St. Clair Shores Public Library Interior Renovation

22500 Eleven Mile Road, St. Clair Shores, MI 48081

DESIGN / ARCHITECT OF RECORD:

PLY+ ARCHITECTURE
409 1/2 N 4TH AVE,
ANN ARBOR, MI 48104

CRAIG BORUM, FAIA
PH. (734) 827-2238

MECHANICAL ENGINEER:

GREEENPATH DESIGN
42030 E ANN ARBOR TRAIL
PLYMOUTH, MI 48170

KELLY SUGG, PE
PH. (248) 310-7286

ELECTRICAL ENGINEER:

TAC ASSOCIATES, LLC
4321 EAST CAMDEN ROAD
OSSEO, MI 49266

THOMAS G. CROW, PE, LEED AP
PH. (517) 254-4789

STRUCTURAL ENGINEER:

WILLIAM A. KIBBE & ASSOCIATES, INC.
146 MONROE CENTER NW, SUITE 1125,
GRAND RAPIDS, MI 49503

ERIC MANNOR, VICE PRESIDENT
EMAIL EMANNOR@KIBBE.COM

SCHEDULE OF ALTERNATES

Add Alternate No. 1:

Base Bid: Acoustical ceiling tile (ACT) and lighting as indicated on Architectural Drawing A2.00 and applicable electrical drawings.

Alternate: Acoustic baffles, soffit, and suspended lighting in children's area (adjacent to maker space and story time room): Provide an add alternate cost for all labor and materials required for the demolition of existing acoustical ceiling tile (ACT) and the installation of new acoustic baffles, soffit, and suspended lighting fixtures, including associated lighting controls. Work shall also include any necessary modifications to mechanical, electrical, or other systems affected by this scope. Refer to drawings A2.11 and E1.02 for extent of work.

Add Alternate No. 2:

Base Bid: Retain existing lighting fixtures and controls in Rooms 101, 101B, 110, 110A–D, 108, 108A, and 107. Refer to Drawing A2.00 and applicable electrical drawings for existing conditions.

Alternate: New lighting in rooms 101 (Adult Stack), 101B (Seating Area), 110 (Study Space), 110A–D (Study Rooms), 108 (Lounge), 108A (Friends Space), and 107 (Adult Stack): Provide an add alternate cost for all labor and materials required to replace existing lighting fixtures and associated lighting controls in the areas noted above. The scope shall include any necessary modifications to ceilings, mechanical systems, electrical systems, or other building components affected by the work. Refer to drawings A2.11 and applicable electrical drawings for the extent of work.

Add Alternate No. 3 :

Base Bid: Retain existing accordion doors in Room 109 (Adult Program Room) and Room 109A (Board Room). No door replacement is included in the base bid.

Alternate: Replacement of accordion doors in 109 (adult program) room and 109A (board room) : Provide an add alternate cost for all labor and materials required to replace two existing accordion doors in room adult program room and the board room. Refer to drawing A2.00 and the architectural specifications for the extent of work.

PLY+
architecture, urbanism, design

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STATE OF MICHIGAN
MICHAEL CRAIG BORUM
ARCHITECT
No. 1301046115
LICENSED ARCHITECT

Project Name
SCSPL

Drawing Name
Cover Sheet

Drawn By
YZ

Checked By
CB

Issue Date
05/16/2025 Permit& Bid Set

Revisions

Issued for	Date

Project No.
P23005

Sheet Number
A0.00

Structural Drawings

		ISSUED: 01/10/2025 100% DD	04/06/25 50% CD	05/01/25 90%CD	05/16/25 Permit & Bid Set
Structural					
S1.0	STRUCTURAL NOTES PLAN AND DETAILS	●	●	●	●

MEP Drawings

		ISSUED: 01/10/2025 100% DD	04/06/25 50% CD	05/01/25 90%CD	05/16/25 Permit & Bid Set
Mechanical & Plumbing					
M-001	Index, Symbols, & Abbreviations	●	●	●	●
M-002	Standard Materials Schedules	●	●	●	●
M-003	Specifications	●	●	●	●
M-004	Specifications	●	●	●	●
M-014	Mechanical Demolition Plan	●	●	●	●
M-100	Fire Protection	●	●	●	●
M-200	Plumbing Plans	●	●	●	●
M-400	Mechanical Plan	●	●	●	●
M-500	Details	●	●	●	●
M-600	Diagrams and Schedules	●	●	●	●
M-700	Schedules	●	●		
Electrical					
E0.01	Drawing Index, Symbol List	●	●	●	●
E0.02	Lighting Fixture Schedule		●	●	●
E1.00	Electrical New Work	●	●	●	●
E1.01	Lighting New Work	●	●	●	●
E1.01A	Lighting New Work		●	●	●
E1.02	Lighting New Work	●	●	●	●
E1.02A	Lighting New Work		●	●	●
E1.03	Lighting New Work	●	●	●	●
E1.03A	Lighting New Work		●	●	●
E2.01	Power & Systems New Work	●	●	●	●
E2.02	Power & Systems New Work	●	●	●	●
E2.03	Power & Systems New Work	●	●	●	●
E3.00	Electrical Schedules	●	●	●	●
E3.01	Electrical Schedules	●	●	●	●
E4.00	Miscellaneous Wiring Diagrams	●	●	●	●
E4.01	Miscellaneous Wiring Diagrams	●	●	●	●
E5.00	Electrical Specification	●	●	●	●
E5.01	Electrical Specification	●	●	●	●
E5.02	Electrical Specification	●	●	●	●
E5.03	Electrical Specifications	●	●	●	●
E5.04	Electrical Specifications	●	●	●	●
ED1.00	Electrical Demolition	●	●	●	●
ED1.01	Electrical Demolition	●	●	●	●
ED1.02	Electrical Demolition	●	●	●	●
ED1.03	Electrical Demolition	●	●	●	●
EX1.01	Emergency Lighting Photometry	●	●	●	●
EX1.02	Emergency Lighting Photometry	●	●	●	●
EX1.03	Emergency Lighting Photometry	●	●	●	●

Architectural Drawings

		ISSUED: 11/22/24. 100% DD	04/06/25 50% CD	05/01/25 90%CD	05/16/25 Permit & Bid Set
0. Project Data					
A0.00	Cover Sheet	●	●	●	●
A0.10	Sheet Index	●	●	●	●
A0.15	General Information	●	●	●	●
A0.20	Code Summary	●	●	●	●
A0.30	Life Safety Drawings	●	●	●	●
A0.31	Life Safety Drawings	●	●	●	●
1. Existing and Demo Plan					
A1.00	Demolition Plans	●	●	●	●
A1.10	Demolition Ceiling Plans	●	●	●	●
A1.11	Demolition Ceiling Plans - Alternate	●	●	●	●
2. Building Plan					
A2.00	New Floor Plans	●	●	●	●
A2.10	Reflected Ceiling Plans	●	●	●	●
A2.11	Reflected Ceiling Plans - Alternate	●	●	●	●
A2.20	Wall Type Plan	●	●	●	●
3. Enlarged Plan					
A3.00	Enlarged Plans	●	●	●	●
A3.10	Enlarged Ceiling Plans	●	●	●	●
A3.11	Enlarged Ceiling Plans - Alternate	●	●	●	●
4. Building Elevations & Section					
A4.00	Building Sections	●	●	●	●
5. Wall Sections					
A5.00	Wall Sections	●	●	●	●
6. Details					
A6.00	Interior Sections and Details		●	●	●
7. Interior Elevations					
A7.00	Interior Elevations	●	●	●	●
A7.01	Interior Elevations	●	●	●	●
A7.02	Interior Elevations		●	●	●
8. Schedules					
A8.00	Room Finish Schedule	●	●	●	●
A8.10	Door Schedule and Details	●	●	●	●
A8.11	Aluminum Framing Detail	●	●	●	●
9. Equipment & Millwork					
A9.00	Millwork Plan and Schedule	●	●	●	●
A9.01	Millwork Components(For Ref.Only)	◌	◌	◌	◌
A9.10	Millwork Detail	●	●	●	●
A9.11	Millwork Detail		●	●	●
A9.12	Millwork Detail		●	●	●
A9.13	Millwork Detail		●	●	●
A9.14a	Millwork Detail		●	●	●
A9.14b	Millwork Detail				●
A9.14c	Millwork Detail				●
A9.15a	Millwork Detail		●	●	●
A9.15b	Millwork Detail				●
A9.16	Millwork Detail	●	●	●	●
A9.17	Millwork Detail	●	●	●	●
A9.18	Millwork Detail	●	●	●	●
A9.19a	Millwork Detail		●	●	●
A9.19b	Millwork Detail		●	●	●
A9.19c	Millwork Detail				●

Architectural Drawings

		ISSUED: 11/22/24. 100% DD	04/06/25 50% CD	05/01/25 90%CD	05/16/25 Permit & Bid Set
A9.20	Millwork Detail	●	●	●	●
A9.21	Millwork Detail	●	●	●	●
10. Finish Plan					
A10.00	Finish Plans	●	●	●	●
A10.01	Finish RCP		●	●	●
Equipment Plan					
EQ1.00	New Library Shelving System Plan (For Ref. Olny)	●	●	●	◌
For Reference					
REF01	Render Reference	◌	◌		
REF02	Render Reference	◌	◌		
Furniture					
F1.00	Furniture Plan (For Ref. Only)	◌	◌	◌	◌
Signage					
SG.100	Interior Signage Plan (For Ref. Only)	◌	◌	◌	◌

LEGEND:

◌ REFERENCE ONLY
● ISSUED

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ABBREVIATION LEGEND

ACU	AIR CONDITIONING UNIT
ADJ	ADJACENT, ADJUSTABLE
AFF	AUTHORITY HAVING JURISDICTION
AHJ	ABOVE FINISH FLOOR
ALT	ALTERNATE
ALUM	AUMINUM
ANO	ANODIZED
APPROX	APPROXIMATELY
ARCH	ARCHITECT, ARCHITECTURE
AUTO	AUTOMATIC
BD	BOARD
BF	BARRIER FREE
BLDG	BUILDING
BLKG	BLOCKING
BN	BULLNOSE
BOT	BOTTOM
BRKT	BRACKET
BSMT	BASEMENT
B/D	BOTTOM OF DECK
CAB	CABINET
CBB	CEMENT BACKER BOARD
CG	CORNER GUARD
CJ	CONTROL JOINT
CL	CENTER LINE
CLG	CEILING
CMU	CONCRETE MASONRY UNIT
CONC	CONCRETE
CONT	CONTINUOUS
CORR	CORRIDOR
COORD	COORDINATE
CT	CERAMIC TILE
D	DEPTH
DEMO	DEMOLISH, DEMOLITION
DEPT	DEPARTMENT
DET	DETAIL
DF	DRINKING FOUNTAIN
DIA	DIAMETER
DIAG	DIAGONAL
DIFF	DIFFUSER
DIM	DIMENSION
DN	DOWN
DR	DOOR
DWG	DRAWING
EIFS	EXTERIOR INSULATION FINISH SYSTEM
EJ	EXPANSION JOINT
EL	ELEVATION
ELEC	ELECTRIC, ELECTRICAL
ELEV	ELEVATOR
ENCL	ENCLOSURE
ENTR	ENTRANCE
EP	ELECTRICAL PANEL
EQ	EQUAL
EQUIP	EQUIPMENT
EXIST	EXISTING
EXT	EXTERIOR
FACT	FACTORY
FACP	FIRE ALARM CONTROL PANEL
FD	FLOOR DRAIN
FDC	FIRE DEPT CONNECTION
FDTN	FOUNDATION
FE	FIRE EXTINGUISHER
FEB	FIRE EXTINGUISHER BRACKET
FEC	FIRE EXTINGUISHER CABINET
FIN	FINISH
FLR	FLOOR
FRP	FIBERGLASS REINFORCED PANEL
FWC	FABRIC WALL COVERING
GRFC	GLASS FIBER REINFORCED CONCRETE
GRFG	GLASS FIBER REINFORCED GYPSUM
GL	GLASS
GYP	GYPSUM
H	HIGH, HEIGHT
HC	HOLLOW CORE
HDWD	HARDWOOD
HM	HOLLOW METAL
HORIZ	HORIZONTAL
HR	HOUR
ID	INSIDE DIAMETER
INCL	INCLUDE, INCLUDING
INFO	INFORMATION
IN	INCH, INCHES
INSUL	INSULATE, INSULATION
IR	IMPACT RESISTANT
INT	INTERIOR
JC	JANITOR CLOSET
JT	JOINT
JST	JOIST
KD	KNOCK DOWN
KIT	KITCHEN
L	LONG, LENGTH
LAM	LAMINATE
LAV	LAVATORY
LBS	POUNDS
LF	LINEAR FOOT
LH	LEFT HAND
LVL	LEVEL
LT WT	LIGHT WEIGHT
MAINT	MAINTENANCE
MATL	MATERIAL
MAX	MAXIMUM
MECH	MECHANICAL
MT	METAL
MEZZ	MEZZANINE
MFR	MANUFACTURER
MIN	MINIMUM
MISC	MISCELLANEOUS
MTD	MOUNTED
MAINT	MAINTENANCE
MATL	MATERIAL
MAX	MAXIMUM
MECH	MECHANICAL
MT	METAL
MEZZ	MEZZANINE
MFR	MANUFACTURER
MIN	MINIMUM
MISC	MISCELLANEOUS
MTD	MOUNTED
PERF	PERFORATED
PLBG	PLUMBING
PLAM	PLASTIC LAMINATE
PLYWD	PLYWOOD
PREFAB	PREFABRICATED
PSF	POUNDS PER SQUARE FOOT
PSI	POUNDS PER SQUARE INCH
PT	PAINT
RAD	RADIUS
REF	REFER, REFERENCE
REFL	REFLECTED
REFRIG	REFRIGERATOR
REINF	REINFORCED
REV	REVISION
RH	RIGHT HAND
RO	ROUGH OPENING
SC	SOLID CORE
SCHED	SCHEDULE
SECT	SECTION
SF	SQUARE FEET
SIM	SIMILAR
SPEC	SPECIFICATION
SS	SOLID SURFACE
STC	SOUND TRANSMISSION CLASS
STD	STANDARD
STL	STEEL
STRUCT	STRUCTURAL
ST STL	STAINLESS STEEL
SURF	SURFACE
T&G	TONGUE AND GROOVE
TEL	TELEPHONE
TEMP	TEMPERED, TEMPORARY
TER	TERRAZZO
TO	TOP OF
TOS	TOP OF SLAB
TV	TELEVISION
TYP	TYPICAL
UC	UNDERCOUNTER
VCT	VINYL COMPOSITION TILE
VERT	VERTICAL
VIF	VERIFY IN FIELD
VWC	VINYL WALL COVERING
W	WIDE, WIDTH
WC	WATER CLOSET
WD	WOOD
WO	WINDOW OPENING
W/O	WITHOUT
WP	WATERPROOF
X	BY

LEGEND

FINISH PLAN
NOTE: NOT ALL SYMBOLS MAY USED

- FL-01 CARPET
- FL-02 CARPET
- FL-03 CARPET
- FL-04 RUBBER FLOOR
- FL-05 CARPET
- FL-06 RUBBER FLOOR
- FL-07 CARPET
- FL-08 FLOOR TILE
- FL-09 ENTRY MAT
- EXISTING FLOOR FINISH

SYMBOL LEGEND

SECTION DETAIL MARKER — 1 / A8.10

BUILDING AND WALL SECTION MARKER — 1 / A8.10

INTERIOR ELEVATION MARKER — 1 / A8.1 (1, 2, 3, 4)

EXTERIOR ELEVATION MARKER — 1 / A8.00

FINISH TAG — PT-01

WINDOW/STOREFRONT TAG — 100

WALL TAG — W1-1

DOOR TAG — 15

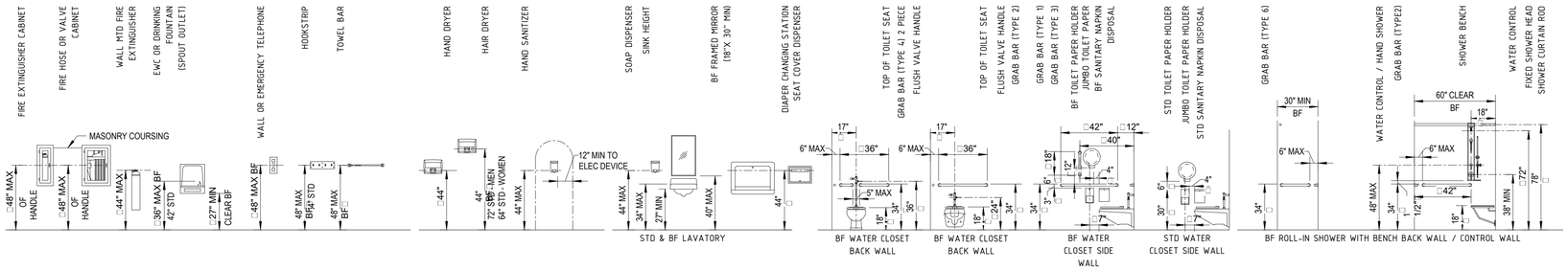
ROOM TAG — 101 / XXX.XX SF

PLAN AND SECTION DETAIL MARKER — 1 / A8.10

XX-XX — ACCENT MATERIAL XX-XX, REFER TO COLOR CODES

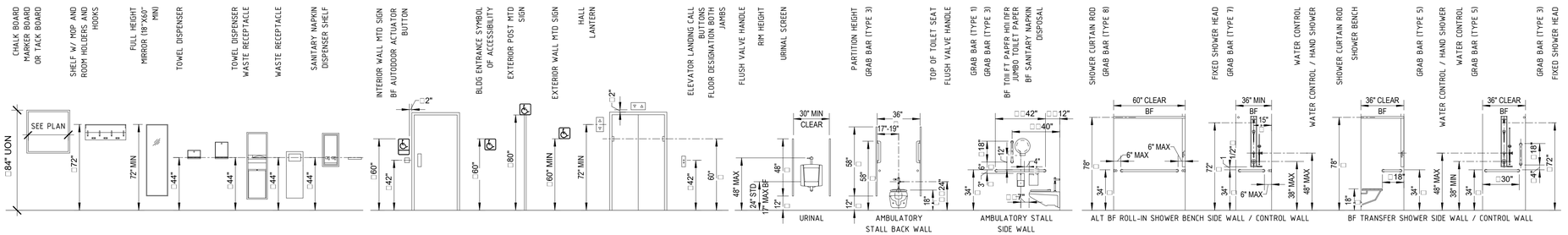
ROOM NAME
101 — ROOM NUMBER
XX-XX — WALL FINISH, REFER TO COLOR CODES
XX-XX — BASE, REFER TO COLOR CODES
XX-XX — FLOOR FINISH, REFER TO COLOR CODES
PT-XX — ACCENT MATERIAL XX-XX, REFER TO COLOR CODES

MOUNTING HEIGHTS



MOUNTING HEIGHTS SHOWN ARE BASED UPON RECOGNIZED DESIGN STANDARDS AND/OR BARRIER FREE CODE REQUIREMENTS. IT IS INTENDED THAT LIKE DEVICES ALL BE MOUNTED AT THE SAME HEIGHT THROUGHOUT THE ENTIRE PROJECT. RECESSED DEVICES IN MASONRY WALLS MAY DICTATE A DEVIATION (± 2") FROM THESE HEIGHTS (WHEN PERMITTED BY CODE) SO AS TO ALLOW THE BOTTOM OR THE TOP OF THE DEVICE RECESS TO ALIGN WITH MASONRY COURSING. COORDINATE THESE DEVIATIONS WITH THE ARCHITECT'S/OWNER'S REPRESENTATIVE.

MOUNTING HEIGHTS ARE TYPICAL UNLESS OTHERWISE NOTED ON DRAWINGS.



THIS PROJECT MAY NOT UTILIZE ALL THE SYMBOLS, MATERIALS, ABBREVIATIONS AND STANDARD INFORMATION SHOWN ON THIS SHEET

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STATE OF MICHIGAN
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General Information

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YZ

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PLUMBING FIXTURE CALCULATIONS

ASSEMBLY (A-3)

WC:	1 PER 125 MALE OCCUPANTS
	1 PER 65 FEMALE OCCUPANTS
LAV:	1 PER 200 MALE OCCUPANTS
	1 PER 200 FEMALE OCCUPANTS
FOUNTAIN:	1 PER 500 TOTAL OCCUPANTS

BUSINESS (B)

WC:	1 PER 25 MALE OCC. FOR THE FIRST 50, 1 PER 50 AFTER
	1 PER 25 FEMALE OCC. FOR THE FIRST 50, 1 PER 50 AFTER
LAV:	1 PER 40 MALE OCC. FOR THE FIRST 80, 1 PER 80 AFTER
	1 PER 40 FEMALE OCC. FOR THE FIRST 80, 1 PER 80 AFTER
FOUNTAIN:	1 PER 100 TOTAL OCCUPANTS

A-3: 383 OCCUPANTS/ 2 = 192 EACH GENDER

MALE: 192/ 125 = 1.54 WC
FEMALE: 192/ 65 = 2.95 WC

MALE: 192/ 200 = 0.96 LAV
FEMALE: 192/ 200 = 0.96 LAV

383/ 500 = 0.77 FOUNTAINS

B: 32 OCCUPANTS/ 2 = 16 EACH GENDER

MALE: 16/ 25 = 0.64 WC
FEMALE: 16/ 25= 0.64 WC

MALE: 16/ 40 = 0.4 LAV
FEMALE: 16/ 40 = 0.4 LAV

32/ 100 = 0.32 FOUNTAIN

BUILDING TOTAL FIXTURE COUNT:

	REQUIRED:	PROVIDED:
MALE WATER CLOSET:	3	5
MALE LAVATORY:	1	4
FEMALE WATER CLOSET:	4	5
FEMALE LAVATORY:	1	5
DRINKING FOUNTAIN:	2	3
SERVICE SINK:	2	3

APPLICABLE CODES

BUILDING
MICHIGAN DEPARTMENT OF LICENSING AND REGULATORY AFFAIRS, BUREAU OF CONSTRUCTION CODES, 2021 MICHIGAN REHABILITATION CODE FOR EXISTING BUILDINGS.
ENFORCING AGENCY: CITY OF ST. CLAIR SHORES, CDI

MICHIGAN DEPARTMENT OF LICENSING AND REGULATORY AFFAIRS, BUREAU OF CONSTRUCTION CODES, 2021 MICHIGAN BUILDING CODE INCORPORATING THE 2021 EDITION OF THE INTERNATIONAL BUILDING CODE
ENFORCING AGENCY: CITY OF ST. CLAIR SHORES, CDI

BARRIER FREE
MICHIGAN DEPARTMENT OF LICENSING AND REGULATORY AFFAIRS, 2021 MICHIGAN BUILDING CODE INCORPORATING THE 2021 EDITION OF THE INTERNATIONAL BUILDING CODE
ENFORCING AGENCY: CITY OF ST. CLAIR SHORES, CDI

AMERICANS WITH DISABILITIES ACT (ADA), 2010, STANDARDS FOR ACCESSIBLE DESIGN
ENFORCING AGENCY: ALL FEDERAL AGENCIES (ON COMPLAINT BASIS) FOR U.S. REHABILITATION ACT OF 1973, U.S. DEPARTMENT OF JUSTICE AND ARCHITECTURE AND TRANSPORTATION BARRIERS COMPLIANCE BOARD (ON COMPLIANT BASIS) FOR AMERICANS WITH DISABILITY ACT

ENERGY
MICHIGAN DEPARTMENT OF LICENSING AND REGULATORY AFFAIRS, BUREAU OF CONSTRUCTION CODES, 2021 MICHIGAN UNIFORM ENERGY CODE FOR BUILDINGS AND STRUCTURES, NOT INCLUDING RESIDENTIAL BUILDINGS, INCORPORATING ANSI/ASHRAE/ESNA STANDARD 90.1-2019
ENFORCING AGENCY: CITY OF ST. CLAIR SHORES, CDI

STRUCTURAL
MICHIGAN DEPARTMENT OF LICENSING AND REGULATORY AFFAIRS, BUREAU OF CONSTRUCTION CODES, 2021 MICHIGAN BUILDING CODE INCORPORATING THE 2021 EDITION OF THE INTERNATIONAL BUILDING CODE
ENFORCING AGENCY: CITY OF ST. CLAIR SHORES, CDI

MECHANICAL
MICHIGAN DEPARTMENT OF LICENSING AND REGULATORY AFFAIRS, 2021 MICHIGAN MECHANICAL CODE INCORPORATING THE 2021 EDITION OF THE INTERNATIONAL MECHANICAL CODE
ENFORCING AGENCY: CITY OF ST. CLAIR SHORES, CDI

PLUMBING
MICHIGAN DEPARTMENT OF LICENSING AND REGULATORY AFFAIRS, 2021 MICHIGAN PLUMBING CODE INCORPORATING THE 2021 EDITION OF THE INTERNATIONAL PLUMBING CODE
ENFORCING AGENCY: CITY OF ST. CLAIR SHORES, CDI

FIRE SUPPRESSION SYSTEM
NFPA 13, SPRINKLER SYSTEMS, 2019 EDITION AS REFERENCED IN THE 2021 MICHIGAN MECHANICAL CODE
ENFORCING AGENCY: CITY OF ST. CLAIR SHORES, CDI

ELECTRICAL
MICHIGAN DEPARTMENT OF LICENSING AND REGULATORY AFFAIRS, 2023 MICHIGAN ELECTRICAL CODE INCORPORATING THE 2023 EDITION OF THE NATIONAL ELECTRICAL CODE
ENFORCING AGENCY: CITY OF ST. CLAIR SHORES, CDI

FIRE ALARM
NFPA 72, NATIONAL FIRE ALARM CODE, 2019 EDITION AS REFERENCED IN THE 2021 MICHIGAN MECHANICAL CODE
ENFORCING AGENCY: CITY OF ST. CLAIR SHORES, CDI

BUILDING INFORMATION

CLASSIFICATION OF WORK: (MRCEB 602.1, 603.1)	MICHIGAN REHABILITATION FOR EXISTING BUILDING - METHOD OF COMPLIANCE: WORK AREA METHOD LEVEL OF ALTERATION: LEVEL 1 & 2 ALTERATION
ALLOWABLE BUILDING AREA: (MBC TABLE 506.2)	REQUIRED: 38,000 SF (S1)
	PROPOSED: EXIST. TO REMAIN GROUND FLOOR GROUND FLOOR (GROSS): 29,826 SF GROUND FLOOR (NET): 28,276 SF
ALLOWABLE BUILDING HEIGHT: (MBC TABLE 504.3, TABLE 504.4)	REQUIRED: 3 STORIES, 75 FEET (S)
	PROVIDED: 1 STORY (+/-) 16 FEET
USE GROUP CLASSIFICATION MAIN FLOOR: (MBC 303.4, 304.1)	MIXED USES, NON-SEPARATED ASSEMBLY A-3 (21,965 SF) BUSINESS B (3,316 SF)
CONSTRUCTION TYPE: (MBC TABLE 601)	TYPE IIB
OCCUPANT LOAD MAIN FLOOR: (MBC 1004.1, 1004.2)	415 OCCUPANTS
BUILDING FIRE RESISTANCE RATING REQUIREMENTS: (MBC 602, TABLE 601)	PRIMARY STRUCTURAL FRAME - 0 HOUR BEARING WALL (EXTERIOR, EXISTING) - 0 HOUR BEARING WALL (INTERIOR) - 0 HOUR NONBEARING WALLS AND PARTITIONS - 0 HOUR FLOOR CONSTRUCTION - 0 HOUR ROOF CONSTRUCTION - 0 HOUR
CORRIDOR FIRE RESISTANCE RATING: (MBC TABLE 1020.2)	0 HOUR WITH SPRINKLER SYSTEM
MINIMUM INTERIOR FINISH REQUIREMENTS: (MBC TABLE 803.13, 804.4)	INTERIOR EXIT STAIRWAYS AND RAMPS - B CORRIDORS AND LOBBIES - B ROOMS AND ENCLOSED SPACES - C INTERIOR FLOOR FINISH REQUIREMENT - CLASS II

EGRESS AND FIRE PROTECTION SYSTEMS

EGRESS CAPACITY: (MBC 1005.3.2 OTHER COMPONENTS)	0.2 GROUND LEVEL CAPACITY
EGRESS TRAVEL DISTANCE ASSEMBLY: (MBC TABLE 1017.2)	ASSEMBLY 250' (SPRINKLERED) BUSINESS 300' (SPRINKLERED)
COMMON PATH OF TRAVEL: (MBC TABLE 1006.2.1)	ASSEMBLY 75' (SPRINKLERED) BUSINESS 100' (SPRINKLERED)
SEPARATION OF EXITS: (MBC 1007.1.1)	1/3 THE LONGEST DIAGONAL OF THE SPACE (SPRINKLERED)
AUTOMATIC SPRINKLER SYSTEM (MBC 903.2.1.3)	EXISTING AUTOMATIC SPRINKLER SYSTEM PROVIDED AS REQUIRED
FIRE EXTINGUISHERS: (MBC 906.1, NFPA 10)	PROVIDED AS REQUIRED. (75 FEET MAXIMUM TRAVEL DISTANCE AND IN HAZARDOUS LOCATIONS)
FIRE ALARM AND DETECTION SYSTEM: (MBC 907.2.1, 907.2.2)	EXISTING FIRE ALARM SYSTEM PROVIDED AS REQUIRED
PANIC EXIT HARDWARE: (MBC 1010.2.9)	SHALL MEET THE REQUIREMENTS OF MBC 1010.2.9
EGRESS SIGNAGE AND LIGHTING:	SHALL MEET THE REQUIREMENTS OF MBC 1013 TACTILE EXIT SIGNS (ICC A117.1) EMERGENCY LIGHTING SHALL MEET THE REQUIREMENTS OF MBC 1008
PRIMARY LEVEL OF EXIT DISCHARGE	MAIN FLOOR (GROUND FLOOR)

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Project Name
SCSPL

STATE OF MICHIGAN
MICHAEL CRAIG BORUM
ARCHITECT
No. 1301046115
LICENSED ARCHITECT

Drawing Name
Code Summary

Drawn By
YJ

Checked By
CB

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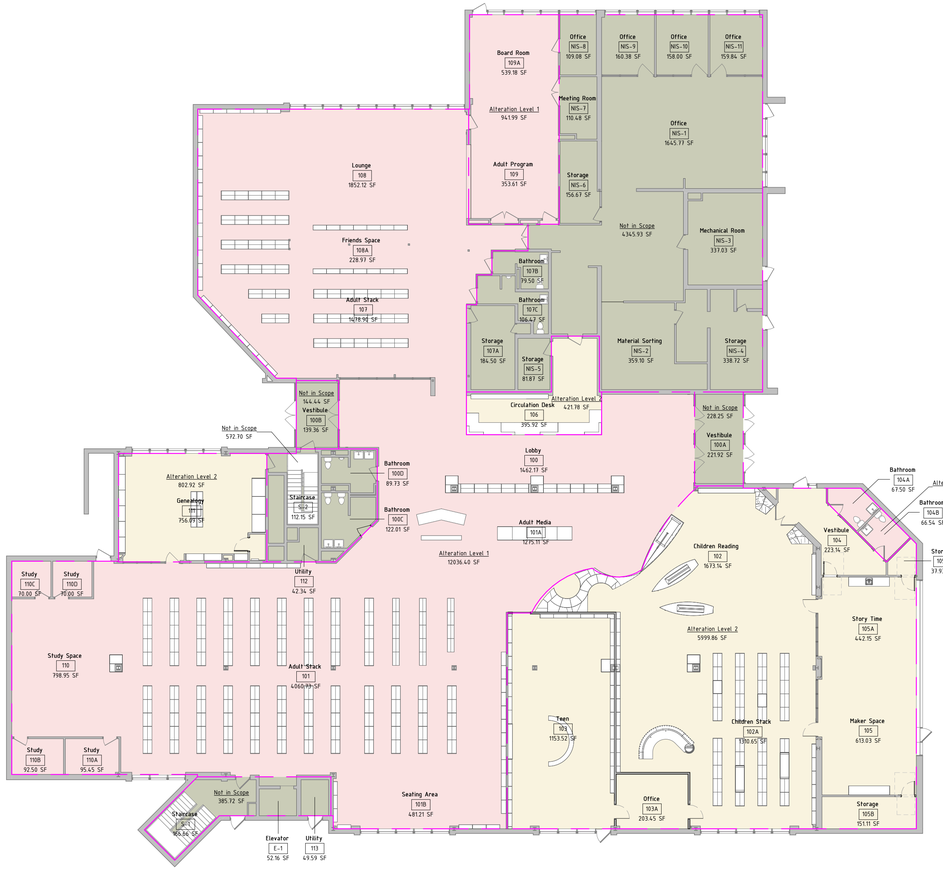
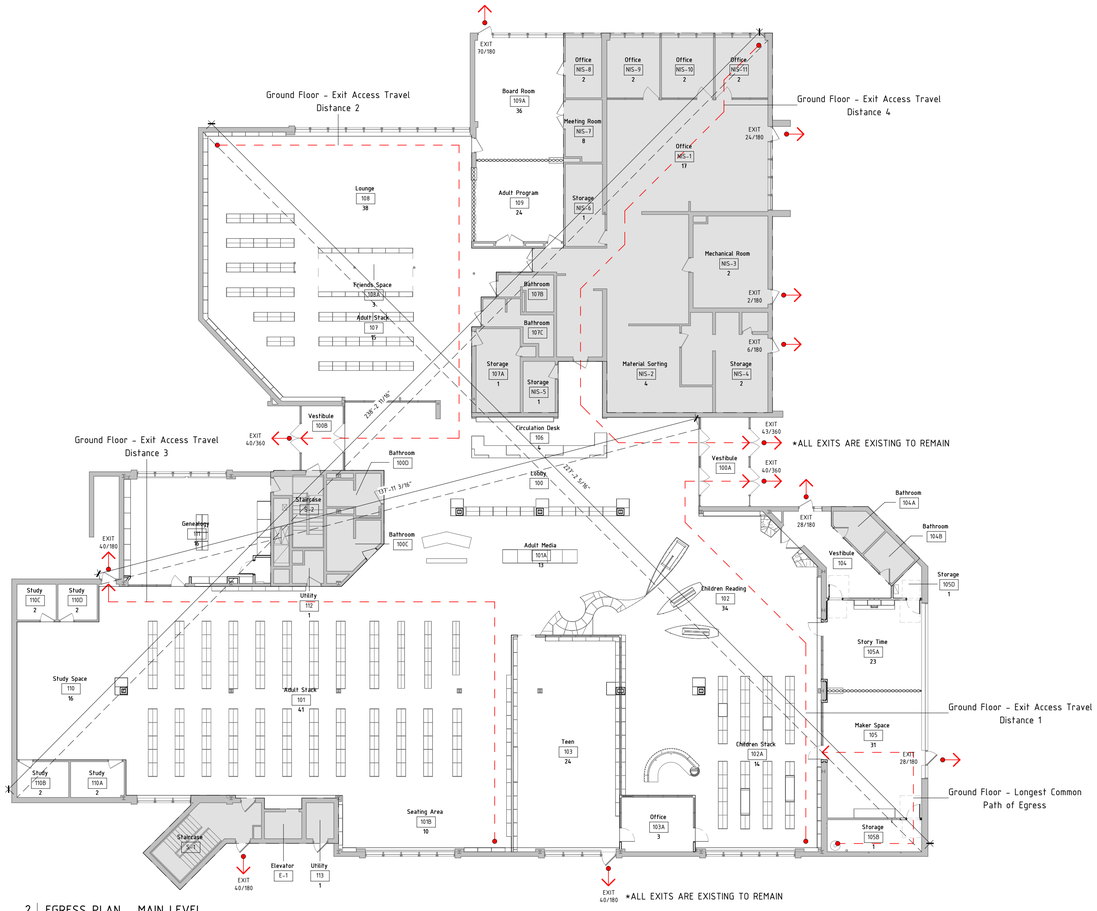


4 ALTERATION LEVEL PLAN - MAIN LEVEL

1/16" = 1'-0"

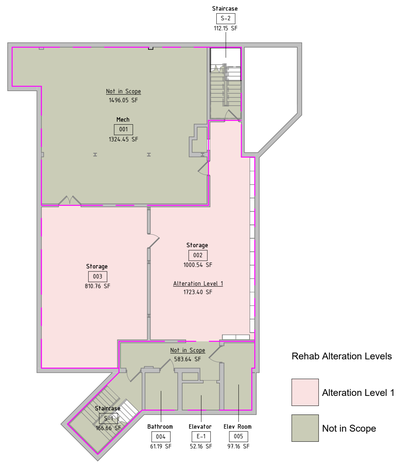
Rehab Alteration Levels

- Alteration Level 1
- Alteration Level 2
- Not in Scope



2 EGRESS PLAN - MAIN LEVEL

1/16" = 1'-0"



3 ALTERATION LEVEL PLAN - BASEMENT LEVEL

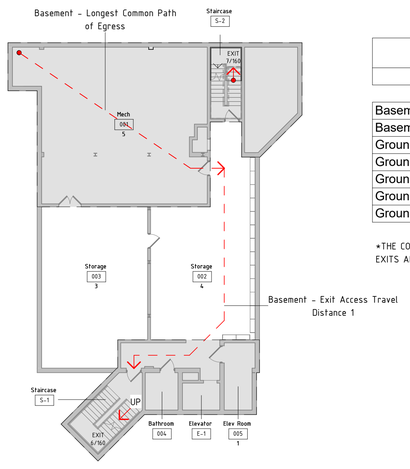
1/16" = 1'-0"

Rehab Alteration Levels

- Alteration Level 1
- Not in Scope

Area Schedule (Rehab Code Work Plan)		
Name	Area	Work Area
Alteration Level 1	14844.77 SF	0.00 SF
Alteration Level 2	7224.56 SF	7224.56 SF
Not in Scope	7756.73 SF	0.00 SF
	29826.06 SF	7224.56 SF

*THE WORK AREA INCLUDES ALL ITEMS IN THE BID ALTERNATES, AND THE CHART REFLECTS THE HIGHEST LEVEL OF ALTERNATION ACROSS THE AREAS.



1 EGRESS PLAN - BASEMENT LEVEL

1/16" = 1'-0"

Travel Distance Calculation		
Travel Path	Travel Distance	Compliance
Basement - Exit Access Travel Distance 1	114'-0 7/16"	Y
Basement - Longest Common Path of Egress	53'-8 11/16"	Y
Ground Floor - Exit Access Travel Distance 1	105'-11 1/4"	Y
Ground Floor - Exit Access Travel Distance 2	154'-9 1/4"	Y
Ground Floor - Exit Access Travel Distance 3	143'-8 3/8"	Y
Ground Floor - Exit Access Travel Distance 4	138'-0"	Y
Ground Floor - Longest Common Path of Egress	57'-7"	Y

*THE CONFIGURATION AND SPACE ON THE BASEMENT LEVEL REMAIN UNCHANGED, AND THE EGRESS PATHS AND EXITS ARE RETAINED.

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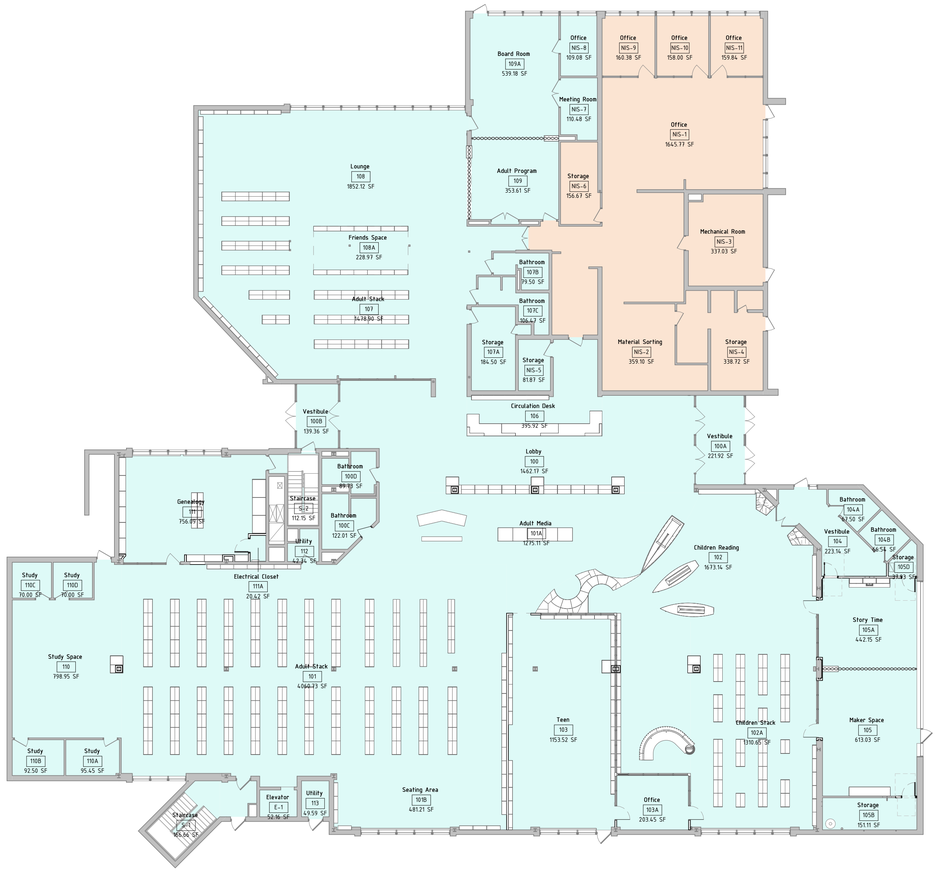
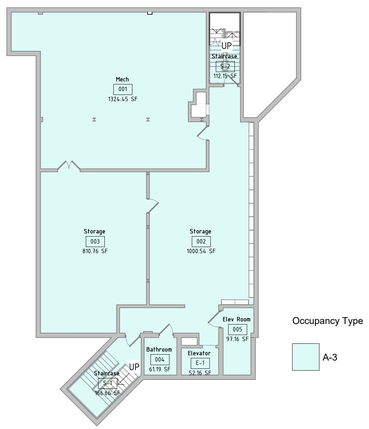
Schedule- Room Occupancy Type					
Number	Name	Area	Occupancy	Occupant Load Factor	Occupant Load
001	Mech	1324.45 SF	A-3	300.00 SF	5
002	Storage	1000.54 SF	A-3	300.00 SF	4
003	Storage	810.76 SF	A-3	300.00 SF	3
005	Elev Room	97.16 SF	A-3	300.00 SF	1
101	Adult Stack	4060.73 SF	A-3	100.00 SF	41
101A	Adult Media	1275.11 SF	A-3	100.00 SF	13
101B	Seating Area	481.21 SF	A-3	50.00 SF	10
102	Children Reading	1673.14 SF	A-3	50.00 SF	34
102A	Children Stack	1310.65 SF	A-3	100.00 SF	14
103	Teen	1153.52 SF	A-3	50.00 SF	24
103A	Office	203.45 SF	A-3	100.00 SF	3
105	Maker Space	613.03 SF	A-3	20.00 SF	31
105A	Story Time	442.15 SF	A-3	20.00 SF	23
105B	Storage	151.11 SF	A-3	300.00 SF	1
105D	Storage	37.93 SF	A-3	300.00 SF	1
106	Circulation Desk	395.92 SF	A-3	100.00 SF	4
107	Adult Stack	1478.90 SF	A-3	100.00 SF	15
107A	Storage	184.50 SF	A-3	300.00 SF	1
108	Lounge	1852.12 SF	A-3	50.00 SF	38
108A	Friends Space	228.97 SF	A-3	100.00 SF	3
109	Adult Program	353.61 SF	A-3	15.00 SF	24
109A	Board Room	539.18 SF	A-3	15.00 SF	36
110	Study Space	798.95 SF	A-3	50.00 SF	16
110A	Study	95.45 SF	A-3	50.00 SF	2
110B	Study	92.50 SF	A-3	50.00 SF	2
110C	Study	70.00 SF	A-3	50.00 SF	2
110D	Study	70.00 SF	A-3	50.00 SF	2
111	Genealogy	756.09 SF	A-3	50.00 SF	16
111A	Electrical Closet	20.42 SF	A-3	300.00 SF	1
112	Utility	42.34 SF	A-3	300.00 SF	1
113	Utility	49.59 SF	A-3	300.00 SF	1
NIS-5	Storage	81.87 SF	A-3	300.00 SF	1
NIS-7	Meeting Room	110.48 SF	A-3	15.00 SF	8
NIS-8	Office	109.08 SF	A-3	100.00 SF	2
A-3		21964.90 SF			383
NIS-1	Office	1645.77 SF	B	100.00 SF	17
NIS-2	Material Sorting	359.10 SF	B	100.00 SF	4
NIS-3	Mechanical Room	337.03 SF	B	300.00 SF	2
NIS-4	Storage	338.72 SF	B	300.00 SF	2
NIS-6	Storage	156.67 SF	B	300.00 SF	1
NIS-9	Office	160.38 SF	B	100.00 SF	2
NIS-10	Office	158.00 SF	B	100.00 SF	2
NIS-11	Office	159.84 SF	B	100.00 SF	2
B		3315.51 SF			32
Grand total		25280.41 SF			415



2 OCCUPANCY PLAN - MAIN LEVEL
1/16" = 1'-0"



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1/16" = 1'-0"

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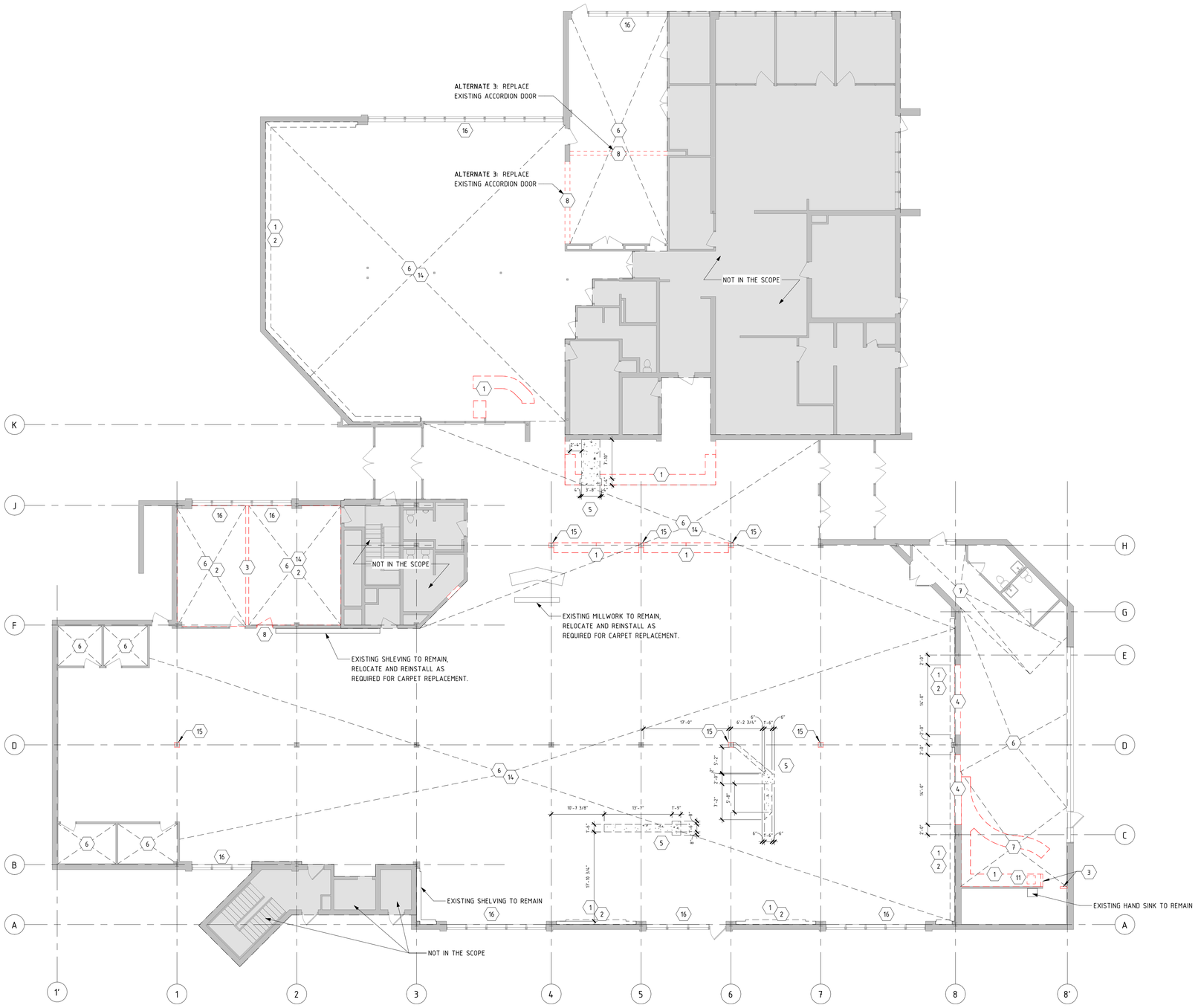

2 DEMOLITION PLAN - MAIN LEVEL
3/32" = 1'-0"

GENERAL NOTES

1. ALL DIMENSIONS NOT LABELED WITH CL ARE TO BE MEASURED TO THE FINISHED FACE (FF) OF THE DRYWALL.
2. PATCH AND/OR REPAIR ALL EXISTING FLOOR, WALL AND OR CEILING. FINISHES AS REQUIRED TO MATCH EXISTING OR TO ACCEPT NEW. FINISHES AS SCHEDULED AT ALL AREAS AFFECTED BY THE DEMOLITION WORK.
3. REFER TO MECHANICAL AND ELECTRICAL DRAWINGS FOR RELATED AND ADDITIONAL DEMOLITION AND PATCHING WORK.
4. INFILL ALL OPENINGS IN EXISTING WALLS ABOVE CEILINGS THAT ARE THE RESULT OF MECHANICAL OR ELECTRICAL DEMOLITION. OPENINGS IN MASONRY WALLS SHALL BE FILLED WITH MASONRY OF SIMILAR TYPES AND THICKNESS AS EXISTING. OPENINGS IN OTHER TYPES OF WALL CONSTRUCTION SHALL MATCH EXISTING MATERIALS, FINISHES AND WALL THICKNESS. REFER TO MECHANICAL AND ELECTRICAL DRAWINGS FOR SCOPE OF WORK.
5. COORDINATE SIZE AND LOCATION OF ALL ACCESS DOORS WITH TRADES REQUIRING SAME. QUANTITIES SHOWN DO NOT NECESSARILY REPRESENT ALL ACCESS DOORS REQUIRED FOR ACCESSIBILITY.
6. WHERE REMOVAL OF CASEWORK, MILLWORK, CHALKBOARD, TACKBOARD, OR EQUIPMENT, IS INDICATED. FILL HOLES AND PATCH EXISTING WALLS, BASES AND CEILINGS WHICH ARE TO REMAIN EXPOSED.
7. CONTRACTOR SHALL COORDINATE WITH OWNER AND/OR OWNER'S CONSULTANT REGARDING REMOVAL AND RELOCATION OF EXISTING BOOKSHELF SYSTEM TO ALIGN WITH NEW SHELVING LAYOUT AND OWNER REQUIREMENTS (REFER TO EQ1.00).
8. CONTRACTOR SHALL COORDINATE WITH OWNER REGARDING EXISTING FURNITURE REMOVAL AND NEW FURNITURE INSTALLATION, AND SHALL CLEAR THE AREA AS REQUIRED FOR CARPETING AND OTHER WORK.

DEMOLITION KEYNOTES

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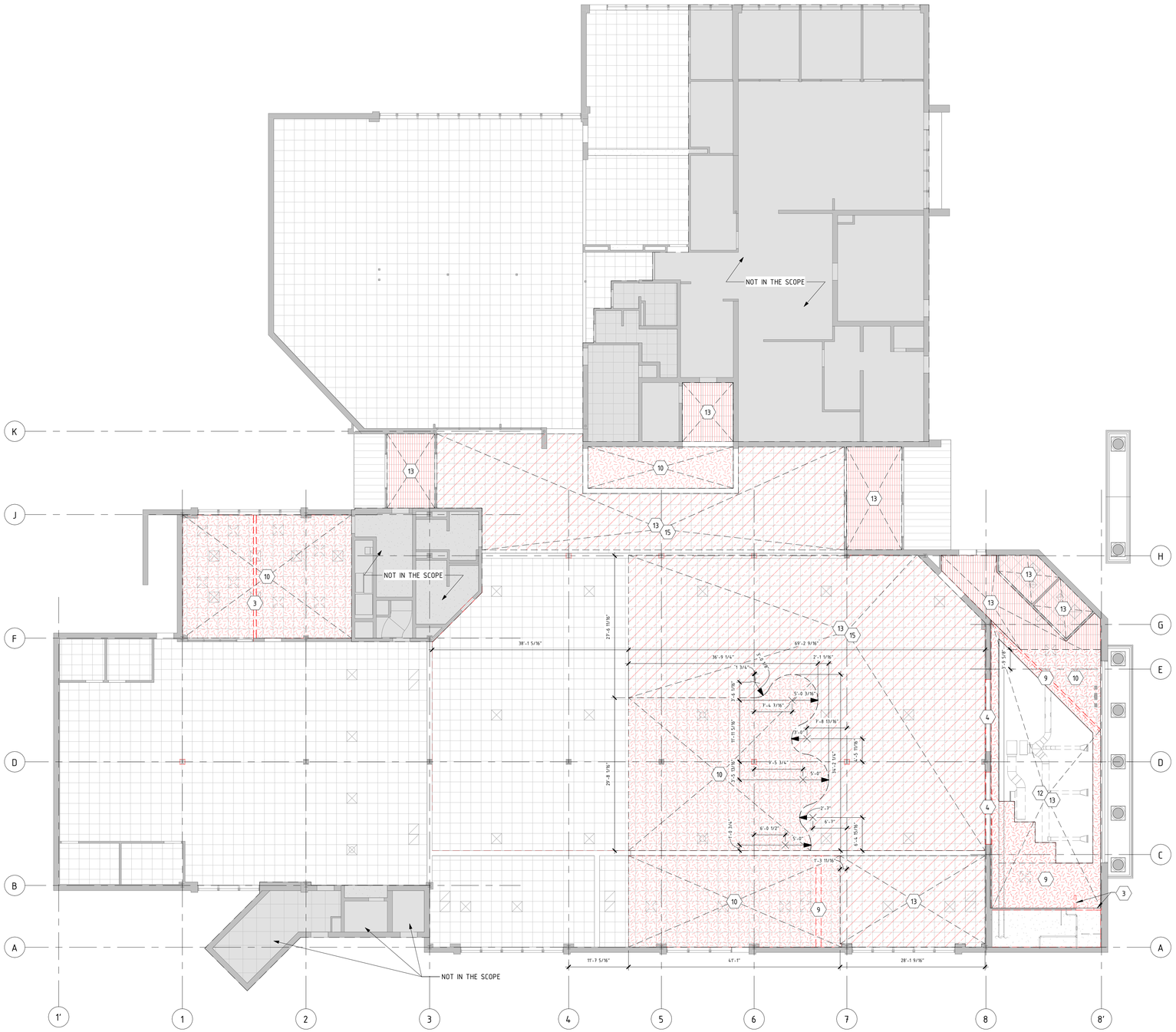

1 DEMOLITION CEILING PLAN - MAIN LEVEL
3/32" = 1'-0"

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CEILING SCOPE LEGEND

1. REFER TO THE ELECTRICAL FOR LIGHTING AND ELECTRICAL SCOPE
2. REFER TO THE FLOOR PLAN FOR OTEHR SCOPES.

- NOT IN SCOPE
- NOT IN BASE BID
- REMOVE EXISTING CEILING AND LIGHTING FIXTURES AS REQUIRED FOR INSTALLATION OF NEW CEILING AND LIGHTING PER CONSTRUCTION DOCUMENTS.
- REFER TO THE ELECTRICAL LIGHTING PLAN. KEEP THE EXISTING CEILING, REMOVE ACT TILES AS NEEDED FOR THE NEW LIGHTING PATTERN. PATCH AND REPAIR AS NECESSARY TO MATCH EXISTING CEILING TILES.
- REFER TO THE ELECTRICAL LIGHTING PLAN. REPLACE LIGHTING FIXTURES IN PLACE.

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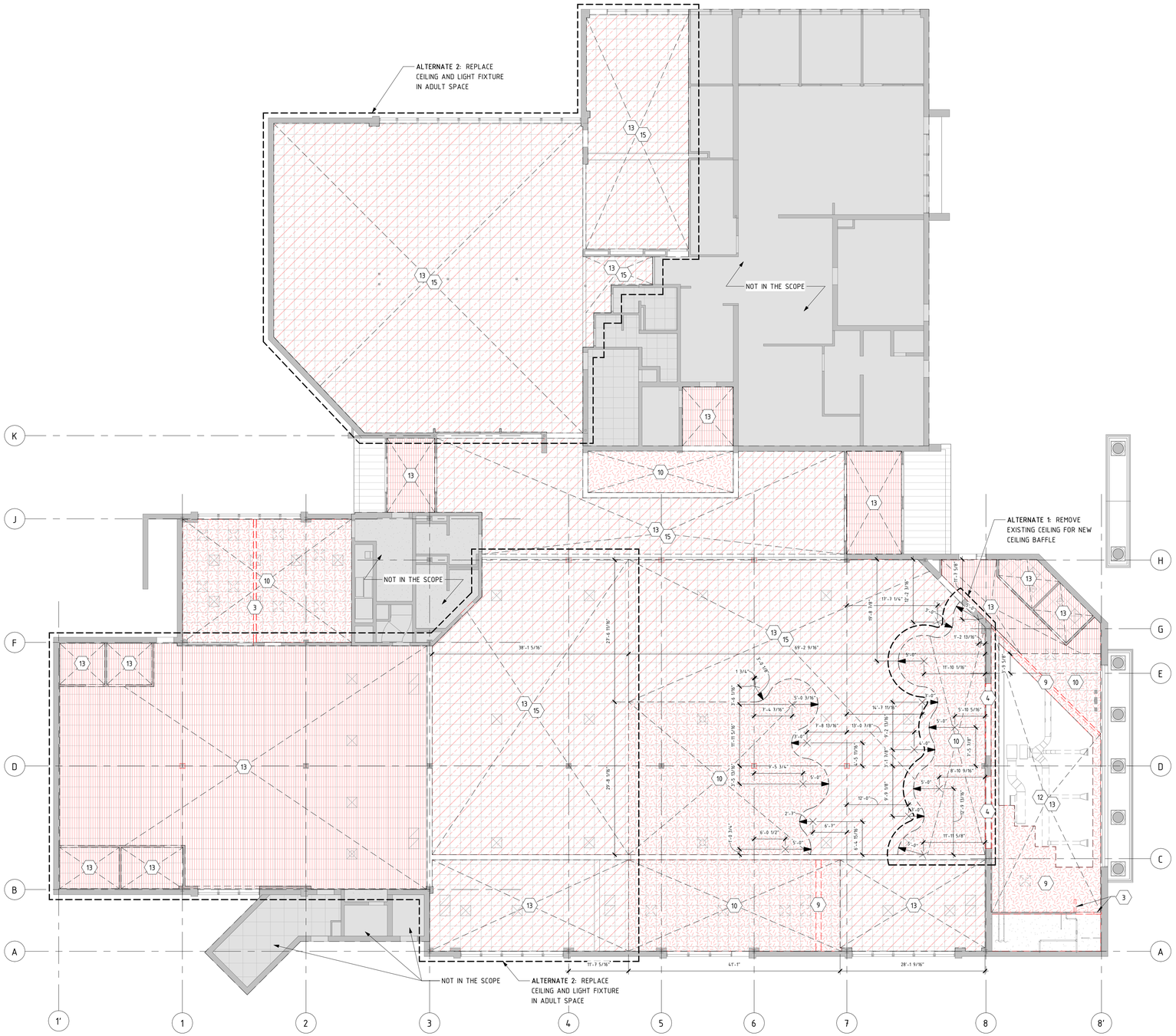

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- NOT IN BASE BID
- REMOVE EXISTING CEILING AND LIGHTING FIXTURES AS REQUIRED FOR INSTALLATION OF NEW CEILING AND LIGHTING PER CONSTRUCTION DOCUMENTS.
- REFER TO THE ELECTRICAL LIGHTING PLAN. KEEP THE EXISTING CEILING, REMOVE ACT TILES AS NEEDED FOR THE NEW LIGHTING PATTERN. PATCH AND REPAIR AS NECESSARY TO MATCH EXISTING CEILING TILES.
- REFER TO THE ELECTRICAL LIGHTING PLAN. REPLACE LIGHTING FIXTURES IN PLACE.

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Project Name
SCSPL

STATE OF MICHIGAN
MICHAEL CRAIG BORUM
ARCHITECT
No. 1301046115
LICENSED ARCHITECT

Drawing Name
Demolition Ceiling Plans - Alternate

Drawn By
YZ

Checked By
CB

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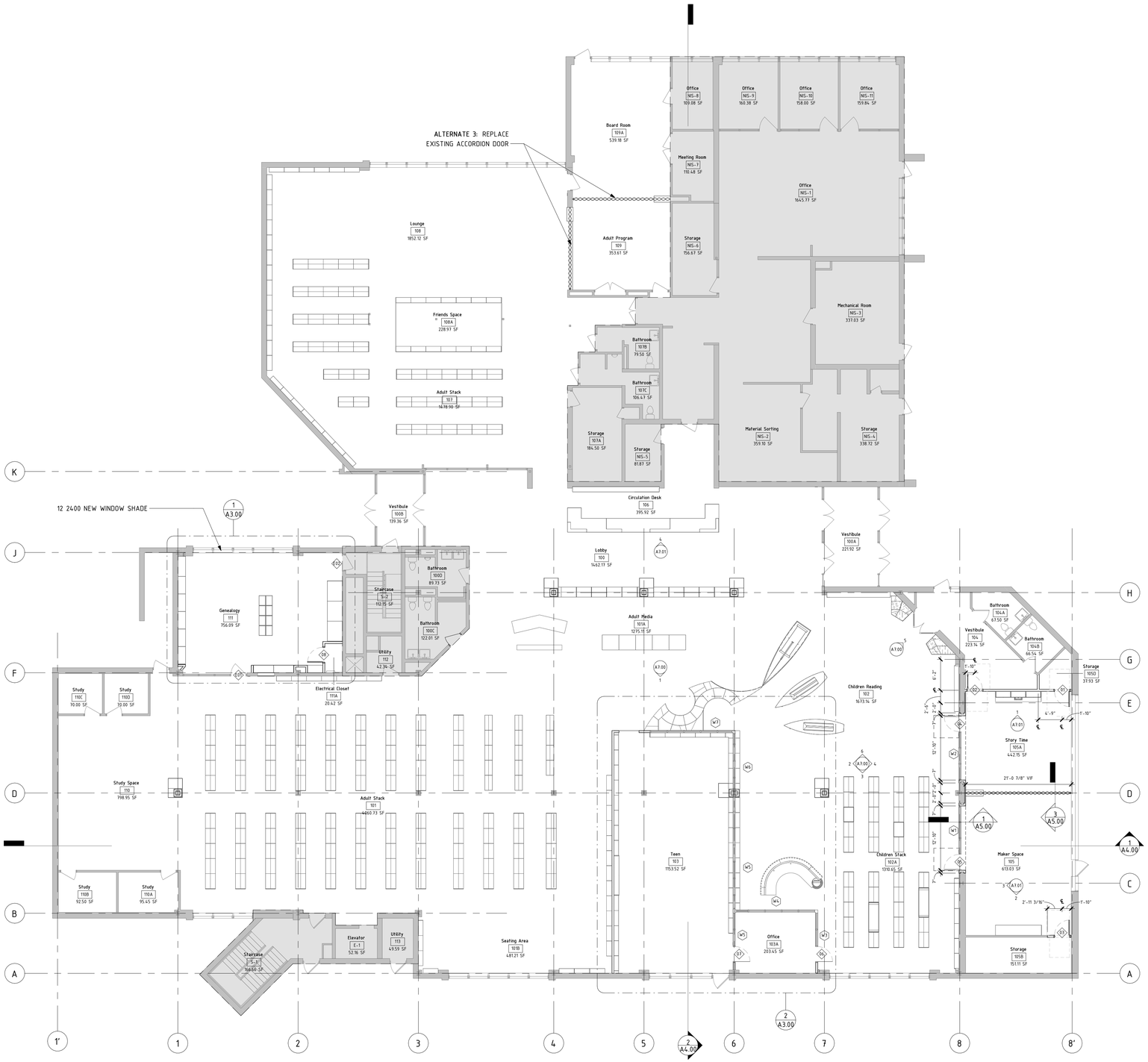

1 FLOOR PLAN - MAIN LEVEL

3/32" = 1'-0"

GENERAL NOTES

1. ALL DIMENSIONS NOT LABELED WITH CL ARE TO BE MEASURED TO THE FINISHED FACE (FF) OF THE DRYWALL.
2. PATCH AND/OR REPAIR ALL EXISTING FLOOR, WALL AND OR CEILING. FINISHES AS REQUIRED TO MATCH EXISTING OR TO ACCEPT NEW. FINISHES AS SCHEDULED AT ALL AREAS AFFECTED BY THE DEMOLITION WORK.
3. REFER TO MECHANICAL AND ELECTRICAL DRAWINGS FOR RELATED AND ADDITIONAL DEMOLITION AND PATCHING WORK.
4. INFILL ALL OPENINGS IN EXISTING WALLS ABOVE CEILINGS THAT ARE THE RESULT OF MECHANICAL OR ELECTRICAL DEMOLITION. OPENINGS IN MASONRY WALLS SHALL BE FILLED WITH MASONRY OF SIMILAR TYPES AND THICKNESS AS EXISTING. OPENINGS IN OTHER TYPES OF WALL CONSTRUCTION SHALL MATCH EXISTING MATERIALS, FINISHES AND WALL THICKNESS. REFER TO MECHANICAL AND ELECTRICAL DRAWINGS FOR SCOPE OF WORK.
5. COORDINATE SIZE AND LOCATION OF ALL ACCESS DOORS WITH TRADES REQUIRING SAME. QUANTITIES SHOWN DO NOT NECESSARILY REPRESENT ALL ACCESS DOORS REQUIRED FOR ACCESSIBILITY.
6. WHERE REMOVAL OF CASEWORK, MILLWORK, CHALKBOARD, TACKBOARD, OR EQUIPMENT, IS INDICATED. FILL HOLES AND PATCH EXISTING WALLS, BASES AND CEILINGS WHICH ARE TO REMAIN EXPOSED.
7. INSTALL CONTROL JOINTS IN GYPSUM BOARD AND METAL STUD-FRAMED PARTITIONS, WALLS, CEILINGS, BULKHEADS, FASCIAE AND SOFFITS IN COMPLIANCE WITH SPECIFICATIONS, AND WITH GENERAL REQUIREMENTS OF ASTM C840. PRIOR TO COMMENCEMENT OF FRAMING INSTALLATION SUBMIT COORDINATION DRAWINGS INDICATING PROPOSED LOCATIONS OF ALL CONTROL JOINTS, AS SPECIFIED.
8. CONTRACTOR SHALL COORDINATE WITH THE OWNER FOR THE MODIFICATION, RELOCATION, AND REINSTALLATION OF THE EXISTING BOOKSHELF SYSTEM BASED ON THE NEW SHELVING LAYOUT AND THE OWNER'S REQUIREMENTS (REFER TO EQ1.00).

PATCHING NOTES

1. REFER TO DEMOLITION PLAN OR ADDITIONAL PATCHING NOTES.
2. FOR ALL FLOORING SURFACES RECIEVING NE FLOOR FINISHES, PREPARE SUBSTRATE BY PROVIDING LEVELS AND PATCHING COMPOUNDS RECOMMENDED BY FINISH FLOORING MANUFACTURERS, CONTRACTOR'S BID PROPOSAL SHALL ASSUME THAT ALL AREAS, INICATED TO RECIEVE NEW FINISHES, WILL REQUIRE FLOOR PREPARATION.
3. PATCH AN REPAIR ALL FLOOR AND WALL SURFACES LEFT DAMAGED OR INCOMPLETE FROM REMOVAL OF EXISTING PARTITIONS, MILLWORK, CASEWORK, CHALKBOARDS, TACKBOARDS, DISPLAY CASES, OR OTHER FIXED EQUIPMENT WITH MATERIAL TO MATCH EXISTING, AS ACCEPTABLE TO THE ARCHITECT.
4. MATCH EXISTING MASONRY COURSING ADJACENT IN EAC AREA AND TOOTH NEW WORK INTO EXISTING, UNLESS OTHERWISE INDICATED.
5. AT EXISTING FLOOR FINISHES TO REAMAIN, THAT BECOME SUBSTRATES FOR NEW FLOOR FINISHES, PATCH AND FILL EXISTING AS REQUIRED TO PREPARE FOR NEW FLOOR FINISH UNTIL ACCEPTABLE TO NEW FLOOR FINISH CONTRACTOR.
6. TOOTH-IN MASONRY INT EXISTING, U.O.N., INCLUDING JAMBS OF DOORS AND OTHER OPENINGS.

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Project Name

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STATE OF MICHIGAN
MICHAEL CRAIG BORUM
ARCHITECT
No. 1301046115
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Drawing Name

New Floor Plans

Drawn By

YZ

Checked By

CB

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Project No.

P23005

Sheet Number

A2.00

CEILING KEYNOTES

1. ALTERNATE SCOPE AREA: NOT IN SCOPE OF BASE BID, REFER TO A2.11 FOR ALTERNATE, EXISTING CEILING AND EXISTING LIGHTING FIXTURES TO REMAIN IN BASE BID
2. REPLACE ACT AS NEEDED AND PROVIDE NEW LIGHT FIXTURE, RELOCATE ANY CONFLICTING CEILING-MOUNTED ITEMS (E.G., SUPPLY/RETURN GRILLES, FIRE ALARM DEVICES) TO ADJACENT LOCATIONS AS NEEDED TO ACCOMMODATE NEW LIGHTING LAYOUT.
3. NEW ACT CEILING WITH NEW LIGHT FIXTURE
4. REPLACE LIGHT FIXTURE IN PLACE
5. ACOUSTIC CEILING BAFFLES
6. EXPOSED STRUCTURE, PAINTED AS INDICATED
7. PAINTED NEW GYP CEILING WITH NEW LIGHT FIXTURE

GENERAL NOTES

1. EXISTING WALL SHOWN AS SOLID GREY HATCH
2. FOR ALL ACOUSTIC CEILING TILES IN WORK AREA: REAREPLACE DAMAGED, STAINED, OR DETERIORATED PANELS TO MAINTAIN UNIFORM APPEARANCE.

FIXTURE LEGEND

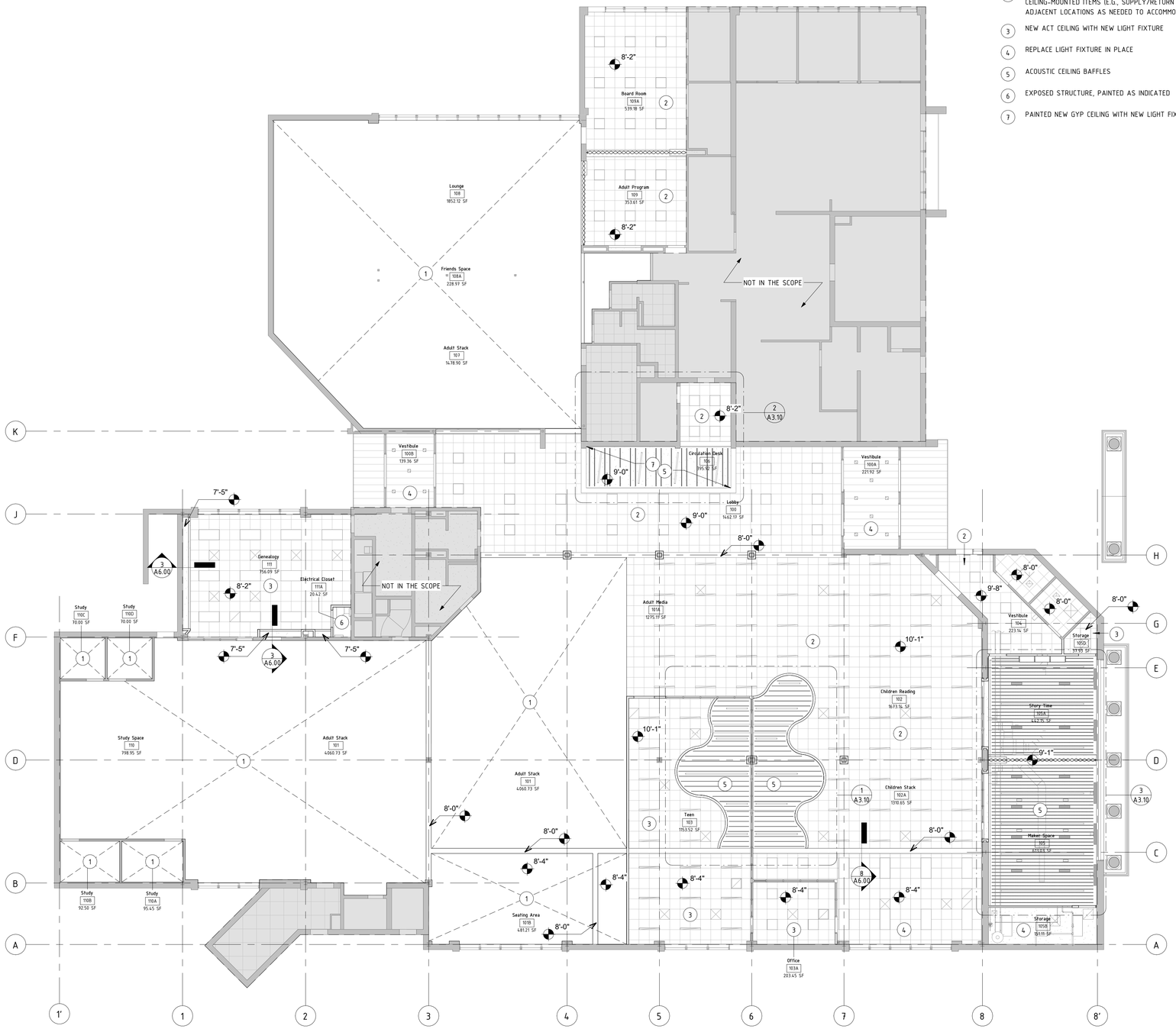
- RECESSED LED TROFFER (2'x4')
- RECESSED LED TROFFER (2'x2')
- RECESSED LED LINEAR
- PENDANT LED LINEAR
- SURFACE MOUNTED LED (4Φ, 3Φ, 2Φ)

FIRE/LIFE SAFETY FIXTURES: SEE ELECTRICAL, FIRE PROTECTION, PLUMBING, AND TECHNOLOGY DRAWINGS & SPECIFICATIONS

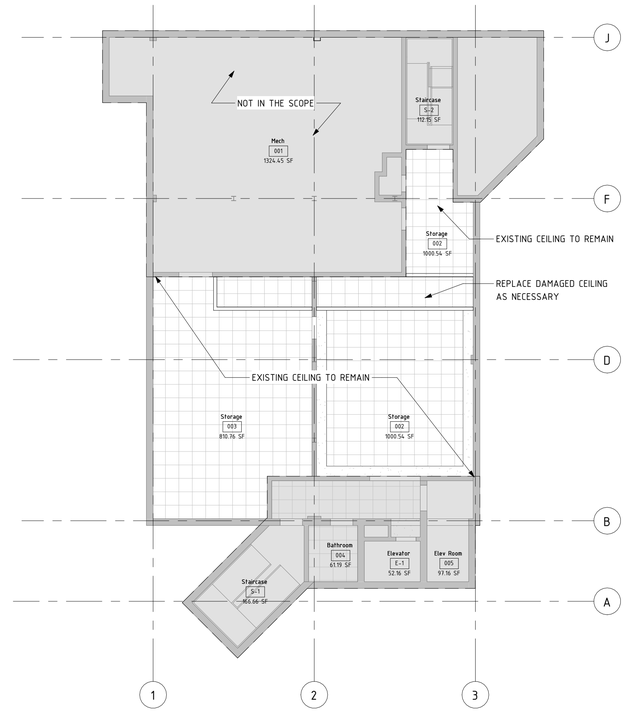
MECHANICAL EQUIPMENT/FIXTURES - SEE MECHANICAL DRAWINGS & SPECIFICATIONS

CEILING KEY

- 24"x48" SUSPENDED LAY-IN ACOUSTICAL CEILING
- 24"x24" SUSPENDED LAY-IN ACOUSTICAL CEILING
- GYPSUM BOARD ABOVE BAFFLES (PAINTED)
- EXPOSED OR EXISTING CONSTRUCTION TO REMAIN (PAINTED U.O.N.)
- AREAS NOT SCOPE



2 REFLECTED CEILING PLAN - MAIN LEVEL
3/32" = 1'-0"



1 REFLECTED CEILING PLAN - BASEMENT LEVEL
3/32" = 1'-0"

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Drawing Name
Reflected Ceiling Plans

Drawn By
YZ

Checked By
CB

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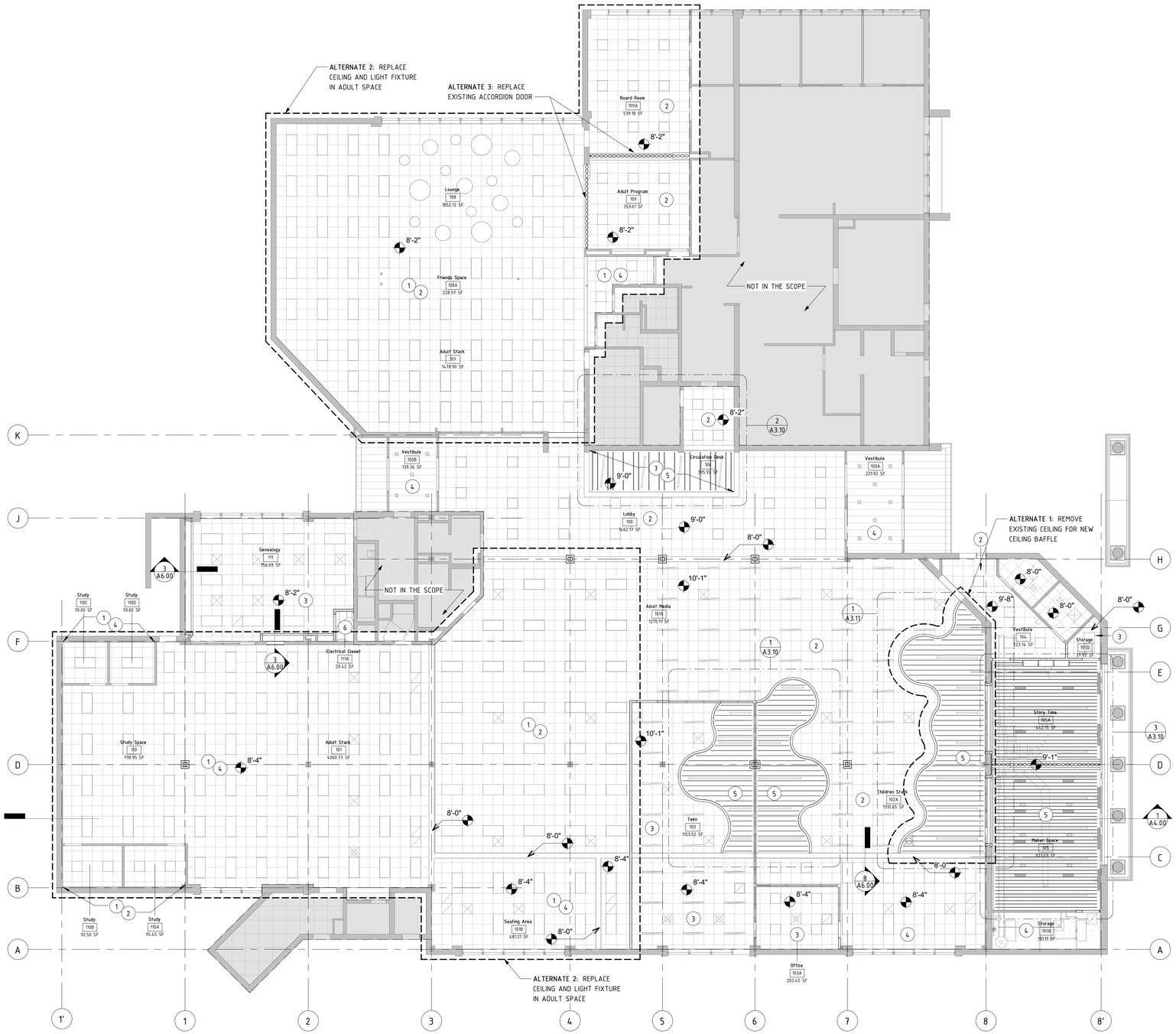

1 REFLECTED CEILING PLAN - MAIN LEVEL - ALTERNATE
3/32" = 1'-0"

GENERAL NOTES

1. EXISTING WALL SHOWN AS SOLID HATCH
2. FOR ALL ACT IN WORK AREA: REAREPLACE DAMAGED, STAINED, OR DETERIORATED PANELS TO MAINTAIN UNIFORM APPEARANCE.

FIXTURE LEGEND

- RECESSED LED TROFFER (2'x4')
- RECESSED LED TROFFER (2'x2')
- RECESSED LED LINEAR
- PENDANT LED LINEAR
- SURFACE MOUNTED LED (4Φ, 3Φ, 2Φ)

FIRE/LIFE SAFETY FIXTURES: SEE ELECTRICAL, FIRE PROTECTION, PLUMBING, AND TECHNOLOGY DRAWINGS & SPECIFICATIONS

MECHANICAL EQUIPMENT/FIXTURES - SEE MECHANICAL DRAWINGS & SPECIFICATIONS

CEILING KEY

- 24"x48" SUSPENDED LAY-IN ACOUSTICAL CEILING
- 24"x24" SUSPENDED LAY-IN ACOUSTICAL CEILING
- GYPSUM BOARD ABOVE BAFFLES (PAINTED)
- EXPOSED OR EXISTING CONSTRUCTION TO REMAIN (PAINTED U.O.N.)
- AREAS NOT SCOPE

CEILING KEYNOTES

1. ALTERNATE SCOPE AREA: NOT IN SCOPE OF BASE BID, REFER TO A2.11 FOR ALTERNATE, EXISTING CEILING AND EXISTING LIGHTING FIXTURES TO REMAIN IN BASE BID
2. REPLACE ACT AS NEEDED AND PROVIDE NEW LIGHT FIXTURE, RELOCATE ANY CONFLICTING CEILING-MOUNTED ITEMS (E.G., SUPPLY/RETURN GRILLES, FIRE ALARM DEVICES) TO ADJACENT LOCATIONS AS NEEDED TO ACCOMMODATE NEW LIGHTING LAYOUT.
3. NEW ACT CEILING WITH NEW LIGHT FIXTURE
4. REPLACE LIGHT FIXTURE IN PLACE
5. ACOUSTIC CEILING BAFFLES
6. EXPOSED STRUCTURE, PAINTED AS INDICATED
7. PAINTED NEW GYP CEILING WITH NEW LIGHT FIXTURE

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Reflected Ceiling Plans - Alternate

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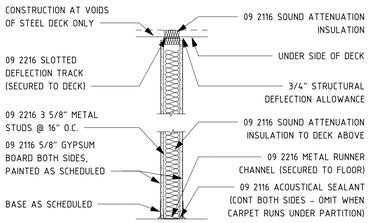
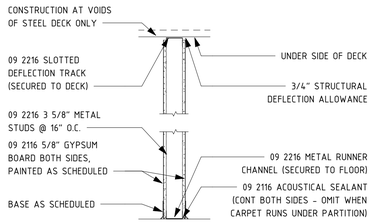
W1: 3 5/8" LIGHT GAUGE FRAMING WITH PAINTED GYPSUM WALLBOARD AND SOUND INSULATION



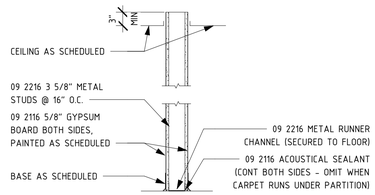
W2: 3 5/8" LIGHT GAUGE FRAMING WITH PAINTED GYPSUM WALLBOARD

TO DECK



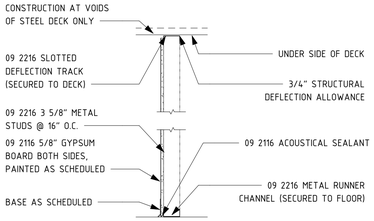
W2: 3 5/8" LIGHT GAUGE FRAMING WITH PAINTED GYPSUM WALLBOARD

AT CEILING HEIGHT



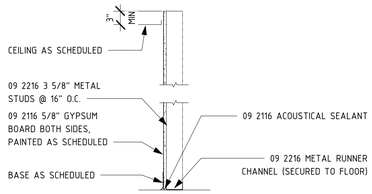
W3: 3 5/8" LIGHT GAUGE FRAMING WITH PAINTED GYPSUM WALLBOARD ONE SIDE

TO DECK



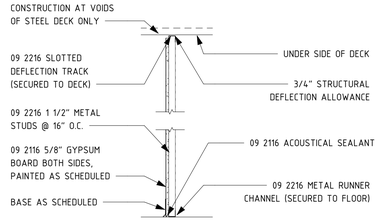
W3: 3 5/8" LIGHT GAUGE FRAMING WITH PAINTED GYPSUM WALLBOARD ONE SIDE

AT CEILING HEIGHT

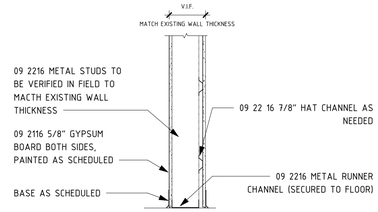


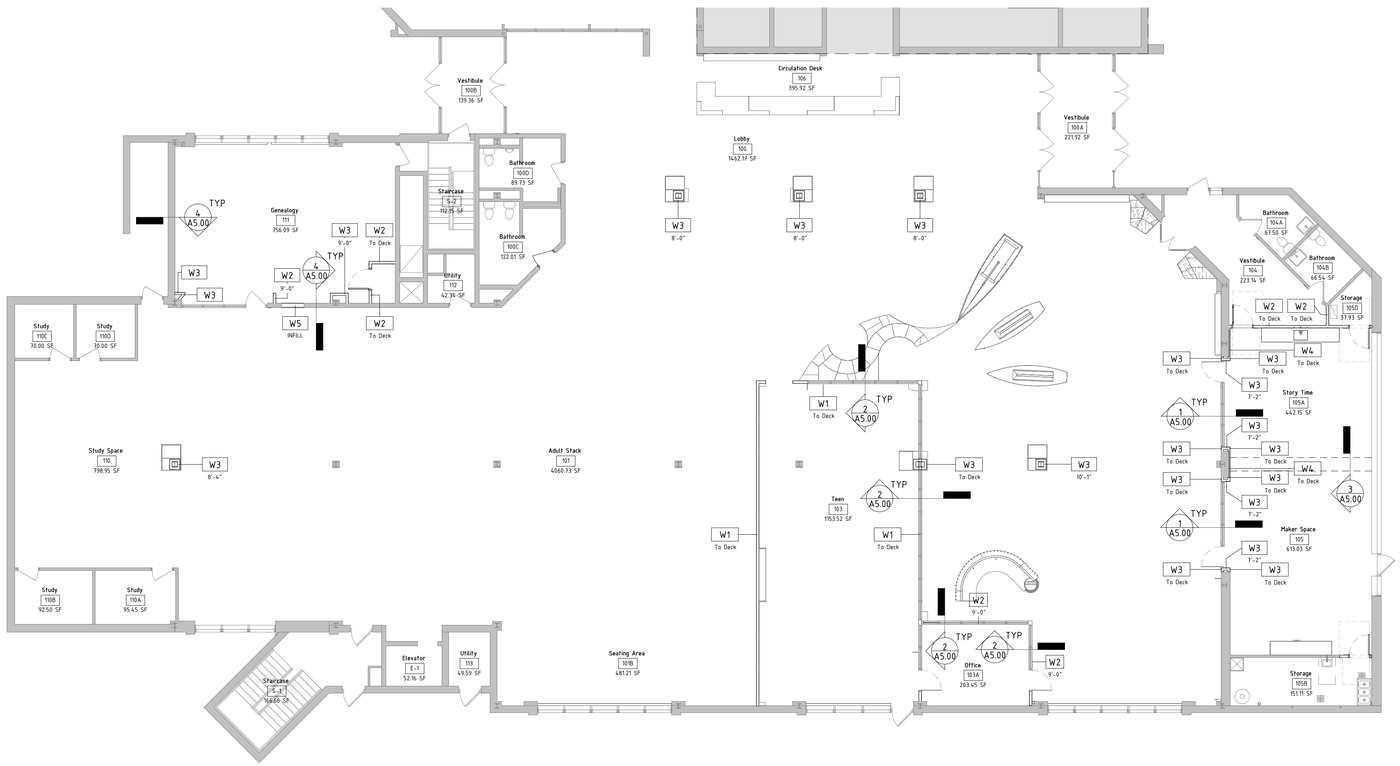
W4: 1 1/2" LIGHT GAUGE FRAMING WITH PAINTED GYPSUM WALLBOARD ONE SIDE

TO DECK



W5: LIGHT GAUGE FRAMING INFILL WITH PAINTED GYPSUM WALLBOARD BOTH SIDES





1 WALL TYPE PLAN - MAIN LEVEL
3/32" = 1'-0"

GENERAL NOTES

1. SOLID GREY HATCH INDICATES EXISTING WALLS.
2. REFER TO WALL SECTIONS FOR COMPLETE WALL ASSEMBLY DETAILS.
3. REFER TO REFLECTED CEILING PLAN AND CEILING SECTION DETAILS FOR CEILING CONDITIONS.
4. REFERENCE SPECIFICATIONS WHERE SOUND INSULATION IS CALLED OUT FOR SPECIFIC RATINGS.
5. REFER TO COMPOSITE LIFE SAFETY PLANS FOR PARTITION FIRE RATINGS.
6. REFER TO ROOM FINISH SCHEDULE FOR WALL FINISHES AND WALL BASE.
7. ALL NON-LOAD BEARING METAL WALL FRAMING SHALL BE BASED ON TOTAL STUD HEIGHT. REFER TO SPECIFICATION FOR ADDITIONAL REQUIREMENTS.
8. STC RATINGS ARE MINIMUM ACOUSTICAL PERFORMANCE REQUIREMENT. SPECIFIC ACOUSTICAL TESTS ARE GIVEN FOR REFERENCE ONLY. SOUND ATTENUATION BLANKET THICKNESS SHALL BE AS FOLLOWS:
   A. 1 1/2 " FOR PARTITIONS WITH 1 5/8 " AND 2 1/2 " STUDS (INCLUDING SHAFTWALLS).
   B. 3" FOR PARTITIONS WITH 3 5/8 ", 4" OR 6" STUDS.
6. DETAILS ARE DIAGRAMMATIC - PRECISE REQUIREMENTS OF TESTS ASSEMBLIES SHALL GOVERN.

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Project Name

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Drawing Name

Wall Type Plan

Drawn By

YZ

Checked By

CB

Issue Date

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Revisions

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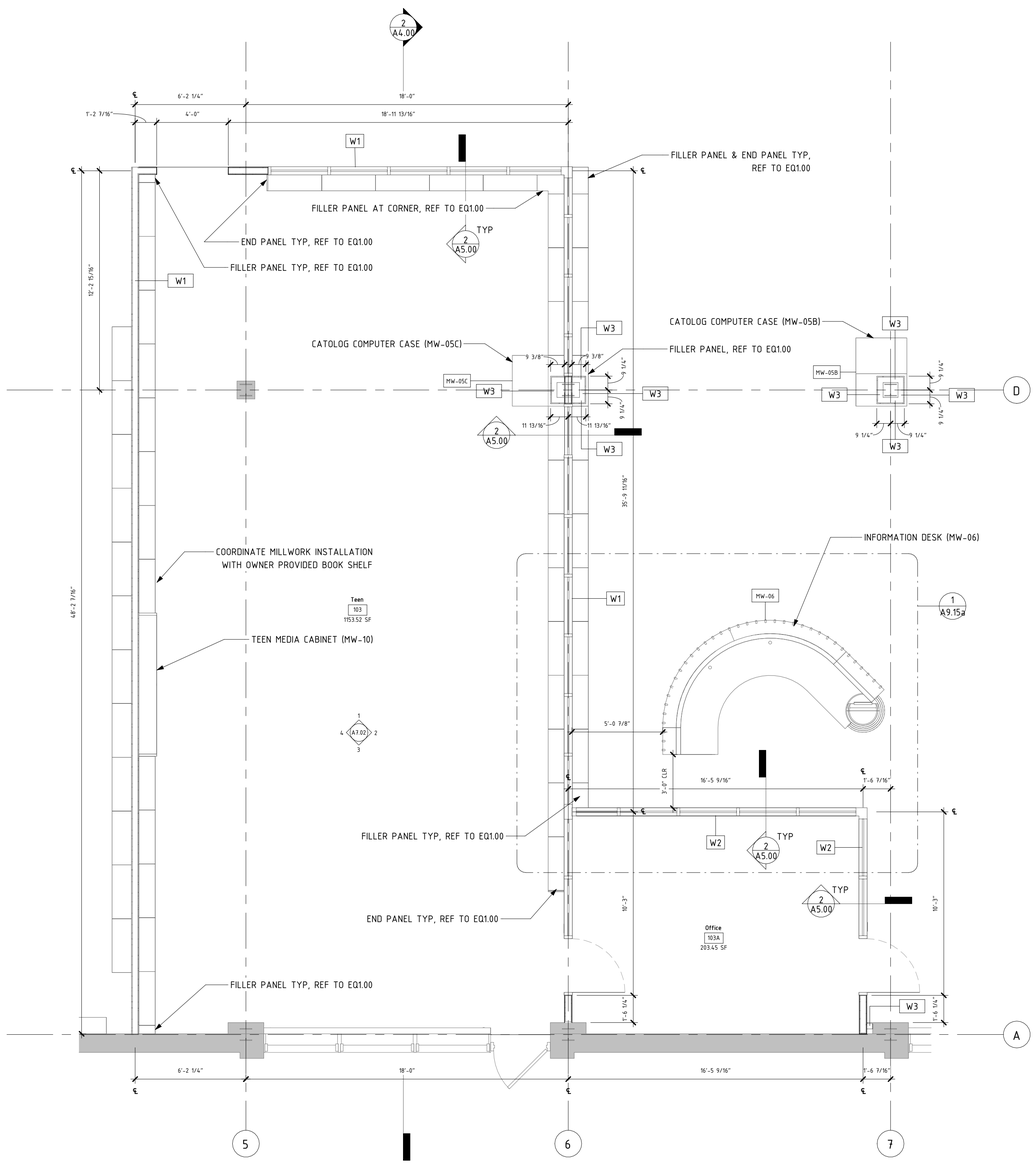
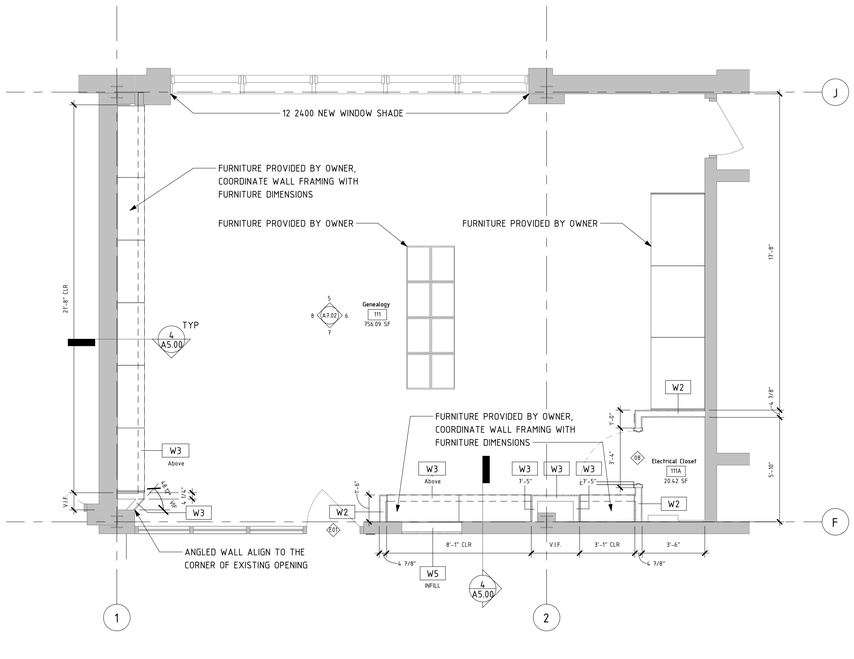


2 | A2.00 ENLARGED FLOOR PLAN
1/4" = 1'-0"



1 | A2.00 ENLARGED FLOOR PLAN
1/4" = 1'-0"

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Drawing Name

Enlarged Plans

Drawn By

YZ

Checked By

CB

Issue Date

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P23005

Sheet Number

A3.00

GENERAL NOTES

1. REFER TO FINISH RCPs FOR PAINT COLOR ON VERTICAL SOFFIT WALL.
2. REFER TO COLOR CODE FOR BAFFLE SYSTEM TYPE AND COLOR. SEE SPECIFICATION 09 8430 – ACOUSTIC CEILING BAFFLES FOR DETAILS.
3. FOR EXPOSED CEILINGS, PROVIDE 09 9100 BLACKOUT PAINT (PT-11) ON EXPOSED DECK, INCLUDING DUCTWORK AND EXPOSED MEP EQUIPMENT.

FIXTURE LEGEND

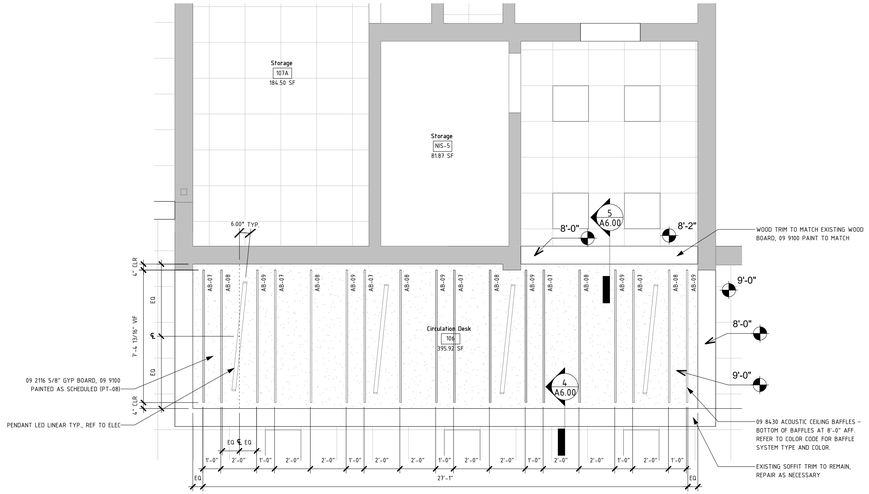
- RECESSED LED TROFFER (2'x4')
- RECESSED LED TROFFER (2'x2')
- RECESSED LED LINEAR
- PENDANT LED LINEAR
- SURFACE MOUNTED LED (4-0, 3'-0, 2'-0)

FIRE/LIFE SAFETY FIXTURES: SEE ELECTRICAL, FIRE PROTECTION, PLUMBING, AND TECHNOLOGY DRAWINGS & SPECIFICATIONS

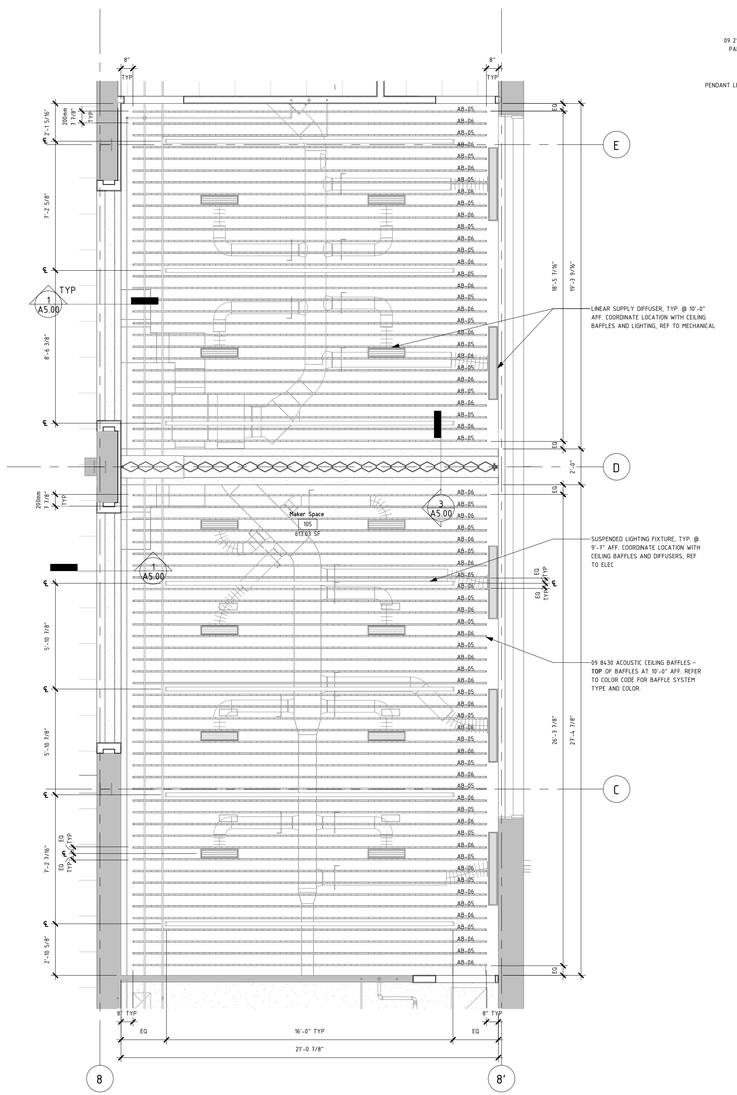
MECHANICAL EQUIPMENT/FIXTURES – SEE MECHANICAL DRAWINGS & SPECIFICATIONS

CEILING KEY

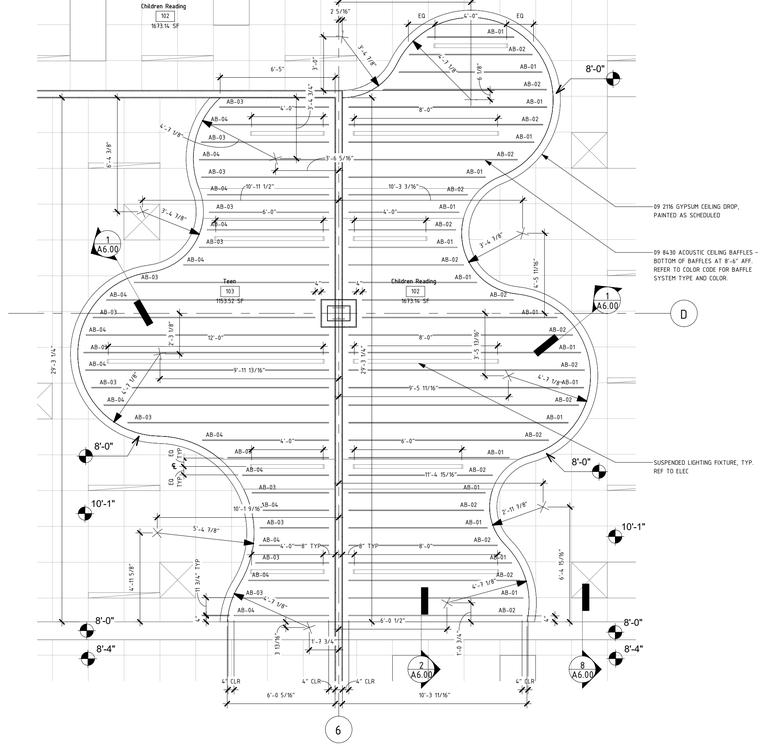
- 24"x48" SUSPENDED LAY-IN ACOUSTICAL CEILING
- 24"x24" SUSPENDED LAY-IN ACOUSTICAL CEILING
- GYPSUM BOARD ABOVE BAFFLES (PAINTED)
- EXPOSED OR EXISTING CONSTRUCTION TO REMAIN (PAINTED U.O.N.)
- AREAS NOT SCOPE



2 | A2.10 ENLARGED REFLECTED CEILING PLAN
1/4" = 1'-0"



3 | A2.10 ENLARGED REFLECTED CEILING PLAN
1/4" = 1'-0"



1 | A2.10 ENLARGED REFLECTED CEILING PLAN
1/4" = 1'-0"

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ARCHITECT
No. 1301046115
LICENSED ARCHITECT

Drawing Name

Enlarged Ceiling Plans

Drawn By

YZ

Checked By

CB

Issue Date

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Project No.

P23005

Sheet Number

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GENERAL NOTES

1. REFER TO FINISH RCPs FOR PAINT COLOR ON VERTICAL SOFFIT WALL.
2. REFER TO COLOR CODE FOR BAFFLE SYSTEM TYPE AND COLOR. SEE SPECIFICATION 09 8430 – ACOUSTIC CEILING BAFFLES FOR DETAILS.
3. FOR EXPOSED CEILINGS, PROVIDE 09 9100 BLACKOUT PAINT (PT-11) ON EXPOSED DECK, INCLUDING DUCTWORK AND EXPOSED MEP EQUIPMENT.

FIXTURE LEGEND

- RECESSED LED TROFFER (2'x4')
- RECESSED LED TROFFER (2'x2')
- RECESSED LED LINEAR
- PENDANT LED LINEAR
- SURFACE MOUNTED LED (4 @, 3 @, 2 @)

FIRE/LIFE SAFETY FIXTURES: SEE ELECTRICAL, FIRE PROTECTION, PLUMBING, AND TECHNOLOGY DRAWINGS & SPECIFICATIONS

MECHANICAL EQUIPMENT/FIXTURES – SEE MECHANICAL DRAWINGS & SPECIFICATIONS

CEILING KEY

- 24"x48" SUSPENDED LAY-IN ACOUSTICAL CEILING
- 24"x24" SUSPENDED LAY-IN ACOUSTICAL CEILING
- GYPSUM BOARD ABOVE BAFFLES (PAINTED)
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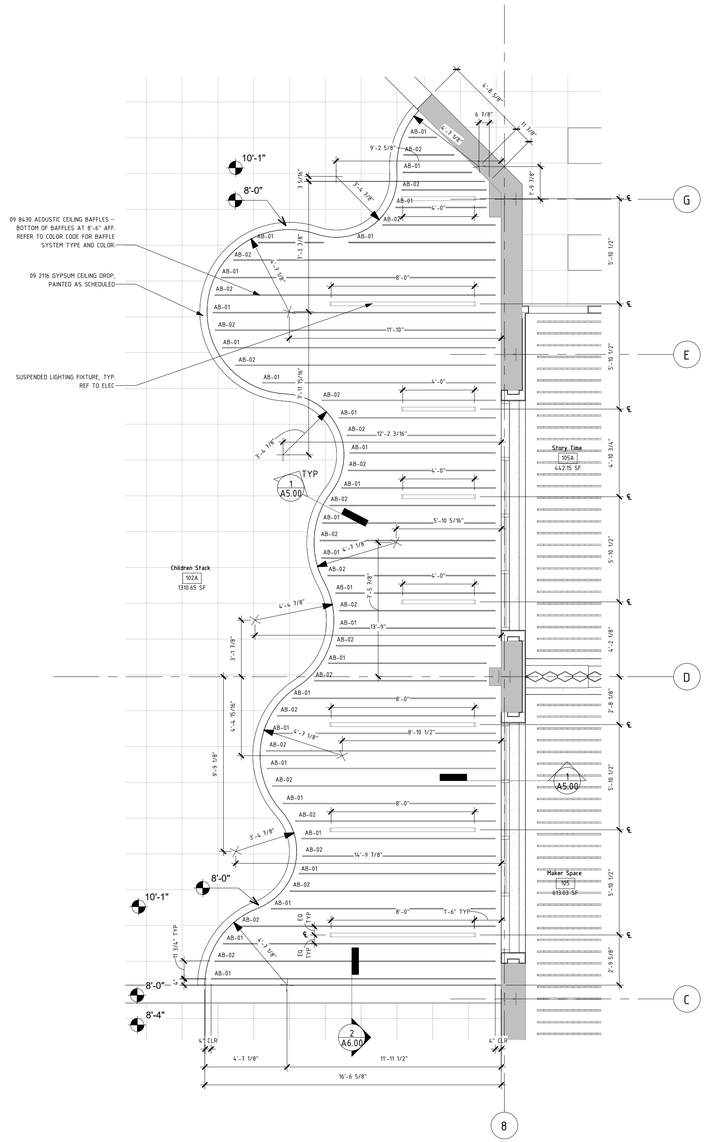
- AREAS NOT SCOPE



1 A2.11 ENLARGED REFLECTED CEILING PLAN – ALTERNATE
1/4" = 1'-0"

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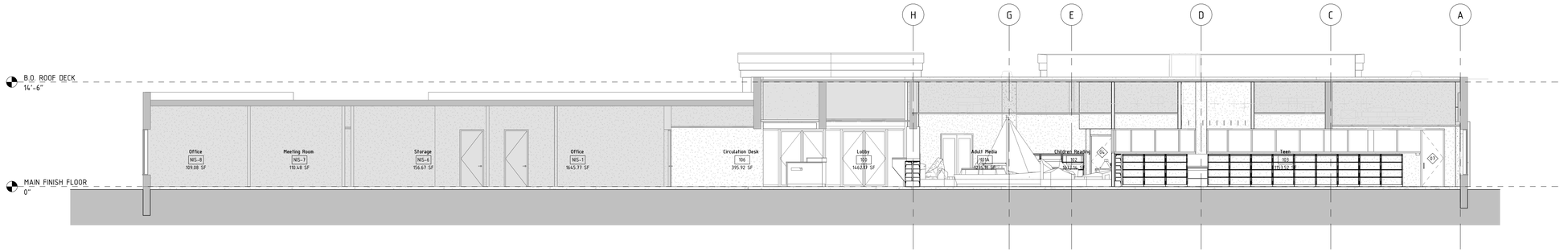
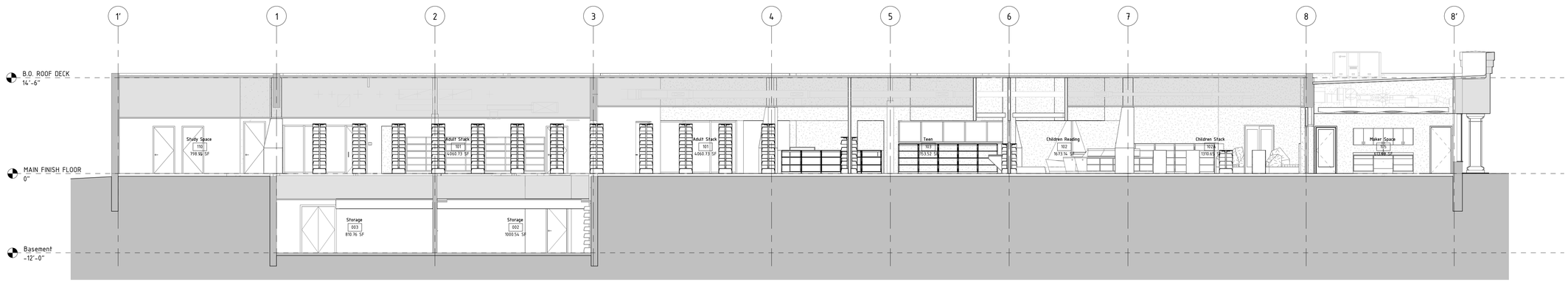


2 | BUILDING SECTION
A2.00 | 1/8" = 1'-0"



1 | BUILDING SECTION
A2.00 | 1/8" = 1'-0"

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ARCHITECT
No. 1301046115
LICENSED ARCHITECT

Drawing Name
Building Sections

Drawn By
YZ

Checked By
CB

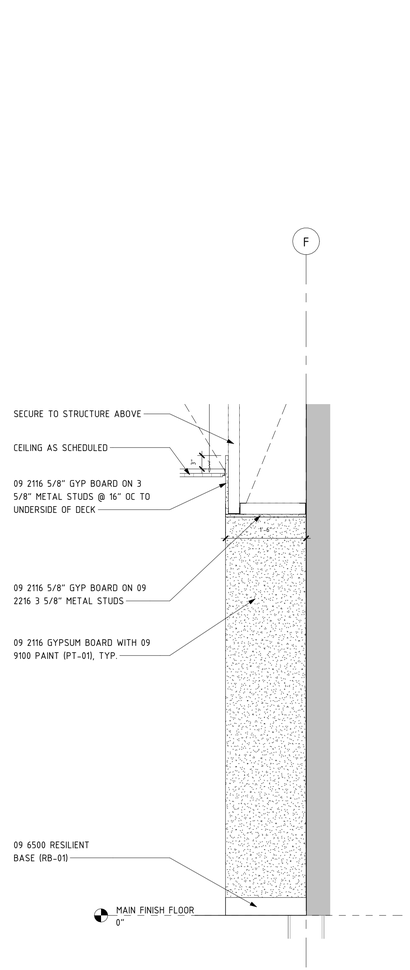
Issue Date
05/16/2025 Permit& Bid Set

Revisions

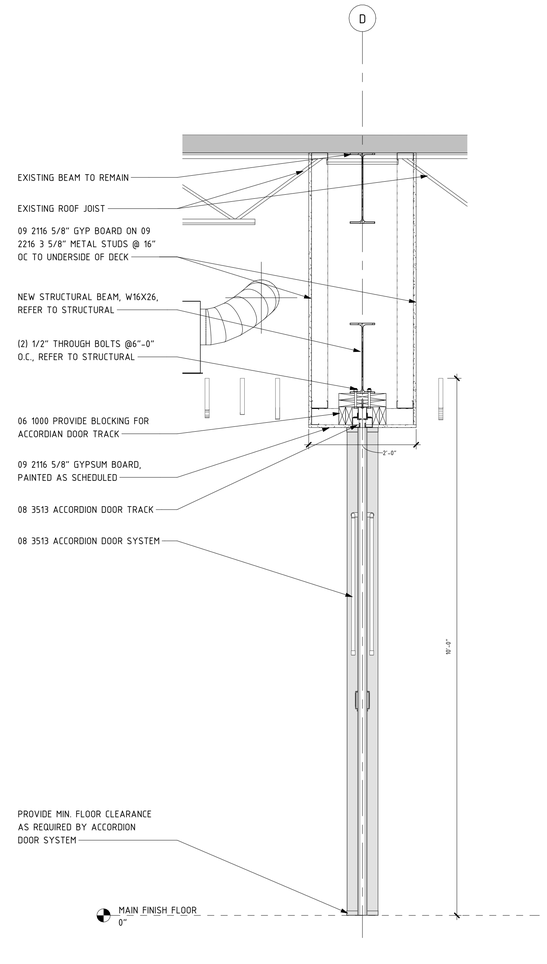
Issued for	Date

Project No.
P23005

Sheet Number
A4.00



4 | WALL SECTION
A2.20 | 3/4" = 1'-0"



3 | WALL SECTION
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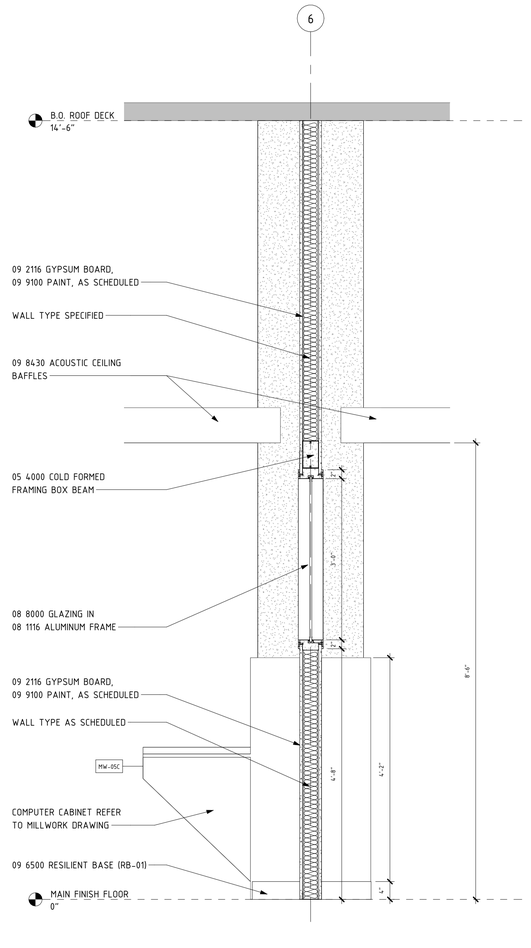

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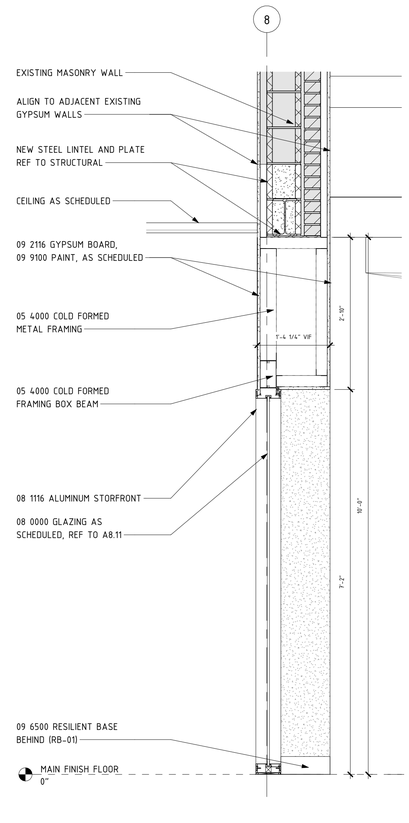
A2.20 | 3/4" = 1'-0"



1 | WALL SECTION
A2.00 | 3/4" = 1'-0"

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USA

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734 827 2238
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Project Name

SCSPL

STATE OF MICHIGAN
MICHAEL CRAIG BORUM
ARCHITECT
No. 1301046115
LICENSED ARCHITECT

Drawing Name

Wall Sections

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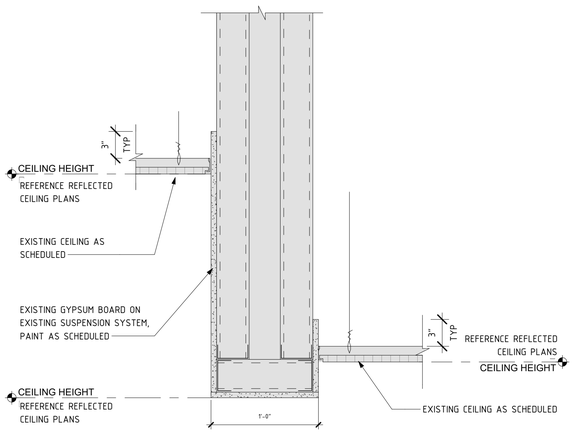
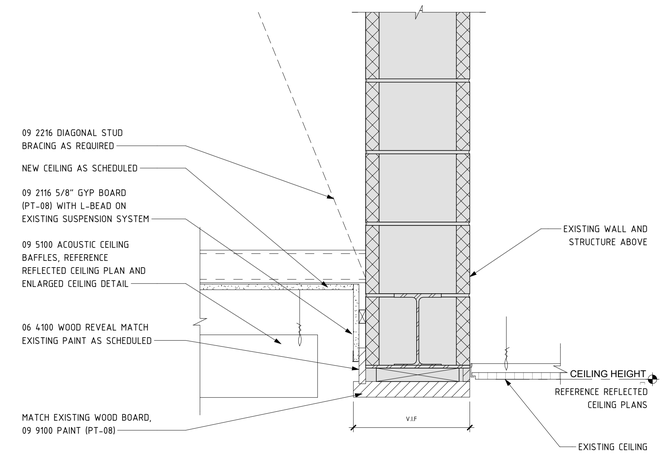
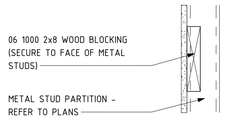
A5.00



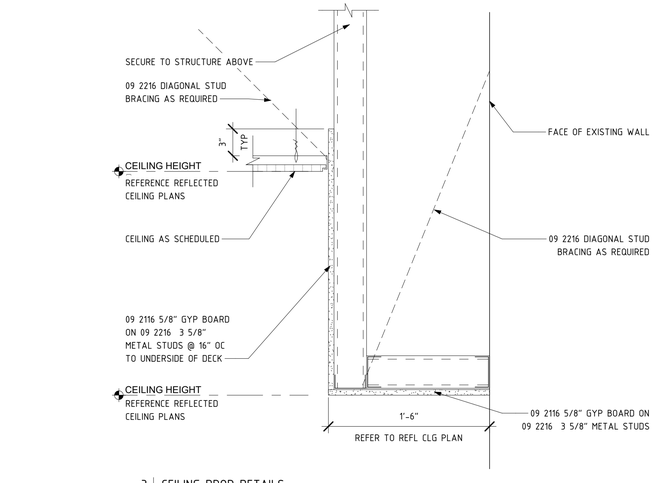
8 | CEILING DROP DETAIL (REFERENCE ONLY)
A2.10 | 1 1/2" = 1'-0"



5 | CEILING DROP DETAILS
A3.10 | 1 1/2" = 1'-0"



7 | TYP REINFORCEMENT
1 1/2" = 1'-0"



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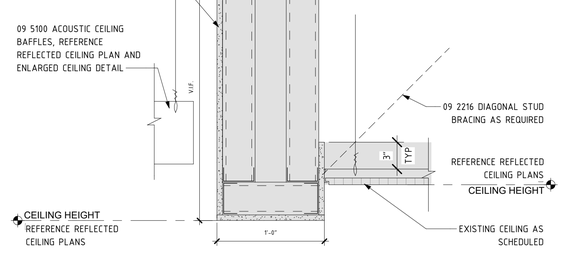

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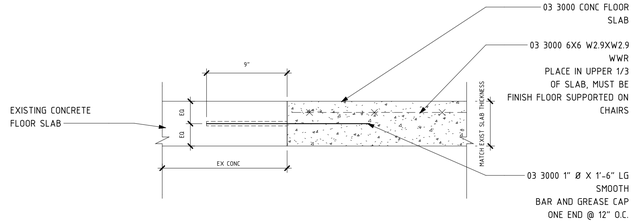
A3.10 | 1 1/2" = 1'-0"



6 | CONCRETE FLOOR SLAB INFILL
1 1/2" = 1'-0"

3 | CEILING DROP DETAILS
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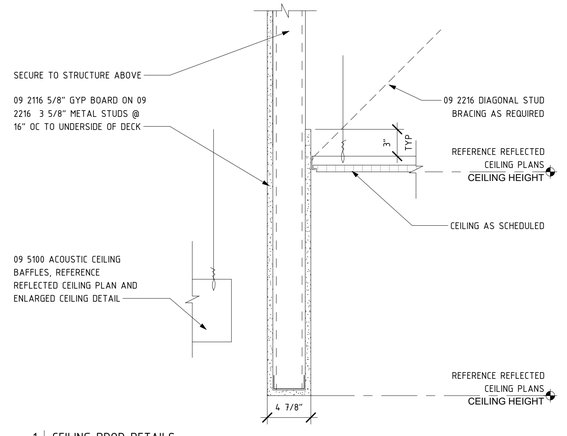

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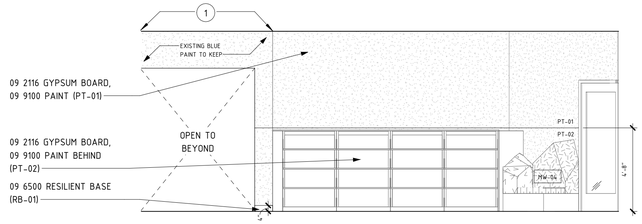
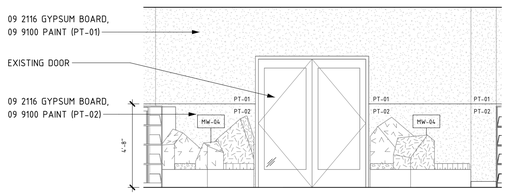
P23005

Sheet Number
A6.00



6 INTERIOR ELEVATION
A2.00 1/4" = 1'-0"



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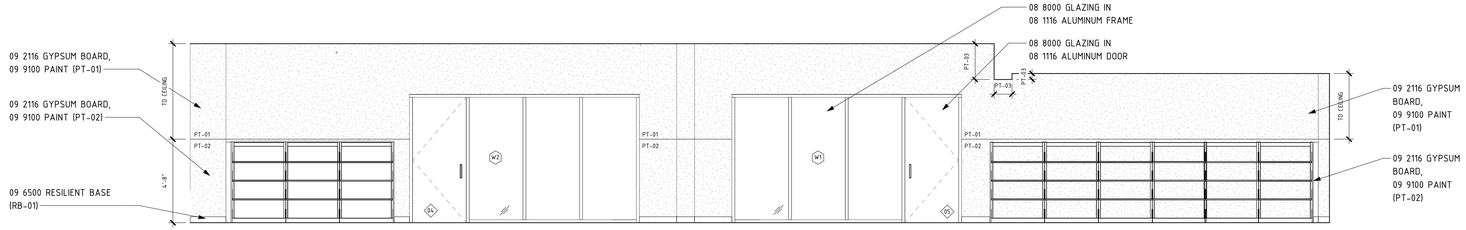

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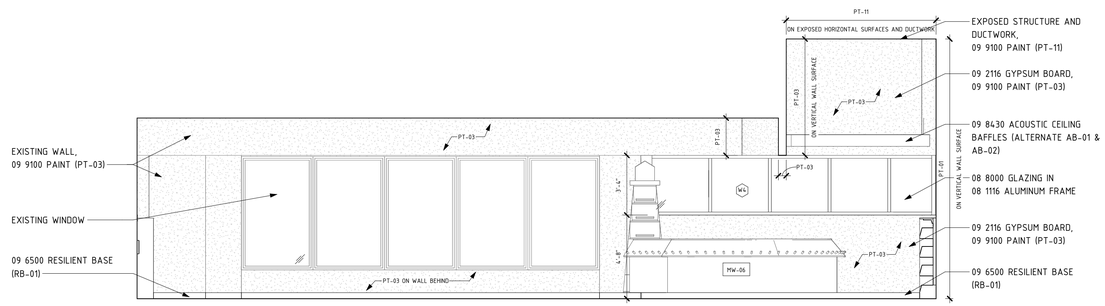

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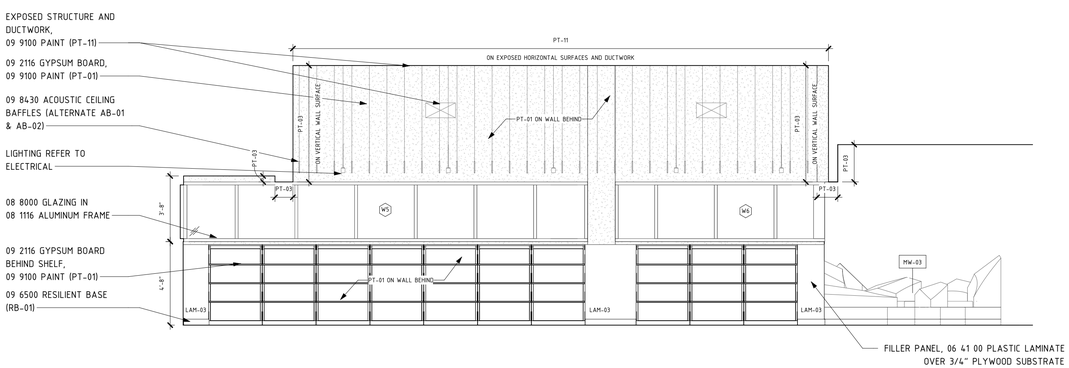

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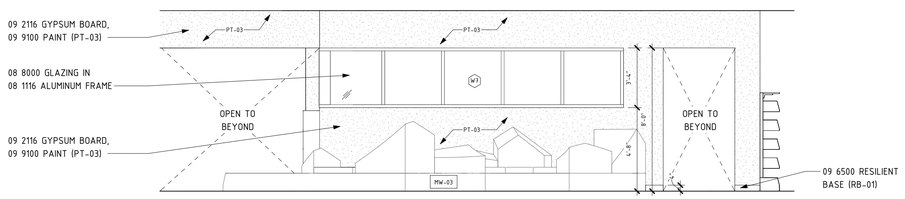

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A2.00 1/4" = 1'-0"

GENERAL NOTES

1. ALL DIMENSIONS ARE TO FACE OF GYP BOARD UON.
2. COORDINATE THE INTERFACING OF ALL TRADES WITH RESPECT TO DELIVERY AND INSTALLATION OF ALL FIXTURES AND EQUIPMENT.
3. CONTRACTOR TO FIELD VERIFY EXISTING CONDITIONS BEFORE INSTALLATION. CONSULT ARCHITECT WHEN ACTUAL FIELD CONDITIONS VARY FROM THOSE SHOWN ON CONSTRUCTION DOCUMENTS.
4. COORDINATE LOCATIONS OF ALL REQUIRED UTILITIES WITH THE TRADE PROVIDING THE SAME. REFER TO MECHANICAL AND ELECTRICAL DRAWINGS FOR ADDITIONAL INFORMATION.
5. FASTEN ALL TALL CASES TO THE ADJOINING WALL THROUGH THE BACK OR SIDE OF THE UNIT.
6. ALL COUNTERTOPS INSTALLED ALONG A WALL OR EQUIPMENT ARE TO HAVE 4" BACKSPLASH AND SIDE SPLASH UON..
7. FINISH ALL EXPOSED ENDS AND BACKS OF FREESTANDING CASEWORK/ MILLWORK.
8. PROVIDE LOCKS ON ALL CABINET DOORS AND DRAWERS UON. ALL LOCKS SHOULD BE KEYED ALIKE BY ROOM, PROVIDE MASTER KEYING.
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16. PROVIDE REINFORCEMENT IN STUDS AS SHOWN IN A6.00-7, AS NECESSARY FOR WALL-MOUNTED FURNITURE, FIXTURES, AND EQUIPMENT.

LEGEND

INTERIOR ELEVATION
NOTE: NOT ALL SYMBOLS MAY USED

- 09 2116 GYPSUM BOARD WITH 09 9100 PAINT, AS SCHEDULED
- 10 1100 TACKABLE SURFACE
- EXISTING WOOD SLATWALL PANELS WITH 09 9100 PAINT, AS SCHEDULED
- PT-XX — ACCENT PAINT PT-XX, REFER TO COLOR CODES.
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- WX — ALUMINUM STOREFRONT SYSTEM, REFER TO A8.XX
- XX — NEW DOOR, REFER TO A8.XX

PAINT KEYNOTES

1. MAINTAIN AND KEEP EXISTING BLUE PAINT, TOUCHING UP AS NECESSARY.
2. NEW 09 9100 PAINT MATCH EXISTING BLUE PAINT

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MICHAEL CRAIG BORUM
ARCHITECT
No. 1301046115
LICENSED ARCHITECT

Project Name
SCSPL

Drawing Name
Interior Elevations

Drawn By
YZ

Checked By
CB

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Revisions

Issued for	Date

Project No.
P23005

Sheet Number
A7.00

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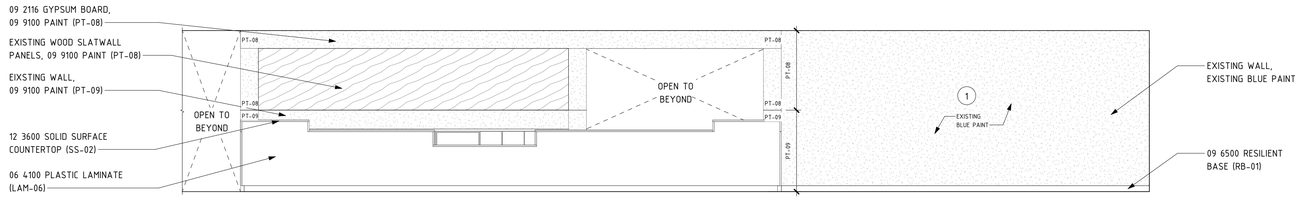
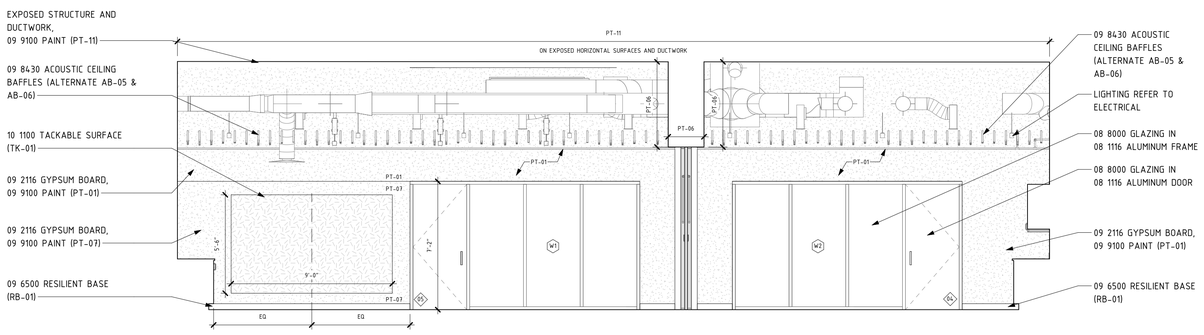


4 | A2.00 INTERIOR ELEVATION
1/4" = 1'-0"



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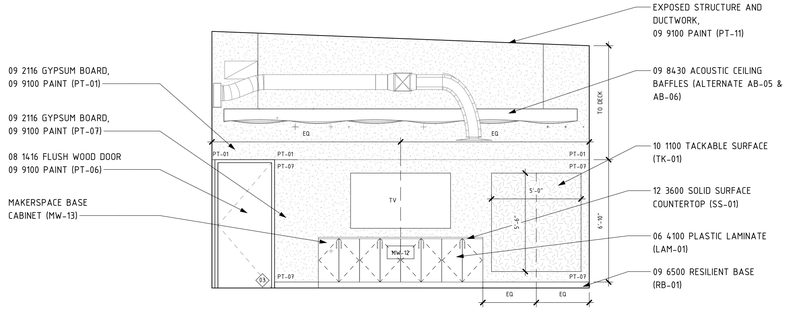

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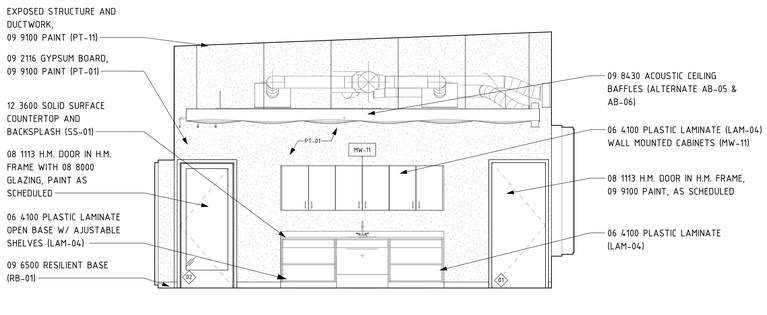

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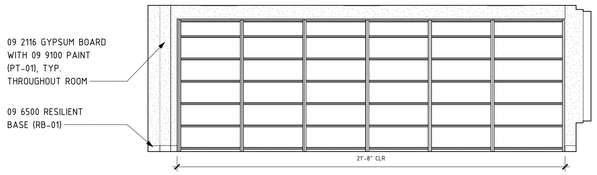
A7.01



8 | INTERIOR ELEVATION
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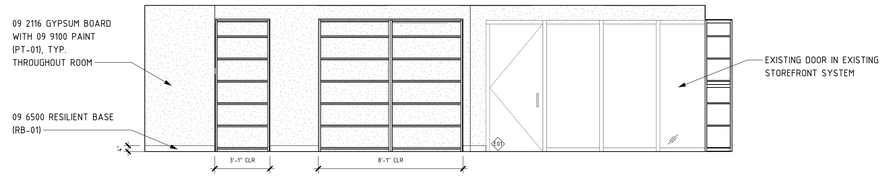

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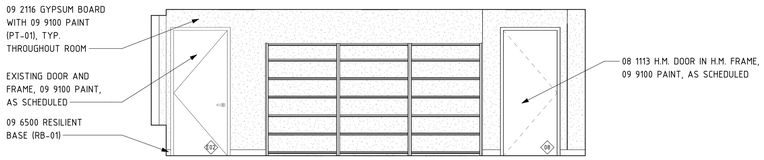

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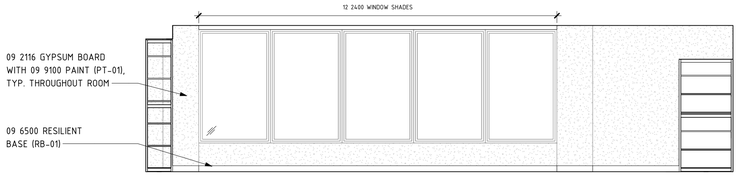

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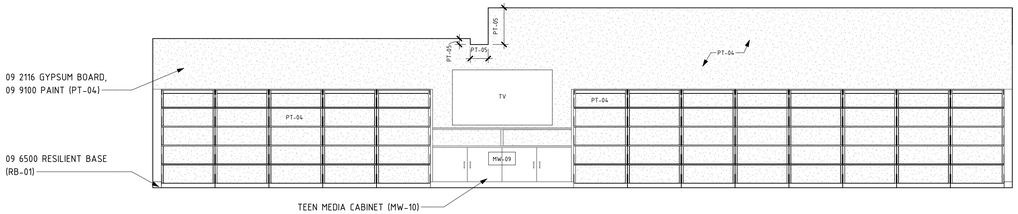

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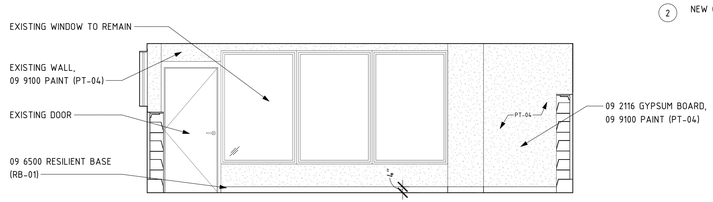

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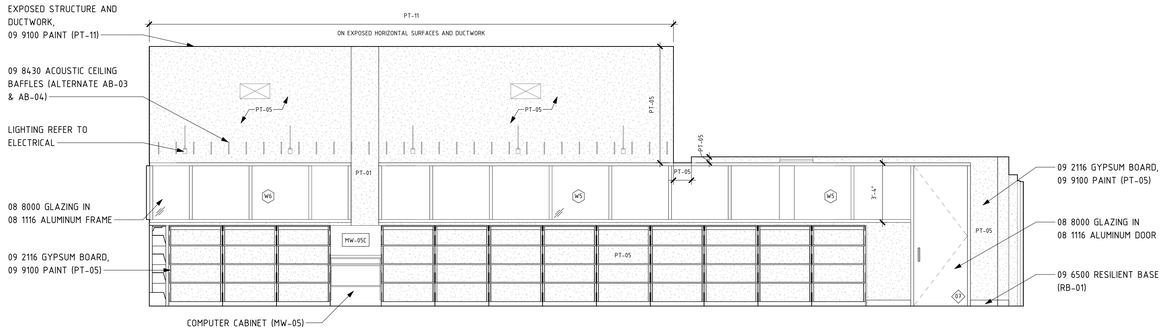

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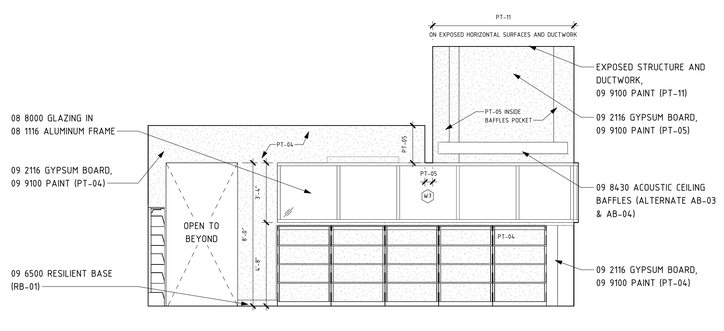

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P23005

Sheet Number
A7.02

Schedule- Window Shades

TYPE	LENGTH	WIDTH	MANUFACTURER	MATERIAL	MECHANISM	MOUNTING
WS-01	20' V.I.F.	6'4" V.I.F.	DRAPER	SC-01	MANUAL OPERATION, SINGLE ROLLER	INSIDE TOP MOUNT

Schedule- Room Finish

Number	Name	Floor Finish	Base Finish	Wall Finish	Ceiling Finish	Remarks
100	Lobby	FL-01	RB-01	EXISTING, PT-03, PT-08. PT-09	EXISTING, ACT-02	1
100A	Vestibule	FL-09	RB-01	EXISTING	EXISTING	2
100B	Vestibule	FL-09	RB-01	EXISTING	EXISTING	2
101	Adult Stack	FL-02	RB-01	EXISTING	EXISTING	
101A	Adult Media	FL-02	RB-01	EXISTING	EXISTING, ACT-02	1
101B	Seating Area	FL-02	RB-01	EXISTING	EXISTING	
102	Children Reading	FL-01, FL-03	RB-01	PT-01, PT-02, PT-03	EXISTING, ACT-02, EXP, AB-01, AB-02	1,3
102A	Children Stack	CPT-01	B-01	PT-XX	EXISTING, ACT-02, EXP	1,3
103	Teen	FL-02, FL-03	RB-01	PT-04, PT-05	ACT-01, EXP, AB-03,AB-04	3
103A	Office	FL-01	RB-01	PT-01	ACT-01	
104	Vestibule	FT-08	RB-01	MATCH EXISTING BLUE	EXISTING, ACT-02	1
105	Maker Space	FL-04	RB-01	PT-01, PT-06, PT-07	EXP, AB-05, AB-06	3
105A	Story Time	FL-04	RB-01	PT-01, PT-06, PT-07	EXP, AB-05, AB-06	3
105B	Storage	EXISTING	EXISTING	PT-08	EXISTING,PT-08	2
105D	Storage	FL-04	RB-01	PT-08	ACT-01	2
106	Circulation Desk	FL-05	RB-01	PT-08, PT-09	PT-08, AB-07, AB-08, AB-09	
107	Adult Stack	FL-05	RB-01	MATCH EXISTING BLUE	EXISTING	
107A	Storage	CPT-05	EXISTING	EXISTING	EXISTING	
108	Lounge	FL-02	RB-01	MATCH EXISTING BLUE	EXISTING	
108A	Friends Space	FL-05	-	-	EXISTING	
109	Adult Program	FL-02	RB-01	EXISTING	EXISTING, ACT-02	1
109A	Board Room	FL-02	RB-01	EXISTING	EXISTING, ACT-02	1
110	Study Space	FL-07	RB-01	EXISTING	EXISTING	
110A	Study	FL-07	RB-01	EXISTING	EXISTING	
110B	Study	FL-07	RB-01	EXISTING	EXISTING	
110C	Study	FL-07	RB-01	EXISTING	EXISTING	
110D	Study	FL-07	RB-01	EXISTING	EXISTING	
111	Genealogy	FL-06	RB-01	PT-01	ACT-01	
111A	Electrical Closet	FL-06	RB-01	PT-08	EXPOSED, PT-08	

GENERAL NOTES

1. REFER TO A7 & A10 SERIES FOR MATERIAL LOCATION WHERE MULTIPLE FLOOR AND WALL FINISHES ARE INDICATED ON FINISH SCHEDULE.
2. REFER TO FINISH PLANS AND ELEVATIONS FOR ADDITIONAL ACCENT FLOORING AND WALL FINISHES.
3. REFER TO A7 SERIES FOR INTERIOR ELEVATIONS.
4. BULLETIN BOARDS TO BE TK-01
5. PATCH AND REPAIR AS REQUIRED TO MATCH EXISTING
6. METAL TRIM TO BE APPLIED TO TILE WHERE TILE DOES NOT EXTEND TO CEILING AND A BULLNOSE PROFILE IS NOT AVAILABLE.
7. METAL TRIM TRANSITION TO BE APPLIED AT BASE WHERE TILE AND A DIFFERENT MATERIAL MEET.
8. SUBJECT TO REVIEW AND APPROVAL BY THE ARCHITECT, PROVIDE ASHLAR INSTALLATION PATTERN FOR CARPET TILES UNLESS OTHERWISE INDICATED IN THE DRAWINGS OR SPECIFICATIONS

REMARKS

1. REPLACE ACTOUTICAL CEILING TILES AS NEEDED TO ACCOMMODATE NEW LIGHTING FIXTURES PATTERNS.
2. LIGHTING FIRTURE REPLACE IN PLACE.
3. BLACKOUT PAINT IN EXPOSED STRUCTURE ABOVE ACOUSTIC CEILING BAFFLES.

Schedule- Color Code

COLOR CODES	PRODUCT / MATERIAL	MANUFACTURER	PRODUCT NAME / NUMBER	COLOR NAME / NUMBER	SIZE	FINISH	NOTES
CEILING + ACOUSTICS							
ACT-01	ACOUSTICAL CEILING TILE	ARMSTRONG	CALLA SQUARE LAY-IN, TEGULAR	White(WH)	24X24X1		NEW ACT CEILING SYSTEM
ACT-02	ACOUSTICAL CEILING TILE			Match Existing ACT Tile			EXISTING ACT TILE REPLACEMENT
AB-01	ACOUSTIC BAFFLES	IMPACT ACOUSTIC/ARCHISONIC	CEILING BAFFLE- STRAIGHT BESPOKE	MOSS - 439	12mm		CHILDREN'S AREA BAFFLES
AB-02	ACOUSTIC BAFFLES	IMPACT ACOUSTIC/ARCHISONIC	CEILING BAFFLE- STRAIGHT BESPOKE	SPEARMINT - 706	12mm		CHILDREN'S AREA BAFFLES
AB-03	ACOUSTIC BAFFLES	IMPACT ACOUSTIC/ARCHISONIC	CEILING BAFFLE- STRAIGHT BESPOKE	MARINE BLUE - 864	12mm		TEEN AREA BAFFLES
AB-04	ACOUSTIC BAFFLES	IMPACT ACOUSTIC/ARCHISONIC	CEILING BAFFLE- STRAIGHT BESPOKE	MIDNIGHT - 810	12mm		TEEN AREA BAFFLES
AB-05	ACOUSTIC BAFFLES	IMPACT ACOUSTIC/ARCHISONIC	CEILING BAFFLE- WAVE SINE BESPOKE	CLOUD - 103	12mm		MAKERSPACE/ STORYTIME ROOM
AB-06	ACOUSTIC BAFFLES	IMPACT ACOUSTIC/ARCHISONIC	CEILING BAFFLE- WAVE SINE BESPOKE	SUCCULENT - 712	12mm		MAKERSPACE/ STORYTIME ROOM
AB-07	ACOUSTIC BAFFLES	IMPACT ACOUSTIC/ARCHISONIC	CEILING BAFFLE- STRAIGHT BESPOKE	MOSS - 439	24mm		ABOVE CIRCULATION DESK
AB-08	ACOUSTIC BAFFLES	IMPACT ACOUSTIC/ARCHISONIC	CEILING BAFFLE- STRAIGHT BESPOKE	CLOUD - 103	24mm		ABOVE CIRCULATION DESK
AB-09	ACOUSTIC BAFFLES	IMPACT ACOUSTIC/ARCHISONIC	CEILING BAFFLE- STRAIGHT BESPOKE	SUCCULENT - 712	24mm		ABOVE CIRCULATION DESK
EXP	Exposed Construction						
PAINT							
PT-01	PAINT	SHERWIN WILLIAMS		OPEN AIR - SW 6491			CHILDREN'S AREA + MAKERSPACE/STORYTIME
PT-02	PAINT	SHERWIN WILLIAMS		LAKESHORE - SW 6494			CHILDREN'S AREA
PT-03	PAINT	SHERWIN WILLIAMS		FADED FLAXFLOWER - SW 9146			YOUTH AREA BAFFLE SURROUND + CIRCULATION/ENTRY + COMPUTER COLUMNS THROUGHOUT + GENEALOGY
PT-04	PAINT	SHERWIN WILLIAMS		MESMERIZE - SW 6544			TEEN AREA
PT-05	PAINT	SHERWIN WILLIAMS		BLUE PLATE - SW 6796			TEEN AREA + TEEN BAFFLE SURROUND
PT-06	PAINT	SHERWIN WILLIAMS		RIVULET - SW 6760			MAKERSPACE/STORYTIME
PT-07	PAINT	SHERWIN WILLIAMS		KINGDOM GOLD - SW 6698			MAKERSPACE STORYTIME
PT-08	PAINT	SHERWIN WILLIAMS		PURE WHITE - SW 7005			CIRCULATION/ENTRY
PT-09	PAINT	SHERWIN WILLIAMS		BAIZE GREEN - SW 6429			CIRCULATION/ENTRY + COMPUTER COLUMNS THROUGHOUT
PT-11	PAINT	SHERWIN WILLIAMS		REGATTA - SW 6517			CEILING BLACKOUT PAINT WHERE NEEDED
SPECIALTIES							
TK-01	BULLETIN BOARD	FORBO	2212	FRESH PINEAPPLE			MAKERSPACE/STORYTIME
SC-01	SHADE CLOTH	DRAPER INC	FLEXSHADE	TEXSTYLE SOLAR SCREEN 3000 NET / WHITE/BEIGE, 1% OPEN FACTOR			
BASE							
RB-01	RUBBER BASE	TARKETT	58	WINDOSOR BLUE			RESILIENT BASE THROUGHOUT
TL-01	TILE BASE	MOSA	GLOBAL COLLECTION	SMALL SPECKLED PEARL WHITE - 75420	4" COVE		ENTRY VESTIBULES
FLOORING							
FL-01	CARPET	INTERFACE	DRIFTWOOD	PALM - 104854			CHILDREN'S AREA + CIRCULATION/ENTRY AREA
FL-02	CARPET	INTERFACE	DIDDLY DOT	TOURMALINE - 108108			TEEN AREA + ADULT AREAS
FL-03	CARPET	INTERFACE	NET EFFECT COLLECTION	ATLANTIC B603-102961			CHILDREN'S AREA + TEEN AREA
FL-04	RUBBER FLOORING	INTERFACE	NORAMENT PADO (NORA)	CORAL - 5502			MAKERSPACE/STORYTIME
FL-05	CARPET	INTERFACE	DRIFTWOOD	OAK - 104851			ADULT AREA + CIRCULATION DESK
FL-06	RUBBER FLOORING	INTERFACE	NORAMENT PADO (NORA)	WINDSOR - 5508			GENEALOGY
FL-07	CARPET	INTERFACE	DIDDLY DOT	PEBBLE - 108103			ADULT AREAS
FL-08	TILE	MOSA	GLOBAL COLLECTION	SMALL SPECKLED PEARL WHITE - 75420	12" X 12"		FRONT RESTROOM VESTIBULES
FL-09	WALK-OFF CARPET	J+J FLOORING	INCOGNITO WALK-OFF MODULAR	1837 OPERATIVE			ENTRY VESTIBULES
MILLWORK							
LAM-01	FURNITURE LAMINATE	ABET LAMINATI		454 VERDE CARAIBI		SEI (STANDARD)	MAKERSPACE CABINETS + GENEALOGY OPEN SHELVES
LAM-02	FURNITURE LAMINATE	ABET LAMINATI		847 AZZURRO		SEI (STANDARD)	CHILDREN'S AREA MILLWORK
LAM-03	FURNITURE LAMINATE	ABET LAMINATI		487 AZZURRO POLVERE		SEI (STANDARD)	CHILDREN'S AREA MILLWORK
LAM-04	FURNITURE LAMINATE	ABET LAMINATI		1940 INDIA		SEI (STANDARD)	STORYTIME CABINETS
LAM-05	FURNITURE LAMINATE	ABET LAMINATI		838 BLUE PRIMARIO		SEI (STANDARD)	TEEN AREA GAME CABINET
LAM-06	FURNITURE LAMINATE	ABET LAMINATI		1941 CADAQUES		SEI (STANDARD)	CIRCULATION DESK
SS-01	SOLID SURFACE	CORIAN		SEAGRASS			MAKERSPACE/STORYTIME
SS-02	SOLID SURFACE	FORMICA		WHITE SPEX			CIRCULATION DESK
SS-03	SOLID SURFACE	DURAT		182 - ICE BLUE			CHILDREN'S AREA MILLWORK
UPH-01	UPHOLSTERY	ARC COM	MAJORCA - AC-62925	MOONSTONE #6			CHILDREN'S AREA MILLWORK
UPH-02	UPHOLSTERY	ARC COM	MAJORCA - AC-62952	GREEN TEA #33			CHILDREN'S AREA MILLWORK
UPH-03	UPHOLSTERY	ARCHITEX	RELAX - 22454	SKYFALL			CHILDREN'S AREA MILLWORK
UPH-04	UPHOLSTERY	ARCHITEX	RELAX - 22455	OCEANSIDE			CHILDREN'S AREA MILLWORK

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Drawing Name
Room Finish Schedule

Drawn By
YZ

Checked By
CB

Issue Date
05/16/2025 Permit& Bid Set

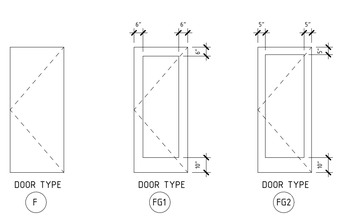
Revisions
Issued for Date

Project No.
P23005

Sheet Number
A8.00

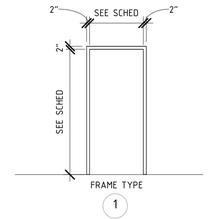
Door Schedule

Door Number	Door						Frame			Details			Hardware Set	Remarks
	Width	Height	Type	Material	Finish	Glass	Type	Material	Finish	Head	Jamb	Sill		
01	3'-0"	7'-0"	F	HM	PT-09	-	1	HM	PT-09	A8.10-2	A8.10-1	A8.10-4	03	
02	3'-0"	7'-0"	FG1	HM	PT-09	G-01	1	HM	PT-09	A8.10-2	A8.10-1	A8.10-3	05	
03	3'-0"	7'-0"	F	HM	PT-09	-	1	HM	PT-09	A8.10-2	A8.10-1	A8.10-3	03	
04	3'-0"	7'-0"	FG2	ALGL	PAINTED ALUMINUM – REFER TO 08 1116 ALUMINUM DOORS AND FRAMES	G-01	SEE ELEV.	AL	PAINTED ALUMINUM – REFER TO 08 1116 ALUMINUM DOORS AND FRAMES	A8.10-7	A8.10-5,6	A8.10-8	07	
05	3'-0"	7'-0"	FG2	ALGL	PAINTED ALUMINUM – REFER TO 08 1116 ALUMINUM DOORS AND FRAMES	G-01	SEE ELEV.	AL	PAINTED ALUMINUM – REFER TO 08 1116 ALUMINUM DOORS AND FRAMES	A8.10-7	A8.10-5,6	A8.10-8	07	
06	3'-0"	7'-10"	FG2	ALGL	ANOD	G-01	SEE ELEV.	AL	ANOD	A8.10-7	A8.10-5,6	A8.10-9	06	
07	3'-0"	7'-10"	FG2	ALGL	ANOD	G-01	SEE ELEV.	AL	ANOD	A8.10-7	A8.10-5,6	A8.10-9	06	
08	3'-0"	7'-0"	F	HM	MATCH EXISTING BLUE	-	1	HM	MATCH EXISTING BLUE	A8.10-2	A8.10-1	A8.10-4	04	
E01	2'-11 5/8"	7'-1 1/2"	Existing	Existing	EXISTING BLUE	Existing	Existing	Existing	EXISTING BLUE	-	-	-	02	
E02	3'-0"	7'-0"	Existing	Existing	MATCH EXISTING BLUE	Existing	Existing	Existing	MATCH EXISTING BLUE	-	-	-	01	



DOOR TYPES

1/4" = 1'-0"

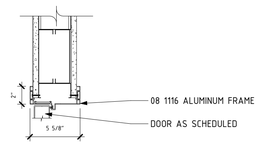


FRAME TYPES

1/4" = 1'-0"

GLAZING TYPES

G-01 MONILITHIC SAFETY GLAZING: NON-FIRE-RATED



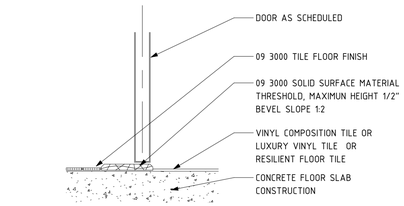
8 ALUMINUM STOREFRONT DOOR HEAD 2

1 1/2" = 1'-0"

12 ALUMINUM STOREFRONT VERTICAL MULLION

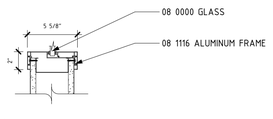
1 1/2" = 1'-0"

NOTE: ALL SOLID SURFACE THRESHOLD SHALL BE THE SAME WIDTH AS DOOR FRAMES



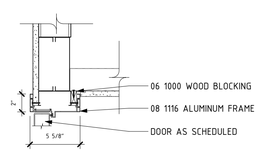
3 HM DOOR SILL IN MTL STD WALL RUBBER-TILE

1 1/2" = 1'-0"



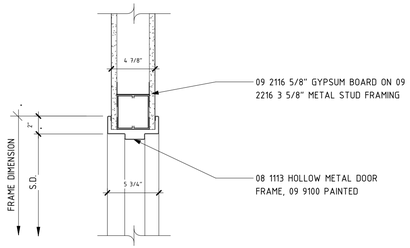
16 ALUMINUM STOREFRONT SILL AT WALL

1 1/2" = 1'-0"



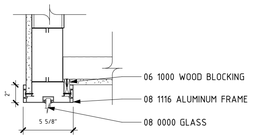
6 ALUMINUM STOREFRONT DOOR JAMB WITH SIDELITE

1 1/2" = 1'-0"



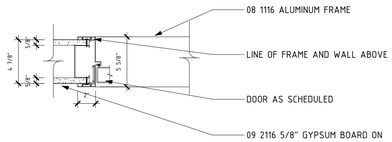
2 HM DOOR HEAD IN MTL STD WALL

1 1/2" = 1'-0"



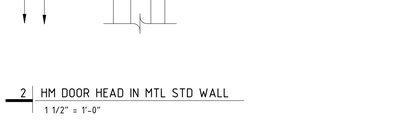
11 ALUMINUM STOREFRONT GLASS HEAD 1

1 1/2" = 1'-0"



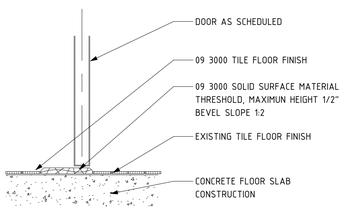
5 ALUMINUM STOREFRONT DOOR JAMB

1 1/2" = 1'-0"



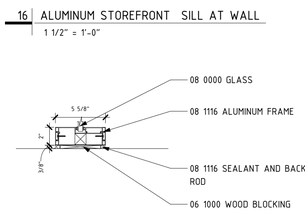
1 HM DOOR JAMB IN MTL STD WALL

1 1/2" = 1'-0"



19 EXISTING BATHROOM DOOR SILL TILE-TILE

1 1/2" = 1'-0"

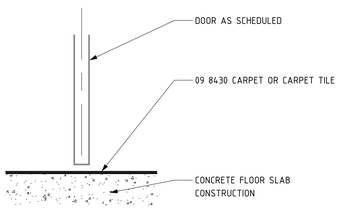


15 ALUMINUM STOREFRONT SILL

1 1/2" = 1'-0"

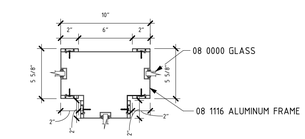
11 ALUMINUM STOREFRONT GLASS HEAD 1

1 1/2" = 1'-0"



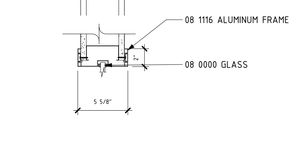
10 ALUMINUM DOOR SILL CARPET-CARPET

1 1/2" = 1'-0"



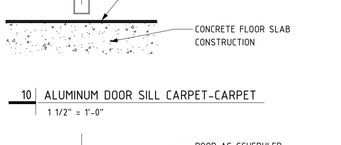
18 ALUMINUM STOREFRONT T MULLION

1 1/2" = 1'-0"



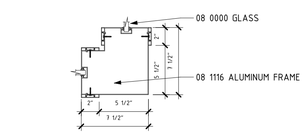
14 ALUMINUM STOREFRONT GLASS HEAD 2

1 1/2" = 1'-0"



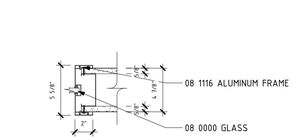
9 ALUMINUM DOOR SILL LVT-CARPET

1 1/2" = 1'-0"



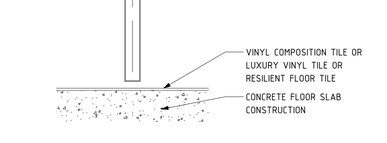
17 ALUMINUM STOREFRONT L MULLION

1 1/2" = 1'-0"



13 ALUMINUM STOREFRONT GLASS JAMB

1 1/2" = 1'-0"



4 HM DOOR SILL IN MTL STD WALL RUBBER-RUBBER

1 1/2" = 1'-0"

GENERAL NOTES

1. REFER TO THE DRAWINGS FOR DOOR LOCATIONS.
2. "DOOR NUMBER" CORRESPONDS TO THE DOOR NUMBER INDICATED ON THE DRAWINGS. **NOTE: AT EXISTING WALL OPENINGS, FIELD VERIFY SIZE OF DOORS AND FRAMES.**
3. DOOR "SIZE" INDICATES THE NOMINAL WIDTH AND HEIGHT OF THE DOOR IN FEET AND INCHES. ALL DOORS ARE 1 3/4" THICK UNLESS OTHERWISE NOTED.
4. "DOOR AND FRAME TYPE/MATL/FINISH" INDICATES THE CODES FOR TYPE (INDICATED ON THE DRAWINGS), MATERIAL AND FINISH.
5. "DETAILS HEAD-JAMB-SILL" INDICATES THE DTAIL NUMBER INDICATED ON THE DRAWINGS.
6. "HARDWARE SET" INDICATES HARDWARE SET NUMBERS SPECIFIED IN 08 7100 - DOOR HARDWARE.
7. FOR ALUMINUM DOORS AND FRAMES REFER TO 08 1116 ALUMINUM DOORS AND FRAMES.

DOOR SCHEDULE ABBREVIATIONS

AL	ALUMINUM
ALGL	ALUMINUM AND GLASS
ANOD	ANODIZED
HM	HOLLOW METAL
PT	PAINT
PTAL	PAINTED ALUMINIUM

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STATE OF MICHIGAN
MICHAEL CRAIG BORUM
ARCHITECT
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Drawing Name

Door Schedule and Details

Drawn By

YZ

Checked By

CB

Issue Date

05/16/2025 Permit& Bid Set

Revisions

Issued for	Date

Project No.

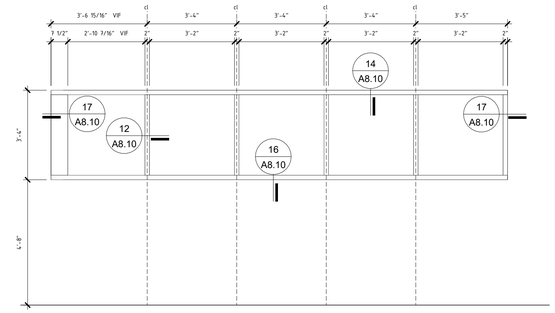
P23005

Sheet Number

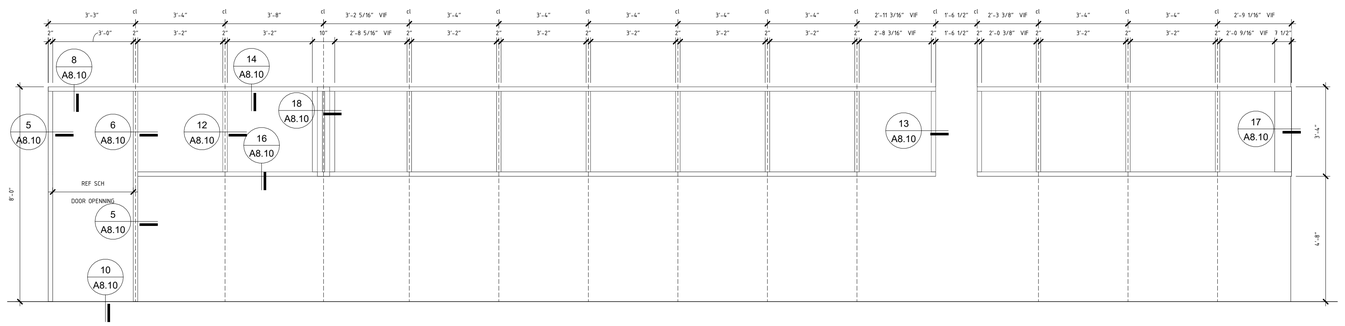
A8.10

GLAZING TYPES

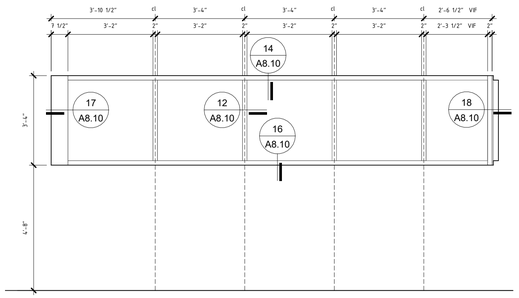
G-01 MONILITHIC SAFETY GLAZING: NON-FIRE-RATED



W7



W5 W6



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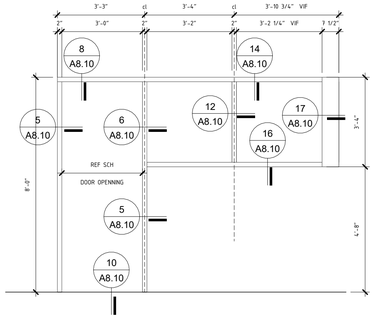

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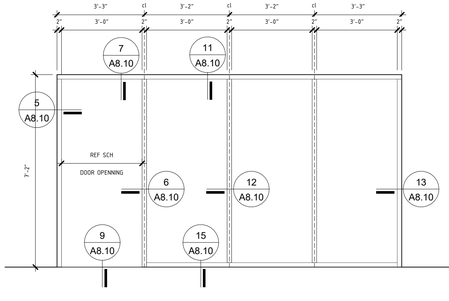

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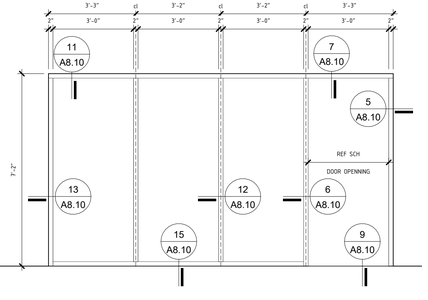

W1

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MICHAEL CRAIG BORUM
ARCHITECT
No. 1301046115
LICENSED ARCHITECT

Drawing Name

Aluminum Framing Detail

Drawn By

YZ

Checked By

CB

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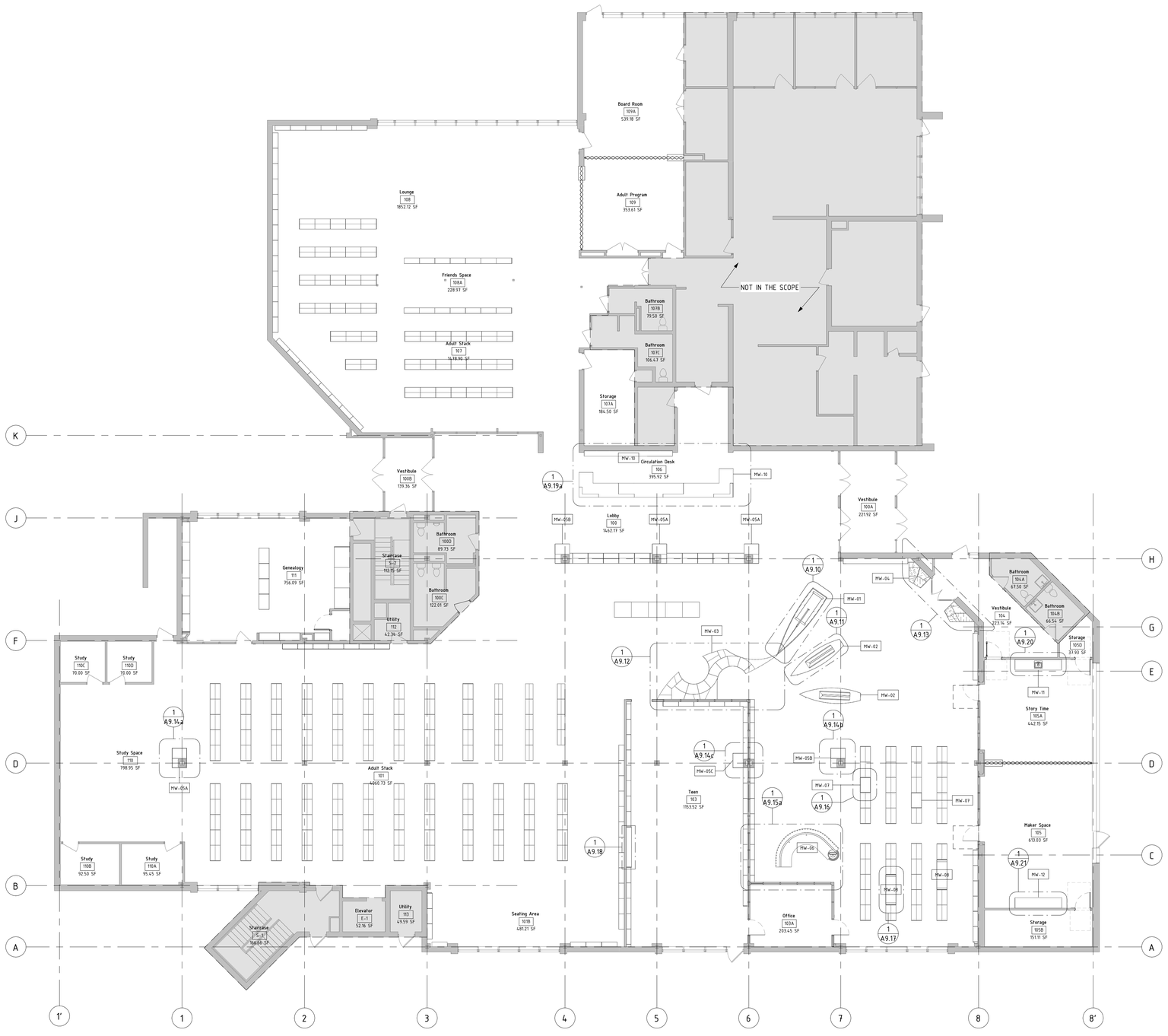

1 MILLWORK KEY PLAN

3/32" = 1'-0"

Millwork Schedule		
Type Mark	Description	Count
MW-01	Sailboat - Large Book Display	1
MW-02	Small Boat- Book Display	2
MW-03	Rock Bench - Soft Seating 01	1
MW-04	Rock Bench - Soft Seating 02	1
MW-05A	Catalog Computer Cabinet	3
MW-05B	Catalog Computer Cabinet - ADA Compliant	2
MW-05C	Catalog Computer Cabinet - Teen Room	1
MW-06	Information Desk	1
MW-07	Stack Bench Seating 01	2
MW-08	Stack Bench Seating 02	2
MW-09	Teen Media Cabinet	1
MW-10	Circulation Desk	1
MW-11	Storytime Base and Upper Cabinet	1
MW-12	Makerspace Base Cabinet	1

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Drawing Name

Millwork Plan and Schedule

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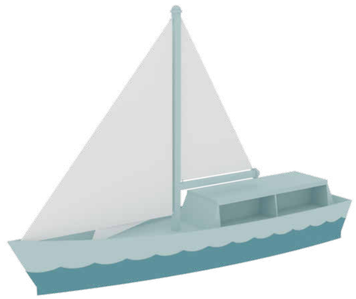
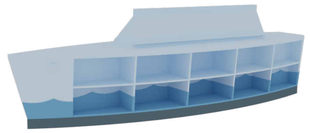
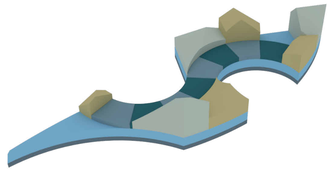


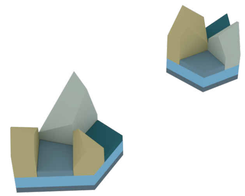
MW-01 SAILBOAT - LARGE BOOK DISPLAY



MW-02 SMALL BOAT - BOOK DISPLAY

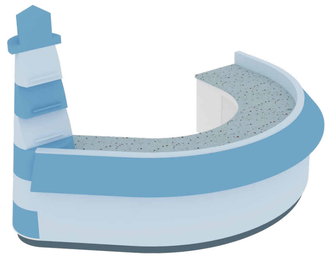


MW-03 ROCK BENCH - SOFT SEATING 01

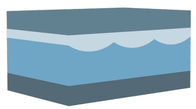


MW-04 ROCK BENCH - SOFT SEATING 02

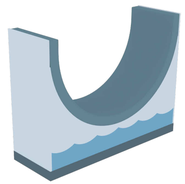
MW-05 CATOLOG COMPUTER CASE



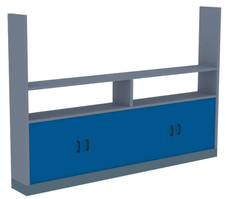
MW-06 INFORMATION DESK



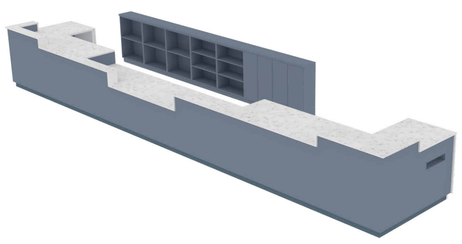
MW-07 STACK BENCH SEATING 01



MW-08 STACK BENCH SEATING 02

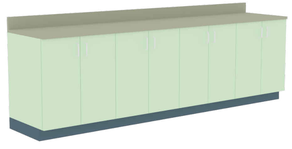


MW-09 TEEN MEDIA CABINET



MW-10 CIRCULATION DESK

MW-11 STORYTIME BASE & UPPER CABINET



MW-12 MAKERSPACE BASE CABINET

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Drawing Name
Millwork Components(For Ref.Only)

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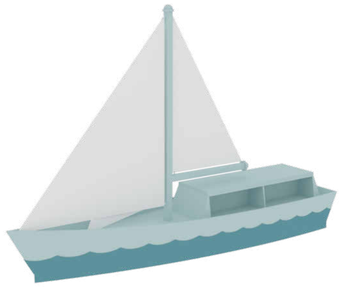
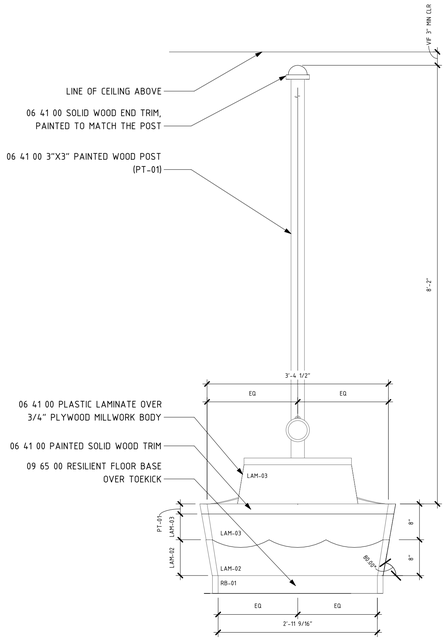
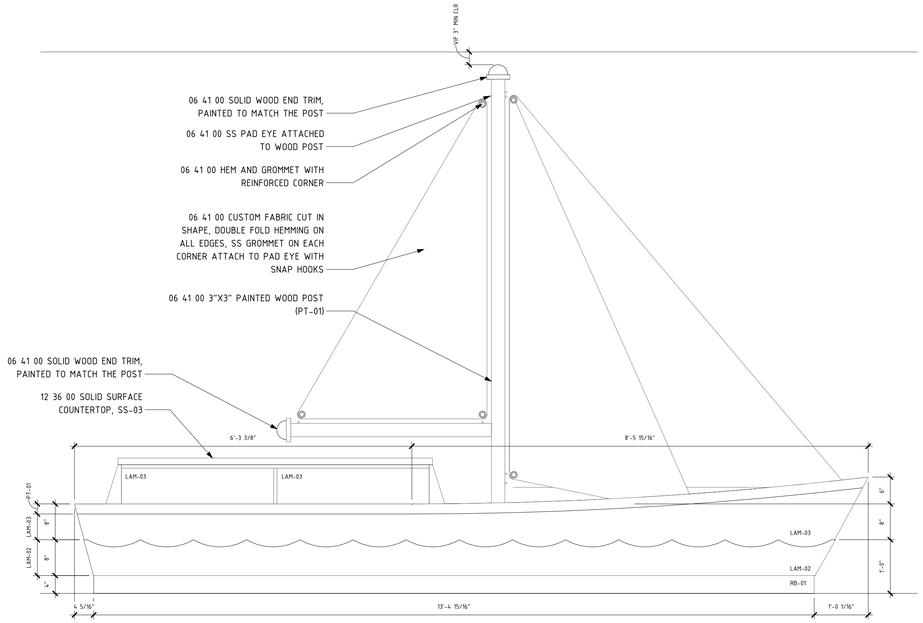


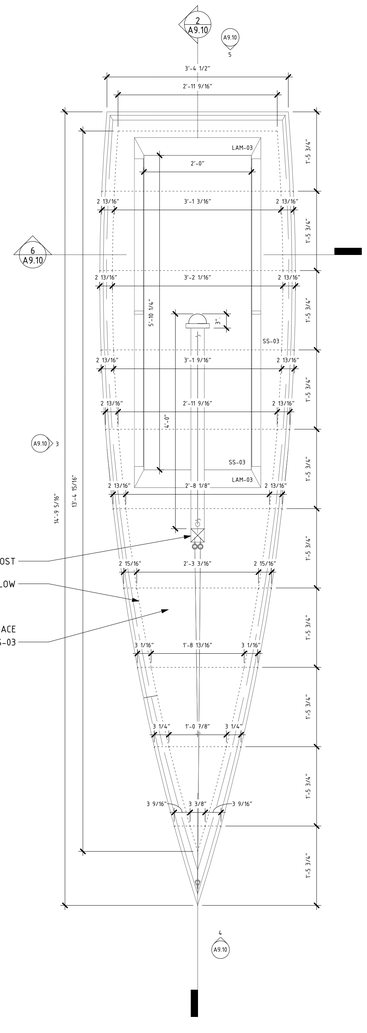
ISOMETRIC VIEW REFERENCE
MW-01 SAILBOAT - LARGE BOOK DISPLAY



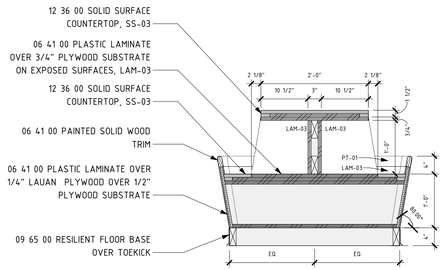
5 | A9.10 MILLWORK ELEVATION - BACK
3/4" = 1'-0"



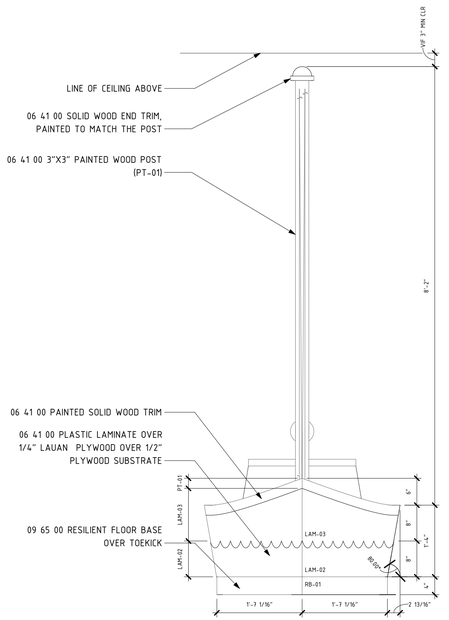
3 | A9.10 MILLWORK ELEVATION - SIDE
3/4" = 1'-0"



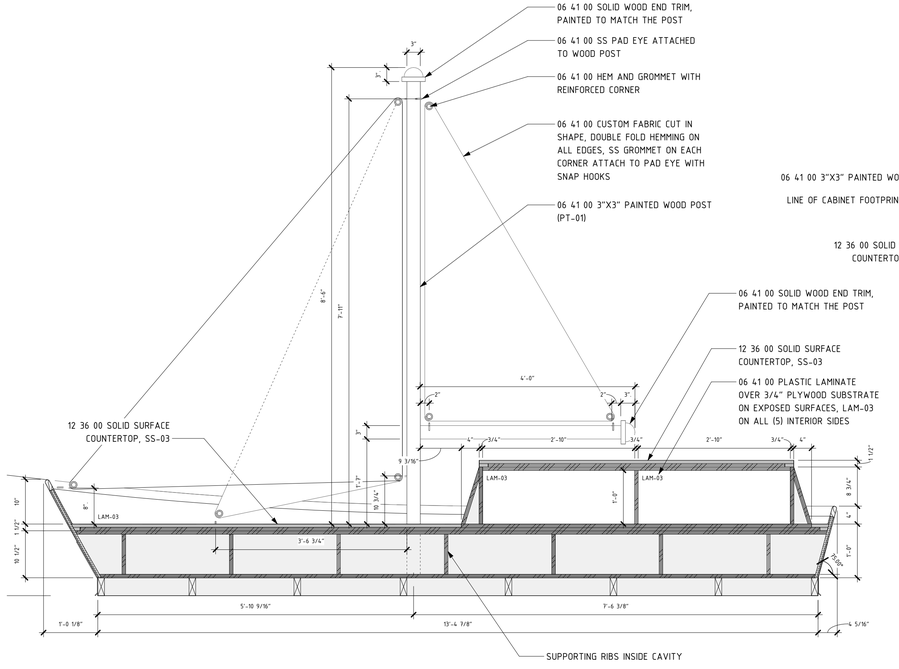
1 | A9.00 MILLWORK ENLARGED PLAN
3/4" = 1'-0"



6 | A9.10 MILLWORK SECTION
3/4" = 1'-0"



4 | A9.10 MILLWORK ELEVATION - FRONT
3/4" = 1'-0"



2 | A9.10 MILLWORK SECTION
3/4" = 1'-0"

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SCSPL

Drawing Name
Millwork Detail

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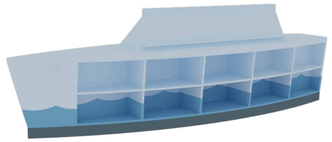
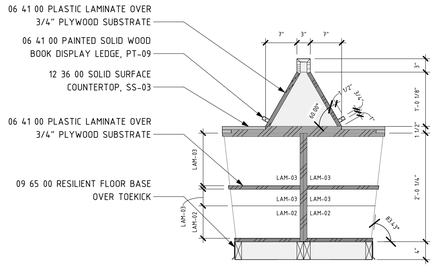
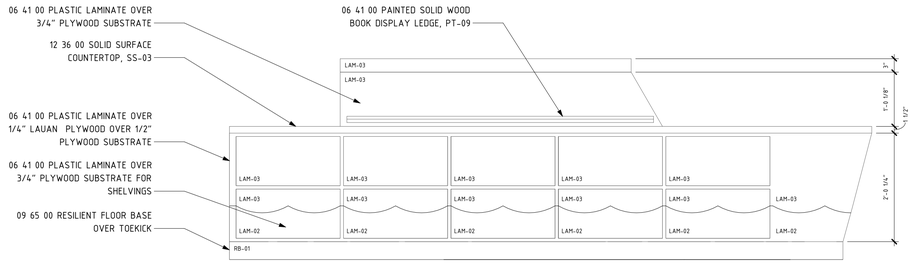


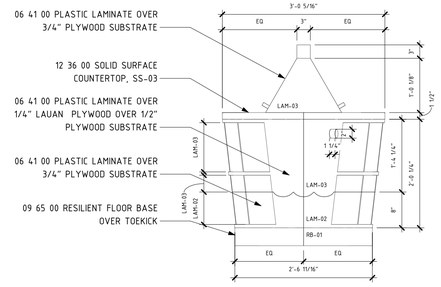
ISOMETRIC VIEW REFERENCE
MW-02 SMALL BOAT - BOOK DISPLAY



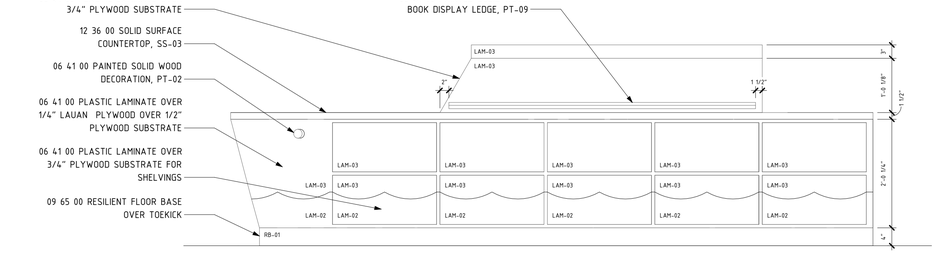
7 | MILLWORK SECTION
A9.11 | 3/4" = 1'-0"



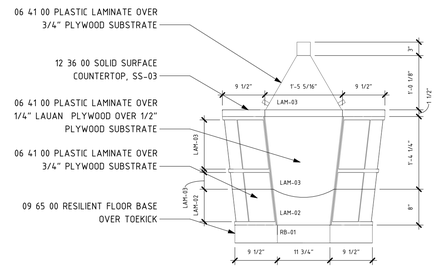
4 | MILLWORK ELEVATION - SIDE
A9.11 | 3/4" = 1'-0"



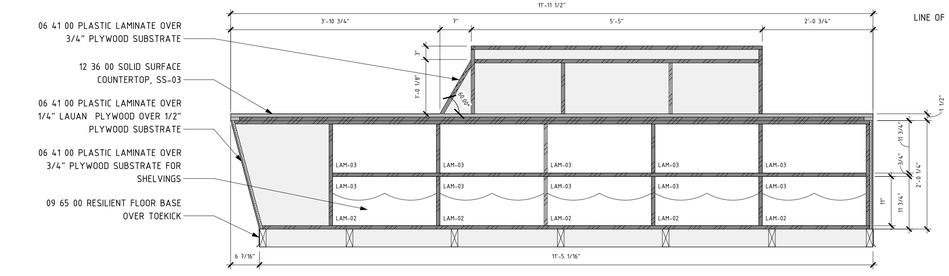
6 | MILLWORK ELEVATION - FRONT
A9.11 | 3/4" = 1'-0"



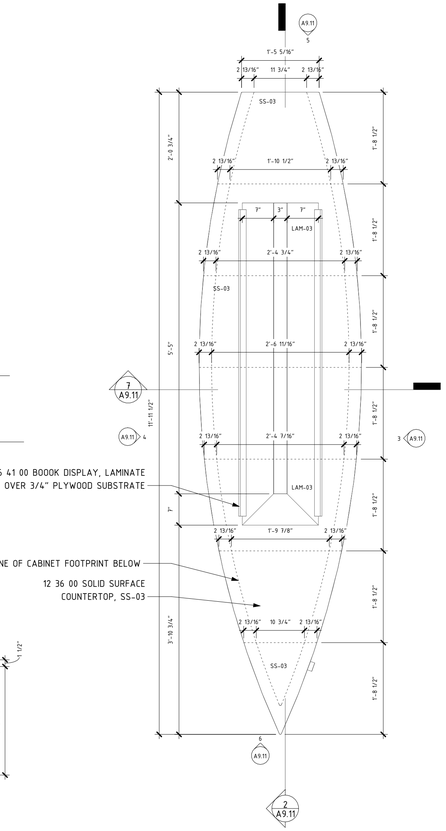
3 | MILLWORK ELEVATION - SIDE
A9.11 | 3/4" = 1'-0"



5 | MILLWORK ELEVATION - BACK
A9.11 | 3/4" = 1'-0"



2 | MILLWORK SECTION
A9.11 | 3/4" = 1'-0"



06 41 00 BOOOK DISPLAY, LAMINATE OVER 3/4" PLYWOOD SUBSTRATE
LINE OF CABINET FOOTPRINT BELOW
12 36 00 SOLID SURFACE COUNTERTOP, SS-03

1 | MILLWORK ENLARGED PLAN
A9.00 | 3/4" = 1'-0"

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Drawing Name
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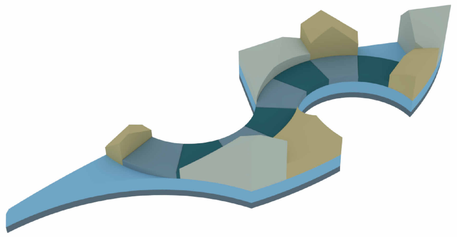
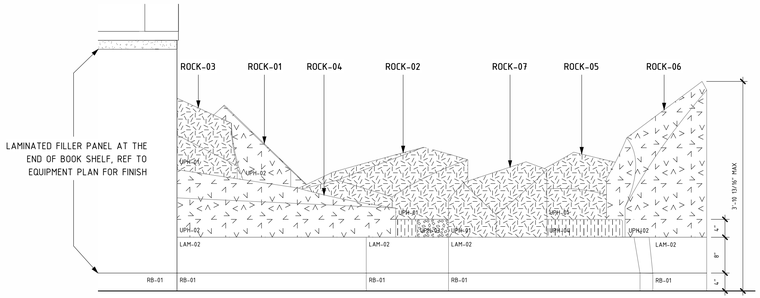
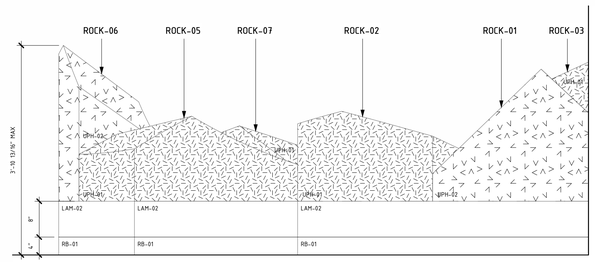


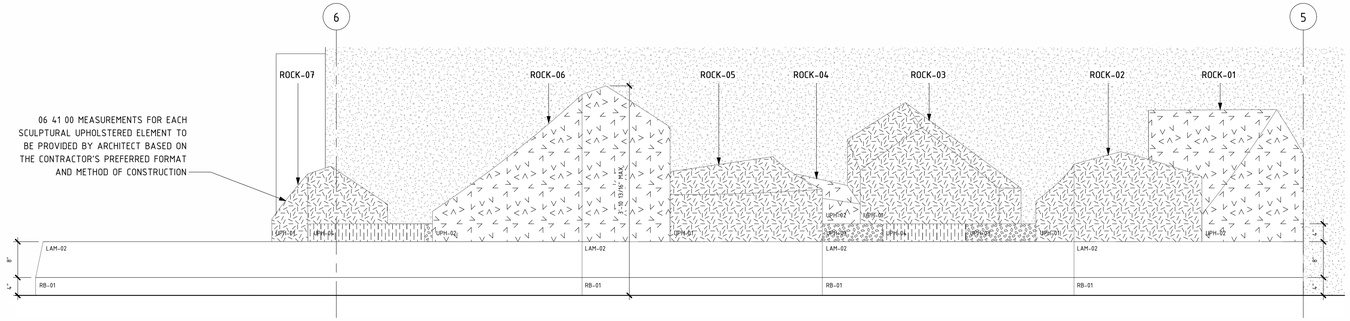
ISOMETRIC VIEW REFERENCE
MW-03 ROCK BENCH - SOFT SEATING



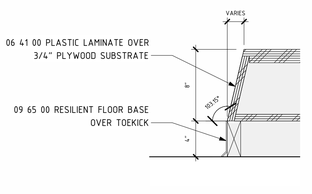
4 | MILLWORK ELEVATION - SIDE
A9.10 | 3/4" = 1'-0"



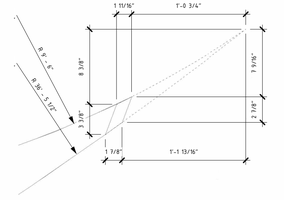
3 | MILLWORK ELEVATION - SIDE
A9.12 | 3/4" = 1'-0"



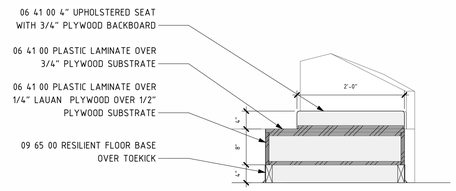
2 | MILLWORK ELEVATION - FRONT
A9.10 | 3/4" = 1'-0"



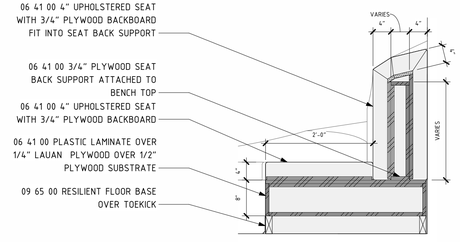
8 | MILLWORK SECTION
A9.12 | 1 1/2" = 1'-0"



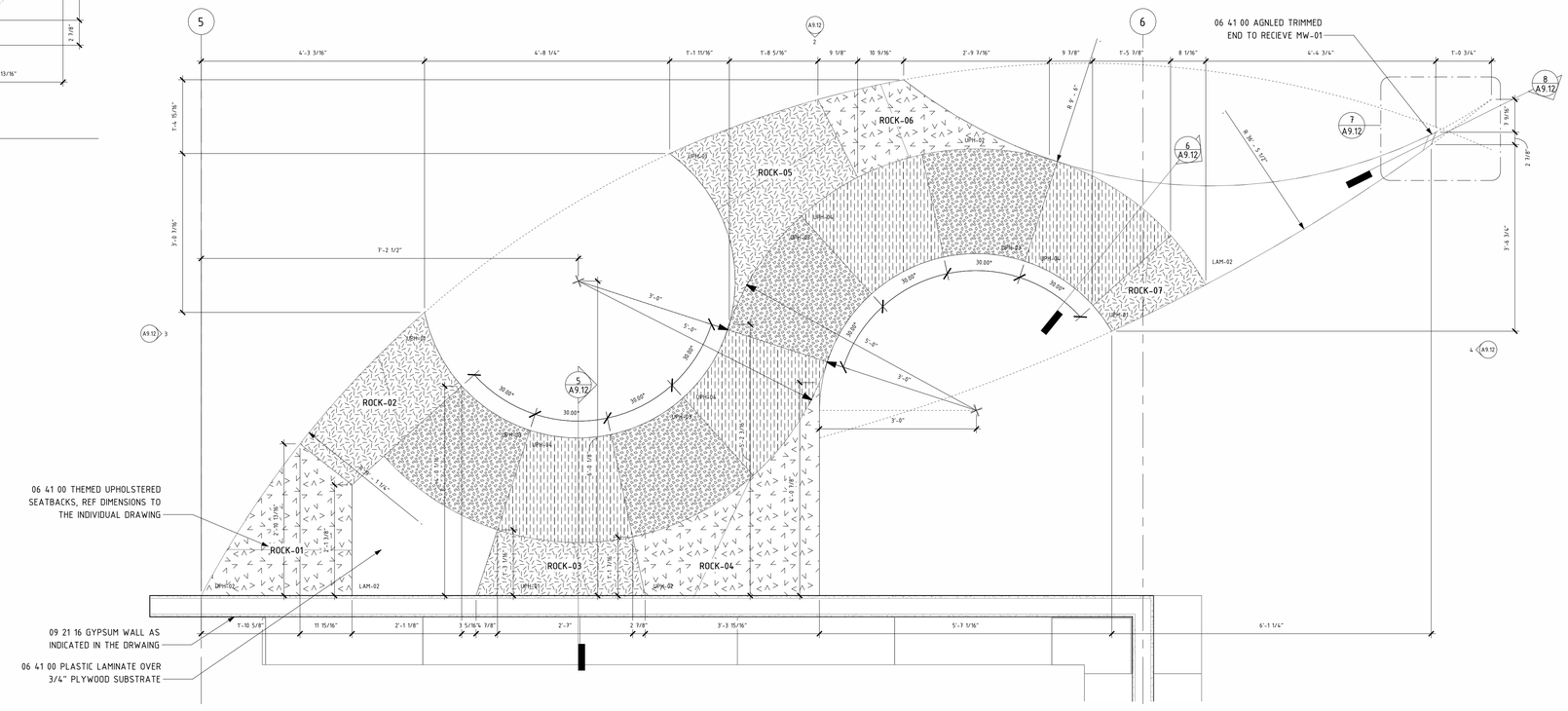
7 | MILLWORK ENLARGED PLAN
A9.12 | 1 1/2" = 1'-0"



6 | MILLWORK SECTION
A9.12 | 3/4" = 1'-0"



5 | MILLWORK SECTION
A9.12 | 3/4" = 1'-0"



1 | MILLWORK ENLARGED PLAN
A9.00 | 3/4" = 1'-0"

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Project Name
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Drawing Name
Millwork Detail

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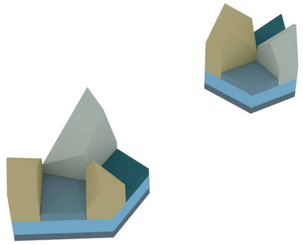
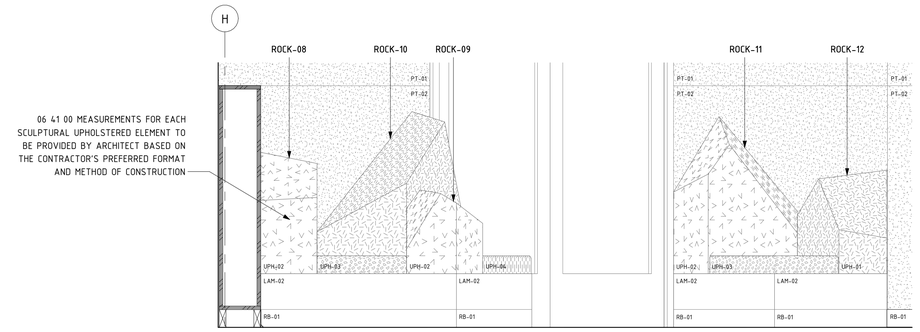
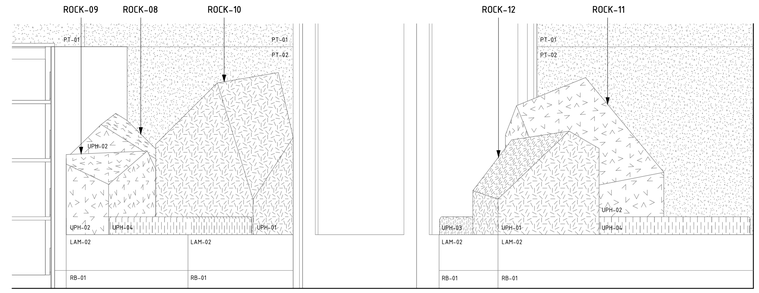


ISOMETRIC VIEW REFERENCE
MW-04 ROCK BENCH - SOFT SEATING



4 | A9.13 MILLWORK ELEVATION - SIDE
3/4" = 1'-0"



3 | A9.13 MILLWORK ELEVATION - SIDE
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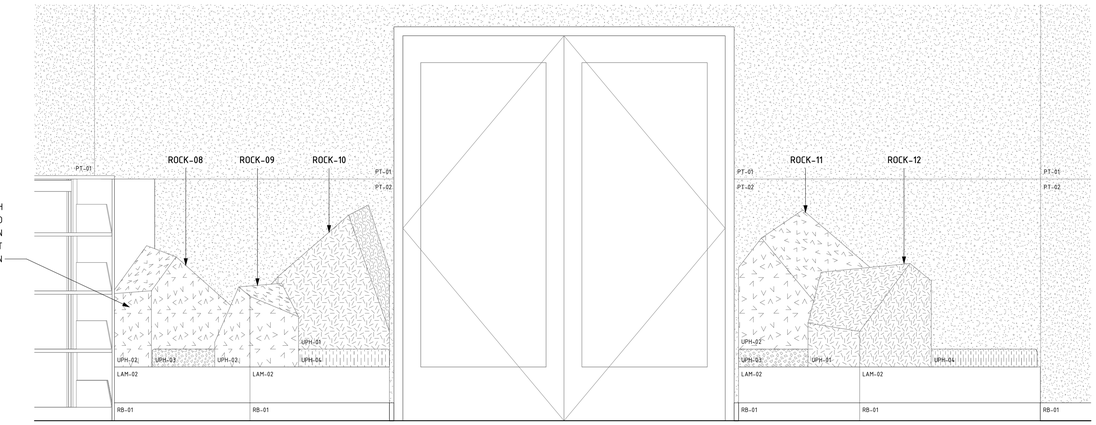

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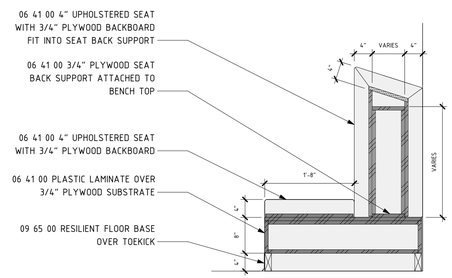
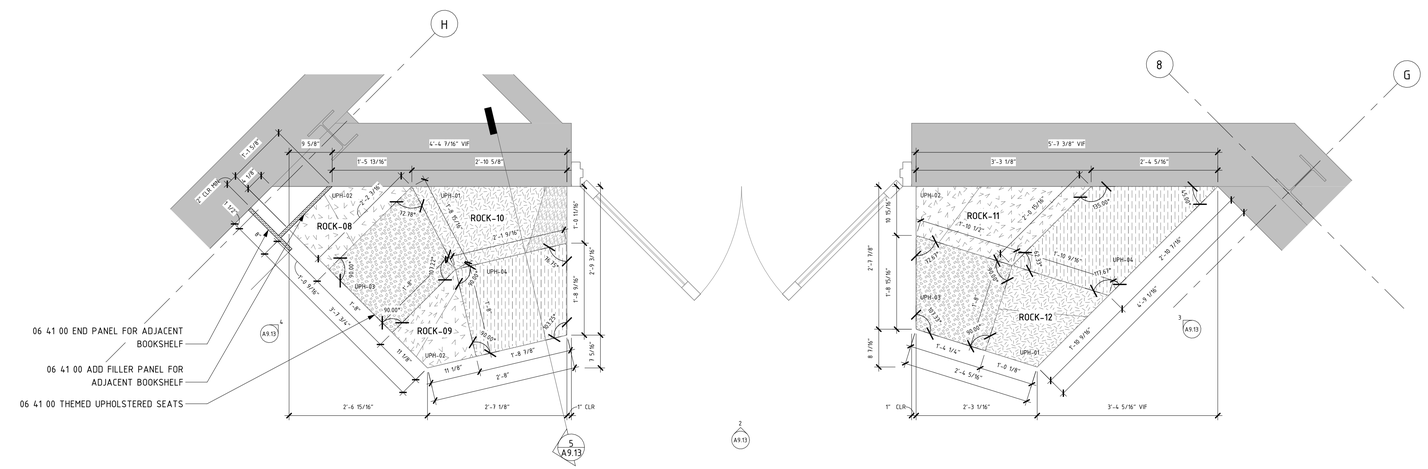
3/4" = 1'-0"



5 | A9.13 MILLWORK SECTION
3/4" = 1'-0"



1 | A9.00 MILLWORK ENLARGED PLAN
3/4" = 1'-0"

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Project Name
SCSPL

STATE OF MICHIGAN
MICHAEL CRAIG BORUM
ARCHITECT
No. 1301046115
LICENSED ARCHITECT

Drawing Name
Millwork Detail

Drawn By
YZ

Checked By
CB

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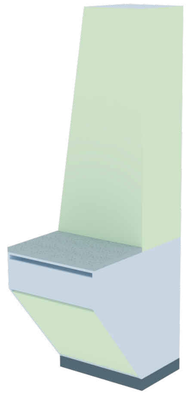
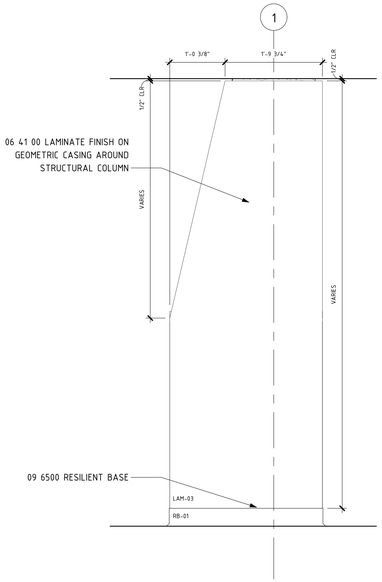
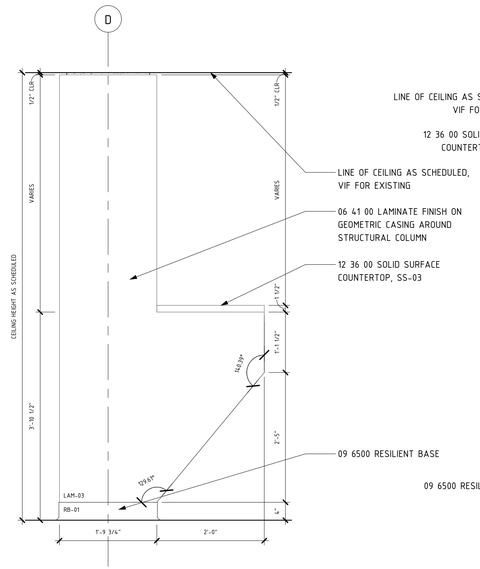
A9.13



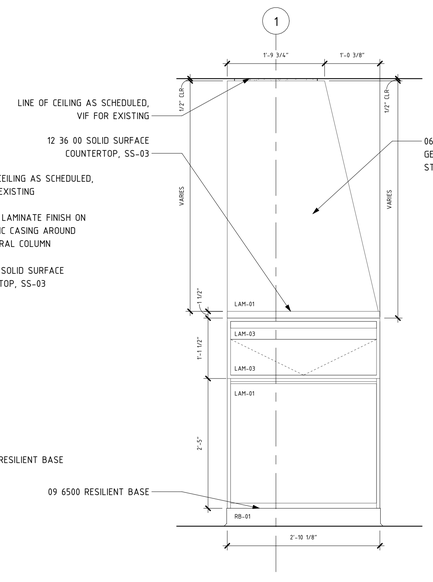
ISOMETRIC VIEW REFERENCE
MW-05A CATOLOG COMPUTER CASE
STANDING POSITION



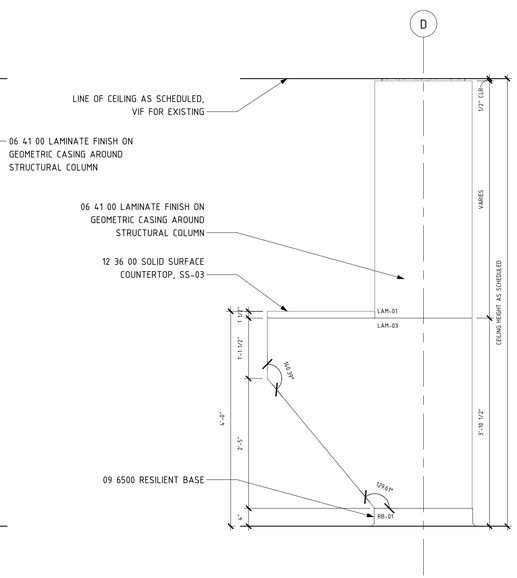
3 | Elevation 3 - a
A9.14a | 3/4" = 1'-0"



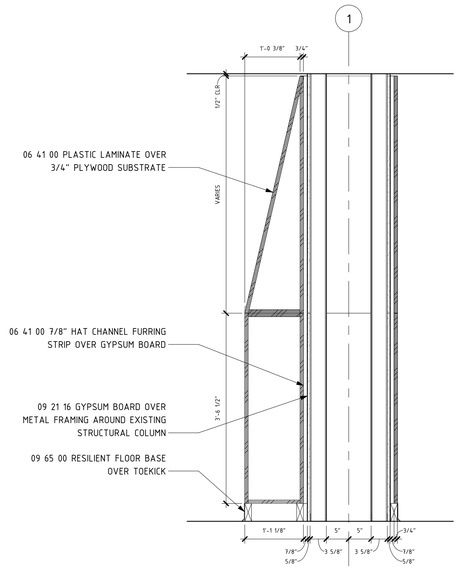
6 | MILLWORK ELEVATION - SIDE
A9.14a | 3/4" = 1'-0"



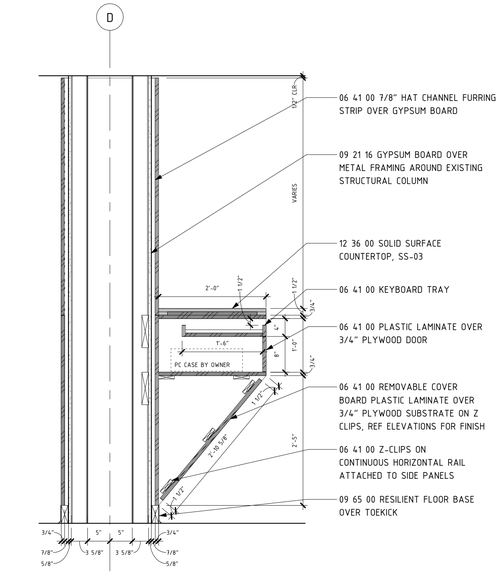
5 | MILLWORK ELEVATION - FRONT
A9.14a | 3/4" = 1'-0"



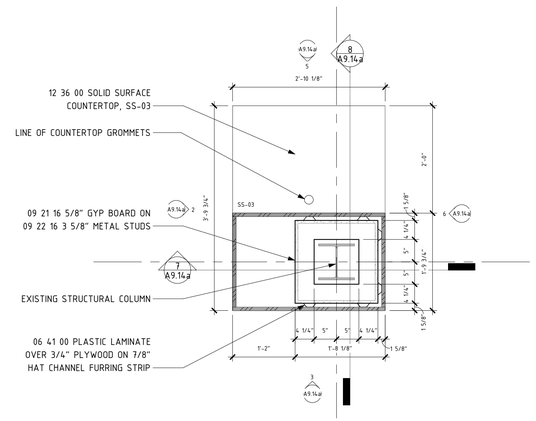
2 | Elevation 4 - a
A9.14a | 3/4" = 1'-0"



7 | MILLWORK SECTION
A9.14a | 3/4" = 1'-0"



8 | MILLWORK SECTION
A9.14a | 3/4" = 1'-0"



1 | MILLWORK ENLARGED PLAN
A9.00 | 3/4" = 1'-0"

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Millwork Detail

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CB

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P23005

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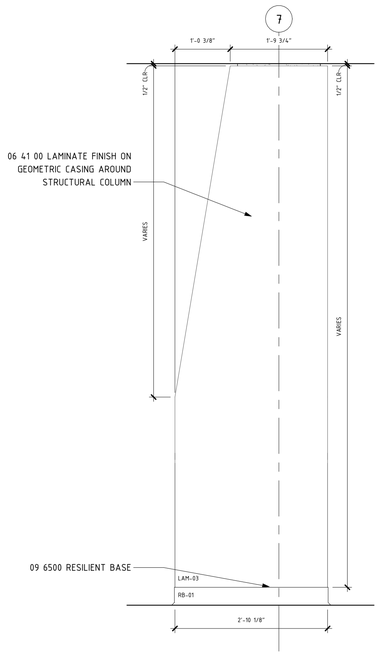
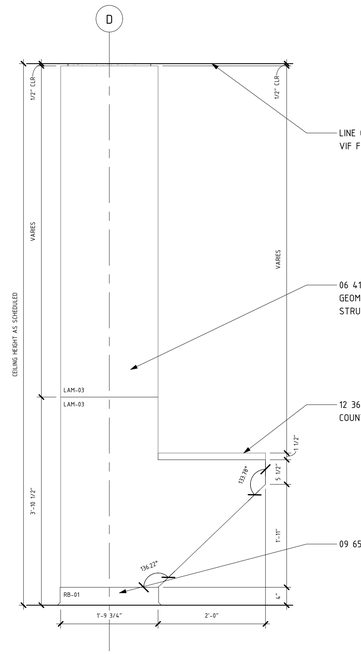
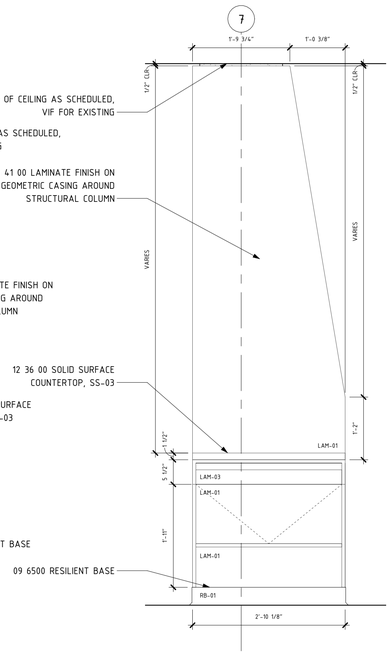
A9.14a



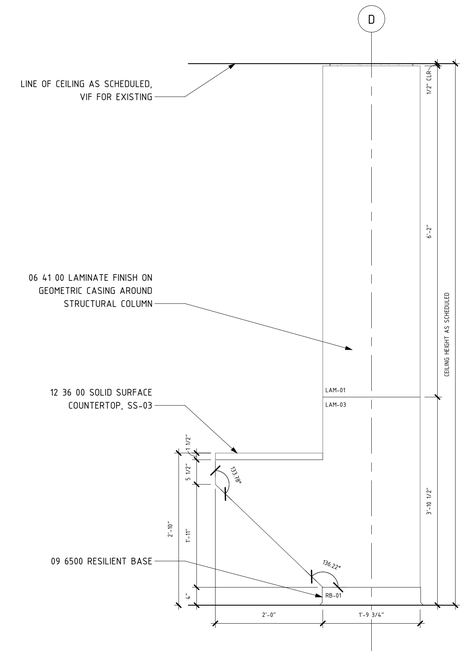
7 | MILLWORK ELEVATION - BACK
A9.14b | 3/4" = 1'-0"



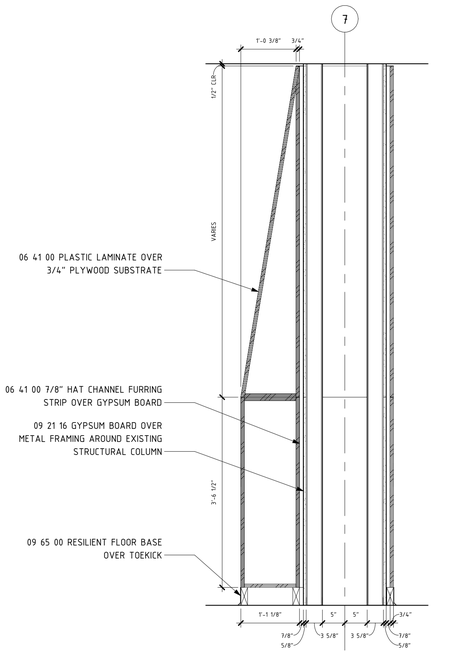
4 | MILLWORK ELEVATION - SIDE
A9.14b | 3/4" = 1'-0"



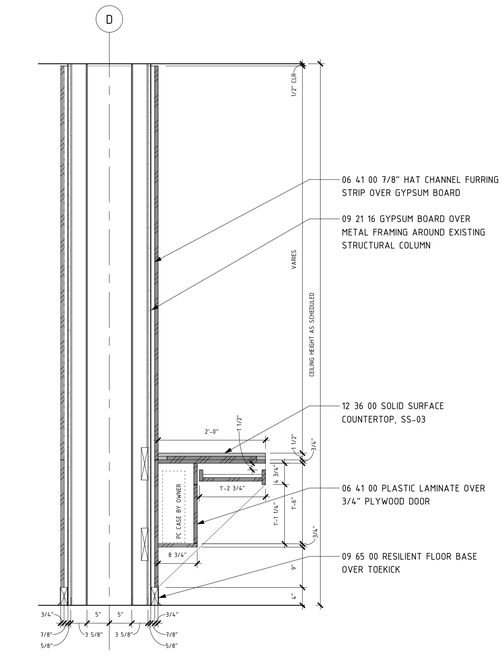
5 | MILLWORK ELEVATION - FRONT
A9.14b | 3/4" = 1'-0"



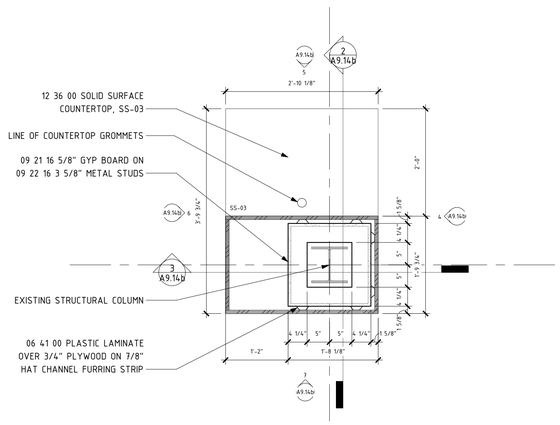
6 | MILLWORK ELEVATION - SIDE
A9.14b | 3/4" = 1'-0"



3 | MILLWORK SECTION
A9.14b | 3/4" = 1'-0"



2 | MILLWORK SECTION
A9.14b | 3/4" = 1'-0"



1 | MILLWORK ENLARGED PLAN
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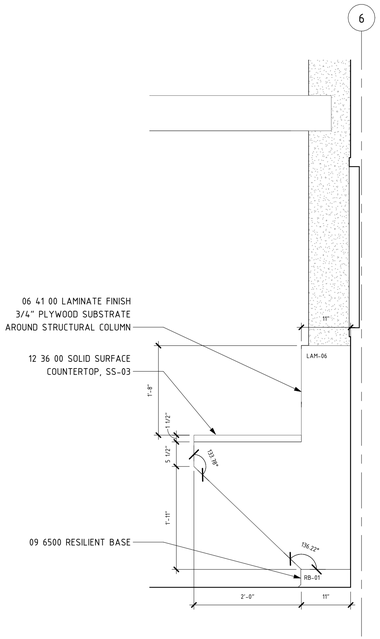
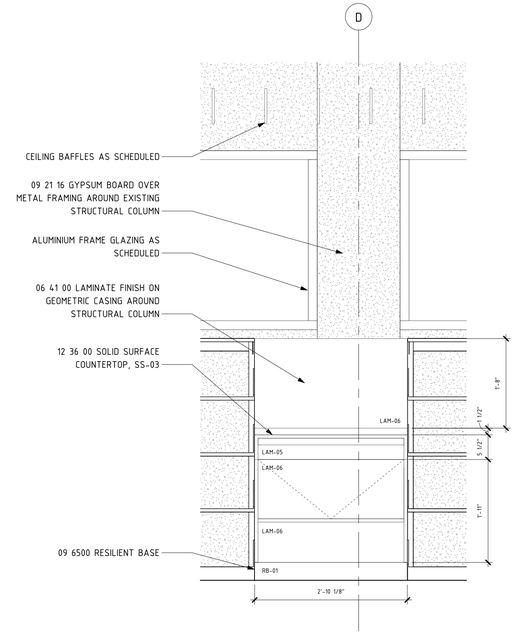
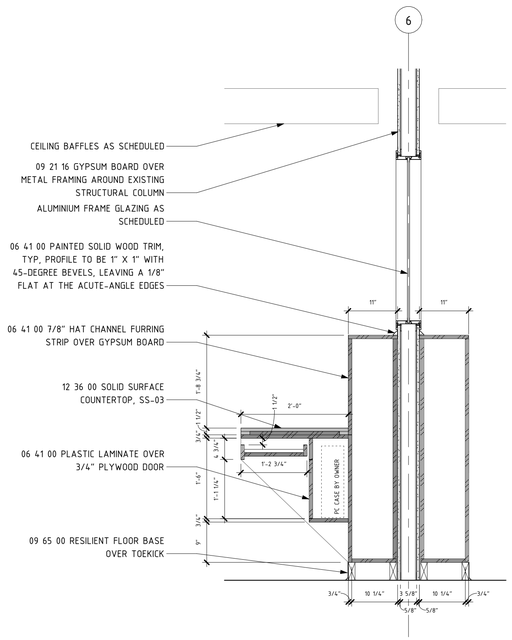
A9.14b



5 | MILLWORK ELEVATION - SIDE
A9.14c | 3/4" = 1'-0"



4 | MILLWORK ELEVATION - FRONT
A9.14c | 3/4" = 1'-0"



3 | MILLWORK SECTION
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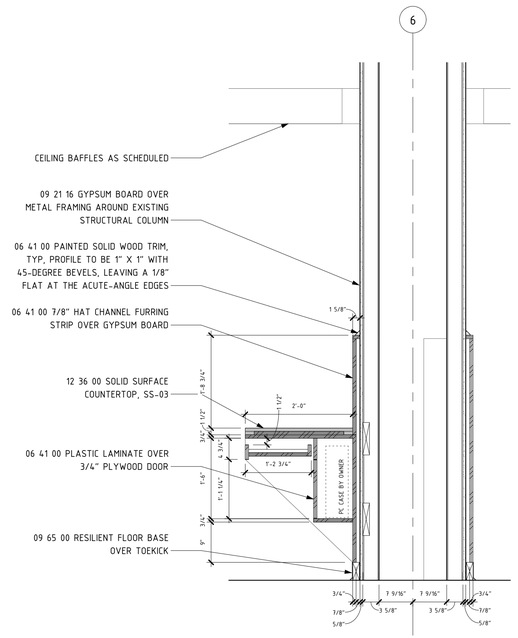
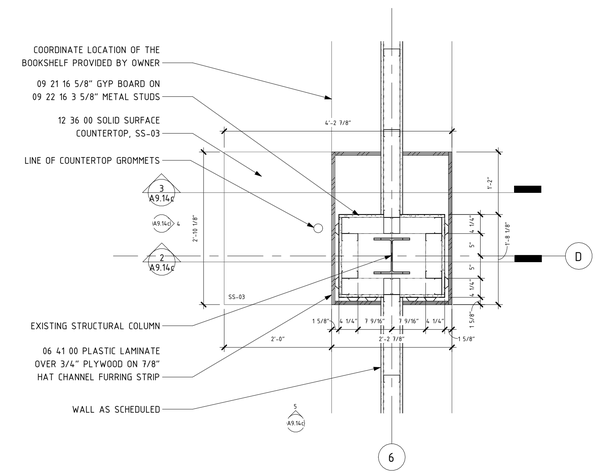


2 | MILLWORK SECTION
A9.14c | 3/4" = 1'-0"



1 | MILLWORK ENLARGED PLAN
A9.00 | 3/4" = 1'-0"

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P23005

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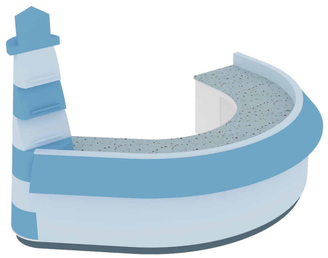
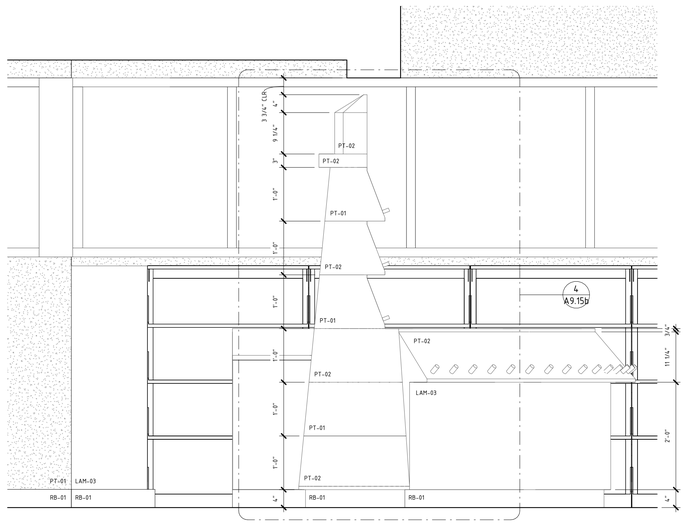
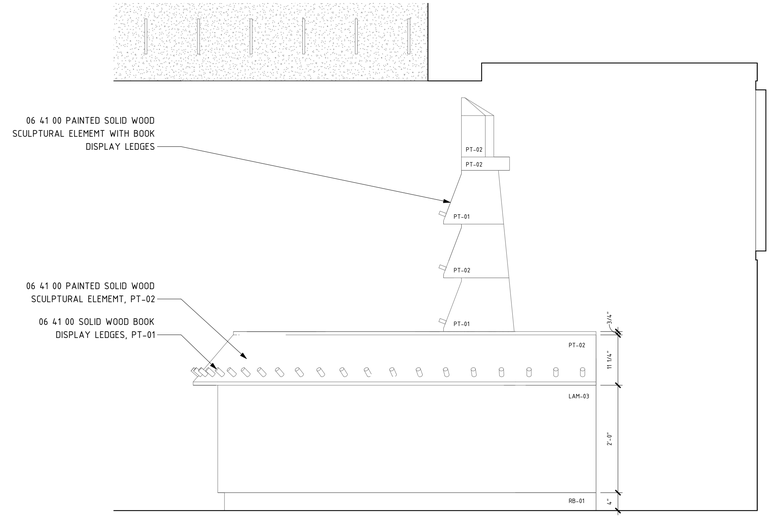
A9.14c



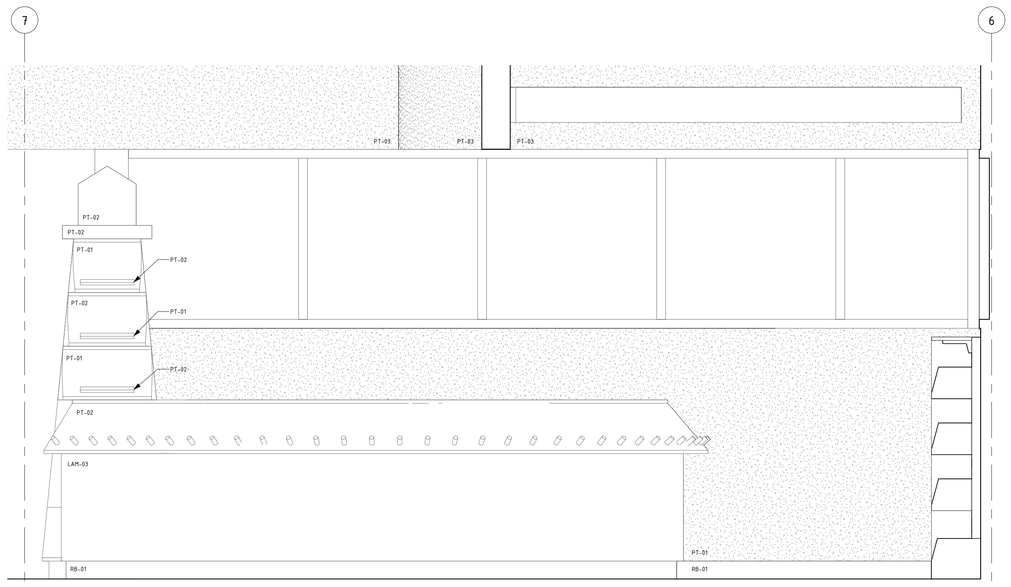
ISOMETRIC VIEW REFERENCE
MW-06 CIRCULATION DESK



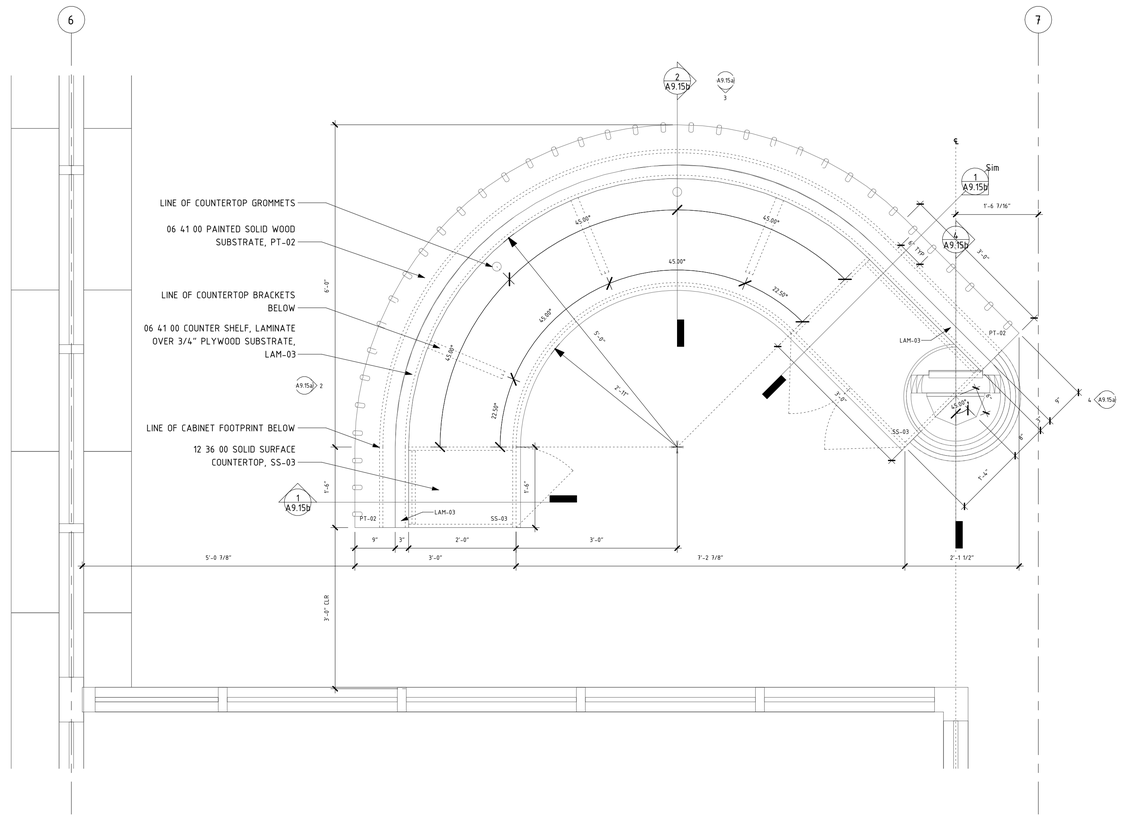
4 | A9.15a MILLWORK ELEVATION - SIDE
3/4" = 1'-0"



2 | A9.15a MILLWORK ELEVATION - SIDE
3/4" = 1'-0"



3 | A9.15a MILLWORK ELEVATION - FRONT
3/4" = 1'-0"



1 | A3.00 MILLWORK ENLARGED PLAN
3/4" = 1'-0"

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No. 1301046115
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Issue Date
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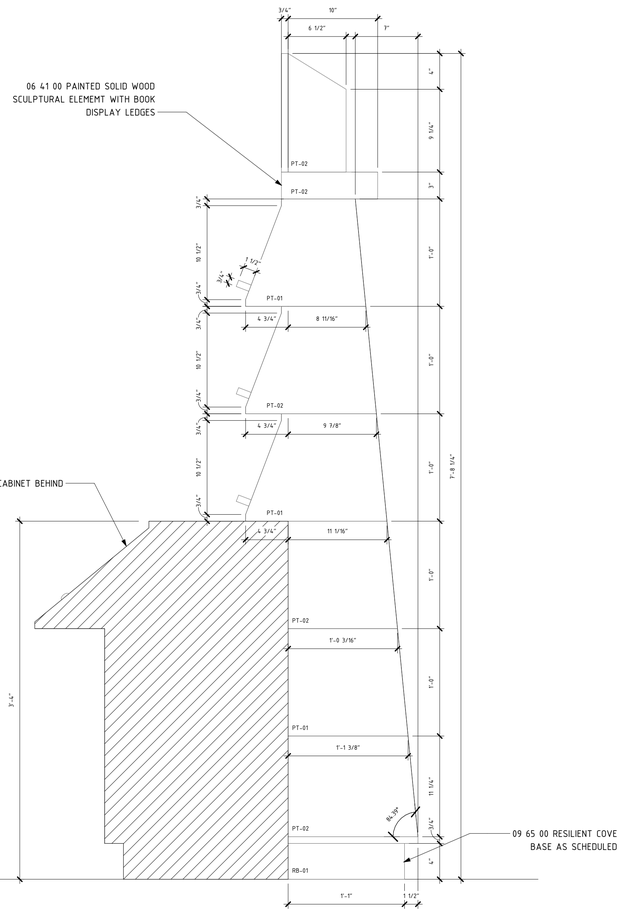
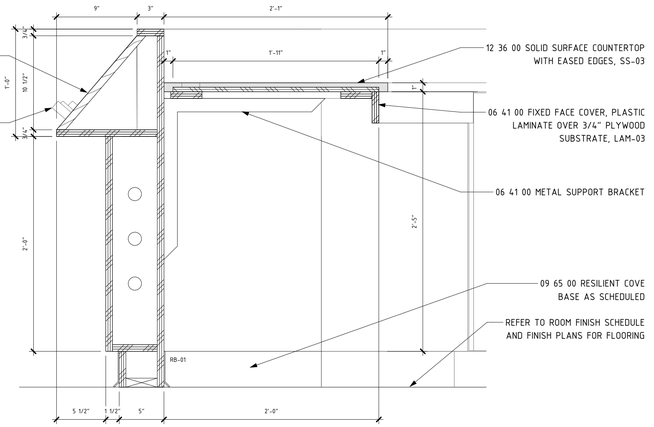
Issued for Date

Project No.
P23005

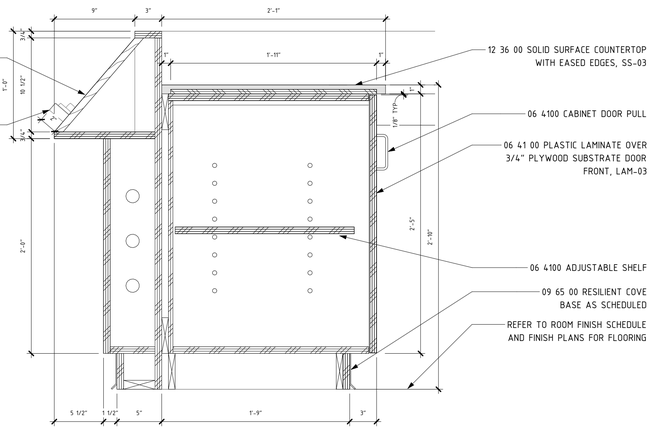
Sheet Number
A9.15a



4 | Section 12
A9.15a | 1 1/2" = 1'-0"



2 | MILLWORK SECTION
A9.15a | 1 1/2" = 1'-0"



1 | MILLWORK SECTION
A9.15a | 1 1/2" = 1'-0"

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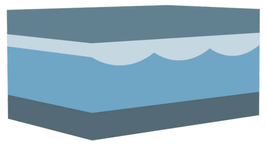
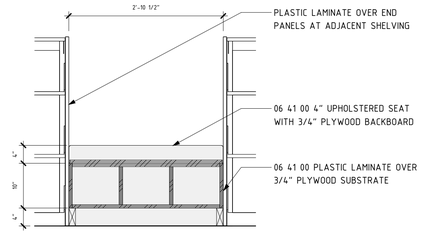
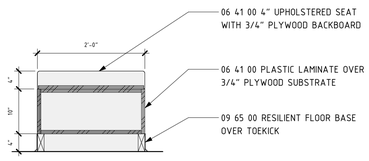
A9.15b



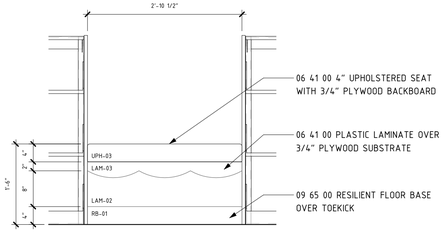
ISOMETRIC VIEW REFERENCE
MW-07 STACK BENCH SEATING 01



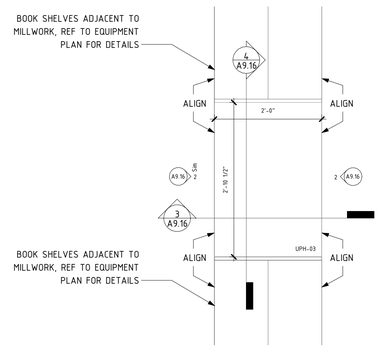
4 | A9.16 MILLWORK SECTION
3/4" = 1'-0"



3 | A9.16 MILLWORK SECTION
3/4" = 1'-0"



2 | A9.16 MILLWORK ELEVATION - FRONT
3/4" = 1'-0"



1 | A9.00 MILLWORK ENLARGED PLAN
3/4" = 1'-0"

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P23005

Sheet Number
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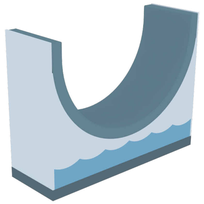
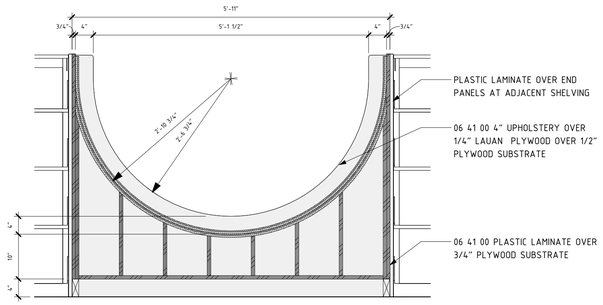
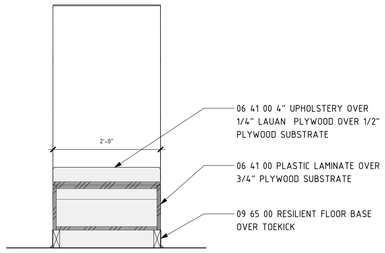


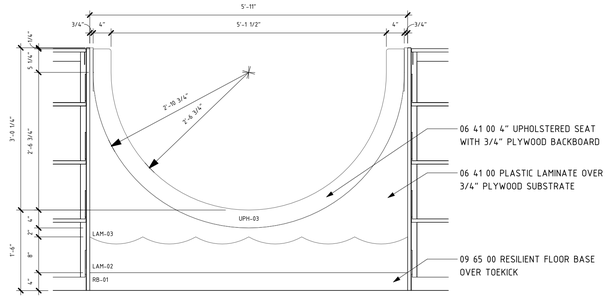
ISOMETRIC VIEW REFERENCE
MW-08 STACK BENCH SEATING 02



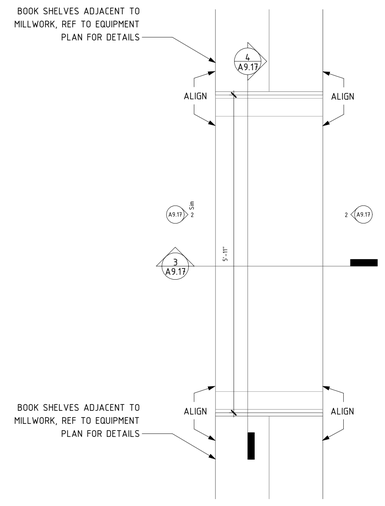
4 | A9.17 MILLWORK SECTION
3/4" = 1'-0"



3 | A9.17 BUILDING SECTION
3/4" = 1'-0"



2 | A9.17 MILLWORK ELEVATION - FRONT
3/4" = 1'-0"



1 | A9.00 MILLWORK ENLARGED PLAN
3/4" = 1'-0"

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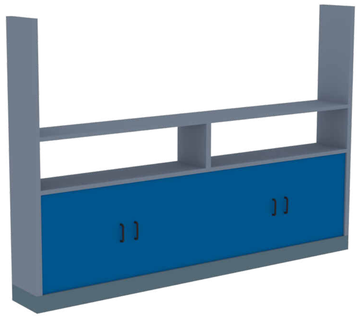
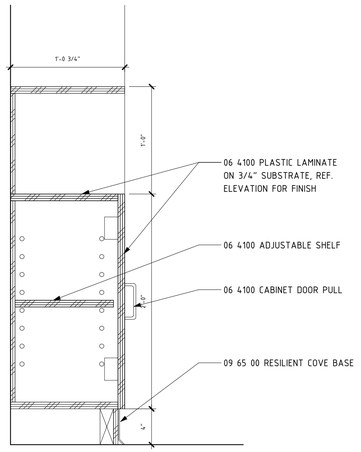
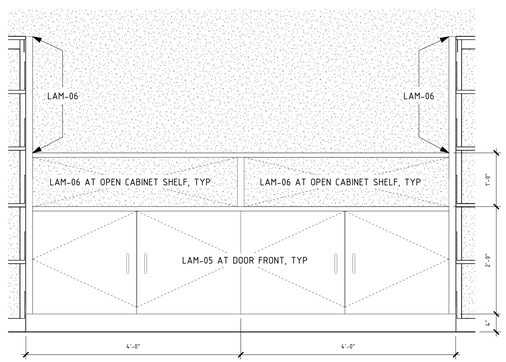


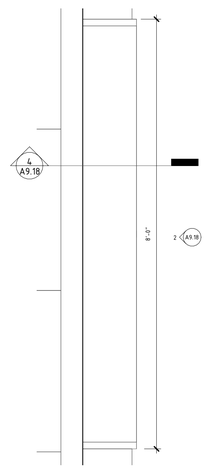
ISOMETRIC VIEW REFERENCE
MW-09 TEEN MEDIA CABINET



4 MILLWORK SECTION
1 1/2" = 1'-0"



2 MILLWORK ELEVATION - FRONT
3/4" = 1'-0"



1 MILLWORK ENLARGED PLAN
3/4" = 1'-0"

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architecture, urbanism, design

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SCSPL

STATE OF MICHIGAN
MICHAEL CRAIG BORUM
ARCHITECT
No. 1301046115
LICENSED ARCHITECT

Drawing Name
Millwork Detail

Drawn By
YZ

Checked By
CB

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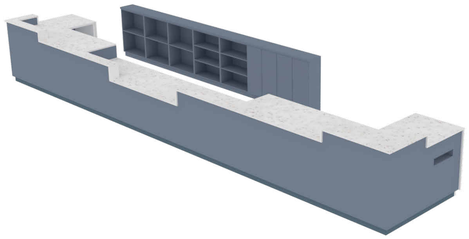
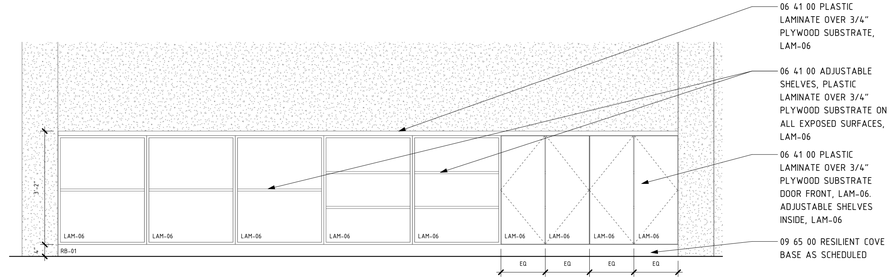
A9.18



ISOMETRIC VIEW REFERENCE
MW-10 CIRCULATION DESK



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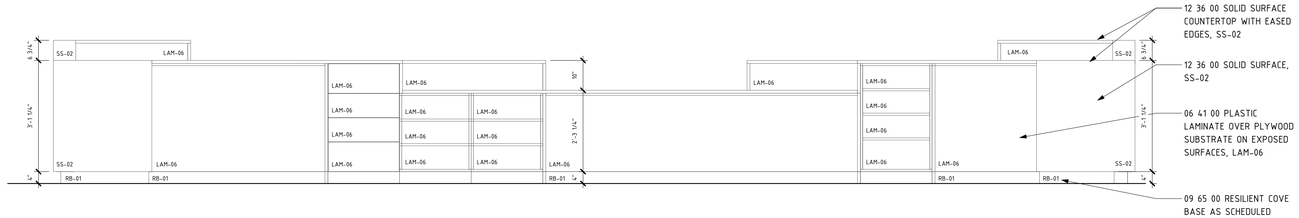
1/2" = 1'-0"



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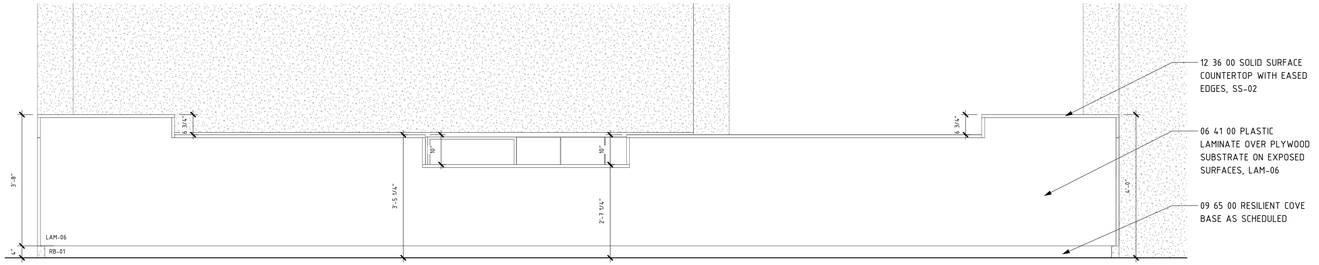

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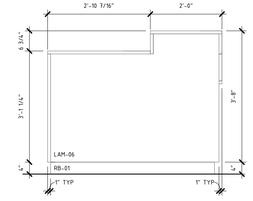
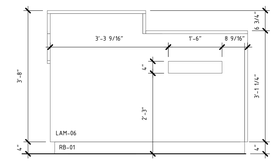


6 | A9.19a MILLWORK ELEVATION - SIDE
1/2" = 1'-0"



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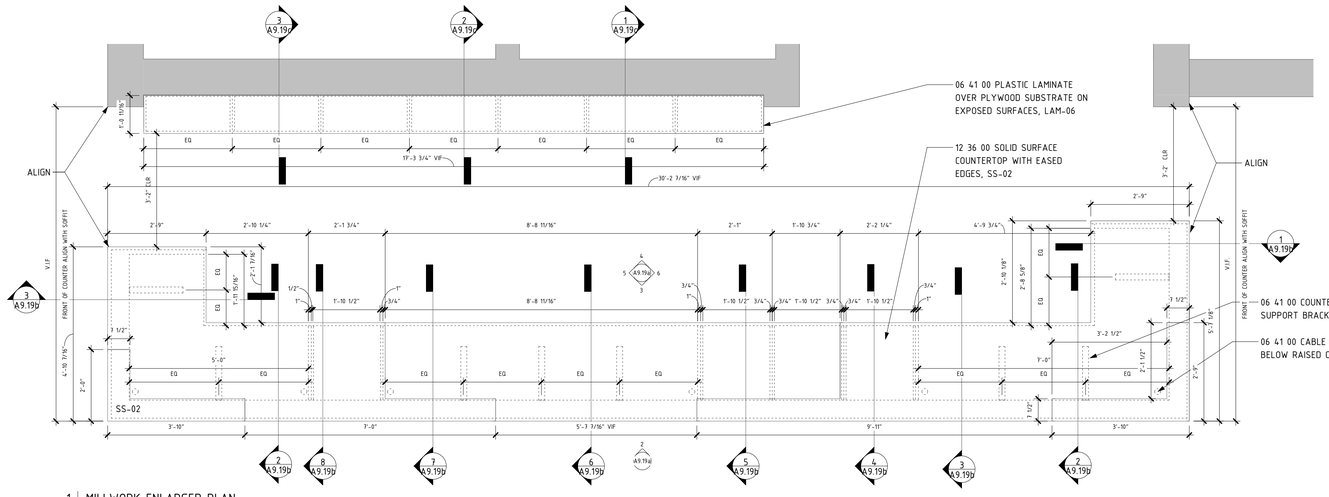
1/2" = 1'-0"



1 | A9.00 MILLWORK ENLARGED PLAN
1/2" = 1'-0"

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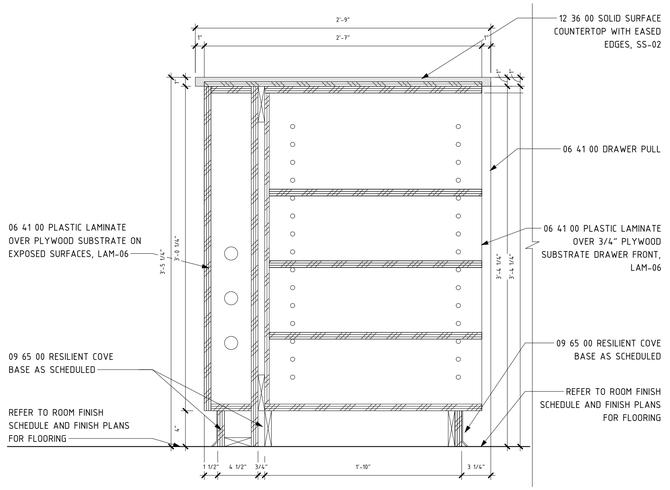

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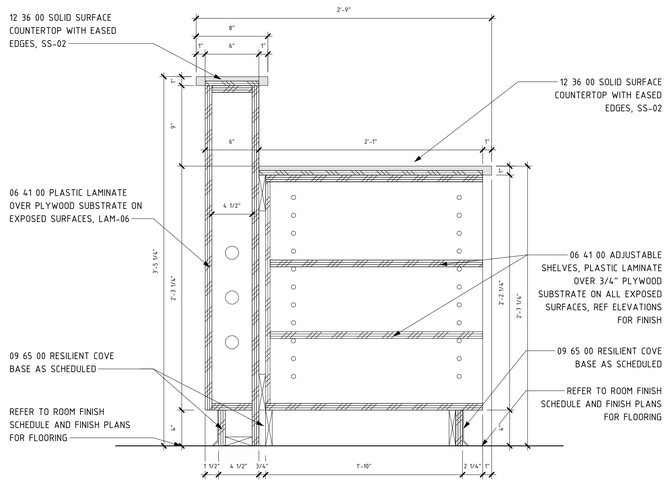
1 1/2" = 1'-0"



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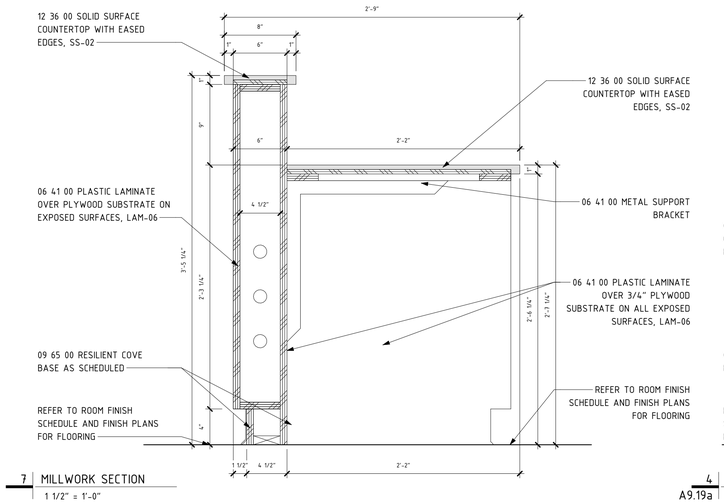
A9.19a | 1 1/2" = 1'-0"



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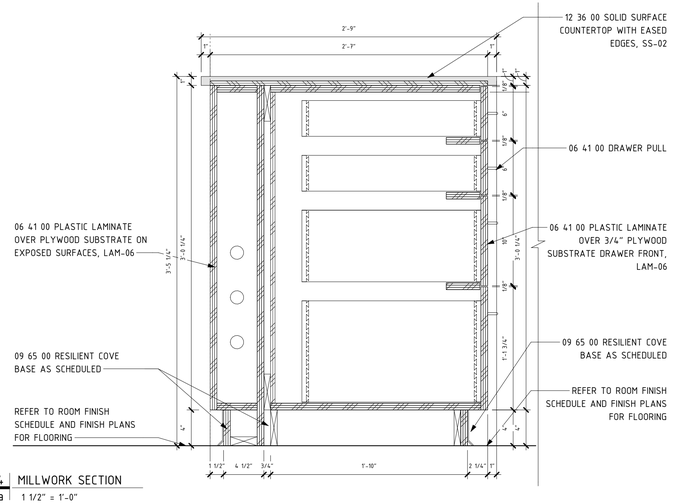
1 1/2" = 1'-0"



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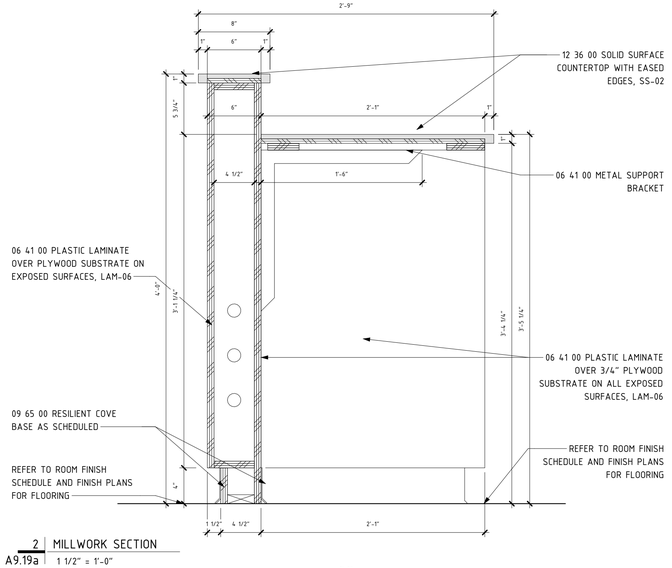
A9.19a | 1 1/2" = 1'-0"



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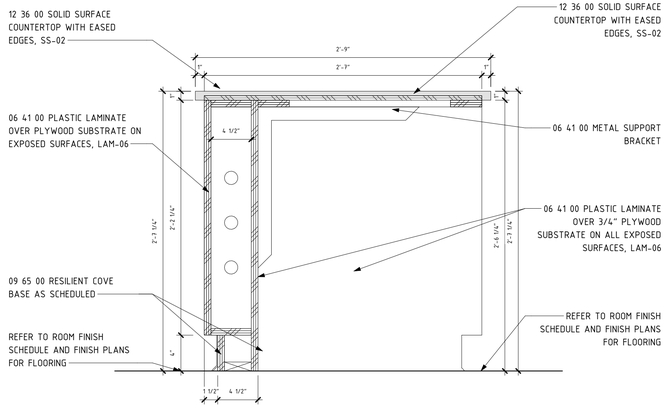
A9.19a | 1 1/2" = 1'-0"



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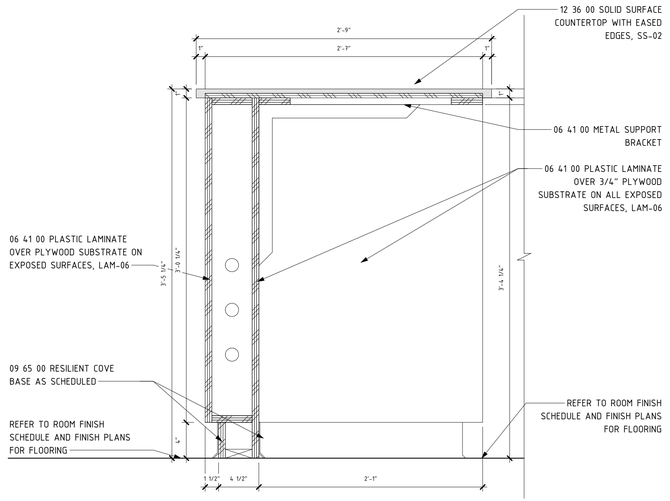
1 1/2" = 1'-0"



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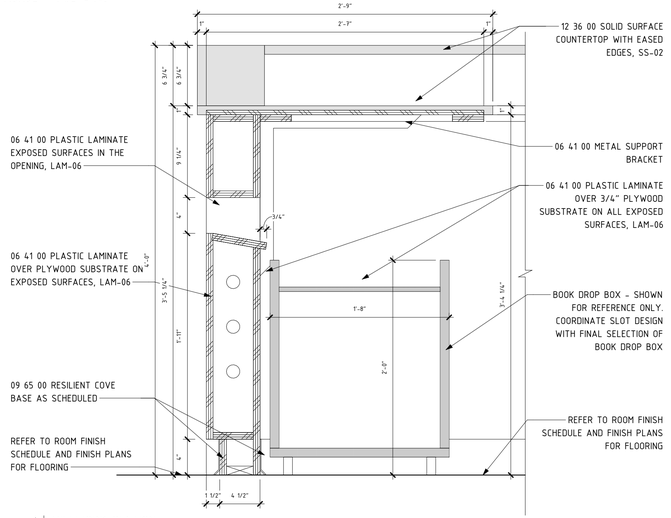
A9.19a | 1 1/2" = 1'-0"



1 | MILLWORK SECTION
A9.19a | 1 1/2" = 1'-0"

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Drawing Name

Millwork Detail

Drawn By

YZ

Checked By

CB

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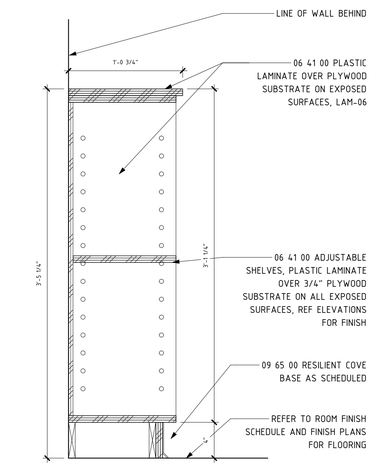
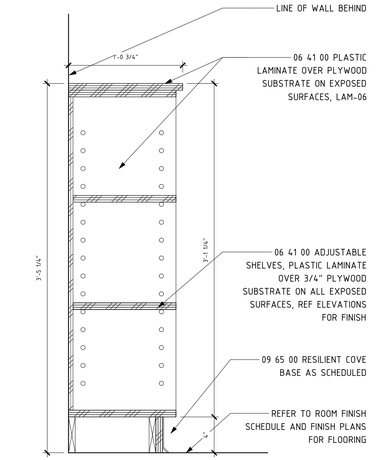
P23005

Sheet Number

A9.19b



3 | MILLWORK SECTION
1 1/2" = 1'-0"



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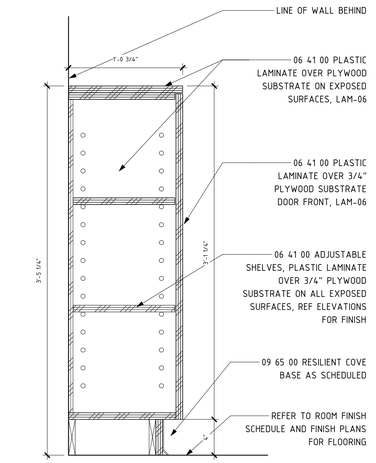

1 | MILLWORK SECTION
1 1/2" = 1'-0"

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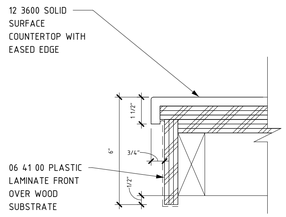
A9.19c

ISOMETRIC VIEW REFERENCE
MW-11 STORYTIME BASE & UPPER CABINET



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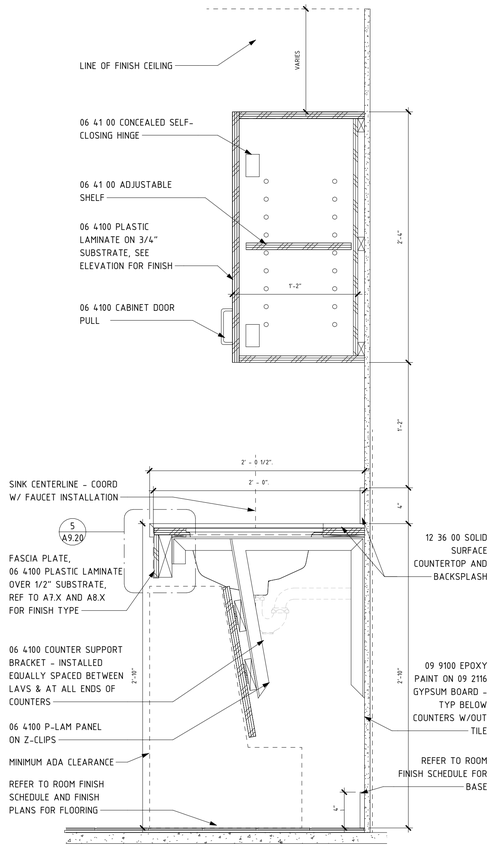
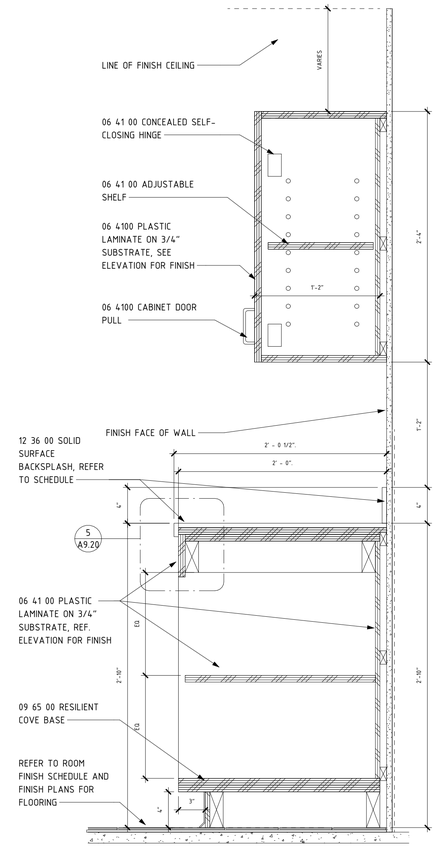
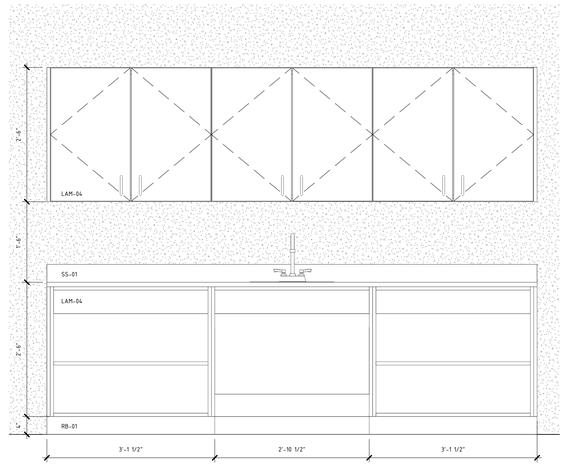
3" = 1'-0"



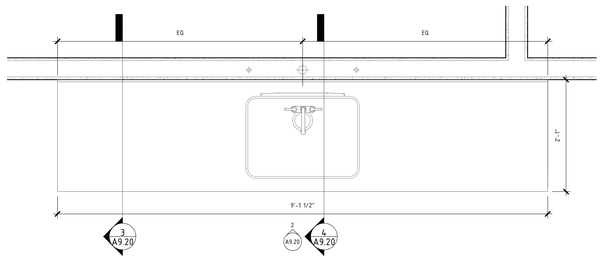
4 MILLWORK SECTION
1 1/2" = 1'-0"



3 MILLWORK SECTION
1 1/2" = 1'-0"



2 MILLWORK ELEVATION - FRONT
3/4" = 1'-0"



1 MILLWORK ENLARGED PLAN
3/4" = 1'-0"

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Project Name
SCSPL

Drawing Name
Millwork Detail

Drawn By
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Checked By
CB

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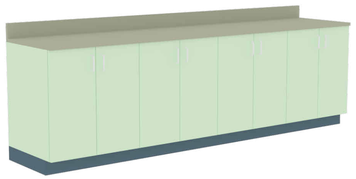
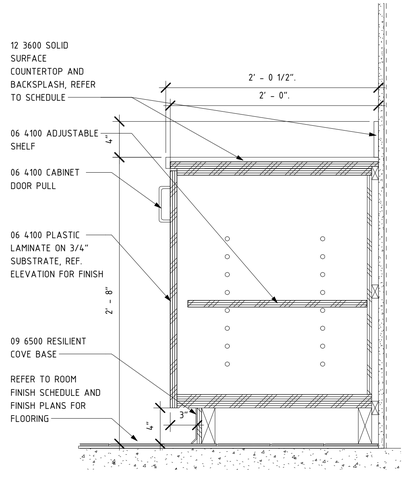
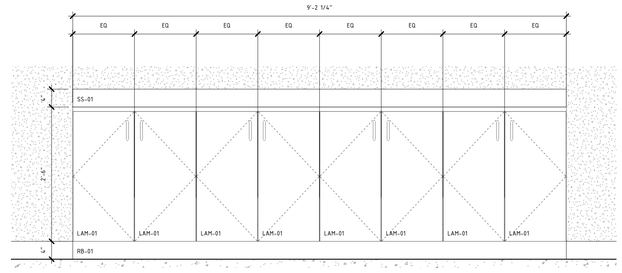


ISOMETRIC VIEW REFERENCE
MW-12 MAKERSPACE BASE CABINET



3 | MILLWORK SECTION
1 1/2" = 1'-0"



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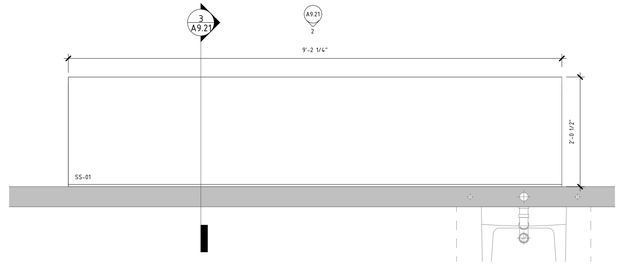
A9.21 | 3/4" = 1'-0"



1 | MILLWORK ENLARGED PLAN
A9.00 | 3/4" = 1'-0"

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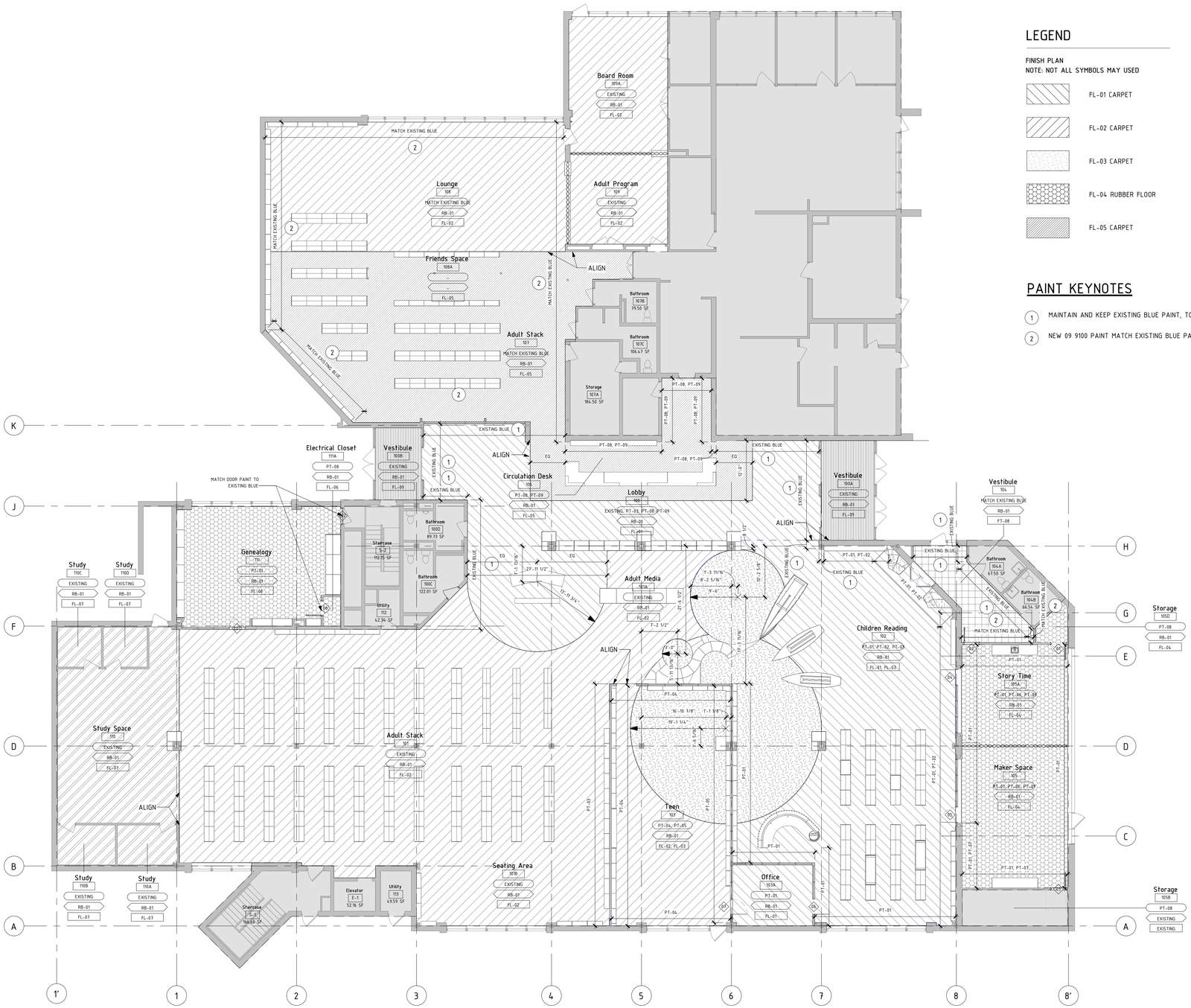
P23005

Sheet Number
A9.21



1 N-Main Level Floor Finish Plan
3/32" = 1'-0"

GENERAL NOTES

1. REFER TO ROOM FINISH SCHEDULE AND COLOR CODES FOR MORE INFORMATION
2. CONTRACTOR TO FIELD VERIFY EXISTING SLAB AND SUBFLOOR CONDITIONS BEFORE INSTALLATION. CONSULT ARCHITECT WHEN ACTUAL FIELD CONDITIONS VARY FROM THOSE SHOWN ON CONSTRUCTION DOCUMENTS.

LEGEND

FINISH PLAN
NOTE: NOT ALL SYMBOLS MAY USED

- FL-01 CARPET
- FL-02 CARPET
- FL-03 CARPET
- FL-04 RUBBER FLOOR
- FL-05 CARPET
- FL-06 RUBBER FLOOR
- FL-07 CARPET
- FL-08 FLOOR TILE
- FL-09 ENTRY MAT
- EXISTING FLOOR FINISH

ROOM NAME ← ROOM NAME
101 ← ROOM NUMBER
XX-XX ← WALL FINISH, REFER TO COLOR CODES
XX-XX ← BASE, REFER TO COLOR CODES
XX-XX ← FLOOR FINISH, REFER TO COLOR CODES

PT-XX ACCENT MATERIAL XX-XX, REFER TO COLOR CODES

PAINT KEYNOTES

1. MAINTAIN AND KEEP EXISTING BLUE PAINT, TOUCHING UP AS NECESSARY.
2. NEW 09 9100 PAINT MATCH EXISTING BLUE PAINT

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Drawing Name
Finish Plans

Drawn By
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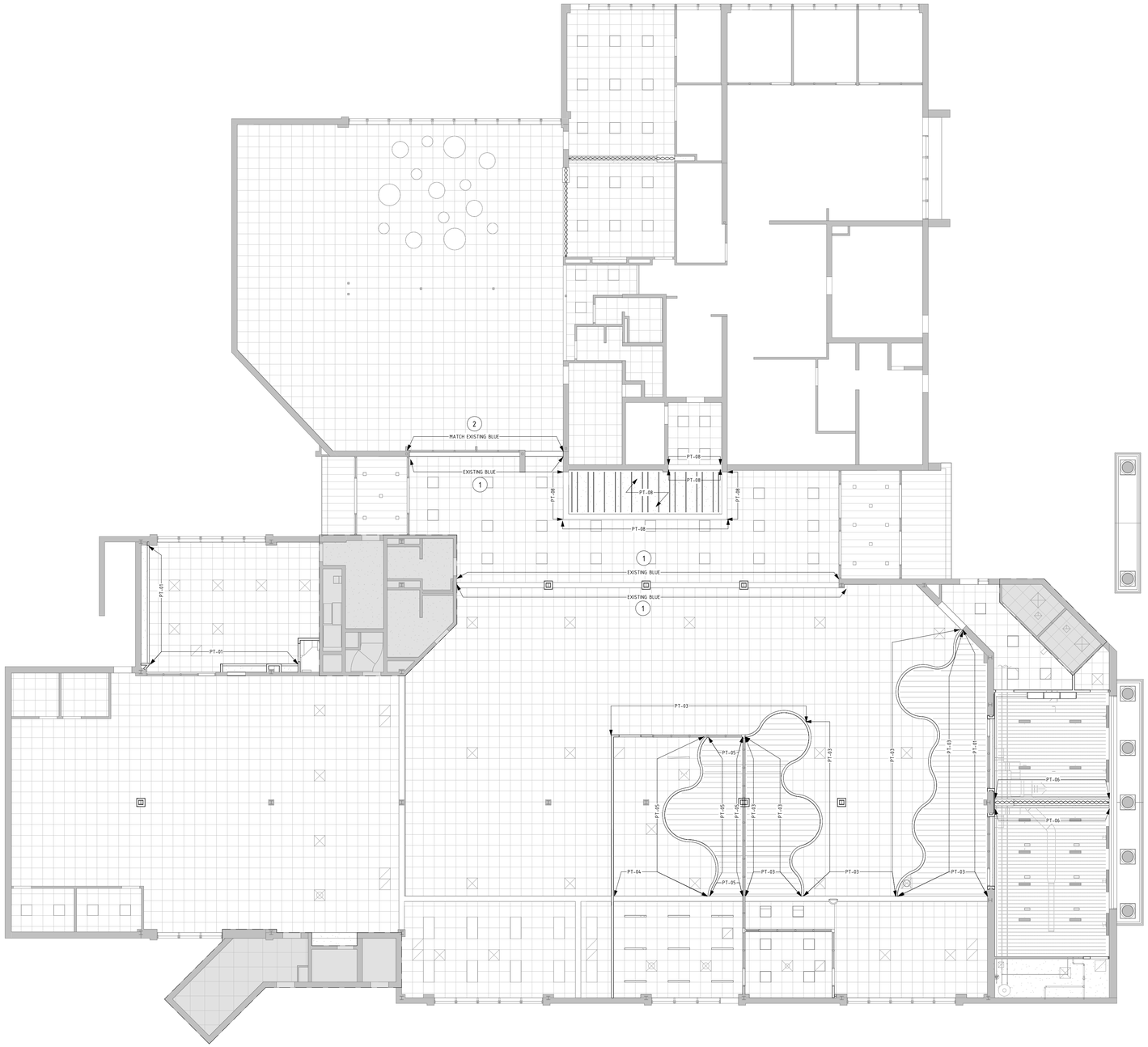
P23005

Sheet Number
A10.00



1 | N-Main Level Floor Finish RCP
3/32" = 1'-0"

GENERAL NOTES

1. FINISH RCP PLAN INDICATES LOCATIONS OF CEILINGS, WALLS, AND SOFFITS RECEIVING ACCENT PAINT. REFER TO FINISH PLANS AND INTERIOR ELEVATIONS FOR WALL PAINTS.
2. REFER TO RCPs AND ENLARGED RCPs FOR CEILING TYPES.
3. REFER TO ENLARGED RCPs FOR ACOUSTICAL CEILING BAFFLE COLOR CODES AND MOUNTING HEIGHTS. REFER TO COLOR CODE FOR BAFFLE SYSTEM TYPE AND COLOR. SEE SPECIFICATION 09 8430 – ACOUSTIC CEILING BAFFLES FOR DETAILS.
4. FOR EXPOSED CEILINGS, PROVIDE 09 9100 BLACKOUT PAINT (PT-11) ON EXPOSED DECK, INCLUDING DUCTWORK AND EXPOSED MEP EQUIPMENT.
5. REFER TO REFLECTED CEILING PLAN AND CEILING SECTION DETAILS FOR CEILING CONDITIONS.

CEILING KEY

- 24"x48" SUSPENDED LAY-IN ACOUSTICAL CEILING
- 24"x24" SUSPENDED LAY-IN ACOUSTICAL CEILING
- GYPSUM BOARD ABOVE BAFFLES (PAINTED)
- EXPOSED OR EXISTING CONSTRUCTION TO REMAIN (PAINTED U.O.N.)
- AREAS NOT SCOPE

PAINT KEYNOTES

1. MAINTAIN AND KEEP EXISTING BLUE PAINT, TOUCHING UP AS NECESSARY.
2. NEW 09 9100 PAINT MATCH EXISTING BLUE PAINT

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Finish RCP

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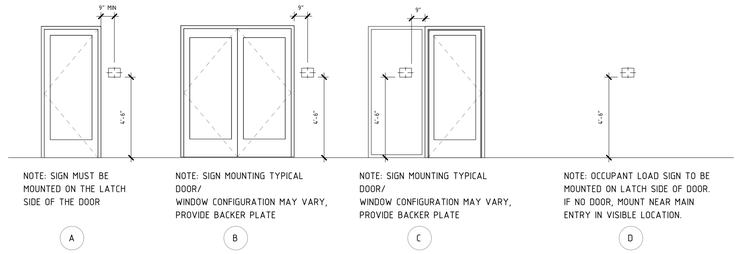
P23005

Sheet Number
A10.01

INTERIOR SIGNAGE SCHEDULE

Assoc. Room Number	Assoc. Room Name	Sign Type/Tag	Mounting Type	Room Name Text	REMARKS
100	Lobby	S2	D	-	
100	Lobby	S2	D	-	
103A	Office	S1	C	Youth Services Office	
103A	Office	S1	C	Youth Services Office	
104	Vestibule	S1	A	Vestibule	
104A	Bathroom	S3	A	Family Restroom	
104B	Bathroom	S3	A	Family Restroom	
105	Maker Space	S1	C	Maker Space	
105A	Story Time	S1	C	Story Time Room	
105B	Storage	S1	A	Storage	
105D	Storage	S1	A	Storage	
107A	Storage	S1	A	Storage	
109A	Board Room	S1	A	Board Room	
109A	Board Room	S2	D	-	
111	Genealogy	S1	A	Genealogy Room	
111A	Electrical Closet	S1	A	Electrical Closet	



NOTE: SIGN MUST BE MOUNTED ON THE LATCH SIDE OF THE DOOR

A

NOTE: SIGN MOUNTING TYPICAL DOOR/ WINDOW CONFIGURATION MAY VARY, PROVIDE BACKER PLATE

B

NOTE: SIGN MOUNTING TYPICAL DOOR/ WINDOW CONFIGURATION MAY VARY, PROVIDE BACKER PLATE

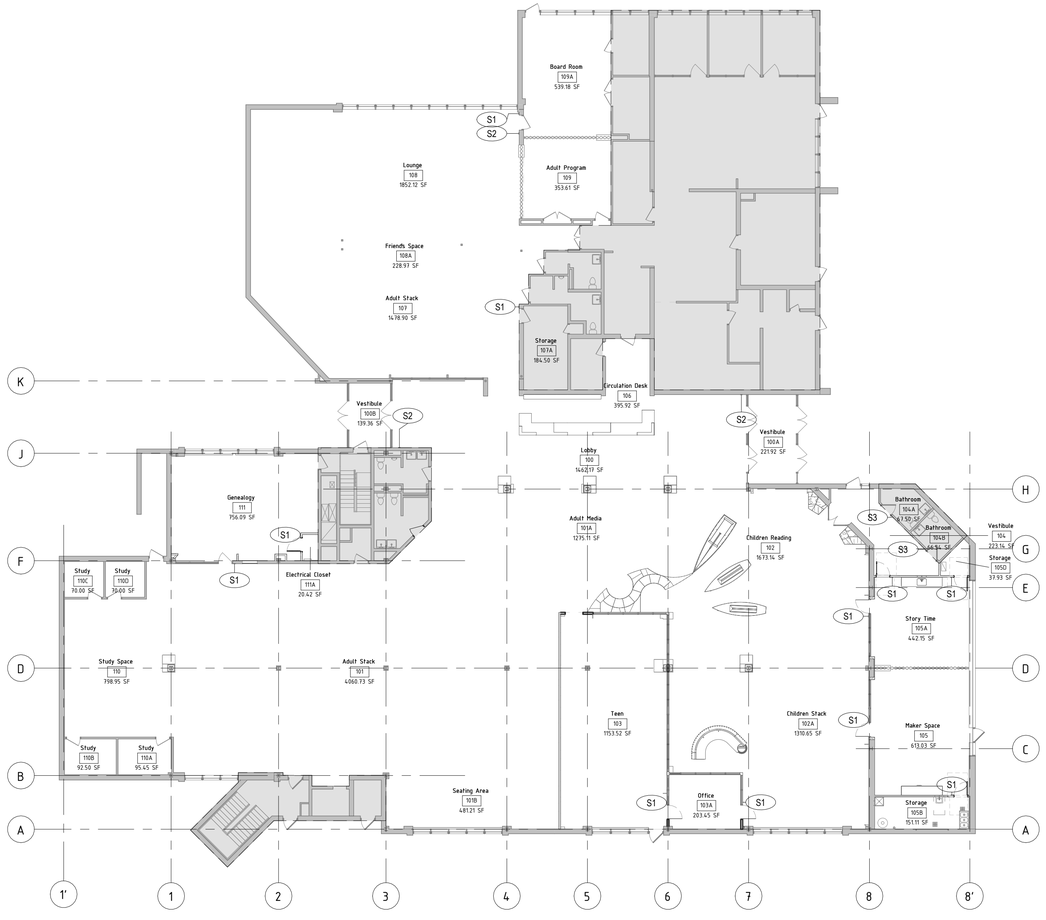
C

NOTE: OCCUPANT LOAD SIGN TO BE MOUNTED ON LATCH SIDE OF DOOR. IF NO DOOR, MOUNT NEAR MAIN ENTRY IN VISIBLE LOCATION.

D

Interior Signage Mounting Types

1/4" = 1'-0"

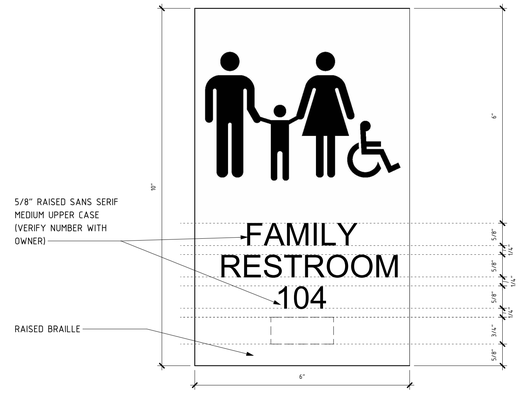


2 N-Main Level Signage Plan

1/16" = 1'-0"

GENERAL NOTES

1. DRAWING IS FOR REFERENCE ONLY, CONTRACTOR NEED TO VERFITY WITH OWNER FOR TYPE, ROOM NAME AND ALL RELATED REQUIEMENT.



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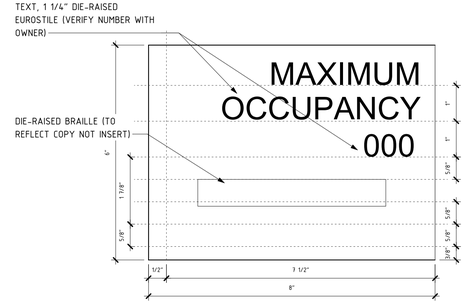

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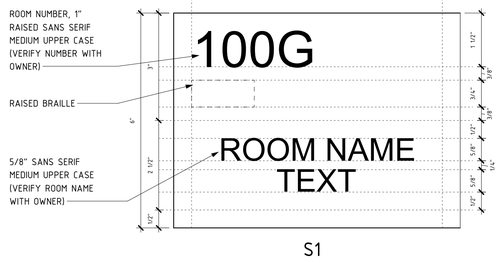

S1

1 SIGN TYPES

6" = 1'-0"

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No. 1301046115
LICENSED ARCHITECT

Project Name

SCSPL

Drawing Name

Interior Signage Plan (For Ref. Only)

Drawn By

YZ

Checked By

CB

Issue Date

05/16/2025 Permit& Bid Set

Revisions

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Project No.

P23005

Sheet Number

SG.100

STRUCTURAL GENERAL NOTES

GENERAL

1. THESE RENOVATIONS HAVE BEEN DESIGNED AND SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE MICHIGAN BUILDING CODE, 2021 EDITION.
2. THE OWNER WILL EMPLOY QUALIFIED SPECIAL INSPECTORS TO PERFORM INSPECTIONS IN ACCORDANCE WITH CHAPTER 17 OF THE MICHIGAN BUILDING CODE, EXCEPT AS NOTED BELOW. SPECIAL INSPECTIONS WILL BE PERFORMED FOR THE FOLLOWING:
   A. MASONRY.
      I. MASONRY SPECIAL INSPECTION SHALL BE PERFORMED IN ACCORDANCE WITH TMS 402 & TMS 602 AND SHALL BE LEVEL B QUALITY ASSURANCE.
   B. STEEL.
      I. STEEL SPECIAL INSPECTION SHALL BE PERFORMED IN ACCORDANCE WITH AISC 360.
3. WHEN "PROFESSIONAL ENGINEER" IS REFERRED TO IN THE FOLLOWING NOTES, IT DENOTES A LICENSED PROFESSIONAL ENGINEER REGISTERED IN THE STATE OF MICHIGAN, QUALIFIED TO PERFORM THE WORK.
4. THE CONTRACTOR SHALL VISIT THE SITE TO BECOME FAMILIAR WITH THE EXISTING CONDITIONS, THE OWNERS REQUIREMENTS FOR ACCESS TO THE SITE AND CONTINUED OPERATIONS DURING CONSTRUCTION.
5. THE PLAN, DETAIL DIMENSIONS & ELEVATIONS RELATIVE TO THE EXISTING STRUCTURE HAVE BEEN TAKEN FROM AVAILABLE DRAWINGS. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY SUCH DIMENSIONS, ELEVATIONS & DETAILS AS NECESSARY AND MAKE APPROVED ADJUSTMENTS PRIOR TO CONSTRUCTION OR ORDERING OF MATERIAL.
6. THE CONTRACTOR SHALL SUBMIT STRUCTURAL STEEL SHOP DRAWINGS PRIOR TO FABRICATION. ALLOW (2) WEEKS FOR ENGINEER REVIEW.
7. THE STRUCTURE SHALL BE CONSIDERED TO BE IN AN UNSTABLE CONDITION UNTIL ALL STRUCTURES ARE COMPLETED. CONTRACTOR SHALL PROVIDE TEMPORARY BRACING FOR STABILITY AND TO RESIST LATERAL LOADS DURING ERECTION.

DIVISION 2 - DEMOLITION/SHORING

1. CONTRACTOR SHALL PROVIDE ALL NECESSARY SHORING WHERE REQUIRED DURING CONSTRUCTION. SHORING SHALL BE DESIGNED & DETAILED UNDER THE DIRECT SUPERVISION OF A PROFESSIONAL ENGINEER. SHORING PROCEDURES, DESIGNS AND DETAILS SHALL BE SUBMITTED FOR REVIEW PRIOR TO COMMENCEMENT OF WORK, ALLOW (2) WEEKS FOR ENGINEER TO REVIEW.
2. THE CONTRACTOR IS RESPONSIBLE FOR DETERMINING ERECTION PROCEDURE AND SEQUENCING AND TO SUBMIT WRITTEN PROCEDURES TO ENSURE THE SAFETY OF THE STRUCTURE AND ITS COMPONENTS DURING ERECTION.
3. FIELD VERIFY ALL EXISTING CONDITIONS PRIOR TO DEMOLITION. IF CONDITIONS EXIST THAT ARE DIFFERENT FROM WHAT IS INDICATED ON THE DRAWINGS, NOTIFY ARCHITECT FOR DIRECTION BEFORE PROCEEDING.

DIVISION 3 - CONCRETE

1. THE LATEST REVISION OF THE FOLLOWING CODES GOVERN THE DESIGN, DETAILING, FABRICATION AND CONSTRUCTION OF ALL REINFORCED CONCRETE:
   A. AMERICAN CONCRETE INSTITUTE (ACI) ACI 318, BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE.
   B. ACI 315, DETAILS & DETAILING OF CONCRETE REINFORCEMENT.
2. REINFORCING STEEL SHALL CONFORM TO THE FOLLOWING ASTM MATERIAL SPECIFICATIONS.
   A. DEFORMED BAR REINFORCING: ASTM A615 GRADE 60.
   B. WELDED WIRE REINFORCEMENT: A1064 (FLAT SHEETS ONLY).
3. ALL INTERIOR CONCRETE SHALL BE AS FOLLOWS:
   A. MINIMUM 28-DAY COMPRESSIVE STRENGTH (f'c) = 4000 PSI.
   B. SLUMP = 3" TO 5".
   C. WATER/CEMENTITIOUS RATIO = 0.50.
   D. EXPOSURE CLASSES = F0, S0, W1, & C1.
4. SPLICES FOR DEFORMED BARS SHALL BE CLASS B WITH APPLICABLE INCREASES FOR BAR SPACING, COVER, TOP BAR EFFECT ETC. PER ACI 318.
5. BEFORE PLACING CONCRETE REFER TO ARCHITECTURAL, MECHANICAL AND ELECTRICAL DRAWINGS FOR LOCATIONS OF PIPE SLEEVES, EMBEDDED ITEMS, OPENINGS, EQUIPMENT PADS, ELECTRICAL CONDUITS, RECESSES, DRAINS, ETC. ALL OPENINGS FOR PIPE, CONDUITS, ETC. SHALL BE SLEEVED. MINIMUM SLEEVE SPACING SHALL BE 3 SLEEVE DIAMETERS.
6. SUGGESTED CONSTRUCTION AND CONTROL JOINT LOCATIONS ARE INDICATED ON THE DRAWINGS. THE CONTRACTOR MAY DEVIATE FROM SUGGESTED JOINT LOCATIONS WITH PRIOR APPROVAL OF THE ARCHITECT.
7. CONCRETE CONTROL JOINTS SHALL BE CUT AS SOON AS CONCRETE HAS HARDENED SUFFICIENTLY TO PREVENT DISLODGMENT OF AGGREGATES. SAW A CONTINUOUS SLOT TO A DEPTH OF 1/4 THE THICKNESS OF THE SLAB BUT NOT LESS THAN 1". COMPLETE SAWING WITHIN 12 HOURS AFTER PLACEMENT.
8. PROVIDE BENT CORNER BARS IN ALL WALLS AND FOOTINGS OF THE SAME SIZE AND NUMBER AS THE CONTINUOUS REINFORCEMENT.
9. CONCRETE SHALL BE TESTED BY AN INDEPENDENT TESTING AGENCY. A SET OF (3) CONCRETE TEST CYLINDERS SHALL BE MADE AND TESTED FOR COMPRESSION STRENGTH AT 7 AND 28 DAYS OR EVERY 50 CUBIC YARDS OF CONCRETE CAST (MINIMUM OF (1) SET PER DAY OF CASTING). ALSO SLUMP AND UNIT WEIGHT TESTS SHALL BE PERFORMED EVERY OTHER TRUCK LOAD. CONTRACTOR MADE CONCRETE TEST CYLINDERS ARE NOT ACCEPTABLE.

DIVISION 4 - MASONRY

1. THE LATEST REVISION OF THE FOLLOWING CODES GOVERN THE DESIGN, DETAILING AND CONSTRUCTION OF ALL MASONRY:
   A. THE MASONRY SOCIETY (TMS) TMS 402, BUILDING CODE REQUIREMENTS FOR MASONRY STRUCTURES.
   B. TMS 602, SPECIFICATIONS FOR MASONRY STRUCTURES.
2. ALL MASONRY SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF F'm = 2000 PSI.
3. ALL MORTAR SHALL BE TYPE S, PROPORTIONED BY VOLUME ACCORDING TO ASTM C270.
4. ALL GROUT SHALL HAVE A MINIMUM 28 DAY COMPRESSIVE STRENGTH OF 2000 PSI AND SHALL BE PROPORTIONED BY VOLUME ACCORDING TO ASTM C476.
5. ALL CONCRETE MASONRY UNITS SHALL BE NORMAL WEIGHT WEIGHT ASTM C90, GRADE N, UNITS UNLESS NOTED OTHERWISE. UNITS SHALL HAVE A MINIMUM NET AREA COMPRESSIVE STRENGTH OF 2000 PSI.
6. ALL MASONRY WALLS SHALL HAVE HORIZONTAL JOINT REINFORCEMENT (9 GA, HOT DIPPED GALVANIZED) AT 16" O.C. PROVIDE PREFABRICATED CORNER PIECES AT ALL CORNERS AND INTERSECTIONS OF WALLS.
7. ALL DEFORMED BAR REINFORCING SHALL BE ASTM A615, GRADE 60. AT LOCATIONS WHERE REINFORCING IS TO BE WELDED, THE DEFORMED BAR REINFORCING SHALL BE ASTM A706, GRADE 60.
8. LAP SPLICES IN WALLS SHALL BE DETERMINED IN ACCORDANCE WITH TMS 402 AND ARE INDICATED IN THE TYPICAL DETAILS, THE MINIMUM SPLICE SHALL BE 48 BAR DIAMETERS.
9. ALL MASONRY REINFORCING SHALL BE SECURED IN PLACE WITH REBAR POSITIONERS AND SPACERS.
10. IN ADDITION TO ALL OTHER REINFORCING IN MASONRY WALLS PROVIDE A MINIMUM OF (1) #5 BAR AT EACH SIDE OF ALL OPENINGS, EACH SIDE OF CONTROL JOINTS, AT CORNERS OR ENDS OF WALLS AND AT BEAM OR LINTEL BEARING. BAR TO BE FULL HEIGHT OF WALL.
11. THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING TEMPORARY WALL BRACING ADEQUATE TO RESIST LATERAL LOADS.
12. SEE ARCHITECTURAL DRAWINGS FOR LOCATIONS OF WALL CONTROL JOINTS AND EXPANSION JOINTS.
13. REFER TO ARCHITECTURAL DRAWINGS AND SPECIFICATIONS FOR TYPE, SIZE, LOCATION AND ATTACHMENT REQUIREMENTS FOR MASONRY VENEER AND OTHER CLADDING.

DIVISION 5 - STRUCTURAL STEEL

1. THE LATEST REVISION OF THE FOLLOWING CODES GOVERN THE DESIGN, DETAILING, FABRICATION AND ERECTION OF ALL STRUCTURAL STEEL.
   A. AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC) AISC 360, SPECIFICATION FOR STRUCTURAL STEEL BUILDINGS.
   B. AISC 303, CODE OF STANDARD PRACTICE FOR STEEL BUILDINGS AND BRIDGES.
2. STRUCTURAL STEEL SHALL CONFORM TO THE FOLLOWING ASTM MATERIAL SPECIFICATIONS:
   A. W AND WT SHAPES: ASTM A992, GRADE 50 (Fy = 50 KSI).
   B. MISCELLANEOUS SHAPES AND PLATES: ASTM A36 (Fy = 36 KSI).
3. ALL WELDING SHALL BE PERFORMED USING THE ELECTRIC ARC METHOD IN ACCORDANCE WITH THE LATEST REVISION OF THE AMERICAN WELDING SOCIETY (AWS) D1.1 "STRUCTURAL WELDING CODE". E70XX ELECTRODES CONFORMING TO AWS A5.1 OR A5.5 SHALL BE USED FOR SHIELDED METAL ARC METHOD & FX7-ECXX FLUX - ELECTRODE COMBINATION CONFORMING TO AWS A5.17 FOR SUBMERGED ARC METHOD.
4. ALL BOLTS SHALL BE 3/4" DIAMETER ASTM F3125 GRADE A325 TYPE N BOLTS. ALL BOLTED CONNECTIONS SHALL BE SNUG-TIGHT BEARING TYPE BOLTS UNLESS NOTED OTHERWISE.
5. THE CONTRACTOR SHALL SUBMIT SHOP DRAWINGS SHOWING SIZES, DESIGN VALUES, MATERIALS, DIMENSIONS AND CONNECTIONS.
6. ALL CONNECTIONS NOT SPECIFICALLY DETAILED, SHALL BE DESIGNED AND DETAILED UNDER THE DIRECT SUPERVISION OF A PROFESSIONAL ENGINEER. DETAILING SHALL BE PERFORMED USING RATIONAL ENGINEERING DESIGN AND STANDARD PRACTICE IN ACCORDANCE WITH THE CONTRACT DOCUMENTS. THE GENERAL DETAILS SHOWN ON THE DRAWINGS ARE APPROXIMATE ONLY AND DO NOT INDICATE THE REQUIRED NUMBER OF BOLTS OR WELD SIZES, UNLESS SPECIFICALLY NOTED.
7. ALL BEAM CONNECTIONS ARE TO CONFORM TO AISC STANDARD TWO ANGLE WEB CONNECTIONS CAPABLE OF SUPPORTING 66% OF THE TOTAL UNIFORM LOAD CAPACITY OF THE BEAM OR FOR LOADS INDICATED ON DRAWING. NO CONNECTION SHALL CONSIST OF LESS THAN TWO 3/4" DIAMETER BOLTS OR A WELD DEVELOPING LESS THAN 10 KIPS.
8. ALL FIELD CONNECTIONS SHALL BE BOLTED UNLESS NOTED OTHERWISE. FIELD WELDING IS NOT ALLOWED EXCEPT WHERE SPECIFICALLY INDICATED OR APPROVED.
9. ALL SHOP AND FIELD WELDS SHALL BE VISUALLY INSPECTED PER AWS D1.1. ALL DEFICIENT OR NON CONFORMING ITEMS SHALL BE REPORTED TO THE ENGINEER WHO WILL DETERMINE THE CORRECTIVE ACTION REQUIRED.
10. ALL BEAMS SHALL BE FABRICATED WITH THE NATURAL CAMBER UP. PROVIDE CAMBERS AS INDICATED ON THE DRAWINGS.
11. PROVIDE AND HAVE IN PLACE ADEQUATE LATERAL BRACING AND VERTICAL SUPPORTS FOR THE SAFE ERECTION AND TRUE ALIGNMENT OF THE STRUCTURAL STEEL. THIS CONTRACTOR ASSUMES FULL RESPONSIBILITY FOR THE SAFE ERECTION AND TEMPORARY BRACING OF STRUCTURAL STEEL.
12. ALL DIMENSIONS RELATED TO STRUCTURAL STEEL USED TO SUPPORT EQUIPMENT OR FRAME OPENINGS SHALL BE VERIFIED WITH CERTIFIED AND APPROVED SHOP DRAWINGS OF PURCHASED EQUIPMENT PRIOR TO DETAILING AND FABRICATION.
13. ALL BEAMS, JOISTS, OR LINTELS BEARING ON MASONRY WALLS SHALL HAVE BEARING PLATES WITH ANCHOR BOLTS. IF NOT NOTED ON PLAN, SEE TYPICAL DETAILS.
14. ALL WF BEAMS SUPPORTING MASONRY AND WITH SPANS GREATER THAN 6'-0" SHALL HAVE 1/2" DIAMETER BY 6" LONG HEADED CONCRETE ANCHORS SPACED AT 2'-0" O.C. WELDED TO THE TOP FLANGE.
15. ALL STEEL IN EXTERIOR MASONRY WALLS IS TO BE HOT-DIP GALVANIZED IN ACCORDANCE WITH ASTM A-123.

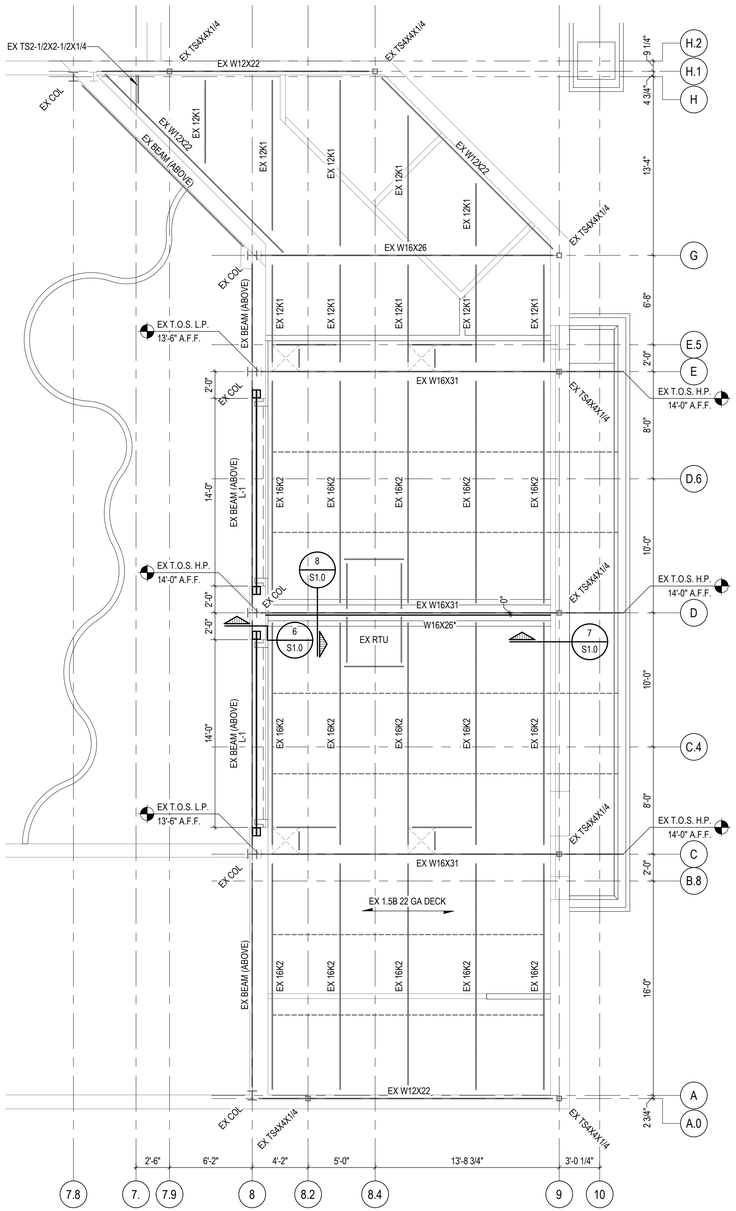
ABBREVIATIONS

@	AT
A.B.	ANCHOR BOLT
ADD'L	ADDITIONAL
A.F.F.	ABOVE FINISHED FLOOR
B.C.	BOTTOM CHORD
B.O.	BOTTOM OF
B.O.D.	BOTTOM OF DECK
B.O.F.	BOTTOM OF FOOTING
B.O.S.	BOTTOM OF STEEL
B.O.T.	BOTTOM OF TRUSS
B.S.	BOTH SIDES
BM	BEAM
BOTT	BOTTOM
BRG	BEARING
C.L.	CENTER LINE
CJ	CONTROL JOINT
COL	COLUMN
CONC	CONCRETE
CONT	CONTINUOUS
CSJ	CONSTRUCTION JOINT
DET	DETAIL
DIA	DIAMETER
DIAG	DIAGONAL
DIM	DIMENSION
DL	DEAD LOAD
DWG	DRAWING
E.F.	EACH FACE
EA	EACH
ELEV	ELEVATION
EQ	EQUAL
EX	EXISTING
F.S.	FAR SIDE
F.V.	FIELD VERIFY
FIN	FINISH
FLG	FLANGE
FLR	FLOOR
FDN	FOUNDATION
FT	FOOT
FTG	FOOTING
GA	GAGE
G.L.	GRT LINE
H.P.	HIGH POINT
HORIZ	HORIZONTAL
k	KIPS
LG	LONG
L.P.	LOW POINT
LL	LIVE LOAD
L.L.H.	LONG LEG HORIZONTAL
L.L.V.	LONG LEG VERTICAL
LN	LINE
L.S.H.	LONG SIDE HORIZONTAL
MAX	MAXIMUM
MTL	METAL
MIN	MINIMUM
MISC	MISCELLANEOUS
N.S.	NEAR SIDE
N.T.S.	NOT TO SCALE
NO	NUMBER
O.C.	ON CENTER
OPP	OPPOSITE
PC	PIECE
PL	PLATE
PLCS	PLACES
PSF	POUNDS PER SQUARE FOOT
PSI	POUNDS PER SQUARE INCH
REF	REFERENCE
REINF	RINFORC-ED, -ING, EMENT
REQ'D	REQUIRED
SCHED	SCHEDULE
SECT	SECTION
SIM	SIMILAR
SPA	SPACES
STD	STANDARD
STL	STEEL
T.O.	TOP OF
T.O.C.	TOP OF CONCRETE
T.O.F.	TOP OF FOOTING
T.O.M.	TOP OF MASONRY
T.O.S.	TOP OF STEEL
TYP	TYPICAL
U.N.O.	UNLESS NOTED OTHERWISE
VERT	VERTICAL
W.P.	WORK POINT
W/	WITH
WWR	WELDED WIRE REINFORCEMENT

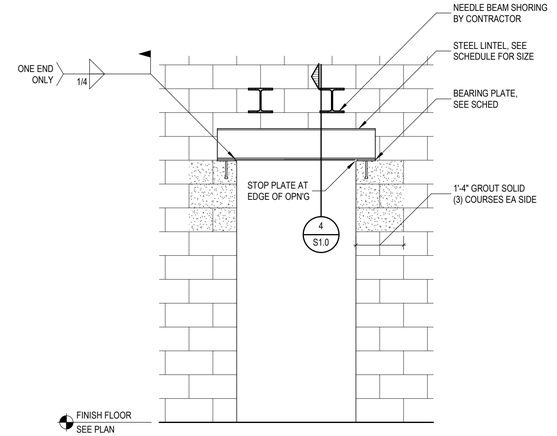
DESIGN CRITERIA

MICHIGAN BUILDING CODE 2021 (ASCE 7-16)
RISK CATEGORY II.

SOUNDMASTER WALL WEIGHT 5 PSF



1 ROOF FRAMING PLAN
3/16" = 1'-0"
*COORDINATE ELEVATION WITH PARTITION MANUFACTURER



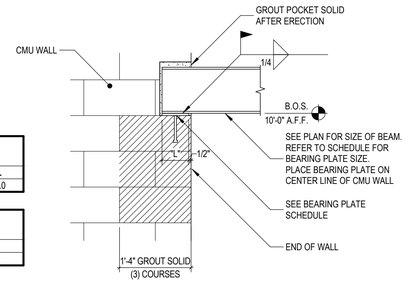
2 TYPICAL MASONRY OPENING W/ STEEL LINTEL
NOT TO SCALE

STEEL LINTEL SCHEDULE

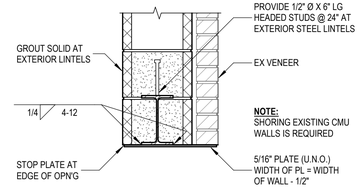
MARK	SIZE	BEARING PLATE	DETAIL
L-1	W8X28 + 5/16" PL	BP-1	4 & 5/S1.0

BEARING PLATE SCHEDULE

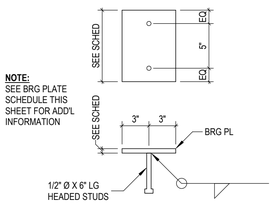
MARK	SIZE
BP-1	3/8" X 7" X 7" W/ (2) 1/2" Ø X 6" LG HEADED STUDS (GA = 5")



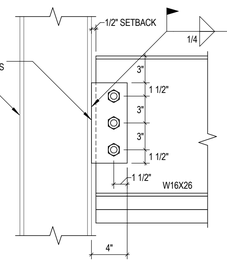
3 TYPICAL BEAM PARALLEL TO WALL
NOT TO SCALE



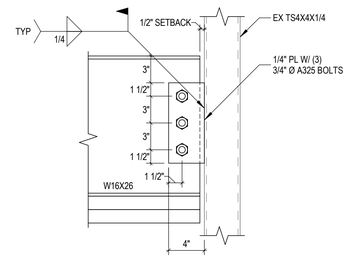
4 TYP STEEL LINTEL DETAIL
NOT TO SCALE



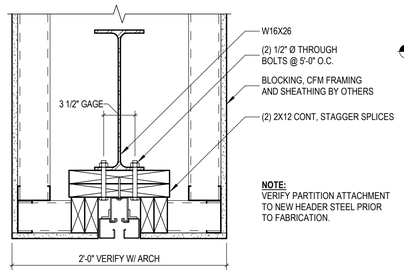
5 TYP BEARING PL DETAIL
NOT TO SCALE



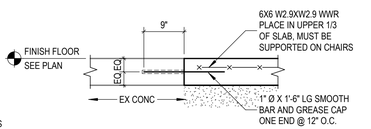
6 DETAIL
1 1/2" = 1'-0"



7 DETAIL
1 1/2" = 1'-0"



8 DETAIL
1 1/2" = 1'-0"



9 TYP SLAB ON GRADE REPLACEMENT
NOT TO SCALE

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Ann Arbor, Michigan
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Telephone:
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Project Name
SCSPL

PRELIMINARY SET
NOT FOR CONSTRUCTION

Drawing Name
STRUCTURAL NOTES, PLAN, & DETAILS

Drawn By
D. BART

Checked By
E. MANNOR

Issue Date
05/16/2025 Permit & Bid Set

Revisions
Issued for Date

NATHAN QUINN STURTEVANT
License No. 6201312659
5/16/25
STATE OF MICHIGAN
LICENSED PROFESSIONAL ENGINEER

Project No.
P23005

Sheet Number
S1.0

WILLIAM A. KIBBE & ASSOCIATES, INC.
ENGINEERS | ARCHITECTS | SURVEYORS

ELECTRICAL SYMBOL LIST

SYMBOL	DESCRIPTION
	SITE LIGHTING FIXTURE - POLE MOUNTED (DOUBLE HEAD INDICATED)
	SITE LIGHTING FIXTURE - BUILDING MOUNTED. SEE FIXTURE SCHEDULE
S	SINGLE POLE SWITCH
S_3	THREE WAY SWITCH
S_4	FOUR WAY SWITCH
S_A	WALL MOUNTED OCCUPANCY SENSOR. REFER TO KEY NOTES ON LIGHTING DRAWINGS
	2' X 4' LIGHT FIXTURE
	1' X 4' LIGHT FIXTURE
	2' X 2' LIGHT FIXTURE
	RECESSED ROUND LIGHT FIXTURE / RECESSED SQUARE LIGHT FIXTURE
	WALL MOUNTED LIGHT FIXTURE
	NIGHT LIGHT OR EMERGENCY LIGHT
N.L. EM	NIGHT LIGHT / EMERGENCY LIGHT FIXTURE
	EXIT LIGHT, SINGLE FACE
	EXIT LIGHT DOUBLE FACE (SHADING INDICATES FACE OF FIXTURE)
EM	EMERGENCY LIGHT FIXTURE
EM	DUPLEX RECEPTACLE / DUPLEX RECEPTACLE SERVED FROM EMERG. POWER
EM	DOUBLE DUPLEX RECEPTACLE (SHADING INDICATES SERVED FROM EMERG. POWER)
	TAMPER-RESISTANT DUPLEX RECEPTACLE / TAMPER-RESISTANT DOUBLE DUPLEX RECEPTACLE
	WIRELESSLY CONTROLLED TAMPER-RESISTANT DUPLEX RECEPTACLE (ENERGY CODE PLUG LOAD)
	SPECIAL PURPOSE OUTLET - TYPE AND SIZE AS INDICATED ON PLAN
	COMBINATION TELEPHONE/DATA OUTLET
W	WALL MOUNTED COMBINATION TELEPHONE/DATA OUTLET, MOUNTED AT 54" A.F.F.
	TELEPHONE ONLY OUTLET
W	WALL MOUNTED TELEPHONE ONLY OUTLET, MOUNTED AT 54" A.F.F.
	PANEL BOARD
J	JUNCTION BOX
	SINGLE PHASE MOTOR
	THREE PHASE MOTOR
P	MANUAL MOTOR STARTER WITH OVERLOADS (P= WITH PILOT LIGHT)
	COMBINATION MAGNETIC MOTOR STARTER WITH OVERLOADS
	DISCONNECT SWITCH
	CONTROL PANEL
FP	FIRE ALARM SYSTEM MANUAL PULL STATION
SD	CEILING MOUNTED FIRE ALARM SMOKE DETECTOR
SD R	DUCT MOUNTED SMOKE DETECTOR (R = MOUNTED ON COMMON RETURN AIR DUCT)
	15 CANDELA SYNCHRONIZED FIRE ALARM SPEAKER/STROBE, WALL MOUNTED
	15 CANDELA SYNCHRONIZED FIRE ALARM STROBE, WALL MOUNTED
XX	SYNCHRONIZED FIRE ALARM SPEAKER/STROBE, WALL MOUNTED (XX=CANDELA RATING, i.e. 30)
XX	SYNCHRONIZED FIRE ALARM STROBE, WALL MOUNTED (XX=CANDELA RATING, i.e. 30)
M	FIRE ALARM SYSTEM CONTROL MODULE
N.L.	NIGHT LIGHT
EM	DEVICE OR LIGHTING FIXTURE SERVED FROM EMERGENCY POWER
A.F.F.	ABOVE FINISH FLOOR
(E)	EXISTING ELECTRICAL DEVICE OR FIXTURE TO REMAIN
(R)	NEW LOCATION OF RELOCATED ELECTRICAL DEVICE OR FIXTURE
W.P.	WEATHER PROOF
G.F.I.	GROUND FAULT INTERRUPTER

ELECTRICAL GENERAL NOTES

1. EXTENT OF DEMOLITION IS NOT INTENDED TO BE SHOWN IN FULL ON THESE DRAWINGS. FINAL DESIGNED CONDITIONS ARE SHOWN. EACH TRADE/CONTRACTOR IS RESPONSIBLE FOR REMOVAL AS REQUIRED TO ACHIEVE FINAL DESIGN CONDITIONS. REFERENCES TO EXISTING AS IDENTIFIED ARE TO CLARIFY SCOPE OF NEW CONSTRUCTION.
2. ALL WORK CONDITIONS ARE TO BE FIELD VERIFIED AND DETAILS ADJUSTED AS REQUIRED TO MAINTAIN FIRE RESISTIVE RATINGS. INTEGRITY OF INSTALLED SYSTEMS (EXISTING AND NEW) AND THE MATCHING OF WORK WITH EXISTING CONDITIONS AND FINISHES.
3. REMOVAL WORK SHALL BE EXECUTED WITH DUE CARE, INCLUDING PROTECTION OF EXISTING MATERIALS/SYSTEMS TO REMAIN SHORING, BRACING, ETC. EACH TRADE/SUBCONTRACTORS WILL BE RESPONSIBLE FOR ANY DAMAGE THEY CAUSE TO OTHER'S WORK.
4. THE FULL EXTENT OF THE WORK FOR EACH TRADE IS IDENTIFIED THROUGHOUT ALL THE DRAWINGS. DO NOT ASSUME OR OMIT INDIVIDUAL TRADE WORK NOT SHOWN IN THE INDIVIDUAL TRADE DRAWINGS. FAILURE TO REVIEW ALL DRAWINGS FOR AN INDIVIDUAL TRADE'S COMPLETE SCOPE OF WORK WILL RESULT IN DENIAL FOR ANY CHANGE ORDER REQUESTS FOR MISSED ITEMS DURING BIDDING.
5. SUBCONTRACTORS AND ALL TRADES MUST EXAMINE AREAS, DIMENSIONS CONDITIONS AND SUBSTRATES AFFECTING THE WORK AND THE CONDITIONS UNDER WHICH THE WORK IS TO BE INSTALLED, APPLIED AND COMPLETED. NOTIFY THE ARCHITECT IN WRITING OF UNSATISFACTORY CONDITIONS AND OTHER CONDITIONS DETRIMENTAL TO THE PROPER AND TIMELY COMPLETION OF THE WORK.
   A. DO NOT PROCEED WITH THE WORK UNTIL THE UNSATISFACTORY CONDITIONS HAVE BEEN CORRECTED IN THE MANNER ACCEPTABLE TO THE CONTRACTOR OR TRADE PERFORMING THE WORK. PROCEED WITH INSTALLATION ONLY AFTER UNSAFE OR UNSATISFACTORY CONDITIONS HAVE BEEN CORRECTED.
   B. BEGINNING WORK MEANS ACCEPTANCE OF THE CONDITIONS.
   C. NO CHANGE ORDERS FOR ADDITIONAL WORK WILL BE ACCEPTED FOR CONDITIONS NOT IDENTIFIED DURING THE EXAMINATION PERIOD PRIOR TO THE COMMENCING OF WORK.
6. CONTRACTOR(S) WARRANTS THEY HAVE EXAMINED THOROUGHLY ALL DRAWINGS AND SPECIFICATIONS DIRECTLY AND INDIRECTLY RELATED TO THEIR WORK. BY BEGINNING THE WORK, CONTRACTOR CERTIFIES THAT ALL NECESSARY ITEMS REQUIRED TO PERFORM HIS WORK HAVE BEEN IDENTIFIED AND DOCUMENTED IN THE DRAWINGS AND/OR SPECIFICATIONS.
   A. NOTIFY THE ARCHITECT IN WRITING OF ANY DISCREPANCIES, MISSING INFORMATION OR ANY UNCLEAR ITEMS WHICH WILL AFFECT THE WORK TO BE PERFORMED. DO NOT PROCEED WITH THE WORK UNTIL THE DISCREPANCIES, MISSING INFORMATION OR ANY UNCLEAR ITEMS HAVE BEEN CLARIFIED OR CORRECTED TO THE CONTRACTOR OR TRADE PERFORMING THE WORK.
   B. BEGINNING THE WORK INDICATES FULL ACCEPTANCE AND CORRECTNESS OF THE INFORMATION PROVIDED.
   C. NO CHANGE ORDERS FOR ADDITIONAL WORK WILL BE ACCEPTED FOR ANY DISCREPANCIES, MISSING INFORMATION OR UNCLEAR ITEMS OR INFORMATION NOT IDENTIFIED DURING THE EXAMINATION PERIOD PRIOR TO THE COMMENCING OF WORK.
7. THE ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING ALL NECESSARY FIRESTOPPING AROUND ALL PENETRATIONS OF FIRE RATED WALLS, CEILINGS AND FLOORS. REFER TO ARCHITECTURAL AND ELECTRICAL SPECIFICATIONS FOR ADDITIONAL INFORMATION REGARDING THE SPECIFIC FIRESTOPPING REQUIREMENTS AND PRODUCT SPECIFICATIONS.
8. ALL ANCHORS FOR ELECTRICAL SYSTEMS SHALL BE STEEL. REFER TO SPECIFICATIONS FOR SPECIFIC APPROVED PRODUCTS. **UNDER NO CIRCUMSTANCES SHALL PLASTIC ANCHORS BE USED.**

ELECTRICAL DRAWING INDEX

SHEET NUMBER	SHEET TITLE
E0.01	ELECTRICAL DRAWING INDEX, SYMBOL LIST & GENERAL NOTES
E0.02	LIGHTING FIXTURE SCHEDULE
ED1.00	MAIN LEVEL FLOOR PLAN - ELECTRICAL DEMOLITION
ED1.01	PARTIAL MAIN LEVEL FLOOR PLAN - ELECTRICAL DEMOLITION
ED1.02	PARTIAL MAIN LEVEL FLOOR PLAN - ELECTRICAL DEMOLITION
ED1.03	PARTIAL MAIN LEVEL FLOOR PLAN - ELECTRICAL DEMOLITION
E1.00	MAIN LEVEL FLOOR PLAN - ELECTRICAL NEW WORK
E1.01	PARTIAL MAIN LEVEL FLOOR PLAN - LIGHTING NEW WORK - BASE BID
E1.02	PARTIAL MAIN LEVEL FLOOR PLAN - LIGHTING NEW WORK - BASE BID
E1.03	PARTIAL MAIN LEVEL FLOOR PLAN - LIGHTING NEW WORK - BASE BID
E1.01A	PARTIAL MAIN LEVEL FLOOR PLAN - LIGHTING NEW WORK - ADD ALTERNATE No. 1 & 2
E1.02A	PARTIAL MAIN LEVEL FLOOR PLAN - LIGHTING NEW WORK - ADD ALTERNATE No. 1 & 2
E1.03A	PARTIAL MAIN LEVEL FLOOR PLAN - LIGHTING NEW WORK - ADD ALTERNATE No. 1 & 2
E2.01	PARTIAL MAIN LEVEL FLOOR PLAN - POWER & SYSTEMS NEW WORK
E2.02	PARTIAL MAIN LEVEL FLOOR PLAN - POWER & SYSTEMS NEW WORK
E2.03	PARTIAL MAIN LEVEL FLOOR PLAN - POWER & SYSTEMS NEW WORK
E3.00	ELECTRICAL SCHEDULES
E3.01	ELECTRICAL SCHEDULES
E4.00	MISCELLANEOUS WIRING DIAGRAMS & DETAILS
E4.01	MISCELLANEOUS WIRING DIAGRAMS & DETAILS
E5.00	ELECTRICAL SPECIFICATIONS
E5.01	ELECTRICAL SPECIFICATIONS
E5.02	ELECTRICAL SPECIFICATIONS
E5.03	ELECTRICAL SPECIFICATIONS
E5.04	ELECTRICAL SPECIFICATIONS
EX1.01	PARTIAL MAIN LEVEL FLOOR PLAN - EMERGENCY EGRESS LIGHTING PHOTOMETRY
EX1.02	PARTIAL MAIN LEVEL FLOOR PLAN - EMERGENCY EGRESS LIGHTING PHOTOMETRY
EX1.03	PARTIAL MAIN LEVEL FLOOR PLAN - EMERGENCY EGRESS LIGHTING PHOTOMETRY

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Drawing Name
Drawing Index, Symbol List

Drawn By
CAD

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TGC

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LIGHTING FIXTURE SCHEDULE

TYPE	DESCRIPTION
“LA1”	SOLID-STATE TYPE 2X4 RECESS MOUNTED SOLID-STATE LIGHTING FIXTURE. 3,500 DEGREE K, 80 CRI MINIMUM WITH A DELIVERED LUMEN OUTPUT OF 4,602 LUMENS (MINIMUM). STEEL HOUSING; FIELD REPLACEABLE LIGHT ENGINE WITH INTEGRATED LED'S, DRIVER, POWER SUPPLY; ONE-PIECE LOWER REFLECTOR FINISHED WITH A TEXTURED HIGH REFLECTANCE WHITE POLYESTER POWDER COATING. STANDARD RIBBED FROSTED ACRYLIC LENS. TOTAL FIXTURE HEIGHT OF 3-1/4”. MATTE WHITE FINISH. 60,000 HOURS RATED TM21 LIFE AT 94% LUMEN OUTPUT (L94) (UP TO 290,000 HOURS PROJECTED LIFE AT L70). 35 WATT INPUT POWER, EFFICACY OF 132 LUMENS/WATT, WITH CONSTANT INPUT POWER OVER THE LIFE OF THE FIXTURE. FIVE YEAR WARRANTY. STANDARD 0-10V DIMMING DRIVER, WITH A DIMMING RANGE OF 1% TO 100%. UNIVERSAL 120/277 VOLT OPERATION. FIXTURE TO INCLUDE WAVELINX PRO WIRELESS INTEGRATED SENSOR FOR WIRELESS DAYLIGHT HARVESTING AND OCCUPANCY SENSOR CONTROL. METALUX “CRUZE ST” 24CZ2-45-UNV-L835-CD1-WPS SERIES OR EQUAL COLUMBIA “LCAT” (WITH NX WIRELESS CONTROLS) OR LITHONIA “BLT” (WITH NLIGHTAIR2 WIRELESS CONTROLS) SERIES.
“LA1-EM”	SIMILAR TO TYPE “LA1” EXCEPT WITH INTEGRAL EMERGENCY DRIVER CAPABLE OF DRIVING THE FIXTURE AT 7 WATTS FOR 90 MINUTES, PROVIDING A TOTAL LUMEN OUTPUT OF APPROXIMATELY 924 LUMENS. EMERGENCY DRIVER TO BE FACTORY INSTALLED IN FIXTURE. METALUX “CRUZE ST” 24CZ2-45-UNV-UEL7W-L835-CD1-WPS SERIES OR EQUAL COLUMBIA “LCAT” (WITH NX WIRELESS CONTROLS) OR LITHONIA “BLT” (WITH NLIGHTAIR2 WIRELESS CONTROLS) SERIES.
“LA2”	SOLID-STATE TYPE 2X4 RECESS MOUNTED SOLID-STATE LIGHTING FIXTURE. 3,500 DEGREE K, 80 CRI MINIMUM WITH A DELIVERED LUMEN OUTPUT OF 6,056 LUMENS (MINIMUM). STEEL HOUSING; FIELD REPLACEABLE LIGHT ENGINE WITH INTEGRATED LED'S, DRIVER, POWER SUPPLY; ONE-PIECE LOWER REFLECTOR FINISHED WITH A TEXTURED HIGH REFLECTANCE WHITE POLYESTER POWDER COATING. STANDARD RIBBED FROSTED ACRYLIC LENS. TOTAL FIXTURE HEIGHT OF 3-1/4”. MATTE WHITE FINISH. 60,000 HOURS RATED TM21 LIFE AT 94% LUMEN OUTPUT (L94) (UP TO 290,000 HOURS PROJECTED LIFE AT L70). 46.3 WATT INPUT POWER, EFFICACY OF 131 LUMENS/WATT, WITH CONSTANT INPUT POWER OVER THE LIFE OF THE FIXTURE. FIVE YEAR WARRANTY. STANDARD 0-10V DIMMING DRIVER, WITH A DIMMING RANGE OF 1% TO 100%. UNIVERSAL 120/277 VOLT OPERATION. FIXTURE TO INCLUDE WAVELINX PRO WIRELESS INTEGRATED SENSOR FOR WIRELESS DAYLIGHT HARVESTING AND OCCUPANCY SENSOR CONTROL. METALUX “CRUZE ST” 24CZ2-60-UNV-L835-CD1-WPS SERIES OR EQUAL COLUMBIA “LCAT” (WITH NX WIRELESS CONTROLS) OR LITHONIA “BLT” (WITH NLIGHTAIR2 WIRELESS CONTROLS) SERIES.
“LA2-EM”	SIMILAR TO TYPE “LA2” EXCEPT WITH INTEGRAL EMERGENCY DRIVER CAPABLE OF DRIVING THE FIXTURE AT 7 WATTS FOR 90 MINUTES, PROVIDING A TOTAL LUMEN OUTPUT OF APPROXIMATELY 917 LUMENS. EMERGENCY DRIVER TO BE FACTORY INSTALLED IN FIXTURE. METALUX “CRUZE ST” 24CZ2-60-UNV-UEL7W-L835-CD1-WPS SERIES OR EQUAL COLUMBIA “LCAT” (WITH NX WIRELESS CONTROLS) OR LITHONIA “BLT” (WITH NLIGHTAIR2 WIRELESS CONTROLS) SERIES.
“LB1”	SOLID-STATE TYPE 2X2 RECESS MOUNTED SOLID-STATE LIGHTING FIXTURE. 3,500 DEGREE K, 80 CRI MINIMUM WITH A DELIVERED LUMEN OUTPUT OF 2,454 LUMENS (MINIMUM). STEEL HOUSING; FIELD REPLACEABLE LIGHT ENGINE WITH INTEGRATED LED'S, DRIVER, POWER SUPPLY; ONE-PIECE LOWER REFLECTOR FINISHED WITH A TEXTURED HIGH REFLECTANCE WHITE POLYESTER POWDER COATING. STANDARD RIBBED FROSTED ACRYLIC LENS. TOTAL FIXTURE HEIGHT OF 3-1/4”. MATTE WHITE FINISH. 60,000 HOURS RATED TM21 LIFE AT 94% LUMEN OUTPUT (L94) (UP TO 290,000 HOURS PROJECTED LIFE AT L70). 18.5 WATT INPUT POWER, EFFICACY OF 133 LUMENS/WATT, WITH CONSTANT INPUT POWER OVER THE LIFE OF THE FIXTURE. FIVE YEAR WARRANTY. STANDARD 0-10V DIMMING DRIVER, WITH A DIMMING RANGE OF 1% TO 100%. UNIVERSAL 120/277 VOLT OPERATION. FIXTURE TO INCLUDE WAVELINX PRO WIRELESS INTEGRATED SENSOR FOR WIRELESS DAYLIGHT HARVESTING AND OCCUPANCY SENSOR CONTROL. METALUX “CRUZE ST” 22CZ2-24-UNV-L835-CD1-WPS SERIES OR EQUAL COLUMBIA “LCAT” (WITH NX WIRELESS CONTROLS) OR LITHONIA “BLT” (WITH NLIGHTAIR2 WIRELESS CONTROLS) SERIES.
“LB1-EM”	SIMILAR TO TYPE “LB1” EXCEPT WITH INTEGRAL EMERGENCY DRIVER CAPABLE OF DRIVING THE FIXTURE AT 7 WATTS FOR 90 MINUTES, PROVIDING A TOTAL LUMEN OUTPUT OF APPROXIMATELY 931 LUMENS. EMERGENCY DRIVER TO BE FACTORY INSTALLED IN FIXTURE. METALUX “CRUZE ST” 22CZ2 -24-UNV-UEL7W-L835-CD1-WPS SERIES OR EQUAL COLUMBIA “LCAT” (WITH NX WIRELESS CONTROLS) OR LITHONIA “BLT” (WITH NLIGHTAIR CONTROLS) SERIES.
“LB2”	SOLID-STATE TYPE 2X2 RECESS MOUNTED SOLID-STATE LIGHTING FIXTURE. 3,500 DEGREE K, 80 CRI MINIMUM WITH A DELIVERED LUMEN OUTPUT OF 3,272 LUMENS (MINIMUM). STEEL HOUSING; FIELD REPLACEABLE LIGHT ENGINE WITH INTEGRATED LED'S, DRIVER, POWER SUPPLY; ONE-PIECE LOWER REFLECTOR FINISHED WITH A TEXTURED HIGH REFLECTANCE WHITE POLYESTER POWDER COATING. STANDARD RIBBED FROSTED ACRYLIC LENS. TOTAL FIXTURE HEIGHT OF 3-1/4”. MATTE WHITE FINISH. 60,000 HOURS RATED TM21 LIFE AT 94% LUMEN OUTPUT (L94) (UP TO 290,000 HOURS PROJECTED LIFE AT L70). 24.2 WATT INPUT POWER, EFFICACY OF 135 LUMENS/WATT, WITH CONSTANT INPUT POWER OVER THE LIFE OF THE FIXTURE. FIVE YEAR WARRANTY. STANDARD 0-10V DIMMING DRIVER, WITH A DIMMING RANGE OF 1% TO 100%. UNIVERSAL 120/277 VOLT OPERATION. FIXTURE TO INCLUDE WAVELINX PRO WIRELESS INTEGRATED SENSOR FOR WIRELESS DAYLIGHT HARVESTING AND OCCUPANCY SENSOR CONTROL. METALUX “CRUZE ST” 22CZ2-32-UNV-L835-CD1-WPS SERIES OR EQUAL COLUMBIA “LCAT” (WITH NX WIRELESS CONTROLS) OR LITHONIA “BLT” (WITH NLIGHTAIR2 WIRELESS CONTROLS) SERIES.
“LB2-EM”	SIMILAR TO TYPE “LB2” EXCEPT WITH INTEGRAL EMERGENCY DRIVER CAPABLE OF DRIVING THE FIXTURE AT 7 WATTS FOR 90 MINUTES, PROVIDING A TOTAL LUMEN OUTPUT OF APPROXIMATELY 945 LUMENS. EMERGENCY DRIVER TO BE FACTORY INSTALLED IN FIXTURE. METALUX “CRUZE ST” 22CZ2-32-UNV-UEL7W-L835-CD1-WPS SERIES OR EQUAL COLUMBIA “LCAT” (WITH NX WIRELESS CONTROLS) OR LITHONIA “BLT” (WITH NLIGHTAIR CONTROLS) SERIES.
“LB3”	SOLID-STATE TYPE 2X2 RECESS MOUNTED SOLID-STATE LIGHTING FIXTURE. 3,500 DEGREE K, 80 CRI MINIMUM WITH A DELIVERED LUMEN OUTPUT OF 4,462 LUMENS (MINIMUM). STEEL HOUSING; FIELD REPLACEABLE LIGHT ENGINE WITH INTEGRATED LED'S, DRIVER, POWER SUPPLY; ONE-PIECE LOWER REFLECTOR FINISHED WITH A TEXTURED HIGH REFLECTANCE WHITE POLYESTER POWDER COATING. STANDARD RIBBED FROSTED ACRYLIC LENS. TOTAL FIXTURE HEIGHT OF 3-1/4”. MATTE WHITE FINISH. 60,000 HOURS RATED TM21 LIFE AT 94% LUMEN OUTPUT (L94) (UP TO 290,000 HOURS PROJECTED LIFE AT L70). 33 WATT INPUT POWER, EFFICACY OF 134 LUMENS/WATT, WITH CONSTANT INPUT POWER OVER THE LIFE OF THE FIXTURE. FIVE YEAR WARRANTY. STANDARD 0-10V DIMMING DRIVER, WITH A DIMMING RANGE OF 1% TO 100%. UNIVERSAL 120/277 VOLT OPERATION. FIXTURE TO INCLUDE WAVELINX PRO WIRELESS INTEGRATED SENSOR FOR WIRELESS DAYLIGHT HARVESTING AND OCCUPANCY SENSOR CONTROL. METALUX “CRUZE ST” 22CZ2-44-UNV-L835-CD1-WPS SERIES OR EQUAL COLUMBIA “LCAT” (WITH NX WIRELESS CONTROLS) OR LITHONIA “BLT” (WITH NLIGHTAIR2 WIRELESS CONTROLS) SERIES.
“LB3-EM”	SIMILAR TO TYPE “LB3” EXCEPT WITH INTEGRAL EMERGENCY DRIVER CAPABLE OF DRIVING THE FIXTURE AT 7 WATTS FOR 90 MINUTES, PROVIDING A TOTAL LUMEN OUTPUT OF APPROXIMATELY 938 LUMENS. EMERGENCY DRIVER TO BE FACTORY INSTALLED IN FIXTURE. METALUX “CRUZE ST” 22CZ2-44-UNV-UEL7W-L835-CD1-WPS SERIES OR EQUAL COLUMBIA “LCAT” (WITH NX WIRELESS CONTROLS) OR LITHONIA “BLT” (WITH NLIGHTAIR CONTROLS) SERIES.
“LB4”	SOLID-STATE TYPE 2X2 RECESS MOUNTED SOLID-STATE LIGHTING FIXTURE. 3,500 DEGREE K, 80 CRI MINIMUM WITH A DELIVERED LUMEN OUTPUT OF 6,110 LUMENS (MINIMUM). STEEL HOUSING; FIELD REPLACEABLE LIGHT ENGINE WITH INTEGRATED LED'S, DRIVER, POWER SUPPLY; ONE-PIECE LOWER REFLECTOR FINISHED WITH A TEXTURED HIGH REFLECTANCE WHITE POLYESTER POWDER COATING. STANDARD RIBBED FROSTED ACRYLIC LENS. TOTAL FIXTURE HEIGHT OF 3-1/4”. MATTE WHITE FINISH. 60,000 HOURS RATED TM21 LIFE AT 94% LUMEN OUTPUT (L94) (UP TO 290,000 HOURS PROJECTED LIFE AT L70). 44.1 WATT INPUT POWER, EFFICACY OF 139 LUMENS/WATT, WITH CONSTANT INPUT POWER OVER THE LIFE OF THE FIXTURE. FIVE YEAR WARRANTY. STANDARD 0-10V DIMMING DRIVER, WITH A DIMMING RANGE OF 1% TO 100%. UNIVERSAL 120/277 VOLT OPERATION. METALUX “CRUZE ST” 22CZ2-60VHE-UNV-L835-CD1 SERIES OR EQUAL COLUMBIA “LCAT” OR LITHONIA “BLT” SERIES.
“LC”	SOLID-STATE TYPE 4” WIDE NARROW APERTURE RECESSED LIGHT FIXTURE WITH A COLOR TEMPERATURE OF 3500 DEGREE K AND CRI >80 AND SUITABLE FOR MOUNTING IN A LAY-IN OR DRYWALL CEILING. FIXTURE TO BE NOMINALLY 4'-0” LONG WITH A NOMINAL LUMEN OUTPUT OF 1020 LUMENS PER FOOT. HOUSING CONSTRUCTED OF EXTRUDED ALUMINUM WITH ALUMINUM FRAME AND EXTRUDED END-CAPS. LUMINAIRE FINISH TO BE SELECTED BY ARCHITECT. COORDINATE EXACT CEILING TYPE WITH ARCHITECTURAL DRAWINGS; STEEL REFLECTOR FINISHED IN HIGH REFLECTANCE WHITE FINISH; FLUSH SATIN WHITE, HIGH DIFFUSION GLARE-FREE ACRYLIC LENS. POWER CONSUMPTION OF 8.9 WATTS PER FOOT, WITH AN EFFICACY OF 118 LUMENS/WATT. UL LISTED CONSTANT VOLTAGE DRIVER WITH 0-10V 1% DIMMING AND UNIVERSAL 120-277 VOLT OPERATION. FIXTURE TO INCLUDE WAVELINX PRO WIRELESS INTEGRATED SENSOR FOR WIRELESS DAYLIGHT HARVESTING AND OCCUPANCY SENSOR CONTROL. NEO-RAY DEFINE 4 S124DR-S1020D835-XXX4F0-1-UDD-F-Y-WPS SERIES, WHERE THE “XXX” IN THE CATALOG NUMBER INDICATES THE CEILING TYPE, TO BE VERIFIED WITH ARCHITECT, AND THE “Y” IN THE CATALOG NUMBER INDICATES THE FIXTURE FINISH, TO BE SELECTED BY ARCHITECT; OR EQUAL LITECONTROL (WITH NX WIRELESS CONTROLS) OR MARK ARCHITECTURAL LIGHTING (WITH NLIGHTAIR2 WIRELESS CONTROLS).
“LC-EM”	SIMILAR TO TYPE “LC” EXCEPT WITH INTEGRAL EMERGENCY DRIVER CAPABLE OF DRIVING THE FIXTURE AT 7 WATTS FOR 90 MINUTES, PROVIDING A TOTAL LUMEN OUTPUT OF APPROXIMATELY 826 LUMENS. EMERGENCY DRIVER TO BE FACTORY INSTALLED IN FIXTURE. NEO-RAY DEFINE 4 S124DR-S1020D835-XXX4F0-1B1-UDD-F-Y-WPS SERIES, WHERE THE “XXX” IN THE CATALOG NUMBER INDICATES THE CEILING TYPE, TO BE VERIFIED WITH ARCHITECT, AND THE “Y” IN THE CATALOG NUMBER INDICATES THE FIXTURE FINISH, TO BE SELECTED BY ARCHITECT; OR EQUAL LITECONTROL (WITH NX WIRELESS CONTROLS) OR MARK ARCHITECTURAL LIGHTING (WITH NLIGHTAIR2 WIRELESS CONTROLS).
“LD1”	SOLID-STATE TYPE 2.6” WIDE X 3” HIGH LINEAR SUSPENDED DIRECT LIGHT FIXTURE WITH A COLOR TEMPERATURE OF 3,500 DEGREE K AND CRI >80. FIXTURE TO BE NOMINALLY 4'-0” LONG WITH A NOMINAL LUMEN OUTPUT OF 750 LUMENS PER FOOT. SINGLE-PIECE EXTRUDED ALUMINUM HOUSING, DIE-CAST ALUMINUM END CAPS, ATTACHED MECHANICALLY WITHOUT EXPOSED FASTENERS; FINISH TO BE WHITE; DIE-FORMED 20 GA. COLD ROLLED STEEL LED TRAY; FROSTED BATWING DISTRIBUTION CONTINUOUS FLEXIBLE ROLL LENS TO CREATE A SEAMLESS ILLUMINATION ALONG THE ENTIRE ROW LENGTH. AIRCRAFT CABLE SUSPENSION WITH STRAIGHT POWER CORD, PROVIDED IN SUFFICIENT LENGTH TO ALLOW FOR MOUNTING ELEVATION NOTED ON FLOOR PLANS. FIXTURE TO HAVE A TOTAL WATTAGE OF 6.7 WATTS PER FOOT, WITH AN EFFICACY OF 111 LUMENS PER WATT. UL LISTED CONSTANT VOLTAGE DRIVER WITH 0-10V 1% DIMMING AND UNIVERSAL 120-277 VOLT OPERATION. FIXTURE TO INCLUDE “WAVELINX PRO” WIRELESS INTEGRATED SENSOR FOR WIRELESS DAYLIGHT HARVESTING AND OCCUPANCY SENSOR CONTROL. TM21 LIFE AT 60,000 HOURS UP TO L85 AND CALCULATED L70 EXCEEDING 135,000 HOURS. CORELITE “CONTINUA SQ2” SQ2-FB-0U-0750D-835-1D-UNV-STD-WPS-W-AC48-XX-4 SERIES, WHERE “XX” DENOTES THE CEILING TYPE, TO BE CONFIRMED BY CONTRACTOR IN FIELD PRIOR TO ORDERING FIXTURE, BASED ON EXISTING CEILING CONSTRUCTION, OR EQUAL LITE CONTROL (WITH CURRENT LIGHTING NX WIRELESS CONTROLS) OR MARK ARCHITECTURAL LIGHTING (WITH NLIGHTAIR WIRELESS CONTROLS).
“LD1-EM”	SIMILAR TO TYPE “LD1” EXCEPT WITH INTEGRAL EMERGENCY DRIVER CAPABLE OF DRIVING THE FIXTURE AT 10 WATTS FOR 90 MINUTES, PROVIDING A TOTAL LUMEN OUTPUT OF APPROXIMATELY 1,110 LUMENS. EMERGENCY DRIVER TO BE FACTORY INSTALLED IN FIXTURE. CORELITE “CONTINUA SQ2” SQ2-FB-0U-0750D-835-1D-UNV-STD-WPS-B10-W-AC48-XX-4 SERIES, WHERE “XX” DENOTES THE CEILING TYPE, TO BE CONFIRMED BY CONTRACTOR IN FIELD PRIOR TO ORDERING FIXTURE, BASED ON EXISTING CEILING CONSTRUCTION, OR EQUAL LITE CONTROL (WITH CURRENT LIGHTING NX WIRELESS CONTROLS) OR MARK ARCHITECTURAL LIGHTING (WITH NLIGHTAIR WIRELESS CONTROLS).
“LD2”	SOLID-STATE TYPE 2.6” WIDE X 3” HIGH LINEAR SUSPENDED DIRECT LIGHT FIXTURE WITH A COLOR TEMPERATURE OF 3,500 DEGREE K AND CRI >80. FIXTURE TO BE NOMINALLY 6'-0” LONG WITH A NOMINAL LUMEN OUTPUT OF 750 LUMENS PER FOOT. SINGLE-PIECE EXTRUDED ALUMINUM HOUSING, DIE-CAST ALUMINUM END CAPS, ATTACHED MECHANICALLY WITHOUT EXPOSED FASTENERS; FINISH TO BE WHITE; DIE-FORMED 20 GA. COLD ROLLED STEEL LED TRAY; FROSTED BATWING DISTRIBUTION CONTINUOUS FLEXIBLE ROLL LENS TO CREATE A SEAMLESS ILLUMINATION ALONG THE ENTIRE ROW LENGTH. AIRCRAFT CABLE SUSPENSION WITH STRAIGHT POWER CORD, PROVIDED IN SUFFICIENT LENGTH TO ALLOW FOR MOUNTING ELEVATION NOTED ON FLOOR PLANS. FIXTURE TO HAVE A TOTAL WATTAGE OF 6.7 WATTS PER FOOT, WITH AN EFFICACY OF 111 LUMENS PER WATT. UL LISTED CONSTANT VOLTAGE DRIVER WITH 0-10V 1% DIMMING AND UNIVERSAL 120-277 VOLT OPERATION. FIXTURE TO INCLUDE “WAVELINX PRO” WIRELESS INTEGRATED SENSOR FOR WIRELESS DAYLIGHT HARVESTING AND OCCUPANCY SENSOR CONTROL. TM21 LIFE AT 60,000 HOURS UP TO L85 AND CALCULATED L70 EXCEEDING 135,000 HOURS. CORELITE “CONTINUA SQ2” SQ2-FB-0U-0750D-835-1D-UNV-STD-WPS-W-AC48-XX-6 SERIES, WHERE “XX” DENOTES THE CEILING TYPE, TO BE CONFIRMED BY CONTRACTOR IN FIELD PRIOR TO ORDERING FIXTURE, BASED ON EXISTING CEILING CONSTRUCTION, OR EQUAL LITE CONTROL (WITH CURRENT LIGHTING NX WIRELESS CONTROLS) OR MARK ARCHITECTURAL LIGHTING (WITH NLIGHTAIR WIRELESS CONTROLS).
“LD3”	SOLID-STATE TYPE 2.6” WIDE X 3” HIGH LINEAR SUSPENDED DIRECT LIGHT FIXTURE WITH A COLOR TEMPERATURE OF 3,500 DEGREE K AND CRI >80. FIXTURE TO BE NOMINALLY 8'-0” LONG WITH A NOMINAL LUMEN OUTPUT OF 750 LUMENS PER FOOT. SINGLE-PIECE EXTRUDED ALUMINUM HOUSING, DIE-CAST ALUMINUM END CAPS, ATTACHED MECHANICALLY WITHOUT EXPOSED FASTENERS; FINISH TO BE WHITE; DIE-FORMED 20 GA. COLD ROLLED STEEL LED TRAY; FROSTED BATWING DISTRIBUTION CONTINUOUS FLEXIBLE ROLL LENS TO CREATE A SEAMLESS ILLUMINATION ALONG THE ENTIRE ROW LENGTH. AIRCRAFT CABLE SUSPENSION WITH STRAIGHT POWER CORD, PROVIDED IN SUFFICIENT LENGTH TO ALLOW FOR MOUNTING ELEVATION NOTED ON FLOOR PLANS. FIXTURE TO HAVE A TOTAL WATTAGE OF 6.7 WATTS PER FOOT, WITH AN EFFICACY OF 111 LUMENS PER WATT. UL LISTED CONSTANT VOLTAGE DRIVER WITH 0-10V 1% DIMMING AND UNIVERSAL 120-277 VOLT OPERATION. FIXTURE TO INCLUDE “WAVELINX PRO” WIRELESS INTEGRATED SENSOR FOR WIRELESS DAYLIGHT HARVESTING AND OCCUPANCY SENSOR CONTROL. TM21 LIFE AT 60,000 HOURS UP TO L85 AND CALCULATED L70 EXCEEDING 135,000 HOURS. CORELITE “CONTINUA SQ2” SQ2-FB-0U-0750D-835-1D-UNV-STD-WPS-W-AC48-XX-8 SERIES, WHERE “XX” DENOTES THE CEILING TYPE, TO BE CONFIRMED BY CONTRACTOR IN FIELD PRIOR TO ORDERING FIXTURE, BASED ON EXISTING CEILING CONSTRUCTION, OR EQUAL LITE CONTROL (WITH CURRENT LIGHTING NX WIRELESS CONTROLS) OR MARK ARCHITECTURAL LIGHTING (WITH NLIGHTAIR WIRELESS CONTROLS).
“LD3-EM”	SIMILAR TO TYPE “LD3” EXCEPT WITH INTEGRAL EMERGENCY DRIVER CAPABLE OF DRIVING A FOUR (4) FOOT SECTION OF THE FIXTURE AT 10 WATTS FOR 90 MINUTES, PROVIDING A TOTAL LUMEN OUTPUT OF APPROXIMATELY 1,110 LUMENS. EMERGENCY DRIVER TO BE FACTORY INSTALLED IN FIXTURE. CORELITE “CONTINUA SQ2” SQ2-FB-0U-0750D-835-1D-UNV-STD-WPS-B10-W-AC48-XX-8 SERIES, WHERE “XX” DENOTES THE CEILING TYPE, TO BE CONFIRMED BY CONTRACTOR IN FIELD PRIOR TO ORDERING FIXTURE, BASED ON EXISTING CEILING CONSTRUCTION, OR EQUAL LITE CONTROL (WITH CURRENT LIGHTING NX WIRELESS CONTROLS) OR MARK ARCHITECTURAL LIGHTING (WITH NLIGHTAIR WIRELESS CONTROLS).
“LD4”	SOLID-STATE TYPE 2.6” WIDE X 3” HIGH LINEAR SUSPENDED DIRECT LIGHT FIXTURE WITH A COLOR TEMPERATURE OF 3,500 DEGREE K AND CRI >80. FIXTURE TO BE NOMINALLY 12'-0” LONG WITH A NOMINAL LUMEN OUTPUT OF 750 LUMENS PER FOOT. SINGLE-PIECE EXTRUDED ALUMINUM HOUSING, DIE-CAST ALUMINUM END CAPS, ATTACHED MECHANICALLY WITHOUT EXPOSED FASTENERS; FINISH TO BE WHITE; DIE-FORMED 20 GA. COLD ROLLED STEEL LED TRAY; FROSTED BATWING DISTRIBUTION CONTINUOUS FLEXIBLE ROLL LENS TO CREATE A SEAMLESS ILLUMINATION ALONG THE ENTIRE ROW LENGTH. AIRCRAFT CABLE SUSPENSION WITH STRAIGHT POWER CORD, PROVIDED IN SUFFICIENT LENGTH TO ALLOW FOR MOUNTING ELEVATION NOTED ON FLOOR PLANS. FIXTURE TO HAVE A TOTAL WATTAGE OF 6.7 WATTS PER FOOT, WITH AN EFFICACY OF 111 LUMENS PER WATT. UL LISTED CONSTANT VOLTAGE DRIVER WITH 0-10V 1% DIMMING AND UNIVERSAL 120-277 VOLT OPERATION. FIXTURE TO INCLUDE “WAVELINX PRO” WIRELESS INTEGRATED SENSOR FOR WIRELESS DAYLIGHT HARVESTING AND OCCUPANCY SENSOR CONTROL. TM21 LIFE AT 60,000 HOURS UP TO L85 AND CALCULATED L70 EXCEEDING 135,000 HOURS. CORELITE “CONTINUA SQ2” SQ2-FB-0U-0750D-835-1D-UNV-STD-WPS-W-AC48-XX-12 SERIES, WHERE “XX” DENOTES THE CEILING TYPE, TO BE CONFIRMED BY CONTRACTOR IN FIELD PRIOR TO ORDERING FIXTURE, BASED ON EXISTING CEILING CONSTRUCTION, OR EQUAL LITE CONTROL (WITH CURRENT LIGHTING NX WIRELESS CONTROLS) OR MARK ARCHITECTURAL LIGHTING (WITH NLIGHTAIR WIRELESS CONTROLS).
“LD5”	SOLID-STATE TYPE 2.6” WIDE X 3” HIGH LINEAR SUSPENDED DIRECT LIGHT FIXTURE WITH A COLOR TEMPERATURE OF 3,500 DEGREE K AND CRI >80. FIXTURE TO BE NOMINALLY 16'-0” LONG WITH A NOMINAL LUMEN OUTPUT OF 750 LUMENS PER FOOT. SINGLE-PIECE EXTRUDED ALUMINUM HOUSING, DIE-CAST ALUMINUM END CAPS, ATTACHED MECHANICALLY WITHOUT EXPOSED FASTENERS; FINISH TO BE WHITE; DIE-FORMED 20 GA. COLD ROLLED STEEL LED TRAY; STANDARD LAMBERTIAN DISTRIBUTION WITH FROSTED CONTINUOUS FLEXIBLE ROLL LENS TO CREATE A SEAMLESS ILLUMINATION ALONG THE ENTIRE ROW LENGTH. AIRCRAFT CABLE SUSPENSION WITH STRAIGHT POWER CORD, PROVIDED IN SUFFICIENT LENGTH TO ALLOW FOR MOUNTING ELEVATION NOTED ON FLOOR PLANS. FIXTURE TO HAVE A TOTAL WATTAGE OF 6.7 WATTS PER FOOT, WITH AN EFFICACY OF 111.3 LUMENS PER WATT. UL LISTED CONSTANT VOLTAGE DRIVER WITH 0-10V 1% DIMMING AND UNIVERSAL 120-277 VOLT OPERATION. FIXTURE TO INCLUDE “WAVELINX PRO” WIRELESS INTEGRATED SENSOR FOR WIRELESS DAYLIGHT HARVESTING AND OCCUPANCY SENSOR CONTROL. TM21 LIFE AT 60,000 HOURS UP TO L85 AND CALCULATED L70 EXCEEDING 135,000 HOURS. CORELITE “CONTINUA SQ2” SQ2-F-0U-0750D-835-1D-UNV-STD-WPS-W-AC48-XX-16 SERIES, WHERE “XX” DENOTES THE CEILING TYPE, TO BE CONFIRMED BY CONTRACTOR IN FIELD PRIOR TO ORDERING FIXTURE, BASED ON EXISTING CEILING CONSTRUCTION, OR EQUAL LITE CONTROL (WITH CURRENT LIGHTING NX WIRELESS CONTROLS) OR MARK ARCHITECTURAL LIGHTING (WITH NLIGHTAIR WIRELESS CONTROLS).
“LD5-EM”	SIMILAR TO TYPE “LD5” EXCEPT WITH INTEGRAL EMERGENCY DRIVER CAPABLE OF DRIVING A FOUR (4) FOOT SECTION OF THE FIXTURE AT 10 WATTS FOR 90 MINUTES, PROVIDING A TOTAL LUMEN OUTPUT OF APPROXIMATELY 1,110 LUMENS. EMERGENCY DRIVER TO BE FACTORY INSTALLED IN FIXTURE. CORELITE “CONTINUA SQ2” SQ2-F-0U-0750D-835-1D-UNV-STD-WPS-B10-W-AC48-XX-16 SERIES, WHERE “XX” DENOTES THE CEILING TYPE, TO BE CONFIRMED BY CONTRACTOR IN FIELD PRIOR TO ORDERING FIXTURE, BASED ON EXISTING CEILING CONSTRUCTION, OR EQUAL LITE CONTROL (WITH CURRENT LIGHTING NX WIRELESS CONTROLS) OR MARK ARCHITECTURAL LIGHTING (WITH NLIGHTAIR WIRELESS CONTROLS).
“LE”	SOLID-STATE TYPE 2X4 RECESS MOUNTED FLAT PANEL LIGHTING FIXTURE. 3500 DEGREE K, CRI GREATER THAN 80 WITH A DELIVERED LUMEN OUTPUT OF 4,756 LUMENS. STEEL BACKPLATE WITH NARROW ALUMINUM BEZEL, WITH A MAXIMUM FIXTURE HEIGHT OF 7/16”, AND A MAXIMUM HEIGHT OF 2-1/4” FROM THE BOTTOM OF THE FIXTURE TO THE TOP OF THE FIXTURE JUNCTION BOX. MATTE WHITE FINISH. 60,000 HOURS RATED LIFE AT L73. 40.3-WATT INPUT POWER, WITH AN EFFICACY OF 113.2 LUMENS PER WATT. DLC LABELED. FIVE YEAR WARRANTY. STANDARD 0-10V DIMMING DRIVER, WITH A DIMMING RANGE OF 10% TO 100%. UNIVERSAL 120/277 VOLT OPERATION. U.L. LISTED. METALUX 24FPX-47-L835 OR EQUAL COLUMBIA LIGHTING OR LITHONIA.
“LE-EM”	SIMILAR TO TYPE “LE” EXCEPT WITH INTEGRAL EMERGENCY DRIVER CAPABLE OF DRIVING THE FIXTURE AT 7 WATTS FOR 90 MINUTES, PROVIDING A TOTAL LUMEN OUTPUT OF APPROXIMATELY 792 LUMENS. EMERGENCY DRIVER TO BE FACTORY INSTALLED IN FIXTURE. METALUX 24FPX-47-EL7W -L835 OR EQUAL COLUMBIA LIGHTING OR LITHONIA.
“LF”	SOLID-STATE TYPE 2X2 RECESS MOUNTED FLAT PANEL LIGHTING FIXTURE. 3500 DEGREE K, CRI GREATER THAN 80 WITH A DELIVERED LUMEN OUTPUT OF 3,543 LUMENS. STEEL BACKPLATE WITH NARROW ALUMINUM BEZEL, WITH A MAXIMUM FIXTURE HEIGHT OF 7/16”, AND A MAXIMUM HEIGHT OF 2-1/4” FROM THE BOTTOM OF THE FIXTURE TO THE TOP OF THE FIXTURE JUNCTION BOX. MATTE WHITE FINISH. 60,000 HOURS RATED LIFE AT L73. 30.4-WATT INPUT POWER, WITH AN EFFICACY OF 116.2 LUMENS PER WATT. DLC LABELED. FIVE YEAR WARRANTY. STANDARD 0-10V DIMMING DRIVER, WITH A DIMMING RANGE OF 10% TO 100%. UNIVERSAL 120/277 VOLT OPERATION. U.L. LISTED. METALUX 22FPX-32-L835 OR EQUAL COLUMBIA LIGHTING OR LITHONIA.
“LG”	SOLID-STATE SURFACE WALL MOUNTED VANITY LIGHT FIXTURE. 3,500 DEGREE K, CRI GREATER THAN OR EQUAL TO 90 AND A DELIVERED LUMEN OUTPUT OF 1,727 LUMENS. 24.1 SYSTEM WATTS. 2.75” HIGH X 2.50” DEEP X 27.75” LONG. METAL END CAPS. FINISH TO BE SELECTED AND APPROVED BY ARCHITECT PRIOR TO ORDERING FIXTURE. MATTE WHITE ACRYLIC DIFFUSER. 60,000 HOUR RATED LIFE AT 70% LUMEN OUTPUT. UNIVERSAL 120 TO 277-VOLT OPERATION, THERMALLY PROTECTED. ETL LISTED FOR DAMP LOCATION USE. FIVE YEAR WARRANTY. OXYGEN LIGHTING “APOLLO VANITY” 3-524-35XX SERIES, WHERE “XX” DENOTES THE FIXTURE FINISH TO BE SELECTED BY ARCHITECT PRIOR TO ORDERING FIXTURE, OR EQUAL BROWNLEE OR SCOTT ARCHITECTURAL LIGHTING.
“LH”	LED TYPE RECESS MOUNTED SQUARE OPEN SOLID-STATE DOWN LIGHT FIXTURE IN A REMODEL HOUSING TO ALLOW FOR INSTALLATION IN AN EXISTING CEILING OPENING. LED ENGINE TO BE 3,500 DEGREE K, WITH CRI GREATER THAN OR EQUAL TO 80 AND A 1000 LUMEN LIGHT ENGINE. FIXTURE TO HAVE A 50,000 HOUR RATED LIFE AND 5-YEAR WARRANTY. RUGGED ONE-PIECE, DIE-CAST HOUSING. 6” SQUARE CLEAR REFLECTOR WITH DIFFUSE LENS AND WHITE FLANGE. REFLECTOR OFFERS A 45-55 DEGREE CUTOFF; MEDIUM DISTRIBUTION OPTICS. LED LIGHT SOURCE SHIELDED FROM DIRECT VIEW. THERMAL PROTECTION. HIGH-EFFICIENCY ELECTRONIC LED DRIVER MOUNTED IN JUNCTION BOX OF FIXTURE. INPUT WATTAGE OF FIXTURE IS 10 WATTS. 0-10V DIMMING DRIVER STANDARD, WITH A DIMMING RANGE FROM 100% TO 1%. 50,000 HOUR RATED LIFE AT 70% LUMEN OUTPUT. FIVE-YEAR LIMITED WARRANTY. UNIVERSAL 120-277 VOLT OPERATION, THERMALLY PROTECTED, U.L. LISTED FOR WET LOCATION USE. FIXTURE TO INCLUDE WAVELINX PRO WIRELESS NODE WITHOUT SENSOR OPTION FOR WIRELESS COMMUNICATION WITH OTHER WAVELINX PRO SENSORS AND CONTROLS IN THE AREA. HALO COMMERCIAL HCSQ610D010WPN -HM60525835-61SQHWF SERIES OR EQUAL PRESCOLITE (WITH CURRENT NX WIRELESS) OR LITHONIA (WITH NLIGHTAIR CONTROLS).
“LH-EM”	SIMILAR TO TYPE “LH” EXCEPT WITH INTEGRAL EMERGENCY DRIVER CAPABLE OF DRIVING THE FIXTURE AT 6 WATTS FOR 90 MINUTES, PROVIDING A TOTAL LUMEN OUTPUT OF APPROXIMATELY 600 LUMENS, WITH INTEGRAL TEST SWITCH / INDICATOR LIGHT. EMERGENCY DRIVER TO BE FACTORY INSTALLED IN FIXTURE. HALO COMMERCIAL HCSQ610D010EM6WPN-HM60525835 -61SQHWF-IEM SERIES OR EQUAL PRESCOLITE (WITH CURRENT NX WIRELESS) OR LITHONIA (WITH NLIGHTAIR CONTROLS).
“LJ”	SOLID-STATE TYPE (AKA “LED”) SURFACE MOUNTED LENSED STRIP LIGHT FIXTURE; 3,148 NOMINAL LUMENS, 3,500 DEGREE K, GREATER THAN OR EQUAL TO 80 CRI. 3” WIDE X 3-1/2” HIGH X 4'-0” LONG. DURABLE CODE-GAUGE STEEL HOUSING WITH 100% ACRYLIC FORMED DIFFUSER TO PROVIDE A LOW-GLARE DIFFUSED WIDE LIGHT DISTRIBUTION. WHITE FINISH. STANDARD 0-10V DIMMING DRIVER, WITH A DIMMING RANGE OF 10% TO 100%. UNIVERSAL VOLTAGE DRIVER CAPABLE OF SUPPORTING VOLTAGES FROM 120 TO 277 VOLT. INPUT WATTAGE OF 21.1 WATTS, WITH AN EFFICACY OF 149.2 LUMENS/WATT. 60,000 HOUR RATED LIFE AT L87 LUMEN MAINTENANCE. FIVE-YEAR LIMITED WARRANTY. UL LISTED. METALUX SNX SERIES 4SNX-33SL-LW-UNV -L835-CD1 SERIES OR EQUAL COLUMBIA LIGHTING “MPS4” SERIES OR LITHONIA CLX SERIES.
“LK1”	SOLID-STATE TYPE ROUND DECORATIVE SURFACE MOUNTED LIGHT FIXTURE. LED LIGHT ENGINE TO BE 3,500 DEGREE K, 80 CRI (MINIMUM), WITH A LUMEN OUTPUT OF 2,700 LUMENS. FIXTURE TO BE 26” DIAMETER X 5” HIGH. FIXTURE BODY AND TRIM CONSTRUCTED OF EXTRUDED ALUMINUM, ROLLED AND WELDED WITH GREATER THAN 25% POST-CONSUMER RECYCLED CONTENT, AND 100% RECYCLABLE. SKY (MATTE) FINISH, WITH THE EXACT FINISH TO BE SELECTED BY ARCHITECT PRIOR TO ORDERING OF FIXTURE; FLAT WHITE ACRYLIC LENS. HIGH-EFFICIENCY ELECTRONIC LED DRIVER. INPUT WATTAGE OF FIXTURE IS 35 WATTS. 0-10V DIMMING DRIVER STANDARD, WITH DIMMING TO 1%. 90% LUMEN MAINTENANCE AT 100,000 HOURS, WITH L70 (70% OF INITIAL LUMEN OUTPUT) EXCEEDING 150,000 HOURS. FIVE-YEAR LIMITED WARRANTY. UNIVERSAL 120-277 VOLT OPERATION, U.L. LISTED AND LABELED. PRUDENTIAL LIGHTING “P4000 SKY” P4020 -LED35-LO-FWA-YXXX-D1-SC-UNV-SUR-X1-DM01 SERIES, WHERE THE “YXXX” DENOTES THE FIXTURE FINISH TO BE SELECTED BY ARCHITECT, OR EQUAL BY CAMMEN LIGHTING OR FOCAL POINT LIGHTING “SKYDOME”.
“LK2”	SOLID-STATE TYPE ROUND DECORATIVE SURFACE MOUNTED LIGHT FIXTURE. LED LIGHT ENGINE TO BE 3,500 DEGREE K, 80 CRI (MINIMUM), WITH A LUMEN OUTPUT OF 4,900 LUMENS. FIXTURE TO BE 37” DIAMETER X 5” HIGH. FIXTURE BODY AND TRIM CONSTRUCTED OF EXTRUDED ALUMINUM, ROLLED AND WELDED WITH GREATER THAN 25% POST-CONSUMER RECYCLED CONTENT, AND 100% RECYCLABLE. SKY (MATTE) FINISH, WITH THE EXACT FINISH TO BE SELECTED BY ARCHITECT PRIOR TO ORDERING OF FIXTURE; FLAT WHITE ACRYLIC LENS. HIGH-EFFICIENCY ELECTRONIC LED DRIVER. INPUT WATTAGE OF FIXTURE IS 56 WATTS. 0-10V DIMMING DRIVER STANDARD, WITH DIMMING TO 1%. 90% LUMEN MAINTENANCE AT 100,000 HOURS, WITH L70 (70% OF INITIAL LUMEN OUTPUT) EXCEEDING 150,000 HOURS. FIVE-YEAR LIMITED WARRANTY. UNIVERSAL 120-277 VOLT OPERATION, U.L. LISTED AND LABELED. PRUDENTIAL LIGHTING “P4000 SKY” P4030 -LED35-LO-FWA-YXXX-D1-SC-UNV-SUR-X1-DM01 SERIES, WHERE THE “YXXX” DENOTES THE FIXTURE FINISH TO BE SELECTED BY ARCHITECT, OR EQUAL BY CAMMEN LIGHTING OR FOCAL POINT LIGHTING “SKYDOME”.
“LK3”	SOLID-STATE TYPE ROUND DECORATIVE SURFACE MOUNTED LIGHT FIXTURE. LED LIGHT ENGINE TO BE 3,500 DEGREE K, 80 CRI (MINIMUM), WITH A LUMEN OUTPUT OF 8,100 LUMENS. FIXTURE TO BE 47-1/2” DIAMETER X 5” HIGH. FIXTURE BODY AND TRIM CONSTRUCTED OF EXTRUDED ALUMINUM, ROLLED AND WELDED WITH GREATER THAN 25% POST-CONSUMER RECYCLED CONTENT, AND 100% RECYCLABLE. SKY (MATTE) FINISH, WITH THE EXACT FINISH TO BE SELECTED BY ARCHITECT PRIOR TO ORDERING OF FIXTURE; FLAT WHITE ACRYLIC LENS. HIGH-EFFICIENCY ELECTRONIC LED DRIVER. INPUT WATTAGE OF FIXTURE IS 88 WATTS. 0-10V DIMMING DRIVER STANDARD, WITH DIMMING TO 1%. 90% LUMEN MAINTENANCE AT 100,000 HOURS, WITH L70 (70% OF INITIAL LUMEN OUTPUT) EXCEEDING 150,000 HOURS. FIVE-YEAR LIMITED WARRANTY. UNIVERSAL 120-277 VOLT OPERATION, U.L. LISTED AND LABELED. PRUDENTIAL LIGHTING “P4000 SKY” P4030 -LED35-LO-FWA-YXXX-D1-SC-UNV-SUR-X1-DM01 SERIES, WHERE THE “YXXX” DENOTES THE FIXTURE FINISH TO BE SELECTED BY ARCHITECT, OR EQUAL BY CAMMEN LIGHTING OR FOCAL POINT LIGHTING “SKYDOME”.
“XA”	UNIVERSAL MOUNTING "EXIT" LIGHT FIXTURE, HIGH BRIGHTNESS LED'S, 25 YEAR LIFE, ACRYLIC DIFFUSING LENS, SINGLE FACE, ARROWS AS INDICATED ON PLAN, POLYCARBONATE HOUSING AND FACE, 6" RED LETTERS, WHITE FINISH, LED POWER SUPPLY CIRCUIT; SEALED NICKEL CADMIUM BATTERY AND CHARGER, UNIVERSAL 120-277 VOLT OPERATION. ISOLITE RL-EM-R-U-WH-METB SERIES OR EQUAL SURE-LITES LPX7 SERIES, LIGHTALARMS, DUAL-LITE OR LITHONIA.
“XB”	SIMILAR TO TYPE “XA” EXCEPT DOUBLE FACE.

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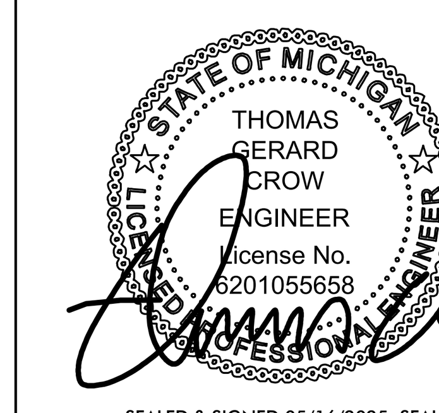
PROJECT NAME

SCSPL



SEALED & SIGNED 05/16/2025; SEAL APPLIES ONLY TO THE ELECTRICAL DOCUMENTS PREPARED BY TAC ASSOCIATES, LLC

Drawing Name
Lighting Fixture Schedule

Drawn By
CAD

Checked By
TGC

Issue Date
05/16/2025 Permit & Bid Set

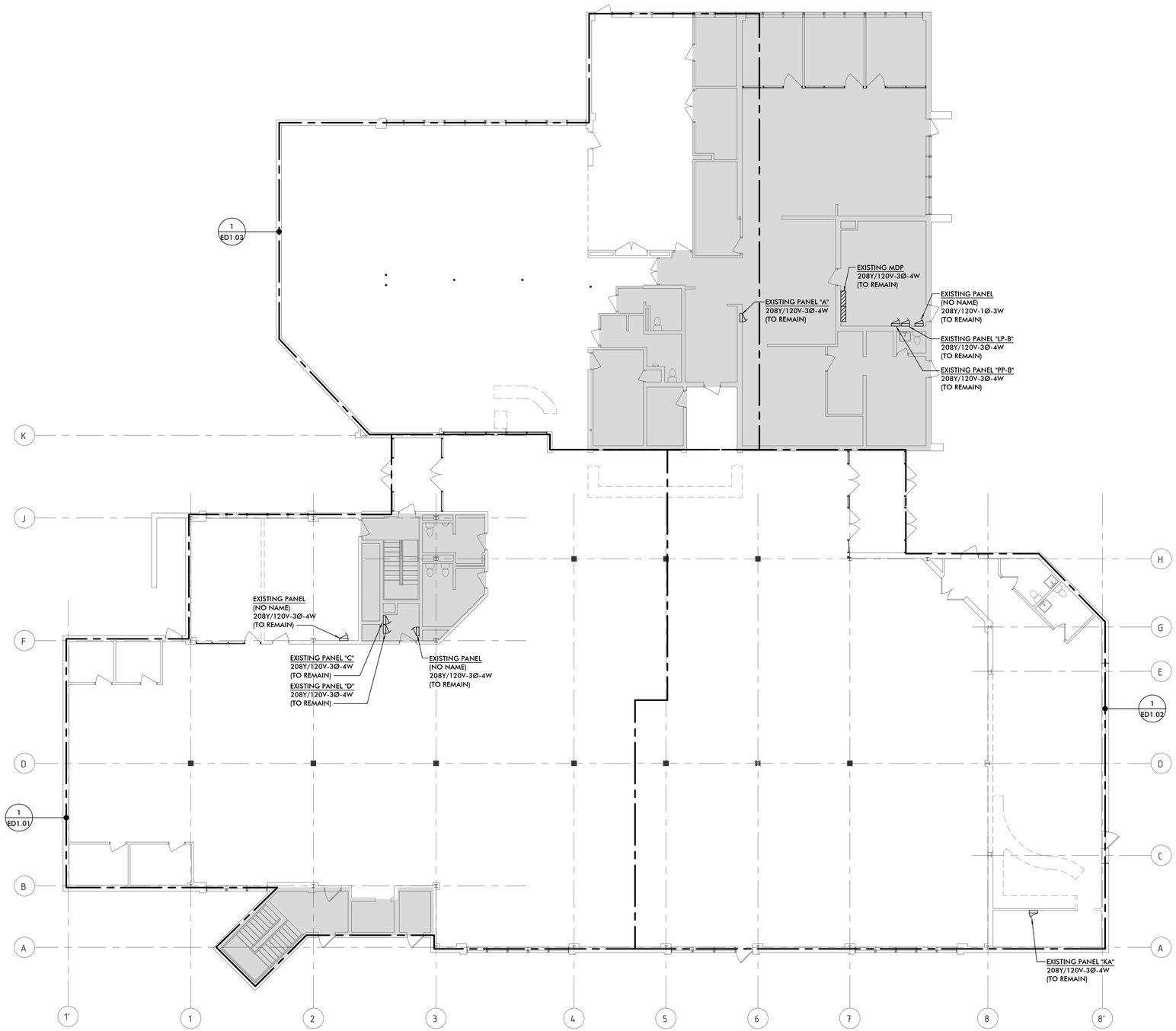
Revisions

Issued for	Date

Project No.
P23005

Sheet Number

E0.02



NORTH

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MAIN LEVEL FLOOR PLAN - ELECTRICAL DEMOLITION

SCALE: 3/32" = 1'-0"

CONTRACTORS PRE-BID NOTIFICATION:

ALL EXISTING ITEMS INDICATED IN THE CONTRACT DRAWINGS HAVE BEEN TAKEN FROM THE OWNER'S LIMITED RECORD DRAWINGS AND SUBSTANTIAL FIELD OBSERVATIONS AND VERIFICATION. THIS CONTRACTOR AND ALL RELATED SUB-CONTRACTORS SHALL VISIT THE SITE AND COMPLETELY UNDERSTAND THE CONDITIONS UNDER WHICH THE WORK MUST BE PERFORMED. IF A DEPARTURE FROM THE DESIGN INTENT OF THE DOCUMENTS IS REQUIRED DUE TO THE ACTUAL FIELD CONDITIONS OBSERVED BY THE CONTRACTOR, THE CONTRACTOR SHALL NOTIFY THE ARCHITECT IN WRITING FOR RESOLUTION PRIOR TO SUBMITTING FINAL BID OR ENTERING INTO A CONTRACT FOR CONSTRUCTION. FAILURE TO PROVIDE THE ARCHITECT WITH NOTIFICATION SHALL RESULT IN THE CONTRACTOR BEING HELD RESPONSIBLE TO COMPLETE ALL WORK TO MEET THE DESIGN INTENT WITH NO ADDITIONAL COST BEING INCURRED BY THE OWNER.

ELECTRICAL GENERAL NOTES:

1. ALL DEVICES INDICATED WITH SOLID LIGHT LINES ARE EXISTING DEVICES TO REMAIN.
2. ALL DEVICES AND FIXTURES INDICATED WITH SOLID DARK CROSS-HATCHED LINES ARE EXISTING TO BE REMOVED OR RELOCATED BY THIS ELECTRICAL CONTRACTOR.
3. ALL DEVICES INDICATED WITH SOLID DARK LINES ARE NEW DEVICES TO BE INSTALLED BY THE ELECTRICAL CONTRACTOR AS PART OF THIS SCOPE OF WORK.
4. ELECTRICAL CONTRACTOR SHALL PROVIDE DEMOLITION OF ELECTRICAL DEVICES, CONDUIT, WIRING, FIXTURES, LIGHTING CONTROLS, EQUIPMENT, ETC. AS REQUIRED TO ACCOMMODATE ARCHITECTURAL, MECHANICAL AND ELECTRICAL REVISIONS. ELECTRICAL DEMOLITION SHEET PROVIDES A GENERAL GUIDELINE AS TO THE SCOPE OF THE WORK. HOWEVER, ALL DEMOLITION REQUIREMENTS MAY NOT BE INDICATED. PROVIDE DEMOLITION AS REQUIRED TO ACCOMMODATE PROJECT REVISIONS.
5. COORDINATE DEMOLITION REQUIREMENTS WITH THE WORK OF OTHER TRADES.
6. PRIOR TO START OF CONSTRUCTION, AND PRIOR TO ANY DEMOLITION WORK THE ELECTRICAL CONTRACTOR SHALL PERFORM CIRCUIT TRACING TO IDENTIFY ALL EXISTING BRANCH CIRCUITS SERVING THE RENOVATION AREA, AND TO IDENTIFY THE AVAILABLE BRANCH CIRCUITS THAT MAY BE RE-USED AS PART OF THE PROPOSED RENOVATION, AS WELL AS CIRCUITS THAT SERVE EXISTING LIGHTING FIXTURES OR DEVICES THAT ARE TO REMAIN AND BE MAINTAINED.

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PROJECT NAME

SCSPL

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PROFESSIONAL ENGINEER

SEALED & SIGNED 05/16/2025; SEAL APPLIES ONLY TO THE ELECTRICAL DOCUMENTS PREPARED BY TAC ASSOCIATES, LLC

Drawing Name
Electrical Demolition

Drawn By
CAD

Checked By
TGC

Issue Date
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Revisions

Issued for	Date

Project No.
P23005

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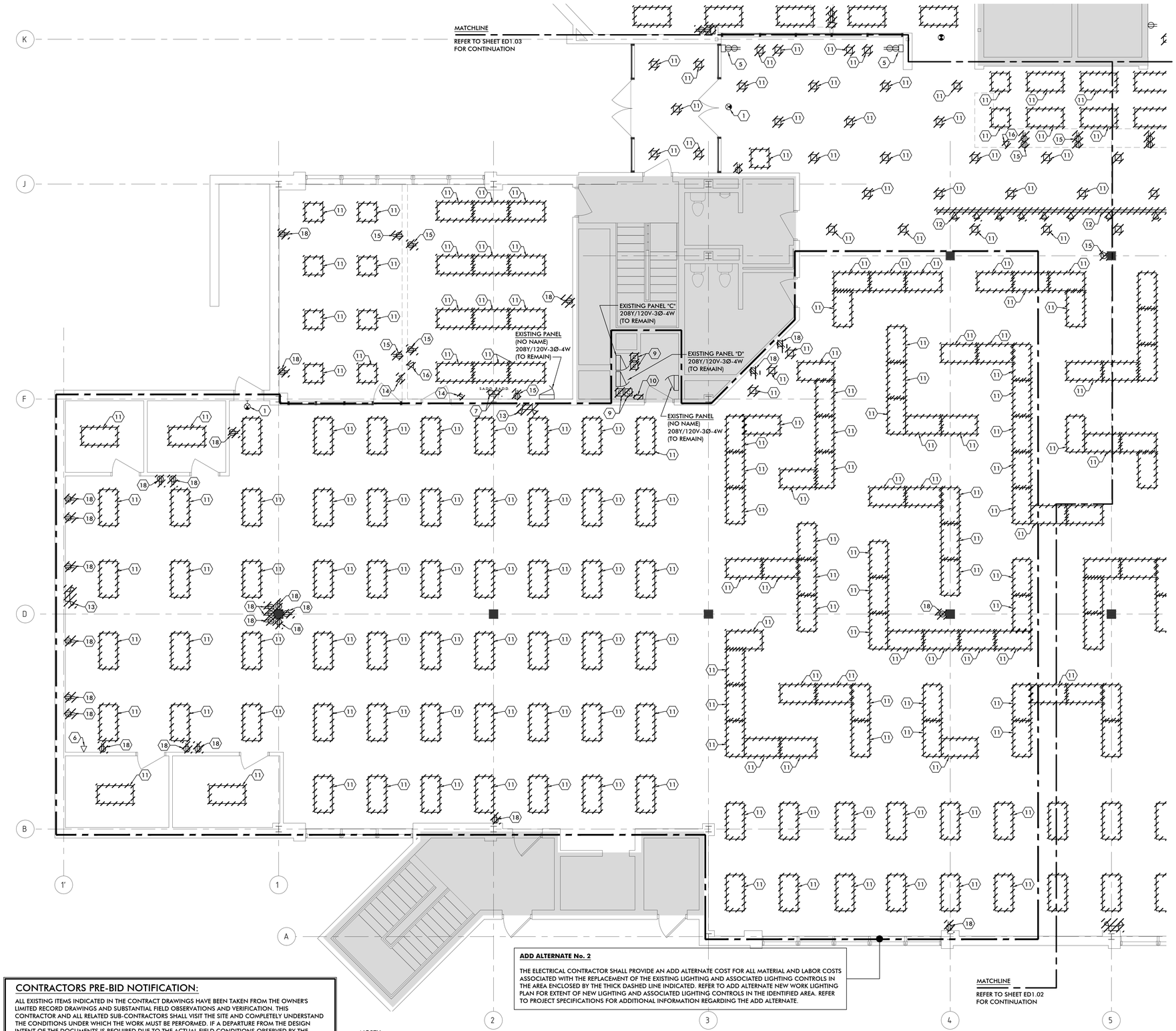


DEMOLITION KEY NOTES

1. EXISTING EXIT LIGHT FIXTURE TO REMAIN.
2. EXISTING WALL MOUNTED EMERGENCY BATTERY UNIT FIXTURE TO REMAIN.
3. EXISTING EXTERIOR WALL MOUNTED EMERGENCY REMOTE HEAD, SERVED FROM EXISTING EMERGENCY BATTERY UNIT INDICATED, TO REMAIN.
4. EXISTING DUPLEX RECEPTACLE TO REMAIN.
5. EXISTING TELEPHONE POWER POLE, WITH 120-VOLT POWER AND LOW VOLTAGE OUTLETS, TO REMAIN.
6. EXISTING LOW VOLTAGE DATA OUTLET TO REMAIN.
7. EXISTING LOCAL AUDIBLE AND VISUAL ALARM SERVING DUCT MOUNTED SMOKE DETECTOR IN MECHANICAL AIR HANDLING UNIT, TO BE RELOCATED TO NEW FURRED OUT WALL. CONDUIT AND BOX SERVING ALARM TO BE CONCEALED IN NEW FURRED OUT WALL. REFER TO NEW WORK POWER PLAN FOR ADDITIONAL INFORMATION.
8. ELECTRICAL CONTRACTOR SHALL DISCONNECT AND REMOVE EXISTING EXIT LIGHT FIXTURE. EXISTING BRANCH CIRCUIT CONDUIT AND WIRING SERVING EXIT LIGHT TO REMAIN FOR RE-USE TO SERVE NEW EXIT LIGHT FIXTURE TO BE INSTALLED IN SAME LOCATION. REFER TO NEW WORK PLANS FOR ADDITIONAL INFORMATION.
9. EXISTING LIGHTING CONTACTOR SERVING LIBRARY LIGHTING TO BE REMOVED COMPLETE. ELECTRICAL CONTRACTOR SHALL DEMOLISH EXISTING LIGHTING CONTACTORS NO LONGER REQUIRED DUE TO THE DEMOLITION OF EXISTING LIGHTING AND ASSOCIATED BRANCH CIRCUITS AS PART OF THE RENOVATION PROJECT. EXISTING CONTACTORS THAT SERVE EXISTING LIGHTING IN AREAS OUTSIDE OF THE RENOVATION AREA SHALL REMAIN AND BE MAINTAINED. PROVIDE NEW BRANCH CIRCUIT WIRING AS REQUIRED TO MAINTAIN LIGHTING CONTROL AND SERVICE TO EXISTING LIGHTING OUTSIDE OF THE RENOVATION AREA THAT IS TO REMAIN.
10. EXISTING LIGHTING CONTROL TOGGLE SWITCH CABINET, MOUNTED IN A SURFACE BOX, TO BE REMOVED. ELECTRICAL CONTRACTOR SHALL DISCONNECT AND REMOVE EXISTING SURFACE MOUNTED BOX AND ASSOCIATED TOGGLE SWITCHES CONTROLLING LIGHTING IN AREAS INDICATED FOR REMOVAL AND REPLACEMENT WITH NEW LIGHTING AS PART OF THE RENOVATION PROJECT.
11. ELECTRICAL CONTRACTOR SHALL DISCONNECT AND REMOVE EXISTING LIGHT FIXTURE INDICATED. DISCONNECT AND REMOVE EXISTING EXISTING BRANCH CIRCUIT CONDUIT AND WIRING COMPLETE TO SOURCE. PORTIONS OF THE EXISTING CONDUIT SYSTEM MAY REMAIN WHERE FEASIBLE TO SERVE NEW LIGHTING FIXTURES, AS DETERMINED BY THE ELECTRICAL CONTRACTOR BASED ON FIELD INVESTIGATION AND SUITABILITY TO SERVE THE NEW LIGHTING LAYOUT INDICATED. WHERE THERE IS EXISTING CONDUIT THAT IS NOT REQUIRED TO SERVE THE NEW LIGHTING, THE ELECTRICAL CONTRACTOR SHALL REMOVE THE CONDUIT COMPLETE TO SOURCE. DEMOLITION WORK TO INCLUDE DEMOLITION OF THE EXISTING SWITCHING CONTROL COMPLETE, INCLUDING LOCAL WALL SWITCHES, WALL BOX TYPE OCCUPANCY SENSOR SWITCHES, LIGHTING RELAYS / CONTACTORS AND THE ASSOCIATED TOGGLE SWITCHES THAT CONTROL GROUPS OF LIGHTING FIXTURES VIA THE LIGHTING RELAYS / CONTACTORS. REFER TO NEW WORK LIGHTING PLANS FOR ADDITIONAL INFORMATION REGARDING THE NEW LIGHTING AND ASSOCIATED LIGHTING CONTROL SYSTEM COMPONENTS. NOTE THAT THE EXISTING LIGHTING CONTROL SYSTEM SWITCHES ARE NOT REFLECTED ON THESE PLANS, BUT SHALL BE REMOVED BY THE ELECTRICAL CONTRACTOR AS NOTED ABOVE.
12. ELECTRICAL CONTRACTOR SHALL DISCONNECT AND REMOVE EXISTING TRACK LIGHTING FIXTURES AND ASSOCIATED LIGHTING TRACK, TRANSFORMERS, POWER SUPPLY AND ASSOCIATED COMPONENTS COMPLETE. DISCONNECT AND REMOVE EXISTING BRANCH CIRCUIT CONDUIT AND WIRING COMPLETE TO SOURCE. PORTIONS OF THE EXISTING CONDUIT SYSTEM MAY REMAIN WHERE FEASIBLE TO SERVE NEW LIGHTING FIXTURES, AS DETERMINED BY THE ELECTRICAL CONTRACTOR BASED ON FIELD INVESTIGATION AND SUITABILITY TO SERVE THE NEW LIGHTING LAYOUT INDICATED. WHERE THERE IS EXISTING CONDUIT THAT IS NOT REQUIRED TO SERVE THE NEW LIGHTING, THE ELECTRICAL CONTRACTOR SHALL REMOVE THE CONDUIT COMPLETE TO SOURCE. DEMOLITION WORK TO INCLUDE DEMOLITION OF THE EXISTING SWITCHING CONTROL COMPLETE, INCLUDING LOCAL WALL SWITCHES, WALL BOX TYPE OCCUPANCY SENSOR SWITCHES, LIGHTING RELAYS / CONTACTORS AND THE ASSOCIATED TOGGLE SWITCHES THAT CONTROL GROUPS OF LIGHTING FIXTURES VIA THE LIGHTING RELAYS / CONTACTORS. REFER TO NEW WORK LIGHTING PLANS FOR ADDITIONAL INFORMATION REGARDING THE NEW LIGHTING AND ASSOCIATED LIGHTING CONTROL SYSTEM COMPONENTS. NOTE THAT THE EXISTING LIGHTING CONTROL SYSTEM SWITCHES ARE NOT REFLECTED ON THESE PLANS, BUT SHALL BE REMOVED BY THE ELECTRICAL CONTRACTOR AS NOTED ABOVE.
13. ELECTRICAL CONTRACTOR SHALL DISCONNECT AND REMOVE EXISTING EMERGENCY BATTERY UNIT LIGHT FIXTURE INDICATED. DISCONNECT AND REMOVE EXISTING EXISTING BRANCH CIRCUIT CONDUIT AND WIRING COMPLETE TO SOURCE.
14. ELECTRICAL CONTRACTOR SHALL DISCONNECT AND REMOVE EXISTING SWITCHING CONTROL COMPLETE TO SOURCE.
15. ELECTRICAL CONTRACTOR SHALL DISCONNECT AND REMOVE EXISTING DUPLEX RECEPTACLE (OR SINGLE RECEPTACLE WHERE INDICATED). DISCONNECT AND REMOVE EXISTING CONDUIT AND WIRING TO NEAREST JUNCTION BOX TO ALLOW FOR RE-USE OF THE EXISTING BRANCH CIRCUIT TO SERVE NEW WIRING DEVICES OR EQUIPMENT IN THE RENOVATION AREA. PROVIDE NEW BRANCH CIRCUIT CONDUIT AND WIRING AS REQUIRED TO MAINTAIN SERVICE TO EXISTING DEVICES SERVED BY THE CIRCUIT THAT ARE EXISTING TO REMAIN. REFER TO GENERAL NOTE #6 FOR ADDITIONAL REQUIREMENTS ASSOCIATED WITH CIRCUIT TRACING REQUIRED TO BE PERFORMED BY THE ELECTRICAL CONTRACTOR AS PART OF THEIR SCOPE OF WORK. IF THE EXISTING BRANCH CIRCUIT IS NOT RE-USED BY THE NEW WORK, THE ELECTRICAL CONTRACTOR SHALL REMOVE THE EXISTING BRANCH CIRCUIT CONDUIT AND WIRING COMPLETE TO SOURCE AND LABEL THE EXISTING BRANCH CIRCUIT AS "SPARE".
16. ELECTRICAL CONTRACTOR SHALL DISCONNECT AND REMOVE EXISTING LOW VOLTAGE TELEPHONE OR TELEPHONE/ DATA OUTLET. DISCONNECT AND REMOVE EXISTING CONDUIT AND LOW VOLTAGE WIRING COMPLETE TO SOURCE. COORDINATE DEMOLITION WORK ASSOCIATED WITH THE EXISTING LOW VOLTAGE TELEPHONE AND DATA SYSTEMS CABLING WITH THE OWNER'S COMMUNICATION CONTRACTOR IN THE FIELD PRIOR TO START OF DEMOLITION WORK.
17. ELECTRICAL CONTRACTOR SHALL DISCONNECT AND REMOVE EXISTING TELEPHONE POWER POLE. DISCONNECT AND REMOVE EXISTING BRANCH CIRCUIT CONDUIT AND WIRING TO NEAREST JUNCTION BOX TO ALLOW FOR RE-USE OF THE EXISTING BRANCH CIRCUIT TO SERVE NEW WIRING DEVICES OR EQUIPMENT IN THE RENOVATION AREA. PROVIDE NEW BRANCH CIRCUIT CONDUIT AND WIRING AS REQUIRED TO MAINTAIN SERVICE TO EXISTING DEVICES SERVED BY THE CIRCUIT THAT ARE EXISTING TO REMAIN. REFER TO GENERAL NOTE #6 FOR ADDITIONAL REQUIREMENTS ASSOCIATED WITH CIRCUIT TRACING REQUIRED TO BE PERFORMED BY THE ELECTRICAL CONTRACTOR AS PART OF THEIR SCOPE OF WORK. IF THE EXISTING BRANCH CIRCUIT IS NOT RE-USED BY THE NEW WORK, THE ELECTRICAL CONTRACTOR SHALL REMOVE THE EXISTING BRANCH CIRCUIT CONDUIT AND WIRING COMPLETE TO SOURCE AND LABEL THE EXISTING BRANCH CIRCUIT AS "SPARE". DISCONNECT AND REMOVE EXISTING LOW VOLTAGE TELEPHONE AND/OR DATA CABLING COMPLETE TO SOURCE. COORDINATE DEMOLITION WORK ASSOCIATED WITH THE EXISTING LOW VOLTAGE TELEPHONE AND DATA SYSTEMS CABLING WITH THE OWNER'S COMMUNICATION CONTRACTOR IN THE FIELD PRIOR TO START OF DEMOLITION WORK.
18. ELECTRICAL CONTRACTOR SHALL REMOVE EXISTING DUPLEX RECEPTACLE (NON-TAMPER-RESISTANT TYPE) AND REPLACE WITH NEW TAMPER-RESISTANT DUPLEX RECEPTACLE IN THE SAME LOCATION AS INDICATED ON THE NEW WORK PLAN. EXISTING BOX, CONDUIT AND WIRING SERVING RECEPTACLE TO REMAIN TO SERVE NEW WIRING DEVICE AS INDICATED ON THE NEW WORK PLAN. REFER TO GENERAL NOTE #6 FOR ADDITIONAL REQUIREMENTS ASSOCIATED WITH CIRCUIT TRACING REQUIRED TO BE PERFORMED BY THE ELECTRICAL CONTRACTOR AS PART OF THEIR SCOPE OF WORK.
19. ELECTRICAL CONTRACTOR SHALL COORDINATE DEMOLITION OF EXISTING CEILING MOUNTED VIDEO SURVEILLANCE SYSTEM CAMERA WITH THE OWNER'S SECURITY AND VIDEO SURVEILLANCE SYSTEM CAMERA CONTRACTOR IN THE FIELD. DISCONNECT AND REMOVE ASSOCIATED POWER, CONDUIT AND WIRING SERVING CAMERA COMPLETE BASED ON THE NOTED COORDINATION IN THE FIELD PRIOR TO START OF CONSTRUCTION AND PRIOR TO START OF ANY DEMOLITION WORK.

ADD ALTERNATE No. 2

THE ELECTRICAL CONTRACTOR SHALL PROVIDE AN ADD ALTERNATE COST FOR ALL MATERIAL AND LABOR COSTS ASSOCIATED WITH THE REPLACEMENT OF THE EXISTING LIGHTING AND ASSOCIATED LIGHTING CONTROLS IN THE AREA ENCLOSED BY THE THICK DASHED LINE INDICATED. REFER TO ADD ALTERNATE NEW WORK LIGHTING PLAN FOR EXTENT OF NEW LIGHTING AND ASSOCIATED LIGHTING CONTROLS IN THE IDENTIFIED AREA. REFER TO PROJECT SPECIFICATIONS FOR ADDITIONAL INFORMATION REGARDING THE ADD ALTERNATE.

CONTRACTORS PRE-BID NOTIFICATION:

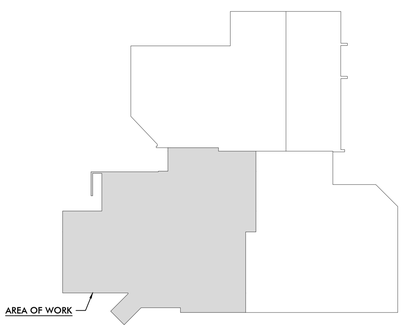
ALL EXISTING ITEMS INDICATED IN THE CONTRACT DRAWINGS HAVE BEEN TAKEN FROM THE OWNER'S LIMITED RECORD DRAWINGS AND SUBSTANTIAL FIELD OBSERVATIONS AND VERIFICATION. THIS CONTRACTOR AND ALL RELATED SUB-CONTRACTORS SHALL VISIT THE SITE AND COMPLETELY UNDERSTAND THE CONDITIONS UNDER WHICH THE WORK MUST BE PERFORMED. IF A DEPARTURE FROM THE DESIGN INTENT OF THE DOCUMENTS IS REQUIRED DUE TO THE ACTUAL FIELD CONDITIONS OBSERVED BY THE CONTRACTOR, THE CONTRACTOR SHALL NOTIFY THE ARCHITECT IN WRITING FOR RESOLUTION PRIOR TO SUBMITTING FINAL BID OR ENTERING INTO A CONTRACT FOR CONSTRUCTION. FAILURE TO PROVIDE THE ARCHITECT WITH NOTIFICATION SHALL RESULT IN THE CONTRACTOR BEING HELD RESPONSIBLE TO COMPLETE ALL WORK TO MEET THE DESIGN INTENT WITH NO ADDITIONAL COST BEING INCURRED BY THE OWNER.

NORTH
1
ED1.01
SCALE: 3/16" = 1'-0"

PARTIAL MAIN LEVEL FLOOR PLAN - ELECTRICAL DEMOLITION

ELECTRICAL GENERAL NOTES

1. REFER TO SHEET ED1.03 FOR ELECTRICAL GENERAL NOTES.



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SEALED & SIGNED 05/16/2025; SEAL APPLIES ONLY TO THE ELECTRICAL DOCUMENTS PREPARED BY TAC ASSOCIATES, LLC

Drawing Name
Electrical Demolition

Drawn By
CAD

Checked By
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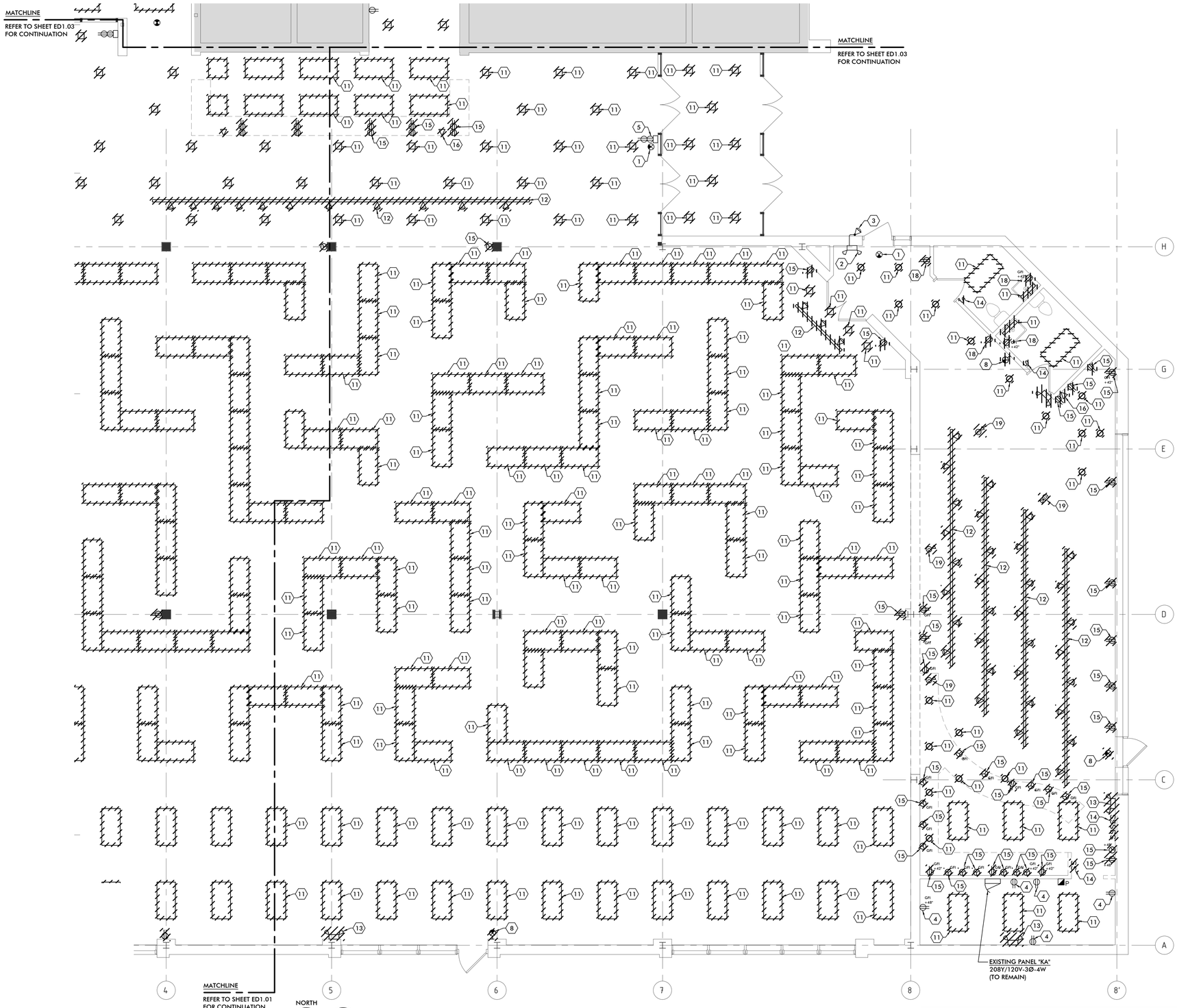

NORTH

1 ED1.02 SCALE: 3/16" = 1'-0"

PARTIAL MAIN LEVEL FLOOR PLAN - ELECTRICAL DEMOLITION

ELECTRICAL GENERAL NOTES

1. REFER TO SHEET ED1.03 FOR ELECTRICAL GENERAL NOTES.

DEMOLITION KEY NOTES

1. EXISTING EXIT LIGHT FIXTURE TO REMAIN.
2. EXISTING WALL MOUNTED EMERGENCY BATTERY UNIT FIXTURE TO REMAIN.
3. EXISTING EXTERIOR WALL MOUNTED EMERGENCY REMOTE HEAD, SERVED FROM EXISTING EMERGENCY BATTERY UNIT INDICATED, TO REMAIN.
4. EXISTING DUPLEX RECEPTACLE TO REMAIN.
5. EXISTING TELEPHONE POWER POLE, WITH 120-VOLT POWER AND LOW VOLTAGE OUTLETS, TO REMAIN.
6. EXISTING LOW VOLTAGE DATA OUTLET TO REMAIN.
7. EXISTING LOCAL AUDIBLE AND VISUAL ALARM SERVING DUCT MOUNTED SMOKE DETECTOR IN MECHANICAL AIR HANDLING UNIT, TO BE RELOCATED TO NEW FURRED OUT WALL. CONDUIT AND BOX SERVING ALARM TO BE CONCEALED IN NEW FURRED OUT WALL. REFER TO NEW WORK POWER PLAN FOR ADDITIONAL INFORMATION.
8. ELECTRICAL CONTRACTOR SHALL DISCONNECT AND REMOVE EXISTING EXIT LIGHT FIXTURE. EXISTING BRANCH CIRCUIT CONDUIT AND WIRING SERVING EXIT LIGHT TO REMAIN FOR RE-USE TO SERVE NEW EXIT LIGHT FIXTURE TO BE INSTALLED IN SAME LOCATION. REFER TO NEW WORK PLANS FOR ADDITIONAL INFORMATION.
9. EXISTING LIGHTING CONTACTOR SERVING LIBRARY LIGHTING TO BE REMOVED COMPLETE. ELECTRICAL CONTRACTOR SHALL DEMOLISH EXISTING LIGHTING CONTACTORS NO LONGER REQUIRED DUE TO THE DEMOLITION OF EXISTING LIGHTING AND ASSOCIATED BRANCH CIRCUITS AS PART OF THE RENOVATION PROJECT. EXISTING CONTACTORS THAT SERVE EXISTING LIGHTING IN AREAS OUTSIDE OF THE RENOVATION AREA SHALL REMAIN AND BE MAINTAINED. PROVIDE NEW BRANCH CIRCUIT WIRING AS REQUIRED TO MAINTAIN LIGHTING CONTROL AND SERVICE TO EXISTING LIGHTING OUTSIDE OF THE RENOVATION AREA THAT IS TO REMAIN.
10. EXISTING LIGHTING CONTROL TOGGLE SWITCH CABINET, MOUNTED IN A SURFACE BOX, TO BE REMOVED. ELECTRICAL CONTRACTOR SHALL DISCONNECT AND REMOVE EXISTING SURFACE MOUNTED BOX AND ASSOCIATED TOGGLE SWITCHES CONTROLLING LIGHTING IN AREAS INDICATED FOR REMOVAL AND REPLACEMENT WITH NEW LIGHTING AS PART OF THE RENOVATION PROJECT.
11. ELECTRICAL CONTRACTOR SHALL DISCONNECT AND REMOVE EXISTING LIGHT FIXTURE INDICATED. DISCONNECT AND REMOVE EXISTING EXISTING BRANCH CIRCUIT CONDUIT AND WIRING COMPLETE TO SOURCE. PORTIONS OF THE EXISTING CONDUIT SYSTEM MAY REMAIN WHERE FEASIBLE TO SERVE NEW LIGHTING FIXTURES, AS DETERMINED BY THE ELECTRICAL CONTRACTOR BASED ON FIELD INVESTIGATION AND SUITABILITY TO SERVE THE NEW LIGHTING LAYOUT INDICATED. WHERE THERE IS EXISTING CONDUIT THAT IS NOT REQUIRED TO SERVE THE NEW LIGHTING, THE ELECTRICAL CONTRACTOR SHALL REMOVE THE CONDUIT COMPLETE TO SOURCE. DEMOLITION WORK TO INCLUDE DEMOLITION OF THE EXISTING SWITCHING CONTROL COMPLETE, INCLUDING LOCAL WALL SWITCHES, WALL BOX TYPE OCCUPANCY SENSOR SWITCHES, LIGHTING RELAYS / CONTACTORS AND THE ASSOCIATED TOGGLE SWITCHES THAT CONTROL GROUPS OF LIGHTING FIXTURES VIA THE LIGHTING RELAYS / CONTACTORS. REFER TO NEW WORK LIGHTING PLANS FOR ADDITIONAL INFORMATION REGARDING THE NEW LIGHTING AND ASSOCIATED LIGHTING CONTROL SYSTEM COMPONENTS. NOTE THAT THE EXISTING LIGHTING CONTROL SYSTEM SWITCHES ARE NOT REFLECTED ON THESE PLANS, BUT SHALL BE REMOVED BY THE ELECTRICAL CONTRACTOR AS NOTED ABOVE.
12. ELECTRICAL CONTRACTOR SHALL DISCONNECT AND REMOVE EXISTING TRACK LIGHTING FIXTURES AND ASSOCIATED LIGHTING TRACK, TRANSFORMERS, POWER SUPPLY AND ASSOCIATED COMPONENTS COMPLETE. DISCONNECT AND REMOVE EXISTING EXISTING BRANCH CIRCUIT CONDUIT AND WIRING COMPLETE TO SOURCE. PORTIONS OF THE EXISTING CONDUIT SYSTEM MAY REMAIN WHERE FEASIBLE TO SERVE NEW LIGHTING FIXTURES, AS DETERMINED BY THE ELECTRICAL CONTRACTOR BASED ON FIELD INVESTIGATION AND SUITABILITY TO SERVE THE NEW LIGHTING LAYOUT INDICATED. WHERE THERE IS EXISTING CONDUIT THAT IS NOT REQUIRED TO SERVE THE NEW LIGHTING, THE ELECTRICAL CONTRACTOR SHALL REMOVE THE CONDUIT COMPLETE TO SOURCE. DEMOLITION WORK TO INCLUDE DEMOLITION OF THE EXISTING SWITCHING CONTROL COMPLETE, INCLUDING LOCAL WALL SWITCHES, WALL BOX TYPE OCCUPANCY SENSOR SWITCHES, LIGHTING RELAYS / CONTACTORS AND THE ASSOCIATED TOGGLE SWITCHES THAT CONTROL GROUPS OF LIGHTING FIXTURES VIA THE LIGHTING RELAYS / CONTACTORS. REFER TO NEW WORK LIGHTING PLANS FOR ADDITIONAL INFORMATION REGARDING THE NEW LIGHTING AND ASSOCIATED LIGHTING CONTROL SYSTEM COMPONENTS. NOTE THAT THE EXISTING LIGHTING CONTROL SYSTEM SWITCHES ARE NOT REFLECTED ON THESE PLANS, BUT SHALL BE REMOVED BY THE ELECTRICAL CONTRACTOR AS NOTED ABOVE.
13. ELECTRICAL CONTRACTOR SHALL DISCONNECT AND REMOVE EXISTING EMERGENCY BATTERY UNIT LIGHT FIXTURE INDICATED. DISCONNECT AND REMOVE EXISTING EXISTING BRANCH CIRCUIT CONDUIT AND WIRING COMPLETE TO SOURCE.
14. ELECTRICAL CONTRACTOR SHALL DISCONNECT AND REMOVE EXISTING SWITCHING CONTROL COMPLETE TO SOURCE.
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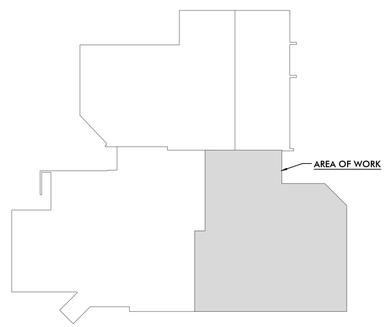
16. ELECTRICAL CONTRACTOR SHALL DISCONNECT AND REMOVE EXISTING LOW VOLTAGE TELEPHONE OR TELEPHONE/ DATA OUTLET. DISCONNECT AND REMOVE EXISTING CONDUIT AND LOW VOLTAGE WIRING COMPLETE TO SOURCE. COORDINATE DEMOLITION WORK ASSOCIATED WITH THE EXISTING LOW VOLTAGE TELEPHONE AND DATA SYSTEMS CABLING WITH THE OWNER'S COMMUNICATION CONTRACTOR IN THE FIELD PRIOR TO START OF DEMOLITION WORK.
17. ELECTRICAL CONTRACTOR SHALL DISCONNECT AND REMOVE EXISTING TELEPHONE POWER POLE. DISCONNECT AND REMOVE EXISTING BRANCH CIRCUIT CONDUIT AND WIRING TO NEAREST JUNCTION BOX TO ALLOW FOR RE-USE OF THE EXISTING BRANCH CIRCUIT TO SERVE NEW WIRING DEVICES OR EQUIPMENT IN THE RENOVATION AREA. PROVIDE NEW BRANCH CIRCUIT CONDUIT AND WIRING AS REQUIRED TO MAINTAIN SERVICE TO EXISTING DEVICES SERVED BY THE CIRCUIT THAT ARE EXISTING TO REMAIN. REFER TO GENERAL NOTE #6 FOR ADDITIONAL REQUIREMENTS ASSOCIATED WITH CIRCUIT TRACING REQUIRED TO BE PERFORMED BY THE ELECTRICAL CONTRACTOR AS PART OF THEIR SCOPE OF WORK. IF THE EXISTING BRANCH CIRCUIT IS NOT RE-USED BY THE NEW WORK, THE ELECTRICAL CONTRACTOR SHALL REMOVE THE EXISTING BRANCH CIRCUIT CONDUIT AND WIRING COMPLETE TO SOURCE AND LABEL THE EXISTING BRANCH CIRCUIT AS "SPARE". DISCONNECT AND REMOVE EXISTING LOW VOLTAGE TELEPHONE AND/OR DATA CABLING COMPLETE TO SOURCE. COORDINATE DEMOLITION WORK ASSOCIATED WITH THE EXISTING LOW VOLTAGE TELEPHONE AND DATA SYSTEMS CABLING WITH THE OWNER'S COMMUNICATION CONTRACTOR IN THE FIELD PRIOR TO START OF DEMOLITION WORK.
18. ELECTRICAL CONTRACTOR SHALL REMOVE EXISTING DUPLEX RECEPTACLE (NON-TAMPER-RESISTANT TYPE) AND REPLACE WITH NEW TAMPER-RESISTANT DUPLEX RECEPTACLE IN THE SAME LOCATION AS INDICATED ON THE NEW WORK PLAN. EXISTING BOX, CONDUIT AND WIRING SERVING RECEPTACLE TO REMAIN TO SERVE NEW WIRING DEVICE AS INDICATED ON THE NEW WORK PLAN. REFER TO GENERAL NOTE #6 FOR ADDITIONAL REQUIREMENTS ASSOCIATED WITH CIRCUIT TRACING REQUIRED TO BE PERFORMED BY THE ELECTRICAL CONTRACTOR AS PART OF THEIR SCOPE OF WORK.
19. ELECTRICAL CONTRACTOR SHALL COORDINATE DEMOLITION OF EXISTING CEILING MOUNTED VIDEO SURVEILLANCE SYSTEM CAMERA WITH THE OWNER'S SECURITY AND VIDEO SURVEILLANCE SYSTEM CAMERA CONTRACTOR IN THE FIELD. DISCONNECT AND REMOVE ASSOCIATED POWER, CONDUIT AND WIRING SERVING CAMERA COMPLETE BASED ON THE NOTED COORDINATION IN THE FIELD PRIOR TO START OF CONSTRUCTION AND PRIOR TO START OF ANY DEMOLITION WORK.

CONTRACTORS PRE-BID NOTIFICATION:

ALL EXISTING ITEMS INDICATED IN THE CONTRACT DRAWINGS HAVE BEEN TAKEN FROM THE OWNER'S LIMITED RECORD DRAWINGS AND SUBSTANTIAL FIELD OBSERVATIONS AND VERIFICATION. THIS CONTRACTOR AND ALL RELATED SUB-CONTRACTORS SHALL VISIT THE SITE AND COMPLETELY UNDERSTAND THE CONDITIONS UNDER WHICH THE WORK MUST BE PERFORMED. IF A DEPARTURE FROM THE DESIGN INTENT OF THE DOCUMENTS IS REQUIRED DUE TO THE ACTUAL FIELD CONDITIONS OBSERVED BY THE CONTRACTOR, THE CONTRACTOR SHALL NOTIFY THE ARCHITECT IN WRITING FOR RESOLUTION PRIOR TO SUBMITTING FINAL BID OR ENTERING INTO A CONTRACT FOR CONSTRUCTION. FAILURE TO PROVIDE THE ARCHITECT WITH NOTIFICATION SHALL RESULT IN THE CONTRACTOR BEING HELD RESPONSIBLE TO COMPLETE ALL WORK TO MEET THE DESIGN INTENT WITH NO ADDITIONAL COST BEING INCURRED BY THE OWNER.



NORTH

KEY PLAN

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SEALED & SIGNED 05/16/2025; SEAL APPLIES ONLY TO THE ELECTRICAL DOCUMENTS PREPARED BY TAC ASSOCIATES, LLC

Drawing Name
Electrical Demolition

Drawn By
CAD

Checked By
TGC

Issue Date
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Revisions

Issued for	Date

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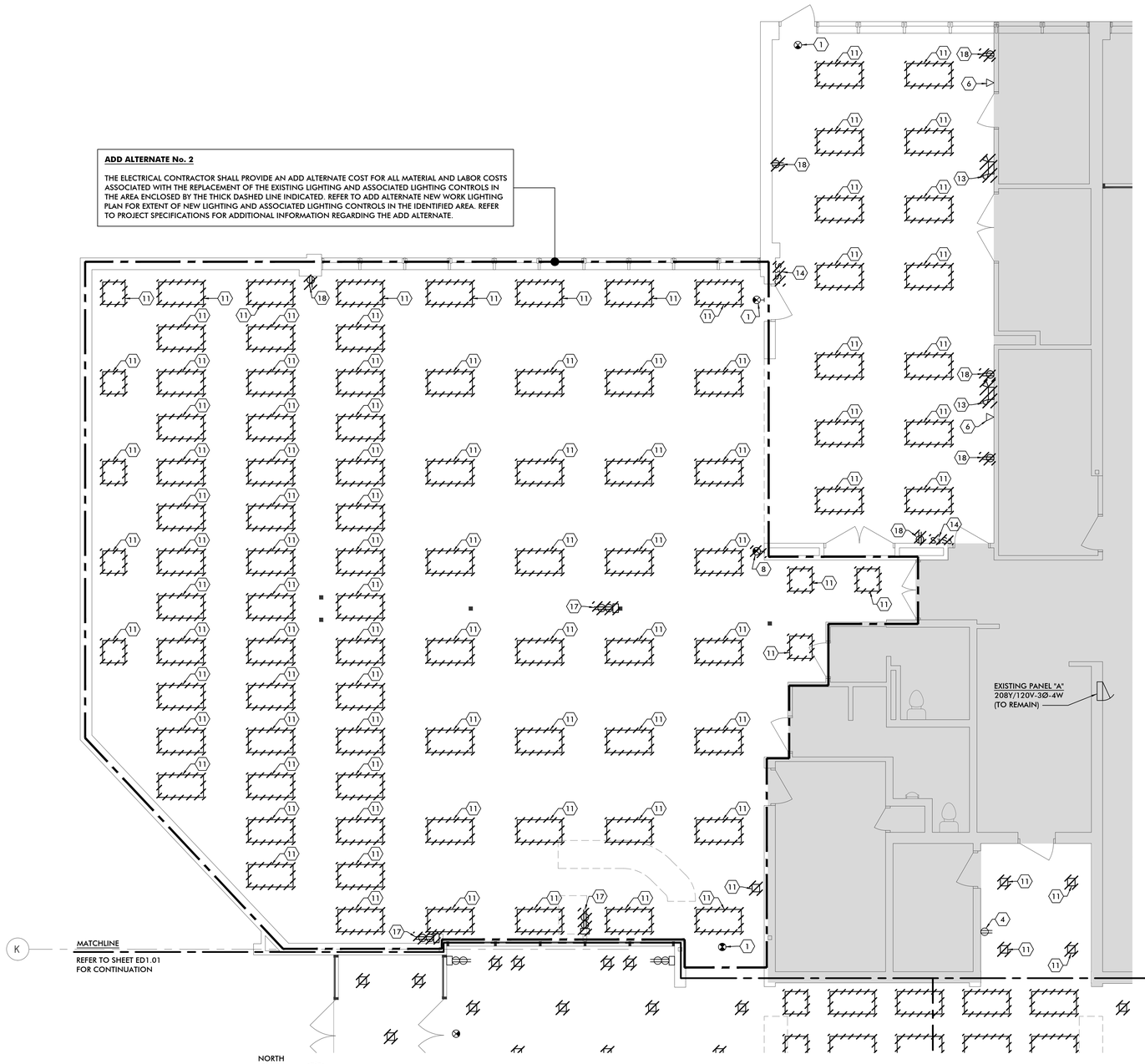
P23005

Sheet Number
ED1.02

ADD ALTERNATE No. 2

THE ELECTRICAL CONTRACTOR SHALL PROVIDE AN ADD ALTERNATE COST FOR ALL MATERIAL AND LABOR COSTS ASSOCIATED WITH THE REPLACEMENT OF THE EXISTING LIGHTING AND ASSOCIATED LIGHTING CONTROLS IN THE AREA ENCLOSED BY THE THICK DASHED LINE INDICATED. REFER TO ADD ALTERNATE NEW WORK LIGHTING PLAN FOR EXTENT OF NEW LIGHTING AND ASSOCIATED LIGHTING CONTROLS IN THE IDENTIFIED AREA. REFER TO PROJECT SPECIFICATIONS FOR ADDITIONAL INFORMATION REGARDING THE ADD ALTERNATE.



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1 ED1.03 **PARTIAL MAIN LEVEL FLOOR PLAN - ELECTRICAL DEMOLITION**

SCALE: 3/16" = 1'-0"

CONTRACTORS PRE-BID NOTIFICATION:

ALL EXISTING ITEMS INDICATED IN THE CONTRACT DRAWINGS HAVE BEEN TAKEN FROM THE OWNER'S LIMITED RECORD DRAWINGS AND SUBSTANTIAL FIELD OBSERVATIONS AND VERIFICATION. THIS CONTRACTOR AND ALL RELATED SUB-CONTRACTORS SHALL VISIT THE SITE AND COMPLETELY UNDERSTAND THE CONDITIONS UNDER WHICH THE WORK MUST BE PERFORMED. IF A DEPARTURE FROM THE DESIGN INTENT OF THE DOCUMENTS IS REQUIRED DUE TO THE ACTUAL FIELD CONDITIONS OBSERVED BY THE CONTRACTOR, THE CONTRACTOR SHALL NOTIFY THE ARCHITECT IN WRITING FOR RESOLUTION PRIOR TO SUBMITTING FINAL BID OR ENTERING INTO A CONTRACT FOR CONSTRUCTION. FAILURE TO PROVIDE THE ARCHITECT WITH NOTIFICATION SHALL RESULT IN THE CONTRACTOR BEING HELD RESPONSIBLE TO COMPLETE ALL WORK TO MEET THE DESIGN INTENT WITH NO ADDITIONAL COST BEING INCURRED BY THE OWNER.

ELECTRICAL GENERAL NOTES

1. ALL DEVICES INDICATED WITH SOLID LIGHT LINES ARE EXISTING DEVICES TO REMAIN.
2. ALL DEVICES AND FIXTURES INDICATED WITH SOLID DARK CROSS-HATCHED LINES ARE EXISTING TO BE REMOVED OR RELOCATED BY THIS ELECTRICAL CONTRACTOR.
3. ALL DEVICES INDICATED WITH SOLID DARK LINES ARE NEW DEVICES TO BE INSTALLED BY THE ELECTRICAL CONTRACTOR AS PART OF THIS SCOPE OF WORK.
4. ELECTRICAL CONTRACTOR SHALL PROVIDE DEMOLITION OF ELECTRICAL DEVICES, CONDUIT, WIRING, FIXTURES, LIGHTING CONTROLS, EQUIPMENT, ETC. AS REQUIRED TO ACCOMMODATE ARCHITECTURAL, MECHANICAL AND ELECTRICAL REVISIONS. ELECTRICAL DEMOLITION SHEET PROVIDES A GENERAL GUIDELINE AS TO THE SCOPE OF THE WORK. HOWEVER, ALL DEMOLITION REQUIREMENTS MAY NOT BE INDICATED. PROVIDE DEMOLITION AS REQUIRED TO ACCOMMODATE PROJECT REVISIONS.
5. COORDINATE DEMOLITION REQUIREMENTS WITH THE WORK OF OTHER TRADES.
6. PRIOR TO START OF CONSTRUCTION, AND PRIOR TO ANY DEMOLITION WORK THE ELECTRICAL CONTRACTOR SHALL PERFORM CIRCUIT TRACING TO IDENTIFY ALL EXISTING BRANCH CIRCUITS SERVING THE RENOVATION AREA, AND TO IDENTIFY THE AVAILABLE BRANCH CIRCUITS THAT MAY BE RE-USED AS PART OF THE PROPOSED RENOVATION, AS WELL AS CIRCUITS THAT SERVE EXISTING LIGHTING FIXTURES OR DEVICES THAT ARE TO REMAIN AND BE MAINTAINED.

DEMOLITION KEY NOTES

1. EXISTING EXIT LIGHT FIXTURE TO REMAIN.
2. EXISTING WALL MOUNTED EMERGENCY BATTERY UNIT FIXTURE TO REMAIN.
3. EXISTING EXTERIOR WALL MOUNTED EMERGENCY REMOTE HEAD, SERVED FROM EXISTING EMERGENCY BATTERY UNIT INDICATED, TO REMAIN.
4. EXISTING DUPLEX RECEPTACLE TO REMAIN.
5. EXISTING TELEPHONE POWER POLE, WITH 120-VOLT POWER AND LOW VOLTAGE OUTLETS, TO REMAIN.
6. EXISTING LOW VOLTAGE DATA OUTLET TO REMAIN.
7. EXISTING LOCAL AUDIBLE AND VISUAL ALARM SERVING DUCT MOUNTED SMOKE DETECTOR IN MECHANICAL AIR HANDLING UNIT, TO BE RELOCATED TO NEW FURRED OUT WALL. CONDUIT AND BOX SERVING ALARM TO BE CONCEALED IN NEW FURRED OUT WALL. REFER TO NEW WORK POWER PLAN FOR ADDITIONAL INFORMATION.
8. ELECTRICAL CONTRACTOR SHALL DISCONNECT AND REMOVE EXISTING EXIT LIGHT FIXTURE. EXISTING BRANCH CIRCUIT CONDUIT AND WIRING SERVING EXIT LIGHT TO REMAIN FOR RE-USE TO SERVE NEW EXIT LIGHT FIXTURE TO BE INSTALLED IN SAME LOCATION. REFER TO NEW WORK PLANS FOR ADDITIONAL INFORMATION.
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10. EXISTING LIGHTING CONTROL TOGGLE SWITCH CABINET, MOUNTED IN A SURFACE BOX, TO BE REMOVED. ELECTRICAL CONTRACTOR SHALL DISCONNECT AND REMOVE EXISTING SURFACE MOUNTED BOX AND ASSOCIATED TOGGLE SWITCHES CONTROLLING LIGHTING IN AREAS INDICATED FOR REMOVAL AND REPLACEMENT WITH NEW LIGHTING AS PART OF THE RENOVATION PROJECT.
11. ELECTRICAL CONTRACTOR SHALL DISCONNECT AND REMOVE EXISTING LIGHT FIXTURE INDICATED. DISCONNECT AND REMOVE EXISTING EXISTING BRANCH CIRCUIT CONDUIT AND WIRING COMPLETE TO SOURCE. PORTIONS OF THE EXISTING CONDUIT SYSTEM MAY REMAIN WHERE FEASIBLE TO SERVE NEW LIGHTING FIXTURES, AS DETERMINED BY THE ELECTRICAL CONTRACTOR BASED ON FIELD INVESTIGATION AND SUITABILITY TO SERVE THE NEW LIGHTING LAYOUT INDICATED. WHERE THERE IS EXISTING CONDUIT THAT IS NOT REQUIRED TO SERVE THE NEW LIGHTING, THE ELECTRICAL CONTRACTOR SHALL REMOVE THE CONDUIT COMPLETE TO SOURCE. DEMOLITION WORK TO INCLUDE DEMOLITION OF THE EXISTING SWITCHING CONTROL COMPLETE, INCLUDING LOCAL WALL SWITCHES, WALL BOX TYPE OCCUPANCY SENSOR SWITCHES, LIGHTING RELAYS / CONTACTORS AND THE ASSOCIATED TOGGLE SWITCHES THAT CONTROL GROUPS OF LIGHTING FIXTURES VIA THE LIGHTING RELAYS / CONTACTORS. REFER TO NEW WORK LIGHTING PLANS FOR ADDITIONAL INFORMATION REGARDING THE NEW LIGHTING AND ASSOCIATED LIGHTING CONTROL SYSTEM COMPONENTS. NOTE THAT THE EXISTING LIGHTING CONTROL SYSTEM SWITCHES ARE NOT REFLECTED ON THESE PLANS, BUT SHALL BE REMOVED BY THE ELECTRICAL CONTRACTOR AS NOTED ABOVE.
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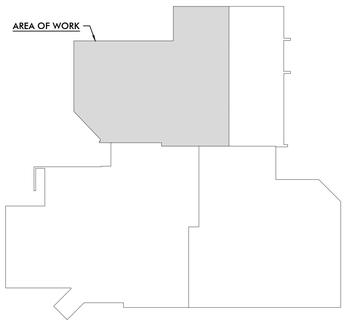
13. ELECTRICAL CONTRACTOR SHALL DISCONNECT AND REMOVE EXISTING EMERGENCY BATTERY UNIT LIGHT FIXTURE INDICATED. DISCONNECT AND REMOVE EXISTING EXISTING BRANCH CIRCUIT CONDUIT AND WIRING COMPLETE TO SOURCE.
14. ELECTRICAL CONTRACTOR SHALL DISCONNECT AND REMOVE EXISTING SWITCHING CONTROL COMPLETE TO SOURCE.
15. ELECTRICAL CONTRACTOR SHALL DISCONNECT AND REMOVE EXISTING DUPLEX RECEPTACLE (OR SINGLE RECEPTACLE WHERE INDICATED). DISCONNECT AND REMOVE EXISTING CONDUIT AND WIRING TO NEAREST JUNCTION BOX TO ALLOW FOR RE-USE OF THE EXISTING BRANCH CIRCUIT TO SERVE NEW WIRING DEVICES OR EQUIPMENT IN THE RENOVATION AREA. PROVIDE NEW BRANCH CIRCUIT CONDUIT AND WIRING AS REQUIRED TO MAINTAIN SERVICE TO EXISTING DEVICES SERVED BY THE CIRCUIT THAT ARE EXISTING TO REMAIN. REFER TO GENERAL NOTE #6 FOR ADDITIONAL REQUIREMENTS ASSOCIATED WITH CIRCUIT TRACING REQUIRED TO BE PERFORMED BY THE ELECTRICAL CONTRACTOR AS PART OF THEIR SCOPE OF WORK. IF THE EXISTING BRANCH CIRCUIT IS NOT RE-USED BY THE NEW WORK, THE ELECTRICAL CONTRACTOR SHALL REMOVE THE EXISTING BRANCH CIRCUIT CONDUIT AND WIRING COMPLETE TO SOURCE AND LABEL THE EXISTING BRANCH CIRCUIT AS "SPARE".
16. ELECTRICAL CONTRACTOR SHALL DISCONNECT AND REMOVE EXISTING LOW VOLTAGE TELEPHONE OR TELEPHONE/ DATA OUTLET. DISCONNECT AND REMOVE EXISTING CONDUIT AND LOW VOLTAGE WIRING COMPLETE TO SOURCE. COORDINATE DEMOLITION WORK ASSOCIATED WITH THE EXISTING LOW VOLTAGE TELEPHONE AND DATA SYSTEMS CABLING WITH THE OWNER'S COMMUNICATION CONTRACTOR IN THE FIELD PRIOR TO START OF DEMOLITION WORK.
17. ELECTRICAL CONTRACTOR SHALL DISCONNECT AND REMOVE EXISTING TELEPHONE POWER POLE. DISCONNECT AND REMOVE EXISTING BRANCH CIRCUIT CONDUIT AND WIRING TO NEAREST JUNCTION BOX TO ALLOW FOR RE-USE OF THE EXISTING BRANCH CIRCUIT TO SERVE NEW WIRING DEVICES OR EQUIPMENT IN THE RENOVATION AREA. PROVIDE NEW BRANCH CIRCUIT CONDUIT AND WIRING AS REQUIRED TO MAINTAIN SERVICE TO EXISTING DEVICES SERVED BY THE CIRCUIT THAT ARE EXISTING TO REMAIN. REFER TO GENERAL NOTE #6 FOR ADDITIONAL REQUIREMENTS ASSOCIATED WITH CIRCUIT TRACING REQUIRED TO BE PERFORMED BY THE ELECTRICAL CONTRACTOR AS PART OF THEIR SCOPE OF WORK. IF THE EXISTING BRANCH CIRCUIT IS NOT RE-USED BY THE NEW WORK, THE ELECTRICAL CONTRACTOR SHALL REMOVE THE EXISTING BRANCH CIRCUIT CONDUIT AND WIRING COMPLETE TO SOURCE AND LABEL THE EXISTING BRANCH CIRCUIT AS "SPARE". DISCONNECT AND REMOVE EXISTING LOW VOLTAGE TELEPHONE AND/OR DATA CABLING COMPLETE TO SOURCE. COORDINATE DEMOLITION WORK ASSOCIATED WITH THE EXISTING LOW VOLTAGE TELEPHONE AND DATA SYSTEMS CABLING WITH THE OWNER'S COMMUNICATION CONTRACTOR IN THE FIELD PRIOR TO START OF DEMOLITION WORK.
18. ELECTRICAL CONTRACTOR SHALL REMOVE EXISTING DUPLEX RECEPTACLE (NON-TAMPER-RESISTANT TYPE) AND REPLACE WITH NEW TAMPER-RESISTANT DUPLEX RECEPTACLE IN THE SAME LOCATION AS INDICATED ON THE NEW WORK PLAN. EXISTING BOX, CONDUIT AND WIRING SERVING RECEPTACLE TO REMAIN TO SERVE NEW WIRING DEVICE AS INDICATED ON THE NEW WORK PLAN. REFER TO GENERAL NOTE #6 FOR ADDITIONAL REQUIREMENTS ASSOCIATED WITH CIRCUIT TRACING REQUIRED TO BE PERFORMED BY THE ELECTRICAL CONTRACTOR AS PART OF THEIR SCOPE OF WORK.
19. ELECTRICAL CONTRACTOR SHALL COORDINATE DEMOLITION OF EXISTING CEILING MOUNTED VIDEO SURVEILLANCE SYSTEM CAMERA WITH THE OWNER'S SECURITY AND VIDEO SURVEILLANCE SYSTEM CAMERA CONTRACTOR IN THE FIELD. DISCONNECT AND REMOVE ASSOCIATED POWER, CONDUIT AND WIRING SERVING CAMERA COMPLETE BASED ON THE NOTED COORDINATION IN THE FIELD PRIOR TO START OF CONSTRUCTION AND PRIOR TO START OF ANY DEMOLITION WORK.



NORTH

KEY PLAN

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PROJECT NAME

SCSPL

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PROFESSIONAL ENGINEER

SEALED & SIGNED 05/16/2025; SEAL APPLIES ONLY TO THE ELECTRICAL DOCUMENTS PREPARED BY TAC ASSOCIATES, LLC

Drawing Name
Electrical Demolition

Drawn By
CAD

Checked By
TGC

Issue Date
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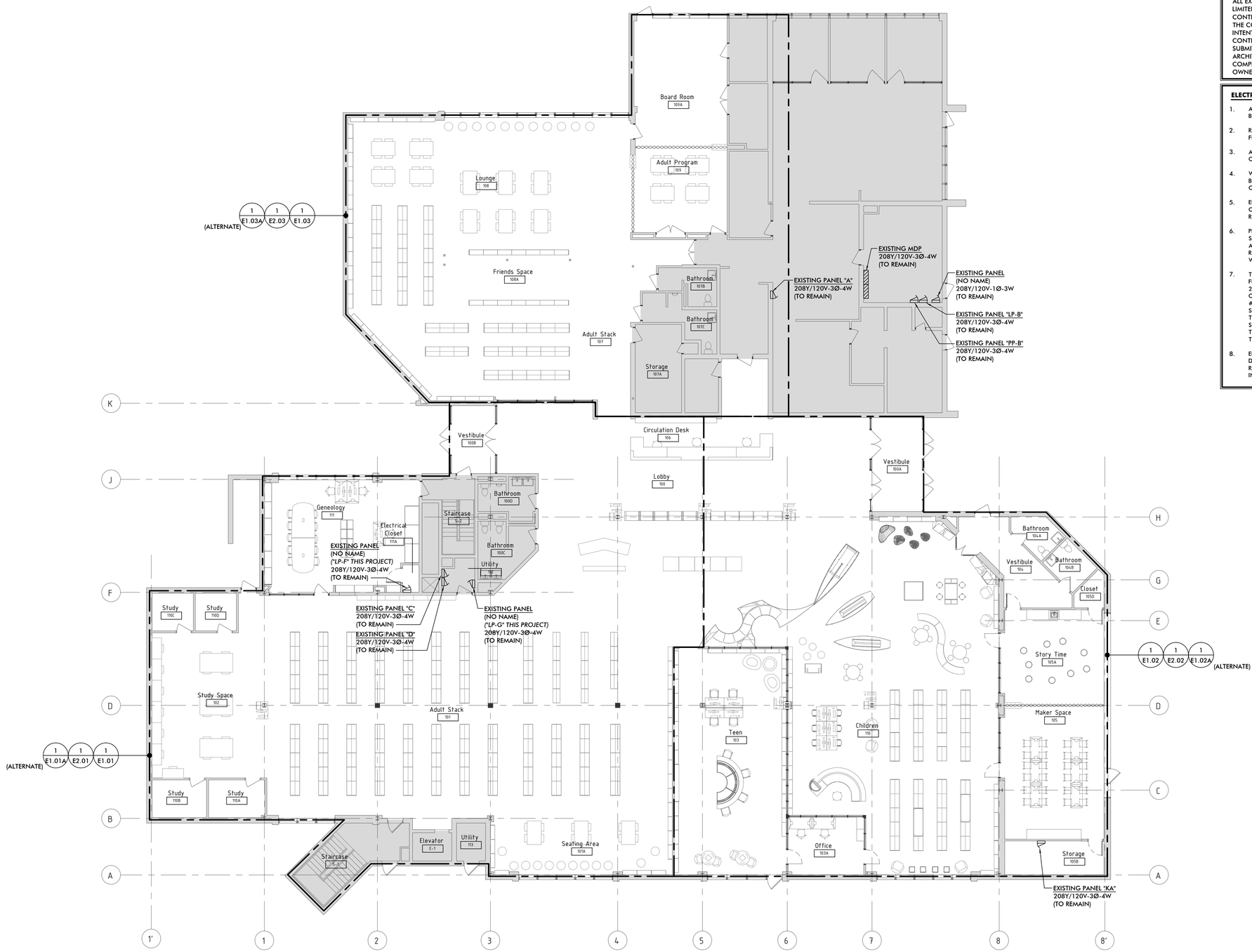

NORTH

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MAIN LEVEL FLOOR PLAN - ELECTRICAL NEW WORK

SCALE: 3/32" = 1'-0"

CONTRACTORS PRE-BID NOTIFICATION:

ALL EXISTING ITEMS INDICATED IN THE CONTRACT DRAWINGS HAVE BEEN TAKEN FROM THE OWNER'S LIMITED RECORD DRAWINGS AND SUBSTANTIAL FIELD OBSERVATIONS AND VERIFICATION. THIS CONTRACTOR AND ALL RELATED SUB-CONTRACTORS SHALL VISIT THE SITE AND COMPLETELY UNDERSTAND THE CONDITIONS UNDER WHICH THE WORK MUST BE PERFORMED. IF A DEPARTURE FROM THE DESIGN INTENT OF THE DOCUMENTS IS REQUIRED DUE TO THE ACTUAL FIELD CONDITIONS OBSERVED BY THE CONTRACTOR, THE CONTRACTOR SHALL NOTIFY THE ARCHITECT IN WRITING FOR RESOLUTION PRIOR TO SUBMITTING FINAL BID OR ENTERING INTO A CONTRACT FOR CONSTRUCTION. FAILURE TO PROVIDE THE ARCHITECT WITH NOTIFICATION SHALL RESULT IN THE CONTRACTOR BEING HELD RESPONSIBLE TO COMPLETE ALL WORK TO MEET THE DESIGN INTENT WITH NO ADDITIONAL COST BEING INCURRED BY THE OWNER.

ELECTRICAL GENERAL NOTES

1. ALL JUNCTION BOXES SERVING BRANCH CIRCUIT WIRING SHALL BE LABELED WITH CIRCUITS SERVED. USE BROTHER P-TOUCH LABEL OR EQUAL ON BOX COVER.
2. REFER TO ARCHITECTURAL REFLECTED CEILING PLANS FOR EXACT LOCATION OF ALL CEILING MOUNTED LIGHT FIXTURES AND OTHER CEILING MOUNTED DEVICES.
3. ALL DEVICES INDICATED WITH SOLID DARK LINES ARE NEW DEVICES TO BE INSTALLED BY THE ELECTRICAL CONTRACTOR AS PART OF THIS SCOPE OF WORK.
4. WHERE MORE THAN ONE LIGHT SWITCH IS INDICATED TO BE INSTALLED AT THE SAME LOCATION, THEY SHALL BE GROUPED UNDER A COMMON COVERPLATE. ALL SWITCHES SHALL BE MOUNTED AT 48"AFF UNLESS OTHERWISE NOTED.
5. ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING ALL LOCATIONS OF FIRE-RATED WALLS, CEILINGS, ETC. WITH ARCHITECTURAL DRAWINGS AND FOR PROVIDING FIRE-RATED BOXES, FIRE CAULK, ETC. AS REQUIRED TO MAINTAIN THE FIRE RATING OF THE SURFACE BEING PENETRATED.
6. PRIOR TO START OF CONSTRUCTION, AND PRIOR TO ANY DEMOLITION WORK THE ELECTRICAL CONTRACTOR SHALL PERFORM CIRCUIT TRACING TO IDENTIFY ALL EXISTING BRANCH CIRCUITS SERVING THE RENOVATION AREA, AND TO IDENTIFY THE AVAILABLE BRANCH CIRCUITS THAT MAY BE RE-USED AS PART OF THE PROPOSED RENOVATION, AS WELL AS CIRCUITS THAT SERVE EXISTING LIGHTING FIXTURES OR DEVICES OUTSIDE OF THE WORK AREA THAT ARE TO REMAIN AND BE MAINTAINED.
7. THE ELECTRICAL CONTRACTOR SHALL INSTALL ALL BRANCH CIRCUITS TO HAVE A MAXIMUM VOLTAGE DROP FROM THE CIRCUIT BREAKER PANEL SERVING THE LOAD TO THE LAST LOAD ON THE CIRCUIT OF NO MORE THAN 2%. ALL 120 VOLT, 20 AMPERE BRANCH CIRCUITS OVER 100 FEET IN LENGTH SHALL BE SERVED WITH #10 CONDUCTORS; ALL 120 VOLT, 20 AMPERE BRANCH CIRCUITS OVER 200 FEET IN LENGTH SHALL BE SERVED WITH #8 CONDUCTORS; AND ALL 120 VOLT, 20 AMPERE BRANCH CIRCUITS OVER 300 FEET IN LENGTH SHALL BE SERVED WITH #6 CONDUCTORS. THE OVER-SIZING OF THE CONDUCTORS SHALL INCLUDE OVER-SIZING OF THE EQUIPMENT GROUND CONDUCTOR IN ACCORDANCE WITH N.E.C. ARTICLE 250. ELECTRICAL CONTRACTOR SHALL PROVIDE STA-CON CONNECTORS ON THE ENDS OF CONDUCTORS WHERE NECESSARY TO FACILITATE TERMINATION OF THE CONDUCTORS AT THE WIRING DEVICES (i.e. DUPLEX RECEPTACLES, SWITCHES, ETC) AND THE CIRCUIT BREAKERS.
8. ELECTRICAL CONTRACTOR SHALL REVIEW TO THE ARCHITECTURAL FLOOR PLANS, ELEVATIONS, SECTIONS AND DETAILS FOR ADDITIONAL ELECTRICAL SCOPE OF WORK, INCLUDING BUT NOT LIMITED TO CONDUIT RACEWAYS REQUIRED TO BE INSTALLED IN MILLWORK, OUTLET SPACING, ETC; THE ELECTRICAL CONTRACTOR SHALL INCLUDE ALL COSTS ASSOCIATED WITH THIS ADDITIONAL ELECTRICAL SCOPE OF WORK IN HIS/HER BID.

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Drawing Name
Electrical New Work

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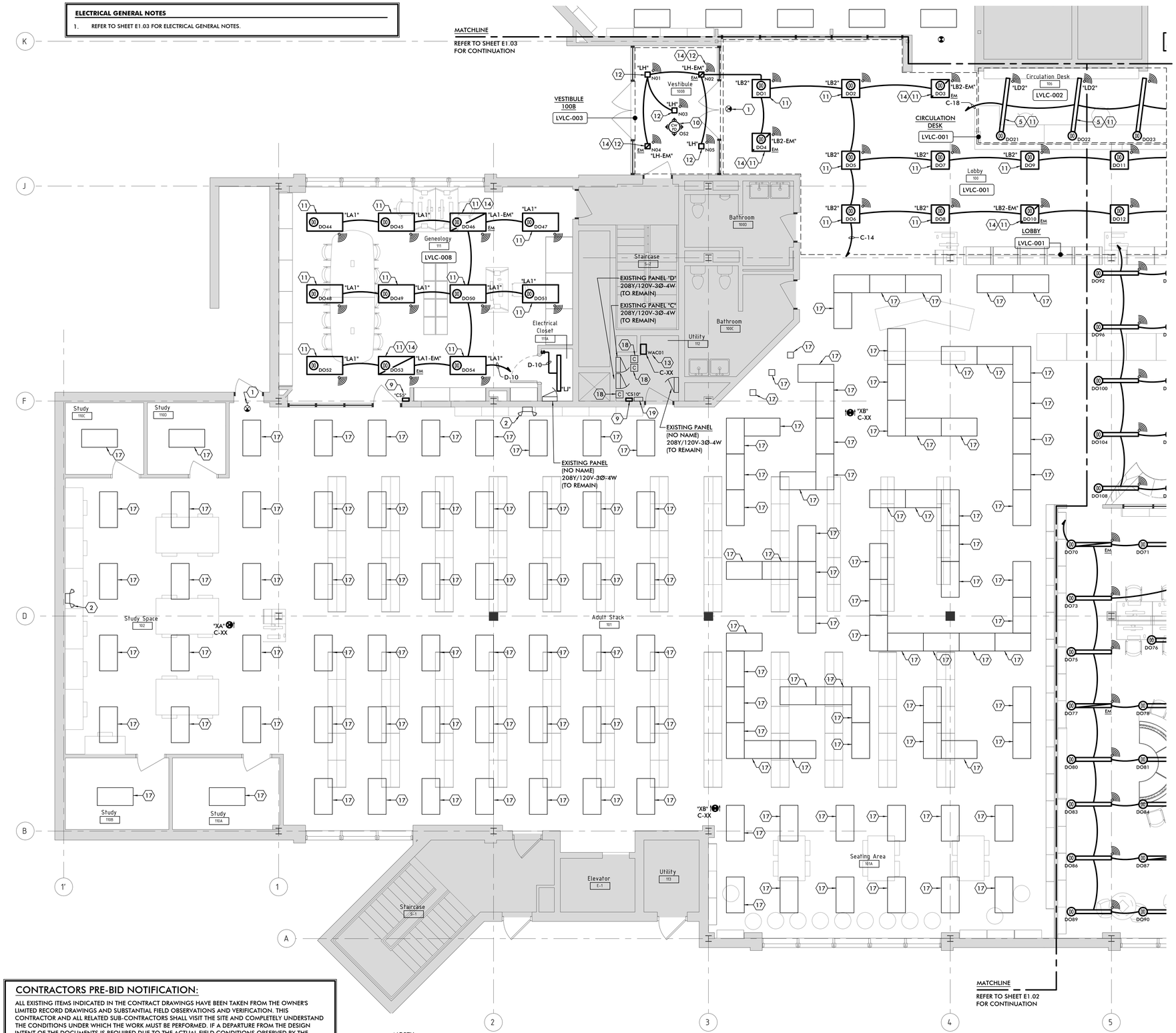
ELECTRICAL GENERAL NOTES

1. REFER TO SHEET E1.03 FOR ELECTRICAL GENERAL NOTES.



CONTRACTORS PRE-BID NOTIFICATION:

ALL EXISTING ITEMS INDICATED IN THE CONTRACT DRAWINGS HAVE BEEN TAKEN FROM THE OWNER'S LIMITED RECORD DRAWINGS AND SUBSTANTIAL FIELD OBSERVATIONS AND VERIFICATION. THIS CONTRACTOR AND ALL RELATED SUB-CONTRACTORS SHALL VISIT THE SITE AND COMPLETELY UNDERSTAND THE CONDITIONS UNDER WHICH THE WORK MUST BE PERFORMED. IF A DEPARTURE FROM THE DESIGN INTENT OF THE DOCUMENTS IS REQUIRED DUE TO THE ACTUAL FIELD CONDITIONS OBSERVED BY THE CONTRACTOR, THE CONTRACTOR SHALL NOTIFY THE ARCHITECT IN WRITING FOR RESOLUTION PRIOR TO SUBMITTING FINAL BID OR ENTERING INTO A CONTRACT FOR CONSTRUCTION. FAILURE TO PROVIDE THE ARCHITECT WITH NOTIFICATION SHALL RESULT IN THE CONTRACTOR BEING HELD RESPONSIBLE TO COMPLETE ALL WORK TO MEET THE DESIGN INTENT WITH NO ADDITIONAL COST BEING INCURRED BY THE OWNER.

NORTH

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PARTIAL MAIN LEVEL FLOOR PLAN - LIGHTING NEW WORK - BASE BID

SCALE: 3/16" = 1'-0"

LIGHTING KEY NOTES

1. EXISTING EXIT LIGHT FIXTURE TO REMAIN.
2. EXISTING WALL MOUNTED EMERGENCY BATTERY UNIT FIXTURE TO REMAIN.
3. EXISTING EXTERIOR WALL MOUNTED EMERGENCY REMOTE HEAD, SERVED FROM EXISTING EMERGENCY BATTERY UNIT INDICATED, TO REMAIN.
4. CIRCUIT NEW EXIT LIGHT FIXTURE TO EXISTING BRANCH CIRCUIT PREVIOUSLY SERVING EXISTING EXIT LIGHT FIXTURE REMOVED BY DEMOLITION WORK AT THIS LOCATION. REFER TO DEMOLITION PLAN FOR ADDITIONAL INFORMATION. REFER TO GENERAL NOTE #6 FOR CIRCUIT TRACING TO BE PERFORMED BY CONTRACTOR PRIOR TO START OF CONSTRUCTION TO IDENTIFY EXISTING BRANCH CIRCUITS.
5. MOUNT SUSPENDED LIGHT FIXTURE AT 8'-0" ABOVE FINISHED FLOOR, MEASURED TO THE BOTTOM OF THE FIXTURE. ADJUST FINAL SUSPENSION HEIGHT TO AVOID CONFLICT WITH WORK OF OTHER TRADES. NOTIFY ENGINEER IF REQUIRED ADJUSTMENT IN SUSPENSION HEIGHT DEVIATES MORE THAN +/- 6".
6. MOUNT SUSPENDED LIGHT FIXTURE AT 8'-6" ABOVE FINISHED FLOOR, MEASURED TO THE BOTTOM OF THE FIXTURE. ADJUST FINAL SUSPENSION HEIGHT TO AVOID CONFLICT WITH WORK OF OTHER TRADES. NOTIFY ENGINEER IF REQUIRED ADJUSTMENT IN SUSPENSION HEIGHT DEVIATES MORE THAN +/- 6".
7. NEW WALL MOUNTED DUAL-TECHNOLOGY OCCUPANCY SENSOR WITH INTEGRAL 0-10V DIMMING CONTROL AND DAYLIGHT HARVESTING PHOTOCELL. SENSOR TO BE GREENGATE CONTROLS OSW-D-010-XX, WHERE THE "XX" DENOTES THE FINISH, TO BE SELECTED BY ARCHITECT, OR APPROVED EQUAL BY WATTSTOPPER, TOUCHE OR HUBBELL CONTROL SOLUTIONS. SENSOR TO BE CONFIGURED FOR PARTIAL AUTO-ON, WITH A SETTING OF PARTIAL AUTO-ON TO 50% DIMMED STATE, FOR COMPLIANCE WITH THE ENERGY CODE.
8. NEW WALL MOUNTED DUAL-TECHNOLOGY OCCUPANCY SENSOR. SENSOR TO BE GREENGATE CONTROLS ONW-D-1001-MV-XX, WHERE "XX" DENOTES THE FINISH, TO BE SELECTED BY ARCHITECT, OR APPROVED EQUAL BY WATTSTOPPER OR HUBBELL CONTROL SOLUTIONS.
9. NEW WIRELESS LIGHTING CONTROL SYSTEM WALL MOUNTED CONTROL STATION. CONTROL STATION TO CONNECT WIRELESS TO THE ASSOCIATED WIRELESS SWITCHPACK FOR CONTROL OF THE LIGHTING LOADS AS NOTED IN THE WIRELESS LIGHTING CONTROL SYSTEM SCHEDULE ON SHEET E4.01. NOTE THAT THE WALLSTATION REQUIRES 120-VOLT FOR OPERATION AND SHALL BE CIRCUITED TO THE SAME 120-VOLT BRANCH CIRCUIT SERVING THE LIGHT FIXTURE WITH THE "IN-FIXTURE" WIRELESS CONTROLS. REFER TO WIRELESS LIGHTING CONTROL SYSTEM SCHEDULE ON SHEET E4.01 FOR WIRELESS FIXTURES CONTROLLED BY THE CONTROL STATION, FUNCTIONALITY TO BE INCLUDED IN STATION (i.e. SWITCHED ONLY, DIMMING, ETC), AND THE STYLE OF CONTROL STATION TO BE PROVIDED. THE SYSTEM MANUFACTURE SHALL BE RESPONSIBLE FOR PREPARING SHOP DRAWINGS / INSTALLATION DRAWINGS SHOWING THE COMPLETE SYSTEM AND ALL ALL DEVICES ON THE NETWORK, THE LOCATIONS WHERE INTERCONNECTING CABLING MAY BE REQUIRED AND THE LOCATIONS OF ADDITIONAL EQUIPMENT AND OTHER DEVICES REQUIRED FOR A COMPLETE AND OPERATING SYSTEM. THE DEVICES INDICATED ON THE DRAWINGS ARE LIMITED TO THE SWITCHPACKS. WIRELESS FIXTURES WITH IN-FIXTURE SENSORS OR WIRELESS NODES, WIRELESS AREA CONTROLLERS, CONTROL STATIONS, OCCUPANCY SENSORS AND DAYLIGHT SENSORS. COORDINATE EXACT DETAILS WITH THE MANUFACTURE.
10. NEW WIRELESS LIGHTING CONTROL SYSTEM CEILING MOUNTED DAYLIGHT SENSOR AND PASSIVE INFRARED OCCUPANCY SENSOR, BATTERY OPERATED. DAYLIGHT / OCCUPANCY SENSOR CONNECTS WIRELESSLY TO THE ASSOCIATED WIRELESS SWITCHPACK TO PROVIDE AUTOMATIC DAYLIGHT HARVESTING AND OCCUPANCY CONTROL FOR THE LIGHTING LOAD SERVED BY THE SWITCHPACK. REFER TO WIRELESS LIGHTING CONTROL SYSTEM SCHEDULE ON SHEET E4.01 FOR WIRELESS FIXTURES CONTROLLED BY OCCUPANCY SENSOR. SEE KEY NOTE #9 ABOVE FOR ADDITIONAL REQUIREMENTS ASSOCIATED WITH THE LIGHTING CONTROL SYSTEM.
11. NEW LIGHTING FIXTURE WITH COOPER LIGHTING SOLUTIONS "WAVELINX" SYSTEM IN-FIXTURE PASSIVE INFRARED OCCUPANCY AND DAYLIGHT SENSOR AND WIRELESS RADIO FOR WIRELESS CONNECTIVITY. REFER TO LIGHTING FIXTURE SCHEDULE FOR ADDITIONAL INFORMATION REGARDING THE IN-FIXTURE CONTROL SYSTEM. REFER TO WIRELESS LIGHTING CONTROL SYSTEM SCHEDULE ON SHEET E4.01 FOR ZONING, GROUPING OF CONTROLS AND ADDITIONAL INFORMATION.
12. NEW LIGHTING FIXTURE WITH COOPER LIGHTING SOLUTIONS "WAVELINX" SYSTEM IN-FIXTURE WIRELESS NODE FOR WIRELESS CONNECTIVITY. REFER TO LIGHTING FIXTURE SCHEDULE FOR ADDITIONAL INFORMATION REGARDING THE IN-FIXTURE CONTROL SYSTEM. REFER TO WIRELESS LIGHTING CONTROL SYSTEM SCHEDULE ON SHEET E4.01 FOR ZONING, GROUPING OF CONTROLS AND ADDITIONAL INFORMATION.
13. LIGHTING CONTROL SYSTEM WIRELESS AREA CONTROLLER, MOUNTED HIGH ON WALL ***ABOVE ACCESSIBLE CEILING SPACE*** IN ROOM AS INDICATED. THE INTENT OF THE DESIGN IS FOR THE WIRELESS AREA CONTROLLER TO BE LOCATED OUT OF PUBLIC VIEW, ABOVE ACCESSIBLE CEILING SPACE. IF IT IS NECESSARY TO LOCATE A CONTROLLER OUTSIDE OF THE ACCESSIBLE CEILING SPACE IN ORDER FOR THE SYSTEM TO PROPERLY OPERATE THEN THE LOCATION SHALL BE COORDINATED WITH THE ARCHITECT PRIOR TO FINAL PLACEMENT, AND SHALL BE LOCATED AS HIGH AS POSSIBLE ON THE WALL TO BE OUT OF DIRECT VIEW. COORDINATE EXACT LOCATION OF AREA CONTROLLER WITH THE LIGHTING CONTROL SYSTEM MANUFACTURE BASED ON THEIR INSTALLATION DRAWINGS. NOTE THAT THE AREA CONTROLLER IS POWERED FROM A POWER OVER ETHERNET CONNECTION. PROVIDE NETWORK SWITCH WITH POWER OVER ETHERNET (P.O.E.) TO PROVIDE POWER TO THE WIRELESS AREA CONTROLLER, AS COORDINATED WITH THE WIRELESS LIGHTING CONTROL SYSTEM MANUFACTURE. AT THE CONTRACTORS OPTION, BASED ON COORDINATION WITH THE LIGHTING CONTROL SYSTEM MANUFACTURE, A SEPARATE P.O.E. INJECTOR MAY BE UTILIZED; CIRCUIT 120-VOLT OF INJECTOR TO A SPARE 120-VOLT BRANCH CIRCUIT FROM THE NEAREST PANEL, AND REFLECT BRANCH CIRCUIT ON THE AS-BUILT RECORD DRAWINGS. MOUNT 120 VOLT RECEPTACLE SERVING P.O.E. INJECTOR AND THE P.O.E. INJECTOR IN AN ACCESSIBLE CLOSET OR OTHER LOCATION NEARBY THE WIRELESS AREA CONTROLLER.
14. EMERGENCY FIXTURE WITH INTERNAL BATTERY BACKUP. FIXTURE SHALL OPERATE IN THE NORMAL CONDITION AS A SWITCHED/DIMMED FIXTURE. UPON LOSS OF NORMAL POWER, THE FIXTURE SHALL ENERGIZE TO THE LUMEN OUTPUT AS SPECIFIED IN THE LIGHTING FIXTURE SCHEDULE, REGARDLESS OF THE SWITCHED OR DIMMED STATE OF THE FIXTURE. REFER TO THE MANUFACTURES WIRING DIAGRAMS FOR EXACT WIRING OF THE INTERNAL BATTERY BACKUP WHEN CONTROLLED BY THE WIRELESS LIGHTING CONTROL SYSTEM INDICATED.
15. CIRCUIT TO EXISTING BRANCH CIRCUIT PREVIOUSLY SERVING LIGHTING FIXTURES IN THE AREA, AND REMOVED BY DEMOLITION WORK. CIRCUIT NUMBER INDICATED IS BASED ON EXISTING PANEL SCHEDULE INFORMATION AND AS-BUILT DRAWING INFORMATION, AND MAY NOT BE ACCURATE. REFER TO GENERAL NOTE #6 FOR ADDITIONAL REQUIREMENTS ASSOCIATED WITH CIRCUIT TRACING REQUIRED TO BE PERFORMED BY THE ELECTRICAL CONTRACTOR AS PART OF THEIR SCOPE OF WORK. UPDATE ACTUAL CIRCUIT NUMBER AS DETERMINED BY CIRCUIT TRACING ON THE "AS-BUILT" RECORD DRAWINGS.
16. MOUNT SUSPENDED LIGHT FIXTURE AT 9'-7" ABOVE FINISHED FLOOR, MEASURED TO THE BOTTOM OF THE FIXTURE. ADJUST FINAL SUSPENSION HEIGHT TO AVOID CONFLICT WITH WORK OF OTHER TRADES. NOTIFY ENGINEER IF REQUIRED ADJUSTMENT IN SUSPENSION HEIGHT DEVIATES MORE THAN +/- 6".
17. EXISTING CEILING MOUNTED LIGHT FIXTURE TO REMAIN.
18. EXISTING LIGHTING CONTROL CONTACTOR TO REMAIN. THE EXACT LIGHTING CONTACTORS THAT ARE TO REMAIN TO BE VERIFIED IN FIELD BY THE ELECTRICAL CONTRACTOR BASED ON CIRCUIT TRACING AND THE LIGHTING FIXTURES TO BE REMOVED BY THE BASE BID SCOPE OF WORK.
19. EXISTING LIGHTING CONTROL TOGGLE SWITCH CABINET, MOUNTED IN A SURFACE BOX, TO REMAIN. ELECTRICAL CONTRACTOR SHALL REMOVE EXISTING TOGGLE SWITCHES SERVING AREAS WHERE THE EXISTING LIGHTING, AND ASSOCIATED LIGHTING CONTACTOR HAS BEEN REMOVED BY DEMOLITION WORK, AND THE TOGGLE SWITCH IS NO LONGER FUNCTIONAL. PROVIDE CLOSURE PLUG TO SEAL OPENING IN COVER OF BOX WHERE THE TOGGLE SWITCH IS REMOVED. EXACT SCOPE OF TOGGLE SWITCHES AND ASSOCIATED LIGHTING CONTACTORS TO BE REMOVED BY DEMOLITION WORK TO BE VERIFIED IN FIELD BY THE ELECTRICAL CONTRACTOR BASED ON CIRCUIT TRACING TO BE PERFORMED PRIOR TO THE START OF DEMOLITION WORK, AND THE EXACT SCOPE OF DEMOLITION REQUIRED AS PART OF THE BASE BID SCOPE OF WORK.

NORTH

KEY PLAN

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Drawing Name
Lighting New Work

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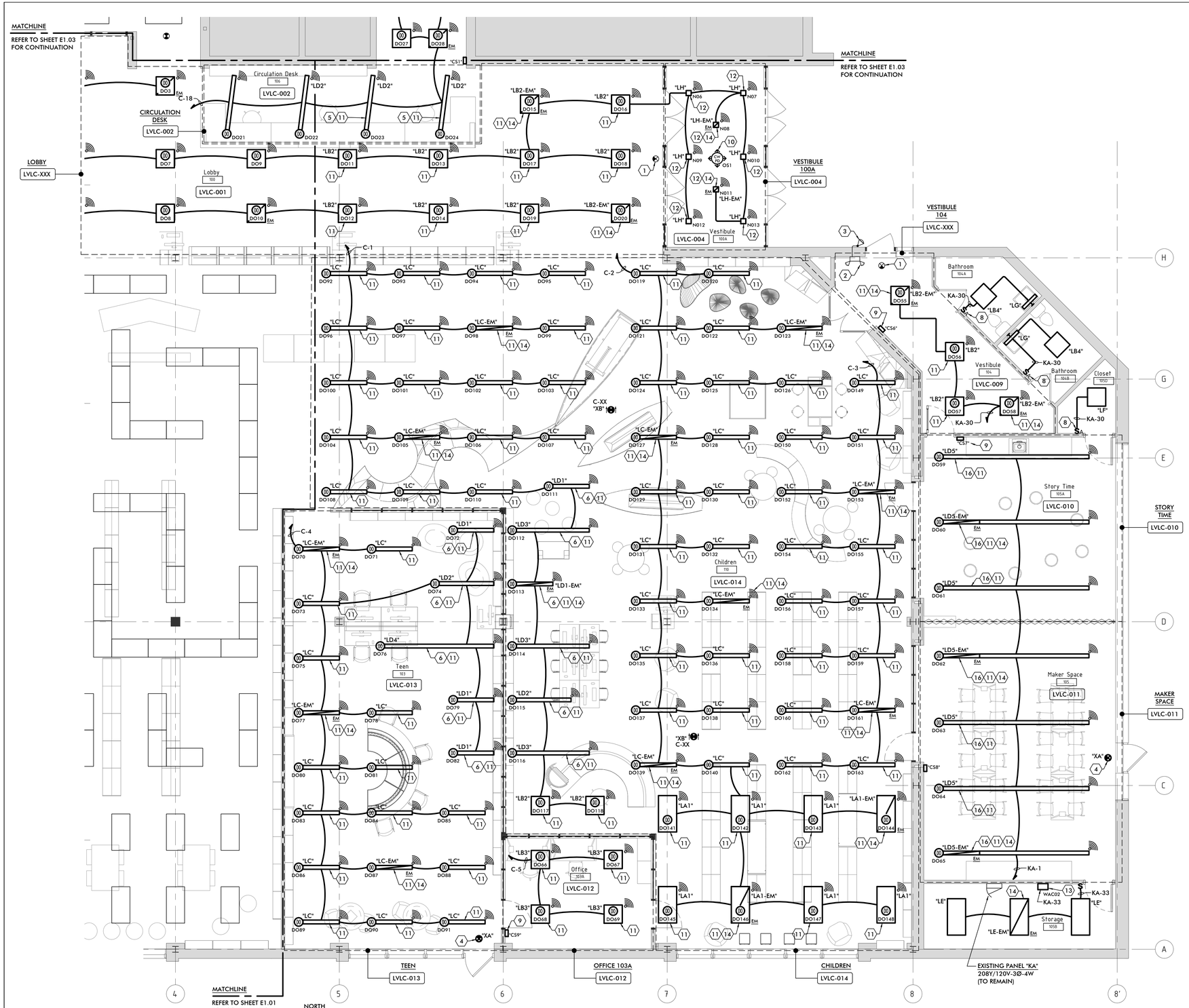

PARTIAL MAIN LEVEL FLOOR PLAN - LIGHTING NEW WORK - BASE BID

NORTH 1 E1.02 SCALE: 3/16" = 1'-0"

ELECTRICAL GENERAL NOTES

1. REFER TO SHEET E1.03 FOR ELECTRICAL GENERAL NOTES.

CONTRACTORS PRE-BID NOTIFICATION:

ALL EXISTING ITEMS INDICATED IN THE CONTRACT DRAWINGS HAVE BEEN TAKEN FROM THE OWNER'S LIMITED RECORD DRAWINGS AND SUBSTANTIAL FIELD OBSERVATIONS AND VERIFICATION. THIS CONTRACTOR AND ALL RELATED SUB-CONTRACTORS SHALL VISIT THE SITE AND COMPLETELY UNDERSTAND THE CONDITIONS UNDER WHICH THE WORK MUST BE PERFORMED. IF A DEPARTURE FROM THE DESIGN INTENT OF THE DOCUMENTS IS REQUIRED DUE TO THE ACTUAL FIELD CONDITIONS OBSERVED BY THE CONTRACTOR, THE CONTRACTOR SHALL NOTIFY THE ARCHITECT IN WRITING FOR RESOLUTION PRIOR TO SUBMITTING FINAL BID OR ENTERING INTO A CONTRACT FOR CONSTRUCTION. FAILURE TO PROVIDE THE ARCHITECT WITH NOTIFICATION SHALL RESULT IN THE CONTRACTOR BEING HELD RESPONSIBLE TO COMPLETE ALL WORK TO MEET THE DESIGN INTENT WITH NO ADDITIONAL COST BEING INCURRED BY THE OWNER.

LIGHTING KEY NOTES

1. EXISTING EXIT LIGHT FIXTURE TO REMAIN.
2. EXISTING WALL MOUNTED EMERGENCY BATTERY UNIT FIXTURE TO REMAIN.
3. EXISTING EXTERIOR WALL MOUNTED EMERGENCY REMOTE HEAD, SERVED FROM EXISTING EMERGENCY BATTERY UNIT INDICATED, TO REMAIN.
4. CIRCUIT NEW EXIT LIGHT FIXTURE TO EXISTING BRANCH CIRCUIT PREVIOUSLY SERVING EXISTING EXIT LIGHT FIXTURE REMOVED BY DEMOLITION WORK AT THIS LOCATION. REFER TO DEMOLITION PLAN FOR ADDITIONAL INFORMATION. REFER TO GENERAL NOTE #6 FOR CIRCUIT TRACING TO BE PERFORMED BY CONTRACTOR PRIOR TO START OF CONSTRUCTION TO IDENTIFY EXISTING BRANCH CIRCUITS.
5. MOUNT SUSPENDED LIGHT FIXTURE AT 8'-0" ABOVE FINISHED FLOOR, MEASURED TO THE BOTTOM OF THE FIXTURE. ADJUST FINAL SUSPENSION HEIGHT TO AVOID CONFLICT WITH WORK OF OTHER TRADES. NOTIFY ENGINEER IF REQUIRED ADJUSTMENT IN SUSPENSION HEIGHT DEVIATES MORE THAN +/- 6".
6. MOUNT SUSPENDED LIGHT FIXTURE AT 8'-6" ABOVE FINISHED FLOOR, MEASURED TO THE BOTTOM OF THE FIXTURE. ADJUST FINAL SUSPENSION HEIGHT TO AVOID CONFLICT WITH WORK OF OTHER TRADES. NOTIFY ENGINEER IF REQUIRED ADJUSTMENT IN SUSPENSION HEIGHT DEVIATES MORE THAN +/- 6".
7. NEW WALL MOUNTED DUAL-TECHNOLOGY OCCUPANCY SENSOR WITH INTEGRAL 0-10V DIMMING CONTROL AND DAYLIGHT HARVESTING PHOTOCELL. SENSOR TO BE GREENGATE CONTROLS OSW-D-010-XX, WHERE THE "XX" DENOTES THE FINISH, TO BE SELECTED BY ARCHITECT, OR APPROVED EQUAL BY WATTSTOPPER, TOUCHE OR HUBBELL CONTROL SOLUTIONS. SENSOR TO BE CONFIGURED FOR PARTIAL AUTO-ON, WITH A SETTING OF PARTIAL AUTO-ON TO 50% DIMMED STATE, FOR COMPLIANCE WITH THE ENERGY CODE.
8. NEW WALL MOUNTED DUAL-TECHNOLOGY OCCUPANCY SENSOR. SENSOR TO BE GREENGATE CONTROLS ONW-D-1001-MV-XX, WHERE "XX" DENOTES THE FINISH, TO BE SELECTED BY ARCHITECT, OR APPROVED EQUAL BY WATTSTOPPER OR HUBBELL CONTROL SOLUTIONS.
9. NEW WIRELESS LIGHTING CONTROL SYSTEM WALL MOUNTED CONTROL STATION. CONTROL STATION TO CONNECT WIRELESS TO THE ASSOCIATED WIRELESS SWITCHPACK FOR CONTROL OF THE LIGHTING LOADS AS NOTED IN THE WIRELESS LIGHTING CONTROL SYSTEM SCHEDULE ON SHEET E4.01. NOTE THAT THE WALLSTATION REQUIRES 120-VOLT FOR OPERATION AND SHALL BE CIRCUITED TO THE SAME 120-VOLT BRANCH CIRCUIT SERVING THE LIGHT FIXTURE WITH THE "IN-FIXTURE" WIRELESS CONTROLS. REFER TO WIRELESS LIGHTING CONTROL SYSTEM SCHEDULE ON SHEET E4.01 FOR WIRELESS FIXTURES CONTROLLED BY THE CONTROL STATION, FUNCTIONALITY TO BE INCLUDED IN STATION (i.e. SWITCHED ONLY, DIMMING, ETC), AND THE STYLE OF CONTROL STATION TO BE PROVIDED. THE SYSTEM MANUFACTURE SHALL BE RESPONSIBLE FOR PREPARING SHOP DRAWINGS / INSTALLATION DRAWINGS SHOWING THE COMPLETE SYSTEM AND ALL ALL DEVICES ON THE NETWORK, THE LOCATIONS WHERE INTERCONNECTING CABLING MAY BE REQUIRED AND THE LOCATIONS OF ADDITIONAL EQUIPMENT AND OTHER DEVICES REQUIRED FOR A COMPLETE AND OPERATING SYSTEM. THE DEVICES INDICATED ON THE DRAWINGS ARE LIMITED TO THE SWITCHPACKS, WIRELESS FIXTURES WITH IN-FIXTURE SENSORS OR WIRELESS NODES, WIRELESS AREA CONTROLLERS, CONTROL STATIONS, OCCUPANCY SENSORS AND DAYLIGHT SENSORS. COORDINATE EXACT DETAILS WITH THE MANUFACTURE.
10. NEW WIRELESS LIGHTING CONTROL SYSTEM CEILING MOUNTED DAYLIGHT SENSOR AND PASSIVE INFRARED OCCUPANCY SENSOR, BATTERY OPERATED. DAYLIGHT / OCCUPANCY SENSOR CONNECTS WIRELESSLY TO THE ASSOCIATED WIRELESS SWITCHPACK TO PROVIDE AUTOMATIC DAYLIGHT HARVESTING AND OCCUPANCY CONTROL FOR THE LIGHTING LOAD SERVED BY THE SWITCHPACK. REFER TO WIRELESS LIGHTING CONTROL SYSTEM SCHEDULE ON SHEET E4.01 FOR WIRELESS FIXTURES CONTROLLED BY OCCUPANCY SENSOR. SEE KEY NOTE #9 ABOVE FOR ADDITIONAL REQUIREMENTS ASSOCIATED WITH THE LIGHTING CONTROL SYSTEM.
11. NEW LIGHTING FIXTURE WITH COOPER LIGHTING SOLUTIONS "WAVELINX" SYSTEM IN-FIXTURE PASSIVE INFRARED OCCUPANCY AND DAYLIGHT SENSOR AND WIRELESS RADIO FOR WIRELESS CONNECTIVITY. REFER TO LIGHTING FIXTURE SCHEDULE FOR ADDITIONAL INFORMATION REGARDING THE IN-FIXTURE CONTROL SYSTEM. REFER TO WIRELESS LIGHTING CONTROL SYSTEM SCHEDULE ON SHEET E4.01 FOR ZONING, GROUPING OF CONTROLS AND ADDITIONAL INFORMATION.
12. NEW LIGHTING FIXTURE WITH COOPER LIGHTING SOLUTIONS "WAVELINX" SYSTEM IN-FIXTURE WIRELESS NODE FOR WIRELESS CONNECTIVITY. REFER TO LIGHTING FIXTURE SCHEDULE FOR ADDITIONAL INFORMATION REGARDING THE IN-FIXTURE CONTROL SYSTEM. REFER TO WIRELESS LIGHTING CONTROL SYSTEM SCHEDULE ON SHEET E4.01 FOR ZONING, GROUPING OF CONTROLS AND ADDITIONAL INFORMATION.
13. LIGHTING CONTROL SYSTEM WIRELESS AREA CONTROLLER, MOUNTED HIGH ON WALL ***ABOVE ACCESSIBLE CEILING SPACE*** IN ROOM AS INDICATED. THE INTENT OF THE DESIGN IS FOR THE WIRELESS AREA CONTROLLER TO BE LOCATED OUT OF PUBLIC VIEW, ABOVE ACCESSIBLE CEILING SPACE. IF IT IS NECESSARY TO LOCATE A CONTROLLER OUTSIDE OF THE ACCESSIBLE CEILING SPACE IN ORDER FOR THE SYSTEM TO PROPERLY OPERATE THEN THE LOCATION SHALL BE COORDINATED WITH THE ARCHITECT PRIOR TO FINAL PLACEMENT, AND SHALL BE LOCATED AS HIGH AS POSSIBLE ON THE WALL TO BE OUT OF DIRECT VIEW. COORDINATE EXACT LOCATION OF AREA CONTROLLER WITH THE LIGHTING CONTROL SYSTEM MANUFACTURE BASED ON THEIR INSTALLATION DRAWINGS. NOTE THAT THE AREA CONTROLLER IS POWERED FROM A POWER OVER ETHERNET CONNECTION. PROVIDE NETWORK SWITCH WITH POWER OVER ETHERNET (P.O.E.) TO PROVIDE POWER TO THE WIRELESS AREA CONTROLLER, AS COORDINATED WITH THE WIRELESS LIGHTING CONTROL SYSTEM MANUFACTURE. AT THE CONTRACTORS OPTION, BASED ON COORDINATION WITH THE LIGHTING CONTROL SYSTEM MANUFACTURE, A SEPARATE P.O.E. INJECTOR MAY BE UTILIZED; CIRCUIT 120-VOLT INPUT OF INJECTOR TO A SPARE 120-VOLT BRANCH CIRCUIT FROM THE NEAREST PANEL, AND REFLECT BRANCH CIRCUIT ON THE AS-BUILT RECORD DRAWINGS. MOUNT 120 VOLT RECEPTACLE SERVING P.O.E. INJECTOR AND THE P.O.E. INJECTOR IN AN ACCESSIBLE CLOSET OR OTHER LOCATION NEARBY THE WIRELESS AREA CONTROLLER.
14. EMERGENCY FIXTURE WITH INTERNAL BATTERY BACKUP. FIXTURE SHALL OPERATE IN THE NORMAL CONDITION AS A SWITCHED/DIMMED FIXTURE. UPON LOSS OF NORMAL POWER, THE FIXTURE SHALL ENERGIZE TO THE LUMEN OUTPUT AS SPECIFIED IN THE LIGHTING FIXTURE SCHEDULE, REGARDLESS OF THE SWITCHED OR DIMMED STATE OF THE FIXTURE. REFER TO THE MANUFACTURES WIRING DIAGRAMS FOR EXACT WIRING OF THE INTERNAL BATTERY BACKUP WHEN CONTROLLED BY THE WIRELESS LIGHTING CONTROL SYSTEM INDICATED.
15. CIRCUIT TO EXISTING BRANCH CIRCUIT PREVIOUSLY SERVING LIGHTING FIXTURES IN THE AREA, AND REMOVED BY DEMOLITION WORK. CIRCUIT NUMBER INDICATED IS BASED ON EXISTING PANEL SCHEDULE INFORMATION AND AS-BUILT DRAWING INFORMATION, AND MAY NOT BE ACCURATE. REFER TO GENERAL NOTE #6 FOR ADDITIONAL REQUIREMENTS ASSOCIATED WITH CIRCUIT TRACING REQUIRED TO BE PERFORMED BY THE ELECTRICAL CONTRACTOR AS PART OF THEIR SCOPE OF WORK. UPDATE ACTUAL CIRCUIT NUMBER AS DETERMINED BY CIRCUIT TRACING ON THE "AS-BUILT" RECORD DRAWINGS.
16. MOUNT SUSPENDED LIGHT FIXTURE AT 9'-7" ABOVE FINISHED FLOOR, MEASURED TO THE BOTTOM OF THE FIXTURE. ADJUST FINAL SUSPENSION HEIGHT TO AVOID CONFLICT WITH WORK OF OTHER TRADES. NOTIFY ENGINEER IF REQUIRED ADJUSTMENT IN SUSPENSION HEIGHT DEVIATES MORE THAN +/- 6".
17. EXISTING CEILING MOUNTED LIGHT FIXTURE TO REMAIN.
18. EXISTING LIGHTING CONTROL CONTACTOR TO REMAIN. THE EXACT LIGHTING CONTACTORS THAT ARE TO REMAIN TO BE VERIFIED IN FIELD BY THE ELECTRICAL CONTRACTOR BASED ON CIRCUIT TRACING AND THE LIGHTING FIXTURES TO BE REMOVED BY THE BASE BID SCOPE OF WORK.
19. EXISTING LIGHTING CONTROL TOGGLE SWITCH CABINET, MOUNTED IN A SURFACE BOX, TO REMAIN. ELECTRICAL CONTRACTOR SHALL REMOVE EXISTING TOGGLE SWITCHES SERVING AREAS WHERE THE EXISTING LIGHTING, AND ASSOCIATED LIGHTING CONTACTOR HAS BEEN REMOVED BY DEMOLITION WORK, AND THE TOGGLE SWITCH IS NO LONGER FUNCTIONAL. PROVIDE CLOSURE PLUG TO SEAL OPENING IN COVER OF BOX WHERE THE TOGGLE SWITCH IS REMOVED. EXACT SCOPE OF TOGGLE SWITCHES AND ASSOCIATED LIGHTING CONTACTORS TO BE REMOVED BY DEMOLITION WORK TO BE VERIFIED IN FIELD BY THE ELECTRICAL CONTRACTOR BASED ON CIRCUIT TRACING TO BE PERFORMED PRIOR TO THE START OF DEMOLITION WORK, AND THE EXACT SCOPE OF DEMOLITION REQUIRED AS PART OF THE BASE BID SCOPE OF WORK.

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Drawing Name
Lighting New Work

Drawn By
CAD

Checked By
TGC

Issue Date
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Revisions

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Project No.
P23005

Sheet Number
E1.02

NORTH

1 E1.03

PARTIAL MAIN LEVEL FLOOR PLAN - LIGHTING NEW WORK - BASE BID

SCALE: 3/16" = 1'-0"

CONTRACTORS PRE-BID NOTIFICATION:

ALL EXISTING ITEMS INDICATED IN THE CONTRACT DRAWINGS HAVE BEEN TAKEN FROM THE OWNER'S LIMITED RECORD DRAWINGS AND SUBSTANTIAL FIELD OBSERVATIONS AND VERIFICATION. THIS CONTRACTOR AND ALL RELATED SUB-CONTRACTORS SHALL VISIT THE SITE AND COMPLETELY UNDERSTAND THE CONDITIONS UNDER WHICH THE WORK MUST BE PERFORMED. IF A DEPARTURE FROM THE DESIGN INTENT OF THE DOCUMENTS IS REQUIRED DUE TO THE ACTUAL FIELD CONDITIONS OBSERVED BY THE CONTRACTOR, THE CONTRACTOR SHALL NOTIFY THE ARCHITECT IN WRITING FOR RESOLUTION PRIOR TO SUBMITTING FINAL BID OR ENTERING INTO A CONTRACT FOR CONSTRUCTION. FAILURE TO PROVIDE THE ARCHITECT WITH NOTIFICATION SHALL RESULT IN THE CONTRACTOR BEING HELD RESPONSIBLE TO COMPLETE ALL WORK TO MEET THE DESIGN INTENT WITH NO ADDITIONAL COST BEING INCURRED BY THE OWNER.

ELECTRICAL GENERAL NOTES

1. ALL JUNCTION BOXES SERVING BRANCH CIRCUIT WIRING SHALL BE LABELED WITH CIRCUITS SERVED. USE BROTHER P-TOUCH LABEL OR EQUAL ON BOX COVER.
2. REFER TO ARCHITECTURAL REFLECTED CEILING PLANS FOR EXACT LOCATION OF ALL CEILING MOUNTED LIGHT FIXTURES AND OTHER CEILING MOUNTED DEVICES.
3. ALL DEVICES INDICATED WITH SOLID DARK LINES ARE NEW DEVICES TO BE INSTALLED BY THE ELECTRICAL CONTRACTOR AS PART OF THIS SCOPE OF WORK.
4. WHERE MORE THAN ONE LIGHT SWITCH IS INDICATED TO BE INSTALLED AT THE SAME LOCATION, THEY SHALL BE GROUPED UNDER A COMMON COVERPLATE. ALL SWITCHES SHALL BE MOUNTED AT 48"AFF UNLESS OTHERWISE NOTED.
5. ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING ALL LOCATIONS OF FIRE-RATED WALLS, CEILINGS, ETC. WITH ARCHITECTURAL DRAWINGS AND FOR PROVIDING FIRE-RATED BOXES, FIRE CAULK, ETC. AS REQUIRED TO MAINTAIN THE FIRE RATING OF THE SURFACE BEING PENETRATED.
6. PRIOR TO START OF CONSTRUCTION, AND PRIOR TO ANY DEMOLITION WORK THE ELECTRICAL CONTRACTOR SHALL PERFORM CIRCUIT TRACING TO IDENTIFY ALL EXISTING BRANCH CIRCUITS SERVING THE RENOVATION AREA, AND TO IDENTIFY THE AVAILABLE BRANCH CIRCUITS THAT MAY BE RE-USED AS PART OF THE PROPOSED RENOVATION, AS WELL AS CIRCUITS THAT SERVE EXISTING LIGHTING FIXTURES OR DEVICES OUTSIDE OF THE WORK AREA THAT ARE TO REMAIN AND BE MAINTAINED.
7. THE ELECTRICAL CONTRACTOR SHALL INSTALL ALL BRANCH CIRCUITS TO HAVE A MAXIMUM VOLTAGE DROP FROM THE CIRCUIT BREAKER PANEL SERVING THE LOAD TO THE LAST LOAD ON THE CIRCUIT OF NO MORE THAN 2%. ALL 120 VOLT, 20 AMPERE BRANCH CIRCUITS OVER 100 FEET IN LENGTH SHALL BE SERVED WITH #10 CONDUCTORS; ALL 120 VOLT, 20 AMPERE BRANCH CIRCUITS OVER 200 FEET IN LENGTH SHALL BE SERVED WITH #8 CONDUCTORS; AND ALL 120 VOLT, 20 AMPERE BRANCH CIRCUITS OVER 300 FEET IN LENGTH SHALL BE SERVED WITH #6 CONDUCTORS. THE OVER-SIZING OF THE CONDUCTORS SHALL INCLUDE OVER-SIZING OF THE EQUIPMENT GROUND CONDUCTOR IN ACCORDANCE WITH N.E.C. ARTICLE 250. ELECTRICAL CONTRACTOR SHALL PROVIDE STA-CON CONNECTORS ON THE ENDS OF CONDUCTORS WHERE NECESSARY TO FACILITATE TERMINATION OF THE CONDUCTORS AT THE WIRING DEVICES (i.e. DUPLEX RECEPTACLES, SWITCHES, ETC) AND THE CIRCUIT BREAKERS.
8. ELECTRICAL CONTRACTOR SHALL REVIEW TO THE ARCHITECTURAL FLOOR PLANS, ELEVATIONS, SECTIONS AND DETAILS FOR ADDITIONAL ELECTRICAL SCOPE OF WORK, INCLUDING BUT NOT LIMITED TO CONDUIT RACEWAYS REQUIRED TO BE INSTALLED IN MILLWORK, OUTLET SPACING, ETC; THE ELECTRICAL CONTRACTOR SHALL INCLUDE ALL COSTS ASSOCIATED WITH THIS ADDITIONAL ELECTRICAL SCOPE OF WORK IN HIS/HER BID.

LIGHTING KEY NOTES

1. EXISTING EXIT LIGHT FIXTURE TO REMAIN.
2. EXISTING WALL MOUNTED EMERGENCY BATTERY UNIT FIXTURE TO REMAIN.
3. EXISTING EXTERIOR WALL MOUNTED EMERGENCY REMOTE HEAD, SERVED FROM EXISTING EMERGENCY BATTERY UNIT INDICATED, TO REMAIN.
4. CIRCUIT NEW EXIT LIGHT FIXTURE TO EXISTING BRANCH CIRCUIT PREVIOUSLY SERVING EXISTING EXIT LIGHT FIXTURE REMOVED BY DEMOLITION WORK AT THIS LOCATION. REFER TO DEMOLITION PLAN FOR ADDITIONAL INFORMATION. REFER TO GENERAL NOTE #6 FOR CIRCUIT TRACING TO BE PERFORMED BY CONTRACTOR PRIOR TO START OF CONSTRUCTION TO IDENTIFY EXISTING BRANCH CIRCUITS.
5. MOUNT SUSPENDED LIGHT FIXTURE AT 8'-0" ABOVE FINISHED FLOOR, MEASURED TO THE BOTTOM OF THE FIXTURE. ADJUST FINAL SUSPENSION HEIGHT TO AVOID CONFLICT WITH WORK OF OTHER TRADES. NOTIFY ENGINEER IF REQUIRED ADJUSTMENT IN SUSPENSION HEIGHT DEVIATES MORE THAN +/- 6".
6. MOUNT SUSPENDED LIGHT FIXTURE AT 8'-6" ABOVE FINISHED FLOOR, MEASURED TO THE BOTTOM OF THE FIXTURE. ADJUST FINAL SUSPENSION HEIGHT TO AVOID CONFLICT WITH WORK OF OTHER TRADES. NOTIFY ENGINEER IF REQUIRED ADJUSTMENT IN SUSPENSION HEIGHT DEVIATES MORE THAN +/- 6".
7. NEW WALL MOUNTED DUAL-TECHNOLOGY OCCUPANCY SENSOR WITH INTEGRAL 0-10V DIMMING CONTROL AND DAYLIGHT HARVESTING PHOTOCELL. SENSOR TO BE GREENGATE CONTROLS OSW-D-010-XX, WHERE THE "XX" DENOTES THE FINISH, TO BE SELECTED BY ARCHITECT, OR APPROVED EQUAL BY WATTSTOPPER, TOUCHE OR HUBBELL CONTROL SOLUTIONS. SENSOR TO BE CONFIGURED FOR PARTIAL AUTO-ON, WITH A SETTING OF PARTIAL AUTO-ON TO 50% DIMMED STATE, FOR COMPLIANCE WITH THE ENERGY CODE.
8. NEW WALL MOUNTED DUAL-TECHNOLOGY OCCUPANCY SENSOR. SENSOR TO BE GREENGATE CONTROLS ONW-D-1001-MV-XX, WHERE "XX" DENOTES THE FINISH, TO BE SELECTED BY ARCHITECT, OR APPROVED EQUAL BY WATTSTOPPER OR HUBBELL CONTROL SOLUTIONS.
9. NEW WIRELESS LIGHTING CONTROL SYSTEM WALL MOUNTED CONTROL STATION. CONTROL STATION TO CONNECT WIRELESS TO THE ASSOCIATED WIRELESS SWITCHPACK FOR CONTROL OF THE LIGHTING LOADS AS NOTED IN THE WIRELESS LIGHTING CONTROL SYSTEM SCHEDULE ON SHEET E4.01. NOTE THAT THE WALLSTATION REQUIRES 120-VOLT FOR OPERATION AND SHALL BE CIRCUITED TO THE SAME 120-VOLT BRANCH CIRCUIT SERVING THE LIGHT FIXTURE WITH THE "IN-FIXTURE" WIRELESS CONTROLS. REFER TO WIRELESS LIGHTING CONTROL SYSTEM SCHEDULE ON SHEET E4.01 FOR WIRELESS FIXTURES CONTROLLED BY THE CONTROL STATION, FUNCTIONALITY TO BE INCLUDED IN STATION (i.e. SWITCHED ONLY, DIMMING, ETC), AND THE STYLE OF CONTROL STATION TO BE PROVIDED. THE SYSTEM MANUFACTURE SHALL BE RESPONSIBLE FOR PREPARING SHOP DRAWINGS / INSTALLATION DRAWINGS SHOWING THE COMPLETE SYSTEM AND ALL ALL DEVICES ON THE NETWORK, THE LOCATIONS WHERE INTERCONNECTING CABLING MAY BE REQUIRED AND THE LOCATIONS OF ADDITIONAL EQUIPMENT AND OTHER DEVICES REQUIRED FOR A COMPLETE AND OPERATING SYSTEM. THE DEVICES INDICATED ON THE DRAWINGS ARE LIMITED TO THE SWITCHPACKS, WIRELESS FIXTURES WITH IN-FIXTURE SENSORS OR WIRELESS NODES, WIRELESS AREA CONTROLLERS, CONTROL STATIONS, OCCUPANCY SENSORS AND DAYLIGHT SENSORS. COORDINATE EXACT DETAILS WITH THE MANUFACTURE.
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11. NEW LIGHTING FIXTURE WITH COOPER LIGHTING SOLUTIONS "WAVELINX" SYSTEM IN-FIXTURE PASSIVE INFRARED OCCUPANCY AND DAYLIGHT SENSOR AND WIRELESS RADIO FOR WIRELESS CONNECTIVITY. REFER TO LIGHTING FIXTURE SCHEDULE FOR ADDITIONAL INFORMATION REGARDING THE IN-FIXTURE CONTROL SYSTEM. REFER TO WIRELESS LIGHTING CONTROL SYSTEM SCHEDULE ON SHEET E4.01 FOR ZONING, GROUPING OF CONTROLS AND ADDITIONAL INFORMATION.
12. NEW LIGHTING FIXTURE WITH COOPER LIGHTING SOLUTIONS "WAVELINX" SYSTEM IN-FIXTURE WIRELESS NODE FOR WIRELESS CONNECTIVITY. REFER TO LIGHTING FIXTURE SCHEDULE FOR ADDITIONAL INFORMATION REGARDING THE IN-FIXTURE CONTROL SYSTEM. REFER TO WIRELESS LIGHTING CONTROL SYSTEM SCHEDULE ON SHEET E4.01 FOR ZONING, GROUPING OF CONTROLS AND ADDITIONAL INFORMATION.
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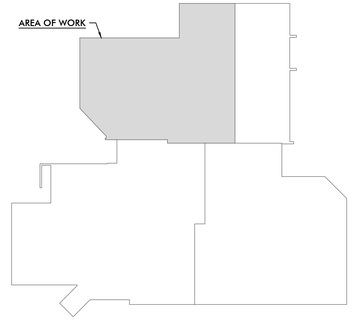
16. MOUNT SUSPENDED LIGHT FIXTURE AT 9'-7" ABOVE FINISHED FLOOR, MEASURED TO THE BOTTOM OF THE FIXTURE. ADJUST FINAL SUSPENSION HEIGHT TO AVOID CONFLICT WITH WORK OF OTHER TRADES. NOTIFY ENGINEER IF REQUIRED ADJUSTMENT IN SUSPENSION HEIGHT DEVIATES MORE THAN +/- 6".
17. EXISTING CEILING MOUNTED LIGHT FIXTURE TO REMAIN.
18. EXISTING LIGHTING CONTROL CONTACTOR TO REMAIN. THE EXACT LIGHTING CONTACTORS THAT ARE TO REMAIN TO BE VERIFIED IN FIELD BY THE ELECTRICAL CONTRACTOR BASED ON CIRCUIT TRACING AND THE LIGHTING FIXTURES TO BE REMOVED BY THE BASE BID SCOPE OF WORK.
19. EXISTING LIGHTING CONTROL TOGGLE SWITCH CABINET, MOUNTED IN A SURFACE BOX, TO REMAIN. ELECTRICAL CONTRACTOR SHALL REMOVE EXISTING TOGGLE SWITCHES SERVING AREAS WHERE THE EXISTING LIGHTING, AND ASSOCIATED LIGHTING CONTACTOR HAS BEEN REMOVED BY DEMOLITION WORK, AND THE TOGGLE SWITCH IS NO LONGER FUNCTIONAL. PROVIDE CLOSURE PLUG TO SEAL OPENING IN COVER OF BOX WHERE THE TOGGLE SWITCH IS REMOVED. EXACT SCOPE OF TOGGLE SWITCHES AND ASSOCIATED LIGHTING CONTACTORS TO BE REMOVED BY DEMOLITION WORK TO BE VERIFIED IN FIELD BY THE ELECTRICAL CONTRACTOR BASED ON CIRCUIT TRACING TO BE PERFORMED PRIOR TO THE START OF DEMOLITION WORK, AND THE EXACT SCOPE OF DEMOLITION REQUIRED AS PART OF THE BASE BID SCOPE OF WORK.



NORTH

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SEALED & SIGNED 05/16/2025; SEAL APPLIES ONLY TO THE ELECTRICAL DOCUMENTS PREPARED BY TAC ASSOCIATES, LLC

Drawing Name
Lighting New Work

Drawn By
CAD

Checked By
TGC

Issue Date
05/16/2025 Permit & Bid Set

Revisions

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Project No.
P23005

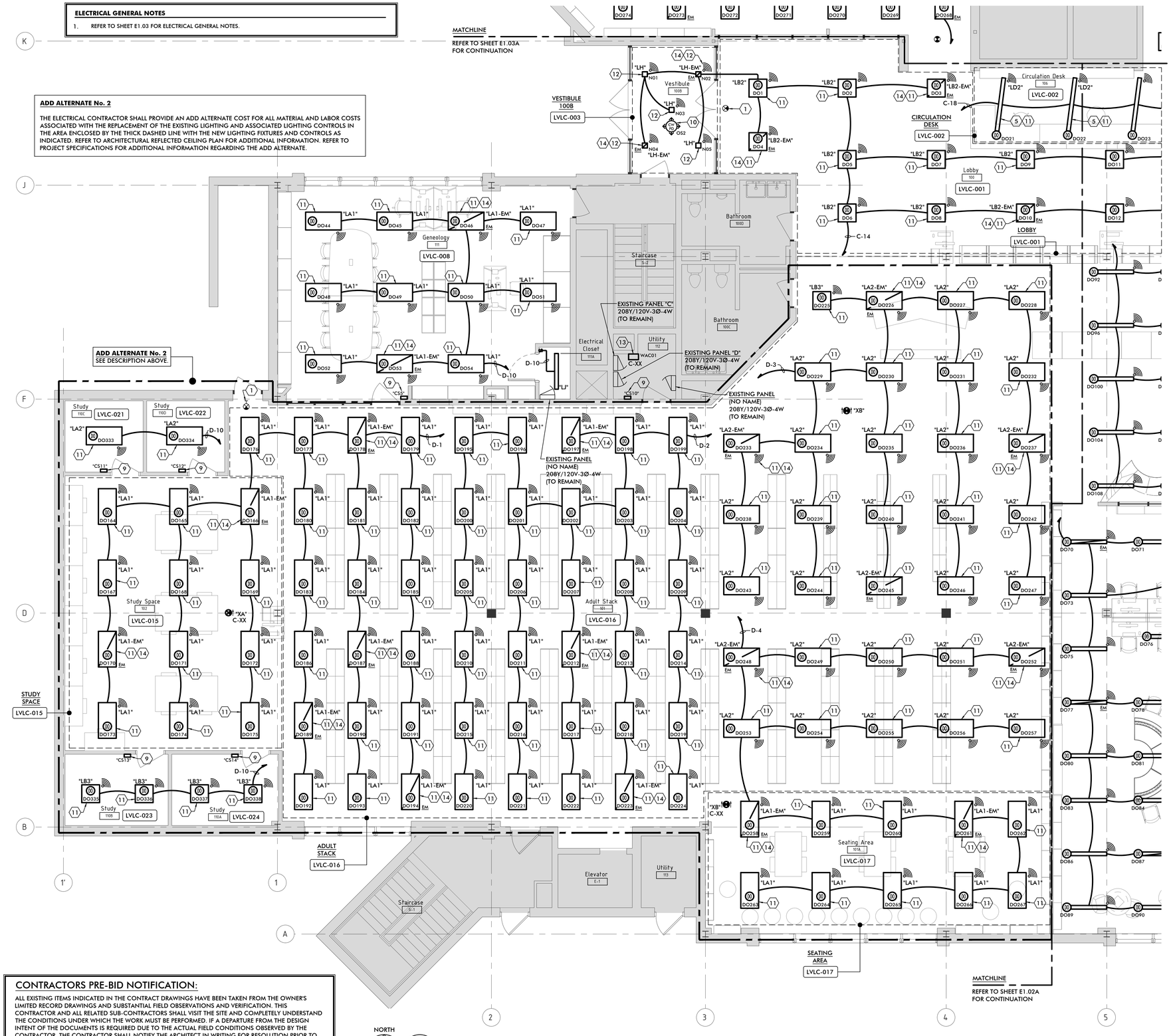
Sheet Number
E1.03

ELECTRICAL GENERAL NOTES

1. REFER TO SHEET E1.03 FOR ELECTRICAL GENERAL NOTES.

ADD ALTERNATE No. 2

THE ELECTRICAL CONTRACTOR SHALL PROVIDE AN ADD ALTERNATE COST FOR ALL MATERIAL AND LABOR COSTS ASSOCIATED WITH THE REPLACEMENT OF THE EXISTING LIGHTING AND ASSOCIATED LIGHTING CONTROLS IN THE AREA ENCLOSED BY THE THICK DASHED LINE WITH THE NEW LIGHTING FIXTURES AND CONTROLS AS INDICATED. REFER TO ARCHITECTURAL REFLECTED CEILING PLAN FOR ADDITIONAL INFORMATION. REFER TO PROJECT SPECIFICATIONS FOR ADDITIONAL INFORMATION REGARDING THE ADD ALTERNATE.



CONTRACTORS PRE-BID NOTIFICATION:

ALL EXISTING ITEMS INDICATED IN THE CONTRACT DRAWINGS HAVE BEEN TAKEN FROM THE OWNER'S LIMITED RECORD DRAWINGS AND SUBSTANTIAL FIELD OBSERVATIONS AND VERIFICATION. THIS CONTRACTOR AND ALL RELATED SUB-CONTRACTORS SHALL VISIT THE SITE AND COMPLETELY UNDERSTAND THE CONDITIONS UNDER WHICH THE WORK MUST BE PERFORMED. IF A DEPARTURE FROM THE DESIGN INTENT OF THE DOCUMENTS IS REQUIRED DUE TO THE ACTUAL FIELD CONDITIONS OBSERVED BY THE CONTRACTOR, THE CONTRACTOR SHALL NOTIFY THE ARCHITECT IN WRITING FOR RESOLUTION PRIOR TO SUBMITTING FINAL BID OR ENTERING INTO A CONTRACT FOR CONSTRUCTION. FAILURE TO PROVIDE THE ARCHITECT WITH NOTIFICATION SHALL RESULT IN THE CONTRACTOR BEING HELD RESPONSIBLE TO COMPLETE ALL WORK TO MEET THE DESIGN INTENT WITH NO ADDITIONAL COST BEING INCURRED BY THE OWNER.

NORTH 1 / E1.01

PARTIAL MAIN LEVEL FLOOR PLAN - LIGHTING NEW WORK - ADD ALTERNATE No. 1 & 2

SCALE: 3/16" = 1'-0"

LIGHTING KEY NOTES

1. EXISTING EXIT LIGHT FIXTURE TO REMAIN.
2. EXISTING WALL MOUNTED EMERGENCY BATTERY UNIT FIXTURE TO REMAIN.
3. EXISTING EXTERIOR WALL MOUNTED EMERGENCY REMOTE HEAD, SERVED FROM EXISTING EMERGENCY BATTERY UNIT INDICATED, TO REMAIN.
4. CIRCUIT NEW EXIT LIGHT FIXTURE TO EXISTING BRANCH CIRCUIT PREVIOUSLY SERVING EXISTING EXIT LIGHT FIXTURE REMOVED BY DEMOLITION WORK AT THIS LOCATION. REFER TO DEMOLITION PLAN FOR ADDITIONAL INFORMATION. REFER TO GENERAL NOTE #6 FOR CIRCUIT TRACING TO BE PERFORMED BY CONTRACTOR PRIOR TO START OF CONSTRUCTION TO IDENTIFY EXISTING BRANCH CIRCUITS.
5. MOUNT SUSPENDED LIGHT FIXTURE AT 8'-0" ABOVE FINISHED FLOOR, MEASURED TO THE BOTTOM OF THE FIXTURE. ADJUST FINAL SUSPENSION HEIGHT TO AVOID CONFLICT WITH WORK OF OTHER TRADES. NOTIFY ENGINEER IF REQUIRED ADJUSTMENT IN SUSPENSION HEIGHT DEVIATES MORE THAN +/- 6".
6. MOUNT SUSPENDED LIGHT FIXTURE AT 8'-6" ABOVE FINISHED FLOOR, MEASURED TO THE BOTTOM OF THE FIXTURE. ADJUST FINAL SUSPENSION HEIGHT TO AVOID CONFLICT WITH WORK OF OTHER TRADES. NOTIFY ENGINEER IF REQUIRED ADJUSTMENT IN SUSPENSION HEIGHT DEVIATES MORE THAN +/- 6".
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NORTH

KEY PLAN

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TAC Project No. 24-017

PROJECT NAME

SCSPL

STATE OF MICHIGAN — THOMAS GERARD CROW — ENGINEER — License No. 6201055659 — PROFESSIONAL ENGINEER

SEALED & SIGNED 05/16/2025; SEAL APPLIES ONLY TO THE ELECTRICAL DOCUMENTS PREPARED BY TAC ASSOCIATES, LLC

Drawing Name
Lighting New Work

Drawn By
CAD

Checked By
TGC

Issue Date
05/16/2025 Permit & Bid Set

Revisions

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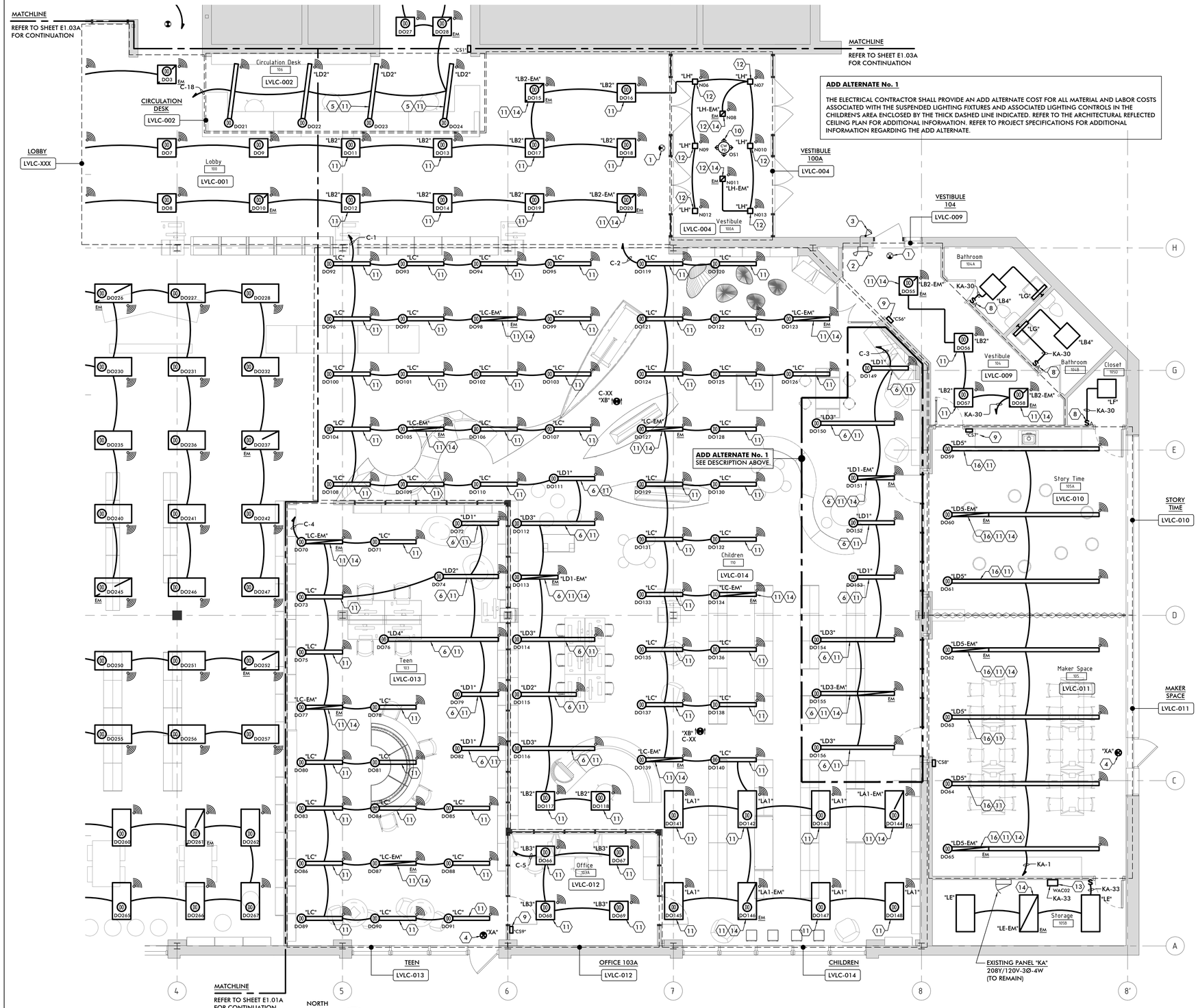
Project No.
P23005

Sheet Number
E1.01A



PARTIAL MAIN LEVEL FLOOR PLAN - LIGHTING NEW WORK - ADD ALTERNATE No. 1 & 2

NORTH

1 / E1.02

SCALE: 3/16" = 1'-0"

LIGHTING KEY NOTES

1. EXISTING EXIT LIGHT FIXTURE TO REMAIN.
2. EXISTING WALL MOUNTED EMERGENCY BATTERY UNIT FIXTURE TO REMAIN.
3. EXISTING EXTERIOR WALL MOUNTED EMERGENCY REMOTE HEAD, SERVED FROM EXISTING EMERGENCY BATTERY UNIT INDICATED, TO REMAIN.
4. CIRCUIT NEW EXIT LIGHT FIXTURE TO EXISTING BRANCH CIRCUIT PREVIOUSLY SERVING EXISTING EXIT LIGHT FIXTURE REMOVED BY DEMOLITION WORK AT THIS LOCATION. REFER TO DEMOLITION PLAN FOR ADDITIONAL INFORMATION. REFER TO GENERAL NOTE #6 FOR CIRCUIT TRACING TO BE PERFORMED BY CONTRACTOR PRIOR TO START OF CONSTRUCTION TO IDENTIFY EXISTING BRANCH CIRCUITS.
5. MOUNT SUSPENDED LIGHT FIXTURE AT 8'-0" ABOVE FINISHED FLOOR, MEASURED TO THE BOTTOM OF THE FIXTURE. ADJUST FINAL SUSPENSION HEIGHT TO AVOID CONFLICT WITH WORK OF OTHER TRADES. NOTIFY ENGINEER IF REQUIRED ADJUSTMENT IN SUSPENSION HEIGHT DEVIATES MORE THAN +/- 6".
6. MOUNT SUSPENDED LIGHT FIXTURE AT 8'-6" ABOVE FINISHED FLOOR, MEASURED TO THE BOTTOM OF THE FIXTURE. ADJUST FINAL SUSPENSION HEIGHT TO AVOID CONFLICT WITH WORK OF OTHER TRADES. NOTIFY ENGINEER IF REQUIRED ADJUSTMENT IN SUSPENSION HEIGHT DEVIATES MORE THAN +/- 6".
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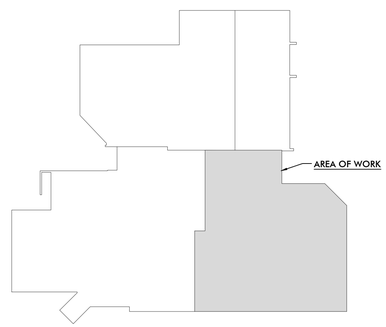
ELECTRICAL GENERAL NOTES

1. REFER TO SHEET E1.03 FOR ELECTRICAL GENERAL NOTES.

CONTRACTORS PRE-BID NOTIFICATION:

ALL EXISTING ITEMS INDICATED IN THE CONTRACT DRAWINGS HAVE BEEN TAKEN FROM THE OWNER'S LIMITED RECORD DRAWINGS AND SUBSTANTIAL FIELD OBSERVATIONS AND VERIFICATION. THIS CONTRACTOR AND ALL RELATED SUB-CONTRACTORS SHALL VISIT THE SITE AND COMPLETELY UNDERSTAND THE CONDITIONS UNDER WHICH THE WORK MUST BE PERFORMED. IF A DEPARTURE FROM THE DESIGN INTENT OF THE DOCUMENTS IS REQUIRED DUE TO THE ACTUAL FIELD CONDITIONS OBSERVED BY THE CONTRACTOR, THE CONTRACTOR SHALL NOTIFY THE ARCHITECT IN WRITING FOR RESOLUTION PRIOR TO SUBMITTING FINAL BID OR ENTERING INTO A CONTRACT FOR CONSTRUCTION. FAILURE TO PROVIDE THE ARCHITECT WITH NOTIFICATION SHALL RESULT IN THE CONTRACTOR BEING HELD RESPONSIBLE TO COMPLETE ALL WORK TO MEET THE DESIGN INTENT WITH NO ADDITIONAL COST BEING INCURRED BY THE OWNER.



NORTH

KEY PLAN

NOT TO SCALE

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TAC Project No. 24-017

PROJECT NAME

SCSPL

STATE OF MICHIGAN
THOMAS GERARD CROW
ENGINEER
License No. 6201055658
PROFESSIONAL ENGINEER

SEALED & SIGNED 05/16/2025; SEAL APPLIES ONLY TO THE ELECTRICAL DOCUMENTS PREPARED BY TAC ASSOCIATES, LLC

Drawing Name
Lighting New Work

Drawn By
CAD

Checked By
TGC

Issue Date
05/16/2025 Permit & Bid Set

Revisions

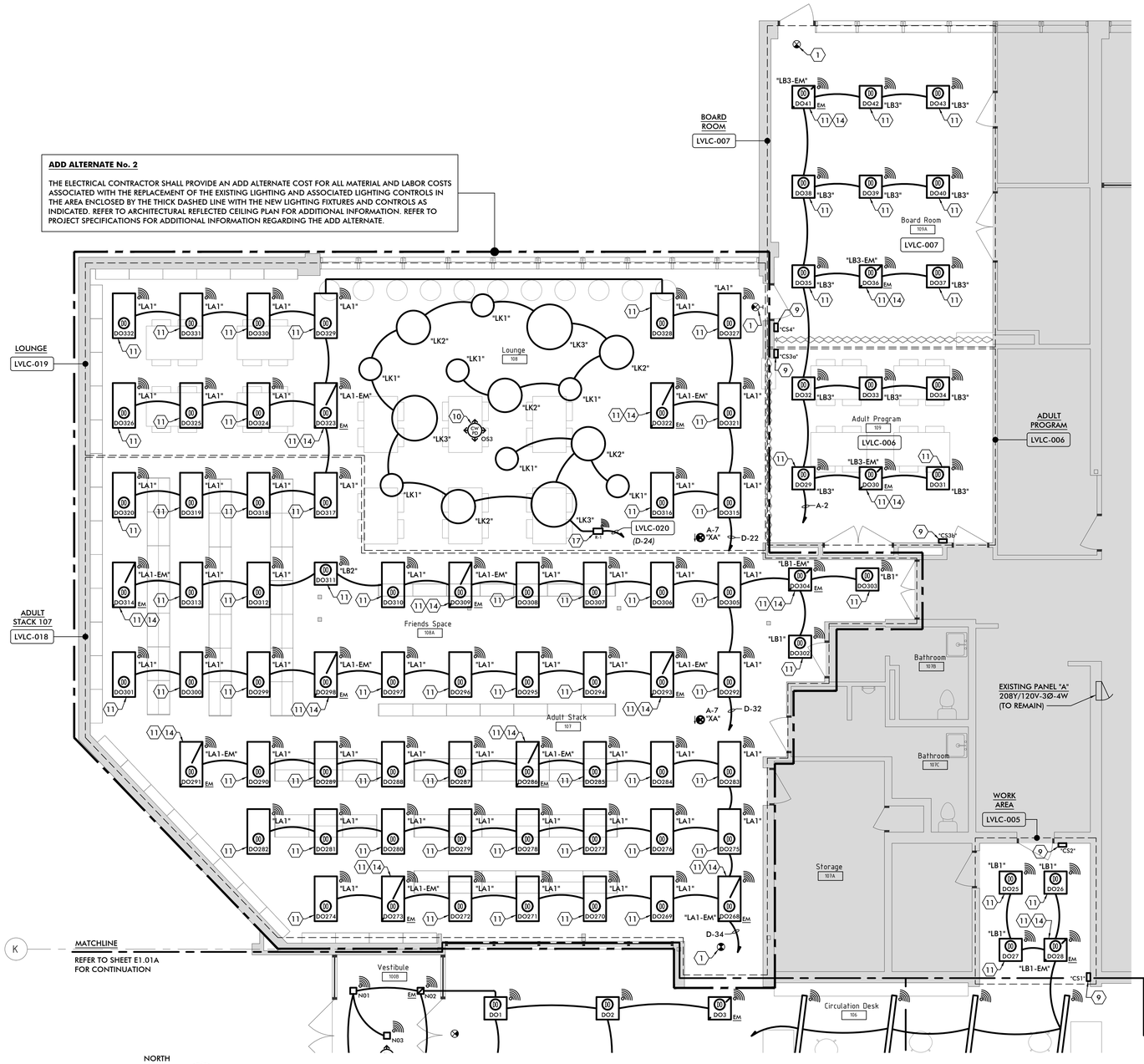
Issued for	Date

Project No.
P23005

Sheet Number
E1.02A

ADD ALTERNATE No. 2

THE ELECTRICAL CONTRACTOR SHALL PROVIDE AN ADD ALTERNATE COST FOR ALL MATERIAL AND LABOR COSTS ASSOCIATED WITH THE REPLACEMENT OF THE EXISTING LIGHTING AND ASSOCIATED LIGHTING CONTROLS IN THE AREA ENCLOSED BY THE THICK DASHED LINE WITH THE NEW LIGHTING FIXTURES AND CONTROLS AS INDICATED. REFER TO ARCHITECTURAL REFLECTED CEILING PLAN FOR ADDITIONAL INFORMATION. REFER TO PROJECT SPECIFICATIONS FOR ADDITIONAL INFORMATION REGARDING THE ADD ALTERNATE.



NORTH

1 E1.03

PARTIAL MAIN LEVEL FLOOR PLAN - LIGHTING NEW WORK - ADD ALTERNATE No. 1 & 2

SCALE: 3/16" = 1'-0"

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13. LIGHTING CONTROL SYSTEM WIRELESS AREA CONTROLLER, MOUNTED HIGH ON WALL ***ABOVE ACCESSIBLE CEILING SPACE*** IN ROOM AS INDICATED. THE INTENT OF THE DESIGN IS FOR THE WIRELESS AREA CONTROLLER TO BE LOCATED OUT OF PUBLIC VIEW, ABOVE ACCESSIBLE CEILING SPACE. IF IT IS NECESSARY TO LOCATE A CONTROLLER OUTSIDE OF THE ACCESSIBLE CEILING SPACE IN ORDER FOR THE SYSTEM TO PROPERLY OPERATE THEN THE LOCATION SHALL BE COORDINATED WITH THE ARCHITECT PRIOR TO FINAL PLACEMENT, AND SHALL BE LOCATED AS HIGH AS POSSIBLE ON THE WALL TO BE OUT OF DIRECT VIEW. COORDINATE EXACT LOCATION OF AREA CONTROLLER WITH THE LIGHTING CONTROL SYSTEM MANUFACTURE BASED ON THEIR INSTALLATION DRAWINGS. NOTE THAT THE AREA CONTROLLER IS POWERED FROM A POWER OVER ETHERNET CONNECTION. PROVIDE NETWORK SWITCH WITH POWER OVER ETHERNET (P.O.E.) TO PROVIDE POWER TO THE WIRELESS AREA CONTROLLER, AS COORDINATED WITH THE WIRELESS LIGHTING CONTROL SYSTEM MANUFACTURE. AT THE CONTRACTORS OPTION, BASED ON COORDINATION WITH THE LIGHTING CONTROL SYSTEM MANUFACTURE, A SEPARATE P.O.E. INJECTOR MAY BE UTILIZED; CIRCUIT 120-VOLT INPUT OF INJECTOR TO A SPARE 120-VOLT BRANCH CIRCUIT FROM THE NEAREST PANEL, AND REFLECT BRANCH CIRCUIT ON THE AS-BUILT RECORD DRAWINGS. MOUNT 120 VOLT RECEPTACLE SERVING P.O.E. INJECTOR AND THE P.O.E. INJECTOR IN AN ACCESSIBLE CLOSET OR OTHER LOCATION NEARBY THE WIRELESS AREA CONTROLLER.
14. EMERGENCY FIXTURE WITH INTERNAL BATTERY BACKUP. FIXTURE SHALL OPERATE IN THE NORMAL CONDITION AS A SWITCHED/DIMMED FIXTURE. UPON LOSS OF NORMAL POWER, THE FIXTURE SHALL ENERGIZE TO THE LUMEN OUTPUT AS SPECIFIED IN THE LIGHTING FIXTURE SCHEDULE, REGARDLESS OF THE SWITCHED OR DIMMED STATE OF THE FIXTURE. REFER TO THE MANUFACTURES WIRING DIAGRAMS FOR EXACT WIRING OF THE INTERNAL BATTERY BACKUP WHEN CONTROLLED BY THE WIRELESS LIGHTING CONTROL SYSTEM INDICATED.
15. CIRCUIT TO EXISTING BRANCH CIRCUIT PREVIOUSLY SERVING LIGHTING FIXTURES IN THE AREA, AND REMOVED BY DEMOLITION WORK. CIRCUIT NUMBER INDICATED IS BASED ON EXISTING PANEL SCHEDULE INFORMATION AND AS-BUILT DRAWING INFORMATION, AND MAY NOT BE ACCURATE. REFER TO GENERAL NOTE #6 FOR ADDITIONAL REQUIREMENTS ASSOCIATED WITH CIRCUIT TRACING REQUIRED TO BE PERFORMED BY THE ELECTRICAL CONTRACTOR AS PART OF THEIR SCOPE OF WORK. UPDATE ACTUAL CIRCUIT NUMBER AS DETERMINED BY CIRCUIT TRACING ON THE "AS-BUILT" RECORD DRAWINGS.
16. MOUNT SUSPENDED LIGHT FIXTURE AT 9'-7" ABOVE FINISHED FLOOR, MEASURED TO THE BOTTOM OF THE FIXTURE. ADJUST FINAL SUSPENSION HEIGHT TO AVOID CONFLICT WITH WORK OF OTHER TRADES. NOTIFY ENGINEER IF REQUIRED ADJUSTMENT IN SUSPENSION HEIGHT DEVIATES MORE THAN +/- 6".

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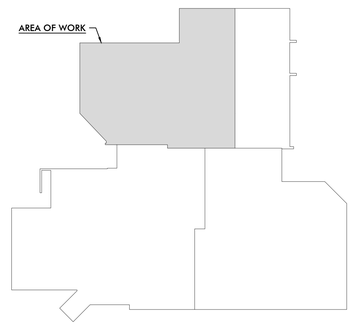
ELECTRICAL GENERAL NOTES

1. ALL JUNCTION BOXES SERVING BRANCH CIRCUIT WIRING SHALL BE LABELED WITH CIRCUITS SERVED. USE BROTHER P-TOUCH LABEL OR EQUAL ON BOX COVER.
2. REFER TO ARCHITECTURAL REFLECTED CEILING PLANS FOR EXACT LOCATION OF ALL CEILING MOUNTED LIGHT FIXTURES AND OTHER CEILING MOUNTED DEVICES.
3. ALL DEVICES INDICATED WITH SOLID DARK LINES ARE NEW DEVICES TO BE INSTALLED BY THE ELECTRICAL CONTRACTOR AS PART OF THIS SCOPE OF WORK.
4. WHERE MORE THAN ONE LIGHT SWITCH IS INDICATED TO BE INSTALLED AT THE SAME LOCATION, THEY SHALL BE GROUPED UNDER A COMMON COVERPLATE. ALL SWITCHES SHALL BE MOUNTED AT 48"AFF UNLESS OTHERWISE NOTED.
5. ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING ALL LOCATIONS OF FIRE-RATED WALLS, CEILINGS, ETC. WITH ARCHITECTURAL DRAWINGS AND FOR PROVIDING FIRE-RATED BOXES, FIRE CAULK, ETC. AS REQUIRED TO MAINTAIN THE FIRE RATING OF THE SURFACE BEING PENETRATED.
6. PRIOR TO START OF CONSTRUCTION, AND PRIOR TO ANY DEMOLITION WORK THE ELECTRICAL CONTRACTOR SHALL PERFORM CIRCUIT TRACING TO IDENTIFY ALL EXISTING BRANCH CIRCUITS SERVING THE RENOVATION AREA, AND TO IDENTIFY THE AVAILABLE BRANCH CIRCUITS THAT MAY BE RE-USED AS PART OF THE PROPOSED RENOVATION, AS WELL AS CIRCUITS THAT SERVE EXISTING LIGHTING FIXTURES OR DEVICES OUTSIDE OF THE WORK AREA THAT ARE TO REMAIN AND BE MAINTAINED.
7. THE ELECTRICAL CONTRACTOR SHALL INSTALL ALL BRANCH CIRCUITS TO HAVE A MAXIMUM VOLTAGE DROP FROM THE CIRCUIT BREAKER PANEL SERVING THE LOAD TO THE LAST LOAD ON THE CIRCUIT OF NO MORE THAN 2%. ALL 120 VOLT, 20 AMPERE BRANCH CIRCUITS OVER 100 FEET IN LENGTH SHALL BE SERVED WITH #10 CONDUCTORS; ALL 120 VOLT, 20 AMPERE BRANCH CIRCUITS OVER 200 FEET IN LENGTH SHALL BE SERVED WITH #8 CONDUCTORS; AND ALL 120 VOLT, 20 AMPERE BRANCH CIRCUITS OVER 300 FEET IN LENGTH SHALL BE SERVED WITH #6 CONDUCTORS. THE OVER-SIZING OF THE CONDUCTORS SHALL INCLUDE OVER-SIZING OF THE EQUIPMENT GROUND CONDUCTOR IN ACCORDANCE WITH N.E.C. ARTICLE 250. ELECTRICAL CONTRACTOR SHALL PROVIDE STA-CON CONNECTORS ON THE ENDS OF CONDUCTORS WHERE NECESSARY TO FACILITATE TERMINATION OF THE CONDUCTORS AT THE WIRING DEVICES (i.e. DUPLEX RECEPTACLES, SWITCHES, ETC) AND THE CIRCUIT BREAKERS.
8. ELECTRICAL CONTRACTOR SHALL REVIEW TO THE ARCHITECTURAL FLOOR PLANS, ELEVATIONS, SECTIONS AND DETAILS FOR ADDITIONAL ELECTRICAL SCOPE OF WORK, INCLUDING BUT NOT LIMITED TO CONDUIT RACEWAYS REQUIRED TO BE INSTALLED IN MILLWORK, OUTLET SPACING, ETC; THE ELECTRICAL CONTRACTOR SHALL INCLUDE ALL COSTS ASSOCIATED WITH THIS ADDITIONAL ELECTRICAL SCOPE OF WORK IN HIS/HER BID.



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SEALED & SIGNED 05/16/2025; SEAL APPLIES ONLY TO THE ELECTRICAL DOCUMENTS PREPARED BY TAC ASSOCIATES, LLC

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Lighting New Work

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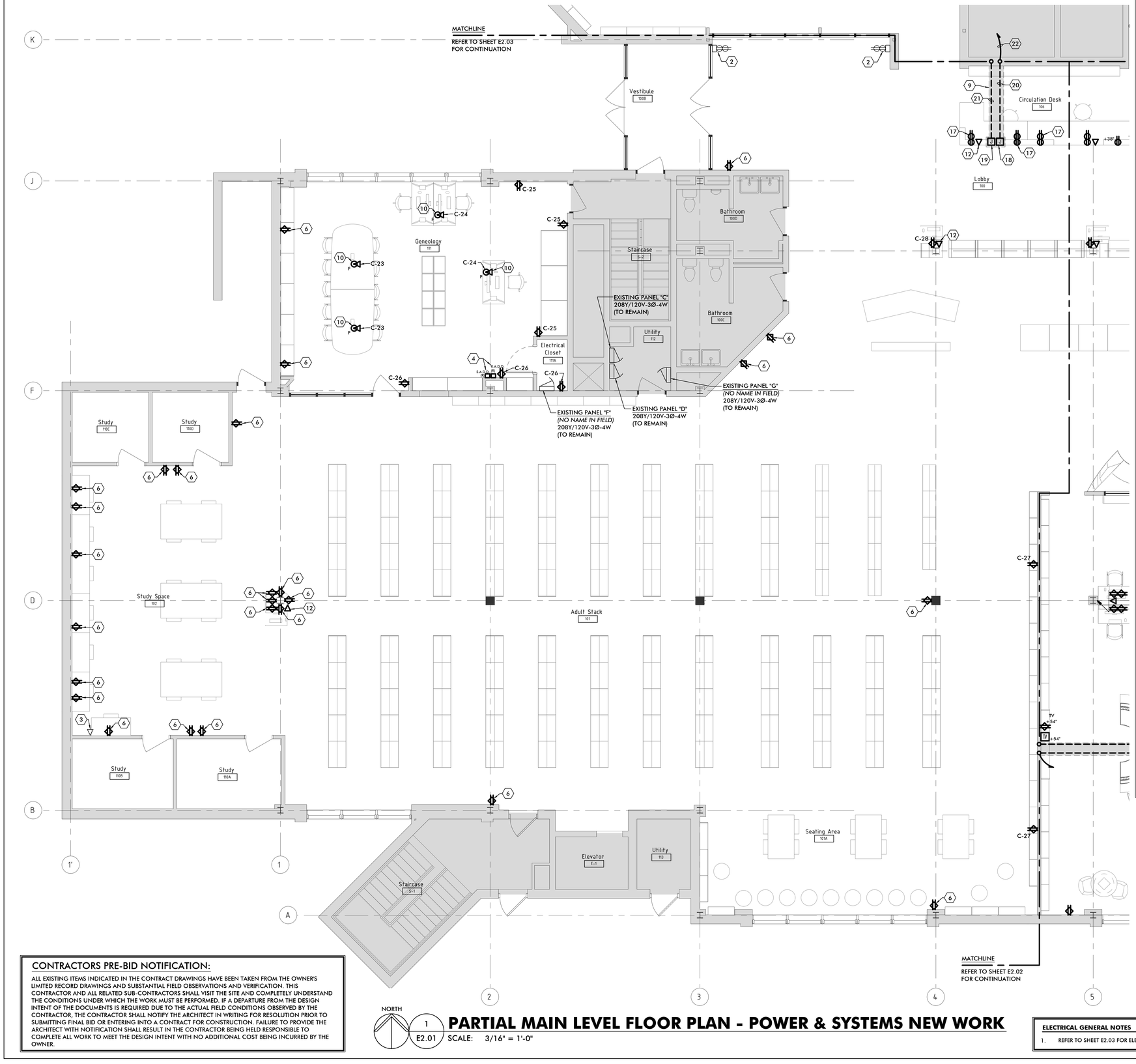

POWER & SYSTEMS KEY NOTES

1. EXISTING DUPLEX RECEPTACLE TO REMAIN.
2. EXISTING TELEPHONE POWER POLE, WITH 120-VOLT POWER AND LOW VOLTAGE OUTLETS, TO REMAIN.
3. EXISTING LOW VOLTAGE DATA OUTLET TO REMAIN.
4. NEW LOCATION OF RELOCATED LOCAL AUDIBLE AND VISUAL ALARM SERVING DUCT MOUNTED SMOKE DETECTOR IN MECHANICAL AIR HANDLING UNIT. ELECTRICAL CONTRACTOR SHALL INSTALL RELOCATED ALARM DEVICES ON NEW WALL INDICATED. BACK BOX AND CONDUIT SERVING RELOCATED ALARM DEVICES TO BE CONCEALED IN NEW WALL CONSTRUCTION. PROVIDE NEW WIRING FROM THE RELOCATED ALARM DEVICES TO THE EXISTING ROOF TOP UNIT. COORDINATE EXACT DETAILS IN FIELD WITH THE EXISTING ROOF TOP UNIT EQUIPMENT, AND THE MANUFACTURES INSTALLATION DRAWINGS AND WIRING DIAGRAMS.
5. EXISTING MANUAL MOTOR STARTER SERVING EXHAUST FAN, TO REMAIN.
6. ELECTRICAL CONTRACTOR SHALL INSTALL THE NEW TAMPER-RESISTANT DUPLEX RECEPTACLE IN THE SAME LOCATION AS AN EXISTING DEVICE REMOVED BY DEMOLITION WORK. EXISTING BOX, CONDUIT AND WIRING SERVING RECEPTACLE TO REMAIN TO SERVE NEW WIRING DEVICE AS INDICATED. REFER TO GENERAL NOTE #6 FOR ADDITIONAL REQUIREMENTS ASSOCIATED WITH CIRCUIT TRACING REQUIRED TO BE PERFORMED BY THE ELECTRICAL CONTRACTOR AS PART OF THEIR SCOPE OF WORK. REFER TO DEMOLITION PLAN FOR ADDITIONAL INFORMATION.
7. NEW SURFACE FLOOR MOUNTED "ON-FLOOR" WIREWAY SYSTEM, INSTALLED ON TOP OF EXISTING FLOOR SURFACE (CARPET); "CONNECTRAC EXPRESS KIT" SYSTEM, WITH MODULAR PRE-WIRED QUAD POWER DEVICE (aka DOUBLE-DUPLEX RECEPTACLE), AND PROVISIONS FOR FOUR (4) CAT-5e OR CAT-6 CABLES TO SERVE THE LOW VOLTAGE CABLING TO CONFERENCE TABLE LOCATION. LOW VOLTAGE CABLING TO BE INSTALLED BY THE OWNER'S COMMUNICATION CONTRACTOR. ELECTRICAL CONTRACTOR SHALL PROVIDE ROUGH-IN BOX AND TERMINATION FITTINGS FOR TERMINATION OF THE CONNECTRAC AT THE WALL TO CONCEAL THE RACEWAY AND CABLING FROM WITHIN THE WALL CONSTRUCTION TO THE CONNECTRAC SYSTEM. SYSTEM TO CONSIST OF WIREWAY SEGMENTS, CORNER KITS, PRE-WIRED DUPLEX POWER DEVICE AND POWER FEED AND ALL MISCELLANEOUS ACCESSORIES AND COMPONENTS FOR A COMPLETE SYSTEM. FINISH TO BE STANDARD SILVER FINISH, WITH EXACT FINISH VERIFIED BY ARCHITECT PRIOR TO ORDERING SYSTEM. COORDINATE ALL WORK WITH ARCHITECTURAL TRADES. SYSTEM TO BE CONNECTRAC CT XPO.1-XX-25.1c-SV SERIES, WHERE THE "XX" DENOTES THE LENGTH OF THE FLOOR KIT, TO BE DETERMINED BY THE CONTRACTOR IN THE FIELD PRIOR TO ORDERING SYSTEM. PROVIDE ALL REQUIRED ADDITIONAL COMPONENTS FOR A COMPLETE AND OPERATING SYSTEM. ROUTE POWER FEED SERVING CONNECTRAC CONCEALED IN WALL CONSTRUCTION TO ABOVE ACCESSIBLE CEILING SPACE; CONTINUE IN ACCESSIBLE CEILING SPACE TO PANEL NOTED. PROVIDE NEW 1" EMPTY CONDUIT (WITH PULLWIRE), ROUTED FROM THE CONNECTRAC LOCATION TO THE CEILING SPACE ABOVE. STUB CONDUIT OUT TO ACCESSIBLE CEILING SPACE. TERMINATE CONDUIT AT 3" ABOVE FINISHED FLOOR AT THE CONNECTRAC TERMINATION POINT, AND ACCESSIBLE FROM THE CONNECTRAC ROUGH-IN BOX AT THE FLOOR LEVEL; BUSH CONDUIT ENDS. TELEPHONE AND DATA CABLING TO BE BY THE OWNER'S COMMUNICATION CONTRACTOR. COORDINATE ALL CABLING RACEWAY REQUIREMENTS WITH THE OWNERS COMMUNICATION CONTRACTOR IN THE FIELD PRIOR TO START OF CONSTRUCTION.
8. NEW RECTANGULAR RECESSED FLUSH FLOOR BOX FOR USE IN SLAB ON GRADE CONCRETE FLOORS WITH POWER AND LOW VOLTAGE SERVICES. WIREMOLD "EVOLUTION" SERIES SIX-GANG BOX WITH THREE (3) 20A, 125V. TAMPER-RESISTANT DUPLEX RECEPTACLES AND TWO (2) LOW VOLTAGE DEVICE BRACKET. COORDINATE EXACT LOW VOLTAGE DEVICE BRACKET TYPE REQUIRED WITH THE OWNERS COMMUNICATION CONTRACTOR IN FIELD PRIOR TO ORDERING OF BOX. INCLUDE BLANK FITTINGS TO CLOSE-OFF UNUSED GANGS. BOX TO INCLUDE FLUSH STYLE RECTANGULAR COVER ASSEMBLY WITH SOLID LID. EXACT FINISH TO BE SELECTED BY ARCHITECT BASED ON SAMPLES OF ALL COVER ASSEMBLY FINISH OPTIONS TO BE FURNISHED TO THE ARCHITECT BY THE ELECTRICAL CONTRACTOR PRIOR TO ORDERING OF FLOOR BOX. BOX TO BE WIREMOLD EFB65-OG SERIES WITH EFB6810BTSX COVER, WHERE THE THE "XX" IS THE FINISH, TO BE SELECTED BY ARCHITECT. BOX TO INCLUDE ALL REQUIRED MODULES, BRACKETS AND FITTINGS TO ACCEPT THE NUMBER OF OUTLETS AND RECEPTACLES LISTED ABOVE, AND FOR A COMPLETE AND OPERATING SYSTEM.
9. COORDINATE SAW-CUTTING OF EXISTING CONCRETE FLOOR SLAB TO SUPPORT THE INSTALLATION OF THE NEW FLOOR BOX AND ASSOCIATED CONDUITS, OR AS APPLICABLE NEW CONDUITS TO SERVE RECEPTACLES AND OUTLETS IN NEW MILLWORK (AS INDICATED), WITH ARCHITECTURAL TRADES PRIOR TO START OF CONSTRUCTION. REFER TO ARCHITECTURAL DRAWINGS FOR ADDITIONAL INFORMATION REGARDING THE SAW-CUTTING OF THE EXISTING CONCRETE FLOOR.
10. NEW WIREMOLD RECESSED FLOOR MOUNTED "EVOLUTION SERIES" POKE-THRU DEVICE WITH TWO (2) 120 VOLT DUPLEX RECEPTACLES. DEVICE TO BE INSTALLED IN A 6" DIAMETER CORED HOLE. COORDINATE EXACT CORED HOLE LOCATION WITH ARCHITECT, OWNER AND STRUCTURAL ENGINEER IN FIELD PRIOR TO START OF CONSTRUCTION. POKE-THRU TO BE WIREMOLD EVOLUTION 6AT SERIES WITH TWO (2) PROPRIETARY 20A, 125 VOLT DUPLEX RECEPTACLES IN THE SIDE COMPARTMENTS AND ONE (1) BLANK PLATE IN THE CENTER COMPARTMENT. POKE-THRU CATALOG NUMBER WIREMOLD 6ATCPXX, WHERE THE "XX" IN THE CATALOG NUMBER INDICATES THE FINISH OPTION FOR THE DIE-CAST ALUMINUM COVER ASSEMBLY. COVER ASSEMBLY FINISH TO BE SELECTED BY ARCHITECT BASED ON FINISH SAMPLES PROVIDED TO THE ARCHITECT DURING THE SHOP DRAWING APPROVAL PROCESS.
11. NEW INDUSTRIAL POWER CORD REEL WITH ONE (1) 20A, 125V DUPLEX RECEPTACLE; 25'-0" LONG #12/3 SJO CORD, 20 AMPERE RATED, WITH 5'-0" LONG CORD AND PLUG FOR CONNECTION OF POWER CORD REEL TO RECEPTACLE MOUNTED AT TRUSS SPACE. COORDINATE EXACT MOUNTING LOCATION OF RECEPTACLE TO TRUSS WITH ARCHITECTURAL / STRUCTURAL TRADES IN FIELD PRIOR TO START OF CONSTRUCTION AND PRIOR TO ROUGH-IN OF ANY BOXES, RACEWAYS, ETC. ELECTRICAL CONTRACTOR SHALL PROVIDE AND INSTALL A SINGLE NEMA 5-20R RECEPTACLE AT THE TRUSS SPACE NOTED ABOVE. POWER CORD REEL TO BE HUBBELL CATALOG NUMBER HBL12123R220M1; SINGLE RECEPTACLE MOUNTED AT THE TRUSS SPACE TO SERVE THE CORD REEL TO BE HUBBELL 5361.
12. NEW TELEPHONE / DATA OR DATA ONLY OUTLET. REFER TO TYPICAL TELEPHONE / DATA OUTLET DETAIL ON SHEET E4.00 FOR ADDITIONAL INFORMATION. "W" = WALL MOUNTED AT 48" A.F.F.; NOTE THAT ALL TELEPHONE AND DATA SYSTEM OUTLETS, JACKS, CABLING, TERMINATIONS, ETC ARE BY THE OWNER'S COMMUNICATION CONTRACTOR. COORDINATE FINAL OUTLET PLACEMENT LOCATIONS IN FIELD WITH THE OWNERS COMMUNICATION CONTRACTOR PRIOR TO START OF CONSTRUCTION. REFER TO ARCHITECTURAL DRAWINGS AND ELEVATIONS FOR MOUNTING HEIGHTS OF ALL OUTLETS.
13. NEW CABLE TELEVISION OUTLET, REFER TO ARCHITECTURAL DRAWINGS FOR MOUNTING HEIGHT. COORDINATE EXACT MOUNTING ELEVATION WITH THE OWNER'S CONSTRUCTION REPRESENTATIVE AND ARCHITECT IN FIELD PRIOR TO INSTALLATION. REFER TO TYPICAL CABLE TELEVISION OUTLET DETAIL ON SHEET E400. NOTE THAT THE CABLE TELEVISION OUTLET AND THE ASSOCIATED 120 VOLT, 20 AMPERE DUPLEX RECEPTACLE SERVING THE TELEVISION ARE TO BE MOUNTED IN A SINGLE RECESSED BOX, WITH INTERNAL BARRIER TO SEPARATE THE 120 VOLT POWER AND LOW VOLTAGE WIRING, AS INDICATED ON THE TYPICAL CABLE TELEVISION OUTLET DETAIL ON SHEET E4.00.
14. NEW 120 VOLT DUPLEX RECEPTACLE SERVING TELEVISION, REFER TO ARCHITECTURAL DRAWINGS FOR MOUNTING HEIGHT. COORDINATE EXACT MOUNTING ELEVATION WITH THE OWNER'S CONSTRUCTION REPRESENTATIVE AND ARCHITECT IN FIELD PRIOR TO INSTALLATION. NOTE THAT THE CABLE TELEVISION OUTLET AND THE ASSOCIATED 120 VOLT, 20 AMPERE DUPLEX RECEPTACLE SERVING THE TELEVISION ARE TO BE MOUNTED IN A SINGLE RECESSED BOX, WITH INTERNAL BARRIER TO SEPARATE THE 120 VOLT POWER AND LOW VOLTAGE WIRING, AS INDICATED ON THE TYPICAL CABLE TELEVISION OUTLET DETAIL ON SHEET E4.00.
15. NEW 120 VOLT BRANCH CIRCUIT CONDUIT AND WIRING SERVING FLOOR BOX ROUTED BELOW THE NEW FLOOR SLAB (TO REPLACE SECTION OF FLOOR REMOVED BY SAW CUTTING) TO THE WALL, AND CONCEALED INSIDE WALL TO ABOVE ACCESSIBLE CEILING SPACE. CONTINUE THROUGH CEILING SPACE TO PANEL NOTED.
16. NEW 2" EMPTY CONDUIT WITH PULL WIRE BELOW THE NEW FLOOR SLAB (TO REPLACE SECTION OF FLOOR REMOVED BY SAW CUTTING) TO THE WALL, AND CONCEALED INSIDE WALL TO ABOVE ACCESSIBLE CEILING SPACE. STUB CONDUIT ABOVE ACCESSIBLE CEILING SPACE AND BUSH CONDUIT END.
17. CIRCUIT TO EXISTING BRANCH CIRCUIT PREVIOUSLY SERVING DUPLEX RECEPTACLES AT THIS LOCATION, AND REMOVED BY DEMOLITION WORK. REFER TO GENERAL NOTE #6 FOR ADDITIONAL REQUIREMENTS ASSOCIATED WITH CIRCUIT TRACING REQUIRED TO BE PERFORMED BY THE ELECTRICAL CONTRACTOR AS PART OF THEIR SCOPE OF WORK. UPDATE "AS-BUILT" DRAWINGS TO REFLECT ACTUAL CIRCUIT NUMBER AS DETERMINED BY CIRCUIT TRACING.
18. NEW JUNCTION BOX MOUNTED IN MILLWORK TO SERVE 120-VOLT POWER TO RECEPTACLES IN THE MILLWORK. COORDINATE EXACT MOUNTING LOCATION OF JUNCTION BOX IN MILLWORK WITH ARCHITECTURAL TRADES AND MILLWORK CONTRACTOR. ALL CONDUIT SERVING DUPLEX RECEPTACLES IN MILLWORK TO BE CONCEALED IN THE MILLWORK.
19. NEW JUNCTION BOX MOUNTED IN MILLWORK TO SERVE LOW VOLTAGE TELEPHONE / DATA OUTLETS IN MILLWORK. COORDINATE EXACT MOUNTING LOCATION OF JUNCTION BOX IN MILLWORK WITH ARCHITECTURAL TRADES AND MILLWORK CONTRACTOR. ALL CONDUIT SERVING LOW VOLTAGE TELEPHONE / DATA OUTLETS IN MILLWORK TO BE CONCEALED IN THE MILLWORK.
20. NEW 120 VOLT BRANCH CIRCUIT CONDUIT AND WIRING SERVING RECEPTACLES IN MILLWORK, ROUTED BELOW THE NEW FLOOR SLAB (TO REPLACE SECTION OF FLOOR REMOVED BY SAW CUTTING) TO THE WALL, AND CONCEALED INSIDE WALL TO ABOVE ACCESSIBLE CEILING SPACE. CONTINUE THROUGH CEILING SPACE TO PANEL NOTED (OR TO FLOOR BOX AS APPLICABLE AND INDICATED ON FLOOR PLAN).
21. NEW 1 ½" EMPTY CONDUIT WITH PULL WIRE TO SERVE LOW VOLTAGE OUTLETS AT MILLWORK, ROUTED BELOW THE NEW FLOOR SLAB (TO REPLACE SECTION OF FLOOR REMOVED BY SAW CUTTING) TO THE WALL, AND CONCEALED INSIDE WALL TO ABOVE ACCESSIBLE CEILING SPACE. STUB CONDUIT ABOVE ACCESSIBLE CEILING SPACE AND BUSH CONDUIT END (OR TO FLOOR BOX AS APPLICABLE AND INDICATED ON FLOOR PLAN).
22. NEW HOMERUN TO EXISTING BRANCH CIRCUIT PREVIOUSLY SERVING DUPLEX RECEPTACLES AT THE CIRCULATION DESK, REMOVED BY DEMOLITION WORK, AND NEW CIRCUITS INDICATED ON FLOOR PLAN. REFER TO GENERAL NOTE #6 FOR ADDITIONAL REQUIREMENTS ASSOCIATED WITH CIRCUIT TRACING REQUIRED TO BE PERFORMED BY THE ELECTRICAL CONTRACTOR AS PART OF THEIR SCOPE OF WORK. UPDATE "AS-BUILT" DRAWINGS TO REFLECT ACTUAL CIRCUIT NUMBER AS DETERMINED BY CIRCUIT TRACING.
23. NEW BRANCH CIRCUIT CONDUIT AND WIRING CONCEALED IN MILLWORK TO SERVE NEW DUPLEX RECEPTACLES INDICATED. COORDINATE EXACT ROUTING PATH AND CONCEALMENT IN MILLWORK WITH ARCHITECTURAL TRADES AND MILLWORK CONTRACTOR IN FIELD PRIOR TO START OF CONSTRUCTION AND PRIOR TO ROUGH-IN OF ANY BOXES, RACEWAYS, ETC.
24. MOUNT NEW DUPLEX RECEPTACLE IN FACE OF MILLWORK / BENCH. COORDINATE EXACT DETAILS WITH ARCHITECTURAL DRAWINGS. ALL BOXES AND CONDUIT SERVING RECEPTACLE TO BE CONCEALED.

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NORTH

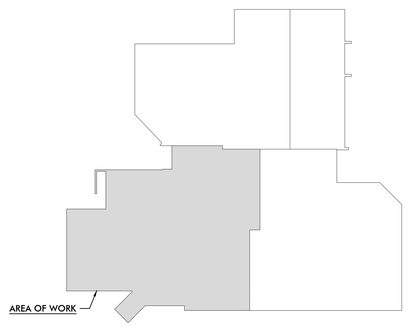
1
E2.01

PARTIAL MAIN LEVEL FLOOR PLAN - POWER & SYSTEMS NEW WORK

SCALE: 3/16" = 1'-0"

ELECTRICAL GENERAL NOTES

1. REFER TO SHEET E2.03 FOR ELECTRICAL GENERAL NOTES.



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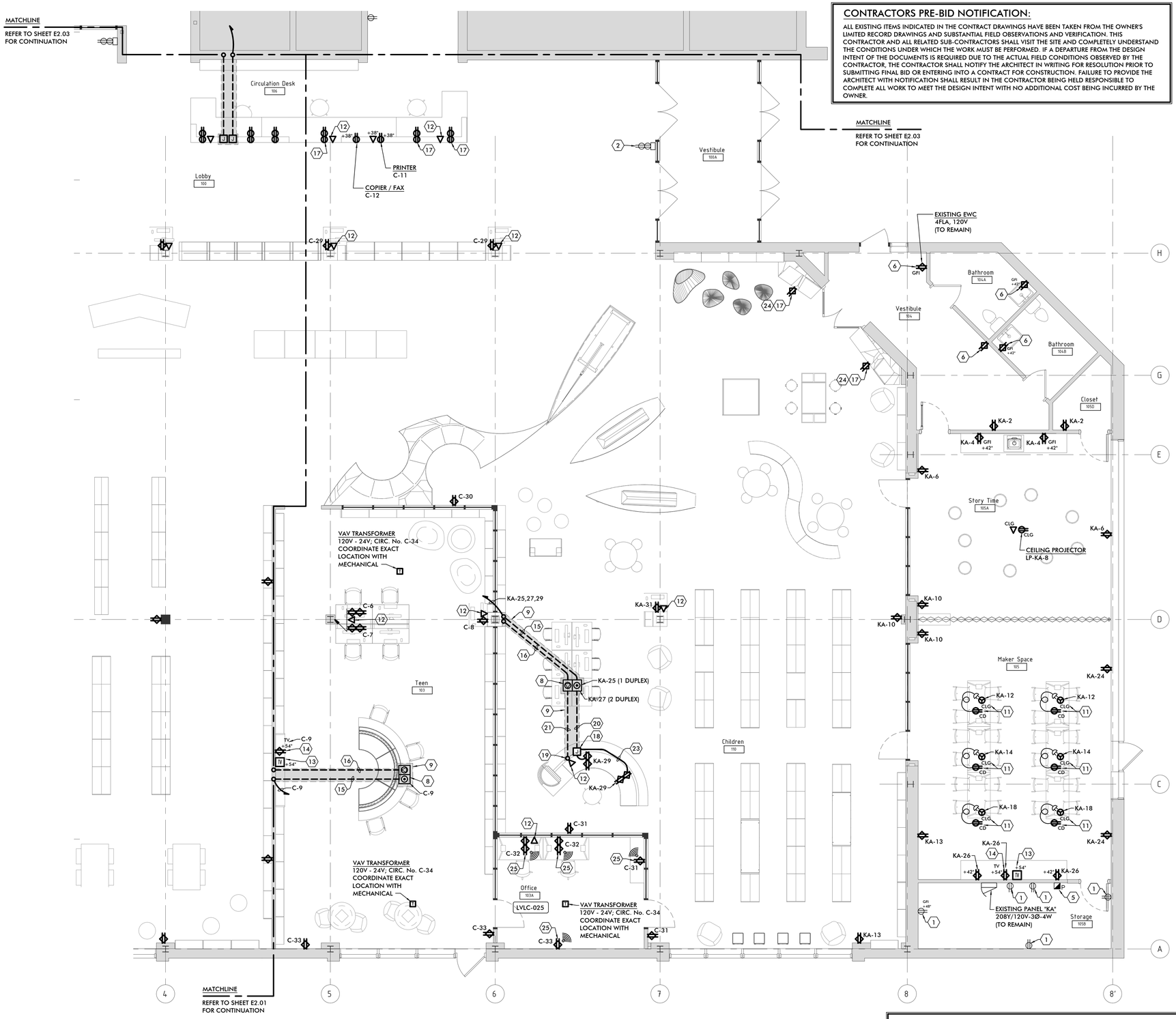

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2. EXISTING TELEPHONE POWER POLE, WITH 120-VOLT POWER AND LOW VOLTAGE OUTLETS, TO REMAIN.
3. EXISTING LOW VOLTAGE DATA OUTLET TO REMAIN.
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5. EXISTING MANUAL MOTOR STARTER SERVING EXHAUST FAN, TO REMAIN.
6. ELECTRICAL CONTRACTOR SHALL INSTALL THE NEW TAMPER-RESISTANT DUPLEX RECEPTACLE IN THE SAME LOCATION AS AN EXISTING DEVICE REMOVED BY DEMOLITION WORK. EXISTING BOX, CONDUIT AND WIRING SERVING RECEPTACLE TO REMAIN TO SERVE NEW WIRING DEVICE AS INDICATED. REFER TO GENERAL NOTE #6 FOR ADDITIONAL REQUIREMENTS ASSOCIATED WITH CIRCUIT TRACING REQUIRED TO BE PERFORMED BY THE ELECTRICAL CONTRACTOR AS PART OF THEIR SCOPE OF WORK. REFER TO DEMOLITION PLAN FOR ADDITIONAL INFORMATION.
7. NEW SURFACE FLOOR MOUNTED "ON-FLOOR" WIREWAY SYSTEM, INSTALLED ON TOP OF EXISTING FLOOR SURFACE (CARPET); "CONNECTRAC EXPRESS KIT" SYSTEM, WITH MODULAR PRE-WIRED QUAD POWER DEVICE (aka DOUBLE-DUPLEX RECEPTACLE), AND PROVISIONS FOR FOUR (4) CAT-5e OR CAT-6 CABLES TO SERVE THE LOW VOLTAGE CABLING TO CONFERENCE TABLE LOCATION. LOW VOLTAGE CABLING TO BE INSTALLED BY THE OWNER'S COMMUNICATION CONTRACTOR. ELECTRICAL CONTRACTOR SHALL PROVIDE ROUGH-IN BOX AND TERMINATION FITTINGS FOR TERMINATION OF THE CONNECTRAC AT THE WALL TO CONCEAL THE RACEWAY AND CABLING FROM WITHIN THE WALL CONSTRUCTION TO THE CONNECTRAC SYSTEM. SYSTEM TO CONSIST OF WIREWAY SEGMENTS, CORNER KITS, PRE-WIRED DUPLEX POWER DEVICE AND POWER FEED AND ALL MISCELLANEOUS ACCESSORIES AND COMPONENTS FOR A COMPLETE SYSTEM. FINISH TO BE STANDARD SILVER FINISH, WITH EXACT FINISH VERIFIED BY ARCHITECT PRIOR TO ORDERING SYSTEM. COORDINATE ALL WORK WITH ARCHITECTURAL TRADES. SYSTEM TO BE CONNECTRAC CT.XPO.1-XX-25.1c-SV SERIES, WHERE THE "XX" DENOTES THE LENGTH OF THE FLOOR KIT, TO BE DETERMINED BY THE CONTRACTOR IN THE FIELD PRIOR TO ORDERING SYSTEM. PROVIDE ALL REQUIRED ADDITIONAL COMPONENTS FOR A COMPLETE AND OPERATING SYSTEM. ROUTE POWER FEED SERVING CONNECTRAC CONCEALED IN WALL CONSTRUCTION TO ABOVE ACCESSIBLE CEILING SPACE; CONTINUE IN ACCESSIBLE CEILING SPACE TO PANEL NOTED. PROVIDE NEW 1" EMPTY CONDUIT (WITH PULLWIRE), ROUTED FROM THE CONNECTRAC LOCATION TO THE CEILING SPACE ABOVE. STUB CONDUIT OUT TO ACCESSIBLE CEILING SPACE. TERMINATE CONDUIT AT 3" ABOVE FINISHED FLOOR AT THE CONNECTRAC TERMINATION POINT, AND ACCESSIBLE FROM THE CONNECTRAC ROUGH-IN BOX AT THE FLOOR LEVEL; BUSH CONDUIT ENDS. TELEPHONE AND DATA CABLING TO BE BY THE OWNER'S COMMUNICATION CONTRACTOR. COORDINATE ALL CABLING RACEWAY REQUIREMENTS WITH THE OWNERS COMMUNICATION CONTRACTOR IN THE FIELD PRIOR TO START OF CONSTRUCTION.
8. NEW RECTANGULAR RECESSED FLUSH FLOOR BOX FOR USE IN SLAB ON GRADE CONCRETE FLOORS WITH POWER AND LOW VOLTAGE SERVICES. WIREMOLD "EVOLUTION" SERIES SIX-GANG BOX WITH THREE (3) 20A, 125V. TAMPER-RESISTANT DUPLEX RECEPTACLES AND TWO (2) LOW VOLTAGE DEVICE BRACKET. COORDINATE EXACT LOW VOLTAGE DEVICE BRACKET TYPE REQUIRED WITH THE OWNER'S COMMUNICATION CONTRACTOR IN FIELD PRIOR TO ORDERING OF BOX. INCLUDE BLANK FITTINGS TO CLOSE-OFF UNUSED GANGS. BOX TO INCLUDE FLUSH STYLE RECTANGULAR COVER ASSEMBLY WITH SOLID LID. EXACT FINISH TO BE SELECTED BY ARCHITECT BASED ON SAMPLES OF ALL COVER ASSEMBLY FINISH OPTIONS TO BE FURNISHED TO THE ARCHITECT BY THE ELECTRICAL CONTRACTOR PRIOR TO ORDERING OF FLOOR BOX. BOX TO BE WIREMOLD EFB6S-0G SERIES WITH EFB6B108TXX COVER, WHERE THE "XX" IS THE FINISH, TO BE SELECTED BY ARCHITECT. BOX TO INCLUDE ALL REQUIRED MODULES, BRACKETS AND FITTINGS TO ACCEPT THE NUMBER OF OUTLETS AND RECEPTACLES LISTED ABOVE, AND FOR A COMPLETE AND OPERATING SYSTEM.
9. COORDINATE SAW-CUTTING OF EXISTING CONCRETE FLOOR SLAB TO SUPPORT THE INSTALLATION OF THE NEW FLOOR BOX AND ASSOCIATED CONDUITS, OR AS APPLICABLE NEW CONDUITS TO SERVE RECEPTACLES AND OUTLETS IN NEW MILLWORK (AS INDICATED), WITH ARCHITECTURAL TRADES PRIOR TO START OF CONSTRUCTION. REFER TO ARCHITECTURAL DRAWINGS FOR ADDITIONAL INFORMATION REGARDING THE SAW-CUTTING OF THE EXISTING CONCRETE FLOOR.
10. NEW WIREMOLD RECESSED FLOOR MOUNTED "EVOLUTION SERIES" POKE-THRU DEVICE WITH TWO (2) 120 VOLT DUPLEX RECEPTACLES. DEVICE TO BE INSTALLED IN A 6" DIAMETER CORED HOLE. COORDINATE EXACT CORED HOLE LOCATION WITH ARCHITECT, OWNER AND STRUCTURAL ENGINEER IN FIELD PRIOR TO START OF CONSTRUCTION. POKE-THRU TO BE WIREMOLD EVOLUTION 6AT SERIES WITH TWO (2) PROPRIETARY 20A, 125 VOLT DUPLEX RECEPTACLES IN THE SIDE COMPARTMENTS AND ONE (1) BLANK PLATE IN THE CENTER COMPARTMENT. POKE-THRU CATALOG NUMBER WIREMOLD 6ATCPXX, WHERE THE "XX" IN THE CATALOG NUMBER INDICATES THE FINISH OPTION FOR THE DIE-CAST ALUMINUM COVER ASSEMBLY. COVER ASSEMBLY FINISH TO BE SELECTED BY ARCHITECT BASED ON FINISH SAMPLES PROVIDED TO THE ARCHITECT DURING THE SHOP DRAWING APPROVAL PROCESS.
11. NEW INDUSTRIAL POWER CORD REEL WITH ONE (1) 20A, 125V DUPLEX RECEPTACLE; 25'-0" LONG #12/3 SJO CORD, 20 AMPERE RATED, WITH 5'-0" LONG CORD AND PLUG FOR CONNECTION OF POWER CORD REEL TO RECEPTACLE MOUNTED AT TRUSS SPACE. COORDINATE EXACT MOUNTING LOCATION OF RECEPTACLE TO TRUSS WITH ARCHITECTURAL / STRUCTURAL TRADES IN FIELD PRIOR TO START OF CONSTRUCTION AND PRIOR TO ROUGH-IN OF ANY BOXES, RACEWAYS, ETC. ELECTRICAL CONTRACTOR SHALL PROVIDE AND INSTALL A SINGLE NEMA 5-20R RECEPTACLE AT THE TRUSS SPACE NOTED ABOVE. POWER CORD REEL TO BE HUBBELL CATALOG NUMBER HBL125123R220M1; SINGLE RECEPTACLE MOUNTED AT THE TRUSS SPACE TO SERVE THE CORD REEL TO BE HUBBELL 5361.
12. NEW TELEPHONE / DATA OR DATA ONLY OUTLET. REFER TO TYPICAL TELEPHONE / DATA OUTLET DETAIL ON SHEET E4.00 FOR ADDITIONAL INFORMATION. "W" = WALL MOUNTED AT 48" A.F.F.; NOTE THAT ALL TELEPHONE AND DATA SYSTEM OUTLETS, JACKS, CABLING, TERMINATIONS, ETC ARE BY THE OWNER'S COMMUNICATION CONTRACTOR. COORDINATE FINAL OUTLET PLACEMENT LOCATIONS IN FIELD WITH THE OWNER'S COMMUNICATION CONTRACTOR PRIOR TO START OF CONSTRUCTION. REFER TO ARCHITECTURAL DRAWINGS AND ELEVATIONS FOR MOUNTING HEIGHTS OF ALL OUTLETS.
13. NEW CABLE TELEVISION OUTLET, REFER TO ARCHITECTURAL DRAWINGS FOR MOUNTING HEIGHT. COORDINATE EXACT MOUNTING ELEVATION WITH THE OWNER'S CONSTRUCTION REPRESENTATIVE AND ARCHITECT IN FIELD PRIOR TO INSTALLATION. REFER TO TYPICAL CABLE TELEVISION OUTLET DETAIL ON SHEET E400. NOTE THAT THE CABLE TELEVISION OUTLET AND THE ASSOCIATED 120 VOLT, 20 AMPERE DUPLEX RECEPTACLE SERVING THE TELEVISION ARE TO BE MOUNTED IN A SINGLE RECESSED BOX, WITH INTERNAL BARRIER TO SEPARATE THE 120 VOLT POWER AND LOW VOLTAGE WIRING, AS INDICATED ON THE TYPICAL CABLE TELEVISION OUTLET DETAIL ON SHEET E4.00.
14. NEW 120 VOLT DUPLEX RECEPTACLE SERVING TELEVISION, REFER TO ARCHITECTURAL DRAWINGS FOR MOUNTING HEIGHT. COORDINATE EXACT MOUNTING ELEVATION WITH THE OWNER'S CONSTRUCTION REPRESENTATIVE AND ARCHITECT IN FIELD PRIOR TO INSTALLATION. NOTE THAT THE CABLE TELEVISION OUTLET AND THE ASSOCIATED 120 VOLT, 20 AMPERE DUPLEX RECEPTACLE SERVING THE TELEVISION ARE TO BE MOUNTED IN A SINGLE RECESSED BOX, WITH INTERNAL BARRIER TO SEPARATE THE 120 VOLT POWER AND LOW VOLTAGE WIRING, AS INDICATED ON THE TYPICAL CABLE TELEVISION OUTLET DETAIL ON SHEET E4.00.
15. NEW 120 VOLT BRANCH CIRCUIT CONDUIT AND WIRING SERVING FLOOR BOX ROUTED BELOW THE NEW FLOOR SLAB (TO REPLACE SECTION OF FLOOR REMOVED BY SAW CUTTING) TO THE WALL, AND CONCEALED INSIDE WALL TO ABOVE ACCESSIBLE CEILING SPACE. CONTINUE THROUGH CEILING SPACE TO PANEL NOTED.
16. NEW 1 ½" EMPTY CONDUIT WITH PULL WIRE BELOW THE NEW FLOOR SLAB (TO REPLACE SECTION OF FLOOR REMOVED BY SAW CUTTING) TO THE WALL, AND CONCEALED INSIDE WALL TO ABOVE ACCESSIBLE CEILING SPACE. STUB CONDUIT ABOVE ACCESSIBLE CEILING SPACE AND BUSH CONDUIT END.
17. CIRCUIT TO EXISTING BRANCH CIRCUIT PREVIOUSLY SERVING DUPLEX RECEPTACLES AT THIS LOCATION, AND REMOVED BY DEMOLITION WORK. REFER TO GENERAL NOTE #6 FOR ADDITIONAL REQUIREMENTS ASSOCIATED WITH CIRCUIT TRACING REQUIRED TO BE PERFORMED BY THE ELECTRICAL CONTRACTOR AS PART OF THEIR SCOPE OF WORK. UPDATE "AS-BUILT" DRAWINGS TO REFLECT ACTUAL CIRCUIT NUMBER AS DETERMINED BY CIRCUIT TRACING.
18. NEW JUNCTION BOX MOUNTED IN MILLWORK TO SERVE 120-VOLT POWER TO RECEPTACLES IN THE MILLWORK. COORDINATE EXACT MOUNTING LOCATION OF JUNCTION BOX IN MILLWORK WITH ARCHITECTURAL TRADES AND MILLWORK CONTRACTOR. ALL CONDUIT SERVING DUPLEX RECEPTACLES IN MILLWORK TO BE CONCEALED IN THE MILLWORK.
19. NEW JUNCTION BOX MOUNTED IN MILLWORK TO SERVE LOW VOLTAGE TELEPHONE / DATA OUTLETS IN MILLWORK. COORDINATE EXACT MOUNTING LOCATION OF JUNCTION BOX IN MILLWORK WITH ARCHITECTURAL TRADES AND MILLWORK CONTRACTOR. ALL CONDUIT SERVING LOW VOLTAGE TELEPHONE / DATA OUTLETS IN MILLWORK TO BE CONCEALED IN THE MILLWORK.
20. NEW 120 VOLT BRANCH CIRCUIT CONDUIT AND WIRING SERVING RECEPTACLES IN MILLWORK, ROUTED BELOW THE NEW FLOOR SLAB (TO REPLACE SECTION OF FLOOR REMOVED BY SAW CUTTING) TO THE WALL, AND CONCEALED INSIDE WALL TO ABOVE ACCESSIBLE CEILING SPACE. CONTINUE THROUGH CEILING SPACE TO PANEL NOTED (OR TO FLOOR BOX AS APPLICABLE AND INDICATED ON FLOOR PLAN).
21. NEW 2" EMPTY CONDUIT WITH PULL WIRE TO SERVE LOW VOLTAGE OUTLETS AT MILLWORK, ROUTED BELOW THE NEW FLOOR SLAB (TO REPLACE SECTION OF FLOOR REMOVED BY SAW CUTTING) TO THE WALL, AND CONCEALED INSIDE WALL TO ABOVE ACCESSIBLE CEILING SPACE. STUB CONDUIT ABOVE ACCESSIBLE CEILING SPACE AND BUSH CONDUIT END (OR TO FLOOR BOX AS APPLICABLE AND INDICATED ON FLOOR PLAN).
22. NEW HOMERUN TO EXISTING BRANCH CIRCUIT PREVIOUSLY SERVING DUPLEX RECEPTACLES AT THE CIRCULATION DESK, REMOVED BY DEMOLITION WORK, AND NEW CIRCUITS INDICATED ON FLOOR PLAN. REFER TO GENERAL NOTE #6 FOR ADDITIONAL REQUIREMENTS ASSOCIATED WITH CIRCUIT TRACING REQUIRED TO BE PERFORMED BY THE ELECTRICAL CONTRACTOR AS PART OF THEIR SCOPE OF WORK. UPDATE "AS-BUILT" DRAWINGS TO REFLECT ACTUAL CIRCUIT NUMBER AS DETERMINED BY CIRCUIT TRACING.
23. NEW BRANCH CIRCUIT CONDUIT AND WIRING CONCEALED IN MILLWORK TO SERVE NEW DUPLEX RECEPTACLES INDICATED. COORDINATE EXACT ROUTING PATH AND CONCEALMENT IN MILLWORK WITH ARCHITECTURAL TRADES AND MILLWORK CONTRACTOR IN FIELD PRIOR TO START OF CONSTRUCTION AND PRIOR TO ROUGH-IN OF ANY BOXES, RACEWAYS, ETC.
24. MOUNT NEW DUPLEX RECEPTACLE IN FACE OF MILLWORK / BENCH. COORDINATE EXACT DETAILS WITH ARCHITECTURAL DRAWINGS. ALL BOXES AND CONDUIT SERVING RECEPTACLE TO BE CONCEALED.

POWER & SYSTEMS KEY NOTES (CONTINUED)

25. NEW TAMPER-RESISTANT, 20-AMPERE, 125-VOLT DUPLEX RECEPTACLE CONTROLLED WIRELESSLY BY THE LIGHTING CONTROL SYSTEM. THE BOTTOM RECEPTACLE SHALL BE CONSTANTLY ENERGIZED. THE TOP RECEPTACLE SHALL BE CONTROLLED BY THE OCCUPANCY SENSOR CONTROL SERVING THE LIGHTING FIXTURES IN THE ROOM, AND SHALL BE PROGRAMMED TO SHUT-OFF THE TOP RECEPTACLE AFTER THERE HAS BEEN NO MOTION DETECTED IN THE SPACE AFTER THE TIME DELAY NOTED ON THE WIRELESS LIGHTING CONTROL SYSTEM SCHEDULE ON SHEET E4.01. REFER TO THE NOTED SCHEDULE ON SHEET E4.01 FOR ADDITIONAL INFORMATION. THE RECEPTACLE SHALL BE COOPER WAVELINX WR-20. WHERE THE LIGHTING CONTROL SYSTEM IS FROM ONE OF THE SPECIFIED "EQUAL" MANUFACTURES, THE RECEPTACLE SHALL BE MANUFACTURED BY ONE OF THE SPECIFIED "EQUAL" RECEPTACLE MANUFACTURES, AND CONTROLLED BY THE RESPECTIVE "EQUAL" LIGHTING CONTROL SYSTEM MANUFACTURE. EXACT DETAILS REGARDING ADDITIONAL CONTROL COMPONENTS REQUIRED SHALL BE DETERMINED BY THE LIGHTING CONTROL SYSTEM MANUFACTURE AND REFLECTED ON THE LIGHTING CONTROL SYSTEM MANUFACTURES INSTALLATION DRAWINGS AND SHOP DRAWINGS.

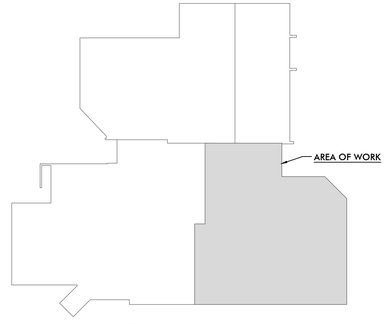
ELECTRICAL GENERAL NOTES

1. REFER TO SHEET E2.03 FOR ELECTRICAL GENERAL NOTES.

NORTH

1 / E2.02 SCALE: 3/16" = 1'-0"

PARTIAL MAIN LEVEL FLOOR PLAN - POWER & SYSTEMS NEW WORK



NORTH

KEY PLAN
NOT TO SCALE

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PROJECT NAME

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SEALED & SIGNED 05/16/2025; SEAL APPLIES ONLY TO THE ELECTRICAL DOCUMENTS PREPARED BY TAC ASSOCIATES, LLC

Drawing Name
Power & Systems New Work

Drawn By
CAD

Checked By
TGC

Issue Date
05/16/2025 Permit & Bid Set

Revisions

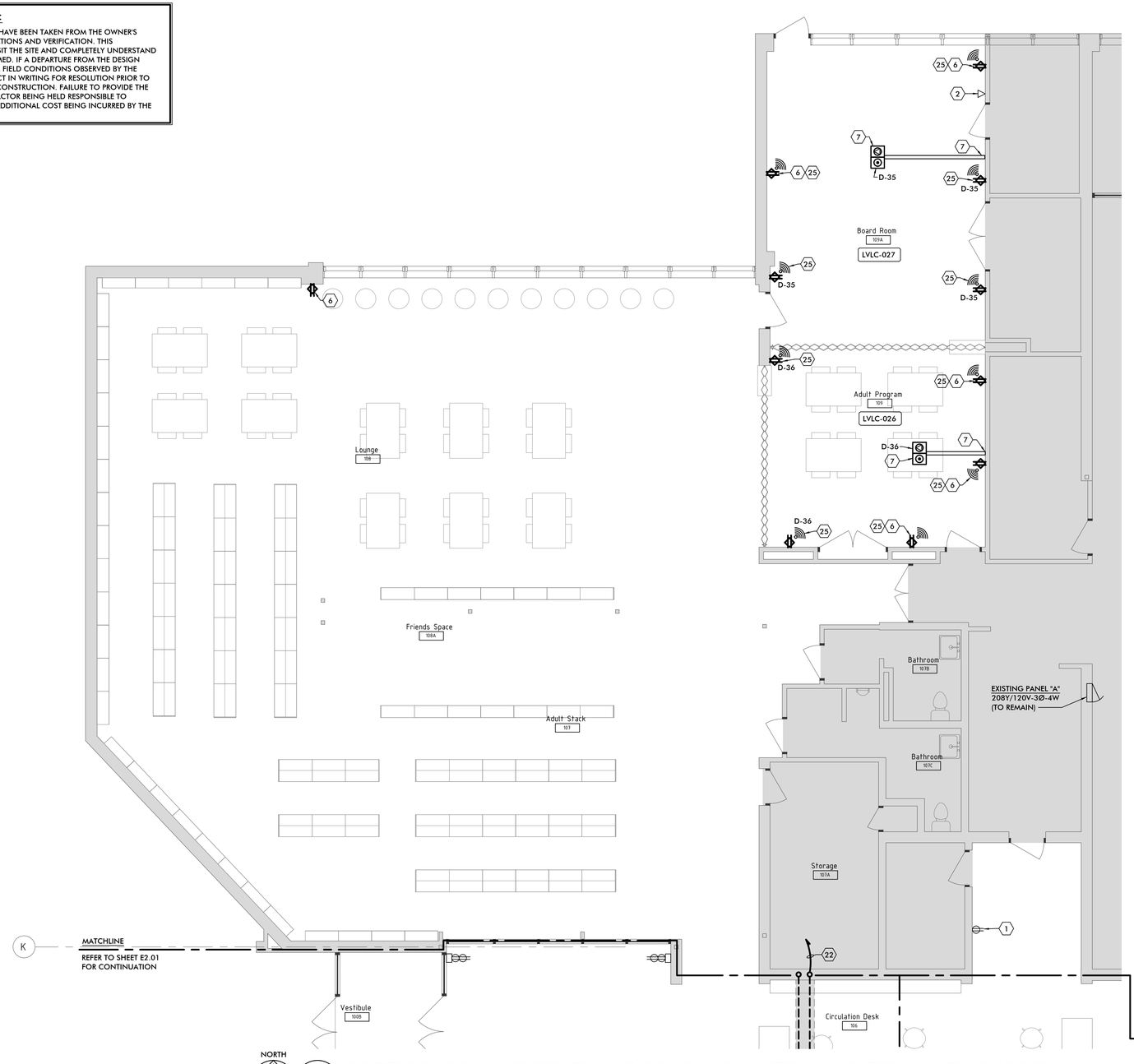
Issued for	Date

Project No.
P23005

Sheet Number
E2.02

CONTRACTORS PRE-BID NOTIFICATION:

ALL EXISTING ITEMS INDICATED IN THE CONTRACT DRAWINGS HAVE BEEN TAKEN FROM THE OWNER'S LIMITED RECORD DRAWINGS AND SUBSTANTIAL FIELD OBSERVATIONS AND VERIFICATION. THIS CONTRACTOR AND ALL RELATED SUB-CONTRACTORS SHALL VISIT THE SITE AND COMPLETELY UNDERSTAND THE CONDITIONS UNDER WHICH THE WORK MUST BE PERFORMED. IF A DEPARTURE FROM THE DESIGN INTENT OF THE DOCUMENTS IS REQUIRED DUE TO THE ACTUAL FIELD CONDITIONS OBSERVED BY THE CONTRACTOR, THE CONTRACTOR SHALL NOTIFY THE ARCHITECT IN WRITING FOR RESOLUTION PRIOR TO SUBMITTING FINAL BID OR ENTERING INTO A CONTRACT FOR CONSTRUCTION. FAILURE TO PROVIDE THE ARCHITECT WITH NOTIFICATION SHALL RESULT IN THE CONTRACTOR BEING HELD RESPONSIBLE TO COMPLETE ALL WORK TO MEET THE DESIGN INTENT WITH NO ADDITIONAL COST BEING INCURRED BY THE OWNER.



PARTIAL MAIN LEVEL FLOOR PLAN - POWER & SYSTEMS NEW WORK

SCALE: 3/16" = 1'-0"

POWER & SYSTEMS KEY NOTES

1. EXISTING DUPLEX RECEPTACLE TO REMAIN.
2. EXISTING TELEPHONE POWER POLE, WITH 120-VOLT POWER AND LOW VOLTAGE OUTLETS, TO REMAIN.
3. EXISTING LOW VOLTAGE DATA OUTLET TO REMAIN.
4. NEW LOCATION OF RELOCATED LOCAL AUDIBLE AND VISUAL ALARM SERVING DUCT MOUNTED SMOKE DETECTOR IN MECHANICAL AIR HANDLING UNIT. ELECTRICAL CONTRACTOR SHALL INSTALL RELOCATED ALARM DEVICES ON NEW WALL INDICATED. BACK BOX AND CONDUIT SERVING RELOCATED ALARM DEVICES TO BE CONCEALED IN NEW WALL CONSTRUCTION. PROVIDE NEW WIRING FROM THE RELOCATED ALARM DEVICES TO THE EXISTING ROOF TOP UNIT. COORDINATE EXACT DETAILS IN FIELD WITH THE EXISTING ROOF TOP UNIT EQUIPMENT, AND THE MANUFACTURES INSTALLATION DRAWINGS AND WIRING DIAGRAMS.
5. EXISTING MANUAL MOTOR STARTER SERVING EXHAUST FAN, TO REMAIN.
6. ELECTRICAL CONTRACTOR SHALL INSTALL THE NEW TAMPER-RESISTANT DUPLEX RECEPTACLE IN THE SAME LOCATION AS AN EXISTING DEVICE REMOVED BY DEMOLITION WORK. EXISTING BOX, CONDUIT AND WIRING SERVING RECEPTACLE TO REMAIN TO SERVE NEW WIRING DEVICE AS INDICATED. REFER TO GENERAL NOTE #6 FOR ADDITIONAL REQUIREMENTS ASSOCIATED WITH CIRCUIT TRACING REQUIRED TO BE PERFORMED BY THE ELECTRICAL CONTRACTOR AS PART OF THEIR SCOPE OF WORK. REFER TO DEMOLITION PLAN FOR ADDITIONAL INFORMATION.
7. NEW SURFACE FLOOR MOUNTED "ON-FLOOR" WIREWAY SYSTEM, INSTALLED ON TOP OF EXISTING FLOOR SURFACE (CARPET); "CONNECTRAC EXPRESS KIT" SYSTEM, WITH MODULAR PRE-WIRED QUAD POWER DEVICE (aka DOUBLE-DUPLEX RECEPTACLE), AND PROVISIONS FOR FOUR (4) CAT-5e OR CAT-6 CABLES TO SERVE THE LOW VOLTAGE CABLING TO CONFERENCE TABLE LOCATION. LOW VOLTAGE CABLING TO BE INSTALLED BY THE OWNER'S COMMUNICATION CONTRACTOR. ELECTRICAL CONTRACTOR SHALL PROVIDE ROUGH-IN BOX AND TERMINATION FITTINGS FOR TERMINATION OF THE CONNECTRAC AT THE WALL TO CONCEAL THE RACEWAY AND CABLING FROM WITHIN THE WALL CONSTRUCTION TO THE CONNECTRAC SYSTEM. SYSTEM TO CONSIST OF WIREWAY SEGMENTS, CORNER KITS, PRE-WIRED DUPLEX POWER DEVICE AND POWER FEED AND ALL MISCELLANEOUS ACCESSORIES AND COMPONENTS FOR A COMPLETE SYSTEM. FINISH TO BE STANDARD SILVER FINISH, WITH EXACT FINISH VERIFIED BY ARCHITECT PRIOR TO ORDERING SYSTEM. COORDINATE ALL WORK WITH ARCHITECTURAL TRADES. SYSTEM TO BE CONNECTRAC CT XPO.1-XX-25.1c-SV SERIES, WHERE THE "XX" DENOTES THE LENGTH OF THE FLOOR KIT, TO BE DETERMINED BY THE CONTRACTOR IN THE FIELD PRIOR TO ORDERING SYSTEM. PROVIDE ALL REQUIRED ADDITIONAL COMPONENTS FOR A COMPLETE AND OPERATING SYSTEM. ROUTE POWER FEED SERVING CONNECTRAC CONCEALED IN WALL CONSTRUCTION TO ABOVE ACCESSIBLE CEILING SPACE; CONTINUE IN ACCESSIBLE CEILING SPACE TO PANEL NOTED. PROVIDE NEW 1" EMPTY CONDUIT (WITH PULLWIRE), ROUTED FROM THE CONNECTRAC LOCATION TO THE CEILING SPACE ABOVE. STUB CONDUIT OUT TO ACCESSIBLE CEILING SPACE. TERMINATE CONDUIT AT 3" ABOVE FINISHED FLOOR AT THE CONNECTRAC TERMINATION POINT, AND ACCESSIBLE FROM THE CONNECTRAC ROUGH-IN BOX AT THE FLOOR LEVEL; BUSH CONDUIT ENDS. TELEPHONE AND DATA CABLING TO BE BY THE OWNER'S COMMUNICATION CONTRACTOR. COORDINATE ALL CABLING RACEWAY REQUIREMENTS WITH THE OWNERS COMMUNICATION CONTRACTOR IN THE FIELD PRIOR TO START OF CONSTRUCTION.
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9. COORDINATE SAW-CUTTING OF EXISTING CONCRETE FLOOR SLAB TO SUPPORT THE INSTALLATION OF THE NEW FLOOR BOX AND ASSOCIATED CONDUITS, OR AS APPLICABLE NEW CONDUITS TO SERVE RECEPTACLES AND OUTLETS IN NEW MILLWORK (AS INDICATED), WITH ARCHITECTURAL TRADES PRIOR TO START OF CONSTRUCTION. REFER TO ARCHITECTURAL DRAWINGS FOR ADDITIONAL INFORMATION REGARDING THE SAW-CUTTING OF THE EXISTING CONCRETE FLOOR.
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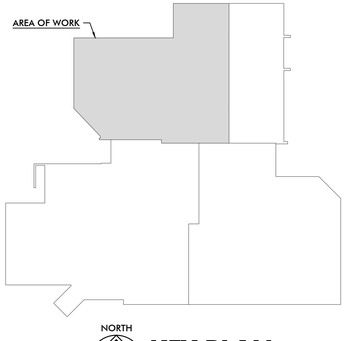
18. NEW JUNCTION BOX MOUNTED IN MILLWORK TO SERVE 120-VOLT POWER TO RECEPTACLES IN THE MILLWORK. COORDINATE EXACT MOUNTING LOCATION OF JUNCTION BOX IN MILLWORK WITH ARCHITECTURAL TRADES AND MILLWORK CONTRACTOR. ALL CONDUIT SERVING DUPLEX RECEPTACLES IN MILLWORK TO BE CONCEALED IN THE MILLWORK.
19. NEW JUNCTION BOX MOUNTED IN MILLWORK TO SERVE LOW VOLTAGE TELEPHONE / DATA OUTLETS IN MILLWORK. COORDINATE EXACT MOUNTING LOCATION OF JUNCTION BOX IN MILLWORK WITH ARCHITECTURAL TRADES AND MILLWORK CONTRACTOR. ALL CONDUIT SERVING LOW VOLTAGE TELEPHONE / DATA OUTLETS IN MILLWORK TO BE CONCEALED IN THE MILLWORK.
20. NEW 120 VOLT BRANCH CIRCUIT CONDUIT AND WIRING SERVING RECEPTACLES IN MILLWORK, ROUTED BELOW THE NEW FLOOR SLAB (TO REPLACE SECTION OF FLOOR REMOVED BY SAW CUTTING) TO THE WALL, AND CONCEALED INSIDE WALL TO ABOVE ACCESSIBLE CEILING SPACE. CONTINUE THROUGH CEILING SPACE TO PANEL NOTED (OR TO FLOOR BOX AS APPLICABLE AND INDICATED ON FLOOR PLAN).
21. NEW 1 ½" EMPTY CONDUIT WITH PULL WIRE TO SERVE LOW VOLTAGE OUTLETS AT MILLWORK, ROUTED BELOW THE NEW FLOOR SLAB (TO REPLACE SECTION OF FLOOR REMOVED BY SAW CUTTING) TO THE WALL, AND CONCEALED INSIDE WALL TO ABOVE ACCESSIBLE CEILING SPACE. STUB CONDUIT ABOVE ACCESSIBLE CEILING SPACE AND BUSH CONDUIT END (OR TO FLOOR BOX AS APPLICABLE AND INDICATED ON FLOOR PLAN).
22. NEW HOMERUN TO EXISTING BRANCH CIRCUIT PREVIOUSLY SERVING DUPLEX RECEPTACLES AT THE CIRCULATION DESK, REMOVED BY DEMOLITION WORK, AND NEW CIRCUITS INDICATED ON FLOOR PLAN. REFER TO GENERAL NOTE #6 FOR ADDITIONAL REQUIREMENTS ASSOCIATED WITH CIRCUIT TRACING REQUIRED TO BE PERFORMED BY THE ELECTRICAL CONTRACTOR AS PART OF THEIR SCOPE OF WORK. UPDATE "AS-BUILT" DRAWINGS TO REFLECT ACTUAL CIRCUIT NUMBER AS DETERMINED BY CIRCUIT TRACING.
23. NEW BRANCH CIRCUIT CONDUIT AND WIRING CONCEALED IN MILLWORK TO SERVE NEW DUPLEX RECEPTACLES INDICATED. COORDINATE EXACT ROUTING PATH AND CONCEALMENT IN MILLWORK WITH ARCHITECTURAL TRADES AND MILLWORK CONTRACTOR IN FIELD PRIOR TO START OF CONSTRUCTION AND PRIOR TO ROUGH-IN OF ANY BOXES, RACEWAYS, ETC.
24. MOUNT NEW DUPLEX RECEPTACLE IN FACE OF MILLWORK / BENCH. COORDINATE EXACT DETAILS WITH ARCHITECTURAL DRAWINGS. ALL BOXES AND CONDUIT SERVING RECEPTACLE TO BE CONCEALED.

ELECTRICAL GENERAL NOTES

1. ALL JUNCTION BOXES SERVING BRANCH CIRCUIT WIRING SHALL BE LABELED WITH CIRCUITS SERVED. USE BROTHER P-TOUCH LABEL OR EQUAL ON BOX COVER.
2. REFER TO ARCHITECTURAL REFLECTED CEILING PLANS FOR EXACT LOCATION OF ALL CEILING MOUNTED LIGHT FIXTURES AND OTHER CEILING MOUNTED DEVICES.
3. ALL DEVICES INDICATED WITH SOLID DARK LINES ARE NEW DEVICES TO BE INSTALLED BY THE ELECTRICAL CONTRACTOR AS PART OF THIS SCOPE OF WORK.
4. WHERE MORE THAN ONE LIGHT SWITCH IS INDICATED TO BE INSTALLED AT THE SAME LOCATION, THEY SHALL BE GROUPED UNDER A COMMON COVERPLATE. ALL SWITCHES SHALL BE MOUNTED AT 48"AFF UNLESS OTHERWISE NOTED.
5. ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING ALL LOCATIONS OF FIRE-RATED WALLS, CEILINGS, ETC. WITH ARCHITECTURAL DRAWINGS AND FOR PROVIDING FIRE-RATED BOXES, FIRE CAULK, ETC. AS REQUIRED TO MAINTAIN THE FIRE RATING OF THE SURFACE BEING PENETRATED.
6. PRIOR TO START OF CONSTRUCTION, AND PRIOR TO ANY DEMOLITION WORK THE ELECTRICAL CONTRACTOR SHALL PERFORM CIRCUIT TRACING TO IDENTIFY ALL EXISTING BRANCH CIRCUITS SERVING THE RENOVATION AREA, AND TO IDENTIFY THE AVAILABLE BRANCH CIRCUITS THAT MAY BE RE-USED AS PART OF THE PROPOSED RENOVATION, AS WELL AS CIRCUITS THAT SERVE EXISTING LIGHTING FIXTURES OR DEVICES OUTSIDE OF THE WORK AREA THAT ARE TO REMAIN AND BE MAINTAINED.
7. THE ELECTRICAL CONTRACTOR SHALL INSTALL ALL BRANCH CIRCUITS TO HAVE A MAXIMUM VOLTAGE DROP FROM THE CIRCUIT BREAKER PANEL SERVING THE LOAD TO THE LAST LOAD ON THE CIRCUIT OF NO MORE THAN 2%. ALL 120 VOLT, 20 AMPERE BRANCH CIRCUITS OVER 100 FEET IN LENGTH SHALL BE SERVED WITH #10 CONDUCTORS; ALL 120 VOLT, 20 AMPERE BRANCH CIRCUITS OVER 200 FEET IN LENGTH SHALL BE SERVED WITH #8 CONDUCTORS; AND ALL 120 VOLT, 20 AMPERE BRANCH CIRCUITS OVER 300 FEET IN LENGTH SHALL BE SERVED WITH #6 CONDUCTORS. THE OVER-SIZING OF THE CONDUCTORS SHALL INCLUDE OVER-SIZING OF THE EQUIPMENT GROUND CONDUCTOR IN ACCORDANCE WITH N.E.C. ARTICLE 250. ELECTRICAL CONTRACTOR SHALL PROVIDE STA-CON CONNECTORS ON THE ENDS OF CONDUCTORS WHERE NECESSARY TO FACILITATE TERMINATION OF THE CONDUCTORS AT THE WIRING DEVICES (i.e. DUPLEX RECEPTACLES, SWITCHES, ETC) AND THE CIRCUIT BREAKERS.
8. ELECTRICAL CONTRACTOR SHALL REVIEW TO THE ARCHITECTURAL FLOOR PLANS, ELEVATIONS, SECTIONS AND DETAILS FOR ADDITIONAL ELECTRICAL SCOPE OF WORK, INCLUDING BUT NOT LIMITED TO CONDUIT RACEWAYS REQUIRED TO BE INSTALLED IN MILLWORK, OUTLET SPACING, ETC; THE ELECTRICAL CONTRACTOR SHALL INCLUDE ALL COSTS ASSOCIATED WITH THIS ADDITIONAL ELECTRICAL SCOPE OF WORK IN HIS/HER BID.
9. CIRCUIT NUMBER DOES NOT INDICATE ACTUAL POLE POSITION USED BUT RATHER LOADS INTENDED TO BE GROUPED TOGETHER. ELECTRICAL CONTRACTOR SHALL CIRCUIT LOADS INTENDED TO BE GROUPED TOGETHER TO AN EXISTING SPARE 20A BRANCH CIRCUIT IN THE PANEL NOTED, OR EXISTING CIRCUIT MADE AVAILABLE BY DEMOLITION WORK IN THE RENOVATION AREA. UPDATE PANEL TYPED CIRCUIT DIRECTORY TO REFLECT REVISED LOAD SERVED BY THE BRANCH CIRCUIT. SEE NOTE #6 ABOVE FOR CIRCUIT TRACING REQUIREMENTS.

POWER & SYSTEMS KEY NOTES (CONTINUED)

25. NEW TAMPER-RESISTANT, 20-AMPERE, 125-VOLT DUPLEX RECEPTACLE CONTROLLED WIRELESSLY BY THE LIGHTING CONTROL SYSTEM. THE BOTTOM RECEPTACLE SHALL BE CONSTANTLY ENERGIZED. THE TOP RECEPTACLE SHALL BE CONTROLLED BY THE OCCUPANCY SENSOR CONTROL SERVING THE LIGHTING FIXTURES IN THE ROOM, AND SHALL BE PROGRAMMED TO SHUT-OFF THE TOP RECEPTACLE AFTER THERE HAS BEEN NO MOTION DETECTED IN THE SPACE AFTER THE TIME DELAY NOTED ON THE WIRELESS LIGHTING CONTROL SYSTEM SCHEDULE ON SHEET E4.01. REFER TO THE NOTED SCHEDULE ON SHEET E4.01 FOR ADDITIONAL INFORMATION. THE RECEPTACLE SHALL BE COOPER WAVELINX WR-20. WHERE THE LIGHTING CONTROL SYSTEM IS FROM ONE OF THE SPECIFIED "EQUAL" MANUFACTURES, THE RECEPTACLE SHALL BE MANUFACTURED BY ONE OF THE SPECIFIED "EQUAL" RECEPTACLE MANUFACTURES, AND CONTROLLED BY THE RESPECTIVE "EQUAL" LIGHTING CONTROL SYSTEM MANUFACTURE. EXACT DETAILS REGARDING ADDITIONAL CONTROL COMPONENTS REQUIRED SHALL BE DETERMINED BY THE LIGHTING CONTROL SYSTEM MANUFACTURE AND REFLECTED ON THE LIGHTING CONTROL SYSTEM MANUFACTURES INSTALLATION DRAWINGS AND SHOP DRAWINGS.



KEY PLAN

NOT TO SCALE

PLY+

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PROJECT NAME

SCSPL

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PROFESSIONAL ENGINEER

SEALED & SIGNED 05/16/2025; SEAL APPLIES ONLY TO THE ELECTRICAL DOCUMENTS PREPARED BY TAC ASSOCIATES, LLC

Drawing Name
Power & Systems New Work

Drawn By
CAD

Checked By
TGC

Issue Date
05/16/2025 Permit & Bid Set

Revisions

Issued for	Date

Project No.
P23005

Sheet Number
E2.03

EXISTING PANEL SCHEDULE

TYPE	DESCRIPTION	CB	VA	#	ØA	ØB	ØC	#	VA	CB	DESCRIPTION	TYPE
L	Existing Lighting Storage - SEE NOTE - 2	20/1	900	1	1800			16	900	20/1	Existing Plugs Loan Book Room - SEE NOTE - 2	D
L	New Lights - Board Room & Adult Program - SEE NOTE - 3	20/1	570	2		1050		17	480	20/1	Existing Water Cooler - SEE NOTE - 2	M
L	Existing Lighting Book Sorting - SEE NOTE - 2	20/1	900	3			1620	18	720	20/1	Existing Plug Book Processing - SEE NOTE - 2	D
L	Existing Lighting Loan Book Room - SEE NOTE - 2	20/1	800	4	1880			19	1080	20/1	Existing Plugs Office - SEE NOTE - 2	D
L	Existing Lighting Loan Book Room - SEE NOTE - 2	20/1	800	5		1580		20	780	20/1	Existing Bathroom Lights & Fan - SEE NOTE - 2	L
M	Existing Drinking Fountain - SEE NOTE - 2	20/1	480	6			1260	21	780	20/1	Existing Bathroom Lights & Fan - SEE NOTE - 2	L
L	Existing Night Lights - SEE NOTE - 2	20/1	900	7	2400			22	1500	20/1	Existing Ladies Dryer - SEE NOTE - 2	O
C	SPARE	20/1		8		720		23	720	20/1	Existing Floor Plugs Gen. Reading Area - SEE NOTE - 2	D
L	Existing Lights Librarians Office - SEE NOTE - 2	20/1	600	9			1500	24	900	20/1	Existing Circuit - SEE NOTE - 2	D
D	Existing Data Rack QUAD - SEE NOTE - 2	20/1	720	10	1320			25	600	20/1	Existing Outside Lights - SEE NOTE - 2	L
L	Existing Lights Book Processing - SEE NOTE - 2	20/1	900	11		1800		26	900	20/1	Existing Plugs Gen. Reading S.E. - SEE NOTE - 2	D
L	Existing Lights Passage - SEE NOTE - 2	20/1	600	12			1500	27	900	20/1	Existing Plugs Gen. Stacking N.E. / W - SEE NOTE - 2	D
L	Existing Lights Child Lib. Office - SEE NOTE - 2	20/1	600	13	1500			28	900	20/1	Existing Plugs Control Desk (Circ. Desk) - SEE NOTE - 2	D
L	Existing Lights Hall - SEE NOTE - 2	20/1	600	14		1680		29	1080	20/1	Existing Plugs Adult Rd & Work Room - SEE NOTE - 2	D
D	Existiing Computer Hub - SEE NOTE - 2	20/1	720	15			1320	30	600	20/1	Existing Lights Control Desk & Under Desk - DEMO - NOTE - 2	L
					8900	6830	7200					
					ØA	ØB	ØC					
					74.11	56.87	59.95					

PANELBOARD INFORMATION

DESIGNATION:	**LP-A**
VOLTAGE:	**208Y/120**
PHASE-WIRE:	**3Ø-4W**
BUS AMPACITY:	**100A**
MAIN TYPE:	**MLO**
MINIMUM A.I.C.:	
NEUTRAL SIZE:	**100%**
MOUNTING:	**SURFACE**
TOTAL POLES:	**30**
ENGINEER:	**TGC**
DATE:	**4/3/25**

AMPS PER PHASE

PANEL LOCATION

Existing Work Room

REMARKS

NEC ARTICLE 220 DEMAND CALCULATIONS

CONTINUOUS LOAD (C):	
KITCHEN LOAD (K):	
RECEPT BASE LOAD (D):	**9540**
RECEPT DEMAND LOAD (D):	
LIGHTING LOAD (L):	**10930**
ELECTRIC HEAT LOAD (H):	
MECHANICAL LOAD (M):	**960**
OTHER LOAD (O):	**1500**
CONNECTED 3Ø LOAD (kVA):	**22.93**
CONNECTED 3Ø LOAD (AMPS):	**63.65**
DEMAND 3Ø LOAD (kVA):	**22.93**
DEMAND 3Ø LOAD (AMPS):	**63.65**

NOTES:

1. ALL EXISTING LOADS INDICATED IN THE ABOVE PANEL SCHEDULE ARE ESTIMATED BASED UPON THE LIMITED ACCURATE AS-BUILT INFORMATION, PANEL SCHEDULES AND CIRCUIT NUMBERS AT DEVICES.
2. ELECTRICAL CONTRACTOR SHALL PERFORM CIRCUIT TRACING OF ALL EXISTING BRANCH CIRCUITS PRIOR TO START OF CONSTRUCTION TO VERIFY EXISTING LOAD SERVED. ELECTRICAL CONTRACTOR SHALL UPDATE THE PANEL TYPED CIRCUIT DIRECTORY BASED ON THE CIRCUIT TRACING; REFLECT CIRCUIT DIRECTORY CHANGES ON AS-BUILT RECORD DRAWINGS. NOTIFY ENGINEER IF EXISTING BRANCH CIRCUITS NOTED TO BE RE-USED, AND ANTICIPATED TO BE MADE AVAILABLE BY DEMOLITION WORK, ARE FOUND TO SERVE EXISTING LOADS THAT ARE TO REMAIN AS A RESULT OF THE CIRCUIT TRACING.
3. FOR SELECT EXISTING LOADS, THE POLE POSITION INDICATED MAY NOT REPRESENT THE ACTUAL POLE POSITION USED BUT RATHER THAT AN EXISTING BRANCH CIRCUIT IS TO BE REUSED. SEE NOTE-2.
4. ELECTRICAL CONTRACTOR SHALL VERIFY RECOMMENDED OVER-CURRENT PROTECTIVE DEVICE SETTING WITH MECHANICAL AND/OR PLUMBING CONTRACTOR BASED ON THE MECHANICAL AND/OR PLUMBING EQUIPMENT SHOP DRAWINGS. ADJUST OVER-CURRENT PROTECTIVE DEVICE SETTING AND ASSOCIATED CONDUCTOR SIZES WHERE THE INSTALLED EQUIPMENT RECOMMENDED OVER-CURRENT PROTECTIVE DEVICE SETTING DIFFERS FROM THE SETTING INDICATED. NOTE THAT THE SETTING INDICATED IS BASED ON THE INFORMATION PROVIDED BY THE MECHANICAL ENGINEER DURING THE DESIGN PHASE OF THE PROJECT.

EXISTING PANEL SCHEDULE

TYPE	DESCRIPTION	CB	VA	#	ØA	ØB	ØC	#	VA	CB	DESCRIPTION	TYPE
D	Existing N. IG Outlets - SEE NOTE - 2	20/1	540	1	1080			2	540	20/1	Existing W. IG Outlets - SEE NOTE - 2	D
D	Existing W. Wall Outlets - SEE NOTE - 2	20/1	360	3		900		4	540	20/1	Existing W. IG Outlets - SEE NOTE - 2	D
D	Existing S. Wall Outlets - SEE NOTE - 2	20/1	360	5			1080	6	720	20/1	Existing N/W Office Outlets - SEE NOTE - 2	D
D	Existing S. Office Outlets - SEE NOTE - 2	20/1	720	7	1080			8	360	20/1	Existing Column Outlets - SEE NOTE - 2	D
D	Existing W. Wall Outlets - SEE NOTE - 2	20/1	540	9		840		10	300	20/1	Existing Smoke Detector - SEE NOTE - 2	D
D	Existing IG Outlet on Column - SEE NOTE - 2	20/1	360	11			900	12	540	20/1	Existing IG Outlets West Wall - SEE NOTE - 2	D
D	Existing IG Outlet on Column - SEE NOTE - 2	20/1	360	13	540			14	180	20/1	Existing Outlet on Panel Box - SEE NOTE - 2	D
D	Existing Sub-Panel (Panel LP-G?) - SEE NOTE - 2	100/3	6623	15		6923		16	300	20/1	Existing Night Light - SEE NOTE - 2	L
D			6963	17			6963	18				O
D			7163	19	7163			20		50/3	Existing Surge Suppressor Next To Panel - SEE NOTE - 2	O
	SPACE			21				22				O
C				23				24			SPACE	
C	SPARE - SEE NOTE - 2	40/3		25	3543			26	3543			M
C				27		3543		28	3543	40/3	Existing City Hall Chilled Water Pump (10HP, 208V-3PH) - SEE NOTE - 2	M
D	Existing Load - SEE NOTE - 2	20/1	800	29			4343	30	3543			M
	SPACE			31	3543			32	3543			M
C	SPARE	30/2		33		3543		34	3543	40/3	Existing Library Chilled Water Pump (10HP, 208V-3PH) - SEE NOTE - 2	M
C				35			3543	36	3543			M
	SPACE			37				38			SPACE	
	SPACE			39				40			SPACE	
	SPACE			41				42			SPACE	
					16949	15749	16829					
					ØA	ØB	ØC					
					141.13	131.14	140.13					

PANELBOARD INFORMATION

DESIGNATION:	**LP-F**
VOLTAGE:	**208Y/120**
PHASE-WIRE:	**3Ø-4W**
BUS AMPACITY:	**225A**
MAIN TYPE:	**200A MCB**
MINIMUM A.I.C.:	
NEUTRAL SIZE:	**100%**
MOUNTING:	**SURFACE**
TOTAL POLES:	**42**
ENGINEER:	**TGC**
DATE:	**4/3/25**

AMPS PER PHASE

PANEL LOCATION

Geneology Electrical Room 111A

Panel Designation Added by this Project - No Name In Field

REMARKS

NEC ARTICLE 220 DEMAND CALCULATIONS

CONTINUOUS LOAD (C):	
KITCHEN LOAD (K):	
RECEPT BASE LOAD (D):	**10000**
RECEPT DEMAND LOAD (D):	**8985**
LIGHTING LOAD (L):	**300**
ELECTRIC HEAT LOAD (H):	
MECHANICAL LOAD (M):	**21258**
OTHER LOAD (O):	
CONNECTED 3Ø LOAD (kVA):	**49.53**
CONNECTED 3Ø LOAD (AMPS):	**137.48**
DEMAND 3Ø LOAD (kVA):	**40.54**
DEMAND 3Ø LOAD (AMPS):	**112.54**

NOTES:

1. ALL EXISTING LOADS INDICATED IN THE ABOVE PANEL SCHEDULE ARE ESTIMATED BASED UPON THE LIMITED ACCURATE AS-BUILT INFORMATION, PANEL SCHEDULES AND CIRCUIT NUMBERS AT DEVICES.
2. ELECTRICAL CONTRACTOR SHALL PERFORM CIRCUIT TRACING OF ALL EXISTING BRANCH CIRCUITS PRIOR TO START OF CONSTRUCTION TO VERIFY EXISTING LOAD SERVED. ELECTRICAL CONTRACTOR SHALL UPDATE THE PANEL TYPED CIRCUIT DIRECTORY BASED ON THE CIRCUIT TRACING; REFLECT CIRCUIT DIRECTORY CHANGES ON AS-BUILT RECORD DRAWINGS. NOTIFY ENGINEER IF EXISTING BRANCH CIRCUITS NOTED TO BE RE-USED, AND ANTICIPATED TO BE MADE AVAILABLE BY DEMOLITION WORK, ARE FOUND TO SERVE EXISTING LOADS THAT ARE TO REMAIN AS A RESULT OF THE CIRCUIT TRACING.
3. FOR SELECT EXISTING LOADS, THE POLE POSITION INDICATED MAY NOT REPRESENT THE ACTUAL POLE POSITION USED BUT RATHER THAT AN EXISTING BRANCH CIRCUIT IS TO BE REUSED. SEE NOTE-2.

EXISTING PANEL SCHEDULE

TYPE	DESCRIPTION	CB	VA	#	ØA	ØB	ØC	#	VA	CB	DESCRIPTION	TYPE
L	New Lights - Children's Area - SEE NOTE - 3	20/1	1143	1	1743			22	600	20/1	Existing Roof - SEE NOTE - 2	L
L	New Lights - Children's Area - SEE NOTE - 3	20/1	1234	2		1954		23	720	20/1	New (2) DBL Duplex - Poke-Thru - Geneology - NOTE - 3	D
L	New Lights - Children's Area - SEE NOTE - 3	20/1	614	3			1334	24	720	20/1	New (2) DBL Duplex - Poke-Thru - Geneology - NOTE - 3	D
L	New Lights - Teen Room 103 - SEE NOTE - 3	20/1	925	4	1465			25	540	20/1	New (3) Duplex - Geneology - SEE NOTE - 3	D
L	New Lights - Office 103A - SEE NOTE - 3	20/1	148	5		688		26	540	20/1	New (2) Duplex - Geneology + (1) Duplex Elec. 111A - NOTE - 3	D
D	New (1) DBL Duplex - Teen's Computer Desk - SEE NOTE - 3	20/1	620	6			980	27	360	20/1	New (2) Duplex - Adult Stack - East Wall - SEE NOTE - 3	D
D	New (1) DBL Duplex - Teen's Computer Desk - SEE NOTE - 3	20/1	620	7	1110			28	490	20/1	New (1) Duplex - Comp Station - Lobby - SEE NOTE - 3	D
D	New (1) Duplex - Comp. Station - Teen's - SEE NOTE - 3	20/1	490	8		1470		29	980	20/1	New (2) Duplex - Comp Station - Lobby - SEE NOTE - 3	D
D	New (1) Floor Box (3 Duplex) + (1) Duplex - Teen's - SEE NOTE - 3	20/1	720	9			900	30	180	20/1	New (1) Duplex - Children's Area - SEE NOTE - 3	D
L	Existing Night Lights - SEE NOTE - 2	20/1	800	10	1340			31	540	20/1	New (3) Duplex - Children's 110 + Office 103A - SEE NOTE - 3	D
O	NEW PRINTER - CIRCULATION DESK - SEE NOTE - 3	20/1	1200	11		2180		32	980	20/1	New (2) DBL Duplex - Office 103A - SEE NOTE - 3	D
O	NEW COPIER / FAX - CIRCULATION DESK - SEE NOTE - 3	20/1	1200	12			1740	33	540	20/1	New (3) Duplex - Teen 103 + Office 103A - SEE NOTE - 3	D
C	SPARE (DEMO) - SEE NOTE - 2	20/1		13	60			34	60	20/1	New VAV Transformer (3 @ 20VA each) - SEE NOTE - 3	M
L	New Lights - Lobby & Vestibules 100A & 100B - SEE NOTE - 3	20/1	729	14		729		35		20/1	SPARE (DEMO) - SEE NOTE - 2	C
C	SPARE (DEMO) - SEE NOTE - 2	20/1		15			670	36	670	20/1	Existing Toilet Room Exhaust Fan - SEE NOTE - 2	M
L	Existing Roof Lights - SEE NOTE - 2	20/1	300	16	300			37		20/1	SPARE (DEMO) - SEE NOTE - 2	C
C	SPARE (DEMO) - SEE NOTE - 2	20/1		17		300		38	300	20/1	Existing Chime - SEE NOTE - 2	O
L	New Lights - Circulation Desk (Lobby) - SEE NOTE - 3	20/1	271	18			1771	39	1500	20/1	Existing Men's Dryer - SEE NOTE - 2	H
C	SPARE (DEMO) - SEE NOTE - 2	20/1		19				40		20/1	SPARE - SEE NOTE - 2	C
L	Existing Outside E. Entrance Lighting - SEE NOTE - 2	20/1	800	20		800		41		20/1	SPARE - SEE NOTE - 2	C
C	SPARE (DEMO) - SEE NOTE - 2	20/1		21			600	42	600	20/1	Existing Roof - SEE NOTE - 2	D
					6018	8121	7995					
					ØA	ØB	ØC					
					50.11	67.62	66.57					

PANELBOARD INFORMATION

DESIGNATION:	**LP-C**
VOLTAGE:	**208Y/120**
PHASE-WIRE:	**3Ø-4W**
BUS AMPACITY:	**225A**
MAIN TYPE:	**MLO**
MINIMUM A.I.C.:	
NEUTRAL SIZE:	**100%**
MOUNTING:	**SURFACE**
TOTAL POLES:	**42**
ENGINEER:	**TGC**
DATE:	**4/3/25**

AMPS PER PHASE

PANEL LOCATION

Existing Utility Closet

SCHEDULE IS BASED ON FULL PROJECT SCOPE, INCLUDING ALTERNATES #1 AND #2.

REMARKS

NEC ARTICLE 220 DEMAND CALCULATIONS

CONTINUOUS LOAD (C):	
KITCHEN LOAD (K):	
RECEPT BASE LOAD (D):	**9640**
RECEPT DEMAND LOAD (D):	
LIGHTING LOAD (L):	**7564**
ELECTRIC HEAT LOAD (H):	**1500**
MECHANICAL LOAD (M):	**730**
OTHER LOAD (O):	**2700**
CONNECTED 3Ø LOAD (kVA):	**22.13**
CONNECTED 3Ø LOAD (AMPS):	**61.44**
DEMAND 3Ø LOAD (kVA):	**22.13**
DEMAND 3Ø LOAD (AMPS):	**61.44**

NOTES:

1. ALL EXISTING LOADS INDICATED IN THE ABOVE PANEL SCHEDULE ARE ESTIMATED BASED UPON THE LIMITED ACCURATE AS-BUILT INFORMATION, PANEL SCHEDULES AND CIRCUIT NUMBERS AT DEVICES.
2. ELECTRICAL CONTRACTOR SHALL PERFORM CIRCUIT TRACING OF ALL EXISTING BRANCH CIRCUITS PRIOR TO START OF CONSTRUCTION TO VERIFY EXISTING LOAD SERVED. ELECTRICAL CONTRACTOR SHALL UPDATE THE PANEL TYPED CIRCUIT DIRECTORY BASED ON THE CIRCUIT TRACING; REFLECT CIRCUIT DIRECTORY CHANGES ON AS-BUILT RECORD DRAWINGS. NOTIFY ENGINEER IF EXISTING BRANCH CIRCUITS NOTED TO BE RE-USED, AND ANTICIPATED TO BE MADE AVAILABLE BY DEMOLITION WORK, ARE FOUND TO SERVE EXISTING LOADS THAT ARE TO REMAIN AS A RESULT OF THE CIRCUIT TRACING.
3. FOR SELECT EXISTING LOADS, THE POLE POSITION INDICATED MAY NOT REPRESENT THE ACTUAL POLE POSITION USED BUT RATHER THAT AN EXISTING BRANCH CIRCUIT IS TO BE REUSED. SEE NOTE-2.
4. ELECTRICAL CONTRACTOR SHALL VERIFY RECOMMENDED OVER-CURRENT PROTECTIVE DEVICE SETTING WITH MECHANICAL AND/OR PLUMBING CONTRACTOR BASED ON THE MECHANICAL AND/OR PLUMBING EQUIPMENT SHOP DRAWINGS. ADJUST OVER-CURRENT PROTECTIVE DEVICE SETTING AND ASSOCIATED CONDUCTOR SIZES WHERE THE INSTALLED EQUIPMENT RECOMMENDED OVER-CURRENT PROTECTIVE DEVICE SETTING DIFFERS FROM THE SETTING INDICATED. NOTE THAT THE SETTING INDICATED IS BASED ON THE INFORMATION PROVIDED BY THE MECHANICAL ENGINEER DURING THE DESIGN PHASE OF THE PROJECT.

EXISTING PANEL SCHEDULE

TYPE	DESCRIPTION	CB	VA	#	ØA	ØB	ØC	#	VA	CB	DESCRIPTION	TYPE
O	Existing Auto Door Opener - SEE NOTE - 2	20/1	600	1	5163			2	4563			M
O	Existing Copy Machine - SEE NOTE - 2	20/1	1500	3		6063		4	4563	50/3	Existing Meeting Room HVAC - SEE NOTE - 2	M
D	Existing Computer HUB - SEE NOTE - 2	20/1	600	5			5163	6	4563			M
D	Existing Receptacle under Sink Ladies Rm - SEE NOTE - 2	20/1	180	7	360			8	180	20/1	Existing Roof Top Outlet - SEE NOTE - 2	D
M	Existing Heat Control - SEE NOTE - 2	20/1	300	9		900		10	600	20/1	Existing AV Equipment - Meeting Room - SEE NOTE - 2	D
D	Existing Load - SEE NOTE - 2	20/2	1000	11			2000	12	1000	20/2	Existing Load - SEE NOTE - 2	D
D			1000	13	1100			14	100			D
	SPACE			15				16			SPACE	
	SPACE			17				18			SPACE	
					6623	6963	7163					
					ØA	ØB	ØC					
					55.15	57.98	59.65					

PANELBOARD INFORMATION

DESIGNATION:	**LP-G**
VOLTAGE:	**208Y/120**
PHASE-WIRE:	**3Ø-4W**
BUS AMPACITY:	**125A**
MAIN TYPE:	**MLO**
MINIMUM A.I.C.:	
NEUTRAL SIZE:	**100%**
MOUNTING:	**SURFACE**
TOTAL POLES:	**18**
ENGINEER:	**TGC**
DATE:	**4/3/25**

AMPS PER PHASE

PANEL LOCATION

Existing Utility Closet

Panel Designation Added by this Project - No Name In Field

REMARKS

NEC ARTICLE 220 DEMAND CALCULATIONS

CONTINUOUS LOAD (C):	
KITCHEN LOAD (K):	
RECEPT BASE LOAD (D):	**4660**
RECEPT DEMAND LOAD (D):	
LIGHTING LOAD (L):	
ELECTRIC HEAT LOAD (H):	
MECHANICAL LOAD (M):	**13989**
OTHER LOAD (O):	**2100**
CONNECTED 3Ø LOAD (kVA):	**20.75**
CONNECTED 3Ø LOAD (AMPS):	**57.60**
DEMAND 3Ø LOAD (kVA):	**20.75**
DEMAND 3Ø LOAD (AMPS):	**57.60**

NOTES:

1. ALL EXISTING LOADS INDICATED IN THE ABOVE PANEL SCHEDULE ARE ESTIMATED BASED UPON THE LIMITED ACCURATE AS-BUILT INFORMATION, PANEL SCHEDULES AND CIRCUIT NUMBERS AT DEVICES.
2. ELECTRICAL CONTRACTOR SHALL PERFORM CIRCUIT TRACING OF ALL EXISTING BRANCH CIRCUITS PRIOR TO START OF CONSTRUCTION TO VERIFY EXISTING LOAD SERVED. ELECTRICAL CONTRACTOR SHALL UPDATE THE PANEL TYPED CIRCUIT DIRECTORY BASED ON THE CIRCUIT TRACING; REFLECT CIRCUIT DIRECTORY CHANGES ON AS-BUILT RECORD DRAWINGS. NOTIFY ENGINEER IF EXISTING BRANCH CIRCUITS NOTED TO BE RE-USED, AND ANTICIPATED TO BE MADE AVAILABLE BY DEMOLITION WORK, ARE FOUND TO SERVE EXISTING LOADS THAT ARE TO REMAIN AS A RESULT OF THE CIRCUIT TRACING.
3. FOR SELECT EXISTING LOADS, THE POLE POSITION INDICATED MAY NOT REPRESENT THE ACTUAL POLE POSITION USED BUT RATHER THAT AN EXISTING BRANCH CIRCUIT IS TO BE REUSED. SEE NOTE-2.
4. ELECTRICAL CONTRACTOR SHALL VERIFY RECOMMENDED OVER-CURRENT PROTECTIVE DEVICE SETTING WITH MECHANICAL AND/OR PLUMBING CONTRACTOR BASED ON THE MECHANICAL AND/OR PLUMBING EQUIPMENT SHOP DRAWINGS. ADJUST OVER-CURRENT PROTECTIVE DEVICE SETTING AND ASSOCIATED CONDUCTOR SIZES WHERE THE INSTALLED EQUIPMENT RECOMMENDED OVER-CURRENT PROTECTIVE DEVICE SETTING DIFFERS FROM THE SETTING INDICATED. NOTE THAT THE SETTING INDICATED IS BASED ON THE INFORMATION PROVIDED BY THE MECHANICAL ENGINEER DURING THE DESIGN PHASE OF THE PROJECT.

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TAC Project No. 24-017

PROJECT NAME

SCSPL

STATE OF MICHIGAN
THOMAS GERARD CROW
ENGINEER
License No. 6201055658
PROFESSIONAL ENGINEER

SEALED & SIGNED 05/16/2025; SEAL APPLIES ONLY TO THE ELECTRICAL DOCUMENTS PREPARED BY TAC ASSOCIATES, LLC

Drawing Name
Electrical Schedules

Drawn By
CAD

Checked By
TGC

Issue Date
05/16/2025 Permit & Bid Set

Revisions

Issued for	Date

Project No.
P23005

Sheet Number
E3.00

EXISTING PANEL SCHEDULE

TYPE	DESCRIPTION	CB	VA	#	ØA	ØB	ØC	#	VA	CB	DESCRIPTION	TYPE
L	New Lights - Adult Stack 101 + Study Space 102 - NOTE - 3	20/1	1251	1	1967			22	716	20/1	New Lights - Adult Stacks & Lounge - SEE NOTE - 3	L
L	New Lights - Adult Stack 101 - SEE NOTE - 3	20/1	1191	2		1791		23	600	20/1	Existing Basement Stair Adult Rm - SEE NOTE - 2	L
L	New Lights - Adult Stack 101 - SEE NOTE - 3	20/1	1187	3			2064	24	877	20/1	New Lights - Adult Lounge - SEE NOTE - 3	L
L	New Lights - Adult Stack 101 + Seating Area 101A - SEE NOTE - 3	20/1	928	4	928			25		20/1	SPARE (DEMO) - SEE NOTE - 2	C
C	SPARE (DEMO) - SEE NOTE - 2	20/1		5				26		20/1	SPARE (DEMO) - SEE NOTE - 2	C
C	SPARE (DEMO) - SEE NOTE - 2	20/1		6				27		20/1	SPARE (DEMO) - SEE NOTE - 2	C
C	SPARE (DEMO) - SEE NOTE - 2	20/1		7				28		20/1	SPARE (DEMO) - SEE NOTE - 2	C
D	Existing Load - SEE NOTE - 2	20/1	720	8		720		29		20/1	SPARE (DEMO) - SEE NOTE - 2	C
L	Existing Staff Lounge - SEE NOTE - 2	20/1	900	9			900	30		20/1	SPARE (DEMO) - SEE NOTE - 2	C
L	New Lights - Geneology 111 & Study Rms 110A-110D - NOTE - 3	20/1	716	10	716			31		20/1	SPARE (DEMO) - SEE NOTE - 2	C
C	SPARE (DEMO) - SEE NOTE - 2	20/1		11		866		32	866	20/1	New Lights - Adult Stacks - SEE NOTE - 3	L
D	Existing Desk E. End - SEE NOTE - 2	20/1	900	12			900	33		20/1	SPARE (DEMO) - SEE NOTE - 2	C
D	Existing Desk W. End - SEE NOTE - 2	20/1	900	13	1864			34	964	20/1	New Lights - Adult Stacks - SEE NOTE - 3	L
C	SPARE (DEMO) - SEE NOTE - 2	20/1		14		900		35	900	20/1	New (1) DBL Duplex Floor + (3) Duplex - Board Rm - NOTE - 3	D
D	Existing Load - SEE NOTE - 2	20/1	720	15			1440	36	720	20/1	New (1) DBL Duplex Floor + (2) Duplex - Adult Program - NOTE - 3	D
D	Existing Load - SEE NOTE - 2	20/1	720	16	1220			37	500	20/1	Existing West Ent. Lights - SEE NOTE - 2	L
C	SPARE (DEMO) - SEE NOTE - 2	20/1		17		900		38	900	20/1	Existing Load - SEE NOTE - 2	D
L	Existing Lighting - SEE NOTE - 2	20/1	800	18			1520	39	720	20/1	Existing Load - SEE NOTE - 2	D
D	Existing Load - SEE NOTE - 2	20/1	900	19	1500			40	600	20/1	Existing Bathroom Lights - SEE NOTE - 2	L
D	Existing Load - SEE NOTE - 2	20/1	900	20		1620		41	720	20/1	Existing Load - SEE NOTE - 2	D
D	Existing Load - SEE NOTE - 2	20/1	900	21			1500	42	600	20/1	Existing Night Lights - SEE NOTE - 2	L
					8195	6797	8324					
					ØA	ØB	ØC					
					68.24	56.60	69.31					

AMPS PER PHASE

PANELBOARD INFORMATION

DESIGNATION:	LP-D
VOLTAGE:	208Y/120
PHASE-WIRE:	3Ø-4W
BUS AMPACITY:	225A
MAIN TYPE:	MLO
MINIMUM A.I.C.:	
NEUTRAL SIZE:	100%
MOUNTING:	SURFACE
TOTAL POLES:	42
ENGINEER:	TGC
DATE:	4/3/25

PANEL LOCATION

Existing Utility Closet

SCHEDULE IS BASED ON FULL PROJECT SCOPE, INCLUDING ALTERNATES #1 AND #2.

REMARKS

NEC ARTICLE 220 DEMAND CALCULATIONS

CONTINUOUS LOAD (C):	
KITCHEN LOAD (K):	
RECEPT BASE LOAD (D):	10000
RECEPT DEMAND LOAD (D):	310
LIGHTING LOAD (L):	12696
ELECTRIC HEAT LOAD (H):	
MECHANICAL LOAD (M):	
OTHER LOAD (O):	
CONNECTED 3Ø LOAD (kVA):	23.32
CONNECTED 3Ø LOAD (AMPS):	64.72
DEMAND 3Ø LOAD (kVA):	23.01
DEMAND 3Ø LOAD (AMPS):	63.86

NOTES:

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EXISTING PANEL SCHEDULE

TYPE	DESCRIPTION	CB	VA	#	ØA	ØB	ØC	#	VA	CB	DESCRIPTION	TYPE
L	New Lights - Makers Space & Story Time - SEE NOTE -3	20/1	863	1	1223			2	360	20/1	New (2) Duplex - Vest 104 & Closet 105D - SEE NOTE - 3	D
C	SPARE (DEMO) - SEE NOTE - 2	20/1		3		360		4	360	20/1	New (2) GFI Duplex - Story Time 105A	D
D	Existing Receptacles RM 101-102 - SEE NOTE - 2	20/1	540	5			900	6	360	20/1	New (2) Duplex - Story Time 105A	D
C	SPARE (DEMO) - SEE NOTE - 2	20/1		7	400			8	400	20/1	New Ceiling Video Projector - Story Time 105A	D
L	Existing Canopy Lights - SEE NOTE - 2	20/1	600	9		1140		10	540	20/1	New (3) Duplex - Story Time, Maker Space, Children - NOTE - 3	D
D	Existing HVAC #1 Roof Receptacle - SEE NOTE - 2	20/1	180	11			540	12	360	20/1	New (2) Duplex - Cord Reel - Makers Space - SEE NOTE - 3	D
D	(1) Duplex - Makers Space + (1) Duplex - Children's - NOTE - 3	20/1	360	13	720			14	360	20/1	New (2) Duplex - Cord Reel - Makers Space - SEE NOTE - 3	D
C	SPARE (DEMO) - SEE NOTE - 2	20/1		15		40		16	40	20/1	Existing Front Exit Light - NOTE - 2	L
C	SPARE (DEMO) - SEE NOTE - 2	20/1		17			360	18	360	20/1	New (2) Duplex - Cord Reel - Makers Space - SEE NOTE - 3	D
C	SPARE (DEMO) - SEE NOTE - 2	20/1		19	180			20	180	20/1	Existing Receptacle Rm 106 - SEE NOTE - 2	D
C	SPARE (DEMO) - SEE NOTE - 2	20/1		21		180		22	180	20/1	Existing Receptacle Rm 106 - SEE NOTE - 2	D
C	SPARE	20/1		23			360	24	360	20/1	New (2) Duplex - Makers Space - SEE NOTE - 3	D
D	New (1) Duplex - Floor Box - Children's Area - SEE NOTE - 4		620	25	1160			26	540	20/1	New (3) Duplex - Makers Space - SEE NOTE - 3	D
D	New (2) Duplex - Floor Box - Children's Area - SEE NOTE - 4	20/3	1240	27		1910		28	670	20/1	Existing Exhaust Fan - SEE NOTE - 2	M
D	New (2) DBL Duplex - Children's Info Desk - SEE NOTE - 4		850	29			1154	30	304	20/1	New Lights Vest 104, Bath 104A & B, Closet 105D - NOTE - 3	L
D	New (1) Duplex - Comp. Station - Children's - SEE NOTE - 3	20/1	490	31	490			32		40/2	SPARE (DEMO) - SEE NOTE - 2	C
L	New Lights - Storage 105B & WAC01 (Ltg Control) - SEE NOTE - 3	20/1	310	33		310		34				C
D	Existing Receptacle Work Room 106 - SEE NOTE - 2	20/1	720	35			720	36		30/2	SPARE (DEMO) - SEE NOTE - 2	C
M			4920	37	4920			38				C
M	Existing Roof Top Unit - SEE NOTE - 2	60/3	4920	39		4920		40		20/2	SPARE (DEMO) - SEE NOTE - 2	C
M			4920	41			4920	42				C
					9093	8860	8954					
					ØA	ØB	ØC					
					75.72	73.78	74.56					

AMPS PER PHASE

PANELBOARD INFORMATION

DESIGNATION:	LP-KA
VOLTAGE:	208Y/120
PHASE-WIRE:	3Ø-4W
BUS AMPACITY:	225A
MAIN TYPE:	MLO
MINIMUM A.I.C.:	
NEUTRAL SIZE:	100%
MOUNTING:	SURFACE
TOTAL POLES:	42
ENGINEER:	TGC
DATE:	4/3/25

PANEL LOCATION

Existing Storage Room

REMARKS

NEC ARTICLE 220 DEMAND CALCULATIONS

CONTINUOUS LOAD (C):	
KITCHEN LOAD (K):	
RECEPT BASE LOAD (D):	9360
RECEPT DEMAND LOAD (D):	
LIGHTING LOAD (L):	2117
ELECTRIC HEAT LOAD (H):	
MECHANICAL LOAD (M):	15430
OTHER LOAD (O):	
CONNECTED 3Ø LOAD (kVA):	26.91
CONNECTED 3Ø LOAD (AMPS):	74.69
DEMAND 3Ø LOAD (kVA):	26.91
DEMAND 3Ø LOAD (AMPS):	74.69

NOTES:

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3. FOR SELECT EXISTING LOADS, THE POLE POSITION INDICATED MAY NOT REPRESENT THE ACTUAL POLE POSITION USED BUT RATHER THAT AN EXISTING BRANCH CIRCUIT IS TO BE REUSED. SEE NOTE-2.
4. ELECTRICAL CONTRACTOR SHALL REMOVE EXISTING SINGLE POLE CIRCUIT BREAKER AT THIS POSITION, MADE AVAILABLE BY DEMOLITION WORK, AND PROVIDE AND INSTALL A NEW MULTI-POLE 20A CIRCUIT BREAKER AS INDICATED TO SERVE NEW MULTI-WIRE CIRCUITS SERVING FLOOR BOXES. NOTE THAT THE MULIT-POLE CIRCUIT BREAKER IS REQUIRED ON A MULTI-WIRE BRANCH CIRCUIT FOR COMPLIANCE WITH NEC ARTICLE 210.4(B). SEE NOTE-2 ABOVE FOR CIRCUIT TRACING REQUIRED TO BE PERFORMED PRIOR TO START OF CONSTRUCTION TO CONFIRM AVAILABILITY FOR RE-USE OF EXISTING CIRCUIT POSITION BASED ON DEMOLITION WORK.
5. ELECTRICAL CONTRACTOR SHALL VERIFY RECOMMENDED OVER-CURRENT PROTECTIVE DEVICE SETTING WITH MECHANICAL AND/OR PLUMBING CONTRACTOR BASED ON THE MECHANICAL AND/OR PLUMBING EQUIPMENT SHOP DRAWINGS. ADJUST OVER-CURRENT PROTECTIVE DEVICE SETTING AND ASSOCIATED CONDUCTOR SIZES WHERE THE INSTALLED EQUIPMENT RECOMMENDED OVER-CURRENT PROTECTIVE DEVICE SETTING DIFFERS FROM THE SETTING INDICATED. NOTE THAT THE SETTING INDICATED IS BASED ON THE INFORMATION PROVIDED BY THE MECHANICAL ENGINEER DURING THE DESIGN PHASE OF THE PROJECT.

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Drawing Name
Electrical Schedules

Drawn By
CAD

Checked By
TGC

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Revisions

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P23005

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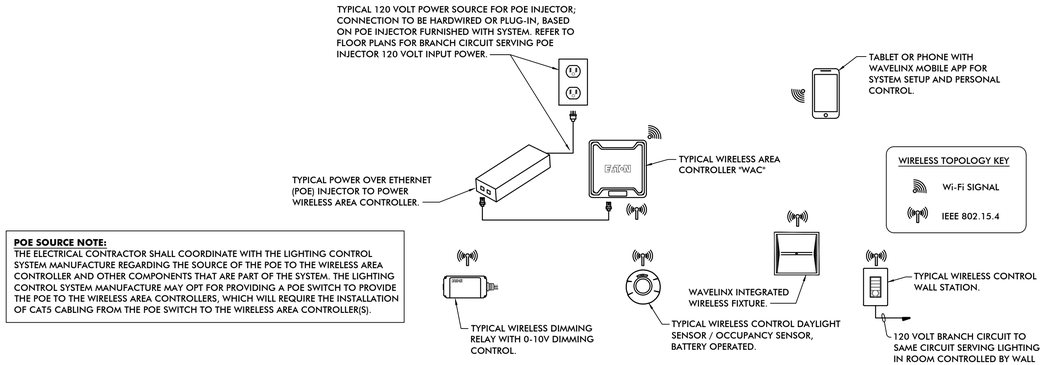


WIRELESS LIGHTING CONTROL SYSTEM - GENERAL SYSTEM TOPOLOGY DIAGRAM

NO SCALE

WIRING DIAGRAM SHOWN IS BASED ON A WIRELESS LIGHTING CONTROL SYSTEM MANUFACTURED BY COOPER; THE COOPER "WAVELINX PRO" SYSTEM. SYSTEMS FROM "EQUAL" MANUFACTURES SENSOR SWITCH "nLIGHTAIR" AND CURRENT LIGHTING "NX WIRELESS" ARE ACCEPTABLE ALTERNATE MANUFACTURES.

WIRELESS LIGHTING CONTROL SYSTEM GENERAL NOTES:

GENERAL REQUIREMENTS

1. The general system topology diagram is diagrammatic only, and intended to convey the general configuration of the lighting control system components used on the project and the method in which the system is interconnected, programmed and operates. Refer to the manufactures approved shop / installation drawings for exact system installation and locations where interconnecting wiring may be required. Refer to wireless lighting control system schedule on this sheet for additional information.

2. Electrical contractor shall provide and install 1" conduit sleeves between fire rated walls to accommodate routing of the low voltage cabling that may be required in order to support the system installation. The intent of the project is that the system is completely wireless; however, the lighting control system manufacture shall be responsible for directing the contractor where interconnecting wiring and cabling may be required. Provide fire proofing at all penetrations of fire rated walls, floors and ceilings to maintain the fire rating of the surface penetrated.

COORDINATION REQUIREMENTS

1. Prewire meeting: conducted on-site or during design meeting with lighting control system manufacturers or designated representative prior to commencing work as part of the manufacturer's standard practice and startup services. Manufacturer to review with the installer:

   a) Installation of lighting area controller and supervisory controller and locations
   b) Lighting control network wiring
   c) Network IT requirements
   d) Low voltage wiring requirements
   e) Lighting control integration requirements
   f) Lighting control system integration network wiring and connectivity
   g) Installer responsibilities
   h) Startup and training schedule and actions

CLOSEOUT SUBMITTALS

1. Sustainable design closeout documentation.

2. Wireless lighting control system manufacturer to provide an operation and maintenance manual that details the start-up procedure being performed including a process to follow, details on tests performed and an area that documents any test results.

APPROVALS

1. 10-working days prior approval before bid date is required for alternate proposals.

2. Complete catalog data, specifications and technical information on alternate equipment must be furnished to the architect and owner at least 30 business days in advance of the submission of approved construction documents.

3. For wired alternatives, manufacturer shall provide wiring diagrams and architectural details of interconnecting wiring for power signal and control. Contractor shall provide a labor cost (adder or deduction) to install the wired alternative to the lighting control system.

COMMISSIONING

1. Provide factory-certified field service engineer to a site visit to ensure proper system installation and operation.

2. Qualifications for factory-certified field service engineer:

   a) Certified by the equipment manufacturer on the system installed.

3. Conclude commissioning with or make a follow-up visit to:

   a) Verify system control operation area by area.
   b) Obtain sign-off on system functions.
   c) User to be trained on system operation.

MAINTENANCE MATERIAL SUBMITTALS

1. The manufacturer shall make available to the End-User a method of ordering new equipment for expansions, replacements and spare parts through established distributor channels.

2. The manufacturer shall make new replacement parts available for minimum of 5 years from date of manufacture.

3. The manufacturer shall make directly available to the owner additional software apps that may be desired for a minimum of 10 years from the system's date of purchase.

LIGHTING CONTROL APPLICATIONS

1. Minimum lighting control performance required, unless local energy code is more stringent.

2. Occupancy/vacancy requirements - provide an occupancy/vacancy sensor with manual on/ automatic off or automatic on/ automatic off functionality in all spaces. Manual on vacancy sensors should be used for any enclosed space with a manual on switch that does not require hands free operation. Spaces with multiple occupants or where line of sight might be obscured ceiling or corner mount sensors and manual wallstations would be required. Automatic on of lighting via occupancy sensor cannot exceed 50% of lighting. Systems that do that allow the user to select occupancy or vacancy mode shall not be acceptable.

3. Daylight zones - primary sidelit or toplit areas within an enclosed space shall be controlled separately and automatically by individual integrated daylight sensors. Adjustments to the daylight zones must be provided by a simple to use, intuitive mobile application.

4. Provide smooth and continuous daylight dimming for areas marked on drawings. Daylighting control system may be designed to dim electric light to the lowest light level and off.

5. Provide the ability to adjust the high-end and low-end trim of the dimmers to ensure the lighting automatically provides energy saving even when daylighting calls for full illumination.

6. Provide the ability for the dimmers and the relays to function separately. Systems where the 0-10v dimmers and relays are tied together reduce design capabilities and shall not be acceptable.

CYBERSECURITY

1. The network connectable products within the Wireless Lighting Control system must be UL2900-1 listed to the Standard for Software Cybersecurity for Network-Connectable Products. Wireless Lighting Control Systems that fail to meet this requirement will not be accepted.

INSTALLATION

1. The control system shall be installed and fully wired as shown on the plans by the installing contractor. The contractor shall complete all electrical connections to all control circuits.

2. Install the work of this Section in accordance with manufacturer's printed instructions unless otherwise indicated.

3. Provide written or computer-generated documentation on the commissioning of the system including room by room description including:

   a) Sensor parameters, time delays, sensitivities and daylighting setpoints.
   b) Sequence of operation, (e.g. manual ON, Auto OFF. Etc.).
   c) Load parameters (e.g. blink warning, etc.).

PRODUCT SUPPORT AND SERVICE

1. Factory telephone support shall be available at no cost to the owner. Factory assistance shall consist of solving programming or application questions concerning the control equipment.

FACTORY COMMISSIONING

1. Upon completion of the installation, the system shall be commissioned by the manufacturer's factory authorized representative who will verify a complete fully functional system.

2. The electrical contractor shall provide both the manufacturer and the electrical engineer with twenty-one (21) working days written notice of the system startup and adjustment date.

3. Upon completion of the system commissioning the factory-authorized technician shall provide the proper training to the owner's personnel on the adjustment and maintenance of the system.

4. Qualifications for factory certified field service engineer:

   a) Certified by the equipment manufacturer on the system installed.

5. Make first visit upon completion of installation of WaveLinx Connected Lighting system:

   a) Verify locations of Wireless Area Controllers
   b) Verify implementation of Construction Group process

6. Identify connected devices and program using WaveLinx Mobile and Automatic Code Commissioning.

7. Verify that system operation control based on defined Sequence of Operations (SOO).

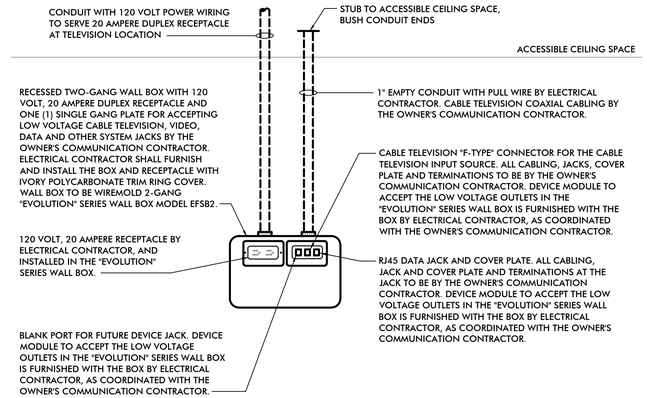
8. Obtain sign-off on system functions.

CLOSEOUT ACTIVITIES

1. Training Visit

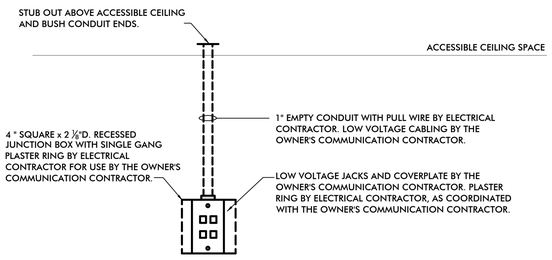
2. Lighting control system manufacturer to provide one (1) day additional on-site system training to site personnel. This shall be a part of the second visit by field service to the site. A separate third visit will require an additional charge.

3. During this visit, the manufacturer's Field Service Engineer will perform tasks, at the request of the facility representative or Commissioning Agent, such as to demonstrate wall control functions, explain or describe occupancy and/or daylight sensor functionality.



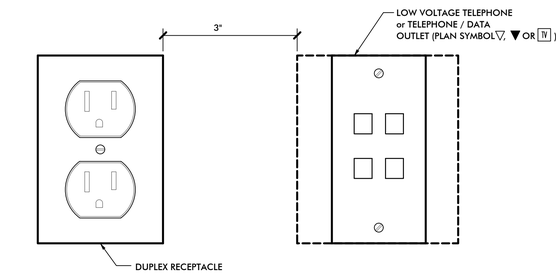
TYPICAL CABLE TELEVISION OUTLET DETAIL

NO SCALE (PLAN SYMBOL = TV)



TYPICAL TELEPHONE / DATA OUTLET DETAIL

NO SCALE (PLAN SYMBOL =▽)



TYPICAL OUTLET SPACING DETAIL

NO SCALE

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Drawing Name
Miscellaneous Wiring Diagrams

Drawn By
CAD

Checked By
TGC

Issue Date
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Sheet Number
E4.00

WIRELESS LIGHTING CONTROL SYSTEM SCHEDULE

CIRCUIT TAG	ROOM CONTROLLER TAG	SWITCHPACK CONTROL FUNCTION *(COOPER WSP-MV-010 SERIES)*	BRANCH CIRCUIT No.	LIGHTING LOAD DESCRIPTION	CONTROL STATION - SEE NOTE - 3			ASTRO TIME CLOCK CONTROL		OCCUPANCY SENSOR CONTROL / OUTDOOR CONTROL MODULE					DAYLIGHT HARVESTING CONTROL			REMARKS
					STATION No.	ZONE No.	DIMMER	YES / NO	ON / OFF SET POINT	"ON" CONTROL	"OFF" CONTROL	TIME DELAY	SENSOR No.	NODE No.	"ON" SETPOINT	"OFF" SETPOINT	SENSOR No.	
LVLC-001	-	IN-FIXTURE SENSOR / RADIO WAVELINX PRO WPS	*SEE FLOOR PLAN*	LOBBY LIGHTING	"CS1"	1	YES	YES	MIDNIGHT SWEEP - OFF	AUTO-ON (FULL ON)	AUTO-OFF AT 30% DIMMED LEVEL	20-MINUTES	"DO1" thru "DO24"	-	-	-	-	EXACT TIME OF DAY, DIM LEVEL AND SCENE PROGRAMMING TO BE VERIFIED WITH THE OWNER'S CONSTRUCTION REPRESENTATIVE.
LVLC-002	-	IN-FIXTURE SENSOR / RADIO WAVELINX PRO WPS	*SEE FLOOR PLAN*	CIRCULATION DESK LIGHTING	"CS1"	2	YES	YES	MIDNIGHT SWEEP - OFF	AUTO-ON AT 50% DIMMED LEVEL	AUTO-OFF AT 10% DIMMED LEVEL	20-MINUTES	"DO1" thru "DO24"	-	-	-	-	EXACT TIME OF DAY, DIM LEVEL AND SCENE PROGRAMMING TO BE VERIFIED WITH THE OWNER'S CONSTRUCTION REPRESENTATIVE.
LVLC-003	-	IN-FIXTURE RADIO NODE WAVELINX PRO WPN	*SEE FLOOR PLAN*	VESTIBULE 100B LIGHTS	"CS1"	3	YES	YES	MIDNIGHT SWEEP - OFF	AUTO-ON AT 50% DIMMED LEVEL	AUTO-OFF AT 10% DIMMED LEVEL	20-MINUTES	"OS2"	"N01" thru "N05"	-	-	-	EXACT TIME OF DAY, DIM LEVEL AND SCENE PROGRAMMING TO BE VERIFIED WITH THE OWNER'S CONSTRUCTION REPRESENTATIVE.
LVLC-004	-	IN-FIXTURE SENSOR / RADIO WAVELINX PRO WPN	*SEE FLOOR PLAN*	VESTIBULE 100A LIGHTS	"CS1"	4	YES	YES	MIDNIGHT SWEEP - OFF	AUTO-ON AT 50% DIMMED LEVEL	AUTO-OFF AT 10% DIMMED LEVEL	20-MINUTES	"OS1"	"N6" thru "N13"	-	-	-	EXACT TIME OF DAY, DIM LEVEL AND SCENE PROGRAMMING TO BE VERIFIED WITH THE OWNER'S CONSTRUCTION REPRESENTATIVE.
LVLC-005	-	IN-FIXTURE SENSOR / RADIO WAVELINX PRO WPS	*SEE FLOOR PLAN*	CIRCULATION DESK WORK AREA LIGHTING	"CS2"	1	YES	YES	MIDNIGHT SWEEP - OFF	AUTO-ON AT 50% DIMMED LEVEL	AUTO-OFF AT 10% DIMMED LEVEL	20-MINUTES	"DO25" thru "DO28"	-	-	-	-	EXACT TIME OF DAY, DIM LEVEL AND SCENE PROGRAMMING TO BE VERIFIED WITH THE OWNER'S CONSTRUCTION REPRESENTATIVE.
LVLC-006	-	IN-FIXTURE SENSOR / RADIO WAVELINX PRO WPS	*SEE FLOOR PLAN*	ADULT PROGRAM LIGHTING	"CS3a", "CS3b"	1	YES	YES	MIDNIGHT SWEEP - OFF	AUTO-ON AT 50% DIMMED LEVEL	AUTO-OFF (SWITCH OFF)	20-MINUTES	"DO29" thru "DO34"	-	-	-	-	EXACT TIME OF DAY, DIM LEVEL AND SCENE PROGRAMMING TO BE VERIFIED WITH THE OWNER'S CONSTRUCTION REPRESENTATIVE.
LVLC-007	-	IN-FIXTURE SENSOR / RADIO WAVELINX PRO WPS	*SEE FLOOR PLAN*	BOARD ROOM LIGHTING	"CS4"	1	YES	YES	MIDNIGHT SWEEP - OFF	AUTO-ON AT 50% DIMMED LEVEL	AUTO-OFF (SWITCH OFF)	20-MINUTES	"DO35" thru "DO43"	-	-	-	-	EXACT TIME OF DAY, DIM LEVEL AND SCENE PROGRAMMING TO BE VERIFIED WITH THE OWNER'S CONSTRUCTION REPRESENTATIVE.
LVLC-008	-	IN-FIXTURE SENSOR / RADIO WAVELINX PRO WPS	*SEE FLOOR PLAN*	GENEOLOGY ROOM LIGHTING	"CS5"	1	YES	YES	MIDNIGHT SWEEP - OFF	AUTO-ON AT 50% DIMMED LEVEL	AUTO-OFF (SWITCH OFF)	20-MINUTES	"DO44" thru "DO54"	-	-	-	-	EXACT TIME OF DAY, DIM LEVEL AND SCENE PROGRAMMING TO BE VERIFIED WITH THE OWNER'S CONSTRUCTION REPRESENTATIVE.
LVLC-009	-	IN-FIXTURE SENSOR / RADIO WAVELINX PRO WPS	*SEE FLOOR PLAN*	VESTIBULE 104 LIGHTING	"CS6"	1	YES	YES	MIDNIGHT SWEEP - OFF	AUTO-ON (FULL ON)	AUTO-OFF AT 30% DIMMED LEVEL	20-MINUTES	"DO55" thru "DO58"	-	-	-	-	EXACT TIME OF DAY, DIM LEVEL AND SCENE PROGRAMMING TO BE VERIFIED WITH THE OWNER'S CONSTRUCTION REPRESENTATIVE.
LVLC-010	-	IN-FIXTURE SENSOR / RADIO WAVELINX PRO WPS	*SEE FLOOR PLAN*	STORY TIME 105 A LIGHTING	"CS7"	1	YES	YES	MIDNIGHT SWEEP - OFF	AUTO-ON AT 50% DIMMED LEVEL	AUTO-OFF (SWITCH OFF)	20-MINUTES	"DO59" thru "DO61"	-	-	-	-	EXACT TIME OF DAY, DIM LEVEL AND SCENE PROGRAMMING TO BE VERIFIED WITH THE OWNER'S CONSTRUCTION REPRESENTATIVE.
LVLC-011	-	IN-FIXTURE SENSOR / RADIO WAVELINX PRO WPS	*SEE FLOOR PLAN*	MAKERS ROOM 105 LIGHTING	"CS8"	1	YES	YES	MIDNIGHT SWEEP - OFF	AUTO-ON AT 50% DIMMED LEVEL	AUTO-OFF (SWITCH OFF)	20-MINUTES	"DO62" thru "DO65"	-	-	-	-	EXACT TIME OF DAY, DIM LEVEL AND SCENE PROGRAMMING TO BE VERIFIED WITH THE OWNER'S CONSTRUCTION REPRESENTATIVE.
LVLC-012	-	IN-FIXTURE SENSOR / RADIO WAVELINX PRO WPS	*SEE FLOOR PLAN*	OFFICE 103A LIGHTING	"CS9"	1	YES	YES	MIDNIGHT SWEEP - OFF	AUTO-ON AT 50% DIMMED LEVEL	AUTO-OFF (SWITCH OFF)	20-MINUTES	"DO66" thru "DO69"	-	-	-	-	EXACT TIME OF DAY, DIM LEVEL AND SCENE PROGRAMMING TO BE VERIFIED WITH THE OWNER'S CONSTRUCTION REPRESENTATIVE.
LVLC-013	-	IN-FIXTURE SENSOR / RADIO WAVELINX PRO WPS	*SEE FLOOR PLAN*	TEEN ROOM LIGHTING	"CS10"	1	YES	YES	MIDNIGHT SWEEP - OFF	AUTO-ON AT 50% DIMMED LEVEL	AUTO-OFF AT 10% DIMMED LEVEL	20-MINUTES	"DO70" thru "DO91"	-	-	-	-	EXACT TIME OF DAY, DIM LEVEL AND SCENE PROGRAMMING TO BE VERIFIED WITH THE OWNER'S CONSTRUCTION REPRESENTATIVE.
LVLC-014	-	IN-FIXTURE SENSOR / RADIO WAVELINX PRO WPS	*SEE FLOOR PLAN*	CHILDREN'S AREA LIGHTING	"CS10"	2	YES	YES	MIDNIGHT SWEEP - OFF	AUTO-ON AT 50% DIMMED LEVEL	AUTO-OFF AT 10% DIMMED LEVEL	20-MINUTES	"DO92" thru "DO163"	-	-	-	-	EXACT TIME OF DAY, DIM LEVEL AND SCENE PROGRAMMING TO BE VERIFIED WITH THE OWNER'S CONSTRUCTION REPRESENTATIVE.
LVLC-015	-	IN-FIXTURE SENSOR / RADIO WAVELINX PRO WPS	*SEE FLOOR PLAN*	STUDY SPACE 102 LIGHTING	"CS10"	3	YES	YES	MIDNIGHT SWEEP - OFF	AUTO-ON AT 50% DIMMED LEVEL	AUTO-OFF AT 10% DIMMED LEVEL	20-MINUTES	"DO164" thru "DO175"	-	-	-	-	EXACT TIME OF DAY, DIM LEVEL AND SCENE PROGRAMMING TO BE VERIFIED WITH THE OWNER'S CONSTRUCTION REPRESENTATIVE.
LVLC-016	-	IN-FIXTURE SENSOR / RADIO WAVELINX PRO WPS	*SEE FLOOR PLAN*	ADULT STACK 101 LIGHTING	"CS10"	4	YES	YES	MIDNIGHT SWEEP - OFF	AUTO-ON AT 50% DIMMED LEVEL	AUTO-OFF AT 10% DIMMED LEVEL	20-MINUTES	"DO176" thru "DO257"	-	-	-	-	EXACT TIME OF DAY, DIM LEVEL AND SCENE PROGRAMMING TO BE VERIFIED WITH THE OWNER'S CONSTRUCTION REPRESENTATIVE.
LVLC-017	-	IN-FIXTURE SENSOR / RADIO WAVELINX PRO WPS	*SEE FLOOR PLAN*	SEATING AREA 101A LIGHTING	"CS10"	5	YES	YES	MIDNIGHT SWEEP - OFF	AUTO-ON AT 50% DIMMED LEVEL	AUTO-OFF AT 10% DIMMED LEVEL	20-MINUTES	"DO258" thru "DO267"	-	-	-	-	EXACT TIME OF DAY, DIM LEVEL AND SCENE PROGRAMMING TO BE VERIFIED WITH THE OWNER'S CONSTRUCTION REPRESENTATIVE.
LVLC-018	-	IN-FIXTURE SENSOR / RADIO WAVELINX PRO WPS	*SEE FLOOR PLAN*	ADULT STACK 107 LIGHTING	"CS10"	6	YES	YES	MIDNIGHT SWEEP - OFF	AUTO-ON AT 50% DIMMED LEVEL	AUTO-OFF AT 10% DIMMED LEVEL	20-MINUTES	"DO268" thru "DO324"	-	-	-	-	EXACT TIME OF DAY, DIM LEVEL AND SCENE PROGRAMMING TO BE VERIFIED WITH THE OWNER'S CONSTRUCTION REPRESENTATIVE.
LVLC-019	-	IN-FIXTURE SENSOR / RADIO WAVELINX PRO WPS	*SEE FLOOR PLAN*	LOUNGE 108 LIGHTING	"CS10"	7	YES	YES	MIDNIGHT SWEEP - OFF	AUTO-ON AT 50% DIMMED LEVEL	AUTO-OFF AT 10% DIMMED LEVEL	20-MINUTES	"DO325" thru "DO332"	-	-	-	-	EXACT TIME OF DAY, DIM LEVEL AND SCENE PROGRAMMING TO BE VERIFIED WITH THE OWNER'S CONSTRUCTION REPRESENTATIVE.
LVLC-020	R-1	SPST SWITCH WITH 0-10V DIMMING	*SEE FLOOR PLAN*	LOUNGE 108 SURFACE MTD DRUM LIGHTING	"CS10"	8	YES	YES	MIDNIGHT SWEEP - OFF	AUTO-ON AT 40% DIMMED LEVEL	AUTO-OFF AT 10% DIMMED LEVEL	20-MINUTES	"DO325" thru "DO332" & "OS3"	-	-	-	-	EXACT TIME OF DAY, DIM LEVEL AND SCENE PROGRAMMING TO BE VERIFIED WITH THE OWNER'S CONSTRUCTION REPRESENTATIVE.
LVLC-021	-	IN-FIXTURE SENSOR / RADIO WAVELINX PRO WPS	*SEE FLOOR PLAN*	STUDY 110C LIGHTING	"CS11"	1	YES	YES	MIDNIGHT SWEEP - OFF	AUTO-ON AT 50% DIMMED LEVEL	AUTO-OFF (SWITCH OFF)	20-MINUTES	"DO333"	-	-	-	-	EXACT TIME OF DAY, DIM LEVEL AND SCENE PROGRAMMING TO BE VERIFIED WITH THE OWNER'S CONSTRUCTION REPRESENTATIVE.
LVLC-022	-	IN-FIXTURE SENSOR / RADIO WAVELINX PRO WPS	*SEE FLOOR PLAN*	STUDY 110D LIGHTING	"CS12"	1	YES	YES	MIDNIGHT SWEEP - OFF	AUTO-ON AT 50% DIMMED LEVEL	AUTO-OFF (SWITCH OFF)	20-MINUTES	"DO334"	-	-	-	-	EXACT TIME OF DAY, DIM LEVEL AND SCENE PROGRAMMING TO BE VERIFIED WITH THE OWNER'S CONSTRUCTION REPRESENTATIVE.
LVLC-023	-	IN-FIXTURE SENSOR / RADIO WAVELINX PRO WPS	*SEE FLOOR PLAN*	STUDY 110B LIGHTING	"CS13"	1	YES	YES	MIDNIGHT SWEEP - OFF	AUTO-ON AT 50% DIMMED LEVEL	AUTO-OFF (SWITCH OFF)	20-MINUTES	"DO335", "DO336"	-	-	-	-	EXACT TIME OF DAY, DIM LEVEL AND SCENE PROGRAMMING TO BE VERIFIED WITH THE OWNER'S CONSTRUCTION REPRESENTATIVE.
LVLC-024	-	IN-FIXTURE SENSOR / RADIO WAVELINX PRO WPS	*SEE FLOOR PLAN*	STUDY 110A LIGHTING	"CS14"	1	YES	YES	MIDNIGHT SWEEP - OFF	AUTO-ON AT 50% DIMMED LEVEL	AUTO-OFF (SWITCH OFF)	20-MINUTES	"DO337", "DO338"	-	-	-	-	EXACT TIME OF DAY, DIM LEVEL AND SCENE PROGRAMMING TO BE VERIFIED WITH THE OWNER'S CONSTRUCTION REPRESENTATIVE.
LVLC-025	-	WIRELESS RECEPTACLES - WAVELINX PRO WR-20	*SEE FLOOR PLAN*	OFFICE 103A PLUG LOAD (RECEPTACLES)	"CS9"	1	NO	YES	MIDNIGHT SWEEP - OFF	AUTO-ON	AUTO-OFF	20-MINUTES	"DO66" thru "DO69"	-	-	-	-	
LVLC-026	-	WIRELESS RECEPTACLES - WAVELINX PRO WR-20	*SEE FLOOR PLAN*	ADULT PROGRAM PLUG LOAD (RECEPTACLES)	"CS3a", "CS3b"	1	NO	YES	MIDNIGHT SWEEP - OFF	AUTO-ON	AUTO-OFF	20-MINUTES	"DO29" thru "DO34"	-	-	-	-	
LVLC-027	-	WIRELESS RECEPTACLES - WAVELINX PRO WR-20	*SEE FLOOR PLAN*	BOARD ROOM PLUG LOAD (RECEPTACLES)	"CS4"	1	NO	YES	MIDNIGHT SWEEP - OFF	AUTO-ON	AUTO-OFF	20-MINUTES	"DO35" thru "DO43"	-	-	-	-	

NOTES:

1. THE LIGHTING CONTROL SYSTEM MANUFACTURE SHALL BE RESPONSIBLE FOR THE SELECTION OF THE EXACT SWITCHPACK AND ADDITIONAL COMPONENTS REQUIRED FOR ALL "SWITCHPACKS" / RELAYS INDICATED IN THE ABOVE SCHEDULE. THE RELAY TYPE INDICATED IN THE SCHEDULE ABOVE PROVIDES ONLY THE GENERIC GENERAL TYPE OF RELAY, AND IS NOT INTENDED TO CONVEY THE EXACT SPECIFIC TYPE OR MODEL NUMBER REQUIRED.
2. REFER TO WIRELESS LIGHTING CONTROL SYSTEM - GENERAL SYSTEM TOPOLOGY DIAGRAM ON SHEET E4.00 FOR ADDITIONAL INFORMATION REGARDING THE GENERAL CONFIGURATION OF THE SYSTEM AND THE ASSOCIATED COMPONENTS THAT COMPRISE THE SYSTEM. THE SYSTEM MANUFACTURE SHALL BE RESPONSIBLE FOR PREPARING SYSTEM WIRING DIAGRAMS SPECIFIC TO THIS PROJECT FOR THE ELECTRICAL CONTRACTOR'S USE FOR THE SYSTEM INSTALLATION. THE NOTED WIRING DIAGRAM SHALL BE SUBMITTED DURING THE SHOP DRAWING PHASE OF THE PROJECT FOR REVIEW. THE MANUFACTURES GENERIC WIRING DIAGRAMS ARE NOT INCLUDED SINCE THESE DIAGRAMS DO NOT PROVIDE ANY CLARIFICATION OF HOW THIS SPECIFIC SYSTEM WILL BE INSTALLED. THE BIDDING CONTRACTOR SHALL CONTACT THE LOCAL MANUFACTURES REPRESENTATIVES TO GAIN A COMPLETE UNDERSTANDING OF HOW THE SYSTEM OPERATES AND HOW THE SYSTEM IS INSTALLED PRIOR TO SUBMITTING HIS/HER BID.
3. REFER TO WIRELESS LIGHTING CONTROL STATION SCHEDULE ON THIS SHEET FOR PROGRAMMING AND ASSIGNING OF THE LIGHTING ZONES INDICATED TO THE RESPECTIVE CONTROL STATION SCENES AND/OR CONTROL BUTTONS.
4. REFER TO LIGHTING FLOOR PLANS FOR BRANCH CIRCUIT SERVING LIGHTING FIXTURES WITH IN-FIXTURE SENSORS AND WIRELESS RADIO. CIRCUIT NUMBER INDICATED IS THE BRANCH CIRCUIT SHOWN ON THE FLOOR PLANS TO SERVE THE FIXTURES WITH IN-FIXTURE SENSORS, BUT WILL ALSO SERVE THE ROOM CONTROLLER POWER FOR ALTERNATE MANUFACTURES LIGHTING CONTROL SYSTEMS WHICH REQUIRE A ROOM CONTROLLER TO BE PART OF THE WIRELESS CONTROL SYSTEM. THE BASIS OF DESIGN SYSTEM DOESN'T REQUIRE A ROOM CONTROLLER, BUT THIS DETAIL IS NOTED IN THE EVENT ONE OF THE ALTERNATE MANUFACTURE SYSTEMS IS UTILIZED.

WIRELESS LIGHTING CONTROL STATION SCHEDULE

STATION No.	CONTROL STATION MODEL NUMBER - SEE NOTES 1 & 2 *(COOPER WaveLinx SERIES)*	SCENE 1		SCENE 2		SCENE 3		SCENE 4		RAISE / LOWER BUTTON		REMARKS
		ZONES	DIM STATE	ZONES	DIM STATE	ZONES	DIM STATE	ZONES	DIM STATE	YES/NO	ZONES	
CS1	WW5L-X-ENGRV	1	LOBBY	2	CIRC DESK	3	W. VEST.	4	E. VEST.	YES	1,2,3,4	VERIFY EXACT PROGRAMMING OF SCENES WITH THE OWNERS CONSTRUCTION REPRESENTATIVE.
CS2	WW3L-X-ENGRV	1	"LIGHTS - 50%" 50%	1	"LIGHTS - 100%" 100%	-	-	-	-	YES	1	VERIFY EXACT PROGRAMMING OF SCENES WITH THE OWNERS CONSTRUCTION REPRESENTATIVE.
CS3a, CS3b	WW3L-X-ENGRV	1	"LIGHTS - 50%" 50%	1	"LIGHTS - 100%" 100%	-	-	-	-	YES	1	VERIFY EXACT PROGRAMMING OF SCENES WITH THE OWNERS CONSTRUCTION REPRESENTATIVE.
CS4	WW3L-X-ENGRV	1	"LIGHTS - 50%" 50%	1	"LIGHTS - 100%" 100%	2	"DOWN LIGHTS 50%"	2	"DOWN LIGHTS 100%"	YES	1,2	VERIFY EXACT PROGRAMMING OF SCENES WITH THE OWNERS CONSTRUCTION REPRESENTATIVE.
CS5	WW3L-X-ENGRV	1	"LIGHTS - 50%" 50%	1	"LIGHTS - 100%" 100%	-	-	-	-	YES	1	VERIFY EXACT PROGRAMMING OF SCENES WITH THE OWNERS CONSTRUCTION REPRESENTATIVE.
CS6	WW3L-X-ENGRV	1	"LIGHTS - 50%" 50%	1	"LIGHTS - 100%" 100%	-	-	-	-	YES	1	VERIFY EXACT PROGRAMMING OF SCENES WITH THE OWNERS CONSTRUCTION REPRESENTATIVE.
CS7	WW3L-X-ENGRV	1	"LIGHTS - 50%" 50%	1	"LIGHTS - 100%" 100%	-	-	-	-	YES	1	VERIFY EXACT PROGRAMMING OF SCENES WITH THE OWNERS CONSTRUCTION REPRESENTATIVE.
CS8	WW3L-X-ENGRV	1	"LIGHTS - 50%" 50%	1	"LIGHTS - 100%" 100%	-	-	-	-	YES	1	VERIFY EXACT PROGRAMMING OF SCENES WITH THE OWNERS CONSTRUCTION REPRESENTATIVE.
CS9	WW3L-X-ENGRV	1	"LIGHTS - 50%" 50%	1	"LIGHTS - 100%" 100%	-	-	-	-	YES	1	VERIFY EXACT PROGRAMMING OF SCENES WITH THE OWNERS CONSTRUCTION REPRESENTATIVE.
CS10	TSE57-WLX-B (Touchscreen)	1 thru 8	"DAY"	1 thru 8	"NIGHT"	1 thru 8	TBD	1 thru 8	TBD	YES	1 thru 8	VERIFY EXACT PROGRAMMING OF SCENES WITH THE OWNERS CONSTRUCTION REPRESENTATIVE.
CS11	WW3L-X-ENGRV	1	"LIGHTS - 50%" 50%	1	"LIGHTS - 100%" 100%	-	-	-	-	YES	1	VERIFY EXACT PROGRAMMING OF SCENES WITH THE OWNERS CONSTRUCTION REPRESENTATIVE.
CS12	WW3L-X-ENGRV	1	"LIGHTS - 50%" 50%	1	"LIGHTS - 100%" 100%	-	-	-	-	YES	1	VERIFY EXACT PROGRAMMING OF SCENES WITH THE OWNERS CONSTRUCTION REPRESENTATIVE.
CS13	WW3L-X-ENGRV	1	"LIGHTS - 50%" 50%	1	"LIGHTS - 100%" 100%	-	-	-	-	YES	1	VERIFY EXACT PROGRAMMING OF SCENES WITH THE OWNERS CONSTRUCTION REPRESENTATIVE.
CS14	WW3L-X-ENGRV	1	"LIGHTS - 50%" 50%	1	"LIGHTS - 100%" 100%	-	-	-	-	YES	1	VERIFY EXACT PROGRAMMING OF SCENES WITH THE OWNERS CONSTRUCTION REPRESENTATIVE.

NOTES:

1. CONTROL STATION FINISH TO BE SELECTED BY ARCHITECT. FINISH OPTION IS DENOTED BY THE "-X" IN THE SCHEDULE ABOVE.
2. PROVIDE CUSTOM ENGRAVING OF PUSHBUTTONS TO REFLECT SCENE DESCRIPTION INDICATED IN THE SCHEDULE ABOVE.

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Drawing Name
Miscellaneous Wiring Diagrams

Drawn By
CAD

Checked By
TGC

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Electrical Specifications

SECTION 260519 - LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Copper building wire rated 600 V or less.
2. Aluminum building wire rated 600 V or less.
3. Metal-clad cable, Type MC, rated 600 V or less.
4. Connectors, splices, and terminations rated 600 V and less.

1.2 INFORMATIONAL SUBMITTALS

A. Field quality-control reports.

PART 2 - PRODUCTS

2.1 COPPER BUILDING WIRE

A. Description: Flexible, insulated and uninsulated, drawn copper current-carrying conductor with an overall insulation layer or jacket, or both, rated 600 V or less.

B. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Alpha Wire Company.
2. Belden Inc.
3. Cerro Wire LLC.
4. General Cable Technologies Corporation.
5. Service Wire Co.
6. Southwire Company.

C. Standards:

1. Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and use.
2. RoHS compliant.
3. Conductor and Cable Marking: Comply with wire and cable marking according to UL's "Wire and Cable Marking and Application Guide."

D. Conductors: Copper, complying with ASTM B 3 for bare annealed copper and with ASTM B 8 for stranded conductors.

E. Conductor Insulation:

1. Type THHN and Type THWN-2: Comply with UL 83.
2. Type THW and Type THW-2: Comply with NEMA WC-70/ICEA S-95-658 and UL 83.
3. Type XHHW-2: Comply with UL 44.

2.2 ALUMINUM BUILDING WIRE

A. Description: Flexible, insulated and uninsulated, drawn aluminum current-carrying conductor with an overall insulation layer or jacket, or both, rated 600 V or less.

B. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Alpha Wire Company.
2. Belden Inc.
3. Cerro Wire LLC.
4. General Cable Technologies Corporation.
5. Okonite Company (The).
6. Southwire Company.

C. Standards:

1. Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and use.
2. RoHS compliant.
3. Conductor and Cable Marking: Comply with wire and cable marking according to UL's "Wire and Cable Marking and Application Guide."

D. Conductors: Aluminum, complying with ASTM B 800 and ASTM B 801.

E. Conductor Insulation:

1. Type THHN and Type THWN-2: Comply with UL 83.
2. Type THW and Type THW-2: Comply with NEMA WC-70/ICEA S-95-658 and UL 83.
3. Type XHHW-2: Comply with UL 44.

2.3 METAL-CLAD CABLE, TYPE MC

A. Description: A factory assembly of one or more current-carrying insulated conductors in an overall metallic sheath.

B. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Alpha Wire Company.
2. Belden Inc.
3. General Cable Technologies Corporation.
4. Okonite Company (The).
5. Service Wire Co.
6. Southwire Company.

C. Standards:

1. Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and use.
2. Comply with UL 1569.
3. RoHS compliant.
4. Conductor and Cable Marking: Comply with wire and cable marking according to UL's "Wire and Cable Marking and Application Guide."

D. Circuits:

1. Single circuit and multicircuit with color-coded conductors.

E. Conductors: Copper, complying with ASTM B 3 for bare annealed copper and with ASTM B 8 for stranded conductors.

F. Ground Conductor: Insulated.

G. Conductor Insulation:

1. Type TFN/THHN/THWN-2: Comply with UL 83.
2. Type XHHW-2: Comply with UL 44.

H. Armor: Aluminum, interlocked.

I. Jacket: PVC applied over armor.

2.4 CONNECTORS AND SPLICES

A. Description: Factory-fabricated connectors, splices, and lugs of size, ampacity rating, material, type, and class for application and service indicated; listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and use.

B. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. 3M Electrical Products.
2. AFC Cable Systems; a part of Atkore International.
3. Hubbell Power Systems, Inc.
4. Ideal Industries, Inc.
5. ILSCO.
6. NSi Industries LLC.
7. O-Z/Gedney; a brand of Emerson Industrial Automation.
8. Service Wire Co.

C. Jacketed Cable Connectors: For steel and aluminum jacketed cables, zinc die-cast with set screws, designed to connect conductors specified in this Section.

D. Lugs: One piece, seamless, designed to terminate conductors specified in this Section.

1. Material: Copper.
2. Type: One hole with standard barrels.
3. Termination: Compression.

PART 3 - EXECUTION

3.1 CONDUCTOR MATERIAL APPLICATIONS

A. Feeders: Copper; solid for No. 10 AWG and smaller; stranded for No. 8 AWG and larger, unless noted otherwise on the drawings.

B. Branch Circuits: Copper. Solid for No. 12 AWG and smaller; stranded for No. 10 AWG and larger.

3.2 CONDUCTOR INSULATION AND MULTICONDUCTOR CABLE APPLICATIONS AND WIRING METHODS

A. Service Entrance: Type XHHW-2, single conductors in raceway.

B. Exposed Feeders: Type THHN/THWN-2, single conductors in raceway.

C. Feeders Concealed in Ceilings, Walls, Partitions, and Crawlspaces: Type THHN/THWN-2, single conductors in raceway.

D. Feeders Concealed in Concrete, below Slabs-on-Grade, and Underground: Type XHHW-2, single conductors in raceway.

E. Exposed Branch Circuits, Including in Crawlspaces: Type THHN/THWN-2, single conductors in raceway.

F. Branch Circuits Concealed in Ceilings, Walls, and Partitions: Type THHN/THWN-2, single conductors in raceway or Metal-clad cable, Type MC. For Branch Circuits serving Patient Care Areas, Hospital Grade Armored Cable, Type AC shall be used in lieu of Type MC.

G. Branch Circuits Concealed in Concrete, below Slabs-on-Grade, and Underground: Type XHHW-2, single conductors in raceway.

3.3 INSTALLATION OF CONDUCTORS AND CABLES

A. Conceal cables in finished walls, ceilings, and floors unless otherwise indicated.

B. Complete raceway installation between conductor and cable termination points according to Section 260533 "Raceways and Boxes for Electrical Systems" prior to pulling conductors and cables.

C. Use manufacturer-approved pulling compound or lubricant where necessary; compound used must not deteriorate conductor or insulation. Do not exceed manufacturer's recommended maximum pulling tensions and sidewall pressure values.

D. Use pulling means, including fish tape, cable, rope, and basket-weave wire/cable grips, that will not damage cables or raceway.

E. Install exposed cables parallel and perpendicular to surfaces of exposed structural members, and follow surface contours where possible.

F. Support cables according to Section 260529 "Hangers and Supports for Electrical Systems."

3.4 CONNECTIONS

A. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A-486B.

B. Make splices, terminations, and taps that are compatible with conductor material and that possess equivalent or better mechanical strength and insulation ratings than unspliced conductors.

1. Use oxide inhibitor in each splice, termination, and tap for aluminum conductors.

C. Wiring at Outlets: Install conductor at each outlet, with at least 6 inches (150 mm) of slack.

3.5 IDENTIFICATION

A. Identify and color-code conductors and cables according to Section 260553 "Identification for Electrical Systems."

B. Identify each spare conductor at each end with identity number and location of other end of conductor, and identify as spare conductor.

3.6 SLEEVE AND SLEEVE-SEAL INSTALLATION FOR ELECTRICAL PENETRATIONS

A. Install sleeves and sleeve seals at penetrations of exterior floor and wall assemblies. Coordinate installation and requirements for sleeves with Architectural specifications.

3.7 FIRESTOPPING

A. Apply firestopping to electrical penetrations of fire-rated floor and wall assemblies to restore original fire-resistance rating of assembly according to Section 078413 "Penetration Firestopping."

END OF SECTION 260519

SECTION 260526 - GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes grounding and bonding systems and equipment.

1.2 INFORMATIONAL SUBMITTALS

A. Coordination Drawings: Plans showing dimensioned as-built locations of grounding features specified in "Field Quality Control" Article.

B. Qualification Data: For testing agency and testing agency's field supervisor.

C. Field quality-control reports.

1.3 CLOSEOUT SUBMITTALS

A. Operation and maintenance data.

1. Plans showing as-built, dimensioned locations of grounding features specified in "Field Quality Control" Article, including the following:
   a. Test wells.
   b. Ground rods.
2. Instructions for periodic testing and inspection of grounding features at test wells based on NFPA 70B.
   a. Tests shall determine if ground-resistance or impedance values remain within specified maximums, and instructions shall recommend corrective action if values do not.
   b. Include recommended testing intervals.

1.4 QUALITY ASSURANCE

A. Testing Agency Qualifications: Certified by NETA.

PART 2 - PRODUCTS

2.1 SYSTEM DESCRIPTION

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

B. Comply with UL 467 for grounding and bonding materials and equipment.

2.2 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Burndy; Part of Hubbell Electrical Systems.
2. ERICO International Corporation.
3. Galvan Industries, Inc.; Electrical Products Division, LLC.
4. Harger Lightning & Grounding.
5. ILSCO.
6. O-Z/Gedney; a brand of Emerson Industrial Automation.
7. SIEMENS Industry, Inc.; Energy Management Division.

2.3 CONDUCTORS

A. Insulated Conductors: Copper wire or cable insulated for 600 V unless otherwise required by applicable Code or authorities having jurisdiction.

B. Bare Copper Conductors:

1. Solid Conductors: ASTM B 3.
2. Stranded Conductors: ASTM B 8.
3. Tinned Conductors: ASTM B 33.
4. Bonding Cable: 28 kcmil, 14 strands of No. 17 AWG conductor, 1/4 inch (6 mm) in diameter.
5. Bonding Conductor: No. 4 or No. 6 AWG, stranded conductor.
6. Bonding Jumper: Copper tape, braided conductors terminated with copper ferrules; 1-5/8 inches (41 mm) wide and 1/16 inch (1.6 mm) thick.
7. Tinned Bonding Jumper: Tinned-copper tape, braided conductors terminated with copper ferrules; 1-5/8 inches (41 mm) wide and 1/16 inch (1.6 mm) thick.

C. Grounding Bus: Predrilled rectangular bars of annealed copper, 1/4 by 4 inches (6.3 by 100 mm) in cross section, with 9/32-inch (7.14-mm) holes spaced 1-1/8 inches (28 mm) apart. Stand-off insulators for mounting shall comply with UL 891 for use in switchboards, 600 V and shall be Lexan or PVC, impulse tested at 5000 V.

2.4 CONNECTORS

A. Listed and labeled by an NRTL acceptable to authorities having jurisdiction for applications in which used and for specific types, sizes, and combinations of conductors and other items connected.

B. Welded Connectors: Exothermic-welding kits of types recommended by kit manufacturer for materials being joined and installation conditions.

C. Bus-Bar Connectors: Compression type, copper or copper alloy, with two wire terminals.

D. Beam Clamps: Mechanical type, terminal, ground wire access from four directions, with dual, tin-plated or silicon bronze bolts.

E. Cable-to-Cable Connectors: Compression type, copper or copper alloy.

F. Conduit Hubs: Mechanical type, terminal with threaded hub.

G. Ground Rod Clamps: Mechanical type, copper or copper alloy, terminal with hex head bolt.

H. Lay-in Lug Connector: Mechanical type, copper rated for direct burial terminal with set screw.

I. Service Post Connectors: Mechanical type, bronze alloy terminal, in short- and long-stud lengths, capable of single and double conductor connections.

J. Signal Reference Grid Clamp: Mechanical type, stamped-steel terminal with hex head screw.

K. Straps: Solid copper, copper lugs. Rated for 600 A.

L. U-Bolt Clamps: Mechanical type, copper or copper alloy, terminal listed for direct burial.

M. Water Pipe Clamps:

1. Mechanical type, two pieces with stainless-steel bolts.
   a. Material: Die-cast zinc alloy.
   b. Listed for direct burial.
2. U-bolt type with malleable-iron clamp and copper ground connector.

2.5 GROUNDING ELECTRODES

A. Ground Rods: Copper-clad steel; 3/4 inch by 10 feet (19 mm by 3 m).

PART 3 - EXECUTION

3.1 APPLICATIONS

A. Conductors: Install solid conductor for No. 8 AWG and smaller, and stranded conductors for No. 6 AWG and larger unless otherwise indicated.

B. Underground Grounding Conductors: Install bare copper conductor, No. 3/0 AWG minimum.

1. Bury at least 24 inches (600 mm) below grade.

C. Grounding Bus: Install in electrical equipment rooms, in rooms housing service equipment, and elsewhere as indicated.

1. Install bus horizontally, on insulated spacers 2 inches (50 mm) minimum from wall, 6 inches (150 mm) above finished floor unless otherwise indicated.
2. Where indicated on both sides of doorways, route bus up to top of door frame, across top of doorway, and down; connect to horizontal bus.

D. Conductor Terminations and Connections:

1. Pipe and Equipment Grounding Conductor Terminations: Bolted connectors.
2. Underground Connections: Welded connectors except at test wells and as otherwise indicated.
3. Connections to Ground Rods at Test Wells: Bolted connectors.
4. Connections to Structural Steel: Welded connectors.

3.2 GROUNDING AT THE SERVICE

A. Equipment grounding conductors and grounding electrode conductors shall be connected to the ground bus. Install a main bonding jumper between the neutral and ground buses.

3.3 GROUNDING SEPARATELY DERIVED SYSTEMS

A. Generator: Install grounding electrode(s) at the generator location. The electrode shall be connected to the equipment grounding conductor and to the frame of the generator.

3.4 EQUIPMENT GROUNDING

A. Install insulated equipment grounding conductors with all feeders and branch circuits.

B. Air-Duct Equipment Circuits: Install insulated equipment grounding conductor to duct-mounted electrical devices operating at 120 V and more, including air cleaners, heaters, dampers, humidifiers, and other duct electrical equipment. Bond conductor to each unit and to air duct and connected metallic piping.

C. Water Heater, Heat-Tracing, and Antifrost Heating Cables: Install a separate insulated equipment grounding conductor to each electric water heater and heat-tracing cable. Bond conductor to heater units, piping, connected equipment, and components.

D. Poles Supporting Outdoor Lighting Fixtures: Install grounding electrode and a separate insulated equipment grounding conductor in addition to grounding conductor installed with branch-circuit conductors.

3.5 FENCE GROUNDING

A. Fence Grounding: Install at maximum intervals of 1500 feet (450 m) except as follows:

1. Fences within 100 Feet (30 m) of Buildings, Structures, Walkways, and Roadways: Ground at maximum intervals of 750 feet (225 m).
   a. Gates and Other Fence Openings: Ground fence on each side of opening.

B. Protection at Crossings of Overhead Electrical Power Lines: Ground fence at location of crossing and at a maximum distance of 150 feet (45 m) on each side of crossing.

C. Fences Enclosing Electrical Power Distribution Equipment: Ground as required by IEEE C2 unless otherwise indicated.

3.6 INSTALLATION

A. Grounding Conductors: Route along shortest and straightest paths possible unless otherwise indicated or required by Code. Avoid obstructing access or placing conductors where they may be subjected to strain, impact, or damage.

B. Ground Bonding Common with Lightning Protection System: Comply with NFPA 780 and UL 96 when interconnecting with lightning protection system. Bond electrical power system ground directly to lightning protection system grounding conductor at closest point to electrical service grounding electrode. Use bonding conductor sized same as system grounding electrode conductor, and install in conduit.

C. Ground Rods: Drive rods until tops are 2 inches (50 mm) below finished floor or final grade unless otherwise indicated.

1. Interconnect ground rods with grounding electrode conductor below grade and as otherwise indicated. Make connections without exposing steel or damaging coating if any.

D. Bonding Straps and Jumpers: Install in locations accessible for inspection and maintenance except where routed through short lengths of conduit.

1. Bonding to Structure: Bond straps directly to basic structure, taking care not to penetrate any adjacent parts.
2. Bonding to Equipment Mounted on Vibration Isolation Hangers and Supports: Install bonding so vibration is not transmitted to rigidly mounted equipment.
3. Use exothermic-welded connectors for outdoor locations; if a disconnect-type connection is required, use a bolted clamp.

E. Grounding and Bonding for Piping:

1. Metal Water Service Pipe: Install insulated copper grounding conductors, in conduit, from building's main service equipment, or grounding bus, to main metal water service entrances to building. Connect grounding conductors to main metal water service pipes; use a bolted clamp connector or bolt a lug-type connector to a pipe flange by using one of the lug bolts of the flange. Where a dielectric main water fitting is installed, connect grounding conductor on street side of fitting. Bond metal grounding conductor conduit or sleeve to conductor at each end.
2. Water Meter Piping: Use braided-type bonding jumpers to electrically bypass water meters. Connect to pipe with a bolted connector.
3. Bond each aboveground portion of gas piping system downstream from equipment shutoff valve.

3.7 FIELD QUALITY CONTROL

A. Perform tests and inspections.

B. Tests and Inspections:

1. After installing grounding system but before permanent electrical circuits have been energized, test for compliance with requirements.
2. Inspect physical and mechanical condition. Verify tightness of accessible, bolted, electrical connections with a calibrated torque wrench according to manufacturer's written instructions.
3. Test completed grounding system at each location where a maximum ground-resistance level is specified, at service disconnect enclosure grounding terminal, at ground test wells. Make tests at ground rods before any conductors are connected.
   a. Measure ground resistance no fewer than two full days after last trace of precipitation and without soil being moistened by any means other than natural drainage or seepage and without chemical treatment or other artificial means of reducing natural ground resistance.
   b. Perform tests by fall-of-potential method according to IEEE 81.
4. Prepare dimensioned Drawings locating each test well, ground rod and ground-rod assembly, and other grounding electrodes. Identify each by letter in alphabetical order, and key to the record of tests and observations. Include the number of rods driven and their depth at each location, and include observations of weather and other phenomena that may affect test results. Describe measures taken to improve test results.

C. Grounding system will be considered defective if it does not pass tests and inspections.

D. Prepare test and inspection reports.

E. Report measured ground resistances that exceed the following values:

1. Power and Lighting Equipment or System with Capacity of 500 kVA and Less: 10 ohms.
2. Power Distribution Units or Panelboards Serving Electronic Equipment: 3 ohm(s).

F. Excessive Ground Resistance: If resistance to ground exceeds specified values, notify Architect promptly and include recommendations to reduce ground resistance.

END OF SECTION 260526

SECTION 260529 - HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Steel slotted support systems.
2. Conduit and cable support devices.
3. Support for conductors in vertical conduit.
4. Structural steel for fabricated supports and restraints.
5. Mounting, anchoring, and attachment components, including powder-actuated fasteners, mechanical expansion anchors, concrete inserts, clamps, through bolts, toggle bolts, and hanger rods.
6. Fabricated metal equipment support assemblies.

1.2 INFORMATIONAL SUBMITTALS

A. Coordination Drawings: Reflected ceiling plan(s) and other details, drawn to scale, and coordinated with each other, using input from installers of the items involved.

B. Welding certificates.

1.3 QUALITY ASSURANCE

A. Welding Qualifications: Qualify procedures and personnel according to the following:

1. AWS D1.1/D1.1M.
2. AWS D1.2/D1.2M.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

Retain "Delegated Design" Paragraph below if Contractor is required to assume responsibility for design.

A. Delegated Design: Engage a qualified professional engineer, as defined in Section 014000 "Quality Requirements," to design hanger and support system.

B. Surface-Burning Characteristics: Comply with ASTM E 84; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.

1. Flame Rating: Class 1.
2. Self-extinguishing according to ASTM D 635.

2.2 SUPPORT, ANCHORAGE, AND ATTACHMENT COMPONENTS

A. Steel Slotted Support Systems: Preformed steel channels and angles with minimum 13/32-inch-(10-mm-) diameter holes at a maximum of 8 inches (200 mm) o.c. in at least one surface.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   a. Allied Tube & Conduit; a part of Atkore International.
   b. B-line, an Eaton business.
   c. ERICO International Corporation.
   d. G-Strut.
   e. Thomas & Betts Corporation; A Member of the ABB Group.
   f. Unistrut; Part of Atkore International.
2. Standard: Comply with MFMA-4 factory-fabricated components for field assembly.
3. Material for Channel, Fittings, and Accessories: Galvanized steel.
4. Channel Width: Selected for applicable load criteria.
5. Metallic Coatings: Hot-dip galvanized after fabrication and applied according to MFMA-4.
6. Painted Coatings: Manufacturer's standard painted coating applied according to MFMA-4.
7. Protect finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

B. Conduit and Cable Support Devices: Steel hangers, clamps, and associated fittings, designed for types and sizes of raceway or cable to be supported.

C. Support for Conductors in Vertical Conduit: Factory-fabricated assembly consisting of threaded body and insulating wedging plug or plugs for nonarmored electrical conductors or cables in riser conduits. Plugs shall have number, size, and shape of conductor gripping pieces as required to suit individual conductors or cables supported. Body shall be made of malleable iron.

D. Structural Steel for Fabricated Supports and Restraints: ASTM A 36/A 36M steel plates, shapes, and bars; black and galvanized.

E. Mounting, Anchoring, and Attachment Components: Items for fastening electrical items or their supports to building surfaces include the following:

1. Powder-Actuated Fasteners: Threaded-steel stud, for use in hardened portland cement concrete, steel, or wood, with tension, shear, and pullout capacities appropriate for supported loads and building materials where used.
   a. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
      1) Hilti, Inc.
      2) ITW Ramset/Red Head; Illinois Tool Works, Inc.
      3) MKT Fastening, LLC.
2. Mechanical-Expansion Anchors: Insert-wedge-type, zinc-coated steel, for use in hardened portland cement concrete, with tension, shear, and pullout capacities appropriate for supported loads and building materials where used.
   a. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
      1) B-line, an Eaton business.
      2) Empire Tool and Manufacturing Co., Inc.
      3) Hilti, Inc.
      4) ITW Ramset/Red Head; Illinois Tool Works, Inc.
3. Concrete Inserts: Steel or malleable-iron, slotted support system units are similar to MSS Type 18 units and comply with MFMA-4 or MSS SP-58.
4. Clamps for Attachment to Steel Structural Elements: MSS SP-58 units are suitable for attached structural element.
5. Through Bolts: Structural type, hex head, and high strength. Comply with ASTM A 325.
6. Toggle Bolts: Stainless-steel springhead type.
7. Hanger Rods: Threaded steel.

2.3 FABRICATED METAL EQUIPMENT SUPPORT ASSEMBLIES

A. Description: Welded or bolted structural-steel shapes, shop or field fabricated to fit dimensions of supported equipment.

B. Materials: Comply with requirements in Section 055000 "Metal Fabrications" for steel shapes and plates.

PART 3 - EXECUTION

3.1 APPLICATION

A. Comply with the following standards for application and installation requirements of hangers and supports, except where requirements on Drawings or in this Section are stricter:

1. NECA 1.
2. NECA 101
3. NECA 102.
4. NECA 105.
5. NECA 111.

B. Comply with requirements in Section 078413 "Penetration Firestopping" for firestopping materials and installation for penetrations through fire-rated walls, ceilings, and assemblies.

C. Comply with requirements for raceways and boxes specified in Section 260533 "Raceways and Boxes for Electrical Systems."

D. Maximum Support Spacing and Minimum Hanger Rod Size for Raceways: Space supports for EMT, IMC, and RMC as required by NFPA 70. Minimum rod size shall be 1/4 inch (6 mm) in diameter.

E. Multiple Raceways or Cables: Install trapeze-type supports fabricated with steel slottedsupport system, sized so capacity can be increased by at least 25 percent in future without exceeding specified design load limits.

1. Secure raceways and cables to these supports with single-bolt conduit clamps.

F. Spring-steel clamps designed for supporting single conduits without bolts may be used for 1-1/2-inch (38-mm) and smaller raceways serving branch circuits and communication systems above suspended ceilings, and for fastening raceways to trapeze supports.

3.2 SUPPORT INSTALLATION

A. Comply with NECA 1 and NECA 101 for installation requirements except as specified in this article.

B. Raceway Support Methods: In addition to methods described in NECA 1, EMT may be supported by openings through structure members, according to NFPA 70.

C. Strength of Support Assemblies: Where not indicated, select sizes of components so strength will be adequate to carry present and future static loads within specified loading limits. Minimum static design load used for strength determination shall be weight of supported components plus 200 lb (90 kg).

D. Mounting and Anchorage of Surface-Mounted Equipment and Components: Anchor and fasten electrical items and their supports to building structural elements by the following methods unless otherwise indicated by code:

1. To Wood: Fasten with lag screws or through bolts.
2. To New Concrete: Bolt to concrete inserts.
3. To Masonry: Approved toggle-type bolts on hollow masonry units and expansion anchor fasteners on solid masonry units.
4. To Existing Concrete: Expansion anchor fasteners.
5. Instead of expansion anchors, powder-actuated driven threaded studs provided with lock washers and nuts may be used in existing standard-weight concrete 4 inches (100 mm) thick or greater. Do not use for anchorage to lightweight-aggregate concrete or for slabs less than 4 inches (100 mm) thick.
6. To Steel: Beam clamps (MSS SP-58,Type 19, 21, 23, 25, or 27), complying with MSS SP-69.
7. To Light Steel: Sheet metal screws.
8. Items Mounted on Hollow Walls and Nonstructural Building Surfaces: Mount cabinets, panelboards, disconnect switches, control enclosures, pull and junction boxes, transformers, and other devices on slotted-channel racks attached to substrate.

E. Drill holes for expansion anchors in concrete at locations and to depths that avoid the need for reinforcing bars.

3.3 INSTALLATION OF FABRICATED METAL SUPPORTS

A. Comply with installation requirements in Section 055000 "Metal Fabrications" for site-fabricated metal supports.

B. Cut, fit, and place miscellaneous metal supports accurately in location, alignment, and elevation to support and anchor electrical materials and equipment.

C. Field Welding: Comply with AWS D1.1/D1.1M.

END OF SECTION 260529

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SEALED & SIGNED 05/16/2025; SEAL APPLIES ONLY TO THE ELECTRICAL DOCUMENTS PREPARED BY TAC ASSOCIATES, LLC

Drawing Name
Electrical Specifications

Drawn By
CAD

Checked By
TGC

Issue Date
05/16/2025 Permit & Bid Set

Revisions

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Project No.
P23005

Sheet Number
E5.00

Electrical Specifications (Continued)

SECTION 260533 - RACEWAYS AND BOXES FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
1. Metal conduits and fittings.
2. Nonmetallic conduits and fittings.
3. Metal wireways and auxiliary gutters.
4. Surface raceways.
5. Boxes, enclosures, and cabinets.

B. Related Requirements:
1. Section 078413 "Penetration Firestopping" for firestopping at conduit and box entrances.

1.2 INFORMATIONAL SUBMITTALS

A. Coordination Drawings: Conduit routing plans, drawn to scale, on which the following items are shown and coordinated with each other, using input from installers of items involved:
1. Structural members in paths of conduit groups with common supports.
2. HVAC and plumbing items and architectural features in paths of conduit groups with common supports.

PART 2 - PRODUCTS

2.1 METAL CONDUITS AND FITTINGS

A. Metal Conduit:
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
a. AFC Cable Systems; a part of Atkore International.
b. Allied Tube & Conduit; a part of Atkore International.
c. Electri-Flex Company.
d. O-Z/Gedney; a brand of Emerson Industrial Automation.
e. Republic Conduit.
f. Southwire Company.
g. Thomas & Betts Corporation; A Member of the ABB Group.
h. Western Tube and Conduit Corporation.
2. Listing and Labeling: Metal conduits, tubing, and fittings shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
3. GRC: Comply with ANSI C80.1 and UL 6.
4. IMC: Comply with ANSI C80.6 and UL 1242.
5. EMT: Comply with ANSI C80.3 and UL 797.
6. FMC: Comply with UL 1; zinc-coated steel or aluminum.
7. LFMC: Flexible steel conduit with PVC jacket and complying with UL 360.

B. Metal Fittings: Comply with NEMA FB 1 and UL 514B.
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
a. AFC Cable Systems; a part of Atkore International.
b. Allied Tube & Conduit; a part of Atkore International.
c. O-Z/Gedney; a brand of Emerson Industrial Automation.
d. Republic Conduit.
e. Southwire Company.
f. Thomas & Betts Corporation; A Member of the ABB Group.
g. Western Tube and Conduit Corporation.
2. Listing and Labeling: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
3. Fittings, General: Listed and labeled for type of conduit, location, and use.
4. Conduit Fittings for Hazardous (Classified) Locations: Comply with UL 1203 and NFPA 70.
5. Fittings for EMT:
a. Material: Steel.
b. Type: Setscrew.
6. Expansion Fittings: PVC or steel to match conduit type, complying with UL 651, rated for environmental conditions where installed, and including flexible external bonding jumper.

C. Joint Compound for IMC, GRC, or ARC: Approved, as defined in NFPA 70, by authorities having jurisdiction for use in conduit assemblies, and compounded for use to lubricate and protect threaded conduit joints from corrosion and to enhance their conductivity.

2.2 NONMETALLIC CONDUITS AND FITTINGS

A. Nonmetallic Conduit:
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
a. AFC Cable Systems; a part of Atkore International.
b. CANTEX INC.
c. CertainTeed Corporation.
d. Electri-Flex Company.
e. Kraloy.
f. RACO; Hubbell.
g. Thomas & Betts Corporation; A Member of the ABB Group.

B. Listing and Labeling: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
1. ENT: Comply with NEMA TC 13 and UL 1653.
2. RNC: Type EPC-40-PVC, complying with NEMA TC 2 and UL 651 unless otherwise indicated.

C. Nonmetallic Fittings:
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
a. AFC Cable Systems; a part of Atkore International.
b. CANTEX INC.
c. CertainTeed Corporation.
d. Electri-Flex Company.
e. Kraloy.
f. RACO; Hubbell.
g. Thomas & Betts Corporation; A Member of the ABB Group.
2. Fittings, General: Listed and labeled for type of conduit, location, and use.
3. Fittings for ENT and RNC: Comply with NEMA TC 3; match to conduit or tubing type and material.
4. Solvents and Adhesives: As recommended by conduit manufacturer.

2.3 METAL WIREWAYS AND AUXILIARY GUTTERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. B-line, an Eaton business.
2. Hoffman; a brand of Pentair Equipment Protection.
3. MonoSystems, Inc.

B. Description: Sheet metal, complying with UL 870 and NEMA 250, Type 12 unless otherwise indicated, and sized according to NFPA 70.
1. Metal wireways installed outdoors shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

C. Fittings and Accessories: Include covers, couplings, offsets, elbows, expansion joints, adapters, hold-down straps, end caps, and other fittings to match and mate with wireways as required for complete system.

2.4 BOXES, ENCLOSURES, AND CABINETS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Crouse-Hinds, an Eaton business.
2. Erickson Electrical Equipment Company.
3. Hoffman; a brand of Pentair Equipment Protection.
4. Hubbell Incorporated.
5. Milbank Manufacturing Co.
6. O-Z/Gedney; a brand of Emerson Industrial Automation.
7. Thomas & Betts Corporation; A Member of the ABB Group.

B. General Requirements for Boxes, Enclosures, and Cabinets: Boxes, enclosures, and cabinets installed in wet locations shall be listed for use in wet locations.

C. Sheet Metal Outlet and Device Boxes: Comply with NEMA OS 1 and UL 514A.

D. Cast-Metal Outlet and Device Boxes: Comply with NEMA FB 1, ferrous alloy, Type FD, with gasketed cover.

E. Metal Floor Boxes:
1. Material: Cast metal.
2. Type: Fully adjustable.
3. Shape: Rectangular.
4. Listing and Labeling: Metal floor boxes shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

F. Luminaire Outlet Boxes: Nonadjustable, designed for attachment of luminaire weighing 50 lb (23 kg). Outlet boxes designed for attachment of luminaires weighing more than 50 lb (23 kg) shall be listed and marked for the maximum allowable weight.

G. Paddle Fan Outlet Boxes: Nonadjustable, designed for attachment of paddle fan weighing 70 lb (32 kg).
1. Listing and labeling: Paddle fan outlet boxes shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

H. Small Sheet Metal Pull and Junction Boxes: NEMA OS 1.

I. Cast-Metal Access, Pull, and Junction Boxes: Comply with NEMA FB 1 and UL 1773, galvanized, cast iron with gasketed cover.

J. Box extensions used to accommodate new building finishes shall be of same material as recessed box.

K. Device Box Dimensions: 4 inches square by 2-1/8 inches deep (100 mm square by 60 mm deep).

L. Gangable boxes are prohibited.

M. Hinged-Cover Enclosures: Comply with UL 50 and NEMA 250, Type 12 with continuous-hinge cover with flush latch unless otherwise indicated.
1. Metal Enclosures: Steel, finished inside and out with manufacturer's standard enamel.
2. Interior Panels: Steel; all sides finished with manufacturer's standard enamel.

N. Cabinets:
1. NEMA 250, Type 12 galvanized-steel box with removable interior panel and removable front, finished inside and out with manufacturer's standard enamel.
2. Hinged door in front cover with flush latch and concealed hinge.
3. Key latch to match panelboards.
4. Metal barriers to separate wiring of different systems and voltage.
5. Accessory feet where required for freestanding equipment.

PART 3 - EXECUTION

3.1 RACEWAY APPLICATION

A. Outdoors: Apply raceway products as specified below unless otherwise indicated:
1. Exposed Conduit: GRC.
2. Concealed Conduit, Aboveground: GRC or EMT.
3. Underground Conduit: RNC, Type EPC-40-PVC, direct buried.
4. Connection to Vibrating Equipment (Including Transformers and Hydraulic, Pneumatic, Electric Solenoid, or Motor-Driven Equipment): LFMC.
5. Boxes and Enclosures, Aboveground: NEMA 250, Type 3R.

B. Indoors: Apply raceway products as specified below unless otherwise indicated.
1. Exposed, Not Subject to Physical Damage: EMT.
2. Exposed, Not Subject to Severe Physical Damage: EMT.
3. Exposed and Subject to Severe Physical Damage: GRC. Raceway locations include the following:
a. Mechanical rooms.
4. Concealed in Ceilings and Interior Walls and Partitions: EMT.
5. Connection to Vibrating Equipment (Including Transformers and Hydraulic, Pneumatic, Electric Solenoid, or Motor-Driven Equipment): FMC, except use LFMC in damp or wet locations.
6. Damp or Wet Locations: GRC.
7. Boxes and Enclosures: NEMA 250, Type 1, except use NEMA 250, Type 4 stainless steel in institutional and commercial kitchens and damp or wet locations.

C. Minimum Raceway Size: 3/4-inch (21-mm) trade size.

D. Raceway Fittings: Compatible with raceways and suitable for use and location.
1. Rigid and Intermediate Steel Conduit: Use threaded rigid steel conduit fittings unless otherwise indicated. Comply with NEMA FB 2.10.
2. EMT: Use setscrew, steel fittings. Comply with NEMA FB 2.10.
3. Flexible Conduit: Use only fittings listed for use with flexible conduit. Comply with NEMA FB 2.20.

E. Do not install aluminum conduits, boxes, or fittings in contact with concrete or earth.

F. Install surface raceways only where indicated on Drawings.

G. Do not install nonmetallic conduit above grade, inside the building or on the roof. Nonmetallic conduit shall ONLY BE USED BELOW GRADE. UNDER NO CIRCUMSTANCES SHALL NONMETALLIC CONDUIT BE INSTALLED ABOVE GRADE, WITHIN THE BUILDING ENVELOPE OR EXPOSED ON THE ROOF. Any nonmetallic conduit found on the project to be installed in any of the locations described above will result in the Electrical Contractor having to remove and replace the raceway with a specified metallic raceway at the Contractor's expense.

3.2 INSTALLATION

A. Comply with requirements in Section 260529 "Hangers and Supports for Electrical Systems" for hangers and supports.

B. Comply with NECA 1 and NECA 101 for installation requirements except where requirements on Drawings or in this article are stricter. Comply with NECA 102 for aluminum conduits. Comply with NFPA 70 limitations for types of raceways allowed in specific occupancies and number of floors.

C. Do not install raceways or electrical items on any "explosion-relief" walls or rotating equipment.

D. Do not fasten conduits onto the bottom side of a metal deck roof.

E. Keep raceways at least 6 inches (150 mm) away from parallel runs of flues and steam or hot-water pipes. Install horizontal raceway runs above water and steam piping.

F. Comply with requirements in Section 260529 "Hangers and Supports for Electrical Systems" for hangers and supports.

G. Arrange stub-ups so curved portions of bends are not visible above finished slab.

H. Install no more than the equivalent of three 90-degree bends in any conduit run except for control wiring conduits, for which fewer bends are allowed. Support within 12 inches (300 mm) of changes in direction.

I. Make bends in raceway using large-radius preformed ells. Field bending shall be according to NFPA 70 minimum radii requirements. Use only equipment specifically designed for material and size involved.

J. Conceal conduit and EMT within finished walls, ceilings, and floors unless otherwise indicated. Install conduits parallel or perpendicular to building lines.

K. Support conduit within 12 inches (300 mm) of enclosures to which attached.

L. Raceways Embedded in Slabs:
1. Run conduit larger than 1-inch (27-mm) trade size, parallel or at right angles to main reinforcement. Where at right angles to reinforcement, place conduit close to slab support. Secure raceways to reinforcement at maximum 10-foot (3-m) intervals.
2. Arrange raceways to cross building expansion joints at right angles with expansion fittings.
3. Arrange raceways to keep a minimum of 1 inch (25 mm) of concrete cover in all directions.
4. Do not embed threadless fittings in concrete unless specifically approved by Architect for each specific location.
5. Change from ENT to GRC before rising above floor.

M. Stub-ups to Above Recessed Ceilings:
1. Use EMT for raceways.
2. Use a conduit bushing or insulated fitting to terminate stub-ups not terminated in hubs or in an enclosure.

N. Threaded Conduit Joints, Exposed to Wet, Damp, Corrosive, or Outdoor Conditions: Apply listed compound to threads of raceway and fittings before making up joints. Follow compound manufacturer's written instructions.

O. Coat field-cut threads on PVC-coated raceway with a corrosion-preventing conductive compound prior to assembly.

P. Raceway Terminations at Locations Subject to Moisture or Vibration: Use insulating bushings to protect conductors including conductors smaller than No. 4 AWG.

Q. Terminate threaded conduits into threaded hubs or with locknuts on inside and outside of boxes or cabinets. Install bushings on conduits up to 1-1/4-inch (35-mm) trade size and insulated throat metal bushings on 1-1/2-inch (41-mm) trade size and larger conduits terminated with locknuts. Install insulated throat metal grounding bushings on service conduits.

R. Install pull wires in empty raceways. Use polypropylene or monofilament plastic line with not less than 200-lb (90-kg) tensile strength. Leave at least 12 inches (300 mm) of slack at each end of pull wire. Cap underground raceways designated as spare above grade alongside raceways in use.

S. Surface Raceways:
1. Install surface raceway with a minimum 2-inch (50-mm) radius control at bend points.
2. Secure surface raceway with screws or other anchor-type devices at intervals not exceeding 48 inches (1200 mm) and with no less than two supports per straight raceway section. Support surface raceway according to manufacturer's written instructions. Tape and glue are not acceptable support methods.

T. Install raceway sealing fittings at accessible locations according to NFPA 70 and fill them with listed sealing compound. For concealed raceways, install each fitting in a flush steel box with a blank cover plate having a finish similar to that of adjacent plates or surfaces.

U. Install devices to seal raceway interiors at accessible locations. Locate seals so no fittings or boxes are between the seal and the following changes of environments. Seal the interior of all raceways at the following points:
1. Where conduits pass from warm to cold locations, such as boundaries of refrigerated spaces.
2. Where an underground service raceway enters a building or structure.
3. Conduit extending from interior to exterior of building.
4. Conduit extending into pressurized duct and equipment.
5. Conduit extending into pressurized zones that are automatically controlled to maintain different pressure set points.
6. Where otherwise required by NFPA 70.

V. Expansion-Joint Fittings:
1. Install type and quantity of fittings that accommodate temperature change listed for each of the following locations:
a. Outdoor Locations Not Exposed to Direct Sunlight: 125 deg F (70 deg C) temperature change.
b. Outdoor Locations Exposed to Direct Sunlight: 155 deg F (86 deg C) temperature change.
c. Indoor Spaces Connected with Outdoors without Physical Separation: 125 deg F (70 deg C) temperature change.
d. Attics: 135 deg F (75 deg C) temperature change.
2. Install expansion fittings at all locations where conduits cross building or structure expansion joints.
3. Install each expansion-joint fitting with position, mounting, and piston setting selected according to manufacturer's written instructions for conditions at specific location at time of installation. Install conduit supports to allow for expansion movement.

W. Flexible Conduit Connections: Comply with NEMA RV 3. Use a maximum of 72 inches (1830 mm) of flexible conduit for recessed and semirecessed luminaires, equipment subject to vibration, noise transmission, or movement; and for transformers and motors.
1. Use LFMC in damp or wet locations subject to severe physical damage.
2. Use LFMC in damp or wet locations not subject to severe physical damage.

X. Mount boxes at heights indicated on Drawings. If mounting heights of boxes are not individually indicated, give priority to ADA requirements. Install boxes with height measured to center of box unless otherwise indicated.

Y. Recessed Boxes in Masonry Walls: Saw-cut opening for box in center of cell of masonry block, and install box flush with surface of wall. Prepare block surfaces to provide a flat surface for a raintight connection between the box and cover plate or the supported equipment and box.

Z. Horizontally separate boxes mounted on opposite sides of walls so they are not in the same vertical channel.

AA. Locate boxes so that cover or plate will not span different building finishes.

BB. Support boxes of three gangs or more from more than one side by spanning two framing members or mounting on brackets specifically designed for the purpose.

CC. Fasten junction and pull boxes to or support from building structure. Do not support boxes by conduits.

DD. Set metal floor boxes level and flush with finished floor surface.

3.3 INSTALLATION OF UNDERGROUND CONDUIT

A. Direct-Buried Conduit:
1. Excavate trench bottom to provide firm and uniform support for conduit. Prepare trench bottom as specified in Section 312000 "Earth Moving" for pipe less than 6 inches (150 mm) in nominal diameter.
2. Install backfill as specified in Section 312000 "Earth Moving."
3. After installing conduit, backfill and compact. Start at tie-in point, and work toward end of conduit run, leaving conduit at end of run free to move with expansion and contraction as temperature changes during this process. Firmly hand tamp backfill around conduit to provide maximum supporting strength. After placing controlled backfill to within 12 inches (300 mm) of finished grade, make final conduit connection at end of run and complete backfilling with normal compaction as specified in Section 312000 "Earth Moving."
4. Install manufactured duct elbows for stub-up at poles and equipment and at building entrances through floor unless otherwise indicated. Encase elbows for stub-up ducts throughout length of elbow.
5. Install manufactured rigid steel conduit elbows for stub-ups at poles and equipment and at building entrances through floor.
a. Couple steel conduits to ducts with adapters designed for this purpose, and encase coupling with 3 inches (75 mm) of concrete for a minimum of 12 inches (300 mm) on each side of the coupling.
b. For stub-ups at equipment mounted on outdoor concrete bases and where conduits penetrate building foundations, extend steel conduit horizontally a minimum of 60 inches (1500 mm) from edge of foundation or equipment base. Install insulated grounding bushings on terminations at equipment.
6. Underground Warning Tape: Comply with requirements in Section 260553 "Identification for Electrical Systems."

3.4 SLEEVE AND SLEEVE-SEAL INSTALLATION FOR ELECTRICAL PENETRATIONS

A. Install sleeves and sleeve seals at penetrations of exterior floor and wall assemblies.

3.5 FIRESTOPPING

A. Install firestopping at penetrations of fire-rated floor and wall assemblies. Comply with requirements in Section 078413 "Penetration Firestopping."

3.6 PROTECTION

A. Protect coatings, finishes, and cabinets from damage and deterioration.
1. Repair damage to galvanized finishes with zinc-rich paint recommended by manufacturer.

END OF SECTION 260533

SECTION 260553 - IDENTIFICATION FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:
1. Color and legend requirements for raceways, conductors, and warning labels and signs.
2. Labels.
3. Tapes and stencils.
4. Tags.
5. Signs.
6. Cable ties.
7. Paint for identification.
8. Fasteners for labels and signs.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Comply with ASME A13.1 and IEEE C2.

B. Comply with NFPA 70.

C. Comply with 29 CFR 1910.144 and 29 CFR 1910.145.

D. Comply with ANSI Z535.4 for safety signs and labels.

E. Comply with NFPA 70E and Section 260573.19 "Arc-Flash Hazard Analysis" requirements for arc-flash warning labels.

F. Adhesive-attached labeling materials, including label stocks, laminating adhesives, and inks used by label printers, shall comply with UL 969.

G. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes.
1. Temperature Change: 120 deg F (67 deg C), ambient; 180 deg F (100 deg C), material surfaces.

2.2 COLOR AND LEGEND REQUIREMENTS

A. Color-Coding for Phase- Identification, 600 V or Less: Use colors listed below for ungrounded service, feeder and branch-circuit conductors.
1. Color shall be factory applied or field applied for sizes larger than No. 8 AWG if authorities having jurisdiction permit.
2. Colors for 208Y/120-V Circuits: Match existing color coding used in the facility. If there is not an existing color coding used in the facility, use the following:
a. Phase A: Black.
b. Phase B: Red.
c. Phase C: Blue.
3. Color for Neutral: White or gray.
4. Color for Equipment Grounds: Green.
5. Colors for Isolated Grounds: Green with white stripe.

B. Warning labels and signs shall include, but are not limited to, the following legends:
1. Workspace Clearance Warning: "WARNING - OSHA REGULATION - AREA IN FRONT OF ELECTRICAL EQUIPMENT MUST BE KEPT CLEAR FOR 36 INCHES (915 MM)."
2. Multiple Power Source Warning: "DANGER - ELECTRICAL SHOCK HAZARD - EQUIPMENT HAS MULTIPLE POWER SOURCES."
3. Arc Flash Hazard Warning: Refer to Section 260573.19 "Arc-Flash Hazard Analysis" requirements for arc-flash warning labels

C. Equipment Identification Labels:
1. Black letters on a white field.

2.3 LABELS

A. Self-Adhesive Wraparound Labels: Preprinted, 3-mil- (0.08-mm-) thick, vinyl flexible label with acrylic pressure-sensitive adhesive.
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
a. Brady Corporation.
b. Brother International Corporation.
c. Ideal Industries, Inc.
d. Panduit Corp.
2. Self-Lamination: Clear; UV-, weather- and chemical-resistant; self-laminating, protective shield over the legend. Labels sized such that the clear shield overlaps the entire printed legend.
3. Marker for Labels: Machine-printed, permanent, waterproof, black ink recommended by printer manufacturer.

2.4 TAPES AND STENCILS

A. Marker Tapes: Vinyl or vinyl-cloth, self-adhesive wraparound type, with circuit identification legend machine printed by thermal transfer or equivalent process.
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
a. Carlton Industries, LP.
b. Ideal Industries, Inc.
c. Marking Services, Inc.

B. Self-Adhesive Vinyl Tape: Colored, heavy duty, waterproof, fade resistant; not less than 3 mils (0.08 mm) thick by 1 to 2 inches (25 to 50 mm) wide; compounded for outdoor use.
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
a. Brady Corporation.
b. Carlton Industries, LP.
c. emedco.

C. Floor Marking Tape: 2-inch- (50-mm-) wide, 5-mil (0.125-mm) pressure-sensitive vinyl tape, with yellow and black stripes and clear vinyl overlay.

D. Underground-Line Warning Tape:
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
a. Brady Corporation.
b. Ideal Industries, Inc.
c. LEM Products Inc.
d. Marking Services, Inc.
e. Reef Industries, Inc.
2. Tape:
a. Recommended by manufacturer for the method of installation and suitable to identify and locate underground electrical and communications utility lines.
b. Printing on tape shall be permanent and shall not be damaged by burial operations.
c. Tape material and ink shall be chemically inert and not subject to degradation when exposed to acids, alkalis, and other destructive substances commonly found in soils.
3. Color and Printing:
a. Comply with ANSI Z535.1, ANSI Z535.2, ANSI Z535.3, ANSI Z535.4, and ANSI Z535.5.
b. Inscriptions for Red-Colored Tapes: "ELECTRIC LINE, HIGH VOLTAGE".
c. Inscriptions for Orange-Colored Tapes: "TELEPHONE CABLE, CATV CABLE, COMMUNICATIONS CABLE, OPTICAL FIBER CABLE".
4. Tag: :
a. Detectable three-layer laminate, consisting of a printed pigmented polyolefin film, a solid aluminum-foil core, and a clear protective film that allows inspection of the continuity of the conductive core; bright colored, continuous-printed on one side with the inscription of the utility, compounded for direct-burial service.
b. Width: 3 inches (75 mm).
c. Overall Thickness: 5 mils (0.125 mm).
d. Foil Core Thickness: 0.35 mil (0.00889 mm).
e. Weight: 28 lb/1000 sq. ft. (13.7 kg/100 sq. m).
f. Tensile according to ASTM D 882: 70 lbf (311.3 N) and 4600 psi (31.7 MPa).

2.5 SIGNS

A. Laminated Acrylic or Melamine Plastic Signs:
1. Engraved legend.
2. Thickness:
a. For signs up to 20 sq. in. (129 sq. cm), minimum 1/16 inch (1.6 mm) thick.
b. For signs larger than 20 sq. in. (129 sq. cm), 1/8 inch (3.2 mm) thick.
c. Engraved legend with black letters on white face.
d. Self-adhesive.
e. Framed with mitered acrylic molding and arranged for attachment at applicable equipment.

2.6 CABLE TIES

A. General-Purpose Cable Ties: Fungus inert, self-extinguishing, one piece, self-locking, and Type 6/6 nylon.
1. Minimum Width: 3/16 inch (5 mm).
2. Tensile Strength at 73 Deg F (23 Deg C) according to ASTM D 638: 12,000 psi (82.7 MPa).
3. Temperature Range: Minus 40 to plus 185 deg F (Minus 40 to plus 85 deg C).
4. Color: Black, except where used for color-coding.

2.7 MISCELLANEOUS IDENTIFICATION PRODUCTS

A. Paint: Comply with requirements in painting Sections for paint materials and application requirements. Retain paint system applicable for surface material and location (exterior or interior).

B. Fasteners for Labels and Signs: Self-tapping, stainless-steel screws or stainless-steel machine screws with nuts and flat and lock washers.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Verify and coordinate identification names, abbreviations, colors, and other features with requirements in other Sections requiring identification applications, Drawings, Shop Drawings, manufacturer's wiring diagrams, and operation and maintenance manual. Use consistent designations throughout Project.

B. Install identifying devices before installing acoustical ceilings and similar concealment.

C. Verify identity of each item before installing identification products.

D. Coordinate identification with Project Drawings, manufacturer's wiring diagrams, and operation and maintenance manual.

E. Apply identification devices to surfaces that require finish after completing finish work.

F. Install signs with approved legend to facilitate proper identification, operation, and maintenance of electrical systems and connected items.

G. Self-Adhesive Identification Products: Before applying electrical identification products, clean substrates of substances that could impair bond, using materials and methods recommended by manufacturer of identification product.

H. Auxiliary Electrical Systems Conductor Identification: Identify field-installed alarm, control, and signal connections.

I. Elevated Components: Increase sizes of labels, signs, and letters to those appropriate for viewing from the floor.

J. Self-Adhesive Wraparound Labels: Secure tight to surface of raceway or cable at a location with high visibility and accessibility.

K. Self-Adhesive Labels:
1. On each unit of equipment, install unique designation label that is consistent with wiring diagrams, schedules, and operation and maintenance manual.
2. Unless otherwise indicated, provide a single line of text with 1/2-inch- (13-mm-) high letters on 1-1/2-inch- (38-mm-) high label; where two lines of text are required, use labels 2 inches (50 mm) high.

L. Self-Adhesive Vinyl Tape: Secure tight to surface at a location with high visibility and accessibility.
1. Field-Applied, Color-Coding Conductor Tape: Apply in half-lapped turns for a minimum distance of 6 inches (150 mm) where splices or taps are made. Apply last two turns of tape with no tension to prevent possible unwinding.

M. Floor Marking Tape: Apply stripes to finished surfaces following manufacturer's written instructions.

N. Underground Line Warning Tape:
1. During backfilling of trenches, install continuous underground-line warning tape directly above cable or raceway at 6 to 8 inches (150 to 200 mm) below finished grade. Use multiple tapes where width of multiple lines installed in a common trenchexceeds 16 inches (400 mm) overall.
2. Install underground-line warning tape for direct-buried cables and cables in raceways.

O. Laminated Acrylic or Melamine Plastic Signs:
1. Attach signs and plastic labels that are not self-adhesive type with mechanical fasteners appropriate to the location and substrate.
2. Unless otherwise indicated, provide a single line of text with 1/2-inch- (13-mm-) high letters on minimum 1-1/2-inch- (38-mm-) high sign; where two lines of text are required, use signs minimum 2 inches (50 mm) high.

P. Cable Ties: General purpose, for attaching tags.

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PROJECT NAME

SCSPL

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SEALED & SIGNED 05/16/2025; SEAL APPLIES ONLY TO THE ELECTRICAL DOCUMENTS PREPARED BY TAC ASSOCIATES, LLC

Drawing Name
Electrical Specifications

Drawn By
CAD

Checked By
TGC

Issue Date
05/16/2025 Permit & Bid Set

Revisions

Issued for	Date

Project No.
P23005

Sheet Number
E5.01

Electrical Specifications (Continued)

SECTION 260553 - IDENTIFICATION FOR ELECTRICAL SYSTEMS (Continued)

3.2 IDENTIFICATION SCHEDULE

A. Install identification materials and devices at locations for most convenient viewing without interference with operation and maintenance of equipment. Install access doors or panels to provide view of identifying devices.

B. Identify conductors, cables, and terminals in enclosures and at junctions, terminals, pull points, and locations of high visibility. Identify by system and circuit designation.

C. Power-Circuit Conductor Identification, 600 V or Less: For conductors in vaults, pull and junction boxes, manholes, and handholes, use self-adhesive vinyl tape to identify the phase.

1. Locate identification at changes in direction, at penetrations of walls and floors, at 50-foot (15-m) maximum intervals in straight runs, and at 25-foot (7.6-m) maximum intervals in congested areas.

D. Control-Circuit Conductor Identification: For conductors and cables in pull and junction boxes, manholes, and handholes, use self-adhesive wraparound labelswith the conductor or cable designation, origin, and destination.

E. Control-Circuit Conductor Termination Identification: For identification at terminations, provide self-adhesive wraparound labels with the conductor designation.

F. Conductors to Be Extended in the Future: Attach write-on tags to conductors and list source.

G. Auxiliary Electrical Systems Conductor Identification: Self-adhesive vinyl tape that is uniform and consistent with system used by manufacturer for factory-installed connections.

1. Identify conductors, cables, and terminals in enclosures and at junctions, terminals, and pull points. Identify by system and circuit designation.

H. Locations of Underground Lines: Underground-line warning tape for power, lighting, communication, and control wiring and optical-fiber cable.

I. Workspace Indication: Apply floor marking tape to finished surfaces. Show working clearances in the direction of access to live parts. Workspace shall comply with NFPA 70 and 29 CFR 1926.403 unless otherwise indicated. Do not install at flush-mounted panelboards and similar equipment in finished spaces.

J. Instructional Signs: Self-adhesive labels, including the color code for grounded and ungrounded conductors.

K. Arc Flash Warning Labeling: Self-adhesive labels.

L. Equipment Identification Labels:

1. Indoor Equipment: Laminated acrylic or melamine plastic sign.

2. Outdoor Equipment: Laminated acrylic or melamine sign.

END OF SECTION 260553

SECTION 260573.13 - SHORT-CIRCUIT STUDIES

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes a computer-based, fault-current study to determine the minimum interrupting capacity of circuit protective devices.

1.2 ACTION SUBMITTALS

A. Product Data: For computer software program to be used for studies.

B. Other Action Submittals: Submit the following after the approval of system protective devices submittals. Submittals shall be in digital form.

1. Short-circuit study input data, including completed computer program input data sheets.

2. Short-circuit study and equipment evaluation report; signed, dated, and sealed by a qualified professional engineer.

a. Submit study report for action prior to receiving final approval of the distribution equipment submittals. If formal completion of studies will cause delay in equipment manufacturing, obtain approval from Architect for preliminary submittal of sufficient study data to ensure that the selection of devices and associated characteristics is satisfactory.

b. Revised single-line diagram, reflecting field investigation results and results of short-circuit study.

1.3 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Short-Circuit Study Specialist.

B. Product Certificates: For short-circuit study software, certifying compliance with IEEE 399.

1.4 QUALITY ASSURANCE

A. Study shall be performed using commercially developed and distributed software designed specifically for power system analysis.

B. Software algorithms shall comply with requirements of standards and guides specified in this Section.

C. Manual calculations are unacceptable.

1. Power System Analysis Software Qualifications: Computer program shall be designed to perform short-circuit studies or have a function, component, or add-on module designed to perform short-circuit studies.

2. Computer program shall be developed under the charge of a licensed professional engineer who holds IEEE Computer Society's Certified Software Development Professional certification.

D. Power Systems Analysis Specialist Qualifications: Professional engineer licensed in the state where Project is located, with local representation or office in the State where the project is located. All elements of the study shall be performed under the direct supervision and control of this professional engineer.

E. Short-Circuit Study Certification: Short-Circuit Study Report shall be signed and sealed by Power Systems Analysis Specialist.

F. Power Systems Analysis Companies: The Study shall be performed by one of the following companies, as a sub-contractor to the bidding Electrical Contractor. Companies other than those listed will be Rejected for non-compliance: a) Utilities Instrumentation Services (UIS); b) Power Factor Engineering, LLC; c) Northern Electrical Testing; d) Schneider Electric (Square-D) (as part of the new distribution equipment); e) Eaton Power Systems (as part of the new distribution equipment); f) Siemens Power Systems (as part of the new distribution equipment).

G. Field Adjusting Agency Qualifications: Employer of a NETA ETT-Certified Technician Level III or NICET Electrical Power Testing Level III certification responsible for all field adjusting of the Work; A member company of NETA and Acceptable to authorities having jurisdiction.

PART 2 - PRODUCTS

2.1 COMPUTER SOFTWARE

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. EDSA Micro Corporation.

2. SKM System Analysis, Inc.

B. Comply with IEEE 399 and IEEE 551.

C. Analytical features of fault-current-study computer software program shall have the capability to calculate mandatory features as listed in IEEE 399.

2.2 SHORT-CIRCUIT STUDY REPORT CONTENTS

A. Executive summary.

B. Study descriptions, purpose, basis, and scope. Include case descriptions, definition of terms, and guide for interpretation of the computer printout.

C. One-line diagram, showing the following:

1. Protective device designations and ampere ratings.

2. Cable size and lengths.

3. Transformer kilovolt ampere (kVA) and voltage ratings.

4. Motor and generator designations and kVA ratings.

5. Switchgear, switchboard, motor-control center, and panelboard designations.

D. Comments and recommendations for system improvements, where needed.

E. Protective Device Evaluation:

1. Evaluate equipment and protective devices and compare to short-circuit ratings.

2. Tabulations of circuit breaker, fuse, and other protective device ratings versus calculated short-circuit duties.

3. For 600-V overcurrent protective devices, ensure that interrupting ratings are equal to or higher than calculated 1/2-cycle symmetrical fault current.

4. For devices and equipment rated for asymmetrical fault current, apply multiplication factors listed in the standards to 1/2-cycle symmetrical fault current.

F. Short-Circuit Study Input Data: As described in "Power System Data" Article in the Evaluations.

G. Short-Circuit Study Output:

1. Low-Voltage Fault Report: Three-phase and unbalanced fault calculations, showing the following for each overcurrent device location: a) Voltage; b) Calculated fault-current magnitude and angle; c) Fault-point X/R ratio; d) Equivalent impedance.

2. Momentary Duty Report: Three-phase and unbalanced fault calculations, showing the following for each overcurrent device location: a) Voltage; b) Calculated symmetrical fault-current magnitude and angle; c) Fault-point X/R ratio; d) Calculated asymmetrical fault currents: 1) Based on fault-point X/R ratio; 2) Based on calculated symmetrical value multiplied by 1.6; 3) Based on calculated symmetrical value multiplied by 2.7.

3. Interrupting Duty Report: Three-phase and unbalanced fault calculations, showing the following for each overcurrent device location: a) Voltage; b) Calculated symmetrical fault-current magnitude and angle; c) Fault-point X/R ratio; d) No AC Decrement (NACD) ratio; e) Equivalent impedance; f) Multiplying factors for 2-, 3-, 5-, and 8-cycle circuit breakers rated on a symmetrical basis; g) Multiplying factors for 2-, 3-, 5-, and 8-cycle circuit breakers rated on a total basis.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Obtain all data necessary for the conduct of the study.

1. Verify completeness of data supplied on the one-line diagram. Call any discrepancies to the attention of Architect.

2. For equipment provided that is Work of this Project, use characteristics submitted under the provisions of action submittals and information submittals for this Project.

B. Gather and tabulate the following input data to support the short-circuit study:

1. Product Data for Project's overcurrent protective devices involved in overcurrent protective device coordination studies. Use equipment designation tags that are consistent with electrical distribution system diagrams, overcurrent protective device submittals, input and output data, and recommended device settings.

2. Obtain electrical power utility impedance at the service.

3. Power sources and ties.

4. For transformers, include kVA, primary and secondary voltages, connection type, impedance, X/R ratio, taps measured in percent, and phase shift.

5. For reactors, provide manufacturer and model designation, voltage rating, and impedance.

6. For circuit breakers and fuses, provide manufacturer and model designation. List type of breaker, type of trip, SCCR, current rating, and breaker settings.

7. Busway manufacturer and model designation, current rating, impedance, lengths, and conductor material.

8. Motor horsepower and NEMA MG 1 code letter designation.

9. Cable sizes, lengths, number, conductor material and conduit material (magnetic or nonmagnetic).

3.2 SHORT-CIRCUIT STUDY

A. Perform study following the general study procedures contained in IEEE 399.

B. Calculate short-circuit currents according to IEEE 551.

C. Base study on the device characteristics supplied by device manufacturer.

D. The extent of the electrical power system to be studied is indicated on Drawings.

E. Begin short-circuit current analysis at the service, extending down to the system overcurrent protective devices as follows:

1. To normal system low-voltage load buses where fault current is 10 kA or less.

F. Study electrical distribution system from normal and alternate power sources throughout electrical distribution system for Project. Study all cases of system-switching configurations and alternate operations that could result in maximum fault conditions.

G. The calculations shall include the ac fault-current decay from induction motors. The calculations shall also account for the fault-current dc decrement, to address the asymmetrical requirements of the interrupting equipment.

1. For grounded systems, provide a bolted line-to-ground fault-current study for areas as defined for the three-phase bolted fault short-circuit study.

H. Calculate short-circuit momentary and interrupting duties for a three-phase bolted fault at each of the following:

1. Electric utility's supply termination point.

2. Incoming switchgear.

3. Low-voltage switchgear.

4. Control panels.

5. Branch circuit panelboards.

6. Disconnect switches.

3.3 ADJUSTING

A. Make minor modifications to equipment as required to accomplish compliance with short-circuit study.

3.4 DEMONSTRATION

A. Train Owner's operating and maintenance personnel in the use of study results.

END OF SECTION 260573.13

SECTION 260573.16 - COORDINATION STUDIES

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes computer-based, overcurrent protective device coordination studies to determine overcurrent protective devices and to determine overcurrent protective device settings for selective tripping.

1.2 ACTION SUBMITTALS

A. Product Data: For computer software program to be used for studies.

B. Other Action Submittals: Submit the following after the approval of system protective devices submittals. Submittals shall be in digital form.

1. Coordination-study input data, including completed computer program input data sheets.

2. Study and equipment evaluation reports.

3. Overcurrent protective device coordination study report; signed, dated, and sealed by a qualified professional engineer.

a. Submit study report for action prior to receiving final approval of the distribution equipment submittals. If formal completion of studies will cause delay in equipment manufacturing, obtain approval from Architect for preliminary submittal of sufficient study data to ensure that the selection of devices and associated characteristics is satisfactory.

1.3 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Coordination Study Specialist.

B. Product Certificates: For overcurrent protective device coordination study software, certifying compliance with IEEE 399.

1.4 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For the overcurrent protective devices to include in emergency, operation, and maintenance manuals.

1. In addition to items specified in Section 017823 "Operation and Maintenance Data," include the following:

a. The following parts from the Protective Device Coordination Study Report:

1) One-line diagram.

2) Protective device coordination study.

3) Time-current coordination curves.

b. Power system data.

1.5 QUALITY ASSURANCE

A. Studies shall use computer programs that are distributed nationally and are in wide use. Software algorithms shall comply with requirements of standards and guides specified in this Section. Manual calculations are unacceptable.

B. Coordination Study Software Developer Qualifications: An entity that owns and markets computer software used for studies, having performed successful studies of similar magnitude on electrical distribution systems using similar devices.

1. The computer program shall be developed under the charge of a licensed professional engineer who holds IEEE Computer Society's Certified Software Development Professional certification.

C. Coordination Study Specialist Qualifications: Professional engineer in charge of performing the study and documenting recommendations, licensed in the state where Project is located. All elements of the study shall be performed under the direct supervision and control of this professional engineer.

F. Coordination Study Companies: The Study shall be performed by one of the following companies, as a sub-contractor to the bidding Electrical Contractor. Companies other than those listed will be Rejected for non-compliance: a) Utilities Instrumentation Services (UIS); b) Power Factor Engineering, LLC; c) Northern Electrical Testing; d) Schneider Electric (Square-D) (as part of the new distribution equipment); e) Eaton Power Systems (as part of the new distribution equipment); f) Siemens Power Systems (as part of the new distribution equipment).

G. Field Adjusting Agency Qualifications: An independent agency, with the experience and capability to adjust overcurrent devices and to conduct the testing indicated, that is a member company of the InterNational Electrical Testing Association or is a nationally recognized testing laboratory (NRTL) as defined by OSHA in 29 CFR 1910.7, and that is acceptable to authorities having jurisdiction.

PART 2 - PRODUCTS

2.1 COMPUTER SOFTWARE DEVELOPERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. EDSA Micro Corporation.

2. SKM Systems Analysis, Inc.

B. Comply with IEEE 242 and IEEE 399.

C. Analytical features of device coordination study computer software program shall have the capability to calculate mandatory features as listed in IEEE 399.

D. Computer software program shall be capable of plotting and diagramming time-current-characteristic curves as part of its output. Computer software program shall report device settings and ratings of all overcurrent protective devices and shall demonstrate selective coordination by computer-generated, time-current coordination plots.

2.2 PROTECTIVE DEVICE COORDINATION STUDY REPORT CONTENTS

A. Executive summary.

B. Study descriptions, purpose, basis and scope. Include case descriptions, definition of terms and guide for interpretation of the computer printout.

C. One-line diagram, showing the following:

1. Protective device designations and ampere ratings.

2. Cable size and lengths.

3. Transformer kilovolt ampere (kVA) and voltage ratings.

4. Motor and generator designations and kVA ratings.

5. Switchgear, switchboard, motor-control center, and panelboard designations.

D. Study Input Data: As described in "Power System Data" Article.

E. Short-Circuit Study Output: As specified in "Short Circuit Study Output" Paragraph in "Short-Circuit Study Report Contents" Article in Section 260572 "Overcurrent Protective Device Short-Circuit Study."

F. Protective Device Coordination Study:

1. Report recommended settings of protective devices, ready to be applied in the field. Use manufacturer's data sheets for recording the recommended setting of overcurrent protective devices when available.

a. Phase and Ground Relays:

1) Device tag.

2) Relay current transformer ratio and tap, time dial, and instantaneous pickup value.

3) Recommendations on improved relaying systems, if applicable.

b. Circuit Breakers:

1) Adjustable pickups and time delays (long time, short time, ground).

2) Adjustable time-current characteristic.

3) Adjustable instantaneous pickup.

4) Recommendations on improved trip systems, if applicable.

c. Fuses: Show current rating, voltage, and class.

G. Time-Current Coordination Curves: Determine settings of overcurrent protective devices to achieve selective coordination. Graphically illustrate that adequate time separation exists between devices installed in series, including power utility company's upstream devices. Prepare separate sets of curves for the switching schemes and for emergency periods where the power source is local generation. Show the following information:

1. Device tag and title, one-line diagram with legend identifying the portion of the system covered.

2. Terminate device characteristic curves at a point reflecting maximum symmetrical or asymmetrical fault current to which the device is exposed.

3. Identify the device associated with each curve by manufacturer type, function, and, if applicable, tap, time delay, and instantaneous settings recommended.

4. Plot the following listed characteristic curves, as applicable:

a. Power utility's overcurrent protective device.

b. Low-voltage fuses including manufacturer's minimum melt, total clearing, tolerance, and damage bands.

c. Low-voltage equipment circuit-breaker trip devices, including manufacturer's tolerance bands.

d. Transformer full-load current, magnetizing inrush current.

e. Ground-fault protective devices.

f. The largest feeder circuit breaker in each motor-control center and panelboard.

5. Provide adequate time margins between device characteristics such that selective operation is achieved.

6. Comments and recommendations for system improvements.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine Project overcurrent protective device submittals for compliance with electrical distribution system coordination requirements and other conditions affecting performance. Devices to be coordinated are indicated on Drawings.

1. Proceed with coordination study only after relevant equipment submittals have been assembled. Overcurrent protective devices that have not been submitted and approved prior to coordination study may not be used in study.

3.2 PROTECTIVE DEVICE COORDINATION STUDY

A. Comply with IEEE 242 for calculating short-circuit currents and determining coordination time intervals.

B. Comply with IEEE 399 for general study procedures.

C. The study shall be based on the device characteristics supplied by device manufacturer.

D. The extent of the electrical power system to be studied is indicated on Drawings.

E. Begin analysis at the service, extending down to the system overcurrent protective devices as follows:

1. To normal system low-voltage load buses where fault current is 10 kA or less.

F. Study electrical distribution system from normal and alternate power sources throughout electrical distribution system for Project. Study all cases of system-switching configurations and alternate operations that could result in maximum fault conditions.

G. The calculations shall include the ac fault-current decay from induction motors. The calculations shall also account for the fault-current dc decrement, to address the asymmetrical requirements of the interrupting equipment.

1. For grounded systems, provide a bolted line-to-ground fault-current study for areas as defined for the three-phase bolted fault short-circuit study.

H. Calculate short-circuit momentary and interrupting duties for a three-phase bolted fault and single line-to-ground fault at each of the following:

1. Electric utility's supply termination point.

2. Switchgear.

3. Low-voltage switchgear.

4. Branch circuit panelboards.

I. Protective Device Evaluation:

1. Evaluate equipment and protective devices and compare to short-circuit ratings.

2. Adequacy of switchgear, motor-control centers, and panelboard bus bars to withstand short-circuit stresses.

3.3 POWER SYSTEM DATA

A. Obtain all data necessary for the conduct of the overcurrent protective device study.

1. Verify completeness of data supplied in the one-line diagram on Drawings. Call discrepancies to the attention of Architect.

2. Use characteristics submitted under the provisions of action submittals and information submittals for this Project.

B. Gather and tabulate the following input data to support coordination study. The list below is a guide.

1. Product Data for overcurrent protective devices specified in other Sections and involved in overcurrent protective device coordination studies. Use equipment designation tags that are consistent with electrical distribution system diagrams, overcurrent protective device submittals, input and output data, and recommended device settings.

2. Electrical power utility impedance at the service.

3. Power sources and ties.

4. Short-circuit current at each system bus, three phase and line-to-ground.

5. Full-load current of all loads.

6. Voltage level at each bus.

7. For transformers, include kVA, primary and secondary voltages, connection type, impedance, X/R ratio, taps measured in percent, and phase shift.

8. For circuit breakers and fuses, provide manufacturer and model designation. List type of breaker, type of trip and available range of settings, SCCR, current rating, and breaker settings.

9. Maximum demands from service meters.

10. Busway manufacturer and model designation, current rating, impedance, lengths, and conductor material.

11. Motor horsepower and NEMA MG 1 code letter designation.

12. Low-voltage cable sizes, lengths, number, conductor material, and conduit material (magnetic or nonmagnetic).

13. Data sheets to supplement electrical distribution system diagram, cross-referenced with tag numbers on diagram, showing the following:

a. Special load considerations, including starting inrush currents and frequent starting and stopping.

b. Ratings, types, and settings of utility company's overcurrent protective devices.

c. Special overcurrent protective device settings or types stipulated by utility company.

d. Time-current-characteristic curves of devices indicated to be coordinated.

e. Manufacturer, frame size, interrupting rating in amperes rms symmetrical, ampere or current sensor rating, long-time adjustment range, short-time adjustment range, and instantaneous adjustment range for circuit breakers.

f. Manufacturer and type, ampere-tap adjustment range, time-delay adjustment range, instantaneous attachment adjustment range, and current transformer ratio for overcurrent relays.

g. Panelboards, switchboards, motor-control center ampacity, and SCCR in amperes rms symmetrical.

3.4 FIELD ADJUSTING

A. Adjust relay and protective device settings according to the recommended settings provided by the coordination study. Field adjustments shall be completed by the engineering service division of the equipment manufacturer under the Startup and Acceptance Testing contract portion.

B. Make minor modifications to equipment as required to accomplish compliance with short-circuit and protective device coordination studies.

C. Testing and adjusting shall be by a full-time employee of the Field Adjusting Agency, who holds NETA ETT Level III certification or NICET Electrical Power Testing Level III certification.

1. Perform each visual and mechanical inspection and electrical test stated in NETA Acceptance Testing Specification. Certify compliance with test parameters. Perform NETA tests and inspections for all adjustable overcurrent protective devices.

3.5 DEMONSTRATION

A. Engage the Coordination Study Specialist to train Owner's maintenance personnel in the following:

1. Acquaint personnel in the fundamentals of operating the power system in normal and emergency modes.

2. Hand-out and explain the objectives of the coordination study, study descriptions, purpose, basis, and scope. Include case descriptions, definition of terms, and guide for interpreting the time-current coordination curves.

3. Adjust, operate, and maintain overcurrent protective device settings.

END OF SECTION 260573.16

SECTION 260573.19 - ARC-FLASH HAZARD ANALYSIS

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes a computer-based, arc-flash study to determine the arc-flash hazard distance and the incident energy to which personnel could be exposed during work on or near electrical equipment.

1.2 ACTION SUBMITTALS

A. Product Data: For computer software program to be used for studies.

B. Study Submittals: Submit the following submittals after the approval of system protective devices submittals. Submittals shall be in digital form.

1. Arc-flash study input data, including completed computer program input data sheets.

2. Arc-flash study report; signed, dated, and sealed by a qualified professional engineer.

a. Submit study report for action prior to receiving final approval of the distribution equipment submittals. If formal completion of studies will cause delay in equipment manufacturing, obtain approval from Architect for preliminary submittal of sufficient study data to ensure that the selection of devices and associated characteristics is satisfactory.

1.3 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Arc-Flash Study Specialist.

B. Product Certificates: For arc-flash hazard analysis software, certifying compliance with IEEE 1584 and NFPA 70E.

1.4 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data:

1. Maintenance procedures according to requirements in NFPA 70E shall be provided in the equipment manuals.

2. Operation and Maintenance Procedures: In addition to items specified in Section 017823 "Operation and Maintenance Data," provide maintenance procedures for use by Owner's personnel that comply with requirements in NFPA 70E.

1.5 QUALITY ASSURANCE

A. Studies shall use computer programs that are distributed nationally and are in wide use. Software algorithms shall comply with requirements of standards and guides specified in this Section. Manual calculations are unacceptable.

B. Arc-Flash Study Software Developer Qualifications: An entity that owns and markets computer software used for studies, having performed successful studies of similar magnitude on electrical distribution systems using similar devices.

1. The computer program shall be developed under the charge of a licensed professional engineer who holds IEEE Computer Society's Certified Software Development Professional certification.

C. Arc-Flash Study Specialist Qualifications: Professional engineer in charge of performing the study, analyzing the arc flash, and documenting recommendations, licensed in the state where Project is located. All elements of the study shall be performed under the direct supervision and control of this professional engineer.

F. Arc-Flash Study Companies: The Study shall be performed by one of the following companies, as a sub-contractor to the bidding Electrical Contractor. Companies other than those listed will be Rejected for non-compliance: a) Utilities Instrumentation Services (UIS); b) Power Factor Engineering, LLC; c) Northern Electrical Testing; d) Schneider Electric (Square-D) (as part of the new distribution equipment); e) Eaton Power Systems (as part of the new distribution equipment); f) Siemens Power Systems (as part of the new distribution equipment).

G. Field Adjusting Agency Qualifications: An independent agency, with the experience and capability to adjust overcurrent devices and to conduct the testing indicated, that is a member company of the InterNational Electrical Testing Association or is a nationally recognized testing laboratory (NRTL) as defined by OSHA in 29 CFR 1910.7, and that is acceptable to authorities having jurisdiction.

PART 2 - PRODUCTS

2.1 SOFTWARE DEVELOPERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. EDSA Micro Corporation.

2. SKM Systems Analysis, Inc.

B. Comply with IEEE 1584 and NFPA 70E.

C. Analytical features of device coordination study computer software program shall have the capability to calculate mandatory features as listed in IEEE 399.

2.2 ARC-FLASH STUDY REPORT CONTENT

A. Executive summary.

B. Study descriptions, purpose, basis and scope.

C. One-line diagram, showing the following:

1. Protective device designations and ampere ratings.

2. Cable size and lengths.

3. Transformer kilovolt ampere (kVA) and voltage ratings.

4. Motor and generator designations and kVA ratings.

5. Switchgear, switchboard, motor-control center and panelboard designations.

D. Study Input Data: As described in "Power System Data" Article.

E. Short-Circuit Study Output: As specified in "Short-Circuit Study Output" Paragraph in "Short-Circuit Study Report Contents" Article in Section 260572 "Overcurrent Protective Device Short-Circuit Study."

F. Protective Device Coordination Study Report Contents: As specified in "Protective Device Coordination Study Report Contents" Article in Section 260573 "Overcurrent Protective Device Coordination Study."

G. Arc-Flash Study Output:

1. Interrupting Duty Report: Three-phase and unbalanced fault calculations, showing the following for each overcurrent device location:

a. Voltage.

b. Calculated symmetrical fault-current magnitude and angle.

c. Fault-point X/R ratio.

d. No AC Decrement (NACD) ratio.

e. Equivalent impedance.

f. Multiplying factors for 2-, 3-, 5-, and 8-cycle circuit breakers rated on a symmetrical basis.

g. Multiplying factors for 2-, 3-, 5-, and 8-cycle circuit breakers rated on a total basis.

H. Incident Energy and Flash Protection Boundary Calculations:

1. Arcing fault magnitude.

2. Protective device clearing time.

3. Duration of arc.

4. Arc-flash boundary.

5. Working distance.

6. Incident energy.

7. Hazard risk category.

8. Recommendations for arc-flash energy reduction.

I. Fault study input data, case descriptions, and fault-current calculations including a definition of terms and guide for interpretation of the computer printout.

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SEALED & SIGNED 05/16/2025; SEAL APPLIES ONLY TO THE ELECTRICAL DOCUMENTS PREPARED BY TAC ASSOCIATES, LLC

Drawing Name
Electrical Specifications

Drawn By
CAD

Checked By
TGC

Issue Date
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Revisions

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Project No.
P23005

Sheet Number
E5.02

Electrical Specifications (Continued)

SECTION 260573.19 - ARC-FLASH HAZARD ANALYSIS (Continued)

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine Project overcurrent protective device submittals. Proceed with arc-flash study only after relevant equipment submittals have been assembled. Overcurrent protective devices that have not been submitted and approved prior to arc-flash study may not be used in study.

3.2 ARC-FLASH HAZARD ANALYSIS

A. Comply with NFPA 70E and its Annex D for hazard analysis study.

B. Preparatory Studies:

1. Short-Circuit Study Output: As specified in "Short-Circuit Study Output" Paragraph in "Short-Circuit Study Report Contents" Article in Section 260572 "Overcurrent Protective Device Short-Circuit Study."

2. Protective Device Coordination Study Report Contents: As specified in "Protective Device Coordination Study Report Contents" Article in Section 260573 "Overcurrent Protective Device Coordination Study."

C. Calculate maximum and minimum contributions of fault-current size.

1. The minimum calculation shall assume that the utility contribution is at a minimum and shall assume no motor load.

2. The maximum calculation shall assume a maximum contribution from the utility and shall assume motors to be operating under full-load conditions.

D. Calculate the arc-flash protection boundary and incident energy at locations in the electrical distribution system where personnel could perform work on energized parts.

E. Include low-voltage equipment locations.

F. Safe working distances shall be specified for calculated fault locations based on the calculated arc-flash boundary, considering incident energy of 1.2 cal/sq.cm.

G. Incident energy calculations shall consider the accumulation of energy over time when performing arc-flash calculations on buses with multiple sources. Iterative calculations shall take into account the changing current contributions, as the sources are interrupted or decremented with time. Fault contribution from motors shall be decremented as follows:

1. Fault contribution from induction motors should not be considered beyond three to five cycles.

H. Arc-flash computation shall include both line and load side of a circuit breaker as follows:

1. When the circuit breaker is in a separate enclosure.

2. When the line terminals of the circuit breaker are separate from the work location.

I. Base arc-flash calculations on actual overcurrent protective device clearing time. Cap maximum clearing time at two seconds based on IEEE 1584, Section B.1.2.

3.3 POWER SYSTEM DATA

A. Obtain all data necessary for the conduct of the arc-flash hazard analysis.

1. Verify completeness of data supplied on the one-line diagram on Drawings and under "Preparatory Studies" Paragraph in "Arc-Flash Hazard Analysis" Article. Call discrepancies to the attention of Architect.

2. For new equipment, use characteristics submitted under the provisions of action submittals and information submittals for this Project.

B. Electrical Survey Data: Gather and tabulate the following input data to support study.

1. Product Data for overcurrent protective devices specified in other Sections and involved in overcurrent protective device coordination studies. Use equipment designation tags that are consistent with electrical distribution system diagrams, overcurrent protective device submittals, input and output data, and recommended device settings.

2. Obtain electrical power utility impedance at the service.

3. Power sources and ties.

4. For circuit breakers and fuses, provide manufacturer and model designation. List type of breaker, type of trip and available range of settings, SCCR, current rating, and breaker settings.

5. Busway manufacturer and model designation, current rating, impedance, lengths, and conductor material.

6. Motor horsepower and NEMA MG 1 code letter designation.

7. Low-voltage cable sizes, lengths, number, conductor material and conduit material (magnetic or nonmagnetic).

3.4 DEMONSTRATION

A. Engage the Arc-Flash Study Specialist to train Owner's maintenance personnel in the potential arc-flash hazards associated with working on energized equipment and the significance of the arc-flash warning labels.

END OF SECTION 260573.19

SECTION 262416 - PANELBOARDS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Distribution panelboards.

2. Lighting and appliance branch-circuit panelboards.

1.2 DEFINITIONS

A. MCCB: Molded-case circuit breaker.

B. SPD: Surge protective device.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of panelboard.

B. Shop Drawings: For each panelboard and related equipment.

1. Include dimensioned plans, elevations, sections, and details.

2. Detail enclosure types including mounting and anchorage, environmental protection, knockouts, corner treatments, covers and doors, gaskets, hinges, and locks.

3. Detail bus configuration, current, and voltage ratings.

4. Short-circuit current rating of panelboards and overcurrent protective devices.

5. Include evidence of NRTL listing for series rating of installed devices.

6. Include evidence of NRTL listing for SPD as installed in panelboard.

7. Detail features, characteristics, ratings, and factory settings of individual overcurrent protective devices and auxiliary components.

1.4 CLOSEOUT SUBMITTALS

A. Operation and maintenance data.

1.5 FIELD CONDITIONS

A. Service Conditions: NEMA PB 1, usual service conditions, as follows:

1. Ambient temperatures within limits specified.

2. Altitude not exceeding 6600 feet (2000 m).

1.6 WARRANTY

A. Manufacturer's Warranty: Manufacturer agrees to repair or replace panelboards that fail in materials or workmanship within specified warranty period.

1. Panelboard Warranty Period: 18 months from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PANELBOARDS COMMON REQUIREMENTS

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

B. Comply with NEMA PB 1.

C. Comply with NFPA 70.

D. Enclosures: Flush and Surface-mounted, dead-front cabinets.

1. Rated for environmental conditions at installed location.

a. Indoor Dry and Clean Locations: NEMA 250, Type 1.

b. Outdoor Locations: NEMA 250, Type 3R.

c. Other Wet or Damp Indoor Locations: NEMA 250, Type 4.

d. Indoor Locations Subject to Dust, Falling Dirt, and Dripping Noncorrosive Liquids: NEMA 250, Type 12.

2. Height: 84 inches (2.13 m) maximum.

3. Front: Secured to box with concealed trim clamps. For surface-mounted fronts, match box dimensions; for flush-mounted fronts, overlap box. Trims shall cover all live parts and shall have no exposed hardware.

4. Hinged Front Cover: Entire front trim hinged to box and with standard door within hinged trim cover. Trims shall cover all live parts and shall have no exposed hardware.

E. Incoming Mains Location: Convertible between top and bottom.

F. Phase, Neutral, and Ground Buses: Tin-plated aluminum.

G. Conductor Connectors: Suitable for use with conductor material and sizes.

1. Material: Hard-drawn copper, 98 percent conductivity.

2. Main and Neutral Lugs: Mechanical type, with a lug on the neutral bar for each pole in the panelboard.

3. Ground Lugs and Bus-Configured Terminators: Mechanical type, with a lug on the bar for each pole in the panelboard.

4. Feed-Through Lugs: Mechanical type, suitable for use with conductor material. Locate at opposite end of bus from incoming lugs or main device.

5. Subfeed (Double) Lugs: Mechanical type suitable for use with conductor material. Locate at same end of bus as incoming lugs or main device.

H. NRTL Label: Panelboards shall be labeled by an NRTL acceptable to authority having jurisdiction for use as service equipment with one or more main service disconnecting and overcurrent protective devices.

I. Future Devices: Panelboards shall have mounting brackets, bus connections, filler plates, and necessary appurtenances required for future installation of devices.

J. Panelboard Short-Circuit Current Rating: Fully rated to interrupt symmetrical short-circuit current available at terminals. Assembly listed by an NRTL for 100 percent interrupting capacity.

2.2 PERFORMANCE REQUIREMENTS

A. Surge Suppression: Factory installed as an integral part of indicated panelboards, complying with UL 1449 SPD Type 1.

2.3 POWER PANELBOARDS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Eaton.

2. General Electric Company; GE Energy Management - Electrical Distribution.

3. SIEMENS Industry, Inc.; Energy Management Division.

4. Square-D Company.

B. Panelboards: NEMA PB 1, distribution type.

C. Doors: Secured with vault-type latch with tumbler lock; keyed alike.

1. For doors more than 36 inches (914 mm) high, provide two latches, keyed alike.

D. Mains: As indicated on drawings.

E. Branch Overcurrent Protective Devices for Circuit-Breaker Frame Sizes 125 A and Smaller: Bolt-on circuit breakers.

F. Branch Overcurrent Protective Devices for Circuit-Breaker Frame Sizes Larger Than 125 A: Bolt-on circuit breakers.

2.4 LIGHTING AND APPLIANCE BRANCH-CIRCUIT PANELBOARDS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Eaton.

2. General Electric Company; GE Energy Management - Electrical Distribution.

3. SIEMENS Industry, Inc.; Energy Management Division.

4. Square-D Company.

B. Panelboards: NEMA PB 1, lighting and appliance branch-circuit type.

C. Mains: As indicated on drawings.

D. Branch Overcurrent Protective Devices: Bolt-on circuit breakers, replaceable without disturbing adjacent units.

E. Doors: Concealed hinges; secured with flush latch with tumbler lock; keyed alike.

2.5 ELECTRONIC-GRADE PANELBOARDS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Eaton.

2. General Electric Company; GE Energy Management - Electrical Distribution.

3. SIEMENS Industry, Inc.; Energy Management Division.

4. Square-D Company.

B. Panelboards: NEMA PB 1; with factory-installed, integral SPD; labeled by an NRTL for compliance with UL 67 and UL 1449 after installing SPD.

C. Doors: Secured with vault-type latch with tumbler lock; keyed alike.

D. Main Overcurrent Protective Devices: Bolt-on thermal-magnetic circuit breakers.

E. Branch Overcurrent Protective Devices: Bolt-on thermal-magnetic circuit breakers.

F. SPD.

1. Peak Surge Current Rating: The minimum single-pulse surge current withstand rating per phase shall not be less than 100 kA. The peak surge current rating shall be the arithmetic sum of the ratings of the individual MOVs in a given mode.

2. Protection modes and UL 1449 VPR for 208/120-V, three-phase, four-wire circuits shall not exceed the following:

a. Line to Neutral: 700 V.

b. Line to Ground: 700 V.

c. Neutral to Ground: 700 V.

d. Line to Line: 1200 V.

3. SCCR: Equal to the SCCR of the panelboard in which installed.

4. Nominal Rating: 20 kA.

G. Buses:

1. Copper phase and neutral buses; 200 percent capacity neutral bus and lugs.

2. Copper equipment and isolated ground buses.

2.6 DISCONNECTING AND OVERCURRENT PROTECTIVE DEVICES

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Eaton.

2. General Electric Company; GE Energy Management - Electrical Distribution.

3. SIEMENS Industry, Inc.; Energy Management Division.

4. Square-D Company.

B. MCCB: Comply with UL 489, with interrupting capacity to meet available fault currents.

1. Thermal-Magnetic Circuit Breakers:

a. Inverse time-current element for low-level overloads.

b. Instantaneous magnetic trip element for short circuits.

c. Adjustable magnetic trip setting for circuit-breaker frame sizes 250 A and larger.

2. Current-Limiting Circuit Breakers: Frame sizes 400 A and smaller; let-through ratings less than NEMA FU 1, RK-5.

3. GFCI Circuit Breakers: Single- and double-pole configurations with Class A ground-fault protection (6-mA trip).

4. Arc-Fault Circuit Interrupter Circuit Breakers: Comply with UL 1699; 120/240-V, single-pole configuration.

5. Subfeed Circuit Breakers: Vertically mounted.

6. MCCB Features and Accessories:

a. Standard frame sizes, trip ratings, and number of poles.

b. Breaker handle indicates tripped status.

c. UL listed for reverse connection without restrictive line or load ratings.

d. Lugs: Mechanical style, suitable for number, size, trip ratings, and conductor materials.

e. Application Listing: Appropriate for application; Type SWD for switching fluorescent lighting loads; Type HID for feeding fluorescent and HID lighting circuits.

f. Ground-Fault Protection: Integrally mounted relay and trip unit with adjustable pickup and time-delay settings, push-to-test feature, and ground-fault indicator.

g. Shunt Trip: 120-V trip coil energized from separate circuit, set to trip at 75 percent of rated voltage.

h. Handle Padlocking Device: Fixed attachment, for locking circuit-breaker handle in on or off position.

i. Handle Clamp: Loose attachment, for holding circuit-breaker handle in on position.

2.7 IDENTIFICATION

A. Panelboard Label: Manufacturer's name and trademark, voltage, amperage, number of phases, and number of poles shall be located on the interior of the panelboard door.

B. Breaker Labels: Faceplate shall list current rating, UL and IEC certification standards, and AIC rating.

C. Circuit Directory: Directory card inside panelboard door, mounted in metal frame with transparent protective cover.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Comply with NECA 1.

B. Install panelboards and accessories according to NEMA PB 1.1.

C. Mount top of trim 90 inches (2286 mm) above finished floor unless otherwise indicated. Adjust top elevation to ensure that operating handle of the highest overcurrent protective device does not exceed the maximum elevation noted in the NEC.

D. Mount panelboard cabinet plumb and rigid without distortion of box.

E. Mount recessed panelboards with fronts uniformly flush with wall finish and mating with back box.

F. Install overcurrent protective devices and controllers not already factory installed.

G. Make grounding connections and bond neutral for services and separately derived systems to ground. Make connections to grounding electrodes, separate grounds for isolated ground bars, and connections to separate ground bars.

H. Install filler plates in unused spaces.

I. Stub four 1-inch (27-EMT) empty conduits from panelboard into accessible ceiling space or space designated to be ceiling space in the future. Stub four 1-inch (27-EMT) empty conduits into raised floor space or below slab not on grade.

J. Arrange conductors in gutters into groups and bundle and wrap with wire ties.

3.2 IDENTIFICATION

A. Identify field-installed conductors, interconnecting wiring, and components; install warning signs complying with requirements in Section 260553 "Identification for Electrical Systems."

B. Create a directory to indicate installed circuit loads; incorporate Owner's final room designations. Obtain approval before installing. Handwritten directories are not acceptable. Install directory inside panelboard door.

C. Panelboard Nameplates: Label each panelboard with a nameplate complying with requirements for identification specified in Section 260553 "Identification for Electrical Systems."

D. Device Nameplates: Label each branch circuit device in power panelboards with a nameplate complying with requirements for identification specified in Section 260553 "Identification for Electrical Systems."

E. Install warning signs complying with requirements in Section 260553 "Identification for Electrical Systems" identifying source of remote circuit.

3.3 FIELD QUALITY CONTROL

A. Perform tests and inspections.

B. Acceptance Testing Preparation:

1. Test insulation resistance for each panelboard bus, component, connecting supply, feeder, and control circuit.

2. Test continuity of each circuit.

C. Panelboards will be considered defective if they do not pass tests and inspections.

D. Prepare test and inspection reports. Include notation of deficiencies detected, remedial action taken, and observations after remedial action.

END OF SECTION 262416

SECTION 262726 - WIRING DEVICES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Straight-blade convenience, tamper-resistant receptacles.

2. USB charger devices.

3. GFCI receptacles.

4. Toggle switches.

5. Wall switch sensor light switches with dual technology sensors.

6. Digital timer light switches.

7. Wall plates.

1.3 DEFINITIONS

A. Abbreviations of Manufacturers' Names:

1. Cooper: Cooper Wiring Devices; Division of Cooper Industries, Inc.

2. Hubbell: Hubbell Incorporated: Wiring Devices-Kellems.

3. Leviton: Leviton Mfg. Company, Inc.

4. Pass & Seymour: Pass& Seymour/Legrand.

B. BAS: Building automation system.

C. EMI: Electromagnetic interference.

D. GFCI: Ground-fault circuit interrupter.

E. Pigtail: Short lead used to connect a device to a branch-circuit conductor.

F. RFI: Radio-frequency interference.

G. SPD: Surge protective device.

H. UTP: Unshielded twisted pair.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings: List of legends and description of materials and process used for premarking wall plates.

1.5 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For wiring devices to include in all manufacturers' packing-label warnings and instruction manuals that include labeling conditions.

1.6 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Poke-Through, Fire-Rated Closure Plugs: One for every five floor service outlets installed, but no fewer than two.

PART 2 - PRODUCTS

2.1 GENERAL WIRING-DEVICE REQUIREMENTS

A. Wiring Devices, Components, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

B. Comply with NFPA 70.

C. Devices that are manufactured for use with modular plug-in connectors may be substituted under the following conditions:

1. Connectors shall comply with UL 2459 and shall be made with stranding building wire.

2. Devices shall comply with the requirements in this Section.

D. Devices for Owner-Furnished Equipment:

1. Receptacles: Match plug configurations.

2. Cord and Plug Sets: Match equipment requirements.

E. Source Limitations: Obtain each type of wiring device and associated wall plate from single source from single manufacturer.

2.2 STRAIGHT-BLADE RECEPTACLES

A. Duplex Convenience Receptacles: 125 V, 20 A; comply with NEMA WD 1, NEMA WD 6 Configuration 5-20R, UL 498, and FS W-C-596, Extra-Heavy-Duty Type.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Eaton (Arrow Hart).

b. Hubbell Incorporated; Wiring Device-Kellems.

c. Leviton Manufacturing Co., Inc.

d. Pass & Seymour/Legrand (Pass & Seymour).

B. Tamper-Resistant Convenience Receptacles: 125 V, 20 A; comply with NEMA WD 1, NEMA WD 6 Configuration 5-20R, UL 498, and FS W-C-596, Extra-Heavy-Duty Type.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Eaton (Arrow Hart).

b. Hubbell Incorporated; Wiring Device-Kellems.

c. Leviton Manufacturing Co., Inc.

d. Pass & Seymour/Legrand (Pass & Seymour).

2. Description: Labeled and complying with NFPA 70.

2.3 USB CHARGER DEVICES

A. Tamper-Resistant, USB Charger Receptacles: 125 V, 20 A; comply with NEMA WD 1, NEMA WD 6 Configuration 5-20R, UL 498, UL 1310, and FS W-C-596, Extra-Heavy-Duty Type.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Eaton (Arrow Hart).

b. Hubbell Incorporated; Wiring Device-Kellems.

c. Leviton Manufacturing Co., Inc.

d. Pass & Seymour/Legrand (Pass & Seymour).

2. Description: Single-piece, rivetless, nickel-plated, all-brass grounding system. Nickel-plated, brass mounting strap.

3. USB Receptacles: Dual, One (1) Type A and One (1) Type C.

4. Line Voltage Receptacles: Dual, two pole, three wire, and self-grounding.

2.4 GFCI RECEPTACLES

A. General Description:

1. 125 V, 20 A, straight blade, non-feed-through type.

2. Comply with NEMA WD 1, NEMA WD 6 Configuration 5-20R, UL 498, UL 943 Class A, and FS W-C-596.

3. Include indicator light that shows when the GFCI has malfunctioned and no longer provides proper GFCI protection.

4. Extra-Heavy-Duty Type.

B. Duplex GFCI Convenience Receptacles:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Eaton (Arrow Hart).

b. Hubbell Incorporated; Wiring Device-Kellems.

c. Leviton Manufacturing Co., Inc.

d. Pass & Seymour/Legrand (Pass & Seymour).

C. Tamper-Resistant, Duplex GFCI Convenience Receptacles, Extra-Heavy-Duty Type:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Hubbell Incorporated; Wiring Device-Kellems.

b. Pass & Seymour/Legrand (Pass & Seymour).

2.5 TOGGLE SWITCHES

A. Comply with NEMA WD 1, UL 20, and FS W-S-896.

B. Switches, 120/277 V, 20 A:

1. Single Pole:

a. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1) Eaton (Arrow Hart).

2) Hubbell Incorporated; Wiring Device-Kellems.

3) Leviton Manufacturing Co., Inc.

4) Pass & Seymour/Legrand (Pass & Seymour).

2. Three Way:

a. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1) Eaton (Arrow Hart).

2) Hubbell Incorporated; Wiring Device-Kellems.

3) Leviton Manufacturing Co., Inc.

4) Pass & Seymour/Legrand (Pass & Seymour).

3. Four Way:

a. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1) Eaton (Arrow Hart).

2) Hubbell Incorporated; Wiring Device-Kellems.

3) Leviton Manufacturing Co., Inc.

4) Pass & Seymour/Legrand (Pass & Seymour).

2.6 WALL SWITCH SENSOR LIGHT SWITCH, DUAL TECHNOLOGY

C. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Hubbell Incorporated; Wiring Device-Kellems.

2. Leviton Manufacturing Co., Inc.

3. Wattstopper.

B. Description: Switchbox-mounted, combination lighting-control sensor and conventional switch lighting-control unit using dual technology.

1. Connections: Provisions for connection to BAS.

2. Connections: Hard wired.

3. Connections: Wireless.

4. Rated 960 W at 120-V ac for tungsten lighting, 10 A at 120-V ac or 10 A at 277-V ac for fluorescent or LED lighting, and 1/4 hp at 120-V ac.

5. Integral relay for connection to BAS.

6. Adjustable time delay of 20 minutes.

7. Able to be locked to Manual-On mode.

8. Automatic Light-Level Sensor: Adjustable from 2 to 200 fc (21.5 to 2152 lux).

9. Comply with NEMA WD 1, UL 20, and FS W-S-896.

2.7 WALL PLATES

A. Single and combination types shall match corresponding wiring devices.

1. Plate-Securing Screws: Metal with head color to match plate finish.

2. Material for Finished Spaces: Smooth, high-impact thermoplastic, or as selected by Architect.

3. Material for Unfinished Spaces: Galvanized steel.

4. Material for Damp Locations: Cast aluminum with spring-loaded lift cover, and listed and labeled for use in wet and damp locations.

B. Wet-Location, Weatherproof Cover Plates: NEMA 250, complying with Type 3R, weather-resistant, die-cast aluminum with lockable cover.

2.8 FINISHES

A. Device Color:

1. Wiring Devices Connected to Normal Power System: To be selected by Architect prior to ordering of wiring devices.

2. Wiring Devices Connected to Isolated Ground Power System: Orange.

B. Wall Plate Color: For plastic covers, match device color.

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SEALED & SIGNED 05/16/2025; SEAL APPLIES ONLY TO THE ELECTRICAL DOCUMENTS PREPARED BY TAC ASSOCIATES, LLC

Drawing Name
Electrical Specifications

Drawn By
CAD

Checked By
TGC

Issue Date
05/16/2025 Permit & Bid Set

Revisions

Issued for	Date
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Project No.
P23005

Sheet Number
E5.03

Electrical Specifications (Continued)

SECTION 262726 - WIRING DEVICES (Continued)

PART 3 - EXECUTION

3.1 INSTALLATION

A. Comply with NECA 1, including mounting heights listed in that standard, unless otherwise indicated.

B. Coordination with Other Trades:

1. Protect installed devices and their boxes. Do not place wall finish materials over device boxes and do not cut holes for boxes with routers that are guided by riding against outside of boxes.
2. Keep outlet boxes free of plaster, drywall joint compound, mortar, cement, concrete, dust, paint, and other material that may contaminate the raceway system, conductors, and cables.
3. Install device boxes in brick or block walls so that the cover plate does not cross a joint unless the joint is troweled flush with the face of the wall.
4. Install wiring devices after all wall preparation, including painting, is complete.

C. Conductors:

1. Do not strip insulation from conductors until right before they are spliced or terminated on devices.
2. Strip insulation evenly around the conductor using tools designed for the purpose. Avoid scoring or nicking of solid wire or cutting strands from stranded wire.
3. The length of free conductors at outlets for devices shall meet provisions of NFPA 70, Article 300, without pigtails.
4. Existing Conductors:
   a. Cut back and pigtail, or replace all damaged conductors.
   b. Straighten conductors that remain and remove corrosion and foreign matter.
   c. Pigtailing existing conductors is permitted, provided the outlet box is large enough.

D. Device Installation:

1. Replace devices that have been in temporary use during construction and that were installed before building finishing operations were complete.
2. Keep each wiring device in its package or otherwise protected until it is time to connect conductors.
3. Do not remove surface protection, such as plastic film and smudge covers, until the last possible moment.
4. Connect devices to branch circuits using pigtails that are not less than 6 inches (152 mm) in length.
5. When there is a choice, use side wiring with binding-head screw terminals. Wrap solid conductor tightly clockwise, two-thirds to three-fourths of the way around terminal screw.
6. Use a torque screwdriver when a torque is recommended or required by manufacturer.
7. When conductors larger than No. 12 AWG are installed on 15- or 20-A circuits, splice No. 12 AWG pigtails for device connections.
8. Tighten unused terminal screws on the device.
9. When mounting into metal boxes, remove the fiber or plastic washers used to hold device-mounting screws in yokes, allowing metal-to-metal contact.

E. Receptacle Orientation:

1. Install ground pin of vertically mounted receptacles up, and on horizontally mounted receptacles to the right.
2. Install hospital-grade receptacles in patient-care areas with the ground pin or neutral blade at the top.

F. Device Plates: Do not use oversized or extra-deep plates. Repair wall finishes and remount outlet boxes when standard device plates do not fit flush or do not cover rough wall opening.

G. Dimmers:

1. Install dimmers within terms of their listing.
2. Verify that dimmers used for fan-speed control are listed for that application.
3. Install unshared neutral conductors on line and load side of dimmers according to manufacturers' device listing conditions in the written instructions.

H. Arrangement of Devices: Unless otherwise indicated, mount flush, with long dimension vertical and with grounding terminal of receptacles on top. Group adjacent switches under single, multigang wall plates.

3.2 GFCI RECEPTACLES

A. Install non-feed-through-type GFCI receptacles where protection of downstream receptacles is not required.

3.3 IDENTIFICATION

A. Comply with Section 260553 "Identification for Electrical Systems."

B. Identify each receptacle with panelboard identification and circuit number. Use hot, stamped, or engraved machine printing with black-filled lettering on face of plate, and durable wire markers or tags inside outlet boxes.

3.4 FIELD QUALITY CONTROL

A. Test Instruments: Use instruments that comply with UL 1436.

B. Tests for Convenience Receptacles:

1. Confirm receptacle energized.
2. Confirm receptacle properly wired, and grounded. Correct any receptacles found to have hot/neutral reversed, open ground or other wiring faults.

C. Wiring device will be considered defective if it does not pass tests and inspections.

D. Prepare test and inspection reports.

END OF SECTION 262726

SECTION 262816 - ENCLOSED SWITCHES AND CIRCUIT BREAKERS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Fusible switches.
2. Nonfusible switches.
3. Enclosures.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of enclosed switch, circuit breaker, accessory, and component indicated. Include nameplate ratings, dimensioned elevations, sections, weights, and manufacturers' technical data on features, performance, electrical characteristics, ratings, accessories, and finishes.

B. Shop Drawings: For enclosed switches and circuit breakers.

1. Include plans, elevations, sections, details, and attachments to other work.
2. Include wiring diagrams for power, signal, and control wiring.

1.3 INFORMATIONAL SUBMITTALS

A. Qualification Data: For qualified testing agency.

B. Field quality-control reports.

1.4 CLOSEOUT SUBMITTALS

A. Operation and maintenance data.

1.5 QUALITY ASSURANCE

A. Testing Agency Qualifications: Accredited by NETA.

1. Testing Agency's Field Supervisor: Currently certified by NETA to supervise on-site testing.

1.6 WARRANTY

A. Manufacturer's Warranty: Manufacturer and Installer agree to repair or replace components that fail in materials or workmanship within specified warranty period.

1. Warranty Period: One year(s) from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 GENERAL REQUIREMENTS

A. Source Limitations: Obtain enclosed switches and circuit breakers, overcurrent protective devices, components, and accessories, within same product category, from single manufacturer.

B. Product Selection for Restricted Space: Drawings indicate maximum dimensions for enclosed switches and circuit breakers, including clearances between enclosures, and adjacent surfaces and other items. Comply with indicated maximum dimensions.

C. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by an NRTL, and marked for intended location and application.

D. Comply with NFPA 70.

2.2 FUSIBLE SWITCHES

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. ABB Inc.
2. Eaton.
3. General Electric Company.
4. SIEMENS Industry, Inc.; Energy Management Division.
5. Square-D Company.

B. Type HD, Heavy Duty:

1. Single throw.
2. Three pole.
3. 240-V ac.
4. 1200 A and smaller.
5. UL 98 and NEMA KS 1, horsepower rated, with clips or bolt pads to accommodate specified fuses.
6. Lockable handle with capability to accept three padlocks, and interlocked with cover in closed position.

C. Accessories:

1. Equipment Ground Kit: Internally mounted and labeled for copper and aluminum ground conductors.
2. Neutral Kit: Internally mounted; insulated, capable of being grounded and bonded; labeled for copper and aluminum neutral conductors.
3. Isolated Ground Kit: Internally mounted; insulated, labeled for copper and aluminum neutral conductors.
4. Class R Fuse Kit: Provides rejection of other fuse types when Class R fuses are specified.
5. Service-Rated Switches: Labeled for use as service equipment.

2.3 NONFUSIBLE SWITCHES

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Eaton.
2. General Electric Company.
3. SIEMENS Industry, Inc.; Energy Management Division.
4. Square-D Company.

B. Type HD, Heavy Duty, Three Pole, Single Throw, 240-V ac, 1200 A and Smaller: UL 98 and NEMA KS 1, horsepower rated, lockable handle with capability to accept three padlocks, and interlocked with cover in closed position.

C. Accessories:

1. Equipment Ground Kit: Internally mounted and labeled for copper and aluminum ground conductors.
2. Neutral Kit: Internally mounted; insulated, capable of being grounded and bonded; labeled for copper and aluminum neutral conductors.
3. Isolated Ground Kit: Internally mounted; insulated, labeled for copper and aluminum neutral conductors.
4. Class R Fuse Kit: Provides rejection of other fuse types when Class R fuses are specified.
5. Service-Rated Switches: Labeled for use as service equipment.

2.4 ENCLOSURES

A. Enclosed Switches and Circuit Breakers: UL 489, NEMA KS 1, NEMA 250, and UL 50, to comply with environmental conditions at installed location.

B. Enclosure Finish: The enclosure shall be gray baked enamel paint, electrodeposited on cleaned, phosphatized steel (NEMA 250 Type 1).

C. Conduit Entry: NEMA 250 Types 4, 4X, and 12 enclosures shall contain no knockouts. NEMA 250 Types 7 and 9 enclosures shall be provided with threaded conduit openings in both endwalls.

D. Operating Mechanism: The circuit-breaker operating handle shall be externally operable with the operating mechanism being an integral part of the box, not the cover. The cover interlock mechanism shall have an externally operated override. The override shall not permanently disable the interlock mechanism, which shall return to the locked position once the override is released. The tool used to override the cover interlock mechanism shall not be required to enter the enclosure in order to override the interlock.

E. Enclosures designated as NEMA 250 Type 4, 4X stainless steel, 12, or 12K shall have a dual cover interlock mechanism to prevent unintentional opening of the enclosure cover when the circuit breaker is ON and to prevent turning the circuit breaker ON when the enclosure cover is open.

F. NEMA 250 Type 7/9 enclosures shall be furnished with a breather and drain kit to allow their use in outdoor and wet location applications.

PART 3 - EXECUTION

3.1 ENCLOSURE ENVIRONMENTAL RATING APPLICATIONS

A. Enclosed Switches and Circuit Breakers: Provide enclosures at installed locations with the following environmental ratings.

1. Indoor, Dry and Clean Locations: NEMA 250, Type 1.
2. Outdoor Locations: NEMA 250, Type 3R.
3. Other Wet or Damp, Indoor Locations: NEMA 250, Type 4.
4. Indoor Locations Subject to Dust, Falling Dirt, and Dripping Noncorrosive Liquids: NEMA 250, Type 12.
5. Hazardous Areas Indicated on Drawings: NEMA 250, Type 9 with cover attached by Type 316 stainless steel bolts.

3.2 INSTALLATION

A. Interruption of Existing Electric Service: Do not interrupt electric service to facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary electric service according to requirements indicated:

1. Notify Construction Manager no fewer than seven days in advance of proposed interruption of electric service.
2. Indicate method of providing temporary electric service.
3. Do not proceed with interruption of electric service without Construction Manager's written permission.
4. Comply with NFPA 70E.

B. Coordinate layout and installation of switches, circuit breakers, and components with equipment served and adjacent surfaces. Maintain required workspace clearances and required clearances for equipment access doors and panels.

C. Install individual wall-mounted switches and circuit breakers with tops at uniform height unless otherwise indicated.

D. Temporary Lifting Provisions: Remove temporary lifting of eyes, channels, and brackets and temporary blocking of moving parts from enclosures and components.

E. Install fuses in fusible devices.

F. Comply with NFPA 70 and NECA 1.

3.3 IDENTIFICATION

A. Comply with requirements in Section 260553 "Identification for Electrical Systems."

1. Identify field-installed conductors, interconnecting wiring, and components; provide warning signs.
2. Label each enclosure with engraved metal or laminated-plastic nameplate.

3.4 FIELD QUALITY CONTROL

A. Testing Agency: Engage a qualified testing agency to perform tests and inspections.

B. Perform tests and inspections.

C. Tests and Inspections for Switches:

1. Visual and Mechanical Inspection:
   a. Inspect physical and mechanical condition.
   b. Inspect anchorage, alignment, grounding, and clearances.
   c. Verify that the unit is clean.
   d. Verify blade alignment, blade penetration, travel stops, and mechanical operation.
   e. Verify that fuse sizes and types match the Specifications and Drawings.
   f. Verify that each fuse has adequate mechanical support and contact integrity.
   g. Inspect bolted electrical connections for high resistance using one of the two following methods:
      1) Use a low-resistance ohmmeter.
         a) Compare bolted connection resistance values to values of similar connections. Investigate values that deviate from those of similar bolted connections by more than 50 percent of the lowest value.
      2) Verify tightness of accessible bolted electrical connections by calibrated torque-wrench method in accordance with manufacturer's published data or NETA ATS Table 100.12.
         a) Bolt-torque levels shall be in accordance with manufacturer's published data. In the absence of manufacturer's published data, use NETA ATS Table 100.12.
   h. Verify that operation and sequencing of interlocking systems is as described in the Specifications and shown on the Drawings.
   i. Verify correct phase barrier installation.
   j. Verify lubrication of moving current-carrying parts and moving and sliding surfaces.
2. Electrical Tests:
   a. Perform resistance measurements through bolted connections with a low-resistance ohmmeter. Compare bolted connection resistance values to values of similar connections. Investigate values that deviate from adjacent poles or similar switches by more than 50 percent of the lowest value.
   b. Measure contact resistance across each switchblade fuseholder. Drop values shall not exceed the high level of the manufacturer's published data. If manufacturer's published data are not available, investigate values that deviate from adjacent poles or similar switches by more than 50 percent of the lowest value.
   c. Perform insulation-resistance tests for one minute on each pole, phase-to-phase and phase-to-ground with switch closed, and across each open pole. Apply voltage in accordance with manufacturer's published data. In the absence of manufacturer's published data, use Table 100.1 from the NETA ATS. Investigate values of insulation resistance less than those published in Table 100.1 or as recommended in manufacturer's published data.
   d. Measure fuse resistance. Investigate fuse-resistance values that deviate from each other by more than 15 percent.
   e. Perform ground fault test according to NETA ATS 7.14 "Ground Fault Protection Systems, Low-Voltage."

D. Enclosed switches and circuit breakers will be considered defective if they do not pass tests and inspections.

E. Prepare test and inspection reports.

1. Test procedures used.
2. Include identification of each enclosed switch and circuit breaker tested and describe test results.
3. List deficiencies detected, remedial action taken, and observations after remedial action.

END OF SECTION 262816

SECTION 262913.03 - MANUAL AND MAGNETIC MOTOR CONTROLLERS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Manual motor controllers.
2. Enclosures.
3. Accessories.
4. Identification.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

1.3 INFORMATIONAL SUBMITTALS

A. Field quality-control reports.

1.4 CLOSEOUT SUBMITTALS

A. Operation and maintenance data.

1.5 QUALITY ASSURANCE

A. Testing Agency Qualifications: Accredited by NETA.

1. Testing Agency's Field Supervisor: Certified by NETA to supervise on-site testing.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and use.

B. UL Compliance: Fabricate and label magnetic motor controllers to comply with UL 508 and UL 60947-4-1.

C. NEMA Compliance: Fabricate motor controllers to comply with ICS 2.

2.2 MANUAL MOTOR CONTROLLERS

A. Fractional Horsepower Manual Controllers (FHPMC): "Quick-make, quick-break" toggle or push-button action; marked to show whether unit is off, on, or tripped.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   a. Eaton.
   b. General Electric Company.
   c. Rockwell Automation, Inc.
   d. SIEMENS Industry, Inc.; Energy Management Division.
2. Configuration: Nonreversing.
3. Overload Relays: Inverse-time-current characteristics; NEMA ICS 2, Class 10 tripping characteristics; heaters matched to nameplate full-load current of actual protected motor; external reset push button; bimetallic type.
4. Pilot Light: Red.

2.3 COMBINATION FULL-VOLTAGE MAGNETIC MOTOR CONTROLLER

A. Description: Factory-assembled, combination full-voltage magnetic motor controller consisting of the controller described in this article, indicated disconnecting means, SCPD and OCPD, in a single enclosure.

B. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Eaton.
2. General Electric Company.
3. Rockwell Automation, Inc.
4. Siemens Industry, Inc., Energy Management Division.

C. Standard: Comply with NEMA ICS 2, general purpose, Class A.

D. Configuration: Nonreversing.

E. Contactor Coils: Pressure-encapsulated type.

1. Operating Voltage: Manufacturer's standard, unless indicated.

F. Control Power:

1. For on-board control power, obtain from line circuit or from integral CPT. The CPT shall have capacity to operate integral devices and remotely located pilot, indicating, and control devices.

G. Overload Relays:

1. Solid-State Overload Relay:
   a. Switch or dial selectable for motor-running overload protection.
   b. Sensors in each phase.
   c. Class 10/20 selectable tripping characteristic selected to protect motor against voltage and current unbalance and single phasing.

H. Class II ground-fault protection shall comply with UL 1053 to interrupt low-level ground faults. The ground-fault detection system shall include circuitry that will prevent the motor controller from tripping when the fault current exceeds the interrupting capacity of the controller. Equip with start and run delays to prevent nuisance trip on starting, and a trip indicator.

I. Fusible Disconnecting Means:

1. NEMA KS 1, heavy-duty, horsepower-rated, fusible switch with clips or bolt pads to accommodate indicated fuses.
2. Lockable Handle: Accepts three padlocks and interlocks with cover in closed position.

J. Nonfusible Disconnecting Means:

1. NEMA KS 1, heavy-duty, horsepower-rated, nonfusible switch.
2. Lockable Handle: Accepts three padlocks and interlocks with cover in closed position.

2.4 ENCLOSURES

A. Comply with NEMA 250, type designations as indicated on Drawings, complying with environmental conditions at installed location.

B. The construction of the enclosures shall comply with NEMA ICS 6.

2.5 IDENTIFICATION

A. Controller Nameplates: Laminated acrylic or melamine plastic signs, as described in Section 260553 "Identification for Electrical Systems," for each compartment, mounted with corrosion-resistant screws.

B. Arc-Flash Warning Labels:

1. Comply with requirements in Section 260573.19 "Arc-Flash Hazard Analysis." Produce a 3.5-by-5-inch (89-by-127-mm) self-adhesive equipment label for each work location included in the analysis.
2. Comply with requirements in Section 260553 "Identification for Electrical Systems." Produce a 3.5-by-5-inch (89-by-127-mm) self-adhesive equipment label for each work location included in the analysis. Labels shall be machine printed, with no field-applied markings.
   a. The label shall have an orange header with the wording, "WARNING, ARC-FLASH HAZARD," and shall include the following information taken directly from the arc-flash hazard analysis:
      1) Location designation.
      2) Nominal voltage.
      3) Flash protection boundary.
      4) Hazard risk category.
      5) Incident energy.
      6) Working distance.
      7) Engineering report number, revision number, and issue date.
   b. Labels shall be machine printed, with no field-applied markings.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Comply with NECA 1.

B. Wall-Mounted Controllers: Install magnetic controllers on walls with tops at uniform height indicated, and by bolting units to wall or mounting on lightweight structural-steel channels bolted to wall. For controllers not at walls, provide freestanding racks complying with Section 260529 "Hangers and Supports for Electrical Systems" unless otherwise indicated.

C. Maintain minimum clearances and workspace at equipment according to manufacturer's written instructions and NFPA 70.

D. Wiring within Enclosures: Bundle, lace, and train conductors to terminal points with no excess and without exceeding manufacturer's limitations on bending radii. Install lacing bars and distribution spools.

E. Setting of Overload Relays: Select and set overloads on the basis of full-load current rating as shown on motor nameplate. Adjust setting value for special motors as required by NFPA 70 for motors that are high-torque, high-efficiency, and so on.

3.2 IDENTIFICATION

A. Identify system components, wiring, cabling, and terminals. Comply with requirements for identification specified in Section 260553 "Identification for Electrical Systems."

3.3 FIELD QUALITY CONTROL

A. Perform tests and inspections.

B. Tests and Inspections:

1. Comply with the provisions of NFPA 708, "Testing and Test Methods" Chapter.
2. Visual and Mechanical Inspection
   a. Compare equipment nameplate data with drawings and specifications.
   b. Inspect physical and mechanical condition.
   c. Inspect anchorage, alignment, and grounding.
   d. Verify the unit is clean.
   e. Inspect contactors:
      1) Verify mechanical operation.
      2) Verify contact gap, wipe, alignment, and pressure are according to manufacturer's published data.
   f. Motor-Running Protection:
      1) Verify overload element rating is correct for its application.
      2) If motor-running protection is provided by fuses, verify correct fuse rating.
   g. Inspect bolted electrical connections for high resistance using one of the two following methods:
      1) Use a low-resistance ohmmeter. Compare bolted connection resistance values with values of similar connections. Investigate values that deviate from those of similar bolted connections by more than 50 percent of the lowest value.
      2) Verify tightness of accessible bolted electrical connections by calibrated torque-wrench method according to manufacturer's published data or NETA ATS Table 100.12. Bolt-torque levels shall be according to manufacturer's published data. In the absence of manufacturer's published data, use NETA ATS Table 100.12.
   h. Verify appropriate lubrication on moving current-carrying parts and on moving and sliding surfaces.

C. Motor controller will be considered defective if it does not pass tests and inspections.

D. Prepare test and inspection reports.

END OF SECTION 262913.03

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Electrical Specifications

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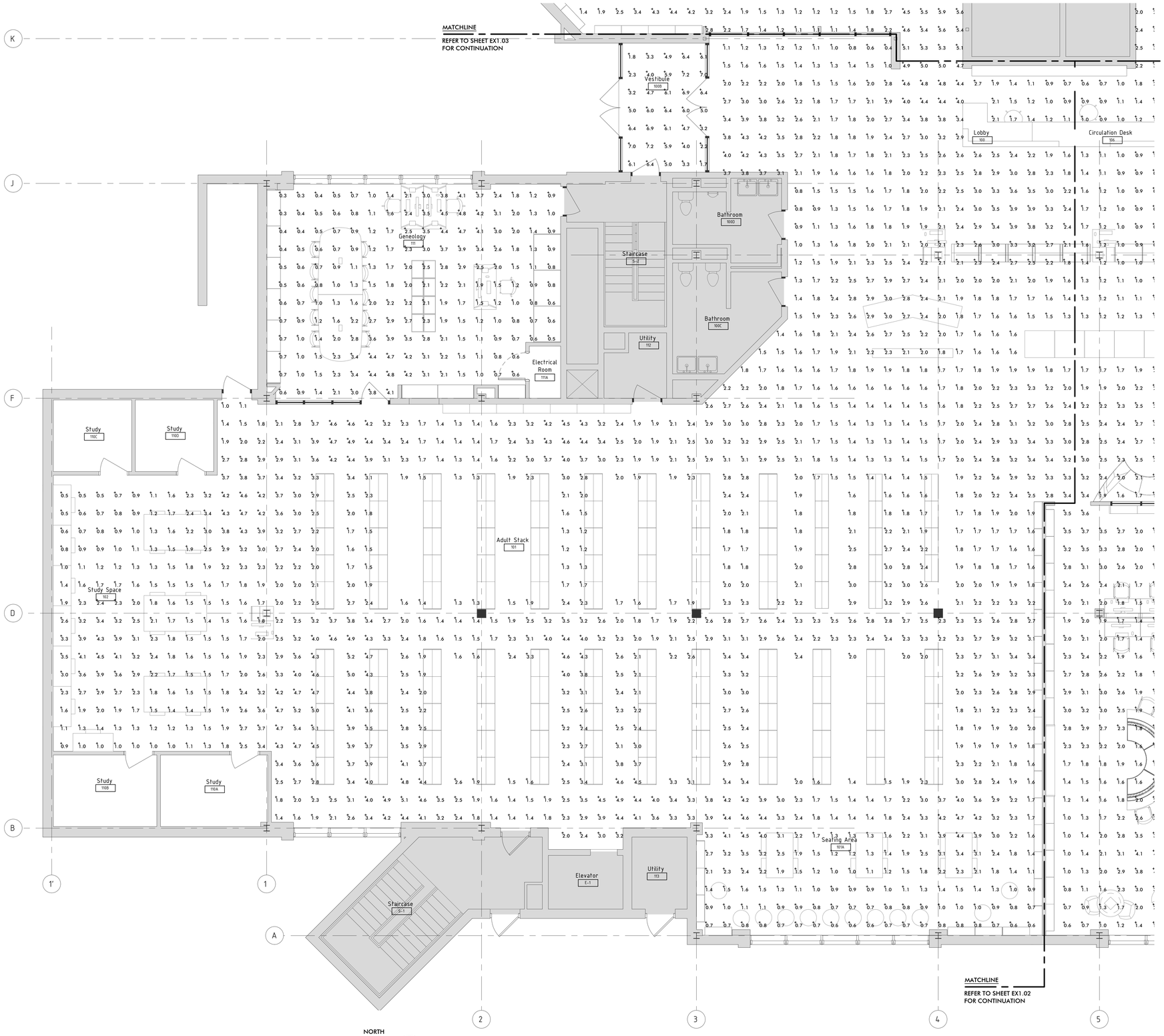

Emergency Egress Lighting Calculation Summary

Label	CalcType	Units	Avg	Max	Min	Avg/Min	Max/Min
Adult Program 109_Floor	Illuminance	Fc	2.30	5.4	0.4	5.75	13.50
Geneology 111_Floor	Illuminance	Fc	1.81	4.8	0.3	6.03	16.00
Maker Space 105_Floor	Illuminance	Fc	1.89	4.7	0.3	6.30	15.67
Open Area_Floor	Illuminance	Fc	2.27	5.9	0.3	7.57	19.67
Vestibule 100A_Floor	Illuminance	Fc	4.72	8.2	1.7	2.78	4.82
Vestibule 100B_Floor	Illuminance	Fc	5.16	7.2	1.7	3.04	4.24
Vestibule 104_Floor	Illuminance	Fc	3.58	4.9	1.9	1.88	2.58
Adult Stack 101	Illuminance	Fc	2.47	5.4	1.1	2.25	4.91
Adult Stack 107	Illuminance	Fc	2.91	5.9	0.9	3.23	6.56
Children 110	Illuminance	Fc	2.36	5.6	0.3	7.87	18.67
Circulation Desk 106	Illuminance	Fc	1.65	3.8	0.6	2.75	6.33
Lobby 100	Illuminance	Fc	2.36	5.3	0.4	5.90	13.25
Lounge 108	Illuminance	Fc	1.54	4.4	0.3	5.13	14.67
Maker Space 105	Illuminance	Fc	1.85	4.7	0.4	4.63	11.75
Seating Area 101A	Illuminance	Fc	1.79	4.7	0.6	2.98	7.83
Story Time 105A	Illuminance	Fc	1.93	4.6	0.3	6.43	15.33
Study Space 102	Illuminance	Fc	2.03	4.7	0.5	4.06	9.40
Teen 103	Illuminance	Fc	1.59	4.5	0.3	5.30	15.00

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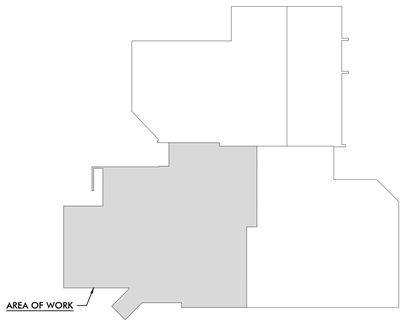
EX1.01

PARTIAL MAIN LEVEL FLOOR PLAN - EMERGENCY LIGHTING PHOTOMETRY

SCALE: 3/16" = 1'-0"



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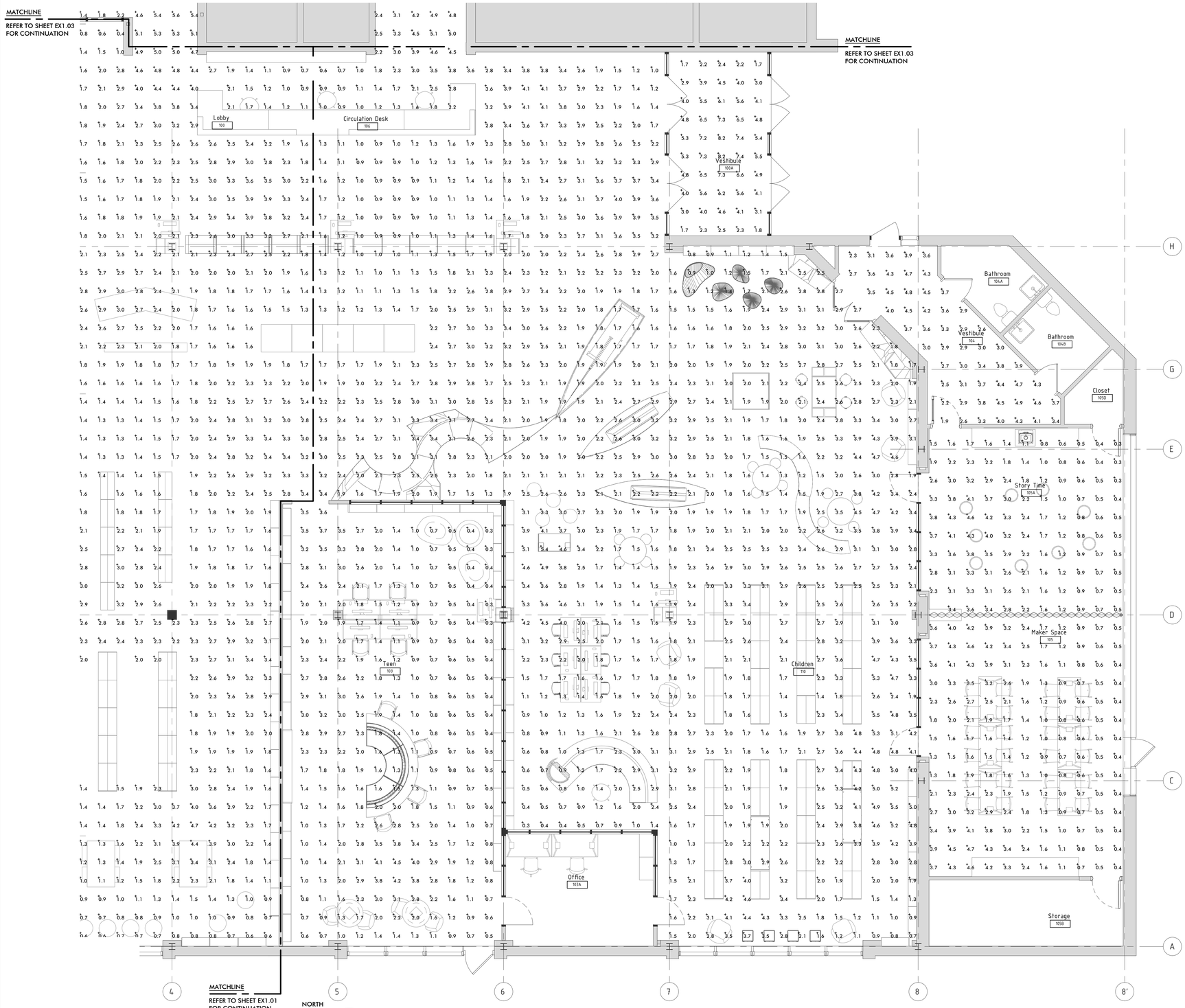


NORTH

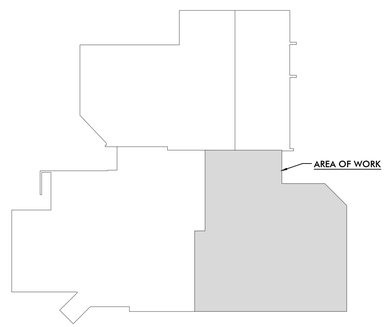
1 EX1.02

PARTIAL MAIN LEVEL FLOOR PLAN - EMERGENCY LIGHTING PHOTOMETRY

SCALE: 3/16" = 1'-0"

Emergency Egress Lighting Calculation Summary

Label	CalcType	Units	Avg	Max	Min	Avg/Min	Max/Min
Adult Program 109_Floor	Illuminance	Fc	2.30	5.4	0.4	5.75	13.50
Geneology 111_Floor	Illuminance	Fc	1.81	4.8	0.3	6.03	16.00
Maker Space 105_Floor	Illuminance	Fc	1.89	4.7	0.3	6.30	15.67
Open Area_Floor	Illuminance	Fc	2.27	5.9	0.3	7.57	19.67
Vestibule 100A_Floor	Illuminance	Fc	4.72	8.2	1.7	2.78	4.82
Vestibule 100B_Floor	Illuminance	Fc	5.16	7.2	1.7	3.04	4.24
Vestibule 104_Floor	Illuminance	Fc	3.58	4.9	1.9	1.88	2.58
Adult Stack 101	Illuminance	Fc	2.47	5.4	1.1	2.25	4.91
Adult Stack 107	Illuminance	Fc	2.91	5.9	0.9	3.23	6.56
Children 110	Illuminance	Fc	2.36	5.6	0.3	7.87	18.67
Circulation Desk 106	Illuminance	Fc	1.65	3.8	0.6	2.75	6.33
Lobby 100	Illuminance	Fc	2.36	5.3	0.4	5.90	13.25
Lounge 108	Illuminance	Fc	1.54	4.4	0.3	5.13	14.67
Maker Space 105	Illuminance	Fc	1.85	4.7	0.4	4.63	11.75
Seating Area 101A	Illuminance	Fc	1.79	4.7	0.6	2.98	7.83
Story Time 105A	Illuminance	Fc	1.93	4.6	0.3	6.43	15.33
Study Space 102	Illuminance	Fc	2.03	4.7	0.5	4.06	9.40
Teen 103	Illuminance	Fc	1.59	4.5	0.3	5.30	15.00



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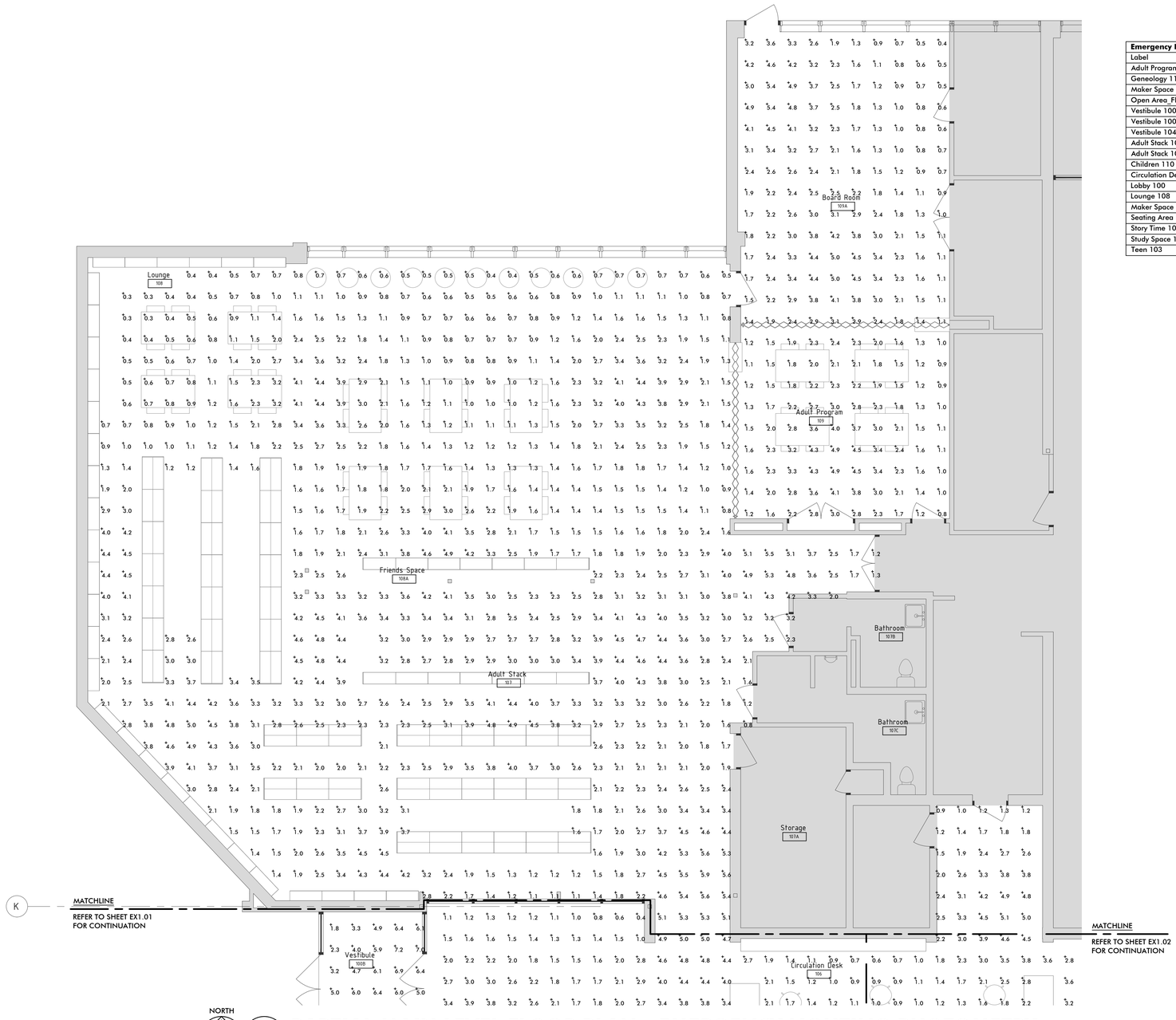

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EX1.03

PARTIAL MAIN LEVEL FLOOR PLAN - EMERGENCY LIGHTING PHOTOMETRY

SCALE: 3/16" = 1'-0"

Emergency Egress Lighting Calculation Summary

Label	CalcType	Units	Avg	Max	Min	Avg/Min	Max/Min
Adult Program 109_Floor	Illuminance	Fc	2.30	5.4	0.4	5.75	13.50
Geneology 111_Floor	Illuminance	Fc	1.81	4.8	0.3	6.03	16.00
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Maker Space 105	Illuminance	Fc	1.85	4.7	0.4	4.63	11.75
Seating Area 101A	Illuminance	Fc	1.79	4.7	0.6	2.98	7.83
Story Time 105A	Illuminance	Fc	1.93	4.6	0.3	6.43	15.33
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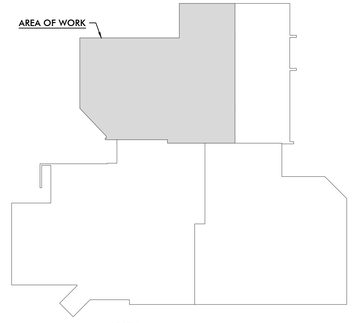

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SECTION 21 11 00 - FIRE SUPPRESSION SYSTEM

2.01 PIPE AND FITTINGS
B. STANDARD-WEIGHT BLACK STEEL PIPE AND FITTINGS
1. THREADED-END, STANDARD-WEIGHT STEEL PIPE: ASTM A 53/A 53M, ASTM A 135, OR ASTM A 795, WITH FACTORY- OR FIELD-FORMED THREADED ENDS, AND WITH FACTORY APPLIED ANTIMICROBIAL COATING ON INNER WALL OF PIPE.
a. CAST-IRON THREADED FLANGES: ASME B16.1.
b. MALLEABLE-IRON THREADED FITTINGS: ASME B16.3.
c. GRAY-IRON THREADED FITTINGS: ASME B16.4.
d. STEEL THREADED PIPE NIPPLES: ASTM A 733, MADE OF ASTM A 53/A 53M OR ASTM A 106, SCHEDULE 40, SEAMLESS STEEL PIPE. INCLUDE ENDS MATCHING JOINING METHOD.
e. STEEL THREADED COUPLINGS: ASTM A 865.
2. PLAIN-END, STANDARD-WEIGHT STEEL PIPE: ASTM A 53/A 53M, ASTM A 135, OR ASTM A 795, AND WITH FACTORY APPLIED ANTIMICROBIAL COATING ON INNER WALL OF PIPE.
a. STEEL WELDING FITTINGS: ASTM A 234/A 234M, AND ASME B16.9 OR ASME B16.11.
b. STEEL FLANGES AND FLANGED FITTINGS: ASME B16.5.
3. GROOVED-END, STANDARD-WEIGHT STEEL PIPE: ASTM A 53/A 53M, ASTM A 135, OR ASTM A 795, WITH FACTORY- OR FIELD-FORMED, SQUARE-CUT- OR ROLL- GROOVED ENDS, AND WITH FACTORY APPLIED ANTIMICROBIAL COATING ON INNER WALL OF PIPE.
a. APPROVED MANUFACTURES: ANVIL INTERNATIONAL, INC., TYCO FIRE & BUILDING PRODUCTS; GRINNELL MECHANICAL PRODUCTS, VICTAULIC CO. OF AMERICA
b. GROOVED-END FITTINGS: UL-LISTED, ASTM A 536, DUCTILE-IRON CASTING WITH OD MATCHING STEEL-PIPE OD.
c. GROOVED-END-PIPE COUPLINGS: UL 213 AND AWWA C606, RIGID PATTERN, UNLESS OTHERWISE INDICATED; GASKETED FITTING MATCHING STEEL-PIPE OD. INCLUDE DUCTILE-IRON HOUSING WITH KEYS MATCHING STEEL-PIPE AND FITTING GROOVES, PRELUBRICATED RUBBER GASKET LISTED FOR USE WITH HOUSING, AND STEEL BOLTS AND NUTS.
C. SCHEDULE 10 BLACK STEEL PIPE AND FITTINGS
1. PLAIN-END, SCHEDULE 10 STEEL PIPE: ASTM A 135 OR ASTM A 795, SCHEDULE 10 IN NPS 5 (DN 125) AND SMALLER; AND NFPA 13 SPECIFIED WALL THICKNESS IN NPS 6 TO NPS 10 (DN 150 TO DN 250), AND WITH FACTORY APPLIED ANTIMICROBIAL COATING ON INNER WALL OF PIPE.
a. STEEL WELDING FITTINGS: ASTM A 234/A 234M, AND ASME B16.9 OR ASME B16.11.
b. STEEL FLANGES AND FLANGED FITTINGS: ASME B16.5.
2. GROOVED-END, SCHEDULE 10 STEEL PIPE: ASTM A 135 OR ASTM A 795, SCHEDULE 10 IN NPS 5 (DN 125) AND SMALLER; AND NFPA 13-SPECIFIED WALL THICKNESS IN NPS 6 TO NPS 10 (DN 150 TO DN 250); WITH FACTORY- OR FIELD-FORMED, ROLL-GROOVED ENDS, AND WITH FACTORY APPLIED ANTIMICROBIAL COATING ON INNER WALL OF PIPE.
A. APPROVED MANUFACTURES: ANVIL INTERNATIONAL, INC., TYCO FIRE & BUILDING PRODUCTS; GRINNELL MECHANICAL PRODUCTS, VICTAULIC CO. OF AMERICA
B. GROOVED-END FITTINGS: UL-LISTED, ASTM A 536, DUCTILE-IRON CASTING WITH OD MATCHING STEEL-PIPE OD.
C. GROOVED-END-PIPE COUPLINGS: UL 213 AND AWWA C606, RIGID PATTERN, UNLESS OTHERWISE INDICATED; GASKETED FITTING MATCHING STEEL-PIPE OD. INCLUDE DUCTILE-IRON HOUSING WITH KEYS MATCHING STEEL-PIPE AND FITTING GROOVES, PRELUBRICATED RUBBER GASKET LISTED FOR USE WITH HOUSING, AND STEEL BOLTS AND NUTS.

2.03 SPRINKLER SPECIALTY FITTINGS
A. SPRINKLER SPECIALTY FITTINGS SHALL BE UL LISTED OR FMG APPROVED, WITH 175-PSIG MINIMUM WORKING-PRESSURE RATING, AND MADE OF MATERIALS COMPATIBLE WITH PIPING. SPRINKLER SPECIALTY FITTINGS SHALL HAVE 300-PSIG MINIMUM WORKING-PRESSURE RATING IF FITTINGS ARE COMPONENTS OF HIGH-PRESSURE PIPING SYSTEM.
B. DROP-NIPPLE FITTINGS: UL 1474, ADJUSTABLE WITH THREADED INLET AND OUTLET, AND SEALS.
1. APPROVED MANUFACTURERS: CECA, LLC. AND MERIT.
C. FLEXIBLE SPRINKLER DROP FITTINGS
1. APPROVED MANUFACTURERS: VICTAULIC CO. OF AMERICA; AQUAFLEX SPRINKLER FITTINGS; AH-2 WITH AB1 BRACKET ASSEMBLY OR FLEXHEAD INDUSTRIES, INC.
2. DESCRIPTION: UL LISTED AND FMG APPROVED FLEXIBLE HOSE FOR CONNECTION TO SPRINKLER, AND WITH BRACKET FOR CONNECTION TO COMMERCIAL CEILING GRID.
3. STANDARD: UL 2443.
4. PRESSURE RATING: 175 PSIG
5. SIZE: SAME AS CONNECTED PIPING, FOR SPRINKLER.
6. DRY-PIPE-SYSTEM FITTINGS: UL LISTED FOR DRY-PIPE SERVICE.

2.04 LISTED FIRE-PROTECTION VALVES
A. VALVES SHALL BE UL LISTED OR FMG APPROVED, WITH 175-PSIG (1200 KPA) MINIMUM PRESSURE RATING. VALVES SHALL HAVE 300-PSIG PRESSURE RATING IF VALVES ARE COMPONENTS OF HIGH-PRESSURE PIPING SYSTEM.
B. BALL VALVES: COMPLY WITH UL 1091, EXCEPT WITH BALL INSTEAD OF DISC.
1. APPROVED MANUFACTURERS: NIBCO., VICTAULIC CO. OF AMERICA, MUELLER COMPANY, TYCO FIRE AND BUILDING PRODUCTS
2. NPS 1-1/2 AND SMALLER: BRONZE BODY WITH THREADED ENDS.
3. NPS 2 AND NPS 2-1/2 : BRONZE BODY WITH THREADED ENDS OR DUCTILE-IRON BODY WITH GROOVED ENDS.
4. NPS 3 : DUCTILE-IRON BODY WITH GROOVED ENDS.
C. BUTTERFLY VALVES: UL 1091.
1. APPROVED MANUFACTURERS: NIBCO., VICTAULIC CO. OF AMERICA, MUELLER COMPANY, TYCO FIRE AND BUILDING PRODUCTS
2. NPS 2-1/2 AND LARGER: BRONZE, CAST-IRON, OR DUCTILE-IRON BODY; WAFER TYPE OR WITH FLANGED OR GROOVED ENDS.
D. CHECK VALVES NPS 2 AND LARGER: UL 312, SWING TYPE, CAST-IRON BODY WITH FLANGED OR GROOVED ENDS.
1. APPROVED MANUFACTURERS: NIBCO., VICTAULIC CO. OF AMERICA, MUELLER COMPANY, TYCO FIRE AND BUILDING PRODUCTS, WATTS

2.11 SPRINKLERS
A. SPRINKLERS SHALL BE UL LISTED OR FMG APPROVED, WITH 175-PSIG MINIMUM PRESSURE RATING. SPRINKLERS SHALL HAVE 300-PSIG PRESSURE RATING IF SPRINKLERS ARE COMPONENTS OF HIGH-PRESSURE PIPING SYSTEM.
B. APPROVED MANUFACTURERS: RELIABLE AUTOMATIC SPRINKLER CO., INC., TYCO FIRE & BUILDING PRODUCTS., VICTAULIC CO. OF AMERICA., VIKING CORP.
C. AUTOMATIC SPRINKLERS WITH HEAT-RESPONSIVE GLASS BULB ELEMENT COMPLYING WITH THE FOLLOWING:
1. UL 199, FOR NONRESIDENTIAL APPLICATIONS.
2. UL 1626, FOR RESIDENTIAL APPLICATIONS.
3. UL 1767, FOR EARLY-SUPPRESSION, FAST-RESPONSE APPLICATIONS.
D. OPEN SPRINKLERS: UL 199, WITHOUT HEAT-RESPONSIVE ELEMENT.
1. ORIFICE: 1/2 INCH, WITH DISCHARGE COEFFICIENT K BETWEEN 5.3 AND 5.8.
2. ORIFICE: 17/32 INCH, WITH DISCHARGE COEFFICIENT K BETWEEN 7.4 AND 8.2.
E. SPRINKLER TYPES AND CATEGORIES: NOMINAL 1/2-INCH ORIFICE FOR 165 DEG F "ORDINARY", 212 DEG F “INTERMEDIATE”, 286 DEG F “HIGH” TEMPERATURE CLASSIFICATION RATING, UNLESS OTHERWISE INDICATED OR REQUIRED BY APPLICATION.
F. SPRINKLER TYPES, FEATURES, AND OPTIONS AS FOLLOWS: CONCEALED CEILING SPRINKLERS, INCLUDING COVER PLATE; EXTENDED-COVERAGE SPRINKLERS; FLUSH CEILING SPRINKLERS, INCLUDING ESCUTCHEON; HIGH-PRESSURE SPRINKLERS; OPEN SPRINKLERS; PENDENT SPRINKLERS; PENDENT, DRY-TYPE SPRINKLERS; QUICK-RESPONSE SPRINKLERS; RECESSED SPRINKLERS, INCLUDING ESCUTCHEON; SIDEWALL SPRINKLERS; SIDEWALL, DRY-TYPE SPRINKLERS; UPRIGHT SPRINKLERS.
G. SPRINKLER FINISHES: CHROME PLATED, BRONZE, AND PAINTED. COORDINATE WITH ARCHITECT/EXISTING SPRINKLERS.
H. SPRINKLER ESCUTCHEONS: MATERIALS, TYPES, AND FINISHES FOR THE FOLLOWING SPRINKLER MOUNTING APPLICATIONS. ESCUTCHEONS FOR CONCEALED, FLUSH, AND RECESSED-TYPE SPRINKLERS ARE SPECIFIED WITH SPRINKLERS. ESCUTCHEONS LISTED, SUPPLIED, AND APPROVED FOR USE WITH THE SPRINKLER BY THE SPRINKLER MANUFACTURER.
1. CEILING MOUNTING: CHROME-PLATED STEEL, 2 PIECE, WITH 3/4-INCH VERTICAL ADJUSTMENT.
2. SIDEWALL MOUNTING: CHROME-PLATED STEEL, ONE PIECE, FLAT.
I. SPRINKLER GUARDS: WIRE-CAGE TYPE, INCLUDING FASTENING DEVICE FOR ATTACHING TO SPRINKLER. SPRINKLER GUARDS LISTED, SUPPLIED, AND APPROVED FOR USE WITH THE SPRINKLER BY THE SPRINKLER MANUFACTURER.

3.02 PIPING AND VALVE INSTALLATION
A. INSTALL SUPPRESSION SYSTEM IN ACCORDANCE WITH NFPA 13 OR 13R AND AUTHORITIES HAVING JURISDICTION.
B. INSTALL STANDPIPES AND HOSE SYSTEMS IN ACCORDANCE WITH NFPA 14 AND AUTHORITIES HAVING JURISDICTION.

3.02 SPRINKLER APPLICATIONS
A. USE THE FOLLOWING SPRINKLER TYPES:
1. ROOMS WITHOUT CEILINGS: UPRIGHT SPRINKLERS.
2. ROOMS WITH SUSPENDED CEILINGS: PENDENT, RECESSED, FLUSH, AND CONCEALED SPRINKLERS, AS INDICATED.
3. WALL MOUNTING: SIDEWALL SPRINKLERS.
4. SPACES SUBJECT TO FREEZING: UPRIGHT, PENDENT, DRY SPRINKLERS; AND SIDEWALL, DRY SPRINKLERS AS INDICATED.
5. SPECIAL APPLICATIONS: EXTENDED-COVERAGE, AND QUICK-RESPONSE SPRINKLERS WHERE INDICATED.
B. SPRINKLER FINISHES:
1. UPRIGHT, PENDENT, AND SIDEWALL SPRINKLERS: CHROME PLATED IN FINISHED SPACES EXPOSED TO VIEW; ROUGH BRONZE IN UNFINISHED SPACES NOT EXPOSED TO VIEW; WAX COATED WHERE EXPOSED TO ACIDS, CHEMICALS, OR OTHER CORROSIVE FUMES; WHITE POLYESTER FINISH IN NATATORIUMS.
2. CONCEALED SPRINKLERS: ROUGH BRASS, WITH FACTORY-PAINTED WHITE COVER PLATE.
3. FLUSH SPRINKLERS: BRIGHT CHROME, WITH PAINTED WHITE ESCUTCHEON.
4. RECESSED SPRINKLERS: BRIGHT CHROME, WITH BRIGHT CHROME ESCUTCHEON.
5. RESIDENTIAL SPRINKLERS: DULL CHROME.
6. SPRINKLER GUARDS: FOR EXPOSED SPRINKLER HEADS SUBJECT TO DAMAGE.

SECTION 22 34 00 FUEL-FIRED WATER HEATERS

2.03 EXPANSION TANKS
A. APPROVED MANUFACTURERS: AMTROL INC., ARMSTRONG PUMPS, BELL & GOSSETT, TACO
B. STEEL, PRESSURE-RATED TANK, ASME-CODE CONSTRUCTED WITH WELDED JOINTS AND FACTORY-INSTALLED, BUTYL-RUBBER DIAPHRAGM. INCLUDE AIR PRECHARGE TO MINIMUM SYSTEM-OPERATING PRESSURE AT TANK. FACTORY-FABRICATED STEEL TAPS WELDED TO TANK BEFORE TESTING AND LABELING. INCLUDE ASME B1.20.1 PIPE THREAD. INTERIOR FINISH SHALL COMPLY WITH NSF 61 BARRIER MATERIALS FOR POTABLE-WATER TANK LININGS, INCLUDING EXTENDING FINISH INTO AND THROUGH TANK FITTINGS AND OUTLETS. PROVIDE AIR CHARGING VALVE.
C. CONTRACTOR SHALL ADJUST THE PNEUMATIC PRESSURE INTERNAL TO EXPANSION TANK PRIOR TO SYSTEM CONNECTION. TANK PRESSURE SHALL MATCH SYSTEM PRESSURE.

SECTION 22 42 00 PLUMBING FIXTURES

1.01 GENERAL
A. OBTAIN PLUMBING FIXTURES, FAUCETS, AND OTHER COMPONENTS OF EACH CATEGORY THROUGH ONE SOURCE FROM A SINGLE MANUFACTURER. IF FIXTURES, FAUCETS, OR OTHER COMPONENTS ARE NOT AVAILABLE FROM A SINGLE MANUFACTURER, OBTAIN SIMILAR PRODUCTS FROM OTHER MANUFACTURERS SPECIFIED FOR THAT CATEGORY.
B. ELECTRICAL COMPONENTS, DEVICES, AND ACCESSORIES: LISTED AND LABELED AS DEFINED IN NFPA 70, ARTICLE 100, BY AN NRTL ACCEPTABLE TO AUTHORITIES HAVING JURISDICTION, AND MARKED FOR INTENDED USE.
C. FIXTURES WITH ADA NOTED SHALL COMPLY WITH REQUIREMENTS IN ICC A117.1, "ACCESSIBLE AND USABLE BUILDINGS AND FACILITIES"; PUBLIC LAW 90-480, "ARCHITECTURAL BARRIERS ACT"; AND PUBLIC LAW 101-336, "AMERICANS WITH DISABILITIES ACT"; FOR PLUMBING FIXTURES FOR PEOPLE WITH DISABILITIES.
D. COMPLY WITH REQUIREMENTS IN PUBLIC LAW 102-486, "ENERGY POLICY ACT," ABOUT WATER FLOW AND CONSUMPTION RATES FOR PLUMBING FIXTURES.
E. COMPLY WITH REQUIREMENTS IN PUBLIC LAW 111-380, "REDUCTION OF LEAD IN DRINKING WATER ACT," ABOUT LEAD CONTENT IN MATERIALS THAT WILL BE IN CONTACT WITH POTABLE WATER FOR HUMAN CONSUMPTION.
F. COMPLY WITH NSF 61, "DRINKING WATER SYSTEM COMPONENTS - HEALTH EFFECTS; SECTIONS 1 THROUGH 9," AND NSF 372 DRINKING WATER SYSTEM COMPONENTS – LEAD CONTENT FOR POTABLE DOMESTIC WATER PIPING AND COMPONENTS.
G. SELECT COMBINATIONS OF FIXTURES AND TRIM, FAUCETS, FITTINGS, AND OTHER COMPONENTS THAT ARE COMPATIBLE.
H. COMPLY WITH APPLICABLE ANSI, ASME, ASSE, ASTM, ICC, NSF, AND UL STANDARDS AND OTHER REQUIREMENTS SPECIFIED FOR PLUMBING FIXTURES, TRIM, FITTINGS, COMPONENTS, AND FEATURES.
I. REFER TO PLUMBING FIXTURE SCHEDULES FOR BASIS OF DESIGN AND REQUIREMENTS.

2.01 PLUMBING FIXTURES
A. APPROVED LAVATORY MANUFACTURES: AMERICAN STANDARD, KOHLER, SLOAN, AND ZURN
B. APPROVED LAVATORY FAUCET MANUFACTURES: AMERICAN STANDARD, MOEN, DELTA, SPEAKMAN, KOHLER, SLOAN, T&S BRASS AND BRONZE WORKS, AND ZURN
C. APPROVED SINK MANUFACTURES: ELKAY, JUST MFG., KOHLER, AND MOEN,
D. APPROVED SINK FAUCET MANUFACTURES: AMERICAN STANDARD, MOEN, DELTA, SPEAKMAN, KOHLER, CHICAGO FAUCET, T&S BRASS AND BRONZE WORKS, AND ZURN
E. APPROVED SERVICE SINK MANUFACTURES: AMERICAN STANDARD, KOHLER, AND ZURN
F. APPROVED SERVICE SINK FAUCET MANUFACTURES: AMERICAN STANDARD, KOHLER, T&S BRASS AND BRONZE WORKS, AND ZURN
G. APPROVED ELECTRIC WATER COOLER MANUFACTURES: ELKAY AND FILTRINE
H. APPROVED DISPOSER MANUFACTURES: AMERICAN STANDARD, MAYTAG, IN-SINK-ERATOR, AND MOEN
I. APPROVED FIXTURE SUPPLY MANUFACTURES: ANY APPROVED FIXTURE MANUFACTURE

SECTION 22 05 23 AND 23 05 23 GENERAL VALVES FOR PLUMBING AND HVAC

2.01 VALVES, GENERAL
A. REFER TO PIPING APPLICATION SCHEDULES FOR SIZE, TYPE, AND CONNECTIONS.
B. VALVE PRESSURE RATING SHALL NOT BE LESS THAT INDICATED AS REQUIRED FOR SYSTEM TEMPERATURE AND PRESSURE RATINGS.
C. DOMESTIC WATER VALVES
a. REGULATORY REQUIREMENTS: COMPLY WITH REQUIREMENTS IN PUBLIC LAW 111-380, "REDUCTION OF LEAD IN DRINKING WATER ACT," ABOUT LEAD CONTENT IN MATERIALS THAT WILL BE IN CONTACT WITH POTABLE WATER FOR HUMAN CONSUMPTION.
b. NSF COMPLIANCE: NSF 61 AND NSF 372 FOR VALVE MATERIALS FOR POTABLE-WATER SERVICE.
c. BRONZE VALVES SHALL BE MADE WITH DEZINCIFICATION-RESISTANT MATERIALS. BRONZE VALVES MADE WITH COPPER ALLOY (BRASS) CONTAINING MORE THAN 15 PERCENT ZINC ARE NOT PERMITTED UNLESS OTHERWISE NOTED. WETTED SURFACES OF VALVES CONTACTED BY CONSUMABLE WATER SHALL CONTAIN NOT MORE THAN 0.25 PERCENT WEIGHTED AVERAGE LEAD CONTENT.
D. VALVE ACTUATORS:
a. CHAINWHEEL: FOR ATTACHMENT TO VALVES
b. GEAR DRIVE OPERATOR: FOR QUARTER-TURN VALVES 8 INCH AND LARGER.
c. HANDWHEEL: FOR VALVES OTHER THAN QUARTER-TURN TYPES.
d. LEVER HANDLE: FOR QUARTER-TURN VALVES 6 INCH AND SMALLER.
E. EXTENDED STEMS ON INSULATED VALVES.

2.02 BRONZE BALL VALVES
A. APPROVED MANUFACTURERS: APOLLO VALVES, HAMMOND, NIBCO, WATTS, MILWAUKEE VALVE CO.
B. BRONZE BALL VALVES SHALL COMPLY WITH MSS SP-110 AND HAVE BRONZE BODY COMPLYING WITH ASTM B 584, EXCEPT FOR CLASS 250 WHICH SHALL COMPLY WITH ASTM B 61, FULL-DEPTH ASME B1.20.1 THREADED OR SOLDER ENDS, AND BLOWOUT-PROOF STEMS.
C. TWO-PIECE, REGULAR PORT BRONZE BALL VALVES WITH STAINLESS-STEEL TRIM SHALL BE TYPE 316 STAINLESS-STEEL BALL AND STEM, REINFORCED TFE SEATS, BLOW-OUT-PROOF STEM, WITH ADJUSTABLE STEM PACKING, SOLDERED OR THREADED ENDS; AND 150 PSIG SWP AND 600-PSIG CWP RATINGS.
D. TWO-PIECE, FULL-PORT, BRONZE BALL VALVES WITH STAINLESS-STEEL TRIM SHALL BE TYPE 316 STAINLESS-STEEL BALL AND STEM, REINFORCED TFE SEATS, BLOW-OUT-PROOF STEM, WITH ADJUSTABLE STEM PACKING, SOLDERED OR THREADED ENDS; 150 PSIG SWP AND 600-PSIG CWP RATINGS.

SECTION 22 11 16 - DOMESTIC WATER PIPING

1.01 GENERAL
A. POTABLE-WATER PIPING AND COMPONENTS SHALL COMPLY WITH NSF 14 AND NSF 61 ANNEX G. PLASTIC PIPING COMPONENTS SHALL BE MARKED WITH "NSF-PW."
B. COMPLY WITH NSF STANDARD 372 FOR LOW LEAD.

2.01 COPPER TUBE AND FITTINGS
A. SOFT COPPER, TYPE K
a. TUBE SHALL BE IN ACCORDANCE WITH ASTM B 88, TYPE K (ASTM B 88M, TYPE A), WATER TUBE, ANNEALED TEMPER.
b. COPPER PRESSURE FITTINGS SHALL BE IN ACCORDANCE WITH ASME B16.18, CAST-COPPER-ALLOY OR ASME B16.22, WROUGHT-COPPER, SOLDER-JOINT FITTINGS.
c. BRONZE FLANGES SHALL BE IN ACCORDANCE WITH ASME B16.24, CLASS 150, WITH SOLDER-JOINT ENDS.
d. COPPER UNIONS SHALL BE IN ACCORDANCE WITH MSS SP-123, CAST-COPPER-ALLOY, HEXAGONAL-STOCK BODY, WITH BALL-AND-SOCKET, METAL-TO-METAL SEATING SURFACES, AND SOLDER-JOINT OR THREADED ENDS.
B. HARD COPPER, TYPE L
a. TUBE SHALL BE IN ACCORDANCE WITH ASTM B 88, TYPE L (ASTM B 88M, TYPE B), WATER TUBE, DRAWN TEMPER.
b. COPPER PRESSURE FITTINGS SHALL BE IN ACCORDANCE WITH ASME B16.18, CAST-COPPER-ALLOY OR ASME B16.22, WROUGHT- COPPER, SOLDER-JOINT FITTINGS.
c. BRONZE FLANGES SHALL BE IN ACCORDANCE WITH ASME B16.24, CLASS 150, WITH SOLDER-JOINT ENDS.
d. COPPER UNIONS SHALL BE IN ACCORDANCE WITH MSS SP-123, CAST-COPPER-ALLOY, HEXAGONAL-STOCK BODY, WITH BALL-AND-SOCKET, METAL-TO-METAL SEATING SURFACES, AND SOLDER-JOINT OR THREADED ENDS.

SECTION 22 11 19 DOMESTIC WATER PIPING SPECIALTIES

2.01 BACKFLOW PREVENTERS
A. APPROVED MANUFACTURERS: APOLLO VALVES, FEBCO, WATTS, AND ZURN
B. INTERMEDIATE ATMOSPHERIC-VENT BACKFLOW PREVENTERS
a. SHALL COMPLY WITH ASSE 1012 FOR CONTINUOUS-PRESSURE APPLICATIONS. BRONZE BODY WITH UNION SOLDER JOINTS AND SIZES UP TO 3/4 INCH.
C. DOUBLE-CHECK BACKFLOW-PREVENTION ASSEMBLIES
a. SHALL COMPLY WITH ASSE 1015 FOR CONTINUOUS-PRESSURE APPLICATIONS. BRONZE BODY WITH THREADED CONNECTIONS AND SIZES UP TO 2 INCH. CAST-IRON OR DUCTILE-IRON, WITH INTERIOR LINING COMPLYING WITH AWWA C550 OR THAT IS FDA APPROVED FOR SIZES 2-1/2 AND LARGER. DESIGNED FOR HORIZONTAL, STRAIGHT THROUGH FLOW
b. ACCESSORIES: PROVIDE BALL VALVE WITH THREADED ENDS ON INLET AND OUTLET OF 2 INCH AND SMALLER; GATE-TYPE WITH FLANGED ENDS ON INLET AND OUTLET OF 2-1/2 INCH AND LARGER.

2.02 VACUUM BREAKERS
A. APPROVED MANUFACTURERS: APOLLO VALVES, FEBCO, WATTS, AND ZURN
B. ATMOSPHERIC TYPE
a. SHALL COMPLY WITH ASSE 1001 FOR SIZES 1/4 TO 3, AS REQUIRED TO MATCH CONNECTED PIPING. DEVICE SHALL HAVE A BRONZE BODY, INLET AND OUTLET CONNECTION SHALL BE THREADED, AND CHROME PLATED FINISH.
C. HOSE CONNECTION TYPE
a. SHALL COMPLY WITH ASSE 1011. DEVICE SHALL HAVE A BRONZE OR BRASS BODY WITH DRAIN, OUTLET CONNECTION SHALL BE GARDEN HOSE THREADED, AND CHROME OR NICKEL PLATED FINISH.

2.03 TEMPERATURE ACTUATED MIXING VALVES (TMV)
A. APPROVED MANUFACTURERS: APOLLO VALVES, BRADLEY, LAWLER, LEONARD, WATTS, AND ZURN
B. WATER TEMPERATURE LIMITING DEVICE (FIXTURE)
a. SHALL COMPLY WITH ASSE 1070 WITH MINIMUM PRESSURE RATING OF 125 PSIG. THERMOSTATICALLY CONTROLLED WITH BRONZE BODY CHROME PLATED. 1/2 INCH UNION OR 3/8 COMPRESSION WITH INTEGRAL CHECK VALVES AND TEMPERATURE ADJUSTMENT.

2.04 HOSE BIBBS (HB-1)
A. APPROVED MANUFACTURERS: JOSAM, MIFAB, ZURN, WOODFORD, WATTS
B. SHALL COMPLY WITH ASME A112.18.1 AND HAVE BRONZE BODY, BRONZE REPLACEABLE SEAT, VACUUM BREAKER INTEGRAL AND NONREMOVABLE, 1/2 OR 3/4 INCH THREADED OR SOLDERED CONNECTIONS, OUTLET SHALL BE A GARDEN HOSE CONNECTOR, PRESSURE RATING SHALL BE 125 PSIG.

SECTION 22 11 23 DOMESTIC WATER CIRCULATION PUMPS

2.01 CLOSE COUPLED, IN-LINE, SEALLESS CENTRIFUGAL PUMPS
A. APPROVED MANUFACTURERS: ARMSTRONG PUMPS INC., BELL & GOSSETT; XYLEM INC., GRUNDFOS PUMPS CORP., TACO, INC.
B. PUMPS SHALL BE FACTORY-ASSEMBLED AND -TESTED, SINGLE-STAGE, CLOSE-COUPLED, IN-LINE, SEALLESS CENTRIFUGAL PUMPS. PUMP AND MOTOR ASSEMBLY SHALL BE HERMETICALLY SEALED, REPLACEABLE-CARTRIDGE-TYPE UNIT WITH MOTOR AND IMPELLER ON COMMON SHAFT AND DESIGNED FOR INSTALLATION WITH PUMP AND MOTOR SHAFT MOUNTED HORIZONTALLY. CASING SHALL BE BRONZE, WITH THREADED COMPANION-FLANGE CONNECTIONS. IMPELLER SHALL BE CORROSION-RESISTANT MATERIAL. MOTOR SHALL BE SINGLE SPEED, UNLESS OTHERWISE INDICATED.
C. PROVIDE AN AQUASTAT OR TIMER FOR ON/OFF PUMP CONTROL. TIMER SHALL BE PROGRAMMABLE WITH TIME SCHEDULE AND 24 VAC.

SECTION 22 13 16 DRAINAGE PIPING

2.01 HUBLESS CAST-IRON SOIL PIPE AND FITTINGS
A. PIPE AND FITTINGS SHALL COMPLY WITH ASTM A 888 OR CISPI 301.
B. CAST-IRON SOIL PIPE, HUBLESS-PIPING COUPLINGS SHALL BE NSF CERTIFIED FOR COMPLIANCE WITH CISPI 310. STAINLESS-STEEL CORRUGATED SHIELD WITH STAINLESS-STEEL BANDS AND TIGHTENING DEVICES; AND ASTM C 564, RUBBER SLEEVE WITH INTEGRAL, CENTER PIPE STOP.
C. HEAVY DUTY CAST-IRON SOIL PIPE, HUBLESS-PIPING COUPLINGS SHALL COMPLY WITH ASTM C 1277 AND ASTM C 1540, OR ASTM C 1277 AND FM 1680 CLASS I. STAINLESS-STEEL SHIELD WITH STAINLESS-STEEL BANDS AND TIGHTENING DEVICES; AND ASTM C 564, RUBBER SLEEVE WITH INTEGRAL, CENTER PIPE STOP.
D. APPROVED MANUFACTURERS: ANACO-HUSKY, FERGUSON ENTERPRISES, INC., IDEAL-TRIDON., MISSION RUBBER COMPANY, TYLER PIPE, FERNCO INC.

2.02 COPPER PIPE AND FITTINGS
A. DRAIN WASTE AND VENT (DWV) COPPER
a. TUBE SHALL COMPLY WITH ASTM B 306, DRAINAGE TUBE, DRAWN TEMPER.
b. FITTINGS SHALL COMPLY WITH ASME B16.23, CAST COPPER OR ASME B16.29, WROUGHT COPPER, SOLDER-JOINT FITTINGS.
B. HARD COPPER, TYPE L
a. TUBE SHALL BE IN ACCORDANCE WITH ASTM B 88, TYPE L (ASTM B 88M, TYPE B), WATER TUBE, DRAWN TEMPER.
b. COPPER PRESSURE FITTINGS SHALL BE IN ACCORDANCE WITH ASME B16.18, CAST-COPPER-ALLOY OR ASME B16.22, WROUGHT- COPPER, SOLDER-JOINT FITTINGS.
c. BRONZE FLANGES SHALL BE IN ACCORDANCE WITH ASME B16.24, CLASS 150, WITH SOLDER-JOINT ENDS.
d. COPPER UNIONS SHALL BE IN ACCORDANCE WITH MSS SP-123, CAST-COPPER-ALLOY, HEXAGONAL-STOCK BODY, WITH BALL-AND-SOCKET, METAL-TO-METAL SEATING SURFACES, AND SOLDER-JOINT OR THREADED ENDS.

2.03 POLYVINYL CHLORIDE (PVC) PIPE AND FITTINGS
A. SOLID-WALL PVC PIPE SHALL BE SCHEDULE 40, ASTM D 2665, DRAIN, WASTE, AND VENT.
B. PVC SOCKET FITTINGS SHALL BE ASTM D 2665, SOCKET TYPE, MADE TO ASTM D 3311, DRAIN, WASTE, AND VENT PATTERNS AND TO FIT SCHEDULE 40 PIPE.

SECTION 22 13 19 DRAINAGE PIPING SPECIALTIES

2.01 CLEANOUTS
A. APPROVED MANUFACTURERS: JOSAM, MIFAB, JAY R. SMITH, ZURN
B. CLEANOUTS SHALL BE THE SAME NOMINAL SIZE AS PIPE THEY SERVE UP TO 4 INCHES. PIPES LARGE THAN 4 INCHES SHALL HAVE A CLEANOUT OF 4 INCHES MINIMUM.
C. BODY SHALL BE HUB-AND-SPIGOT, CAST-IRON SOIL PIPE T-BRANCH OR HUBLESS, CAST-IRON SOIL PIPE TEST TEE AS REQUIRED TO MATCH CONNECTED PIPING. CLOSURE SHALL BE COUNTERSUNK OR RAISED-HEAD, DRILLED-AND-THREADED BRONZE OR BRASS PLUG WITH TAPERED THREADS.
D. CLEANOUTS IN FINISHED FLOOR SHALL HAVE A NICKEL-BRONZE, COPPER ALLOY WITH SCORIATED COVER IN SERVICE AREAS, AND RECESSED COVER TO ACCEPT FLOOR FINISH MATERIAL IN FINISHED FLOOR AREAS.
E. CLEANOUTS IN FINISHED WALL SHALL HAVE A ROUND, CHROME-PLATED BRONZE FLAT, CHROME-PLATED BRASS OR STAINLESS-STEEL COVER PLATE WITH SCREW.
F. A CLEAN-OUT SHALL BE INSTALLED AT THE BASE OF EACH SOIL AND WASTE STACK, AND AT NOT MORE THAN 100'-0" INTERVALS ON HORIZONTAL RUNS AND AS REQUIRED BY CODE.

2.02 FLOOR DRAINS, SINKS, AND TRENCH DRAINS
A. APPROVED MANUFACTURERS: JOSAM, MIFAB, JAY R. SMITH, ZURN
B. REFER TO PLUMBING SCHEDULES.

2.03 AIR ADMITTANCE VALVES
A. APPROVED MANUFACTURERS: OATEY, STUDOR, RECTORSEAL
B. STANDARD ASSE 1051 TYPE A FOR SINGLE FIXTURE OF TYPE B FOR BRANCH PIPING. HOUSING SHALL BE PLASTIC WITH MECHANICAL SEALING DIAPHRAGM THE SAME SIZE AS BRANCH VENT.
C. STANDARD ASSE 1050 TYPE FOR VENT STACKS. HOUSING SHALL BE PLASTIC WITH MECHANICAL SEALING DIAPHRAGM THE SAME SIZE AS VENT STACK.
D. PROVIDE A WHITE PLASTIC WALL BOX WITH GRILLE FOR RECESSED INSTALLATION. SIZE SHALL BE MINIMUM 9 INCHES WIDE BY 9 INCHES TALL BY 4 INCHES DEEP.

2.06 TRAP SEAL PROTECTION DEVICE
A. APPROVED MANUFACTURERS: ZURN, JAY R. SMITH, SURESEAL MANUFACTURING
B. BARRIER TYPE TRAP SEAL PROTECTION DEVICE SHALL COMPLY WITH ASSE 1072 AND SHALL HAVE A NEOPRENE RUBBER OR CHEMICAL RESISTANT ELASTOMER SEAL ELEMENT. DEVICE SHALL BE SAME SIZE AS DRAIN WITH A COMPRESSION FIT SEALING GASKET.

SECTION 23 33 00 - DUCT ACCESSORIES

2.01 BALANCING DAMPERS
A. APPROVED MANUFACTURES: GREENHECK, KRUEGER, NAILOR, RUSKIN, OR APPROVED EQUAL.
B. WHERE SHOWN ON DRAWINGS AND WHEREVER NECESSARY FOR COMPLETE ACCESS & CONTROL OF AIR FLOW:
a. ROUND VOLUME DAMPERS SHALL BE BUTTERFLY OR SINGLE BLADE TYPE CONSISTING OF CIRCULAR BLADE MOUNTED TO A SHAFT. AMCA CERTIFIED. INSTALL WITH GASKETS ON OUTSIDE OF DUCT. BLADES SHALL NOT BE LESS THAN 16 GAUGE GALVANIZED, ROLL-FORMED STEEL WITH GALVANIZED STEEL AXLE. OIL-IMPREGNATED BRONZE WITH MOLDED SYNTHETIC STAINLESS STEEL BEARINGS. ZINC PLATED STEEL DAMPER HARDWARE AND 1 INCH GALVANIZED STEEL JACKSHAFT.
b. RECTANGULAR VOLUME DAMPERS SHALL BE MULTIPLE OPPOSED BLADE, AMCA CERTIFIED. INSTALL WITH GASKETS ON OUTSIDE OF DUCT. BLADES AND FRAME SHALL NOT BE LESS THAN 16 GAUGE GALVANIZED, ROLL-FORMED STEEL WITH GALVANIZED STEEL AXLE. OIL-IMPREGNATED BRONZE WITH MOLDED SYNTHETIC STAINLESS STEEL BEARINGS. ZINC PLATED STEEL DAMPER HARDWARE AND 1 INCH GALVANIZED STEEL JACKSHAFT.
c. DAMPERS FRAMES SHALL BE FLANGED FOR INSTALLATION IN WALLS AND FLANGELESS FOR INSTALLATION IN DUCTWORK.

2.02 BACKDRAFT DAMPERS
A. DAMPERS SHALL BE PARALLEL ACTION COUNTER BALANCED FACTORY MADE OF 0.05" EXTRUDED ALUMINUM BLADES WITH EDGE SEALS, 16 GAUGE ALUMINUM FRAME SUPPORTED BY BRONZE OR ALUMINUM RODS. BLADES SHALL NOT BE LARGER THAN 30INCHES LENGTH AND 6 INCHES WIDE. DAMPERS SHALL COMPLY WITH AMCA 500. BACKDRAFT DAMPERS SHALL BE MANUFACTURED BY GREENHECK, RUSKIN, OR APPROVED EQUAL.

2.03 FIRE DAMPERS
A. APPROVED MANUFACTURES: RUSKIN, GREENHECK, NAILOR, OR APPROVED EQUAL.
B. DYNAMIC FIRE DAMPERS WITH CURTAIN STYLE BLADES, AND LABELED ACCORDING TO UL 555, MAXIMUM VELOCITY 2000 FPM, MAXIMUM STATIC PRESSURE 4 INCHES W.G. FRAME SHALL BE TYPE B OR TYPE C CURTAIN TYPE WITH BLADES OUTSIDE AIRSTREAM; FABRICATED WITH ROLL-FORMED, GALVANIZED STEEL IN GAGES REQUIRED BY MANUFACTURER'S UL LISTING; WITH MITERED AND INTERLOCKING CORNERS. DAMPERS SHALL HAVE REPLACEABLE FUSIBLE LINK RATED AT 165 OR 212 DEGREES, COORDINATE WITH SPRINKLER RATING, AND SHALL BE ACCESSIBLE OR ACCESS DOOR IN DUCT/CEILING SHALL BE PROVIDED. DAMPER BLADES SHALL BE FABRICATED WITH 21 GAUGE GALVANIZED STEEL. DAMPERS SHALL BE LOW-PROFILE TYPE WITH BLADES OUTSIDE THE AIRSTREAM. PROVIDE MOUNTING SLEEVES AS REQUIRED AND THEY SHALL BE THE SAME GAUGE AS DUCTWORK AND LENGTH SUITABLE TO FIT APPLICATION. MOUNTING ORIENTATION: VERTICAL OR HORIZONTAL AS INDICATED. FIRE DAMPERS SHALL COMPLY WITH UL 555 AND NFPA 90A.
C. RATING:
a. 1-1/2 HOUR FOR 2 HOUR RATED WALL
b. 3 HOURS FOR A 4 HOUR RATED WALL

2.04 MOTORIZED CONTROL DAMPERS
A. CONTROL DAMPERS SHALL COMPLY WITH AMCA 500. FRAME SHALL BE MINIMUM 16 GAUGE GALVANIZED STEEL. BLADES SHALL BE MINIMUM 14 GAUGE GALVANIZED STEEL MAXIMUM 8" WIDE AND 60" LONG ATTACHED TO MINIMUM 1/2" SHAFTS. DAMPERS RATED TO 4 INCH WG. SHALL HAVE 3/4" SHAFTS. PROVIDE SYNTHETIC ELASTOMERIC OR NEOPRENE BLADE SEALS. JAMB SEALS SHALL BE STAINLESS STEEL. RATED PRESSURE AND VELOCITY TO EXCEED DESIGN AIRFLOW CONDITIONS.
a. APPROVED MANUFACTURES: RUSKIN, GREENHECK, TAMCO, JOHNSON CONTROLS, HONEYWELL, OR APPROVED EQUAL.
B. ELECTRIC DAMPER OPERATORS/ DAMPER MOTOR SHALL BE 24V OR 120V TWO-POSITION OR MODULATING AS REQUIRED WITH SPRING RETURN. OPERATOR SHALL BE SIZED TO OPERATE WITH SUFFICIENT RESERVE POWER FOR SMOOTH OPERATION FROM FULL CLOSE TO FULL OPEN AND TIGHT SHUTOFF. DAMPER MOTOR SHALL HAVE O-RINGS FOR WEATHERPROOF OPERATION
a. APPROVED MANUFACTURES: BELIMO, HONEYWELL, JOHNSON CONTROLS, SIEMENS, SCHNEIDER ELECTRIC.

2.06 PLENUMS AND SCREENS
A. CONSTRUCT PLENUMS WITH GALVANIZED STEEL FRAMING MEMBERS AND GALVANIZED SHEETMETAL BRACED WITH GALVANIZED ANGLES. GAUGES AND BRACING SHALL CONFORM TO SMACNA RECOMMENDATIONS FOR DUCTWORK SIZES. WHERE ACCESS DOORS ARE SHOWN, PROVIDE HINGED DOORS WITH #202 VENTLOK LATCH. MAKE WATERTIGHT CONNECTIONS TO LOUVERS, SLOPING BOTTOM OF PLENUM TO DRAIN WATER TO WEEPHOLES IN BOTTOM OF LOUVER.
B. PROVIDE SCREENS ON LOUVERS, DUCTS, HOODS, FANS, AND OPENINGS TO THE OUTDOORS AS SCHEDULED AND/OR NOTED ON THE DRAWINGS. BIRD SCREENS SHALL BE 0.041-INCH, 1/2-INCH MESH GALVANIZED STEEL WIRE.

2.07 TURNING VANES
A. DOUBLE WALL AIRFOIL FORMED TYPE TURNING VANES WITH VANE RUNNERS SHALL BE INSTALLED AT EACH CHANGE IN DIRECTION FOR ALL SQUARE/ RECTANGULAR DUCTWORK. SHALL BE MANUFACTURED BY AERO/DYNE COMPANY, DUCTMATE, DURO DYNE CORP, OR WARD INDUSTRIES.

2.08 FLEXIBLE DUCTWORK (POLYMER LINER):
A. APPROVED MANUFACTURES: FLEXMASTER TYPE 1M, HART & COOLEY, HART & COOLER OR EQUIVALENT.
B. FLEXIBLE DUCTWORK SHALL BE CONSTRUCTED OF A SPRING STEEL HELIX SUPPORTING A PLASTIC CORE. IT SHALL BE INSULATED WITH 1" FIBERGLASS HAVING A DENSITY OF 1 LB./CU.FT (R-6.0). THE INSULATION SHALL BE SHEATHED IN A FIRE-RETARDANT POLYETHYLENE PROTECTIVE JACKET/VAPOR BARRIER, U.L.181 CLASS 1.
C. THE DUCT SHALL BE RATED AT 10" W.G., AND A MAXIMUM VELOCITY OF 4000 FPM. THE DUCT SHALL BE LISTED IN CONFORMANCE WITH UL STANDARD 181, CLASS 1.
D. FLEXIBLE DUCT SHALL BE LIMITED TO A MAXIMUM LENGTH OF 5'-0", AS A MEANS OF CONNECTING BOXES, DIFFUSERS, ETC. TO THE DUCT SYSTEM.
E. FLEXIBLE DUCT RUNS SHALL BE INSTALLED FULLY EXTENDED AND STRAIGHT AS POSSIBLE AVOIDING TIGHT TURNS. INSTALL FLEXIBLE DUCT IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS. NO MORE THAN ONE (1) 90-DEGREE BEND SHALL BE CREATED. BENDS SHALL NOT EXCEED A CENTERLINE RADIUS OF ONE DUCT DIAMETER. DUCT SAG SHALL NOT EXCEED 1/2-INCH. SUPPORTING MATERIAL IN DIRECT CONTACT WITH THE DUCT SHALL NOT BE LESS THAN 1-1/2-INCHES IN WIDTH.
F. CONNECT FLEXIBLE DUCT TO RIGID METAL DUCT OR AIR DEVICES AS RECOMMENDED BY THE MANUFACTURER. AT A MINIMUM, INSTALL TWO WRAPS OF DUCT TAPE AROUND THE INNER CORE CONNECTION AND A METALLIC OR NON- METALLIC CLAMP OVER THE TAPE AND TWO WRAPS OF DUCT TAPE OR A CLAMP OVER THE OUTER JACKET. DUCT CLAMPS SHALL BE LABELED IN ACCORDANCE WITH U.L.181B AND MARKED 181B-C. DUCT TAPE SHALL BE LABELED IN ACCORDANCE WITH U.L.181B AND MARKED 181B-FX.
G. PROVIDE FLEXIBLE ELBOW SUPPORT CONSTRUCTED OF DURABLE COMPOSITE THAT IS FULLY 2.08 FLEXIBLE DUCTWORK (POLYMER LINER):

2.09 DUCT ACCESS DOORS
A. WHERE MOTORIZED DAMPERS, FIRE DAMPERS, CONTROL EQUIPMENT, ETC. ARE INSTALLED IN DUCTS, AND FOR CLEANING DUCTWORK, ACCESS DOORS SHALL BE PROVIDED IN THE DUCTS, MADE AIR-TIGHT WITH GASKETED EDGES. USE VENTLOK, OR EQUAL, SPONGE RUBBER OR FELT GASKETING MATERIAL. THE DOORS SHALL BE DOUBLE-WALL CONSTRUCTION WITH 1" OF RIGID INSULATION FILL AND SHALL BE ATTACHED TO THE DUCT WITH CAM LATCHES. PROVIDE HINGES AND MULTIPLE COMPRESSION CAM LOCKS FOR ACCESS DOORS GREATER THAN 12 INCHES. OMIT ACCESS DOOR INSULATION AND DOUBLE-WALL CONSTRUCTION IF DUCTS ARE NOT SPECIFIED TO BE INSULATED. ACCESS DOORS SHALL BE CONSTRUCTED OF THE SAME MATERIALS AS THE DUCTWORK. APPROVED MANUFACTURES ARE DUCTMATE AND FLEXMASTER.
B. PROVIDE ACCESS PANELS WHERE REQUIRED FOR ACCESS TO THE "DUCT ACCESS DOORS." IF THESE ACCESS PANELS ARE PLACED IN FIRE-RATED WALLS OR CEILING OR FLOOR, THEN THE ACCESS PANEL SHALL HAVE THE SAME RATING.
C. SOLUTIONS.

SECTION 23 05 93-TESTING, ADJUSTING, AND BALANCING

1.01 GENERAL
A. BALANCING SHALL BE DONE BY AN INDEPENDENT FIRM SPECIALIZING SOLELY IN THE DISCIPLINE OF BALANCING AIR AND WATER SYSTEMS, AND A MEMBER OF NEBB.. FIRMS DESIRING TO FURNISH SERVICES FOR THIS PROJECT SHALL SUBMIT FOR WRITTEN APPROVAL DURING BIDDING. ALL AIR AND HYDRONIC SYSTEMS SHALL BE BALANCED USING APPLICABLE PROPORTIONATE PROCEDURE.
B. CONTRACTOR SHALL FURNISH SERVICES FOR TWO COMPLETE ADJUSTMENTS OF THE HEATING, AIR CONDITIONING AND AIR DISTRIBUTION SYSTEMS WITH A REPORT FOR EACH VISIT. REPORTS MUST BE SUBMITTED TO ENGINEER FOR REVIEW AND APPROVAL.
C. SYSTEM SHALL BE TESTED, ADJUSTED & BALANCED BY 'NEBB' CERTIFIED PERSONNEL.

2.01 TESTING CONDITIONS
A. (AIR) BEFORE ADJUSTMENTS ARE MADE, CHECK THE SYSTEM FOR SUCH ITEMS AS DIRTY FILTERS, DUCT AND DAMPER LEAKAGE, VIBRATIONS, ETC. ALL DIFFUSERS, DUCT SECTIONS, ETC SHALL BE ADJUSTED TO DELIVER DESIGN QUANTITIES WITHIN 5%. AIR QUANTITIES SHALL BE TESTED SIMULATING FILTERS BEING 50% LOADED. ADJUST/REPLACE SHEAVES AND BELTS AS REQUIRED TO ACHIEVE DESIGN AIR QUANTITIES. REPLACE THERMAL MOTOR OVERLOADS AS REQUIRED.
B. MERV-8 FILTERS SHALL BE INSTALLED PRIOR TO TEST AND BALANCE.

2.02 VERIFICATION OF TEMPERATURE CONTROL
A. THE TEST AND BALANCE AGENCY SHALL BE ASSISTED BY THE CONTROL CONTRACTOR IN VERIFYING THE OPERATION AND CALIBRATION OF ALL TEMPERATURE CONTROL SYSTEMS. THE FOLLOWING TESTS SHALL BE CONDUCTED:
a. VERIFY THAT ALL CONTROL COMPONENTS ARE INSTALLED IN ACCORDANCE WITH PROJECT REQUIREMENTS AND ARE FUNCTIONAL, INCLUDING ALL ELECTRICAL INTERLOCKS, DAMPER SEQUENCES, AND FIRE AND SMOKE DETECTORS.
b. VERIFY THAT ALL CONTROLLING INSTRUMENTS ARE CALIBRATED AND SET FOR DESIGN OPERATING CONDITIONS.
c. VERIFY THE ACCURACY OF THE FINAL SETTING BY TAKING TEMPERATURE READINGS. THE READINGS SHALL BE IN A TYPICAL CONDITIONED SPACE FOR EACH SEPARATELY CONTROLLED ZONE.

2.03 REPORT
A. AFTER ALL ADJUSTMENTS ARE MADE, A DETAIL WRITTEN REPORT SHALL BE PREPARED AND SUBMITTED FOR APPROVAL. FINAL ACCEPTANCE OF THE PROJECT WILL NOT BE MADE UNTIL A SATISFACTORY REPORT IS RECEIVED AND FIELD VERIFIED. THE REPORT SHALL DETAIL THE TEST EQUIPMENT AND BALANCING PROCEDURES BEING USED; THE GENERAL STATUS OF THE SYSTEM BEING TESTED INCLUDING EQUIPMENT DETAILS; PROVIDE DATA SHEETS INDICATING THE REQUIRED AND ACTUAL CFM OF ALL OUTLETS AND INLETS.
B. SIX (6) COPIES OF THE TEST AND BALANCE REPORT ARE REQUIRED AND SHALL BE SUBMITTED TO THE ARCHITECT.
C. TEST & BALANCE REPORT TO INCLUDE OUTSIDE AIRFLOW READINGS.
D. THE REPORT SHALL CONTAIN THE FOLLOWING GENERAL DATA IN A FORMAT SELECTED BY THE TEST AND BALANCE AGENCY: PROJECT NUMBER, PROJECT TITLE, PROJECT LOCATION, PROJECT ARCHITECT, PROJECT MECHANICAL ENGINEER, TEST AND BALANCE AGENCY, TEST AND BALANCE ENGINEER, OWNER, MECHANICAL SUBCONTRACTORS, DATES TESTS WERE PERFORMED, CERTIFICATION.
E. THE TEST AND BALANCE REPORT SHALL BE RECORDED ON REPORT FORMS CONFORMING TO THE RECOMMENDED FORMS IN THE A.A.B.C. NATIONAL STANDARDS.
a. PREFACE - A GENERAL DISCUSSION OF THE SYSTEM, ANY ABNORMALITIES AND PROBLEMS ENCOUNTERED (DEFICIENCIES OUTSTANDING LISTED).
b. INSTRUMENTATION LIST - THE LIST OF INSTRUMENTS INCLUDE TYPE, MODEL, MANUFACTURER, SERIAL NUMBER AND CALIBRATION DATE.
c. SYSTEM IDENTIFICATION - IN EACH REPORT, THE VAV BOXES, ZONES, SUPPLY, RETURN, DATA SHEETS, ALONG WITH A DRAWING SHOWING THE ABOVE.
d. AIR HANDLING EQUIPMENT TEST REPORT FORMS - RECORD THE FOLLOWING ON EACH AIR-HANDLING EQUIPMENT TEST FORM:
e. MANUFACTURER, MODEL NUMBER AND SERIAL NUMBER
f. ALL DESIGN AND MANUFACTURER-RATED DATA.
g. TOTAL ACTUAL CFM BY TRAVERSE IF PRACTICAL, IF NOT PRACTICAL, THE SUM OF THE OUTLETS MAY BE USED, OR A COMBINATION OF EACH OF THESE PROCEDURES.
h. SUCTION AND DISCHARGE STATIC PRESSURE OF EACH FAN, AS APPLICABLE.

2.04 ACCEPTANCE OF TEST AND BALANCE REPORT
A. AT THE TIME OF ACCEPTANCE OF THE TEST AND BALANCE REPORT, THE TEST AND BALANCE AGENCY SHALL, IF REQUESTED, RECHECK IN THE PRESENCE OF THE OWNER REPRESENTATIVE, SPECIFIC AND RANDOM SELECTIONS OF DATA RECORDED IN THE CERTIFIED TEST AND BALANCE REPORT.
B. POINTS AND AREAS FOR RECHECK SHALL BE SELECTED BY THE ENGINEER OF RECORD.
C. MEASUREMENTS AND TEST PROCEDURES SHALL BE THE SAME AS THE ORIGINAL TEST AND BALANCE.
D. SELECTIONS FOR RECHECK, SPECIFIC PLUS RANDOM, SHALL NOT NORMALLY EXCEED 15% OF THE TOTAL NUMBER TABULATED IN THE REPORT, EXCEPT WHERE SPECIAL AIR SYSTEMS REQUIRE A COMPLETE RECHECK FOR SAFETY REASONS.
E. IF RANDOM TESTS DEMONSTRATED A MEASURED FLOW DEVIATION OF 15% OR MORE FROM THAT RECORDED, A NEW CERTIFIED TEST AND BALANCE REPORT MUST BE SUBMITTED, AND A NEW INSPECTION TEST MADE, ALL AT NO ADDITIONAL COST TO OWNER.

3.01 AIR SYSTEM PROCEDURES
A. THE TEST AND BALANCE AGENCY SHALL PERFORM THE FOLLOWING TESTING AND BALANCING FUNCTIONS:
1. DESIGN CONDITIONS INCLUDING SUPPLY/ EXHAUST AIRFLOW, MOTOR HP, FAN RPM, OUTLET VELOCITY, STATIC PRESSURE.
2. INSTALLED EQUIPMENT INFORMATION INCLUDING BELT, SHEAVE SIZE, MOTOR, MODEL NUMBERS.
3. FAN SPEEDS - TEST AND ADJUST FAN RPM TO ACHIEVE DESIGN CFM REQUIREMENTS.
4. CURRENT AND VOLTAGE - MEASURE AND RECORD MOTOR CURRENT AND VOLTAGE.
5. PITOT TUBE TRAVERSE - PERFORM A PITOT TUBE TRAVERSE OF MAIN SUPPLY AND RETURN DUCTS TO OBTAIN TOTAL CFM. IF A PITOT TUBE TRAVERSE IS NOT PRACTICAL, THE SUMMATION OF THE OUTLETS OR INLETS MAY BE USED. AN EXPLANATION WHY A TRAVERSE WAS NOT MADE MUST APPEAR ON THE APPROPRIATE DATA SHEET.
6. OUTSIDE AIR - TEST AND ADJUST SYSTEM MINIMUM OUTSIDE AIR BY PITOT TUBE TRAVERSE. IF A PITOT TUBE TRAVERSE IS NOT PRACTICAL, THE PERCENTAGE OF OUTSIDE AIR MAY BE DETERMINED BY CALCULATIONS FROM THE RETURN AIR, OUTSIDE AIR, AND MIXED AIR TEMPERATURE. MAKE ALLOWANCES FOR HEAT OF COMPRESSION AND MOTOR HEAT WHERE APPLICABLE.
7. STATIC PRESSURE - TEST AND RECORD SYSTEM STATIC PRESSURES, INCLUDING SUCTION AND DISCHARGE STATIC PRESSURE PROFILE OF EACH FAN.
8. AIR TEMPERATURE - TAKE WET-BULB AND DRY-BULB AIR TEMPERATURES ON THE ENTERING AND LEAVING SIDE OF EACH HEATING COIL.
9. TOLERANCE - TEST AND BALANCE EACH DIFFUSER, GRILLE, AND REGISTER TO WITHIN 10 PERCENT OF DESIGN AND REQUIREMENT.
10. DESCRIPTION - RECORD THE SIZE AND TYPE OF EACH DIFFUSER, GRILLE, AND REGISTER ON AIR OUTLET DATA SHEETS.
11. TERMINAL BOXES - ALL ASSOCIATED TEMPERATURE CONTROLS SHALL BE CHECKED FOR PROPER OPERATION AND CALIBRATION
12. MINIMIZING DRAFTS - ADJUST ALL DIFFUSERS, GRILLES, AND REGISTERS TO MINIMIZE DRAFTS IN ALL AREAS
13. EQUIPMENT SHALL BE BALANCED TO AIRFLOWS WITHIN:
A. TERMINAL DEVICES & BRANCH LINES: ±10% OF DESIGNED LOADS
B. MAIN DUCTS & AHU'S: ± 5% OF DESIGNED LOADS
14. EXHAUST FANS/HOODS
a. MEASURE EXHAUST FAN STATIC PRESSURE, TOTAL CFM. MAKEUP AIR AND FAN RPM.
b. MEASURE MOTOR OPERATING VOLTAGE AND AMPERAGE.
c. MEASURE HOOD AVERAGE FACE VELOCITIES AND ADJUST AS NECESSARY. WHERE POSSIBLE, BALANCE FLOW USING A PITOT TRAVERSE WITHIN HOOD WHERE DUCTS ARE CONNECTED.
d. RECORD THE SPECIFIED AGAINST THE ACTUAL SUPPLIED HORSEPOWER AND ELECTRICAL CHARACTERISTICS OF ALL MOTORS. RECORD, IF SPECIFIED, TO BE SELF OR PERMANENTLY LUBRICATED.

SECTION 23 31 13 - METAL DUCTS

1.01 DUCTWORK
A. GENERAL
1. ALL DUCTWORK SHALL BE CONSTRUCTED STRICTLY ACCORDING TO THE LATEST ASHRAE 90A, SMACNA, AND IMC STANDARDS. DUCT SIZES SHOWN ARE INSIDE CLEAR DIMENSIONS; MAINTAIN SIZES INSIDE LINING FOR LINED DUCTS.
2. REFER TO DUCT APPLICATION SCHEDULES FOR MATERIALS, PRESSURE CLASS, SEAL CLASS, AND LOCATIONS.
3. DUCT PRESSURE DEFINITIONS:
A. LOW PRESSURE: UP TO 2 INCH WG AND VELOCITIES LESS THAN 1,500 FPM. CONSTRUCT FOR 2 INCH WG POSITIVE OR NEGATIVE STATIC PRESSURE.
B. MEDIUM PRESSURE: GREATER THAN 2 INCH WG TO 6 INCH WG AND VELOCITIES GREATER THAN 1,500 FPM AND LESS THAN 2,500 FPM. CONSTRUCT FOR 6 INCH WG POSITIVE OR NEGATIVE STATIC PRESSURE.
C. HIGH PRESSURE: GREATER THAN 6 INCH WG TO 12 INCH WG AND VELOCITIES GREATER THAN 2,500 FPM. CONSTRUCT FOR 12 INCH WG POSITIVE OR NEGATIVE STATIC PRESSURE.

2.01 SHEET METAL
A. MATERIALS
a. GALVANIZED STEEL CONFORMING TO ASTM STANDARDS ASTM A-653/ A 653M. GALVANIZED COATING DESIGNATION SHALL BE G90 WITH FINISHES FOR EXPOSED SURFACES MILL PHOSPHATIZED. REINFORCEMENT SHALL BE CONSTRUCTED OF GALVANIZED STEEL.
b. CARBON-STEEL SHEETS CONFORMING WITH ASTM A 366/A 366A, WITH OILED, MATTE FINISH FOR EXPOSED DUCTS.
c. ALUMINUM SHEETS CONFORMING WITH ASTM B 209 (ASTM B 209M) ALLOY 3003, H14 TEMPER; WITH MILL FINISH FOR CONCEALED DUCTS, AND STANDARD, ONE-SIDE BRIGHT FINISH FOR DUCT SURFACES EXPOSED TO VIEW.
d. STAINLESS-STEEL SHEETS CONFORMING WITH ASTM A 480/A 480M, TYPE 304 OR 316, COLD ROLLED, ANNEALED, SHEET. EXPOSED SURFACE FINISH SHALL BE NO. 4.
e. PVC-COATED GALVANIZED STEEL CONFORMING WITH UL 181, CLASS 1 LISTING. LOCK-FORMING-QUALITY, GALVANIZED SHEET STEEL COMPLYING WITH ASTM A 653/A 653M AND HAVING G60 (Z180) COATING DESIGNATION. FACTORY-APPLIED PVC COATINGS SHALL BE 4 MILS THICK ON INTERIOR SHEET METAL SURFACES OF DUCTS AND FITTINGS EXPOSED TO CORROSIVE CONDITIONS AND MINIMUM 1 MIL THICK ON INTERIOR AND/OR EXTERIOR SURFACES.
B. DUCT THICKNESS SHALL CONFORM TO THE ABOVE STANDARDS. WHERE THERE IS A DISCREPANCY, THE GREATER THICKNESS SHALL APPLY. REINFORCEMENT, JOINT TYPE, SPACING AND THICKNESS MAY BE VARIED AT THE CONTRACTORS DISCRETION, IN CONFORMANCE WITH THE ABOVE STANDARDS, EXCEPT WHERE SPECIFICALLY NOTED. MINIMUM THICKNESS OF DUCTS SHALL BE 26-GAUGE SHEET METAL.
C. RECTANGULAR DUCTWORK
a. PROVIDE RECTANGULAR DUCTWORK AND HOUSINGS TO SIZES AS SHOWN ON DRAWINGS.
b. PROVIDE RADIUS ELBOWS, TURNS AND OFFSETS WITH A MINIMUM CENTERLINE RADIUS OF 1-1/2 TIMES THE DUCT WIDTH. WHERE SPACE DOES NOT PERMIT FULL RADIUS ELBOWS PROVIDE SHORT RADIUS ELBOWS WITH A MINIMUM OF TWO CONTINUOUS SPLITTER VANES. VANES SHALL BE THE ENTIRE LENGTH OF THE BEND. PROVIDE MITERED ELBOWS WHERE SPACE DOES NOT PERMIT RADIUS ELBOWS WHERE SHOWN ON THE DRAWINGS OR AT THE OPTION OF THE CONTRACTOR WITH THE ENGINEER'S APPROVAL. MITERED ELBOWS LESS THAN 45 DEGREES SHALL NOT REQUIRE TURNING VANES. MITERED ELBOWS 45 DEGREES AND GREATER SHALL HAVE DOUBLE WALL AIRFOIL FORMED TYPE TURNING VANES OF SAME GAUGE AS DUCTWORK RIGIDLY FASTENED WITH GUIDE STRIPS IN DUCTWORK. VANES FOR MITERED ELBOWS SHALL BE PROVIDED IN ALL SUPPLY, RETURN, OUTSIDE AIR, AND EXHAUST DUCTWORK.
D. ROUND AND FLAT-OVAL DUCTWORK
a. PROVIDE ROUND AND FLAT-OVAL DUCT TO SIZES AS SHOWN ON DRAWINGS.
b. LOW PRESSURE FITTINGS 24" IN DIAMETER AND LESS SHALL BE PREFABRICATED, SPOTWELDED AND INTERNALLY SEALED. CONTINUOUSLY WELD FITTINGS LARGER THAN 24" IN DIAMETER. FITTING GAUGE SHALL BE 22-GAUGE FOR 36" FITTINGS AND UNDER 20-GAUGE FOR LARGER SIZES. 90- DEGREE TEE'S SHALL BE CONICAL-TYPE. SEAL LONGITUDINAL AND TRANSVERSE DUCTWORK JOINTS AIR-TIGHT WITH HEAVY WATER BASED LIQUID SEALANT APPLIED ACCORDING TO MANUFACTURER'S INSTRUCTIONS. PROVIDE GAUGE THICKNESS IN MEDIUM PRESSURE DUCTWORK AS RECOMMENDED BY SMACNA.
c. APPROVED MANUFACTURERS OF ROUND AND FLAT-OVAL SPIRAL LOCK-SEAM DUCTS ARE LINDAB INC, MCGILL AIRFLOW CORP, SEMCO INC, LAPINE METAL PRODUCTS, OR APPROVED EQUAL. ROUND AND FLAT-OVAL SPIRAL LOCK-SEAM SUPPLY AND RETURN DUCTS SHALL BE FABRICATED ACCORDING TO SMACNA STANDARDS BASED ON PRESSURE CLASS. MINIMUM THICKNESS OF DUCT SHALL BE 26 GAUGE SHEET METAL. ROUND AND FLAT-OVAL FITTINGS SHALL BE FACTORY FABRICATED WELDED DESIGN. DUCTS UP TO 20" INCHES IN DIAMETER SHALL HAVE CENTER-BEADED SLIP COUPLING, SEALED BEFORE AND AFTER FASTENING, ATTACHED WITH SHEET METAL SCREWS. DUCTS 21" TO 72" INCHES SHALL HAVE A THREE-PIECE GASKETED FLANGED JOINT CONSISTING OF TWO INTERNAL FLANGES WITH SEALANT AND ONE EXTERNAL CLOSURE BAND WITH GASKET. PREFABRICATED CONNECTION SYSTEM CONSISTING OF FLANGES AND GASKET ARE ACCEPTABLE, APPROVED MANUFACTURERS ARE DUCTMATE INDUSTRIES INC AND LINDAB. ELBOWS, TEES, AND BENDS SHALL HAVE A RADIUS NOT LESS THAN 1-1/2 TIMES THE WIDTH OF THE CENTERLINE. TRANSITIONS IN DUCT SIZE SHALL BE GRADUAL NOT EXCEEDING 15 DEGREES WHERE POSSIBLE. ROUND ELBOWS UP TO 14 INCHES SHALL BE PLEATED AND GORED FOR 16" AND ABOVE. ALL FLAT OVAL ELBOWS SHALL BE GORED. 90 DEGREE TEES, LATERALS, AND CONICAL TEES SHALL BE FABRICATED TO SMACNA.
d. ROUND DUCTWORK EXPOSED TO THE PUBLIC SHALL BE GALVANIZED STEEL, SPIRAL WOUND, MAINTAINING IN A CLEAN, SHINY APPEARANCE, AND NOT UTILIZING VISIBLE SEALING MATERIAL. CONCEALED ROUND DUCTWORK MAY SPIRAL WOUND, OR SNAP LOCK TYPE GALVANIZED STEEL DUCTWORK.
E. SEAL DUCTWORK WITH HEAVY LIQUID WATER BASED SEALANT - SEALANTS SHALL COMPLY WITH THE FOLLOWING REQUIREMENTS: MILL FINISH ALUMINUM SUBSTRATE WITH GRAY ADHESIVES, MINIMUM 30 MIL THICK, MINIMUM 17 LB/IN PEEL STRENGTH, MAX SMOKE DEVELOPED OF 50 WHEN TESTED IN ACCORDANCE WITH ASTM G-53, VOC CONTENT OF 250 g/L OR LESS, PRESSURE CLASS UP TO 10" W.C. - HARDCAST FLEXGRIP 550, UNITED MCGILL DUCT SEALER, MON-ECO INDUSTRIES ECO DUCT SEAL 44-50 OR EQUIVALENT, OR APPROVED EQUAL APPLIED ACCORDING TO SEALANT MANUFACTURER'S INSTRUCTIONS.
F. LOCATION: SHEET METAL MAY BE USED THROUGHOUT THE PROJECT.
G. SUPPORTS
a. SUPPORT HORIZONTAL RUNS OF DUCT ON CENTERS NOT TO EXCEED 8'-0". DO NOT SUPPORT CEILING GRID, CONDUITS, PIPES, EQUIPMENT, ETC. FROM DUCTWORK. COORDINATE ROUTING OF DUCTWORK WITH OTHER CONTRACTORS SUCH THAT PIPING, ELECTRICAL CONDUIT, AND ASSOCIATED SUPPORTS ARE NOT ROUTED THROUGH THE DUCTWORK.

SECTION 23 37 13 - GRILLES, REGISTERS, AND DIFFUSERS

2.01 GRILLES, REGISTERS, AND DIFFUSERS
A. APPROVED MANUFACTURES: TITUS, PRICE, METALLAIRE, NAILOR OR APPROVED EQUAL
B. PROVIDE GRILLES, REGISTERS, AND DIFFUSERS OF THE SIZE AND TYPE SHOWN ON THE PLANS. GRD'S SHALL BE MADE WITH A BAKED WHITE ENAMEL FINISH UNLESS OTHERWISE NOTED. COORDINATE FRAME TYPES WITH ARCHITECTURAL REFLECTED CEILING PLANS. PROVIDE PLASTER FRAMES FOR UNITS INSTALLED IN PLASTER CEILINGS. SECURE GRD'S TO STRUCTURE WHERE CONNECTED BY FLEX DUCTWORK, OR WHERE REQUIRED BY LOCAL CODE. PAINT DUCTWORK VISIBLE BEHIND GRD'S FLAT BLACK.
C. PROVIDE DEVICES WITH A SOFT PLASTIC GASKET TO MAKE AN AIR-TIGHT SEAL AGAINST THE MOUNTING SURFACE. COORDINATE FINAL LOCATION, FRAME, AND MOUNTING TYPE OF AIR DEVICES WITH ARCHITECTURAL REFLECTED CEILING PLANS.

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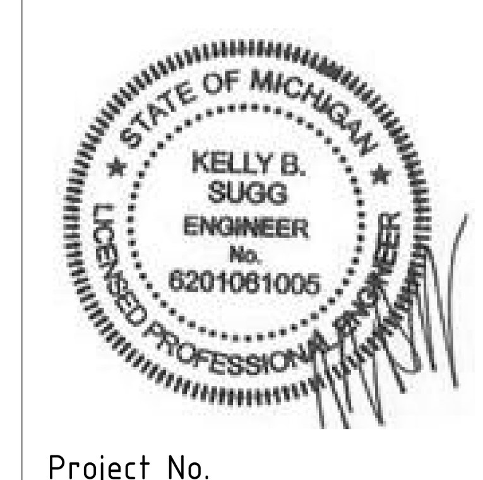

Project No.
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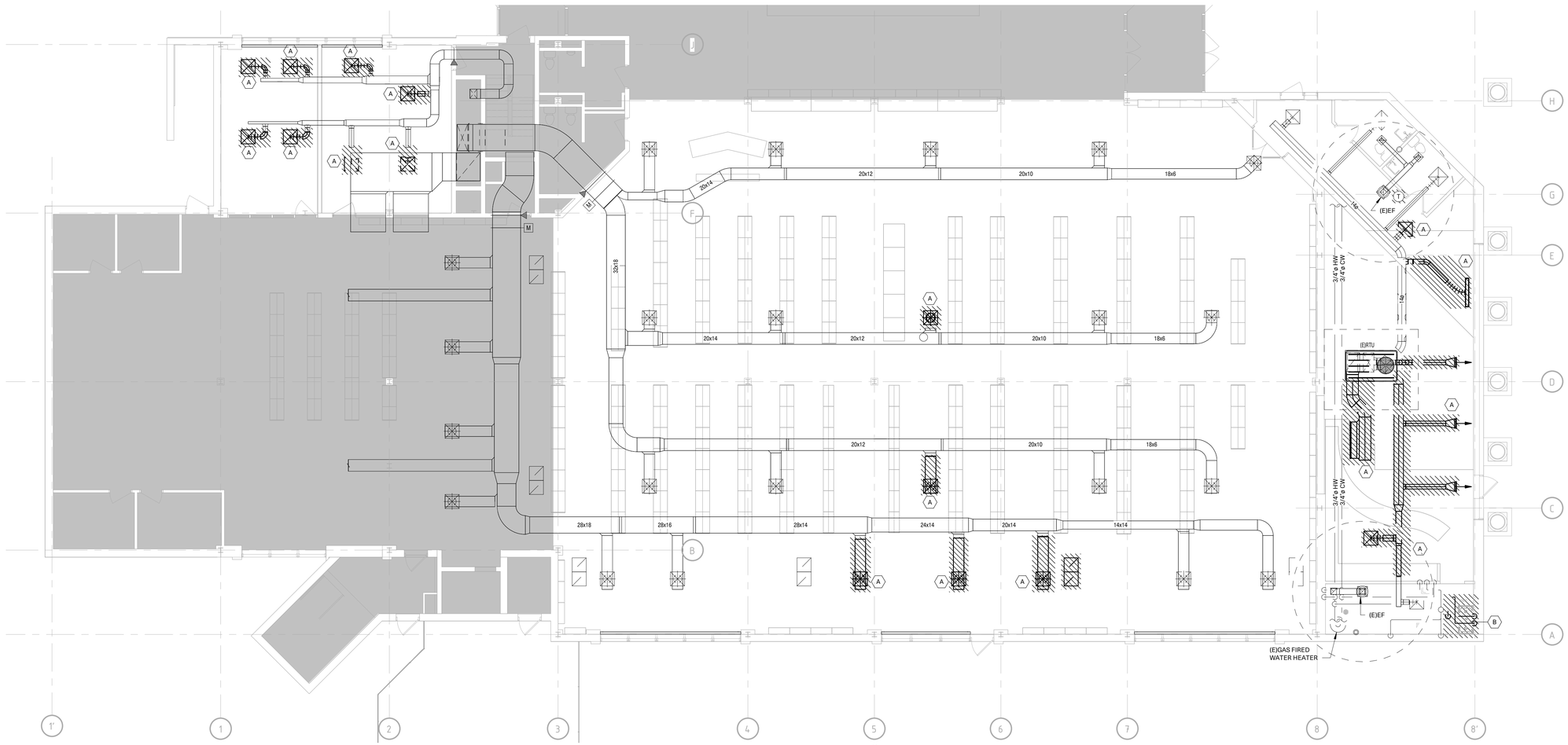
GENERAL MECHANICAL DEMOLITION NOTES

1. ALL DEMOLITION SHALL BE IN ACCORDANCE WITH THE APPLICABLE BUILDING CODE AND ALL LOCAL ORDINANCES.
2. DURING ALL PHASES OF DEMOLITION AND CONSTRUCTION, THE GENERAL CONTRACTOR SHALL MAINTAIN INTEGRITY TO THE STRUCTURE TO BE DEMOLISHED AND ADJACENT AREAS TO REMAIN WITH INTERIOR OR EXTERIOR SHORING, BRACING, OR SUPPORT TO PREVENT MOVEMENT, SETTLEMENT, OR COLLAPSE OF STRUCTURE. EXISTING STRUCTURE TO REMAIN SHALL BE SAFED OFF AND PROTECTED FROM ELEMENTS AT ALL TIMES.
3. WHERE THE EXISTING WORK IS TO BE CUT, UNDERPINNED, AND/OR SHORED, CONTRACTOR SHALL PROVIDE ALL SHORING, NEEDLING, BRACING, WEDGING, AND DRY PACKING, AND BE RESPONSIBLE FOR THE SAFETY OF THE STRUCTURE DURING THESE OPERATIONS.
4. AREA OF WORK SHALL BE KEPT CLEAN AT ALL TIMES.
5. ANY MATERIALS DEEMED AS HAZARDOUS, SUCH AS BUT NOT LIMITED TO ASBESTOS OR LEAD PAINTS SHALL BE REMOVED AS REQUIRED BY FEDERAL, STATE, OR LOCAL CODES. CONTRACTOR SHALL UTILIZE THE APPROPRIATE TECHNIQUES, PROCEDURES, AND DISPOSAL METHODS AS PER STANDARD PRACTICE AND ALL FEDERAL, STATE, AND LOCAL CODES.
6. CONTRACTOR SHALL REMOVE ALL EXISTING MECHANICAL EQUIPMENT, DUCTWORK, HANGERS, AND CONTROLS NOT SCHEDULED TO BE REUSED, BACK TO THE EXISTING CURB. CURBS NOT SCHEDULED TO BE REUSED OR ADAPTED FOR NEW UNITS SHALL BE CAPPED AND INSULATED FOR A WEATHERTIGHT SEAL. DO NOT ABANDON. SEAL ALL PENETRATIONS THROUGH WALLS, AND FLOORS AT REMOVED MECHANICAL COMPONENTS.
7. CONTRACTOR SHALL REMOVE ALL PLUMBING FIXTURES, DRAINS, PIPING SYSTEMS, ETC. NOT SCHEDULED FOR REUSE BACK TO NEAREST ACTIVE LINE SCHEDULED FOR REUSE. CAP AND SEAL LINES AT ACTIVE LINES WITH SAME MATERIALS. DO NOT ABANDON COMPONENT IN PLACE. SEAL ALL PENETRATIONS THROUGH WALLS AND FLOORS AT REMOVED PLUMBING SYSTEM COMPONENTS.
8. EXISTING CONCRETE FLOOR SLAB SHALL BE LEVELED, BROOM CLEAN WITH NO REMAINING ADHESIVE RESIDUES, AND SEALED.
9. REMOVAL OF ALL DEMOLITION AND CONSTRUCTION DEBRIS SHALL BE COORDINATED BETWEEN THE GENERAL CONTRACTOR AND THE LANDLORD AND SHALL COMPLY WITH ALL APPLICABLE CODES AND ORDINANCES.
10. IN AREA WHERE ELECTRICAL OR MECHANICAL SYSTEMS CONFLICT OR ALTERATIONS TO AN EXISTING SYSTEM IS REQUIRED BY THE GENERAL CONTRACT; NOTIFY AND COORDINATE ALL TRADES SO THAT THE PROPER ARRANGEMENTS AND SCHEDULING CAN BE MADE FOR INSTALLATION, CUTTING, REMOVING, TERMINATING, AND PATCHING OF SURROUNDING SYSTEMS AND MATERIALS CAN BE PROPERLY COMPLETED.
11. CONTRACTOR SHALL FAMILIARIZE WITH EXISTING BUILDING CONDITIONS AND OBSERVE THE SITE, STRUCTURE, AND PHYSICAL SPACE LIMITATIONS AND CHALLENGES TO COMPLETE WORK DESCRIBED ON DOCUMENTS.
12. ANY DEPARTURES FROM DESIGN INTENT ON DOCUMENTS, CONTRACTOR SHALL NOTIFY ARCHITECT/ENGINEER BEFORE PROCEEDING.

MECHANICAL DEMOLITION KEYNOTES

A. CONTRACTOR SHALL DEMOLISH EXISTING DIFFUSER, DUCTWORK, GRILLE, SUPPORTS, AND ACCESSORIES AS REQUIRED.

B. DEMOLISH EXISTING SINK AND ASSOCIATED PIPING AND ACCESSORIES. DEMOLISH WATER PIPES TO BELOW FLOOR.



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1 MECHANICAL DEMOLITION PLAN
M-014 1/8" = 1'-0"

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KELLY B. SUGG
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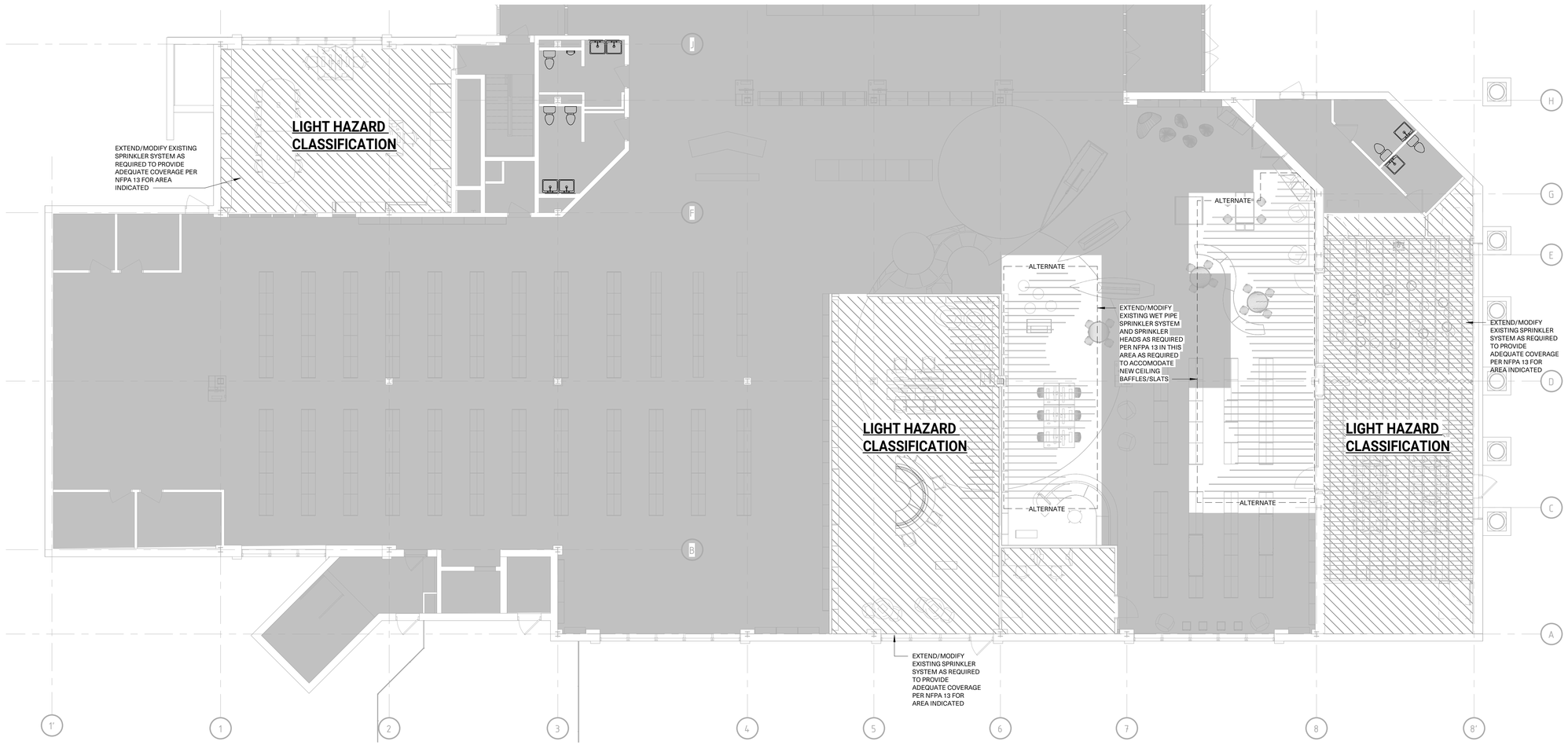
FIRE PROTECTION GENERAL NOTES

1. THESE DRAWINGS ARE INTENDED TO BE DIAGRAMATIC AND ARE NOT TO BE CONSIDERED FABRICATION OR SHOP DRAWINGS. COORDINATION WITH OTHER TRADES IS REQUIRED. PROVIDE THE ADDITIONAL FITTINGS AND OFFSETS THAT WILL BE REQUIRED TO COMPLETE EACH SYSTEM INCLUDING THE STRUCTURE, SHEET METAL, CONDUITS, CABLE TRAY, AND LIGHT FIXTURES.
2. INSTALL SYSTEMS SUCH THAT REQUIRED CLEARANCE AND SERVICE ACCESS SPACE IS PROVIDED AROUND ALL MECHANICAL AND ELECTRICAL EQUIPMENT, AND AROUND ANY COMPONENTS WHICH REQUIRE SERVICE ACCESS.
3. MINIMUM RUN-OUT PIPE SIZE TO SPRINKLER HEADS SHALL BE 1".
4. PROVIDE AN AUTOMATIC WET PIPE SPRINKLER SYSTEM IN ACCORDANCE WITH NFPA 13 FOR LIGHT HAZARD CLASSIFICATION FOR THE INDICATED AREAS. HYDRAULIC CALCULATIONS SHALL BE BASED ON DENSITY OF 0.10 GPM/ SQ. FT. OVER THE MOST REMOTE 1500 SQ. FT.
5. SPRINKLER HEADS INDICATED ARE SHOWN AS A GUIDE FOR LAYOUT IN ARCHITECTURALLY SENSITIVE AREAS. ANY DEVIATION FROM INDICATED LAYOUT OF HEADS AND ANY ADDITIONAL EXPOSED PIPING SHALL BE COORDINATED WITH ARCHITECT AND ENGINEER PRIOR TO INSTALLATION. PROVIDE ADDITIONAL HEADS AS REQUIRED FOR ABOVE PARTIAL CEILINGS AND TO MEET REQUIRED COVERAGE.
6. CONTRACTOR SHALL CONDUCT A PRESSURE AND FLOW TEST PRIOR TO HYDRAULIC CALCULATIONS TO DETERMINE STATIC AND FLOWING PRESSURES.
7. SPRINKLER MAINS & BRANCH PIPES SHOWN FOR REFERENCE ONLY AS A GUISE. COORDINATE ROUTING WITH OTHER TRADES.
8. REFER TO ARCHITECTURAL REFLECTED CEILING PLAN(S) FOR CEILING TYPES SOFFITS, DROPS, OPEN, FOR DESIGN OF THE SYSTEM.



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1 / M-100 FIRST FLOOR FIRE PROTECTION PLAN
1/8" = 1'-0"

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PLUMBING GENERAL NOTES

1. THESE DRAWINGS ARE INTENDED TO BE DIAGRAMATIC AND ARE NOT TO BE CONSIDERED FABRICATION OR SHOP DRAWINGS. COORDINATION WITH OTHER TRADES IS REQUIRED. PROVIDE THE ADDITIONAL FITTINGS AND OFFSETS THAT WILL BE REQUIRED TO COMPLETE EACH SYSTEM INCLUDING THE STRUCTURE, SHEET METAL, CONDUITS, CABLE TRAY, AND LIGHT FIXTURES.
2. PROVIDE ALL NECESSARY CLEARANCES AROUND MECHANICAL AND ELECTRICAL EQUIPMENT, DEVICES, VALVES, AND ANY COMPONENT REQUIRING MAINTENANCE PER MANUFACTURER RECOMMENDATIONS AND CODE REQUIREMENTS.
3. COORDINATE ROUTING OF PIPING AND SHEET METAL WITH ARCHITECTURAL, STRUCTURAL, AND ELECTRICAL TRADES TO AVOID INTERFERENCES. PROVIDE ADDITIONAL FITTINGS AND ELBOWS NECESSARY TO AVOID CONFLICTS.
4. ALL SANITARY PIPING BELOW SLAB SHALL BE A MINIMUM OF 4"Ø UNLESS NOTED OR AS REQUIRED BY THE LOCAL AUTHORITY HAVING JURISDICTION.
5. ALL SANITARY AND STORM PIPING 2 AND SMALLER SHALL BE SLOPED AT A MINIMUM 1/4" PER FOOT, AND ALL SANITARY AND STORM PIPING 3 AND LARGER SHALL BE SLOPED AT A MINIMUM OF 1/8" PER FOOT, UNLESS OTHERWISE NOTED OR AS REQUIRED BY THE LOCAL AUTHORITY HAVING JURISDICTION.
6. INSTALL PIPING SUCH THAT ALL VALVES, STRAINERS, TRAPS, FLANGES, UNIONS, AND PIPE ACCESSORIES ARE ACCESSIBLE.
7. SLEEVE AND FIRE STOP ALL PENETRATION OF RATED WALLS, FLOORS, CEILINGS, ETC. IN ACCORDANCE WITH APPLICABLE UL STANDARDS AND LISTINGS AND LOCAL CODES TO MAINTAIN RATINGS. REFER TO ARCHITECTURAL DRAWINGS FOR RATED ASSEMBLIES.
8. INSTALL WATER HAMMER ARRESTORS, BACKFLOW PREVENTERS, THERMOSTATIC MIXING VALVES, AND TRAP PRIMERS AS REQUIRED BY CODE IN THE DOMESTIC WATER SYSTEM.
9. ALL EQUIPMENT AND FIXTURES SHALL BE INSTALLED COMPLETE INCLUDING ISOLATION VALVES, ANGLE SUPPLIES, STOPS, SUPPORT HARDWARE, P-TRAPS, OFFSETS, MIXING VALVES, ETC.
10. ALL PIPING LOCATED WITHIN RETURN AIR PLENUM SHALL BE PLENUM RATED OR FIRE WRAPPED AS NEEDED. COORDINATE PLENUM LOCATIONS WITH MECHANICAL TRADES.
11. ALL ADA FIXTURES, WHERE DESIGNATED BY THE ARCHITECT SHALL BE FURNISHED AND INSTALLED IN ACCORDANCE WITH THE LATEST EDITION OF THE "BARRIER-FREE" DESIGN REQUIREMENTS OF THE APPLICABLE LOCAL CODE.
12. CONTRACTOR SHALL VIDEO CAMERA AND SCOPE ALL SANITARY AND STORM PIPING TO CONFIRM INTEGRITY AND IS FREE OF OBSTRUCTIONS AND DEFECTS TO ENSURE PROPER FLOW.

PLUMBING CONSTRUCTION KEYNOTES

- A EXISTING FLOOR SINK SHALL REMAIN. PROVIDE BARRIER TRAP PROTECTION DEVICE FOR FLOOR SINK.
- B PROVIDE CAP FOR WATER PIPES BELOW FLOOR AND PATCH FLOOR AS REQUIRED.
- C EXTEND AND CONECT TO EXISTING VENT TO EXISTING 3" VENT THROUGH ROOF IN THIS AREA.
- D CAP SANITARY PIPE BELOW FLOOR AND PATCH FLOOR AS REQUIRED.

N

1 M-200 FIRST FLOOR PLUMBING PLAN
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MECHANICAL - GENERAL NOTES

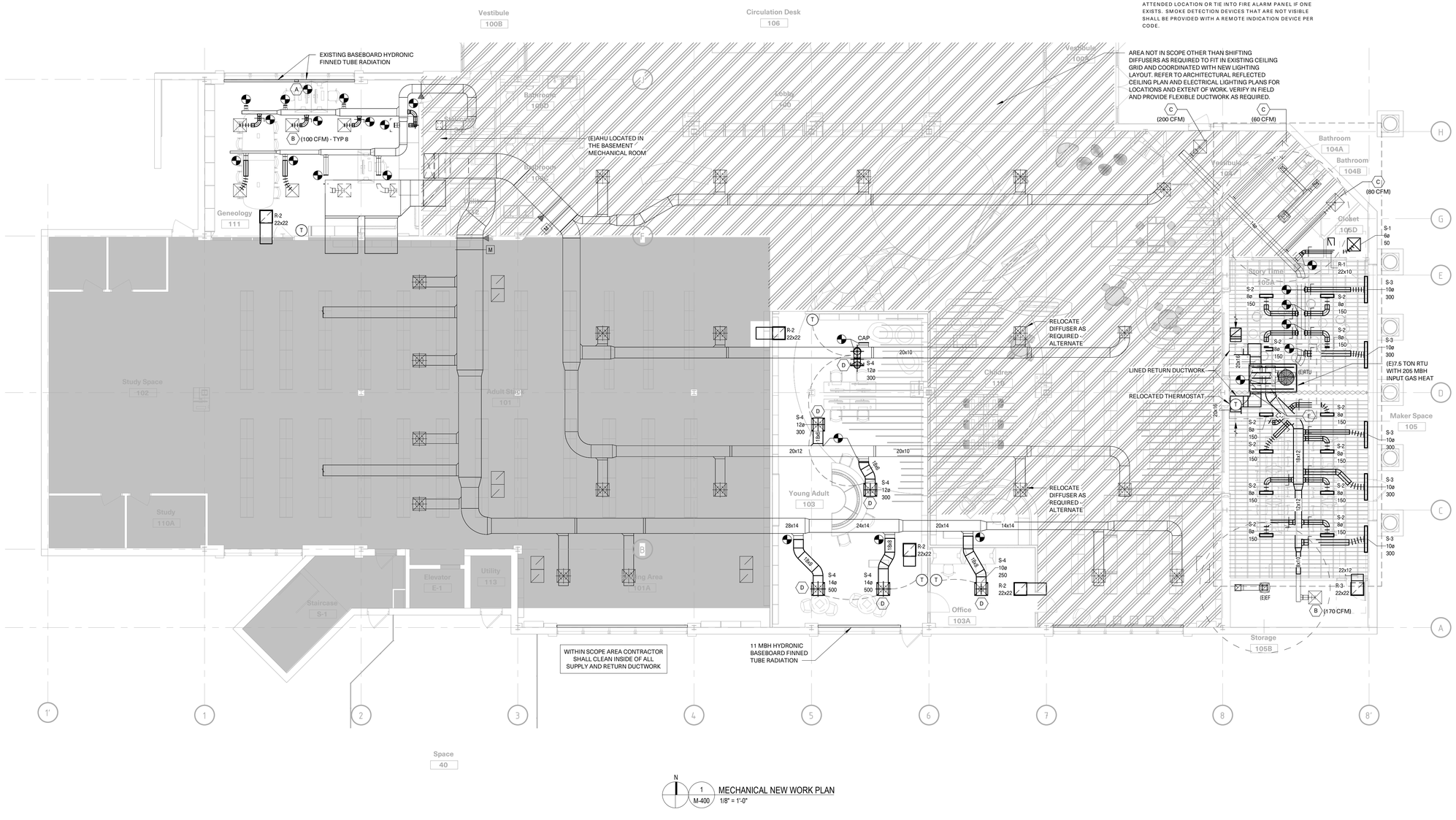
1 THESE DRAWINGS ARE INTENDED TO BE DIAGRAMMATIC AND ARE NOT TO BE CONSIDERED FABRICATION OR SHOP DRAWINGS. COORDINATE PIPING AND DUCTWORK AMONGST OTHER TRADES AS REQUIRED
2 PROVIDE ALL NECESSARY CLEARANCES AROUND MECHANICAL AND ELECTRICAL EQUIPMENT, DEVICES, VALVES, AND ANY COMPONENT REQUIRING MAINTENANCE PER MANUFACTURER RECOMMENDATIONS AND CODE REQUIREMENTS.
3 COORDINATE ROUTING OF PIPING AND SHEET METAL WITH ARCHITECTURAL, STRUCTURAL, AND ELECTRICAL TRADES TO AVOID INTERFERENCES. PROVIDE ADDITIONAL FITTINGS, OFFSETS, AND ELBOWS WHICH ARE REQUIRED DUE TO SPACE CONSTRAINTS OR OTHER FIELD CONDITIONS AND ARE NECESSARY TO AVOID CONFLICTS.
4 MOUNT THERMOSTATS 48" ABOVE FINISH FLOOR UNLESS NOTED OTHERWISE.
5 PROVIDE ACCESS DOORS IN DUCTWORK TO PROVIDE ACCESS FOR ALL SMOKE DETECTORS, FIRE DAMPERS, SMOKE DAMPERS, VOLUME DAMPERS, HUMIDIFIERS, COILS, AND OTHER ITEMS LOCATED IN THE DUCTWORK THAT REQUIRE SERVICE AND/OR INSPECTION.
6 PROVIDE ACCESS DOORS IN HARD CEILINGS FOR THE OPERATION, ADJUSTMENT, AND MAINTENANCE OF ALL FANS, VALVES, AND MECHANICAL EQUIPMENT.
7 DUCTWORK AND PIPING SHALL NOT BE LOCATED OVER ANY ELECTRICAL EQUIPMENT OR PANELS. PROVIDE REQUIRED N.E.C. CLEARANCE IN FRONT AND ABOVE ELECTRICAL EQUIPMENT.
8 CONTRACTOR SHALL PROVIDE ALL MISCELLANEOUS SUPPORTING STEEL FOR THE PROPER INSTALLATION AND SUPPORT OF MECHANICAL SYSTEMS.
9 CONTRACTOR SHALL VERIFY THERE ARE NO COMBUSTIBLES IN ANY RETURN AIR PLENUM. IF COMBUSTIBLES ARE PRESENT CONTRACTOR SHALL COORDINATE WITH ARCHITECT/ENGINEER FOR COURSE OF ACTION. DUCTED RETURN SYSTEM OR ELIMINATE COMBUSTIBLES WITH FIREPROOF, WRAP, OR BY OTHER MEANS.
10 ALL EQUIPMENT SHALL BE INSTALLED PER MANUFACTURE RECOMMENDATIONS AND REQUIREMENTS.
11 MECHANICAL AIR HANDLING EQUIPMENT SHALL HAVE DUCT DETECTOR IN RETURN AND/OR SUPPLY DUCT. SMOKE DETECTION WILL SHUT OFF HVAC UNIT UPON ACTIVATION. THE ACTIVATION OF THE SMOKE DETECTOR SHALL ACTIVATE A VISIBLE AND AUDIBLE SUPERVISORY SIGNAL AT A CONSTANTLY ATTENDED LOCATION OR TIE INTO FIRE ALARM PANEL IF ONE EXISTS. SMOKE DETECTION DEVICES THAT ARE NOT VISIBLE SHALL BE PROVIDED WITH A REMOTE INDICATION DEVICE PER CODE.

MECHANICAL CONSTRUCTION KEYNOTES

A PROVIDE TRIM TO MATCH EXISTING BASEBOARD HYDRONIC FINNED TUBE TO MAKE CONTINUOUS WHERE EXISTING WALL IS DEMOLISHED.
B RELOCATED DIFFUSER. CLEAN DIFFUSER PRIOR TO REINSTALLATION. BALANCE DIFFUSER TO INDICATED AIRFLOW.
C REBALANCE EXISTING DIFFUSER TO INDICATED AIRFLOW.
D PROVIDE VOLUME DAMPER IN THE VERTICAL DUCT.
E AVOID STRUCTURE FOR MOVEABLE PARTITION REFER TO ARCHITECTURAL DRAWINGS.

MECHANICAL CLEANING NOTES

A THE GENERAL CONTRACTOR SHALL COORDINATE WITH THE CITY'S SEPARATELY CONTRACTED TEAM TO PERFORM CLEANING AND SANITIZATION OF THE EXISTING HVAC SYSTEM.



1 MECHANICAL NEW WORK PLAN
M-400 1/8" = 1'-0"

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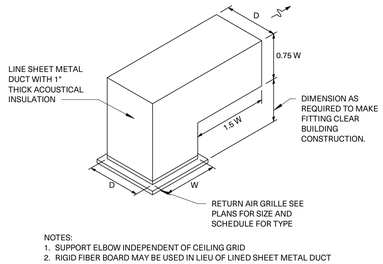
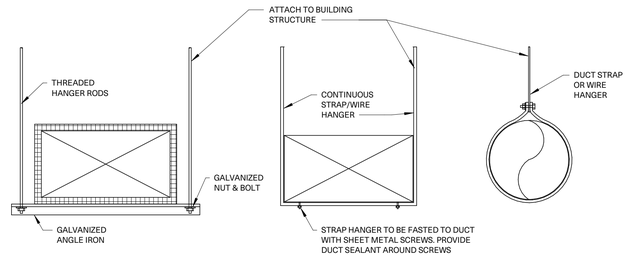


NOTES:
1. SUPPORT ELBOW INDEPENDENT OF CEILING GRID
2. RIGID FIBER BOARD MAY BE USED IN LIEU OF LINED SHEET METAL DUCT

PLENUM RETURN AIR GRILLE DETAIL

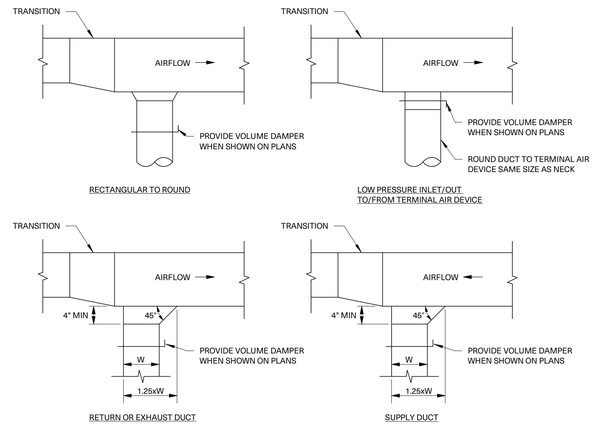
NO SCALE



NOTES:
1. ALL HANGER STRAPS AND HANGER RODS SHALL BE FIRMLY SUPPORTED FROM THE STRUCTURAL STEEL.
2. REFER TO LOW PRESSURE DUCTWORK JOINT AND SUPPORT SCHEDULE FOR HANGER AND SUPPORT GAUGES, SPACING, STRAP SIZES, ETC.

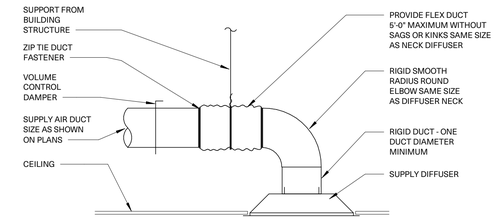
DUCT SUPPORT DETAIL

NO SCALE



RECTANGULAR BRANCH DUCT DETAILS

NO SCALE



NOTE: MAY CONNECT FLEXIBLE DUCT TO DIFFUSER INLET IF A FLEXIBLE DUCT ELBOW SUPPORT IS PROVIDED.

ROUND NECK SUPPLY AIR DIFFUSER DETAIL

NO SCALE

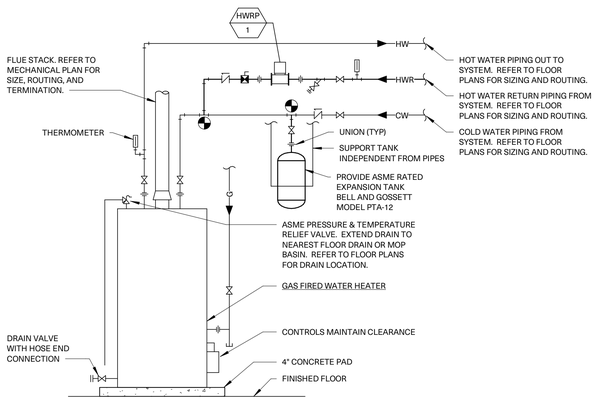
EXPOSED ROUND DUCT DIFFUSER DETAIL

NO SCALE

NOTES:
1. REFER TO FLOOR PLAN FOR LOCATION AND QUANTITY.
2. REFER TO SCHEDULES FOR MOUNTING/GRILLE TYPE

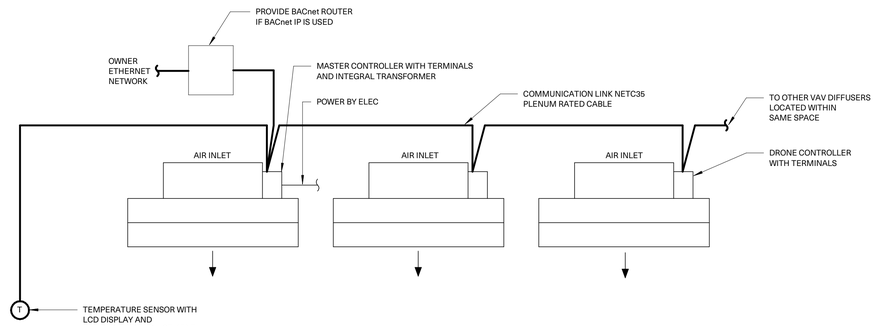
ROUND BRANCH DUCT DETAILS

NO SCALE



GAS FIRED STORAGE WATER HEATER DETAIL

NO SCALE



VAV DIFFUSER CONTROL AND FIELD WIRING

NOTES:
1. REFER TO MECHANICAL PLANS FOR LOCATIONS AND QUANTITY OF UNITS.
2. TEMPERATURE CONTROLS CONTRACTOR SHALL PROVIDE COMPONENTS AND WIRING INDICATED WITH HEAVY LINE WEIGHT. COORDINATE WITH PURCHASED MANUFACTURE FOR EXACT WIRING REQUIREMENTS.
3. TC CONTRACTOR SHALL PROVIDE BAS INTERFACE THROUGH HARD WIRED POINTS AND/OR LAN CONNECTIONS AS INDICATED.
4. VAV DIFFUSER(S) SHALL INCLUDE PACKAGED CONTROLS AND BAS THROUGH BACNET OPEN PROTOCOL COMMUNICATION. APPROPRIATE DEADBANDS SHALL BE USED TO PREVENT SHORT CYCLING SITUATIONS.
5. INTEGRATE VAV DIFFUSERS INTO EXISTING BUILDING MANAGEMENT SYSTEM AND PROVIDE USER INTERFACE WITH SYSTEM GRAPHICS. COORDINATE WITH OWNER AND INSTALLED BUILDING CONTROL SYSTEM MANUFACTURE.

SEQUENCE OF OPERATION:
1. VAV DIFFUSER SHALL MODULATE VAV DIFFUSER INLET DAMPER AS REQUIRED TO MAINTAIN SPACE TEMPERATURE SETPOINT ENABLED/DISABLED BY TEMPERATURE SENSOR.

VAV DIFFUSER UNIT CONTROLS COMMUNICATION POINT LIST:
- SPACE TEMPERATURE (TO BAS)
- COMMON ALARM (TO BAS)
- TEMPERATURE SETPOINT (FROM BAS)

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Sheet Number
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GRILLE, REGISTER, AND DIFFUSER SCHEDULE

UNIT ID	FACE SIZE IN.	NECK SIZE IN.	MOUNTING STYLE	CONSTRUCTION	OPTIONS/ ACCESSORIES	FINISH	MANUFACTURER	MODEL NUMBER	NOTES
R-1	24x12	SEE PLANS	LAY-IN	STEEL		ARCH TO SELECT	PRICE	PDDR	
R-2	24x24	SEE PLANS	LAY-IN	STEEL	--	ARCH TO SELECT	PRICE	PDDR	
R-3	24x24	SEE PLANS	SURFACE	STEEL	PLASTER FRAME	ARCH TO SELECT	PRICE	PDDR	
S-1	24x24	SEE PLANS	LAY-IN	STEEL	--	ARCH TO SELECT	PRICE	SPD	
S-2	24x4	SEE PLANS	SURFACE	ALUMINUM	VCR8EC	ARCH TO SELECT	PRICE	SDS	PROVIDE 2 SLOT 1" SLOT WIDTH AND SDB PLENUM BOX, BORDER TYPE BY ARCHITECT
S-3	48x4	SEE PLANS	SURFACE	ALUMINUM	VCR8EC	ARCH TO SELECT	PRICE	SDS	PROVIDE 2 SLOT 1" SLOT WIDTH AND SDB PLENUM BOX, BORDER TYPE BY ARCHITECT
S-4	24x24	SEE PLANS	LAY-IN	STEEL	PRESSURE RELIEF COLLAR, BACNET SYSTEM INTERFACE, MASTER ONLY ON-BOARD TRANSFORMER 120V/24V 20VA	ARCH TO SELECT	PRICE	PPD	PROVIDE POWER MODULE FOR MULTIPLE DIFFUSERS

**CONTRACTOR SHALL MEASURE EXISTING AIR HANDLER OUTSIDE AND SUPPLY AIRFLOW. IF LESS THAN LISTED OUTSIDE AIRFLOW PERCENTAGE REBALANCE OUTSIDE AIR DAMPER TO ACHIEVE CODE MINIMUM OUTSIDE AIR PERCENTAGE

CODE MINIMUM SYSTEM VENTILATION RESULTS

AIR HANDLING SYSTEM	SYSTEM VENTILATION EFFICIENCY, Ev	MAX			MIN			OCCUPANT DIVERSITY	SYSTEM PRIMARY AIRFLOW, Vps	SYSTEM UNCORRECTED OUTDOOR AIRFLOW, Vou	AVERAGE OUTDOOR AIR FRACTION, Xs	OUTDOOR AIR INTAKE AIRFLOW (MULTI-ZONE), Vot	OUTDOOR AIR INTAKE AIRFLOW (100% OA), Vot
		AIRFLOW, CFM	OUTSIDE AIRFLOW, CFM	OUTSIDE AIRFLOW FRACTION, %	AIRFLOW, CFM	OUTSIDE AIRFLOW, CFM	OUTSIDE AIRFLOW FRACTION, %						
(E)AHU	0.93	2610	370	14	2610	370	14	100	2610	345	0.13	370	431
(E)RTU	0.94	2960	230	8	2960	230	8	100	2960	215	0.07	229	269

CODE MINIMUM VENTILATION SCHEDULE

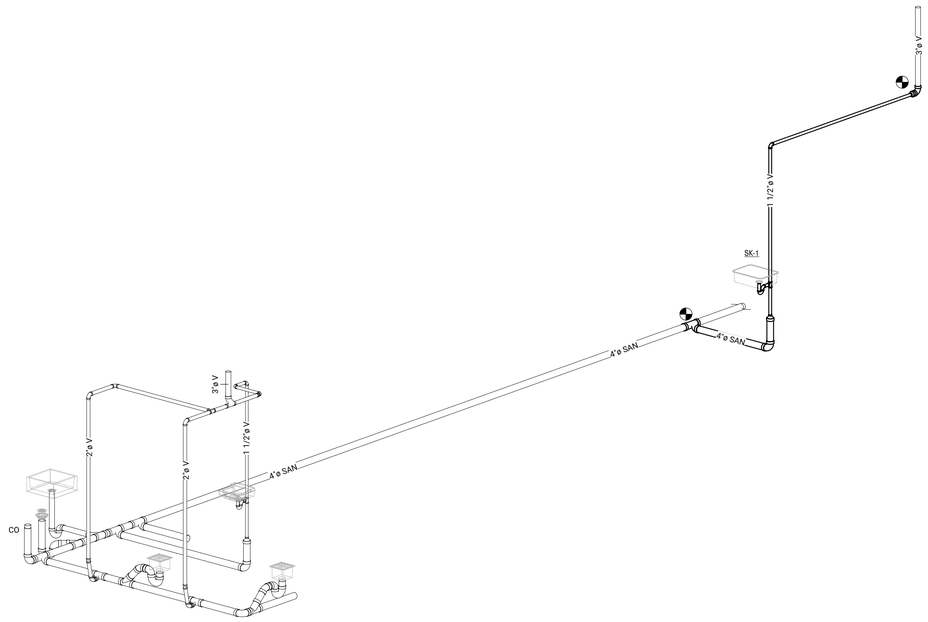
ROOM NO.	ROOM NAME	AREA SQ.FT.	MINIMUM ZONE PRIMARY AIR AT FULL OCCUPNACY Vpz	OCCUPANT DENSITY PEOPLE/1000 sqft	PEOPLE OA RATE CFM/PERSON Rp	TOTAL PEOPLE Pz	AREA OA RATE CFM/sqft Ra	AIR DISTRIBUTION EFFECTIVNESS Ez	BREATHING ZONE OUTDOOR AIRFLOW Vbz	OUTSIDE AIR FRACTION AT MINIMUM SA Zpz	ZONE OUTDOOR AIRFLOW Voz	SYSTEM
103	Young Adult	1154 SF	1225	10	5.0	12	0.12	0.8	196	0.20	245	(E)AHU
103A	Office	203 SF	250	5	5.0	1	0.06	0.8	17	0.09	22	(E)AHU
105	Maker Space	613 SF	1300	10	5.0	6	0.12	0.8	104	0.10	130	(E)RTU
105A	Story Time	442 SF	1100	10	5.0	4	0.12	0.8	75	0.09	94	(E)RTU
105B	Storage	151 SF	170	0	0.0	0	0.12	0.8	18	0.13	23	(E)RTU
105D	Closet	38 SF	50	0	0.0	0	0.12	0.8	5	0.11	6	(E)RTU
111	Geneology	772 SF	1135	10	5.0	8	0.06	0.8	131	0.14	164	(E)AHU

PUMP SCHEDULE

UNIT ID	UNIT TAG	FLUID TYPE	FLOW RATE GPM	HEAD FT.WG.	SYSTEM TEMPERATURE °F	COUPLING TYPE	MOTOR		ELECTRICAL		MANUFACTURER	MODEL NUMBER	NOTES
							HP	CONTROL TYPE	VOLTAGE	PHASE			
HWRP	1	WATER	2	8	100	CLOSE	0.03	AUTO	115	1	TACO	006	PROVIDE TIMER AND AQUASTAT

PLUMBING FIXTURE SCHEDULE - LAVATORY/ SINK

UNIT ID	CONNECTION SIZE IN INCHES				LAVATORY/ SINK FIXTURE							FAUCET			NOTES
	CW	HW	SAN	VENT	MATERIAL	MOUNTING	COLOR	NUMBER OF BOWLS	BOWL DIMENSIONS L"xW"xD"	OVERALL DIMENSIONS L"xW"xD"	MANUFACTURER/ MODEL NUMBER	FLOW RATE GPM	DESCRIPTION	MANUFACTURER/ MODEL NUMBER	
SK-1	1/2	1/2	1 1/2	1 1/2	STAINLESS STEEL	DROP IN	--	1	21" x 15-3/4" x 5-5/8"	25" x 22" x 6"	ELKAY LRAD252260	1.5	SINGLE HOLE MOUNT GOOSENECK WITH SPRAY FAUCET. SWIVEL AND PULL DOWN SPRAY FINISH BY ARCHITECT	DELTA 19933T-SPSD-DST	DRAIN SHALL BE ELKAY PERFECT DRAIN LK99 CHROME PLATED BRASS BODY.STRAINER AND TAILPIECE. P-TRAP ASSEMBLY SHALL BE CAST BRASS WITH CLEANOUT, WATER STOPS. PROVIDE PROFLO INSULATION KIT FOR WASTE AND SUPPLY ASSEMBLIES.



PLUMBING RISER DIAGRAM - SANITARY & VENT PIPING
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TEMPERATURE CONTROLS SCHEMATIC SYMBOLS

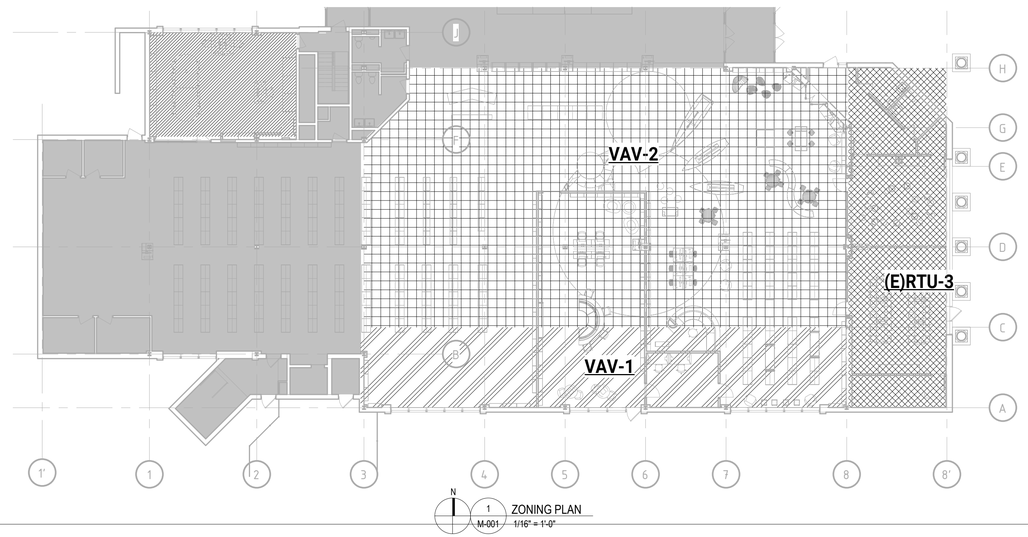
MS	MOTOR STARTER	CONTACTS - NORMALLY CLOSED	
S/S	START/ STOP RELAY	CONTACTS - NORMALLY OPEN	
CS	CURRENT SWITCH	PUSH BUTTONS - NORMALLY CLOSED	
LS	LIMIT SWITCH	PUSH BUTTONS - NORMALLY OPEN	
R	RELAY	SWITCH - NORMALLY CLOSED TIMING CLOSED	
H	HUMIDITY SENSOR, DUCT MOUNTED	SWITCH - NORMALLY OPEN TIMING CLOSED	
T	TEMPERATURE SENSOR - DUCT MOUNTED RIGID ELEMENT	SWITCH - NORMALLY CLOSED TIMING OPEN	
T	TEMPERATURE SENSOR - RIGID ELEMENT WITH THERMAL WELL	SWITCH - NORMALLY OPEN TIMING OPEN	
DD	DUCT SMOKE DETECTOR	SWITCH - NORMALLY OPEN	
FM	FLOW METER	THERMAL OVERLOAD, SINGLE PHASE	
FS	FLOW SWITCH	TRANSFER SWITCH - TEMPERATURE ACTUATED	
M	DAMPER ACTUATOR	SWITCH - LIMIT- NORMALLY OPEN	
DPT	DIFFERENTIAL PRESSURE TRANSMITTER	SWITCH - LIMIT- NORMALLY CLOSED	
DPS	DIFFERENTIAL PRESSURE SENSOR	HAND/OFF/AUTO SWITCH	HAND OFF AUTO
PS	PRESSURE SWITCH		
T	THERMOSTAT OR TEMPERATURE SENSOR	TRANSFORMER	
T/H	TEMPERATURE & HUMIDITY SENSOR	FUSE	
CO2	CARBON DIOXIDE SENSOR	GROUND	
<>	ALARM & STROBE	MOTOR, SINGLE PHASE	
LEL	FLAMMABILITY SENSOR	VARIABLE FREQUENCY CONTROLLER	VFC
O2	OXYGEN SENSOR	ELECTRICALLY COMMUTATED MOTER	ECM
PS	POWER SUPPLY	DAMPER - PARALLEL BLADE	
AI	ANALOG INPUT - SIGNAL - BAS/EMS/DDC	DAMPER - OPPOSED BLADE	
AO	ANALOG OUTPUT - SIGNAL - BAS/EMS/DDC	GUARD FOR STAT OR SENSOR	
DI	DIGITAL INPUT - SIGNAL - BAS/EMS/DDC	CONTROLLER	C
DO	DIGITAL OUTPUT - SIGNAL - BAS/EMS/DDC	EMERGENCY SHUT-OFF SWITCH	SW
AI	ANALOG INPUT - SIGNAL - BAS/EMS/DDC - PACKAGED EQUIPMENT		
AO	ANALOG OUTPUT - SIGNAL - BAS/EMS/DDC - PACKAGED EQUIPMENT		
DI	DIGITAL INPUT - SIGNAL - BAS/EMS/DDC - PACKAGED EQUIPMENT		
DO	DIGITAL OUTPUT - SIGNAL - BAS/EMS/DDC- PACKAGED EQUIPMENT		

ABBREVIATIONS AND DESCRIPTIONS

A	COMPRESSED AIR	LRA	LOCKED ROTOR AMPS
ACC	AIR COOLED CONDENSER	LTU	LAB AIR TERMINAL UNIT
ACCU	AIR COOLED CONDENSING UNIT	LWB	LEAVING WET BULB
AFF	ABOVE FINISHED FLOOR	LWT	LEAVING WATER TEMPERATURE
AHU	AIR HANDLING UNIT		
ALT	ALTERNATE	MAT	MIXED AIR TEMPERATURE
AMP	AMPERE	MAU	MAKE UP AIR UNIT
APD	AIR PRESSURE DROP	MAX	MAXIMUM
ASHRAE	AMERICAN SOCIETY OF HEATING, REFRIGERATION AND AIR-CONDITIONING ENGINEERS	MBH	THOUSAND BRITISH THERMAL UNITS PER HOUR
		MCA	MINIMUM CIRCUIT AMPACITY
AUX	AUXILIARY	MECH	MECHANICAL
AV	ACID VENT	MFR	MANUFACTURER
AVTR	ACID VENT THROUGH ROOF	MIN	MINIMUM
AW	ACID WASTE	MISC	MISCELLANEOUS
		MMBH	MILLION BRITISH THERMAL UNITS PER HOUR
BAS	BUILDING AUTOMATION SYSTEM	M/S	MOTOR STARTED
BCU	BLOWER COIL UNIT	MV	MANUAL AIR VENT
BDD	BACK DRAFT DAMPER		
BFP	BACK FLOW PREVENTER	NC	NORMALLY CLOSED
BHP	BRAKE HORSE POWER	NC	NOISE CRITERIA
BOD	BOTTOM OF DUCT	NFPA	NATIONAL FIRE PROTECTION AGENCY
BOP	BOTTOM OF PIPE	NIC	NOT IN CONTRACT
BTU	BRITISH THERMAL UNIT	NO	NORMALLY OPEN
BTUH	BRITISH THERMAL UNIT PER HOUR	NPCW	NON POTABLE COLD WATER
C	COMMON	OA	OUTSIDE AIR
CAP	CAPACITY	OAT	OUTSIDE AIR TEMPERATURE
CC	COOLING COIL	OBD	OPPOSED BLADE DAMPER
CD	CONDENSATE DRAIN	OD	OUTSIDE DIAMETER
CFH	CUBIC FEET PER HOUR	ORC	OVERFLOW ROOF CONDUCTOR
CFM	CUBIC FEET PER MINUTE	ORD	OVERFLOW ROOF DRAIN
CH	CHILLER	OS&Y	OUTSIDE SCREW AND YOLK
CHW	CHILLED WATER	OV	OUTLET VELOCITY
CHWS	CHILLED WATER SUPPLY		
CHWR	CHILLED WATER RETURN	PC	PUMPED CONDENSATE
CNDS	CONDENSATE	PCR	PROCESS COOLING RETURN
CO	CLEAN OUT	PCS	PROCESS COOLING SUPPLY
CO2	CARBON DIOXIDE	PD	PRESSURE DROP (FEET OF WATER)
CP	CIRCULATING PUMP	PH	PERIMETER HEAT
CRU	CONDENSATE RETURN UNIT	PHR	PERIMETER HEAT RETURN
CT	COOLING TOWER	PHS	PERIMETER HEAT SUPPLY
CUH	CABINET UNIT HEATER	PRV	PRESSURE REDUCING VALVE
CW	DOMESTIC COLD WATER	PS	PUMPED STORM
CWS	CONDENSER WATER SUPPLY	PSI	POUNDS PER SQUARE INCH
CWR	CONDENSER WATER RETURN	PSIA	POUNDS PER SQUARE INCH - ABSOLUTE
		PSIG	POUNDS PER SQUARE INCH - GAUGE
DAT	DISCHARGE AIR TEMPERATURE	PW	PROCESS WATER
DB	DRY BULB	PWR	PROCESS WATER RETURN
DDC	DIRECT DIGITAL CONTROL	PWS	PROCESS WATER SUPPLY
DEG	DEGREE		
DFU	DRAINAGE FIXTURE UNIT	RA	RETURN AIR
DN	DOWN	RAT	RETURN AIR TEMPERATURE
DNZ	DOWNSPOUT NOZZLE	RC	ROOF CONDUCTOR
DT	DRAIN TILE	RCP	RADIANT CEILING PANEL
DWH	DOMESTIC WATER HEATER	RD	ROOF DRAIN
DX	DIRECT EXPANSION COOLING	RF	RETURN FAN
		RH	RELATIVE HUMIDITY
F	FIRE PROTECTION	RH	ROOF HYDRANT
°F	DEGREES FAHRENHEIT	RL	REFRIGERANT LIQUID
FCU	FAN COIL UNIT	RLFA	RELIEF AIR
FD	FLOOR DRAIN	RPM	REVOLUTIONS PER MINUTE
FLA	FULL LOAD AMPS	RS	REFRIGERANT SUCTION
FP	FIRE PUMP	RTU	ROOFTOP UNIT
FS	FLOOR SINK		
FT	FEET	SA	SUPPLY AIR
FTR	FINNED TUBE RADIATION	SA	SOUND ATTENUATOR
		SAN	SANITARY WASTE
G	NATURAL GAS	SF	SUPPLY FAN
GA	GAUGE	SH	SHOWER
GAL	GALLON	SK	SINK
GRH	GRAVITY RELIEF HOOD	SMR	SNOW MELT RETURN
GPH	GALLON PER HOUR	SMS	SNOW MELT SUPPLY
GPM	GALLON PER MINUTE	SP	STATIC PRESSURE
		SPEC	SPECIFICATION
HB	HOSE BIBB	SQFT	SQUARE FEET
HC	HEATING COIL	S/S	START/STOP
HEPA	HIGH EFFICIENCY PARTICULATE ARRESTANCE	SS	SERVICE SINK
HL	HIGH LIMIT	ST	STORM
HOA	HAND/OFF/AUTO	STM	STEAM
HP	HEAT PUMP	SW	SWITCH
HP	HORSEPOWER		
HPLR	HEAT PUMP LOOP RETURN	TC	TEMPERATURE CONTROL
HPLS	HEAT PUMP LOOP SUPPLY	TC	TEMPERING COIL
HTG	HEATING	TCP	TEMPERATURE CONTROL PANEL
HUV	HORIZONTAL UNIT VENTILATOR	TD	TRENCH DRAIN
HV	HEATING VENTILATION	TEMP	TERMPERATURE
HVAC	HEATING, VENTILATION, AIR CONDITIONING	TSP	TOTAL STATIC PRESSURE
HWH	HOT WATER HEATING	TU	AIR TERMINAL UNIT
HWHR	HOT WATER HEATING RETURN	TYP	TYPICAL
HWHS	HOT WATER HEATING SUPPLY		
HW	DOMESTIC HOT WATER	UH	UNIT HEATER
HWR	DOMESTIC HOT WATER RETURN	UL	UNDERWRITER
HX	HEAT EXCHANGER	UR	URINAL
HZ	HERTZ	UV	UNIT VENTILATOR
ID	INSIDE DIAMETER	V	VENT
IE	INVERT ELEVATION	VAC	VACUUM
IH	INTAKE HOOD	VAV	VARIABLE AIR VOLUME
IN	INCHES	VB	VACUUM BREAKER
IW	INDIRECT WASTE	VFC	VARIABLE FREQUENCY CONTROLLER
		VIF	VERIFY IN FIELD
KW	KILOWATT	VTR	VENT THROUGH ROOF
KWH	KILOWATT HOUR	VUV	VERTICAL UNIT VENTILATOR
LAT	LEAVING AIR TEMPERATURE	W	WASTE
LAV	LAVATORY	WB	WET BULB
LBS	POUNDS	WC	WATER CLOSET
LDB	LEAVING DRY BULB	WC	WATER COLUMN
LL	LOW LIMIT	WH	WALL HYDRANT
LPC	LOW PRESSURE CONDENSATE	WPD	WATER PRESSURE DROP
LPS	LOW PRESSURE STEAM		

SYMBOLS AND NOTATION STANDARDS

	DASHED LINES INDICATE PIPING ROUTED BELOW SLAB OR GRADE	FTR A	FINNED TUBE ELEMENT LENGTH: X' - X" / FINNED TUBE ELEMENT HEAT IN MBH: X MBH / GALLONS PER MINUTE FOR ELEMENT: X GPM
	HATCH MARKS INDICATE EQUIPMENT OR MATERIALS TO BE DISCONNECTED AND REMOVED		
	LIGHT LINE WEIGHT INDICATES EXISTING EQUIPMENT OR REFERENCED INFORMATION		SUPPLY DIFFUSER TYPE 1 (SCHEDULED): S-1 / 8" DIAMETER NECK SIZE: ØØ / TWO DIFFUSERS WITH 100 CFM: 100-2
	HEAVY LINE WEIGHT INDICATES NEW WORK		
	MANUAL VOLUME DAMPER	X / X	EQUIPMENT TAG
FD	FIRE DAMPER DYNAMIC; VERTICAL OR HORIZONTAL	X	CONSTRUCTION NOTES
SD	SMOKE DAMPER; VERTICAL OR HORIZONTAL	T	THERMOSTAT/ TEMPERATURE SENSOR
	COMBINATION FIRE & SMOKE DAMPER; HORIZONTAL		NEW CONNECTION
	COMBINATION FIRE & SMOKE DAMPER; VERTICAL		EXHAUST/RETURN/TRANSFER ARROW
	TRANSITION; SYMMETRIC		SUPPLY ARROW
	TRANSITION; ASYMMETRIC		BLANK OFF SECTION
	90 DEG RADIUS ELBOW (R/W = 1.5)		PIPE ENDCAP
	MITERED ELBOW WITH TURNING VANES	VTR	VENT THROUGH ROOF
	TEE, BOOT ENTRY BRANCH		PIPE ELBOW DOWN
	TEE, ROUND BRANCH		PIPE ELBOW UP
	TEE, CONICAL ROUND BRANCH	BFP	BACKFLOW PREVENTER
	CEILING MOUNTED RETURN GRILLE / REGISTER		ISOLATION VALVE
	CEILING MOUNTED SUPPLY DIFFUSER/GRILLE		BALANCE VALVE
	CEILING MOUNTED EXHAUST GRILLE/REGISTER		BALANCE VALVE WITH FLOW MEASURING
24x12	INTERIOR CLEAR DUCTWORK DIMENSIONS; WIDTHxHEIGHT		CONTROL VALVE
12Ø	INTERIOR CLEAR DUCTWORK DIMENSIONS-ROUND; DIAMETER		BALL VALVE
24/12 OR 24x12Ø	INTERIOR CLEAR DUCTWORK DIMENSIONS-OVAL; WIDTHxHEIGHT		GAS VALVE (MANUAL)
	SUPPLY AIR DUCT UP		PIPE CONTINUATION
	SUPPLY AIR DUCT DOWN		PRESSURE REGULATING VALVE
	RETURN AIR DUCT UP		OUTSIDE STEM AND YOKE VALVE
	RETURN AIR DUCT DOWN	TS	OUTSIDE STEM AND YOKE VALVE WITH TAMPER SWITCH
	EXHAUST AIR DUCT UP		CHECK VALVE
	EXHAUST AIR DUCT DOWN		PIPE FLEXIBLE CONNECTION
	FLEXIBLE DUCT		PIPE UNION
	AIR TERMINAL UNIT WITH HOT WATER COIL	CO	CLEAN OUT - PIPE FLANGE
	AIR TERMINAL UNIT WITH ELECTRIC COIL	CO	CLEAN OUT - IN FLOOR
			PUMP
		HB	HOSE BIBB
		WH	WALL HYDRANT
		M	WATER METER
			FLOOR DRAIN/ SINK
			FLOW MEASURING DEVICE
			THERMOMETER
			PRESSURE GAUGE AND COCK
		MV	AIR VENT - MANUAL
		AV	AIR VENT - AUTOMATIC
			PRESSURE RELIEF VALVE
			STRAINER WITH HOSE CONNECTION
			STRAINER
			REDUCER - CONCENTRIC
			REDUCER - ECCENTRIC
			FUNNEL FLOOR DRAIN - ELEVATION (DETAILS)
			FLOOR DRAIN -ELEVATION (DETAIL)
			ACCESS DOOR
		VFC	FLEXIBLE CONNECTOR
			VARIABLE FREQUENCY CONTROLLER
			AUTOFLOW VALVE



1 ZONING PLAN
M-001 1/16" = 1'-0"

SHEET LIST - MECHANICAL

Sheet Number	Sheet Name
M-001	INDEX, SYMBOLS, & ABBREVIATIONS
M-002	STANDARD MATERIALS SCHEDULES
M-003	SPECIFICATIONS
M-004	SPECIFICATIONS
M-014	MECHANICAL DEMOLITION PLAN
M-100	FIRE PROTECTION
M-200	PLUMBING PLANS
M-400	MECHANICAL PLAN
M-500	DETAILS
M-600	DIAGRAMS AND SCHEDULES

DESIGN CONDITIONS

	OUTSIDE AIR	RETURN AIR
COOLING DB (°F)	90.3	75
COOLING WB (°F)	73.4	--
HEATING DB (°F)	0	72
CLIMATE ZONE		5A

NOTE: DESIGN CONDITIONS BASED ON ASHRAE 2013 CLIMATIC DESIGN INFORMATION

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PROJECT NAME

SCSPL

Drawing Name
INDEX, SYMBOLS, & ABBREVIATIONS

Drawn By
KS

Checked By
KS

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STATE OF MICHIGAN
KELLY B. SUGG
ENGINEER
No. 6201061005
LICENSED PROFESSIONAL ENGINEER

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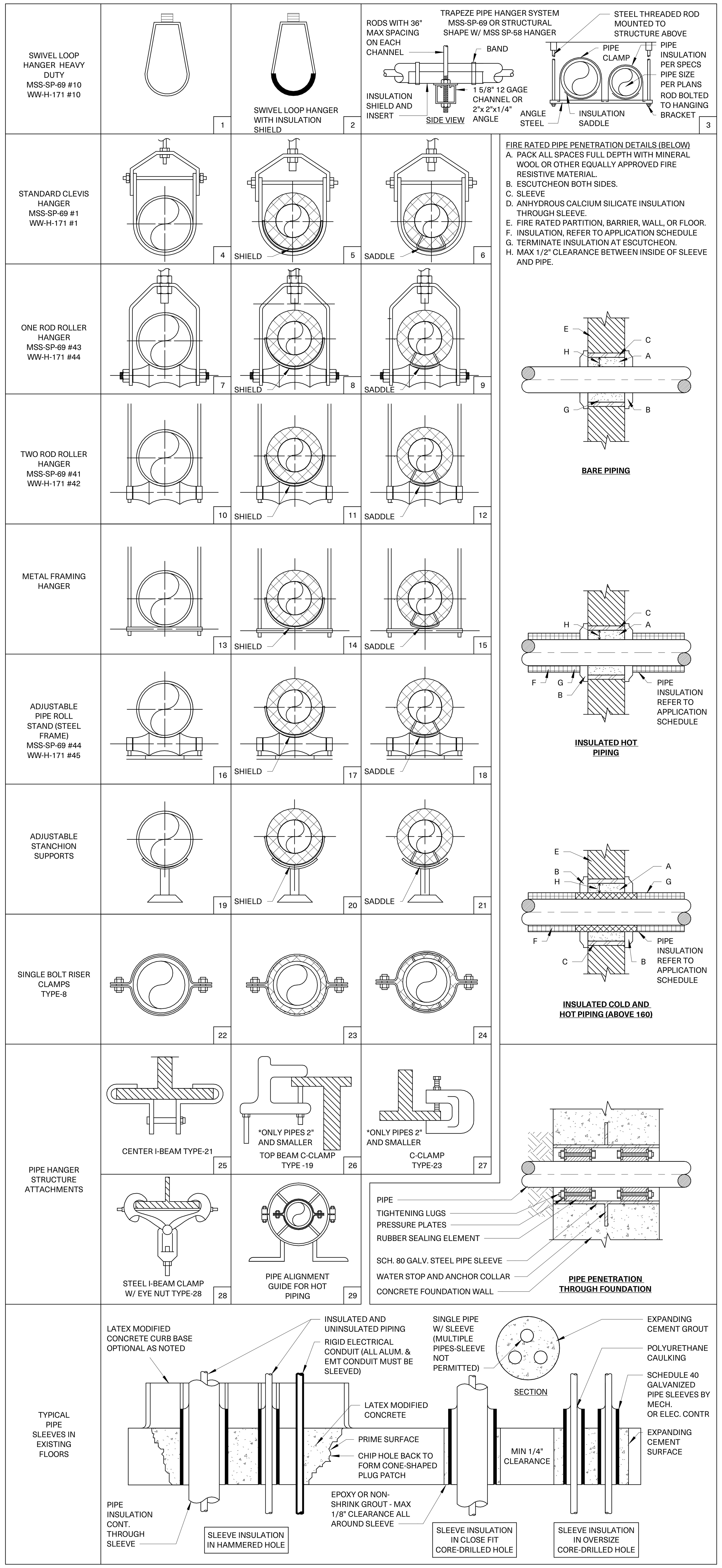

PIPING APPLICATION SCHEDULE

PIPING SYSTEM	PIPE SYSTEM PRESSURE	SIZE: 1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	4	6
ABOVEGROUND DOMESTIC WATER	125 PSIG	X	X	X	X						
ABOVEGROUND DOMESTIC WATER	125 PSIG					X	X				
ABOVEGROUND DOMESTIC WATER	125 PSIG							X	X		
ABOVEGROUND DOMESTIC WATER	125 PSIG									X	
ABOVEGROUND DOMESTIC WATER	125 PSIG										X
ABOVEGROUND DOMESTIC WATER	125 PSIG										
ABOVEGROUND SANITARY WASTE & VENT	10 FT HD					X	X				
ABOVEGROUND SANITARY WASTE & VENT	10 FT HD							X	X		
ABOVEGROUND SANITARY WASTE & VENT	10 FT HD									X	
ABOVEGROUND SANITARY WASTE & VENT	10 FT HD										X
UNDERGROUND SANITARY WASTE AND VENT	10 FT HD					X	X	X	X	X	X
ABOVEGROUND INDIRECT SANITARY WASTE	10 FT HD	X	X	X	X	X	X				
ABOVEGROUND COLD CONDENSATE	10 FT HD	X	X	X	X	X	X				
FIRE SUPPRESSION	150 PSIG			X	X	X	X				
FIRE SUPPRESSION	150 PSIG							X	X		
FIRE SUPPRESSION	150 PSIG									X	
FIRE SUPPRESSION	150 PSIG										X
FIRE SUPPRESSION	150 PSIG										

PIPING SYSTEM	MATERIAL: COPPER TYPE L	COPPER TYPE K	COPPER DWV	CARBON STEEL SCH. 40	CARBON STEEL SCH. 80	GALVANIZED STEEL (SCH. 40)	POLYPROPYLENE	POLYETHYLENE	PVC SCH. 40	CPVC	HDPE	PEX	NO HUB CISP	STD. BALCK STEEL	CPVC FIRE
ABOVEGROUND DOMESTIC WATER	X														
ABOVEGROUND DOMESTIC WATER	X														
ABOVEGROUND DOMESTIC WATER	X														
ABOVEGROUND DOMESTIC WATER	X														
ABOVEGROUND DOMESTIC WATER	X														
ABOVEGROUND DOMESTIC WATER	X														
ABOVEGROUND SANITARY WASTE & VENT									X				X		
ABOVEGROUND SANITARY WASTE & VENT									X				X		
ABOVEGROUND SANITARY WASTE & VENT									X				X		
ABOVEGROUND SANITARY WASTE & VENT									X				X		
UNDERGROUND SANITARY WASTE AND VENT									X				X		
ABOVEGROUND INDIRECT SANITARY WASTE	X		X						X						
ABOVEGROUND COLD CONDENSATE	X		X						X						
FIRE SUPPRESSION														X	
FIRE SUPPRESSION														X	
FIRE SUPPRESSION														X	
FIRE SUPPRESSION														X	
FIRE SUPPRESSION														X	

PIPING SYSTEM	PRESSURE CONNECTION: SOLDERED	BRAZED	WELDED	FLANGED	THREADED	SOLVENT WELDED	MECHANICALLY JOINT	GROOVED	FUSION	GRAVITY CONNECTION: SOLDERED	SOLVENT WELD	CISP HUBLESS	HEAVY DUTY HUBLESS
ABOVEGROUND DOMESTIC WATER	X			X									
ABOVEGROUND DOMESTIC WATER	X			X									
ABOVEGROUND DOMESTIC WATER	X			X				X					
ABOVEGROUND DOMESTIC WATER	X			X				X					
ABOVEGROUND DOMESTIC WATER	X			X				X					
ABOVEGROUND DOMESTIC WATER	X			X				X					
ABOVEGROUND SANITARY WASTE & VENT											X	X	
ABOVEGROUND SANITARY WASTE & VENT											X	X	
ABOVEGROUND SANITARY WASTE & VENT											X	X	
ABOVEGROUND SANITARY WASTE & VENT											X	X	
UNDERGROUND SANITARY WASTE AND VENT											X		X
ABOVEGROUND INDIRECT SANITARY WASTE										X	X		
ABOVEGROUND COLD CONDENSATE										X	X		
FIRE SUPPRESSION					X			X					
FIRE SUPPRESSION			X	X				X					
FIRE SUPPRESSION			X	X				X					
FIRE SUPPRESSION			X	X				X					
FIRE SUPPRESSION			X	X				X					

PIPING SYSTEM	ISOLATION VALVE: BALL	BUTTERFLY	HIGH PERF. BUTTERFLY	GAS BALL VALVE	LUBRICATED PLUG	INSULATION MATERIAL: FIBERGLASS	FLEXIBLE ELASTOMERIC	MINERAL WOOL	CALCIUM SILICATE	THICKNESS, IN: 1/2	3/4	1	1 1/2	2	MINIMUM R-VALUE	FIELD APPLIED JACKETING: PVC	ALUMINUM	SELF ADHESIVE	STAINLESS STEEL
ABOVEGROUND DOMESTIC WATER	X					X	X					X			3.5	X	X		
ABOVEGROUND DOMESTIC WATER	X					X	X						X		5	X	X		
ABOVEGROUND DOMESTIC WATER		X				X	X						X		5	X	X		
ABOVEGROUND DOMESTIC WATER		X				X	X						X		5	X	X		
ABOVEGROUND DOMESTIC WATER		X				X	X						X		5	X	X		
ABOVEGROUND DOMESTIC WATER		X				X	X						X		5	X	X		
ABOVEGROUND SANITARY WASTE & VENT																			
ABOVEGROUND SANITARY WASTE & VENT																			
ABOVEGROUND SANITARY WASTE & VENT																			
ABOVEGROUND SANITARY WASTE & VENT																			
UNDERGROUND SANITARY WASTE AND VENT																			
ABOVEGROUND INDIRECT SANITARY WASTE																			
ABOVEGROUND COLD CONDENSATE						X	XX				XX	X			3.5				
FIRE SUPPRESSION																			
FIRE SUPPRESSION																			
FIRE SUPPRESSION																			
FIRE SUPPRESSION																			
FIRE SUPPRESSION																			

PIPING SYSTEM	SUPPORT – HANGER FIGURE NUMBER: LESS THAN 1/4" MOVEMENT	GREATER THAN 1/4" OF MOVEMENT	VERTICAL	SUPPORT: LESS THAN 1/4" MOVEMENT	GREATER THAN 1/4" OF MOVEMENT	MAX SPACING HORIZONTAL, FT	MAX SPACING VERTICAL, FT	ROD DIAMETER	KEYED NOTES
ABOVEGROUND DOMESTIC WATER	2/5	2/5	23	20	17	6	10	3/8	A, E
ABOVEGROUND DOMESTIC WATER	2/5	2/5	23	20	17	6	10	3/8	A, E
ABOVEGROUND DOMESTIC WATER	5	8	23	20	17	10	10	1/2	A, E
ABOVEGROUND DOMESTIC WATER	5	8	23	20	17	10	10	5/8	A, E
ABOVEGROUND DOMESTIC WATER	5	8	23	20	17	10	10	3/4	A, E
ABOVEGROUND DOMESTIC WATER	14	10	23	20	17	10	10	3/4	A, E
ABOVEGROUND SANITARY WASTE & VENT	1/4	1/4	22	19	16	4	10	3/8	D, F, G
ABOVEGROUND SANITARY WASTE & VENT	4	7	22	19	16	4	10	1/2	D, F, G
ABOVEGROUND SANITARY WASTE & VENT	4	7	22	19	16	4	10	5/8	D, F, G
ABOVEGROUND SANITARY WASTE & VENT	4	7	22	19	16	4	10	3/4	D, F, G
UNDERGROUND SANITARY WASTE AND VENT	-	-	-	-	-	-	-	-	G
ABOVEGROUND INDIRECT SANITARY WASTE	1/4	1/4	22	19	16	12	10	3/8	D
ABOVEGROUND COLD CONDENSATE	2/5	2/5	23	20	17	4	10	3/8	D
FIRE SUPPRESSION	1/4	1/4	22	19	16	12	10	3/8	
FIRE SUPPRESSION	4	7	22	19	16	12	10	1/2	
FIRE SUPPRESSION	4	7	22	19	16	12	10	5/8	
FIRE SUPPRESSION	4	7	22	19	16	12	10	3/4	
FIRE SUPPRESSION	13	10	22	19	16	12	10	3/4	

GENERAL NOTES:
1. EACH ACCEPTABLE MATERIAL IS INDICATED WITH AN "X". IF MORE THAN ONE IS SELECTED, THE CONTRACTOR HAS THE OPTION TO CHOOSE BETWEEN SELECTED MATERIALS.
2. REFER TO SPECIFICATIONS FOR ADDITIONAL INFORMATION.
3. EQUIPMENT CONNECTIONS SHALL BE EITHER GROOVED OR FLANGED OR USE UNIONS.
4. EQUIPMENT DRAINS, RELIEF VALVES, AND VENTS SHALL BE THE SAME MATERIAL AS PIPING SYSTEM.
5. DISSIMILAR METAL PIPING JOINTS SHALL USE DIELECTRIC FITTINGS COMPATIBLE WITH BOTH MATERIALS.
6. ALL INSULATING MATERIALS, THICKNESS, AND THERMAL RESISTANCE SHALL COMPLY WITH THE INTERNATIONAL ENERGY CONSERVATION CODE 2015 OR ASHRAE STANDARD 90.1-2013.
7. INSULATION IS NOT REQUIRED FOR STRAINERS, CONTROL VALVE BODIES, AND BALANCE VALVES ASSOCIATED WITH PIPING 1 INCH AND SMALLER.
8. INSULATION IS NOT REQUIRED FOR PIPING CONVEYING FLUIDS OPERATING BETWEEN 60°F AND 105°F AND DIRECT BURIED PIPING CONVEYING FLUIDS AT OR BELOW 60°F.
9. PIPE HANGER SPACING IS BASED ON WORST CASE ALLOWED MATERIAL. HANGER SPACING FOR SELECTED MATERIAL SHALL COMPLY WITH CURRENT PLUMBING AND MECHANICAL CODE OR APPROVED BY AHJ.

KEYED NOTES:
A. GROOVED FITTINGS SHALL ONLY BE USED IN ACCESSIBLE SPACE(S) (I.E. MECHANICAL ROOMS OR ABOVE LAY-IN CEILINGS).
B. FUEL GAS PIPING LOCATED WITHIN RETURN AIR PLENUM SHALL BE WELDED. VALVES, FLANGES, AND UNIONS ARE PROHIBITED.
C. NO JOINTS ALLOWED UNDERGROUND.
D. PLASTIC PIPE SHALL NOT BE USED IN RETURN AIR PLENUMS. CONTRACTOR SHALL PROVIDE FIRE RATED INSULATION OR GYPSUM ENCLOSURE WHEN ROUTED THROUGH A PLENUM SPACE.
E. PROVIDE INSULATION JACKETS FOR ALL AREAS SUSCEPTABLE FOR DAMAGE INCLUDING BUT NOT LIMITED TO MECHANICAL ROOMS, EQUIPMENT ROOMS, JANITOR CLOSET, RECIEVING. JACKETS SHALL BE INSTALLED UP TO 10 FEET ABOVE FINISHED FLOOR.
F. THE MAXIMUM HORIZONTAL SPACING OF PIPE HANGERS SHALL BE INCREASED TO 10 FEET WHERE 10 FOOT LENGTHS ARE INSTALLED.
G. WASTE PIPING RECIEVING WATER ABOVE 120 DEG SHALL BE METAL.
H. PROVIDE PROTECTIVE COATING FOR INSULATION LOCATED OUTDOORS.
I. INSULATE EXTERIOR PIPE & PROVIDE ALUMINUM JACKET.

LOW PRESSURE DUCTWORK JOINT AND SUPPORT SCHEDULE

STEEL GAUGE	MINIMUM DUCT SIZE	MAXIMUM DUCT SIZE	RECTANGULAR JOINT CONSTRUCTION: PLAIN "S" SLIP	DRIVE SLIP	HEMMED "S" SLIP	FLANGED WITH GASKET	STANDING DRIVE SLIP	STANDING S	STANDING S (BAR REINFORCED)	STANDING S (ANGLE REINFORCED)	RECTANGULAR HANGERS AND SUPPORTS: MAXIMUM HALF OF DUCT PERIMETER	GALVANIZED SHEET STEEL STRAPS	LOAD RATED CABLE	GALVANIZED THREADED STEEL ROD	MAXIMUM SPACING FT	WIRE/ ROD DIAMETER	STRAP WIDTH AND GAUGE	ROUND HANGERS AND SUPPORTS: DIAMETER	MAXIMUM SPACING FT	WIRE DIAMETER	ROD DIAMETER	STRAP WIDTH AND GAUGE
24	4	12	X	X	X		X	X			P/2=30"	X		X	10	10 ga	1' x 22 ga	10	12	12 ga	1/4"	1' x 22 ga
24	13	18	X	X	X		X	X			P/2=72"	X		X	10	3/8"	1' x 18 ga	11-18	12	8 ga	1/4"	1' x 22 ga
24	19	30	X	X	X		X	X			P/2=96"	X		X	10	3/8"	1' x 16 ga	19-24	12	(2) 10 ga	1/4"	1' x 22 ga
22	31	42				X	X	X	X	X	P/2=120"	X		X	10	1/2"	1 1/2' x 16 ga	25-36	12	(2) 8 ga	3/8"	1' x 20 ga
22	43	54				X	X	X	X	X	P/2=168"	X		X	10	1/2"	1 1/2' x 16 ga	37-50	12	-	(2) 3/8"	(2) 1' x 20 ga
20	55	60				X	X	X	X	X	P/2=192"	X		X	10	1/2"	-	51-60	12	-	(2) 3/8"	(2) 1' x 18 ga

GENERAL NOTES:
1. JOINT CONSTRUCTION SHALL COMPLY WITH SMACNA HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE AND NAIMA FIBROUS GLASS DUCT CONSTRUCTION STANDARDS.
2. "X" NOTES ALLOWED JOINT CONSTRUCTION AND SUPPORT TYPE.
3. HANGERS AND SUPPORTS SHALL COMPLY WITH CHAPTER 5 SMACNA HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE AND LOCAL CODE AUTHORITY HAVING JURSIDICTION.
4. REFER TO SMACNA FOR JOINT GAUGE, BRACING, TRANVERSE REINFORCEMENT, AND JOINT REINFORCEMENT REQUIREMENTS.
5. ROUND METALLIC DUCTS SHALL BE MECHANICALLY FASTENED WITH A MINIMUM OF THREE (3) SHEET METAL SCREWS OR RIVETS EQUALLY SPACED.

DUCT APPLICATION SCHEDULE

AIR SYSTEMS	DUCT MATERIAL: G90 GALV. SHEET METAL	G90 GALV. SHEET METAL W/ 1" DUCT LINER	ALUMINUM	TYPE 304 STAINLESS STEEL	FABRIC	DOUBLE WALL LINED G90 GALV. W/ SOLID INNER	DOUBLE WALL LINED G90 GALV. W/ PERF. INNER	14 GAUGE CARBON STEEL	PVC COATED G90 GALV SHEET METAL	UL 1978 PRE-FAB ZERO-CLEARANCE GREASE DUCT	RIGID PHENOLIC PRE-INSULATED DUCT
LOW PRESSURE SUPPLY		X				X					
LOW PRESSURE SUPPLY	X										
LOW PRESSURE SUPPLY	X										
LOW PRESSURE SUPPLY	X										
LOW PRESSURE EXHAUST	X										
LOW PRESSURE RETURN		X				X					
LOW PRESSURE RETURN	X										
LOW PRESSURE RETURN	X										
LOW PRESSURE RETURN	X										
AIR TRANSFER DUCT		X									
LOW PRESSURE OUTSIDE AIR AND MIXED AIR	X										
LOW PRESSURE PLENUMS ADJACENT TO EXTERIOR						X					
LOW PRESSURE EXHAUST (DAMPER TO EXTERIOR)	X						X				

AIR SYSTEMS	MAXIMUM AIR VELOCITY, FPM	MAX FRICTION LOSS (IN. WG.)	DESIGN PRESSURE CLASS (IN. WG.)	MAXIMUM ALLOWABLE LEAKAGE (%)	SEAL CLASS	DUCT LOCATION: EXPOSED (SERVING SPACE)	EXPOSED (NOT SERVING SPACE)	ABOVE CEILING/ CONCEALED/ OUTSIDE THE SPACE SERVED	MECHANICAL ROOM	NATATORIUM/ HIGH HUMIDITY	OUTDOOR/ ATTIC
LOW PRESSURE SUPPLY	1000	0.1	+2	5	A		X				
LOW PRESSURE SUPPLY	1000	0.1	+2	5	A	X					
LOW PRESSURE SUPPLY	1000	0.1	+2	5	A			X	X		
LOW PRESSURE SUPPLY	1000	0.1	+2	5	A						X
LOW PRESSURE EXHAUST	1000	0.1	-2	5	A	X		X	X		X
LOW PRESSURE RETURN	1000	0.1	-2	5	A		X				
LOW PRESSURE RETURN	1000	0.1	-2	5	A	X		X			
LOW PRESSURE RETURN	1000	0.1	-2	5	A						X
LOW PRESSURE RETURN	1000	0.1	-2	5	A			X	X		
AIR TRANSFER DUCT	500	0.05	+2	5	A			X	X		
LOW PRESSURE OUTSIDE AIR AND MIXED AIR	1000	0.1	-2	5	A	X		X	X		
LOW PRESSURE PLENUMS ADJACENT TO EXTERIOR	1000	0.1	+/-2	5	A	X		X	X		
LOW PRESSURE EXHAUST (DAMPER TO EXTERIOR)	1000	0.1	+/-2	5	A	X		X	X		

AIR SYSTEMS	INSULATION MATERIAL/THICKNESS (INCH): FIBERGLASS BLANKET	FIBERGLASS BOARD	FLEXIBLE ELASTOMERIC	ASTM E2336 2-HOUR FIRE BLANKET	2-HOUR FIRE BLANKET	MINIMUM THERMAL RESISTANCE R-VALUE	FIELD APPLIED JACKET: ALUMINUM	SELF-ADHERED CLADDING	FULLY ADHERED TPO ROOFING	NOTES
LOW PRESSURE SUPPLY										
LOW PRESSURE SUPPLY										
LOW PRESSURE SUPPLY	1.5	1.5				4.7				
LOW PRESSURE SUPPLY	3	3	2			8	X	X	X	PROVIDE PROTECTIVE COATING FOR FLEXIBLE ELASTOMERIC INSULATION
LOW PRESSURE EXHAUST										
LOW PRESSURE RETURN										
LOW PRESSURE RETURN										RETURN AIR PLENUM; PROVIDE LINED DUCTWORK FOR THE FIRST 15 FEET FROM AHU
LOW PRESSURE RETURN	3	3	2			8	X	X	X	PROVIDE PROTECTIVE COATING FOR FLEXIBLE ELASTOMERIC INSULATION
LOW PRESSURE RETURN	1.5	1.5				4.7				DUCTED RETURN; PROVIDE LINED DUCTWORK FOR THE FIRST 15 FEET FROM AHU
AIR TRANSFER DUCT										
LOW PRESSURE OUTSIDE AIR AND MIXED AIR	1.5	1.5				4.7				
LOW PRESSURE PLENUMS ADJACENT TO EXTERIOR	1.5	1.5				4.7				
LOW PRESSURE EXHAUST (DAMPER TO EXTERIOR)	1.5	1.5				4.7				

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SECTION 20 05 00 - MECHANICAL AND PLUMBING GENERAL REQUIREMENTS

1.01 WORK INCLUDED
A. THE WORK INCLUDED BY THIS DIVISION OF THE SPECIFICATIONS INCLUDES FURNISHING ALL LABOR, MATERIALS, EQUIPMENT, AND SERVICES, INCLUDING MINOR ITEMS OMITTED BUT NECESSARY TO CONSTRUCT AND INSTALL THE COMPLETE SYSTEMS DESCRIBED BY THE CONTRACT DOCUMENTS AND SPECIFIED BELOW. "CONTRACTOR" REFERS TO THE MECHANICAL/PLUMBING CONTRACTOR. THE GENERAL CONDITIONS OF THE SPECIFICATIONS APPLY AND ARE INCLUDED IN THIS PART OF THIS SECTION.

1.02 CODES AND REGULATIONS
A. COMPLY WITH STATE AND LOCAL CODES, AND UTILITY COMPANY REGULATIONS. FINAL INTERPRETATIONS WILL BE MADE BY THE LOCAL INSPECTION AUTHORITY. THE CONTRACTOR TO VERIFY THE GOVERNANCE OF THE FOLLOWING CODES, INCLUDING ANY LOCAL AMENDMENTS AND SUPPLEMENTARY CODES SUCH AS THE CODES OF THE NATIONAL FIRE PROTECTION ASSOCIATION:
1. BUILDING CODE: 2015 MICHIGAN BUILDING CODE
2. PLUMBING CODE: 2021 MICHIGAN PLUMBING CODE
3. MECHANICAL CODE: 2021 MICHIGAN MECHANICAL CODE
4. FIRE CODE: 2015 INTERNATIONAL FIRE CODE
5. GAS CODE: 2015 INTERNATIONAL FUEL GAS CODE
6. ENERGY CODE: 2015 INTERNATIONAL ENERGY CONSERVATION CODE/ ASHRAE 90.1-2013
7. ELECTRICAL CODE: 2023 MICHIGAN ELECTRICAL CODE

1.03 QUALITY ASSURANCE
A. PERFORM WORK TO AVOID INTERFERENCE WITH THE WORK OF OTHER TRADES. REMOVE AND RELOCATE WORK WHICH IN THE OPINION OF THE OWNER'S REPRESENTATIVES CAUSES INTERFERENCE
B. EQUIPMENT AND MATERIALS SHALL BE NEW, UL-LISTED FOR THE USE INTENDED, AND FREE FROM DAMAGE OR DEFECT. THEY SHALL COMPLY WITH THE LATEST INDUSTRY STANDARDS.
C. PACKAGED EQUIPMENT SHALL BEAR ALL LABELS BY RECOGNIZED NATIONAL TESTING LABORATORY.
D. PERFORM ALL TESTS AND INSPECTIONS REQUIRED BY AUTHORITIES HAVING JURISDICTION.
E. ALL EQUIPMENT OR COMPONENTS OF THIS SPECIFICATION SECTION SHALL MEET OR EXCEED THE REQUIREMENTS AND QUALITY OF THE ITEMS HEREIN SPECIFIED, OR AS DENOTED ON THE DRAWINGS.

1.04 CONTRACT DRAWINGS
A. ILLUSTRATE THE GENERAL DESIGN AND EXTENT OF PERFORMANCE REQUIRED. ALL DIMENSIONS AND LOCATIONS SHALL BE TAKEN FROM THE ARCHITECTURAL DRAWINGS. CONSULT WITH ARCHITECTURAL PLANS AND LOCATE ALL CEILING EQUIPMENT WHERE INDICATED ON REFLECTED CEILING PLANS.
B. DEVIATIONS FROM THE DRAWINGS, WITH THE EXCEPTION OF MINOR CHANGES IN ROUTING AND OTHER SUCH INCIDENTAL CHANGES THAT DO NOT AFFECT THE FUNCTIONING OR SERVICEABILITY OF THE SYSTEMS, SHALL NOT BE MADE WITHOUT THE WRITTEN APPROVAL OF THE ARCHITECT/ENGINEER.
C. THE ARCHITECTURAL AND STRUCTURAL DRAWINGS TAKE PRECEDENCE IN ALL MATTERS PERTAINING TO THE BUILDING STRUCTURE, MECHANICAL DRAWINGS IN ALL MATTERS PERTAINING TO MECHANICAL TRADES AND ELECTRICAL DRAWINGS IN ALL MATTERS PERTAINING TO ELECTRICAL TRADES. WHERE THERE ARE CONFLICTS OR DIFFERENCES BETWEEN THE DRAWINGS FOR THE VARIOUS TRADES, REPORT SUCH CONFLICTS OR DIFFERENCES TO THE ARCHITECT/ENGINEER FOR RESOLUTION.
D. DRAWINGS ARE NOT INTENDED TO SERVE AS SHOP DRAWINGS. TAKE ALL FIELD MEASUREMENTS REQUIRED TO COMPLETE THE WORK.

1.05 SHOP DRAWINGS
A. SUBMIT PROJECT SPECIFIC SUBMITTALS FOR REVIEW IN COMPLIANCE WITH DIVISION 01.
B. PREPARE SHOP DRAWINGS TO SCALE FOR THE ARCHITECT/ENGINEER FOR REVIEW. EQUIPMENT AND MATERIAL SUBMITTALS REQUIRED ARE INDICATED IN THE MECHANICAL; FIRE SUPPRESSION; PLUMBING; AND HEATING, VENTILATING AND AIR CONDITIONING SECTIONS.
C. ALL SUBMITTALS SHALL BE SUBMITTED IN GROUPINGS OF SIMILAR AND/OR RELATED ITEMS.
D. SHOP DRAWINGS SHALL BE REVIEWED BY THE MECHANICAL CONTRACTOR FOR COMPLETENESS AND ACCURACY PRIOR TO SUBMITTING TO THE ARCHITECT/ENGINEER FOR REVIEW. THE SHOP DRAWINGS SHALL BE DATED AND SIGNED BY THE MECHANICAL CONTRACTOR PRIOR TO SUBMISSION.
E. SUBMITTALS MUST BE JOB SPECIFIC AND NOT GENERIC IN NATURE.
F. NO EQUIPMENT SHALL BE SHIPPED FROM STOCK OR FABRICATED UNTIL SHOP DRAWINGS FOR THEM HAVE BEEN REVIEWED BY THE ARCHITECT/ENGINEER.
G. BY THE REVIEW OF SHOP DRAWINGS, THE ARCHITECT/ENGINEER DOES NOT ASSUME RESPONSIBILITY FOR ACTUAL DIMENSIONS OR FOR THE FIT OF COMPLETED WORK IN POSITION, NOR DOES SUCH REVIEW RELIEVE MECHANICAL TRADES OF FULL RESPONSIBILITY FOR THE PROPER AND CORRECT EXECUTION OF THE WORK REQUIRED.
H. CONTRACTOR IS RESPONSIBLE FOR:
a. DIMENSIONS, WHICH SHALL BE CONFIRMED AND CORRELATED AT THE JOB SITE.
b. FABRICATION PROCESSES AND TECHNIQUES OF CONSTRUCTION.
c. QUANTITIES.
d. COORDINATION OF CONTRACTOR'S WORK WITH ALL OTHER TRADES.
e. SATISFACTORY PERFORMANCE OF CONTRACTOR'S WORK.
f. TEMPORARY ASPECTS OF THE CONSTRUCTION PROCESS.
g. SUBMIT DETAILED SHOP DRAWINGS OF PIPING SYSTEMS SHOWING PIPE ROUTING AND TYPES AND LOCATIONS OF ALL PIPE HANGERS.
I. IF DEVIATIONS (NOT SUBSTITUTIONS) FROM CONTRACT DOCUMENTS ARE DEEMED NECESSARY BY THE CONTRACTOR, DETAILS OF SUCH DEVIATIONS, INCLUDING CHANGES IN RELATED PORTIONS OF THE PROJECT AND THE REASONS THEREFORE, SHALL BE SUBMITTED WITH THE SUBMITTAL FOR APPROVAL.
J. MANUFACTURERS NOT LISTED MAY SUBMIT FOR ACCEPTANCE AS AN "APPROVED EQUAL." REQUESTS FOR AN "EQUIVALENT" MEANS "APPROVED EQUIVALENT". FOUR COPIES OF SUCH SUBMITTAL MUST BE RECEIVED BY THE ENGINEER SEVEN (7) WORKING DAYS PRIOR TO BID DATE.
a. THE TERMS "APPROVED", "APPROVED EQUAL", AND "EQUAL" REFER TO APPROVAL BY THE ARCHITECT OR ENGINEER AS AN ACCEPTABLE ALTERNATE BID. NO SUBSTITUTIONS WILL BE CONSIDERED THAT ARE NOT BID AS AN ALTERNATE. NO MATERIAL SUBSTITUTIONS SHALL BE CONSIDERED FOR APPROVAL PRIOR TO AWARD OF CONTRACT.
b. COORDINATE AND VERIFY WITH OTHER TRADES WHETHER OR NOT THE SUBSTITUTED EQUIPMENT CAN BE INSTALLED AS SHOWN ON THE CONSTRUCTION DRAWINGS WITHOUT MODIFICATION TO ASSOCIATED SYSTEMS OR ARCHITECTURAL OR ENGINEERING DESIGN. INCLUDE ADDITIONAL COSTS FOR ARCHITECTURAL AND ENGINEERING DESIGN FEES IN BID IF DRAWING MODIFICATIONS ARE REQUIRED BECAUSE OF SUBSTITUTED EQUIPMENT.

1.06 WARRANTY
A. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE SUCCESSFUL OPERATION OF MECHANICAL SYSTEMS, EQUIPMENT, AND MATERIALS INSTALLED UNDER THIS CONTRACT FOR A PERIOD OF ONE YEAR FROM THE DATE OF FINAL ACCEPTANCE UNLESS SPECIFIC ITEMS ARE NOTED TO CARRY A LONGER WARRANTY IN THE CONSTRUCTION DOCUMENTS OR MANUFACTURER'S STANDARD WARRANTY EXCEEDS ONE YEAR . WARRANT EACH SYSTEM AND EACH ELEMENT THEREOF AGAINST ALL DEFECTS DUE TO FAULTY WORKMANSHIP, DESIGN OR MATERIAL. DEFECTIVE EQUIPMENT OR MATERIALS SHALL BE REPAIRED OR REPLACED AT NO EXPENSE TO THE OWNER. PROVIDE FOUR COMPLETE SERVICE AND MAINTENANCE CALLS SPACED AT EQUAL INTERVALS DURING THE WARRANTY PERIOD.
B. WARRANTIES SHALL INCLUDE LABOR AND MATERIAL. MAKE REPAIRS OR REPLACEMENTS WITHOUT ANY ADDITIONAL COSTS TO THE OWNER.
C. AT THE TIME OF FINAL ACCEPTANCE, DELIVER TO THE OWNER ALL WARRANTIES, IN WRITING AND PROPERLY EXECUTED, INCLUDING TERM LIMITS FOR WARRANTIES EXTENDING BEYOND THE ONE YEAR PERIOD, EACH WARRANTY INSTRUMENT BEING ADDRESSED TO THE OWNER AND STATING THE COMMENCEMENT DATE AND TERM.

1.07 DELIVERY, PRODUCT HANDLING, AND CLEAN UP
A. DELIVER MATERIALS TO THE SITE IN SUCH A MATTER AS TO PROTECT THE MATERIALS FROM SHIPPING AND HANDLING DAMAGE. PROVIDE MATERIALS ON FACTORY PROVIDED SHIPPING SKIDS AND LIFTING LUGS IF REQUIRED FOR HANDLING. MATERIALS DAMAGED BY THE ELEMENTS SHOULD BE PACKAGED IN SUCH A MATTER THAT THEY COULD WITHSTAND SHORT-TERM EXPOSURE TO THE ELEMENTS DURING TRANSPORTATION.
B. STORE MATERIALS IN CLEAN, UNDAMAGED, DRY PLACE AND PROTECT FROM WEATHER AND CONSTRUCTION TRAFFIC. HANDLE CAREFULLY TO AVOID DAMAGE. THE GENERAL CONDITIONS TAKE PRECEDENCE.
C. USE ALL MEANS NECESSARY TO PROTECT EQUIPMENT BEFORE, DURING, AND AFTER INSTALLATION.
D. ALL SCRATCHED, DENTED, AND OTHERWISE DAMAGED UNITS SHALL BE REPAIRED OR REPLACED AS DIRECTED BY THE ARCHITECT/ENGINEER.
E. KEEP JOBSITE CLEAN AND TIDY ALLOWING OTHER TRADES TO CONTINUE WORK.

1.08 OPERATING AND MAINTENANCE DATA
A. PROVIDE THE OWNER WITH OPERATING AND MAINTENANCE INSTRUCTIONS (FOUR COPIES) REQUIRED FOR OPERATION OF ALL MECHANICAL SYSTEMS. BIND THE WRITTEN INSTRUCTIONS IN A NOTEBOOK. THE GENERAL CONDITIONS TAKE PRECEDENCE. THE MANUALS SHALL INCLUDE THE FOLLOWING ITEMS:
1. OPERATING MANUAL AND SPARE PARTS LIST FOR EACH PIECE OF EQUIPMENT.
2. PREVENTIVE MAINTENANCE SCHEDULE FOR LUBRICATING AND CHECKING EACH PIECE OF EQUIPMENT.
3. INSTRUCTIONS ON WHO TO CALL FOR SERVICE DURING THE WARRANTY PERIOD.

1.09 PERMITS
A. THE CONTRACTOR SHALL PAY FOR ALL FEES, TAXES, SECURE PERMITS, LICENSES, AND INSPECTIONS REQUIRED FOR THE PROJECT.
B. RULES OF LOCAL UTILITY COMPANIES SHALL BE COMPLIED WITH. CHECK WITH EACH UTILITY COMPANY SUPPLYING SERVICE TO THE INSTALLATION AND DETERMINE ALL DEVICES INCLUDING, BUT NOT LIMITED TO, ALL VALVES, METER BOXES, AND METERS WHICH WILL BE REQUIRED AND INCLUDE THE COST OF ALL SUCH ITEMS IN PROPOSAL.

1.10 TEMPORARY SERVICES
A. PROVIDE TEMPORARY WATER SERVICE FOR CONSTRUCTION, AS REQUIRED BY THE GENERAL CONTRACTOR.

1.11 COORDINATION
A. COORDINATE OUTLET DEVICE AND EQUIPMENT LOCATIONS WITH THE ARCHITECTURAL PLANS AND WORK OF OTHER TRADES. LOCATE ON HORIZONTAL AND VERTICAL LINES TO AVOID INTERFERENCE AND TO PROVIDE FUNCTIONAL USE OF ALL EQUIPMENT. VERIFY ELECTRICAL POWER CHARACTERISTICS BEFORE ORDERING EQUIPMENT.
B. THE GENERAL GUIDELINE FOR THE DIVISION BETWEEN CONTROL (BY MC) WIRING AND POWER WIRING (BY EC) IS THAT POWER WIRING CARRIES THE CURRENT WHICH ENERGIZES A MOTOR, CONTROL WIRING DOES NOT. CONTROL WIRING MAY BE 120V, WHICH WOULD BE THE RESPONSIBILITY OF THE MC. CONTROL MOTORS ARE WIRED BY THE MC.
C. FURNISH WIRING DIAGRAMS TO THE ELECTRICAL CONTRACTOR AS REQUIRED FOR PROPER EQUIPMENT HOOKUP. COORDINATE WITH THE ELECTRICAL CONTRACTOR THE ACTUAL WIRE SIZING AMPS FOR MECHANICAL EQUIPMENT (FROM THE EQUIPMENT NAMEPLATE) TO ENSURE PROPER INSTALLATION.
D. EXAMINE THE SITE AND BECOME AWARE OF EXISTING CONDITIONS, UTILITIES, AND OTHER ISSUES AFFECTING THE SATISFACTORY COMPLETION OF THE PROJECT.
E. ELECTRICAL WORK PERFORMED BY THIS CONTRACTOR WILL CONFORM TO THE STANDARDS OF DIVISION 26-28. MECHANICAL EQUIPMENT MOTORS AND CONTROLS SHALL BE FURNISHED, SET IN PLACE, AND WIRED ACCORDING WITH THE FOLLOWING SCHEDULE UNLESS OTHERWISE NOTED OR SPECIFIED. MC = DIVISION 21-23 EC = DIVISION 26-28

ITEM	FURN BY	SET BY	POWER WIRING	CONTROL WIRING
COMBINATION STARTERS	MC	EC	EC	MC
EQUIPMENT MOTORS	MC	MC	EC	--
MOTOR STARTERS & O.L. RELAYS	MC	EC	EC	MC
DISCONNECT SWITCHES	EC	EC	EC	MC
THERMAL OVERLOAD HEATERS (1)	EC	EC	EC	--
VARIABLE SPEED DRIVES	MC	EC	EC	MC
CONTROL RELAYS/TRANSFORMERS	MC	MC	EC	MC
TEMPERATURE CONTROL PANELS	MC	MC	EC	MC
TEMP. CONTROLS CONDUIT/WIRING	MC	MC	--	MC
ACTUATOR AND SOLENOID WIRING	MC	MC	--	MC
PUSHBUTTONS & PILOT LIGHTS	MC	MC	--	MC
ROOM THERMOSTATS	MC	MC	--	MC
THERMOSTATS: LINE VOLTAGE	EC	EC	EC	--

1.12 ELECTRICAL
A. LUGS: LUGS FOR WIRING CONNECTIONS SHALL BE RATED FOR COPPER AND ALUMINUM, NAD SHALL HAVE A MINIMUM RATING OF 75C.
B. ELECTRIC MOTORS SHALL BE RATED FOR THE APPROPRIATE APPLICATION: WET LOCATION (TEFC); SUBMERSIBLE; EXPLOSION PROOF, VFD'S, ETC.
C. ALL LOW VOLTAGE CONTROL WIRING (24 -VOLT) SHALL BE IN CONDUIT AND IN ACCORDANCE WITH THE NATIONAL ELECTRICAL CODE AND ALL STATE AND LOCAL CODES AND ORDINANCES AND SHALL BE DONE BY THIS HVAC CONTRACTOR.

1.13 DELIVERY, STORAGE, HANDLING
A. PROVIDE NECESSARY HAULING AND HOISTING EQUIPMENT. PROTECT THE MATERIALS OF THIS DIVISION BEFORE, DURING, AND AFTER INSTALLATION.

1.14 AS-BUILT DRAWINGS
A. KEEP A CURRENT SET OF "AS-BUILT" DRAWINGS ON SITE. UPON COMPLETION OF THE WORK, FURNISH ENGINEER WITH A REPRODUCIBLE PRINTS SHOWING THE "AS-BUILT" INSTALLATION.

1.15 PROJECT/SITE CONDITIONS
A. VISIT THE SITE, EXAMINE AND VERIFY THE CONDITIONS UNDER WHICH THE WORK MUST BE CONDUCTED BEFORE SUBMITTING PROPOSAL. THE SUBMITTING OF A PROPOSAL IMPLIES THAT THE CONTRACTOR HAS VISITED THE SITE AND UNDERSTANDS THE CONDITIONS UNDER WHICH THE WORK MUST BE CONDUCTED. NO ADDITIONAL CHARGES OR TIME EXTENSIONS WILL BE ALLOWED BECAUSE OF FAILURE TO MAKE THIS EXAMINATION OR TO INCLUDE ALL MATERIALS AND LABOR TO COMPLETE THE WORK.

1.16 PLAN VERIFICATION
A. AFTER COMPLETION OF THE BIDDING AND SELECTION PROCESS, PRIOR TO AWARDING THE CONTRACT, THE CONTRACTOR MUST REVIEW AND VERIFY THE CONTRACT DOCUMENTS IN THEIR ENTIRETY, INCLUDING THOSE OF OTHER TRADES. AT THIS TIME, DISCREPANCIES, CONFLICTS, OMISSIONS, ETC IN THE CONTRACT DOCUMENTS MUST BE DOCUMENTED. ALTERATIONS TO THE CONTRACT WILL BE MADE AT THAT TIME TO INCLUDE SUCH ITEMS, AS WELL OTHER MODIFICATIONS WHICH MIGHT BE MADE BY THE OWNER. AFTER AWARD OF THE CONTRACT, CHANGE ORDERS CAUSED BY DISCREPANCIES, CONFLICTS, OMISSIONS IN THE CONTRACT DOCUMENTS WILL NOT BE ALLOWED.

1.17 INSTRUCTION OF OWNER PERSONNEL
A. AT A TIME MUTUALLY AGREED UPON BETWEEN THE OWNER AND CONTRACTOR, PROVIDE THE SERVICES OF A FACTORY TRAINED AND AUTHORIZED REPRESENTATIVE TO TRAIN OWNER'S DESIGNATED PERSONNEL ON THE OPERATION AND MAINTENANCE OF THE EQUIPMENT PROVIDED FOR THIS PROJECT. PROVIDE TRAINING TO INCLUDE, BUT NOT BE LIMITED TO, AN OVERVIEW OF THE SYSTEM AND/OR EQUIPMENT AS IT RELATES TO THE FACILITY AS A WHOLE, OPERATION AND MAINTENANCE PROCEDURES AND SCHEDULES RELATED TO STARTUP AND SHUTDOWN, TROUBLESHOOTING, SERVICING, PREVENTIVE MAINTENANCE AND APPROPRIATE OPERATOR INTERVENTION; AND REVIEW OF DATA INCLUDED IN THE OPERATION AND MAINTENANCE MANUALS.
B. SUBMIT A CERTIFICATION LETTER TO THE ARCHITECT STATING THAT THE OWNER'S DESIGNATED REPRESENTATIVE HAS BEEN TRAINED AS SPECIFIED HEREIN. LETTER SHALL INCLUDE DATE, TIME, ATTENDEES AND SUBJECT OF TRAINING. THE CONTRACTOR AND THE OWNER'S REPRESENTATIVE SHALL SIGN THE CERTIFICATION LETTER INDICATING AGREEMENT THAT THE TRAINING HAS BEEN PROVIDED.
C. SCHEDULE OWNER TRAINING WITHIN AT LEAST 7 DAYS ADVANCE NOTICE.
D. PROVIDE TWO (2) COMPLETE SETS OF OPERATING AND MAINTENANCE INSTRUCTION BOOKLETS.

1.18 HVAC USE DURING CONSTRUCTION
A. HVAC EQUIPMENT SHALL NOT BE USED DURING CONSTRUCTION AS A MEANS TO HEAT OR COOL THE SPACE, UNLESS SPECIFIC APPROVAL IS GIVEN BY THE OWNER. IF SUCH EQUIPMENT IS USED, IT MUST BE COMPLETELY CLEANED AND REPAIRED AS NECESSARY. CLEANING INVOLVES REPLACING ALL FILTERS; CLEANING ALL COILS AND HEAT EXCHANGERS; INSPECTING FANS, PLENUMS, AND DUCTWORK AND CLEANING AS DIRECTED BY THE OWNER.
B. IF HVAC EQUIPMENT IS USED DURING THE CONSTRUCTION PERIOD, THIS CONTRACTOR SHALL PROVIDE MINIMUM MERV-8 FILTERS OR FILTRATION MEDIA OVER ANY RETURN AIR GRILLES AND OPEN RETURN AIR DUCT WORK FOR THE DURATION OF THE CONSTRUCTION PERIOD. CONTRACTOR SHALL PROVIDE ONE SET OF FILTERS WHEN THE UNIT IS STARTED AND REPLACE FILTERS AS NEEDED, BUT NOT LESS THAN EVERY FOUR WEEKS.
C. ON THE DAY OF SUBSTANTIAL COMPLETION, THE CONTRACTOR SHALL CLEAN THE UNIT AND PROVIDE A NEW SET OF FILTERS IN THE UNIT.

1.19 REFRIGERANT AND OIL
A. PROVIDE FULL REFRIGERANT AND OIL CHARGE IN NEW AIR CONDITIONING REFRIGERATION SYSTEMS, AND MAINTAIN IT FOR FULL TERM OF THE GUARANTEE.
B. ALL NEW MECHANICAL EQUIPMENT SHALL UTILIZE R-410A.
C. DISPOSE OF RECOVERED REFRIGERANT LEGALLY, IN ACCORDANCE WITH APPLICABLE RULES AND REGULATIONS.

2.07 MATERIALS AND EQUIPMENT
A. PROVIDE NECESSARY EQUIPMENT, PIPING, DUCTWORK, AND ACCESSORIES THAT ARE NOT PROVIDED BY THE EQUIPMENT SUPPLIER OR OWNER TO COMPLETE INSTALLATION OF EQUIPMENT FURNISHED BY OTHERS/ EXISTING EQUIPMENT IN LOCATIONS AS INDICATED ON THE DRAWINGS AND/OR DESCRIBED IN THE GENERAL NOTES TO THIS CONTRACTOR. EQUIPMENT AND ACCESSORIES NOT PROVIDED BY THE EQUIPMENT SUPPLIER MAY INCLUDE CONDENSATE DRAINS, FLUES, VENTS, INTAKES, ASSOCIATED ROOF JACKS AND CAPS TO EXTERIOR, DAMPERS, INLINE FANS, ROOF FANS, CONTROL INTERLOCKS, ETC. AS REQUIRED FOR PROPER OPERATION OF THE COMPLETE SYSTEM IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS.
B. CONTRACTOR SHALL BE RESPONSIBLE FOR CORRECT ROUGH-IN DIMENSIONS AND SHALL VERIFY SAME WITH ARCHITECT AND/OR EQUIPMENT SUPPLIER PRIOR TO SERVICE INSTALLATIONS.
C. IF AN APPROVED MANUFACTURER IS OTHER THAN THE MANUFACTURER USED AS THE BASIS FOR DESIGN, THE EQUIPMENT OR PRODUCT PROVIDED SHALL BE EQUAL IN SIZE, QUALITY, DURABILITY, APPEARANCE, CAPACITY, AND EFFICIENCY THROUGH ALL RANGES OF OPERATION, SHALL CONFORM WITH ARRANGEMENTS AND SPACE LIMITATIONS OF THE EQUIPMENT SHOWN ON THE PLANS AND/OR SPECIFIED, SHALL BE COMPATIBLE WITH THE OTHER COMPONENTS OF THE SYSTEM AND SHALL COMPLY WITH THE REQUIREMENTS FOR ITEMS REQUIRING PRIOR APPROVAL SPECIFIED IN THIS SECTION OF THE SPECIFICATIONS. ALL COSTS TO MAKE THESE ITEMS OF EQUIPMENT COMPLY WITH THESE REQUIREMENTS INCLUDING, BUT NOT LIMITED TO, PIPING, SHEET METAL, ELECTRICAL WORK, AND BUILDING ALTERATIONS SHALL BE INCLUDED IN THE ORIGINAL BID.
D. CHANGES INVOLVING ELECTRICAL WORK: THE DESIGN OF THE MECHANICAL SYSTEMS IS BASED ON THE EQUIPMENT SCHEDULED ON THE DRAWINGS. EQUIPMENT OF HIGHER ELECTRICAL CHARACTERISTICS MAY BE FURNISHED PROVIDED SUCH PROPOSED EQUIPMENT IS APPROVED IN WRITING AND CONNECTING ELECTRICAL SERVICES, CIRCUIT BREAKERS, AND CONDUIT SIZES ARE APPROPRIATELY MODIFIED WITH NO ADDITIONAL COST TO PROJECT. IF MINIMUM ENERGY RATINGS OR EFFICIENCIES ARE SPECIFIED, EQUIPMENT SHALL COMPLY WITH REQUIREMENTS.
a. WHERE EQUIPMENT CHANGES ARE MADE THAT INVOLVE ADDITIONAL ELECTRICAL WORK (LARGER SIZE MOTOR, ADDITIONAL WIRING OF EQUIPMENT, ETC.) THE MECHANICAL TRADES INVOLVED SHALL COMPENSATE THE ELECTRICAL TRADES FOR THE COST OF THE ADDITIONAL WORK REQUIRED.

SECTION 20 05 10 - MECHANICAL AND PLUMBING BASIC MATERIALS AND METHODS

1.01 GENERAL
A. COMPLY WITH REQUIREMENTS IN PUBLIC LAW 111-380, "REDUCTION OF LEAD IN DRINKING WATER ACT," ABOUT LEAD CONTENT IN MATERIALS THAT WILL BE IN CONTACT WITH POTABLE WATER FOR HUMAN CONSUMPTION.
B. COMPLY WITH NSF 14, "PLASTICS PIPING SYSTEM COMPONENTS AND RELATED MATERIALS," FOR PLASTIC, POTABLE DOMESTIC WATER PIPING AND COMPONENTS. INCLUDE MARKING "NSF-PW" ON PIPING.
C. COMPLY WITH NSF 61, "DRINKING WATER SYSTEM COMPONENTS - HEALTH EFFECTS; SECTIONS 1 THROUGH 9," FOR POTABLE DOMESTIC WATER PIPING AND COMPONENTS.
D. COMPLY WITH NSF 372, "DRINKING WATER SYSTEM COMPONENTS – LEAD CONTENT" FOR POTABLE DOMESTIC WATER PIPING AND COMPONENTS.
E. STEEL SUPPORT WELDING: QUALIFY PROCESSES AND OPERATORS ACCORDING TO AWS D1.1, "STRUCTURAL WELDING CODE--STEEL."
F. STEEL PIPE WELDING: QUALIFY PROCESSES AND OPERATORS ACCORDING TO ASME BOILER AND PRESSURE VESSEL CODE: SECTION IX, "WELDING AND BRAZING QUALIFICATIONS." COMPLY WITH PROVISIONS IN ASME B31 SERIES, "CODE FOR PRESSURE PIPING." CERTIFY THAT EACH WELDER HAS PASSED AWS QUALIFICATION TESTS FOR WELDING PROCESSES INVOLVED AND THAT CERTIFICATION IS CURRENT.
G. BRAZING: QUALIFY PROCESSES AND OPERATORS ACCORDING TO ASME BOILER AND PRESSURE VESSEL CODE: SECTION IX, "WELDING AND BRAZING QUALIFICATIONS," OR AWS B2.2, "STANDARD FOR BRAZING PROCEDURE AND PERFORMANCE QUALIFICATION."
H. SOLDERING: QUALIFY PROCESSES AND OPERATORS ACCORDING TO AWS B2.3/2.3M, "SPECIFICATION FOR SOLDERING PROCEDURE AND PERFORMANCE QUALIFICATION."

2.01 JOINING MATERIALS
A. UNIONS: PIPE SIZE 2 INCHES AND SMALLER:
a. FERROUS PIPE: MALLEABLE IRON GROUND JOINT TYPE UNIONS.
b. UNIONS IN GALVANIZED PIPING SYSTEM SHALL BE GALVANIZED.
c. COPPER TUBE AND PIPE: BRONZE UNIONS WITH SOLDERED JOINTS.
B. FLANGES: PIPE SIZES 2-1/2 INCH AND LARGER:
a. FERROUS PIPE: STANDARD WEIGHT, FORGED STEEL WELD NECK FLANGES.
b. COPPER TUBE AND PIPE: SLIP-ON BRONZE FLANGES.
c. PIPE-FLANGE GASKET MATERIALS: SUITABLE FOR CHEMICAL AND THERMAL CONDITIONS OF PIPING SYSTEM CONTENTS.
C. DIELECTRIC CONNECTONS: UNION WITH GALVANIZED OR PLATED STEEL THREADED END, COPPER SOLDER END, WATER IMPERVIOUS ISOLATON BARRIER. PROVIDE NON-CONDUCTNG DIELECTRIC CONNECTONS WHEREVER JOINTNG DISSIMILAR METALS.
D. FLANGE BOLTS AND NUTS: ASME B18.2.1, CARBON STEEL, UNLESS OTHERWISE INDICATED. SQUARE HEAD BOLTS AND NUTS ARE NOT ACCEPTABLE.
E. SOLDER FILLER METALS: ASTM B 32, LEAD-FREE, ANTIMONY-FREE, SILVER-BEARING ALLOYS. INCLUDE WATER-FLUSHABLE FLUX ACCORDING TO ASTM B 813.
F. BRAZING FILLER METALS: ALLOYS MEETING AWS A5.8.
a. USE TYPE BCUP SERIES, SILVER-BEARING, COPPER-PHOSPHORUS ALLOYS FOR JOINING COPPER OR BRONZE SOCKET FITTINGS WITH COPPER PIPE. FLUX IS PROHIBITED UNLESS USED WITH BRONZE FITTINGS.
b. USE TYPE BAG SERIES, CADMIUM-FREE SILVER ALLOYS FOR JOINING COPPER WITH STEEL, STAINLESS STEEL, OR OTHER FERROUS ALLOYS.
G. WELDING FILLER METALS: COMPLY WITH AWS D10.12/D10.12M FOR WELDING MATERIALS APPROPRIATE FOR WALL THICKNESS AND CHEMICAL ANALYSIS OF STEEL PIPE BEING WELDED.
H. WELDING MATERIALS: COMPLY WITH SECTION II, PART C, OF ASME BOILER AND PRESSURE VESSEL CODE FOR WELDING MATERIALS APPROPRIATE FOR WALL THICKNESS AND FOR CHEMICAL ANALYSIS OF PIPE BEING WELDED.
I. SOLVENT CEMENTS FOR JOINING PVC PIPING: ASTM D 2564. INCLUDE PRIMER ACCORDING TO ASTM F 656.
J. SOLVENT CEMENTS FOR JOINING CPVC PIPING AND TUBING: ASTM F 493.
K. SOLVENT CEMENTS FOR JOINING ABS PIPING: ASTM D 2235.
L. SOLVENT CEMENTS FOR JOINING PVC TO ABS PIPING TRANSITION: ASTM D 3138.
M. PIPE THREAD COMPOUND FOR NATURAL GAS: USE TETRAFLUOROETHYLENE (TEFLON) TAPE 2 TO 3 MILS THICK
N. PIPE THREAD COMPOUNG FOR STEEL PIPEL INORGANIC ZINC-RICH COATINGS OR CORROSION INHIBITED PROPRIETARY COMPOUND.

2.02 MOTORS AND STARTERS
A. PROVIDE MOTORS AND STARTING EQUIPMENT WHERE NOT FURNISHED WITH THE EQUIPMENT PACKAGE. MOTORS SHALL HAVE COPPER WINDINGS, CLASS B INSULATION, AND STANDARD SQUIRREL CAGE WITH STARTING TORQUE CHARACTERISTICS SUITABLE FOR THE EQUIPMENT SERVED. MOTORS FOR AIR HANDLING EQUIPMENT SHALL BE SELECTED FOR QUIET OPERATION. EACH MOTOR SHALL BE CHECKED FOR PROPER ROTATION AFTER ELECTRICAL CONNECTION HAS BEEN COMPLETED. PROVIDE DRIP-PROOF ENCLOSURE FOR LOCATIONS PROTECTED FROM WEATHER AND NOT IN AIR STREAM OF FAN; AND TOTALLY ENCLOSED FAN-COOLED ENCLOSURE FOR MOTORS EXPOSED TO WEATHER. MOTORS SHALL BE MANUFACTURED BY CENTURY, GENERAL ELECTRIC, WESTINGHOUSE, LOUIS-ALLIS OR APPROVED EQUAL.
B. PROVIDE EVERY MOTOR, EXCEPT FRACTIONAL HORSEPOWER SINGLE PHASE MOTORS WITH AN APPROVED TYPE OF BUILT-IN THERMAL OVERLOAD PROTECTION, WITH A MOTOR STARTER. EACH STARTER SHALL BE PROVIDED WITH OVERLOAD HEATERS SIZED TO THE MOTOR RATING, AND EVERY THREE-PHASE MOTOR STARTER SHALL HAVE OVERLOAD HEATERS IN EACH PHASE. AMBIENT COMPENSATED HEATERS SHALL BE INSTALLED WHEREVER NECESSARY, UNLESS NOTED OTHERWISE. MOTOR STARTERS SHALL BE FURNISHED BY THE DIVISION 26 CONTRACTOR. FOR INSTALLATION AND CONNECTION BY THE DIVISION 16 CONTRACTOR, STARTERS SHALL BE ALLEN-BRADLEY, CLARK, FURNAS, SQUARE D, OR APPROVED EQUAL.

2.03 ACCESS PANELS
A. THE MECHANICAL CONTRACTOR SHALL FURNISH AND GENERAL CONTRACTOR SHALL INSTALL ACCESS PANELS WHERE REQUIRED FOR ACCESS TO EQUIPMENT. THE MECHANICAL CONTRACTOR SHALL INCLUDE THE COST OF INSTALLATION IN HIS BID. ACCESS PANELS SHALL BE ADEQUATELY SIZED, OF A TYPE APPROVED BY THE ARCHITECT AND SHALL BE FIRE OR SMOKE-RATED AS REQUIRED. ACCESS PANELS SHALL BE MINIMUM 18"X18".

2.04 STRUCTURAL STEEL
A. STRUCTURAL STEEL USED FOR SUPPORT OF EQUIPMENT, DUCTWORK AND PIPING SHALL BE NEW, CLEAN AND CONFORM TO ASTM DESIGNATION A-36.
B. SUPPORT MECHANICAL COMPONENTS FROM THE BUILDING STRUCTURE. DO NOT SUPPORT MECHANICAL COMPONENTS FROM CEILINGS, OTHER MECHANICAL OR ELECTRICAL COMPONENTS, NOR OTHER NON-STRUCTURAL ELEMENTS.

2.05 PENETRATIONS AND SLEEVES
A. SLEEVE-SEAL SYSTEMS SHALL INCLUDE MODULAR SEALING-ELEMENT DESIGNED FOR FIELD ASSEMBLY FOR FILLING AN ANNULAR SPACE BETWEEN PIPE AND SLEEVE. SEAL SHALL BE DESIGNED FOR HYDROSTATIC PRESSURE OF 20 PSIG. SEAL SHALL BE MADE OF EPDM-RUBBER WITH INTERLOCKING LINKS SHAPED TO FIT SURFACE OF PIPE. PRESSURE PLATES SHALL BE MADE OF STAINLESS STEEL WITH STAINLESS STEEL CONNECTING BOLTS AND NUTS. APPROVED MANUFACTURE ARE METRAFLEX, CALPICO, PIPELINE SEAL AND INSULATOR.
B. PIPE SLEEVES SHALL BE STEEL PIPE IN ACCORDANCE WITH ASTM A 53, TYPE E, GRADE B, SCHEDULE 40 WITH PLAIN ENDS AND INTEGRAL WELDED WATERSTOP COLLAR.
C. SEAL ELEVATED FLOOR, EXTERIOR WALL AND ROOF PENETRATIONS WATERTIGHT AND WEATHERTIGHT WITH NON- SHRINK, NON-HARDENING COMMERCIAL SEALANT. PACK WITH MINERAL WOOL AND SEAL BOTH ENDS WITH MINIMUM OF 1/2" OF SEALANT. SEAL AROUND PENETRATIONS OF FIRE-RATED ASSEMBLIES. COORDINATE FIRE RATINGS AND LOCATIONS WITH THE ARCHITECTURAL DRAWINGS. REFER TO STANDARD PENETRATION DETAILS.
D. INSTALL SLEEVES IN CONCRETE FLOORS, WALLS, ROOFS AS THEY ARE CONSTRUCTED. CUT SLEEVES TO LENGTH FOR MOUNTING FLUSH. EXTEND SLEEVES IN MECHANICAL ROOM FLOORS OR AREAS PIPE IS SUBJECT TO DAMAGE 2 INCHES ABOVE FINISHED FLOOR.

2.06 FIRE STOPPING
A. SEAL OPENINGS OF FIRE RATED CONSTRUCTION WITH A MATERIAL OR PRODUCT THAT HAS BEEN TESTED AT AN INDEPENDENT TESTING LABORATORY SUCH AS UL OR FM. FIRE STOPPING SHALL CONFORM TO ASTM E-814, UL 1479, OR UL 2079. PRODUCTS SHALL BE SIMILAR TO RECTORSEAL METACAULK, 3M BRAND FIRE BARRIER PENETRATION SEALING SYSTEMS, OR HILTI.

2.08 SPARE PARTS
A. CONTRACTOR SHALL PROVIDE TO THE OWNER, WITH RECEIPT, THE FOLLOWING SPARE PARTS FOR THE EQUIPMENT INSTALLED FOR THIS PROJECT:
a. ONE SET OF SPARE FILTERS OF EACH TYPE REQUIRED FOR EACH UNIT. IN ADDITION TO THE SPARE SET OF FILTERS, INSTALL NEW FILTERS PRIOR TO TESTING, ADJUSTING AND BALANCING WORK AND BEFORE TURNING SYSTEM OVER TO OWNER.
b. ONE COMPLETE SET OF BELTS FOR EACH FAN.
c. THREE OPERATING KEYS FOR EACH TYPE OF AIR OUTLET AND INLET THAT REQUIRE THEM.

2.09 LOW EMITTING MATERIALS
A. ALL SEALANTS & ADHESIVES REQUIRED FOR THE INSTALLATION OF MECHANICAL & PLUMBING SYSTEM WITHIN THE BUILDING ENVELOPE SHALL MEET THE REQUIREMENTS FOR LOW EMITTING MATERIALS AS SET FOR IN THE SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT (SCAQMD) RULE #1168 (OR LEED NEW CONSTRUCTION REQUIREMENTS), WHICH INCLUDES BUT IS NOT LIMITED TO:
a. METAL TO METAL ADHESIVE: VOC LIMIT OF 30G/L.
b. FIBERGLASS ADHESIVE: VOC LIMIT OF 80G/L.
c. MULTIPURPOSE CONSTRUCTION ADHESIVE: VOC LIMIT OF 70 G/L.

3.01 UTILITIES AND PROTECTION OF SERVICES
A. DO NOT INTERRUPT AND UTILITY OR SERVICE WITHOUT ADEQUATE NOTICE AND SCHEDULE. CONTRACTOR SHALL, AT OWN EXPENSE, REPAIR, REPLACE, AND MAINTAIN IN SERVICE ANY UTILITIES DAMAGED OR BROKEN OR OTHERWISE RENDERED INOPERATIVE DURING THE COURSE OF CONSTRUCTION.

3.02 PROTECTION DURING CONSTRUCTION
A. PLUMBING FIXTURES, TRIM AND OTHER EQUIPMENT SHALL BE PROTECTED AGAINST DAMAGE OR INJURY. ALL FIXTURES AND EQUIPMENT DAMAGED BY ANY CAUSE AND ANY TRIM WITH MARRED OR SCRATCHED FINISH SHALL BE REPLACED AT NO ADDITIONAL COST TO THE OWNER. THE FIXTURE PROTECTION SHALL BE REMOVED AT THE COMPLETION OF THE WORK OR FOR FINAL INSPECTION.

3.03 EXCAVATION AND BACKFILLING
A. PERFORM EXCAVATION AND BACKFILL REQUIRED FOR INSTALLATION OF UNDERGROUND WORK UNDER THIS CONTRACT. TRENCHES SHALL BE OF SUFFICIENT WIDTH. CRIB OR BRACE TRENCHES TO PREVENT CAVE-IN OR SETTLEMENT. DO NOT EXCAVATE TRENCHES CLOSE TO COLUMNS AND WALLS OF NEW BUILDING WITHOUT PRIOR CONSULTATION WITH THE ARCHITECT. USE PUMPING EQUIPMENT IF REQUIRED TO KEEP TRENCHES FREE OF WATER. BACKFILL TRENCHES IN MAXIMUM 6" LAYERS OF WELL-TAMPED DRY EARTH IN A MANNER TO PREVENT FUTURE SETTLEMENT.
B. EXCAVATION AS HEREIN SPECIFIED SHALL BE UNCLASSIFIED. COMMON EXCAVATION SHALL COMPRISE THE SATISFACTORY REMOVAL AND DISPOSITION OF MATERIAL OF WHATEVER SUBSTANCES AND OF EVERY DESCRIPTION ENCOUNTERED, INCLUDING ROCK, IF ANY, WITHIN THE LIMITS OF THE WORK AS SPECIFIED AND SHOWN ON THE DRAWINGS. EXCAVATION SHALL BE PERFORMED TO THE LINES AND GRADES INDICATED ON THE DRAWINGS. EXCAVATED MATERIALS WHICH ARE CONSIDERED UNSUITABLE FOR BACKFILL, AND SURPLUS OF EXCAVATED MATERIAL WHICH IS NOT REQUIRED FOR BACKFILL, SHALL BE DISPOSED OF BY THE CONTRACTOR AT HIS OWN EXPENSE AND RESPONSIBILITY, AND TO THE SATISFACTION OF THE ARCHITECT.

3.04 CUTTING AND REPAIRING
A. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL CUTTING, DRILLING, WELDING, AND REPAIR OF WALLS, FLOORS, CEILINGS, ETC. AS REQUIRED FOR TO INSTALL WORK UNDER THIS SECTION. OBTAIN PERMISSION FROM THE ARCHITECT PRIOR TO CUTTING. DO NOT CUT OR DISTURB STRUCTURAL MEMBERS WITHOUT PRIOR APPROVAL FROM THE ARCHITECT. CUT HOLES AS SMALL AS POSSIBLE. GENERAL CONTRACTOR SHALL PATCH WALLS, FLOORS, ETC. AS REQUIRED BY WORK UNDER THIS SECTION. PATCHING SHALL MATCH THE ORIGINAL MATERIAL AND CONSTRUCTION. REPAIR AND REFINISH AREAS DISTURBED BY WORK TO THE CONDITION OF ADJOINING SURFACES IN A MANNER SATISFACTORY TO THE ARCHITECT. THE GENERAL CONDITIONS TAKE PRECEDENCE.

3.05 CONCRETE WORK
A. NEW FLOOR MOUNTED EQUIPMENT/ FIXTURES SHALL BE CONNECTED TO THE EXISTING SANITARY DRAINAGE SYSTEM AS SHOWN ON THE DRAWINGS OR AS REQUIRED. SAW-CUT EXISTING CONCRETE FLOOR AS REQUIRED TO INSTALL NEW UNDERFLOOR PIPES, AND PATCH TO MATCH EXISTING SUB-FLOOR INCLUDING ANY WIRE MESH. REFER TO ARCHITECTURAL SPECIFICATIONS FOR FINISH FLOOR PATCHING REQUIREMENTS.
B. CONTRACTOR SHALL PROVIDE CONCRETE EQUIPMENT BASES AS SHOWN ON PLANS.

3.06 START-UP PROCEDURES
A. FOLLOW MANUFACTURER'S RECOMMENDED PROCEDURES IN STARTING UP THE EQUIPMENT; DAMAGE CAUSED DURING START-UP SHALL BE REPLACED AT NO EXPENSE TO THE OWNER.
B. EQUIPMENT PROVIDER SHALL BE RESPONSIBLE FOR PROVIDING EQUIPMENT START-UP AND, WHEN NOTED, AN IN THE FIELD CERTIFIED TRAINING SESSION. NEW EQUIPMENT START-UP SHALL BE FOR THE PURPOSE OF INSPECTING EQUIPMENT INSTALLATION MANNER AND CONTROL SYSTEM START-UP. A COPY OF THE START-UP REPORT SHALL BE MADE AND SENT TO BOTH THE CONTRACTOR AND TO THE ENGINEER.

SECTION 20 05 29 - HANGERS AND SUPPORTS

1.01 GENERAL
A. REFER TO DUCT AND PIPING APPLICATION SCHEDULE FOR HANGER, ROD, SPACING, AND TYPES APPROVED FOR DIFFERENT SYSTEMS AND SIZES.
B. SUPPORT EQUIPMENT, PIPING, DUCTWORK FROM THE STRUCTURE TO PREVENT SAGGING, POCKETING, SWAYING, AND VIBRATIONS, AND ARRANGED TO PROVIDE FOR EXPANSION AND CONTRACTION. HANGERS SUPPORTING VIBRATING EQUIPMENT SHALL BE PROVIDED WITH SPRING ISOLATORS. CHAIN, PERFORATED IRON OR WIRE HANGERS ARE NOT PERMITTED. SUPPORTS SHALL BE CONNECTED TO THE BUILDING STRUCTURE ONLY. EQUIPMENT, PIPES, DUCTWORK SHALL NOT BE SUPPORTED FROM ONE ANOTHER.
C. DUCT HANGER SPACING: COMPLY WITH SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE," TABLE 5-1 (TABLE 5-1M), "RECTANGULAR DUCT HANGERS MINIMUM SIZE," AND TABLE 5-2, "MINIMUM HANGER SIZES FOR ROUND DUCT," FOR MAXIMUM HANGER SPACING; INSTALL HANGERS AND SUPPORTS WITHIN 24 INCHES OF EACH ELBOW AND WITHIN 48 INCHES OF EACH BRANCH INTERSECTION.

2.01 METAL PIPE HANGERS
A. CARBON STEEL WITH GALVANIZED COATING, STAINLESS STEEL, AND COPPER PIPE HANGERS SHALL BE MSS SP-58 TYPES 1 THROUGH 58. COPPER HANGERS SHALL BE USED WITH COPPER PIPE. WET AND CORROSIVE ENVIRONMENTS SHALL USE STAINLESS STEEL.
B. HANGER RODS SHALL BE CONTINUOUS THREAD WITH NUTS AND WASHERS MADE OF CARBON STEEL UNLESS LOCATED IN WET OR CORROSIVE ENVIRONMENT, WHICH SHALL BE STAINLESS STEEL. USE COPPER COATED STEEL ROD FOR COPPER PIPING.

2.02 METAL FRAMING SYSTEMS
A. SHOP OR FIELD FABRICATED ASSEMBLY OF STEEL CHANNELS AND COMPONENTS WITH GALVANIZED COATING. PLASTIC OR JACKET IN WET OR CORROSIVE ENVIRONMENTS. APPROVED MANUFACTURES ARE ANVIL, EATON, UNISTRUT.

2.03 SHIELDS, SADDLES, AND INSERTS
A. PROVIDE MSS SP-69 TYPE 40 METAL SHIELDS, MSS SP-69 TYPE 391 AND TYPE 39B SADDLES, AND THERMAL PIPE SHIELDS AS REQUIRED. APPROVED MANUFACTURERS ARE EATON, ERICO, PIPE SHIELDS INC.

2.04 STAINLESS STEEL LOAD RATE SUSPENSION CABLE
A. APPROVED MANUFACTURES: DUCTMATE, DURO DYNE CORP., GRIPPLE INC.
B. AIRPLANE QUALITY STAINLESS STEEL 7X7 AND 7X19 WIRE ROPE COMPLYING WITH ASTM A 492. ONE PIECE STAINLESS STEEL FASTENER AND LOOP ENDS, STUD END, OR PLAIN ENDS. CABLE SHALL BE USED FOR DUCTWORK ONLY.

SECTION 20 05 33 - MECHANICAL IDENTIFICATION

2.01 IDENTIFICATION
A. APPROVED MANUFACTURERS: BRADY, SETON NAMEPLATE COMPANY, EMED, BRIMAR INDUSTRIES, AND KOLBI
B. TYPES LISTED BELOW SHALL BE IN ACCORDANCE ASME A13.1:
1. EQUIPMENT NAMEPLATES: METAL WITH DATA STAMPED FOR PERMANENT ATTACHMENT WITH FASTENER
2. EQUIPMENT MARKER: ENGRAVED, COLOR-CODED LAMINATED PLASTIC WITH ADHESIVE
3. ACCESS PANEL DOOR MARKER: ENGRAVED LAMINATED PLASTIC WITH CENTER HOLE FOR FASTENER
4. PIPE MARKER: PRE-TENSIONED SEMIRIGID PLASTIC FORMED TO COVER PIPE OR SHAPED PREFORMED SEMIRIGID PLASTIC FORMED TO PARTIALLY COVER PIPE
5. DUCT MARKERS: ENGRAVED PLASTIC WITH ADHESIVE OR VINYL WITH ADHESIVE INCLUDE DIRECTION
6. VALVE TAGS: STAMPED OR ENGRAVED BRASS WITH CHAIN
C. INSTALL IDENTIFICATION ON DUCTS, PIPES, EQUIPMENT IN VISIBLE LOCATIONS IN FINISHED SPACES, SHAFTS, MACHINE ROOMS, PLENUMS, CONCEALED LOCATIONS AND ON BOTH SIDES OF PENETRATIONS.

SECTION 20 07 00 - INSULATION

1.01 GENERAL
1. REFER TO DUCT AND PIPING APPLICATION SCHEDULES FOR INSULATION MATERIAL AND THICKNESS.
2. INSULATING MATERIALS, ADHESIVES, COATINGS, ETC. SHALL NOT EXCEED FLAME SPREAD RATING OF 25 AND SMOKE DEVELOPMENT RATING OF 50 PER ASTM E 84; ADHESIVES, COATINGS, ETC. CONTAINERS FOR MASTICS AND ADHESIVES SHALL HAVE UL LABEL.
3. CONTRACTOR SHALL INSPECT THE INSULATION OF ALL EXISTING AND NEW SUPPLY AIR DUCTWORK CONNECTIONS AND REPAIR AS REQUIRED.

2.01 PIPE INSULATION
A. FLEXIBLE ELASTOMERIC
a. APPROVED MANUFACTURES: ARMACELL OR IK INSULATION GROUP
b. INSULATION SHALL BE CLOSED-CELL, EXPANDED RUBBER MATERIAL HAVING A CONDUCTIVITY OF 0.26 AT 75 °F MEAN, IN ACCORDANCE WITH ASTM C 534.
c. EXTERIOR PIPING INSULATION WILL BE PAINTED WITH A WHITE SOLVENT BASED ALKYD FINISH(ARMAFLEX AB OR EQUIVALENT), INCLUDING ALL FITTINGS, VALVES, ETC. JACKET AND INSULATION WILL BE SEALED WEATHERTIGHT AND INSTALLED PER MANUFACTURERS INSTRUCTIONS. WHERE EXPOSED TO PHYSICAL DAMAGE, EXTERIOR PIPING INSULATION WILL BE COVERED WITH ALUMINUM JACKET, INCLUDING ALL FITTINGS, VALVES, ETC. JACKET AND INSULATION WILL BE SEALED WEATHERTIGHT AND INSTALLED PER MANUFACTURERS INSTRUCTIONS.
B. GLASS-FIBER
a. APPROVED MANUFACTURES: JOHNS MANVILLE, KNAUF, MANSON, AND OWENS CORNING.
b. PREFORMED PIPE INSULATION, TYPE I, 850 DEG GLASS FIBER WITH THERMOSETTING RESIN, COMPLY ASTM C 547, GRADE A, WITH FACTORY APPLIED ALL SERVICE JACKET. CONDUCTIVITY OF 0.26 AT 75 °F MEAN.

2.02 DUCT LINER
A. APPROVED MANUFACTURES: JOHNS MANVILLE, OWENS-CORNING, CERTAINEED OR KNAUF.
B. DUCT LINER SHALL BE 1-1/2 LB DENSITY (3.0LB FOR EXTERIOR DUCTS), CONSTRUCTED OF GLASS FIBER LINER. THE AIR STREAM SURFACE IS COATED WITH BLACK-COATED MAT SURFACE. LINER SHALL HAVE A K-FACTOR OF .25 AT 75 °F MEAN.
C. DUCT LINER SHALL BE INSTALLED AS FOLLOWS OR AS SHOWN ON THE PLANS:
a. RETURN AIR DUCTS (WITHIN 15' OF FAN)
D. LINER SHALL BE SECURED TO ALL DUCT SURFACES BY PRESSING INTO WET ADHESIVE, APPLIED TO 100% OF THE DUCT SURFACE. IN ADDITION, LINER SHALL BE HELD IN PLACE WITH INSULPINS WELDED TO DUCT, SAME MATERIALS, AND WITH CLIPS SLIPPED OVER THE PINS. INSULPINS SHALL BE LOCATED PER SMACNA STANDARDS. LINER SHALL BE LAPPED AND COMPRESSED IN ALL FOUR CORNERS OF THE DUCT. BOTH UPSTREAM AND DOWNSTREAM TRANSVERSE EDGES SHALL BE COATED WITH ADHESIVE, COATED A MINIMUM OF 1" OVER THE EDGE IN ALL PLACES.

2.03 DUCT INSULATION
A. FIBERGLASS
1. APPROVED MANUFACTURERS: JOHNS MANVILLE, KNAUF, OWENS-CORNING, AND CERTAINTEED
2. DUCT BLANKET INSULATION SHALL BE FLEXIBLE FIBERGLASS INSULATION, 1.5 PCF, WITH FACTORY-APPLIED, REINFORCED, ALUMINUM FOIL VAPOR BARRIER/JACKET. INSULATION SHALL HAVE A K-FACTOR OF .25 AT 75 °F MEAN. SHALL BE IN ACCORDANCE WITH ASTM C 553, TYPE II.
3. DUCT BOARD INSULATION SHALL BE RIGID FIBERGLASS INSULATION, 1.5 PCF, WITH FACTORY-APPLIED, ALUMINUM FOIL VAPOR BARRIER/JACKET. INSULATION SHALL HAVE A K-FACTOR OF .25 AT 75 °F MEAN. SHALL BE IN ACCORDANCE WITH ASTM C 553.
4. WRAP THE FIBERGLASS BLANKET WITH HEAVY DUTY FOIL SCRIM FACING AROUND THE DUCTWORK WITH OVERLAPPING FLANGES STAPLED AT 6" ON CENTER. STRIP THE LAP OF INSULATION AND STAPLE THE FACING DIRECTLY TO THE OVERLAPPED FOIL. SECURE THE INSULATION TO THE DUCTWORK WITH 18-GAUGE GALVANIZED WIRE AT 12" ON CENTER. ON DUCTS LARGER THAN 48", USE MECHANICAL FASTENERS ON THE BOTTOM OF THE DUCT.
5. TAPE ALL JOINTS WITH 3" WIDE FOIL REINFORCED KRAFT TAPE. TAPE ALL PIN PENETRATIONS OR PUNCTURES IN THE FACING.

2.04 FIRE RATED INSULATION
A. APPROVED MANUFACTURES: THERMAL CERAMICS, 3M FIRE PROTECTION PRODUCTS, UNIFRAX CORP.
B. FIRE-RATED BLANKET: HIGH-TEMPERATURE, FLEXIBLE, BLANKET INSULATION WITH FSK JACKET THAT IS TESTED ACCORDING TO ASTM E2336.
C. FIRE-RATED BLANKET: HIGH-TEMPERATURE, FLEXIBLE, BLANKET INSULATION WITH FSK JACKET THAT IS UL TESTED AND CERTIFIED TO PROVIDE A 2-HOUR FIRE RATING.
D. FIRE-RATED PLENUM WRAP: HIGH-TEMPERATURE, FLEXIBLE, BLANKET INSULATION WITH FSK JACKET THAT IS UL TESTED, AND DESIGNED TO PROVIDE A SINGLE-LAYER, FLEXIBLE ENCLOSURE AROUND COMBUSTIBLE ITEMS LOCATED WITHIN FIRE-RATED RETURN AIR PLENUM.
E. INSTALL PER MANUFACTURE REQUIREMENTS.

2.05 INSULATING SEALANTS, ADHESIVES, AND MASTICS
A. SEALANTS
a. FOIL SCRIM KRAFT AND METAL JACKET FLASHING SEALANT SHALL BE FIRE AND WATER RESISTANT, FLEXIBLE, ELASTOMERIC SEALANT WITH TEMP RANGE AND ALUMINUM COLOR. APPROVED MANUFACTURE: MARATHON INDUSTRIES, FOSTER PRODUCTS, MON-ECO INC.
b. ALL SERVICE JACKET FLASHING SEALANTS, PVC, PVDC, AND VINYL SEALANTS SHALL BE FIRE AND WATER RESISTANT, FLEXIBLE, ELASTOMERIC SEALANT WITH TEMP RANGE AND ALUMINUM WHITE. APPROVED MANUFACTURE: CHILDERS PRODUCTS
B. ADHESIVES
a. FLEXIBLE ELASTOMERIC ADHESIVE: COMPLY WITH MIL-A-24179A, TYPE II, CLASS I. APPROVED MANUFACTURE: ARMACELL, FOSTER PRODUCTS, RBX CORP.
b. MINERAL-FIBER ADHESIVE: COMPLY WITH MIL-A-3316C, CLASS 2, GRADE A. APPROVED MANUFACTURE: MARATHON INDUSTRIES, FOSTER PRODUCTS, MON-ECO INC.
c. ALL SERVICE JACKET ADHESIVE, AND FOIL SCRIM KRAFT AND PVDC JACKET ADHESIVE: COMPLY WITH MIL-A-3316C, CLASS 2, GRADE A FOR BONDING INSULATION JACKET LAP SEAMS AND JOINTS. APPROVED MANUFACTURE: MARATHON INDUSTRIES, FOSTER PRODUCTS, MON-ECO INC.
C. MASTICS
a. VAPOR BARRIER MASTIC SHALL COMPLY WITH ASTM E 96 WITH 0.013 PERM AND SHALL BE WHITE. APPROVED MANUFACTURE: MARATHON INDUSTRIES, FOSTER PRODUCTS, MON-ECO INC.
b. BREATHER MASTIC SHALL COMPLY WITH ASTM F 1249 WITH 03 PERM AND SHALL BE WHITE. APPROVED MANUFACTURE: MARATHON INDUSTRIES, FOSTER PRODUCTS, MON-ECO INC.

2.06 FACTORY APPLIED JACKETS
A. INSULATION SYSTEMS INDICATE FACTORY-APPLIED JACKETS ON VARIOUS APPLICATIONS. WHEN FACTORY-APPLIED JACKETS ARE INDICATED, COMPLY WITH THE FOLLOWING:
a. ALL SERVICE JACKET WHITE, KRAFT-PAPER, FIBERGLASS-REINFORCED SCRIM WITH ALUMINUM-FOIL BACKING; COMPLYING WITH ASTM C 1136, TYPE I.
b. ALL SERVICE JACKET SELF SEALING LAP: ASJ WITH SELF-SEALING, PRESSURE-SENSITIVE, ACRYLIC-BASED ADHESIVE COVERED BY A REMOVABLE PROTECTIVE STRIP; COMPLYING WITH ASTM C 1136, TYPE I.
c. FOIL SCRIM KRAFT JACKET: ALUMINUM-FOIL, FIBERGLASS-REINFORCED SCRIM WITH KRAFT-PAPER BACKING; COMPLYING WITH ASTM C 1136, TYPE II.

2.07 FIELD APPLIED JACKETS
A. PVC JACKETS SHALL BE HIGH IMPACT RESISTANT, UV-RESISTANT, COMPLY WITH ASTM D 1784 ROLL STOCK FOR FIELD CUTTING AND INSTALLATION. JACKET SHALL BE WHITE WITH ADHESIVE BACKING. PROVIDE ALL NECESSARY FITTING COVERS AND SHAPES. APPROVED MANUFACTURES: JOHNS MANVILLE, P.I.C. PLASTICS, PROTO PVC CORP., AND SPEEDLINE
B. METAL JACKETS SHALL BE ALUMINUM AND COMPLY WITH ASTM B 209 3003, 3005, 3015 OR 5005 TEMPER H-14. SHALL BE ROLL STOCK READY FOR FIELD CUTTING WITH STANDARD FINISH. INDOOR/OUTDOOR APPLICATION SHALL BE HEAT BONDED POLYETHYLENE AND KRAFT PAPER 1 MIL AND 3 MIL THICK RESPECTIVELY.

2.08 TAPES
A. ALL SERVICE JACKET TAPE SHALL BE WHITE, 3 INCHES WIDE AND 11.5 MILS THICK WITH MATCHING FACTORY APPLIED JACKET WITH ACRYLIC ADHESIVE. APPROVED MANUFACTURES: AVERY DENNISON CORP, VENTURE, COMPACT CORP.
B. FOIL SCRIM KRAFT TAPE SHALL BE FOIL FACE, 3 INCHES WIDE AND 6.5 MILS THICK WITH MATCHING FACTORY APPLIED JACKET/VAPOR RETARDER WITH ACRYLIC ADHESIVE. APPROVED MANUFACTURES: AVERY DENNISON CORP, VENTURE, COMPAC CORP.
C. PVC TAPE SHALL BE WHITE AND SUITABLE FOR INDOOR AND OUTDOOR APPLICATION, 2 INCHES WIDE AND 6 MILS THICK WITH MATCHING FACTORY APPLIED JACKET/VAPOR RETARDER WITH ACRYLIC ADHESIVE. APPROVED MANUFACTURES: AVERY DENNISON CORP, VENTURE, COMPAC CORP.
D. COVER JOINTS AND ALL SEAMS WITH TAPE AS RECOMMENDED BY MANUFACTURE TO MAINTAIN VAPOR SEAL.

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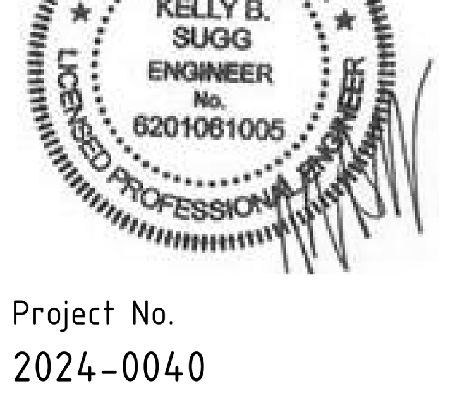

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SECTION 21 11 00 - FIRE SUPPRESSION SYSTEM

2.01 PIPE AND FITTINGS
B. STANDARD-WEIGHT BLACK STEEL PIPE AND FITTINGS
1. THREADED-END, STANDARD-WEIGHT STEEL PIPE: ASTM A 53/A 53M, ASTM A 135, OR ASTM A 795, WITH FACTORY- OR FIELD-FORMED THREADED ENDS, AND WITH FACTORY APPLIED ANTIMICROBIAL COATING ON INNER WALL OF PIPE.
a. CAST-IRON THREADED FLANGES: ASME B16.1.
b. MALLEABLE-IRON THREADED FITTINGS: ASME B16.3.
c. GRAY-IRON THREADED FITTINGS: ASME B16.4.
d. STEEL THREADED PIPE NIPPLES: ASTM A 733, MADE OF ASTM A 53/A 53M OR ASTM A 106, SCHEDULE 40, SEAMLESS STEEL PIPE. INCLUDE ENDS MATCHING JOINING METHOD.
e. STEEL THREADED COUPLINGS: ASTM A 865.
2. PLAIN-END, STANDARD-WEIGHT STEEL PIPE: ASTM A 53/A 53M, ASTM A 135, OR ASTM A 795, AND WITH FACTORY APPLIED ANTIMICROBIAL COATING ON INNER WALL OF PIPE.
a. STEEL WELDING FITTINGS: ASTM A 234/A 234M, AND ASME B16.9 OR ASME B16.11.
b. STEEL FLANGES AND FLANGED FITTINGS: ASME B16.5.
3. GROOVED-END, STANDARD-WEIGHT STEEL PIPE: ASTM A 53/A 53M, ASTM A 135, OR ASTM A 795, WITH FACTORY- OR FIELD-FORMED, SQUARE-CUT- OR ROLL- GROOVED ENDS, AND WITH FACTORY APPLIED ANTIMICROBIAL COATING ON INNER WALL OF PIPE.
a. APPROVED MANUFACTURES: ANVIL INTERNATIONAL, INC., TYCO FIRE & BUILDING PRODUCTS; GRINNELL MECHANICAL PRODUCTS, VICTAULIC CO. OF AMERICA
b. GROOVED-END FITTINGS: UL-LISTED, ASTM A 536, DUCTILE-IRON CASTING WITH OD MATCHING STEEL-PIPE OD.
c. GROOVED-END-PIPE COUPLINGS: UL 213 AND AWWA C606, RIGID PATTERN, UNLESS OTHERWISE INDICATED; GASKETED FITTING MATCHING STEEL-PIPE OD. INCLUDE DUCTILE-IRON HOUSING WITH KEYS MATCHING STEEL-PIPE AND FITTING GROOVES, PRELUBRICATED RUBBER GASKET LISTED FOR USE WITH HOUSING, AND STEEL BOLTS AND NUTS.
C. SCHEDULE 10 BLACK STEEL PIPE AND FITTINGS
1. PLAIN-END, SCHEDULE 10 STEEL PIPE: ASTM A 135 OR ASTM A 795, SCHEDULE 10 IN NPS 5 (DN 125) AND SMALLER; AND NFPA 13 SPECIFIED WALL THICKNESS IN NPS 6 TO NPS 10 (DN 150 TO DN 250), AND WITH FACTORY APPLIED ANTIMICROBIAL COATING ON INNER WALL OF PIPE.
a. STEEL WELDING FITTINGS: ASTM A 234/A 234M, AND ASME B16.9 OR ASME B16.11.
b. STEEL FLANGES AND FLANGED FITTINGS: ASME B16.5.
2. GROOVED-END, SCHEDULE 10 STEEL PIPE: ASTM A 135 OR ASTM A 795, SCHEDULE 10 IN NPS 5 (DN 125) AND SMALLER; AND NFPA 13-SPECIFIED WALL THICKNESS IN NPS 6 TO NPS 10 (DN 150 TO DN 250); WITH FACTORY- OR FIELD-FORMED, ROLL-GROOVED ENDS, AND WITH FACTORY APPLIED ANTIMICROBIAL COATING ON INNER WALL OF PIPE.
A. APPROVED MANUFACTURES: ANVIL INTERNATIONAL, INC., TYCO FIRE & BUILDING PRODUCTS; GRINNELL MECHANICAL PRODUCTS, VICTAULIC CO. OF AMERICA
B. GROOVED-END FITTINGS: UL-LISTED, ASTM A 536, DUCTILE-IRON CASTING WITH OD MATCHING STEEL-PIPE OD.
C. GROOVED-END-PIPE COUPLINGS: UL 213 AND AWWA C606, RIGID PATTERN, UNLESS OTHERWISE INDICATED; GASKETED FITTING MATCHING STEEL-PIPE OD. INCLUDE DUCTILE-IRON HOUSING WITH KEYS MATCHING STEEL-PIPE AND FITTING GROOVES, PRELUBRICATED RUBBER GASKET LISTED FOR USE WITH HOUSING, AND STEEL BOLTS AND NUTS.

2.03 SPRINKLER SPECIALTY FITTINGS
A. SPRINKLER SPECIALTY FITTINGS SHALL BE UL LISTED OR FMG APPROVED, WITH 175-PSIG MINIMUM WORKING-PRESSURE RATING, AND MADE OF MATERIALS COMPATIBLE WITH PIPING. SPRINKLER SPECIALTY FITTINGS SHALL HAVE 300-PSIG MINIMUM WORKING-PRESSURE RATING IF FITTINGS ARE COMPONENTS OF HIGH-PRESSURE PIPING SYSTEM.
B. DROP-NIPPLE FITTINGS: UL 1474, ADJUSTABLE WITH THREADED INLET AND OUTLET, AND SEALS.
1. APPROVED MANUFACTURERS: CECA, LLC. AND MERIT.
C. FLEXIBLE SPRINKLER DROP FITTINGS
1. APPROVED MANUFACTURERS: VICTAULIC CO. OF AMERICA; AQUAFLEX SPRINKLER FITTINGS; AH-2 WITH AB1 BRACKET ASSEMBLY OR FLEXHEAD INDUSTRIES, INC.
2. DESCRIPTION: UL LISTED AND FMG APPROVED FLEXIBLE HOSE FOR CONNECTION TO SPRINKLER, AND WITH BRACKET FOR CONNECTION TO COMMERCIAL CEILING GRID.
3. STANDARD: UL 2443.
4. PRESSURE RATING: 175 PSIG
5. SIZE: SAME AS CONNECTED PIPING, FOR SPRINKLER.
6. DRY-PIPE-SYSTEM FITTINGS: UL LISTED FOR DRY-PIPE SERVICE.

2.04 LISTED FIRE-PROTECTION VALVES
A. VALVES SHALL BE UL LISTED OR FMG APPROVED, WITH 175-PSIG (1200 KPA) MINIMUM PRESSURE RATING. VALVES SHALL HAVE 300-PSIG PRESSURE RATING IF VALVES ARE COMPONENTS OF HIGH-PRESSURE PIPING SYSTEM.
B. BALL VALVES: COMPLY WITH UL 1091, EXCEPT WITH BALL INSTEAD OF DISC.
1. APPROVED MANUFACTURERS: NIBCO., VICTAULIC CO. OF AMERICA, MUELLER COMPANY, TYCO FIRE AND BUILDING PRODUCTS
2. NPS 1-1/2 AND SMALLER: BRONZE BODY WITH THREADED ENDS.
3. NPS 2 AND NPS 2-1/2 : BRONZE BODY WITH THREADED ENDS OR DUCTILE-IRON BODY WITH GROOVED ENDS.
4. NPS 3 : DUCTILE-IRON BODY WITH GROOVED ENDS.
C. BUTTERFLY VALVES: UL 1091.
1. APPROVED MANUFACTURERS: NIBCO., VICTAULIC CO. OF AMERICA, MUELLER COMPANY, TYCO FIRE AND BUILDING PRODUCTS
2. NPS 2-1/2 AND LARGER: BRONZE, CAST-IRON, OR DUCTILE-IRON BODY; WAFER TYPE OR WITH FLANGED OR GROOVED ENDS.
D. CHECK VALVES NPS 2 AND LARGER: UL 312, SWING TYPE, CAST-IRON BODY WITH FLANGED OR GROOVED ENDS.
1. APPROVED MANUFACTURERS: NIBCO., VICTAULIC CO. OF AMERICA, MUELLER COMPANY, TYCO FIRE AND BUILDING PRODUCTS, WATTS

2.11 SPRINKLERS
A. SPRINKLERS SHALL BE UL LISTED OR FMG APPROVED, WITH 175-PSIG MINIMUM PRESSURE RATING. SPRINKLERS SHALL HAVE 300-PSIG PRESSURE RATING IF SPRINKLERS ARE COMPONENTS OF HIGH-PRESSURE PIPING SYSTEM.
B. APPROVED MANUFACTURERS: RELIABLE AUTOMATIC SPRINKLER CO., INC., TYCO FIRE & BUILDING PRODUCTS., VICTAULIC CO. OF AMERICA., VIKING CORP.
C. AUTOMATIC SPRINKLERS WITH HEAT-RESPONSIVE GLASS BULB ELEMENT COMPLYING WITH THE FOLLOWING:
1. UL 199, FOR NONRESIDENTIAL APPLICATIONS.
2. UL 1626, FOR RESIDENTIAL APPLICATIONS.
3. UL 1767, FOR EARLY-SUPPRESSION, FAST-RESPONSE APPLICATIONS.
D. OPEN SPRINKLERS: UL 199, WITHOUT HEAT-RESPONSIVE ELEMENT.
1. ORIFICE: 1/2 INCH, WITH DISCHARGE COEFFICIENT K BETWEEN 5.3 AND 5.8.
2. ORIFICE: 17/32 INCH, WITH DISCHARGE COEFFICIENT K BETWEEN 7.4 AND 8.2.
E. SPRINKLER TYPES AND CATEGORIES: NOMINAL 1/2-INCH ORIFICE FOR 165 DEG F "ORDINARY", 212 DEG F "INTERMEDIATE", 286 DEG F "HIGH" TEMPERATURE CLASSIFICATION RATING, UNLESS OTHERWISE INDICATED OR REQUIRED BY APPLICATION.
F. SPRINKLER TYPES, FEATURES, AND OPTIONS AS FOLLOWS: CONCEALED CEILING SPRINKLERS, INCLUDING COVER PLATE; EXTENDED-COVERAGE SPRINKLERS; FLUSH CEILING SPRINKLERS, INCLUDING ESCUTCHEON; HIGH-PRESSURE SPRINKLERS; OPEN SPRINKLERS; PENDENT SPRINKLERS; PENDENT, DRY-TYPE SPRINKLERS; QUICK-RESPONSE SPRINKLERS; RECESSED SPRINKLERS, INCLUDING ESCUTCHEON; SIDEWALL SPRINKLERS; SIDEWALL, DRY-TYPE SPRINKLERS; UPRIGHT SPRINKLERS.
G. SPRINKLER FINISHES: CHROME PLATED, BRONZE, AND PAINTED. COORDINATE WITH ARCHITECT/EXISTING SPRINKLERS.
H. SPRINKLER ESCUTCHEONS: MATERIALS, TYPES, AND FINISHES FOR THE FOLLOWING SPRINKLER MOUNTING APPLICATIONS. ESCUTCHEONS FOR CONCEALED, FLUSH, AND RECESSED-TYPE SPRINKLERS ARE SPECIFIED WITH SPRINKLERS. ESCUTCHEONS LISTED, SUPPLIED, AND APPROVED FOR USE WITH THE SPRINKLER BY THE SPRINKLER MANUFACTURER.
1. CEILING MOUNTING: CHROME-PLATED STEEL, 2 PIECE, WITH 3/4-INCH VERTICAL ADJUSTMENT.
2. SIDEWALL MOUNTING: CHROME-PLATED STEEL, ONE PIECE, FLAT.
I. SPRINKLER GUARDS: WIRE-CAGE TYPE, INCLUDING FASTENING DEVICE FOR ATTACHING TO SPRINKLER. SPRINKLER GUARDS LISTED, SUPPLIED, AND APPROVED FOR USE WITH THE SPRINKLER BY THE SPRINKLER MANUFACTURER.

3.02 PIPING AND VALVE INSTALLATION
A. INSTALL SUPPRESSION SYSTEM IN ACCORDANCE WITH NFPA 13 OR 13R AND AUTHORITIES HAVING JURISDICTION.
B. INSTALL STANDPIPES AND HOSE SYSTEMS IN ACCORDANCE WITH NFPA 14 AND AUTHORITIES HAVING JURISDICTION.

3.02 SPRINKLER APPLICATIONS
A. USE THE FOLLOWING SPRINKLER TYPES:
1. ROOMS WITHOUT CEILINGS: UPRIGHT SPRINKLERS.
2. ROOMS WITH SUSPENDED CEILINGS: PENDENT, RECESSED, FLUSH, AND CONCEALED SPRINKLERS, AS INDICATED.
3. WALL MOUNTING: SIDEWALL SPRINKLERS.
4. SPACES SUBJECT TO FREEZING: UPRIGHT, PENDENT, DRY SPRINKLERS; AND SIDEWALL, DRY SPRINKLERS AS INDICATED.
5. SPECIAL APPLICATIONS: EXTENDED-COVERAGE, AND QUICK-RESPONSE SPRINKLERS WHERE INDICATED.
B. SPRINKLER FINISHES:
1. UPRIGHT, PENDENT, AND SIDEWALL SPRINKLERS: CHROME PLATED IN FINISHED SPACES EXPOSED TO VIEW; ROUGH BRONZE IN UNFINISHED SPACES NOT EXPOSED TO VIEW; WAX COATED WHERE EXPOSED TO ACIDS, CHEMICALS, OR OTHER CORROSIVE FUMES; WHITE POLYESTER FINISH IN NATATORIUMS.
2. CONCEALED SPRINKLERS: ROUGH BRASS, WITH FACTORY-PAINTED WHITE COVER PLATE.
3. FLUSH SPRINKLERS: BRIGHT CHROME, WITH PAINTED WHITE ESCUTCHEON.
4. RECESSED SPRINKLERS: BRIGHT CHROME, WITH BRIGHT CHROME ESCUTCHEON.
5. RESIDENTIAL SPRINKLERS: DULL CHROME.
6. SPRINKLER GUARDS: FOR EXPOSED SPRINKLER HEADS SUBJECT TO DAMAGE.

SECTION 22 34 00 FUEL-FIRED WATER HEATERS

2.03 EXPANSION TANKS
A. APPROVED MANUFACTURERS: AMTROL INC., ARMSTRONG PUMPS, BELL & GOSSETT, TACO
B. STEEL, PRESSURE-RATED TANK, ASME-CODE CONSTRUCTED WITH WELDED JOINTS AND FACTORY-INSTALLED, BUTYL-RUBBER DIAPHRAGM. INCLUDE AIR PRECHARGE TO MINIMUM SYSTEM-OPERATING PRESSURE AT TANK. FACTORY-FABRICATED STEEL TAPS WELDED TO TANK BEFORE TESTING AND LABELING. INCLUDE ASME B1.20.1 PIPE THREAD. INTERIOR FINISH SHALL COMPLY WITH NSF 61 BARRIER MATERIALS FOR POTABLE-WATER TANK LININGS, INCLUDING EXTENDING FINISH INTO AND THROUGH TANK FITTINGS AND OUTLETS. PROVIDE AIR CHARGING VALVE.
C. CONTRACTOR SHALL ADJUST THE PNEUMATIC PRESSURE INTERNAL TO EXPANSION TANK PRIOR TO SYSTEM CONNECTION. TANK PRESSURE SHALL MATCH SYSTEM PRESSURE.

SECTION 22 42 00 PLUMBING FIXTURES

1.01 GENERAL
A. OBTAIN PLUMBING FIXTURES, FAUCETS, AND OTHER COMPONENTS OF EACH CATEGORY THROUGH ONE SOURCE FROM A SINGLE MANUFACTURER. IF FIXTURES, FAUCETS, OR OTHER COMPONENTS ARE NOT AVAILABLE FROM A SINGLE MANUFACTURER, OBTAIN SIMILAR PRODUCTS FROM OTHER MANUFACTURERS SPECIFIED FOR THAT CATEGORY.
B. ELECTRICAL COMPONENTS, DEVICES, AND ACCESSORIES: LISTED AND LABELED AS DEFINED IN NFPA 70, ARTICLE 100, BY AN NRTL ACCEPTABLE TO AUTHORITIES HAVING JURISDICTION, AND MARKED FOR INTENDED USE.
C. FIXTURES WITH ADA NOTED SHALL COMPLY WITH REQUIREMENTS IN ICC A117.1, "ACCESSIBLE AND USABLE BUILDINGS AND FACILITIES"; PUBLIC LAW 90-480, "ARCHITECTURAL BARRIERS ACT"; AND PUBLIC LAW 101-336, "AMERICANS WITH DISABILITIES ACT"; FOR PLUMBING FIXTURES FOR PEOPLE WITH DISABILITIES.
D. COMPLY WITH REQUIREMENTS IN PUBLIC LAW 102-486, "ENERGY POLICY ACT," ABOUT WATER FLOW AND CONSUMPTION RATES FOR PLUMBING FIXTURES.
E. COMPLY WITH REQUIREMENTS IN PUBLIC LAW 111-380, "REDUCTION OF LEAD IN DRINKING WATER ACT," ABOUT LEAD CONTENT IN MATERIALS THAT WILL BE IN CONTACT WITH POTABLE WATER FOR HUMAN CONSUMPTION.
F. COMPLY WITH NSF 61, "DRINKING WATER SYSTEM COMPONENTS - HEALTH EFFECTS; SECTIONS 1 THROUGH 9," AND NSF 372 DRINKING WATER SYSTEM COMPONENTS – LEAD CONTENT FOR POTABLE DOMESTIC WATER PIPING AND COMPONENTS.
G. SELECT COMBINATIONS OF FIXTURES AND TRIM, FAUCETS, FITTINGS, AND OTHER COMPONENTS THAT ARE COMPATIBLE.
H. COMPLY WITH APPLICABLE ANSI, ASME, ASSE, ASTM, ICC, NSF, AND UL STANDARDS AND OTHER REQUIREMENTS SPECIFIED FOR PLUMBING FIXTURES, TRIM, FITTINGS, COMPONENTS, AND FEATURES.
I. REFER TO PLUMBING FIXTURE SCHEDULES FOR BASIS OF DESIGN AND REQUIREMENTS.

2.01 PLUMBING FIXTURES
A. APPROVED LAVATORY MANUFACTURES: AMERICAN STANDARD, KOHLER, SLOAN, AND ZURN
B. APPROVED LAVATORY FAUCET MANUFACTURES: AMERICAN STANDARD, MOEN, DELTA, SPEAKMAN, KOHLER, SLOAN, T&S BRASS AND BRONZE WORKS, AND ZURN
C. APPROVED SINK MANUFACTURES: ELKAY, JUST MFG., KOHLER, AND MOEN,
D. APPROVED SINK FAUCET MANUFACTURES: AMERICAN STANDARD, MOEN, DELTA, SPEAKMAN, KOHLER, CHICAGO FAUCET, T&S BRASS AND BRONZE WORKS, AND ZURN
E. APPROVED SERVICE SINK MANUFACTURES: AMERICAN STANDARD, KOHLER, AND ZURN
F. APPROVED SERVICE SINK FAUCET MANUFACTURES: AMERICAN STANDARD, KOHLER, T&S BRASS AND BRONZE WORKS, AND ZURN
G. APPROVED ELECTRIC WATER COOLER MANUFACTURES: ELKAY AND FILTRINE
H. APPROVED DISPOSER MANUFACTURES: AMERICAN STANDARD, MAYTAG, IN-SINK-ERATOR, AND MOEN
I. APPROVED FIXTURE SUPPLY MANUFACTURES: ANY APPROVED FIXTURE MANUFACTURE

SECTION 22 05 23 AND 23 05 23 GENERAL VALVES FOR PLUMBING AND HVAC

2.01 VALVES, GENERAL
A. REFER TO PIPING APPLICATION SCHEDULES FOR SIZE, TYPE, AND CONNECTIONS.
B. VALVE PRESSURE RATING SHALL NOT BE LESS THAT INDICATED AS REQUIRED FOR SYSTEM TEMPERATURE AND PRESSURE RATINGS.
C. DOMESTIC WATER VALVES
a. REGULATORY REQUIREMENTS: COMPLY WITH REQUIREMENTS IN PUBLIC LAW 111-380, "REDUCTION OF LEAD IN DRINKING WATER ACT," ABOUT LEAD CONTENT IN MATERIALS THAT WILL BE IN CONTACT WITH POTABLE WATER FOR HUMAN CONSUMPTION.
b. NSF COMPLIANCE: NSF 61 AND NSF 372 FOR VALVE MATERIALS FOR POTABLE-WATER SERVICE.
c. BRONZE VALVES SHALL BE MADE WITH DEZINCIFICATION-RESISTANT MATERIALS. BRONZE VALVES MADE WITH COPPER ALLOY (BRASS) CONTAINING MORE THAN 15 PERCENT ZINC ARE NOT PERMITTED UNLESS OTHERWISE NOTED. WETTED SURFACES OF VALVES CONTACTED BY CONSUMABLE WATER SHALL CONTAIN NOT MORE THAN 0.25 PERCENT WEIGHTED AVERAGE LEAD CONTENT.
D. VALVE ACTUATORS:
a. CHAINWHEEL: FOR ATTACHMENT TO VALVES
b. GEAR DRIVE OPERATOR: FOR QUARTER-TURN VALVES 8 INCH AND LARGER.
c. HANDWHEEL: FOR VALVES OTHER THAN QUARTER-TURN TYPES.
d. LEVER HANDLE: FOR QUARTER-TURN VALVES 6 INCH AND SMALLER.
E. EXTENDED STEMS ON INSULATED VALVES.

2.02 BRONZE BALL VALVES
A. APPROVED MANUFACTURERS: APOLLO VALVES, HAMMOND, NIBCO, WATTS, MILWAUKEE VALVE CO.
B. BRONZE BALL VALVES SHALL COMPLY WITH MSS SP-110 AND HAVE BRONZE BODY COMPLYING WITH ASTM B 584, EXCEPT FOR CLASS 250 WHICH SHALL COMPLY WITH ASTM B 61, FULL-DEPTH ASME B1.20.1 THREADED OR SOLDER ENDS, AND BLOWOUT-PROOF STEMS.
C. TWO-PIECE, REGULAR PORT BRONZE BALL VALVES WITH STAINLESS-STEEL TRIM SHALL BE TYPE 316 STAINLESS-STEEL BALL AND STEM, REINFORCED TFE SEATS, BLOW-OUT-PROOF STEM, WITH ADJUSTABLE STEM PACKING, SOLDERED OR THREADED ENDS; AND 150 PSIG SWP AND 600-PSIG CWP RATINGS.
D. TWO-PIECE, FULL-PORT, BRONZE BALL VALVES WITH STAINLESS-STEEL TRIM SHALL BE TYPE 316 STAINLESS-STEEL BALL AND STEM, REINFORCED TFE SEATS, BLOW-OUT-PROOF STEM, WITH ADJUSTABLE STEM PACKING, SOLDERED OR THREADED ENDS; 150 PSIG SWP AND 600-PSIG CWP RATINGS.

SECTION 22 11 16 - DOMESTIC WATER PIPING

1.01 GENERAL
A. POTABLE-WATER PIPING AND COMPONENTS SHALL COMPLY WITH NSF 14 AND NSF 61 ANNEX G. PLASTIC PIPING COMPONENTS SHALL BE MARKED WITH "NSF-PW."
B. COMPLY WITH NSF STANDARD 372 FOR LOW LEAD.

2.01 COPPER TUBE AND FITTINGS
A. SOFT COPPER, TYPE K
a. TUBE SHALL BE IN ACCORDANCE WITH ASTM B 88, TYPE K (ASTM B 88M, TYPE A), WATER TUBE, ANNEALED TEMPER.
b. COPPER PRESSURE FITTINGS SHALL BE IN ACCORDANCE WITH ASME B16.18, CAST-COPPER-ALLOY OR ASME B16.22, WROUGHT-COPPER, SOLDER-JOINT FITTINGS.
c. BRONZE FLANGES SHALL BE IN ACCORDANCE WITH ASME B16.24, CLASS 150, WITH SOLDER-JOINT ENDS.
d. COPPER UNIONS SHALL BE IN ACCORDANCE WITH MSS SP-123, CAST-COPPER-ALLOY, HEXAGONAL-STOCK BODY, WITH BALL-AND-SOCKET, METAL-TO-METAL SEATING SURFACES, AND SOLDER-JOINT OR THREADED ENDS.
B. HARD COPPER, TYPE L
a. TUBE SHALL BE IN ACCORDANCE WITH ASTM B 88, TYPE L (ASTM B 88M, TYPE B), WATER TUBE, DRAWN TEMPER.
b. COPPER PRESSURE FITTINGS SHALL BE IN ACCORDANCE WITH ASME B16.18, CAST-COPPER-ALLOY OR ASME B16.22, WROUGHT- COPPER, SOLDER-JOINT FITTINGS.
c. BRONZE FLANGES SHALL BE IN ACCORDANCE WITH ASME B16.24, CLASS 150, WITH SOLDER-JOINT ENDS.
d. COPPER UNIONS SHALL BE IN ACCORDANCE WITH MSS SP-123, CAST-COPPER-ALLOY, HEXAGONAL-STOCK BODY, WITH BALL-AND-SOCKET, METAL-TO-METAL SEATING SURFACES, AND SOLDER-JOINT OR THREADED ENDS.

SECTION 22 11 19 DOMESTIC WATER PIPING SPECIALTIES

2.01 BACKFLOW PREVENTERS
A. APPROVED MANUFACTURERS: APOLLO VALVES, FEBCO, WATTS, AND ZURN
B. INTERMEDIATE ATMOSPHERIC-VENT BACKFLOW PREVENTERS
a. SHALL COMPLY WITH ASSE 1012 FOR CONTINUOUS-PRESSURE APPLICATIONS. BRONZE BODY WITH UNION SOLDER JOINTS AND SIZES UP TO 3/4 INCH.
C. DOUBLE-CHECK BACKFLOW-PREVENTION ASSEMBLIES
a. SHALL COMPLY WITH ASSE 1015 FOR CONTINUOUS-PRESSURE APPLICATIONS. BRONZE BODY WITH THREADED CONNECTIONS AND SIZES UP TO 2 INCH. CAST-IRON OR DUCTILE-IRON, WITH INTERIOR LINING COMPLYING WITH AWWA C550 OR THAT IS FDA APPROVED FOR SIZES 2-1/2 AND LARGER. DESIGNED FOR HORIZONTAL, STRAIGHT THROUGH FLOW
b. ACCESSORIES: PROVIDE BALL VALVE WITH THREADED ENDS ON INLET AND OUTLET OF 2 INCH AND SMALLER; GATE-TYPE WITH FLANGED ENDS ON INLET AND OUTLET OF 2-1/2 INCH AND LARGER.

2.02 VACUUM BREAKERS
A. APPROVED MANUFACTURERS: APOLLO VALVES, FEBCO, WATTS, AND ZURN
B. ATMOSPHERIC TYPE
a. SHALL COMPLY WITH ASSE 1001 FOR SIZES 1/4 TO 3, AS REQUIRED TO MATCH CONNECTED PIPING. DEVICE SHALL HAVE A BRONZE BODY, INLET AND OUTLET CONNECTION SHALL BE THREADED, AND CHROME PLATED FINISH.
C. HOSE CONNECTION TYPE
a. SHALL COMPLY WITH ASSE 1011. DEVICE SHALL HAVE A BRONZE OR BRASS BODY WITH DRAIN, OUTLET CONNECTION SHALL BE GARDEN HOSE THREADED, AND CHROME OR NICKEL PLATED FINISH.

2.03 TEMPERATURE ACTUATED MIXING VALVES (TMV)
A. APPROVED MANUFACTURERS: APOLLO VALVES, BRADLEY, LAWLER, LEONARD, WATTS, AND ZURN
B. WATER TEMPERATURE LIMITING DEVICE (FIXTURE)
a. SHALL COMPLY WITH ASSE 1070 WITH MINIMUM PRESSURE RATING OF 125 PSIG. THERMOSTATICALLY CONTROLLED WITH BRONZE BODY CHROME PLATED. 1/2 INCH UNION OR 3/8 COMPRESSION WITH INTEGRAL CHECK VALVES AND TEMPERATURE ADJUSTMENT.

2.04 HOSE BIBBS (HB-1)
A. APPROVED MANUFACTURERS: JOSAM, MIFAB, ZURN, WOODFORD, WATTS
B. SHALL COMPLY WITH ASME A112.18.1 AND HAVE BRONZE BODY, BRONZE REPLACEABLE SEAT, VACUUM BREAKER INTEGRAL AND NONREMOVABLE, 1/2 OR 3/4 INCH THREADED OR SOLDERED CONNECTIONS, OUTLET SHALL BE A GARDEN HOSE CONNECTOR, PRESSURE RATING SHALL BE 125 PSIG.

SECTION 22 11 23 DOMESTIC WATER CIRCULATION PUMPS

2.01 CLOSE COUPLED, IN-LINE, SEALLESS CENTRIFUGAL PUMPS
A. APPROVED MANUFACTURERS: ARMSTRONG PUMPS INC., BELL & GOSSETT; XYLEM INC., GRUNDFOS PUMPS CORP., TACO, INC.
B. PUMPS SHALL BE FACTORY-ASSEMBLED AND -TESTED, SINGLE-STAGE, CLOSE-COUPLED, IN-LINE, SEALLESS CENTRIFUGAL PUMPS. PUMP AND MOTOR ASSEMBLY SHALL BE HERMETICALLY SEALED, REPLACEABLE-CARTRIDGE-TYPE UNIT WITH MOTOR AND IMPELLER ON COMMON SHAFT AND DESIGNED FOR INSTALLATION WITH PUMP AND MOTOR SHAFT MOUNTED HORIZONTALLY. CASING SHALL BE BRONZE, WITH THREADED COMPANION-FLANGE CONNECTIONS. IMPELLER SHALL BE CORROSION-RESISTANT MATERIAL. MOTOR SHALL BE SINGLE SPEED, UNLESS OTHERWISE INDICATED.
C. PROVIDE AN AQUASTAT OR TIMER FOR ON/OFF PUMP CONTROL. TIMER SHALL BE PROGRAMMABLE WITH TIME SCHEDULE AND 24 VAC.

SECTION 22 13 16 DRAINAGE PIPING

2.01 HUBLESS CAST-IRON SOIL PIPE AND FITTINGS
A. PIPE AND FITTINGS SHALL COMPLY WITH ASTM A 888 OR CISPI 301.
B. CAST-IRON SOIL PIPE, HUBLESS-PIPING COUPLINGS SHALL BE NSF CERTIFIED FOR COMPLIANCE WITH CISPI 310. STAINLESS-STEEL CORRUGATED SHIELD WITH STAINLESS-STEEL BANDS AND TIGHTENING DEVICES; AND ASTM C 564, RUBBER SLEEVE WITH INTEGRAL, CENTER PIPE STOP.
C. HEAVY DUTY CAST-IRON SOIL PIPE, HUBLESS-PIPING COUPLINGS SHALL COMPLY WITH ASTM C 1277 AND ASTM C 1540, OR ASTM C 1277 AND FM 1680 CLASS I. STAINLESS-STEEL SHIELD WITH STAINLESS-STEEL BANDS AND TIGHTENING DEVICES; AND ASTM C 564, RUBBER SLEEVE WITH INTEGRAL, CENTER PIPE STOP.
D. APPROVED MANUFACTURERS: ANACO-HUSKY, FERGUSON ENTERPRISES, INC., IDEAL-TRIDON., MISSION RUBBER COMPANY, TYLER PIPE, FERNCO INC.

2.02 COPPER PIPE AND FITTINGS
A. DRAIN WASTE AND VENT (DWV) COPPER
a. TUBE SHALL COMPLY WITH ASTM B 306, DRAINAGE TUBE, DRAWN TEMPER.
b. FITTINGS SHALL COMPLY WITH ASME B16.23, CAST COPPER OR ASME B16.29, WROUGHT COPPER, SOLDER-JOINT FITTINGS.
B. HARD COPPER, TYPE L
a. TUBE SHALL BE IN ACCORDANCE WITH ASTM B 88, TYPE L (ASTM B 88M, TYPE B), WATER TUBE, DRAWN TEMPER.
b. COPPER PRESSURE FITTINGS SHALL BE IN ACCORDANCE WITH ASME B16.18, CAST-COPPER-ALLOY OR ASME B16.22, WROUGHT- COPPER, SOLDER-JOINT FITTINGS.
c. BRONZE FLANGES SHALL BE IN ACCORDANCE WITH ASME B16.24, CLASS 150, WITH SOLDER-JOINT ENDS.
d. COPPER UNIONS SHALL BE IN ACCORDANCE WITH MSS SP-123, CAST-COPPER-ALLOY, HEXAGONAL-STOCK BODY, WITH BALL-AND-SOCKET, METAL-TO-METAL SEATING SURFACES, AND SOLDER-JOINT OR THREADED ENDS.

2.03 POLYVINYL CHLORIDE (PVC) PIPE AND FITTINGS
A. SOLID-WALL PVC PIPE SHALL BE SCHEDULE 40, ASTM D 2665, DRAIN, WASTE, AND VENT.
B. PVC SOCKET FITTINGS SHALL BE ASTM D 2665, SOCKET TYPE, MADE TO ASTM D 3311, DRAIN, WASTE, AND VENT PATTERNS AND TO FIT SCHEDULE 40 PIPE.

SECTION 22 13 19 DRAINAGE PIPING SPECIALTIES

2.01 CLEANOUTS
A. APPROVED MANUFACTURERS: JOSAM, MIFAB, JAY R. SMITH, ZURN
B. CLEANOUTS SHALL BE THE SAME NOMINAL SIZE AS PIPE THEY SERVE UP TO 4 INCHES. PIPES LARGE THAN 4 INCHES SHALL HAVE A CLEANOUT OF 4 INCHES MINIMUM.
C. BODY SHALL BE HUB-AND-SPIGOT, CAST-IRON SOIL PIPE T-BRANCH OR HUBLESS, CAST-IRON SOIL PIPE TEST TEE AS REQUIRED TO MATCH CONNECTED PIPING. CLOSURE SHALL BE COUNTERSUNK OR RAISED-HEAD, DRILLED-AND-THREADED BRONZE OR BRASS PLUG WITH TAPERED THREADS.
D. CLEANOUTS IN FINISHED FLOOR SHALL HAVE A NICKEL-BRONZE, COPPER ALLOY WITH SCORIATED COVER IN SERVICE AREAS, AND RECESSED COVER TO ACCEPT FLOOR FINISH MATERIAL IN FINISHED FLOOR AREAS.
E. CLEANOUTS IN FINISHED WALL SHALL HAVE A ROUND, CHROME-PLATED BRONZE FLAT, CHROME-PLATED BRASS OR STAINLESS-STEEL COVER PLATE WITH SCREW.
F. A CLEAN-OUT SHALL BE INSTALLED AT THE BASE OF EACH SOIL AND WASTE STACK, AND AT NOT MORE THAN 100'-0" INTERVALS ON HORIZONTAL RUNS AND AS REQUIRED BY CODE.

2.02 FLOOR DRAINS, SINKS, AND TRENCH DRAINS
A. APPROVED MANUFACTURERS: JOSAM, MIFAB, JAY R. SMITH, ZURN
B. REFER TO PLUMBING SCHEDULES.

2.03 AIR ADMITTANCE VALVES
A. APPROVED MANUFACTURERS: OATEY, STUDOR, RECTORSEAL
B. STANDARD ASSE 1051 TYPE A FOR SINGLE FIXTURE OF TYPE B FOR BRANCH PIPING. HOUSING SHALL BE PLASTIC WITH MECHANICAL SEALING DIAPHRAGM THE SAME SIZE AS BRANCH VENT.
C. STANDARD ASSE 1050 TYPE FOR VENT STACKS. HOUSING SHALL BE PLASTIC WITH MECHANICAL SEALING DIAPHRAGM THE SAME SIZE AS VENT STACK.
D. PROVIDE A WHITE PLASTIC WALL BOX WITH GRILLE FOR RECESSED INSTALLATION. SIZE SHALL BE MINIMUM 9 INCHES WIDE BY 9 INCHES TALL BY 4 INCHES DEEP.

2.06 TRAP SEAL PROTECTION DEVICE
A. APPROVED MANUFACTURERS: ZURN, JAY R. SMITH, SURESEAL MANUFACTURING
B. BARRIER TYPE TRAP SEAL PROTECTION DEVICE SHALL COMPLY WITH ASSE 1072 AND SHALL HAVE A NEOPRENE RUBBER OR CHEMICAL RESISTANT ELASTOMER SEAL ELEMENT. DEVICE SHALL BE SAME SIZE AS DRAIN WITH A COMPRESSION FIT SEALING GASKET.

SECTION 23 33 00 - DUCT ACCESSORIES

2.01 BALANCING DAMPERS
A. APPROVED MANUFACTURES: GREENHECK, KRUEGER, NAILOR, RUSKIN, OR APPROVED EQUAL.
B. WHERE SHOWN ON DRAWINGS AND WHEREVER NECESSARY FOR COMPLETE ACCESS & CONTROL OF AIR FLOW:
a. ROUND VOLUME DAMPERS SHALL BE BUTTERFLY OR SINGLE BLADE TYPE CONSISTING OF CIRCULAR BLADE MOUNTED TO A SHAFT. AMCA CERTIFIED. INSTALL WITH GASKETS ON OUTSIDE OF DUCT. BLADES SHALL NOT BE LESS THAN 16 GAUGE GALVANIZED, ROLL-FORMED STEEL WITH GALVANIZED STEEL AXLE. OIL-IMPREGNATED BRONZE WITH MOLDED SYNTHETIC STAINLESS STEEL BEARINGS. ZINC PLATED STEEL DAMPER HARDWARE AND 1 INCH GALVANIZED STEEL JACKSHAFT.
b. RECTANGULAR VOLUME DAMPERS SHALL BE MULTIPLE OPPOSED BLADE, AMCA CERTIFIED. INSTALL WITH GASKETS ON OUTSIDE OF DUCT. BLADES AND FRAME SHALL NOT BE LESS THAN 16 GAUGE GALVANIZED, ROLL-FORMED STEEL WITH GALVANIZED STEEL AXLE. OIL-IMPREGNATED BRONZE WITH MOLDED SYNTHETIC STAINLESS STEEL BEARINGS. ZINC PLATED STEEL DAMPER HARDWARE AND 1 INCH GALVANIZED STEEL JACKSHAFT.
c. DAMPERS FRAMES SHALL BE FLANGED FOR INSTALLATION IN WALLS AND FLANGELESS FOR INSTALLATION IN DUCTWORK.

2.02 BACKDRAFT DAMPERS
A. DAMPERS SHALL BE PARALLEL ACTION COUNTER BALANCED FACTORY MADE OF 0.05" EXTRUDED ALUMINUM BLADES WITH EDGE SEALS, 16 GAUGE ALUMINUM FRAME SUPPORTED BY BRONZE OR ALUMINUM RODS. BLADES SHALL NOT BE LARGER THAN 30INCHES LENGTH AND 6 INCHES WIDE. DAMPERS SHALL COMPLY WITH AMCA 500. BACKDRAFT DAMPERS SHALL BE MANUFACTURED BY GREENHECK, RUSKIN, OR APPROVED EQUAL.

2.03 FIRE DAMPERS
A. APPROVED MANUFACTURES: RUSKIN, GREENHECK, NAILOR, OR APPROVED EQUAL.
B. DYNAMIC FIRE DAMPERS WITH CURTAIN STYLE BLADES, AND LABELED ACCORDING TO UL 555, MAXIMUM VELOCITY 2000 FPM, MAXIMUM STATIC PRESSURE 4 INCHES W.G. FRAME SHALL BE TYPE B OR TYPE C CURTAIN TYPE WITH BLADES OUTSIDE AIRSTREAM; FABRICATED WITH ROLL-FORMED, GALVANIZED STEEL IN GAGES REQUIRED BY MANUFACTURER'S UL LISTING; WITH MITERED AND INTERLOCKING CORNERS. DAMPERS SHALL HAVE REPLACEABLE FUSIBLE LINK RATED AT 165 OR 212 DEGREES, COORDINATE WITH SPRINKLER RATING, AND SHALL BE ACCESSIBLE OR ACCESS DOOR IN DUCT/CEILING SHALL BE PROVIDED. DAMPER BLADES SHALL BE FABRICATED WITH 21 GAUGE GALVANIZED STEEL. DAMPERS SHALL BE LOW-PROFILE TYPE WITH BLADES OUTSIDE THE AIRSTREAM. PROVIDE MOUNTING SLEEVES AS REQUIRED AND THEY SHALL BE THE SAME GAUGE AS DUCTWORK AND LENGTH SUITABLE TO FIT APPLICATION. MOUNTING ORIENTATION: VERTICAL OR HORIZONTAL AS INDICATED. FIRE DAMPERS SHALL COMPLY WITH UL 555 AND NFPA 90A.
C. RATING:
a. 1-1/2 HOUR FOR 2 HOUR RATED WALL
b. 3 HOURS FOR A 4 HOUR RATED WALL

2.04 MOTORIZED CONTROL DAMPERS
A. CONTROL DAMPERS SHALL COMPLY WITH AMCA 500. FRAME SHALL BE MINIMUM 16 GAUGE GALVANIZED STEEL. BLADES SHALL BE MINIMUM 14 GAUGE GALVANIZED STEEL MAXIMUM 8" WIDE AND 60" LONG ATTACHED TO MINIMUM 1/2" SHAFTS. DAMPERS RATED TO 4 INCH WG. SHALL HAVE 3/4" SHAFTS. PROVIDE SYNTHETIC ELASTOMERIC OR NEOPRENE BLADE SEALS. JAMB SEALS SHALL BE STAINLESS STEEL. RATED PRESSURE AND VELOCITY TO EXCEED DESIGN AIRFLOW CONDITIONS.
a. APPROVED MANUFACTURES: RUSKIN, GREENHECK, TAMCO, JOHNSON CONTROLS, HONEYWELL, OR APPROVED EQUAL.
B. ELECTRIC DAMPER OPERATORS/ DAMPER MOTOR SHALL BE 24V OR 120V TWO-POSITION OR MODULATING AS REQUIRED WITH SPRING RETURN. OPERATOR SHALL BE SIZED TO OPERATE WITH SUFFICIENT RESERVE POWER FOR SMOOTH OPERATION FROM FULL CLOSE TO FULL OPEN AND TIGHT SHUTOFF. DAMPER MOTOR SHALL HAVE O-RINGS FOR WEATHERPROOF OPERATION
a. APPROVED MANUFACTURES: BELIMO, HONEYWELL, JOHNSON CONTROLS, SIEMENS, SCHNEIDER ELECTRIC.

2.06 PLENUMS AND SCREENS
A. CONSTRUCT PLENUMS WITH GALVANIZED STEEL FRAMING MEMBERS AND GALVANIZED SHEETMETAL BRACED WITH GALVANIZED ANGLES. GAUGES AND BRACING SHALL CONFORM TO SMACNA RECOMMENDATIONS FOR DUCTWORK SIZES. WHERE ACCESS DOORS ARE SHOWN, PROVIDE HINGED DOORS WITH #202 VENTLOK LATCH. MAKE WATERTIGHT CONNECTIONS TO LOUVERS, SLOPING BOTTOM OF PLENUM TO DRAIN WATER TO WEEPHOLES IN BOTTOM OF LOUVER.
B. PROVIDE SCREENS ON LOUVERS, DUCTS, HOODS, FANS, AND OPENINGS TO THE OUTDOORS AS SCHEDULED AND/OR NOTED ON THE DRAWINGS. BIRD SCREENS SHALL BE 0.041-INCH, 1/2-INCH MESH GALVANIZED STEEL WIRE.

2.07 TURNING VANES
A. DOUBLE WALL AIRFOIL FORMED TYPE TURNING VANES WITH VANE RUNNERS SHALL BE INSTALLED AT EACH CHANGE IN DIRECTION FOR ALL SQUARE/ RECTANGULAR DUCTWORK. SHALL BE MANUFACTURED BY AERO/DYNE COMPANY, DUCTMATE, DURO DYNE CORP, OR WARD INDUSTRIES.

2.08 FLEXIBLE DUCTWORK (POLYMER LINER):
A. APPROVED MANUFACTURES: FLEXMASTER TYPE 1M, HART & COOLEY, HART & COOLER OR EQUIVALENT.
B. FLEXIBLE DUCTWORK SHALL BE CONSTRUCTED OF A SPRING STEEL HELIX SUPPORTING A PLASTIC CORE. IT SHALL BE INSULATED WITH 1" FIBERGLASS HAVING A DENSITY OF 1 LB./CU.FT (R-6.0). THE INSULATION SHALL BE SHEATHED IN A FIRE-RETARDANT POLYETHYLENE PROTECTIVE JACKET/VAPOR BARRIER, U.L.181 CLASS 1.
C. THE DUCT SHALL BE RATED AT 10" W.G., AND A MAXIMUM VELOCITY OF 4000 FPM. THE DUCT SHALL BE LISTED IN CONFORMANCE WITH UL STANDARD 181, CLASS 1.
D. FLEXIBLE DUCT SHALL BE LIMITED TO A MAXIMUM LENGTH OF 5'-0", AS A MEANS OF CONNECTING BOXES, DIFFUSERS, ETC. TO THE DUCT SYSTEM.
E. FLEXIBLE DUCT RUNS SHALL BE INSTALLED FULLY EXTENDED AND STRAIGHT AS POSSIBLE AVOIDING TIGHT TURNS. INSTALL FLEXIBLE DUCT IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS. NO MORE THAN ONE (1) 90-DEGREE BEND SHALL BE CREATED. BENDS SHALL NOT EXCEED A CENTERLINE RADIUS OF ONE DUCT DIAMETER. DUCT SAG SHALL NOT EXCEED 1/2-INCH. SUPPORTING MATERIAL IN DIRECT CONTACT WITH THE DUCT SHALL NOT BE LESS THAN 1-1/2-INCHES IN WIDTH.
F. CONNECT FLEXIBLE DUCT TO RIGID METAL DUCT OR AIR DEVICES AS RECOMMENDED BY THE MANUFACTURER. AT A MINIMUM, INSTALL TWO WRAPS OF DUCT TAPE AROUND THE INNER CORE CONNECTION AND A METALLIC OR NON- METALLIC CLAMP OVER THE TAPE AND TWO WRAPS OF DUCT TAPE OR A CLAMP OVER THE OUTER JACKET. DUCT CLAMPS SHALL BE LABELED IN ACCORDANCE WITH U.L.181B AND MARKED 181B-C. DUCT TAPE SHALL BE LABELED IN ACCORDANCE WITH U.L.181B AND MARKED 181B-FX.
G. PROVIDE FLEXIBLE ELBOW SUPPORT CONSTRUCTED OF DURABLE COMPOSITE THAT IS FULLY 2.08 FLEXIBLE DUCTWORK (POLYMER LINER):

2.09 DUCT ACCESS DOORS
A. WHERE MOTORIZED DAMPERS, FIRE DAMPERS, CONTROL EQUIPMENT, ETC. ARE INSTALLED IN DUCTS, AND FOR CLEANING DUCTWORK, ACCESS DOORS SHALL BE PROVIDED IN THE DUCTS, MADE AIR-TIGHT WITH GASKETED EDGES. USE VENTLOK, OR EQUAL, SPONGE RUBBER OR FELT GASKETING MATERIAL. THE DOORS SHALL BE DOUBLE-WALL CONSTRUCTION WITH 1" OF RIGID INSULATION FILL AND SHALL BE ATTACHED TO THE DUCT WITH CAM LATCHES. PROVIDE HINGES AND MULTIPLE COMPRESSION CAM LOCKS FOR ACCESS DOORS GREATER THAN 12 INCHES. OMIT ACCESS DOOR INSULATION AND DOUBLE-WALL CONSTRUCTION IF DUCTS ARE NOT SPECIFIED TO BE INSULATED. ACCESS DOORS SHALL BE CONSTRUCTED OF THE SAME MATERIALS AS THE DUCTWORK. APPROVED MANUFACTURES ARE DUCTMATE AND FLEXMASTER.
B. PROVIDE ACCESS PANELS WHERE REQUIRED FOR ACCESS TO THE "DUCT ACCESS DOORS." IF THESE ACCESS PANELS ARE PLACED IN FIRE-RATED WALLS OR CEILING OR FLOOR, THEN THE ACCESS PANEL SHALL HAVE THE SAME RATING.
C. SOLUTIONS.

SECTION 23 05 93-TESTING, ADJUSTING, AND BALANCING

1.01 GENERAL
A. BALANCING SHALL BE DONE BY AN INDEPENDENT FIRM SPECIALIZING SOLELY IN THE DISCIPLINE OF BALANCING AIR AND WATER SYSTEMS, AND A MEMBER OF NEBB.. FIRMS DESIRING TO FURNISH SERVICES FOR THIS PROJECT SHALL SUBMIT FOR WRITTEN APPROVAL DURING BIDDING. ALL AIR AND HYDRONIC SYSTEMS SHALL BE BALANCED USING APPLICABLE PROPORTIONATE PROCEDURE.
B. CONTRACTOR SHALL FURNISH SERVICES FOR TWO COMPLETE ADJUSTMENTS OF THE HEATING, AIR CONDITIONING AND AIR DISTRIBUTION SYSTEMS WITH A REPORT FOR EACH VISIT. REPORTS MUST BE SUBMITTED TO ENGINEER FOR REVIEW AND APPROVAL.
C. SYSTEM SHALL BE TESTED, ADJUSTED & BALANCED BY 'NEBB' CERTIFIED PERSONNEL.

2.01 TESTING CONDITIONS
A. (AIR) BEFORE ADJUSTMENTS ARE MADE, CHECK THE SYSTEM FOR SUCH ITEMS AS DIRTY FILTERS, DUCT AND DAMPER LEAKAGE, VIBRATIONS, ETC. ALL DIFFUSERS, DUCT SECTIONS, ETC SHALL BE ADJUSTED TO DELIVER DESIGN QUANTITIES WITHIN 5%. AIR QUANTITIES SHALL BE TESTED SIMULATING FILTERS BEING 50% LOADED. ADJUST/REPLACE SHEAVES AND BELTS AS REQUIRED TO ACHIEVE DESIGN AIR QUANTITIES. REPLACE THERMAL MOTOR OVERLOADS AS REQUIRED.
B. MERV-8 FILTERS SHALL BE INSTALLED PRIOR TO TEST AND BALANCE.

2.02 VERIFICATION OF TEMPERATURE CONTROL
A. THE TEST AND BALANCE AGENCY SHALL BE ASSISTED BY THE CONTROL CONTRACTOR IN VERIFYING THE OPERATION AND CALIBRATION OF ALL TEMPERATURE CONTROL SYSTEMS. THE FOLLOWING TESTS SHALL BE CONDUCTED:
a. VERIFY THAT ALL CONTROL COMPONENTS ARE INSTALLED IN ACCORDANCE WITH PROJECT REQUIREMENTS AND ARE FUNCTIONAL, INCLUDING ALL ELECTRICAL INTERLOCKS, DAMPER SEQUENCES, AND FIRE AND SMOKE DETECTORS.
b. VERIFY THAT ALL CONTROLLING INSTRUMENTS ARE CALIBRATED AND SET FOR DESIGN OPERATING CONDITIONS.
c. VERIFY THE ACCURACY OF THE FINAL SETTING BY TAKING TEMPERATURE READINGS. THE READINGS SHALL BE IN A TYPICAL CONDITIONED SPACE FOR EACH SEPARATELY CONTROLLED ZONE.

2.03 REPORT
A. AFTER ALL ADJUSTMENTS ARE MADE, A DETAIL WRITTEN REPORT SHALL BE PREPARED AND SUBMITTED FOR APPROVAL. FINAL ACCEPTANCE OF THE PROJECT WILL NOT BE MADE UNTIL A SATISFACTORY REPORT IS RECEIVED AND FIELD VERIFIED. THE REPORT SHALL DETAIL THE TEST EQUIPMENT AND BALANCING PROCEDURES BEING USED; THE GENERAL STATUS OF THE SYSTEM BEING TESTED INCLUDING EQUIPMENT DETAILS; PROVIDE DATA SHEETS INDICATING THE REQUIRED AND ACTUAL CFM OF ALL OUTLETS AND INLETS.
B. SIX (6) COPIES OF THE TEST AND BALANCE REPORT ARE REQUIRED AND SHALL BE SUBMITTED TO THE ARCHITECT.
C. TEST & BALANCE REPORT TO INCLUDE OUTSIDE AIRFLOW READINGS.
D. THE REPORT SHALL CONTAIN THE FOLLOWING GENERAL DATA IN A FORMAT SELECTED BY THE TEST AND BALANCE AGENCY: PROJECT NUMBER, PROJECT TITLE, PROJECT LOCATION, PROJECT ARCHITECT, PROJECT MECHANICAL ENGINEER, TEST AND BALANCE AGENCY, TEST AND BALANCE ENGINEER, OWNER, MECHANICAL SUBCONTRACTORS, DATES TESTS WERE PERFORMED, CERTIFICATION.
E. THE TEST AND BALANCE REPORT SHALL BE RECORDED ON REPORT FORMS CONFORMING TO THE RECOMMENDED FORMS IN THE A.A.B.C. NATIONAL STANDARDS.
a. PREFACE - A GENERAL DISCUSSION OF THE SYSTEM, ANY ABNORMALITIES AND PROBLEMS ENCOUNTERED (DEFICIENCIES OUTSTANDING LISTED).
b. INSTRUMENTATION LIST - THE LIST OF INSTRUMENTS INCLUDE TYPE, MODEL, MANUFACTURER, SERIAL NUMBER AND CALIBRATION DATE.
c. SYSTEM IDENTIFICATION - IN EACH REPORT, THE VAV BOXES, ZONES, SUPPLY, RETURN, DATA SHEETS, ALONG WITH A DRAWING SHOWING THE ABOVE.
d. AIR HANDLING EQUIPMENT TEST REPORT FORMS - RECORD THE FOLLOWING ON EACH AIR-HANDLING EQUIPMENT TEST FORM:
e. MANUFACTURER, MODEL NUMBER AND SERIAL NUMBER
f. ALL DESIGN AND MANUFACTURER-RATED DATA.
g. TOTAL ACTUAL CFM BY TRAVERSE IF PRACTICAL, IF NOT PRACTICAL, THE SUM OF THE OUTLETS MAY BE USED, OR A COMBINATION OF EACH OF THESE PROCEDURES.
h. SUCTION AND DISCHARGE STATIC PRESSURE OF EACH FAN, AS APPLICABLE.

2.04 ACCEPTANCE OF TEST AND BALANCE REPORT
A. AT THE TIME OF ACCEPTANCE OF THE TEST AND BALANCE REPORT, THE TEST AND BALANCE AGENCY SHALL, IF REQUESTED, RECHECK IN THE PRESENCE OF THE OWNER REPRESENTATIVE, SPECIFIC AND RANDOM SELECTIONS OF DATA RECORDED IN THE CERTIFIED TEST AND BALANCE REPORT.
B. POINTS AND AREAS FOR RECHECK SHALL BE SELECTED BY THE ENGINEER OF RECORD.
C. MEASUREMENTS AND TEST PROCEDURES SHALL BE THE SAME AS THE ORIGINAL TEST AND BALANCE.
D. SELECTIONS FOR RECHECK, SPECIFIC PLUS RANDOM, SHALL NOT NORMALLY EXCEED 15% OF THE TOTAL NUMBER TABULATED IN THE REPORT, EXCEPT WHERE SPECIAL AIR SYSTEMS REQUIRE A COMPLETE RECHECK FOR SAFETY REASONS.
E. IF RANDOM TESTS DEMONSTRATED A MEASURED FLOW DEVIATION OF 15% OR MORE FROM THAT RECORDED, A NEW CERTIFIED TEST AND BALANCE REPORT MUST BE SUBMITTED, AND A NEW INSPECTION TEST MADE, ALL AT NO ADDITIONAL COST TO OWNER.

3.01 AIR SYSTEM PROCEDURES
A. THE TEST AND BALANCE AGENCY SHALL PERFORM THE FOLLOWING TESTING AND BALANCING FUNCTIONS:
1. DESIGN CONDITIONS INCLUDING SUPPLY/ EXHAUST AIRFLOW, MOTOR HP, FAN RPM, OUTLET VELOCITY, STATIC PRESSURE.
2. INSTALLED EQUIPMENT INFORMATION INCLUDING BELT, SHEAVE SIZE, MOTOR, MODEL NUMBERS.
3. FAN SPEEDS - TEST AND ADJUST FAN RPM TO ACHIEVE DESIGN CFM REQUIREMENTS.
4. CURRENT AND VOLTAGE - MEASURE AND RECORD MOTOR CURRENT AND VOLTAGE.
5. PITOT TUBE TRAVERSE - PERFORM A PITOT TUBE TRAVERSE OF MAIN SUPPLY AND RETURN DUCTS TO OBTAIN TOTAL CFM. IF A PITOT TUBE TRAVERSE IS NOT PRACTICAL, THE SUMMATION OF THE OUTLETS OR INLETS MAY BE USED. AN EXPLANATION WHY A TRAVERSE WAS NOT MADE MUST APPEAR ON THE APPROPRIATE DATA SHEET.
6. OUTSIDE AIR - TEST AND ADJUST SYSTEM MINIMUM OUTSIDE AIR BY PITOT TUBE TRAVERSE. IF A PITOT TUBE TRAVERSE IS NOT PRACTICAL, THE PERCENTAGE OF OUTSIDE AIR MAY BE DETERMINED BY CALCULATIONS FROM THE RETURN AIR, OUTSIDE AIR, AND MIXED AIR TEMPERATURE. MAKE ALLOWANCES FOR HEAT OF COMPRESSION AND MOTOR HEAT WHERE APPLICABLE.
7. STATIC PRESSURE - TEST AND RECORD SYSTEM STATIC PRESSURES, INCLUDING SUCTION AND DISCHARGE STATIC PRESSURE PROFILE OF EACH FAN.
8. AIR TEMPERATURE - TAKE WET-BULB AND DRY-BULB AIR TEMPERATURES ON THE ENTERING AND LEAVING SIDE OF EACH HEATING COIL.
9. TOLERANCE - TEST AND BALANCE EACH DIFFUSER, GRILLE, AND REGISTER TO WITHIN 10 PERCENT OF DESIGN AND REQUIREMENT.
10. DESCRIPTION - RECORD THE SIZE AND TYPE OF EACH DIFFUSER, GRILLE, AND REGISTER ON AIR OUTLET DATA SHEETS.
11. TERMINAL BOXES - ALL ASSOCIATED TEMPERATURE CONTROLS SHALL BE CHECKED FOR PROPER OPERATION AND CALIBRATION
12. MINIMIZING DRAFTS - ADJUST ALL DIFFUSERS, GRILLES, AND REGISTERS TO MINIMIZE DRAFTS IN ALL AREAS
13. EQUIPMENT SHALL BE BALANCED TO AIRFLOWS WITHIN:
A. TERMINAL DEVICES & BRANCH LINES: ±10% OF DESIGNED LOADS
B. MAIN DUCTS & AHU'S: ± 5% OF DESIGNED LOADS
14. EXHAUST FANS/HOODS
a. MEASURE EXHAUST FAN STATIC PRESSURE, TOTAL CFM. MAKEUP AIR AND FAN RPM.
b. MEASURE MOTOR OPERATING VOLTAGE AND AMPERAGE.
c. MEASURE HOOD AVERAGE FACE VELOCITIES AND ADJUST AS NECESSARY. WHERE POSSIBLE, BALANCE FLOW USING A PITOT TRAVERSE WITHIN HOOD WHERE DUCTS ARE CONNECTED.
d. RECORD THE SPECIFIED AGAINST THE ACTUAL SUPPLIED HORSEPOWER AND ELECTRICAL CHARACTERISTICS OF ALL MOTORS. RECORD, IF SPECIFIED, TO BE SELF OR PERMANENTLY LUBRICATED.

SECTION 23 31 13 - METAL DUCTS

1.01 DUCTWORK
A. GENERAL
1. ALL DUCTWORK SHALL BE CONSTRUCTED STRICTLY ACCORDING TO THE LATEST ASHRAE 90A, SMACNA, AND IMC STANDARDS. DUCT SIZES SHOWN ARE INSIDE CLEAR DIMENSIONS; MAINTAIN SIZES INSIDE LINING FOR LINED DUCTS.
2. REFER TO DUCT APPLICATION SCHEDULES FOR MATERIALS, PRESSURE CLASS, SEAL CLASS, AND LOCATIONS.
3. DUCT PRESSURE DEFINITIONS:
A. LOW PRESSURE: UP TO 2 INCH WG AND VELOCITIES LESS THAN 1,500 FPM. CONSTRUCT FOR 2 INCH WG POSITIVE OR NEGATIVE STATIC PRESSURE.
B. MEDIUM PRESSURE: GREATER THAN 2 INCH WG TO 6 INCH WG AND VELOCITIES GREATER THAN 1,500 FPM AND LESS THAN 2,500 FPM. CONSTRUCT FOR 6 INCH WG POSITIVE OR NEGATIVE STATIC PRESSURE.
C. HIGH PRESSURE: GREATER THAN 6 INCH WG TO 12 INCH WG AND VELOCITIES GREATER THAN 2,500 FPM. CONSTRUCT FOR 12 INCH WG POSITIVE OR NEGATIVE STATIC PRESSURE.

2.01 SHEET METAL
A. MATERIALS
a. GALVANIZED STEEL CONFORMING TO ASTM STANDARDS ASTM A-653/ A 653M. GALVANIZED COATING DESIGNATION SHALL BE G90 WITH FINISHES FOR EXPOSED SURFACES MILL PHOSPHATIZED. REINFORCEMENT SHALL BE CONSTRUCTED OF GALVANIZED STEEL.
b. CARBON-STEEL SHEETS CONFORMING WITH ASTM A 366/A 366A, WITH OILED, MATTE FINISH FOR EXPOSED DUCTS.
c. ALUMINUM SHEETS CONFORMING WITH ASTM B 209 (ASTM B 209M) ALLOY 3003, H14 TEMPER; WITH MILL FINISH FOR CONCEALED DUCTS, AND STANDARD, ONE-SIDE BRIGHT FINISH FOR DUCT SURFACES EXPOSED TO VIEW.
d. STAINLESS-STEEL SHEETS CONFORMING WITH ASTM A 480/A 480M, TYPE 304 OR 316, COLD ROLLED, ANNEALED, SHEET. EXPOSED SURFACE FINISH SHALL BE NO. 4.
e. PVC-COATED GALVANIZED STEEL CONFORMING WITH UL 181, CLASS 1 LISTING. LOCK-FORMING-QUALITY, GALVANIZED SHEET STEEL COMPLYING WITH ASTM A 653/A 653M AND HAVING G60 (Z180) COATING DESIGNATION. FACTORY-APPLIED PVC COATINGS SHALL BE 4 MILS THICK ON INTERIOR SHEET METAL SURFACES OF DUCTS AND FITTINGS EXPOSED TO CORROSIVE CONDITIONS AND MINIMUM 1 MIL THICK ON INTERIOR AND/OR EXTERIOR SURFACES.
B. DUCT THICKNESS SHALL CONFORM TO THE ABOVE STANDARDS. WHERE THERE IS A DISCREPANCY, THE GREATER THICKNESS SHALL APPLY. REINFORCEMENT, JOINT TYPE, SPACING AND THICKNESS MAY BE VARIED AT THE CONTRACTORS DISCRETION, IN CONFORMANCE WITH THE ABOVE STANDARDS, EXCEPT WHERE SPECIFICALLY NOTED. MINIMUM THICKNESS OF DUCTS SHALL BE 26-GAUGE SHEET METAL.
C. RECTANGULAR DUCTWORK
a. PROVIDE RECTANGULAR DUCTWORK AND HOUSINGS TO SIZES AS SHOWN ON DRAWINGS.
b. PROVIDE RADIUS ELBOWS, TURNS AND OFFSETS WITH A MINIMUM CENTERLINE RADIUS OF 1-1/2 TIMES THE DUCT WIDTH. WHERE SPACE DOES NOT PERMIT FULL RADIUS ELBOWS PROVIDE SHORT RADIUS ELBOWS WITH A MINIMUM OF TWO CONTINUOUS SPLITTER VANES. VANES SHALL BE THE ENTIRE LENGTH OF THE BEND. PROVIDE MITERED ELBOWS WHERE SPACE DOES NOT PERMIT RADIUS ELBOWS WHERE SHOWN ON THE DRAWINGS OR AT THE OPTION OF THE CONTRACTOR WITH THE ENGINEER'S APPROVAL. MITERED ELBOWS LESS THAN 45 DEGREES SHALL NOT REQUIRE TURNING VANES. MITERED ELBOWS 45 DEGREES AND GREATER SHALL HAVE DOUBLE WALL AIRFOIL FORMED TYPE TURNING VANES OF SAME GAUGE AS DUCTWORK RIGIDLY FASTENED WITH GUIDE STRIPS IN DUCTWORK. VANES FOR MITERED ELBOWS SHALL BE PROVIDED IN ALL SUPPLY, RETURN, OUTSIDE AIR, AND EXHAUST DUCTWORK.
D. ROUND AND FLAT-OVAL DUCTWORK
a. PROVIDE ROUND AND FLAT-OVAL DUCT TO SIZES AS SHOWN ON DRAWINGS.
b. LOW PRESSURE FITTINGS 24" IN DIAMETER AND LESS SHALL BE PREFABRICATED, SPOTWELDED AND INTERNALLY SEALED. CONTINUOUSLY WELD FITTINGS LARGER THAN 24" IN DIAMETER. FITTING GAUGE SHALL BE 22-GAUGE FOR 36" FITTINGS AND UNDER 20-GAUGE FOR LARGER SIZES. 90- DEGREE TEE'S SHALL BE CONICAL-TYPE. SEAL LONGITUDINAL AND TRANSVERSE DUCTWORK JOINTS AIR-TIGHT WITH HEAVY WATER BASED LIQUID SEALANT APPLIED ACCORDING TO MANUFACTURER'S INSTRUCTIONS. PROVIDE GAUGE THICKNESS IN MEDIUM PRESSURE DUCTWORK AS RECOMMENDED BY SMACNA.
c. APPROVED MANUFACTURERS OF ROUND AND FLAT-OVAL SPIRAL LOCK-SEAM DUCTS ARE LINDAB INC, MCGILL AIRFLOW CORP, SEMCO INC, LAPINE METAL PRODUCTS, OR APPROVED EQUAL. ROUND AND FLAT-OVAL SPIRAL LOCK-SEAM SUPPLY AND RETURN DUCTS SHALL BE FABRICATED ACCORDING TO SMACNA STANDARDS BASED ON PRESSURE CLASS. MINIMUM THICKNESS OF DUCT SHALL BE 26 GAUGE SHEET METAL. ROUND AND FLAT-OVAL FITTINGS SHALL BE FACTORY FABRICATED WELDED DESIGN. DUCTS UP TO 20" INCHES IN DIAMETER SHALL HAVE CENTER-BEADED SLIP COUPLING, SEALED BEFORE AND AFTER FASTENING, ATTACHED WITH SHEET METAL SCREWS. DUCTS 21" TO 72" INCHES SHALL HAVE A THREE-PIECE GASKETED FLANGED JOINT CONSISTING OF TWO INTERNAL FLANGES WITH SEALANT AND ONE EXTERNAL CLOSURE BAND WITH GASKET. PREFABRICATED CONNECTION SYSTEM CONSISTING OF FLANGES AND GASKET ARE ACCEPTABLE, APPROVED MANUFACTURERS ARE DUCTMATE INDUSTRIES INC AND LINDAB. ELBOWS, TEES, AND BENDS SHALL HAVE A RADIUS NOT LESS THAN 1-1/2 TIMES THE WIDTH OF THE CENTERLINE. TRANSITIONS IN DUCT SIZE SHALL BE GRADUAL NOT EXCEEDING 15 DEGREES WHERE POSSIBLE. ROUND ELBOWS UP TO 14 INCHES SHALL BE PLEATED AND GORED FOR 16" AND ABOVE. ALL FLAT OVAL ELBOWS SHALL BE GORED. 90 DEGREE TEES, LATERALS, AND CONICAL TEES SHALL BE FABRICATED TO SMACNA.
d. ROUND DUCTWORK EXPOSED TO THE PUBLIC SHALL BE GALVANIZED STEEL, SPIRAL WOUND, MAINTAINING IN A CLEAN, SHINY APPEARANCE, AND NOT UTILIZING VISIBLE SEALING MATERIAL. CONCEALED ROUND DUCTWORK MAY SPIRAL WOUND, OR SNAP LOCK TYPE GALVANIZED STEEL DUCTWORK.
E. SEAL DUCTWORK WITH HEAVY LIQUID WATER BASED SEALANT - SEALANTS SHALL COMPLY WITH THE FOLLOWING REQUIREMENTS: MILL FINISH ALUMINUM SUBSTRATE WITH GRAY ADHESIVES, MINIMUM 30 MIL THICK, MINIMUM 17 LB/IN PEEL STRENGTH, MAX SMOKE DEVELOPED OF 50 WHEN TESTED IN ACCORDANCE WITH ASTM G-53, VOC CONTENT OF 250 g/L OR LESS, PRESSURE CLASS UP TO 10" W.C. - HARDCAST FLEXGRIP 550, UNITED MCGILL DUCT SEALER, MON-ECO INDUSTRIES ECO DUCT SEAL 44-50 OR EQUIVALENT, OR APPROVED EQUAL APPLIED ACCORDING TO SEALANT MANUFACTURER'S INSTRUCTIONS.
F. LOCATION: SHEET METAL MAY BE USED THROUGHOUT THE PROJECT.
G. SUPPORTS
a. SUPPORT HORIZONTAL RUNS OF DUCT ON CENTERS NOT TO EXCEED 8'-0". DO NOT SUPPORT CEILING GRID, CONDUITS, PIPES, EQUIPMENT, ETC. FROM DUCTWORK. COORDINATE ROUTING OF DUCTWORK WITH OTHER CONTRACTORS SUCH THAT PIPING, ELECTRICAL CONDUIT, AND ASSOCIATED SUPPORTS ARE NOT ROUTED THROUGH THE DUCTWORK.

SECTION 23 37 13 - GRILLES, REGISTERS, AND DIFFUSERS

2.01 GRILLES, REGISTERS, AND DIFFUSERS
A. APPROVED MANUFACTURES: TITUS, PRICE, METALLAIRE, NAILOR OR APPROVED EQUAL
B. PROVIDE GRILLES, REGISTERS, AND DIFFUSERS OF THE SIZE AND TYPE SHOWN ON THE PLANS. GRD'S SHALL BE MADE WITH A BAKED WHITE ENAMEL FINISH UNLESS OTHERWISE NOTED. COORDINATE FRAME TYPES WITH ARCHITECTURAL REFLECTED CEILING PLANS. PROVIDE PLASTER FRAMES FOR UNITS INSTALLED IN PLASTER CEILINGS. SECURE GRD'S TO STRUCTURE WHERE CONNECTED BY FLEX DUCTWORK, OR WHERE REQUIRED BY LOCAL CODE. PAINT DUCTWORK VISIBLE BEHIND GRD'S FLAT BLACK.
C. PROVIDE DEVICES WITH A SOFT PLASTIC GASKET TO MAKE AN AIR-TIGHT SEAL AGAINST THE MOUNTING SURFACE. COORDINATE FINAL LOCATION, FRAME, AND MOUNTING TYPE OF AIR DEVICES WITH ARCHITECTURAL REFLECTED CEILING PLANS.

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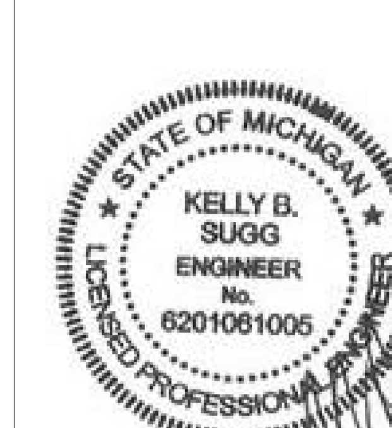

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2024-0040

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M-004

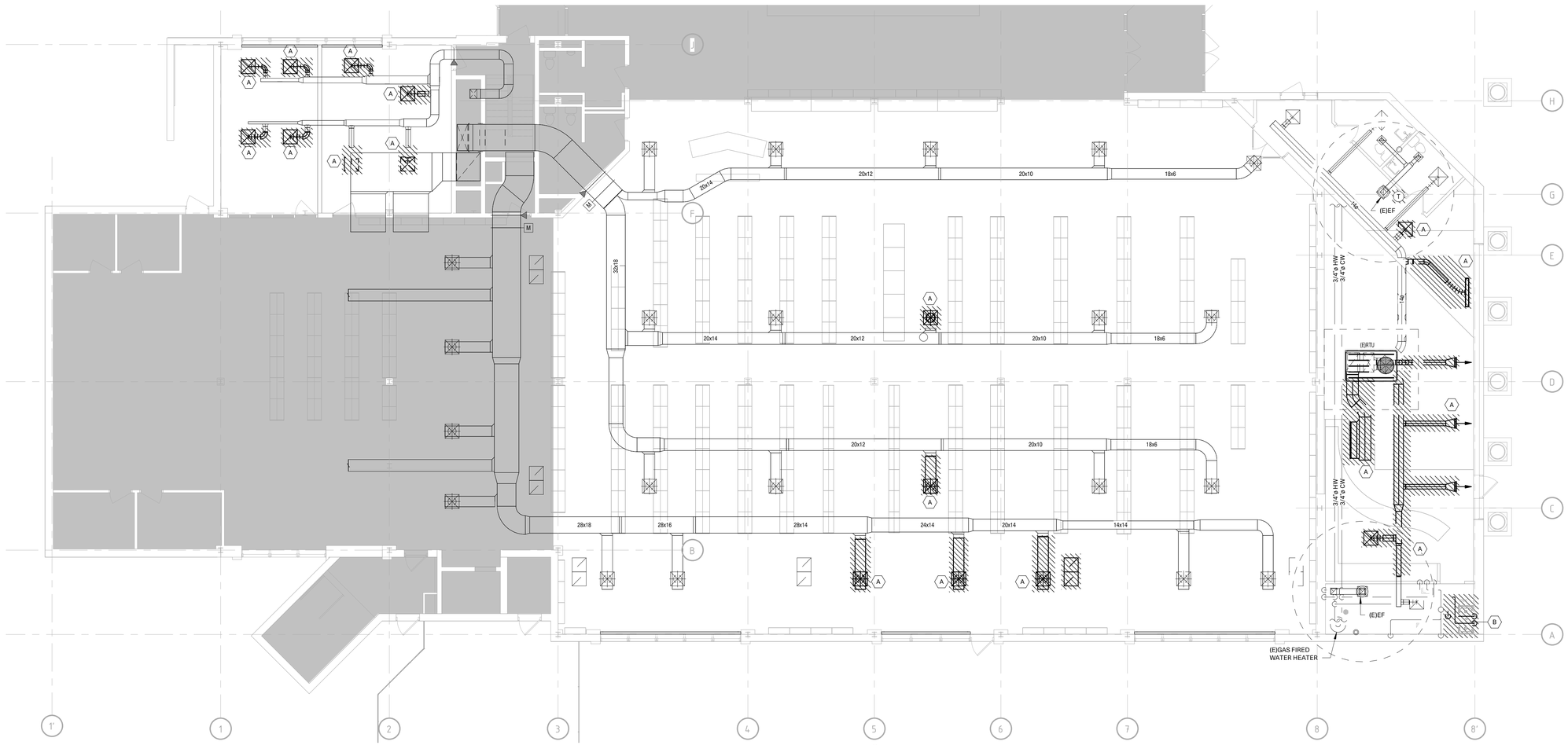
GENERAL MECHANICAL DEMOLITION NOTES

1. ALL DEMOLITION SHALL BE IN ACCORDANCE WITH THE APPLICABLE BUILDING CODE AND ALL LOCAL ORDINANCES.
2. DURING ALL PHASES OF DEMOLITION AND CONSTRUCTION, THE GENERAL CONTRACTOR SHALL MAINTAIN INTEGRITY TO THE STRUCTURE TO BE DEMOLISHED AND ADJACENT AREAS TO REMAIN WITH INTERIOR OR EXTERIOR SHORING, BRACING, OR SUPPORT TO PREVENT MOVEMENT, SETTLEMENT, OR COLLAPSE OF STRUCTURE. EXISTING STRUCTURE TO REMAIN SHALL BE SAFED OFF AND PROTECTED FROM ELEMENTS AT ALL TIMES.
3. WHERE THE EXISTING WORK IS TO BE CUT, UNDERPINNED, AND/OR SHORED, CONTRACTOR SHALL PROVIDE ALL SHORING, NEEDLING, BRACING, WEDGING, AND DRY PACKING, AND BE RESPONSIBLE FOR THE SAFETY OF THE STRUCTURE DURING THESE OPERATIONS.
4. AREA OF WORK SHALL BE KEPT CLEAN AT ALL TIMES.
5. ANY MATERIALS DEEMED AS HAZARDOUS, SUCH AS BUT NOT LIMITED TO ASBESTOS OR LEAD PAINTS SHALL BE REMOVED AS REQUIRED BY FEDERAL, STATE, OR LOCAL CODES. CONTRACTOR SHALL UTILIZE THE APPROPRIATE TECHNIQUES, PROCEDURES, AND DISPOSAL METHODS AS PER STANDARD PRACTICE AND ALL FEDERAL, STATE, AND LOCAL CODES.
6. CONTRACTOR SHALL REMOVE ALL EXISTING MECHANICAL EQUIPMENT, DUCTWORK, HANGERS, AND CONTROLS NOT SCHEDULED TO BE REUSED, BACK TO THE EXISTING CURB. CURBS NOT SCHEDULED TO BE REUSED OR ADAPTED FOR NEW UNITS SHALL BE CAPPED AND INSULATED FOR A WEATHERTIGHT SEAL. DO NOT ABANDON. SEAL ALL PENETRATIONS THROUGH WALLS, AND FLOORS AT REMOVED MECHANICAL COMPONENTS.
7. CONTRACTOR SHALL REMOVE ALL PLUMBING FIXTURES, DRAINS, PIPING SYSTEMS, ETC. NOT SCHEDULED FOR REUSE BACK TO NEAREST ACTIVE LINE SCHEDULED FOR REUSE. CAP AND SEAL LINES AT ACTIVE LINES WITH SAME MATERIALS. DO NOT ABANDON COMPONENT IN PLACE. SEAL ALL PENETRATIONS THROUGH WALLS AND FLOORS AT REMOVED PLUMBING SYSTEM COMPONENTS.
8. EXISTING CONCRETE FLOOR SLAB SHALL BE LEVELED, BROOM CLEAN WITH NO REMAINING ADHESIVE RESIDUES, AND SEALED.
9. REMOVAL OF ALL DEMOLITION AND CONSTRUCTION DEBRIS SHALL BE COORDINATED BETWEEN THE GENERAL CONTRACTOR AND THE LANDLORD AND SHALL COMPLY WITH ALL APPLICABLE CODES AND ORDINANCES.
10. IN AREA WHERE ELECTRICAL OR MECHANICAL SYSTEMS CONFLICT OR ALTERATIONS TO AN EXISTING SYSTEM IS REQUIRED BY THE GENERAL CONTRACT; NOTIFY AND COORDINATE ALL TRADES SO THAT THE PROPER ARRANGEMENTS AND SCHEDULING CAN BE MADE FOR INSTALLATION, CUTTING, REMOVING, TERMINATING, AND PATCHING OF SURROUNDING SYSTEMS AND MATERIALS CAN BE PROPERLY COMPLETED.
11. CONTRACTOR SHALL FAMILIARIZE WITH EXISTING BUILDING CONDITIONS AND OBSERVE THE SITE, STRUCTURE, AND PHYSICAL SPACE LIMITATIONS AND CHALLENGES TO COMPLETE WORK DESCRIBED ON DOCUMENTS.
12. ANY DEPARTURES FROM DESIGN INTENT ON DOCUMENTS, CONTRACTOR SHALL NOTIFY ARCHITECT/ENGINEER BEFORE PROCEEDING.

MECHANICAL DEMOLITION KEYNOTES

A. CONTRACTOR SHALL DEMOLISH EXISTING DIFFUSER, DUCTWORK, GRILLE, SUPPORTS, AND ACCESSORIES AS REQUIRED.

B. DEMOLISH EXISTING SINK AND ASSOCIATED PIPING AND ACCESSORIES. DEMOLISH WATER PIPES TO BELOW FLOOR.



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1 MECHANICAL DEMOLITION PLAN
M-014 1/8" = 1'-0"

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Project No.
2024-0040

Sheet Number
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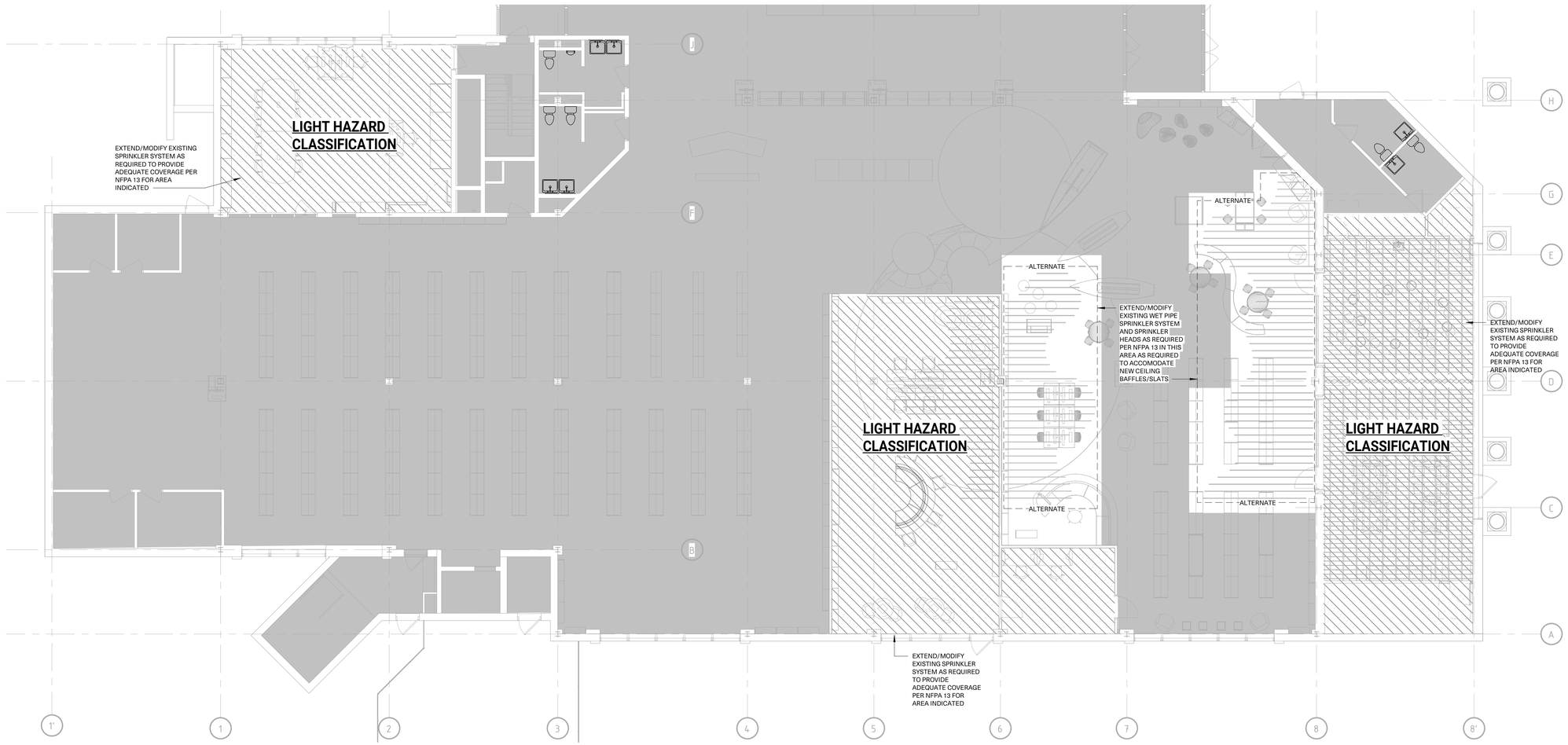
FIRE PROTECTION GENERAL NOTES

1. THESE DRAWINGS ARE INTENDED TO BE DIAGRAMATIC AND ARE NOT TO BE CONSIDERED FABRICATION OR SHOP DRAWINGS. COORDINATION WITH OTHER TRADES IS REQUIRED. PROVIDE THE ADDITIONAL FITTINGS AND OFFSETS THAT WILL BE REQUIRED TO COMPLETE EACH SYSTEM INCLUDING THE STRUCTURE, SHEET METAL, CONDUITS, CABLE TRAY, AND LIGHT FIXTURES.
2. INSTALL SYSTEMS SUCH THAT REQUIRED CLEARANCE AND SERVICE ACCESS SPACE IS PROVIDED AROUND ALL MECHANICAL AND ELECTRICAL EQUIPMENT, AND AROUND ANY COMPONENTS WHICH REQUIRE SERVICE ACCESS.
3. MINIMUM RUN-OUT PIPE SIZE TO SPRINKLER HEADS SHALL BE 1".
4. PROVIDE AN AUTOMATIC WET PIPE SPRINKLER SYSTEM IN ACCORDANCE WITH NFPA 13 FOR LIGHT HAZARD CLASSIFICATION FOR THE INDICATED AREAS. HYDRAULIC CALCULATIONS SHALL BE BASED ON DENSITY OF 0.10 GPM/ SQ. FT. OVER THE MOST REMOTE 1500 SQ. FT.
5. SPRINKLER HEADS INDICATED ARE SHOWN AS A GUIDE FOR LAYOUT IN ARCHITECTURALLY SENSITIVE AREAS. ANY DEVIATION FROM INDICATED LAYOUT OF HEADS AND ANY ADDITIONAL EXPOSED PIPING SHALL BE COORDINATED WITH ARCHITECT AND ENGINEER PRIOR TO INSTALLATION. PROVIDE ADDITIONAL HEADS AS REQUIRED FOR ABOVE PARTIAL CEILINGS AND TO MEET REQUIRED COVERAGE.
6. CONTRACTOR SHALL CONDUCT A PRESSURE AND FLOW TEST PRIOR TO HYDRAULIC CALCULATIONS TO DETERMINE STATIC AND FLOWING PRESSURES.
7. SPRINKLER MAINS & BRANCH PIPES SHOWN FOR REFERENCE ONLY AS A GUISE. COORDINATE ROUTING WITH OTHER TRADES.
8. REFER TO ARCHITECTURAL REFLECTED CEILING PLAN(S) FOR CEILING TYPES SOFFITS, DROPS, OPEN, FOR DESIGN OF THE SYSTEM.



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1 / M-100 FIRST FLOOR FIRE PROTECTION PLAN
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PLUMBING GENERAL NOTES

1. THESE DRAWINGS ARE INTENDED TO BE DIAGRAMATIC AND ARE NOT TO BE CONSIDERED FABRICATION OR SHOP DRAWINGS. COORDINATION WITH OTHER TRADES IS REQUIRED. PROVIDE THE ADDITIONAL FITTINGS AND OFFSETS THAT WILL BE REQUIRED TO COMPLETE EACH SYSTEM INCLUDING THE STRUCTURE, SHEET METAL, CONDUITS, CABLE TRAY, AND LIGHT FIXTURES.
2. PROVIDE ALL NECESSARY CLEARANCES AROUND MECHANICAL AND ELECTRICAL EQUIPMENT, DEVICES, VALVES, AND ANY COMPONENT REQUIRING MAINTENANCE PER MANUFACTURER RECOMMENDATIONS AND CODE REQUIREMENTS.
3. COORDINATE ROUTING OF PIPING AND SHEET METAL WITH ARCHITECTURAL, STRUCTURAL, AND ELECTRICAL TRADES TO AVOID INTERFERENCES. PROVIDE ADDITIONAL FITTINGS AND ELBOWS NECESSARY TO AVOID CONFLICTS.
4. ALL SANITARY PIPING BELOW SLAB SHALL BE A MINIMUM OF 4"Ø UNLESS NOTED OR AS REQUIRED BY THE LOCAL AUTHORITY HAVING JURISDICTION.
5. ALL SANITARY AND STORM PIPING 2 AND SMALLER SHALL BE SLOPED AT A MINIMUM 1/4" PER FOOT, AND ALL SANITARY AND STORM PIPING 3 AND LARGER SHALL BE SLOPED AT A MINIMUM OF 1/8" PER FOOT, UNLESS OTHERWISE NOTED OR AS REQUIRED BY THE LOCAL AUTHORITY HAVING JURISDICTION.
6. INSTALL PIPING SUCH THAT ALL VALVES, STRAINERS, TRAPS, FLANGES, UNIONS, AND PIPE ACCESSORIES ARE ACCESSIBLE.
7. SLEEVE AND FIRE STOP ALL PENETRATION OF RATED WALLS, FLOORS, CEILINGS, ETC. IN ACCORDANCE WITH APPLICABLE UL STANDARDS AND LISTINGS AND LOCAL CODES TO MAINTAIN RATINGS. REFER TO ARCHITECTURAL DRAWINGS FOR RATED ASSEMBLIES.
8. INSTALL WATER HAMMER ARRESTORS, BACKFLOW PREVENTERS, THERMOSTATIC MIXING VALVES, AND TRAP PRIMERS AS REQUIRED BY CODE IN THE DOMESTIC WATER SYSTEM.
9. ALL EQUIPMENT AND FIXTURES SHALL BE INSTALLED COMPLETE INCLUDING ISOLATION VALVES, ANGLE SUPPLIES, STOPS, SUPPORT HARDWARE, P-TRAPS, OFFSETS, MIXING VALVES, ETC.
10. ALL PIPING LOCATED WITHIN RETURN AIR PLENUM SHALL BE PLENUM RATED OR FIRE WRAPPED AS NEEDED. COORDINATE PLENUM LOCATIONS WITH MECHANICAL TRADES.
11. ALL ADA FIXTURES, WHERE DESIGNATED BY THE ARCHITECT SHALL BE FURNISHED AND INSTALLED IN ACCORDANCE WITH THE LATEST EDITION OF THE "BARRIER-FREE" DESIGN REQUIREMENTS OF THE APPLICABLE LOCAL CODE.
12. CONTRACTOR SHALL VIDEO CAMERA AND SCOPE ALL SANITARY AND STORM PIPING TO CONFIRM INTEGRITY AND IS FREE OF OBSTRUCTIONS AND DEFECTS TO ENSURE PROPER FLOW.

PLUMBING CONSTRUCTION KEYNOTES

- A EXISTING FLOOR SINK SHALL REMAIN. PROVIDE BARRIER TRAP PROTECTION DEVICE FOR FLOOR SINK.
- B PROVIDE CAP FOR WATER PIPES BELOW FLOOR AND PATCH FLOOR AS REQUIRED.
- C EXTEND AND CONECT TO EXISTING VENT TO EXISTING 3" VENT THROUGH ROOF IN THIS AREA.
- D CAP SANITARY PIPE BELOW FLOOR AND PATCH FLOOR AS REQUIRED.

N

1 M-200 FIRST FLOOR PLUMBING PLAN
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MECHANICAL - GENERAL NOTES

1 THESE DRAWINGS ARE INTENDED TO BE DIAGRAMMATIC AND ARE NOT TO BE CONSIDERED FABRICATION OR SHOP DRAWINGS. COORDINATE PIPING AND DUCTWORK AMONGST OTHER TRADES AS REQUIRED

2 PROVIDE ALL NECESSARY CLEARANCES AROUND MECHANICAL AND ELECTRICAL EQUIPMENT, DEVICES, VALVES, AND ANY COMPONENT REQUIRING MAINTENANCE PER MANUFACTURER RECOMMENDATIONS AND CODE REQUIREMENTS.

3 COORDINATE ROUTING OF PIPING AND SHEET METAL WITH ARCHITECTURAL, STRUCTURAL, AND ELECTRICAL TRADES TO AVOID INTERFERENCES. PROVIDE ADDITIONAL FITTINGS, OFFSETS, AND ELBOWS WHICH ARE REQUIRED DUE TO SPACE CONSTRAINTS OR OTHER FIELD CONDITIONS AND ARE NECESSARY TO AVOID CONFLICTS.

4 MOUNT THERMOSTATS 48" ABOVE FINISH FLOOR UNLESS NOTED OTHERWISE.

5 PROVIDE ACCESS DOORS IN DUCTWORK TO PROVIDE ACCESS FOR ALL SMOKE DETECTORS, FIRE DAMPERS, SMOKE DAMPERS, VOLUME DAMPERS, HUMIDIFIERS, COILS, AND OTHER ITEMS LOCATED IN THE DUCTWORK THAT REQUIRE SERVICE AND/OR INSPECTION.

6 PROVIDE ACCESS DOORS IN HARD CEILINGS FOR THE OPERATION, ADJUSTMENT, AND MAINTENANCE OF ALL FANS, VALVES, AND MECHANICAL EQUIPMENT.

7 DUCTWORK AND PIPING SHALL NOT BE LOCATED OVER ANY ELECTRICAL EQUIPMENT OR PANELS. PROVIDE REQUIRED N.E.C. CLEARANCE IN FRONT AND ABOVE ELECTRICAL EQUIPMENT.

8 CONTRACTOR SHALL PROVIDE ALL MISCELLANEOUS SUPPORTING STEEL FOR THE PROPER INSTALLATION AND SUPPORT OF MECHANICAL SYSTEMS.

9 CONTRACTOR SHALL VERIFY THERE ARE NO COMBUSTIBLES IN ANY RETURN AIR PLENUM. IF COMBUSTIBLES ARE PRESENT CONTRACTOR SHALL COORDINATE WITH ARCHITECT/ENGINEER FOR COURSE OF ACTION. DUCTED RETURN SYSTEM OR ELIMINATE COMBUSTIBLES WITH FIREPROOF, WRAP, OR BY OTHER MEANS.

10 ALL EQUIPMENT SHALL BE INSTALLED PER MANUFACTURE RECOMMENDATIONS AND REQUIREMENTS.

11 MECHANICAL AIR HANDLING EQUIPMENT SHALL HAVE DUCT DETECTOR IN RETURN AND/OR SUPPLY DUCT. SMOKE DETECTION WILL SHUT OFF HVAC UNIT UPON ACTIVATION. THE ACTIVATION OF THE SMOKE DETECTOR SHALL ACTIVATE A VISIBLE AND AUDIBLE SUPERVISORY SIGNAL AT A CONSTANTLY ATTENDED LOCATION OR TIE INTO FIRE ALARM PANEL IF ONE EXISTS. SMOKE DETECTION DEVICES THAT ARE NOT VISIBLE SHALL BE PROVIDED WITH A REMOTE INDICATION DEVICE PER CODE.

MECHANICAL CONSTRUCTION KEYNOTES

A PROVIDE TRIM TO MATCH EXISTING BASEBOARD HYDRONIC FINNED TUBE TO MAKE CONTINUOUS WHERE EXISTING WALL IS DEMOLISHED.

B RELOCATED DIFFUSER. CLEAN DIFFUSER PRIOR TO REINSTALLATION. BALANCE DIFFUSER TO INDICATED AIRFLOW.

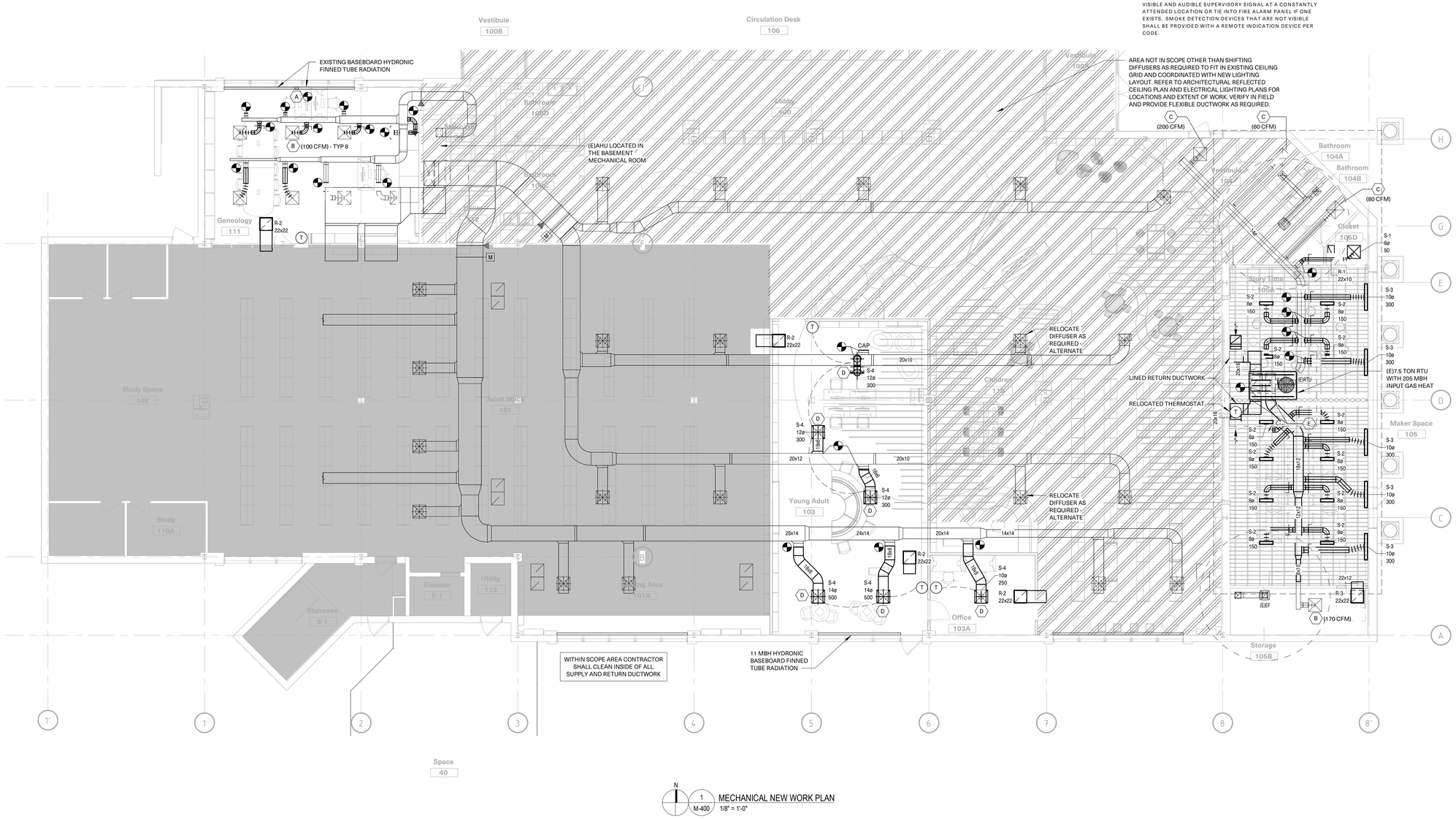
C REBALANCE EXISTING DIFFUSER TO INDICATED AIRFLOW.

D PROVIDE VOLUME DAMPER IN THE VERTICAL DUCT.

E AVOID STRUCTURE FOR MOVEABLE PARTITION REFER TO ARCHITECTURAL DRAWINGS.

MECHANICAL CLEANING NOTES:

A. THE GENERAL AND MECHANICAL CONTRACTOR SHALL COORDINATE WITH THE CITY'S SEPARATELY CONTRACTED TEAM TO PERFORM DUCT CLEANING AND SANITIZATION OF THE EXISTING HVAC SYSTEM.



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1 MECHANICAL NEW WORK PLAN
M-400 1/8" = 1'-0"

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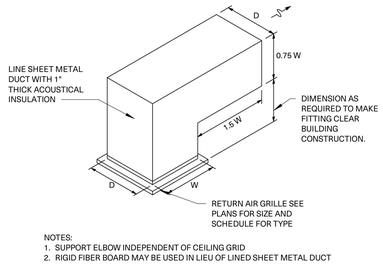
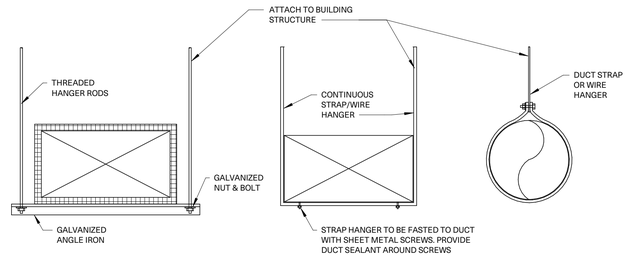


NOTES:
1. SUPPORT ELBOW INDEPENDENT OF CEILING GRID
2. RIGID FIBER BOARD MAY BE USED IN LIEU OF LINED SHEET METAL DUCT

PLENUM RETURN AIR GRILLE DETAIL

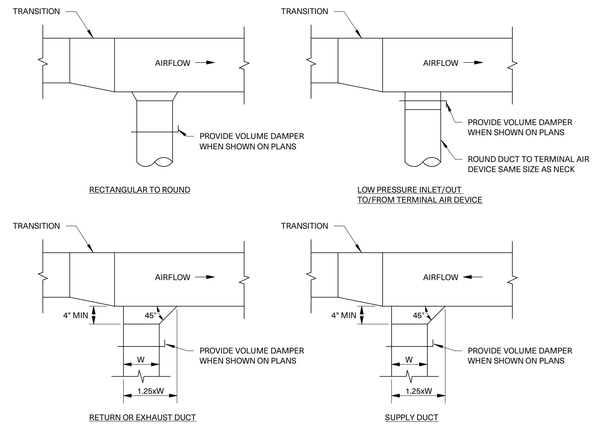
NO SCALE



NOTES:
1. ALL HANGER STRAPS AND HANGER RODS SHALL BE FIRMLY SUPPORTED FROM THE STRUCTURAL STEEL.
2. REFER TO LOW PRESSURE DUCTWORK JOINT AND SUPPORT SCHEDULE FOR HANGER AND SUPPORT GAUGES, SPACING, STRAP SIZES, ETC.

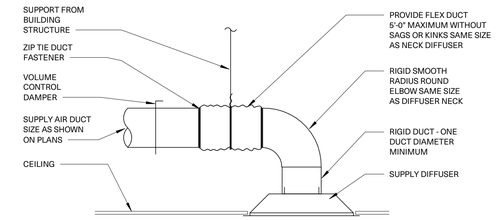
DUCT SUPPORT DETAIL

NO SCALE



RECTANGULAR BRANCH DUCT DETAILS

NO SCALE



NOTE: MAY CONNECT FLEXIBLE DUCT TO DIFFUSER INLET IF A FLEXIBLE DUCT ELBOW SUPPORT IS PROVIDED.

ROUND NECK SUPPLY AIR DIFFUSER DETAIL

NO SCALE

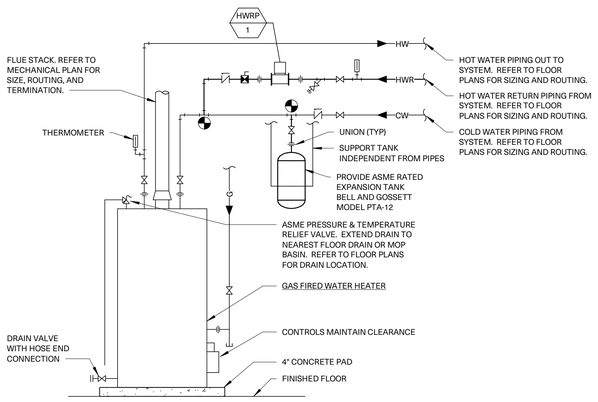
EXPOSED ROUND DUCT DIFFUSER DETAIL

NO SCALE

NOTES:
1. REFER TO FLOOR PLAN FOR LOCATION AND QUANTITY.
2. REFER TO SCHEDULES FOR MOUNTING/GRILLE TYPE

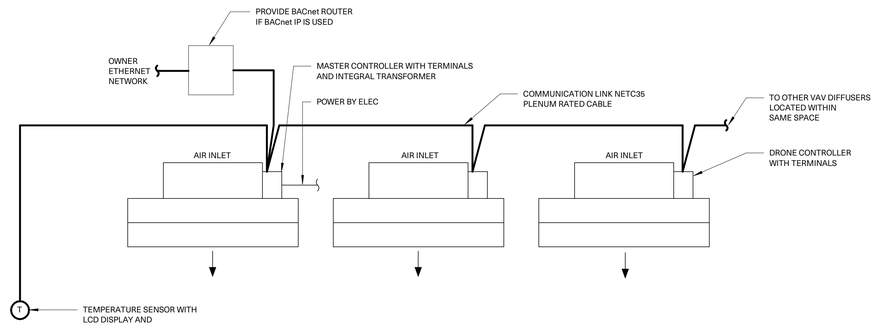
ROUND BRANCH DUCT DETAILS

NO SCALE



GAS FIRED STORAGE WATER HEATER DETAIL

NO SCALE



VAV DIFFUSER CONTROL AND FIELD WIRING

NOTES:
1. REFER TO MECHANICAL PLANS FOR LOCATIONS AND QUANTITY OF UNITS.
2. TEMPERATURE CONTROLS CONTRACTOR SHALL PROVIDE COMPONENTS AND WIRING INDICATED WITH HEAVY LINE WEIGHT. COORDINATE WITH PURCHASED MANUFACTURE FOR EXACT WIRING REQUIREMENTS.
3. TC CONTRACTOR SHALL PROVIDE BAS INTERFACE THROUGH HARD WIRED POINTS AND/OR LAN CONNECTIONS AS INDICATED.
4. VAV DIFFUSER(S) SHALL INCLUDE PACKAGED CONTROLS AND BAS THROUGH BACNET OPEN PROTOCOL COMMUNICATION. APPROPRIATE DEADBANDS SHALL BE USED TO PREVENT SHORT CYCLING SITUATIONS.
5. INTEGRATE VAV DIFFUSERS INTO EXISTING BUILDING MANAGEMENT SYSTEM AND PROVIDE USER INTERFACE WITH SYSTEM GRAPHICS. COORDINATE WITH OWNER AND INSTALLED BUILDING CONTROL SYSTEM MANUFACTURE.

SEQUENCE OF OPERATION:
1. VAV DIFFUSER SHALL MODULATE VAV DIFFUSER INLET DAMPER AS REQUIRED TO MAINTAIN SPACE TEMPERATURE SETPOINT ENABLED/DISABLED BY TEMPERATURE SENSOR.

VAV DIFFUSER UNIT CONTROLS COMMUNICATION POINT LIST:
- SPACE TEMPERATURE (TO BAS)
- COMMON ALARM (TO BAS)
- TEMPERATURE SETPOINT (FROM BAS)

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M-500

GRILLE, REGISTER, AND DIFFUSER SCHEDULE

UNIT ID	FACE SIZE IN.	NECK SIZE IN.	MOUNTING STYLE	CONSTRUCTION	OPTIONS/ ACCESSORIES	FINISH	MANUFACTURER	MODEL NUMBER	NOTES
R-1	24x12	SEE PLANS	LAY-IN	STEEL		ARCH TO SELECT	PRICE	PDDR	
R-2	24x24	SEE PLANS	LAY-IN	STEEL	--	ARCH TO SELECT	PRICE	PDDR	
R-3	24x24	SEE PLANS	SURFACE	STEEL	PLASTER FRAME	ARCH TO SELECT	PRICE	PDDR	
S-1	24x24	SEE PLANS	LAY-IN	STEEL	--	ARCH TO SELECT	PRICE	SPD	
S-2	24x4	SEE PLANS	SURFACE	ALUMINUM	VCR8EC	ARCH TO SELECT	PRICE	SDS	PROVIDE 2 SLOT 1" SLOT WIDTH AND SDB PLENUM BOX, BORDER TYPE BY ARCHITECT
S-3	48x4	SEE PLANS	SURFACE	ALUMINUM	VCR8EC	ARCH TO SELECT	PRICE	SDS	PROVIDE 2 SLOT 1" SLOT WIDTH AND SDB PLENUM BOX, BORDER TYPE BY ARCHITECT
S-4	24x24	SEE PLANS	LAY-IN	STEEL	PRESSURE RELIEF COLLAR, BACNET SYSTEM INTERFACE, MASTER ONLY ON-BOARD TRANSFORMER 120V/24V 20VA	ARCH TO SELECT	PRICE	PPD	PROVIDE POWER MODULE FOR MULTIPLE DIFFUSERS

**CONTRACTOR SHALL MEASURE EXISTING AIR HANDLER OUTSIDE AND SUPPLY AIRFLOW. IF LESS THAN LISTED OUTSIDE AIRFLOW PERCENTAGE REBALANCE OUTSIDE AIR DAMPER TO ACHIEVE CODE MINIMUM OUTSIDE AIR PERCENTAGE

CODE MINIMUM SYSTEM VENTILATION RESULTS

AIR HANDLING SYSTEM	SYSTEM VENTILATION EFFICIENCY, Ev	MAX			MIN			OCCUPANT DIVERSITY	SYSTEM PRIMARY AIRFLOW, Vps	SYSTEM UNCORRECTED OUTDOOR AIRFLOW, Vou	AVERAGE OUTDOOR AIR FRACTION, Xs	OUTDOOR AIR INTAKE AIRFLOW (MULTI-ZONE), Vot	OUTDOOR AIR INTAKE AIRFLOW (100% OA), Vot
		AIRFLOW, CFM	OUTSIDE AIRFLOW, CFM	OUTSIDE AIRFLOW FRACTION, %	AIRFLOW, CFM	OUTSIDE AIRFLOW, CFM	OUTSIDE AIRFLOW FRACTION, %						
(E)AHU	0.93	2610	370	14	2610	370	14	100	2610	345	0.13	370	431
(E)RTU	0.94	2960	230	8	2960	230	8	100	2960	215	0.07	229	269

CODE MINIMUM VENTILATION SCHEDULE

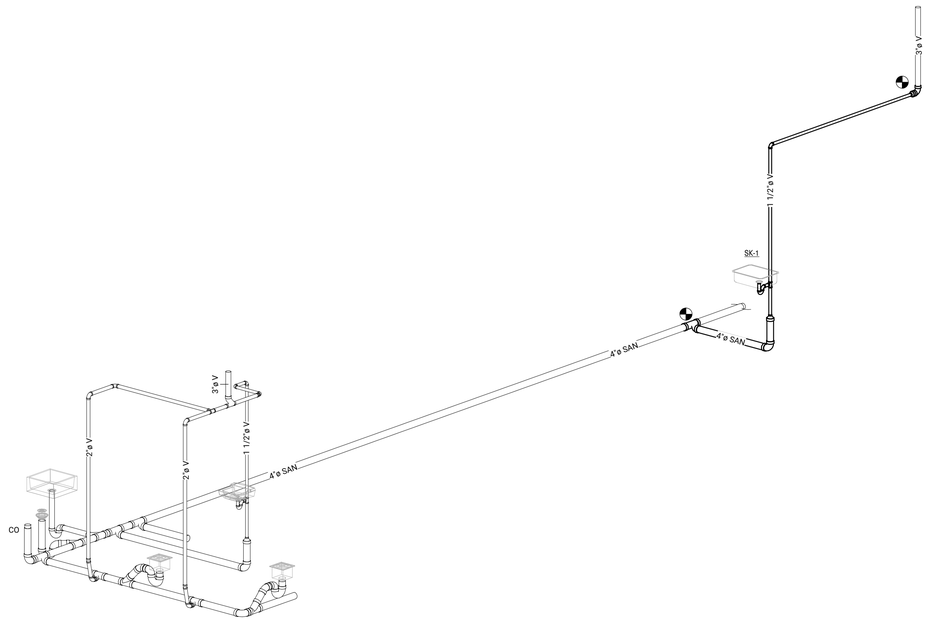
ROOM NO.	ROOM NAME	AREA SQ.FT.	MINIMUM ZONE PRIMARY AIR AT FULL OCCUPNACY Vpz	OCCUPANT DENSITY PEOPLE/1000 sqft	PEOPLE OA RATE CFM/PERSON Rp	TOTAL PEOPLE Pz	AREA OA RATE CFM/sqft Ra	AIR DISTRIBUTION EFFECTIVNESS Ez	BREATHING ZONE OUTDOOR AIRFLOW Vbz	OUTSIDE AIR FRACTION AT MINIMUM SA Zpz	ZONE OUTDOOR AIRFLOW Voz	SYSTEM
103	Young Adult	1154 SF	1225	10	5.0	12	0.12	0.8	196	0.20	245	(E)AHU
103A	Office	203 SF	250	5	5.0	1	0.06	0.8	17	0.09	22	(E)AHU
105	Maker Space	613 SF	1300	10	5.0	6	0.12	0.8	104	0.10	130	(E)RTU
105A	Story Time	442 SF	1100	10	5.0	4	0.12	0.8	75	0.09	94	(E)RTU
105B	Storage	151 SF	170	0	0.0	0	0.12	0.8	18	0.13	23	(E)RTU
105D	Closet	38 SF	50	0	0.0	0	0.12	0.8	5	0.11	6	(E)RTU
111	Geneology	772 SF	1135	10	5.0	8	0.06	0.8	131	0.14	164	(E)AHU

PUMP SCHEDULE

UNIT ID	UNIT TAG	FLUID TYPE	FLOW RATE GPM	HEAD FT.WG.	SYSTEM TEMPERATURE °F	COUPLING TYPE	MOTOR		ELECTRICAL		MANUFACTURER	MODEL NUMBER	NOTES
							HP	CONTROL TYPE	VOLTAGE	PHASE			
HWRP	1	WATER	2	8	100	CLOSE	0.03	AUTO	115	1	TACO	006	PROVIDE TIMER AND AQUASTAT

PLUMBING FIXTURE SCHEDULE - LAVATORY/ SINK

UNIT ID	CONNECTION SIZE IN INCHES				LAVATORY/ SINK FIXTURE							FAUCET			NOTES
	CW	HW	SAN	VENT	MATERIAL	MOUNTING	COLOR	NUMBER OF BOWLS	BOWL DIMENSIONS L"xW"xD"	OVERALL DIMENSIONS L"xW"xD"	MANUFACTURER/ MODEL NUMBER	FLOW RATE GPM	DESCRIPTION	MANUFACTURER/ MODEL NUMBER	
SK-1	1/2	1/2	1 1/2	1 1/2	STAINLESS STEEL	DROP IN	--	1	21" x 15-3/4" x 5-5/8"	25" x 22" x 6"	ELKAY LRAD252260	1.5	SINGLE HOLE MOUNT GOOSENECK WITH SPRAY FAUCET. SWIVEL AND PULL DOWN SPRAY FINISH BY ARCHITECT	DELTA 19933T-SPSD-DST	DRAIN SHALL BE ELKAY PERFECT DRAIN LK99 CHROME PLATED BRASS BODY.STRAINER AND TAILPIECE. P-TRAP ASSEMBLY SHALL BE CAST BRASS WITH CLEANOUT, WATER STOPS. PROVIDE PROFLO INSULATION KIT FOR WASTE AND SUPPLY ASSEMBLIES.



PLUMBING RISER DIAGRAM - SANITARY & VENT PIPING
NO SCALE

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DIAGRAMS AND SCHEDULES

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