MIDGARD - SPRING LAKE

14396 NC-210 S SPRING LAKE 28390

APPLICABLE BUILDING CODES

BUILDING	2018 NORTH CAROLINA STATE BUILDING CODE (NCBC) WITH AMENDMENTS
FIRE SAFETY	2018 INTERNATIONAL FIRE CODE (IFC) WITH NORTH CAROLINA STATE FIRE PREVENTION CODE AMENDMENTS
PLUMBING	2018 NORTH CAROLINA STATE BUILDING CODE (NCBC): PLUMBING CODE WITH AMENDMENTS
MECHANICAL	2018 NORTH CAROLINA STATE BUILDING CODE (NCBC): MECHANICAL CODE WITH AMENDMENTS
GAS PIPING	2018 NORTH CAROLINA STATE BUILDING CODE (NCBC): FUEL GAS CODE WITH AMENDMENTS
ELECTRICAL	2020 NORTH CAROLINA STATE ELECTRICAL CODE WITH AMENDMENTS
ENERGY	2018 NORTH CAROLINA STATE BUILDING CODE: ENERGY CONSERVATION CODE WITH AMENDMENTS
ACCESSIBILITY	2009 NORTH CAROLINA ACCESSIBILITY CODE - REFERENCING ANSI A117.1

BUILDING INFORMATION

BUILDING DESCRIPTION -
TRAVEL DISTANCE - 100FT SPRINKLER
DEAD END - 50FT
ORDINARY HAZARAD PER LSC

BUILDING CONSTRUCTION TYPE (per IBC): TYPE IIB

OCCUPANCY CLASSIFICATION (per LSC Ch. 6): S-1 (MODERATE HAZARD STORAGE)

FIRE PROTECTION: FULLY SPRINKLERED

GENERATOR: N/A

HIGH-RISE: N/A

NUMBER OF STORIES: 2

TYPICAL FLOOR AREA: 1ST FLR: 12,774 SF 2ND FLR: 12,774 SF

ARCHITECT'S SCOPE OF SERVICE

HENDRICK, AS THE REGISTERED DESIGN PROFESSIONAL OF WORK, IS ALSO RETAINED TO PERFORM THE DUTIES OF THE REGISTERED PROFESSIONAL AS REQUIRED BY CODE DURING THE CONSTRUCTION ADMINISTRATION PHASE OF THIS WORK.
BUILDING OFFICIAL SHALL BE NOTIFIED IN WRITING BY THE OWNER IF THE REGISTERED DESIGN PROFESSIONAL IS CHANGED OR IS UNABLE TO CONTINUE TO PERFORM THE DUTIES.

PROJECT DESCRIPTION

PROJECT CONSISTS OF A CLIMATE-CONTROLLED TWO STORY PRE-ENGINEERED METAL SELF-STORAGE BUILDING, AN OFFICE SPACE, AND ON-SITE MANAGER APARTMENT. CONSTRUCTION INCLUDES NEW LIGHTING, PLUMBING, ELECTRICAL, AND NEW MECHANICAL AS INDICATED.

DRAWING INDEX

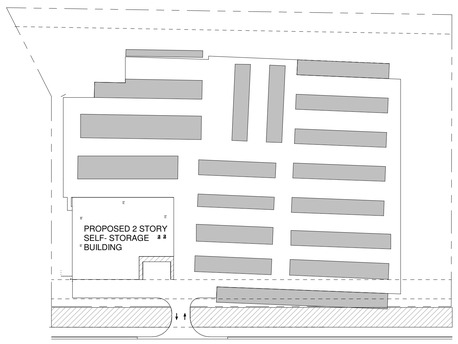
ABBREVIATIONS

A.B.	ANCHOR BOLT	F.A.	FIRE ALARM	N	NORTH	T.	TREAD
ACC.	ACCESS	F.D.	FLOOR DRAIN	N.I.C.	NOT IN CONTRACT	T & G	TONGUE & GROOVE
ACOUS.	ACOUSTIC (AL)	F.E.	FIRE EXTINGUISHER	NO.	NUMBER	TEL.	TELEPHONE
ADJ.	ADJUSTABLE	F.E.C.	EXTINGUISHER CABINET	NOM.	NOMINAL	TEMP.	TEMPERED
ADJT.	ADJACENT	F.H.C.	FIRE HOSE CABINET	N.T.S.	NOT TO SCALE	THK.	THICK(NESS)
A.F.F.	ABOVE FINISH FLOOR	FIN.	FINISH	O.C.	ON CENTER	THRESH.	THRESHOLD
A.H.U.	AIR HANDLING UNIT	FIXT.	FIXTURE	O.D.	OUTSIDE DIAMETER	TYP.	TYPICAL
AL.	ALUMINUM	FLR.	FLOOR(ING)	OFF.	OFFICE	U.L.	UNDERWRITER'S LABORATORY
ANOD.	ANODIZED	FLUOR.	FLUORESCENT	O.F.C.I.	OWNER FURNISHED CONTRATOR INSTALLED	U.N.O.	UNLESS NOTED OTHERWISE
APPROX.	APPROXIMATE(LY)	FP.	FIREPROOF	O.F.O.I.	OWNER FURNISHED OWNER INSTALLED	V.C.T.	VINYL COMPOSITION TILE
BD.	BOARD	FT.	FOOT OR FEET	O.H.	OPPOSITE HAND	VERT.	VERTICAL
BLDG.	BUILDING	FUR.	FURRING	OPNG.	OPENING	VEST.	VESTIBULE
BLKG.	BLOCKING	FURN.	FURNISH(ING)	PARTN.	PARTITION	VOL.	VOLUME
BOT.	BOTTOM	GA.	GAUGE	PERIM.	PERIMETER	W.	WIDE
B.S.	BUILDING STANDARD	GALV.	GALVANIZED	PERP.	PERPENDICULAR	W/	WITH
B.O.	BY OWNER	GL.	GLASS OR GLAZING	PREFAB.	PREFABRICATED	WC	WALLCOVERING
CAB.	CABINET	GND.	GROUND	PREFIN.	PREFINISHED	WD.	WOOD
CEM.	CEMENT	G.W.B.	GYPSUM WALL BOARD	PG.	PAGE	W.H.	WATER HEATER
CER.	CERAMIC	GYP.	GYPSUM	P.LAM.	PLASTIC LAMINATE	W/I	WITHIN
CLG.	CEILING	H.	HIGH	PLAS.	PLASTER	W/O	WITHOUT
CLKG.	CAULKING	H.C.	HOLLOW CORE	PLYWD.	PLYWOOD	WOM.	WOMEN
CLO.	CLOSET	HDW.	HARDWARE	PNL.	PANEL(ING)	WSCT.	WAINSCOT
CLR.	CLEAR(ANCE)	HDWD.	HARDWOOD	PT.	PAINT(ED)	WT.	WEIGHT
C.M.U.	CONCRETE MASONARY UNIT	H.M.	HOLLOW METAL	POL.	POLISHED		
COL.	COLUMN	HORZ.	HORIZONTAL	Q.T.	QUARRY TILE		
CONC.	CONCRETE	HR.	HOUR	QTY.	QUANTITY		
CONT.	CONTINUOUS	HTR.	HEATER	QUAD.	QUADRAPLEX		
CORR.	CORRIDOR	H.V.A.C.	HEATING, VENTILATING, AIR CONDITIONING	R.	RISER,RANGE		
CPT.	CARPET(ED)	H.W.		R.A.	RETURN AIR		
CNTR.	CENTER TO CENTER			RAD.	RADIUS		
C.T.	CERAMIC TILE	I.D.	INSIDE DIAMETER	RCP	REFLECTED CLG. PLAN		
C.W.	COLD WATER	INCL.	INCLUDE(D),(ING)	REFR.	REFRIGERATOR		
D.	DEEP	INFO.	INFORMATION	RELOC.	RELOCATE(D)		
DBL.	DOUBLE	INSUL.	INSULATE(D),(ING)	REQ.	REQUIRE(D),(ING)		
D.D.	DOUBLE DUPLEX	INT.	INTERIOR	RES.	RESILIENT		
DEPT.	DEPARTMENT			REV.	REVISE(D),REVISION		
DET.	DETAIL	JAN.	JANITOR	RFL.	REFLECT(ED),(IVE)		
D.F.	DRINKING FOUNTAIN	J.B.	JUNCTION BOX	R.H.	RIGHT-HAND		
DIA.	DIAMETER	JT.	JOINT	RLG.	RAILING		
DIAG.	DIAGONAL			RM.	ROOM		
DIFF.	DIFFUSER	KIT.	KITCHEN	S.	SOUTH		
DIM.	DIMENSION			SCHED.	SCHEDULE		
DISP.	DISPENSER	L.	LENGTH	S.C.	SOLID CORE		
DN.	DOWN	LAM.	LAMINATE(D)	S.C.F.W.	FLUSH WOOD JOIN		
DO.	DITTO	LAV.	LAVATORY	SECT.	SECTION		
DR.	DOOR	LBL.	LABEL	SHT.	SHEET		
DS.	DOWNSPOUT	LBS.	POUNDS	SIM.	SIMILAR		
DW.	DISHWASHER	LG.	LONG	SK.	SINK		
DWG.	DRAWING	L.H.	LEFT-HAND	SPEC.	SPECIFICATION		
DWR.	DRAWER	LT.	LIGHT	SPKR.	SPEAKER		
E.	EAST			SPRK.	SPRINKLER		
EA.	EACH	MATL.	MATERIAL(S)	SQ.	SQUARE		
E.F.	EXHAUST FAN	MAX.	MAXIMUM	S.S.	STAINLESS STEEL		
EL.	ELEVATOR	MECH.	MECHANICAL	STD.	STANDARD		
ELEC.	ELECTRIC(AL)	MED.	MEDIUM	STL.	STEEL		
ELEV.	ELEVATION	MET.	METAL	STN.	STAIN		
EMER.	ENCLODE(D), (ENCLOSURE)	MEZZ.	MEZZANINE	STOR.	STORAGE		
ENCL.		MFG.	MANUFACTURER	SUSP.	SUSPEND(ED)		
EQ.	EQUAL	MIN.	MINIMUM	SW.	SWITCH		
EQPT.	EQUIPMENT	MISC.	MISCELLANEOUS				
E.W.C.	ELECTRICAL WATER COOLER	M.O.	MASONRY OPENING				
		MT.	MOUNT(ED),(ING)				
EX.	EXISTING	MULL.	MULLION				
EXP.	EXPANSION						
EXT.	EXTERIOR						

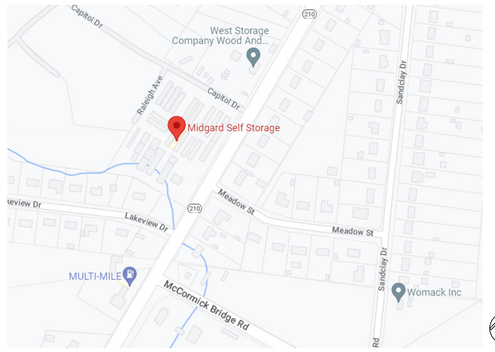
GENERAL NOTES

1. THESE DRAWINGS ARE THE PROPERTY OF HENDRICK, INC., AND ARE NOT TO BE REPRODUCED OR COPIED IN WHOLE OR IN PART WITHOUT WRITTEN PERMISSION OF HENDRICK, INC., THESE DRAWINGS ARE TO BE USED FOR THE PROJECT AND SITE SPECIFICALLY IDENTIFIED HEREIN AND ARE NOT TO BE USED ON ANY OTHER PROJECT OR LOCATION.
2. THESE WORKING DRAWINGS INDICATE MATERIALS AND METHODS OF CONSTRUCTION TO SET STANDARDS OF QUALITY AND/OR PERFORMANCE. OTHER MATERIALS AND/OR METHODS WILL BE CONSIDERED BY HENDRICK, INC. (HEREINAFTER REFERRED TO AS "ARCHITECT(S)") FOR ACCEPTANCE PROVIDED THEY DO NOT AFFECT THE VISUAL APPEARANCE FROM THAT INDICATED IN ANY WAY.
3. THE ARCHITECT'S SEAL, AFFIXED HEREON, CERTIFIES THAT TO THE BEST OF OUR KNOWLEDGE, INFORMATION AND BELIEF, THESE DRAWINGS HAVE BEEN PREPARED IN CONFORMITY WITH THE LOCAL ACCESSIBILITY CODES (LISTED ABOVE) FOR BUILDINGS AND FACILITIES, AS WELL AS THE ANSI SPECIFICATION A 117.1, 1998 EDITION, SECTIONS 3 & 4 AND THE ADA (AMERICANS WITH DISABILITIES ACT). IT IS THE RESPONSIBILITY OF THE OWNER (CLIENT), HIS AGENT OR THE CONTRACTOR TO REVIEW THESE PLANS WITH THE LOCAL GOVERNING AUTHORITY DURING THE BUILDING PERMIT PROCESS AND PRIOR TO BEGINNING CONSTRUCTION. THE ARCHITECT SHOULD BE NOTIFIED IMMEDIATELY OF ANY ITEMS IN CONFLICT WITH THESE ACCESSIBILITY REQUIREMENTS.
4. THESE DRAWINGS DO NOT PURPORT TO SHOW ALL OBJECTS EXISTING AT THE SITE. PRIOR TO COMMENCEMENT THE CONTRACTOR MUST VERIFY ALL SITE CONDITIONS AS WELL AS EXISTING UTILITIES TO DETERMINE ALL REQUIREMENTS FOR DISCONNECTING, CAPPING OR PROTECTING ALL SUCH WORK IN ACCORDANCE WITH THE UTILITY COMPANY OR OWNER.
5. THE CONTRACTOR WILL BE PRESUMED TO HAVE INSPECTED THE SITE AND TO HAVE READ AND TO BE THOROUGHLY FAMILIAR WITH THE PLANS, SPECIFICATIONS AND DOCUMENTS. THE FAILURE OR OMISSION OF ANY CONTRACTOR TO EXAMINE ANY FORM OF DOCUMENT SHALL RESULT IN NO WAY RELIEVE THE CONTRACTOR FROM ANY OBLIGATION IN RESPECT TO HIS/HER WORK.
6. THE CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS SHOWN AND NOTIFY THE ARCHITECT OF ANY DISCREPANCIES PRIOR TO THE ORDERING OF MATERIALS, BEGINNING FABRICATION AND/OR STARTING CONSTRUCTION.
7. FOR ANY CONFLICT BETWEEN THE FIELD CONDITIONS AND THE DRAWINGS OR SPECIFICATIONS, THE CONTRACTOR SHALL NOTIFY THE ARCHITECT AND REQUEST CLARIFICATION OR DIRECTION PRIOR TO THE START OF WORK AND IN SUFFICIENT TIME FOR THE INTERIO DESIGNER TO RENDER A DECISION WITHOUT DELAYING PROGRESS.
8. UPON AWARDING CONTRACTS TO SUBCONTRACTORS; THE GENERAL CONTRACTOR SHALL SUBMIT TO THE ARCHITECT AND THE OWNER, A SCHEDULE FOR ALL LONG LEAD TIME ITEMS ON THE PROJECT (I.E. MATERIALS, HARDWARE, FABRICS, ETC.) AND SHALL BE RESPONSIBLE FOR NOTIFYING THE ARCHITECT AND OWNER AS TO ANY ITEM WHICH MAY CAUSE THE PROJECT TO BE DELAYED, PRIOR TO ORDERING THAT ITEM.
9. THE CONTRACTOR SHALL BE REQUIRED TO OBTAIN
A BUILDING PERMIT AS WELL AS SEPARATE MECHANICAL, ELECTRICAL AND PLUMBING PERMITS, PRIOR TO THE START OF CONSTRUCTION. THE COMMUNICATIONS VENDOR IS RESPONSIBLE FOR OBTAINING THE 'LOW VOLTAGE' PERMIT.
10. THE CONTRACTOR SHALL SUBMIT TO THE OWNER ONE (1) COPY OF ALL BUILDING PERMITS, INSPECTION AND OCCUPANCY CERTIFICATES.
11. ALL WORK SHALL BE PERFORMED IN STRICT ACCORDANCE WITH ALL APPLICABLE NATIONAL, STATE AND LOCAL BUILDING CODES AND LOCAL ORDINANCES.
12. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY DAMAGE WHICH MAY OCCUR DURING CONSTRUCTION TO EXISTING EQUIPMENT, BUILDING FEATURES, OR ANY OTHER RELATED PROPERTY OF THE LANDLORD OR OWNER.
13. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ADEQUATE FIRE EXTINGUISHERS IN THE WORK SPACE TO COMPLY WITH ALL FIRE REGULATIONS THROUGHOUT THE DURATION OF CONSTRUCTION. THE CONTRACTOR SHALL COMPLY WITH ALL FEDERAL AND LOCAL SAFETY REGULATIONS IN THE EXECUTION OF THE WORK.
14. UPON COMPLETION OF THE WORK, THE CONTRACTOR SHALL LEAVE ALL WORK AREAS AND FINISHED SPACES IN A CLEAN AND ACCEPTABLE CONDITION.
15. DIMENSIONS NOTED AS "CLEAR" SHALL BE FROM FINISHED FACE TO FINISHED FACE.
16. ALL WOOD BLOCKING IN WALLS OR ABOVE CEILINGS SHALL BE FIRE TREATED TO MEET LOCAL CODES. DIMENSIONS FOR BLOCKING SHALL BE MEASURED TO THE CENTERLINE OF THE BLOCKING.
17. ALL FIRE RATED/SMOKE BARRIER WALL CONSTRUCTION SHALL BE PERMANENTLY IDENTIFIED WITH SIGNS OR STENCILING ABOVE FINISHED CEILINGS OR IN CONCEALED SPACES, WHICH READ AS FOLLOWS: "FIRE and SMOKE BARRIER - PROTECT ALL OPENINGS".
18. THE ARCHITECT HAS NOT CONDUCTED ANY INVESTIGATION AS TO THE PRESENCE OF ANY HAZARDOUS MATERIAL, INCLUDING ASBESTOS, WITHIN THE LIMITS OF THE PROJECT. THE ARCHITECT WILL NOT ACCEPT RESPONSIBILITY FOR THE IDENTIFICATION AND REMOVAL OF ANY HAZARDOUS MATERIAL OR FOR ANY EFFECT FROM ITS PRESENCE. IF ANY SUCH MATERIAL IS FOUND IN THE PROJECT, THE CONTRACTOR SHALL NOTIFY THE OWNER AND ARCHITECT IMMEDIATELY.

KEY PLAN



VICINITY MAP



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CHRISTOPHER J HEARD REGISTERED ARCHITECT 13274 NORTH CAROLINA ATLANTA GEORGIA

No.	Date	Description
	05/26/23	PERMIT & CONSTRUCTION

Project Name

MIDGARD - SPRING LAKE

14396 NC-210 S SPRING LAKE 28390

ISSUE
NOT FOR CONSTRUCTION

COVER SHEET

Author
Drawn
Checker
Checked
As indicated
Scale
247-001-01
Project No.

A-0.0.0
Drawing Number

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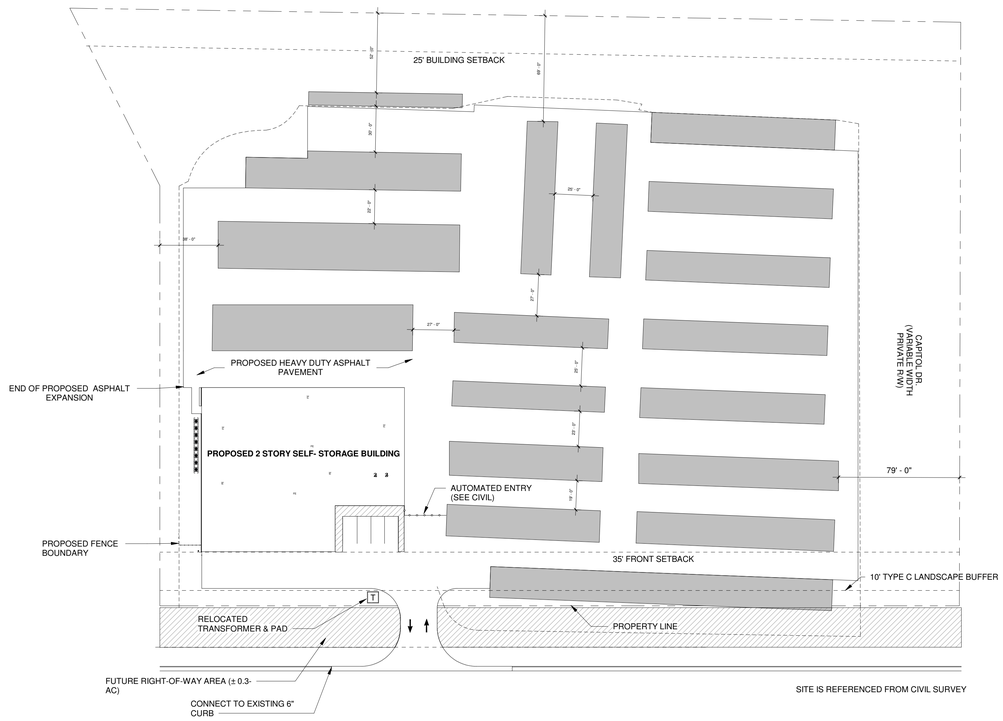
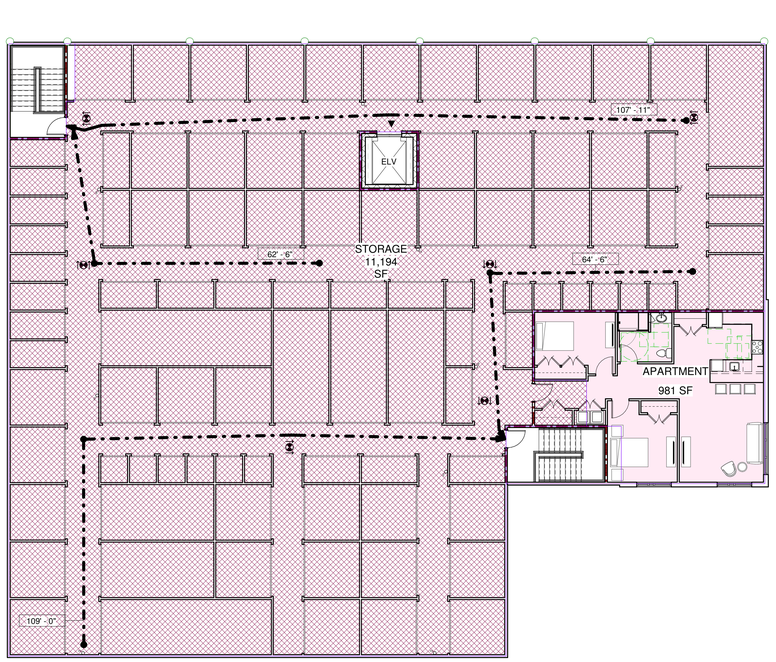
SITE PLAN

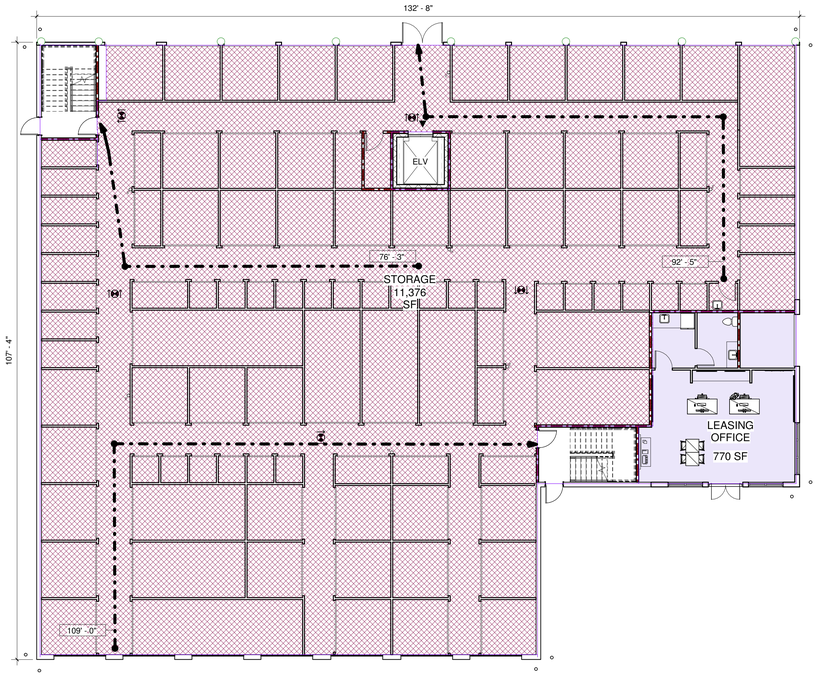


3 SITE PLAN
1" = 40'-0"

LIFE SAFETY PLAN



2 LIFE SAFETY PLAN SECOND FLOOR
3/32" = 1'-0"



1 LIFE SAFETY PLAN FIRST FLOOR
3/32" = 1'-0"

OCCUPANT LOAD SCHEDULE

OCCUPANT LOAD - SUMMARY

USAGE TYPE	AREA	SF PER PERSON	CALCULATED LOAD (PER NCBC)	COMMENTS
LEVEL 1				
LEASING OFFICE	770 SF	100	8	
STORAGE	11,376 SF	300	38	
LEVEL 2				
APARTMENT	981 SF	200	5	
STORAGE	11,194 SF	300	38	
	24,322 SF		90	

PROJECT CODE SUMMARY

OCCUPANCY USE AND CLASSIFICATION PER 2018 NORTH CAROLINA STATE FIRE PREVENTION BUILDING CODE:
CHAPTER 10, SECTION 1004.12 S-1 STORAGE OCCUPANCY, ORDINARY HAZARD
B - BUSINESS AREAS
RESIDENTIAL

OCCUPANCY LOAD FOR THE FLOOR:
REFER TO OCCUPANT LOAD SCHEDULE

OCCUPANT LOAD CALCUATION FOR THE FLOOR PER 2018 NORTH CAROLINA STATE FIRE PREVENTION BUILDING CODE (NC SFPC):

FLOOR X

DOORS: X DOORS @ XX" EACH (EFFECTIVE WIDTH) = X x (X"/0.2) = XXX

STAIRS: STAIR #1 & #2: XX" WIDE EACH - PER NC SFPC = 2 x (XX"/0.3) = XXX

MAXIMUM OCCUPANT LOAD / FLOOR = **XXX**

LIFE SAFETY LEGEND

- CEILING HEIGHT GYP BOARD PARTITION
- 2 HOUR FIRE RATED BARRIER
- EXIT SIGN
- EXIT SIGN WITH DIRECTIONAL ARROW
- WALL MOUNTED 10 lbs. A/B/C TYPE FIRE EXTINGUISHER - HANDLE OF EXTINGUISHER AT 48"AFF.
- LONGEST TRAVEL DISTANCE TO EXIT: 109'-0" < 250'-0"
- LONGEST COMMON PATH OF TRAVEL: 00'-0" < 100'-0"

SPRINKLERED BUILDING
TRAVEL DISTANCE: 250 FEET MAXIMUM DISTANCE TO EXIT
COMMON PATH OF TRAVEL: 100 FEET MAXIMUM DISTANCE OF COMMON PATH
DEAD-END CORRIDOR: 50 FEET MAXIMUM

Heard

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CHRISTOPHER J HEARD
REGISTERED ARCHITECT
13274
NORTH CAROLINA
ATLANTA, GEORGIA

No.	Date	Description
	05/26/23	PERMIT & CONSTRUCTION

Project Name

MIDGARD - SPRING LAKE

14396 NC-210 S SPRING LAKE 28390

ISSUE
NOT FOR CONSTRUCTION

SITE & LIFE SAFETY PLAN

Author Drawn	
Checker Checked	
As indicated Scale	**A-0.1.1**
247-001-01 Project No.	Drawing Number

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UL Product iQ®

BXUV.U419 - Fire-resistance Ratings - ANSI/UL 263

Fire-resistance Ratings - ANSI/UL 263

BXUV - Fire Resistance Ratings - ANSI/UL 263 Certified for United States

BXUV7 - Fire Resistance Ratings - CAN/ULC-S101 Certified for Canada

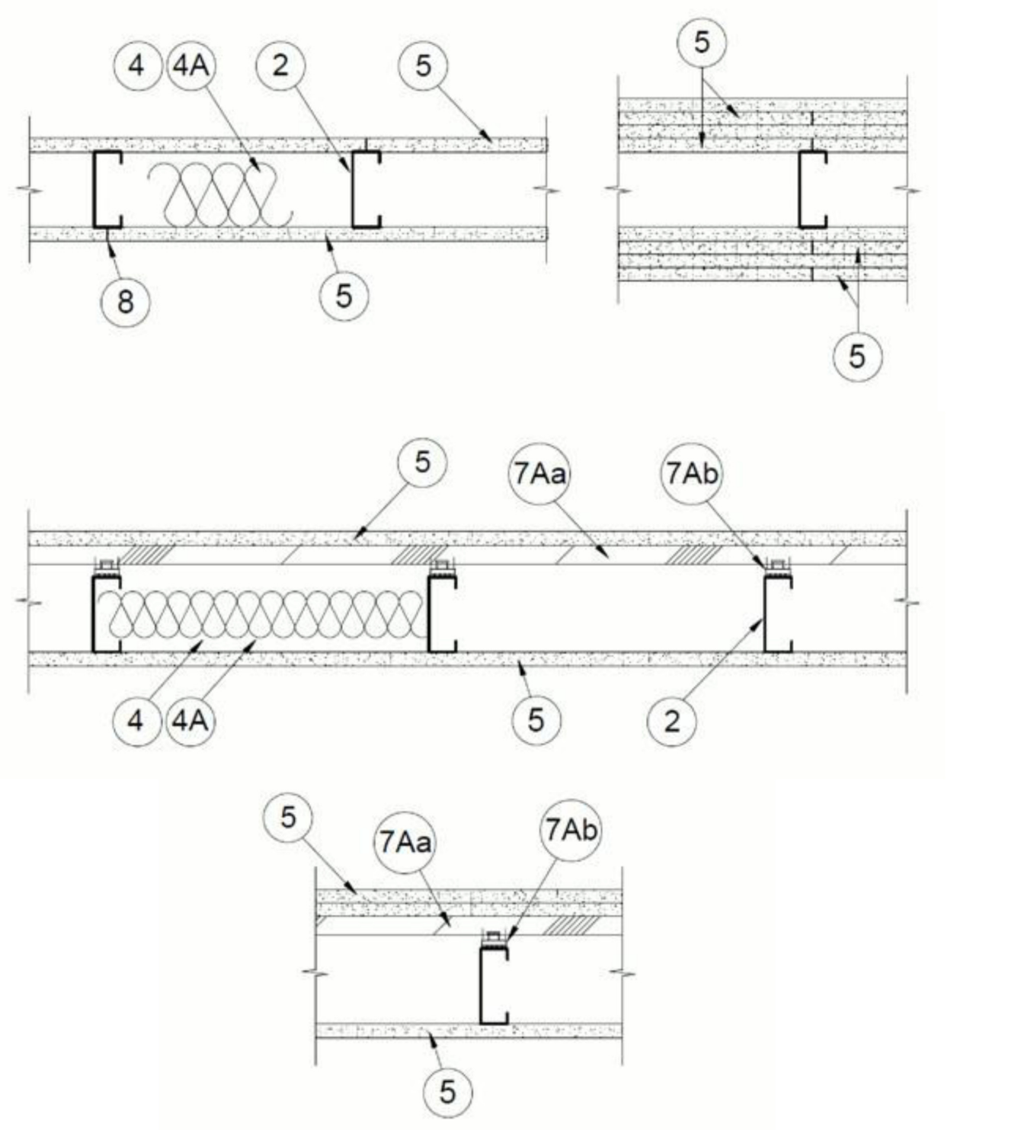
See General Information for Fire-resistance Ratings - ANSI/UL 263 Certified for United States
Design Criteria and Allowable Variances

See General Information for Fire Resistance Ratings - CAN/ULC-S101 Certified for Canada
Design Criteria and Allowable Variances

Design No. **U419**

September 5, 2022

Nonbearing Wall Ratings — 1, 2, 3 or 4 Hr (See Items 4 & 5 through 5J)
*** Indicates such products shall bear the UL or cUL Certification Mark for jurisdictions employing the UL or cUL Certification (such as Canada), respectively.**



1. **Floor and Ceiling Runners —** (Not Shown) — For use with Item 2 — Channel shaped, fabricated from min 25 MSG corrosion-protected steel, min depth to accommodate stud size, with min 1-1/4 in. long legs, attached to floor and ceiling with fasteners 24 in. OC max.

1A. **Framing Members* — Floor and Ceiling Runner —** Not Shown — In lieu of Item 1 — For use with Item 2B, proprietary channel shaped runners, 3-5/8 in. deep attached to floor and ceiling with fasteners 24 in. OC max.
CALIFORNIA EXPANDED METAL PRODUCTS CO — Viper25™ Track

CRACO MFG INC — SmartTrack25™

MARINO/WARE, DIV OF WARE INDUSTRIES INC — Viper25™ Track

IMPERIAL MANUFACTURING GROUP INC — Viper25™ Track

1B. **Framing Members* — Floor and Ceiling Runner —** Not Shown — In lieu of Item 1 — For use with Item 2C, proprietary channel shaped runners, 1-1/4 in. wide by 3-5/8 in. deep fabricated from min 0.018 in. thick galv steel, attached to floor and ceiling with fasteners spaced 24 in. OC max.
CALIFORNIA EXPANDED METAL PRODUCTS CO — Viper20™ Track

MARINO/WARE, DIV OF WARE INDUSTRIES INC — Viper20™ Track

IMPERIAL MANUFACTURING GROUP INC — Viper20™ Track

1C. **Framing Members* — Floor and Ceiling Runners —** (Not Shown) — In lieu of Item 1 — Channel shaped, attached to floor and ceiling with fasteners 24 in. OC. max.
ALLSTEEL & GYPSUM PRODUCTS INC — Type SUPREME D24/30EQD and Type SUPREME D20

CONSOLIDATED FABRICATORS CORP, BUILDING PRODUCTS DIV — Type SUPREME D24/30EQD and Type SUPREME D20

QUAIL RUN BUILDING MATERIALS INC — Type SUPREME D24/30EQD and Type SUPREME D20

SCAFCO STEEL STUD MANUFACTURING CO — Type SUPREME D24/30EQD and Type SUPREME D20

STEEL CONSTRUCTION SYSTEMS INC — Type SUPREME D24/30EQD and Type SUPREME D20

TELLING INDUSTRIES L L C — Type SUPREME D24/30EQD and Type SUPREME D20

UNITED METAL PRODUCTS INC — Type SUPREME D24/30EQD and Type SUPREME D20

1D. **Floor and Ceiling Runners —** (Not Shown) — For use with Item 2A — Channel shaped, fabricated from min 20 MSG corrosion-protected or galv steel, min depth to accommodate stud size, with min 1 in. long legs, attached to floor and ceiling with fasteners spaced max 24 in. OC.

1E. **Framing Members* — Floor and Ceiling Runners —** (Not Shown, As an alternate to Item 1) — For use with Items 2E, 5F or 5G or 5I only, channel shaped, fabricated from min. 0.015 in. (min bare metal thickness) galvanized steel, attached to floor and ceiling with fasteners 24 in. OC. max.
CLARKDIETRICH BUILDING SYSTEMS — CD ProTRAK

DMFCWBS L L C — ProTRAK

MBA METAL FRAMING — ProTRAK

RAM SALES L L C — Ram ProTRAK

STEEL STRUCTURAL PRODUCTS L L C — Tri-S ProTRAK

1F. **Framing Members* — Floor and Ceiling Runner —** Not Shown — In lieu of Item 1 — For use with Item 2F, proprietary channel shaped runners, minimum width to accommodate stud size, with 1- 1/8 in. long legs fabricated from min 0.015 in. (min bare metal thickness) galv steel, attached to floor and ceiling with fasteners spaced 24 in. OC max.
SUPER STUD BUILDING PRODUCTS — The Edge

1G. **Framing Members* — Floor and Ceiling Runner —** For use with Item 2G, proprietary channel shaped runners, minimum width to accommodate stud size attached to floor and ceiling with fasteners 24 in. OC max.
STUDCO BUILDING SYSTEMS — CROCSTUD Track

1H. **Floor and Ceiling Runners —** (Not Shown) — Channel shaped, fabricated from min 0.02 in. galv steel, min width to accommodate stud size, with min 1 in. long legs, for use with studs specified below and fabricated from min 0.018 in. galv steel or thicker, attached to floor and ceiling with fasteners spaced max 24 in. OC.
MARINO/WARE, DIV OF WARE INDUSTRIES INC — Viper20™ Track VT100

IMPERIAL MANUFACTURING GROUP INC — Viper20™ Track VT100

1I. **Framing Members* — Floor and Ceiling Runners —** (Not Shown, As an alternate to Item 1) — For use with Items 2H, channel shaped, fabricated from min. 0.015 in. (min bare metal thickness) galvanized steel, attached to floor and ceiling with fasteners 24 in. OC. max.
TELLING INDUSTRIES L L C — TRUE-TRACK™

1J. **Framing Members* — Floor and Ceiling Runner —** Not Shown — In lieu of Item 1 — For use with Item 2I, proprietary channel shaped runners, 3-5/8 in. deep attached to floor and ceiling with fasteners 24 in. OC max.

1K. **Framing Members* — Floor and Ceiling Runner —** Not Shown — In lieu of Item 1 — For use with Item 2J, proprietary channel shaped runners, 1-1/4 in. wide by 3-5/8 in. deep fabricated from min 0.018 in. thick galv steel, attached to floor and ceiling with fasteners spaced 24 in. OC max.

1L. **Framing Members* — Floor and Ceiling Runner —** Not Shown — In lieu of Item 1 — For use with Item 2N, proprietary channel shaped runners, 1-1/4 in. wide by min. 3-1/2 in. deep fabricated from min 0.018 in. thick galv steel, attached to floor and ceiling with fasteners spaced 24 in. OC max.
RESCUE METAL FRAMING, L L C — AlphaTRAK

1M. **Framing Members* — Floor and Ceiling Runners —** Not Shown — As an alternate to Item 1 — For use with Item 2O, proprietary channel shaped runners, min width to accommodate stud size, galv steel, attached to floor and ceiling with fasteners spaced 24 in. OC max.
RONDO BUILDING SERVICES PTY LTD — Rondo Wall Track

1N. **Framing Members* — Floor and Ceiling Runners —** Not Shown — As an alternate to Item 1 — For use with Item 2P, proprietary channel shaped runners, min width to accommodate stud size, galv steel, attached to floor and ceiling with fasteners spaced 24 in. OC max.
OEG BUILDING MATERIALS — OEG Track

1O. **Framing Members* — Floor and Ceiling Runner —** Not Shown — In lieu of Item 1 — For use with Item 2Q, proprietary channel shaped runners, min width to accommodate stud size, fabricated from min. 25 MSG (0.018 in. min. bare metal thickness), attached to floor and ceiling with fasteners spaced 24 in. OC max.
CALIFORNIA EXPANDED METAL PRODUCTS CO — Viper X Track

2. **Steel Studs —** Channel shaped, fabricated from min 25 MSG corrosion-protected steel, min depth as indicated under Item 5, spaced a max of 24 in. OC. Studs to be cut 3/8 to 3/4 in. less than assembly height.

2A. **Steel Studs —** (As an alternate to Item 2, For use with Items 5B, 5E, 5H, 5J or Type ULIX) — Channel shaped, fabricated from min 20 MSG corrosion-protected or galv steel, 3-1/2 in. min depth, spaced a max of 16 in. OC. Studs friction-fit into floor and ceiling runners. Studs to be cut 5/8 to 3/4 in. less than assembly height.

2B. **Framing Members* - Steel Studs —** (As an alternate to Item 2, For use with Items 5C, 5I or Type ULIX) — Proprietary channel shaped studs, 3-5/8 in. deep spaced a max of 24 in. OC. Studs to be cut 3/4 in less than the assembly height and installed with a 1/2 in. gap between the end of the stud and track at the bottom of the wall. For direct attachment of gypsum board only.
CALIFORNIA EXPANDED METAL PRODUCTS CO — Viper25™

CRACO MFG INC — SmartStud25™

MARINO/WARE, DIV OF WARE INDUSTRIES INC — Viper25™

IMPERIAL MANUFACTURING GROUP INC — Viper25™

2C. **Framing Members* — Steel Studs —** Not Shown — In lieu of Item 2 — proprietary channel shaped steel studs, min depth as indicated under Item 5, spaced a max if 24 in. OC, fabricated from min 0.018 in. thick galv steel. Studs cut 3/8 in. to 3/4 in. less in lengths than assembly heights.
CALIFORNIA EXPANDED METAL PRODUCTS CO — Viper20™

MARINO/WARE, DIV OF WARE INDUSTRIES INC — Viper20™

IMPERIAL MANUFACTURING GROUP INC — Viper20™

2D. **Framing Members* — Steel Studs —** In lieu of Item 2 — Channel shaped studs, min depth as indicated under Item 5, spaced a max of 24 in. OC. Studs to be cut 3/4 in. less than assembly height.
ALLSTEEL & GYPSUM PRODUCTS INC — Type SUPREME D24/30EQD and Type SUPREME D20

CONSOLIDATED FABRICATORS CORP, BUILDING PRODUCTS DIV — Type SUPREME D24/30EQD and Type SUPREME D20

QUAIL RUN BUILDING MATERIALS INC — Type SUPREME D24/30EQD and Type SUPREME D20

SCAFCO STEEL STUD MANUFACTURING CO — Type SUPREME D24/30EQD and Type SUPREME D20

STEEL CONSTRUCTION SYSTEMS INC — Type SUPREME D24/30EQD and Type SUPREME D20

TELLING INDUSTRIES L L C — Type SUPREME D24/30EQD and Type SUPREME D20

UNITED METAL PRODUCTS INC — Type SUPREME D24/30EQD and Type SUPREME D20

2E. **Framing Members* — Steel Studs —** (Not Shown, As an alternate to Item 2) — For use with Items 5F or 5G or 5I or Type ULIX only, channel shaped studs, min depth as indicated under Item 5F, 5G or 5I, fabricated from min. 0.015 in. (min bare metal thickness) galvanized steel, spaced a max of 24 in. OC. Studs to be cut 3/4 in. less than assembly height.
CLARKDIETRICH BUILDING SYSTEMS — CD ProSTUD

DMFCWBS L L C — ProSTUD

MBA METAL FRAMING — ProSTUD

RAM SALES L L C — Ram ProSTUD

STEEL STRUCTURAL PRODUCTS L L C — Tri-S ProSTUD

2F. **Framing Members* — Steel Studs —** Not Shown — In lieu of Item 2 — proprietary channel shaped steel studs, minimum width indicated under Item 5, 1-1/4 in. deep fabricated from min 0.015 in. (min bare metal thickness) galvanized steel. Studs 3/8 in. to 3/4 in. less in lengths than assembly heights.
SUPER STUD BUILDING PRODUCTS — The Edge

2G. **Framing Members* — Steel Studs —** Not Shown — In lieu of Item 2 — proprietary channel shaped studs, minimum width indicated under Item 5, Studs to be cut 3/8 to 3/4 in less than the assembly height.
STUDCO BUILDING SYSTEMS — CROCSTUD

2H. **Framing Members* — Steel Studs —** (Not Shown, As an alternate to Item 2) — Fabricated from min. 0.015 in. (min bare metal thickness) galvanized steel, spaced a max of 24 in. OC. Studs to be cut 3/4 in. less than assembly height.
TELLING INDUSTRIES L L C — TRUE-STUD™

2I. **Framing Members* — Steel Studs —**

2J. **Framing Members* — Metal Studs —** Not Shown — In lieu of Item 2 — proprietary channel shaped steel studs, min depth as indicated under Item 5, spaced a max if 24 in. OC, fabricated from min 0.018 in. thick galv steel. Studs cut 3/8 in. to 3/4 in. less in lengths than assembly heights

2K. **Framing Members* — Steel Studs —** As an alternate to Item 2 — For use with Item 1, channel shaped studs, fabricated from min 25 MSG corrosion-protected steel, min depth as indicated under Item 5, spaced a max of 24 in. OC. Studs to be cut 3/8 to 3/4 in. less than assembly height.
EB METAL INC — NITROSTUD

2L. **Framing Members* — Steel Studs —** As an alternate to Item 2 — For use with Item 1, channel shaped studs, fabricated from min 25 MSG corrosion-protected steel, min depth as indicated under Item 5, spaced a max of 24 in. OC. Studs to be cut 3/8 to 3/4 in. less than assembly height.
OLMAR SUPPLY INC — PRIMESTUD

2M. **Framing Members* — Steel Studs —** As an alternate to Item 2 — For use with Item 1, channel shaped studs, fabricated from min 25 MSG corrosion-protected steel, min depth as indicated under Item 5, spaced a max of 24 in. OC. Studs to be cut 3/8 to 3/4 in. less than assembly height.
MARINO/WARE, DIV OF WARE INDUSTRIES INC — StudRite™

2N. **Framing Members*— Steel Studs —** As an alternate to Item 2 — proprietary channel shaped steel studs, min depth 3-1/2 in. and as indicated under Item 5, spaced a max of 24 in. OC, fabricated from min 0.018 in. thick galv steel. Studs cut 3/8 in. to 3/4 in. less in length than assembly height.
RESCUE METAL FRAMING, L L C — AlphaSTUD

2O. **Framing Members* — Steel Studs —** As an alternate to Item 2 — proprietary channel shaped steel studs, min width as indicated under Item 5, galv steel. Studs to be cut 3/8 to 3/4 in. less in lengths than assembly height. Spaced 24 in. OC max.
RONDO BUILDING SERVICES PTY LTD — Rondo Lipped Wall Stud

2P. **Framing Members* — Steel Studs —** As an alternate to Item 2 — proprietary channel shaped steel studs, min width as indicated under Item 5, min 25 MSG galv steel. Studs to be cut 3/8 to 3/4 in. less in lengths than assembly height. Spaced 24 in. OC max.
OEG BUILDING MATERIALS — OEG Stud

2Q. **Framing Members* — Steel Studs —** Not Shown — In lieu of Item 2 — For use with Item 1O, proprietary channel shaped steel studs, min depth as indicated under Item 5, spaced a max of 24 in. OC, fabricated from min 25 MSG (0.018 in. min. bare metal thickness). Studs cut 3/8 in. to 3/4 in. less in lengths than assembly heights.
CALIFORNIA EXPANDED METAL PRODUCTS CO — Viper X

3. **Wood Structural Panel Sheathing —** (Optional, For use with Item 5 Only) — (Not Shown) — 4 ft wide, 7/16 in. thick oriented strand board (OSB) or 15/32 in. thick structural 1 sheathing (plywood) complying with DOC PS1 or PS2, or APA Standard PRP-108, manufactured with exterior glue, applied horizontally or vertically to the steel studs. Vertical joints centered on studs, and staggered one stud space from wallboard joints. Attached to studs with flat-head self-drilling tapping screws with a min. head diam. of 0.292 in. at maximum 6 in. OC. in the perimeter and 12 in. OC. in the field. When used, gypsum panels attached over OSB or plywood panels and fastener lengths for gypsum panels increased by min. 1/2 in.

4. **Batts and Blankets* —** (Required as indicated under Item 5) — Mineral wool batts, friction fitted between studs and runners. Min nom thickness as indicated under Item 5.
See **Batts and Blankets** (BKNV or BZJZ) Categories for names of Classified companies.

4A. **Batts and Blankets* —** (Optional) — Placed in stud cavities, any glass fiber or mineral wool insulation bearing the UL Classification Marking as to Surface Burning Characteristics and/or Fire Resistance.
See **Batts and Blankets** (BKNV or BZJZ) Categories for names of Classified companies.

4B. **Fiber, Sprayed* —** (Optional, for use with Type ULIX) Where insulation is required - Spray applied granulated mineral fiber material. The fiber is applied with adhesive at a minimum density of 4.0 pcf to completely fill the wall cavity in accordance with the application instructions supplied with the product. See **Fiber, Sprayed** (CCAZ).
AMERICAN ROCKWOOL MANUFACTURING, LLC — Type Rockwool Premium Plus

4C. **Foamed Plastic* —** (Where Batts and Blankets*, Item 4, are optional, for use with Item 5K) — Spray applied, foamed plastic insulation, at any thickness from partial fill to completely filling stud cavity, for 2 hour rated assemblies only. When foamed plastic is used, minimum stud depth shall be 3-1/2 in.

CARLISLE SPRAY FOAM INSULATION — Types SealTite Pro Closed Cell (CC), SealTite Pro Open Cell (OC), SealTite Pro OCX, SealTite Pro No Trim 21, SealTite Pro One Zero, Foamsulate Closed Cell, Foamsulate OCX, Foamsulate 70, and Foamsulate HFO.

4D. **Foamed Plastic* —** (Where Batts and Blankets*, Item 4, are optional, for use with Item 5L) — Spray applied, foamed plastic insulation, at any thickness from partial fill to completely filling stud cavity, for up to 2 hour rated assemblies only. When foamed plastic is used, minimum stud depth shall be 3-1/2 in. with minimum 20 MSG steel thickness.

BASF CORP - Enertite® NM, Enertite® G, FE178®, Spraytite® 178, Spraytite® 81206, Walltite® 200, Walltite® US, Walltite® US-N, Walltite HP+, FE137®, FE158®, Spraytite® 158, Spraytite® SP and Spraytite® 81205

5. **Gypsum Board* —** Gypsum panels with beveled, square or tapered edges, applied vertically or horizontally. Vertical joints centered over studs and staggered one stud cavity on opposite sides of studs. Vertical joints in adjacent layers (multilayer systems) staggered one stud cavity. Horizontal joints need not be backed by steel framing. Horizontal edge joints and horizontal butt joints on opposite sides of studs need not be staggered. Horizontal edge joints and horizontal butt joints in adjacent layers (multilayer systems) staggered a min of 12 in. Horizontal edge joints and horizontal butt joints in adjacent layers (multilayer systems) with Type ULIX need not be staggered. The thickness and number of layers for the 1 hr, 2 hr, 3 hr and 4 hr ratings are as follows:

Gypsum Board Protection on Each Side of Wall

Rating, Hr	Min Stud Depth, in. Items 2, 2C, 2D, 2F, 2G, 2O	No. of Layers & Thkns of Panel	Min Thkns of Insulation (Item 4)
1	3-1/2	1 layer, 5/8 in. thick	Optional
1	2-1/2	1 layer, 1/2 in. thick	1-1/2 in.
1	1-5/8	1 layer, 3/4 in. thick	Optional
2	1-5/8	2 layers, 1/2 in. thick	Optional
2	1-5/8	2 layers, 5/8 in. thick	Optional
2	3-1/2	1 layer, 3/4 in. thick	3 in.
3	1-5/8	3 layers, 1/2 in. thick	Optional
3	1-5/8	2 layers, 3/4 in. thick	Optional
3	1-5/8	3 layers, 5/8 in. thick	Optional
4	1-5/8	4 layers, 5/8 in. thick	Optional
4	1-5/8	4 layers, 1/2 in. thick	Optional
4	2-1/2	2 layers, 3/4 in. thick	2 in.

CGC INC — 1/2 in. thick Type C, IP-X2 or IPC-AR; WRC, 5/8 in. thick Type AR, C, IP-AR, IP-X1, IP-X2, IPC-AR, SCX, SHX, ULIX, WRX or WRC; 3/4 in. thick Types IP-X3 or ULTRACODE

THE SIAM GYPSUM INDUSTRY (SONGKHLA) CO — 1/2 in. thick Type C and 5/8 in. thick Type SCX

UNITED STATES GYPSUM CO — 1/2 in. thick Type C, IP-X2, IPC-AR or WRC; 5/8 in. thick Type SCX, SGX, SHX, ULIX, WRX, IP-X1, AR, C, WRC, FRX-G, IP-AR, IP-X2, IPC-AR; 3/4 in. thick Types IP-X3 or ULTRACODE

USG BORAL DRYWALL SFZ LLC — 1/2 in. Type C; 5/8 in. Types C, SCX, SGX, ULTRACODE

USG MEXICO S A DE C V — 1/2 in. thick Type C, IP-X2, IPC-AR or WRC; 5/8 in. thick Type AR, C, IP-AR, IP-X1, IP-X2, IPC-AR, SCX, SHX, WRX, WRC or; 3/4 in. thick Types IP-X3 or ULTRACODE

When Item 7B, **Steel Framing Members***, is used, Nonbearing Wall Rating is limited to 1 Hr. Min. stud depth is 3-1/2 in., min. thickness of insulation (Item 4) is 3 in., and two layers of gypsum board panels (1/2 in. or 5/8 in. thick) shall be attached to furring channels as described in Item 6. One layer of gypsum board panels (1/2 in. or 5/8 in. thick) attached to opposite side of stud without furring channels as described in Item 6.

5A. **Gypsum Board* —** (As an alternate to Item 5) — 5/8 in. thick, 24 to 54 in. wide, applied horizontally as the outer layer to one side of the assembly. Secured as described in Item 6.
CGC INC — Type SHX.

UNITED STATES GYPSUM CO — Type FRX-G, SHX.

USG MEXICO S A DE C V — Type SHX.

5B. **Gypsum Board* —** (Not Shown) — As an alternate to Item 5 when used as the base layer on one or both sides of wall when 5/8 in or 3/4 in. thick products are specified. For direct attachment only to steel studs Item 2A, (not to be used with Item 3) — Nom 5/8 in. or 3/4 in. may be used as alternate to all 5/8 in. or 3/4 in. shown in Item 5, Wallboard Protection on Each Side of Wall table. Nom 5/8 in. or 3/4 in. thick lead backed gypsum panels with beveled, square or tapered edges, applied vertically. Vertical joints centered over studs and staggered min 1 stud cavity on opposite sides of studs. Gypsum board secured to 20 MSG steel studs Item 2A with 1-1/4 in. long Type S-12 steel screws spaced 8 in. OC at perimeter and 12 in. OC in the field. To be used with Lead Batten Strips (see Item 11) or Lead Discs or Tabs (see Item 12).
RAY-BAR ENGINEERING CORP — Type RB-LBG

5C. **Gypsum Board* —** (For Use With Item 2B) — Rating Limited to 1 Hour. 5/8 in. thick, 48 in. wide, Gypsum panels with beveled, square or tapered edges, applied vertically or horizontally. (Vertical Application) - The gypsum board is to be installed on each side of the studs with 1 in. long Type S coated steel screws spaced 8 in. OC starting 4 in. from the edge of the board at the vertical edges and 12 in. OC starting 6 in. from the edge of the board at the center of each board. Gypsum boards are to be secured to the top and bottom track with screws spaced 8 in. OC starting 4 in. from the board edge. Fasteners shall not penetrate through both the stud and the track at the same time. Vertical joints are to be centered over studs and staggered one stud cavity on opposite sides of studs. (Horizontal Application) - The gypsum board is to be installed on each side of the studs with 1 in. long Type S coated steel screws spaced 8 in. OC starting 4 in. from the edge of the board at the vertical edges and 12 in. OC starting 6 in. from the edge of the board at the center of each board. Gypsum boards are to be secured to the top and bottom track with screws spaced 8 in. OC starting 4 in. from the board edge. Fasteners shall not penetrate through both the stud and the track at the same time. All horizontal joints are to be backed as outlined under section VI of Volume 1 in the Fire Resistive Directory.

CGC INC — Type SCX, ULIX.

THE SIAM GYPSUM INDUSTRY (SONGKHLA) CO — Type SCX

UNITED STATES GYPSUM CO — Type SCX, SGX, ULIX.

USG BORAL DRYWALL SFZ LLC — Type SCX

USG MEXICO S A DE C V — Type SCX

5D. **Gypsum Board* —** (As an alternate to Item 5) — 5/8 in. thick, 48 in. wide, applied vertically or horizontally. Secured as described in Item 6. For use with Items 1 and 2 only.
CGC INC — Type USGX

UNITED STATES GYPSUM CO — Type USGX

USG BORAL DRYWALL SFZ LLC — Type USGX

USG MEXICO S A DE C V — Type USGX

5E. **Gypsum Board* —** (Not Shown) — (As an alternate to Item 5 when used as the base layer on one or both sides of wall when 1/2 in. or 5/8 in thick products are specified, For direct attachment only to steel studs Item 2A, not to be used with Item 3). Nominal 5/8 in. thick lead backed gypsum panels with beveled, square or tapered edges, applied vertically. Vertical joints centered over studs and staggered min 1 stud cavity on opposite sides of studs. Wallboard secured to studs with 1-1/4 in. long Type S-12 (or No. 6 by 1-1/4 in. long bugle head fine driller) steel screws spaced 8 in. OC at perimeter and 12 in. OC in the field.
NEW ENGLAND LEAD BURNING CO INC, DBA NELCO — Nelco

5F. **Gypsum Board* —** (As an alternate to Item 5) — For use with Items 1E and 2E and limited to 1 Hour Rating only, Gypsum panels with beveled, square or tapered edges, applied vertically, and fastened to the steel studs with 1 in. long Type S screws spaced 8 in. OC along vertical and bottom edges and 12 in. OC in the field. Vertical joints centered over studs and staggered one stud cavity on opposite sides of studs. Steel stud depth shall be a minimum 3-5/8 in.
THE SIAM GYPSUM INDUSTRY (SONGKHLA) CO — Type SCX

UNITED STATES GYPSUM CO — 5/8 in. thick Type SCX, SGX, ULIX

USG BORAL DRYWALL SFZ LLC — 5/8 in. thick Type SCX, SGX

5G. **Gypsum Board* —** (As an alternate to Item 5) — For use with Items 1E and 2E only, Gypsum panels with beveled, square or tapered edges, applied vertically or horizontally, as specified in the table below and fastened to the steel studs as described in Item 6. Vertical joints centered over studs and staggered one stud cavity on opposite sides of studs. Vertical joints in adjacent layers (multilayer systems) staggered one stud cavity. Horizontal joints need not be backed by steel framing. Horizontal edge joints and horizontal butt joints on opposite sides of studs need not be staggered. Horizontal edge joints and horizontal butt joints in adjacent layers (multilayer systems) staggered a min of 12 in. The thickness and number of layers for the 2 hr, 3 hr and 4 hr ratings are as follows:

Gypsum Board Protection on Each Side of Wall

Rating, Hr	Min Stud Depth, in. Item 2E	No. of Layers & Thickness of Panel	Min Thkns of Insulation (Item 4)
2	1-5/8	2 layers, 1/2 in. thick	Optional
2	1-5/8	2 layers, 5/8 in. thick	Optional
3	1-5/8	3 layers, 1/2 in. thick	Optional
3	1-5/8	3 layers, 5/8 in. thick	Optional

CGC INC — 1/2 in. thick Type C, IP-X2 or IPC-AR;, 5/8 in. thick Type AR, C, IP-AR, IP-X1, IP-X2, IPC-AR, SCX, SHX, ULIX or 3/4 in. thick Types IP-X3 or ULTRACODE

THE SIAM GYPSUM INDUSTRY (SONGKHLA) CO — 1/2 in. thick Types C and 5/8 in. thick SCX

UNITED STATES GYPSUM CO — 1/2 in. thick Type C, IP-X2, IPC-AR or; 5/8 in. thick Type SCX, SGX, SHX, IP-X1, AR, C, , FRX-G, IP-AR, IP-X2, IPC-AR, ULIX; 3/4 in. thick Types IP-X3 or ULTRACODE

USG BORAL DRYWALL SFZ LLC — 1/2 in. Type C; 5/8 in. Types C, SCX, SGX, ULTRACODE

USG MEXICO S A DE C V — 1/2 in. thick Type C, IP-X2, IPC-AR or; 5/8 in. thick Type AR, C, IP-AR, IP-X1, IP-X2, IPC-AR, SCX, SHX, or; 3/4 in. thick Types IP-X3 or ULTRACODE

5H. **Gypsum Board* —** (Not Shown) — (As an alternate to Item 5 when used as the base layer on one or both sides of wall when 5/8 or 3/4 in thick products are specified. For direct attachment only to steel studs Item 2A, (not to be used with Item 3) - Nom 5/8 or 3/4 in. may be used as alternate to all 5/8 or 3/4 in. shown in Item 5, Wallboard Protection on Each Side of Wall table. Nom 5/8 or 3/4 in. thick lead backed gypsum panels with beveled, square or tapered edges, applied vertically. Vertical joints centered over 20 MSG steel studs and staggered min 1 stud cavity on opposite sides of studs. Wallboard secured to studs with 1-1/4 in. long Type S-12 steel screws spaced 8 in. OC at perimeter and 12 in. OC in the field. Gypsum board secured to 20 MSG steel studs Item 2B with 1-1/4 in. long Type S-12 steel screws spaced 8 in. OC at perimeter and 12 in. OC in the field. For Joint Compound see Item 5. To be used with Lead Batten Strips (see Item 11A) or Lead Discs (see Item 12A).
MAYCO INDUSTRIES INC — Type X-Ray Shielded Gypsum

5I. **Gypsum Board* —** (As an alternate to Item 5) — Nom. 5/8 in. thick gypsum panels with beveled, square or tapered edges installed as described in Item 5. Steel stud minimum depth shall be as indicated in Item 5.
CGC INC — Type ULIX, ULX

UNITED STATES GYPSUM CO — Type ULIX, ULX

USG MEXICO S A DE C V — Type ULX

5J. **Gypsum Board* —** (Not Shown) — (As an alternate to Item 5 when used as the base layer on one or both sides of wall when 1/2 in. or 5/8 in thick products are specified, For direct attachment only to steel studs Item 2A, not to be used with Item 3). Nom 5/8 in. thick lead backed gypsum panels with beveled, square or tapered edges, applied vertically. Vertical joints centered over studs and staggered min 1 stud cavity on opposite sides of studs. Wallboard secured to studs with 1-1/4 in. long Type S-12 steel screws gypsum panel steel screws spaced 8 in. OC at perimeter and 12 in. OC in the field. Lead batten strips required behind vertical joints of lead backed gypsum wallboard and optional at remaining stud locations. Lead batten strips, min 2 in. wide, max 8 ft long with a max thickness of 0.14 in. placed on the face of studs and attached to the stud with construction adhesive and two 1 in. long Type S-12 pan head steel screws, one at the top of the strip and one at the bottom of the strip. Lead discs, nominal 3/8 in. diam by max 0.085 in. thick. Compression fitted or adhered over the screw heads. Lead batten strips and discs to have a purity of 99.9% meeting the Federal specification QQ-L-201f, Grade "C".
RADIATION PROTECTION PRODUCTS INC — Type RPP - Lead Lined Drywall

5K. **Gypsum Board* —** (As an alternate to Item 5 when Foam Plastic insulation (Item 4C) is used) **—** Any 5/8 in. thick, 4 ft. wide, Gypsum Board listed in Item 5 above. Applied vertically with vertical joints centered over studs and staggered one stud cavity on opposite sides of studs. Gypsum panels secured to studs with 1 in. long Type S steel screws spaced 8 in. OC at perimeter and in the field. For 2 layer assemblies outer layer will be attached to studs over inner layer with the 1-5/8 in. long steel screws spaced 8 in. OC.

5L. **Gypsum Board* —** (As an alternate to Item 5 when Foam Plastic insulation (Item 4D) is used) **—** Any 5/8 in. thick, 4 ft. wide, Gypsum Board listed in Item 5 above. Applied vertically with vertical joints centered over studs and staggered one stud cavity on opposite sides of studs. Gypsum panels secured to studs with 1-1/4 in. long Type S steel screws spaced 8 in. OC at perimeter and in the field. For 2 layer assemblies outer layer will be attached to studs over inner layer with the 1-7/8 in. long steel screws spaced 8 in. OC.

6. **Fasteners —** (Not Shown) — For use with Items 2 and 2F - Type S or S-12 steel screws used to attach panels to studs (Item 2) or furring channels (Item 7). **Single layer systems:** 1 in. long for 1/2 and 5/8 in. thick panels or 1-1/4 in. long for 3/4 in. thick panels, spaced 8 in. OC when panels are applied horizontally, or 8 in. OC along vertical and bottom edges and 12 in. OC in the field when panels are applied vertically. **Single layer system with Type ULIX:** 1 in. long, spaced 12 in. OC in the field and perimeter, when panels are applied horizontally or vertically.**Two layer systems:** First layer- 1 in. long for 1/2 and 5/8 in. thick panels or 1-1/4 in. long for 3/4 in. thick panels, spaced 16 in. OC. Second layer- 1-5/8 in. long for 1/2 in., 5/8 in. thick panels or 2-1/4 in. long for 3/4 in. thick panels, spaced 16 in. OC with screws offset 8 in. from first layer.**Three-layer systems:** First layer- 1 in. long for 1/2 in., 5/8 in. thick panels, spaced 24 in. OC. Second layer- 1-5/8 in. long for 1/2 in., 5/8 in. thick panels, spaced 24 in. OC. Third layer- 2-1/4 in. long for 1/2 in., 5/8 in. thick panels or 2-5/8 in. long for 5/8 in. thick panels, spaced 12 in. OC. Screws offset min 6 in. from layer below. **Four-layer systems:** First layer- 1 in. long for 1/2 in., 5/8 in. thick panels, spaced 24 in. OC. Second layer- 1-5/8 in. long for 1/2 in., 5/8 in. thick panels, spaced 24 in. OC. Third layer- 2-1/4 in. long for 1/2 in. thick panels or 2-5/8 in. long for 5/8 in. thick panels, spaced 24 in. OC. Fourth layer- 2-5/8 in. long for 1/2 in. thick panels or 3 in. long for 5/8 in. thick panels, spaced 12 in. OC. Screws offset min 6 in. from layer below.

7. **Furring Channels —** (Optional, Not Shown, for single or double layer systems) — Resilient furring channels fabricated from min 25 MSG corrosion-protected steel, spaced vertically a max of 24 in. OC. Flange portion attached to each intersecting stud with 1/2 in. long Type S-12 steel screws. Not for use with Item 5A.

7A. **Framing Members* —** (Optional on one or both sides, not shown, for single or double layer systems) — As an alternate to Item 7, furring channels and Steel Framing Members as described below:
a. **Furring Channels —** Formed of No. 25 MSG galv steel. 2-9/16 in. or 2-23/32 in. wide by 7/8 in. deep, spaced max. 24 in. OC perpendicular to studs. Channels secured to studs as described in Item b. Gypsum board attached to furring channels as described in Item 6. Not for use with Item 5A.

b. **Steel Framing Members* —** Used to attach furring channels (Item 7Aa) to studs (Item 2). Clips spaced max. 48 in. OC. RSIC-1 and RSIC-1 (2.75) clips secured to studs with No. 8 x 1-1/2 in. minimum self-drilling, S-12 steel screw through the center grommet. RSIC-V and RSIC-V (2.75) clips secured to studs with No. 8 x 9/16 in. minimum self-drilling, S-12 steel screw through the center hole. Furring channels are friction fitted into clips. RSIC-1 and RSIC-V clips for use with 2-9/16 in. wide furring channels. RSIC-1 (2.75) and RSIC-V (2.75) clips for use with 2-23/32 in. wide furring channels.
PAC INTERNATIONAL L L C — Types RSIC-1, RSIC-V, RSIC-1 (2.75), RSIC-V (2.75).

7B. **Framing Members* —** (Optional, Not Shown) — As an alternate to Item 7, for single or double layer systems, furring channels and Steel Framing Members on only one side of studs as described below:
a. **Furring Channels —** Formed of No. 25 MSG galv steel, spaced 24 in. OC perpendicular to studs. Channels secured to studs as described in Item b. Batts and Blankets placed in stud cavity as described in Item 5. Two layers of gypsum board attached to furring channels as described in Item 5. Not for use with Item 5A.

b. **Steel Framing Members* —** Used to attach furring channels (Item 7Ba) to one side of studs (Item 2) only. Clips spaced 48 in. OC., and secured to studs with two No. 8 x 2-1/2 in. coarse drywall screws, one through the hole at each end of the clip. Furring channels are friction fitted into clips.
KINETICS NOISE CONTROL INC — Type Isomax

7C. **Framing Members* —** (Not Shown) — (Optional on one or both sides, not shown, for single or double layer systems) — As an alternate to Item 7, furring channels and Steel Framing Members as described below:
a. **Furring Channels —** Formed of No. 25 MSG galv steel. 2-3/8 in. wide by 7/8 in. deep, spaced max. 24 in. OC perpendicular to studs. Channels secured to studs as described in Item b. Gypsum board attached to furring channels as described in Item 6. Not for use with Item 5A.

b. **Steel Framing Members* —** Used to attach furring channels (Item 7Ca) to studs (Item 2). Clips spaced max. 48 in. OC. GENIECLIPS secured to studs with No. 8 x 1-1/2 in. minimum self-drilling, S-12 steel screw through the center grommet. Furring channels are friction fitted into clips.
PLITEQ INC — Type GENIECLIP

7D. **Steel Framing Members* —** (Optional on one or both sides, not shown, for single or double layer systems) — Furring channels and Steel Framing Members as described below:
a. **Furring Channels —** Formed of No. 25 MSG galv steel. Spaced 24 in. OC perpendicular to studs. Channels secured to studs as described in Item b. Ends of adjoining channels overlapped 6 in. and tied together with double strand of No. 18 AWG galvanized steel wire.. Gypsum board attached to furring channels as described in Item 6. Not for use with Item 5A.

b. **Steel Framing Members* —** Used to attach furring channels (Item 7Da) to studs. Clips spaced 48 in. OC., and secured to studs with 2 in. coarse drywall screw with 1 in. diam washer through the center hole. Furring channels are friction fitted into clips
STUDCO BUILDING SYSTEMS — RESILMOUNT Sound Isolation Clips - Type A237 or A237R

7E. **Steel Framing Members* —** (Optional on one or both sides, not shown, for single or double layer systems) — Furring channels and Steel Framing Members as described below:
a. **Furring Channels —** Formed of No. 25 MSG galv steel. Spaced 24 in. OC perpendicular to studs. Channels secured to studs as described in Item 7Eb. Ends of adjoining channels overlapped 6 in. and tied together with double strand of No. 18 AWG galvanized steel wire.. Gypsum board attached to furring channels as described in Item 6. Not for use with Item 5A and 5E.

b. **Steel Framing Members* —** Used to attach furring channels (Item 7Ea) to studs. Clips spaced 48 in. OC., and secured to studs with No. 8 x 2-1/2 in. coarse drywall screw through the center hole. Furring channels are friction fitted into clips.
REGUPOL AMERICA — Type SonusClip

7F. **Steel Framing Members* —** (Optional on one or both sides, not shown, for single or double layer systems) — Resilient channels and Steel Framing Members as described below:
a. **Resilient Channels —** Formed of No. 25 MSG galv steel, spaced 24 in. OC, and perpendicular to studs. Channels secured to studs as described in Item b. Ends of adjoining channels overlapped 6 in. and secured in place with two No. 8 15 x 1/2 in. Philips Modified Truss screws spaced 2-1/2 in. from the center of the overlap. Gypsum board attached to resilient channels as described in Item 5. Not for use with Item 5A and 5E.

b. **Steel Framing Members* —** Used to attach resilient channels (Item 7Fa) to studs. Clips spaced 48 in. OC., and secured to studs with No. 8 x 2-1/2 in. coarse drywall screw through the center hole. Resilient channels are secured to clips with one No. 10 x 1/2 in. pan-head self-drilling screw.
KEENE BUILDING PRODUCTS CO INC — Type RC+ Assurance Clip

7G. **Framing Members* —** (Optional on one or both sides, not shown, for single or double layer systems) — As an alternate to Item 7, furring channels and Steel Framing Members as described below:
a. **Furring Channels —** Formed of No. 25 MSG galv steel. 2-23/32 in. wide by 7/8 in. deep, spaced max. 24 in. OC perpendicular to studs. Channels secured to studs as described in Item b. Gypsum board attached to furring channels as described in Item 6. Not for use with Item 5A.

b. **Steel Framing Members* —** Used to attach furring channels (Item 7Ga) to studs (Item 2). Clips spaced max. 48 in. OC. Clips secured to studs with No. 8 x 1-1/2 in. minimum self-drilling, S-12 steel screw through the center hole. Furring channels are friction fitted into clips.
CLARKDIETRICH BUILDING SYSTEMS — Type ClarkDietrich Sound Clip

8. **Joint Tape and Compound —** Vinyl or casein, dry or premixed joint compound applied in two coats to joints and screw heads of outer layers. Paper tape, nom 2 in. wide, embedded in first layer of compound over all joints of outer layer panels. Paper tape and joint compound may be omitted when gypsum panels are supplied with a square edge.

9. **Siding, Brick or Stucco —** (Optional, Not Shown) — Aluminum, vinyl or steel siding, brick veneer or stucco, meeting the requirements of local code agencies, installed over gypsum panels. Brick veneer attached to studs with corrugated metal wall ties attached to each stud with steel screws, not more than each sixth course of brick.

10. **Caulking and Sealants* —** (Optional, Not Shown) — A bead of acoustical sealant applied around the partition perimeter for sound control.
UNITED STATES GYPSUM CO — Type AS

11. **Lead Batten Strips —** (Not Shown, For Use With Item 5B) — Lead batten strips, min 1-1/2 in. wide, max 10 ft long with a max thickness of 0.125 in. Strips placed on the interior face of studs and attached from the exterior face of the stud with two 1 in. long Type S-12 pan head steel screws, one at the top of the strip and one at the bottom of the strip. Lead batten strips to have a purity of 99.9% meeting the Federal specification QQ-L-201f, Grade "C". Lead batten strips required behind vertical joints of lead backed gypsum wallboard (Item 5B) and optional at remaining stud locations. Required behind vertical joints.

11A. **Lead Batten Strips —** (Not Shown, For Use With Item 5H) — Lead batten strips, 2 in. wide, max 10 ft long with a max thickness of 0.140 in. Strips placed on the face of studs and attached to the stud with two min. 1 in. long min. Type S-8 pan head steel screws, one at the top of the strip and one at the bottom of the strip or with one min. 1 in. long min. Type S-8 pan head steel screw at the top of the strip. Lead batten strips to have a purity of 99.5% meeting the Federal specification QQ-L-201f, Grades "B, C or D". Lead batten strips required behind vertical joints of lead backed gypsum wallboard and optional at remaining stud locations.

12. **Lead Discs or Tabs —** (Not Shown, For Use With Item 5B) — Used in lieu of or in addition to the lead batten strips (Item 11) or optional at other locations - Max 3/4 in. diam by max 0.125 in. thick lead discs compression fitted or adhered over steel screw heads or max 1/2 in. by 1-1/4 in. by max 0.125 in. thick lead tabs placed on gypsum boards (Item 5B) underneath screw locations prior to the installation of the screws. Lead discs or tabs to have a purity of 99.9% meeting the Federal specification QQ-L-201f, Grade "C".

12A. **Lead Discs —** (Not Shown, for use with Item 5H) — Max 5/16 in. diam by max 0.140 in. thick lead discs compression fitted or adhered over steel screw heads. Lead discs to have a purity of 99.5% meeting the Federal Specification QQ-L-201f, Grades "B, C or D".

13. **Lead Batten Strips —** (Not Shown, For Use With Item 5E) — Lead batten strips, 2 in. wide, max 10 ft long with a max thickness of 0.142 in. Strips placed on the face of studs and attached to the stud with two min. 1 in. long min. Type S-8 pan head steel screws, one at the top of the strip and one at the bottom of the strip or with one min. 1 in. long min. Type S-8 pan head steel screw at the top of the strip. Lead batten strips to have a purity of 99.9% meeting the Federal specification QQ-L-201f, Grade "C". Lead batten strips required behind vertical joints of lead backed gypsum wallboard (Item 5E) and optional at remaining stud locations.

14. **Lead Tabs —** (Not Shown, For Use With Item 5E) — 2 in. wide, 5 in. long with a max thickness of 0.142 in. Tabs friction-fit around front face of stud, the stud folded back flange, and the back face of the stud. Tabs required at each location where a screw (that secures the gypsum boards, Item 5E) will penetrate the steel stud. Lead tabs to have a purity of 99.9% meeting the Federal specification QQ-L-201f, Grade "C". Lead tabs may be held in place with standard adhesive tape if necessary.

15. **Barrier Mesh —** (Optional, Not Shown) - Attached to steel studs on one or both sides of the wall using Barrier Mesh Clips spaced at maximum 12 inches on center vertically, using a flat head type screw penetrating through the steel at least 3/8 of an inch. For Steel Studs less than 0.033 inches in thickness, use self-piercing screws. For Steel Studs equal to or greater than 0.033 inches in thickness, use steel drill screws (self-tapping). Gypsum Board (Item 5) to be installed directly over the Barrier Mesh using prescribed screw patterns with lengths increased by a minimum 1/8 in. Barrier Mesh may be installed with the long dimension of the diamond pattern positioned vertically or horizontally. Barrier Mesh joints may occur as butt joints at the framing members and secured using the Barrier Mesh Clips or occur in between framing members as overlapping joints secured using 18 SWG wire ties spaced a maximum 12 in. on center.
CLARKDIETRICH BUILDING SYSTEMS — Barrier Mesh, Barrier Mesh Clips

*** Indicates such products shall bear the UL or cUL Certification Mark for jurisdictions employing the UL or cUL Certification (such as Canada), respectively.**

Last Updated on 2022-09-05

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CHRISTOPHER J HEARD REGISTERED ARCHITECT 13274 NORTH CAROLINA ATLANTA, GEORGIA

No.	Date	Description
	05/26/23	PERMIT & CONSTRUCTION

Project Name

MIDGARD - SPRING LAKE

14396 NC-210 S SPRING LAKE 28390

ISSUE
NOT FOR CONSTRUCTION

UL PRODUCT IQ

Author
Drawn

Checker
Checked

Scale

247-001-01
Project No.

A-0.1.2
Drawing Number

5/30/2023 11:55:15 AM

UL Product iQ™

BXUV.U415 - Fire-resistance Ratings - ANSI/UL 263

Design/System/Construction/Assembly Usage Disclaimer

- Authorities Having Jurisdiction should be consulted in all cases as to the particular requirements covering the installation and use of UL Certified products, equipment, system, devices, and materials.
- Authorities Having Jurisdiction should be consulted before construction.
- Fire resistance assemblies and products are developed by the design submitter and have been investigated by UL for compliance with applicable requirements. The published information cannot always address every construction nuance encountered in the field.
- When field issues arise, it is recommended the first contact for assistance be the technical service staff provided by the product manufacturer noted for the design. Users of fire resistance assemblies are advised to consult the general Guide Information for each product category and each group of assemblies. The Guide Information includes specifics concerning alternate materials and alternate methods of construction.
- Only products which bear UL's Mark are considered Certified.

BXUV - Fire Resistance Ratings - ANSI/UL 263 Certified for United States

BXUV7 - Fire Resistance Ratings - CAN/ULC-S101 Certified for Canada

See General Information for Fire-resistance Ratings - ANSI/UL 263 Certified for United States
Design Criteria and Allowable Variances

See General Information for Fire Resistance Ratings - CAN/ULC-S101 Certified for Canada
Design Criteria and Allowable Variances

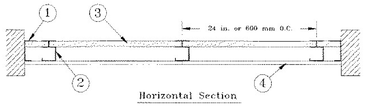
Design No. U415

December 22, 2020

Nonbearing Wall Ratings — 1, 2, 3 or 4 Hr

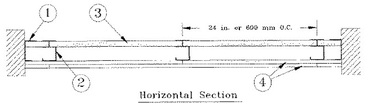
*** Indicates such products shall bear the UL or cUL Certification Mark for jurisdictions employing the UL or cUL Certification (such as Canada), respectively.**

System A – 1 Hr.



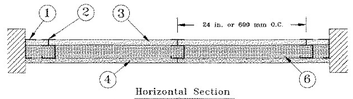
Horizontal Section

System B – 2 Hr.



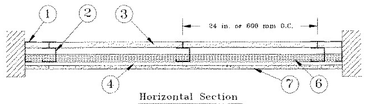
Horizontal Section

System C – 2 Hr.



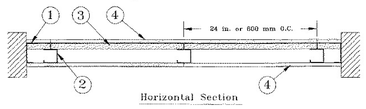
Horizontal Section

System D – 2 Hr.



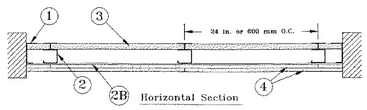
Horizontal Section

System E – 2 Hr.



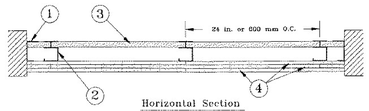
Horizontal Section

System F – 2 Hr.



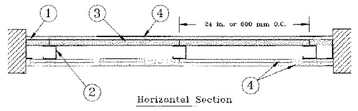
2B Horizontal Section

System G – 3 Hr.



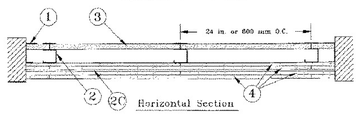
Horizontal Section

System H – 3 Hr.



Horizontal Section

System I – 4 Hr.



Horizontal Section

1. **Floor, Side and Ceiling Runners —** "J" - shaped runner, min 2-1/2 in. deep (min 4 in. deep when System C is used), with unequal legs of 1 in. and 2 in., fabricated from min 24 MSG (min 20 MSG when Item 4A, 4B, 4C, 4D or 7 are used) galv steel. Runners positioned with short leg toward finished side of wall. Runners attached to structural supports with steel fasteners located not greater than 2 in. from ends and not greater than 24 in. OC. "E" - shaped studs (Item 2A) may be used as side runners in place of "J" - shaped runners.

2. **Steel Studs —** "C-H" - shaped studs, min 2-1/2 in. deep (min 4 in. deep when System C is used), fabricated from min 25 MSG (min 20 MSG when Items 2D, 4A, 4B, 4C, 4D or 7 is used) galv steel. Cut to lengths 3/8 to 1/2 in. less than floor-to-ceiling height and spaced 24 in. or 600 mm OC (max 16 in. OC when Items 4A, 4B, 4C, or 4D are used).

2A. **Steel Studs —** (Not Shown) — "E" - shaped studs installed back to back in place of "C-H" - shaped studs (Item 2) "E" - shaped studs secured together with steel screws spaced a maximum 12 in. OC. Fabricated from min 25 MSG (min 20 MSG when Item 2D, 4A, 4B or 7 is used) galv steel, min 2-1/2 in. deep (min 4 in. deep when System C is used), with one leg 1 in. long and two legs 3/4 in. long. Shorter legs 1 in. apart to engage gypsum liner panels. Cut to lengths 3/8 to 1/2 in. less than floor to ceiling heights.

2B. **Furring Channels —** (Optional, Not Shown) — For use with single or double layer systems. Resilient furring channels fabricated from min 25MSG corrosion protected steel, installed horizontally, and spaced vertically a max 24 in. OC. Flange portion of channel attached to each intersecting "C-H" or "E" stud on side of stud opposite the 1 in. liner panels with 1/2 in. long Type S or S-12 pan-head steel screws. When furring channels are used, wallboard to be installed vertically only. . Not to be used with Type FRX-G gypsum board, lead backed gypsum boards (Items 4A-4D), or cementitious backer units (Item 7).

2C. **Furring Channels —** For use with System I - "Hat" - shaped, 25 MSG galv steel furring channels attached directly over the inner layers of wallboard to each stud with 2 in. long Type S pan head steel screws. Screws alternate from top flange to bottom flange at each stud intersection. Furring channels spaced vertically max 24 in. OC.

2D. **Steel Framing Members* —** (Optional, Not Shown) — For use with single or double layer systems. Furring channels and Steel Framing Members as described below. Not to be used with Type FRX-G gypsum board, lead backed gypsum boards (Items 4A-4D), or cementitious backer units (Item 7).

a. **Furring Channels —** Formed of No. 25 MSG galv steel. 2-9/16 in. or 2-23/32 in. wide by 7/8 in. deep, spaced max. 24 in. OC perpendicular to studs. Channels secured to studs as described in Item b. Gypsum board installed vertically only and attached to furring channels as described in Item 4.

b. **Steel Framing Members* —** Used to attach furring channels (Item 2Da) to studs (Item 2 or 2A). Clips spaced max. 24 in. OC., and secured to studs with No. 8 x 1-1/2 in. minimum self-drilling, S-12 steel screw through the center grommet. Furring channels are friction fitted into clips. RSIC-1 clip for use with 2-9/16 in. wide furring channels. RSIC-1 (2.75) clip for use with 2-23/32 in. wide furring channels.
PAC INTERNATIONAL L L C — Types RSIC-1, RSIC-1 (2.75)

2E. **Steel Framing Members* —** (Optional, Not Shown) — Furring channels and Steel Framing Members as described below . Not to be used with Type FRX-G gypsum board, lead backed gypsum boards (Items 4A-4D), or cementitious backer units (Item 7).

a. **Furring Channels —** Formed of No. 25 MSG galv steel. Spaced 24 in. OC perpendicular to studs. Channels secured to studs as described in Item b. Ends of adjoining channels overlapped 6 in. and tied together with double strand of No. 18 AWG galvanized steel wire.Gypsum board attached to furring channels as described in Item 4.

b. **Steel Framing Members* —** Used to attach furring channels (Item 2Ea) to studs. Clips spaced 24 in. OC., and secured to studs with 2 in. coarse drywall screw with 1 in. diam washer through the center hole. Furring channels are friction fitted into clips.
STUDCO BUILDING SYSTEMS — RESILMOUNT Sound Isolation Clips - Type A237R

2F. **Steel Framing Members* —** (Optional, Not Shown) — For use with single or double layer systems. Furring channels and Steel Framing Members as described below. Not to be used with Type FRX-G gypsum board, lead backed gypsum boards (Items 4A-4D), or cementitious backer units (Item 7).

a. **Furring Channels —** Formed of No. 25 MSG galv steel. 2-3/8 in. wide by 7/8 in. deep, spaced max. 24 in. OC perpendicular to studs. Channels secured to studs as described in Item b. Gypsum board installed vertically only and attached to furring channels as described in Item 3.

b. **Steel Framing Members* —** Used to attach furring channels (Item 2Da) to studs (Item 2 or 2A). Clips spaced max. 24 in. OC. GENIECLIPS secured to studs with No. 8 x 1-1/2 in. minimum self-drilling, S-12 steel screw through the center grommet. Furring channels are friction fitted into clips.
PLITEQ INC — Type GENIECLIP

2G. **Steel Framing Members* —** (Optional, Not Shown) — Furring channels and Steel Framing Members as described below. Not to be used with Type FRX-G gypsum board, lead backed gypsum boards (Items 4A-4D), or cementitious backer units (Item 7).

a. **Furring Channels —** Formed of No. 25 MSG galv steel. Spaced 24 in. OC perpendicular to studs. Channels secured to studs as described in Item 2Gb. Ends of adjoining channels overlapped 6 in. and tied together with double strand of No. 18 AWG galvanized steel wire. Gypsum board attached to furring channels as described in Item 4.

b. **Steel Framing Members* —** Used to attach furring channels (Item 2Ga) to studs. Clips spaced 24 in. OC., and secured to studs with No. 8 x 2-1/2 in. coarse drywall screw through the center hole. Furring channels are friction fitted into clips.
REGUPOL AMERICA — Type SonusClip

2H. **Steel Framing Members* —** (Optional, Not Shown) — Resilient channels and Steel Framing Members as described below. Not to be used with Type FRX-G gypsum board, lead backed gypsum boards (Items 4A-4D), or cementitious backer units (Item 7).

a. **Resilient Channels —** Formed of No. 25 MSG galv steel, spaced 24 in. OC, and perpendicular to studs. Channels secured to studs as described in Item b. Ends of adjoining channels overlapped 6 in. and secured in place with two No. 8 15 x 1/2 in. Philips Modified Truss screws spaced 2-1/2 in. from the center of the overlap. Gypsum board attached to resilient channels as described in Item 4.

b. **Steel Framing Members* —** Used to attach resilient channels (Item 2Ha) to studs. Clips spaced 48 in. OC., and secured to studs with No. 8 x 2-1/2 in. coarse drywall screw through the center hole. Resilient channels are secured to clips with one No. 10 x 1/2 in. pan-head self-drilling screw.
KEENE BUILDING PRODUCTS CO INC — Type RC+ Assurance Clip

2I. **Steel Framing Members* —** (Optional, Not Shown) — For use with single or double layer systems. Furring channels and Steel Framing Members as described below. Not to be used with Type FRX-G gypsum board, lead backed gypsum boards (Items 4A-4D), or cementitious backer units (Item 7).

a. **Furring Channels —** Formed of No. 25 MSG galv steel. 2-23/32 in. wide by 7/8 in. or 1-1/2 in. deep, spaced max. 24 in. OC perpendicular to studs. Channels secured to studs as described in Item b. Gypsum board installed vertically only and attached to furring channels as described in Item 4.

b. **Steel Framing Members* —** Used to attach furring channels (Item 2Ia) to studs (Item 2 or 2A). Clips spaced max. 24 in. OC., and secured to studs with No. 8 x 1-1/2 in. minimum self-drilling, S-12 steel screw through the center grommet. Furring channels are friction fitted into clips.
CLARKDIETRICH BUILDING SYSTEMS — Type ClarkDietrich Sound Clip

3. **Gypsum Board* —** *Gypsum* liner panels, nom 1 in. thick, 24 in. or 600 mm (for metric spacing) wide. Panels cut 1 in. less in length than floor to ceiling height. Vertical edges inserted in "H" portion of "C-H" studs or the gap between the two 3/4 in. legs of the "E" studs. Free edge of end panels attached to long leg of vertical "J" - runners with 1-5/8 in. long Type S steel screws spaced not greater than 12 in. OC. When wall height exceeds liner panel length, liner panel may be butted to extend to the full height of the wall. Horizontal joints need not be backed by steel framing. In System I, butt joints in liner panels are staggered min 36 in. Butt joints backed with 6 in. by 22 in. strips of 3/4 in. thick gypsum wallboard (Item 4). Wallboard strips centered over butt joints and secured to liner panels with six 1-1/2 in. long Type G steel screws, three screws along the 22 in. dimension at the top and bottom of the strips.
CGC INC — Type SLX

UNITED STATES GYPSUM CO — Type SLX

USG BORAL DRYWALL SFZ LLC — Type SLX

USG MEXICO S A DE C V — Type SLX

4. **Gypsum Board* —**

System A — 1 Hr

Gypsum panels, with beveled, square or tapered edges, nom 5/8 in. thick, 48 in. or 1200 mm wide, applied vertically or horizontally, attached to studs with 1 in. long Type S steel screws spaced 12 in. when installed vertically or 8 in OC when installed horizontally. Horizontal joints need not be backed by steel framing.

CGC INC — Types AR, C, IP-AR, IP-X1, IP-X2, IPC-AR, SCX, SHX, ULIX, ULX, USGX, WRC, WRX

THE SIAM GYPSUM INDUSTRY (SONGKHLA) CO — Types C and SCX

UNITED STATES GYPSUM CO — Types AR, C, FRX-G, IP-AR, IP-X1, IP-X2, IPC-AR, SCX, SGX, SHX, ULIX, ULX, WRC, WRX, USGX.

USG BORAL DRYWALL SFZ LLC — Types C, SCX, SGX, USGX

USG MEXICO S A DE C V — Types AR, C, IP-AR, IP-X1, IP-X2, IPC-AR, SCX, SHX, ULIX, USGX, WRC, WRX

System B — 2 Hr

Gypsum panels, with beveled, square or tapered edges, nom 1/2 in. or 5/8 in. thick, 48 in. or 1200 mm wide, applied vertically or horizontally in two layers. Inner or base layer attached to studs with 1 in. long Type S steel screws spaced 24 in. OC when installed vertically or 16 in. OC when installed horizontally. Outer or face layer attached to studs with 1-5/8 in. long Type S steel screws spaced 12 in. OC when installed vertically and staggered 12 in. from base layer screws or 8 in. OC when installed horizontally and staggered 8 in. from base layer screws. Horizontal joints between inner and outer layers staggered a min of 12 in. Horizontal joints need not be backed by steel framing. Vertical joints centered over studs and staggered 24 in.

CGC INC — 1/2 in. Type C, IP-X2, IPC-AR or WRC; 5/8 in. Types AR, C, IP-AR, IP-X1, IP-X2, IPC-AR, SCX, SHX, ULIX, USGX, WRC, WRX

THE SIAM GYPSUM INDUSTRY (SONGKHLA) CO — Types C and SCX

UNITED STATES GYPSUM CO — 1/2 in. Types C, IP-X2, IPC-AR or WRC; 5/8 in. Types AR, C, FRX-G, IP-AR, IP-X1, IP-X2, IPC-AR, SCX, SGX, SHX, ULIX, ULX, USGX, WRC, WRX.

USG BORAL DRYWALL SFZ LLC — 1/2 in. Type C; 5/8 in. Types C, SCX

USG MEXICO S A DE C V — 1/2 in. Types C, IP-X2, IPC-AR or WRC; 5/8 in. Types AR, C, IP-AR, IP-X1, IP-X2, IPC-AR, SCX, SHX, ULIX, USGX, WRC, WRX

System C — 2 Hr

Gypsum panels, with beveled, square or tapered edges, nom 3/4 in. thick, 48 in. or 1200 mm wide, applied vertically or horizontally, secured with 1-1/4 in. long Type S steel screws spaced 8 in. OC along vertical edges and 12 in. OC in the field when installed vertically or 8 in. OC along the vertical edges and in the field when installed horizontally. Horizontal joints need not be backed by steel framing. Screws along side joints offset 4 in. Requires min 4 in. deep framing per Items 1, 2 and 3. Requires min 3 in. thick mineral wool batts per Item 6.

CGC INC — Types IP-X3 or ULTRACODE

UNITED STATES GYPSUM CO — Types IP-X3 or ULTRACODE

USG BORAL DRYWALL SFZ LLC — Type ULTRACODE

USG MEXICO S A DE C V — Types IP-X3 or ULTRACODE

System D — 2 Hr

Gypsum panels, with beveled, square or tapered edges, nom 5/8 in. thick, 48 in. or 1200 mm wide, applied vertically or horizontally, attached directly to studs with 1 in. long Type S steel screws spaced 24 in. when installed vertically or 16 in. OC when installed horizontally. Horizontal joints need not be backed by steel framing. Requires face layer of 1/2 or 5/8 in. thick cementitious backer units per Item 7 and min 1-1/2 in. thick mineral wool batts per Item 6.

CGC INC — Types AR, C, IP-AR, IP-X1, IP-X2, IPC-AR, SCX, SHX, ULIX, USGX, WRC, WRX

THE SIAM GYPSUM INDUSTRY (SONGKHLA) CO — Types C and SCX

UNITED STATES GYPSUM CO — Types AR, C, FRX-G, IP-AR, IP-X1, IP-X2, IPC-AR, SCX, SGX, SHX, ULIX, ULX, USGX, WRC, WRX.

USG BORAL DRYWALL SFZ LLC — Types C, SCX, SGX, USGX

USG MEXICO S A DE C V — Types AR, C, IP-AR, IP-X1, IP-X2, IPC-AR, SCX, SHX, ULIX, USGX, WRC, WRX

System E — 2 Hr

Gypsum panels, with beveled, square or tapered edges, nom 1/2 in. or 5/8 in. thick, 48 in. or 1200 mm wide, applied vertically or horizontally, attached to studs with 1 in. long Type S steel screws spaced 12 in. OC when installed vertically or 8 in. when installed horizontally. Horizontal joints need not be backed by steel framing.

CGC INC — 1/2 in. Types C, IP-X2, IPC-AR; 5/8 in. Types AR, C, IP-AR, IP-X1, IP-X2, IPC-AR, SCX, SHX, ULIX, USGX, WRC, WRX

THE SIAM GYPSUM INDUSTRY (SONGKHLA) CO — Types C and SCX

UNITED STATES GYPSUM CO — 1/2 in. Types C, IP-X2, IPC-AR; 5/8 in. Types AR, C, FRX-G, IP-AR, IP-X1, IP-X2, IPC-AR, SCX, SGX, SHX, ULIX, ULX, USGX, WRC, WRX.

USG BORAL DRYWALL SFZ LLC — 1/2 in. Type C; 5/8 in. Types C, SCX

USG MEXICO S A DE C V — 1/2 in. Types C, IP-X2, IPC-AR or WRC; 5/8 in. Types AR, C, IP-AR, IP-X1, IP-X2, IPC-AR, SCX, SHX, ULIX, USGX, WRC, WRX

System F — 2 Hr

Gypsum panels, with beveled, square or tapered edges, nom 1/2 in. or 5/8 in. thick, 48 in. or 1200 mm wide, applied vertically in two layers. Inner or base layer attached to resilient furring channels (Item 2B) with 1 in. long Type S steel screws spaced 24 in. Outer or face layer attached to resilient furring channels (Item 2B) with 1-5/8 in. long Type S steel screws spaced 12 in. OC and staggered 12 in. from base layer screws. Joints between inner and outer layers staggered 24 in.

CGC INC — 1/2 in. Type C, IP-X2, IPC-AR or WRC; 5/8 in. Types AR, C, FRX-G, IP-AR, IP-X1, IP-X2, IPC-AR, SCX, SHX, ULIX, USGX, WRC, WRX

THE SIAM GYPSUM INDUSTRY (SONGKHLA) CO — Types C and SCX

UNITED STATES GYPSUM CO — 1/2 in. Type C, IP-X2, IPC-AR or WRC; 5/8 in. Types AR, C, FRX-G, IP-AR, IP-X1, IP-X2, IPC-AR, SCX, SGX, SHX, ULIX, ULX, USGX, WRC, WRX.

USG BORAL DRYWALL SFZ LLC — 1/2 in. Type C; 5/8 in. Types C, SCX

USG MEXICO S A DE C V — 1/2 in. Types C, IP-X2, IPC-AR or WRC; 5/8 in. Types AR, C, IP-AR, IP-X1, IP-X2, IPC-AR, SCX, SHX, ULIX, USGX, WRC, WRX

System G — 3 Hr

Gypsum panels, with beveled, square or tapered edges, nom 5/8 in. thick, 48 in. or 1200 mm wide, applied vertically or horizontally in three layers. Inner or base layer attached to studs with 1 in. long Type S steel screws spaced 24 in. OC when installed vertically or 16 in OC when installed horizontally. Middle layer attached to studs with 1-5/8 in. long Type S steel screws spaced 24 in. when installed vertically or 16 in. OC when installed horizontally. Outer or face layer attached to studs with 2-1/4 in. long Type S steel screws spaced 16 in. when installed vertically or 12 in. OC when installed horizontally. Screws offset 6 in. from layer below. Horizontal joints on adjacent layers staggered a min of 12 in .. Horizontal joints need not be backed by steel framing. Vertical joints centered over studs and staggered 24 in. on adjacent layers.

CGC INC — Types C, IP-X2, IPC-AR, ULIX, WRC

THE SIAM GYPSUM INDUSTRY (SONGKHLA) CO — Type C

UNITED STATES GYPSUM CO — Types C, IP-X2, IPC-AR, ULIX, WRC

USG BORAL DRYWALL SFZ LLC — Type C

USG MEXICO S A DE C V — Types C, IP-X2, IPC-AR, WRC

System H — 3 Hr

Gypsum panels, with beveled, square or tapered edges, nom 5/8 in. thick, 48 in. or 1200 mm wide, applied vertically or horizontally, two layers over the flange of the "C" section of the studs, one layer over the flange of the "H" section of the studs. Inner or base layer attached to studs with 1 in. long Type S steel screws spaced 24 in. OC when installed vertically or 16 in. OC when installed horizontally. Face layer attached to studs with 1-5/8 in. long Type S steel screws spaced 16 in. when installed vertically or 12 in. OC when installed horizontally. Screws offset 6 in. from layer below. Horizontal joints on adjacent layers staggered a min of 12 in. Horizontal joints need not be backed by steel framing. Vertical joints centered over studs and staggered 24 in. on adjacent layers.

CGC INC — Types C, IP-X2, IPC-AR, ULIX, WRC

THE SIAM GYPSUM INDUSTRY (SONGKHLA) CO — Type C

UNITED STATES GYPSUM CO — Types C, IP-X2, IPC-AR, ULIX, WRC

USG BORAL DRYWALL SFZ LLC — Type C

USG MEXICO S A DE C V — Types C, IP-X2, IPC-AR, WRC

System I — 4 Hr

Gypsum panels, with beveled, square or tapered edges, nom 3/4 in. thick, 4 ft wide (or 1200 mm for metric spacing) wallboard with square or tapered edges. Total of four layers to be used. First and second (inner) layers applied vertically or horizontally over the steel studs. Horizontal joints need not be backed by steel framing. When applied vertically, joints centered over studs and staggered min 24 in., otherwise all joints staggered min 12 in. First layer secured to studs with 1-1/4 in. long Type S self-drilling, self-tapping bugle-head steel screws spaced 24 in. OC. Second layer secured to studs with 2-1/4 in. long Type S self-drilling, self-tapping bugle-head steel screws spaced 12 in. OC. Third layer applied vertically over the furring channels (Item 2C) with a 1-1/4 in. long Type S self-drilling, self-tapping bugle-head steel screws spaced 12 in. OC. Fourth layer applied vertically or horizontally with 2-1/4 in. long Type S self-drilling, self-tapping bugle-head steel screws spaced 12 in. OC. When applied vertically, joints to be staggered min 24 in. from third layer, otherwise all joints staggered min 12 in.

CGC INC — Types IP-X3 or ULTRACODE

UNITED STATES GYPSUM CO — Types IP-X3 or ULTRACODE

USG BORAL DRYWALL SFZ LLC — Type ULTRACODE

USG MEXICO S A DE C V — Types IP-X3 or ULTRACODE

4A. **Gypsum Board* —** (As an alternate to Item 4 Systems A, B, C, D, E, G, H, and I when used as the base layer, For direct attachment only) — Nom 5/8 in. or 3/4 in. thick lead backed gypsum panels with beveled, square or tapered edges, applied vertically. Vertical joints centered over 20 MSG steel studs and staggered min 1 stud cavity on opposite sides of studs. See Items 1, 2, 2A, 2B and 2D. Wallboard secured to studs with 1-1/4 in. long Type S-12 steel screws spaced 8 in. OC at perimeter and 12 in. OC in the field. For Joint Compound see Item 5. To be used with Lead Batten Strips (see Item 9) or Lead Discs or Tabs (see Item 10).
RAY-BAR ENGINEERING CORP — Type RB-LBG

4B. **Gypsum Board* —** (As an alternate to Item 4 Systems A, B, C, D, E, G, H, and I when used as the base layer, For direct attachment only) — Nominal 5/8 in. thick lead backed gypsum panels with beveled, square or tapered edges, applied vertically. Vertical joints centered over studs and staggered min 1 stud cavity on opposite sides of studs. Wallboard secured to studs with 1-1/4 in. long Type S-12 (or #6 by 1-1/4 in. long bugle head fine driller) steel screws spaced 8 in. OC at perimeter and 12 in. OC in the field.
NEW ENGLAND LEAD BURNING CO INC, DBA NELCO — Type Nelco

4C. **Gypsum Board* —** (As an alternate to Item 4 Systems A, B, C, D, E, G, H, and I when used as the base layer, For direct attachment only) — Nom 5/8 or 3/4 in. thick lead backed gypsum panels with beveled, square or tapered edges, applied vertically. Vertical joints centered over 20 MSG steel studs and staggered min 1 stud cavity on opposite sides of studs. See Items 1, 2, 2A, 2B and 2D. Wallboard secured to studs with 1-1/4 in. long Type S-12 steel screws spaced 8 in. OC at perimeter and 12 in. OC in the field. For Joint Compound see Item 5. To be used with Lead Batten Strips (see Item 9A) or Lead Discs (see Item 10A). Lead batten strips required behind vertical joints of lead backed gypsum wallboard and optional at remaining stud locations. Lead batten strips, min 2 in. wide, max 10 ft long with a max thickness of 0.140 in. placed on the face of studs and attached to the stud with two 1 in. long Type S-8 pan head steel screws, one at the top of the strip and one at the bottom of the strip.
MAYCO INDUSTRIES INC — Type X-Ray Shielded Gypsum

4D. **Gypsum Board* —** (As an alternate to Item 4 Systems A, B, C, D, E, G, H, and I when used as the base layer, For direct attachment only) — Nom 5/8 in. thick lead backed gypsum panels with beveled, square or tapered edges, applied vertically. Vertical joints centered over studs and staggered min 1 stud cavity on opposite sides of studs. Wallboard secured to studs with 1-1/4 in. long Type S-12 steel screws spaced 8 in. OC at perimeter and 12 in. OC in the field. Lead batten strips required behind vertical joints of lead backed gypsum wallboard and optional at remaining stud locations. Lead batten strips, min 2 in. wide, max 8 ft long with a max thickness of 0.14 in. placed on the face of studs and attached to the stud with construction adhesive and two 1 in. long Type S-12 pan head steel screws, one at the top of the strip and one at the bottom of the strip. Lead discs, nominal 3/8 in. diam by max 0.085 in. thick. Compression fitted or adhered over the screw heads. Lead batten strips and discs to have a purity of 99.9% meeting the Federal specification QQ-L-201f, Grade "C".
RADIATION PROTECTION PRODUCTS INC — Type RPP - Lead Lined Drywall

5. **Joint Tape and Compound —** (Not Shown)

Systems A, B, C, E, F, G, H, I

Joints on outer layers of gypsum boards (Item 4 and 4A) covered with paper tape and joint compound. Paper tape and joint compound may be omitted when gypsum boards are supplied with square edges. Exposed screw heads covered with joint compound.

6. **Batts and Blankets* —**

Systems A, B, E, F, G, H, I

(Optional) — Mineral wool or glass fiber batts partially or completely filling stud cavity. Any mineral wool or glass fiber batt mineral bearing the UL Classification Marking as to Fire Resistance.

Systems C & D

Min 3 in. (System C) and min 1-1/2 in. (System D) thick mineral wool batts, friction fitted between the studs and floor and ceiling runners.

ROCKWOOL — Type AFB, min. density 1.8 pcf / 28.8 kg/m^3

THERMAFIBER INC — Type SAFB, SAFB FF

7. **Cementitious Backer Units* —** (System D) — Nom 1/2 or 5/8 in. thick panels, square edge, attached to studs over gypsum wallboard with 1-5/8 in. long, Type S-12, corrosion resistant steel screws spaced 8 in. OC and staggered 8 in. from gypsum wall board screws. Joints covered with glass fiber mesh tape. Vertical joints staggered one stud cavity from gypsum wallboard joints. Horizontal joints staggered a min of 12 in. from the gypsum wallboard joints.
UNITED STATES GYPSUM CO — Type DCB

8. **Laminating Adhesive* —** (Optional, Not Shown) — Used to bond outer layer of Cementitious Backer Units (Item 7) to inner layers of Gypsum Board (Item 4) in System D. ANSI A136.1 Type 1 organic adhesive applied with 1/4 in. square notched trowel. See Adhesives (BYWR) in the Fire Resistance Directory or Adhesives (BJLZ) in the Building Materials Directory for names of Classified companies.

9. **Lead Batten Strips —** (Not Shown, For Use With Item 4A) — Lead batten strips, min 1-1/2 in. wide, max 10 ft long with a max thickness of 0.125 in. Strips placed on the interior face of studs and attached from the exterior face of the stud with two 1 in. long Type S-12 pan head steel screws, one at the top of the strip and one at the bottom of the strip. Lead batten strips to have a purity of 99.9% meeting the Federal specification QQ-L-201f, Grade "C". Lead batten strips required behind vertical joints of lead backed gypsum wallboard (Item 4A) and optional at remaining stud locations. Required behind vertical joints.

9A. **Lead Batten Strips —** (Not Shown, for use with Item 4C) — Lead batten strips, 2 in. wide, max 10 ft long with a max thickness of 0.140 in. Strips placed on the face of studs and attached to the stud with two min. 1 in. long Type S-8 pan head steel screws, one at the top of the strip and one at the bottom of the strip or with one min. 1 in. long min. Type S-8 pan head steel screw at the top of the strip. Lead batten strips to have a purity of 99.5% meeting the Federal specification QQ-L-201f, Grades "B, C or D". . Lead batten strips required behind vertical joints of lead backed gypsum wallboard (Item 6) and optional at remaining stud locations.

10. **Lead Discs or Tabs —** (Not Shown, For Use With Item 4A) — Used in lieu of or in addition to the lead batten strips (Item 9) or optional at other locations - Max 3/4 in. diam by max 0.125 in. thick lead discs compression fitted or adhered over steel screw heads or max 1/2 in. by 1-1/4 in. by max 0.125 in. thick lead tabs placed on gypsum boards (Item 4A) underneath screw locations prior to the installation of the screws. Lead discs or tabs to have a purity of 99.9% meeting the Federal specification QQ-L-201f, Grade "C" .

10A. **Lead Discs —** (Not Shown, for use with Item 4C) — Max 5/16 in. diam by max 0.140 in. thick lead discs compression fitted or adhered over steel screw heads. Lead discs to have a purity of 99.5% meeting the Federal Specification QQ-L-201f, Grades "B, C or D".

11. **Lead Batten Strips —** (Not Shown, For Use With Item 4B) — Lead batten strips, 2 in. wide, max 10 ft long with a max thickness of 0.142 in. Strips placed on the face of studs and attached to the stud with two min. 1 in. long min. Type S-8 pan head steel screws, one at the top of the strip and one at the bottom of the strip or with one min. 1 in. long min. Type S-8 pan head steel screw at the top of the strip. Lead batten strips to have a purity of 99.9% meeting the Federal specification QQ-L-201f, Grade "C". Lead batten strips required behind vertical joints of lead backed gypsum wallboard (Item 4B) and optional at remaining stud locations.

12. **Lead Tabs —** (Not Shown, For Use With Item 4B) — 2 in. wide, 5 in. long with a max thickness of 0.142 in. Tabs friction-fit around front face of stud, the stud folded back flange, and the back face of the stud. Tabs required at each location where a screw (that secures the gypsum boards, Item 4B) will penetrate the steel stud. Lead tabs to have a purity of 99.9% meeting the Federal specification QQ-L-201f, Grade "C". Lead tabs may be held in place with standard adhesive tape if necessary.

*** Indicates such products shall bear the UL or cUL Certification Mark for jurisdictions employing the UL or cUL Certification (such as Canada), respectively.**

Last Updated on 2020-12-22

5/30/2023 11:55:19 AM

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CHRISTOPHER J. HEARD
REGISTERED ARCHITECT
13274
NORTH CAROLINA
ATLANTA, GEORGIA

No.	Date	Description
	05/26/23	PERMIT & CONSTRUCTION

Project Name

MIDGARD - SPRING LAKE

14396 NC-210 S SPRING LAKE 28390

ISSUE
NOT FOR CONSTRUCTION

UL ELEVATOR SHAFT

Author	
Drawn	
Checker	
Checked	
Scale	
247-001-01 Project No.	

A-0.1.3

Drawing Number

2018 APPENDIX B
BUILDING CODE SUMMARY FOR ALL COMMERCIAL PROJECTS
(EXCEPT 1 AND 2-FAMILY DWELLINGS AND TOWNHOUSES)
(Reproduce the following data on the building plans sheet 1 or 2)

Name of Project: _____
Address: _____ Zip Code _____
Owner/Authorized Agent: _____ Phone # (____) ____ - ____ E-Mail _____
Owned By: ☐ City/County ☐ Private ☐ State
Code Enforcement Jurisdiction: ☐ City_____ ☐ County_____ ☐ State

CONTACT: _____

DESIGNER	FIRM	NAME	LICENSE #	TELEPHONE #	E-MAIL
Architectural				(___)_____	
Civil				(___)_____	
Electrical				(___)_____	
Fire Alarm				(___)_____	
Plumbing				(___)_____	
Mechanical				(___)_____	
Sprinkler-Standpipe				(___)_____	
Structural				(___)_____	
Retaining Walls >5' High				(___)_____	
Other				(___)_____	

("Other" should include firms and individuals such as truss, precast, pre-engineered, interior designers, etc.)

2018 NC BUILDING CODE: ☐ New Building ☐ Addition ☐ Renovation
☐ 1st Time Interior Completion
☐ Shell/Core - Contact the local inspection jurisdiction for possible additional procedures and requirements
☐ Phased Construction - Shell/Core- Contact the local inspection jurisdiction for possible additional procedures and requirements

2018 NC EXISTING BUILDING CODE: EXISTING: ☐ Prescriptive ☐ Repair ☐ Chapter 14
Alteration: ☐ Level I ☐ Level II ☐ Level III
☐ Historic Property ☐ Change of Use

CONSTRUCTED: (date) _____ **CURRENT OCCUPANCY(S)** (Ch. 3): _____
RENOVATED: (date) _____ **PROPOSED OCCUPANCY(S)** (Ch. 3): _____

RISK CATEGORY (Table 1604.5): **Current:** ☐ I ☐ II ☐ III ☐ IV
Proposed: ☐ I ☐ II ☐ III ☐ IV

BASIC BUILDING DATA
Construction Type: (check all that apply) ☐ I-A ☐ I-B ☐ II-A ☐ II-B ☐ III-A ☐ III-B ☐ IV ☐ V-A ☐ V-B
Sprinklers: ☐ No ☐ Partial ☐ Yes ☐ NFPA 13 ☐ NFPA 13R ☐ NFPA 13D
Standpipes: ☐ No ☐ Yes Class ☐ I ☐ II ☐ III ☐ Wet ☐ Dry
Fire District: ☐ No ☐ Yes **Flood Hazard Area:** ☐ No ☐ Yes
Special Inspections Required: ☐ No ☐ Yes (Contact the local inspection jurisdiction for additional procedures and requirements.)

Gross Building Area Table

FLOOR	EXISTING (SQ FT)	NEW (SQ FT)	SUB-TOTAL
3rd Floor			
2nd Floor			
Mezzanine			
1st Floor			
Basement			
TOTAL			

ALLOWABLE AREA

Primary Occupancy Classification(s):
Assembly ☐ A-1 ☐ A-2 ☐ A-3 ☐ A-4 ☐ A-5
Business ☐
Educational ☐
Factory ☐ F-1 Moderate ☐ F-2 Low
Hazardous ☐ H-1 Detonate ☐ H-2 Deflagrate ☐ H-3 Combust ☐ H-4 Health ☐ H-5 HPM
Institutional ☐ I-1 Condition ☐ 1 ☐ 2 ☐ I-2 Condition ☐ 1 ☐ 2 ☐ I-3 Condition ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ I-4
Mercantile ☐
Residential ☐ R-1 ☐ R-2 ☐ R-3 ☐ R-4
Storage ☐ S-1 Moderate ☐ S-2 Low ☐ High-piled ☐ Parking Garage ☐ Open ☐ Enclosed ☐ Repair Garage
Utility and Miscellaneous ☐
Accessory Occupancy Classification(s): _____
Incidental Uses (Table 509): _____
Special Uses (Chapter 4 – List Code Sections): _____
Special Provisions: (Chapter 5 – List Code Sections): _____
Mixed Occupancy: ☐ No ☐ Yes Separation: _____ Hr. Exception: _____

☐ Non-Separated Use (508.3) - The required type of construction for the building shall be determined by applying the height and area limitations for each of the applicable occupancies to the entire building. The most restrictive type of construction, so determined, shall apply to the entire building.

☐ Separated Use (508.4) - See below for area calculations for each story, the area of the occupancy shall be such that the sum of the ratios of the actual floor area of each use divided by the allowable floor area for each use shall not exceed 1.

$$\frac{\text{Actual Area of Occupancy A}}{\text{Allowable Area of Occupancy A}} + \frac{\text{Actual Area of Occupancy B}}{\text{Allowable Area of Occupancy B}} \leq 1$$

_____ + _____ + ... = _____ ≤ 1.00

STORY NO.	DESCRIPTION AND USE	(A) BLDG AREA PER STORY (ACTUAL)	(B) TABLE 506.2[4] AREA	(C) AREA FOR FRONTAGE INCREASE[1,2]	(D) ALLOWABLE AREA PER STORY OR UNLIMITED[2,3]

[1] Frontage area increases from Section 506.3 are computed thus:
a. Perimeter which fronts a public way or open space having 20 feet minimum width = _____ (F)
b. Total Building Perimeter = _____ (P)
c. Ratio (F/P) = _____ (F/P)
d. W = Minimum width of public way = _____ (W)
e. Percent of frontage increase $I_f = 100[F/P - 0.25]$ x $W/30$ = _____ (%)
[2] Unlimited area applicable under conditions of Section 507.
[3] Maximum Building Area = total number of stories in the building x D (maximum3 stories) (506.2).
[4] The maximum area of open parking garages must comply with Table 406.5.4.
[5] Frontage increase is based on the unsprinklered area value in Table 506.2.

ALLOWABLE HEIGHT

	ALLOWABLE	SHOWN ON PLANS	CODE REFERENCE [1]
Building Height in Feet (Table 504.3) [2]			
Building Height in Stories (Table 504.4) [3]			

[1] Provide code reference if the "Shown on Plans" quantity is not based on Table 504.3 or 504.4.
[2] The maximum height of air traffic control towers must comply with Table 412.3.1.
[3] The maximum height of open parking garages must comply with Table 406.5.4.

FIRE PROTECTION REQUIREMENTS

BUILDING ELEMENT	FIRE SEPARATION DISTANCE (FEET)	RATING REQ'D	RATING PROVIDED (w/ * REDUCTIONS)	DETAIL # AND SHEET #	DESIGN # FOR RATED ASSEMBLY	SHEET # FOR RATED PENETRATION	SHEET # FOR RATED JOINTS
Structural Frame, including columns, girders, trusses							
Bearing Walls							
Exterior							
North							
East							
West							
South							
Interior							
Nonbearing Walls and Partitions							
Exterior walls							
North							
East							
West							
South							
Interior walls and partitions							
Floor Construction Including supporting beams and joists							
Floor Ceiling Assembly							
Columns Supporting Floors							
Roof Construction, including supporting beams and joists							
Roof Ceiling Assembly							
Columns Supporting Roof							
Shaft Enclosures - Exit							
Shaft Enclosures - Other							
Corridor Separation							
Occupancy/Fire Barrier Separation							
Party/Fire Wall Separation							
Smoke Barrier Separation							
Smoke Partition							
Tenant/Dwelling Unit/ Sleeping Unit Separation							
Incidental Use Separation							

* Indicate section number permitting reduction

PERCENTAGE OF WALL OPENING CALCULATIONS

FIRE SEPARATION DISTANCE (FEET) FROM PROPERTY LINES	DEGREE OF OPENINGS PROTECTION (TABLE 705.8)	ALLOWABLE AREA (%)	ACTUAL SHOWN ON PLANS (%)

LIFE SAFETY SYSTEM REQUIREMENTS

Emergency Lighting: ☐ No ☐ Yes
Exit Signs: ☐ No ☐ Yes
Fire Alarm: ☐ No ☐ Yes
Smoke Detection Systems: ☐ No ☐ Yes ☐ Partial _____
Carbon Monoxide Detection: ☐ No ☐ Yes

LIFE SAFETY PLAN REQUIREMENTS

Life Safety Plan Sheet #: _____

☐ Fire and/or smoke rated wall locations (Chapter 7)
☐ Assumed and real property line locations (if not on the site plan)
☐ Exterior wall opening area with respect to distance to assumed property lines (705.8)
☐ Occupancy Use for each area as it relates to occupant load calculation (Table 1004.1.2)
☐ Occupant loads for each area
☐ Exit sign locations (1013)
☐ Exit access travel distances (1017)
☐ Common path of travel distances (Tables 1006.2.1 & 1006.3.2(1))
☐ Dead end lengths (1020.4)
☐ Clear exit widths for each exit door
☐ Maximum calculated occupant load capacity each exit door can accommodate based on egress width (1005.3)
☐ Actual occupant load for each exit door
☐ A separate schematic plan indicating where fire rated floor/ceiling and/or roof structure is provided for purposes of occupancy separation
☐ Location of doors with panic hardware (1010.1.10)
☐ Location of doors with delayed egress locks and the amount of delay (1010.1.9.7)
☐ Location of doors with electromagnetic egress locks (1010.1.9.9)
☐ Location of doors equipped with hold-open devices
☐ Location of emergency escape windows (1030)
☐ The square footage of each fire area (202)
☐ The square footage of each smoke compartment for Occupancy Classification I-2 (407.5)
☐ Note any code exceptions or table notes that may have been utilized regarding the items above

PERCENTAGE OF WALL OPENING CALCULATIONS

FIRE SEPARATION DISTANCE (FEET) FROM PROPERTY LINES	DEGREE OF OPENINGS PROTECTION (TABLE 705.8)	ALLOWABLE AREA (%)	ACTUAL SHOWN ON PLANS (%)

LIFE SAFETY SYSTEM REQUIREMENTS

Emergency Lighting: ☐ No ☐ Yes
Exit Signs: ☐ No ☐ Yes
Fire Alarm: ☐ No ☐ Yes
Smoke Detection Systems: ☐ No ☐ Yes ☐ Partial _____
Carbon Monoxide Detection: ☐ No ☐ Yes

LIFE SAFETY PLAN REQUIREMENTS

Life Safety Plan Sheet #: _____

☐ Fire and/or smoke rated wall locations (Chapter 7)
☐ Assumed and real property line locations (if not on the site plan)
☐ Exterior wall opening area with respect to distance to assumed property lines (705.8)
☐ Occupancy Use for each area as it relates to occupant load calculation (Table 1004.1.2)
☐ Occupant loads for each area
☐ Exit sign locations (1013)
☐ Exit access travel distances (1017)
☐ Common path of travel distances (Tables 1006.2.1 & 1006.3.2(1))
☐ Dead end lengths (1020.4)
☐ Clear exit widths for each exit door
☐ Maximum calculated occupant load capacity each exit door can accommodate based on egress width (1005.3)
☐ Actual occupant load for each exit door
☐ A separate schematic plan indicating where fire rated floor/ceiling and/or roof structure is provided for purposes of occupancy separation
☐ Location of doors with panic hardware (1010.1.10)
☐ Location of doors with delayed egress locks and the amount of delay (1010.1.9.7)
☐ Location of doors with electromagnetic egress locks (1010.1.9.9)
☐ Location of doors equipped with hold-open devices
☐ Location of emergency escape windows (1030)
☐ The square footage of each fire area (202)
☐ The square footage of each smoke compartment for Occupancy Classification I-2 (407.5)
☐ Note any code exceptions or table notes that may have been utilized regarding the items above

ENERGY SUMMARY

ENERGY REQUIREMENTS:
The following data shall be considered minimum and any special attribute required to meet the energy code shall also be provided. Each Designer shall furnish the required portions of the project information for the plan data sheet. If performance method, state the annual energy cost for the standard reference design vs annual energy cost for the proposed design.

Existing building envelope complies with code: ☐ No ☐ Yes (The remainder of this section is not applicable)

Exempt Building: ☐ No ☐ Yes (Provide code or statutory reference): _____

Climate Zone: ☐ 3A ☐ 4A ☐ 5A

Method of Compliance: Energy Code ☐ Performance ☐ Prescriptive
ASHRAE 90.1 ☐ Performance ☐ Prescriptive
(If "Other" specify source here)_____

THERMAL ENVELOPE (Prescriptive method only)

Roof/ceiling Assembly (each assembly)
Description of assembly: _____
U-Value of total assembly: _____
R-Value of insulation: _____
Skylights in each assembly: _____
U-Value of skylight: _____
total square footage of skylights in each assembly: _____

Exterior Walls (each assembly)
Description of assembly: _____
U-Value of total assembly: _____
R-Value of insulation: _____
Openings (windows or doors with glazing)
U-Value of assembly: _____
Solar heat gain coefficient: _____
projection factor: _____
Door R-Values: _____

Walls below grade (each assembly)
Description of assembly: _____
U-Value of total assembly: _____
R-Value of insulation: _____

Floors over unconditioned space (each assembly)
Description of assembly: _____
U-Value of total assembly: _____
R-Value of insulation: _____

Floors slab on grade
Description of assembly: _____
U-Value of total assembly: _____
R-Value of insulation: _____
Horizontal/vertical requirement: _____
slab heated: _____

2018 APPENDIX B
BUILDING CODE SUMMARY FOR ALL COMMERCIAL PROJECTS
STRUCTURAL DESIGN
(PROVIDE ON THE STRUCTURAL SHEETS IF APPLICABLE)

DESIGN LOADS:

Importance Factors: Snow (I_S) _____
Seismic (I_E) _____

Live Loads: Roof _____ psf
Mezzanine _____ psf
Floor _____ psf

Ground Snow Load: _____ psf

Wind Load: Ultimate Wind Speed _____ mph (ASCE-7)
Exposure Category _____

SEISMIC DESIGN CATEGORY: ☐ A ☐ B ☐ C ☐ D
Provide the following Seismic Design Parameters:
Risk Category (Table 1604.5) ☐ I ☐ II ☐ III ☐ IV
Spectral Response Acceleration S_S_____ %g S_1_____ %g
Site Classification (ASCE 7) ☐ A ☐ B ☐ C ☐ D ☐ E ☐ F
Data Source: ☐ Field Test ☐ Presumptive ☐ Historical Data
Basic structural system ☐ Bearing Wall ☐ Dual w/Special Moment Frame ☐ Building Frame ☐ Dual w/Intermediate R/C or Special Steel ☐ Moment Frame ☐ Inverted Pendulum
Analysis Procedure: ☐ Simplified ☐ Equivalent Lateral Force ☐ Dynamic
Architectural, Mechanical, Components anchored? ☐ Yes ☐ No

LATERAL DESIGN CONTROL: Earthquake ☐ Wind ☐

SOIL BEARING CAPACITIES:
Field Test (provide copy of test report) _____ psf
Presumptive Bearing capacity _____ psf
Pile size, type, and capacity _____

2018 APPENDIX B
BUILDING CODE SUMMARY FOR ALL COMMERCIAL PROJECTS
MECHANICAL DESIGN
(PROVIDE ON THE MECHANICAL SHEETS IF APPLICABLE)

MECHANICAL SUMMARY

MECHANICAL SYSTEMS, SERVICE SYSTEMS AND EQUIPMENT

Thermal Zone
winter dry bulb: _____
summer dry bulb:_____

Interior design conditions
winter dry bulb: _____
summer dry bulb:_____
relative humidity:_____

Building heating load: _____

Building cooling load: _____

Mechanical Spacing Conditioning System
Unitary
description of unit: _____
heating efficiency: _____
cooling efficiency: _____
size category of unit: _____
Boiler
Size category. If oversized, state reason.: _____
Chiller
Size category. If oversized, state reason.: _____

List equipment efficiencies: _____

2018 APPENDIX B
BUILDING CODE SUMMARY FOR ALL COMMERCIAL PROJECTS
ELECTRICAL DESIGN
(PROVIDE ON THE ELECTRICAL SHEETS IF APPLICABLE)

ELECTRICAL SUMMARY

ELECTRICAL SYSTEM AND EQUIPMENT

Method of Compliance: Energy Code ☐ Performance ☐ Prescriptive
ASHRAE 90.1 ☐ Performance ☐ Prescriptive

Lighting schedule (each fixture type)
lamp type required in fixture
number of lamps in fixture
ballast type used in the fixture
number of ballasts in fixture
total wattage per fixture
total interior wattage specified vs. allowed (whole building or space by space)
total exterior wattage specified vs. allowed

Additional Efficiency Package Options
(When using the 2018 NCECC; not required for ASHRAE 90.1)
☐ C406.2 More Efficient HVAC Equipment Performance
☐ C406.3 Reduced Lighting Power Density
☐ C406.4 Enhanced Digital Lighting Controls
☐ C406.5 On-Site Renewable Energy
☐ C406.6 Dedicated Outdoor Air System
☐ C406.7 Reduced Energy Use in Service Water Heating

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CHRISTOPHER J. HEARD REGISTERED ARCHITECT 13274 NORTH CAROLINA ATLANTA, GEORGIA

No.	Date	Description
	05/26/23	PERMIT & CONSTRUCTION

Project Name

MIDGARD - SPRING LAKE

14396 NC-210 S SPRING LAKE 28390

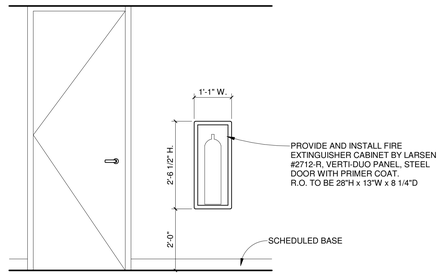
ISSUE
NOT FOR CONSTRUCTION

APPENDIX B 2018 BUILDING SUMMARY

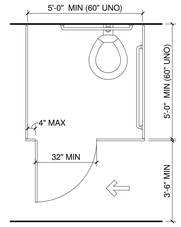
Author
Drawn
Checker
Checked
Scale
247-001-01
Project No.

A-0.1.4
Drawing Number

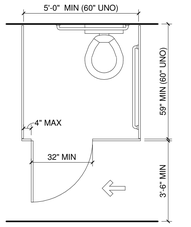
5/30/2023 11:55:23 AM



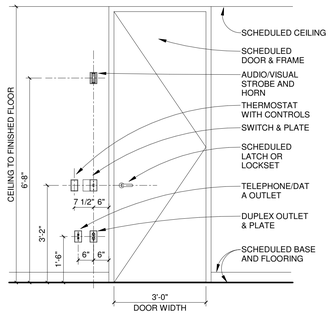
2 TYPICAL FIRE EXTINGUISHER CABINET
1/2" = 1'-0"



ACCESSIBLE - WALL HUNG WATER CLOSET

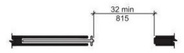


ACCESSIBLE - FLOOR MOUNT WATER CLOSET

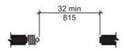


4 RESTROOM SIGNAGE DIAGRAM
1/2" = 1'-0"

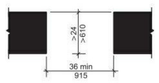
CLEAR WIDTH OF DOORWAYS - HINGED DOOR



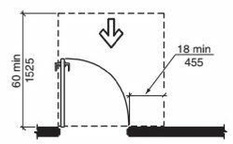
CLEAR WIDTH OF DOORWAYS - SLIDING DOOR



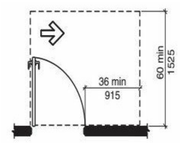
CLEAR WIDTH OF DOORWAYS - FOLDING DOOR



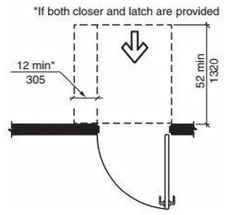
CLEAR WIDTH OF DOORWAYS - DOORWAYS WITHIN DOORS



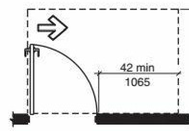
MANEUVERING CLEARANCE AT MANUAL SWINGING DOORS FRONT APPROACH - PULL SIDE



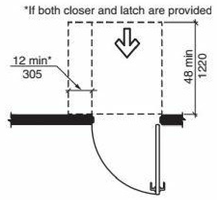
MANEUVERING CLEARANCE AT MANUAL SWINGING DOORS HINGE APPROACH - PULL SIDE



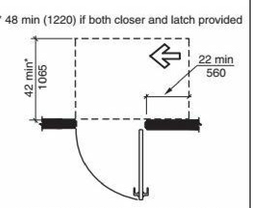
MANEUVERING CLEARANCE AT MANUAL SWINGING DOORS FRONT APPROACH - PUSH SIDE - NEW BUILDINGS



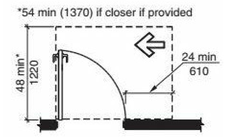
MANEUVERING CLEARANCE AT MANUAL SWINGING DOORS HINGE APPROACH - PULL SIDE



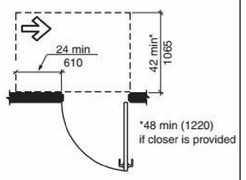
MANEUVERING CLEARANCE AT MANUAL SWINGING DOORS FRONT APPROACH - PUSH SIDE - EXISTING BUILDINGS



MANEUVERING CLEARANCE AT MANUAL SWINGING DOORS HINGE APPROACH - PUSH SIDE

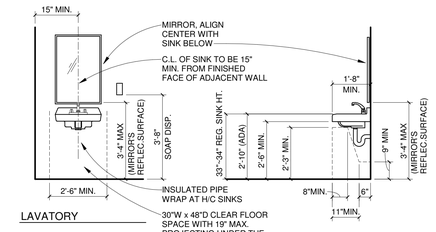


MANEUVERING CLEARANCE AT MANUAL SWINGING DOORS LATCH APPROACH - PULL SIDE

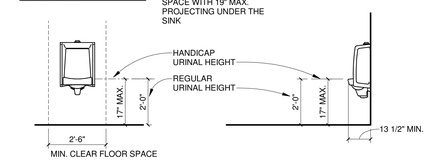


MANEUVERING CLEARANCE AT MANUAL SWINGING DOORS LATCH APPROACH - PUSH SIDE

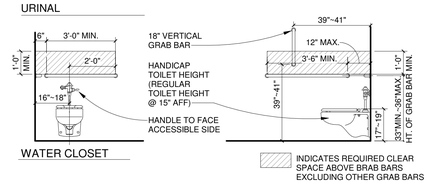
3 DOOR CLEARANCES
3/8" = 1'-0"



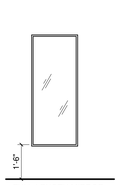
LAVATORY



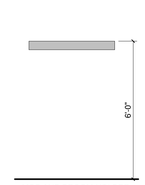
URINAL



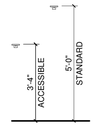
WATER CLOSET



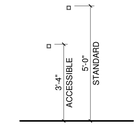
FULL-LENGTH MIRROR



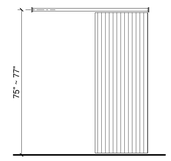
MOP AND BROOM HOLDER



SOAP DISH

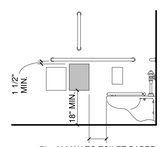


TOWEL PIN OR COAT HOOK

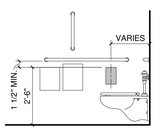


SHOWER CURTAIN, ROD, AND HOOKS

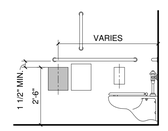
WASHROOM ACCESSORIES



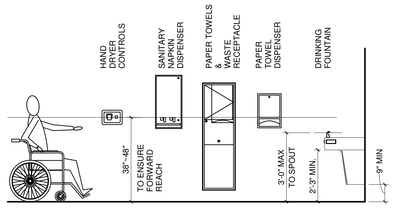
7" ~ 9" MAX TO TOILET PAPER DISPENSER OUTLET FROM EDGE OF WC



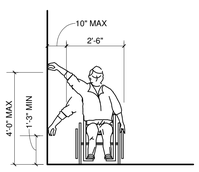
SANITARY NAPKIN DISPOSAL SURFACE MOUNTED



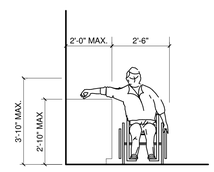
SEAT COVER DISPENSER SURFACE MOUNTED



ACCESSORY HEIGHTS



SIDE REACH



REACH OVER COUNTER

1 TYPICAL REACH & HEIGHT
3/8" = 1'-0"

Heard
Architect
Atlanta, Georgia 30361
Christopher Jerome Heard
1201 Peachtree Street NE, Suite 1900
T: 404.240.9383

No.	Date	Description
	05/26/23	PERMIT & CONSTRUCTION

Project Name

MIDGARD - SPRING LAKE

14396 NC-210 S SPRING LAKE 28390

ISSUE
NOT FOR CONSTRUCTION

ADA AND TYPICAL MOUNTING HEIGHTS

Author	
Drawn	
Checker	
Checked	
As indicated	
Scale	
247-001-01	
Project No.	

A-0.2.1
Drawing Number

5/30/2023 11:55:24 AM

SECTION 01340 - SUBMITTALS

1. **GENERAL PROVISIONS:**
   A. PROVISIONS IN THIS SECTION ARE MANDATORY PROCEDURES FOR PREPARING AND SUBMITTING SAMPLES, SHOP DRAWINGS AND PRODUCT DATA.
   B. SUBMITTALS WILL BE IN ORDERLY SEQUENCE AND TIMED TO CAUSE NO DELAY IN THE WORK.
   C. JOB DELAYS OCCASIONED BY REQUIREMENT OF RESUBMISSION OF SAMPLES, SHOP DRAWINGS AND PRODUCT DATA NOT IN ACCORDANCE WITH CONTRACT DOCUMENTS ARE CONTRACTOR'S RESPONSIBILITY AND WILL NOT BE CONSIDERED VALID JUSTIFICATION FOR EXTENSION OF CONTRACT TIME.
   D. COMMENCE NO PORTION OF WORK REQUIRING SUBMITTALS UNTIL SUBMITTAL HAS BEEN APPROVED.

2. **SAMPLE PREPARATION:**
   A. PREPARE SAMPLES IN SIZES, SHAPES AND FINISHES IN ACCORDANCE WITH PROVISIONS OF INDIVIDUAL SPECIFICATION SECTIONS.
   B. SAMPLES SUBMITTED FOR COLOR, SHEEN OR TEXTURE SELECTION FOR APPROVAL SHALL BE ACTUAL SAMPLES OF THE REQUIRED MATERIAL. WHERE A RANGE OF COLOR, SHEEN OR TEXTURE IS ANTICIPATED OR PROPOSED, SAMPLES SHALL INDICATE FULL RANGE PROPOSED, FROM WHICH ARCHITECT MAY SELECT THE EXACT RANGE TO BE PROVIDED.
   C. THE NUMBER OF SAMPLES SUBMITTED SHALL BE THE NUMBER REQUIRED BY CONTRACTOR, PLUS ONE WHICH WILL BE RETAINED BY ARCHITECT, UNLESS OTHERWISE INDICATED.
   D. ATTACH A TAG TO EACH SAMPLE, SIZED TO ACCEPT CONTRACTOR'S AND ARCHITECT'S STAMPS. SAMPLES SUBMITTED TO ARCHITECT SHALL HAVE TAG STAMPED WITH CONTRACTOR'S STAMP AND APPROPRIATE ACTION SHALL BE INDICATED THEREON.
   E. SIZE OF THE ARCHITECT'S STAMP IS 3"X5".

3. **SHOP DRAWING PREPARATION:**
   A. FORM: SUBMIT ONE COPY (PDF FORMAT OR PAPER) OF EACH SHOP DRAWING.
   B. SUBMIT ALL RELATED SHOP DRAWING ITEMS TOGETHER. (FOR EXAMPLE, DOORS, FRAMES, HARDWARE AND SPECIFIED SAMPLES ARE TO BE WITHIN THE SAME SUBMITTAL.)

4. **CONTRACTOR'S REVIEW:**
   A. REVIEW, STAMP WITH APPROVAL AND SUBMIT TO THE ARCHITECT SUBMITTALS REQUIRED BY THE CONTRACT DOCUMENTS WITH REASONABLE PROMPTNESS AND IN SUCH SEQUENCE AS TO CAUSE NO DELAY IN THE WORK OR IN THE ACTIVITIES OF THE OWNER OR OF SEPARATE CONTRACTORS.
   B. BY APPROVING AND SUBMITTING SUBMITTALS, THE CONTRACTOR REPRESENTS THAT HE HAS DETERMINED AND VERIFIED MATERIALS, FIELD MEASUREMENTS, AND RELATED FIELD CONSTRUCTION CRITERIA, AND HAS CHECKED AND COORDINATED THE INFORMATION CONTAINED WITHIN SUCH SUBMITTAL WITH THE REQUIREMENTS OF THE WORK AND OF THE CONTRACT DOCUMENTS.
   C. THE CONTRACTOR SHALL NOT BE RELIEVED OF RESPONSIBILITY FOR ERRORS OR OMISSIONS IN SHOP DRAWINGS, PRODUCT DATA, SAMPLES OR SIMILAR SUBMITTALS BY THE ARCHITECT'S APPROVAL THEREOF.
   D. THE PURPOSE OF SUBMITTALS BY CONTRACTOR IS TO DEMONSTRATE HIS UNDERSTANDING OF THE PROJECT BY INDICATING WHICH EQUIPMENT AND MATERIAL HE INTENDS TO FURNISH AND INSTALL AND BY DETAILING FABRICATION AND INSTALLATION METHODS HE INTENDS TO USE.

5. **ARCHITECT'S REVIEW AND APPROVAL:**
   A. THE ARCHITECT WILL REVIEW EACH SUBMITTAL, MARK IT WITH APPROPRIATE ACTION, AND RETURN IT TO CONTRACTOR WITH REASONABLE PROMPTNESS. SUBMITTALS WILL BE MARKED BY ARCHITECT AS FOLLOWS:
      1. "NO EXCEPTIONS" INDICATES THE DRAWINGS HAVE BEEN REVIEWED FOR CONFORMANCE WITH DESIGN AND NO EXCEPTIONS ARE TAKEN. PROCEED WITH THE WORK.
      2. "EXCEPTIONS AS NOTED" INDICATES CONTRACTOR MAY PROCEED WITH THE WORK AS NOTED.
      3. "RESUBMIT" OR INDICATES DRAWING TO BE REVISED AND RESUBMITTED FOR REVIEW PRIOR TO PROCEEDING WITH THE WORK OR THAT SUBMITTAL DOES NOT COMPLY WITH CONTRACT DOCUMENTS.
   B. THE ARCHITECT'S REVIEW AND APPROVAL IS ONLY FOR CHECKING FOR CONFORMANCE WITH INFORMATION GIVEN AND THE DESIGN CONCEPT EXPRESSED IN THE CONTRACT DOCUMENTS.
   C. THE ARCHITECT WILL RETURN ONE COPY OF REVIEWED SHOP DRAWINGS FOR PRINTING AND DISTRIBUTION BY CONTRACTOR.
   D. MAKE CORRECTIONS AND CHANGES INDICATED FOR UNAPPROVED SUBMITTALS, AND RESUBMIT IN SAME MANNER AS SPECIFIED ABOVE UNTIL ARCHITECT'S APPROVAL IS OBTAINED.

SECTION 01630 - PRODUCT OPTIONS AND SUBSTITUTIONS

1. **PRODUCT OPTIONS AND SUBSTITUTIONS:**
   A. IF IT IS DESIRED TO USE PRODUCTS DIFFERENT FROM THOSE INDICATED IN THE CONTRACT DOCUMENTS, THE PARTY REQUESTING THE SUBSTITUTION SHALL MAKE WRITTEN APPLICATION. THE BURDEN OF PROVING EQUIVALENCY OF PROPOSED SUBSTITUTIONS RESTS WITH THE CONTRACTOR.
      1. REQUESTS FOR SUBSTITUTION WILL BE CONSIDERED BY ARCHITECT IN ACCORDANCE WITH THE FOLLOWING:
         A. REQUESTS WILL BE CONSIDERED FROM CONTRACTOR ONLY, FOLLOWING CONTRACT AWARD.
         B. CONTRACT SUM SHALL BE BASED ONLY ON PRODUCTS AND SYSTEMS SPECIFIED IN THE CONTRACT DOCUMENTS.
         C. REQUESTS FOR SUBSTITUTION SHALL BE MADE IN A TIMELY MANNER SUCH THAT PROGRESS OF THE WORK WILL NOT BE ADVERSELY AFFECTED IF SUBSTITUTION IS UNACCEPTABLE.
         D. SUBSTITUTION REQUESTS SHALL PRECEDE AND SHALL NOT BE MADE AS A PART OF SHOP DRAWINGS OR PRODUCT DATA SUBMITTALS.
      2. REQUESTS FOR SUBSTITUTION SHALL BE ACCOMPANIED BY SUCH TECHNICAL DATA AND SAMPLES AS THE PARTY MAKING THE REQUEST DESIRES TO SUBMIT AND SHALL INDICATE IN WHAT RESPECTS PROPOSED MATERIALS OR PRODUCTS DIFFER FROM THOSE SPECIFIED AND THE EFFECT ON INTERFACING OR RELATED WORK.
      3. REQUESTS FOR SUBSTITUTION SHALL BE ACCOMPANIED BY COMPLETE COST DATA INDICATING MATERIAL COST, INSTALLED COST AND SAVINGS, IF ANY, RESULTING FROM PROPOSED SUBSTITUTION.
      4. DETERMINATION AS TO ACCEPTABILITY OF PROPOSED SUBSTITUTIONS WILL BE MADE BASED ONLY ON DATA SUBMITTED.
      5. CONTRACTOR SHALL COORDINATE INSTALLATION OF ACCEPTED SUBSTITUTIONS WITH INTERFACING WORK, BEARING RE-DESIGN COSTS AND MAKING APPROVED CHANGES IN THE WORK TO PROPERLY INCORPORATE THE SUBSTITUTIONS, AND SHALL WAIVE ALL CLAIMS FOR ADDITIONAL COSTS RELATED TO USE OF ACCEPTABLE SUBSTITUTIONS WHICH BECOME APPARENT FOLLOWING ACCEPTANCE.
         A. IN THE EVENT THAT SPECIFIED ITEMS CANNOT BE DELIVERED TO THE JOB SITE AND INCORPORATED INTO THE WORK AT SUCH TIMES AND IN SUCH QUANTITIES AS TO CAUSE NO DELAY, THEN CONTRACTOR MAY REQUEST A SUBSTITUTION IN THE MANNER DESCRIBED ABOVE. SHOULD THE ACCEPTED SUBSTITUTION PROVIDE A COST SAVINGS, THE CONTRACT PRICE WILL BE ADJUSTED BY CHANGE ORDER, WITH OWNER RECEIVING THE BENEFIT OF THE NET SAVINGS. NO INCREASE IN THE CONTRACT PRICE WILL BE ALLOWED ON SUBSTITUTIONS MADE AFTER THE AWARD OF CONTRACT, EXCEPT WHERE THE CONTRACTOR CAN VERIFY A TIMELY PLACEMENT OF ORDERS APPROPRIATE TO THE MATERIALS AND CONDITIONS INVOLVED.
         B. INABILITY TO OBTAIN SPECIFIED ITEMS DUE TO CONTRACTOR'S FAILURE TO PLACE TIMELY ORDERS WILL NOT BE CONSIDERED REASON FOR AUTHORIZING SUBSTITUTIONS.

SECTION 06110 - ROUGH CARPENTRY

1. **TREATED WOOD PRODUCTS:**
   A. ALL BLOCKING SHALL BE FIRE-RETARDANT-TREATED WOOD. PRESSURE-IMPREGNATED WITH A CHEMICAL RETARDANT TESTED AND LISTED BY UNDERWRITERS LABORATORIES, INC., (UL) TO PROVIDE A MINIMUM FLAME SPREAD WHEN TESTED IN ACCORDANCE WITH ASTM 384-91A.
   B. INSTALL IN CONTINUOUS HORIZONTAL ROW IN MIDDLE THIRD OF STUD HEIGHT. COORDINATE BLOCKING WITH LOCATIONS OF FINISHING MATERIAL, MILLWORK, FIXTURES, SPECIALTY ITEMS AND TRIM.
   C. ANY COMPOSITE WOOD PRODUCT MUST CONTAIN NO ADDED UREA FORMALDEHYDE

SECTION 07250 - FIRESTOPPING

1. PROVIDE FIRESTOPPING AS REQUIRED BY APPLICABLE CODE.

SECTION 08100 - METAL DOORS AND FRAMES

1. **FRAME INSTALLATION:**
   A. INSTALL HOLLOW METAL FRAMES IN ACCORDANCE WITH ANSI/SDI-119-83. CLEARANCE BETWEEN FRAME AND INTERFACING WALL SURFACES SHALL BE 1/16" MAXIMUM.
   B. WELDED FRAMES:
      1. SET WELDED FRAMES IN POSITION PRIOR TO BEGINNING PARTITION WORK. BRACE FRAMES UNTIL PERMANENT ANCHORS ARE SET.
      2. SET ANCHORS FOR FRAMES AS WORK PROGRESSES. INSTALL ANCHORS AT HINGE AND STRIKE LEVELS.
      3. REMOVE TEMPORARY BRACES AND SPREADERS AFTER WALL CONSTRUCTION IS COMPLETE.
      4. INSTALL WELDED FRAMES IN PREPARED OPENINGS IN CONCRETE AND MASONRY WALLS USING COUNTERSUNK BOLTS AND EXPANSION SHIELDS.
      5. WELD FIELD SPLICES IN BORROWED LITE FRAMES AND GRIND SMOOTH.
   C. DRYWALL (KD) FRAMES: SECURE USING ADJUSTABLE JAMB AND BASE ANCHORS. COMPLETE INSTALLATION SHALL HAVE TIGHT-FITTING JOINTS, WITHOUT GAPS OR OFFSETS.

2. **DOOR INSTALLATION:**
   A. INSTALL HOLLOW METAL DOORS IN FRAMES IN ACCORDANCE WITH SDI-100-85 AND ANSI A151.1-87, USING HARDWARE INDICATED.
   B. EDGE CLEARANCES AT DOORS:
      1. BETWEEN DOOR AND FRAME, AT HEAD AND JAMBS: 1/8".
      2. AT MEETING EDGES OF PAIRS OF DOORS AND AT MULLIONS: 1/8".
      3. AT TRANSOM PANELS, WITHOUT TRANSOM BARS: 1/8".
      4. AT SILLS WITHOUT THRESHOLDS: 3/8" MAXIMUM ABOVE FINISH FLOOR.
      5. AT SILLS WITH THRESHOLDS: 3/8" MAXIMUM ABOVE TOP OF THRESHOLD.
   C. FIRE-RATED DOORS: INSTALL IN ACCORDANCE WITH REQUIREMENTS OF NFPA #80.

SECTION 083323 - OVERHEAD COILING DOORS

1.1 SECTION REQUIREMENTS
SUBMITTALS: PRODUCT DATA, SHOP DRAWINGS, MANUFACTURER'S COLOR CHARTS, AND MAINTENANCE DATA.
1.2 DOOR ASSEMBLY
MANUFACTURERS: BASIS OF DESIGN: JANUS MODEL 650, SUBJECT TO COMPLIANCE WITH REQUIREMENTS
1.3 DESCRIPTION TYPE:
CONTINUOUS SHEET ROLLING DOOR MODEL 650 AS MANUFACTURED BY JANUS INTERNATIONAL CORPORATION, TEMPLE, GA. 1.01.02. MOUNTING: TO BE INTERIOR OR EXTERIOR FACE MOUNTED ON A PREPARED JAMB.
1.4 RELATED WORK
PREPARATION OF OPENING, MISCELLANEOUS OR STRUCTURAL STEEL, IRON WORK, ACCESS PANELS, MASTER KEYING CYLINDERS, FINISH OR FIELD PAINTING, ELECTRICAL WIRING, CONDUIT, DISCONNECTING SWITCHES ARE IN THE SCOPE OF THE WORK OF OTHER SECTIONS OR TRADES.
1.5 QUALITY ASSURANCE
QUALIFICATIONS OF MANUFACTURER: PRODUCTS UTILIZED IN THIS SECTION SHALL BE MANUFACTURED BY AN ORGANIZATION WHO REGULARLY ENGAGES IN THE PRODUCTION OF SIMILAR PRODUCTS AND HAS A PROVEN HISTORY OF SUCCESSFUL MANUFACTURED PRODUCTS ACCEPTABLE TO THE ARCHITECT, SUCH AS JANUS INTERNATIONAL CORPORATION.
1.6 GUARANTEE: ALL DOORS AND COMPONENTS SPECIFIED HEREIN SHALL BE GUARANTEED TO BE FREE OF WORKMANSHIP AND DEFECT FOR A PERIOD OF 3 YEARS.
2.1 CURTAIN SHEETS: CONTINUOUS 20" CORRUGATED SHEETS ROLL FORMED FROM 26 GAUGE ASTM A653 GRADE 80 FULL HARD STEEL AND LOCK SEAMED TOGETHER.
2.2 FINISH — GALVANIZED AND PRE-PAINTED WITH SUPER DURABLE POLYESTER PAINT GUARANTEED WITH A 40 YEAR FILM INTEGRITY WARRANTY TO NOT CRACK, PEEL, FLAKE, SPLIT, DELAMINATE OR BLISTER. ADDITIONAL GUARANTEE UP TO 25 YEARS AGAINST FADING OR CHANGING COLOR BASED ON COLOR
2.3 BOTTOM BAR — ROLL FORMED CLEAR ACRYLIC COATED GALVANIZED STEEL REINFORCED WITH A 1-1/2" X 1-1/2" X 12 GAUGE GALVANIZED ANGLE THAT EXTENDS FULLY INTO THE GUIDES. EXTERIOR MOUNTED LIFT HANDLE(S) AND #6 ANGOLA ROPE ATTACHED TO INTERIOR ANGLE.
2.4 WEATHERSTRIPPING:
BLACK PVC BULB-TYPE ASTRAGAL AFFIXED TO THE BOTTOM BAR ASSEMBLY PROVIDES POSITIVE CONTACT WITH THE FLOOR.
2.5 BARREL ASSEMBLY — GALVANIZED COIL STEEL FABRICATED IN A 9-1/2" DIAMETER SPIRAL FORMATION TO ENCLOSE SPRING COUNTERBALANCE SYSTEM AND PROVIDE FULL SPAN CURTAIN WEIGHT SUPPORT. ATTACHED GALVANIZED DRUMS ARE FURNISHED WITH GREASE-FILLED, SHIELDED RADIAL BALL BEARINGS AT ROTATING POINTS AROUND THE AXLE.

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SECTION 083323 - OVERHEAD COILING DOORS (CONTINUED)

2.6 SPRING COUNTERBALANCE — FACTORY LUBRICATED, OIL TEMPERED, HELICAL TORSION SPRINGS LOCATED INSIDE THE BARREL AND MADE OF WIRE CONFORMING TO ASTM A229. SPRINGS ARE ATTACHED TO THE STEEL AXLE TUBE BY MEANS OF A WELDED SPRING CLIP. AXLE TUBE PROVIDED IS SUFFICIENT SIZE TO CARRY CURTAIN LOAD AND SPRING TORQUE.
2.7 SUPPORT BRACKETS — GALVANIZED AND REINFORCED ONE-PIECE 12 GAUGE FORMED STEEL BRACKETS ARE FACTORY INSTALLED TO THE DOOR ASSEMBLY.
2.8 SPRING TENSIONER — LEFT END EXTERNAL MOUNTED RATCHET TENSIONER DEVICE ALLOWS FOR FIELD ADJUSTMENT OF SPRING TENSION ON ALL SPRINGS.
2.9 GUIDE ASSEMBLY — UNIVERSAL MOUNTED GUIDES ROLL FORMED FROM 18 GAUGE GALVANIZED STEEL AND FITTED WITH LEG WEAR STRIPS. 1-5/8" GUIDE DEPTH FURNISHED FOR SUFFICIENT CURTAIN ENGAGEMENT. REMOVABLE GALVANIZED DOOR STOP AT TOP OF EACH GUIDE.
2.10 LOCKING MECHANISM — SINGLE YELLOW ZINC OR OPTIONAL STAINLESS STEEL MINI LATCH FACTORY INSTALLED ON RIGHT SIDE OF DOOR (OUTSIDE LOOKING IN) WITH FOUR BOLTS. SLIDE EXHIBITS MAGNETIC PROPERTIES THAT CAN ACTIVATE GUIDE MOUNTED SECURITY SENSORS. ACCEPTS ALL INDUSTRY PADLOCKS, INCLUDING 7/16" DIAMETER SHANKS. PROVISIONS FOR CYLINDER LOCK INCLUDED.
2.11 FINISH — NON-GALVANIZED SURFACES, EXCLUDING AXLE TUBE, TO CONSIST OF SHOP COAT OF RUST INHIBITOR PRIMER.
3.1 INSTALLATION
A. INSTALL DOOR, TRACK, AND OPERATING EQUIPMENT COMPLETE WITH NECESSARY HARDWARE, ANCHORS, INSERTS, HANGERS, AND EQUIPMENT SUPPORTS.
B. ACCESSIBILITY: INSTALL DOORS, SWITCHES, AND CONTROLS ALONG ACCESSIBLE ROUTES IN COMPLIANCE WITH REGULATORY REQUIREMENTS FOR ACCESSIBILITY.
D. TEST AND ADJUST CONTROLS AND SAFETIES.

SECTION 09250 - GYPSUM DRYWALL

1. **QUALITY ASSURANCE:**
   A. PROVIDE FIRE-RESISTANCE-RATED ASSEMBLIES IDENTICAL TO DESIGN DESIGNATIONS IN UL. "FIRE RESISTANCE DIRECTORY" OR IN LISTING OF OTHER TESTING AGENCIES ACCEPTABLE TO AUTHORITIES HAVING JURISDICTION.

2. **STEEL FRAMING FOR WALLS AND PARTITIONS:**
   A. STEEL STUDS AND RUNNERS: ASTM C 645, WITH FLANGE EDGES OF STUDS BENT BACK 90° AND DOUBLED OVER TO FORM 3/16" MINIMUM LIP (RETURN) AND COMPLYING WITH THE FOLLOWING REQUIREMENTS FOR MINIMUM THICKNESS OF BASE (UNCOATED) METAL AND FOR DEPTH:
      1. THICKNESS: AS INDICATED ON DRAWINGS. (TO MATCH BUILDING STANDARD CONSTRUCTION.)
      2. DEPTH: 11/4"
      3. INSTALL AS PER ASTM C754 & ASTM C840
      4. MAXIMUM STUD SPACING 24 O.C.

3. **GYPSUM BOARD:**
   A. GENERAL: PROVIDE GYPSUM BOARD OF TYPES INDICATED IN MAXIMUM LENGTHS AVAILABLE TO MINIMIZE END-TO-END JOINTS.
   B. GYPSUM WALLBOARD: ASTM C 36, AND AS FOLLOWS:
      1. TYPE: REGULAR, UNLESS OTHERWISE INDICATED.
      2. TYPE: TYPE X FOR FIRE-RESISTANCE-RATED ASSEMBLIES.
      3. EDGES: TAPERED.
      4. THICKNESS: AS INDICATED ON DRAWINGS.

4. **MISCELLANEOUS MATERIALS:**
   A. CONCEALED ACOUSTICAL SEALANT: NONDRYING, NONHARDENING, NONSKINNING, NONSTAINING, NONBLEEDING, GUNNABLE SEALANT. ALL SEALANT SHOULD MEET THE SCAQMD RULE #1168 REQUIREMENTS FOR VOC LIMIT OF 250 G/L.
   B. SOUND ATTENUATION BLANKETS: UNFACED, FORMALDEHYDE FREE GLASS/MINERAL FIBER BLANKET INSULATION WITHOUT MEMBRANE FACING.

SECTION 09900 - PAINTING

1. **SUBMITTALS:**
   A. (2) TWO 8 1/2" X 11" BRUSH OUTS ON COVERSTOCK FOR EACH COLOR AND SPECIFIED SHEEN IS REQUIRED. SUBMIT LABELED DRY SAMPLES TO ARCHITECT FOR APPROVAL.

2. **MANUFACTURERS:**
   A. MANUFACTURER: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE PRODUCTS OF ONE OF THE FOLLOWING: PPG; SHERWIN WILLIAMS; BENJAMIN MOORE.

3. **PAINT SCHEDULE:** USE ONLY LOW ODOR; MINIMAL VOC EMITTING PRODUCTS:
   1. GYPSUM DRYWALL (FLAT FINISH AT CEILINGS AND SOFFITS, MAX 50g/L VOC):
      A. PRIMER:
         1. PPG: 6-2 SPEEDHIDE INTERIOR LATEX PRIMER SEALER
         2. SHERWIN WILLIAMS: PRO-MAR 200 ZERO VOC INT. LATEX PRIMER B28W02600
         3. BENJAMIN MOORE: SUPER SPEC LATEX ENAMEL UNDERCOATER & PRIMER 253
      B. FIRST AND SECOND COATS:
         1. PPG: 6-70 SERIES SPEEDHIDE INTERIOR LATEX FLAT WALL PAINT
         2. SHERWIN WILLIAMS: PRO-MAR 200 INTERIOR FLAT LATEX WALL PAINT B30W251
         3. BENJAMIN MOORE: SUPER SPEC INTERIOR FLAT LATEX WALL PAINT 275

   2. GYPSUM WALLBOARD (EGGSHELL FINISH FOR WALLS, MAX 150g/L VOC):
      A. PRIMER:
         1. PPG: 6-1 SPEEDHIDE MAXBUILD, HIGH BUILD DRYWALL SURFACER
         2. SHERWIN WILLIAMS: BUILDERS SOLUTION INTERIOR LATEX PRIMER/SURFACER #A63W00100
         3. BENJAMIN MOORE: SUPER SPEC PREP COAT HIGH BUILD LATEX INTERIOR PRIMER 270
      B. FIRST AND SECOND COATS:
         1. PPG: 6-411 SPEEDHIDE INTERIOR LATEX EGGSHELL ENAMEL
         2. SHERWIN WILLIAMS: PRO-MAR 200 LATEX EGG-SHELL ENAMEL B20W2251
         3. BENJAMIN MOORE: MOORECRAFT SUPER SPEC LATEX EGGSHELL ENAMEL 274

   3. STEEL DOORS & FRAMES (SEMI-GLOSS FINISH, MAX 150g/L VOC):
      A. PRIMER:
         1. PPG: 90-712 PITT TECH INTERIOR EXTERIOR DTM ACRYLIC PRIMER FINISH
         2. SHERWIN WILLIAMS: PRO-CRYL UNIVERSAL ACRYLIC PRIMER B66 SERIES
         3. BENJAMIN MOORE: SUPER SPEC HP ACRYLIC METAL PRIMER P04
      B. FIRST AND SECOND COATS:
         1. PPG: PP919 ADVANTAGE 900 INTERIOR EXTERIOR ACRYLIC SEMI-GLOSS ENAMEL
         2. SHERWIN WILLIAMS: PROCLASSIC SEMI-GLOSS ACRYLIC ENAMEL B31 SERIES
         3. BENJAMIN MOORE: MOORE'S KITCHEN & BATH ACRYLIC ENAMEL 322

   4. WOOD DOORS, WOOD FRAMES AND TRIM (SEMI GLOSS FINISH, MAX 150g/L VOC):
      A. PRIMER:
         1. PPG: 17-951 SEAL GRIP INTERIOR ACRYLIC PRIMER/FINISH
         2. SHERWIN WILLIAMS: PREPRITE PRO BLOCK LATEX PRIMER/SEALER: B51-600
         3. BENJAMIN MOORE: FRESH START ALL PURPOSE ACRYLIC PRIMER 023
      B. FIRST AND SECOND COATS:
         1. PPG: PP919 ADVANTAGE 900 INTERIOR EXTERIOR ACRYLIC SEMI-GLOSS ENAMEL
         2. SHERWIN WILLIAMS: PROCLASSIC SEMI-GLOSS ACRYLIC ENAMEL B31 SERIES
         3. BENJAMIN MOORE: MOORE'S KITCHEN & BATH ACRYLIC ENAMEL 322

4. **EXAMINATION AND INSTALLATION:**
   A. EXAMINE SUBSTRATES AND CONDITIONS UNDER WHICH PAINTING WILL BE PERFORMED FOR COMPLIANCE WITH PAINT APPLICATION REQUIREMENTS. SURFACES RECEIVING PAINT MUST BE THOROUGHLY DRY BEFORE PAINT IS APPLIED. START OF PAINTING WILL BE CONSTRUED AS THE APPLICATOR'S ACCEPTANCE OF SURFACES AND CONDITIONS WITHIN A PARTICULAR AREA.
   B. SURFACE PREPARATION: CLEAN AND PREPARE SURFACES TO BE PAINTED ACCORDING TO THE MANUFACTURER'S INSTRUCTIONS FOR EACH PARTICULAR SUBSTRATE CONDITION AND AS SPECIFIED.
   C. MINIMUM COATING THICKNESS: APPLY MATERIALS NO THINNER THAN THE MANUFACTURER'S RECOMMENDED SPREADING RATE. PROVIDE THE TOTAL DRY FILM THICKNESS OF THE ENTIRE SYSTEM AS RECOMMENDED BY THE MANUFACTURER.

5. **CLEAN AND PROTECT:**
   A. PROTECT WORK OF OTHER TRADES, WHETHER BEING PAINTED OR NOT, AGAINST DAMAGE BY PAINTING. CORRECT DAMAGE BY CLEANING, REPAIRING OR REPLACING, AND REPAINTING, AS ACCEPTABLE TO ARCHITECT.
   B. PROVIDE "WET PAINT" SIGNS TO PROTECT NEWLY PAINTED FINISHES. REMOVE TEMPORARY PROTECTIVE WRAPPINGS PROVIDED BY OTHERS TO PROTECT THEIR WORK AFTER COMPLETING PAINTING OPERATIONS.
      1. AT COMPLETION OF CONSTRUCTION ACTIVITIES OF OTHER TRADES, TOUCH UP AND RESTORE DAMAGED OR DEFACED PAINTED SURFACES.

SECTION 10522 - FIRE EXTINGUISHERS, CABINETS AND ACCESSORIES

1. **QUALITY ASSURANCE:**
   A. UL-LISTED PRODUCTS: FIRE EXTINGUISHERS UL-LISTED AND BEAR UL "LISTING MARK" FOR TYPE, RATING, AND CLASSIFICATION OF EXTINGUISHER.

2. **MANUFACTURERS:**
   A. MANUFACTURERS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE PRODUCTS BY ONE OF THE FOLLOWING:
   1. LARSEN'S MANUFACTURING CO. 2. J.L. INDUSTRIES. 3. POTTER ROEMER, INC.

3. **FIRE EXTINGUISHERS:**
   A. MULTIPURPOSE DRY CHEMICAL TYPE: UL-RATED 4-A:60-B:C, 10-LB. NOMINAL CAPACITY, IN ENAMELED STEEL CONTAINER.
   B. PROVIDE WALL HUNG FIRE EXTINGUISHERS (HANDLE ON EXTINGUISHER AT 48"AFF.) AS INDICATED ON DRAWINGS.

4. **FIRE EXTINGUISHER CABINETS:**
   A. GENERAL: PROVIDE RECESSED FIRE EXTINGUISHER CABINETS WHERE INDICATED, OF SUITABLE SIZE FOR HOUSING FIRE EXTINGUISHERS OF TYPES AND CAPACITIES INDICATED.
   B. CABINET TYPE: SUITABLE FOR MOUNTING CONDITIONS INDICATED, OF THE FOLLOWING TYPES:
   1. RECESSED: CABINET BOX (TUB) FULLY RECESSED IN WALLS OF SUFFICIENT DEPTH TO SUIT STYLE OF TRIM INDICATED. VERTICAL GLAZED OPENING WITH CLEAR PLEXIGLASS MATERIAL.
   2. MANUFACTURER: LARSON ARCHITECTURAL SERIES #2409-R2, VERTICAL DUO STEEL DOOR (DSA GLASS STANDARD) WITH PRIME COAT
   3. INSTALLATION: MOUNT BOTTOM OF CABINET AT 30" AFF TO WOOD BLOCKING.

SECTION 13 34 19 METAL BUILDING SYSTEMS

1. **SECTION INCLUDES**
   A. METAL BUILDING SYSTEMS INCLUDING:
      1. METAL FRAMING COMPONENTS.
      2. METAL WALL PANELS AND TRIM.
      3. METAL ROOF PANELS AND TRIM.
      4. METAL BUILDING ACCESSORIES.

2. **RELATED SECTIONS**
   A. SECTION 07 92 00 -JOINT SEALANTS.
   B. SECTION [03 30 00 -CAST-IN-PLACE CONCRETE:] [__ -_:] CONCRETE SLABS AND FOOTINGS.
   C. SECTION [05 12 00 -STRUCTURAL METAL FRAMING:] [_ ___-___:] METAL WALL AND ROOF FRAMING.
   D. SECTION [05 40 00 -COLD-FORMED METAL FRAMING:] [09 22 00 -METAL SUPPORT ASSEMBLIES:] [____-___:] METAL PARTITION WALL FRAMING.

3. **REFERENCES**
   SPECIFIER: THE STANDARDS REFERENCED BELOW ARE IN GENERAL CHOSEN TO MATCH THOSE REQUIRED BY THE 2015 VERSION OF THE INTERNATIONAL BUILDING CODE. REVIEW AND EDIT AS NECESSARY TO REFLECT THE APPLICABLE BUILDING CODE FOR THE PROJECT.
   A. AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC):
      1. AISC 360 -SPECIFICATION FOR STRUCTURAL STEEL BUILDINGS, JUNE 22, 2010. METAL
      2. AISC 341 - AISC SEISMIC PROVISIONS FOR STRUCTURAL STEEL BUILDINGS, JUNE 22ND, 2010.
      3. AISC 303 - CODE OF STANDARD PRACTICE FOR STEEL BUILDINGS AND BRIDGES, APRIL 14TH, 2010.
   B. AMERICAN IRON AND STEEL INSTITUTE (AISI):
      1. AISI S100 -NORTH AMERICAN SPECIFICATION FOR THE DESIGN OF COLD-FORMED STEEL STRUCTURAL MEMBERS, 2012 EDITION.
   C. AMERICAN WELDING SOCIETY (AWS):
      1. AWS D1.1/D1.1M -STRUCTURAL WELDING CODE – STEEL, 2010.
      2. AWS D1.3/D1.3M -STRUCTURAL WELDING CODE -SHEET STEEL, 2008
   D. AMERICAN SOCIETY OF HEATING, REFRIGERATION AND AIR CONDITIONING ENGINEERS (ASHRAE):
      1. ASHRAE 90.1-2013 -ENERGY STANDARD FOR BUILDINGS EXCEPT LOW-RISE RESIDENTIAL BUILDINGS (I-P EDITION).
   E. ASTM INTERNATIONAL (ASTM): LATEST VERSIONS OF:
      1. ASTM A 36/A 36M -STANDARD SPECIFICATION FOR CARBON STRUCTURAL STEEL.
      2. ASTM A 475 -STANDARD SPECIFICATION FOR ZINC-COATED STEEL WIRE STRAND.
      3. ASTM A 500/A 500M -STANDARD SPECIFICATION FOR COLD-FORMED WELDED AND SEAMLESS CARBON STEEL STRUCTURAL TUBING IN ROUNDS AND SHAPES.
      4. ASTM A 529/A 529M -STANDARD SPECIFICATION FOR HIGH-STRENGTH CARBON-MANGANESE STEEL OF STRUCTURAL QUALITY.
      5. ASTM A 563 -STANDARD SPECIFICATION FOR CARBON AND ALLOY STEEL NUTS.
      6. ASTM A 572/A 572M -STANDARD SPECIFICATION FOR HIGH-STRENGTH LOW-ALLOY COLUMBIUM-VANADIUM STRUCTURAL STEEL.
      7. ASTM A 653/A 653M -STANDARD SPECIFICATION FOR STEEL SHEET, ZINC-COATED (GALVANIZED) OR ZINC-IRON ALLOY-COATED (GALVANNEALED) BY THE HOT-DIP PROCESS.
      8. ASTM A 792/A 792M -STANDARD SPECIFICATION FOR STEEL SHEET, 55 PERCENT ALUMINUM- ZINC ALLOY-COATED BY HOT-DIP PROCESS.
      9. ASTM A 992/A 992M -STANDARD SPECIFICATION FOR STRUCTURAL STEEL SHAPES.
      10. ASTM A 1011/A 1011M -STANDARD SPECIFICATION FOR STEEL, SHEET AND STRIP, HOT-ROLLED, CARBON, STRUCTURAL, HIGH-STRENGTH, LOW-ALLOY AND HIGH-STRENGTH LOW-ALLOY WITH IMPROVED FORMABILITY AND ULTRA-HIGH STRENGTH
      11. ASTM A 1018/A 1018A -STANDARD SPECIFICATION FOR STEEL, SHEET AND STRIP, HEAVY- THICKNESS COILS, HOT-ROLLED, CARBON, COMMERCIAL, DRAWING, STRUCTURAL, HIGH-STRENGTH LOW-ALLOY, HIGH-STRENGTH LOW-ALLOY WITH IMPROVED FORMABILITY, AND ULTRA-HIGH STRENGTH
      12. ASTM C 518 -STANDARD TEST METHOD FOR STEADY-STATE THERMAL TRANSMISSION PROPERTIES BY MEANS OF THE HEAT FLOW METER APPARATUS.
      13. ASTM C 1363 -STANDARD TEST METHOD FOR THERMAL PERFORMANCE OF BUILDING MATERIALS AND ENVELOPE ASSEMBLIES BY MEANS OF A HOT BOX APPARATUS.
      14. ASTM D 635 -STANDARD TEST METHOD FOR RATE OF BURNING AND/OR EXTENT AND TIME OF BURNING OF PLASTICS IN A HORIZONTAL POSITION.
      15. ASTM D 1003 -STANDARD TEST METHOD FOR HAZE AND LUMINOUS TRANSMITTANCE OF TRANSPARENT PLASTICS.
      16. ASTM D 1494 -STANDARD TEST METHOD FOR DIFFUSE LIGHT TRANSMISSION FACTOR OF REINFORCED PLASTICS PANELS.
      17. ASTM D 1929 -STANDARD TEST METHOD FOR DETERMINING IGNITION TEMPERATURE OF PLASTICS.
      18. ASTM D 2240 -STANDARD TEST METHOD FOR RUBBER PROPERTY—DUROMETER HARDNESS.
      19. ASTM D 2244 -STANDARD PRACTICE FOR CALCULATION OF COLOR TOLERANCES AND COLOR DIFFERENCES FROM INSTRUMENTALLY MEASURED COLOR COORDINATES.
      20. ASTM D 4214 -STANDARD TEST METHODS FOR EVALUATING THE DEGREE OF CHALKING OF EXTERIOR PAINT FILMS.
      21. ASTM E 84 -STANDARD TEST METHOD FOR SURFACE BURNING CHARACTERISTICS OF BUILDING MATERIALS.
      22. ASTM E 72 -STANDARD TEST METHODS OF CONDUCTING STRENGTH TESTS OF PANELS FOR BUILDING CONSTRUCTION.
      23. ASTM E 283 -STANDARD TEST METHOD FOR DETERMINING RATE OF AIR LEAKAGE THROUGH EXTERIOR WINDOWS, CURTAIN WALLS, AND DOORS UNDER SPECIFIED PRESSURE DIFFERENCES ACROSS SPECIMEN.
      24. ASTM E 331 -STANDARD TEST METHOD FOR WATER PENETRATION OF EXTERIOR WINDOWS, SKYLIGHTS, DOORS, AND CURTAIN WALLS BY UNIFORM STATIC AIR PRESSURE DIFFERENCE.
      25. ASTM E 1592 -STANDARD TEST METHOD FOR STRUCTURAL PERFORMANCE OF SHEET METAL ROOF AND SIDING SYSTEMS BY UNIFORM STATIC AIR PRESSURE DIFFERENCE.
      26. ASTM E 1646 -STANDARD TEST METHOD FOR WATER PENETRATION OF EXTERIOR METAL ROOF PANEL SYSTEMS BY UNIFORM STATIC AIR PRESSURE DIFFERENCE.
      27. ASTM E 1680 -STANDARD TEST METHOD FOR RATE OF AIR LEAKAGE THROUGH EXTERIOR METAL ROOF PANEL SYSTEMS.
      28. ASTM E 1980 -STANDARD PRACTICE FOR CALCULATING SOLAR REFLECTANCE INDEX OF HORIZONTAL AND LOW-SLOPED OPAQUE SURFACES.
      29. ASTM F 436 -STANDARD SPECIFICATION FOR HARDENED STEEL WASHERS
      30. ASTM F 1941 -STANDARD SPECIFICATION FOR ELECTRODEPOSITED COATINGS ON THREADED FASTENERS (UNIFIED INCH SCREW THREADS (UN/UNR))
      31. ASTM F 3125 -STANDARD SPECIFICATION FOR HIGH STRENGTH STRUCTURAL BOLTS, STEEL AND ALLOY STEEL, HEAT TREATED, 120 KSI (830 MPA) AND 150 KSI (1040 MPA) MINIMUM TENSILE STRENGTH, INCH AND METRIC DIMENSIONS.
   F. COOL ROOF RATING COUNCIL (CRRC):
      1. ANSI/CRRC S100 -STANDARD TEST METHODS FOR DETERMINING RADIATIVE PROPERTIES OF MATERIALS, APRIL 26TH, 2016.
   G. FACTORY MUTUAL APPROVALS (FM APPROVALS):
      1. FM 4471 -APPROVAL STANDARD FOR CLASS 1 PANEL ROOFS.
      2. FM 4880 -APPROVAL STANDARD FOR CLASS 1 FIRE RATING OF INSULATED WALL OR WALL AND ROOF/ROOF/CEILING PANELS, INTERIOR FINISH MATERIALS OR COATINGS AND EXTERIOR WALL SYSTEMS.
      3. FM 4881 -APPROVAL STANDARD FOR CLASS 1 EXTERIOR WALL SYSTEMS.
   H. FM GLOBAL:
      1. FM 1-28 – PROPERTY LOSS PREVENTION DATA SHEET 1-28, WIND DESIGN, OCTOBER 2015.
   I. INTERNATIONAL ACCREDITATION SERVICE (IAS):
      1. ACCREDITATION CRITERIA 472 (AC472) -ACCREDITATION CRITERIA FOR INSPECTION PROGRAMS FOR MANUFACTURERS OF METAL BUILDING SYSTEMS, APRIL 2017
   J. INTERNATIONAL STANDARDS ORGANIZATION (ISO):
      1. ISO 14044 – ENVIRONMENTAL MANAGEMENT -- LIFE CYCLE ASSESSMENT – REQUIREMENTS AND GUIDELINES, 2006
      2. ISO 21930 – SUSTAINABILITY IN BUILDING CONSTRUCTION – ENVIRONMENTAL DECLARATION OF BUILDING PRODUCTS, 2007.
   K. METAL BUILDING MANUFACTURERS ASSOCIATION (MBMA):
      1. METAL BUILDING SYSTEMS MANUAL, 2012 EDITION.
   L. NATIONAL FENESTRATION RATING COUNCIL (NFRC):
      1. NFRC 100 -PROCEDURE FOR DETERMINING FENESTRATION PRODUCT U-FACTORS, 2014
      2. NFRC 200 -PROCEDURE FOR DETERMINING FENESTRATION PRODUCT SOLAR HEAT GAIN COEFFICIENT AND VISIBLE TRANSMITTANCE AT NORMAL INCIDENCE, 2010.
   M. NATIONAL FIRE PROTECTION ASSOCIATION (NFPA):
      1. NFPA 285 -STANDARD FIRE TEST METHOD FOR EVALUATION OF FIRE PROPAGATION CHARACTERISTICS OF EXTERIOR NON-LOAD-BEARING WALL ASSEMBLIES CONTAINING COMBUSTIBLE COMPONENTS, 2012 EDITION.
   N. RESEARCH COUNCIL ON STRUCTURAL CONNECTIONS (RCSC):
      1. SPECIFICATION FOR STRUCTURAL JOINTS USING HIGH STRENGTH BOLTS, AUGUST 1, 2014.
   O. UNDERWRITERS LABORATORIES (UL):
      1. UL-580 -TESTS FOR UPLIFT RESISTANCE OF ROOF ASSEMBLIES.
      2. UL-790 -STANDARD TEST METHODS FOR FIRE TESTS OF ROOF COVERINGS.
      3. UL-2218 -IMPACT RESISTANCE OF PREPARED ROOF COVERING MATERIALS.
   P. UNITED STATES GREEN BUILDING COUNCIL (USGBC):
      1. LEED V4 -LEADERSHIP IN ENERGY AND ENVIRONMENTAL DESIGN FOR BUILDING DESIGN AND CONSTRUCTION, JANUARY 27TH, 2017.

4. **ADMINISTRATIVE REQUIREMENTS**
   A. PRE-INSTALLATION MEETING: PRIOR TO ERECTION OF FRAMING, CONDUCT PRE-INSTALLATION MEETING AT SITE ATTENDED BY OWNER, ARCHITECT, MANUFACTURER'S TECHNICAL REPRESENTATIVE, INSPECTION AGENCY AND RELATED TRADE CONTRACTORS.
   B. COORDINATE WORK OF DIVISION 07 SECTIONS "ROOF SPECIALTIES" AND "ROOF ACCESSORIES" AND OPENINGS AND PENETRATIONS AND MANUFACTURER'S ACCESSORIES WITH INSTALLATION OF METAL PANELS.

5. **DEFINITIONS**
   A. TRADITIONAL METAL BUILDING SYSTEM: BUILDING SYSTEM USING EITHER CONTINUOUS OR SIMPLE SPAN "Z" PURLINS FOR SUPPORT OF ROOF COVERING MATERIAL.
   B. GABLE SYMMETRICAL: CONTINUOUS FRAME BUILDING WITH RIDGE IN CENTER OF BUILDING, CONSISTING OF TAPERED OR STRAIGHT COLUMNS AND TAPERED OR STRAIGHT RAFTERS. SIDEWALL GIRTS MAY BE CONTINUOUS (BY-PASSING COLUMNS) OR SIMPLE SPAN (FLUSH IN COLUMN LINE). RAFTERS MAY OR MAY NOT HAVE INTERIOR COLUMNS.
   C. GABLE UNSYMMETRICAL: CONTINUOUS FRAME BUILDING WITH AN OFF-CENTER RIDGE, CONSISTING OF TAPERED OR STRAIGHT COLUMNS, AND TAPERED OR STRAIGHT RAFTERS. EAVE HEIGHT AND ROOF SLOPE MAY DIFFER ON EACH SIDE OF RIDGE. SIDEWALL GIRTS MAY BE CONTINUOUS (BY-PASSING COLUMNS) OR SIMPLE SPAN (FLUSH IN COLUMN LINE). RAFTERS MAY OR MAY NOT HAVE INTERIOR COLUMNS.
   D. SINGLE SLOPE: CONTINUOUS FRAME BUILDING WHICH DOES NOT CONTAIN RIDGE BUT CONSISTS OF ONE CONTINUOUS SLOPE FROM SIDE TO SIDE. BUILDING CONSISTS OF STRAIGHT OR TAPERED COLUMNS AND TAPERED OR STRAIGHT RAFTERS. SIDEWALL GIRTS MAY BE CONTINUOUS (BY-PASSING COLUMNS) OR SIMPLE SPAN (FLUSH IN COLUMN LINE). RAFTERS MAY OR MAY NOT HAVE INTERIOR COLUMNS.
   E. LEAN-TO (LT): BUILDING EXTENSION, WHICH DOES NOT CONTAIN RIDGE, BUT CONSISTS OF ONE CONTINUOUS SLOPE FROM SIDE TO SIDE, USUALLY WITH SAME ROOF SLOPE AND GIRT DESIGN AS BUILDING TO WHICH ATTACHED.
   F. ROOF SLOPE: PITCH EXPRESSED AS INCHES OF RISE FOR EACH 12 INCHES (305 MM) OF HORIZONTAL RUN.
   G. ACRYLIC-COATED GALVALUME: ALUMINUM-ZINC COATED STEEL WITH A THIN CLEAR ACRYLIC FINISH COATING ELIMINATING THE NEED FOR ROLL-FORMING OIL AND REDUCING INCIDENCE OF FIELD MARKING BY HANDLING OR FOOT TRAFFIC.
   H. BUILDING EAVE HEIGHT: NOMINAL DIMENSION MEASURED FROM FINISHED FLOOR TO TOP FLANGE OF EAVE STRUT.
   I. BUILDING WIDTH: MEASURED FROM OUTSIDE TO OUTSIDE OF SIDE WALL SECONDARY STRUCTURAL MEMBER.
   J. BUILDING LENGTH: MEASURED FROM OUTSIDE TO OUTSIDE OF END WALL SECONDARY STRUCTURAL MEMBER.
   K. AUXILIARY LOADS: DYNAMIC LOADS INDUCED BY CRANES, CONVEYORS, OR MATERIAL HANDLING SYSTEMS.
   L. COLLATERAL LOADS: WEIGHT OF ANY NON-MOVING EQUIPMENT OR MATERIAL, SUCH AS CEILINGS, ELECTRICAL OR MECHANICAL EQUIPMENT, SPRINKLER SYSTEMS, PLUMBING, OR CEILINGS.
   M. DEAD LOAD: ACTUAL WEIGHT OF BUILDING SYSTEM AS SUPPLIED BY MANUFACTURER SUPPORTED BY GIVEN MEMBER.
   N. FLOOR LIVE LOADS: LOADS INDUCED ON FLOOR SYSTEM BY BUILDING OCCUPANTS AND POSSESSIONS INCLUDING BUT NOT LIMITED TO FURNITURE AND EQUIPMENT.
   O. ROOF LIVE LOADS: LOADS PRODUCED BY MAINTENANCE ACTIVITIES, RAIN, ERECTION ACTIVITIES, AND OR MOVABLE OR MOVING LOADS BUT NOT INCLUDING WIND, SNOW, SEISMIC, CRANE, OR DEAD LOADS.
   P. ROOF SNOW LOADS: GRAVITY LOAD INDUCED BY WEIGHT OF SNOW OR ICE ON ROOF, ASSUMED TO ACT ON HORIZONTAL PROJECTION OF ROOF.
   Q. SEISMIC LOADS: LOADS ACTING IN ANY DIRECTION ON STRUCTURAL SYSTEM DUE TO ACTION OF AN EARTHQUAKE.
   R. WIND LOADS: LOADS ON STRUCTURE INDUCED BY FORCES OF WIND BLOWING FROM ANY HORIZONTAL DIRECTION.

SECTION 13 34 19 METAL BUILDING SYSTEMS (CONTINUED)

6. **DESIGN REQUIREMENTS**
   A. GOVERNING DESIGN CODE: STRUCTURAL DESIGN FOR THE METAL BUILDING SYSTEM SHALL BE PERFORMED BY THE MANUFACTURER OF THE METAL BUILDING SYSTEM IN ACCORDANCE WITH THE BUILDING CODE PROVIDED IN THE CONTRACT DOCUMENTS.
      SPECIFIER: THE STANDARDS REFERENCED BELOW ARE IN GENERAL CHOSEN TO MATCH THOSE REQUIRED BY THE 2015 VERSION OF THE INTERNATIONAL BUILDING CODE. REVIEW AND EDIT AS
   B. DESIGN BASIS:
      1. USE STANDARDS, SPECIFICATIONS, RECOMMENDATIONS, FINDINGS, AND INTERPRETATIONS OF PROFESSIONALLY RECOGNIZED GROUPS AS BASIS FOR ESTABLISHING DESIGN, DRAFTING, FABRICATION, AND QUALITY CRITERIA, PRACTICES, AND TOLERANCES, INCLUDING THE AISC CODE OF STANDARD PRACTICE FOR STEEL BUILDINGS AND BRIDGES.
      2. DESIGN STRUCTURES IN ACCORDANCE WITH MBMA PRACTICES AND MANUAL INCLUDING FABRICATION AND ERECTION TOLERANCES.
      3. DESIGN STRUCTURAL MILL SECTIONS AND WELDED PLATE SECTIONS IN ACCORDANCE WITH AISC 360, ASD METHOD.
      4. DESIGN THE LATERAL FORCE RESISTING SYSTEMS AND RELATED COMPONENTS FOR SEISMIC LOADS IN ACCORDANCE WITH AISC 341.
      5. DESIGN COLD-FORMED STEEL STRUCTURAL MEMBERS AND PANELS IN ACCORDANCE WITH AISI S-100.
      6. DESIGN ALL BOLTED JOINTS IN ACCORDANCE WITH RCSC SPECIFICATION.
   C. DESIGN LOADS:
      1. IN ACCORDANCE WITH CONTRACT DOCUMENTS AND MANUFACTURER'S STANDARD DESIGN PRACTICES.
      2. DESIGN LOADS INCLUDE DEAD LOADS, ROOF LIVE LOADS, WIND LOADS, SEISMIC LOADS, COLLATERAL LOADS, AUXILIARY LOADS, FLOOR LIVE LOADS AND APPLIED OR SPECIFIED LOADS.

7. **SUBMITTALS**
   A. SUBMITTALS FOR REVIEW:
      1. SHOP DRAWINGS:
         a. COMPLETE ERECTION DRAWINGS WITH IDENTIFICATION AND ASSEMBLY OF BUILDING COMPONENTS.
         B. SHOW ANCHOR BOLT SETTINGS, TRANSVERSE CROSS-SECTIONS, SIDEWALL, ENDWALL, AND ROOF FRAMING, FLASHING, AND SHEETING, AND ACCESSORY INSTALLATION DETAILS.
         C. BEAR SEAL AND SIGNATURE OF REGISTERED PROFESSIONAL ENGINEER RESPONSIBLE FOR METAL BUILDING SYSTEM DESIGN IN ACCORDANCE WITH STATE LAW.
      2. MANUFACTURER INSTALLATION MANUAL SHOWING:
         a. PREPARATION INSTRUCTIONS AND RECOMMENDATIONS.
         B. STORAGE AND HANDLING REQUIREMENTS AND RECOMMENDATIONS.
         C. INSTALLATION METHODS.
      3. STRUCTURAL DESIGN CALCULATIONS: [_ SETS] SEALED AND SIGNED BY A PROFESSIONAL ENGINEER LICENSED IN ACCORDANCE WITH APPLICABLE STATE LAW.
         SPECIFIER: RETAIN AND MODIFY THE FOLLOWING ITEM FOR PROJECTS REQUIRING DOMESTIC MATERIALS.
      4. BUY AMERICAN/ARRA COMPLIANCE LETTER OF CERTIFICATION.
   B. SAMPLES:
      1. SUBMIT COLOR CHIPS SHOWING MANUFACTURER'S FULL RANGE OF AVAILABLE COLORS AND PATTERNS FOR EACH FINISH PRODUCT.
      2. AFTER COLOR SELECTION SUBMIT SAMPLES REPRESENTING ACTUAL PRODUCT, COLOR, AND PATTERNS.
   C. QUALITY CONTROL SUBMITTALS:
      1. IAS AC472 CERTIFICATE FOR EACH FACILITY INVOLVED IN THE DESIGN AND FABRICATION OF THE METAL BUILDING SYSTEM.
         SPECIFIER: RETAIN THIS PARAGRAPH FOR WHEN MTR SUBMITTAL IS REQUIRED IN THE CONTRACT DOCUMENTS.
      2. MATERIAL TEST REPORTS (MTR) FOR ALL STEEL MATERIAL USED IN THE MANUFACTURE OF PRIMARY AND SECONDARY FRAMING MEMBERS, PANELS AND BOLTS SPECIFIED IN THIS SECTION AND WHEN REQUIRED BY ASTM A 6/A 6M

8. **QUALITY ASSURANCE**
   A. MANUFACTURER AND FABRICATOR QUALIFICATIONS: PRIMARY PRODUCTS FURNISHED BY SINGLE IAS AC472 ACCREDITED MANUFACTURER/FABRICATOR WITH MINIMUM [5] [__] YEARS OF EXPERIENCE.
   B. ERECTOR QUALIFICATIONS:
      1. SINGLE INSTALLER WITH MINIMUM [5] [ ] YEARS OF EXPERIENCE IN INSTALLING PRODUCTS OF SAME OR SIMILAR TYPE AND SCOPE.
      2. INSTALLER MUST BE CERTIFIED BY THE METAL BUILDING MANUFACTURER.

9. **DELIVERY, STORAGE AND HANDLING**
   A. STORE PACKAGED PRODUCTS IN ORIGINAL, UNOPENED PACKAGING UNTIL READY FOR INSTALLATION.
   B. STORE AND DISPOSE OF SOLVENT-BASED MATERIALS AND MATERIALS USED WITH SOLVENT-BASED MATERIALS IN ACCORDANCE WITH REQUIREMENTS OF THE AUTHORITY HAVING JURISDICTION.
   C. PROTECT STEEL PRODUCTS FROM WEATHER AS SPECIFIED BY MANUFACTURER INSTRUCTIONS.

10. **PROJECT CONDITIONS**
   A. DO NOT INSTALL SYSTEMS WHEN TEMPERATURE, HUMIDITY, OR VENTILATION IS OUTSIDE OF LIMITS RECOMMENDED BY MANUFACTURER.

11. **WARRANTIES**
   A. SPECIAL MANUFACTURER'S WARRANTY: ON MANUFACTURER'S STANDARD FORM, IN WHICH MANUFACTURER AGREES TO REPAIR OR REPLACE METAL BUILDING SYSTEM COMPONENTS THAT FAIL IN MATERIALS AND WORKMANSHIP WITHIN ONE YEAR FROM DATE OF SUBSTANTIAL COMPLETION.
   B. SPECIAL WEATHERTIGHTNESS WARRANTY: ON MANUFACTURER'S STANDARD FORM, IN WHICH MANUFACTURER AGREES TO REPAIR OR REPLACE METAL BUILDING SYSTEM COMPONENTS THAT FAIL TO REMAIN WEATHERTIGHT, INCLUDING LEAKS, [WITHOUT MONETARY LIMITATION] [UP TO COST LIMITATION OF SEVEN DOLLARS ($7.00) PER SQUARE FOOT OF COVERED AREA] [UP TO COST LIMITATION OF FOURTEEN DOLLARS ($14.00) PER SQUARE FOOT OF COVERED AREA] WITHIN [5] [10] [15] [20] YEARS FROM DATE OF SUBSTANTIAL COMPLETION.
   C. SPECIAL PANEL FINISH WARRANTY: ON MANUFACTURER'S STANDARD FORM, IN WHICH MANUFACTURER AGREES TO REPAIR OR REPLACE METAL PANELS THAT EVIDENCE DETERIORATION OF FACTORY-APPLIED F FINISH WITHIN THE SPECIFIED NUMBER YEARS FROM DATE OF SUBSTANTIAL COMPLETION, INCLUDING:
      1. ACRYLIC COATED GALVALUME (GALVALUME® PLUS): PRODUCT WILL NOT RUPTURE, FAIL STRUCTURALLY, OR PERFORATE WITHIN PERIOD OF 20 YEARS DUE TO NORMAL ATMOSPHERIC CORROSION.
      2. FLUOROPOLYMER TWO-COAT SYSTEM (PVDF):
         SPECIFIER: CONFIRM WARRANTED PERFORMANCE VALUES BELOW FOR CUSTOM COLORS. SECOND OPTIONS IN SUBPARAGRAPHS BELOW ARE FOR VULCAN STEEL STRUCTURES, INC. BRITE RED.
         a. COLOR FADING IN EXCESS OF [5] [10] HUNTER UNITS PER ASTM D 2244 FOR [30] [25] YEARS.
         B. CHALKING IN EXCESS OF NO. [8] [6] RATING PER ASTM D 4214 FOR [30] [25] YEARS.
         C. FAILURE OF ADHESION, PEELING, CHECKING, OR CRACKING FOR 40 YEARS.
      3. METALLIC FLUOROPOLYMER TWO-COAT SYSTEM (METALLIC PVDF):
         a. CHALKING IN EXCESS OF NO. 6 RATING PER ASTM D 4214 FOR 25 YEARS.
         B. FAILURE OF ADHESION, PEELING, CHECKING, OR CRACKING FOR 25 YEARS.
      4. MODIFIED SILICONE-POLYESTER TWO-COAT SYSTEM (SMP):
         SPECIFIER: CONFIRM WARRANTED PERFORMANCE VALUES BELOW FOR CUSTOM COLORS. SECOND OPTIONS IN SUBPARAGRAPHS BELOW ARE FOR VULCAN STEEL STRUCTURES, INC. CRIMSON RED. VULCAN STEEL STRUCTURES, INC. POLAR WHITE POLYESTER DOES NOT CARRY A WARRANTY AGAINST CHALKING.
         a. COLOR FADING IN EXCESS OF [5] [7] HUNTER UNITS PER ASTM D 2244, FOR VERTICAL APPLICATIONS FOR [30] [25] YEARS.
         B. COLOR FADING IN EXCESS OF [7] [10] HUNTER UNITS PER ASTM D 2244, FOR NON-VERTICAL APPLICATIONS FOR [30] [25] YEARS.
         C. CHALKING IN EXCESS OF NO. [8] [7] RATING PER ASTM D 4214, FOR VERTICAL APPLICATIONS FOR [30] [25] YEARS.
         D. CHALKING IN EXCESS OF NO. [6] [5] RATING PER ASTM D 4214, FOR NON-VERTICAL APPLICATIONS FOR [30] [25] YEARS.
         E. FAILURE OF ADHESION, PEELING, CHECKING, OR CRACKING FOR 40 YEARS.
         PART 2- PRODUCTS

12.1 MANUFACTURERS
   A. BASIS OF DESIGN MANUFACTURER: VULCAN STEEL STRUCTURES, INC. HYPERLINK "HTTP://WWW.VULCANSTEEL.COM/"WWW.VULCANSTEEL.COM.
   B. SUBSTITUTIONS: [UNDER PROVISIONS OF DIVISION 01] [NOT PERMITTED].

12.2 MATERIALS
   SPECIFIER: RETAIN AND MODIFY THE FOLLOWING SECTION WHEN PROJECT HAS DOMESTIC CONTENT REQUIREMENTS, WHICH WOULD BE ALL FEDERAL GOVERNMENT WORK AND MOST STATE GOVERNMENT WORK. ALSO NOTE THAT THERE WAS A SIGNIFICANT CHANGE IN HOW FERROUS PRODUCTS APPLY MADE TO THE BUY AMERICAN ACT BY THE AMERICAN REINVESTMENT AND RECOVERY ACT OF 2009. SPECIFICALLY, MANY OF THE COST LIMITATIONS AND EXCEPTIONS PROVIDED TO FOREIGN MATERIALS PROCESSED IN AMERICA IN THE ORIGINAL ACT WERE DISALLOWED FOR FERROUS PRODUCTS, REQUIRING THEM TO BE 100% DOMESTIC STEEL.
   A. BUY AMERICAN ACT/AMERICAN REINVESTMENT AND RECOVERY ACT (ARRA) REQUIREMENTS: PROVIDE MATERIALS IN COMPLIANCE WITH THE FOLLOWING REQUIREMENTS:
      1. BUY AMERICAN ACT OF 1933 BAA-41 U.S.C §§ 10A – 10D FOR NON-FERROUS PRODUCTS.
      2. BUY AMERICAN PROVISIONS OF SECTION 1605 OF THE AMERICAN RECOVERY AND REINVESTMENT ACT OF 2009 (ARRA), FOR FERROUS PRODUCTS.
   B. PRIMARY FRAMING STEEL:
      SPECIFIER: RECYCLED CONTENT IS REQUIRED FOR SOME SUSTAINABLE BUILDING PROGRAMS AND STANDARDS. RETAIN AS NECESSARY HERE AND ELSEWHERE. PRIMARY FRAMING RECYCLED CONTENT IS BASED ON THE STEEL RECYCLING INSTITUTE (SRI) DATA FOR ELECTRIC ARC FURNACE (EAF) METHOD. SECONDARY FRAMING AND PANEL RECYCLED CONTENT IS BASED ON SRI DATA FOR BASIC OXYGEN FURNACE (BOF) METHOD.
      1. RECYCLED CONTENT: POST-CONSUMER RECYCLED CONTENT PLUS ONE-HALF OF PRE-CONSUMER RECYCLED CONTENT NOT LESS THAN 75 PERCENT.
      2. HOT-ROLLED SHAPES: ASTM A 36 OR ASTM A 992, MINIMUM YIELD OF 36 KSI (248 MPA) OR 50 KSI (345 MPA).
      3. BUILT-UP SECTIONS:
         a. WEBS:
            1. ASTM A 1011 OR ASTM A1018, SS OR HSLAS, GRADE 55 (380) FOR WEBS 3/16 INCH (4.76 MM) THICK AND THINNER.
            2) ASTM A 572 GRADE 50 (340) OR ASTM A572 GRADE 55 (380) OR ASTM A 529 GRADE 55 FOR WEBS THICKER THAN 3/16 INCH (4.76 MM).
         B. FLANGES: ASTM A 529 GRADE 55 (380) OR ASTM A 572 GRADE 50 (340) OR 55 (380).
      4. ROUND TUBE: ASTM A 500, GRADE B OR C WITH MINIMUM YIELD STRENGTH OF 42 KSI (290 MPA).
      5. SQUARE AND RECTANGULAR TUBE: ASTM A 500, GRADE B OR C, MINIMUM YIELD STRENGTH OF 42 KSI (290 MPA).
      6. COLD-FORMED C SECTIONS: ASTM A 1011, GRADE 55 (380), OR ASTM A 653, GRADE 55 (380).
      7. X-BRACING: ASTM A 529 OR A 572 FOR ROD BRACING 36 KSI (248 MPA) OR 50 KSI (345 MPA), ASTM A 36 FOR ANGLE BRACING OR ASTM A 475 FOR CABLE BRACING.
   C. SECONDARY FRAMING STEEL:
      1. PURLINS, GIRTS, AND EAVE STRUTS: ASTM A 1011 GRADE 55 (380), OR ASTM A 653, GRADE 55 (380).
      2. RECYCLED CONTENT: POST-CONSUMER RECYCLED CONTENT PLUS ONE-HALF OF PRE-CONSUMER RECYCLED CONTENT NOT LESS THAN 25 PERCENT.
      SPECIFIER: GAUGE IS AN INSUFFICIENT WAY TO SPECIFY THICKNESS FOR COLD-FORMED STEEL COIL MATERIAL DUE TO OUTDATED STANDARDS WHICH HAVE BUILT-IN TOLERANCES GREATER THAN CURRENT COIL STEEL MANUFACTURING TECHNOLOGY REQUIRES. HOWEVER, MUCH OF THE CONSTRUCTION INDUSTRY CONTINUES TO SPECIFY THICKNESS BY GAUGE ALONE, WHICH OPENS UP POSSIBLE GAMESMANSHIP IN MATERIAL THICKNESS SPECIFICATION BY ALLOWING MANUFACTURERS TO INTENTIONALLY USE TOLERANCES TO REDUCE SUPPLIED MINIMUM THICKNESS. IN ORDER TO ENSURE THE MATERIAL PROVIDED MEETS THE INTENDED SPECIFICATION, IT IS RECOMMENDED THAT THE GAUGE DESIGNATIONS BE USED ONLY AS DESCRIPTORS THAT REFERENCE A MINIMUM UNCOATED DECIMAL THICKNESS DEFINED EXPLICITLY IN A COMMON AREA OF THE SPECIFICATION AS SHOWN BELOW. SPECIFYING MATERIAL BY GAUGE ALONE WILL DEFAULT TO OUTDATED STANDARDS BEING USED TO PROVIDE A MINIMUM OR NOMINAL THICKNESS.
      3. THICKNESS:
         a. 16 GAUGE: 0.056 INCH (1.421 MM) MINIMUM UNCOATED THICKNESS.
         B. 14 GAUGE: 0.067 INCH (1.689 MM) MINIMUM UNCOATED THICKNESS.
         C. 13 GAUGE: 0.081 INCH (2.051 MM) MINIMUM UNCOATED THICKNESS.
         D. 12 GAUGE: 0.100 INCH (2.534 MM) MINIMUM UNCOATED THICKNESS.
      4. FINISH: [G-90 PRE-GALVANIZED] [RED OXIDE] [GRAY] SHOP COAT. SHOP COAT ONLY INTENDED TO PROVIDE TEMPORARY PROTECTION DURING TRANSPORTATION AND ERECTION.

SECTION 13 34 19 METAL BUILDING SYSTEMS (CONTINUED)

   D. PANELS:
      1. MATERIALS: ASTM A 792.
      2. RECYCLED CONTENT: POST-CONSUMER RECYCLED CONTENT PLUS ONE-HALF OF PRE-CONSUMER RECYCLED CONTENT NOT LESS THAN 25 PERCENT.
      3. THICKNESS AND YIELD STRENGTH:
         a. 26 GAUGE: 0.0172 INCH (0.437 MM) MINIMUM UNCOATED THICKNESS, 80 KSI (550 MPA) YIELD STRENGTH.
         B. 24 GAUGE: 0.0212 INCH (0.538 MM) MINIMUM UNCOATED THICKNESS, 50 KSI (340 MPA) YIELD STRENGTH.
         C. 22 GAUGE: 0.0272 INCH (0.690 MM) MINIMUM UNCOATED THICKNESS, 50 KSI (380 MPA) YIELD STRENGTH.
      4. FINISHES:
         SPECIFIER: DELETE BRAND NAMES HERE AND REPLACE THEM WITH REFERENCES TO THIS SECTION GOING FORWARD IF REQUIRED.
         A. GALVALUME: ALUMINUM-ZINC ALLOY COATING, 55% ALUMINUM, 50% ZINC COATED STEEL PER ASTM A 792 AZ55.
         B. GALVALUME® PLUS: ACRYLIC-COATED ALUMINUM-ZINC ALLOY COATING, 55% ALUMINUM, 50% ZINC COATED STEEL PER ASTM A 792 AZ55 WITH ACRYLIC FINISH WITH NO ADDED LUBRICANT.
         C. EXTERIOR PAINT:
            SPECIFIER: RETAIN ONE OR MORE OF THE FOLLOWING THREE FINISH PARAGRAPHS AS APPLICABLE TO THE PROJECT. COORDINATE WITH WARRANTY ARTICLE IN PART 1.
            1. MODIFIED SILICONE-POLYESTER TWO-COAT SYSTEM (SMP): 0.20 – 0.25 MIL PRIMER WITH 0.7 – 0.8 MIL COLOR COAT. BASIS OF DESIGN: STANDARD COLOR.
            SPECIFIER: FLUOROPOLYMER COATINGS ARE BASED ON ARKEMA, INC. KYNAR 500 AND SOLVAY SOLEXIS HYLAR 5000 PVF2 RESINS.
            2) FLUOROPOLYMER TWO-COAT SYSTEM (PVDF): 0.2 – 0.3 MIL PRIMER WITH 0.7 - 0.8 MIL 70 PERCENT PVDF FLUOROPOLYMER COLOR COAT. BASIS OF DESIGN: KYNAR®.
            3) FLUOROPOLYMER TWO-COAT METALLIC SYSTEM (PVDF METALLIC): 0.2 – 0.3 MIL PRIMER WITH 0.7 -0.8 MIL 70 PERCENT PVDF METALLIC FLUOROPOLYMER COLOR COAT. BASIS OF DESIGN: KYNAR® METALLIC.
         D. INTERIOR PAINT: 0.5 MIL TOTAL DRY FILM THICKNESS CONSISTING OF PRIMER COAT AND WASH COAT OF MANUFACTURER'S STANDARD LIGHT-COLORED ACRYLIC OR POLYESTER BACKER FINISH.
      5. FASTENERS:
         a. THROUGH-FASTENED PANELS: SELF-DRILLING WITH SEALING WASHER.
         B. STANDING SEAM PANELS: LONG LIFE SELF-DRILLING WITH SEALING WASHER.
         C. RIDGE: LONG-LIFE SELF-DRILLING WITH SEALING WASHER.
         D. CLIPS TO PURLIN OR BAR JOISTS: LONG-LIFE SELF-DRILLING WITH HEX WASHER HEAD AND WASHER.
      6. CLIPS:
         a. LOW OR HIGH FIXED CLIPS: USE WHERE MODERATE THERMAL EXPANSION AND CONTRACTION IN ROOF PANEL IS EXPECTED.
         B. LOW OR HIGH SLIDING CLIPS: PROVIDE 2 TO 4 INCHES OF TRAVEL FOR PANEL THERMAL EXPANSION AND CONTRACTION.
      7. SEALANTS AND CLOSURES:
         a. SIDE-LAPS: FACTORY APPLIED, HOT MELT, FOAMABLE MASTIC.
         B. END-LAPS, EAVE, RIDGE ASSEMBLY, GABLE FLASHINGS: FIELD-APPLIED NON-SKINNING SEALANT AS SPECIFIED IN SECTION 07 92 00.
         C. STANDING SEAM ROOF CLOSURES: 1) OUTSIDE CLOSURES: 24 GAUGE STEEL SHEET. 2) INSIDE CLOSURES: 18 GAUGE GALVALUME OR G-40 GALVANIZED COATED STEEL COMPLYING WITH ASTM A 653/A 653M
         D. THROUGH-FASTENED ROOF CLOSURES: PROVIDE CLOSED-CELL POLYETHYLENE INSIDE [AND OUTSIDE] FOAM CLOSURES.
            1. BULK DENSITY: 2 POUNDS PER CUBIC FOOT. 2) SERVICE TEMPERATURE: -100 TO 180 DEGREES FAHRENHEIT. 3) SHORE HARDNESS: 7 ON AA SCALE OR 51 ON 00 SCALE WHEN TESTED TO ASTM D 2240.

2.3 PRIMARY FRAMING
   A. FRAME DESIGN: [AS INDICATED ON DRAWINGS] [GABLE SYMMETRICAL] [SINGLE SLOPE] [LEAN-TO].
   B. SIDEWALL COLUMN PROFILE: [TAPERED OR PRISMATIC] [PRISMATIC] [AS INDICATED ON DRAWINGS].
   C. FRAME SPAN: [MODULAR OR CLEAR SPAN AS INDICATED ON DRAWINGS] [MODULAR SPAN AS INDICATED ON DRAWINGS] [CLEAR SPAN].
   D. MODULAR FRAME INTERIOR COLUMN PROFILE: H SHAPE, ROUND PIPE, OR TUBE] [H SHAPE] [ROUND PIPE] [TUBE SECTIONS] [AS INDICATED ON DRAWINGS].
   E. BRACING: [STANDARD X-BRACING OR PORTAL FRAMES AS ALLOWED BY ACCESSORIES] [X-BRACING] [PORTAL FRAMES] [SHEAR WALLS BY OTHERS].

2.4 SECONDARY FRAMING
   A. ROOF ZEE PURLINS:
      1. HORIZONTAL STRUCTURAL MEMBERS WHICH SUPPORT ROOF COVERINGS.
      2. DEPTH: AS REQUIRED BY DESIGN, [8] [10] [12] INCHES ([203] [216] [254] [305] MM) MINIMUM.
      3. THICKNESS: AS REQUIRED BY DESIGN, 16 GAUGE MINIMUM.
      4. FINISH: [RED OXIDE] [GRAY] SHOP COAT. SHOP COAT ONLY INTENDED TO PROVIDE TEMPORARY PROTECTION DURING TRANSPORTATION AND ERECTION.
   B. WALL ZEE GIRTS:
      1. HORIZONTAL STRUCTURAL MEMBERS THAT SUPPORT VERTICAL PANELS.
      2. DEPTH: AS REQUIRED BY DESIGN, [8] [10] [12] INCHES ([203] [216] [254] [305] MM) MINIMUM.
      3. GAUGE: AS REQUIRED BY DESIGN, 16 GAUGE (0.056 INCH (1.424 MM) MINIMUM UNCOATED THICKNESS).
      4. FINISH: [RED OXIDE] [GRAY] SHOP COAT. SHOP COAT ONLY INTENDED TO PROVIDE TEMPORARY PROTECTION DURING TRANSPORTATION AND ERECTION.
   C. SPANDREL BEAMS: ASTM A 36/A 36M OR ASTM A 992/A 992M WIDE FLANGE SHAPES, MINIMUM YIELD 50 KSI FOR SUPPORT OF WALL SYSTEMS PROVIDED BY OTHERS, AS REQUIRED BY DESIGN.

2.5 BOLTS
   A. RIGID FRAME CONNECTIONS: PROVIDE HIGH STRENGTH BOLTS, NUTS AND WASHERS:
      1. BOLTS: ASTM F 3125 GRADE A325 HEAVY HEX STRUCTURAL TYPE I.
      2. WASHERS: [ASTM F 436 TYPE 1 HARDENED STEEL] [NOT REQUIRED].
      3. NUTS: ASTM A 563 GRADE C HEAVY HEX. NUTS SHALL BE WAX COATED BY EMULSION SUCH THAT THE TORQUE REQUIRED TO COMPLETE A ROTATIONAL CAPACITY (RC) TEST SHALL BE REDUCED BY 40% FROM THE UN-WAXED STATE.
      4. COATING: [ASTM F 1941 ELECTRODEPOSITED YELLOW ZINC] [HOT-DIPPED GALVANIZED].
   B. OTHER CONNECTIONS: PROVIDE HIGH STRENGTH OR MACHINE BOLTS AS REQUIRED BY MANUFACTURER DESIGN:
      1. HIGH STRENGTH BOLTS AND NUTS:
         a. BOLTS: ASTM F 3125 GRADE A325 HEAVY HEX STRUCTURAL TYPE I.
         B. NUTS: ASTM A 563 GRADE C HEAVY HEX.
         C. COATING: ASTM F 1941 ELECTRODEPOSITED YELLOW ZINC.
      2. MACHINE BOLTS:
         a. BOLTS: ASTM A 307 GRADE CARBON STEEL.
         B. NUTS: ASTM A 563 GRADE A HEX NUT.
         C. COATING: ASTM F 1941 ELECTRODEPOSITED CLEAR ZINC.

2.6 ROOF SYSTEMS
   A. ASSEMBLY PERFORMANCE REQUIREMENTS: PROVIDE ROOF PRODUCTS AND ASSEMBLIES MEETING THE FOLLOWING REQUIREMENTS:
      SPECIFIER: COORDINATE THESE REQUIREMENTS WITH APPLICABLE NATIONAL CODES AND STANDARDS. ROOF RADIATIVE PROPERTIES ARE PARTICULAR TO CLIMATE AND STANDARDS AND MAY NOT BE REQUIRED. UL AND/OR FM GLOBAL REQUIREMENTS MAY BE NEEDED FOR INSURANCE PURPOSES.
      1. CLASS 90 RATED AND LISTED IN ACCORDANCE WITH UL-580 FOR WIND UPLIFT.
      2. CLASS A RATED AND LISTED IN ACCORDANCE WITH UL-790 FOR EXTERNAL FIRE.
      3. CLASS 4 RATED AND LISTED IN ACCORDANCE WITH UL-2218 FOR IMPACT RESISTANCE.
   B. THROUGH-FASTENED PANELS:
      1. TYPE: SINGLE SKIN RIBBED PANELS WITH EXPOSED FASTENERS.
      2. STRENGTH: DETERMINE AND CERTIFY ALLOWABLE PANEL STRENGTHS IN ACCORDANCE WITH AISI S100.
      3. PANEL PROFILE(S): PBR; 1-1/4 INCH (32 MM) RIBS AT 12 INCH (305 MM) CENTERS, 1/2:12 MINIMUM ROOF SLOPE.
         a. THICKNESS: [26 GAUGE] [24 GAUGE] [22 GAUGE]
         B. FINISH: [GALVALUME® PLUS] [SMP] [PVDF] [PVDF METALLIC]
            SPECIFIER: DELETE COLOR FOR UNPAINTED FINISHES SUCH AS GALVALUME® AND GALVALUME® PLUS.
         C. COLOR: [SELECTED FROM MANUFACTURER STANDARD COLORS] [AS SHOWN ON DRAWINGS].
         D. AIR INFILTRATION: MAXIMUM AIR INFILTRATION OF 0.04 CUBIC FEET PER MINUTE PER SQUARE FOOT OF SPECIMEN AREA WHEN TESTED TO ASTM E 1680 AT A PRESSURE DIFFERENTIAL OF +/-1.57 PSF (75 PA).
         E. WATER INFILTRATION: NO UNCONTROLLABLE WATER LEAKAGE WHEN TESTED TO ASTM E 1646 AT A 20 PSF (955 PA) PRESSURE DIFFERENTIAL WHEN SPRAYED WITH 5 GALLONS OF WATER PER HOUR PER SQUARE FOOT (203 LITERS PER SQUARE METER) OF SPECIMEN AREA.
            SPECIFIER: RETAIN FM APPROVALS' LISTING REQUIREMENT FOR FM GLOBAL-INSURED PROJECTS OR WHERE FM GLOBAL REQUIREMENTS ARE USED AS MINIMUM DESIGN STANDARD. SELECT REQUIRED WINDSTORM CLASSIFICATION BASED UPON CALCULATION METHOD IN FM GLOBAL LOSS PREVENTION SHEET 1-28; NOTE THAT FM APPROVALS' WINDSTORM CLASSIFICATION DOES NOT CORRELATE DIRECTLY TO DESIGN WIND SPEED.
         F. FM APPROVALS RATING: PROVIDE FM 4471 APPROVED ASSEMBLIES ON THE BASIS OF THE FOLLOWING RATINGS. IDENTIFY MATERIALS WITH FM APPROVALS MARKINGS:
            1. EXTERNAL FIRE: CLASS A.
            2) INTERNAL FIRE: CLASS 1.
            3) HAIL: SEVERE.
            4) WIND: [1-60] [1-75] [1-90] [1-120] [AS DETERMINED BY FM 1-28]
      4. PANEL PROFILE(S): [PBU; 3/4 INCH (19 MM) RIBS AT 6 INCH (152 MM) CENTERS, 1:12 MINIMUM ROOF SLOPE.] [7.2; (1-1/2 INCH (39 MM) RIBS AT 7.2 INCH CENTERS, 1/2:12 MINIMUM ROOF SLOPE.]
         a. THICKNESS: [26 GAUGE] [24 GAUGE] [22 GAUGE]
         B. FINISH: [GALVALUME® PLUS] [SMP] [PVDF] [PVDF METALLIC]
            SPECIFIER: DELETE COLOR FOR UNPAINTED FINISHES SUCH AS GALVALUME® AND GALVALUME® PLUS.
         C. COLOR: [SELECTED FROM MANUFACTURER STANDARD COLORS] [AS SHOWN ON DRAWINGS].
      5. PANEL FASTENERS: [LONG-LIFE FINISH.] [410 SERIES STAINLESS STEEL] [300 SERIES STAINLESS STEEL].
      6. SIDELAP MASTIC: [1 INCH X 3/32 INCH (25 MM X 2.4 MM)] [1/2 INCH X 3/32 INCH (13 MM X 2.4 MM)].
   C. STANDING SEAM PANELS:
      1. TYPE: SINGLE SKIN PANELS WITH CONCEALED CLIPS.
      2. PANEL STRENGTH: DETERMINE AND CERTIFY PANEL STRENGTH AS FOLLOWS:
         a. POSITIVE LOADING (TOWARD PANEL SUPPORTS): DETERMINE IN ACCORDANCE WITH AISI S100.
         B. NEGATIVE LOADING (AWAY FROM PANEL SUPPORTS): DETERMINE IN ACCORDANCE WITH ASTME 1592.
      3. PANEL PROFILE: DL324®:
         a. PANEL TYPE: TRAPEZOIDAL MACHINE SEAMED, 1/4:12 MINIMUM ROOF SLOPE.
         B. PANEL WIDTH: [24 INCHES WIDE X 3 INCHES HIGH (610 MM WIDE X 76 MM HIGH)] [24 INCHES WIDE X 3 INCHES HIGH (610 MM WIDE X 76 MM HIGH)] [18 INCHES WIDE X 3 INCHES HIGH (457 MM WIDE X 76 MM HIGH)] [12 INCHES WIDE X 3 INCHES HIGH (305 MM WIDE X 76 MM HIGH)].
         C. THICKNESS: [24 GAUGE] [22 GAUGE].
         D. FINISH: [GALVALUME® PLUS] [PVDF] [SMP] [PVDF METALLIC].
            SPECIFIER: DELETE COLOR FOR UNPAINTED FINISHES SUCH AS GALVALUME® AND GALVALUME® PLUS.
         E. COLOR: [SELECTED FROM MANUFACTURER STANDARD COLORS] [AS SHOWN ON DRAWINGS].
         F. AIR INFILTRATION: MAXIMUM AIR INFILTRATION OF 0.04 CUBIC FEET PER MINUTE PER SQUARE FOOT OF SPECIMEN AREA WHEN TESTED TO ASTM E 1680 AT A PRESSURE DIFFERENTIAL OF +/-1.57 PSF (75 PA).
         G. WATER INFILTRATION: NO UNCONTROLLABLE WATER LEAKAGE WHEN TESTED TO ASTM E 1646 AT A 20 PSF (955 PA) PRESSURE DIFFERENTIAL WHEN SPRAYED WITH 5 GALLONS OF WATER PER HOUR PER SQUARE FOOT (203 LITERS PER SQUARE METER) OF SPECIMEN AREA.
            SPECIFIER: RETAIN FM APPROVALS' LISTING REQUIREMENT FOR FM GLOBAL-INSURED PROJECTS OR WHERE FM GLOBAL REQUIREMENTS ARE USED AS MINIMUM DESIGN STANDARD. SELECT REQUIRED WINDSTORM CLASSIFICATION BASED UPON CALCULATION METHOD IN FM GLOBAL LOSS PREVENTION SH

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No.	Date	Description
	05/26/23	PERMIT & CONSTRUCTION

Project Name

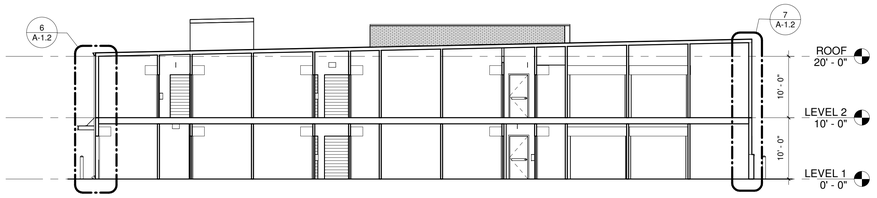
MIDGARD - SPRING LAKE

14396 NC-210 S SPRING LAKE 28390

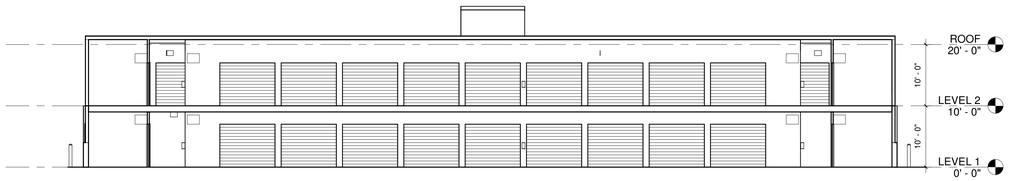
ISSUE
NOT FOR CONSTRUCTION

PROJECT SPECIFICATIONS

Author Drawn	
Checker Checked	
1/8" = 1'-0" Scale	**A-0.3.0**
247-001-01 Project No.	Drawing Number



5 TRANSVERSE SECTION
1" = 10'-0"



4 LONGITUDINAL SECTION
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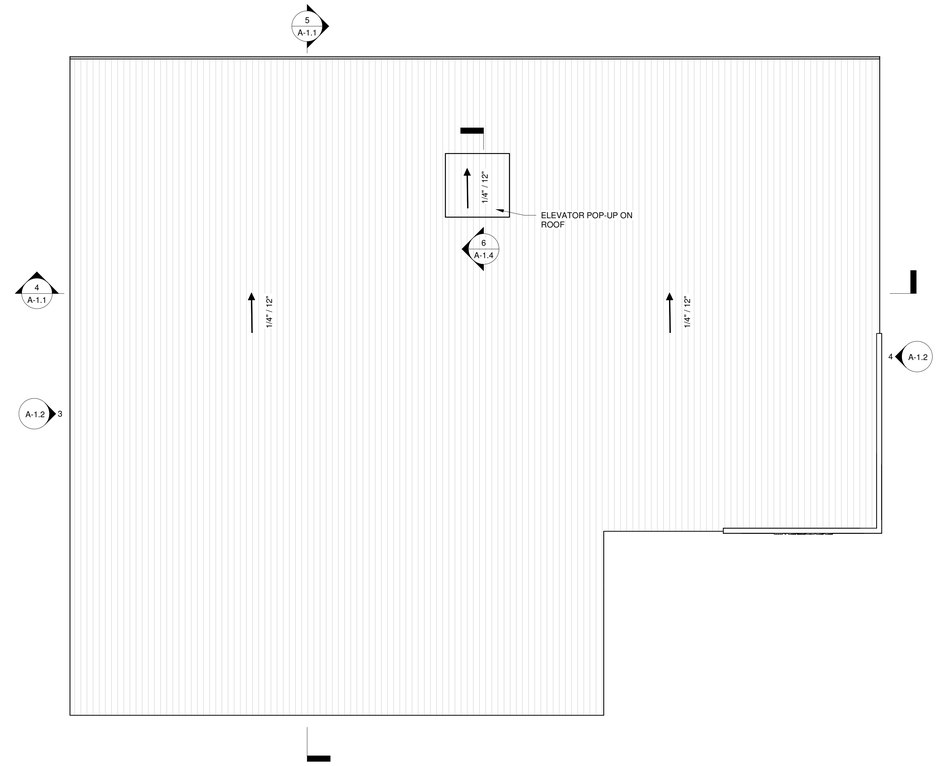
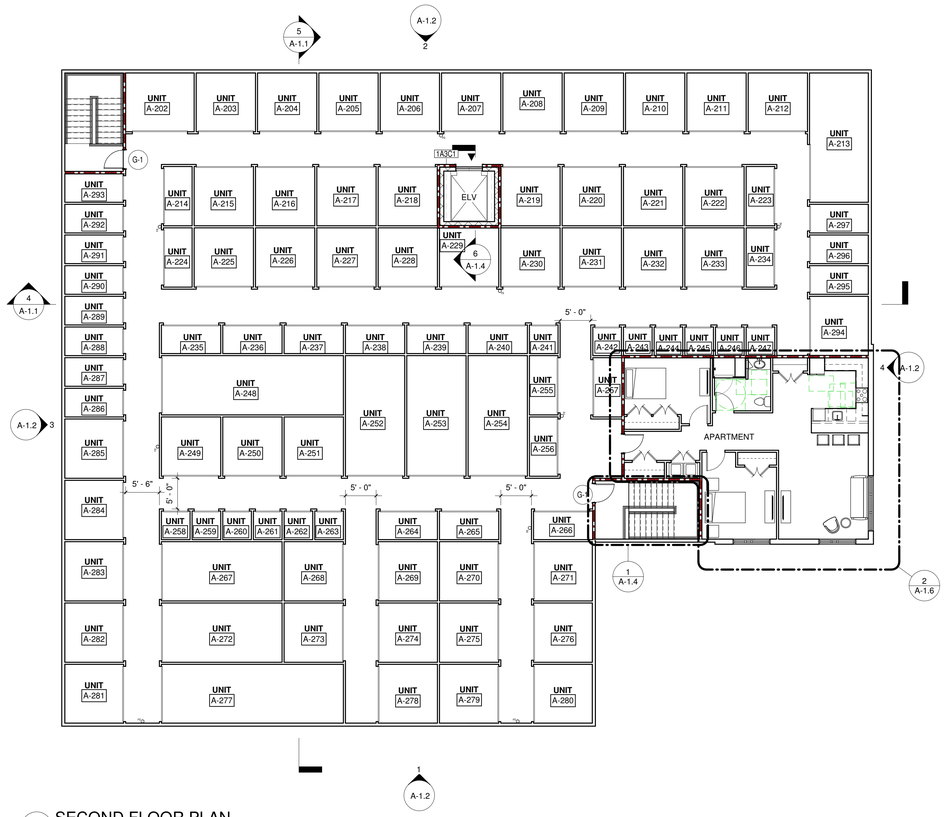
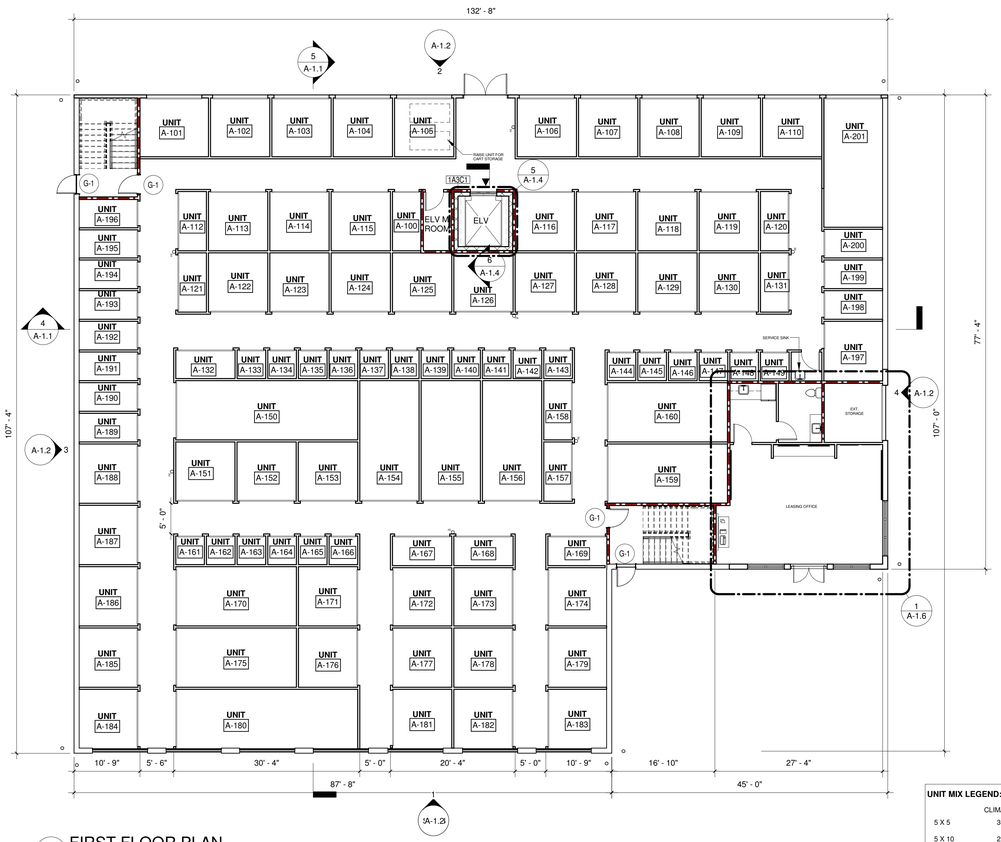


3 ROOF PLAN
1" = 10'-0"



2 SECOND FLOOR PLAN
1" = 10'-0"



1 FIRST FLOOR PLAN
1" = 10'-0"

UNIT MIX LEGEND:

	CLIMATE	NON-CLIMATE	TOTAL
5 X 5	36	0	36
5 X 10	22	0	22
10 X 5	26	0	26
10 X 10	93	0	93
10 X 20	14	0	14
10 X 30	4	0	4
	195	**0**	**195**

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No.	Date	Description
	05/26/23	PERMIT & CONSTRUCTION

Project Name

MIDGARD - SPRING LAKE

14396 NC-210 S SPRING LAKE 28390

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PARTITION PLANS, ROOF PLAN, SECTIONS

Author	
Drawn	
Checker	
Checked	
As indicated	
Scale	
247-001-01	
Project No.	

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Drawing Number

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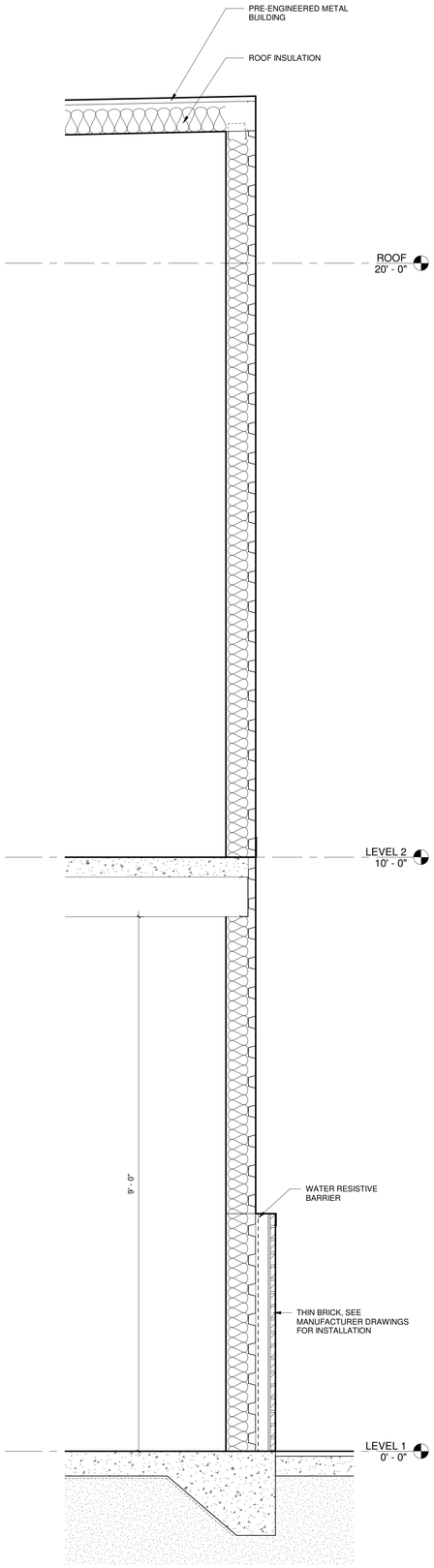
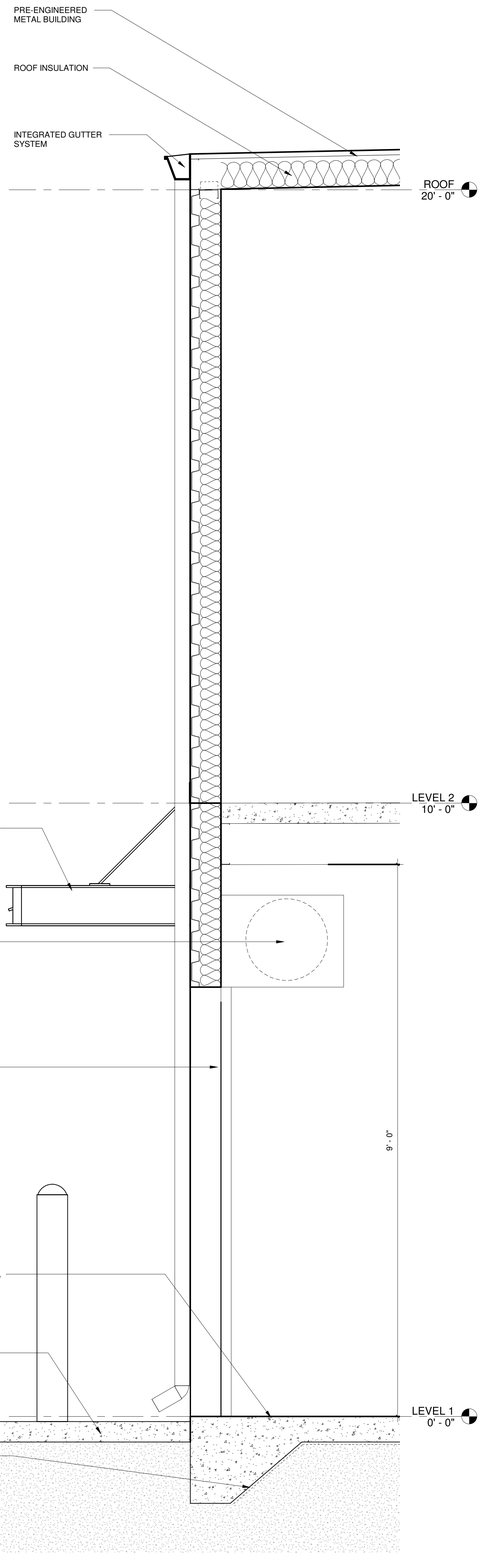
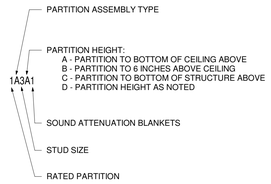


7 TYP STACKED WALL SECTION
1" = 1'-0"



6 TYP WALL SECTION
1" = 1'-0"

PARTITION TAG LEGEND

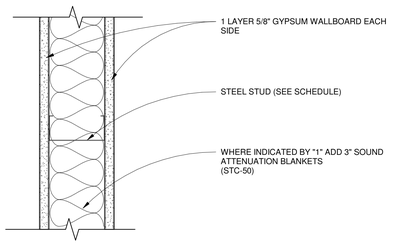


STANDARD PARTITION TYPE			
	STRUCTURAL ASSEMBLY		
TYPE	SHEATHING	STUD	SHEATHING
A	1-Layer	Metal C-Stud	1-Layer
B	2-Layers	Metal C-Stud	2-Layers
C	1-Layer	Metal C-Stud	None
D	1-Layer	Furring Channel	None

RATED PARTITION DESIGNATIONS	
DESIGNATOR	PARTITION RATED
0	Smoke Rated
1	1 Hour Rated
2	2 Hours Rated

SOUND ATTENUATION BLANKETS DESIGNATIONS	
DESIGNATOR	METAL STUD SIZE
0	No Sound Attenuation Blankets
1	Sound Attenuation Blankets

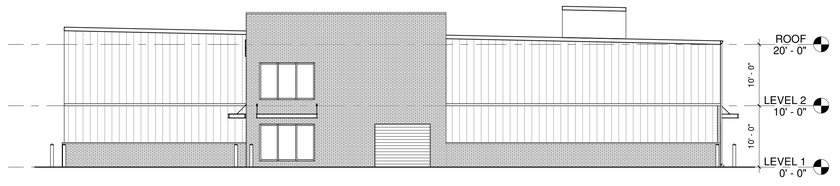
STANDARD METAL STUD SIZE DESIGNATIONS	
SIZE DESIGNATOR	METAL STUD SIZE
0	7/8" Furring Channel
1	1 5/8" Stud
2	2 1/2" Stud
3	3 5/8" Stud
4	4" Stud
6	6" Stud



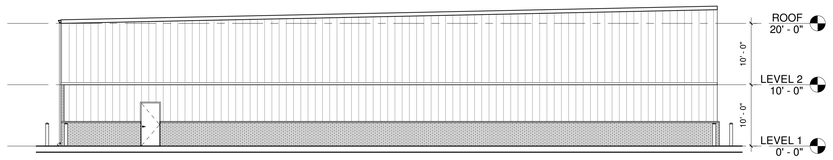
5 TYP 1HR PARTITION TYPE
3" = 1'-0"

PARTITION SCHEDULE - TYPE A

PARTITION TYPE	STUD SIZE	STUD GAUGE	STUD SPACING	GYP BD THICKNESS	ATTENUATION THICKNESS	FIRE RATING	TESTED ASSEMBLY NUMBER	STC RATING	HEAD DETAIL	BASE DETAIL	REMARKS
1A3C1	3 5/8"	25	16"	5/8"	3"	1HR	U.L. U419	-			

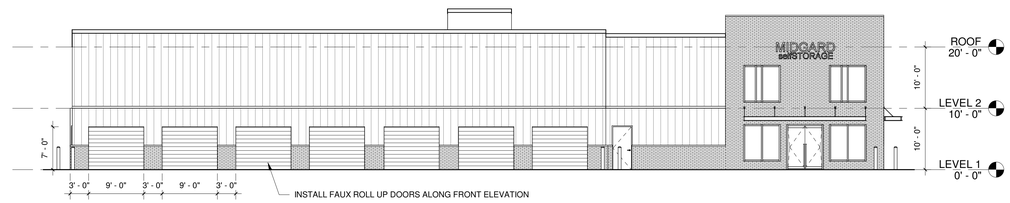


4 EAST ELEVATION
1" = 10'-0"



3 WEST ELEVATION
1" = 10'-0"

2 REAR ELEVATION
1" = 10'-0"



1 FRONT ELEVATION
1" = 10'-0"

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Project Name

MIDGARD - SPRING LAKE

14396 NC-210 S SPRING LAKE 28390

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EXTERIOR ELEVATIONS & WALL SECTIONS

Author	
Drawn	
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Scale	
247-001-01	
Project No.	

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Drawing Number

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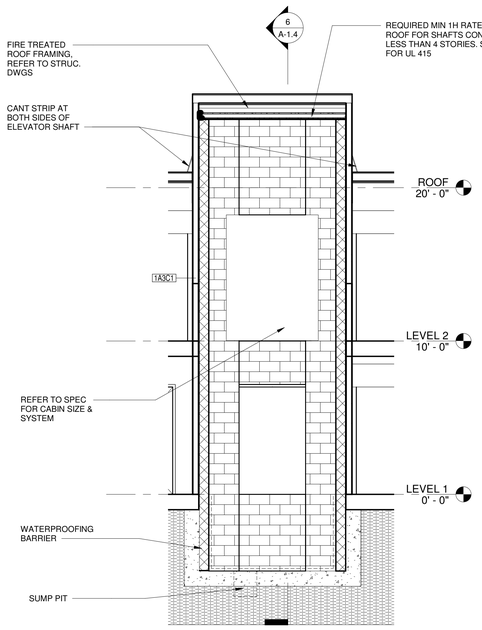
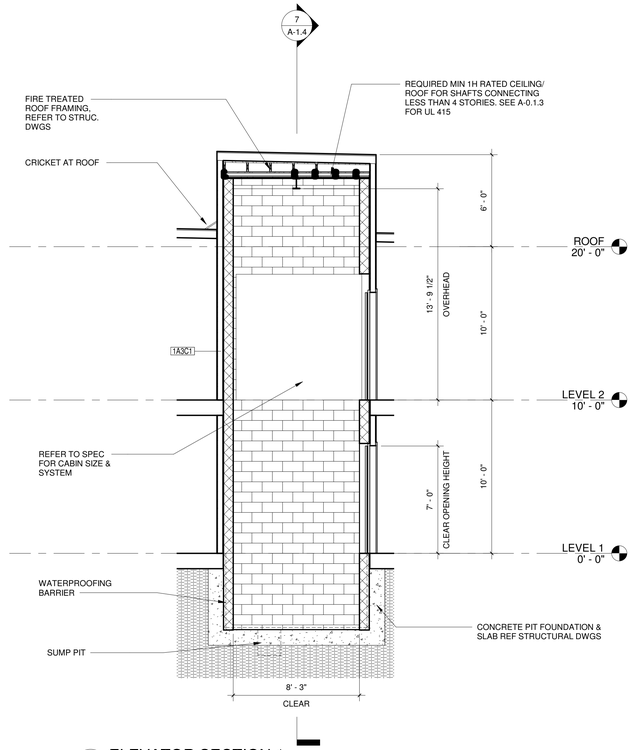
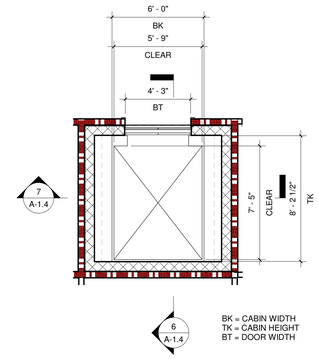


7 ELEVATOR SECTION 2
1/4" = 1'-0"

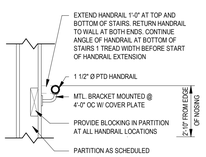


6 ELEVATOR SECTION 1
1/4" = 1'-0"

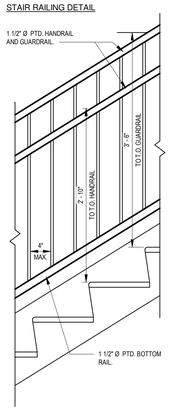


5 ELEVATOR ENLARGED PLAN
1/4" = 1'-0"

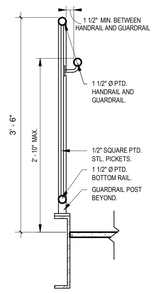
STAIR HANDRAIL SECTION



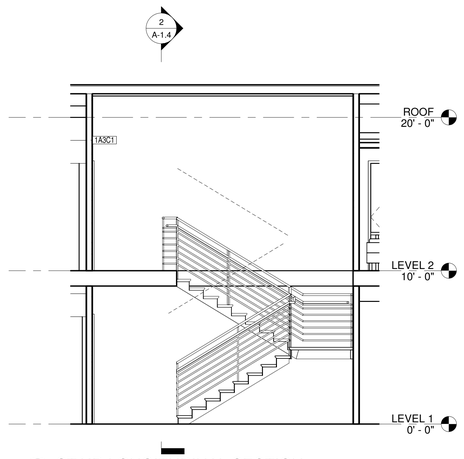
STAIR RAILING DETAIL



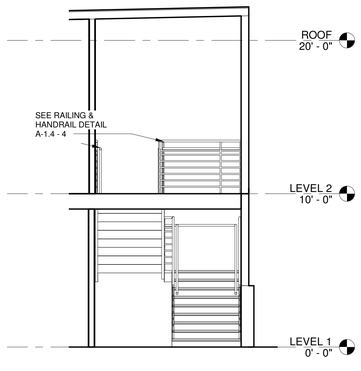
RAILING SECTION



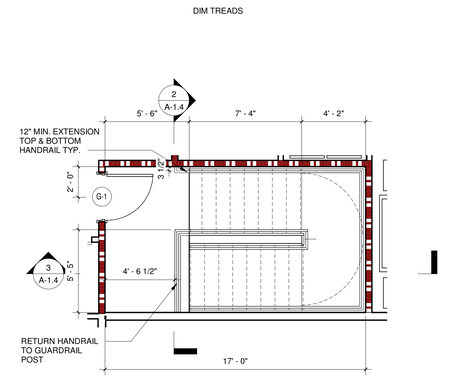
4 RAILING DETAIL SECTION
1" = 1'-0"



3 STAIR LONGITUDINAL SECTION
1/4" = 1'-0"



2 STAIR CROSS SECTION
1/4" = 1'-0"



1 STAIR ENLARGED PLAN
1/4" = 1'-0"

5/30/2023 11:55:32 AM

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No.	Date	Description
	05/26/23	PERMIT & CONSTRUCTION

Project Name

MIDGARD - SPRING LAKE

14396 NC-210 S SPRING LAKE 28390

ISSUE
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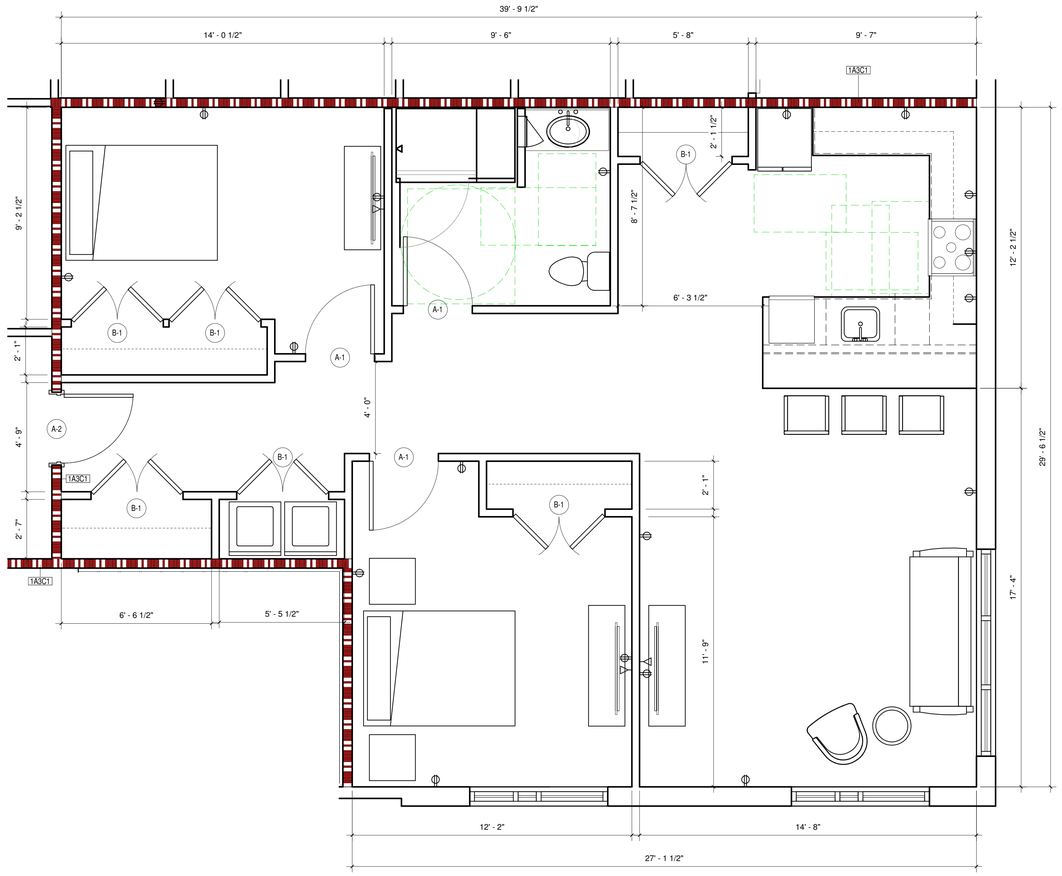
VERT CIRCULATION PLANS, SECTIONS AND DETAILS

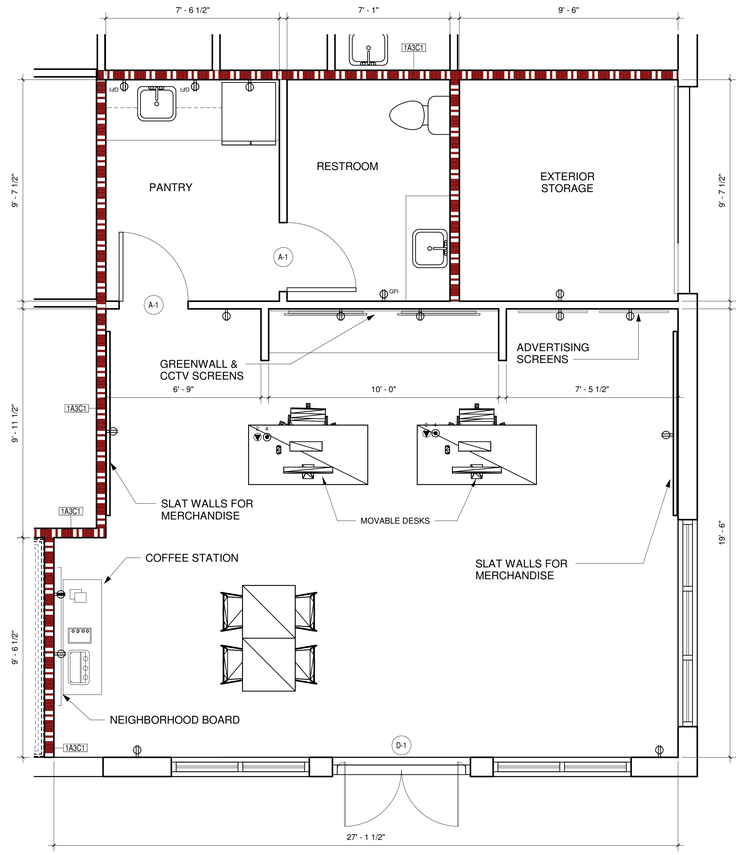
Author	
Drawn	
Checker	
Checked	
As indicated	
Scale	
247-001-01	
Project No.	

A-1.4

Drawing Number



2 APARTMENT PLAN
3/8" = 1'-0"



1 LEASING OFFICE PLAN
3/8" = 1'-0"

PROJECT NORTH

SYMBOLS

- CEILING HEIGHT GYP BOARD PARTITION - REFER TO TAG FOR FULL DETAILS
- 6" ABOVE CEILING HEIGHT GYP BOARD PARTITION WITH SOUND ATTENUATION BLANKETS - REFER TO TAG FOR FULL DETAILS
- 1 HOUR RATED GYP BOARD PARTITION FULL HT. TO DECK ABOVE - REFER TO TAG FOR FULL DETAILS
- NEW PARTITION/DOOR CONSTRUCTION
- WALL MOUNTED 10 lbs. A/B/C TYPE FIRE EXTINGUISHER - HANDLE OF EXTINGUISHER AT 48"AFF.
- 1A3A1 — PARTITION TAG (REFER TO SHEET ID-8.1 FOR FURTHER INFORMATION) — *PARTITION ASSEMBLY TYPE*, *PARTITION HEIGHT*, *SOUND ATTENUATION BLANKETS*, *STUD SIZE*, *RATED PARTITION*
- 5'-0" CLR — CLEAR DIMENSION
- N.I.C.

GENERAL NOTES (U.N.O. = UNLESS NOTED OTHERWISE)

A. CONTRACTOR TO NOTIFY DESIGNER OF ANY DISCREPANCIES BETWEEN DRAWINGS AND ACTUAL FIELD DIMENSIONS PRIOR TO CONSTRUCTION.

B. DIMENSIONS ARE TO FINISHED FACE OF PARTITION U.N.O.

C. WALLS ARE LAID OUT AT 90 DEGREE ANGLES U.N.O.

D. ALL WALLS ARE CONSTRUCTED TO UNDERSIDE OF CEILING U.N.O.

E. INSIDE FACE OF DOOR FRAMES T OBEGIN 6" FROM WALL U.N.O.

F. THOROUGHLY CLEAN THE SPACE, INCLUDING EXTERIOR GLASS/BLINDS AT THE COMPLETION OF CONSTRUCTION.

KEY NOTES

NOTE: NOT ALL KEY NOTES APPLY TO ALL SHEETS.

Heard

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CHRISTOPHER J HEARD REGISTERED ARCHITECT 13274 NORTH CAROLINA ATLANTA GEORGIA

No.	Date	Description
	05/26/23	PERMIT & CONSTRUCTION

Project Name

MIDGARD - SPRING LAKE

14396 NC-210 S SPRING LAKE 28390

ISSUE
NOT FOR CONSTRUCTION

LEASING OFFICE & APARTMENT PLANS

Author	
Drawn	
Checker	
Checked	
As indicated	
Scale	
247-001-01	
Project No.	Drawing Number

A-1.6

5/30/2023 11:55:33 AM

DOOR SCHEDULE

DOOR NUMBER	ROOM NAME	TYPE	WIDTH	HEIGHT	THICKNESS	DOOR		FRAME		DETAILS			FIRE RATING	HARDWARE SET	COMMENTS
						MATERIAL	FINISH	MATERIAL	FINISH	HEAD	JAMB	SILL			
LEVEL 1															
A-1		A	3' - 0"	7' - 0"	2"	WD	PT	WD	PT						WOOD DOOR
C-1		C	7' - 0"	7' - 0"	1 3/4"	AL / GL	-	HM	-						STORAGE BUILDING REAR ENTRANCE
D-1		D	5' - 7"	7' - 0"	1 3/4"	AL / GL	-	HM	-						LEASING OFFICE ENTRANCE DOOR
E-1	<varies>	E	4' - 0"	7' - 0"	2"	AL	PT	HM	PT						OVERHEAD COILING DOOR
F-1	<varies>	F	9' - 0"	7' - 0"	2"	AL	PT	HM	PT						OVERHEAD COILING DOOR
G-1		A	3' - 0"	7' - 0"	1 3/4"	AL	PT	HM	PT				90 min		HOLLOW METAL DOOR AT STAIRCASE
LEVEL 2															
A-1		A	3' - 0"	7' - 0"	2"	WD	PT	WD	PT						WOOD DOOR
A-2		A	3' - 0"	7' - 0"	1 3/4"	AL	PT	HM	PT				90 min		APARTMENT ENTRY
B-1		B	4' - 0"	7' - 0"	2"	WD	PT	WD	PT						CLOSET DOORS
E-1	<varies>	E	4' - 0"	7' - 0"	2"	AL	PT	HM	PT						OVERHEAD COILING DOOR
F-1	<varies>	F	9' - 0"	7' - 0"	2"	AL	PT	HM	PT						OVERHEAD COILING DOOR
G-1		A	3' - 0"	7' - 0"	1 3/4"	AL	PT	HM	PT				90 min		HOLLOW METAL DOOR AT STAIRCASE

HARDWARE SETS

1 LATCHSET (SINGLE DOOR)
4 - BUTT HINGES
1 - MORTISE LATCHSET WITH LEVER
3 - DOOR SILENCERS
1 - FLOOR STOP

2 LATCHSET (SINGLE DOOR)
4 - BUTT HINGES
1 - MORTISE LATCHSET WITH LEVER
1 - SURFACE MOUNTED CLOSER (INSIDE OF ROOM)
3 - DOOR SILENCERS
1 - FLOOR STOP

3 LOCKSET (SINGLE DOOR)
4 - BUTT HINGES
1 - MORTISE LOCKSET WITH LEVER (OFFICE FUNCTION)
3 - DOOR SILENCERS
1 - FLOOR STOP

4 LOCKSET (SINGLE DOOR)
4 - BUTT HINGES
1 - MORTISE LOCKSET WITH LEVER (STORAGE FUNCTION)
1 - SURFACE MOUNTED CLOSER (INSIDE OF ROOM)
3 - DOOR SILENCERS
1 - FLOOR STOP

11 LOCKSET (DOUBLE DOOR)
ACTIVE LEAF
4 - BUTT HINGES
1 - MORTISE LOCKSET WITH LEVER
1 - SURFACE MOUNTED CLOSER WITH HOLD OPEN (INSIDE OF ROOM)
3 - DOOR SILENCERS
1 - FLOOR STOP

INACTIVE LEAF
4 - BUTT HINGES
1 - AUTO FLUSH BOLT (TOP AND BOTTOM)
1 - SURFACE MOUNTED CLOSER WITH HOLD OPEN (INSIDE OF ROOM)
1 - DUST PROOF STRIKE
1 - DOOR COORDINATOR
3 - DOOR SILENCERS
1 - FLOOR STOP

HARDWARE SPECIFICATION

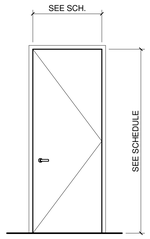
BUTT HINGE:	IVES, 5BB1 4.5" X 4.5" NRP, US26D
ELECTRIFIED BUTT HINGE:	IVES, 5BB1 4.5" X 4.5" CON TW8, US26D
CENTER PIVOT:	IVES, 7255, BHMA 626
OFFSET PIVOT:	IVES, 7226, BHMA 626
MORTISE LOCKSET:	SCHLAGE, L-SERIES, LEVER LATITUDE, US26D
MORTISE LATCHSET:	SCHLAGE, L-SERIES, LEVER LATITUDE, US26D
SURFACE MOUNTED CLOSER:	LCN, 4110 SERIES, BHMA 689
SURFACED MOUNTED HOLD OPEN:	GLYNN-JOHNSON, 450 SERIES, US32D
OVERHEAD STOP:	GLYNN-JOHNSON, 90S, BHMA 630
SILENCER:	IVES, SR64 GRAY
FLOOR STOP:	DOUG MOCKETT, D52 2-3/8" DIAMETER - DOOR STOP, SSS
ELECTRIC STRIKE:	DORMA, ES62, US26D
DOOR CONTACT:	SCHLAGE, 679-05HM, BLACK
KICK PLATE:	IVES, 8400, BHMA 630
CARD READER:	PROVIDED BY SECURITY VENDOR
EXIT MOTION SENSOR:	SECURITRON, XMS
PUSH TO EXIT BUTTON:	DORTRONICS, 5276-HD, N-SERIES, ENGRAVING XE-1
ALL GLASS ENTRANCE PIVOT WITH PATCH FITTING:	DORMA, UNIVERSAL, US26D
ALL GLASS ENTRANCE PIVOT WITH FULL RAILS:	DORMA, UNIVERSAL, US26D
ALL GLASS ENTRANCE SLIDING SYSTEM:	DORMA, AGILE 150, US26D
PULL SET:	ROCKWOOD, MEGATEK RM3301, BHMA 630
CONCEALED OVER CLOSER:	DORMA, RTS88 SERIES, CENTER HUNG
GLASS DOOR OVERHEAD STOP:	DORMA, 233-989, US26D
DUST PROOF STRIKE:	IVES, DP2, BHMA 626
AUTO FLUSH BOLT:	IVES, FB41P, BHMA 630
DOOR COORDINATOR:	IVES, COR SERIES, US26D
ANGLE STOP:	IVES, AS18, US26D
ROLLER LATCH ANGLE STOP:	IVES, RL1152, US26D
ROLLER LATCH:	IVES, RL30, US26D
EXIT DEVICE:	SARGENT, 80 SERIES, US26D

DOOR & HARDWARE GENERAL NOTES

A. CONTRACTOR SHALL COORDINATE ALL SECURITY DEVICE REQUIREMENTS WITH THE TENANT'S SECURITY CONSULTANT/VENDOR.
B. ALL DOORS TO BE PAINTED, COLOR TBD, U.N.O.

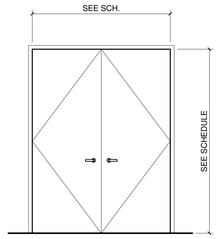
DOORS & FRAMES TYPES

NOTE: ALL INTERIOR GLASS PANELS SHALL MEET THE TEST REQUIREMENTS OF CPSC 16 CFR 1201 AND SHALL DISPLAY THE MANUFACTURERS MARK DESIGNATING TYPE & THICKNESS OF GLASS



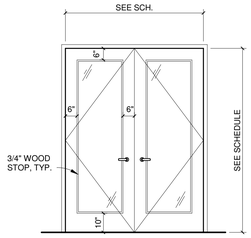
SINGLE HOLLOW METAL OR FLUSH WOOD DOOR IN HOLLOW METAL OR WOOD FRAME

A



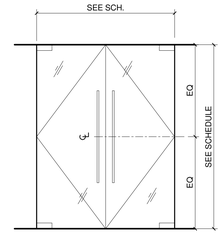
PAIR HOLLOW METAL OR SOLID CORE, FLUSH WOOD DOORS IN HOLLOW METAL OR WOOD FRAME

B



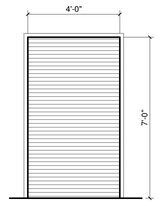
DOUBLE SOLID CORE, FLUSH WOOD DOOR WITH 3/8" THICK TEMPERED GLASS INSERT. HOLLOW METAL OR WOOD FRAME

C



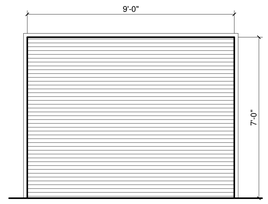
PAIR 1/2" THICK TEMPERED GLASS DOOR

D



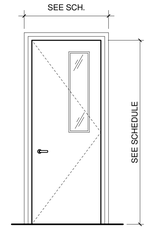
OVERHEAD COILING DOOR
(TYPICAL FOR 5FT WIDE UNITS)

E



OVERHEAD COILING DOOR
(TYPICAL FOR ALL UNITS, UNO)

F



HOLLOW METAL FLUSH DOOR IN HOLLOW METAL FRAME

G

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Architect
Atlanta, Georgia 30361
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CHRISTOPHER J HEARD REGISTERED ARCHITECT 13274 NORTH CAROLINA ATLANTA GEORGIA

No.	Date	Description
	05/26/23	PERMIT & CONSTRUCTION

Project Name

MIDGARD - SPRING LAKE

14396 NC-210 S SPRING LAKE 28390

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DOOR & FRAME SCHEDULES

Author	
Drawn	
Checker	
Checked	
As indicated	
Scale	
247-001-01	
Project No.	

A-1.7
Drawing Number

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ELECTRICAL SYSTEM AND EQUIPMENT

Method of Compliance
Prescriptive ____ Performance _X_ Energy Cost Budget ______

REFER TO ENERGY MODEL FOR ADDITIONAL COMPLIANCE

Provide a standard riser diagram which indicates designated points for check metering.
Provide a standard panel schedule description which idenifies different enduse loads.

Standard riser diagram is on Sheet E0.1
Standard panel schedules are on Sheets E0.1

Lighting Schedule

lamp type required in fixture	See Lighting Fixture Schedule, Sheet E0.1
number of lamps in fixture	See Lighting Fixture Schedule, Sheet E0.1
ballast type used in the fixture	See Lighting Fixture Schedule, Sheet E0.1
number of ballasts in fixture	See Lighting Fixture Schedule, Sheet E0.1
total wattage per fixture	See Lighting Fixture Schedule, Sheet E0.1

total interior wattage specified vs. allowed
Per 2018 North Carolina Energy Code:

Allowable	Specified
OFFICE (0.82 X 582 SQFT) = 477 WATTS	556 WATTS
WAREHOUSE (0.63 X 23,190 SQFT) = 14,610 WATTS	3,960 WATTS
RESTROOM (0.88 X 95 SQFT) = 84 WATTS	66 WATTS
MECH/ELEC (0.85 X 92 SQFT) = 78 WATTS	33 WATTS
STAIRWELL (0.62 X 630 SQFT) = 391 WATTS	304WATTS
TOTAL INTERIOR LIGHTING = 15,640 WATTS	4,919 WATTS

total exterior wattage specified vs. allowed

Entry: 350W Specified VS. 216W Allowed (Tradeable)
Illuminated Area of Facade: 360W Specified VS. 398W Allowed (Nontradeable)

Base Site Allowance: 600W

Equipment schedules with motors (not used for mechanical systems)

motor horsepower	(1) 20HP
number of phases	3
minimum efficiency	N/A
motor type	REFER TO SPECIFICATION 142123
# of poles	REFER TO SPECIFICATION 142123

ELECTRICAL DESIGNER STATEMENT

I hereby certify that the design of this building complies with the mechanical systems, service systems and equipment requirements of the 2018 North Carolina Energy Code.

signed SHEET SIGNED AND STAMPED date 05/26/2023

Name SCOTT WILKINS

Title Project Engineer

PANEL LM

(S.E. RATED)

VOLTAGE: 120 / 208 PHASE: 3 AMP: 600 MAIN: MCB

	DESCRIPTION	KW	BKR	CK	PH	CK	BKR	KW	DESCRIPTION
	1ST FLOOR STORAGE LTS.	1.4	20/1	1	A	2	20/1	1.4	2ND FLOOR STORAGE LTS.
	1ST FLOOR STORAGE LTS.	1.4	20/1	3	B	4	20/1	1.4	2ND FLOOR STORAGE LTS.
	LEASING OFFICE LIGHTS	0.7	20/1	5	C	6	20/1	0.6	2ND FLR. EXTERIOR LTS.
	1ST FLR. EXTERIOR LTS.	0.6	20/1	7	A	8	20/1	0.2	2ND FLR. CONV. RECEPT.
	LEASING OFFICE REC.	1.4	20/1	9	B	10	45/2	3.3	AHU-5
	LEASING OFFICE REC.	0.7	20/1	11	C	12	---	3.3	---
#	LEASING OFFICE REF. REC.	1.0	20/1	13	A	14	25/2	1.2	CU-5
	LEASING OFFICE BK. RM.	0.4	20/1	15	B	16	---	1.2	---
	LEASING OFFICE COFFEE	1.0	20/1	17	C	18	45/2	3.4	AHU-6
	ELEV. ROOM RECEPT.	0.3	20/1	19	A	20	---	3.4	---
	ELEV. CAB LTS.	0.2	20/1	21	B	22	30/2	1.7	CU-6
	ELEVATOR	5.6	100/3	23	C	24	---	1.7	---
	---	5.6	---	25	A	26	45/2	3.4	AHU-7
	---	5.6	---	27	B	28	---	3.4	---
	SHUNT TRIP			29	C	30	30/2	1.7	CU-7
	ELEV. PIT LTS/RECEPT.	0.4	20/1	31	A	32	---	1.7	---
	EXT. STORAGE RECEPT.	0.2	20/1	33	B	34	45/2	3.4	AHU-8
	AHU-2	3.4	45/2	35	C	36	---	3.4	---
	---	3.4	---	37	A	38	30/2	1.7	CU-8
	CU-2	1.7	30/2	39	B	40	---	1.7	---
	---	1.7	---	41	C	42	30/2	1.1	AHU-9/CU-9
	AHU-3	3.4	45/2	43	A	44	---	1.1	---
	---	3.4	---	45	B	46	30/2	1.5	MOTORIZED GATE ENTRY
	CU-3	1.7	30/2	47	C	48	---	1.5	---
	----	1.7	---	49	A	50	20/1		SPARE
	AHU-4	3.4	45/2	51	B	52	20/1		SPARE
	---	3.4	---	53	C	54	20/1		SPARE
	CU-4	1.7	30/2	55	A	56	20/1		SPARE
	---	1.7	---	57	B	58	20/1		SPARE
	EWH-A	1.7	20/3	59	C	60	20/1		SPARE
	---	1.7	---	61	A	62	20/1		SPARE
	---	1.7	---	63	B	64	20/1		SPARE
	EWH-A	1.7	20/3	65	C	66	20/1		SPARE
	---	1.7	---	67	A	68	100/3	9.8	PANEL 'LA'
	---	1.7	---	69	B	70	---	11.0	---
	SPARE		20/1	71	C	72	---	11.8	---

- PROVIDE GFCI BREAKER.

Phase A Load (kVA)	46.8	Connected kVA	148.1	91%	A-B Balance
Phase B Load (kVA)	51.3	Dem. kVA	124.4	98%	B-C Balance
Phase C Load (kVA)	50.1	Dem. Amps	345.2	93%	C-A Balance

PANEL LA

VOLTAGE: 120 / 208 PHASE: 3 AMP: 100 MAIN: MLO

	DESCRIPTION	KW	BKR	CK	PH	CK	BKR	KW	DESCRIPTION	
	LIVING ROOM RECEPT.	0.9	20/1	1	A	2	20/1	0.8	DISHWASER	#
#	BEDROOM RECEPTACLES	1.1	20/1	3	B	4	20/1	0.5	KITCHEN RECEPTACLES	
#	BEDROOM RECEPTACLES	0.9	20/1	5	C	6	40/2	3.4	RANGE	
#	WASHER RECEPT.	1.0	20/1	7	A	8	---	3.4	---	
	DRYER RECEPT.	1.5	30/2	9	B	10	20/1	1.4	MICROWAVE/HOOD	#
	---	1.5	---	11	C	12	20/1	0.8	KITCHEN RECEPTACLES	#
#	BATHROOM GFCI RECEPT.	0.2	20/1	13	A	14	20/1	0.4	APARTMENT LIGHTS	
	AHU-1	3.3	45/2	15	B	16	30/3	2.0	WH-1	
	---	3.3	---	17	C	18	---	2.0	---	
	CU-1	1.2	25/2	19	A	20	---	2.0	SPARE	
	---	1.2	---	21	B	22	20/1		SPARE	
	SPARE		20/1	23	C	24	20/1		SPARE	
	SPARE		20/1	25	A	26	20/1		SPARE	
	SPARE		20/1	27	B	28	20/1		SPARE	
	SPARE		20/1	29	C	30	20/1		SPARE	

- PROVIDE WITH AFCI & GFCI BREAKER.

Phase A Load (kVA)	9.8	Connected kVA	32.5	89%	A-B Balance
Phase B Load (kVA)	11.0	Dem. kVA	30.2	93%	B-C Balance
Phase C Load (kVA)	11.8	Dem. Amps	83.9	83%	C-A Balance

NCECC 2018 SECTION C408 - SYSTEM COMMISSIONING NOTES:

A. Functional Testing:
1. Test all systems described in this Division in the presence of the Owner or a designated representative upon completion of the work. Demonstrate that the installation is in accordance with Contract Documents.
2. For all new lighting and lighting control systems within the Contract Documents, the contractor shall obtain the services of a licensed professional engineer (registered to the state this project is within) to perform system commissioning in compliance with local energy conservation codes. The contractor shall demonstrate in the presence of the commissioning agent that the installation of such systems are in accordance with the Contract Documents.

B. Any work found not to be in compliance with the Contract Documents shall be repaired or replaced without incurring any additions to the Contract price.

C. Provide to the Owner and System Commissioning Agent, all instruction on maintenance and operation of all systems and equipment provided under this Division. Provide all necessary tools and personnel to thoroughly present these instructions.The documentation shall include the following, at minimum:
1. Submittal data indicating all selected options.
2. Operation and maintenance manual for all equipment and systems. Include routine maintenance actions and cleaning procedures.
3. A schedule for inspecting and recalibrating, where applicable.
4. A narrative of how each system is intended to operate, including any recommended set points where adjustment is available.

D. At project completion, prior to obtaining Certificate of Occupancy, present at final inspection to the jurisdiction's AHJ a signed and dated statement of system commissioning for all lighting and lighting control systems. The format of the statement of system commissioning shall be in the form required by the state's energy conservation codes and/or AHJ requirements. The document shall be signed by the contractor's licensed professional engineer representative

PROJECT TYPE

[X] New Construction (C405) [ ] Addition (C502) [ ] Alterations (C503)

When 'New Construction' is selected, indicate NCECC Section C406 method of compliance below. If project is other than 'New Construction', compliance with referenced section is 'N/A'.

Unless specifically exempt below, the contractor shall obtain the services of a NC licensed engineering professional to perform all required commissioning services of all lighting and lighting control systems in the project scope in compliance with NCECC Section C408.

NCECC 2018 SECTION C406 - COMPLIANCE STATEMENT

Method of Compliance
a. C406.1.1 More Efficient HVAC Performace ____
b. C406.1.2 Reduced Lighting Power Density _X_
c. C406.1.3 Enhanced Lighting Controls ____
d. C406.1.4 On-Site Supply of Renewable Energy ____
e. C406.1.5 Dedicated Outdoor Air System ____
f. C406.1.6 Higher Efficiency Service Water Heating ____

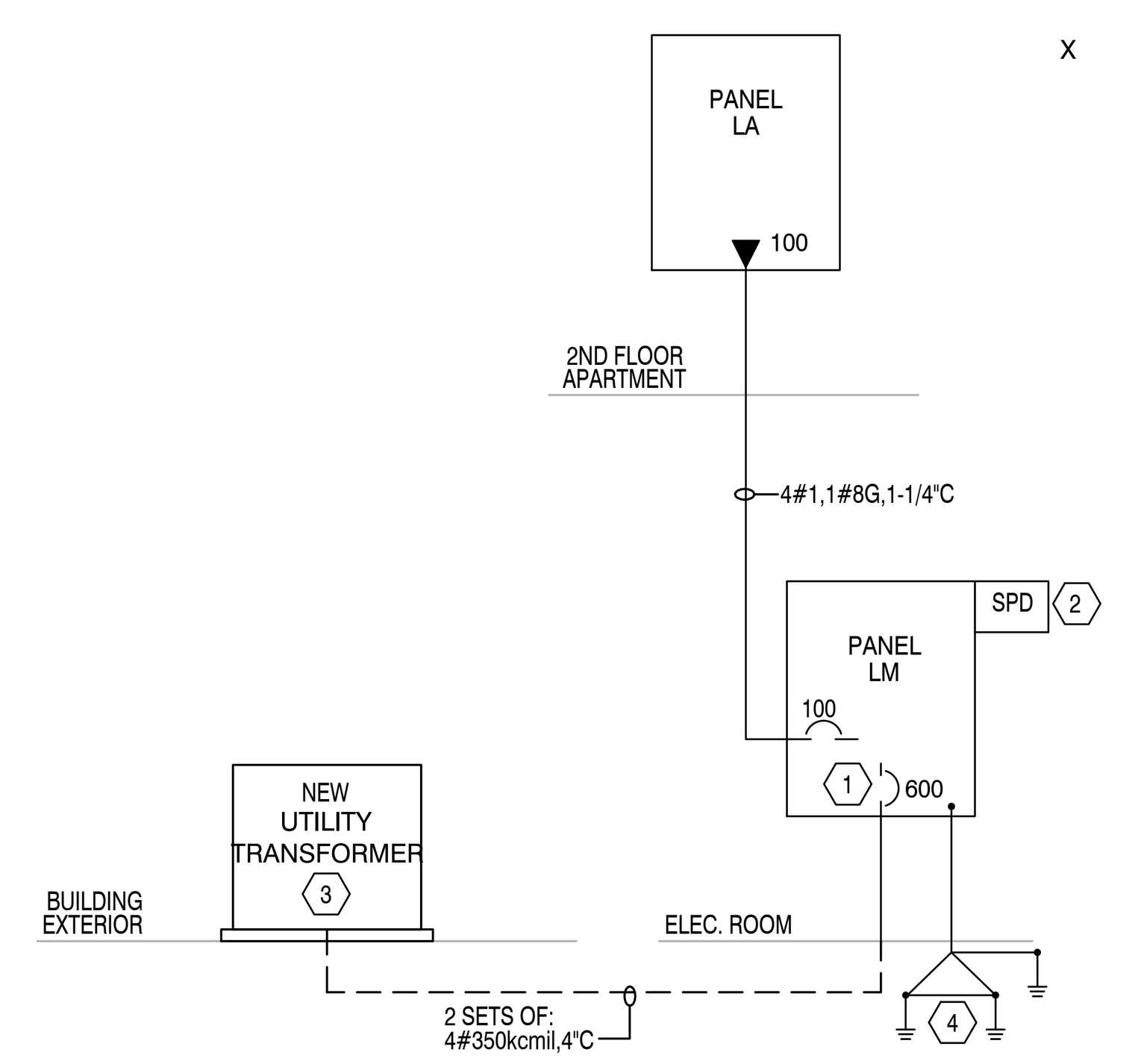
Demonstration of compliance:

REFER TO ELECTRICAL SYSTEM AND EQUIPMENT INFORMATION ON SHEET E0-01

NCECC 2018 SECTION C408 - SYSTEM COMMISSIONING

[ ] Exempt (For Alterations only per NCECC C503.1 Exception 2.g.)

Refer to 2018 NCECC Appendix C1 for required statement of system commissioning to be presented to the AHJ at final inspections.



1 / E0.1 ELECTRICAL RISER DIAGRAM
NOT TO SCALE

GENERAL NOTES
(APPLY TO THIS SHEET ONLY)

1. ALL CONDUCTORS SHALL BE COPPER UNLESS NOTED OTHERWISE ON THE PLAN.
2. PROVIDE U.L. SERIES RATINGS FOR A.I.C. VALUES INDICATED ON PLAN. WHERE NO VALUES ARE INDICATED PROVIDE 10kA MINIMUM RATINGS.
3. PROVIDE ARC-FLASH RATINGS ON ALL PANELS.
4. REFER TO PANELBOARD SCHEDULES FOR ADDITIONAL INFORMATION.
5. AVAILABLE FAULT CURRENTS ARE INDICATED ADJACENT TO EACH PANELBOARD. WHERE NO VALUE IS SHOWN, THE CALCULATED VALUE IS LESS THAN THE MINIMUM RATING SPECIFIED IN SECTION 26200. PROVIDE FULLY RATED PANELS / BREAKERS THAT EQUAL OR EXCEED VALUES INDICATED FOR ALL PANELS RATED 800 AMPS AND ABOVE. ALL PANELS RATED LESS THAN 800 AMPS SHALL BE U.L. SERIES RATED TO MEET OR EXCEED VALUES INDICATED. SHOP DRAWINGS SHALL INCLUDE ALL RATINGS.

LEGEND NOTES
(APPLY TO THIS DETAIL ONLY)

(1) PROVIDE SERVICE-RATED MAIN CIRCUIT BREAKER.
(2) PROVIDE TYPE I SURGE PROTECTION DEVICE EXTERNAL TO PANELBOARD. UTILIZE LOW IMPEDANCE CABLE AND MINIMIZE LENGTH AND BENDING OF CONNECTION. REFER TO SPECIFICATIONS SECTION 266500.
(3) COORDINATE ALL METERING REQUIREMENTS WITH POWER COMPANY. PROVIDE AND INSTALL CURRENT TRANSFORMERS (CT'S) AND ALL ADDITIONAL MATERIALS AND/OR EQUIPMENT AS REQUIRED.
(4) CONDUCTOR SHALL BE CONNECTED TO BUILDING GROUNDING ELECTRODE SYSTEM PER SPECIFICATION 260526 AND NEC 250. REFER TO GROUNDING DETAIL FOR FURTHER INFORMATION.

LIGHTING FIXTURE SCHEDULE

A RECESSED, 6" LED DOWNLIGHT FIXTURE. PROVIDE WITH FACTORY INSTALLED 120V ELECTRONIC DRIVER. COORDINATE FINISH OPTIONS WITH ARCHITECT PRIOR TO PURCHASE.
LAMPS: (1) 20W LED
MANUFACTURER: HE WILLIAMS - 6DR-L20-8-35-DIM-UNV

A1 SAME AS TYPE 'A' EXCEPT PROVIDE WITH 90-MINUTE, 1100 LUMEN EMERGENCY BATTERY INVERTER.

B SURFACE MOUNTED, DECORATIVE LED PENDANT FIXTURE. COORDINATE FINISH OPTIONS WITH ARCHITECT PRIOR TO PURCHASE. 120V.
LAMPS: (1) 60W A19
MANUFACTURER: AS SPECIFIED BY ARCHITECT.

C PENDANT MOUNTED, LED HIGH-BAY LIGHT FIXTURE. PROVIDE WITH FACTORY INSTALLED 120V ELECTRONIC DRIVER. COORDINATE FINISH OPTIONS WITH ARCHITECT PRIOR TO PURCHASE.
LAMPS: (1) 70W LED
MANUFACTURER: AS SPECIFIED BY ARCHITECT

C1 SAME AS TYPE 'C' EXCEPT PROVIDE WITH 90-MINUTE, 1100 LUMEN EMERGENCY BATTERY INVERTER

D RECESSED, 2X2 LED LIGHT FIXTURE. PROVIDE WITH FACTORY INSTALLED 120V ELECTRONIC DRIVER. COORDINATE FINISH OPTIONS WITH ARCHITECT PRIOR TO PURCHASE.
LAMPS: (1) 33W LED
MANUFACTURER: HE WILLIAMS - LT-2-2-L39-8-35-AF-120

E SURFACE MOUNTED, LED TRACK LIGHT FIXTURE. PROVIDE WITH REMOTE LED DRIVER. PROVIDE WITH 1-AMP CURRENT LIMITING DEVICE. COORDINATE FINISH OPTIONS WITH ARCHITECT PRIOR TO PURCHASE.
LAMPS: (1) 6W LED
MANUFACTURER: AS SPECIFIED BY ARCHITECT

F SURFACE MOUNTED, 4'-0" LED STRIP LIGHT FIXTURE. PROVIDE WITH FACTORY INSTALLED 120V ELECTRONIC DRIVER. PROVIDE WITH FACTORY INSTALLED INTEGRAL OCCUPANCY SENSORS. COORDINATE FINISH OPTIONS WITH ARCHITECT PRIOR TO PURCHASE.
LAMPS: (1) 33W LED
MANUFACTURER: HE WILLIAMS - 75R-4-L50-8-40-VBY-2-VDO-DSR-120

F1 SAME AS TYPE 'F' EXCEPT PROVIDE WITH 90-MINUTE, 1100 LUMEN EMERGENCY BATTERY INVERTER.

G SURFACE MOUNTED, 4'-0" LED STAIRWELL LIGHT FIXTURE. PROVIDE WITH FACTORY INSTALLED 120V ELECTRONIC DRIVER. PROVIDE WITH FACTORY INSTALLED 90-MINUTE, 1100 LUMEN EMERGENCY BATTERY INVERTER. COORDINATE FINAL FINISH OPTIONS WITH ARCHITECT PRIOR TO PURCHASE.
LAMPS: (1) 38W LED
MANUFACTURER: HE WILLIAMS - SLF-4-L52-8-35-HAI/TP-EM/10W-120

H PENDANT MOUNTED, LED DOWNLIGHT. PROVIDE WITH FACTORY INSTALLED 120V ELECTRONIC DRIVER. COORDINATE FINISH OPTIONS WITH ARCHITECT PRIOR TO PURCHASE.
LAMPS: (1) 35W LED
MANUFACTURER: AS SPECIFIED BY ARCHITECT

J SURFACE MOUNTED, LED WALLPACK LIGHT FIXTURE. PROVIDE FACTORY INSTALLED 120V ELECTRONIC DRIVER. COORDINATE FINAL FINISH OPTIONS WITH ARCHITECT PRIOR TO PURCHASE.
LAMPS: (1) 69W LED
MANUFACTURER: HE WILLIAMS - WPAL-L49-8-50-BZ-PC-UNV

K SURFACE MOUNTED, LED WALLPACK LIGHT FIXTURE. PROVIDE FACTORY INSTALLED 120V ELECTRONIC DRIVER. PROVIDE WITH FACTORY INSTALLED 90-MINUTE, 1100 LUMEN EMERGENCY BATTERY INVERTER. COORDINATE FINAL FINISH OPTIONS WITH ARCHITECT PRIOR TO PURCHASE.
LAMPS: (1) 36W LED
MANUFACTURER: HE WILLIAMS - VWP-H-L30-7-40-TFT-DBZ-CGL-EM/4W-120

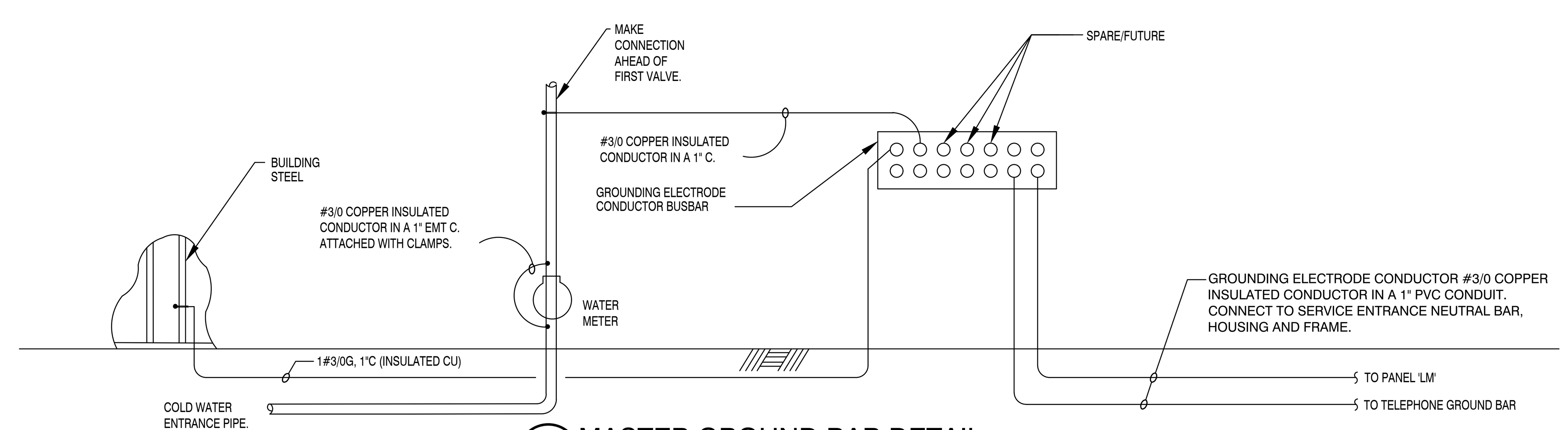
L SURFACE MOUNTED, EXTERIOR LED PENDANT FIXTURE. PROVIDE WITH FACTORY INSTALLED 120V ELECTRONIC DRIVER. COORDINATE FINISH OPTIONS WITH ARCHITECT PRIOR TO PURCHASE.
LAMPS: (1) 50W LED
MANUFACTURER: AS SPECIFIED BY ARCHITECT

M SURFACE MOUNTED, LED ELEVATOR PIT LIGHT FIXTURE WITH GASKETED LENS. PROVIDE WITH FACTORY INSTALLED 120V ELECTRONIC DRIVER. PROVIDE WITH 90-MINUTE, 1100 LUMEN EMERGENCY BATTERY INVERTER. COORDINATE FINAL FINISH OPTIONS WITH ARCHITECT PRIOR TO PURCHASE. 120V.
LAMPS: (1) 30W LED
MANUFACTURER: HE WILLIAMS - 96-4-L40-8-40-HIAFR-EM/10W-120

X SURFACE MOUNTED, LED POLYCARBONATE EXIT SIGN. PROVIDE WITH RED LETTERS AND CONTINUOUS ILLUMINATION. PROVIDE WITH SINGLE/DOUBLE FACED AND DIRECTIONAL ARROWS AS INDICATED. PROVIDE WITH FACTORY INSTALLED 90-MINUTE, 1100 LUMEN EMERGENCY BATTERY INVERTER.
MANUFACTURER: BEGHELLI - PACO-PX SERIES

ELECTRICAL GENERAL NOTES:

1. ALL WORK IN THIS DIVISION SHALL COMPLY WITH ALL LOCAL BUILDING CODES, LAWS, REGULATIONS, ORDINANCES, AND THE REQUIREMENTS OF THE 2020 NATIONAL ELECTRICAL CODE.
2. THE CONTRACTOR SHALL KEEP A RECORD OF THE CHANGES WHICH ARE IN CONFLICT WITH THESE DRAWINGS AND SPECIFICATIONS. AT THE COMPLETION OF HIS WORK HE SHALL SUBMIT "AS BUILT" PRINTS TO THE OWNER.
3. DRAWINGS ARE GENERALLY DIAGRAMMATIC AND DO NOT NECESSARILY SHOW EVERY FITTING AND DETAIL. ALL WORK SHALL BE INSTALLED SO THAT JUNCTION BOXES AND COMPONENTS WILL BE ACCESSIBLE FOR SERVICE.
4. ALL SYSTEMS, EQUIPMENT, COMPONENTS, WORK, ETC. PROVIDED UNDER THIS DIVISION SHALL BE COVERED BY A ONE YEAR GUARANTEE STARTING AT THE TIME OF FINAL ACCEPTANCE OF THE WORK BY THE OWNER. ANY DEFECTS IN THE WORK, SYSTEMS, EQUIPMENT, OR COMPONENTS FOUND DURING THIS YEAR SHALL BE CORRECTED AT NO CHARGE. THE GUARANTEE SHALL INCLUDE PROVIDING ALL NECESSARY CUTTING, PATCHWORK, REPAINTING, ETC. TO MAKE THE WORK COMPLETE AND NEW.
5. ALL CONDUIT MUST BE CONCEALED IN THE WALLS OR ABOVE THE CEILING UNLESS OTHERWISE NOTED. ALL HOMERUN BRANCH-CIRCUITS SHALL BE MINIMUM 2#12, 1#12G, IN 3/4" CONDUIT UNLESS OTHERWISE NOTED. ALL NON-HOMERUN BRANCH-CIRCUITS SHALL BE MINIMUM 2#12, 1#12G, IN 1/2" CONDUIT UNLESS OTHERWISE NOTED.
6. ALL CONDUCTORS SHALL BE COPPER WITH TYPE "THW" OR "THHN" INSULATION AND THE MINIMUM WIRE SIZE SHALL BE #12AWG WITH A 194-DEGREE F TEMPERATURE RATING.
7. ALL WORK MUST BE PERFORMED IN A NEAT AND WORKMANLIKE MANNER ACCORDING TO GENERALLY ACCEPTED PRINCIPALS OF FIRST CLASS WORKMANSHIP.
8. ALL ROOF PENETRATIONS SHALL BE AS AUTHORIZED BY LANDLORD AND IN ACCORDANCE WITH LANDLORD REQUIREMENTS. MAINTAIN ROOF WATERTIGHT INTEGRITY.
9. FASTEN ALL RECESSED LIGHTING FIXTURES TO STRUCTURE OR GRID PER N.E.C. 410.10 & 410.36.
10. DUPLEX RECEPTACLES SHALL BE PLASTIC, TWO-POLE, THREE WIRE, SELF-GROUNDING, SIDE-WIRED, 125 VOLTS AND 20A RATED, AND MATCH EXISTING IF POSSIBLE.
11. ALL PENETRATIONS THRU RATED WALLS, FLOORS AND CEILINGS SHALL BE FIRE STOPPED PER N.E.C. 300.21.
12. PROVIDE ALL GROUNDING AS REQUIRED BY N.E.C.
13. ALL UPPER LEVEL FLOOR SLAB PENETRATIONS SHALL BE CORE DRILLED, SLEEVED & SEALED PER LANDLORDS REQUIREMENTS.
14. DEVICE MOUNTING HEIGHTS ARE TO BE MEASURED TO THE DEVICE CENTERLINE UNLESS NOTED OTHERWISE.
15. ALL SWITCHES FOR FANS, LIGHTS, ETC. WHICH ARE SHOWN TO BE MOUNTED IN THE SAME GENERAL AREA SHALL SHARE A MULTI-GANG COVER PLATE AS REQUIRED.
16. REUSE ALL REMOVED, EXISTING UNDAMAGED RECEPTACLES WHERE POSSIBLE.
17. REUSE EXISTING HOMERUNS WHERE APPLICABLE WITHIN THE DESIGN CRITERIA OF THESE DRAWINGS. ALL HOMERUNS ARE TO BE PROTECTED BY 20A/1P BREAKERS UNLESS OTHERWISE NOTED.
18. REMOVE ALL ABANDONED CIRCUITING, WIRING, CABLING, AND CONDUIT SYSTEMS FOR POWER, LOW VOLTAGE CONTROLS AND COMMUNICATIONS BACK TO SOURCE.
19. WHERE DEMOLITION DISRUPTS ELECTRICAL CONTINUITY OF EXISTING TO REMAIN RECEPTACLES/LIGHTS, AND NO RECONNECTION IS SHOWN, RECONNECT TO ITS EXISTING CIRCUIT.
20. COORDINATE ALL FLOOR CORES WITH ARCHITECT AND BUILDING OWNER/MANAGEMENT REPRESENTATIVE (BUILDING ENGINEER).
21. PROVIDE A UPDATED, PRINTED PANEL SCHEDULE FOR ALL PANELS MODIFIED WITHIN SCOPE OF WORK. CORRECTLY LABEL ALL EXISTING CIRCUITS, NEW CIRCUIT, SPARES AND SPACES. NOTIFY DESIGN ENGINEER OF ANY DISCREPANCY OF PANEL LABELS.
22. PROVIDE #12AWG GND FOR ALL MECHANICAL EQUIPMENT UNLESS SHOWN OTHERWISE. ALL EQUIPMENT SHALL BE GROUNDED AT THE PANEL WHICH FEEDS THE EQUIPMENT.
23. COORDINATE RECEPTACLE NEMA TYPE AND VOLTAGE WITH COPIERS AND EQUIPMENT.
24. ALL CABLE USED IN PLENUM SHALL BE PLENUM-RATED.
25. PROVIDE A SEPARATE GREEN, INSULATED, #12AWG EQUIPMENT GROUNDING CONDUCTOR ROUTED WITH THE BRANCH CIRCUIT HOMERUN CONDUCTORS.
26. WHERE RECEPTACLES ARE REMOVED OR MOVED, REUSE EXISTING CIRCUITRY IF POSSIBLE.
27. PROVIDE A JUNCTION BOX WITH A 3/4" CONDUIT STUBBED UP 6" ABOVE ACCESSIBLE CEILING FOR ALL NEW DATA AND TELEPHONE OUTLETS. PROVIDE CONDUIT PULLSTRING AND BUSHING AT THE TERMINATION. EXISTING DATA CABLES ARE TO BE REMOVED WHERE NOT USED BY THIS TENANT. COORDINATE WITH THE TENANT.
28. REUSE ALL AVAILABLE AND ABANDONED CIRCUITS AND BREAKERS IN EXISTING PANELS.
29. WHERE WORK BY THE GENERAL CONTRACTOR (WALL REMOVAL, NEW OR RELOCATED WALL OPENING, ETC.) RESULTS IN THE REMOVAL, RELOCATION OR REFEEDING OF ELECTRICAL DEVICES OR LIGHTING FIXTURES, THE ELECTRICAL CONTRACTOR SHALL DISCONNECT OR RECONNECT AS REQUIRED ALL ACTIVE DEVICES REMAINING ON THAT CIRCUIT SYSTEM.
30. RING OUT ALL CIRCUITS IN EXISTING PANEL AFFECTED BY THIS ALTERATION. WHERE ADDITIONAL CIRCUITS ARE NEEDED, REUSE CIRCUITS AVAILABLE FOR REUSE, OR PROVIDE NEW BREAKERS, TAG ALL UNUSED CIRCUITS AS SPARE, REPLACE ALL INOPERATIVE OR DEFECTIVE CIRCUIT BREAKERS. TIGHTEN ALL CONNECTIONS.
31. CONTRACTOR SHALL RELOCATE ALL JUNCTION BOXES, PULL BOXES, ETC. ABOVE ALL INACCESSIBLE CEILING TO NEW ACCESSIBLE CEILING.
32. ARMORED CABLE MAY BE USED IN WALLS AND MILLWORK ONLY AND MUST BE MC TYPE (WITH GROUND). ALL CONDUIT TO AND ABOVE THE PLENUM SHALL BE EMT.
33. CONTRACTOR SHALL CLEAN SITE AT END OF PROJECT. ALL DUST, DEBRIS, OILS, SPRAYS, FINGERPRINTS, AND LABELS SHALL BE REMOVED FROM ALL EXPOSED FINISHED SURFACES. ELECTRICAL AND TELEPHONE ROOMS SHALL BE PUT BACK AS FOUND; FLOORS ARE TO BE SWEPT, MOPPED, AND REPAINTED.
34. LIGHTING CONTROLS SYSTEMS SHALL BE FUNCTIONALLY TESTED TO ENSURE PROPER WORKING CONDITIONS IN ACCORDANCE WITH 2015 IECC, SECTION C408.3.1 AND IN ACCORDANCE WITH THE SPECIFICATIONS. PROVIDE DOCUMENTATION TO ENGINEER PRIOR TO FINAL INSPECTION.
35. PROVIDE DOCUMENTATION THAT ALL LIGHTING CONTROLS MEET THE PERFORMANCE CRITERIA OF 2015 IECC SECTION C405 TO OWNER WITHIN 90-DAYS OF CERTIFICATE OF OCCUPANCY PER 2015 IECC SECTION C408.3.2.



2 / E0.1 MASTER GROUND BAR DETAIL
NOT TO SCALE

ELECTRICAL SYMBOL LEGEND

SYMBOL	DESCRIPTION	NOTES
	CONCEALED CONDUIT IN CEILING OR WALL - 2 CONDUCTORS + GROUND	
	CONCEALED CONDUIT UNDER RAISED FLOOR - 2 CONDUCTORS + GROUND	
	CIRCUIT HOMERUN TO PANEL; EACH ARROWHEAD = 1 CIRCUIT	
	NO. OF CONDUCTORS IN CONDUIT; EACH CROSSHATCH = 1 CONDUCTOR; GROUND CONDUCTOR DENOTED BY INDICATION	
○ ●	CONDUIT STUBBED UP OR TURNED DOWN	
	FLUSH-MOUNTED FLOOR BOX WITH INSERTS FOR POWER CONNECTIONS. PROVIDE WITH TWO (2) DUPLEX RECEPTACLES [(2) #4REC OR EQUAL]. COORDINATE EXACT LOCATION AND CONNECTION REQUIREMENTS WITH ARCHITECT/FURNITURE VENDOR PRIOR TO ROUGH-IN AND INSTALLATION. (WIREMOLD EVOLUTION RFB4 SERIES OR EQUAL)	①
	WALL MOUNTED DUPLEX RECEPTACLE OUTLET	②
	WALL MOUNTED DUPLEX RECEPTACLE MOUNTED ABOVE COUNTER	②
	WALL MOUNTED G.F.C.I. DUPLEX RECEPTACLE OUTLET	②
	G.F.C.I. DUPLEX RECEPTACLE MOUNTED ABOVE COUNTER	②
	WALL MOUNTED DOUBLE DUPLEX RECEPTACLE OUTLET	②
	SPECIAL NEMA RECEPTACLE OUTLET - NEMA 5-30R U.N.O.	②
	JUNCTION BOX - SIZE AND MOUNTING AS REQUIRED	MOUNT AS REQ'D
	WALL MOUNTED DATA OUTLET	②
	WALL MOUNTED COMBINATION TELEPHONE/DATA OUTLET	②
TV	TWO (2) WALL MOUNTED JUNCTION BOX ES (1 FOR POWER AND 1 FOR LOW VOLTAGE) FOR TV OUTLET - PROVIDE 1-GANG JUNCTION BOX WITH SINGLE GANG MUD RING AND 1" CONDUIT, WITH PULLSTRING, TO ABOVE ACCESSIBLE CEILING FOR ROUTING OF DATA AND COAX CABLING.	② ③
CR	CARD READER - PROVIDE JUNCTION BOX WITH 3/4" CONDUIT, WITH PULLSTRING, TO A 6"X6" JUNCTION BOX ABOVE ACCESSIBLE CEILING ON SECURED SIDE. COORDINATE EXACT REQUIREMENTS WITH ACCESS CONTROLS VENDOR PRIOR TO ROUGH-IN AND INSTALLATION	① ②
M	MOTOR OPERATED DAMPER - PROVIDED BY DIVISION 23	
M	MOTOR-RATED TOGGLE SWITCH - 30A MINIMUM RATING	MOUNT AS REQ'D
S 30/3/F	DISCONNECT SWITCH (FRAME/POLES/FUSE-IF REQUIRED)	MOUNT AS REQ'D
AFF/AFG	ABOVE FINISHED FLOOR/ABOVE FINISHED GRADE	
WP	WEATHER PROOF	
VS	DUAL TECH OCCUPANCY SENSOR SWITCH (MANUAL-ON / AUTO-OFF) (ACUITY #WSXA-PDT-SA OR EQUAL)	④
2	2-BUTTON LOW VOLTAGE CONTROL STATION FOR ON/OFF CONTROLS (ACUITY #nPODMA-2P OR EQUAL)	④
	WIRELESS OCCUPANCY SENSOR INTERFACED WITH EITHER THE LIGHTING CONTROL WIRELESS HUB OR THE QS CONTROL LINK. PROVIDE ALL COMPONENTS REQUIRED FOR A FULLY FUNCTIONAL SYSTEM. (ACUITY #nCM-PDT-10 OR EQUAL)	
	ON/OFF SWITCHING MODULE CONTROLLED VIA AREA OCCUPANCY SENSOR (ACUITY #nPP16 OR EQUAL)	

NOTES:
① PROVIDE ALL ACCESSORIES AND FITTINGS NEEDED FOR COMPLETE INSTALLATION.
② COORDINATE EXACT LOCATION, MOUNTING HEIGHT AND REQUIREMENTS WITH ARCHITECT PRIOR TO ROUGH-IN AND INSTALLATION. REFER TO ARCHITECTURAL DRAWINGS FOR ADDITIONAL INFORMATION AND REQUIREMENTS.
③ COORDINATE EXACT TEL/DATA AND COMMUNICATIONS WITH TENANT'S I.T. REPRESENTATIVE AND TENANT'S TEL/DATA VENDOR. PROVIDE BUSHINGS FOR ALL LOW VOLTAGE CABLING ENTRANCES.
④ DEVICE SHALL BE INSTALLED IN COMPLIANCE WITH ADA. COORDINATE EXACT LOCATION, MOUNTING HEIGHT, AND DEVICE COLOR/FINISH WITH ARCHITECT PRIOR TO ROUGH-IN AND INSTALLATION. REFER TO ARCHITECTURAL DRAWINGS FOR ADDITIONAL INFORMATION AND REQUIREMENTS.

BW&A
Barrett,Woodyard & Associates, Inc.
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Phone (770) 810-8800

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 053853 THOMAS WILLIAM KELLY

2023.05.30 07:52:10-04'00'

No.	Drawing Issue Description	Date
	ISSUED FOR PERMIT	05/26/23

14396 NC-210 SPRING LAKE, NC 28390

MIDGARD - SPRING LAKE

LEGEND, NOTES, DETAILS, SCHEDULES & ENERGY FORMS

WILL KELLY	2023-0683
PROJECT MANAGER	PROJECT NO.
SCOTT WILKINS	AS NOTED
PROJECT ENGINEER	SCALE
SCOTT WILKINS	05/26/23
DRAWN BY	DATE

E0.1
DRAWING NO.

ISSUED FOR CONSTRUCTION

SECTION 260100
ELECTRICAL GENERAL

1.0 GENERAL

1.01 SCOPE

A. Division 26 includes all Specifications in the 260000 series and the accompanying Electrical Drawings. Provide all labor, materials and equipment, and all necessary operations to provide the compete the complete scope of the electrical systems intended under this Division. Division 26 is not a stand alone document, but a part of the complete Project Documents.

B. Attention is called to the fact that there are many interfaces between the work required in this Division and the work required in other Divisions. Provide the necessary interface and coordination with other Divisions to provide a complete project.

1.02 EXISTING CONDITIONS

A. Attention is called to the fact that the work is to be performed within an existing, operational facility. Prior to the submission of bids, each bidder shall visit the project site, thoroughly investigate and be familiar with all existing conditions which will affect their work; especially the work to be performed above the existing ceilings.

B. When the project is finished, the work under this Division shall be complete in every respect, completely integrated with all the existing systems, and left in perfect operating condition. the electrical service to the building shall not be interrupted at any time without written coordination of the building's Owner. All existing electrical equipment removed during the project shall be removed from the site after inspection of the building's Owner. all existing electrical systems required to be operating at the project's completion or required to remain in use during the project shall be reconnected, replaced, rerouted or otherwise made to fit with proper workmanship techniques and left in safe working order.

C. Connect new work to existing work in a neat and workmanlike manner. Where an existing structure must be cut or existing utilities interfere, such obstructions shall be bypassed, removed, replaced, ore relocated, patched and repaired. Work disturbed or damaged shall be replaced or repaired to its prior condition.

D. Prior to the start of any demolition or construction, secure the services of a qualified, EPA Certified asbestos abatement agency to check the existing insulation, etc. for asbestos. Should asbestos be found, do not proceed with demolition or construction; notify the Architect in any case in writing of the agency's findings.

1.03 CODES AND REGULATIONS

A. All work under this Division shall comply with all local building codes, laws, regulations, ordinances and the requirements of the 2020 National Electrical Code.

B. Where conflicts of installation requirements occur between the aforementioned codes, regulations or the Contract Documents, the most restrictive shall govern.

C. Obtain all permits and licenses and pay all fees required by local authorities. Arrange for all necessary inspections required by the authorities having jurisdiction and provide written certificates of approval to the project Owner or his designated representative.

1.04 DEFINITIONS

A. Contract Documents: The complete set of project Drawings and Specifications.

B. Provide: Furnish, install and connect.

C. Work: All materials installed, including all labor to provide complete system.

D. Wiring or Wired: All wire or cable installed in conduit from panelboard to equipment and connected at both ends with all required boxes, connectors, couplings, etc.

E. Conduit: Rigid steel conduit intermediate metal conduit (I.M.C.), electrical metallic tubing (EMT), plastic conduit (PVC), or flexible steel conduit.

1.05 DRAWINGS AND SPECIFICATIONS

A. The Drawings and Specifications together are to be considered as the Contract Documents. Any work shown in one and not shown in the other, or implied by either, shall be provided to give a complete project.

B. Should any conflicts exist between the Drawings and Specifications or there is an item shown/called for which is not clearly defined, immediately submit a request for clarification. No additional monies will be granted later when a conflict is resolved or an item is more clearly defined.

C. The Drawings are schematic and are not intended to show the exact location outlets, etc. or the routing of conduit.

D. The exact location of equipment requiring electrical connections (mechanical equipment, elevators, lights, etc.) shall be as located by other Divisions of the Contract Documents. Refer to the Architectural, Structural and Mechanical Documents for dimensions and details of building construction and provide work described in this Division so that it conforms to the details of the project. The right is reserved to relocate any receptacle, switch or other outlet a maximum of 10'-0" before it is permanently installed without incurring additions to the Contract amount.

1.06 SITE VISIT

A. Visit the site and become familiar with all aspects of the site and existing conditions before submitting Contract price. No allowance will be made for lack of knowledge of existing conditions.

1.07 DEVIATIONS

A. No deviations from the Contract Documents shall be made without the full knowledge and written consent of the Architect.

B. If the existing conditions make it desirable to modify the Contract Documents in regard to any item, provide a written request to the Architect.

2.0 PRODUCTS

2.01 STANDARDS FOR MATERIALS AND WORKMANSHIP

A. All materials used shall be new and shall be stamped with the label of Underwriters Laboratories, Inc. (UL).

B. All materials shall meet the standards of the following associations and institutes where applicable:

1. National Fire Protection Association (NFPA)
2. American Society of Testing Materials (ASTM)
3. American National Standards Institute (ANSI)
4. National Electrical Manufacturer's Association (NEMA)
5. Institute of Electrical and Electronic Engineers (IEEE)

C. Manufacutrer's names and catalog numbers specified herein are intended to describe the material and set the standard of quality. All buds shall be based on materials specified. Requests for approval of material not specified shall be considered if the request is in written form and submitted to the Architect no later than fourteen (14) days before bid date. All requests shall conform with the provisions of the general and supplementary conditions.

D. Samples of materials requested to be substituted shall be furnished upon the request of the Architect.

2.02 SHOP DRAWINGS AND SUBMITTAL

A. The Engineer's review of shop drawings or submittals is a cursory review to check for general compliances of submittals with the design intent of the Contract Documents. The Engineer's review does not relieve the Contractor of his responsibility of complying with the Contract Documents. All coordination of the work in strict compliance with the Contract Documents is the sole responsibility of the Contractor.

B. The following items shall be submitted for review:

1. Conduit and wire
2. Grounding System
3. Devices
4. Coverplates
5. Fuses
6. Overcurrent Devices
7. Disconnect Switches
8. Lighting Fixtures
9. Life Safety Systems

C. All shop drawings and submittals shall be submitted in compliance with the requirements of the general and supplemental conditions. No more than four (4) copies of submittal data will be reviewed, Any additional copies will be returned unmarked. The responsibility of copying review comments on any additional copies will rest solely with the contractor.

D. All submittals shall bear the name of the manufacturer to be used.

E. All shop drawings and submittals shall include a stamped indication signifying that the submittal has been reviewed for compliance with the Contract Documents by the Contractor. The Stamped indication also represents the fact that the Contractor has checked this submittal for its interaction with all other Divisions and certifies by his signature or initials that all coordination has taken place. The stamp shall include the date, name of the Contracting Firm, the signature of the Contractor, certification of compliance and approval. The stamp shall be on the submittal before the Engineer will review it.

F. The Engineer will review an individual submittal not more than twice. If the submittal is rejected again on the second review, the contractor will bare all responsibility for paying for the Engineer's time for additional reviews. Such payments to the Engineer shall be withheld from the next monthly pay application.

2.03 RECORD (AS-BUILT) DRAWINGS AND MAINTENANCE MANUALS

A. At job completion, submit to the Architect, a set of prints (PDF and DWG) showing all deviations from the Contract Documents. The Drawings shall also have dimensions locating all underground conduits.

B. At job completion, submit to the Architect, three (3) sets of maintenance and instruction manuals for all equipment furnished on the project.

3.0 EXECUTION

3.01 COORDINATION

A. Coordinate all space requirements with all other Divisions before installing any work. Install work such that adequate space will be allotted for all other work from other Divisions to be installed and also will allow room for future access for repair and maintenance.

B. Any work installed without proper coordination shall be relocated at the Architect's direction without increasing the Contract price.

C. During the bidding process or the pricing for a guaranteed maximum price, coordinate with all other Divisions for the total amount of work required in Division 26. Any work shown or implied in another Division requiring work in Division 26 shall be included in the Contract price regardless of whether or not it is addressed in Division 26.

3.02 PROTECTION OF MATERIALS

A. All equipment shall have the original finish when the building is turned over to the Owner.

B. Protect equipment during construction from dirt, water, chemical, mechanical damage, etc. Protect all conduit openings so that no foreign materials will enter the conduit.

3.03 TEST, DEMONSTRATIONS AND INSTRUCTIONS

A. Test all systems described in this Division in the presence of the Owner or a designated representative upon completion of the work. Demonstrate that the installation is in accordance with Contract Documents.

B. Any work found not to be in compliance with the Contract Documents shall be repaired or replaced without incurring any additions to the Contract price.

C. Provide to the Owner, all instruction on maintenance and operations of all systems and equipment provided under this Division. Provide all necessary tools and personnel to thoroughly present these instructions.

3.02 GUARANTEE

A. All systems, equipment, components, work, etc. provided under this Division shall be covered by a one year guarantee starting at the time of final acceptance of the work by the Owner. Any defects in the work, systems, equipment or components found during this year shall be corrected at no charge. The guarantee shall include providing all necessary cutting, patchwork, repainting, etc. to make the work complete and new.

B. Present this guarantee and any additional warranties or guarantees on furnished equipment or systems to the Architect. All equipment or system guarantees are in addition to the general guarantee.

\- END OF SECTION -

SECTION 261000
ELECTRICAL BASIC MATERIALS & METHODS

1.0 GENERAL

1.01 DESCRIPTION

A. All work specified in the Section shall comply with the provisions of Section 260100.

B. The Section describes the basic electrical materials and installation methods that are acceptable and applicable to Division 26.

2.0 PRODUCTS

2.01 CONDUIT

A. Galvanized rigid steel conduit shall be low carbon, hot-dipped galvanized both inside and out with threaded joints.

B. Intermediate metal conduit (IMC) shall be steel, galvanized both inside and out with threaded joints.

C. Electrical metallic tubing (EMT) shall be steel, galvanized both inside and out.

D. Plastic conduit (PVC) shall be schedule 40 PVC heavy wall type. A grounding conductor shall be provided.

E. Flexible metal conduit shall be flexible steel conduit tubing and shall meet Underwriters Laboratories Standard for Flexible Steel Conduit.

F. Liquid-tight flexible metal conduit and liquid-tight non-metallic conduits shall be liquid-tight and sunlight resistant.

G. Steel conduit approved manufacturers are Allied, Triangle and Republic.

H. PVC conduit approved manufacturers are Carlon and Triangle.

2.02 CONDUIT FITTINGS

A. Rigid conduit and IMC conduit fittings shall be zinc-coated, ferrous metal and taper threaded type.

B. EMT fittings shall be zinc-coated steel and hexnut compression or set-screw type. EMT connectors shall have insulated throats.

C. PVC fittings, elbows and cement shall be produced by the same manufacturer. All joints shall be solvent welded in accordance with the manufacturer's recommendations.

D. Conduit connections to transformers, panel cabinets, and pull boxes shall have grounding wedge lugs between the bushing and the box or locknuts designed to bite into the metal.

E. Each conduit end shall be provided with either an insulated throat connector or separate locknut and insulated bushing. Bushing shall be installed before any wire is pulled.

F. Conduit fittings approved manufacturers are Raco, Steel City, O.Z. Gedney, Thomas & Betts and Appleton.

G. Expansion fittings shall be provided in all conduit which crosses an expansion joint.

2.03 CONDUCTORS

A. Conductors shall be copper of 98% conductivity, 600 volt insulation. Sizes specified are AWG gauge for No. 4/0 and smaller and circular mils (MCM) for all sizes larger than no. 4/0. Conductors No. 10 and smaller shall be solid and type "THHN" or "THWN" insulation. No. 8 and larger shall be stranded and type "THW" or "XHHW" insulation.

2.04 OUTLETS

A. Outlet boxes and covers shall be of such form and dimensions as to be adapted to their specified usage, locations, size and quantity of conduit, and size and quantity of conductors entering the boxes. In special "Fire Rated" partitions, outlets shall comply with ASTM No. E119.

B. Flush ceiling outlets for surface or pendant mounted lighting fixtures shall be one-piece 4" square or octagonal pressed steel boxes. Boxes for devices in unfinished masonry walls or stud walls shall be pressed steel, square corner, sectional switch boxes, or shall be 4" square box with a square cornered tile wall cover, set flush with masonry construction. Boxes in concrete ceiling slab shall be octagonal, shallow concrete boxes. Welded boxes are not acceptable.

A. All outlet boxes in plaster or masonry walls or ceiling shall be provided with plaster rings.

B. Junction boxes and all outlets not indicated as containing wiring devices or lighting fixtures shall have covers. Covers for outlets in walls shall be as specified for wall switches and receptacles.

C. Outlet boxes exposed to the weather shall be of cast iron corrosion resistant type.

F. Outlet box approved manufacturers are Appleton, Raco, Steel City or Crouse-Hinds.

2.05 DISCONNECT SWITCHES

A. Disconnect switches shall be "heavy-duty" type, enclosed switches of quick-make, quick-break construction. Switches shall be horsepower rated for 600 volts AC as required. Lugs shall be UL listed for copper and aluminum.

B. Padlocking provisions shall be provided for padlocking in the OFF position.

C. Switches shall be furnished in NEMA 1 General purpose enclosure unless noted otherwise. Switches located on the exterior of the building or in "wet" locations shall have NEMA 3R enclosures.

D. Disconnect switches shall be mounted to structure. Disconnect switches shall not be mounted to mechanical equipment or ductwork.

E. Fused disconnect switches shall have rejection type fuse clips with dual element, current limiting fuses of rating shown.

2.06 NAMEPLATES

A. Nameplates shall have 3/8" high engraved letters.

B. 120 or 208 volts: white core laminated bakelite with black finish.

C. Nameplate shall indicate the panel name and the name of the device or equipment where the power supply/feeder originates.

2.07 WALL SWITCHES

A. Wall switches shall be plastic, totally enclosed, quiet type, self-grounding, 120 volt and 20A rating and shall match existing.

B. Color shall be as selected by architect.

2.08 RECEPTACLES

A. Duplex receptacles shall be plastic, two-pole, three wire, self-grounding, side wired, 125 volts and 15A rating and shall match existing.

B. Dedicated receptacles shall be plastic, two-pole, three wire, self-grounding, side wired, 125 volts and 20A rating and shall match existing.

C. Ground fault circuit interrupt (GFCI) receptacles shall be provided in accordance with NEC 210.8(B). Provide new to match existing.

D. Receptacles connected to generator circuit shall be red. Color of all other receptacles shall be as selected by the Architect.

2.09 COVERPLATES

A. Coverplates for flush mounted devices shall be brushed finished stainless steel standard size, Hubbell “P” Series or equal by Leviton, P&S, or Cooper.

B. Telephone and data outlet coverplates shall have same finish as above.

C. Coverplates for exterior devices shall be self-closing, die-cast aluminum Hubbell WP8M or equal by Leviton, P&S, or Cooper.

2.10 PLYWOOD BACKBOARDS

A. Provide plywood backboards where shown. Backboards shall be minimum 3/4" thick and sized as shown or to accommodate equipment indicated to be mounted thereon.

B. Secure plywood to the building structure and paint with two coats to match wall color.

2.11 SMOKE AND FIRE STOP FITTINGS

A. Smoke and Fire Stop Fittings shall be UL listed for that purpose. The fittings used to seal conduit either on the outside of the conduit, busway or cable or internally shall have heat activated intumescent material, which expands to fill all voids. Smoke and fire stop fittings shall be O.Z./Gedney "FIRE-SEAL" or Dow Corning silicone RTV foam with an hourly fire-rating equal to or higher than the rating of the floor, ceiling or wall through which the cable or conduit passes. The seals for conduit shall be of the flanged type.

2.12 FUSES

A. Provide all fuses. All fuses shall be of the same manufacturer. All fuses shall be of the high interrupting rating (200,000 Amps), current limiting type and manufactured by Bussmann. Fuses shall be provided for each fuse cutout and the specified quantity of fuses shall be furnished for spares.

B. Circuits 0 to 600 ampere shall be protected by rejection type, current limiting BUSSMANN LOWPEAK Dual Element Fuses LPN-RK (250 volts). All dual-element fuses shall have separate overload and short-circuit clearing chamber. The fuse must hold 500% of rated current for a minimum of 10 seconds and be listed by Underwriter's Laboratories, Inc., with an interrupting rating of 200,000 amperes RMS symmetrical. The fuses shall be UL Class RK-1.

C. Furnish and turn over to the Owner/Tenatn a minimum of one (1) set of spare fuses (set consisting of three fuses) for each type and rating of fuse used. When the number of fuse sets of the same type and rating actually installed exceeds five (5) sets, furnish an additional spare set of fuses for each five (5) or fraction thereof.

D. Acceptable manufacturers are Bussman or equal by Littlefuse.

3.0 EXECUTION

3.01 CONDUIT

A. Rigid steel (or IMC) shall be used for service entrance and all feeders and branch circuit where exposed to damage.

B. EMT shall be used for branch circuits, fire alarm and telephone when not underground or in concrete in contact with the earth.

C. Schedule 40 PVC may be used for all underground feeders under the lowest floor slab.

D. Conduit shall be continuous from outlet to outlet, from outlet to cabinet, junction box and pull box. Conduit shall enter and be secured to all boxes, etc., in such a manner that each system will be electrically continuous from service to all outlets such that a good ground is provided. All conduit from cabinets and junction boxes or conduit fittings. Conduit connections to any box with has no threaded hub shall be doubled locknutted.

E. Provide junction boxes or pull boxes where shown and where necessary to avoid excessive runs or too many bends between outlets. The conduit sizes shown may increase if desired to facilitate the pulling of cables.

F. All conduit shall be concealed unless indicated otherwise. Install exposed conduit parallel with or at right angles to the building walls and support from walls or ceilings at intervals required by Code with approved galvanized iron clamps or hangers. Concealed conduit above the ceiling shall be supported independent of ceiling construction. Where ceilings of lay-in type are used, conduit must be installed high enough to permit removal of ceiling panels and lighting fixtures. Use threaded roads and hangers for supporting single conduit. Use trapeze hangers consisting of double-nutted threaded rods and "Unistrut" channels or angles of 12 gauge minimum steel for supporting multiple conduit.

G. Minimum size conduit for branch circuits shall not be smaller than 1/2". Home runs sahll extend from outlets shown to panel designated. Home runs shown shall not be combined. Home run conduit shall not be smaller than 3/4" conduit.

H. At couplings, conduit ends shall be threaded so that they meet in the coupling. Right and left hand couplings shall not be used; conduit couplings of the Erikson Type shall be used at locations requiring such joints.

I. All conduits for future use, for telephone wire, or for data communication cable, shall be left with No. 16 gauge wire pulled in them or a pull line as manufactured by Ideal, and the ends securely corked or capped.

J. Expansion fitting shall be installed in all conduit which pass through the cross-sectional area of expansion joints.

K. Provide non-hardening elastic type duct seal compound, Neer No. DC., 3M Co. "Scotchfil", or Gardner Bender duct seal, for each conduit entering the building from outside and for each conduit passing through one space into another which is normally at a lower temperature.

L. Provide watertight conduit hubs on conduit terminating in a box or cabinet exposed to the weather.

M. Space in sleeves or around conduit that pass through fire resistive or fire rated walls, partitions, floors, or ceiling shall be closed by packing with an unlabelled fire resistive material that will maintain the fire rating of the barrier penetrated.

3.02 FLEXIBLE CONDUIT

A. PVC extruded cover flexible conduit shall be used in making short flexible connections to rotating or vibrating machinery or equipment. The flexible conduit at these locations shall be as short as possible, but shall have a minimum length of 12".

B. A green stranded bonding jumper shall be installed outside of all flexible conduit that extends directly from a non-flex conduit to a rotating or vibrating machine. Where a junction box is used, the green stranded bonding jumper shall be installed inside the flexible conduit and attached to the junction box and to the machine. When the bonding jumper is installed outside of the flexible conduit, plastic wire straps shall be used 6" o.c. to secure the jumper to the flexible conduit.

C. Flexible metal (MC) conduit system may be utilized where concealed in walls, millwork, and/or below raised accessible floor. MC Cable shall run from point of exit from wall or millwork to nearest structurally support junction box. MC cable will not be permitted to be installed in the above ceiling space and shall not pass through a fire rated partition. Conductor colors of the MC cable shall comply with 261000 3.04 D.

1. MC cable shall be constructed to have an insulated, copper ground conductor. Sheathing with a bare aluminum conductor shall not be used as the ground.

3.03 CONDUIT PROTECTION

A. Conduit shall be secured in place and protected where necessary to prevent damage to work during construction. The ends of all conduit shall be plugged to avoid filling with any foreign matter. All conduit shall be blown out and swabbed clear of water and trash prior to pulling wire.

3.04 WIRING

A. All conductors shall be installed in conduit. No conductors shall be pulled into the conduit until the conduit system is complete and plaster had dried. Wire pulling lubricants shall be Gardner-Bender "Wireaide" or Ideal "Yellow 77".

B. Conductors shall be continuous from outlet to outlet and from outlet to junction box or pull box. All splices and joints shall be carefully and securely made to be mechanically and electrically solid with pressure type connectors, Gardner Bender "Winggard" or Ideal "Wingnut". Tape shall be "Scotch" No. 33 for indoor and No. 88 for outdoor or Gardner Bender No. 95-661. Where connection is made to any terminals of more than 30 amperes capacity and where conductors larger than No. 10 are connected to any terminal, copper terminal lugs shall be bolted to the conductors. Where multiple connections are made to the same terminal, individual lugs for each conductor shall be used. (Aluminum conductors, if used for service conductors, shall be made with high compression lugs as manufactured by Square D, Ideal or MAC.)

C. Each conduit shall have a minimum of two (2) conductors, plus ground, pulled in unless that particular conduit is noted as being for systems other than electrical circuitry and/or future use or unless noted otherwise.

D. Conductors for lighting and receptacle circuits shall have color coded jackets. The wiring shall be color coded with the same color used with its respective phase through the entire job as follows:

<u>208/120 Volt System</u>

Phase A - Black
Phase B - Red
Phase C - Blue
Neutral - White
Ground - Green

E. The feeder and service entrance conductors shall be color coded by the use of colored plastic tape applied within 6" of each conductor end.

F. Branch circuit conductors shall not be smaller than No. 12 and where the home run from center of load exceeds 100'-0", the conductors from home run outlet to panel shall be No. 10 minimum.

G. For branch circuits terminating in outlet without device, leave minimum of 12" of slack wire coiled for connection of equipment. All conductors shall be identified with proper circuit numbers at terminals, junction boxes at panelboards within 6" of conductor ends.

3.05 OUTLETS

A. Provide galvanized steel or cast type boxes for all outlets.

B. Where outlet boxes are used to support lighting fixtures, the outlet box shall be anchored to the structural members of the building per NEC 370.13.

C. Outlet boxes shall be flush mounted unless they are specifically shown as being used with exposed conduit or are located above a ceiling.

D. Where outlets are supplied from conduit run in or below floor slabs, the conduit shall be stubbed up at the location shown and the wall built up around the conduit.

E. Cuts for outlet boxes in masonry walls shall be made so that the coverplate will completely cover the cut. The mounting height of switch, receptacle and other outlets may be varied slightly, with the Architect's approvals, so that the outlet box, top or bottom, will occur at a masonry joint.

F. The edge of all outlet boxes shall be flush with the surface in which they are recessed. The devices that fit into the outlet boxes shall be screwed tight before the coverplate is installed and the coverplate shall not be used as a means of tightening the devices in place.

G. Where outlets are shown as being adjacent and different mounting heights are specified for each, they shall be mounted one directly over the other, on the centerline of the group.

3.06 NAMEPLATES

A. Provide specified nameplates on the panelboards, disconnect switches, and motor switches.

B. Nameplates for surface mounted equipment shall be installed on the exterior of equipment with sheetmetal screws. Nameplates for flush or recessed mounted equipment shall be installed on the inside of the panel door or cover with epoxy cement.

3.07 WALL SWITCHES AND RECEPTACLES

A. Where more than one device is indicated at a location, the devices shall be gang-mounted in combined multi-gang boxes and covered jointly by a common coverplate. Provide barriers as required by the devices and voltages being used.

3.08 COVERPLATES

A. All junction boxes, outlet boxes, multi-gang switch boxes, utility boxes, etc., shall be covered with a coverplate. The coverplate shall be a finished plate as specified unless designated otherwise.

B. Coverplates shall be mounted vertically unless designated otherwise

3.09 GROUNDING

A. Ground connections shall be in accordance with the 2020 National Electrical Code.

B. Provide an insulated green bonding jumper from the grounding lug of all receptacles to Steel City "GEE" clip or sheet metal screw in the outlet box. The grounding wire installed behind the device mounting screw will not be acceptable.

C. Provide a main teleco ground bar located in the Tenant's MDF Room on level 2. From building ground, provide a #2 copper insulated conductor to the main telcoground bar.

D. Provide a telco ground bar within each Tenant's IDF rooms (located on level 1 and 3). From the main teleco ground bar located in the Tenant's MDF Room on level 2, provide a #2 copper insulated conductor to each IDF teleco ground bar.

E. Provide a minimum #6 insulated ground conductor to ladder tray and all equipment within the Tenant's MDF/IDF Rooms from the ground bar serving that room.

3.10 TELEPHONE CONDUIT SYSTEM

A. Provide an outlet and conduit system for the telephones as shown and leave the same in readiness for wiring by others. Provide pull line in all telephone conduit. Terminate all conduit at a uniform height with smooth insulated bushings at the telephone wood backboards.

B. Telephone wall outlets shall be pressed steel sectional switch boxes, wall mounted at the locations indicated. Coverplate shall have a bushed hole.

C. Telephone floor outlets shall be floor boxes as specified at the locations indicated.

3.11 CONNECTION TO EQUIPMENT

A. Equipment furnished by the Owner or under other Sections, such as mechanical equipment, elevators, escalators, signs, kitchen equipment, etc., will be installed by others. Provide electrical service and make the electrical circuit connection to this equipment.

B. Provide PVC insulated flexible cord sets for all cord and plug connected building appliances and equipment. Cords shall be sized in accordance with electrical circuits indicated. Multiple conductor cords shall be "SO" cable with PVC jacket and green insulated ground conductor.

3.12 CORING, CUTTING AND PATCHING

A. Set sleeves for conduit accurately before the concrete floors are poured, or set boxes on the forms so as to leave openings in the floors in which the required sleeves can be subsequently located. Fill in the voids around the sleeves with concrete.

B. Should the performance of this preliminary work be neglected and should cutting be required in order to install conduit, then the expense of the cutting and restoring of surfaces to their original conditions shall be accomplished without incurring additions to the Contract.

3.13 EQUIPMENT ANCHORING

A. All items of electrical equipment, such as switchboards, motor control centers, transformers, standby generator, etc., shall be securely anchored to the building structure. The anchoring shall be accomplished by utilizing a minimum size of 3/8" steel anchor bolts in the structure and to the item of equipment. A minimum of two (2) anchor bolts shall be provided on each side of each item of equipment with the following exceptions:

Exception No. 1: If the equipment manufacturer includes more than two (2) anchor holes per side in the base or base frame of the equipment item, then there shall be one anchor for each anchor hole.

Exception No. 2: If the equipment manufacturer recommends a particular quantity greater than two (2) per side, then that quantity of anchors shall be provided.

\- END OF SECTION -

SECTION 262000
SERVICE AND DISTRIBUTION

1.0 GENERAL

1.01 DESCRIPTION

A. All work specified in this Section shall comply with the provisions of Section 26 01 00.

B. Provide a complete electrical distribution system. The system shall include the service entrance, main switchboard, feeders, transformers, distribution panels, panelboards, busway, remote control switches, contactors, etc., to provide a complete system.

C. All distribution switchgear (branch circuit panelboards, switchboard, distribution panelboards, transformers, busway, etc.) shall be the unit responsibility of one manufacturer. All component parts of the above listed items shall be of the same manufacturer except where a written request for deviation from this requirement has been approved prior to bid date.

D. Shop drawings for equipment specified in this Section shall show that all specified requirements have been incorporated.

E. Coordination studies shall be done prior to shop drawing submittals. Shop drawings shall include all breakers that meet the coordination study. If study is performed after the shop drawings are submitted, any revisions to breakers or panels shall be at no additional cost to the project.

F. All floor mounted distribution equipment shall be mounted on a 4" high concrete pad.

2.0 PRODUCTS

2.01 BRANCH CIRCUIT PANELBOARDS

A. Panelboards (panels) shall be general purpose enclosures and shall be surface or flush mounted as indicated. Panels shall be of the automatic circuit breaker type, factory assembled by the manufacturer of the circuit breakers. Panels shall be for the voltage indicated with the quantity of poles and ampacity of circuit breakers shown.

B. Boxes and trim shall be made from code gauge steel. Boxes shall be sufficient size to provide a minimum gutter space of 4" on all sides. Boxes shall be minimum 20" width and 5 3/4" depth.

C. Hinged door covering all device handles shall be included in all panel trim. Doors shall have flush-type cylinder lock and catch, except that doors over 48" in height shall have auxiliary fasteners at top and bottom of door in addition to flush-type cylinder lock and catch. Door hinges shall be concealed. All locks shall be keyed alike. Directory frame and card having a transparent cover shall be furnished each panel door.

D. Trims for flush panels shall overlap the box by at least 3/4" all around. Surface trims shall have the same width and height as the box. Trims shall be mountable by a screwdriver without the need for special tools. After installation, trim mounting mechanism or hardware shall not be accessible when panel door is closed and locked.

E. All exterior and interior steel surfaces of the trim shall be cleaned and finished with gray paint over a rust-inhibiting phosphatized coating.

F. All interiors shall be completely factory assembled with protective devices, wire connectors, etc. All wire connectors, except screw terminals, shall be of the anti-turn solderless type and all shall be suitable for copper or aluminum wire.

G. Interiors shall be so designed that devices can be replaced without disturbing adjacent units and without removing the main bus connectors, and shall be so designed that devices may be changed without machining, drilling or tapping.

H. Bus bars for the mains shall be of copper sized in accordance with U.L. standards. Full size bars shall be included. Bus bar taps for panels with single pole branches shall be arranged for sequence phasing of the branch circuit devices.

I. Phase bussing shall be full height without reduction. Cross and center connectors shall be of the same material as the bus.

J. The neutral bus shall utilize setscrews to bond the neutral wire to the neutral bus through holes drilled in the neutral bar. A sheet copper neutral bus utilizing flathead screws to hold the neutral wires will not be acceptable.

K. Spaces for future devices shall be included as indicated and shall be bussed for the maximum rated device that can be fitted into them.

L. All circuit breakers shall be manually operated, thermal-magnetic, automatic, of the ampacity and poles as indicated. They shall be quick-make, quick-break, both on manual and automatic operation. Breakers shall be over-the-center toggle operating type, with the handle going to a position between ON and OFF to indicate automatic tripping. All multi-pole breakers shall have internal common trip. The minimum interrupting capacity of the breakers furnished shall be 10,000 amperes RMS symmetrical for 120/208 volt and 14,000 amperes RMS symmetrical for 480/277 volt unless indicated otherwise on the riser diagram. The breakers furnished shall be determined by the specifications and by the minimum U.L. labeled RMS symmetrical amperes interrupting capacity at circuit voltage. All circuit breakers shall be bolted on and rigidly braced.

M. Panels having sub-feed lugs for feeding through shall have 8" minimum extra gutter space at the lug end and on one side.

N. Each panel as a complete unit shall have a short-circuit current rating equal to or greater than the equipment rating indicated.

O. All circuit breakers serving the fire alarm system shall include red marking and a listed locking mechanism per NFPA 72.

P. Panels shall be as manufactured by ABB - General Electric, Square D, Siemens, or Eaton.

2.02 DISTRIBUTION PANELBOARDS

A. Distribution panelboards (panels) shall be of the circuit breaker type, factory assembled by the manufacturer of the circuit breakers, complete with front door cover. The main breaker and the branch circuit breakers shall be as indicated. The main bus shall be 98% conductivity silver plated copper, rated as and of capacity equal to or greater than the rating or setting of the over-current protective device next back in the line. Panel shall be suitable for the voltage and phase indicated. Provide 25% ground bus.

B. Panels shall be flush or surface mounted as indicated, with baked-on enamel trim, adjustable trim clamps and door with chromium plated combination cylinder lock and catch, all locks keyed alike. Provide a specified nameplate for each device and a blank (not engraved) nameplate for each spare breaker or space.

C. Provide energy reducing active arc flash mitigation system to comply with NEC 240.87 for all breakers rated 1200 amps or can be adjusted to 1200 amps or higher.

D. The neutral bus shall utilize setscrews to bond the neutral bus through holes drilled in the neutral bar. A sheet copper neutral bus utilizing flathead screws to hold the neutral wires will not be acceptable.

E. All circuit breakers shall be manually operated, thermal-magnetic, automatic, of the ampacity and poles as indicated. They shall be quick-make, quick-break both on manual and on automatic operation. Breakers shall be over-the-center toggle operating type, with the handle going to a position between "ON" and "OFF" to indicate automatic tripping. All multi-pole breakers shall have internal common trip.

F. The minimum interrupting capacity of the breakers furnished shall be 10,000 amperes RMS symmetrical for 120/208 volt and 14,000 amperes RMS symmetrical for 480/277 volt unless indicated otherwise on the riser diagram.

G. All main circuit breakers shall be molded case and vertically mounted. All vertically mounted molded case circuit breakers shall be mounted so that the handle is up for "ON" and down for "OFF", when viewed from the normal standing position. All vertically mounted molded case main circuit breakers shall be UL approved for feeding in the bottom and out the top.

H. All circuit breakers, including any connectors to the main bus, shall be bolted and rigidly braced.

I. Spaces for future installation of molded case circuit breakers are specifically by range of trip rather than a single trip size or frame size. The spaces so scheduled shall be complete with all bus and required bus connectors such that future breakers can be installed without adding or changing bus connectors on the main bus and without using a larger (frame size) or more expensive breaker than the trip size and interrupting capacity would require. If the bus connectors furnished on the main bus will not cover the trip range specified, then duplicate sets of connectors shall be furnished on the main bus for each frame size required.

J. Distribution panels shall be as manufactured by ABB - General Electric, Square D, Siemens, or Eaton.

3.0 EXECUTION

3.01 INSTALLATION

A. Provide a typewritten directory under plastic for all panelboards with spares marked in pencil. Circuit identification shall include sufficient detail to allow each circuit to be distinguished from all others. Include specific tenant suite numbers in multi-tenant buildings in the circuit description. Provide a label on each breaker in a switchboard or distribution panelboard with the same level of circuit identification details.

B. Provide all necessary hardware to level and secure the switchgear as required by the manufacturer's instructions. Make all electrical connections for supply and load circuits and leave in operating condition.

C. Clean enclosure of all switchgear of all foreign matter, including dust.

D. Remove all rust marks and repaint to leave switchgear in new condition.

3.02 STUDIES

A. As a requirement for the project documents to be delivered by the contractor, provide a complete short circuit and selective coordination study from the service entrance to all end devices. The study shall be provided by the switchgear manufacturer or their vendor and shall utilize time current curves that are developed by the gear manufacturer selected for use in the building. The study shall be made available for review by the engineer and local code enforcement authorities no later than at the times they deem necessary for certificates of occupancy to be issued. Obtain critical dates from the inspections department of the local code enforcement department during the inspection process to determine when presentation of the selective coordination study to the inspections department is necessary for timely issuance of the certificate of occupancy.

B. The minimum project requirement described in A. above shall not be scaled back to the minimum NEC code requirement unless agreed to by all parties associated with the construction of the project including, but not limited to, the owner, architect, engineer, developer, etc.

\- END OF SECTION -

SECTION 263000
LIGHTING

1.0 GENERAL

1.01 DESCRIPTION

A. All work in this Section shall comply with the provisions of Section 260100.

B. Provide all lighting fixtures and lamps as specified herein and as shown.

C. All lamps shall be operating at the time of the final inspection and for a period of six (6) months after the final acceptance of the project by the Owner.

D. Confirm exact locations of all lighting fixtures by coordination with the Architects Reflected Ceiling Plans and mechanical equipment above or on the ceiling.

E. Confirm all ceiling types before ordering lighting fixtures.

F. Each lighting fixture shall have been tested and certified for proper operation by the fixture manufacturer for the type mounting and ceiling on/in, which it is installed.

2.0 PRODUCTS

2.01 LIGHTING FIXTURES

A. Each lighting fixture shall be as specified in the Lighting Fixture Schedule corresponding with its fixture type indication (letter).

B. Most lighting outlets are lettered or groups of outlets are indicated by a letter.

C. Each lighting fixture shall have a manufacturer's label affixed and shall comply with the requirements of all authorities having jurisdiction.

D. The lighting fixtures that are indicated by the letters shall be as indicated on the Lighting Fixture Schedule.

E. All LED fixtures shall be equipped with LEDs integral to fixture.

F. The type lamps as specified for each lighting fixture in the lighting fixture schedule for all fixtures not equipped with integral LEDs.

2.02 LED LIGHTING FIXTURES

A. LED lamps for interior use shall be 4000K, CRI 80 (min.), unless noted otherwise. Color temperature chromaticity over the lifetime of the product shall be within 0.007 on the CIE 1976 (u',v') diagram.

B. System shall be rated at a minimum for 50,000 hours (min.) at 70% lumen maintenance (L80).

C. System shall comply with the following:

1. ENERGY STAR® SSL Requirements for Luminaires
2. IESNA LM-16
3. IESNA LM-58-94
4. IESNA LM-79
5. IESNA LM-80
6. ANSI C82.2-2002
7. ANSI C82.77-2002
8. ANSI C78.377-2008
9. CIE 13.3-1995
10. CIE 15-2002
11. ANSI/UL 153
12. UL 1598

D. LED boards and drivers shall be provided with plug-in connections for tool-less replacement of components.

E. Compatibility of dimming switches for control of dimmable LED drivers shall be confirmed with LED fixture manufacturer.

2.03 LED DRIVERS

A. Drivers shall be replaceable with removal of the fixture, and shall be rated for 50,000 hours minimum.

B. Drivers shall be electronic, thermally protected and have an input voltage of 120/277VAC, 60Hz with a power factor greater than 0.90.

C. Drivers shall have less than 20% Total Harmonic Distortion.

D. Drivers shall have Class “A” sound rating.

E. Drivers shall come standard with 0-10V dimming.

2.04 DIFFUSERS

A. All diffusers for fixtures shall be as indicated on the Lighting Fixture Schedule.

2.05 LIGHT FIXTURE TRIM

A. Each recessed lighting fixture shall have a trim to match the type of ceiling (plaster, exposed grid, concealed spline, exposed panel, etc.) in which it is being installed, regardless of catalog number given. Coordinate with the Architect's reflected ceiling plan to provide the right trim for the type of ceiling the fixture is to be installed in.

B. Each lighting fixture recessed in a plastered ceiling of any type shall have a plaster frame.

3.0 EXECUTION

3.01 SUPPORT OF LIGHTING FIXTURES

A. All lighting shall be supported from the building structure. The fixtures shall be supported in a manner that will insure the fixture weight being equally distributed from each support and the fixture remaining in a level position.

B. Fluorescent fixtures installed recessed in a suspended ceiling system shall be supported from the building structure with two (2) 12 gauge wires on diagonal corners of the fixture. In addition, the fixture shall be clipped to members of the ceiling suspension system.

C. Fluorescent fixtures installed in or on any ceiling other than a suspended ceiling system specifically mentioned above shall be supported with concealed steel rods. Rods shall be 1/4" diameter minimum and shall be located where recommended by the fixture manufacturer. Provide a minimum of two (2) supports for each 4' or 8' fixture chassis. Supports shall be maximum of 48" centers. For incandescent fixtures, steel hanging wire may be used by attaching the wire to the fixture mounting frame.

D. Pendant mounted incandescent fixtures shall be stem supported by a fixture stud mounted in the outlet box. Suspended fluorescent fixtures shall have mounting stems located as per the manufacturer's recommendations, but in no case shall have less than two (2) stems per chassis.

3.02 AIMING OF ADJUSTABLE LIGHT FIXTURES

A. All fixtures with lamp position, tilt, shutters, rotation, or other types of adjustments during the final inspection. Fixtures serving areas where day lighting is predominant will be adjusted after sunset.

3.03 LIGHTING FIXTURES IN MILLWORK

A. Special attention shall be given to lighting fixtures indicated to be mounted within, under, on or otherwise incorporated into millwork or cabinetry.

B. Refer to the Architectural drawings and details for specific dimensions. This coordination shall occur prior to ordering fixtures to assure fixtures will fit the space limitations of the millwork.

C. This requirement is intended to preclude incurring additions to the Contract due to fixtures being too small or too large for the space.

3.04 FINAL PREPARATION

A. All plastic covers shall be removed from fixtures.

B. Clean all lens and reflectors from debris, fingerprints, dust, etc.

\- END OF SECTION -

BW&A

Barrett, Woodyard & Associates, Inc.

3495 Holcomb Bridge Road
Norcross, GA 30092
Phone (770) 810-8800

2023.05.30 07:52:30-04'00'

No.	Drawing Issue Description	Date
	ISSUED FOR PERMIT	05/26/23

14396 NC-210 SPRING LAKE, NC 28390

MIDGARD - SPRING LAKE

ELECTRICAL SPECIFICATIONS

WILL KELLY	2023-0683
PROJECT MANAGER	PROJECT NO.
SCOTT WILKINS	AS NOTED
PROJECT ENGINEER	SCALE
SCOTT WILKINS	05/26/23
DRAWN BY	DATE

E0.2
DRAWING NO.

ISSUED FOR CONSTRUCTION

SCHEDULES OF HILTI THROUGH PENETRATION FIRESTOP SYSTEMS					
CONCRETE FLOORS			GYPSUM WALLBOARD ASSEMBLIES		
TYPE OF PENETRANT	F-RATING	UL-CLASSIFIED SYSTEM	TYPE OF PENETRANT	F-RATING	UL-CLASSIFIED SYSTEM
METAL PIPES OR CONDUIT	1	F-A-1016	METAL PIPE OR CONDUIT	1	W-L-1054
	2	F-A-1016		2	W-L-1054
CONCRETE OR BLOCK WALLS			MULIPLE METAL PIPES OR CONDUITS	1	W-L-1389
TYPE OF PENETRANT	F-RATING	UL-CLASSIFIED SYSTEM		2	W-L-1389
SINGLE METAL PIPES OR CONDUIT	1	C-AJ-1226	BUNDLED CABLES	1	W-L-3334
	2	C-AJ-1226		2	W-L-3334
MULTIPLE METAL PIPES OR CONDUIT	1	C-AJ-1513	CABLE	1	W-L-3414
	2	C-AJ-1513		2	W-L-3414
ELECTRICAL BUSWAY	1	C-AJ-6042			
	2	C-AJ-6042			

NOTES:

1. Jobsite conditions of each through-penetration firestop system must meet ALL details of the UL-Classified System selected.

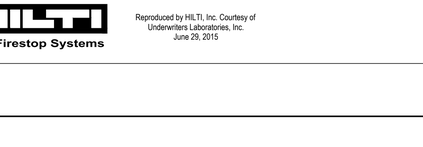
2. Where more than one applicable UL-Clssified System is listed in the schedules, choose the UL System which is most economical for each through-penetration firestop system.

3. Coordinate work with other trades to assure that penetration opening sizes are appropriate for penetrant locations, and vice versa.

System No. F-A-1016

Classified by Underwriters Laboratories, Inc. to UL 1479 and CAN/ULC-S115

ANSI/UL1479 (ASTM E814)	CAN/ULC S115
F Rating — 2 Hr	F Rating — 2 Hr
T Rating — 0 Hr	FT Rating — 0 Hr
L Rating At Ambient — Less Than 1 CFM/sq ft (See Item 3)	FH Rating — 2 Hr
L Rating At 400 F — Less Than 1 CFM/sq ft (See Item 3)	FTH Rating — 0 Hr
W Rating — Class 1 (See Items 4B and 4B1)	L Rating At Ambient — Less Than 1 CFM/sq ft (See Item 3)
	L Rating At 400 F — Less Than 1 CFM/sq ft (See Item 3)



SECTION A-A

1. Floor and Wall Assembly — Min 2-1/2 in. (64 mm) thick reinforced lightweight or normal weight (100-150 pcf or 1600-2400 kg/m3) concrete.
1A. Floor Assembly — (Optional, Not Shown)—The fire rated unprotected concrete and steel floor assembly shall be constructed of the materials and in the manner specified in the individual D900 Series designs in the UL Fire Resistance Directory and as summarized below:
   A. Concrete — Min 2-1/2 in. (64 mm) thick reinforced lightweight or normal weight (100-150 pcf or 1600-2400 kg/m3) concrete.
   B. Steel Floor and Form Units* — Composite or non-composite max 3 in. (76 mm) deep galv steel fluted units as specified in the individual Floor-Ceiling Design.
2. Firestop Device* — Cast in place firestop device permanently embedded during concrete placement or grouted in concrete floor assembly in accordance with accompanying installation instructions. The devices may extend a max of 2 in. (51 mm) above the top surface of the concrete.
   HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — CP 680N-7/5.5", CP 680N-110/4", CP 680N-160/6", CP 682-7/5.5", CP 682-110/4", CP 680-M 3", CP 680-M 4", CP 680-M 6", CP 680-P 2", CP 680-P 3", CP 680-P 4", CP 680-P 6", CP 680-PX 2", CP 680-PX 3"
3. Through Penetrants — One metallic pipe, conduit or tubing to be installed within the firestop device. Pipe, conduit or tubing to be rigidly supported on both sides of floor assembly. The following types of pipe, conduit or tubing may be used:
   A. Steel Pipe — Nom 6 in. (152 mm) diam (or smaller) Schedule 10 (or heavier) steel pipe.
   B. Iron Pipe — Nom 6 in. (152 mm) diam (or smaller) cast or ductile iron pipe.
   C. Conduit — Nom 6 in. (152 mm) diam (or smaller) rigid steel conduit.
   D. Conduit — Nom 4 in. (102 mm) diam (or smaller) steel electrical metallic tubing.
   E. Copper Tubing — Nom 6 in. (152 mm) diam (or smaller) Type L (or heavier) copper tubing.
   F. Copper Pipe — Nom 6 in. (152 mm) diam (or smaller) Regular) or heavier copper pipe.

The firestop device and metallic penetrant shall be sized as follows:

Nom Pipe Diam +, ++	Firestop Device
1-1/2 to 2-1/2 in.(38 to 64 mm) - Other than copper pipe or tubing	CP680N-7/5/2.5"or CP682-7/5/2.5"
1-1/2 to 2 in.(38 to 51 mm) - Other than copper pipe or tubing	CP 680-M 2", CP 680-P 2, CP 680-PX 2"
2 to 2-1/2 in. (51 to 64 mm) - Copper pipe or tubing	CP680N-7/5/2.5"or CP682-7/5/2.5"
	CP 680-M 2", CP 680-P 2", CP 680-PX 2"
2-1/2 to 3 in. (64 to 76 mm)	CP 680-M 3", CP 680-P 3", CP 680-PX 3"
4 in. (102 mm)	CP680N-110/4"or CP682-110/4"
	CP 680-M 4", CP 680-P 4"
6 in. (152 mm)	CP680N-160/6"
	CP 680-M 6", CP 680-P 6"

+ When metallic pipes of diameters smaller than those shown above are installed within the device, CP618 Firestop Putty Stick or mineral wool insulation shall be installed within the device.
++ L Rating applies only to CP 680-M and -P(X) devices and only when the nom diam of pipe equals size of device (2 in. diam pipe in 2" device etc.). L Rating does not apply to CP 680N and CP682 devices.
4. Fill, Void or Cavity Material* - Putty (Not Shown) — Min 1 in. (25 mm) thickness of fill material applied within annulus flush with top surface of device.
   HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — CP 618 Firestop Putty Stick
4A. Packing Material (Not Shown) — As an alternate to item 4, min 4 in. (102 mm) thickness of min 4 pcf (64 kg/m3) mineral wool insulation firmly packed to the fullest extent possible within annulus flush with top surface of device.
4B. Firestop Device* - Top Seal Plug — (Optional, Not Shown) - Top seal plug for use with CP 680-M 2" and CP 680-P 2" devices and nom pipe, conduit or tubing sizes of 1/2 in. (13 mm) to 2 in. (51 mm) diam. Plug is friction fit into top of firestop device (Item 2) in accordance with the manufacturer's instructions. When top seal plug is used, no putty (Item 4) or packing material (Item 4A) is required. W Rating applies only to nom 1, 1-1/4, 1-1/2 and 2 in. (25, 32, 38 and 51 mm) diam copper pipe/tube in conjunction with 2" CPS Top Seal and CP 680-M 2" or CP 680-P(X) 2" devices.
   HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — CPS Top Seal Plug

4B1. Firestop Device* - Water Barrier Module — (Optional, Not Shown) - Used as an alternate to the top seal plug (Item 4B) and in combination with the CP 680-M and CP 680-P(X) devices to achieve a W Rating. Module is threaded onto top of device. See Table below for sizes of device/module and penetrants covered. When water barrier module is used, a W Rating applies to the water barrier module, device and penetrant sizes specified in Table below. For W Rating with Water Barrier Module, pipe shall be installed from bottom of device.
   HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — Water Barrier Module

Penetrant Type (See Item 3 above)	Nom Penetrant Diam	Size of Device/Module
A, B, C, D	2"	2"
	2-1/2"	3"
	3"	3"
	4"	4"
	6"	6"
E, F	2"	2"
	3"	3"
	4"	4"
	6"	6"

* Indicates such products shall bear the UL or cUL Certification Mark for jurisdictions employing the UL or cUL Certification (such as Canada), respectively.

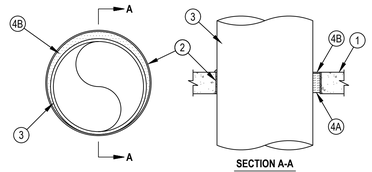
Hilti Firestop Systems

Reproduced by HILTI, Inc. Courtesy of Underwriters Laboratories, Inc. June 29, 2015

System No. C-AJ-1226

Classified by Underwriters Laboratories, Inc. to UL 1479 and CAN/ULC-S115

ANSI/UL1479 (ASTM E814)	CAN/ULC S115
F Rating — 3 Hr	F Rating — 3 Hr
T Rating — 0 Hr	FT Rating — 0 Hr
L Rating At Ambient — Less Than 1 CFM/sq ft	FH Rating — 3 Hr
L Rating At 400 F — 4 CFM/sq ft	FTH Rating — 0 Hr
	L Rating At Ambient — Less Than 1 CFM/sq ft
	L Rating At 400 F — 4 CFM/sq ft



SECTION A-A

1. Floor or Wall Assembly — Min 4-1/2 in. (114 mm) thick reinforced lightweight or normal weight (100-150 pcf or 1600-2400 kg/m³) concrete. Wall may also be constructed of any UL Classified Concrete Blocks*. Max diam of opening is 32 in. (813 mm).
2. Metallic Sleeve — (Optional) Nom 32 in. (813 mm) diam (or smaller) Schedule 40 (or heavier) steel sleeve cast or grouted into floor or wall assembly, flush with floor or wall surfaces or extending a max of 3 in. (76 mm) above floor or beyond both surfaces of wall.
2A. Sheet Metal Sleeve — (Optional) Max 6 in. (152 mm) diam, min 26 ga. galv steel provided with a 26 ga galv steel square flange spot welded to the sleeve at approx mid-height, or flush with bottom of sleeve in floors, and sized to be a min of 2 in. (51 mm) larger than the sleeve diam. The sleeve is to be cast in place and may extend a max of 4 in. (102 mm) below the bottom of the deck and a max of 1 in. (25 mm) above the top surface of the concrete floor.
2B. Sheet Metal Sleeve — (Optional) - Max 12 in. (305 mm) diam, min 24 ga galv steel provided with a 24 ga galv steel square flange spot welded to the sleeve at approx mid-height, or flush with bottom of sleeve in floors, and sized to be a min of 2 in. (51 mm) larger than the sleeve diam. The sleeve is to be cast in place and may extend a max of 4 in. (102 mm) below the bottom of the deck and a max of 1 in. (25 mm) above the top surface of the concrete floor.
3. Through-Penetrant — One metallic pipe, tube or conduit to be installed either concentrically or eccentrically within the firestop system. The annular space between penetrant and periphery of opening shall be min 0 in. (point contact) to max 1-7/8 in. (48 mm). Penetrant may be installed with continuous point contact. Penetrant to be rigidly supported on both sides of floor or wall assembly. The following types and sizes of metallic penetrants may be used:
   A. Steel Pipe — Nom 30 in. (762 mm) diam (or smaller) Schedule 10 (or heavier) steel pipe.
   B. Iron Pipe — Nom 30 in. (762 mm) diam (or smaller) cast or ductile iron pipe.
   C. Copper Pipe — Nom 6 in. (152 mm) diam (or smaller) Regular (or heavier) copper pipe.
   D. Copper Tubing — Nom 6 in. (152 mm) diam (or smaller) Type L (or heavier) copper tubing.
   E. Conduit — Nom 6 in. (152 mm) diam (or smaller) steel conduit.
   F. Conduit — Nom 4 in. (102 mm) diam (or smaller) steel electrical metallic tubing (EMT).
4. Firestop System — The firestop system shall consist of the following:
   A. Packing Material — Min 4 in. (102 mm) thickness of min 4 pcf (64 kg/m³) mineral wool batt insulation firmly packed into opening as a permanent form. Packing material to be recessed from top surface of floor or sleeve or from both surfaces of wall or sleeve as required to accommodate the required thickness of fill material.
   B. Fill, Void or Cavity Material* — Sealant — Min 1/4 in. (6 mm) thickness of fill material applied within the annulus, flush with top surface of floor or sleeve or with both surfaces of wall or sleeve. At the point or continuous contact locations between penetrant and concrete or sleeve, a min 1/4 in. (6 mm) diam bead of fill material shall be applied at the concrete or sleeve/ pipe penetrant interface on the top surface of floor and on both surfaces of wall.
   HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — FS-One Sealant or FS-ONE MAX Intumescent Sealant

* Indicates such products shall bear the UL or cUL Certification Mark for jurisdictions employing the UL or cUL Certification (such as Canada), respectively.

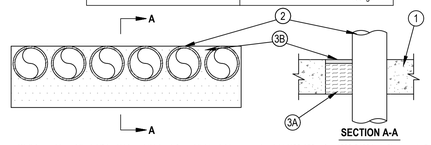
Hilti Firestop Systems

Reproduced by HILTI, Inc. Courtesy of Underwriters Laboratories, Inc. January 07, 2015

System No. C-AJ-1513

Classified by Underwriters Laboratories, Inc. to UL 1479 and CAN/ULC-S115

ANSI/UL1479 (ASTM E814)	CAN/ULC S115
F Rating - 2 Hr	F Rating - 2 Hr
T Rating - 0 Hr	FT Rating - 0 Hr
	FH Rating - 2 Hr
	FTH Rating - 0 Hr



SECTION A-A

1. Floor or Wall Assembly — Min 4-1/2 in. (114 mm) thick reinforced lightweight or normal weight (100-150 pcf or 1600-2400 kg/m3) concrete floor. Min 5 in. (127 mm) thick reinforced lightweight or normal weight (100-150 pcf or 1600-2400 kg/m3) concrete wall. Wall may also be constructed of any UL Classified Concrete Blocks*. Max size of opening is 8 in. (203 mm) by 30 in. (763 mm).
   See Concrete Blocks (CAZT) category in the Fire Resistance Directory for names of manufacturers.
2. Through Penetrants — One or more metallic penetrants to be installed either concentrically or eccentrically within the firestop system. The total number of penetrants is dependent on the size of the opening and sizes of penetrants. The annular space between the penetrants and periphery of opening shall be min 0 in. (point contact). The annular space between nom 2 in. (51 mm) diam (and smaller) penetrants shall be a min 0 in. (point contact). The annular space between penetrants greater than nom 2 in. (51 mm) diam shall be a min. 1/2 in. (13 mm) . A max annular space in the system shall be 12 in. (305 mm). Penetrants to be rigidly supported on both sides of floor or wall assembly. The following types and sizes of penetrants may be used:
   A. Conduit — Nom 4 in. (102 mm) diam (or smaller) steel electrical metallic tubing or rigid steel conduit
   B. Through Penetrating Product* — Flexible Metal Piping — The following types of steel flexible metal gas piping may be used:
      1.) Nom 2 in. (51 mm) diam (or smaller) steel flexible metal gas piping. Plastic covering on piping may or may not be removed on both sides of floor or wall assembly.
      OMEGA FLEX INC.
      2.) Nom 1 in. (25 mm) diam (or smaller) steel flexible metal gas piping. Plastic covering on piping may or may not be removed on both sides of floor or wall assembly.
      GASTITE, DIV OF TITEFLEX
      3.) Nom 2 in. (51 mm) diam (or smaller) steel flexible metal gas piping. Plastic covering on piping may or may not be removed on both sides of floor or wall assembly.
      WARD MFG L L C
3. Firestop System — The firestop system shall consist of the following:
   A. Packing Material — Min 4 in. (102 mm) thickness of 4 pcf (64 kg/m3) mineral wool batt insulation tightly packed into the opening as a permanent form. Packing material to be recessed from top surface of floor or both surfaces of wall to accommodate the required thickness of fill material.
   B. Fill, Void or Cavity Material - Sealant* — Min 1/2 in. (13 mm) thickness of fill material applied within the annulus flush with the top surface of the floor or both surfaces of the wall.
   HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — FS-ONE Sealant or FS-ONE MAX Intumescent Sealant.

* Indicates such products shall bear the UL or cUL Certification Mark for jurisdictions employing the UL or cUL Certification (such as Canada), respectively.

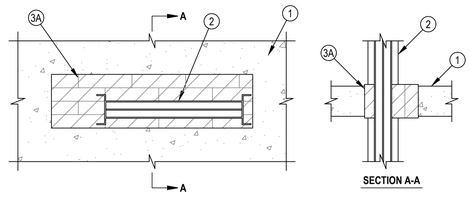
Hilti Firestop Systems

Reproduced by HILTI, Inc. Courtesy of Underwriters Laboratories, Inc. January 08, 2015

System No. C-AJ-6042

Classified by Underwriters Laboratories, Inc. to UL 1479 and CAN/ULC-S115

ANSI/UL1479 (ASTM E814)	CAN/ULC S115
F Rating — 2 Hr	F Rating — 2 Hr
T Rating — 0 Hr	FT Rating — 0 Hr
	FH Rating — 2 Hr
	FTH Rating — 0 Hr



SECTION A-A

1. Floor or Wall Assembly — Min 4-1/2 in. (114 mm) thick reinforced lightweight or normal weight (100-150 pcf or 1600-2400 kg/m3) concrete floor or wall. Wall may also be constructed of any UL Listed Concrete Blocks*. Max area of opening is 240 in.2 (1548 mm2) with max dimension of 30 in. (762 mm).
   See Concrete Blocks (CAZT) in the UL Fire Resistance Directory for names of manufacturers.
2. Busway — One nom 23 in. (584 mm) wide (or smaller) by 4-1/2 in. (114 mm) deep, or max two nom 11-1/4 in. (286 mm) wide (or smaller) by 4-1/2 in. (114 mm) deep, "I" shaped aluminum enclosure containing factory mounted aluminum bars rated for 600 V, 4000A or copper bars rated for 600 V, 5000 A. When two busways are installed, they shall be placed end to end and the annular space between busways shall be min 1/2 in. (13 mm). The annular space between busways and periphery of opening shall be min 1/4 in. (6 mm) to max 5-3/4 in. (146 mm). Busways to be rigidly supported on both sides of floor and wall assembly. The busways shall bear the UL Listing Mark and shall be installed in accordance with the National Electrical Code, NFPA No. 70.
3. Firestop System — The firestop system shall consist of the following:
   A. Fill, Void or Cavity Material* — Fire blocks installed with 5 in. (127 mm) dimension passed through the opening and centered within the thickness of the floor or wall. In concrete block walls, fire block to fill entire thickness of wall opening unless wall is solid filled. Blocks to be firmly packed and completely fill the entire area of opening between and around busways.
   HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — CFS-BL Firestop Block
   B. Fill, Void or Cavity Material* — (Not Shown) - Fill material to be applied to maximum extent possible within the opening between and around busways and fire block to fill any voids. This fill material is to be applied from the top surface of the floor assembly or both surfaces of wall assembly.
   HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — FS-ONE Intumescent Sealant or FS-ONE MAX Intumescent Sealant.

* Indicates such products shall bear the UL or cUL Certification Mark for jurisdictions employing the UL or cUL Certification (such as Canada), respectively.

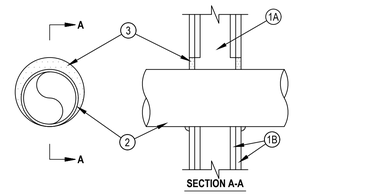
Hilti Firestop Systems

Reproduced by HILTI, Inc. Courtesy of Underwriters Laboratories, Inc. April 26, 2017

System No. W-L-1054

Classified by Underwriters Laboratories, Inc. to UL 1479 and CAN/ULC-S115

ANSI/UL1479 (ASTM E814)	CAN/ULC S115
F Ratings —1 and 2 Hr (See Items 1 and 3)	F Ratings — 1 and 2 Hr (See Items 1 and 3)
T Rating — 0 Hr	FT Rating — 0 Hr
L Rating at Ambient — Less Than 1 CFM/sq ft	FH Ratings —1 and 2 Hr (See Items 1 and 3)
L Rating at 400 F — Less Than 1 CFM/sq ft	FTH Rating — 0 Hr
	L Rating at Ambient — Less Than 1 CFM/sq ft
	L Rating at 400 F — Less Than 1 CFM/sq ft



SECTION A-A

1. Wall Assembly — The 1 or 2 hr fire-rated gypsum wallboard/stud wall assembly shall be constructed of the materials and in the manner specified in the individual U300 or U400 Series Wall and Partition Designs in the UL Fire Resistance Directory and shall include the following construction features:
   A. Studs — Wall framing may consist of either wood studs or steel channel studs. Wood studs to consist of nom 2 by 4 in. (51 by 102 mm) lumber spaced 16 in. (406 mm) OC. Steel studs to be min 2-1/2 in. (64 mm) wide and spaced max 24 in. (610 mm) OC. When steel studs are used and the diam of opening exceeds the width of stud cavity, the opening shall be framed on all sides using lengths of steel stud installed between the vertical studs and screw-attached to the steel studs at each end. The framed opening in the wall shall be 4 to 6 in. (102 to 152 mm) wider and 4 to 6 in. (102 to 152 mm) higher than the diam of the penetrating item such that, when the penetrating item is installed in the opening, a 2 to 3 in. (51 to 76 mm) clearance is present between the penetrating item and the framing on all four sides.
   B. Gypsum Board* — 5/8 in. (16 mm) thick, 4 ft (122 cm) wide with square or tapered edges. The gypsum board type, thickness, number of layers, fastener type and sheet orientation shall be as specified in the individual U300 or U400 Series Design in the UL Fire Resistance Directory. Max diam of opening is 32-1/4 in. (819 mm) for steel stud walls. Max diam of opening is 14-1/2 in. (368 mm) for wood stud walls.
   The F and FH Ratings of the firestop system are equal to the fire rating of the wall assembly.
2. Through-Penetrants — One metallic pipe, conduit or tubing to be installed either concentrically or eccentrically within the firestop system. The annular space shall be min 0 in. to max 2-1/4 in. (57 mm). Pipe may be installed with continuous point contact. Pipe, conduit or tubing to be rigidly supported on both sides of wall assembly. The following types and sizes of metallic pipes, conduits or tubing may be used:
   A. Steel Pipe — Nom 30 in. (762 mm) diam (or smaller) Schedule 10 (or heavier) steel pipe.
   B. Iron Pipe — Nom 30 in. (762 mm) diam (or smaller) cast or ductile iron pipe.
   C. Conduit — Nom 4 in. (102 mm) diam (or smaller) steel electrical metallic tubing or 6 in. (152 mm) . diam steel conduit.
   D. Copper Tubing — Nom 6 in. (152 mm) diam (or smaller) Type L (or heavier) copper tubing.
   E. Copper Pipe — Nom 6 in. (152 mm) diam (or smaller) regular (or heavier) copper pipe.
3. Fill, Void or Cavity Material* — Sealant — Min 5/8 in. (16 mm) thickness of fill material applied within the annulus, flush with both surfaces of wall. At the point or continuous contact locations between pipe and wall, a min 1/2 in. (13 mm) diam bead of fill material shall be applied at the pipe wall interface on both surfaces of wall.
   HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — FS-One Sealant or FS-ONE MAX Intumescent Sealant

* Indicates such products shall bear the UL or cUL Certification Mark for jurisdictions employing the UL or cUL Certification (such as Canada), respectively.

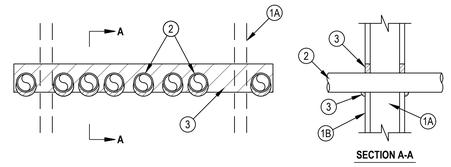
Hilti Firestop Systems

Reproduced by HILTI, Inc. Courtesy of Underwriters Laboratories, Inc. October 14, 2015

System No. W-L-1389

Classified by Underwriters Laboratories, Inc. to UL 1479 and CAN/ULC-S115

ANSI/UL1479 (ASTM E814)	CAN/ULC S115
F Ratings — 1 and 2 Hr (See Item 1and 3)	F Ratings — 1 and 2 Hr (See Items 1 and 3)
T Rating — 0 Hr	FT Rating — 0 Hr
	FH Ratings — 1 and 2 Hr (See Items 1 and 3)
	FTH Rating — 0 Hr



SECTION A-A

1. Wall Assembly — The 1 or 2 hr fire-rated gypsum board/stud wall assembly shall be constructed of the materials and in the manner described in the individual U400, V400 or W400 Series Wall and Partition Designs in the UL Fire Resistance Directory and shall include the following construction features:
   A. Studs — Wall framing shall consist of min 3-5/8 in. (92 mm) wide steel studs spaced max 24 in. (610 mm) OC.
   B. Gypsum Board* — Thickness, type, number of layers and fasteners, as specified in the individual Wall and Partition Design. Max height of opening is 3-1/2 in. (89 mm). Max width of opening is 32 in. (813 mm).
   The hourly F, FH Ratings of the firestop system are equal to the hourly fire rating of the wall assembly in which it is installed.
2. Through Penetrants — Multiple pipes or conduits installed in single layer array within the firestop system. The annular space between the pipes and conduits and the edges of the opening shall be min 0 in. (0 mm, point contact) to max 1-3/8 in. (35 mm). The separation between pipes and conduits to be a min 0 in. (0 mm, point contact) to a max 1-1/4 in. (32 mm). Pipes and conduits to be rigidly supported on both sides of wall assembly. The following types and sizes of metallic pipes or conduits may be used:
   A. Steel Pipe — Nom 2 in. (51 mm) diam (or smaller) Schedule 5 (or heavier) steel pipe.
   B. Conduit — Nom 2 in. (51 mm) diam (or smaller) rigid steel conduit or steel electrical metallic tubing (EMT).
3. Fill Void or Cavity Materials* - Sealant — Min 5/8 in. (16 mm) thickness of fill material installed to completely fill annular space between pipes, conduits and gypsum flush with each surface of wall. Min 1/2 in. (13 mm) diam bead of fill material applied to the through penetrant/wall interface at the point contact locations on both sides of the wall. The 2 hour F, FH Ratings apply only when FS-ONE Sealant is used.
   HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — Hilti CP 606 Flexible Firestop Sealant or FS-ONE Sealant, FS-ONE MAX Intumescent Sealant

* Indicates such products shall bear the UL or cUL Certification Mark for jurisdictions employing the UL or cUL Certification (such as Canada), respectively.

Hilti Firestop Systems

Reproduced by HILTI, Inc. Courtesy of Underwriters Laboratories, Inc. January 22, 2015

BW&A

Barrett, Woodyard & Associates, Inc.

3495 Holcomb Bridge Road
Norcross, GA 30092
Phone (770) 810-8800

NORTH CAROLINA PROFESSIONAL SEAL 053859 ENGINEER THOMAS WILLIAM KELLY

2023.05.30 07:52:43-04'00'

No.	Drawing Issue Description	Date
	ISSUED FOR PERMIT	05/26/23

14396 NC-210 SPRING LAKE, NC 28390

MIDGARD - SPRING LAKE

FIRE PENETRATION DETAILS

WILL KELLY	2023-0683
PROJECT MANAGER	PROJECT NO.
SCOTT WILKINS	AS NOTED
PROJECT ENGINEER	SCALE
SCOTT WILKINS	05/26/23
DRAWN BY	DATE

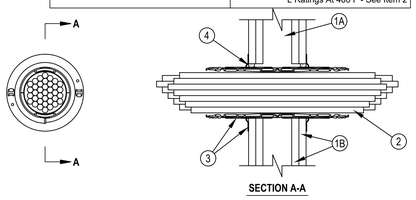
E0.3

DRAWING NO.

ISSUED FOR CONSTRUCTION

System No. W-L-3334

ANSI/UL1479 (ASTM E814)	CAN/ULC S115
F Ratings - 1, 2, 3 and 4 Hr (See Item 1)	F Ratings - 1, 2, 3 and 4 Hr (See Item 1)
T Ratings - 0, 1/2, 1, 1-1/2, 2 Hr (See Items 2 and 3)	FT Ratings - 0, 1/2, 1, 1-1/2, and 2 Hr (See Items 2 and 3)
L Rating At Ambient - See Item 2	FH Ratings - 1, 2, 3 and 4 Hr (See Item 1)
L Ratings At 400 F - See Item 2	FTH Ratings - 0, 1/2, 1, 1-1/2, and 2Hr (See Items 2 and 3)
	L Rating At Ambient - See Item 2
	L Ratings At 400 F - See Item 2



SECTION A-A

1. Wall Assembly — The 1, 2, 3 or 4 hr fire rated gypsum board/stud wall assembly shall be constructed of the materials and in the manner described within the individual U300, U400, V400 or W400 Series Wall and Partition Designs in the UL Fire Resistance Directory and shall incorporate the following construction features:
   A. Studs — Wall framing shall consist of either wood studs or steel channel studs. Wood studs to consist of nom 2 by 4 in. (51 by 102 mm) lumber spaced max 16 in. (406 mm) OC. Steel studs to be min 2-1/2 in. (64 mm) wide and spaced max 24 in. (610 mm) OC for 1 and 2 hr wall assemblies. Steel Studs to be 3-5/8 in. (92 mm) for 3 and 4 hr wall assemblies. Steel studs to be min 3-1/2 in. (89 mm) wide when 3/4 in. (19 mm) thick gypsum board is used (see Item 1B).
   B. Gypsum Board* — Nom 5/8 in. (16 mm) thick gypsum board as specified in the individual Wall and Partition Design. Alternately, for 1 and 2 hr rated walls only, one layer of nom 3/4 in. (19 mm) thick gypsum board on each side of wall as specified in the individual Wall and Partition Design may be used. Opening in gypsum board to be max 2-1/2 in. (64 mm) diam for 2" device and max 4-1/2 in. (114 mm) diam for 4" device.
   The hourly F and FH Ratings of the firestop system are dependent upon the hourly rating of the wall in which it is installed.
2. Cables — Within the loading area for each firestop device, the cables may represent a 0 to 100 percent visual fill. Cables to be tightly bundled within the device and rigidly supported on both sides of wall assembly. Any combination of the following types of cables may be used:
   A. Max 100 pair No. 24 AWG (or smaller) copper conductor telecommunication cable with polyvinyl chloride (PVC) jacketing and insulation.
   B. Max 7/C No. 12 AWG copper conductor control cable with PVC or XLPE jacket and insulation.
   C. Max 4/0 AWG Type RHH ground cable.
   D. Max 4 pr No. 22 AWG Cat 5 or Cat 6 computer cables.
   E. Max RG 6/U coaxial cable with fluorinated ethylene insulation and jacketing.
   F. Fiber optic cable with polyvinyl chloride (PVC) or polyethylene (PE) jacket and insulation having a max diam of 1/2 in. (13 mm).
   G. Max 20/C No. 22 AWG shielded printer cable with PVC jacket.
   H. Through-Penetrating Product* - Two copper conductors No. 18 AWG (or smaller) Power or Non Power Limited Fire Alarm Cable with or without a jacket under a metal armor.
   AFC CABLE SYSTEMS INC
   I. Max. 1/4 in. (6 mm) diameter S-Video Cable consisting of 2 max 24 AWG 75 ohm coax or twisted pair cable with PE insulation and PVC jacket .
   J. Max 3/C No 12 AWG MC Cable.
   K. Through Penetrating Product* — Any cables, Armored Cable+ or Metal Clad Cable+ currently Classified under the Through Penetrating Product category. See Through Penetrating Product (XHLY) category in the Fire Resistance Directory for names of manufacturers.
   When the hourly rating of the wall assembly is 1 hr, the T, FT and FTH Ratings are 0 hr. When the hourly rating of the wall assembly is 2 hr, the T, FT and FTH Ratings are 1 hr except that, when Item 2J or 2K is used, the T, FT and FTH Ratings are 1/2 hr . When the hourly rating of the wall assembly is 3 or 4 hr, the T, FT and FTH Ratings are 1-1/2 and 2 hr, respectively.
   L Ratings apply only when device flanges are used. L Ratings vary depending on whether the gasketing material (see Item 3) or the sealant (Item 4) is used. See Table below for L Ratings.

Max Cable Fill	Cable Type	L Rating, CFM/Sq Ft				L Rating, CFM			
		Ambient		400°F		Ambient		400°F	
		Sealant	Gasket	Sealant	Gasket	Sealant	Gasket	Sealant	Gasket
0%	—	Less than 1	1.0	Less than 1	2.7	Less than 1	Less than 1	Less than 1	Less than 1
100%	Item 2D only	4.9	4.9	1.3	3.5	Less than 1	Less than 1	Less than 1	Less than 1
100%	Any cables (Item 2) in any combination	9.2	9.2	9.6	11.8	1.2	1.2	1.3	1.6

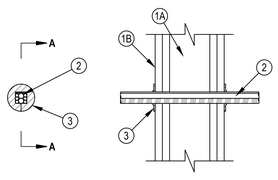
3. Firestop Device* — Firestop device consists of a corrugated steel tube with an inner plastic housing, intumescent material rings, twisted inner fabric smoke seal, flanges and gasketing material (not shown). Firestop device to be installed in accordance with the accompanying installation instructions. As an option, the inner fabric seal may remain open except that, to attain the L Rating, the inner fabric seal shall be twisted to completely close off the opening within device. Device slid into wall such that ends project an equal distance from the approximate centerline of the wall assembly. The annular space between the device and the periphery of the opening shall be min 0 in. (point contact). Device provided with flanges that are spun clockwise onto device threads, over gasketing material butting tightly to both sides of wall. As an alternate to gasket material, sealant (Item 4) may be used. Device flanges are optional, except that when ¾ in. (19 mm) gypsum board (see Item 1B) is used, device flanges shall be used and for 3 and 4 hr fire rating, device flanges shall be used. When the device flanges are not used, the T, FT and FTH Ratings for the firestop system are 0 hr.
   HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — CP 653 and CP 653 BA 2" Speed Sleeve, CP 653 and CP 653 BA 4" Speed Sleeve
4. Fill, Void or Cavity Material* - Sealant — As an alternate to gasket material (see Item 3), min 1/2 in. (13 mm) thickness of fill material applied within the annulus between firestop device and wall, flush with both surfaces of wall, and an additional 1/4 in. (6 mm) bead applied around periphery of device. When device flanges are used, gypsum drywall compound may be used in place of the fill material. Sealant is required when device flanges are not used (see Item 3).
   HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — FS-ONE, FS-ONE MAX Intumescent Sealant, or CP 606 Sealant

* Indicates such products shall bear the UL or cUL Certification Mark for jurisdictions employing the UL or cUL Certification (such as Canada), respectively.
+Bearing the UL Listing Mark

Hilti Firestop Systems

System No. W-L-3414

ANSI/UL1479 (ASTM E814)	CAN/ULC S115
F Ratings — 1 and 2 Hr (See Item 1)	F Ratings — 1 and 2 Hr (See Item 1)
T Ratings — 0, ½, 1 and 2 Hr (See Item 2)	FT Ratings — 0, ½, 1 and 2 Hr (See Item 2)
L Rating at Ambient — Less than 1 CFM/Opening	FH Ratings — 1 and 2 Hr (See Item 1)
L Rating at 400 F — Less than 1 CFM/Opening	FTH Ratings — 0, ½, 1 and 2 Hr (See Item 2)
	L Rating at Ambient — Less than 1 CFM/Opening
	L Rating at 400 F — Less than 1 CFM/Opening



SECTION A-A

1. Wall Assembly — The 1 or 2 hr fire rated gypsum board/stud wall assembly shall be constructed of the materials and in the manner specified in the individual U300, U400, V400 or W400 Series Wall and Partition Designs in the UL Fire Resistance Directory and shall include the following construction features:
   A. Studs — Wall framing may consist of either wood studs or steel channel studs. Wood studs to consist of nom 2 in. (51 mm) by 4 in. (102 mm) lumber spaced 16 in. (406 mm) OC. Steel studs to be min 3-1/2 in. (89 mm) wide and spaced max 24 in. (610 mm) OC.
   B. Gypsum Board* — 5/8 in. (16 mm) thick, 4 ft (1219 cm) wide with square or tapered edges. The gypsum wallboard type, thickness, number of layers, fastener type and sheet orientation shall be as specified in the individual Wall and Partition Design. Opening may be round, rectangular or irregular with a max diam or dimension of 1 in. (25 mm).
   The hourly F and FH Ratings of the firestop system are equal to the hourly fire rating of the wall assembly in which it is installed.
2. Cables — Single or tight bundle of cables to be installed within the opening. Aggregate cross-sectional area of cables in opening to have a visual fill of min 0% to max 100%. The annular space between the cable bundle and the periphery of the opening to be min 0 in. (point contact). Cables to be rigidly supported on both sides of the wall assembly. Any combination of the following types and sizes of cables may be used:
   A. Max 3/C No. 8 AWG NM copper conductor cable (Romex) with PVC insulation and jacket.
   B. Max 7/C-No. 12 AWG copper conductor control cable with PVC or XLPE insulation and jacket.
   C. Max 100 pair No. 24 AWG (or smaller) copper conductor telecommunication cable with PVC or plenum rated insulation and jacketing.
   D. Max 4 pr No. 22 AWG (or smaller) Cat 5 or Cat 6 computer cables with PVC or plenum rated insulation and jacketing.
   E. Type RG/U coaxial cable with fluorinated ethylene or PVC insulation and jacketing having a max outside diameter of ⅓ in. (13 mm).
   F. Max 24 fiber optic cable with polyvinyl chloride (PVC) or polyethylene (PE) jacket and insulation.
   G. Through Penetrating Product* — Max two copper conductor No. 18 AWG (or smaller) Power or Non-Power Limited Fire Alarm Cable with or without a jacket under a metal armor.
   AFC CABLE SYSTEMS INC
   H. Maximum 3/C No. 10 AWG copper conductor metal-clad cable.
   The hourly T, FT and FTH Ratings of the firestop system are dependent on cable type and hourly wall rating as specified in Table below.

Cable Type	Hourly Wall Rating	Hourly T, FT and FTH Rating
None (Blank Opening)	1 and 2	1 and 2
A	1 and 2	1 and 2
B	1	0
	2	1/2
C	1	0
	2	1/2
D	1 and 2	1 and 2
E	1 and 2	1 and 2
F	1 and 2	1 and 2
G	1 and 2	1 and 2
H	1 and 2	1 and 2

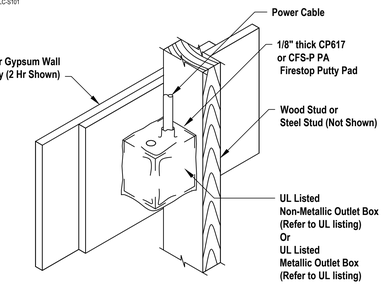
3. Fill, Void or Cavity Material* — Nom 60 mm diam by 3 mm thick putty disc with one seam at radius. Paper-backer of disc to be removed and disc firmly pressed around the cable/cable bundle lapping nom 5 mm onto cables to completely cover opening and firmly pressed to lap onto the wall around periphery of opening. Disc seam to be firmly pressed and sealed tight, Disc to be installed at both surfaces of wall.
   HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — CFS-D 1" Firestop Cable Disc

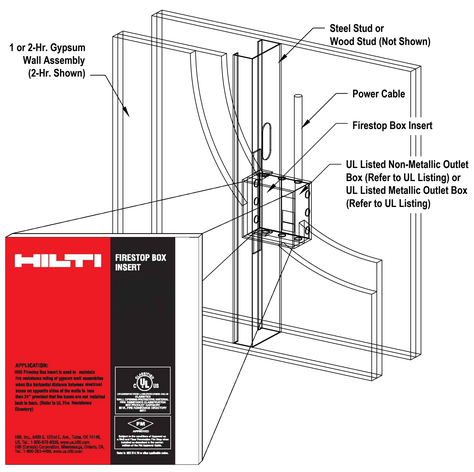
* Indicates such products shall bear the UL or cUL Certification Mark for jurisdictions employing the UL or cUL Certification (such as Canada), respectively.

Hilti Firestop Systems

Wall Opening Protective Materials (CLIV, CLIV7)

Classified by Underwriters Laboratories, Inc. to UL 263 and CAN/ULC-S101





CP 617 or CFS-P PA Firestop Putty Pads, for use with flush device UL Listed Metallic Outlet Boxes installed with steel mud rings or UL Listed Nonmetallic Outlet Boxes in framed wall assemblies as specified below. When protective material is used on outlet boxes on both sides of the wall as directed, the horizontal separation between outlet boxes on opposite sides of the wall may be less than 24 in. provided that the boxes are not installed back-to-back (unless otherwise indicated). Installation shall comply with the National Electrical Code (NFPA 70). Min 1/8 in. thick (CP 617) or min 0.2 in. (CFS-P PA) thick moldable putty pads are to be installed to completely cover the exterior surfaces of the outlet box (except for the side of the outlet box against the stud) and conduit fittings/connectors and to completely seal against the stud and gypsum board in the wall cavity unless otherwise noted below. When CFS-P PA is used, the putty pads may be installed with the release liner intact on the outside of the pad with the exception of any overlaps, in which case the liner is to be removed from the bottom layer at the overlap location. The box composition, max device dimensions, hourly rating, type of stud and type of faceplate are specified below.

CP 617 or CFS-P PA Firestop Putty Pads, for use with max 4 by 4 by max 2-1/8 in. flush device UL Listed Metallic Outlet Boxes installed with steel cover plates in 1 and 2 hr. fire rated gypsum wallboard wall assemblies framed with min 3-1/2 in. deep wood or steel studs and constructed as specified in the individual U300, U400 or V400 Series Wall and Partition Designs in the Fire Resistance Directory.

CP 617 or CFS-P PA Firestop Putty Pads, for use with max 4-11/16 by 4-11/16 by max 2-1/8 in., or max 4-3/8 by 4-7/8 by max 2-1/8 in., flush device UL Listed Metallic Outlet Boxes installed with steel cover plates for use in 1 hr fire rated V446 gypsum board/steel stud or U341 gypsum board/wood stud Wall and Partition Design No. in the Fire Resistance Directory. When U341 wall design is used, wall shall be sheathed with 5/8 in. gypsum board, and glass or mineral fiber batt insulation shall be installed in stud cavities in accordance with U341 design. Boxes may be installed back-to-back.

CP 617 or CFS-P PA Firestop Putty Pads, for use with max 4-11/16 by 4-11/16 by max 2-1/8 in. flush device UL Listed Metallic Outlet Boxes installed with steel cover plates for use in 1 and 2 hr fire rated gypsum board wall assemblies framed with min 3-1/2 in. deep wood or steel studs and constructed of the materials and in the manner specified in the individual U300, U400 or V400 Series Wall and Partition Designs in the Fire Resistance Directory. Min 0.8 pcf density fiberglass batt insulation is to be installed within the wall cavity required for 1 hr fire rated gypsum board wall assemblies and optional in 2 hr fire rated gypsum wallboard assemblies.

CP 617 or CFS-P PA Firestop Putty Pads, for use with max 4 by 3-3/4 by 3 in. deep UL Listed Nonmetallic Outlet Boxes manufactured by Carlon Electrical Products, made from polyvinyl chloride, and bearing a 2 hr rating under the "Outlet Boxes and Fittings Classification for Fire Resistance" category in the Fire Resistance Directory. Putty pads and boxes for use in 1 and 2 hr fire rated gypsum wallboard assemblies, framed with min 3-1/2 in. deep wood studs and constructed as specified in the individual U300 Series Wall and Partition Designs in the Fire Resistance Directory. Outlet box secured to wood stud by means of two nailing tabs supplied with the outlet box. Putty pads shall lap min 1/2 in. onto the stud and gypsum board within the stud cavity. Outlet boxes installed with steel or plastic cover plates.

CP 617 or CFS-P PA Firestop Putty Pads, for use with max 4 by 4 by 2-7/8 in. deep UL Listed Nonmetallic Outlet Boxes manufactured by Carlon Electrical Products, made from polyvinyl chloride, and bearing a 2 hr rating under the "Outlet Boxes and Fittings Classification for Fire Resistance" category in the Fire Resistance Directory. Putty pads and boxes for use in the 1 hr fire rated V446 gypsum board/steel stud or U341 gypsum board/wood stud Wall and Partition Design in the Fire Resistance Directory. When U341 wall design is used, wall shall be sheathed with 5/8 in. gypsum board, and glass or mineral fiber batt insulation shall be installed in stud cavities in accordance with U341 design. Outlet box secured to steel stud by means of fastening tab supplied with the outlet box. Putty pads shall lap min 1/2 in. onto the stud and gypsum board within the stud cavity. Outlet boxes installed with steel or plastic cover plates. Boxes may be installed back to back.

CP 617 Firestop Putty Pads, for use with max 2-1/4 by 3-3/4 by 2-3/4 in. deep UL Listed Nonmetallic Outlet Boxes manufactured by Pass and Seymore, Inc., and bearing a 2 hr rating under the "Outlet Boxes and Fittings Classification for Fire Resistance" category in the Fire Resistance Directory. Putty pads and boxes for use in 1 and 2 hr fire rated gypsum wallboard assemblies, framed with min 3-1/2 in. deep wood studs and constructed as specified in the individual U300 Series Wall and Partition Designs in the Fire Resistance Directory. Outlet box secured to wood stud by means of two nailing tabs supplied with the outlet box Putty pads shall lap min 1/2 in. onto the stud and gypsum board within the stud cavity. Outlet boxes installed with steel or plastic cover plates.

CP 617 or CFS-P PA Firestop Putty Pads, for use with max 4 by 3-3/4 by 3 in. deep UL Listed Nonmetallic Outlet Boxes manufactured by Allied Molded Products, Inc., made from fiber reinforced thermoplastic and bearing a 2 hr rating under the "Outlet Boxes and Fittings Classification for Fire Resistance" category in the Fire Resistance Directory. Putty pads and boxes for use in 1 hr fire rated gypsum wallboard assemblies, framed with min 3-1/2 in. deep wood studs and constructed as specified in the individual U300 Series Wall and Partition Designs in the Fire Resistance Directory. Outlet box secured to wood stud by means of two nailing tabs supplied with the outlet box. Putty pads shall lap min 1/2 in. onto the stud and gypsum board within the stud cavity. Outlet boxes installed with plastic cover plates.

CP 617 or CFS-P PA Firestop Putty Pads, for use with max 4 in. by 1-1/2 in. deep flush device UL Listed Metallic Outlet Boxes installed with steel cover plates in 1 hr. fire rated gypsum wallboard wall assemblies framed with min 3-1/2 in. deep wood or steel studs and constructed as specified in the individual U300, U400 or V400 Series Wall and Partition Designs in the Fire Resistance Directory. The boxes are installed back to back with 5 in. by 4 in. UL Classified fire block, CP 657 or CFS-BL Firestop Block installed in the cavity between the two boxes.

CP 617 or CFS-P PA Firestop Putty Pads, for use with max 14 by 4 by max 2-1/2 in. flush device UL Listed Metallic Outlet Boxes installed with steel cover plates in 1 and 2 hr. fire rated gypsum board wall assemblies framed with min 5-1/2 in. deep wood or steel studs for 2 hr fire rated walls and min 3-1/2 in. deep wood or steel studs for 1 hr fire rated walls. Walls constructed as specified in the individual U300, U400 or V400 Series Wall and Partition Designs in the Fire Resistance Directory. Stud cavity insulation is required and shall consist of min 5-1/2 in. (2 hr rated walls) or min 3-1/2 in. (1 hr rated walls) thick fiberglass (min 0.8 pcf) or mineral fiber (min 4 pcf). Putty pads shall lap min 1/2 in. onto the stud and gypsum board within the stud cavity. When boxes are interconnected by means of electrical metallic tube (EMT) or conduit, a ball of putty pad material shall be used to completely plug the open end of each EMT or conduit within the box.

CP 617 or CFS-P PA Firestop Putty Pads, for use with max 4-11/16 by 4-11/16 by max 2-1/8 in. flush device UL Listed Metallic Outlet Boxes installed with steel or plastic cover plates in 1 and 2 hr fire rated gypsum board wall assemblies framed with min 5-1/2 in. deep steel studs and constructed of the materials and in the manner specified in the individual U400 or V400 Series Wall and Partition Designs in the Fire Resistance Directory. Putty pads shall lap min 1/2 in. onto the stud and gypsum board within the stud cavity. When boxes are interconnected by means of electrical metallic tube (EMT) or conduit, a ball of putty pad material shall be used to completely plug the open end of each EMT or conduit within the box. Metallic outlet boxes may be provided with steel attachment brackets which offset box min 1/4 in. from stud. When steel attachment brackets are used, putty pad to be affixed to the back and all four sides of the box.

CFS-P PA Moldable Putty Pads, for use with max 4-11/16 by 4-11/16 in. by max 2-1/8 in. flush device UL Listed Metallic Outlet Boxes installed with steel cover plates in 2 hr fire rated gypsum board wall assemblies framed with min 3-1/2 in. deep steel studs and constructed of the materials and in the manner specified in the individual U400 and V400 Series Wall and Partition Designs in the Fire Resistance Directory. An additional 3/4 in. ball of putty pad material shall be used to plug the end of each electrical metallic tube or conduit at its connection to the box.

CFS-P PA Moldable Putty Pads, for use with max 4 by 4 by 2-1/8 in. flush device UL Listed Metallic Outlet Boxes installed with steel or plastic cover plates in 2 hr fire rated gypsum board wall assemblies framed with min 3-1/2 in. deep steel studs and constructed of the materials and in the manner specified in the individual U400 and V400 Series Wall and Partition Designs in the Fire Resistance Directory. An additional 3/4 in. ball of putty pad material shall be used to plug the end of each electrical metallic tube or conduit at its connection to the box.

CFS-P PA Moldable Putty Pads, for use with max 14-1/4 by 4-1/2 by 2-1/2 in. flush device UL Listed Metallic Outlet Boxes installed with steel cover plates in 2 hr fire rated gypsum board wall assemblies framed with min 3-1/2 in. deep steel studs and constructed of the materials and in the manner specified in the individual U400 and V400 Series Wall and Partition Designs in the Fire Resistance Directory. An additional 3/4 in. ball of putty pad material shall be used to plug the end of each electrical metallic tube or conduit at its connection to the box.

HILTI Firestop Box Insert, for use with flush device UL Listed Metallic Outlet Boxes installed with steel mud rings or UL Listed Nonmetallic Outlet Boxes in framed wall assemblies as specified below. When protective material is used on outlet boxes on both sides of the wall as directed, the horizontal separation between outlet boxes on opposite sides of the wall may be less than 24 in. provided that the boxes are not installed back-to-back (unless otherwise indicated). Installation shall comply with the National Electrical Code (NFPA 70). The box composition, max device dimensions, hourly rating, type of stud and type of faceplate are specified below.

HILTI Firestop Box Insert, for use with max 4-11/16 by 4-11/16 by 2-1/8 in. deep UL Listed Metallic Outlet Boxes without internal clamps in 1 or 2 hr fire rated gypsum wallboard wall assemblies framed with min 3-1/2 in. deep wood or steel studs and constructed of materials and in the manner specified in the individual U300, U400 or V400 Series Wall and Partition Designs in the Fire Resistance Directory. Outlet boxes in 1 hr fire rated walls may be installed with plastic or steel cover plates. Outlet boxes in 2 hr fire rated walls shall be installed with steel cover plates. One 4-3/8 by 4-3/8 in. insert adhered to the interior back wall of the outlet box in accordance with the instructions supplied with the product. Smaller sized inserts may be cut and combined to achieve the 4-3/8 x 4-3/8 in coverage.

HILTI Firestop Box Insert, for use with max 4 by 4 by 1-1/2 in. deep and 2-1/8 in. deep UL Listed Metallic Outlet Boxes without internal clamps in 1 or 2 hr fire rated gypsum wallboard wall assemblies framed with min 3 1/2 in. deep steel or wood studs and constructed of materials and in the manner specified in the individual U400, V400 or U300 Series Wall and Partition Designs in the Fire Resistance Directory, as summarized in the Table below. One 3-11/16 by 3-3/4 in. insert adhered to the interior back wall of the outlet box in accordance with the instructions supplied with the product. Smaller sized inserts may be cut and combined to achieve the 3-11/16 x 3-3/4 in coverage.

Box Size	Type of Box and Cover Plate	Hourly Rating	Wall Type
4 x 4 x 2-1/8 in deep	Metallic w/ steel cover plates	2-hour	U300, U400 or V400 - wood or steel studs
4 x 4 x 2-1/8 in deep	Metallic w/ plastic cover plates	1-hour	U300, U400 or V400 - wood or steel studs
4 x 4 x 1-1/2 in deep	Metallic w/ plastic cover plates	1-hour	U300 - wood studs

HILTI Firestop Box Insert, for use with max 2 1/8 x 4 x 2 1/8 in. deep UL Listed Metallic Outlet Boxes without internal clamps in 2 hr fire rated gypsum wallboard wall assemblies framed with min 3 1/2 in. deep wood or steel studs and constructed of materials and in the manner specified in the individual U300, U400 or V400 Series Wall and Partition Designs in the Fire Resistance Directory. Outlet boxes may be installed with steel cover plates. One 1-7/8 x 2-13/16 insert adhered to the interior back wall of the outlet box in accordance with the instructions supplied with the product.

HILTI Firestop Box Insert, for use with max 4-1/2 x 8-1/2 in. by 1-5/8 in. deep or max 3-3/4 x 5-1/2 in. by 2-1/2 in deep UL Listed Metallic Outlet Boxes without internal clamps in 1 hr or 2 hr fire rated gypsum wallboard wall assemblies framed with min 3 1/2 in. deep steel or wood studs and constructed of materials and in the manner specified in the individual U400, V400 or U300 Series Wall and Partition Designs in the Fire Resistance Directory, as summarized in the Table below. Outlet boxes installed with steel cover plates. Box inserts evenly spaced and adhered to the interior back wall of the outlet box in accordance with the instructions supplied with the product.

Box Size	Inserts Used	Fire Rating	Wall Type
4-1/2 x 8-1/2 x 1-5/8 in deep	Two 3-11/16 x 3-3/4 in. inserts **	2 hour	U300, U400 or V400 - wood or steel studs
3-3/4 x 5-1/2 x 2-1/2 in deep	One 3-11/16 x 3-3/4 in. insert and one 1-7/8 x 2-13/16 in. insert	1 hour	U300, U400, or V400 - wood or steel studs
** - Min 3/4 in. deep plaster rings installed over outlet box. After installation of gypsum board, nom 1/4 in. thickness of Hilti FS-ONE Sealant or FS-ONE MAX Intumescent Sealant, bearing the UL Classification Marking for Fill, Void or Cavity Materials, applied between the base layer of wallboard and the plaster ring.			

HILTI Firestop Box Insert , for use with 4-3/8 by 4-7/8 by 2-1/4 in. deep flush device UL Listed Metallic Outlet Boxes without internal clamps in 1 hr fire rated gypsum board wall assemblies framed with min 3-1/2 in. deep wood or steel studs and constructed of the materials and in the manner specified in the individual U300, U400 or V400 Series Wall and Partition Designs in the Fire Resistance Directory. One 4-3/8 in. wide by 4-3/8 in. high insert adhered to the interior back wall of the outlet box in accordance with the installation instructions supplied with the product. Smaller sized inserts may be cut and combined to achieve the 4-3/8 in. by 4-3/8 in. coverage and adhered to the interior back wall of the outlet box. Outlet boxes installed with plastic or steel cover plates.

HILTI Firestop Box Insert, for use with 4-3/8 by 4-7/8 by 2-1/4 in. deep flush device UL Listed Metallic Outlet Boxes without internal clamps in 2 hr fire rated gypsum board wall assemblies framed with min 3-1/2 in. deep wood or steel studs and constructed of the materials and in the manner specified in the individual U300, U400 or V400 Series Wall and Partition Designs in the Fire Resistance Directory. One 4-3/8 in. wide by 4-3/8 in. high insert adhered to the interior back wall of the outlet box in accordance with the installation instructions supplied with the product. Smaller sized inserts may be cut and combined to achieve the 4-3/8 in. by 4-3/8 in. coverage and adhered to the interior back wall of the outlet box. Outlet boxes installed with steel cover plates.

CP 617 or CFS-P PA Firestop Putty Pads and HILTI Firestop Box Inserts, for use with maximum 4 by 4 by 1-1/2 in. (102 by 102 by 38 mm) deep flush device UL Listed Metallic Outlet Boxes installed with steel mud rings and with steel or plastic faceplates in 1 or 2 hr fire rated gypsum board wall assemblies constructed with min 3-1/2 in. (89 mm) wide wood or steel studs. When both protective materials are used with outlet boxes on both sides of the wall as directed, the boxes may be installed back-to-back provided that the backs of the boxes are minimum 1/2 in. (13 mm) apart and provided that the boxes are not interconnected. Adjoining pieces of moldable putty pads to be overlapped approx 1/2 in. (13 mm) at the seam. An insert pad shall be installed to completely cover the back inside surface of each outlet box.

Hilti Firestop Systems

BW&A
Barrett, Woodyard & Associates, Inc.
3495 Holcomb Bridge Road
Norcross, GA 30092
Phone (770) 810-8800

NORTH CAROLINA PROFESSIONAL SEAL 053895 ENGINEER THOMAS WILLIAM KELLY

2023.05.30 07:52:54-04'00'

No.	Drawing Issue Description	Date
	ISSUED FOR PERMIT	05/26/23

14396 NC-210 SPRING LAKE, NC 28390

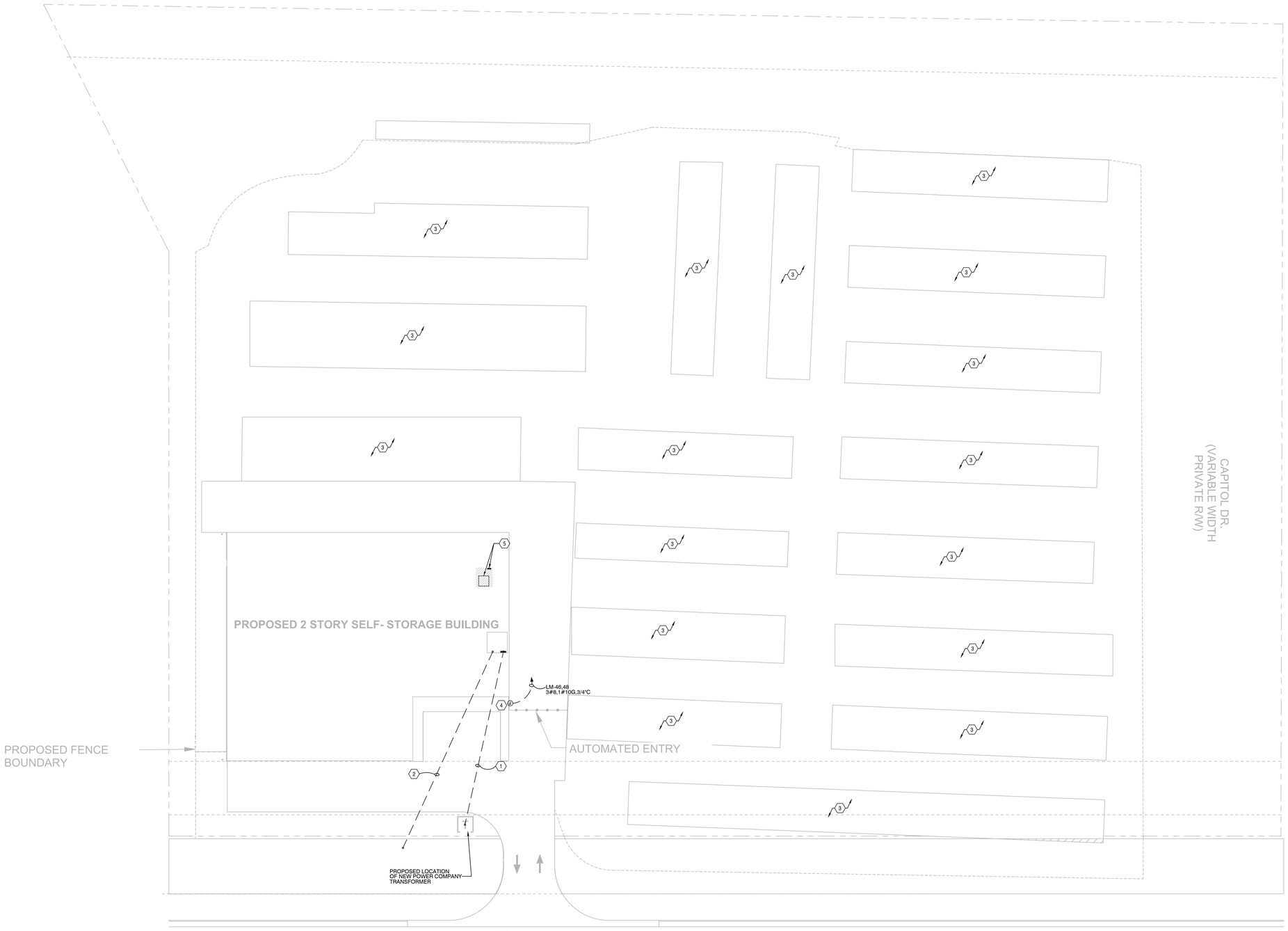
MIDGARD - SPRING LAKE

FIRE PENETRATION DETAILS

WILL KELLY	2023-0683
PROJECT MANAGER	PROJECT NO.
SCOTT WILKINS	AS NOTED
PROJECT ENGINEER	SCALE
SCOTT WILKINS	05/26/23
DRAWN BY	DATE

E0.4
DRAWING NO.

ISSUED FOR CONSTRUCTION



1 E1.0 SITE PLAN - ELECTRICAL
1"=20'-0"

GENERAL NOTES:
(APPLY TO THIS SHEET ONLY)

1. PROVIDE PULL STRINGS FOR ALL EMPTY CONDUIT. PROVIDE ENDCAPS FOR ALL EMPTY CONDUIT.
2. COORDINATE ROUTING OF ALL CONDUIT WITH CIVIL ENGINEER AND APPROPRIATE UTILITIES PRIOR TO INSTALLATION.
3. CONDUIT STUB LOCATIONS ARE SHOWN FOR DRAFTING PURPOSES ONLY. ACTUAL CONDUIT ROUTING AND STUB-UP LOCATIONS MUST BE COORDINATED IN THE FIELD PRIOR TO INSTALLATION.

LEGEND NOTES:
(APPLY TO THIS SHEET ONLY)

(1) PROVIDE SERVICE FEEDERS EXTENDING FROM NEW POWER COMPANY TRANSFORMER TO ELECTRICAL PANEL 'LM'. REFER TO ELECTRICAL RISER DIAGRAM 1/E0.1 FOR FURTHER INFORMATION.

(2) PROVIDE TWO (2) 4" CONDUITS (FOR COMMUNICATIONS) EXTENDING FROM EXTERIOR TELEPHONE COMPANY MANHOLE TO TELEPHONE BACKBOARD AS INDICATED.

(3) ALL POWER/LIGHTING ASSOCIATED WITH EXISTING STORAGE UNITS SHALL REMAIN AS IS UNLESS NOTED OTHERWISE.

(4) PROVIDE TWO (2) WEATHERPROOF JUNCTION BOXES (1 FOR POWER AND 1 FOR COMMUNICATION) FOR CONNECTION TO MOTORIZED GATE. COORDINATE FINAL LOCATION, MOUNTING HEIGHT AND CONNECTION REQUIREMENTS WITH ARCHITECT AND OWNER PRIOR TO ROUGH-IN AND INSTALLATION.

(5) EXISTING ELECTRICAL PANEL AND POWER COMPANY TRANSFORMER SHALL BE REMOVED. ALL EXISTING BRANCH CIRCUITS ASSOCIATED WITH SUPPLYING POWER TO ADJACENT STORAGE UNITS SHALL BE ROUTED AND CONNECTED TO NEW PANEL. EXTEND/MODIFY EXISTING CIRCUITS TO NEW PANEL AS REQUIRED. COORDINATE FINAL REMOVAL OF ELECTRICAL SYSTEMS AND RELOCATING OF CIRCUITS WITH ARCHITECT AND OWNER PRIOR TO COMMENCEMENT OF ANY WORK.

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NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 053655 THOMAS WILLIAM KELLY

2023.05.30 07:53:09-04'00'

No.	Drawing Issue Description	Date
	ISSUED FOR PERMIT	05/26/23

14396 NC-210 SPRING LAKE, NC 28390

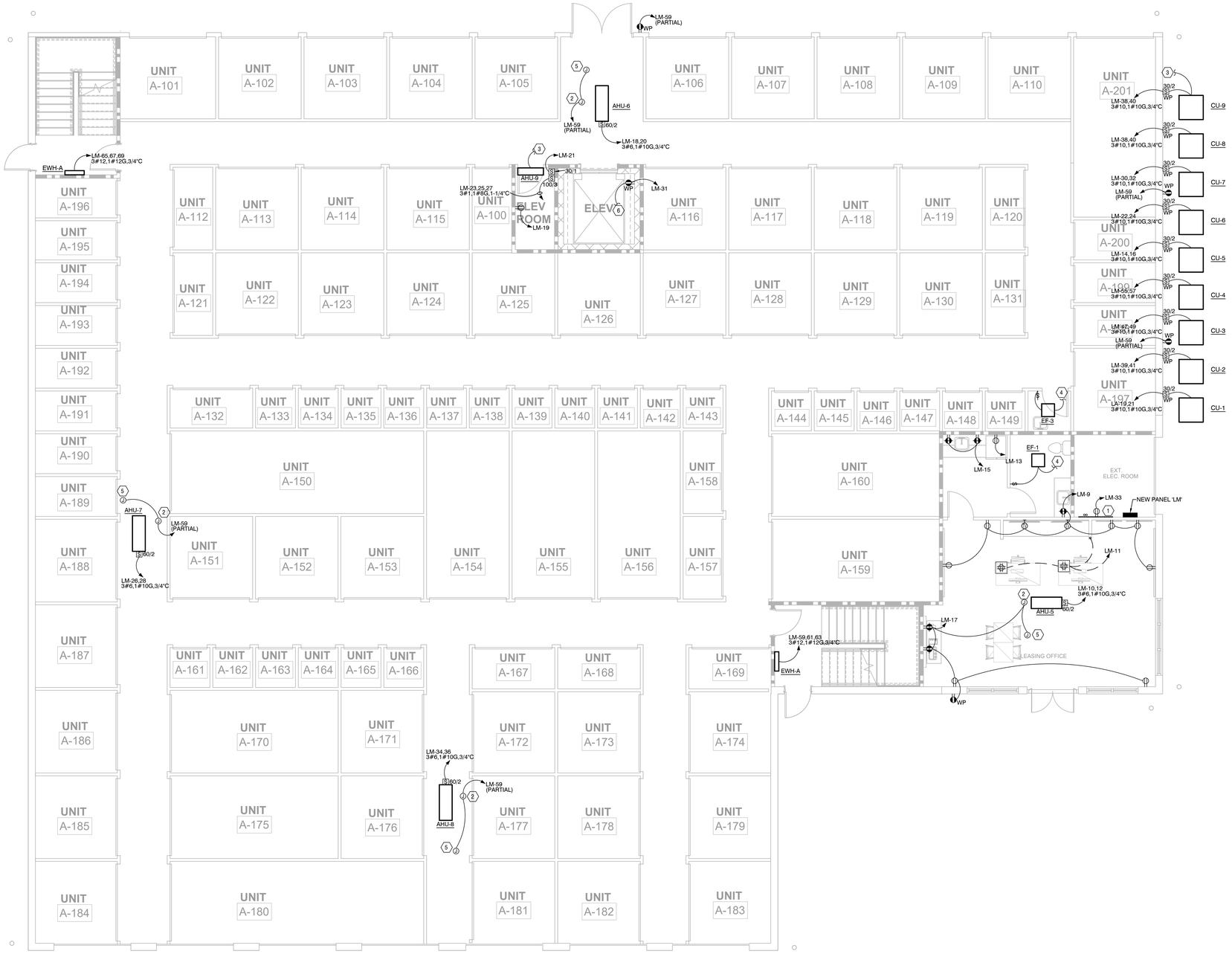
MIDGARD - SPRING LAKE

SITE PLAN - ELECTRICAL
(SHEET TITLE)

WILL KELLY	2023-0683
PROJECT MANAGER	PROJECT NO.
SCOTT WILKINS	AS NOTED
PROJECT ENGINEER	SCALE
SCOTT WILKINS	05/26/23
DRAWN BY	DATE

E1.0
DRAWING NO.

ISSUED FOR CONSTRUCTION



1 E1.1 FIRST FLOOR PLAN - ELECTRICAL

3/16"=1'-0"

GENERAL NOTES:
(APPLY TO THIS SHEET ONLY)

1. COORDINATE EXACT LOCATION OF ALL ELECTRICAL AND LOW VOLTAGE DEVICES WITH ARCHITECTURAL PLANS PRIOR TO INSTALLATION. COORDINATE ANY DISCREPANCIES PRIOR TO ROUGH-IN.
2. PROVIDE PULL STRINGS FOR ALL EMPTY CONDUIT.
3. ALL ELECTRICAL CIRCUITS SHALL BE PROVIDED WITH A SEPARATE AND DEDICATED NEUTRAL FOR EACH INDIVIDUAL CIRCUIT.
4. ELECTRICAL CONTRACTOR SHALL COORDINATE FINAL NEMA TYPE REQUIREMENTS FOR ALL ELECTRICAL DEVICES FOR OFFICE EQUIPMENT (i.e. COPIERS, ETC.) PRIOR TO INSTALLATION.
5. PROVIDE A #10 NEUTRAL WIRE FOR ALL MULTI-PHASE HOMERUNS.
6. COORDINATE COLOR AND FINISH OPTIONS FOR ELECTRICAL & FIRE ALARM DEVICES, VOICE/DATA OUTLETS, AND FACEPLATES WITH ARCHITECT PRIOR TO INSTALLATION.

LEGEND NOTES:
(APPLY TO THIS SHEET ONLY)

1. PROVIDE 3/4" THICK, PLYWOOD TELEPHONE BACKBOARD ACROSS WALL AS SHOWN. PROVIDE WITH ONE (1) 20"X4" GROUNDING BUS BAR CONNECTED VIA #6 GROUND WIRE TO BUILDING GROUND. PROVIDE GROUND CONNECTIONS TO ALL EQUIPMENT IN ROOM. PROVIDE TELEPHONE SERVICE CONDUIT AS SPECIFIED PER ELECTRICAL SITE PLAN 1/E1.0. COORDINATE EXACT REQUIREMENTS AND CONDUIT ROUTING WITH OWNER'S IT SYSTEM INSTALLER, ALL TRADES AND LOCAL UTILITY COMPANIES PRIOR TO INSTALLATION. PAINT BACKBOARD WITH TWO (2) COATS OF FLAME RETARDANT SEALANT ON BOTH SIDES WITH GREY FINISH. ALL PENETRATIONS THRU ELECTRICAL/IT ROOM WALL SHALL BE FIRE RATED WITH WIREMOLD FS4R FIRE STOP OR BY APPROVED EQUAL.
2. PROVIDE CEILING MOUNTED JUNCTION BOX FOR CONNECTION TO CONDENSATE PUMP. ELECTRICAL CONTRACTOR SHALL COORDINATE FINAL LOCATION, MOUNTING HEIGHT AND CONNECTION REQUIREMENTS WITH DIVISION 15 PRIOR TO INSTALLATION.
3. EXTERIOR CONDENSING UNIT (CU) SHALL PROVIDE POWER TO CORRESPONDING INDOOR AIR HANDLING UNIT (AHU). COORDINATE FINAL LOCATION AND CONNECTION REQUIREMENTS WITH DIVISION 23 PRIOR TO ROUGH-IN AND INSTALLATION.
4. PROVIDE CONNECTION OF BATHROOM EXHAUST FAN FROM 120V RESTROOM LIGHTING CIRCUIT. REFER TO 1/E2.1 FOR FURTHER INFORMATION.
5. PROVIDE CEILING MOUNTED JUNCTION BOX FOR CONNECTION TO MOTOR OPERATED DAMPER (MOD). ELECTRICAL CONTRACTOR SHALL COORDINATE FINAL LOCATION, MOUNTING HEIGHT AND CONNECTION REQUIREMENTS WITH DIVISION 15 PRIOR TO INSTALLATION.
6. PROVIDE CONNECTION TO ELEVATOR PIT LIGHT AND SWITCH.

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NORTH CAROLINA PROFESSIONAL SEAL 053858 ENGINEER WILLIAM KELLY

2023.05.30 07:53:20-04'00'

No.	Drawing Issue Description	Date
	ISSUED FOR PERMIT	05/26/23

14396 NC-210 SPRING LAKE, NC 28390

MIDGARD - SPRING LAKE

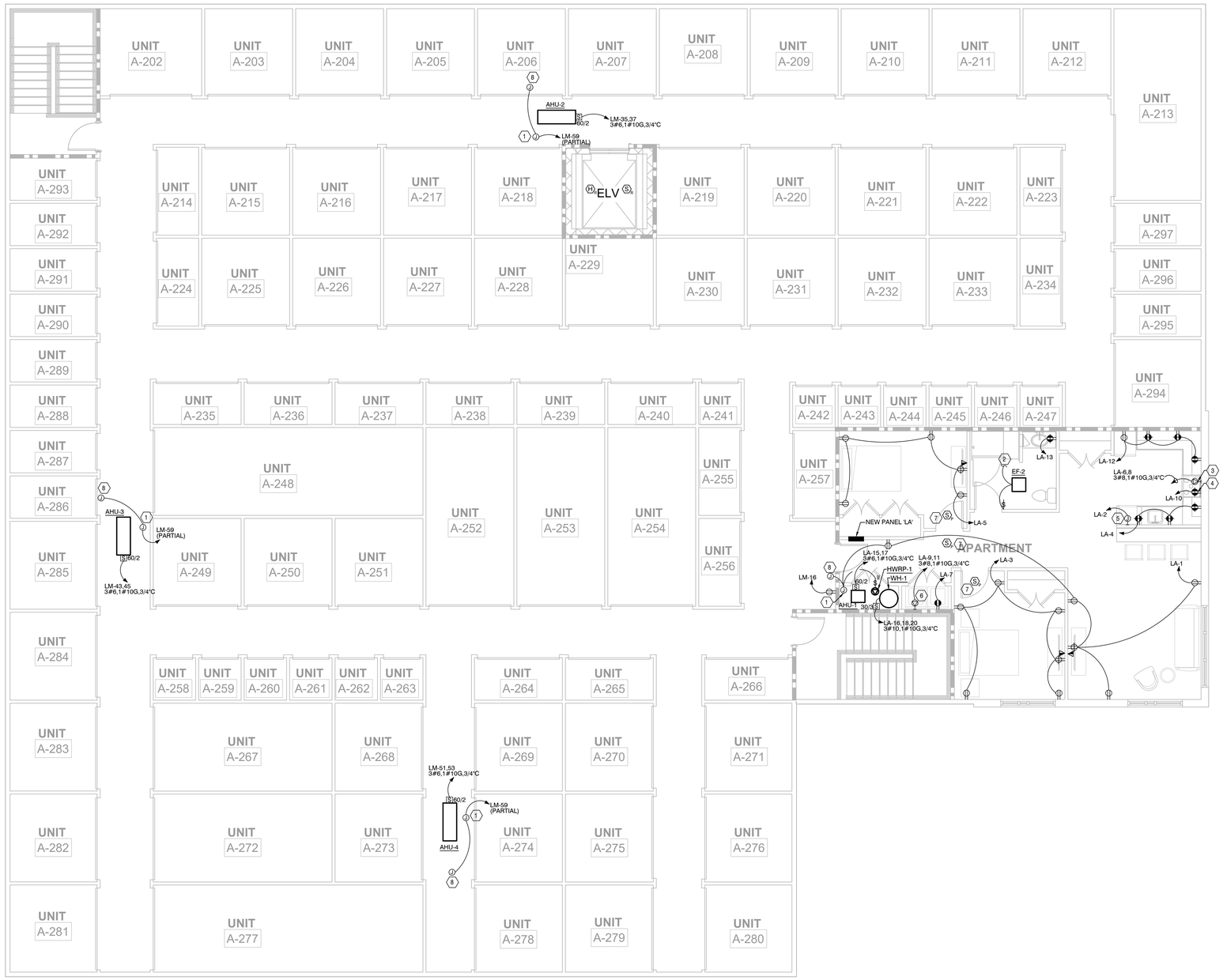
FIRST FLOOR PLAN - ELECTRICAL

WILL KELLY	2023-0683
PROJECT MANAGER	PROJECT NO.
SCOTT WILKINS	AS NOTED
PROJECT ENGINEER	SCALE
SCOTT WILKINS	05/26/23
DRAWN BY	DATE

E1.1

DRAWING NO.

ISSUED FOR CONSTRUCTION



1 SECOND FLOOR PLAN - ELECTRICAL
E1.2 3/16"=1'-0"

GENERAL NOTES:
(APPLY TO THIS SHEET ONLY)

1. COORDINATE EXACT LOCATION AND MOUNTING HEIGHT OF ALL ELECTRICAL AND LOW VOLTAGE DEVICES WITH ARCHITECTURAL PLANS PRIOR TO INSTALLATION. COORDINATE ANY DISCREPANCIES PRIOR TO ROUGH-IN.
2. COORDINATE FINAL LOCATION AND MOUNTING HEIGHT OF ALL COUNTERTOP AND WORK SURFACE RECEPTACLES WITH ARCHITECT PRIOR TO ROUGH-IN AND INSTALLATION.
3. ALL 125-VOLT, 15 AND 20 AMPERE RECEPTACLES SHALL BE LISTED TAMPER RESISTANT PER NEC 406.12.
4. ALL RECEPTACLES THAT ARE DEDICATED SHALL BE 20 AMP RATED UNLESS NOTED OTHERWISE.
5. ALL ELECTRICAL CIRCUITS SHALL BE PROVIDED WITH A SEPARATE AND DEDICATED NEUTRAL FOR EACH INDIVIDUAL CIRCUIT.
6. ELECTRICAL CONTRACTOR SHALL COORDINATE FINAL NEMA TYPE REQUIREMENTS FOR ALL ELECTRICAL DEVICES FOR OFFICE EQUIPMENT (i.e. COPIERS, ETC.) PRIOR TO INSTALLATION.
7. PROVIDE A #10 NEUTRAL WIRE FOR ALL MULTI-PHASE HOMERUNS.
8. COORDINATE COLOR AND FINISH OPTIONS FOR ELECTRICAL & FIRE ALARM DEVICES, VOICE/DATA OUTLETS, AND FACEPLATES WITH ARCHITECT PRIOR TO INSTALLATION.
9. ALL SMOKE DETECTORS, WITHIN SOUND BASE, SHALL BE INTERCONNECTED IN SUCH A MANNER THAT THE ACTIVATION OF ONE (1) DEVICE WILL ACTIVATE ALL DEVICES THROUGHOUT THE UNIT IN ACCORDANCE WITH THE 2018 INTERNATIONAL BUILDING CODE, SECTION 907.2.11.3.
10. ALL SOUND BASES FOR SMOKE DETECTORS SHALL PROVIDE A SOUND WAVE SIGNAL AND SHALL HAVE A LOW FREQUENCY, 520Hz WAVE FOR PER NFPA 72.

LEGEND NOTES:
(APPLY TO THIS SHEET ONLY)

(1) PROVIDE ABOVE CEILING MOUNTED JUNCTION BOX FOR CONNECTION TO CONDENSATE PUMP. ELECTRICAL CONTRACTOR SHALL COORDINATE FINAL LOCATION, MOUNTING HEIGHT AND CONNECTION REQUIREMENTS WITH DIVISION 15 PRIOR TO INSTALLATION.

(2) PROVIDE CONNECTION OF BATHROOM EXHAUST FAN FROM 120V RESTROOM LIGHTING CIRCUIT. REFER TO 1/E2.2 FOR FURTHER INFORMATION.

(3) PROVIDE NEMA 14-50 RECEPTACLE AND CONNECTION FOR ELECTRIC RANGE. CAP AND COIL NEUTRAL CONDUCTOR WITHIN JUNCTION BOX FOR FUTURE USE. COORDINATE EXACT LOCATION AND CONNECTION REQUIREMENTS WITH ARCHITECT AND MANUFACTURER PRIOR TO ROUGH-IN AND INSTALLATION. PROVIDE CORD-AND-PLUG AND MATCHING RECEPTACLE AS REQUIRED BY MANUFACTURER.

(4) PROVIDE NEMA 5-15R RECEPTACLE FOR POWER CONNECTION TO MICROWAVE/EXHAUST HOOD. COORDINATE EXACT LOCATION AND CONNECTION REQUIREMENTS WITH ARCHITECT AND MANUFACTURER PRIOR TO ROUGH-IN AND INSTALLATION.

(5) PROVIDE JUNCTION BOX AND HARDWIRED CONNECTION TO DISHWASHER. COORDINATE EXACT LOCATION AND CONNECTION REQUIREMENTS WITH ARCHITECT AND MANUFACTURER PRIOR TO ROUGH-IN AND INSTALLATION.

(6) PROVIDE NEMA 14-20 RECEPTACLE FOR POWER CONNECTION TO CLOTHES DRYER. COORDINATE EXACT LOCATION AND CONNECTION REQUIREMENTS WITH ARCHITECT AND MANUFACTURER PRIOR TO ROUGH-IN AND INSTALLATION.

(7) PROVIDE SMOKE ALARM OUTSIDE THE SLEEPING AREA IN THE IMMEDIATE VICINITY OF THE BEDROOMS.

(8) PROVIDE CEILING MOUNTED JUNCTION BOX FOR CONNECTION TO MOTOR OPERATED DAMPER (MOD). ELECTRICAL CONTRACTOR SHALL COORDINATE FINAL LOCATION, MOUNTING HEIGHT AND CONNECTION REQUIREMENTS WITH DIVISION 15 PRIOR TO INSTALLATION.

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NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 053855 THOMAS WILLIAM KELLY

2023.05.30 07:53:32-04'00'

No.	Drawing Issue Description	Date
	ISSUED FOR PERMIT	05/26/23

14396 NC-210 SPRING LAKE, NC 28390

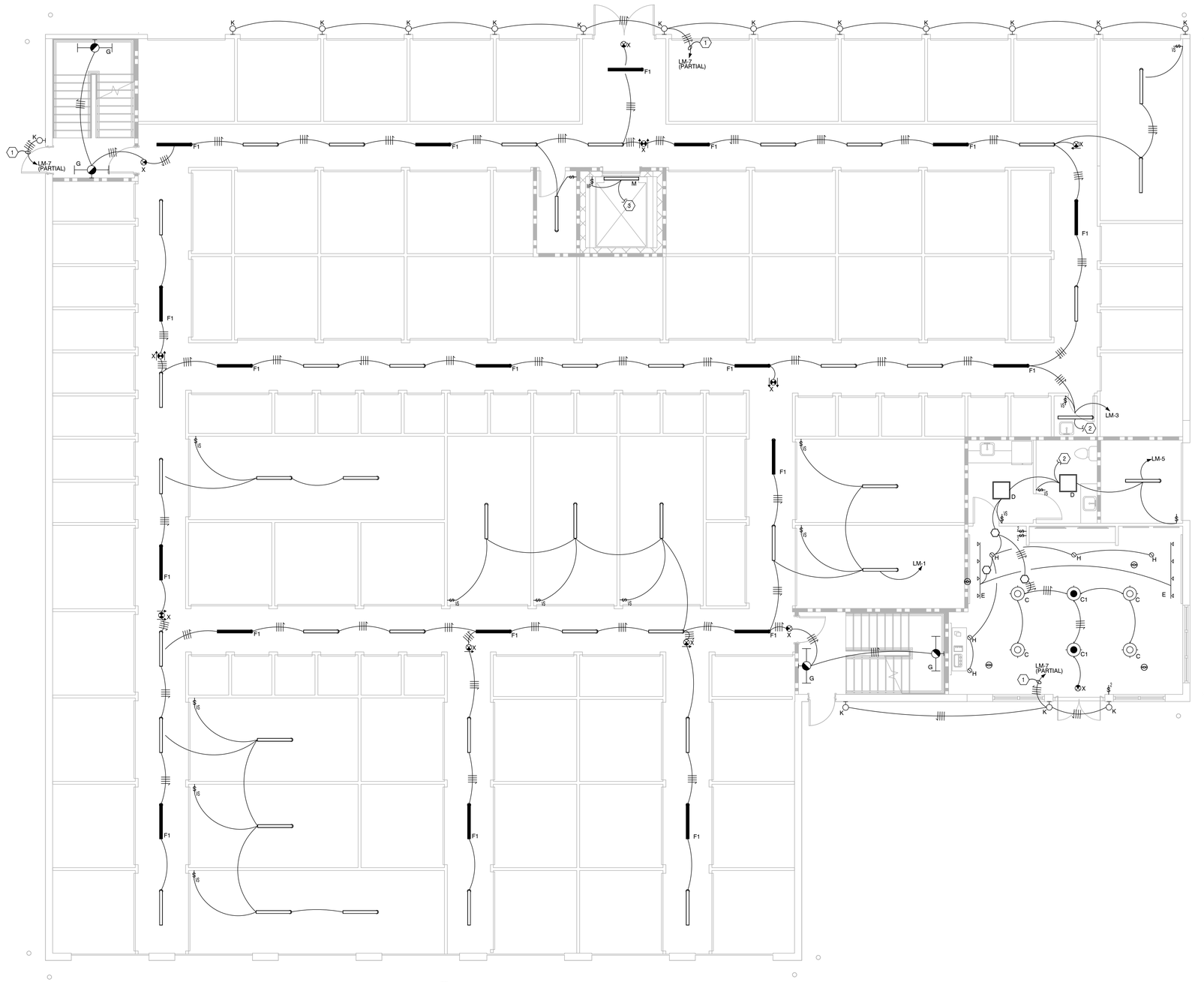
MIDGARD - SPRING LAKE

SECOND FLOOR PLAN - ELECTRICAL

WILL KELLY	2023-0683
PROJECT MANAGER	PROJECT NO.
SCOTT WILKINS	AS NOTED
PROJECT ENGINEER	SCALE
SCOTT WILKINS	05/26/23
DRAWN BY	DATE

E1.2
DRAWING NO.

ISSUED FOR CONSTRUCTION



1 / E2.1 FIRST FLOOR PLAN - LIGHTING
3/16"=1'-0"

GENERAL NOTES:
(APPLY TO THIS SHEET ONLY)

1. COORDINATE EXACT LOCATION OF ALL LIGHT FIXTURES WITH ARCHITECTURAL PLANS PRIOR TO INSTALLATION. COORDINATE ANY DISCREPANCIES PRIOR TO ROUGH-IN.
2. PROVIDE PULL STRINGS FOR ALL EMPTY CONDUIT.
3. ALL LIGHTING CIRCUITS SHALL BE PROVIDED WITH A SEPARATE AND DEDICATED NEUTRAL FOR EACH INDIVIDUAL CIRCUIT.
4. ALL LIGHT FIXTURES SHALL BE TYPE 'F' UNLESS NOTED OTHERWISE.
5. PROVIDE A #10 NEUTRAL WIRE FOR ALL MULTI-PHASE HOMERUNS.
6. PROVIDE A CONTINUOUS UNSWITCHED "HOT" TO ALL EMERGENCY LIGHT FIXTURES AND EXIT SIGNS SUCH THAT UPON LOSS OF POWER FIXTURE SHALL RETURN TO FULL BRIGHTNESS.

LEGEND NOTES:
(APPLY TO THIS SHEET ONLY)

1. ROUTE LIGHTING CIRCUIT THROUGH PHOTOCELL CONTROLLED CONTACTOR. COORDINATE FINAL LOCATION, MOUNTING HEIGHT AND ORIENTATION OF PHOTOCELL WITH ARCHITECT, OWNER AND FIELD CONDITIONS PRIOR ROUGH-IN AND INSTALLATION.
2. PROVIDE POWER CONNECTION TO BATHROOM EXHAUST FAN AS INDICATED.
3. PROVIDE CONNECTION TO ELEVATOR PIT RECEPTACLE CIRCUIT. COORDINATE FINAL LOCATION, MOUNTING HEIGHT AND CONNECTION REQUIREMENTS WITH ELEVATOR MANUFACTURER PRIOR TO ROUGH-IN AND INSTALLATION. SEE SHEET 1/E1.1 FOR FURTHER INFORMATION.

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NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 053689 THOMAS WILLIAM KELLY

2023.05.30 07:53:43-04'00'

No.	Drawing Issue Description	Date
	ISSUED FOR PERMIT	05/26/23

14396 NC-210 SPRING LAKE, NC 28390

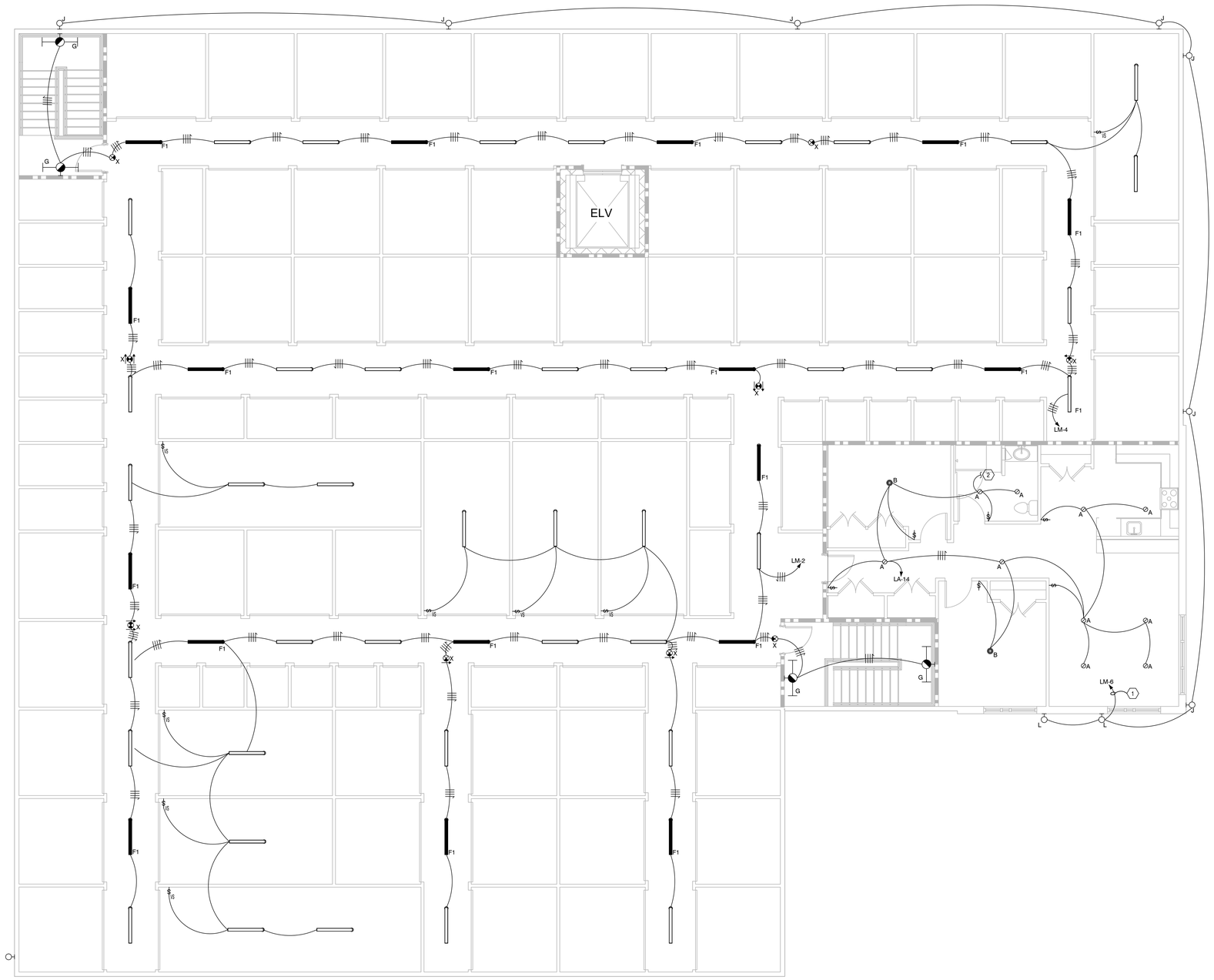
MIDGARD - SPRING LAKE

FIRST FLOOR PLAN - LIGHTING

WILL KELLY	2023-0683
PROJECT MANAGER	PROJECT NO.
SCOTT WILKINS	AS NOTED
PROJECT ENGINEER	SCALE
SCOTT WILKINS	05/26/23
DRAWN BY	DATE

E2.1
DRAWING NO.

ISSUED FOR CONSTRUCTION



1 E2.2 SECOND FLOOR PLAN - LIGHTING
3/16"=1'-0"

GENERAL NOTES:
(APPLY TO THIS SHEET ONLY)

1. COORDINATE EXACT LOCATION OF ALL LIGHT FIXTURES WITH ARCHITECTURAL PLANS PRIOR TO INSTALLATION. COORDINATE ANY DISCREPANCIES PRIOR TO ROUGH-IN.
2. PROVIDE PULL STRINGS FOR ALL EMPTY CONDUIT.
3. ALL LIGHTING CIRCUITS SHALL BE PROVIDED WITH A SEPARATE AND DEDICATED NEUTRAL FOR EACH INDIVIDUAL CIRCUIT.
4. ALL LIGHT FIXTURES SHALL BE TYPE 'F' UNLESS NOTED OTHERWISE.
5. PROVIDE A #10 NEUTRAL WIRE FOR ALL MULTI-PHASE HOMERUNS.
6. PROVIDE A CONTINUOUS UNSWITCHED "HOT" TO ALL EMERGENCY LIGHT FIXTURES AND EXIT SIGNS SUCH THAT UPON LOSS OF POWER FIXTURE SHALL RETURN TO FULL BRIGHTNESS.

LEGEND NOTES:
(APPLY TO THIS SHEET ONLY)

(1) ROUTE LIGHTING CIRCUIT THROUGH PHOTOCELL CONTROLLED CONTACTOR. COORDINATE FINAL LOCATION, MOUNTING HEIGHT AND ORIENTATION OF PHOTOCELL WITH ARCHITECT, OWNER AND FIELD CONDITIONS PRIOR ROUGH-IN AND INSTALLATION.

(2) PROVIDE POWER CONNECTION TO BATHROOM EXHAUST FAN AS INDICATED.

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NORTH CAROLINA PROFESSIONAL SEAL 053859 ENGINEER THOMAS WILLIAM KELLY

2023.05.30 07:53:57-04'00'

No.	Drawing Issue Description	Date
	ISSUED FOR PERMIT	05/26/23

14396 NC-210 SPRING LAKE, NC 28390

MIDGARD - SPRING LAKE

SECOND FLOOR PLAN - LIGHTING

WILL KELLY	2023-0683
PROJECT MANAGER	PROJECT NO.
SCOTT WILKINS	AS NOTED
PROJECT ENGINEER	SCALE
SCOTT WILKINS	05/26/23
DRAWN BY	DATE

E2.2
DRAWING NO.

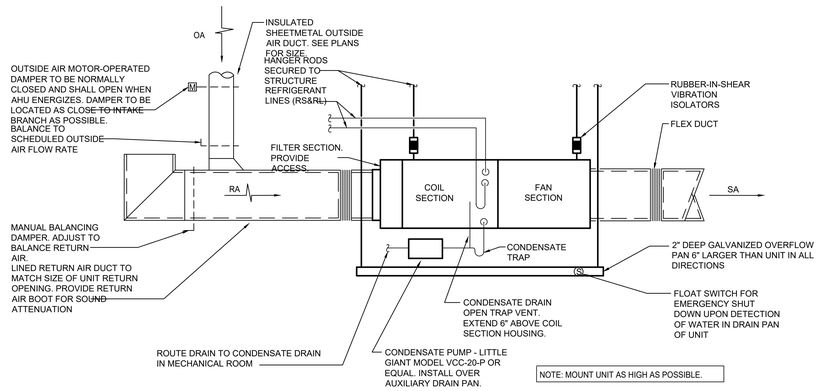
ISSUED FOR CONSTRUCTION

ABBREVIATIONS

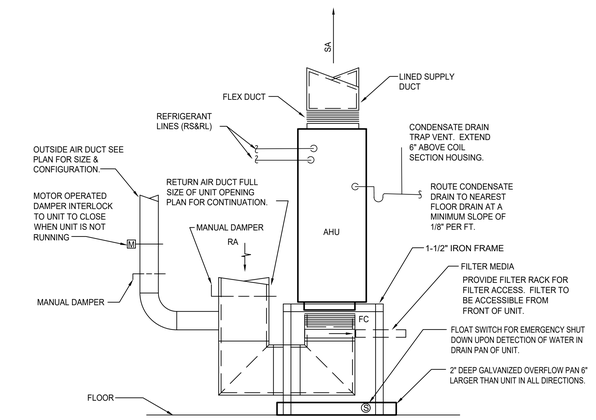
A/C	ABOVE CEILING	ID	INSIDE DIMENSION
AC	AIR CONDITIONING	IN	INCHES
AD	ACCESS DOOR		
ADJ	ADJUSTABLE	KW	KILOWATTS
AFF	ABOVE FINISHED FLOOR		
AHU	AIR HANDLING UNIT	LAT	LEAVING AIR TEMPERATURE
AUTO	AUTOMATIC	LB	POUNDS
		LG	LINEAR GRILLE
B/F	BELOW FLOOR	LRG	LINEAR RETURN GRILLE
B/G	BELOW GRADE	LWR	LOOP WATER RETURN
BAL	BALANCING	LWS	LOOP WATER SUPPLY
BDD	BACKDRAFT DAMPER		
BFLY	BUTTERFLY	MAX	MAXIMUM
BHP	BRAKE HORSEPOWER	MD	MANUAL DAMPER
BOD	BASIS OF DESIGN/BOTTOM OF DUCT	MIN	MINIMUM
		MOD	MOTOR OPERATED DAMPER
CD	CEILING DIFFUSER	MFR	MANUFACTURER
CFM	CUBIC FEET PER MINUTE		
CHWS	CHILLED WATER SUPPLY	NC	NORMALLY CLOSED
CHWR	CHILLED WATER RETURN	NG	NATURAL GAS
CO	CLEANOUT	NO	NORMALLY OPEN
COND	CONDENSATE	NOM	NOMINAL
CSR	CURVED SUPPLY REGISTER		
CU	CONDENSING UNIT	OA	OUTSIDE AIR
CWR	CONDENSER WATER RETURN	OBD	OPPOSED BLADE DAMPER
CWS	CONDENSER WATER SUPPLY	OC	ON CENTER
		OD	OUTSIDE DIMENSION
dB	DECIBELS		
DB	DRY BULB	PIU	POWERED INDUCTION UNIT
DO	DITTO	PSI	POUNDS PER SQUARE INCH
DN	DOWN		
DWG	DRAWING	RA	RETURN AIR
		RAD	RADIUS
EA	EACH	RAG	RETURN AIR GRILLE
EAT	ENTERING AIR TEMPERATURE	RAR	RETURN AIR REGISTER
ECC	ECCENTRIC	RED	REDUCER
EF	EXHAUST FAN	RL	REFRIGERANT LIQUID
EFF	EFFICIENCY	RS	REFRIGERANT SUCTION
ER	EXHAUST REGISTER	RTU	ROOFTOP UNIT
ESP	EXTERNAL STATIC PRESSURE		
ETR	EXISTING TO REMAIN	SA	SUPPLY AIR
EWT	ENTERING WATER TEMPERATURE	SAN	SANITARY
EX	EXISTING	SD	SMOKE DAMPER
EXH	EXHAUST	SEN	SENSIBLE
		SP	STATIC PRESSURE
F	FAHRENHEIT	SPS	STATIC PRESSURE SENSOR
FCU	FAN COIL UNIT	SQ	SQUARE
FD	FIRE DAMPER	SR	SUPPLY REGISTER
FLR	FLOOR	SS	SPLIT SYSTEM
FOB	FLAT ON BOTTOM	ST	STORM
FOT	FLAT ON TOP		
FPM	FEET PER MINUTE	TEMP	TEMPERATURE
FPS	FEET PER SECOND	TG	TRANSFER GRILLE
FSD	FIRE/SMOKE DAMPER	TYP	TYPICAL
FT	FEET		
		UON	UNLESS OTHERWISE NOTED
GA	GAUGE		
GPM	GALLONS PER MINUTE	V	VENT
		VA	VALVE
HD	HUB DRAIN	VAV	VARIABLE AIR VOLUME
HP	HORSEPOWER	VTR	VENT THRU ROOF
HTG	HEATING		
HHWR	HEATING HOT WATER RETURN	WB	WET BULB
HWRR	HOT WATER REVERSE RETURN	WC	WATER COLUMN
HHWS	HEATING HOT WATER SUPPLY	WT	WEIGHT
HZ	HERTZ		

LEGEND

	CEILING DIFFUSER
	CEILING RETURN AIR GRILLE
	CEILING EXHAUST GRILLE
	SUPPLY REGISTER
	SLOT DIFFUSER UON
	FIRE DAMPER UON
	MANUAL VOLUME DAMPER UON
M	MOTOR OPERATED DAMPER
T	THERMOSTAT
H	HUMIDISTAT
	CARBON DIOXIDE SENSOR
S	SMOKE DETECTOR
	CONNECT TO EXISTING
	EXISTING WORK
	NEW WORK
	WORK TO BE REMOVED
	SHUTOFF VALVE
	CHECK VALVE
	MOTOR ACTUATED 3-WAY VALVE
	BALANCING VALVE
	THERMOMETER
	PRESSURE GAUGE
	GAUGE COCK
#	KEYNOTE



1 M0.1 INDOOR UNIT DETAIL
NOT TO SCALE



2 M0.1 VERTICAL INDOOR UNIT DETAIL
NOT TO SCALE

SPLIT SYSTEM SCHEDULE

			FAN COIL UNIT DATA										HEATING SECTION		CONDENSING UNIT DATA					
I.D. TAG	MINIMUM TOTAL CAP. (BTUH)	MINIMUM SENSIBLE CAP. (BTUH)	AIRFLOW (CFM)	OUTSIDE AIR (CFM)	EXT. S.P. (IN. W.C.) (1)	MAX H.P.	COIL EAT °F db	COIL EAT °F wb	VOLTS/ PHASE	DRIVE (2)	MAX FAN RPM	TYPE OF UNIT	TYPE	CAPACITY (3)	AMBIENT TEMP.(°F)	VOLTS/ PHASE	STAGES	MIN. SEER	BASIS OF DESIGN	REMARKS
AHU/CU-1,5	24,000	---	800	60	--	--	80	67	208/1	D		DUCTED	HP	24 MBH	95	208/1	1	15.2	CARRIER FJ4D/25SCA	(4)(5)(6)(7)
AHU/CU-2,3,4,6,7,8	36,000	---	1200	230	--	--	80	67	208/1	D		DUCTED	HP	35 MBH	95	208/1	1	14.3	CARRIER FJ4D/25SCA	(4)(5)(6)(7)
AHU/CU-9	12,000	---	400	--	--	--	80	67	208/1	D		WALL MOUNT	--	--	95	208/1	1	21	MITSUBISHI PKA-A12LA/PUY-A12NKA7	(4)(5)(6)

(1) THIS IS THE SP EXTERNAL TO THE ENTIRE FAN COIL UNIT ASSEMBLY (WET COIL, CASING, CLEAN FILTERS, AND FURNACE LOSSES ARE NOT INCLUDED IN THIS EXT. SP.)

(2) B = BELT DRIVE, D = DIRECT

(3) HP STANDS FOR HEAT PUMP AND CAPACITY IS GIVEN IN MBH, ELEC STANDS FOR ELECTRIC HEAT AND VALUES ARE GIVEN IN kW.

(4) PROVIDE WITH REMOTE WALL MOUNTED THERMOSTAT LOCATED AS SHOWN ON PLANS.

(5) PROVIDE WITH CONDENSATE PUMP, PER MANUFACTURERS RECCOMENDATIONS.

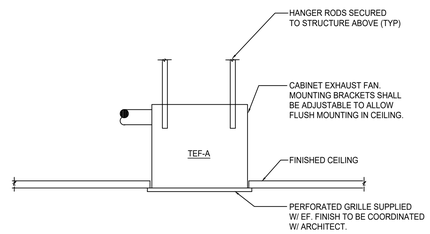
(6) PROVIDE WITH LOW AMBIENT CONTROLS.

(7) PROVIDE UNIT WITH 5kW OF AUXILIARY HEAT.

ELECTRIC HEATER SCHEDULE

I.D. TAG	DESCRIPTION	CAPACITY KW	MIN. CFM	FAN HP	S.P. (IN. WG)	VOLTS/ PHASE	BASIS OF DESIGN	REMARKS
EWH-A	WALL HEATER	5.0	175	--	--	208/3	REDDI AFA	(1)

(1) PROVIDE WITH INTEGRAL THERMOSTAT AND DISCONNECT SWITCH. UNITS SHALL BE RECESSED IN STUD WALLS OR SURFACE MOUNTED ON BLOCK AND RATED WALLS UNLESS NOTED OTHERWISE ON DRAWINGS. COORDINATE COLOR WITH ARCHITECT.



3 M0.1 CEILING FAN DETAIL
NOT TO SCALE

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NORTH CAROLINA PROFESSIONAL SEAL 054269 ENGINEER JOSEPH CRAWFORD

05/26/2023

No.	Drawing Issue Description	Date
	ISSUED FOR PERMIT	05/26/23

14396 NC-210 SPRING LAKE, NC 28390

MIDGARD - SPRING LAKE

MECHANICAL LEGEND, NOTES, SCHEDULES, & DETAILS

WILL KELLY	2023-0683
PROJECT MANAGER	PROJECT NO.
JOE CRAWFORD	AS NOTED
PROJECT ENGINEER	SCALE
JORDAN BRANHAM	05/26/23
DRAWN BY	DATE

M0.1
DRAWING NO.

ISSUED FOR CONSTRUCTION

CSIMASPEX 01-12-22 Common Work Results for HVAC

SECTION 23 05 00

COMMON WORK RESULTS FOR HVAC

1.0 GENERAL

1.01 DESCRIPTION

A. This Division 23 and the accompanying drawings cover the provision of all labor, equipment, appliances, and materials and performing all operations in connection with the construction of the air conditioning, ventilating, heating, fire suppression and plumbing systems as specified herein and as shown.

B. The General Provisions and Division 01, including the general, supplementary and other conditions and other Divisions, as appropriate, apply to work specified in this Division.

1.02 INTENT OF DRAWINGS AND SPECIFICATIONS

A. The implied and stated intent of the drawings and specifications is to establish minimum acceptable standards for materials, equipment and workmanship, and to provide operable mechanical systems complete in every respect.

B. The engineering drawings are diagrammatic, intended to show general arrangement and sizes of system components, and shall not be scaled. Rather, the architectural and structural drawings shall govern space constraints, dimensions and finishes. All offsets and fittings which will be necessary to accomplish the finished installation shall be provided at no additional cost or increase in the Contract.

1.03 SPACE PRIORITY

A. Ensure optimum use of available space for materials and equipment installed above ceilings. Allocate space in the order of priority as listed below except as otherwise detailed. Items are listed in the order of priority, with items of equal importance listed under a single priority number.
1. Gravity flow piping systems
2. Vent piping systems
3. Recessed lighting fixtures
4. Concealed HVAC terminals and equipment
5. Air duct systems
6. Sprinkler piping systems
7. Pressurized piping systems
8. Electrical conduit, wiring, control air tubing

B. Order of space priority does not dictate installation sequence. Installation sequence shall be as required to install all affected trades.

C. The work of this Division 23 shall not obstruct access for installation, operation and maintenance of the work of any other Division.

D. All major items of equipment shall be arranged so as to provide a minimum of 28" clear aisle space. Additional space shall be provided between and around equipment for maintenance and proper operation as shown in the Equipment Manufacturer's literature.

1.04 COORDINATION

A. Coordinate all work under this Division 23 with work under all other Divisions, providing adjustment as necessary.

B. Coordination of space requirements with respect to Division 26 shall be performed such that:

1. No equipment, piping or ductwork, other than electrical, shall be installed within 42" of switchboards or panelboards.

2. No piping or ductwork which ever operates at a temperature in excess of 120°F shall be installed within 3" of any electrical conductor.

C. All items mounted in or below the ceiling, and all items penetrating the ceiling, shall be coordinated with the architectural reflected ceiling plans. If any items are not shown on these plans, or any items need to be relocated for coordination purposes, prepare a reflected ceiling plan and submit it to the Architect for approval.

D. Variable-Frequency Drives shall be provided under Division 23 and installed by Division 26. See specification 26 29 23 Variable - Frequency Motor Controllers.

E. Fused disconnects shall be provided under this Division 23 for all equipment connected directly to bus duct, and rating shall match bus duct rating. Coordinate with Division 26.

1.05 CODE COMPLIANCE

A. All workmanship and materials provided under this Division 23 shall comply with all laws, ordinances, codes and regulations of all Federal, State and Local Authorities Having Jurisdiction.

B. All fire suppression, plumbing, heating, ventilating, and air conditioning materials and workmanship shall comply with the current codes.

C. Secure and pay all fees associated with all permits and licenses required for execution of the Contract. Arrange for all inspections required by City, County, State and other Authorities Having Jurisdiction, and deliver certificates of approval to the Architect.

D. The code requirements are strictly a minimum and shall be met without incurring additions to the Contract. Where requirements of the drawings or specifications exceed the code requirements, the work shall be provided in accordance with these drawings or specifications. In the event of conflict or ambiguity between the various codes, the most stringent requirement shall govern.

1.06 ELECTRICAL REQUIREMENTS AND INTERFACE

A. All electrical equipment and wiring provided under this Division 23 shall comply with the electrical system characteristics indicated on the electrical drawings and specified in Division 26.

B. Electric controls, contactors, starters, pilot lights, push buttons, etc., shall be provided complete as part of the motor, heater or other equipment which it operates. All electrical components shall be in conformance with the requirements of the National Electrical Code and Division 26. Starters shall be wye-delta, closed transition type. Reference Division 26 and the electrical engineering drawings for those motor starters provided under that Division 26. All starters not shown shall be provided under this Division 23. Unless specified otherwise under other individual equipment Sections, motor starters shall conform to the following minimum requirements:

1. Starters for motors 1/3 horsepower or smaller shall be manual unless remote or automatic starting is required, in which case the starters shall be magnetic, full voltage, non-reversing, single-speed, unless otherwise indicated. All other starters shall be magnetic.

2. Each starter for a three-phase motor shall be furnished with three (3) overload relays sized for the full load running current of the motor actually provided. Provide an external "HAND-OFF-AUTO" selector switch with red "RUNNING" light. Provide a green pilot light to indicate motor "STOPPED". Each pilot light shall have a legend plate indicating reason for signal.

3. Each overload relay shall have a normally open alarm contact which will close only when actuated by an overload (not to be confused with N.O. or N.C. auxiliary contacts). These contacts shall be properly wired to their respective blue pilot light provided on the starter front cover and having a "TRIPPED" legend plate.

4. Individually mounted motor starters shall be in a NEMA Type 1 general purpose enclosure in unfinished areas and shall be flush mounted in all finished areas. All starters mounted in exterior areas shall have a NEMA 3R enclosure. Each starter shall have a laminated nameplate to indicate equipment unit number, function and circuit number.

5. All motor starters, push buttons and pilot lights shall be of the same Manufacturer as the switchboard and shall be General Electric, Square D, Siemens I.T.E., or Westinghouse.

C. Motor starters for the following equipment shall be provided under this Division 23 by the Manufacturer of the equipment:
1. Packaged air conditioning equipment
2. Water chillers
3. Other equipment hereinafter specified in other Sections to be provided with integral starters

D. Unless otherwise noted or specified in individual Sections, all 3-phase motors shall be standard NEMA continuous duty "B" type, with Class B insulation, open drip-proof frame for indoor service, TEFC for outdoor service and a service factor of 1.15. All motors 5 HP and larger shall be U.S. Motors Hi-Efficiency Model or Reliance XE Hi-Efficiency Model.

E. All power wiring and final connections to equipment shall be provided under Division 26.

F. Control components, all interlocks, (VAVs, actuators, smoke dampers, fire/smoke dampers, motor-operated dampers, fire alarm motors, etc.) and control wiring (277 volt, single phase and less) shall be provided under this Division 23 as required to achieve the specified control sequences. All electrical connections shall be specifically coordinated with Division 26 and any necessary scope included as part of Division 23.

G. All control wiring over 30 volts shall be installed by a licensed Electrician working under this Division 23.

1.07 SLEEVES, SEALS AND ESCUTCHEONS

A. Sleeves shall be provided through all pipe and ductwork penetrations of concrete or masonry walls, elevated floors and roofs, except those piping penetrations for equipment, etc.

B. Sleeves shall be fabricated from Schedule 40 steel pipe through 10" and Standard Wall steel pipe for sleeve sizes 12" and larger. All sleeves penetrating exterior walls, underground walls, pit or vault walls shall be provided with a 3" x 3/8" thick waterstop ring welded completely to the midpoint of the sleeve.

C. All sleeves penetrating exterior walls, underground walls, pit or vault walls and elevated floors shall be packed and sealed watertight.

D. Sleeves through roofs shall extend above the roof surface and be flashed watertight.

E. Sleeves through walls shall be cut and finished flush with each surface of the wall in which they are installed.

F. Sleeves through floors in mechanical rooms or other back of house spaces shall be installed with the top no less than 1/2" above the finished floor to allow for leak protection. Space between the top of the fire-stopping and top of the sleeve shall be packed with mineral wool and caulked to not allow water ponding within the sleeve.

G. Sleeves shall be sized to provide a minimum of 1/2" clearance between the inside surface of the sleeve and the outside finished surface of the pipe plus any insulation specified.

H. Fire-stops shall be provided as specified herein. All annular spaces between piping and sleeves, which do not require fire-stops, shall be packed with mineral wool and caulked.

I. Provide round, chrome-plated escutcheons on all exposed piping and ductwork penetrations passing through walls, floors, partitions and ceilings. Escutcheons shall be painted and caulked in coordination with Architect. Note that escutcheons should be only attached to the wall as piping and ductwork may move slightly during operation.

1.08 FIRESTOPS

A. Where piping, conduit, etc. pass through fire partitions, fire walls and floors, a firestop shall be provided that will ensure an effective barrier against the spread of fire, smoke and gases. Firestop material shall be packed tight and completely fill gaps between the ductwork, piping, conduit, etc. and the perimeter of their rough openings.

B. All penetrations shall be in accordance with UL 1479 or ASTM E 814 listed systems, and products used shall be specifically applicable for the appropriate installation conditions. Assemblies shall provide a minimum rating equal to the construction penetrated. Products shall be by HILTI, 3M, or ProSet.

C. Installation shall be by a Qualified Installer. Installer shall be certified, licensed, or otherwise qualified by the Firestopping Manufacturer as having the necessary training to install the Manufacturer's specific product. A Manufacturer or Vendor's willingness to sell the firestopping product to the Contractor or Installer does not in itself confer qualification.

D. Installer shall have at least one of the following qualifications:
1. FM 4991 Approved Contractor
2. UL Approved Contractor
3. HILTI, 3M, or ProSet Acredited Fire Stop Specialty Contractor

E. Installing Firm shall have no less than 3 years of experience with firestop installation.

F. A Manufacturer's direct Representative (not Distributor or Agent) shall be on site during initial installation of firestop systems to train appropriate Contractor personnel in proper selection and installation procedures.

G. The firestop Contractor or Installer shall supply As-Built documentation of each individual penetration location on the project. Documentation shall include a sequential location number, detailed description of the penetration location, size, and type, tested system number, type of assembly penetrated, and rating to be achieved. As-Built documentation shall be included with the close-out materials.

H. Identify through-penetration firestop systems with pressure-sensitive, self-adhesive, preprinted vinyl labels. Attach label permanently on both sides of penetrated construction in a visible location. The label shall include the following:
1. The words "Warning - Through Penetration Firestop System-Do Not Disturb"
2. Through Penetration firestop system designation and Manufacturer
3. Date of Installation

1.09 CORE DRILLING

A. Cutting of holes through concrete and masonry shall be by diamond core or concrete saw. Pneumatic hammer, impact electric and hand or manual hammer type drills will not be allowed, except as permitted by the Architect where required by limited working space. Locate holes such that they will not affect structural sections such as ribs or beams. Holes shall be laid out well in advance of the installation. These layout locations shall be approved by the Architect prior to drilling.

2.0 PRODUCTS

2.01 BID BASIS AND SUBSTITUTION PROCEDURES

A. Manufacturer names, series and model numbers, as noted or specified, are for the purpose of describing type, capacity, and quality of equipment, materials and products to be used. Unless "or equal" is specifically stated, bids shall be based only on the specified "basis of design" Manufacturer. The listing of a particular manufacturer as an "equal" or "acceptable substitute" manufacturer shall not be misconstrued as approving nor allowing the substitution of that Manufacturer's standard product in place of the basis of design. No consideration will be given to a product, which would require dimensional, spatial or aesthetic changes to the project. "Acceptable substitute" and "equal" manufacturers shall only bid those products, which exactly match the size and other characteristics of the specified basis of design. Any changes to other disciplines and trades of work required by an "or equal" or "substitute" product shall be duly considered and priced accordingly prior to bidding or pricing. The decision as to whether or not a proposed substitute or "equal" product is actually equal to that specified shall rest solely with the Architect.

B. Requests to provide "equal" products in lieu of those specified shall be submitted to the Architect in writing at least ten (10) days prior to final pricing and execution of the Contract. No consideration will be given to substitute products after final pricing and execution of the Contract.

C. Any "or equal" product or proposed product substitution which will cause a change in the appearance, dimensions or design of any part of the building, it structure, electrical system or any other engineered systems shall be accompanied by a sealed drawing and written description of the required change(s) for approval by the Architect. If deemed necessary by the Architect, Owner, or AHJ, design changes shall be signed and sealed by a registered Professional Engineer, currently licensed in this State. This shall be performed under the Contractor's scope who selects the substitution.

D. Any and all changes due to a substitution of basis of design equipment including but not limited to electrical connection, physical size, access, duct or piping connections, controls, etc. shall be solely the responsibility of substituting Contractor.

2.02 MINIMUM STANDARDS

A. Every piece of energy consuming equipment, all fire suppression products and life safety equipment shall comply with the following standards as applicable; especially in regard to prevailing codes:
1. Factory Mutual Laboratories (FM)
2. Industrial Risk Insurers (IRI)
3. Underwriters Laboratories, Inc. (UL)
4. ADC: Air Diffusion Council
5. AGA: American Gas Association
6. AMCA: Air Moving and Conditioning Association, Inc.
7. ANSI: American National Standards Institute
8. API: American Petroleum Institute
9. AIHRI: Air Conditioning, Heating, and Refrigeration Institute
10. ASHRAE: American Society of Heating, Refrigerating and Air Conditioning Engineers
11. ASME: American Society of Mechanical Engineers
12. ASTM: American Society of Testing and Materials
13. AWWA: American Water Works Association
14. IBR: Institute of Boiler and Radiator Manufacturers
15. MSS: Manufacturers Standardization Society
16. NBBPVI: National Board of Boiler and Pressure Vessel Inspectors
17. NEMA: National Electrical Manufacturer's Association
18. OSHA: Occupational Safety & Health Administration
19. PDI: Plumbing Drainage Institute
20. PPI: Plastic Pipe Institute
21. SMACNA: Sheet Metal and Air Conditioning Contractors National Association, Inc.

3.0 EXECUTION

3.01 SUBMITTALS

A. Before preparing submittals, study all Contract Drawings and specifications in detail, obtain manufacturer's recommended instructions, and have submittals prepared based on specific equipment and material proposed for installation. An officer of the Contracting Firm shall sign all shop drawings (certifying conformance with plans and specifications) before submitting to the Architect or releasing to the field.

B. The submittal process shall not be utilized as an avenue to substitute products after the execution of the contract. Should an unspecified or unequal product be submitted, it will be rejected. If a second attempt at substitution is made during the resubmittal of the same product, then no more reviews of that product will be performed without direct compensation to the Engineer being paid for the additional services required for the third review and any further reviews.

C. All submittals shall be submitted and returned electronically.

D. Submittals will not be accepted for review unless they:
1. Comply with the requirements of Division 1
2. Include complete information pertaining to all appurtenances and accessories
3. Are submitted as complete packages which pertain to all related items in Division 23. Separate packages shall be submitted as follows:
   a. All HVAC equipment and components
   b. The automatic controls and EMS
4. Are properly marked with equipment, service, or function identification as related to the project and are marked with pertinent specification paragraph number

E. Submit catalog information, factory assembly drawings, field installation drawings and certifications as required for complete explanation and description of all items of equipment. The submittal data shall provide ample, unquestionable compliance with the Contract Documents.

F. Review of submittals shall not be construed as authorizing any deviations from the plans and specifications unless such deviations are clearly identified and separately submitted in the form of a letter that is enclosed with the submittals.

G. Submittals are required on all manufactured equipment, especially energy consuming equipment. Submittals shall include, but are not limited to, the following items of equipment:
1. Piping and Piping Specialties
2. Ductwork and Piping Insulation
3. Split Systems
4. Air Distribution Devices
5. Ductwork Accessories (Including All Dampers)
6. Fans
7. Unit, Wall, Ceiling, Duct, Etc. Heaters
8. Louvers and Hoods
9. T&B Company Certifications and Final Report
10. Control Diagrams, System, and Components
11. Ductwork and Piping Shop Drawings
12. Firestopping Products and Applicable UL Firestop Details

3.02 INSTALLATION REQUIREMENTS

A. All equipment shall be installed in strict conformance with the recommendations of the Equipment Manufacturer, as indicated on the Drawings and as specified.

B. Provide installation manuals for each piece of equipment. Submit in separately bound volumes after review of submittals.

C. Provide supplementary steel framing and welded steel equipment support stands as required for proper hanging and support of the mechanical systems. Steel angles, channels and tubing utilized for such framing shall be selected for a maximum deflection of 1/360th of the span.

D. All roof curbs shall be a minimum of 12" high and selected for the various roof pitches. Curbs installed on roofs having pitches of not more than 1/4" per foot may be standard curbs shimmed level with steel channels or Zs to provide suitable support and flashing surfaces.

3.03 CLEANING, LUBRICATION AND ADJUSTMENT

A. The exterior surfaces of all mechanical equipment, piping, ductwork, conduit, etc., shall be cleaned and free of all dirt, grease, oil, paint splatter, and other construction debris.

B. Ducts, plenums, and air unit casings shall be cleaned of all debris and either vacuumed or blown free of all rubbish, dirt, and dust before installing grilles, registers or diffusers.

C. Bearings that require lubrication shall be lubricated in strict accordance with the manufacturer's recommendations.

D. All control equipment shall be adjusted to the settings required for the performance specified.

E. Fans shall be adjusted to the speed indicated by the Manufacturer to meet the installed final system pressure at the airflows indicated. Any additional sheaves and belts required for final adjustments shall be provided with no increase in the Contract amount.

F. Any fans operated during construction shall have temporary filters. Temporary filters shall be changed regularly to minimize contamination of the equipment and duct systems. Permanent filters shall be installed prior to final inspection.

G. All coils shall be thoroughly cleaned and combed prior to final inspection.

H. All materials, equipment, etc. subject to weather, corrosion, dust, debris, water etc. to be installed or utilized for the project shall be fully protected. This is inclusive of piping and duct openings and internal fan ventilation intakes and discharges. This Division's scope includes protection and remediation of any and all Division materials, etc. including cleaning, vacuuming, dusting, etc. required for a clean system and operation. Insulation and equipment with electrical connections subject to water shall be replaced in their entirety. Coordinate with all other trades and schedules.

3.04 PAINTING

A. All uncoated and uninsulated steel surfaces exposed to sight inside the building, such as piping, equipment hangers and supports which are not provided with factory prime coat or galvanizing, shall be cleaned and painted with one coat of rust inhibiting primer. In addition, all surfaces in finished spaces shall also be painted with two coats of finish paint in a colour selected by the Architect.

B. All ductwork surfaces, piping, supports, etc. visible through grilles, registers and diffusers in finished areas shall be painted flat black. All ductwork, equipment, piping, supports, air distribution, etc. visible in exposed finished areas shall be painted a colour selected by the Architect, except that nameplates shall not be painted.

C. Steel items exposed outside the building, such as equipment supports, uninsulated piping and hangers, which are not factory painted or galvanized, shall be cleaned and painted with one coat of rust inhibiting primer and two coats of asphaltic base aluminum paint. Insulated steel pipes outside the building shall be cleaned and painted with one coat of rust inhibiting primer before installing insulation.

D. Factory painted equipment that has been scratched or marred shall be repainted to match the original factory color.

3.05 DUCTWORK AND PIPING LEAK TESTING

A. Insulated, underground, and concealed ductwork and piping shall be tested for leaks in place before backfilling, concealing or covering. Tests shall be conducted in the presence of the Architect or their designated Representative.

B. All low pressure ductwork (design operating pressure of 1.0" WC ESP or less) shall be tested by the operation of the system to which it is connected.

C. All medium and high pressure ductwork (operating pressure of more than 1.0" WC ESP) shall be tested at 1.5 times the design operating pressure of the system to which it is connected, or at the total fan pressure at shut-off, whichever is greater, up to the maximum pressure classification of the associated ductwork system.

D. All visible and audible air leaks from the ductwork systems shall be repaired.

E. See specification section 23 11 23 for testing requirements of natural gas piping. System shall be part of Division 22 scope unless otherwise arranged within the Contract. Coordinate with Division 22.

F. Condenser water supply and return piping shall be hydrostatically tested at a pressure of not less than the greater of 1.5 times the operating pressure or 100 psig, whichever is greater, for a minimum of one hour. No loss in pressure shall be permitted.

G. All refrigerant piping shall be 100% tested with the applicable ASHRAE standard - latest version.

H. All leaks shall be repaired by tightening, remaking joints, or replacing pipe and fittings. Caulking of joints shall not be permitted.

3.06 RECORD (AS-BUILT) DRAWINGS

A. At the completion of the project, provide a set of reproducible prints to the Architect which reflects all changes, deviations and revisions made to the original design documents. Locations of all underground piping and utilities shall be clearly shown and dimensioned from permanent reference points such as building column lines. Record drawings shall be produced in electronic format compatible with AUTOCAD. Furnish electronic copies of all drawings in dwg. format, and two (2) bond copies of all drawing sheets.

3.07 OPERATING AND MAINTENANCE MANUALS AND INSTRUCTIONS

A. Complete operating and maintenance manuals shall be provided to the Owner. Four copies shall be provided. Each copy shall be bound in a separate 3-ring, loose-leaf notebook. Operating instructions shall be provided for each mechanical system, and shall each include a brief system description, a simple schematic and a sequence of operation. Operating and maintenance instructions shall be provided for each piece of equipment. A control system wiring diagram shall be included in each operating and maintenance manual.

B. Prior to final acceptance or beneficial occupancy, provide the services of a Competent Technician for not less than one (1) day to instruct the Owner in the operation of the mechanical systems.

3.08 TESTING AND BALANCING

A. Testing and balancing of the HVAC system shall be performed as specified in Section 23 05 93. Note that this work is to be performed under a separate Contract directly under the General Contractor. Submit four (4) copies of the test and balance report directly to the Architect.

3.09 PIPING SUPPORTS

A. Pipe hangers or supports shall be provided within 18" of each horizontal fitting, equipment connection, valve, etc. and within 18" of the centerline of horizontal or vertical changes in direction summing to 90° or more. Specific attention is called to vertical turns into risers.

B. Piping supports shall be provided, at a minimum, in accordance with the greater of the below or at code minimum. Where the below or code does not address support for specific piping, supports shall be in accordance with manufacturer's requirements.

Piping Material	Max. Horz. Spacing	Max. Vert. Spacing
Cast-iron pipe	5'	15'
Copper pipe	12'	10'
Copper tubing ≤ 1-1/4" dia.	6'	10'
Copper tubing ≥ 1-1/2" dia.	10'	10'
PVC pipe	4'	10'*

*Midstory guide required for piping 2" diameter and smaller

C. Riser clamps shall be provided at each floor penetration. For pressurized piping systems except refrigerant suction and liquid service, provide vibration isolation at all riser clamps with two (2) pad-type mountings consisting of a minimum 3/8" thick ribbed or waffled elastomeric pads bonded between minimum 16-gauge galvanized steel separator plates. Pads shall be sized for a deflection of 0.12" to 0.16". Pads shall be minimum 3" x 3" square.

3.10 WARRANTY

A. All work provided under this Division 23 shall be subject to a minimum one year warranty. The warranty shall include prompt repair or replacement of equipment or system failures and shall include all parts, refrigerant, and labor. In addition, all compressors shall carry an additional four year parts-only warranty. Extended warranties shall be provided on all other equipment so specified in other Sections.

3.11 SHOP DRAWINGS

A. Shop drawings per the submittal requirements shall be submit to the Design Team with adequate time for multiple rounds of review. Shop drawings shall show "As-Built" conditions including elevations, offsets, transitions, and accessories. Shop drawings shall indicate all code and manufacturer's recommended clearances, access, and coordinate the clearance and access requirements with all other trades.

B. Shop drawings that use keynotes direct from the Design Documents shall not be acceptable as they do not demonstrate coordination with all other trades, necessary transitions, etc.

C. Shop drawings shall be provided as complete packages in parallel with all trades to document coordination. Floor-by-floor or otherwise piecemeal shop drawings are generally not acceptable.

3.12 BID REQUIREMENTS

A. The Contractor shall include all systems, equipment and accessories shown on the plans and specifications.

B. The Contractor is responsible for providing all design documents to all SubContractors. All systems, equipment and accessories shall be included in the bid, whether shown on the SubContractor applicable plans or other design documents.

C. Should any discrepancy occur in the Design Documents, the Contractor shall provide a request for clarification prior to bid or note the discrepancy in the bid and provide an appropriate cost allowance in the bid.

D. The Contractor shall acknowledge that the Design Documents are diagrammatic and shall provide all systems, equipment and accessories required for a complete facility. Any areas that appear to be void of systems or inappropriate systems shall be noted in the bid. No post bid change order shall be considered for areas or discrepancies not noted in the bid.

E. All installation coordination and means and methods and labor and materials required for proper system installation shall be included.

F. These requirements are in addition to bid procedures and requirements of the RFP or general specifications.

END OF SECTION

SECTION 23 05 93

TESTING, ADJUSTING, AND BALANCING FOR HVAC

1.0 GENERAL

1.10 DESCRIPTION

A. All work specified in this Section is governed by the Common Work Results for HVAC Section 23 05 00.

B. This Section 23 05 93 and the accompanying drawings cover the provision of all labor, equipment, appliances, and materials and performing all operations in connection with the testing and balancing (T&B) of the heating, ventilating and air conditioning (HVAC) systems as specified herein and as shown. These systems include, but are not limited to, the following:
1. Supply distribution systems
2. Return and exhaust air systems
3. Heating, ventilating and air conditioning equipment (all scheduled equipment as a minimum)
4. Hydronic systems

1.11 INTENT

A. It is the intent of this Section of the specifications to provide a complete operable and balanced HVAC system as shown and specified which is reasonably airtight, comfortable and free of objectionable noise and vibration.

1.12 SCOPE OF WORK

A. HVAC test and balance shall be performed by an Independent Agency certified by the Associated Air Balance Council (AABC) or National Environmental Balancing Bureau (NEBB) under direct contract to the General Contractor. All work performed by this Agency shall be performed by qualified Technicians under the direct supervision of an AABC or NEBB Certified Test and Balance Engineer. The Agency shall be independent and shall not be associated in any way with the installing HVAC SubContractor.

B. HVAC Test and Balance shall be performed in accordance with the 7th edition of the AABC National Standards, 2016 for Total System Balance or the NEBB Procedural Standards for TAB of Environmental Systems, 8th Edition, 2015 together with the NEBB TAB Manual for Technicians, 2nd Edition.

C. The final Test and Balance report shall serve to substantiate compliance with the intent of the Contract Documents, specifically the HVAC systems.

D. HVAC Test and Balance shall not begin until the systems are substantially complete.

E. Upon the completion of the Test and Balance work, the Agency shall submit four (4) copies of the complete HVAC Test and Balance Report directly to the Architect.

F. The Agency, as a part of its contract with the General Contractor, shall act as an Authorized Inspection Agency, responsible to the General Contractor and the Architect and shall, during the test and balance, list those items which require correction or have not been installed in accordance with the Contract Documents.

G. The Agency shall plainly mark the settings of all valves, dampers and other adjustable devices. If a balancing device is provided with a memory stop, it shall be set, locked and marked.

H. The Agency shall record all of the final set points on all variable speed drives.

1.13 SUBMITTALS

A. The name and certification of the Agency, along with the name and certification of the Certified Test and Balance Engineer, shall be submitted to the Architect for review within 30 days after the award of the General Contract.

B. The selected Agency shall submit to the Owner:
1. Procedural Manual
2. Report Forms
3. AABC or NEBB Performance Guaranty
4. Instrument List and Calibration Dates
5. Schedule
6. Floorplans as Needed to Uniquely Identify Device Locations

C. A reviewed copy of each of the above shall be returned to the Agency before the HVAC Test and Balance begins.

D. If a complete submittal in accordance with these requirements is not received within 60 days from award of the General Contract, then the Architect reserves the right to select the Agency.

2.0 PRODUCTS

2.03 (Not applicable).

3.0 EXECUTION

3.13 GENERAL CONTRACTOR'S DUTIES

A. The General Contractor shall provide the following, within 10 days after his receipt, to the Agency:
1. Contract Drawings
2. Contract applicable specification Division 23 (others as applicable)
3. Addenda
4. Change orders
5. Reviewed submittals

B. The General Contractor shall start-up and maintain the HVAC systems and shall continue the operation of the HVAC systems during each day of testing and balancing. Start-up and operation shall include, as a minimum, the following:
1. All equipment operable and in safe condition.
2. Temperature control system complete.
3. Proper thermal overload protection in place for electrical equipment.
4. Ductwork leakage rates not exceeding those specified and all duct systems clean of debris.
5. Air transfer systems shall have:
   a. Correct fan rotation and RPM.
   b. Coil fins cleaned and combed.
   c. Filters clean and in place.
   d. Access doors closed.
   e. All dampers in place and open.
   f. All grilles, registers and diffusers installed.

C. Provide sufficient time before final completion date so that testing and balancing can be accomplished. Coordinate the submitted T&B schedule.

D. Provide immediate labor and tools to make required corrections and repairs without undue delay.

E. The General Contractor and his SubContractors shall cooperate fully with the Agency to provide the following:
1. Access to HVAC system components.
2. The right to adjust the systems.

F. Any conditions which prevent a proper HVAC Test and Balance shall be reported by the Agency to the General Contractor and Architect within 7 days of their discovery.

G. If it is determined by the Agency and confirmed by the Architect that drive changes or additional balancing dampers are required, the Contractor shall obtain and install all necessary components.

H. The Agency shall cooperate with the Architect and the Contractor and all his SubContractors to perform the work in such a manner as to meet the job schedule.

I. The Agency shall verify that all system components are in place and in proper working order prior to leaving the project.

J. All reported and recorded data shall represent true measured conditions.

K. Where equipment uses variable speed drives, and where feasible, VFDs shall be used as the primary balancing method prior to adjustment or balancing of valves, dampers, etc.

END OF SECTION

SECTION 23 07 13

DUCT INSULATION

1.0 GENERAL

1.14 DESCRIPTION

A. All work specified in this Section is governed by the Common Work Results for HVAC Section 23 05 00.

B. This Section 23 07 13 and the accompanying drawings cover the provisions of all labor, equipment, appliances, and materials and performing all operations in connection with the construction of the ductwork systems as specified herein and as shown. These systems include, but are not limited to, the following:
1. Insulation for typical ductwork
2. Duct liner

1.15 INTENT

A. It is the intent of this Section of the specifications to provide a complete operable duct system as shown and specified which is reasonably airtight, free of noise, vibration and sweating, and fabricated so as to fit into the space allotted and to exhibit a minimum resistance to airflow.

2.0 PRODUCTS

2.04 DUCT LINER

A. Duct liner shall be one inch thick, 1 ½ lb. density (3 lb. density on medium- and high-pressure supply air systems except that 1 lb. density is acceptable if the liner is at least R ≥ 4.2 and NRC ≥ 0.65) fibrous glass with one face coated with a black fire retardant compound. The permanent composite fire and smoke hazard rating of the liner shall be stenciled on the liner face and shall be:
1. Maximum Flame Spread 25
2. Maximum Smoke Developed 50

2.05 TYPICAL DUCT INSULATION

A. Duct insulation shall be 2.2" thick, minimum 3/4 lb. density fiberglass, installed R ≥ 6.0, with an FSKL 0.00035" thick aluminum foil jacket, reinforced with fiberglass scrim. Thermal conductivity shall be a maximum of K = 0.29 at 75°F mean temperature, or a maximum of K=0.27 at 25% compression.

B. Insulation adhesive shall be Benjamin Foster 85-20. Tape shall be aluminum foil and shall be SMACNA listed and labeled.

C. The composite NFPA 90A and 90B, ASTM E84, UL rating of the installed insulation shall not exceed 25/50.

D. The grease exhaust ductwork shall have zero-clearance to combustibles wrap from the hood connection to discharge termination. Coordinate the insulation with all required access panels, drains, etc. as required by NFPA 96.

3.0 EXECUTION

3.14 INSTALLATION

A. Ductwork shall be installed in strict accordance with SMACNA, UL, and NFPA standards.

B. Duct liner shall be provided throughout all return air, transfer, and plenums. Duct liner shall also be provided for the following minimum distances, through the first elbow(s), or as otherwise indicated on the drawings, whichever is greater, downstream of each unit indicated below:
1. Packaged rooftop unit - 25 ft
2. Self-contained air conditioning unit - 25 ft
3. Central air handling unit - 25 ft
4. Split system air handling unit - 5 ft
5. Water-source heat pump - 5 ft
6. Fan coil unit - 5 ft
7. Terminal unit - 5 ft

C. Straight runs only shall be factored into the above distance requirements. Elbows, etc. within the length shall be lined but shall not count towards the length requirement.

D. Duct liner shall not be installed within six inches of a damper, including fire and/or smoke dampers. Metal nosings are required on the upstream side of the exposed insulation. Where lining has been interrupted, external insulation is required.

E. Duct liner shall be cut to provide overlapped and compressed longitudinal corner joints. Liner shall be installed with the coated surface facing the air stream. Duct liner shall be adhered to the ductwork with a 100% coverage of the sheet metal surfaces using a fire-retardant adhesive applied by spraying. Coat all exposed leading edges and all transverse joints with fire retardant adhesive. The liner shall be additionally secured using metal pins welded to the duct and speed washers. All leading edges shall be secured with sheet metal airfoils.

F. Inside the vapor barrier of the building all supply air ductwork which is not lined shall be insulated. All outside air ductwork shall be insulated. Insulation shall be cut slightly longer than circumference of duct to insure full thickness at corners. All insulation shall be applied with edges tightly banded. Insulation shall be adhered to duct with fire resistant adhesive. Adhesive shall be applied so that insulation conforms to duct surfaces uniformly and firmly. In addition to the adhesive, the insulation shall be additionally secured to the bottom of all ducts 18" or wider by means of welded pins and speed clips. The protruding end of the pins shall be cut off flush after the speed clips have been applied. The vapor barrier facing shall be thoroughly sealed with tape where the pins have pierced through. All joints shall be sealed with 2" wide SMACNA tape. Any cuts or tears shall be sealed with SMACNA tape.

G. All outside air ductwork located in conditioned or semi-conditioned spaces shall be externally insulated similar to supply ductwork.

H. All conditioned air ductwork, including partially conditioned energy recovery ventilator outside air supply to the building and exhaust ductwork, installed in spaces that are ventilated only, i.e. penthouses, shall be insulated.

END OF SECTION

BW&A

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NORTH CAROLINA PROFESSIONAL SEAL 054269 ENGINEER JOSEPH CRAWFORD

05/26/2023

No.	Drawing Issue Description	Date
	ISSUED FOR PERMIT	05/26/23

14396 NC-210 SPRING LAKE, NC 28390

MIDGARD - SPRING LAKE

MECHANICAL SPECIFICATIONS

WILL KELLY	2023-0683
PROJECT MANAGER	PROJECT NO.
JOE CRAWFORD	AS NOTED
PROJECT ENGINEER	SCALE
JORDAN BRANHAM	05/26/23
DRAWN BY	DATE

M0.2

DRAWING NO.

ISSUED FOR CONSTRUCTION

SECTION 23 07 19

HVAC PIPING INSULATION

1.0 GENERAL

1.16 DESCRIPTION

A. All work specified in this Section is governed by the Common Work Results for HVAC Section 23 05 00.

B. This Section 23 07 19 and the accompanying drawings cover the provisions of all labor, equipment, appliances, and materials and performing all operations in connection with the insulation of the HVAC piping systems as specified herein and as shown for the heating, ventilating and air conditioning (HVAC) systems. These insulated piping systems include, but are not limited to, the following:
1. Condenser water supply and return (CWS&R)
2. Refrigerant suction and liquid (RS&L)
3. Condensate drains (indoors only)

C. All insulation products installed indoors shall meet ASTM E 84, UL 723, NFPA 90A, and 90B requirements for Flame Spread Rating 25 and Smoke Developed Rating 50.

D. Inserts for all piping which is specified to have hangers outside the insulation shall be provided at such hangers and supports for all piping 2" and larger. Inserts shall be Foamglas insulation, and shall be at least 2" longer than the length of the associated pipe shields.

E. Insulation products in air plenum spaces shall be listed and labeled and have a fire hazard rating not more than 25 for flame developed and not more than 50 for smoke developed.

1.17 INTENT

A. It is the intent of this Section of the specifications to provide a complete piping insulation system which is free of gaps and tears, properly fitted and finished, free of sweating, and fabricated so as to fit the space allotted and to exhibit a negligible heat transfer.

B. The word "piping" is defined to mean all piping, fittings, joints, hangers, coatings, valves, cocks, test and sensor wells and accessories necessary for the HVAC piping systems described, shown and specified.

1.18 ACCEPTABLE MANUFACTURERS

A. Insulation products shall be as manufactured by Owens Corning, Knauf, Manville, Certainteed, Dow, or Armacell.

2.0 PRODUCTS

2.06 PIPING INSULATION

A. Piping insulation installed inside the building, except for the refrigerant suction and liquid service and cooling coil condensate drains, shall be fiberglass preformed pipe insulation with a white all-service jacket/vapor barrier. Insulation shall have a maximum K of 0.27 BTU/In/Hr/SF/°F, at a mean temperature of 75°F. For pipe sizes larger than 1.5", 2" thick insulation shall be used; and for pipe sizes 1.5" and smaller, 1.5" thick insulation shall be used.

B. Piping insulation installed outside the building, except for the refrigerant suction service, shall be prefabricated 2 lb/ft^3 density polyisocyanurate insulation (Trymer 2000 XP or approved equal) with waterproof mastic and glass fiber jacket finished with an aluminum jacket with waterproof silicone caulk joints and seams. Outside the building, insulation with a maximum K of 0.19 BTU/In/Hr/SF/°F at a mean temperature of 75°F shall be used. Outdoor piping 1.5" and smaller shall be insulated with 1.5" thick insulation; outdoor piping larger than 1.5" shall be insulated with 2" thick insulation.

C. Piping insulation installed underground, either inside or outside the building, shall be prefabricated 2 lb/ft^3 density polyisocyanurate insulation (Trymer 2000 XP or approved equal) with HDPE jacket. Jacket shall conform to ASTM D1248 and D3350, be extruded, have a minimum thickness of 175 mils.

D. Flexible elastomeric foam closed-cell insulation shall be provided over all refrigerant suction piping, cooling coil condensate, and other services as specified or noted. Refrigerant suction piping insulation shall be 1-1/2" thick 25/50 AP Armaflex, black. Insulation shall be wrapped by listed and labeled product in return air plenums. Cooling coil condensate insulation shall be 1" thick ArmaFlex Ultra. All glues and coatings shall be products of the same Manufacturer as the insulation. Insulation shall comply with ASTM C534, Type I for tubular materials. Insulation shall be listed and labeled per UL 723 at 25/50 when used in return air plenums.

E. Insulation shall be continuous over all valve bodies, fittings, and wall and floor penetrations. Do not insulate unions on hot water piping; nor instruments, gauges, valve handwheels, etc. on any piping.

F. All piping insulation covering water-carrying piping which is exposed to the weather and subject to bursting from freezing temperatures shall have oversized insulation to accommodate heating cable. See Section 23 05 33.

G. Provide a continuous watertight aluminum jacket and fitting covers for all polyisocyanurate insulation piping exposed to the weather.

3.0 EXECUTION

3.15 INSTALLATION OF PREFORMED PIPE INSULATION

A. Indoors

1. Preformed pipe insulation with all-service jackets shall have all longitudinal joints lapped by a minimum of 2" and sealed with fire retardant adhesive. Butt joints shall be sealed with 3" wide tape similar to the insulation vapor barrier jacket and secured with adhesive.

2. All elbows shall be insulated with preformed fitted insulation equal to the thickness specified for the adjacent piping insulation. As an alternative, provide fitting covers meeting NFPA/UL 25/50 ratings; stuff all covers with fiberglass insulation having characteristics equal to adjacent pipe insulation.

B. Outdoors

1. Preformed pipe insulation for exterior water-carrying pipe shall have insulation secured on with copper wire with ends twisted and turned into the insulation. Over the insulation, apply mastic to a minimum 1/4" thickness and draw in, while mastic is wet, glass fiber cloth. Finish with aluminum jacket with waterproof silicone caulk joints and seams. All seams shall be overlapped in the direction of rainfall, as practical.

2. All elbows shall be insulated with preformed fitted insulation equal to the thickness specified for the adjacent piping insulation.

3. All water-carrying piping weather shall have self-regulating electric heat tracing installed as specified in Section 23 05 33.

3.16 CLOSED-CELL PIPING INSULATION INSTALLATION

A. Insulation shall be provided on all refrigerant suction and indoor cooling coil condensate drain lines. The insulation shall be installed by the slip-on method; slitting of the insulation is prohibited and shall be cause for rejection, except that AP ArmaFlex Lapseal with interior adhesive liner and wide adhesive lap seal is acceptable. All elbows shall be mitered and all such joints and butt joints shall be tightly made and glued.

B. All insulation installed outdoors shall be coated with a glossy white, ultraviolet protective coating applied in two coats.

3.17 MISCELLANEOUS REQUIREMENTS

A. Where insulation is installed over pipe hangers, supports, etc., seal vapor barrier at all penetrations. Also seal all end joints at unions and points of termination by bevel cutting the end and drawing jacket over until secured at the pipe. Apply white mastic to all end seals over jacket.

END OF SECTION

SECTION 23 31 00

HVAC DUCTS, ACCESSORIES, AND CASINGS

1.0 GENERAL

1.19 DESCRIPTION

A. All work specified in this Section is governed by the Common Work Results for HVAC Section 23 05 00.

B. This Section 23 31 00 and the accompanying drawings cover the provisions of all labor, equipment, appliances, and materials and performing all operations in connection with the construction of the ductwork systems as specified herein and as shown. These systems include, but are not limited to, the following:
1. Supply air ductwork
2. Return, transfer and relief air ductwork
3. Exhaust ductwork
4. Outside air ductwork
5. Ductwork accessories

1.20 INTENT

A. It is the intent of this Section of the specifications to provide a complete operable duct system as shown and specified which is reasonably airtight, free of noise, vibration and sweating, and fabricated so as to fit into the space allotted and to exhibit a minimum resistance to airflow.

1.21 DESIGN AND CONSTRUCTION - DUCTWORK

A. Ductwork shall be provided in strict accordance with the third edition - 2005 - of the SMACNA HVAC Duct Construction Standards - Metal and Flexible, NFPA No. 90A, 90B, 91 and 96, and UL 181. **Where SMACNA tables have an option between different gauges and supports, the heavier gauge shall be used.**

B. Ductwork dimensions shown are net, clear, inside dimensions with no allowance shown for duct liner. All ductwork specified to be lined shall be 2" larger than shown in each dimension to compensate for the liner. Ductwork shall be square, rectangular, round, spiral or flat oval as noted. Conversion of duct shapes and sizes shown shall be accomplished without increasing air velocities or friction losses and is subject to prior approval by the Architect and Engineer.

C. Elbows shall be either full radius type (inside radius equal to duct width), five-gore radiused flat-oval type or, in low pressure systems only, mitered with double-thickness turning vanes except that lined ductwork for low pressure returns and transfers shall not have turning vanes.

D. Abrupt changes in duct sizes and shapes shall not be permitted. The total angle of diverging transitions shall be not more than 15 degrees; converging transitions shall be not more than 30 degrees unless otherwise noted or required due to structural constraints.

E. Offsets, transitions, rises and drops are not individually called out on the Design Drawings. They shall be provided as required to fit the ductwork into the allocated spaces.

F. Transition rectangular ductwork on bottom and sides. Maintain top of ductwork level and as high as possible.

G. All other ductwork shall be constructed for standard 1" WC static pressure class at 2500 FPM with Class C seals and is herein defined as "low pressure ductwork".

H. Provide the following types of ductwork material for the services indicated:

1. Galvanized sheetmetal: supply, return, exhaust, and relief of conditioned and outside air

2.0 PRODUCTS

2.07 GALVANIZED SHEETMETAL

A. Galvanized sheetmetal shall be lock-forming grade G90-ASTM A 653 hot dip galvanized steel sheets. Sheetmetal shall be galvanized on each side with not less than 1.25 ounces of zinc per square foot.

B. Galvanized sheetmetal installed outside the building and subject to weather shall be soldered or welded. See Section 23 07 13 for additional information about covering and insulation.

C. Galvanized sheetmetal installed outside the building and not exposed to weather, such as in covered loading docks and parking decks, may match the construction of ductwork inside the building.

D. Galvanized sheetmetal ductwork outside the building within 20 miles of the seacoast shall have corrosion coating appropriate to the installation location.

2.08 SPIRAL DUCT

A. Spiral duct shall be utilized for all flat-oval and round ductwork in medium and high-pressure systems.

B. Spiral duct shall be the product of United McGill Corporation, R.V. Money, Eastern Sheet Metal, or an approved equal.

C. Spiral duct with internal ribs is not acceptable.

D. Spiral duct shall conform to SMACNA 2005 Standards. Lighter gauges, etc. due to standing ribs are not acceptable.

E. Spiral duct in exposed ceiling applications shall have slip fittings, minimum Class 3 for 2" WG negative pressure to 10" WG positive pressure, with EPDM gaskets. Coordinate assembly with ductwork insulation.

2.09 DAMPERS

A. Manual Volume Dampers

1. Single blade butterfly dampers are acceptable up to 12" round or 12" x 12" square. Dampers larger than these dimensions shall be multi-blade type. Single blade dampers shall be constructed of 16 gauge or heavier galvanized sheetmetal.

2. No multi-blade damper blade shall exceed 8" in width. All multiple blade dampers shall be constructed of 16 gauge galvanized steel or heavier. The damper frame shall be 16 gauge or heavier. The damper action shall be opposed-blade type.

3. Each blade shall pivot on a 1/2" cadmium plated, cold-rolled steel axle which pivots within self-lubricating, Oilite bronze bearings.

4. The top and bottom edges of each rectangular damper blade shall be crimped for stiffness.

5. The operating rod for all dampers shall be extended outside the damper frame for attachment of an operator. Each operator shall have a position indicator and locking quadrant.

6. All dampers utilized for introduction of outside air shall have flexible, gasketed edge and end seals. The leakage rate shall be less than 4 CFM per SF of face area against a 1" WC differential pressure, based on a nominal 48" x 48" damper size.

7. All dampers utilized for exhaust or relief air shall have flexible, gasketed edge and end seals. The leakage rate shall be less than 4 CFM per SF of face area against a 1" WC differential pressure, based on a nominal 48" x 48" damper size.

8. Dampers to be installed in insulated ductwork shall have standoffs sufficient to allow for insulation and vapor barrier integrity.

9. Manual volume dampers shall be as manufactured by Louvers & Dampers, Inc., Pottorff, Greenheck, Nailor, Ruskin, or an approved equal.

B. Control Dampers

1. Control dampers shall be of the same construction as manual volume dampers, except that no manual operator and quadrant is required. The operating rod shall be suitable for operation by an automatic pneumatic or electric operator.

C. Fire Dampers

1. Fire dampers shall be UL-listed and labeled for 1 1/2 or 3 hours, in accordance with the installation location, and shall be provided with 160°F links or linkages appropriate for the service. Dampers installed within ducts shall be Type B or Type C with the blades out of the air stream. Areas indicated shall be net, clear, open areas.

2. Fire dampers shall be appropriate for the installation location and application. All fire dampers in supply, return, exhaust, etc. shall be dynamic-type.

3. Fire dampers shall be as manufactured by Louvers & Dampers, Inc., Pottorff, Greenheck, Nailor, Ruskin, or an approved equal.

D. Smoke Dampers

1. Smoke dampers shall be UL-listed as Class 1 low-leakage smoke dampers. Smoke dampers shall be 24V and wired under this Division.

2. Smoke dampers shall be appropriate for the installation location and application. All fire dampers in supply, return, exhaust, etc. shall be dynamic-type.

3. Smoke dampers shall be as manufactured by Prefco, Louvers & Dampers, Inc., Pottorff, Greenheck, Nailor, Ruskin, or an approved equal.

E. Fire/Smoke Dampers

1. Fire/smoke dampers may be combined into a combination fire/smoke dampers. All provisions of the above shall apply. Fire/smoke dampers shall be UL-listed.

F. Backdraft Dampers

1. Backdraft dampers shall be sized according to their installation location and noted pressure setting. Damper pressure setting shall be adjustable and shall be accessible from outside ductwork or via access hatch, as applicable.

2.10 LOW-PRESSURE DUCT BRANCHES

A. Splitter dampers shall be provided at all low-pressure ductwork branches. All low-pressure ductwork branches shall be radiused or 45 degree take-offs; straight taps are unacceptable. The length of the damper blade shall be the same as the width of the widest duct section at the split, but in no case shall blade length be less than 12". Each operator rod shall have a locking swivel joint.

2.11 FLEXIBLE DUCT

A. Flexible ductwork shall be Class 1, UL 181 air duct and meet NFPA 90A and 90B Standards.

B. The internal duct surface shall be acoustically rated, black CPE bonded to a coated steel wire helix. The external jacket shall be a fiberglass, bi-directionally reinforced, metallized vapor barrier with a standing, triple ply seam. Fiberglass insulation shall be provided between the duct surface and the jacket to achieve a maximum thermal conductance of 0.24 BTU/Hr./sq. ft./°F at 75°F mean.

C. Flexible ductwork shall be suitable for 10" WG positive pressure and 1" WG negative pressure in sizes 4" through 12" ID, and 6" WG positive pressure and 0.5" WG negative pressure in sizes 14-16" ID.

D. Flexible ductwork, insulation and insulation cover shall be suitable for ceiling return air plenum installation and shall comply with all applicable codes and standards regarding such ceiling plenum installations.

E. Flexible duct shall be Thermaflex M-KE or an approved equal.

F. The maximum allowable installed length of flexible ductwork shall be as follows:

1. 8'-0" on low-pressure supply air systems limited to short runouts and end of runs connected to round neck supply diffusers and registers.

2. 4'-0" on medium and high-pressure supply air systems limited to the runouts from the sheetmetal ductwork to each terminal unit.

3. 2'-0" on connections from round neck grilles to sheetmetal ductwork on return, exhaust and transfer ductwork.

G. Provide a spin-in fitting with integral scoop and volume damper at all flexible run-out connections in low-pressure supply air ductwork only, except locations where spin-in fittings would project more than 50% into the projecting ductwork dimension.

H. Flexible ductwork shall not pass through wall, floors, or ceilings.

2.12 TERMINAL UNIT RUNOUTS

A. Medium and high-pressure runouts to terminal units shall be connected to the trunk duct with factory-welded laterals, conical tees or bellmouth fittings; abrupt round to rectangular taps are strictly prohibited and shall be rejected.

B. Terminal unit runouts shall be the largest of the associated terminal unit inlet size, the size noted on the drawings, or the scheduled runout size.

2.13 FLEXIBLE CONNECTIONS

A. Provide flexible duct connections at the inlet and outlet of each belt-driven fan, indoor unit, fan coil unit, air handling unit, etc., and at all other locations indicated. Flexible connections shall be fabricated from a glass fabric coated on both sides with neoprene. Minimum weight shall be 30 oz. per sq. yard. Flexible connections shall be used for vibration isolation only and shall not be used to correct connection misalignment.

2.14 DUCT HARDWARE

A. Duct hardware shall be as manufactured by Young Regulator or an approved equal.

2.15 ACCESS DOORS

A. A duct access door shall be provided at each fire and smoke damper. Access doors shall be designed for 1.5 times the pressure of the duct in which they are mounted. Access doors shall be of sufficient size to provide access to the dampers for resetting the blades and replacing the links. Access doors in medium and high-pressure ductwork shall be installed downstream of fire dampers and shall be implosion type. Where access is provided through gypsum board walls or ceilings, furnish access door for installation under Division 09. Coordinate with Division 09 and Architect. Each door shall match the fire-rating of the wall or ceiling indicated.

B. Access shall be provided to duct-mounted smoke detector locations. Access shall allow inspection and maintenance of all aspects of the detector. Access doors shall meet the requirements of A, above, as needed.

3.0 EXECUTION

3.18 INSTALLATION

A. Ductwork shall be installed in strict accordance with SMACNA, UL, and NFPA standards.

B. All ductwork installed outside the building shall be secured to the structure. Coordinate with the Structural Engineer as needed. It is the Contractor's responsibility to design and coordinate all supports. All supports shall be designed to withstand all code-required wind and seismic loads.

C. Flexible ducts utilized in the low-pressure ductwork systems shall be installed without kinks or bends which are less than a centerline radius equal to or greater than twice the diameter of the flexible duct being installed. Also, in the runouts from the medium or high-pressure ductwork to the terminal units, the flexible ducts shall be installed with a variance of no more than 1" per foot of installed length off a straight and level line from the centerline of the sheetmetal ductwork runout or tap to the centerline of the terminal unit inlet. The size of the flexible ductwork connected to each terminal unit shall be the equivalent size of the larger of the following:
1. The inlet size of the terminal unit valve
2. The runout size indicated on the drawings

Should the runout size indicated on the drawings differ from the inlet size of the terminal unit valve, or where the inlet to the terminal unit is rectangular, the transition shall be made with sheetmetal and shall occur at the inlet to the terminal unit.

D. All low pressure ductwork downstream of VAV units shall be left uncapped for balancing until tenant fit-up affects the units.

E. All intersections (crossing) of low-pressure and medium-pressure ductwork shall be made with offsets in the low-pressure ductwork only. The medium pressure ductwork shall be ran straight and level.

F. Electric duct heaters shall be installed as indicated and in conformance with the manufacturer's recommendations. Coordinate the actual units to be provided with all trades. The heater shall be tested and adjusted after installation to provide the capacities indicated.

G. Ductwork labels, including factory labels, tags, etc. except equipment nameplates shall be removed to the satisfaction of the Architect in all exposed areas.

H. Dampers shall be adjustable. Where dampers are not or will not be accessible without access panels, provide and install remote balancing cable control system, Young Regulator or equal. Adjustment shall be from a nearby accessible area.

END OF SECTION

SECTION 23 34 00

HVAC FANS

1.0 GENERAL

1.22 DESCRIPTION

A. All work specified in this Section is governed by the Common Work Results for HVAC Section 23 05 00.

B. This Section 23 34 00 and the accompanying drawings cover the provision of all labor, equipment, appliances and materials, and performing all operations in connection with the construction and installation of the fans as specified herein and as shown. These fans include, but are not limited to the following:
1. Ceiling/cabinet fans

1.23 INTENT

A. It is the intent of this Section of the specifications to provide complete, operable, adjusted fans as shown and specified which are free of excessive noise, vibration and airflow fluctuations.

1.24 BASIS OF DESIGN

A. The basis of design is as scheduled. Any proposed substitutions shall be proven equal in all aspects to the equipment specified as the basis of design. Particular attention is called to the requirements of Section 23 05 00.

1.25 ACCEPTABLE SUBSTITUTE MANUFACTURERS

A. Acceptable substitute manufacturers are Carnes, Cook, Acme, PennBarry, Twin City, Price, and Greenheck. Acceptable manufacturers for kitchen grease exhaust fans are Captive-Aire, Viking, and Greenheck.

2.0 PRODUCTS

2.16 GENERAL REQUIREMENTS

A. All non-filtered fans shall be factory tested, rated and certified in accordance with the requirements of AMCA Standard No. 210 and shall be labeled accordingly. Filtered fans may be non-labeled but must be rated in an AMCA approved laboratory in accordance with 210.

B. All exhaust fans shall be provided complete with gravity-type backdraft dampers.

C. All electric motors and equipment shall be UL labeled.

D. Refer to Division 26 of these specifications and to the electrical Contract Drawings for electrical characteristics and connections to all equipment. Coordinate all electric motors and other equipment with these electrical documents.

E. All exposed motors and belts shall be protected with enclosures or guards in accordance with OSHA requirements.

2.17 CEILING/CABINET EXHAUST FANS

A. Ceiling/cabinet exhaust fans shall be Greenheck Model CSP (inline/cabinet) or Greenheck Model SP (ceiling) with integral grille, or an approved equal.

3.0 EXECUTION

3.19 INSTALLATION

A. Fans shall be installed as indicated and in conformance with the manufacturer's recommendations. Coordinate the actual units to be provided with all trades.

3.20 ADJUSTMENT

A. The fans shall be tested and adjusted after installation to provide the capacities indicated.

END OF SECTION

SECTION 23 37 13

DIFFUSERS, REGISTERS, AND GRILLES

1.0 GENERAL

1.26 DESCRIPTION

A. All work specified in this Section is governed by the Common Work Results for HVAC Section 23 05 00.

B. This Section 23 37 13 and the accompanying drawings cover the provisions of all labor, equipment, appliances and materials, and performing all operations in connection with the construction and installation of air distribution devices as specified herein and as shown. These units include, but are not limited to the following:
1. Ceiling Diffusers (CD)
2. Return Air Grilles (RAG)
3. Exhaust Grilles (EG)
4. Residential Supply/Return Registers (RSR/RRR)

1.27 INTENT

A. It is the intent of this Section of the specifications to provide complete, operable, adjusted air distribution devices as shown and specified which are free of excessive noise, vibration and airflow fluctuations.

1.28 SELECTION CRITERIA

A. All air distribution devices shall be selected in accordance with the following minimum criteria unless otherwise noted below or on the drawings:

1. Method of mounting shall be compatible with the ceiling, wall or duct surface which it mounts on or in; i.e. lay-in, surface mounting, plaster frame, duct collar, etc. The architectural drawings shall be referenced to determine the mounting method for each device. All flanges on surface mounted devices shall be provided with a gasket.

2. Finish of all ceiling mounted devices shall be selected to match the color of the adjacent ceiling. Finish of all wall mounted devices shall be primer which is compatible with the finish coating specified for the adjacent wall; finish coat will be applied under Division 9.

1.29 BASIS OF DESIGN

A. The basis of design is Titus. Any proposed substitutions shall be proven equal in all respects to the equipment specified as the basis of design. Any modifications to ductwork, controls, ceilings, building structure, etc., that result from any substitution shall be coordinated with all trades. This coordination shall occur before delivery of equipment and any modifications shall be performed without incurring additions to the Contract.

1.30 ACCEPTABLE MANUFACTURERS

A. Acceptable manufacturers are Price, Carnes, Metal Aire, Krueger, Nailor, and Titus, UON, provided that their units, performance, appearance and physical characteristics are equal in all respects for this specific project.

2.0 PRODUCTS

2.18 DESCRIPTION

A. Ceiling Diffusers (CD)

1. Ceiling diffusers shall be perforated face diffusers equipped with fully adjustable pattern controls, capable of providing one-way, two-way, two-way corner, three-way, and four-way air patterns; Titus PAS. Diffuser performance data shall be in accordance with ADC equipment test code 162R4. The perforated face shall be hinged for easy access to pattern controls and duct accessories. The maximum NC level at design airflow shall not exceed 35 when measured in a direct field 5'-0" from the face of the device.

B. Return Air Grilles (RAG)

1. Return air grilles shall match the ceiling diffusers in the area or shall be hollow core, perforated face, lay-in type, selected to match the CDs; with the largest neck size available UON Titus PAR. Performance data shall be in accordance with ADC 162R4. All other characteristics shall be equal to the ceiling diffusers.

C. Residential Registers (RSR/RRR)

1. Residential Supply Registers (RSR) shall be heavy gauge all steel welded construction; ProSelect or substitution by Hart & Cooley or Shoemaker. RSRs shall have three-way air pattern and shall have face-adjustable damper. Registers shall have externally insulated sheet metal plenum area equal to the register, minimum 9" depth. Penetrations through rated assemblies shall include fire and/or smoke dampers, rated appropriately for the penetration.

3.0 EXECUTION

3.21 INSTALLATION

A. Air distribution devices shall be installed as indicated and in conformance with the manufacturer's recommendations. The color, frame, and border types shall be coordinated with Architectural requirements and shall be selected to install in the finished surface indicated.

B. All air distributions devices to be reused shall be installed the same way as indicated for new devices. All existing color, frame, and border types shall modified as required to match new device requirements.

C. All air distribution devices with blade orientations shall be coordinated with Architect. Specific attention is called to devices in exposed ceiling areas, including wall-mounted.

3.22 ADJUSTMENT

A. Grilles, registers, diffusers, etc. shall be tested and adjusted to provide the scheduled air flow capacities.

B. All devices shall have adjustable and accessible volume dampers. Where dampers are not or will not be accessible without access panels, provide and install remote balancing cable control system, Young Regulator or equal. Adjustment shall be from the face of the air distribution device, coordinated with the Air Distribution Manufacturer. Coordinate the location and size of the damper with the installation.

END OF SECTION

SECTION 23 81 26

SPLIT-SYSTEM AIR-CONDITIONERS

1.0 GENERAL

1.31 DESCRIPTION

A. All work specified in this Section is governed by the Common Work Results for HVAC Section 23 05 00.

B. This Section 23 81 26 and the accompanying drawings cover the provision of all labor, equipment, appliances and materials, and performing all operations in connection with the construction and installation of the split systems as specified herein and as shown. This work includes, but is not limited to, the following:
1. Split system fan coil, heating section and condensing units
2. Control system (interlocked to all split system components)

C. Split system units shall be self-contained, automatic, packaged units. These units shall be completely factory-assembled as unitary packages complete with operating controls, internal wiring and piping and fully charged with R-410A refrigerant. Only one electrical power connection shall be required for each unit.

D. Units shall be UL listed and cooling capacities shall be certified in accordance with ANSI/AHRI 210/240.

1.32 INTENT

A. It is the intent of this Section of the specifications to provide complete, operable, adjusted split systems, as shown and specified, which operate efficiently and automatically, and are free of excessive noise and vibration.

1.33 BASIS OF DESIGN

A. The basis of design is as scheduled. Acceptable alternate manufactures include Trane, Carrier, Mitsubishi, Lennox, and Daikin for ducted systems except that Liebert systems are also acceptable for Server/IT spaces, and Carrier, Mitsubishi, LG, Hitachi, and Daikin for ductless mini-splits. Any proposed substitutions shall be submitted in accordance with the prior approval requirements.

2.0 PRODUCTS

2.19 UNIT CASINGS

A. Unit casings shall be formed, galvanized steel construction with welded assembly. Galvanized steel surfaces shall be bonderized and painted with baked acrylic enamel for complete weather protection. Accessories and components shall match and interlock with all other split system components. Fan coil unit casings shall be fully internally insulated with liner which meets NFPA 25/50 flame spread/smoke developed ratings.

2.20 CONDENSING UNITS

A. Condensing unit refrigeration systems shall be factory-charged and ready for operation. All units with capacities greater than five (5) tons shall be provided with minimum 2-stage (50% and 100%) cooling. Compressor(s) shall be direct drive, 3600 RPM, hermetic reciprocating type with centrifugal oil pump, crankcase heater and internal pressure relief valve. Compressor(s) shall have internal spring isolation and sound muffling and exhibit minimum vibration transmission and noise. Anti-recycle timers shall be provided to prevent excessive cycling of compressors thru utilization of a minimum five (5) minute time shutdown of unit on interruption of power or controlled shutdown.

B. Condensing unit condenser fans shall be direct-driven, propeller blade type. Condensing unit heat rejection shall be vertically upward.

2.21 COILS

A. Evaporator and condenser coils shall be copper tubing mechanically bonded to heavy duty aluminum fins. Aluminum tubes shall not be acceptable.

2.22 ELECTRIC HEATING SECTIONS

A. Electric heating sections shall be UL listed with nickel-chromium open coil resistance heating elements. Each heater shall be protected by an automatic reset high-limit thermostat and manual reset high-limit thermostat for the primary and secondary overcurrent/thermal protection. A proof of airflow/fan interlock shall also be provided. Controls shall provide for multiple stage start-up and operation.

2.23 CONTROLS AND ACCESSORIES

A. All operating and safety controls which are internal to each unit shall be factory-installed and shall include, as a minimum, solid state compressor overload protection, magnetic contactors, thermostatic expansion valve(s), refrigerant line drier(s), outdoor fan and compressor cycling thermostats, high and low limit protection against excessive temperatures or pressures.

B. A 24 volt transformer shall be provided to accommodate an accessory 24 volt indoor thermostat complete with an electronic programmable night setback, separate automatic heat/cool settings, auto/manual fan control and seasonal selector. Thermostat shall provide staging of the cooling and heating to match the stages of each component.

C. Automatic shutdown controls shall be provided on units ≥2,000 CFM to meet local Codes (or NFPA 90A as a minimum) and shall consist of firestats and duct-mounted smoke detectors interlocked to the fan coil unit for shutdown on the detection of fire or smoke.

2.24 FILTERS

A. Units shall have minimum 1 inch thick, low velocity, glass fiber throwaway filters in commercially available sizes.

3.0 EXECUTION

3.23 INSTALLATION

A. The split systems and associated controls shall be installed in strict accordance with the manufacturer's recommendations.

B. The control system shall be completely wired under this Division 23. Wiring shall be in accordance with the NEC and shall meet all requirements for this installation.

3.24 STARTUP

A. Provide the services of a factory-trained and qualified Service Technician employed by the Unit Manufacturer who shall inspect the installation including external interlock and power connections; supervise leak testing, initial operation, calibration of operating and safety controls and supervise electrical testing including insulation resistance of motors and voltage balance between phases during starting and running.

B. This Service Technician shall forward a report in four (4) copies to the Owner when the unit is in safe and proper operating condition. This report shall include all pressure and control settings, meg readings, voltage readings per phase during start and run, and shall list minor discrepancies to be corrected that affect safe and reliable operation. One additional copy of the report shall be left in the unit control panel. One copy of bound installation, operation, maintenance service and parts brochures, including applicable serial numbers, full unit description and parts ordering sources, shall be placed in the unit control panel at the time of startup; four (4) additional copies shall be forwarded to the Owner.

END OF SECTION

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Norcross, GA 30092
Phone (770) 810-8800

NORTH CAROLINA PROFESSIONAL SEAL 054269 ENGINEER JOSEPH CRAWFORD

05/26/2023

No.	Drawing Issue Description	Date
	ISSUED FOR PERMIT	05/26/23

14396 NC-210 SPRING LAKE, NC 28390

MIDGARD - SPRING LAKE

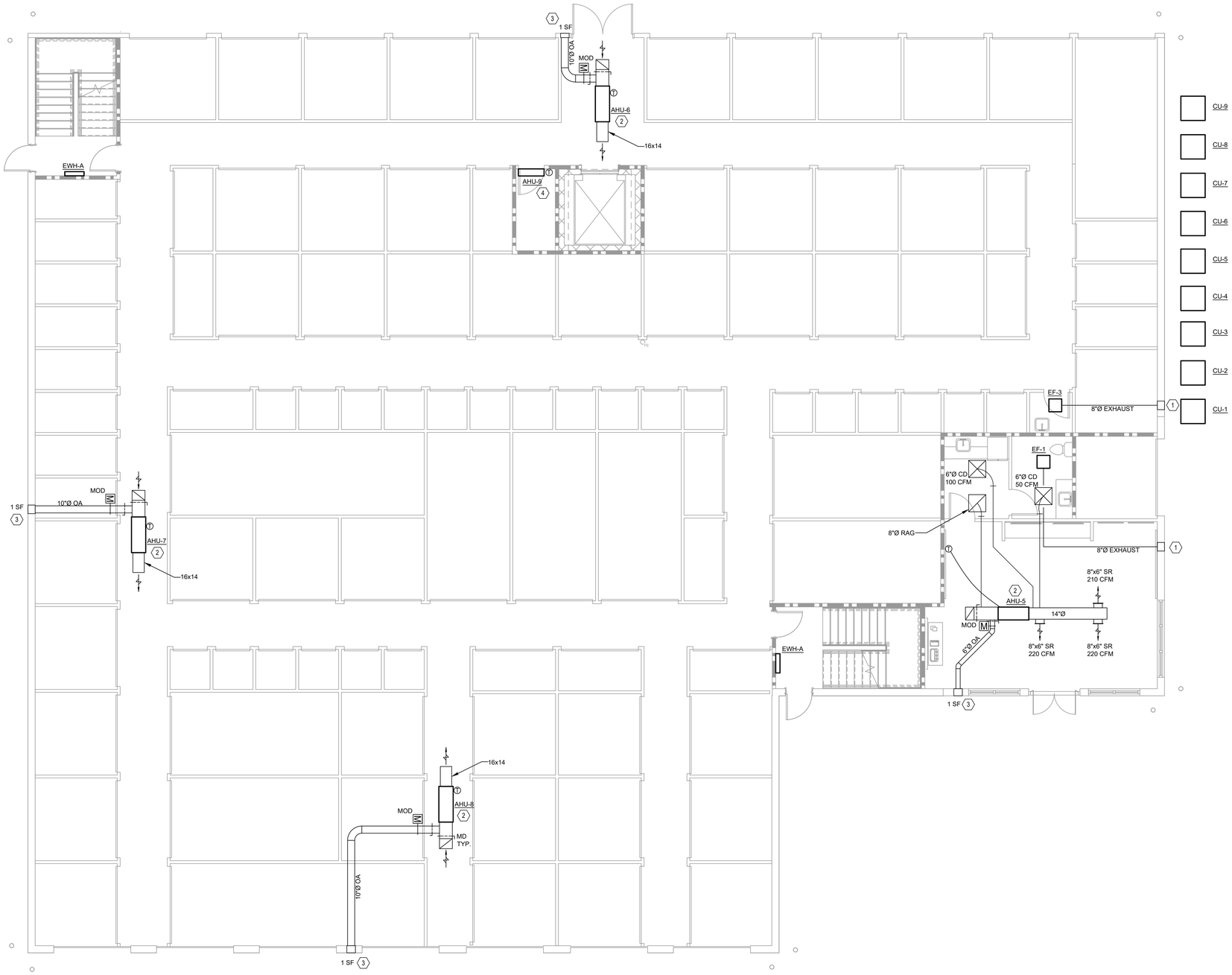
MECHANICAL SPECIFICATIONS

WILL KELLY	2023-0683
PROJECT MANAGER	PROJECT NO.
JOE CRAWFORD	AS NOTED
PROJECT ENGINEER	SCALE
JORDAN BRANHAM	05/26/23
DRAWN BY	DATE

M0.3

DRAWING NO.

ISSUED FOR CONSTRUCTION



1 M1.1 FIRST FLOOR PLAN - MECHANICAL

3/16" = 1'-0"

GENERAL NOTES

1. ALL PIPING AND DUCTWORK THAT IS EXPOSED TO VIEW SHALL BE PREPARED FOR PAINTING IN A COLOR SELECTED BY THE ARCHITECT, EXCEPT THAT EQUIPMENT AND PIPE LABELS SHALL NOT BE PAINTED. COORDINATE WITH ARCHITECTURAL PLANS.

SHEET KEYNOTES

1. EXHAUST TERMINATION VIA WALL CAP WITH SPRING LOADED BACKDRAFT DAMPER.
2. PROVIDE AND INSTALL NEW SPLIT SYSTEM SUSPENDED AT DECK PER DETAIL 1/M0.1. PROVIDE LINED SHEET METAL RETURN BOOT FULL SIZE OF UNIT CONNECTION. OA CONNECTION SHALL BE A MINIMUM OF 5'-0" FROM UNIT INLET.
3. PROVIDE AND INSTALL NEW EXTERIOR STORMPROOF LOUVER WITH THE MINIMUM FREE AREA INDICATED. EXTEND 12" DEEP INSULATION SHEET METAL PLENUM FROM INSIDE LOUVER CONNECTION, FULL SIZE OF LOUVER DIMENSIONS. COORDINATE EXACT LOUVER LOCATION AND DIMENSIONS WITH ARCHITECT.
4. PROVIDE AND INSTALL SPLIT SYSTEM INDOOR UNIT AS SCHEDULED.

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14396 NC-210 SPRING LAKE, NC 28390

MIDGARD - SPRING LAKE

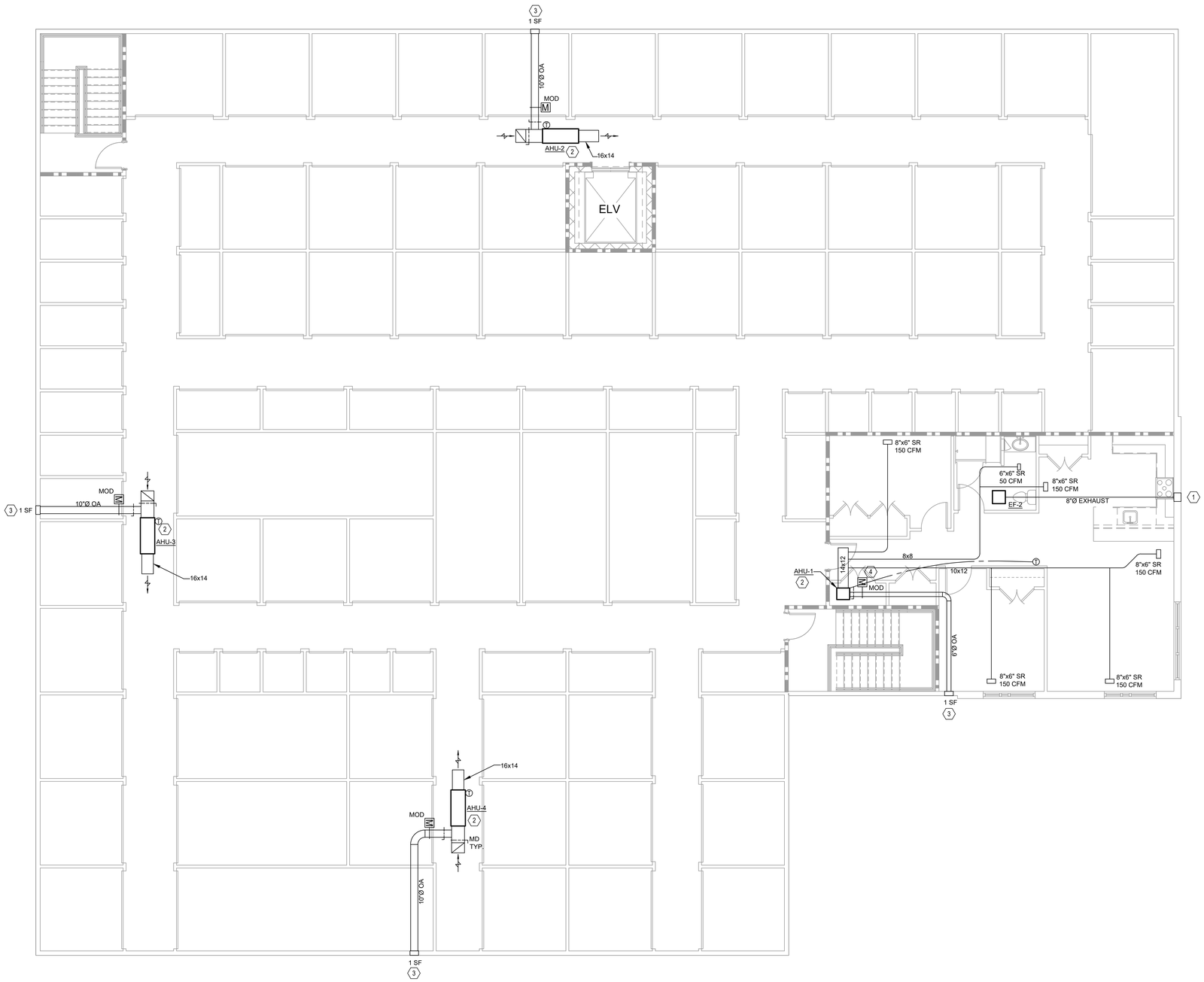
FIRST FLOOR PLAN - MECHANICAL

WILL KELLY	2023-0683
PROJECT MANAGER	PROJECT NO.
JOE CRAWFORD	AS NOTED
PROJECT ENGINEER	SCALE
JORDAN BRANHAM	05/26/23
DRAWN BY	DATE

M1.1

DRAWING NO.

ISSUED FOR CONSTRUCTION



1 M1.2 SECOND FLOOR PLAN - MECHANICAL

3/16" = 1'-0"

SHEET KEYNOTES

1. EXHAUST TERMINATION VIA WALL CAP WITH SPRING LOADED BACKDRAFT DAMPER.
2. PROVIDE AND INSTALL NEW SPLIT SYSTEM SUSPENDED AT DECK PER DETAIL X/M. PROVIDE LINED SHEET METAL RETURN BOOT FULL SIZE OF UNIT CONNECTION. OA CONNECTION SHALL BE A MINIMUM OF 5'-0" FROM UNIT INLET.
3. PROVIDE AND INSTALL NEW EXTERIOR STORMPROOF LOUVER WITH THE MINIMUM FREE AREA INDICATED. EXTEND 12" DEEP INSULATION SHEET METAL PLENUM FROM INSIDE LOUVER CONNECTION, FULL SIZE OF LOUVER DIMENSIONS. COORDINATE EXACT LOUVER LOCATION AND DIMENSIONS WITH ARCHITECT.
4. 14"x14" RAR ABOVE MECH CLOSET DOOR.

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No.	Drawing Issue Description	Date
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14396 NC-210 SPRING LAKE, NC 28390

MIDGARD - SPRING LAKE

SECOND FLOOR PLAN - MECHANICAL

WILL KELLY	2023-0683
PROJECT MANAGER	PROJECT NO.
JOE CRAWFORD	AS NOTED
PROJECT ENGINEER	SCALE
JORDAN BRANHAM	05/26/23
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M1.2

DRAWING NO.

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ABBREVIATIONS

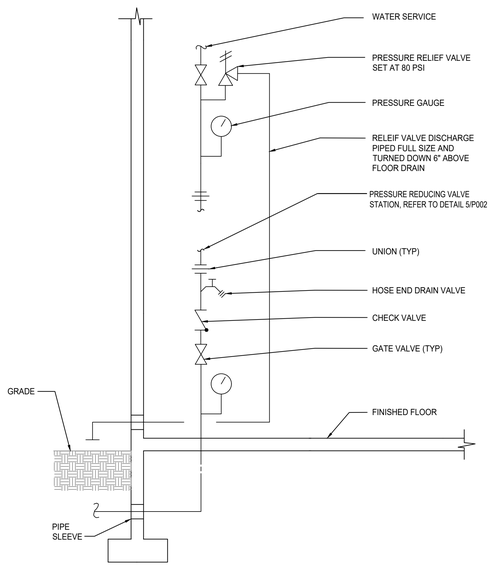
A/C	ABOVE CEILING
AAV	AIR ADMITTANCE VALVE
AC	AIR CONDITIONING
AD	ACCESS DOOR
ADJ	ADJUSTABLE
AFF	ABOVE FINISHED FLOOR
AHU	AIR HANDLING UNIT
ARP	ACID RESISTANCE PIPING
AUTO	AUTOMATIC
B/F	BELOW FLOOR
B/G	BELOW GRADE
B/S	BELOW SLAB
BAL	BALANCING
BHP	BRAKE HORSEPOWER
BCO	BASE CLEANOUT
CO	CLEANOUT
CW	COLD WATER (DOMESTIC)
DN	DOWN
DO	DITTO
DR	DRAIN
DWG	DRAWING
EA	EACH
ECC	ECCENTRIC
EFF	EFFICIENCY
EOD	EMERGENCY OVERFLOW DRAIN
ETR	EXISTING TO REMAIN
EWT	ENTERING WATER TEMP.
EX	EXISTING
FCO	FLOOR CLEANOUT
FD	FLOOR DRAIN
FLR	FLOOR
FOB	FLAT ON BOTTOM
FOT	FLAT ON TOP
FPM	FEET PER MINUTE
FPS	FEET PER SECOND
FT	FEET
G	GATE
GA	GAUGE
GCO	GRADE CLEANOUT
GPM	GALLONS PER MINUTE
GW	GREASE WASTE
HD	HUB DRAIN
HP	HORSEPOWER
HP	HIGH PRESSURE
HTG	HEATING
HW	HOT WATER (DOMESTIC)
HWR	HOT WATER RETURN
HWRR	HW REVERSE RETURN
HWS	HOT WATER SUPPLY
ID	INSIDE DIMENSION
IE	INVERTED ELEVATION
IN	INCHES
KW	KILOWATTS
LB	POUNDS
LP	LIQUID PROPANE GAS
LWR	LOOP WATER RETURN
LWS	LOOP WATER SUPPLY
MAX	MAXIMUM
MIN	MINIMUM
MFR	MANUFACTURER
NC	NORMALLY CLOSED
NG	NATURAL GAS
NFGH	NON-FREEZE GROUND HYDRANT
NFWH	NON-FREEZE WALL HYDRANT
NO	NORMALLY OPEN
NOM	NOMINAL
OD	OVERFLOW DRAIN
PSI	POUNDS PER SQUARE INCH
RAD	RADIUS
RD	ROOF DRAIN
RED	REDUCER
RTU	ROOFTOP UNIT
SAN	SANITARY
SQ	SQUARE
ST	STORM
TEMP	TEMPERATURE
TYP	TYPICAL
UON	UNLESS OTHERWISE NOTED
V	VENT
VA	VALVE
VTR	VENT THRU ROOF
W	WASTE
WC	WATER COLUMN
WCO	WALL CLEANOUT
WHA	WATER HAMMER ARRESTOR
WT	WEIGHT

LEGEND

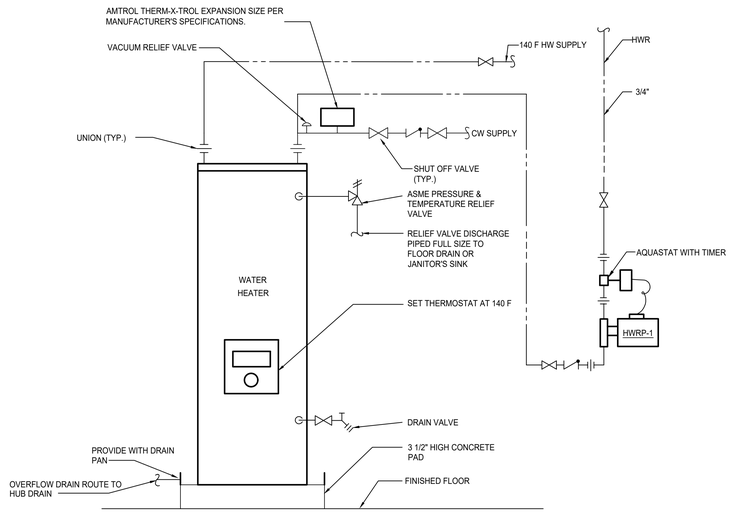
	COLD WATER
	HOT WATER
	HOT WATER RECIRCULATION
	SANITARY / GREASE WASTE
	VENT
	GAS
	EX. CW (SIMILAR FOR OTHERS)
	EX. PIPE (TYPE NOT SPECIFIED)
	WORK TO BE REMOVED
	CONNECT TO EXISTING
	FLOOR DRAIN
	FLOOR SINK
	FLOOR CLEANOUT
	WALL CLEANOUT
	HOSE BIBB (UON)
	SHUT-OFF VALVE
	CHECK VALVE
	MOTOR ACTUATED BALL VALVE
	MOTOR ACTUATED 3-WAY VALVE
	BALANCING VALVE
	PRESSURE GAUGE
	GAUGE COCK
(#)	KEYNOTE

FIRE PROTECTION NOTES

1. THE SPRINKLER SYSTEMS SHALL BE DESIGNED AND INSTALLED IN CONFORMANCE WITH THE STANDARDS OF NFPA 13, NFPA 72A, 72B, 72C, 72D, NFPA 231, THE STANDARDS OF THE UNDERWRITER (IRI/FMISO, ETC.) AND ALL PREVAILING LOCAL CODES.
2. FIRE PROTECTION SCOPE OF WORK CONSISTS OF RELOCATING EXISTING SPRINKLER HEADS TO COORDINATE WITH NEW WALL, DIFFUSER, AND LIGHT FIXTURE LOCATIONS. PROVIDE NEW PIPING AND SPRINKLER HEADS AS NECESSARY. COORDINATE CLOSELY WITH ARCHITECTURAL PARTITION AND REFLECTED CEILING PLANS VERIFY THAT ALL SPRINKLER HEADS ARE IN GOOD CONDITION. REPLACE ANY SPRINKLER HEADS THAT ARE NO LONGER IN GOOD CONDITION.
3. PROVIDE CONCEALED TYPE HEADS IN ALL AREAS WITH GYPSUM WALLBOARD CEILINGS. PROVIDE SEMI-RECESSED HEADS IN LAY-IN CEILINGS.
4. RE-WORK SPRINKLER HEADS IN AREAS OPEN TO STRUCTURE TO BE UPRIGHT, BRONZE HEADS.
5. RELOCATE SPRINKLER MAINS AND BRANCH LINES LOCATED ABOVE IT/SERVER/ELECTRICAL ROOMS (NOT DIRECTLY SERVING THE ROOM) TO RESIDE OUTSIDE THE LIMITS OF THE ROOM.
6. PIPING SHALL BE SCHEDULE 40, GRADE A53 OR A120; EXCEPT THAT SCHEDULE 10 PIPING IS ACCEPTABLE ON PIPE SIZES 2-1/2" AND LARGER WHERE PERMITTED BY THE APPLICABLE CODES AND STANDARDS. SCHEDULE 10 PIPING SHALL NOT BE THREADED IN THE FIELD, NOR SHALL BE CUT-GROOVED IN THE FIELD OR BY A MANUFACTURER. COUPLINGS AND FITTINGS SHALL BE THREADED OR GROOVED; VIKING, VICTAULIC, OR APPROVED EQUAL.
7. AS PART OF THE SHOP DRAWING PROCESS, A LICENSED FIRE PROTECTION SUBCONTRACTOR SHALL PROVIDE FIRE SPRINKLER CALCULATIONS AND PLANS TO MEET LOCAL CODE REQUIREMENTS AND NFPA PARAMETERS. DRAWINGS SHALL HAVE EXISTING AND NEW FIRE SPRINKLER HEADS LAYOUT WITH THE ARCHITECTURAL RCP COORDINATED. ARCHITECT AND PROJECT ENGINEER WILL REVIEW PLANS.
8. THE STANDPIPES AND SPRINKLER SYSTEMS SHALL BE DESIGNED AND INSTALLED BY A FIRM WHICH IS DULY LICENSED TO INSTALL SUCH SYSTEMS IN THE STATE OF GEORGIA AND CARRIES A CURRENT CERTIFICATE FROM THE GEORGIA STATE FIRE MARSHAL'S OFFICE. THESE NOTES AND ANY FIRE PROTECTION PLANS PROVIDED ARE FOR PERFORMANCE, MATERIAL, AND DESIGN INTENT REQUIREMENTS ONLY. ALL ASPECTS OF THE SCOPE SHALL ULTIMATELY BE THE RESPONSIBILITY OF THE DESIGNER AND INSTALLER.



4 P0.1 WATER SERVICE RISER
NO SCALE

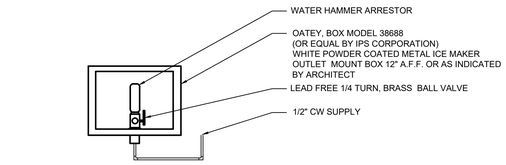


1 P0.1 WATER HEATER DETAIL
NO SCALE

FIXTURE SCHEDULE

DESCRIPTION	WASTE	VENT	CW	HW
WATER CLOSET (P-1)	3"	2"	1/2"	---
LAVATORY (P-2)	3"	2"	1/2"	1/2"
SINK (P-3)	3"	2"	1/2"	1/2"
SHOWER (P-4)	3"	2"	3/4"	3/4"
UTILITY SINK (P-5)	3"	2"	3/4"	3/4"
FLOOR DRAIN (FD)	3"	2"	1/2" TP	---
HUB DRAIN (HD)	3"	2"	1/2" TP	---
NON-FREEZE WALL HYDRANT (NFWH)	---	---	3/4"	---

TP: PROVIDE WITH 1/2" TRAP PRIMER



2 P0.1 GUY GRAY BOX DETAIL
NO SCALE

ELECTRIC WATER HEATER SCHEDULE

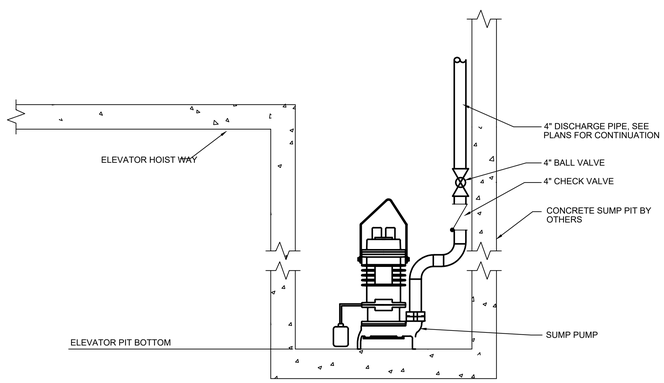
I.D. TAG	TYPE OF WATER HEATER	TANK CAPACITY (GALLONS)	RECOVERY @ 100°F (GPH)	POWER INPUT (kW)	ELEC. CHAR. (VOLTS/PHASE)	WEIGHT (lbs)	BASIS OF DESIGN	REMARKS
WH-A	ELEC TANK TYPE	50	25	6.0 kW	208/3	265	A.O. SMITH DRE-52	(1)

(1) REFER TO DETAIL 1/P-0.1 FOR INSTALLATION.

PUMP SCHEDULE

I.D. TAG	FLUID	TYPE OF PUMP	FLOW (GPM)	HEAD (FT)	MAX. NPSHR (FT.)	MAXIMUM RPM	MOTOR HP	VOLTS/ PHASE	MINIMUM EFFICIENCY	BASIS OF DESIGN	REMARKS
HWRP-1	WATER	HW RECIRC PUMP	10	8	---	2,950	1/15	120/1	--	BELL & GOSSETT NBF-33	(1) (2)
SP-1	WATER	SUBMERSIBLE SUMP PUMP	100	12	---	3,450	1	120/1	--	STANCOR SE100	(3)

(1) PUMP TO BE SUPPLIED WITH 3/4" FLANGES.
(2) PUMP SHALL RUN CONTINUOUSLY DURING OCCUPIED HOURS AND PROVIDE AUTOMATIC MEANS TO DE-ENERGIZE DURING OFF HOURS. COORDINATE WITH DIVISION 16.
(3) PROVIDE PUMP WITH STAINLESS STEEL CONSTRUCTION OIL MINDER CONTROL SYSTEM WITH MANUAL RESET BUTTON LED INDICATORS FOR HIGH WATER, HIGH MOTOR AMPS, POWER AND PUMP ACTIVATION.



3 P0.1 ELEVATOR SUMP PUMP DETAIL
NO SCALE

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NORTH CAROLINA PROFESSIONAL SEAL 054269 ENGINEER JOSEPH CRAWFORD

05/26/2023

No.	Drawing Issue Description	Date
	ISSUED FOR PERMIT	05/26/23

14396 NC-210 SPRING LAKE, NC 28390

MIDGARD - SPRING LAKE

PLUMBING LEGEND, NOTES, SCHEDULES, & DETAILS

WILL KELLY	2023-0683
PROJECT MANAGER	PROJECT NO.
JOE CRAWFORD	AS NOTED
PROJECT ENGINEER	SCALE
JORDAN BRANHAM	05/26/23
DRAWN BY	DATE

P0.1
DRAWING NO.

ISSUED FOR CONSTRUCTION

SECTION 22 05 00

COMMON WORK RESULTS FOR PLUMBING

1.0 GENERAL

1.01 DESCRIPTION

A. This Division 22 and the accompanying drawings cover the provision of all labor, equipment, appliances, and materials and performing all operations in connection with the construction of the plumbing systems as specified herein and as shown.

B. All work specified in this Section is governed by the Common Work Results for Plumbing 22 05 00.

C. The General Provisions and Division 1, including the general, supplementary and other conditions and other Divisions, as appropriate, apply to work specified in this Division.

1.02 INTENT OF DRAWINGS AND SPECIFICATIONS

A. The implied and stated intent of the drawings and specifications is to establish minimum acceptable standards for materials, equipment and workmanship, and to provide operable plumbing systems complete in every respect.

B. The engineering drawings are diagrammatic, intended to show general arrangement and sizes of system components, and shall not be scaled. Rather, the architectural and structural drawings shall govern space constraints, dimensions and finishes. All offsets and fittings which will be necessary to accomplish the finished installation shall be provided at no additional cost or increase in the Contract.

1.03 SPACE PRIORITY

A. Ensure optimum use of available space for materials and equipment installed above ceilings. Allocate space in the order of priority as listed below except as otherwise detailed. Items are listed in the order of priority, with items of equal importance listed under a single priority number.
1. Gravity flow piping systems
2. Vent piping systems
3. Recessed lighting fixtures
4. Concealed HVAC terminals and equipment
5. Air duct systems
6. Sprinkler piping systems
7. Pressurized piping systems
8. Electrical conduit, wiring, control air tubing

B. Order of space priority does not dictate installation sequence. Installation sequence shall be as required to install all affected trades.

C. The work of this Division 22 shall not obstruct access for installation, operation and maintenance of the work of any other Division.

D. All major items of equipment shall be arranged so as to provide a minimum of 28" clear aisle space. Additional space shall be provided between and around equipment for maintenance and proper operation as shown in the Equipment Manufacturer's literature.

1.04 COORDINATION

A. Coordinate all work under this Division 22 with work under all other Divisions, providing adjustment as necessary.

B. Coordination of space requirements with respect to Division 26 shall be performed such that:

1. No equipment, piping or ductwork, other than electrical, shall be installed within 42" of switchboards or panelboards.
2. No piping or ductwork which ever operates at a temperature in excess of 120°F shall be installed within 3" of any electrical conductor.

C. All items mounted in or below the ceiling, and all items penetrating the ceiling, shall be coordinated with the architectural reflected ceiling plans. If any items are not shown on these plans, or any items need to be relocated for coordination purposes, prepare a reflected ceiling plan and submit it to the Architect for approval.

1.05 CODE COMPLIANCE

A. All workmanship and materials provided under this Division 22 shall comply with all laws, ordinances, codes and regulations of all Federal, State and Local Authorities Having Jurisdiction.

B. All fire suppression, plumbing, heating, ventilating, and air conditioning materials and workmanship shall comply with all local, state, and federal codes.

C. Secure and pay all fees associated with all permits and licenses required for execution of the Contract. Arrange for all inspections required by City, County, State and other Authorities Having Jurisdiction, and deliver certificates of approval to the Architect.

D. The code requirements are strictly a minimum and shall be met without incurring additions to the Contract. Where requirements of the drawings or specifications exceed the code requirements, the work shall be provided in accordance with these drawings or specifications. In the event of conflict or ambiguity between the various codes, the most stringent requirement shall govern.

1.06 ELECTRICAL REQUIREMENTS AND INTERFACE

A. All electrical equipment and wiring provided under this Division 22 shall comply with the electrical system characteristics indicated on the electrical drawings and specified in Division 26.

B. Electric controls, contactors, starters, pilot lights, push buttons, etc., shall be provided complete as part of the motor, heater or other equipment which it operates. All electrical components shall be in conformance with the requirements of the National Electrical Code and Division 26. Starters shall be wye-delta, closed transition type. Reference Division 26 and the electrical engineering drawings for those motor starters provided under that Division 26. All starters not shown shall be provided under this Division 22. Unless specified otherwise under other individual equipment Sections, motor starters shall conform to the following minimum requirements:

1. Starters for motors 1/3 horsepower or smaller shall be manual unless remote or automatic starting is required, in which case the starters shall be magnetic, full voltage, non-reversing, single-speed, unless otherwise indicated. All other starters shall be magnetic.

2. Each starter for a three-phase motor shall be furnished with three (3) overload relays sized for the full load running current of the motor actually provided. Provide an external "HAND-OFF-AUTO" selector switch with red "RUNNING" light. Provide a green pilot light to indicate motor "STOPPED". Each pilot light shall have a legend plate indicating reason for signal.

3. Each overload relay shall have a normally open alarm contact which will close only when actuated by an overload (not to be confused with N.O. or N.C. auxiliary contacts). These contacts shall be properly wired to their respective blue pilot light provided on the starter front cover and having a "TRIPPED" legend plate.

4. Individually mounted motor starters shall be in a NEMA Type 1 general purpose enclosure in unfinished areas and shall be flush mounted in all finished areas. All starters mounted in exterior areas shall have a NEMA 3R enclosure. Each starter shall have a laminated nameplate to indicate equipment unit number, function and circuit number.

5. All motor starters, push buttons and pilot lights shall be of the same manufacturer as the switchboard and shall be General Electric, Square D, Siemens I.T.E., or Westinghouse.

C. Motor starters for the following equipment shall be provided under this Division 22 by the Manufacturer of the equipment:
1. Other equipment hereinafter specified in other Sections to be provided with integral starters

D. Unless otherwise noted or specified in individual Sections, all 3-phase motors shall be standard NEMA continuous duty "B" type, with Class B insulation, open drip-proof frame for indoor service, TEFC for outdoor service and a service factor of 1.15. All motors 5 HP and larger shall be U.S. Motors Hi-Efficiency Model or Reliance XE Hi-Efficiency Model.

E. All power wiring and final connections to equipment shall be provided under Division 26.

F. Control components, all interlocks (control valves, leak sensors, etc.) and control wiring (120 volt, single phase and less) shall be provided under this Division 22 as required to achieve the specified control sequences.

G. All control wiring over 30 volts shall be installed by a Licensed Electrician working under this Division 22.

1.07 SLEEVES, SEALS AND ESCUTCHEONS

A. Sleeves shall be provided through all pipe penetrations of concrete or masonry walls, elevated floors and roofs, except those plumbing piping penetrations for fixtures, vents, etc.

B. Sleeves shall be fabricated from Schedule 40 steel pipe through 10" and Standard Wall steel pipe for sleeve sizes 12" and larger. All sleeves penetrating exterior walls, underground walls, pit or vault walls shall be provided with a 3" x 3/8" thick waterstop ring welded completely to the midpoint of the sleeve.

C. All sleeves penetrating exterior walls, underground walls, pit or vault walls and elevated floors shall be packed and sealed watertight.

D. Sleeves through roofs shall extend above the roof surface and be flashed watertight.

E. Sleeves through walls shall be cut and finished flush with each surface of the wall in which they are installed.

F. Sleeves through elevated floors shall extend at least ½" above the finished floor and be sealed waterproof between the sleeve and slab.

G. Sleeves shall be sized to provide a minimum of 1/2" clearance between the inside surface of the sleeve and the outside finished surface of the pipe plus any insulation specified.

H. Fire-stops shall be provided as specified herein. All annular spaces between piping and sleeves which do not require fire-stops shall be packed with mineral wool and caulked.

I. Fire-stopping or packing at elevated floor penetrations shall be level with or above the elevation of the top of sleeve to prevent any water ponding on top of the sleeve.

J. Provide round, chrome-plated escutcheons on all exposed piping penetrations passing through walls, floors, partitions and ceilings.

K. All penetrations through rated slabs, walls, etc. shall be in accordance with UL listed systems. Provide rated box-out, fire caulking, etc. as needed to ensure fire rating is maintained in compliance with UL listed systems.

1.08 FIRESTOPS

A. Where piping, conduit, etc. pass through fire partitions, fire walls and floors, a firestop shall be provided that will ensure an effective barrier against the spread of fire, smoke and gases. Firestop material shall be packed tight and completely fill gaps between the ductwork, piping, conduit, etc. and the perimeter of their rough openings.

B. All penetrations shall be in accordance with UL 1479 or ASTM E 814 listed systems, and products used shall be specifically applicable for the appropriate installation conditions. Assemblies shall provide a minimum rating equal to the construction penetrated. Products shall be by HILTI, 3M, or ProSet.

C. Installation shall be by a Qualified Installer. Installer shall be certified, licensed, or otherwise qualified by the Firestopping Manufacturer as having the necessary training to install the Manufacturer's specific product. A Manufacturer or Vendor's willingness to sell the firestopping product to the Contractor or Installer does not in itself confer qualification.

D. Installer shall have at least one of the following qualifications:
1. FM 4991 Approved Contractor
2. UL Approved Contractor
3. HILTI, 3M, or ProSet Accredited Fire Stop Specialty Contractor

E. Installing Firm shall have no less than 3 years of experience with firestop installation.

F. A Manufacturer's direct Representative (not Distributor or Agent) shall be on site during initial installation of firestop systems to train appropriate Contractor personnel in proper selection and installation procedures.

G. The firestop Contractor or Installer shall supply As-Built documentation of each individual penetration location on the project. Documentation shall include a sequential location number, detailed description of the penetration location, size, and type, tested system number, type of assembly penetrated, and rating to be achieved. As-Built documentation shall be included with the close-out materials.

H. Identify through-penetration firestop systems with pressure-sensitive, self-adhesive, preprinted vinyl labels. Attach label permanently on both sides of penetrated construction in a visible location. The label shall include the following:
1. The words "Warning - Through Penetration Firestop System-Do Not Disturb"
2. Through Penetration firestop system designation and Manufacturer
3. Date of Installation

1.09 CORE DRILLING

A. Cutting of holes through concrete and masonry shall be by diamond core or concrete saw. Pneumatic hammer, impact electric and hand or manual hammer type drills will not be allowed, except as permitted by the Architect where required by limited working space. Locate holes such that they will not affect structural sections such as ribs or beams. Holes shall be laid out well in advance of the installation. These layout locations shall be approved by the Architect prior to drilling.

1.10 IDENTIFICATION OF PIPING

A. All aboveground plumbing systems piping and valves sized 3/4" and larger which are installed in accessible locations (including piping above removable ceilings and behind access panels) shall be identified in strict conformance with the "Scheme for the Identification of Piping Systems" (ANSI A13.1-2015)

B. Piping labels in exposed areas shall be oriented and located in coordination with the Architect.

C. System names shall, at minimum, uniquely identify the system and performance category - i.e. 140°F Hot Water Supply, High Pressure Cold Water, etc.

D. Specialized piping (grease waste, acid waste, fuel piping, etc.) installed underground shall be labeled. The label shall be corrosion resistant or shall be permanently marked.

E. Each identification marker shall include the following:
1. Proper color-coded background
2. Proper color of legend in relation to background color
3. Proper legend letter size
4. Proper marker length
5. Direction of flow arrow shall be included on each marker

F. Locations for pipe markers shall be as follows:
1. Adjacent to each valve and fitting
2. At each branch and riser take off
3. At each pipe passage through walls, floors and ceilings
4. On all straight pipe runs every 25 feet except that piping underground required to be labeled shall be labeled every 10 feet or more often as required by the AHJ

G. Identification markers may be stenciled or shall be Setmark Pipe Markers, as manufactured by Seton Name Plate Corporation.

H. All valves shall be identified with the appropriate service designation and valve number brass valve tags. Each valve tag shall be 19 gauge brass with 1/4" black-filled letters over 1/2" black-filled numbers. Tags shall be fastened to valves with brass "S" hooks or brass jack chain. Brass tags and fasteners shall be as manufactured by Seton Name Plate Corporation.

I. Provide charts of all valves. Valve charts shall include the following items:
1. Valve identification Number
2. Location
3. Purpose/Material

2.0 PRODUCTS

2.01 BID BASIS AND SUBSTITUTION PROCEDURES

A. Manufacturer names, series and model numbers, as noted or specified, are for the purpose of describing type, capacity, and quality of equipment, materials and products to be used. Unless "or equal" is specifically stated, bids shall be based only on the specified "basis of design" Manufacturer. The listing of a particular manufacturer as an "equal" or "acceptable substitute" manufacturer shall not be misconstrued as approving, nor allowing the substitution of, that Manufacturer's standard product in place of the basis of design. No consideration will be given to a product which would require dimensional, spatial or aesthetic changes to the project. "Acceptable substitute" and "equal" manufacturers shall only bid those products which exactly match the size and other characteristics of the specified basis of design. Any changes to other disciplines and trades of work required by an "or equal" or "substitute" product shall be duly considered and priced accordingly prior to bidding or pricing. The decision as to whether or not a proposed substitute or "equal" product is actually equal to that specified shall rest solely with the Architect.

B. Requests to provide "equal" products in lieu of those specified shall be submitted to the Architect in writing at least ten (10) days prior to final pricing and execution of the Contract. No consideration will be given to substitute products after final pricing and execution of the Contract.

C. Any "or equal" product or proposed product substitution which will cause a change in the appearance, dimensions or design of any part of the building, structure, electrical system, or any other engineered systems shall be accompanied by a scaled drawing and written description of the required change(s) for approval by the Architect. If deemed necessary by the Architect, design changes shall be signed and sealed by a registered Professional Engineer, currently licensed in this State. This shall be performed under the Contractor selecting the substitution's scope.

D. Any and all changes due to a substitution of basis of design equipment including but not limited to electrical connection, physical size, access, piping connections, controls, etc. shall be solely the responsibility of Contractor selecting the substitution.

2.02 MINIMUM STANDARDS

A. Every piece of energy consuming equipment, all fire suppression products and life safety equipment shall comply with the following standards as applicable; especially in regard to prevailing codes:
1. Factory Mutual Laboratories (FM)
2. Industrial Risk Insurers (IRI)
3. Underwriters Laboratories, Inc. (UL)
4. ADC: Air Diffusion Council
5. AGA: American Gas Association
6. AMCA: Air Moving and Conditioning Association, Inc.
7. ANSI: American National Standards Institute
8. API: American Petroleum Institute
9. AHRI: Air Conditioning, Heating, and Refrigeration Institute
10. ASHRAE: American Society of Heating, Refrigerating and Air Conditioning Engineers
11. ASME: American Society of Mechanical Engineers
12. ASTM: American Society of Testing and Materials
13. AWWA: American Water Works Association
14. IBR: Institute of Boiler and Radiator Manufacturers
15. MSS: Manufacturers Standardization Society
16. NBBPVI: National Board of Boiler and Pressure Vessel Inspectors
17. NEMA: National Electrical Manufacturer's Association
18. OSHA: Occupational Safety & Health Administration
19. PDI: Plumbing Drainage Institute
20. PPI: Plastic Pipe Institute
21. CISPI: Cast Iron Soil Piping Institute

2.03 PIPE HANGERS AND SUPPORTS

A. Pipe hangers, hanger rods, trapeze type hangers, upper attachments and other supports shall be selected based on pipe size (plus insulation of pipes specified to be insulated) and the weight of the medium being transported or the medium used for testing, whichever is greater. Provide all hangers and rods, turnbuckles, angles, channels, and other structural supports to support the piping systems. Rods for pipe hangers shall be full size of the Hanger Manufacturer's catalog listed rod size for each type hanger specified. Hangers and supports shall be Michigan, ITT Grinnell or B-Line.

B. All material utilized for the hanging and support of the piping systems shall be manufactured products which are specifically intended for the purpose of hanging piping systems. The use of wire, steel straps, plastic ties, etc. is strictly prohibited.

C. Pipe hangers selected for supporting horizontal insulated piping shall be sized to fit around the outside of the pipe insulation. Insulated piping shall be supported on galvanized shields.

1. Shields shall be as follows:
a. Pipes 2" and smaller: 18 gauge x 12" long
b. Pipes 2 1/2" and larger: 16 gauge x 18" long

2. Shields shall be 180 degrees around the lower half of the pipe at all pipe hangers, except that on trapeze hangers, pipe racks and floor supported horizontal pipes, shields shall be 360 degrees around the entire pipe.

D. Pipe hangers touching copper piping shall be copper plated or the piping shall be dielectrically isolated from any steel hangers or clamps that are used. Note the requirement for domestic water piping requires the hangers to be installed over the insulation.

E. Steel rods, framing and clamps shall be plated or primed to prevent rust formation.

3.0 EXECUTION

3.01 GENERAL

A. All piping, valves, and fittings shall be products of a domestic Manufacturer and made in the USA.

B. Flexible piping connections shall be provided and installed at all suction and discharge connections of packaged booster pumps and at any pump 2.0 HP and above. Flexible piping connections shall be suitable for 150 working pressure or the system pressure at the installation location, whichever is greater, and be suitable for the temperature of the system. Flexible connections shall be stainless steel braided hose type, with a length not less than their pipe diameter. Provide and install restraining rods if recommended by the Manufacturer for the installation location and application.

C. Provide and install shut-off valves at any and all equipment including water heaters, domestic booster pumps, recirculation pumps, storage and pressure tanks, etc. and at any locations required by code, such as branch lines from risers serving more than one fixture. Shut-offs shall be in addition to those specifically shown or noted in the Contract Documents.

3.02 SUBMITTALS

A. Before preparing submittals, study all Contract Drawings and specifications in detail, obtain manufacturer's recommended instructions, and have submittals prepared based on specific equipment and material proposed for installation. An officer of the contracting firm shall sign all shop drawings (certifying conformance with plans and specifications) before submitting to the Architect or releasing to the field.

B. The submittal process shall not be utilized as an avenue to substitute products after the execution of the contract. Should an unspecified or unequal product be submitted, it will be rejected. If a second attempt at substitution is made during the resubmittal of the same product, then no more reviews of that product will be performed without direct compensation to the Engineer being paid for the additional services required for the third review and any further reviews.

C. All submittals shall be submitted and returned electronically.

D. Submittals will not be accepted for review unless they:
1. Comply with the requirements of Division 1.
2. Include complete information pertaining to all appurtenances and accessories.
3. Are submitted as complete packages which pertain to all related items in Division 22. Separate packages shall be submitted as follows:
a. All plumbing equipment, piping, specialties, and components
b. All plumbing fixtures
4. Are properly marked with equipment, service or function identification as related to the project and are marked with pertinent specification paragraph number.

E. Submit catalog information, factory assembly drawings, field installation drawings and certifications as required for complete explanation and description of all items of equipment. The submittal data shall provide ample, unquestionable compliance with the Contract Documents.

F. Review of submittals shall not be construed as authorizing any deviations from the plans and specifications unless such deviations are clearly identified and separately submitted in the form of a letter that is enclosed with the submittals.

G. Submittals are required on all manufactured equipment, especially energy consuming equipment. Submittals shall include, but are not limited to, the following items of equipment:
1. Piping and Piping Specialties
2. Insulation
3. Water Heaters
4. Pumps
5. Plumbing Fixtures
6. Firestopping Products and Applicable UL Firestop Details

3.03 EXCAVATION, TRENCHING AND BACKFILLING

A. Perform all excavation, trenching and backfilling for underground work under this Division 22. During excavation, the excavated material shall be piled back from the banks of the trench to avoid overloading, slides or cave-ins. Do not exceed the angle of repose unless written approval is obtained in advance from the Architect for shoring, bracing or other alternate excavation methods. All excavated material not used for backfilling shall be removed from the building and disposed of as indicated or directed by the Architect. Take measures to prevent surface water from flowing into trenches and other excavations and any water accumulating therein shall be removed by pumping. All excavation shall be made by open cut. Tunneling shall not be allowed.

B. The bottom of all trenches shall be evenly graded to provide firm support and an even bearing surface. Pipe shall be laid on firm soil, laid in straight lines and on uniform grades. Provide bell holes so that the barrel of the pipe rests evenly on the bottom of the trench along the entire length of the pipe.

C. Pipe shall be inspected and tested prior to backfilling. Trench shall be handfilled to a minimum of 12" above the top of pipe with suitable earth (free of rocks, trash, large clods and organic material) and compacted to a minimum 95% proctor. After the first layer is completed, subsequent layers shall be filled and compacted the same as the first layer. Settling the backfill with water shall not be permitted.

3.04 INSTALLATION REQUIREMENTS

A. All equipment shall be installed in strict conformance with the recommendations of the Equipment Manufacturer, as indicated on the Drawings, and as specified.

B. Provide installation manuals for each piece of equipment. Submit in separately bound volumes after review of submittals.

C. Provide supplementary steel framing and welded steel equipment support stands as required for proper hanging and support of the plumbing systems. Steel angles, channels and tubing utilized for such framing shall be selected for a maximum deflection of 1/360th of the span.

D. All roof curbs shall be a minimum of 12" high and selected for the various roof pitches. Curbs installed on roofs having pitches of not more than 1/4" per foot may be standard curbs shimmed level with steel channels or Zs to provide suitable support and flashing surfaces.

3.05 CLEANING, LUBRICATION AND ADJUSTMENT

A. The exterior surfaces of all plumbing equipment, piping, conduit, etc., shall be cleaned and free of all dirt, grease, oil, paint splatter, and other construction debris.

B. Bearings that require lubrication shall be lubricated in strict accordance with the manufacturer's recommendations.

C. All control equipment, valves, equipment settings, pressure tanks, etc. shall be adjusted to the settings required for the performance specified.

D. All materials, equipment, etc. subject to weather, corrosion, dust, debris, water etc. to be installed or utilized for the project shall be fully protected. This is inclusive of piping and duct openings and internal fan ventilation intakes and discharges. This Division's scope includes protection and remediation of any and all Division materials, etc. including cleaning, vacuuming, dusting, etc. required for a clean system and operation. Insulation and equipment with electrical connections subject to water shall be replaced in their entirety. Coordinate with all other trades and schedules.

3.06 PAINTING

A. All uncoated and uninsulated steel surfaces exposed to sight inside the building, such as piping, equipment hangers and supports, which are not provided with factory prime coat or galvanizing, shall be cleaned and painted with one coat of rust inhibiting primer. In addition, all surfaces in finished spaces shall also be painted with two coats of finish paint in a color selected by the Architect.

B. Steel items exposed outside the building, such as equipment supports, uninsulated piping and hangers which are not factory painted or galvanized shall be cleaned and painted with one coat of rust inhibiting primer and two coats of asphaltic base aluminum paint. Insulated steel pipes outside the building shall be cleaned and painted with one coat of rust inhibiting primer before installing insulation.

C. Factory painted equipment that has been scratched or marred shall be repainted to match the original factory color.

3.07 PIPING LEAK TESTING

A. Sanitary, waste, storm, and vent piping shall be tested with water before installing fixtures. Water test shall be applied to the system either in its entirety or to the individual sections. Each opening except the highest opening of the section under test shall be plugged, and the section shall be filled with water and tested with a head of water of at least ten (10) feet above the highest point in the system. The water shall be kept in the portion under test, for at least thirty (30) minutes; no drop in the water level will be acceptable.

B. The water piping systems shall be tested at a minimum pressure of 125 psi, or 1.5 times the system operating conditions, whichever is greater, and proved tight at this pressure for not less than thirty (30) minutes or longer if required to permit inspection of all joints. No loss in pressure will be permitted.

C. All compressed air piping shall be tested pneumatically and proved tight at a pressure of not less than 100 psi for a period of not less than two (2) hours. No loss in pressure will be permitted.

D. All leaks shall be repaired by tightening, remaking joints, or replacing pipe and fittings. Caulking of joints shall not be permitted.

E. See specification section 23 11 23 for testing requirements of natural gas and liquid propane gas piping. System shall be part of Division 22 scope unless otherwise arranged within the Contract. Coordinate with Division 23.

3.08 RECORD (AS-BUILT) DRAWINGS

A. At the completion of the project, provide a set of reproducible prints to the Architect which reflects all changes, deviations and revisions made to the original design documents. Locations of all underground piping and utilities shall be clearly shown and dimensioned from permanent reference points such as building column lines. Record drawings shall be produced in electronic format compatible with AUTOCAD. Furnish electronic copies of all drawings in dwg. format, and two (2) bond copies of all drawing sheets. As-Builts for electronic incorporation by the Design Team, as applicable, shall be redline mark-ups of the Construction Documents.

3.09 OPERATING AND MAINTENANCE MANUALS AND INSTRUCTIONS

A. Complete operating and maintenance manuals shall be provided to the Owner. Four copies shall be provided. Each copy shall be bound in a separate 3-ring, loose leaf notebook. Operating instructions shall be provided for each plumbing system, and shall each include a brief system description, a simple schematic and a sequence of operation. Operating and maintenance instructions shall be provided for each piece of equipment. A control system wiring diagram shall be included in each operating and maintenance manual.

B. Prior to final acceptance or beneficial occupancy, provide the services of a Competent Technician for not less than one (1) day to instruct the Owner in the operation of the plumbing systems.

3.10 MINIMUM HANGER SPACING

A. Pipe hangers or supports shall be provided within 18" of each horizontal fitting, equipment connection, valve, etc. and within 18" of the centerline of horizontal or vertical changes in direction summing to 90° or more. Specific attention is called to turns into vertical risers.

B. Piping supports shall be provided, at a minimum, in accordance with the greater of the below or code minimum. Where the below or code does not address support for specific piping, supports shall be in accordance with manufacturer's requirements.

Piping Material	Max. Horz. Spacing	Max. Vert. Spacing
Cast-iron pipe	5'	15'
Copper pipe	12'	10'
Copper tubing ≤ 1-1/4" dia.	6'	10'
Copper tubing ≥ 1-1/2" dia.	10'	10'
PVC pipe	4'	10'*

*Midstory guide required for piping 2" diameter and smaller

C. Riser clamps shall be provided at each floor penetration. For pressurized piping systems, provide vibration isolation at all riser clamps with two (2) pad-type mountings consisting of a minimum 3/8" thick ribbed or waffled elastomeric pads bonded between minimum 16-gauge galvanized steel separator plates. Pads shall be sized for a deflection of 0.12" to 0.16". Pads shall be minimum 3"x3" square.

3.11 WARRANTY

A. All work provided under this Division 22 shall be subject to a minimum one year warranty. The warranty shall include prompt repair or replacement of equipment or system failures and shall include all parts and labor. In addition, all compressors shall carry an additional four year parts-only warranty. Extended warranties shall be provided on all other equipment so specified in other Sections.

3.12 OWNER TRAINING

A. Owner training shall be provided for all systems and equipment and shall include the following:
1. 8-hours of training for each type of equipment
2. 16-hours for overall system operational training

B. A training summary and schedule shall be submitted to the Architect for approval within ninety (90) days of the date of substantial completion.

C. Training timing will vary and shall be assumed to include multiple sessions as required by the Owner.

3.13 BID REQUIREMENTS

A. The Contractor shall include all systems, equipment and accessories shown on the plans and specifications.

B. The Contractor is responsible for providing all Contract Documents to all SubContractors. All systems, equipment and accessories shall be included in the bid, whether shown on the SubContractor applicable plans or other design documents.

C. Should any discrepancy occur in the Contract Documents, the Contractor shall provide a request for clarification prior to bid or note the discrepancy in the bid and provide an appropriate cost allowance in the bid.

D. The Contractor shall acknowledge that the Contract Documents are diagrammatic and shall provide all systems, equipment and accessories required for a complete facility. Any areas that appear to be void of systems or inappropriate systems shall be noted in the bid. No post bid change order shall be considered for areas or discrepancies not noted in the bid.

E. All installation coordination and means and methods and labor and materials required for proper system installation shall be included.

F. These requirements are in addition to bid procedures and requirements of the RFP or general specifications.

END OF SECTION

SECTION 22 07 00

PLUMBING INSULATION

1.0 GENERAL

1.11 DESCRIPTION

A. All work specified in this Section is governed by the Common Work Results for Plumbing Section 22 05 00.

B. This Section 22 07 00 and the accompanying drawings cover the provision of all labor, equipment, appliances, and materials and performing all operations in connection with the insulation of the plumbing systems as specified herein and as shown. These systems include, but are not limited to, the following:
1. Sanitary waste and vent systems
2. Domestic water systems

1.12 INTENT

A. It is the intent of this Section of the specifications to provide complete and operable plumbing systems complete with insulation, which are free of unreasonable noise, vibration and sweating, and fabricated so as to fit the space allotted.

B. The word "piping" is defined to mean all piping, fittings, joints, hangers, coatings, valves, cocks, insulation and accessories necessary for the plumbing systems described, shown and specified.

1.13 ACCEPTABLE MANUFACTURERS

A. Insulation products shall be as manufactured by Owens Corning, Knauf, Manville, Certainteed, Dow, Armacell, or Armstrong.

2.0 PRODUCTS

2.04 PLUMBING INSULATION

A. All pipe insulation products shall have a permanent composite insulation, jacket and adhesive fire and smoke hazard rating as tested by procedure ASTM-84, NFPA 255 and UL 723 not exceeding Flame Spread 25 or Smoke Developed 50.

B. Preformed insulation for all domestic hot water piping shall be minimum 1-1/2" thick for piping less than or equal to 1-1/2" diameter, 2" thick for piping above 1-1/2" in diameter, preformed fiberglass pipe insulation with white all-service jacket. All longitudinal joints shall be lapped, self-sticking type with all butt joints, tears, etc. sealed with a matching white vapor barrier tape. Elbows shall be mitered or may be Zeston covers filled with equivalent fiberglass insulation. The maximum conductivity (k-value) of the insulation shall be 0.23 BTU per inch/h·ft²·°F at 75°F.

C. Insulation shall be continuous over all valve bodies, fittings, and wall and floor penetrations. Do not insulate unions on hot water piping; nor instruments, gauges, valve handwheels, etc. on any piping.

D. Closed-cell insulation shall be provided over all piping called to have insulation that is installed below ground. Closed-cell piping insulation shall match the thicknesses for above ground piping, 25/50 Armaflex or Rubatex. All glues and coatings shall be products of the same manufacturer as the insulation. The insulation shall be installed by the slip-on method; slitting of the insulation is prohibited and shall be cause for rejection.

3.0 EXECUTION

3.14 ARRANGEMENT

A. Follow the general piping layout, arrangement, schematics and details. Provide all offsets, vents, drains and connections necessary to accomplish the installation. Fabricate piping accurately to measurements established at the project site to avoid interference with ductwork, other piping, equipment, openings, electrical conduits and light fixtures. Make suitable provision for expansion and contraction with expansion loops and offsets.

3.15 INSULATION INSTALLATION

A. Provide blanket insulation over all horizontal roof drain piping which is within the building and including the vertical risers to the roof drains and the underbody of the roof drains.

1. Blanket insulation shall be wrapped around the piping and underbodies of roof drains. Ends of insulation shall overlap at least 2" and bottom of insulation shall overlap pipe insulation at pipe connection to roof drain at least 3". Adhere insulation to roof drain underbodies with 100% coverage of fire retardant adhesive and tape all joints with 3" wide foil reinforced kraft tape.

B. Provide insulation over all above ground hot water piping, except that no insulation is required on cold water lines installed inside interior plumbing chases (those chases with no exterior wall). In addition, no insulation is required for cold water piping outside the building vapor barrier and designed to be drained down for freeze-protection, such as parking deck hose bibbs for washdown.

1. All joints and tears shall be sealed with matching white vapor barrier tape

C. See specification 23 07 19 for HVAC piping insulation requirements.

END OF SECTION

SECTION 22 10 00

PLUMBING PIPING

1.0 GENERAL

BW&A

Barrett, Woodyard & Associates, Inc.

3495 Holcomb Bridge Road
Norcross, GA 30092
Phone (770) 810-8800

NORTH CAROLINA PROFESSIONAL SEAL 054269 ENGINEER JOSEPH CRAWFORD

05/26/2023

No.	Drawing Issue Description	Date
	ISSUED FOR PERMIT	05/26/23

14396 NC-210 SPRING LAKE, NC 28390

MIDGARD - SPRING LAKE

PLUMBING SPECIFICATIONS

WILL KELLY	2023-0683
PROJECT MANAGER	PROJECT NO.
JOE CRAWFORD	AS NOTED
PROJECT ENGINEER	SCALE
JORDAN BRANHAM	05/26/23
DRAWN BY	DATE

P0.2

DRAWING NO.

ISSUED FOR CONSTRUCTION

1.14 DESCRIPTION

A. All work specified in this Section is governed by the Common Work Results for Plumbing Section 22 05 00.

B. This Section 22 10 00 and the accompanying drawings cover the provision of all labor, equipment, appliances, and materials and performing all operations in connection with the construction of the plumbing systems as specified herein and as shown. These systems include, but are not limited to, the following:
1. Sanitary, waste, and vent systems
2. Domestic water systems

C. Provide all final plumbing connections to all equipment furnished by Owner.

D. Provide isolation valve and reduced pressure backflow preventer or vacuum breaker at the service entrance and at those connections (especially to kitchen equipment) required by local plumbing code.

1.15 INTENT

A. It is the intent of this Section of the specifications to provide complete and operable plumbing systems as shown and specified which are free of leaks, properly vented, free of unreasonable noise, vibration and sweating, and fabricated so as to fit the space allotted and to exhibit a minimum resistance to fluid flow.

B. The word "piping" is defined to mean all piping, fittings, joints, hangers, coatings, valves, cocks, insulation and accessories necessary for the plumbing systems described, shown and specified.

1.16 GENERAL REQUIREMENTS

A. Provide all reducing fittings, flanges, couplings and unions of the size and type of material to match the piping connections at each fixture, piece of equipment, valve and accessory.

B. Union joints, couplings or flanges shall be provided in each pipe connected to each piece of equipment, fixture and elsewhere as indicated and specified. Unions shall match the piping system in which they are installed.

C. Unions or flanges shall be provided between all copper to steel connections. These unions shall be dielectric, insulating type.

D. All changes in direction and branches shall be made with manufactured fittings.

E. The use of offset-type reducers is strictly prohibited in any piping system.

F. In all water piping systems, changes in horizontal pipe sizes shall be made with eccentric reducers installed flat on top for proper air venting. Reducing tees, reducing elbows and concentric reducers shall only be allowed in water piping systems for changing pipe sizes in vertical risers and for making connections to equipment and accessories from vertical risers.

G. All pipe joints shall be cut square and all burrs shall be removed.

H. Open ends of pipes not currently being handled shall be plugged during installation to keep dirt, water, and foreign material out of the system.

I. Sanitary, waste, vent, and storm drainage piping shall slope down in the direction of flow as shown on the drawings or as prescribed by Code, but not less than 1 percent.

J. All vents through roof (VTRs) shall be offset just below the roof such that their termination points are at least 15 ft from any outside air intake of any HVAC unit; special attention is called to packaged rooftop and dedicated make-up air units.

K. Trap primers shall be provided at all floor drains, floor sinks, trench drains, and hub drains except trap primers may be omitted where drain routes to the storm system. Route water piping from nearest cold-water line and as allowed by code. Trap primer shall be tapped off the top of the horizontal line, have an isolation valve, and be at least 1' in elevation above the connection for every 20' of downstream piping.

L. All piping, valves, and fittings shall be provided by a domestic Manufacturer and manufactured in the USA.

2.0 PRODUCTS

2.05 SANITARY WASTE AND VENT SYSTEMS

A. All underground sanitary waste and vent piping shall be PVC, DWV Solid Wall Schedule 40 with socket-type, solvent welded joints in sizes up to 12"; **14" and larger piping shall be PVC, DWV Solid Wall Schedule 80 with socket-type, solvent welded joints. All PVC piping shall be installed in accordance to ASTM D2321.

B. All aboveground sanitary, waste, and vent piping shall be hubless cast iron soil pipe UON. All cast iron soil pipe and fittings shall bear the collective trademark of the Cast Iron Soil Pipe Institute and shall be listed by NSF International or receive prior approval by the **Architect/Engineer. All hubless cast iron pipe shall conform to ASTM A 888 and CISPI Standard 301.
1. Sanitary, waste, and vent piping less than or equal to 2.5" may be copper DWV with brazed joints. Piping shall meet ASTM B 75, B 88, B 251, and B 306.
2. Drain piping from equipment with high temperature discharge, such as kitchen warewashers, pot sinks, etc. shall be Type L hard drawn copper tubing with wrought copper fittings and soldered joints.
3. Sanitary and waste piping in pressurized piping systems, such as for elevator sump pumps or sanitary sump pumps, shall be copper DWV with wrought copper fittings. All joints shall be brazed.

C. Joints on hubless cast iron soil pipe shall be made with neoprene couplings and stainless-steel clamps. Gaskets shall conform to ASTM C 564. Couplings and gaskets shall be produced by the same manufacturer and shall be installed in accordance with the manufacturer's recommendations, including band tightening sequence and torque. All couplings shall be manufactured to the CISPI 310 standard, ASTM C 1277, ASTM C 150, FM Standard 1680 Class I and certified by NSF International. Coupling shall be as follows:
1. 1 ½" to 3" - Two (2) stainless steel bands
2. 4" to 8" - Four (4) stainless steel bands
3. 10" to 15" - Heavy duty coupling with six (6) stainless steel bands. Heavy duty couplings shall conform to ASTM C 1540.

D. All offsets on 8" pipe and larger shall have metal restraining straps by Holdrite or approved equal.

E. Cleanouts shall be provided at the locations indicated and, as a minimum, where required by Code. Floor cleanouts shall be a minimum of 4" and shall be complete with a flush plug and removable, scoriated bronze floor plate. Provide carpet buttons in carpeted areas. Wall cleanouts shall be threaded cleanout tees and plugs with polished stainless steel coverplate with centerset screw.

F. Floor drains in toilets and finished areas shall be JR Smith 2000 Series with 6" Type B square adjustable strainers finished in satin nickel bronze or equal products by Josam or Zurn. Provide vandalproof secured tops.

G. Floor drains in mechanical rooms and unfinished concrete floors shall be JR Smith 2131 Series with round 11 3/4" cast iron grate, sediment bucket and deep-seal P-trap; or equal products by Josam or Zurn. Provide vandalproof secured tops.

H. Hub drains (HD) shall be made with a reducer fitting with opening at least one nominal size larger than the connected piping as scheduled. HDs shall be sized to receive all discharges without splashing.

2.06 DOMESTIC WATER SYSTEM

A. Underground domestic water service entrance piping 3" and smaller in size shall be Type K hard drawn copper tubing with wrought copper fittings. All joints shall be brazed.

B. All underground copper branch lines (1/2" and 3/4" only) shall be continuous lengths of soft Type K copper tubing with no joints allowed underground.

C. Aboveground domestic water system piping 3" in size and smaller shall be Type L hard drawn copper tubing with wrought copper fittings and soldered joints.

D. Aboveground domestic water piping 4" and larger shall be Type L hard drawn copper tubing with rolled grooved joints and fittings. Installation ready copper fittings shall meet the same gasket material specifications as couplings. Fittings shall be as follows, or equal, and shall be provided by the Manufacturer with the gasket included in the coupler assembly:
1. Coupling: Rigid, Victaulic style 607 (8" and smaller)
2. Gaskets: Grade EHP EPDM (8" and smaller)

E. All valves in potable water systems shall be "lead-free" type.

F. All valves ¼" and smaller shall be "full-port" type, and greater than ¼" may be "reduced-port" type.

G. Ball valves:

1. Valves 2 inch and smaller shall be two-piece bronze body, full port with solid, smooth bore chrome plated brass ball, meeting MSS-SP110 and rated for no less than 300 psi. Seats shall be reinforced TFE with Teflon packing ring and threaded adjustable packing nut. Valves on insulated lines will be provided with stem extensions to provide clearance for two inches of pipe insulation. Valves to be Apollo Valves 77C, Hammond/Milwaukee UP8301, or Watts B-6080.

2. Valves larger than 2 inch and up to 4 inch shall be two piece bronze body, standard port with solid, smooth bore chrome plated brass ball, meeting MSS-SP110, and rated for no less than 300 psi. Seats shall be reinforced TFE (or TFM for 4") with Teflon packing ring and threaded adjustable packing nut. Valves on insulated lines will be provided with stem extensions to provide clearance for two inches of pipe insulation. Valves to be Apollo Valves 70-100, Hammond/Milwaukee UP8501, or Watts B-6000.

H. Balancing valves:

1. Valves shall be NSF/ANSI 61/372 certified and suitable for potable water applications. Valve shall be suitable for the greater of 125 psig pressure and 40°F to 250°F temperature or the system's operating conditions. Valve shall provide positive shut-off and be rated for 300 psig. Each balancing valve shall be equipped with two gauge taps with check valves and drip caps. Balancing valves shall be Bell and Gossett Circuit-Setter Plus or equal by Nexus, FlowDesign, or Watts. Provide preformed insulation to encase valve assembly in insulated piping.

2. Valves up to 3" shall have lead-free brass body, full-port ball constructed of 304 stainless steel, and shall have calibrated nameplate with memory stop. Balancing valves shall be Bell and Gossett Circuit-Setter Plus or equal by Nexus, FlowDesign, or Watts. After the test and balance is complete, provide to the Owner a differential pressure gauge to match the balancing valves. Autoflow valves are acceptable as a substitution provided the flow cartridge is replaceable and the flowrate is clearly and permanently labeled.

I. Water connections to appliances shall be made with flexible copper tubing or commercial grade double-reinforced stainless steel braided hose, no less than 3/8" in size, or the connections size of the appliance, whichever is greater.

J. All water hammer arresters (WHA) shall be size A, B, C, D, E or F, as required for the fixture units served; Josam, JR Smith, Watts, or Zurn. WHAs shall conform to ASSE 1010. WHAs in potable water applications shall be lead-free.

K. Soldered joints shall be made with tin-antimony/silver solder. Solder containing lead shall not be permitted.

L. Saddle valves and "T" fittings that rely on puncturing the piping main are disallowed.

M. Thermometers and pressure gauges shall be products of Trerice, Weksler, or Weiss. Select all devices to operate within 20% of the midpoint of their scales under normal operating conditions. Gauges provided on pumps shall be compound type.

N. Pressure and temperature (P&T) test plugs shall be constructed of brass with two (2) self-closing Nordel cores and be complete with cap and gasket. Plugs shall be as manufactured by Peterson or Lancaster. Provide a complete test kit to the Owner at the time of final inspection. Test kit shall be complete with pressure gauge, thermometer, probes and carrying case.

3.0 EXECUTION

3.16 ARRANGEMENT

A. Follow the general piping layout, arrangement, schematics and details. Provide all offsets, vents, drains and connections necessary to accomplish the installation. Fabricate piping accurately to measurements established at the project site to avoid interference with ductwork, other piping, equipment, openings, electrical conduits and light fixtures. Make suitable provision for expansion and contraction with expansion loops and offsets.

B. Water hammer arresters shall be installed at the top of each riser and on each fixture branch in accordance with Plumbing and Drainage Institute Standard WH201. WHAs shall also be installed at all water service to appliances with quick-closing valves, such as clothes washers, kitchen warewashers, icemakers, etc.

C. Cleanouts shall be provided at the base of all sanitary and storm risers and as required by code.

D. Fittings, unions, joints, couplings (including no-hub couplings), etc. shall not be within slabs.

E. All potable domestic water connections to equipment shall be provided with backflow prevention as required by the specification section and code.

F. Pressure gauges and thermometers called to be permanently installed shall be easily visible from a standing position on the ground.

3.17 UNDERGROUND WATER PIPING

A. All domestic water piping shall have a minimum cover of 3'-0", or below the frost line, whichever is deeper, except piping at least 20' from any exterior wall may be installed 3" or more below the bottom of the slab.

B. For water piping 2" and above, provide concrete thrust blocks at all changes of direction and secure all mechanical joints with restraining rods.

C. All copper water lines, or other material subject to corrosion, shall be protected from corrosion with a continuous plastic sheathing or coating and wrapping. This sheathing or coating and wrapping shall be extended 6" to 12" above finished floor. The protection shall be installed on the outside of any insulation required.

3.18 DISINFECTION

A. All domestic water piping installed under this Division shall be disinfected with chlorine before it is placed into operation. The chlorinating material shall be liquid chlorine conforming to Federal Specification BB-C-120 and shall be introduced to the system by experienced operators only. The chlorine solution applied to the piping sections or system shall contain at least fifty parts per million of available chlorine and shall remain in the sections or system for a period of not less than sixteen (16) hours. During the disinfection period, all valves shall be opened and closed at least four times. After the disinfection period, the chlorinated water shall be flushed from the system with clear water until the residual chlorine content is not greater than two-tenths parts per million (0.2 PPM). Submit certification to the Architect that the system was disinfected.

END OF SECTION

SECTION 22 30 00

PLUMBING EQUIPMENT

1.0 GENERAL

1.17 DESCRIPTION

A. All work specified in this Section is governed by the Common Work Results for Plumbing Section 22 05 00.

B. This Section 22 30 00 and the accompanying drawings cover the provisions of all labor, equipment, appliances, and materials and performing all operations in connection with the construction of the water heating systems as specified herein and as shown. These systems include, but are not limited to, the following:
1. Water Heaters
2. Hot Water Circulator

1.18 GENERAL REQUIREMENTS

A. All plumbing equipment installed in locations with a water hardness of 25 grains per gallon or more, shall be resistant to corrosion. Where copper materials are in the water stream, it shall be Cupro-Nickel of not more than 90% copper.

B. All water heaters shall be NSF/ANSI 61 certified "lead free" for potable water service.

C. All water heaters shall have ASME rated temperature and pressure relief valve(s). Valve(s) shall be provided by the Manufacturer and sized for the discharge location noted in the plans.

D. All water heaters and tanks shall be glass-lined, 1600°F fired, with a working pressure of 150 psi, a test pressure of 300 psi, or the system pressure at the installation location, whichever is greater, and shall have magnesium anodes for electrolytic protection. Separate storage tanks may also be cement-lined. Tanks shall be ASTM stamped.

E. All water heaters shall meet or exceed the energy efficiency requirements of the latest version of ASHRAE 90.1.

F. All water heaters and pumps shall be UL approved and labeled, and be AGA certified where applicable.

G. All water heaters and pumps shall be NEMA rated appropriate for the installation location in which they are installed.

H. Water heater controls shall include an operating thermostat and manual reset high limit control for each heating element or burner. The safety high limit control shall prevent over heating in the event of a thermostat failure.

I. All controls shall be factory-wired and require no external power source.

J. Water heaters and tanks shall have drain with external access and hose end connection.

2.0 PRODUCTS

2.07 WATER HEATER

A. The water heater shall be as scheduled. Acceptable substitute manufacturers are AO Smith, Lochinvar, State, Rheem, and Bradford White, subject to substitution requirements. Water heaters shall be commercial-grade.

B. The immersion heating elements shall be low watt density with a plated incoloy sheath material for long life. The heating elements shall mount in individual screw-in tank flanges.

C. All field electrical wiring connections to the water heater shall be made to a main terminal block. All internal wiring shall be made to solderless terminal lug wiring connections. Wiring to be color coded for ease of servicing. The water heater shall be factory assembled, wired and tested.

2.08 HOT WATER CIRCULATOR

A. Hot water circulator shall be as scheduled. Acceptable substitute manufacturers are B&G, Goulds, and Grundfos, subject to substitution requirements.

B. Hot water circulators used in potable water system shall be lead-free.

3.0 EXECUTION

3.19 INSTALLATION

A. The water heaters and accessories shall be installed in strict accordance with the manufacturer's recommendations and the Contract Documents.

B. All temperature and pressure relief valves shall be piped full size to an indirect waste such as the nearest floor drain, service sink, sink tailpiece, etc. Piping shall be in accordance with specification 22 10 00 for DWV services. Size shall be in accordance with manufacturer's requirements.

C. All water heaters shall have internal heat traps or shall have heat traps installed in the cold water and hot water piping. Instantaneous water heaters shall be provided with heat traps unless manufacturer documentation specifically allows exclusion.

D. Water heaters shall be completely encased in high density insulation of sufficient value to meet the energy efficiency standards of latest version of ASHRAE 90.1, or shall be factory insulated with non-CFC polyurethane closed-cell foam insulation. Provide removable insulation panels to maintain access to all required components.

E. All water heaters or boilers subject to condensing under normal steady-state operating conditions shall be provided and installed with accessory condensate neutralization kits.

3.20 WARRANTY

A. Provide 5-year limited warranty on all tanks and 1-year limited warranty on parts unless otherwise noted.

END OF SECTION

SECTION 22 40 00

PLUMBING FIXTURES

1.0 GENERAL

1.19 DESCRIPTION

A. All work specified in this section is governed by the Common Work Results for Plumbing Section 22 05 00.

B. This Section 22 40 00 and the accompanying drawings cover the provisions of all labor, fixtures, equipment, appliances and materials, and performing all operations in connection with the construction and installation of the plumbing fixtures and trim as specified herein and as shown.

C. All finishes shall be as selected by the Architect. Where the Architect does not have a preference, finishes shall be in accordance with this specification.

D. All exposed piping, valves, stops, P-traps, etc. shall be chrome-plated. Also, all exposed piping penetrations through walls, floors or ceilings shall be provided with chrome-plated cast brass escutcheons.

E. All P-traps shall be minimum 17-gauge brass.

F. All exposed P-traps subject to contact, such as those below wall-mounted or counter-mounted lavatories, shall be provided with insulated covers as required.

G. All exposed supply stops for hot water, such as those below wall-mounted or counter-mounted lavatories, shall be provided with insulated covers as required. Where there are hot and cold water supply stops together, cold water supply stops shall match insulated cover of hot water supply stop.

H. Flush valves shall have non-hold open feature, vacuum breakers and cover cap on angle-type stop.

I. Provide all final connections to all equipment and fixtures furnished by Owner.

J. Unless otherwise specified in an individual fixture description, all enameled cast-iron and porcelain fixtures shall be white.

K. All lavatories and other hand-washing fixtures shall be provided and installed with ASSE 1070 point-of-use mixing valve on the hot water connection. Mixing valve shall be set to provide no more than 110°F hot water.

1.20 INTENT

A. It is the intent of this Section of the specifications to provide complete, operable, adjusted, clean plumbing fixtures as shown and specified, which are free of leaks, noise, air, vibration and waterflow fluctuations.

1.21 BASIS OF DESIGN

A. The basis of design is as outlined for each fixture in the 2.0 PRODUCTS subsection. Any proposed substitutions shall be proven equal in all respects to the equipment specified as the basis of design.

1.22 ACCEPTABLE MANUFACTURERS

A. Acceptable fixture manufacturers for each type of fixture is as follows:
1. Water Closets - American Standard, Kohler, Sloan, TOTO, and Zurn
2. Urinals - American Standard, Kohler, Sloan, TOTO, and Zurn
3. Manual Flushvalves - American Standard, Kohler, Sloan, and Zurn
4. Automatic Flushvalves - American Standard, Kohler, Sloan, TOTO, and Zurn
5. Lavatories - American Standard, Bradley, Crane, Kohler, Sloan, TOTO, and Zurn.
6. Lavatory Faucets - American Standard, Bradley, Chicago, Delany, Grohe, Kohler, Sloan, TOTO, and Zurn
7. Breakroom/Kitchen/Pantry/Etc. Sinks - American Standard, Elkay, Grohe, Just, and Kohler
8. Breakroom/Kitchen/Pantry/Etc. Faucets - American Standard, Chicago, Delta, Elkay, Just, Kohler, and Zurn
9. Water Coolers and Water Fountains - Acorn, Elkay, Halsey Taylor, and Oasis
10. Service and Laundry Sinks - Fiat, Kohler, Mustee, ProFlo, and Stern-Williams
11. Service and Laundry Faucets - American Standard, Delta, Elkay, Fiat, Kohler, T&S Brass, Speakman, and Stern-Williams
12. Shower Stalls - American Standard, Aquatic Bath, Freedom, and Kohler
13. Shower Fittings - Acorn, American Standard, Bradley, Chicago, Delta, Kohler, Speakman, and Zurn
14. Emergency Shower and Eyewash - Acorn, Bradley, and Guardian

2.0 PRODUCTS

2.09 WATER CLOSETS

A. Provide solid plastic white toilet seats with each water closet, selected to match the water closet noted. Toilet seats shall be elongated style with slow close or self-sustaining check hinge, stainless steel hardware; Beneke, Kohler, Church, Bemis, American Standard, or approved equal.

B. Fixtures P-1 shall American Standard, Cadet. Fixture shall be floor-mounted, siphon jet, elongated style, tank-type water closet. Fixture shall be 17-1/2" high toilet complete with tank, bowl, flush unit, antisyphon float valve, and chrome plated supply stops and level. Include Centoco closed front toilet seat with check hinge and anti-microbial agent. Ensure handle is on ADA accessible side of the tank.

2.10 LAVATORIES

A. Fixtures P-2 shall be American Standard, "Ovalyn" # 0495.221, 19" x 16", vitreous china, undercounter, oval lavatory complete with front overflow and 1 1/4" drain. Fittings shall include Chicago Faucet No. 404-317ABCP faucet with lever handles, chrome-plated finish, aerator, chrome-plated tailpieces, strainers, P-trap, supply stops, anchoring clips and all other trim. Wall supply stops, drains and tailpieces shall be offset wheelchair type.

2.11 SINKS

A. Fixtures P-3 shall be single compartment, 18 gauge stainless steel with sound-deadening, 15" x 15" outside dimensions, 9 1/4 " x 12" inside dimensions, 6 1/8" deep; Elkay Model No. BLR15. Faucet punching shall be 3 hole, 4" OC. Faucet set shall match the punching and shall be deck-mounted, lever-style chrome-plated, all brass, gooseneck faucet with aerator and wrist blade handles; American Standard "Monterrey" 6545.170 Series and a stainless steel drain, cup strainer and rubber stopper. Provide complete trim such as service stops, tailpieces and P-trap.

B. Fixture P-5 shall be American Standard "Akron" #7695.008, 24" x 20", acid-resisting, porcelain enameled inside only cast iron service sink, stainless steel rim guard with 9" high drilled back and wall hanger. Fittings shall include rough plated service sink faucet, American Standard Model 8340.243 with controls and rigid hose end spout with pail hook and 2" cast iron P-trap and strainer. *Provide 24" tall, 20 gauge stainless steel splash panels on all walls adjacent to sink.*

2.12 SHOWERS

A. Fixture P-4 shall be Aquatic Bath Model #2603CTH single piece molded tub-shower combination. Provide FRT wood blocking and four (4) 24" and one (1) 18" long stainless steel grab bars located on back and side walls. Shower curtain shall be by others. "Provide shower fittings by American Standard #1662.601 anti-scald, polish chrome balanced shower, wall supply, slide bar, and vacuum breaker and volume control."

3.0 EXECUTION

3.21 INSTALLATION

A. Units shall be installed as indicated and in conformance with the manufacturer's recommendations. Coordinate the actual units to be provided with all trades.

B. All plumbing fixtures shall be free of leaks, provided completely finished, trimmed, adjusted, cleaned and ready for use. They shall be properly secured to the structure by the use of thru-bolting, backplates, carriers, expansion shields (for floor mounting only) or toggle bolts.

C. Wall hung fixtures supported on chair carriers shall be bolted to the floor slab. Carefully coordinate space requirements and fixture mounting height requirements with supports being furnished.

D. Fixtures supported with wall hangers on masonry chase walls shall be fastened to the wall with not less than 3/8" bolts which shall pass through the wall and through a 1/4" x 4" wide steel backplate on the unfinished chase wall side.

E. Where fixtures are hung on single masonry walls without a pipe chase behind, they shall be mounted with 3/8" toggle bolts.

F. Fixtures on steel stud walls shall have a 1/4" x 4" wide steel backplate wired with 1/16" steel wire to the studs. Bolts not less than 3/8" shall secure the fixtures through the fixture hanger and the backplate.

G. All mounting holes provided in fixtures shall be used for support. In addition to the main hangers, 1/4" toggle bolts shall secure the bottom of all wall hung fixtures at each drilling provided for this purpose.

H. Mount wall-hung fixtures at the heights indicated on the Architectural Drawings or as prescribed by local code. Special attention is called to the installation requirements of the ANSI Handicap Code.

3.22 CLEANING AND ADJUSTMENT

A. The units shall be cleaned, tested and field-adjusted to provide optimum flow and drainage. Specific attention is called to adjustment of automatic flush valves and faucets for empirical conditions.

B. All flush valves, diaphragms, strainers, aerators, etc. shall be fully cleaned after all piping and fixture flushing.

END OF SECTION

BW&A
Barrett, Woodyard & Associates, Inc.
3495 Holcomb Bridge Road
Norcross, GA 30092
Phone (770) 810-8800

NORTH CAROLINA PROFESSIONAL SEAL 054269 ENGINEER JOSEPH CRAWFORD

05/26/2023

No.	Drawing Issue Description	Date
	ISSUED FOR PERMIT	05/26/23

14396 NC-210 SPRING LAKE, NC 28390

MIDGARD - SPRING LAKE

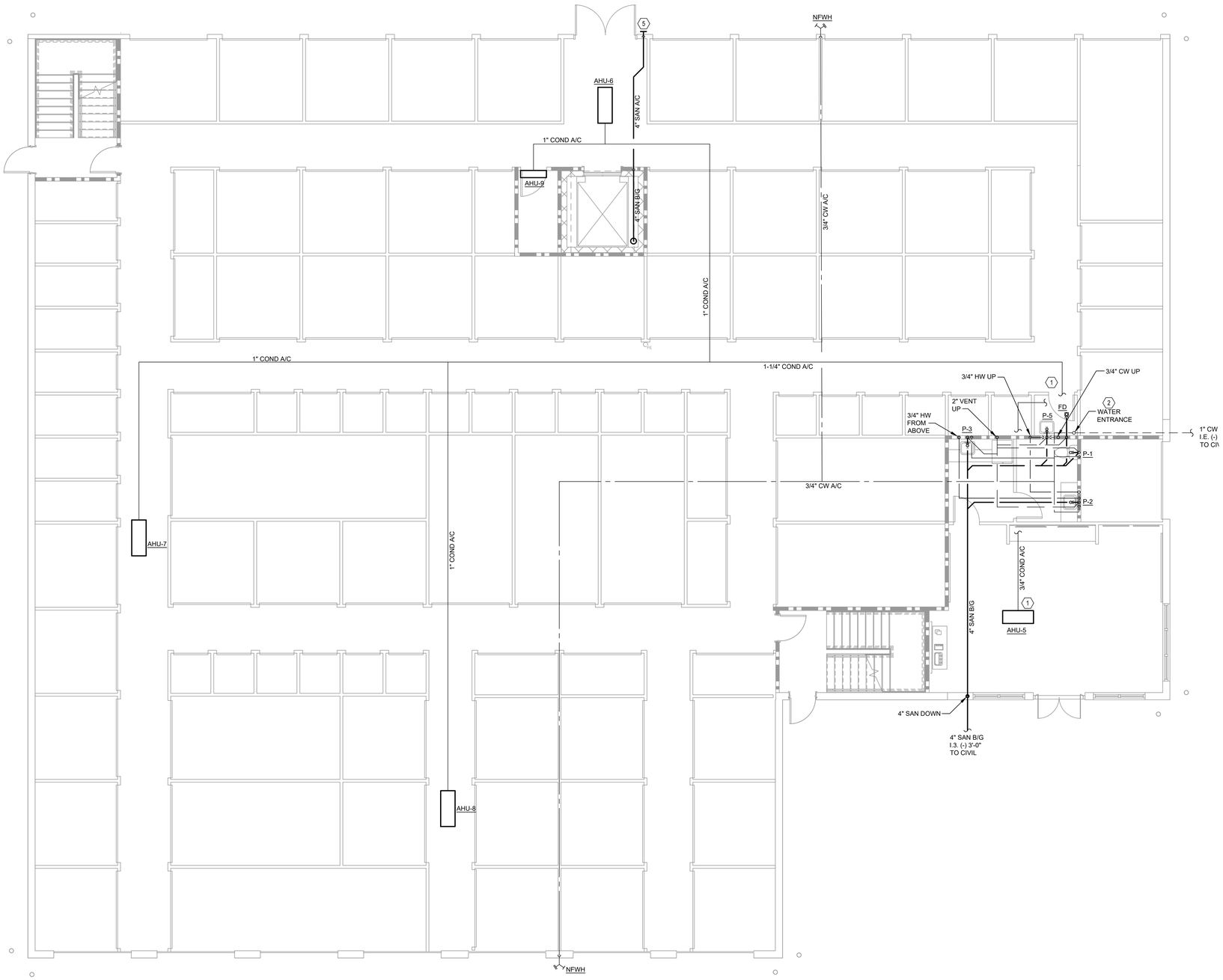
PLUMBING SPECIFICATIONS

WILL KELLY	2023-0683
PROJECT MANAGER	PROJECT NO.
JOE CRAWFORD	AS NOTED
PROJECT ENGINEER	SCALE
JORDAN BRANHAM	05/26/23
DRAWN BY	DATE

P0.3

DRAWING NO.

ISSUED FOR CONSTRUCTION



GENERAL NOTES

1. ALL NEW PIPING SHALL CONNECT TO EXISTING PIPING OF EQUAL OR GREATER SIZE. CONTRACTOR SHALL ROUTE AS REQUIRED TO MEET THIS INTENT.
2. EXISTING SANITARY SEWER PIPING WAS NOT LOCATED PER INVESTIGATIVE SITE VISIT. CONTRACTOR SHALL PERFORM REQUIRED DUE DILIGENCE AND ROUTE NEW PIPING AS REQUIRED FOR A COMPLETE INSTALLATION TO MAINTAIN REQUIRED INVERT ELEVATION. COORDINATE WITH ALL TRADES, LANDLORD, ARCHITECT, AND EXISTING TENANTS.
3. ALL BELOW SLAB SANITARY SEWER PIPING SHALL BE PROVIDED WITH CLEANOUTS AS REQUIRED TO MEET IPC.
4. PROVIDE SHUTOFF VALVE AT EACH EQUIPMENT/FIXTURE CONNECTION. PROVIDE BACKFLOW PREVENTION DEVICES WHERE REQUIRED BY CODE.
5. REPAIR/REPLACE ANY PIPE INSULATION THAT IS LOOSE, TORN OR DETACHED.
6. REMOVE ALL ABANDONED PIPING BACK TO RISERS AND CAP WATERTIGHT. EXISTING TAPS MAY BE REUSED FOR THE NEW WORK PROVIDED THEY ARE OF ADEQUATE SIZE.
7. ALL HUB DRAINS SHALL BE READILY ACCESSIBLE.

(#) SHEET KEYNOTES

1. ROUTE CONDENSATE TO FLOOR DRAIN.
2. PROVIDE SHUT OFF VALVE IN WALL FOR MAIN WATER ENTRANCE. PROVIDE WITH ACCESS PANEL. REFER TO DETAIL 2/P0.1 FOR WATER ENTRANCE.
3. PROVIDE 1/2" CW WITH SHUT OFF VALVE AND BACK FLOW PREVENTOR FOR REFRIGERATOR.
4. PROVIDE SUMP PUMP DISCHARGE WITH DOWNSPOUT COVER EQUAL TO ZURN 2-199-DC.

1 / P1.1 FIRST FLOOR PLAN - PLUMBING

3/16" = 1'-0"

BW&A

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MIDGARD - SPRING LAKE

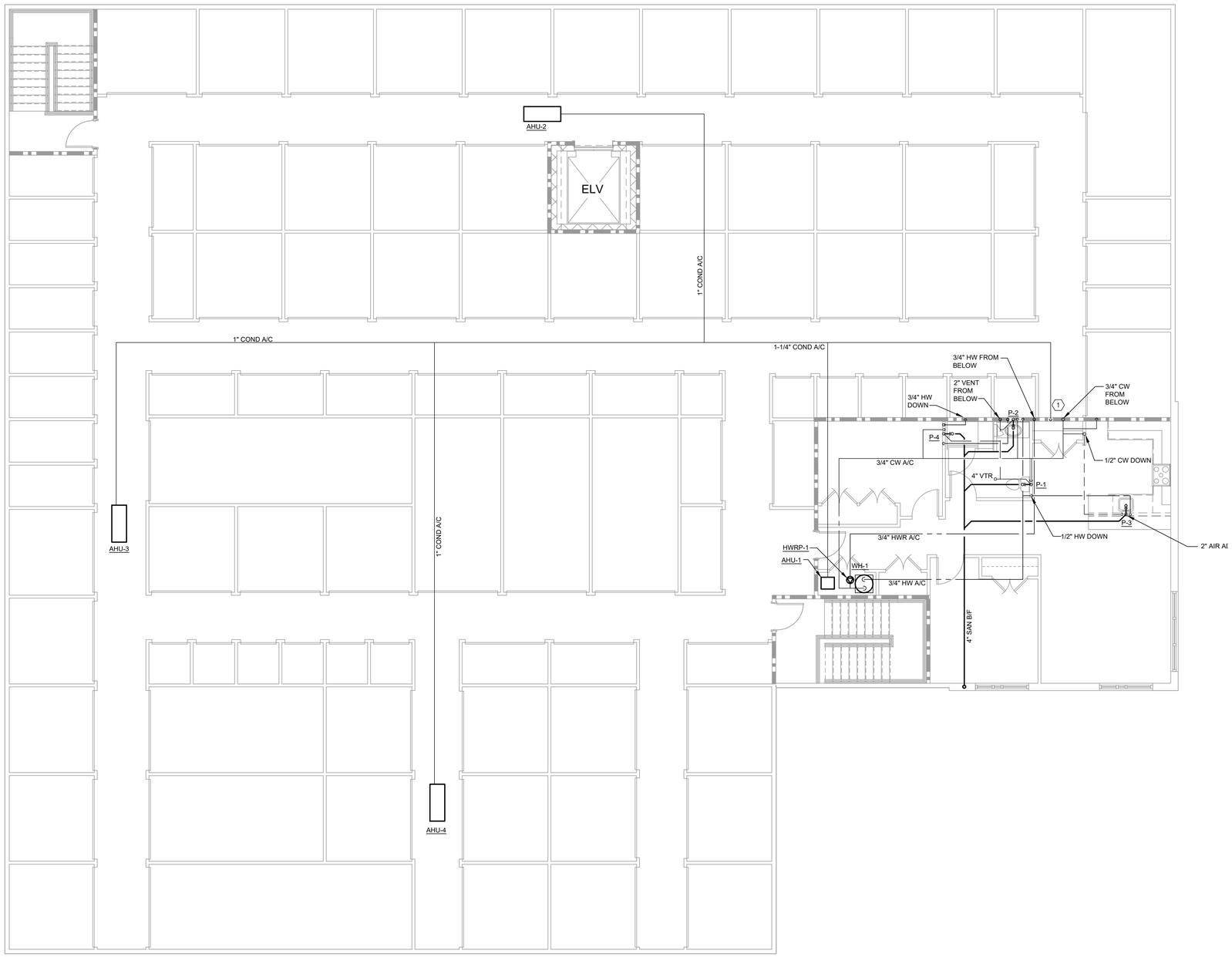
FIRST FLOOR PLAN - PLUMBING

WILL KELLY	2023-0683
PROJECT MANAGER	PROJECT NO.
JOE CRAWFORD	AS NOTED
PROJECT ENGINEER	SCALE
JORDAN BRANHAM	05/26/23
DRAWN BY	DATE

P1.1

DRAWING NO.

ISSUED FOR CONSTRUCTION



1 P1.2 SECOND FLOOR PLAN - PLUMBING
3/16" = 1'-0"

GENERAL NOTES

1. ALL NEW PIPING SHALL CONNECT TO EXISTING PIPING OF EQUAL OR GREATER SIZE. CONTRACTOR SHALL ROUTE AS REQUIRED TO MEET THIS INTENT.
2. EXISTING SANITARY SEWER PIPING WAS NOT LOCATED PER INVESTIGATIVE SITE VISIT. CONTRACTOR SHALL PERFORM REQUIRED DUE DILIGENCE AND ROUTE NEW PIPING AS REQUIRED FOR A COMPLETE INSTALLATION TO MAINTAIN REQUIRED INVERT ELEVATION. COORDINATE WITH ALL TRADES, LANDLORD, ARCHITECT, AND EXISTING TENANTS.
3. ALL BELOW SLAB SANITARY SEWER PIPING SHALL BE PROVIDED WITH CLEANOUTS AS REQUIRED TO MEET IPC.
4. PROVIDE SHUTOFF VALVE AT EACH EQUIPMENT/FIXTURE CONNECTION. PROVIDE BACKFLOW PREVENTION DEVICES WHERE REQUIRED BY CODE.
5. REPAIR/REPLACE ANY PIPE INSULATION THAT IS LOOSE, TORN OR DETACHED.
6. REMOVE ALL ABANDONED PIPING BACK TO RISERS AND CAP WATERTIGHT. EXISTING TAPS MAY BE REUSED FOR THE NEW WORK PROVIDED THEY ARE OF ADEQUATE SIZE.
7. ALL HUB DRAINS SHALL BE READILY ACCESSIBLE.

(#) SHEET KEYNOTES

1. ROUTE CONDENSATE PIPING TO FLOOR DRAIN. TERMINATE WITH INDIRECT CONNECTION.

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05/26/2023

No.	Drawing Issue Description	Date
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14396 NC-210 SPRING LAKE, NC 28390

MIDGARD - SPRING LAKE

SECOND FLOOR PLAN - PLUMBING

WILL KELLY	2023-0683
PROJECT MANAGER	PROJECT NO.
JOE CRAWFORD	AS NOTED
PROJECT ENGINEER	SCALE
JORDAN BRANHAM	05/26/23
DRAWN BY	DATE

P1.2
DRAWING NO.

ISSUED FOR CONSTRUCTION