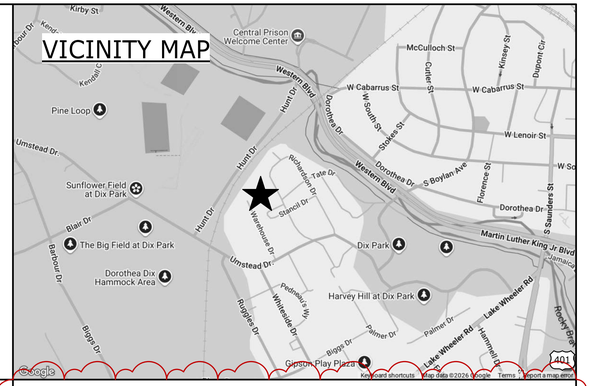
DIX PARK - 1105 WAREHOUSE DR RENOVATION

CITY OF RALEIGH

1105 WAREHOUSE DRIVE
RALEIGH, NC 27603

Raleigh

VICINITY MAP



DESIGN TEAM

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PROJECT NARRATIVE

THIS PROJECT PROPOSES THE RENOVATION OF AN EXISTING ONE-STORY 2,172 SF FIELD OFFICE BUILDING FOR THE CITY OF RALEIGH LOCATED IN DIX PARK IN RALEIGH, NC. THE BUILDING WILL INCLUDE OFFICES AND OPEN WORK AREAS AS WELL AS NEW RESTROOMS AND SUPPORT SPACES. THE BUILDING IS OF LOAD BEARING MASONRY CONSTRUCTION, NON SPRINKLERED, WITH A PRIMARY BUSINESS OCCUPANCY. THE SCOPE OF WORK INCLUDES ASSOCIATED MECHANICAL, ELECTRICAL, AND PLUMBING IMPROVEMENTS.

DRAWING LIST

WARNINGS & NOTES

WARNING - POSSIBLE PRESENCE OF ASBESTOS

MATERIALS CONTAINING ASBESTOS MAY BE PRESENT IN THE CONSTRUCTION AREA. UNDER NO CIRCUMSTANCES WILL THE CONTRACTOR DISTURB ASBESTOS OR ASBESTOS CONTAINING MATERIAL IN ANY WAY THAT WILL ALLOW THE RELEASE OF ASBESTOS FIBERS INTO THE AIR. THE CONTRACTOR IS HEREBY NOTIFIED THAT UNKNOWN ASBESTOS CONTAINING MATERIALS MAY BE PRESENT IN THE CONSTRUCTION AREA. IN THE EVENT THAT SUSPICIOUS MATERIALS ARE ENCOUNTERED THE CONTRACTOR SHALL IMMEDIATELY CEASE ALL WORK IN THE AREA, SECURE THE INVOLVED AREA TO PREVENT IN ADVERTENT CONTAMINATION OR EXPOSURE, AND NOTIFY THE OWNER.

LEAD-BASED PAINT WARNING

LEAD-BASED PAINT MAY EXIST ON BUILDING STRUCTURE(S) OR OTHER ITEMS IN THE CONSTRUCTION AREA. THE CONTRACTOR IS HEREBY ADVISED OF THE NEED FOR COMPLIANCE w/ **OSHA STANDARD 1926.62. SUBPART D. TITLED "LEAD", [29 CFR 1919]** DURING WORK WITH ALL LEAD CONTAINING MATERIALS. ALL TESTING AND/OR OTHER COMPLIANCE ACTIVITIES ARE THE COMPLETE RESPONSIBILITY OF THE CONTRACTOR.

CONSTRUCTION DOCUMENTS
06/01/2026

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DIX PARK - 1105 WAREHOUSE DR RENOVATION
CITY OF RALEIGH
1105 WAREHOUSE DRIVE
RALEIGH, NC 27603

HH ARCHITECTURE, P.A. REGISTERED ARCHITECTURAL CORPORATION 51670 NORTH CAROLINA

JENESSA A. VAN DEEN REGISTERED 13246 ARCHITECT NORTH CAROLINA 6.1.26

NO.	REVISION	DATE
1	PLAN CHECK	06/01/26

JOB NUMBER
23-022
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PROJECT STATUS
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ABBREVIATIONS

Abbrev.	Description
ADJ	ADJACENT
AFF	ABOVE FINISHED FLOOR
ALT	ALTERNATE
ALUM	ALUMINUM
APC	ACOUSTICAL PANEL CEILING
APPROX	APPROXIMATE
ARA	AREA OF RESCUE ASSISTANCE
BD	BOARD
BEJ	BUILDING EXPANSION JOINT
BLDG	BUILDING
BOT	BOTTOM
BSMT	BASEMENT
CFCI	CONTRACTOR-FURNISHED CONTRACTOR-INSTALLED
CFOI	CONTRACTOR-FURNISHED OWNER-INSTALLED
CJ	CONTROL JOINTS
CLG	CEILING
CLR	CLEAR
CMU	CONCRETE MASONRY UNIT
CO	CLEAN OUT
COL	COLUMN
CONC	CONCRETE
CONST	CONSTRUCTION
CONT	CONTINUOUS
COORD	COORDINATE
CPT	CARPET
CT	CERAMIC TILE
DEPT	DEPARTMENT
DIA	DIAMETER
DIM	DIMENSION
DWG	DRAWING
EA	EACH
EJ	EXPANSION JOINT
ELEC	ELECTRICAL
ELEV	ELEVATION
EQ	EQUAL
EQUIP	EQUIPMENT
EWC	ELECTRIC WATER COOLER
EXIST	EXISTING
EXT	EXTERIOR
FACT	FACTORY FINISH
FD	FLOOR DRAIN
FE	FIRE EXTINGUISHER
FE (SM)	SURFACE MOUNTED
FE (SR)	SEMI-RECESSED
FFE	FURNITURE, FIXTURES, EQUIPMENT
FIN	FINISH
FLR	FLOOR
FLUOR	FLUORESCENT
FOEW	FACE OF EXISTING WALL
FOM	FACE OF MASONRY
FOS	FACE OF STUD
FPHB	FREEZE-PROOF HOSE BIB
FRP	FIBERGLASS REINFORCED PANELS
FTG	FOOTING
GA	GAUGE
GALV	GALVANIZED
GC	GENERAL CONTRACTOR
GDS	GUTTER DOWNSPOUT
GWB	GYPSUM WALL BOARD
GYP	GYPSUM
HD	HEAVY DUTY
HDW	HARDWARE
HM	HOLLOW METAL
HT	HEIGHT
ID	INSIDE DIAMETER
INSUL	INSULATION
INT	INTERIOR
JT	JOINT
K	KIPS
LAM	LAMINATE
LAV	LAVATORY
MAT'L	MATERIAL
MAX	MAXIMUM
MECH	MECHANICAL
MFR	MANUFACTURER
MIN	MINIMUM
MISC	MISCELLANEOUS
MO	MASONRY OPENING
MTL	METAL
N/A	NOT APPLICABLE
NIC	NOT IN CONTRACT
NOM	NOMINAL
NTS	NOT TO SCALE
OC	ON CENTER
OD	OUTSIDE DIAMETER
OFCI	OWNER-FURNISHED CONTRACTOR-INSTALLED
OFOI	OWNER-FURNISHED OWNER-INSTALLED
OH	OPPOSITE HAND
OVHD	OVERHEAD
PART	PARTITION
PL	PLASTIC LAMINATE
PLY	PLYWOOD
PROP	PROPERTY
PSF	POUNDS PER SQ. FOOT
PSI	POUNDS PER SQ. INCH
PT	PAINT
PVC	POLYVINYL CHLORIDE
QT	QUARRY TILE
R	RADIUS
R/A	RETURN AIR
RCP	REFLECTED CEILING PLAN
RD	ROOF DRAIN
RDL	ROOF DRAIN LEADER
REBAR	REINFORCING BAR
REC	RECYCLING
REF	REFERENCE
REINF	REINFORCING
REQ'D	REQUIRED
REV	REVISION
RM	ROOM
SC	SOLID CORE
SHT	SHEET
SIM.	SIMILAR
SPEC	SPECIFICATION
SQ FT	SQUARE FEET
SQ IN	SQUARE INCH
SS	STAINLESS STEEL
STD	STANDARD
STL	STEEL
STRUC	STRUCTURAL
T/R	TRASH/RECYCLING
TELE	TELEPHONE
THR'LD	THRESHOLD
TOS	TOP OF STEEL
TYP	TYPICAL
UC	UNDER COUNTER
UNO	UNLESS NOTED OTHERWISE
VCT	VINYL COMPOSITION TILE
VERT	VERTICAL
VIF	VERIFY IN FIELD
VWC	VINYL WALL COVERING
w/	WITH
WC	WATER CLOSET
WD	WOOD
WG	WIRE GLASS
WWF	WELDED WIRE FABRIC

SYMBOLS LEGEND

ROOM NAME 101 — ROOM / AREA

101 — DOOR ID.

NORTH ARROW

01 / A000 — DETAIL

01 / A000 — EXTERIOR ELEVATION CALLOUT

01/A000 — INTERIOR ELEVATION CALLOUT

01 / A000 — SECTION CALLOUT

12' - 0" — CEILING ELEVATION HEIGHT (SEE FINISH SCHEDULE FOR CEILING TYPE)

X' - X" — SPOT ELEVATION

A — WINDOW TYPE

MXXX — PARTITION TYPE

LOCKABLE
MODIFIER
L M
ID-FH-2
24 24
DEPTH
WIDTH
CASEWORK TYPE

GENERAL ARCHITECTURAL NOTES

1. THE CONTRACTOR SHALL FIELD VERIFY THE DIMENSIONS, ELEVATIONS, AND OTHER REQUIREMENTS NECESSARY FOR CONSTRUCTION. ANY DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF THE ARCHITECT.
2. SEE SITE, CIVIL, AND LANDSCAPE PLANS FOR CONTINUATION OF WORK OUTSIDE OF BUILDING.
3. U.N.O., ALL DIMENSIONS ARE TO THE FACE OF CMU, FACE OF STUD, OR FACE OF EXISTING WALL. DIMENSIONS NOTED AS CLEAR ARE TO FACE OF FINISH.
4. ALL DOOR HINGE-SIDE JAMBS TO BE 4" FROM FACE OF THE PERPENDICULAR WALL TO THE INSIDE FACE OF THE METAL JAMB, TYP., U.N.O.
5. SEE **A510** FOR TYPICAL ACCESSORIES & MOUNTING HEIGHTS.
6. REFERENCED FIRST FLOOR ELEVATION = **0' - 0"**.
7. FOR NEW AND EXISTING FINISHES AND PLANS, SEE ID SHEETS.
8. GENERAL CONTRACTOR TO VERIFY ALL EXISTING CONDITIONS. KEYNOTES DO NOT EXCLUDE CONTRACTOR FROM REPAIRING AND PATCHING ALL FLOORS, WALLS AND CEILINGS AS NEEDED AS A RESULT OF DEMOLITION WORK. GENERAL CONTRACTOR TO PREPARE ALL FLOORS AND WALL SUBSTRATES AS REQUIRED TO APPLY NEW FINISH AS INDICATED IN THE FINISH PLANS AND SPECIFICATIONS.

KEYNOTES - OVERALL

035216.A	LWIC, INSULATING CONCRETE
035216.B	LWIC, EXPANDED POLYSTYRENE BOARD INSULATION, R-28
042000.A	FACE BRICK
042000.A1	FACE BRICK INFILL
042000.A2	FACE BRICK, ROWLOCK COURSE
042000.B4	CONCRETE MASONRY UNITS, 4x8x16 NOMINAL
042000.B8	CONCRETE MASONRY UNITS, 8x8x16 NOMINAL; SEE STRUCTURAL
042000.B12	CONCRETE MASONRY UNITS, 12x8x16 NOMINAL; SEE STRUCTURAL
042000.E	MASONRY VENEER ANCHOR
044313.A	LIMESTONE VENEER
044313.B	STONE VENEER ANCHOR
047200.A	CAST STONE MASONRY UNITS
051200	STRUCTURAL STEEL FRAMING; SEE STRUCTURAL
053100.A	STEEL DECKING; SEE STRUCTURAL
054000.M3	C-SHAPED STUDS, 3-5/8"
054000.M6	C-SHAPED STUDS, 6"
061000.W4	WOOD STUDS, 4"
061516	WOOD ROOF DECKING
061600.A	GLASS-MAT GYP SHEATHING
064116.01	PLASTIC-LAMINATE-CLAD ARCHITECTURAL CABINETS, PL-1
070543.A	PRIMARY HORIZONTAL RAIL
070543.B	SECONDARY VERTICAL RAIL
072100.B4	FIBERGLASS BATT INSUL, R-19
072100.C1	MINERAL WOOL INSUL BOARD, R-7.5
072119.A	FOAMED-IN-PLACE INSUL
072726.A	FLUID-APPLIED AIR BARRIER
074113.A	STANDING SEAM METAL ROOF PANELS
074113.B	UNDERLAYMENT
074113.C	ROOF PANEL CLIP AND ATTACHMENT ACCESSORIES
074113.D	ROOF INSULATION, R-30
074213	FORMED METAL WALL PANELS (FMC)
074223.A	METAL COMPOSITE MATERIAL WALL PANEL (MCM)
074229.A	TERRACOTTA PANEL
075216.A	SBS MODIFIED BITUMINOUS MEMBRANE ROOF
075216.B	SUBSTRATE BOARD
075216.C	COVER BOARD
075216.D	ROOF INSUL. R-30
075419.A	PVC ROOFING, FIELD MEMBRANE
075419.B	SUBSTRATE BOARD
075419.C	COVER BOARD
075419.D	ROOF INSULATION, R-30
076200.A	CONTINUOUS THRU-WALL FLASHING w/ HEMMED EDGE
076200.C	CONTINUOUS SILL FLASHING w/ END-DAM & HEMMED EDGE
076200.I	TERM BAR AND SEALANT
078100.A	APPLIED FIREPROOFING
078400.A	FIRESTOPPING; SEE UL DETAILS
079200	JOINT SEALANTS
079200.B	BACKER ROD AND JOINT SEALANTS
079219.A	ACOUSTICAL JOINT SEALANTS
081113	HOLLOW METAL DOORS AND FRAMES
084113.B	ALUMINUM STOREFRONT SYSTEM
087100.02	DOOR HARDWARE, DOOR THRESHOLD
092116.M2	GWB SHAFT WALL ASSEMBLIES, CH STUDS, 2-1/2"
092116.M6	GWB SHAFT WALL ASSEMBLIES, CH STUDS, 6"
092116.X	GYPSUM SHAFTLINER BOARD
092216.HC	HAT CHANNEL, 7/8"
092216.M2	STEEL STUD FRAMING, 2-1/2"
092216.M3	STEEL STUD FRAMING, 3-5/8"
092216.M6	STEEL STUD FRAMING, 6"
092216.R1	RESILIENT CHANNEL, 1/2"
092900.A	GYP WALLBOARD, TYPE X, 5/8"
092900.F	SOUND ATTENUATION BLANKET
093013.01	CERAMIC TILING, WT-1
095113	ACOUSTICAL PANEL CEILINGS
096513.01	RESILIENT BASE, RB-1
099113.01	EXTERIOR PAINTING, EP-1
099123.01	INTERIOR PAINTING, PT-1
102800	TOILET, BATH, AND LAUNDRY ACCESSORIES
102800.03	TOILET TISSUE DISPENSER
102800.06	WASTE RECEPTACLE
102800.08	SANITARY NAPKIN DISPOSAL
102800.09	SEAT COVER-DISPENSER
102800.12	SHOWER CURTAIN & ROD
102800.13	FOLDING SHOWER SEAT
102800.15	CUSTODIAL MOP AND BROOM HOLDER
102800.16	MIRROR UNIT
102800.17	SHOWER SHELF
102800.18	GRAB BAR 18"
102800.24	GRAB BAR 24"
102800.36	GRAB BAR 36"
102800.42	GRAB BAR 42"
102800.54	GRAB BAR 54" L
104413.A	FIRE EXTINGUISHER & CABINET (FEC)
122413	ROLLER WINDOW SHADES
123623.01	PL-1; SEE FINISH SCHEDULE
123661.01	SS-1; SEE FINISH SCHEDULE
133419.B	METAL BUILDING GIRT
133419.D	METAL BUILDING ROOF PANELS
133419.I	METAL BUILDING INSULATION
220000	PLUMBING

HH ARCHITECTURE

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DIX PARK - 1105 WAREHOUSE DR RENOVATION

CITY OF RALEIGH
1105 WAREHOUSE DRIVE
RALEIGH, NC 27603

HH ARCHITECTURE, P.A. — REGISTERED ARCHITECTURAL CORPORATION — 51670 — NORTH CAROLINA

JESSA A. VAN DEEN — REGISTERED — 13246 — ARCHITECT — NORTH CAROLINA — 6.1.26

NO.	REVISION	DATE

JOB NUMBER
23-022

DATE ISSUED
06/01/2026

PROJECT STATUS
CONSTRUCTION DOCUMENTS

SHEET
GENERAL ARCHITECTURAL NOTES

G001

Plot Time: 6/3/2026 10:12:17 AM

2018 APPENDIX B
BUILDING CODE SUMMARY FOR ALL COMMERCIAL PROJECTS

NAME OF PROJECT: DIX PARK - 1105 WAREHOUSE DRIVE RENOVATON
ADDRESS: 1105 WAREHOUSE DRIVE, RALEIGH, NC ZIP CODE: 27603
OWNER/AUTHORIZED AGENT: CITY OF RALEIGH PHONE: 919.996.2989 EMAIL: glen.willert@raleighnc.gov
OWNED BY: ■ CITY/COUNTY ☐ PRIVATE ☐ STATE
CODE ENFORCEMENT JURISDICTION: ■ CITY RALEIGH ☐ COUNTY - ☐ STATE

CONTACT: JENESSA VAN DEEN, AIA

DESIGNER	FIRM	NAME	LICENSE #	TELEPHONE #	E-MAIL
ARCHITECTURAL	HH ARCHITECTURE	JENESSA VAN DEEN, AIA	13246	919.828.2301	jvandeen@hh-arch.com
CIVIL	DEWBERRY	MICHAEL URCHUK	-	321.354.9744	murchuk@dewberry.com
ELECTRICAL	IMEG (ATLANTEC ENG.)	ALEX R. BOWLING	058287	919.855.2051	alex.r.bowling@imegcorp.com
FIRE ALARM	-	-	-	-	-
PLUMBING	IMEG (ATLANTEC ENG.)	J. HARRISON HOLT	049754	919.855.2032	alex.r.bowling@imegcorp.com
MECHANICAL	IMEG (ATLANTEC ENG.)	PATRICK J. MCCABE	051195	919.855.2024	patrick.j.mccabe@imegcorp.com
SPRINKLER-STANDPIPE	-	-	-	-	-
STRUCTURAL	-	-	-	-	-
RETAINING WALLS >5' HIGH	-	-	-	-	-
PRE-CAST	-	-	-	-	-
TRUSS	-	-	-	-	-
LANDSCAPE	-	-	-	-	-
HAZMAT	-	-	-	-	-

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): B - OFFICE
RENOVATED (date): - **PROPOSED OCCUPANCY(S)** (Ch. 3): B - OFFICE

RISK CATEGORY (Table 1604.5): **CURRENT:** ☐ I ■ II ☐ III ☐ IV
PROPOSED: ☐ I ■ II ☐ III ☐ IV

BASIC BUILDING DATA

CONSTRUCTION TYPE: ☐ I-A ☐ II-A ☐ III-A ☐ IV ☐ V-A
(check all that apply) ☐ I-B ☐ II-B ☐ III-B ■ 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	N/A	-	-
2nd FLOOR	N/A	-	-
MEZZANINE	N/A	-	-
1st FLOOR	2,172	0	2,172
BASEMENT	N/A	-	-
TOTAL			2,172 SF

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): N/A
INCIDENTAL USES (Table 509): N/A
SPECIAL USES (Chapter 4 - List Code Sections): N/A
SPECIAL PROVISIONS (Chapter 5 - List Code Sections): N/A
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.

$$\frac{\text{Actual Area of Occupancy A}}{\text{Allowable Area of Occupancy A}} + \frac{\text{Actual Area of Occupancy B}}{\text{Allowable Area of Occupancy B}} \leq 1.00 \qquad \text{AREA } \frac{-}{-} + \frac{-}{-} = X \leq 1.00$$

STORY NO.	DESCRIPTION AND USE	(A) BLDG AREA PER STORY (ACTUAL)	(B) TABLE 506.2 [4] AREA	(C) AREA FOR FRONTAGE INCREASE [1,5]	(D) ALLOWABLE AREA PER STORY OR UNLIMITED [2,3]
1	BUSINESS	2,172 SF	23,000 SF	17,250 SF	40,250 SF

[1] Frontage area increases from Section 506.2 are computed thus:
a. Perimeter which fronts a public way or open space having 20 feet minimum width = 224 (F)
b. Total building perimeter = 224 (P)
c. Ratio (F/P) = 1 (F/P)
d. W = Minimum width of public way = 30 (W)
e. Percent of frontage increase formula: $I_f = 100[F/P - 0.25] \times W/30 =$ 75 (%)

[2] Unlimited area applicable under conditions of section 507.
[3] Maximum Building Area = total number of stories in the building x D (maximum 3 stories) (506.2).
[4] The maximum area of open parking garages must comply with Table 406.5.4. The maximum area of air traffic control towers must comply with Table 412.3.1.
[5] Frontage increase is based on the unsprinklered area value in Table 506.2.

ALLOWABLE HEIGHT

	ALLOWABLE	SHOWN ON PLANS	CODE REFERENCE
BUILDING HEIGHT IN FEET (Table 504.3)	40	12.75	-
BUILDING HEIGHT IN STORIES (Table 504.4)	2	1	-

[1] Provide code reference if the "Shown on Plans" quantity is not based on Table 504.3 or 504.4.

FIRE PROTECTION REQUIREMENTS

BUILDING ELEMENT	FIRE SEPARATION DISTANCE (FEET)	RATING REQ'D	RATING PROVIDED (w/ * REDUCTION)	DETAIL # AND SHEET #	DESIGN # FOR RATED ASSEMBLY	SHEET # FOR RATED PENETRATION	SHEET # FOR RATED JOINTS
STRUCTURAL FRAME, INCLUDING COLUMNS, GIRDERS, TRUSSES		0 HR	-		-	-	-
BEARING WALLS		0 HR	-	-	-	-	-
EXTERIOR							
NORTH	> 30	0 HR	-	-	-	-	-
EAST	> 30	0 HR	-	-	-	-	-
WEST	> 30	0 HR	-	-	-	-	-
SOUTH	> 30	0 HR	-	-	-	-	-
INTERIOR	> 30	0 HR	-	-	-	-	-
NONBEARING WALLS AND PARTITIONS							
EXTERIOR WALLS							
NORTH							
EAST							
WEST							
SOUTH							
INTERIOR WALLS & PARTITIONS		0 HR					
FLOOR CONSTRUCTION INCLUDING SUPPORTING BEAMS AND JOISTS		0 HR					
FLOOR CEILING ASSEMBLY		0 HR					
COLUMNS SUPPORTING FLOORS		0 HR					
ROOF CONSTRUCTION, INCLUDING SUPPORTING BEAMS AND JOISTS		0 HR					
ROOF CEILING ASSEMBLY		0 HR					
COLUMNS SUPPORTING ROOF		0 HR					
SHAFT ENCLOSURES - EXIT		0 HR					
SHAFT ENCLOSURES - OTHER							
CORRIDOR SEPARATION		0 HR					
OCCUPANCY/FIRE BARRIER SEPARATION							
PARTY/FIRE WALL SEPARATION							
SMOKE BARRIER SEPARATION							
SMOKE PARTITION							
TENANT / DWELLING UNIT / SLEEPING UNIT SEPARATION							
INCIDENTAL USE SEPARATION							

* Indicates 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 (%)
> 30 (ALL SIDES)	NS	NO LIMIT	-

LIFE SAFETY SYSTEM REQUIREMENTS

EMERGENCY LIGHTING: ☐ NO ■ YES
EXIT SIGNS: ☐ NO ■ YES
FIRE ALARM: ☐ NO ■ YES
SMOKE DETECTION SYSTEM: ☐ NO ■ YES ☐ PARTIAL -
CARBON MONOXIDE DETECTION: ■ NO ☐ YES

LIFE SAFETY PLAN REQUIREMENTS

LIFE SAFETY PLAN SHEET #: G111

☐ 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 ACCESS TRAVEL DISTANCES (1017)
■ COMMON PATH OF TRAVEL DISTANCES (1006.2.1 & 1006.3.2(1))
■ DEAD END LENGTHS (1020.4)
■ CLEAR EXIT WIDTHS FOR EACH EXIT DOOR
■ MAX. CALCULATED OCC. 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

ACCESSIBLE DWELLING UNITS
(SECTION 1107)

TOTAL UNITS	ACCESSIBLE UNITS REQUIRED	ACCESSIBLE UNITS PROVIDED	TYPE A UNITS REQUIRED	TYPE A UNITS PROVIDED	TYPE B UNITS REQUIRED	TYPE B UNITS PROVIDED	TOTAL ACCESSIBLE UNITS PROVIDED
-	-	-	-	-	-	-	-

ACCESSIBLE PARKING
(SECTION 1106)

NOT APPLICABLE

LOT OR PARKING AREA	TOTAL # OF PARKING SPACES REQUIRED	TOTAL # OF PARKING SPACES PROVIDED	ACCESSIBLE SPACES REQUIRED	ACCESSIBLE SPACES PROVIDED VAN SPACES WITH 132" ACCESS AISLE	ACCESSIBLE SPACES PROVIDED VAN SPACES WITH 8' ACCESS AISLE	TOTAL # ACCESSIBLE PROVIDED
-	-	-	-	-	-	-
TOTAL	-	-	-	-	-	-

PLUMBING FIXTURE REQUIREMENTS
(TABLE 2902.1)

USE		WATERCLOSETS MALE	WATERCLOSETS FEMALE	WATERCLOSETS UNISEX	URINALS	LAVATORIES MALE	LAVATORIES FEMALE	LAVATORIES UNISEX	SHOWERS /TUBS	DRINKING FOUNTAINS REGULAR	DRINKING FOUNTAINS ACCESSIBLE
SPACE	EXIST'G	-	-	-	-	-	-	-	-	2	-
	NEW	-	-	2	-	-	-	2	-	0	-
	REQ'D	-	-	1	-	-	-	1	-	1	-

SPECIAL APPROVALS

SPECIAL APPROVAL: (LOCAL JURISDICTION, DEPARTMENT OF INSURANCE, OSC, DPI, DHHS, ICC, ETC., DESCRIBE BELOW)
AHJ - CITY OF RALEIGH

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 COMPLIES WITH CODE: ☐ NO ☐ YES (THE REMAINDER OF THIS SECTION IS NOT APPLICABLE)
EXEMPT BUILDING: ☐ NO ☐ YES (PROVIDE CODE OR STATUTORY REFERENCE): -
CLIMATE ZONE: ☐ 4 ☐ 4A ☐ 5A
METHOD OF COMPLIANCE: ENERGY CODE ☐ PERFORM ☐ PRESCRIPTIVE
ASHRAE 90.1 ☐ PERFORMANCE ☐ PRESCRIPTIVE
(IF "OTHER" SPECIFY): -

NOT APPLICABLE

THERMAL ENVELOPE (PRESCRIPTIVE METHOD)

SEE NCEBC 907.1

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: -

STRUCTURAL SUMMARY

DESIGN LOADS:
IMPORTANCE FACTORS: SNOW (Is) -
SEISMIC (Ie) -
LIVE LOADS: ROOF - psf
MEZZANINE - psf
FLOOR - psf
GROUND SNOW LOAD: - psf
WIND LOAD: ULTIMATE WIND SPEED - mph (Vult)
EXPOSURE CATEGORY -

NOT APPLICABLE

SEISMIC DESIGN CATEGORY: ☐ A ☐ B ☐ C ☐ D
PROVIDE THE FOLLOWING SEISMIC DESIGN DATA:
RISK CATEGORY (Table 1604.5) ☐ I ☐ II ☐ III ☐ IV
SPECTRAL RESPONSE ACCELERATION Ss - %g S1 - %g
SITE CLASSIFICATION (ASCE 7) ☐ A ☐ B ☐ C ☐ D
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 -

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

SEE MECHANICAL

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: -

ELECTRICAL SUMMARY

ELECTRICAL SYSTEMS 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 ALLOWED VS. ALLOWED (WHOLE BUILDING OR SPACE BY SPACE)
TOTAL EXTERIOR WATTAGE SPECIFIED VS. ALLOWED

SEE ELECTRICAL

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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JENESSA A. VAN DEEN 13246 REGISTERED ARCHITECT NORTH CAROLINA

NO.	REVISION	DATE

JOB NUMBER **23-022**
DATE ISSUED **06/01/2026**
PROJECT STATUS **CONSTRUCTION DOCUMENTS**
SHEET **BUILDING CODE SUMMARY (APPENDIX B)**

G002

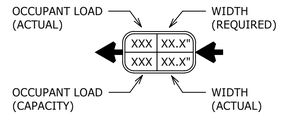
LIFE SAFETY PLAN LEGEND

WORST-CASE TRAVEL DISTANCE = **37'**
(MAX. ALLOWABLE 200')

WORST-CASE TO COMMON PATH OF TRAVEL = **19'**
(MAX ALLOWABLE 75')

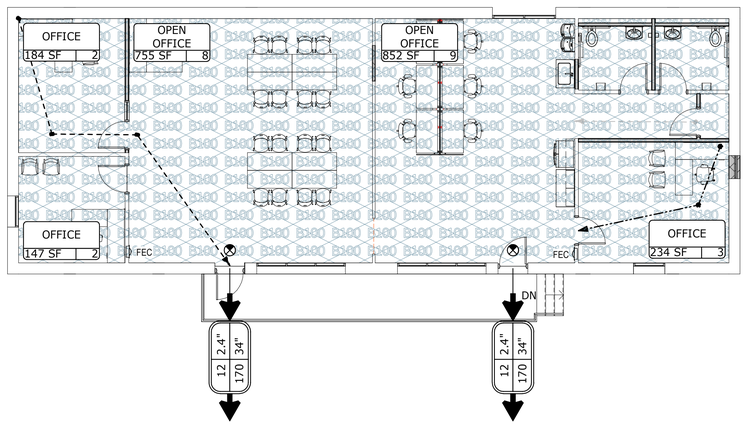
WORST-CASE DEAD END CORRIDOR = **17'**
(MAX ALLOWABLE 20')

DEDICATED EXIT:



OCCUPANCY SCHEDULE

NAME	OCCUPIABLE AREA	AREA PER OCCUPANT	OCCUPANT LOAD
OFFICE	184 SF	100 SF	2
OFFICE	147 SF	100 SF	2
OPEN OFFICE	755 SF	100 SF	8
OPEN OFFICE	852 SF	100 SF	9
OFFICE	234 SF	100 SF	3
	2,172 SF		24



LIFE SAFETY OCCUPANCY

BUSINESS AREAS, 100 GROSS S.F.
PER PERSON

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

0' 4' 8' 16' 32'

N

01 G111 LIFE SAFETY PLAN
1/8" = 1'-0"

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MELISSA A. VAN DEEN REGISTERED 13246 ARCHITECT NORTH CAROLINA 6.1.26

Plot Time: 6/2/2026 10:12:19 AM

NO.	REVISION	DATE

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DATE ISSUED
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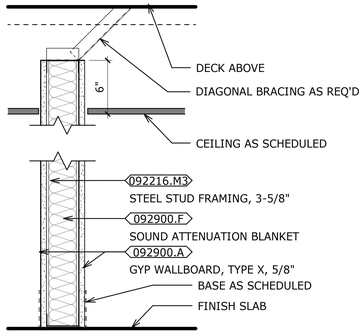
PROJECT STATUS
CONSTRUCTION DOCUMENTS

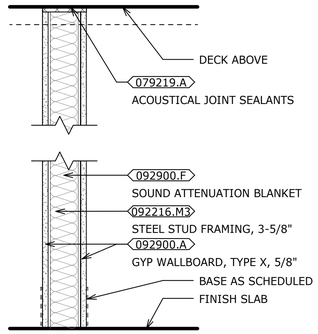
SHEET
LIFE SAFETY PLAN

G111

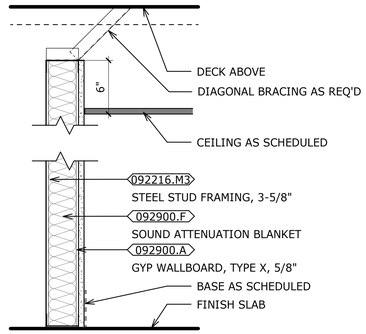
INTERIOR WALL TYPES



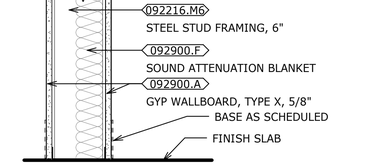
M30A	3-5/8" METAL STUDS, 5/8" GWB BOTH SIDES



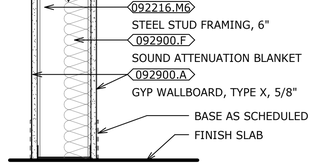
M3DA	3-5/8" METAL STUDS TO DECK, 5/8" GWB BOTH SIDES



M30B	3-5/8" METAL STUDS, 5/8" GWB ONE SIDE

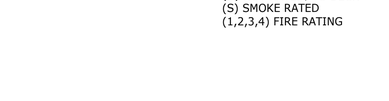


M60A	6" METAL STUDS, 5/8" GWB BOTH SIDES



M6DA	6" METAL STUDS TO DECK, 5/8" GWB BOTH SIDES

INTERIOR PARTITION NAMING LEGEND



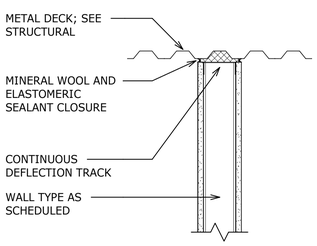
KEYNOTES

079219.A	ACOUSTICAL JOINT SEALANTS
092216.M3	STEEL STUD FRAMING, 3-5/8"
092216.M6	STEEL STUD FRAMING, 6"
092900.A	GYP WALLBOARD, TYPE X, 5/8"
092900.F	SOUND ATTENUATION BLANKET

PARTITION NOTES:

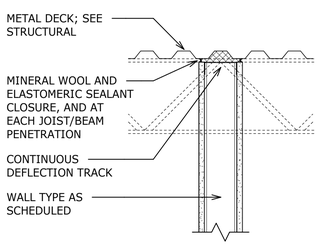
1. U.N.O. ALL INTERIOR PARTITIONS TO BE TYPE '**M30A**'; SEE PLANS FOR PARTITION TYPES.
2. COORDINATE ADJACENT WALLS OF DIFFERENT TYPES SO THAT GYPSUM BOARD WALL FACES ALIGN.
3. SEAL PERIMETER OF ALL WALLS, TYP.
4. USE 5/8" CEMENTITIOUS TILE BACKING SHEETS IN LIEU OF 5/8" GWB BEHIND ALL WALL TILE, TYPICAL.
5. SEE FINISH SCHEDULE AND FINISH PLANS FOR WALL TILE AND WALL FINISHES.
6. APC CEILING INSTALLATION MUST CONFORM TO **ASTM C636** AND **E580** TO MEET **SEISMIC DESIGN CATEGORY C**. ALL CEILINGS SHOWN IN PARTITION SCHEDULE ARE GRAPHIC IN NATURE. COORDINATE WITH MANUFACTURER'S DETAILS.
7. INTERIOR WALLS AND PARTITION FRAMING SHALL EXTEND OR BE BRACED TO THE DECK ABOVE WITH 45-DEGREE KICKERS AT A MINIMUM OF 4'-0" O.C. TO PROVIDE ADEQUATE STRENGTH AND STIFFNESS TO RESIST THE LOADS TO WHICH THEY ARE TO BE SUBJECTED BUT NO LESS THAN A HORIZ. LOAD OF 5 PSF.
8. PROVIDE CONTINUOUS DEFLECTION TRACK AT ALL PARTITIONS THAT EXTEND TO UNDERSIDE OF DECKING OR STRUCTURE ABOVE.

PARTITION TERMINATION DETAILS



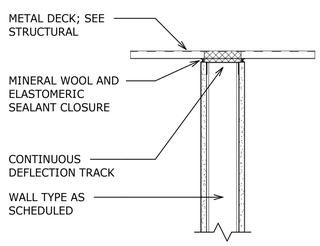
PARALLEL TO DECK FLUTES

TYPICAL AT ALL NON-LOAD BEARING PARTITIONS INDICATED AT FULL HEIGHT, INCLUDING SMOKE PARTITIONS



STRUCTURAL PENETRATIONS

TYPICAL AT ALL NON-LOAD BEARING PARTITIONS INDICATED AT FULL HEIGHT, INCLUDING SMOKE PARTITIONS



PERPENDICULAR TO DECK FLUTES

TYPICAL AT ALL NON-LOAD BEARING PARTITIONS INDICATED AT FULL HEIGHT, INCLUDING SMOKE PARTITIONS

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PROJECT STATUS
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SHEET
INTERIOR WALL TYPES

A002

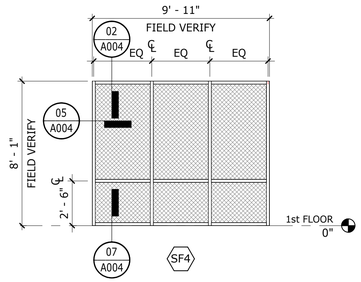
DOOR SCHEDULE

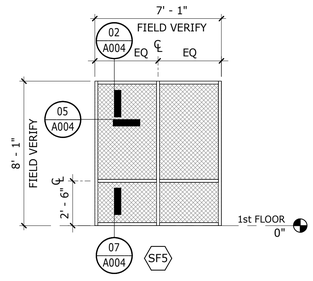
DOOR NUMBER	ROOM	DOOR						FRAME			HDW	SIGN TYPE	COMMENTS
		TYPE	WIDTH	HEIGHT	THICK	MAT'L	FINISH	TYPE	MAT'L	FINISH			
101	OFFICE	FG	3' - 0"	7' - 0"	1 3/4"	WD	FACT	1	HM	PT	01		
102	OFFICE	FG	3' - 0"	7' - 0"	1 3/4"	WD	FACT	3A	HM	PT	01		
103	OFFICE	FG	3' - 0"	7' - 0"	1 3/4"	WD	FACT	1	HM	PT	01		
106	RESTROOM	F	3' - 0"	7' - 0"	1 3/4"	WD	FACT	1	HM	PT	02	B	
107	RESTROOM	F	3' - 0"	7' - 0"	1 3/4"	WD	FACT	1	HM	PT	02	B	
108	CLOSET	F	3' - 0"	7' - 0"	1 3/4"	WD	FACT	1	HM	PT	03		
X104	WORK AREA	FG	3' - 0"	7' - 0"	1 3/4"	HM	PT	1	HM	PT	04		EXISTING DOOR TO REMAIN
X105	WORK AREA	FG	3' - 0"	7' - 0"	1 3/4"	HM	PT	1	HM	PT	04		EXISTING DOOR TO REMAIN

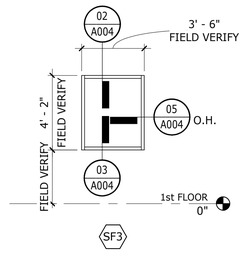
DOOR & FRAME NOTES

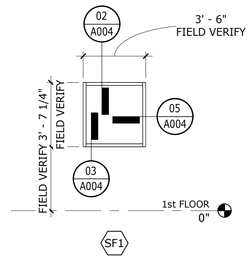
1. SEE DETAILS FOR HEAD, JAMB, AND THRESHOLD CONDITIONS AT DOORS.
2. ALL HOLLOW METAL FRAMES TO BE 2" WIDE FACE FRAME, U.N.O.
3. PROVIDE TEMPERED GLASS AT DOOR AND WINDOW LITES.
4. ALL GLAZING TO BE TEMPERED SAFETY GLAZING, U.N.O.
5. ALL FRAMES AT MASONRY WALLS 6" DEEP, TYPICAL, U.N.O.
6. EXTERIOR DOORS ARE TO BE RECESSED 1-1/2" FROM FACE OF EXTERIOR MASONRY, TYP. U.N.O.
7. VERIFY FRAME DEPTH AT ALL WALL CONDITIONS.
8. KEYING WITH MEDCO LOCK AND CORE.

STOREFRONT TYPES









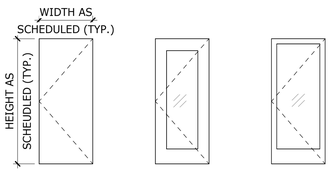
GLAZING SCHEDULE

1. ALL INTERIOR GLASS TO BE **GL-1**; SEE SPECIFICATIONS
2. ALL EXTERIOR GLASS TO BE **GL-2**; SEE SPECIFICATIONS

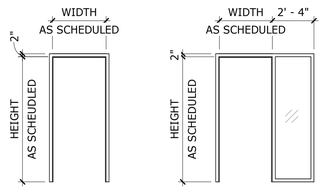
INDICATES SPANDREL GLASS

INDICATES WIRED GLASS

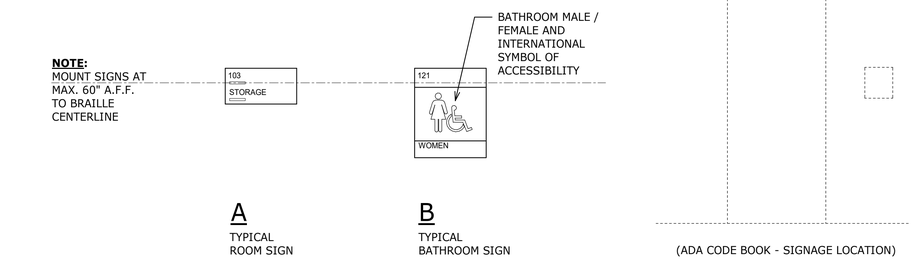
DOOR TYPES



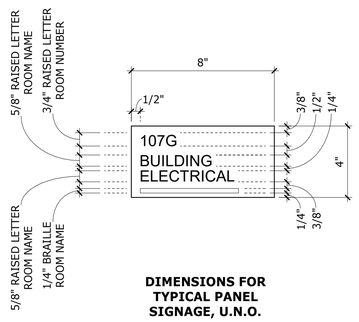
DOOR FRAME TYPES



TYPICAL ROOM SIGNAGE TYPES & PLACEMENT



TYPICAL ROOM SIGNAGE SIZES



DIMENSIONS FOR TYPICAL PANEL SIGNAGE, U.N.O.

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23-022
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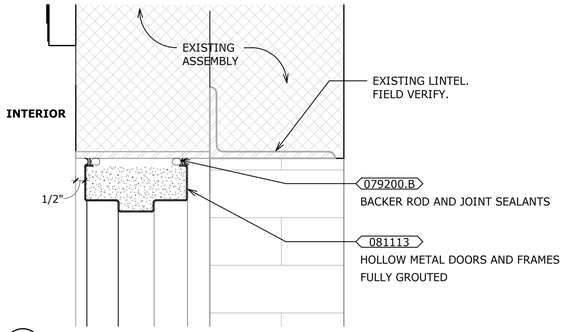
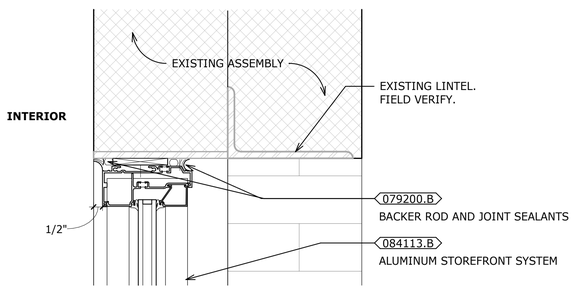
PROJECT STATUS
CONSTRUCTION DOCUMENTS
SHEET
DOOR/WINDOW SCHEDULES & DETAILS

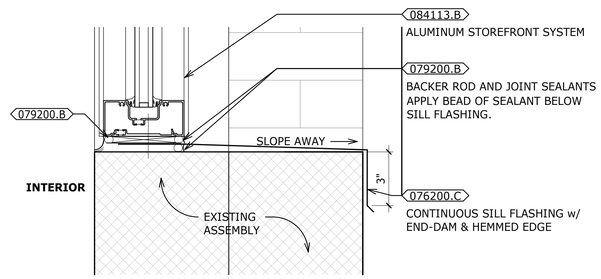
A003



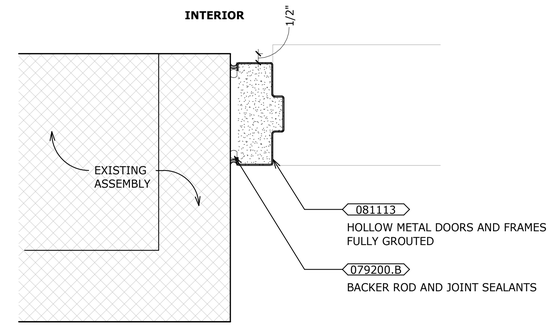
01 A004 OPENING DETAIL - TYPICAL HM DOOR HEAD (ALTERNATE # 6)
3" = 1'-0"



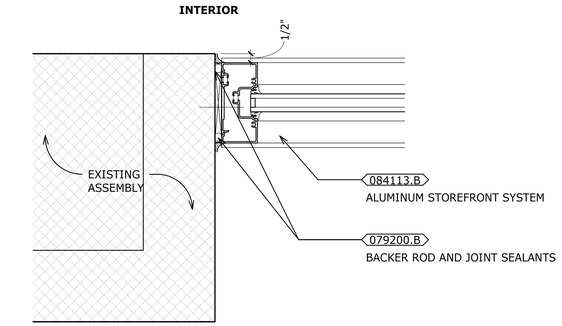
02 A004 OPENING DETAIL - TYPICAL STOREFRONT HEAD
3" = 1'-0"



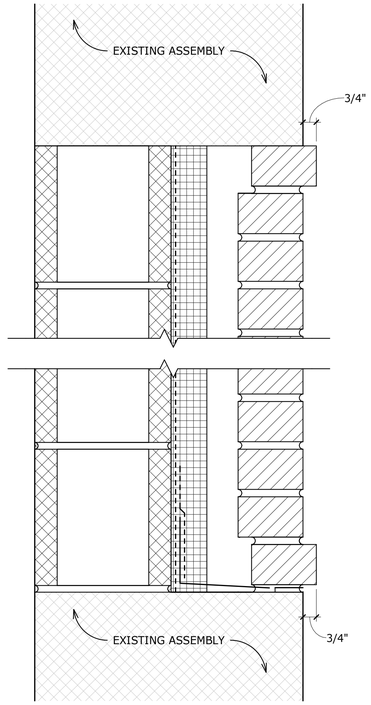
03 A004 OPENING DETAIL - TYPICAL STOREFRONT SILL
3" = 1'-0"



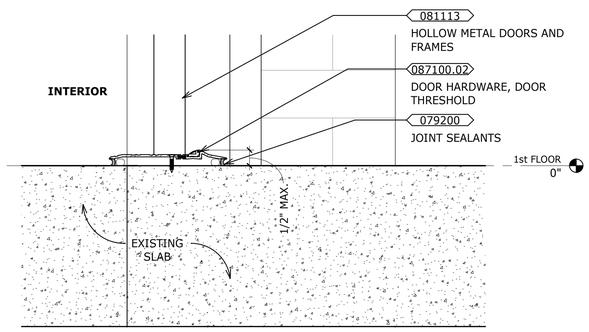
04 A004 OPENING DETAIL - TYPICAL HM DOOR JAMB (ALTERNATE # 6)
3" = 1'-0"



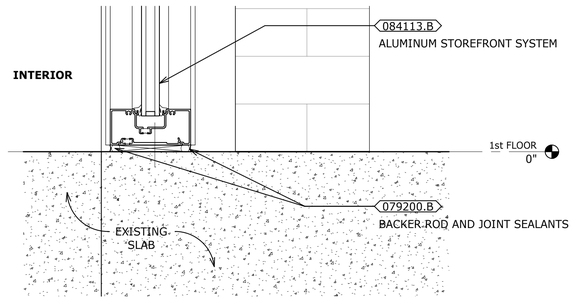
05 A004 OPENING DETAIL - TYPICAL STOREFRONT JAMB
3" = 1'-0"



08 A004 TYPICAL BRICK INFILL DETAIL
3" = 1'-0"

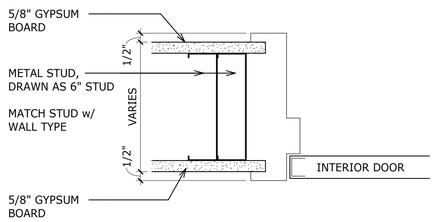


06 A004 OPENING DETAIL - TYPICAL HM DOOR THRESHOLD (ALTERNATE # 6)
3" = 1'-0"

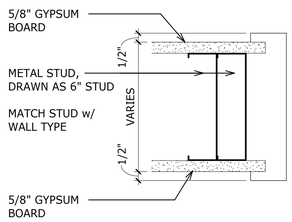


07 A004 OPENING DETAIL - TYPICAL STOREFRONT SILL AT GRADE
3" = 1'-0"

TYPICAL INTERIOR METAL DOOR FRAME JAMB AND HEADER



TYPICAL INTERIOR METAL CASED OPENING FRAME JAMB AND HEADER



09 A004 INTERIOR DOOR FRAME CONDITIONS
3" = 1'-0"

KEYNOTES

076200.C	CONTINUOUS SILL FLASHING w/ END-DAM & HEMMED EDGE
079200	JOINT SEALANTS
079200.B	BACKER ROD AND JOINT SEALANTS
081113	HOLLOW METAL DOORS AND FRAMES
084113.B	ALUMINUM STOREFRONT SYSTEM
087100.02	DOOR HARDWARE, DOOR THRESHOLD

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HH ARCHITECTURE, P.A. REGISTERED ARCHITECTURAL CORPORATION 51670 NORTH CAROLINA

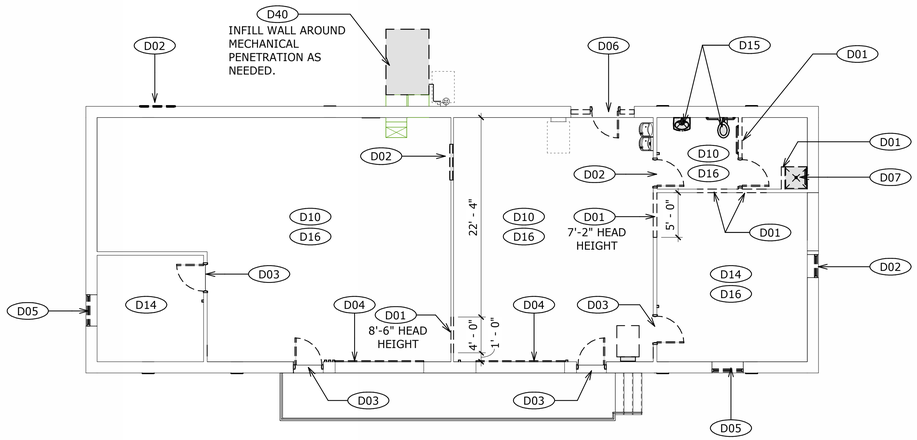
JENISSA A. VAN DEEN REGISTERED 13246 ARCHITECT NORTH CAROLINA 6.1.26

Plot Time: 6/3/2026 10:12:21 AM

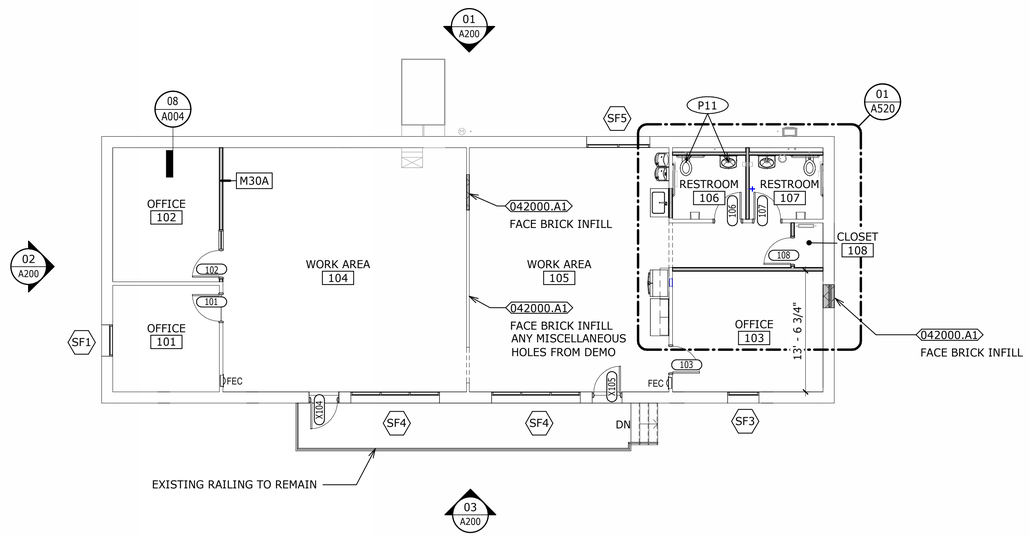
NO.	REVISION	DATE

JOB NUMBER
23-022
DATE ISSUED
06/01/2026
PROJECT STATUS
CONSTRUCTION DOCUMENTS
SHEET
OPENING DETAILS

A004



01 A100 DEMO FLOOR PLAN
1/8" = 1'-0"



02 A100 FLOOR PLAN
1/8" = 1'-0"

GRAPHIC SCALE: 1/8" = 1' - 0"
0' 4' 8' 16' 32'

DEMOLITION LEGEND

	EXISTING CONSTRUCTION TO REMAIN
	EXISTING CONSTRUCTION, ETC. TO BE DEMOLISHED. REFER TO DEMO NOTES FOR SPECIFIC INFORMATION.
RD	EXISTING ROOF DRAIN AND SUMP
RF	EXISTING ROOF FAN

KEYNOTES - DEMO

D01	DEMOLISH EXISTING WALL CONSTRUCTION.
D02	REMOVE EXISTING LOUVER/WINDOW/DOOR AND FRAME. PREPARE OPENING FOR INFILL.
D03	REMOVE EXISTING DOOR AND FRAME, PREPARE FOR NEW DOOR AND FRAME.
D04	REMOVE EXISTING OVERHEAD COILING DOOR, PREPARE OPENING FOR STOREFRONT.
D05	REMOVE EXISTING WINDOW AND FRAME, PREPARE FOR NEW STOREFRONT.
D06	DEMOLISH EXISTING WALL CONSTRUCTION AND DOOR, PREPARE FOR NEW STOREFRONT.
D07	DEMO MISCELANEOUS OBJECTS.
D10	DEMOLISH CEILING AND CEILING ACCESSORIES MOUNTED FIXTURES AND EQUIPMENT.
D14	EXISTING CEILING TO REMAIN
D15	SALVAGE AND RELOCATE EXISTING PLUMBING FIXTURES
D16	DEMOLISH EXISTING FLOOR FINISH AND BASE BOARD.
D40	EXISTING MECHANICAL EQUIPMENT AND ACCESSORIES. REFER TO MECHANICAL DRAWINGS.

KEYNOTES - PLAN NOTES

P11	REINSTALL EXISTING PLUMBING FIXTURES

DEMOLITION GENERAL NOTES

1. PRIOR TO PREPARING A BID, THE CONTRACTOR MUST VISIT THE SITE AND HAVE A WORKING KNOWLEDGE OF THE EXISTING CONSTRUCTION AND CONDITIONS.
2. CONTRACTOR AND ALL SUB-CONTRACTORS MUST VISIT THE SITE AND FULLY EXAMINE EXISTING CONDITIONS PRIOR TO COMMENCING WORK. ANY DISCREPANCIES IN THE EXISTING CONDITION AND THE WORK MUST BE BROUGHT TO THE IMMEDIATE ATTENTION OF THE ARCHITECT.
3. GENERAL CONTRACTOR MUST PROTECT ALL EXISTING MATERIALS TO REMAIN. REPAIR OR REPLACEMENT WILL BE THE RESPONSIBILITY OF THE CONTRACTOR.
4. ALL DEMOLITION WORK INDICATED ON THESE DRAWINGS INVOLVING THE REMOVAL OF EXISTING CONSTRUCTION SHALL BE COORDINATED WITH CORRESPONDING STRUCTURAL, PLUMBING, MECHANICAL, ELECTRICAL, AND CIVIL DRAWINGS. REMOVE EXISTING CONSTRUCTION AS INDICATED. DEMOLITION SHALL BE TO THE LEAST EXTENT POSSIBLE IN ORDER TO COMPLETE THE WORK. DO NOT PERFORM DEMOLITION BEYOND THE SCOPE OF CONSTRUCTION.
5. DETAILS OF EXISTING CONDITIONS: ACTUAL FIELD CONDITIONS WHICH ARE CONCEALED BY EXISTING CONSTRUCTION MAY VARY FROM THOSE INDICATED. ALL WORK THAT RELATES TO, OR IS IN ANY WAY AFFECTED BY EXISTING CONDITIONS WHICH VARY FROM THOSE INDICATED SHALL BE MODIFIED TO ACHIEVE THE REQUIREMENTS OF THE CONTRACT DOCUMENTS ACCORDING TO FIELD ASSESSMENTS AND MEASUREMENTS. REPORT ANY DISCREPANCIES TO THE ARCHITECT BEFORE PROCEEDING WITH THE ASPECTS OF DEMOLITION OR CONSTRUCTION.
6. CONTRACTOR TO COORDINATE DEMOLITION WITH ALL CONSTRUCTION WASTE MANAGEMENT SPECIFICATIONS.
7. PLAN DIMENSIONS ARE TO FACE OF FINISHED WALL U.N.O. ALL DIMENSIONS INDICATED FOR EXISTING CONSTRUCTION ARE APPROXIMATE; FIELD VERIFY ALL DIMENSIONS PRIOR TO COMMENCEMENT OF WORK.
8. THE GENERAL CONTRACTOR IS TO PROVIDE SHORING AND BRACING FROM DEMO THROUGHOUT FINAL COMPLETION OF NEW CONSTRUCTION AS NECESSARY TO ACHIEVE THE INTENT OF THE CONTRACT DOCUMENTS.
9. PATCH AND RESTORE ALL AREAS AFFECTED BY DEMOLITION WORK TO NEW CONDITION / MATCH ADJACENT CONDITION, IRRESPECTIVE OF NEW WORK.
10. CONTRACTOR TO COORDINATE AND VERIFY ALL EXISTING CONDITIONS w/ ABATEMENT PLAN PRIOR TO COMMENCEMENT OF ANY DEMOLITION WORK.

PLAN LEGEND

- EXISTING CONSTRUCTION TO REMAIN
- NEW WALL CONSTRUCTION
- F.E.C. — SEMI-RECESSED FIRE EXTINGUISHER CABINET

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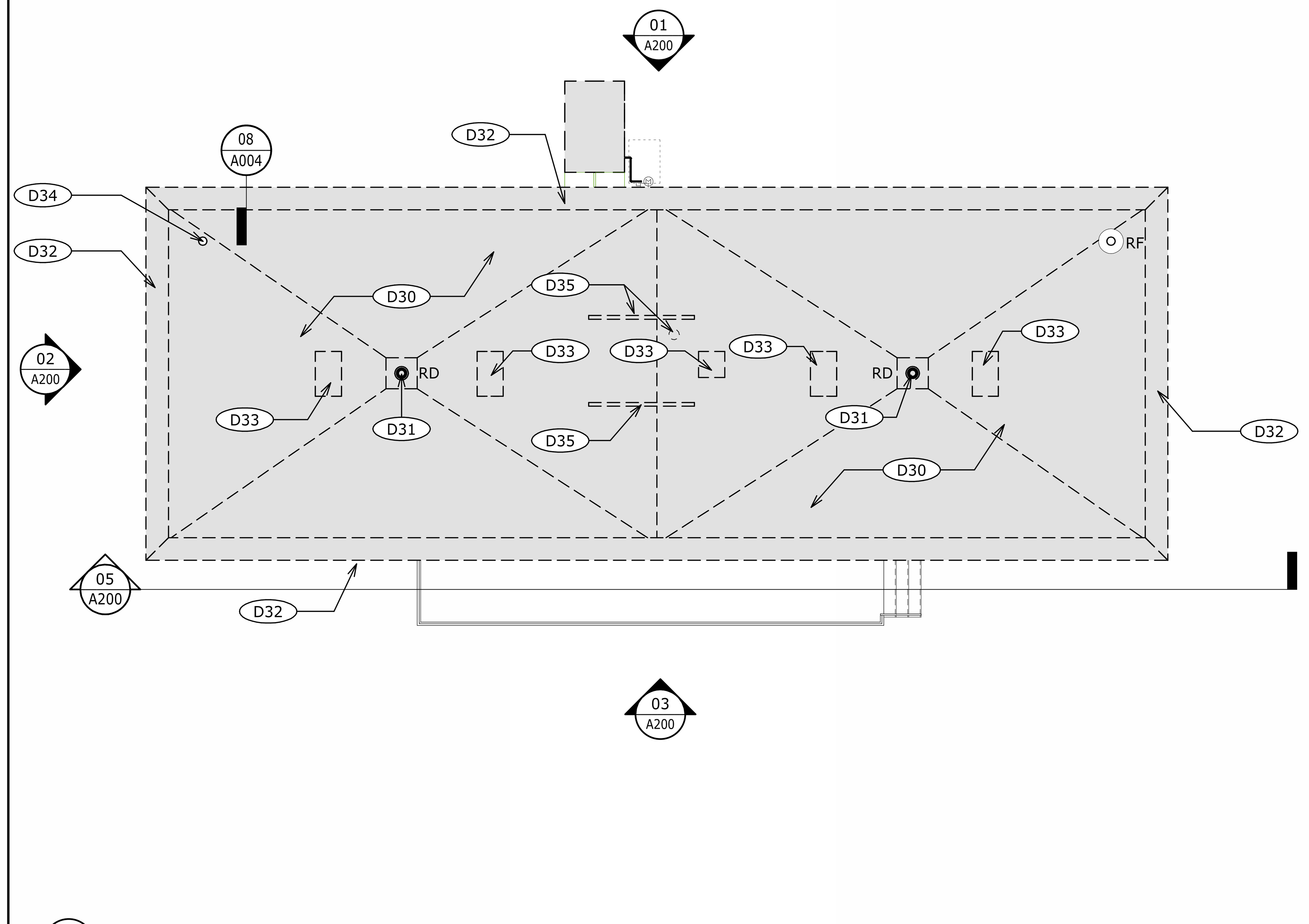
HH ARCHITECTURE, P.A. — REGISTERED ARCHITECTURAL CORPORATION — 51670 — NORTH CAROLINA

VANESSA A. VANDEN — REGISTERED — 13246 — ARCHITECT — NORTH CAROLINA — 6.1.26

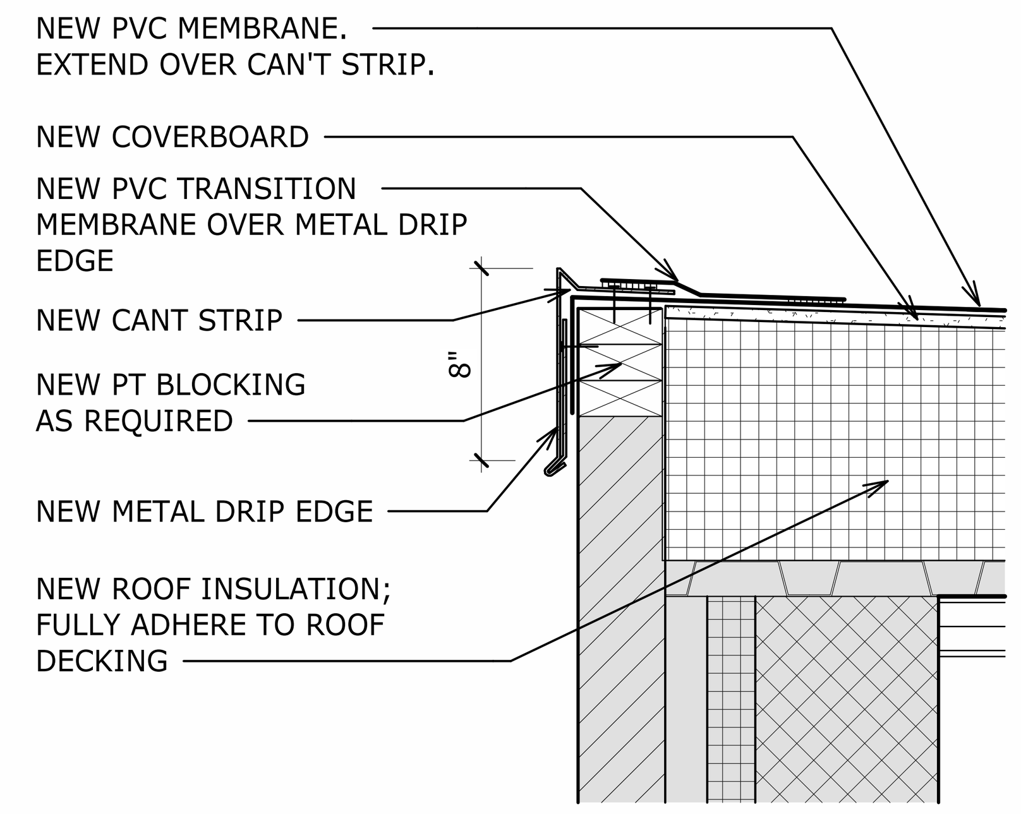
NO.	REVISION	DATE

JOB NUMBER **23-022**
DATE ISSUED **06/01/2026**
PROJECT STATUS **CONSTRUCTION DOCUMENTS**
SHEET **DEMO PLAN & FLOOR PLANS**

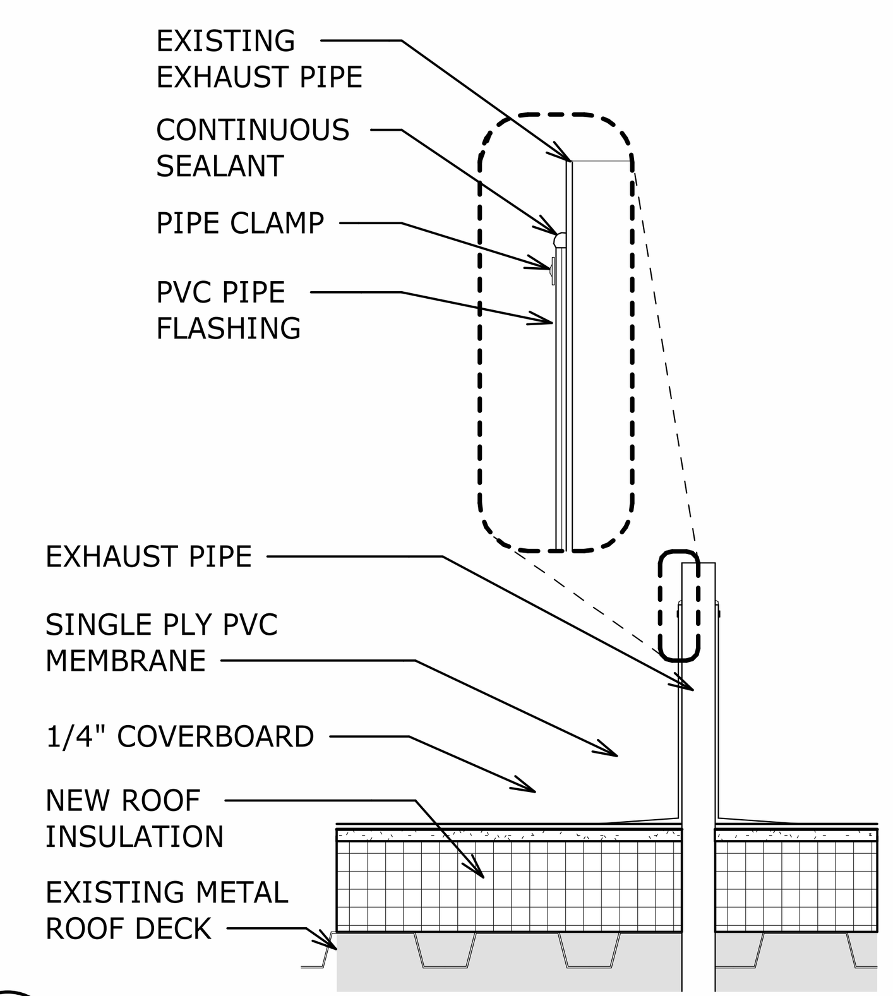
A100



01 DEMOLITION ROOF PLAN (ALTERNATE # 1)
A110 1/8" = 1'-0"



03 TYPICAL ROOF EDGE DETAIL (ALTERNATE # 1)
A110 1 1/2" = 1'-0"



04 TYPICAL EXHAUST STACK DETAIL (ALTERNATE # 1)
A110 1 1/2" = 1'-0"

DEMOLITION LEGEND

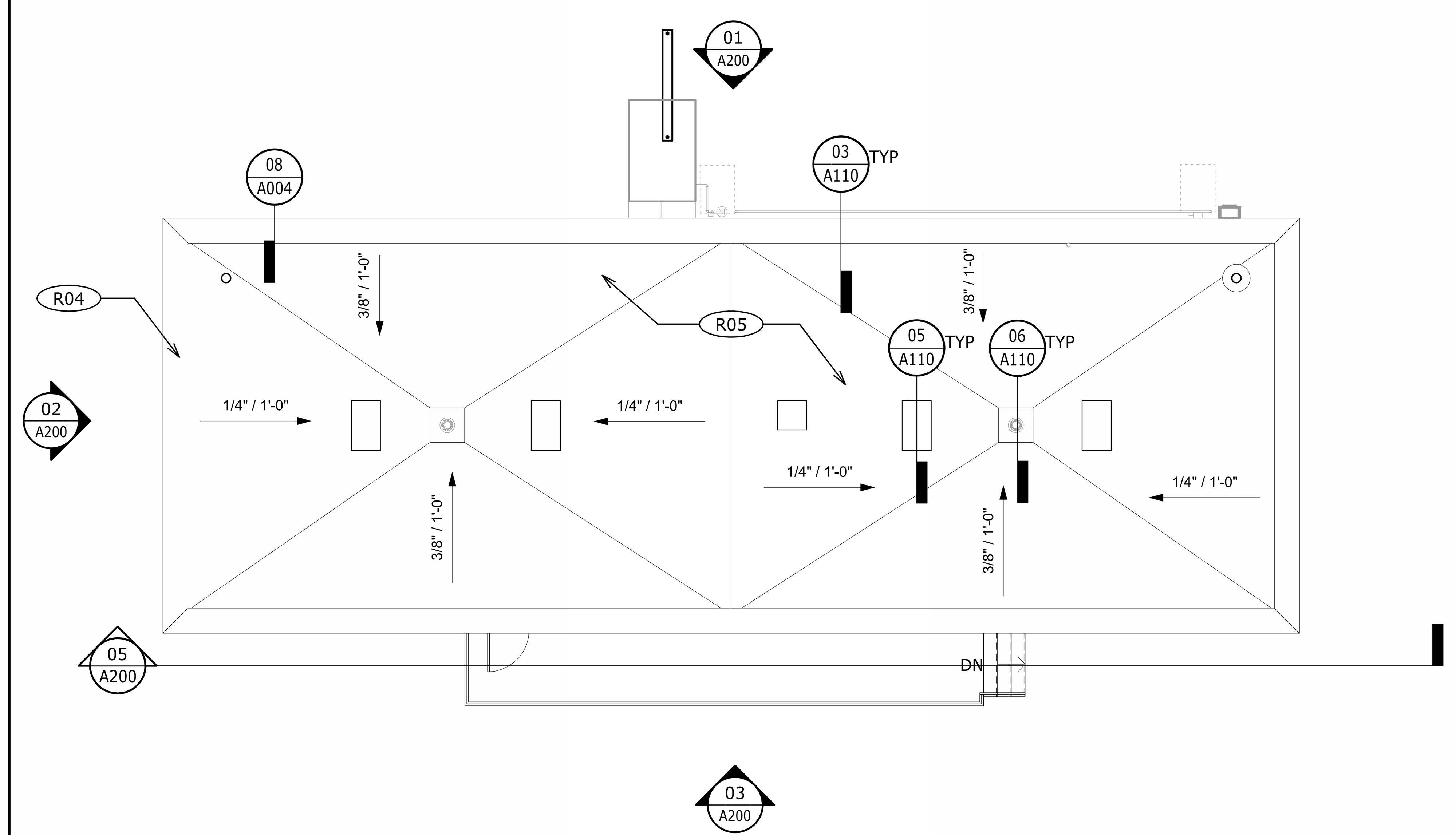
(line)	EXISTING CONSTRUCTION TO REMAIN
(dashed line)	EXISTING CONSTRUCTION, ETC. TO BE DEMOLISHED. REFER TO DEMO NOTES FOR SPECIFIC INFORMATION.
RD	EXISTING ROOF DRAIN AND SUMP
RF	EXISTING ROOF FAN

KEYNOTES - DEMO

D30	REMOVE AND DISPOSE OF EXISTING ROOF MEMBRANE, ROOF INSULATION, AND ALL RELATED COMPONENTS. PREP FOR NEW ROOF MEMBRANE AND INSULATION SYSTEM.
D31	REMOVE AND DISPOSE OF EXISTING ROOF DRAIN, CAP AND PREP DRAIN PIPE FOR NEW EXTENDED ROOF DRAIN.
D32	REMOVE AND DISPOSE OF EXISTING DRIP EDGE AND ALL RELATED COMPONENTS. PREP FOR NEW METAL COPING SYSTEM.
D33	REMOVE AND DISPOSE OF EXISTING ROOFING MEMBRANE AND SHEET METAL COVER. PREP CURB AND OPENING FOR NEW CAP.
D34	REMOVE AND DISPOSE OF EXISTING FLASHING SLEEVE. PREP EXHAUST STACK FOR NEW FLASHING SLEEVE.
D35	REMOVE AND DISPOSE OF EXISTING MISCELANEOUS MATERIAL.

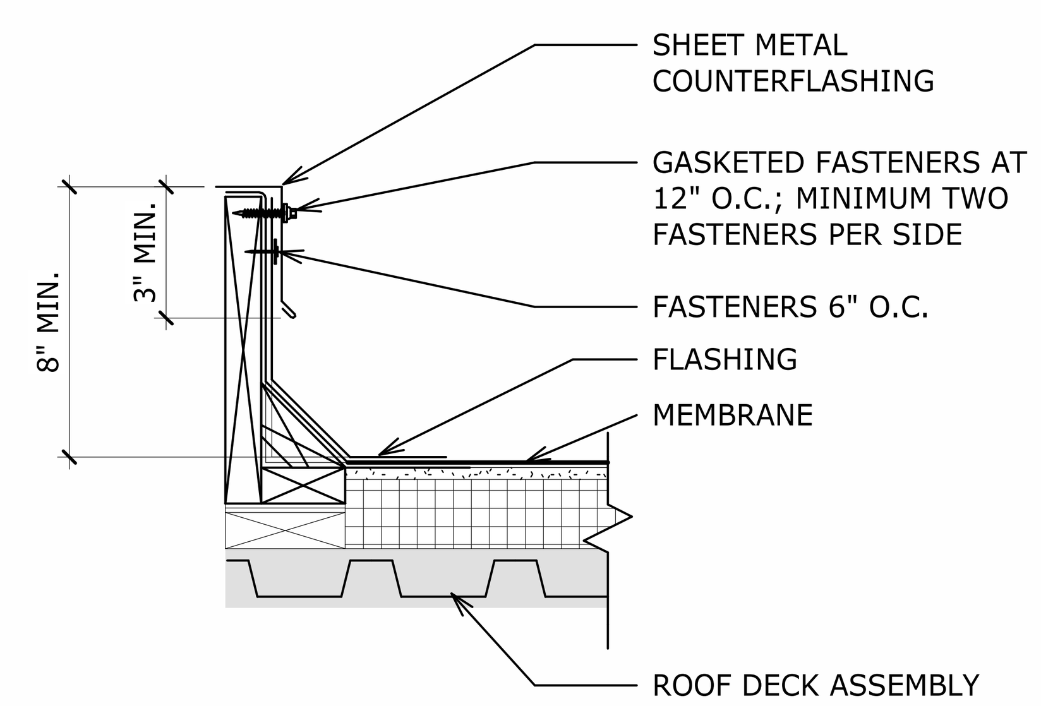
DEMOLITION GENERAL NOTES

1. PRIOR TO PREPARING A BID, THE CONTRACTOR MUST VISIT THE SITE AND HAVE A WORKING KNOWLEDGE OF THE EXISTING CONSTRUCTION AND CONDITIONS.
2. CONTRACTOR AND ALL SUB-CONTRACTORS MUST VISIT THE SITE AND FULLY EXAMINE EXISTING CONDITIONS PRIOR TO COMMENCING WORK. ANY DISCREPANCIES IN THE EXISTING CONDITION AND THE WORK MUST BE BROUGHT TO THE IMMEDIATE ATTENTION OF THE ARCHITECT.
3. GENERAL CONTRACTOR MUST PROTECT ALL EXISTING MATERIALS TO REMAIN. REPAIR OR REPLACEMENT WILL BE THE RESPONSIBILITY OF THE CONTRACTOR.
4. ALL DEMOLITION WORK INDICATED ON THESE DRAWINGS INVOLVING THE REMOVAL OF EXISTING CONSTRUCTION SHALL BE COORDINATED WITH CORRESPONDING STRUCTURAL, PLUMBING, MECHANICAL, ELECTRICAL, AND CIVIL DRAWINGS. REMOVE EXISTING CONSTRUCTION AS INDICATED. DEMOLITION SHALL BE TO THE LEAST EXTENT POSSIBLE IN ORDER TO COMPLETE THE WORK. DO NOT PERFORM DEMOLITION BEYOND THE SCOPE OF CONSTRUCTION.
5. DETAILS OF EXISTING CONDITIONS: ACTUAL FIELD CONDITIONS WHICH ARE COVERED BY EXISTING CONSTRUCTION MAY VARY FROM THOSE INDICATED. ALL WORK THAT RELATES TO, OR IS IN ANY WAY AFFECTED BY EXISTING CONDITIONS WHICH VARY FROM THOSE INDICATED SHALL BE MODIFIED TO ACHIEVE THE REQUIREMENTS OF THE CONTRACT DOCUMENTS ACCORDING TO FIELD ASSESSMENTS AND MEASUREMENTS. REPORT ANY DISCREPANCIES TO THE ARCHITECT BEFORE PROCEEDING WITH THE ASPECTS OF DEMOLITION OR CONSTRUCTION.
6. CONTRACTOR TO COORDINATE DEMOLITION WITH ALL CONSTRUCTION WASTE MANAGEMENT SPECIFICATIONS.
7. PLAN DIMENSIONS ARE TO FACE OF FINISHED WALL U.N.O. ALL DIMENSIONS INDICATED FOR EXISTING CONSTRUCTION ARE APPROXIMATE; FIELD VERIFY ALL DIMENSIONS PRIOR TO COMMENCEMENT OF WORK.
8. THE GENERAL CONTRACTOR IS TO PROVIDE SHORING AND BRACING FROM DEMO THROUGHOUT FINAL COMPLETION OF NEW CONSTRUCTION AS NECESSARY TO ACHIEVE THE INTENT OF THE CONTRACT DOCUMENTS.
9. PATCH AND RESTORE ALL AREAS AFFECTED BY DEMOLITION WORK TO NEW CONDITION / MATCH ADJACENT CONDITION, IRRESPECTIVE OF NEW WORK.
10. CONTRACTOR TO COORDINATE AND VERIFY ALL EXISTING CONDITIONS w/ ABATEMENT PLAN PRIOR TO COMMENCEMENT OF ANY DEMOLITION WORK.

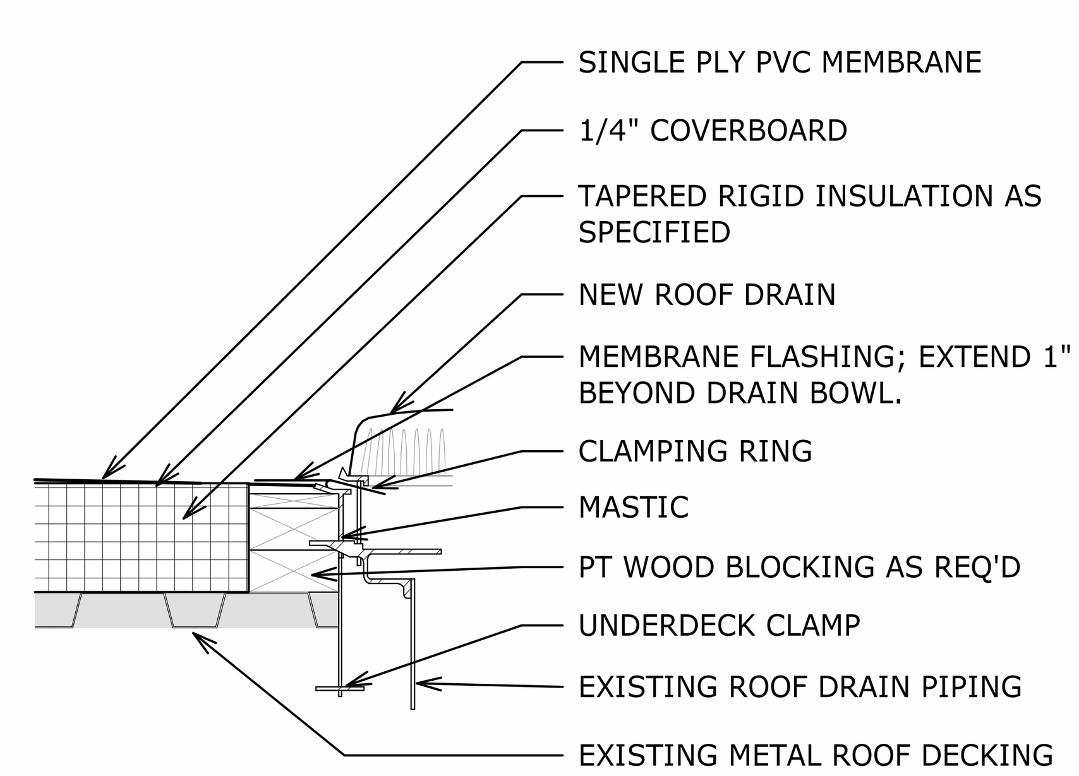


02 ROOF PLAN (ALTERNATE # 1)
A110 1/8" = 1'-0"

GRAPHIC SCALE: 1/8" = 1' - 0"
0' 4' 8' 16' 32'



05 TYPICAL ROOF CURB DETAIL (ALTERNATE # 1)
A110 1 1/2" = 1'-0"



06 TYPICAL ROOF DRAIN DETAIL (ALTERNATE # 1)
A110 1 1/2" = 1'-0"

ROOF PLAN LEGEND

R.D.	ROOF DRAIN LOCATION

KEYNOTES - ROOF PLAN

R04	EXISTING ROOF EDGE, SEE DETAIL 03/A110 FOR NEW FLASHING MEMBRANE AND COPING DETAIL.
R05	NEW PVC ROOFING SYSTEM

ROOF GENERAL NOTES

1. PRIOR TO PREPARING A BID, THE CONTRACTOR MUST VISIT THE SITE AND HAVE A WORKING KNOWLEDGE OF THE EXISTING CONSTRUCTION AND CONDITIONS.
2. CONTRACTOR AND ALL SUB-CONTRACTORS MUST VISIT THE SITE AND FULLY EXAMINE EXISTING CONDITIONS PRIOR TO COMMENCING WORK. ANY DISCREPANCIES IN THE EXISTING CONDITION AND THE WORK MUST BE BROUGHT TO THE IMMEDIATE ATTENTION OF THE ARCHITECT.
3. GENERAL CONTRACTOR MUST PROTECT ALL EXISTING MATERIALS TO REMAIN. REPAIR OR REPLACEMENT WILL BE THE RESPONSIBILITY OF THE CONTRACTOR.
4. PLAN DIMENSIONS ARE TO FACE OF FINISHED WALL U.N.O. ALL DIMENSIONS INDICATED FOR EXISTING CONSTRUCTION ARE APPROXIMATE; FIELD VERIFY ALL DIMENSIONS PRIOR TO COMMENCEMENT OF WORK.
5. THE GENERAL CONTRACTOR IS TO PROVIDE SHORING AND BRACING FROM DEMO THROUGHOUT FINAL COMPLETION OF NEW CONSTRUCTION AS NECESSARY TO ACHIEVE THE INTENT OF THE CONTRACT DOCUMENTS.
6. PATCH AND RESTORE ALL AREAS AFFECTED BY DEMOLITION WORK TO NEW CONDITION / MATCH ADJACENT CONDITION, IRRESPECTIVE OF NEW WORK.
7. CONTRACTOR TO INSTALL NEW ROOF INSULATION AS REQ'D TO ALLOW FOR PROPER DRAINAGE TO EXISTING ROOF DRAINS.
8. PROVIDE PROPER FLASHING AT ALL EXISTING PENETRATIONS.
9. SEE SPECIFICATION SECTION **075419** FOR NEW PVC MEMBRANE ROOFING ASSEMBLY.
10. SEE SPECIFICATION SECTION **072200** FOR NEW CONTINUOUS ROOFING INSULATION. INSULATION THICKNESS SHALL BE MIN. R-VALUE REQUIREMENT OF R-30ci AS NOTED IN **TABLE C402.1.3 OF THE 2018 NC ENERGY CONSERVATION CODE**.

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JENISSA A. VANIDEN REGISTERED ARCHITECT 13246 NORTH CAROLINA 6/26

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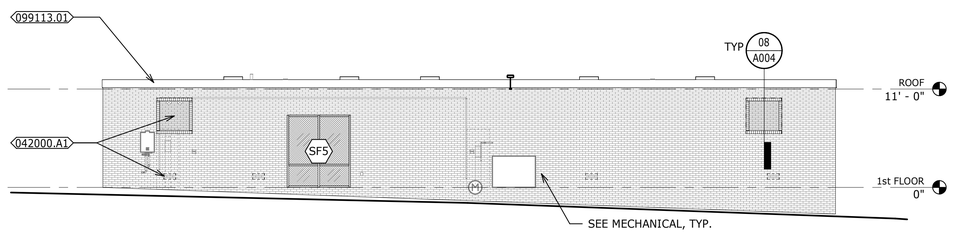
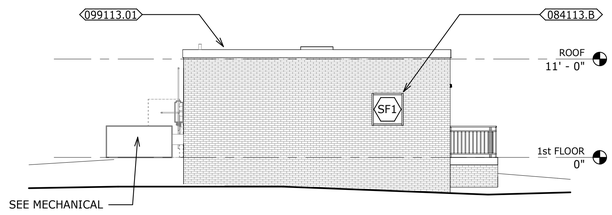
PROJECT STATUS
CONSTRUCTION DOCUMENTS
SHEET
DEMO ROOF PLAN, ROOF PLAN & DETAILS

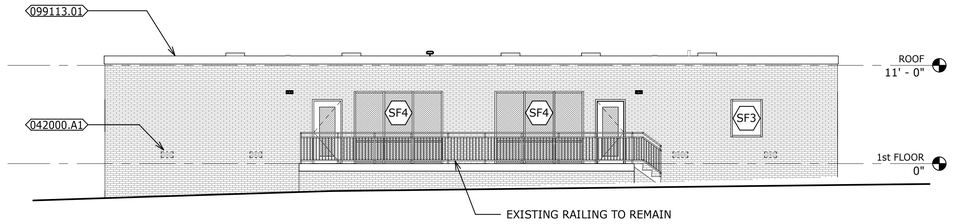
A110



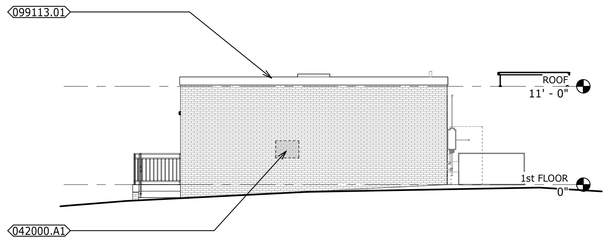
01 A200 NORTH ELEVATION
1/8" = 1'-0"



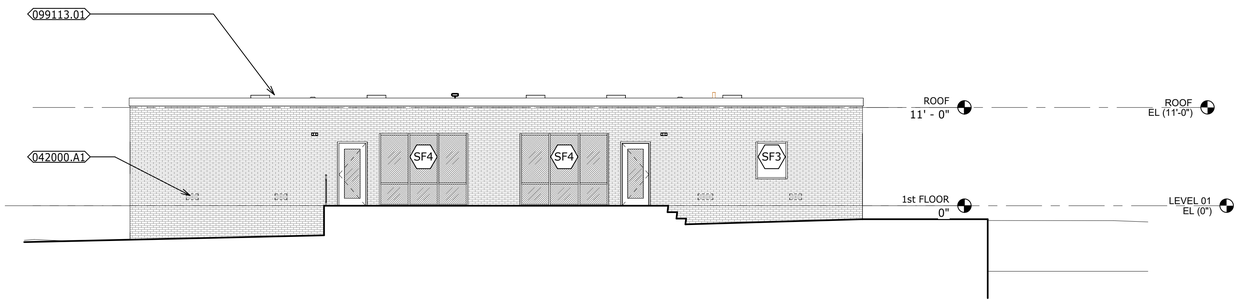
02 A200 WEST ELEVATION
1/8" = 1'-0"



03 A200 SOUTH ELEVATION
1/8" = 1'-0"



04 A200 EAST ELEVATION
1/8" = 1'-0"



05 A200 SOUTH ELEVATION
1/8" = 1'-0"

KEYNOTES

042000.A1 FACE BRICK INFILL
084113.B ALUMINUM STOREFRONT SYSTEM
099113.01 EXTERIOR PAINTING, EP-1

ELEVATION LEGEND

GLAZING; SEE GLAZING SCHEDULE

EXISTING FACE BRICK

INFILL FACE BRICK TO MATCH EXISTING. SEE TYPICAL BRICK INFILL DETAIL 08/A004.

WIRED GLASS

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VANESSA A. VANDIVIER REGISTERED 13246 ARCHITECT NORTH CAROLINA 6.1.26

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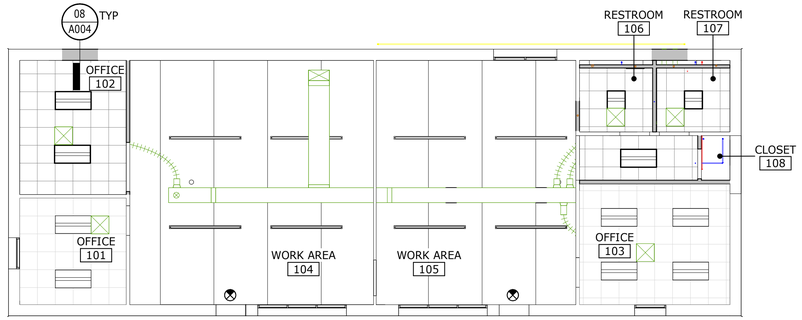
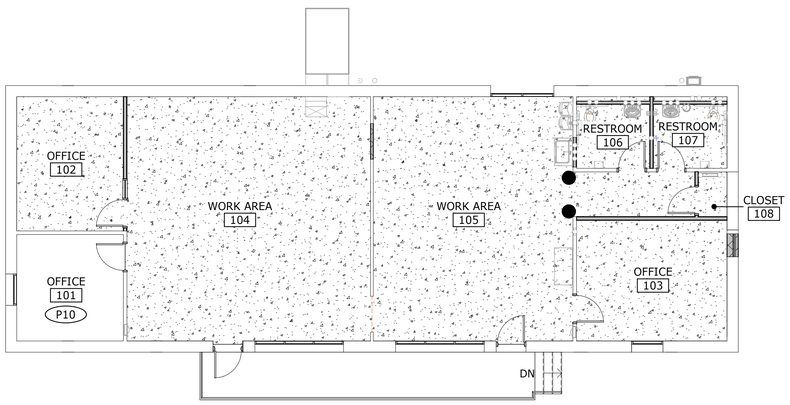
EXTERIOR ELEVATIONS

A200

Plot Time: 6/3/2026 10:12:28 AM



01 A400 REFLECTED CEILING PLAN
1/8" = 1'-0"



02 A400 FINISH PLAN
1/8" = 1'-0"

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

0' 4' 8' 16' 32'

RCP GENERAL NOTES

1. ALL CEILING HEIGHTS TO BE **8' - 0" A.F.F.** U.N.O.
2. CEILING GRIDS ARE CENTERED IN EACH SPACE WITH EQUAL WIDTH TILES ON PARALLEL EDGES, U.N.O. INSTALL CEILING GRID AS SHOWN TO AVOID CEILING PANEL SLIVERS.
3. SEE MEP DRAWINGS FOR MORE DETAILED INFORMATION ON LIGHTS, MECHANICAL VENTS, ETC.
4. ROOMS WITH NO CEILINGS, HVAC NOT SHOWN; SEE MEP DRAWINGS FOR COORDINATION.
5. U.N.O. ALL RCP ELEVATIONS ARE TAKEN FROM THE F.F.E. OF THE ROOM IN WHICH THE CEILING IS LOCATED.
6. CONTRACTOR IS REQUIRED TO PROVIDE FULL COORDINATION DRAWINGS FOR ALL MEP & FP SYSTEMS OVERHEAD AND ABOVE CEILING.
7. PAINT ALL EXPOSED MEP FIXTURES **PT-2**; SEE FINISH SCHEDULE.

KEYNOTES - RCP

RCP LEGEND

EXISTING CONSTRUCTION TO REMAIN

NEW WALL CONSTRUCTION

CEILINGS (SEE FINISH SCHEDULE FOR TYPES AND FINISH)

X' - X" CEILING HEIGHT

095113 2 x 2 APC SYSTEM

OPEN TO DECK, PT-2

RS48SBPA — LENGTH (INCHES); OPERATION (M=MANUAL, P=POWERED); ROLLER SHADE; MODIFIER; STANDARD AND/OR BLACKOUT

CEILING SYMBOLS (SEE MEP)

EXIT SIGN

SUPPLY

RETURN

EXHAUST

OCCUPANCY SENSOR

SMOKE DETECTOR

LIGHTING TYPES (SEE ELECTRICAL)

A RECESSED TROFFER

B LINEAR PENDANT

GENERAL FINISH NOTES

1. ALL MATERIALS SHALL BE INSTALLED PER MANUFACTURERS' RECOMMENDATIONS WITH APPROVED ADHESIVES.
2. IF THERE ARE QUESTIONS ABOUT THE DESIGN INTENT OF ANY PATTERN OR MATERIAL TO BE INSTALLED, THE G.C. SHALL SUBMIT A REQUEST FOR INFORMATION TO THE DESIGNER FOR CLARIFICATION PRIOR TO ORDERING THE MATERIALS.
3. U.N.O. THE G.C. SHALL PROVIDE ALL FINISHING PIECES AND TRANSITIONS WHERE DIFFERENT FLOORING THICKNESSES MEET. ARCHITECT TO SELECT COLOR/FINISH FROM MANUFACTURER'S FULL RANGE.
4. ALL WALLS TO BE FIELD PAINT, **PT-1**, U.N.O.
5. G.C. TO PROVIDE SHOP DRAWINGS FOR ALL FLOOR PATTERN TYPES FOR APPROVAL, PRIOR TO ORDERING MATERIALS.

KEYNOTES - PLAN NOTES

P10 EXISTING CARPET TO REMAIN

FINISH PLAN LEGEND

APPLIED CORNER GUARD

FLOOR FINISHES LEGEND

EXISTING TO REMAIN

SC-1

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DIX PARK - 1105 WAREHOUSE DR RENOVATION
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HH ARCHITECTURE, P.A. REGISTERED ARCHITECTURAL CORPORATION 51670 NORTH CAROLINA

VANESSA A. VAN DEEN REGISTERED 13246 ARCHITECT NORTH CAROLINA 6.1.26

NO.	REVISION	DATE

JOB NUMBER **23-022**

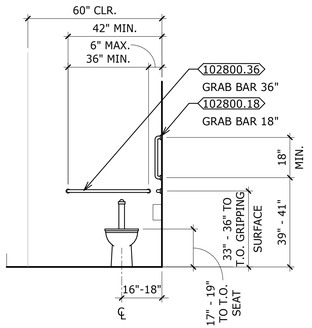
DATE ISSUED **06/01/2026**

PROJECT STATUS **CONSTRUCTION DOCUMENTS**

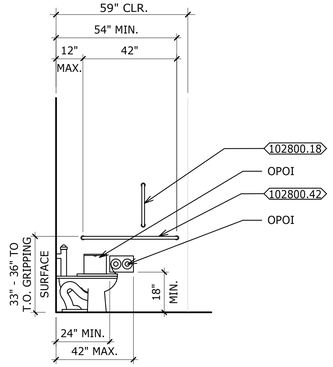
SHEET **REFLECTED CEILING & FINISH PLANS**

A400

NOTE: FLUSH VALVE TO BE INSTALLED ON CLEAR SIDE OF TOILET.

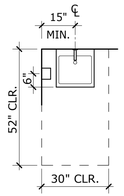


A
ADA TOILET,
FRONT ELEVATION



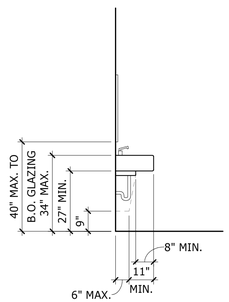
A
ADA TOILET,
SIDE ELEVATION

NOTE: CLEARANCE TO BE CENTERED ON FAUCET

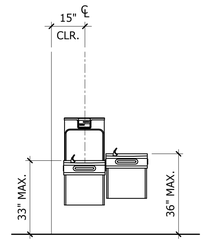


B
LAVATORY CLEARANCES,
PLAN

NOTE: THERMALLY INSULATE ALL EXPOSED PIPING BELOW LAVATORIES.



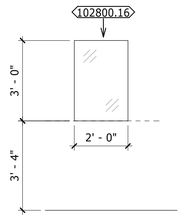
B
LAVATORY,
SIDE ELEVATION

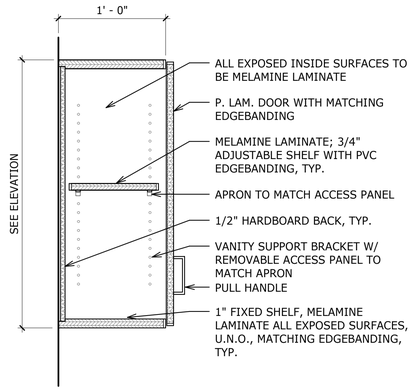


C
BI-LEVEL DRINKING FOUNTAIN WITH BOTTLE FILLER,
FRONT ELEVATION

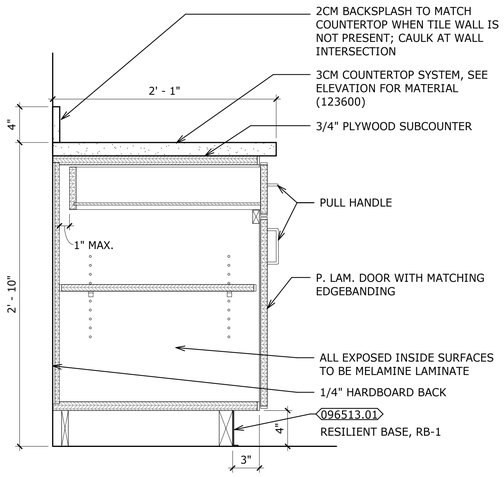
TOILET ACCESSORIES GENERAL NOTES

1. COORDINATE BLOCKING FOR ALL WALL-MOUNTED ACCESSORIES.
2. PROVIDE TOILET ACCESSORIES NOTED AT EACH PLAN LOCATION OF CORRESPONDING TYPICAL KEYED FIXTURE ELEVATION, AND AS NOTED OTHERWISE.
3. ALL ACCESSIBLE DETAILS TO COMPLY WITH CURRENT **NC ACCESSIBILITY CODE**.
4. FOR ALL PLUMBING FIXTURES, SEE PLUMBING.
5. COORDINATE THERMAL INSULATION AT ALL EXPOSED PIPING BELOW SINKS / LAVATORIES.

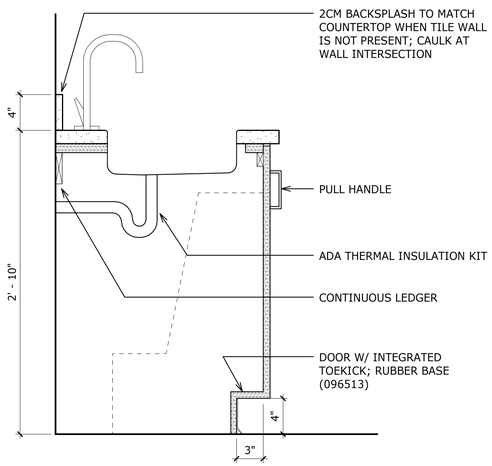




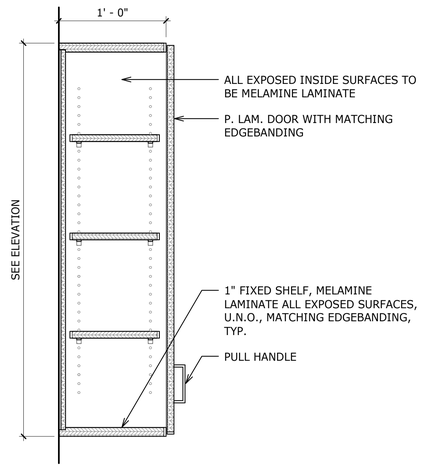
01 A510 TYP. UPPER SINK CABINET SECTION
1 1/2" = 1'-0"



03 A510 TYP. BASE CABINET SECTION
1 1/2" = 1'-0"



04 A510 TYPICAL ADA SINK W/ DOUBLE DOOR CABINET
1 1/2" = 1'-0"



05 A510 TYP. UPPER CABINET SECTION
1 1/2" = 1'-0"

KEYNOTES

096513.01 RESILIENT BASE, RB-1
102800.16 MIRROR UNIT
102800.18 GRAB BAR 18"
102800.36 GRAB BAR 36"
102800.42 GRAB BAR 42"

CASEWORK GENERAL NOTES

1. CASEWORK SHALL BE CONSTRUCTED FROM MDF OR PARTICLE BOARD. SHOP DRAWINGS OF CASEWORK TO BE SUBMITTED TO DESIGNER FOR APPROVAL.
2. PROVIDE CONCEALED HINGES FOR ALL DOORS.
3. G.C. TO COORDINATE GROMMET LOCATIONS WITH OWNER.
4. ALL DOOR AND DRAWER PULLS TO BE **4" SS SQUARE MATTE**, U.N.O.
5. PROVIDE SILENCERS FOR ALL CABINET DRAWERS.
6. WOOD GRAIN LAMINATE, **PL-1** SHALL RUN IN VERTICAL DIRECTION.
7. ALL EXPOSED EDGES TO RECEIVE **3MM PVC EDGEBANDING** TO MATCH COORDINATING LAMINATE SURFACE.

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VANESSA A. VAN BEEN REGISTERED Issued 13246 ARCHITECT NORTH CAROLINA

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23-022
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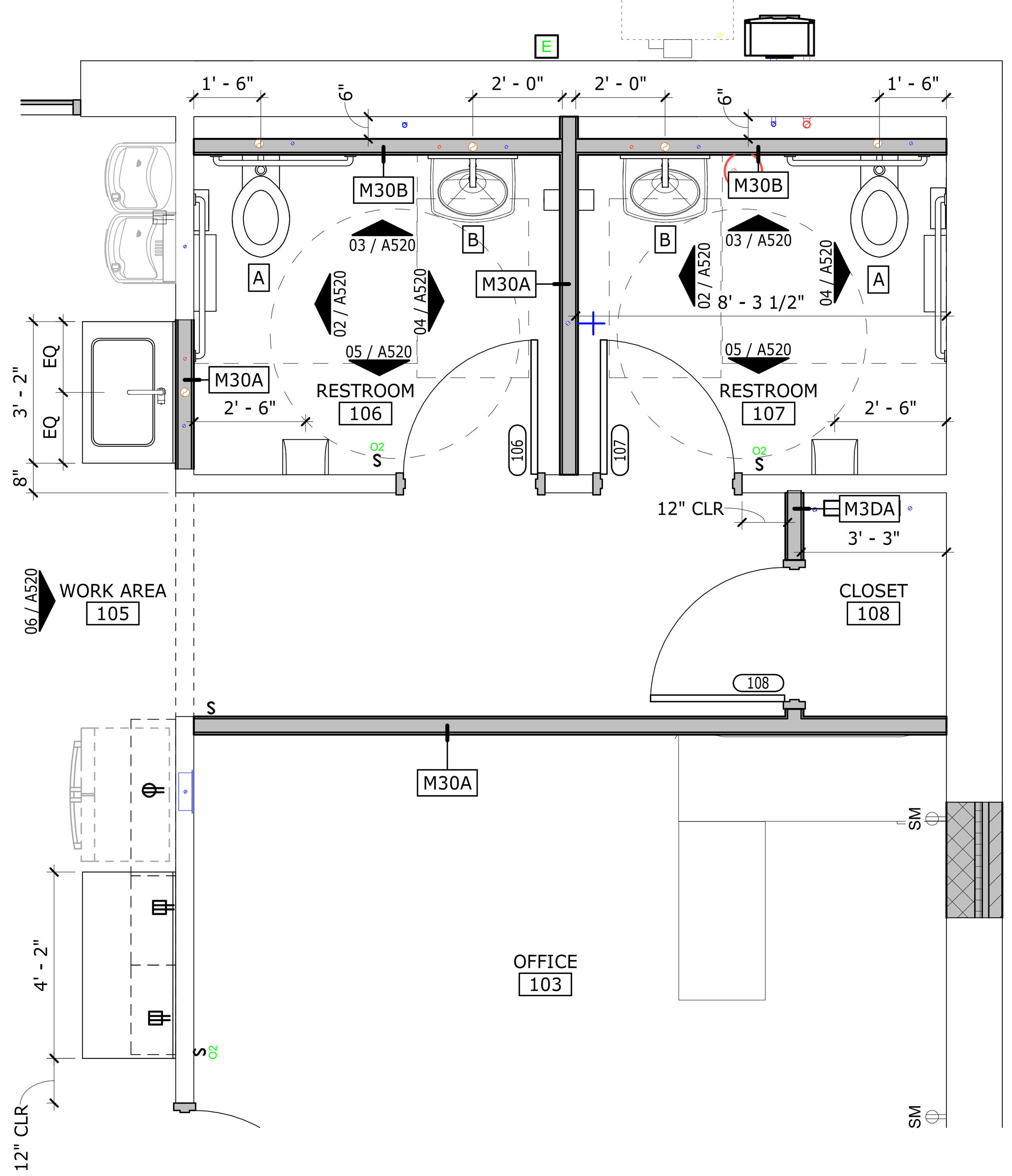
CONSTRUCTION DOCUMENTS
SHEET
TYPICAL TOILET ACCESSORIES & CASEKWORK DETAILS

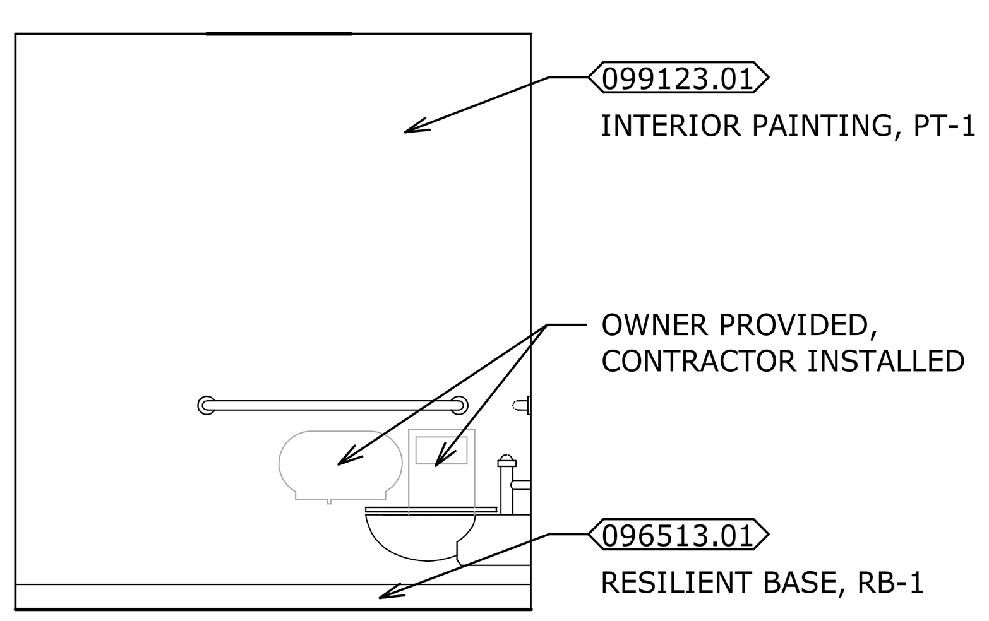
A510



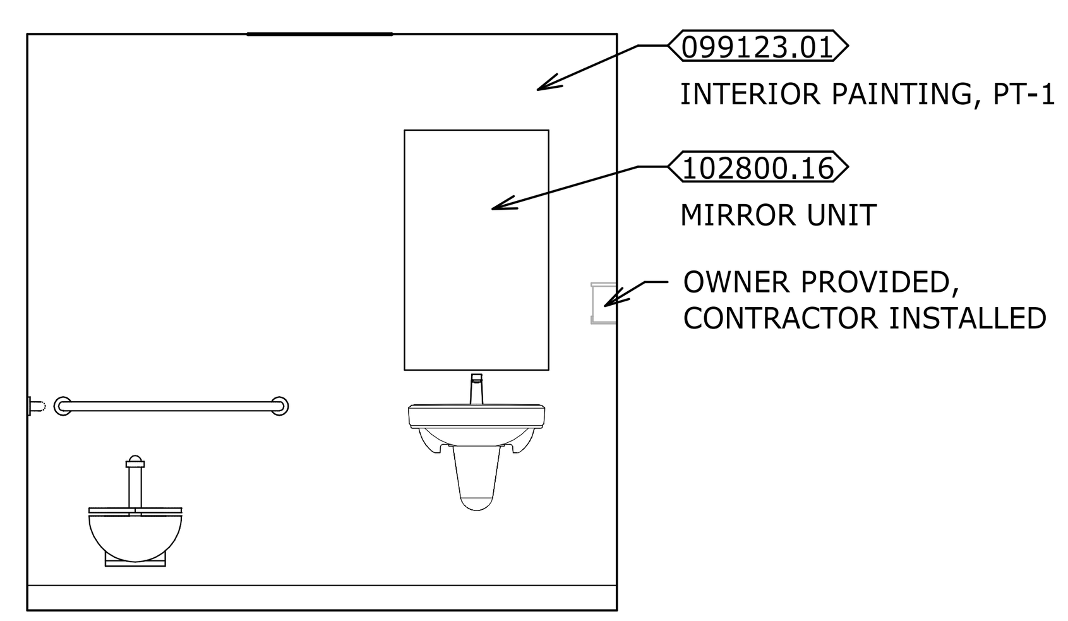
01 ENLARGED FLOOR PLAN
A520 3/8" = 1'-0"

GRAPHIC SCALE: 3/8" = 1' - 0"
0' 1.5' 3' 6' 12'

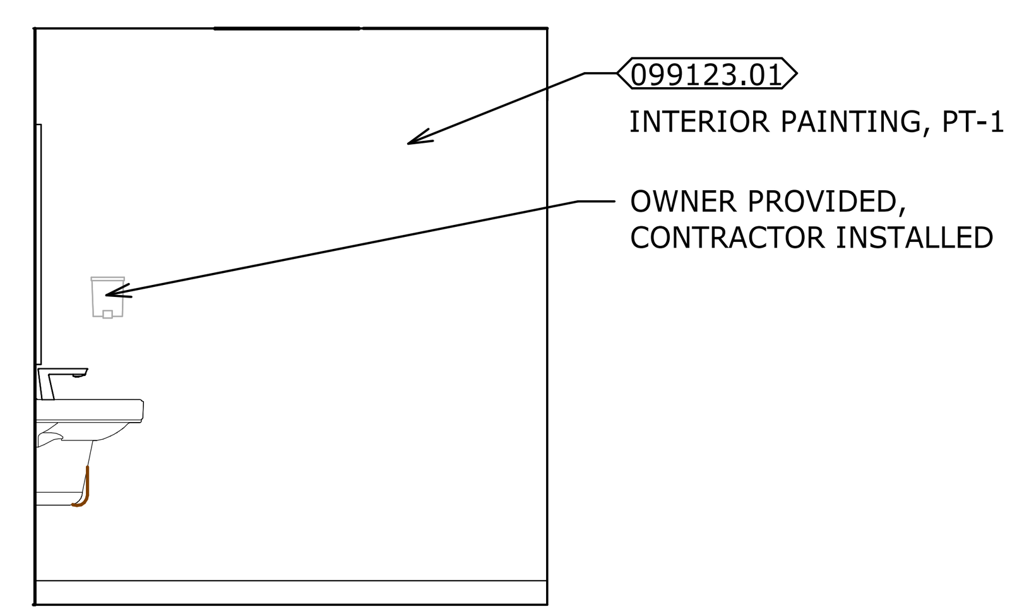
KEYNOTES - PLAN NOTES



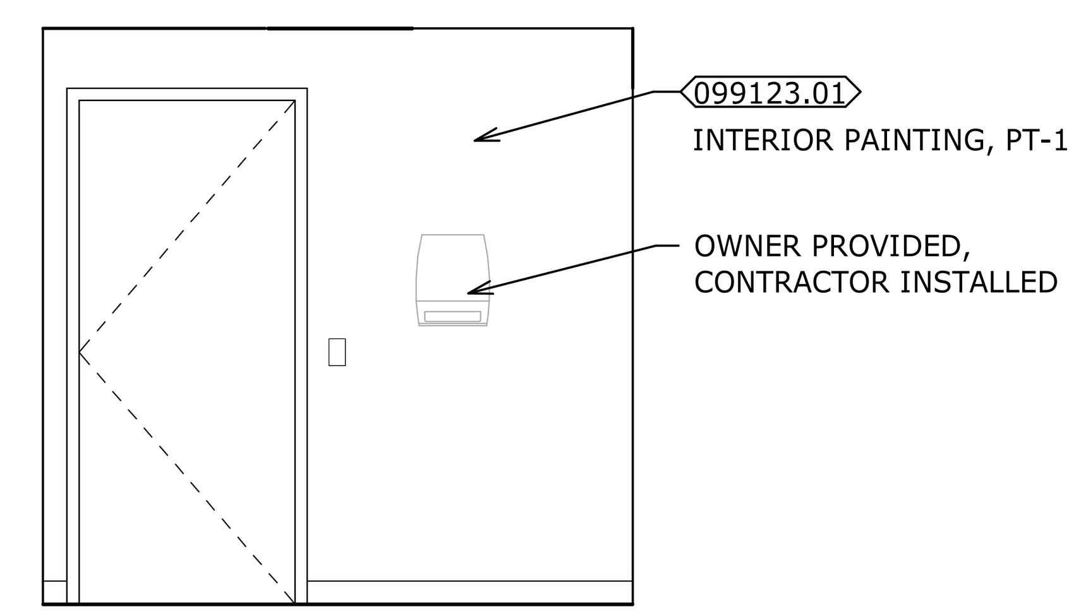
02 RESTROOM W ELEVATION
A520 3/8" = 1'-0"



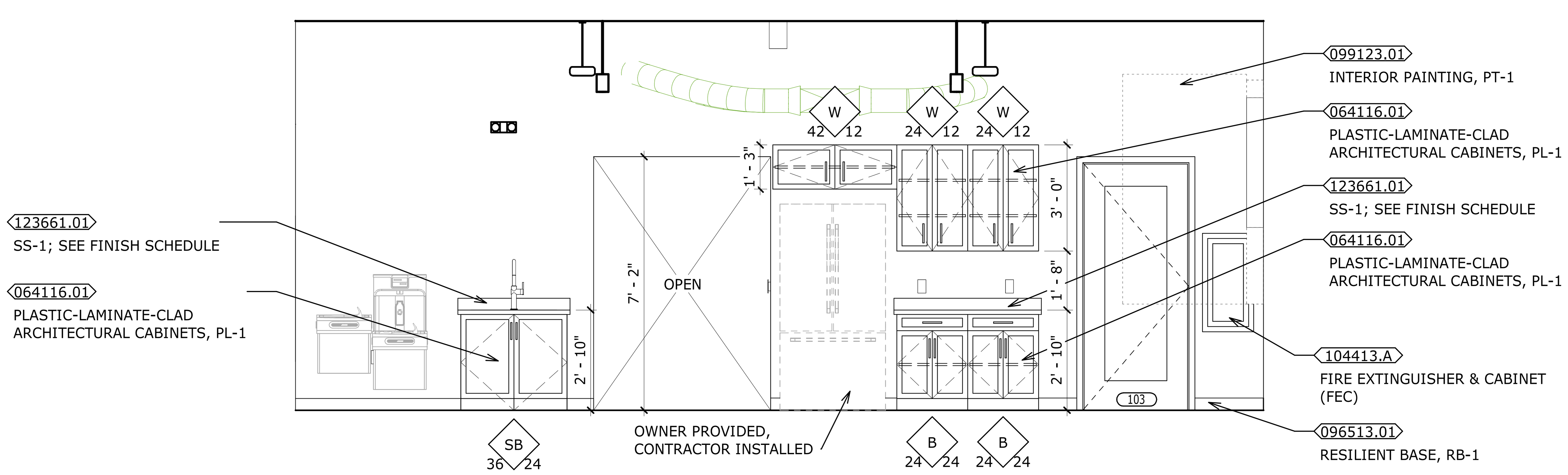
03 RESTROOM N ELEVATION
A520 3/8" = 1'-0"



04 RESTROOM E ELEVATION
A520 3/8" = 1'-0"



05 RESTROOM S ELEVATION
A520 3/8" = 1'-0"



06 OPEN OFFICE E ELEVATION
A520 3/8" = 1'-0"

KEYNOTES

064116.01	PLASTIC-LAMINATE-CLAD ARCHITECTURAL CABINETS, PL-1
096513.01	RESILIENT BASE, RB-1
099123.01	INTERIOR PAINTING, PT-1
102800.16	MIRROR UNIT
104413.A	FIRE EXTINGUISHER & CABINET (FEC)
123661.01	SS-1; SEE FINISH SCHEDULE

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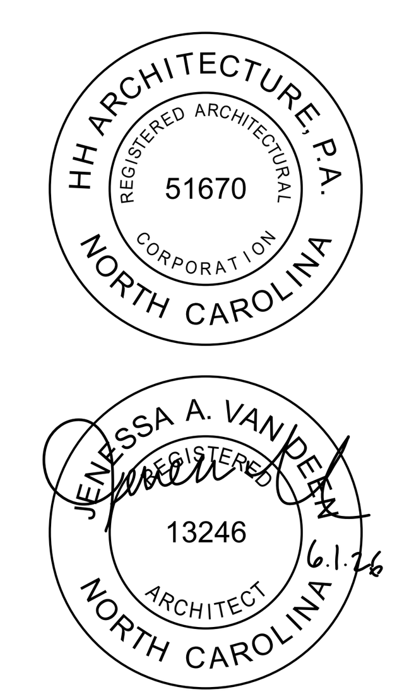

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SHEET
ENLARGED PLAN & ELEVATIONS

A520

FINISH SCHEDULE

ROOM NO.	ROOM NAME	BASE	FLOOR	WALLS				CEILING	COMMENTS
				NORTH	EAST	SOUTH	WEST		
101	OFFICE	EXIST	EXIST	PT-1	PT-1	PT-1	PT-1	EXIST	
102	OFFICE	RB-1	SC-1	PT-1	PT-1	PT-1	PT-1	ACP-1	
103	OFFICE	RB-1	SC-1	PT-1	PT-1	PT-1	PT-1	EXIST	
104	WORK AREA	RB-1	SC-1	PT-1	PT-1	PT-1	PT-1	PT-2	
105	WORK AREA	RB-1	SC-1	PT-1	PT-1	PT-1	PT-1	PT-2	
106	RESTROOM	RB-1	SC-1	PT-1	PT-1	PT-1	PT-1	ACP-1	
107	RESTROOM	RB-1	SC-1	PT-1	PT-1	PT-1	PT-1	ACP-1	
108	CLOSET	RB-1	SC-1	PT-1	PT-1	PT-1	PT-1	PT-2	

FINISH LEGEND

FLOORS

	BASIS OF DESIGN:	
099123.04	MANUFACTURER	SEE SPECIFICATION
SC-1 SEALED CONCRETE	COLOR	SW 7673 PEWTER CAST

BASE

	BASIS OF DESIGN:		EQUAL 1:	EQUAL 2:
096513	MANUFACTURER	JOHNSONITE	ROPPE	ALLSTATE
RB-1 RUBBER BASE	COLOR	29 MOON ROCK	114 LUNAR DUST	D49

CEILINGS

095113.01	MANUFACTURER	ARMSTRONG	CERTAINTEED	USG
APC-1 ACOUSTICAL PANEL CEILINGS	STYLE	MATCH EXISTING	MATCH EXISTING	MATCH EXISTING
	COLOR	WHITE (WH)	WHITE	WHITE
	SIZE	24" x 24"	24" x 24"	24" x 24"

MILLWORK

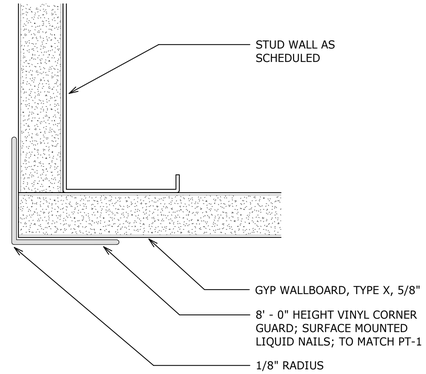
064116.01	MANUFACTURER	WILSONART	ARBORITE	FORMICA
PL-1 PLASTIC LAMINATE	COLOR	SKYLINE WALNUT	W484 CW	BLACK RIFTWOOD
	SHEEN	SOFTGRAIN	SOFTGRAIN	NATURAL GRAIN
123661.16	MANUFACTURER	WILSONART	CORIAN	MEGANITE
SS-1 SOLID SURFACE COUNTERTOP	COLOR	ANGEL FALLS	ARROWROOT	STORM CLOUD
	SHEEN	STANDARD	STANDARD	STANDARD

INTERIOR PAINTING (ALL WALLS TO RECEIVE PT-1, U.N.O.)

099123.01	MANUFACTURER	SHERWIN WILLIAMS	BENJAMIN MOORE	PPG
PT-1 (FIELD)	COLOR	SW 7647 CRUSHED ICE	859 COLLINGWOOD	PPG1025-3
	SHEEN	EGGSHELL	EGGSHELL	EGGSHELL
099123.02	MANUFACTURER	SHERWIN WILLIAMS	BENJAMIN MOORE	PPG
PT-2 CEILINGS	COLOR	SW 7007 CEILING BRIGHT WHITE	873 BABYS BREATH	PPG1011-1
	SHEEN	EGGSHELL	EGGSHELL	EGGSHELL
099123.03	MANUFACTURER	SHERWIN WILLIAMS	BENJAMIN MOORE	PPG
PT-3 (FRAMES, U.N.O.)	COLOR	SW 7019 GAUNTLET GRAY	CSP-200 QUICKSAND	PPG1019-4
	SHEEN	SEMI-GLOSS	SEMI-GLOSS	SEMI-GLOSS

MISC

102600	MANUFACTURER	INPRO	ACCULINE	ACROVYN
CG-1 CORNER GUARDS	COLOR	MATCH PT-1	MATCH PT-1	MATCH PT-1
	SIZE	8' - 0"	8' - 0"	8' - 0"



01 ID001 TYP. SURFACE MOUNTED ALUMINUM CORNER GUARD
12" = 1'-0"

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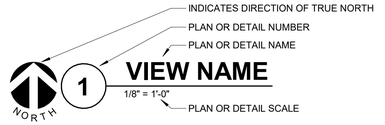
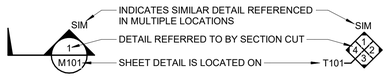
ID001

VIEW KEY

NAME — LEVEL NAME
10'-0" — HEIGHT ABOVE PROJECT 0'-0"

1 — KEYNOTE: INDICATES NOTE USED TO DESCRIBE ADDITIONAL INFORMATION ABOUT WORK REQUIRED, SPECIFIC TO THE SHEET AND/OR DETAIL





LINE TYPE AND TAG KEY:

NEW WORK BY THIS CONTRACTOR (WIDE LINE)
——— NEW
- - - - - - - - EXISTING TO BE REMOVED (SHORT DASHED PATTERN)
— — — — NEW UNDERFLOOR OR UNDERGROUND (LONG DASHED PATTERN)

EXISTING TO REMAIN OR WORK BY OTHERS (NARROW LINE)
——— EXISTING
- - - - - - - - EXISTING TO BE REMOVED BY OTHERS (SHORT DASHED PATTERN)
— — — — EXISTING UNDERFLOOR OR UNDERGROUND (LONG DASHED PATTERN)

HALFTONING DOES NOT MODIFY SCOPE.

'TAG'-E — TAGS WITH DASH 'E' INDICATES THE REFERENCED OBJECT IS EXISTING

TAG-1 — UNDERLINED TAG INDICATES OBJECT IS IN-SCOPE. IF NEW, ADDITIONAL INFORMATION IS AVAILABLE IN A SCHEDULE, MATERIAL LIST, OR SYMBOL LIST

INDICATES AN EXISTING SYSTEM'S POINT OF CONNECTION/REMOVAL

APPLICABLE CODES

CONTRACTOR SHALL COMPLY WITH APPLICABLE CODES AND LOCAL AMENDMENTS INCLUDING, BUT NOT LIMITED TO, THE FOLLOWING:

ENERGY CONSERVATION CODE:	NCECC 2018
MECHANICAL CODE:	NCMC 2018
PLUMBING CODE:	NCPC 2018
ELECTRICAL CODE:	NEC 2020

CONTRACTOR ABBREVIATION KEY

ABBR:	DESCRIPTION:
E	EXISTING
E.C.	ELECTRICAL CONTRACTOR
G.C.	GENERAL CONTRACTOR
M.C.	MECHANICAL CONTRACTOR
P.C.	PLUMBING CONTRACTOR

PLUMBING ABBREVIATION KEY

ABBR:	DESCRIPTION:
AD	ACCESS DOOR
AFF	ABOVE FINISHED FLOOR
BFP	BACKFLOW PREVENTER
BT	BATHTUB
CB	CATCH BASIN
CI	CAST IRON
CO	CLEANOUT
CS	CLINICAL SINK
DB	DIALYSIS BOX
DF	DRINKING FOUNTAIN
DI	DUCTILE IRON
DN	DOWN
E	EXISTING
EE	EMERGENCY EYEWASH
ES	EMERGENCY SHOWER
ESE	EMERGENCY SHOWER/EYEWASH
EWC	ELECTRIC WATER COOLER
FCO	FLOOR CLEANOUT
FD	FLOOR DRAIN
FM	FLOW METER
FS	FLOOR SINK
GD	GARBAGE DISPOSER
GI	GREASE INTERCEPTOR
HB	HOSE BIBB
I.E.	INVERT ELEVATION (FOR REFERENCE ONLY)
L or LAV	LAVATORY
MB	MOP BASIN
MH	MANHOLE
MV	MIXING VALVE
NIC	NOT IN CONTRACT
NT	NEUTRALIZATION TANK
OS	OIL SEPARATOR
RD	ROOF DRAIN
SCCR	SHORT CIRCUIT CURRENT RATING
SH	SHOWER
SK	SINK
SS	SERVICE SINK
TD	TRENCH DRAIN
TP	TRAP PRIMER
TYP	TYPICAL
UR	URINAL
VTR	VENT THROUGH ROOF
WC	WATER CLOSET
WCO	WALL CLEANOUT
WF	WASH FOUNTAIN
WH	WATER HEATER
WMF	WASHING MACHINE FIXTURE
WM	WATER METER
WS	WATER SOFTENER
UB	UTILITY BOX
UON	UNLESS OTHERWISE NOTED
YCO	YARD CLEANOUT

SYMBOL LIST - PIPE ACCESSORIES

SYMBOL	DESCRIPTION
—o —o	PIPE DOWN AND PIPE UP / UP AND DOWN
▯	REDUCER
⋈	SHUTOFF VALVE

SYMBOL LIST - PLUMBING SYSTEMS

SYMBOL	DESCRIPTION
CW	COLD WATER - POTABLE
G	NATURAL GAS
HW	HOT WATER - POTABLE
HWC	HOT WATER CIRCULATING - POTABLE
SAN	SANITARY DRAINAGE
V	VENT

PLUMBING SLOPE REQUIREMENTS:

BASED ON PLUMBING CODE: NCPC-2018

INTERIOR:	
SANITARY WASTE:	1/8" PER FOOT
GREASE WASTE:	1/8" PER FOOT
STORM (GRAVITY):	1/8" PER FOOT
CONDENSATE AND INDIRECT DRAINAGE:	1/8" PER FOOT
SANITARY AND GREASE VENT:	NO SPECIFIC PITCH, PITCH TO FIXTURES
DOMESTIC WATER:	NO SPECIFIC PITCH, PITCH TO FIXTURES

PLUMBING SHEET INDEX

PLUMBING FIXTURE UNIT SCHEDULE

TAG NAME	DESCRIPTION	COLD WATER		HOT WATER		SUPPLY WATER		DRAINAGE	
		EA.	TOTAL	EA.	TOTAL	EA.	TOTAL	EA.	TOTAL
HB-1	HOSE BIBB - INTERIOR	0	0	0	0	0	0	0	0
L-1	LAVATORY (ACCESSIBLE)	1.5	3	1.5	3	2	4	1	2
SK-1	SINK (ACCESSIBLE)	1.5	1.5	0	0	2	2	2	2
UB-1	UTILITY BOX (COLD WATER)	0	0		0	0	0		0
WC-1	WATER CLOSET (ACCESSIBLE)	10	20	0	0	10	20	6	12
GRAND TOTALS			24.5		3		26		16

PLUMBING GENERAL NOTES:

1. THE SYMBOLS AND THE MATERIAL LIST ARE FOR THE CONVENIENCE OF THE CONTRACTOR. CONTRACTOR SHALL VERIFY QUANTITIES AND FURNISH ALL MATERIALS REQUIRED FOR FULLY OPERATIONAL SYSTEMS, WHETHER SPECIFIED OR NOT.
2. CATALOG NUMBERS SHALL NOT BE CONSIDERED COMPLETE, BUT ARE GIVEN AS AN AID TO THE CONTRACTOR AND TO INDICATE THE QUALITY REQUIRED. CONTRACTOR IS RESPONSIBLE FOR A COMPLETE DESCRIPTION OF MATERIAL ON THESE DRAWINGS AND IN THE SPECIFICATIONS BEFORE ORDERING. THE DESCRIPTION OF THE MATERIAL TAKES PRECEDENCE OVER THE CATALOG NUMBER. THE FIRST MANUFACTURER LISTED IS THE BASIS OF DESIGN.
3. CONTRACTOR SHALL VERIFY THAT FIXTURES SUPPLIED ARE APPROVED PER ALL APPLICABLE STATE, LOCAL AND GOVERNING AUTHORITIES.
4. ALL FIXTURES SHALL CONFORM TO FEDERAL ACT S.3874
5. INVERT ELEVATIONS ARE FROM EXISTING DRAWINGS AND MAY NOT BE ACCURATE. VERIFY ALL ELEVATIONS BEFORE BEGINNING WORK.
6. VERIFY UNDERGROUND PIPE SIZES, INVERT ELEVATIONS, AND LOCATIONS PRIOR TO BEGINNING ANY WORK.
7. REFER TO THE PLUMBING ROUGH-IN SCHEDULE FOR THE SIZES OF BRANCH PIPES TO PLUMBING FIXTURES.
8. EXISTING CONDITIONS ON DEMOLITION PLANS ARE PROVIDED TO INDICATE THE GENERAL SCOPE OF ITEMS TO BE REMOVED. REFER TO SPECIFICATION SECTION 22 05 05 FOR ADDITIONAL DEMOLITION INFORMATION.
9. P.C. SHALL CUT AND PATCH EXISTING AS REQUIRED FOR NEW OR DEMOLITION WORK UNLESS NOTED OTHERWISE. REFER TO SPECIFICATION SECTION 22 05 05 FOR ADDITIONAL INFORMATION.

PLUMBING ROUGH-IN SCHEDULE

NOTES: (APPLIES TO ALL PLUMBING FIXTURES LISTED BELOW)
1) SIZES SHOWN ARE MINIMUMS. LARGER SIZES SHOWN ON THE DRAWING SHALL DICTATE THE ROUGH-IN SIZE. 2) SANITARY RISERS UP IN WALL TO FIXTURES SHALL BE A MINUMUM OF 2". 3) DOMESTIC WATER BRANCH PIPING OUTSIDE OF THE WALL/CHASE SHALL BE A MINIMUM OF 3/4" UNLESS NOTED OTHERWISE. ONLY THE FINAL RISE-DROP SHALL BE SMALLER. 4) FINAL SANITARY SIZE SHALL MATCH P-TRAP SIZE (REFER TO MATERIAL LIST).

TAG NAME	DESCRIPTION	CW	HW	SAN	VENT
L-1	LAVATORY (ACCESSIBLE)	1/2"	1/2"	1 1/2"	1 1/2"
SK-1	SINK (ACCESSIBLE)	1/2"	1/2"	1 1/2"	1 1/2"
UB-1	UTILITY BOX (COLD WATER)	1/2"	-	-	-
WC-1	WATER CLOSET (ACCESSIBLE)	1/2"	-	4"	2"

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www.imegcorp.com
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P: 919.571.1111

0 1 2 3
REF. SCALE IN INCHES
PROJECT #25007050.00

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DIX PARK - 1105 WAREHOUSE DRIVE
RENOVATION
CITY OF RALEIGH
1105 WAREHOUSE DRIVE
RALEIGH, NC 27603

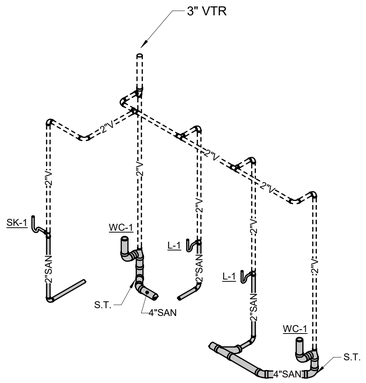
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 049754 JARRISON HOY IMEG CONSULTANTS CORP. No. P-1507
06/02/2026

NO.	REVISION	DATE

JOB NUMBER
23-022
DATE ISSUED
06/01/2026
PROJECT STATUS
CONSTRUCTION DOCUMENTS
SHEET
PLUMBING COVERSHEET

P000

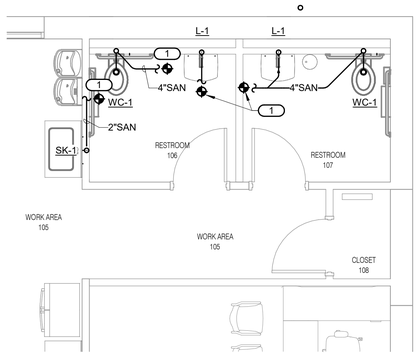
Plot Time: 6/1/2026 2:25:19 PM



1 WASTE RISER

RENOVATION KEYNOTES:

1. CONNECT TO EXISTING SANITARY SEWER PIPING LOCATED BELOW FINISHED FLOOR. IT IS THE PLUMBING CONTRACTOR'S RESPONSIBILITY TO FIELD VERIFY THE EXACT LOCATION AND INVERT ELEVATION OF THE EXISTING WASTE LINE AND MAKE NECESSARY CONNECTIONS.

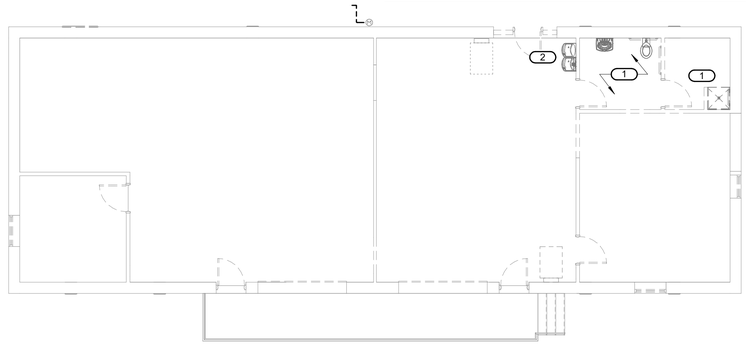


2 ENLARGED UNDERFLOOR PLAN

1/4" = 1'-0"

DEMOLITION KEY NOTES:

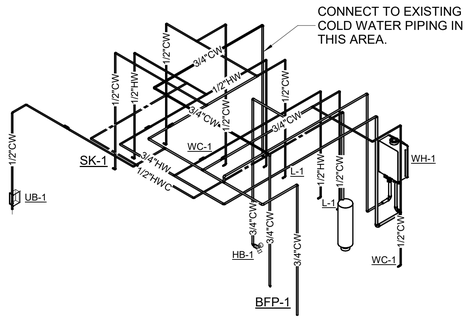
1. **REMOVE PLUMBING FIXTURE AND APPURTENANCES IN THIS AREA. CAP ALL RELATED WATER, WASTE, AND VENT PIPING ABOVE FINISHED CEILING, IN WALL, AND/OR BELOW FINISHED FLOOR AS REQUIRED. REMOVE ALL COLD/HOT WATER PIPING BACK TO POINT OF ENTRY TO THE BUILDING.**
2. EXISTING PLUMBING FIXTURE TO REMAIN.



NORTH

3 PLUMBING DEMOLITION PLAN

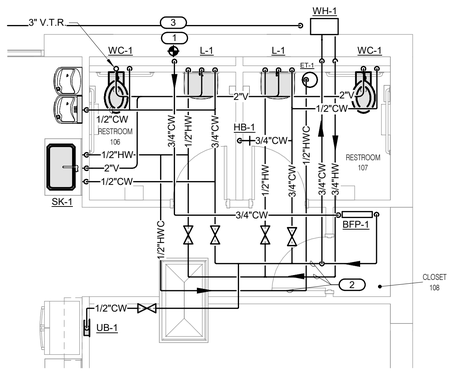
1/8" = 1'-0"



4 DOMESTIC WATER RISER

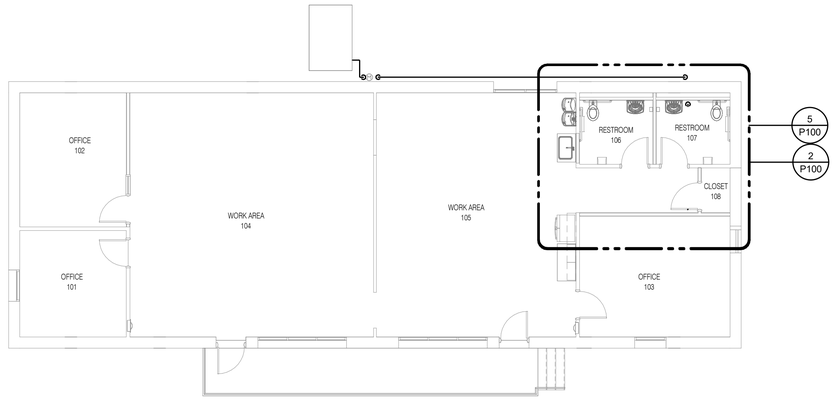
RENOVATION KEY NOTES:

1. CONNECT TO EXISTING COLD WATER PIPING IN THIS AREA. IT IS THE PLUMBING CONTRACTOR'S RESPONSIBILITY TO FIELD VERIFY THE EXACT LOCATION OF THE EXISTING WATER LINE AND MAKE CONNECTION AS REQUIRED.
2. WATER PIPING ABOVE FINISHED CEILING. COORDINATE LOCATION WITH MECHANICAL AND ELECTRICAL CONTRACTOR'S.
3. PROVIDE MAIN SHUT OFF WITH ACCESS PANEL.



5 ENLARGED PLUMBING PLAN

1/4" = 1'-0"



NORTH

6 PLUMBING RENOVATION PLAN

1/8" = 1'-0"

0 1 2 3
REF. SCALE IN INCHES
PROJECT #25007050.00

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DIX PARK - 1105 WAREHOUSE DRIVE RENOVATION

CITY OF RALEIGH
1105 WAREHOUSE DRIVE
RALEIGH, NC 27603

NORTH CAROLINA PROFESSIONAL ENGINEER CORPORATE SEAL
IMEG CONSULTANTS CORP.
No. F-1507
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL
049754
ENGINEER
J. HARRISON MEEK
06/02/2026

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SHEET
PLUMBING PLAN

P100

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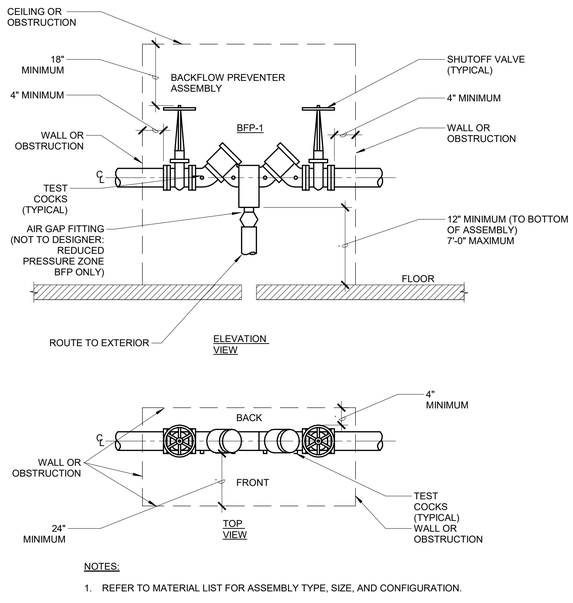
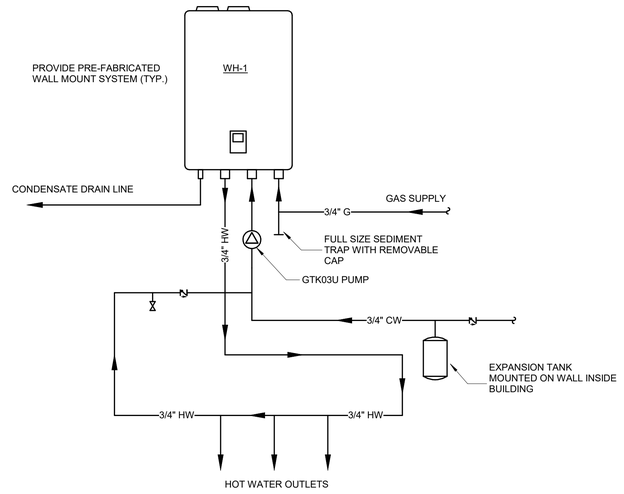


NOTES:

1. REFER TO MATERIAL LIST FOR ASSEMBLY TYPE, SIZE, AND CONFIGURATION.

1 BACKFLOW PREVENTER DETAIL

NO SCALE



2 WATER HEATER - GAS INSTANTANEOUS W/HWC - WALL MOUNTED

NO SCALE

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PLUMBING DETAILS

P200

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PLUMBING MATERIAL LIST

TAG NAME	DESCRIPTION	MANUFACTURER AND MODEL
BFP-1	BACK FLOW PREVENTER - REDUCED PRESSURE ZONE, LEAD FREE BRONZE CONSTRUCTION, SIZE SAME AS PIPE 3/4", NON-CORROSIVE INTERNAL PARTS, STAINLESS STEEL SPRINGS, DIFFERENTIAL PRESSURE RELIEF VALVE BETWEEN SPRING-LOADED CHECK VALVES, BALL STYLE SHUT-OFF VALVES ON INLET AND OUTLET OF UNIT, AIR GAP DRAIN FITTING, TEST PORTS WITH SHUT-OFF VALVES, RATED FOR 175 PSI AT 33°F TO 140°F, 15 PSI (MAXIMUM) PRESSURE DROP AT 10 FPS, FACTORY TESTED, ALL PARTS TO BE SERVICEABLE WITHOUT REMOVING UNIT FROM LINE, APPROVED BY USC FCCC & HR, AWWA C511-92, ASSE 1013, IAPMO AND SBCCI LISTED. MOUNT WITHIN 60" OF FINISHED FLOOR. ROUTE DRAIN PIPE FROM AIR GAP FITTING TO FLOOR DRAIN. PROVIDE AND INSTALL BRONZE OR EPOXY COATED STRAINER UPSTREAM OF EACH UNIT AND ADDITIONAL VALVE UPSTREAM OF EACH STRAINER. FLOW PRESSURE DROP CURVES SHALL BE SUBMITTED.	APOLLO (RPLF4A), WATTS (LF919), ZURN WILKINS (975XL2)
HB-1	HOSE BIBB - FOR INDOOR USE, BRASS CONSTRUCTION, POLISHED CHROME-PLATED FINISH, VACUUM BREAKER, 3/4" MALE HOSE THREAD, 3/4" FLANGED I.P.S. INLET, REMOVABLE TEE HANDLE, ASSE 1011 LISTED AND APPROVED. MOUNT AT 18" ABOVE FINISHED FLOOR UNLESS NOTED OTHERWISE ON DRAWINGS.	PRIER (C-255CP.75), CHICAGO FAUCET (952), ACORN (8121CP-LF), T&S BRASS (B-0720), MIFAB (MHY-9241)
L-1	LAVATORY - ACCESSIBLE, WALL MOUNTED, WHITE VITREOUS CHINA, 23"x21", SINGLE FAUCET HOLE, DRILLED FOR CONCEALED ARM CARRIER, VITREOUS CHINA HALF PEDESTAL (SHROUD ENCLOSURE TO HIDE WASTE AND SUPPLY LINES). LAVATORY TRIM - SINGLE HANDLE MIXING FAUCET, BRASS CONSTRUCTION, CHROME-PLATED FINISH, CONVENTIONAL SPOUT WITH SPRAY PATTERN OUTLET, WASHERLESS PUSH-PULL LEVER HANDLE WITH SUPPLIES AT 4" CENTERS, CERAMIC DISC CARTRIDGE, PERFORATED GRID STRAINER WITH 1-1/4" 17 GAUGE TAILPIECE. MAXIMUM FLOW TO BE 0.5 GPM IN COMPLIANCE WITH ENERGY POLICY ACT OF 2005 AND ASME/ANSI STANDARD A112.18.1M. FAUCET SHALL COMPLY WITH FEDERAL ACT S.3874. PROVIDE RESTRICTIVE DEVICE AS REQUIRED.	LAVATORY - ZURN (Z5321-PED), AMERICAN STANDARD (0955001EC, 0059020EC), KOHLER (K-1999-1), SLOAN (SS-3165, SS-27) LAVATORY TRIM - DELTA (22C131), AMERICAN STANDARD (7385), CHICAGO FAUCET (420), KOHLER (K-15597), MOEN (8413), SPEAKMAN (S-3561), SYMMONS (S-20), T&S BRASS (B-2711-VF05), ZURN (Z7440-XL)
SK-1	SINK - ACCESSIBLE, UNDERMOUNT, SINGLE COMPARTMENT, 18 GAUGE TYPE 304 STAINLESS STEEL, 23-1/2" (SIDE-TO-SIDE) x 18-1/4" (FRONT-TO-BACK) OVERALL SIZE, 23-1/2" x 18-1/4" x 4-3/8" DEEP BOWL. COMPLETELY UNDERCOATED, 3-1/2" DIAMETER DRAIN OUTLET LOCATION CENTERED IN BOWL, PERFORATED TYPE 304 STAINLESS STEEL GRID STRAINER. SINK TRIM - SINGLE HANDLE MIXING FAUCET, BRASS CONSTRUCTION, CHROME-PLATED FINISH, NOMINAL 10" HIGH-RISE SWING SPOUT, CERAMIC CARTRIDGE, NOMINAL 8" REACH, PULL DOWN SPRAY HOSE WITH AERATOR STREAM / SPRAY SELECTOR, LEVER HANDLE. MAXIMUM FLOW TO BE 2.2 GPM IN COMPLIANCE WITH ENERGY POLICY ACT OF 2005 AND ASME/ANSI STANDARD A112.18.1M. FAUCET SHALL COMPLY WITH FEDERAL ACT S.3874. PROVIDE RESTRICTIVE DEVICE AND ESCUTCHEON PLATE AS REQUIRED.	SINK - ELKAY (ELUHAD211545PD), JUST (NSFB124-J), ULINE(H-10304) SINK TRIM - DELTA (9178-DST), AMERICAN STANDARD (4285.300), CHICAGO FAUCET (434-ABCP), ELKAY (LK6000), KOHLER (K-597-CP), GERBER (D454058), MOEN (7594C), SYMMONS (S-2302-PD)
UB-1	UTILITY BOX - UNPAINTED GALVANIZED STEEL OR WHITE PAINTED STEEL ENCLOSURE, MATCHING FACEPLATE, ANGLE VALVE WITH 1/4" COMPRESSION OUTLET, INTREGAL WATER HAMMER ARRESTOR. PROVIDE A 6 FOOT STAINLESS STEEL FLEXIBLE HOSE FOR CONNECTION TO EQUIPMENT.	GUY GRAY (BIM875AB), OATEY (39140 WITH 38686 FACEPLATE)
WC-1	WATER CLOSET - ACCESSIBLE, FLOOR MOUNTED, TANK TYPE, WHITE VITREOUS CHINA, CLOSE COUPLED, SIPHON JET, ELONGATED BOWL, BOLT CAPS, 12" ROUGH-IN, FLOAT VALVE WITH VACUUM BREAKER, CHROME-PLATED TRIP LEVER, 1.6 GALLONS PER FLUSH (MAXIMUM). SEAT - WHITE, EXTRA HEAVY, OPEN FRONT, INJECTION MOLDED SOLID PLASTIC, SELF-SUSTAINING HINGE, STAINLESS STEEL OR PLATED STEEL POSTS AND NUTS. ACCESSORIES - QUARTER-TURN 3/8" CHROME-PLATED HEAVY BRASS ANGLE SUPPLY WITH LOOSE-KEY STOP, CHROME-PLATED SOFT COPPER SUPPLY LINE. TOP OF SEAT SHALL BE AT 17"-19" ABOVE FINISHED FLOOR. FLUSH HANDLE SHALL BE LOCATED ON THE WIDE SIDE OF THE TOILET STALL AND OPERATE WITH NO GREATER THAN 5 LB FORCE IN COMPLIANCE WITH LATEST ADA STANDARDS. VERIFY EQUIPMENT REQUIREMENTS AND ROUGH-IN LOCATIONS.	WATER CLOSET - [ZURN (Z5555-K), CRANE (3814), KOHLER (K-3979), ELJER (091-2175), GERBER (21-718), TOTO (CST744SL), NIAGARA PRO (C11.300.01 or C11.301.01)] SEAT - [BEMIS (1655SSCT), CHURCH (9500C), BENEKE (533), KOHLER (K-4666-C), OLSONITE (95), CENTOCO (550STSCCSS-001), SAME AS WATER CLOSET MANUFACTURER]

PLUMBING (WITH POWER) MATERIAL LIST

		ELECTRICAL																	
				TOTAL (QTY*KW)											DISCONNECT		CONTROLLER /STARTER		
TAG NAME	DESCRIPTION	WATTS	# OF STAGES	QTY	KW	HP (NOTE E)	FLA	MCA	MOCP	VOLTAGE	PHASES	SCCR	# OF WIRES	BY (NOTE A)	TYPE (NOTE B)	BY (NOTE A)	TYPE (NOTE C)	EMERGENCY POWER	MANUFACTURER AND MODEL
WH-1	WATER HEATER - GAS FIRED, CONDENSING, WALL MOUNTED, INSTANTANEOUS, MINIMUM 94% EFFICIENT, SEALED COMBUSTION, METAL CABINET, BAKED ENAMEL FINISH, 160 PSI WORKING PRESSURE, FIBERGLASS OR FOAM INSULATION, BRASS WATER CONNECTIONS AND DRAIN VALVE, ASME APPROVED T&P RELIEF VALVE, VENT PIPING KIT, HIGH TEMPERATURE GAS SHUT OFF, AUTOMATIC WATER THERMOSTAT, BUILT-IN GAS REGULATING VALVE, ADJUSTABLE TEMPERATURE RANGE, 3-YEAR WARRANTY, UL LISTED, COMPLIANT TO NAECA, ASHRAE 90.1 AND ASHRAE 90A. PROVIDE WITH INTERNAL RECIRCULATING PUMP MODEL RINNAI CIRC-LOGIC WITH GRUNDFOS GTK15 KIT. PROVIDE WITH HEATING CABINET ENCLOSURE SYSTEM. 3.0 GPM AT 100°F TEMPERATURE RISE HEATING CAPACITY, 150,000 BTUH INPUT NATURAL GAS. TURN ON AT 0.5 GPM OR LESS ELECTRICAL REQUIREMENTS - HARD-WIRED. SET WATER TEMPERATURE AT 110°F. SET SUPPLY GAS PRESSURE AT 7" W.C. CONDENSATE DRAIN NEUTRALIZATION KIT - RATED FOR MAXIMUM 250 MBH WATER HEATER AND 1.9 GPH CONDENSATE FLOW, WALL MOUNT BRACKET, POLYPROPYLENE REMOVABLE SCREW TYPE HOUSING, 3/4"FNPT INLET AND OUTLET, REPLACABLE PH NEUTRALIZING PELLET CARTRIDGE. COLD WEATHER KIT TO BE PROVIDED.	0	0	0	0.075	0	4	0	0	120	1	0	0	EC	NF	0	0	No	WATER HEATER - [RINNAE (RUC80i), RHEEM (RTGH-84DVLN), NAVIEN (NPE-180), A.O. SMITH (ATI-240), STATE (GTS-240-NIH)] NEUTRALIZATION KIT - JJM BOILER WORKS (JM-3), NUTRASAFE (CN2-220)

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SHEET
PLUMBING SCHEDULES

P300

Plot Time: 6/1/2026 2:25:23 PM

SECTION 22 05 00 - BASIC PLUMBING REQUIREMENTS

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Requirements applicable to all Division 22 Sections. Also refer to Division 1 - General Requirements.

B. All materials and installation methods shall conform to the applicable standards, guidelines and codes referenced herein and within each specification section.

1.2 SCOPE OF WORK

A. This Specification and the associated drawings govern the furnishing, installing, testing and placing into satisfactory operation the Mechanical Systems.

B. Each Contractor shall provide all new materials indicated on the drawings and/or in these specifications, and all items required to make the portion of the Mechanical Work a finished and working system.

1.3 DIVISION OF WORK BETWEEN MECHANICAL, ELECTRICAL & CONTROL CONTRACTORS

A. General contractor shall be responsible for coordination between subcontractors.

B. Mechanical, electrical and control subcontractors shall work cooperatively to insure all mechanical equipment is powered and operates according to sequence of operation identified on the drawings.

1.4 CONTRACTOR COORDINATION

Definitions: Contractor Coordination: A compilation of the pertinent layout and system drawings that show the sizes and locations, including elevations, of system components and required access areas to ensure that no two objects will occupy the same space.

A. Coordination drawings are not shop drawings and shall not be submitted as such.

B. The contract drawings are schematic in nature and do not show every fitting and appurtenance for each utility. Each contractor is expected to have included in the bid sufficient fittings, material, and labor to allow for adjustments in routing of utilities made necessary by the coordination process and to provide a complete and functional system.

C. The contractors will not be allowed additional costs or time extensions due to participation in the coordination process.

D. The contractors will not be allowed additional costs or time extensions for additional fittings, reroutings or changes of duct size, that are essentially equivalent sizes to those shown on the drawings and determined necessary through the coordination process.

1.5 QUALITY ASSURANCE

A. Contractor's Responsibility Prior to Submitting Pricing Data:

1. The Contractor is responsible for constructing complete and operating systems. The Contractor acknowledges and understands that the Contract Documents are a two-dimensional representation of a three-dimensional object, subject to human interpretation. This representation may include imperfect data, interpreted codes, utility guidelines, three-dimensional conflicts, and required field coordination items. Such deficiencies can be corrected when identified prior to ordering material and starting installation. The Contractor agrees to carefully study and compare the individual Contract Documents and report at once in writing to the Design Team any deficiencies the Contractor may discover. The Contractor further agrees to require each subcontractor to likewise study the documents and report at once any deficiencies discovered.

2. The Contractor shall resolve all reported deficiencies with the Architect/Engineer prior to awarding any subcontracts, ordering material, or starting any work with the Contractor's own employees. Any work performed prior to receipt of instructions from the Design Team will be done at the Contractor's risk.

B. Compliance with Codes, Laws, Ordinances:

1. Conform to all requirements of the State of North Carolina Codes, Laws, Ordinances and other regulations having jurisdiction.

2. Conform to Federal Act S.3874 requiring the reduction of lead in drinking water.

3. If there is a discrepancy between the codes and regulations and these specifications, the Architect/Engineer shall determine the method or equipment used.

4. If the Contractor notes, at the time of bidding, that any parts of the drawings or specifications do not comply with the codes or regulations, Contractor shall inform the Architect/Engineer in writing, requesting a clarification. If there is insufficient time for this procedure, Contractor shall submit with the proposal a separate price to make the system comply with the codes and regulations.

5. All changes to the system made after letting of the contract, to comply with codes or requirements of Inspectors, shall be made by the Contractor without cost to the Owner.

6. If there is a discrepancy between manufacturer's recommendations and these specifications, the manufacturer's recommendations shall govern.

C. Permits, Fees, Taxes, Inspections:

1. Procure all applicable permits and licenses.

D. Examination of Drawings:

1. The drawings for the plumbing work are completely diagrammatic, intended to convey the scope of the work and to indicate the general arrangements and locations of equipment, outlets, etc., and the approximate sizes of equipment.

2. Contractor shall determine the exact locations of equipment and rough-ins, and the exact routing of pipes and ducts to best fit the layout of the job.

3. Scaling of the drawings is not sufficient or accurate for determining these locations.

4. Where job conditions require reasonable changes in indicated arrangements and locations, such changes shall be made by the Contractor at no additional cost to the Owner.

5. Because of the scale of the drawings, certain basic items, such as fittings, boxes, valves, unions, etc., may not be shown, but where required by other sections of the specifications or required for proper installation of the work, such items shall be furnished and installed.

6. If an item is either on the drawings or in the specifications, it shall be included in this contract.

7. Determination of quantities of material and equipment required shall be made by the Contractor from the documents. Where discrepancies arise between drawings, schedules and/or specifications, the greater number shall govern.

8. Where used in mechanical documents, the word "furnish" shall mean supply for use, the word "install" shall mean connect complete and ready for operation, and the word "provide" shall mean to supply for use and connect complete and ready for operation.

a. Any item listed as furnished shall also be installed, unless otherwise noted.

b. Any item listed as installed shall also be furnished, unless otherwise noted.

E. Field Measurements:

1. Verify all pertinent dimensions at the job site before ordering any materials or fabricating any supports, pipes or ducts.

1.6 SUBMITTALS

A. Submittals shall be provided as described in Architect's specifications. Submittals shall be required for the following items, and for additional items where required elsewhere in the specifications or on the drawings.

1. Submittals List:

Referenced Specification Section	Submittal Item
22 05 29	PLUMBING SUPPORTS AND ANCHORS
22 05 53	PLUMBING IDENTIFICATION
22 07 19	PLUMBING PIPING INSULATION
22 10 00	PLUMBING PIPING
22 10 30	PLUMBING SPECIALTIES
22 40 00	PLUMBING FIXTURES

B. General Submittal Procedures: Refer to the provisions of Division 1.

1.7 PRODUCT DELIVERY, STORAGE, HANDLING & MAINTENANCE

A. Equipment and components that are visibly damaged or have been subject to environmental conditions prior to building turnover to Owner that could shorten the life of the component (for example, water damage, humidity, dust and debris, excessive hot or cold storage location, etc.) shall be repaired or replaced with new equipment or components without additional cost to the building owner.

B. Contractor is responsible for moving equipment into the building and/or site. Contractor shall review site prior to bid for path locations and any required building modifications to allow movement of equipment. Contractor shall coordinate the work with other trades.

1.8 MATERIAL SUBSTITUTION

A. The first manufacturer is the basis for job design and establishes the quality.

B. Equivalent equipment manufactured by the other listed manufacturers may be used. Contractor shall ensure that all items submitted by these other manufacturers meet all requirements of the drawings and specifications and fits in the allocated space. When using other listed manufacturers, the Contractor shall assume responsibility for any and all modifications necessary (including, but not limited to structural supports, electrical connections, piping and ductwork connections and arrangement, plumbing connections and rough-in, and regulatory agency approval, etc.) and coordinate such with other contractors.

C. Any material, article or equipment of other unnamed manufacturers which will adequately perform the services and duties imposed by the design and is of a quality equal to or better than the material, article or equipment identified by the drawings and specifications may be used if approval is secured in writing from the Architect/Engineer not later than ten days prior to the bid opening.

D. This Contractor assumes all costs incurred as a result of using the offered material, article or equipment, on the Contractor's part or on the part of other Contractors whose work is affected.

E. This Contractor may list voluntary add or deduct prices for alternate materials on the bid form. These items will not be used in determining the low bidder.

F. All material substitutions requested later than ten (10) days prior to bid opening must be listed as voluntary changes on the bid form.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 JOBSITE SAFETY

A. Neither the professional activities of the Architect/Engineer, nor the presence of the Architect/Engineer or the employees and subconsultants at a construction site, shall relieve the Contractor and other entity of their obligations, duties and responsibilities including, but not limited to, construction means, methods, sequence, techniques or procedures necessary for performing, superintending or coordinating all portions of the work of construction in accordance with the contract documents and any health or safety precautions required by any regulatory agencies. The Architect/Engineer and personnel have no authority to exercise any control over any construction contractor or other entity or their employees in connection with their work or any health or safety precautions. The Contractor is solely responsible for jobsite safety. The Architect/Engineer and the Architect/Engineer's consultants shall be indemnified and shall be made additional insureds under the Contractor's general liability insurance policy.

3.2 EXCAVATION, FILL, BACKFILL, COMPACTION

A. General:

1. Prior to the commencement of any excavation or digging, the Contractor shall verify all underground utilities with the regional utility locator. Provide prior notice to the locator before excavations. Contact information for most regional utility locaters can be found at the website (https://call811.com/) or by calling 811.

2. The Contractor shall do all excavating, filling, backfilling and compacting associated with the work.

B. Excavation:

1. Make all excavations to accurate, solid, undisturbed earth, and to proper dimensions.

2. Where excavations are made in error below foundations, concrete of same strength as specified for the foundations or thoroughly compacted sand-gravel fill, as determined by the Architect/Engineer, shall be placed in such excess excavations. Place thoroughly compacted, clean, stable fill in excess excavations under slabs on grade, at the Contractor's expense.

3. Trim bottom and sides of excavations to grades required for foundations.

4. Protect excavations against frost and freezing.

5. Take care in excavating not to damage surrounding structures, equipment, or buried pipe. Do not undermine footing or foundation.

6. Perform all trenching in a manner to prevent cave-ins and risk to workers.

7. Where original surface is pavement or concrete, the surface shall be saw cut to provide clean edges and assist in the surface restoration.

8. Where satisfactory bearing soil for foundations is not found at the indicated levels, the Architect/Engineer or their representative shall be notified immediately, and no further work shall be done until further instructions are given by the Architect/Engineer or their representative.

C. Dewatering:

1. Contractor shall furnish, install, operate, and remove all dewatering pumps and pipes needed to keep trenches and pits free of water.

D. Underground Obstructions:

1. Known underground piping, foundations, and other obstructions in the vicinity of construction are shown on the drawings. Use great care in making installations near underground obstruction.

2. If objects not shown on the drawings are encountered, remove, relocate, or perform extra work as directed by the Architect/Engineer.

E. Fill and Backfilling:

1. Utilities Bedding: Lay underground utilities on minimum of 6" (150 mm) sand bedding or CA6 crushed stone. Compact bedding under utilities smooth, with no sharp edges protruding, to protect the utilities from puncture. Shape bedding to provide continuous support for bells, joints, and barrels of utilities and for joints and fittings.

2. Envelope Around Utilities to 6" (150 mm) Above Utilities: Place sand or CA6 crushed stone or flowable fill to a height of 6" (150 mm) over utilities in 6" (150 mm) layers. After connection joints are made, any misalignment can be corrected by tamping backfill around the utilities.

3. Backfill From 6" (150 mm) Above Utilities to Earthen Grade: Place all backfill materials above the utilities in uniform layers not exceeding 6" (150 mm) deep.

4. Backfill From 6" (150 mm) Above Utilities to Below Slabs or Paved Area: Where the sand or CA6 crushed stone fill and backfill will ultimately be under a building, floor or paving, each layer of backfill materials shall be compacted to 95% of the maximum density determined by AASHTO Designation T 99 or ASTM Designation D 698. Moisture content of soil at time of compaction shall not exceed plus or minus 2% of optimum moisture content determined by AASHTO T 99 or ASTM D 698 test.

5. Backfill Materials:

a. Sand, CA6: Each layer shall be placed, then carefully and uniformly tamped, to eliminate lateral or vertical displacement.

b. Native Soil: Native soil materials may be used as backfill if approved by the Geotechnical Engineer. Native soils shall be free of rock or gravel larger than 3" (75 mm) in any dimension and shall be free of debris, waste, frozen materials, vegetation, high void content, and other deleterious materials. Each layer shall be placed, then carefully and uniformly tamped, to eliminate lateral or vertical displacement.

c. Flowable Fill: Cementitious, self-leveling, self-compacting slurry as defined by the ACI with compressive strength of 50-100psi (0.3-0.7 mpa) at 28 days; consisting of a mixture of fine aggregate or filler, water and cementitious materials. Filler material consist of sand, fly ash, spent foundry sand, quarry fines, baghouse dust. Cementitious materials consist of Portland cement, pozzolanic materials, and self-cementing materials. Flowable fill may be placed in a pour instead of 6" (150 mm) layers noted above.

6. Water shall not be permitted to rise in unbackfilled trenches.

7. Dispose of excess excavated earth as directed.

8. Backfill all trenches and excavations immediately after installing utilities or removal of forms, unless other protection is provided.

9. Around piers and isolated foundations and structures, backfill and fill shall be placed and consolidated simultaneously on all sides to prevent wedge action and displacement. Fill and backfill materials shall be spread in 6 inch (150 mm) uniform horizontal layers with each layer compacted separately to required density.

F. Surface Restoration:

1. Where trenches are cut through existing graded, planted, or landscaped areas, the areas shall be restored to the original condition. Replace all planting removed or damaged to its original condition. A minimum of 6 inches (150 mm) of topsoil shall be applied where disturbed areas are to be seeded or sodded.

2. Concrete or asphalt type pavement, seal coat, rock, gravel or earth surfaces removed or damaged shall be replaced with comparable materials and restored to original condition.

3.3 INSTRUCTING THE OWNER'S REPRESENTATIVES

A. Adequately instruct the Owner's designated representatives in the maintenance, care, and operation of all systems installed under this contract.

3.4 SYSTEM STARTING AND ADJUSTING

A. The plumbing systems shall be complete and operating. System startup, testing, adjusting, and balancing to obtain satisfactory system performance is the responsibility of the Contractor. This includes calibration and adjustments of all controls, noise level adjustments and final adjustments as required.

B. All operating conditions and control sequences shall be tested during the start-up period. Test all interlocks, safety shutdowns, controls, and alarms.

C. The Contractor, subcontractors, and equipment suppliers shall have skilled technicians to ensure that all systems perform properly.

3.5 RECORD DOCUMENTS

A. Maintain at the job site a separate and complete set of plumbing drawings and specifications with all changes made to the systems clearly and permanently marked in complete detail.

3.6 ADJUST AND CLEAN

A. Thoroughly clean all equipment and systems prior to the Owner's final acceptance of the project. Clean all foreign paint, grease, oil, dirt, labels, stickers, and other foreign material from all equipment.

3.7 SPECIAL REQUIREMENTS

A. Contractor shall coordinate the installation of all equipment, valves, dampers, operators, etc., with other trades to maintain clear access area for servicing.

B. All equipment shall be installed in such a way to maximize access to parts needing service or maintenance. Review the final field location, placement, and orientation of equipment with the Owner's designated representative prior to setting equipment.

C. Installation of equipment or devices without regard to coordination of access requirements and confirmation with the Owner's designated representative will result in removal and reinstallation of the equipment at the Contractor's expense.

3.8 IAQ MAINTENANCE FOR OCCUPIED FACILITIES UNDER CONSTRUCTION

A. Contractors shall make all reasonable efforts to prevent construction activities from affecting the air quality of the occupied areas of the building or outdoor areas near the building. These measures shall include, but not be limited to:

1. All contractors shall endeavor to minimize the amount of contaminants generated during construction. Methods to be employed shall include, but not be limited to:

a. Minimizing the amount of dust generated.

b. Reducing solvent fumes and VOC emissions.

c. Maintain good housekeeping practices, including sweeping and periodic dust and debris removal. There should be no visible haze in the air.

d. Protect stored on-site and installed absorptive materials from moisture damage.

2. Request that the Owner designate an IAQ representative.

3. Review and receive approval from the Owner's IAQ representative for all IAQ-related construction activities and negative pressure containment plans.

4. Inform the IAQ representative of all conditions that could adversely impact IAQ, including operations that will produce higher than normal dust production or odors.

5. Schedule activities that may cause IAQ conditions that are not acceptable to the Owner's IAQ representative during unoccupied periods.

6. Request copies of and follow all of the Owner's IAQ and infection control policies.

7. Unless no other access is possible, the entrance to construction site shall not be through the existing facility.

8. To minimize growth of infectious organisms, do not permit damp areas in or near the construction area to remain for over 24 hours.

9. In addition to the criteria above, provide measures as recommended in the SMACNA "IAQ Guidelines for Occupied Buildings Under Construction".

END OF SECTION 22 05 00

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CITY OF RALEIGH

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IMEG CONSULTANTS CORP.
No. F-1507

NORTH CAROLINA PROFESSIONAL SEAL 049754 ENGINEER HARRISON HOLT
06/02/2026

NO.	REVISION	DATE

JOB NUMBER
23-022

DATE ISSUED
06/01/2026

PROJECT STATUS
CONSTRUCTION DOCUMENTS

SHEET
PLUMBING SPECIFICATIONS

Plot Time: 6/1/2026 2:25:23 PM

SECTION 220529 - PLUMBING SUPPORTS AND ANCHORS

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Hangers, Supports, and Associated Anchors.
B. Sleeves and Seals.
C. Flashing and Sealing of Equipment and Pipe Stacks.
D. Cutting of Openings.
E. Escutcheon Plates and Trim.

1.2 WORK FURNISHED BUT INSTALLED UNDER OTHER SECTIONS

A. Furnish sleeves and hanger inserts to General Contractor for placement into formwork.

PART 2 - PRODUCTS

2.1 HANGER RODS

A. Hanger rods for single rod hangers shall conform to the following:
1. Steel, Cast Iron, and Glass Pipe:
a. Hanger Rod Diameter:
1) 2" (50 mm) and smaller: 3/8" (10 mm)
2) 2-1/2" (65 mm) through 3-5/8" (92 mm): 1/2" (15 mm)
3) 4" (100 mm) through 6" (150 mm): 1/2" (15 mm)
4) 8" (200 mm): 5/8" (16 mm)
5) 10" (250 mm): 3/4" (20 mm)
6) 12" (300 mm): 7/8" (24 mm)
7) 14" (350 mm) and 16" (400 mm): 1" (25 mm)
8) 18" (450 mm) and 24" (500 mm): 1-1/4" (32 mm)
2. Copper and Plastic Pipe:
a. Hanger Rod Diameter:
1) 2" (50 mm) and smaller: 3/8" (10 mm)
2) 2-1/2" (65 mm) through 3-5/8" (92 mm): 1/2" (15 mm)
3) 4" (100 mm) through 6" (150 mm): 1/2" (15 mm)
4) 8" (200 mm): 5/8" (16 mm)
5) 10" (250 mm): 3/4" (20 mm)
6) 12" (300 mm): 7/8" (24 mm)
7) 14" (350 mm) and 16" (400 mm): 1" (25 mm)
8) 18" (450 mm) and 24" (500 mm): 1-1/4" (32 mm)

B. Rods for double rod hangers may be reduced one size. Minimum rod diameter is 3/8 inches (10 mm).
C. Hanger rods and accessories used in mechanical spaces or otherwise dry areas shall have ASTM B633 electro-plated zinc finish.
D. All hanger rods, nuts, washers, clevises, etc., in damp areas shall have ASTM A123 hot-dip galvanized finish applied after fabrication. This applies to the following areas:

2.2 PIPE AND STRUCTURAL SUPPORTS

A. General:
1. Pipe hangers, clamps, and supports shall conform to Manufacturers Standardization Society MSS SP-58, 69, 89, and 127 (where applicable).
2. On all insulated piping, provide at each support an insert of same thickness and contour as adjoining insulation, between the pipe and insulation jacket, to prevent insulation from sagging and crushing. Refer to insulation specifications for materials and additional information.
3. Copper piping located in an exposed area, including indirect waste piping in janitor's closets, shall use split ring standoff hangers for copper tubing. Support shall include plastic pipe insert similar to Unistrut Cush-A-Clamp, Hydra-Zorb, nVent Cushion Clamp or Eaton Vibra-Clamp. Use electro-galvanized or more corrosion resistant and threaded rod for floor applications. Use anchors applicable to the wall type with corrosion resistant threaded rod for wall applications.
a. Products:
1) nVent/M-Co Model #456
2) Eaton Fig. 3198HCT
3) Anvil Fig. CT138R

B. Vertical Supports:
1. Support and laterally brace vertical pipes at every floor level in multi-story structures, unless otherwise noted by applicable codes, but never at intervals over 15 feet (4600 mm). Support vertical pipes with riser clamps installed below hubs, couplings, or lugs. Provide sufficient flexibility to accommodate expansion and contraction to avoid compromising fire barrier penetrations or stressing piping at fixed takeoff locations.
a. Products:
1) Eaton Fig B3373 Series
2) nVent 510 Series
3) Anvil Fig. 90
2. Wall supports shall be used where vertical height of structure exceeds minimum spacing requirements. Install wall supports at same spacing as hangers or strut supports along vertical length of pipe runs. Wall supports shall be coordinated with the Structural Engineer.

C. Hangers and Clamps:
1. Oversize all hangers, clamps, and supports on insulated piping to allow insulation and jacket to pass through unbroken. This applies to both hot and cold pipes.
2. Hangers in direct contact with bare copper pipe shall include plastic pipe insert similar to Unistrut Cush-A-Clamp, Hydra-Zorb, nVent Cushion Clamp or Eaton Vibra-Clamp within their temperature limits of -65F (-54C) to +275F (135C).
3. Vertical cold pipe drops and rough-ins to fixtures shall be supported by insulated pipe clamps to prevent thermal bridging and condensation.
4. On all insulated piping, provide a semi-cylindrical metallic shield and vapor barrier jacket.
5. Unless otherwise indicated, hangers shall be as follows:
a. Clevis Type: Bare Metal Pipe, Rigid Plastic Pipe, Insulated Cold Pipe, Insulated Hot Pipe - 3 inches (80 mm) & Smaller
1) Products: Bare Steel Plastic or Insulated Pipe:
a) Anvil Fig. 260
b) Eaton Fig. 3100
c) nVent Model 400
2) Products: Bare Copper Pipe Felt or PVC Coated:
a) Eaton Fig. B3104F or B3100CTC
b) Anvil Fig. CT65
c) nVent Fig. 402
6. Support may be fabricated from U-channel strut or similar shapes. Piping less than 4" (100 mm) in diameter shall be secured to strut with clamps of proper design and capacity as required to maintain spacing and alignment. Strut shall be independently supported from hanger drops or building structure. Size and support shall be per manufacturer's installation requirements for structural support of piping. Clamps shall not interrupt piping insulation.
a. Strut used in mechanical spaces or otherwise dry areas shall have ASTM B633 electro-plated zinc finish.
b. Strut used in damp areas listed in hanger rods shall have ASTM A123 hot-dip galvanized finish applied after fabrication.
7. Unless otherwise indicated, pipe supports for use with struts shall be as follows:
a. Clamp Type: Bare Metal Pipe, Rigid Plastic Pipe, Insulated Cold Pipe, Insulated Hot Pipe - 3 inches (80 mm) and smaller
1) Clamps in direct contact with copper pipe shall include plastic pipe insert similar to Unistrut Cush-A-Clamp, Hydra-Zorb, nVent Cushion Clamp or Eaton Vibra-Clamp.
2) Pipes subject to expansion and contraction shall have clamps oversized to allow limited pipe movement.
3) Products: Bare Steel, Plastic or Insulated Pipe:
a) Unistrut Fig. P1100 or P2500
b) Eaton Fig. B2000 or B2400
c) Anvil Fig. AS1200
d) nVent USC
4) Products: Bare Copper Pipe:
a) Eaton Fig. BVT
b) nVent CADDY Cushion Clamp

D. Upper (Structural) Attachments:
1. Unless otherwise shown, upper attachments for hanger rods or support struts shall be as follows:
a. Steel Structure Clamps: C-Type Wide Flange Beam Clamps (for use on top and/or bottom of wide flanges. Not permitted for use with bar-joists.):
1) Products:
a) Anvil Fig. 86
b) Eaton Fig. B3033/B3034
c) nVent Model 300 & 310
b. Concrete Anchors: Fasten to concrete using cast-in or post-installed anchors designed per the requirements of Appendix D of ACI 318-[05]. Post-installed anchors shall be qualified for use in cracked concrete by ACI-355.2.
c. Masonry Anchors: Fasten to concrete masonry units with expansion anchors or self-tapping masonry screws. For expansion anchors into hollow concrete block, use sleeve-type anchors designed for the specific application. Do not fasten in masonry joints. Do not use powder actuated fasteners, wooden plugs, or plastic inserts.
d. Wood Anchors: Tension wood rod hanger for suspending 3/8" (9.5 mm) threaded rod. Zinc plated carbon steel.
1) Minimum allowable tension loads for Douglass Fir/Southern Pine:
a) 3/8" (9.5 mm) diameter rod; 2-1/2" (64 mm) shank: 600 lb (272kg)/590 lb (268kg).
b) Load values are based on full shank penetration into wood member. Minimum edge distance 3/4" (19 mm). Minimum end distance 3-1/4" (83 mm).
2) Limitations:
a) Truss: Do not hang from wood trusses without truss manufacturer or Structural Engineer's approval.
b) Sheetrock/Gypsum Ceiling: When drilling through non-wood materials (e.g., sheet rock, gypsum, etc.), increase shank length by depth of non-wood materials.
c) Plywood Flooring/Roofing: Do not hang from plywood floor or roofing.
d) Spacing: Refer to wood structure spacing of hangers.
3) Products:
a) Simpson RWV
b) DeWALT
c) ITI Sammys GT25

2.3 OPENINGS IN FLOORS, WALLS AND CEILINGS

A. Exact locations of all openings for the installation of materials shall be determined by the Contractor and given to the General Contractor for installation or construction as the structure is built.
B. Coordinate all openings with other Contractors.
C. Hire the proper tradesman and furnish all labor, material and equipment to cut openings in or through existing structures, or openings in new structures that were not installed, or additional openings. Repair all spalling and damage to the satisfaction of the Architect/Engineer. Make saw cuts before breaking out concrete to ensure even and uniform opening edges.
D. Said cutting shall be at the complete expense of each Contractor. Failure to coordinate openings with other Contractors shall not exempt the Contractor from providing openings at Contractor's expense.
E. Do not cut structural members without written approval of the Architect or Structural Engineer.
F. Exposed Housing Penetrations: Seal pipes with surface temperature below 150F (66C), penetrating housings with conical stepped, white silicone, EPDM or neoprene pipe flashings and stainless steel clamps equal to Portals Plus Pipe Boots or Pipetite.

2.4 ROOF PENETRATIONS

A. Roof Curb Enclosure: Provide weatherproof roof curb and enclosure for pipe penetrations. Refer to drawings for details.
B. Conical Pipe Boot: Seal pipes with surface temperature below 150F (66C), penetrating single-ply roofs with conical stepped, UV-resistant silicone, EPDM or neoprene pipe flashings and stainless steel clamps equal to Portals Plus Pipe Boots or Pipetite. Color: White shall match roofing membrane.
C. Break insulation only at the clamp for pipes between 60F (16C) and 150F (66C). Seal outdoor insulation edges watertight.

2.5 SLEEVES AND LINTELS

A. Each Contractor shall provide sleeves and lintels for all duct and pipe openings required for the Contractor's work in masonry walls and floors, unless specifically shown as being by others.
B. Fabricate all sleeves from standard weight black steel pipe or as indicated on the drawings. Provide continuous sleeve. Cut or split sleeves are not acceptable.
C. Fabricate all lintels for masonry walls from structural steel shapes or as indicated on the drawings. Have all lintels approved by the Architect or Structural Engineer.
D. Sleeves through the floors on exposed risers shall be flush with the ceiling, with planed squared ends extending 1" (25 mm) above the floor in unfinished areas, and flush with the floor in finished areas, to accept spring closing floor plates.
E. Sleeves shall not penetrate structural members or masonry walls without approval from the Structural Engineer. Sleeves shall then comply with the Architect/Engineer's design.
F. Openings through unexcavated floors and/or foundation walls below the floor shall have a smooth finish with sufficient annular space around material passing through opening so slight settling will not place stress on the material or building structure.
G. Install all sleeves concentric with pipes. Secure sleeves in concrete to wood forms. This Contractor is responsible for sleeves dislodged or moved when pouring concrete.
H. Where pipes rise through concrete floors that are on earthen grade, provide 3/4" (20 mm) resilient expansion joint material (e.g., foam, rubber, asphalt-coated fiber, bituminous-impregnated felt, or cork) wrapped around the pipe, the full depth of concrete, at the point of penetration. Secure to prevent shifting during concrete placement and finishing.
I. Size sleeves large enough to allow expansion and contraction movement. Provide continuous insulation wrapping.
J. Wall Seals ("Link-Seals"):
1. Underground foundation wall penetrations and where shown on the drawings, pipes passing through walls, ceilings, or floors shall have their annular space (sleeve or drilled hole - not tapered hole made with knockout plug) sealed by properly sized sealing elements consisting of a synthetic rubber material compounded to resist aging, ozone, sunlight, water and chemical action.
2. Sleeves, if used, shall be at least 2 pipe sizes larger than the service pipe and shall include a waterstop/anchor around the mid section of the sleeve, continuously welded to or integral formed with the sleeve. Sleeve material options based on fluid carrying pipe design temperature:
a. Any temperature: galvanized steel, painted steel.
b. Only fluids below 120°F (49°C): HDPE, PVC.
3. Pressure shall be maintained by stainless steel bolts and other parts. Pressure plates may be of composite material for Models S and OS.
4. Sealing element shall be as follows:

Model	Service	Element Material	Temperature Range
S	Standard (Stainless)	EPDM	-40F (-40C) to 250F (121C)
T	High/Low Temperature (Steam)	Silicone	-67F (-55C) to 400F (204C)
T	Fire Seals (1 hour)	Silicone	-67F (-55C) to 400F (204C)
FS	Fire Seals (3 hours)	Silicone	-67F (-55C) to 400F (204C)
OS	Oil Resistant/Stainless	Nitrile	-40F (-40C) to 210F (99C)

5. Manufacturers:
a. Garlock Pipeline Technologies (GPT) "Link-Seals"
b. O-Z/Gedney Company
c. Calpico, Inc.
d. Innerlynx
e. Metraflex
f. Flexicraft
g. Polywater

2.6 ESCUTCHEON PLATES AND TRIM

A. Fit escutcheons to all insulated or uninsulated exposed pipes passing through walls, floors, or ceilings of finished rooms.
B. Escutcheons shall be heavy gauge, cold rolled steel, copper coated under a chromium plated finish, heavy spring clip, rigid hinge and latch.
C. Install galvanized steel (unless otherwise indicated) trim strip to cover vacant space and raw construction edges of all rectangular openings in finished rooms. This includes pipe openings.

2.7 PIPE PENETRATIONS

A. Seal all pipe penetrations. Seal non-rated walls and floor penetrations with grout or caulk. Backing material may be used.
B. Seal fire rated wall and floor penetrations with fire seal system as specified.

2.8 PIPE ANCHORS

A. Provide all items needed to allow adequate expansion and contraction of all piping. All piping shall be supported, guided, aligned, and anchored as required.
B. Repair all piping leaks and associated damage. Pipes shall not rub on any part of the building.

2.9 FINISH

A. Prime coat exposed steel hangers and supports. Hangers and supports in crawl spaces, pipe shafts, and suspended ceiling spaces are not considered exposed.

PART 3 - EXECUTION

3.1 PLUMBING SUPPORTS AND ANCHORS

A. General Installation Requirements:
1. Install all items per manufacturer's instructions.
2. Coordinate the location and method of support of piping systems with all installations under other Divisions and Sections of the Specifications.
3. Where pipe support members are welded to structural building framing, scrape, brush clean, and apply one coat of zinc rich primer to welding.
4. Supports shall extend directly to building structure. Do not support piping from duct hangers unless coordinated with Sheet Metal Contractor prior to installation. Do not allow lighting or ceiling supports to be hung from piping supports.

B. Supports Requirements:
1. Where building structural steel is fireproofed, all hangers, clamps, auxiliary steel, etc., which attach to it shall be installed prior to application of fireproofing. Repair all fireproofing damaged during pipe installation.
2. Set all concrete inserts in place before pouring concrete.
3. Furnish, install and prime all auxiliary structural steel for support of piping systems that are not shown on the Drawings as being by others.
4. Install hangers and supports complete with lock nuts, clamps, rods, bolts, couplings, swivels, inserts and required accessories.
5. Hangers for horizontal piping shall have adequate means of vertical adjustment for alignment.

C. Pipe Requirements:
1. Support all piping and equipment, including valves, strainers, traps and other specialties and accessories to avoid objectionable or excessive stress, deflection, swaying, sagging or vibration in the piping or building structure during erection, cleaning, testing and normal operation of the systems.
2. Do not, however, restrain piping to cause it to snake or buckle between supports or to prevent proper movement due to expansion and contraction.
3. Support piping at equipment and valves so they can be disconnected and removed without further supporting the piping.
4. Piping shall not introduce strains or distortion to connected equipment.
5. Parallel horizontal pipes may be supported on trapeze hangers made of structural shapes and hanger rods; otherwise, pipes shall be supported with individual hangers.
6. Trapeze hangers may be used where ducts interfere with normal pipe hanging.
7. Provide additional supports where pipe changes direction, adjacent to flanged valves and strainers, at equipment connections and heavy fittings.
8. Provide at least one hanger adjacent to each joint in grooved end steel pipe with mechanical couplings.

D. Provided the installation complies with all loading requirements of truss and joist manufacturers, the following practices are acceptable:
1. For attachments to joists that are concentrically loaded on the joist, a max of 100 lbs (45 kg) may be attached to the joist within a chord panel.
2. For attachments to joists that are eccentrically loaded, a max of 25 lbs (11 kg) may be attached to the joist within a chord panel without an additional angle.
3. Multiple attachments are allowed in each chord panel as long as the sum of the loads do not exceed the max load indicated.
4. For loads between 100 lbs - 200 lbs (45 kg and 90 kg), additional L2x2x3/16" (L51xL51x4.8) ASTM A36 structural steel angles are required and joist must be concentrically loaded.
5. For loading conditions noted above, total sum of loads shall not exceed 200 lbs (90 kg) for an 8 ft (244 cm) segment of joist. For loads greater than 200 lbs (90 kg) and not noted on the drawings, contact engineer prior to installation.
6. No loads shall be supported from joist bridging.
7. It is prohibited to cantilever a load using an angle or other structural component that is attached to a truss or joist in such a fashion that a torsional force is applied to that structural member.
8. If conditions cannot be met, coordinate installation with truss or joist manufacturer and contact Architect/Engineer.

E. After piping and insulation installation are complete, cut hanger rods back at trapeze supports so they do not extend more than 3/4" (20 mm) below bottom face of lowest fastener and blunt any sharp edges.

F. Do not exceed 25 lbs. (12 kg) per hanger and a minimum spacing of 2'-0" (600 mm) on center when attaching to metal roof decking (limitation not required with concrete on metal deck). This 25 lbs. (12 kg) load and 2'-0" (600 mm) spacing include adjacent electrical and architectural items hanging from deck. If the hanger restrictions cannot be achieved, supplemental framing off steel framing will need to be added.

G. Do not exceed the manufacturer's recommended maximum load for any hanger or support.

H. Steel/Concrete Structure: Spacing of hangers shall not exceed the compressive strength of the insulation inserts, and in no case shall exceed the following:
1. Steel and Fiberglass (Std. Weight or Heavier - Liquid Service):
a. Maximum Spacing:
1) 1-1/4" (32 mm) & under: 7'-0" (2100 mm)
2) 1-1/2" (40 mm): 9'-0" (2700 mm)
3) 2" (50 mm): 10'-0" (3000 mm)
4) 2-1/2" (65 mm): 11'-0" (3300 mm)
5) 3" (80 mm): 12'-0" (3600 mm)
6) 4" (100 mm) & larger: 12'-0" (3600 mm)
2. Steel (Std. Weight or Heavier - Vapor Service):
a. Maximum Spacing:
1) 1-1/4" (32 mm) and under: 9'-0" (2700 mm)
2) 1-1/2" (40 mm): 12'-0" (3600 mm)
3) 2" (50 mm) & larger: 12'-0" (3600 mm)
3. Hard Drawn Copper & Brass (Liquid Service):
a. Maximum Spacing:
1) 3/4" (20 mm) and under: 5'-0" (1500 mm)
2) 1" (25 mm): 6'-0" (1800 mm)
3) 1-1/4" (32 mm): 7'-0" (2100 mm)
4) 1-1/2" (40 mm): 8'-0" (2435 mm)
5) 2" (50 mm): 8'-0" (2435 mm)
6) 2-1/2" (65 mm): 9'-0" (2700 mm)
7) 3" (80 mm): 10'-0" (3000 mm)
8) 4" (100 mm): 12'-0" (3600 mm)
9) 6" (150 mm): 12'-0" (3600 mm)
4. Hard Drawn Copper & Brass (Vapor Service):
a. Maximum Spacing:
1) 3/4" (20 mm) & under: 7'-0" (2100 mm)
2) 1" (25 mm): 8'-0" (2435 mm)
3) 1-1/4" (32 mm): 9'-0" (2700 mm)
4) 1-1/2" (40 mm): 10'-0" (3000 mm)
5) 2" (50 mm): 11'-0" (3300 mm)
6) 2-1/2" (65 mm) & larger: 12'-0" (3600 mm)
5. Plastic Pipe:
a. Hangers shall be spaced based on the piping system manufacturer's instructions or, if no system instructions are available, space hangers at 4'-0" (1220 mm) maximum centers.
6. Ultra-Flexible Pipe, and Flexible Hose, and Soft Copper Tubing:
a. Continuous channel with hangers maximum 8'-0" (2435 mm) OC.

I. Wood Structure: Spacing of hangers shall not exceed the compressive strength of the insulation inserts, and in no case shall exceed the following:
1. Steel and Fiberglass (Std. Weight or Heavier - Liquid Service):
a. Maximum Spacing:
1) 1-1/4" (32 mm) & under: 7'-0" (2100 mm)
2) 1-1/2" (40 mm): 9'-0" (2700 mm)
3) 2" (50 mm): 10'-0" (3000 mm)
4) 2-1/2" (65 mm): 11'-0" (3300 mm)
5) 3" (80 mm): 12'-0" (3600 mm)
6) 4" (100 mm) through 6" (150 mm): 12'-0" (3600 mm)
7) 8" (200 mm): 9'-0" (2700 mm)
8) 10" (250 mm): 6'-0" (1800 mm)
9) 12" (305 mm): 4'-0" (1220 mm)
2. Steel (Std. Weight or Heavier - Vapor Service):
a. Maximum Spacing:
1) 1-1/4" (32 mm) and under: 9'-0" (2700 mm)
2) 1-1/2" (40 mm): 12'-0" (3600 mm)
3) 2" (50 mm) & larger: 12'-0" (3600 mm)
4) 2-1/2" (65 mm): 11'-0" (3300 mm)
5) 3" (80 mm): 12'-0" (3600 mm)
6) 4" (100 mm) through 8" (200 mm): 12'-0" (3600 mm)
7) 10" (250 mm): 9'-0" (2700mm)
8) 12" (305 mm): 6'-0" (1800mm)
3. Hard Drawn Copper & Brass (Liquid Service):
a. Maximum Spacing:
1) 3/4" (20 mm) and under: 5'-0" (1500 mm)
2) 1" (25 mm): 6'-0" (1800 mm)
3) 1-1/4" (32 mm): 7'-0" (2100 mm)
4) 1-1/2" (40 mm): 8'-0" (2435 mm)
5) 2" (50 mm): 8'-0" (2435 mm)
6) 2-1/2" (65 mm): 9'-0" (2700 mm)
7) 3" (80 mm): 10'-0" (3000 mm)
8) 4" (100 mm): 12'-0" (3600 mm)
9) 6" (150 mm): 12'-0" (3600 mm)
4. Hard Drawn Copper & Brass (Vapor Service):
a. Maximum Spacing:
1) 3/4" (20 mm) & under: 7'-0" (2100 mm)
2) 1" (25 mm): 8'-0" (2435 mm)
3) 1-1/4" (32 mm): 9'-0" (2700 mm)
4) 1-1/2" (40 mm): 10'-0" (3000 mm)
5) 2" (50 mm): 11'-0" (3300 mm)
6) 2-1/2" (65 mm) & larger: 12'-0" (3600 mm)
5. Plastic Pipe:
a. Hangers shall be spaced based on the piping system manufacturer's instructions or, if no system instructions are available, space hangers at 4'-0" (1220 mm) maximum centers.
6. Ultra-Flexible Pipe, Flexible Hose, and Soft Copper Tubing:
a. Continuous channel with hangers maximum 8'-0" (2435 mm) OC.

J. Wood Structure: Spacing of hangers shall not exceed the compressive strength of the insulation inserts, and in no case shall exceed the following:
1. Steel and Fiberglass (Std. Weight or Heavier - Liquid Service):
a. Maximum Spacing:
1) 1-1/4" (32 mm) & under: 7'-0" (2100 mm)
2) 1-1/2" (40 mm): 9'-0" (2700 mm)
3) 2" (50 mm): 10'-0" (3000 mm)
4) 2-1/2" (65 mm): 11'-0" (3300 mm)
5) 3" (80 mm): 12'-0" (3600 mm)
6) 4" (100 mm) through 6" (150 mm): 12'-0" (3600 mm)

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NORTH CAROLINA PROFESSIONAL SEAL 049754 ENGINEER HARRISON HOLT
06/02/2026

NO.	REVISION	DATE

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7) 8" (200 mm): 9'-0" (2700 mm)
8) 10" (250 mm): 6'-0" (1800 mm)
9) 12" (305 mm): 4'-0" (1220 mm)

2. Steel (Std. Weight or Heavier - Vapor Service):
   a. Maximum Spacing:
      1) 1/2" (12 mm) and under: 6'-0" (1800 mm)
      2) 3/4" (19 mm) to 1" (25 mm): 8'-0" (2435 mm)
      3) 1-1/4" (32 mm) and under: 9'-0" (2700 mm)
      4) 1-1/2" (40 mm): 10'-0" (3000 mm)
      5) 2" (50 mm) & larger: 10'-0" (3000 mm)
      6) 3" (80 mm): 12'-0" (3600 mm)
      7) 4" (100 mm) through 8" (200 mm): 12'-0" (3600 mm)
      8) 10" (250 mm): 9'-0" (2700mm)
      9) 12" (305 mm): 6'-0" (1800mm)
3. Hard Drawn Copper & Brass (Liquid Service):
   a. Maximum Spacing:
      1) 3/4" (20 mm) & under: 5'-0" (1500 mm)
      2) 1" (25 mm): 6'-0" (1800 mm)
      3) 1-1/4" (32 mm): 6'-0" (1800 mm)
      4) 1-1/2" (40 mm): 6'-0" (1800 mm)
      5) 2" (50 mm): 8'-0" (2435 mm)
      6) 2-1/2" (65 mm): 9'-0" (2700 mm)
      7) 3" (80 mm): 10'-0" (3000 mm)
      8) 4" (100 mm): 10'-0" (3000 mm)
      9) 6" (150 mm): 10'-0" (3000 mm)
4. Hard Drawn Copper & Brass (Vapor Service):
   a. Maximum Spacing:
      1) 3/4" (20 mm) & under: 6'-0" (1800 mm)
      2) 1" (25 mm): 6'-0" (1800 mm)
      3) 1-1/4" (32 mm): 6'-0" (1800 mm)
      4) 1-1/2" (40 mm): 6'-0" (1800 mm)
      5) 2" (50 mm): 10'-0" (3000 mm)
      6) 2-1/2" (65 mm) & larger: 10'-0" (3000 mm)
5. Plastic Pipe:
   a. Hangers shall be spaced based on the piping system manufacturer's instructions or, if no system instructions are available, space hangers at 4'-0" (1220 mm) maximum centers.
6. Ultra-Flexible Pipe, Flexible Hose, and Soft Copper Tubing:
   a. Continuous channel with hangers maximum 8'-0" (2435 mm) OC.

K. Installation of hangers shall conform to MSS SP-58, 69, 89 and the applicable Plumbing Code.

END OF SECTION

SECTION 22 05 53 - PLUMBING IDENTIFICATION

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Identification of products installed under Division 22.

PART 2 - PRODUCTS

2.1 MATERIALS{MATERIALS}

A. All pipe markers (purchased or stenciled) shall conform to ANSI A13.1. Marker lengths and letter sizes shall be at least the following:

OD of Pipe or Insulation	Marker Length	Size of Letters
Up to and including 1-1/4" (32mm)	8" (200 mm)	1/2" (12 mm)
1-1/2" (40 mm) to 2" (50 mm)	8" (200 mm)	3/4" (20 mm)
2-1/2" (65 mm) to 6" (150 mm)	12" (300 mm)	1-1/4" (32 mm)
.	.	.

Plastic tags may be used for outside diameters under 3/4" (20 mm)

B. Plastic Nameplates: Laminated three-layer phenolic with engraved black, 1/4" (6 mm) minimum letters on light contrasting background.{PLASTIC NAMEPLATES}

C. Aluminum Nameplates: Black enamel background with natural aluminum border and engraved letters furnished with two mounting holes and screws.{ALUMINUM NAMEPLATES}

D. Plastic Tags: Minimum 1-1/2" (40 mm) square or round laminated three-layer phenolic with engraved, 1/4" (6 mm) minimum black letters on light contrasting background.{PLASTIC TAGS}

E. Brass Tags: Brass background with engraved black letters. Tag size minimum 1-1/2" (40 mm) square or 1-1/2" (40 mm) round.{BRASS TAGS}

F. Vinyl Pipe Markers: Colored vinyl with permanent pressure sensitive adhesive backing.{VINYL PIPE MARKERS}

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install all products per manufacturer's recommendations.

B. Degrease and clean surfaces to receive adhesive for identification materials.

C. Valves:
   1. All valves (except shutoff valves at equipment) shall have numbered tags.
   2. Provide or replace numbered tags on all existing valves that are connected to new systems or that have been revised.
   3. Provide all existing valves used to extend utilities to this project with numbered tags. Review tag numbering sequence with the Owner prior to ordering tags.
   4. Number all tags and show the service of the pipe.
   5. Provide two sets of laminated 8-1/2" x 11" (216 mm x 280 mm) (letter size) copies of a valve directory listing all valves, with respective tag numbers, uses, and locations. The directory shall be reviewed by the Owner and Architect/Engineer prior to laminating final copies. Laminated copies shall have brass eyelet in at least one corner for easy hanging.

D. Pipe Markers:{PLASTIC PIPE MARKERS}{VINYL PIPE MARKERS}{STENCIL PAINTED PIPE MARKERS}{UNDERGROUND PIPE MARKERS}
   1. Adhesive Backed Markers: Use Brady Style 1, 2, or 3 on pipes 3" (80 mm) diameter and larger. Use Brady Style 4, 6, or 8 on pipes under 3" (80 mm) diameter. Similar styles by other listed manufacturers are acceptable. Secure all markers at both ends with a wrap of pressure sensitive tape completely around the pipe.
   2. Apply markers and arrows in the following locations where clearly visible:
      a. At each valve.
      b. On both sides of walls that pipes penetrate.
      c. At least every 20 feet (6000 mm) along all pipes.
      d. On each riser and each leg of each "T" joint.
      e. At least once in every room and each story traversed.
   3. Underground Pipe Markers: Install 8" (200 mm) to 10" (250 mm) below grade, directly above buried pipes.{UNDERGROUND PIPE MARKERS}

3.2 SCHEDULE

A. Pipes to be marked shall be labeled with text as follows, regardless of which method or material is used:
   1. CONDENSATE DRAIN: White lettering; green background
   2. DOMESTIC COLD WATER: White lettering; green background
   3. DOMESTIC HOT WATER - 140°F (60°C): White lettering; green background
   4. DOMESTIC HOT WATER CIRCULATING - 140°F (60°C): White lettering; green background
   5. SANITARY SEWER: Black lettering; yellow background
   6. VENT: Black lettering; yellow background
   7. STORM SEWER (PRIMARY AND SECONDARY): White lettering; green background
   8. NATURAL GAS: Black lettering; yellow background
   9. TEMPERED WATER: White lettering; green background

END OF SECTION 22 05 53

SECTION 22 07 19 - PLUMBING PIPING INSULATION

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Piping Insulation.

B. Insulation Jackets.

PART 2 - PRODUCTS

2.1 INSULATION

A. Type A: Glass fiber; ANSI/ASTM C547; 0.24 (0.42) maximum 'K' value at 75°F (24° C); non-combustible. All-purpose polymer or polypropylene service jacket, listed and labeled at no more than 25/50 when tested per ASTM E84 or UL 723 as required by code.

2.2 VAPOR BARRIER JACKETS

A. All-purpose polymer or polypropylene service jacket vapor barrier with self-sealing adhesive joints. Beach puncture resistance ratio of at least 50 units. Tensile strength: 35 psi (241 kPa) minimum. Single, self-seal acrylic adhesive on longitudinal jacket laps and butt strips.

2.3 JACKET COVERINGS

A. Plastic Jackets and Fitting Covers: High impact, glossy white, 0.020" (0.5mm) thick, self-extinguishing plastic. Suitable for use indoors or outdoors with ultraviolet inhibitors. Suitable for -40°F (-40°C) to 150°F (66°C). Listed and labeled at no more than 25/50 when tested per ASTM E84 or UL 723 as required by code.

PART 3 - EXECUTION

3.1 INSTALLATION

A. General Installation Requirements:
   1. Install materials per manufacturer's instructions, building codes and industry standards.
   2. Continue insulation with vapor barrier through penetrations. This applies to all insulated piping. Maintain fire rating of all penetrations.

B. Insulated Piping Operating Below 60°F (16°C):
   1. Insulate fittings, valves, unions, flanges, strainers, flexible connections, flexible hoses, and expansion joints. Seal all penetrations of vapor barrier.
   2. On piping operating below 60°F (16°C) in locations that are not mechanically cooled (e.g., penthouses, mechanical rooms, tunnels, chases at exterior walls, etc.), Type B insulation shall be used.
   3. All balance valves with fluid operating below 60°F (16°C) shall be insulated with a removable plug wrapped with vapor barrier tape to allow reading and adjusting of the valve.

C. Insulated Piping Operating Between 60°F (16°C) and 140°F (60°C):
   1. Do not insulate flanges and unions, but bevel and seal ends of insulation at such locations. Insulate all fittings, valves and strainers.

D. Insulated Piping Operating Above 140°F (60°C):
   1. Insulate fittings, valves, flanges, and strainers.
   2. All balance valves with fluid operating above 140°F (60°C) shall be insulated and an opening shall be left in the insulation to allow for reading and adjusting the valve.

3.2 SUPPORT PROTECTION[DB1]

A. Provide a shield on all insulated piping at each support between the insulation jacket and the support.

B. On all insulated piping greater than 1-1/2" (38mm), provide shield with insulation insert of same thickness and contour as adjoining insulation at each support, between the pipe and insulation jacket, to prevent insulation from sagging and crushing.

C. Install metal shields between all hangers or supports and the pipe insulation. Shields shall be galvanized sheet metal, half-round with flared edges. Adhere shields to insulation. On cold piping, seal the shields vapor-tight to the insulation as required to maintain the vapor barrier, or add separate vapor barrier jacket.

D. Shields shall be at least the following lengths and gauges:

Pipe Size	Shield Size
1/2" (15 mm) to 3-1/2" (90 mm)	12" (300 mm) long x 18 gauge (1.31 mm)
4" (100 mm)	12" (300 mm) long x 16 gauge (1.61 mm)
5" (125 mm) to 6" (150 mm)	18" (450 mm) long x 16 gauge (1.61 mm)
8" (200 mm) to 14" (350 mm)	24" (600 mm) long x 14 gauge (1.99 mm)
16" (400 mm) to 24" (600 mm)	24" (600 mm) long x 12 gauge (2.75 mm)

E. Elastomeric foam insulation shields/saddle; molded thermoplastic rigid pipe saddle sized for insulation outside diameter. Length as indicated above.

F. Ferrous hot piping 4 inches (100 mm) and larger, provide steel saddle at rollers as described in Section 22 05 29 "Plumbing Supports and Anchors".

G. Minimum 1/4" (6 mm) rolled galvanized steel plates shall be provided in addition to the sleeves as reinforcement on large pipes to reduce point loading on roller, trapeze hanger and strut support locations depending on insulation compressive strength. Refer to section above for exact locations.

3.3 INSULATION

A. Type A Insulation:
   1. All Service Jackets: Seal all longitudinal joints with self-seal laps using a single pressure sensitive adhesive system. Do not staple.
   2. Insulation without self-seal lap may be used if installed with Benjamin Foster 85-20 or equivalent Chicago Mastic, 3M or Childers lap adhesive.
   3. Apply insulation with laps on top of pipe.
   4. Fittings, Valve Bodies and Flanges: For 4" (100 mm) and smaller pipes, insulate with 1 lb. (16 kg/m³) density insulation wrapped under compression to a thickness equal to the adjacent pipe insulation. For pipes over 4" (100 mm), use mitered segments of pipe insulation. Finish with preformed plastic fitting covers. Secure fitting covers with pressure sensitive tape at each end. Overlap tape at least 2" (50 mm) on itself. For pipes operating below 60°F (16°C), seal fitting covers with vapor retarder mastic in addition to tape.
   5. Insulation Installation on Valves and Pipe Specialties:
      a. Install preformed sections of same material as straight segments of pipe insulation when available.
      b. When preformed sections are not available, install mitered sections of pipe insulation to valve body.
      c. Arrange insulation to permit access to packing and to allow valve operation without disturbing insulation.

3.4 JACKET COVER INSTALLATION

A. Plastic Covering:
   1. Provide vapor barrier as specified for insulation type. Cover with plastic jacket covering. Position seams to shed water.
   2. Solvent weld all joints with manufacturer recommended cement.
   3. Overlap all laps and butt joints 1-1/2" (40 mm) minimum. Repair any loose ends that do not seal securely. Solvent weld all fitting covers in the same manner. Final installation shall be watertight.
   4. All joints in areas noted shall meet USDA standards for Totally Sealed Systems, including overlaps of 1" (25 mm) on circumferential and 1.5" (40 mm) to 2" (50 mm) on longitudinal seams.
   5. Use plastic insulation covering on all exposed pipes including, but not limited to:
      a. All exposed piping in finished spaces unless noted otherwise on the drawings.
   6. Elastomeric piping insulation may have two coats of latex paint instead of plastic jacket.

END OF SECTION 22 07 19

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06/02/2026

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SECTION 22 10 00 - PLUMBING PIPING

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Pipe and Pipe Fittings.

B. Valves.

C. Check Valves.

PART 2 - PRODUCTS

2.1 COPPER PIPE{COPPER PIPE}

A. Copper Pipe; Type L; Solder Joints:{COPPER PIPE TYPE L SOLDER JOINTS}

1. Pipe: Type L hard drawn seamless copper tube, ASTM B88.
2. Design Pressure: 175 psi (1210 kPa); Maximum Design Temperature: 200°F (93° C).
3. Joints: Solder with 100% lead-free solder and flux, ASTM B32.
4. Fittings: Wrought copper solder joint, ANSI B16.22.

2.2 PLASTIC PIPE{PLASTIC PIPE}

A. PVC-DWV or ABS-DWV; Schedule 40; Solvent Weld Joints:{PVC-DWV OR ABS-DWV SCHEDULE 40 SOLVENT WELD JOINTS}

1. Pipe: Schedule 40 rigid, PVC-DWV, or ABS-DWV, normal impact Type I, with plain ends, conforming to ASTM Standards D2665 or D2661. Cellular core piping is not acceptable.
2. Design Pressure/Temperature: Gravity at 140°F (60°C).
3. Joints: Solvent-weld socket type with solvent recommended by pipe manufacturer.
4. Fittings: PVC-DWV, or ABS-DWV, normal impact Type I, with solvent-weld socket type ends for Schedule 40 pipe.
5. Limits: Schedule 40 PVC-DWV, or ABS-DWV pipe must not be threaded. Do not use where exposed or in return air plenums.
6. Use: Use PVC or ABS only where allowed by local jurisdiction. Comply with all special requirements or limitations.
7. Special Requirements: Provide expansion loop(s) and/or expansion joints in the piping system per the manufacturer's guidelines and as shown on the drawings. Refer to Section 22 05 16 for expansion joint requirements.

2.3 VALVES{VALVES}

A. Shutoff Valves:{SHUTOFF VALVES}

1. For pipe systems where mechanical press connections are allowed, shutoff valves with mechanical press connections are acceptable subject to the requirements in the paragraphs below.
2. Ball Valves:{BALL VALVES}
   a. BA-1: 3" (80 mm) and under, 150 psi (1035 kPa) saturated steam, 600 psi (4135 kPa) CWP, full port, threaded or solder ends (acceptable only if rated for soldering in line with 470°F (243°C) melting point of lead-free solder), stainless steel ball and trim, Teflon seats and seals.{BA-1}
      1) Body: Lead free NSF-372, two-piece bronze of a copper alloy containing less than 15% zinc.
      2) Body: Dezincification resistant brass alloy, lead free NSF-372. }
      3) Provide solid extended shaft for all insulated piping. (For example, Apollo adds option -04 Stem Extension, NIBCO Nib-Seal Handle -NS, and Jomar modifies valve part number with -IH for insulated handle.)
      4) Provide lock out trim for all valves opening to atmosphere installed in domestic water piping over 120°F (49°C), heating water piping over 120° F (49°C), steam, condensate, boiler feed water piping, and gasoline/kerosene piping, and as indicated on the drawings. Solid extended shaft is not required on valves with lockout trim. (For example, Jomar and NIBCO modify valve part number with -LH for locking handle.)

2.4 CHECK VALVES{CHECK VALVES}

A. For pipe systems where mechanical press connections are allowed, check valves with mechanical press connections are acceptable subject to the requirements in the paragraphs below.

B. CK-1: Threaded Ends, 2" (50 mm) and under, 125 psi (865 kPa) steam @ 406°F (208°C), 200 psi (1380 kPa) CWP @ 150°F (66°C), threaded connection, lead free bronze body with brass or bronze disc, horizontal swing.

2.5 CONNECTIONS BETWEEN DISSIMILAR METALS{CONNECTIONS BETWEEN DISSIMILAR METALS}

A. Connections between dissimilar metals shall be insulating dielectric types that provide a water gap between the connected metals, and that either allow no metal path for electron transfer or that provide a wide water gap lined with a non-conductive material to impede electron transfer through the water path.

B. Screwed and/or Grooved Joints (acceptable up to 4" (100 mm) size):{SCREWED AND/OR GROOVED JOINTS (ACCEPTABLE UP TO 4" (100 MM) SIZE)}

1. Dielectric waterway rated for 300 psi (2065 kPa) CWP and 225°F (107°C).
2. Optional: Copper-silicon casting conforming to UNS C87850 with grooved and/or threaded ends.
3. UL classified in accordance with ANSI / NSF-61 for potable water service.

PART 3 - EXECUTION

3.1 PREPARATION

A. Install all products per manufacturer's recommendations and industry recognized standards. .

B. Ream pipe and tube ends. Remove burrs. Bevel plain end ferrous pipe.

C. Remove scale and dirt, on inside and outside, before assembly.

D. Remove all scale, rust, dirt, oils, stickers and thoroughly clean exterior of all bare metal exposed piping, hangers, and accessories in preparation to be painted.

E. Connect to equipment with flanges or unions. Unions or flanges for servicing and disconnect are not required in installations using grooved joint couplings.

F. Use only piping materials rated for the maximum temperature of the application, e.g., do not use PVC for dishwasher drainage or piping that receives boiler blowdown.

G. Roof Penetration (Vent) Flashing:

1. Built-up Roofing: Flash vents with 3# (14.6 kg/m2) seamless sheet lead of sufficient size to extend 15" (375 mm) into roofing felts for built-up roofs.
2. Membrane, Metal or Shingled Roofs: Flash vents with premolded pipe flashing cones for single-ply membrane roofs, metal roofs, or shingled roofs.

H. Existing building sewers or building drains which are shown on the documents to be reused shall be inspected and recorded by closed circuit television for their condition. Report findings back to the Architect, Engineer, and Owner before proceeding with work so any necessary rework can take place if needed.

3.2 SYSTEM, PIPING AND VALVE SCHEDULE

A. Cold Water, Hot Water, Tempered Water - Potable and Non-Potable (Above Ground):

1. Copper Pipe; Type L; Solder Joints: All Sizes{COPPER PIPE TYPE L SOLDER JOINTS}
2. Shutoff Valves: BA-1{BUTTERFLY VALVES}{BALL VALVES}[BF-1][BA-1]
3. Check Valves: CK-1{CHECK VALVES}[CK-1][CK-2][CK-3]

B. Sanitary Waste and Vent, Gravity (Above Ground):

1. PVC-DWV or ABS-DWV; Schedule 40; Solvent Weld Joints: All Sizes{PVC-DWV OR ABS-DWV SCHEDULE 40 SOLVENT WELD JOINTS}

C. Sanitary Indirect Drainage (Above Ground):

1. PVC-DWV or ABS-DWV; Schedule 40; Solvent Weld Joints: All Sizes{PVC-DWV OR ABS-DWV SCHEDULE 40 SOLVENT WELD JOINTS}

D. Sanitary Waste and Vent, Gravity (Underground - Inside Building):

1. PVC-DWV or ABS-DWV; Schedule 40; Solvent Weld Joints: All Sizes{PVC-DWV OR ABS-DWV SCHEDULE 40 SOLVENT WELD JOINTS}

E. Condensate/Equipment Drainage:{CAST IRON STANDARD WEIGHT NO-HUB SLEEVE GASKETS}

1. Copper Pipe: Type DWV; Solder Joints: 1-1/4" (31.75 mm) to 4" (100 mm) {COPPER PIPE TYPE DWV}
2. PVC-DWV or ABS-DWV; Schedule 40; Solvent Weld Joints: All Sizes{PVC-DWV OR ABS-DWV SCHEDULE 40 SOLVENT WELD JOINTS}

3.3 TESTING PIPING

A. Sanitary Drainage, Sanitary Vent

1. Test all piping with water to prove tight.
2. Test piping before insulation is applied.

B. Hot Water - Potable and Non-Potable, Cold Water - Potable and Non-Potable

1. Test pipes underground or in chases and walls before piping is concealed.
2. Test all pipes before the insulation is applied. If insulation is applied before the pipe is tested and a leak develops which ruins the insulation, replace damaged insulation.

C. All Water Piping:

1. Flush all piping using faucets, flush valves, etc. until the flow is clean.
2. After flushing, thoroughly clean all inlet strainers, aerators, and other such devices.
3. If necessary, remove valves to clean out all foreign material.

3.4 INSTALLATION

A. Valves/Fittings and Accessories:

1. Install shutoff valves that permit the isolation of equipment/fixtures in each room without isolating any other room or portion of the building. Individual fixture angle stops do not meet this requirement. Exception: Back-to-back rooms in no more than two adjacent rooms.
2. Provide clearance for installation of insulation and access to valves and fittings.
3. Provide access doors for concealed valves and fittings.

B. Sanitary and Storm Piping:

1. Install all sanitary and storm piping inside the building with a slope as shown on the drawings.
2. Install horizontal offset at all connections to roof drains to allow for pipe expansion.
3. Slope sanitary and storm piping outside the building to meet invert elevations shown on drawings and to maintain a minimum velocity of 2 feet per second (0.6 m/s).
4. Sway Bracing: Where horizontal sanitary and/or storm pipes 4 inches (102mm) and larger change flow direction greater than 45°, rigid bracing or thrust restraints shall be installed to resist movement of the upstream pipe in the direction of pipe flow. The rigid bracing or thrust restraint shall be connected to structure. A change of flow direction from horizontal into a vertical pipe does not require the upstream pipe to be braced.

3.5 DISINFECTION OF DOMESTIC WATER PIPING SYSTEM

A. Disinfection of the domestic water piping shall be completed within three (3) weeks prior to building occupancy. Contractor is responsible for disinfecting water piping if used by workers during construction; disinfection during construction does not eliminate the requirement for final disinfection prior to occupancy. Flushing of piping shall be completed within two (2) weeks prior to building occupancy.

B. Follow the disinfection of potable water procedure outlined in this project's applicable plumbing code. For example: IPC 610.1, UPC 609.10, CPC 609.9, and Illinois 890.1180. Where local codes do not outline a disinfection procedure, follow the International Plumbing Code procedure 610.1.

END OF SECTION 22 10 00

SECTION 22 10 30 - PLUMBING SPECIALTIES

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Cleanouts.{CLEANOUTS}

B. Floor Drains and Sinks{FLOOR DRAINS AND SINKS}

C. Hub Drains and Standpipes{HUB DRAINS AND STANDPIPES}

D. Backflow Preventers.{BACKFLOW PREVENTERS}

E. Dielectric Fittings (Connections Between Dissimilar Metals).{DIELECTRIC FITTINGS (CONNECTIONS BETWEEN DISSIMILAR METALS)}

PART 2 - PRODUCTS

2.1 CLEANOUTS{CLEANOUTS}

A. Provide cleanouts as shown and specified on the drawings as well as required by code.

B. Coordinate floor cleanout cover with surrounding floor finish. Provide either solid, recessed for tile or terrazzo or carpet marker as applicable.

C. Cleanouts on exposed pipes shall be cast iron with heavy duty cast brass plug with raised head.

D. Cleanout shall be same size as the pipe up to 6" (150 mm) and 6" (150 mm) for larger pipes.

2.2 FLOOR DRAINS{FLOOR DRAINS AND SINKS}

A. Floor drains shall be in the form of a receptor with grate/strainer set flush with the surrounding floor.

B. Provide floor drains and sinks as shown and specified on the drawings as well as required by code.

2.3 HUB DRAINS AND STANDPIPES{HUB DRAINS AND STANDPIPES}

A. A hub drain shall be in the form of a hub or pipe without a grate/strainer extending through the floor for receiving indirect waste. A hub drain has a flood level rim above the finished floor.

B. Provide hub drains as shown and specified on the drawings as well as required by code.

2.4 BACKFLOW PREVENTERS{BACKFLOW PREVENTERS}

A. Provide backflow preventers as shown and specified on the drawings as well as required by code.

2.5 DIELECTRIC FITTINGS (CONNECTIONS BETWEEN DISSIMILAR METALS) {DIELECTRIC FITTINGS (CONNECTIONS BETWEEN DISSIMILAR METALS)}

A. Connections between dissimilar metals shall be insulating dielectric types that provide a water gap between the connected metals, and that either allow no metal path for electron transfer or that provide a wide water gap lined with a non-conductive material to impede electron transfer through the water path.

PART 3 - EXECUTION

3.1 INSTALLATION AND APPLICATION

A. Coordinate construction to receive drains at required invert elevations.

1. Install all materials conformance with code, manufacturer's requirements and industry recognized standards.

B. Floor Drains and Floor Sinks:{FLOOR DRAINS AND SINKS}

1. Drains in upper floors shall have a flashing of EPDM or similar membrane sheet. The sheet shall be at least 36" (900 mm) X 36" (900 mm) square with the drain in the center. Clamp membrane in auxiliary clamping ring of floor drain.
2. Use alternate sealing method when installing drains in existing floor slabs.
3. Coordinate sloping requirements with the architectural plans and specifications.
4. Top of floor drain and sinks grate/strainer shall not extend above the finished floor elevation.
5. Top of floor drain and sink grate/strainer shall not extend above the finished floor elevation. Grate/strainer shall be installed flush with surrounding finished floor. Should the Plumbing Contractor believe this presents a conflict with code, the issue should be evaluated before installation of the floor drain or sink begins. Proceeding with installing a floor drain or sink raised above the finished floor without prior approval will result in the Contractor being required to remove the drain or sink in question and reinstall it at the approved elevation.

C. Hub Drains and Standpipes:{HUB DRAINS AND STANDPIPES}

1. The top of a hub drain/standpipe shall extend above the finished floor elevation. Refer to drawings for dimensions above the finished floor.
2. Access shall be provided to drains and standpipes for rodding.

D. Backflow Preventer:{BACKFLOW PREVENTERS}

1. Provide an air gap fitting and piping to drain. On 2-1/2" (65 mm) and larger units, install a tail piece from air gap fitting to drain to prevent water from spraying out of drain air gap receptor. Maintain air gap distance required by Code.
2. Units shall be field tested and tagged in accordance with manufacturer's instructions and applicable codes by a certified tester before initial operation.
3. Install unit between 12" (300 mm) and 60" (1500 mm) above finish floor in a location that is accessible for annual testing and maintenance.

END OF SECTION 22 10 30

SECTION 22 40 00 - PLUMBING FIXTURES

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. All plumbing fixtures.

PART 2 - PRODUCTS

2.1 MATERIALS{MATERIALS}

A. All fixtures shall be lead free. Faucets, traps, stops, and other fixture accessories shall not contain more lead than allowed per the latest State or Federal Act.

B. P-Traps and Tailpieces:

1. Lavatories:
   a. Accessible Type: 1 ¼" chrome plated 17-gauge cast brass offset tailpiece and p-trap with cleanout on bottom of trap.
   b. Non-Accessible Type: Offset not required for tailpiece, otherwise same.
2. Sinks:
   a. Accessible Type: 1 ½" chrome plated 17-gauge cast brass offset tailpiece and p-trap with cleanout on bottom of trap.
   b. Non-Accessible Type: Offset not required for tailpiece, otherwise same.

SPECIFIER – Premanufactured covers are designed to protect users from scalding if they were to touch hot water pipe or waste pipe. It is commonly applied to cold water also to avoid condensation. This is cost effective and meets code, but if done poorly can look bad. Premanufactured rigid enclosures can offer an alternate way to meet this code requirement. Review with Owner.

C. Insulation Covers and Enclosures for Accessible Lavatories and Sinks:

1. Premanufactured cover for P-Trap, stop valves, and supply lines.
   a. 1/8" thick vinyl construction, paintable, tool free installation,
2. Premanufactured rigid enclosure for concealing lavatory P-Trap, stop valves, and supply lines.
   a. Rigid, high impact PVC, paintable, stainless steel fasteners for anchoring and removal.
3. Premanufactured rigid enclosure for concealing sink P-Trap, stop valves, supply lines, garbage disposal, etc.
   a. Rigid, high impact PVC, white or beige (Color by architect), paintable, 36" or 42" widths, stainless steel fasteners for anchoring and removal.

D. Wall Hung Fixture Carriers:{WALL HUNG FIXTURE CARRIERS}

1. Material: All Metal, ASME/ANSI A112.6.1M.
2. Water closet carrier shall be rated to support 500 lbs. (225 kg) unless noted otherwise on the drawings.

PART 3 - EXECUTION

3.1 INSTALLATION

A. General Installation Requirements:

1. Install fixtures per manufacturer's instructions and industry recognized standards.
2. Review millwork shop drawings. Confirm location and size of fixtures and openings before rough-in and installation.
3. Install each fixture with trap easily removable for servicing and cleaning. Use screwed tailpiece couplings. Connect fixture waste to stack with slip fitting.
4. Provide fixtures with supply lines, stop valves, reducers, escutcheons, and any other items required for a complete and operational plumbing fixture assembly.
5. Install components level and plumb.
6. Caulk joint between finish floor and floor mounted fixtures and between finish walls and wall mounted fixtures with silicon caulk. Caulk the joint, between rim and fixture where a fixture builds into a counter top, with caulking compound. Refer to DIVISION 7 for "Caulking" requirements. Color to match fixture.
7. Where there is a possibility of water following pipe brackets, etc., into a wall; caulk escutcheons, space around brackets, etc., to exclude water. Refer to DIVISION 7 for "Caulking" requirements.
8. Refer to [Plumbing Material List][architectural drawings] for fixture mounting heights.
9. All non-potable outlets shall be clearly marked with a permanently affixed laminated sign with 3/8" (10 mm) high lettering saying "Non-Potable Water Not for Human Consumption." Sign shall have black lettering on a yellow background.

B. ADA Accessible Exposed Sink and Lavatory Trim:

1. All exposed sink and lavatory traps, piping and angle stops installed at accessible sink and lavatory locations shall include offset style drain tailpiece, p-trap installed near and parallel with back wall, and insulation kit specially manufactured for this installation. Armaflex with duct tape is not acceptable.

C. ADA Accessible Water Closet Requirements:

1. Handicapped accessible water closet flush valve or flush tank handles shall be on the left hand or right hand side of the fixture, whichever is nearer to the center of the stall.
2. Coordinate flush valves in handicap accessible locations with grab bars installed by the General Contractor. Make modifications as necessary to flush valve piping to avoid conflict with grab bars. Common solutions include shortened or offset vacuum breaker tailpieces.

END OF SECTION 22 40 00

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DIX PARK - 1105 WAREHOUSE DRIVE RENOVATION
CITY OF RALEIGH
1105 WAREHOUSE DRIVE
RALEIGH, NC 27603

NO.	REVISION	DATE

JOB NUMBER
23-022

DATE ISSUED
06/01/2026

PROJECT STATUS
CONSTRUCTION DOCUMENTS

SHEET
PLUMBING SPECIFICATIONS

P403

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SUITE 113
RALEIGH, NC 27612
P: 919.571.1111

0 1 2 3
REF. SCALE IN INCHES
PROJECT #25007050.00

Plot Time: 6/1/2026 2:25:25 PM

VIEW KEY

NAME — LEVEL NAME; 10'-0" — HEIGHT ABOVE PROJECT 0'-0"	(1) — KEYNOTE: INDICATES NOTE USED TO DESCRIBE ADDITIONAL INFORMATION ABOUT WORK REQUIRED, SPECIFIC TO THE SHEET AND/OR DETAIL

VIEW NAME (1) 1/8" = 1'-0" NORTH

- INDICATES DIRECTION OF TRUE NORTH
- PLAN OR DETAIL NUMBER
- PLAN OR DETAIL NAME
- PLAN OR DETAIL SCALE

SIM / M101 / SIM / T101

- INDICATES SIMILAR DETAIL REFERENCED IN MULTIPLE LOCATIONS
- DETAIL REFERRED TO BY SECTION CUT
- SHEET DETAIL IS LOCATED ON

LINE TYPE AND TAG KEY:

NEW WORK BY THIS CONTRACTOR (WIDE LINE)
- NEW
- EXISTING TO BE REMOVED (SHORT DASHED PATTERN)
- NEW UNDERFLOOR OR UNDERGROUND (LONG DASHED PATTERN)

EXISTING TO REMAIN OR WORK BY OTHERS (NARROW LINE)
- EXISTING
- EXISTING TO BE REMOVED BY OTHERS (SHORT DASHED PATTERN)
- EXISTING UNDERFLOOR OR UNDERGROUND (LONG DASHED PATTERN)

HALFTONING DOES NOT MODIFY SCOPE.

'TAG'-E — TAGS WITH DASH 'E' INDICATES THE REFERENCED OBJECT IS EXISTING

TAG-1 — UNDERLINED TAG INDICATES OBJECT IS IN-SCOPE. IF NEW, ADDITIONAL INFORMATION IS AVAILABLE IN A SCHEDULE, MATERIAL LIST, OR SYMBOL LIST

INDICATES AN EXISTING SYSTEM'S POINT OF CONNECTION/REMOVAL

APPLICABLE CODES

CONTRACTOR SHALL COMPLY WITH APPLICABLE CODES AND LOCAL AMENDMENTS INCLUDING, BUT NOT LIMITED TO, THE FOLLOWING:

ENERGY CONSERVATION CODE:	NCECC 2018
MECHANICAL CODE:	NCMC 2018
PLUMBING CODE:	NCPC 2018
ELECTRICAL CODE:	NEC 2020

FIRE / SMOKE BARRIER DESIGNATIONS

FIRE AND SMOKE SEPARATIONS ARE NOT SHOWN ON THESE DOCUMENTS. CONTRACTOR SHALL REVIEW THE ARCHITECTURAL PLANS AND DETERMINE THE LOCATIONS OF ALL FIRE AND SMOKE PARTITIONS, BARRIERS, AND WALLS. THIS INCLUDES FLOOR RATINGS. PRICING SHALL INCLUDE ALL MATERIALS AND LABOR REQUIRED TO MAINTAIN THE RATINGS OF ALL RATED SEPARATIONS, WHETHER SHOWN ON THE ENGINEERING PLANS OR NOT.

HVAC ABBREVIATION KEY

ABBR:	DESCRIPTION:
AD	ACCESS DOOR
AFF	ABOVE FINISHED FLOOR
C	COMMON
CO	CLEANOUT
CFSD	CONTROL/FIRE/SMOKE DAMPER
DN	DOWN
DPG (0-2")	DIFFERENTIAL PRESSURE GAUGE (RANGE)
DPS	DIFFERENTIAL PRESSURE SWITCH
EP	ELECTRICAL TO PNEUMATIC VALVE
FD	FIRE DAMPER
FOB	FLAT ON BOTTOM
FOT	FLAT ON TOP
FSD	FIRE/SMOKE DAMPER
MV	MIXING VALVE
N.C.	NORMALLY CLOSED
NIC	NOT IN CONTRACT
N.O.	NORMALLY OPEN
PS	PRESSURE SWITCH
SCCR	SHORT CIRCUIT CURRENT RATING
SD	SMOKE DAMPER
TAB	TERMINAL AIR BOX
TD	TRANSFER DUCT
TYP	TYPICAL
UC-1	DOOR UNDERCUT BY OTHERS (1" TYPICAL)
UON	UNLESS OTHERWISE NOTED

MECHANICAL RENOVATION NOTES:

THESE NOTES APPLY TO ALL MECHANICAL SHEETS AND TRADES, INCLUDING BUT NOT LIMITED TO, VENTILATION, AND PIPING.

1. EXISTING CONDITIONS ARE SHOWN BASED ON INFORMATION OBTAINED FROM FIELD SURVEYS, EXISTING BUILDING DOCUMENTS, AND STAFF. VERIFY EXISTING CONDITIONS AND REPORT ANY CONFLICTS BEFORE PROCEEDING.
2. NOT ALL EXISTING DUCTWORK AND PIPING IS SHOWN. VERIFY EXISTING CONDITIONS BEFORE STARTING WORK. NOTIFY ENGINEER OF ANY CONFLICTS WITH NEW WORK.
3. FIELD VERIFY THE AVAILABLE CLEARANCES FOR DUCTWORK AND PIPING BEFORE FABRICATION. RISES AND DROPS MAY BE NECESSARY BECAUSE OF EXISTING FIELD CONDITIONS.
4. EACH CONTRACTOR SHALL FIELD VERIFY ACCESSIBILITY TO THE AREA OF THEIR WORK AND SHALL NOTIFY THE GENERAL CONTRACTOR PRIOR TO BIDDING IF OTHER UTILITIES ARE REQUIRED TO BE REMOVED OR RELOCATED TO ALLOW ACCESS TO THEIR AREA OF WORK.
5. THE GENERAL CONTRACTOR IS RESPONSIBLE FOR CUTTING, REMOVAL AND PATCHING OF ROOFS, WALLS, AND FLOORS ASSOCIATED WITH WORK BY ALL CONTRACTORS. CONTRACTORS SHALL NOTIFY THE GC OF AFFECTED AREAS PRIOR TO BIDDING.
6. THE GENERAL CONTRACTOR IS RESPONSIBLE FOR REMOVAL AND REPLACEMENT OF CEILINGS, CEILING TILES, AND CEILING GRIDS ASSOCIATED WITH AREAS OF WORK BY ALL CONTRACTORS. NOTIFY THE GENERAL CONTRACTOR OF AFFECTED AREAS PRIOR TO BIDDING.
7. WHERE EXISTING MECHANICAL SYSTEMS DIFFER FROM THOSE SHOWN ON THE PROJECT DRAWINGS AND CREATE CONFLICTS WITH NEW EQUIPMENT, PIPING, OR DUCTWORK INSTALLATIONS, THE CONTRACTOR SHALL PROVIDE DETAILED DOCUMENTATION (SUCH AS SKETCHES, PHOTOS, AND DIMENSIONS) ALONG WITH RECOMMENDATIONS TO RESOLVE THE CONFLICT. THIS INFORMATION MUST BE SUBMITTED TO THE ENGINEER FOR REVIEW AND APPROVAL. NO WORK RELATED TO THE CONFLICT SHALL PROCEED UNTIL AN APPROVED RESOLUTION IS PROVIDED BY THE ENGINEER.
8. PROVIDE TEMPORARY CONNECTIONS TO MAINTAIN EXISTING SYSTEMS IN SERVICE DURING CONSTRUCTION. MAINTAIN ACCESS TO EXISTING MECHANICAL INSTALLATIONS THAT REMAIN ACTIVE.
9. OBTAIN PERMISSION FROM OWNER BEFORE SHUTTING DOWN ANY SYSTEM FOR ANY REASON. MAINTAIN SERVICE TO ALL COMPONENTS THAT ARE TO REMAIN UNTIL NEW SYSTEMS ARE INSTALLED.
10. MAINTAIN EXISTING SYSTEM IN SERVICE UNTIL NEW SYSTEM IS COMPLETE AND READY FOR TIE IN AND SWITCHOVER. DRAIN SYSTEM ONLY TO MAKE SWITCHOVERS AND CONNECTIONS. OBTAIN PERMISSION FROM OWNER BEFORE PARTIALLY OR COMPLETELY DRAINING SYSTEM. MAKE CHANGEOVER TO NEW SYSTEMS WITH MINIMUM OUTAGE.
11. PROPERLY RECLAIM AND DISPOSE OF ALL REFRIGERANT IN REMOVED EQUIPMENT/ REFRIGERANT PIPING. RECLAIMED REFRIGERANT SHALL HAVE DOCUMENTATION AS REQUIRED BY THE AUTHORITY HAVING JURISDICTION (AHJ).

OUTSIDE AIR SUMMARY:

REQUIRED:

TOTAL REQUIRED = 2172 SQFT * 0.06 CFM/SQFT + 28 PERSONS * 5 CFM/PERSON = 270 CFM

PROVIDED:

RTU-1 = 275 CFM

REFRIGERANT CHARGE SUMMARY:

THE EQUATIONS BELOW REPRESENT THE MAXIMUM ALLOWABLE EFFECTIVE DISPERSAL VOLUME CHARGE. EACH MECHANICAL SYSTEM SHALL HAVE A TOTAL CHARGE VOLUME LESS THAN WHAT IS PROVIDED IN THE EQUATIONS BELOW. TOTAL CHARGE VOLUMES SHALL COMPLY WITH MANUFACTURER'S INSTALLATION INSTRUCTIONS.

ASHRAE 15 EQUATION 7-8:

EDVC = V/eff X LFL X CF X F/occ

EDVC = EFFECTIVE DISPERSAL VOLUME CHARGE (LB)
V/eff = EFFECTIVE DISPERSAL VOLUME (FT3)
LFL = LOWER FLAMMABILITY LIMIT (LB/FT3)
CF = CONCENTRATION FACTOR (VALUE OF 0.5)
F/occ = OCCUPANCY ADJUSTMENT FACTOR (VALUE OF 1 FOR ALL OCCUPANCIES OTHER THAN INDUSTRIAL)

RTU-1 = 26,064 FT3 * 0.0191 LB/FT3 * 0.5 * 1.0 = 248.9 LBS

ESTIMATED INSTALLED REFRIGERANT LINESET LENGTHS AND CHARGE VOLUMES:

RTU-1: 8.2 LBS OF R454B

1

VENTILATION GENERAL NOTES:

1. UNLESS NOTED OTHERWISE, THE SIZE OF EACH BRANCH DUCT TO AN AIR TERMINAL SHALL MATCH THE INLET SIZE.
2. UNLESS NOTED OTHERWISE, DUCT SIZES SHOWN ON DRAWINGS ARE INSIDE CLEAR DIMENSIONS. MAINTAIN CLEAR DIMENSIONS INSIDE ANY LINING
3. ALIGN TEMPERATURE SENSORS WITH LIGHT SWITCHES AND WHEN IN CLOSE PROXIMITY TO EACH OTHER.
4. PROVIDE ACCESS DOORS AT ALL DUCT MOUNTED EQUIPMENT.
5. EXISTING AIR INLET AND OUTLET CFM SHOWN ON DRAWINGS ARE FROM EXISTING DRAWINGS, AND ARE FOR REFERENCE ONLY. CONTRACTOR SHALL USE PRE-BALANCE VALUES, AND NOT EXISTING CFM SHOWN ON DRAWINGS.
6. CONTRACTOR MAY REUSE PORTIONS OF EXISTING DUCT PROVIDED SIZES AND PRESSURE CLASSES ARE CORRECT, DUCT IS THOROUGHLY CLEANED AND FREE OF DEFECTS, AND ALL TRANSVERSE JOINTS, LONGITUDINAL SEAMS, AND DUCT WALL PENETRATIONS ARE SEALED AS SPECIFIED FOR NEW DUCTWORK.
7. CLEAN ALL SUPPLY, RETURN, AND EXHAUST DUCTWORK UPSTREAM OF ALL NEW CONNECTIONS PER SPECIFICATION SECTION 23 31 00.

MECHANICAL GENERAL NOTES:

THESE NOTES APPLY TO ALL MECHANICAL SHEETS AND TRADES, INCLUDING BUT NOT LIMITED TO, VENTILATION, AND PIPING.

1. DRAWINGS SHOWING LOCATIONS OF EQUIPMENT, DUCTWORK, PIPING, ETC. ARE DIAGRAMMATIC AND MAY NOT ALWAYS REFLECT EXACT INSTALLATION CONDITIONS. DRAWINGS SHOW THE GENERAL ARRANGEMENT OF DUCTWORK, PIPING, EQUIPMENT, ETC., AND MAY NOT INCLUDE ALL OFFSETS AND FITTINGS REQUIRED FOR COMPLETE INSTALLATION. THE DRAWINGS SHALL BE FOLLOWED AS CLOSELY AS ACTUAL BUILDING CONSTRUCTION AND THE WORK OF OTHERS WILL PERMIT.
2. CATALOG AND MODEL NUMBERS SHALL NOT BE CONSIDERED COMPLETE, BUT ARE GIVEN AS AN AID TO THE CONTRACTOR AND TO INDICATE THE QUALITY REQUIRED. CONTRACTOR IS RESPONSIBLE FOR THE COMPLETE DESCRIPTION OF MATERIAL SCHEDULED ON THESE DRAWINGS AND IN THE SPECIFICATIONS BEFORE ORDERING. THE DESCRIPTION OF THE MATERIAL AND SCHEDULED PERFORMANCE TAKES PRECEDENCE OVER THE MODEL NUMBER. THE FIRST MANUFACTURER SCHEDULED IS THE BASIS OF DESIGN.
3. DETERMINATION OF QUANTITIES OF MATERIAL AND EQUIPMENT REQUIRED SHALL BE MADE BY THE CONTRACTOR FROM THE DOCUMENTS. WHERE MATERIAL AND/OR QUANTITY DISCREPANCIES ARISE BETWEEN DRAWINGS, SCHEDULES AND/OR SPECIFICATIONS, THE HIGHER QUALITY/ GREATER NUMBER SHALL GOVERN.
4. DO NOT SCALE DRAWINGS. VERIFY ALL DIMENSIONS AND CLEARANCES FROM ARCHITECTURAL, STRUCTURAL, SUBMITTALS, AND OTHER APPROPRIATE DRAWINGS OR PHYSICALLY AT SITE. REVIEW ALL DRAWINGS, INCLUDING THOSE OF OTHER TRADES.
5. COORDINATE ALL WORK WITH ALL OTHER TRADES PRIOR TO INSTALLATION TO PROVIDE CLEARANCES REQUIRED FOR OPERATION, MAINTENANCE, CODE COMPLIANCE, AND TO VERIFY NON-INTERFERENCE WITH OTHER WORK. DO NOT FABRICATE PRIOR TO VERIFICATION OF NECESSARY CLEARANCES FOR ALL TRADES. BRING ANY INTERFERENCES OR CONFLICTS TO THE ATTENTION OF THE ARCHITECT/ENGINEER BEFORE PROCEEDING WITH FABRICATION OR EQUIPMENT ORDERS.
6. REVIEW SPACE REQUIREMENTS OF EQUIPMENT SPECIFIED OR SUBSTITUTED AND MAKE REASONABLE ACCOMMODATIONS IN LAYOUT AND POSITIONING TO PROVIDE PROPER ACCESS.
7. ANY CHANGES REQUIRED TO ELIMINATE CONFLICTS OR THAT RESULT FROM A FAILURE TO COORDINATE SHALL BE MADE BY THE CONTRACTOR WITHOUT ADDITIONAL COST OR EXPENSE TO OTHERS.
8. EACH CONTRACTOR IS RESPONSIBLE FOR ALL COSTS ASSOCIATED WITH ELECTRICAL CHANGES REQUIRED FOR EQUIPMENT PROPOSED THAT DIFFERS FROM THE BASIS OF DESIGN.
9. REFER TO ARCHITECTURAL REFLECTED CEILING PLAN, ELECTRICAL, TECHNOLOGY AUDIO/VISUAL, AND OTHER MECHANICAL PLANS FOR EXACT LOCATIONS OF ALL CEILING MOUNTED DEVICES, OTHER THAN SPRINKLERS.
10. EACH CONTRACTOR IS RESPONSIBLE FOR DAMAGE CAUSED BY THEIR ACTIONS TO WALLS, FLOORS, CEILINGS, AND ROOFS. THE CONTRACTOR WHOSE WORK CAUSES DAMAGE IS RESPONSIBLE FOR PATCHING TO MATCH ORIGINAL CONSTRUCTION, FIRE RATING, AND FINISH.
11. IN AREAS WITH DRYWALL CEILINGS COORDINATE LOCATIONS OF ACCESS PANELS WITH THE GC FOR ACCESS TO VALVES, DUCTWORK ACCESSORIES, DAMPERS, ETC. COORDINATE PANEL TYPE AND COLOR WITH ARCHITECT. NOTIFY THE GC OF THE REQUIRED ACCESS PANELS PRIOR TO BIDDING.
12. SEAL ALL FLOOR, WALL, AND ROOF PENETRATIONS AIRTIGHT WHERE CONDUITS, PIPING, AND DUCTS PENETRATE.
13. CAULK ALL PIPE AND DUCT PENETRATIONS OF FULL HEIGHT NON-FIRE RATED WALL, PARTITION, FLOOR, AND ROOF ASSEMBLIES. THIS IS ESSENTIAL TO PREVENT NOISE TRANSMISSION FROM ONE ROOM TO ANOTHER AND TO PROVIDE THE DESIRED NC LEVELS WITHIN ROOMS.
14. WHERE PIPES AND DUCTS ARE SHOWN TO PENETRATE FLOORS, PROVIDE SLEEVED OPENINGS WITH THE TOP EDGE RAISED ABOVE FLOOR SURFACE IN ACCORDANCE WITH ALL RELEVANT SPEC SECTIONS. SEAL SLEEVE PERIMETER TO BE WATERTIGHT.
15. EQUIPMENT SIZES AND SERVICE CLEARANCE REQUIREMENTS VARY AMONG DIFFERENT MANUFACTURERS. CONSULT APPROVED SHOP DRAWINGS FOR EQUIPMENT SIZES AND REQUIRED SERVICE CLEARANCES. COORDINATE WITH LAYOUT OF EQUIPMENT PADS, PIPING, DUCTWORK, ETC.
16. DO NOT BLOCK TUBE PULL OR EQUIPMENT SERVICE CLEARANCES.
17. MAINTAIN A MINIMUM WORKING CLEARANCE OF 3'-0" IN FRONT OF ALL ELECTRICAL EQUIPMENT REQUIRING MAINTENANCE, INSPECTION, AND TESTING INCLUDING BUT NOT LIMITED TO PANELS, DISTRIBUTION PANELS, SWITCHBOARDS, MOTOR CONTROL CENTERS, TRANSFORMERS, EQUIPMENT DISCONNECTS AND STARTERS.
18. MAINTAIN THE DEDICATED ELECTRICAL EQUIPMENT SPACE DEFINED BY THE WIDTH / DEPTH OF ELECTRICAL EQUIPMENT MEASURED FROM THE FLOOR TO A HEIGHT 6'-0" ABOVE THE EQUIPMENT OR THE STRUCTURAL CEILING, WHICHEVER IS LOWER. SYSTEMS FOREIGN TO THE ELECTRICAL SYSTEM ARE NOT ALLOWED IN THE DEDICATED ELECTRICAL SPACE INCLUDING: DUCTWORK, PIPING, ETC.
19. DO NOT EXCEED 25 LBS PER HANGER AND A MINIMUM SPACING OF 2'-0" ON CENTER WHEN ATTACHING TO METAL ROOF DECKING (LIMITATION NOT REQUIRED WITH CONCRETE ON METAL DECK). THIS 25 LBS. LOAD AND 2'-0" SPACING INCLUDE ADJACENT ELECTRICAL AND ARCHITECTURAL ITEMS HANGING FROM DECK. IF THE HANGER RESTRICTIONS CANNOT BE ACHIEVED, SUPPLEMENTAL FRAMING OFF STEEL FRAMING SHALL BE ADDED. ANCHORS EMBEDDED IN CONCRETE SHALL BE CRACKED CONCRETE APPROVED IN ACCORDANCE WITH SPECIFICATIONS.
20. MECHANICAL SYSTEMS AND INSTALLATION SHALL COMPLY WITH ALL SECTIONS OF 2022 ASHRAE 15 AS PATH #1 OF OSFM GUIDANCE PER SECTION 105 ALTERNATE MEANS AND METHOD.
21. REFRIGERANT PIPING SHALL BE INSTALLED PER ASHRAE 15 SECTION 9.12. WHERE PIPING IS INSTALLED WITHIN BUILDING ELEMENTS, PROTECT PIPING WITH STEEL SHIELD OR PROVIDE 1.5" OF CLEARANCE FROM NEAREST BUILDING MEMBER. WHERE REFRIGERANT PIPING IS EXPOSED IN MECHANICAL ROOMS OR CLOSETS, PIPING SHALL BE LABELED IN ACCORDANCE WITH 2022 ASHRAE 15 SECTION 9.12.1.8.

1

MECHANICAL DESIGN CONDITIONS:

DESIGN CONDITIONS: BASED ON WEATHER DATA FOR: RALEIGH, NC

SUMMER:	93°F DRY BULB, 76°F WET BULB
WINTER:	16°F DRY BULB

TYPICAL ROOM SETPOINTS:

SUMMER DESIGN:	74°F DRY BULB, 60% RELATIVE HUMIDITY
WINTER DESIGN:	70°F DRY BULB
SUMMER SETBACK:	78°F DRY BULB
WINTER SETBACK:	66°F DRY BULB

HVAC SHEET INDEX

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DIX PARK - 1105 WAREHOUSE DRIVE RENOVATION

CITY OF RALEIGH

1105 WAREHOUSE DRIVE
RALEIGH, NC 27603

NORTH CAROLINA IMEG CONSULTANTS CORP. No. F-1507 PROFESSIONAL CORPORATION

6/1/26
NORTH CAROLINA PROFESSIONAL SEAL 051195 ENGINEER

NO.	REVISION	DATE
1	PLAN CHECK	6/1/2026

JOB NUMBER
23-022

DATE ISSUED
06/01/2026

PROJECT STATUS
CONSTRUCTION DOCUMENTS

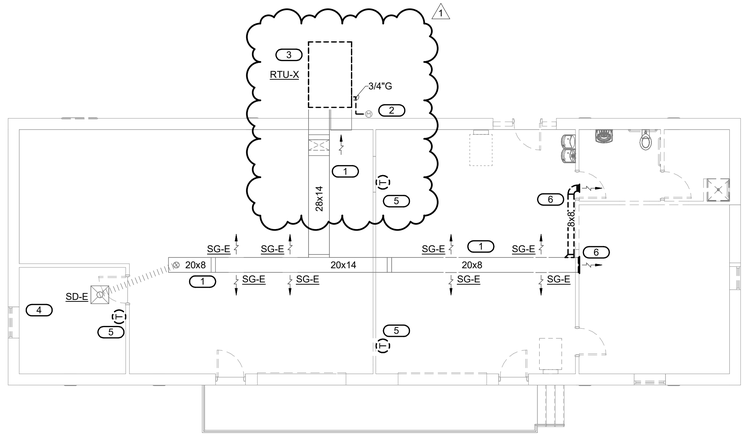
SHEET
HVAC COVERSHEET

Plot Time: 6/1/2026 8:10:01 AM

M000

DEMO KEY NOTES:

1. EXISTING DUCTWORK AND ALL ASSOCIATED AIR DISTRIBUTION TO REMAIN.
2. EXISTING GAS METER TO REMAIN.
3. REPLACE EXISTING PACKAGED UNIT WITH NEW. SEE SCHEDULE ON SHEET M600 FOR MORE INFORMATION. ALL ASSOCIATED DUCTWORK, AIR DISTRIBUTION, CONTROLS, ETC TO REMAIN. REMOVE EXISTING 3/4" GAS PIPING AND PREPARE FOR NEW WORK CONNECTION.
4. REMOVE EXISTING BASEBOARD MOUNTED HEATER AND ALL ASSOCIATED CONTROLS.
5. REMOVE EXISTING THERMOSTAT.
6. REMOVE EXISTING DUCTWORK AND GRILLE.

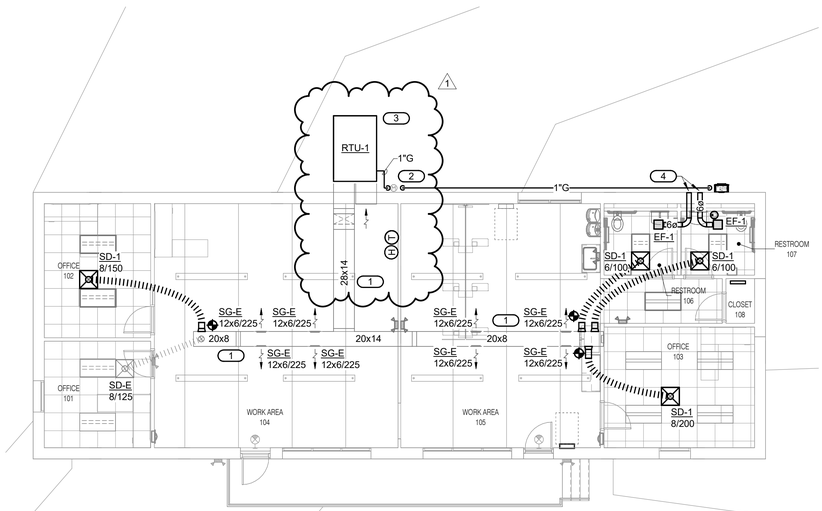


2 LEVEL 01 DEMOLITION PLAN - HVAC

1/8" = 1'-0"

RENO KEY NOTES:

1. EXISTING DUCTWORK AND ALL ASSOCIATED AIR DISTRIBUTION TO REMAIN.
2. EXISTING GAS METER TO REMAIN. NEW LOAD TO BE 350 MBH AT 0.25 PSI. PIPE SIZE BASED ON TOTAL DEVELOPED LENGTH OF 90 FEET AND 2018 NCFGC TABLE 402.4(2). PROVIDE NEW 1-1/4" HEADER OFF GAS METER.
3. PROVIDE NEW RTU AND RECONNECT TO EXISTING DUCTWORK AS REQUIRED. PROVIDE NEW 1" PIPE FROM HEADER. NEW PACKAGED UNIT MOUNTED ON EXISTING STAND. SEE SHEET M600 FOR MORE INFORMATION.
4. ROUTE 6"Ø EXHAUST DUCT TO EXTERIOR. TERMINATE WITH WALL CAP.



1 LEVEL 01 PLAN - HVAC

1/8" = 1'-0"

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NORTH CAROLINA PROFESSIONAL CORPORATION — IMEG CONSULTANTS CORP. — No. P-1507

6/1/26

NORTH CAROLINA PROFESSIONAL ENGINEER — SEAL 051195

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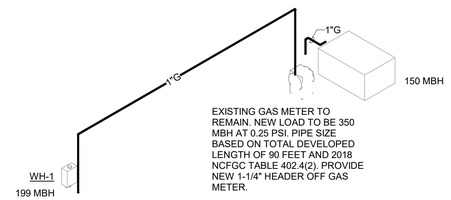
DATE ISSUED
06/01/2026

PROJECT STATUS
CONSTRUCTION DOCUMENTS

SHEET
LEVEL 01 PLAN - HVAC

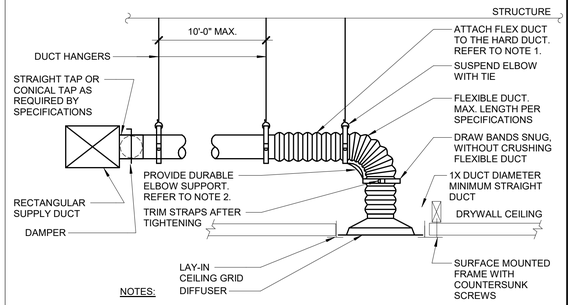
M201

Plot Time: 6/1/2026 8:10:03 AM



EXISTING GAS METER TO REMAIN. NEW LOAD TO BE 350 MBH AT 0.25 PSI. PIPE SIZE BASED ON TOTAL DEVELOPED LENGTH OF 90 FEET AND 2018 NCFGC TABLE 402.4(2). PROVIDE NEW 1-1/4" HEADER OFF GAS METER.

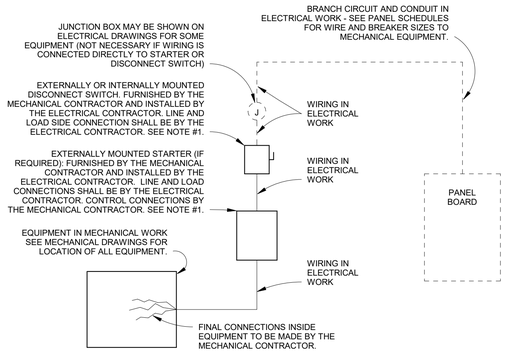
5 GAS RISER
NO SCALE



NOTES:

1. TO ATTACH FLEX DUCT TO THE HARD DUCT, TAPE THE INNER LINER TO THE HARD DUCT THEN ATTACH WITH TWO NYLON TIE WRAPS; ONE FOR THE INNER LINER AND ONE FOR THE OUTER SHELL. FOLD THE OUTER SHELL INSIDE ITSELF SO IT HAS NEAT EDGES PRIOR TO TIE WRAPPING.
2. DURABLE ELBOW SUPPORT ACCEPTABLE MANUFACTURER AND MODEL: HART AND COOLEY - SMARTFLOW, THERMAFLEX - FLEXFLOW, TITUS - FLEXRIGHT, OR APPROVED EQUAL.

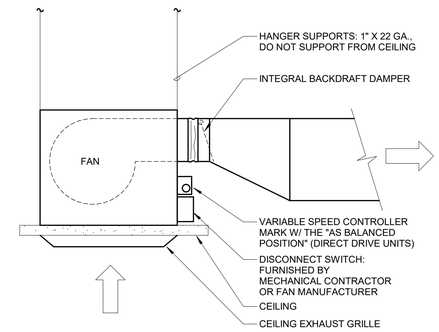
2 SUPPLY DIFFUSER DETAIL
NO SCALE



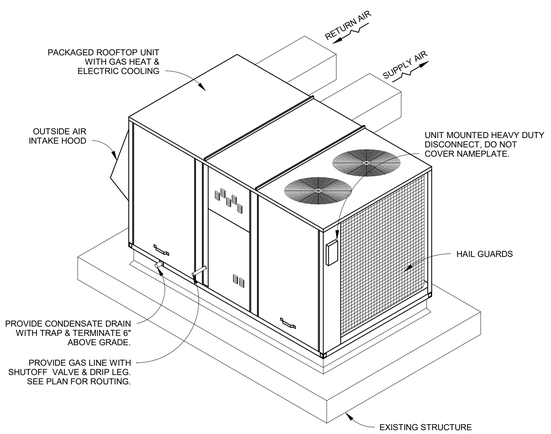
NOTE:

1. A COMBINATION STARTER MAY BE USED IN LIEU OF A SEPARATE DISCONNECT SWITCH AND STARTER.
   - COMBINATION STARTER SHALL BE FURNISHED AND INSTALLED BY THE MECHANICAL CONTRACTOR.
   - LINE AND LOAD SIDE CONNECTION SHALL BE BY THE ELECTRICAL CONTRACTOR.
   - CONTROL CONNECTIONS BY THE MECHANICAL CONTRACTOR.
2. ELECTRICAL CONTRACTOR SHALL FURNISH ALL REQUIRED FUSES.

4 TYPICAL WIRING DETAIL
NO SCALE



1 CABINET FAN DETAIL
NO SCALE



3 GAS PACK DETAIL (ALTERNATE #1)
NO SCALE

IMEG
3321 BLUE RIDGE ROAD
SUITE 113
RALEIGH, NC 27612
P: 919.571.1111
www.imegcorp.com

0 1 2 3
REF. SCALE IN INCHES
PROJECT #25007050.00

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Office 919.828.2301
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DIX PARK - 1105 WAREHOUSE DRIVE
RENOVATION

CITY OF RALEIGH
1105 WAREHOUSE DRIVE
RALEIGH, NC 27603

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL IMEG CONSULTANTS CORP. No. F-1507

6/1/26
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 051195 PATRICK J. MCDUFFIE

NO.	REVISION	DATE

JOB NUMBER
23-022

DATE ISSUED
06/01/2026

PROJECT STATUS
CONSTRUCTION DOCUMENTS

SHEET
HVAC DETAILS

M400

Raleigh

JURISDICTIONAL ALTERNATE METHOD APPROVAL

A2L REFRIGERANTS

This is a jurisdictional Alternate Method approval (City of Raleigh) to allow registered design professionals and Mechanical Contractors to use A2L low flammability refrigerants in their HVAC systems and designs to include high-probability systems prior to the effective date of the NC 2024 Mechanical and Building Codes.

This approval requires compliance with Chapters 1-10 and Chapters 12-15 of the 2018 NCMC as applicable to the installation.

This approval is only good for the following three paths of compliance:

1) Path 1 – Utilizing ASHRAE 15-2022 under the 2018 North Carolina Mechanical Code, Section 105.2 "Alternate materials, methods, equipment and appliances."
2) Path 2 – Utilizing Chapter 11 of the 2024 North Carolina Mechanical Code under the 2018 North Carolina Mechanical Code, Section 105.2 "Alternate materials, methods, equipment and appliances."
3) Path 3 – 2018 North Carolina Mechanical Code, Prescriptive Method.

Please see attached links for important NCDOI guidance below.

https://www.ncosfm.gov/engineering-newsletter-june-2024-a2l-edition/open

https://www.ncosfm.gov/guidance-papers/a2l-refrigeration-system-installation-under-2018-north-carolina-mechanical-code/open

Any other path of compliance will require a standard "Request for Alternate Methods" submitted to the City of Raleigh for review and approval.

Bryan Robinson

Chief Building Official

03/13/2025

Signature Bryan D. Robinson

Date 03/20/2025

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AIR TERMINAL SCHEDULE (EG, RG, SD, etc.)

NOTES:
1. REFER TO DRAWINGS FOR NECK SIZE. ALL BRANCH DUCTWORK TO AIR TERMINALS SHALL BE NECK SIZE UNLESS NOTED OTHERWISE.
2. CONTRACTOR SHALL DETERMINE PROPER BORDER TYPE TO MATCH CEILING/WALL CONSTRUCTION.
3. COORDINATE FINISH WITH ARCHITECT.
4. GRILLE TO HAVE FULLY LOUVERED FACE.
5. PROVIDE WITH INSULATED SHEET METAL PLENUM.
6. PROVIDE WITH EXTRACTOR AND FRAME FOR DUCT MOUNTING.
7. PROVIDE WITH OPPOSED BLADE DAMPER.

TAG NAME	TYPE	MATERIAL	FACE SIZE (NOTE 1,2) WIDTH	FACE SIZE (NOTE 1,2) HEIGHT	BORDER	MANUFACTURER	MODEL	NOTES
SD-1	LOUVERED LAY-IN	STEEL	24"	24"	LAY-IN	PRICE	SCD	1-5

FAN SCHEDULE

NOTES:
1. PROVIDE WITH DISCONNECT SWITCH.
2. PROVIDE WITH BACKDRAFT DAMPER.
3. CONTROL VIA LIGHT SWITCH BY E.C.

TAG NAME	SERVICE	ARRANGEMENT	CFM DESIGN	TOTAL S.P. IN. WC	WHEEL DIA	RPM	MOTOR WATTS	DAMPER TYPE	ELECTRICAL VOLTS	ELECTRICAL PH	MANUFACTURER	MODEL	NOTES
EF-1	TOILET	CABINET FAN	105	0.25	0"	1500	67	BACKDRAFT	120	1	COOK	GC-140	1-3
EF-1	TOILET	CABINET FAN	105	0.25	0"	1500	67	BACKDRAFT	120	1	COOK	GC-140	1-3

PACKAGED UNIT SCHEDULE

NOTES:
1. PROVIDE WITH HEAVY DUTY FUSIBLE DISCONNECT SWITCH.
2. PROVIDE WITH HORIZONTAL CONVERSION KIT AND HAIL GUARDS.
3. PROVIDE WITH 2" MERV 13 FILTERS.
4. PROVIDE WITH OUTSIDE AIR INTAKE WEATHER HOOD WITH WASHABLE METAL FILTER.
5. PROVIDE WITH PROGRAMMABLE THERMOSTAT.
6. PROVIDE WITH HOT GAS REHEAT COIL AND WALL MOUNTED HUMIDISTAT.
7. UNIT IS PROVIDED WITH R-454B REFRIGERANT.

TAG NAME	FAN CFM	FAN S.P.	FAN HP	COOLING CAPACITY TOTAL	COOLING CAPACITY SENSIBLE	GAS HEATING INPUT	GAS HEATING OUTPUT	ELECTRICAL VOLTS	ELECTRICAL PH	ELECTRICAL MCA	ELECTRICAL MOCP	WEIGHT	MANUFACTURER	MODEL	NOTES
RTU-1	2475	1.232	3	90.89 MBH	65.86 MBH	150 MBH	121.5 MBH	208	3	43	50	1033 LBS	TRANE	YSK060AS0M	1-7

1

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DIX PARK - 1105 WAREHOUSE DRIVE RENOVATION

CITY OF RALEIGH

1105 WAREHOUSE DRIVE
RALEIGH, NC 27603

NORTH CAROLINA PROFESSIONAL ENGINEER CORPORATE SEAL — IMEG CONSULTANTS CORP. No. F-1507

6/1/26

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 051195 — PATRICK J. MICHALSKI

NO.	REVISION	DATE
1	PLAN CHECK	6/1/2026

JOB NUMBER
23-022

DATE ISSUED
06/01/2026

PROJECT STATUS
CONSTRUCTION DOCUMENTS

SHEET
HVAC SCHEDULES

M600

Plot Time/6/1/2026 6:10:04 AM

SECTION 22 10 23 - NATURAL GAS PIPING
PART 1 - GENERAL
1.1 SECTION INCLUDES
A. Pipe and Pipe Fittings.
B. Valves.
C. Natural Gas Piping System.
PART 2 - PRODUCTS
2.1 NATURAL GAS (0 to 125 PSI (865 kPa))[NATURAL GAS (0 TO 125 PSI (0 TO 865 KPA) OR PROPANE (0 TO 125 PSI (0 TO 865 KPA)]
A. Design Pressure: 125 psi (865 kPa). Maximum Design Temperature: 350°F (177°C)
B. Piping - 2" (50 mm) and Under:{PIPING - 2" (50 MM) AND UNDER THREADED AND COUPLED}
1. Pipe: Standard weight black steel, threaded and coupled, ASTM A53.
2. Joints: Screwed. (NOTE: For below ground, all sizes to have welded joints.)
3. Fittings: 150# (1035 kPa) steam - 300# (2070 kPa) CWP, black malleable iron, banded, ASTM A197, ANSI B16.3.
4. Unions: 250# (1725 kPa) - 500# (3445 kPa) CWP, black malleable iron, ANSI B16.39, ground joint with brass seat.
C. Shutoff Valves/Throttling Valves:
1. For pipe systems where mechanical press connections are allowed, shutoff valves with mechanical press connections are acceptable subject to the requirements in the paragraphs below.
2. BA-13: 2" (50 mm) and under, threaded 600 psi (4135 kPa) CWP; UL listed for 250# (1725 kPa) LP, flammable liquid, heating oil, natural and manufactured gases, 150 psi (1035 kPa) steam, bronze body and chrome plated brass ball, Teflon seats and packing.{BA-13}
a. Body: Bronze.
b. Body: Dezincification resistant brass alloy. Jomar T-100NE.
PART 3 - EXECUTION
3.1 INSTALLATION
A. Install all piping conforming to code, manufacturers' requirements and industry recognized standards.
B. Route piping in orderly manner, straight, plumb, with consistent pitch, parallel to building structure, with minimum use of offsets and couplings. Provide only offsets required for needed headroom or clearance and needed flexibility in pipe system.
C. Install piping to conserve building space, and not interfere with other work.
D. Do not install piping or other equipment above electrical switchboards or panelboards. This includes a dedicated space extending 25 feet (7600 mm) from the floor to the structural ceiling with width and depth equal to the equipment.
E. Group piping whenever practical at common elevations.
F. Install piping to allow for expansion and contraction without stressing pipe, joints, or connected equipment.
G. Provide shutoff valves and flanges or unions at all connections to equipment, traps, and items that require servicing.
3.2 BONDING AND GROUNDING
A. Each above ground portion of a corrugated stainless steel tubing gas piping systems shall be bonded to the electrical service grounding electrode system. The bonding jumper shall connect to a metallic pipe or fitting between the point of delivery and the first downstream corrugated stainless steel tube fitting. The bonding jumper shall not be smaller than 6 AWG copper wire or equivalent. Gas piping systems that contain one or more segments of corrugated stainless steel tubing shall be bonded in accordance with this section.
B. Each above ground portion of a gas piping system, other than corrugated stainless steel tubing systems, that is likely to become energized shall be electrically continuous and bonded to an effective ground-fault current path. Gas piping, other than corrugated stainless steel tubing, shall be considered to be bonded when it is connected to appliances that are connected to the appliance grounding conductor of the circuit supplying that appliance.
C. Gas piping shall not be used as a grounding conductor or electrode.
D. Where a lightning protection system is installed, the bonding of the gas piping shall be in accordance with NFPA 780, Standard for the Installation of Lightning Protection Systems.
3.3 DRAINING AND VENTING
A. Unless otherwise indicated on the drawings, all horizontal pipes, including branches, shall pitch 1" (25 mm) in 40 feet (12,200 mm) to low points for complete drainage.
3.4 JOINING OF PIPE
A. Threaded Joints:{PIPING - 2" (50 MM) AND UNDER THREADED AND COUPLED}
1. Ream pipe ends and remove all burrs and chips.
2. Protect plated pipe and valve bodies from wrench marks when making up joints.
3. Apply gas-rated Teflon tape or thread compound to male threads.
3.5 PAINTING EXPOSED PIPE
A. Paint all outdoor exposed natural gas piping the color selected by Owner or Architect/Engineer.
END OF SECTION 22 10 23

SECTION 23 05 00 - BASIC HVAC REQUIREMENTS
PART 1 - GENERAL
1.1 SECTION INCLUDES
A. Requirements applicable to all Division 23 Sections. Also refer to Division 01 - General Requirements.
B. All materials and installation methods shall conform to the applicable standards, guidelines and codes referenced herein and within each specification section.
1.2 SCOPE OF WORK
A. This Specification and the associated drawings govern the furnishing, installing, testing and placing into satisfactory operation the Mechanical Systems.
B. Each Contractor shall provide all new materials indicated on the drawings and/or in these specifications, and all items required to make the portion of the Mechanical Work a finished and working system. Used or refurbished materials will not be acceptable.
1.3 DIVISION OF WORK BETWEEN MECHANICAL, ELECTRICAL & CONTROL CONTRACTORS
A. General contractor shall be responsible for coordination between subcontractors.
B. Mechanical, electrical and control subcontractors shall work cooperatively to insure all mechanical equipment is powered and operates according to sequence of operation identified on the drawings.

1.4 CONTRACTOR COORDINATION
Definitions:
Coordination Drawings: All disciplines shall coordinate between each other prior to installation of any material. Said coordination shall include, but not limited to maintenance clearances, elevation between trades, electrical service clearance, etc.
A. Coordination drawings are not shop drawings and shall not be submitted as such.
B. The contract drawings are schematic in nature and do not show every fitting and appurtenance for each utility. Each contractor is expected to have included in the bid sufficient fittings, material, and labor to allow for adjustments in routing of utilities made necessary by the coordination process and to provide a complete and functional system.
C. The contractors will not be allowed additional costs or time extensions due to participation in the coordination process.
D. The contractors will not be allowed additional costs or time extensions for additional fittings, reroutings or changes of duct size, that are essentially equivalent sizes to those shown on the drawings and determined necessary through the coordination process.

1.5 QUALITY ASSURANCE
A. Contractor's Responsibility Prior to Submitting Pricing Data:
1. The Contractor is responsible for constructing complete and operating systems. The Contractor acknowledges and understands that the Contract Documents are a two-dimensional representation of a three-dimensional object, subject to human interpretation. This representation may include imperfect data, interpreted codes, utility guidelines, three-dimensional conflicts, and required field coordination items. Such deficiencies can be corrected when identified prior to ordering material and starting installation. The Contractor agrees to carefully study and compare the individual Contract Documents and report at once in writing to the Design Team any deficiencies the Contractor may discover. The Contractor further agrees to require each subcontractor to likewise study the documents and report at once any deficiencies discovered.
2. The Contractor shall resolve all reported deficiencies with the Architect/Engineer prior to awarding any subcontracts, ordering material, or starting any work with the Contractor's own employees. Any work performed prior to receipt of instructions from the Design Team will be done at the Contractor's risk.
B. Qualifications:
1. Only products of reputable manufacturers are acceptable.
2. All Contractors and subcontractors shall employ only workers skilled in their trades.
C. Compliance with Codes, Laws, Ordinances:
1. Conform to all requirements of the **State** of North Carolina Codes, Laws, Ordinances and other regulations having jurisdiction.
2. If there is a discrepancy between the codes and regulations and these specifications, the Architect/Engineer shall determine the method or equipment used.
3. If the Contractor notes, at the time of bidding, that any parts of the drawings or specifications do not comply with the codes or regulations, Contractor shall inform the Architect/Engineer in writing, requesting a clarification. If there is insufficient time for this procedure, Contractor shall submit with the proposal a separate price to make the system comply with the codes and regulations.
4. All changes to the system made after letting of the contract, to comply with codes or requirements of Inspectors, shall be made by the Contractor without cost to the Owner.
5. If there is a discrepancy between manufacturer's recommendations and these specifications, the manufacturer's recommendations shall govern.
D. Permits, Fees, Taxes, Inspections:
1. Procure all applicable permits and licenses.
E. Examination of Drawings:
1. The drawings for the mechanical work are completely diagrammatic, intended to convey the scope of the work and to indicate the general arrangements and locations of equipment, outlets, etc., and the approximate sizes of equipment.
2. Contractor shall determine the exact locations of equipment and rough-ins, and the exact routing of pipes and ducts to best fit the layout of the job.
3. Scaling of the drawings is not sufficient or accurate for determining these locations.
4. Where job conditions require reasonable changes in indicated arrangements and locations, such changes shall be made by the Contractor at no additional cost to the Owner.
5. Because of the scale of the drawings, certain basic items, such as fittings, boxes, valves, unions, etc., may not be shown, but where required by other sections of the specifications or required for proper installation of the work, such items shall be furnished and installed.
6. If an item is either on the drawings or in the specifications, it shall be included in this contract.
7. Determination of quantities of material and equipment required shall be made by the Contractor from the documents. Where discrepancies arise between drawings, schedules and/or specifications, the greater number shall govern.
8. Where used in mechanical documents, the word "furnish" shall mean supply for use, the word "install" shall mean connect complete and ready for operation, and the word "provide" shall mean to supply for use and connect complete and ready for operation.
a. Any item listed as furnished shall also be installed, unless otherwise noted.
b. Any item listed as installed shall also be furnished, unless otherwise noted.

1.6 SUBMITTALS
A. Submittals shall be provided as described in Architect's specifications. Submittals shall be required for the following items, and for additional items where required elsewhere in the specifications or on the drawings.

1.7 PRODUCT DELIVERY, STORAGE, HANDLING & MAINTENANCE
A. Equipment and components that are visibly damaged or have been subject to environmental conditions prior to building turnover to Owner that could shorten the life of the component (for example, water damage, humidity, dust and debris, excessive hot or cold storage location, etc.) shall be repaired or replaced with new equipment or components without additional cost to the building owner.
B. Contractor is responsible for moving equipment into the building and/or site. Contractor shall review site prior to bid for path locations and any required building modifications to allow movement of equipment. Contractor shall coordinate the work with other trades.
1.8 MATERIAL SUBSTITUTION
A. The scheduled manufacturer is the basis for job design and establishes the quality required.
B. Contractor shall ensure that all items submitted by these other manufacturers meet all requirements of the drawings and specifications and fits in the allocated space. When using other listed manufacturers, the Contractor shall assume responsibility for any and all modifications necessary (including, but not limited to structural supports, electrical connections, piping and ductwork connections and arrangement, plumbing connections and rough-in, and regulatory agency approval, etc.) and coordinate such with other contractors.
C. Any material, article or equipment of other unnamed manufacturers which will adequately perform the services and duties imposed by the design and is of a quality equal to or better than the material, article or equipment identified by the drawings and specifications may be used if approval is secured in writing from the Architect/Engineer not later than ten days prior to the bid opening.
D. This Contractor assumes all costs incurred as a result of using the offered material, article or equipment, on the Contractors part or on the part of other Contractors whose work is affected.
E. This Contractor may list voluntary add or deduct prices for alternate materials on the bid form. These items will not be used in determining the low bidder.
F. All material substitutions requested later than ten (10) days prior to bid opening must be listed as voluntary changes on the bid form.
PART 2 - PRODUCTS (Not Used)
PART 3 - EXECUTION

3.2 INSTRUCTING THE OWNER'S REPRESENTATIVES
A. Adequately instruct the Owner's designated representatives in the maintenance, care, and operation of all systems installed under this contract.
3.3 SYSTEM STARTING AND ADJUSTING
A. The mechanical systems shall be complete and operating. System startup, testing, adjusting, and balancing to obtain satisfactory system performance is the responsibility of the Contractor. This includes calibration and adjustments of all controls, noise level adjustments and final comfort adjustments as required.
B. Operate all HVAC systems continuously for at least one week prior to occupancy to bring construction materials to suitable moisture levels.
C. All operating conditions and control sequences shall be tested during the start-up period. Test all interlocks, safety shutdowns, controls, and alarms.
D. The Contractor, subcontractors, and equipment suppliers shall have skilled technicians to ensure that all systems perform properly.

3.4 RECORD DOCUMENTS
A. Maintain at the job site a separate and complete set of mechanical drawings and specifications with all changes made to the systems clearly and permanently marked in complete detail.

3.5 MAINTAINING CLEAN DUCTWORK THROUGHOUT CONSTRUCTION
A. Throughout the duration of construction, all ductwork shall be capped or sealed with sheet metal caps, polyethylene film, or other airtight protective to keep dust, dirt, and construction debris out of ducts. Similar means shall be used to seal air-side connections of HVAC equipment to include, but not limited to, air handling units, fans, terminal air boxes, fan coil units, cabinet heaters, blower coils, and the like.
B. When air terminal devices are installed, contractors shall seal all supply, return, and exhaust grilles with polyethylene film or other airtight protective to keep dust, dirt, and construction debris out of ducts.
C. Should HVAC equipment be started during construction, Contractor shall remove airtight protectives and shall install one-inch thick MERV 8 filter media over all return and exhaust grilles to prevent dust, dirt, and construction debris from entering ductwork. Filter media shall cover the entire grille face and shall be secured such that air cannot bypass filter media.
D. Should filter media become laden with dust and dirt, Contractor shall replace filter media with new media to prevent damage to air distribution system and equipment.
E. The following steps shall be taken during testing, adjusting, and balancing of each air system:
1. All construction activities in all spaces served by the air system shall stop.
2. All airtight protectives and temporary filter media shall be removed from all portions of the air system.
3. Testing, adjusting, and balancing work shall not commence until all construction activity is stopped and all airtight protectives and temporary filter media is removed.
4. Once testing, adjusting, and balancing work is complete for the air system, airtight protectives or temporary filter media shall be installed over all ductwork openings and air terminals on the air system prior to resuming construction activities in any spaces served by the air system.
F. The Owner shall agree the building is sufficiently clean prior to the removal of any filtration media and airtight protectives from air terminal devices.
END OF SECTION 23 05 00

SECTION 23 05 05 HVAC DEMOLITION FOR REMODELING
PART 1 - GENERAL
1.1 SECTION INCLUDES
A. Mechanical demolition.
PART 2 - PRODUCTS
2.1 MATERIALS AND EQUIPMENT
A. Materials and equipment shall be as specified in individual Sections.
PART 3 - EXECUTION
3.1 PREPARATION
A. Disconnect mechanical systems in walls, floors, and ceilings scheduled for removal.
3.2 CUTTING AND PATCHING
A. This Contractor is responsible for all penetrations of existing construction required to complete the work of this project. Refer to Section 23 05 29 for additional requirements.
B. Penetrations in existing construction should be reviewed carefully prior to proceeding with any work.
C. Penetrations shall be neat and clean with smooth and/or finished edges. Core drill where possible for clean opening.
D. Repair existing construction as required after penetration is complete to restore to original condition. Use similar materials and match adjacent construction unless otherwise noted or agreed to by the Architect/Engineer prior to start of work.
E. This Contractor is responsible for <u>all</u> costs incurred in repair, relocations, or replacement of any cables, conduits, or other services if damaged without proper investigation.
3.3 CLEANING AND REPAIR
A. Clean and repair existing materials and equipment which remain or are to be reused.
B. Clean all systems adjacent to project which are affected by the dust and debris caused by this construction.
C. MECHANICAL ITEMS REMOVED AND NOT RELOCATED REMAIN THE PROPERTY OF THE OWNER. CONTRACTOR SHALL PLACE ITEMS RETAINED BY THE OWNER IN A LOCATION COORDINATED WITH THE OWNER. THE CONTRACTOR SHALL DISPOSE OF MATERIAL THE OWNER DOES NOT WANT TO REUSE OR RETAIN FOR MAINTENANCE PURPOSES.

3.4 SPECIAL REQUIREMENTS
A. Review locations of all new penetrations in existing floor slabs or walls. Determine construction type and review for possible interferences. Bring all concerns to the attention of the Architect/Engineer before proceeding.

END OF SECTION

SECTION 23 05 93 - TESTING, ADJUSTING, AND BALANCING
PART 1 - GENERAL
1.1 SECTION INCLUDES
A. Testing, adjusting, and balancing
1.2 SUBMITTALS{SUBMITTALS}
A. Submit copies of report forms, balancing procedures, and the name and qualifications of testing and balancing agency for approval within 30 days after award of Contract.
B. Electronic Copies:
1. Submit a certified copy of test reports to the Architect/Engineer for approval. Electronic copies shall be in PDF format only. Scanned copies, in PDF format, of paper originals are acceptable. Copies that are not legible will be returned to the Contractor for resubmittal. Do not set any permission restrictions on files; protected, locked, or secured documents will be rejected.
2. Electronic file size shall be limited to a maximum of 10MB. Larger files shall be divided into files that are clearly labeled as "1 of 2", "2 of 2", etc.
3. All text shall be searchable.
4. Bookmarks shall be used. All bookmark titles shall be an active link to the index page and index tabs.
C. Paper Copies:
1. Submit [four (4)] certified copies of test reports to the Architect/Engineer for approval in soft cover, 3-hole binder manuals, with cover identification. Include index page and indexing tabs.
1.3 REPORT FORMS
A. Submit reports on AABC, SMACNA or NEBB forms. Use custom forms approved by the Architect/Engineer when needed to supply specified information.
B. Include in the final report a schematic drawing showing each system component, including balancing devices, for each system. Each drawing shall be included with the test reports required for that system. The schematic drawings shall identify all testing points and cross-reference these points to the report forms and procedures.
C. Refer to PART 4 for required reports.
1.4 WARRANTY/GUARANTEE
A. The TAB Contractor shall include an extended warranty of 90 days after owner receipt of a completed balancing report, during which time the Owner may request a recheck of terminals, or resetting of any outlet, coil, or device listed in the test report. This warranty shall provide a minimum of [24] manhours of onsite service time. If it is determined that the new test results are not within the design criteria, the balancer shall rebalance the system according to design criteria.
B. Warranty/Guarantee must meet one of the following programs: TABB International Quality Assurance Program, AABC National Project Performance Guarantee, NEBB's Conformance Certification.
1.5 SCHEDULING
A. Coordinate schedule with other trades. Provide a minimum of seven days' notice to all trades and the Architect/Engineer prior to performing each test.
B. Project will be constructed in phases. Provide balancing report after each phase is complete.
PART 2 - PRODUCTS (Not Used)
PART 3 - EXECUTION
3.1 GENERAL REQUIREMENTS
A. All procedures must conform to a published standard listed in the References article of this section. All equipment shall be adjusted in accordance with the manufacturer's recommendations. Any system not listed in this specification but installed under the contract documents shall be balanced using a procedure from a published standard listed in the References article.
B. The Balancing Contractor shall incorporate all pertinent documented construction changes (e.g. submittals/shop drawings, change orders, RFIs, ASIs, etc.) and include in the balancing report.
C. Recorded data shall represent actual measured or observed conditions.
D. Cut insulation, ducts, pipes, and equipment cabinets for installation of test probes to the minimum extent necessary to allow adequate performance of procedures. After testing and balancing is complete, close probe holes and patch insulation with new materials as specified. Restore vapor barrier and finish as specified.
E. Permanently mark setting of valves, dampers, and other adjustment devices allowing for settings to be restored. Set and lock memory stops.
F. Leave systems in proper working order, replacing belt guards, closing access doors, closing doors to electrical switch boxes, plugging test holes, and restoring thermostats to specified settings.
G. The Balancing Contractor shall measure terminal air box air flow, and the TCC shall adjust DDC readout to match..
SPECIFIER: Refer to TABB procedures for balancing systems with diversity.
H. Installations with systems consisting of multiple components shall be balanced with all system components operating.
3.2 EXAMINATION
A. Before beginning work, verify that systems are complete and operable. Ensure the following:
1. General Equipment Requirements:
a. Equipment is safe to operate and in normal condition.
b. Equipment with moving parts is properly lubricated.
c. Temperature control systems are complete and operable.
d. Proper thermal overload protection is in place for electrical equipment.
e. Direction of rotation of all fans and pumps is correct.
f. Access doors are closed and end caps are in place.
2. Duct System Requirements:
a. All filters are clean and in place. If required, install temporary media.
b. Duct systems are clean and free of debris.
c. Fire/smoke and manual volume dampers are in place, functional and open.
d. Air outlets are installed and connected.
e. Duct system leakage has been minimized.
B. Report any defects or deficiencies to Architect/Engineer.
C. Promptly report items that are abnormal or prevent proper balancing.
D. If, for design reasons, system cannot be properly balanced, report as soon as observed.
E. Beginning of work means acceptance of existing conditions.
3.3 PREPARATION
A. Provide instruments required for testing, adjusting, and balancing operations. Make instruments available to the Architect/Engineer for spot checks during testing.
B. Instruments shall be calibrated within six months of testing performed for project, or more recently if recommended by the instrument manufacturer.
3.4 INSTALLATION TOLERANCES
A. ± 10% of scheduled values:
1. Adjust air inlets and outlets to ± 10% of scheduled values.
B. Adjust supply, return, and exhaust air-handling systems to +10% / -5% of scheduled values.
3.5 ADJUSTING
A. After adjustment, take measurements to verify balance has not been disrupted or that disruption has been rectified.
B. Once balancing of systems is complete, at least one damper or valve must be 100% open.
C. After testing, adjusting and balancing are complete, operate each system and randomly check measurements to verify system is operating as reported in the report. Document any discrepancies.
D. Contractor responsible for each motor shall also be responsible for replacement sheaves. Coordinate with contractor.
E. Report of test results shall include original recording and three reproductions.
3.6 SUBMISSION OF REPORTS
A. Fill in test results on appropriate forms.
PART 4 - SYSTEMS TO BE TESTED, ADJUSTED AND BALANCED
4.1 GENERAL REQUIREMENTS
A. Title Page:
1. Project name.
2. Project location.
3. Project Architect.
4. Project Engineer (IMEG Corp.).
5. Project General Contractor.
6. TAB Company name, address, phone number.
7. TAB Supervisor's name and certification number.
8. TAB Supervisor's signature and date.
9. Report date.
B. Report Index
C. General Information:
1. Test conditions.
2. Nomenclature used throughout report.
3. Notable system characteristics/discrepancies from design.
4. Test standards followed.
5. Any deficiencies noted.
6. Quality assurance statement.
D. Instrument List:
1. Instrument.
2. Manufacturer, model, and serial number.
3. Range.
4. Calibration date.
4.2 AIR SYSTEMS{AIR SYSTEMS}
A. Duct Traverse: {DUCT TRAVERSE}
1. System zone/branch/location.
2. Duct size.
3. Free area.
4. Velocity: specified and actual.
5. Flow rate (cfm (L/s)): specified and actual.
6. Duct static pressure.
7. Air temperature.
8. Air correction factor.
B. Air Terminal (Inlet or Outlet):{AIR TERMINAL (INLET OR OUTLET)}
1. Drawing symbol.
2. Room number/location.
3. Terminal type and size.
4. Velocity: specified and actual.
5. Flow rate (cfm (L/s)): specified and actual.
6. Percent of design flow rate.

END OF SECTION 23 05 93

SECTION 23 07 13 - DUCTWORK INSULATION
PART 1 - GENERAL
1.1 SECTION INCLUDES
A. Ductwork Insulation.
B. Insulation Jackets.
PART 2 - PRODUCTS
2.1 MATERIALS
SPECIFIER: Duct Wrap - Inside Use. Keep in specification if using trapeze hanger duct vapor seal detail.
A. Type A: Flexible Fiberglass - Outside Wrap; ANSI/ASTM C553; commercial grade; 0.28 (0.040 W/(m K)) / 0.26 (0.036 W/(m K)) (Out-Of-Package/Installed-Compressed 25%) maximum 'K' value at 75F (24C); foil scrim Kraft facing, 1.0 lb./cu. ft. (16 kg/m³) density. Submit both "Out of Package" and "Installed-Compressed 25%" K and R-values.
B. Type C: Flexible Fiberglass Liner; ANSI/ASTM C1071; 0.28 (0.040 W/(m K)) maximum 'K' value at 75F (24C); 1.5 lb/cu ft (24 kg/m³) minimum density; coated air side for 5000 fpm (25.4 m/s) air velocity.
2.2 JACKETS
A. Vapor Barrier Jackets: Kraft reinforced foil scrim vapor barrier with self-sealing adhesive joints. Beach puncture resistance ratio of at least 25 units. Tensile strength: 35 psi (240 kPa) minimum. Single, self-seal acrylic adhesive on longitudinal jacket laps and butt strips.
PART 3 - EXECUTION
3.1 INSTALLATION
A. Install materials in accordance with manufacturer's instructions, codes, and industry standards.
B. Install materials after ductwork has been tested.
C. Clean surfaces for adhesives.
D. Provide insulation with vapor barrier when air conveyed may be below ambient temperature.
E. Exterior Duct Wrap - Flexible, Type A:
1. Apply with edges tightly butted.
2. Cut slightly longer than perimeter of duct to insure full thickness at corners. Do not wrap excessively tight.
3. Seal joints with adhesive backed tape.
4. Apply so insulation conforms uniformly and firmly to duct.
5. Seal all penetrations of the vapor barrier by strap hangers or slip cable hangers with adhesive backed tape.
6. Provide high-density insulation inserts on rectangular ducts at trapeze duct hangers to prevent crushing of insulation. Provide high-density insulation inserts with clamp-on round ducts requiring two (2) rods or straps to prevent crushing of insulation. Maintain continuous vapor barrier through the hanger.
7. Tape all joints with Royal Tapes #RT 350 (216-439-7229), Venture Tape 1525CW, or Compac Type FSK. No substitutions will be accepted without written permission from the Architect/Engineer.
8. Press tape tightly to the duct covering with a squeegee for a tight continuous seal. Fish mouths and loose tape edges are not acceptable.
9. Staples may be used, but must be covered with tape.
10. Vapor barrier must be continuous.
11. Mechanically fasten on 12" (300 mm) centers at bottom of ducts over 24" (600 mm) wide and on all sides of vertical ducts.
F. Interior Insulation - Flexible Duct Liner, Type C:
1. Impale on spindle anchors welded or mechanically fastened to the duct. Adhesive or glue fastened anchors are not acceptable. Maximum anchor spacing per SMACNA Duct Construction Standards or manufacturer's recommendations, whichever is more restrictive. Locate pins less than 3" (80 mm) from corners and at intervals not over 6" (150 mm) around the perimeter at leading and trailing edges. Locate pins within 3" (80 mm) of transverse joints and at intervals not over 16" (400 mm) long the length of the duct. Pins must be long enough to prevent compressing the insulation.
2. In addition to anchors, secure liner with UL listed adhesive covering over 90% of the duct surface.
3. Install per the latest edition of the SMACNA Manual.
4. Leading edges shall be covered as follows:
a. For duct velocities below 3000 fpm (15 m/s), coat leading edges with adhesive. Neatly butt liner without gaps at transverse joints. Cut liner flush with end of the duct section for tight joints with no exposed duct. If adhesive is shop installed, field apply additional adhesive to the end of each duct section for complete adhesion of the liner. Protect edges from dirt and debris.
b. For duct velocities above 3000 fpm (15 m/s), cover leading edges with metal nosing. Use nosing on upstream edges of each section of duct. If the duct can be installed in either direction, provide nosing on each end or clearly mark the duct to allow visual verification after installation. Verify duct velocities based on the scheduled air flow rates and determine where metal nosing is required.
c. Install metal nosing in the following locations (regardless of velocity):
1) The first three fittings downstream of all fans.
2) At all duct liner interruptions. This includes fire dampers, access doors, branch connections, and all other locations where the edge of the liner is exposed.
3) Trailing edges of transverse joints do not require metal nosings.
5. Overlap liner at longitudinal joints. Make longitudinal joints at corners of the duct unless the duct size does not allow this. Coat longitudinal joints with adhesive at velocities over 2500 fpm (13 m/s).
6. Seal all damaged duct liner with adhesive and glass cloth. Do not damage duct liner surface coatings.
7. Duct dimensions given are net inside dimensions. Increase sheet metal to allow for insulation thickness.
G. Continue insulation with vapor barrier through penetrations unless code prohibits.
H. Provide 2" (50 mm) wide, 24" (600 mm) high, 26 gauge (0.55 mm), galvanized sheet metal corner protection angles for all externally insulated ductwork extending to a floor or curb.
END OF SECTION 23 07 13

SECTION 23 31 00 - DUCTWORK
PART 1 - GENERAL
1.1 SECTION INCLUDES
A. Galvanized Ductwork
B. Ductwork Reinforcement
C. Ductwork Sealants
D. Rectangular Ductwork
E. Round and Flat Oval Ductwork
F. Exposed Ductwork (Rectangular, Round, or Oval)
G. Flexible Duct
H. Leakage Testing
I. Ductwork Penetrations
Painting
1.2 COORDINATION DRAWINGS
A. Reference Coordination Drawings article in Section 23 05 00 for required duct systems electronic CAD drawings to be provided to Coordinating Contractor for inclusion into composite coordination drawings.
B. Duct drawings shall be at 1/4" (1:50) minimum scale complete with the following information:
1. Actual duct routing, ductwork fittings, actual sheet metal dimensions including insulation liner and wrap, duct hanger and support types, ductwork accessories, etc. with lengths and weights noted.
2. Differentiate ducts that are lined or wrapped. Include insulation thickness, type of insulation, and acoustical lagging.
3. Location and size of all duct access doors.
4. Room names and numbers, ceiling types, and ceiling heights.
5. Indicate location of all beams, bar joists, etc. along with bottom of steel elevations for each member.
6. IMEG will provide electronic file copies of ventilation drawings for contractor's use if the contractor signs and returns an "Electronic File Transfer" waiver provided by IMEG. IMEG will not consider blatant reproductions of original file copies an acceptable alternative for coordination drawings. Architectural plans will need to be obtained from the Architect.

PART 2 - PRODUCTS
2.1 GENERAL REQUIREMENTS AND SUPPORTS
A. Rectangular Duct - Single Wall:
1. General Requirements:
a. All ductwork gauges and reinforcements shall be as listed in SMACNA Duct Construction Standards Chapter 2. Where necessary to fit in confined spaces, furnish heaviest duct gauge and least space consuming reinforcement.
b. Transitions shall not exceed the angles in Figure 4-7.
2. Exceptions and modifications to the 2005 HVAC Duct Construction Standards are:
a. All ducts shall be cross-broken or beaded.
b. Snap lock seams are not permitted.
c. Turning vanes shall be used in all 90° mitered elbows, unless clearly noted otherwise on the drawings. Vanes shall be as follows:
1) Type 1:
a) Description: Single wall type with 22-gauge (0.029") (0.76 mm) or heavier vanes, 3-1/4" (80 mm) blade spacing, and 4" (100 mm) to 4-1/2" (115 mm) radius. Vanes hemmed if recommended by runner manufacturer. Runners shall have extra-long locking tabs. C-value independently tested at below 0.26..
b) Usage: Limited to 3,000 fpm (15 m/s) and vane lengths 36" (900 mm) and under.
2) Type 2:
a) Description: Double wall type with 3-1/4" (80 mm) blade spacing, 4-1/2" (115 mm) radius, 24-gauge (0.61 mm) minimum, and SMACNA Type 1 runners. C-value below 0.27.
b) Usage: No limits other than imposed by the manufacturer. Provide intermediate support for vanes over 48" (1200 mm) long.
3) Turning vanes shall operate quietly. Repair or replace vanes that rattle or flutter.
4) Runners must be installed at a 45° angle. Elbows with different size inlet and outlet must be radius type.
5) Omitting every other vane is prohibited.
d. Where smooth radius rectangular elbows are shown, they shall be constructed per SMACNA Figure 4-2. Type RE1 shall be constructed with a centerline duct radius R/W of 1.0. Where shown on drawings, Type RE3 elbows with 3 vanes shall be used with centerline duct radius R/W of 0.6 (SMACNA r/W=0.1). RE1 or RE3 elbows may be used where mitered elbows are shown if space permits. Mitered elbows (with or without turning vanes) may not be substituted for radius elbows. Do not make branch takeoffs within 4 duct diameters on the side of the duct downstream from the inside radius of radius elbows
e. Rectangular branch and tee connections in ducts over 1" (0.25 kPa) pressure class shall be 45° entry type per Figs. 4-5 and 4-6. Rectangular straight taps are not acceptable above 1" (0.25 kPa) pressure class.
f. Round taps off rectangular unlined ducts shall be flanged conical or bellmouth type (equal to Buckley Bellmouth or Sheet Metal Connectors E-Z Tap), or 45° rectangular with transition to round (equal to Sheet Metal Connectors Inc. High Efficiency Takeoff). Straight taps are acceptable if pressure class is 1" (0.25 kPa) or less, round duct is 12" (300 mm) diameter or less, and the tap is not located between fans and TAB devices.
g. Duct offsets shall be constructed as shown on drawings. Additional offsets required in the field shall be formed of mitered elbows without turning vanes for offsets up to 30° maximum angle in accordance with SMACNA offset Type 2. Offsets of greater than 30° angle shall be formed of radius elbows with centerline radius R/W=1.0 or greater. SMACNA Type 1 offsets are not permitted.
h. All lined duct shall utilize dovetail joints where round or conical taps occur. The dovetail joints shall extend past the liner before being folded over.
i. Cushion heads are acceptable only downstream of TAB devices in ducts up to ± 2" (±0.5 kPa) pressure class, and must be less than 6" (150 mm) in length.
j. Slide-on flanged transverse joint systems are acceptable provided they are a manufactured product that has been tested for conformance with Chapter 2 of the SMACNA HVAC Duct Construction Standards for sheet and joint deflection at the specified pressure class.
1) Apply sealant to all inside corners. Holes at corners are not acceptable.
k. Formed-on flanged transverse joint systems are acceptable provided they are a manufactured product that has been tested for conformance with Chapter 2 of the SMACNA HVAC Duct Construction Standards for sheet and joint deflection at the specified pressure class.
1) Apply sealant to all inside corners. Holes at corners are not acceptable.
2) Flanges shall be 24-gauge (0.61 mm) minimum (not 26 gauge (0.45 mm)).
B. Round and Flat Oval Spiral Seam Ductwork - Single Wall:
1. 90° elbows shall be smooth radius or have a minimum of five sections with mitered joints and R/D of at least 1.5.
2. Duct and fittings shall meet the required minimum gauges listed in chapter 3 of the SMACNA requirements for the specified pressure class. Ribbed and lightweight duct are not permitted.
3. Ductwork shall be suitable for velocities up to 5,000 fpm (25 m/s).
4. Divided flow fittings may be made as separate fittings or factory installed taps with sound, airtight, continuous welds at intersection of fitting body and tap.
5. Spot weld and bond all fitting seams in the pressure shell. Coat galvanizing damaged by welding with corrosion resistant paint to match galvanized duct color.
6. Reinforce flat oval ducts with external angles. Internal tie rods are permitted only as indicated for rectangular ductwork.
7. Transverse Joint Connections:
a. Crimped joints are not permitted.
b. Ducts and fittings 36" (900 mm) in diameter and smaller shall have slip joint connections. Size fitting ends to slip inside mating duct sections with minimum 2-inch insertion length and a stop bead. Use inside slip couplings for duct-to-duct joints, and outside slip couplings for fitting-to-fitting joints.
c. Ducts and fittings larger than 36" (900 mm) shall have flanged connections.
d. Secure all joints with at least 3 sheet metal screws before sealing.
C. Round and Flat Oval Spiral Seam Ductwork - Double Wall:
1. Exterior ducts shall have an airtight outer pressure shell, a 2" (50 mm) insulation layer, and a perforated inner wall that completely covers the insulation.
2. Duct and Fittings shall meet the required minimum gauges listed in chapter 3 of the SMACNA standards for the specified pressure class. Ribbed and lightweight duct are not permitted.
3. Ductwork shall be suitable for up to 5,000 fpm (25 m/s) velocity.
4. Divided flow fittings may be separate fittings or factory installed taps with the following construction requirements:
Sound airtight, continuous welds at intersection of fitting body and tap.
a. Tap liner welded to inner liner with weld spacing not over 3" (80 mm).
b. Insulation packed around the tap area for complete cavity filling.
c. Carefully fit branch connections to cut-out openings in inner liner without spaces for air erosion of insulation or sharp projections for noise and airflow disturbance.
5. Support inner liner of ducts and fittings with metal spacers welded to maintain spacing and concentricity.
6. Ducts with minor axis under 22" (550 mm) shall be spiral seam type. Larger ducts may be rolled, longitudinal welded seam type. SMACNA seams RL-2 and RL-3 are not permitted.
7. Transverse Joint Connections:
a. Provide couplings to align the inner liners. Butt joints are not permitted for inner liners. Make alignment by extending the liner of the fitting into the duct or by using a double concentric coupling with the two couplings held by spacers for rigidity and wall spacing.
b. Above 34" (850 mm) ID provide a separate coupling for inner alignment with the pressure shells joined by angle ring flanged connections.
c. Use outside slip couplings for fitting-to-fitting joints.
d. Secure all joints with at least 3 sheet metal screws before sealing.
D. Round Snap-Lock Seam Ductwork - Single Wall:
1. Factory sealed snap-lock pipe. Transverse and longitudinal seams shall contain factory-applied self-sealing EPDM and co-polymer gasket. Snap-lock shall conform to SMACNA RL-8. Duct and gasket material shall meet the flame/smoke spread rating of 25/50 per ASTM-E84.
2. G-60 galvanized coating meeting ASTM A653 and ASTM A90 G-90 galvanized steel aluminum meeting ASTM B209 Alloy 3003 Temper H14 304 stainless steel meeting ASTM A480 2B Finish.
3. Snap-lock seams are only permitted on systems between -1"w.c. (-0.25 kPa) and 2"w.c. (0.050 kPa) pressure class.
4. 90° elbows shall be smooth radius or have a minimum of five sections with mitered joints and R/D of at least 1.5.
5. Duct and fittings shall meet the required minimum gauges listed in Chapter 3 of the SMACNA requirements for the specified pressure class.
6. Divided flow fittings may be made as separate fittings or factory installed taps with sound, airtight, continuous welds at intersection of fitting body and tap.
7. Spot weld and bond all fitting seams in the pressure shell. Coat galvanizing damaged by welding with corrosion resistant paint to match galvanized duct color.
E. Hangers and Supports General Requirements:
1. Hanger and support materials shall be as defined within Materials and Application Specific section below.
2. Strap Hangers: Strap hanger shall be a minimum of 1 inch (25 mm), 18 gauge (1.21 mm) attached to the bottom of ducts at 8'-0" (200 mm) OC and as required by NCMC and SMACNA guidelines.
3. Cable Hangers:
a. Aircraft cable and slip cable hangers are acceptable for ducts up to 18" (457 mm) diameter. Protective sleeve tubing shall be used on the cable when supporting duct with exterior insulation. Corner saddles are required when supporting rectangular ductwork.
b. Aircraft cable with 2-point support in standard horseshoe arrangement. Protective sleeve tubing shall be used on the cable when supporting duct with exterior insulation. 8'-0" (200 mm) OC and as required by CMC/UMC and SMACNA guidelines.
4. Integral Corner Connector Hanger: Integral hanger and corner assembly for use with TDC/TDF style duct flanges. Die stamped offset hanger connects to the flanged corner assembly. For use with aircraft cable or 1/4" (6.4 mm) or 3/8" (9.5 mm) diameter threaded rods. Tested to hold up to 1,400 lbs. (635kg). Install per manufacturer's ratings and instructions.
2.2 MATERIAL AND APPLICATION SPECIFIC
A. Galvanized Steel:
1. General Requirements:
a. Duct and reinforcement materials shall conform to ASTM A653 and A924.
b. Interior Ductwork and reinforcements: G60 (Z180) galvanized (0.60 ounces per square foot (180 g/m²) total zinc coating for two sides per ASTM A90) unless noted otherwise.
c. Exterior Ductwork: G90 (Z275) galvanized (0.90 ounces per square foot (275 g/m²) total zinc coating for two sides per ASTM A90) unless noted otherwise. G60 is not acceptable for exterior use.
d. Ductwork reinforcement shall be of galvanized steel.
2. Duct Hangers and Support Material:
a. Ductwork hangers and supports shall be of galvanized or painted steel.
b. All fasteners shall be galvanized or cadmium plated.
2.3 DUCTWORK REINFORCEMENT
A. All reinforcement shall be external to the duct except that tie rods may be used with the following limitations.
1. Ducts must be over 18" (450 mm) wide.
2. Duct dimensions must be increased 2" (50 mm) in one dimension (h or w) for each row of tie rods installed.
3. Tie rods must not exceed 1/2" (15 mm) diameter.
4. Manufacturer of tie rod system must certify pressure classifications of various arrangements, and this must be in the shop drawings.
2.4 DUCTWORK SEALANTS
A. One-part joint sealers shall be water-based mastic systems that meet the following requirements: maximum 48-hour cure time, service temperature of -20°F (-29°C) to +175°F (80°C), resistant to mold, mildew and water, flame spread rating below 25 and smoke-developed rating below 50 when tested in accordance with ASTM E84, suitable for all SMACNA seal classes and pressure classes. Mastic used to seal flexible ductwork shall be marked UL 181B-M. Joint sealers for use on exterior weather exposed ductwork shall be rated for -30°F (-34°C) to +175°F (80°C) and 2000-hour minimum UV resistance per ASTM G-53.
B. Pressure sensitive tape used for sealing ductwork shall be minimum 2.5-inch (65 mm) wide, listed and marked UL 181A-P, having minimum 60 oz/inch (67 kg/m) peel adhesion to steel, and service temperature range from -20°F (-29°C) to +250°F (121° C).
C. Adhesives and Sealants: All sealers, adhesives, and sealants shall be low emitting material type :
D. Where pressure sensitive tape is called for on drawings and specifications for sealing flexible ductwork, tape shall be minimum 2.5-inch (65 mm) wide, UL 181 B-FX listed, and marked tape having minimum 60 oz/inch (67 kg/m) peel adhesion to steel and service temperature range from -20°F (-29°C) to +250°F (121°C).
2.5 FLEXIBLE DUCT
A. Flexible duct shall be listed and labeled as UL 181 Class 1 Air Duct Material, and shall comply with NFPA 90A and 90B, and meet GSA, FHA and other U.S. Government agency standards. Flexible duct shall bear the ADC Seal of Certification.
B. Flame Spread/Smoke Developed: Not over 25/50.
C. Stretch all flexible duct to prevent sags and reduce air friction. Shorten and reinstall all sagging or loose flexible duct. Avoid sharp elbows. Elbows shall maintain 1.5 diameter centerline turning radius.
D. Install per the SMACNA Flexible Duct Manual. Secure inner layer with draw band. Wrap with pressure sensitive tape for protection prior to installing draw band. Pressure sensitive tape alone is not acceptable.
E. Standard:
1. Flexible duct shall have corrosion-resistant wire helix, bonded to an inner liner that prevents air from contacting the insulation, covered with minimum 1-1/2" (40 mm thick), 3/4 lb/cf (12 kg/m³) density fiberglass insulation blanket, sheathed in a vapor barrier of metalized polyester film laminated to glass mesh.
2. Usage:
a. Take-offs from supply ducts to inlets of terminal air boxes. Do not exceed 36" (900 mm) in length.
b. Connections to air inlets and outlets. Do not exceed [5'-0" (1525mm)][6'-0" (1800 mm)] in length.
F. Radius Forming Elbows:
1. Flexible plastic radius forming elbow for use with flexible ducts to create 90deg elbow. One size for 6" (150 mm) to 16" (400 mm) diameter ducts. UL listed for return plenum spaces.
2. Usage: All supply air terminals with flexible ductwork connection.
3. Installation: Attach to flex duct and secure draw bands without crushing flex duct to form smooth radius elbow. Suspend radius forming elbow to structure. Install per manufacturer's instructions.
PART 3 - EXECUTION
3.1 INSTALLATION
A. Provide openings in ducts for thermometers and controllers.
B. Locate ducts with space around equipment for normal operation and maintenance.
C. Do not install ducts or other equipment above electrical switchboards or panelboards. This includes a dedicated space extending 25 feet (7.6 m) from the floor to the structural ceiling with width and depth equal to the electrical equipment. Unless intended to serve these rooms, do not install any ductwork or equipment in electrical rooms, transformer rooms, electrical closets, telephone rooms or elevator machine rooms.
D. Provide temporary closures of metal or taped polyethylene on open ducts to prevent dust from entering ductwork.
E. Supply ductwork shall be free of construction debris, and shall comply with Level "B" of the SMACNA Duct Cleanliness for New Construction Guidelines.
F. Repair all duct insulation and liner tears.
G. Install manual volume dampers in branch supply ducts so all outlets can be adjusted. Do not install dampers at air terminal device or in outlets, unless specifically shown.
H. Install flexible duct in accordance with the ADC Flexible Duct Performance and Installation Standards.
I. Flexible duct shall NOT be joined to flat-oval connections. Provide sheet metal oval-to-round transitions where required, to include, but not limited to, all connections to air inlets, air outlets, and terminal air boxes.
J. Support all duct systems in accordance with the SMACNA HVAC Duct Construction Standards: Metal and Flexible and the SMACNA Seismic Restraint Manual: Guidelines for Mechanical Systems, where applicable. Refer to Section 23 05 50 for seismic requirements.
K. Install ducts with hangers and braces designed to withstand, without damage to equipment, seismic force required by California Building Codes.
L. Adhesives, sealants, tapes, vapor retarders, films, and other supplementary materials added to ducts, plenums, housing panels, silencers, etc. shall have flame spread/smoke developed ratings of under 25/50 per ASTM E84, NFPA 255, or UL 723.
M. All duct support shall extend directly to building structure. Do not support ductwork from pipe hangers unless coordinated with piping contractor prior to installation. Do not allow lighting or ceiling supports to be hung from ductwork or ductwork supports.
3.2 DUCTWORK SEALING
A. General Requirements:
1. Openings, such as rotating shafts, shall be sealed with bushings or similar.
2. Pressure sensitive tape shall not be used as the primary sealant unless it has been certified to comply with UL-181A or UL-181B by an independent testing laboratory and the tape is used in accordance with that certification.
3. All connections shall be sealed including, but not limited to, taps, other branch connections, access doors, access panels, and duct connections to equipment. Sealing that would void product listings is not required. Spiral lock seams need not be sealed.
4. Mastic-based duct sealants shall be applied to joints and seams in minimum 3 inch (80 mm) wide by 20 mil (500 µm) thick bands using brush, putty knife, trowel, or spray, unless manufacturer's data sheet specifies other application methods or requirements.
B. All ducts systems, regardless of pressure class, shall be Seal Class A as defined by Section 5-1 of SMACNA HVAC Air Duct Leakage Test Manual per the Energy Code, unless specifically noted otherwise. Seal Class A shall include sealing of all transverse joints, longitudinal seams, and duct wall penetrations with welds, gaskets, mastics, or fabric-embedded mastic system. Joints are inclusive of, but not limited to, girth joints, branch and sub-branch intersections, duct collar tap-ins, fitting subsections, louver and air terminal connections to ducts, access door and access panel frames and jambs, duct, plenum, and casing abutments to building structures.
3.3 TESTING
A. Interior Duct - Less than 3" WG (0.75 kPa) (positive or negative):
1. Leak testing of these pressure classes is not normally required for interior ductwork (inside the building envelope). However, leak tests will be required if, in the opinion of the Architect/Engineer, the leakage appears excessive. All exterior ductwork shall be tested. If duct has outside wrap, testing shall be done before it is applied.
2. Leak test shall be at the Contractor's expense and shall require capping and sealing all openings.
3. Seal ducts to bring the air leakage into compliance.
4. Contractor shall notify the Architect/Engineer five business days prior to pressurizing ductwork for testing.

B. Test Procedure:
1. Testing shall be as listed in the latest edition of the SMACNA HVAC Duct Leakage Manual, with the following additional requirements:
a. The required leakage class for Seal Class A, rectangular ducts, shall be 4; round shall be 2.
b. Test pressure shall be the specified duct pressure class. Testing at reduced pressures and converting the results mathematically is not acceptable. This is required to test the structural integrity of the duct system.
c. If any leak causes discernible noise at a distance of 3 feet (1 m), that leak shall be eliminated, regardless of whether that section of duct passed the leakage test.
d. All joints shall be felt by hand, and all discernible leaks shall be sealed.
e. Totaling leakage from several tested sections and comparing them to the allowable leakage for the entire system is not acceptable. Each section must pass the test individually.
f. Contractor shall notify the Architect/Engineer five business days prior to pressurizing ductwork for testing. Failure to notify the Architect/Engineer of pressure testing may require the contractor to repeat the duct pressure test after proper notification.
g. Upon completion of the pressure test, the contractor shall submit an air duct leakage test summary report as outlined in the SMACNA HVAC Duct Leakage Test Manual.
h. All access doors, taps to terminal air boxes, and other accessories and penetrations must be installed prior to testing. Including terminal air boxes in the test is not required.
i. Positive pressure leakage testing is acceptable for negative pressure ductwork.
3.4 DUCTWORK PENETRATIONS
A. Seal all duct penetrations of walls that are not fire rated by caulking or packing with fiberglass. Install trim strip to cover vacant space and raw construction edges of all openings in finished rooms. Install escutcheon ring at all round duct openings in finished rooms. Trim strips and rings shall be same material and finish as exposed duct.
END OF SECTION 23 31 00

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CITY OF RALEIGH
1105 WAREHOUSE DRIVE
RALEIGH, NC 27603

NORTH CAROLINA PROFESSIONAL CORPORATION
IMEG CONSULTANTS CORP.
No. F-1507

6/1/26
NORTH CAROLINA
PROFESSIONAL ENGINEER
SEAL
051195
PATRICK J. McCABE

NO.	REVISION	DATE

JOB NUMBER
23-022
DATE ISSUED
06/01/2026
PROJECT STATUS
CONSTRUCTION DOCUMENTS
SHEET
HVAC SPECIFICATIONS

M700

SECTION 23 33 00 - DUCTWORK ACCESSORIES
PART 1 - GENERAL
1.1 SECTION INCLUDES
A. Manual Volume Dampers.
B. Fire Dampers.
C. Ceiling Fire Dampers.
D. Fire/Smoke Dampers.
E. Smoke Dampers.
F. Pressure Relief Doors.
G. Backdraft Dampers.
H. Fabric Connectors.
I. Drip Pans.
J. Duct Access Doors.
K. Duct Access Sleeve.
L. Duct Test Holes.
M. Remote Volume Control Devices.
PART 2 - PRODUCTS
2.1 MANUAL VOLUME DAMPERS
A. Fabricate in accordance with SMACNA Duct Construction Standards, and as indicated.
B. Fabricate single blade dampers for duct sizes to 9-1/2 (240) x 30 inches (750 mm).
C. Fabricate multi-blade damper of opposed blade pattern with maximum blade sizes 12" (300 mm) x 72" (1800 mm). Assemble center and edge crimped blades in prime coated or galvanized channel frame with suitable hardware.
D. Except in round ductwork 12 inches (300 mm) and smaller, provide end bearings. On multiple blade dampers, provide molded synthetic or oil-impregnated nylon or sintered bronze bearings.
E. Provide locking quadrant regulators on single and multi-blade dampers.
F. On insulated ducts, mount quadrant regulators on stand-off mounting brackets, bases, or adapters.
G. If blades are in open position and extend into the main duct, mount damper so blades are parallel to airflow.
H. Contractor assembled modular manual dampers are acceptable as long as it contains the components listed above.
2.2 BACKDRAFT DAMPERS
A. Gravity backdraft dampers, size 18 inches (450 mm) x 18 inches (450 mm) or smaller, furnished with air moving equipment, may be air moving equipment manufacturer's standard construction.
B. Fabricate multi-blade, parallel action gravity balanced backdraft dampers of extruded aluminum, with blades of maximum 6 inch (150 mm) width, with felt or flexible vinyl sealed edges, linked together in rattle-free manner with 90° stop, and plated steel pivot pin; adjustment device to permit setting for varying differential static pressure.
2.3 DUCT TEST HOLES
A. Cut or drill temporary test holes in ducts as required. Cap with neat patches, neoprene plugs, threaded plugs, or threaded or twist-on metal caps.
PART 3 - EXECUTION
3.1 INSTALLATION
A. General Installation Requirements:
1. Install accessories in accordance with manufacturer's instructions and recognized industry standards.
2. Where duct access doors are located above inaccessible ceilings, provide ceiling access doors. Coordinate location with the Architect/Engineer.
3. Coordinate and install access doors provided by others.
4. Provide access doors for all equipment requiring maintenance or adjustment above an inaccessible ceiling. Minimum size shall be 24" (600 mm) x 24" (600 mm).
5. Provide duct test holes where indicated and as required for testing and balancing purposes.
B. Manual Volume Damper:
1. Provide manual volume dampers at points on low pressure supply, return, and exhaust systems where branches are taken from larger ducts where indicated on drawings and as required for air balancing. Use splitter dampers only where indicated.
2. Provide ceiling access doors for manual volume dampers. When manual volume dampers are located above an inaccessible ceiling and an access door cannot be installed, provide a remote-controlled volume control device for operation of the damper. Coordinate location with the Architect/Engineer.
END OF SECTION 23 33 00

SECTION 23 34 23 - POWER VENTILATORS
PART 1 - GENERAL
1.1 SECTION INCLUDES
A. Roof Exhaust Fan.
B. Rooftop Fan Curbs.
C. Room Exhaust Fan.
D. Ceiling Fan.
PART 2 - PRODUCTS
2.1 CEILING FAN (CF-1)
A. Ceiling mounted, fan with enclosed motor, three or four blades and mounting accessories.
B. Ratings: Fan shall be tested in accordance with AMCA 230 and shall be listed in the USDoE Compliance Certification Management Ceiling (CCMS) Fan Database.
C. Housing: Aluminum suspended with hanger bracket and pivot ball. Standard ceiling hugger x 1" (25 mm) OD steel pipe extension kit.
D. Motor: Energy efficient fixed-stator with copper windings, steel laminated core, and internal thermal overload protection.
E. Blades: Aerodynamically contoured aluminum, matched in weight.
F. Balance: Components balanced to prevent wobble or vibration.
G. Provide full coverage fan guard to totally enclose blades.
H. Unit shall be vapor tight for installation in damp locations.
PART 3 - EXECUTION
3.1 INSTALLATION
A. Install in accordance with manufacturer's instructions and recognized industry standards.
B. MC shall install and wire factory provided damper to open when the fan runs if the manufacturer does not provide an option to pre-wire the damper.
END OF SECTION 23 34 23

SECTION 23 37 00 - AIR INLETS AND OUTLETS
PART 1 - GENERAL
1.1 SECTION INCLUDES
A. Grilles And Registers.
PART 2 - PRODUCTS
2.1 AIR TERMINALS - GRILLES AND REGISTERS
A. Reference to a grille means an air supply, exhaust or transfer device without a damper.
B. Reference to a register means an air supply, exhaust or transfer device with a damper.
C. The type of unit, margin, material, finish, etc., shall be as shown on the drawing schedule and suitable for the intended use.
D. All margins shall be compatible with ceiling types specified (including 'Thin-Line' T-bar lay-in grid system). Any discrepancies in contract documents shall be brought to the attention of the Architect/Engineer, in writing, prior to Bid Date. Submission of Bid indicates ceiling and air inlet and outlet types have been coordinated.
E. The capacity and size of the unit shall be as shown on the drawings.
F. All units shall handle the indicated cfm (airflow L/s) as shown on the drawings while not exceeding an NC level of 25, referenced to 10^{-12} watts with a 10 dB room effect.
G. Refer to the drawings for construction material, color and finish, margin style, deflection, and sizes of grilles and registers.
H. Provide with 3/4" (20 mm) blade spacing. Blades shall have steel friction pivots to allow for blade adjustment, plastic pivots are not acceptable.
I. Corners of steel grilles and registers shall be welded and ground smooth before painting. Aluminum grilles and registers shall have staked corners.
J. Where specified to serve registers, provide opposed blade volume dampers operable from the face of the register.
K. Where specified to have filters, provide with filter rack suitable for [1" (25 mm)][2" (50 mm)] thick MERV-8 pleated media filters. Grille border shall be fabricated from minimum 22 gauge (0.76 mm) steel or minimum 0.040-inch (1 mm) thick for aluminum grilles. Provide removable grille face with metal knurled knob or quarter turn fastener to allow for filter media replacement.
L. Screw holes for surface fasteners shall be countersunk for a neat appearance. Provide concealed fasteners for installation in lay-in ceilings and as specified on the drawings.
2.2 AIR TERMINALS - SQUARE STEPDOWN CONE DIFFUSERS
A. Reference to a diffuser means an air supply device, ceiling mounted, that shall diffuse air uniformly throughout the conditioned space.
B. The type of unit, margin, material, finish, etc., shall be as shown on the drawing schedule. Flat-oval inlets are not acceptable for connection to flexible ducts.
C. All margins shall be compatible with ceiling types specified (including 'Thin-Line' T-bar lay-in grid system). Any discrepancies in contract documents should be brought to the attention of the Architect/Engineer, in writing, prior to Bid Date. Submission of Bid indicates ceiling and air inlet and outlet types have been coordinated.
D. The capacity and size of the unit shall be as shown on the drawings.
E. All units shall handle the indicated cfm (airflow L/s) as shown on the drawings while not exceeding an NC level of 25, referenced to 10^{-12} watts with a 10 dB room effect
F. Diffuser shall be entirely constructed of stamped panel and a minimum of three diffusion cones.
G. Stepdown cones shall be mechanically fastened to panel with metal fasteners. Diffuser stepdown cones glued, fastened with plastic clips, or otherwise attached to face panel will not be acceptable.
H. Each stepdown cone shall be one-piece stamped construction. The cones shall be removable for cleaning.
I. Diffusers shall be constructed of minimum 24 gauge (0.61 mm) steel.
PART 3 - EXECUTION
3.1 INSTALLATION
A. General Installation Requirements:
1. Install items in accordance with manufacturers' instructions and industry recognized standards.
2. Check location of inlets and outlets and make necessary adjustments in position to conform to architectural features, symmetry, and lighting arrangement.
3. Install diffusers to ductwork with air tight connections.
4. Flexible ducts shall NOT be joined to flat-oval connections. Provide sheet metal oval-to-round transitions where required.
5. Supply grille and register blades shall be aimed in the field to provide adequate air distribution in the space. All return grilles and registers blades shall be oriented to minimize sight distance beyond installed device.
B. Volume Damper:
1. Provide manual volume dampers on duct take-off to diffusers when there are multiple connections to a common duct. Locate volume dampers as far as possible from the air inlet or outlet.
C. Maintaining Duct Cleanliness:
1. When grilles, registers, and diffusers are installed, Contractor shall prevent construction dust, dirt, and debris from entering ductwork as required by Section 23 05 00.
END OF SECTION 23 37 00

SECTION 23 81 26 - SPLIT SYSTEM AIR CONDITIONING UNITS
PART 1 - GENERAL
1.1 SECTION INCLUDES
A. Split system air conditioning ceiling-mounted units.
PART 2 - PRODUCTS
2.1 SPLIT SYSTEM WALL AND CEILING-MOUNTED UNITS
A. Manufactured Units:
1. Provide packaged, air-cooled, factory assembled, pre-wired and pre-piped unit consisting of cabinet, fans, filters, remote condensing unit, and controls. Wall-mounted units shall be furnished with integral wall mounting bracket and mounting hardware.
2. Assemble unit for wall-mounted or ceiling installation with service access required.
3. Performance shall be as scheduled on the drawings.
4. Unit shall be rated per AHRI Standards 210/240 and listed in the AHRI directory as a matched system.
5. Provide unit with factory-supplied cleanable air filters.
6. The units shall be listed by Electrical Laboratories (ETL) in accordance with UL-1995 certification and bear the ETL label.
7. All wiring shall be in accordance with the National Electric Code (NEC).
B. Evaporator Cabinet and Frame:
1. Cabinet:
a. Refer to schedule on drawings for mounting type
b. Exposed units shall have a finished appearance with concealed refrigerant piping, condensate drain piping, and wiring connections.
2. Air Distribution Panel (for ceiling-mounted units): Heavy molded plastic 4-way discharge plenum with return air grille and unit filter. Designed for installation into T-bar ceiling system, 24" (615 mm) x 24" (615 mm)
C. Evaporator Fans and Motors:
1. Fans:
a. The evaporator fan shall be direct drive with a single motor having permanently lubricated bearings.
b. The fan shall be statically and dynamically balanced.
c. The indoor fan shall have at least three speeds.
2. Motor:
a. Direct driven, digitally controlled with multiple speeds. Permanently lubricated with internal overload protection.
D. Evaporator Coils (Direct Expansion):
1. Direct expansion cooling coil of seamless copper tubes expanded into aluminum fins.
2. Single refrigeration circuit with externally equalized expansion valve.
3. Coils shall be pressure tested at the factory.
4. A sloped, corrosion-resistant condensate pan with drain shall be provided under the coil.
E. Electrical Panel:
1. Service Connections, Wiring, and Disconnect Requirements: Conform to the National Electrical Code and local electrical codes.
F. Control:
1. The unit shall have a hard-wired 7-day programmable remote controller to operate the system. Provide wall mounting bracket for controller.
2. Remote controller shall have "automatic", "dry" (dehumidification), and "fan only" operating modes.
3. The remote controller shall have the following features:
a. On/Off power switch.
b. Mode Selector to operate the system in auto, cool, heat, fan, or dehumidification (dry) operation.
c. Fan Setting to provide multiple fan speeds.
d. Swing Louver for adjusting supply louver discharge.
e. On/Off Timer for automatically switching the unit off or on.
f. Temperature Adjustment allows for the increase or decrease of the desired temperature.
g. Powerful Operation to allow quick cool down or heating up in the desired space to achieve maximum desired temperature in the shortest allowable time.
4. The remote controller shall perform fault diagnostic functions that may be system related, indoor or outdoor unit related depending on the fault code.
5. Temperature range on the remote controller shall be 64°F (18°C) to 90°F (32°F) in cooling mode and 50°F (10°C) to 86°F (32°F) in heating mode.
6. The indoor unit microprocessor shall have the capability to receive and process commands via return air temperature and indoor coil temperature sensors enabled by commands from the remote controller.
G. Outdoor Unit:
1. General:
a. The outdoor unit shall be specifically matched to the corresponding indoor unit size. The outdoor unit shall be completely factory assembled and pre-wired with all necessary electronic and refrigerant controls.
2. Cabinet:
a. The outdoor unit shall be fabricated of galvanized steel, bonderized and coated with a baked enamel finish for corrosion protection.
3. Fan:
a. The fan shall be direct drive, propeller type fan with fan guard.
b. Fan blades shall be statically and dynamically balanced.
c. The fan shall have permanently lubricated type bearings.
d. Motor shall be protected by internal thermal overload protection.
e. Airflow shall be horizontal discharge.
4. Coil:
a. The outdoor coil shall be nonferrous construction with corrugated fin tube.
b. The coil shall be protected with an internal guard.
c. Refrigerant flow from the condenser shall be controlled via a metering device.
5. Compressor:
a. Hermetic or scroll refrigerant compressors with resilient suspension system, inverter driven, oil strainer, sight glass/moisture indicator, internal motor protection, high pressure switch, and crankcase heater.
b. The outdoor unit shall have an accumulator and four-way reversing valve.
6. Refrigerant:
a. Unit shall use low GWP refrigerants (e.g. R32 or R454B).
b. The use of chlorofluorocarbon (CFC)-based refrigerants is prohibited.
H. Integral Condensate Pump:
1. Packaged unit matched to evaporator unit including float switch, pump, motor assembly, check valve, and reservoir.
2. Provide alarm to indicate high level reservoir.
3. Unit shall be powered from evaporator unit with appropriate field connections available.
I. Condensate Pump:
2.2 PIPING
A. Design Pressure: 450 psig (3100 kPa gauge); Maximum Design Temperature: 250°F (120°C)
B. Type ACR Seamless Copper Tube Linesets; Brazed Joints:
1. 3/4" (20 mm) and under.
2. Tubing: Type ACR seamless copper tube linesets, ASTM B1003. Sizes indicated are nominal designation.
3. Joints: Brazed with silver solder.
4. Fittings: Wrought copper solder joint, ANSI B16.22.
5. Special Requirements: All tubing shall be cleaned, dehydrated, pressurized with dry nitrogen, plugged, and tagged by manufacturer "for refrigeration service". During brazing operations, continuously purge the interior of the pipe with nitrogen to prevent oxide formation.
6. Limitations:
a. Only between refrigerant splitter box and indoor terminal unit.
b. For use above ceiling only. Do not use in exposed areas.
C. Type ACR Hard Drawn Seamless Copper Tube; Brazed Joint:
1. 4" (100 mm) and under.
2. Tubing: Type ACR hard drawn seamless copper tube, ASTM B280. Sizes indicated are nominal designation.
3. Joints: Brazed with silver solder.
4. Fittings: Wrought copper solder joint, ANSI B16.22.
5. Special Requirements: All tubing shall be cleaned, dehydrated, pressurized with dry nitrogen, plugged and tagged by manufacturer "for refrigeration service". During brazing operations, continuously purge the interior of the pipe with nitrogen to prevent oxide formation.
D. Piping - 1-3/8" (35 mm) and Under; Dual Concentric Crimp Mechanical Press Connection (Contractor's Option):
1. Tubing: Type ACR hard drawn seamless copper tube, ASTM B280. Sizes indicated are nominal designation.
2. Joints: Dual concentric crimp band mechanical press connection.
3. Fittings: Refrigerant grade copper in accordance with ASTM B75 or ASTM B743 with embedded HNBR O-ring.
E. Piping - 1-3/8" (35 mm) and Under; Mechanically Attached, Axially Swaged Compression Connection (Contractor's Option):
1. Tubing: Type ACR hard drawn seamless copper tube, ASTM B280. Sizes indicated are nominal designation.
2. Joints: Mechanically attached connector, axially swaged compression connection.
3. Fittings: Refrigerant grade copper in accordance with ASTM B75 or ASTM B743. Brass body with two stabilization inserts in accordance with ASTM B15/B16M, two steel rings in accordance with ASTM A108-13, anerobic adhesive sealant.
F. Refrigerant linesets are permitted.
1. Provide manufacturer-packaged refrigerant linesets and accessories of sizes needed for installation. Verify lengths of piping required for installation.
2.3 INSULATION
A. EPDM (NBR/PVC Blend is not permitted) elastomeric cellular foam; ANSI/ASTM C534; flexible plastic; 0.25 (0.035 W/(m K) maximum 'K' value at 75°F (24°C), 25/50 flame spread/smoke developed rating when tested in accordance with ASTM E84 (UL 723). Minimum 1/2" (15 mm) thick for pipe sizes less than 1-1/4" (32 mm) and 3/4" (20 mm) thick for pipe sizes 1-1/4" (32 mm) and above.
2.4 EXPANSION COMPENSATION
A. Assembly consisting of two flexible connectors, two copper flexible connectors, two 90° elbows, and a 180° return pipe. Unit shall be in the form of a pipe loop.
B. Connectors shall have corrugated copper hose bodies with copper braided casings.
C. Connectors shall be rated for 150 psi (1035 kpa) working pressure at 70°F (21°C).
D. Sizes 2" (50 mm) and smaller shall have copper sweat ends.
E. Connectors shall be suitable for 1/2" (13 mm) permanent misalignment.
PART 3 - EXECUTION
3.1 EXAMINATION
A. Verify that proper power supply is available.
3.2 INSTALLATION
A. General Installation Requirements:
1. Install per manufacturer's instructions and recognized industry standards.
2. Install piping to allow for expansion and contraction without stressing pipe, joints, or connected equipment.
3. Install units in accordance with manufacturer's instructions. Install all units level and plumb. Indoor units shall be installed using manufacturer's standard mounting hardware securely fastened to building structure.
4. Refer to Section 23 05 29 for concrete base for outdoor unit.
5. Coordinate the exact mounting location of all indoor and outdoor units with architectural and electrical work. Coordinate installation of ceiling-mounted units with ceiling grid layout. Provide additional ceiling grid reinforcement or modification as required and coordinate the work with the GC. Locate the indoor unit where it is readily accessible for maintenance and filter changes. Where outdoor units are located on the roof, locate at least 10' from the roof edge.
6. Verify locations of wall-mounted remote controllers with drawings and room details before installation. Coordinate mounting heights to be consistent with other wall-mounted devices. Height above finished floor shall not exceed 48" (1220 mm).
7. Maintain minimum clearances to all equipment. Maintain manufacturer's minimum maintenance, and airflow clearances, and maintain minimum spaces about electrical equipment, whichever is greater.
a. 120V: 36" (915 mm) deep x 30" (765 mm) wide or the width of the panel whichever is wider.
b. 208V: 42" (1065 mm) deep x 30" (765 mm) wide or the width of the panel whichever is wider.
c. 480V: 42" (1065 mm) deep x 30" (765 mm) wide or the width of the panel whichever is wider.
B. Condensate Removal:
1. Install condensate piping with trap and route from drain pan to nearest drain. Discharge to nearest code-approved receptor or to a properly vented indirect waste fitting. Flush all piping before making final connections to units.
C. Comb all coils to repair bent fins.
D. Install new filters in the unit at Substantial Completion.
E. A factory-authorized service agent shall assist in commissioning the unit and inspecting the installation prior to startup. Submit startup report with O&M manuals.
3.3 REFRIGERANT PIPING
A. Install refrigerant piping from the indoor unit(s) to the condensing unit. Refrigerant pipe sizes, lengths, specialties and configurations shall be as recommended by the manufacturer. Evacuate refrigerant piping and fully charge system with refrigerant per manufacturer's requirements.
B. Insulate all refrigerant piping.
C. Joining of Piping:
1. Brazed Joints:
a. Make up joints with brazing filler metal conforming to ANSI/AWS A5.8. Cut copper tubing ends perfectly square and remove all burrs inside and outside. Thoroughly clean sockets of fittings and ends of tubing to remove all oxide, dirt, and grease just prior to brazing. Apply flux evenly, but sparingly, to all surfaces to be joined. Brazing filler metal with a flux coating may also be used. Heat joints uniformly to proper brazing temperature so braze filler metal flows to all mated surfaces. Wipe excess braze filler metal, leaving a uniform fillet around cup of fitting.
b. Flux shall conform to ANSI/AWS AS.31.
c. Remove composition discs and all swabs during brazing if not suitable for a minimum of 840°F (449°C) or greater than the melting temperature of the brazing filler metal, whichever is greater.
2. Mechanical Press Connection:
a. Copper press fitting shall be made in accordance with the manufacturer's installation instructions.
b. Examination: Upon delivery to the jobsite, examine copper tubing and fittings for debris, defects, incise marks (manufacturer's engraving on tube), holes, or cracks.
c. Fully insert tubing into the fitting and mark tubing.
d. Prior to making connection, the fitting alignment shall be checked against the mark made on the tube to ensure the tubing is fully engaged in the fitting.
e. Joint shall be pressed with a tool approved by the manufacturer.
f. Installers shall be trained by manufacturer personnel or representative. Provide documentation upon request.
3. Axially Swaged Connection:
a. Brass axially swaged connectors shall be installed in accordance with the manufacturer's installation instructions.
b. Installers shall be trained by manufacturer personnel or representative. Provide documentation upon request.
D. Insulation:
1. Insulate all refrigerant pipes between the heat pump and indoor units. This includes the liquid pipe, the suction pipe, the hot gas pipe, and the high-low pressure gas pipe. All fittings, valves, and specialty refrigerant components in the piping between the indoor and heat pump units shall also be insulated. The insulation shall have a continuous vapor barrier and shall pass through hangers and supports unbroken. All exterior insulated piping shall be painted with minimum of one (1) coat of UV resistant paint. Over size hangers and supports to allow the insulation to pass through unbroken. Following are the minimum insulation thicknesses unless noted otherwise in the manufacturer's literature or required by local AHJ:
a. Code/Year: ASHRAE 2013 AND IECC 2018
b. Refrigerant Suction (40°F (4°C) & Below):
1) Up to 1" (25 mm): 1/2" (15 mm)
2) 1" (25 mm) and up: 1" (25 mm)
c. Refrigerant Suction (41°F (5°C) to 60°F (16°C)):
1) Up to 1-1/2" (40 mm): 1/2" (15 mm)
2) 1-1/2" (40 mm) and up: 1" (25 mm)
d. Refrigerant Low Pressure Gas (141°F (61°C) to 200°F (93°C)):
1) Up to 1-1/2" (40 mm): 1-1/2" (40 mm)
2) 1-1/2" (40 mm) and up: 2" (50 mm)
e. Refrigerant High Pressure Gas (201°F (94°C) to 250°F (121°C)):
1) Up to 4" (100 mm): 2-1/2" (65 mm)
f. Refrigerant Liquid:
1) Up to 1-1/2" (40 mm): 1" (25 mm)
2) 1-1/2" (40 mm) and up: 1-1/2" (40 mm)
c. Refrigerant Low Pressure Gas (141°F (61°C) to 200°F (93°C)):
1) Up to 1-1/2" (40 mm): 1-1/2" (40 mm)
2) 1-1/2" (40 mm) and up: 2" (50 mm)
d. Refrigerant High Pressure Gas (201°F (94°C) to 250°F (121°C)):
1) Up to 4" (100 mm): 2-1/2" (65 mm)
e. Refrigerant Liquid:
1) Up to 1" (25 mm): 1" (25 mm)
2) 1" (25 mm) and up: 1-1/2" (40 mm)
END OF SECTION 23 81 26

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6/1/26

NO.	REVISION	DATE

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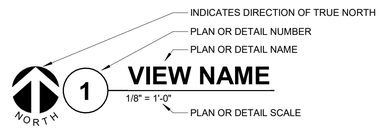
0 1 2 3
REF. SCALE IN INCHES
PROJECT #25007050.00

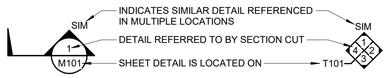
Plot Time: 6/1/2026 8:10:05 AM

VIEW KEY

NAME — LEVEL NAME
10'-0" — HEIGHT ABOVE PROJECT 0'-0"

1 — KEYNOTE: INDICATES NOTE USED TO DESCRIBE ADDITIONAL INFORMATION ABOUT WORK REQUIRED, SPECIFIC TO THE SHEET AND/OR DETAIL





LINE TYPE AND TAG KEY:

NEW WORK BY THIS CONTRACTOR (WIDE LINE)
——— NEW
- - - - - - - - - EXISTING TO BE REMOVED (SHORT DASHED PATTERN)
— — — — NEW UNDERFLOOR OR UNDERGROUND (LONG DASHED PATTERN)

EXISTING TO REMAIN OR WORK BY OTHERS (NARROW LINE)
——— EXISTING
- - - - - - - - - EXISTING TO BE REMOVED BY OTHERS (SHORT DASHED PATTERN)
— — — — EXISTING UNDERFLOOR OR UNDERGROUND (LONG DASHED PATTERN)

HALFTONING DOES NOT MODIFY SCOPE.

'TAG'-E — TAGS WITH DASH 'E' INDICATES THE REFERENCED OBJECT IS EXISTING

TAG-1 — UNDERLINED TAG INDICATES OBJECT IS IN-SCOPE. IF NEW, ADDITIONAL INFORMATION IS AVAILABLE IN A SCHEDULE, MATERIAL LIST, OR SYMBOL LIST

INDICATES AN EXISTING SYSTEM'S POINT OF CONNECTION/REMOVAL

RECEPTACLE SUBSCRIPT KEY:

DEVICE KEY:

DEVICE # = MOUNTING (IF APPLICABLE)
1 = CIRCUIT NUMBER

*IF LABEL IS ORIENTED HORIZONTALLY A SLASH WILL SEPARATE THIS INFORMATION. EX: A / 1

ELECTRICAL MOUNTING SUBSCRIPT KEY:

A	MOUNT AT +6" TO CENTERLINE ABOVE COUNTER OR BACKSPLASH
C	MOUNT AT CEILING (DEVICE OR ROUGH-IN CONTEXT)
H	MOUNT ORIENTED HORIZONTALLY
L	MOUNT IN CASEWORK
M	MOUNT IN MODULAR FURNITURE
R	MOUNT IN SURFACE RACEWAY
SM	SURFACE MOUNTED
WG	WIRE GUARD
+#'	MOUNT AT #' TO CENTERLINE ABOVE FINISHED FLOOR

2018 APPENDIX B BUILDING CODE SUMMARY FOR COMMERCIAL PROJECTS ELECTRICAL SUMMARY

ELECTRICAL SYSTEMS AND EQUIPMENT

METHOD OF COMPLIANCE: **Energy Code:** ☒ **Prescriptive** ☐ **Performance**
ASHRAE 90.1: ☐ **Prescriptive** ☐ **Performance**

LIGHTING SCHEDULE

LAMP TYPE REQUIRED IN FIXTURE: SEE FIXTURE SCHEDULE

NUMBER OF LAMPS IN THE FIXTURE: SEE FIXTURE SCHEDULE

BALLAST TYPE USED IN THE FIXTURE: SEE FIXTURE SCHEDULE

NUMBER OF BALLASTS IN THE FIXTURE: SEE FIXTURE SCHEDULE

TOTAL WATTAGE PER FIXTURE: SEE FIXTURE SCHEDULE

TOTAL INTERIOR WATTAGE: 1228 VS 1782
SPECIFIED VS. ALLOWED (WHOLE BUILDING OR SPACE BY SPACE)

TOTAL EXTERIOR WATTAGE: 120 VS 600
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

DESIGNER STATEMENT:
TO THE BEST OF MY KNOWLEDGE AND BELIEF, THE DESIGN OF THIS BUILDING COMPLIES WITH THE ELECTRICAL SYSTEM AND EQUIPMENT REQUIREMENTS OF THE NORTH CAROLINA STATE BUILDING CODE, 2018 - ENERGY.

SIGNED: Alex Bowling
NAME: ALEX BOWLING, P.E.
TITLE: ENGINEER

ELECTRICAL SYMBOL LIST - POWER

SYMBOL	EQUIP ABBREV	SPEC SECTION	DESCRIPTION
(E)	ECONN	26 05 33	ELECTRICAL CONNECTION - CEILING/SURFACE
[E]	ECONN	26 05 33	ELECTRICAL CONNECTION - WALL
	PANEL-'##'	26 24 16	PANELBOARD - SURFACE MOUNT
F	FDS-#	26 28 16	FUSIBLE DISCONNECT SWITCH, REFER TO DISCONNECT AND STARTER SCHEDULE

ELECTRICAL SYMBOL LIST - RECEPTACLES

SYMBOL	TAG	EQUIP ABBREV	SPEC SECTION	DESCRIPTION
#	###		26 27 26	SPECIALTY SIMPLEX RECEPTACLE
#		REC-DUP	26 27 26	DUPLEX RECEPTACLE, 125V
	SM	REC-DUP	26 27 26	DUPLEX RECEPTACLE, 125V - SURFACE MOUNTED
		REC-DUP-GFI	26 27 26	DUPLEX RECEPTACLE, GROUND FAULT CIRCUIT INTERRUPTER, 125V
#		REC-QUAD	26 27 26	QUAD RECEPTACLE, 125V

CONTRACTOR ABBREVIATION KEY

ABBR:	DESCRIPTION:
E	EXISTING
E.C.	ELECTRICAL CONTRACTOR
G.C.	GENERAL CONTRACTOR
M.C.	MECHANICAL CONTRACTOR
P.C.	PLUMBING CONTRACTOR

ELECTRICAL ABBREVIATION KEY

ABBR:	DESCRIPTION:
ABV	ABOVE
AFC	ABOVE FINISHED CEILING
AFF	ABOVE FINISHED FLOOR
AFG	ABOVE FINISHED GRADE
ASR	ARCHITECTURAL SURFACE RACEWAY
BC	BELOW COUNTER
C	CONDUIT (BRANCH CIRCUIT OR FEEDER CONTEXT)
CO	CONDUIT AND BOX ROUGH-IN ONLY (ROUGH-IN ONLY)
E	EXISTING
EG	EQUIPMENT GROUND
EGC	EQUIPMENT GROUNDING CONDUCTOR
NC	NORMALLY CLOSED
NEMA #	NEMA RATING
NIC	NOT IN CONTRACTED SCOPE
SM	SURFACE MOUNTED
TYP	TYPICAL
UG	UNDERGROUND
UON	UNLESS OTHERWISE NOTED

ELECTRICAL RENOVATION NOTES:

THESE NOTES APPLY TO ALL ELECTRICAL SHEETS AND TRADES, INCLUDING BUT NOT LIMITED TO, LIGHTING, POWER, FIRE ALARM, AND OTHER LOW VOLTAGE SYSTEMS.

1. EXISTING CONDITIONS ARE SHOWN BASED ON INFORMATION OBTAINED FROM FIELD SURVEYS, EXISTING BUILDING DOCUMENTS. CONTRACTOR SHALL REVIEW EXISTING CONDITIONS AND REPORT CONFLICTS.
2. NOT ALL EXISTING EQUIPMENT, LUMINAIRES, AND CONDUIT ARE SHOWN. CONTRACTOR SHALL REVIEW EXISTING CONDITIONS AND REPORT CONFLICTS.
3. CONTRACTOR SHALL REVIEW EXISTING CONDITIONS PRIOR TO FABRICATION OF CABLE TRAY, BUSWAY, CONDUIT RACKS, AND OTHER SYSTEMS. RISES AND DROPS MAY BE NECESSARY BECAUSE OF EXISTING FIELD CONDITIONS. ELECTRICAL CONTRACTOR SHALL REVIEW EXISTING CONDITIONS TO VERIFY ACCESSIBILITY TO THE AREAS OF THEIR WORK INCLUDING WALLS, FLOOR, CEILINGS, CEILING TILES/GRID, AND ROOF. ELECTRICAL CONTRACTOR IS RESPONSIBLE TO PROVIDE CUTTING, REMOVAL, PATCHING, AND REINSTALLATION OF AFFECTED AREAS ASSOCIATED WITH THEIR WORK BY COORDINATING WITH THE GENERAL CONTRACTOR OR QUALIFIED CONTRACTOR. CONTRACTOR SHALL NOTIFY THE PRIME CONTRACTOR OF AFFECTED AREAS PRIOR TO BIDDING.
4. WHERE EXISTING ELECTRICAL SYSTEMS ARE LOCATED IN AREAS THAT CONFLICT WITH NEW EQUIPMENT, PIPING, OR DUCTWORK TO BE INSTALLED, EACH CONTRACTOR SHALL EITHER ARRANGE NEW EQUIPMENT, CONDUIT, OR DUCTWORK IN SUCH A FASHION THAT IT DOES NOT CONFLICT WITH EXISTING SYSTEMS, OR REWORK EXISTING ELECTRICAL SYSTEMS TO ALLOW FOR INSTALLATION OF NEW EQUIPMENT, PIPING, OR DUCTWORK.
5. PRIOR TO CONNECTING ANY NEW RECEPTACLES TO EXISTING CIRCUITS, THE ELECTRICAL CONTRACTOR SHALL FIELD VERIFY THAT NO MORE THAN 10 RECEPTACLES ARE CONNECTED TO A 20 AMP CIRCUIT. AFTER RECONNECTING ALL NEW AND RELOCATED LIGHT FIXTURES THE ELECTRICAL CONTRACTOR SHALL MEASURE THE CONNECTED LOAD FOR EACH LIGHTING CIRCUIT TO INSURE THAT NO MORE THAN 16 AMPS IS CONNECTED TO A 20 AMP CIRCUIT. THE CONTRACTOR SHALL NOTIFY THE ENGINEER IF EITHER OF THE ABOVE CONDITIONS CAN NOT BE ACHIEVED.
6. THE ELECTRICAL CONTRACTOR IS RESPONSIBLE FOR MAINTAINING CIRCUIT CONTINUITY TO ALL LIGHTING, DEVICES AND EQUIPMENT NOT SUBJECT TO REMOVAL. PROVIDE ADDITIONAL CONDUIT AND WIRING AS REQUIRED.
7. RELOCATE AS NECESSARY ALL EXISTING CIRCUITS FOUND PASSING THROUGH THE AREA OF CONSTRUCTION, AND WHICH ARE PRESENTLY IN USE IN OTHER PARTS OF THE BUILDING UNAFFECTED BY THIS PROJECT PHASE, TO MAINTAIN THE CONTINUITY OF SERVICE AND GROUNDING, AND TO CONCEAL THEM ABOVE NEW CEILINGS.
8. WHERE EXISTING EQUIPMENT AND DEVICES SHALL BE REMOVED, THE CONTRACTOR SHALL REMOVE ALL THE ASSOCIATED CONDUIT AND CONDUCTORS THAT SHALL NOT REMAIN IN OPERATION BACK TO THEIR RESPECTIVE SOURCE OR TO THE POINT ON A SHARED CIRCUIT FROM WHERE THE EQUIPMENT OR DEVICE IS SERVED.

ELECTRICAL EQUIPMENT TAGS

TAG:	DESCRIPTION:	RELATED SPECIFICATION
C-#	GENERAL PURPOSE CONTACTOR	26 28 21
DP-#	DISTRIBUTION PANEL	26 24 16

EQUIPMENT ABBREVIATION KEY

ABBR:	DESCRIPTION:
COF	COFFEE
ESP	ESPRESSO MACHINE
EWC	ELECTRIC WATER COOLER
FFE	OWNER FURNISHED FIXTURES, FURNITURE, AND EQUIPMENT
FURN	OWNER FURNITURE
HD	HAND DRYER
MW	MICROWAVE
PFR	PLUMB FIXTURE RECEPT FOR LV VALVE POWER
REF	REFRIGERATOR
TV	TELEVISION - MONITOR - DISPLAY

FIRE / SMOKE BARRIER DESIGNATIONS

FIRE AND SMOKE SEPARATIONS ARE NOT SHOWN ON THESE DOCUMENTS. CONTRACTOR SHALL REVIEW THE ARCHITECTURAL PLANS AND DETERMINE THE LOCATIONS OF ALL FIRE AND SMOKE PARTITIONS, BARRIERS, AND WALLS. THIS INCLUDES FLOOR RATINGS. PRICING SHALL INCLUDE ALL MATERIALS AND LABOR REQUIRED TO MAINTAIN THE RATINGS OF ALL RATED SEPARATIONS, WHETHER SHOWN ON THE ENGINEERING PLANS OR NOT.

ELECTRICAL INSTALLATION NOTES:

1. **[THE COMPLETE INSTALLATION SHALL BE IN ACCORDANCE WITH THE 2010 (LATEST PUBLISHED) ADA STANDARDS FOR ACCESSIBLE DESIGN. REFER TO THE ADA STANDARDS FOR ALL CONFIGURATION DETAILS ON THIS PAGE FOR ADDITIONAL INFORMATION.]**
2. CIRCUIT NUMBERS ARE SHOWN FOR CIRCUIT IDENTIFICATION. CIRCUITING SHALL AGREE WITH NUMBERING ON THE PANEL PROVIDED. COMMON NEUTRALS MAY NOT BE USED FOR BRANCH CIRCUITS. BALANCE THE LOAD ON PANEL AS EVENLY AS POSSIBLE BETWEEN EACH PHASE.
3. FLUSH MOUNT ALL LIGHTING CONTROL DEVICES AT +42" FROM FLOOR (CENTERLINE DIMENSION), EXCEPT WHERE OTHERWISE NOTED.
4. FLUSH MOUNT ALL DUPLEX RECEPTACLES AND TECHNOLOGY OUTLETS AT +18" FROM FLOOR (CENTERLINE DIMENSION), EXCEPT WHERE OTHERWISE NOTED. RECEPTACLES AND OUTLETS MAY BE SURFACE MOUNTED WHEN CONDUIT IS SPECIFIED EXPOSED. MOUNT EXTERIOR LOCATED RECEPTACLES WITH WHILE-IN-USE COVERS AT +20" FROM FINISHED GRADE (CENTER DIMENSIONS) TO MAINTAIN INSTALLATION ADA COMPLIANCE.
5. ALL MATERIALS USED TO SEAL PENETRATIONS OF FIRE RATED WALLS AND FLOORS SHALL BE TESTED AND CERTIFIED AS A SYSTEM PER ASTM E814 STANDARDS FOR FIRE TESTS OF THROUGH-PENETRATION FIRESTOPS. REFER TO **[27 05 03 AND 28 05 03] [26 05 03]** FOR ADDITIONAL INFORMATION AND REQUIREMENTS SPECIFIC TO FIRESTOPPING.
6. CONNECTION FOR ELECTRIC WATER COOLERS (EWC) SHALL BE A JUNCTION BOX CONCEALED BEHIND WATER COOLER ACCESS PLATE OR BE A GFI RECEPTACLE LOCATED DIRECTLY BELOW AND CENTERED ON EWC. CONTRACTOR SHALL VERIFY TYPE OF EWC TO BE INSTALLED.
7. CONTRACTOR SHALL COORDINATE THE LOCATION OF ALL CEILING MOUNTED DEVICES AND EQUIPMENT WITH LUMINAIRES, SPRINKLER, AND CEILING DIFFUSERS. CENTER ALL DEVICES IN CEILING TILE PATTERN. OCCUPANCY/VACANCY SENSORS SHALL BE LOCATED NO CLOSER THAN 3 FEET TO AN AIR SUPPLY DIFFUSER OR RETURN GRILLE.
8. CONTRACTOR SHALL VERIFY ALL FURNITURE, MODULAR FURNITURE, AND EQUIPMENT LOCATIONS WITH ARCHITECTURAL PLANS, ELEVATIONS, AND REVIEWED SHOP DRAWINGS. PRIOR TO MAKING THE ACTUAL ELECTRICAL INSTALLATION, THIS CONTRACTOR SHALL ADJUST RECEPTACLES, OUTLETS, OR CONNECTION LOCATIONS TO ACCOMMODATE FURNITURE AND/OR EQUIPMENT.
9. ELECTRICAL AND TECHNOLOGY EQUIPMENT SHALL BE MOUNTED TO AVOID IMPEDANCE OF, OPERATION OF, AND/OR ACCESS TO ELECTRICAL AND MECHANICAL EQUIPMENT. ALL MOUNTING OF ELECTRICAL AND TELECOMMUNICATIONS EQUIPMENT, ON EQUIPMENT SUPPLIED BY ANOTHER CONTRACTOR, SHALL BE APPROVED IN ADVANCE BY THE OTHER CONTRACTOR.
10. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL OPENINGS REQUIRED IN WALLS. ALL OPENINGS SHALL BE REPAIRED TO MATCH EXISTING BY A QUALIFIED CONTRACTOR AT THE EXPENSE OF THIS CONTRACTOR. ALL CONDUITS THROUGH WALLS SHALL BE GROUTED OR SEALED INTO OPENINGS.
11. EACH CONTRACTOR IS RESPONSIBLE FOR DAMAGE CAUSED BY THEIR ACTIONS TO THE WALLS, FLOORS, CEILINGS, AND ROOFS. THE CONTRACTOR WHOSE WORK CAUSES DAMAGE IS RESPONSIBLE FOR PATCHING TO MATCH ORIGINAL CONSTRUCTION, FIRE RATING, AND FINISH.
12. REFER TO ARCHITECTURAL REFLECTED CEILING PLAN, ELECTRICAL, TECHNOLOGY AUDIO/VISUAL, AND OTHER ELECTRICAL PLANS FOR EXACT LOCATIONS OF ALL CEILING MOUNTED DEVICES, OTHER THAN SPRINKLERS.
13. ELECTRICAL IDENTIFICATION. REFER TO SPECIFICATION SECTION 26 05 53 FOR COLOR/LABEL REQUIREMENTS FOR CONDUIT, BOX, CABLE/WIRE, AND EQUIPMENT.

ELECTRICAL PHASING NOTES:

THESE NOTES APPLY TO ALL ELECTRICAL SHEETS AND TRADES, INCLUDING BUT NOT LIMITED TO, LIGHTING, POWER, FIRE ALARM, AND OTHER LOW VOLTAGE SYSTEMS.

1. REFER TO **[ARCHITECTURAL]** DRAWINGS FOR GENERAL DESCRIPTION OF PHASES.
2. REFER TO**[ARCHITECTS]** INSTRUCTIONS FOR MORE DETAILS AND PHASING SCHEDULES AND FOR CONCURRENT WORK. MECHANICAL, ELECTRICAL AND TECHNOLOGY DRAWINGS DEPICT THE INTENT OF THE FINAL DESIGN. THE MECHANICAL, ELECTRICAL, AND TECHNOLOGY DRAWINGS DO NOT DEPICT THE MEANS AND METHODS TO MEET THE REQUIREMENTS OF THE PHASING CRITERIA.
3. REVIEW PROJECT PHASING PLANS TO COORDINATE DEMOLITION WORK, OUTAGES, ETC. WITH AFFECTED ADJACENT AREAS.
4. PROVIDE TEMPORARY LIGHTING, POWER, FIRE ALARM, AND OTHER LOW VOLTAGE SYSTEMS, ETC. AS NEEDED TO MAINTAIN SERVICE TO ALL AREAS DURING ALL PHASES OF PROJECT.

APPLICABLE CODES

CONTRACTOR SHALL COMPLY WITH APPLICABLE CODES AND LOCAL AMENDMENTS INCLUDING, BUT NOT LIMITED TO, THE FOLLOWING:

ENERGY CONSERVATION CODE:	NCECC 2018
MECHANICAL CODE:	NCMC 2018
PLUMBING CODE:	NCPC 2018
ELECTRICAL CODE:	NEC 2020

ELECTRICAL SHEET INDEX

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05/28/2026

NO.	REVISION	DATE

JOB NUMBER **23-022**
DATE ISSUED **06/01/2026**
PROJECT STATUS **CONSTRUCTION DOCUMENTS**
SHEET **ELECTRICAL COVERSHEET**

E000

Plot Time: 5/28/2026 1:48:21 PM

LUMINAIRE SCHEDULE

TAG	DESCRIPTION	MTG	DIMENSIONS	LIGHT SOURCE	DELIVERED LUMENS	WATTS	POWER SUPPLY	MANUFACTURER - SERIES	NOTES
B	2x2 LED PANEL	CL	24"L X 24"W X 5 1/4"H	LED	0 lm4212	37 / FIX	120 LV	NEW TO MATCH EXISTING	
C	2x4 LED PANEL	CL	48"L X 24"W X 5 1/4"H	LED	0 lm6241	50 / FIX	120 LV	NEW TO MATCH EXISTING	
E	LINEAR INDIRECT	SP	96"L X 8 1/2"W X 3"H	LED	0 lm6111	50 / FIX	120 LV {LS2}	EXISTING	
EM#	EMERGENCY UNIT	WL	14"L X 6"W X 3 3/4"H			0 / FIX	120	NEW TO MATCH EXISTING	
EX#	EMERGENCY LIGHT/EXIT COMBO	WL	13"L X 2"W X 9"H	LED	0 lm113	2 / FIX	120 LV	LITHONIA - ECRG SQ	

ELECTRICAL SYMBOL LIST - LIGHTING CONTROLS

SYMBOL	TAG	EQUIP ABBREV	SPEC SECTION	DESCRIPTION
S		SW-1P	26 09 33	SWITCH - SINGLE POLE
	3	SW-3W	26 09 33	SWITCH - THREE WAY
	O2	SW-O2	26 09 33	SWITCH - OCCUPANCY SENSOR AND DUAL SWITCH
	SM			SURFACE MOUNT
# OC	D	SW-OC-D	26 09 33	OCCUPANCY SENSOR - DUAL TECHNOLOGY

LIGHTING SEQUENCE OF OPERATION

NOTES:
1. {L##} DENOTES THE LIGHTING SEQUENCE OF OPERATIONS FOR THIS SPACE.
2. {#B} PUSH BUTTON REFERS TO SCENE QUANTITY. CONTROL STATION SHALL BE CAPABLE OF [RAISE/LOWER AND] SWITCHING ON/OFF FOR MULTIPLE SCENES AS INDICATED ON SHEETS AND THE LIGHTING SEQUENCE OF OPERATIONS {L##}. COORDINATE QUANTITIES OF BUTTONS FOR CONTROL STATIONS WITH LIGHTING CONTROL MANUFACTURER.
3. {Z#} DENOTES LIGHTING CONTROL ZONE. PROVIDE SEPARATE CONTROL OF EACH CONTROLLED ZONE. LUMINAIRES ASSOCIATED WITH THE SAME ZONE SHALL OPERATE TOGETHER WITHIN THE SAME PROGRAMMED SCENE.
4. a = SWITCH DESIGNATION FOR LIGHTING CONTROL
5. VERIFY AND COORDINATE ALL TIME CLOCK SETTINGS WITH OWNER PRIOR TO FINAL PROGRAMMING.
6. VERIFY AND COORDINATE ALL PUSH BUTTON WALL DEVICES AND QUANTITIES OF INDIVIDUAL BUTTONS WITH SCENES AND ZONES PER LOCATION.
7. VERIFY AND COORDINATE ALL PUSH BUTTON QUANTITIES AND SCENE NAMES WITH OWNER PRIOR TO SUBMITTING ENGRAVING TEMPLATE TO MANUFACTURER.

CONTROL METHOD	CONTROL NOTES
{LS1}	SEQUENCE: LIGHTING CONTROL PROVIDES OCCUPANCY CONTROL, MANUAL SWITCHING IN THIS SPACE. ON: LIGHTS TURN ON VIA OCCUPANCY SENSOR. OFF: LIGHTS AUTOMATICALLY TURN OFF AFTER THE SPACE HAS BEEN VACANT FOR 15 MINUTES.

CONDUIT INSTALLATION SCHEDULE

THE FOLLOWING SCHEDULE SHALL BE ADHERED TO UNLESS THEY CONSTITUTE A VIOLATION OF APPLICABLE CODES OR ARE NOTED OTHERWISE ON THE DRAWINGS. THE INSTALLATION OF RMC CONDUIT WILL BE PERMITTED IN PLACE OF ALL CONDUIT SPECIFIED IN THIS SCHEDULE. REFER TO CONDUIT AND BOXES SPECIFICATION 26 05 33 FOR ADDITIONAL INFORMATION.

INSTALLATION TYPE	RMC	IMC	EMT	PVC	PVC CONCRETE ENCASED	RTRC	PVC COATED RMC	HDPE	ASR
FEEDERS: SWITCHBOARDS, DISTRIBUTION PANELS, PANELBOARDS, MOTOR CONTROL CENTERS, ETC.		X	X						
BRANCH CIRCUITS: LIGHTING, RECEPTACLES, CONTROLS, ETC.		X	X						
MECHANICAL EQUIPMENT FEEDERS: PUMPS, CHILLERS, AIR HANDLING UNITS, ETC.		X	X						
FLOOR MOUNTED EQUIPMENT FEEDERS: PUMPS, ETC. (INCLUDE NO MORE THAN 6 FEET OF LFMC TO PUMP)		X	X						
CONTROLS (LIGHTING, POWER, BUILDING AUTOMATION, ETC.)		X	X						
WET AND DAMP LOCATIONS: (CONDUIT, BOXES, FITTINGS, INSTALLED AND EQUIPPED TO PREVENT WATER ENTRY)	X					X			
ELEVATED CONCRETE SLABS (ABOVE GRADE)	X			X					
INTERIOR LOCATIONS WITH FINISHED CEILING AND WALLS: CONCEALED IN WALLS AND ABOVE FINISHED CEILINGS			X						
INTERIOR LOCATIONS WITHOUT FINISHED CEILINGS: CONCEALED IN WALL, EXPOSED ABOVE CEILINGS		X	X						
EXISTING INTERIOR LOCATIONS WITH FINISHED CEILINGS AND WALLS: CONCEALED IN WALLS AND ABOVE FINISHED CEILING UNLESS OTHERWISE NOTED			X						X

LIGHTING SYSTEM DESCRIPTION KEY:

THE DESIGN DOCUMENTS DESCRIBE THE OPERATIONAL PERFORMANCE REQUIREMENTS OF THE LIGHTING CONTROL SYSTEM. THE PROJECT MAY REQUIRE ONE OR MORE LIGHTING CONTROL STRATEGIES FOR THE PROJECT. REFER TO THE ELECTRICAL SYMBOL KEY, SPECIFICATION SECTION 26 09 33 LIGHTING CONTROL SYSTEMS, AND THE DRAWINGS TO DETERMINE THE DESIGN APPLICATION FOR EACH SPACE. THE POTENTIAL STRATEGIES ARE AS FOLLOWS:

1. STANDALONE LIGHTING CONTROL DEVICES: INDEPENDENT (STANDALONE) DEVICES TRADITIONALLY OPERATING AT LINE OR LOW VOLTAGE, FIELD CONFIGURABLE WITH OTHER STANDALONE DEVICES TO PROVIDE AN OVERALL LIGHTING CONTROL SYSTEM.

LIGHTING CONTROL SYSTEM DESIGNATION: THE FOLLOWING KEY MAY BE USED AS AN EXAMPLE TO DETERMINE THE DESIGNATED LIGHTING CONTROL SYSTEM FOR EACH SPACE. REFER TO ELECTRICAL COVERSHEET FOR ELECTRICAL SYMBOLS LIST AND DEVICE SPECIFICATION TAG. REFER TO THE SPECIFICATIONS FOR ADDITIONAL INFORMATION.

1. STANDALONE LIGHTING CONTROL DEVICES: CONTROL STATION COMMONLY DEFINED BY AN ALPHA CHARACTER WITH SUBSCRIPTS.
   A. EXAMPLE SYMBOL "S", SPECIFICATION TAG "SW-1P", DESCRIPTION "SWITCH-SINGLE POLE SWITCH".
   B. EXAMPLE CONTROL DESIGNATION: a, b, c (WHEN REQUIRED TO CLARIFY DESIGN INTENT).
   C. SINGLE POLE LIGHT SWITCH "SA" CONTROLS LUMINAIRES WITH THE SUBSCRIPT "a" WITHIN THE SAME SPACE.
   D. REFER TO THE LIGHT CONTROL SEQUENCE OF OPERATION TAG {L#-##} FOR A COMPLETE DESCRIPTION OF THE LIGHTING CONTROL REQUIREMENTS.

F#/a — LUMINAIRE; a/S — CONTROL

LIGHTING CONTROL NOTES:

LIGHTING CONTROL NOTES:

{L#-##} INDICATES THE LIGHTING SEQUENCE OF OPERATION FOR THE SPACE. REFER TO THE LIGHTING SEQUENCE OF OPERATION MATRIX ON SHEET **[E001]**

{#B} LIGHTING CONTROL STATION. THE "#" INDICATES THE MINIMUM QUANTITY OF ZONES/SCENES AS DEFINED IN THE LIGHTING SEQUENCE OF OPERATIONS. THE LIGHTING CONTROL STATION SHALL PROVIDE SEPARATE **[ON AND]** OFF AS WELL AS RAISE AND LOWER BUTTON(S). **[PRESS AND HOLD BUTTONS FOR DIMMING ARE NOT ACCEPTABLE]**. CONTROL SHALL BE CAPABLE OF DIMMING UP/DOWN AND SWITCHING AS DEFINED IN THE LIGHTING SEQUENCE OF OPERATIONS. REFER TO DRAWINGS AND LUMINAIRE SUBSCRIPTS TO DETERMINE IF A ROOM BASED CONTROLLER (a, b, c SUBSCRIPTS) OR NETWORK CONTROL SYSTEM {z1, z2, z3} IS REQUIRED.

{z##} INDICATES ZONING AND REFLECTS A LIGHTING CONTROL GROUP. PROVIDE RELAYS AS REQUIRED TO ALLOW LUMINAIRES WITHIN THE DEFINED ZONE TO FUNCTION TOGETHER.

LIGHTING CONTROL SUBSCRIPTS:
1. LOWER CASE ALPHA SUBSCRIPTS "a, b, c" INDICATE LINE VOLTAGE OR ROOM BASED LIGHTING CONTROL SYSTEMS. REFER TO DRAWINGS TO DETERMINE IF LINE VOLTAGE CONTROL (S, S3, S4, ETC) OR {#B} ROOM BASED CONTROLLER SYSTEM (#B) IS REQUIRED.
2. LOWER CASE ALPHA NUMERIC SUBSCRIPTS "z1, z2, z3" INDICATE NETWORK BASED LIGHTING CONTROL SYSTEM.

REFER TO SHEET **[E001]** FOR LUMINAIRE SCHEDULE

LUMINAIRE CIRCUIT AND CONTROL KEY

LUMINAIRE

F1 = FIXTURE TAG
1 = CIRCUIT NUMBER
a = SWITCH DESIGNATION
z1=ZONE DESIGNATION
"NL" INDICATES LUMINAIRE IS UNSWITCHED FOR NIGHT LIGHT.
"SE" INDICATES LUMINAIRE IS SWITCHED/CONTROLLED DURING NORMAL OPERATION AND OPERATES FROM **[EMERGENCY BATTERY (EXTEND UNSWITCHED CIRCUIT LEG TO BATTERY)] [EMERGENCY CIRCUIT]** UPON LOSS OF POWER.

*IF LABEL IS ORIENTED HORIZONTALLY A SLASH WILL SEPARATE THIS INFORMATION. EX: F1 / 1 / a / NL

LUMINAIRE SHADING KEY

NORMAL BRANCH LUMINAIRE

ELECTRICAL SYMBOL LIST

SYMBOL:	TAG:	SPEC SECTION:	DESCRIPTION:
	REFER TO LUMINAIRE SCHEDULE		LINEAR LUMINAIRES
			TROFFER
			LINEAR LUMINAIRES
			SINGLE FACE EXIT SIGN
			WALL/CEILING EMERGENCY EXIT SIGN
			EMERGENCY UNIT

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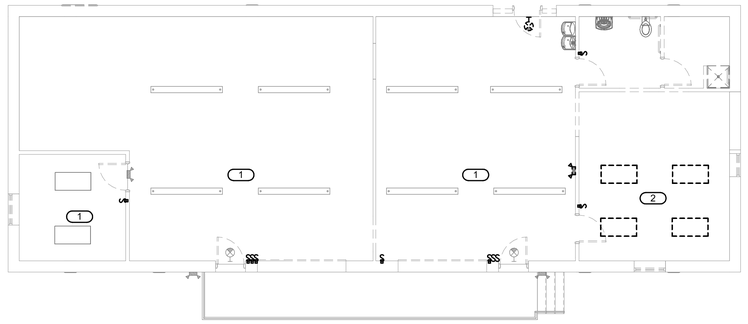
PROJECT STATUS **CONSTRUCTION DOCUMENTS**
SHEET **ELECTRICAL LIGHTING COVERSHEET**

E001

Plot Time: 5/28/2026 1:48:21 PM

KEY NOTES

1. EC TO REMOVE EXISTING LIGHTING DEVICES IN THIS AREA. LIGHTING FIXTURES ARE EXISTING TO REMAIN. SEE RENOVATION PLAN FOR NEW FIXTURES AND DEVICES.
2. EC TO REPLACE EXISTING LIGHTING FIXTURES IN THIS AREA. SEE RENOVATION PLAN FOR NEW FIXTURES AND DEVICES.



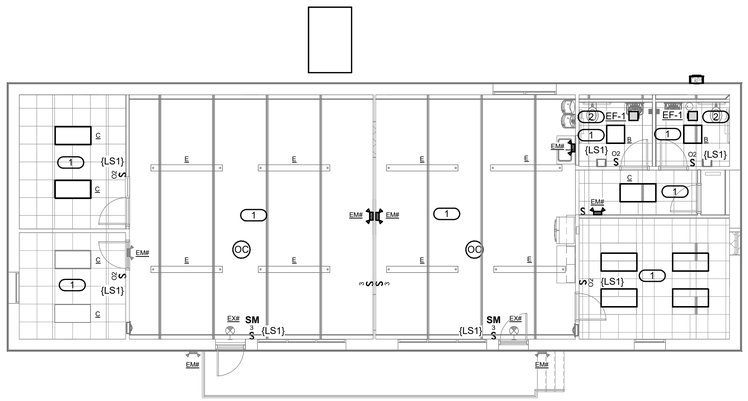
NORTH

2 LEVEL 01 DEMOLITION PLAN - LIGHTING

1/8" = 1'-0"

KEY NOTES

1. CONNECT ALL LIGHT FIXTURES TO EXISTING LIGHTING CIRCUIT IN THIS AREA.
2. CONNECT EXHAUST FANS TO EXISTING LIGHTING CIRCUIT IN THIS AREA.



NORTH

1 LEVEL 01 PLAN - LIGHTING

1/8" = 1'-0"

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PROJECT STATUS
CONSTRUCTION DOCUMENTS

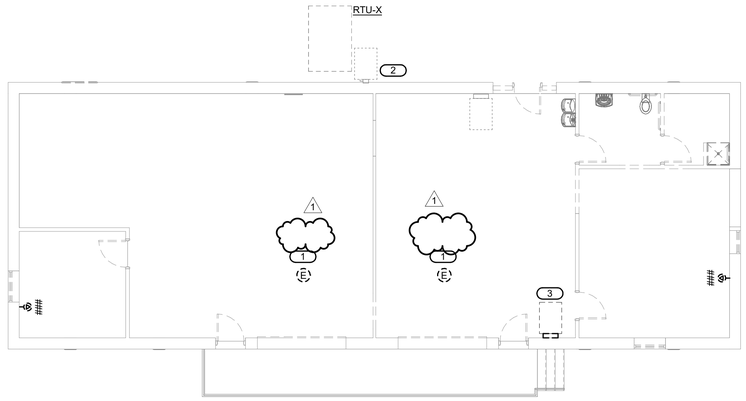
SHEET
LEVEL 01 PLAN - LIGHTING

E201

Plot Time: 5/28/2026 1:40:22 PM

KEY NOTES

1. E.C. TO REMOVE GARAGE DOOR MOTOR AND ALL ASSOCIATED COMPONENTS.
2. 60A DISCONNECT EXISTING TO REMAIN. SEE POWER RENOVATION PLAN ON THIS SHEET.
3. SEE DEMOLITION RISER DIAGRAM; E300



NORTH

2 LEVEL 01 DEMOLITION PLAN - POWER

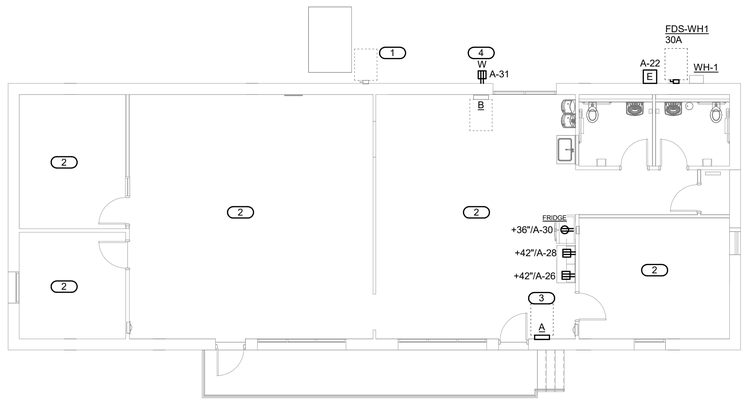
1/8" = 1'-0"

KEY NOTES

1. EXISTING RTU-X TO BE REPLACED LIKE FOR LIKE; NO ELECTRICAL CHANGE.
2. LOWER EXISTING RECEPTACLES TO 18" AFF. CONTRACTOR TO EXTEND/MODIFY EXISTING CONDUCTORS AND CONDUIT AS REQUIRED. COORDINATE WITH OWNER/ARCHITECT PRIOR TO RELOCATION.
3. SEE RISER DIAGRAM; E300
4. FIELD COORDINATE EXACT LOCATION OF SERVICE RECEPTACLE. RECEPTACLE SHOULD BE ACCESSIBLE WITHIN 25 FEET OF DISCONNECT FDS-RTU AND FDS-WH1 PER NEC 210.63.

SHEET NOTES

1. UNLESS OTHERWISE NOTED, RELOCATE ALL EXISTING RECEPTACLES AND COMMUNICATION OUTLETS TO 18" AFF. EXTEND MODIFY EXISTING CONDUIT/CONDUCTORS AS REQUIRED. COORDINATE WITH OWNER AND/OR ARCHITECT PRIOR TO RELOCATION.



NORTH

1 LEVEL 01 PLAN - POWER

1/8" = 1'-0"

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REF. SCALE IN INCHES
PROJECT #25007050.00

NORTH CAROLINA PROFESSIONAL CORPORATION
IMEG CONSULTANTS CORP.
No. F-1507

Alex Bowling
NORTH CAROLINA PROFESSIONAL
SEAL 058287
ENGINEER
ALEX R. BOWLING
05/28/2026

NO.	REVISION	DATE
1	PLAN CHECK	6/1/2026

JOB NUMBER
23-022

DATE ISSUED
06/01/2026

PROJECT STATUS
CONSTRUCTION DOCUMENTS

SHEET
LEVEL 01 PLAN - POWER

E211

Plot Time: 5/28/2026 1:40:23 PM

DISCONNECT AND STARTER SCHEDULE

NOTE: ALL DISCONNECTS (EXCEPT MANUAL STARTERS) SHALL BE HEAVY DUTY TYPE.

DISCONNECT TYPE:	**ACCESSORIES & OPTIONS**	
FU - FUSED	SA - STANDARD ACCESSORIES (INCLUDES * ITEMS)	PF - PHASE LOSS PROTECTION (5 HP OR GREATER, 3 PHASE...
NF - NON-FUSED	*CT - CONTROL TRANSFORMER, FUSED 120V	TO - MELTING THERMAL OVERLOADS (1 PHASE)
CB - CIRCUIT BREAKER	*EO - ELECTRONIC OVERLOAD (3 PHASE MOTORS)	TS - 2 SPEED SELECTOR SWITCH IN DOOR
	*HA - HAND-OFF-AUTO IN DOOR	GP - GREEN (OFF) PILOT LIGHT IN DOOR
STARTER TYPE:	*RP - RED (RUN) PILOT LIGHT IN DOOR	FA - 4-CONVERTIBLE AUXILIARY CONTACTS
FV - FULL VOLTAGE	*TA - TWO CONVERTIBLE AUXILIARY CONTACTS	EI - ELECTRICAL INTERLOCK (2)-N.O. & (2)-N.C.
YD - WYE - DELTA	S/N - INSULATED NEUTRAL ASSEMBLY	SS - START-STOP PUSHBUTTON IN DOOR
RE - REVERSING		HL - HANDLE PADLOCK HASP
TW - 2 SPEED, 2 WINDING		
SW - 2 SPEED, 1 WINDING		
RV - REDUCED VOLTAGE AUTOXFMR		
SS - SOLID STATE		
MS - MANUAL STARTER		
MX - MANUAL SWITCH		
FS - FUSED SWITCH		
AMS-ASSEMBLED MOTOR STARTER		

ITEM	DISCONNECT TYPE & RATING: TYPE	RATING	TRIP RATING	VOLTAGE	POLES	STARTER: NEMA SIZE	STARTER: TYPE	ENCLOSURE	REQUIRED ACCESSORIES & OPTIONS	COMMENTS
FDS-WH1	FU	30	20	120	1			NEMA 3R		

B

MOUNTING: SURFACE
ENCLOSURE: NEMA 1
FED FROM: PANEL A
LOCATION: WORK AREA 105

SINGLE TUB
SOLID NEUTRAL
GROUND BUS

FEED THRU LUGS

MAIN: 60 MLO
VOLTS: 120/208 Single
PHASE: 1
WIRE: 3
SCCR: 10 kA
ISC UNKNOWN 0.00 kA

NOTES: ALL CIRCUITS ARE EXISITNG TO REMAIN.
NO WORK IN THIS PANEL.

KEY	CKT NO.	LOAD DESCRIPTION	OCPD AMPS	P	WIRE SIZE H	N	G	A	B	C	WIRE SIZE G	N	H	P	OCPD AMPS	LOAD DESCRIPTION	CKT NO.	KEY
E	1	AV COMPRESSOR OUTLET	20	2	E	E	E		0.75	0.1	E	E	E	1	20	EXIT LIGHT OVER DOOR	2	E
	3									0.75	0.5	E	E	E	1	20	WORK BENCH REC	4	E
E	5	LIGHT OVER WORK BENCH	20	1	E	E	E		0.1	0.5		E	E	E	1	20	WASHER?	6	E
					Total Load:			0.00 kVA	1.45 kVA	1.25 kVA								
					Total Amps:			0.00	13.69	12.02								

LOAD SUMMARY

LOAD CLASSIFICATION	CONNECTED LOAD	DEMAND FACTOR	ESTIMATED DEMAND	TOTALS*	
Lighting	0.200 kVA	100%	0.200 kVA		
Receptacles	2.500 kVA	100%	2.500 kVA	**TOTAL CONNECTED LOAD:**	2.70 kVA
				TOTAL ESTIMATED DEMAND LOAD:	2.700 kVA
				TOTAL CONNECTED AMPS:	12.98 A
				TOTAL ESTIMATED DEMAND AMPS:	13

*TOTAL DEMAND CALCS SUBTRACT ANY REDUNDANT LOAD AND THE SMALLER OF ANY NONCOINCIDENT HVAC LOADS. THIS CALC IS DONE AT EACH PANEL.

CIRCUIT KEY NOTES:

A

MOUNTING: SURFACE
ENCLOSURE: NEMA 1
FED FROM: UTILITY
LOCATION: WORK AREA 105

SINGLE TUB
SOLID NEUTRAL
GROUND BUS

MAIN: 100 MCB
VOLTS: 120/208 Wye
PHASE: 3
WIRE: 4
SCCR: 10 kA
ISC UNKNOWN 0.00 kA

NOTES: 1. NEW SQUARE D NQ PANELBOARD

KEY	CKT NO.	LOAD DESCRIPTION	OCPD AMPS	P	WIRE SIZE H	N	G	A	B	C	WIRE SIZE G	N	H	P	OCPD AMPS	LOAD DESCRIPTION	CKT NO.	KEY
EB	1	LIGHTS- EXTERMATING	20	1	E	E	E	0.1	0.1		E	E	E	1	20	LIGHTS - PAINT STORAGE	2	EB
EB	3	LIGHTS - EXTERMATING	20	1	E	E	E				0.1	0.1		E	E	E	1	20	LIGHTS - PAINT STORAGE	4	EB
EB	5	LIGHTS	20	1	E	E	E						0.1	0.5	E	E	E	1	20	REC - PAINT STORAGE	6	EB
EB	7	REC - EXTERMATING	20	1	E	E	E	0.5	0.1						E	E	E	1	20	EXHAUST FAN - PAINT STORAGE	8	EB
EB	9	REC - PAINT STORAGE	20	1	E	E	E				0.1	0.5			E	E	E	1	20	REC - EXTERMATING	10	EB
EB	11	EXHAUST FAN - PAINT STORAGE	20	1	E	E	E						0.1	0.5	E	E	E	1	20	REC - PAINT SHAKER	12	EB
EB	13	HEAT CONTROL TIMECLOCK	20	1	E	E	E	0.1	0.5						E	E	E	1	20	EXISTING	14	EB
EB	15	FURNACE	20	1	E	E	E				0.5	1.45									16	EB
	17												5.17	1.25	E	E	E	2	60	PANELBOARD - B	18	
EB	19	RTU-X	50	3	E	E	E	5.17	0.5						E	E	E	1	20	EXISTING	20	EB
	21										5.17	0.6			12	12	12	1	20	WATER HEATER	22	1
EB	23	EXISTING	30	2	E	E	E						1.5	0	--	--	--	1	20	SPARE	24	1
	25							1.5	1						12	12	12	1	20	ABOVE COUNTER RECEPTACLE	26	1
EB	27	EXISTING	30	2	E	E	E				1.5	1			12	12	12	1	20	MICROWAVE	28	1
	29												1.5	1	12	12	12	1	20	REFRIGERATOR	30	G
NB	31	DISCONNECT RECEPTACLE OUTDOOR	20	1	12	12	12	0.18	--						--	--	--	1	--	SPACE	32	--
--	33	SPARE	20	1	--	--	--			0	--				--	--	--	1	--	SPACE	34	--
--	35	SPARE	20	1	--	--	--						0	--	--	--	--	1	--	SPACE	36	--
--	37	SPARE	20	1	--	--	--	0	--						--	--	--	1	--	SPACE	38	--
--	39	SPARE	20	1	--	--	--			0	--				--	--	--	1	--	SPACE	40	--
--	41	SPARE	20	1	--	--	--						0	--	--	--	--	1	--	SPACE	42	--
					Total Load:			9.75 kVA		11.02 kVA			11.62 kVA									
					Total Amps:			81.22		93.43			98.43									

LOAD SUMMARY

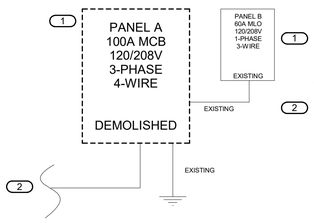
LOAD CLASSIFICATION	CONNECTED LOAD	DEMAND FACTOR	ESTIMATED DEMAND	TOTALS*	
HVAC	15.500 kVA	100%	15.500 kVA		
HVAC Heating Only	0.500 kVA	100%	0.500 kVA	**TOTAL CONNECTED LOAD:**	32.38 kVA
Lighting	1.100 kVA	100%	1.100 kVA	**TOTAL ESTIMATED DEMAND LOAD:**	30.040 kVA
Power	0.600 kVA	100%	0.600 kVA	**TOTAL CONNECTED AMPS:**	89.88 A
Receptacles	14.680 kVA	84.06%	12.340 kVA	**TOTAL ESTIMATED DEMAND AMPS:**	83.4

*TOTAL DEMAND CALCS SUBTRACT ANY REDUNDANT LOAD AND THE SMALLER OF ANY NONCOINCIDENT HVAC LOADS. THIS CALC IS DONE AT EACH PANEL.

CIRCUIT KEY NOTES: 1. BRANCH CIRCUIT MADE AVAILABLE DUE TO DEMOLITION OF OLD WATER HEATER AND STOVE.

ELECTRICAL DISTRIBUTION AND PANEL SCHEDULE NOTES:

1. BRANCH PANEL KEY:
   a. *G = GROUND FAULT CIRCUIT INTERRUPT
   b. *NB = NEW BREAKER
   c. *E = EXISTING CIRCUITS FROM REMOVED PANEL EXTEND/MODIFY AS NEEDED.
   d. *EB = EXISTING BREAKER TO REMAIN.

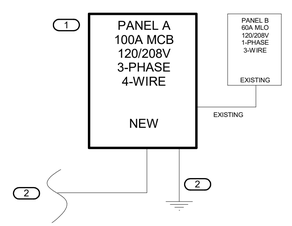


KEYNOTES

1. EC TO REPLACE EXISTING PANEL TO BE IN PLACE. EXTEND/MODIFY EXISTING TO REMAIN BRANCH CIRCUITS AS NEEDED TO TERMINATE IN NEW PANEL. RETAIN AND PROTECT ALL FEEDER CONDUCTORS SERVING THIS PANEL FOR REUSE WITH NEW PANEL INSTALLATION (EXTEND/MODIFY AS REQUIRED).
2. EXISTING 120/208V, 3-PHASE, 4 WIRE SERVICE.

1 PARTIAL ELECTRICAL RISER DIAGRAM - DEMOLITION

NO SCALE



KEYNOTES

1. E.C. TO PROVIDE AND INSTALL NEW 100A 42-POLE PANELBOARD, SURFACE MOUNT, NEMA 1 ENCLOSURE. RECONNECT EXISTING FEEDER CONDUCTORS AND TERMINATE ALL NEW AND EXISTING BRANCH CIRCUITS. EXTEND/MODIFY EXISTING CONDUCTORS AS REQUIRED.
2. EXISTING TO REMAIN.

2 PARTIAL ELECTRICAL RISER DIAGRAM

NO SCALE

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Alex Bowling
NORTH CAROLINA PROFESSIONAL SEAL 058287 ENGINEER ALEX P. BOWLING
05/28/2026

NO.	REVISION	DATE

JOB NUMBER **23-022**
DATE ISSUED **06/01/2026**
PROJECT STATUS **CONSTRUCTION DOCUMENTS**
SHEET **ELECTRICAL SCHEDULES & POWER RISER**

E300

26 05 00 BASIC ELECTRICAL REQUIREMENTS

SCOPE OF WORK
THE CONTRACTOR SHALL FURNISH AND INSTALL ALL NEW MATERIALS AS INDICATED ON THE DRAWINGS, AND/OR IN THESE SPECIFICATIONS, AND ALL ITEMS REQUIRED TO MAKE ASSOCIATED PORTION OF THE ELECTRICAL WORK A FINISHED AND WORKING SYSTEM.

TELECOMMUNICATIONS CABLING WILL BE BY OTHERS, IN RACEWAYS AND CONDUITS FURNISHED AND INSTALLED AS PART OF THE ELECTRICAL WORK.

TEMPERATURE CONTROL WIRING FOR PLUMBING AND HVAC EQUIPMENT WILL BE BY OTHER CONTRACTORS.

ALL WORK THAT WILL PRODUCE EXCESSIVE NOISE OR INTERFERENCE WITH NORMAL BUILDING OPERATIONS, AS DETERMINED BY THE OWNER, SHALL BE SCHEDULED WITH THE OWNER. IT MAY BE NECESSARY TO SCHEDULE SUCH WORK DURING UNOCCUPIED HOURS.

CODES AND STANDARDS
CONFORM TO ALL REQUIREMENTS OF THE CITY OF RALEIGH CODES, LAWS, ORDINANCES, AND OTHER REGULATIONS HAVING JURISDICTION OVER THIS INSTALLATION.

CONFORM TO ALL PUBLISHED STANDARDS OF NORTH CAROLINA.

IF THE CONTRACTOR NOTES, AT THE TIME OF BIDDING, THAT ANY PARTS OF THE DRAWINGS OR SPECIFICATIONS DO NOT COMPLY WITH THE CODES OR REGULATIONS, CONTRACTOR SHALL INFORM THE ARCHITECT/ENGINEER IN WRITING, REQUESTING A CLARIFICATION.

PERMITS AND FEES
PROCURE ALL APPLICABLE PERMITS AND LICENSES. ABIDE BY LOCAL AND STATE LAWS, REGULATIONS, AND ORDINANCES. PAY ALL CHARGES FOR PERMITS OR LICENSES. PAY ALL FEES AND TAXES IMPOSED BY STATE, MUNICIPAL, AND OTHER REGULATORY BODIES. PAY ALL CHARGES ARISING OUT OF REQUIRED INSPECTIONS BY AN AUTHORIZED BODY. PAY ALL CHARGES ARISING OUT OF REQUIRED CONTRACT DOCUMENT REVIEWS ASSOCIATED WITH THE PROJECT AND AS INITIATED BY THE OWNER OR AUTHORIZED AGENCY/CONSULTANT.

WHERE APPLICABLE, ALL FIXTURES, EQUIPMENT AND MATERIALS SHALL BE LISTED BY UNDERWRITER'S LABORATORIES, INC. OR A NATIONALLY RECOGNIZED TESTING ORGANIZATION.

DRAWINGS
THE DRAWINGS FOR THE ELECTRICAL WORK ARE DIAGRAMMATIC, INTENDED TO CONVEY THE SCOPE OF THE WORK AND TO INDICATE THE GENERAL ARRANGEMENTS AND LOCATIONS OF EQUIPMENT, OUTLETS, ETC., AND THE APPROXIMATE SIZES OF EQUIPMENT.

CONTRACTOR SHALL DETERMINE THE EXACT LOCATIONS OF EQUIPMENT AND ROUGH-INS, AND THE EXACT ROUTING OF RACEWAYS SO AS TO BEST FIT THE LAYOUT OF THE JOB. CONDUIT ENTRY POINTS FOR ELECTRICAL EQUIPMENT INCLUDING, BUT NOT LIMITED TO, PANELBOARDS, SWITCHBOARDS, SWITCHGEAR AND UNIT SUBSTATIONS, SHALL BE DETERMINED BY THE CONTRACTOR UNLESS NOTED IN THE CONTRACT DOCUMENTS.

CONSTRUCTION DRAWINGS FOR THIS PROJECT HAVE BEEN PREPARED UTILIZING AUTOCAD MEP REVIT. CONTRACTORS AND SUBCONTRACTORS MAY REQUEST ELECTRONIC MEDIA FILES OF THE CONTRACT DRAWINGS. THE ELECTRONIC CONTRACT DOCUMENTS CAN BE USED FOR PREPARATION OF SHOP DRAWINGS AND AS-BUILT DRAWINGS ONLY. THE INFORMATION MAY NOT BE USED IN WHOLE OR IN PART FOR ANY OTHER PROJECT.

VERIFY ALL PERTINENT DIMENSIONS AT THE JOB SITE BEFORE ORDERING ANY CONDUIT, CONDUCTORS, WIREWAYS, BUS DUCT, FITTINGS, ETC.

SUBMITTALS
SUBMITTALS SHALL BE REQUIRED WHERE REQUIRED IN THE SPECIFICATIONS OR ON THE DRAWINGS. THE CONTRACTOR SHALL SUBMIT ELECTRONIC COPIES OF EACH SHOP DRAWING FOR REVIEW BY THE ARCHITECT/ENGINEER BEFORE RELEASING ANY EQUIPMENT FOR MANUFACTURE OR SHIPMENT.

THE CONTRACTOR SHALL THOROUGHLY REVIEW AND APPROVE ALL SHOP DRAWINGS BEFORE SUBMITTING THEM TO THE ARCHITECT/ENGINEER. CONTRACTOR SHALL CLEARLY MARK ALL DEVIATIONS FROM THE CONTRACT DOCUMENTS ON ALL SUBMITTALS. ASSEMBLE ALL SUBMITTALS IN SETS, SUCH AS PANELBOARDS, FIRE ALARM, LIGHTING, OR MOTOR CONTROL. ALL SETS SHALL BE IDENTICAL AND CONTAIN AN INDEX OF THE ITEMS ENCLOSED WITH A GENERAL TOPIC DESCRIPTION ON THE COVER. WHERE MORE THAN ONE MODEL IS SHOWN ON A MANUFACTURER'S SHEET, CLEARLY INDICATE EXACTLY WHICH ITEM AND WHICH DATA IS RELEVANT TO THE WORK. REFER TO SUBSECTIONS FOR SPECIFIC SUBMITTAL REQUIREMENTS.

WARRANTY
PROVIDE MINIMUM ONE-YEAR WARRANTY FOR ALL FIXTURES, EQUIPMENT, MATERIALS, AND WORKMANSHIP. REFER TO SUBSECTIONS FOR ADDITIONAL WARRANTY REQUIREMENTS.

MATERIAL SUBSTITUTION
WHERE SEVERAL MANUFACTURERS' NAMES ARE GIVEN, THE MANUFACTURER FOR WHICH A CATALOG NUMBER IS GIVEN IS THE BASIS OF DESIGN AND ESTABLISHES THE QUALITY REQUIRED. EQUIVALENT EQUIPMENT MANUFACTURED BY THE OTHER NAMED MANUFACTURERS MAY BE USED. CONTRACTOR SHALL ENSURE THAT ALL ITEMS SUBMITTED BY THESE OTHER MANUFACTURERS MEET ALL REQUIREMENTS OF THE DRAWINGS AND SPECIFICATIONS, AND FIT IN THE ALLOCATED SPACE. THE ARCHITECT/ENGINEER SHALL MAKE THE FINAL DETERMINATION OF WHETHER A PRODUCT IS EQUIVALENT.

ANY MATERIAL, ARTICLE, OR EQUIPMENT OF OTHER UNNAMED MANUFACTURERS WHICH WILL ADEQUATELY PERFORM THE SERVICES AND DUTIES IMPOSED BY THE DESIGN AND IS OF A QUALITY EQUAL TO OR BETTER THAN THE EQUIPMENT IDENTIFIED BY THE DRAWINGS MAY BE USED IF APPROVAL IS SECURED IN WRITING FROM THE ARCHITECT/ENGINEER VIA ADDENDUM.

OBSERVATION OF WORK
THE CONTRACTOR SHALL PROVIDE SEVEN (7) CALENDAR DAYS' NOTICE TO THE ARCHITECT/ENGINEER PRIOR TO COVERING INTERIOR PARTITIONS AND CHASES AND INSTALLING HARD OR SUSPENDED CEILINGS AND SOFFITS.

ALL WORK ABOVE THE CEILINGS MUST BE COMPLETE PRIOR TO THE ARCHITECT/ENGINEER'S REVIEW. THIS INCLUDES, BUT IS NOT LIMITED TO: ALL JUNCTION BOXES ARE CLOSED AND IDENTIFIED (CONDUIT INCLUDED) IN ACCORDANCE WITH ELECTRICAL IDENTIFICATION, FIRE ALARM JUNCTION BOXES ARE PAINTED RED, LUMINAIRES INCLUDING EXIT AND EMERGENCY FIXTURES ARE INSTALLED AND OPERATIONAL, FLEXIBLE CONDUIT IS SUPPORTED ABOVE AND INDEPENDENTLY OF THE CEILING, AND ALL WALL PENETRATIONS ARE SEALED.

IN ORDER TO PREVENT THE FINAL JOBSITE OBSERVATION FROM OCCURRING TOO EARLY, THE CONTRACTOR SHALL REVIEW THE COMPLETION STATUS OF THE PROJECT AND CERTIFY IN WRITING THAT THE JOB IS READY FOR THE FINAL JOBSITE OBSERVATION.

PROJECT CLOSEOUT
SUBMIT THE FOLLOWING: OPERATION AND MAINTENANCE MANUALS INCLUDING BOUND COPIES OF APPROVED SHOP DRAWINGS, RECORD DOCUMENTS INCLUDING REPRODUCIBLE DRAWINGS COMPLETED IN [REVIT] [AUTOCAD], SPARE PARTS AND EXTRA MATERIALS IN QUANTITIES SPECIFIED IN THESE SPECIFICATIONS, INSPECTION AND TESTING REPORT BY THE FIRE ALARM SYSTEM MANUFACTURER.

PROVIDE CUSTOM UPDATED/NEW TYPED CIRCUIT DIRECTORY FOR EACH EXISTING/NEW BRANCH CIRCUIT PANELBOARD INCLUDED IN THE SCOPE OF WORK. LABEL SHALL INCLUDED EQUIPMENT NAME OR FINAL APPROVED ROOM NAME, ROOM NUMBER, AND LOAD TYPE FOR EACH CIRCUIT (EXAMPLES: SUMP PUMP SP-1 OR ROOM 101 RECEPT). PRINTED COPIES OF THE BID DOCUMENT PANEL SCHEDULES ARE NOT ACCEPTABLE AS CIRCUIT DIRECTORIES.

RECORD DOCUMENTS
MAINTAIN AT THE JOB SITE A SEPARATE AND COMPLETE SET OF ELECTRICAL DRAWINGS AND SPECIFICATIONS WITH ALL CHANGES MADE TO THE SYSTEMS CLEARLY AND PERMANENTLY MARKED IN COMPLETE DETAIL. MARK DRAWINGS TO INDICATE APPROVED SUBSTITUTIONS, CHANGE ORDERS, AND ACTUAL EQUIPMENT AND MATERIALS USED. ALL CHANGE ORDERS, RFI RESPONSES, CLARIFICATIONS, AND OTHER SUPPLEMENTAL INSTRUCTIONS SHALL BE MARKED ON THE DOCUMENTS. RECORD DOCUMENTS THAT MERELY REFERENCE THE EXISTENCE OF THE ABOVE ITEMS ARE NOT ACCEPTABLE. RECORD CHANGES DAILY AND KEEP THE MARKED DRAWINGS AVAILABLE FOR THE ARCHITECT/ENGINEER'S EXAMINATION AT ANY NORMAL WORK TIME.

UPON COMPLETING THE JOB AND BEFORE FINAL PAYMENT IS MADE, PROVIDE REPRODUCIBLE DRAWINGS COMPLETED IN AUTOCAD TO THE ARCHITECT/ENGINEER.

CLEANING
THOROUGHLY CLEAN ALL EQUIPMENT AND SYSTEMS PRIOR TO THE OWNER'S FINAL ACCEPTANCE OF THE PROJECT. CLEAN ALL FOREIGN PAINT, GREASE, OIL, DIRT, LABELS, STICKERS, ETC. FROM ALL EQUIPMENT. REMOVE ALL RUBBISH, DEBRIS, ETC., ACCUMULATED DURING CONSTRUCTION FROM THE PREMISES.

26 05 05 ELECTRICAL DEMOLITION FOR REMODELING

THE DRAWINGS ARE INTENDED TO INDICATE THE SCOPE OF WORK REQUIRED AND DO NOT INDICATE EVERY BOX, CONDUIT, OR WIRE THAT MUST BE REMOVED. THE CONTRACTOR SHALL VISIT THE SITE PRIOR TO SUBMITTING A BID AND VERIFY EXISTING CONDITIONS.

WHERE WALLS, CEILINGS, STRUCTURES, ETC., ARE INDICATED AS BEING REMOVED ON GENERAL OR ELECTRICAL DRAWINGS, THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE REMOVAL OF ALL ELECTRICAL EQUIPMENT, DEVICES, FIXTURES, RACEWAYS, WIRING, SYSTEMS, ETC., FROM THE REMOVED AREA.

WHERE CEILINGS, WALLS, STRUCTURES, ETC., ARE TEMPORARILY REMOVED AND REPLACED BY OTHERS, THIS CONTRACTOR SHALL BE RESPONSIBLE FOR THE REMOVAL, STORAGE, AND REPLACEMENT OF EQUIPMENT, DEVICES, FIXTURES, RACEWAYS, WIRING, SYSTEMS, ETC.

THE CONTRACTOR SHALL BE RESPONSIBLE FOR DISCONNECTING EQUIPMENT REMOVED BY OTHER TRADES AND REMOVING ALL ASSOCIATED STARTERS, CONTROLLERS, RACEWAYS, WIRING, ETC.

VERIFY THAT ABANDONED WIRING AND EQUIPMENT SERVE ONLY ABANDONED EQUIPMENT OR FACILITIES. EXTEND CONDUIT AND WIRE TO FACILITIES AND EQUIPMENT THAT WILL REMAIN IN OPERATION FOLLOWING DEMOLITION. EXTENSION OF CONDUIT AND WIRE TO EQUIPMENT SHALL BE COMPATIBLE WITH THE SURROUNDING AREA. EXTENDED CONDUIT AND CONDUCTORS SHALL MATCH EXISTING SIZE AND MATERIAL.

COORDINATE SCOPE OF WORK WITH ALL OTHER CONTRACTORS AND THE OWNER AT THE PROJECT SITE. SCHEDULE REMOVAL OF EQUIPMENT AND ELECTRICAL SERVICE TO AVOID CONFLICTS.

BID SUBMITTAL SHALL MEAN THE CONTRACTOR HAS VISITED THE PROJECT SITE AND HAS VERIFIED EXISTING CONDITIONS AND SCOPE OF WORK.

PREPARATION
COORDINATE ALL OUTAGES WITH OWNER. COORDINATE UTILITY SERVICE OUTAGES WITH UTILITY COMPANY.

PROVIDE TEMPORARY WIRING AND CONNECTIONS TO MAINTAIN EXISTING SYSTEMS IN SERVICE DURING CONSTRUCTION. WHEN WORK MUST BE PERFORMED ON ENERGIZED EQUIPMENT OR CIRCUITS, USE PERSONNEL EXPERIENCED IN SUCH OPERATIONS. ASSUME ALL EQUIPMENT AND SYSTEMS MUST REMAIN OPERATIONAL UNLESS SPECIFICALLY NOTED OTHERWISE ON DRAWINGS.

MAINTAIN EXISTING ELECTRICAL SYSTEM IN SERVICE UNTIL NEW SYSTEM IS COMPLETE AND READY FOR SERVICE. MAKE TEMPORARY CONNECTIONS TO MAINTAIN SERVICE IN AREAS ADJACENT TO WORK AREA. SERVICE CHANGEOVER SHALL BE COMPLETED ON AN OVERTIME BASIS.

REMOVE ABANDONED WIRING AND RACEWAY TO SOURCE OF SUPPLY. EXISTING CONDUIT IN GOOD CONDITION MAY BE REUSED IN PLACE BY INCLUDING AN EQUIPMENT GROUND CONDUCTOR IN REUSED CONDUIT. REUSED CONDUIT AND BOXES SHALL HAVE SUPPORTS REVISED TO MEET CURRENT CODES. RELOCATING CONDUIT SHALL NOT BE ALLOWED.

REMOVE EXPOSED ABANDONED RACEWAY, INCLUDING ABANDONED RACEWAY ABOVE ACCESSIBLE CEILING FINISHES. CUT EMBEDDED RACEWAY FLUSH WITH WALLS AND FLOORS, AND PATCH SURFACES. REMOVE ALL ASSOCIATED CLAMPS, HANGERS, SUPPORTS, ETC.

DISCONNECT AND REMOVE OUTLETS AND DEVICES THAT ARE TO BE DEMOLISHED. REMOVE CONDUIT, SUPPORTS, AND CONDUCTORS BACK TO SOURCE. BACK BOX AND CONDUIT MOUNTED IN WALLS THAT ARE TO REMAIN CAN BE ABANDONED IN PLACE. PROVIDE APPROPRIATE COVER PLATE FOR ALL ABANDONED BACK BOXES PER WIRING DEVICES SPECIFICATION.

DISCONNECT AND REMOVE ABANDONED LUMINAIRES. REMOVE BRACKETS, STEMS, HANGERS, AND OTHER ACCESSORIES. BALLASTS IN LIGHT FIXTURES INSTALLED PRIOR TO 1980 SHALL BE INCINERATED IN EPA-APPROVED INCINERATOR OR DISPOSED OF IN EPA-CERTIFIED CONTAINERS AND DEPOSITED IN AN EPA LANDFILL CERTIFIED FOR PCB DISPOSAL OR RECYCLED BY PERMITTED BALLAST RECYCLER.

FLUORESCENT LAMPS DETERMINED BY THE TOXICITY CHARACTERISTIC LEACHATE PROCEDURE (TCLP) TO BE HAZARDOUS WASTE SHALL BE DISPOSED OF IN AN EPA-PERMITTED HAZARDOUS WASTE DISPOSAL FACILITY OR BY A PERMITTED LAMP RECYCLER.

REPAIR ADJACENT CONSTRUCTION AND FINISHES DAMAGED DURING DEMOLITION AND EXTENSION WORK. PATCH OPENINGS TO MATCH EXISTING SURROUNDING FINISHES. MAINTAIN ACCESS TO EXISTING ELECTRICAL INSTALLATIONS THAT REMAIN ACTIVE. MODIFY INSTALLATION OR PROVIDE JUNCTION BOXES AND ACCESS PANEL AS APPROPRIATE. EXTEND EXISTING INSTALLATIONS USING MATERIALS AND METHODS COMPATIBLE WITH EXISTING ELECTRICAL INSTALLATIONS.

FLOOR SLAB IS POST-TENSIONED. ALL PENETRATIONS SHALL BE X-RAYED PRIOR TO CUTTING AND/OR DRILLING TO AVOID ANY TENSION CABLES OR UTILITIES ENCASED IN FLOOR CONSTRUCTION.

FLOOR SLABS MAY CONTAIN CONDUIT SYSTEMS. THIS CONTRACTOR IS RESPONSIBLE FOR TAKING ANY MEASURES REQUIRED TO ENSURE NO CONDUITS OR OTHER SERVICES ARE DAMAGED. THIS INCLUDES X-RAY OR SIMILAR NON-DESTRUCTIVE MEANS. WHERE CONDUIT IS IN CONCRETE SLAB, CUT CONDUIT FLUSH WITH FLOOR, PULL OUT CONDUCTORS, AND PLUG CONDUIT ENDS.

THIS CONTRACTOR IS RESPONSIBLE FOR ALL COSTS INCURRED IN REPAIR, RELOCATIONS, OR REPLACEMENT OF ANY CABLES, CONDUITS, OR OTHER SERVICES IF DAMAGED WITHOUT PROPER INVESTIGATION.

CLEAN AND REPAIR EXISTING MATERIALS AND EQUIPMENT THAT REMAIN OR ARE TO BE REUSED.

PROVIDE TYPED PANEL DIRECTORIES SHOWING REVISED CIRCUITING ARRANGEMENTS. CLEAN EXPOSED PANEL SURFACES AND CHECK TIGHTNESS OF ELECTRICAL CONNECTIONS. REPLACE DAMAGED CIRCUIT BREAKERS AND PROVIDE CLOSURE PLATES FOR VACANT POSITIONS.

EXISTING LUMINAIRES THAT ARE TO REMAIN OR BE REINSTALLED AS INDICATED ON THE DRAWINGS SHALL BE CLEANED WITH MILD DETERGENT ON ALL EXTERIOR AND INTERIOR SURFACES. REPLACE LAMPS, BALLASTS, AND BROKEN ELECTRICAL PARTS. REPLACEMENT PARTS SHALL MATCH SPECIFIED COMPONENTS FOR NEW LUMINAIRES OF SAME TYPE WHEN APPLICABLE. REINSTALL LUMINAIRE AND CONNECT TO CIRCUITING AS INDICATED ON DRAWINGS.

ELECTRICAL ITEMS REMOVED REMAIN THE PROPERTY OF THE OWNER. CONTRACTOR SHALL PLACE ITEMS RETAINED BY THE OWNER IN A LOCATION COORDINATED WITH THE OWNER. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE DISPOSAL OF MATERIAL THE OWNER ABANDONS.

26 05 13 WIRE AND CABLE

FEEDERS AND BRANCH CIRCUITS 8 AWG AND LARGER SHALL BE COPPER, STRANDED, 600 VOLT INSULATION, THHN. UNDERGROUND OR IN SLABS ON GRADE SHALL BE THWN or XHHW-2.

FEEDERS AND BRANCH CIRCUITS 10 AWG AND SMALLER: COPPER, SOLID OR STRANDED, 600 VOLT INSULATION, THHN/THWN. NOTED ON THE DRAWINGS. MINIMUM SIZE #12 AWG. ALUMINUM, COMPACT STRANDED CONDUCTOR IS NOT ACCEPTABLE FOR FEEDER AND BRANCH CIRCUITS 6 AWG AND SMALLER.

ALUMINUM CONDUCTORS ARE NOT TO BE USED FOR FEEDS TO MOTOR LOADS.

CONTROL CABLE FOR CLASS 1, CLASS 2, AND CLASS 3 CIRCUITS SHALL BE COPPER, 600 VOLT INSULATION, RATED 60°C, INDIVIDUAL CONDUCTORS TWISTED TOGETHER, SHIELDED, AND COVERED WITH PVC. MINIMUM SIZE #14 AWG.

FIRE RATED MINERAL INSULATED CABLES SHALL BE COPPER, 600 VOLT INSULATION, RATED 90ºC, TYPE MI RATED FOR TWO-HOUR.

ARMORED CABLE (AC) SHALL BE CONSTRUCTED IN ACCORDANCE WITH UL STANDARD FOR TYPE AC CABLES, UL 4, AND INCLUDE FLEXIBLE METALLIC INTERLOCKED ARMOR.

METAL CLAD CABLE (MC) SHALL BE CONSTRUCTED IN STRICT ACCORDANCE WITH UL STANDARD FOR TYPE MC CABLES, UL 4, EXTERIOR OF METAL INTERLOCKED ARMOR.

THE CONTRACTOR SHALL BE RESPONSIBLE FOR DERATING AND SIZING CONDUCTORS AND CONDUITS TO EQUAL OR EXCEED THE AMPACITY OF NEC TABLE B.310.15(B)(2)(7) CBC TABLE 18-27-310.77, IF METHODS OR MATERIALS OTHER THAN THE BASIS OF DESIGN ARE USED.

USE # 10 AWG CONDUCTORS FOR 20 AMPERE, 120 VOLT BRANCH CIRCUIT HOME RUNS LONGER THAN 75 FEET, AND FOR 20 AMPERE, 277 VOLT BRANCH CIRCUIT HOME RUNS LONGER THAN 200 FEET.

ALL WIRES IN OUTLET BOXES NOT CONNECTED TO FIXTURES OR OTHER DEVICES SHALL BE ROLLED UP, SPLICED IF CONTINUITY OF CIRCUIT IS REQUIRED, AND INSULATED.

OPEN CABLE SHALL BE SUPPORTED BY THE APPROPRIATE SIZE BRIDLE RINGS OR OTHER MEANS IF CALLED FOR ON THE DRAWINGS. WIRE AND CABLE FROM DIFFERENT SYSTEMS SHALL NOT BE INSTALLED IN THE SAME BRIDLE RINGS. BRIDLE RING SUPPORTS SHALL BE INSTALLED AT A MINIMUM OF FIVE FOOT (5') INTERVALS.

OPEN CABLE INSTALLED ABOVE SUSPENDED CEILINGS SHALL NOT REST ON THE SUSPENDED CEILING CONSTRUCTION, NOR UTILIZE THE CEILING SUPPORT SYSTEM FOR WIRE AND CABLE SUPPORT. SPLICE AND TAP ONLY IN ACCESSIBLE JUNCTION BOXES.

USE SOLDERLESS, TIN-PLATED COPPER LUGS APPLIED WITH CIRCUMFERENTIAL CRIMP FOR COPPER TERMINATIONS #8 AWG AND LARGER. USE INDENTER CRIMP #10 AWG AND SMALLER.

AC/MC CABLE SHALL BE SUPPORTED BY AN APPROVED MEANS EVERY 4.5' AND WITHIN 12" OF OUTLET BOXES, JUNCTION BOXES, CABINETS, OR FITTINGS.

TEST WIRE AND CABLE INSULATION WITH DEVICE SUCH AS A "MEGGER", USING NOT LESS THAN 500 VOLTS D.C. TEST POTENTIAL.

USE ANTIOXIDANT JOINT COMPOUND ON ALL ALUMINUM CONDUCTOR TERMINATIONS. APPLY ANTIOXIDANT JOINT COMPOUND PER MANUFACTURER'S RECOMMENDATIONS. PROVIDE DOCUMENTATION OF THE MANUFACTURER'S RECOMMENDED LUG TORQUE VALUE FOR ALUMINUM CONDUCTORS, THE DATE THE LUGS WERE TORQUED, AND INSTALLED TORQUE READINGS.

26 05 26 GROUNDING AND BONDING

COMPLY WITH UL 467 GROUNDING AND BONDING EQUIPMENT.

CONDUCTORS SHALL BE COPPER ALUMINUM IN ACCORDANCE WITH 26 05 13.

CONNECTORS SHALL BE HYDRAULIC COMPRESSION TYPE OR EXOTHERMIC-WELDED TYPE.

PROVIDE GROUNDING AND BONDING AT UTILITY COMPANY'S METERING EQUIPMENT AND TRANSFORMERS PER UTILITY REQUIREMENTS.

PROVIDE AN EQUIPOTENTIAL GROUNDING SYSTEM IN CLASS I DIV 1 AND DIV 2 LOCATIONS AS REQUIRED IN NEC CBC, SWIMMING POOL, FOUNTAINS, CRITICAL PATIENT CARE AND SPECIAL CARE AREAS AS INDICATED ON DRAWINGS. NON-CURRENT-CARRYING METAL PARTS OF EQUIPMENT, RACEWAYS AND OTHER ENCLOSURES SHALL BE BONDED TO THE GROUNDING SYSTEM.

EQUIPMENT GROUNDING
INSTALL EQUIPMENT GROUNDING CONDUCTORS IN ALL FEEDERS AND CIRCUITS.

EQUIPMENT GROUNDING CONDUCTORS: INSULATED WITH GREEN-COLORED INSULATION.

ISOLATED GROUND CONDUCTORS SHALL BE INSULATED WITH GREEN-COLORED INSULATION WITH YELLOW STRIPE.

FIELD QUALITY CONTROL
MEASURE GROUND RESISTANCE FROM SYSTEM NEUTRAL CONNECTION AT SERVICE ENTRANCE TO CONVENIENT GROUND REFERENCE POINTS USING SUITABLE GROUND TESTING EQUIPMENT. RESISTANCE SHALL NOT EXCEED 5 OHMS. NOTIFY ARCHITECT/ENGINEER PROMPTLY AND INCLUDE RECOMMENDATIONS TO REDUCE GROUND RESISTANCE.

PROVIDE GROUND TESTING IN ACCORDANCE WITH IEEE STANDARDS.

26 05 27 SUPPORTING DEVICES

APPROVED MANUFACTURERS: ALLIED, COOPER B-LINE, ERICO, HILTI, POWER FASTENERS.

SUPPORT CHANNELS SHALL BE PAINTED STEEL. PROVIDE GALVANIZED STAINLESS STEEL FOR WET/DAMP LOCATIONS. ALL HARDWARE TO BE CORROSION RESISTANT.

ANCHORS AND STRUCTURAL COMPONENTS
SUPPORTS SHALL HAVE STRUCTURAL SAFETY FACTOR STRENGTH OF TWICE THE MAXIMUM SEISMIC FORCES TO WHICH THEY WILL BE SUBJECTED. THROUGH BOLTS SHALL COMPLY WITH ASTM A 325. WELDING LUGS SHALL COMPLY WITH MSS-SP-69, TYPE 57.

BEAM CLAMPS FOR STRUCTURAL STEEL SHALL BE DOUBLE SIDED.

FASTEN CONCRETE ANCHORS PER THE REQUIREMENTS OF APPENDIX D OF ACI 318-11 CBC.

FASTEN MASONRY ANCHORS WITH EXPANSION ANCHORS OR SELF-TAPPING MASONRY SCREWS.

DO NOT EXCEED 25 LBS. PER HANGER AND A MINIMUM SPACING OF 2'-0" ON CENTER WHEN ATTACHING TO METAL ROOF DECKING.

CONDUIT SLEEVES
PROVIDE TO THE GENERAL CONTRACTOR FOR INSTALLATION LINTELS FOR ALL OPENINGS REQUIRED FOR THE CONTRACTOR'S WORK IN MASONRY WALLS AND CONDUIT SLEEVES FOR FLOORS.

REFER TO STRUCTURAL PLANS AND SPECIFICATIONS FOR LINTEL REQUIREMENTS AND SIZES.

SLEEVES THROUGH THE FLOORS ON EXPOSED RISERS SHALL BE FLUSH WITH THE CEILING, WITH PLANED SQUARED ENDS EXTENDING 1" ABOVE THE FLOOR IN UNFINISHED AREAS, AND FLUSH WITH THE FLOOR IN FINISHED AREAS, TO ACCEPT SPRING CLOSING FLOOR PLATES.

SLEEVES SHALL NOT PENETRATE STRUCTURAL MEMBERS.

INSTALL ALL SLEEVES CONCENTRIC WITH CONDUITS. SLEEVES THROUGH CONCRETE WALLS MAY BE HIGH DENSITY POLYETHYLENE PIPE PENETRATION SLEEVE WITH A WATER STOP COLLAR, SUITABLE FOR USE WITH LINK-SEAL MECHANICAL SEALS. CENTURY-LINE MODEL CS.

SIZE SLEEVES LARGE ENOUGH TO ALLOW EXPANSION AND CONTRACTION MOVEMENT.

26 05 33 CONDUIT AND BOXES

CONDUIT
ACCEPTABLE CONDUIT MANUFACTURERS: ALLIED, LTV, STEELDUCT, WHEATLAND TUBE CO, O-Z GEDNEY.

ACCEPTABLE FITTINGS MANUFACTURERS: APPLETON ELECTRIC, O-Z GEDNEY, ELECTROLINE, RACO, BRIDGEPORT, MIDWEST, REGAL, THOMAS & BETTS, CROUSE-HINDS, KILLARK

ELECTRICAL METALLIC TUBING (EMT), MINIMUM 3/4" AND 1" FOR LOW VOLTAGE RACEWAYS, SHALL BE USED IN FINISHED SPACES FOR ALL BRANCH CIRCUITS, TELECOMMUNICATIONS SYSTEMS PUMP FEEDERS ELECTRICAL DISTRIBUTION AND PANEL BOARDS.

INTERMEDIATE METALLIC CONDUIT (IMC), MINIMUM 3/4", SHALL BE USED FOR EXPOSED MECHANICAL AND PUMP FEEDERS, AND ELECTRICAL DISTRIBUTION EQUIPMENT.

RIGID METALLIC CONDUIT (RMC) SHALL BE USED IN WET OR DAMP LOCATIONS, HAZARDOUS LOCATIONS SLAB ON-GRADE AND ABOVE-GRADE UNDERGROUND WHERE SUBJECT TO VEHICULAR TRAFFIC.

POLYVINYL CHLORIDE (PVC), SCHEDULE 40 SCHEDULE 80, SHALL BE USED IN SLAB ON-GRADE AND ABOVE-GRADE UNDERGROUND CONCRETE ENCASED WHERE SUBJECT TO VEHICULAR TRAFFIC FOR LOW VOLTAGE SERVICE SYSTEMS.

FLEXIBLE METALLIC CONDUIT (FMC) SHALL BE USED FOR CONNECTIONS TO MOTORS AND LIGHT FIXTURES. LIQUIDTIGHT FLEXIBLE METALLIC CONDUIT (LFMC) WITH WATERTIGHT FITTINGS SHALL BE USED IN EXTERIOR OR WET/DAMP LOCATIONS. LENGTH OF CONDUIT SHALL NOT EXCEED 6'.

EMT AND IMC CONDUIT FITTINGS SHALL BE COMPRESSION STEEL SET-SCREW TYPE.

CONDUIT AND CONDUCTOR SIZING SHALL BE COORDINATED TO LIMIT CONDUCTOR FILL TO LESS THAN 40%, MAINTAIN CONDUCTOR AMPERE CAPACITY AS REQUIRED BY THE NATIONAL ELECTRICAL CODE CHICAGO ELECTRICAL CODE. NUMBER OF CURRENT-CARRYING CONDUCTORS PER RACEWAY NOT TO EXCEED NINE (9).

CONDUIT SHALL NOT CONTAIN MORE FOUR (4) QUARTER BENDS (360°) BETWEEN PULL BOX POINTS. TELECOMMUNICATIONS CONDUITS SHALL HAVE NO MORE THAN TWO (2) 90° BENDS BETWEEN PULL BOX POINTS AND CONTAIN NO CONTINUOUS SECTIONS LONGER THAN 100 FEET.

ALL CONDUITS THROUGH WALLS SHALL BE GROUTED OR SEALED INTO OPENINGS. WHERE CONDUIT PENETRATES FIREWALLS AND FLOORS, SEAL WITH A UL LISTED SEALANT. SEAL INTERIOR OF CONDUIT AT EXTERIOR ENTRIES.

PROVIDE A POLYPROPYLENE PULL CORD WITH 2000 LBS. TENSILE STRENGTH IN EACH EMPTY CONDUIT.

BOXES
OUTLET BOXES FOR LUMINAIRES TO BE MINIMUM 1-1/2" DEEP.

LIGHT CONTROL SWITCHES, DIMMERS AND OCCUPANCY SENSOR BOXES SHALL BE 4 INCHES SQUARE BY 2-1/8 INCHES DEEP.

MULTIPLE GANG SWITCH OUTLETS SHALL CONSIST OF THE REQUIRED NUMBER OF GANG BOXES APPROPRIATE TO THE QUANTITY OF SWITCHES COMPRISING THE GANG. PROVIDE PLASTER RINGS AND COVERS AS NEEDED.

RECEPTACLE OUTLET BOXES SHALL BE 4 INCHES SQUARE.

PROVIDE FIRE-RATED MOLDABLE PADS AND SOUND BARRIER INSULATION PADS.

GALVANIZED STEEL BOXES MAY BE USED IN CONCEALED OR EXPOSED INTERIOR LOCATIONS, ABOVE CEILINGS, AND MIN RECESSED STUDDED PARTITIONS.

CAST BOXES SHALL BE USED IN EXTERIOR LOCATIONS, HAZARDOUS LOCATIONS, WET LOCATIONS, CONCRETE SLAB ON GRADE, KITCHENS AND LAUNDRIES WHEN EXPOSED ON WALL SURFACE.

[ECONN]: ELECTRICAL CONNECTION TO EQUIPMENT AND MOTORS, SIZED PER NEC CBC.

[JB]: PULL AND JUNCTION BOXES, GALVANIZED STEEL, SIZED PER NEC CBC.

[RI-TECH]: TECHNOLOGY ROUGH-IN CONSISTING OF ONE (1) 1" CONDUIT STUBBED TO ABOVE THE LAY-IN CEILING ROUTED TO THE CORRIDOR CABLE TRAY ROUTED TO THE NEAREST TECHNOLOGY CLOSET. SUBSCRIPT W INDICATES WALL-PHONE; TV INDICATES ANTENNA OUTLET.

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05/28/2026

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JOB NUMBER
23-022
DATE ISSUED
06/01/2026
PROJECT STATUS
CONSTRUCTION DOCUMENTS
SHEET
ELECTRICAL SPECIFICATIONS

E400

26 05 35 SURFACE RACEWAYS

SUBMIT SHOP DRAWING PRODUCT DATA INCLUDING ALL DEVICES AND ACCESSORIES.

FINISH SHALL BE BUFF GRAY IVORY ENAMEL STAINLESS STEEL SELECTED BY ARCHITECT

[WM-#]: MULTI-OUTLET ASSEMBLY, METALLIC, RECEPTACLE MOUNTED IN COVER: WIREMOLD 2000, MONO-SYSTEMS 1900 SERIES, HUBBELL HBL2000 SERIES.

[WW-#]: SURFACE METAL RACEWAY, MINIMUM 3 SQUARE INCH CAPACITY: WIREMOLD G3000, MONO-SYSTEMS SMS3200, HUBBELL HBL3000 SERIES.

[WW-#]: SURFACE METAL RACEWAY, MINIMUM 4" OPENING, POWER / COMMUNICATION DIVIDER, MINIMUM 7.5 SQUARE INCH CAPACITY: WIREMOLD G4000/G4048, MONO-SYSTEMS SMS4200, HUBBELL HBL4750 SERIES.

[WW-#]: SURFACE METAL RACEWAY, MINIMUM 4" OPENING, POWER / COMMUNICATION DIVIDER, MINIMUM 16.6 SQUARE INCH CAPACITY: WIREMOLD G6000/G4048, MONO-SYSTEMS SMS4400, HUBBELL HBL6750 SERIES.

26 05 53 ELECTRICAL IDENTIFICATION

COLORED ADHESIVE MARKING TAPE FOR BANDING RACEWAYS, WIRES, AND CABLES: 3 MILS THICK BY 2" WIDTH.

PRETENSIONED FLEXIBLE WRAPAROUND COLORED PLASTIC SLEEVES FOR CABLE IDENTIFICATION.

WIRE/CABLE DESIGNATION TAPE MARKERS: VINYL OR VINYL-CLOTH, SELF-ADHESIVE, WRAPAROUND, WITH PREPRINTED NUMBERS AND LETTER.

CABLE TIES: NYLON, 0.18" WIDTH, 50-LB MINIMUM TENSILE STRENGTH.

UNDERGROUND PLASTIC MARKERS: BRIGHT COLORED CONTINUOUSLY PRINTED PLASTIC RIBBON TAPE, 6" WIDE BY 4 MILS THICK.

ALUMINUM, WRAPAROUND MARKER BANDS: 1" WIDTH, 0.014 INCH THICK ALUMINUM BANDS WITH STAMPED OR EMBOSSED LEGEND, AND FITTED WITH SLOTS OR EARS FOR PERMANENTLY SECURING AROUND WIRE OR CABLE JACKET OR AROUND GROUPS OF CONDUCTORS.

ENGRAVED, PLASTIC-LAMINATED LABELS, SIGNS AND INSTRUCTION PLATES: BLACK LETTERS ON WHITE FACE FOR NORMAL POWER WHITE LETTERS ON RED FACE FOR EMERGENCY POWER WHITE LETTERS ON GREEN FACE FOR GROUNDING BLACK LETTER ON YELLOW FACE FOR CAUTION OR UPS.

SAFETY SIGNS: COMPLY WITH 29 CFR, CHAPTER XVII, PART 1910.145.

JUNCTION, PULL AND CONNECTION BOXES: 3/8-INCH KROY TAPE OR BROTHER SELF-LAMINATING VINYL LABEL PERMANENT MARKER.

APPLY DESIGNATION LABELS OF ENGRAVED PLASTIC LAMINATE FOR PUSHBUTTONS, PILOT LIGHTS, ALARM/SIGNAL COMPONENTS, AND SIMILAR ITEMS, EXCEPT WHERE LABELING IS SPECIFIED ELSEWHERE.

INSTALL ARC FLASH WARNING SIGNS ON ALL SWITCHBOARDS, PANELBOARDS, INDUSTRIAL CONTROL PANELS, AND MOTOR CONTROL CENTERS.

UNDERGROUND ELECTRICAL LINES: CONTINUOUS UNDERGROUND PLASTIC LINE MARKER LOCATED DIRECTLY ABOVE LINE AT 6 TO 8 INCHES BELOW GRADE.

COVER PLATES FOR RECEPTACLES AND SWITCHES: INDICATE SOURCE AND CIRCUIT NUMBER SERVING THE DEVICE: 3/8-INCH KROY TAPE OR BROTHER SELF-LAMINATING VINYL LABEL WITH BLACK LETTERS.

CONDUIT IDENTIFICATION: SELF-ADHESIVE VINYL LABELS PERMANENT MARKER AT 10 20 FOOT INTERVALS TO IDENTIFY ALL CONDUITS EXPOSED OR LOCATED ABOVE ACCESSIBLE CEILINGS.

PAINT JUNCTION BOX COVERS AS FOLLOWS: FIRE ALARM: RED, EMERGENCY: YELLOW, TEMPERATURE CONTROL/BUILDING AUTOMATION: BLUE.

WHERE CONDUIT LEAVES A SWITCHBOARD OR PANELBOARD, IDENTIFY EACH CONDUIT INDICATING LOAD SERVED.

CONDUCTORS SHALL BE COLOR CODED AS FOLLOWS:

208Y/120 VOLT, 4 WIRE:
A_PHASE - BLACK
B_PHASE - RED
C_PHASE - BLUE
NEUTRAL - WHITE
GROUND BOND - GREEN

PROVIDE ENGRAVED IDENTIFICATION ON THE FRONT OF ALL POWER DISTRIBUTION AND CONTROL EQUIPMENT, SUCH AS PANELBOARDS, SWITCHBOARDS, TRANSFORMERS, VFD'S, STARTERS, DISCONNECTS, ETC. LABELING SHALL INCLUDE: EQUIPMENT DESIGNATION, VOLTAGE, UPSTREAM SOURCE OF ORIGIN, RATING, AND TYPE OF THE OVERCURRENT PROTECTION DEVICE SERVING THE EQUIPMENT.

A SEPARATE NAMEPLATE FOR THE SERVICE ENTRANCE EQUIPMENT SHALL BE LABELED WITH THE MAXIMUM AVAILABLE FAULT CURRENT AND DATE OF CALCULATION GIVEN ON THE ONE-LINE DIAGRAM.

BRANCH PANELBOARDS SHALL BE PROVIDED WITH TYPED PANEL SCHEDULES UPON COMPLETION OF THE PROJECT. EXISTING PANELBOARDS SHALL HAVE THEIR EXISTING PANEL SCHEDULES TYPED, WITH ALL CIRCUIT CHANGES, ADDITIONS, OR DELETIONS ALSO TYPED ON THE PANEL SCHEDULES. HANDWRITTEN MARKINGS SHALL NOT BE ACCEPTABLE.

UPSTREAM DEVICES OF SERIES RATED COMPONENTS SHALL BE IDENTIFIED "CAUTION: SERIES RATED SYSTEM - IDENTICAL COMPONENT REPLACEMENT REQUIRED". DOWNSTREAM DEVICES OF SERIES RATED COMPONENTS SHALL BE IDENTIFIED "CAUTION: SERIES RATED SYSTEM - ADDITIONAL SERIES COMBINATION RATING: XX,XXX RMS SYMMETRICAL AMPERES" WHERE XX,XXX SHALL BE THE SERIES COMBINATION RATING.

SECTION 26 09 33 LIGHTING CONTROL SYSTEMS

RELATED SECTIONS
THE LIGHTING SYSTEM DESIGN INCLUDES A COMBINATION OF LUMINAIRE SOURCES, LIGHTING CONTROL COMPONENTS, PROGRAMMING SEQUENCES, AND SUPPLEMENTARY COMPONENTS FOR BUILDING AND ENERGY CODE COMPLIANCE. THE DESIGN USES PERFORMANCE-BASED SPECIFICATIONS FOR PORTIONS OF THE LIGHTING SYSTEM TO ACCOUNT FOR THE LIMITATION OF DIRECTLY COMPARABLE PRODUCT SOLUTIONS AVAILABLE BY COMPETITIVE MANUFACTURERS. THE CONTRACTOR SHALL REFERENCE RELATED SPECIFICATION SECTIONS, PLANS, SCHEDULES, AND DETAILS PRIOR TO SUBMITTING PRICING, SUBMITTALS, AND INSTALLATION. THE CONTRACTOR SHALL COORDINATE SYSTEM COMPONENT COMPATIBILITY AMONG VARIOUS MANUFACTURERS AND SUPPLIERS FOR A TURNKEY LIGHTING SYSTEM.

REFERENCED SECTIONS INCLUDE, BUT ARE NOT LIMITED TO, THE FOLLOWING:
SPECIFICATION SECTION 26 51 00 LED LIGHTING
ELECTRICAL DRAWINGS: ELECTRICAL COVERSHEET, PLANS, LUMINAIRE SCHEDULES, LIGHTING CONTROL SEQUENCE OF OPERATIONS, DIAGRAMS, AND DETAILS.

SUBMITTALS
SUBMIT PRODUCT DATA UNDER PROVISIONS OF SECTION 26 05 00.

SUBMIT A COMPREHENSIVE PACKAGE INCLUDING DEVICES, HARDWARE, SOFTWARE, PRODUCT SPECIFICATION, FINISHES, DIMENSIONS, INSTALLATION INSTRUCTIONS, COMPONENT REPLACEMENT INSTRUCTIONS, WARRANTY, SYSTEM SOFTWARE REQUIREMENTS, AND ROLES AND RESPONSIBILITIES OF ALL PERSONS AND GROUPS INVOLVED IN INSTALLATION, EXECUTION, AND COMMISSIONING.

PROVIDE FLOOR PLAN SHOWING LOCATION, ORIENTATION, AND COVERAGE AREA OF EACH CONTROL DEVICE, SENSOR, AND CONTROLLER/INTERFACE. FOR AREAS REQUIRING MULTIPLE SENSOR DEVICES FOR APPROPRIATE COVERAGE, SUBMIT SPECIFIC MANUFACTURER-APPROVED SENSOR LAYOUT AS AN OVERLAY DIRECTLY ON THE PROJECT DRAWINGS, EITHER IN PRINT OR APPROVED ELECTRONIC FORM. SENSOR COVERAGE PATTERNS SHALL HAVE A 20% OVERLAP.

SUBMIT A LIST OF DEVICES AND EQUIPMENT THAT WILL BE INSTALLED FOR EACH SEQUENCE OF OPERATION.

SUBMIT PROJECT SPECIFIC CONTROL WIRING DIAGRAMS SHOWING ALL EQUIPMENT, LINE VOLTAGE, AND CONTROL WIRING REQUIREMENTS FOR ALL COMPONENTS INCLUDING, BUT NOT LIMITED TO, DIMMERS, RELAYS, LOW VOLTAGE SWITCHES, OCCUPANCY SENSORS, CONTROL STATIONS, DIMMER PANELS, RELAY PANELS, AND COMMUNICATION INTERFACES AND PROGRAMMING INSTRUCTIONS FOR EACH SEQUENCE OF OPERATION. INCLUDE NETWORK CABLE SPECIFICATION AND END-OF-LINE TERMINATION DETAILS, IF REQUIRED.

PROGRAMMING SEQUENCES: PROVIDE A COPY OF THE INITIAL LIGHTING CONTROL PROGRAMMING SEQUENCES IN NARRATIVE AND MANUFACTURER/VENDOR FORMAT.

LIGHTING CONTROL STATIONS: THE MANUFACTURER/VENDOR SHALL PROVIDE CONTROL STATION SHOP DRAWINGS SHOWING ARRANGEMENT OF CONTROLS, DIMENSIONED ELEVATIONS, WIRING DIAGRAM, AND RECOMMENDED BACKBOXES. LABEL EACH APPLICABLE SUBMITTAL WITH THE APPLICABLE SEQUENCE OF OPERATION SOO DESCRIPTION. SUBMIT DATA SHEETS ON THE SWITCHES, DIMMERS, SENSORS, BUTTONS, ETC. CONTAINED IN THE CONTROL STATION.

NAMEPLATE LABELS AND CUSTOM ENGRAVING: SUBMIT SAMPLE LABEL/ENGRAVING TEXT FOR REVIEW FOR EACH APPLICABLE LIGHTING SEQUENCE OF OPERATION SOO. INCLUDE REFERENCE TO APPLICABLE SOO DESCRIPTION. PROVIDE STENCIL TEMPLATES FOR EACH DEVICE REQUIRING STENCILING.

SYSTEM DESCRIPTION
PERFORMANCE STATEMENT: THE SPECIFICATION SECTION AND LIGHTING DESIGN DOCUMENTS DESCRIBE THE MINIMUM MATERIAL QUALITY, REQUIRED FEATURES, AND OPERATIONAL PERFORMANCE REQUIREMENTS OF THE LIGHTING CONTROL SYSTEM. THE DOCUMENTS DO NOT CONVEY EVERY COMPONENT, RELAY, WIRE, AND EQUIPMENT CONNECTION REQUIRED. THE CONTRACTOR AND LIGHTING CONTROL MANUFACTURER/VENDOR ARE SOLELY RESPONSIBLE FOR DETERMINING ALL SYSTEM COMPONENTS, WIRING, AND PROGRAMMING REQUIRED FOR A COMPLETE AND OPERATIONAL SYSTEM BASED ON THE PERFORMANCE BASED REQUIREMENTS OF THE DOCUMENTS.

LIGHTING SEQUENCE OF OPERATION (SOO): THE SEQUENCE OF OPERATION (SOO) DESCRIBES THE REQUIRED LIGHTING CONTROL OPERATION AND PERFORMANCE IN EACH SPACE. THE SEQUENCE OF OPERATION DESCRIPTIONS ARE INCLUDED ON THE DRAWINGS.

DRAWINGS: THE DRAWINGS INCLUDE THE SEQUENCE OF OPERATION (SOO), LUMINAIRE SCHEDULE, LOCATION OF CONTROL DEVICES, SENSORS, AND IDENTIFICATION OF CONTROL ZONES, AND BRANCH POWER CIRCUITING. CONTROL WIRING AND MANUFACTURER/VENDOR SPECIFIC COMPONENTS ARE NOT SHOWN, BUT SHALL BE SUBMITTED WITH THE SHOP DRAWING SUBMITTALS.

LIGHTING CONTROL OVERVIEW
LIGHTING CONTROL SYSTEM: AS DEFINED IN THE SYSTEM DESCRIPTION, THE DESIGN DOCUMENTS DESCRIBE THE OPERATIONAL PERFORMANCE REQUIREMENTS OF THE LIGHTING CONTROL SYSTEM.

ALL SYSTEM COMPONENTS AND MATERIALS OF SIMILAR FUNCTION (E.G., SWITCHES, DIMMERS, SENSORS, CONTACTORS, RELAYS, ETC.) SHALL BE OF THE SAME MANUFACTURER, UNLESS SPECIFICALLY STATED OTHERWISE ON DRAWINGS OR ELSEWHERE IN THE SPECIFICATIONS. LIGHTING CONTROL SWITCHES, SYSTEMS, AND COMPONENTS SHALL BE LISTED.

EMERGENCY LIGHTING OVERRIDE CONTROL (UL924 AND UL1008): LIGHTING CONTROL EQUIPMENT COUPLED WITH REMOTE EMERGENCY POWER SOURCES (EXTERNAL TO THE LUMINAIRE) REQUIRE ALCR (UL924) OR BCELTS (UL1008) DEVICES FOR EMERGENCY (LIFE SAFETY) COMPLIANCE. AN EMERGENCY LIGHTING CONTROL BYPASS IS REQUIRED FOR EVERY INDIVIDUAL LIGHTING CONTROL ZONE-CIRCUIT BUT NOT SHOWN ON THE PLANS. REFER TO THIS SPECIFICATION FOR ALCR AND BCELTS DESCRIPTIONS. REFER TO THE SEQUENCE OF OPERATION LIGHTING CONTROL DESCRIPTIONS ON THE PLANS FOR ADDITIONAL REQUIREMENTS. (FOR ADDITIONAL EXPLANATION PURPOSES: INTEGRAL EMERGENCY POWER SOURCES LIKE BATTERY DRIVERS INSIDE THE LUMINAIRE ARE COMMONLY PROVIDED WITH A SWITCH AND NON-SWITCHED PORTION OF THE CIRCUIT ALLOWING COMPLIANCE WITHOUT AN ALCR NOR BCELTS DEVICE TO BYPASS THE LIGHTING CONTROLS).

ELECTRICAL PLAN SYMBOLS
REFER TO ELECTRICAL COVERSHEET FOR ELECTRICAL SYMBOLS LIST AND DEVICE SPECIFICATION TAG. SENSORS, RELAYS, ACCESSORIES: COMMON PLAN SYMBOLS ARE USED FOR OCCUPANCY, VACANCY, AND DAYLIGHTING SENSORS. THE CONTROL DESIGNATIONS (A, B, C OR Z1, Z2, Z3) AND IDENTIFICATION OF A STANDALONE OR #B TYPE CONTROL STATION IN THE SPACE DEFINES THE BASIS-OF-DESIGN INTENT CATEGORY OF THE LIGHTING CONTROL SENSORS AND ACCESSORIES.

EXAMPLE, A STANDALONE OCCUPANCY SENSOR SW-OC-## DEVICE IS THE BASIS OF DESIGN WHEN SHOWN IN THE SAME ROOM AS A STANDALONE S (SW-1P) SINGLE POLE LIGHT SWITCH WITH OR WITHOUT A, B, C CONTROL DESIGNATIONS.

EXAMPLE, A ROOM-BASED LIGHTING OCCUPANCY SENSOR SW-OC-## DEVICE IS THE BASIS OF DESIGN WHEN SHOWN IN THE SAME ROOM AS A #B (SW-#B) LIGHTING CONTROL STATION WITH OR WITHOUT A, B, C CONTROL DESIGNATIONS.

DEVICE COLOR AND COVERPLATES
ALL SWITCHES AND LIGHTING CONTROLS SHALL BE COMPLETE WITH COVERPLATES THAT MATCH MATERIAL AND COLOR OF THE WIRING DEVICE COVERPLATES IN THE SPACE. WHEN THE COVERPLATE IS PROPRIETARY TO THE DEVICE/MANUFACTURER AND DO NOT MATCH THE WIRING DEVICE COVERPLATES, THE ARCHITECT SHALL SELECT THE COVERPLATE COLOR AND MATERIALS FROM THE STANDARD COVERPLATE OPTIONS.

WHERE SEVERAL DEVICES ARE GANGED TOGETHER, THE COVERPLATE SHALL BE OF THE GANGED STYLE FOR THE NUMBER OF DEVICES USED.

STANDALONE LINE AND LOW VOLTAGE LIGHTING CONTROLS

OVERVIEW: WALL SWITCHES AND WALL DIMMERS: UL LISTED WITH INTEGRAL AIR-GAP SWITCH FOR ON/OFF CONTROL, INTEGRAL EMI/RFI SUPPRESSION, NON-VIEWABLE HEAT SINK, DIMMER TO MATCH DEVICE COLOR. DIMMER COMPATIBILITY AND WIRING WITH THE LOAD BEING CONTROLLED SHALL BE VERIFIED BY CONTRACTOR PRIOR TO PURCHASE AND INSTALLATION.

SW-1P; SINGLE POLE SWITCH: SINGLE THROW, 120/277-VOLT, 20-AMP MAINTAINED CONTACT. TOGGLE HANDLE, SIDE AND BACK WIRED. MANUFACTURERS: HUBBELL HBL1221, LEVITON 1221-2, PASS & SEYMOUR PS20AC1, COOPER AH1221.
*****OR DECORATOR STYLE*****
SW-1P; SINGLE POLE SWITCH: SINGLE THROW, 120/277-VOLT, 20-AMP MAINTAINED CONTACT. ROCKER HANDLE, SIDE AND BACK WIRED. MANUFACTURERS: HUBBELL DS120, LEVITON 5621, PASS & SEYMOUR 2621, COOPER 7601.

SW-3W; THREE-WAY SWITCH: SINGLE THROW, 120/277 VOLT, 20 AMP. TOGGLE HANDLE, SIDE AND BACK WIRED. MANUFACTURERS: HUBBELL 1223, LEVITON 1223-2, PASS & SEYMOUR PS20AC3, COOPER AH1223.
*****OR DECORATOR STYLE*****
SW-3M; THREE-WAY SWITCH: SINGLE THROW, 120/277-VOLT, 20-AMP MAINTAINED CONTACT. ROCKER HANDLE, SIDE AND BACK WIRED. MANUFACTURERS: HUBBELL DS320, LEVITON 5623, PASS & SEYMOUR 2623, COOPER 7623.

SW-4W; FOUR-WAY SWITCH: SINGLE THROW, 120/277 VOLT, 20 AMP. TOGGLE HANDLE, SIDE AND BACK WIRED. MANUFACTURERS: HUBBELL 1224, LEVITON 1224-2, PASS & SEYMOUR PS20AC4, COOPER AH1224.

SW-O; DUAL TECHNOLOGY OCCUPANCY SENSOR WITH WALL SWITCH (STANDALONE): WALL SWITCH WITH MANUAL ON/AUTO/OFF. 120/277 VAC LOAD RATING OF 0-800 W FOR BALLAST, LED OR TUNGSTEN. 5-, 15-, 20-MINUTE ADJUSTABLE OFF DELAY. DUAL TECHNOLOGY ULTRASONIC/ACOUSTIC AND PIR COVERAGE OF MINOR MOTION IN 12' X 15' PATTERN AND OCCUPANCY DETECTION IN AREA BASED ON HALF-STEP WALKING MOTION. SENSITIVITY ADJUSTMENTS SEPARATE FOR EACH SENSING TECHNOLOGY. MANUFACTURERS: WATT STOPPER DW-100 SERIES, HUBBELL LHMTS, LEVITON OSSMT SERIES, SENSOR SWITCH WSX-PDT SA SERIES (ACOUSTIC APPROVED WHEN LISTED IN ABOVE DESCRIPTION).

SW-O2; DUAL TECHNOLOGY OCCUPANCY SENSOR WITH DUAL BUTTON WALL SWITCH (STANDALONE): MULTI-RELAY WALL SWITCH WITH MANUAL ON/AUTO/OFF FOR TWO SEPARATE LOADS. 120/277 VAC LOAD RELAY RATING OF 0-800 W FOR BALLAST, LED OR TUNGSTEN. 5-, 15-, 20-MINUTE ADJUSTABLE OFF DELAY. DUAL TECHNOLOGY ULTRASONIC/ACOUSTIC AND PIR COVERAGE OF MINOR MOTION IN 12' X 15' PATTERN AND OCCUPANCY DETECTION IN AREA BASED ON HALF-STEP WALKING MOTION. SENSITIVITY ADJUSTMENTS SEPARATE FOR EACH SENSING TECHNOLOGY. MANUFACTURERS: WATT STOPPER DW-200 SERIES, HUBBELL LHMTD, LEVITON OSSMD SERIES, SENSOR SWITCH WSX-PDT 2P SERIES.

SUBSCRIPTS: SUBSCRIPTS ARE USED TO DEFINE THE DEVICE TYPE. BLANK (OR D) = DUAL TECHNOLOGY, A = ULTRASONIC TWO-SIDED CORRIDOR COVERAGE, P = PASSIVE INFRARED, P2 = PASSIVE INFRARED 100 DEGREE COVERAGE, U = ULTRASONIC 360 DEGREE COVERAGE, HA = HIGHBAY AISLE COVERAGE, HB = HIGHBAY, W = WIRELESS WITH BATTERY, 10 YEAR MINIMUM.

GENERAL DESCRIPTION: WALL- OR CEILING-MOUNTING, SOLID-STATE UNITS WITH A SEPARATE POWER SUPPLY/RELAY UNIT. OPERATION - OCCUPANCY: OCCUPANCY SENSORS TURN LIGHTS 'ON' WHEN COVERED AREA IS OCCUPIED AND TURN LIGHTS 'OFF' WITH A TIME DELAY WHEN UNOCCUPIED, UNLESS OTHERWISE INDICATED. OPERATION - VACANCY: VACANCY SENSORS REQUIRE A MANUAL SWITCH OPERATION TO TURN LIGHTS 'ON' WITH A TIME DELAY WHEN OCCUPIED TO TURN LIGHTS 'OFF'. TIME DELAY 'OFF': FIELD ADJUSTABLE WITH A MINIMUM RANGE OF 1-20 MINUTES. SENSOR OUTPUT: CONTACTS RATED TO OPERATE THE CONNECTED RELAY, COMPLYING WITH UL 773A. SENSOR SHALL BE POWERED FROM THE RELAY UNIT. RELAY UNIT: DRY CONTACTS RATED FOR 20 A BALLAST LOAD AT 120 AND 277 VAC, FOR 13-AMP TUNGSTEN AT 120 VAC, AND FOR 1 HP AT 120 VAC. POWER SUPPLY TO SENSOR SHALL BE 24 V DC, 150-MA, CLASS 2 POWER SOURCE AS DEFINED BY ELECTRICAL CODE. MOUNTING: SENSOR: SUITABLE FOR MOUNTING

26 24 16 PANELBOARDS

SUBMIT SHOP DRAWINGS INCLUDING OUTLINE AND SUPPORT POINT DIMENSIONS, VOLTAGE, MAIN BUS AMPACITY, INTEGRATED SHORT CIRCUIT AMPERE RATING, CIRCUIT BREAKER OR FUSIBLE SWITCH ARRANGEMENT AND SIZES.

FURNISH SPARE PARTS TO OWNER INCLUDING FOUR (4) KEYS AND THREE (3) BREAKERS AND FUSES OF EACH TYPE AND RATING.

PANELBOARDS FOR THIS PROJECT SHALL BE FULLY SERIES RATED.

MAIN AND DISTRIBUTION PANELBOARDS
[DP-#] CONCEALED TRIM CLAMPS AND HINGED TRIM ON DOOR TO ALLOW ACCESS TO WIRING GUTTERS WITHOUT REMOVAL OF TRIM, FLUSH LOCK, COPPER ALUMINUM BUS: SQUARE D QMB, I-LINE, GENERAL ELECTRIC SPECTRA ADS, SIEMENS F2, P4, CUTLER HAMMER PRL4, PRL5.

ALL SPACES SHOWN ON THE ONE-LINE DIAGRAM SHALL BE FULLY PREPARED SPACES FOR FUTURE BREAKERS.

FUSIBLE SWITCH ASSEMBLIES INTERLOCKED TO PREVENT OPENING FRONT COVER WITH SWITCH IN ON POSITION, LOCKABLE IN OFF POSITION.

MOLDED CASE CIRCUIT BREAKERS WITH INTEGRAL THERMAL AND INSTANTANEOUS MAGNETIC TRIP IN EACH POLE.

SOLID STATE MOLDED CASE CIRCUIT BREAKERS: ELECTRONIC SENSING, TIMING, AND TRIPPING CIRCUITS FOR FULLY ADJUSTABLE TIME CURRENT CHARACTERISTIC SETTINGS INCLUDING GROUND FAULT TRIP, INSTANTANEOUS TRIP, LONG TIME TRIP, LONG TIME DELAY, SHORT TIME TRIP, AND SHORT TIME DELAY. TRIP SETTING SHALL BE FIELD PROGRAMMABLE WITH A SEALABLE CLEAR COVER.

PROVIDE AN ARC ENERGY REDUCTION AER SYSTEM FOR OVERCURRENT PROTECTION DEVICES RATED 1,200 AMPS OR LARGER. PROVIDE AN ENGRAVED LABEL FOR THE AER SYSTEM ON THE APPLICABLE EQUIPMENT.

SUITABLE FOR USE AS SERVICE ENTRANCE EQUIPMENT.

BRANCH CIRCUIT PANELBOARDS
DOOR-IN-DOOR CONSTRUCTION, HINGED TRIM TO ALLOW ACCESS TO WIRING GUTTERS WITHOUT REMOVAL OF TRIM, COPPER ALUMINUM BUS: SQUARE D NQ / NF, GENERAL ELECTRIC AQ / AE, SIEMENS P1, CUTLER HAMMER PRL1, PRL2.

MOLDED CASE BOLT-ON TYPE CIRCUIT BREAKERS WITH THERMAL MAGNETIC TRIP, TYPE SWD FOR LIGHTING CIRCUITS. DO NOT USE TANDEM CIRCUIT BREAKERS.

FUSIBLE BRANCH CIRCUIT PANELBOARDS
DOOR-IN-DOOR CONSTRUCTION, HINGED TRIM, COPPER ALUMINUM BUS: BUSSMANN, LITTELFUSE.

BRANCH FUSE DISCONNECT SHALL HAVE VISIBLE ON/OFF INDICATION, BLOWN FUSE INDICATING LIGHTS, AND PERMANENTLY INSTALLED LOCKOUT MEANS.

LOAD CENTERS
PULL RING AND LATCH, LOCK ON DOOR: SQUARE D, GENERAL ELECTRIC, SIEMENS, CUTLER HAMMER.

MOLDED CASE PLUG-ON TYPE CIRCUIT BREAKERS WITH INTEGRAL THERMAL AND INSTANTANEOUS MAGNETIC TRIP, TYPE SWD FOR LIGHTING CIRCUITS. DO NOT USE TANDEM CIRCUIT BREAKERS.

INSTALLATION

ARRANGE CIRCUITS IN PANELBOARDS TO BALANCE THE PHASE LOADS WITHIN 20 PERCENT. MAINTAIN PROPER PHASING FOR MULTI-WIRE BRANCH CIRCUITS.

INSTALL PANELBOARDS PLUMB AS INDICATED ON THE DRAWINGS IN CONFORMANCE WITH NEMA PB 1.1. HEIGHT: 6 FEET TO HANDLE OF HIGHEST DEVICE.

PROVIDE FILLER PLATES FOR UNUSED SPACES IN PANELBOARDS.

PROVIDE CUSTOM UPDATED/NEW TYPED CIRCUIT DIRECTORY FOR EACH EXISTING/NEW BRANCH CIRCUIT PANELBOARD INCLUDED IN THE SCOPE OF WORK. LABEL SHALL INCLUDED EQUIPMENT NAME OR FINAL APPROVED ROOM NAME, ROOM NUMBER, AND LOAD TYPE FOR EACH CIRCUIT (EXAMPLES: SUMP PUMP SP-1 OR ROOM 101 RECEPT). PRINTED COPIES OF THE BID DOCUMENT PANEL SCHEDULES ARE NOT ACCEPTABLE AS CIRCUIT DIRECTORIES.

STUB FIVE (5) EMPTY ONE-INCH CONDUITS TO ACCESSIBLE LOCATION ABOVE CEILING OUT OF EACH RECESSED PANELBOARD.

INSTALL FUSES IN FUSIBLE SWITCH ASSEMBLIES.

VISUAL AND MECHANICAL INSPECTION: INSPECT FOR PHYSICAL DAMAGE, PROPER ALIGNMENT, ANCHORAGE, AND GROUNDING. CHECK PROPER INSTALLATION AND TIGHTNESS OF CONNECTIONS FOR CIRCUIT BREAKERS, FUSIBLE SWITCHES, AND FUSES.

26 27 26 WIRING DEVICES

SUBMIT SHOP DRAWING PRODUCT DATA INCLUDING ALL DEVICES AND ACCESSORIES.

ALL SWITCH, RECEPTACLE, OUTLET, AND COVERPLATE COLORS SHALL BE IVORY GRAY WHITE ALMOND OFFICE WHITE, VERIFIED WITH ARCHITECT, UNLESS INDICATED OTHERWISE.

ALL SWITCHES, RECEPTACLES, AND OUTLET FACEPLATES SHALL BE COMPLETE WITH UNBREAKABLE THERMOPLASTIC #302 STAINLESS STEEL BRASS COVERPLATES IN FINISHED SPACES WHERE WALLS ARE FINISHED. PROVIDE #302 STAINLESS STEEL COVERPLATES IN UNFINISHED SPACES FOR FLUSH BOXES, AND GALVANIZED STEEL COVERPLATES IN UNFINISHED SPACES FOR SURFACE MOUNTED BOXES.

WHERE SEVERAL DEVICES ARE GANGED TOGETHER, THE COVERPLATE SHALL BE OF THE GANGED STYLE FOR THE NUMBER OF DEVICES USED.

MODULAR CONNECTORS: CONTRACTOR OPTION TO PROVIDE EQUIVALENT MODULAR CONNECTOR-TYPE DEVICES (HUBBELL SNAP CONNECT, PASS & SEYMOUR PLUG TAIL, LEVITON LEV-LOCK, COPPER ARROWLINK) WHERE APPLICABLE.

INSTALL RECEPTACLES VERTICALLY WITH GROUND SLOT UP. HORIZONTALLY WHERE INDICATED ON DRAWINGS WITH GROUND SLOT TO THE LEFT.

INSTALL DECORATIVE PLATES ON SWITCH, RECEPTACLE, AND BLANK OUTLETS IN FINISHED AREAS, USING JUMBO SIZE PLATES FOR OUTLETS INSTALLED IN MASONRY WALLS. INSTALL GALVANIZED STEEL PLATES ON OUTLET BOXES AND JUNCTION BOXES IN UNFINISHED AREAS, ABOVE ACCESSIBLE CEILINGS, AND ON SURFACE MOUNTED OUTLETS.

INSTALL NAMEPLATE IDENTIFICATION TO RECEPTACLE COVER PLATES INDICATED. IDENTIFICATION SHALL IDENTIFY PANEL NAME AND CIRCUIT NUMBER.

TEST RECEPTACLES FOR PROPER POLARITY, GROUND CONTINUITY, AND COMPLIANCE WITH REQUIREMENTS.

RECEPTACLES
REFER TO ELECTRICAL SYMBOLS LIST FOR DEVICE TYPE.

[REC-DUP]: NEMA 5-20R DUPLEX RECEPTACLE: HUBBELL 5352A, LEVITON, 5362-S, PASS & SEYMOUR 5362, COOPER 5352. [* * * OR SPEC * * *] HUBBELL 5352, LEVITON 5362-S, PASS & SEYMOUR 5362, COOPER 5362. [* * * OR HEAVY DUTY * * *] HUBBELL 5362, LEVITON 5362, PASS & SEYMOUR 5362A, COOPER AH5362. [* * * OR HOSPITAL GRADE* * *] HUBBELL HBL8300, LEVITON 8300, PASS & SEYMOUR 8300, COOPER AH8300. [* * * OR DECORATOR * * *] HUBBELL DR20, LEVITON 16362, PASS & SEYMOUR 26342, COOPER6352.

[REC-DUP-GFI]: NEMA 5-20R GROUND FAULT DUPLEX RECEPTACLE: HUBBELL GF20L, LEVITON GFNT2, PASS & SEYMOUR 2097, COOPER SGF20. [* * *OR HOSPITAL GRADE* * *] HUBBELL GFR-8300HL, LEVITON GFNT2-HG, PASS & SEYMOUR 2097-HG, COOPER SGFH20.

[REC-DUP-WP]: NEMA 5-20R WEATHERPROOF GROUND FAULT DUPLEX RECEPTACLE WITH CLEAR CAST ALUMINUM COVER: HUBBELL GFTR20/(RW57300) WP826, LEVITON GFWT2/(5977-CL) M5979, PASS & SEYMOUR 2097TRWR/(WIUC10-C) WIUCAST1, COOPER WRSGF20/(WIU-1) WIUMV-1.

[REC-TAMP]: NEMA 5-20R TAMPER RESISTANT DUPLEX RECEPTACLE: HUBBELL BR20TR, LEVITON TBR20, PASS & SEYMOUR TR5362, COOPER TRBR20. [* * *OR HOSPITAL GRADE* * *] HUBBELL HBL8300SG, LEVITON 8300-SG, PASS & SEYMOUR TR63-H, COOPER TR8300. [* * * OR DECORATOR * * *] HUBBELL DR20TR, LEVITON TDR20, PASS & SEYMOUR 2635.

[REC-TAMP-GFI]: NEMA 5-20R GFI TAMPER RESISTANT RECEPTACLE: HUBBELL GFTR20, COOPER TRSGF20, PASS & SEYMOUR 2097TR, LEVITON GFTR2. [* * *OR HOSPITAL GRADE* * *] HUBBELL GFR5262 TR, COOPER TRSGFH20, PASS & SEYMOUR 2097HGTR, LEVITON GFTR2-HG.

26 28 13 FUSES

SUBMIT SHOP DRAWINGS INCLUDING PRODUCT DATA, CLASS, CURRENT RATING, ETC.

FURNISH SPARE PARTS TO OWNER INCLUDING TWO (2) FUSE PULLERS AND THREE (3) OF EACH SIZE AND TYPE OF FUSE INSTALLED.

ACCEPTABLE MANUFACTURERS: COOPER BUSSMAN, EAGLE ELECTRIC. MERSEN, TRACOR; LITTELFUSE SUBSIDIARY.

CLASS L (TIME DELAY): FUSES WITH RATINGS LARGER THAN 600 AMPERES.

CLASS RK-1 (TIME DELAY): FUSES WITH RATINGS LARGER THAN 200 AMPERES BUT EQUAL TO OR LESS THAN 600 AMPERES.

CLASS RK-5: FUSES WITH RATINGS LESS THAN OR EQUAL TO 200 AMPERES.

CLASS S (PLUG TYPE): FUSES WITH RATINGS LESS THAN OR EQUAL TO 30 AMPERES AND 125 VOLTS IN ACCORDANCE WITH THE CHICAGO ELECTRICAL CODE.

26 28 16 DISCONNECT SWITCHES

SUBMIT SHOP DRAWINGS INCLUDING PRODUCT DATA, DIMENSIONS, WEIGHTS, PERFORMANCE, RATINGS, ENCLOSURE TYPE, CURRENT, VOLTAGE, AND SHORT-CIRCUIT RATINGS.

REFER TO DISCONNECT SCHEDULE ON DRAWINGS FOR ADDITIONAL INFORMATION.

FUSIBLE AND NON-FUSIBLE SWITCHES
ACCEPTABLE MANUFACTURERS: SQUARE D 3110 SERIES, EATON DH SERIES, ABB TH SERIES, SIEMENS HNF / HF SERIES

[FDS-#]: FUSIBLE SWITCH ASSEMBLIES, HEAVY DUTY TYPE, QUICK-MAKE, QUICK-BREAK, LOAD INTERRUPTER ENCLOSED KNIFE SWITCH, HANDLE LOCKABLE IN OFF POSITION. CLASS 'R' FUSE.

[DS-#]: NON-FUSIBLE SWITCH ASSEMBLIES, HEAVY DUTY TYPE, QUICK-MAKE, QUICK-BREAK, LOAD INTERRUPTER ENCLOSED KNIFE SWITCH, HANDLE LOCKABLE IN OFF POSITION.

MOLDED CASE CIRCUIT BREAKERS
ACCEPTABLE MANUFACTURERS: SQUARE D, EATON, ABB, SIEMENS

[CB-#]: MOLDED CASE CIRCUIT BREAKER, INTERRUPTING CAPACITY TO MEET AVAILABLE FAULT CURRENTS.

THERMAL MAGNETIC CIRCUIT BREAKERS SHALL HAVE INVERSE TIME-CURRENT ELEMENT FOR LOW-LEVEL OVERLOADS AND INSTANTANEOUS MAGNETIC TRIP ELEMENT FOR SHORT CIRCUITS. PROVIDE ADJUSTABLE MAGNETIC TRIP SETTING FOR CIRCUIT-BREAKER FRAME SIZES 250 A AND LARGER.

ADJUSTABLE INSTANTANEOUS TRIP CIRCUIT BREAKERS: MAGNETIC TRIP ELEMENT WITH FRONT-MOUNTED, FIELD-ADJUSTABLE TRIP SETTINGS.

ELECTRONIC TRIP UNIT CIRCUIT BREAKERS: RMS SENSING; FIELD-REPLACEABLE RATING PLUG; WITH THE FOLLOWING FIELD-ADJUSTABLE SETTINGS: INSTANTANEOUS TRIP, LONG- AND SHORT-TIME PICKUP LEVELS, LONG- AND SHORT-TIME ADJUSTMENTS, GROUND-FAULT PICKUP LEVEL, TIME DELAY, AND I2T RESPONSES.

26 51 00 LIGHTING

SUBMIT PRODUCT DATA SHEETS FOR LUMINAIRES, LED LAMPS, LED LIGHTING ENGINES, DRIVERS, AND POLES. INCLUDE COMPLETE PRODUCT MODEL NUMBER WITH ALL OPTIONS AS SPECIFIED. SUBMITTAL SHALL BE ARRANGED WITH LUMINAIRES LISTED IN ASCENDING ORDER, AND WITH EACH LUMINAIRE'S ASSOCIATED LED LIGHT ENGINE, DRIVER, OR POLE INFORMATION FOLLOWING LUMINAIRE'S PRODUCT DATA.

SUBMIT IESNA LM-79 PHOTOMETRIC REPORT FOR THE LATEST GENERATION SYSTEM BEING FURNISHED. PROVIDE NAME OF INDEPENDENT TESTING LABORATORY, REPORT NUMBER, DATE OF TEST, LUMINAIRE SERIES/MODEL NUMBER, INPUT WATTAGE, AND LIGHT SOURCE SPECIFICATIONS. PRODUCT DATA SHALL ALSO INCLUDE IESNA LM-80 MEASURING LUMEN MAINTENANCE OF LED LIGHT SOURCES.

SUBMIT LIGHTING CONTROL CAPABILITY DATA FOR EACH LUMINAIRE. THE SUBMITTAL SHALL CLEARLY IDENTIFY DEVICE DATA PROPOSED BY THE CONTRACTOR AND APPROVED BY THE LUMINAIRE MANUFACTURER FOR DIMMING, SWITCHING, ADDRESSABLE, WIRELESS, AND SIMILAR CONTROL CHARACTERISTICS.

PROVIDE EXTRA STOCK TO OWNER INCLUDING 10% OF FIELD-REPLACEABLE LED LIGHT ENGINES OR MODULES, 3% LENSES, 10% LED DRIVERS, 10% LED LAMPS MINIMUM ONE (1) OF EACH SIZE AND TYPE FOR ALL.

DELIVER PRODUCTS TO SITE. PROTECT LUMINAIRE FINISHES, LENSES, AND TRIMS FROM DAMAGE DURING STORAGE AND INSTALLATION. DO NOT REMOVE PROTECTIVE FILMS UNTIL CONSTRUCTION CLEANUP WITHIN EACH AREA IS COMPLETE. HANDLE SITE LIGHTING POLES CAREFULLY TO PREVENT BREAKAGE AND DAMAGE TO FINISH.

THE WARRANTY PERIOD BEGINS AT THE DATE OF SUBSTANTIAL COMPLETION. PROVIDE LED LIGHT ENGINES AND DRIVERS WITH A FIVE (5) YEAR WARRANTY. PROVIDE EMERGENCY LIGHTING UNITS AND EXIT SIGNS WITH A THREE (3) YEAR NON-PRORATED WARRANTY. PROVIDE EMERGENCY UNITS AND EXIT SIGN BATTERIES WITH SEALED LEAD ACID OR LEAD CALCIUM CELL, REQUIRING NO MAINTENANCE OR REPLACEMENT FOR TEN (10) YEARS UNDER NORMAL CONDITIONS. PROVIDE EMERGENCY LED DRIVER WITH FIVE (5) YEAR WARRANTY. PROVIDE EMERGENCY INVERTER AND BATTERY, SEALED NICKEL CADMIUM, WITH FIVE (5) YEAR NON-PRORATED WARRANTY. PROVIDE AUTOMATIC LOAD CONTROL RELAY (ALCR) WITH FIVE (5) YEAR WARRANTY. PROVIDE EXTERIOR FINISH ON POLES WITH THREE (3) YEAR WARRANTY. PROVIDE LED LIGHT ENGINE WITH THREE (3) YEAR WARRANTY AND ANY DRIVER WITH FIVE (5) YEAR WARRANTY.

PROVIDE LENSED TROFFERS WITH HINGED FRAMES WITH LATCHES AND 0.125-INCH THICK VIRGIN ACRYLIC LENSES. PRISMATIC LENSES SHALL HAVE DEPTH OF NO LESS THAN 0.080", KSH12 OR EQUAL. OTHER LENSES AS SCHEDULED. CONFIRM CEILING AND WALL TYPE FOR RECESSED LUMINAIRES AND FURNISH TRIM AND ACCESSORIES NECESSARY TO PERMIT PROPER INSTALLATION IN EACH SYSTEM. WHERE FIRE-RATED CEILING OR WALL ASSEMBLIES ARE SPECIFIED, FURNISH AND INSTALL LISTED ENCLOSURES AROUND LUMINAIRES THAT MAINTAIN THE SYSTEM RATING. FOR SUSPENDED LUMINAIRES, COORDINATE POWER FEED AND SUSPENSION CANOPIES WITH CEILING TYPE AND ARCHITECTURAL RCP FOR PROPER FIT AND LOCATION. VERIFY SUSPENSION LENGTH PRIOR TO SUBMITTAL. PAINTED REFLECTOR SURFACES SHALL HAVE A MINIMUM REFLECTANCE OF 90%. ALL PAINTED COMPONENTS SHALL BE PAINTED AFTER FABRICATION

EXTERIOR LUMINAIRES SHALL BE LISTED FOR WET OR DAMP LOCATION AS SCHEDULED. PROVIDE INGRESS PROTECTION (IP) RATING WHEN SCHEDULED. PROVIDE LOW TEMPERATURE LED DRIVERS, WITH RELIABLE STARTING TO -20°F.

LIGHT EMITTING DIODES USED IN INTERIOR APPLICATIONS SHALL HAVE A MINIMUM COLOR RENDERING INDEX (CRI) OF 70 80 90. THE R9 COLOR RENDERING VALUE SHALL BE A MINIMUM OF 50. LIGHT EMITTING DIODES USED IN EXTERIOR APPLICATIONS SHALL HAVE A MINIMUM COLOR RENDERING INDEX (CRI) OF 70. COLOR TEMPERATURE OF THE LUMINAIRES SHALL BE AS NOTED ON THE LUMINAIRE SCHEDULE. PROVIDE LIGHT SOURCE COLOR CONSISTENCY BY UTILIZING A BINNING TOLERANCE WITHIN A MAXIMIN 3-STEP MCADAM ELLIPSE UNLESS NOTED OTHERWISE. RATED LIFE SHALL BE MINIMUM OF 50,000 HOURS AT L70. LED CHIPS SHALL BE WIRED SO THAT FAILURE OF ONE CHIP DOES NOT PROHIBIT OPERATION OF THE REMAINDER OF THE CHIP ARRAY. LUMINAIRE DELIVERED LUMENS IS DEFINED AS THE ABSOLUTE LUMENS PER THE MANUFACTURER'S LM-79-08 TEST REPORT. LED LIGHT ENGINE SHALL HAVE A MAXIMUM LLD OF 0.85 AT 50,000 100,000 HOURS AT 25°C AMBIENT.

PROVIDE SOLID STATE DRIVERS WITH INTEGRAL HEAT SINK. DRIVER SHALL HAVE OVERHEAT, SHORT-CIRCUIT AND OVERLOAD PROTECTION, POWER FACTOR 0.90 OR ABOVE, AND MAXIMUM TOTAL HARMONIC DISTORTION OF 10 20%. DIMMING SHALL CONTROL LIGHT OUTPUT IN A CONTINUOUS CURVE FROM 100% TO 10% UNLESS NOTED OTHERWISE. DRIVER SHALL HAVE A MINIMUM OF 50,000 HOURS RATED LIFE. DRIVER SHALL BE FIELD REPLACEABLE WITHOUT REMOVAL OF THE LUMINAIRE. CLASS A SOUND RATING; INAUDIBLE IN A 27 DBA AMBIENT.

PROVIDE SELF-POWERED EMERGENCY LIGHTING UNITS: ONE-PIECE, SELF-CONTAINED UNIT WITH SEALED, MAINTENANCE-FREE NICKEL CADMIUM BATTERY, AUTOMATIC CHARGER AND ELECTRONIC CIRCUITRY. BATTERY: MAINTENANCE FREE LEAD CALCIUM TYPE, WITH 90 120 MINUTE CAPACITY TO SUPPLY THE CONNECTED LOAD. CHARGER: DUAL-RATE SOLID STATE CURRENT LIMITING CHARGER, CAPABLE OF MAINTAINING THE BATTERY IN A FULL-CHARGE STATE DURING NORMAL CONDITIONS AND CAPABLE OF RECHARGING DISCHARGED BATTERY TO FULL CHARGED WITHIN 168 HOURS. LOW VOLTAGE DISCONNECT TO PREVENT DEEP DISCHARGE OF BATTERY. BATTERY SHALL BE PROVIDED WITH INDICATOR LIGHT AND TEST SWITCH. UNIT SHALL BE SELF-DIAGNOSTIC WITH CONTINUOUS MONITORING OF CHARGER PERFORMANCE AND BATTERY VOLTAGE. ANY MALFUNCTION OF BATTERY, CHARGER, TRANSFER CIRCUIT, OR EMERGENCY LAMPS SHALL BE DETECTED AND VISUALLY INDICATED. UNIT SHALL BE PROGRAMMED TO EXERCISE THE BATTERY AND TEST EMERGENCY OPERATION BY PERFORMING A FIVE-MINUTE DISCHARGE/DIAGNOSTIC CYCLE EVERY SIX MONTHS. A MANUAL TEST SWITCH SHALL ALLOW A FIVE-MINUTE DISCHARGE/DIAGNOSTIC TEST AT ANY TIME.

EXIT SIGNS SHALL BE STENCIL FACE, 6-INCH HIGH LETTERS, DIRECTIONAL ARROWS AS INDICATED, UNIVERSAL MOUNTING TYPE AS INDICATED ON THE DRAWINGS WITH DIRECTIONAL INDICATOR (CHEVRON TYPE MEETING ALL REQUIREMENTS OF NFPA 101). UNIT SHALL BE SELF-DIAGNOSTIC WITH CONTINUOUS MONITORING OF CHARGER PERFORMANCE AND BATTERY VOLTAGE.

LED LAMPS USED WITH DIMMING SHALL BE VERIFIED FOR COMPATIBILITY WITH DIMMER MANUFACTURER PRIOR TO ORDERING.

EMERGENCY INVERTERS (INTEGRAL IN INDIVIDUAL LUMINAIRES) SHALL BE SELF-CONTAINED, WITH AUTOMATIC TRANSFER TO BATTERY SUPPLY ON LOSS OF NORMAL POWER, UL 924 LISTED FOR FACTORY OR FIELD INSTALLATION, INDOOR AND DAMP LOCATIONS, 32ºF TO 122ºF (0ºC TO 50ºC) OPERATING TEMPERATURE. COMPATIBLE WITH SWITCHED, DIMMED, AND UNSWITCHED LIGHTING CONTROLS. COMPATIBLE WITH LED LIGHT ENGINES. BATTERY SHALL BE SEALED, HIGH TEMPERATURE, MAINTENANCE FREE, NICKEL CADMIUM BATTERY WITH CAPACITY TO PROVIDE 90 120 MINUTES OF EMERGENCY OPERATION AT FULL LUMEN AND WATTAGE OUTPUT, WITH 24-HOUR RECHARGE TIME. INTEGRAL BATTERY CHARGER WITH LED CHARGING INDICATOR LIGHT, TEST SWITCH, ELECTRONIC CIRCUITRY FOR USE WITH LED DRIVERS. TEST AND MONITOR SWITCH SHALL BE INTEGRAL TO LUMINAIRE OR MOUNTED FLUSH IN FINISHED CEILING PER LUMINAIRE SCHEDULE. LISTED FOR INSTALLATION INSIDE AND ADJACENT TO LUMINAIRE. REMOTE-MOUNTED UNITS SHALL BE LOCATED ABOVE FINISHED CEILING, ADJACENT TO LUMINAIRE, AND ACCESSIBLE FROM BELOW THROUGH LUMINAIRE OPENING. PROVIDE WITH LISTED AUTOMATIC MONTHLY SELF-TEST DIAGNOSTICS.

SECURELY FASTEN LUMINAIRES TO THE LISTED AND LABELED CEILING FRAMING MEMBER BY MECHANICAL MEANS SUCH AS BOLTS, SCREWS, RIVETS OR LISTED CLIPS IDENTIFIED FOR USE WITH THE TYPE OF CEILING FRAMING MEMBERS. PROVIDE A MINIMUM OF TWO (2) FOUR (4) #12 GAUGE WIRES LOCATED ON DIAGONAL CORNERS OF LUMINAIRES. THE ARCHITECTURAL CEILING FRAMING SYSTEM MAY BE USED IN LIEU OF INDEPENDENT SUPPORT WITH PRIOR WRITTEN APPROVAL BY THE CEILING SYSTEM MANUFACTURER AND AUTHORITY HAVING JURISDICTION (AHJ). LUMINAIRES AND WIRING INSTALLED IN FIRE-RATED CEILING ASSEMBLIES SHALL BE INDEPENDENTLY SUPPORTED FOR ALL APPLICATIONS

INSTALL RECESSED FLANGED LUMINAIRES TO PERMIT REMOVAL FROM BELOW. USE MANUFACTURER-SUPPLIED PLASTER FRAMES AND SWING GATE SUPPORTS. SUPPORT LUMINAIRES INDEPENDENT OF CEILING WITH A MINIMUM OF TWO (2) FOUR (4) #12 GAUGE WIRES LOCATED ON DIAGONAL CORNERS. SUPPORT SURFACE-MOUNTED LUMINAIRES DIRECTLY FROM BUILDING STRUCTURE. SUPPORT SUSPENDED OR PENDANT MOUNTED LUMINAIRES INDEPENDENT OF CEILING GRID WITH A MINIMUM OF TWO FOUR (4) #12 GAUGE WIRES LOCATED ON DIAGONAL CORNERS. SUSPENSION ASSEMBLY AND ANCHORS SHALL BE CAPABLE OF SUPPORTING 300 POUNDS DEAD LOAD AT EACH SUSPENSION POINT.

ADJUST AIMABLE LUMINAIRES TO OBTAIN LIGHTING LEVELS ON OBJECTS AND AREAS AS DIRECTED TO OBTAIN DESIRED LIGHTING LEVELS.

THE CONTRACTOR SHALL PROVIDE TEMPORARY CONSTRUCTION LIGHTING PER THE REQUIREMENTS OF DIVISION 1. THE PROJECT LUMINAIRES SHOWN ON THE CONSTRUCTION DOCUMENTS SHALL NOT BE USED FOR TEMPORARY CONSTRUCTION PURPOSES WITHOUT PROVIDING A PLAN FOR OWNER APPROVAL THAT ADDRESSES ENERGY AND LUMINAIRE OPERATING HOURS.

ALCR UNITS SHALL BE FACTORY OR FIELD INSTALLATION PER MANUFACTURER REQUIREMENTS. PROVIDE REMOTE TEST SWITCH CONNECTION. PROVIDE CONNECTION TO ADDRESSABLE FIRE ALARM RELAY FOR FIRE ALARM OVERRIDE. FOR EMERGENCY LIGHTING UNITS AND EXIT SIGNS, INSTALL UNITS PLUMB AND LEVEL, AIM DIRECTIONAL LAMP HEADS AS DIRECTED, AND TEST EMERGENCY LIGHTING EQUIPMENT FOR 60 MINUTES TO DETERMINE PROPER OPERATION, PRIOR TO SUBSTANTIAL COMPLETION. PROVIDE ELECTRONIC COPY OF PERIODIC TEST LOG FORM TO OWNER'S REPRESENTATIVE. EXPLAIN AND INSTRUCT OWNER'S REPRESENTATIVE OF REQUIREMENTS FOR TESTING AND MAINTENANCE. REFER TO LATEST ADOPTED NFPA 101 FOR TESTING AND LOGGING REQUIREMENTS.

REPLACE FAILED LED LAMPS AND LIGHT ENGINE MODULES OR ARRAYS AT COMPLETION OF WORK.

ALIGN LUMINAIRES AND CLEAN LENSES AND DIFFUSERS AT COMPLETION OF WORK. CLEAN PAINT SPLATTERS, DIRT, AND DEBRIS FROM INSTALLED LUMINAIRES. TOUCH UP LUMINAIRE AND POLE FINISH AT COMPLETION OF WORK.

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NO.	REVISION	DATE

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PROJECT STATUS
CONSTRUCTION DOCUMENTS

SHEET
ELECTRICAL SPECIFICATIONS

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