	GROUND	10	8	4	4	4
60	PHASE	6	4	3	2	1
	GROUND	10	6	6	4	4
70	PHASE	6	4	3	2	1
	GROUND	8	4	4	3	2
80-90	PHASE	4	3	2	1	1/0
	GROUND	8	6	4	4	3
100	PHASE	3	2	1	1/0	2/0
	GROUND	8	6	4	4	3

PER NEC 250.122(B)

CIRCUIT DESCRIPTIONS SHOWN AS "existing" OR IN LOWER CASE LETTERS INDICATE AN EXISTING CIRCUIT BREAKER TO REMAIN AND IS BASED ON ORIGINAL BUILDING PLANS, PANEL SCHEDULES AND BREAKER ARRANGEMENTS AT THE TIME OF THE SITE VISIT.

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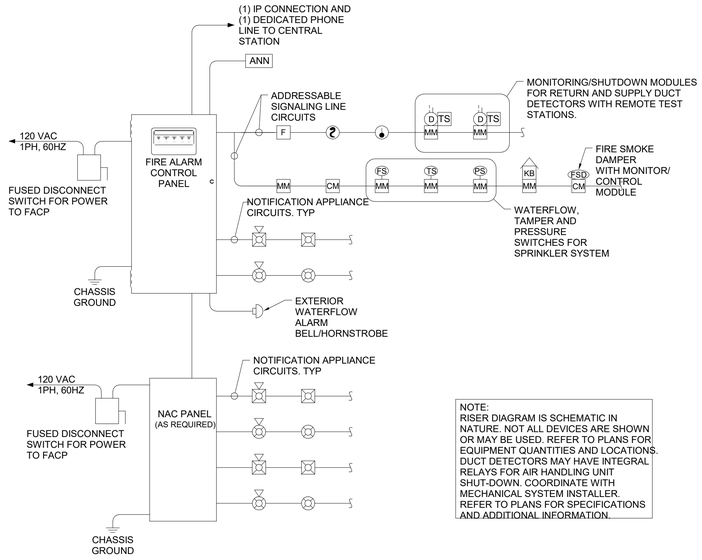
E1.1
POWER PLAN



NOTE:
RISER DIAGRAM IS SCHEMATIC IN NATURE. NOT ALL DEVICES ARE SHOWN OR MAY BE USED. REFER TO PLANS FOR EQUIPMENT QUANTITIES AND LOCATIONS. DUCT DETECTORS MAY HAVE INTEGRAL RELAYS FOR AIR HANDLING UNIT SHUT-DOWN. COORDINATE WITH MECHANICAL SYSTEM INSTALLER. REFER TO PLANS FOR SPECIFICATIONS AND ADDITIONAL INFORMATION.

3 TYPICAL FIRE ALARM RISER DETAIL
N.T.S.

FIRE ALARM LEGEND

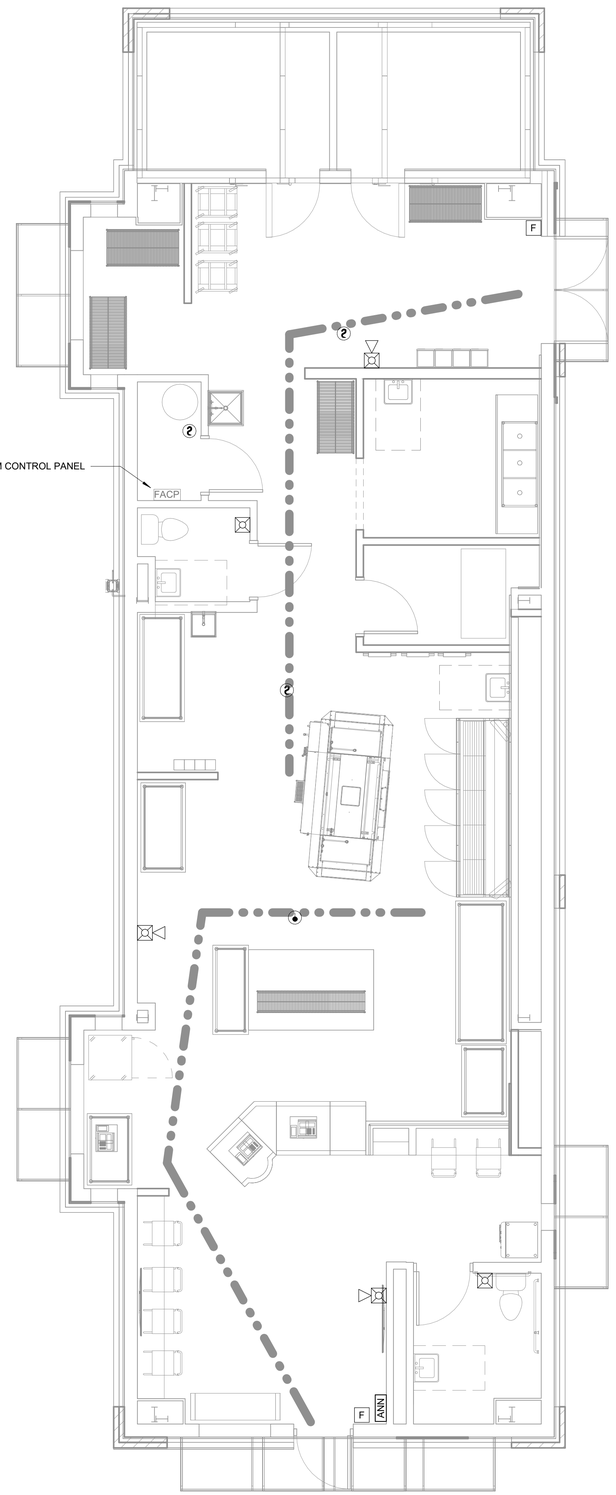
(2)	SMOKE DETECTOR
(H)	HEAT DETECTOR
(D)	DUCT DETECTOR
	WALL MOUNT HORN STROBE
	CEILING MOUNT HORN STROBE
	WALL MOUNT STROBE
	CEILING MOUNT STROBE
F	PULL STATION
ANN	FIRE ALARM ANNUNCIATOR PANEL
FACP	FIRE ALARM CONTROL PANEL
FS	SPRINKLER FLOW SWITCH
TS	SPRINKLER TAMPER SWITCH
MM	FIRE ALARM MONITOR MODULE
CM	FIRE ALARM CONTROL MODULE

FIRE ALARM INSTALLATION NOTES

1	SYSTEM SHALL BE INSTALLED IN CONFORMANCE WITH NFPA 72 AND LOCAL CODES AND REGULATIONS. ALL EQUIPMENT AND MATERIALS SHALL BE UL LISTED AND APPROVED BY THE AUTHORITY HAVING JURISDICTION
2	INTERFACE WITH AND MONITOR ALL FIRE SUPPRESSION SYSTEM DEVICES INCLUDING (BUT NOT LIMITED TO) SPRINKLER FLOW AND TAMPER SWITCHES
3	WIRE AND CABLE SHALL BE UL LISTED AND LABELED AS COMPLYING WITH NFPA 70, ARTICLE 760. SIGNALING LINE CIRCUITS TO BE TWISTED, SHIELDED PAIR, SIZED AS RECOMMENDED BY SYSTEM MANUFACTURER. NON-POWER-LIMITED CIRCUITS TO BE SOLID-COPPER CONDUCTORS WITH 600-V RATED, 75 DEG C, COLOR-CODED INSULATION. 9.1 LOW-VOLTAGE CIRCUITS: NO. 16 AWG, MINIMUM 9.2 LINE-VOLTAGE CIRCUITS: NO. 12 AWG, MINIMUM
4	INSTALL AND TEST SYSTEMS ACCORDING TO NFPA 72. COMPLY WITH NECA 1
5	TEST ALL SYSTEM DEVICES FOR PROPER OPERATION IN THE PRESENCE OF THE AHJ AND OTHER OFFICIALS INSPECTING THE FIRE ALARM SYSTEM
6	IF REQUIRED BY THE LOCAL AHJ, EQUIPMENT DATA SHEETS AND BATTERY CALCULATIONS IN ACCEPTANCE WITH NFPA 72 SHALL BE PERFORMED BY THE FIRE ALARM SYSTEM MANUFACTURER/INSTALLER TO MATCH EQUIPMENT TO BE INSTALLED
7	SYSTEM INSTALLER SHALL BE A LICENSED FIRE ALARM CONTRACTOR IN THE RESPECTIVE STATE OF THIS PROJECT

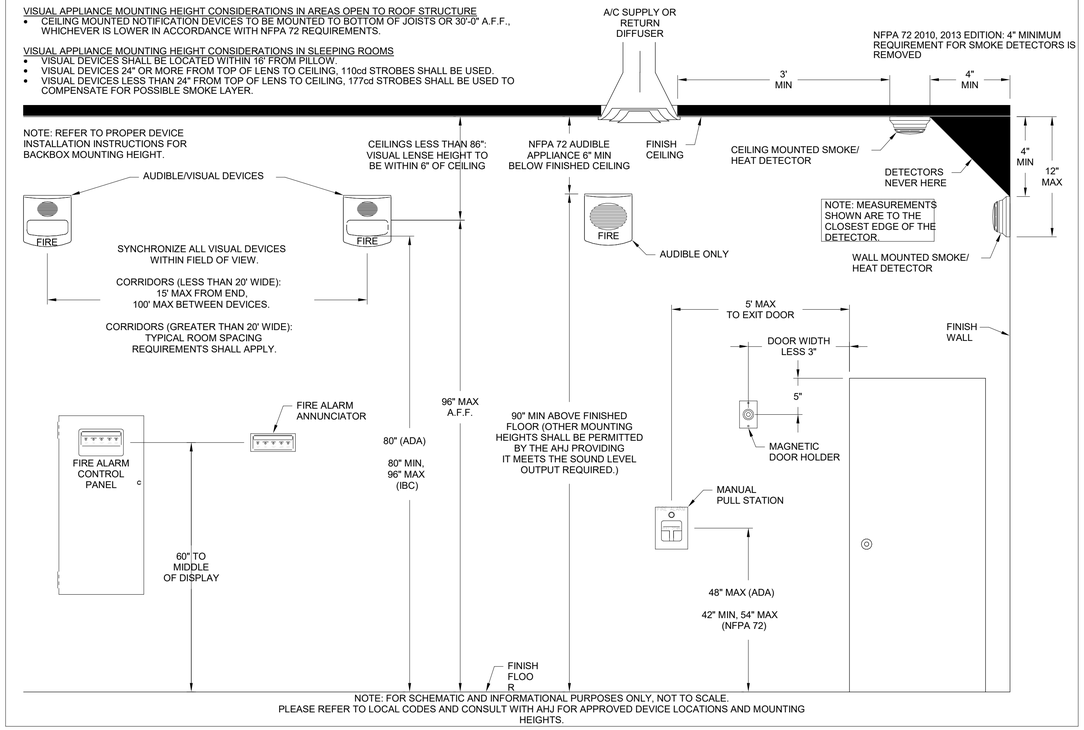
FIRE ALARM GENERAL NOTES

1	FIRE ALARM SYSTEM DESIGN, INSTALLATION AND MATERIALS SHALL BE IN ACCORDANCE WITH NFPA 70 AND NFPA 72. SYSTEM SHALL ALSO MEET ALL APPLICABLE BUILDING CODES. FIRE CODES AND THE REQUIREMENTS OF THE AUTHORITY HAVING JURISDICTION AND INSURANCE CARRIER. VERIFY REQUIREMENTS PRIOR TO BID SUBMITTAL
2	INFORMATION ON CONTRACT DOCUMENTS IS GENERAL INFORMATION AND FOR BID PURPOSES ONLY. PERFORM REQUIRED CALCULATIONS AND COORDINATE WITH OTHER TRADES. DEVIATIONS FROM ENGINEERS LAYOUT WILL NOT BE CONSIDERED UNLESS A FORMALLY SUBMITTED RFI IS RECEIVED AND APPROVED
3	PROVIDE ADDITIONAL MATERIALS AND LABOR REQUIRED DUE TO LACK OF COORDINATION OR TO MEET AUTHORITY HAVING JURISDICTION AND INSURANCE CARRIER REQUIREMENTS AT NO ADDITIONAL COST TO THE OWNER
4	PROVIDE ALL EQUIPMENT AND LABOR REQUIRED FOR A COMPLETE AND OPERATIONAL FIRE ALARM SYSTEM
5	AUDIBLE NOTIFICATION DEVICES SHALL SOUND UNTIL SILENCED AT THE CONTROL PANEL OR REMOTE ANNUNCIATOR AS REQUIRED. VISUAL ALARM IS DISPLAYED UNTIL DEVICE IS RETURNED TO ITS NORMAL POSITION OR SUPERVISORY CONDITION IS CLEARED
6	FORWARD COMPLETED FIRE ALARM CERTIFICATE OF COMPLETION TO THE OWNER
7	PROVIDE NOTIFICATION, INITIATING AND MONITORING DEVICES AS INDICATED ON THE DRAWINGS. FIRE ALARM DEVICES SHALL BE OF ONE MANUFACTURER AND SHALL BE LISTED FOR USE WITH THE FIRE ALARM CONTROL PANEL
8	PROVIDE NOTIFICATION APPLIANCE CIRCUIT PANEL(S) TO POWER NOTIFICATION DEVICES AS REQUIRED. CONNECT TO FIRE ALARM SYSTEM
9	THE FIRE ALARM CONTROL PANEL AND REMOTE ANNUNCIATOR LOCATIONS SHOWN SHALL BE COORDINATED WITH THE FIRE DEPARTMENT AND AHJ PRIOR TO INSTALLATION
10	AIR HANDLING SYSTEMS THAT ARE MONITORED SHALL SHUTDOWN AND REMAIN DOWN UNTIL MANUALLY RESET



1 FIRE ALARM PLAN
1/4" = 1'-0"

FIRE ALARM DEVICE MOUNTING HEIGHTS (PER NFPA 72)



2 FIRE ALARM MOUNTING HEIGHTS
12" = 1'-0"

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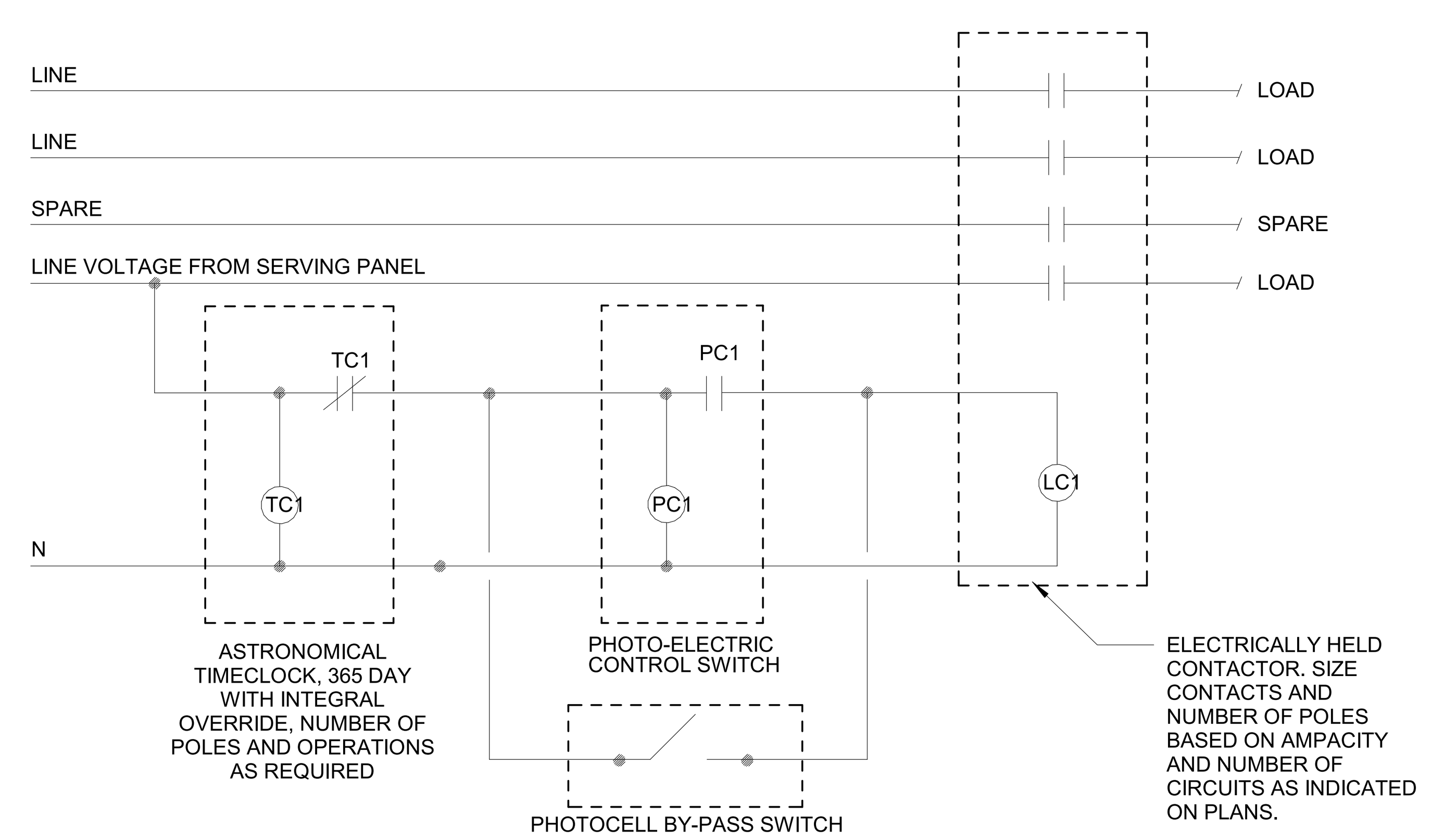
E1.2
FIRE ALARM PLAN

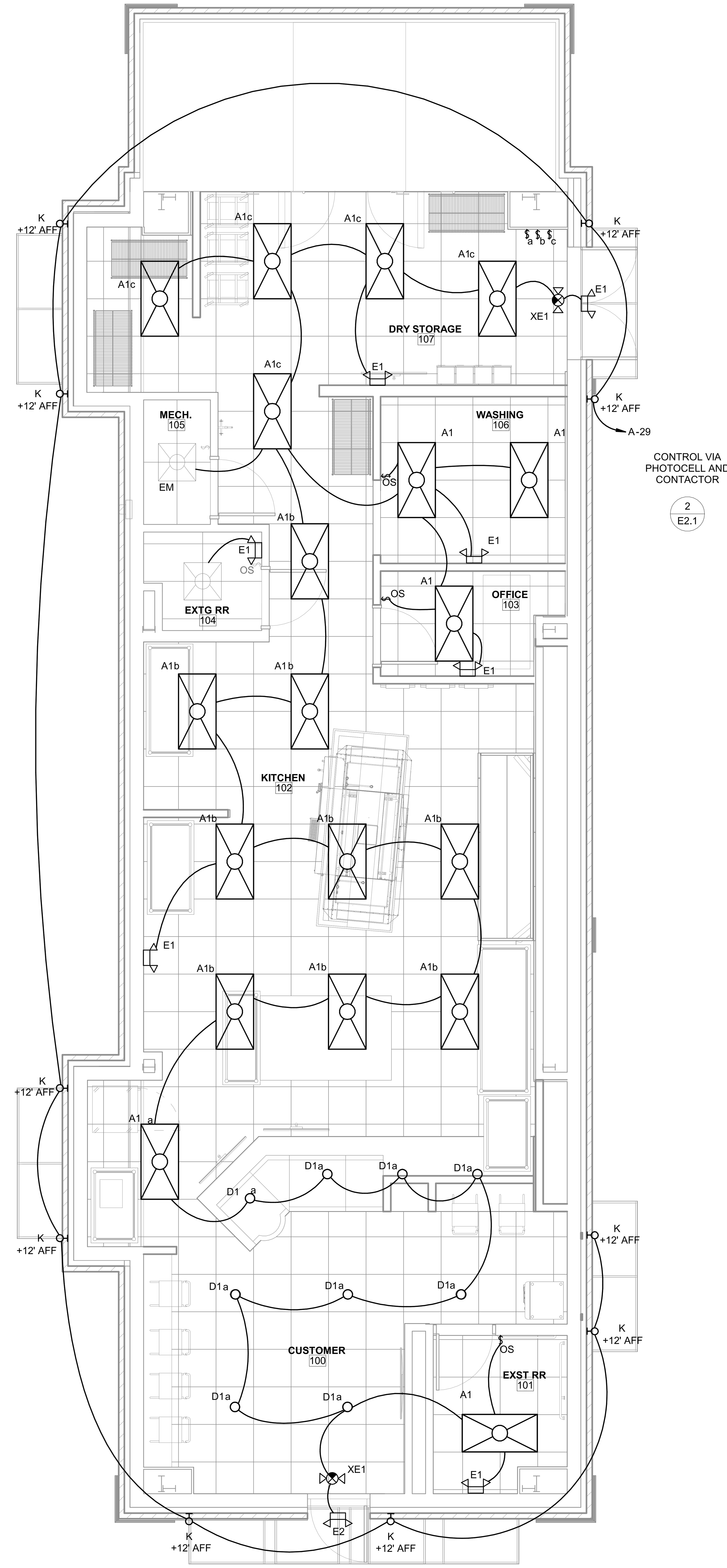
LUMINAIRE SCHEDULE

NOTES:
1. EC SHALL PROVIDE A SUBMITTAL PACKAGE INCLUDING CUTSHEETS FOR EACH FIXTURE.
2. EC SHALL PROVIDE ALL ACCESSORIES FOR A COMPLETE ASSEMBLY INCLUDING MOUNTING HARDWARE.
3. THE MOUNTING TYPE OF EACH FIXTURE SHALL BE COMPATIBLE WITH INSTALLATION SURFACE OF EACH FIXTURE.
4. ALL FINISHES SHALL BE COORDINATED WITH ARCHITECT AND DOCUMENTED ON SUBMITTALS.

TYPE	LAMP	VOLTS	WATTS	DESCRIPTION	MANUFACTURER
A1	LED, 3500K	120/277	56 W	2X4, TROFFER, FLAT PANEL	METALUX - 24FP
D1	LED, 3500K	120/277	19 W	6", RECESSED, DOWNLIGHT, WHITE, 1500LM	HALO - HC6
E1	(2) LED	120/277	10 W	EMERGENCY LIGHT, BUGEYE, SELF DIAGNOSTIC	ASTRALITE EU-3
E2	(2) LED	120/277	10 W	EMERGENCY LIGHT, WALLPACK, SELF DIAGNOSTIC, WP	ASTRALITE REM
K	LED 5000K	120/277	56 W	DECORATIVE GOOSNECK WALL FIXTURE, 12" SHADE, 30" STEM, BLACK	MILLENIUM LIGHTING - RAS12
XE1	LED	120/277	15 W	EXIT/EMERGENCY COMBO, SELF DIAGNOSTIC, RED LETTERS, WHITE	ASTRALITE EEU-3



2 *TYPICAL LIGHTING CONTACTOR*
12" = 1'-0"



1 *LIGHTING PLAN*
1/4" = 1'-0"

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E2.1
LIGHTING PLAN

SECTION 26A GENERAL ELECTRICAL REQUIREMENTS
Rev - 20150422

26A 1 GENERAL INSTRUCTIONS

26A 1-1 GENERAL REQUIREMENTS
Requirements under Division 1 and the general and supplementary conditions of these specifications apply to this section and division. Where the requirements of this section and division exceed those of Division 1, this section and division take precedence. Become thoroughly familiar with all their contents as to requirements that affect this division, section or both. The work required under this section includes material, equipment, appliances, transportation, services, and labor required to complete the entire system as required by the drawings and specifications, or reasonably inferred to be necessary to facilitate each system's functioning as implied by the design and the equipment specified.

The specifications and drawings for the project are complementary, and portions of the work described in one, shall be provided as if described in both. In the event of discrepancies, notify the engineer and request clarification prior to proceeding with the work involved.

Drawings are graphic representations of the work upon which the contract is based. They show the materials and their relationship to one another, including sizes, shapes, locations, and connections. They also convey the scope of work, indicating the intended general arrangement of the equipment and other materials without showing all of the exact details as to elevations, offsets, control lines, and other installation requirements. Use the drawings as a guide when laying out the work and to verify that materials and equipment will fit into the designated spaces, and which, when installed per manufacturers' requirements, will ensure a complete, coordinated, satisfactory and properly operating system. Determine exact locations by job measurements, by checking the requirements of other trades, and by reviewing all contract documents. Correct errors that could have been avoided by proper checking and inspection, at no additional cost to the owner.

Specifications define the qualitative requirements for products, materials, and workmanship upon which the contract is based.

26A 1-2 DEFINITIONS

Whenever used in these specifications or drawings, the following terms shall have the indicated meanings:

Furnish: "to supply and deliver to the project site, ready for unloading, unpacking, assembling, installing, and similar operations."

Install: "to perform all operations at the project site, including, but not limited to, and as required: unloading, unpacking, assembling, erecting, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning, testing, commissioning, starting up and similar operations, complete, and ready for the intended use."

Provide: "to furnish and install complete, and ready for the intended use."

Furnished by owner (or owner-furnished) or furnished by others: "an item furnished by the owner or under other divisions or contracts, and installed under the requirements of this division, complete, and ready for the intended use, including all items and services incidental to the work necessary for proper installation and operation. Include the installation under the warranty required by this division.

Engineer: where referenced in this division, "engineer" is the engineer of record and the design professional for the work under this division, and is a consultant to, and an authorized representative of, the architect, as defined in the general and/or supplementary conditions. When used in this division, it means increased involvement by, and obligations to, the engineer, in addition to involvement by, and obligations to, the "architect".
AHJ: the local code and/or inspection agency (authority) having jurisdiction over the work.

NRTL: nationally recognized testing laboratory, as defined and listed by OSHA in 29 CFR 1910.7 (e.g., UL, ETL, CSA), and acceptable to the AHJ over this project.

The terms "approved equal", "equivalent", or "equal" are used synonymously and shall mean "accepted by or acceptable to the engineer as equivalent to the item or manufacturer specified". The term "approved" shall mean labeled, listed, certified, or all three, by an NRTL, and acceptable to the AHJ over this project.

26A 1-3 PRE-BID SITE VISIT

Prior to submitting bid, visit the site of the proposed work and become fully informed as to the conditions under which the work is to be done. Failure to do so will not be considered sufficient justification to request or obtain extra compensation over and above the contract price.

26A 1-4 MATERIAL AND WORKMANSHIP

Provide all material and equipment new and in first class condition. Provide markings or a nameplate for all material and equipment identifying the manufacturer and providing sufficient reference to establish quality, size and capacity. In general, provide the following quality grade(s) for all materials and equipment:

Commercial Specification Grade
Work performed under this contract shall provide a neat and "workmanlike" appearance when completed, to the satisfaction of the architect and engineer. Workmanship shall be the finest possible by experienced mechanics of the proper trade
The complete installation shall function as designed and intended with respect to efficiency, capacity, noise level, etc. Abnormal or excessive noise from equipment, devices or other system components will not be acceptable.

Remove from the premises waste material present as a result of work. Clean equipment installed under this contract to present a neat and clean installation at the termination of the work.

Repair or replace public and private property damaged as a result of work performed under this contract to the satisfaction of authorities and regulations having jurisdiction.

26A 1-5 MANUFACTURERS

In other articles where lists of manufacturers are introduced, subject to compliance with requirements, provide products by one of the manufacturers specified.

Where a list is provided, manufacturers listed are not in accordance with any ranking or preference.

Where manufacturers are not listed, provide products subject to compliance with requirements from manufacturers that have been actively involved in manufacturing the specified product for no less than 5 years.

26A 1-6 COORDINATION

Coordinate all work with other divisions and trades so that the various components of the systems will be installed at the proper time, fit the available space, and will allow proper service access to those items requiring maintenance. Refer to all other division's drawings, and to relevant equipment submittals and shop drawings to determine the extent of clear spaces. Components which are installed without regard to the above shall be relocated at no additional cost to the owner.

Unless otherwise indicated, the general contractor will provide chases and openings in building construction required for installation of the systems specified herein. Contractor shall furnish the general contractor with information where chases and openings are required. Make all offsets required to clear equipment, beams and other structural members, and to facilitate concealing system components in the manner anticipated in the design. Keep informed as to the work of other trades engaged in the construction of the project, and execute work in a manner as to not interfere with or delay the work of other trades.

Figured dimensions shall be taken in preference to scale dimensions. Contractor shall take his own measurements at the building, as variations may occur. Contractor will be held responsible for errors that could have been avoided by proper checking and inspection

Provide materials with trim that will properly fit the types of ceiling, wall, or floor finishes actually installed. Model numbers listed in the construction documents are not necessarily intended to designate the required trim.

26A 1-7 ORDINANCES, CODES, AND STANDARDS

Work performed under this contract shall, at a minimum, be in conformance with applicable national, state and local codes having jurisdiction. Equipment furnished and associated installation work performed under this contract shall be in strict compliance with current applicable codes adopted by the local AHJ including any amendments and standards as set forth by the National Fire Protection Association (NFPA), Underwriters Laboratories (UL), Occupational Safety and Health Administration (OSHA), American Society of Mechanical Engineers (ASME), American Society of Heating, Refrigeration, and Air Conditioning Engineers (ASHRAE), American National Standards Institute (ANSI), American Society of Testing Materials (ASTM) and other national standards and codes where applicable. Additionally, comply with rules and regulations of public utilities and municipal departments affected by connection of services.
Where the contract documents exceed the requirements of the referenced codes, standards, etc., the contract documents shall take precedence.

Promptly bring all conflicts observed between codes, ordinances, rules, regulations, referenced standards, and these documents to the engineer's attention for final resolution. Contractor will be held responsible for any violation of the law.

Procure and pay for permits and licenses required for the accomplishment of the work herein described. Where required, obtain, pay for and furnish certificates of inspection to owner. Contractor will be held responsible for violations of the law.

26A 1-8 PROTECTION OF EQUIPMENT AND MATERIALS

Store and protect from damage equipment and materials delivered to job site, in accordance with manufacturers' recommendations. For materials and equipment susceptible to changing weather conditions, dampness, or temperature variations, store inside in conditioned spaces. For materials and equipment not susceptible to these conditions, cover with waterproof, tear-resistant, heavy tarp or polyethylene plastic as required to protect from plaster, dirt, paint, water, or physical damage. Equipment and material that has been damaged by construction activities will be rejected, and contractor shall furnish new equipment and material as required at no additional cost to the owner.

Keep premises broom clean from foreign material created during work performed under this contract. Piping, equipment, etc. shall have a neat and clean appearance at the termination of the work.

Plug or cap open ends of conduits while stored and installed during construction when not in use to prevent the entrance of debris into the systems.

26A 1-9 SUBSTITUTIONS

Include in the base bid the products specifically named in these specifications or on the drawings. Submit, in the form of alternates, with bid, products of any other manufacturers for similar use, provided the differences in cost, if any, are included for each proposed alternate.

No substitutions will be considered with receipt of Bids, unless the Architect and Engineer have received from the Bidder a written request for approval to bid a substitution at least ten calendar days prior to the date for receipt of Bids, and have approved the substitution request. Include, with each such request, the name of the material or equipment for which substitution is being requested, and a complete description of the proposed substitution, including drawings, cut sheets, performance and test data, and all other information necessary for an evaluation. Include also a statement setting forth changes in other materials, equipment or other work that would be required to incorporate the substitution. The burden of proof of the merit of the proposed substitute is upon the proposer. The proposer of any substitutions shall compensate the Engineer at a rate of $150.00 per hour for time spent evaluating proposed substitutions and or the subsequent revisions to the design required to utilize the substitution.

The Architect's or Engineer's decision to approve or disapprove a substitution in a Bid is final.

If the proposed substitution is approved prior to receipt of Bids, such approval will be stated in an Addendum. Bidders shall not rely upon approvals made in any other manner, including verbal.

No substitutions will be considered after receipt of Bids and before award of the Contract.

No substitutions will be considered after the Contract is awarded unless specifically provided in the Contract Documents.

26A 1-10 SUBMITTALS

Assemble and submit to the architect, for engineer's review, manufacturers' product literature for material and equipment to be furnished, installed, or both, under this division, including shop drawings, manufacturers' product data and performance sheets, samples, and other submittals required by this division. Highlight, mark, list or indicate the materials, performance criteria and accessories that are being proposed. Provide the number of submittals required by division 1; however, at a minimum, submit two (2) sets. Before submitting, verify that all materials and equipment submitted are mutually compatible and suitable for the intended use, fit the available spaces, and allow ample and code-required room for access and maintenance. Submittals shall contain the following information. Submittals not so identified will be returned to the contractor without action:

The project name.
The applicable specification section and paragraph.
The submittal date.
The contractor's stamp, which shall certify that the stamped drawings have been checked by the contractor, comply with the drawings and specifications, and have been coordinated with other trades.

Submittals and shop drawings shall not contain HP Engineering's firm name or logo, nor shall it contain the HP Engineering's engineers' seal and signature. They shall not be copies of HP Engineering's work product.

Transmit submittals as early as required to support the project schedule. Allow for two weeks engineer review time, plus mailing time, plus a duplication of this time for re-submittals, if required. The engineer's submittal reviews will not relieve the contractor from responsibility for errors in dimensions, details, size of members, or quantities; or for omitting components or fittings; or for not coordinating items with actual building conditions.

Refer to division 1 for acceptance of electronic submittals for this project. For electronic submittals, contractor shall submit the documents in accordance with the procedures specified in division 1. Contractor shall notify the architect and engineer that the shop drawings have been posted. If electronic submittal procedures are not defined in division 1, contractor shall include the website, user name and password information needed to access the submittals. For submittals sent by e-mail, contractor shall copy the architect and engineer's designated representatives. Contractor shall allow the engineer review time as specified above in the construction schedule. Contractor shall submit only the documents required to purchase the materials and/or equipment in the electronic submittal and shall clearly indicate the materials, performance criteria and accessories being proposed. General product catalog data not specifically noted to be part of the specified product will be rejected and returned without review.

26A 1-11 ELECTRONIC DRAWING FILES

In preparation of shop drawings or record drawings, contractor may, as an option, obtain electronic drawing files in Revit, AutoCAD, or DXF format from the engineer for a fee of $200 for the first sheet and $100 per sheet for each additional sheet. Contact the architect for written authorization; and, contact the engineer to obtain the necessary release agreement form and to indicate the desired shipping method and drawing format. In addition to payment, architect's written authorization and engineer's release agreement form must be received before electronic drawing files will be sent.

26A 1-12 OPERATION AND MAINTENANCE MANUALS

Submit to the architect, for engineer's review, copies each of operations and maintenance instruction manuals, appropriately bound into manual form including approved copies of the following, revised if necessary to show system and equipment as actually installed. Paper clips, staples, rubber bands, and mailing envelopes are not considered approved binders. Provide the number of submittals required by Division 1; however, at a minimum, submit two (2) sets, and include, at a minimum, the following information:

Cover sheet that lists the project name, date, owner, architect, consulting engineer, general contractor, sub-contractor, and an index of contents.
Manufacturers' catalogs and product data sheets
Wiring diagrams
Operation and Maintenance instructions
Parts lists
Approved shop drawings
Test reports as defined in NETA ATS for the systems and equipment provided or furnished or installed under this contract.
Names, addresses, telephone numbers, and e-mail addresses of local contacts for warranty services and spare parts.

Submit manuals prior to requesting the final punch list and before any requests for substantial completion. Final approval of this division's systems installed under this contract will be withheld until this equipment brochure is received and deemed complete by the architect and engineer.

Provide "as-built" drawings (see Division 1 and general conditions).

26A 1-13 TRAINING

At a time mutually agreed upon between the owner and contractor, provide the services of a factory trained and authorized representative to train owner's designated personnel on the operation and maintenance of the equipment provided for this project.

Provide training to include but not be limited to an overview of the system and/or equipment as it relates to the facility as a whole; operation and maintenance procedures and schedules related to startup and shutdown, troubleshooting, servicing, preventive maintenance and appropriate operator intervention; and review of data included in the operation and maintenance manuals.

Submit a certification letter to the architect stating that the owner's designated representative has been trained as specified herein. Letter shall include date, time, attendees and subject of training. The contractor and the owner's representative shall sign the certification letter indicating agreement that the training has been provided.

Schedule training with owner with at least 7 days advance notice.

26A 1-14 WARRANTIES
Warrant each system and each element thereof against all defects due to faulty workmanship, design or material for a period of 12 months from date of substantial completion, unless specific items are noted to carry a longer warranty in the construction documents or manufacturer's standard warranty exceeds this duration. Warranties shall include labor and material. Remedy all defects, occurring within the warranty period(s), as stated in the general conditions and Division 1 without any additional costs to the owner.

Perform any required remedial work promptly, upon written notice from the engineer or owner.

At the time of substantial completion, deliver to the owner all warranties, in writing and properly executed, including term limits for warranties extending beyond the required period, each warranty instrument being addressed to the owner and stating the commencement date and term.

26A 2 ELECTRICAL WORK

26A 2-1 BUILDING OPERATION

Comply with the schedule of operations as outlined in the architectural portions of this specification. Building shall be in continuous operation. Accomplish work that requires interruption of building operation at a time when the building is not in operation, and only with written approval of building owner and/or tenant. Coordinate interruption of building operation with the owner and/or tenant a minimum of 7 days in advance of work.

26A 2-2 EXCAVATION AND BACKFILLING
Perform excavation and backfill required for installation of underground work under this contract. Trenches shall be of sufficient width. Crib or brace trenches to prevent cave-in or settlement. Do not excavate trenches close to columns and walls of building without prior consultation with the architect. Use pumping equipment if required to keep trenches free of water. Backfill trenches in maximum 6" layers of well-tamped dry earth in a manner to prevent future settlement.

Excavation as herein specified shall be classified as common excavation. Common excavation shall comprise the satisfactory removal and disposition of material of whatever substances and of every description encountered, including rock, if any, within the limits of the work as specified and shown on the drawings. Excavation shall be performed to the lines and grades indicated on the drawings. Excavated materials which are considered unsuitable for backfill, and surplus of excavated material which is not required for backfill, shall be disposed of by the contractor at his own expense and responsibility, and to the satisfaction of the architect.

26A 2-3 COINCIDENTAL DAMAGE

Repair all streets, sidewalks, drives, paving, walls, finishes, and other facilities damaged in the course of this work. Repair materials shall match existing construction and or conform to all requirement identified in other divisions. All backfilling and repairing shall meet all requirements of the owner, city and others having jurisdiction. Repair work shall be thoroughly first class.

26A 2-4 CUTTING AND PATCHING

Following the requirements in Division 1, cut walls, floors, ceilings, and other portions of the facility as required to perform work under this division. Obtain permission of the architect, owner, or both, before doing any cutting. Cut all holes as small as possible. Patch walls, floors, and other portions of the facility as required by work under this division. All patching shall be thoroughly first class and shall match the original material and construction, including fire ratings if applicable in a manner satisfactory to the architect.

26A 2-5 ROUGH-IN

Coordinate without delay all roughing-in with other divisions. Conceal all piping and rough-in except in unfinished areas and where otherwise indicated in the construction documents.

26A 2-6 SUPPORT SYSTEMS

1.Steel slotted support systems (slotted channel): comply with MFMA-3, factory-fabricated components for field assembly; 12-gauge, 1-5/8-inch by 1-5/8-inch; Cooper B-Line, Erico International Corporation, Hilti, Inc., Power-Strut, Thomas & Betts Corporation, Unistrut.

Finishes:

A.Metallic coatings: hot-dip galvanized after fabrication and applied according to MFMA-3
B.Nonmetallic coatings: manufacturer's standard PVC, polyurethane or polyester coating applied according to MFMA-3.
C.Painted coatings: manufacturer's standard painted coating applied according to MFMA-3.
D. Stainless steel: type 304, per ASTM A240.
2.Aluminum slotted support systems (slotted channel): comply with MFMA-3, type 6063-T6, per ASTM B221; factory-fabricated components for field assembly; 12-gauge, 1-5/8-inch by 1-5/8-inch; Cooper B-Line, Erico International Corporation, Hilti, Inc., Power-Strut, Thomas & Betts Corporation, Unistrut.

Field Fabrication:

Where field cutting of standard lengths of channel are required, make cuts straight and perpendicular to manufactured surfaces.

For field-cut or damaged surfaces of coated channels, dress cut ends, damaged surfaces, or both, with an abrasive material (e.g., file, grinding stone, or similar) and cleanser to remove oils, rust, sharp edges and shards.

For channel with a factory-applied coating, re-finish cut edges with a coating compatible with the factory finish and as recommended by the manufacturer (e.g., manufacturer's touch-up paint or zinc-rich cold-galvanizing compound, as applicable).

26A 2-7 PENETRATIONS

Coordinate sleeve selection and application with selection and application of fire-stopping specified in Division 7 section "through-penetration firestop systems."

Roofs:

Coordinate all roof penetrations with engineer, owner, and as applicable, the roofing contractor providing a roof warranty.

Keep all raceway penetrations within mechanical equipment curbs wherever possible. Coordinate with all other applicable Division's work.

Flash and counterflash all openings through roof, and/or provide pre-fabricated molded seals compatible with the roof construction installed, or as required by the engineer, owner, or roofing contractor. All roof penetrations shall be leak-tight at the termination of the work and shall not void any new or existing roof warranties.

Walls and Floors:

Sleeves for raceways and cables

Steel pipe sleeves: ASTM A 53/A 53M, type E, grade B, schedule 40, galvanized steel, plain ends and drip rings.
Cast-iron pipe sleeves: cast or fabricated "wall pipe," equivalent to ductile-iron pressure pipe, with plain ends and integral waterstop, unless otherwise indicated.

Sleeves for rectangular openings: galvanized sheet steel with minimum 0.138 inch thickness and of width and length to suit application.

26A 2-8 FIRE-STOPPING THROUGH PENETRATIONS

Fire-resistant through penetration sealants: two-part, foamed-in-place, silicone sealant formulated for use in through-penetration fire-stopping around cables, raceways, and cable tray penetrations through fire-rated walls and floors. Sealants and accessories shall have fire-resistance ratings indicated, as established by testing identical assemblies in accordance with ASTM E 814, by underwriters' laboratories, inc., or other NRTL acceptable to AHJ.

Acceptable manufacturers:

Hilti, Inc.
3m Corp.
Rectorseal.
Specify Technology Inc.
United States Gypsum Company.

Submittals

Submit product data, manufacturer's specifications and technical data for each material including the composition and limitations, documentation of UL firestop systems to be used and manufacturer's installation instructions to comply with Division 1.

Manufacturer's engineering judgment identification number and drawing details when no UL system is available for an application. Engineering judgment shall include both project name and contractor's name who will install firestop system as described in drawings.

Submit material safety data sheets provided with product delivered to job-site.

26A 2-9 CONCRETE BASES

Provide concrete bases (e.g., housekeeping pads) for equipment where indicated on the drawings and as specified herein. Concrete bases shall have chamfered edges. Size of base shall be a minimum of 2 inches greater than the footprint of the equipment that it is supporting.

Construct equipment bases of a minimum 28-day, 4000-psi concrete conforming to American Concrete Institute standard building code for reinforced concrete (ACI 318-99) and the latest applicable recommendations of the ACI standard practice manual. Concrete shall be composed of cement conforming to ASTM C 150 type I, aggregate conforming to ASTM C33, and potable water. Exposed exterior concrete shall contain 5 to 7 percent air entrainment.

Unless otherwise specified or shown on the structural drawings, reinforce equipment bases with no. 4 reinforcing bars conforming to ASTM A 615 or 6x6 – w2.9 x w2.9 welded wire mesh conforming to ASTM A185. Place reinforcing bars 24 inches on center with a minimum of two bars each direction.

Provide galvanized anchor bolts for equipment placed on concrete bases or on concrete slabs. Anchor bolts size, number and placement shall be as recommended by the manufacturer of the equipment.

Concrete equipment bases shall have a minimum height of 4 inches and shall be poured-in-place.

26A 2-10 ACCESS DOORS

Provide access doors in ceilings and walls, where indicated or required for access or maintenance to concealed equipment installed under this section. Provide concealed hinges, screwdriver-type lock, and anchor straps.

Manufactured by Milcor, Zurn, Titus, or equal. Obtain architect's approval of type, size, location and color before ordering.

26A 2-11 EQUIPMENT FURNISHED BY OTHERS

Provide necessary equipment and accessories that are not provided by the equipment supplier or owner to complete installation of equipment furnished by others, in locations as indicated on the drawings, specified herein, or both. Equipment and accessories not provided by the equipment supplier may include such items as flexible cords and plugs, as required for proper operation of the complete system, in accordance with the manufacturers' instructions.

Be responsible for correct rough-in dimensions, and verify them with engineer, owner's representative, equipment supplier, or all three, prior to rough-in and service installations.

26A 2-12 CLEANING

In addition to the requirements of Division 1, remove from the premises dirt and refuse resulting from the performance of the electrical work, as required, to prevent accumulation. Cooperate in maintaining reasonably clean premises at all times. Immediately prior to final inspection, make a final cleanup of dirt and refuse resulting from the work. Clean all material and equipment installed under this division. Remove dirt, dust, plaster, stains and foreign matter from all surfaces. Touch up and restore all damaged finishes to their original condition.

26A 2-13 ADJUSTING, ALIGNING AND TESTING

Adjust, align, and test all electrical equipment on this project provided under this division and all electrical equipment furnished by others for installation or wiring under this division, for proper operation.

Test all systems and equipment according to the requirements in NETA ATS (latest edition) and all additional requirements specified in following sections.

Maintain the following on the project premises at all times: a true RMS reading voltmeter, a true RMS reading ammeter, and a megohmmeter insulation resistance tester. Provide test data readings as requested or as required by the engineer.

26A 2-14 EQUIPMENT IDENTIFICATION

Provide equipment identification nameplates:

-On all panelboards, switches, starters, dimmers, switches in distribution panelboards and switchboards as well as where indicated elsewhere in the construction documents.

Nameplates:

Engraved, contrasting color, three-layer, laminated plastic indicating the name of the equipment, load, or circuit as designated on the drawings and in the specifications:

-Field-applied permanent epoxy adhesive, compatible with the equipment finish.
-Attachment method shall be acceptable to the manufacturers of the equipment to which the nameplates are being applied.
Color: black background with white letters for normal power; red background with white letters for emergency power. Letter height: ½ -inch minimum.

26A 2-15 SYSTEM START UP

Prior to starting up the electrical systems:

Check all components and devices.

Lubricate items accordingly.

Tighten screws and bolts for connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486a and UL 486b.

Adjust taps on each transformer for rated secondary voltage when the transformer is at minimum load.

Check and record building's service entrance voltage, grounding conditions, grounding resistance, and proper phasing.

Replace all burned-out lamps and lamps used for temporary construction lighting in permanent light fixtures.

After all systems have been inspected and adjusted, confirm all operating features required by the drawings and specifications and make final adjustments as necessary.

26A 4 ALTERNATES

Provide all work contemplated under the different alternates to include labor, materials, equipment and services necessary for and incidental to the completion of work under each particular alternate. Furnish separate bids for each alternate applicable to contractor's proposal, stating the amount to be added or deducted from the base bid in case the alternate is accepted. Comply with applicable sections of the base specifications for work required by the alternate unless otherwise specified. Refer to the architectural portion of the specification.

END OF SECTION 26A

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JOB NO.
22151

REVISIONS

E3.1
ELECTRICAL SPECIFICATIONS

26B BASIC ELECTRICAL MATERIALS AND METHODS
rev - 20150520

26B 1 METHODS

26B 1-1 RACEWAYS

Metallic Conduit And Tubing:

Electrical Metallic Tubing and fittings (EMT): ANSI C80.3, UL 797.
Reduced wall EMT is not allowed.
Flexible Metal Conduit (FMC): zinc-coated steel or aluminum, UL 1.
Reduced-wall FMC is not allowed.
Intermediate Metal Conduit (IMC): hot-dip galvanized rigid steel conduit: ANSI C80.6, UL 1242.

Liquidtight Flexible Metal Conduit (LFMC): flexible steel conduit with PVC jacket: UL 360

Rigid Metal Conduit (RMC): hot-dip Galvanized Rigid Steel conduit (GRS): ANSI C80.1, UL 6.
Plastic-coated IMC, RMC, and fittings: NEMA RN 1, UL listed.

IMC and RMC fittings: NEMA FB 1; compatible with conduit type and material, UL listed

Non-Metallic Conduit And Tubing:

Rigid Nonmetallic Conduit (RNC): schedule 40 PVC, 90 deg C rated, NEMA TC-2, UL 651; fittings: NEMA TC 3, TC 6; UL 514, compatible with conduit/tubing type and material, UL listed.
Electrical Nonmetallic Tubing (ENT): NEMA TC 13, UL listed.
Liquidtight Flexible Nonmetallic Conduit (LFNC): UL 1660.
ENT and LFNC fittings: Compatible with conduit/tubing type and material, UL listed.

26B 1-2 RACEWAY INSTALLATION

Above Ground Use:
Install all circular raceways concealed above suspended ceilings or concealed in walls or floors wherever possible except where otherwise indicated.

Provide GRS for all conduits run exposed to weather, or exposed to other hazardous conditions.

All other raceway may be EMT where approved by local code. Use compression type fittings for EMT, with all fittings UL listed for the environment in which they are used.

Underground use:

Provide GRS installed below grade with a corrosion resistant bonded-plastic or approved mastic coating. This shall include the 90-degree elbow below grade and the entire vertical transition to above grade.
RNC conduit may be used underground where permitted by local code and where not specifically restricted by these documents. When used, provide coated GRS, as specified above, for all bends greater than 30 degrees, including the 90-degree elbows below grade and the entire vertical risers for transitions from below to above grade or above-slab.
Equipment Connections:
Use FMC for final connection to each motor and transformer, and to any device that would otherwise transmit motion, vibration, or noise. Use LFMC where exposed to liquids, vapors or sunlight, and to connect to kitchen and food service equipment. Provide all FMC and LFMC with an insulated bonding conductor.

Use only metal raceways for all power wiring from the output of variable frequency drives to their respective motors. All feeders to variable frequency drives (VFDs) shall be in EMT or other metallic conduit. PVC or fiberglass is not allowed for feeders to VFDs.

General Raceway Installation Requirements:
Install raceways parallel and perpendicular to building lines.

Install raceways to requirements of structure and to requirements of all other work on the project; to clear all openings, depressions, pipes, ducts, reinforcing steel, and other immovable obstacles.

Install raceways set in forms for concrete structure in such a manner that installation will not affect the strength of the structure.

Except where approved in writing by the engineer, install no raceway in a slab-on-grade. Locate raceway in granular fill below slabs-on-grade.

Install raceways continuous between connections to outlets, boxes and cabinets with a minimum possible number of bends and not more than the equivalent of four 90-degree bends between connections. Use manufactured elbows for all 45- and 90-degree bends, unless approved by the engineer in advance. Make other bends smooth and even and without flattening raceway or flaking galvanizing or enamel. Radii of bends shall be as long as possible and never shorter than the corresponding trade elbow.

Use long radius elbows for all underground installations, where necessary or indicated.

Securely fasten raceways in place with approved straps, hangers and steel supports as required. Attach raceway supports to the building structure. Hang single raceways for feeders with malleable split ring hangers with rod and turnbuckle suspension from inserts spaced not over 10 feet apart in construction above. Clamp groups of horizontal feeder raceways to steel channels that are suspended from inserts spaced not over 10 feet apart in construction above. Securely clamp vertical feeder raceways to structural steel members attached to structure. Install cable clamps for support of vertical feeders where required. Add raceway supports within 12 inches of all bends, on both sides of the bends. Do not support raceways from suspended ceiling components.

Ream raceway ends, thoroughly clean raceways before installation, and keep clean after installation. Plug or cover openings and boxes as required to keep raceways clean during construction and fish all raceways clear of obstructions before pulling conductors. Provide raceways of ample size for pulling of wire and not smaller than code requirements and not less than 1/2-inch in size, unless indicated otherwise on drawings.

Protect all raceway installations against damage during construction. Repair all raceways damaged or moved out of line after roughing-in to meet engineer's approval without additional cost to the owner.

Align and install true and plumb all raceway terminations at panelboards, switchboards, motor control equipment and junction boxes.

Install approved expansion/deflection fittings where raceways pass through (if embedded) or across (if exposed) expansion joints. Also when using RNC or RAC in exposed environments in accordance with the NEC and expansion/contraction properties of RNC or RAC.

Install a pull wire in each empty raceway that is left for installation of conductors or cables under other divisions or contracts. Use polypropylene or monofilament plastic line with not less than 200-lb tensile strength. Leave at least 24 inches of slack at each end of pull wire.

Make all joints and connections in a manner that will ensure mechanical strength and electrical continuity.

26B 1-3 BUSHINGS AND LOCKNUTS

Rigidly terminate conduits entering sheet metal enclosures to the enclosure with a bushing and locknut on the inside and a locknut or an approved hub on the outside. Conduit shall enter the enclosure squarely.

Provide bushings and locknuts made of galvanized malleable iron with sharp, clean-cut threads.

Where EMT enters a box, provide approved EMT compression connectors.

Use insulated, grounding, or combination, bushings wherever connection is subject to vibration or moisture, when required by NFPA 70, or both.

26B 1-4 CONDUCTORS AND CABLES

Conductor Material:
Annealed (soft) copper complying with ICEA S-95-658/NEMA WC70;

Conductor insulation types: 90-degree C-rated, type THHN/THWN-2 or XHHW-2 complying with ICEA S-95-658/NEMA WC70.

Sizes of conductors and cables indicated or specified are in American Wire Gage (AWG - brown and sharpe).

All feeder and branch circuit conductors no. 8 AWG and larger: stranded.

All conductors, no. 10 AWG and smaller: solid copper

All branch circuit wiring: not smaller than no. 12 AWG. If no conductor size is indicated on the drawings for a branch circuit, provide conductors and conduit sized per NFPA 70 and based on the indicated branch circuit overcurrent protective device (OCPD) rating and number of poles. Where no circuit size (i.e., conductors and OCPD) is indicated on the drawings for a branch circuit, provide three no. 12 AWG conductors, in 1/2-inch raceway, and a 20a circuit breaker.

Control wiring: stranded copper conductors, 600v insulation, of the proper type, size and number as required to accomplish specified function. Minimum size: no. 14 AWG, unless noted otherwise.

Stranded for all flexible cords and cables, or as otherwise indicated.

Unless indicated otherwise, special purpose conductors and cables, such as low voltage control and shielded instrument wiring, shall be as recommended by the system equipment manufacturer.

Type MC cable: 600v, unjacketed; ANSI E119 and E814, UL standards 44 or 83 (as applicable), and 1569, NFPA 70 article 330; aluminum or galvanized steel interlocked armor; THHN- or XHHW-insulated conductors; color code: ICEA method 1, with green insulated grounding conductor

26B 1-5 INSTALLATION OF CONDUCTORS AND CABLES

Install all wiring in approved raceway and enclosures
, except where specified or indicated, for low-voltage wiring or direct-buried cables; or, where type MC cable is indicated, specified as acceptable, or both.
Support all conductors and cables in vertical installations, as required by NFPA 70, by installing cable supports or plug-type conduit riser supports, or wire-mesh safety grips.

Install all conductors and cable in raceways continuous without taps or splices. Splice or tap only in approved boxes and enclosures with approved solderless connectors, or crimp connectors and terminal blocks for control wiring, and keep to the minimum required. Insulate all splices, taps, and joints as required by codes.

All materials used to terminate, splice or tap conductors: designed for, properly sized for, and UL listed for the specific application and conductors involved, and installed in strict accordance with the manufacturer's recommendations, using the manufacturer's recommended tools.

Where wiring is indicated as installed, but the connection is indicated "future" or "by other division, trades, or contracts", leave a minimum 3-foot "pigtail" at the box, tape the ends of the conductors, and cover the box.

The number of conductors in a specific raceway "home run" is typically indicated with cross lines (tick marks) on each "circuit run" on the drawings. In general, the direction of branch circuit "home run" routing is indicated on the drawings, complete with circuit numbers and panelboard designation. Continue all such "home run" wiring to the designated panelboard, as though "circuit runs" were indicated in their entirety.

Multi-wire branch circuits (i.e., shared neutral) shall be provided with a means that will simultaneously disconnect all ungrounded conductors at the point the branch circuit originates. Multi-pole breakers or 3 single pole breakers with a handle tie are two examples.

When multiple home runs are combined into a single raceway such that the number of conductors exceeds four (conductor count is made up of any combination of phase and neutral conductors), the following restrictions apply, which are in addition to those in NFPA 70:

NORMAL or NON-ESSENTIAL CIRCUITS:

Maximum of 16 conductors in a single raceway. For up to eight conductors in a raceway, minimum raceway size: 3/4-inch. For greater than eight conductors, minimum raceway size: 1-inch. Do not install any other type of circuit in this raceway.

The minimum wire size for all conductors in this raceway: no. 10 AWG.

Only 15a and 20a branch circuit homeruns may be combined into one raceway.

ISOLATED GROUND (IG) CIRCUITS:

The Isolated Ground conductor of each IG circuit shall be continuous (no splices) the entire length of the circuit.

IG circuits shall be provided with dedicated neutrals, equipment grounds, and isolated grounds and routed in separate conduits from other circuits.

GFCI CIRCUITS:

Do not use multi-conductor circuits, with a shared neutral, for any GFCI circuit breaker or receptacle circuit.

For branch circuits fed from GFCI circuit breakers, limit the one-way conductor length to 100 feet between the panelboard and the most remote receptacle or load on the GFCI circuit

Properly identify all terminal blocks and wire terminals for control wiring with vinyl stick-on markers or equivalent. Provide engineer with a list of proposed identifying numbers for review prior to installing markers.

Provide an equipment-grounding conductor, or bonding jumper, as applicable, in all feeders and branch circuits, sized in accordance with NFPA 70 tables 250.66 or 250.122, as applicable, unless indicated as larger on the drawings.

Voltage drop in branch circuits shall not exceed 3 percent.

Wiring shall have insulation of the proper color to match color code system in the table below unless there is a color system currently in use by the facility, in which case the colors are to match the existing system. In larger sizes, where properly colored insulation is not available, use vinyl plastic electrical tape of the appropriate color around each conductor at all termination points, junction and pull boxes

System Voltage
240v and under – 208y/120, 120/240, 120/208, 240d/120
Phase A – black, phase B – red, phase C – blue, neutral – white, equipment ground green, isolated ground – green w/yellow stripe.
Use of MC Cable, May Only Be Used:

In lieu of flexible conduit and wiring from light fixtures in accessible ceilings to junction boxes (attached to building structure) above the ceiling. Provide cable whips of sufficient lengths to allow for relocating each light fixture within a 5-foot radius of its installed location, but not exceeding 6 feet in unsupported lengths.

For vertical drops in stud walls.

In lieu of EMT, only for 15a and 20a branch circuits (with up to four (4) conductors, not including ground conductor), and only in dry concealed locations above grade, except where specifically not permitted by NFPA 70.
Do Not Use MC Cable For The Following:

Homeruns to panelboards.

Where exposed to view.

Where exposed to damage.

Hazardous locations.

Wet locations.

When restricted otherwise above, and when specifically disallowed by the local AHJ, landlord, or both.

Circuits that can be supplied by an emergency or standby power source.

26B 1-6 JUNCTION BOXES, PULL BOXES, CABINETS AND WIREWAYS

Provide junction boxes, pull boxes, cabinets and wireways wherever necessary for proper installation of various electrical systems according to NFPA 70 and where indicated on the drawings. Size as required for the specific function or as required by NFPA 70, whichever is larger. Construction shall be of a NEMA design suitable for the environment installed.

Junction boxes installed behind wall cases, and in or on other display fixtures, except where otherwise specified, shall be 4-inch square or larger, with galvanized covers.

26B 1-7 OUTLET BOXES

All outlets including light fixture, switch, receptacle, and similar outlets: National Electrical, Appleton, Steel City, Raco, or approved equal, galvanized steel knockout boxes, suitable in design to the purpose they serve and the space they occupy. Size as required for the specific function or as required by NFPA 70, whichever is larger. Set all outlet boxes in walls, columns, floors, or ceilings so they are flush with the finished surface, accurately set, and rigidly secured in position. Provide plaster rings, extension rings and/or masonry rings as required for flush mounting. Provide approved cast outlet boxes, with hubs and weatherproof covers, in all areas subject to damp, wet, or harsh conditions.

26B 1-8 OUTLET LOCATIONS

Coordinate locations of outlet boxes. Outlets are only approximately located on the small scale drawings. Use great care in the actual location by consulting the various large scale detailed drawings used by other division trades, and by securing definite locations from the architect and/or engineer.

26B 1-9 MOUNTING HEIGHTS

Unless noted otherwise, install wiring devices as indicated below (note: all dimensions are to the bottom of the outlet box unless noted otherwise):

Receptacles:
Vertically aligned with the ground slot mounted at the bottom: 16 inches above finished floor.
Horizontally aligned, with neutral slot mounted at the top: 16 inches above finished floor.
For above counters: 6 inches above top of counter or as specified by others.
Mechanical and electrical equipment rooms and janitors closets: 44 inches above finished floor, vertically aligned.
Weatherproof exterior receptacles: 24 inches above finished grade or as indicated on drawings, vertically aligned.
GFCI receptacles: same as general receptacles

Isolated ground receptacles: same as general receptacles

SPD receptacles: same as general receptacles
Clock receptacles: 84 inches above finished floor or as specified by others.
Concrete block walls: dimensions above may be adjusted slightly, as required to compensate for variable joint dimensions, such that bottom or top of boxes, as applicable, are at block joints.

Switches:
General: 46 inches above finished floor.
Above counters: same as for receptacles.
Concrete block walls: 40 inches above finished floor (dimension may be adjusted slightly, as required to compensate for variable joint dimensions, such that bottom of boxes are at block joints).
Walls with wainscoting: 6 inches minimum above wainscoting, but not exceeding 48 inches above finished floor.
Telephone/Data Outlet Boxes:

General: match mounting height of adjacent wiring device listed above.

Wall-mounted telephone: 40 inches above finished floor.

For other than wiring devices, refer to paragraphs, articles, sections, divisions, or drawings to obtain mounting heights for specific equipment or systems.

26B 1-10 WIRING DEVICES

Unless noted otherwise on the drawings wiring devices are 20a rated devices. Where 15a rated devices are indicated on the drawings or required for circuit rating limitations, provide wiring devices equivalent to those specified for 20a, but rated for 15a.

Provide the following wiring devices where shown on drawings or required. Minor changes relative to the location of electrical equipment may be made to comply with structural and building requirements as determined in the course of construction. Provide all wiring devices of the same manufacturer and not mixed on the project, to the maximum extent possible. Provide color of toggles and receptacles as requested by the engineer:

Duplex convenience receptacles: Specification grade, NEMA 5-20R, 125V, 20A, grounding type, UL listed and labeled, nylon face, side and back wired, self grounding, manufactured by Leviton or approved equivalent.
Hospital Grade straight blade receptacles: NEMA 5-20R, 125V, 20A, grounding type, UL listed and labeled, nylon face, side and back wired, self-grounding, manufactured by Leviton or approved equivalent.
Hospital Grade straight blade safety type, tamper-resistant receptacles: NEMA 5-20R, 125V, 20A, grounding type, UL listed and labeled, nylon face, side and back wired, self-grounding, manufactured by Leviton or approved equivalent.
Twist-Locking type receptacles: NEMA L5-20R, 125V, 20A, grounding type, UL listed and labeled, nylon face, side and back wired, self-grounding, Leviton 2310 or approved equivalent.

Ground fault circuit interrupter type receptacles: Specification Grade, Self-Test type
UL listed and labeled complying with UL 943, Class A and NEMA WD-1-1.10, 125V, 20A, trip at 4-6mA within 0.25 second, and feed-thru type with integral heavy duty NEMA 5-20R receptacle arranged to protect receptacles downstream on the same circuit, manufactured by Leviton or approved equivalent
Isolated ground receptacles: Specification Grade NEMA 5-20R NEMA L5-20R,
125V, 20A, grounding type, UL listed and labeled, nylon face, side and back wired, furnished with a green pigtail connected to the grounding contact, and grounding contacts electrically isolated from the mounting strap, manufactured by Leviton or approved equivalent.
voltage) service: NEMA 5-20R, 125V, 20A, self-grounding type, RFI/EMI noise filtering, UL listed 1449 Second Edition (1998) & 489; equipped with LED indicator(s) and audible alarm, manufactured by Leviton or approved equivalent.
Suppression module shall protect normal and common modes, with the following mode characteristics, and be suitable for ANSI/IEEE C62.41-1991 A, B installations:
Peak Energy 240 joules minimum
Peak Current 13,000A minimum
UL 3000A Test 400V minimum
Response Time 5 nano-seconds
Special Warranty: Manufacturer agrees to repair or replace TVSS receptacles, or replaceable surge modules (if removable),
that fail in materials or workmanship within 5 years from date of Substantial Completion.
Special purpose receptacles: Grounding type, UL listed with NEMA configurations as implied on the Drawings, manufactured by Leviton or approved equivalent.
Switches: Specification grade, rated for 120/277V, 20A, back and side wired, and UL listed and labeled, manufactured by Leviton or approved equivalent.
Pilot Light switches: 20A, 1-pole, 2-pole, 3-way switch with red neon lighted handle. Toggle shall be illuminated when the switch is in the "ON" position, manufactured by Leviton or approved equivalent.
Lighted Handle switches: 20A, 1-pole, 3-way switch with clear neon lighted handle. Toggle shall be illuminated when the switch is in the "OFF" position. Manufactured by Leviton or approved equivalent.
Key operated light switches: Same as standard light switches except toggle handle shall be operated by a factory provided key, manufactured by Leviton or approved equivalent.
Switches for use with mechanically-held, electrically-operated lighting contactors: Single pole, double throw, momentary, center off switch, rated for 120/277V, and UL listed and labeled, manufactured by Leviton or approved equivalent.
Wall box dimmers: Specification grade slider type wall box dimmers, UL listed and labeled, with Radio Frequency Interference (RFI) filters to avoid interference with electronic equipment, and a minimum wattage as indicated on the Drawings or as required for the load, manufactured by Leviton or approved equivalent.
Dual Voltage Switch Relay; A normally-open, electrically-held relay that allows a single-pole switch to control loads operating at two different voltages (e.g., 120V and 277V); listed to UL Standard 916; installed in a 2-gang outlet box, with a voltage-separating barrier and plaster ring manufactured by Lighting Controls and Designs (GR 2001 DV) or approved equivalent.
Wall switch occupancy sensors: Passive Infrared type, wall box switch, 120/277V, up to 20-minute time delay, light level sensor, 180-degree field of view, square-foot coverage as required for minimum coverage of the space per the manufacturer, UL listed and labeled, and conforms to California Title 24 Energy Code, manufactured by Leviton or approved equivalent.
Wall switch occupancy sensors: Adaptive technology type, wall box switch, 120/277V, up to 20-minute time delay, light level sensor, 180-degree field of view, square-foot coverage as required for minimum coverage of the space per the manufacturer, UL listed and labeled, and conforms to California Title 24 Energy Code, manufactured by Leviton or approved equivalent.

26B 1-11 SWITCH AND OUTLET COVER PLATES

Switch and outlet plates: colored, smooth nylon; by the same manufacturer as the wiring devices, wherever possible. Verify desired materials and colors with architect and/or engineer before installation. Switch plates in unfinished rooms and spaces: stamped steel, cadmium plated. Install groups of switches under one ganged-plate, usually horizontally; or, where required by details, vertically. Set all cover plates plumb, parallel, and finished flush with the wall.

26B 1-12 WEATHERPROOF COVER PLATES

For exterior unattended, wet locations or other locations as indicated: in-use NEMA 3R recessed or flush mount, UL-labeled plates molded from a clear high impact ultraviolet stabilized polycarbonate material for easy verification that cords are plugged in and that the GFCI is functioning. Back box must be suitable for conduit connecting. Coordinate back box with wall depth. Intermatic WP1000RC/HRC or equal.

For attended wet or damp locations: weatherproof cover plates, UL-listed for wet locations with cover(s) closed; die-cast aluminum or type 302 stainless steel; single-cover for switches and vertically mounted receptacles; double-cover for horizontally mounted receptacles; self-closing covers.

Cover plates: by the same manufacturer as the wiring devices; complying with NFPA 70 406.8 (A) or (B) requirements for attended or unattended use as applicable.

26B 2 ELECTRICAL SERVICE AND GROUNDING

26B 2-1 ELECTRICAL SERVICE

See drawings for type, size, voltage, phase, and other requirements.

Provide, or arrange with the serving utility for installation to provide, a recording voltmeter at the service point, on the first day the facility is open for business, for a 24-hour voltage test. If voltage and regulation are not within acceptable limits, arrange with the utility for proper voltage. Submit to the owner a report of maximum and minimum voltage and a copy of the recording voltmeter chart.

26B 2-2 CONNECTION TO SERVING UTILITIES

Provide raceways, terminations, metering provisions, and miscellaneous equipment, as required, for electrical and telephone services for connection by the serving utility, in strict compliance with the requirements of all applicable codes and of the serving utility involved. Verify all service terminations and connection points in the field and work in conjunction with the utility involved in the installation of all services. Provide all materials and equipment required for complete utility connection but not furnished by the serving utility. Notify the utility companies involved within two weeks after notice to proceed, of all required information necessary for the utility to supply the project without delay. Pay all charges of the serving utility for the electrical service(s).

26B 2-3 GROUNDING

Permanently and effectively ground and bond the electrical installation in a thorough and efficient manner, and in conformance, at a minimum, with NFPA 70, or these documents, where they exceed code requirements. Use bare or insulated conductors, as specified herein, and other materials indicated on the drawings.

26B 3 DISTRIBUTION AND CONTROL EQUIPMENT

26B 3-3 SERVICE ENTRANCE CIRCUIT BREAKER – ENCLOSED, 100A – 6000A

Enclosed circuit breaker: Square D micro-logic and thermal magnetic type or equal by Siemens, Cutler-Hammer, or General Electric; rated at 100% of the ampere size indicated, number of phases and other ratings as indicated on the drawings; permanently labeled as suitable for use as service entrance equipment; integral ground fault relay and operator where indicated or required by NFPA 70; interlocked cover and an engraved nameplate for identification. Provide with integral and separate neutral and ground assemblies, suitable for the sizes of conductors indicated. Do not double-lug any terminations not specifically listed as suitable for more than one conductor. Enclosure: NEMA design suitable for the environment in which installed or as indicated.

26B 3-5 POWER DISTRIBUTION PANELBOARDS - CIRCUIT BREAKER, 1200A BUS OR SMALLER

Panelboards: Square D type I-Line, Siemens types S4 or S5, Cutler-Hammer type Pow-R-Line 4, or General Electric types CCB or AV-1; dead front distribution panelboards with number and sizes of circuit breakers as indicated on the drawings; where installed as service entrance equipment, permanently label as suitable for use as service entrance equipment; fully-rated for the available fault current as required unless specifically indicated otherwise on the drawings; hinged, lockable front door that covers the circuit breaker handles. Circuit breakers: quick-make, quick-break, indicating type; engraved nameplates for circuit identification of each circuit breaker. Any feeder circuit breakers 800 amps and larger and all main circuit breaker(s) shall be rated at 100% of the ampere size indicated. Provide a typewritten card directory indicating exactly what each circuit breaker controls on the inside face of the door for circuit identification.

26B 3-6 MODULAR METER CENTERS

Modular meter centers: Square D type EZ Meter-Pak, or approved equal by Siemens, Cutler-Hammer, or General Electric, complete with integral bus, individual current limiting circuit breaker for each module, meter sockets compatible with utility company meters, NEMA rated construction, and main lugs or disconnect as indicated on the drawings. Provide centers fully-rated for the available fault current as required unless specifically indicated otherwise on the drawings. All main circuit breaker(s) shall be rated at 100% of the ampere size indicated.

26B 3-7 GENERAL PURPOSE PANELBOARDS

Panelboards: Square D type NQOD or NF, as applicable, based on voltage and ampere ratings and required short-circuit interrupting ratings as required unless otherwise indicated on the drawings, or approved equal by Siemens, Cutler Hammer, or General Electric; complete with bolt-on thermal magnetic, molded case circuit breakers assembled in a dead-front finished cabinet containing a typewritten card directory indicating exactly what each circuit breaker controls; main circuit breaker shall be rated at 100% of the ampere size indicated, fully-rated and with the integrated short circuit current ratings as required. Plug-in type breakers will not be acceptable. All two and three pole breakers: common trip type. Breakers used as switches for 120v or 277v lighting circuits: approved for the purpose and marked "SWD". Breakers used for the protection of HVAC and refrigeration equipment: HACR type.

26B 3-11 DISCONNECT (SAFETY) SWITCHES

Disconnect (safety) switches: Square D, Siemens, Cutler Hammer, or General Electric fused or non-fused (as indicated on drawings or required) NEMA KS1, heavy duty, externally operated, visible-blade safety switches; NEMA enclosure type indicated on the drawings or suitable for the environment in which installed. Based on fusible switch and fuse sizes indicated, include class R, J, or I fuse provisions as applicable.

Where indicated, provide fusible switches permanently labeled as suitable for use as service entrance equipment, with integral and separate neutral and ground assemblies, suitable for the sizes of conductors indicated. Do not double-lug any terminations not specifically listed as suitable for more than one conductor.

Provide switches where not furnished with the starting equipment, at all other points required by NFPA 70, and where indicated on the drawings.

26B 3-12 SURGE-PROTECTIVE DEVICES (SPD)

Provide SPD labeled in accordance with the latest editions of UL 1283 and 1449, including the highest fault current of section 37.3 (UL recognized for integral).

SPD shall meet or exceed the following criteria:

UL 1449 ratings: the system performance ratings shall be based on the UL 1449 listing ratings for IEEE C62.41 category C3 impulse waveforms of 6kv 1.2 x 50 microseconds, 3ka, 8 x 20 microsecond waveshapes. The maximum UL 1449 listed surge rating for each and/or all of the specified protection modes shall not be exceeded.

Maximum surge current capability (single pulse rated) per phase shall be:

Service entrance switchboards, switchgear: 240ka.

Distribution panelboards, panelboards used for service entrance & MCC: 120ka.

Branch panelboards: 80ka (non-modular is acceptable).

UL 1449 listed and recognized component suppression voltage ratings shall not exceed the following:

VOLTAGE	L-N	L-G	N-G
208y/120	330v	330v	330v
480y/277	700v	700v	700v

SPD shall have a minimum EMI/RFI filtering of –50db at 100khz.

Indicators: the SPD shall use LED indicators that provide indication of suppression component failure in all protection modes including N-G, as well as optically isolated N/C dry contacts for remote monitoring.

Transient counter: a transient voltage surge counter shall be included to totalize transient voltage surges which deviate from the sine wave envelope by more than 125v. The readout shall be at least a six digit LCD located on the unit's hinged front cover. The counter shall be equipped with a battery back-up to retain memory when power is not present. A push-button switch on the display's face-plate shall be provided for manual counter reset.
Manufacturers: Cutler hammer, General Electric, Siemens, Square D, APT, Surge Suppression Incorporated.

Switchboard, switchgear, panelboard and MCC internally mounted SPD: factory installed, UL- labeled by, and at the facility of the electrical distribution equipment manufacturer.

Externally mounted SPD (only allowed where noted on the construction documents): install with conductors as short and straight as possible. Twist the SPD input conductors together to reduce input conductor inductance. Follow the SPD manufacturer's recommended installation practices and comply with all applicable codes.

Warranty: the manufacturer shall provide a minimum full five year parts, labor, travel warranty from date of substantial completion against any part failure, excluding breakers, when installed in compliance with manufacturer's written instructions, UL listing requirements, and all applicable national or local electrical codes. Manufacturer shall make available local, national field engineering service support. Where direct factory employed service engineers are not locally available, travel time from the factory or nearest dispatch center shall be stated.

Thoroughly factory test the specified system before shipment. Testing of each system shall include, but shall not be limited to, quality control checks, dielectric voltage withstand tests at twice rated voltage plus 1000v per UL requirements, and operational and calibration tests.

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DOMINOS BRYANT
3415 W. HWY 5
BRYANT, AR

DATE 10-31-22
JOB NO. 22151
REVISIONS

E3.2
ELECTRICAL SPECIFICATIONS

26B 4 LIGHT FIXTURES, LAMPS AND BALLASTS

26B 4-1 LIGHT FIXTURE LOCATIONS

Light fixtures shown on the electrical drawings represent general arrangements only. Refer to architectural drawings for more exact locations. Coordinate location with all other trades before installation to avoid conflicts. Coordinate light fixture locations in mechanical rooms with final installed piping and ductwork layouts.

26B 4-2 LIGHT FIXTURES

Provide light fixtures as scheduled on drawings, including all lamps, all necessary accessories, material and labor to securely hang, clean, and make light fixtures completely ready for use. Provide: all hangers, supports, and miscellaneous hardware required to install light fixtures; proper trim to fit each ceiling condition actually encountered; additional tie wires connected to structure to conform to seismic requirements where required by the applicable building code.

Packaging of light fixtures will not be allowed. Only those luminares listed in the light fixture schedule, or approved in accordance with substitutions of these specifications, will be accepted. Where the light fixture schedule indicates an allowance for a specific light fixture, the price is a contractor price. Include all additional costs for freight, lamps, and installation of light fixture and lamps.

Install all linear light fixtures located in areas without ceilings immediately below the roof-framing members, or suspended from chain hangers suitable in length to provide the indicated mounting height.

Through wiring of recessed light fixtures, in suspended ceilings, is not permitted. Connect each light fixture by a whip to a junction box. Provide cable whips of sufficient lengths to allow for relocating each light fixture within a 5-foot radius of its installed location, but not exceeding 6 feet in unsupported lengths.

26B 4-3 EMERGENCY LIGHTING UNITS AND EXIT SIGNS

Description: self-contained units complying with UL 924.

Battery: sealed, maintenance-free, lead-acid type. The batteries shall be of suitable rating and capacity to supply and maintain at not less than 87 1/ 2 percent of the nominal battery voltage for the total lamp load associated with the unit for a period of at least 1 1/ 2 hours, or the unit equipment shall supply and maintain not less than 60 percent of the initial emergency illumination for a period of at least 1 1/ 2 hours.

Charger: fully automatic, solid-state type with sealed transfer relay.

Operation: relay automatically turns lamp on when power supply circuit voltage drops to 80 percent of nominal voltage or below. Lamp automatically disconnects from battery when voltage approaches deep-discharge level. When normal voltage is restored, relay disconnects lamps from battery, and battery is automatically recharged and floated on charger.
Test push button: push-to-test type, in unit housing, simulates loss of normal power and demonstrates unit operability.
LED indicator light: indicates normal power on. Normal glow indicates trickle charge; bright glow indicates charging at end of discharge cycle.

Integral time-delay relay: holds unit on for fixed interval of 15 minutes when power is restored after an outage
Integral self-test: factory-installed electronic device automatically initiates code-required test of unit emergency operation at required intervals. Test failure is annunciated by an integral audible alarm and flashing red LED.

26B 5 MISCELLANEOUS ELECTRICAL

26B 5-1 WIRING OF EQUIPMENT

Provide all raceways and power wiring for all applicable Divisions equipment requiring electrical connections, including, but not limited to, pumps, water heaters, and HVAC equipment, and all line-voltage control and interlock wiring not provided under other Divisions. Connect per manufacturers' wiring diagrams. Coordinate with applicable Divisions for disconnects furnished with equipment, and provide all disconnect switches as required. After installing wiring, verify that each motor load has the correct phase rotation.

Verify the actual "maximum overcurrent protection" (MOCP) device ratings and "minimum circuit ampacity" (MCA) conductor sizing for mechanical equipment from the equipment nameplate. Base electrical installations on actual required amperages, which may vary somewhat from the conductor and equipment sizes shown on the drawings; however, in no case, reduce the size of conductors indicated on the drawings without authorization from the engineer. Provide properly sized electrical wiring and equipment without extra cost to the owner. Notify the engineer of all changes required in the electrical installation due to equipment variances so that the effects on feeders, branch circuits, panelboards, fuses and circuit breakers can be checked prior to purchasing and installation. Be responsible for coordinating with applicable Divisions to verify the actual ampacities and correct sizes of all conductors and overcurrent protective devices for all equipment, and correct overload heaters for all motors, when starters are provided under Division 26.

26B 5-2 WIRING OF THERMOSTATS, TIME AND TEMPERATURE CONTROLS

Provide all raceways, power wiring, and line-voltage control and interlock wiring not provided under other Divisions, for all thermostats, temperature control devices, and controls, including, but not limited to, night-stats, water heater interlocks, time switches and override timers. See mechanical drawings for locations and temperature control diagrams. Low-voltage conductors for thermostats and temperature control system may be run exposed above finished accessible ceilings, if approved and listed for this purpose, but shall be installed in conduit within walls and where exposed in the work areas.

26B 5-3 TELEPHONE SYSTEM PROVISIONS

Provide incoming telephone service raceways as indicated on drawings or as required by the serving telephone company. Provide 3/4-inch thick plywood board, fire-retardant-treated and stamped FRT, securely anchored to the wall, at the location and of the size as indicated on the drawings.

Provide flush mounted telephone outlet boxes with ¾ -inch EMT stub-up concealed to accessible ceiling space at locations as indicated on the drawings.

26B 5-4 DATA SYSTEM PROVISIONS

Provide flush mounted data outlet boxes with ¾ -inch conduit stub-up concealed to accessible ceiling space at locations as indicated on the drawings.

22,000a at 240v maximum

as indicated on the drawings

Enclosures: NEMA rated for environment installed in or as indicated on the drawings.

Coil voltage: 120v AC or as indicated on the drawings.

Mechanically-held type, control interface shall be 2-wire input module with 3-wire output or as indicated on the drawings; Square D class 8903 LX or equivalent of General Electric, Siemens, Cutler Hammer or Asco.

26B 5-9 MISCELLANEOUS EQUIPMENT AND CONNECTIONS

Provide all wiring and connections to equipment furnished by others, including, but not limited to, bakery equipment, deli equipment, meat room equipment, kitchen equipment, checkstand and scanners, exhaust hood fire extinguishing system, etc. Install scan system electronic communication cable in underfloor duct (cable provided by others).

Provide all raceways, wiring and related connections of devices to energy management system that are not the responsibility of Division 23.

All wiring and connections of exit door alarms.

END OF SECTION 26B

HP ENGINEERING
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100 % COMPLETE

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JOB NO. 22151
REVISIONS

E3.3
ELECTRICAL SPECIFICATIONS

#620

1 sign Staff Approved 11/4/22 CL

City of Bryant, Arkansas
Community Development
210 SW 3rd Street Bryant, AR 72022
501-943-0943

SIGN PERMIT APPLICATION

Applicants are advised to read the Sign Ordinance prior to completing and signing this form. The Sign Ordinance is available at www.cityofbryant.com under the Planning and Community Development tab.

Note: Electrical Permits may be Required, Please contact the Community Development Office for more information.

Date: 10/24/2022

Sign Co. or Sign Owner

Name L Graphics
Address 701 N. Reynolds Rd
City, State, Zip Bryant, AR 72022
Phone (501) 653-4444
Email Address Joe@LGraphix.com

Property Owner

Name Bart Furguson
Address 205 Progress Dr
City, State, Zip Bryant, AR 72022
Phone (501) 840-2282
Email Address _____

GENERAL INFORMATION

Name of Business the office
Address/Location of sign 205 progress drive ste, 200
Zoning Classification _____

Please use following page to provide details on the signs requesting approval. Along with information provided on this application, **a Site Plan showing placement of sign(s) and any existing sign(s) on the property is required** to be submitted. **Renderings of the sign(s) showing the correct dimensions is also required** to be submitted with the application. A thirty-five dollar ($35) per sign payment will be collected at the time of permit issuance. According to the Sign Ordinance a fee for and sign variance or special sign permit request shall be one hundred dollars ($100). Additional documentation may be required by Sign Administrator.

READ CAREFULLY BEFORE SIGNING

I Joe Lam, do hereby certify that all information contained within this application is true and correct. I fully understand that the terms of the Sign Ordinance supersede the Sign Administrator's approval and that all signs must fully comply with all terms of the Sign Ordinance regardless of approval. I further certify that the proposed sign is authorized by the owner of the property and that I am authorized by the property owner to make this application. I understand

that no sign may be placed in public right of way. I understand that I must comply with all Building and Electrical Codes and that it is my responsibility to obtain all necessary permits.

Use table below to enter information regarding each sign for approval. Please use each letter to reference each sign rendering.

SIGN	**Type** (Façade, Pole, Monument, other)	**Dimensions** (Height, Length, Width)	**Sqft** (Measured in whole as rectangle)	**Height of Sign** (Measured from lot surface)		Column for Admin Certifying Approval
				Top of Sign	Bottom of Sign	
A	Remote Channel letter	22"X138"X5"	22	18'	16'	CL 11/4/22
B						
C						
E						
F						
G						


205 Progress Drive ste. 200
Bryant, AR 72022
remote channel letter W/ LED lighting
25 feet
138 in
22 in
the office

#621

1 Sign Staff Approved CL 11/4/22

City of Bryant, Arkansas
Community Development
210 SW 3rd Street Bryant, AR 72022
501-943-0943

SIGN PERMIT APPLICATION

Applicants are advised to read the Sign Ordinance prior to completing and signing this form. The Sign Ordinance is available at www.cityofbryant.com under the Planning and Community Development tab.

Note: Electrical Permits may be Required, Please contact the Community Development Office for more information.

Date: 10/24/2022

Sign Co. or Sign Owner

Name L. Graphics
Address 701 N. Reynolds Rd
City, State, Zip Bryant, AR
Phone (501) 653-4444
Email Address Joe@LGraphix.com

Property Owner

Name Bart Furguson
Address 205 progress Dr
City, State, Zip Bryant, AR 72022
Phone (501) 840-2282
Email Address

GENERAL INFORMATION

Name of Business The office
Address/Location of sign 205 progress drive Ste. 500
Zoning Classification

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