CRUMBL COOKIES - WATERFORD #1046

4978 HIGHLAND RD
WATERFORD TWP, MI 48327

DRAWING INDEX

DESIGN CRITERIA

APPLICABLE CODE:
- 2015 MICHIGAN BUILDING CODE (I.B.C.)
- 2015 MICHIGAN MECHANICAL CODE
- 2018 MICHIGAN PLUMBING CODE
- 2015 MICHIGAN FIRE CODE
- 2015 MICHIGAN ENERGY CONSERVATION CODE
- 2017 NATIONAL ELECTRIC CODE

ACCESSIBILITY
I.C.C. A.N.S.I. 117.1 - 2009

PROJECT DIRECTORY

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PROJECT INFORMATION

THESE DRAWINGS ARE PART OF A SET OF CONSTRUCTION DOCUMENTS. THE CONSTRUCTION DOCUMENTS CONSIST OF ONE OR MORE OF THE FOLLOWING ELEMENTS:

- CONSTRUCTION DRAWINGS
- SPECIFICATIONS
- STRUCTURAL CALCULATIONS
- CONTRACT FORMS AND CONDITIONS
- ADDENDA
- MODIFICATIONS AND REVISIONS

CONTRACTORS, SUBCONTRACTORS, AND OTHERS WHO PROVIDE LABOR AND/OR MATERIALS REFERENCING THESE DRAWINGS ARE RESPONSIBLE FOR OBTAINING AND REVIEWING ALL CURRENT CONSTRUCTION DOCUMENTS.

CONTRACTORS, SUBCONTRACTORS, AND OTHERS ARE TO REPORT ANY DISCREPANCIES OR ERRORS TO JZW ARCHITECTURE, INC. IMMEDIATELY. ANY CHANGES TO THE PROJECT WILL BE VERIFIED WITH THE OWNER BY THE ARCHITECT AND REVISIONS WILL BE ISSUED BY ARCHITECT. CONTRACTORS ARE NOT TO MAKE ALTERATIONS OF ANY KIND WITHOUT THE PRIOR WRITTEN CONSENT OF ARCHITECT. DISCREPANCIES NOT REPORTED IMMEDIATELY ARE RESPONSIBILITY OF CONTRACTOR.

CONTRACTORS SHALL NOT SCALE FROM DRAWINGS. DIMENSIONS ARE PROVIDED TO ALLOW FOR ACCURATE CONSTRUCTION OF BUILDING. QUESTIONS ARISING FROM DIMENSIONS SHOULD BE RESOLVED BY CONTACTING ARCHITECT.

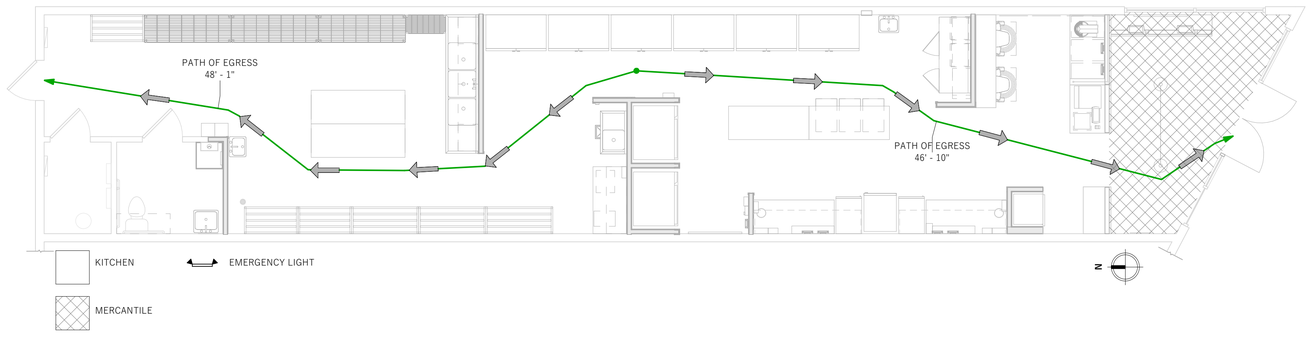
SCOPE OF WORK

CONSTRUCTION OF INTERIOR PARTITION WALLS, TRANSACTION COUNTERS AND NEW FINISHES, INSTALLATION OF KITCHEN EQUIPMENT AND MECHANICAL, ELECTRICAL AND PLUMBING SYSTEMS AS REQUIRED BY RETAIL BAKERY FUNCTIONS AND APPLICABLE CODES. SCOPE OF WORK TO INCLUDE THE REUSE OR REPLACEMENT OF ELECTRICAL SERVICE PANEL AND EXISTING ROOF TOP UNIT.

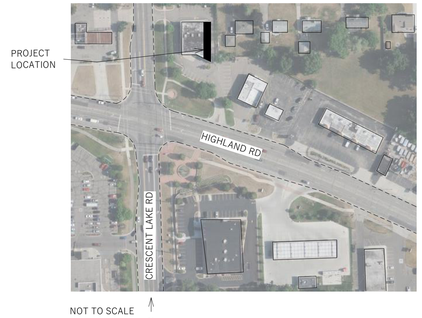
DEFERRED SUBMITTALS

FIRE ALARM SYSTEM
FIRE SPRINKLER SYSTEM

EGRESS PLAN



PROJECT LOCATION



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ISSUED: DECEMBER 10, 2022 CURRENT REVISION:

CRUMBL COOKIES - WATERFORD #1046

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CRUMBL CORPORATE APPROVAL

COVER SHEET
G0.0

crumbl cookies

JZW ARCHITECTS

GENERAL PROJECT NOTES

GENERAL PROJECT NOTES

1. ALL DIMENSIONS TO NEW WALLS ARE TO FACE OF STUD UNLESS NOTED OTHERWISE. ALL DIMENSIONS TO EXISTING WALLS ARE TO FACE OF FINISH. EXISTING DIMENSIONS WERE PROVIDED BY OWNER. CONTRACTOR TO VERIFY PRIOR TO CONSTRUCTION.
2. CONTRACTOR TO VERIFY EXISTING CONDITIONS. DISCREPANCIES BETWEEN ACTUAL CONDITIONS AND PLANS SHALL BE BROUGHT TO THE ATTENTION OF THE ARCHITECT. CONTRACTOR SHALL SUBMIT SPECIFIC DISCREPANCIES FOR ARCHITECT REVIEW.
3. IN ALL AREAS OF CONSTRUCTION. PROTECT ALL EXISTING WALLS, CEILINGS, FLOORING FINISHES, EQUIPMENT, FURNITURE, ACCESSORIES, AND ALL EXISTING BUILDING ELEMENTS TO REMAIN FROM DAMAGE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PATCHING, REPAIR, AND/OR REPLACEMENTS OF ALL SUCH ITEMS AT NO EXPENSE TO OWNER IF DAMAGE OCCURS.

GENERAL FRAMING NOTES

1. ALL DIMENSIONS AND CONDITIONS TO BE VERIFIED BY CONTRACTOR PRIOR TO ANY WORK.
2. ALL INTERIOR WALLS TO BE 3 5/8" METAL STUDS AT 16" O.C. UNLESS NOTED OTHERWISE. PROVIDE ALL BACKING FOR EQUIPMENT AS REQUIRED.
3. ALL WORK SHALL BE IN STRICT ACCORDANCE WITH THE NOTED EDITION OF THE INTERNATIONAL BUILDING CODE (I.B.C.), AND LOCAL ORDINANCES.
4. ALL STRUCTURAL PLYWOOD SHALL BE STRUCTURAL GRADE I OR STRUCTURAL GRADE II.

GENERAL THERMAL, MOISTURE, AND ACOUSTICAL PROTECTION NOTES

1. AIRTIGHT DRYWALL SYSTEMS SHALL BE USED (USE VAPOR BARRIERS AT ALL EXTERIOR WALLS AND CEILINGS).
2. SEAL AROUND ALL ELECTRICAL, PLUMBING, OR MECHANICAL PENETRATIONS AT EXTERIOR WALL AND IN CEILING/FLOOR OR CEILING ROOF ASSEMBLIES.
3. ALL EXTERIOR WALL INSULATION TO MATCH EXISTING.

GENERAL DOOR NOTES

1. COORDINATE WITH OWNER FOR DOOR MANUFACTURER.
2. DOORS TO BE SOLID CORE, PAINT GRADE, COLOR TO BE SELECTED BY OWNER.
3. DOOR HARDWARE TO BE SELECTED BY OWNER.

GENERAL FINISH NOTES

1. ALL INTERIOR WALLS TO BE WRAPPED WITH 5/8" GYPSUM WALL BOARD, TAPED, FILLED, AND FINISHED AS PER ROOM FINISH SCHEDULE AND OWNER.
2. SEE FLOOR PLANS AND/OR FINISH SCHEDULE FOR FINISH FLOOR MATERIALS.
3. OWNER TO SELECT ALL HARDWARE, FIXTURES, APPLIANCES, ETC. CONTRACTOR TO INSTALL AS PER OWNER.
4. ALL SPECIAL ACCESSIBILITY FACILITIES SHALL BE IDENTIFIED WITH APPROPRIATE SIGNAGE.
5. IN ALL AREAS SCHEDULED TO RECEIVE NEW WALL FINISH, CLEAN, PATCH, AND REPAIR ALL WALLS IN PREPARATION FOR NEW PAINT OR FINISH. COORDINATE REMOVAL OF EXISTING WALL ITEMS AND ACCESSORIES WITH OWNER.
6. AT WALL TRANSITIONS FROM NEW TO EXISTING WALLS, PATCH REPAIR AND/OR REPLACE GYP. BOARD AS REQUIRED TO PROVIDE FLUSH TRANSITION BETWEEN NEW AND EXISTING WALL SURFACES.
7. IT IS THE CONTRACTOR'S RESPONSIBILITY TO COORDINATE AND LOCATE ELECTRICAL, DATA, AND PHONE RECEPTACLES, SWITCHES, ETC. TO AVOID CASEWORK, DOORS ETC.

GENERAL PLUMBING, ELECTRICAL, EQUIPMENT NOTES

1. EXISTING CONDITIONS FOR ALL BUILDING SYSTEMS: PLUMBING, MECHANICAL, ELECTRICAL, SEWER, FIRE PROTECTION, STRUCTURAL, ETC. WERE PROVIDED BY OWNER. CONTRACTOR TO VERIFY EXISTING CONDITIONS PRIOR TO CONSTRUCTION.
2. ALL ELECTRICAL FINISH HARDWARE TO BE SELECTED BY OWNER.
3. PROVIDE (2) SEISMIC STRAPS (MIN.) FOR EVERY WATER HEATER.
4. IT IS THE RESPONSIBILITY OF THE GENERAL CONTRACTOR TO ASSURE REQUIRED PLUMBING AND ELECTRICAL SERVICE TO ALL FIXTURES AS INDICATED ON PLANS AND AS REQUIRED BY BUILDING CODE AND OWNER.
5. THE GENERAL CONTRACTOR SHALL VERIFY AND COORDINATE WITH ALL TRADES, SIZES, AND LOCATIONS OF ALL OPENINGS FOR MECHANICAL, PLUMBING, AND ELECTRICAL EQUIPMENT, EQUIPMENT PADS FOR BASES. AS WELL AS ELECTRIC POWER, WATER AND DRAIN INSTALLATIONS, BEFORE PROCEEDING WITH WORK. CONTRACTOR SHALL PROVIDE COORDINATION DRAWINGS FOR PROPER PLACEMENT OF ALL TRADES WORK, ANY CONCERNS, SPACE LIMITATIONS OR STRUCTURAL CONFLICTS, SHALL BE BROUGHT TO THE ATTENTION OF THE ARCHITECT, A REASONABLE RESPONSE TIME SHALL BE ALLOWED.

CODE ANALYSIS

CHAPTER 3: USE AND OCCUPANCY CLASSIFICATION

302 CLASSIFICATION. BUSINESS: GROUP B
304 BUSINESS GROUP B
FOOD PROCESSING ESTABLISHMENTS AND COMMERCIAL KITCHENS NOT ASSOCIATED WITH RESTAURANTS, CAFETERIAS AND SIMILAR DINING FACILITIES NOT MORE THAN 2,500 SF IN AREA

CHAPTER 6: TYPES OF CONSTRUCTION

TYPE II-B

CHAPTER 9: FIRE PROTECTION SYSTEMS

903 AUTOMATIC SPRINKLER SYSTEM
EXISTING: EQUIPPED WITH AUTOMATIC SPRINKLER
NFPA 13 FIRE SPRINKLER SYSTEM PROVIDED IN BUILDING

CHAPTER 10: MEANS OF EGRESS

1004 OCCUPANT LOAD
1004.1 DESIGN OCCUPANT LOAD - TABLE 1004.1.2

FUNCTION OF SPACE	LOAD FACTOR	AREA	# OCC.
MERCANTILE:	60 GROSS	156 SF	3
KITCHENS, COMMERCIAL:	200 GROSS	1202 SF	7
OCCUPIED SPACE		1358 SF	10
UTILITY	NA	37 SF	NA
EMPLOYEE RESTROOM	NA	59 SF	NA
TOTAL AREA		1454 SF	10

1005 MEANS OF EGRESS SIZING
1005.2 MINIMUM WIDTH BASED ON COMPONENT
MIN 36" PROVIDED
1006 NUMBER OF EXITS AND EXIT ACCESS DOORWAYS
TABLE 1006.2.1 SPACES WITH ONE EXIT OR EXIT ACCESS DOORWAY
OCCUPANCY:B
OCCUPANT LOAD OF SPACE: <30
COMMON PATH OF EGRESS TRAVEL DISTANCE W/ FS: <100FT
ONE EXIT REQUIRED FROM EACH SPACE
ONE EXIT PROVIDED FROM EACH SPACE

PLUMBING CODE

403 MINIMUM PLUMBING FACILITIES
403.1 MINIMUM NUMBER OF FIXTURES.
MINIMUM NUMBER IN TABLE 2902.1
BUSINESS = 1 PER 25 FOR FIRST 50
403.2 SEPARATE FACILITIES.
EXCEPTION 4: SEPARATE FACILITIES SHALL NOT BE REQUIRED IN BUSINESS OCCUPANCIES IN WHICH THE MAXIMUM OCCUPANT LOAD IS 25 OR FEWER.
403.3 EMPLOYEE AND PUBLIC TOILET FACILITIES
EXCEPTION 2: PUBLIC TOILET FACILITIES SHALL NOT BE REQUIRED FOR STRUCTURES AND TENANT SPACES INTENDED FOR QUICK TRANSACTIONS, INCLUDING TAKEOUT, PICKUP AND DROP-OFF, HAVING A PUBLIC ACCESS AREA LESS THAN OR EQUAL TO 300 SF.

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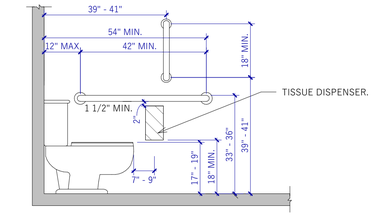
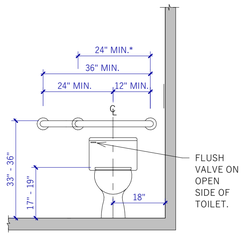
GENERAL NOTES
G1.0



NOTE: SOLID BLOCKING REQUIRED FOR GRAB BARS AND TISSUE DISPENSER.

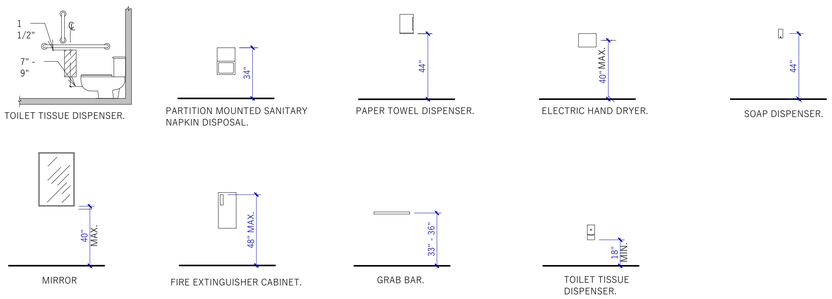
1 G1.1 TYPICAL WATER CLOSET - SIDE VIEW 1/2" = 1'-0"



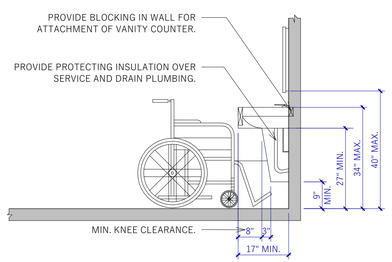
*24" MIN. WHERE WALL SPACE DOES NOT PERMIT A 36" GRAB BAR AS PER ANSI 117.1-2009 SECTION 604.5.2.

NOTE: SOLID BLOCKING REQUIRED FOR GRAB BARS. GRAB BARS TO SUPPORT 250# FORCE

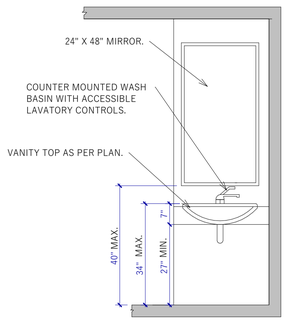
2 G1.1 TYPICAL WATER CLOSET - FRONT VIEW 1/2" = 1'-0"



3 G1.1 MOUNTING HEIGHTS AND TOILET ROOM ACCESSORIES 1/4" = 1'-0"

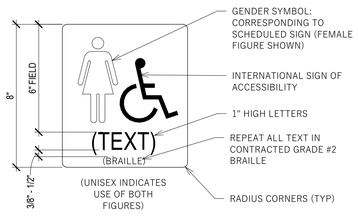


4 G1.1 TYPICAL VANITY DETAIL 1/2" = 1'-0"

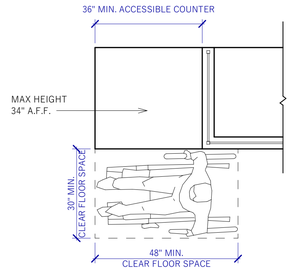


5 G1.1 TYPICAL VANITY ELEVATION 1/2" = 1'-0"

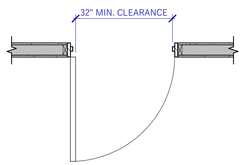
NOTES
1. SIGN IS ENGRAVED LAMINATED ACRYLIC
2. TEXT PER SIGNAGE SCHEDULE
3. MOUNT ON WALL AT LATCH SIDE OF DOOR WITHIN 18" OF OPENING AND AT +5'-0" A.F.F TO CENTER LINE OF SIGN (TYPICAL, U.O.N.)



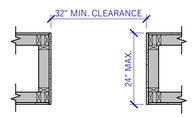
6 G1.1 RESTROOM SIGNAGE 3" = 1'-0"



7 G1.1 SALES AND SERVICE COUNTER DETAIL 1/2" = 1'-0"



8 G1.1 CLEAR DOORWAY WIDTH - HINGED 1/2" = 1'-0"



9 G1.1 CLEAR PASSAGEWAY WIDTH - MAX. DEPTH 1/2" = 1'-0"

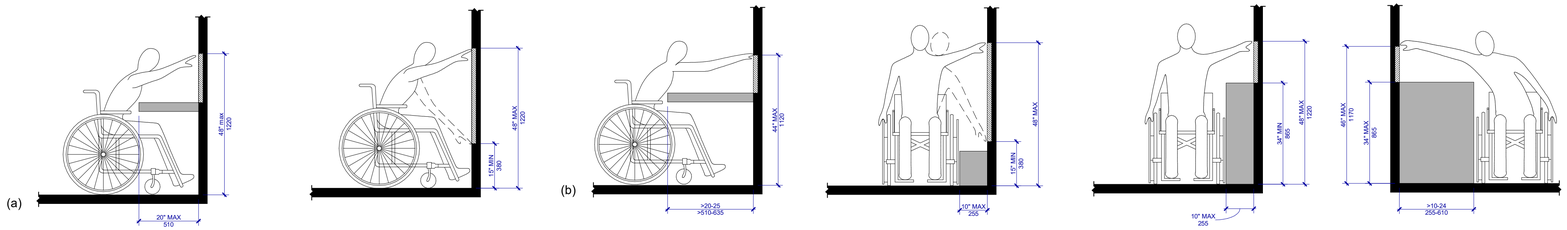


FIG. 308.2.1 UNOBSTRUCTED FORWARD REACH

FIG. 308.2.2 OBSTRUCTED HIGH FORWARD REACH

FIG. 308.3.1 UNOBSTRUCTED SIDE REACH

FIG. 308.3.2 OBSTRUCTED HIGH SIDE REACH

10 G1.1 TYPICAL REACH RANGES 1/2" = 1'-0"

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ACCESSIBILITY DETAILS

G1.1

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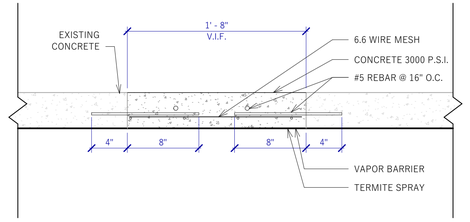
JZW ARCHITECTS



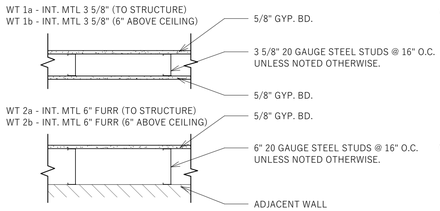
4 A1.1

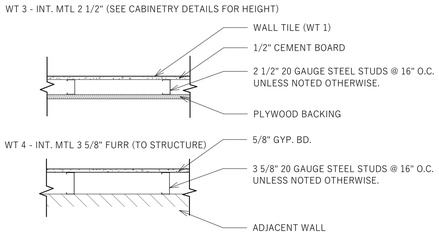
TRENCH POUR BACK DETAIL

1 1/2" = 1'-0"

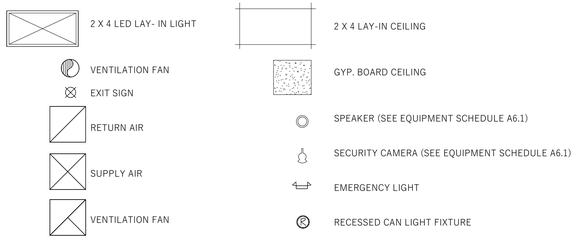
WALL TYPES

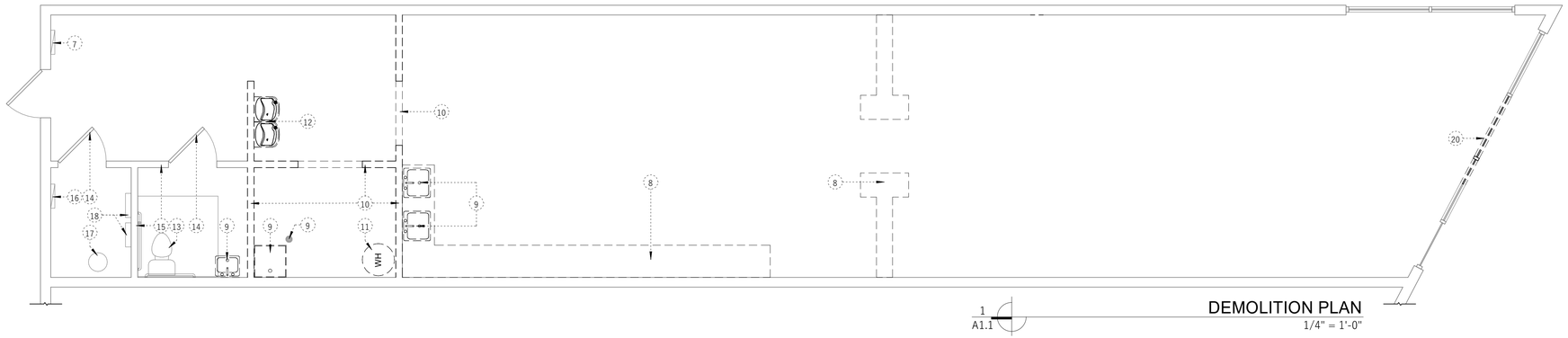
SEE DETAIL 3/A7.3 FOR WALLS TO STRUCTURE
SEE DETAIL 4/A7.3 FOR WALLS 6" ABOVE CEILING





SYMBOL LEGEND

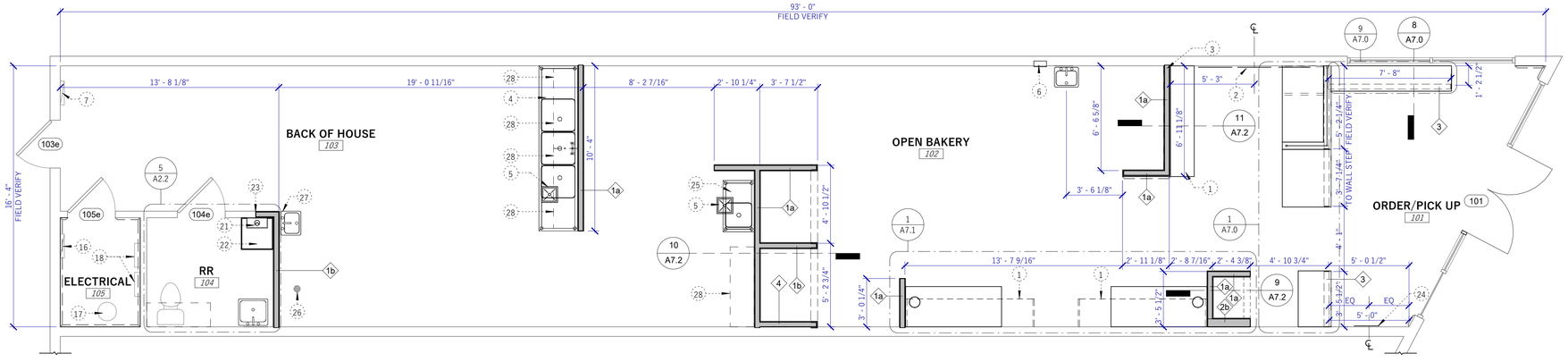




1 A1.1

DEMOLITION PLAN

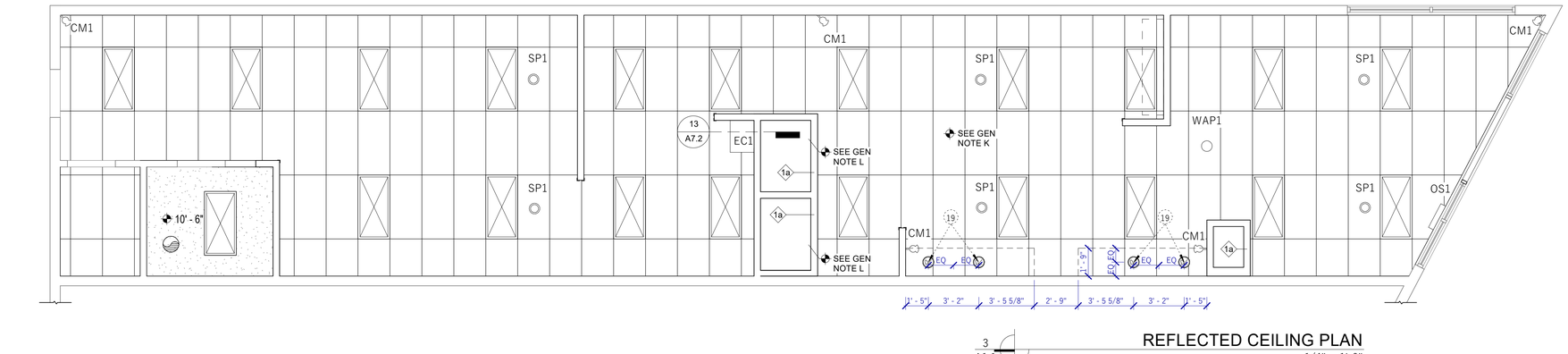
1/4" = 1'-0"



2 A1.1

MAIN FLOOR PLAN

1/4" = 1'-0"



3 A1.1

REFLECTED CEILING PLAN

1/4" = 1'-0"

GENERAL NOTES - PLAN

A	COORDINATE ALL MECHANICAL, PLUMBING, & ELEC. DEMOLITION AND/OR REUSE W/OWNER.
B	CONTRACTOR TO DISPOSE ALL DEMOLITION ITEMS AS PER LOCAL CODES & REGULATIONS.
C	UNKNOWN CONDITIONS MAY EXIST. DEMOLITION SHALL BE DONE W/ CARE TO ENSURE THAT THERE IS NO DAMAGE TO UNSEEN COMPONENTS OR MATERIALS THAT MAY NEED TO REMAIN OR BE RELOCATED.
D	ANY PENETRATIONS THROUGH CONCRETE FLOOR SLABS, CONCRETE WALLS, OR CONCRETE COLUMNS WILL NEED TO BE APPROVED BY THE STRUCTURAL ENGINEER OF RECORD FOR THE BUILDING, PRIOR TO COMMENCING WORK.
E	PROVIDE BLOCKING, WHERE APPLIES, IN NEW AND EXISTING WALLS AS NEEDED FOR NEW MILLWORK (COORDINATE WITH MILLWORK CONTRACTORS).
F	FIELD VERIFY ALL DIMENSIONS AND NOTIFY ARCHITECT OF ANY DISCREPENCIES.
G	ALL DIMENSIONS FROM EXISTING WALLS ARE FROM EDGE OF EXISTING WALL FINISH.
H	ALL DIMENSIONS FROM NEW WALLS ARE MEASURED TO EDGE OF STUD.
I	SEE SHEET A 6.1 FOR EQUIPMENT AND A6.4 FOR FINISH INFORMATION.
J	ALL EXISTING WALL, FLOOR, AND CEILING FINISHES TO BE REMOVED DURING DEMOLITION UNLESS NOTED OTHERWISE.
K	DESIRED CEILING HEIGHT TO BE AS HIGH AS POSSIBLE IF NOT ABLE TO BE PLACED AT 12'-0" AFF AS REQUIRED. GENERAL CONTRACTOR TO FIELD VERIFY EXISTING CONDITIONS.
L	LEAVE OVEN CAVITY OPEN TO STRUCTURE OR INSTALL HARD LID BY GC. REFER TO OWNER.

KEYED NOTES

1	SOLID SURFACE FLOATING SHELF, SEE DETAILS
2	COOKIE SIGNAGE DIMENSIONED FROM FINISHED WALL FACE TO CENTER LINE. SEE DETAILS FOR SIGNAGE INSTALLATION.
3	WALL FINISH WT 1, TO TERMINATE AT T.O. WALL.
4	NEW 3-COMPARTMENT SINK
5	FLOOR SINK, COORDINATE WITH PLUMBING
6	FIRE EXTINGUISHER. INSTALL 48" MAX A.F.F. TO TOP OF HANDLE.
7	EXISTING ELECTRICAL PANEL
8	EXISTING CASEWORK/FURNITURE/FIXTURE TO BE REMOVED
9	EXISTING PLUMBING FIXTURE TO BE REMOVED
10	EXISTING WALL TO BE REMOVED
11	EXISTING WATER HEATER TO BE REMOVED.
12	EXISTING DRINKING FOUNTAIN TO BE REMOVED.
13	EXISTING PLUMBING FIXTURES TO REMAIN
14	EXISTING DOOR TO REMAIN
15	EXISTING WALL TO REMAIN
16	SEE ELECTRICAL PLANS FOR EQUIPMENT INFORMATION.
17	FIRE RISER
18	EXISTING FIRE PANEL TO REMAIN
19	UNDERSHELF LIGHTING.
20	MODIFY STOREFRONT FOR NEW DOORS, COORDINATE WITH OWNER.
21	TANKLESS WATER HEATER.
22	NEW MOP SINK
23	ALIGN END OF WALL WITH INSIDE FACE OF OVEN WALL.
24	BAKERHEAD LOGO SIGN, DIMENSIONED TO CENTER LINE. SEE DETAILS FOR SIGNAGE INSTALLATION.
25	NEW COMMERCIAL PREP SINK
26	EXISTING FLOOR DRAIN TO REMAIN
27	ALIGN SIDE SPLASH OF HAND SINK WITH END OF WALL
28	18" WIRE WALL MOUNTED STORAGE SHELVING. CONTINUOUS PLYWOOD BACKING BEHIND SHEETROCK. SEE DETAILS

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DEMOLITION PLAN, REMODEL FLOOR PLAN & RCP

A1.1

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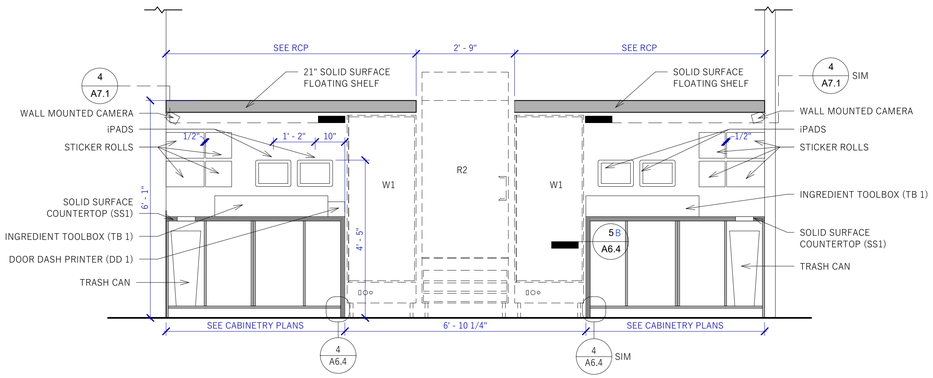
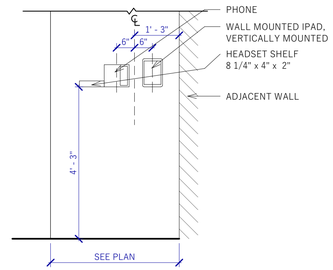
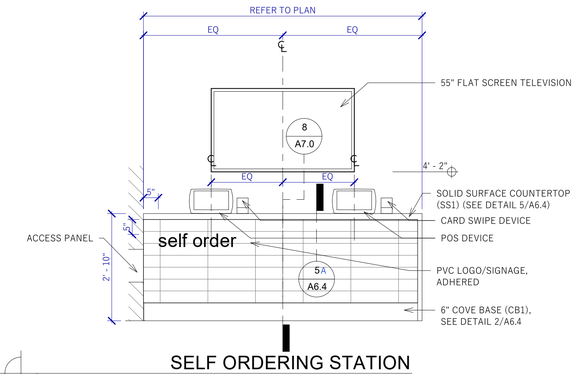
JZW ARCHITECTS



1 A2.1 DRESSING STATIONS 1/2" = 1'-0"



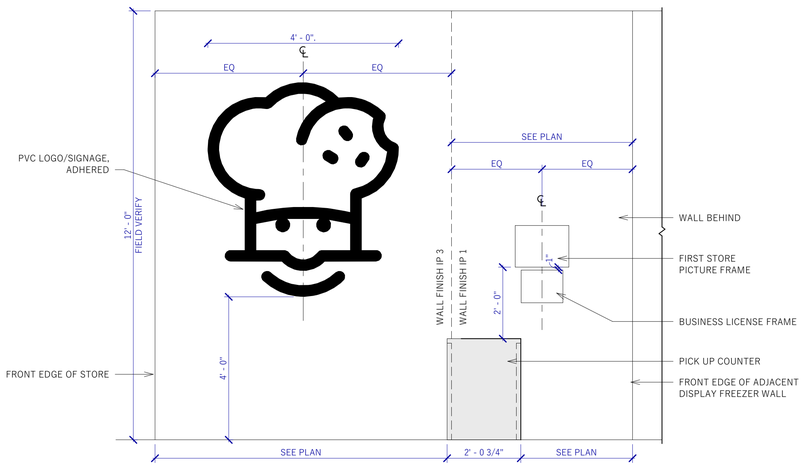
2 A2.1 PHONE/iPAD @ PICK UP 1/2" = 1'-0"



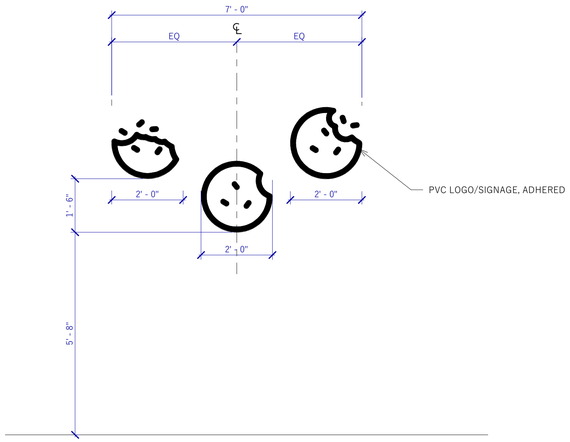
3 A2.1 SELF ORDERING STATION 1/2" = 1'-0"

4 A2.1 PICK UP COUNTER 1/2" = 1'-0"

5 A2.1 FRIDGE @ MIXER WAL 1/2" = 1'-0"



6 A2.1 WALL @ PICK UP COUNTER 1/2" = 1'-0"



7 A2.1 COOKIES LOGO 1/2" = 1'-0"

8 A2.1 OVEN WALL ELEVATION 1/2" = 1'-0"

9 A2.1 MIXER WALL ELEVATION 1/2" = 1'-0"

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INTERIOR ELEVATIONS

A2.1

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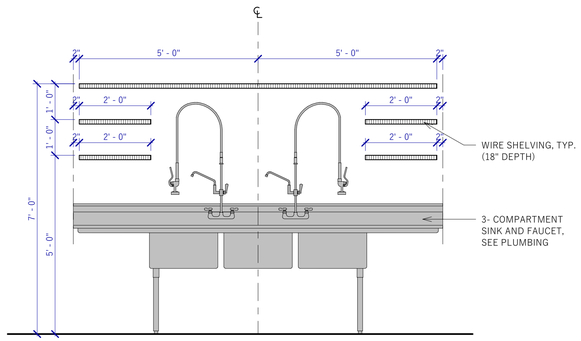
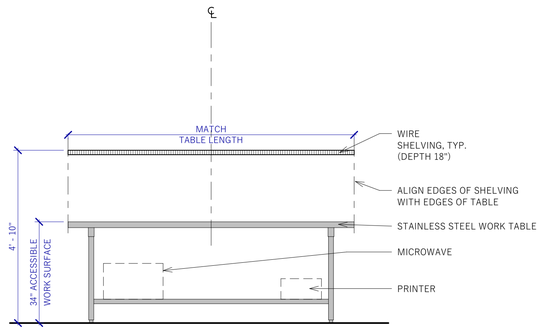
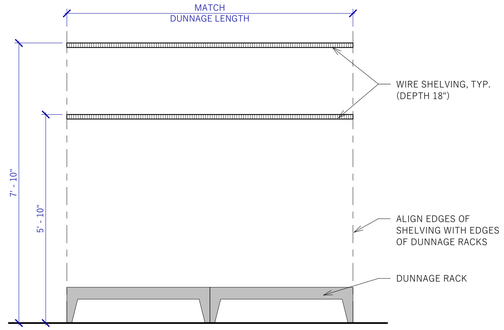
JZW ARCHITECTS



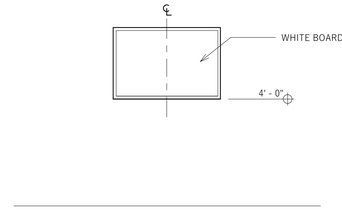
1 A2.2 — 3 COMPARTMENT SINK AND SHELVING — 1/2" = 1'-0"



2 A2.2 — BOXING SHELVING @ BACK OF HOUSE — 1/2" = 1'-0"



3 A2.2 — DUNNAGE SHELVING — 1/2" = 1'-0"



4 A2.2 — WHITE BOARD @ BACK OF HOUSE — 1/2" = 1'-0"

5 A2.2 — ADA ACCESSIBLE BATHROOM — 1/2" = 1'-0"

6 A2.2 — BATHROOM SHELVING — 1/2" = 1'-0"

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INTERIOR ELEVATIONS

A2.2

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JZW ARCHITECTS

KEYED NOTES

1	TV MOUNTED ON CEILING MOUNT B.O. TV @ 4'-2" AFF.
2	FIRE EXTINGUISHER.
3	TV MOUNTED VERTICALLY CENTERED BETWEEN WALL OPENING AND CEILING. REFER TO BUILDOUT GUIDE FOR ADDITIONAL TV SIZE OPTIONS AS NEEDED.
4	55" WALL MOUNTED TELEVISION, BOTTOM OF TV AT 6'-6
5	SOLID SURFACE FLOATING SHELF, SEE DETAILS
6	SNEEZE GUARD
7	TANKLESS WATER HEATER.
8	NEW MOP SINK
9	SEE ELECTRICAL PLANS FOR EQUIPMENT INFORMATION.
10	FIRE RISER
11	EXISTING FIRE PANEL TO REMAIN
12	EXISTING FLOOR DRAIN TO REMAIN
13	HONEYWELL THERMOSTAT MOUNTED 48" A.F.F. TO TOP OF THERMOSTAT.
14	FLOOR SINK, COORDINATE WITH PLUMBING
15	HEADSET SHELF.

EQUIPMENT/FIXTURE SCHEDULE

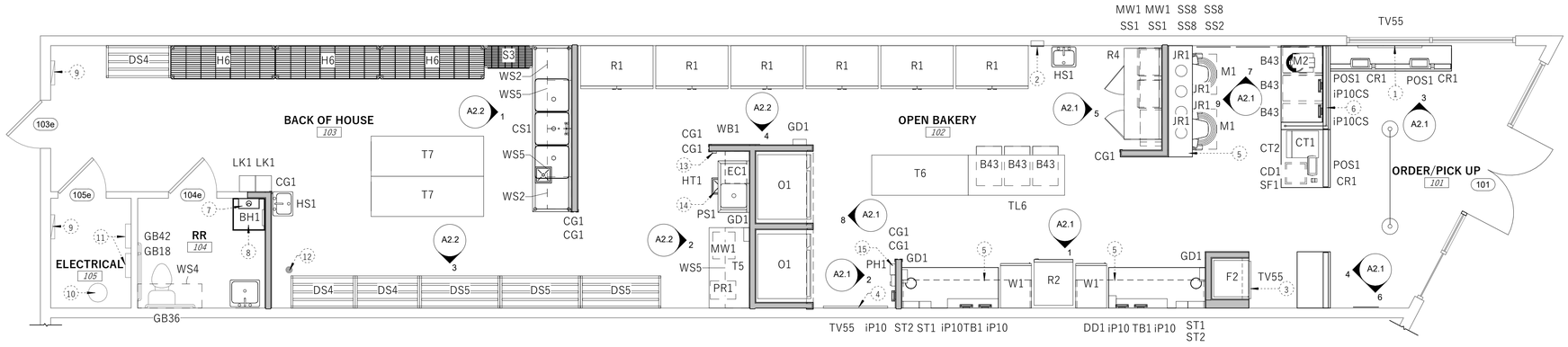
ITEM NUMBER	QTY	DESCRIPTION	DIMENSIONS	PROVIDER	INSTALLER	ADDITIONAL NOTES
	1					
B43	6	43 GALLON INGREDIENT BIN	SEE BUILD OUT GUIDE	OWNER	OWNER	
BH1	1	BROOM HANGER	SEE EQUIPMENT GUIDE	OWNER	GC	
CD1	1	CASH DRAWER	SEE EQUIPMENT GUIDE	OWNER	OWNER	
CM1	5	SECURITY CAMERA	SEE EQUIPMENT GUIDE	OWNER	GC	POWER OVER ETHERNET 802.3af
CR1	3	CARD READER	8 3/4" L X 5" D X 8 5/8" H	OWNER	GC	
CS1	1	STAINLESS STEEL THREE COMPARTMENT SINK	SEE PLUMBING FIXTURE SCHEDULE	GC	GC	SEE PLUMBING FIXTURE SCHEDULE
CT1	1	COOKIE TRAY	SEE DETAILS	OWNER	OWNER	
CT2	1	SMALL COOKIE TRAY	SEE DETAILS	OWNER	OWNER	
DD1	1	DOOR DASH LABEL PRINTER	5.7" L X 9.2" D X 5" H	OWNER	OWNER	
DS4	3	NEW AGE SHELVING	48" L X 24" W X 8" H	OWNER	OWNER	
EC1	1	EQUIPMENT CABINET	SEE BUILD OUT GUIDE	OWNER	GC	MUSIC RECEIVER, INTERNET MODEM, CLOUD COVER MUSIC BOX, CAMERA CONTROLLER
F2	1	GLASS DOOR FREEZER	27 1/8" L X 26 1/4" D X 85 3/8" H	OWNER	GC	
GB18	1	BOBRICK STAINLESS STEEL GRAB BAR	18" L X 1 1/2" DIA.	GC	GC	SEE G1.1 FOR GRAB BAR INSTALLATION
GB36	1	BOBRICK STAINLESS STEEL GRAB BAR	36" L X 1 1/2" DIA	GC	GC	SEE G1.1 FOR GRAB BAR INSTALLATION
GB42	1	BOBRICK STAINLESS STEEL GRAB BAR	42" L X 1 1/2" DIA.	GC	GC	SEE G1.1 FOR GRAB BAR INSTALLATION
GD1	4	GLOVE DISPENSER	9" L X 3" D X 18" H	OWNER	GC	
HS1	2	STAINLESS STEEL HAND SINK	SEE PLUMBING FIXTURE SCHEDULE	GC	GC	SEE PLUMBING FIXTURE SCHEDULE
HT1	1	HONEYWELL THERMOSTAT	SEE BUILD OUT GUIDE	OWNER	GC	MOUNT @ 48" A.F.F. MAX
iP10	5	10.2 INCH WALL MOUNTED IPAD	SEE BUILD OUT GUIDE	OWNER	GC	
iP10CS	2	10.2 INCH COUNTER STAND	SEE BUILD OUT GUIDE	OWNER	GC	
JR1	4	INGREDIENT JAR	SEE BUILD OUT GUIDE	OWNER	OWNER	
LK1	2	EMPLOYEE LOCKERS	SEE BUILD OUT GUIDE	OWNER	OWNER	
M1	2	HOBART LEGACY HL600-1 MIXER	31" L X 47" D X 61" H	OWNER	GC	
M2	1	HOBART LEGACY HL200-1 20 QT MIXER	17 1/8" W X 21" D X 30 1/2" H	OWNER	GC	
MW1	3	1000W COMMERCIAL MICROWAVE	20" L X 18.5" D X 12" H	OWNER	GC	
O1	2	BLODGETT XR8-E	48 1/4" L X 45" D X 75" H	OWNER	GC	
OS1	1	OPEN SIGN	SEE EQUIPMENT GUIDE	OWNER	GC	
PH1	1	PHONE	SEE EQUIPMENT GUIDE	OWNER	GC	POWER OVER ETHERNET 802.3af
POS1	3	STRIPE REGISTER KIT	SEE BUILD OUT GUIDE	OWNER	GC	
PR1	1	PRINTER	SEE EQUIPMENT GUIDE	OWNER	OWNER	
PS1	1	REGENCY STAINLESS STEEL PREP SINK	SEE BUILD OUT GUIDE	GC	GC	SEE PLUMBING FIXTURE SCHEDULE
R1	6	REACH-IN REFRIGERATOR	54" L X 33 1/4" D X 82 1/2" H	OWNER	GC	
R2	1	REACH-IN REFRIGERATOR	29" L X 32 1/4" D X 82 1/2" H	OWNER	GC	
R4	1	COUNTER HEIGHT BACK BAR REFRIGERATOR	68" L X 28" D X 40" H	OWNER	GC	
SF1	1	SAFE	SEE EQUIPMENT GUIDE	OWNER	GC	
SP1	6	SPEAKER	SEE BUILD OUT GUIDE	GC	GC	AMAZON BASICS 16 GAUGE AUDIO STEREO SPEAKER WIRE
SS1	2	REGENCY STAINLESS STEEL MICROWAVE SHELF	24" L X 18" D	GC	GC	LOCATE ON WEBSAURANTSTORE.COM, MODEL #600MS1824
SS2	1	STAINLESS STEEL SHELF	24" L x 16" D	GC	GC	CONTACT LENNY AT LDOUGLAS@BARGREEN.COM
SS8	3	STAINLESS STELL WALL SHELF	72" L x 16" D	GC	GC	CONTACT LENNY AT LDOUGLAS@BARGREEN.COM
ST1	4	SMALL STICKER ROLL	8 3/4" L X 5" D X 8 5/8" H	OWNER	GC	
ST2	4	LARGE STICKER ROLL	12 3/4" L X 5" D X 8 5/8" H	OWNER	GC	
T5	1	STAINLESS STEEL WORK TABLE	60" L X 30" D X 34" H	OWNER	OWNER	
T6	1	STAINLESS STEEL WORK TABLE	72" L X 30" D X 34" H	OWNER	OWNER	
T7	2	STAINLESS STEEL WORK TABLE	84" L X 30" D X 34" H	OWNER	OWNER	
TB1	2	BOXING STATION TOOL BOX	38" L X 7" D X 7" H	OWNER	OWNER	
TL6	1	STAINLESS STEEL WORK TABLE	72" L X 30" D X 34" H	OWNER	OWNER	
TV55	3	55 INCH FLAT SCREEN TELEVISION	<varies>	OWNER	GC	
W1	2	WARMING CABINET	23 1/8" L X 33 3/16" D X 66 1/2" H	OWNER	GC	
WAP1	1	WIFI ACCESS POINT	SEE EQUIPMENT GUIDE	OWNER	GC	POWER OVER ETHERNET 802.3af
WB1	1	WHITE BOARD	SEE EQUIPMENT GUIDE	OWNER	GC	
WS2	4	STAINLESS STEEL WIRE SHELVING	24" L x 18" D	GC	GC	CONTACT LENNY AT LDOUGLAS@BARGREEN.COM
WS4	1	STAINLESS STEEL WIRE SHELVING	48" L x 18" D	GC	GC	CONTACT LENNY AT LDOUGLAS@BARGREEN.COM
WS5	3	STAINLESS STEEL WIRE SHELVING	60" L x 18" D	GC	GC	CONTACT LENNY AT LDOUGLAS@BARGREEN.COM

NOTE: SEE PLANS FOR PLACEMENT OF ALL EQUIPMENT AND FIXTURES.

NOTE: SEE CORPORATE BUILD OUT GUIDE

WIRE SHELVING SCHEDULE

ITEM NUMBER	LINEAR FEET	DESCRIPTION	DIMENSIONS	PROVIDER	INSTALLER	ADDITIONAL NOTES
DS5	15' - 0"	NEW AGE SHELVING	60" L X 24" W X 8" H	OWNER	OWNER	
H6	77' - 0"	STAINLESS STEEL 4-LEVEL STEEL STORAGE RACK	SEE EQUIPMENT GUIDE	OWNER	OWNER	
S3	11' - 8"	5 SHELF STORAGE UNIT	SEE EQUIPMENT GUIDE	OWNER	OWNER	
WS2	8' - 0"	STAINLESS STEEL WIRE SHELVING	24" L x 18" D	GC	GC	CONTACT LENNY AT LDOUGLAS@BARGREEN.COM
WS4	4' - 0"	STAINLESS STEEL WIRE SHELVING	48" L x 18" D	GC	GC	CONTACT LENNY AT LDOUGLAS@BARGREEN.COM
WS5	15' - 0"	STAINLESS STEEL WIRE SHELVING	60" L x 18" D	GC	GC	CONTACT LENNY AT LDOUGLAS@BARGREEN.COM



1 A6.1 EQUIPMENT/FIXTURE PLAN

1/4" = 1'-0"

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EQUIPMENT PLAN AND SCHEDULES

A6.1

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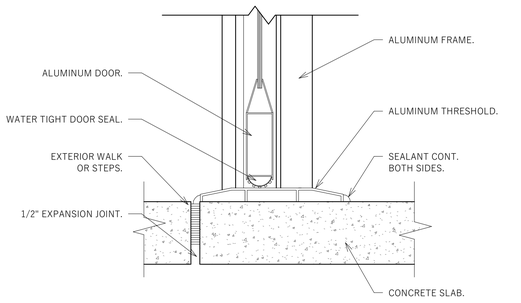


3
A6.2

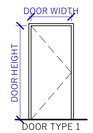
ALUMINUM THRESHOLD

1 1/2" = 1'-0"

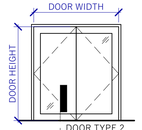
DOOR SCHEDULE

DOOR #	WIDTH	HEIGHT	DOOR		FRAME		DOOR TYPE	HARDWARE GROUP	REMARKS
			MATERIAL	FINISH	MATERIAL	FINISH			
101	6' - 0"	7' - 11"	METAL	MANUF	METAL	MANUF	2	1	
103e	3' - 0"	7' - 0"	METAL	PAINT	METAL	PAINT	1	--	EXISTING, ENSURE COMPLIANCE TO ANSI 117.1 2009
104e	3' - 0"	7' - 0"	WOOD	PAINT	METAL	PAINT	1	--	EXISTING, ENSURE COMPLIANCE TO ANSI 117.1 2009
105e	3' - 0"	7' - 0"	WOOD	PAINT	METAL	PAINT	1	--	EXISTING, ENSURE COMPLIANCE TO ANSI 117.1 2009

NOTE: OWNER TO SELECT DOOR MANUFACTURER.



DOOR TYPE 1



DOOR TYPE 2

3
A6.2

DOOR HARDWARE:

1. CONTINOUS HINGE
   DOOR PULL
   SURFACE CLOSER
   THRESHOLD
   PERIMETER SEALS
   THUMB TURN

NOTE: ALL DOOR HARDWARE TO BE LEVER TYPE HARDWARE AS PER ANSI A117.1. HARDWARE TO BE SELECTED BY OWNER.

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DOOR SCHEDULE

A6.2

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JZW ARCHITECTS

HUSKY®

Item Number: 458-424
Model Number: ERZ782478W4B

4-LEVEL WELDED STEEL STORAGE RACK
77"W x 24"D x 78"H

Warranty

GUARANTEED FOREVER. If your Husky tool or storage unit ever fails bring it back and we will replace it for free. This full warranty gives you specific rights which vary from state to state. If this product is defective contact the manufacturer for repair or replacement parts.

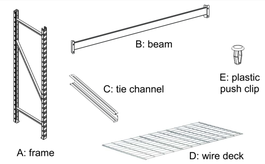
Items you might find helpful

Rubber Mallet, Gloves

Contents

Description	Quantity	Part Number
A: frame	2	ERF7824BLK
B: beam	8	ERB72BLKN
C: tie channel	12	ER-V4-TB
D: wire deck	4	RWD2472SF
E: plastic push clip	16	BBC.118B

Components



General Instructions

Assembly of this unit is done by fitting the brackets of the beams into the slots of the post frames.

A rubber mallet should be used on the ledge of the beams to properly seat the beam brackets. If a hammer is used care should be taken to protect the beam surface to avoid damage by using a protective cloth or block of wood.

The stepped surface of the beam ledge is the top, and should face upwards. This is the surface that the wire deck will rest on.

A bracket should engage and fit firmly into the tapered slot of the post frame. This engagement is a tight swaged fit and will apply resistance as it fully engages. A visual inspection should be made to show that the bracket is properly engaged in the slot.

After assembly re-check each beam for proper engagement.

Safety Instructions

This unit should be placed on a level surface. Failure to do so can result in poor product performance or create a possible safety hazard.

This unit should be securely anchored to a wall or floor with suitable fasteners, which are not included.

Do not use this unit for anything other than the manufacture's intended purpose.

DO NOT STAND ON ANY PART OF THE UNIT, OR USE IT AS A LADDER.

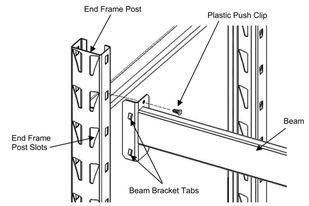
Use care when working with metal parts. Wear gloves for protection.

Evenly distribute the weight on each level and always keep the heavier loads on the bottom.

Assembly Instructions

- Attach the beams to the welded end frame posts (see figure 1) starting at the bottom level by using both end frames to establish the left and the right sides of the units.
- After a beam has been placed in both end frame post slots, tap the beam down at both ends with a rubber mallet to help drive the beam bracket tabs into the slots to secure the beam. Continue assembling each level from bottom to top level (front and back).
- If the beam bracket tabs become bent due to mishandling, it may be necessary to adjust the tabs back to their proper form.
- Place a plastic push clip into the hole of the beam end bracket, then tap the plastic clip with a mallet to drive it into the square hole of the end frame post to secure the beam to the end frame (see figure 1).

Figure 1



- The completed unit should have four (4) levels evenly spaced for maximum stability.
- Although the beams are adjustable in height, it's recommended to evenly space them so that the stability of the unit is not compromised.
- Install (3) tie channels in each level by inserting the tab located on both ends of the tie channel into the slot holes located along the inside bottom edge of the beams (see figure 2).
- Insert wire deck on each level (figure 3).
- Assembly is now complete

Figure 2

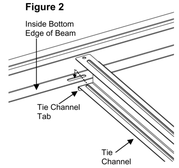


Figure 3

- Husky Welded Storage Rack is engineered to offer maximum flexibility as well as ease and quickness of assembly. The rack units can stand individually, or for greater stability, be joined together using the common post.
- Individual beams can be adjusted without disturbing the beams in adjoining units.
- These instructions should be followed exactly. All parts supplied must be used as shown. Any alteration or deviation from this instruction sheet can result in unit failure.
- After the unit is assembled, it must be placed on a level surface for safety, and optimal product performance.

Questions, problems, damage or missing part? Contact Husky's partnered manufacturer for assistance:

Chat: www.edsal.com/chat or www.edsal.com/contact

Email: support@edsal.com

Phone: 773-475-3131

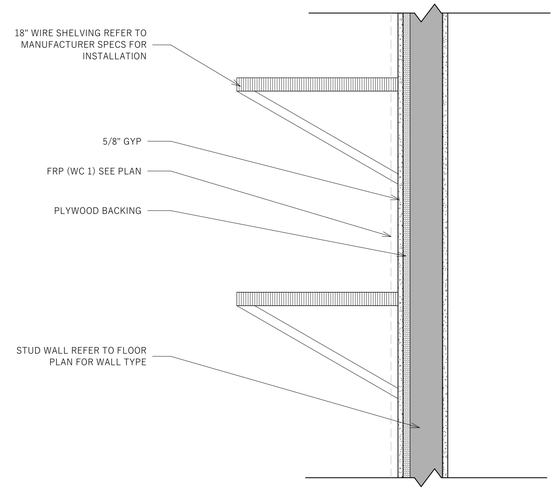
To obtain replacement parts please provide:
Model Number, Part Number & Description, Location Purchased, and Date Purchased

Edsal Manufacturing
Chicago, IL 60609

US Patents & Patents Pending

Assembled in USA
using global components

Rev: C050918_V3-4



1
A6.3

PLYWOOD BACKING DETAIL
1 1/2" = 1'-0"

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WIRE SHELVING DETAILS
A6.3

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JZW ARCHITECTS

HDX™

SKU # 1001 298 075
Model # 21656CPS

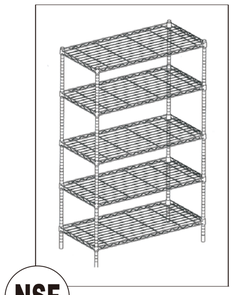
USE AND CARE GUIDE

5 Shelf Storage Unit
Unité de rangement à cinq tablettes
Unidad para Almacenamiento de 5 Estantes

Questions, problems, missing parts?
Before returning to the store, call
Customer Service
8 a.m – 6 p.m., EST, Monday-Thursday
8 a.m – 5 p.m., EST, Friday

888-449-5520

WWW.HOMEDEPOT.COM



NSF

THANK YOU

We appreciate the trust and confidence you have placed in HDX through the purchase of this Storage Unit. We strive to continually create quality products designed to enhance your home. Visit us online to see our full line of products available for your home improvement needs. Thank you for choosing HDX!

Table of Contents

Note

Please dispose of loose, round plastic pieces. These are used to separate the shelves for shipping purposes.

Caution Warnings

1. Two adults are recommended for ease of assembly. Use care when handling.
2. Do not allow children to climb or play in or around the shelves.
3. Assembly recommended on a soft surface, such as carpet, to avoid scratching flooring finish.
4. Each shelf holds up to 350 lbs. evenly distributed.

Specifications

Product weight	36.63 lbs.
Product width	36 in.
Product depth	16 in.
Product height	72 in.

Helpful Hints

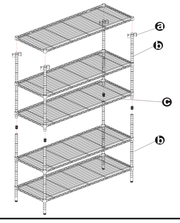
1. Carefully read all instructions and caution warnings before beginning assembly.
2. Determine shelving heights prior to assembly to avoid dismantling for adjustment.
3. When placing the plastic tapered sleeves onto the posts (step 2-ii), slide tapered sleeves up or down on the post until you feel it "snap" into the lines or grooves of the post.

Accessory Parts List

a) (40) plastic tapered sleeves (2) replacements

b) (8) posts (with 4 threaded post jointers pre-installed in posts, 4 foot levelers pre- installed in bottom of posts)

c) (5) shelves



Assembly

Step 1: Post Assembly

i. The top post section has a plastic endcap on one end and the bottom post has a foot leveler attached. Threaded post jointers are pre-installed for your convenience. Screw the posts (1 long & short) tightly together. (See Diagram #1)

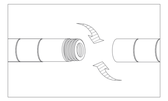


Diagram #1

Step 2: Bottom Shelf Assembly

i. Locate the desired position of the bottom shelf.
ii. Insert four plastic tapered sleeves into the appropriate post groove, one in each post. Ensure tapered end is up. See arrow on lock. (See Diagram #2)
iii. Place shelf on its side and slide each post with tapered sleeves through the bottom of the shelf until snug. (See Diagram #3)
iv. After all posts are in place, position the unit in the upright position.
v. Push down on each corner of the shelf, ensuring that the shelf is in the fully locked position.

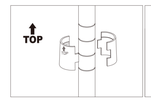


Diagram #2

Diagram #3

Step 3: Additional Shelves Assembly (See Diagram #4)

i. Locate the desired position of the next lowest shelf and insert the tapered sleeves into the posts.
ii. Slide the shelf down from the top of the posts and onto the tapered sleeves. Push down on each shelf corner, ensuring that the shelf is in the fully locked position.
iii. Repeat for the remaining shelves.

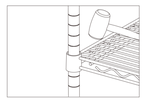


Diagram #4

Step 4: Adjust the foot levelers in or out at the bottom of the posts to attain proper leveling. (See Diagram #5)

Diagram #5

Please contact 888-449-5520 for further assistance.

SPECTRALOCK® 1

NEW

Pre-Mixed Grout with Epoxy Performance

Data Sheet 36589.0

FEATURES	BENEFITS
Stainproof*	Locks in color, blocks out stains
10X stronger than other pre-mixed grouts	More durability, minimizing application failures
No mixing required, resealable packaging	Reduces waste and material costs
Meets ANSI A118.3†	As strong as epoxy; excellent stain and chemical resistance
Light foot traffic within 6 hours	Complete projects in less time
Submerged and intermittent wet applications	Ready to submerge in 14 days; Showers ready for use next day**
No efflorescence	Uniform color consistency; eliminating discoloring, blotches, and shading
Low VOC and low odor	Easy and safe to use with no epoxy resins
Optional SPECTRALOCK® DAZZLE™ component	Compliments tile and stone design

Uses

- Ceramic tile, glass tile and stone
- Residential and commercial
- Interior and exterior floors and walls^,^^
- Ideal for re-grouting applications
- Submerged and intermittent wet areas

Available Colors

- All 40 LATICRETE colors#
- 12 SPECTRALOCK® DAZZLE™ options

Packaging

- 1 (3.8L) gallon~

Snap for more information and the **SPECTRALOCK 1** story.

*Stainproof (residential installation only) to common household cleaners, liquids and other goods. Clean all spills immediately.
†Meets or exceeds ANSI A118.3 specific test designation 5.6
^Refer to Data Sheet 365B9.0 for limitations and complete packaging information.
^^Not for exterior facades.
#Refer to LATICRETE® Grout Color Chart, Data Sheet 254.3 for complete color selection information.
**See Data Sheet 230.99 for complete warranty information.

LIFETIME Warranty

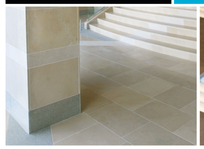
MICROBAN

LATICRETE International, Inc. ■ One LATICRETE Park North, Bethany, CT 06524-3423 USA ■ 1.800.243.4788 ■ +1.203.393.0010 ■ www.laticrete.com

TRI-LITE™

Globally Proven Construction Solutions

A lightweight, high performance tri-purpose mortar designed for large and heavy tile, thin-bed and wall installations



Data Sheet 320.0

25 YEAR Warranty

FEATURES	BENEFITS
Lightweight mortar	Lighter to transport, easier to trowel. A 30 lb (13.6 kg) bag provides the same coverage as a 50 lb (22.7 kg) bag of standard mortar.
Smooth creamy consistency	Lightweight consistency is easy to trowel providing unmatched workability.
Versatility	One mortar for large heavy tile, thin-bed and wall installations.
Non-sag, non-slump	Meets the challenging demands of installing large and heavy tile on both walls and floors. Fast and easy vertical installations.
Exceeds ANSI A118.15	Exceeds the industry's highest performance standard for a cementitious based adhesive mortar. Superior bond strength for worry-free installations of ceramic tile, porcelain tile and stone.
A component of the LATICRETE® 25 year system warranty*	Backed by LATICRETE means peace of mind for trouble-free installations in both interior and exterior installations.

Uses

- Large and heavy ceramic tile, porcelain tile and stone
- Wall installations, interior and exterior, of ceramic tile, porcelain tile and stone
- Ideal for most types of thin-set applications

Testing

Meets or exceeds the following standards:
- ANSI A118.4, A118.11 and A118.15
- ISO 13007 - C2TE1P1

Suitable Substrates

- Exterior Glue Plywood*
- Concrete
- Concrete Block
- Ceramic Tile and Stone
- Gypsum Wallboard*
- Cement Backer Board*,**
- Brick and Concrete Masonry

Packaging

30 lb (13.6 kg) bag, 56 bags per pallet

Available Colors

Grey and white

Approximate Coverage 30 lb (13.6 kg) bag

Trowel Size	ft²	(m²)
1/4" x 1/4" (6 mm x 6 mm) notched trowel	80 – 95	(7.4 – 8.8)
1/4" x 3/8" (6 mm x 9 mm)	60 – 70	(5.6 – 6.5)
1/2" x 1/2" (12 mm x 12 mm) notched trowel	40 – 47	(3.7 – 4.4)

* Interior use only. ** Consult cement backer board manufacturer for specific installation recommendations and to verify acceptability for exterior use. *See Data Sheet 025.0 for complete warranty information.

Snap for more information.

INTERIOR MATERIAL SCHEDULE

CODE	DESCRIPTION	MFR.	NAME/NUMBER	COLOR/FINISH	COMMENTS
FLOORS					
EP 1	EPOXY	LATICRETE	SPARTACOTE CHIP XPL	CRUMBL GREY	
WALLS					
CG1	CORNER GUARD	KSC	#A673	BRIGHT WHITE	3/4" X 3/4" X 8' - 0"
GT 1	WALL GROUT	LATICRETE	ZLC1644-0025-2	1600 UNSAND BRIGHT WHITE	AT WALL TILE. PURCHASE WITH TILE PACKAGE FROM EMSER. REQUIRED FOR WARRANTY. GC TO INSTALL 3/16" GROUT LINE.
IP 1	LATEX BASE PAINT	SHERWIN WILLIAMS	H REFLECTIVE WHITE SW7757	SEMI-GLOSS	ON ALL WALLS U.N.O., LEVEL 5 FINISH
IP 3	LATEX BASE PAINT	BEHR	FUNNY FACE M140-2	SEMI-GLOSS	AS NOTED ON PLAN, LEVEL 5 FINISH
TT 1	EDGE PROTECTOR	EMSER TILE	ZBL300-450-10025	WHITE/POWDER COATED	3/8", ALUMINUM
WC 1	FRP	--	--	SMOOTH, BRIGHT WHITE	
WS 1	WALL SETTING	LATICRETE	ZLC0279-0030-22	TRI-LITE WHITE	PURCHASE WITH TILE PACKAGE FROM EMSER. REQUIRED FOR WARRANTY. GC TO INSTALL 3/16" GROUT LINE.
WT 1	FIELD TILE	EMSER TILE	CATCH ICE	CATCH ICE GLOSS	4"x16" FIELD TILE, STACK BOND W/ EMSER TRIM @ EXPOSED EDGES, crumbl@emser.com, WHITE TILE FROM FLOOR TO CEILING WHERE APPLIED. GC TO INSTALL 3/16" GROUT LINE.
BASE					
CB 1	COVE BASE	EASYCOVE	EC-EZ1X4P	--	INSTALL AS PER MANUFACTURER SPECFICATIONS.
CEILINGS					
C1	GRID CEILING	--	VINYL TILE	WHITE	WHITE VINYL TILE WITH WHITE GRID
IP 2	LATEX BASE PAINT	SHERWIN WILLIAMS	TRICORN BLACK SW6258	EGGSHELL	EXPOSED CEILING COLOR/WALLS ABOVE 12' - 0"
IP 4	LATEX BASE PAINT	SHERWIN WILLIAMS	HIGH REFLECTIVE WHITE SW7757	EGGSHELL	RESTROOM CEILING
MILLWORK					
SS 1	SOLID SURFACE	HI-MACS by LX HAUSYS	S028	ALPINE WHITE	WATERFALL EDGE WHERE OCCURING, BUILT UP EDGE
DOORS					
DP	LATEX BASED PAINT	SHERWIN WILLIAMS	HIGH REFLECTIVE WHITE SW7757	SEMI-GLOSS	

NOTE: COORDINATE WITH OWNER FOR FINAL SELECTION AND APPLICATION OF ALL FINISHES.

ROOM FINISH SCHEDULE

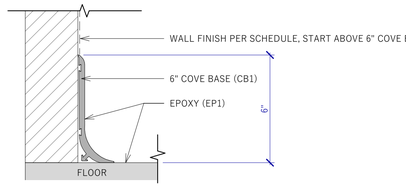
ROOM NUMBER	ROOM NAME	FLOOR	WALLS	BASE FINISH	CEILING FINISH	NOTES
101	ORDER/PICK UP	EP 1	IP 1 / IP 3 / WT 1	CB1	C1	SEE KEYED NOTES.
102	OPEN BAKERY	EP 1	WC 1/ WT 1 / IP1 / IP3	CB1	C1	IP 1 ABOVE WC 1 TO CEILING, SEE KEYED NOTES.
103	BACK OF HOUSE	EP 1	WC 1	CB1	C1	IP 1 ABOVE WC 1 TO CEILING, SEE KEYED NOTES.
104	RR	EP 1	WC 1	CB1	IP4	IP 1 ABOVE WC 1 TO CEILING, SEE KEYED NOTES.
105	ELECTRICAL	EP 1	WC 1	CB1	C1	IP 1 ABOVE WC 1 TO CEILING, SEE KEYED NOTES.

KEYED NOTES

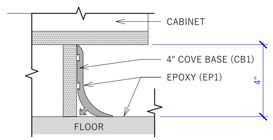
1. WALL FINISH WC 1, UP TO 8'-6" AFF.
2. WALL FINISH WC 1 UP TO B.O. CEILING ADJACENT TO WATER HEATER.
3. WALL FINISH WC 1 IN BATHROOM, UP TO 4'-6" A.F.F.
4. WALL FINISH WT 1, TO TERMINATE AT T.O. WALL.
5. WALL FINISH WC 1 UP TO 7'-0" A.F.F.
6. WALL FINISH IP 3
7. WALL FINISH IP 1
8. WALL FINISH WT 1 ON BACK OF CABINETRY WALL
9. WALL FINISH WC 1 UP TO 3' - 6" A.F.F.
10. WALL FINISH IP3 TO TERMINATE AT THE EDGE OF CABINETRY FRAMING
11. WALL FINISH WC 1 UP TO BOTTOM OF FLOATING SHELF

FLOOR FINISH LEGEND

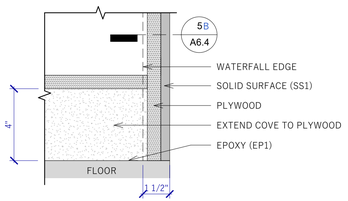
EP 1



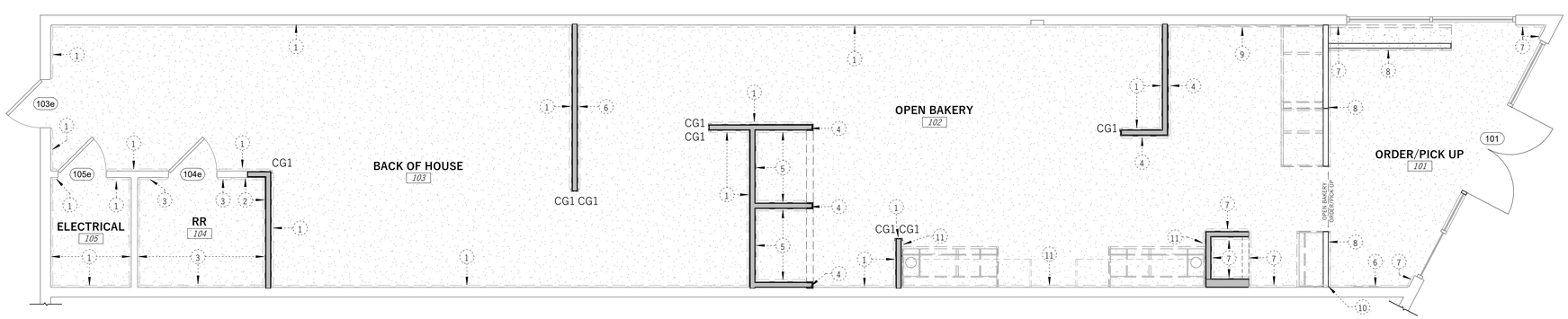
2 A6.4 — 6" COVE BASE DETAIL — 3" = 1'-0"



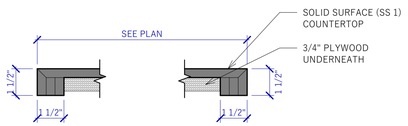
3 A6.4 — 4" COVE BASE DETAIL — 3" = 1'-0"



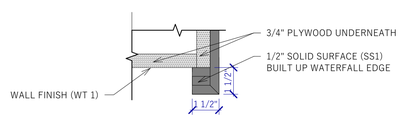
4 A6.4 — 4" COVE BASE @ WATERFALL EDGE — 3" = 1'-0"



1 A6.4 — MAIN FLOOR FINISH PLAN — 1/4" = 1'-0"



SECTION A (ALL TOPS)



PLAN B (WATERFALL EDGES)

5 A6.4 — TYPICAL EDGE PROFILE — 3" = 1'-0"

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FINISH PLAN AND DETAILS

A6.4

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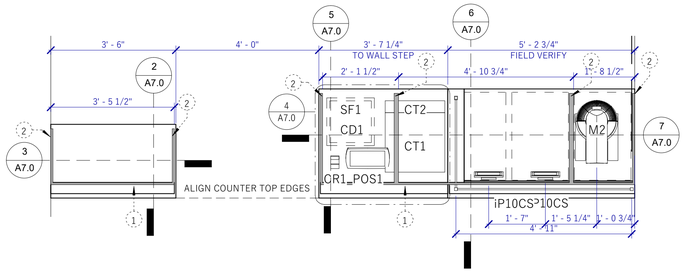
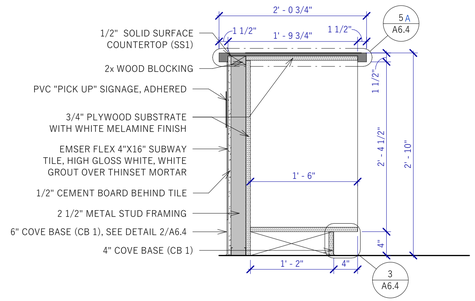


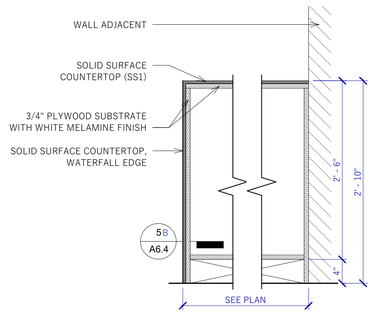
1 A7.0 **ENLARGED PLAN @ PREP COUNTER**
1/2" = 1'-0"



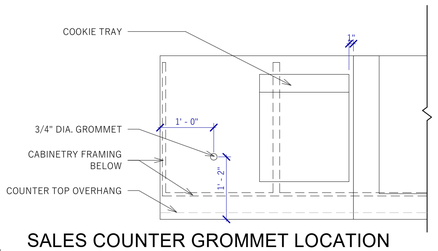
2 A7.0 **PICK-UP COUNTER - CABINETRY**
1" = 1'-0"

KEYED NOTES

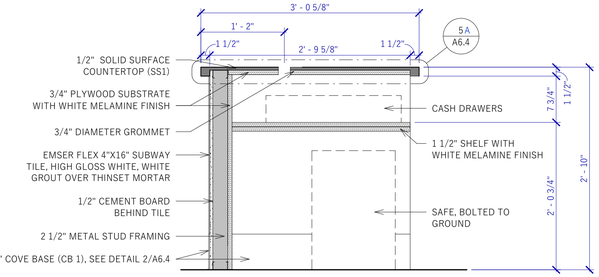
1	FRAMED WALL AT REAR OF CABINETRY.
2	CABINETRY FRAMING BELOW. SEE DETAILS.



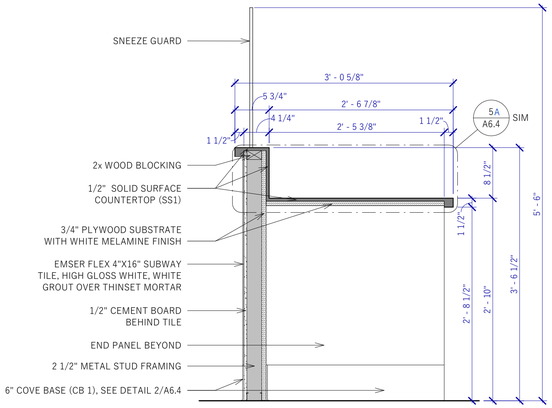
3 A7.0 **WATERFALL EDGE @ PICK UP COUNTER**
1" = 1'-0"



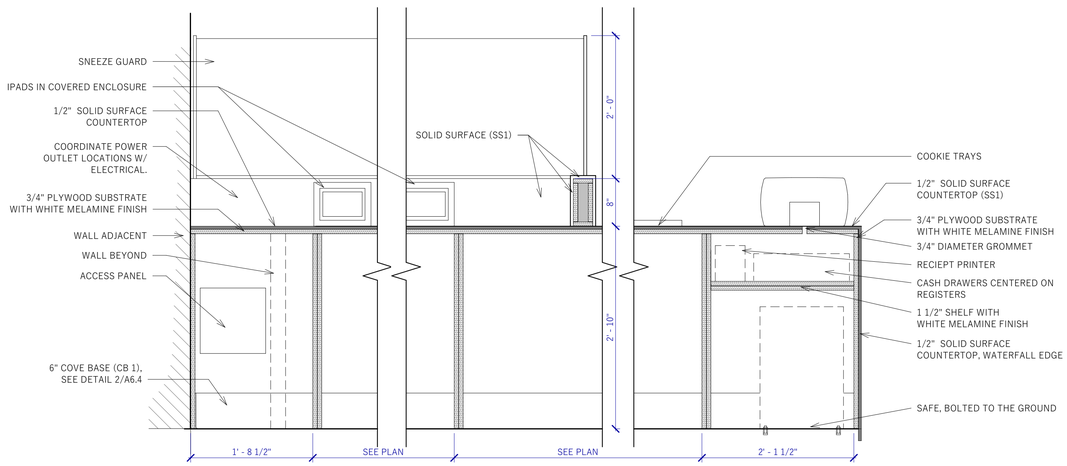
4 A7.0 **SALES COUNTER GROMMET LOCATION DETAIL**
3/4" = 1'-0"



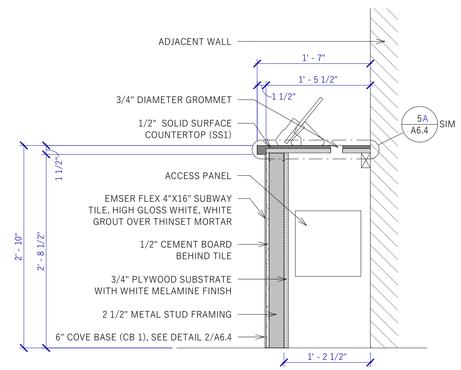
5 A7.0 **POS @ BOX STORAGE SAFE - CABINETRY**
1" = 1'-0"



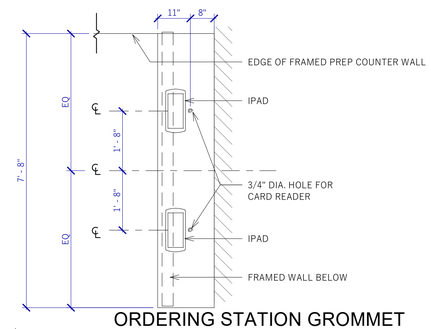
6 A7.0 **PREP COUNTER @ BINS - CABINETRY**
1" = 1'-0"



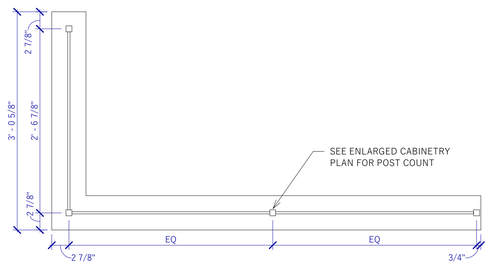
7 A7.0 **PREP COUNTER - CABINETRY**
1" = 1'-0"



8 A7.0 **ORDERING STATION**
1" = 1'-0"



9 A7.0 **ORDERING STATION GROMMET LOCATION DETAIL**
1/2" = 1'-0"



10 A7.0 **SNEEZE GUARD PLAN**
1" = 1'-0"

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FRONT COUNTER CABINETRY DETAILS

A7.0

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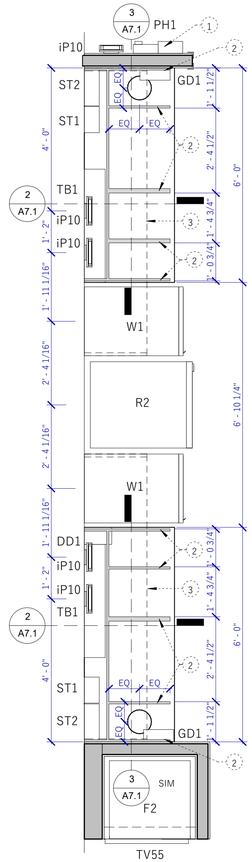
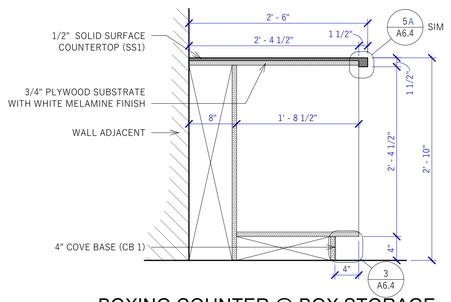
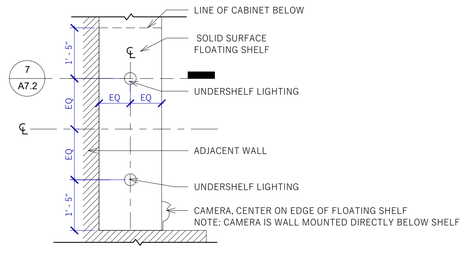


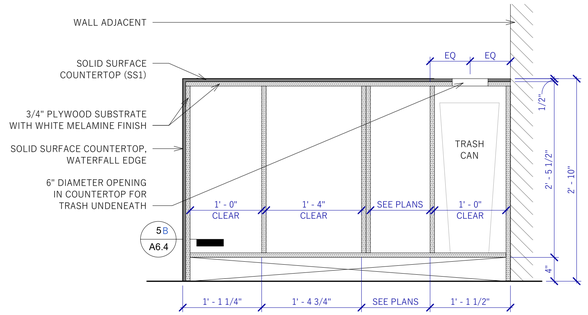
1 A7.1 ENLARGED PLAN @ DRESSING STATION
1/2" = 1'-0"



2 A7.1 BOXING COUNTER @ BOX STORAGE - CABINETRY
1" = 1'-0"



4 A7.1 CAMERA LOCATION @ FLOATING SHELF @ BOXING STATION
1/2" = 1'-0"



3 A7.1 WATERFALL EDGE @ CABINETRY
1" = 1'-0"

KEYED NOTES

1	HEADSET SHELF.
2	CABINETRY FRAMING BELOW, SEE DETAILS.
3	SOLID SURFACE FLOATING SHELF, SEE DETAILS

CRUMBL COOKIES - WATERFORD #1046

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DRESSING STATION CABINETRY DETAILS
A7.1

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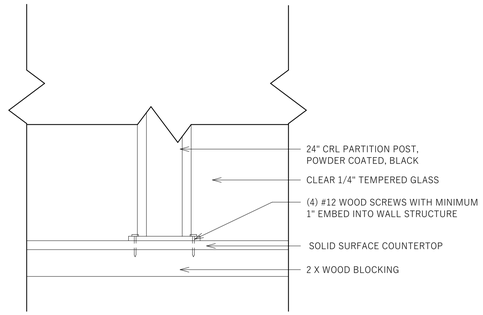
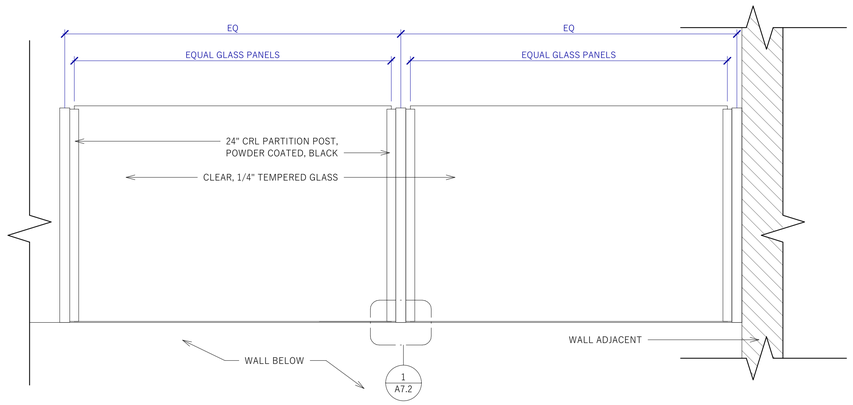
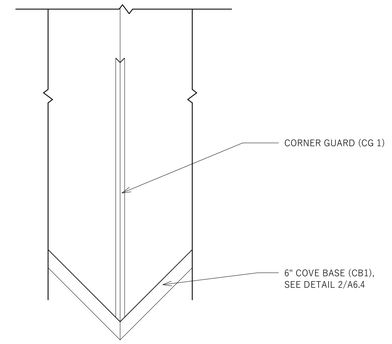


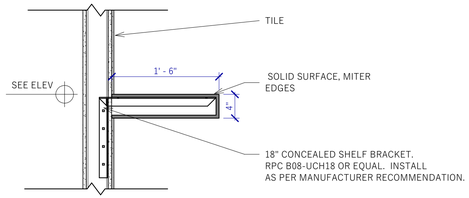
1 A7.2 SNEEZE GUARD ATTACHMENT DETAIL
3" = 1'-0"



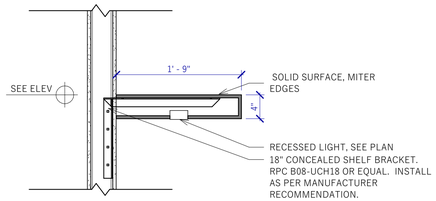
2 A7.2 SNEEZE GUARD
1 1/2" = 1'-0"



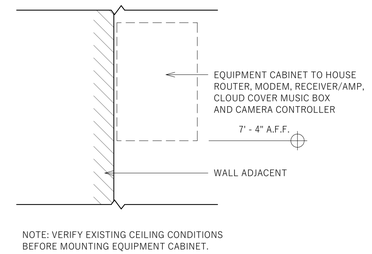
12 A7.2 CORNER GUARD DETAIL
3/4" = 1'-0"



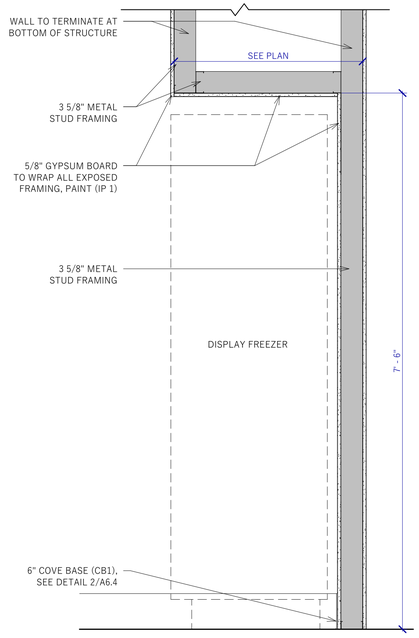
6 A7.2 18" INGREDIENT SHELF
1" = 1'-0"



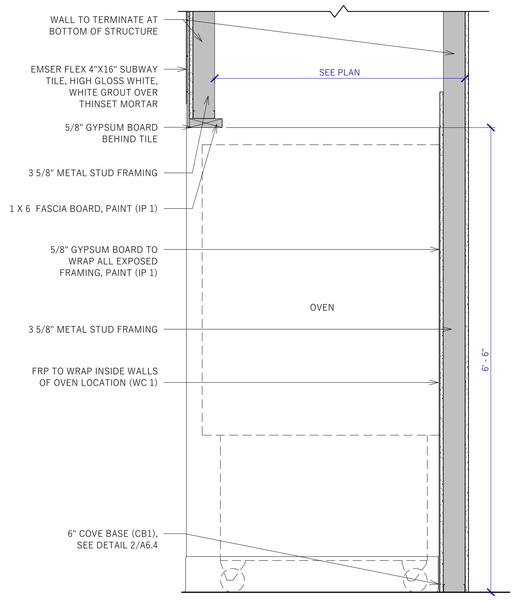
7 A7.2 21" BOX SHELF
1" = 1'-0"



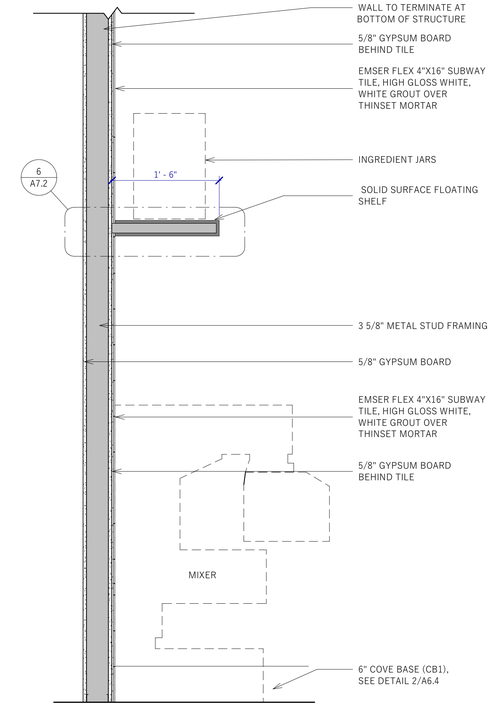
13 A7.2 EQUIPMENT CABINET DETAIL
3/4" = 1'-0"



9 A7.2 DISPLAY FREEZER WALL
1" = 1'-0"



10 A7.2 OVEN WALL
1" = 1'-0"



11 A7.2 MIXER WALL
1" = 1'-0"

CRUMBL COOKIES - WATERFORD #1046

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SECTIONS AND DETAILS
A7.2

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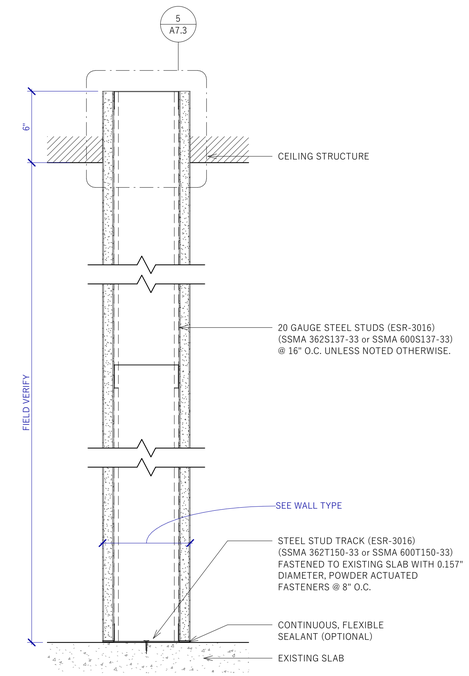
INTERIOR WALLS DETAIL - TO STRUCTURE

3 A7.3

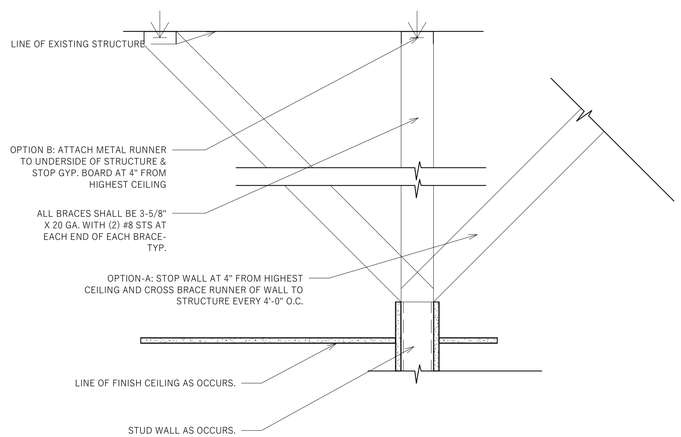
3" = 1'-0"



INTERIOR WALLS DETAIL - 6" ABOVE CEILING

4 A7.3

3" = 1'-0"



WALL BRACING DETAIL - 6" ABOVE CEILING

5 A7.3

1 1/2" = 1'-0"

CRUMBL COOKIES - WATERFORD #1046

4978 HIGHLAND RD
WATERFORD TWP, MI 48327

ISSUED: DECEMBER 10, 2022

CURRENT REVISION:

22-246

WALL & CEILING DETAILS

A7.3

crumbl cookies

JZW ARCHITECTS

MECHANICAL SYMBOLS

NOTES:
1. ALL SYMBOLS MAY NOT BE USED.
2. DOTTED SYMBOLS INDICATE EXISTING EQUIPMENT, ETC

SYMBOL	EXPLANATION
ø	ROUND MEASUREMENT.
Ⓣ	THERMOSTAT CONTROL
	RETURN AIR
	SUPPLY AIR
	EXHAUST AIR
	EXHAUST FAN
A / #	MECHANICAL EQUIPMENT SYMBOL
#	KEYED NOTE REFERENCE
#"ø / #	DUCT SIZE FROM MAIN DUCT TO DIFFUSER. DIFFUSER OR GRILLE BALANCED TO CFM.
#SLOT / #	NUMBER OF SLOT IN LINEAR GRILLE. DIFFUSER OR GRILLE BALANCED TO CFM.
	SUPPLY AIR DUCTWORK
	RETURN AIR DUCTWORK
—EA—	EXHAUST AIR DUCTWORK
—CA—	COMBUSTION AIR DUCTWORK
	BALANCE DAMPER

DESIGN CONTACTS

MECHANICAL ENGINEER:	MARK MAKIN
MECHANICAL PROJECT MANAGER:	JESSE EGAN
MECHANICAL DESIGNER:	JESSE EGAN

MECHANICAL SHEET INDEX

SHEET NUMBER	SHEET TITLE
M0.1	MECHANICAL NOTES & LEGEND
M1.1	MECHANICAL PLAN
M5.1	MECHANICAL DETAILS
M6.1	MECHANICAL SCHEDULES
M7.1	MECHANICAL SPECIFICATIONS
M7.2	MECHANICAL SPECIFICATIONS
M8.1	OVEN SPECIFICATIONS & COMCHECK
M8.2	COMCHECK

SEISMIC SUPPORT NOTES:

BRACING FOR SUSPENDED DUCTWORK, ETC

1. PER ASCE STANDARD 7–16 SEISMIC SUPPORTS ARE NOT REQUIRED FOR EITHER OF THE FOLLOWING CONDITIONS:
   A. HVAC DUCTS ARE SUSPENDED WITH HANGERS 12" OR LESS IN LENGTH.
   B. HVAC DUCTS HAVE A CROSS–SECTIONAL AREA OF LESS THAN 6 SQUARE FEET.
2. IF INSTANCES OCCUR WHERE HVAC DUCT IS SUSPENDED WITH HANGERS GREATER THAN 12" IN LENGTH AND HVAC DUCT HAS A CROSS–SECTIONAL AREA GREATER THAN 6 SQUARE FEET SYSTEM CONNECTORS AND COMPONENTS SHALL BE COMPATIBLE AND DESIGNED FOR THE APPLICATION THAT THEY ARE USED FOR. SHALL HAVE A MINIMUM OF TWO TRANSVERSE BRACES PER STRAIGHT DUCT RUN WITH A MAXIMUM DISTANCE OF 30' BETWEEN TRANSVERSE BRACES. SHALL HAVE A MINIMUM OF ONE LONGITUDINAL BRACE PER STRAIGHT DUCT RUN WITH A MAXIMUM DISTANCE OF 40' BETWEEN LONGITUDINAL BRACES. BRACING SHALL ONLY OCCUR AT OR NEAR AREAS WHERE SUFFICIENT DUCT STIFFNESS IS PRESENT (AT OR NEAR JOINT CONNECTIONS).
3. FOR SEISMIC BRACING OF MECHANICAL EQUIPMENT AN INDEPENDENT SEISMIC AND VIBRATION CONTROL SUBCONTRACTOR WITH EXPERIENCE, COMPUTING CAPABILITIES, AND MANUFACTURED PRODUCTS SHALL BE FURNISHED BY MECHANICAL CONTRACTOR. INDEPENDENT SEISMIC CONSULTANT SHALL PROVIDE REQUIRED COMPUTATIONS, SHOP DRAWINGS, AND MANUFACTURED PRODUCTS TO MEET THE MINIMUM REQUIREMENTS OF ASCE 7–16 AND INTERNATIONAL BUILDING CODES (LATEST ADOPTED EDITION) FOR THE RESPECTIVE SEISMIC DESIGN FOR SEISMIC ZONE WITH IMPORTANCE FACTOR 1.5. SEISMIC SUBCONTRACTOR SHALL EXERCISE THE QUALITY CONTROL FOR THIS WORK AND SHALL NOT BE LIMITED TO INSTRUCTIONS DIRECTED TO THE MECHANICAL CONTRACTOR. THE SEISMIC SUBCONTRACTOR SHALL CERTIFY IN WRITING THAT THEY HAVE INSPECTED THE INSTALLATION AND THAT ALL ISOLATION ANCHORS AND SEISMIC RESTRAINT MATERIALS ARE INSTALLED CORRECTLY AND FUNCTIONING PROPERLY. CERTIFICATION SHALL BE PROVIDED AFTER ALL CORRECTIVE WORK HAS BEEN COMPLETED.

SUBMITTAL NOTES:

1. CONTRACTOR TO ALLOW 10 WORKING DAYS FOR SUBMITTAL TURNAROUND.
2. CONTRACTOR TO PROVIDE SUBMITTALS FOR ALL EQUIPMENT AND MATERIALS IN A SINGLE PACKAGE. PIECEMEAL SUBMITTALS WILL BE RETURNED WITH A NOTE TO REVISE AND RESUBMIT.
3. SUBMITTALS WILL BE CHECKED FOR COMPLIANCE WITH CAPACITY REQUIREMENTS AND ELECTRICAL REQUIREMENTS. CONTRACTOR TO VERIFY THAT WEIGHTS, DIMENSIONS, AND DUCT CONNECTIONS ON SUBMITTED EQUIPMENT IS CONSISTENT WITH SCHEDULED EQUIPMENT PRIOR TO SUBMITTAL. CHANGES IN SCOPE BROUGHT ABOUT BY SUBMITTED EQUIPMENT THAT DOES NOT COMPLY WITH THE WEIGHTS, DIMENSIONS, OR CONNECTION LOCATIONS ON SCHEDULED EQUIPMENT SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR.

MECHANICAL PERFORMANCE NOTES:

M1. MECHANICAL CONTRACTOR TO PROVIDE AND INSTALL A HONEYWELL TC500A–N 7–DAY PROGRAMMABLE THERMOSTAT FOR THE EXISTING ROOFTOP UNIT AND NEW MINI SPLIT SYSTEM. VERIFY THERMOSTAT LOCATION WITH OWNER REPRESENTATIVE IN FIELD.

M2. COORDINATE EXACT LOCATION OF ALL MECHANICAL UNITS WITH GENERAL CONTRACTOR. VERIFY IN FIELD.

M3. PROVIDE AND INSTALL OUTSIDE AIR SYSTEM AS SPECIFIED ON THE PLANS. ROOFTOP UNIT WILL BE VIA EXISTING ECONOMIZER.

M4. PROVIDE AND INSTALL MANUAL CONTROL DAMPERS AT EACH BRANCH TAKE–OFF. EACH SUPPLY AIR GRILLE SHALL BE DOWNSTREAM FROM A CONTROL DAMPER FOR BALANCING AND ADJUSTMENT. SOME INSTALLATIONS MAY REQUIRE OPPOSED BLADE DAMPERS OR CONCEALED DAMPER REGULATORS THAT ARE REMOTELY ADJUSTED.

M5. PROVIDE AND INSTALL FIRE DAMPERS IN MECHANICAL DUCT WITH REQUIRED ACCESS DOORS AT ALL FIRE RATED ASSEMBLY PENETRATIONS. FIRE BARRIER IS AT GYP. BOARD. (COORDINATE WITH ARCHITECTURAL PLANS).

M6. MECHANICAL CONTRACTOR TO PROVIDE DOCUMENTATION OF MANUFACTURER START–UP FOR RTU AND MINI SPLIT. (NOT REQUIRED WHEN ALREADY COMPLETED PRIOR TO THIS PROJECT.) IF THE EQUIPMENT HAS BEEN PREVIOUSLY INSTALLED, COMPLETE A FULL SERVICE/PERFORMANCE CHECK. SEE HVAC UNIT SCHEDULE FOR ADDITIONAL INFORMATION.

M7. MECHANICAL CONTRACTOR TO PROVIDE AND INSTALL SINGLE THICKNESS TURNING VANES AT EACH 90 DEGREE SQUARE DUCT ELBOW.

COMMISSIONING NOTES:

MECHANICAL CONTRACTOR SHALL BE RESPONSIBLE TO PROVIDE ALL DOCUMENTATION TO THE OWNER.

A COMMISSIONING PLAN SHALL BE DEVELOPED BY A REGISTERED DESIGN PROFESSIONAL OR APPROVED AGENCY AND SHALL INCLUDE THE FOLLOWING ITEMS:
1. A NARRATIVE DESCRIPTION OF THE ACTIVITIES THAT WILL BE ACCOMPLISHED DURING EACH PHASE OF COMMISSIONING, INCLUDING THE PERSONNEL INTENDED TO ACCOMPLISH EACH OF THE ACTIVITIES.
2. A LISTING OF THE SPECIFIC EQUIPMENT, APPLIANCES OR SYSTEMS TO BE TESTED AND A DESCRIPTION OF THE TESTS TO BE PERFORMED.
3. FUNCTIONS TO BE TESTED, INCLUDING, BUT NOT LIMITED TO CALIBRATIONS AND ECONOMIZER CONTROLS.
4. CONDITIONS UNDER WHICH THE TESTS WILL BE PERFORMED. AT A MINIMUM, TESTING SHALL AFFIRM WINTER AND SUMMER DESIGN CONDITIONS AND FULL OUTSIDE AIR CONDITIONS.
5. MEASURABLE CRITERIA FOR PERFORMANCE.

PRELIMINARY COMMISSIONING REPORT. A PRELIMINARY REPORT OF COMMISSIONING TEST PROCEDURES AND RESULTS SHALL BE COMPLETED AND CERTIFIED BY THE REGISTERED DESIGN PROFESSIONAL OR APPROVED AGENCY AND PROVIDED TO THE BUILDING OWNER. THE REPORT SHALL BE IDENTIFIED AS "PRELIMINARY COMMISSIONING REPORT" AND SHALL IDENTIFY:
1. ITEMIZATION OF DEFICIENCIES FOUND DURING TESTING REQUIRED BY THIS SECTION THAT HAVE NOT BEEN CORRECTED AT THE TIME OF REPORT PREPARATION.
2. DEFERRED TESTS THAT CANNOT BE PERFORMED AT THE TIME OF REPORT PREPARATION BECAUSE OF CLIMATIC CONDITIONS.
3. CLIMATIC CONDITIONS FOR PERFORMANCE OF THE DEFERRED TESTS.

ACCEPTANCE OF REPORT. BUILDINGS, OR PORTIONS THEREOF, SHALL NOT PASS THE FINAL MECHANICAL INSPECTION UNTIL SUCH TIME AS THE CODE OFFICIAL HAS RECEIVED A LETTER OF TRANSMITTAL FROM THE BUILDING OWNER ACKNOWLEDGING THAT THE BUILDING OWNER HAS RECEIVED THE PRELIMINARY COMMISSIONING REPORT.

THE CODE OFFICIAL SHALL BE PERMITTED TO REQUIRE THAT A COPY OF THE PRELIMINARY COMMISSIONING REPORT BE MADE AVAILABLE FOR REVIEW BY THE CODE OFFICIAL.

DOCUMENTATION REQUIREMENTS. THE CONSTRUCTION DOCUMENTS SHALL SPECIFY THAT THE DOCUMENTS DESCRIBED IN THIS SECTION BE PROVIDED TO THE BUILDING OWNER WITHIN 90 DAYS OF THE RECEIPT OF THE CERTIFICATE OF OCCUPANCY.

WHICH SHALL INCLUDE DRAWINGS, MANUALS, SYSTEM BALANCING REPORT, AND FINAL COMMISSIONING REPORT.

PROJECT MECHANICAL NOTES:

1. USING CFM NOTED ON PLANS INSTALL GRILLES AND DIFFUSERS WITH MAXIMUM NOISE CRITERIA (NC) OF 25.
2. DUCTWORK SIZING, ROUTING, AND LOCATION TO BE FIELD VERIFIED AND APPROVED FOR ANY CHANGES TO THE DUCT SIZING AND/OR ROUTING PRIOR TO DUCT FABRICATION AND INSTALLATION. DUCTWORK FABRICATED PRIOR TO FIELD VERIFICATION AND APPROVALS THAT NEEDS TO BE ALTERED WILL BE ALTERED AS NEEDED BY THE CONTRACTOR WITH NO ADDITIONAL COST TO THE OWNER.
3. ANY NEW FRESH/OUTSIDE AIR INTAKES SHALL BE 10 FEET MIN. FROM ALL EXHAUST & PLUMBING VENTS.
4. NEW RETURN AIR & SUPPLY AIR DUCTWORK IN UNCONDITIONED SPACES SHALL BE INSULATED PER APPLICABLE CODES.
5. ALL NEW EQUIPMENT SHALL HAVE A FLEXIBLE CONNECTION FOR THE RETURN AIR & SUPPLY AIR DUCTWORK.
6. BALANCE ALL NEW SYSTEMS TO CFM NOTED AT EACH DIFFUSER AND GRILLE BY AN INDEPENDENT BALANCING CONTRACTOR.
7. ALL NEW GAS FIRED EQUIPMENT WILL BE TESTED BY CERTIFIED GAS INSTALLERS AND HAVE GREEN STICKERS STATING COMPLIANCE WITH ALL REQUIRED LOCAL AND 2018 MFGC REQUIREMENTS.
8. HEATING LOADS COMPLETED USING CHVAC OR OTHER APPROVED CALCULATION METHODS.
9. MECHANICAL CONTRACTOR SHALL CLEAN EXISTING DUCT SYSTEM AND GRILLES CONNECTED TO ALL EXISTING RTU.
10. PROVIDE AND INSTALL NEW FILTERS FOR EXISTING RTU AT THE COMPLETION OF THIS PROJECT.
11. MECHANICAL CONTRACTOR SHALL TEST THE EXISTING RTU FOR PROPER OPERATION. INFORM THE GENERAL CONTRACTOR/OWNER REPRESENTATIVE OF ANY PROBLEMS OR CONCERNS.
12. MECHANICAL CONTRACTOR SHALL RELOCATE EXISTING SUPPLY AIR & RETURN AIR DUCTING AND REGISTERS AS REQUIRED TO ACCOMMODATE NEW WALLS AND LIGHTING LAYOUT. EXTEND AND OR MODIFY DUCTWORK AS REQUIRED. COORDINATE WITH GENERAL CONTRACTOR/OWNER REPRESENTATIVE IN FIELD.
13. MECHANICAL CONTRACTOR SHALL VISIT THE PROJECT SITE DURING THE BIDDING PROCESS.

CRUMBL COOKIES - WATERFORD #1046

4978 HIGHLAND RD
WATERFORD TWP, MI 48327

ISSUED: DECEMBER 19, 2022

CURRENT REVISION:

22-246

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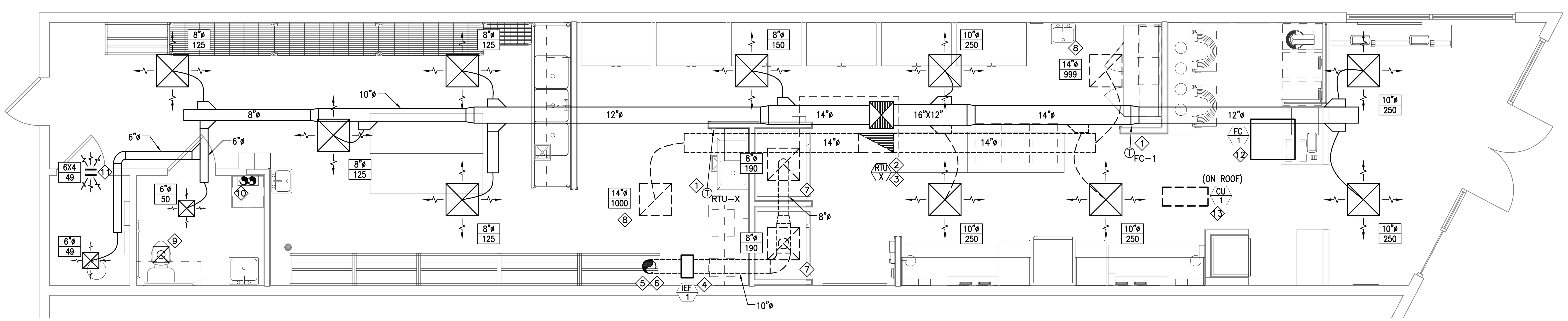
MECHANICAL NOTES & LEGEND

M0.1

MECHANICAL KEYED NOTES:

1. PROVIDE AND INSTALL HONEYWELL TC500A-N 7-DAY PROGRAMMABLE THERMOSTAT. FIELD VERIFY THERMOSTAT LOCATION WITH OWNERS REPRESENTATIVE. INSTALL THERMOSTAT AT 48" A.F.F..
2. EXISTING RTU RISER/DROP. FIELD VERIFY EXACT LOCATION.
3. EXISTING RTU ON ROOF TO REMAIN. FIELD VERIFY EXACT LOCATION.
4. PROPOSED LOCATION OF INLINE EXHAUST FAN. FIELD VERIFY EXACT LOCATION WITH OWNER'S REPRESENTATIVE.
5. PROVIDE AND INSTALL EXHAUST DUCT TO OWNER APPROVED EXHAUST VENT TERMINATION. VERIFY LOCATION IN FIELD. ACTUAL DUCT SIZE DETERMINED BY EXHAUST FAN OUTLET. SEE DETAILS AND SCHEDULES FOR ADDITIONAL INFORMATION.
6. ALL EXHAUST AIR DUCTING SHALL TERMINATE WITH A BACKDRAFT DAMPER AND MANUFACTURER/OWNER REPRESENTATIVE RECOMMENDED TERMINATION GRILLE AT A MINIMUM OF 3' FROM OPERABLE BUILDING OPENINGS AND 10' FROM MECHANICAL FRESH AIR INTAKES.
7. THE OVENS IN THIS PROJECT ARE LIGHT DUTY ELECTRIC COOKING APPLIANCES AND DO NOT PRODUCE GREASE OR SMOKE AS A RESULT OF THE COOKING PROCESS, THEREFORE THE OVENS DO NOT REQUIRE A TYPE I HOOD. PER 2018 MICHIGAN MECHANICAL CODE 507.3 TYPE II HOOD IS NOT REQUIRED BECAUSE THE HEAT AND MOISTURE LOADS HAVE BEEN INCORPORATED INTO THE HVAC DESIGN. THE KITCHEN AREA HAS AN EXHAUST FAN THAT HAS BEEN SIZED TO 0.7 CFM/SF AND THE MAKE UP AIR IS VIA OUTSIDE AIR DUCT. PLEASE SEE THE OUTSIDE AIR BALANCING SCHEDULE AND IN-LINE EXHAUST FAN SCHEDULE ON MP6.1 AND THE OVEN SPECIFICATION SHEET ON MP8.1.
8. PROPOSED LOCATION OF RETURN AIR GRILLE SIZED AT NOTED CFM WITH AN NC NO GREATER THAN 25.
9. EXISTING RESTROOM EXHAUST FAN TO REMAIN. CONTRACTOR TO VERIFY PROPER OPERATION AND PERFORMANCE. MINIMUM 70 CFM REQUIRED.
10. TANKLESS WATER HEATER EXHAUST AND COMBUSTION PIPING BY PLUMBING CONTRACTOR. INSTALL PER MANUFACTURER'S RECOMMENDATIONS. FIELD VERIFY ALL ROUTING.
11. PROPOSED LOCATION OF UNDER DOOR CUT OR TRANSFER GRILLE FOR NOTED CFM IN ENCLOSED UTILITY ROOM. COORDINATE FINAL LOCATION WITH STRUCTURE. SEE TRANSFER DETAIL FOR MORE INFORMATION. A 1" DOOR UNDERCUT (36" DOOR) CAN ACCOUNT FOR UP TO 80 CFM OF RETURN AIR TRANSFER. PROVIDE AND INSTALL TRANSFER GRILLE ABOVE DOOR IF CLEARANCES DO NOT ALLOW FOR UNDER-DOOR CUT.
12. PROPOSED LOCATION OF NEW CEILING FAN COIL UNIT. CONTRACTOR SHALL MAKE CONNECTION TO OUTDOOR UNIT. ROUTE CONDENSATE PIPING TO CR-1. INSTALL PER MANUFACTURER'S RECOMMENDATIONS.
13. PROPOSED LOCATION OF NEW OUTDOOR UNIT ON ROOF. CONFIRM EXACT LOCATION WITH STRUCTURE AND OWNER'S REPRESENTATIVE. PENETRATION FOR REFRIGERANT PIPING SHALL BE THROUGH THE ROOF. CONTRACTOR TO ENSURE PENETRATIONS ARE PROPERLY SEALED. COORDINATE THE DIVISION OF LABOR WITH THE GENERAL CONTRACTOR.



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

CRUMBL COOKIES - WATERFORD #1046

4978 HIGHLAND RD
WATERFORD TWP, MI 48327

ISSUED: DECEMBER 19, 2022

CURRENT REVISION:

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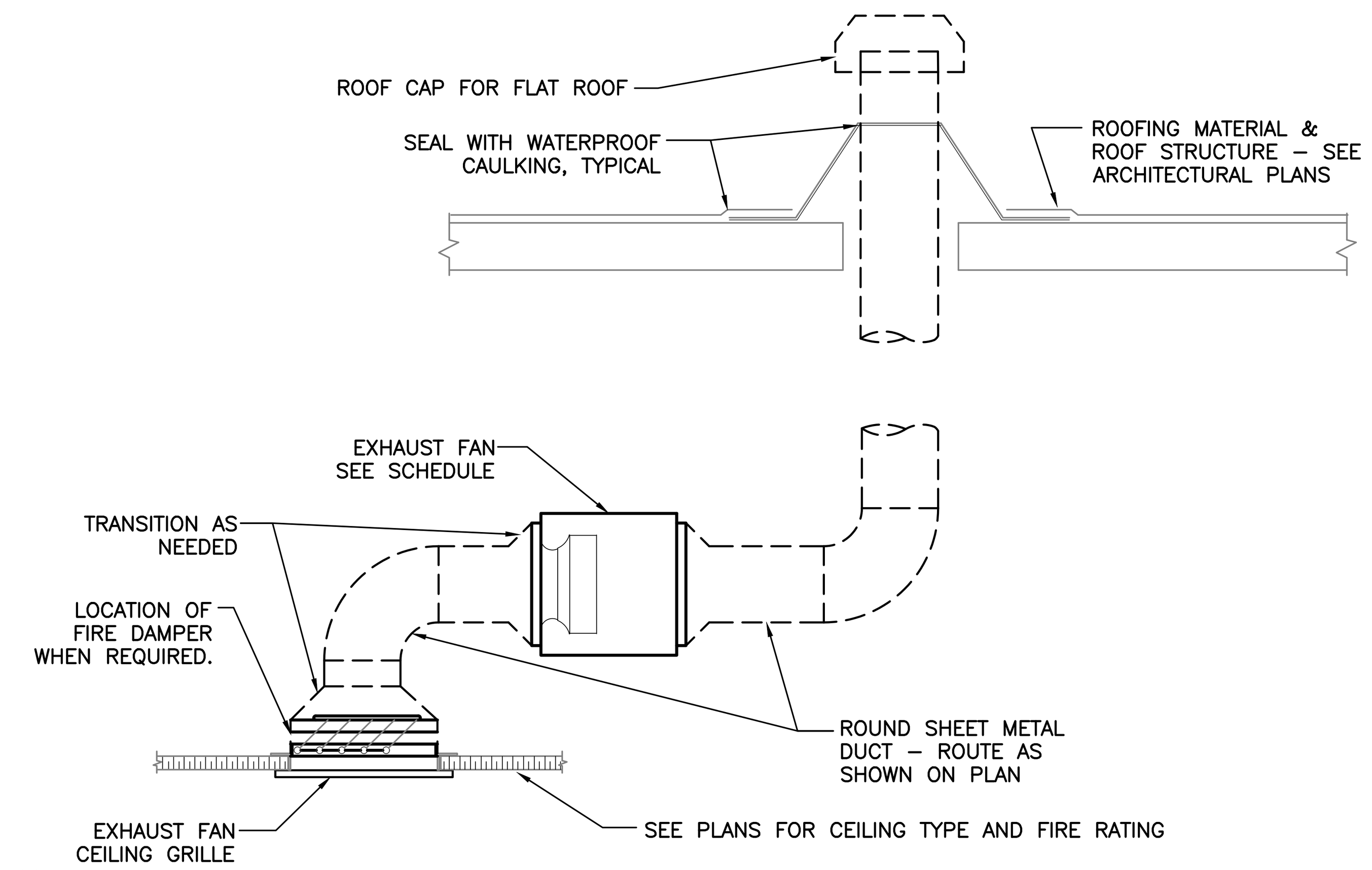
MECHANICAL PLAN

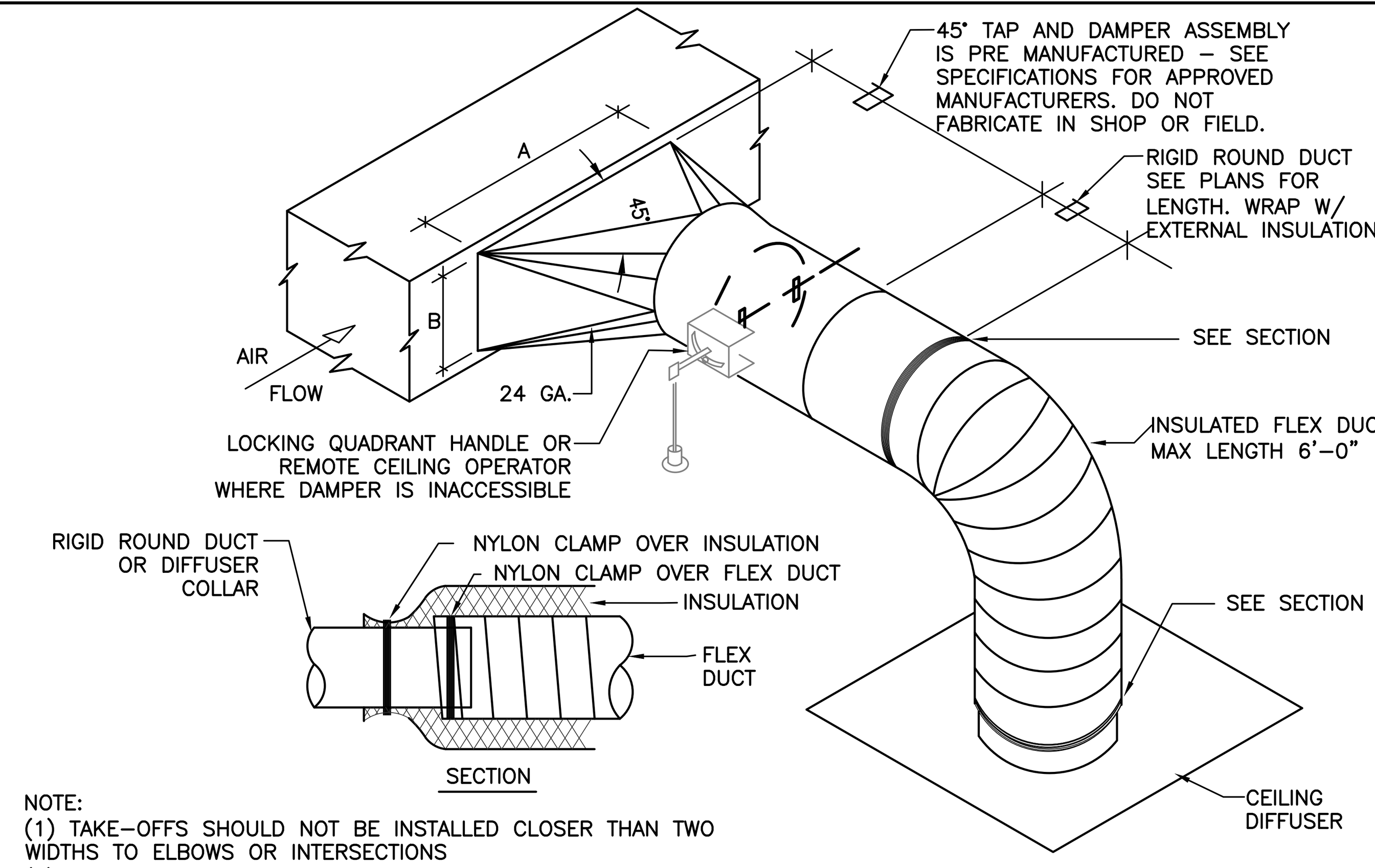
M1.1



NOTE:
ALL EXHAUST DUCT PENETRATIONS OF THERMAL ENVELOPE SHALL HAVE A BACK DRAFT DAMPER AT THE DUCT PENETRATION.

INLINE EXHAUST FAN DETAIL

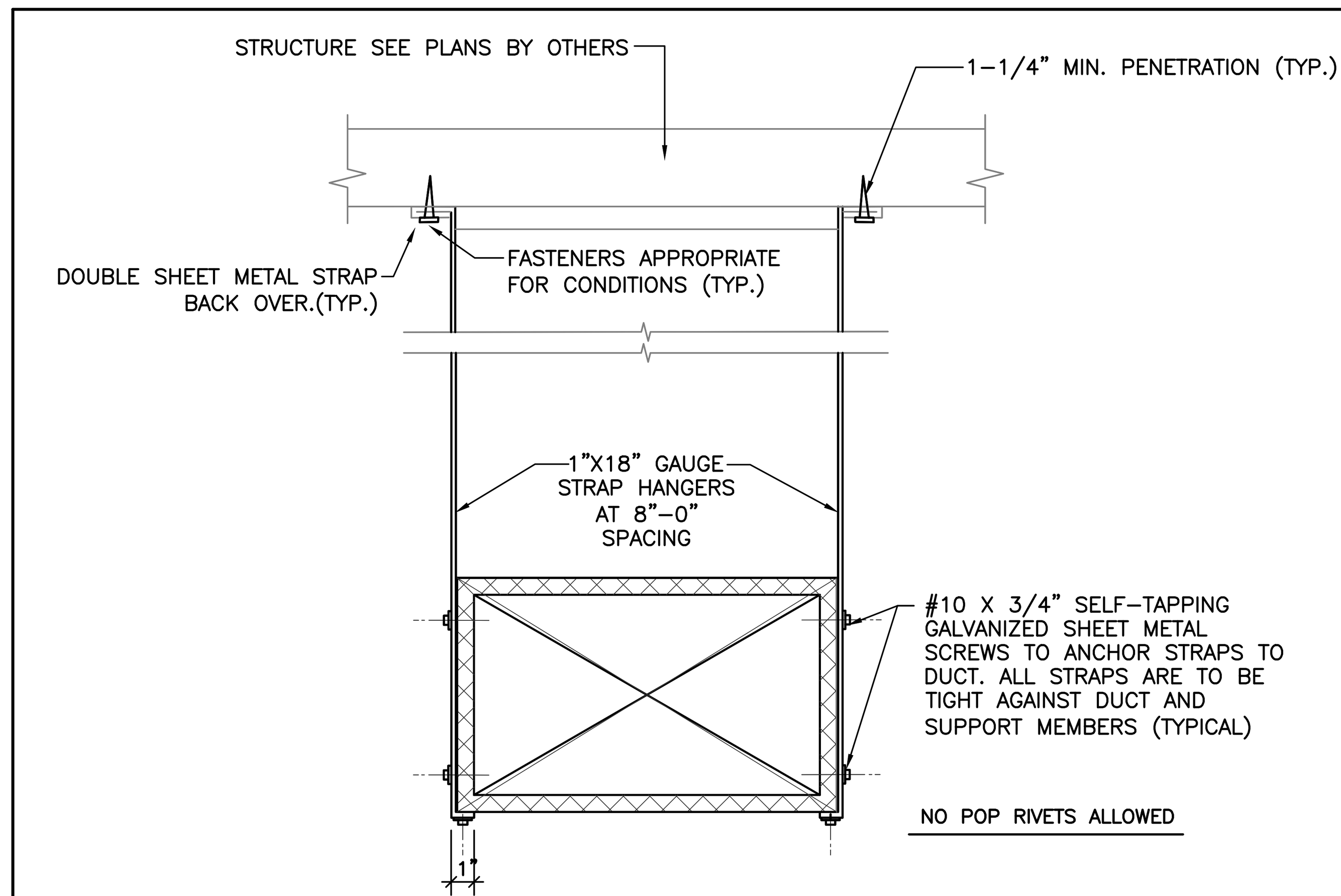
SCALE: NONE



NOTE:
(1) TAKE-OFFS SHOULD NOT BE INSTALLED CLOSER THAN TWO WIDTHS TO ELBOWS OR INTERSECTIONS
(2) AREA OF A X B SHALL BE EQUAL TO 1.5 X AREA BRANCH DUCT
(3) SHALL BE FLEXMASTER USA STO-LDS, SHEET METAL CONNECTORS HET, OR AIR-RITE ST-1HD.

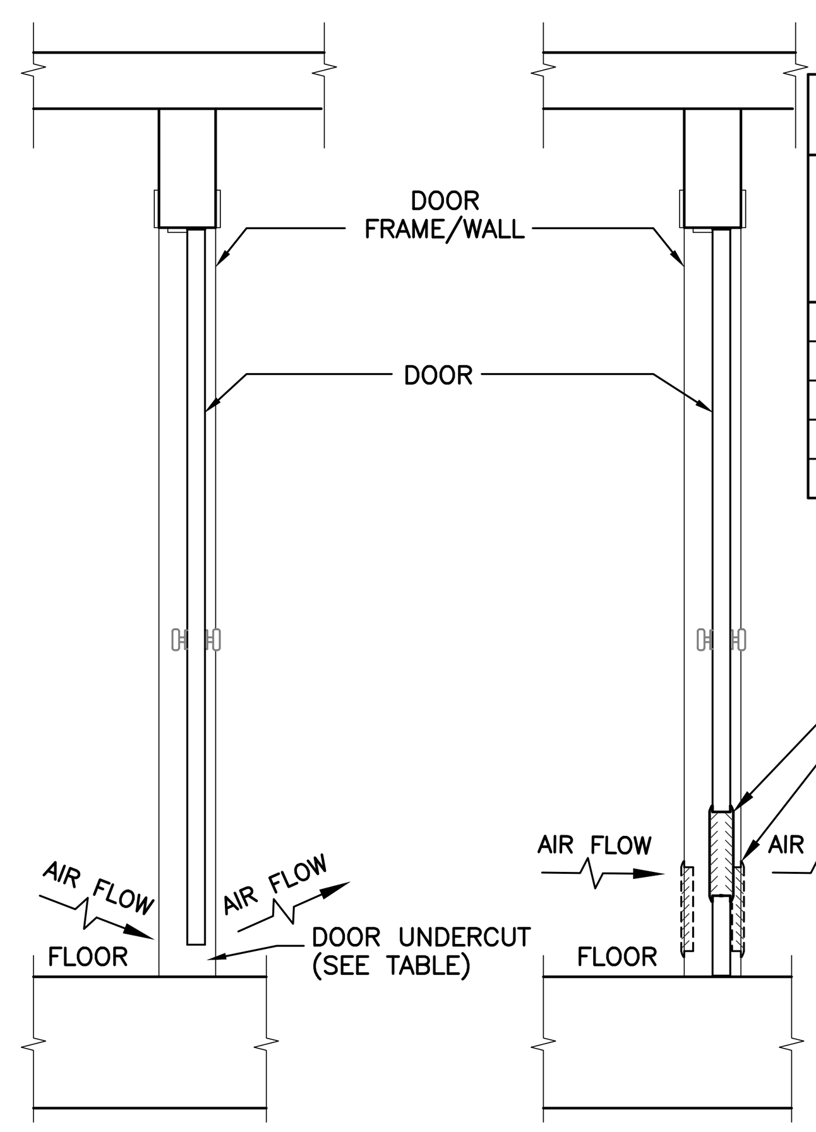
INSULATED ROUND TAKE-OFF

SCALE: NONE



TYPICAL DUCT STRAP HANGER DETAIL

SCALE: NONE



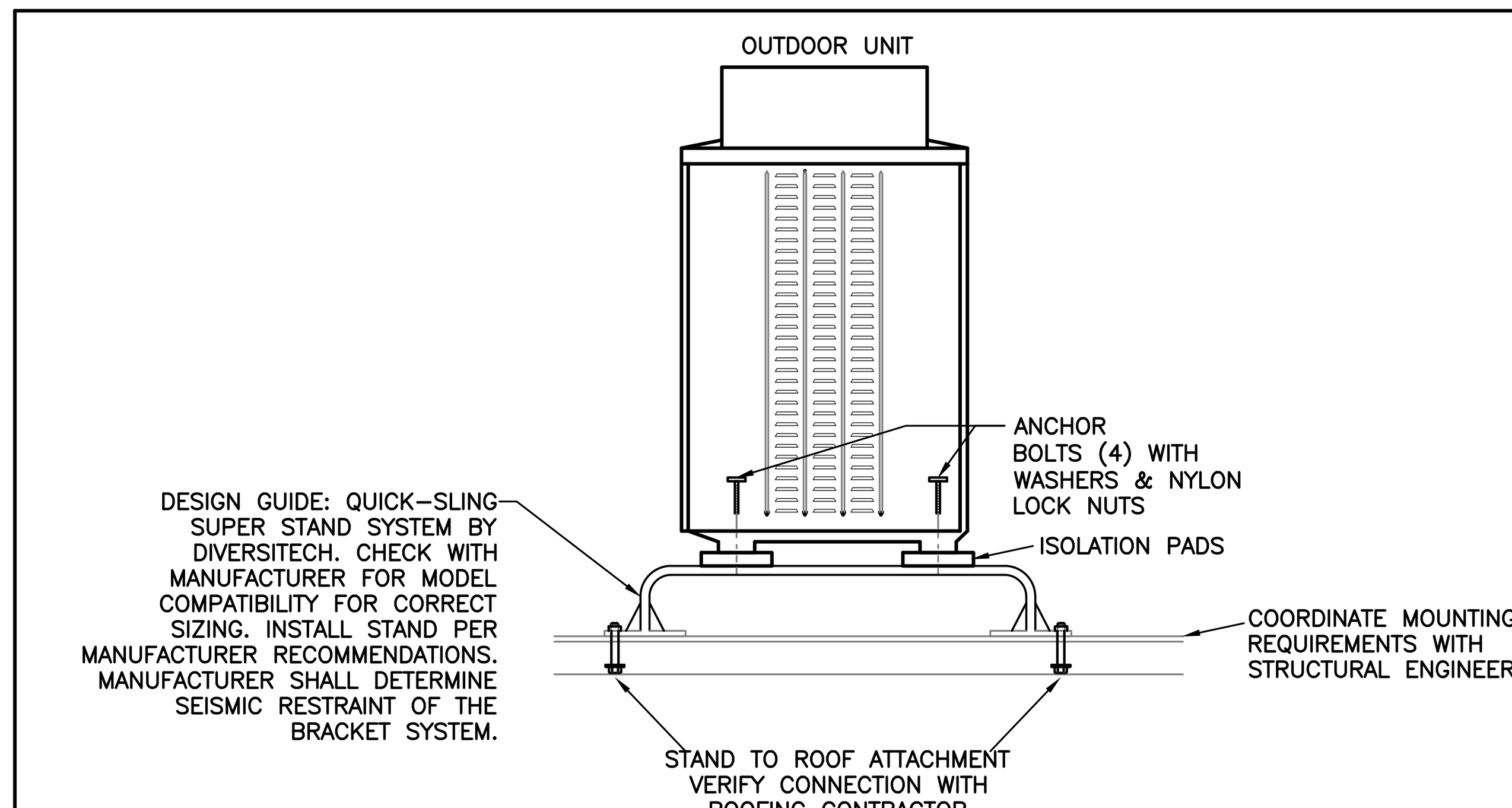
MINIMUM DOOR CUT HEIGHT FOR RETURN AIR

CFM UNDER DOOR	DOOR WIDTH (INCHES)						
	24	30	36	42	48	54	60
	CLEARANCE (INCHES) TO FLOOR TO TOP OF CARPET						
40	.75	0.6	0.48	0.4	0.38	0.34	0.3
50	1.0	0.8	0.65	0.55	0.5	0.45	0.4
100	2.0	1.6	1.3	1.1	1.0	0.9	0.8
200			2.7	2.3	2.0	1.8	1.6
300							2.4

NOTES:
1. GENERAL CONTRACTOR SHALL ENSURE THAT ALL GRILLES ARE PAINTED TO MATCH THE ADJACENT SURFACES, OR COLOR AS APPROVED BY OWNER REPRESENTATIVE.
2. MECHANICAL CONTRACTOR TO PROVIDE ALL GRILLES (SCHEDULED FOR PAINTING) PRIMED FROM FACTORY.
3. VERIFY MODEL AND STYLE WITH OWNER REPRESENTATIVE.
4. FINAL PAINTING REQUIRED TO BE COMPUTED IN FIELD.

UNDERCUT DOOR OR TRANSFER GRILLE DETAILS

SCALE: NONE



NOTES:
1. INSTALL UNIT LEVEL OR, IF ON A SLOPE, MAINTAIN SLOPE TOLERANCE OF 2 DEGREES (OR 2 INCHES PER 5 FEET).
2. COORDINATE WITH ARCHITECTURAL FOR MOUNTING HEIGHT REQUIREMENTS
3. PROTECT ADJACENT SURFACE(S) TO AVOID EXPOSURE OF ADJACENT SURFACE TO UNIT REFRIGERANT AND OIL DURING INSTALLATION.
4. FOLLOW ALL MANUFACTURER RECOMMENDATIONS.
5. VERIFY STAND LOCATION(S) WITH STRUCTURAL AND ARCHITECTURAL PLANS.
6. INSTALL UNIT WITH MANUFACTURER RECOMMENDED CLEARANCES AROUND ALL SIDES OF THE UNIT. SEE UNIT MANUFACTURER INSTALLATION MANUAL FOR RECOMMENDED DISTANCES.
7. SECURE STAND TO ROOF UNDER THE DIRECTION OF THE STRUCTURAL ENGINEER AND PER MANUFACTURER RECOMMENDATIONS.

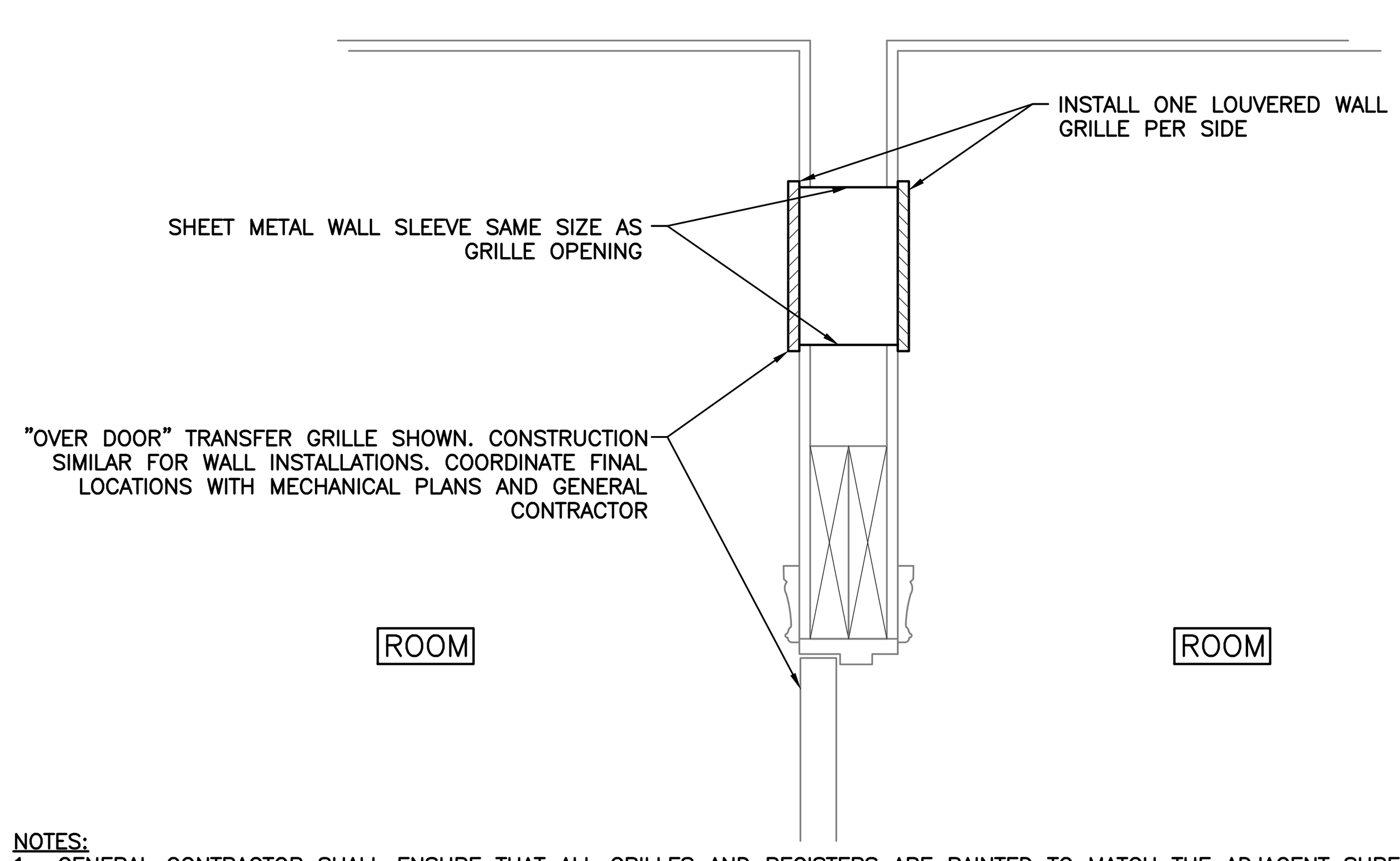
TYPICAL OUTDOOR UNIT DETAIL

SCALE: NONE

NOTES:
1. RTU SUPPLY AIR FAN SHALL RUN CONTINUOUSLY IN OCCUPIED MODE.
2. MOTORIZED OUTSIDE AIR DAMPER SHALL OPEN DURING OCCUPIED MODE AND SHALL REMAIN CLOSED DURING UNOCCUPIED MODE.
3. DURING A CALL FOR HEAT, IN BOTH OCCUPIED AND UNOCCUPIED MODES, THE HEATING SYSTEM SHALL CYCLE ON AND OPERATE UNTIL THE PROGRAMMED SET-POINT IS REACHED.
4. DURING A CALL FOR COOLING, IN BOTH OCCUPIED AND UNOCCUPIED MODES, THE COOLING SYSTEM SHALL CYCLE ON IN COOLING MODE AND OPERATE UNTIL THE PROGRAMMED SET-POINT IS REACHED.
5. UNLESS OTHERWISE SPECIFIED, EACH HVAC SYSTEM SHALL BE CONTROLLED BY A 7-DAY PROGRAMMABLE THERMOSTAT THAT HAS AUTOMATIC CHANGE OVER BETWEEN HEATING AND COOLING. THERMOSTAT SHALL HAVE OCCUPIED AND UNOCCUPIED MODES. THERMOSTAT SHALL MEET CURRENT REQUIREMENTS OF THE INTERNATIONAL ENERGY CONSERVATION CODE.
6. MECHANICAL CONTRACTOR SHALL PROVIDE AND INSTALL ALL LOW VOLTAGE WIRING, LOW VOLTAGE MOTORIZED ACTUATORS FOR DAMPER CONTROL, AND ANY OTHER NEEDED COMPONENTS FOR A FULLY OPERATIONAL SYSTEM.
7. THERMOSTAT DESIGN STANDARD SHALL BE HONEYWELL TC500A-N 7-DAY PROGRAMMABLE THERMOSTAT.

RTU CONTROL SEQUENCE

SCALE: NONE



NOTES:
1. GENERAL CONTRACTOR SHALL ENSURE THAT ALL GRILLES AND REGISTERS ARE PAINTED TO MATCH THE ADJACENT SURFACES OR COLOR AS APPROVED BY OWNER REPRESENTATIVE.
2. MECHANICAL CONTRACTOR TO PROVIDE ALL GRILLES (SCHEDULED FOR PAINTING) PRIMED FROM FACTORY.
3. VERIFY MODEL AND STYLE WITH GENERAL CONTRACTOR.
4. FINAL PAINTING TO BE DONE IN FIELD.

"OVER DOOR" TRANSFER GRILLE DETAIL

SCALE: NONE

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JZW ARCHITECTS

MECHANICAL DETAILS

M5.1

STATE OF MICHIGAN
MARK L. MAKIN
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No. 6201070110
LICENSED PROFESSIONAL ENGINEER

22-246

CRUMBL COOKIES - WATERFORD #1046

4978 HIGHLAND RD
WATERFORD TWP, MI 48327

ISSUED: DECEMBER 19, 2022
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SPLIT SYSTEM CEILING CASSETTE INDOOR & OUTDOOR UNITS

INDOOR UNIT							OUTDOOR CONDENSING UNIT							REMARKS
MARK	DESIGN GUIDE	NOMINAL SUPPLY CFM	NOMINAL COOLING BTU/H	NOMINAL HEATING BTU/H	ELECTRICAL VOLTAGE (DC VOLTS)	ELECTRICAL UNIT MCA	DESIGN GUIDE	ELECTRICAL VOLT/PH/HZ	ELECTRICAL UNIT MCA	ELECTRICAL UNIT MOCP	REFRIGERANT	SEER	HSPF	MARK	
FC 1	DAIKIN FCQ48TAVJU	1,218	48,000	48,000	24	1.8	DAIKIN RZQ48TAVJUA	208–230 /1/60	29.1	35	R410A	17.0	9.3	CU 1	1, 2, 3, 4, 5, 6, 7, 8, 9, 10

1. SITE CONDITIONS ARE 91/73 DEG. DB/WB SUMMER, 3 DEG. F DB WINTER, AND AN ELEVATION OF 319' FEET ABOVE SEA LEVEL.
2. APPROVED MANUFACTURERS: DAIKIN, MITSUBISHI, FRIEDRICH, FUJITSU, SANYO. (SUBJECT TO DOCUMENT CONFORMANCE)1 STAGE COOLING.
3. WITH R410a REFRIGERANT.
4. PROVIDE AND INSTALL ALL REQUIRED MOUNTING HARDWARE.
5. PROVIDE AND INSTALL CONDENSATE PIPING TO NEAREST PLUMBING DRAIN.
6. THERMOSTAT CONTROLS SHALL BE WITH HONEYWELL TC500A–N THERMOSTAT WITH REQUIRED ADAPTER FOR FUNCTIONALITY.
7. PROVIDE SNOW STAND AND WIND BAFFLES AS REQUIRED FOR YEAR ROUND OPERATION.
8. ELECTRICAL CONTRACTOR SHALL PROVIDE CONNECTION BETWEEN INDOOR AND OUTDOOR UNIT.
9. FACTORY PROVIDED OR FIELD INSTALLED DEHUMIDIFICATION MODE OR CAPABILITY FOR FAN COIL UNIT.
10. CONSULT WITH DAIKIN ON DEHUMIDIFICATION FEATURE TO ENSURE UNIT IS PROPERLY ACCOUNTED FOR AND NO INCORRECT SUBSTITUTIONS ARE MADE.

EXISTING PACKAGED AIR CONDITIONING UNIT SCHEDULE

MARK	DESCRIPTION	SUPPLY CFM	COOLING CAPACITY (BTU/hr)	HEATING CAPACITY (BTU/hr)	ELECTRICAL VOLT/PH/HZ	ELECTRICAL UNIT MCA	ELECTRICAL UNIT MOCP	ARI EFFICIENCY SEER	ARI EFFICIENCY EER	ARI EFFICIENCY IPLV IEER	OPERATING WEIGHT(LB)	REMARKS
RTU X	EXISTING BRYANT 580FPV060 SERIES 5–TON	1,999	60,000	output / input	208/3/60	28.6	35	–	–	–	–	1

1. FULL SERVICE AND A COMPONENT CHECK SHALL BE PERFORMED FOR EACH EXISTING ROOF TOP UNIT. IT SHALL BE PERFORMED FOR A MINIMUM OF TWO HOURS (ON SITE) PER UNIT. THIS SHALL INCLUDE BUT IS NOT LIMITED TO:
   –A REFRIGERANT LEAK TEST
   –VERIFICATION OF REFRIGERANT CHARGE
   –A VISUAL INSPECTION OF COILS
   –REPLACEMENT OF ALL BELTS (LEAVE ONE SPARE OF EACH SIZE)
   –REPLACEMENT OF FILTERS
   –CHECKING ALL MOTORS AND FANS (INCLUDING THE CONDENSER FAN MOTOR)
   –CHECKING ALL CAPACITORS AND CONTACTORS
   –CHECKING THE FUNCTIONALITY OF ECONOMIZER (IF APPLICABLE)
   –CHECKING THERMOSTAT OPERATION AND CONTROL
   –VERIFICATION THAT ENTERING AND LEAVING AIR TEMPERATURE OF ALL STAGES OF COOLING AND HEATING ARE WITHIN SPECIFICATIONS
   –CLEANING OF EVAPORATOR COILS BY MANUFACTURER RECOMMENDED PROCEDURE
   –CHECKING THE CONTROLS
   –CLEANING THE CONDENSATE PANS/DRAINS
   –CHECKING ACCESS AND MAINTENANCE DOOR HINGES AND LATCHES
   –VERIFY THAT UNIT IS CAPABLE OF BRINGING IN RESPECTIVE OUTSIDE AIR AMOUNTS INDICATED IN OUTSIDE AIR BALANCING SCHEDULE.
   TESTS SHOULD ONLY BE PERFORMED WHEN OUTSIDE AIR TEMPERATURE IS WITHIN RECOMMENDED RANGE. IT MAY BE NECESSARY TO PERFORM HEATING AND/OR COOLING TESTS ON A DIFFERENT DAY WHEN THE TEMPERATURE IS WITHIN THE ACCEPTABLE RANGE.

OUTSIDE AIR CALCULATIONS

ORDER AREA = 156 ft^2

PEOPLE OUTDOOR AIRFLOW RATE = 7.5 CFM/PERSON
AREA OUTDOOR AIRFLOW RATE = 0.12 CFM/ft^2

(5 [PEOPLE]*7.5 [CFM of OA/person])+(0.12 [cfm/ft^2 OA rate] * 156 [area ft^2]) = 56.22 CFM

OUTSIDE AIR REQUIRED: 57 CFM

STORAGE AREA = 662 ft^2

AREA OUTDOOR AIRFLOW RATE = 0.12 CFM/ft^2

0.12 [cfm/ft^2 OA rate] * 662 [area ft^2] = 79.44 CFM

OUTSIDE AIR REQUIRED: 80 CFM

KITCHEN AREA = 540 ft^2

PEOPLE OUTDOOR AIRFLOW RATE = 7.5 CFM/PERSON
AREA OUTDOOR AIRFLOW RATE = 0.12 CFM/ft^2

(5 [PEOPLE]*7.5 [CFM of OA/person])+(0.12 [cfm/ft^2 OA rate] * 540 [area ft^2]) = 102.3 CFM
OUTSIDE AIR REQUIRED: 103 CFM

TOTAL OUTSIDE AIR REQUIRED = 240 CFM

NOTE:
OUTSIDE AIR CALCULATED USING THE FOLLOWING CODES:
2018 MICHIGAN MECHANICAL CODE TABLE 403.3.1.1

OUTSIDE AIR BALANCING SCHEDULE

MARK	ZONE / AREA	BALANCE TO CFM	MINIMUM DUCT SIZE	REMARKS	VENTILATION RATES PER MMC $(V_{bz} = R_p P_z + R_a A_z)$
RTU X	MAIN AREA	380	–	RTU VIA ECONOMIZER	

IN-LINE EXHAUST FAN SCHEDULE

MARK	NOMINAL CFM	TOTAL STATIC PRESSURE IN. W.C.	FAN RPM	ELECTRICAL RATED LOAD HP	ELECTRICAL VOLTS	ELECTRICAL HERTZ	ELECTRICAL PHASE	SOUND RATING SONES	SELECTION BASED ON GREENHECK MODEL	REMARKS
IEF 1	380	0.1	800	0.25	115	60	1	1.1	SQ–100–VG	2, 1, 3

1. APPROVED MANUFACTURERS: BROAN, FANTECH, ACME, CARNES, PENN, COOK, BREIDERT, COOLAIR, CAPTIVE AIRE, S&P, GREENHECK, TWIN CITY FAN, DELTA BREEZ, AIR KING. (SUBJECT TO PROJECT DOCUMENT CONFORMANCE)
2. PROVIDE AND INSTALL BACKDRAFT DAMPER AT THERMAL ENVELOPE PENETRATION.
3. CONTROL WITH LIGHTS BY ELECTRICAL CONTRACTOR.

EXHAUST AIR CALCULATIONS

KITCHEN AREA = 540 ft^2

EXHAUST AIRFLOW RATE = 0.7 CFM/ft^2

0.7 [cfm/ft^2 EXH rate] * 540 [area ft^2] = 378 CFM

TOTAL EXHAUST REQUIRED = 378 CFM

NOTE:
EXHAUST AIR CALCULATED USING THE FOLLOWING CODE:

2018 MICHIGAN MECHANICAL CODE TABLE 403.3.1.1

4978 HIGHLAND RD
WATERFORD TWP, MI 48327

ISSUED: DECEMBER 19, 2022

CURRENT REVISION:

CRUMBL COOKIES - WATERFORD #1046

22-246

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JZW ARCHITECTS

MECHANICAL SCHEDULES

M6.1

SECTION 23 Mechanical – GENERAL PROVISIONS
Not all specification items are used in every project.

PART 1 – GENERAL

– **Scope:**

A. Provisions of this section apply to all work specified in all sections under Division 23.

B. In addition, work in Division 23 is governed by the provisions of the Bidding Requirements, Contract Forms, General Conditions and all sections under Division 1, General Requirements.

C. Contractor is responsible for results deviating from the plans.

– **Examination of Premises:** Visit the site, verify all measurements and job conditions, and pay all costs necessary to perform the work. Coordinate division of fee responsibilities with the General Contractor.

– **The Mechanical Contractor** shall be licensed and hold a current contracting license that has been valid for a minimum of two years as a Mechanical Contractor in the State where the project is located.

– **The Mechanical Contractor** shall have a minimum of five years experience installing commercial cooling and heating systems similar to those described in these specifications and provide a list of previous projects, including name of project and contact person names and phone numbers as a separate document in addition to the mechanical bid submitted if required by the General Contractor.

– **The Mechanical Contractor** shall be able to bond work he is bidding to perform and shall provide a written statement from the bonding agency proposed to be used for this project as a separate document in addition to the mechanical bid submitted if required by the General Contractor. The bonding agency shall be one having a Best's insurance rating of A or A+.

– **Regulations, Permits, Fees, Charges, Inspections:**

A. Regulations: Comply with all applicable codes, rules and regulations. All materials and work must comply with local construction, mechanical, plumbing, electrical and fire codes. As a minimum, comply with the following: Michigan State codes and all City codes.
B. In addition to the requirements of all governing codes, ordinances and agencies, conform to the requirements of the following codes and standards.
1. 2018 Michigan Mechanical Code
2. 2018 Michigan Building Code
3. 2018 Michigan Energy Code
4. 2018 Michigan Plumbing Code
5. 2018 Michigan Fuel Gas Code
6. ASHRAE 90.1 – 2016
***Current codes adopted by the respective jurisdiction will supercede this list of codes.

C. Fees and Permits: Pay all connection, installation, use, development, etc., fees and/or charges. Obtain and pay for all required permits and licenses. Coordinate division of fee responsibilities with the General Contractor.

D. Inspections: All work must be inspected and approved by local authorities. Prior to final approval, furnish the Architect with certificates of inspections and approvals by the local authorities in accordance with Division 1.

1. Preheat and interpass temperature shall be determined by temperature indicating crayons, contact pyrometers or other equally suitable means.

D. Postweld Heat Treatment: Postweld heat treatment for pressure components shall be as specified in Table 131 of ANSI B31.1.

– **Drawings and Specifications:**

A. Refer to Division 1 for information on submittals and shop drawings.

B. If a conflict exists between the drawings and specifications, promptly notify the Architect and Engineer.

– **Record Drawings:** Provide record drawings for all work under sections in Division 22 & 23. See Division 1 for detailed requirements covering preparation of record drawings.

– **Work and Materials:** Unless otherwise specified, all materials must be new and of the quality specified. The workmanship shall be of a quality that is acceptable to the Architect and is equal to the standards of the trades. Contractor must staff the project with sufficient skilled workmen, including a fully qualified construction Superintendent, to complete the work in the time allotted. The Superintendent must be qualified to supervise all of the work in his work category.

Approvals of Materials and Equipment: Refer to Division 1 for description of material and equipment for prior approvals and substitutions. Must be received by Engineer 10 days prior to due date/bid opening.

– **Maintenance Manual:**

A. Prior to completion of the project, compile a complete equipment and maintenance manual for all equipment supplied under sections of Division 23, as described in Division 1.

B. Manuals shall be bound in a three–ring binder. A preliminary submittal of the manual shall be made to the Architect 90 days after receiving approved submittals. Final submittal of the manual shall be made four weeks prior to substantial completion of the project.

– **Equipment Purchases:** Arrange for purchase and delivery of all materials and equipment within 15 days after approval of submittals. Coordinate with General Contractor.

– **Cooperative Work:**

A. Correct without charge any work requiring alteration due to lack of proper supervision or failure to make proper provision in time. Correct without charge any damage to adjacent work caused by the alteration. See Division 1 for additional requirements.

B. Cooperative Work Includes:

1. General supervision and responsibility for proper location, rough–in and size of work related to Division 22 & 23 but provided under other divisions of these specifications.

2. Installation of sleeves, inserts and anchors bolts for work under sections in Division 23.

3. Electrical work as specified herein. Refer to Division 26 for requirements.

– **Construction Facilities:**

A. General: Under this division of the specifications execute all work in a manner to provide safe and lawful ingress and egress to the Owner's establishment and such facilities shall be kept clear of materials or equipment as directed by the Architect. Refer to Division 1 for additional requirements.

B. Furnish and maintain from the beginning to the completion of all work all lawful and necessary guards, railings, fences, canopies, lights, and warning signs. Take all necessary precautions required by city and state laws to avoid injury or damage to any and all persons and property.

– **Guarantee:** Guarantee all material, equipment, and workmanship for all sections under Division 23 in writing to be free from defects of material and workmanship for one year from date of final acceptance as outlined in Division 1. Replace without charge any material or equipment proving defective during this period. The guarantee shall include performance of the equipment under all conditions of load, installing any additional items of control and/or protective devices as required and the replacing of any refrigerant lost.

– **Mechanical Wiring:**

A. Provide all temperature control wiring, all interlock wiring, and equipment control wiring for the equipment that is to be provided under this Division unless specifically shown on electrical drawings.

B. All wiring shall be not less than No. 14 insulated, color coded wire in electrical metallic tubing. Installation shall comply with Division 26.

C. Before ordering motors, equipment, etc., verify the available voltage and phase with the electrical trades.

– **Electrical Work:**

A. Electrical wiring, including power wiring and control wiring (except as otherwise specified under Automatic Temperature Controls), all raceways, wiring, outlet and junction boxes, and labor for installation of the wiring and equipment shall be included in Electrical Division 26 of the specifications.

B. All starters in motor control centers are to be furnished and installed under the Electrical Division of the specifications.

C. Under the Automatic Temperature Control section of these specifications, furnish and install all wiring, conduit, electric automatic temperature control devices, thermostats, relays, pneumatic electric switches, automatic control switches and pilot lights. See the Automatic Temperature Control Section, for additional detailed information.

D. All loose starters and control devices for equipment furnished under Division 23 (except as otherwise specified under Automatic Temperature Control Section) are to be furnished under that particular section of Division 23 and installed under the electrical division.

E. Contractor shall be responsible for the checking and testing of all controls and the interlocks for a complete and satisfactory operating system.

F. Before ordering any motors and equipment. Verify the available voltage and phase for all motors with the Electrical Contractor.

G. Submit a complete list of all motors prior to final closeout of job indicating the location, horsepower, voltage, phase specified in Table 132 of ANSI B.1.

H. All field wiring and equipment must conform to the applicable section of the Electrical specifications, Division 26.

– **Welding Codes and Standards:** All welding and other criteria covered by this specification shall be in accordance with the following code:

A. ASME Boiler and Pressure Vessel Code

B. Section IX ANSI Code for Power Piping: B31.1

– **Product Handling**

A. Protection: Take all precautions necessary to protect the materials of this section, before, during and after installation.

B. Replacements: In the event of damage immediately repair all damaged and defective work to the approval of the Engineer, at no additional cost to the Owner.

– **Job Conditions**

A. Examination of site: Examine the site and include in bid proposal all conditions under which work is to be performed.

– **Miscellaneous**

A. Permit and Fees: Apply and pay for all necessary permits, inspections, examinations and fees or charges required by Public Authorities having jurisdiction.

B. Locations and Accessibility: Contractor shall fully inform himself regarding peculiarities and limitations of space available for installation of work under this section. Valves, motors, controls and other devices requiring service. Maintenance and adjustments shall be placed in fully accessible positions and locations, provide access doors where required in ductwork and/or construction whether specifically detailed or not, and mender all such devices accessible.

C. Scaffolding: Furnish all scaffolding, rigging and hoisting as required for the proper execution of the work.

D. All HVAC equipment shall be labeled. Information on labels shall include: Identification number and name same as the drawings, flow and static pressure and the area to which the unit serves. Labels shall be black faced Formica with white engraved lettering at least $\frac{3}{16}$ inch high.

E. All gas fired equipment shall include a label indication that the appliance has been adjusted, modified or re–calibrated for the altitude wherein the project is to be located. The appliance shall also include a compliance statement indicating that the appliance has been adjusted, modified or re–calibrated for the proper operation at the altitude of the project and shall be listed capable for use with natural gas or propane gas if propane is listed on the drawings.

– **Submittals**

A. Shop Drawings: Within 15 days after award of contract, and before any of the materials of this section are fabricated and delivered to the jobsite, submit complete shop drawings and equipment submittals for the Engineer to review in accordance with these specifications. show all details of all ductwork and equipments pads.

B. Product Data:
1. Submit six (6) copies of all manufacturer's product data simultaneously with all shop drawings submittals.

2. Product data to include, all air conditioning equipment, hangers, fans and other standard items as required to complement shop drawings for a submittal indications products to be used on this work.
C. Record Drawings: Maintain throughout the progress of the work project record drawings and submit to the Owner.

D. Operating Manuals and Maintenance Manuals:

1. Submit four (4) copies of all operating instructions and maintenance manuals.

2. Fully instruct Owner's operating personnel and demonstrate performance, operation and maintenance of equipment. Amount of allocated for said instruction and demonstration of equipment and systems shall be part of these obligations. Submit to Engineer a letter signed by Owner's representative who will operate system stating that he has been fully instructed by contractor about operation and maintenance of equipment and system.

3. Submit one (1) additional set of approved instructions and one (1) additional set of approved control diagrams.

E. Guarantees: In addition to equipment warranties, furnish a written guarantee against defects in materials and workmanship for one year. Guarantee shall include repair of damage to, or replacement of any part of equipment or premises caused by leaks or breaks in pipe or equipment provided under this section.

– **Equipment Identification**

A. Except for individual room heating units and items furnished under temperature control all items of mechanical equipment, including fans, pumps, boilers and electrical switches and starters for mechanical equipment and gauges shall be labeled.
B. Information on labels shall include the following:

1. Identification number and name. Generally this number and name shall be the same as that shown on the drawings or in the specs.

2. If the item is a fan or pump, the flow and head shall be indicated.

3. If the item is part of a unit, the label shall have in addition to its item number, the number of the main item it is serving.

4. Valves shall be tagged with the area served and their normal operating positions shall be indicated.

5. Where the main unit is served by the valve is apparent, only the valve function needs to be included on the nameplate.

C. The types of Nameplates shall be as follows:
1. The valve tags shall be $\frac{1}{2}$" embossed aluminum tapes with identification on one side for valves. Tags for magnetic starters shall be screwed to the metal starter cover. Gags sags shall be Addressograph No. B–5300.

2. Equipment nameplates shall be black faced Formica with white engraved lettering at least $\frac{3}{16}$" high.

D. Valve tags shall be connected to valve stems by steel rings or chains. Screws shall be used for equipment labels prior to installation. The contractor shall submit to the Engineer a complete list of all valves and each item of equipment to be identified with the proper identification.

– **Fire Stopping**

A. Only tested fire stop systems shall be used.

B. Fire stop system installation must meet requirements of ASTM E–814, UL 1479 or UL 2079 tested assemblies that provide a fire rating equal to that of construction being penetrated.

C. Proposed fire stop materials and methods shall conform to applicable having codes having local jurisdiction.

D. Fire stop systems do not reestablish the structural integrity of the load bearing partitions/assemblies, or support live loads and traffic. Installer shall consult the Structural Engineer prior to penetrating any load bearing assembly.

E. For those fire stop applications that exist for which no UL tested system is available through a manufacturer, and engineering judgment derived from similar UL system design or other test will be submitted to local authorities having jurisdiction for their review and approval prior to installation. Engineer judgment drawings must follow requirements set forth by the International Fire stop Council.

F. The work of this section shall be accomplished by a single source contractor or by those contractors who, by their contract, are penetrating rated construction with their work. Regardless of responsibility the General Contractor shall be responsible to assure and verify that all products, systems, etc. used under this section are appropriate and meet the intent of this specification and is accomplished by factory trained workmen.

G. Acceptable manufacturers are subject to compliance with through penetration firestop systems (XHEZ) listed in volume 2 of the UL fire resistance directory. Provide products from the following manufacturers as identified: 1. Hilti Inc. 2. 3M Corporations. 3. Specified Technologies Inc. 4. Metacaulk, Rectorseal Corp. F. Tremco. 6. Cafco, Isolatek International. 7. Nelson Firestop Product.

H. Use only firestop products that have been UL 1479, ASTM E–814, or UL 2079 listed for specific fire–rated construction conditions conforming to construction assembly type, penetrating item type, annular space requirements and fire–rating involved for each separate instance.

I. Cast–in–place firestop devices for use with non–combustible and combustible plastic pipe (closed and open piping systems) penetrating concrete floors, the following products are acceptable:

1. HILTI CP 680 cast–in–place firestop devise.

J. Add aerator adaptor when used in conjunction with aerator ("Solvent") system.

1. HILTI CP 681 tub box kit for use with tub installations.

K. Sealants, caulking materials, or foams for use with non–combustible items including steal pipe, copper pipe, rigid steel conduit and electrical metallic tubing (EMT). The following products are acceptable:
1. HILTI FS–One Intumescent Firestop Sealant
2. HILTI CP 604 Self–leveling Firestop Sealant
3. HILTI CP 620 Fire Foam
4. HILTI CP 606 Flexible Firestop Sealant
5. HILTI CP 601S Elastomeric Firestop Sealant

L. Sealants or caulking materials for use with sheet metal ducts. The following products are acceptable:
1. HILTI CP 601S Elastomeric Firestop Sealant
2. HILTI CP 606 Flexible Firestop Sealant
3. HILTI FS–One Intumescent Firestop Sealant

M. Intumescent sealants, caulking materials for use with combustible items (penetrants consumed by high heat and flame) including insulated metal pipe, PVC jacketed, flexible cable or cable bundles and plastic pipe. The following products are acceptable:
1. HILTI FS–One Intumescent Firestop Sealant

N. Firestop collar or wrap devices attached to assembly around combustible plastic pipe (closed or open piping systems),
1. HILTI CP 642 Firestop Collar
2. HILTI CP 643 Firestop Collar
3. HILTI CP 645 Wrap Strips

O. Materials used for complex penetrations made to accommodate cable trays, multiple steel and copper pipes, electrical busways in raceways. The following products are acceptable
1. HILTI CP 637 Trowelable Firestop Compound
2. HILTI FS 657 Fire Block
3. HILTI CP 620 fire Foam

P. Non curing, re–penetrable materials used for large size/complex penetrations made to accommodate cable trays, multiple steel and copper pipes, electrical busways in raceways. The following products are acceptable:
1. HILTI FS 657 Fire Block

PART 2 – PRODUCT

– **Equipment Design and Installation:**

A. Uniformity: Unless otherwise specified, provide all equipment of same type or classification by the same manufacturer.

B. Design: Design all equipment in accordance with ASME, AGA, UL and other applicable technical standards as follows:

C. Pressures vessels – ASME Code constructed and stamped

D. Electric appliances – UL labeled

E. Cooling equipment – ARI certified

F. Concrete Inserts:

1. The work under this section includes furnishing and installing all concrete inserts required for all materials and equipment specified herein or in other sections of Division 23.

2. Provide concrete inserts equal to Unistrut Series 3200 with standard, plain, oiled finish. Provide exposed Unistrut pipe supports with factory finished enamel paint.

– **Split System Indoor Fan Coil Unit**

Model of size and capacity indicated. Units shall be completely assembled and tested complete with refrigerant charge and ready to operate. Unit shall be UL listed and carry a UL label.

A. Cabinet shall be constructed of galvanized steel, bonderized and coated with a baked enamel finish. Cabinet interior shall be insulated with 1 inch thick neoprene coated fiberglass. Cabinet panels shall be easily removable for service to all operating components.

B. Indoor air fans shall be forward–curve centrifugal, multi–speed type.

C. Coils shall be of nonferrous construction with aluminum plate fins mechanically bonded to seamless copper tubes with all joints brazed.

D. Primary and secondary drain connections with brass inserts. Condensate drains shall be trapped outside the cabinet.

E. Factory installed electric heater as noted in schedules and/or on drawings.

F. Shipped with cleanable, permanent frame filter.

– **Split System Outdoor Heat Pump Unit**

Model of size and capacity indicated. Units shall be complete assembled and tested complete with refrigerant charge and ready to operate. Total unit shall be UL listed and carry a UL label

A. Cabinet shall be constructed of galvanized steel, bonderized and coated with a power coat paint.

B. Coils shall be of nonferrous construction with aluminum plate fins mechanically bonded to seamless copper tubes with all joints brazed.

C. Compressors shall be hermetically sealed. Compressor will be mounted on rubber vibrations isolators.

D. Refrigerant circuit components shall include the following: Liquid tube shutoff valve with seat connections, suction tube shutoff valves with sweat connections, system charge of refrigerant R410, Compressor oil, accumulator, freezestat, and reversing valve.

E. Compressor fans shall be direct drive propeller type, discharging air upward. Fan motors shall be totally enclosed, 1–phase type class B insulation and permanently lubricated bearings, shafts shall be corrosion resistant. Fan blades shall be statically and dynamically balanced. Condenser fan openings shall be equipped with steel wire safety guards.

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MECHANICAL SPECIFICATIONS
M7.1

- **Diffusers, Registers and Grilles**

Air distribution equipment shall be of sizes, types, and capacities indicated.

A. Registers, grilles, and diffusers of the sizes shown on the drawings and described here in shall be furnished and installed. all grilles, diffusers and registers shall be complete with frames with rubber gaskets suitable for the area and wall construction where shown on the drawings.

B. Finish for all registers, diffusers, grilles, etc. shall be off–white unless otherwise selected by the Owner. approved manufacturers for all air distribution products shall be Price Industries, Nailor, Metal Air, Tuttle & Bayley, Carnes, Hart and Cooley, or Anemostat.

C. Supply air shall be introduced into conditioned space in such a manner that conditioned air and room air is rapidly and evenly mixed, resulting in equalization of temperature and draftless air distribution through zone of occupancy with temperature differentials up to 25 degrees F for both cooling and heating air. Quantities and throws shall be as indicated.

D. Velocity of moving air below 5 foot level, during cooling cycle, shall not exceed limits of either 50 fpm at 1.5 degrees F below average room temperature or 70 fpm at 1 degree F below average room temperature. Velocity of moving air at the 1 foot level, during heating cycle shall not be less than 10 fpm. Temperature difference at or below the 5 foot level shall not exceed the following: 2 degrees F below average room temperature at 30 fpm, 1.5 degrees F below average room temperature at 50 fpm, 1 degree F below average room temperature at 70 fpm. Sound pressure level in all octave bands for each diffuser shall not exceed NC35 noise criteria curve at task level when units operate at designed capacities.

E. Ceiling diffusers, grilles and registers shall be independently supported from the structure so that they are not depending on the ceiling for support.

F. Ceiling diffusers may be round necked or equivalent size square neck. Provide square to round neck adapter as necessary. Flex duct shall typically connect directly to the diffuser using a 1–1/2" radius flexible duct elbow. If space does not allow for a full 1–1/2" radius to be provided, then a lined sheet metal boot shall be provided. The flexible duct shall be connected to the side of the sheet metal boot. The flexible duct shall not be connected to the top of the sheet metal boot.

G. Ceiling supply air diffusers shall be louvered faced directional diffuser model SMD manufactured by Price Industries with border type 36 for lay in ceiling or border type 1 for surface mounting in other than lay in ceilings, baked enamel finish, blow and pattern shown on the drawings.

H. Supply, exhaust, transfer and return air grilles mounted on walls 6 feet above the floor shall be Price Industries model 635, with 45–degree deflection, $\frac{1}{2}$" blade spacing, horizontal extruded aluminum blades, baked enamel finish.

I. Supply, exhaust, transfer and return air grilles mounted on walls lower than 6 feet above the floor shall be sight–proof, heavy duty gymnasium type equal to Price Industries model 91 with horizontal 45–degree deflection blades, $\frac{3}{8}$" blade spacing, baked enamel finish.

J. Drum louvers shall be Price Industries model HCD with opposed blade damper.

K. Exposed duct round diffuser shall be Price Industries model RCD, 3–position adjustment, 4 cone style, baked enamel finish.

O. Make up air supply diffusers shall be Price Industries model PDC perforated face ceiling diffusers, fixed 1–way air pattern, hinged removable perforated face screen, baked enamel finish.

P. Ceiling filter return air grilles in lay in ceiling shall be Price Industries model 10FF, with hinged, perforated faceplate and 1" filter for lay in T–bar application, baked enamel finish. The contractor shall provide the 1" filter.

Q. Ceiling filter return grilles and transfer air grilles shall be Price Industries model PDR or PDDR perforated diffuser with removable perforated faceplate in lay in T–bar application, bake enamel finish.

R. Ceiling return, exhaust and transfer air grilles for surface mounting in other than lay in ceilings shall be Price industries model 10F, with perforated removable faceplate, baked enamel finish.

- **Ducts and Sheet Metal Work**

A. Provide ducts, plenums, access doors, fresh air intakes, and exhaust as indicated and required. All ductwork shall be constructed, erected and tested in accordance with the most restrictive of local regulations, procedures and detailed in the ASHRAE Handbook of Fundamentals or the applicable standards adopted by the Sheet Metal and Air Conditioning Contractors National Association (SMACNA). Provide prefabricated spiral lockseam ducts and fittings and rectangular ducts of galvanized steel. Aluminum flexible ductwork or gypsum board ductwork is not acceptable.

B. All connections to main ducts shall be made with low loss fittings.

C. Flat duct surfaces shall be crimped diagonally regardless of size. Longitudinal joints in all duct sizes may be flat lock joints. Transverse joints and intermediate bracing shall be constructed of galvanized sheet metal or galvanized structural angles in accordance with requirements of ASHRAE Guide and public authorities having jurisdiction.

D. Transverse joints on all ducts shall be sealed with mastic or tape.

E. Longitudinal joints on ducts with internal static pressures in excess of 0.75 inches of water pressure shall be sealed with mastic or tape.

F. Lock joints shall be hammered to make them airtight. Inside of duct shall present a smooth surface to flow air.

G. Changes in size of ducts shall increase gradually with a slope of not more than 12 inches in 5 feet where possible, but not more than 12 inches in 3 feet in any event.

H. Turns shall be made with throat radius of not less then the duct width.

I. Plenums shall be made of 18 gauge galvanized sheet steel reinforced horizontally on a maximum of 48" centers by 1–1/2"x1–1/4"x $\frac{1}{8}$" galvanized angles reinforced vertically by 1–1/2" standing seams.

- **Volume Dampers**

A. Dampers used in low velocity branch ducts to control the volume of air flow shall be Young No. 817 volume damper or equal. All operating head shall be place on the side of the duct and shall locked in position by a set key where the damper is accessible. Where the damper is not accessible, Young No. 817A or 817B volume control damper or equal consisting of an end bearing or miter gear, coupling, 3/8–inch square shaft, and regulator for operating the unit from the ceiling shall be provided.

- **Temperature Controls**

A. Thermostats shall be provided with the air conditioning units. They shall be installed and wired by the HVAC contractor. T–stats for roof top units shall be programmable with night setback and override control.

- **Insulation**

A. Thermal/Acoustical duct insulation: Line the first 10' of supply air and return air ducts from the mechanical unit, unless otherwise specified with Knauf or equal. Duct Liner shall be mat–faced to provide a smooth air–steam surface, mold resistant, 1–1/2" thick insulation wrapped entirely around duct with joints lapped at least 2" and secured with 16 gauge galvanized wire on 12" centers. Insulation shall cover all surfaces including standing seams.

B. Rectangular supply ducts and return air ducts located on unconditioned spaces shall be lined with Knauf un–acoustic or equal. 1 inch of 1–1/2 lb. thermal resistive value of duct liner shall be a minimum of R–6. Rectangular supply ducts and return air ducts located outside the building envelope shall be lined with Knauf un–acoustic or equal. 2 inch, 1–1/2 lb. thermal resistive value of duct liner shall be a minimum of R–8. Density coated fiberglass duct liner complying with friction correction factor not greater than 1.1 at a velocity of 3000 fpm. Apply insulation to inside of ducts with an approved fire retardant adhesive to provide 100% coverage and a smooth surface. In ducts with one side more than 12" secure insulation with mechanical fasteners in addition to adhesive, spaced at 14" centers in both directions. Mechanical fasteners shall be flush with the liner surface and shall start within 2" of the leading edge of each section and within 3" of the leading edge of all cross joints of the liner shall be heavily coated with an approved fire resistant adhesive. The duct liner shall shall be cut to assure snug closing corner joints. The black surface of the liner shall face the air stream. Transverse joints shall be neatly butted and all damaged areas shall be heavily coated with a approved adhesive.

C. All duct insulation shall have an NRC rating of not less than 0.60 and a K factor of not more than 0.27. Duct dimensions shall be increased 2 inches on each side from those shown on drawings to accommodated insulation.

- **Turning Vanes**

A. Turning vanes shall be furnished and installed in all 90–degree turns in supply, return, mixed air and fresh air ducts, and elsewhere as shown on the drawings. Material of turning vanes shall match ductwork. Vanes are to be single blade, of size, gauge, and fabrication in accordance with SMACNA recommendations.

- **Equal Materials and Substitutions**

A. In addition to manufacturers specified, the following shall also be considered equal. Provided corresponding models meet specified requirements. Equivalent substituted equipment named herein shall be submitted to Architect for approval. Submit alternate selections for prior approval. Must be received by Engineer 10 days prior to due date/bid opening.

Insulation:	Certainteed, Manville, Fiberglas
Air Filters:	AAF, Farr
Diffusers and Grilles:	Titus, Nailor, Price, Krueger, Hart and Cooley, Carnes, or Engineer approved equivalent.

- **Motorized Volume Dampers**

A. Motorized dampers used in low velocity branch ducts to control the volume or air flow shall be Carrier model Damprnd–B for round ducts and Damprec–B rectangle ducts or equal.

- **High Efficiency Branch Take–Offs**

A. Expanded throat high efficiency takeoffs shall be used for all branch takeoffs unless shown otherwise on the drawings. an opposed blade volume damper with locking quadrant shall be provided at each branch takeoff. Where dampers are not accessible for adjustment from above, concealed ceiling regulators with adjustable chrome–plated covers shall be provided. High efficiency take–offs shall be Hercules or Daniel.

PART 3 – EXECUTION

- **Verification of Dimensions:**

A. Scaled and figured dimensions are approximate only. Before proceeding with work, carefully check and verify dimensions at site, and be responsible for properly fitting equipment and materials together and to the structure in spaces provided.

B. Drawings are essentially diagrammatic and many offsets, bends, special fittings and exact locations are not indicated. Carefully study drawings and premises in order to determine best methods, exact locations, routes, building obstructions, and install apparatus and equipment in available locations. Install apparatus and equipment in manner and in locations to avoid obstructions, preserve headroom, and keep openings and passageways clear.

- **Cutting and Patching:** Cut work and patch per Division 1 as necessary to properly install the new work. As the work progresses, coordinate necessary openings, holes, chases, etc., in their correct location. If the required openings, holes and chases are not in their correct locations, make the necessary corrections at no cost to the Owner. Avoid excessive cutting and do not cut structural members without the consent of the Architect. Patching by General Contractor at Mechanical, Plumbing or Fire Protection Contractor's expense. Include as a part of the work under this contract all structural framing required by penetrations through the roof and necessary steel to support ducts and pipes between structural steel unless shown on the structural drawings.

- **Closing–in of Unfinished Work:** Cover no work until inspected, tested and approved. Where work is covered before inspection and test, uncover it, and when inspected, tested and approved, restore all work to original proper condition.

- **Excavation and Backfill:**

A. Perform all necessary excavation, shoring and backfilling required for the proper laying of all pipes and conduits inside the building and premises, and outside as may be necessary. Conform to Division 2 requirements. Remove all excess excavated materials from the site or dispose of on site as directed by General Contractor.

B. Excavate all trenches open cut, keep trench banks as nearly vertical as practicable, and sheet and brace trenches where required for stability and safety. Excavate trenches true to line and make bottoms not less than 18" wide but no wider than necessary to provide ample work room. Grade trench bottoms accurately to provide uniform bearing and support for each section of pipe on undisturbed soil along its entire length. Dig "bell" holes after the trench bottom has been graded. Machine grade only to the top line of the pipes, doing the balance by hand. Do not cut any trench near or under footings without first consulting the Architect. Comply with OSHA requirements.

C. Provide backfilling and compaction in accordance with requirement of Division 2 and under the direction of the Architect and the Owner's testing firm to the required density. Make the first 2 feet of fill in 6" layers, each thoroughly compacted as directed, and free from rocks, large clods of earth, leaves, branches, and debris. Compact the rest of the backfill to prevent settlement as directed, using in the backfill no rocks larger than 4" in diameter, and using no rocks at all in the top 12".

- **Accessibility:**

A. Install valves, dampers, thermometers, gauges, traps, cleanouts, control devices or other specialties requiring reading, adjustment, inspection, repairs, removal or replacement conveniently and accessibly throughout the finished building. Where any of these devices are shown on the contract drawings to be installed above any inaccessible ceiling, the Mechanical Contractor shall furnish access doors or panels as required.

B. All access doors or panels in walls and ceilings required for access to control devices, traps, valves and similar devices are to be furnished and installed as part of the work under this section. Provide type as specified under Division 8.

C. Provide ducts which pierce a fire separation with fire dampers of same fire rating as the separation.

D. Refer to drawings and "Finish Schedule" for type of wall and ceiling in each area and for rated construction.

E. Coordinate work of various sections to locate valves, traps, and dampers with others to avoid unnecessary duplication of access doors.

- **Roof Flashings:** Flash and counterflash all piping, conduits and ductwork penetrating roofing membrane with flashing per roofing manufacturer's recommendations. Refer to architectural drawings for detailing of duct and pipe penetrations through roof.

- **Equipment Rough–in:**

A. Rough in all equipment and fixtures as designated on the drawings and in the specifications. The drawings indicate only the approximate location of rough–ins. The exact rough–in locations must be determined from large–scale certified drawings. The Contractor shall obtain all certified rough–in information before progressing with any work for rough–in final connections.

B. Be responsible for providing all outlets and services of proper size at the required locations.

C. Minor changes in the contract drawings shall be anticipated and provided for under this division of the specifications.

D. Rough–in only (unless otherwise designated on the drawings) shall include the following:

1. Mechanical: Provide all services as indicated and required, including all ductwork, piping and valves. Valve and cap all piping stub–outs. Cap all ductwork stub–outs in a manner suitable for future extension.

E. Mechanical equipment installed on the roof shall not be installed any closer than 10'–0" to the edge of the roof unless there is a 42" high parapet or equipment guardrail.

- **Owner–Furnished and Other Equipment:**

A. Rough–in only for all Owner–furnished equipment (see Division 1) and all equipment furnished under other sections of the specifications, except as otherwise specified and/or noted on the drawings.

- **Equipment identification**

A. All major equipment shall bear firmly attached metal nameplates which state name of manufacturer, model number and electrical data.

- **Discrepancies**

A. In the event of discrepancy, immediately notify the Owner.

B. Do not proceed with installation in areas of discrepancy until all such discrepancies have been fully resolved.

- **Initial Lubrication, Adjusting, and Filling Systems**

A. Before operating any mechanical system, equipment bearings shall be lubricated and bolts, pulleys, and other moving parts checked for alignment and tolerances in accordance with manufacturer's operating instructions. Vibrations and noise shall be suppressed.

- **Cleaning of Equipment, Materials and Premises**

A. Be painted smooth and clean, ready for painters. Clean entire premises of unused materials, rubbish, debris, grease spots and dirt left by subcontractor.

- **Equipment and Material**

A. Install all equipment and material per manufacturer's recommendations.

- **Accessibility**

A. Install work readily accessible for normal operation, reading of instruments, adjustment, service inspection and repair, provide access panels where indicated and required. Access panels shall be the responsibility of respective subcontractors.

B. Provide all services designated, valve and cap all piping, cap all waste piping and ductwork and leave in a clean and orderly manner.

C. Rough–in requirements shall be as outlined in the preceding paragraph titled "Equipment Rough–In."

- **Equipment Final Connections:**

A. Provide all piping and duct final connections for all equipment under Division 22 & 23 as required herein specified and indicated on the drawings.

B. Air Conditioning, Heating, and Ventilating: Provide final connections complete with necessary valves, drains, unions, flanges and duct connections for equipment furnished and installed under other sections of the specifications, except as otherwise designated. Included under the HVAC sections of the specifications are the final connections to the following:

1. Condensate and evaporative cooler drain piping from air conditioning equipment.
2. Supply, return, relief, outside air and exhaust duct connections for all equipment including exhaust fans.
3. Piping connections for all equipment.
4. Duct connections for all kitchen hoods.

- **Machinery Drives:** After tests have been performed on the air conditioning and air handling systems, make without cost not more than two changes in the size of the nonadjustable sheaves to obtain the required air quantities.

- **Machinery Accessories:**

A. Application: Do not install any equipment in an application not recommended by the manufacturer.

B. Installation: Align, level and adjust all equipment for proper operation. Install so connecting and disconnecting of piping and accessories can readily be done and so all parts are readily accessible for inspection, service and repair. Install equipment in accordance with manufacturer's recommendations.

- **Pipe and Equipment Supports:**

A. Where supports, foundations, stands, suspended platforms for machinery, tanks, or other equipment are indicated or specified, perform the following:

1. Locate support members to avoid equipment strains and interference with piping connections, tube pulling or other maintenance operations.
2. Where saddles are required, use cast iron or welded steel saddles with curvature to fit the tank shell.
3. Mount power–driven equipment on common base with driver.

B. Concrete Inserts: Furnish and install all concrete inserts required for all materials and equipment specified and/or shown on the drawings for Division 22.

C. Concrete Foundations: Work under this section includes coordination of construction of all concrete foundations indicated or required for equipment specified herein or in other sections under Division 22. Materials and workmanship shall be described under Division 3.

D. Grout under all equipment after leveling, filling completely the space between machinery bed plate and foundation surface as specified in Division 3. Finish exposed surface of grout for a neat appearance.

E. Floor Stands: Where equipment is mounted standard or on legs, construct of structural steel or steel pipe and fittings, cross–brace and fasten with flanges or plates bolted to floor.

F. Ceiling or Wall Supports: Use suspended platform, strap hangers, bracket or shelf, whichever is most suitable for equipment and location. Construct of structural steel members, steel plates, rods or pipe as required. Cross–brace and fasten to building structure or inserts in an approved manner.

G. Steel Work: Neatly fabricate and erect steel work with burrs and welding spatter ground off. Paint after fabrication with a rust–inhibitive primer.

H. Roof Mounted Equipment (Steel Supported): Provide curbs and flashings for metal support structures as shown in the latest SMACNA manual for roof supports.

- **Cleanup:**

A. In addition to cleanup specified under Division 1, thoroughly clean all parts of the equipment. Where exposed parts are to be painted, thoroughly clean off any splattered construction materials and remove all oil and grease spots. Wipe the surface carefully and scrape out all cracks and corners.

B. Thoroughly flush and clean out all water circulating systems. Remove, clean and replace all strainer elements.

C. During the progress of the work, keep the premises clean and free of debris.

- **Painting:**

A. Except as otherwise specified or indicated in the architectural drawings and/or specifications, paint all exposed unfinished metal with one coat of rust–inhibiting primer. (Galvanized ductwork and factory painted equipment shall be considered as having primed surface.)

B. Finished painting is specified under Division 9.

- **Objectionable Noise and Vibration:** Construct and brace the metal partitions, ducts and sheet metal housings to prevent vibration or rattling when systems are in operation. Install connections to equipment so noise and vibration will not reach the conditioned area through ducts, piping, conduit, sheet metal work, or the building structure. Provide power–driven equipment suspended from the structure with spring type isolation.

- **Welding:**

A. Procedures:

1. All procedures and welders must be qualified in accordance with the requirements of Section IX, ASME Boiler and Pressure Vessel Code and ANSI code for power piping B31.1. Procedure qualification test records and acceptance shall be submitted with the welding procedure prior to the start of fabrication.
2. Architect's inspector or authorized representative will review performance qualification records of individual welders.

B. Welding Processes: The following welding processes are permitted, provided that the procedure is qualified in accordance with Section IX, ASME Boiler and Pressure Vessel Code.

1. Manual shielded metal–arc.
2. Gas tungsten–arc.
3. Other welding processes may be used providing they are qualified in accordance with Section IX, ASME Boiler and Pressure Vessel Code.

C. Restrictions: Weld bevel preparations shall be provided on all welding fittings and shall be machined or ground to remove all discoloration if flame or arc cut.

D. Welding Filler Material:

1. A filler material control procedure shall be submitted to Owner for review and acceptance prior to performing any welding.
2. All shielded metal–arc welding shall be performed using low–hydrogen type electrodes such as E 7018.

E. Preheat and Interpass Temperature:

F. Preheat for pressure components shall be as specified in Table 132 of ANSI B.1.

- **System Balancing**

A. Balancing work included:

1. Complete testing and balancing of the HVAC system as herein specified.

B. Verification of Conditions: Prior to testing and balancing, inspect equipment and materials and arrange with contractor for satisfactory correction of all defects in workmanship and/or material that could affect the work specified herein.

C. Protection: As specified herein.

D. System Operation: contractor shall put all parts of systems in full operation and shall continue to operation of same during each working day of testing and balancing.

E. Test Data: Submit copy of test data to Owner on completion of work under this section.

F. Test and balance contractor shall certify in writing that system has been adjusted and balanced and design conditions have been attained in all areas of the building.

G. Instruments: Instruments used by contractor shall be accurately calibrated and maintained in good working order.

H. Air Distribution Testing and Balancing:

1. Test and record motor full load amperes and RPM.
2. Test and record system static pressures, suction and discharge.
3. Adjust all supply and return air ducts to proper design CFM.
4. In cooperation with the control manufacturer's representative, the setting adjustment of automatically operated controls to operate as specified indicated and/or noted.

I. Witness: Notify Owner in writing two weeks prior to testing and balancing of all major equipment in order to arrange that Owner's representative will witness the test.

- **Operation**

D. Place system in operation and regulate and adjust to Owner's satisfaction. System shall operate quietly and without vibration or noise.

E. Contractor shall make necessary field adjustments for even temperatures throughout the project.

- **Certification**

A. Upon completion, the contractor shall inspect work of this section and deliver to Owner a written certification that installed materials and workmanship conform to specifications.

CRUMBL COOKIES - WATERFORD #1046

4978 HIGHLAND RD
WATERFORD TWP, MI 48327

ISSUED: DECEMBER 19, 2022

CURRENT REVISION:

22-246

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JZW ARCHITECTS

MECHANICAL SPECIFICATIONS

M7.2

BLODGETT
A Middleby Company

The Blodgett Oven Company
44 Lakeside Avenue
Burlington, VT 05401
Telephone: (802) 860-3700
Engineering Fax: (802) 860-3785

Burlington, December 06 2016

Ventilation of XR8-E electric oven,

To Whom It May Concern:

Blodgett's electric convection ovens must be installed in accordance with NFPA 96. This standard states that cooking equipment used in processes producing smoke or grease laden vapors shall be equipped with an exhaust system complying with hood, duct system, grease removal, and fire extinguishing requirements in various chapters of the standard.

Blodgett Oven Company does not require the use of fire suppression Type I or a Type II exhaust hood for electric convection oven installations that do not produce smoke or grease laden vapors.

Thousands of installations throughout North America of Blodgett electric convection ovens exist without fire suppression. However, we cannot make judgments as to types of cooking that produce smoke or grease laden vapors. Blodgett and the NFPA committee therefore depend on the judgment of the local authority having jurisdiction to determine which cooking operations require protection features addressed in NFPA 96.
A certain model oven used for baking bread products such as cakes, sweet breads, and cookies might be judged by the local authority having jurisdiction as not producing grease laden vapors. The very same model oven used in a different location for broiling meats might be deemed as producing grease laden vapors. Since the Standard cannot address specific installations, the judgment must be made by the authority having jurisdiction.

I hope this correspondence helps you in your situation. If you require further assistance regarding this matter, do not hesitate to contact me

Sincerely,

Stanley Sienko
Compliance Engineer
(802) 860-3738
ssienko@blodgett.com

BLODGETT® BLODGETT COMBI®

COM*check* Software Version 4.1.5.5
Mechanical Compliance Certificate

Project Information

Energy Code:	2018 IECC
Project Title:	Crumbl Cookies
Location:	Waterford, Michigan
Climate Zone:	5a
Project Type:	Alteration

Construction Site:	Owner/Agent:	Designer/Contractor:
4978 Highland Rd Waterford, MI 48327	JZW Architectrure 45 E Center St Street 202 North Salt Lake, UT 84054 (801) 936-1243 https://jzw-a.com/	Royal Engineering 1837 S. East Bay Blvd. Provo, UT 84606 (801) 375-2228 https://www.royaleng.com/

Mechanical Systems List

Quantity	System Type & Description
1	FC-1/CU-1 (Single Zone): Split System Heat Pump Heating Mode: Capacity = 48 kBtu/h, Proposed Efficiency = 9.30 HSPF, Required Efficiency = 8.20 HSPF Cooling Mode: Capacity = 48 kBtu/h, Proposed Efficiency = 17.00 SEER, Required Efficiency: 14.00 SEER Fan System: None
1	WH-1: Gas Instantaneous Water Heater, Capacity: 0 gallons, Input Rating: 199 kBtu/h w/ Circulation Pump No minimum efficiency requirement applies

Mechanical Compliance Statement

Compliance Statement: The proposed mechanical alteration project represented in this document is consistent with the building plans, specifications, and other calculations submitted with this permit application. The proposed mechanical systems have been designed to meet the 2018 IECC requirements in COM*check* Version 4.1.5.5 and to comply with any applicable mandatory requirements listed in the Inspection Checklist.

Jesse Egan - Mechanical Designer		12/15/2022
Name - Title	Signature	Date

COM*check* Software Version 4.1.5.5
Inspection Checklist
Energy Code: 2018 IECC

Requirements: 0.0% were addressed directly in the COM*check* software

Text in the "Comments/Assumptions" column is provided by the user in the COMcheck Requirements screen. For each requirement, the user certifies that a code requirement will be met and how that is documented, or that an exception is being claimed. Where compliance is itemized in a separate table, a reference to that table is provided.

Section # & Req.ID	Plan Review	Complies?	Comments/Assumptions
C103.2 [PR2][1]	Plans, specifications, and/or calculations provide all information with which compliance can be determined for the mechanical systems and equipment and document where exceptions to the standard are claimed. Load calculations per acceptable engineering standards and handbooks.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
C103.2 [PR3][1]	Plans, specifications, and/or calculations provide all information with which compliance can be determined for the service water heating systems and equipment and document where exceptions to the standard are claimed. Hot water system sized per manufacturer's sizing guide.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	

Additional Comments/Assumptions:

1 High Impact (Tier 1) 2 Medium Impact (Tier 2) 3 Low Impact (Tier 3)

Section # & Req.ID	Footing / Foundation Inspection	Complies?	Comments/Assumptions
C403.12.2, C403.12.3 [FO9][3]	Snow/ice melting system and freeze protection systems have sensors and controls configured to limit service for pavement temperature and outdoor temperature. future connection to controls.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	

Additional Comments/Assumptions:

1 High Impact (Tier 1) 2 Medium Impact (Tier 2) 3 Low Impact (Tier 3)

Section # & Req.ID	Plumbing Rough-In Inspection	Complies?	Comments/Assumptions
C404.5, C404.5.1, C404.5.2 [PL6][3]	Heated water supply piping conforms to pipe length and volume requirements. Refer to section details.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
C404.5, C404.5.1, C404.5.2 [PL6][3]	Heated water supply piping conforms to pipe length and volume requirements. Refer to section details.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
C404.6.1, C404.6.2 [PL3][1]	Automatic time switches installed to automatically switch off the recirculating hot-water system or heat trace.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
C404.6.3 [PL7][3]	Pumps that circulate water between a heater and storage tank have controls that limit operation from startup to <= 5 minutes after end of heating cycle.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
C404.6.3 [PL7][3]	Pumps that circulate water between a heater and storage tank have controls that limit operation from startup to <= 5 minutes after end of heating cycle.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
C404.7 [PL8][3]	Demand recirculation water systems have controls that start the pump upon receiving a signal from the action of a user of a fixture or appliance and limits the temperature of the water entering the cold-water piping to 104°F.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
C404.7 [PL8][3]	Demand recirculation water systems have controls that start the pump upon receiving a signal from the action of a user of a fixture or appliance and limits the temperature of the water entering the cold-water piping to 104°F.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	

Additional Comments/Assumptions:

1 High Impact (Tier 1) 2 Medium Impact (Tier 2) 3 Low Impact (Tier 3)

Section # & Req.ID	Mechanical Rough-In Inspection	Complies?	Comments/Assumptions
C402.2.6 [ME41][3]	Thermally ineffective panel surfaces of sensible heating panels have insulation >= R-3.5.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
C403.11.3 [ME61][2]	HVAC piping insulation insulated in accordance with Table C403.11.3. Insulation exposed to weather is protected from damage and is provided with shielding from solar radiation.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
C403.8.1 [ME65][3]	HVAC fan systems at design conditions do not exceed allowable fan system motor nameplate hp or fan system bhp.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	*See the Mechanical Systems list for values.*
C403.8.3 [ME117][2]	Fans have efficiency grade (FEG) >= 67. The total efficiency of the fan at the design point of operation <= 15% of maximum total efficiency of the fan.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
C403.12.1 [ME71][2]	Systems that heat outside the building envelope are radiant heat systems controlled by an occupancy sensing device or timer switch.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
C403.2.3 [ME55][2]	HVAC equipment efficiency verified.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	*See the Mechanical Systems list for values.*
C403.2.2 [ME59][1]	Natural or mechanical ventilation is provided in accordance with International Mechanical Code Chapter 4. Mechanical ventilation has capability to reduce outdoor air supply to minimum per IMC Chapter 4.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
C403.7.1 [ME59][1]	Demand control ventilation provided for spaces >500 ft2 and >25 people/1000 ft2 occupant density and served by systems with air side economizer, auto modulating outside air damper control, or design airflow >3,000 cfm.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
C403.7.2 [ME115][3]	Enclosed parking garage ventilation has automatic contaminant detection and capacity to stage or modulate fans to 50% or less of design capacity.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
C403.7.6 [ME141][3]	HVAC systems serving guestrooms in Group R-1 buildings with > 50 guestrooms: Each guestroom is provided with controls that automatically manage temperature setpoint and ventilation (see sections C403.7.6.1 and C403.7.6.2).	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
C403.7.4 [ME57][1]	Exhaust air energy recovery on systems meeting Table C403.7.4(1) and C403.7.4(2).	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	

1 High Impact (Tier 1) 2 Medium Impact (Tier 2) 3 Low Impact (Tier 3)

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STATE OF MICHIGAN
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OVEN SPECIFICATIONS & COMCHECK

M8.1

JZW ARCHITECTS

CRUMBL COOKIES - WATERFORD #1046

4978 HIGHLAND RD
WATERFORD TWP, MI 48327

22-246

ISSUED: DECEMBER 19, 2022

CURRENT REVISION:

Section # & Req.ID	Mechanical Rough-In Inspection	Complies?	Comments/Assumptions
C403.7.5 [ME116][3]	Kitchen exhaust systems comply with replacement air and conditioned supply air limitations, and satisfy hood rating requirements and maximum exhaust rate criteria.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
C403.11.1, C403.11.2 [ME60][2]	HVAC ducts and plenums insulated in accordance with C403.11.1 and constructed in accordance with C403.11.2, verification may need to occur during Foundation Inspection.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
C403.4.3.3.2 [ME121][3]	Closed-circuit cooling tower within heat pump loop have either automatic bypass valve or lower leakage positive closure dampers. Open-circuit tower within heat pump loop have automatic valve to bypass all heat pump water flow around the tower. Open- or closed-circuit cooling towers used in conjunction with a separate heat exchanger have heat loss by shutting down the circulation pump on the cooling tower loop. Open- or closed circuit cooling towers have a separate heat exchanger to isolate the cooling tower from the heat pump loop, and heat loss is controlled by shutting down the circulation pump on the cooling tower loop.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
C403.4.1.4 [ME63][2]	Heating for vestibules and air curtains with integral heating include automatic controls that shut off the heating system when outdoor air temperatures > 45F. Vestibule heating and cooling systems controlled by a thermostat in the vestibule with heating setpoint <= 60F and cooling setpoint >= 80F.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
C408.2.2.1 [ME53][3]	Air outlets and zone terminal devices have means for air balancing.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
C403.5, C403.5.1, C403.5.2 [ME123][3]	Refrigerated display cases, walk-in coolers or walk-in freezers served by remote compressors and remote condensers not located in a condensing unit, have fan-powered condensers that comply with Sections C403.5.1 and refrigeration compressor systems that comply with C403.5.2..	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	

Additional Comments/Assumptions:

1	High Impact (Tier 1)	2	Medium Impact (Tier 2)	3	Low Impact (Tier 3)

Section # & Req.ID	Rough-In Electrical Inspection	Complies?	Comments/Assumptions
C405.6 [EL26][2]	Low-voltage dry-type distribution electric transformers meet the minimum efficiency requirements of Table C405.6.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
C405.7 [EL27][2]	Electric motors meet the minimum efficiency requirements of Tables C405.7(1) through C405.7(4). Efficiency verified through certification under an approved certification program or the equipment efficiency ratings shall be provided by motor manufacturer (where certification programs do not exist).	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
C405.8.2, C405.8.2.1 [EL28][2]	Escalators and moving walks comply with ASME A17.1/CSA B44 and have automatic controls configured to reduce speed to the minimum permitted speed in accordance with ASME A17.1/CSA B44 or applicable local code when not conveying passengers.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
C405.9 [EL29][2]	Total voltage drop across the combination of feeders and branch circuits <= 5%.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	

Additional Comments/Assumptions:

1	High Impact (Tier 1)	2	Medium Impact (Tier 2)	3	Low Impact (Tier 3)

Section # & Req.ID	Final Inspection	Complies?	Comments/Assumptions
C303.3, C408.2.5.3 [FI8][3]	Furnished O&M manuals for HVAC systems within 90 days of system acceptance.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
C403.2.2 [FI27][3]	HVAC systems and equipment capacity does not exceed calculated loads.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
C403.2.4.1 [FI47][3]	Heating and cooling to each zone is controlled by a thermostat control. Minimum one humidity control device per installed humidification/dehumidification system.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
C403.2.4.1.1 [FI42][3]	Heat pump controls prevent supplemental electric resistance heat from coming on when not needed.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
C403.4.1.2 [FI38][3]	Thermostatic controls have a 5 °F deadband.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
C403.2.4.1.3 [FI20][3]	Temperature controls have setpoint overlap restrictions.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
C403.2.4.2 [FI39][3]	Each zone equipped with setback controls using automatic time clock or programmable control system.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
C403.2.4.2.1, C403.2.4.2.2 [FI40][3]	Automatic Controls: Setback to 55°F (heat) and 85°F (cool); 7-day clock, 2-hour occupant override, 10-hour backup	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
C404.3 [FI11][3]	Heat traps installed on supply and discharge piping of non-circulating systems.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
C404.4 [FI25][2]	All piping insulated in accordance with section details and Table C403.11.3.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
C404.6.1 [FI12][3]	Controls are installed that limit the operation of a recirculation pump installed to maintain temperature of a storage tank. System return pipe is a dedicated return pipe or a cold water supply pipe.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	

1	High Impact (Tier 1)	2	Medium Impact (Tier 2)	3	Low Impact (Tier 3)

Section # & Req.ID	Final Inspection	Complies?	Comments/Assumptions
C408.1.1 [FI57][1]	Building operations and maintenance documents will be provided to the owner. Documents will cover manufacturers' information, specifications, programming procedures and means of illustrating to owner how building, equipment and systems are intended to be installed, maintained, and operated.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
C408.2.1 [FI28][1]	Commissioning plan developed by registered design professional or approved agency.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
C408.2.3.1 [FI31][1]	HVAC equipment has been tested to ensure proper operation.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
C408.2.3.2 [FI10][1]	HVAC control systems have been tested to ensure proper operation, calibration and adjustment of controls.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
C408.2.4 [FI29][1]	Preliminary commissioning report completed and certified by registered design professional or approved agency.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
C408.2.5.1 [FI7][3]	Furnished HVAC as-built drawings submitted within 90 days of system acceptance.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
C408.2.5.3 [FI43][1]	An air and/or hydronic system balancing report is provided for HVAC systems.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
C408.2.5.4 [FI30][1]	Final commissioning report due to building owner within 90 days of receipt of certificate of occupancy.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	

Additional Comments/Assumptions:

1	High Impact (Tier 1)	2	Medium Impact (Tier 2)	3	Low Impact (Tier 3)

CURRENT REVISION:
ISSUED: DECEMBER 19, 2022

4978 HIGHLAND RD
WATERFORD TWP, MI 48327

CRUMBL COOKIES - WATERFORD #1046

22-246

STATE OF MICHIGAN MARK L. MAKIN ENGINEER No. 6201070110 LICENSED PROFESSIONAL ENGINEER

COMCHECK
M8.2

ROYAL ENGINEERING
ELECTRICAL MECHANICAL
1837 S. EAST BAY BLVD. PROVO, UTAH 84606
PHONE: 801.375.2228 FAX: 801.375.2676

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PLUMBING SYMBOLS

NOTES:
1. ALL SYMBOLS MAY NOT BE USED.
2. DOTTED SYMBOLS INDICATE EXISTING EQUIPMENT, ETC

SS	SANITARY OR WASTE PIPING
GR	GREASE WASTE PIPING
CW	COLD WATER PIPING
HW	HOT WATER PIPING
GAS	GAS PIPING
RW	HOT WATER RETURN PIPING
○	PIPE RISER OR FIXTURE CONNECTION
	WALL HYDRANT/HOSE BIBB
	FLOOR DRAIN
	AREA DRAIN
PRV	PRESSURE REDUCING VALVE STATION
	GATE VALVE & BACKFLOW PREVENTOR

DESIGN CONTACTS

MECHANICAL ENGINEER:	MARK MAKIN
PLUMBING PROJECT MANAGER:	JESSE EGAN
PLUMBING DESIGNER:	JESSE EGAN

PLUMBING SHEET INDEX

SHEET NUMBER	SHEET TITLE
P0.1	PLUMBING NOTES & LEGEND
P1.1	PLUMBING PLANS
P5.1	PLUMBING DETAILS
P5.2	PLUMBING DETAILS
P5.3	GREASE INTERCEPTOR DETAILS
P6.1	PLUMBING SCHEDULE & SCHEMATICS
P7.1	PLUMBING SPECIFICATIONS
P7.2	PLUMBING SPECIFICATIONS

SEISMIC SUPPORT NOTES:

BRACING FOR SUSPENDED PIPING, ETC

PER ASCE STANDARD 7-16 SEISMIC SUPPORTS ARE NOT REQUIRED FOR THE FOLLOWING CONDITION:

A. PIPING IS SUPPORTED BY ROD HANGERS 12" OR LESS IN LENGTH FROM THE TOP OF THE PIPE TO THE SUPPORTING STRUCTURE.
B. HIGH-DEFORMABILITY PIPING IS USED.

IF INSTANCES OCCUR WHERE PIPING IS SUSPENDED BY HANGERS GREATER THAN 12" IN LENGTH. SYSTEM CONNECTORS AND COMPONENTS SHALL BE COMPATIBLE AND DESIGNED FOR THE APPLICATION THAT THEY ARE USED FOR. SHALL HAVE A MINIMUM OF TWO TRANSVERSE BRACES PER STRAIGHT PIPING RUN. THE MAXIMUM DISTANCE BETWEEN TRANSVERSE BRACES WILL BE DETERMINED BY PIPE SIZE AND PIPING COMPOSITION. SHALL HAVE A MINIMUM OF ONE LONGITUDINAL BRACE PER STRAIGHT DUCT RUN. IF LENGTH OF PIPING EXCEEDS LONGITUDINAL BRACE SPACING, ADDITIONAL LONGITUDINAL BRACES WILL BE REQUIRED.

FOR SEISMIC BRACING OF PLUMBING EQUIPMENT AND PIPING AN INDEPENDENT SEISMIC AND VIBRATION CONTROL SUBCONTRACTOR WITH EXPERIENCE, COMPUTING CAPABILITIES, AND MANUFACTURED PRODUCTS SHALL BE FURNISHED BY PLUMBING CONTRACTOR. INDEPENDENT SEISMIC CONSULTANT SHALL PROVIDE REQUIRED COMPUTATIONS, SHOP DRAWINGS, AND MANUFACTURED PRODUCTS TO MEET THE MINIMUM REQUIREMENTS OF ASCE 7-16 AND INTERNATIONAL BUILDING CODES (LATEST ADOPTED EDITION) FOR THE RESPECTIVE SEISMIC DESIGN FOR SEISMIC ZONE WITH IMPORTANCE FACTOR 1.5. SEISMIC SUBCONTRACTOR SHALL EXERCISE THE QUALITY CONTROL FOR THIS WORK AND SHALL NOT BE LIMITED TO INSTRUCTIONS DIRECTED TO THE PLUMBING CONTRACTOR. THE SEISMIC SUBCONTRACTOR SHALL CERTIFY IN WRITING THAT THEY HAVE INSPECTED THE INSTALLATION AND THAT ALL ISOLATION ANCHORS AND SEISMIC RESTRAINT MATERIALS ARE INSTALLED CORRECTLY AND FUNCTIONING PROPERLY. CERTIFICATION SHALL BE PROVIDED AFTER ALL CORRECTIVE WORK HAS BEEN COMPLETED.

PLUMBING PERFORMANCE NOTES:

P1. PLUMBING CONTRACTOR SHALL PROVIDE AND INSTALL WATER TEMPERING DEVICE (SHALL CONFORM TO ASSE 1070) FOR ALL HAND WASH AREAS IN PROJECT. HOT WATER TEMPERATURE SHALL HAVE A MAXIMUM TEMPERATURE OF 110° F.

P2. MAKE CONNECTION TO EXISTING UTILITIES SERVING THIS AREA. FIELD LOCATE AND VERIFY ALL CONNECTION REQUIREMENTS.

P3. PLUMBING CONTRACTOR SHALL PROVIDE AND INSTALL COLD WATER SHUT-OFF AT EACH FIXTURE GROUP.

SUBMITTAL NOTES:

1. CONTRACTOR TO ALLOW 10 WORKING DAYS FOR SUBMITTAL TURNAROUND.
2. CONTRACTOR TO PROVIDE SUBMITTALS FOR ALL EQUIPMENT AND MATERIALS IN A SINGLE PACKAGE. PIECEMEAL SUBMITTALS WILL BE RETURNED WITH A NOTE TO REVISE AND RESUBMIT.
3. SUBMITTALS WILL BE CHECKED FOR COMPLIANCE WITH CAPACITY REQUIREMENTS AND ELECTRICAL REQUIREMENTS. CONTRACTOR TO VERIFY THAT WEIGHTS, DIMENSIONS, AND DUCT CONNECTIONS ON SUBMITTED EQUIPMENT IS CONSISTENT WITH SCHEDULED EQUIPMENT PRIOR TO SUBMITTAL. CHANGES IN SCOPE BROUGHT ABOUT BY SUBMITTED EQUIPMENT THAT DOES NOT COMPLY WITH THE WEIGHTS, DIMENSIONS, OR CONNECTION LOCATIONS ON SCHEDULED EQUIPMENT SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR.

PROJECT PLUMBING NOTES:

1. SEE PIPING SCHEMATIC(S) FOR ADDITIONAL INFORMATION ON WASTE & VENT, GAS AND CULINARY WATER PIPING DIAMETERS.
2. COORDINATE ALL WORK WITH OTHER TRADES AS REQUIRED. CONCEAL ALL PIPING IN FINISHED AREAS.
3. PROVIDE AND INSTALL ALL REQUIRED VALVES IN PIPING SYSTEM. REMOVE OR RELOCATE ANY EXISTING PLUMBING FIXTURES & ASSOCIATED PIPING IN CONFLICT WITH THIS PLUMBING PLAN. COORDINATE ALL REQUIREMENTS WITH OWNER REPRESENTATIVE. EXTEND OR REMOVE & TERMINATE ANY PIPING AS REQUIRED. MAINTAIN FUNCTIONALITY OF ALL DOWNLINE FIXTURES. RETURN ANY REMOVED FIXTURES & PIPING TO OWNER REPRESENTATIVE OR DISPOSE FIXTURES AND PIPING AS DIRECTED BY OWNER REPRESENTATIVE. VERIFY ALL ITEMS WITH OWNER REPRESENTATIVE.
4. MAKE CONNECTION TO EXISTING WATER SUPPLY LINE. 1-1/4"Ø TENANT WATER SUPPLY LINE MINIMUM. VERIFY PROPER FUNCTION OF EXISTING MAIN SHUT-OFF, PRV, ETC. (FIELD VERIFY LOCATION) AND REPAIR/REPLACE AS REQUIRED UNDER DIRECTION OF OWNERS REPRESENTATIVE.
5. MAKE CONNECTION TO EXISTING SEWER LINE. MODIFY SEWER LINE TO ACCOMMODATE NEW PLUMBING FIXTURES. PROVIDE AND INSTALL ALL REQUIRED CLEANOUTS.
6. MAKE CONNECTION TO EXISTING NATURAL GAS LINE. VERIFY SIZE AND ALL REQUIREMENTS. SEE PLANS FOR MINIMUM MAIN GAS PIPE SIZE. SEE GAS PIPING SCHEMATICS FOR SYSTEM PRESSURE.
7. WHERE REQUIRED PLUMBING CONTRACTOR SHALL PROVIDE AND INSTALL 2 POUND TO 4 OUNCE PRESSURE REGULATORS WITH LEAK-LIMITING DEVICE AND TEST TEE FITTING. MFGC 410.
8. COORDINATE ALL REQUIRED SAW CUTTING OF EXISTING FLOOR OR SLAB FOR DRAIN PIPING, ETC. WITH GENERAL CONTRACTOR. REPAIR FLOOR OR SLAB AS DIRECTED BY OWNER REPRESENTATIVE. PROVIDE AND INSTALL EPOXY DOWELS AT SLAB TO SLAB JOINTS.
9. INSULATE ALL HOT AND COLD WATER PIPING PER APPLICABLE CODES. ALL EXPOSED HOT AND COLD WATER PIPING SHALL BE INSULATED. INSULATE HOT WATER PIPING THAT IS PLACED IN UNINSULATED INTERIOR WALLS. EXCEPTION: VERTICAL AND HORIZONTAL COLD WATER PIPING LOCATED INSIDE OF INTERIOR WALLS MAY HAVE THE INSULATION OMITTED.
10. MAKE PROVISIONS FOR A TRAP GUARD WHERE NOTED AND/OR CALLED FOR.
11. PIPING LOCATIONS ARE GRAPHICALLY SHOWN. PLUMBING CONTRACTOR SHALL DETERMINE ACTUAL PIPE ROUTING IN FIELD PER AVAILABLE SPACE AND BUILDING CONSTRUCTION.

PROJECT PLUMBING NOTES:

12. NOT ALL CLEANOUTS ARE SHOWN. PROVIDE AND INSTALL ALL REQUIRED CLEANOUTS. CLEANOUTS FOR HORIZONTAL DRAINS SHALL BE INSTALLED NO MORE THAN 100' APART. CLEANOUTS SHALL BE INSTALLED AT EACH CHANGE OF DIRECTION GREATER THAN 45°. A CLEANOUT SHALL BE PROVIDED AT THE BASE OF EACH WASTE OR SOIL STACK. CLEANOUTS SHALL BE ACCESSIBLE AND THE SAME SIZE AS THE WASTE LINES ON WHICH THEY ARE INSTALLED.
13. COORDINATE WITH OTHER TRADES TO ENSURE AND ALL PLUMBING VENTS ARE A MINIMUM OF 10-FEET FROM ALL FRESH AIR INTAKES.
14. WATER PIPING MATERIAL SHALL MEET THE STANDARDS SET FORTH IN 2018 MICHIGAN PLUMBING CODE TABLES 605.3, 605.4 & 605.5.
15. SANITARY WASTE AND VENT PIPING MATERIAL SHALL MEET THE STANDARDS SET FORTH IN 2018 MICHIGAN PLUMBING CODE TABLES 702.1, 702.2 AND 702.3 & 702.4.
16. NATURAL GAS PIPING MATERIAL SHALL MEET THE STANDARDS SET FORTH IN 2018 MFGC SECTION 403.
17. PLUMBING CONTRACTOR TO PROVIDE AND INSTALL BACKFLOW PREVENTER AT ALL CHEMICAL DISPENSING LOCATIONS.
18. PAINT ALL EXTERIOR GAS PIPING WITH WEATHER RESISTANT PAINT.
19. PLUMBING CONTRACTOR SHALL INCLUDE PRICING TO INVESTIGATE EXISTING SEWER LINE LOCATIONS AND INVERT ELEVATIONS. GIVE RECOMMENDATIONS TO OWNER FOR MOST ECONOMICAL AND LEAST INTRUSIVE WAY TO CONNECT NEW DRAIN PIPING IN ADDITION TO EXISTING DRAIN PIPING.
20. PLUMBING CONTRACTOR SHALL VISIT THE PROJECT SITE DURING THE BIDDING PROCESS.
21. CONTRACTOR SHALL VERIFY LOCATION, SIZE, AND DEPTH OF ALL UTILITIES PRIOR TO BEGINNING OF CONSTRUCTION.
22. EXISTING PLUMBING FIXTURES AND ASSOCIATED SYSTEMS TO REMAIN. PLUMBING CONTRACTOR SHALL INCLUDE PRICING TO VERIFY PROPER FUNCTION OF ALL PLUMBING FIXTURES. THIS WILL INCLUDE BUT NOT BE LIMITED TO VERIFYING: COLD WATER CONNECTION & DELIVERY, HOT WATER CONNECTION & DELIVERY, DRAIN LINE CONNECTION & PROPER FUNCTION, HOT WATER HEATER FUNCTION & CONDITION, ETC. FOR FULLY FUNCTIONING PLUMBING FIXTURES & ASSOCIATED PLUMBING SYSTEMS. PLUMBING CONTRACTOR SHALL REPORT FINDINGS & CONCERNS BACK TO GENERAL CONTRACTOR & PROJECT OWNER.
23. TANKLESS WATER HEATER EXHAUST AND COMBUSTION PIPING BY PLUMBING CONTRACTOR. INSTALL PER MANUFACTURER'S RECOMMENDATIONS.

CRUMBL COOKIES - WATERFORD #1046

4978 HIGHLAND RD
WATERFORD TWP, MI 48327

ISSUED: DECEMBER 19, 2022

CURRENT REVISION:

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STATE OF MICHIGAN
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ENGINEER
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LICENSED PROFESSIONAL ENGINEER

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 | JOB# J22418.00 | DATE PLOTTED: 12/20/2022

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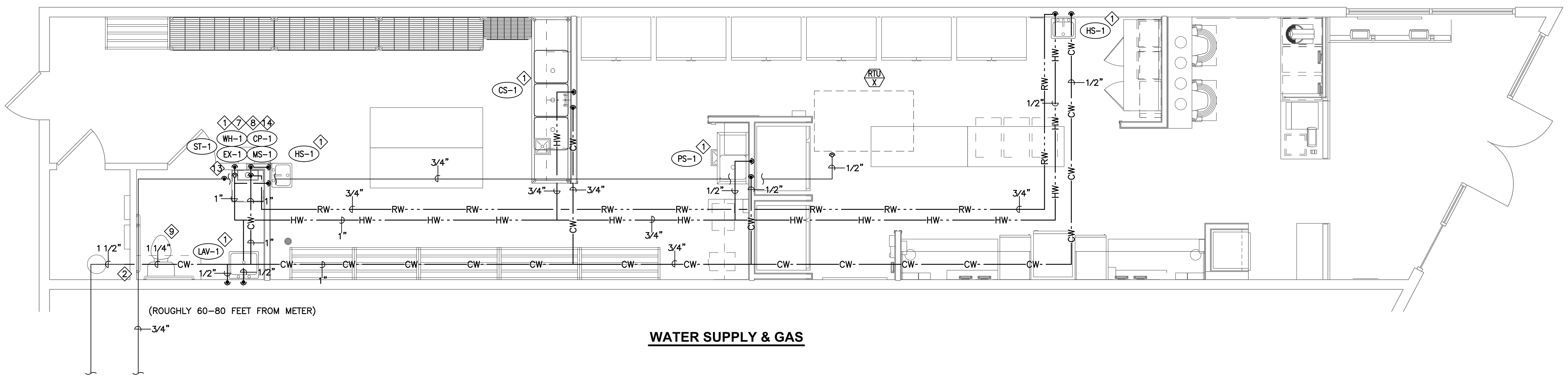
PLUMBING NOTES & LEGEND

PLUMBING KEYED NOTES:

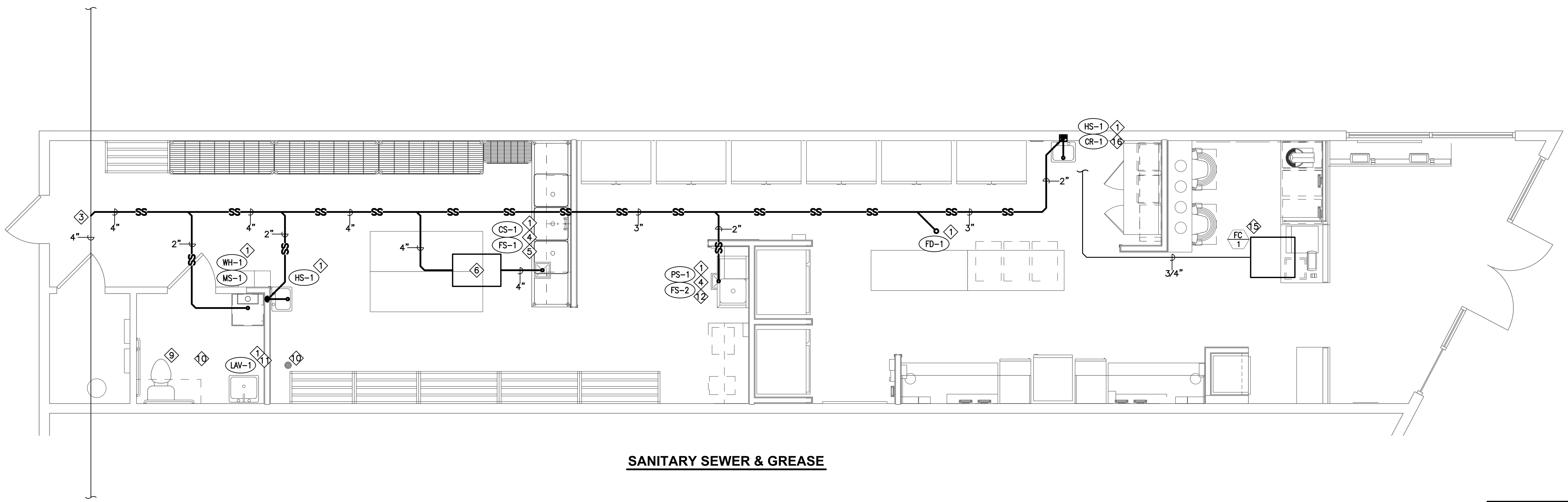
1. SEE PLUMBING SCHEMATICS FOR ADDITIONAL INFORMATION.
2. CONNECT INTO EXISTING DOMESTIC WATER LINE. FIELD VERIFY EXACT LOCATION.
3. FIELD VERIFY SEWER LINE LOCATION AND FLOW DIRECTION. CONNECT TO EXISTING 4" SEWER LINE IN THIS AREA.
4. FIELD VERIFY FLOOR SINK LOCATION WITH OWNER REPRESENTATIVE.
5. ROUTE INDIRECT WASTE FROM 3-COMPARTMENT SINK WITH AIR GAP TO FLOOR SINK. SEE DETAILS FOR MORE INFORMATION.
6. PROPOSED LOCATION OF INLINE GREASE INTERCEPTOR. FIELD VERIFY EXACT LOCATION WITH OWNERS REPRESENTATIVE. SEE SHEET P5.3 FOR SIZING CALCULATIONS AND SPECIFICATIONS. DESIGN GUIDE: SCHIER GB-2.
7. MOUNT WATER HEATER ON WALL ABOVE MOP SINK. SEE DETAIL FOR ADDITIONAL INFORMATION.
8. PROVIDE AND INSTALL CP-1 WITH 3/4" HOT WATER RETURN FROM THE FURTHEST FIXTURE GROUP TO A COMMON HOT WATER RETURN LOOP. INSTALL CP-1 PER MANUFACTURER RECOMMENDATIONS.
9. EXISTING PLUMBING FIXTURE TO REMAIN. CONTRACTOR TO REFER TO GENERAL PLUMBING NOTE #22 ON P0.1 FOR MORE INFORMATION.
10. EXISTING FLOOR DRAIN TO REMAIN. ADD TRAP GUARD INSERT IF FUNCTION TRAP PRIMER OR SEAL PROTECTION IS NOT FOUND TO BE EXISTING.

PLUMBING KEYED NOTES:

11. LAVATORY TO USE EXISTING PLUMBING CONNECTIONS FROM PREVIOUS FIXTURE. FIELD VERIFY EXACT LOCATIONS. PROVIDE NEW SHUT OFF VALVE ON WATER SUPPLY LINE.
12. ROUTE INDIRECT WASTE FROM FOOD PREP SINK WITH AIR GAP TO FLOOR SINK. SEE DETAILS FOR MORE INFORMATION.
13. FIELD VERIFY EXACT LOCATION OF EXISTING NATURAL GAS PIPING ON ROOF OR WITHIN TENANT SPACE. MAKE CONNECTION TO NEW TANKLESS WATER HEATER IN THIS AREA. PROVIDE AND INSTALL SHUT-OFF VALVE AND PRESSURE REGULATOR AS NEEDED. COORDINATE ALL METER, PIPING AND PRESSURE DETAILS WITH LOCAL GAS COMPANY PRIOR TO INSTALLATION OR ORDERING OF ANY SUPPLIES.
14. PROVIDE AND INSTALL 6 GALLON STORAGE TANK SERVING HOT WATER SUPPLY LINE IN THIS AREA. SHALL HELP ELIMINATE COLD WATER SANDWICH EFFECT CAUSED BY FREQUENT ON/OFF OPERATION. MAKE CONNECTION INTO HOT WATER LINE SERVING PLUMBING FIXTURES IN THIS AREA. FIELD VERIFY EXACT LOCATION.
15. PROPOSED LOCATION OF NEW CEILING FAN COIL UNIT. CONTRACTOR SHALL MAKE CONNECTION TO OUTDOOR UNIT. ROUTE CONDENSATE PIPING TO CR-1. INSTALL PER MANUFACTURER'S RECOMMENDATIONS.
16. CONDENSATE RECEPTOR TO BE LOCATED HIGH IN CEILING SPACE. FIELD VERIFY EXACT LOCATION.



WATER SUPPLY & GAS



SANITARY SEWER & GREASE

PLUMBING PLANS

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

ROYAL ENGINEERING

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JOB# J22418.00 | DATE PLOTTED: 12/20/2022

CRUMBL COOKIES - WATERFORD #1046

4978 HIGHLAND RD
WATERFORD TWP, MI 48327

ISSUED: DECEMBER 19, 2022

CURRENT REVISION:

22-246

PLUMBING PLANS

P1.1

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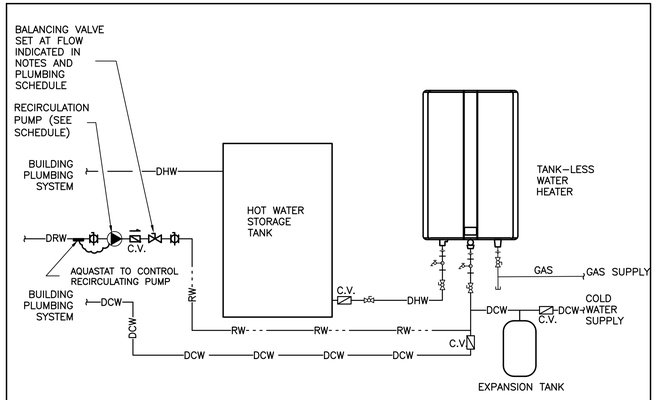
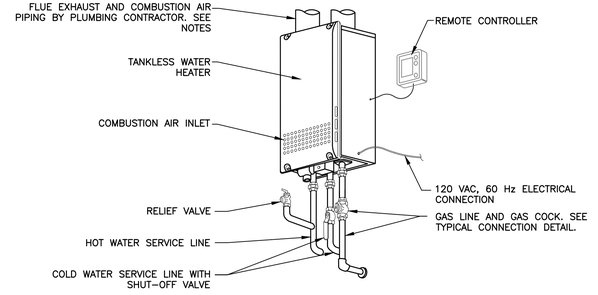


TANKLESS WATER HEATER WITH STORAGE TANK

SCALE: NONE



NOTES:
1. INSTALL AND FOLLOW ALL MANUFACTURERS INSTRUCTIONS. (MOUNTING, FLUE, CONTROLLER ETC,).
2. 120 VOLT ELECTRICAL CONNECTION BY ELECTRICAL CONTRACTOR.
3. APPROVED MANUFACTURERS: BOSCH, NORITZ, ARMSTRONG, RHEEM AND AO SMITH.
4. DRAIN LINE (TO NEAREST FLOOR DRAIN OR CONDENSATE RECEPTOR). PROVIDE AND INSTALL NEUTRALIZING DEVICE WHERE CONDENSATE WILL CAUSE DAMAGE TO THE DRAINAGE PIPING. SHALL BE PER IPC SECTION 803.

TANKLESS GAS WATER HEATER DETAIL

SCALE: NONE

MECHANICAL PIPING - MINIMUM INSULATION THICKNESS

SERVICE	TEMPERATURE RANGE (°F)	PIPE SIZE (IN.)					NOTES
		< 1	1 TO 1-1/2	2 TO 3-1/2	4 TO 7-1/2	8 & LARGER	
> 120 PSI STEAM	> 350	2.5	3	3	4	4	1, 2, 3, 5, 6
16 - 120 PSI STEAM	251 - 350	1.5	2.5	3	3	3	1, 2, 3, 5, 6
0 - 15 PSI STEAM	201 - 250	1.5	1.5	3	3	3	1, 2, 3, 5, 6
HOT WATER	141 - 200	1.5	1.5	2	2	2	1, 3, 5, 6
HOT WATER	105 - 140	1.5	1.5	2	2	2	1, 3, 5, 6
COOLING SYSTEMS	40 - 60	1.5	1.5	2	2	2	1, 3, 4, 5, 6
COOLING COIL CONDENSATE	32 - 65	.5	.5	.5	.5	.5	1, 5, 6

1. INSULATION CONDUCTIVITY NOT TO EXCEED 0.27 BTU PER INCH. WHERE INSULATION IS NOT EQUAL TO 0.27 BTU PER INCH THE INSULATION THICKNESS SHALL BE INCREASE AS DIRECTED IN THE INTERNATIONAL ENERGY CONSERVATION CODE.
2. STEAM SERVICE INCLUDES BOTH STEAM AND CONDENSATE RETURN PIPING.
3. INSULATION THICKNESS FOR RUN-OUT PIPING BETWEEN THE CONTROL VALVE AND HVAC EQUIPMENT MAY BE REDUCED TO 1".
4. COOLING SYSTEMS INCLUDE CHILLED WATER, CHILLED BRINE, REFRIGERANT SUCTION, REFRIGERANT HOT GAS, AND CONDENSER WATER AND HEAT RECOVERY PIPING FALLING WITHIN THE LISTED TEMPERATURE RANGE.
5. INSULATION THICKNESS FOR PIPING LOCATED OUTDOORS OR EXPOSED TO OUTSIDE AIR SHALL BE INCREASED BY 1".
6. WHERE SCHEDULED THICKNESS DIFFERS FROM SPECIFICATIONS THE THICKER DIMENSION SHALL BE USED.

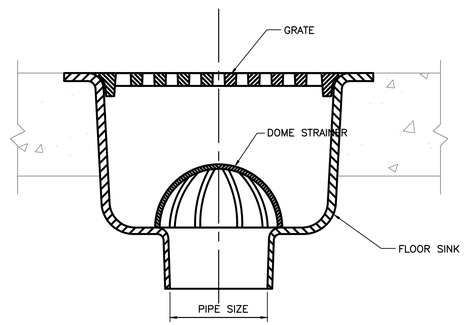
PLUMBING PIPING - MINIMUM INSULATION THICKNESS

SERVICE	TEMPERATURE RANGE (°F)	PIPE SIZE (IN.)					NOTES
		< 1	1 TO 1-1/2	2 TO 3-1/2	4 TO 7-1/2	8 & LARGER	
DOMESTIC COLD WATER	45 - 90	1	1	1	1	1	1, 2, 3
DOMESTIC HOT WATER	90+	1	1	1.5	1.5	1.5	1, 2, 3, 4
SERVICE HOT WATER	90+	1	1	1.5	1.5	1.5	1, 2, 3, 4
ROOF DRAIN PIPING	32+	1	1	1	1	1	1, 2, 3, 5

1. INSULATION CONDUCTIVITY NOT TO EXCEED 0.27 BTU PER INCH. WHERE INSULATION IS NOT EQUAL TO 0.27 BTU PER INCH THE INSULATION THICKNESS SHALL BE INCREASE AS DIRECTED IN THE INTERNATIONAL ENERGY CONSERVATION CODE.
2. INSULATION THICKNESS FOR PIPING LOCATED OUTDOORS OR EXPOSED TO OUTSIDE AIR SHALL BE INCREASED BY 1".
3. WHERE SCHEDULED THICKNESS DIFFERS FROM SPECIFICATIONS THE THICKER DIMENSION SHALL BE USED.
4. SERVICE AND DOMESTIC HOT WATER INCLUDES RE-CIRCULATION LOOP PIPING.
5. ROOF DRAIN PIPING INCLUDES DRAIN BOWELS AND OVERFLOW DRAIN PIPING.

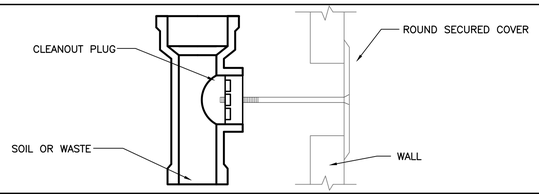
PIPING INSULATION DETAIL

SCALE: NONE



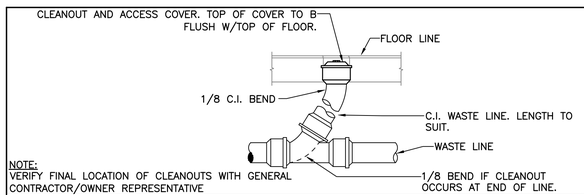
TYPICAL FLOOR SINK DETAIL

SCALE: NONE



TYPICAL WALL CLEANOUT DETAIL

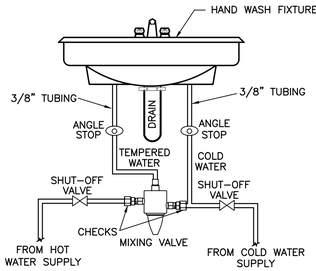
SCALE: NONE



NOTE:
VERIFY FINAL LOCATION OF CLEANOUTS WITH GENERAL CONTRACTOR/OWNER REPRESENTATIVE

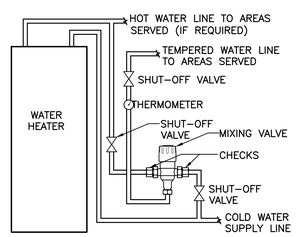
TYPICAL FLOOR CLEANOUT DETAIL

SCALE: NONE



MIXING VALVE DESIGN STANDARD:
SYMMONS 7-210-CK (5 GPM)

SINGLE HAND WASH LOCATION



USED W/	GPM	MIXING VALVE	INLETS & OUTLETS
4-20GAL WH	14	SYMMONS 7-225-CK-F	1/2"
40GAL WH	14	SYMMONS 7-230-CK-F	3/4"

NOTE:
IF REQUIRED GPM EXCEEDS CAPABILITIES OF MIXING VALVES LISTED, PROVIDE MIXING VALVE WITH CAPABILITY NEEDED.

SERVING MULTIPLE FIXTURES

NOTES:
1. PROVIDE WITH SEPARATE CHECKS AND WALL MOUNTING BRACKET.
2. SHALL CONFORM TO ASSE 1070 – LIMIT THE TEMPERED WATER TEMPERATURE TO A MAXIMUM OF 110 deg F. MPC 2018, 607.1.2.
3. SET MIXING VALVE TEMPERATURE WHEN INSTALLATION IS COMPLETE.
4. FOLLOW ALL MANUFACTURER INSTALLATION AND OTHER INSTRUCTIONS.
5. APPROVED MANUFACTURERS: SYMMONS, POWERS, LEONARD, BRADLEY, WATTS, LAWLER.
6. INSTALL HANDY-SHIELD, AS MANUFACTURED BY PLUMBEREX SPECIALTY PRODUCTS, SAFETY COVERS ON ALL SUPPLY PIPING AND WASTE PIPING BENEATH HANDICAPPED LAVATORIES. SHIELDS SHALL MEET THE REQUIREMENTS OF UNIFORM FEDERAL ACCESSIBILITY STANDARDS 4.19.4 GSA AND ANSI DOCUMENT A117-1-1980.

WATER TEMPERING DETAILS

SCALE: NONE

CRUMBL COOKIES - WATERFORD #1046

4978 HIGHLAND RD
WATERFORD TWP, MI 48327

ISSUED: DECEMBER 19, 2022

CURRENT REVISION:

22-246

STATE OF MICHIGAN
MARK L. MAKIN
ENGINEER
No. 6201070110
LICENSED PROFESSIONAL ENGINEER

PLUMBING DETAILS

P5.1

ROYAL ENGINEERING
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PROVO, UTAH 84606
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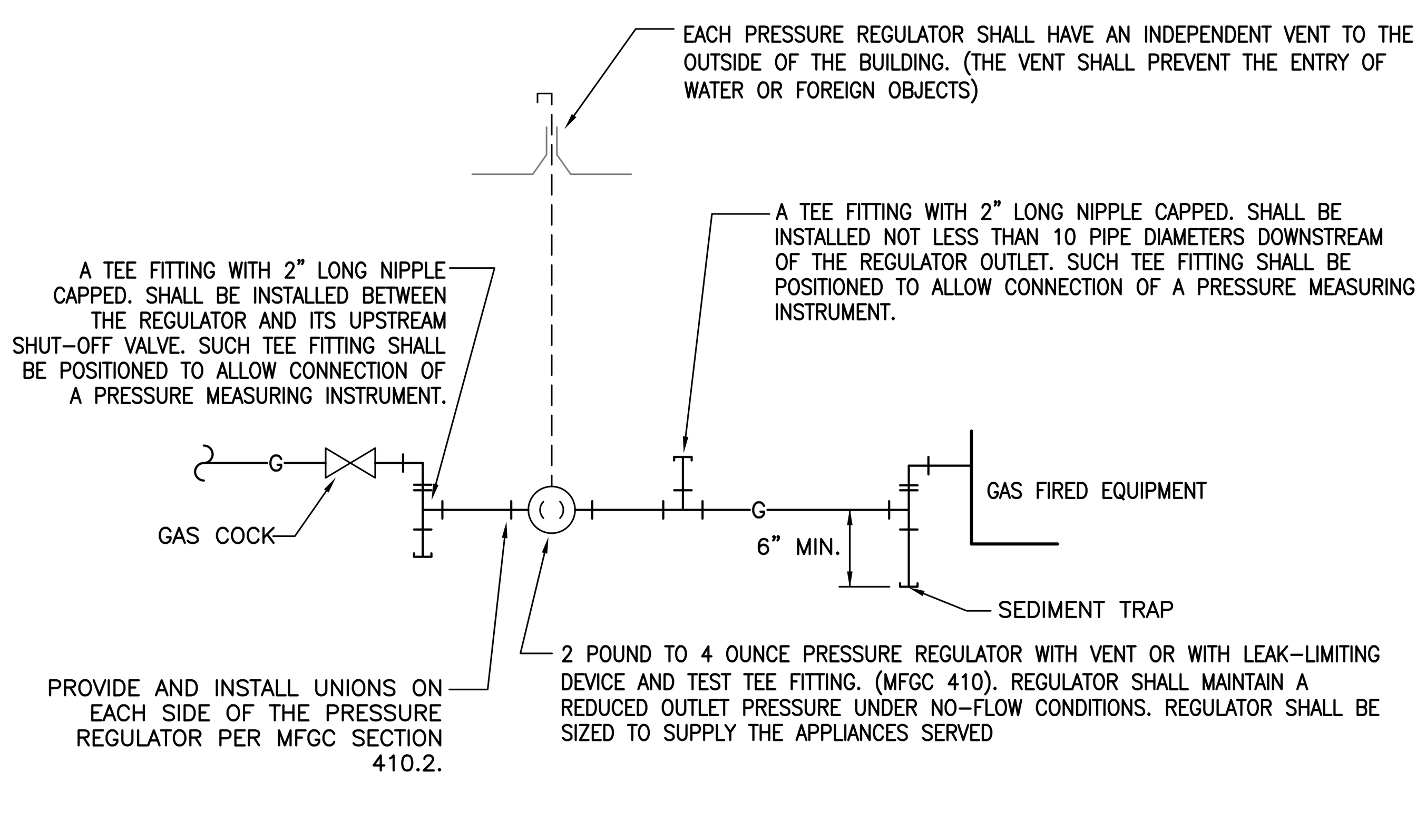
JZW ARCHITECTS

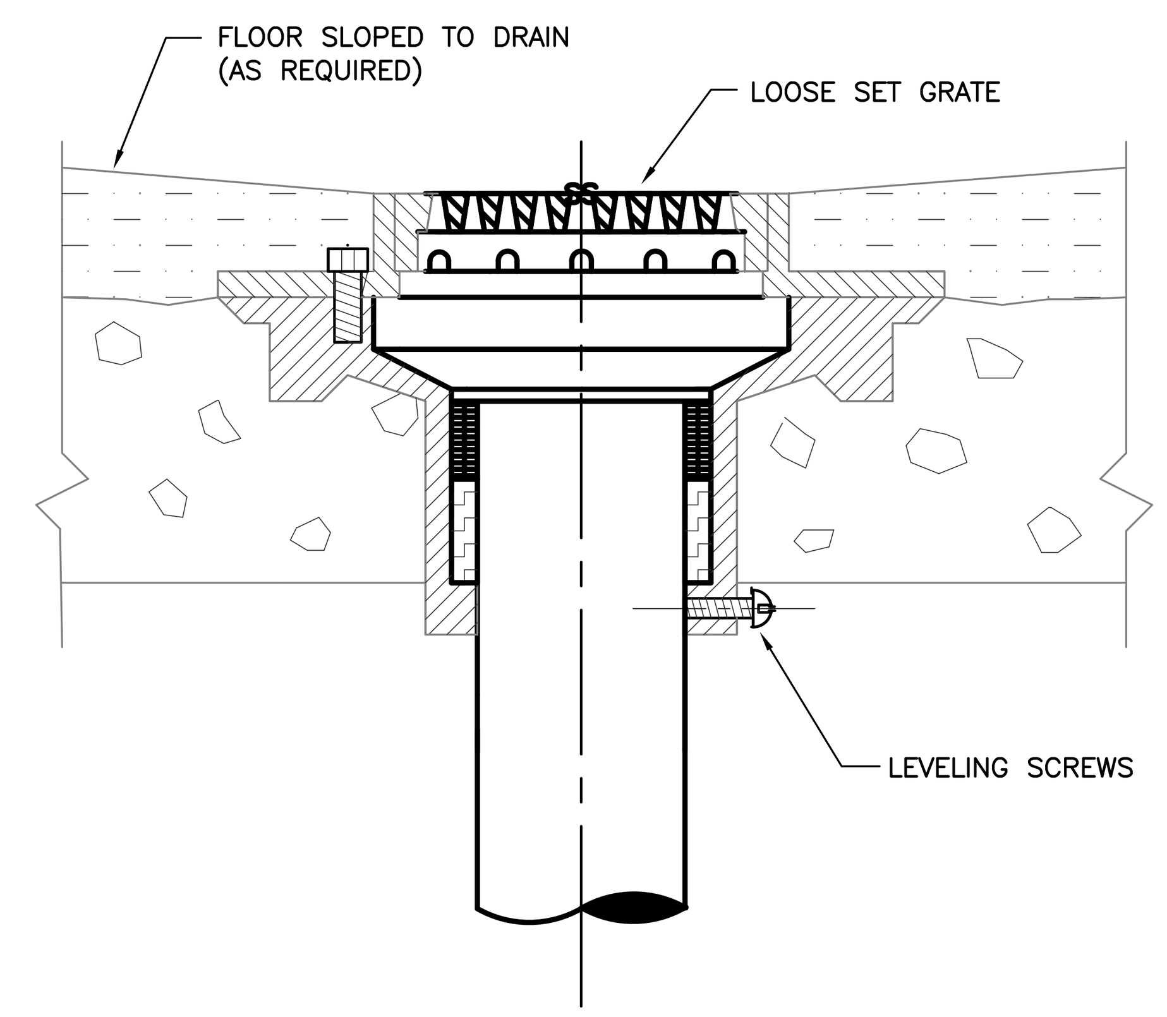
NOTE:
VENT TO OUTSIDE MAY BE ELIMINATED PROVIDED IF REGULATOR IS EQUIPPED WITH AND LABELED FOR USE WITH A VENT LIMITING DEVICE.



NOTE:
PRESSURE REGULATORS INSTALLED INSIDE BUILDING SHALL BE PROVIDED WITH ACCESS.

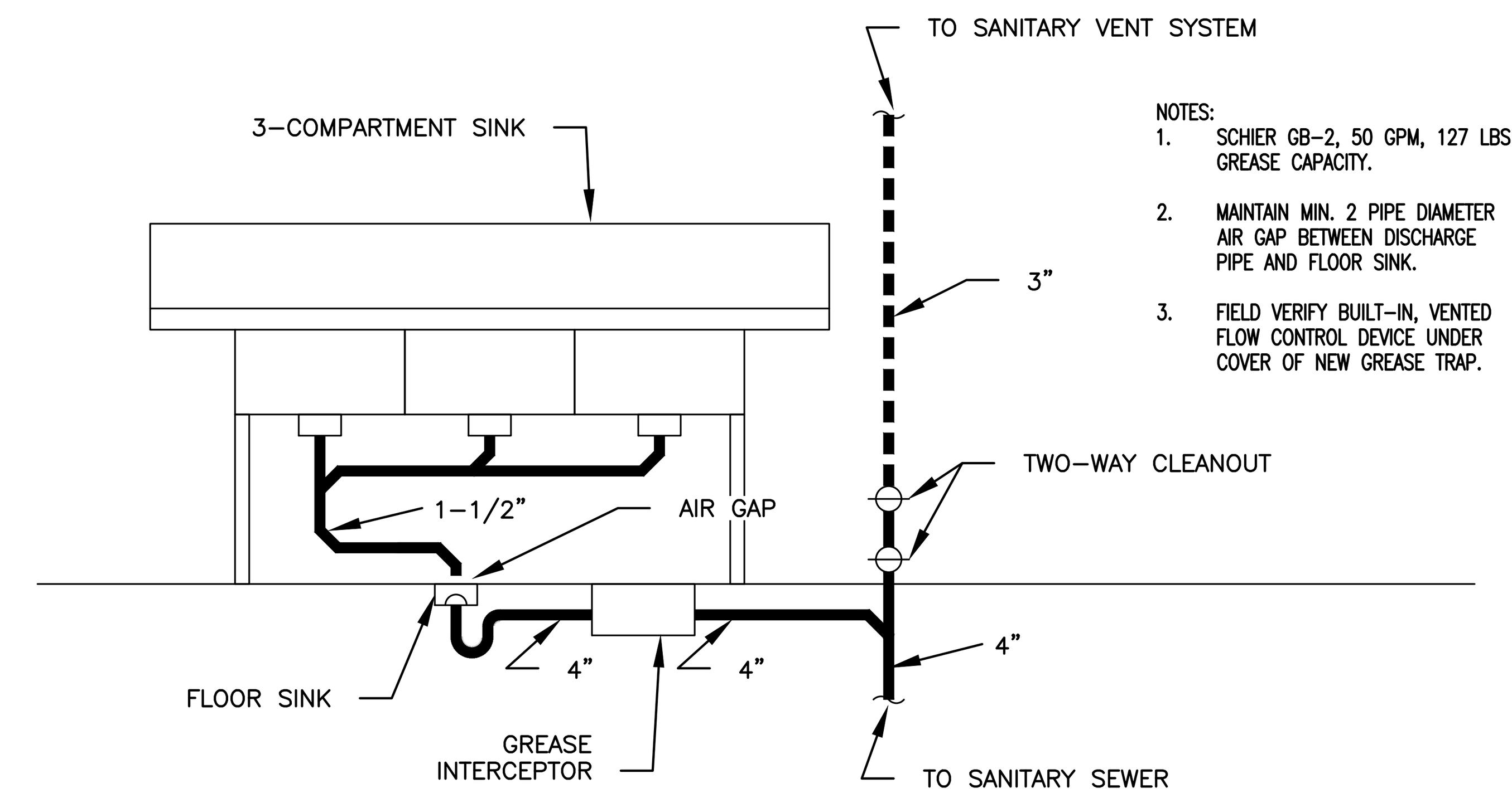
TYPICAL 2LB GAS CONNECTION DETAIL

SCALE: NONE



TYPICAL FLOOR DRAIN

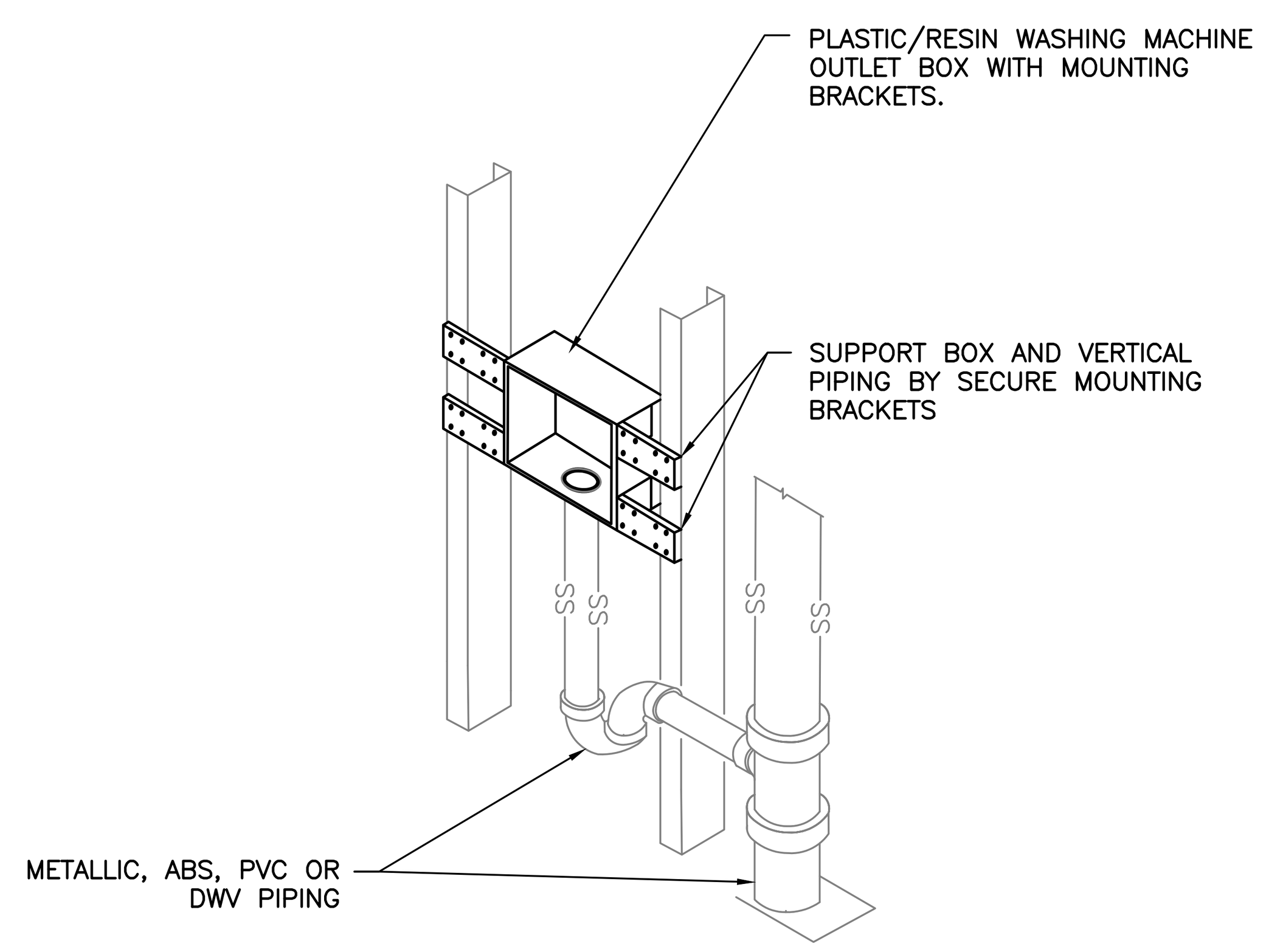
SCALE: NONE



NOTES:
1. SCHIER GB-2, 50 GPM, 127 LBS GREASE CAPACITY.
2. MAINTAIN MIN. 2 PIPE DIAMETER AIR GAP BETWEEN DISCHARGE PIPE AND FLOOR SINK.
3. FIELD VERIFY BUILT-IN, VENTED FLOW CONTROL DEVICE UNDER COVER OF NEW GREASE TRAP.

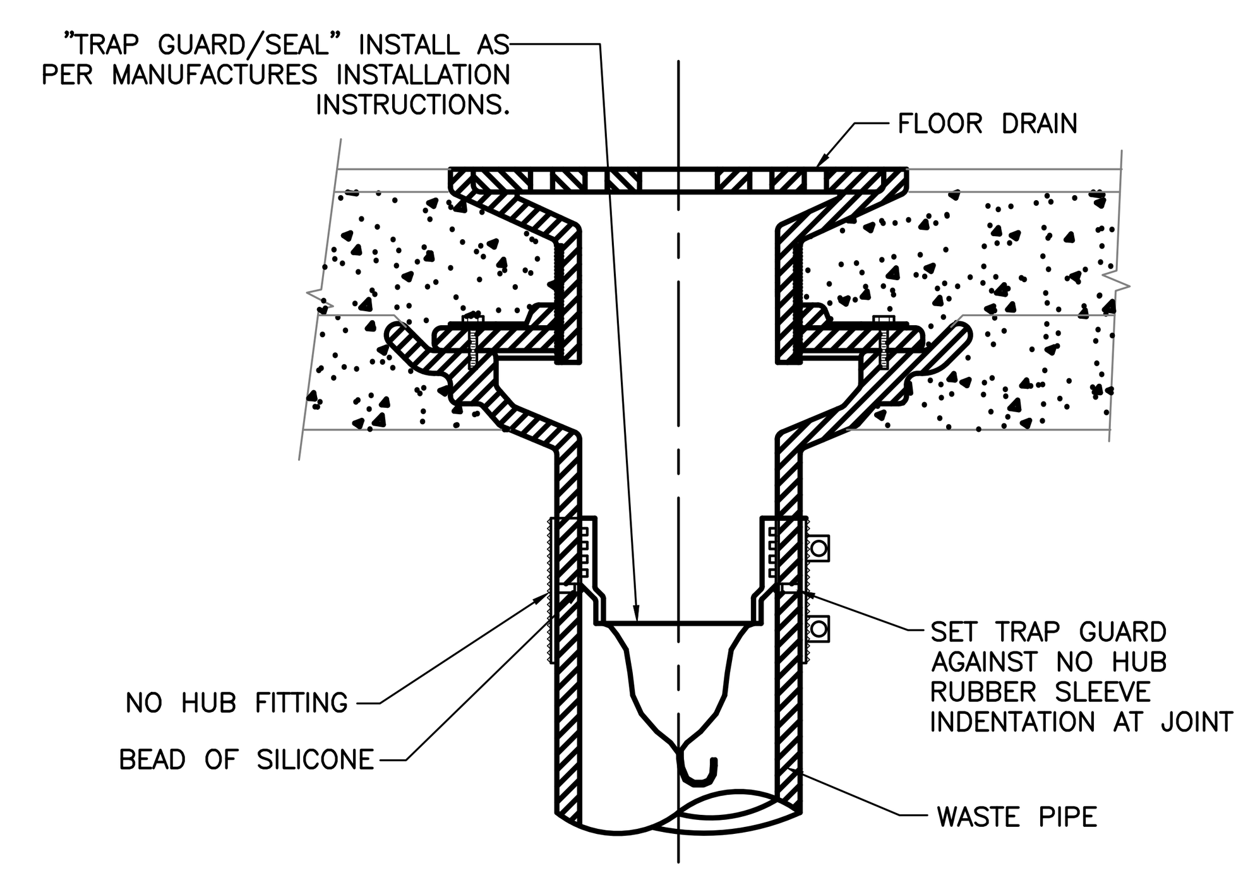
3-COMPARTMENT SINK WITH GREASE INTERCEPTOR

SCALE: NONE



RECESSED WALL DRAIN BOX

SCALE: NONE



NOTES:
1. TRAP GUARD FLOOR DRAIN BY PROSET SYSTEMS INC.
2. FOLLOW ALL MANUFACTURER INSTALLATION AND OTHER INSTRUCTIONS.
3. APPROVED MANUFACTURES: PROSET, J.R. SMITH, RECTORSEAL.

TRAP GUARD DETAIL

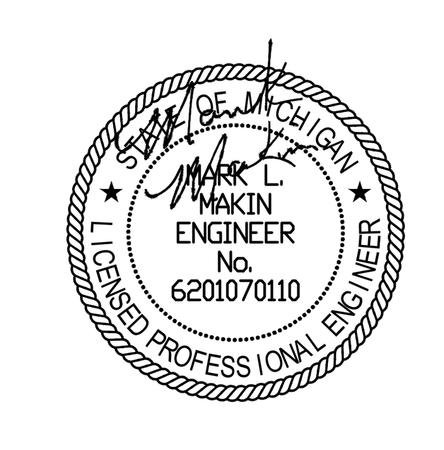
SCALE: NONE

CURRENT REVISION:
ISSUED: DECEMBER 19, 2022

4978 HIGHLAND RD
WATERFORD TWP, MI 48327

CRUMBL COOKIES - WATERFORD #1046

22-246



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PLUMBING DETAILS

P5.2

JZW ARCHITECTS

SPECIFICATIONS

Notes:

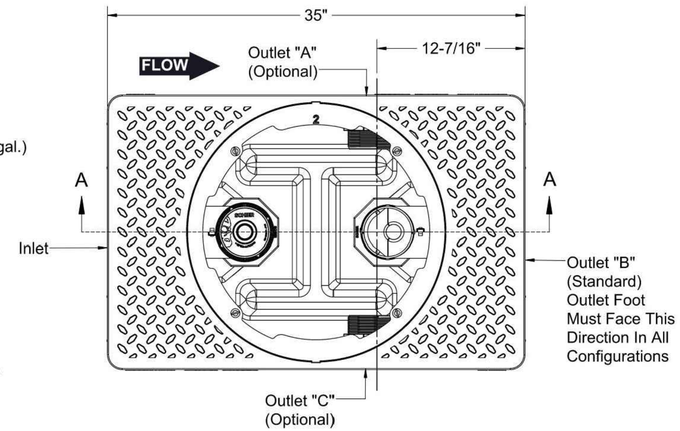
1. 4" FPT inlet/outlet with 3" and 4" plain end fittings.
2. Unit weight - 49 lbs. (wet weight 216 lbs.)
3. Maximum operating temperature: 150º F continuous
4. Capacities - Liquid: 20 gal.
   Grease: 130 lbs. (17.8 gal.) @35 GPM
   Grease: 127 lbs. (17.3 gal.) @50 GPM
   Grease (99% - at least 2 units in series): 180 lbs. (24.7 gal.) @35 GPM
   Solids: 1.8 gal.
5. Built-in flow control.
6. For gravity drainage applications only.
7. Do not use for pressure applications.
8. Cover placement allows full access to tank for proper maintenance.
9. Vent not required unless per local code.
10. Engineered inlet and outlet diffusers are removable to inspect/clean piping.
11. Integral air relief / anti-siphon.
12. Designed for indoor, on-floor, below-grade or low-profile under sink installations.

ENGINEER SPECIFICATION GUIDE

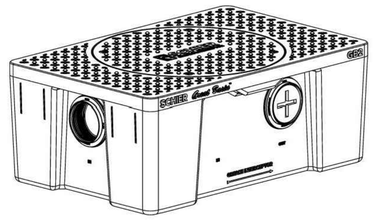
Schier Great Basin™ grease interceptor model # GB2 shall be lifetime guaranteed and made in USA of seamless, rotationally-molded polyethylene with minimum 5/16" uniform wall thickness. Interceptor shall be furnished for above or below grade installation. Interceptor shall be certified to ASME A112.14.3 (type C) and CSA B481.1, with field cut riser system, built-in flow control and three outlet options. Interceptor flow rate shall be 35 or 50 GPM. Interceptor grease capacity shall be 130 lbs. @ 35 GPM or 127 lbs. @ 50 GPM. Cover shall provide water/gas-tight seal and have minimum 450 lbs. load capacity.

CERTIFIED PERFORMANCE

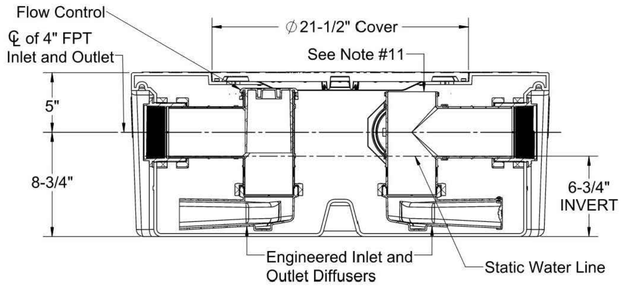
Great Basin™ hydromechanical grease interceptors are third party performance-tested and listed by IAPMO to ASME #A112.14.3 and CSA B481.1 grease interceptor standards and greatly exceed requirements for grease separation and storage. They are compliant to the Uniform Plumbing Code, the National Standard Plumbing Code, the National Plumbing Code of Canada, and the International Plumbing Code.



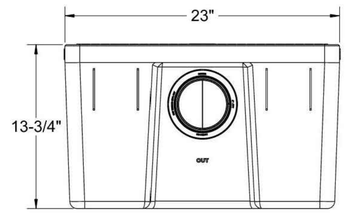
TOP VIEW
(COVER REMOVED FOR CLARITY)



ISOMETRIC VIEW



SECTION A-A



END VIEW

MIAMI-DADE COUNTY

Satisfies Miami DERM 99% efficiency requirements when at least 2 units are installed in series. Product labels are permanently attached to inside and outside of unit for easy viewing.

SPECIFICATION SHEET

MODEL NUMBER:	PART NUMBER: 4065-001-05				
GB2	DESCRIPTION: GB2 GREASE INTERCEPTOR 35 GPM / 50 GPM, 4" FPT INLET/OUTLET, WITH 3" AND 4" PLAIN END FITTING ADAPTERS AND PEDESTRIAN RATED COVER				
	DWG BY: C.SINCLAIR	DATE: 5/5/2022	REV: -	ECO: -	

SCHIER

6455 Woodland Dr
Shawnee, KS 66218
Tel: 913-951-3300
Fax: 913-951-3399
schierproducts.com

GREASE INTERCEPTOR CALCULATIONS

Reference No. 46494 — Project Name: Crumbl Cookies - Waterford

Step 1: Flow rate to grease interceptor

Fixture flow rate: (cu in / 231) = gal x 0.75 / 2 min = 2 min flow rate

NAME	TYPE	DIMENSIONS	QTY	CU IN	FLOW RATE
CS-1	3 Compartment Sink	24" x 24" x 14" (3)	1	24,192	39.27 GPM
Total					**39.27 GPM**

Step 2: Grease Production

Servings per day x Grease production value x Days between pump-outs = Grease output

Number of meals served per day: 250
Grease production value: 0.005 lbs per serving (Coffee Shop: Low / No flatware)
Days between pump-outs: 90 days

250 x 0.005 x 90 = 112.5 lbs of FOG

SCHIER MODEL	
GB2	**Description:** Polyethylene Grease Interceptor **Dimensions:** Length: 35", Width: 23", Height: 13.75" **Flow Rates/Grease Capacities:** 50 GPM / 127.6 lbs **Liquid Capacity:** 20 gal

CRUMBL COOKIES - WATERFORD #1046

4978 HIGHLAND RD
WATERFORD TWP, MI 48327

ISSUED: DECEMBER 19, 2022 CURRENT REVISION:

22-246

MARK L. MAKIN ENGINEER No. 6201070110 LICENSED PROFESSIONAL ENGINEER

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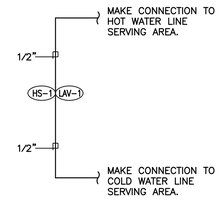
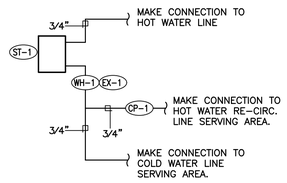
GREASE INTERCEPTOR DETAILS

P5.3

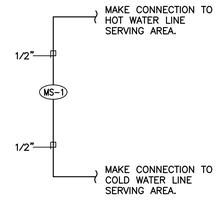
JZW ARCHITECTS



TYPICAL LAVATORY / SINK



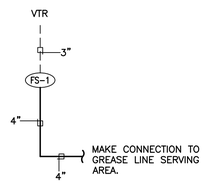
TYPICAL WATER HEATER



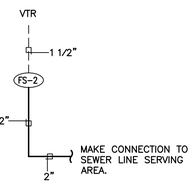
TYPICAL MOP SINK

WATER PIPING SCHEMATICS

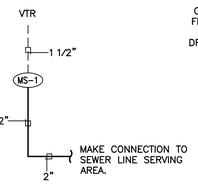
SCALE: NONE



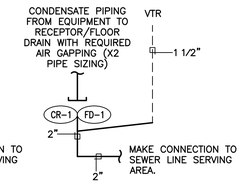
FLOOR SINK (FS-1)



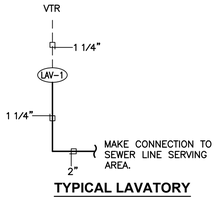
FLOOR SINK (FS-2)



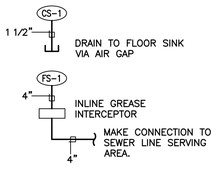
TYPICAL MOP SINK



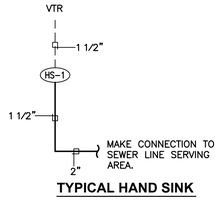
TYPICAL CONDENSATE



TYPICAL LAVATORY



3-COMPARTMENT SINK WITH INLINE GREASE INTERCEPTOR



TYPICAL HAND SINK

WASTE AND VENT PIPING SCHEMATICS

SCALE: NONE

GENERAL NOTE: VENT & CONDENSATE SHALL BE 12"–24" BELOW DECK/ROOF ABOVE TO AVOID CONDENSATION ICING

PLUMBING FIXTURE SCHEDULE

MARK	FIXTURE	PIPE SIZE					REMARKS
		TRAP	WASTE	VENT	C.W.	H.W.	
HS-1	SINK-HAND SINK	1 1/2"	1 1/2"	1 1/2"	1/2"	1/2"	REGENCY 600HS12SP SINGLE BOWL, STAINLESS STEEL HAND SINK WITH REGENCY 600FA12 FAUCET AND SAFETY COVERS FOR ALL EXPOSED PIPING.
CS-1	SINK-3 COMPARTMENT SINK	——	1 1/2"	——	1/2"	1/2"	REGENCY 3 COMPARTMENT SINK 600S324242X, STAINLESS STEEL SINK WITH REGENCY 600FPRS8 FAUCET AND SAFETY COVERS FOR ALL EXPOSED PIPING.
WH-1	GAS TANKLESS WATER HEATER	——	——	——	3/4"	3/4"	GAS TANKLESS WATER HEATER. 199,000 BTU INPUT, 4.4 GPM AT 90°F RISE, MAX 4 AMPS, 120V/1ø. DESIGN GUIDE: NAVIEN NPE-240S2-NG.
EX-1	EXPANSION TANK	——	——	——	3/4"	——	WATTS PLT-5 (OR EQUAL), DRAWN STEEL POTABLE WATER EXPANSION TANK WITH DIAPHRAGM SEPARATING THE AIR CHAMBER FROM THE WATER CHAMBER. DIAPHRAGM MATERIALS SHALL BE FDA APPROVED.
CP-1	HOT WATER CIRCULATING PUMP		——	——	——	3/4"	DESIGN GUIDE: TACO-007. 2 GPM @ 9.5 FT. HEAD, 115V/1PH/60HZ, 0.43 AMPS, 1/40 HP. PROVIDE WITH AQUASTAT FOR AUTOMATIC CIRCULATION PUMP CONTROL.
FD-1	FLOOR DRAIN	2"	2"	1 1/2"	——	——	FLOOR DRAIN WITH STRAINER. PROVIDE AND INSTALL TRAP GUARD. SEE ARCHITECTURAL DRAWINGS FOR FLOOR TYPE.
WC-1	WATER CLOSET-FLOOR MOUNT-TANK-ADA COMPLIANT	INT.	4"	2"	1/2"	——	AMERICAN STANDARD-CHAMPION-4, "RIGHT HEIGHT" VITREOUS CHINA ELONGATED TANK TOILET, OPEN SEAT W/O COVER. SEE ARCHITECTURAL DRAWINGS FOR HEIGHTS AND CLEARANCES.
LAV-1	LAVATORY-WALL MOUNTED-ADA COMPLIANT	1 1/4"	1 1/4"	1 1/4"	1/2"	1/2"	AMERICAN STANDARD-LUCERNE, WALL HUNG, VITREOUS CHINA BASIN, SINGLE LEVER MOEN 8413 FAUCET AND SAFETY COVERS FOR ALL EXPOSED PIPING. SEE ARCHITECTURAL DRAWINGS.
MS-1	MOP SINK	2"	2"	1 1/2"	1/2"	1/2"	FIAT MODEL MSB-2424, MOLDED STONE FLOOR MOUNTED MOP SINK, AMERICAN STANDARD 8344.112 WALL MOUNTED FAUCET WITH THREADED HOSE CONNECTION.
FS-1	FLOOR SINK	4"	4"	3"	——	——	SANITARY FLOOR SINK WITH ACID RESISTING WHITE PORCELAIN ENAMEL COATED INTERIOR, LOOSE SET PORCELAIN ENAMEL COATED GRATE WITH ANTI-SPLASH DOME BOTTOM STRAINER.
FS-2	FLOOR SINK	2"	2"	1 1/2"	——	——	SANITARY FLOOR SINK WITH ACID RESISTING WHITE PORCELAIN ENAMEL COATED INTERIOR, LOOSE SET PORCELAIN ENAMEL COATED GRATE WITH ANTI-SPLASH DOME BOTTOM STRAINER.
PS-1	FOOD PREP SINK	1 1/2"	1 1/2"	——	1/2"	1/2"	REGENCY FOOD PREP SINK, STAINLESS STEEL SINK WITH REGENCY 600FPRS8 FAUCET AND SAFETY COVERS FOR ALL EXPOSED PIPING. DESIGN GUIDE: REGENCY 600S1181818LFT
ST-1	HOT WATER STORAGE TANK	——	——	——	——	3/4"	6 GALLON STORAGE TANK SERVING HOT WATER SUPPLY LINE.
CR-1	CONDENSATE RECEPTOR	2"	2"	1 1/2"	——	——	CONDENSATE RECEPTOR WITH WALL DRAIN BOX FOR CONDENSATE FROM HIGH EFFICIENCY EQUIPMENT. PROVIDE AND INSTALL TRAP GUARD.

NOTES:
1. VERIFY ALL MANUFACTURERS, FINISHES, AND OPTIONS WITH OWNER BEFORE ORDERING ANY PLUMBING FIXTURES.
2. MINIMUM UNDERGROUND SANITARY SEWER PIPING SIZE SHALL BE 2 INCHES.

WATER SUPPLY FIXTURE UNITS

FIXTURE	QUANTITY	LOAD VALUES	TOTAL
3-COMPARTMENT SINK	1	4	4
HAND SINK	2	2	4
LAVATORY	1	2	2
MOP SINK	1	3	3
WATER CLOSET	1	5	5
FOOD PREP SINK	1	2	2
			20

*LOAD VALUES ASSIGNED TO FIXTURES PER 2018 MICHIGAN PLUMBING CODE APPENDIX E TABLE E103.3(2).

DRAINAGE FIXTURE COUNT

FIXTURE	QUANTITY	LOAD VALUES	TOTAL
3-COMPARTMENT SINK	1	4	4
HAND SINK	2	2	4
LAVATORY	1	1	1
MOP SINK	1	2	2
WATER CLOSET	1	4	4
FLOOR DRAIN	2	2	4
FOOD PREP SINK	1	2	2
			21

*LOAD VALUES ASSIGNED TO FIXTURES PER 2018 MICHIGAN PLUMBING CODE TABLE 709.1.

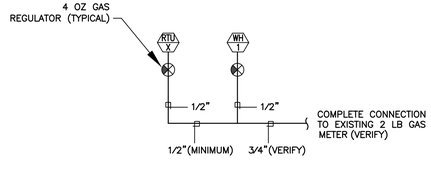
GAS PIPING CALCULATIONS

DESIGN CONDITIONS

CITY	– WATERFORD, MI
LONGEST GAS PIPE	– 125 FEET (VERIFY)
GAS PRESSURE	– 2 POUND (VERIFY)
DERATION FACTOR	– 1,011

EQUIPMENT

WH-1	197 CFH	(199,000 BTU/HR)
RTU-X	241 CFH	(224,000 BTU/HR)
TOTAL	418 CFH	(423,000 BTU/HR)



GAS SCHEMATIC

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FAX: 801.375.2676

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JZW ARCHITECTS

CRUMBL COOKIES - WATERFORD #1046

4978 HIGHLAND RD
WATERFORD TWP, MI 48327

ISSUED: DECEMBER 19, 2022
CURRENT REVISION:

22-246

DEVON L. MAKIN ENGINEER No. 6201070110 LICENSED PROFESSIONAL ENGINEER

PLUMBING SCHEDULE & SCHEMATICS
P6.1

SECTION 22 PLUMBING – GENERAL PROVISIONS
Not all specification items are used in every project.

PART 1 – GENERAL

– **Scope:**

Furnish all labor, materials, equipment, appliances and necessary incidentals for the complete installation of all plumbing shown on the drawings and as specified.

A. Work specified in this section

1. Sanitary soil, waste and vent systems.
2. Domestic hot and cold water systems.
3. Domestic water heaters.
4. Furnish and set all sleeves for pipes passing through walls and floors.
5. Pipe covering, insulation and wrapping.
6. Excavation and backfill.
7. Rougn–in and final connections to air conditioning equipment of condensate drains.
8. All plumbing fixtures, water heaters, valves, and other miscellaneous items or equipment required for a complete installation.
9. Provide collars at fire rated penetrations.

B. Provisions of this section apply to all work specified in all sections under Division 22. All items indicated on site, Architectural, Mechanical, or Plumbing drawings are to be provided complete from point of connection to finished fixture in conformance with all governing authority requirements. Nothing in these drawings or specifications shall be construed to permit work in violation of governing codes.

C. In addition, work in Division 22 is governed by the provisions of the Bidding Requirements, Contract Forms, General Conditions and all sections under Division 1, General Requirements.

1. Examination of Premises: Visit the site, verify all measurements and job conditions, and pay all costs necessary to perform the work. Coordinate division of fee responsibilities with the General Contractor.
2. The Plumbing Contractor shall be licensed and hold a current contracting license as a Plumbing Contractor that has been valid for a minimum of two years in the State where the project is located.
3. The Plumbing Contractor shall have a minimum of five years experience installing commercial plumbing systems similar to those described in these specifications and provide a list of previous projects, including name of project and contact person names and phone numbers if required by the General Contractor.
4. The Plumbing Contractor shall be able to bond work he is bidding to perform and shall provide a written statement from the bonding agency proposed to be used for this project as a separate document in addition to the plumbing bid submitted if required by the General Contractor. The bonding agency shall be one having a Best's insurance rating of A or A+.

D. Contractor is responsible for results caused by deviating from the plans.

– **Regulations, Permits, Fees, Charges, Inspections:**

A. Regulations: Comply with all applicable codes, rules and regulations. All materials and work must comply with local construction, mechanical, plumbing, electrical and fire codes. As a minimum, comply with the following: Michigan State codes and all City codes.

B. In addition to the requirements of all governing codes, ordinances and agencies, conform to the requirements of the following codes and standards:

1. 2018 Michigan Plumbing Code
2. 2018 Michigan Building Code
3. 2018 Michigan Mechanical Code
4. 2018 Michigan Energy Conservation Code.

C. Current codes adopted by the respective jurisdiction will supercede the listed codes.

D. Fees and Permits: Pay all connection, installation, use, development, etc., fees and/or charges. Obtain and pay for all required permits and licenses. Coordinate division of fee responsibilities with the General Contractor.

E. Inspections: All work must be inspected and approved by local authorities. Prior to final approval, furnish the Architect with certificates of inspections and approvals by the local authorities in accordance with Division 1.

1. Preheat and interpass temperature shall be determined by temperature indicating crayons, contact pyrometers or other equally suitable means.

F. Postweld Heat Treatment: Postweld heat treatment for pressure components shall be as specified in Table 131 of ANSI B31.1.

– **Drawings and Specifications:**

A. Refer to Division 1 for information on submittals and shop drawings.

B. If a conflict exists between the drawings and specifications, promptly notify the Architect and Engineer.

– **Record Drawings:** Provide record drawings for all work under sections in Division 22. See Division 1 for detailed requirements covering preparation of record drawings.

– **Work and Materials:** Unless otherwise specified, all materials must be new and of the quality specified. The workmanship shall be of a quality that is acceptable to the Architect and is equal to the standards of the trades. Contractor must staff the project with sufficient skilled workmen, including a fully qualified construction Superintendent, to complete the work in the time allotted. The Superintendent must be qualified to supervise all of the work in his work category.

– **Approvals of Materials and Equipment:** Refer to Division 1 for description of material and equipment for prior approvals and substitutions. Must be received by Engineer 10 days prior to due date/bid opening.

– **Maintenance Manual:**

A. Prior to completion of the project, compile a complete equipment and maintenance manual for all equipment supplied under sections of Division 22 as described in Division 1.

B. Manuals shall be bound in a three–ring binder. A preliminary submittal of the manual shall be made to the Architect 90 days after receiving approved submittals. Final submittal of the manual shall be made four weeks prior to substantial completion of the project.

– **Equipment Purchases:** Arrange for purchase and delivery of all materials and equipment within 15 days after approval of submittals. Coordinate with General Contractor.

– **Cooperative Work:**

A. Correct without charge any work requiring alteration due to lack of proper supervision or failure to make proper provision in time. Correct without charge any damage to adjacent work caused by the alteration. See Division 1 for additional requirements.

B. Cooperative Work Includes:

1. General supervision and responsibility for proper location, rough–in and size of work related to Division 22 but provided under other divisions of these specifications.

2. Installation of sleeves, inserts and anchors bolts for work under sections in Division 22.

3. Electrical work as specified herein. Refer to Division 26 for requirements.

– **Construction Facilities:**

A. General: Under this division of the specifications execute all work in a manner to provide safe and lawful ingress and egress to the Owner's establishment and such facilities shall be kept clear of materials or equipment as directed by the Architect. Refer to Division 1 for additional requirements.

B. Furnish and maintain from the beginning to the completion of all work all lawful and necessary guards, railings, fences, canopies, lights, and warning signs. Take all necessary precautions required by city and state laws to avoid injury or damage to any and all persons and property.

– **Guarantee:** Guarantee all material, equipment, and workmanship for all sections under Division 22 in writing to be free from defects of material and workmanship for one year from date of final acceptance as outlined in Division 1. Replace without charge any material or equipment proving defective during this period. The guarantee shall include performance of the equipment under all conditions of load, installing any additional items of control and/or protective devices as required and the replacing of any refrigerant lost.

– **Electrical Work:**

A. Electrical wiring, including power wiring and control wiring (except as otherwise specified under Automatic Temperature Controls), all raceways, wiring, outlet and junction boxes, and labor for installation of the wiring and equipment shall be included in Electrical Division 26 of the specifications.

B. All starters in motor control centers are to be furnished and installed under the Electrical Division of the specifications.

C. Before ordering any motors and equipment. Verify the available voltage and phase for all motors with the Electrical Contractor.

D. Submit a complete list of all motors prior to final closeout of job indicating the locations, horsepower, voltage, phase specified in Table 132 of ANSI B.1.

E. All field wiring and equipment must conform to the applicable sections of the Electrical specifications, Division 26.

– **Welding Codes and Standards:** All welding and other criteria covered by this specification shall be in accordance with the following code:

A. ASME Boiler and Pressure Vessel Code

B. Section IX ANSI Code for Power Piping: B31.1

C. AWS D10.12.D10.12M Welded joints for gas piping.

– **Product Handling**

A. Protection: Take all precautions necessary to protect the materials of this section before, during, and after installation.

B. Replacements: In the event of damage, immediately repair all damaged and defective work to the approval of the Engineer, at not additional cost to the Owner.

– **Submittals:**

A. Manufacturer's Literature: Within 35 days after award of contract and before any of the materials of this section are delivered to the job site submit seven complete brochures of all materials and equipment, per Division 1 of the specifications.

B. Other Submittals:

1. Shop Drawings.
2. Sterilization Test Report
3. Test Data.

C. Sets in bound booklet form of written operating and maintenance instructions and brochures for equipment specified in this section. Fully instruct Owners Operating Personnel.

D. Record Drawings: Keep an accurate dimensioned record of As–Built locations and elevations, as referred to approved base datum, of buried concealed.

E. Operation and Maintenance Instructions: Deliver to Architect tow complete lines, manhole, cleanouts, valves, plugged tees, capped ends, and of work which is installed different from shown in the plans.

– **Miscellaneous:**

A. Examination of the site: Exercise care in examining the site and coordinate all work indicated on the drawings with existing conditions. Report to Architect in writing conditions that will prevent proper provisions of this work. Verify depth and location of all service lines with servicing companies having jurisdiction before excavating, by submission of the bid. The contractor warrants that he has familiarized himself with the existing conditions and will perform all work as required for hookup and as required by the contract documents at no additional cost.

B. Permits and fees: Arrange and pay for all permits, inspections and fee required by all governing agencies.

C. Service connections: Make all necessary arrangements with applicable utility company for connection to existing service lines. Pay all fees associated with work including meters, hookup charge and utility assessments fees.

D. Drawings: Coordinate all space requirements with other trades, drawings indicate desired location and arrangement of piping, equipment, and other items and are to be followed as closely as possible.

PART 2 – PRODUCTS

– **General**

A. Pipe sleeves and wrapping: Provide polished chromium plated and brass set screw flanges where plumbing piping pass through walls, floors, ceilings, and partitions in finished portions of building including flanges on pipes at fixtures. All sleeves in concrete and exterior walls shall be 20 GA. galvanized iron one inch O.D. larger than the pipe, caulked if below grade in a moisture proof manner. All pipes penetrating through fire walls and floors shall be properly safed with Dow Corning 3=6548 silicone RTV foam or equal. Install per manufacturer's directions.

B. Pipe Identification:

1. Piping identification per ANSI and OSHA Standards: Each individual pipeline shall be marked for quick and easy identification as to contents and character of material carried in the pipes by set on SNA or STR Marker.
2. Markers shall be installed and spaced at not more than 20 foot intervals and so located that markers shall be visible where piping is exposed.
3. Color scheme shall be as follows:

	Background or Color Band	Identification Marker
Domestic Hot Water –	Yellow	Black on Yellow
Domestic Hot Water Return –	Yellow	Black on Yellow
Domestic Cold Water –	Green	White on Green
Sanitary Sewer –	Green	White on Green
Sanitary Vent –	Green	White on Green
Natural Gas –	Yellow	Black on Yellow
Storm Water –	Green	White on Green

C. One marker shall installed at each side of valves, special fittings and at branch take–offs. In furred spaces install one band 2 feet above floor and 19 inches below ceiling line.

D. Materials: Materials when not otherwise definitely specified shall conform to the applicable ASTM, ASME, AGA and ASA standards.

E. All gas fired equipment shall include a label indicating that the appliance has been adjusted, modified or re–calibrated for the altitude where in the project is to be located (Green Sticker). The appliance shall also include a compliance statement indicating that the appliance has been adjusted, modified or re–calibrated for the proper operation at the altitude of the project and shall be listed capable for use with natural gas or propane gas if propane is listed on the drawings.

– **Pipe and Fitting Schedule:**

Pipe and Fittings:

A. No pipe of foreign manufacturer will be acceptable on projects required to meet the Buy American Act.

B. All piping, fittings, flanges, etc. shall be free from defects and shall comply with the appropriate ASTM specifications.

C. Black steel pipe: ASTM A53 ERW Grade B, standard weight (schedule 40) or extra strong (schedule 80) as specified.

D. Copper tubing: ASTM B88, Type L or K as specified.

E. PVC pipe and fittings: ASTM D1785 Class 150 with ASTM D 2564 solvent cement joints unless otherwise specified. Schedule 40. PVC plastic pipe fittings: ASTM F 628, schedule 40.

F. PEX–AL–HPDE distribution system: ASTM F 1986 tubing and metal–insert type with copper or stainless–steel crimp ring and matching PEX–AL–HDPE tube dimensions. Manifold: Multiple–outlet, plastic or corrosion–resistand–metal assembly complying with ASTM F 877: with plastic or corrosion–resistant–metal valve for each outlet.

G. PP piping and fittings: ASTM F 2389; CSA B137.11

H. Acrylonitrile Butadiene Styrene (ABS) plastic pipe: ASTM D 2661, schedule 40, ASTM F 628 schedule 40. ABS plastic pipe fittings: ASTM F 409, accessible and replaceable, solvent cement and threaded types, drain pattern.

I. Cast iron soil pipe and fittings: ASTM A74

J. Welded black steel fittings: ASTM A234 grade B, 150–Pound for standard weight piping, 300–Pound for extra strong piping, or of weight or schedule of matching piping.

K. Threaded malleable iron fittings: ANSI B16.3, 150–Pound for standard weight piping, 300–Pound for extra strong piping, or weight or schedule of matching piping either black or galvanized to match piping.

L. Welded flanges: ASTM A181 grade B, 150–Pound for standard weight piping, 300–Pound for extra strong piping or of equal weight of connected equipment.

M. Copper fittings: Wrought copper, ANSI specification B16.22.

N. Ball valves domestic water: Bronze, fullport, class 150, threaded.
NIBCO T–585 or equal

O. Partition stop valves: T&S B–0415, Loose key type with wall flange.

P. Balancing cocks 2 inches and smaller shall be by Armstrong, NIBCO, Taco or Watts.

Q. Solder: Joints in copper piping above grade shall be stay safe 50 solder or 95–5 solder shall be silfos or silverflow for all refrigerant piping joints.

R. Condensate drains shall be Type L hard copper tubing with wrought–copper fittings (can't be used for condensing gas–fired applications) or PVC pipe and fittings where allowed. A P–trap shall be provided at drains.

S. Domestic hot water, hot water return, and cold water piping shall be Type L or K hard tempered copper pipe with wrought–copper fittings using 95–5 solder. Pex tube piping may be used in lieu of copper on sizes 2–inches and smaller. Where piping is exposed outside partitions, use Type L or K hard copper tubing and wrought copper fittings.

T. Domestic hot water and cold water piping buried below grade shall be Type K soft tempered (annealed) copper without fittings or joints and covered with IMCOA IMCOSHIELD unicellular insulation. PEX tube piping may be used in lieu of copper on sizes 2–inches and smaller.

U. All soil, waste, vent, roof drain and roof drain overflow piping below ground shall be ABS or PVC plastic pipe, rated for domestic waste and vent, with ABS or PVC plastic socket type drain, waste vent pattern fittings, solvent cemented joints. Install ABS drainage pipe and fittings according to ASTM D661. Install PVC drainage pipe and fittings according to ASTM F891.

V. All soil, waste, vent, roof drain and overflow piping above ground shall be standard weight cast iron with no hub coupling or approved material meeting the standards set forth in IPC tables 702.1, 702.2, and 702.3 & 702.4..

– **Roof Flashing:**

A. Sanitary Vent Flashings: SEMCO 1100–3 or 1100–5, with one–piece lead flashing and counterflashing sleeve.

– **Pipe Sleeves:**

A. At concrete walls for floors, adjust–to–crete, paramount, hole–out Sperzel Cretesleeve floor sleeves shall extend to top of concrete curbs for piping rising through floors. Wall sleeves shall be flush with finished surface, sleeves shall be sized to allow $\frac{1}{2}$ inch clearance around pipe insulation. Insulation and covering shall be continuous through wall and floor sleeves.

– **Cleanouts:**

A. Full size cleanouts shall be installed at the base of each soil waste stack. All other cleanouts shall be installed where shown on the drawings and where required by State, Local or National Plumbing Codes.

B. All cleanouts shall be installed in locations easily accessible for rodding. Cleanouts in wall shall be JR Smith 4402, in floors JR Smith 4023/ Cleanouts shall be JR Smith, Wade or Josam.

– **Pipe Insulation:**

A. All domestic hot water, hot water recirculation and cold water piping shall be covered with Owens Corning ASJ–25 fiberglass pipe insulation with vapor seal jacket. Insulation thickness shall be $\frac{1}{2}$ inch for cold water and 1 inch for hot water.

B. Insulate all piping under Lavatories accessible to physically handicapped with hot water supply and "P" trap prefabricated insulation, Handi Lav Guard.

– **Pipe Hangers:**

A. Hangers shall be supplied with factory installed isolation and DI–Chromate finish.

B. Pipe 2 inches and smaller: Grinnel F69. Pipe 2–1/2 inch and larger: Grinnel F65. Concrete Inserts: Grinnel 281 and 282. Riser clamps for copper piping: Grinnel 261P, plastic coated. Riser clamps for other piping: Grinnel 261,

C. Hanger rods shall conform to the following: Pipe size 2 inch and smaller: $\frac{3}{8}$ inch rods. Pipe size 2–1/2 inch and 3 inch: $\frac{1}{2}$ inch rods. Pipe size 3 inch and larger: $\frac{5}{8}$ inch rods.

– **Plumbing Fixtures:**

A. Fixtures shall be the water saving typer with maximum usage of 1.6 gallons per flush for water closets, 2.5 gallons per minute for showers, 3.0 gallons per minute for service sinks, 1.0 gallon per flush for urinals, 0.5 gallons per minute for public lavatories, 2.2 gallons per minute for private lavatories and 2.2 gallons per minute for sinks.

B. All fixtures shall be caulked to the floor or wall with water resistant white butyl rubber caulking compound. Trim for shall match in design. Supply faucets shall have renewable seats and barrels.

PLUMBING EQUIPMENT	MANUFACTURER
Floor Drains & Floor Sinks:	Zurn, JR Smith, Wade, Josam, Ancon, Mifab, Watts, or Equal
Cleanouts:	Zurn, JR Smith, Wade, Josam, Mikro, Mifab, Watts, or Equal
Valves:	Watts, Milwaukee, Crane, Kennedy, Stockham, Misson, Grinnell, Keystone, or NIBCO
Pipe Hangers & Supports:	Grinnell, Elcen, Kin–Line, Unistrut, F&S, B–Line, Michigan, or Piping Technology & Products
Insulation:	CertainTeed, Manville, Pittsburgh, Armstrong, LSP Products, or Owens–Corning
Plumbing Faucets:	American Standard, Chicago, Delta, Moen, Kohler, Symmons, T&S, Gerber, Zurn
Plumbing Fixtures:	American Standard, Kohler, Toto, Gerber, Watts, Zurn, Sterling, Lasco
Plumbing Supply Stops:	Eastman, Crane, Kohler, Wolverine, McGuire, Brasscraft, EBC, Zurn
Pressure Reducing Valves:	Watts series 223, Zurn or Wilkins
Stainless Steel Sinks:	Elkay, Just, Moen, or approved equal
Thermostatic Tempered Water Valves:	Symmons, Powers, Leonard, Bradley, Watts, Caleffi, Lawler
P–Traps:	American Standard, Kohler, McGuire, Brasscraft, Dearborn, EBC
Electric Water Heaters:	Lochnivar, AO Smith, Rheem, State, Ruud, PVI, National, EEMAX or approved equal

– **Tankless Water Heater:**

A. The tankless water heater shall be a Rinnai (or approved equal) temperature controlled continuous flow gas hot water system with hot water capacity of 6 GPM at 50°F rise, forced combustion power direct vent, direct electronic ingnition, simulation feed forward and feedback water temperature controls. Water heater shall have the following safety devices: flame failure flame rod, boiling protection, remaining flame BI–Metal switch, thermal fuse, combustion fan RPM check integrated circuit, over current glass fuse, automatic frost protection and 100° F. ASME Pressure and temperature relief valve and temperature limiting device to be installed.

B. Water Heater inlets shall be equipped with ScaleRX™ devices to condition water and prevent calcite scale accumulation on water heater components. No additional bypass piping or shut–off valves are required. ScaleRX™ should be installed in accordance with instructions included with the device. This is an optional device that owners have the option of adding to their water heater and not required by Royal Engineering. Contact Shannon Buice with American Valve at (678) 684–1160 or sbuice@americanvalve.com for any questions regarding this device or quotes.

– **Domestic Expansion Tank:**

A. ASME 150 PSI steel pressurized expansion tanks for portable use with ASME stamp of the size and capacity shown on the drawings shall be furnished and installed. Tank shall be complete with internal heavy duty Butyl Rubber Diaphragm, rigid Polypropylene liner on water side of tank, complying with FDA. Air charging fitting, tank drain, pressure gauge, air vent and connections as shown on the drawings. Supports for expansion tanks shall be furnished and installed by the plumber. Tanks shall be Watts, Amtrol, Taco, Armstrong or Zurn.

– **Recirculating Hot Water Pump:**

A. A recirculating hot water pump of the size shown on the drawings shall be furnished and installed. The pumps shall be Bell & Gosset, Taco, Chicago, Pacific, Paco, Weinman, Amtrol, Grudnfos, Weil, or Armstrong of all bronze construction with mechanical seal and 1850 RPM drip–proof motor with thermal overload protection. Circulators shall be substantially supported with a full size pipe leg to the floor or by a cradle hanger from the ceiling.

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JZW ARCHITECTS

CRUMBL COOKIES - WATERFORD #1046
4978 HIGHLAND RD
WATERFORD TWP, MI 48327
ISSUED: DECEMBER 19, 2022
CURRENT REVISION:
22-246

PLUMBING SPECIFICATIONS
P7.1

PART 3 – EXECUTION

– **Surface Conditions:**

A. Inspection: All plumbing shall be installed in accordance with the requirements of all governing authorities, The original design, and referenced standards.

B. Discrepancies:
1. In the event of discrepancy, immediately notify the Architect.
2. Do not proceed with installation in areas of discrepancy until all such discrepancies have been fully resolved. Interferences between installed work of various trades due to lack of coordination shall be resolved by the Architect whose decision is final. Relocate or offset any work as required to accommodate work of other trades at no extra cost to the Owner when so directed by the Architect.

– **Verification of Dimensions:**

A. Scaled and figured dimensions are approximate only. Before proceeding with work, carefully check and verify dimensions at site, and be responsible for properly fitting equipment and materials together and to the structure in spaces provided.

B. Drawings are essentially diagrammatic and many offsets, bends, special fittings and exact locations are not indicated. Carefully study drawings and premises in order to determine best methods, exact locations, routes, building obstructions, and install apparatus and equipment in available locations. Install apparatus and equipment in manner and in locations to avoid obstructions, preserve headroom, and keep openings and passageways clear.

– **Locations and Space Requirements:**

A. Contractor shall fully inform himself regarding peculiarities and limitation of spaces available for installation of work under this division. Drawings indicate desired location and arrangement of piping, equipment and other items and are to be followed as closely as possible. Work specified and not clearly defined by drawings shall be installed and arranged in a satisfactory manner. In any case and at any time a change in location required by obstacles or the installation of other trades not shown on the plumbing plans shall be made by contractor without additional charge provided the change is ordered before work is installed and no extra materials are required.

B. Verify all spaces, dimensions for all fixtures, equipment, or owner–furnished equipment and equipment furnished under other sections.

C. Obtain all necessary rough in data and dimensions for all fixtures, equipment, or owner–furnished equipment and equipment furnished under other sections.

D. Maintain ample headroom clearances and accessibility. Maintain ceiling heights.

E. Constantly check work of other trades to prevent interference with this installation.

– **Cutting and Patching:** Cut work and patch per Division 1 as necessary to properly install the new work. As the work progresses, coordinate necessary openings, holes, chases, etc., in their correct location. If the required openings, holes and chases are not in their correct locations, make the necessary corrections at no cost to the Owner. Avoid excessive cutting and do not cut structural members without the consent of the Architect. Patching by General Contractor at Mechanical, Plumbing or Fire Protection Contractor's expense. Include as a part of the work under this contract all structural framing required by penetrations through the roof and necessary steel to support ducts and pipes between structural steel unless shown on the structural drawings.

– **Closing–in of Unfinished Work:** Cover no work until inspected, tested and approved. Where work is covered before inspection and test,uncover it, and when inspected, tested and approved, restore all work to original proper condition.

– **Excavation and Backfill:**

A. Perform all necessary excavation, shoring and backfilling required for the proper laying of all pipes and conduits inside the building and premises, and outside as may be necessary. Conform to Division 2 requirements. Remove all excess excavated materials from the site or dispose of on site as directed by General Contractor.

B. Excavate all trenches open cut, keep trench banks as nearly vertical as practicable, and sheet and brace trenches where required for stability and safety. Excavate trenches true to line and make bottoms not less than 18" wide but no wider than necessary to provide ample work room. Grade trench bottoms accurately to provide uniform bearing and support for each section of pipe on undisturbed soil along its entire length. Dig "bell" holes after the trench bottom has been graded. Machine grade only to the top line of the pipes, doing the balance by hand. Do not cut any trench near or under footings without first consulting the Architect. Comply with OSHA requirements.

C. Provide backfilling and compaction in accordance with requirement of Division 2 and under the direction of the Architect and the Owner's testing firm to the required density. Make the first 2 feet of fill in 6" layers, each thoroughly compacted as directed, and free from rocks, large clods of earth, leaves, branches, and debris. Compact the rest of the backfill to prevent settlement as directed, using in the backfill no rocks larger than 4" in diameter, and using no rocks at all in the top 12".

– **Accessibility:**

A. Install valves, dampers, thermometers, gauges, traps, cleanouts, control devices or other specialties requiring reading, adjustment, inspection, repairs, removal or replacement conveniently and accessibly throughout the finished building. Where any of these devices are shown on the contract drawings to be installed above any inaccessible ceiling, the Mechanical Contractor shall furnish access doors or panels as required.

B. All access doors or panels in walls and ceilings required for access to control devices, traps, valves and similar devices are to be furnished and installed as part of the work under this section. Provide type as specified under Division 8.

C. Provide ducts which pierce a fire separation with fire dampers of same fire rating as the separation.

D. Refer to drawings and "Finish Schedule" for type of wall and ceiling in each area and for rated construction.

E. Coordinate work of various sections to locate valves, traps, and dampers with others to avoid unnecessary duplication of access doors.

– **Roof Flashings:** Flash and counterflash all piping, conduits and ductwork penetrating roofing membrane with flashing per roofing manufacturer's recommendations. Refer to architectural drawings for detailing of duct and pipe penetrations through roof.

– **Equipment Rough–in:**

A. Rough in all equipment and fixtures as designated on the drawings and in the specifications. The drawings indicate only the approximate location of rough–ins. The exact rough–in locations must be determined from large–scale certified drawings. The Contractor shall obtain all certified rough–in information before progressing with any work for rough–in final connections.

B. Be responsible for providing all outlets and services of proper size at the required locations.

C. Minor changes in the contract drawings shall be anticipated and provided for under this division of the specifications.

D. Rough–in only (unless otherwise designated on the drawings) shall include the following:

1. Plumbing: Provide all services designated and required, including waste and water. Valve and cap all stub–outs for water and gas. Cap all waste and vent outlets.

2. Mechanical: Provide all services as indicated and required, including all ductwork, piping and valves. Valve and cap all piping stub–outs. Cap all ductwork stub–outs in a manner suitable for future extension.

– **Owner–Furnished and Other Equipment:**

A. Rough–in only for all Owner–furnished equipment (see Division 1) and all equipment furnished under other sections of the specifications, except as otherwise specified and/or noted on the drawings.

B. Provide all services designated, valve and cap all piping, cap all waste piping and ductwork and leave in a clean and orderly manner.

C. Rough–in requirements shall be as outlined in the preceding paragraph titled "Equipment Rough–In."

– **Equipment Final Connections:**

A. Provide all piping final connections for all equipment under Division 22 as required herein specified and indicated on the drawings.

B. Plumbing: Provide final plumbing connections complete with shutoff valves, risers, traps, vacuum breakers and indirect wastes for all equipment furnished and installed under other sections of these specifications, except as otherwise designated. Included under the Plumbing section of the specifications are the final connections to the following:

1. Miscellaneous equipment specified to be furnished and installed under other divisions of the specifications.

2. Cold water make–up connections to air conditioning equipment.

3. Kitchen equipment, furnished under other sections of the specifications.

– **Sterilization:**

A. Sterilize each unit that will have water in it, the water supply piping and distribution system with liquid chloride or hydrochloride before acceptance of operation in accordance with AWWA C601, "Standard for Disinfection Water Mains" work shall be done by contractor and unless otherwise required by Public Authorities having Jurisdiction, shall conform to the following:

B Materials
1. Liquid Chlorine: U.S. Army Specification 4–1. 2. Hydrochloride: Liquid shall conform to FED. Spec. O–C–11RA (INT. 4).

C. Method: Amount of chlorine shall provide a dosage of 50 PPM minimum. Introduce chlorinating materials into lines and distribution system in approved manner after a contact period of 24 hours during which period chlorine residual shall be maintained at 5 PPM minimum, flush out systems with clean water until residual content is not greater than 0.2 PPM. Flush entire system open and close valves in lines being sterilized several times during contact period.

D. Sterilization report shall be turned into the Engineer for review prior to requesting a substantial completion inspection.

– **Machinery Accessories:**

A. Application: Do not install any equipment in an application not recommended by the manufacturer.

B. Installation: Align, level and adjust all equipment for proper operation. Install so connecting and disconnecting of piping and accessories can readily be done and so all parts are readily accessible for inspection, service and repair. Install equipment in accordance with manufacturer's recommendations.

– **Pipe and Equipment Supports:**

A. Where supports, foundations, stands, suspended platforms for machinery, tanks, or other equipment are indicated or specified, perform the following:

1. Locate support members to avoid equipment strains and interference with piping connections, tube pulling or other maintenance operations.

2. Where saddles are required, use cast iron or welded steel saddles with curvature to fit the tank shell.

3. Mount power–driven equipment on common base with driver.

B. Concrete Inserts: Furnish and install all concrete inserts required for all materials and equipment specified and/or shown on the drawings for Division 22.

C. Concrete Foundations: Work under this section includes coordination of construction of all concrete foundations indicated or required for equipment specified herein or in other sections under Division 22. Materials and workmanship shall be described under Division 3.

D. Grout under all equipment after leveling, filling completely the space between machinery bed plate and foundation surface as specified in Division 3. Finish exposed surface of grout for a neat appearance.

E. Floor Stands: Where equipment is mounted standard or on legs, construct of structural steel or steel pipe and fittings, cross–brace and fasten with flanges or plates bolted to floor.

F. Ceiling or Wall Supports: Use suspended platform, strap hangers, bracket or shelf, whichever is most suitable for equipment and location. Construct of structural steel members, steel plates, rods or pipe as required. Cross–brace and fasten to building structure or inserts in an approved manner.

G. Steel Work: Neatly fabricate and erect steel work with burrs and welding spatter ground off. Paint after fabrication with a rust–inhibitive primer.

– **Hangers and Supports:**

A. Hold horizontal pipe runs firmly in place using approved steel and iron hangers, supports, and/or pipe rest unless otherwise indicated. Suspend hanger rods from concrete inserts or from approved brackets, clamps or clips. Hang pipes individually or in groups if supporting structure is adequate to support weight of piping and fluid. Except for buried piping, hang or support pipe runs so that they may expand or contract freely without strain to pipe or equipment.

1. Horizontal steel piping: Provide hangers or supports every 10 ft. except every 8 ft. for piping 1–1/4 inch and smaller.

2. Horizontal copper tubing: For 2 inch diameter and over, provide hangers every 10 feet, for 1–1/2 inch diameter and smaller every 6 feet.

3. Horizontal cast–iron no–hub piping: Provide hangers or supports at each side of no–hub fittings. Provide anti–separation bracing at each 90 degree change in direction.

4. Horizontal cast–iron hub and spigot piping: Provide hangers or supports at each hub.

5. Vertical piping: Support at floor with iron pipe clamps.

– **Test:**

A. Perform test to Architect's satisfaction. Make test in presence of Owner's Rep and at the time suitable to him if requested. Furnish necessary labor and equipment and bear cost for testing. Cost of replacing and/or repairing damage resulting therefor shall be borne by this contractor, should the contractor refuse or neglect to make test necessary to satisfy the Architect that requirement of specifications and drawings are met, such tests may be made by an independent testing company and the contractor charged for all expenses.

B. Hydrostatic test: Make by completely filling piping system with water and eliminating accumulations of air so that leakage, no matter how small, will be apparent on testing gauge immediately. Maintain pressure until pipe under test has been examined, but in no case less than 24 hours. Test system at the following pressure:

SYSTEM	TEST PRESSURE
Domestic Cold Water	150 PSIG
Domestic Hot Water	150 PSIG

C. Sanitary soil, waste, bent systems test: Before installation of fixtures, cap end of system and fill lines with water to 10 feet above the section being tested. (including bents) and allow to stand for at least fifteen (15) minutes before inspection starts. Make test in sections if necessary or convenient. However, include interconnections between new sections and previously tested section in the new test.

D. Roof drainage system: Test as specified for sanitary system.

E. Gas systems: Test with compressed air at 10 PSI for six hours or longer as directed to provide a tight seal without leaks. Use pressure recorder to record pressure of all lines for duration of test.

F. Repair all leaks and retest as required.

– **Cleanouts:**

A. Provide cleanouts where indicated and required. Unless otherwise indicated, cleanouts shall be accessible with extensions to grade to outside of buildings, or to floors above as indicated or required. Do not locate cleanouts in public lobbies and public corridors unless approved by Architect.

B. Membranes: Where waterproofing membrane occurs under floor, bring membrane to cleanout without puncturing and permanently anchor to integral anchoring flange with heavy cast–iron clamping collar and rustproof bolts.

C. Covers: Set cleanout covers with all finished wall, floor or grade. In all cases securely anchor by means of integral lugs and bolts. Where surfacing material such as resilient coverings is specified, ascertain thickness being used and set cleanout top so finished floor is smooth.

D. Use Acorn 3500 thread compound.

– **Pipe Installation:**

A. Make pipe runs straight and true. Springing or forcing piping into place is not permitted. Install in manner to prevent any undue strain on equipment. Make joints smooth and unobstructed inside and out, and ream pipe ends thoroughly to remove burrs. Conceal piping in finished portions of the building except as otherwise directed or indicated. Cap or plug ends and openings in pipe and fittings immediately to exclude dirt until equipment is installed or final connections are made.

B. Install piping to clear beams unless sleeving is indicated. Constantly check work of other trades to prevent interference with this installation. Obtain approval from Architect if coring or cutting of concrete work is necessary due to failure to install required sleeves prior to the time of concrete pour. Cost of coring and cutting work shall be borne by the subcontractor.

C. Exposed plated or enameled pipe: Make connections to equipment with special care. Show not tool marks or threads.

D. Dielectric Unions: Make connections between two dissimilar metal pipes with dielectric unions.

E. Unions: Provide a union on one side of each shutoff valve. At both sides of automatic valves. At equipment connections and elsewhere indicated or required, unless flanges are indicated.

F. Floor, wall ceiling plates: Provide where pipes pierce finished surfaces.

G. Noise: Install soil, waste, and water piping in a manner that prevents any unusual noise from flow of water under normal conditions.

H. Shutoff Valves: Provide where indicated and required for adequate control of system and for isolation of fixture groups and equipment.

I. Buried Pipe: Install with minimum 36 inches coverage unless otherwise indicated. Lay piping accurately to grade where invert elevations are indicated. When required provide thrust blocks per manufacturer's recommendations.

J. Equipment and Materials: Install per manufacturer's recommendations.

K. Accessibility: Install work readily accessible for normal operation, reading of instruments, adjustments, service, inspections and repair. Provide access panels where indicated and required.

L. Pipe Joints: Make screwed joints with a minimum amount of compound applied to the male thread only. All joints shall be made per code requirements and manufacturer's recommendations.

M. Provide pipe isolation at all hangers for non–insulated materials.

N. Piping Rough–in for Fixtures: Support or secure to building construction of firmly anchored waste piping so that pipes cannot be displaced. Do not secure to walls. Use of makeshift devices, such as rope, wire, tape, etc. is prohibited.

O. Horizontal drainage piping shall be installed in uniform alignment at uniform slopes. The minimum slope for horizontal pipe 4" or larger in diameter may have a slot of not less than 1% ($\frac{1}{8}$ inch per foot). The minimum slope of horizontal pipe less that 4'; may have a slope of not less than 2% ($\frac{1}{4}$ inch per foot).

– **Cleanup:**

A. In addition to cleanup specified under Division 1, thoroughly clean all parts of the equipment. Where exposed parts are to be painted, thoroughly clean off any splattered construction materials and remove all oil and grease spots. Wipe the surface carefully and scrape out all cracks and corners.

B. Thoroughly flush and clean out all water circulating systems. Remove, clean and replace all strainer elements.

C. During the progress of the work, keep the premises clean and free of debris.

– **Painting:**

A. Except as otherwise specified or indicated in the architectural drawings and/or specifications, paint all exposed unfinished metal with one coat of rust–inhibiting primer.

B. Finished painting is specified under Division 9.

– **Connections to Services:** Provide all connections to sanitary sewer lines, storm sewer, gas lines, water lines, electrical services furnished under other contracts, except as otherwise specifically designated. Provide all necessary tees, taps and connections required to properly connect to all mains. Verify all required City requirements before making any piping connections to sanitary sewer, storm sewer, water or gas piping and conform to them during installation.

– **Welding:**

A. Procedures:

1. All procedures and welders must be qualified in accordance with the requirements of Section IX, ASME Boiler and Pressure Vessel Code and ANSI code for power piping B31.1. Procedure qualification test records and acceptance shall be submitted with the welding procedure prior to the start of fabrication.

2. Architect's inspector or authorized representative will review performance qualification records of individual welders.

B. Welding Processes: The following welding processes are permitted, provided that the procedure is qualified in accordance with Section IX, ASME Boiler and Pressure Vessel Code.

1. Manual shielded metal–arc.

2. Gas tungsten–arc.

3. Other welding processes may be used providing they are qualified in accordance with Section IX, ASME Boiler and Pressure Vessel Code.

C. Restrictions: Weld bevel preparations shall be provided on all welding fittings and shall be machined or ground to remove all discoloration if flame or arc cut.

D. Welding Filler Material:

1. A filler material control procedure shall be submitted to Owner for review and acceptance prior to performing any welding.

2. All shielded metal–arc welding shall be performed using low–hydrogen type electrodes such as E 7018.

E. Preheat and Interpass Temperature:

F. Preheat for pressure components shall be as specified in Table 132 of ANSI B.1.

CURRENT REVISION:

ISSUED: DECEMBER 19, 2022

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CRUMBL COOKIES - WATERFORD #1046

22-246

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JZW ARCHITECTS

PLUMBING SPECIFICATIONS

P7.2

ELECTRICAL SYMBOLS

SYMBOL	EXPLANATION	SYMBOL	EXPLANATION	SYMBOL	EXPLANATION
	BRANCH CIRCUIT CONCEALED IN CEILING OR WALL	F1	FIXTURE TYPE SYMBOL		TAMPER AND FLOW
	BRANCH CIRCUIT CONCEALED IN GROUND OR FLOOR		LINIER FIXTURE (TYPICAL)	FACP	FIRE ALARM CONTROL PANEL
A-1,3	BRANCH CIRCUIT HOMERUNS TO PANEL		EMERGENCY LIGHTING UNIT	RFAA	REMOTE FIRE ALARM ANNUNCIATOR PANEL
135	ROOM NUMBER		SURFACE OR PENDANT MOUNTED FIXTURE	NAC	FIRE ALARM NAC PANEL
CH-1	MECHANICAL EQUIPMENT SYMBOL		RECESSED FIXTURE	VOICE	FIRE ALARM VOICE PANEL
1	KEYED NOTE REFERENCE		WALL MOUNTED FIXTURE	D/H	DOOR HOLDER
42X	FEEDER TAG (SEE FEEDER SCHEDULE)		WALL PACK	F/S	FIRE/SMOKE DAMPER
	LIGHTING AND POWER PANELBOARD		STRIP FIXTURE	F	FIRE ALARM PULL STATION
NON-FUSED / FUSED	DISCONNECT SWITCH		TRACK LIGHTING		FIRE ALARM STROBE
NON-FUSED / FUSED	DISCONNECT SWITCH WITH MOTOR STARTER		EMERGENCY LIGHTING UNIT		FIRE ALARM HORN/STROBE
	MOTOR STARTER		WALL MOUNTED EXIT LIGHT (SINGLE FACE)	LF	FIRE ALARM HORN/STROBE (LF = LOW FREQUENCY)
VFD	VARIABLE FREQUENCY DRIVE		WALL MOUNTED EXIT LIGHT (DOUBLE FACE)		FIRE ALARM HORN/STROBE WITH PROTECTIVE COVER
C	CONDUIT STUB		CEILING MOUNTED EXIT LIGHT		FIRE ALARM SPEAKER/STROBE
J	JUNCTION BOX		CEILING MOUNTED EXIT LIGHT (DOUBLE FACE)	LF	FIRE ALARM SPEAKER/STROBE (LF = LOW FREQUENCY)
	ELECTRIC VEHICLE CHARGING STATION		EXIT LIGHT WITH PROTECTIVE COVER		FIRE ALARM SPEAKER
	DUPLEX RECEPTACLE OUTLET WP — MODIFIER A-3 — PANEL SPACE ASSIGNMENT REF — EQUIPMENT DESIGNATION	$	SINGLE POLE SWITCH (SUBSCRIPT AS INDICATED BELOW)	LF	FIRE ALARM SPEAKER (LF = LOW FREQUENCY)
		2	TWO POLE SWITCH		FIRE ALARM HORN
		3	3-WAY SWITCH		
WP	WEATHERPROOF COVER & LISTED WEATHER RESISTANT DEVICE	4	4-WAY SWITCH	LF	FIRE ALARM HORN (LF = LOW FREQUENCY)
		D	DIMMER SWITCH		
GFCI	PROTECTED BY FAULT CIRCUIT INTERRUPTER	K	KEYED SWITCH		FIRE ALARM STROBE CEILING MOUNTED
+44	MOUNTING HEIGHT ABOVE FLOOR OR GRADE GIVEN IN INCHES.	T	TIMER SWITCH		
		M	MANUAL STARTER WITH THERMAL OVERLOAD		FIRE ALARM HORN/STROBE CEILING MOUNTED
REF	REFRIGERATOR	F	PADDLE FAN SPEED CONTROL. (CANARM "CN" SERIES)		
DW	DISHWASHER	OC	OCCUPANCY SENSOR SWITCH	LF	FIRE ALARM HORN/STROBE CEILING MOUNTED (LF = LOW FREQUENCY)
DISP	DISPOSAL	LV	LOW VOLTAGE CONTROL SWITCH		
WASH	WASHING MACHINE	LV/D	LOW VOLTAGE CONTROL SWITCH WITH DIMMER		FIRE ALARM HORN CEILING MOUNTED
EWC	ELECTRIC WATER COOLER	OC/D	OCCUPANCY SENSOR CONTROL SWITCH WITH DIMMER		
USB	DUPLEX PLUS USB CHARGER	OC/2	DUAL RELAY OCCUPANCY SENSOR CONTROL SWITCH	LF	FIRE ALARM HORN CEILING MOUNTED (LF = LOW FREQUENCY)
RCSD	RECESSED OUTLET				
	QUAD RECEPTACLE OUTLET	$$	DOUBLE GANG SWITCH		SMOKE DETECTOR (SUBSCRIPT AS INDICATED BELOW)
	SPLIT WIRED DUPLEX RECEPTACLE OUTLET	$a,b,c LV / a,b S	LOW VOLTAGE MULTI BUTTON CONTROL SWITCH (LETTER INDICATES CONTROL OF CORRESPONDING FIXTURES)	B C	SMOKE ALARM BATTERY-BACKED SMOKE/CARBON MONOXIDE ALARM COMBO BATTERY-BACKED
	220V RECEPTACLE OUTLET	ab	CONTROLLING SWITCH (LETTER INDICATES CONTROL OF CORRESPONDING FIXTURES)	D R	DUCT SMOKE DETECTOR SMOKE DETECTOR WITH ADDRESSABLE RELAY
	ISOLATED GROUND RECEPTACLE	S	OCCUPANCY SENSOR (CEILING MOUNTED)	S	SMOKE DETECTOR WITH SOUNDER BASE
	RECEPTACLE FLOOR DEVICE	S DT	DUAL TECHNOLOGY OCCUPANCY SENSOR (CEILING MOUNTED)		HEAT DETECTOR
	CEILING MOUNTED DEVICE	RC	ROOM CONTROLLER		GAS DETECTOR
	SPECIAL RECEPTACLE	LS	DAYLIGHT SENSOR	CO CO/NO2	CARBON MONOXIDE DETECTOR CARBON MONOXIDE/NITROGEN DIOXIDE SENSOR (GARAGE)
	MOTOR OUTLET	P	PHOTOCELL		ADA TWO-WAY COMMUNICATIONS SYSTEM
	EXHAUST FAN	V	VOLUME CONTROL	KP	ACCESS CONTROL KEY PAD
	THERMOSTAT OUTLET		WALL SPEAKER	CR	ACCESS CONTROL CARD READER
S	REMOTE SENSOR OUTLET		CEILING SPEAKER	SDS	ACCESS CONTROL DOOR STRIKE
	TELEPHONE OUTLET		SURVEILLANCE CAMERA	ML	ACCESS CONTROL MAG LOCK
(#)	COMPUTER DATA OUTLET (#) INDICATES JACK QUANTITIES	DVR	SURVEILLANCE DIGITAL VIDEO RECORDER	DS	ACCESS CONTROL DOOR SENSOR
	NETWORK AND VOICE OUTLET	NURSE	NURSE CALL ANNUNCIATOR PANEL		ACCESS CONTROL REQUEST TO EXIT
	WIRELESS ACCESS POINT CEILING MOUNTED	N	NURSE CALL EMERGENCY CALL DEVICE		PUSHBUTTON
TV	TELEVISION OUTLET	N	NURSE CALL EMERGENCY CALL LIGHT	B	BELL

NOTE: ALL SYMBOLS MAY NOT BE USED.

ABBREVIATIONS INDEX

#	NUMBER	DISP	DISPOSAL	LRA	LOCKED ROTOR AMPS	PV	PHOTOVOLTAIC
ϕ	PHASE	DRY	DRYER	LTG	LIGHTING	PVC	POLYVINYL CHLORIDE
1ϕ	SINGLE PHASE	DW	DISHWASHER	MATV	MASTER ANTENNA TELEVISION	(R)	RELOCATE
2P	TWO-POLE	DWG	DRAWING	MAX	MAXIMUM	RECP	RECEPTACLE
3ϕ	THREE PHASE	EC	EMPTY CONDUIT	MB	MAIN BUS	REF	REFRIGERATOR
4P	FOUR-POLE	EM	EMERGENCY	MCB	MAIN CIRCUIT BREAKER	REQ	REQUIRED
AC	ALTERNATING CURRENT	EMG	EMERGENCY GENERATOR	MCC	MOTOR CONTROL CENTER	RLA	RATED LOAD AMPS
AFF	ABOVE FINISHED FLOOR	EMT	ELECTRICAL METALLIC TUBING	MCM	1000 CIRCULAR MILLS	RCSD	RECESSED
AFG	ABOVE FINISHED GRADE	EPO	EMERGENCY POWER OFF	MH	MANHOLE	SE	SERVICE ENTRANCE
AFP	ARC FAULT PROTECTOR	EWC	ELECTRIC WATER COOLER	MIC	MICROPHONE	SPD	SURGE PROTECTION DEVICE
AIC	AMP INTERRUPTING CURRENT (SYMMETRICAL)	EWH	ELECTRIC WATER HEATER	MIN	MINIMUM	SPEC	SPECIFICATION
AL	ALUMINUM	EX	EXISTING	MLO	MAIN LUGS ONLY	SPK	SPEAKER
AM	AMPS METER	(F)	FUTURE	MNF	MANUFACTURER	SS	SELECTOR SWITCH
AMP	AMPERE	FA	FIRE ALARM	MTG	MOUNTING	SW	SWITCH
ANN	ANNUNCIATOR	FACP	FIRE ALARM CONTROL PANEL	MTR	MOTOR	SWBD	SWITCHBOARD
ATS	AUTOMATIC TRANSFER SWITCH	FC	FOOT CANDLE	MW	MICROWAVE	SWGR	SWITCHGEAR
AUX	AUXILIARY	FLA	FULL LOAD AMPS	(N)	NEW	SWGR	SWITCHGEAR
AWG	AMERICAN WIRE GAUGE	FT	FOOT	N/A	NOT APPLICABLE	TTB	TELEPHONE TERMINAL BOARD
BC	BARE COPPER	FRZ	FREEZER	NC	NORMALLY CLOSED	TBC	TELEPHONE TERMINAL CABINET
BFG	BELOW FINISH GRADE	FS	FUSED SWITCH	NEC	NATIONAL ELECTRICAL CODE	TV	TELEVISION
C	CONDUIT	GFAF	DUAL FUNCTION GFCI/AFCI CIRCUIT BREAKER	NEMA	NATIONAL MANUFACTURING ASSOCIATION	TYP	TYPICAL
CAB	CABINET	GFCI	GROUND FAULT CIRCUIT INTERRUPTER	NFC	NATIONAL FIRE CODE	UG	UNDERGROUND
CATB	COMMUNITY ANTENNA TELEVISION	GFEP	GROUND-FAULT EQUIPMENT PROTECTION	NFPA	NATIONAL FIRE PROTECTION ASSOCIATION	UNO	UNLESS NOTED OTHERWISE
CATV	CABLE TELEVISION	GFP	GROUND FAULT PROTECTOR	NFS	NON FUSED SWITCH	UPS	UNINTERRUPTIBLE POWER SUPPLY
CFCI	CONTRACTOR FURNISHED CONTRACTOR INSTALLED	GRC	GALVANIZED RIGID CONDUIT	NIC	NOT IN CONTRACT	V	VOLT (KV-KILOVOLT)
CKT	CIRCUIT	GRD	GROUND	NL	NIGHT LIGHT	VA/R	VOLT-AMPS/REACTIVE
CLG	CEILING	HP	HORSE POWER	NO	NORMALLY OPEN	VM	VOLT METER
CNTR	CONTRACTOR	HZ	HERTZ	NTS	NOT TO SCALE	W	WATTS
CO	CONDUIT ONLY	IG	ISOLATED GROUND	OFCI	OWNER FURNISHED CONTRACTOR INSTALLED	W/	WITH
CRT	COMPUTER TERMINAL	IMC	INTERMEDIATE METALLIC CONDUIT	OFOI	OWNER FURNISHED OWNER INSTALLED	WASH	WASHER
CT	CURRENT TRANSFORMER	IN	INCH	OS&Y	OUTSIDE SCREW AND YOKE	WH	WATTHOUR
CU	COPPER	J-BOX	JUNCTION BOX	PB	PUSH BUTTON	W/O	WITHOUT
C/W	CONDUIT WITH	KV	KILOVOLT	PF	POWER FACTOR	WP	WEATHER PROOF
(D)	DEMOLISH/DELETE	KVA	KILOVOLT AMPERES	PFR	PHASE FAILURE RELAY	XFMR	TRANSFORMER
DB	DECIBEL	KVAR	KILOVARS	PNL	PANEL	XFMR-SW	TRANSFORMER SWITCH
DC	DIRECT CURRENT	KW	KILOWATT	PT	POTENTIAL TRANSFORMER	XP	EXPLOSION PROOF

NOTE: THIS IS A TYPICAL ABBREVIATION LIST. NOT ALL ABBREVIATIONS MAY BE USED ON THIS PROJECT.

ELECTRICAL GENERAL NOTES:

1. WORK SHALL BE PERFORMED IN A WORKMANLIKE MANNER, PER INDUSTRY STANDARD, AND TO THE SATISFACTION OF THE ARCHITECT AND ENGINEER.
2. WORK, MATERIALS, AND EQUIPMENT SHALL CONFORM TO THE LATEST EDITIONS OF LOCAL, STATE AND NATIONAL CODES, STANDARDS AND ORDINANCES.
3. ALL MATERIALS USED IN THIS INSTALLATION SHALL BE U.L. APPROVED AND NEW.
4. DO NOT PENETRATE STRUCTURAL ELEMENTS OF FLOORS, WALLS, CEILINGS, ROOF, ETC.
5. DETAILS ARE SHOWN ON DIFFERENT SHEETS. THE CONTRACTOR SHALL REFER TO THOSE DETAILS WHETHER OR NOT CALLED IN REFERENCE NOTES.
6. ELECTRICAL CONTRACTOR SHALL NOTIFY AND COOPERATE WITH THE MECHANICAL CONTRACTOR SUCH THAT NO DUCTS, PIPING, OR EQUIPMENT FOREIGN TO THE OPERATION OF THE ELECTRICAL EQUIPMENT SHALL BE PERMITTED TO BE INSTALLED IN, ENTER, OR PASS THROUGH ELECTRICAL ROOMS OR SPACES, OR ABOVE OR BELOW ELECTRICAL EQUIPMENT IN OTHER AREAS.
7. NO WIRING SHALL RUN IN DUCT WORK.
8. THE MINIMUM SIZE OF THE CONDUCTORS ARE TO BE #12 AWG THHN COPPER, UNLESS INDICATED OTHERWISE ON THE DRAWINGS. STRANDED CONDUCTORS ARE NOT ALLOWED IN THE CONDUCTORS SMALLER THAN #10 AWG.
9. USE EPOXY ANCHORS TO SUPPORT THE ELECTRICAL EQUIPMENT. EXPANSION ANCHOR BOLTS ARE NOT ACCEPTED.
10. THE ELECTRICAL CONTRACTOR SHALL REVIEW AND COORDINATE WITH ARCHITECTURAL, CIVIL, STRUCTURAL, MECHANICAL, PLUMBING, AND OTHER DRAWINGS PRIOR TO BID.
11. ELECTRICAL CONTRACTOR SHALL REVIEW ALL ARCHITECT'S ELEVATIONS, SECTIONS, AND FLOOR PLANS PRIOR TO ROUGH-IN OF ELECTRICAL JUNCTION BOXES.
12. ALL JUNCTION BOXES SHALL HAVE MINIMUM DEPTH OF 2-1/8" UNLESS OTHERWISE SPECIFIED. SECURE ALL JUNCTION BOXES AS SHOWN IN THE DETAILS. FURNISH AND INSTALL PROPER PLASTER RINGS.
13. REFER TO ARCHITECTURAL CABINET CASEWORK ELEVATION DRAWINGS FOR CLARIFICATION ON MOUNTING AND PLACEMENT OF ALL RACEWAY, RECEPTACLES, AND SWITCHES.
14. MANY DEVICE MOUNTING LOCATIONS ARE DEPENDENT ON MILLWORK LOCATIONS. COORDINATE ALL APPLICABLE LOCATIONS WITH MILLWORK INSTALLER PRIOR TO BEGINNING WORK.
15. LIGHT SWITCHES INSTALLED ADJACENT TO EACH OTHER, SHALL BE GANGED TOGETHER WITH ONE PIECE COVER PLATE.
16. CONSULT ARCHITECTS REFLECTED CEILING PLANS FOR EXACT LOCATION OF LIGHTING FIXTURES, SPEAKERS, SMOKE DETECTORS, ETC.
17. ELECTRICAL CONTRACTOR SHALL MEET WITH THE CEILING AND MECHANICAL CONTRACTORS TO COORDINATE LOCATIONS, CLEARANCES, CEILING TYPES, AND ROUGH-IN REQUIREMENTS OF ALL LIGHTING FIXTURES PRIOR TO DUCT, PIPING, AND CEILING INSTALLATIONS.
18. CONNECT ALL EM FIXTURES, NIGHT LIGHTS, EGRESS LIGHTS, AND EXIT SIGNS TO UNSWITCHED CONDUCTOR.
19. THE ELECTRICAL CONTRACTOR SHALL TERMINATE THE ELECTRICAL CONNECTIONS TO ALL THE EQUIPMENT BY PROVIDING THE NECESSARY MALE/FEMALE CONNECTOR, RECEPTACLE, PLUG, ETC.
20. FINAL CONNECTIONS TO EQUIPMENT SHALL BE MADE AS PER MANUFACTURERS WRITTEN INSTRUCTIONS AND APPROVED WIRING DIAGRAMS AND DETAILS. IT SHALL BE THE CONTRACTORS RESPONSIBILITY TO PROVIDE ALL MATERIALS AND EQUIPMENT COMPATIBLE WITH EQUIPMENT ACTUALLY SUPPLIED. THE ELECTRICAL CONTRACTOR SHALL VERIFY ALL ELECTRICAL LOADS (VOLTAGE, PHASE, CONNECTION REQUIREMENTS, ETC.) OF EQUIPMENT FURNISHED UNDER OTHER DIVISIONS WITH APPROVED SHOP DRAWINGS PRIOR TO BEGINNING ROUGH-IN.
21. VERIFY EXACT LOCATION(S) OF ALL EQUIPMENT TO BE FURNISHED BY OTHERS PRIOR TO ROUGH-IN.
22. AT THE END OF THE JOB, PROVIDE BLANK COVER PLATES TO MATCH THE OTHER COVER PLATES FOR ALL JUNCTION BOXES WHERE DEVICES HAVE NOT YET BEEN INSTALLED.
23. REMOVE ALL EXISTING WIRES, CABLING, ELECTRICAL DEVICES, ETC., NOT BEING RE-USED.

DESIGN CONTACTS

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ELECTRICAL TEAM LEAD:	JOE HUTCHINGS
ELECTRICAL DESIGNER:	RICH LARSEN
ELECTRICAL DESIGNER:	CALVIN BARLOW

SHEET INDEX

COMMISSIONING NOTES:

C408.3 LIGHTING SYSTEM FUNCTIONAL TESTING.
CONTROLS FOR AUTOMATIC LIGHTING SYSTEMS SHALL COMPLY WITH SECTION C408.3.

C408.3.1 FUNCTIONAL TESTING.
TESTING SHALL ENSURE THAT CONTROL HARDWARE AND SOFTWARE ARE CALIBRATED, ADJUSTED, PROGRAMMED AND IN PROPER WORKING CONDITION IN ACCORDANCE WITH THE CONSTRUCTION DOCUMENTS AND MANUFACTURER'S INSTALLATION INSTRUCTIONS. THE CONSTRUCTION DOCUMENTS SHALL STATE THE PARTY WHO WILL CONDUCT THE REQUIRED FUNCTIONAL TESTING. WHERE REQUIRED BY THE CODE OFFICIAL, AN APPROVED PARTY INDEPENDENT FROM THE DESIGN OR CONSTRUCTION OF THE PROJECT SHALL BE RESPONSIBLE FOR THE FUNCTIONAL TESTING AND SHALL PROVIDE DOCUMENTATION TO THE CODE OFFICIAL CERTIFYING THAT THE INSTALLED LIGHTING CONTROLS MEET THE PROVISIONS OF SECTION C405. WHERE OCCUPANT SENSORS, TIME SWITCHES, PROGRAMMABLE SCHEDULE CONTROLS, PHOTOSENSORS OR DAYLIGHTING CONTROLS ARE INSTALLED, THE FOLLOWING PROCEDURES SHALL BE PERFORMED:

1. CONFIRM THAT THE PLACEMENT, SENSITIVITY AND TIME-OUT ADJUSTMENTS FOR OCCUPANT SENSORS YIELD ACCEPTABLE PERFORMANCE.

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ISSUED: DECEMBER 19, 2022 CURRENT REVISION:

22-246

ELECTRICAL COVER SHEET

E0.1

PERFORMANCE NOTES:

1. E.C. TO INCORPORATE ALL PAGES OF THIS DOCUMENT IN THE CONSTRUCTION OF THE CRUMBL SPACE TO INCLUDE BUT NOT LIMITED TO GENERAL NOTES SHEET E0.1, POWER AND LIGHTING PLANS WITH KEYED NOTES SHEET E1.1, ELECTRICAL ELEVATIONS SHEET E5.1, ELECTRICAL DETAILS SHEETS E5.2 AND 5.3, ELECTRICAL SCHEDULES E6.1 AND ELECTRICAL SPECIFICATIONS SHEET E7.1. E.C. BID SHALL PROVIDE FOR A COMPLETE AND WORKING SYSTEM.
2. PROVIDE ALL CIRCUITING AS SHOWN ON PLAN. DEVIATION WILL CAUSE FAILURE IN EQUIPMENT TO CHARGE PROPERLY OR TO MAINTAIN PROGRAMMING.
3. ALL EQUIPMENT PROVIDED BY THE OWNER AND SENT TO THE JOBSITE WILL BE INSTALLED BY THE E.C.. E.C. TO PROVIDE A FULLY OPERATIONAL AND TESTED SYSTEM WITH REGARDS TO THE DATA/TELE, SPEAKER/AV RECEIVER, AND CAMERA SYSTEMS. E.C. SHALL PROVIDE ONSITE PERSONNEL TO VERIFY STARTUP WITH OWNER AND CORRECT ANY PROBLEMS IN WIRING OR POWER.

ELECTRICAL KEYED NOTES:

1A EXISTING EATON CUTLER–HAMMER PANELBOARD 'A'. SEE PANEL SCHEDULE 'A' FOR ADDITIONAL INFORMATION.

1B NEW PANELBOARD 'B'. SEE PANEL SCHEDULE 'B' FOR ADDITIONAL INFORMATION.

2 COMMUNICATION BOARD. CONNECT TO EXISTING TELEPHONE CONDUIT IN CEILING. REFER TO COMMUNICATIONS RISER DIAGRAM.

3 SIGN POWER JUNCTION BOX. UTILIZE FOR SIGN POWER AND CONTROL VIA TIME CLOCK.

4 COORDINATE OUTLET ORIENTATION AND HEIGHT WITH OWNER PRIOR TO ROUGH–IN.

5 SPEAKER POLK AUDIO MC60. PROVIDE AND INSTALL WESTPENN CABLE AS SHOWN IN SOUND RISER DIAGRAM #1 ON E5.3. OWNER TO PROVIDE ALL EQUIPMENT EXCEPT CABLE. CONTRACTOR TO INSTALL ALL SOUND EQUIPMENT INCLUDING RECEIVER, SPEAKERS AND REMOTE POWER SUPPLY AND MAKE ALL POWER AND SPEAKER WIRED CONNECTIONS FOR AN OPERATIONAL SYSTEM. FOR RECEIVER LOCATION SEE KEYED NOTE #7.

6A EXISTING RTU WITH EXISTING DISCONNECT, GFCI RECEPTACLE AND DUCT SMOKE DETECTOR TO BE MAINTAINED. VERIFY OPERATION WITH MECHANICAL CONTRACTOR. TORQUE DISCONNECT LUGS TO MANUFACTURER'S RECOMMENDATION.

6B FC–1 POWERED BY CU–1. PROVIDE INTERCONNECTING CONDUIT AND WIRE.

7 RECEPTACLE FOR SONY MULTI CHANNEL AV RECEIVER STR–DH590. VERIFY MOUNTING HEIGHT WITH OWNER.

8 PROVIDE AND INSTALL FIRE ALARM COMPONENTS. CONNECT HORN/STROBES & STROBES TO NEW NAC PANEL.

9 CAMERA SYSTEM PROVIDED BY OWNER INSTALLED BY CONTRACTOR. SYSTEM SHALL BE A UNIFI VIDEO BOARD SYSTEM WITH CAMERAS CONNECTED THROUGH POE. SEE POWERED NETWORK DEVICE WIRING DETAILS ON E5.3.

10 TIME CLOCK & CONTACTOR FOR EXTERIOR SIGNAGE & FOR DISPLAY WINDOW RECEPTACLES. REFER TO E5.3/LIGHTING CONTROL DETAIL.

11 RECESSED CAN LIGHT IN SHELF ABOVE BOXING STATION. CONTROL WITH SEPARATE DIMMER SWITCH.

12 PROPOSED LOCATION FOR NEW FIRE ALARM NAC PANEL. REFER TO FIRE ALARM RISER DETAIL FOR CONNECTION TO LANDLORD'S PANEL.

13 DISCONNECT FOR WATER HEATER IN CEILING. RECEPTACLE FOR CIRCULATION PUMP. COORDINATE LOCATIONS FOR BOTH WITH MECHANICAL CONTRACTOR PRIOR TO ROUGH–IN.

14 ALL USB RECEPTACLES SHALL BE 20 AMP DUAL CHARGING PORTS TYPE C. PROVIDE LEVITON T5835–W OR LEGRAND TR20USBPDW NO SUBSTITUTION ALLOWED. REFER TO ELECTRICAL ELEVATION DRAWINGS FOR EXACT IPAD AND RECEPTACLE HEIGHT PRIOR TO ROUGH–IN. ALL RECESSED BOXES (RCSD) SHALL BE OF THE LEGRAND TYPE TVIWMLVKITWCC2. FOR FIRE RATED WALLS USE ARLINGTON TVBS505. REFER TO E5.3 FOR RECEPTACLE AND BOX CUT SHEETS.

15 REFER TO ELECTRICAL ELEVATION DRAWINGS FOR EXACT HEIGHT OF IPAD RECEPTACLES PRIOR TO ROUGH–IN.

16 MOUNT RECEPTACLE FOR WINDOW DISPLAY 4" BELOW GRID CEILING AND CENTERED ON WINDOW WHERE POSSIBLE.

17 CONTRACTOR TO VERIFY EXISTENCE AND CONDITION OF EGRESS LIGHT. INSTALL OR REPLACE AS NECESSARY.

18 VERIFY LOCATION AND HEIGHT OF RECEPTACLE FOR I–PAD STATION WITH OWNER PRIOR TO ROUGH–IN. MAY BE LOCATED ABOVE WINDOW.

19 IN–LINE EXHAUST FAN TO ACTIVATE WHEN LIGHTING IS ON. PROVIDE LIGHTING CONTROLLED RELAY AS REQUIRED.

20 MOUNT RECEPTACLE ABOVE HEADSET SHELF.

21 WIRELESS ACCESS POINT (WAP). PROVIDE DATA CABLE AND INSTALLATION OF WAP IN CEILING. REFER TO COMMUNICATIONS RISER DIAGRAM.

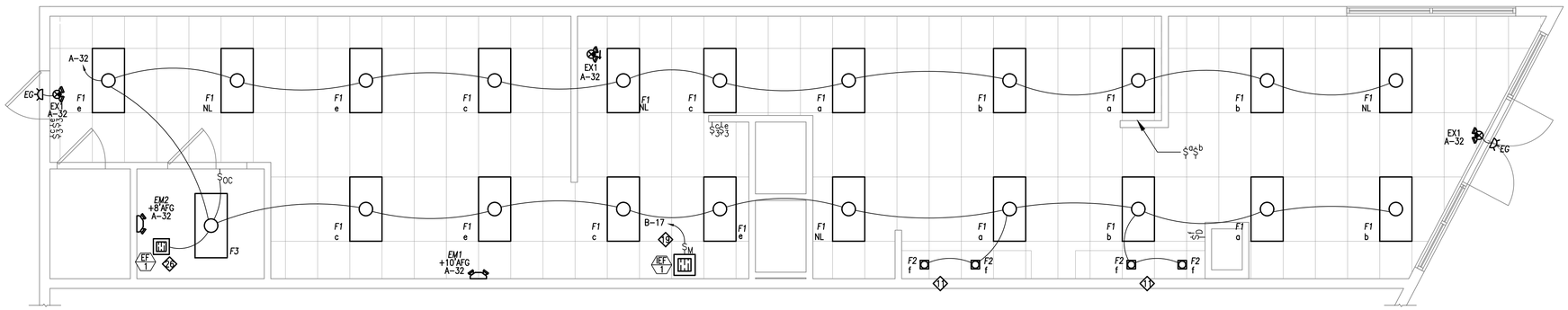
22 INSTALL CAMERA UNDER BOXING STATION. REFER TO ELECTRICAL ELEVATIONS SHEET E5.1 DETAIL CALLOUT E5.1–4.

23 CONNECT DUCT SMOKE DETECTOR TO EXISTING FIRE ALARM SYSTEM. COORDINATE WITH MECHANICAL CONTRACTOR.

24 ALL KITCHEN RECEPTACLES ARE TO HAVE GFCI PROTECTION AS PER NEC 210.8. REFER TO PANEL SCHEDULE.

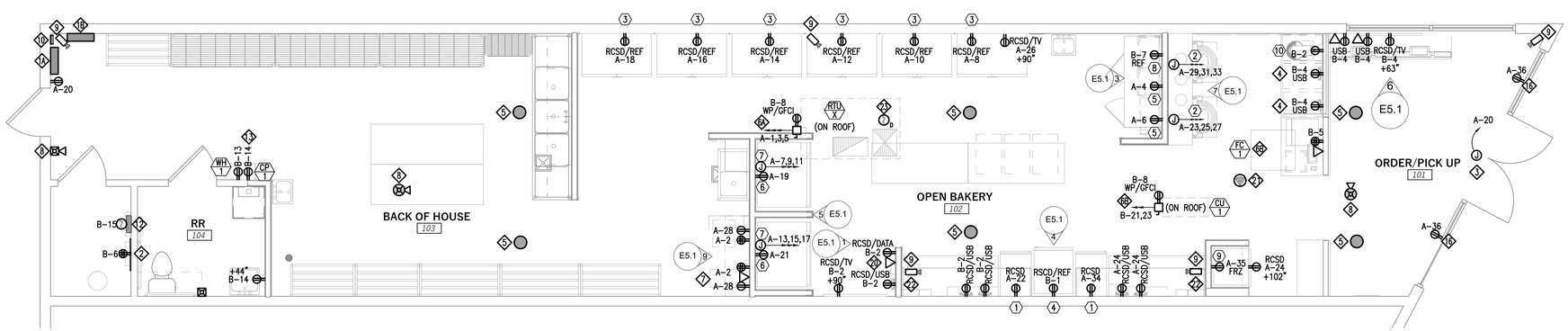
25 PROVIDE A JUNCTION BOX BEHIND THE MIXER FOR POWER DIRECT CONNECTION POINT.

26 CONTROL NEW EXHAUST FAN WITH LIGHTING.



N

LIGHTING PLAN
SCALE: 1/4" = 1'–0"



N

POWER PLAN
SCALE: 1/4" = 1'–0"

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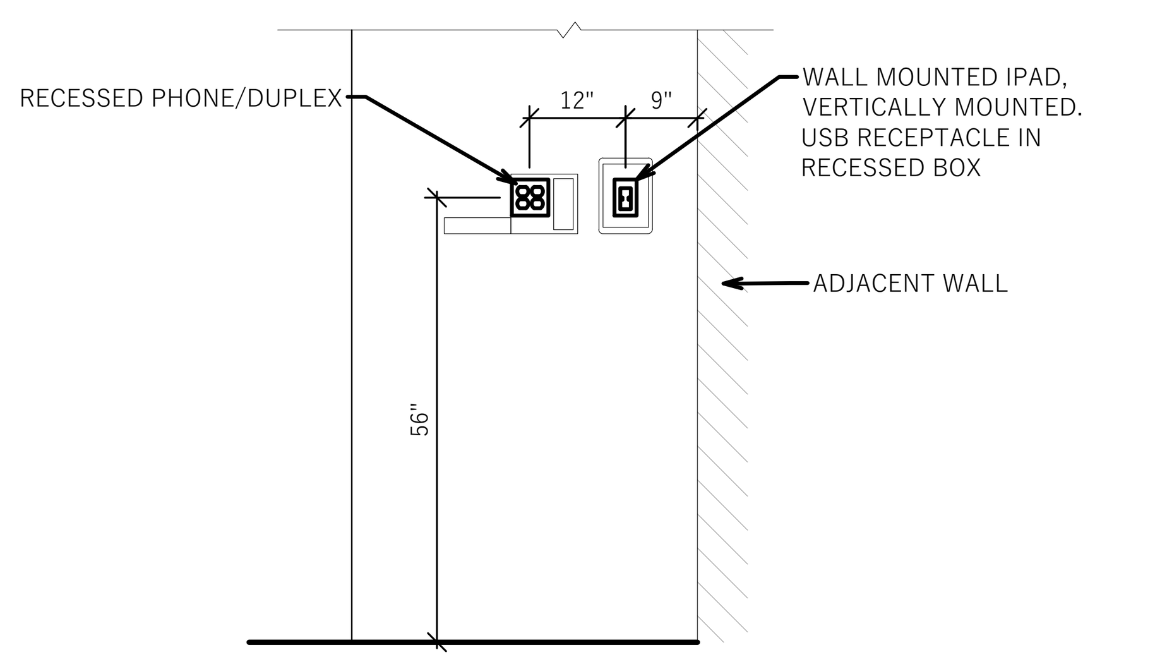
STATE OF MICHIGAN
MATTHEW J. GRAY
REGISTERED
ENGINEER
No.
6201070105
LICENSED PROFESSIONAL ENGINEER

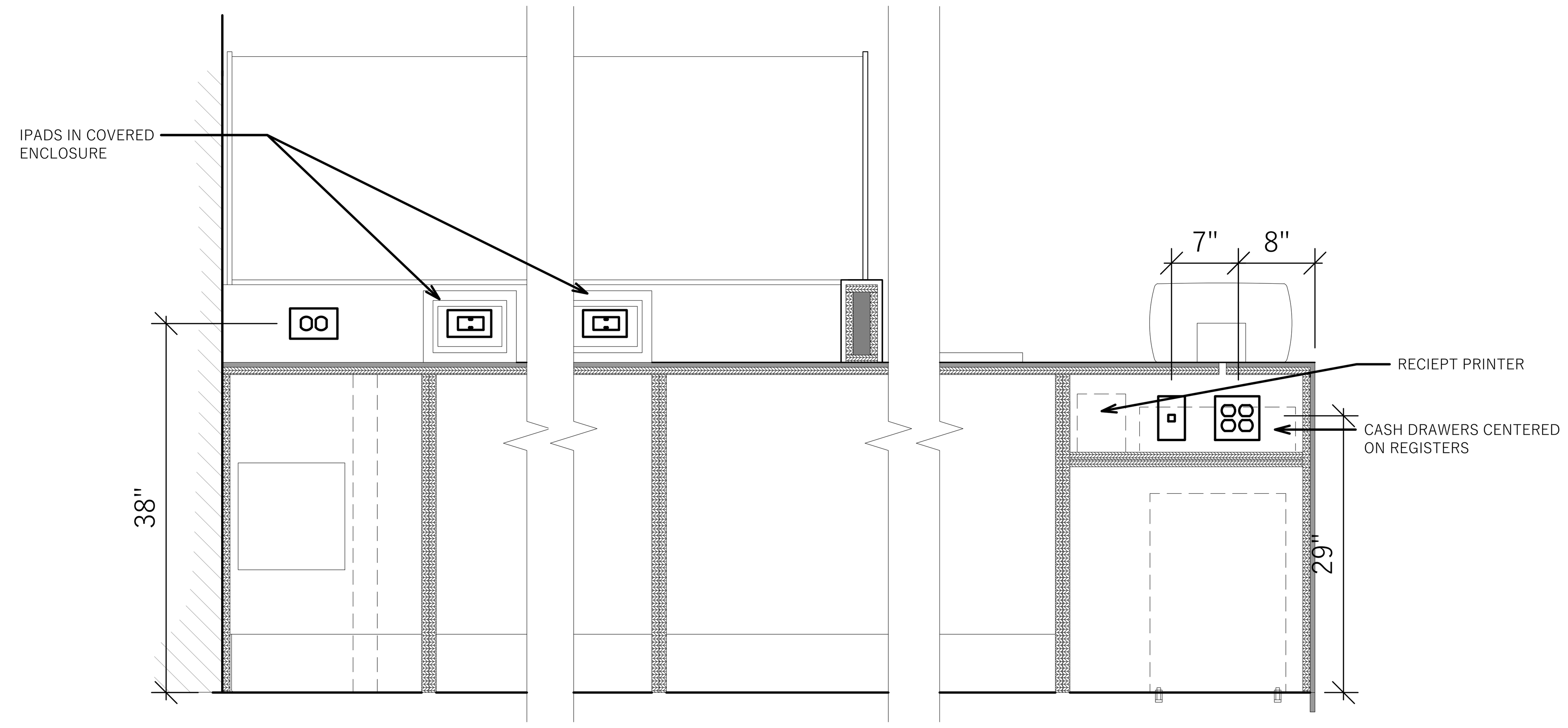
POWER & LIGHTING PLAN
E1.1

22-246

CRUMBL COOKIES - WATERFORD #1046
4978 HIGHLAND RD
WATERFORD TWP. MI 48327
ISSUED: DECEMBER 19, 2022
CURRENT REVISION:

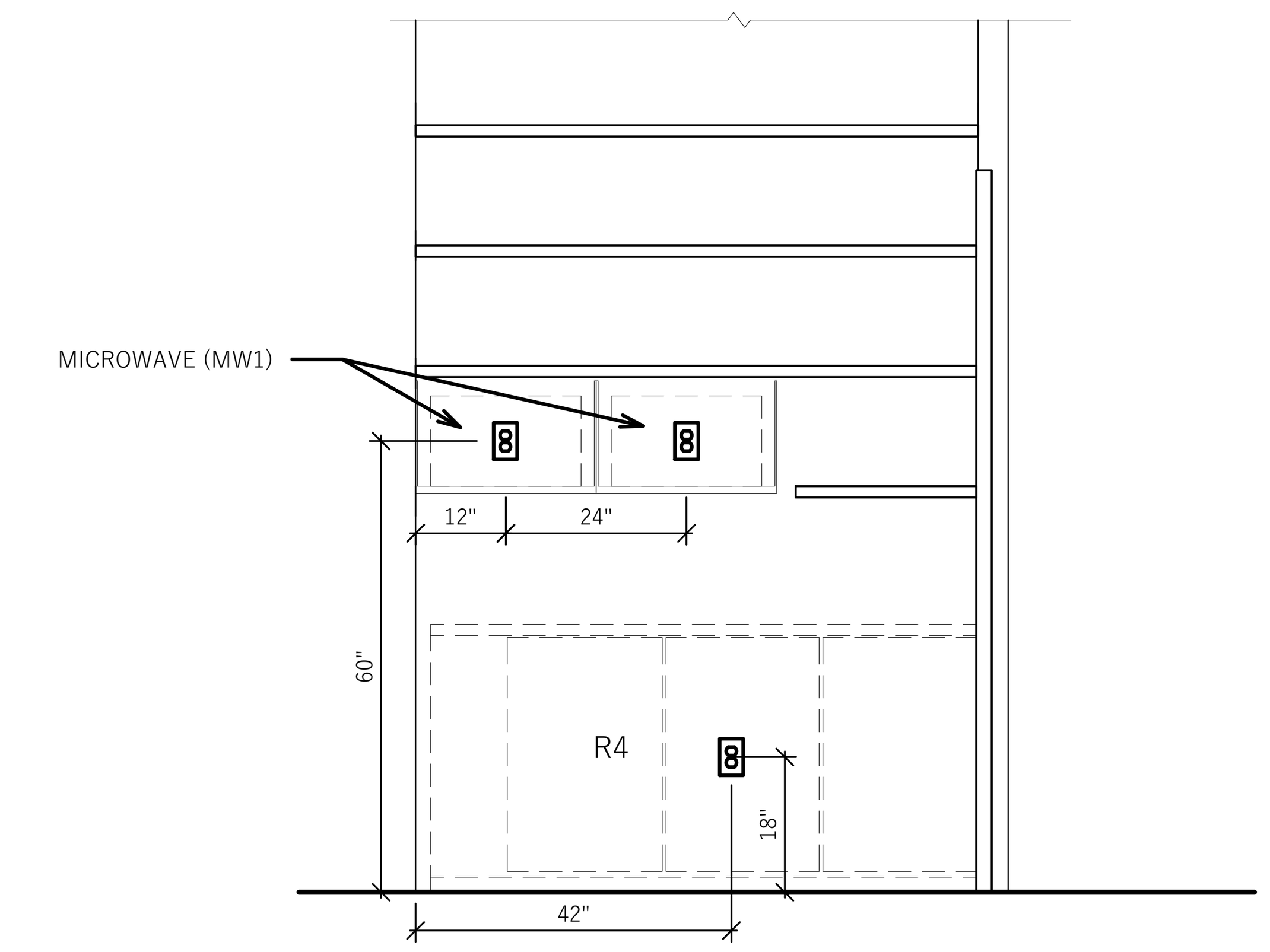


1 E5.1 PHONE/iPAD @ PICK UP
1/2" = 1'-0"

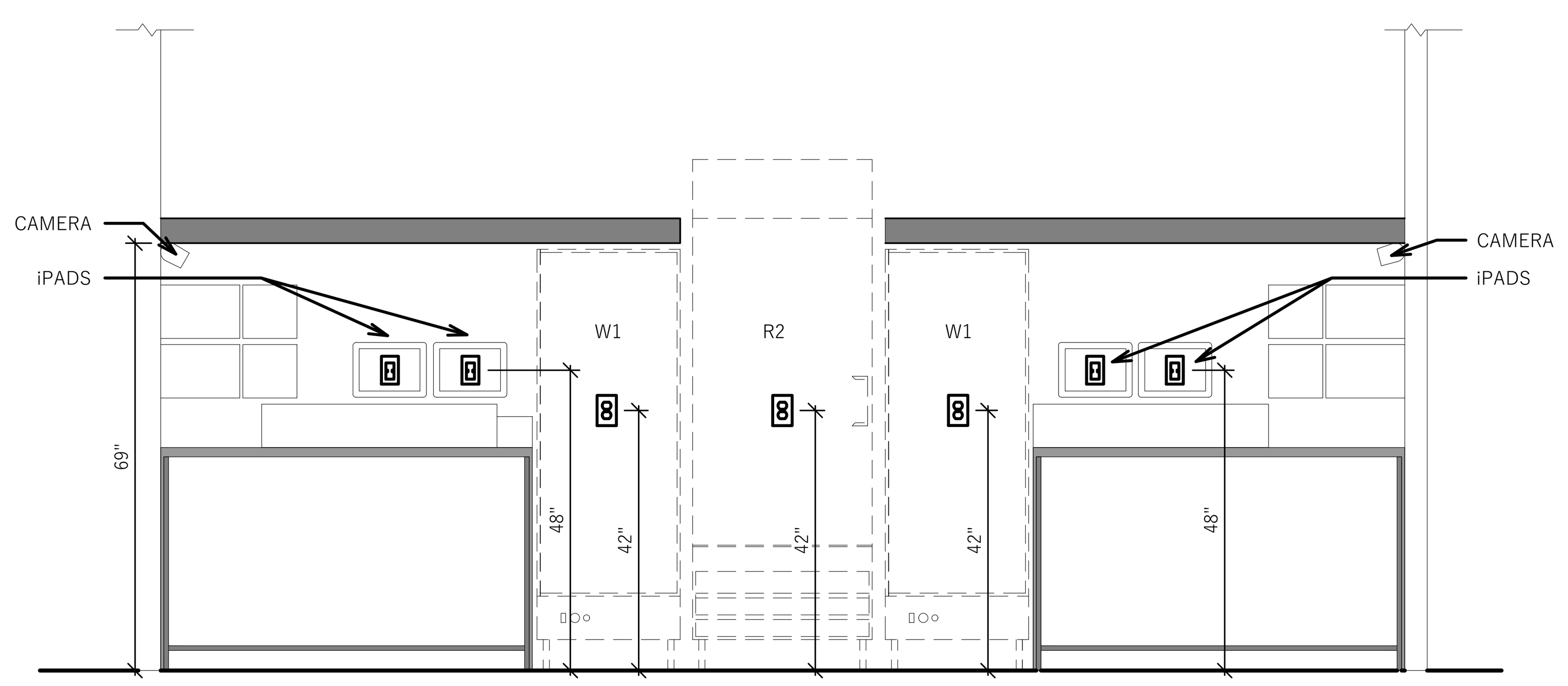


SEE SHEET A7.0 FOR DIMENSIONED EQUIPMENT LOCATIONS. DUPLEX'S TO BE CENTERED BEHIND EQUIPMENT.

2 E5.1 PREP COUNTER - CABINETRY
1" = 1'-0"

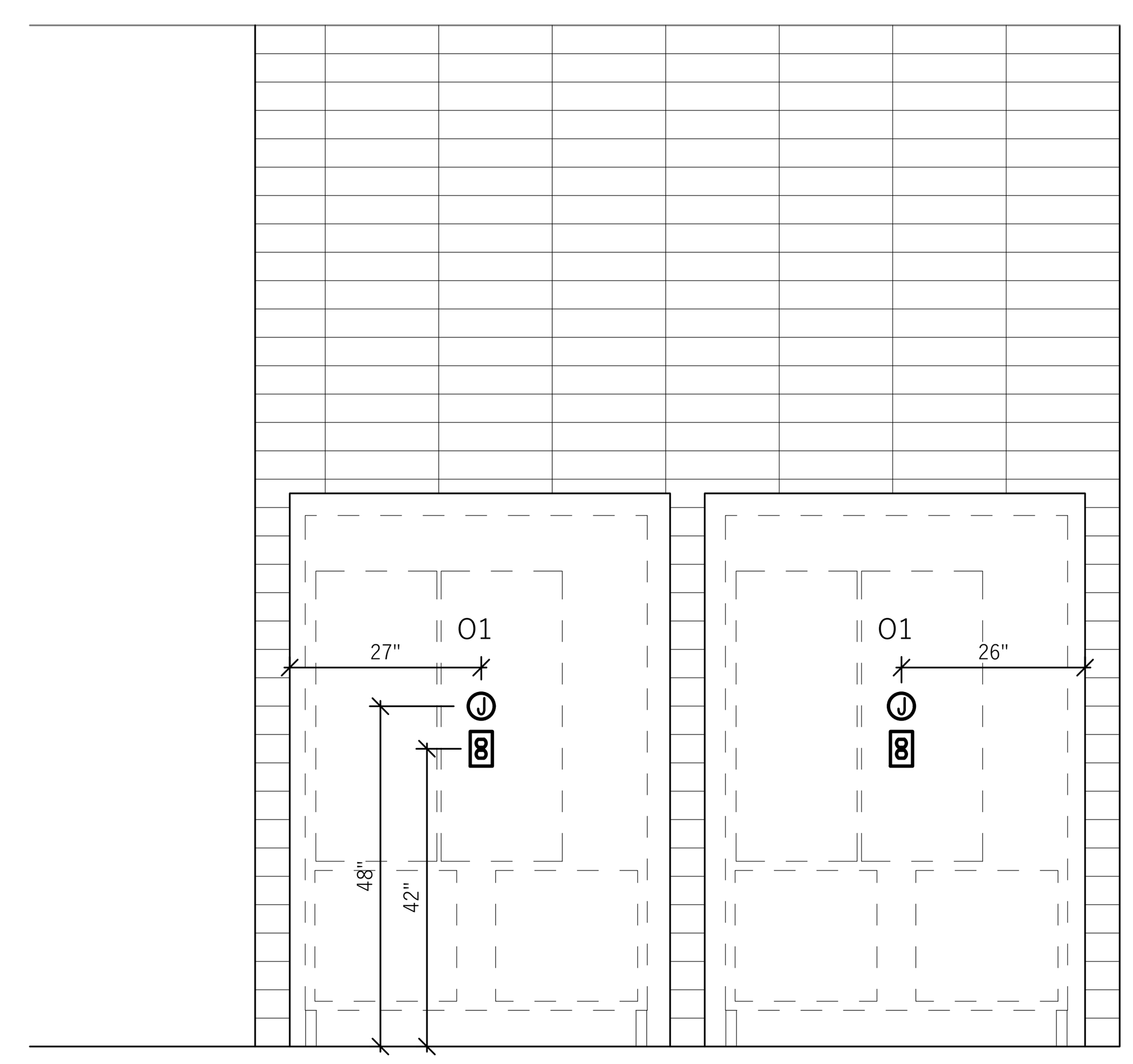


3 E5.1 FRIDGE @ MIXER WALL
1/2" = 1'-0"

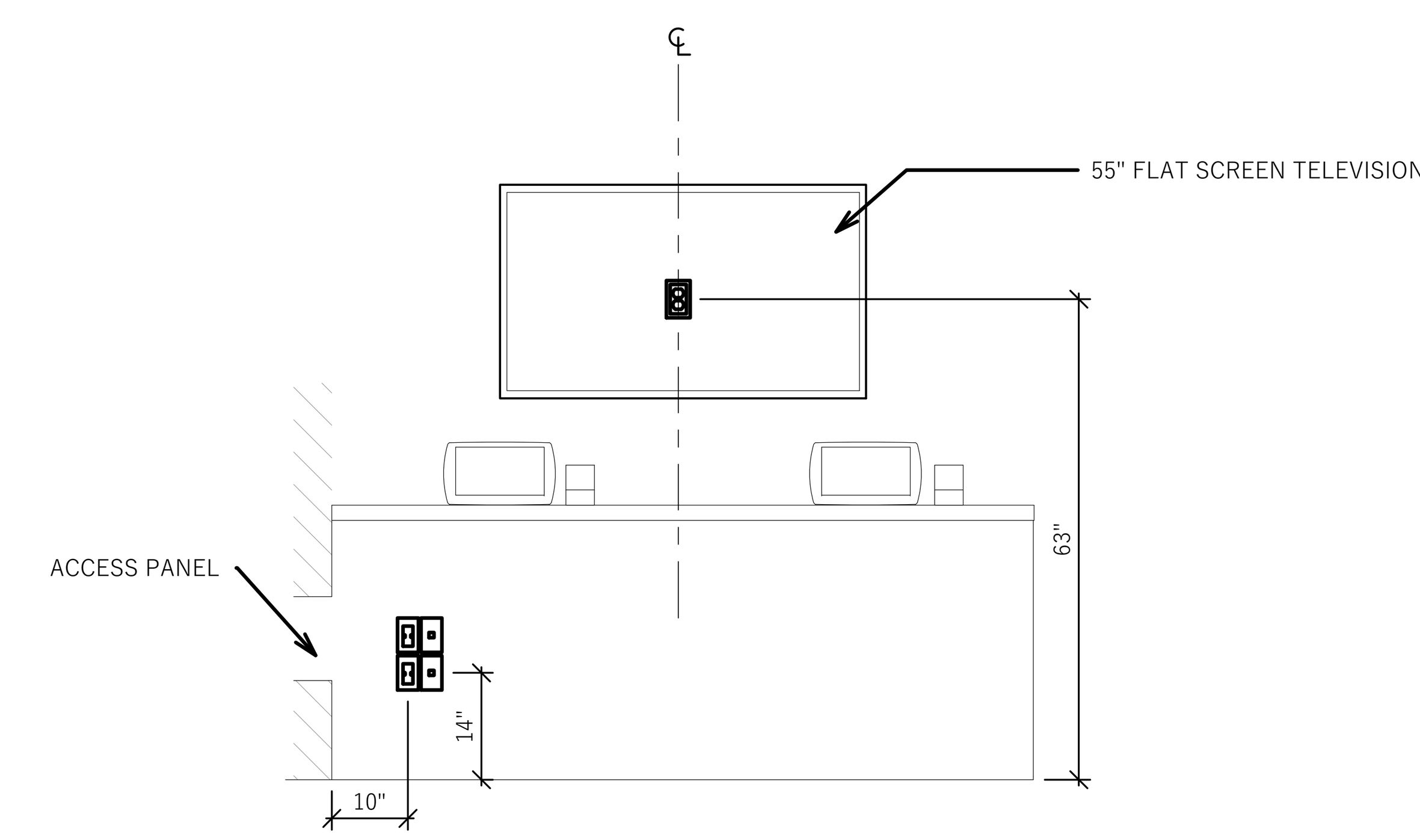


SEE SHEET A7.1 FOR DIMENSIONED EQUIPMENT LOCATIONS. DUPLEX'S TO BE CENTERED BEHIND EQUIPMENT.

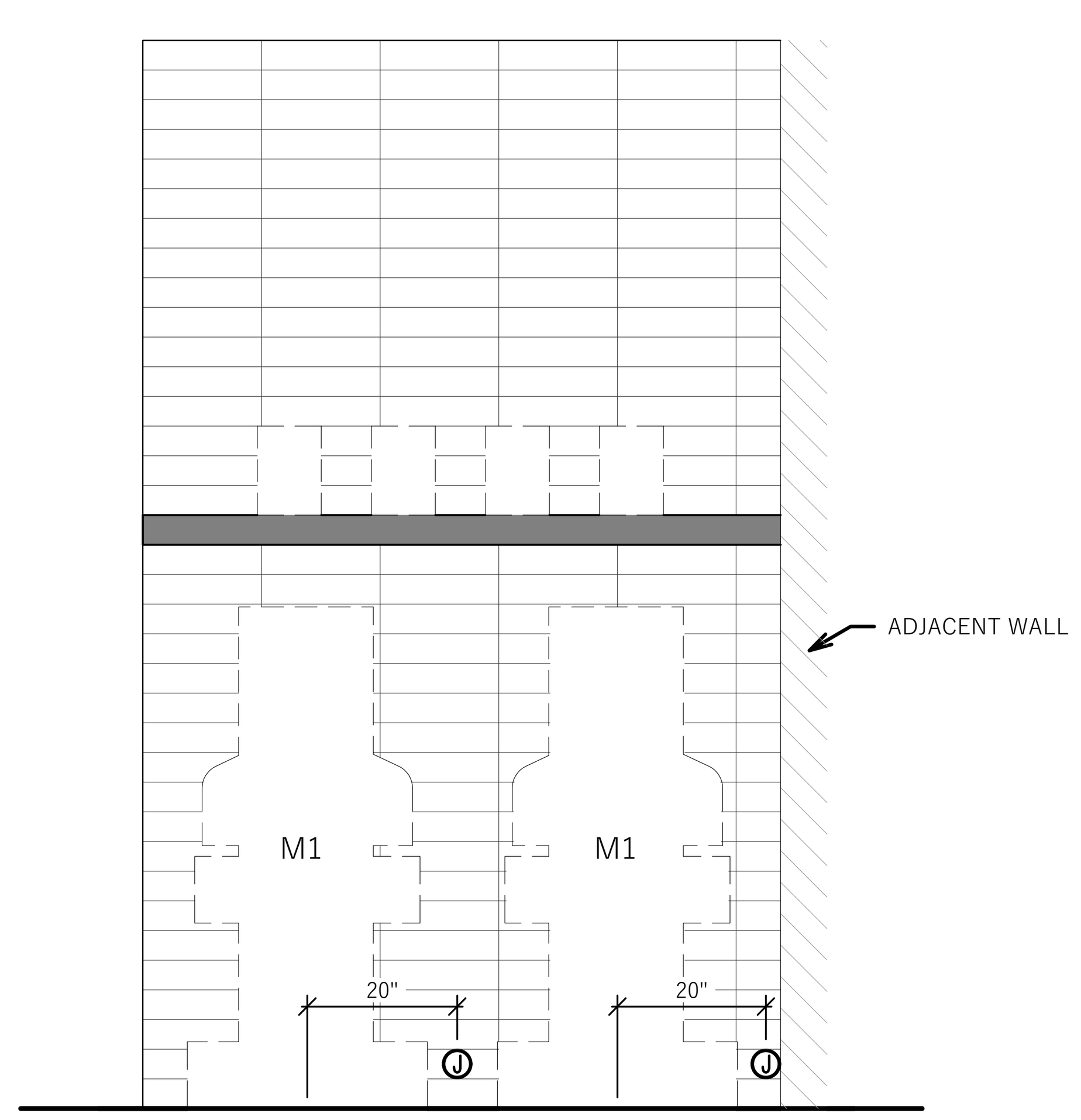
4 E5.1 DRESSING STATIONS
1/2" = 1'-0"



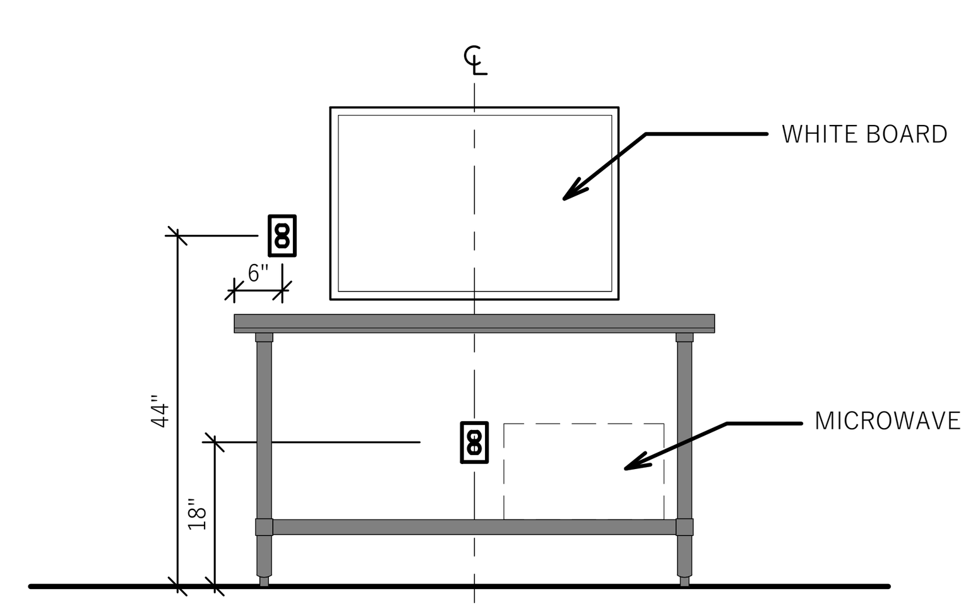
5 E5.1 OVEN WALL ELEVATION
1/2" = 1'-0"



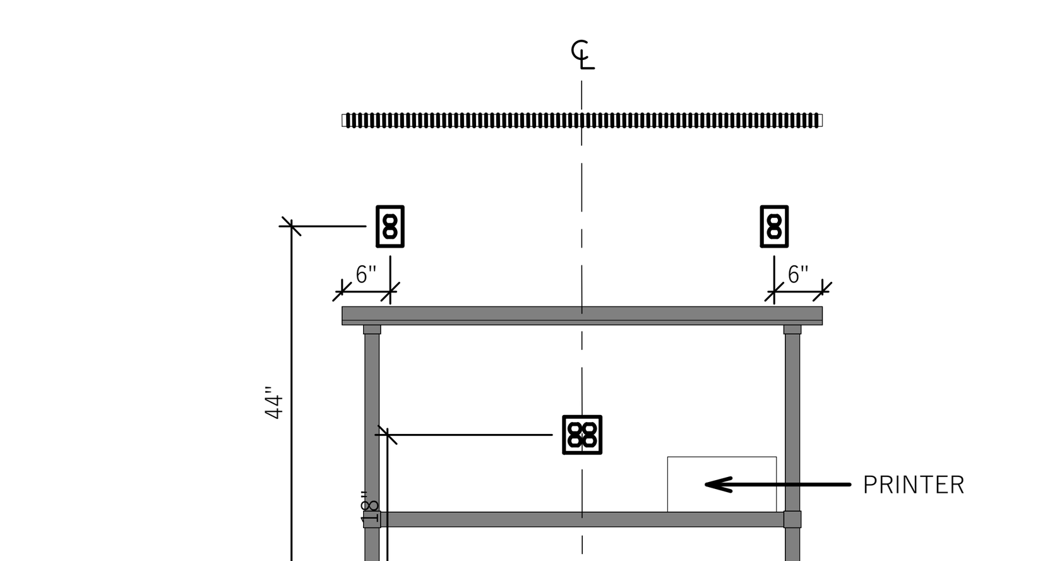
6 E5.1 SELF ORDERING STATION
1/2" = 1'-0"



7 E5.1 MIXER WALL ELEVATION
1/2" = 1'-0"



8 E5.1 WHITE BOARD @ BACK OF HOUSE
1/2" = 1'-0"



9 E5.1 BOXING SHELVING @ BACK OF HOUSE
1/2" = 1'-0"

GENERAL NOTES:

1. ADJUST DUPLEX WITHIN +/- 3" TO ACCOUNT FOR STUD LOCATION.

LEGEND

- RECESSED RECEPTACLE
- DUPLEX RECEPTACLE
- QUADRUPLEX RECEPTACLE
- DUPLEX WITH CHARGING PORTS
- DATA RECEPTACLE

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ELECTRICAL ELEVATIONS
E5.1

CRUMBL COOKIES - WATERFORD #1046

4978 HIGHLAND RD
WATERFORD TWP, MI 48327

ISSUED: DECEMBER 19, 2022
CURRENT REVISION:

22-246

legrand

Pass and Seymour
Single-Gang Recessed TV Box with Metal Electrical Box & Low-Voltage Brush, White
Part No. TV1WMLVKITWCC2

Allows for snug-to-wall placement of your flat-screen TV and handles up to 12 multimedia connections. TV Frame supports line and/or low-voltage devices. Accepts all P&S keystone low-voltage connectors, including Cat 5e and F-Connectors, as well as RCA and audio binding posts (not included).

Features & Benefits

Metal electrical box (M118W) included.

Accepts MC, AC, Conduit or romex cable and standard TP-style wall plates.

Optional TVSS surge supressor kit available.

1/2'' or 3/4'' concentric knock outs.

Molded-in template with easy rectangular cut-out.

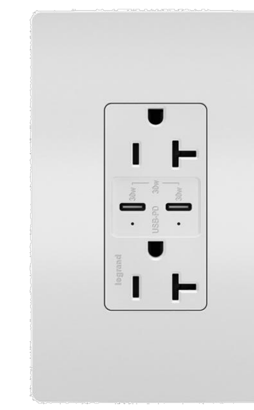
Specifications

General Info

Color	White	UPC Number	785007030150
Country Of Origin	United States	Product Line	Pass & Seymour

legrand

radiant Collection
radiant 20A Tamper Resistant Ultra Fast PLUS Power Delivery USB Type CC Outlet, White
Part No. TR20USBPDW



Charge devices up to 2X faster with the Ultra-Fast PLUS Power Delivery USB Outlet. Made to deliver a leading 30 Watts of power and featuring two built-in Type-C USB connections, this solution adds advanced Power Delivery to the industry-leading amperage of our Ultra-Fast line. The result is a faster, future-proof option for convenient in-wall charging, specially designed to optimize performance for your Power Delivery-enabled devices. Easily replace a traditional outlet in as little as ten minutes to gain the modern functionality of intelligent charging for maximized speeds, complete with multi-layered overcurrent protection to keep the outlet and your devices safe from damage.

Features & Benefits

Charge the latest devices up to 2X as fast, thanks to the industry-leading 6.0A of our Ultra-Fast line and a whopping 30W of power courtesy of advanced Power Delivery

Provides fast and convenient built-in charging through two future-proof USB Type-C ports, accommodating new and upcoming devices without an adapter

Includes multiple layers of overcurrent protection, ensuring the outlet and your favorite devices can charge at optimal levels without risk of damage

Protects children with a patented tamper-resistant shutter system that prevents improper insertion of foreign objects, complete with "invisi-shutters" for an invisible effect

More color options available to fit any style, including finishes to match current hardware and lighting trends

Built for intelligent charging, the outlet detects and delivers the precise amount of power needed to maximize charging speeds

Helpful indicator light lets you see charging status at a glance. Light glows yellow while charging is in progress, and shows green once the device battery is at 90% or more

All Legrand USB Outlets are manufactured through high-quality design, sourcing and production, and backed by a Lifetime Warranty

Replaces a traditional outlet easily, in as little as 10 minutes, with features like scalloped cover design and posted side-wire terminal screws for faster installation

Complete the look with a sleek, screwless radiant® Wall Plate, and coordinate with other designer switches and outlets available from the radiant® Collection

Specifications

General Info

Color	White	UPC Number	785007297744
Country Of Origin	China	Product Line	Pass & Seymour
Finish	Matte	Application Sector	Commercial
Type	Tamper-Resistant, USB		

Additional Information

RoHS Conformant	Yes

Technical Information

LEVITON

T5835-W

Color : White

UPC Code : 078477979396

Country Of Origin : Please Contact Customer Service.

NEMA : 5-20R

Available Colors :

Black, Gray, Ivory, Light Almond

30W (6A) USB Dual Type-C/C Power Delivery Wall Outlet Charger with 20A Tamper-Resistant Outlet

20 Amp, 125 Volt, Decora Tamper-Resistant Outlet. NEMA 5-20R, 30W (6 Amps), Dual Type-C/C Power Delivery USB Chargers, Grounding, Side Wired & Back Wired - White

- POWERFUL – 30W charge on a single port. Up to 2x the charging power with PD-enabled devices
- INNOVATIVE – USB Type-C or USB-C provides faster charging and is emerging as the standard port on many phones, tablets and laptops
- ENHANCED SAFETY – Overcurrent protection helps protect electronic devices from over charging/heating and tamper-resistant outlets prevent unwanted objects from being inserted into the outlets
- FAST CHARGING – Smart chip ensures each device gets the power level it needs to charge fast and efficiently

Technical Information

Product Features
Amperage : 20 A
Brand : Decora
Color : White
Flammability : Rated V-0 per UL 94
Grade : Residential/Commercial Specification Grade
NEMA : 5-20R
Operating Temperature : -10°C to 40°C
Product Type : Outlet/USB Combo
Type : Type C/C with PD Duplex Receptacle
Voltage : 125 VAC
Wallplate : Not Included

Electrical Specifications
Amperage : 20 A
Body Material : Thermoplastic
Color : White
Cover Material : Thermoplastic
Grounding : Grounding
Horsepower Rating : 20A-1/2 HP
Ratings : 20A-125V
Strap Material : Steel
Voltage : 125 VAC

Environmental Specifications
Flammability : Rated V-0 per UL 94
Operating Temperature : -10°C to 40°C
Product ID : Stamped on Strap

Terminal Accom. : 14-12 AWG
Terminal ID : Brass-Hot Black-Hot White-Neutral Green-Gnd
Termination : Back & Side
Torque Range : 14 – 18 in.-lbs

Material Specifications
Body Material : Thermoplastic
Color : White
Cover Material : Thermoplastic
Grade : Residential/Commercial Specification Grade
Strap Material : Steel

Mechanical Specifications
Listed : cCSAus
NOM : 057
Product ID : Stamped on Strap
Terminal Accom. : 14-12 AWG
Terminal ID : Brass-Hot Black-Hot White-Neutral Green-Gnd
Termination : Back & Side
Torque Range : 14 – 18 in.-lbs
Warranty : 2-Year Limited

Standards & Certifications
FCC Part 15 : Class B
Listed : cCSAus
NOM : 057
UL 1310 : Yes
UL 498 : Yes
Warranty : 2-Year Limited

Features and Benefits

* FOR USE IN FIRE RATED WALLS

Arlington

HOME THEATER/AV

Recessed Steel TV BOX™

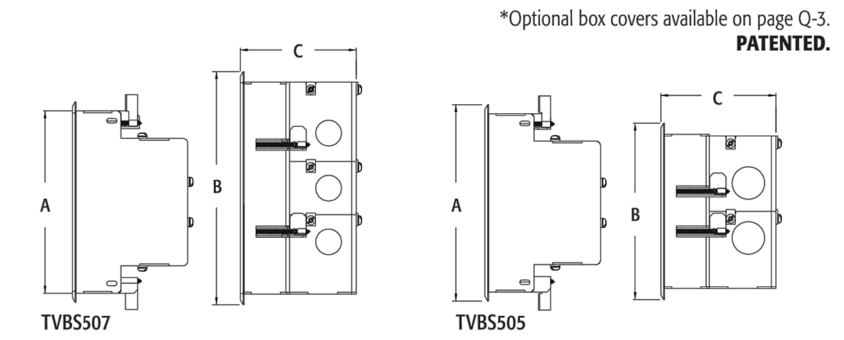
For new or existing construction. Metallic, recessed combo boxes for power and/or low voltage for class 2 wiring of satellite or cable TV, speakers, etc.

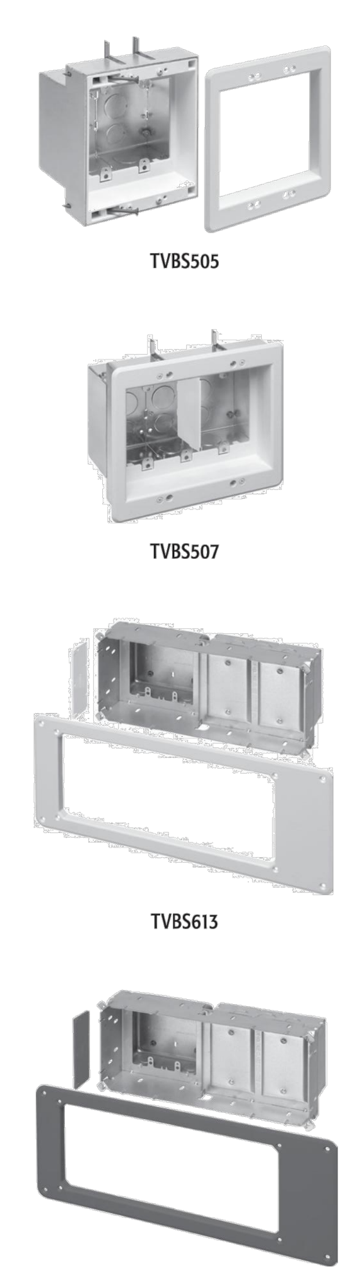
FEATURES AND BENEFITS
- Steel box with non-metallic paintable white or black trim plate
- Easy to install, secure installation
- Mounting wings on two- and three-gang styles hold boxes securely against the wall in retrofit projects
- Boxes screw-mount to stud in new construction
- Optional covers for unused boxes

CATALOG NUMBER	UPC/DCI/NAED MFG #018997	DESCRIPTION	UNIT PKG	STD PKG	DIM A	DIM B	DIM C
TVBS505*	37955	2-Gang steel box w/ white non-metallic trim plate	1	4	6.698	6.012	3.937
TVBS505BL	20740	2-Gang steel box w/ black non-metallic trim plate	1	4	6.698	6.012	3.937
TVBS507*	37956	3-Gang steel box w/ white non-metallic trim plate	1	4	6.205	7.930	3.937
TVBS613	09633	4-Gang steel box with white non-metallic trim plate	1	1	7.000	17.000	3.848
TVBS613BL	09660	4-Gang steel box with black non-metallic trim plate	1	1	7.000	17.000	3.848
TVB613C	15250	4-Gang white cover	5	5	7.000	17.000	.127

*Optional box covers available on page Q-3.
PATENTED.

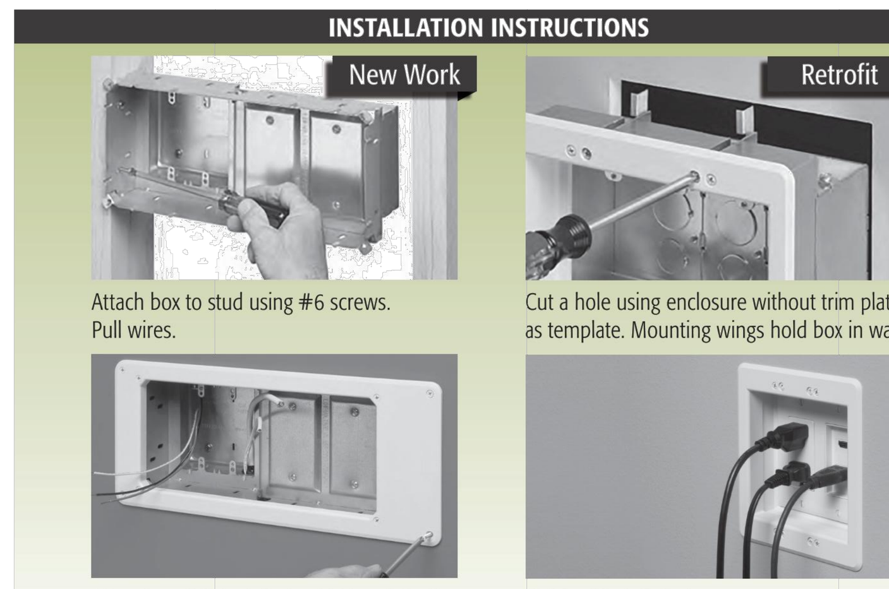
cULus E170558





Scan For Video

INSTALLATION INSTRUCTIONS



Attach box to stud using #6 screws. Pull wires.

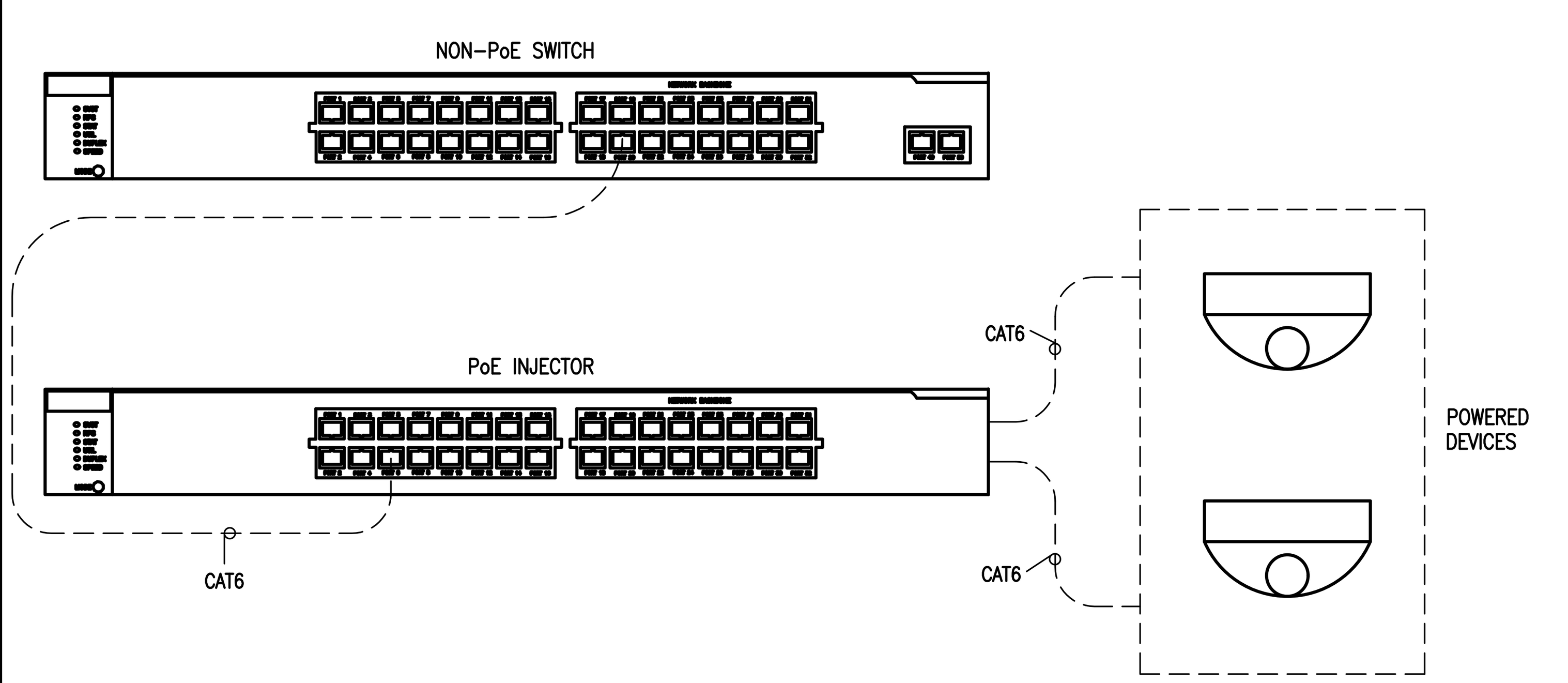
Cut a hole using enclosure without trim plate, as template. Mounting wings hold box in wall.

After drywall is installed, add trim plate, then install enclosure assembly to wall with outer screws.

Finished install shot.

NETWORK GENERAL NOTES:

- * NON-PoE SWITCH, PoE INJECTOR AND CAMERAS PROVIDED BY OWNER



1 POWERED NETWORK DEVICE WIRING DETAIL
SCALE: NTS

GENERAL NOTES:

ITEMS SHOWN ON THIS PAGE ARE FOR EXAMPLE ONLY. OTHER MANUFACTURER'S DEVICES OF EQUAL QUALITY ARE ALLOWED.

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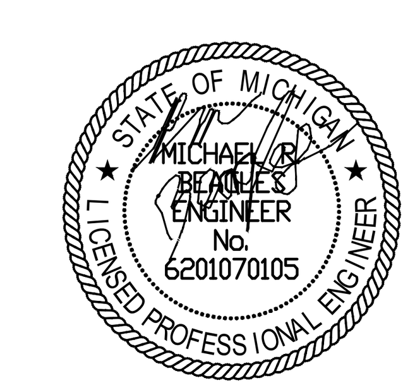


ELECTRICAL DETAILS
E5.2

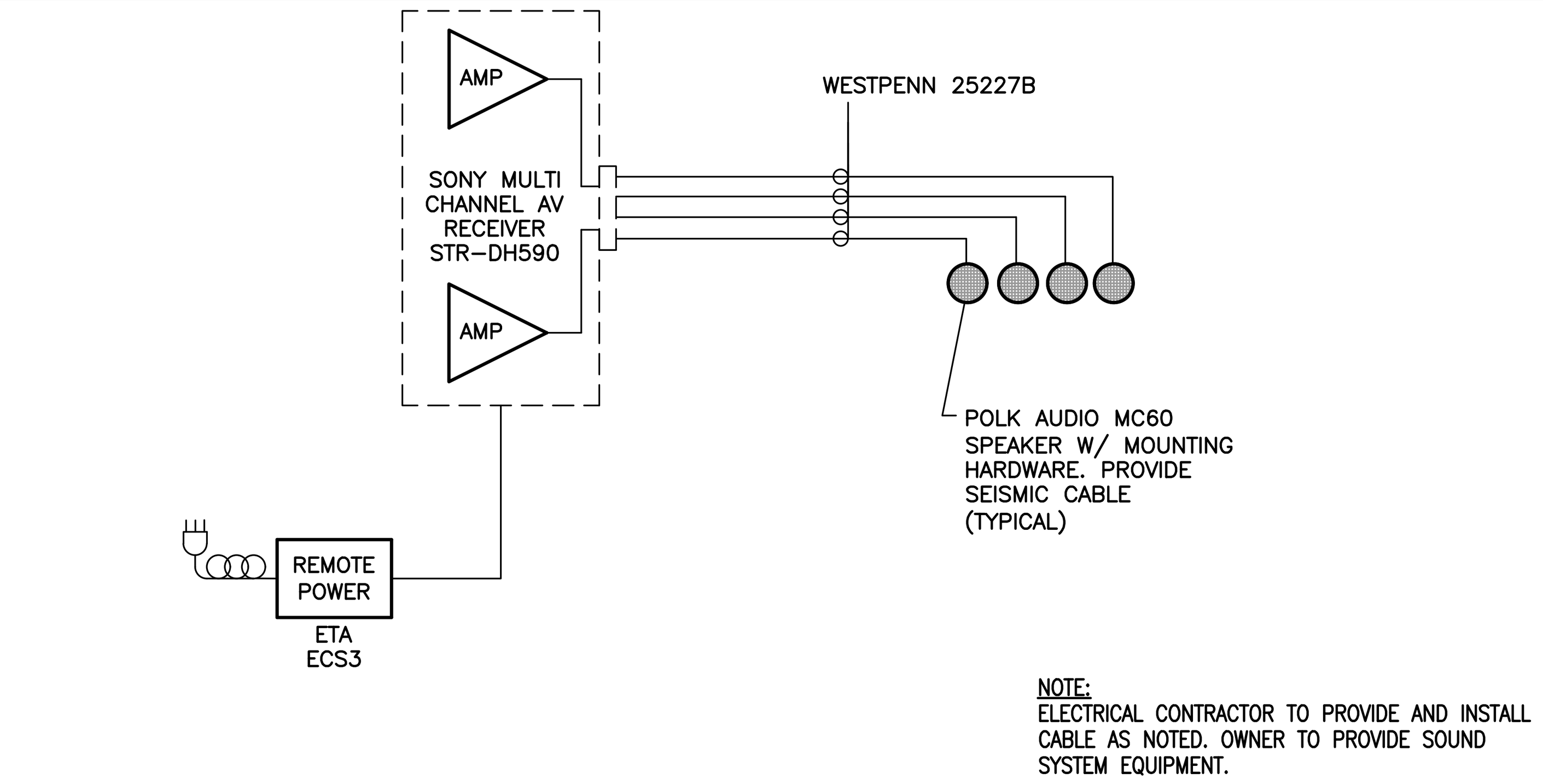
JZW ARCHITECTS

CRUMBL COOKIES - WATERFORD #1046

4978 HIGHLAND RD
WATERFORD TWP, MI 48327

22-246

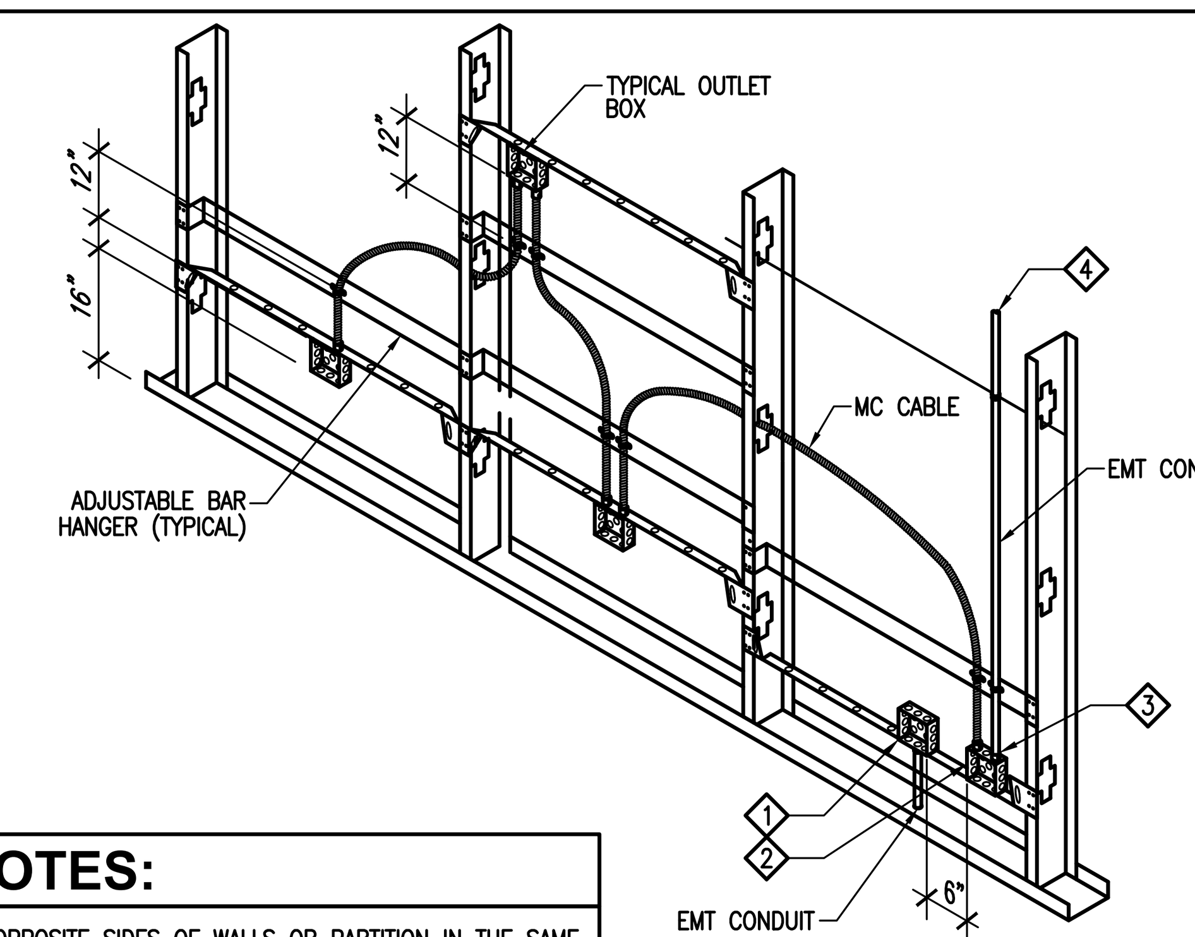
ISSUED: DECEMBER 19, 2022
CURRENT REVISION:



NOTE:
ELECTRICAL CONTRACTOR TO PROVIDE AND INSTALL CABLE AS NOTED. OWNER TO PROVIDE SOUND SYSTEM EQUIPMENT.

1 SOUND SYSTEM RISER DIAGRAM

SCALE: **NTS**



KEYED NOTES:

1. OUTLET BOXES ON OPPOSITE SIDES OF WALLS OR PARTITION IN THE SAME STUD SPACE MUST BE SEPARATED BY A MIN. OF 6" HORIZONTAL DISTANCE.
2. ELECTRICAL BOXES INSTALLED IN FIRE RESISTANT WALLS OR PARTITIONS SHALL COMPLY WITH IBC 714.3.2 (24" SEPARATION ON OPPOSITE SIDES.)
3. INSULATED THROAT EMT CONNECTOR.
4. HOME RUN TO PANEL MUST BE IN RACEWAY.

GENERAL NOTES:

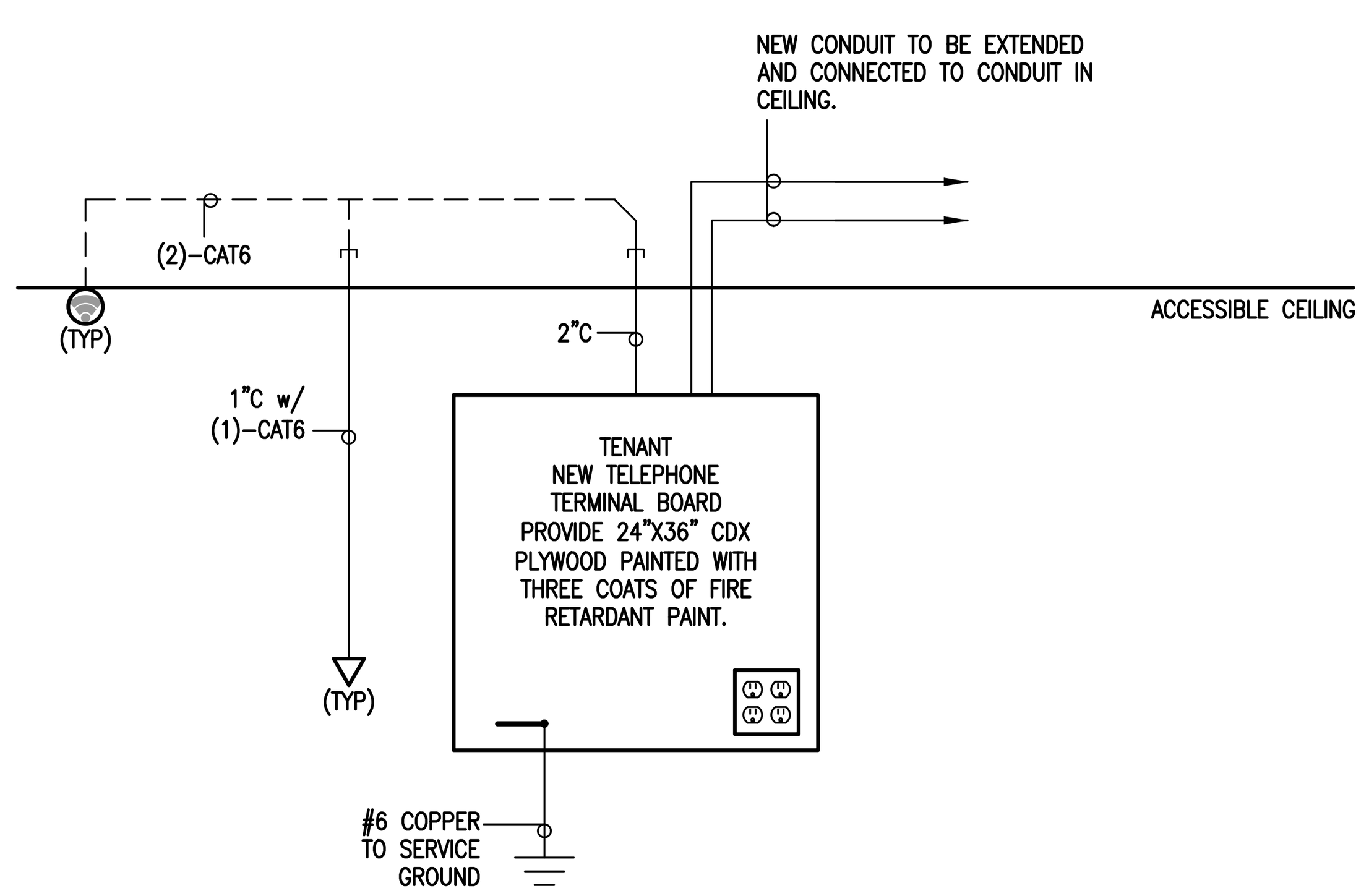
1. TYPICAL FOR WOOD AND METAL STUD ROUGH IN.
2. PLASTER RINGS NOT SHOWN. COORDINATE RING DEPTH TO BE FLUSH WITH FINAL FINISH SURFACE.
3. LOCATE ALL OUTLET BOXES IN ACCORDANCE WITH ARCHITECTURAL AND MECHANICAL DRAWINGS, AND WITH ALL APPLICABLE SHOP DRAWINGS.

2 ROUGH-IN DETAIL FOR MC CABLE

SCALE: **NTS**

NOTES:

1. CONNECT FROM NEW PHONE BOARD TO EXISTING TELEPHONE BOX. 1-1/2" FOR TELEPHONE AND 1" FOR CATV. PROVIDE A PULL STRING BACK TO MAIN BUILDING TELEPHONE TERMINAL BOARD.



3 COMMUNICATIONS RISER DIAGRAM

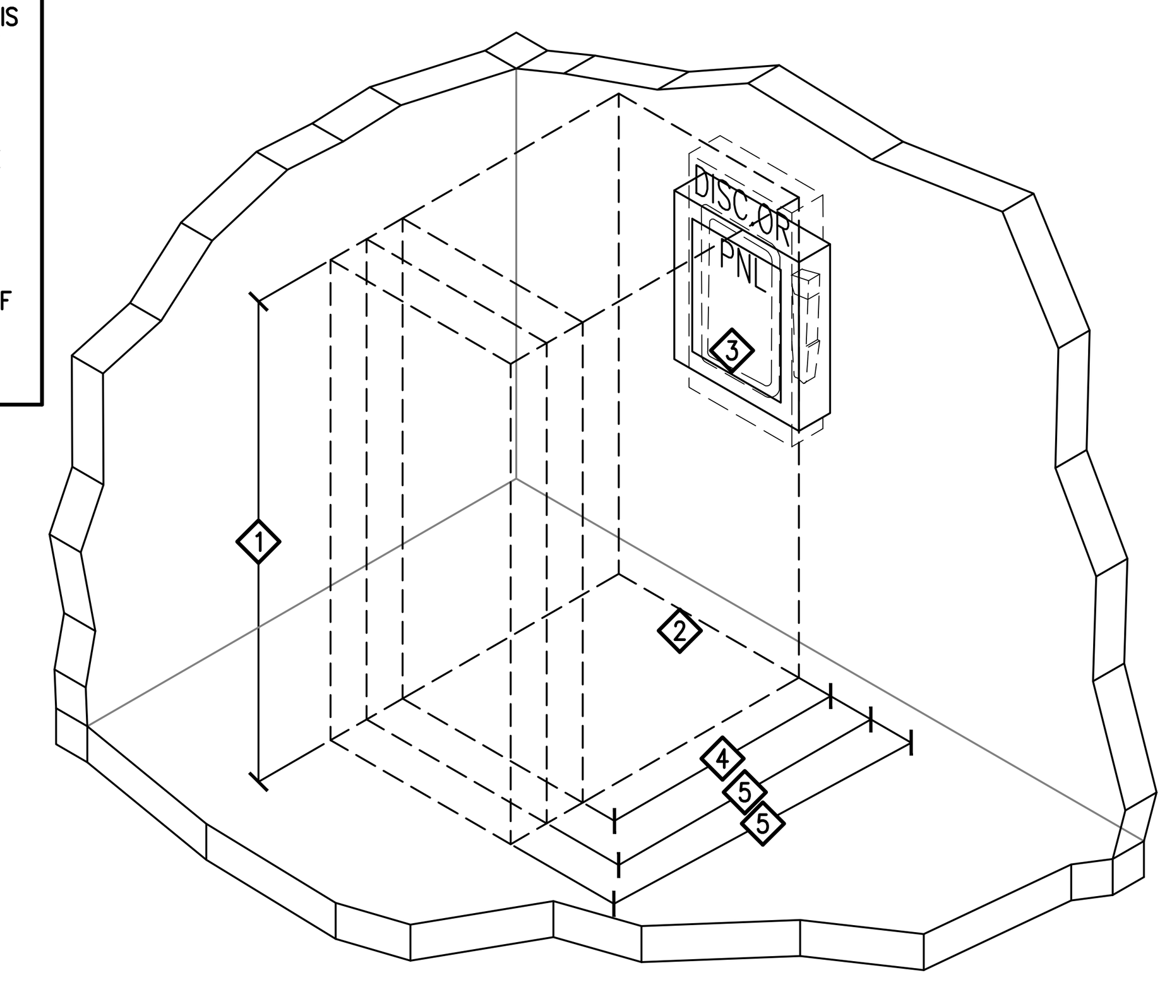
SCALE: **NTS**

KEYED NOTES:

1. THE MINIMUM HEADROOM OF WORKING SPACE SHALL BE 6½ FT.
2. THE WIDTH OF THE WORKING SPACE SHALL BE THE WIDTH OF THE EQUIPMENT OR 30 IN., WHICHEVER IS GREATER. THE PANEL DOOR SHALL OPEN AT LEAST 90 DEGREES.
3. ALL CIRCUIT BREAKERS OR DISCONNECT HANDLES SHALL BE NOT MORE THAN 6 FT 7 IN. ABOVE THE FLOOR WHEN IN THEIR HIGHEST POSITION.
4. 3 FT CLEARANCE IF 0-150V TO GROUND
5. 3.5FT CLEARANCE IF 151-600V TO GROUND. 4FT IF EXPOSED LIVE PARTS ON BOTH SIDES OF THE WORKING SPACE.

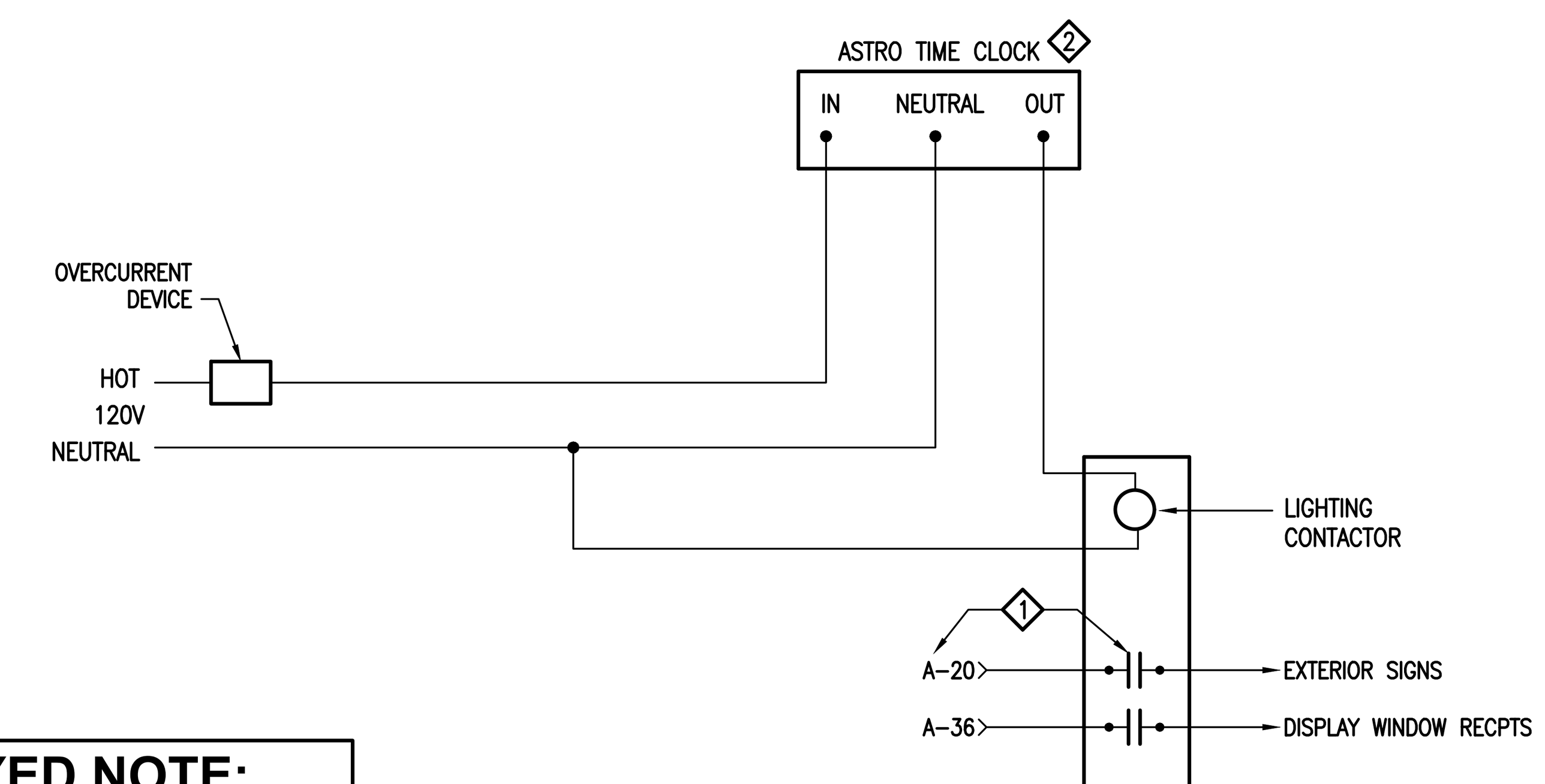
GENERAL NOTE:

1. ALL WORKING SPACE CLEARANCE FROM FACE OF PANEL.



4 ELECTRICAL EQUIPMENT WORK SPACE CLEARANCES

SCALE: **NTS**



KEYED NOTE:

1. CONTRACTOR AMPERAGE SHALL BE COMPATIBLE WITH CIRCUIT AMPERAGE
2. TIME CLOCK SHALL BE CAPABLE OF RETAINING PROGRAMMING AND TIME SETTING DURING LOSS OF POWER FOR A PERIOD OF AT LEAST 10 HOURS.

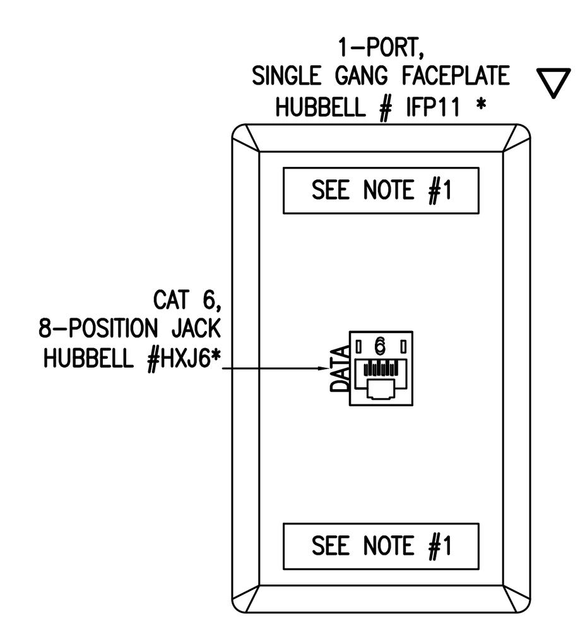
5 LIGHTING CONTROL WIRING DIAGRAM

SCALE: **NTS**

ELECTRICAL GENERAL NOTES:

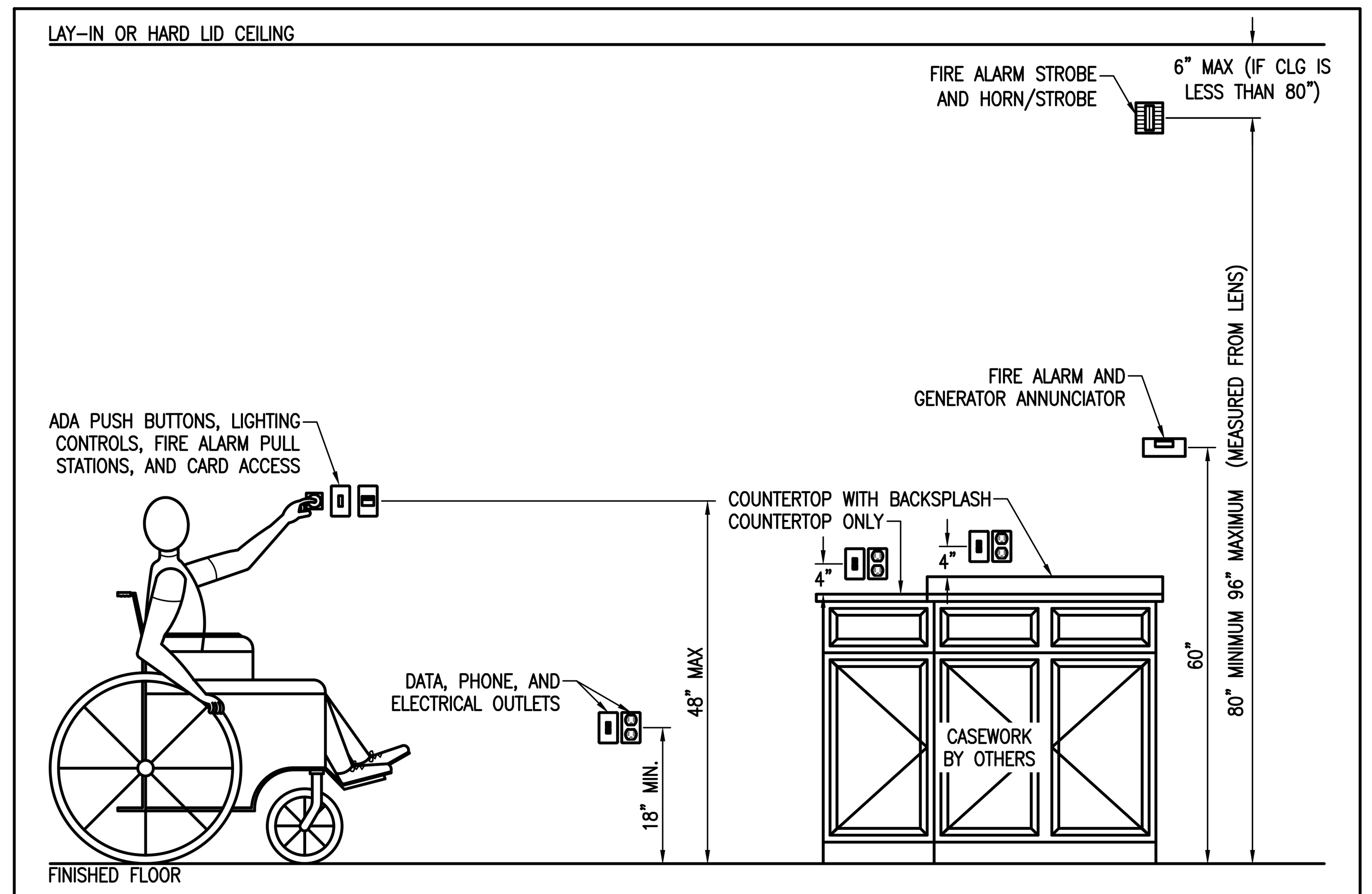
1. COORDINATE STATION AND PORT LABELING WITH OWNER.
2. ALL PATCH CABLES AND STATION CABLES SHALL BE PROVIDED AND INSTALLED BY EC.
3. ALL PATCHING AND/OR CROSS CONNECTION SHALL BE PERFORMED BY THE EC.

* MATCH FACEPLATE COLOR TO RECEPTACLES.



6 DATA/VOICE JACK INSTALLATION DETAIL

SCALE: **NTS**

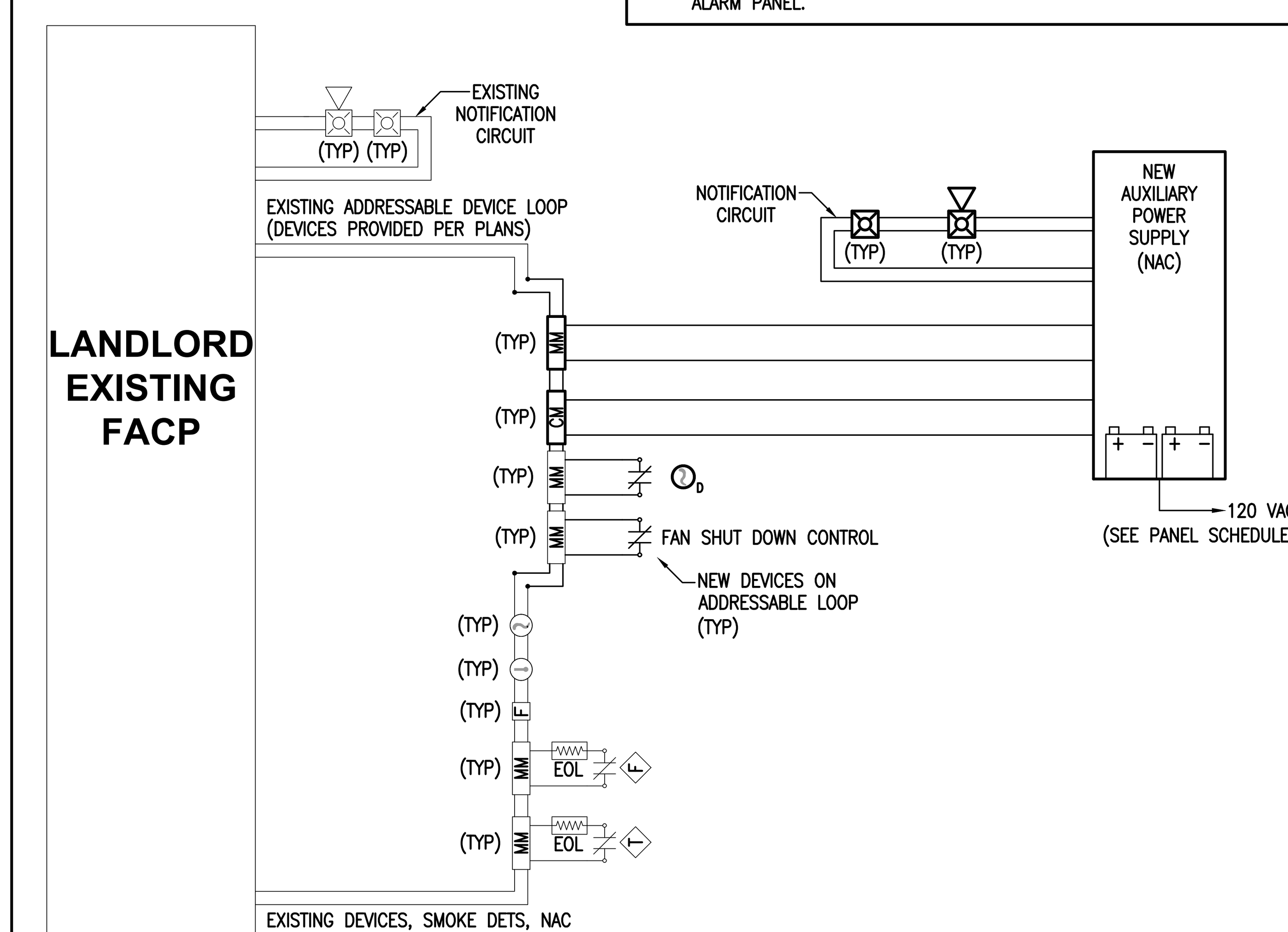


7 DEVICE MOUNTING HEIGHTS INSTALLATION DETAIL

SCALE: NTS

NOTES:

1. FIRE ALARM SYSTEM AS SHOWN IS SCHEMATIC ONLY AND DOES NOT INDICATE ALL DEVICES, EQUIPMENT, WIRING ETC. E.C. SHALL SUBMIT COMPLETE ENGINEERED DRAWINGS TO AHJ FOR REVIEW AND APPROVAL AND SHALL INCLUDE ALL REQUIRED DEVICES AND EQUIPMENT.
2. ALL CABLING TO BE VENDER DETERMINED. CABLING ENTERING SPACE ABOVE CEILING GRID MUST BE PLENUM RATED PER NEC 30.22
3. FIELD VERIFY LOCATION AND MANUFACTURER OF LANDLORD'S BUILDING FIRE ALARM PANEL.



8 EXISTING FIRE ALARM RISER DIAGRAM

SCALE: **NTS**

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ELECTRICAL DETAILS
E5.3

22-246

CRUMBL COOKIES - WATERFORD #1046

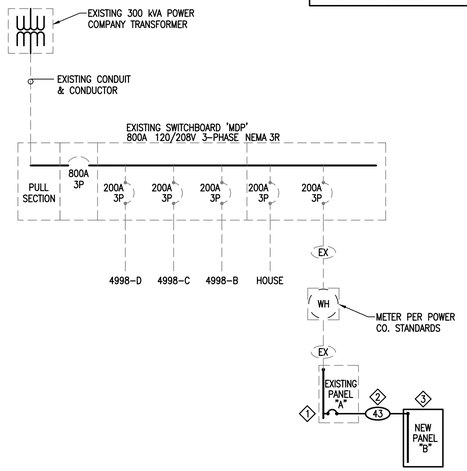
4978 HIGHLAND RD
WATERFORD TWP, MI 48327

ISSUED: DECEMBER 19, 2022 CURRENT REVISION:

STATE OF MICHIGAN — MICHAEL R. BEAGLES — ENGINEER — No. 6201070105 — LICENSED PROFESSIONAL ENGINEER

KEYED NOTES:

1. INSTALL NEW BREAKER TO PANEL "B"
2. INSTALL CONDUCTORS AND CONDUIT AS INDICATED.
3. INSTALL NEW PANEL "B". SEE PANEL SCHEDULE FOR FURTHER DETAILS.



1 POWER ONE-LINE DIAGRAM

SCALE: NTS

COPPER FEEDER SCHEDULE

TYPE	CONDUIT SIZE PVC	CONDUIT SIZE EMT	CONDUCTORS QUAN.	CONDUCTORS SIZE	75°C AMP RATING
212	3/4"	3/4"	2	#12	25
312	3/4"	3/4"	3	#12	
412	3/4"	3/4"	4	#12	
20	3/4"	3/4"	2	#10	35
30	3/4"	3/4"	3	#10	
40	3/4"	3/4"	4	#10	
28	3/4"	3/4"	2	#8	50
38	3/4"	3/4"	3	#8	
48	3/4"	3/4"	4	#8	
26	3/4"	3/4"	2	#6	65
36	3/4"	3/4"	3	#6	
46	1"	1"	4	#6	
24	3/4"	3/4"	2	#4	85
34	1"	1"	3	#4	
44	1-1/4"	1-1/4"	4	#4	
23	1"	1"	2	#3	100
33	1"	1"	3	#3	
43	1-1/4"	1-1/4"	4	#3	
22	1"	1"	2	#2	115
32	1-1/4"	1-1/4"	3	#2	
42	1-1/4"	1-1/4"	4	#2	

TYPE	CONDUIT SIZE PVC	CONDUIT SIZE EMT	CONDUCTORS QUAN.	CONDUCTORS SIZE	75°C AMP RATING
21	1-1/4"	1-1/4"	2	#1	130
31	1-1/4"	1-1/4"	3	#1	
41	1-1/2"	1-1/2"	4	#1	
21X	1-1/4"	1-1/4"	2	1/0	150
31X	1-1/2"	1-1/2"	3	1/0	
41X	1-1/2"	1-1/2"	4	1/0	
22X	1-1/4"	1-1/4"	2	2/0	175
32X	1-1/2"	1-1/2"	3	2/0	
42X	2"	2"	4	2/0	
23X	1-1/2"	1-1/4"	2	3/0	200
33X	2"	2"	3	3/0	
43X	2"	2"	4	3/0	
24X	1-1/2"	1-1/2"	2	4/0	230
34X	2"	2"	3	4/0	
44X	2-1/2"	2-1/2"	4	4/0	
225	2"	2"	2	250 KCMIL	255
325	2"	2"	3	250 KCMIL	
425	3"	2-1/2"	4	250 KCMIL	
230	2"	2"	2	300 KCMIL	285
330	2-1/2"	2-1/2"	3	300 KCMIL	
430	3"	2-1/2"	4	300 KCMIL	

TYPE	CONDUIT SIZE PVC	CONDUIT SIZE EMT	CONDUCTORS QUAN.	CONDUCTORS SIZE	75°C AMP RATING
235	2"	2"	2	350 KCMIL	310
335	2-1/2"	2-1/2"	3	350 KCMIL	
435	3"	2-1/2"	4	350 KCMIL	
240	2"	2"	2	400 KCMIL	335
340	2-1/2"	2-1/2"	3	400 KCMIL	
440	3"	3"	4	400 KCMIL	
250	2-1/2"	2-1/2"	2	500 KCMIL	380
350	3"	2-1/2"	3	500 KCMIL	
450	4"	3-1/2"	4	500 KCMIL	
260	2-1/2"	2-1/2"	2	600 KCMIL	420
360	3-1/2"	3-1/2"	3	600 KCMIL	
460	4"	4"	4	600 KCMIL	

EQUIPMENT GROUNDING CONDUCTORS SCHEDULE

OVERCURRENT DEVICE	COPPER
15	14
20	12
30	10
40	10
60	10
100	8
200	6
300	4
400	3
500	2
600	1
800	1/0

NOTE:
1. SEE EQUIPMENT GROUND CONDUCTOR SCHEDULES OR SERVICE GROUNDING DETAIL FOR GROUND CONDUCTORS RATING.
2. ALL INSULATION SHALL BE THHN (ABOVE GRADE) OR THWN (BELOW GRADE) UNLESS NOTED OTHERWISE.
3. PVC CONDUIT SIZE IS BASED ON SCHEDULE 40 PVC. PVC & THWN ARE APPROVED FOR UNDERGROUND FEEDERS ONLY.

ROYAL ENGINEERING

ELECTRICAL
1837 S. EAST BAY BLVD.
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MECHANICAL
PROVO, UTAH 84606
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crumbl cookies

JZW ARCHITECTS

STATE OF MICHIGAN
MICHAEL R. BOWLES
LICENSED PROFESSIONAL ENGINEER
No. 6201070105

ELECTRICAL DETAILS
E5.4

22-246

CRUMBL COOKIES - WATERFORD #1046

4978 HIGHLAND RD
WATERFORD TWP, MI 48327

ISSUED: DECEMBER 19, 2022
CURRENT REVISION:

LIGHT FIXTURE SCHEDULE

FIXTURE NUMBER	FIXTURE MANUFACTURER	FIXTURE CATALOG #	LAMPS TYPE	LAMPS QTY.	FIXTURE VOLTS	FIXTURE WATTS	FIXTURE MOUNTING	DESCRIPTION	REMARKS
F1	LITHONIA	2GTL4 88L EZ1 LP850	LED	-	120	65	CEILING	LED 2x4 / 9092 LUMENS / 5000K	CHOSEN BY OWNER- NO SUBSTITUTIONS
F2	LITHONIA	WF4 LED 30K40K50K 90CRI MW	LED	-	120	10.6	RECESSED	ULTRA SLIM 4" COLOR SELECTABLE CANLESS LED RECESSED KIT ON SEPARATE DIMMER SWITCH IN SHELF ABOVE BOXING STATION	CHOSEN BY OWNER- NO SUBSTITUTIONS
F3	LITHONIA	2GTL4 30L EZ1 LP850 DGA24	LED	-	120	23.3	RECESSED	LED 2x4 / 3000 LUMENS / 5000K w/FLANGE	CHOSEN BY OWNER- NO SUBSTITUTIONS
EG	LITHONIA	AFB OEL DDBTXD UVOLT LTP WT CW	6W XENON INCLUDED	-	120	11.11	SURFACE WALL	EXTERIOR EMERGENCY EGRESS LIGHT	CONFIRM FINISH WITH ARCHITECT
EM1	LITHONIA	ELM4L	INCLUDED	-	120	0.52	SURFACE WALL	2 HEAD EMERGENCY WALL PACK	CHOSEN BY OWNER- NO SUBSTITUTIONS
EM2	LITHONIA	EU2L M12	INCLUDED	-	120	0.52	SURFACE WALL	2 HEAD EMERGENCY WALL PACK	CHOSEN BY OWNER- NO SUBSTITUTIONS
EX1	LITHONIA	ECR LED M6	INCLUDED	-	120	3.1	SURFACE WALL	RED/GREEN LED EXIT/UNIT COMBO, SQUARE LAMP HEADS	CONFIRM RED or GREEN LETTERS WITH AHJ

FOR LIGHTING INFORMATION CONTACT crumbl@cednationalaccounts.com PH. 562-926-7202

LOAD CALCULATIONS

GROSS BUILDING AREA:	1,766	SQ. FT
BUILDING VOLTAGE:	208	VOLTS
PHASE	3	PHASE
OCCUPANCY TYPE:	BUSINESS	
GENERAL LOADS:		
LIGHTING LOAD	1,832	VA
RECEPTACLE LOAD:	5,040	VA
FIRST 10,000 VA @ 100%	5,040	VA
REMAINDER @50%	-	VA
ADJUSTED RECEPTACLE TOTAL LOAD:	5,040	VA
SMALL APPLIANCE LOAD:	-	VA
KITCHEN EQUIPMENT	37,777	VA
MISC:	2,280	VA
TOTAL LOAD:	40,057	VA
HVAC LOADS:		
COOLING/HEATING	17,427	VA
RESISTANCE HEATING:	-	VA
EXHAUST:	-	VA
TOTAL:	17,427	VA
EQUIPMENT LOADS:		
MACHINERY:	-	VA
ELEVATOR:	-	VA
PUMPS:	-	VA
WELDERS:	-	VA
AIR COMPRESSORS:	-	VA
MOTORS	-	VA
NET COMPUTED LOAD	64,356	VA
NET COMPUTED LOAD (VA ¸ VOLTS):	179	AMPS

EQUIPMENT SCHEDULE

SYMBOL	DESCRIPTION	SERVICE VOLTS	SERVICE PHASE	DISCONNECT SIZE	DISCONNECT FUSE	STARTER	LOAD HP/TON	LOAD VA	LOAD AMPS	REMARKS
RTU X	EXISTING ROOF TOP UNIT	208 V	3Ø	60A NEMA 3R	-	INTEGRAL	5 TON	10,304	28.6A	MOCP 35A
CU 1	AIR COOLED CONDENSING UNIT	208 V	1Ø	60A NEMA 3R	-	INTEGRAL		6,053	29.1A	MOCP 35A
FC 1	AIR COOLED CONDENSING UNIT	208 V	1Ø	2 POLE SWITCH	-	INTEGRAL		374	1.8A	POWERED FROM OUTDOOR UNIT CU-1
IEF 1	IN-LINE EXHAUST FAN	120 V	1Ø	INTEGRAL PLUG	-	-	¼ HP	696	5.8A	IEF CONTROLLED WITH LIGHTING
EF 1	EXHAUST FAN	120 V	1Ø	PLUG/ CORD	-	-		100	0.8A	EF CONTROLLED WITH LIGHTING
WH 1	GAS WATER HEATER	120 V	1Ø	30A NEMA 1	-	-		480	4.0A	
CP 1	RECIRCULATION PUMP	120 V	1Ø	PLUG/ CORD	-	-	FRAC	52	0.4A	

NOTES:

1. VERIFY ALL EQUIPMENT LOCATIONS AND CONNECTION REQUIREMENTS (i.e. VOLTAGE, PHASE, FLA, ETC.) WITH MECHANICAL DRAWINGS/SUBMITTALS BEFORE ACTUAL EQUIPMENT INSTALLED.
2. ALL FUSES SHALL BE DUAL ELEMENT TIME DELAY. FINAL BREAKER/FUSE & DISCONNECT SIZE SHALL BE DETERMINED BY MANUFACTURER'S RECOMMENDATION FOR ACTUAL EQUIPMENT INSTALLED.
3. MAXIMUM VALUES INDICATED.
4. DISCONNECTING MEANS NOT REQUIRED FOR EQUIPMENT WITHIN SIGHT (AS DEFINED IN NEC) OF BRANCH PANEL SERVING EQUIPMENT. SEE NEC 422.31 (B).
5. DISCONNECTING MEANS NOT REQUIRED FOR APPLIANCES NOT OVER 300 VA. SEE NEC 422.31 (A).

KITCHEN EQUIPMENT SCHEDULE

SYMBOL	DESCRIPTION	SERVICE VOLTS	SERVICE PHASE	DISCONNECT SIZE	DISCONNECT NEMA	LOAD HP/TON	LOAD VA	LOAD AMPS	MOUNTING HEIGHT	REMARKS
1	WARMER	120 V	1Ø	PLUG/ CORD	5-15P		1,440	12 A		
2	MIXER - LARGE	208 V	3Ø	30A NEMA 1	-		3,603	10 A		
3	REFRIGERATOR R1	120 V	1Ø	PLUG/ CORD	5-15P		547	4.56 A		
4	REFRIGERATOR R2	120 V	1Ø	PLUG/ CORD	5-15P	-	252	2.1 A		
5	MICROWAVE	120 V	1Ø	PLUG/ CORD	5-15P		1,000	8.33 A		
6	OVEN - L	120 V	1Ø	PLUG/ CORD	5-15P		480	4 A		
7	OVEN - H	208 V	3Ø	CIRCUIT BREAKER	-		18,734	52 A		
8	REFRIGERATOR R4	120 V	1Ø	PLUG/ CORD	5-15P		336	2.8 A		
9	FREEZER - GLASS DOOR	120 V	1Ø	PLUG/ CORD	5-15P	-	1,056	8.8 A		
10	MIXER - SMALL	120 V	1Ø	PLUG/ CORD	5-15P		1,200	10 A		

NOTES:

1. VERIFY ALL EQUIPMENT LOCATIONS AND CONNECTION REQUIREMENTS (i.e. VOLTAGE, PHASE, FLA, ETC.) WITH KITCHEN DRAWINGS/SUBMITTALS BEFORE FOR ACTUAL EQUIPMENT INSTALLED.
2. ALL FUSES SHALL BE DUAL ELEMENT TIME DELAY. FINAL BREAKER/FUSE & DISCONNECT SIZE SHALL BE DETERMINED BY MANUFACTURER'S RECOMMENDATION FOR ACTUAL EQUIPMENT INSTALLED.
3. MAXIMUM VALUES INDICATED.
4. DISCONNECTING MEANS NOT REQUIRED FOR EQUIPMENT WITHIN SIGHT (AS DEFINED IN NEC) OF BRANCH PANEL SERVING EQUIPMENT. SEE NEC 422.31 (B).
5. DISCONNECTING MEANS NOT REQUIRED FOR APPLIANCES NOT OVER 300 VA. SEE NEC 422.31 (A).

FAULT CURRENT CALCULATION TABLE

MAIN UTILITY COMPANY TRANSFORMER	TRANSFORMER KVA	AFC AT UTILITY	%Z
3Ø 120/208V -800A PAD MOUNTED	300	42,000 A	5.75%

CONFIGURATION FROM		TO		LENGTH	SOURCE FAULT CURRENT	FEEDER SIZE	FEEDERS PER PHASE	WIRE CONSTANT	SYSTEM LINE TO LINE VOLTS	XFMR SECONDARY VOLTS	PHASE	KVA	%Z	MOTOR LOAD	FAULT CURRENT AT EQUIPMENT	FULL OR SERIES RATED	MINIMUM SYMMETRICAL EQUIPMENT AIC RATING
TRANSFORMER	UTILITY	SWITCH	DISC	55'-0"	42,000 AIC	350 AL	3	16,812	208 V		3Ø		-		30,404 AIC	FULL	42,000 AIC
SWITCH	DISC	PANELBOARD	A	25'-0"	30,404 AIC	3/0 CU	1	13,923	208 V		3Ø		-		20,902 AIC	FULL	22,000 AIC
PANELBOARD	A	PANELBOARD	B	5'-0"	20,902 AIC	3 CU	1	4,802	208 V		3Ø		-		17,695 AIC	FULL	22,000 AIC

PANEL SCHEDULE "A"

VOLTAGE: 208 Y/ 120 VOLTS
MOUNTING: SURFACE
ENCLOSURE: NEMA 1
PHASE: 3
WIRE: 4
BUS RATING (AMPS): 225
MAIN CIRCUIT BREAKER:
AIC: SEE FAULT CURRENT TABLE
REMARKS: EXISTING EATON CUTLER-HAMMER PANELBOARD ALL PERMANENTLY- CONNECTED APPLIANCES NOT WITHIN SIGHT OF THE PANEL MUST HAVE LOCKABLE CIRCUIT BREAKERS PER NEC 422.31.

No.	AMPS	POLE	MOD.	CIRCUIT NAME	C	WIRE	GRD	DEMAND FACTOR	WATTS	ØA	ØB	ØC	WATTS	DEMAND FACTOR	GRD	WIRE	C	CIRCUIT NAME	MOD.	POLE	AMPS	No.
1	35	3	-	RTU-X	¾"	#10	#10	1.00	3,435	4,155			720	1.00	#12	#12	¾"	CAMERAS/SPEAKERS	GFCI	1	20	2
3	-	-	-	-	-	#10	-	1.00	3,435		4,434		1,000	0.65	#12	#12	¾"	MICROWAVE	GFCI	1	20	4
5	-	-	-	-	-	#10	-	1.00	3,435			4,434	1,000	0.65	#12	#12	¾"	MICROWAVE	GFCI	1	20	6
7	60	3	-	OVEN - H	1"	#6	#10	0.65	6,245	6,792			547	0.65	#12	#12	¾"	REFRIGERATOR R1	GFCI	1	20	8
9	-	-	-	-	-	#6	-	0.65	6,245		6,792		547	0.65	#12	#12	¾"	REFRIGERATOR R1	GFCI	1	20	10
11	-	-	-	-	-	#6	-	0.65	6,245			6,792	547	0.65	#12	#12	¾"	REFRIGERATOR R1	GFCI	1	20	12
13	60	3	-	OVEN - H	1"	#6	#10	0.65	6,245	6,792			547	0.65	#12	#12	¾"	REFRIGERATOR R1	GFCI	1	20	14
15	-	-	-	-	-	#6	-	0.65	6,245		6,792		547	0.65	#12	#12	¾"	REFRIGERATOR R1	GFCI	1	20	16
17	-	-	-	-	-	#6	-	0.65	6,245			6,792	547	0.65	#12	#12	¾"	REFRIGERATOR R1	GFCI	1	20	18
19	20	1	GFCI	OVEN - L	¾"	#12	#12	0.65	480	1,680			1,200	1.25	#12	#12	¾"	SIGNS	-	1	20	20
21	20	1	GFCI	OVEN - L	¾"	#12	#12	0.65	480		1,920		1,440	0.65	#12	#12	¾"	WARMER	GFCI	1	20	22
23	20	3	-	MIXER - LARGE	¾"	#12	#12	0.65	1,201			1,921	720	1.00	#12	#12	¾"	FRONT CO	GFCI	1	20	24
25	-	-	-	-	-	#12	-	0.65	1,201	1,201				1.00	-	#12	-	SPARE	-	-	-	26
27	-	-	-	-	-	#12	-	0.65	1,201		1,741		540	1.00	#12	#12	¾"	BACK CO	GFCI	1	20	28
29	20	3	-	MIXER - LARGE	¾"	#12	#12	0.65	1,201			2,200	1,000	0.65	#12	#12	¾"	MICROWAVE	GFCI	1	20	30
31	-	-	-	-	-	#12	-	0.65	1,201	2,666			1,465	1.25	#12	#12	¾"	LIGHTS / EF-1	-	1	20	32
33	-	-	-	-	-	#12	-	0.65	1,201		2,641		1,440	0.65	#12	#12	¾"	WARMER	GFCI	1	20	34
35	20	1	GFCI	FREEZER - GLASS DOOR	¾"	#12	#12	0.65	1,056			1,416	360	1.25	#12	#12	¾"	DISPLAY WINDOW	GFCI	1	20	36
37	20	3		SURGE PROTECTION DEVICE		#12	#12	1.00		2,494			2,494	1.00	SEE ONE-LINE			PANEL "B"	-	3	100	38
39	-	-		-	-	#12	-	1.00			5,254		5,254	1.00	DIAGRAM FOR			-	-	-	-	40
41	-	-		-	-	#12	-	1.00				4,630	4,630	1.00	REQUIREMENTS			-	-	-	-	42

NOTES :

1. ALL INSULATION ON CONDUCTORS TO BE THHN UNLESS NOTED OTHERWISE. INSULATION ON ALL UNDERGROUND EXTERIOR CONDUCTORS SHALL BE THHW.
2. LOAD DEMANDS CALCULATED AS PER SECTIONS 210 & 220 OF THE NATIONAL ELECTRICAL CODE.
3. PANEL COVER SHALL BE FIELD MARKED FOR FLASH PROTECTION WITH A PERMANENT LABEL AS REQUIRED BY THE NATIONAL ELECTRICAL CODE SECTION 110. LABEL SHALL READ: "DANGER: POTENTIAL ARC FLASH HAZARD"
4. PANELBOARD SHALL BE FIELD MARKED WITH THE AVAILABLE FAULT CURRENT PER NEC 408.6.
5. FIRE ALARM SYSTEMS SHALL HAVE BRANCH CIRCUITS IDENTIFIED BY RED LABELS STATING "FIRE ALARM CIRCUIT" AS REQUIRED BY THE NATIONAL ELECTRICAL CODE ARTICLE 760.41B
6. ABBREVIATIONS: CO-CONVENIENCE OUTLET, RR-RESTROOM, (N)ORTH, (S)OUTH, (E)AST, (W)EST.

ØA	ØB	ØC	TOTALS	
25,779	29,573	28,185	83,537	CONNECTED LOAD (VA)
			232	CONNECTED LOAD (A)
-5,097	-7,121	-6,574	-18,792	DEMAND FACTOR ADJUSTMENTS (VA)
20,683	22,452	21,611	64,746	TOTAL LOAD (VA)
172	187	180		TOTAL LOAD (A)
			187	MAXIMUM LOAD (A)
32%	35%	33%		PHASE BALANCE

PANEL SCHEDULE "B"

VOLTAGE: 208 Y/ 120 VOLTS
MOUNTING: SURFACE
ENCLOSURE: NEMA 1
PHASE: 3
WIRE: 4
BUS RATING (AMPS): 100
MAIN LUGS ONLY
AIC SEE FAULT CURRENT TABLE
REMARKS: NEW PANELBOARD ALL PERMANENTLY- CONNECTED APPLIANCES NOT WITHIN SIGHT OF THE PANEL MUST HAVE LOCKABLE CIRCUIT BREAKERS PER NEC 422.31.

No.	AMPS	POLE	MOD.	CIRCUIT NAME	C	WIRE	GRD	DEMAND FACTOR	WATTS	ØA	ØB	ØC	WATTS	DEMAND FACTOR	GRD	WIRE	C	CIRCUIT NAME	MOD.	POLE	AMPS	No.
1	20	1	GFCI	REFRIGERATOR R2	¾"	#12	#12	0.65	252	1,152			900	1.00	#12	#12	¾"	OPEN BAKERY CO	GFCI	1	20	2
3	20	1	GFCI	MIXER - SMALL	¾"	#12	#12	0.65	1,200		1,740		540	1.00	#12	#12	¾"	FRONT LOBBY CO	GFCI	1	20	4
5	20	1	GFCI	POS	¾"	#12	#12	1.00	360			720	360	1.00	#12	#12	¾"	COMMUNICATIONS BOARD	GFCI	1	20	6
7	20	1	GFCI	REFRIGERATOR R4	¾"	#12	#12	0.65	336	696			360	1.00	#12	#12	¾"	ROOFTOP GFCI RCPT	-	1	20	8
9	20	1	-	SPARE				1.00			0			1.00				SPARE	-	1	20	10
11	20	1	-	SPARE				1.00				0		1.00				SPARE	-	1	20	12
13	20	1	GFCI	GAS WATER HEATER	¾"	#12	#12	0.65	480	1,020			540	1.00	#12	#12	¾"	RESTROOM & BOH & CP-1	GFCI	1	20	14
15	20	1	RED	NAC	¾"	#12	#12	1.00	720		720			1.00				SPARE	-	1	20	16
17	20	1	-	IN-LINE EXHAUST FAN	¾"	#12	#12	1.00	696			696		1.00				SPARE	-	1	20	18
19	20	1	-	SPARE				1.00		0				1.00				SPARE	-	1	20	20
21	35	2	-	CU-1 AND FC-1	¾"	#10	#10	1.00	3,214		3,214			1.00				SPARE	-	1	20	22
23	-	-	-	-	-	#10	-	1.00	3,214			3,214		1.00				SPARE	-	1	20	24
25	20	1	-	SPARE				1.00		0				1.00				SPARE	-	1	20	26
27	20	1	-	SPARE				1.00			0			1.00				SPARE	-	1	20	28
29	20	1	-	SPARE				1.00				0		1.00				SPARE	-	1	20	30

NOTES :

1. ALL INSULATION ON CONDUCTORS TO BE THHN UNLESS NOTED OTHERWISE. INSULATION ON ALL UNDERGROUND EXTERIOR CONDUCTORS SHALL BE THHW.
2. LOAD DEMANDS CALCULATED AS PER SECTIONS 210 & 220 OF THE NATIONAL ELECTRICAL CODE.
3. PANEL COVER SHALL BE FIELD MARKED FOR FLASH PROTECTION WITH A PERMANENT LABEL AS REQUIRED BY THE NATIONAL ELECTRICAL CODE SECTION 110. LABEL SHALL READ: "DANGER: POTENTIAL ARC FLASH HAZARD"
4. PANELBOARD SHALL BE FIELD MARKED WITH THE AVAILABLE FAULT CURRENT PER NEC 408.6.
5. FIRE ALARM SYSTEMS SHALL HAVE BRANCH CIRCUITS IDENTIFIED BY RED LABELS STATING "FIRE ALARM CIRCUIT" AS REQUIRED BY THE NATIONAL ELECTRICAL CODE ARTICLE 760.41B
6. ABBREVIATIONS: CO-CONVENIENCE OUTLET, RR-RESTROOM, (N)ORTH, (S)OUTH, (E)AST, (W)EST.

ØA	ØB	ØC	TOTALS	
2,868	5,674	4,630	13,171	CONNECTED LOAD (VA)
			37	CONNECTED LOAD (A)
-374	-420	0	-794	DEMAND FACTOR ADJUSTMENTS (VA)
2,494	5,254	4,630	12,377	TOTAL LOAD (VA)
21	44	39		TOTAL LOAD (A)
			44	MAXIMUM LOAD (A)
20%	42%	37%		PHASE BALANCE

CURRENT REVISION:

ISSUED: DECEMBER 19, 2022

4978 HIGHLAND RD
WATERFORD TWP, MI 48327

CRUMBL COOKIES - WATERFORD #1046

22-246

STATE OF MICHIGAN
MICHAEL R. BEAGLES
ENGINEER
No. 6201070105
LICENSED PROFESSIONAL ENGINEER

ROYAL ENGINEERING

ELECTRICAL MECHANICAL
1837 S. EAST BAY BLVD. PROVO, UTAH 84606
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 JOB# J22418.00 DATE PLOTTED: 12/22/2022

crumbl cookies

ELECTRICAL SCHEDULES

E6.1

JZW ARCHITECTS

ELECTRICAL SPECIFICATIONS

GENERAL PROVISION
A. REFERENCE
1. THE GENERAL CONDITIONS AND OTHER CONTRACT DRAWINGS AS SET FORTH IN THE FOREGOING PAGES ARE HEREBY INCORPORATED INTO AND BECOME A PART OF THE SPECIFICATIONS FOR WORK UNDER THIS TITLE, INSOFAR AS THEY APPLY HERETO.
2. ALL SPECIFICATIONS UNDER THIS DIVISION TITLE ARE DIRECTED TO AND ARE THE RESPONSIBILITY OF THE ELECTRICAL CONTRACTOR, UNLESS OTHER TRADES OR PERSONS ARE SPECIFICALLY MENTIONED, "ELECTRICAL CONTRACTOR" IS INFERRED AND INTENDED.

B. CONTRACT DRAWINGS
1. THE DRAWINGS ACCOMPANYING THESE SPECIFICATIONS ARE COMPLEMENTARY EACH TO THE OTHER AND WHAT IS CALLED FOR BY ONE SHALL BE AS IF CALLED FOR BY BOTH.
2. CONSULT ALL CONTRACT DRAWINGS WHICH MAY AFFECT THE LOCATION OF EQUIPMENT, CONDUIT AND WIRING AND MAKE MINOR ADJUSTMENTS IN LOCATION TO SECURE COORDINATION.
3. WIRING LAYOUT IS SCHEMATIC AND EXACT LOCATIONS SHALL BE DETERMINED BY FIELD CONDITIONS.
4. OTHER THAN MINOR ADJUSTMENTS SHALL BE SUBMITTED TO THE OWNER'S REPRESENTATIVE FOR APPROVAL BEFORE PROCEEDING WITH THE WORK.

C. JOB-SITE COPY OF DOCUMENTS
1. MAINTAIN AT THE SITE, ONE COPY OF ALL DRAWINGS, SPECIFICATIONS, ADDENDA APPROVED SHOP DRAWINGS, CHANGE ORDERS AND OTHER MODIFICATIONS, IN GOOD ORDER AND MARKED TO RECORD ALL CHANGES MADE DURING CONSTRUCTION. THESE SHALL BE AVAILABLE TO THE OWNER'S REPRESENTATIVE. THE DRAWINGS MARKED TO RECORD ALL CHANGES MADE DURING CONSTRUCTION SHALL BE DELIVERED TO THE OWNER'S REPRESENTATIVE FOR THE OWNER UPON COMPLETION OF THE WORK. AN ADDITIONAL SET OF DRAWINGS WILL BE FURNISHED BY THE OWNER'S REPRESENTATIVE FOR THIS PURPOSE UPON REQUEST.

D. MANUFACTURER'S DRAWINGS
1. THE CONTRACTOR SHALL SUBMIT TO THE ARCHITECT FOR REVIEW. (6) COPIES OF MANUFACTURER'S DRAWINGS AND WIRING DIAGRAMS. THE ENGINEER WILL REVIEW CONTRACTOR'S SHOP DRAWINGS AND RELATED SUBMITTALS (AS INDICATED BELOW) WITH RESPECT TO THE ABILITY OF THE DETAILED WORK, WHEN COMPLETE, TO BE A PROPERLY FUNCTIONING INTEGRAL ELEMENT OF THE OVERALL SYSTEM DESIGNED BY THE ENGINEER. BEFORE SUBMITTING A SHOP DRAWING OR ANY RELATED MATERIAL TO THE ENGINEER, CONTRACTOR SHALL: REVIEW EACH SUCH SUBMISSION FOR CONFORMANCE WITH THE MEANS, METHODS, TECHNIQUES, SEQUENCES,AND OPERATIONS OF CONSTRUCTION, AND SAFETY PRECAUTIONS AND PROGRAMS INCIDENTAL THERETO, ALL OF WHICH ARE THE SOLE RESPONSIBILITY OF CONTRACTOR: APPROVE EACH SUCH SUBMISSION BEFORE SUBMITTING IT; AND SO STAMP EACH SUCH SUBMISSION BEFORE SUBMITTING IT. THE ENGINEER SHALL ASSUME THAT NO SHOP DRAWING OR RELATED SUBMITTAL COMPRISES A VARIATION UNLESS CONTRACTOR ADVISES ENGINEER OTHERWISE VIA A WRITTEN INSTRUMENT WHICH IS ACKNOWLEDGED BY ENGINEER IN WRITING. THE ITEMS, TYPES OF SUBMITTALS AND RELATED MATERIAL (IF ANY) CALLED FOR ARE INDICATED BELOW:

ITEMS	TYPE SUBMITTALS REQUESTED
LIGHTING AND POWER PANELS	SHOP DRAWINGS
LIGHTING FIXTURES	CATALOG CUTS

E. GUARANTEES
1. THE ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE FOR ALL DEFECTS, REPAIRS AND REPLACEMENTS IN MATERIALS AND WORKMANSHIP FOR A PERIOD OF ONE (1) YEAR AFTER DATE OF SUBSTANTIAL COMPLETION AS DETERMINED BY THE OWNER'S REPRESENTATIVE. PRODUCT GUARANTEES GREATER THAN ONE (1) YEAR SHALL BE PASSED ALONG TO THE OWNER FOR FULL BENEFIT OF THE MANUFACTURER'S WARRANTY.

WORK INCLUDED
A. INSTALLATION, MATERIALS, AND WORKMANSHIP
1. FURNISH AND INSTALL ALL NECESSARY ANCHORS, SUPPORTS, STRAPS, BOXES, FITTINGS AND OTHER SIMILAR APPURTENANCES NOT INDICATED ON THE DRAWINGS BUT WHICH ARE REQUIRED FOR A COMPLETE AND PROPERLY INSTALLED SYSTEM CONSISTENT WITH THE ARCHITECTURAL TREATMENT OF THE BUILDING.
2. THE ELECTRICAL CONTRACTOR, INSOFAR AS THE WORK IS CONCERNED, SHALL AT ALL TIMES KEEP THE PREMISES IN A NEAT AND ORDERLY CONDITION. AND AT THE COMPLETION OF THE WORK, SHALL PROPERLY CLEAN UP AND CART AWAY DEBRIS AND EXCESS MATERIALS. ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE FOR THE COST OF DUMPSTER & REFUSED DISPOSAL AS REQUIRED FOR ELECTRICAL WORK.
3. ALL MATERIALS SHALL BE NEW AND UNDETERIORATED AND OF A QUALITY NOT LESS THAN THE MINIMUM SPECIFIED.

B. COORDINATION OF PLANS AND SPECIFICATIONS
1. CONTACT THE OWNER'S REPRESENTATIVE IMMEDIATELY IF THERE IS ANY QUESTIONS REGARDING THE MEANING OR INTENT OF EITHER PLANS OR SPECIFICATIONS, OR UPON NOTICING ANY DISCREPANCIES OR OMISSIONS IN EITHER PLANS OR SPECIFICATIONS.

C. CUTTING AND PATCHING
1. ALL ELECTRICAL EQUIPMENT SHALL BE KEPT DRY AND CLEAN DURING THE CONSTRUCTION PERIOD. INTERIOR OF ALL ENCLOSURES SHALL BE CLEANED OF DIRT AND DEBRIS BEFORE INSTALLING TRIM OR COVERS.
2. ALL FINISHED SURFACES OF EQUIPMENT FURNISHED UNDER THIS CONTRACT SHALL BE THOROUGHLY CLEANED OF DIRT AND ALL SCRATCHED OR DAMAGED SURFACES SHALL BE TOUCHED UP WITH MATCHING MATERIALS BEFORE FINAL ACCEPTANCE OF THE WORK.
3. WHEN ALL WORK IS COMPLETED AND ALL WORK HAS BEEN SATISFACTORILY TESTED AND ACCEPTED BY THE OWNER'S REPRESENTATIVE, ALL CONDUIT AND OTHER EXPOSED SURFACES SHALL BE THOROUGHLY CLEANED.

CODES AND FEES
A. CODES:
1. ALL WORK PERFORMED UNDER THIS SPECIFICATION SHALL BE DONE IN ACCORDANCE WITH THE LATEST EDITION OF THE NATIONAL ELECTRICAL CODE AS PREPARED AND PUBLISHED BY THE NATIONAL FIRE PROTECTION ASSOCIATION AND ANY APPLICABLE STATE OR LOCAL CODES.

B. FEES:
1. OBTAIN AND PAY FOR ANY AND ALL PERMITS REQUIRED BY ALL LAWS AND REGULATIONS AND PUBLIC AUTHORITY HAVING SUCH JURISDICTION.

TESTS AND INSPECTIONS
A. OBTAIN ALL INSPECTIONS REQUIRED BY ALL LAWS, ORDINANCES, RULES, REGULATIONS OR PUBLIC AUTHORITY HAVING JURISDICTION AND OBTAIN CERTIFICATES OF SUCH INSPECTIONS AND SUBMIT SAME TO THE OWNER'S REPRESENTATIVE. PAY ALL FEES, CHARGES AND OTHER EXPENSES IN CONNECTION THEREIN. OBTAIN OCCUPANCY PERMIT AS REQUIRED BY OWNER. FINAL PAYMENT SHALL NOT BE MADE UNTIL OCCUPANCY PERMIT IS OBTAINED.
B. WORK SHALL BE UNACCEPTABLE WHEN FOUND TO BE DEFECTIVE OR CONTRARY TO THE PLANS SPECIFICATIONS, CODES SPECIFIED OR ACCEPTED STANDARDS OF GOOD WORKMANSHIP.
C. THE CONTRACTOR SHALL PROMPTLY CORRECT ALL WORK FOUND UNACCEPTABLE BY THE OWNER'S REPRESENTATIVE WHETHER OBSERVED BEFORE OR AFTER SUBSTANTIAL COMPLETION AND WHETHER OR NOT FABRICATED, INSTALLED OR COMPLETED. THE CONTRACTOR SHALL BEAR ALL COSTS OF CORRECTING SUCH UNACCEPTABLE WORK, INCLUDING COMPENSATION FOR THE OWNERS REPRESENTATIVE ADDITIONAL SERVICES MADE NECESSARY THEREBY.

CONDUIT
A. FURNISH AND INSTALL ALL CONDUITS, BOXES, FITTINGS, ETC., FOR A COMPLETE RACEWAY SYSTEM.
B. ALL WIRING SHALL BE RUN IN EMT CONDUIT OR MC CABLE WITH GROUND CONDUCTOR UNLESS OTHERWISE NOTED.
C. ALL CONDUIT SIZES STATED HEREIN OR MARKED ON THE DRAWINGS ARE MINIMUM SIZE AND SHALL BE NO LESS THAN ½" UNLESS OTHERWISE NOTED.
D. ALL CONDUIT SHALL BE SUBSTANTIALLY SUPPORTED BY PIPE STRAPS OR SUITABLE CLAMPS OR HANGERS ATTACHED TO THE ELEMENTS OF THE BUILDING STRUCTURE TO PROVIDE RIGID INSTALLATION; IN NO CASE SHALL CONDUIT BE ATTACHED OR SUPPORTED FROM ADJOINING PIPE OR INSTALLED IN SUCH A MANNER AS TO PREVENT THE READY REMOVAL OF OTHER PIPE FOR REPAIRS.

WIRE AND CABLE
A. ALL CONDUCTORS SHALL BE COPPER AND OF THE AWG SIZE AND TYPE SHOWN ON THE DRAWINGS. WHERE NO SIZE OR TYPE IS SHOWN. CONDUCTORS SHALL NOT BE LESS THAN #12 TYPE XHHW, THHN, OR THWN. CONDUCTORS #8 AWG AND LARGER SHALL BE STRANDED COPPER AND HAVE 600 VOLT INSULATION; BE UL LABELED AND OF AMERICAN MANUFACTURER.
B. ALL CONNECTIONS ARE TO BE MADE USING PRESSURE TYPE TERMINALS.
C. THE FOLLOWING COLOR CODE SHALL BE USED:

	120/240 VOLT	120/208 VOLT	277/480 VOLT
PHASE A	BLACK	BLACK	BROWN
PHASE B	RED	RED	ORANGE
PHASE C		BLUE	YELLOW
NEUTRAL	WHITE	WHITE	WHITE
GROUND	GREEN	GREEN	GREEN

D. CONDUCTORS NO. 10 AWG OR SMALLER SHALL HAVE INSULATION COLORED AS NOTED ABOVE.
E. CONDUCTORS NO. 8 AWG OR LARGER SHALL HAVE INSULATION COLORED AS NOTED ABOVE OR COLORED TAPE, MINIMUM SIZE ½", WRAPPED TWICE AROUND AT THE FOLLOWING POINTS:
1. AT EACH TERMINAL.
2. AT EACH CONDUIT ENTRANCE.
3. AT INTERVALS NOT MORE THAN 12 INCHES APART IN ALL BOXES, PANEL TUBS, SWITCHBOARDS, ETC.

G. ALL BRANCH CIRCUITS SHALL BE MARKED IN THE PANEL BOARD GUTTERS. MARKERS SHALL INDICATE CORRESPONDING BRANCH--CIRCUIT NUMBERS.
H. EACH BRANCH CIRCUIT REQUIRING A NEUTRAL SHALL BE FURNISHED WITH A SEPARATE INDIVIDUAL NEUTRAL CONDUCTOR.

BOXES AND PLATES
A. FURNISH AND INSTALL ALL OUTLET, JUNCTION, AND PULL BOXES AS INDICATED ON THE DRAWINGS AND AS NECESSARY TO INSTALL THE REQUIRED CONDUIT AND WIRING IN A NEAT AND WORKMANLIKE MANNER.
B. PULL BOXES AND JUNCTION BOXES SHALL BE GALVANIZED AND OF THE CORRECT SIZE AND GAUGE, SIZED IN ACCORDANCE WITH CODE REQUIREMENTS AND SHALL BE U.L. LABELED.
C. BOXES AT EXTERIOR AREAS TO BE WATERTIGHT AND DUST-TIGHT WITH CASKETED COVERS.
D. ALL BOXES FOR EXPOSED WORK IN FINISHED SPACES SHALL BE "FS" TYPE WITH THREADED HUBS WITH RIGID CONDUIT RISER (DEEP WIRE MOLD BOXES).
E. ALL BOXES SHALL BE RIGIDLY SUPPORTED INDEPENDENT OF THE CONDUIT SYSTEM. BOXES CAST INTO MASONRY OR CONCRETE ARE CONSIDERED TO BE RIGIDLY SUPPORTED.
F. FLOOR BOXES:
1. DESCRIPTION: FLOOR BOXES COMPATIBLE WITH FLOOR BOX SERVICE FITTINGS PROVIDED IN ACCORDANCE WITH THE WIRING DEVICES SECTION OF THIS SPECIFICATION; WITH PARTITIONS TO SEPARATE MULTIPLE SERVICES; FURNISHED WITH ALL COMPONENTS, ADAPTERS, AND TRIMS REQUIRED FOR COMPLETE INSTALLATION.
2. USE CAST IRON OR NONMETALLIC FLOOR BOXES WITHIN SLAB ON GRADE.
3. USE SHEET-STEEL, CAST IRON, OR NONMETALLIC FLOOR BOXES WITHIN SLAB ABOVE GRADE.
4. METALLIC FLOOR BOXES: FULLY ADJUSTABLE (WITH INTEGRAL MEANS FOR LEVELING ADJUSTMENT PRIOR TO AND AFTER CONCRETE POUR).
5. MANUFACTURER: SAME AS MANUFACTURER OF FLOOR BOX SERVICE FITTINGS.

G. UNDERGROUND BOXES/ENCLOSURES:
1. DESCRIPTION: IN-GROUND, OPEN BOTTOM BOXES FURNISHED WITH FLUSH, NON-SKID COVERS WITH LEGEND INDICATING TYPE OF SERVICE AND STAINLESS STEEL TAMPER RESISTANT COVER BOLTS.
2. SIZE: AS INDICATED ON DRAWINGS.
3. DEPTH: AS REQUIRED TO EXTEND BELOW FROST LINE TO PREVENT FROST UPHEAVAL, BUT NOT LESS THAN 12 INCHES.
4. APPLICATIONS:
   a. SIDEWALKS AND LANDSCAPED AREAS SUBJECT ONLY TO OCCASIONAL NONDELIBERATE VEHICULAR TRAFFIC: USE POLYMER CONCRETE OR COMPOSITE ENCLOSURE WITH MINIMUM SCTE 77, TIER 8 LOAD RATING.
   b. PARKING LOTS, IN AREAS SUBJECT ONLY TO OCCASIONAL NONDELIBERATE VEHICULAR TRAFFIC: USE POLYMER CONCRETE OR COMPOSITE ENCLOSURE WITH MINIMUM SCTE 77, TIER 15 LOAD RATING.
   c. DO NOT USE POLYMER CONCRETE ENCLOSURES IN AREAS SUBJECT TO DELIBERATE VEHICULAR TRAFFIC.

H. COMPOSITE UNDERGROUND BOXES/ENCLOSURES: COMPLY WITH SCTE 77.

WIRING DEVICES
A. WIRING DEVICES SHALL BE SIMILAR TO THOSE LISTED BELOW AND OF SPECIFIED AMPERAGE. OTHER SPECIAL PURPOSE DEVICES SHALL BE AS SPECIFIED ON THE DRAWINGS.
B. DUPLEX GROUNDING TYPE RECEPTACLE - 20 AMP, 125 VOLT
1. HUBBELL 5352
2. ARROW HART 5352

C. SINGLE POLE SWITCHES - 20 AMP, 120 VOLT
D. WEATHERPROOF RECEPTACLES - 20 AMP, 125 VOLT - NEMA 5-20R
1. HUBBELL 5352 WITH 5205 COVER INTERMATIC GUARDIAN
2. I SERIES, NEMA 3R COVER
3. ARROW HART 5352 WITH 4500 COVER

E. G.F.C.I. RECEPTACLE - 20 AMP, 125 VOLT - NEMA 5-20 R
1. HUBBELL GF 5262 WITH MATCHING NYLON COVER PLATE OR WO-26 W.P. COVER

F. GROUND ALL RECEPTACLES IN ACCORDANCE WITH ARTICLE 250.146 OF NEC AND AS INDICATED IN THE GROUNDING SECTION OF THIS SPECIFICATION.

IDENTIFICATION
A. EACH PIECE OF SERVICE EQUIPMENT AND INDIVIDUAL SWITCHES, ALL DISCONNECTS, STARTERS, ALL EXHAUST FAN MANUAL STARTING SWITCHES.
B. IDENTIFICATION SHALL BE IN THE FORM OF LAMINATED PLASTIC NAMEPLATES, BLACK RACE, WITH THE LETTERS ENGRAVED INTO THE WHITE BACKGROUND, MINIMUM ¼" HIGH. PLATES SHALL BE DRILLED ON EACH END FOR SHEET METAL SCREW ATTACHMENT. NO "DYMO" OR SIMILAR TYPE LABELS WILL BE ALLOWED.
C. PANEL BOARD DIRECTORY: A TYPED CIRCUIT DIRECTORY SHALL BE PROVIDED INDICATING LOCAL AREA SERVED AND LOCATION FOR EACH BRANCH CIRCUIT.

GROUNDING
A. ALL FEEDERS AND BRANCH CIRCUITS OVER 100 VOLTS SHALL INCLUDE A GROUNDING CONDUCTOR SIZED IN ACCORDANCE WITH NEC TABLE 250-122, EXCEPT NOT BE SMALLER THAN #12 FOR POWER AND LIGHTING CIRCUITS AND #14 FOR CONTROL CIRCUITS. ALL GROUND CONDUCTORS SHALL BE GREEN, OR AS SPECIFIED UNDER THE WIRE AND CABLE SECTION OF THIS SPECIFICATION.
B. ALL GROUND CLAMPS SHALL BE PENN-UNION "GPL" TYPE OR SIMILAR BY O.Z. OR BURNDY.
C. CONDUIT FOR SOLITARY GROUND CONDUCTORS SHALL BE RIGID SCHEDULE 40 PVC NON- METALLIC ELECTRICAL CONDUIT WITH U.L. LABEL SOLITARY GROUND CONDUCTORS SHALL NOT BE PLACED THROUGH METALLIC SLEEVES OR CONDUITS AND SHALL NOT BE COMPLETELY ENCIRCLED BY METALLIC HANGERS OR SUPPORTS.
D. THE GROUND CONDUCTOR SHALL BE CONNECTED TO THE NEUTRAL IN ONLY TWO LOCATIONS -ON THE SUPPLY SIDE OF THE SERVICE DISCONNECT MEANS PER NEC--250--24 AND ON SEPARATELY DERIVED SYSTEMS PER NEC 250-30.
E. AT EACH RECEPTACLE BOX, THE GROUND CONDUCTOR SHALL ENTER AND CONNECT, WITH NORMAL WIRING CONNECTOR, TO: 1) THE GROUND PIGTAIL TO RECEPTACLE: 2) THE GROUND PIGTAIL TO THE BOX GROUND SCREW; AND 3) THE OUTGOING GROUND CONDUCTOR TO NEXT DEVICE, IF NOT AT END OF RUN. METAL TO METAL CONTACT BETWEEN THE DEVICE YOKE AND THE OUTLET BOX IS NOT ACCEPTABLE AS A BOND FOR EITHER SURFACE. MOUNTED BOXES OR FLUSH TYPE BOXES.
F. CONDUIT SYSTEM SHALL BE ELECTRICALLY CONTINUOUS. ALL LOCK NUTS SHALL CUT THROUGH ENAMELED OR PAINTED SURFACES ON ENCLOSURES. WHERE ENCLOSURES AND NON-CURRENT CARRYING METALS ARE ISOLATED FROM THE CONDUIT SYSTEM, USE BONDING JUMPERS WITH APPROVED CLAMPS. WHERE REDUCING WASHERS ARE USED AND WHERE CONCENTRIC OR ECCENTRIC KNOCKOUTS ARE NOT COMPLETELY REMOVED BONDING BUSHINGS SHALL BE REQUIRED.

LIGHTING FIXTURES
A. CONTRACTOR SHALL FURNISH AND INSTALL LIGHTING FIXTURES AS INDICATED IN FIXTURE SCHEDULE SHOWN ON DRAWINGS, AND SPECIFIED HEREIN.
B. NEUTRAL ASSEMBLY SHALL HAVE INDIVIDUAL ANTI-TURN SOLDERLESS TERMINALS, SIMILAR TO SQUARE D TYPE PK, FOR CONNECTION OF ULTIMATE NUMBER OF NEUTRAL WIRES. SHEET METAL TERMINAL STRIPS AND CONNECTIONS WILL BE REJECTED.
C. ALL LIGHTING FIXTURES INSTALLED BY THE ELECTRICAL CONTRACTOR SHALL BE FURNISHED COMPLETE WITH AS INDICATED ON THE FIXTURE SCHEDULE.
D. ANY LIGHTING FIXTURES SCRATCHED, BENT, CRACKED OR IN ANY WAY DAMAGED BEFORE ACCEPTANCE BY OWNER SHALL BE REPLACED AT THIS CONTRACTOR'S EXPENSE.
E. ALL LIGHTING FIXTURES SHALL BE IN WORKING ORDER AT THE TIME OF FINAL ACCEPTANCE OF THE WORK BY THE OWNER.
F. ALL LIGHTING FIXTURES ARE TO BE GROUNDED ON THE INTERIOR OF THE FIXTURE HOUSING, ON CLEAN BARE METAL (FREE OF PAINT). BY USE OF PIGTAIL AND FASTENED BY A SCREW USED FOR NO OTHER PURPOSE.

TELEPHONE/DATA SYSTEMS
A. SUMMARY
1. INCLUDES BUT NOT LIMITED TO
   a. FURNISH AND INSTALL BUILDING TELEPHONE AND COMPUTER NETWORK RACEWAY AND CABLE SYSTEM AS DESCRIBED IN CONTRACT DOCUMENTS INCLUDING, BUT NOT LIMITED TO, RACEWAY, OUTLETS, MODULAR JACKS, DEVICE PLATES, CABLES, PUNCH DOWN BLOCKS, PATCH PANELS, GROUNDING AND OTHER MISCELLANEOUS ITEMS REQUIRED FOR A COMPLETE SYSTEM.

B. COMPONENTS
1. TELEPHONE OUTLET BOX SHALL BE SINGLE DEVICE BOX.
2. BUILDING TELEPHONE AND COMPUTER NETWORK SYSTEM CABLE
   a. 23 GAUGE, SOLID TINNED COPPER, FOUR TWISTED PAIRS. CATEGORY 6
   b. USE PLENUM-RATED CABLE IN CEILINGS AND AREAS USED FOR PLENUM AIR RETURN
3. TELEPHONE TERMINATION BLOCKS
   a. UL VERIFIED CATEGORY 6.
   b. 110 TERMINATION WITH TIN LEAD PLATED IDC
4. TELEPHONE/NETWORK JACKS
   a. WALL JACKS
      1) CAT6 - HUBBELL HXJ6 OR ALTERNATE MANUFACTURER WITH EQUIVALENT PERFORMANCE STANDARD.
   b. PLATES
      1) HUBBELL - IFP SERIES (PORT QUANTITY AS REQUIRED, COLOR BY ARCHITECT)
5. NETWORK PATCH PANELS
   a. UL VERIFIED CATEGORY 6
   b. 110 TERMINATION WITH TIN LEAD PLATED IDC
   c. 19" RACK MOUNT WITH BACKBOARD MOUNTING FRAME.
6. CONNECTOR BLOCKS FOR CATEGORY 6 AND UP CABLING: TYPE 110 INSULATION DISPLACEMENT CONNECTORS; CAPACITY SUFFICIENT FOR CABLES TO BE TERMINATED PLUS 25 PERCENT SPARE.

C. INSTALLATION
1. TERMINATE CABLES AT EACH OUTLET WITH SPECIFIED MODULAR JACK ASSEMBLY.
2. TERMINATE CABLES ON PUNCH DOWN BLOCKS OR PATCH PANELS AT TERMINAL BOARD.
3. PROVIDE TYPED LABELS AT ALL JACKS CORRESPONDING TO TYPED NUMBERING SYSTEM AT TERMINAL STRIP.

D. QUALITY ASSURANCE
1. COMPLY WITH APPLICABLE PORTIONS OF NEC ANSI/EIA/TIA 568 AS TO TYPE PRODUCTS USED AND INSTALLATION OF COMPONENTS. PROVIDE PRODUCTS AND MATERIALS WHICH HAVE BEEN UL-LISTED AND LABELED.

ALARM & DETECTION SYSTEMS
A. SUMMARY
1. INCLUDES BUT NOT LIMITED TO: FURNISH AND INSTALL NAC PANEL AND ADDITIONAL NOTIFCATION DEVICES ON EXISTING SYSTEM.

B. SYSTEM DESCRIPTION
1. THE FIRE ALARM SYSTEM SHALL COMPLY WITH REQUIREMENTS OF NFPA STANDARD NO. 72 FOR PROTECTED PREMISES SIGNALING SYSTEMS EXCEPT AS MODIFIED AND SUPPLEMENTED BY THIS SPECIFICATION. THE SYSTEM SHALL BE ELECTRICALLY SUPERVISED AND MONITOR THE INTEGRITY OF ALL CONDUCTORS.

C. QUALITY ASSURANCE
1. REGULATORY REQUIREMENTS
   a. SYSTEM SHALL MEET APPROVAL OF AUTHORITY HAVING JURISDICTION (AHJ). CHANGES OR ADDITIONS SHALL BE MADE TO THE SYSTEM AS REQUIRED WITHOUT ADDITIONAL COST TO OWNER.
   b. EQUIPMENT, DEVICES, AND CABLE SHALL BE UL OR FACTORY MUTUAL LISTED FOR USE IN FIRE ALARM SYSTEMS.
   c. DESIGNER QUALIFICATIONS: NICET LEVEL III OR IV (3 OR 4) CERTIFIED FIRE ALARM TECHNICIAN OR REGISTERED FIRE PROTECTION ENGINEER, EMPLOYED BY FIRE ALARM CONTROL PANEL MANUFACTURER, CONTRACTOR, OR INSTALLER.
   d. INSTALLER QUALIFICATIONS: FIRM WITH MINIMUM 3 YEARS DOCUMENTED EXPERIENCE INSTALLING FIRE ALARM SYSTEMS OF THE SPECIFIED TYPE AND PROVIDING CONTRACT MAINTENANCE SERVICE AS A REGULAR PART OF THEIR BUSINESS.
      1) AUTHORIZED REPRESENTATIVE OF CONTROL UNIT MANUFACTURER; SUBMIT MANUFACTURER'S CERTIFICATION THAT INSTALLER IS AUTHORIZED; INCLUDE NAME AND TITLE OF MANUFACTURER'S REPRESENTATIVE MAKING CERTIFICATION.
      2) INSTALLER PERSONNEL: FACTORY TRAINED AND CERTIFIED WITH AT LEAST 2 YEARS OF EXPERIENCE INSTALLING FIRE ALARM SYSTEMS.
      3) SUPERVISOR: NICET LEVEL III OR IV (3 OR 4) CERTIFIED FIRE ALARM TECHNICIAN; FURNISH NAME AND ADDRESS.

D. FACP COMPONENTS:
1. EQUIPMENT AND ACCESSORIES FURNISHED UNDER TERMS OF THIS SPECIFICATION SHALL BE STANDARD PRODUCTS OF SINGLE MANUFACTURER, OR INCLUDE WRITTEN STATEMENT BY CONTROL PANEL MANUFACTURER CONFIRMING COMPATIBILITY OF COMPONENTS AND INCLUSION OF THESE COMPONENTS UNDER SYSTEM WARRANTY.
2. AUDIBLE HORN ALARM ANNUNCIATION
   a. PROVIDE SEPARATE AND DISTINCT ALARM SIGNALS FOR ALARM AND TROUBLE CONDITIONS.
   b. ALARM SIGNAL SHALL ALSO OPERATE STROBE LIGHTS, IF SPECIFIED.
   c. PROVIDE ALARM SILENCE SWITCHES AT CONTROL PANEL.
   d. TROUBLE ALARM SHALL BE HORN INTEGRAL TO CONTROL PANEL.
   e. SUPERVISORY ALARM MAY BE SAME AUDIBLE ALARM AS TROUBLE ALARM, BUT WITH SEPARATE VISUAL ANNUNCIATION.

E. FIELD MOUNTED SYSTEM COMPONENTS
1. FIRE ALARM ACTUATING DEVICES
   a. NOTIFICATION APPLIANCES
      1) LOW PROFILE HORN-STROBES
         a) AUDIBLE OUTPUT OF 92 DBA AT 10 FT. WHEN MEASURED IN REVERBERATION ROOM PER UL-464.
         b) INTEGRALLY MOUNTED FLASHING LIGHT UNIT WITH BLOCK LETTERS 'FIRE'. MULTI-CANDELA WITH FIELD-SELECTABLE SETTINGS OF 15CD, 30CD, 60CD, 75CD & 110CD, AND FLASH RATE BETWEEN ONE AND THREE HERTZ. ALL UNITS SHALL FLASH IN SYNCHRONIZATION WITH EACH OTHER.
         c) THE HORN SHALL HAVE A SELECTABLE STEADY OR SYNCHRONIZED TEMPORAL OUTPUT.
         d) IN AND OUT SCREW TERMINALS SHALL BE PROVIDED FOR WIRING.
         e) LOW PROFILE HORN/STROBES SHALL MOUNT IN A NORTH AMERICAN 1-GANG BOX.
      2) LOW PROFILE STROBES
         a) PROVIDE LOW PROFILE WALL MOUNTED STROBES AT THE LOCATIONS SHOWN ON THE DRAWINGS. IN AND OUT SCREW TERMINALS SHALL BE PROVIDED FOR WIRING. STROBES SHALL PROVIDE SYNCHRONIZED FLASH OUTPUTS. STROBE OUTPUT SHALL BE DETERMINED AS REQUIRED BY ITS SPECIFIC LOCATION AND APPLICATION FROM A FAMILY OF 15CD, 30CD, 60CD, 75CD, OR 110CD DEVICES. LOW PROFILE STROBES SHALL MOUNT IN A NORTH AMERICAN 1-GANG BOX.

F. INSTALLATION
1. INSTALL FIRE ALARM AND DETECTION SYSTEMS AS INDICATED, IN ACCORDANCE WITH EQUIPMENT MANUFACTURER'S WRITTEN INSTRUCTIONS, AND COMPLYING WITH APPLICABLE PORTIONS OF NEC, NFPA AND NECA'S "STANDARD OF INSTALLATION".
2. INSTALL WIRING, RACEWAYS, CONDUCTORS, ELECTRICAL BOXES AND FITTINGS IN ACCORDANCE WITH CONDUIT, WIRE AND CABLE, AND BOXES AND PLATES SECTION OF THIS SPECIFICATION.
3. LABEL PULL AND JUNCTION BOXES "FIRE ALARM" WITH RED INDELIBLE INK.
4. LOOP WIRES THROUGH EACH DEVICE ON ZONE FOR PROPER SUPERVISION. TEE-TAPS NOT PERMITTED.
5. PROVIDE DUST PROTECTION FOR INSTALLED SMOKE DETECTORS UNTIL FINISH WORK IS COMPLETED AND BUILDING IS READY FOR OCCUPANCY.
6. PROTECT CONDUCTORS FROM CUTS, ABRASION AND OTHER DAMAGE DURING CONSTRUCTION.
7. MINIMUM CONDUCTOR SIZE SHALL BE 14 AWG UNLESS OTHERWISE SPECIFIED.
8. DO NOT INSTALL CEILING MOUNTED DETECTORS WITHIN 3 FEET OF AIR DISCHARGE GRILLS. COORDINATE WITH OTHER TRADES AS REQUIRED.
9. POST COPY OF WIRE IDENTIFICATION LIST INSIDE FIRE ALARM PANEL DOOR OR OTHER AREA ACCESSIBLE TO FIRE ALARM SERVICE PERSONNEL.

POWER AND LIGHTING PANELS
A. FURNISH AND INSTALL, AS SCHEDULED AND SHOWN ON THE DRAWINGS, POWER PANELS FOR OPERATION ON VOLTAGES INDICATED.
B. ALL TERMINATIONS SHALL BE MARKED "75°C ONLY", "60/75° C" OR LISTED FOR USE OF 75° C INSULATED CONDUCTORS AT FULL 75° C AMPACITY.
C. ALL BUS BARS SHALL BE SILVER OR TIN PLATED COPPER.
D. CABINETS SHALL BE OF COMMERCIAL GALVANIZED SHEET STEEL, CODE GAUGE AND SIZE, SURFACE OR RECESSED MOUNTED AS CALLED FOR IN THE DRAWINGS.
E. NEUTRAL ASSEMBLY SHALL HAVE INDIVIDUAL ANTI-TURN SOLDERLESS TERMINALS, SIMILAR TO SQUARE D TYPE PK, FOR CONNECTION OF ULTIMATE NUMBER OF NEUTRAL WIRES. SHEET METAL TERMINAL STRIPS AND CONNECTIONS WILL BE REJECTED.
F. PANEL SHALL HAVE A COPPER GROUND BAR SIMILAR TO NEUTRAL BAR IN NUMBER, SIZE, AND TYPE OF ANTI-TURN SOLDERLESS LUGS. THIS GROUND BAR SHALL BE FACTORY BONDED TO THE PANEL TUB IN THE GUTTER SPACE OPPOSITE THE MAINS AND THE NEUTRAL ASSEMBLY AND SHALL HAVE THE SCREWDRIVER SLOTS FACING THE FRONT OF THE PANEL.
G. QUALITY STANDARD: SQUARE D TYPE NQ (208V) .

STATE OF MICHIGAN
MICHAEL R. BEAGLES
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JOB# J22418.00
DATE PLOTTED: 12/22/2022

crumbl cookies

JZW ARCHITECTS

CRUMBL COOKIES - WATERFORD #1046
4978 HIGHLAND RD
WATERFORD TWP, MI 48327
ISSUED: DECEMBER 19, 2022
CURRENT REVISION:
22-246

ELECTRICAL SPECIFICATIONS
E7.1

COMcheck Software Version 4.1.5.5

Interior Lighting Compliance Certificate

Project Information

Energy Code: 2015 IECC
Project Title: CRUMBL COOKIES - WATERFORD
Project Type: New Construction

Construction Site:
4978 HIGHLAND RD
WATERFORD TWP, MI 48327

Owner/Agent:

Designer/Contractor:

Additional Efficiency Package(s)

Credits: 1.0 Required 0.0 Proposed

Allowed Interior Lighting Power

A Area Category	B Floor Area (ft2)	C Allowed Watts / ft2	D Allowed Watts (B X C)
1-Mercan tile (Retail:Sales Area)	186	1.59	296
2-Open Bakery (Common Space Types:Food Preparation)	746	1.21	903
3-Back of House (Common Space Types:Storage)	423	0.63	266
4-Restroom (Common Space Types:Restrooms)	56	0.98	55
		Total Allowed Watts =	1520

Proposed Interior Lighting Power

A Fixture ID : Description / Lamp / Wattage Per Lamp / Ballast	B Lamps/ Fixture	C # of Fixtures	D Fixture Watt.	E (C X D)
1-Mercan tile (Retail:Sales Area)				
LED 4: F1: 2X4 LAYIN: Other:	1	3	66	196
2-Open Bakery (Common Space Types:Food Preparation)				
LED 5: F1: Other:	1	11	66	720
LED 6: F2: LED A Lamp 11W:	1	4	11	44
3-Back of House (Common Space Types:Storage)				
LED 7: F1: LED Panel 60W:	1	6	66	393
4-Restroom (Common Space Types:Restrooms)				
LED 8: F3: LED Panel 60W:	1	1	23	23
		Total Proposed Watts =		1377

Interior Lighting PASSES: Design 9% better than code

Interior Lighting Compliance Statement

Compliance Statement: The proposed interior lighting design represented in this document is consistent with the building plans, specifications, and other calculations submitted with this permit application. The proposed interior lighting systems have been designed to meet the 2015 IECC requirements in COM*check* Version 4.1.5.5 and to comply with any applicable mandatory requirements listed in the Inspection Checklist.

J. Calvin Barlow - Electrical Designer — Name - Title
JCalvinBarlow — Signature
12/9/2022 — Date

COMcheck Software Version 4.1.5.5

Inspection Checklist

Energy Code: 2015 IECC

Requirements: 0.0% were addressed directly in the COM*check* software

Text in the "Comments/Assumptions" column is provided by the user in the COMcheck Requirements screen. For each requirement, the user certifies that a code requirement will be met and how that is documented, or that an exception is being claimed. Where compliance is itemized in a separate table, a reference to that table is provided.

Section # & Req.ID	Plan Review	Complies?	Comments/Assumptions
C103.2 [PR4][1]	Plans, specifications, and/or calculations provide all information with which compliance can be determined for the interior lighting and electrical systems and equipment and document where exceptions to the standard are claimed. Information provided should include interior lighting power calculations, wattage of bulbs and ballasts, transformers and control devices.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
C406 [PR9][1]	Plans, specifications, and/or calculations provide all information with which compliance can be determined for the additional energy efficiency package options.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	

Additional Comments/Assumptions:

1 High Impact (Tier 1) 2 Medium Impact (Tier 2) 3 Low Impact (Tier 3)

Section # & Req.ID	Rough-In Electrical Inspection	Complies?	Comments/Assumptions
C405.2.1 [EL15][1]	Lighting controls installed to uniformly reduce the lighting load by at least 50%.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
C405.2.1 [EL18][1]	Occupancy sensors installed in required spaces.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
C405.2.1, C405.2.2.3 [EL23][2]	Independent lighting controls installed per approved lighting plans and all manual controls readily accessible and visible to occupants.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
C405.2.2.1 [EL22][2]	Automatic controls to shut off all building lighting installed in all buildings.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
C405.2.3 [EL16][2]	Daylight zones provided with individual controls that control the lights independent of general area lighting.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
C405.2.3, C405.2.3.1, C405.2.3.2 [EL20][1]	Primary sidelighted areas are equipped with required lighting controls.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
C405.2.3, C405.2.3.1, C405.2.3.3 [EL21][1]	Enclosed spaces with daylight area under skylights and rooftop monitors are equipped with required lighting controls.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
C405.2.4 [EL4][1]	Separate lighting control devices for specific uses installed per approved lighting plans.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
C405.2.4 [EL8][1]	Additional interior lighting power allowed for special functions per the approved lighting plans and is automatically controlled and separated from general lighting.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
C405.3 [EL6][1]	Exit signs do not exceed 5 watts per face.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	

Additional Comments/Assumptions:

1 High Impact (Tier 1) 2 Medium Impact (Tier 2) 3 Low Impact (Tier 3)

Section # & Req.ID	Final Inspection	Complies?	Comments/Assumptions
C303.3, C408.2.5.2 [FI17][3]	Furnished O&M instructions for systems and equipment to the building owner or designated representative.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
C405.4.1 [FI18][3]	Interior installed lamp and fixture lighting power is consistent with what is shown on the approved lighting plans, demonstrating proposed watts are less than or equal to allowed watts.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	*See the Interior Lighting fixture schedule for values.*
C408.2.5.1 [FI16][3]	Furnished as-built drawings for electric power systems within 90 days of system acceptance.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
C408.3 [FI33][3]	Lighting systems have been tested to ensure proper calibration, adjustment, programming, and operation.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	

Additional Comments/Assumptions:

1 High Impact (Tier 1) 2 Medium Impact (Tier 2) 3 Low Impact (Tier 3)

CRUMBL COOKIES - WATERFORD #1046

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ISSUED: DECEMBER 19, 2022 CURRENT REVISION:

22-246

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