DEVELOPMENT APPLICATION

City of Rockwall
Planning and Zoning Department
385 S. Goliad Street
Rockwall, Texas 75087

STAFF USE ONLY

PLANNING & ZONING CASE NO.

NOTE: *THE APPLICATION IS NOT CONSIDERED ACCEPTED BY THE CITY UNTIL THE PLANNING DIRECTOR AND CITY ENGINEER HAVE SIGNED BELOW.*

DIRECTOR OF PLANNING:

CITY ENGINEER:

PLEASE CHECK THE APPROPRIATE BOX BELOW TO INDICATE THE TYPE OF DEVELOPMENT REQUEST [SELECT ONLY ONE BOX]:

PLATTING APPLICATION FEES:
- ☐ MASTER PLAT ($100.00 + $15.00 ACRE) [1]
- ☐ PRELIMINARY PLAT ($200.00 + $15.00 ACRE) [1]
- ☐ FINAL PLAT ($300.00 + $20.00 ACRE) [1]
- ☐ REPLAT ($300.00 + $20.00 ACRE) [1]
- ☐ AMENDING OR MINOR PLAT ($150.00)
- ☐ PLAT REINSTATEMENT REQUEST ($100.00)

SITE PLAN APPLICATION FEES:
- ☐ SITE PLAN ($250.00 + $20.00 ACRE) [1]
- ☒ AMENDED SITE PLAN/ELEVATIONS/LANDSCAPING PLAN ($100.00)

ZONING APPLICATION FEES:
- ☐ ZONING CHANGE ($200.00 + $15.00 ACRE) [1]
- ☐ SPECIFIC USE PERMIT ($200.00 + $15.00 ACRE) [1 & 2]
- ☐ PD DEVELOPMENT PLANS ($200.00 + $15.00 ACRE) [1]

OTHER APPLICATION FEES:
- ☐ TREE REMOVAL ($75.00)
- ☐ VARIANCE REQUEST/SPECIAL EXCEPTIONS ($100.00) [2]

NOTES:
[1]: IN DETERMINING THE FEE, PLEASE USE THE EXACT ACREAGE WHEN MULTIPLYING BY THE PER ACRE AMOUNT. FOR REQUESTS ON LESS THAN ONE ACRE, ROUND UP TO ONE (1) ACRE.
[2]: A ***$1,000.00*** FEE WILL BE ADDED TO THE APPLICATION FEE FOR ANY REQUEST THAT INVOLVES CONSTRUCTION WITHOUT OR NOT IN COMPLIANCE TO AN APPROVED BUILDING PERMIT.

PROPERTY INFORMATION [PLEASE PRINT]

ADDRESS	2065 Kristy Ln				
SUBDIVISION	Bodin Industrial Tract	LOT	1-E0	BLOCK	
GENERAL LOCATION					

ZONING, SITE PLAN AND PLATTING INFORMATION [PLEASE PRINT]

CURRENT ZONING	Industrial, Light Manufacturing	CURRENT USE	F2		
PROPOSED ZONING	Industrial, Light manufacturing	PROPOSED USE	F2		
ACREAGE	1.0043	LOTS [CURRENT]	1	LOTS [PROPOSED]	1

☒ ***SITE PLANS AND PLATS:*** *BY CHECKING THIS BOX YOU ACKNOWLEDGE THAT DUE TO THE PASSAGE OF HB3167 THE CITY NO LONGER HAS FLEXIBILITY WITH REGARD TO ITS APPROVAL PROCESS, AND FAILURE TO ADDRESS ANY OF STAFF'S COMMENTS BY THE DATE PROVIDED ON THE DEVELOPMENT CALENDAR WILL RESULT IN THE DENIAL OF YOUR CASE.*

OWNER/APPLICANT/AGENT INFORMATION [PLEASE PRINT/CHECK THE PRIMARY CONTACT/ORIGINAL SIGNATURES ARE REQUIRED]

☐ OWNER	JCH Redhawk LLC	☒ APPLICANT	Independence Engineering
CONTACT PERSON		CONTACT PERSON	Gayla Davis
ADDRESS	2461 N Stemmons Fwy	ADDRESS	123 Farnsworth Ave
CITY, STATE & ZIP	Dallas, TX 75207-2601	CITY, STATE & ZIP	Bordentown, NJ 08505
PHONE		PHONE	239-265-2818
E-MAIL		E-MAIL	gdavis@independence.engineering

NOTARY VERIFICATION [REQUIRED]

BEFORE ME, THE UNDERSIGNED AUTHORITY, ON THIS DAY PERSONALLY APPEARED Corby Hodgkiss [OWNER] THE UNDERSIGNED, WHO STATED THE INFORMATION ON THIS APPLICATION TO BE TRUE AND CERTIFIED THE FOLLOWING:

"I HEREBY CERTIFY THAT I AM THE OWNER FOR THE PURPOSE OF THIS APPLICATION; ALL INFORMATION SUBMITTED HEREIN IS TRUE AND CORRECT; AND THE APPLICATION FEE OF $ 100.00 *, TO COVER THE COST OF THIS APPLICATION, HAS BEEN PAID TO THE CITY OF ROCKWALL ON THIS THE _____ DAY OF _____, 20___. BY SIGNING THIS APPLICATION, I AGREE THAT THE CITY OF ROCKWALL (I.E. "CITY") IS AUTHORIZED AND PERMITTED TO PROVIDE INFORMATION CONTAINED WITHIN THIS APPLICATION TO THE PUBLIC. THE CITY IS ALSO AUTHORIZED AND PERMITTED TO REPRODUCE ANY COPYRIGHTED INFORMATION SUBMITTED IN CONJUNCTION WITH THIS APPLICATION, IF SUCH REPRODUCTION IS ASSOCIATED OR IN RESPONSE TO A REQUEST FOR PUBLIC INFORMATION."*

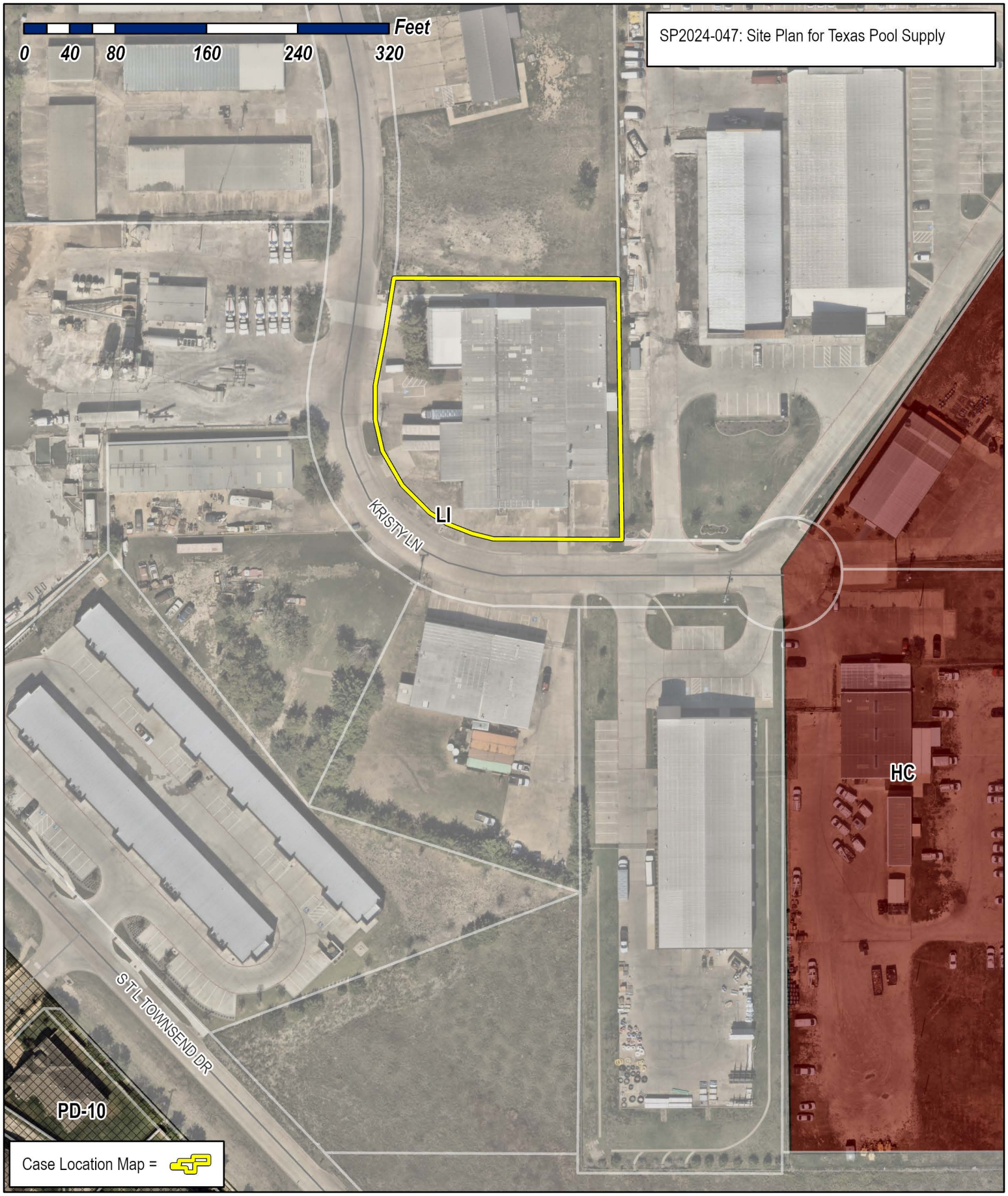
GIVEN UNDER MY HAND AND SEAL OF OFFICE ON THIS THE 12 *DAY OF* November *, 20* 24

OWNER'S SIGNATURE

NOTARY PUBLIC IN AND FOR THE STATE OF TEXAS

VIKKI PRUITT
Notary ID #1680700
My Commission Expires
October 30, 2026

MY COMMISSION EXPIRES



City of Rockwall

Planning & Zoning Department
385 S. Goliad Street
Rockwall, Texas 75087
(P): (972) 771-7745
(W): www.rockwall.com

1777 SENTRY PARKWAY WEST, BUILDING 12, SUITE 103
BLUE BELL, PENNSYLVANIA 19422
(215) 798-4450

November 11, 2024

City of Rockwall
Planning and Zoning Commission
385 South Goliad Street
City of Rockwall, TX 75087

Re: Texas Pool Supply
2065 Kristy Lane
Rockwall, TX 75087
Variance Request
IE Job #030-224

Dear Sir or Madam,

On behalf of the applicant, SRS Distribution, Independence Engineering LLC (IE) is submitting a Variance Request to the Planning and Zoning Commission, to request the variances listed below to be applied to the proposed Texas Pool Supply in Rockwall, TX.

The existing Texas Pool Supply consists of 1.004 acres zoned Light Industrial (LI) and is located at 2065 Kristy Lane in the City of Rockwall. The subject property is bound by Kristy Lane on the west and south, a currently vacant property to the north, and Bacon Plumbing to the east. The property currently contains an approximately 22,625 sf warehouse with associated parking, loading, and storage. The site is mostly impervious with a narrow grass area along the east and north property lines. All runoff is directed towards Kristy Lane.

The applicant is proposing to build a 900-sf addition 900 on the southeast corner of the current warehouse, enclosing an existing concrete slab. The main entrance area on the northwest of the building, including parking, will be reconfigured to provide the required ADA parking spaces and the required ADA access to the building via a newly constructed ADA ramp. Additional parking spaces will be delineated with new paint along the west and south of the building.

The following variances are being requested from the City of Rockwall Unified Development Code:

Article 8, Paragraph 5.01(C) – Building and Paving within a Required Landscape Buffer

A variance from this section is required as the majority of the property along Kristy Lane is existing concrete that is not being removed and is therefore withing the Required Landscape Buffer.

Article 8, Paragraph 5.02(A) – Loading Dock and Outside Storage Area Screening

A variance from this section is required to allow the existing loading docks to remain as is, without adding any landscape screening as the current property layout does not allow for any landscape screening to be installed.

1777 SENTRY PARKWAY WEST, BUILDING 12, SUITE 103
BLUE BELL, PENNSYLVANIA 19422
(215) 798-4450

Article 8, Paragraph 5.03(A) – Total Landscaping Requirements

A variance from this section is required as the current property layout does not allow for the minimum required landscape area percentages.

Per our pre-application meeting with the City of Rockwall on August 8, 2024, we are offering two (2) compensatory actions for each variance requested, for a total of six (6) actions:

1. Remove the existing bumpout on the east side of the building, encroaching on the adjacent property;
2. Remove the existing chain link fence on the east side of the property, also encroaching on the adjacent property;
3. The dumpster currently stored unenclosed outside the south side of the building will be relocated inside the building, and rolled outside for pickup;
4. The existing condenser unit on the south side of the building has been removed;
5. Additional landscaping has been proposed along the north side of the building; and
6. A vinyl fence has been proposed to screen the existing condenser on the north side of the building.

We believe this application is consistent with the requirements of the City of Rockwall. If you need anything else, or have any questions, please don't hesitate to call me at (609) 947-9787.

Sincerely,

Independence Engineering

Neil E. Sander, President

Cc: John Arrowood, SRS
Lisa Francis, Randall Paulson

A TENANT ADDITION
SRS DISTRIBUTION, INC. - ROCKWALL, TEXAS
(H-ROOM)

2065 KRISTY LN
ROCKWALL, TEXAS 75032

TEAM DIRECTORY

OWNER:	SRS DISTRIBUTION, INC. 7440 STATE HIGHWAY 121 MCKINNEY, TX 75070-2196	JOHN ARROWOOD 469.646.7325	JOHN.ARROWOOD@SRSDISTRIBUTION.COM
CONTRACTOR:	TBD		
ARCHITECT: - POINT OF CONTACT - ARCHITECT OF RECORD	RANDALL-PAULSON ARCHITECTS LISA FRANCIS JOHN C. STANTZ, AIA HISTORIC ROSWELL MILL 85-A MILL STREET, SUITE 200 ROSWELL, GEORGIA 30075	 770.650.7558	 LFRANCIS@RANDALLPAULSON.COM JSTANTZ@RANDALLPAULSON.COM
STRUCTURAL ENGINEER:	HAINES GIPSON & ASSOCIATES 1550 N. BROWN ROAD SUITE 145 LAWRENCEVILLE, GA 30043	JEFF VANDIVER 770.491.7550	JVANDIVER@HAINESGIPSON.COM
MECHANICAL ENGINEER:	BARRETT WOODYARD & ASSOCIATES 3495 HOLCOMB BRIDGE RD NORCROSS, GEORGIA 30092	CHRIS LYLES 404.434.1237	CLYLES@BARRETTWOODYARD.COM
ELECTRICAL ENGINEER:	BARRETT WOODYARD & ASSOCIATES 3495 HOLCOMB BRIDGE RD NORCROSS, GEORGIA 30092	CHRIS LYLES 404.434.1237	CLYLES@BARRETTWOODYARD.COM
PLUMBING ENGINEER:	BARRETT WOODYARD & ASSOCIATES 3495 HOLCOMB BRIDGE RD NORCROSS, GEORGIA 30092	CHRIS LYLES 404.434.1237	CLYLES@BARRETTWOODYARD.COM

DRAWING INDEX

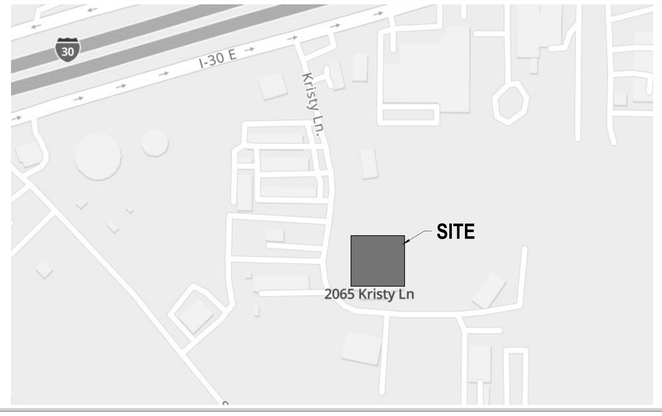
PROJECT DATA

NAME OF DEVELOPMENT:	SRS DISTRIBUTION, INC. - ROCKWALL, TEXAS (H-ROOM)	
PROJECT ADDRESS:	2065 KRISTY LN. ROCKWALL, TEXAS 75032	
ARCHITECT:	JOHN C. STANTZ, AIA PHONE #: 770.650.7558 STATE REGIS. #: 27618	
A: SCOPE OF WORK:	HAZARD ROOM TO BE ADDED TO THE EXISITNG BUILDING.	
B: OCCUPANCY CLASSIFICATION:	STORAGE (S-1), BUSINESS (B), MERCANTILE (M). HIGH HAZARD (H-3/H-4)	
C: TYPE OF CONSTRUCTION:	II-B	
D. SPRINKLERED:	YES	
E: SEISMIC RISK CATEGORY:	II	
F. SEISMIC DESIGN CATEGORY:	C	
G: TOTAL BUILDING AREA IN SQUARE FEET: ±	TENANT BUILD-OUT WAREHOUSE AREA IN SQUARE FEET: ± 20,981	
	TENANT BUILD-OUT INTERIOR OFFICE AREA IN SQUARE FEET: ± 1,572	
	TOTAL TENANT BUILD-OUT AREA IN SQUARE FEET: ± 23,236	
H: BUILDING HEIGHT IN FEET:		
I: NUMBER OF STORIES:	1 , INCLUDES -- BASEMENT: N/A MEZZANINE: N/A	
J: PERMIT APPLIED FOR:	BUILDING PERMIT	
K: CALCULATED LOAD FOR OCCUPANCY:	WAREHOUSE:	± (20,981) SF/ 500 = (44) OCCUPANTS EXISTING TO...
	OFFICE:	± (1,090) SF/ 150 = (8) OCCUPANTS EXISTING TO REMAIN
	MERCANTILE:	± (482) SF/ 60 = (8) OCCUPANTS EXISTING TO REMAIN
	HIGH HAZARD:	± (875) SF/ 500 = (2) OCCUPANTS
L: ALL BUILDINGS DESCRIBED IN THESE PLANS SHALL BE CONSTRUCTED IN COMPLIANCE WITH THE TEXAS STATE CODES AS LISTED BELOW:		
BUILDING - INTERNATIONAL BUILDING CODE, 2021 EDITION, WITH CURRENT STATE AMENDMENT		
PLUMBING - INTERNATIONAL PLUMBING CODE, 2021 EDITION, WITH CURRENT STATE AMENDMENT		
MECHANICAL - INTERNATIONAL MECHANICAL CODE, 2021 EDITION, WITH CURRENT STATE AMENDMENT		
GAS - INTERNATIONAL FUEL AND GAS CODE, 2021EDITION, WITH CURRENT STATE AMENDMENT		
ENERGY - INTERNATIONAL ENERGY CONSERVATION CODE, 2021 EDITION, WITH CURRENT STATE SUPPLEMENTS AND AMENDMENT		
FIRE - INTERNATIONAL FIRE CODE, 2021 EDITION, WITH CURRENT STATE AMENDMENT		
ELECTRICAL - NATIONAL ELECTRICAL CODE, 2020 EDITION, WITH CURRENT STATE AMENDMENT		
THE INTERNATIONAL EXISTING BUILDING CODE, 2021 EDITION, WITH CURRENT STATE AMENDMENT		
LIFE SAFETY - NFPA 101 LIFE SAFETY CODE, 2021 EDITION, WITH CURRENT STATE AMENDMENT		
ICC A117.1 ACCESSIBILITY STANDARDS		
EXISTING BUILDING - INTERNATIONAL BUILDING CODE, 2021 EDITION, WITH CURRENT STATE AMENDMENT		
SEE SHEET A-090 FOR ADDITIONAL CODE INFORMATION		

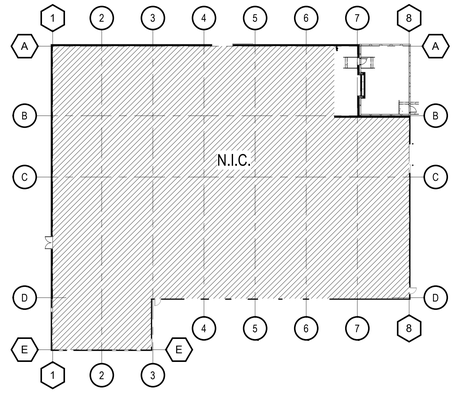
REVISION HISTORY

REV.	DATE	DESCRIPTION	REVISED SHEETS

LOCATION MAP



REFERENCE PLAN



RANDALL PAULSON architects
Roswell . Nashua

Roswell Mill
85-A Mill Street, Suite 200
Roswell, Georgia 30075
770.650.7558
www.randallpaulson.com

architecture/interiors

REGISTERED ARCHITECT JOHN CHRISTOPHER STANTZ 27618 STATE OF TEXAS
22 OCTOBER 2024

A TENANT ADDITION

at

SRS DISTRIBUTION, INC. - ROCKWALL, TEXAS (H-ROOM)

for

SRS Distribution

2065 KRISTY LN
ROCKWALL, TEXAS 75032

Print Record		Drw.	Chk.
14 OCT 24	ISSUED FOR PERMIT	AO	LF

Revisions	

Date: 14 OCTOBER 2024
Project No.: 2023362.00

Sheet Title: COVER SHEET

Sheet No.: A-001

■ Released for Construction
□ Not Released for Construction

ABBREVIATIONS

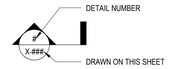
A	
@	AT
AB	ANCHOR BOLT
ABV	ABOVE
AC	ABOVE CEILING
ACI	AMERICAN CONCRETE INSTITUTE
ACT	ACOUSTICAL CEILING TILE
AD	ACCESS DOOR
ADA	AMERICAN DISABILITIES ACT
ADMIN	ADMINISTRATIVE
AF	ACCESS FLOOR
AFF	ABOVE FINISHED FLOOR
AHU	AIR HANDLING UNIT
AISC	AMERICAN INSTITUTE OF STEEL CONSTRUCTION
ALT	ALTERNATE
ALUM	ALUMINUM
ANOD	ANODIZED
ANSI	AMERICAN NATIONAL STANDARDS INSTITUTE
AP	ACCESS PANEL
APPROX	APPROXIMATELY
ARCH	ARCHITECTURAL / ARCHITECT
ASHRAE	AMERICAN SOCIETY HEATING REFRIGERATING AND AIR CONDITIONING ENGINEERS
ASS'Y	ASSEMBLY
ASTM	AMERICAN SOCIETY FOR TESTING MATERIALS
AUX	AUXLIARY
B	
B	BOILER
B/O	BOTTOM OF
BB	BULLENTIN BOARD
BD	BOARD
BFF	BELOW FINISHED FLOOR
BFV	BUTTERFLY VALVE
BLDG	BUILDING
BOS	BOTTOM OF STEEL
BTU	BRITISH THERMAL UNIT
C	
C	CONDUIT
CAP	CAPACITY
CFM	CUBIC FEET PER MINUTE
CJ	CONTROL JOINT
CL	CENTERLINE
CLG	CEILING
CLO	COLUMN
CLOS	CLOSET
CLR	CLEAR
CMU	CONCRETE MASONRY UNIT
CO	CASED OPENING, CLEANOUT
COL	COLUMN
COMP	COMPRESSOR
CONC	CONCRETE
COND	CONDENSATION
CONF	CONFERENCE
CONN	CONNECTION
CONT	CONTINUOUS
CORR	CORRIDOR
CPT	CARPET
CRT	CIRCUIT
CT	CERAMIC TILE
CU	CUBIC
CW	COLD WATER
D	
D	DRAIN
DW	DISHWASHER
DBL	DOUBLE
DIA	DIAMETER
DIV	DIVISION
DN	DOWN
DOE	DEPARTMENT OF ENERGY
DS	DOWNSPOUT
DW	DOMESTIC WATER
DWG(S)	DRAWING(S)
DWLS	DOWELS
E	
EA	EACH
EF	EXHAUST FAN
EIFS	EXTERIOR INSULATION FINISH SYSTEM
EJ	EXPANSION JOINT
ELEC	ELECTRIC(AL)
ELEV, EL	ELEVATION
EMS	ENERGY MANAGEMENT SYSTEM
EPDM	ETHYLENE PROPYLENE DIENE MONOMER, EXISTING OVERHEAD ELECTRICAL
EPS	EXTERIOR PAINT SYSTEM
EQ	EQUAL
EQUIP	EQUIPMENT
ESFR	EARLY SUPPRESSION FAST RESPONSE
ESP	EXTERNAL STATIC PRESSURE
EWC	ELECTRIC WATER COOLER
EWH	ELECTRIC WATER HEATER
EXIST	EXISTING
EXP	EXPANSION
EXPO	EXPOSED
EXT	EXTERIOR
F	
F	FAHRENHEIT
FA	FIRE ALARM
FAP	FIRE ALARM PANEL
FC	FOOTCANDLES
FD	FLOOR DRAIN, FIRE DAMPER
FDC	FIRE DEPARTMENT CONNECTION
FEB	FIRE EXTINGUISHER BRACKET
FEC	FIRE EXTINGUISHER CABINET
FF	FINISHED FLOOR
FIN	FINISH
FM	FACTORY MUTUAL
FOLD PART	FOLDING PARTITION
FP	FIRE PROTECTION
FRP	FIBERGLASS REINFORCED PLASTIC
FT	FEET
G	
G	GAS
GA	GUAGE
GALV	GALVANIZED
GEN	GENERATOR
GFI	GROUND FAULT (CURRENT) INTERRUPTER
GL	GLASS, GLAZING

G (Continued...)	
GND	GROUND
GWB	GYPSUM WALLBOARD
H	
HB	HOSE BIBB
HC	HANDICAPPED
HD	HUB DRAIN
HDWR	HARDWARE
HM	HOLLOW METAL
HORIZ	HORIZONTAL
HP	HORSEPOWER
HPS	HIGH PRESSURE SODIUM
HR	HOUR
HW	HOT WATER
HWH	HOT WATER HEATER
HZ	HERTZ
I	
IM	ICE MAKER
IBC	INTERNATIONAL BUILDING CODE
ICC	INTERNATIONAL CODE COUNCIL
ID	INSIDE DIMENSION
IE	INVERT ELEVATION
IECC	INTERNATIONAL ENERGY CONSERVATION CODE
IFC	INTERNATIONAL FIRE CODE
IMC	INTERNATIONAL MECHANICAL CODE
IN	INCH(ES)
INSUL	INSULATION, INSULATING
INV	INVERT
IPC	INTERNATIONAL PLUMBING CODE
J	
JAN	JANITOR
JB	JOIST BEARING
J-BOX	JUNCTION BOX
JST	JOIST
JT	JOINT
K	
KO	KNOCK OUT
KOP	KNOCK OUT PANEL
kV	KILOVOLTS
kVA	KILOVOLT AMPS
kW	KILOWATT
L	
LAM	LAMINATE
LAU	LAUNDRY
LAV	LAVATORY
LB(S)	POUND(S)
LD BRG	LOAD-BEARING
LF	LINEAR FEET
LG	LARGE
LH	LEFT HAND
LHR	LEFT HAND REVERSE
LIB	LIBRARY
LN	LINE
LOCK	LOCKER
LSP	LIFE SAFETY PLAN
LT	LEFT
LVR	LOUVER
LVT	LUXURY VINYL TILE
M	
M/W	MICROWAVE
MAINT	MAINTENANCE
MATL	MATERIAL
MAU	MAKEUP AIR UNIT
MAX	MAXIMUM
MDF	MEDIUM DENSITY FIBERBOARD
MECH	MECHANICAL
MEZZ	MEZZANINE
MFL	MAXIMUM FORESEEABLE LOSS
MFR(S)	MANUFACTURER(S)
MGR	MANAGER
MH	MANHOLE
MID	MIDDLE
MIN	MINIMUM
MISC	MISCELLANEOUS
MM	MILLIMETER
MO	MASONRY OPENING
MOD	MOTOR OPERATED DOOR
MPH	MILES PER HOUR
MT(D)	MOUNTED
MTL	METAL
N	
NA	NOT APPLICABLE
NEC	NATIONAL ELECTRIC CODE
NEG	NEGATIVE
NFPA	NATIONAL FIRE PROTECTION ASSOCIATION
NFWH	NON-FREEZE WALL HYDRANT
NIC	NOT IN CONTRACT
NO/#	NUMBER
NOM	NOMINAL
NRC	NOISE REDUCTION COEFFICIENT
NTS	NOT TO SCALE
O	
OA	OVERALL
OC	ON CENTER
OCC	OCCUPANT
OD	OUTSIDE DIMENSION
OFF	OFFICE
OH	OVERHEAD
OPNG	OPENING
OPP	OPPOSITE
OSB	ORIENTED STRAND BOARD
P	
PA	PUBLIC ADDRESS
PAR	PARALLEL
PERP	PERPENDICULAR
PIV	POST INDICATOR VALUE
PLAM	PLASTIC LAMINATE
PLYWD	PLYWOOD
PNL	PANEL
POS	POSITIVE
PR	PAIR
PREFAB	PREFABRICATED
PREFIN, PF	PREFINISHED
PRI	PRIMARY
PROV	PROVIDED
PRV	PRESSURE REDUCTION VALVE
PSF	POUND-FORCE PER SQUARE FOOT

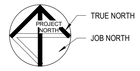
P (Continued...)	
PSI	POUNDS PER SQUARE INCH
PT	PRESSURE TREATMENT, PORCELEAN TILE
PTD	PAINTED
PVC	POLYVINYL CHLORIDE
PVMT	PAVEMENT
Q	
QA	QUALITY ASSURANCE
QC	QUALITY CONTROL
QT	QUARRY TILE
QTY	QUANTITY
R	
R	RADIUS
RA	RETURN AIR
RB	RUBBER BASE, RESILIENT BASE
RCP	REINFORCED CONCRETE PIPE, REFLECTED CEILING PLAN
RCPTN	RECEPTION
RD	ROOF DRAIN
REF	REFRIGERATOR
REG	REGISTRATION, REGISTER
REINF	REINFORCE(D)
REQD	REQUIRED
RFG	ROOFING
RH	RIGHT HAND
RHR	RIGHT HAND REVERSE
RL	RAIN LEADER
RM	ROOM
RO	ROUGH OPENING
ROW	RIGHT OF WAY
RPM	REVOLUTIONS PER MINUTE
RR	RESTROOM
ROW	RIGHT OF WAY
RPM	REVOLUTIONS PER MINUTE
RR	RESTROOM
RT	RIGHT
RTF	RUBBER TILE FLOOR
RTU	ROOF TOP UNIT
S	
SA	SUPPLY AIR
SAN	SANITARY
SC	SHADING COEFFICIENT
SCHED	SCHEDULE
SD	STORM DRAIN
SEC	SECONDARY
SEP	SEPARATE
SGL	SINGLE
SHGH	SOLAR HEAT GAIN COEFFICIENT
SHT	SHEET
SHWR	SHOWER
SIM	SIMILAR
SM	SMALL
SOG	SLAB ON GRADE
SPEC	SPECIFICATION
SQ	SQUARE
SS	SANITARY SEWER LINE, SERVICE SINK, STANDING SEAM, STAINLESS STEEL
STA	STATION
STC	SOUND TRANSMISSION CLASS
STD	STANDARD
STL	STEEL
STL JST	STEEL JOIST
STOR	STORAGE
STRUCT	STRUCTURAL
SVT	STATIC DISSIPATIVE TILE
T	
T/O	TOP OF
TECH	TECHNICAL
TEL	TELEPHONE
TEMP	TEMPERATURE
TFF	TOP OF FINISHED FLOOR
THRESH	THRESHOLD
THRU	THROUGH
TI	TENANT IMPROVEMENT
TLT	TOILET
TOM	TOP OF MASONRY
TOS	TOP OF STEEL
TP	TOILET PARTITION
TR	TRANSITION STRIP
TRTD	TREATED
TSTAT	THERMOSTAT
TYP	TYPICAL
U	
U/S	UNDERSIDE
UBC	UNIFORM BUILDING CODE
UFC	UNIFORM FIRE CODE
UH	UNIT HEATER
UL	UNDERWRITERS LABORATORY
UMC	UNIFORM MECHANICAL CODE
UNO	UNLESS NOTED OTHERWISE
UPC	UNIFORM PLUMBING CODE
UTIL	UTILITY
V	
V	VOLTS, VENT
VA	VOLTAMPS
VAR	VARIATION
VCT	VINYL COMPOSITION TILE
VEND	VENDING
VENT	VENTILATION
VERT	VERTICAL
VEST	VESTIBULE
VIF	VERIFY IN FIELD
VTR	VENT THROUGH ROOF
VWC	VINYL WALL COVERING
W	
W	WATER
W/	WITH
W/H	WATER HEATER
W/O	WITHOUT
WC	WATER CLOSET, WALL COVERING
WCO	WALL CLEANOUT
WD	WOOD
WHSE	WAREHOUSE
WM	WOMEN
WP	WEATHERPROOF
WT	WALL TILE
Y	
YD	YARD

SYMBOLS

WALL SECTION INDICATION

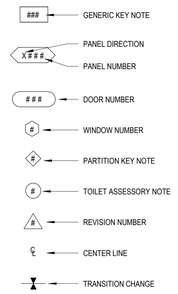


REFERENCE NORTH



ROOF SLOPE INDICATION

PLAN NOTES



ELEVATION INDICATION

ELEVATION HEIGHT INDICATION

GRID LINES

PLAN DETAIL INDICATION

ROOM INDICATION

FINISH NOTES

GENERAL NOTES

A PRODUCT SUBSTITUTION CONSTITUTES A REPRESENTATION THAT THE CONTRACTOR HAS INVESTIGATED THE PROPOSED PRODUCT AND DETERMINED THAT IT MEETS OR EXCEEDS THE QUALITY LEVEL OF THE SPECIFIED PRODUCT; THAT THE CONTRACTOR WILL PROVIDE THE SAME WARRANTY FOR THE SUBSTITUTION AS FOR THE SPECIFIED PRODUCT; THAT THE CONTRACTOR WILL COORDINATE INSTALLATION AND MAKE CHANGES TO OTHER WORK THAT MAY BE REQUIRED FOR THE WORK TO BE COMPLETE WITH NO ADDITIONAL COST TO THE OWNER. SHOULD THIS SUBSTITUTION REQUIRE RE-DESIGN, THERE MAY BE AN ADDITIONAL COST FROM THE ARCHITECT. SHOULD SUCH SUBSTITUTION IMPACT ANY CODE RELATED ITEMS IN THE DOCUMENTS SUCH AS, BUT NOT LIMITED TO, UL DETAILS, FIRE RATINGS, SIZING, SPACING OR REVISION OF STRUCTURAL REQUIREMENTS, IT SHALL BE THE CONTRACTOR'S DUTY TO RESEARCH AND PROVIDE ANY REQUIRED DOCUMENTATION INCLUDING SIGNED AND SEALED ENGINEERING CERTIFICATIONS AS MAY BE NECESSARY FOR APPROVALS BY THE AUTHORITY HAVING JURISDICTION.

1. DO NOT SCALE DRAWINGS; DIMENSIONS GOVERN.
2. REFER TO THE PROJECT SPECIFICATIONS FOR FURTHER INFORMATION.
3. THE DESIGN OF THIS PROJECT TO THE BEST OF OUR PROFESSIONAL KNOWLEDGE, INFORMATION AND BELIEF COMPLIES WITH THE APPLICABLE PROVISIONS OF THE AMERICANS WITH DISABILITIES ACT (ADA), ANSI STANDARD A117.1 AND APPLICABLE ACCESSIBILITY CODE REQUIREMENTS AS THEY APPLY TO THIS PROJECT THAT ARE IN EFFECT AT THE TIME OF PERMITTING. BECAUSE THE REQUIREMENTS OF THE ADA ARE SUBJECT TO VARIOUS AND POSSIBLY CONTRADICTORY INTERPRETATIONS, WE CANNOT AND DO NOT WARRANT OR GUARANTEE THAT THIS PROJECT WILL COMPLY WITH INTERPRETATIONS OF ADA REQUIREMENTS AS THEY APPLY TO THIS PROJECT.
4. ALL WORK SHALL BE DONE IN STRICT ACCORDANCE WITH THE APPLICABLE STATE AND LOCAL CODES AS LISTED ON COVER SHEET.
5. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL REQUIRED PERMITS FOR THE SCOPE OF THE WORK.
6. ANY ERRORS, INCONSISTENCIES OR OMISSIONS IN THE CONTRACT DOCUMENTS DISCOVERED BY THE CONTRACTOR SHALL BE REPORTED PROMPTLY TO THE ARCHITECT AND NO LESS THAN TWO BUSINESS DAYS BEFORE THE WORK IS TO COMMENCE.
7. THE CONTRACTOR SHALL PROVIDE A WARRANTY OF THE WORK FOR THE PERIOD OF ONE YEAR OR PER AGREEMENT WITH OWNER AFTER SUBSTANTIAL COMPLETION OR AS OTHERWISE STIPULATED IN THE CONTRACT DOCUMENTS.
8. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING ALL DESIGN DISCIPLINES WITH THE ARCHITECTURAL DRAWINGS, INCLUDING ALL REQUIRED CLEARANCES FOR INSTALLATION OR MAINTENANCE. ALL DISCREPANCIES IN THE DOCUMENTS OR CONFLICTS WITH ANY DESIGN ELEMENTS SHALL BE REPORTED TO THE ARCHITECT FOR RESOLUTION NO LESS THAN TWO BUSINESS DAYS BEFORE PROCEEDING WITH WORK. IF WORK IS COMPLETE & NOT APPROVED BY THE ARCHITECT, THE WORK SHALL BE REDONE TO MEET INTENT WITH NO ADDITIONAL COST TO OWNER.
9. THE ARCHITECT IS NOT RESPONSIBLE FOR CHANGES MADE OR AUTHORIZED BY THE OWNER, OWNER'S REPRESENTATIVES, TENANTS, CONTRACTOR OR OTHERS WITHOUT WRITTEN CONSENT BY THE ARCHITECT OR CONSULTANT.
10. THE CONTRACTOR SHALL SUBMIT TO THE ARCHITECT OR OWNER'S REPRESENTATIVE AND THE OWNER A LIST OF ALL ITEMS AND THEIR DELIVERY SCHEDULES. THE LIST SHALL IDENTIFY ALL LONG-LEAD TIME ITEMS ON THE PROJECT SUCH AS MATERIALS, FABRICS, HARDWARE, ETC. PRIOR TO ORDERING AN ITEM, THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING THE ARCHITECT AND OWNER OF ANY ITEM WHICH MAY CAUSE THE PROJECT TO BE DELAYED.
11. THE EXTENT OF THE WORK SHALL BE LIMITED TO THAT INDICATED IN THE DRAWINGS. ANY ADDITIONAL WORK DONE MUST HAVE WRITTEN PERMISSION FROM THE ARCHITECT OR OWNER'S REPRESENTATIVE. WORK DONE WITHOUT WRITTEN PERMISSION SHALL BE AT THE CONTRACTOR'S RISK.
12. THE CONTRACTOR SHALL TAKE ADEQUATE PRECAUTIONS TO PROTECT THE BUILDING OCCUPANTS, MATERIALS AND EXISTING FINISHES THROUGHOUT THE DURATION OF THE WORK. BARRIERS TO CONTROL NOISE, DUST, AND SECURITY BETWEEN CONSTRUCTION AREAS AND OCCUPIED AREAS OR PUBLIC AREAS SHALL BE ERECTED AND MAINTAINED BY THE CONTRACTOR.
13. THE CONTRACTOR SHALL FIELD VERIFY CONSTRUCTION TOLERANCES AND TAKE FIELD MEASUREMENTS OF ANY EXISTING CONDITIONS RELATED TO THE WORK OF THIS PROJECT. CONDITIONS ENCOUNTERED AT THE SITE MATERIALLY DIFFERENT FROM THOSE INDICATED IN THE CONTRACT DOCUMENTS SHALL BE PROMPTLY REPORTED TO THE ARCHITECT OR OWNER'S REPRESENTATIVE BEFORE THE CONDITIONS ARE DISTURBED.
14. EXISTING CONSTRUCTION SHOWN TO REMAIN INCLUDING BUT NOT LIMITED TO WALLS, PARTITIONS, DOORS, FRAMES, CONSTRUCTION AND MATERIALS BEYOND THE SCOPED AREA ETC. SHALL BE PROTECTED FROM WEATHER AND OTHER DAMAGE DURING CONSTRUCTION ACTIVITIES. DAMAGE TO EXISTING CONSTRUCTION SHOWN TO REMAIN SHALL BE RESTORED OR REPLACED TO MATCH EXISTING CONDITION IN FINISH, RATING AND APPEARANCE AT NO ADDITIONAL COST.
15. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL CUTTING, PATCHING AND FITTING NECESSARY TO ACHIEVE THE SCOPE OF THE WORK.
16. THE EXISTING UTILITIES OR OTHER MECHANICAL, ELECTRICAL, PLUMBING, AND LOW-VOLTAGE EQUIPMENT REQUIRING REMOVAL, CAPPING, TERMINATION, AND/OR RELOCATION SHALL BE INCLUDED IN THE OVERALL SCOPE AND PERFORMANCE OF THE PROJECT BY THE CONTRACTOR.
17. THE CONTRACTOR SHALL PROTECT AND SHALL NOT DISCONNECT ANY EXISTING FIRE ALARM DEVICES, SMOKE ALARMS, SPRINKLER HEADS, EXIT SIGNS, ASSOCIATED WIRING, AND OTHER LIFE SAFETY DEVICES IN OPERATION, BEFORE COORDINATING WITH FIRE MARSHAL. FINAL LIFE SAFETY DEVICE LOCATION LAYOUT AND EGRESS PLAN SHALL BE REVIEWED AND APPROVED BY AUTHORITY HAVING JURISDICTION PRIOR TO WORK BEING PERFORMED.
18. ALL MATERIALS AND DEVICES USED FOR THIS PROJECT ARE TO BE NEW, NEITHER PREVIOUSLY STORED NOR PREVIOUSLY USED IN THIS OR ANOTHER LOCATION.
19. CENTERLINE OF PARTITIONS SHALL ALIGN WITH CENTERLINE OF COLUMN, COLUMN LINE, DIMENSION REFERENCE, OR CENTERLINE OF WINDOW MULLIONS AS SHOWN, UNLESS OTHERWISE NOTED.
20. DIMENSIONS AT STUD WALLS ARE MEASURED FROM FACE OF STUD TO FACE OF STUD, UNLESS OTHERWISE NOTED. DIMENSIONS AT STOREFRONT ARE MEASURED FROM THE FACE OF STUD TO FACE OF MULLION, UNLESS OTHERWISE NOTED. DIMENSIONS AT BUILDING WALLS (IMP/CONCRETE/CMU) ARE MEASURED FROM FACE OF STUD TO FACE OF BUILDING WALL MATERIAL, UNLESS OTHERWISE NOTED.
21. NEW WORK AT EXISTING CONDITIONS SHALL ALIGN WITH AND MATCH EXISTING WORK EXCEPT WHERE OTHERWISE DIMENSIONED OR DETAILED.
22. "TYPICAL" OR "TYP." SHALL MEAN THAT THE REFERENCED DETAIL OR DIMENSION SHALL APPLY FOR ALL SIMILAR CONDITIONS UNLESS OTHERWISE INDICATED.
23. PROVIDE BRACING ABOVE PARTITIONS AS NECESSARY TO SUPPORT ASSEMBLIES ATTACHED OR CONTAINED WITHIN, IN COMPLIANCE WITH MINIMUM STANDARDS OF ASTM C645-88. DESIGN INTERIOR PARTITIONS FOR MAXIMUM DEFLECTION OF L/240 AT 5 PSF.
24. AT EXISTING PARTITIONS TO REMAIN WHICH ARE CHANGED TO BE RATED PARTITIONS, MODIFY THE PARTITION CONSTRUCTION ASSEMBLY AS REQUIRED TO MEET THE REQUIREMENTS FOR THE APPLICABLE FIRE RATING.
25. PERMANENTLY IDENTIFY BOTH SIDES OF ALL FIRE RATED AND SMOKE PARTITIONS IN CONCEALED SPACES WITH THE WORDING - "FIRE AND/OR) SMOKE BARRIER - PROTECT ALL OPENINGS."
26. ALL SOUND PARTITIONS SHALL INCLUDE ACOUSTICAL SEALANT AT BASE, HEAD, PERIMETER AND ALL OPENINGS.
27. PARTITIONS ABUTTING CURTAIN WALL MULLIONS AND/OR STOREFRONT SHALL NOT BE ATTACHED BY SCREWS OR OTHER MECHANICAL FASTENERS.
28. ALL WOOD USED AS STUDS, BLOCKING OR BRACING SHALL BE PRESSURE TREATED IF EXPOSED TO WET AREAS, AND/OR IS IN CONTACT WITH CONCRETE OR MASONRY AND FIRE TREATED IF REQUIRED BY CODE.
29. PROVIDE BLOCKING, BRACING, AND NAILERS AS REQUIRED FOR FINISHES, MILLWORK (UPPER AND LOWER CABINETS), EQUIPMENT (I.E. RESTROOM), SHELVING, FIXTURES, ETC. CONTRACTOR TO COORDINATE REQUIRED HEIGHTS AND TYPE OF BLOCKING FOR LOCATIONS INDICATED AND/OR CODE REQUIREMENTS. ALL ATTACHMENTS, SCREWS, AND BOLTS BETWEEN STRUCTURAL STEEL AND TREATED WOOD, BLOCKING AND NAILERS SHALL BE GALVANIZED.
30. HORIZONTAL ELEMENTS SUCH AS DOOR HEADS SHALL BE MAINTAINED AT A CONSTANT LEVEL AND SHALL NOT FOLLOW VARIATIONS IN FLOOR PLANE. LEVEL FLOORS AS REQUIRED USING APPROVED LEVELING COMPOUND, UNLESS OTHERWISE DIRECTED IN DRAWINGS.
31. ALL SUBSTRATE SURFACES ARE TO BE PREPARED TO RECEIVE FINISH MATERIALS PER MANUFACTURER'S PRODUCT LITERATURE AND WRITTEN INSTRUCTIONS FOR INSTALLATION OR APPLICATION.
32. ALL FASTENERS AND ATTACHMENTS SHALL BE CONCEALED FROM VIEW, UNLESS OTHERWISE NOTED.
33. EXIT DOORS SHALL NOT REQUIRE THE USE OF A KEY, TOOL, OR SPECIAL KNOWLEDGE OR EFFORT FOR OPERATION FROM THE INSIDE OF THE BUILDING PER THE NFPA 101 LIFE SAFETY CODE IN EFFECT AT TIME OF PERMITTING. LOCKS, LATCHES, AND ALARM DEVICES.
34. NEW AND EXISTING PENETRATIONS, WITHIN THE SCOPE OF THE WORK, INTO OR THROUGH EITHER VERTICAL OR HORIZONTAL FIRE-RATED BARRIERS SHALL BE PROTECTED BY A SYSTEM LISTED BY A RECOGNIZED TESTING AGENCY.
35. THE CONTRACTOR SHALL PROVIDE AND INSTALL EQUIPMENT AND APPLIANCES SPECIFIED, UNLESS OTHERWISE NOTED. THE CONTRACTOR SHALL PROVIDE AND/OR COORDINATE INSTALLATION OF TENANT-FURNISHED EQUIPMENT AND APPLIANCES, IF REQUIRED. THE CONTRACTOR SHALL VERIFY ALL PLUMBING AND ELECTRICAL REQUIREMENTS RELATED TO EQUIPMENT AND APPLIANCES IN THE SCOPE OF THE WORK.
36. VERIFY LOCATIONS OF ALL FIRE EXTINGUISHERS, SURFACE-MOUNTED OR RECESSED, FOR CODE COMPLIANCE. PROVIDE FIRE EXTINGUISHERS PER CODE IF NOT SHOWN ON DRAWINGS.
37. VERIFY LOCATIONS OF ALL ELECTRICAL DEVICES, LIFE SAFETY DEVICES AND THERMOSTAT LOCATIONS WITH ARCHITECT FOR COORDINATION WITH DESIGN ELEMENTS PRIOR TO INSTALLATION. AT LOCATIONS WHERE ELECTRICAL, MECHANICAL AND/OR OTHER DEVICES OCCUR TOGETHER BUT AT DIFFERENT HEIGHTS, THE DEVICES SHALL BE CENTERED ABOVE EACH OTHER.
38. APPROVED NUMERALS OF A MINIMUM OF 12-INCH HEIGH AND A COLOR CONTRASTING WITH THE BACKGROUND DESIGNATING THE ADDRESS SHALL BE PLACED ON THE BUILDING IN A POSITION AS TO BE VISIBLE AND LEGIBLE FROM THE STREET OR ROAD FRONTING THE PROPERTY AND FROM ALL REAR ALLEYWAYS/ACCESS. WHEN POSTED ON GLASS, NUMERALS OR ADDRESSES SHALL BE POSTED ON A MINIMUM 20-INCH BY 30-INCH BACKGROUND. ADDRESS NUMBERS SHALL BE ARABIC NUMERALS OR ALPHABET LETTERS. MINIMUM STROKE WIDTH SHALL BE 0.5 INCHES.

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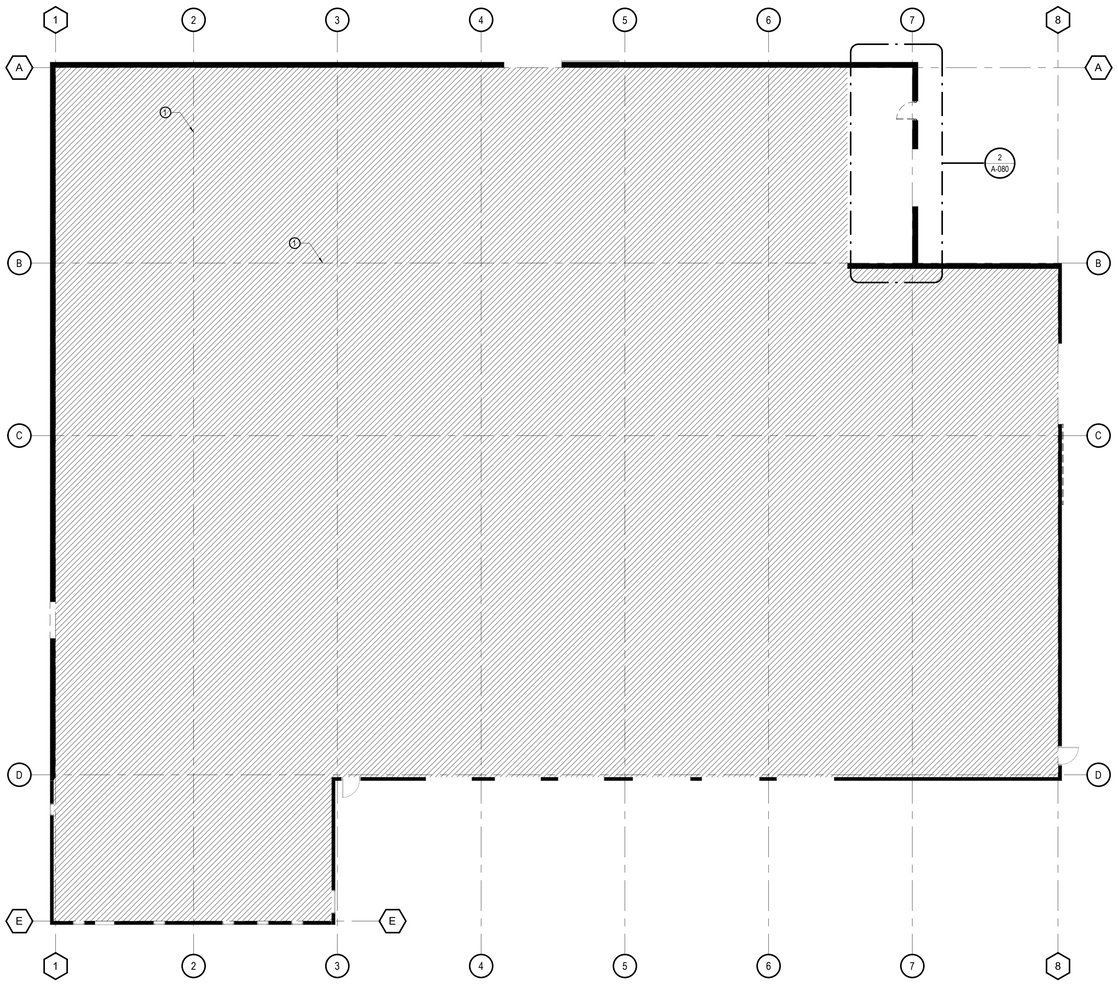
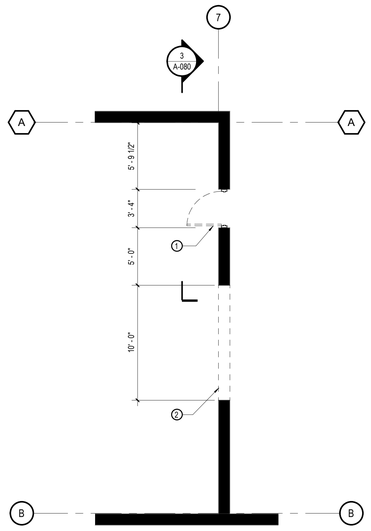
Sheet Title
GENERAL NOTES, SYMBOLS, ABBREVIATIONS, & COMCHECK

Sheet No.
A-002

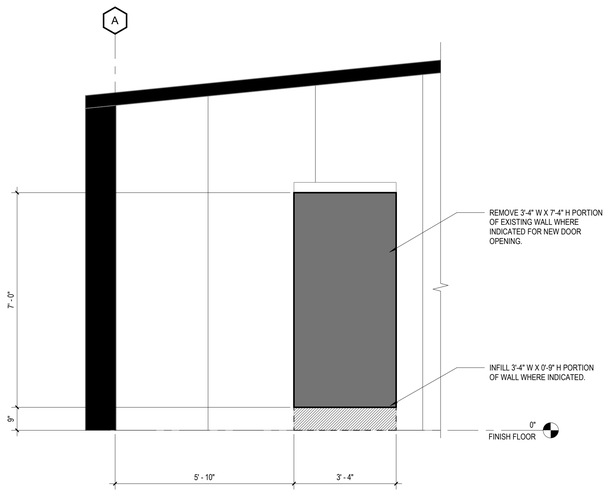
■ Released for Construction
□ Not Released for Construction



1 A-080 DEMOLITION PLAN - OVERALL
3/32" = 1'-0"



2 A-080 DEMOLITION PLAN - H-ROOM
3/16" = 1'-0"



3 A-080 SECTION @ H-ROOM DEMOLITION
1/2" = 1'-0"

DEMOLITION LEGEND:

- EXISTING PARTITION TO REMAIN
- DEMOLISHED PARTITION

DEMOLITION KEY NOTES

1. REMOVE 3'-4" W X 7'-4" H PORTION OF EXISTING WALL WHERE INDICATED FOR NEW DOOR OPENING.
2. REMOVE 10'-0" W X 10'-0" H PORTION OF EXISTING WALL WHERE INDICATED FOR NEW OVERHEAD DOOR OPENING.

DEMOLITION PLAN GENERAL NOTES

1. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING AND PAYING FOR ALL REQUIRED PERMITS, INSPECTION CERTIFICATES, ETC. FOR THE SCOPE OF THE WORK.
2. ALL WORK SHALL BE DONE IN STRICT ACCORDANCE WITH THE PREVAILING EDITIONS OF ALL APPLICABLE STATE AND LOCAL CODES.
3. DEMOLITION PLANS SHOW APPROXIMATE LAYOUT OF THE EXISTING BUILDING AND ARE NOT INTENDED TO REPRESENT PRECISE "AS-BUILT" CONDITIONS. THE CONTRACTOR AND ALL SUBCONTRACTORS SHALL VISIT THE PROJECT SITE AND BECOME FAMILIAR WITH ALL JOB CONDITIONS, INCLUDING EXISTING MECHANICAL, PLUMBING, AND ELECTRICAL WORK.
4. VISITS TO THE SITE DURING THE BID PHASE SHALL BE COORDINATED WITH THE OWNER'S REPRESENTATIVE. THE CONTRACTOR SHALL VERIFY LOCATIONS OF ALL EXISTING CONSTRUCTION AND SHALL VERIFY DIMENSIONS RELATING TO EXISTING CONDITIONS BEFORE ANY NEW CONSTRUCTION OF PARTITIONS OR WALLS IS COMMENCED. ANY DISCREPANCIES SHALL BE REPORTED TO THE ARCHITECT AT ONCE.
5. SHOULD THE CONTRACTOR ENCOUNTER CONDITIONS AT THE SITE MATERIALLY DIFFERING FROM THOSE INDICATED IN THE CONTRACT DOCUMENTS, THE CONTRACTOR SHALL IMMEDIATELY GIVE NOTICE TO THE OWNER'S REPRESENTATIVE OF SAID CONDITIONS BEFORE THEY ARE DISTURBED.
6. THE CONTRACTOR SHALL CEASE OPERATIONS IMMEDIATELY IF HAZARDOUS OR CONTAMINATED MATERIALS SUCH AS ASBESTOS OR POLYCHLORINATED BIPHENYL (PCB), NOT PREVIOUSLY RENDERED HARMLESS, ARE ENCOUNTERED. CONTACT ARCHITECT AND OWNER IN WRITING. DO NOT RESUME OPERATIONS UNTIL DIRECTED, HAZARDOUS OR CONTAMINATED MATERIALS HAVE BEEN RENDERED HARMLESS, AND CONDITIONS ARE AGREED TO BY OWNER AND CONTRACTOR IN WRITING.
7. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATION OF ALL TRADES. THIS INCLUDES SCHEDULING OF ALL WORK TO BE PERFORMED, COORDINATION OF ALL CUTTING, FITTING, PATCHING AND REPAIRING AS REQUIRED, ETC.
8. THE OWNER AND AFFECTED TENANT SHALL BE NOTIFIED PRIOR TO SHUTDOWN OF ANY SHARED MECHANICAL, PLUMBING AND/OR ELECTRICAL SYSTEMS.
9. THE CONTRACTOR SHALL TAKE ADEQUATE PRECAUTIONS TO PROTECT THE BUILDING OCCUPANTS, MATERIALS AND EXISTING FINISHES THROUGHOUT THE DURATION OF THE WORK, INSIDE AND OUTSIDE THE SCOPED AREA. BARRIERS TO CONTROL NOISE, DUST, AND SECURITY BETWEEN CONSTRUCTION AREAS AND OCCUPIED AREAS OR PUBLIC AREAS SHALL BE ERECTED AND MAINTAINED BY THE CONTRACTOR.
10. THE CONTRACTOR SHALL PROVIDE ADEQUATE SHORING AND BRACING AS REQUIRED FOR TEMPORARY SUPPORT OF ALL WORK TO BE PERFORMED. THE SHORING AND BRACING SHALL PREVENT MOVEMENT, SETTLEMENT, AND/OR COLLAPSE OF STRUCTURE OR ELEMENT SHOWN TO REMAIN. IF REQUIRED, SHORING AND BRACING SHALL BE DESIGNED BY A PROFESSIONAL ENGINEER LICENSED IN THE LOCAL JURISDICTION.
11. EXISTING CONSTRUCTION SHOWN TO REMAIN INCLUDING BUT NOT LIMITED TO WALLS, PARTITIONS, DOORS, FRAMES, CONSTRUCTION AND MATERIALS BEYOND THE SCOPED AREA ETC. SHALL BE PROTECTED FROM WEATHER AND OTHER DAMAGE DURING CONSTRUCTION ACTIVITIES. DAMAGE TO EXISTING CONSTRUCTION SHOWN TO REMAIN SHALL BE RESTORED TO MATCH PRE-DAMAGED ADJACENT CONDITION AT NO ADDITIONAL COST TO OWNER.
12. EXISTING ITEMS OR MATERIAL TO BE SALVAGED SHALL EITHER BE CAREFULLY REMOVED, CLEANED AND STORED AT A LOCATION PROVIDED BY THE OWNER OR SHALL BE CAREFULLY REMOVED, CLEANED, TEMPORARILY STORED AND RE-USED AS SHOWN ON DRAWINGS. CONTRACTOR SHALL MAINTAIN AND PROVIDE TO OWNER A LIST OF ALL REMOVED AND SALVAGED ITEMS AT THE COMPLETION OF DEMOLITION WORK. SALVAGE EXISTING RATED DOORS, WINDOWS AND FRAMES TO MAINTAIN RATINGS FOR RE-USE.
13. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL RELOCATION OF MATERIAL WITHOUT PERMANENT DAMAGE OR MARRING. NEW MATERIAL SHALL BE SUBSTITUTED FOR EXISTING MATERIAL THE CONTRACTOR IS UNABLE TO PROTECT FROM PERMANENT DAMAGE OR MARRING.
14. EXISTING UTILITIES OR OTHER MECHANICAL, ELECTRICAL OR PLUMBING EQUIPMENT REQUIRING REMOVAL, CAPPING, TERMINATION, AND/ OR RELOCATION SHALL BE INCLUDED IN THE OVERALL SCOPE AND PERFORMANCE OF THE PROJECT BY THE CONTRACTOR.
15. THE CONTRACTOR SHALL PROTECT AND SHALL NOT DISCONNECT ALL EXISTING FIRE ALARM DEVICES, SMOKE ALARMS, SPRINKLER HEADS, EXIT SIGNS, ASSOCIATED WIRING, AND OTHER LIFE SAFETY DEVICES IN OPERATION. RELOCATE AS REQUIRED IN NEW PLAN.
16. EXISTING CONCRETE FLOOR SLABS, MASONRY WALLS AND EXISTING STRUCTURAL FRAMING SYSTEMS SHOWN TO BE REMOVED SHALL BE CLEANLY SAWCUT FROM EXISTING CONSTRUCTION. COMPLETELY REMOVE FOOTINGS, FOUNDATIONS AND ABOVEGROUND AND UNDERGROUND CONSTRUCTION AS INDICATED ON DRAWINGS.
17. EXISTING EXTERIOR WALL INSULATION SHALL BE LEFT IN PLACE OR SHALL BE REPLACED WITH NEW MATERIAL OF EQUAL INSULATING VALUE.
18. WHERE FINISHES ARE SHOWN TO BE REMOVED FROM EXISTING CONSTRUCTION, REPAIR AND PATCH REMAINING SUBSTRATES AND PREPARE FOR NEW FINISH. CAREFULLY REPAIR AND PATCH ALL REMAINING SUBSTRATES THAT WERE ORIGINALLY CONCEALED BY EXISTING FINISHES, BUT WILL NOW BE EXPOSED IN THE NEW CONSTRUCTION.
19. ALL INFILL OR REPLACEMENT WORK IS TO MATCH EXISTING CONDITIONS IN MATERIALS, CONSTRUCTION, RATING AND FINISH, UNLESS SPECIFICALLY NOTED ELSEWHERE IN THE CONSTRUCTION DOCUMENTS.
20. EXISTING CONDITIONS DISTURBED BY NEW WORK MUST BE RESTORED WITH SIMILAR NEW MATERIAL TO A CLEAN NEW CONDITION. ALL NEW MATERIALS SHALL MATCH EXISTING UNLESS OTHERWISE NOTED.
21. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DEBRIS REMOVAL. DO NOT ALLOW DEBRIS TO ACCUMULATE. ALL AREAS TO BE LEFT CLEAN DAILY. WASH AND CLEAN ALL WORK AFFECTED BY CONSTRUCTION AT COMPLETION OF PROJECT. THE CONTRACTOR SHALL COORDINATE ALL WORK WITH TENANT AND SHALL VERIFY ALL TENANT REQUESTS WITH OWNERS REPRESENTATIVE PRIOR TO PERFORMING SUCH REQUESTS.
22. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE CORRECTION OF IRREGULARITIES IN FLOOR FINISH AND/OR ELEVATION THAT BECOME APPARENT DUE TO DEMOLITION.
23. REMOVE AND REPLACE BROKEN CEILING TILES, TYP.
24. REMOVE ALL OBSOLETE PLUMBING, MECHANICAL, AND ELECTRICAL EQUIPMENT IN THEIR ENTIRETY THROUGHOUT TENANT SPACE AND ON THE ROOF, PARTICULARLY WHERE EXISTING ITEMS WILL INTERFERE WITH THE INSTALLATION OF NEW CONSTRUCTION, OR WHERE EXISTING ITEMS WILL BE EXPOSED IN THE NEW CONSTRUCTION, UNLESS SPECIFICALLY NOTED ELSEWHERE IN THE CONTRACT DOCUMENTS TO REMAIN. REPAIR AND PATCH SYSTEMS TO REMAIN WITH MATCHING EXISTING CONSTRUCTION AND AS INDICATED IN CONTRACT DOCUMENTS. COORDINATE WITH NEW CONSTRUCTION.

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DEMOLITION PLAN

Sheet No.
A-080

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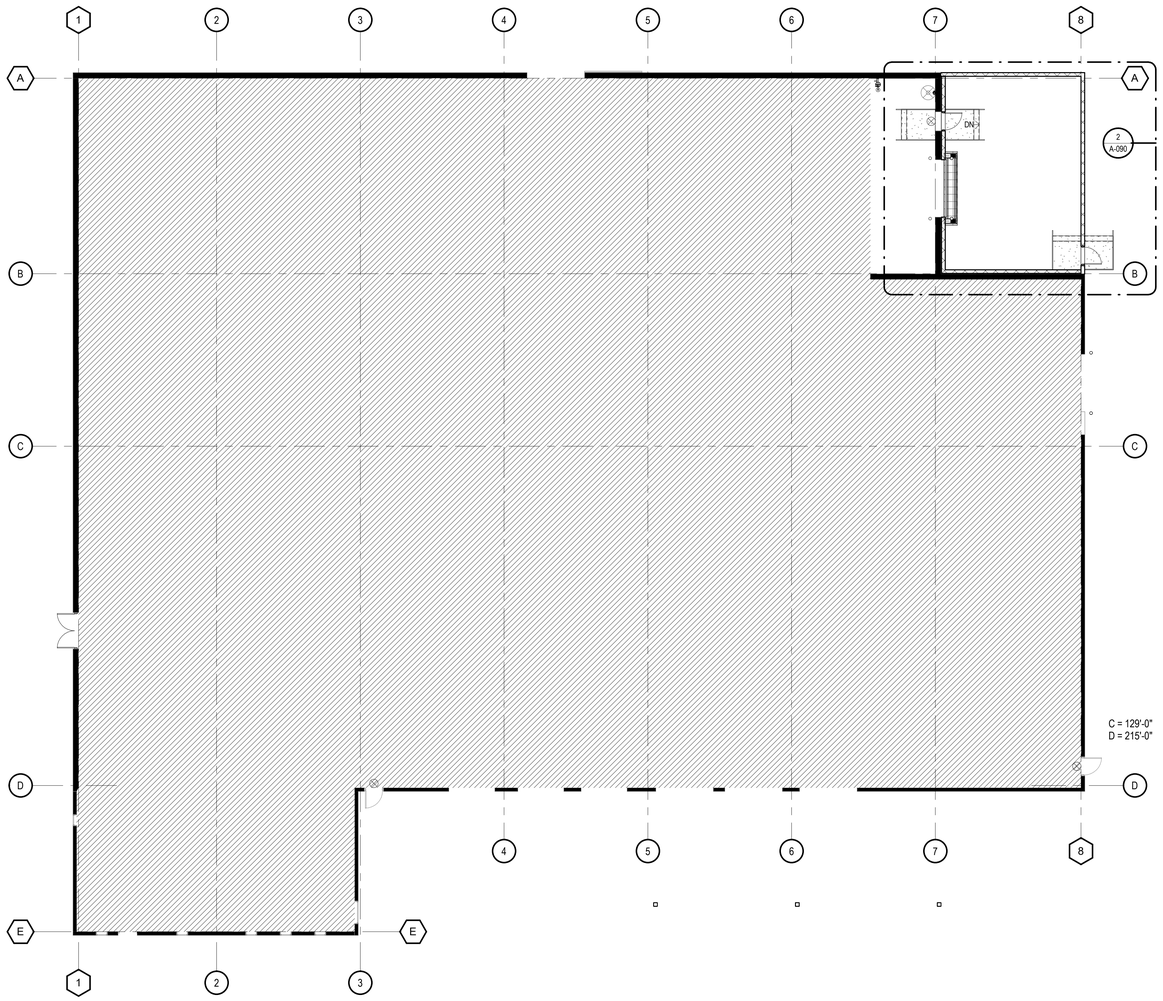
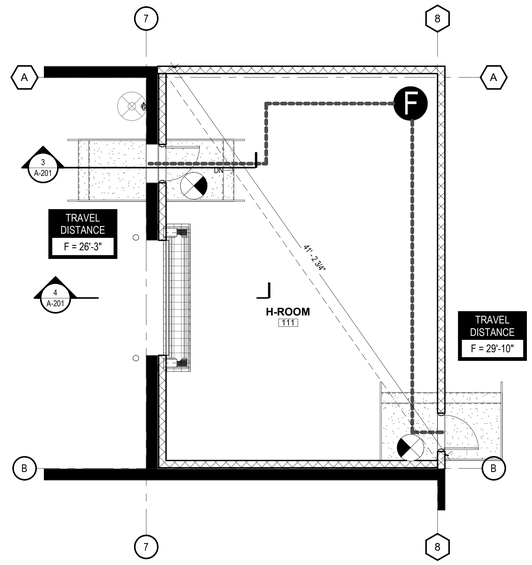


1 A-090 LIFE SAFETY PLAN - OVERALL
3/32" = 1'-0"



2 A-090 LIFE SAFETY PLAN - H-ROOM
3/16" = 1'-0"

LIFE SAFETY LEGEND

DENOTES SURFACE MOUNTED FIRE EXTINGUISHER TO COMPLY WITH PRODUCT REQUIREMENTS OF NFPA 10 AND APPLICABLE CODES, WHICHEVER IS MORE STRINGENT.
- DRY CHEMICAL TYPE FIRE EXTINGUISHERS: CARBON STEEL TANK, WITH PRESSURE GAGE.
- STORED PRESSURE OPERATED: DEEP DRAWN
- CLASS: 4A - 60B:C
- SIZE: 10 POUND

SIZE: 10 POUND

ALL FIRE EXTINGUISHER LOCATIONS TO BE APPROVED BY FIRE MARSHAL AND/OR AHJ

WALL MOUNTED EXIT SIGN

CEILING MOUNTED EXIT SIGN

2021 BUILDING CODE SUMMARY										
OCCUPANCY USE	CLASSIFICATION	AREA	SPRINKLER	CONST. TYPE	STORY LIMIT	ACTUAL STORIES	HEIGHT LIMIT	COMMON PATH OF TRAVEL	DEAD END CORR.	EXIT TRAVEL DISTANCE
OFFICE	B	1,090	YES	II-B	2	1	55'-0"	100' PER IBC TABLE 1006.2.1	50' PER IBC 1020.5.2	400' PER IBC 1017.2.2
SHOWROOM	M	482	YES	II-B	2	1	55'-0"	75' PER IBC TABLE 1006.2.1	50' PER IBC 1020.5.2	250' PER IBC TABLE 1017.2
WAREHOUSE	S-1	21,678	YES	II-B	2	1	55'-0"	100' PER IBC TABLE 1006.2.1	50' PER IBC 1020.5.2	300' PER IBC 1017.2.2
H-ROOM	HIGH HAZARD...	875	YES	II-B	2	1	55'-0"	25' PER IBC PER 1006.2.1	20' PER IBC 1020.5	150' PER IBC TABLE 1017.2

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LIFE SAFETY PLAN

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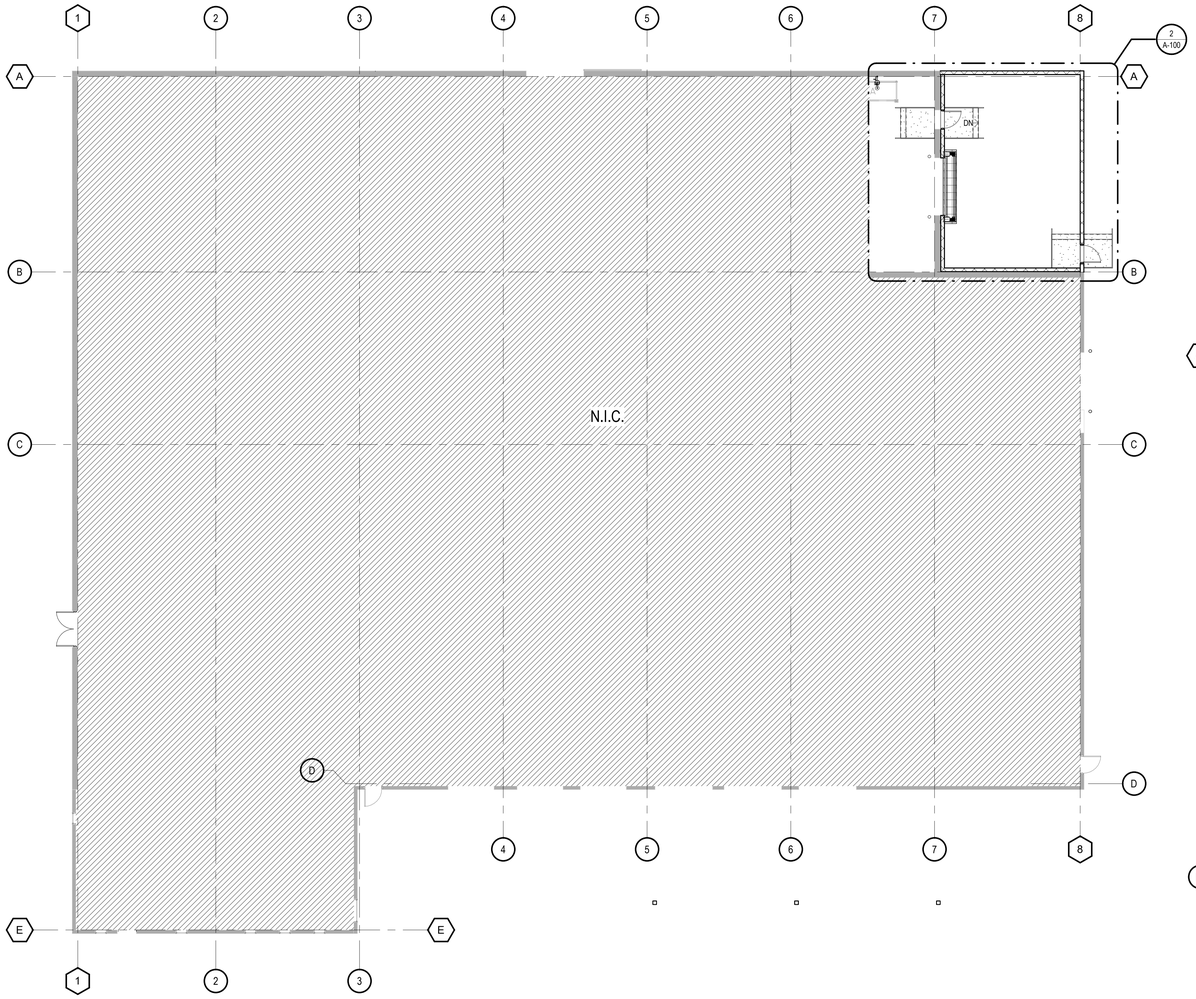
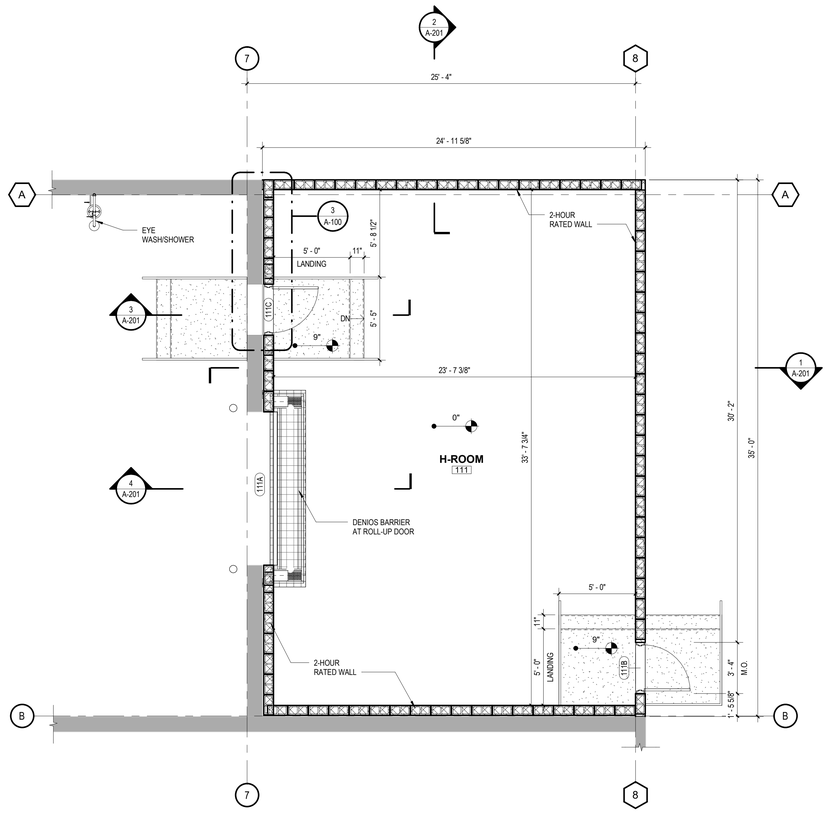
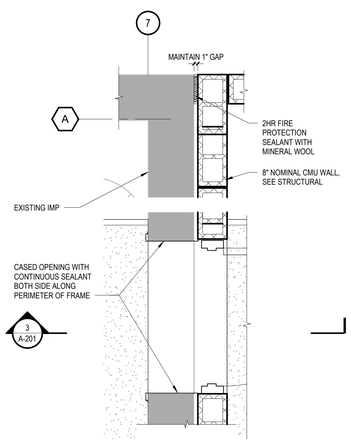


1 A-100 FLOOR PLAN - OVERALL
3/32" = 1'-0"



2 A-100 FLOOR PLAN - H-ROOM
1/4" = 1'-0"



3 A-100 ENLARGED PLAN @ GAP BETWEEN EXISTING AND H-ROOM
3/4" = 1'-0"

MINIMUM EQUIVALENT THICKNESS OF

CAST-IN-PLACE OR PRECAST CONCRETE WALLS,

Table 722.2.1.1 LOAD-BEARING OR NONLOAD-BEARING

CONCRETE TYPE	MINIMUM SLAB THICKNESS (inches) FOR FIRE-RESISTANCE RATING OF				
	1 hour	1½ hours	2 hours	3 hours	4 hours
Siliceous	3.5	4.3	5.0	6.2	7.0
Carbonate	3.2	4.0	4.8	5.7	6.6
Sand-lightweight	2.7	3.3	3.8	4.6	5.4
Lightweight	2.5	3.1	3.6	4.4	5.1

For SI: 1 inch = 25.4 mm.

Table 722.3.2 MINIMUM EQUIVALENT THICKNESS (inches) OF BEARING OR NONBEARING CONCRETE MASONRY WALLS[a, b, c, d]

TYPE OF AGGREGATE	FIRE-RESISTANCE RATING (hours)												
	⅓	¾	1	1¼	1½	1¾	2	2¼	2½	2¾	3	3¼	3½	3¾	4
Pumice or expanded slag	1.5	1.9	2.1	2.5	2.7	3.0	3.2	3.4	3.6	3.8	4.0	4.2	4.4	4.5	4.7
Expanded shale, clay or slate	1.8	2.2	2.6	2.9	3.3	3.4	3.6	3.8	4.0	4.2	4.4	4.6	4.8	4.9	5.1
Limestone, cinders or unexpanded slag	1.9	2.3	2.7	3.1	3.4	3.7	4.0	4.3	4.5	4.8	5.0	5.2	5.5	5.7	5.9
Calcareous or siliceous gravel	2.0	2.4	2.8	3.2	3.6	3.9	4.2	4.5	4.8	5.0	5.3	5.5	5.8	6.0	6.2

For SI: 1 inch = 25.4 mm.

a. Values between those shown in the table can be determined by direct interpolation.
b. Where combustible members are framed into the wall, the thickness of solid material between the end of each member and the opposite face of the wall, or between members set in from opposite sides, shall be not less than 93 percent of the thickness shown in the table.
c. Requirements of ASTM C55, ASTM C73, ASTM C90 or ASTM C744 shall apply.
d. Minimum required equivalent thickness corresponding to the hourly fire-resistance rating for units with a combination of aggregate shall be determined by linear interpolation based on the percent by volume of each aggregate used in manufacture.

NOTE: CONTRACTOR SHALL PERMANENTLY IDENTIFY ALL FIRE RATED WALLS (AND CORRESPONDING HOURLY RATING) REQUIRED TO HAVE PROTECTED OPENINGS, CORRIDOR, PARTITIONS, SMOKESTOP PARTITIONS, HORIZONTAL EXIT PARTITIONS, AND EXIT ENCLOSURES EITHER BY INSTALLING SIGNS OR BY STENCILING IN CONCEALED SPACES THE FOLLOWING:

2 HOUR FIRE AND SMOKE BARRIER PROTECT ALL OPENINGS

IDENTIFICATION SHALL BE SPACED NO MORE THAN TWELVE (12) FEET ON CENTER WITH A MINIMUM LETTER SIZE OF THREE (3) INCHES IN HEIGHT ON A CONTRASTING BACKGROUND.

NOTE: FIRE BARRIERS ARE TO BE 2 HOUR FIRE RATED CONSTRUCTION THAT EXTENDS FROM THE FLOOR TO THE UNDERSIDE OF THE ROOF OR FIRE RATED FLOOR DECK WITH ALL OPENINGS SEALED TIGHT PER NFPA 101 LIFE SAFETY CODE.

FIRE RESISTANCE CALCULATION FOR STANDARD 8" (NOMINAL) CONCRETE MASONRY WALL

STANDARD LIGHTWEIGHT HOLLOW UNITS CONSTRUCTED OF 53% EXPANDED SLAG SOLIDS PER THE NATIONAL CONCRETE MASONRY ASSOCIATION.

EQUIVALENT THICKNESS = 7 5/8" (0.53) = 4.041"

PER IBC TABLE 722.3.2 "MINIMUM EQUIVALENT THICKNESS (inches) OF BEARING OR NONBEARING CONCRETE MASONRY WALLS" CONCRETE MASONRY UNITS OF LIMESTONE, CINDERS OR AIR-COOLED SLAG HAVING A MINIMUM EQUIVALENT THICKNESS OF 2.6 INCHES HAVE A FIRE ENDURANCE RATING OF 1 HOUR.

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A TENANT ADDITION

at

SRS DISTRIBUTION, INC. - ROCKWALL, TEXAS (H-ROOM)

for

SRS Distribution

2065 KRISTY LN
ROCKWALL, TEXAS 75032

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Sheet Title
BUILDING PLAN

Sheet No.
A-100

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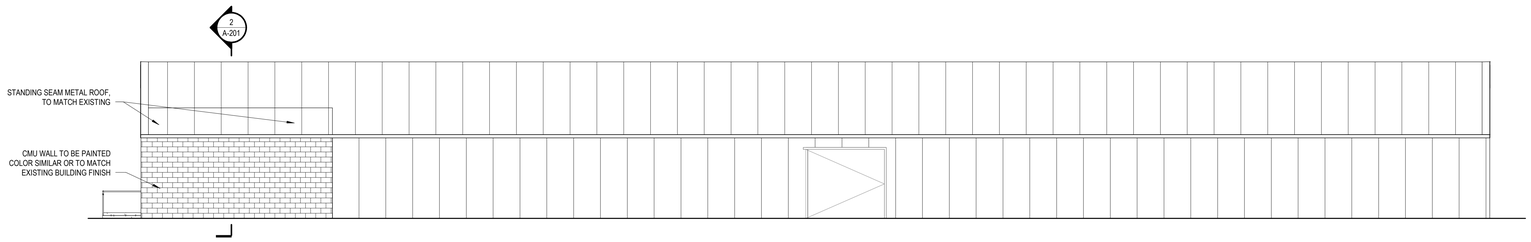
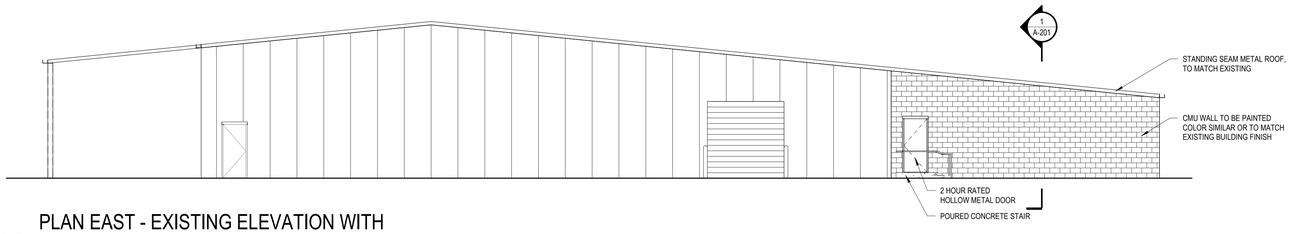
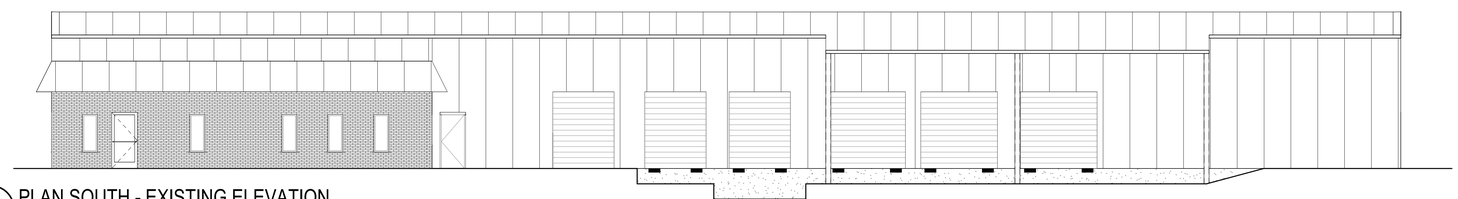


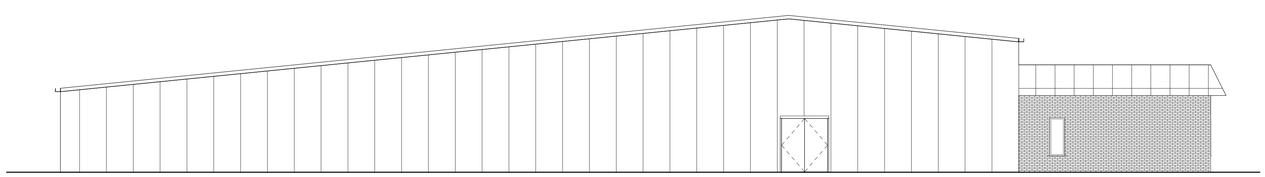
1 A-200 PLAN NORTH - EXISTING ELEVATION WITH ADDED H-ROOM
1/8" = 1'-0"



2 A-200 PLAN EAST - EXISTING ELEVATION WITH ADDED H-ROOM
1/8" = 1'-0"



3 A-200 PLAN SOUTH - EXISTING ELEVATION
1/8" = 1'-0"



4 A-200 PLAN WEST - EXISTING ELEVATION
1/8" = 1'-0"

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BUILDING ELEVATIONS

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A-200

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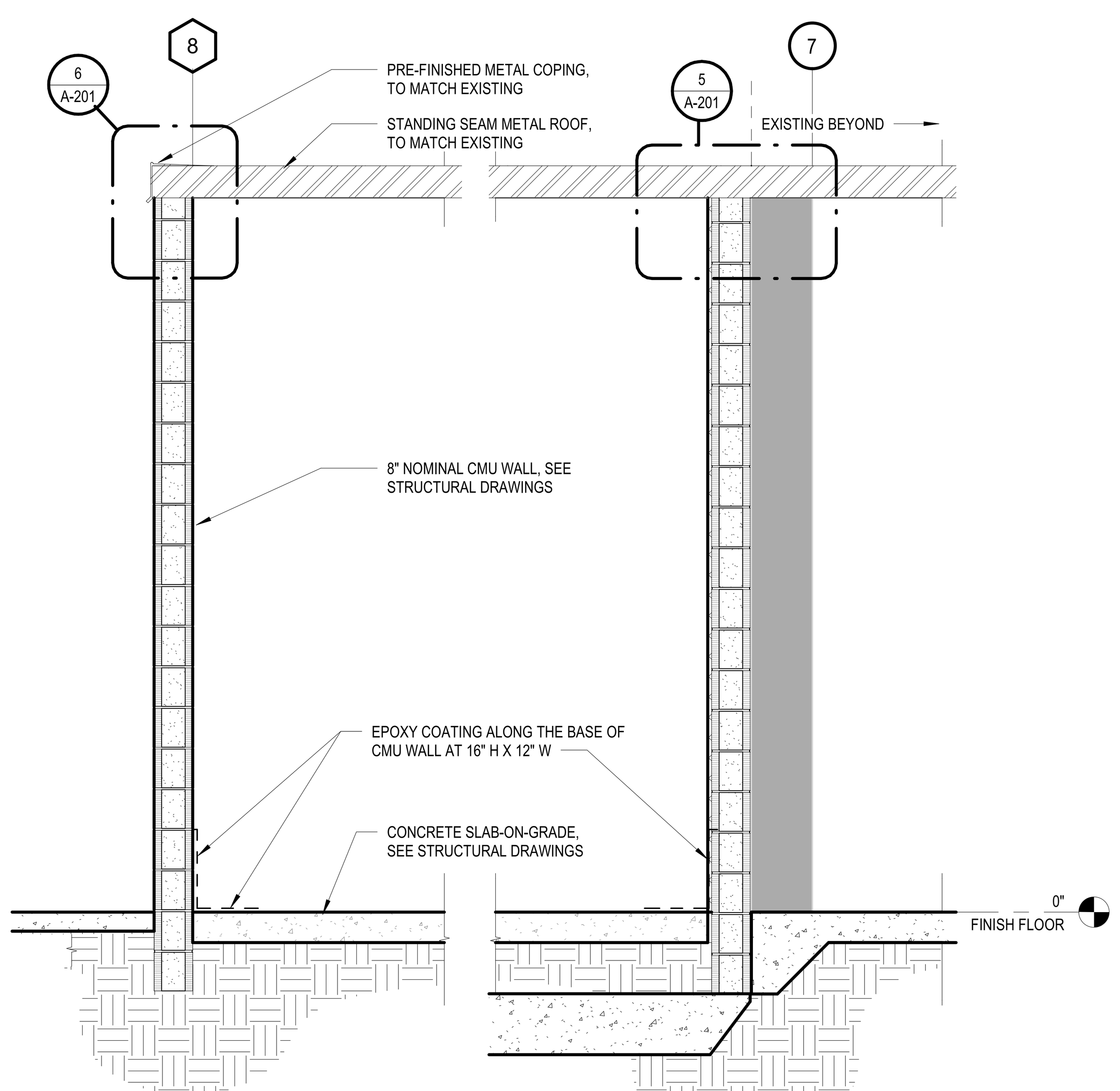
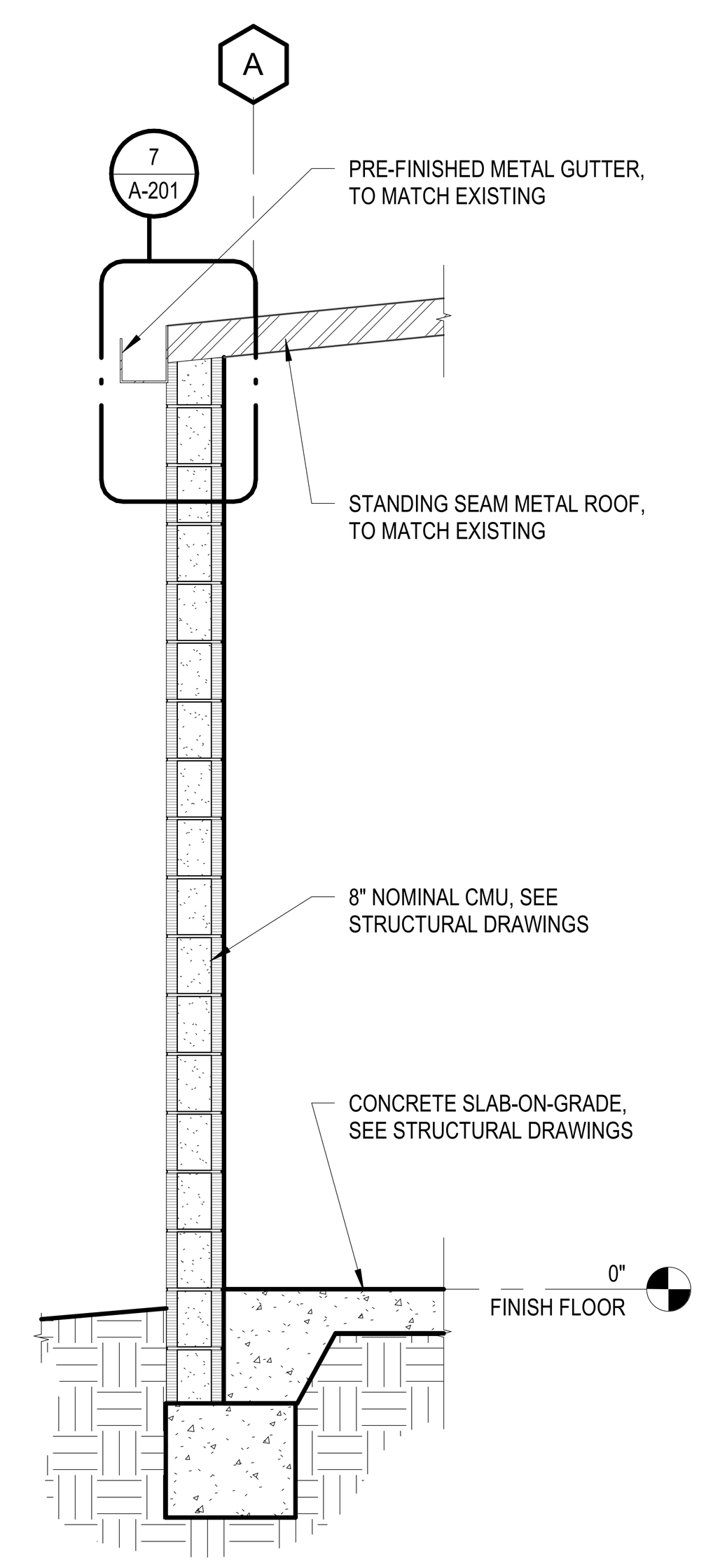
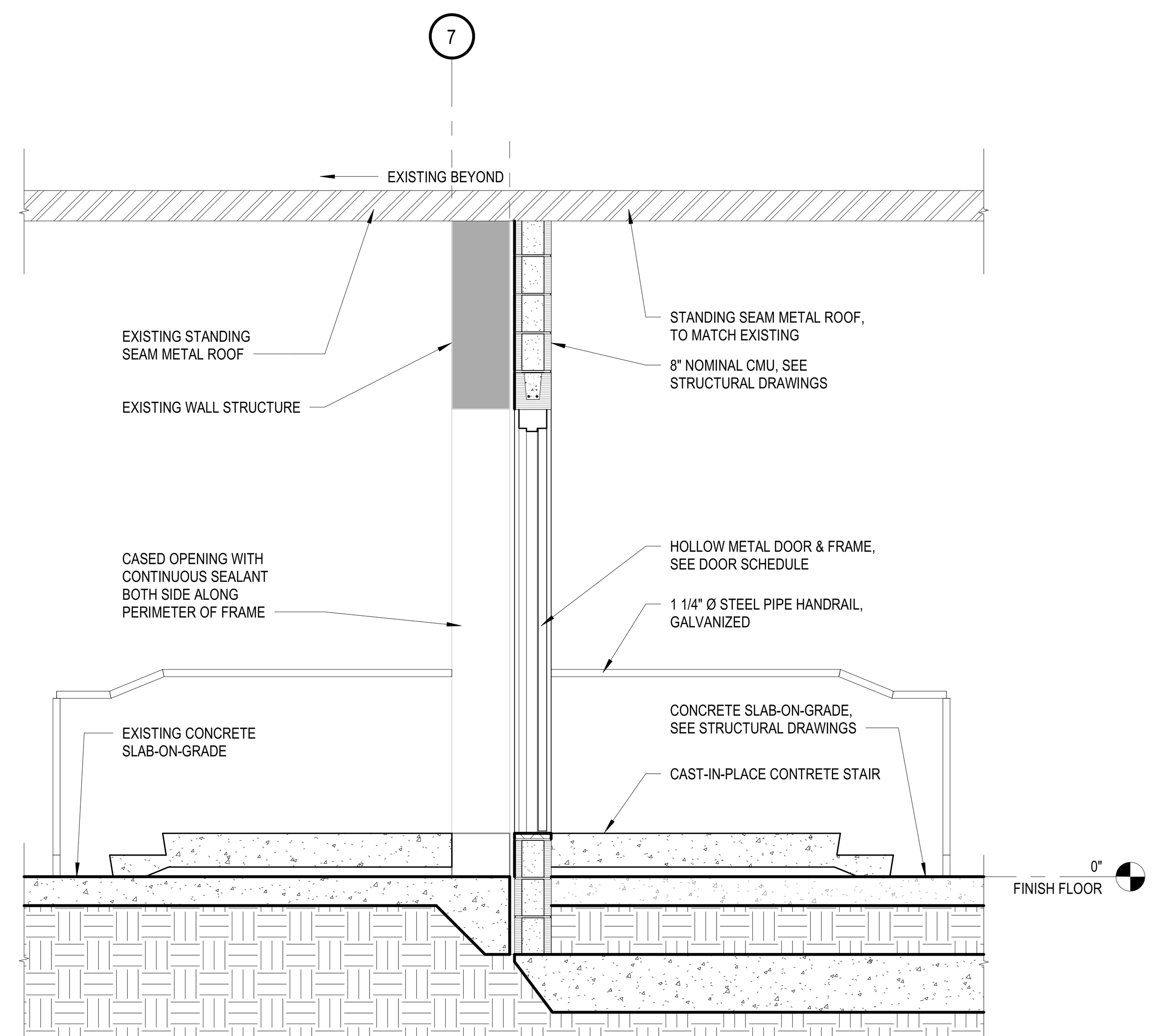


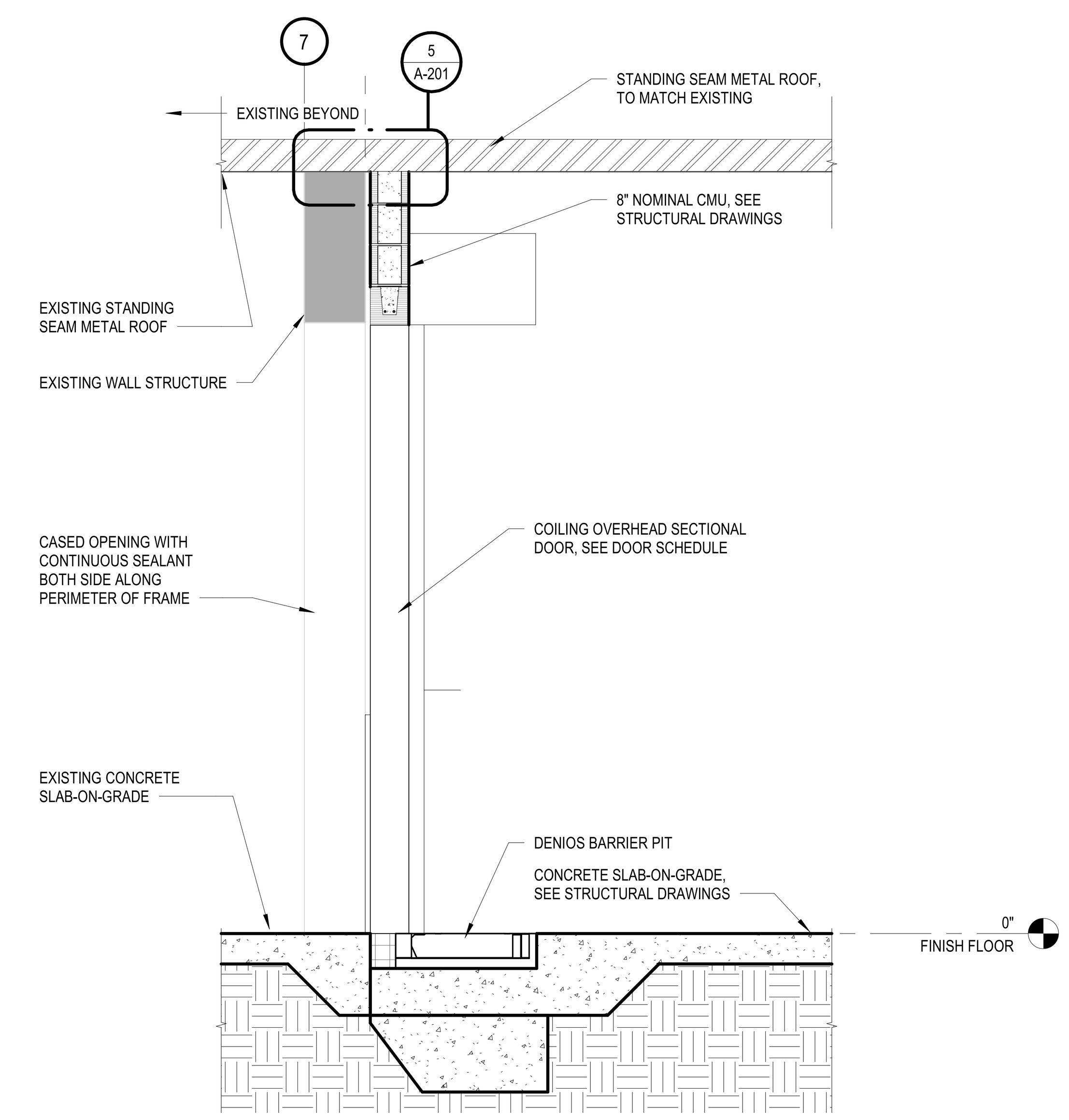
1
A-201
SECTION @ THRU H-ROOM
1/2" = 1'-0"



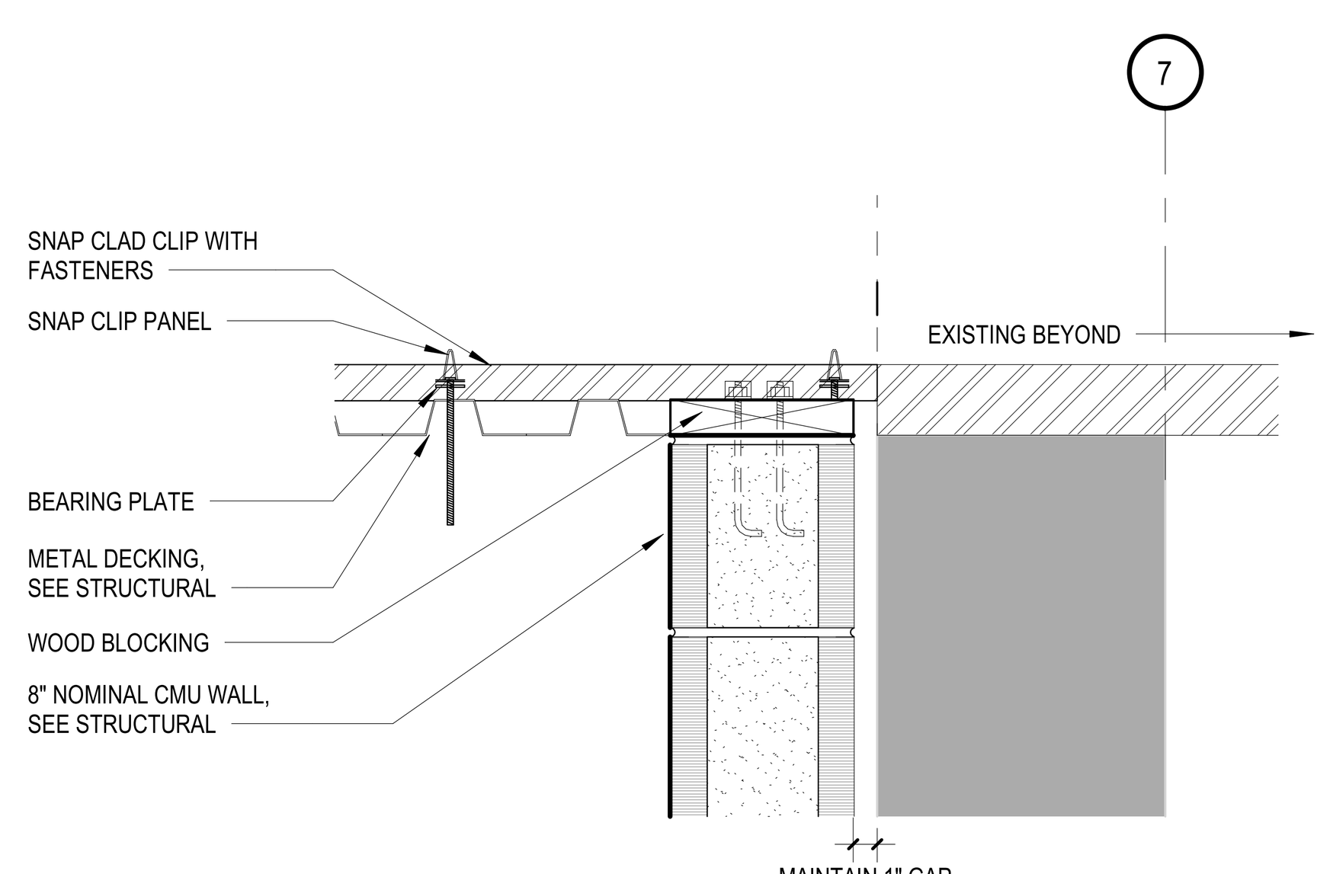
2
A-201
SECTION @ H-ROOM GUTTER WALL
1/2" = 1'-0"



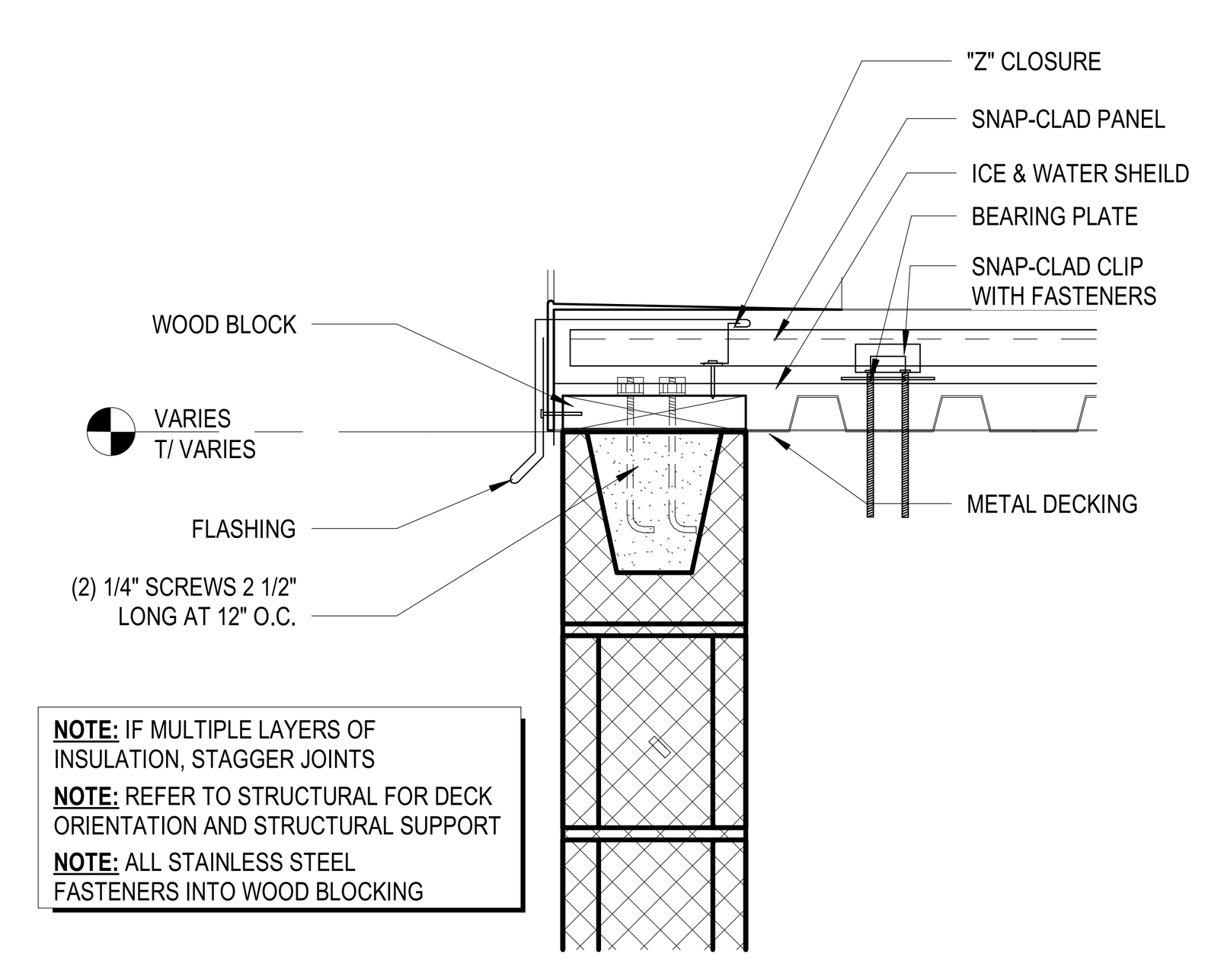
3
A-201
SECTION @ H-ROOM PERSONNEL DOOR ENTRY
1/2" = 1'-0"



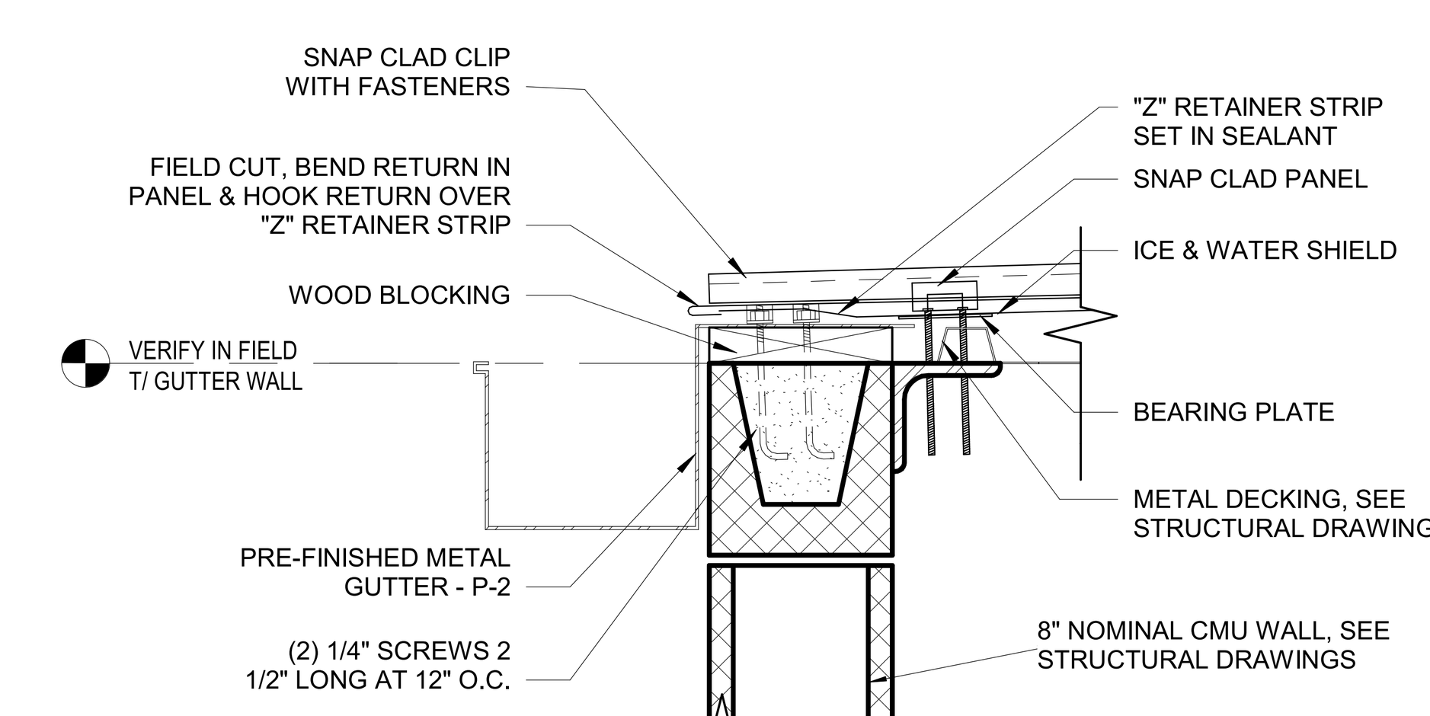
4
A-201
SECTION @ H-ROOM OVERHEAD DOOR
1/2" = 1'-0"



5
A-201
DETAIL - METAL ROOF AT EXISTING
1 1/2" = 1'-0"



6
A-201
METAL ROOF @ GRAVEL STOP
1 1/2" = 1'-0"



7
A-201
METAL ROOF @ GUTTER
1 1/2" = 1'-0"

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Sheet Title: H-ROOM DETAILS

Sheet No.: A-201

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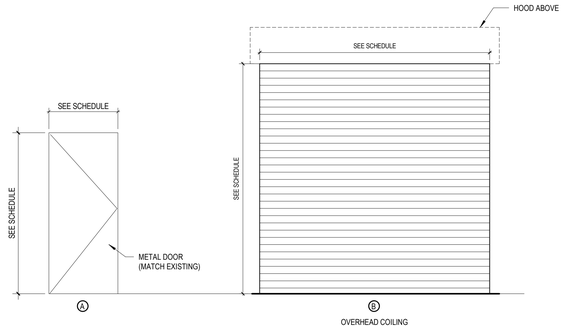
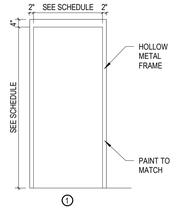
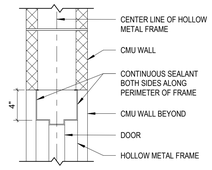


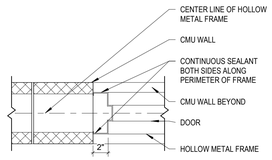
TYPES - DOORS
3/8" = 1'-0"



TYPES - FRAMES
3/8" = 1'-0"



1 A-601 HEAD DETAIL @ CMU
1 1/2" = 1'-0"



2 A-601 JAMB DETAIL @ CMU
1 1/2" = 1'-0"

DOOR AND HARDWARE NOTES

1. (DOORS/HARDWARE) HANDLES, PULLS, LATCHES LOCKS AND OTHER OPERATING DEVICES ON ACCESSIBLE DOORS SHALL HAVE A SHAPE THAT IS EASY TO GRASP WITH ONE HAND AND DOES NOT REQUIRE TIGHT GRASPING, TIGHT PINCHING OR TWISTING OF THE WRIST TO OPERATE. LEVER-OPERATED MECHANISMS AND U-SHAPED HANDLES ARE ACCEPTABLE DESIGN.
2. ALL DOORS TO HAVE SILENCERS.
3. HARDWARE TO MATCH BUILDING STANDARD.
4. DOORS SHALL BE PAINTED TO MATCH BUILDING STANDARD.

HARDWARE SCHEDULE:

SET NO.	DESCRIPTION
NO. 1	3 EA. HINGES, FULL MORTISE
	1 EA. LOCKSET
	1 EA. SURFACE CLOSER
	1 KICK PLATE
	1 DOOR STOP
	1 GASKETING

SCHEDULE - DOOR

NUMBER	LOCATION	DOOR						FRAME			DETAILS			HARDWARE SET	RATING	REMARKS
		TYPE	WIDTH	HEIGHT	THICKNESS	MATERIAL	FINISH	TYPE	MATERIAL	FINISH	HEAD	JAMB	THRESHOLD			
111A	H-ROOM	B	10' - 0"	10' - 0"	2"	MANUF.	MANUF.	MANUF.	MANUF.	MANUF.	N/A	N/A	N/A	N/A	N/A	
111B	H-ROOM	A	3' - 0"	7' - 0"	1 3/4"	HM	PAINT	1	HM	PAINT	1/A-601	2/A-601	-	1	2 HR	ADD LLATCH PROTECTOR & RAIN DRIP EDGE
111C	H-ROOM	A	3' - 0"	7' - 0"	1 3/4"	HM	PAINT	1	HM	PAINT	3/A-601	4/A-601	-	1	2 HR	

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DOOR SCHEDULE & NOTES

Sheet No.
A-601

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GENERAL NOTES:

1. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL BRACING DURING CONSTRUCTION FOUNDATION WALLS WHICH ARE SHOWN TIED INTO SLAB-ON-GRADE OR FLOOR/ROOF FRAMING SHALL BE BRACED AGAINST BACKFILL MOVEMENT UNTIL SLAB/FRAMING (INCLUDING DECK) IS COMPLETED. THOUGH DETAILS DO NOT INDICATE, ADEQUATE DRAINAGE MUST BE PROVIDED BEHIND WALLS TO ELIMINATE UNANTICIPATED HYDROSTATIC LOADING. PROVIDE ADEQUATE SHORING OR BRACING DURING CONSTRUCTION TO RESIST ALL REQUIRED FORCES SUCH AS (BUT NOT LIMITED TO) DEAD LOADS, LIVE LOADS, SOIL PRESSURES, CONSTRUCTION LOADS, WIND AND UNBALANCED LOADING. PROVIDE TEMPORARY SAFETY ENCLOSURES AS NECESSARY TO PROTECT ALL PERSONNEL INVOLVED WITH THIS PROJECT.

2. DETAILS NOT SHOWN SHALL BE ACCORDING TO:

AMERICAN INSTITUTE OF STEEL CONSTRUCTION	A.I.S.C.	SPECS FOR STRUCTURAL STEEL
AMERICAN CONCRETE INSTITUTE	A.C.I.	SPECS FOR CONCRETE
AMERICAN WELDING SOCIETY	A.W.S.	SPECS FOR WELDING
NATIONAL CONCRETE MASONRY ASSOCIATION	N.C.M.A.	SPECS FOR CONCRETE MASONRY
STEEL JOIST INSTITUTE	S.J.I.	SPECS FOR STEEL JOISTS
AMERICAN IRON & STEEL INSTITUTE	A.I.S.I.	SPECS FOR COLD FORMED STEEL

3. CONTRACTOR SHALL REVIEW SHOP DRAWINGS AND VERIFY ALL DIMENSIONS PRIOR TO SUBMITTING SAME TO ARCHITECT AND/OR ENGINEER FOR REVIEW. ARCHITECT AND ENGINEER'S REVIEW OF SHOP DRAWINGS TO BE FOR CONFORMANCE WITH THE DESIGN CONCEPT AND GENERAL COMPLIANCE WITH THE CONTRACT DOCUMENTS.

4. ALL SHOP DRAWINGS SHALL BE PREPARED UNDER THE DIRECT SUPERVISION OF A PROFESSIONAL ENGINEER REGISTERED IN THE STATE OF TEXAS. COMPLETE SHOP DRAWINGS FOR CONSTRUCTION OF ALL APPLICABLE SPECIALTY ITEMS INCLUDING BUT NOT LIMITED TO AWNINGS, STOREFRONT, AND LIGHT GAUGE STEEL FRAMING SHALL BE SEALED AND SIGNED BY A PROFESSIONAL ENGINEER LICENSED IN THE STATE OF TEXAS AND SHALL BE AVAILABLE AT THE JOB SITE DURING TIMES OF INSPECTION. SHOP DRAWING SUBMITTALS SHALL BE SUBMITTED VIA E-MAILED ELECTRONIC FILES THAT ARE IN PDF FORMAT OR CAN BE EASILY CONVERTED INTO PDF FORMAT.

5. SHOP DRAWINGS FOR THE FOLLOWING BUILDING COMPONENTS NOT SPECIFIED ON THE PROJECT CONSTRUCTION DOCUMENTS APPROVED FOR BUILDING PERMIT SHALL BE SEALED AND SIGNED BY A PROFESSIONAL ENGINEER REGISTERED IN THE STATE OF TEXAS AND SUBMITTED TO COUNTY BUILDING PLAN REVIEW FOR REVIEW AFTER APPROVAL BY THE PROJECT ENGINEER OF RECORD:

   - AWNINGS/CANOPIES, INCLUDING ATTACHMENT DETAILS TO SUPPORTING MEMBERS
   - LIGHT GAUGE METAL STUDS, INCLUDING ATTACHMENT DETAILS TO SUPPORTING MEMBERS
   - ANY ADDITIONAL ITEMS THAT REQUIRE STRUCTURAL DESIGN OF PROPRIETARY BLDG. COMPONENTS

6. SPECIAL INSPECTION REPORTS AND A FINAL BUILDING REPORT SHALL BE AVAILABLE AT THE TIME THE BUILDING IS APPROVED FOR OCCUPANCY.

7. CONTRACTOR SHALL VERIFY LOCATION OF ALL ROOF OPENINGS. ROOF OPENINGS GREATER THAN 12" DIAMETER (OR 12" SQUARE) SHALL BE FRAMED WITH ANGLES PER TYPICAL RTU FRAMING DETAIL. MIN. ANGLE SIZE TO BE L3x3x1/4. SEE TYPICAL RTU SUPPORT FRAME DETAIL AS REQUIRED AT OPENINGS & ROOF TOP UNITS.

BUILDING CODE REQUIREMENTS & DESIGN LOADS

1. THE 2018 EDITION OF THE INTERNATIONAL BUILDING CODE AND STATE AMENDMENTS SHALL APPLY.

2. GEOTECHNICAL DESIGN INFO:

   ALLOWABLE SOIL BEARING CAPACITY - 2000 PSF (ASSUMED)

3. DESIGN LOADS:

ROOF:
- DEAD - 12 P.S.F.
- LIVE - 20 P.S.F.

SNOW:
- GROUND SNOW LOAD, Pg 5 P.S.F.
- ROOF SNOW LOAD, Pm 10 P.S.F.
- SNOW EXPOSURE FACTOR, Ce 1.0
- SNOW LOAD IMPORTANCE FACTOR, Is 1.0
- THERMAL FACTOR, Ct 1.0

SEISMIC:
- RISK CATEGORY III
- SEISMIC IMPORTANCE FACTOR, Ie 1.25
- MAPPED SPECTRAL RESPONSE ACCELERATION PARAMETERS
  - Ss .105 g
  - S1 .057 g
- SITE CLASS D
- DESIGN SPECTRAL RESPONSE ACCELERATION PARAMETERS
  - Sds .112 g
  - Sd1 .091 g
- SEISMIC DESIGN CATEGORY B
- BASIC SEISMIC FORCE RESISTING SYSTEM -

  H-ROOM BUILDING
  ORDINARY REINFORCED MASONRY SHEAR WALLS
  R = 2.0 Ω = 2.5 Cd = 1.75
  SEISMIC RESPONSE COEFFICIENT Cs = .0448
  SEISMIC BASE SHEAR - V = .988 KIPS

ANALYSIS PROCEDURE USED - EQUIVALENT LATERAL FORCE

WIND LOADS AND DIAGRAMS FOR ASCE 7-16

WIND:
- ULTIMATE DESIGN WIND SPEED (3 SEC GUST), Vult - 111 MPH
- NOMINAL DESIGN WIND SPEED (3 SEC GUST), Vasd - 86 MPH
- RISK CATEGORY III
- WIND EXPOSURE C
- APPLICABLE INTERNAL PRESSURE COEFFICIENT - +/- 0.18

COMPONENTS AND CLADDING PRESSURES:
NOTE: ROOF PRESSURES SHOWN ARE BASED ON Vult. MULTIPLY PRESSURES BY 0.6 TO OBTAIN NOMINAL DESIGN PRESSURES. TO DETERMINE NET UPLIFT AT ROOF USE ROOF DEAD LOAD = 6 PSF (0.6* 10 PSF)

DIMENSION a = 15 FT.
DIMENSION 0.2H = 7.5 FT.
DIMENSION 0.6H = 23 FT.

ROOF PRESSURES/(SUCTION) PSF					
TRIB. AREA	10 FT^2	20 FT^2	50 FT^2	100 FT^2	500 FT^2
ZONE 1'	11/(-25)	11/(-25)	10/(-25)	9/(-25)	9/(-17)
ZONE 1	11/(-43)	11/(-40)	10/(-37)	9/(-34)	9/(-27)
ZONE 2	11/(-57)	11/(-53)	10/(-48)	9/(-45)	9/(-36)
ZONE 3	11/(-76)	11/(-70)	10/(-60)	9/(-53)	9/(-36)

WALL PRESSURES/(SUCTION) PSF					
TRIB. AREA	10 FT^2	20 FT^2	50 FT^2	100 FT^2	500 FT^2
ZONE 4	25/(-27)	24/(-26)	22/(-25)	21/(-23)	19/(-21)
ZONE 5	25/(-33)	24/(-31)	22/(-28)	21/(-26)	19/(-21)

CONCRETE DRILLED PIER NOTES:

1. ALL AUGER CAST-IN-PLACE PIERS SHALL BE DRILLED SO THAT THE PIERS BEAR PAST THE UPPER HIGHLY PLASTIC SOILS OR AT LEAST 13'-0" BELOW FINISHED GRADE, WHICHEVER WOULD PROVIDE THE LOWER BEARING LEVEL AND SHALL BE EXPECTED TO HAVE AN ALLOWABLE BEARING CAPACITY OF 3,000 P.S.F. THE PIERS SHOULD BE UNDERREAMED SO THAT THE UNDERREAMED PORTION HAS A DIAMETER BETWEEN 2 AND 3 TIMES THE SHAFT DIAMETER. SEE PLAN FOR BELLED DIMENSIONS.
2. CONTINUOUS MONITORING OF THE PIER INSTALLATION BY THE GEOTECHNICAL ENGINEER IS RECOMMENDED IN GENERAL ACCORDANCE WITH THE GUIDELINES PRESENTED IN THE "INSPECTORS" GUIDE TO AUGERED CAST-IN-PLACE PIERS" PREPARED BY THE DEEP FOUNDATIONS INSTITUTE.
3. ALL DRILLED PIER BEARING SURFACES AND CAPACITIES SHALL BE REVIEWED BY THE GEOTECHNICAL ENGINEER PRIOR TO PLACING CONCRETE TO ENSURE THEIR COMPLIANCE WITH PRESSURES NOTED. ALL FOUNDATION ELEVATIONS ARE ESTIMATED AND MAY BE ADJUSTED IN THE FIELD BY THE GEOTECHNICAL ENGINEER.
4. CONCRETE SHALL BE PLACED IN A MANNER TO ENSURE THE EXCLUSION OF ANY FOREIGN MATTER AND TO SECURE A FULL-SIZED SHAFT. WHEN DEPOSITING CONCRETE FROM THE TOP OF THE PIER, THE CONCRETE SHALL NOT BE CHUTED DIRECTLY IN THE PIER BUT SHALL BE POURED IN A RAPID AND CONTINUOUS OPERATION THROUGH A FUNNEL HOPPER CENTERED AT THE TOP OF THE PIER.

MASONRY NOTES:

1. MASONRY SHALL BE NORMAL WEIGHT AND HAVE A MINIMUM COMPRESSIVE STRENGTH (f'm) OF 2000 PSI BASED ON NET AREA. MORTAR SHALL CONFORM TO ASTM C270 TYPE S OR M. GROUT SHALL CONFORM TO ASTM C476, WITH A MAXIMUM AGGREGATE SIZE OF 3/8" AND MINIMUM COMPRESSIVE STRENGTH OF 3000 PSI.
2. ALL STEEL BAR REINFORCEMENT SHALL BE ASTM A-615, GRADE 60.
3. REINFORCED FILLED CELLS IN CONCRETE MASONRY UNITS (C.M.U.) SHALL BE LOCATED AS NOTED ON THE FOUNDATION PLAN SHEET OR TYPICAL DETAILS. ALL C.M.U. WALLS WHICH CONTAIN FILLED CELLS SHALL BE LAID-UP IN A RUNNING BOND PATTERN. SEE SHEET S1.5 FOR FILLED CELL DETAILS.
4. CONTRACTOR SHALL PROVIDE STANDARD GAUGE "DUR-O-WAL" OR EQUIVALENT (JOINT REINFORCEMENT) AT 16" O.C. IN ALL C.M.U. WALLS UNLESS SPECIFICALLY NOTED OTHERWISE ON THE STRUCTURAL DRAWINGS. "DUR-O-WAL" SHALL BE PROVIDED IN A WIDTH APPROPRIATE FOR THE OVERALL TOTAL THICKNESS OF THE FINISHED WALL. PROVIDE "TRUSS-TYPE" JOINT REINFORCMENT TYP. AT C.M.U. WALLS WITH BRICK VENEER PROVIDE ADJUSTABLE ASSEMBLIES.
5. SEE ARCHITECTURAL ELEVATIONS FOR LOCATIONS OF VERTICAL MASONRY CONTROL JOINTS. HORIZONTAL REINFORCING SHALL BE STOPPED EITHER SIDE OF VERTICAL MASONRY CONTROL JOINTS. MAXIMUM SPACING IF NOT SHOWN ON ARCHITECTURAL ELEVATIONS SHALL BE 25'-0" O.C.
6. VERTICAL REINFORCING BARS SHALL HAVE A MINIMUM CLEARANCE OF 3/4" FROM THE MASONRY AND NOT LESS THAN ONE BAR DIAMETER BETWEEN BARS. USE BAR POSITIONERS PER MANUFACTURER'S INSTRUCTIONS TO MAINTAIN BAR POSITIONS DURING GROUTING.
7. VERTICAL CELLS THAT WILL BE GROUTED SHALL HAVE A VERTICAL ALIGNMENT TO MAINTAIN A CONTINUOUS UNOBSTRUCTED CELL AREA NOT LESS THAN 2-1/2" x 3".
8. GROUTING SHALL BE STOPPED 1-1/2" BELOW THE TOP OF A HORIZONTAL COURSE SO AS TO FORM A KEY AT THE POUR JOINT.
9. GROUTING OF MASONRY BOND BEAMS OVER OPENINGS SHALL BE DONE IN ONE CONTINUOUS OPERATION.
10. WALLS SHALL BE GROUTED USING LOW LIFT GROUTING TECHNIQUES.
11. REINFORCING BARS FOR ALL REINFORCED CMU FILLED CELLS SHALL BE LAPPED AS FOLLOWS:

BAR SIZE	LENGTH OF LAP
#4	3'-0"
#5	3'-9"
#6	4'-6"
#7	5'-3"
#8	6'-0"

12. FILLED CELLS SHALL BE CONTINUOUS FROM FOOTING TO TOP BOND BEAM COURSE OR UNDERSIDE OF BEAMS IN ANY GIVEN WALL SEGMENT. AT THE TOP OF BEAM BEARING FILLED CELLS, PROVIDE NON-SHRINK GROUT AND BEARING PLATE AS DETAILED WITH ANCHOR BOLTS OR CAST-IN-PLACE STUD ANCHORS. SEE MASONRY DETAILS.
13. ALL VERTICAL REINFORCEMENT IN FILLED CELLS SHALL BE DOWELED INTO FOOTING AT BOTTOM AND BOND BEAM COURSE AT TOP. THESE DOWELS SHALL BE OF EQUAL SIZE AND QUANTITY AS VERTICAL BAR REINFORCEMENT AND SHALL HAVE A STND. HOOK INTO EITHER FOOTING OR BOND BEAM. VERTICAL DOWELS SHALL EXTEND INTO WALL ABOVE FTG. PER HOOKED BAR SCHEDULE. SEE WALL SECTIONS FOR ADD'L. INFORMATION.
14. MASONRY CONSTRUCTION SHALL CONFORM TO ACI 530.1, CURRENT EDITION. PROVIDE MASONRY INSPECTIONS PER ACI 530. CAVITIES SHALL BE KEPT FREE OF MORTAR.

STEEL JOIST & JOIST GIRDER NOTES:

1. STEEL JOISTS AND JOIST GIRDERS SHALL BE DESIGNED BY THE MANUFACTURER. THE MANUFACTURER'S ENGINEER SHALL BE RESPONSIBLE FOR THE DESIGN, ADEQUACY, AND SAFETY OF ALL STEEL JOISTS AND JOIST GIRDERS.
2. UNLESS OTHERWISE NOTED, STEEL JOISTS AND JOIST GIRDERS SHALL BE DESIGNED AS SIMPLY SUPPORTED TRUSSES LOADED PER THE DESIGN LOADS AS SHOWN ON THE GENERAL NOTES. THE LOAD COMBINATIONS IN SECTION 1605 OF THE INTERNATIONAL BUILDING CODE SHALL APPLY.
3. JOIST & JOIST GIRDER DESIGNATIONS SHOWN ON FRAMING PLANS ARE TO BE CONSIDERED THE MINIMUM SIZES. THE MANUFACTURER'S ENGINEER SHALL BE RESPONSIBLE FOR THE FINAL DESIGN, LAYOUT, AND CONFIGURATION FOR THE JOISTS AND JOIST GIRDERS. THE DEPTHS OF THE MEMBERS SHOWN ARE TO BE USED FOR THE MANUFACTURER'S ENGINEERING DESIGN. IF THE DEPTH OF THE JOIST OR JOIST GIRDER MUST BE INCREASED PLEASE CONTACT THE ARCHITECT AND ENGINEER IMMEDIATELY.
4. MINIMUM BEARING FOR K-SERIES JOISTS, UNLESS NOTED OTHERWISE, SHALL BE AS FOLLOWS:
   2-1/2" ON ALL STRUCTURAL STEEL
   4" ON STEEL BEARING PLATES OVER MASONRY OR CONCRETE
5. MINIMUM BEARING FOR LH-SERIES JOISTS, UNLESS NOTED OTHERWISE, SHALL BE AS FOLLOWS:
   4" ON ALL STRUCTURAL STEEL
   6" ON STEEL BEARING PLATES OVER MASONRY OR CONCRETE
6. UNLESS NOTED OTHERWISE, K-SERIES STEEL JOISTS SHALL BE ATTACHED TO SUPPORTING STEEL WORK OR STEEL BEARING PLATE WITH (2)-1/8" FILLET WELDS (ONE EA. SIDE), 2" LENGTH MIN., OR WITH (2)-1/2" DIAMETER BOLTS (ONE EA. SIDE).
7. UNLESS NOTED OTHERWISE, LH-SERIES STEEL JOISTS SHALL BE ATTACHED TO SUPPORTING STEEL WORK OR STEEL BEARING PLATE WITH (2)-1/4" FILLET WELDS (ONE EA. SIDE), 2" LENGTH MIN., OR WITH (2)-3/4" DIAMETER BOLTS (ONE EA. SIDE).
8. STEEL JOISTS AT COLUMN CENTER LINES SHALL BE BOLTED TO STRUCTURAL STEEL PER NOTES ABOVE.
9. HOLES IN STEEL JOIST CHORDS WILL NOT BE PERMITTED, EXCEPT FOR BOLTED CONNECTIONS AT THE BEARING END OF THE STEEL JOIST.
10. SEE STRUCTURAL DETAILS FOR SUPPLEMENTAL WEB REINFORCEMENT OF JOISTS WHERE CONCENTRATED LOADS ARE NOT APPLIED AT PANEL POINTS.
11. JOIST BRIDGING HAS NOT BEEN SHOWN ON PLANS. JOIST BRIDGING QUANTITIES, SIZES AND CONNECTIONS SHALL BE AS PER THE STEEL JOIST INSTITUTE SPECS. AND SHALL BE SHOWN IN DETAIL ON THE JOIST SUPPLIER'S SHOP DRAWINGS.
12. JOIST MANUFACTURER SHALL COMPENSATE FOR LOADS IMPOSED BY ROOF TOP UNITS (RTU) BY PROVIDING SPECIAL JOISTS AT THESE LOCATIONS. IF RTU LOADS ARE NOT STATED ON THE ROOF FRAMING PLANS, THEY SHALL BE PROVIDED BY THE ARCHITECT OR MECHANICAL ENGINEER. SEE SHEET TYPICAL RTU SUPPORT FRAME, REQUIRED AS SUPPORT FOR ROOF TOP UNITS.

METAL DECK NOTES:

1. ROOF DECK SHALL BE 1 1/2" DEEP WIDE RIB STEEL ROOF DECK, TYPE B - U.N.O. AND SHALL BE ATTACHED TO SUPPORTING MEMBERS AND CHORD ANGLES AND/OR PLATES IN ACCORDANCE WITH THE ATTACHMENT PATTERN STATED ON FRAMING PLANS. DECK SHALL BE CONTINUOUS OVER (3) SPANS MINIMUM. ATTACHMENTS AT PERIMETER ARE NOT TO EXCEED THE LESSER OF THE ATTACHMENT PATTERN SHOWN OR 6". ROOF DECK SHALL BE PAINTED AND/OR PRIMED WHITE PER ARCH./OWNER SPECIFICATIONS.
2. SUBMIT PLACEMENT AND DETAILED SHOP DRAWINGS FOR REVIEW. NO STEEL DECK SHALL BE INSTALLED UNTIL THE SHOP DRAWINGS HAVE BEEN REVIEWED AND RETURNED.
3. DO NOT HANG OR SUPPORT ANY LOADS FROM THE METAL DECK.
4. THE METAL DECK FASTENERS SPECIFIED ON THE FRAMING PLANS ARE THE DESIGN BASIS FOR THIS PROJECT. SUBSTITUTION REQUESTS FOR FASTENERS OTHER THAN THOSE LISTED MAY BE SUBMITTD BY THE CONTRACTOR TO THE E.O.R. FOR REVIEW. SUBSTITUTIONS WILL ONLY BE CONSIDERED FOR PRODUCTS THAT MEET THE CODE REQUIREMENTS FOR DECK ATTACHMENT, POSSESS A FM GLOBAL APPROVAL AND POSSESS A CODE REPORT RECOGNIZING THE FASTENERS FOR THE APPROPRIATE APPLICATION. SUBSTITUTION REQUESTS SHALL INCLUDE CALCULATIONS THAT DEMONSTRATE THE VALUES OF THE DESIGN BASIS FASTENER. CONTRACTOR SHALL CONTACT MANUFACTURER'S REPRESENTATIVE FOR FASTENER INSTALLATION TRAINING AND A LETTER TO THE SHALL BE SUBMITTED TO THE E.O.R. INDICATING TRAINING HAS TAKEN PLACE. REFER TO THE BUILDING CODE AND MANUFACTURER'S LITERATURE FOR ANY OTHER REQUIREMENTS. FASTENERS SHALL BE COLLATED AND INSTALLED USING THE MANUFACTURER'S DELIVERY TOOL AND FOLLOWING MANUFACTURER'S INSTRUCTIONS. REFER TO THE PLAN NOTES, DETAILS, OR SCHEDULES FOR THE SPECIFIC FASTENER PATTERN FOR VARIOUS ZONES OF THE DECK.

POST INSTALLED ANCHOR NOTES:

1. POST-INSTALLED ANCHORS SHALL ONLY BE USED WHERE SPECIFIED ON THE CONSTRUCTION DOCUMENTS. THE CONTRACTOR SHALL OBTAIN APPROVAL FROM THE ENGINEER-OF-RECORD PRIOR TO INSTALLING POST-INSTALLED ANCHORS IN PLACE OF MISSING OR MISPLACED CAST-IN-PLACE ANCHORS. CARE SHALL BE TAKEN IN PLACING POST-INSTALLED ANCHORS TO AVOID CONFLICTS WITH EXISTING REBAR. HOLES SHALL BE DRILLED AND CLEANED IN ACCORDANCE WITH THE MANUFACTURER'S WRITTEN INSTRUCTIONS. SUBSTITUTION REQUESTS, FOR PRODUCTS OTHER THAN THOSE SPECIFIED, SHALL BE SUBMITTED BY THE BY THE CONTRACTOR TO THE ENGINEER-OF-RECORD ALONG WITH CALCULATIONS AND DOCUMENTATION THAT ARE PREPARED & SEALED BY A REGISTERED PROFESSIONAL ENGINEER. THE CALCULATIONS SHALL DEMONSTRATE THAT THE SUBSTITUTED PRODUCT IS CAPABLE OF ACHIEVING THE PERTINENT EQUIVALENT PERFORMANCE VALUES (MINIMUM) OF THE SPECIFIED PRODUCT USING THE APPROPRIATE DESIGN PROCEDURE AND/OR STANDARD(S) AS REQUIRED BY THE BUILDING CODE. ALL POST-INSTALLED ANCHORS SHALL POSSESS A BUILDING CODE REPORT RECOGNIZING THE ANCHORS FOR THE APPROPRIATE APPLICATION.
2. EXPANSION BOLTS AND/OR SLEEVE ANCHORS ARE NEVER TO BE PERMITTED AS A SUBSTITUTE FOR CAST-IN-PLACE ANCHOR BOLTS WHERE CAST-IN-PLACE BOLTS HAVE BEEN SHOWN ON THE DRAWINGS.

STEEL NOTES:

1. THE STEEL STRUCTURE IS A NON-SELF SUPPORTING STEEL FRAME AND IS DEPENDENT UPON DIAPHRAGM ACTION OF THE ROOF DECK AND ATTACHMENT TO THE STRUCTURE FOR STABILITY AND RESISTANCE TO WIND AND SEISMIC FORCES. PROVIDE ALL TEMPORARY SUPPORTS REQUIRED FOR STABILITY AND RESISTANCE TO THESE FORCES UNTIL THESE ELEMENTS ARE COMPLETE AND CAPABLE OF PROVIDING THIS SUPPORT.
2. ALL STRUCTURAL STEEL SHALL BE PROVIDED AS FOLLOWS:

W SHAPES (ASTM A992)	50 KSI YIELD
RECTANGULAR/SQUARE HSS SHAPES (ASTM A500 GR.B)	46 KSI YIELD
ROUND HSS SHAPES (ASTM A500 GR. B)	42 KSI YIELD
STEEL PIPES (ASTM A53 GR. B)	35 KSI YIELD
COLUMN BASE PLs (A36)	36 KSI YIELD
WHERE NOTED AS ASTM A572	50 KSI YIELD
OTHER STRUCTURAL STEEL U.N.O. (A36)	36 KSI YIELD

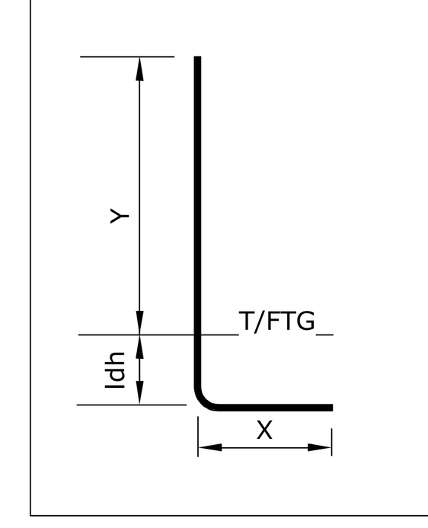
3. ALL STRUCTURAL FASTENERS SHALL BE PROVIDED AS FOLLOWS:

BOLTED CONNECTIONS IN STEEL FRAMEWORK U.N.O.	ASTM A325N
CARBON AND ALLOY NUTS	ASTM A563
HARDENED STEEL WASHERS	ASTM F-436
COMPRESSIBLE-WASHER-TYPE DIRECT TENSION INDICATORS	ASTM F959
HEADED SHEAR STUDS	ASTM A108
THREADED RODS, U.N.O.	ASTM A36
ANCHOR RODS, U.N.O.	ASTM F1554, GR 36

4. SEE COLUMN BASE PLATE DETAILS FOR SIZES AND LAYOUT OF ALL BASE PLATES. COLUMN BASE PLATES SHALL BE ANCHORED TO THE FOOTING BELOW USING HEX HEAD ANCHOR RODS U.N.O. AT DIAMETERS AND GRADES AS SPECIFIED. PROVIDE ANCHOR EMBED. INTO FOOTING PER COLUMN BASE PLATE DETAILS.
5. COLUMN BASE PLATE GROUT SHALL BE NON-SHRINK WITH A MINIMUM 7 DAY COMPRESSIVE STRENGTH OF 3000 PSI. EXPOSED GROUT SHALL BE NON-STAINING.
6. ALL WELDS SHALL BE MADE USING E-70 ELECTRODES.
7. UNLESS NOTED OTHERWISE IN THE DRAWINGS, ALL FILLET WELDS SHALL BE 3/16". MINIMUM LENGTH OF INTERMITTENT WELDS SHALL BE 1-1/2".
8. UNLESS OTHERWISE SHOWN, ALL W BEAM TO HSS COLUMN CONNECTIONS SHALL BE SINGLE-PLATE SHEAR CONNECTIONS PER TABLE 10-10a IN THE 14TH EDITION OF THE AISC STEEL CONSTRUCTION MANUAL.
   MIN. CONN PLATE = 3/8" THICK, A36
   MIN. BOLTS = 3/4" DIA. A325N (GROUP A)
   MIN. WELD = FILLET WELD BOTH SIDES OF CONN. PL - 5/8 x PLATE THICKNESS
10. UNLESS OTHERWISE SHOWN, ALL W BEAM TO W BEAM CONNECTIONS SHALL BE DOUBLE ANGLE BOLTED-BOLTED SHEAR CONNECTIONS PER TABLE 10-1 IN THE 14TH EDITION OF THE AISC STEEL CONSTRUCTION MANUAL. FABRICATOR MAY USE BOLTED/WELDED CONNECTIONS PER TABLE 10-2 IF PREFERABLE:
    MIN. ANGLE THICKNESS = 3/8" THICK, A36
    MIN. BOLTS = 3/4" DIA. A325N (GROUP A)
    MIN. WELD = BY FABRICATOR
11. TYP. AT ALL W BEAM CONNECTIONS PROVIDE MINIMUM # ROWS OF BOLTS AS FOLLOWS, U.N.O.:

BEAM SIZE	# BOLT ROWS
W8	2
W10	3
W12	3
W14	3
W16	4
W18	5
W21	6
W24	7
W27	7
W30	8
W33	9
W36	10
W40	11
W44	12

11. BOLTED CONNECTIONS SHALL BE ASSEMBLIED AND INSPECTED IN ACCORDANCE WITH RCSC-2009 (SPECIFICATIONS FOR STRUCTURAL JOINTS USING ASTM A325 OR ASTM A490 BOLTS).
12. ALL STRUCTURAL WELDED JOINTS SHALL CONFORM TO THE PROVISIONS OF AWS D1.1, STRUCTURAL WELDING CODE BY AMERICAN WELDING SOCIETY.
13. WELDS DESIGNATED AS DEMAND CRITICAL SHALL BE MADE WITH FILLER METALS MEETING THE REQUIREMENTS OF AWS D1.8 CLAUSE 6.3.
14. PROOF OF WELDER CERTIFICATION SHALL BE AVAILABLE AT THE JOB SITE DURING TIMES OF INSPECTION.
15. GRIND EXPOSED WELDS SMOOTH AND FLUSH, TO MATCH AND BLEND WITH ADJOINING SURFACES WHERE DEEMED NECESSARY FOR AESTHETIC PURPOSE BY ARCHITECT.
16. COAT ALL COLUMN BASES EXPOSED TO EARTH W/ BITUMASTIC COATING.
17. STRUCTURAL STEEL MEMBERS TO RECEIVE SPRAYED-ON FIREPROOFING OR BE ENCASED IN LIGHTWEIGHT CONCRETE SHALL NOT BE SHOP PRIMED OR PAINTED.
18. NO HOLES SHALL BE CUT IN ANY STEEL ELEMENT UNLESS DETAILED ON DRAWINGS.
19. OBTAIN ALL FIELD MEASUREMENTS REQUIRED FOR PROPER FABRICATION AND INSTALLATION PRIOR TO DETAILING. PRECISE MEASUREMENTS ARE THE RESPONSIBILITY OF THE CONTRACTOR.
21. PROVIDE STIFFENERS FINISHED TO BEAR UNDER ALL LOAD CONCENTRATIONS OF SUPPORTING MEMBERS, ON ALL MEMBERS FRAMING OVER COLUMNS, AT BEAM COLUMN JOINTS (AS REQUIRED BY AISC SPECIFICATIONS) AND WHERE SHOWN ON DRAWINGS.
22. THE FABRICATOR SHALL BE RESPONSIBLE FOR ALL ERRORS OF DETAILING ON THE SHOP DRAWINGS, ERRORS IN FABRICATION, AND CORRECT FITTING FOR STRUCTURAL STEEL MEMBERS.
23. WHERE PRACTICAL, UNLESS SHOWN DIFFERENTLY ON DRAWINGS, ALL BRACING CONNECTIONS SHALL BE DESIGNED AND DETAILED SO THAT ALL FORCE COMPONENTS CAN BE DELIVERED DIRECTLY TO THE CENTERLINE OF INTERSECTING MEMBERS. WHERE THIS IS NOT PRACTICAL, CONNECTIONS SHALL BE DESIGNED TO ACCOUNT FOR RESULTING ECCENTRICITIES.
24. STRUCTURAL STEEL EXPOSED TO EXTERIOR ENVIRONMENTAL CONDITIONS OR TO BE ENCASED IN CONCRETE SHALL BE GALVANIZED PER ASTM A123.
25. PROVIDE ONE SHOP COAT OF A RUST INHIBITIVE PRIMER (GREY) TO ALL STRUCTURAL STEEL MEMBERS, UNLESS GALVANIZED. DO NOT PAINT SURFACES TO BE WELDED, EMBEDDED IN CONCRETE OR MASONRY, OR CONTACT SURFACE OF FRICTION/SLIP CRITICAL CONNECTIONS.



HOOKED BAR SCHEDULE			
BAR SIZE	X	ldh	Y
#3	0'-6"	0'-6"	LAP SPLICE
#4	0'-8"	0'-8"	LAP SPLICE
#5	0'-10"	0'-10"	LAP SPLICE
#6	1'-0"	1'-0"	LAP SPLICE
#7	1'-2"	1'-2"	LAP SPLICE
#8	1'-4"	1'-4"	LAP SPLICE

CONCRETE LAP SPLICE SCHEDULE					
BAR SIZE	TENSION LAP SPLICE DIMENSION (IN)				COMPRESSION SPLICE
	f'c = 3000 psi		f'c = 4000 psi		
	OTHER	TOP BARS	OTHER	TOP BARS	
#3	22"	29"	19"	25"	12"
#4	29"	38"	25"	32"	15"
#5	36"	46"	31"	40"	19"
#6	43"	56"	38"	49"	23"
#7	63"	81"	55"	71"	27"
#8	72"	94"	63"	81"	30"
#9	81"	105"	70"	91"	34"

FOUNDATION NOTES:

1. ALL FOOTING EXCAVATIONS SHALL BE EVALUATED BY THE GEOTECHNICAL ENGINEER PRIOR TO THE PLACEMENT OF CONCRETE. CONTRACTOR SHALL EXERCISE CAUTION TO ENSURE THAT ALL RECOMMENDATIONS OF THE CIVIL AND SOILS ENGINEERS ARE FOLLOWED CLOSELY. FOR DETAILS OF FILL AND COMPACTION REQUIREMENTS, REFER TO CIVIL DRAWINGS AND THE GEOTECHNICAL SPECIFICATIONS.
2. TOP OF FOOTING ELEVATIONS SHALL BE AS SHOWN ON THE PLANS WITH VERTICAL CHANGES AS INDICATED WITH STEPS IN THE FOOTINGS. LOCATIONS OF STEPS SHOWN ARE APPROXIMATE AND SHALL BE COORDINATED WITH THE CIVIL GRADING PLANS TO ENSURE THAT THE EXTERIOR PERIMETER FOOTINGS BEAR NO LESS THAN 18 INCHES BELOW FINISH GRADE, OR AS OTHERWISE INDICATED BY THE GEOTECHNICAL ENGINEER OR BUILDING OFFICIAL.
3. EXCAVATION FOR FOOTINGS SHALL BE CUT TO ACCURATE SIZE AND DIMENSIONS AS SHOWN ON PLANS. ALL SOIL BELOW SLABS AND FOOTINGS SHALL BE PROPERLY COMPACTED AND SUBGRADE BROUGHT TO A REASONABLE TRUE AND LEVEL PLANE BEFORE PLACING CONCRETE.
4. IN AREAS OF THE BUILDING, EXISTING ORGANIC MATERIAL, UNSUITABLE SOIL, ABANDONED FOOTINGS, AND ANY OTHER EXISTING UNSUITABLE MATERIALS SHALL BE REMOVED. ANY FILL MATERIAL REQUIRED AT THE SITE SHALL BE OF A SIMILAR TYPE SOIL THAT IS PRESENT AT THIS SITE AND APPROVED BY THE GEOTECHNICAL ENGINEER. ROCKS GREATER THAN 6" SHALL BE EXCLUDED FROM STRUCTURAL FILL LIFTS. FILL MATERIAL SHALL BE PLACED IN LOOSE LIFTS NO GREATER THAN 12" IN DEPTH AND SHALL BE COMPACTED PER GEOTECHNICAL RECOMMENDATIONS. ADEQUATE FIELD DENSITY AND MOISTURE CONTENT TESTS SHALL BE PERFORMED TO ENSURE COMPLIANCE.
5. FOOTING CONCRETE SHALL BE CAST ON THE SAME DAY THE EXCAVATION IS APPROVED. IF THE BEARING SURFACE IS ALLOWED TO BECOME DISTURBED IN ANY WAY, IT SHALL BE REWORKED TO THE SATISFACTION OF THE TESTING ENGINEER PRIOR TO CASTING.
6. WHEN UNSATISFACTORY OR UNCONTROLLED FILL IS ENCOUNTERED, REMOVAL AND REPLACEMENT WILL BE PAID ON THE BASIS OF UNIT PRICES SET FORTH IN THE CONTRACT.
7. NO EXCAVATION SHALL BE CLOSER THAN AT A SLOPE OF 1.5:1 (H:V) TO A FOOTING. PROVIDE SHORING AND PROTECTION FOR EXCAVATION BANKS AS NECESSARY TO PRESERVE SAFETY AND PREVENT CAVING.
8. ALL BEARING STRATA SHALL BE ADEQUATELY DRAINED BEFORE FOUNDATION CONCRETE IS PLACED.
9. BACKFILL AGAINST WALLS SHALL BE PLACED IN 8" LIFTS AND SHALL BE DEPOSITED EVENLY AGAINST EACH SIDE OF WALL UNTIL THE LOWER FINAL GRADE IS REACHED. BACKFILL SHALL NOT BE PLACED AGAINST WALLS DEPENDENT UPON TOP AND BOTTOM SLABS/FOUNDATION FOR SUPPORT UNTIL SUCH SLABS HAVE ATTAINED MINIMUM DESIGN COMPRESSIVE STRENGTH. WALLS WITH SLAB ON GRADE ON TOP OF WALL SHALL BE SAFELY SHORED AND BRACED DURING BACKFILLING.
10. COLUMN FOOTINGS AND WALL FOOTINGS SHALL BE POURED MONOLITHIC WHERE TOPS OF ADJACENT FOOTINGS ARE AT THE SAME ELEVATION.

CONCRETE NOTES:

1. ALL CONCRETE SHALL HAVE A SLUMP OF 4" TO 6" AND MINIMUM 28 DAY COMPRESSIVE STRENGTHS AS FOLLOWS:

FOOTINGS	3000 P.S.I. (U.N.O.)
FOUNDATION WALLS & PIERS	3000 P.S.I.
SITE WALLS	3000 P.S.I.
SLAB ON GRADE	4000 P.S.I.
ELEVATED SLAB	3000 P.S.I.
TILT WALL PANELS	SEE TILT WALL PANEL NOTES

2. CONTRACTOR SHALL SUBMIT CONCRETE MIX DESIGNS FOR REVIEW WELL IN ADVANCE OF CONCRETE PLACEMENT. CONCRETE MIX DESIGNS SHALL INCLUDE ALL STRENGTH DATA NECESSARY TO SHOW COMPLIANCE WITH THE PROJECT SPECS BY EITHER THE TRIAL BATCH OR FIELD EXPERIENCE METHOD AND SHALL BE CERTIFIED BY A REGISTERED PROFESSIONAL ENGINEER.
3. AIR ENTRAINING AGENTS SHALL BE USED TO PRODUCE 3% TO 6% AIR BY VOLUME IN ALL CONCRETE EXCEPT INTERIOR SLABS ON GRADE. (3% MAX.)
4. UNLESS OTHERWISE SHOWN ON PLANS; MAINTAIN A MAXIMUM AREA BOUNDED BY THE SLAB CONTROL/CONSTRUCTION JOINTS OF 200 SQUARE FEET. THE MAXIMUM SIDE RATIO OF WHICH SHALL BE 1.5:1. SEE SLAB DETAILS FOR ADD'L. INFO.
5. SLAB-ON-GRADE SHALL BE SAWCUT PER SLAB DETAILS.
6. THE FLATNESS AND LEVELNESS OF THE SLAB-ON-GRADE SHALL BE DETERMINED ACCORDING TO ASTM E-1155 OR ACI 117, SLAB CLASS 5 (ACI 302) STANDARD TEST METHOD. SEE PLANS FOR FLATNESS AND LEVELNESS REQUIREMENTS.
7. ALL STEEL BAR REINFORCEMENT SHALL BE A.S.T.M. A-615, GRADE 60. TIES AND STIRRUPS MAY BE GRADE 40 AT CONTRACTOR'S OPTION. ALL BARS USED IN WELDED CAPACITIES SHALL BE A.S.T.M. A-706.
8. MAINTAIN MINIMUM CONCRETE COVERAGE FOR REINFORCING STEEL AS INDICATED UNLESS OTHERWISE NOTED IN THE DRAWINGS.
   A. 3" CLEAR WHERE CONCRETE IS DEPOSITED DIRECTLY AGAINST EARTH.
   B. 2" CLEAR WHERE CONCRETE IS EXPOSED TO EARTH OR WEATHER BUT CAST AGAINST FORMS FOR BARS #6 OR LARGER.
   C. 1 1/2" CLEAR WHERE CONCRETE IS EXPOSED TO EARTH OR WEATHER BUT CAST AGAINST FORMS FOR BARS #5 OR SMALLER.
   D. 3/4" CLEAR FOR SLABS AND WALLS FORMED ABOVE GRADE AND NOT EXPOSED TO WEATHER.
   E. 1 1/2" CLEAR FOR BEAMS AND COLUMNS FORMED ABOVE GRADE AND NOT EXPOSED TO WEATHER.
9. CONCRETE MIX DESIGN USED FOR SLAB-ON-GRADE SHALL MEET THE FOLLOWING REQUIREMENTS:
   A. MAXIMUM WATER TO CEMENT RATIO (w/c) SUCH THAT COMPRESSIVE STRENGTH IS ATTAINED.
   B. MAXIMUM AGGREGATE SIZE = 1 1/2"
   C. PROVIDE A CONCRETE MIX DESIGN WITH A MAXIMUM UNRESTRAINED SHRINKAGE STRAIN LESS THAN OR EQUAL TO 0.04% AT 28 DAYS PER ASTM 157 (MODIFIED).
   D. PROVIDE EITHER A MINIMUM OF 30 CONSECUTIVE TEST DATA OR TRIAL MIX DATA FOR THREE DIFFERENT WATER TO CEMENT RATIOS FOR APPROVAL PER ACI 318. APPROVAL PER MIX PROPORTIONS WILL NOT BE ACCEPTED.
   E. PROVIDE FIBER REINFORCEMENT PER MANUFACTURER INSTRUCTIONS (IF APPLICABLE).
   F. IF TEST DATA CANNOT BE PROVIDED TO SHOW MIX DESIGN MEETS OR EXCEEDS ASTM 157 REQUIREMENTS IN ITEM C, PROVIDE A MIX DESIGN TO MEET THE FOLLOWING REQUIREMENTS:
      i. NORMAL WEIGHT AGGREGATE SHALL BE UNIFORMLY GRADED FROM COARSEST TO FINESTWITH NOT MORE THAN 18% AND NOT LESS THAN 8% RETAINED ON AN INDIVIDUAL SIEVE, EXCEPT LESS THAN 8% MAY BE RETAINED ON COARSEST SIEVE AND ON NO. 50 SIEVE, AND LESS THAN 8% MAY BE RETAINED ON SIEVES FINER THAN NO. 50 SIEVE. A UNIFORMLY GRADED #467 COARSE AGGREGATE DISTRIBUTION WILL TYPICALLY CLOSELY ALIGN WITH THESE RECOMMENDATIONS.
10. FLY ASH MAY BE USED AS A DIRECT SUBSTITUTE FOR PORTLAND CEMENT. FLY ASH MUST CONFORM TO ALL ASPECTS OF ASTM C618-03 STANDARD SPECIFICATION FOR FLY ASH. CLASS F OR CLASS C FLY ASH MAY USED, HOWEVER, TOTAL LOSS OF IGNITION OF FLY ASH MUST BE 3% OR LESS. FLY ASH MAY BE SUBSTITUTED ON A 1:1 RATIO BY WEIGHT AND ONLY UP TO A 25% REDUCTION IN THE ORIGINAL CEMENT CONTENT. CONCRETE PROPORTIONS SHALL BE SELECTED ON THE BASIS OF TRIAL MIXES CONFORMING TO ACI 211.1.
11. CONCRETE TEST REPORTS SHALL BE AVAILABLE AT THE JOBSITE.
12. THE DESIGN OF CONCRETE STRUCTURAL ELEMENTS INCLUDING WALLS, FORMED SLABS, BEAMS AND COLUMNS SHALL BE IN ACCORDANCE WITH ACI 318-14.
13. WHERE FOOTINGS, WALLS, OR OTHER STRUCTURAL ELEMENTS INTERSECT, CORNER OR TEE, PROVIDE CORNER BARS WITH REQUIRED LAP LENGTHS TO PROVIDE CONTINUITY OF HORIZONTAL STEEL REINFORCING, U.N.O.
14. CHAMFER ALL CORNERS 3/4" TYP. U.N.O.

CONCRETE LAP SPLICE NOTES:

1. SCHEDULE "I" APPLIES FOR TENSILE LAPS OF THE FOLLOWING TYPES OF BARS,
   - BOTTOM HORIZONTAL BARS OF BEAMS, SLABS, JOISTS, AND WALLS.
   - TOP HORIZONTAL BARS OF SLABS 14" OR LESS IN DEPTH.
   - VERTICAL BARS.
2. SCHEDULE "II" APPLIES FOR TENSILE LAPS OF THE FOLLOWING TYPES OF BARS,
   - TOP HORIZONTAL BARS OF BEAMS AND JOISTS.
   - TOP HORIZONTAL BARS OF SLABS GREATER THAN 14" DEEP.
   - ALL HORIZONTAL WALL REINFORCEMENT (EXCEPT BOTTOM BARS).
3. SCHEDULE "III" APPLIES FOR ALL COMPRESSIONS LAPS.
4. ALL LAP SPLICES SHALL BE WIRED IN CONTACT.
5. ALL TENSILE LAP SPLICES SHALL BE "CLASS B" U.N.O. MAINTAIN 2" CLEAR TO MAIN BARS OF BEAMS AND COLUMNS
6. ALL SPLICES OF WALL AND SLAB REINFORCEMENT SHALL BE STAGGERED AS SHOWN.
7. THE SMALLER LAP SPLICE LENGTH MAY BE USED WHEN SPLICIING TWO DIFFERENT SIZE BARS FOR TENSION. THE LARGER LAP SPLICE LENGTH SHALL BE USED WHEN SPLICING TWO DIFFERENT SIZE BARS FOR COMPRESSION.
8. LAP LENGTH SPECIFICALLY CALLED OUT ELSEWHERE IN THE DRAWINGS SHALL GOVERN OVER LAP LENGTHS IN THIS SCHEDULE.
9. MECHANICAL BAR CONNECTORS THAT ARE 125% OR STRONGER THAN THE BARS BEING LAPPED MAY BE USED AT THE CONTRACTOR'S OPTION IN LIEU OF THE CONTACT LAP LENGTHS GIVEN.

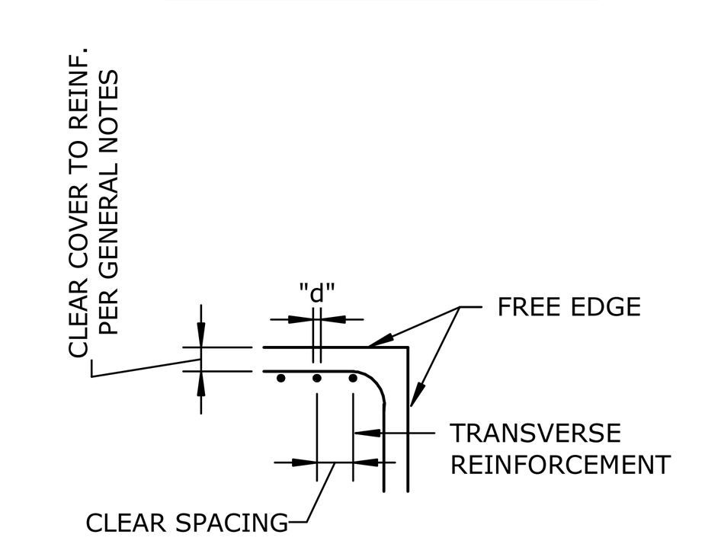
ADJUSTMENT(S) TO GIVEN LAP LENGTHS:

1. LAP LENGTHS GIVEN ARE FOR A CONCRETE COMPRESSIVE STRENGTH, f'c, OF 3000 P.S.I. IF A HIGHER STRENGTH CONCRETE IS USED, THE CONTRACTOR MAY REDUCE THE GIVEN TENSILE LAP LENGTHS BY THE FOLLOWING FACTORS:
   - f'c = 4000 P.S.I. MULTIPLY LAP LENGTH BY 0.86
   - f'c = 5000 P.S.I. MULTIPLY LAP LENGTH BY 0.77
2. IF REINFORCING IS SPECIFICED AS EPOXY COATED, INCREASE TENSILE LENGTHS BY 50%.
3. IF LIGHTWEIGHT AGGREGATE IS SPECIFIED, INCREASE TENSILE LENGTHS BY 30%.
4. LAP LENGTHS SCHEDULE ASSUMES:
   A. CLEAR COVER IS GREATER THAN BAR DIAMETER.
   B. CLEAR SPACING BETWEEN BARS IS GREATER THAN 2 BAR DIAMETERS.
   C. TRANSVERSE REINFORCEMENT INDEX, Ktr, IS ZERO.
   IF EITHER CONDITION A OR B IS NOT MET, FOR A GIVEN BAR, INCREASE THE SCHEDULED LAP LENGTH BY 50%.
5. LAP LENGTH SCHEDULED ARE FOR GR. 60 REINFORCEMENT (Fy = 60 K.S.I.). FOR OTHER STRENGTHS, MULTIPLY LAP LENGTHS BY Fy/60 (K.S.I.).

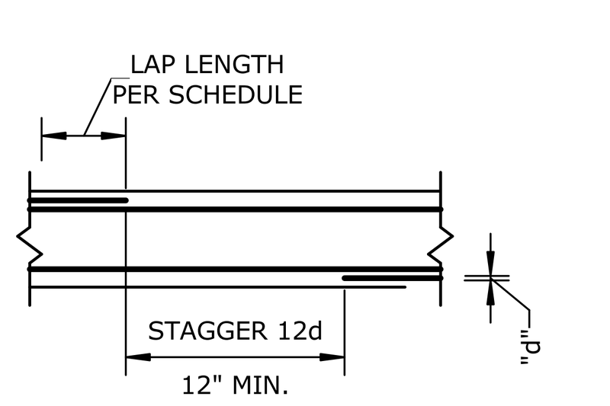
SCHEDULE I		
BAR SIZE	CLASS A	CLASS B
#3	17"	22"
#4	22"	29"
#5	28"	36"
#6	33"	43"
#7	48"	63"
#8	55"	72"
#9	62"	81"
#10	70"	91"
#11	78"	101"

SCHEDULE II		
BAR SIZE	CLASS A	CLASS B
#3	22"	28"
#4	29"	37"
#5	36"	47"
#6	43"	56"
#7	63"	81"
#8	72"	93"
#9	81"	105"
#10	91"	118"
#11	101"	131"

SCHEDULE III	
BAR SIZE	SPLICE LENGTH
#3	12"
#4	15"
#5	19"
#6	23"
#7	27"
#8	30"
#9	34"
#10	38"
#11	42"



TYPICAL REINFORCED CONCRETE MEMBER (SECTION)



WALL AND SLAB SPLICE DETAIL (PLAN OR ELEV.)

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GENERAL NOTES

Sheet No.
S0.1

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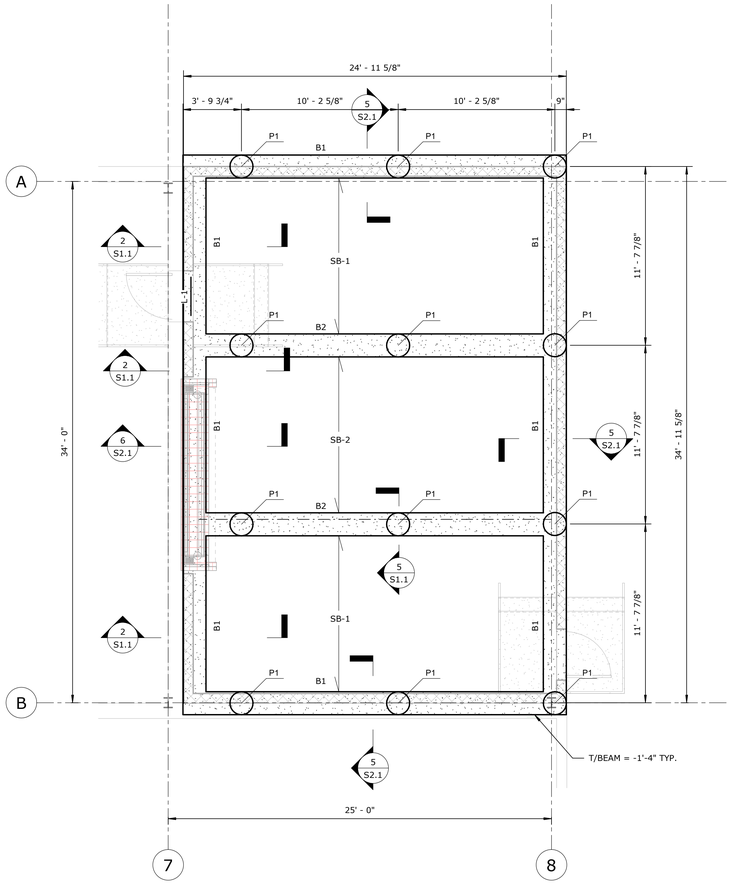


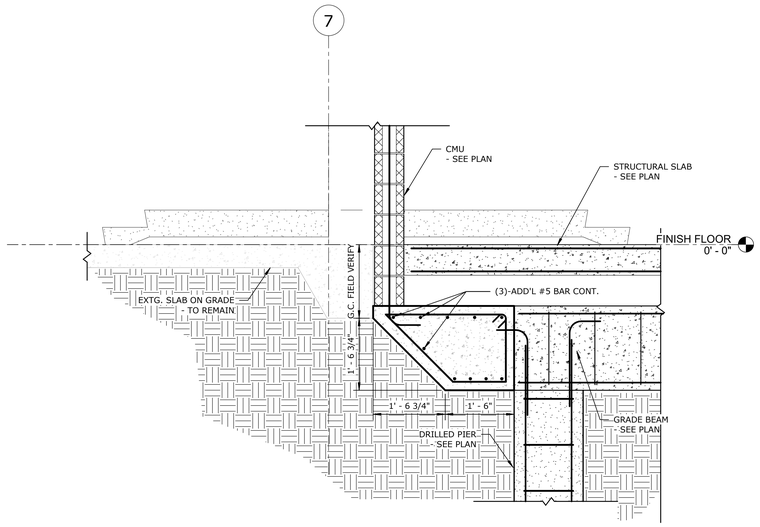
1 S1.1 STORAGE ROOM PARTIAL GRADE BEAM PLAN
SCALE: 1/4" = 1'-0"

LEGEND:

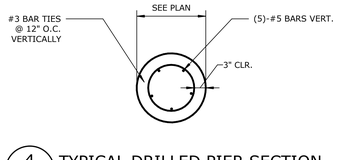
B# INDICATES GRADE BEAM TYPE. SEE SEHEET S2.3 FOR SCHEDULE.

SB-# INDICATES SLAB TYPE AND DIRECTION OF SPAN. SEE SHEET S2.3 FOR SCHEDULE.

P1 INDICATES A DRILLED PIER WITH A 1'-6" DIA. SHAFT AND A 6'-0" DIA. BELL (SEE SECTION 3/S1.1)

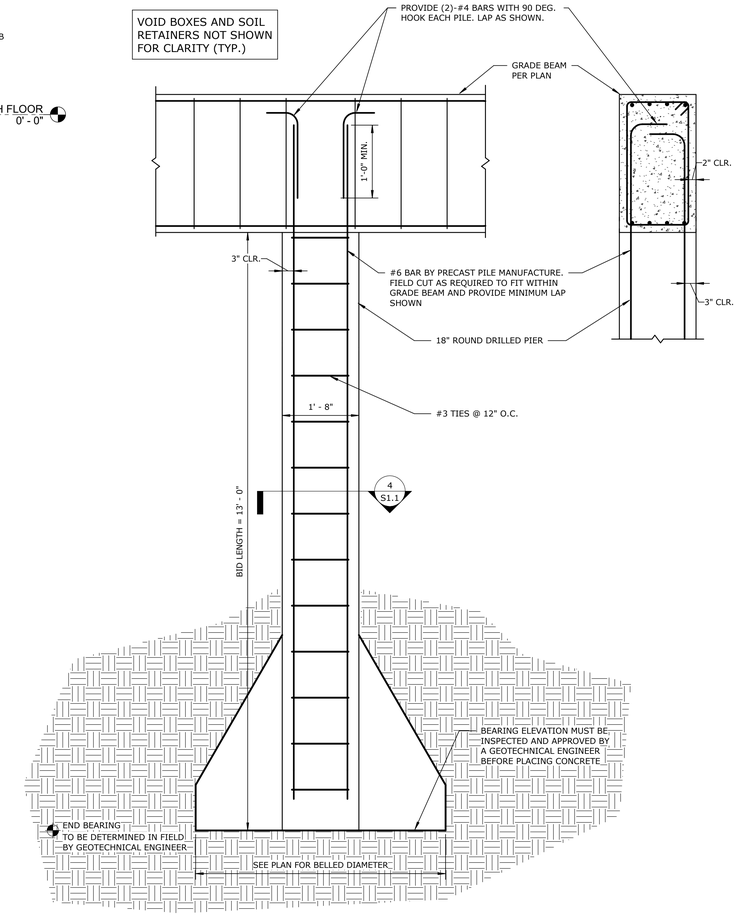


2 S1.1 SECTION
SCALE: 3/4" = 1'-0"

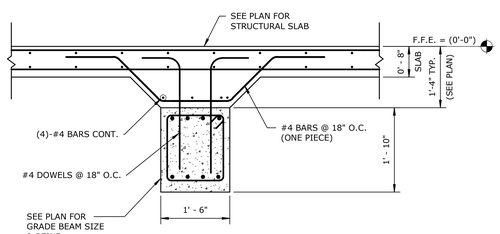


4 S1.1 TYPICAL DRILLED PIER SECTION
SCALE: 3/4" = 1'-0"

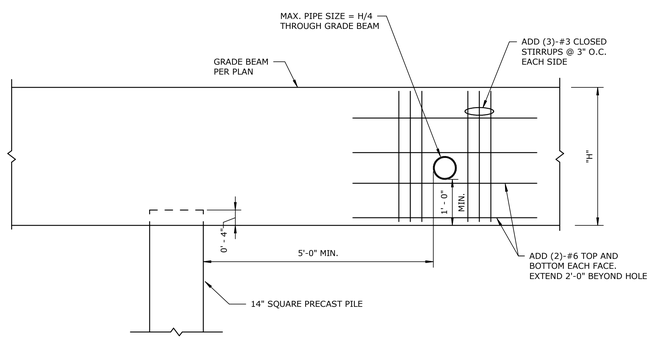
VOID BOXES AND SOIL RETAINERS NOT SHOWN FOR CLARITY (TYP.)



3 S1.1 TYPICAL PILE ELEVATION
SCALE: 3/4" = 1'-0"



5 S1.1 SECTION AT INTERIOR GRADE BEAM SUPPORT
SCALE: 3/4" = 1'-0"



NOTE: PILE / TYP. GRADE BEAM REINFORCEMENT NOT SHOWN FOR CLARITY

6 S1.1 PENETRATION THROUGH GRADE BEAM
SCALE: 3/4" = 1'-0"

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Sheet Title
GRADE BEAM PLAN & DETAILS

Sheet No. S1.1

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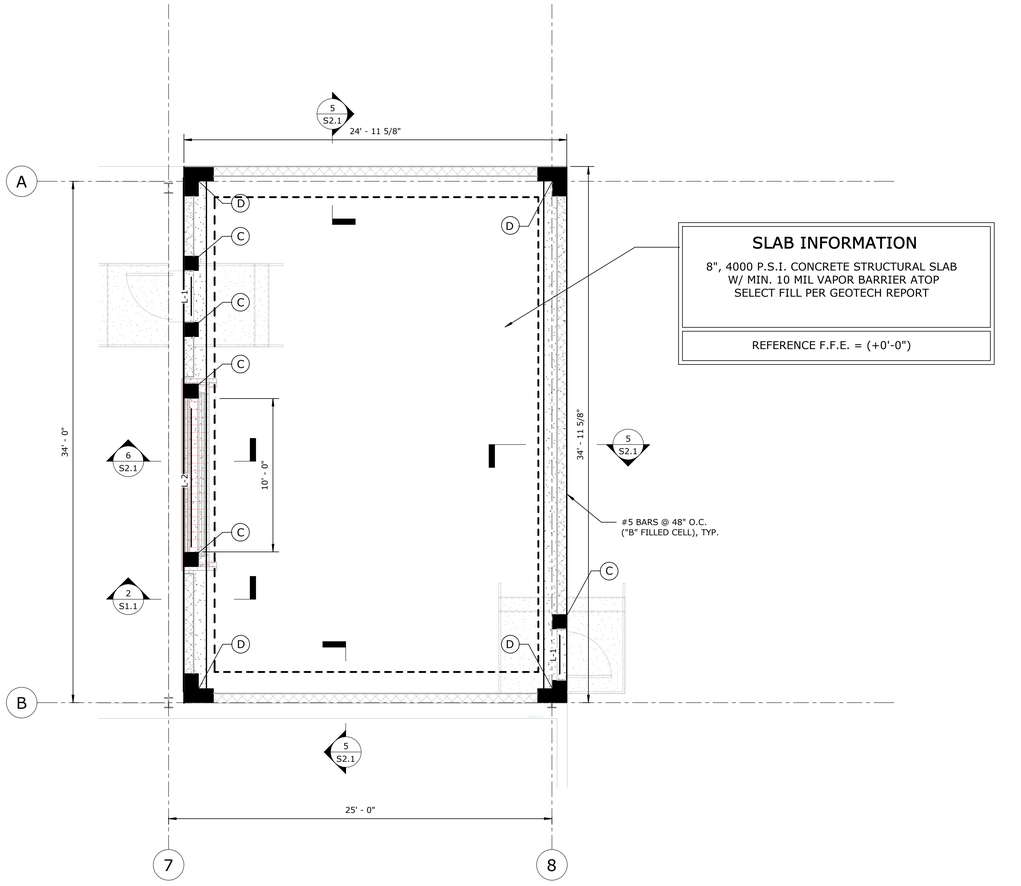


SLAB INFORMATION

8", 4000 P.S.I. CONCRETE STRUCTURAL SLAB
W/ MIN. 10 MIL VAPOR BARRIER ATOP
SELECT FILL PER GEOTECH REPORT

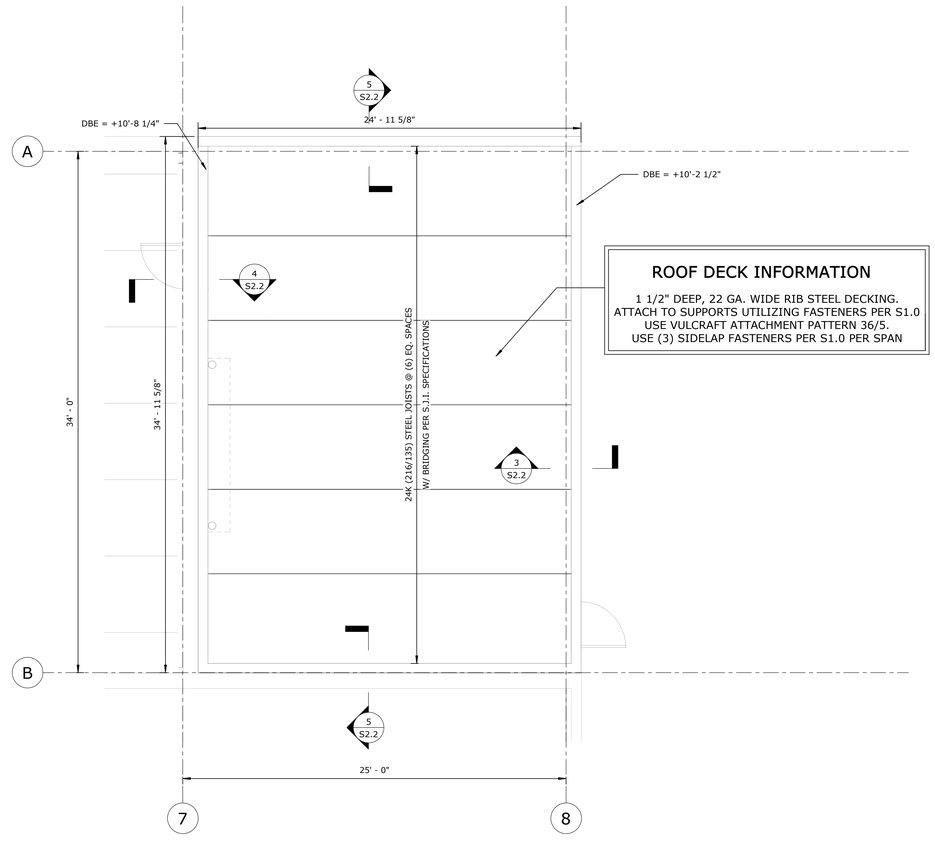
REFERENCE F.F.E. = (+0'-0")

1 S1.2 STORAGE ROOM PARTIAL FOUNDATION PLAN

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

FOUNDATION PLAN NOTES:

1. L-"x" - SEE LINTEL DETAILS ON S2.2 FOR LINTEL SIZES AND DETAILS.
2. SEE SHEET S2.2 FOR ALL FILLED CELL DETAILS.
3. SEE ARCHITECTURAL ELEVATIONS FOR EXACT MASONRY C.J. LOCATIONS.
4. SEE S2.1 FOR SLAB REINFORCEMENT DETAILS.
5. GROUT FILL ALL CELLS BELOW GRADE.
6. SEE ARCH. FOR ALL DIMENSIONS NOT SHOWN. VERIFY DIMENSIONS SHOWN W/ ARCH. DWGS.
7. REFER TO ARCHITECTURAL AND CIVIL DRAWINGS FOR LOCATIONS OF MISTURE BARRIER, CURBS, EXTERIOR SLABS, DRAINAGE,RAMPS, STEPS, WALKS, UTILITY, ETC.
8. EXISTING BUILDING WALLS AND SLAB-ON-GRADE NEED TO BE FIELD VERIFIED PRIOR TO FABRICATION.



ROOF DECK INFORMATION

1 1/2" DEEP, 22 GA. WIDE RIB STEEL DECKING.
ATTACH TO SUPPORTS UTILIZING FASTENERS PER S1.0
USE VULCRAFT ATTACHMENT PATTERN 36/5.
USE (3) SIDELAP FASTENERS PER S1.0 PER SPAN

2 S1.2 STORAGE ROOM PARTIAL ROOF FRAMING PLAN

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

ROOF FRAMING PLAN NOTES:

1. D.B.E. - INDICATES DECK BEARING ELEVATION IN RELATION TO F.F.E.
2. ALL LOADS SHOWN ARE ALLOWABLE (ASD) LEVEL SERVICE LOADS.
3. SEE GENERAL NOTES FOR UPLIFT PRESSURES FOR JOIST.
4. JOIST SIZES SHOWN ARE THE MINIMUM SIZE TO SUPPORT ROOF DEAD AND LIVE LOADS. PROVIDE SPECIAL JOISTS AT ROOF SUPPORTED EQUIPMENT USING WEIGHTS AND LOCATIONS SHOWN ON PLAN. STRUCTURAL PLANS REFLECT THE LATEST INFORMATION PROVIDED TO THE STRUCTURAL ENGINEER FOR ROOF SUPPORTED EQUIPMENT. JOIST MANUFACTURER TO COORDINATE WITH LATEST MECHANICAL DRAWINGS IF DIFFERENT THAN STRUCTURAL DRAWINGS.
5. SEE TYP. RTU FRAMING DETAIL FOR FRAMING AT RTUs & OTHER OPENINGS IN ROOF GREATER THAN 12" SQUARE OR DIAMETER.
6. ALL JOISTS SHALL HAVE BRIDGING PER S.J.I. SPECIFICATIONS. JOIST BRIDGING NOT SHOWN FOR CLARITY.
7. ALL ROOF CHORD ANGLES AND BENT PLs SHALL BE CONTINUOUS AROUND THE PERIMETER OF THE DECK. SEE TYPICAL ROOF CHORD ANGLE SPLICE DETAILS WHERE SPLICES ARE NECESSARY.

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STORAGE ROOM PLAN & DETAILS

Sheet No.
S1.2

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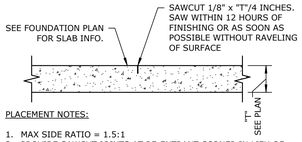
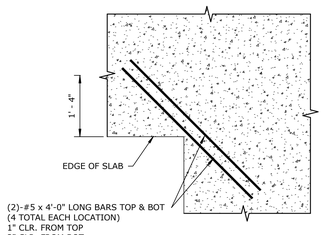


PLACEMENT NOTES:

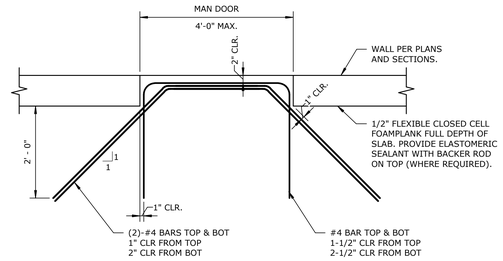
1. MAX SIDE RATIO = 1.5:1
2. PROVIDE SAWCUT JOINTS AT RE-ENTRANT CORNER IN LIEU OF SUPPLEMENTAL REINFORCEMENT, IF PREFERRED.
3. MAX SPACING (IN FEET) = 2.5 * SLAB THICKNESS (IN INCHES)
   MAX SPACING IN POURBACK STRIPS:
   4' STRIP = 6'-0"
   12' STRIP = 15'-0"

1 S2.1 TYPICAL SLAB CONTRACTION JOINT
SCALE: 3/4" = 1'-0"

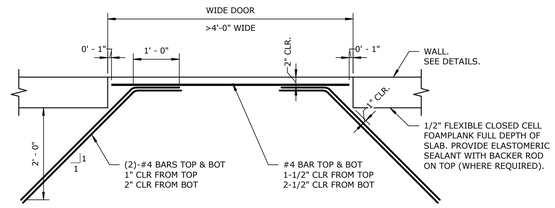


NOTE:
FOR SLABS LESS THAN 6" THICK THE BOTTOM BARS MAY BE ELIMINATED

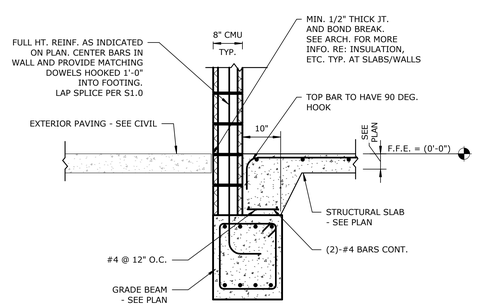
2 S2.1 RE-ENTRANT CORNER
SCALE: 3/4" = 1'-0"



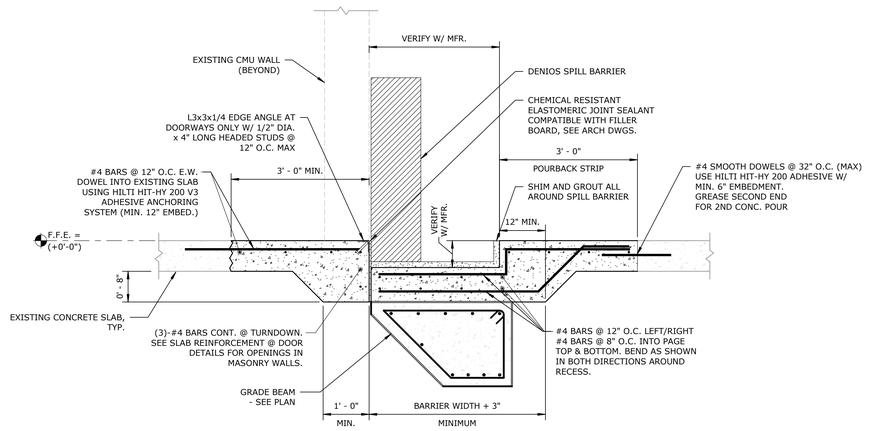
3 S2.1 MAN DOOR SLAB REINFORCEMENT
SCALE: 3/4" = 1'-0"



4 S2.1 WIDE DOOR SLAB REINFORCEMENT
SCALE: 3/4" = 1'-0"



5 S2.1 TYP. 8" CMU WALL - TURNDOWN
SCALE: 3/4" = 1'-0"



NOTE: DETAIL PROVIDED IS GENERIC AND MAY BE MODIFIED BASED ON ACTUAL SPILL BARRIER DIMENSIONS/SPECIFICATIONS

6 S2.1 TYPICAL SPILL BARRIER DETAIL
SCALE: 3/4" = 1'-0"

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Sheet No.: S2.1

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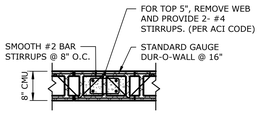
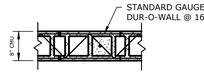
GENERAL NOTES CONCERNING FILLED CELLS

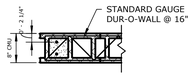
1. FILLED CELLS (CMU) SHALL BE CONTINUOUS FROM FOOTING TO TOP BOND BEAM COURSE IN ANY GIVEN WALL SEGMENT. AT DETAIL "A" FILLED CELLS ARE CONTINUOUS FROM FOOTING TO BEAM (OR GIRDER) BEARING. AT TOP OF FILLED CELL "A" PROVIDE NON-SHRINK GROUT AND BEARING PLATE AS DETAILED WITH ANCHOR BOLTS OR CAST-IN-PLACE STUD ANCHORS. EXPANSION BOLTS OR SLEEVE ANCHORS ARE NOT ALLOWED AS A SUBSTITUTE FOR CAST-IN-PLACE ANCHOR BOLTS WHERE CAST-IN-PLACE ANCHOR BOLTS ARE SHOWN ON THE DRAWINGS.
2. ALL VERTICAL REINFORCEMENT IN FILLED CELLS SHALL BE DOWELED INTO FOOTING AT BOTTOM AND BOND BEAM COURSE AT TOP. THESE DOWELS SHALL BE IN EQUAL QUANTITY AS VERTICAL BAR REINFORCEMENT AND SHALL HAVE A 1'-6" BEND INTO EITHER FOOTING OR BOND BEAM.
3. CONTRACTOR SHALL PROVIDE STANDARD GAUGE "DUR-O-WAL" (JOINT REINFORCEMENT) AT 16" O.C. IN ALL CMU WALLS UNLESS SPECIFICALLY NOTED OTHERWISE ON THE STRUCTURAL DRAWINGS.
4. CONTRACTOR SHALL PROVIDE SMOOTH #2 BAR STIRRUPS (AROUND VERTICAL REINFORCING) AT 16" O.C. IN DETAIL "A". THESE STIRRUPS SHALL BE IN MORTAR JOINTS ALTERNATING WITH "DUR-O-WAL".
5. REINFORCED MASONRY GROUT (R.M.G.) FOR FILLING CELLS IN CONCRETE MASONRY UNITS (VERTICAL FILLED CELLS AND BOND BEAMS) SHALL CONFORM TO "STANDARD SPECS FOR MORTAR AND GROUT FOR REINFORCED MASONRY", A.S.T.M. A-476-62, WITH A SLUMP OF BETWEEN 9" AND 11" AND PLACED NOT MORE THAN 2.5 HOURS AFTER WATER HAS BEEN FIRST ADDED, AND IN 4'-0" LIFTS (MAXIMUM) (1- PART CEMENT TO 2.5 PARTS FINE AGGREGATE BY VOLUME.) (3,000 P.S.I. AT 28 DAYS).
6. SEE GENERAL NOTES SHEET FOR VERTICAL CELL BARS LAPS.
7. BARS SHALL BE A.S.T.M. A-615, GRADE 60: EXCEPT TIES AND STIRRUPS, WHICH MAY BE GRADE 40.



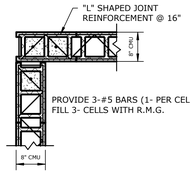
FILLED CELL DETAIL (A)
AT BEAM (OR GIRDER) BEARING



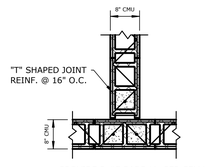
FILLED CELL DETAIL (B)
TYP. FILLED CELL



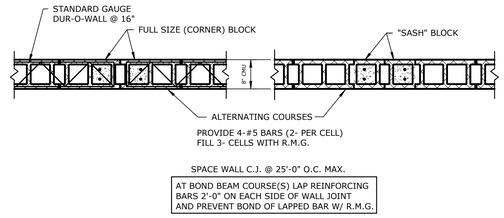
FILLED CELL DETAIL (C)
AT LINTELS/MASONRY OPENINGS



FILLED CELL DETAIL (D)
AT CORNERS

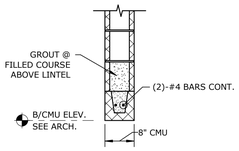


FILLED CELL DETAIL (E)
AT RIGID INTERSECTIONS



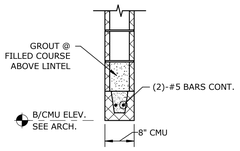
FILLED CELL DETAIL (F)
AT WALL CONTROL JOINT

1 S2.2 FILLED CELL DETAILS
SCALE: 3/4" = 1'-0"



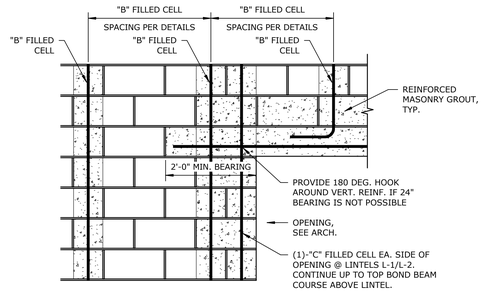
FOR SPANS UP TO 4'-0" IN 8" CMU; 2'-0" MIN. BEARING FOR ALL LINTELS

LINTEL TYPE L-1



FOR SPANS 4'-0" TO 10'-0" IN 8" CMU; 2'-0" MIN. BEARING FOR ALL LINTELS

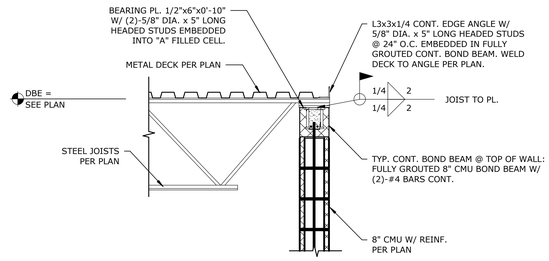
LINTEL TYPE L-2



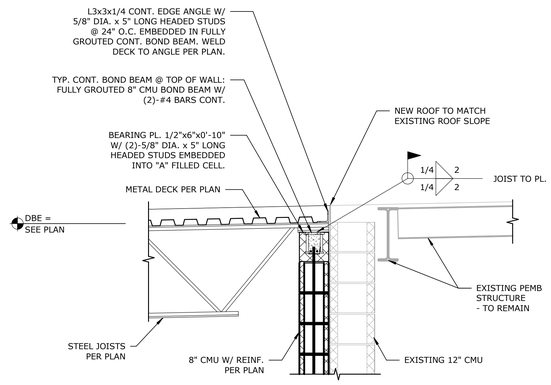
LINTEL L-1/L-2 BEARING ELEV.

AS AN ALTERNATE TO HEADED STUDS, GC OPTION TO EPOXY DOWEL RODS INTO CMU, FULLY WELD TO PLATE, AND GRIND SMOOTH

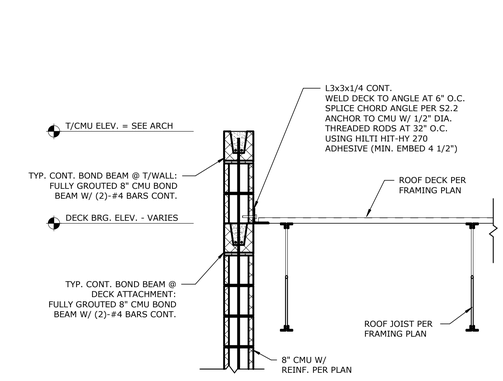
2 S2.2 FILLED CELL LINTELS
SCALE: 3/4" = 1'-0"



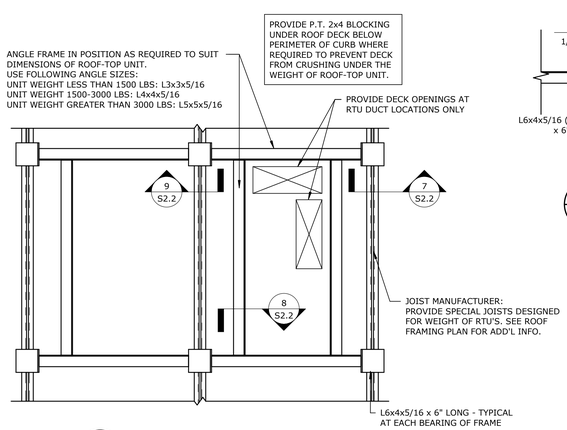
3 S2.2 SECTION @ PUMP/ELECTRICAL ROOM BEAM END
SCALE: 3/4" = 1'-0"



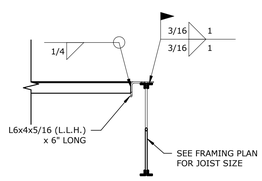
4 S2.2 SECTION @ PUMP/ELECTRICAL ROOM BEAM END
SCALE: 3/4" = 1'-0"



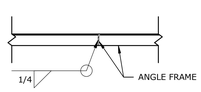
5 S2.2 SECTION @ PUMP/ELECTRICAL ROOM PERIMETER
SCALE: 3/4" = 1'-0"



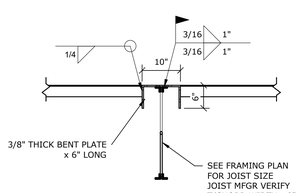
6 S2.2 TYPICAL R.T.U. SUPPORT FRAME
SCALE: 3/4" = 1'-0"



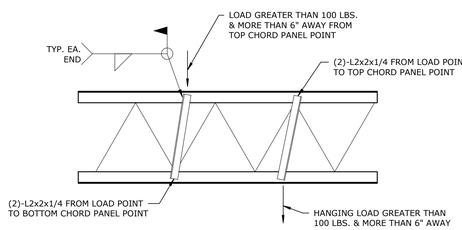
7 S2.2 SECTION
SCALE: 3/4" = 1'-0"



8 S2.2 SECTION
SCALE: 3/4" = 1'-0"



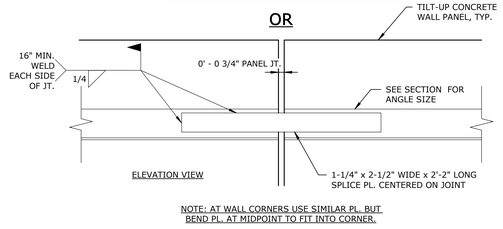
9 S2.2 SECTION
SCALE: 3/4" = 1'-0"



10 S2.2 TYPICAL JOIST WEB REINFORCEMENT DETAIL
SCALE: 3/4" = 1'-0"

CHORD MEMBERS TO BE CONTINUOUS. FIELD WELD USING FULL PENETRATION BUTT WELDS @ SPLICE LOCATIONS

OR



NOTE: AT WALL CORNERS USE SIMILAR PL. BUT BEND PL. AT MIDPOINT TO FIT INTO CORNER.

11 S2.2 TYPICAL CLOSURE ANGLE SPLICE
SCALE: 1 1/2" = 1'-0"

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A TENANT ADDITION

at

AT SRS DISTRIBUTION, INC. - ROCKWALL, TEXAS (H-ROOM)

for

SRS Distribution

2065 KRISTY LN
ROCKWALL, TEXAS 75032

Print Record		Drw.	Chk.
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Sheet Title
SECTIONS & DETAILS

Sheet No.
S2.2

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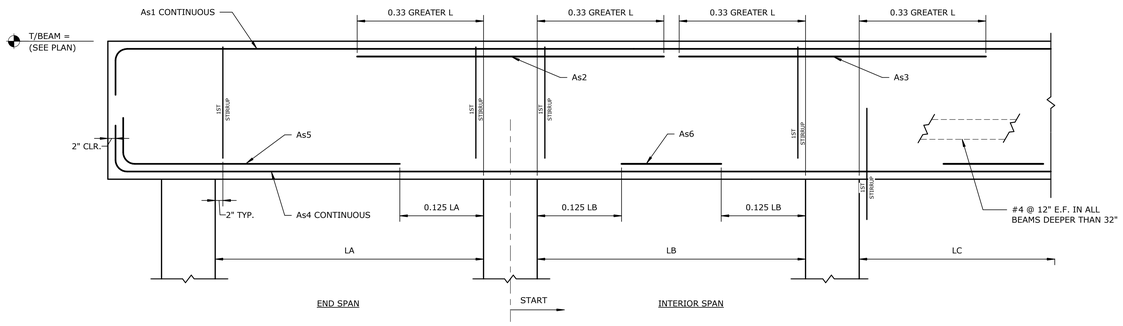
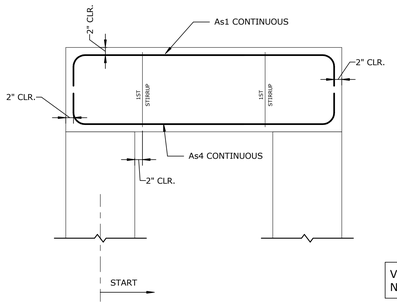
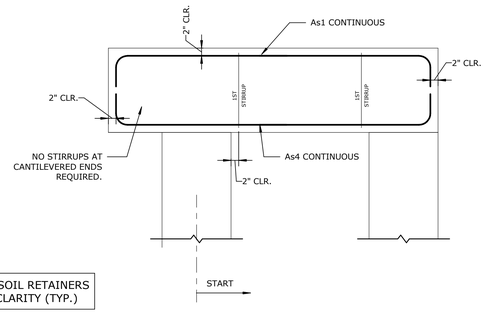




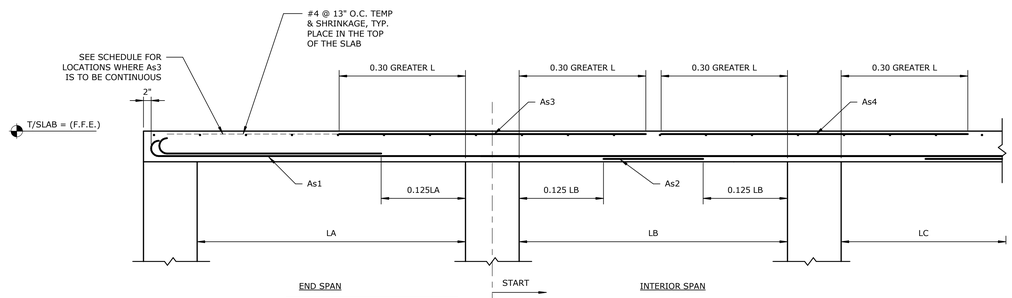


VOID BOXES AND SOIL RETAINERS NOT SHOWN FOR CLARITY (TYP.)

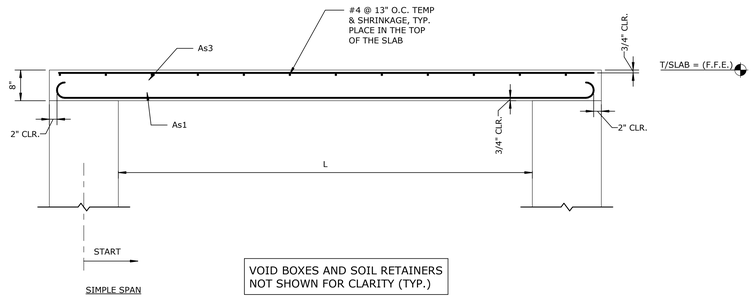
GRADE BEAM REINFORCEMENT SCHEDULE

MARK	SPAN TYPE	SIZE (W x D)	LONGITUDINAL REINFORCING						CLOSED STIRRUPS			NOTES
			A1	A2	A3	A4	A5	A6	LEFT END	INTERIOR	RIGHT END	
B1	END	18X22	4-#8	3-#8		4-#8	4-#5		#4 @ 8" O.C.	#4 @ 8" O.C.	#4 @ 8" O.C.	
B2	INTERIOR	18X22	4-#8			4-#8		2-#6	#4 @ 8" O.C.	#4 @ 8" O.C.	#4 @ 8" O.C.	

1 S2.3 BEAM LONGITUDINAL STEEL DIAGRAMS
SCALE: 3/4" = 1'-0"



1/4 OF THE MINIMUM BOTTOM STEEL AREA IN ANY ONE CONTINUOUS 2-SPAN OR MULTI-SPAN TO BE CONTINUOUS



VOID BOXES AND SOIL RETAINERS NOT SHOWN FOR CLARITY (TYP.)

ONE-WAY SLAB REINFORCEMENT SCHEDULE

MARK	SPAN TYPE	LONGITUDINAL REINFORCING				NOTES
		A1	A2	A3	A4	TOP STEEL TO BE CONTINUOUS
SB-1	END	#6 @ 8		#6 @ 8		
SB-2	INTERIOR		#6 @ 8	#6 @ 8	#6 @ 8	

2 S2.3 BEAM LONGITUDINAL STEEL DIAGRAMS
SCALE: 3/4" = 1'-0"

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Sheet Title: GRADE BEAM & SLAB SCHEDULES

Sheet No.: S2.3

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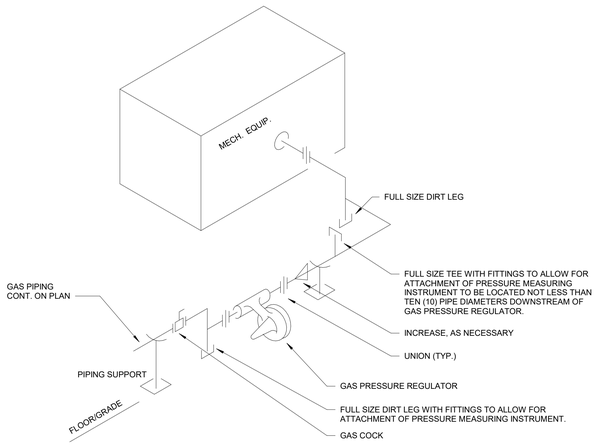
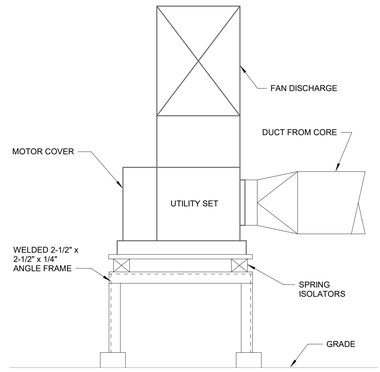


2 MECH - GAS CONNECTION DETAIL



1 UTILITY SET FAN DETAIL

ABBREVIATIONS

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

MECHANICAL LEGEND	
	CEILING DIFFUSER
	CEILING RETURN AIR GRILLE
	CEILING EXHAUST GRILLE
	SUPPLY REGISTER
	SLOT DIFFUSER U.O.N.
	FIRE DAMPER U.O.N.
	MANUAL VOLUME DAMPER U.O.N.
M	MOTOR OPERATED DAMPER
T	THERMOSTAT
H	HUMIDISTAT
CO	CARBON DIOXIDE SENSOR
SD	SMOKE DETECTOR
	CONNECT TO EXISTING
	EXISTING WORK
	NEW WORK
	WORK TO BE REMOVED
	SHUTOFF VALVE (BALL U.O.N.)
	CHECK VALVE
	BALL VALVE
	MOTOR ACTUATED GATE VALVE
3W	MOTOR ACTUATED 3-WAY VALVE
	CIRCUIT SETTER
	PRESSURE GAUGE
	GAUGE COCK
	FLOOR DRAIN
	FLOOR CLEAN-OUT
	WALL CLEAN-OUT
	HOSE BIBB U.O.N.
#	KEYNOTE

COM*check* Software Version COMcheckWeb

Mechanical Compliance Certificate

Project Information

Energy Code: 2021 IECC
Project Title: 2024-1025 SRS Rockwall H-Room
Location: Rockwall, Texas
Climate Zone: 3a
Project Type: Alteration

Construction Site: Owner/Agent: Designer/Contractor:

Mechanical Systems List

Quantity System Type & Description

1 HVAC System (Single Zone):
Heating: 1 each - Central Furnace, Gas, Capacity = 39 kBtu/h
Proposed Efficiency = 92.00% Et, Required Efficiency: 80.00 % Et or 80% AFUE
Fan System: MAU-1 -- Compliance (Motor nameplate HP and fan efficiency method) : Passes

Fans:
MAU-1 Supply, Constant Volume, 800 CFM, 0.5 motor nameplate hp, 0.00 fan energy index , fan exception: Single fan < 1 HP or < 0.89 kW

1 Water Heater:
Gas Storage Water Heater, Capacity: 100 gallons, Input Rating: 250 kBtu/h
Proposed Efficiency: 80.00 % Et, Required Efficiency: 80.00 % Et

Mechanical Compliance Statement

Compliance Statement: The proposed mechanical alteration project represented in this document is consistent with the building plans, specifications, and other calculations submitted with this permit application. The proposed mechanical systems have been designed to meet the 2021 IECC requirements in COM*check* Version COMcheckWeb and to comply with any applicable mandatory requirements listed in the Inspection Checklist.

John Edwards - Mechanical Engineer — Name - Title
Sheet is Signed. — Signature
10/02/2024 — Date

FAN SCHEDULE

I.D. TAG	AREA SERVED	CAPACITY (CFM)	SP (IN. WC)	MOTOR HP	DRIVE	MAX. FAN RPM	MAX. NOISE	VOLTS/ PHASE	TYPE OF FAN	WEIGHT (LBS)	BASIS OF DESIGN	REMARKS
EF-1	H ROOM	800	0.75	1/2	B	1,216	61 dBA	208/3	UTILITY SET	250	GREENHECK 8-BCSW-FRP	1, 2, 3, 4

(1) FAN SHALL RUN CONTINUOUSLY DURING OCCUPIED HOURS. INTERLOCK TO TIMER AS NEEDED.
(2) INSTALL FAN ON 6" CONCRETE PAD ON GRADE OUTSIDE OF WAREHOUSE.
(3) PROVIDE FAN WITH VFD MOUNTED NEXT TO THE FAN. PROVIDE WITH NEMA 3R ENCLOSURE.
(4) PROVIDE FAN WITH DRAIN PLUG.

MAKE-UP AIR UNIT SCHEDULE

		SUPPLY FAN SECTION		HEATING SECTION		WINTER CONDITIONS							
						EAT		Unit LAT					
I.D. TAG	OA AIRFLOW (CFM)	EXT. SP (IN WC) (1)	DESIGN HP	TYPE	CAPACITY (MBH) (5)	°F db	°F wb	°F db	°F wb	WEIGHT (LBS)	VOLTS/ PHASE	BASIS OF DESIGN	REMARKS
MAU-1	800	0.75	1/2	GAS	38.8 / 35.7	28.7	--	70.0	--	1,000	208/3	GREENHECK DGX-P109-H12	1, 2, 3, 4, 5, 6, 7, 8

(1) THIS IS THE SP EXTERNAL TO THE ENTIRE FAN COIL UNIT ASSEMBLY (WET COIL, CASING, CLEAN FILTERS, AND FURNACE LOSSES ARE NOT INCLUDED IN THIS EXT. SP)
(2) PROVIDE WITH MOTORIZED LOW-LEAKAGE OA DAMPERS, DIRTY FILTER SENSOR, 2" 30% MERV 8 FILTERS.
(3) PROVIDE UNIT WITH POWERED GFI SERVICE RECEPTACLE, SINGLE-POINT ELECTRICAL CONNECTION, AND DISCONNECT. COORDINATE WITH DIVISION 26.
(4) UNIT SHALL BE HORIZONTAL/SIDE DISCHARGE.
(5) INPUT/OUTPUT CAPACITY.
(6) PROVIDE UNIT WITH DIRECT GAS FIRED HEATER WITH MODULATING INDUCER, MINIMUM 30:1 TURNDOWN LOW FIRE START CAPABILITY, GAS VALVE LEAK TEST, AND GAS STRAINER.
(7) PROVIDE CONTROLS TO VERIFY OA MOD IS OPEN PRIOR TO FURNACE FIRING.
(8) PROVIDE WITH SUPPORT STAND ON TOP OF 4" THICK BEVELED EDGE HOUSEKEEPING PAD.

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Phone: 919-747-9884
BWA COA# 13267

RANDALL PAULSON architects
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STATE OF TEXAS — JOHN TANNER EDWARDS — 148087 — LICENSED PROFESSIONAL ENGINEER
Date Signed: 10/14/2024

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Sheet Title: MECHANICAL LEGEND, ABBREVIATIONS, DETAILS, SCHEDULES

Sheet No.: M-001

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SECTION 23 05 00

COMMON WORK RESULTS FOR HVAC

1.0 GENERAL

1.01 DESCRIPTION

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

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

1.02 EXISTING CONDITIONS

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

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

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

1.03 INTENT OF DRAWINGS AND SPECIFICATIONS

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

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

1.04 SPACE PRIORITY

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

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

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

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

1.05 COORDINATION

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

B. Coordination of space requirements with respect to Division 26 shall be performed such that:

1. No equipment, piping or ductwork, other than electrical, shall be installed within 42" of switchboards or panelboards.

2. No piping or ductwork which ever operates at a temperature in excess of 120°F shall be installed within 3" of any electrical conductor.

C. All items mounted in or below the ceiling, and all items penetrating the ceiling, shall be coordinated with the architectural reflected ceiling plans. If any items are not shown on these plans, or any items need to be relocated for coordination purposes, prepare a reflected ceiling plan and submit it to the Architect for approval.

D. Fused disconnects shall be provided under this Division 23 for all equipment connected directly to bus duct, and rating shall match bus duct rating. Coordinate with Division 26.

1.06 CODE COMPLIANCE

A. All workmanship and materials provided under this Division 23 shall comply with all laws, ordinances, codes and regulations of all Federal, State and Local Authorities Having Jurisdiction.

B. All fire suppression, plumbing, heating, ventilating, and air conditioning materials and workmanship shall comply with the current codes and standards as minimum requirements:
1. National Electrical Code – 2020 Edition
2. International Building Code (w/ Local Amendments) – 2021 Edition
3. International Mechanical Code (w/ Local Amendments) – 2021 Edition
4. International Plumbing Code (w/ Local Amendments) – 2021 Edition
5. International Fuel Gas Code (w/ Local Amendments) – 2021 Edition
6. International Energy Conservation Code (w/ Local Amendments) – 2021 Edition
7. International Fire Code (w/ Local Amendments) – 2021 Edition
8. NFPA 101 Life Safety Code – 2003 Edition
9. Texas Accessibility Standards – 2012 Edition
10. American with Disabilities Act, January 26, 1992
11. American National Standard Handicapped Code, A117.1 – 1986 Edition
12. ASME A17.1 Safety Code Elevators and Escalators, 2013 Edition

C. Secure and pay all fees associated with all permits and licenses required for execution of the Contract. Arrange for all inspections required by City, County, State, and other Authorities Having Jurisdiction, and deliver certificates of approval to the Architect.

D. The code requirements are strictly a minimum and shall be met without incurring additions to the Contract. Where requirements of the drawings or specifications exceed the code requirements, the work shall be provided in accordance with these drawings or specifications. In the event of conflict or ambiguity between the various codes, the most stringent requirement shall govern.

1.07 ELECTRICAL REQUIREMENTS AND INTERFACE

A. All electrical equipment and wiring provided under this Division 23 shall comply with the electrical system characteristics indicated on the electrical drawings and specified in Division 26.

B. Electric controls, contactors, starters, pilot lights, push buttons, etc., shall be provided complete as part of the motor, heater, or other equipment which it operates. All electrical components shall be in conformance with the requirements of the National Electrical Code and Division 26. Starters shall be wye-delta, closed transition type. Reference Division 26 and the electrical engineering drawings for those motor starters provided under that Division 26. All starters not shown shall be provided under this Division 23. Unless specified otherwise under other individual equipment Sections, motor starters shall conform to the following minimum requirements:

1. Starters for motors 1/3 horsepower or smaller shall be manual unless remote or automatic starting is required, in which case the starters shall be magnetic, full voltage, non-reversing, single-speed, unless otherwise indicated. All other starters shall be magnetic.

2. Individually mounted motor starters shall be in a NEMA Type 1 general purpose enclosure in unfinished areas and shall be flush mounted in all finished areas. All starters mounted in exterior areas shall have a NEMA 3R enclosure. Each starter shall have a laminated nameplate to indicate equipment unit number, function and circuit number.

3. All motor starters, push buttons and pilot lights shall be of the same Manufacturer as the switchboard and shall be General Electric, Square D, Siemens I.T.E., or Westinghouse.

C. Motor starters for the following equipment shall be provided under this Division 23 by the Manufacturer of the equipment:
1. Other equipment hereinafter specified in other Sections to be provided with integral starters

D. All power wiring and final connections to equipment shall be provided under Division 26.

E. Control components, all interlocks, (VAVs, actuators, smoke dampers, fire/smoke dampers, motor-operated dampers, fire alarm motors, etc.) and control wiring (277 volt, single phase and less) shall be provided under this Division 23 as required to achieve the specified control sequences. All electrical connections shall be specifically coordinated with Division 26 and any necessary scope included as part of Division 23.

F. All control wiring over 30 volts shall be installed by a licensed Electrician working under this Division 23.

1.08 SLEEVES, SEALS AND ESCUTCHEONS

A. Sleeves shall be provided through all pipe and ductwork penetrations of concrete or masonry walls and roofs, except those piping penetrations for equipment, etc.

B. Sleeves shall be fabricated from Schedule 40 steel pipe through 10" and Standard Wall steel pipe for sleeve sizes 12" and larger. All sleeves penetrating exterior walls, underground walls, pit or vault walls shall be provided with a 3" x 3/8" thick waterstop ring welded completely to the midpoint of the sleeve.

C. All sleeves penetrating exterior walls shall be packed and sealed watertight.

D. Sleeves through roofs shall extend above the roof surface and be flashed watertight.

E. Sleeves through walls shall be cut and finished flush with each surface of the wall in which they are installed.

F. Sleeves shall be sized to provide a minimum of 1/2" clearance between the inside surface of the sleeve and the outside finished surface of the pipe plus any insulation specified.

1.09 CORE DRILLING

A. Cutting of holes through concrete and masonry shall be by diamond core or concrete saw. Pneumatic hammer, impact electric and hand or manual hammer type drills will not be allowed, except as permitted by the Architect where required by limited working space. Locate holes such that they will not affect structural sections such as ribs or beams. Holes shall be laid out well in advance of the installation. These layout locations shall be approved by the Architect prior to drilling.

2.0 PRODUCTS

2.01 BID BASIS AND SUBSTITUTION PROCEDURES

A. Manufacturer names, series, and model numbers, as noted or specified, are for the purpose of describing type, capacity, and quality of equipment, materials, and products to be used. Unless "or equal" is specifically stated, bids shall be based only on the specified "basis of design" Manufacturer. The listing of a particular manufacturer as an "equal" or "acceptable substitute" manufacturer shall not be misconstrued as approving nor allowing the substitution of that Manufacturer's standard product in place of the basis of design. No consideration will be given to a product, which would require dimensional, spatial, or aesthetic changes to the project. "Acceptable substitute" and "equal" manufacturers shall only bid those products, which exactly match the size and other characteristics of the specified basis of design. Any changes to other disciplines and trades of work required by an "or equal" or "substitute" product shall be duly considered and priced accordingly prior to bidding or pricing. The decision as to whether or not a proposed substitute or "equal" product is actually equal to that specified shall rest solely with the Architect.

B. Requests to provide "equal" products in lieu of those specified shall be submitted to the Architect in writing at least ten (10) days prior to final pricing and execution of the Contract. No consideration will be given to substitute products after final pricing and execution of the Contract.

C. Any "or equal" product or proposed product substitution which will cause a change in the appearance, dimensions, or design of any part of the building, it structure, electrical system or any other engineered systems shall be accompanied by a scaled drawing and written description of the required change(s) for approval by the Architect. If deemed necessary by the Architect, Owner, or AHJ, design changes shall be signed and sealed by a registered Professional Engineer, currently licensed in this State. This shall be performed under the Contractor's scope who selects the substitution.

D. Any and all changes due to a substitution of basis of design equipment including but not limited to electrical connection, physical size, access, duct or piping connections, controls, etc. shall be solely the responsibility of substituting Contractor.

2.02 MINIMUM STANDARDS

A. Every piece of energy consuming equipment, all fire suppression products and life safety equipment shall comply with the following standards as applicable; especially in regard to prevailing codes:
1. Factory Mutual Laboratories (FM)
2. Industrial Risk Insurers (IRI)
3. Underwriters Laboratories, Inc. (UL)
4. ADC: Air Diffusion Council
5. AGA: American Gas Association
6. AMCA: Air Moving and Conditioning Association, Inc.
7. ANSI: American National Standards Institute
8. API: American Petroleum Institute
9. AHRI: Air Conditioning, Heating, and Refrigeration Institute
10. ASHRAE: American Society of Heating, Refrigerating and Air Conditioning Engineers
11. ASME: American Society of Mechanical Engineers
12. ASTM: American Society of Testing and Materials
13. AWWA: American Water Works Association
14. IBR: Institute of Boiler and Radiator Manufacturers
15. MSS: Manufacturers Standardization Society
16. NBBPVI: National Board of Boiler and Pressure Vessel Inspectors
17. NEMA: National Electrical Manufacturer's Association
18. OSHA: Occupational Safety & Health Administration
19. PDI: Plumbing Drainage Institute
20. PPI: Plastic Pipe Institute
21. SMACNA: Sheet Metal and Air Conditioning Contractors National Association, Inc.

2.03 PIPE HANGERS AND SUPPORTS

A. Pipe hangers, trapeze hangers, upper attachments, rods, and other supports shall be selected based on pipe size and material contained therein. Provide all hangers, rods, turnbuckles, angles, channels, and other supports to securely support the piping systems from the building structure.

B. All materials utilized for the hanging and support of the piping systems shall be manufactured products, which are specifically intended for the purpose of hanging piping systems. The use of wire, steel straps, plastic ties, etc. is strictly prohibited.

C. Supports and hangers shall be selected to fit around the pipe (and insulation unless otherwise specified herein) and provide adequate movement for expansion of the piping systems. Anchors shall be provided to restrict and control such movement within offsets and expansion loops.

D. All hangers and supports shall be selected at a minimum factor of safety of five based on the ultimate tensile strength of the material.

E. Intermediate pipe supports shall be provided between building structural members so as not to exceed maximum support spacing specified and shall be structural steel angles (minimum 2 1/2" x 2 1/2" x 1/4"). In steel construction, intermediate supports shall be securely clamped to steel beams and to steel joists, and in no case shall supports be attached to roof decks.

F. For suspending pipes from concrete beams, upper attachments shall be side beam bracket utilizing bolts in sleeves set in top portions of the beams. Where sleeves are not used, provide expansion shields or power-actuated fasteners.

G. Hanger rods for pipe hangers shall be as follows:
1. 3/8" hanger rod – 2" nominal pipe and smaller

H. Pipe hangers selected for supporting horizontal insulated piping shall be sized to fit around the outside of the pipe insulation.

I. Provide shields on all insulated piping as outlined below:

1. Shields shall be as follows:
1) Pipes 2" and smaller: 18 gauge x 12" long

a. Shields and inserts shall be 180 degrees around the lower half of the pipe at all pipe hangers.

3.0 EXECUTION

3.01 SUBMITTALS

A. Before preparing submittals, study all Contract Drawings and specifications in detail, obtain manufacturer's recommended instructions, and have submittals prepared based on specific equipment and material proposed for installation. An officer of the Contracting Firm shall sign all shop drawings (certifying conformance with plans and specifications) before submitting to the Architect or releasing to the field.

B. The submittal process shall not be utilized as an avenue to substitute products after the execution of the contract. Should an unspecified or unequal product be submitted, it will be rejected. If a second attempt at substitution is made during the resubmittal of the same product, then no more reviews of that product will be performed without direct compensation to the Engineer being paid for the additional services required for the third review and any further reviews.

C. All submittals shall be submitted and returned electronically.

D. Submittals will not be accepted for review unless they:
1. Comply with the requirements of Division 1
2. Include complete information pertaining to all appurtenances and accessories
3. Are submitted as complete packages which pertain to all related items in Division 23. Separate packages shall be submitted as follows:
a. All HVAC equipment and components
4. Are properly marked with equipment, service, or function identification as related to the project and are marked with pertinent specification paragraph number

E. Submit catalog information, factory assembly drawings, field installation drawings and certifications as required for complete explanation and description of all items of equipment. The submittal data shall provide ample, unquestionable compliance with the Contract Documents.

F. Review of submittals shall not be construed as authorizing any deviations from the plans and specifications unless such deviations are clearly identified and separately submitted in the form of a letter that is enclosed with the submittals.

G. Submittals are required on all manufactured equipment, especially energy consuming equipment. Submittals shall include, but are not limited to, the following items of equipment:
1. Piping and Piping Specialties
2. Ductwork and Piping Insulation
3. Split Systems
4. Air Distribution Devices
5. Ductwork Accessories (Including All Dampers)
6. Fans
7. T&B Company Certifications and Final Report

3.02 INSTALLATION REQUIREMENTS

A. All equipment shall be installed in strict conformance with the recommendations of the Equipment Manufacturer, as indicated on the Drawings and as specified.

B. Provide installation manuals for each piece of equipment. Submit in separately bound volumes after review of submittals.

C. Provide supplementary steel framing and welded steel equipment support stands as required for proper hanging and support of the mechanical systems. Steel angles, channels and tubing utilized for such framing shall be selected for a maximum deflection of 1/360th of the span.

D. All roof curbs shall be a minimum of 12" high and selected for the various roof pitches. Curbs installed on roofs having pitches of not more than 1/4" per foot may be standard curbs shimmed level with steel channels or Zs to provide suitable support and flashing surfaces.

3.03 CLEANING, LUBRICATION AND ADJUSTMENT

A. The exterior surfaces of all mechanical equipment, piping, ductwork, conduit, etc., shall be cleaned and free of all dirt, grease, oil, paint splatter, and other construction debris.

B. Ducts, plenums, and air unit casings shall be cleaned of all debris and either vacuumed or blown free of all rubbish, dirt, and dust before installing grilles, registers, or diffusers.

C. Bearings that require lubrication shall be lubricated in strict accordance with the manufacturer's recommendations.

D. All control equipment shall be adjusted to the settings required for the performance specified.

E. Fans shall be adjusted to the speed indicated by the Manufacturer to meet the installed final system pressure at the airflows indicated. Any additional sheaves and belts required for final adjustments shall be provided with no increase in the Contract amount.

F. Any fans operated during construction shall have temporary filters. Temporary filters shall be changed regularly to minimize contamination of the equipment and duct systems. Permanent filters shall be installed prior to final inspection.

G. All coils shall be thoroughly cleaned and combed prior to final inspection.

H. All materials, equipment, etc. subject to weather, corrosion, dust, debris, water etc. to be installed or utilized for the project shall be fully protected. This is inclusive of piping and duct openings and internal fan ventilation intakes and discharges. This Division's scope includes protection and remediation of any and all Division materials, etc. including cleaning, vacuuming, dusting, etc. required for a clean system and operation. Insulation and equipment with electrical connections subject to water shall be replaced in their entirety. Coordinate with all other trades and schedules.

3.04 PAINTING

A. All uncoated and uninsulated steel surfaces exposed to sight inside the building, such as piping, equipment hangers and supports which are not provided with factory prime coat or galvanizing, shall be cleaned and painted with one coat of rust inhibiting primer. In addition, all surfaces in finished spaces shall also be painted with two coats of finish paint in a colour selected by the Architect.

B. All ductwork surfaces, piping, supports, etc. visible through grilles, registers and diffusers in finished areas shall be painted flat black. All ductwork, equipment, piping, supports, air distribution, etc. visible in exposed finished areas shall be painted a colour selected by the Architect, except that nameplates shall not be painted.

C. Steel items exposed outside the building, such as equipment supports, uninsulated piping and hangers, which are not factory painted or galvanized, shall be cleaned and painted with one coat of rust inhibiting primer and two coats of asphaltic base aluminum paint. Insulated steel pipes outside the building shall be cleaned and painted with one coat of rust inhibiting primer before installing insulation.

D. Factory painted equipment that has been scratched or marred shall be repainted to match the original factory color.

3.05 DUCTWORK AND PIPING LEAK TESTING

A. Insulated and concealed ductwork and piping shall be tested for leaks in place before concealing or covering. Tests shall be conducted in the presence of the Architect or their designated Representative.

B. All low pressure ductwork (design operating pressure of 1.0" WC ESP or less) shall be tested by the operation of the system to which it is connected.

C. All visible and audible air leaks from the ductwork systems shall be repaired.

D. All refrigerant piping shall be 100% tested with the applicable ASHRAE standard – latest version.

E. All leaks shall be repaired by tightening, remaking joints, or replacing pipe and fittings. Caulking of joints shall not be permitted.

3.06 RECORD (AS-BUILT) DRAWINGS

At the completion of the project, provide a set of reproducible prints to the Architect which reflects all changes, deviations and revisions made to the original design documents. Locations of all underground piping and utilities shall be clearly shown and dimensioned from permanent reference points such as building column lines.

3.07 OPERATING AND MAINTENANCE MANUALS AND INSTRUCTIONS

A. Complete operating and maintenance manuals shall be provided to the Owner. Four copies shall be provided. Each copy shall be bound in a separate 3-ring, loose-leaf notebook. Operating instructions shall be provided for each mechanical system, and shall each include a brief system description, a simple schematic and a sequence of operation. Operating and maintenance instructions shall be provided for each piece of equipment. A control system wiring diagram shall be included in each operating and maintenance manual.

B. Prior to final acceptance or beneficial occupancy, provide the services of a Competent Technician for not less than one (1) day to instruct the Owner in the operation of the mechanical systems.

3.08 TESTING AND BALANCING

A. Testing and balancing of the HVAC system shall be performed as specified in Section 23 05 93. Note that this work is to be performed under a separate Contract directly under the General Contractor. Submit four (4) copies of the test and balance report directly to the Architect.

3.09 PIPING SUPPORTS

A. Pipe hangers or supports shall be provided within 18" of each horizontal fitting, equipment connection, valve, etc. and within 18" of the centerline of horizontal or vertical changes in direction summing to 90° or more. Specific attention is called to vertical turns into risers.

B. Piping supports shall be provided, at a minimum, in accordance with the greater of the below or at code minimum. Where the below or code does not address support for specific piping, supports shall be in accordance with manufacturer's requirements.

Piping Material	Max. Horz. Spacing	Max. Vert. Spacing
Copper tubing ≤ 1-1/4" dia.	6'	10'
Copper tubing ≥ 1-1/2" dia.	10'	10'
PVC pipe	4'	10'

3.10 WARRANTY

A. All work provided under this Division 23 shall be subject to a minimum one year warranty. The warranty shall include prompt repair or replacement of equipment or system failures and shall include all parts, refrigerant, and labor. In addition, all compressors shall carry an additional four year parts-only warranty. Extended warranties shall be provided on all other equipment so specified in other Sections.

3.11 OWNER TRAINING

A. Owner training shall be provided for all systems and equipment and shall include the following:
1. 8-hours for overall system and individual equipment operational training

B. A training summary and schedule shall be submitted to the Architect for approval within ninety (90) days of the date of substantial completion.

3.12 BID REQUIREMENTS

A. The Contractor shall include all systems, equipment and accessories shown on the plans and specifications.

B. The Contractor is responsible for providing all design documents to all SubContractors. All systems, equipment and accessories shall be included in the bid, whether shown on the SubContractor applicable plans or other design documents.

C. Should any discrepancy occur in the Design Documents, the Contractor shall provide a request for clarification prior to bid or note the discrepancy in the bid and provide an appropriate cost allowance in the bid.

D. The Contractor shall acknowledge that the Design Documents are diagrammatic and shall provide all systems, equipment and accessories required for a complete facility. Any areas that appear to be void of systems or inappropriate systems shall be noted in the bid. No post bid change order shall be considered for areas or discrepancies not noted in the bid.

E. All installation coordination and means and methods and labor and materials required for proper system installation shall be included.

F. These requirements are in addition to bid procedures and requirements of the RFP or general specifications.

END OF SECTION

SECTION 23 05 93

TESTING, ADJUSTING, AND BALANCING FOR HVAC

1.0 GENERAL

1.01 DESCRIPTION

A. All work specified in this Section is governed by the Common Work Results for HVAC Section 23 05 00.

B. This Section 23 05 93 and the accompanying drawings cover the provision of all labor, equipment, appliances, and materials and performing all operations in connection with the testing and balancing (T&B) of the heating, ventilating and air conditioning (HVAC) systems as specified herein and as shown. These systems include, but are not limited to, the following:
1. Supply distribution systems
2. Return and exhaust air systems
3. Heating, ventilating and air conditioning equipment (all scheduled equipment as a minimum)

1.02 INTENT

A. It is the intent of this Section of the specifications to provide a complete operable and balanced HVAC system as shown and specified which is reasonably airtight, comfortable, and free of objectionable noise and vibration.

1.03 SCOPE OF WORK

A. HVAC test and balance shall be performed by an Independent Agency certified by the Associated Air Balance Council (AABC) or National Environmental Balancing Bureau (NEBB) under direct contract to the General Contractor. All work performed by this Agency shall be performed by qualified Technicians under the direct supervision of an AABC or NEBB Certified Test and Balance Engineer. The Agency shall be independent and shall not be associated in any way with the installing HVAC SubContractor.

B. HVAC Test and Balance shall be performed in accordance with the 7th edition of the AABC National Standards, 2016 for Total System Balance or the NEBB Procedural Standards for TAB of Environmental Systems, 8th Edition, 2015 together with the NEBB TAB Manual for Technicians, 2nd Edition.

C. The final Test and Balance report shall serve to substantiate compliance with the intent of the Contract Documents, specifically the HVAC systems.

D. HVAC Test and Balance shall not begin until the systems are substantially complete.

E. Upon the completion of the Test and Balance work, the Agency shall submit four (4) copies of the complete HVAC Test and Balance Report directly to the Architect.

F. The Agency, as a part of its contract with the General Contractor, shall act as an Authorized Inspection Agency, responsible to the General Contractor and the Architect and shall, during the test and balance, list those items which require correction or have not been installed in accordance with the Contract Documents.

G. The Agency shall plainly mark the settings of all valves, dampers, and other adjustable devices. If a balancing device is provided with a memory stop, it shall be set, locked and marked.

H. The Agency shall record all of the final set points on all variable speed drives.

1.04 SUBMITTALS

A. The name and certification of the Agency, along with the name and certification of the Certified Test and Balance Engineer, shall be submitted to the Architect for review within 30 days after the award of the General Contract.

B. The selected Agency shall submit to the Owner:
1. Procedural Manual
2. Report Forms
3. AABC or NEBB Performance Guaranty
4. Instrument List and Calibration Dates
5. Schedule
6. Floorplans as Needed to Uniquely Identify Device Locations

C. A reviewed copy of each of the above shall be returned to the Agency before the HVAC Test and Balance begins.

D. If a complete submittal in accordance with these requirements is not received within 60 days from award of the General Contract, then the Architect reserves the right to select the Agency.

2.0 PRODUCTS

2.01 (Not applicable).

3.0 EXECUTION

3.01 GENERAL CONTRACTOR'S DUTIES

A. The General Contractor shall provide the following, within 10 days after his receipt, to the Agency:
1. Contract Drawings
2. Contract applicable specification Division 23 (others as applicable)
3. Addenda
4. Change orders
5. Reviewed submittals

B. The General Contractor shall start-up and maintain the HVAC systems and shall continue the operation of the HVAC systems during each day of testing and balancing. Start-up and operation shall include, as a minimum, the following:
1. All equipment operable and in safe condition.
2. Temperature control system complete.
3. Proper thermal overload protection in place for electrical equipment.
4. Ductwork leakage rates not exceeding those specified and all duct systems clean of debris.
5. Air transfer systems shall have:
a. Correct fan rotation and RPM.
b. Coil fins cleaned and combed.
c. Filters clean and in place.
d. Access doors closed.
e. All dampers in place and open.
f. All grilles, registers and diffusers installed.

C. Provide sufficient time before final completion date so that testing and balancing can be accomplished. Coordinate the submitted T&B schedule.

D. Provide immediate labor and tools to make required corrections and repairs without undue delay.

E. The General Contractor and his SubContractors shall cooperate fully with the Agency to provide the following:
1. Access to HVAC system components.
2. The right to adjust the systems.

F. Any conditions which prevent a proper HVAC Test and Balance shall be reported by the Agency to the General Contractor and Architect within 7 days of their discovery.

G. If it is determined by the Agency and confirmed by the Architect that drive changes or additional balancing dampers are required, the Contractor shall obtain and install all necessary components.

H. The Agency shall cooperate with the Architect and the Contractor and all his SubContractors to perform the work in such a manner as to meet the job schedule.

I. The Agency shall verify that all system components are in place and in proper working order prior to leaving the project.

J. All reported and recorded data shall represent true measured conditions.

K. Where equipment uses variable speed drives, and where feasible, VFDs shall be used as the primary balancing method prior to adjustment or balancing of valves, dampers, etc.

END OF SECTION

SECTION 23 07 13

DUCT INSULATION

1.0 GENERAL

1.01 DESCRIPTION

A. All work specified in this Section is governed by the Common Work Results for HVAC Section 23 05 00.

B. This Section 23 07 13 and the accompanying drawings cover the provisions of all labor, equipment, appliances, and materials and performing all operations in connection with the construction of the ductwork systems as specified herein and as shown. These systems include, but are not limited to, the following:
1. Insulation for typical ductwork
2. Duct liner
3. Insulation for ductwork outside.

1.02 INTENT

A. It is the intent of this Section of the specifications to provide a complete operable duct system as shown and specified which is reasonably airtight, free of noise, vibration, and sweating, and fabricated so as to fit into the space allotted and to exhibit a minimum resistance to airflow.

2.0 PRODUCTS

2.01 DUCT LINER

A. Duct liner shall be one inch thick, 1 ½ lb. density (3 lb. density on medium- and high-pressure supply air systems except that 1 lb. density is acceptable if the liner is at least R ≥ 4.2 and NRC ≥ 0.65) fibrous glass with one face coated with a black fire retardant compound. The permanent composite fire and smoke hazard rating of the liner shall be stenciled on the liner face and shall be:
1. Maximum Flame Spread 25
2. Maximum Smoke Developed 50

2.02 TYPICAL DUCT INSULATION

A. Duct insulation shall be 2.2" thick, minimum 3/4 lb. density fiberglass, installed R ≥ 6.0, with an FSKL 0.00035" thick aluminum foil jacket, reinforced with fiberglass scrim. Thermal conductivity shall be a maximum of K = 0.29 at 75°F mean temperature, or a maximum of K=0.27 at 25% compression.

B. Insulation adhesive shall be Benjamin Foster 85-20. Tape shall be aluminum foil and shall be SMACNA listed and labeled.

C. The composite NFPA 90A and 90B, ASTM E84, UL rating of the installed insulation shall not exceed 25/50.

D. The grease exhaust ductwork shall have zero-clearance to combustibles wrap from the hood connection to discharge termination. Coordinate the insulation with all required access panels, drains, etc. as required by NFPA 96.

2.03 INSULATION FOR DUCTWORK OUTSIDE

A. See specification 23 31 00 for duct construction installed outside the building and exposed to weather. Note requirement for soldered or welded duct. Ductwork installed outside shall be shall be provided with a cover as noted below with water-proof coating and seams. Seams shall be located so as to not be subject to water flow. Cover shall be painted a light colour as selected by the Owner. All ductwork installed outside shall be constructed with sloped top "watershed" design with a slope of not less than 2% to avoid ponding water. Any ductwork supports connected directly to the ductwork shall also adhere to the insulation requirements below.

1. Ductwork conveying conditioned air shall, in addition, have minimum R-12 insulation of one of following options:

a. 3" thick, 3 PCF density rigid fiberglass board insulation, finished with waterproof mastic and glass fiber with aluminum jacket. Jacket shall have waterproof silicone caulk joints and seams. Seam opening shall be installed facing downward.

b. 3" thick, 3 PCF density rigid fiberglass board insulation with foil-kraft facing with Polyguard, or equal, finished with waterproof mastic and glass fiber with aluminum jacket. Jacket shall have waterproof silicone caulk joints and seams. Seam opening shall be installed facing downward.

c. 2" thick polyisocyanurate board insulation finished with waterproof mastic and glass fiber with aluminum jacket. Jacket shall have waterproof silicone caulk joints and seams. Seam opening shall be installed facing downward.

2. As an alternate to single wall duct and exterior insulation, ductwork installed outside may be double-walled meeting SMACNA requirements, R-12 insulation between walls, and the exterior wall shall be corrosion-coated for outside installation. Ductwork shall be weathertight.

3. Access into ductwork installed outside shall be located inside the building where feasible. Where outside access is required, access shall be through removable cover with insulation to match the above requirements. Removable areas shall be permanently labeled on the outside and shall be insulated to minimize exposure to water infiltration.

3.0 EXECUTION

3.01 INSTALLATION

A. Ductwork shall be installed in strict accordance with SMACNA, UL, and NFPA standards.

B. Duct liner shall be provided throughout all return air, transfer, and plenums. Duct liner shall also be provided for the following minimum distances, through the first elbow(s), or as otherwise indicated on the drawings, whichever is greater, downstream of each unit indicated below:
1. Split system air handling unit – 5 ft

C. Straight runs only shall be factored into the above distance requirements. Elbows, etc. within the length shall be lined but shall not count towards the length requirement.

D. Duct liner shall not be installed within six inches of a damper, including fire and/or smoke dampers. Metal nosings are required on the upstream side of the exposed insulation. Where lining has been interrupted, external insulation is required.

E. Duct liner shall be cut to provide overlapped and compressed longitudinal corner joints. Liner shall be installed with the coated surface facing the air stream. Duct liner shall be adhered to the ductwork with a 100% coverage of the sheet metal surfaces using a fire-retardant adhesive applied by spraying. Coat all exposed leading edges and all transverse joints with fire retardant adhesive. The liner shall be additionally secured using metal pins welded to the duct and speed washers. All leading edges shall be secured with sheet metal airfoils.

F. Inside the vapor barrier of the building all supply air ductwork which is not lined shall be insulated. All outside air ductwork shall be insulated. Insulation shall be cut slightly longer than circumference of duct to insure full thickness at corners. All insulation shall be applied with edges tightly banded. Insulation shall be adhered to duct with fire resistant adhesive. Adhesive shall be applied so that insulation conforms to duct surfaces uniformly and firmly. In addition to the adhesive, the insulation shall be additionally secured to the bottom of all ducts 18" or wider by means of welded pins and speed clips. The protruding end of the pins shall be cut off flush after the speed clips have been applied. The vapor barrier facing shall be thoroughly sealed with tape where the pins have pierced through. All joints shall be sealed with 2" wide SMACNA tape. Any cuts or tears shall be sealed with SMACNA tape.

G. Combustion air ductwork located in conditioned spaces, to gas-fired appliances, shall be externally insulated similar to supply ductwork.

H. All outside air ductwork located in conditioned or semi-conditioned spaces shall be externally insulated similar to supply ductwork.

END OF SECTION

SECTION 23 11 23

NATURAL GAS PIPING

RANDALL PAULSON architects
Roswell . Nashua

STATE OF TEXAS
JOHN TANNER EDWARDS
148087
LICENSED
PROFESSIONAL ENGINEER

Date Signed: 10/14/2024

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architecture/interiors

A TENANT ADDITION

at

SRS DISTRIBUTION, INC. - ROCKWALL, TEXAS (H-ROOM)

for

SRS Distribution

2065 KRISTY LN
ROCKWALL, TEXAS 75032

Print Record		Drw.	Chk.
14 OCT 24	ISSUED FOR PERMIT	LC	CK

Revisions	

Date	Project No.
10/14/2024	2023362.00

Sheet Title
MECHANICAL SPECIFICATIONS

Sheet No.
M-002

■ Released for Construction
□ Not Released for Construction

BW&A Barrett, Woodyard & Associates, Inc.
1255 Crescent Green
Ste. 230 | Cary, NC 27518
Phone: 919-747-9884
BWA COA# 13267

BWA Project #: 2024-1025

1.0 GENERAL

1.01 DESCRIPTION

A. All work specified in this Section is governed by the Common Work Results for Plumbing Section 22 05 00.

B. This Section 23 11 23 and the accompanying drawings cover the provision of all labor, equipment, appliances, and materials and performing all operations in connection with the construction of the systems as specified herein and as shown. These systems include, but are not limited to, the following:
1. Natural gas systems

1.02 INTENT

A. It is the intent of this Section of the specifications to provide complete and operable system as shown and specified which is free of leaks, properly vented, free of unreasonable noise, vibration, and fabricated so as to fit the space allotted.

B. The word "piping" is defined to mean all piping, fittings, joints, hangers, coatings, valves, cocks, and accessories necessary for the system described, shown, and specified.

1.03 GENERAL REQUIREMENTS

A. Provide all reducing fittings, flanges, couplings and unions of the size and type of material to match the piping connections at each fixture, piece of equipment, valve, and accessory.

B. All pipe and fittings shall be products of a domestic Manufacturer.

C. Union joints, couplings or flanges shall be provided in each pipe line connected to each piece of equipment, fixture and elsewhere as indicated and specified. Unions shall match the piping system in which they are installed.

1. Unions or flanges shall be provided between all copper to steel connections. These unions shall be dielectric, insulating type.

D. All changes in direction and branches shall be made with manufactured fittings.

E. All pipe joints shall be cut square and all burrs shall be removed.

F. Open ends of pipe lines not currently being handled shall be plugged during installation to keep dirt, water, and foreign material out of the system.

G. This scope shall be part of Division 22 scope unless otherwise arranged within the Contract. Coordinate with Division 22.

1.04 IDENTIFICATION OF PIPING

A. See specification Section 22 05 00 for all requirements.

B. In addition, the natural gas piping shall be painted yellow, in accordance with ANSI standards, with paint suitable for the piping location. Paint shall be corrosion-resistant and continuous through all supports, penetrations, sleeves, etc.

2.0 PRODUCTS

2.04 NATURAL GAS PIPING

A. Piping shall be Schedule 40 black steel complying with ANSI B36.10 or ASTM A 53. Fittings shall be steel or malleable iron. Joints shall be threaded or welded.

B. Gas cocks shall meet ANSI B16.33.

C. Piping installed underground outside may be medium density polyethylene, conforming to ASTM D2513. Coordinate selection with all installation location and connection requirements. Connections to equipment shall be made with piping per the materials listed in this specification. Provide and install transitions as required.

D. For Seismic Design Category C or D, all natural gas piping shall be seismically restrained in accordance with code requirements. Restraints shall be by Mason or approved equal. Submit shop drawings on seismic restraint systems.

2.05 PIPE HANGERS AND SUPPORTS

A. See specification Section 22 05 00 for all requirements.

2.06 REGULATORS

A. Regulators shall be appropriate for the installation in which they are installed, including weather-rated as appropriate. Provide and install all accessories as necessary.

B. Regulators installed inside or within 15' of any outside air intake, including doors and operable windows, shall be ventless. Where ventless regulators are not available, regulator shall have vent piped to outside in accordance with manufacturer's recommendations. Route and size shall be in accordance with manufacturer's recommendations.

3.0 EXECUTION

3.01 ARRANGEMENT

A. Follow the general piping layout, arrangement, schematics and details. Provide all offsets, vents, drains and connections necessary to accomplish the installation. Fabricate piping accurately to measurements established at the project site to avoid interference with ductwork, other piping, equipment, openings, electrical conduits and light fixtures. Make suitable provision for expansion and contraction with expansion loops and offsets.

3.02 MINIMUM HANGER SPACING

A. See specification 22 05 00 for all requirements.

3.03 INSTALLATION

A. Piping installed outside shall be elevated above grade a minimum of 3.5" and shall be securely supported.

B. Piping penetrating floor slabs, walls, etc. shall be protected from damage and corrosion as required by Code.

C. Regulators shall be provided under this scope for each gas-fired equipment without appropriate regulators provided by the Equipment Manufacturer. Coordinate with all equipment. Regulators shall be appropriate for the pressures and capacity of the equipment and installation location.

3.04 TESTING AND PURGING

A. All new gas piping shall be pressure tested at 3 psi or 1.5 times the design pressure, whichever is greater, for a time period of 0.5 hours per 500 cubic feet of pipe volume, not to exceed 24 hours.

END OF SECTION

SECTION 23 23 00

REFRIGERANT PIPING SYSTEMS

1.0 GENERAL

1.01 DESCRIPTION

A. All work specified in this Section is governed by the Common Work Results for HVAC 230500.

B. This Section 23 23 00 and the accompanying drawings cover the provisions of all labor, equipment, appliances, and materials and performing all operations in connection with the construction of the piping systems as specified herein and as shown for the heating, ventilating and air conditioning (HVAC) systems. These piping systems include, but are not limited to, the following:

1. Refrigerant suction and liquid piping (RS&RL)
2. Condensate drains (DR)
3. Refrigerant suction and liquid piping insulation

C. All insulation products installed indoors shall meet ASTM E 84, UL 723, NFPA 90A, and 90B requirements for Flame Spread Rating 25 and Smoke Developed Rating 50.

1.02 INTENT

A. It is the intent of this Section of the specifications to provide complete and operable piping systems as shown and specified which are free of leaks, properly vented, free of noise, vibration, and sweating, and fabricated so as to fit the space allotted and to exhibit a minimum resistance to fluid flow. It is also the intent of this Section of the specifications to provide a complete piping insulation system which is free of gaps and tears, properly fitted and finished, free of sweating, and fabricated so as to fit the space allotted and to exhibit a negligible heat transfer.

B. The word "piping" is defined to mean all piping, fittings, joints, hangers, coatings, valves, test and sensor wells and accessories necessary for the refrigerant piping systems described, shown, and specified.

1.03 GENERAL REQUIREMENTS

A. Provide all reducing fittings, flanges, couplings and unions of the size and type of material to match the piping to each piece of equipment, valve, and accessory.

B. Union joints, couplings or flanges shall be provided in each pipeline connected to each piece of equipment and elsewhere as indicated and specified. Unions shall match the piping system in which they are installed.

1. Unions or flanges shall be provided between all copper to steel connections in water-carrying piping. These unions shall be dielectric, insulating type.

C. All changes in direction and branches shall be made with manufactured fittings.

D. All pipe joints shall be cut square and all burrs shall be removed.

E. Fabrication of a bull-head tee connection is strictly prohibited.

F. Open ends of pipelines not currently being handled shall be plugged during installation to keep dirt, water, and foreign material out of the system.

G. Horizontal refrigerant and drain piping shall slope down in the direction of flow at a minimum slope of 1/8" per foot of run.

H. All insulation products installed indoors shall meet NFPA 90A, 90B and 255 requirements for Flame Spread Rating 25 and Smoke Developed Rating 50.

1.04 FIRE-STOPS

A. Where pipes pass through fire partitions, fire walls and floors, install a fire-stop that shall provide an effective barrier against the spread of fire, smoke and gases. Fire-stop material shall be packed tight and completely fill clearances between pipes and openings. Fire-stop material shall conform to the following:
1. Fire-stopping material shall maintain its dimensions and integrity while preventing the passage of flame, smoke, and gases under conditions of installation and use when exposed to the ASTM E119 time-temperature curve for a time period equivalent to the rating of the assembly penetrated. Fire-stopping material shall be noncombustible as defined by ASTM E136; and in addition, for insulation materials melt point shall be a minimum of 1700°F for 1-hour protection and 1850°F for 2-hour protection. Fire-stopping material shall be Dow-Corning RTV Foam or an approved equal.

1.05 ACCEPTABLE MANUFACTURERS

A. Insulation products shall be as manufactured by Owens Corning, Knauf, Manville, Certainteed, Dow, or Armacell.

2.0 PRODUCTS

2.01 PIPE AND FITTINGS

A. All pipe and fittings shall be products of a domestic manufacturer.

B. Pipe and fittings shall be as listed and outlined below:

SERVICE	MATERIAL TYPE	SIZES
1. Refrigerant Suction and Liquid	1	All
2. Drains*	2	All

*Note: As an option, an cooling coil condensate drains (which are not installed in a plenum) the drain piping may be schedule 40 PVC with solvent joints; subject to advance approval by the Local Authorities. Fittings shall meet ASTM D2466 and solvent shall meet ASTM D2564.

C. The pipe, fittings and joints shall be as outlined below:
1. Material Type 1:
   a. Pipe – Type L hard drawn copper tubing meeting ASTM B88 or ASME B280.
   b. Fittings – Wrought copper meeting ASTM B16.22.
   c. Joints – Silver brazed with sil-fos or silver solder.

2. Material Type 2:
   a. Pipe – Copper drainage tube DWV meeting ASTM B306.
   b. Fittings – Wrought copper solder-joint drainage fittings meeting ASME B16.29.
   c. Joints – Soldered with a solder meeting ASTM B32.

2.02 VALVES

A. All valves shall have the manufacturer's name or trademark and the working pressure cast or stamped on the valve body.

B. All valves shall be designed and constructed for refrigerant service.

2.03 PIPING INSULATION

A. Flexible elastomeric foam closed-cell insulation shall be provided over all refrigerant suction piping, cooling coil condensate, and other services as specified or noted. Refrigerant suction piping insulation shall be 1-1/2" thick 25/50 AP Armaflex, black. Cooling coil condensate insulation shall be 1" thick ArmaFlex Ultra. All glues and coatings shall be products of the same Manufacturer as the insulation. Insulation shall comply with ASTM C534, Type I for tubular materials. Insulation shall be listed and labeled per UL 723 at 25/50 when used in return air plenums.

B. Insulation shall be continuous over all valve bodies, fittings, and wall and floor penetrations.

3.0 EXECUTION

3.01 ARRANGEMENT

A. Piping shall follow the general layout, arrangement, schematics, and details. Provide all offsets, vents, drains, charging ports and connections necessary to accomplish the installation. Fabricate piping accurately to measurements established at the project site to avoid interference with ductwork, other piping, equipment, openings, electrical conduits, and light fixtures. Make suitable provision for expansion and contraction with expansion loops and offsets.

3.02 REFRIGERANT PIPING INSTALLATION

A. All refrigerant piping shall be sized in accordance with the air conditioning equipment manufacturer's written instructions. Provide charging ports, solenoid valves, service valves, dryers, etc. at each piece of equipment.

B. All brazing shall be done while the line is being flushed with carbon dioxide, nitrogen, or other inert gases.

C. The inside of all tubing shall be thoroughly cleaned and internally wiped with a lintless, dry cloth.

D. Suction lines shall drop below their coils before any horizontal run.

E. Provide oil traps at least every ten feet for extended vertical risers.

F. All oil traps shall be constructed from close-radius type fittings.

G. Dryer cores shall be installed to remove horizontally or downward.

H. Install external equalizer downstream of its expansion valve sensing bulb.

I. Install expansion sensing valve bulb on top centerline of piping up to 5/8" size; install 45 degrees down from the horizontal centerline on pipe sizes 7/8" and larger.

3.03 CLOSED-CELL PIPING INSULATION INSTALLATION

A. Insulation shall be provided on all refrigerant suction and indoor cooling coil condensate drain lines. The insulation shall be installed by the slip-on method; slitting of the insulation is prohibited and shall be cause for rejection, except that AP Armaflex Lapseal with interior adhesive liner and wide adhesive lap seal is acceptable. All elbows shall be mitered, and all such joints and butt joints shall be tightly made and glued.

B. All insulation installed outdoors shall be coated with a glossy white, ultraviolet protective coating applied in two coats.

END OF SECTION

SECTION 23 31 00

HVAC DUCTS, ACCESSORIES, AND CASINGS

1.0 GENERAL

1.01 DESCRIPTION

A. All work specified in this Section is governed by the Common Work Results for HVAC Section 23 05 00.

B. This Section 23 31 00 and the accompanying drawings cover the provisions of all labor, equipment, appliances, and materials and performing all operations in connection with the construction of the ductwork systems as specified herein and as shown. These systems include, but are not limited to, the following:
1. Supply air ductwork
2. Return, transfer, and relief air ductwork
3. Exhaust ductwork
4. Outside air ductwork
5. Combustion air ducts and flues
6. Ductwork accessories

1.02 INTENT

A. It is the intent of this Section of the specifications to provide a complete operable duct system as shown and specified which is reasonably airtight, free of noise, vibration, and sweating, and fabricated so as to fit into the space allotted and to exhibit a minimum resistance to airflow.

1.03 DESIGN AND CONSTRUCTION – DUCTWORK

A. Ductwork shall be provided in strict accordance with the third edition – 2005 – of the SMACNA HVAC Duct Construction Standards – Metal and Flexible, NFPA No. 90A, 90B, 91 and 96, and UL 181. Where SMACNA tables have an option between different gauges and supports, the heavier gauge shall be used.

B. Ductwork dimensions shown are net, clear, inside dimensions with no allowance shown for duct liner. All ductwork specified to be lined shall be 2" larger than shown in each dimension to compensate for the liner. Ductwork shall be square, rectangular, round, spiral or flat oval as noted. Conversion of duct shapes and sizes shown shall be accomplished without increasing air velocities or friction losses and is subject to prior approval by the Architect and Engineer.

C. Elbows shall be mitered with double-thickness turning vanes except that lined ductwork for low pressure returns and transfers shall not have turning vanes.

D. Abrupt changes in duct sizes and shapes shall not be permitted. The total angle of diverging transitions shall be not more than 15 degrees; converging transitions shall be not more than 30 degrees unless otherwise noted or required due to structural constraints.

E. Offsets, transitions, rises and drops are not individually called out on the Design Drawings. They shall be provided as required to fit the ductwork into the allocated spaces.

F. Transition rectangular ductwork on bottom and sides. Maintain top of ductwork level and as high as possible.

G. Ductwork shall be constructed for standard 1" WC static pressure class at 2500 FPM with Class C seals and is herein defined as "low pressure ductwork".

H. Provide the following types of ductwork material for the services indicated:

1. Galvanized sheetmetal: supply, return, exhaust, and relief of conditioned and outside air

2.0 PRODUCTS

2.01 GALVANIZED SHEETMETAL

A. Galvanized sheetmetal shall be lock-forming grade G90-ASTM A 653 hot dip galvanized steel sheets. Sheetmetal shall be galvanized on each side with not less than 1.25 ounces of zinc per square foot.

B. Galvanized sheetmetal installed outside the building and subject to weather shall be soldered or welded. See Section 23 07 13 for additional information about covering and insulation.

C. Galvanized sheetmetal installed outside the building and not exposed to weather, such as in covered loading docks and parking decks, may match the construction of ductwork inside the building.

D. Galvanized sheetmetal ductwork outside the building within 20 miles of the seacoast shall have corrosion coating appropriate to the installation location.

2.02 COMBUSTION AIR DUCTS

A. Combustion air ductwork may be constructed per the plumbing vent requirements except PVC and CPVC are disallowed in return air plenums. Ductwork shall be sealed airtight to prevent mechanical room or conditioned space air infiltration. Combustion air ducts shall be complete with storm collars, weatherproof caps, and all accessories.

2.03 FLUES

A. All Category IV flues shall be specified by, and installed in accordance with, the appliance Manufacturer. Flue must be sealed "gas-tight" at all joints. Flues shall be complete with storm collars, drip T with hose end connection, weatherproof caps, and all accessories.

2.04 DAMPERS

A. Manual Volume Dampers

1. Single blade butterfly dampers are acceptable up to 12" round or 12" x 12" square. Dampers larger than these dimensions shall be multi-blade type. Single blade dampers shall be constructed of 16 gauge or heavier galvanized sheetmetal.

2. No multi-blade damper blade shall exceed 8" in width. All multiple blade dampers shall be constructed of 16 gauge galvanized steel or heavier. The damper frame shall be 16 gauge or heavier. The damper action shall be opposed-blade type.

3. Each blade shall pivot on a 1/2" cadmium plated, cold-rolled steel axle which pivots within self-lubricating, Oilite bronze bearings.

4. The top and bottom edges of each rectangular damper blade shall be crimped for stiffness.

5. The operating rod for all dampers shall be extended outside the damper frame for attachment of an operator. Each operator shall have a position indicator and locking quadrant.

6. All dampers utilized for introduction of outside air shall have flexible, gasketed edge and end seals. The leakage rate shall be less than 4 CFM per SF of face area against a 1" WC differential pressure, based on a nominal 48" x 48" damper size.

7. All dampers utilized for exhaust or relief air shall have flexible, gasketed edge and end seals. The leakage rate shall be less than 4 CFM per SF of face area against a 1" WC differential pressure, based on a nominal 48" x 48" damper size.

8. Dampers to be installed in insulated ductwork shall have standoffs sufficient to allow for insulation and vapor barrier integrity.

9. Manual volume dampers shall be as manufactured by Louvers & Dampers, Inc., Pottorff, Greenheck, Nailor, Ruskin, or an approved equal.

B. Backdraft Dampers

1. Backdraft dampers shall be sized according to their installation location and noted pressure setting. Damper pressure setting shall be adjustable and shall be accessible from outside ductwork or via access hatch, as applicable.

2.05 LOW-PRESSURE DUCT BRANCHES

A. Splitter dampers shall be provided at all low-pressure ductwork branches. All low-pressure ductwork branches shall be radiused or 45 degree take-offs; straight taps are unacceptable. The length of the damper blade shall be the same as the width of the widest duct section at the split, but in no case shall blade length be less than 12". Each operator rod shall have a locking swivel joint.

2.06 FLEXIBLE DUCT

A. Flexible ductwork shall be Class 1, UL 181 air duct and meet NFPA 90A and 90B Standards.

B. The internal duct surface shall be acoustically rated, black CPE bonded to a coated steel wire helix. The external jacket shall be a fiberglass, bi-directionally reinforced, metallized vapor barrier with a standing, triple ply seam. Fiberglass insulation shall be provided between the duct surface and the jacket to achieve a maximum thermal conductance of 0.24 BTU/Hr./sq. ft./°F at 75°F mean.

C. Flexible ductwork shall be suitable for 10" WG positive pressure and 1" WG negative pressure in sizes 4" through 12" ID, and 6" WG positive pressure and 0.5" WG negative pressure in sizes 14-16" ID.

D. Flexible ductwork, insulation and insulation cover shall be suitable for ceiling return air plenum installation and shall comply with all applicable codes and standards regarding such ceiling plenum installations.

E. Flexible duct shall be Thermaflex M-KE or an approved equal.

F. The maximum allowable installed length of flexible ductwork shall be as follows:

1. 8'-0" on low-pressure supply air systems limited to short runouts and end of runs connected to round neck supply diffusers and registers.

2. 2'-0" on connections from round neck grilles to sheetmetal ductwork on return, exhaust and transfer ductwork.

G. Provide a spin-in fitting with integral scoop and volume damper at all flexible run-out connections in low-pressure supply air ductwork only, except locations where spin-in fittings would project more than 50% into the projecting ductwork dimension. Adhesive fittings are acceptable provided they are also screwed to the ductwork and sealed with mastic.

H. Flexible ductwork shall not pass through wall, floors, or ceilings.

2.07 FLEXIBLE CONNECTIONS

A. Provide flexible duct connections at the inlet and outlet of each air handling unit and at all other locations indicated. Flexible connections shall be fabricated from a glass fabric coated on both sides with neoprene. Minimum weight shall be 30 oz. per sq. yard. Flexible connections shall be used for vibration isolation only and shall not be used to correct connection misalignment.

2.08 DUCT HARDWARE

A. Duct hardware shall be as manufactured by Young Regulator or an approved equal.

2.09 ACCESS DOORS

A. A duct access door shall be provided at each fire and smoke damper. Access doors shall be designed for 1.5 times the pressure of the duct in which they are mounted. Access doors shall be of sufficient size to provide access to the dampers for resetting the blades and replacing the links. Access doors in medium and high-pressure ductwork shall be installed downstream of fire dampers and shall be implosion type. Where access is provided through gypsum board walls or ceilings, furnish access door for installation under Division 09. Coordinate with Division 09 and Architect. Each door shall match the fire-rating of the wall or ceiling indicated.

B. Access shall be provided to duct-mounted smoke detector locations. Access shall allow inspection and maintenance of all aspects of the detector. Access doors shall meet the requirements of A, above, as needed.

3.0 EXECUTION

3.01 INSTALLATION

A. Ductwork shall be installed in strict accordance with SMACNA, UL, and NFPA standards.

B. All ductwork installed outside the building shall be secured to the structure. Coordinate with the Structural Engineer as needed. It is the Contractor's responsibility to design and coordinate all supports. All supports shall be designed to withstand all code-required wind and seismic loads.

C. Flexible ducts utilized in the low-pressure ductwork systems shall be installed without kinks or bends which are less than a centerline radius equal to or greater than twice the diameter of the flexible duct being installed.

D. Electric duct heaters shall be installed as indicated and in conformance with the manufacturer's recommendations. Coordinate the actual units to be provided with all trades. The heater shall be tested and adjusted after installation to provide the capacities indicated.

E. Ductwork labels, including factory labels, tags, etc. except equipment nameplates shall be removed to the satisfaction of the Architect in all exposed areas.

F. Dampers shall be adjustable. Where dampers are not or will not be accessible without access panels, provide and install remote balancing cable control system, Young Regulator or equal. Adjustment shall be from a nearby accessible area.

END OF SECTION

SECTION 23 34 00

HVAC FANS

1.0 GENERAL

1.01 DESCRIPTION

A. All work specified in this Section is governed by the Common Work Results for HVAC Section 23 05 00.

B. This Section 23 34 00 and the accompanying drawings cover the provision of all labor, equipment, appliances and materials, and performing all operations in connection with the construction and installation of the fans as specified herein and as shown. These fans include, but are not limited to the following:
1. Ceiling/cabinet fans

1.02 INTENT

A. It is the intent of this Section of the specifications to provide complete, operable, adjusted fans as shown and specified which are free of excessive noise, vibration and airflow fluctuations.

1.03 BASIS OF DESIGN

A. The basis of design is as scheduled. Any proposed substitutions shall be proven equal in all aspects to the equipment specified as the basis of design. Particular attention is called to the requirements of Section 23 05 00.

1.04 ACCEPTABLE SUBSTITUTE MANUFACTURERS

A. Acceptable substitute manufacturers are Carnes, Cook, Acme, PennBarry, Twin City, Price, and Greenheck.

2.0 PRODUCTS

2.01 GENERAL REQUIREMENTS

A. All fans shall be factory tested, rated, and certified in accordance with the requirements of AMCA Standard No. 210 and shall be labeled accordingly.

B. All exhaust fans shall be provided complete with gravity-type backdraft dampers.

C. All electric motors and equipment shall be UL labeled.

D. Refer to Division 26 of these specifications and to the electrical Contract Drawings for electrical characteristics and connections to all equipment. Coordinate all electric motors and other equipment with these electrical documents.

2.02 CEILING/CABINET EXHAUST FANS

A. Ceiling/cabinet exhaust fans shall be Greenheck Model CSP (inline/cabinet) or Greenheck Model SP (ceiling) with integral grille, or an approved equal. Fans shall be provided with speed controller for balancing.

3.0 EXECUTION

3.01 INSTALLATION

A. Fans shall be installed as indicated and in conformance with the manufacturer's recommendations. Coordinate the actual units to be provided with all trades.

3.02 ADJUSTMENT

A. The fans shall be tested and adjusted after installation to provide the capacities indicated.

END OF SECTION

SECTION 23 37 13

DIFFUSERS, REGISTERS, AND GRILLES

1.0 GENERAL

1.01 DESCRIPTION

A. All work specified in this Section is governed by the Common Work Results for HVAC Section 23 05 00.

B. This Section 23 37 13 and the accompanying drawings cover the provisions of all labor, equipment, appliances, and materials, and performing all operations in connection with the construction and installation of air distribution devices as specified herein and as shown. These units include, but are not limited to the following:
1. Supply Registers (SR)
2. Return Air Registers (RAR)

1.02 INTENT

A. It is the intent of this Section of the specifications to provide complete, operable, adjusted air distribution devices as shown and specified which are free of excessive noise, vibration and airflow fluctuations.

1.03 SELECTION CRITERIA

A. All air distribution devices shall be selected in accordance with the following minimum criteria unless otherwise noted below or on the drawings:

1. Method of mounting shall be compatible with the ceiling, wall or duct surface which it mounts on or in; i.e. lay-in, surface mounting, plaster frame, duct collar, etc. The architectural drawings shall be referenced to determine the mounting method for each device. All flanges on surface mounted devices shall be provided with a gasket.

2. Finish of all ceiling mounted devices shall be selected to match the color of the adjacent ceiling. Finish of all wall mounted devices shall be primer which is compatible with the finish coating specified for the adjacent wall; finish coat will be applied under Division 9.

1.04 BASIS OF DESIGN

A. The basis of design is Titus. Any proposed substitutions shall be proven equal in all respects to the equipment specified as the basis of design. Any modifications to ductwork, controls, ceilings, building structure, etc., that result from any substitution shall be coordinated with all trades. This coordination shall occur before delivery of equipment and any modifications shall be performed without incurring additions to the Contract.

1.05 ACCEPTABLE MANUFACTURERS

A. Acceptable manufacturers are Price, Carnes, Metal Aire, Krueger, Nailor, and Titus UON, provided that their units, performance, appearance, and physical characteristics are equal in all respects for this specific project.

2.0 PRODUCTS

2.01 DESCRIPTION

A. Supply Registers (SR)

1. Supply registers shall be surface mounted, steel with aluminum blades, adjustable double-deflection type complete with opposed blade dampers for balancing purposes. The outermost set of deflection blades shall be parallel to the long dimension of the SR and the innermost set of deflection blades shall be parallel to the short dimension of the SR. The registers shall be tested in accordance with ADC standards and shall be selected to provide design airflow at a maximum NC of 35. SRs shall be Titus 272R.

B. Return Air Registers (RAR)

1. Return air registers shall be surface mounted, **steel, **aluminum registers with curved hemmed edge blades with an opposed blade damper. Damper blades shall be gang operated by means of a key which can be removed after balancing. RARs shall be **Titus 350ZRL (steel) **Titus 350ZFL (aluminum), except RARs shown on the return air boot detail with upturned blades shall be Titus 350RL, sized as indicated.

3.0 EXECUTION

3.01 INSTALLATION

A. Air distribution devices shall be installed as indicated and in conformance with the manufacturer's recommendations. The color, frame, and border types shall be coordinated with Architectural requirements and shall be selected to install in the finished surface indicated.

B. All air distribution devices with blade orientations shall be coordinated with Architect.

3.02 ADJUSTMENT

A. Grilles, registers, diffusers, etc. shall be tested and adjusted to provide the scheduled air flow capacities.

B. All devices shall have adjustable and accessible volume dampers.

END OF SECTION

SECTION 23 74 23.13

PACKAGED, DIRECT-FIRED, OUTDOOR, HEATING-ONLY MAKEUP-AIR UNITS

1.0 GENERAL

1.06 DESCRIPTION

A. All work specified in this Section is governed by the Common Work Results for HVAC Section 23 05 00.

B. This Section 23 74 23.13 and the accompanying drawings cover the provisions of all labor, equipment, appliances and materials, and performing all operations in connection with the construction and installation of the burners as specified herein and as shown. This work includes, but is not limited to, the following:
1. Burner assemblies
2. Gas train
3. Control system (interlocked to the gas train and central control system)

C. Units shall be completely factory-assembled as three (3) packages complete with individual "loose" control items for field mounting. The gas train shall be completely piped. The control panel shall be internally wired.

D. The only "loose" control items for field installation shall be:
1. Ignition transformer
2. UV flame scanner
3. Blower proving switch
4. Control thermocouple
5. High-limit thermocouple

1.07 INTENT

A. It is the intent of this Section of the specifications to provide complete, operable, adjusted burner units, as shown and specified, which are free of hot spots.

1.08 BASIS OF DESIGN

A. The basis of design is as scheduled. Acceptable substitutes are Greenheck, Captive-Aire, and Cambridge. Any proposed substitutions or equals by other manufacturers shall be proven equal in all respects to the equipment specified as the basis of design. Particular attention is called to the requirements of Section 23 05 00.

1.09 CERTIFICATION

A. Units shall be certified by AGA. Gas train shall be IRI/FM approved.

2.0 PRODUCTS

2.02 BURNER ASSEMBLY

A. Burner plates shall be stainless steel.

B. Burner bodies shall be ductile iron.

C. Burners shall be fully factory-assembled and complete with end plates, spark ignitor and pilot.

2.03 GAS TRAIN

A. Gas train components shall consist of not less than the following: main gas cock, main gas pressure regulator, main gas control valve, pilot gas cock, pilot gas pressure regulator, pilot solenoid gas valve, intermittent spark ignition system, high limit control and high and low pressure gas controls. Gas pressure regulators shall be capable of reducing 5 to 15 psig entering gas pressure to the required operating pressure. Where indoors, regulators shall be listed for unvented use.

B. Units shall be provided with solid state electronic modulating gas valve with duct mounted temperature sensor. Gas valve shall modulate down to 20% of rated input to provide constant leaving air temperature. The temperature selector shall be mounted in the control cabinet.

2.04 CONTROL PANEL

A. Cabinet shall be NEMA 12 construction with an enamel finish.

B. Alarm horn and indicator lights.

C. Step down transformers shall be provided as required.

D. Units shall be factory-wired for single point electrical connection.

E. Provide circuits and screw terminals for connection to fire alarm panel and central control system.

3.0 EXECUTION

3.03 INSTALLATION

A. Burner unit shall be installed where shown on Drawings in strict accordance with manufacturer recommendations. Do not mount rigidly to assure adequate expansion.

B. All piping, power and control wiring shall be provided to complete the installation.

END OF SECTION

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A TENANT ADDITION

at

SRS DISTRIBUTION, INC. - ROCKWALL, TEXAS (H-ROOM)

for

SRS Distribution

2065 KRISTY LN
ROCKWALL, TEXAS 75032

Print Record		Drw.	Chk.
14 OCT 24	ISSUED FOR PERMIT	LC	CK

Revisions		

Date: 10/14/2024
Project No.: 2023362.00

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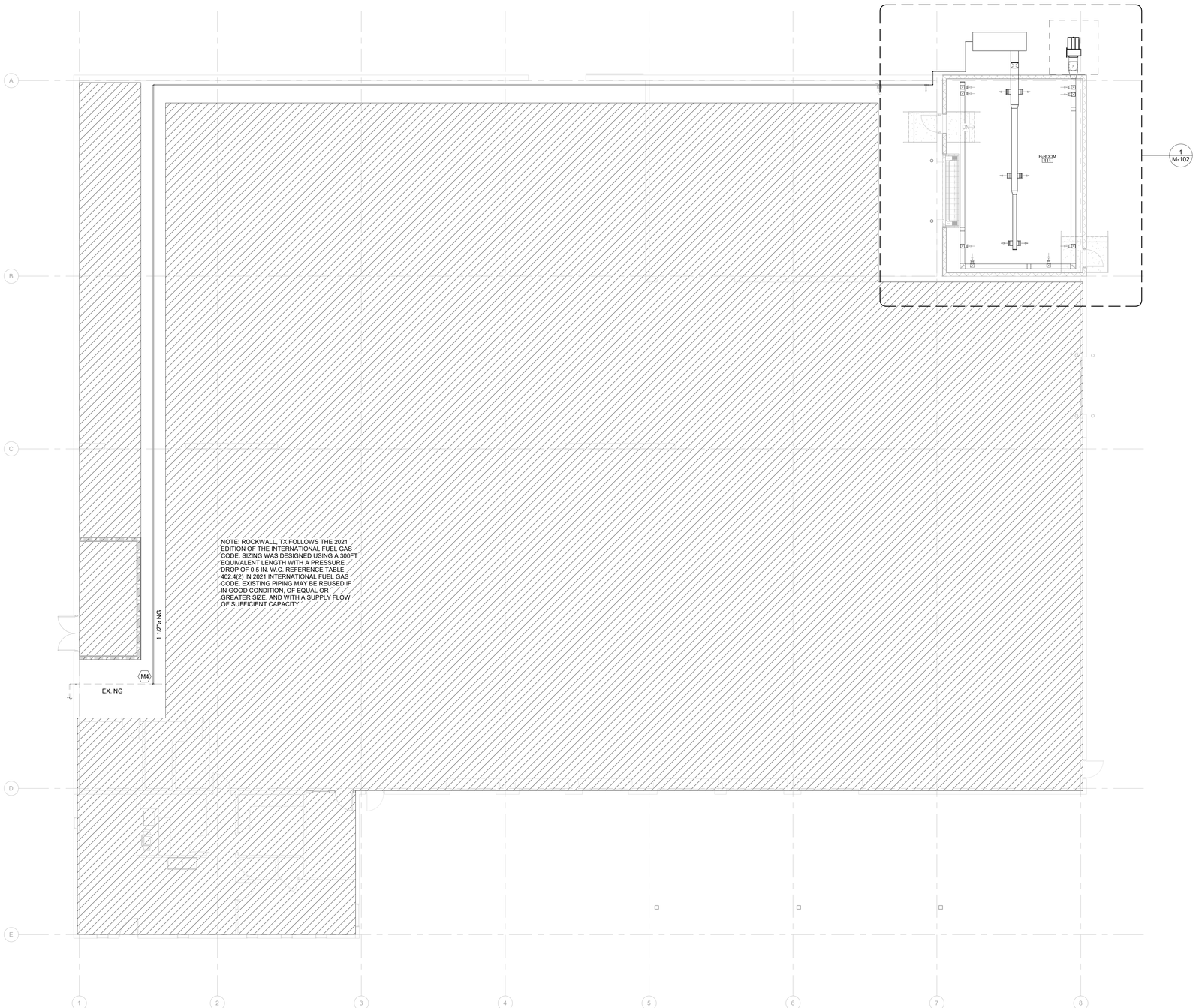
MECHANICAL SPECIFICATIONS

Sheet No.
M-003

■ Released for Construction
□ Not Released for Construction



1 Mechanical Plan - Overall
1/8" = 1'-0"

KEY NOTES

M4 CONNECT NEW NATURAL GAS PIPING PIPING TO EXISTING PIPING OF SUFFICIENT CAPACITY. CONTRACTOR TO VERIFY CONNECTION LOCATION PRIOR TO BEGINNING CONSTRUCTION AND IS TO COORDINATE INCREASED GAS LOAD WITH THE GAS COMPANY. PROVIDE NEW METER IF THE EXISTING METER ISN'T LARGE ENOUGH.

GENERAL NOTES

1 CONTRACTOR SHALL VISIT SITE PRIOR TO BID AND ASCERTAIN ALL EXISTING CONDITIONS. NO ALLOWANCES WILL BE PROVIDED FOR LACK OF KNOWLEDGE OF EXISTING CONDITIONS. CONTRACTOR SHALL DEMO ALL NON-ESSENTIAL DUCTWORK AND PIPING WHICH IS NOT REQUIRED FOR THIS INSTALLATION. COORDINATE ALL DEMO WITH BUILDING REP BEFORE DEMO WORK COMMENCES.

2 EXISTING WORK SHOWN HERE IS BASED ON SITE VISIT AND/OR PROVIDED INFORMATION. THESE DRAWINGS ARE NOT NECESSARILY ACCURATE FOR EXISTING MATERIALS AND SHOULD NOT BE INTERPRETED TO BE A STRICT REPRESENTATION OF AS-BUILT CONDITIONS.

3 ALL DUCTWORK SHOWN IS SCHEMATIC IN NATURE AND DOES NOT REFLECT ALL OFFSETS, CHANGES IN ELEVATION, ETC. NECESSARY FOR COORDINATION BETWEEN TRADES. OFFSET & COORDINATE AS REQUIRED.

4 THERMOSTAT / SENSOR PLACEMENT SHALL BE COORDINATED WITH ARCHITECTURAL FINISH PLANS, FURNITURE PLANS, & ALL WALL-MOUNTED ELECTRICAL DEVICES. DIFFUSER LOCATIONS, SPRINKLER HEADS, ETC. SHALL BE COORDINATED WITH ALL OTHER CEILING DEVICES. SEE ARCHITECTURAL DRAWINGS.

5 FIELD COORDINATE INSTALLATION OF DUCTWORK, PIPING, EQUIPMENT, ETC. WITH ALL OTHER TRADES.

6 CONTRACTOR TO VERIFY ALL MECHANICAL EQUIPMENT AND AIR DISTRIBUTION/RETURN DEVICES ARE IN PROPER WORKING CONDITION. IF NOT, REPAIR OR REPLACE WITH NEW, MATCHING BASE BUILDING STANDARDS.

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A TENANT ADDITION

at

SRS DISTRIBUTION, INC. - ROCKWALL, TEXAS (H-ROOM)

for

SRS Distribution

2065 KRISTY LN
ROCKWALL, TEXAS 75032

Print Record		Drw.	Chk.
14 OCT 24	ISSUED FOR PERMIT	LC	CK

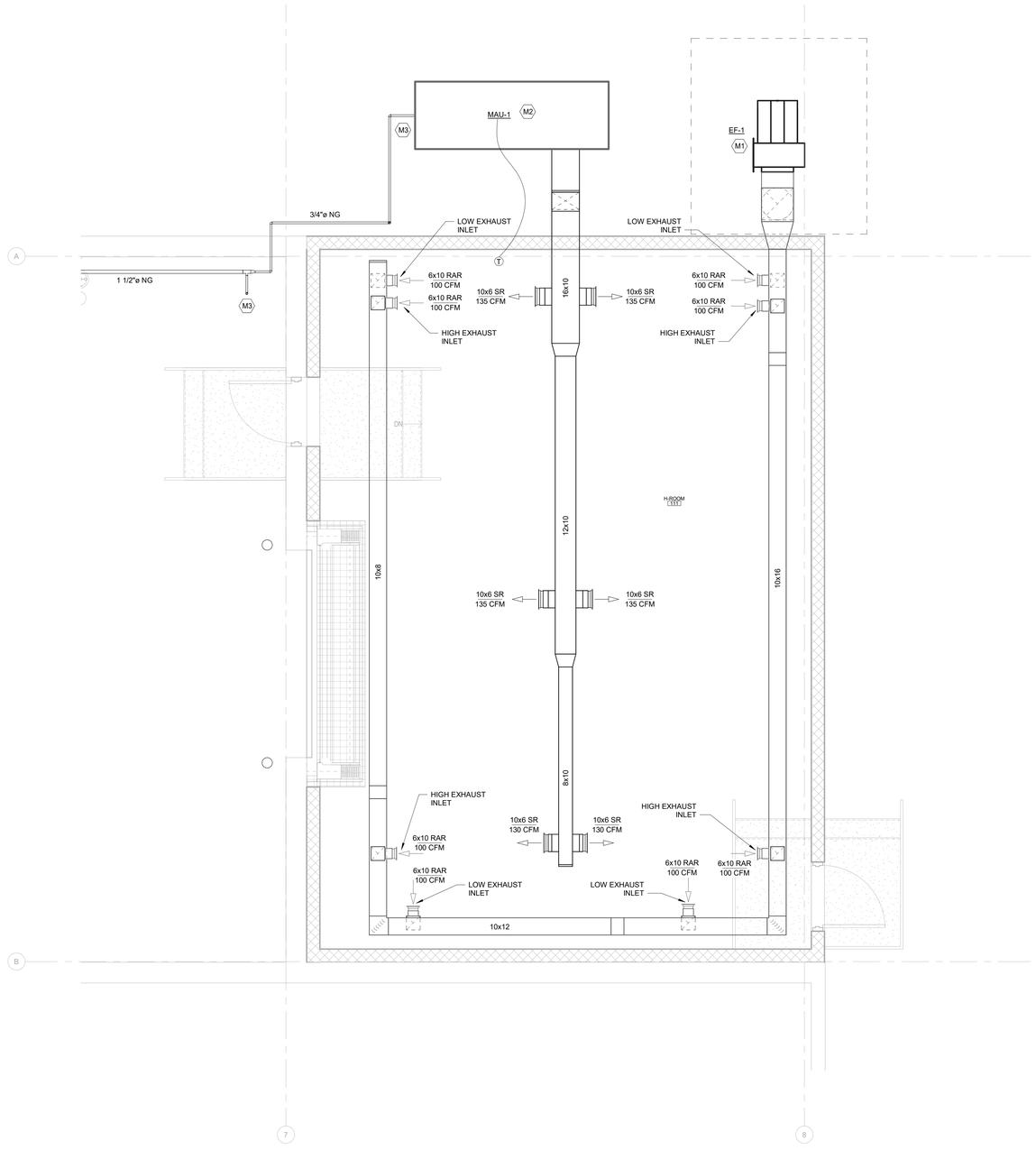
Revisions	

Date: 10/14/2024
Project No.: 2023362.00

Sheet Title
MECHANICAL PLAN - OVERALL

Sheet No.
M-101

■ Released for Construction
□ Not Released for Construction



1 Mechanical Plan - H Room
3/8" = 1'-0"

KEY NOTES

M1 PROVIDE AND INSTALL NEW GRADE-MOUNTED EXHAUST FAN AS SCHEDULED ON P-001. REFER TO DETAIL 1/M-001.

M2 PROVIDE AND INSTALL MAKE UP AIR UNIT AS SCHEDULED ON P-001. MOD SHALL BE INTERLOCKED TO MAU AND SHALL SHUT WHEN NOT IN USE.

M3 PROVIDE NEW NATURAL GAS CONNECTION TO EQUIPMENT AS SHOWN. REFER TO DETAIL 2/M-001. GAS PIPING SHALL HAVE MINIMUM OF 10 DIAMETERS OF STRAIGHT RUN INTO EQUIPMENT. COORDINATE WITH MANUFACTURER REQUIREMENTS.

GENERAL NOTES

1 CONTRACTOR SHALL VISIT SITE PRIOR TO BID AND ASCERTAIN ALL EXISTING CONDITIONS. NO ALLOWANCES WILL BE PROVIDED FOR LACK OF KNOWLEDGE OF EXISTING CONDITIONS. CONTRACTOR SHALL DEMO ALL NON-ESSENTIAL DUCTWORK AND PIPING WHICH IS NOT REQUIRED FOR THIS INSTALLATION. COORDINATE ALL DEMO WITH BUILDING REP BEFORE DEMO WORK COMMENCES.

2 EXISTING WORK SHOWN HERE IS BASED ON SITE VISIT AND/OR PROVIDED INFORMATION. THESE DRAWINGS ARE NOT NECESSARILY ACCURATE FOR EXISTING MATERIALS AND SHOULD NOT BE INTERPRETED TO BE A STRICT REPRESENTATION OF AS-BUILT CONDITIONS.

3 ALL DUCTWORK SHOWN IS SCHEMATIC IN NATURE AND DOES NOT REFLECT ALL OFFSETS, CHANGES IN ELEVATION, ETC. NECESSARY FOR COORDINATION BETWEEN TRADES. OFFSET & COORDINATE AS REQUIRED.

4 THERMOSTAT / SENSOR PLACEMENT SHALL BE COORDINATED WITH ARCHITECTURAL FINISH PLANS, FURNITURE PLANS, & ALL WALL-MOUNTED ELECTRICAL DEVICES. DIFFUSER LOCATIONS, SPRINKLER HEADS, ETC. SHALL BE COORDINATED WITH ALL OTHER CEILING DEVICES. SEE ARCHITECTURAL DRAWINGS.

5 FIELD COORDINATE INSTALLATION OF DUCTWORK, PIPING, EQUIPMENT, ETC. WITH ALL OTHER TRADES.

6 CONTRACTOR TO VERIFY ALL MECHANICAL EQUIPMENT AND AIR DISTRIBUTION/RETURN DEVICES ARE IN PROPER WORKING CONDITION. IF NOT, REPAIR OR REPLACE WITH NEW, MATCHING BASE BUILDING STANDARDS.

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BWA COA# 13267

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Roswell . Nashua

STATE OF TEXAS
JOHN TANNER EDWARDS
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Date Signed: 10/14/2024

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architecture/interiors

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Sheet Title
MECHANICAL PLAN - H ROOM

Sheet No.
M-102

■ Released for Construction
□ Not Released for Construction

LIGHTING FIXTURE SCHEDULE

TYPE	MANUFACTURER CATALOG NO.	LAMPS		BALLAST		TOTAL WATTS	VOLTAGE	DESCRIPTION
		QTY.	TYPE	QTY.	TYPE			
A	HOLOPHANE HEXS SERIES OR APPROVED EQUAL	1	LED (4000K)	1	ELECTRONIC DRIVER	80	120/277	4' LINEAR EXPLOSION-PROOF LED FIXTURE. CLASS 1 DIVISION 1 RATED. CLEAR LENS. PENDANT MOUNT SUCH THAT FIXTURE IS 20' A.F.F. CONNECT INTO EMERGENCY GENERATOR CIRCUIT. 4480 LUMENS.
X	HALOPHANE HDXE EXIT SIGN OR APPROVED EQUAL	-	LED (RED)	1	ELECTRONIC DRIVER	-	120/277	CLASS 1 DIVISION 1 RATED WHITE ALUMINUM EXIT SIGN, WALL MOUNT 96" AFF. PROVIDE RED LETTERING. PROVIDE DIRECTIONAL ARROWS AND NUMBER OF FACES AS INDICATED. CONNECT INTO EMERGENCY GENERATOR CIRCUIT. SEE LIGHTING PLAN.

NOTES:
1. ALL FIXTURES SHALL BE UL LISTED AND APPROVED BY ARCHITECT/OWNER PRIOR TO ORDERING.
2. FIXTURES "X" & FIXTURES DESIGNATED AS EMERGENCY WITH AN "E" SHALL BE WIRED "UNSWITCHED".
3. ALL REMOTE BALLAST LOCATIONS SHALL BE REVIEWED AND APPROVED BY THE ARCHITECT PRIOR TO INSTALLATION.
4. COORDINATE MOUNTING HEIGHTS OF ALL SUSPENDED FIXTURES WITH ARCHITECT PRIOR TO INSTALLATION.

ELECTRICAL GENERAL NOTES

1. ALL WORK IN THIS DIVISION SHALL COMPLY WITH ALL LOCAL BUILDING CODES, LAWS, REGULATIONS, ORDINANCES, AND THE REQUIREMENTS OF THE 2020 NATIONAL ELECTRICAL CODE.
2. THE CONTRACTOR SHALL KEEP A RECORD OF THE CHANGES WHICH ARE IN CONFLICT WITH THESE DRAWINGS AND SPECIFICATIONS. AT THE COMPLETION OF HIS WORK HE SHALL SUBMIT "AS BUILT" PRINTS AND ELECTRONIC CAD FILES TO THE OWNER.
3. DRAWINGS ARE GENERALLY DIAGRAMMATIC AND DO NOT NECESSARILY SHOW EVERY FITTING AND DETAIL. ALL WORK SHALL BE INSTALLED SO THAT JUNCTION BOXES AND COMPONENTS WILL BE ACCESSIBLE FOR SERVICE.
4. ALL SYSTEMS, EQUIPMENT, COMPONENTS, WORK, ETC. PROVIDED UNDER THIS DIVISION SHALL BE COVERED BY A ONE YEAR GUARANTEE STARTING AT THE TIME OF FINAL ACCEPTANCE OF THE WORK BY THE OWNER. ANY DEFECTS IN THE WORK, SYSTEMS, EQUIPMENT, OR COMPONENTS FOUND DURING THIS YEAR SHALL BE CORRECTED AT NO CHARGE. THE GUARANTEE SHALL INCLUDE PROVIDING ALL NECESSARY CUTTING, PATCHWORK, REPAINTING, ETC. TO MAKE THE WORK COMPLETE AND NEW.
5. ALL CONDUCTORS SHALL BE COPPER WITH TYPE "THW" OR "THHN" WITH 90-DEGREE INSULATION TEMPERATURE RATING. THE MINIMUM WIRE SIZE SHALL BE #12 A.W.G.
6. ALL CONDUIT SHALL BE CONCEALED IN THE WALLS OR ABOVE THE CEILING UNLESS OTHERWISE NOTED. ALL HOMERUN CIRCUITRY SHALL BE 2#12, 1#12G, 3/4" CONDUIT UNLESS NOTED OTHERWISE. ALL NON-HOMERUN CIRCUITRY SHALL BE 2#12, 1#12G, 1/2" CONDUIT UNLESS NOTED OTHERWISE.
7. ALL WORK MUST BE PERFORMED IN A NEAT AND WORKMANLIKE MANNER ACCORDING TO GENERALLY ACCEPTED PRINCIPALS OF FIRST CLASS WORKMANSHIP.
8. ALL PENETRATIONS THRU WALLS, FLOORS, AND CEILINGS SHALL BE FIRE STOPPED PER N.E.C. 300.21. ALL UPPER SLAB PENETRATIONS SHALL BE SLEEVED AND SEALED PER OWNER'S REQUIREMENTS.
9. ALL ROOF PENETRATIONS SHALL BE AS AUTHORIZED BY OWNER AND IN ACCORDANCE WITH OWNER REQUIREMENTS. MAINTAIN ROOF WATERTIGHT INTEGRITY.
10. PROVIDE JUNCTION BOX WITH 3/4" EMT STUBBED UP TO 6" ABOVE ACCESSIBLE CEILING IN NEAREST WALL AT EACH TELEPHONE, DATA, AND COMBINATION TELEPHONE/DATA OUTLET. PROVIDE PULSTRING AND BUSHINGS AT THE TERMINATION ABOVE CEILING.
11. FASTEN ALL RECESSED LIGHTING FIXTURES TO STRUCTURE OR GRID PER N.E.C. 410.10 & 410.36.
12. PROVIDE ALL GROUNDING AS REQUIRED BY N.E.C.
13. PROVIDE #12 A.W.G. GROUND CONDUCTOR FOR ALL MECHANICAL EQUIPMENT UNLESS OTHERWISE NOTED. ALL EQUIPMENT SHALL BE GROUNDED AT THE PANEL WHICH FEEDS THE EQUIPMENT.
14. PROVIDE A SEPARATE GREEN, INSULATED, #12 A.W.G. EQUIPMENT GROUNDING CONDUCTOR ROUTED WITH THE BRANCH CIRCUIT HOMERUN CONDUCTORS.
15. DEVICE MOUNTING HEIGHTS ARE TO BE MEASURED TO THE DEVICE CENTERLINE UNLESS NOTED OTHERWISE.
16. ALL SWITCHES FOR FANS, LIGHTS, ETC. WHICH ARE SHOWN TO BE MOUNTED IN THE SAME GENERAL AREA SHALL SHARE A MULTI-GANG COVER PLATE AS REQUIRED.
17. AT COMPLETION OF PROJECT, REMOVE ALL TEMPORARY CONSTRUCTION CIRCUITING, WIRING, CABLING, AND LIGHTING SYSTEMS.
18. PROVIDE A PRINTED PANEL SCHEDULE FOR ALL PANELS. CORRECTLY LABEL ALL CIRCUITS, SPARES AND SPACES. NOTIFY DESIGN ENGINEER OF ANY DISCREPANCY OF PANEL LABELS.
19. COORDINATE RECEPTACLE NEMA TYPE AND VOLTAGE WITH COPIERS AND EQUIPMENT.
20. ALL CABLE USED IN PLENUM SHALL BE PLENUM-RATED.
21. ARMORED CABLE MAY BE USED IN WALLS AND MILLWORK ONLY AND MUST BE MC TYPE (WITH GROUND). ALL CONDUIT TO AND ABOVE THE PLENUM SHALL BE EMT.
22. ALL DEVICES SHALL HAVE WHITE COVER WHERE APPLICABLE AND ALLOWED BY ALL CODE.
23. CONTRACTOR SHALL CLEAN SITE AT END OF PROJECT. ALL DUST, DEBRIS, OILS, SPRAYS, FINGERPRINTS, AND LABELS SHALL BE REMOVED FROM ALL EXPOSED FINISHED SURFACES.
24. ALL SHADED OR HALF-SHADED LUMINAIRES SHOWN ON DRAWINGS SHALL BE EQUIPPED WITH A BATTERY BACK UP ANY FIXTURE USED FOR PATH OF EGRESS ILLUMINATION SHALL BE UNSWITCHED AND REMAIN ON CONTINUOUSLY.

COMcheck Software Version COMcheckWeb

Interior Lighting Compliance Certificate

Project Information

Energy Code: 2015 IECC
Project Title: SRS Rockwall H-Room
Project Type: Alteration

Construction Site:
2065 Kristy Ln
Rockwall, Texas 75032

Owner/Agent:

Designer/Contractor:
Barrett, Woodyard & Associates
1255 Crescent Green Ste. 230
Cary, North Carolina 27518

Allowed Interior Lighting Power

A Area Category	B Floor Area (ft2)	C Allowed Watts / ft2	D Allowed Watts
1-Warehouse:Fine Material Storage	762	0.95	724
		Total Allowed Watts =	724

Proposed Interior Lighting Power

A Fixture ID : Description / Lamp / Wattage Per Lamp / Ballast	B Lamps/ Fixture	C # of Fixture	D Fixture Watt.	E (C X D)
Warehouse: Fine Material Storage (762 sq.ft.)				
LED: A: LED Panel 80W:	1	6	80	480
		Total Proposed Watts =		480

Interior Lighting PASSES

Interior Lighting Compliance Statement

Compliance Statement: The proposed interior lighting alteration project represented in this document is consistent with the building plans, specifications, and other calculations submitted with this permit application. The proposed interior lighting systems have been designed to meet the 2015 IECC requirements in COMcheck Version COMcheckWeb and to comply with any applicable mandatory requirements listed in the Inspection Checklist.

SIGNED AND STAMPED BY ENGINEER OF RECORD — Name - Title / Signature

10/14/2024 — Date

ELECTRICAL SYMBOL LEGEND

SYMBOL	DESCRIPTION	ON CENTER MTG. HT.
	CONCEALED CONDUIT IN CEILING OR WALL	
	CONCEALED CONDUIT IN FLOOR OR UNDERGROUND	
	EXPOSED CONDUIT	
	CIRCUIT HOMERUN TO PANEL; EACH ARROWHEAD = 1 CIRCUIT	
	NO. OF CONDUCTORS IN CONDUIT; EACH CROSSHATCH = 1 WIRE	
	FLEXIBLE CONDUIT OR S.O. CORD	
○ ●	CONDUIT STUBBED UP OR TURNED DOWN	
	PLYWOOD BACKBOARD	
	WALL MOUNTED DUPLEX RECEPTACLE OUTLET	18" AFF U.N.O.
	WALL MOUNTED DUPLEX RECEPTACLE OUTLET WITH (2) USB PORTS	18" AFF U.N.O.
	WALL MOUNTED G.F.C.I. DUPLEX RECEPTACLE OUTLET	18" AFF U.N.O.
	WALL MOUNTED DOUBLE DUPLEX RECEPTACLE OUTLET	18" AFF U.N.O.
	WALL MOUNTED DUPLEX RECEPTACLE MOUNTED ABOVE COUNTER	②
	WALL MOUNTED G.F.C.I. DUPLEX RECEPTACLE MOUNTED ABOVE COUNTER	②
	WALL MOUNTED SPECIAL RECEPTACLE OUTLET	AS REQUIRED
c	CEILING MOUNTED DUPLEX RECEPTACLE OUTLET	AS REQUIRED
J	JUNCTION BOX - SIZE AND MOUNTING AS REQUIRED	AS REQUIRED
	FLUSH FLOOR BOX WITH QUAD RECEPTACLE AND DATA/AV PROVISIONS. SEE ELECTRICAL PLANS FOR EXACT MODEL.	
TV	RECESSED WALL BOX (WIREMOLD EFSB4 OR EQUAL BY HUBBELL) WITH DUPLEX RECEPTACLE, CABLE FEED, AND AV PROVISIONS AT WALL MOUNTED TV LOCATION.	60" AFF U.N.O.
c	CEILING MOUNTED DUPLEX RECEPTACLE OUTLET	AS REQUIRED
	WALL MOUNTED COMBINATION TELEPHONE/DATA OUTLET	18" AFF U.N.O.
	480/277 VOLT PANELBOARD	
	208/120 VOLT PANELBOARD	
	WALL MOUNTED S.P.S.T. TOGGLE SWITCH	48" AFF
3	WALL MOUNTED 3-WAY TOGGLE SWITCH	48" AFF
D	WALL MOUNTED DIMMER SWITCH - AS REQUIRED	48" AFF
T	WALL MOUNTED TIMER SWITCH	48" AFF
P	WALL MOUNTED TOGGLE SWITCH WITH PILOT LIGHT	48" AFF
OS	DUAL TECH WALL MOUNTED OCCUPANCY SENSOR SWITCH (WATTSTOPPER DW-100)	48" AFF
DOS	DUAL TECH WALL MOUNTED OCCUPANCY SENSOR SWITCH WITH DIMMING (WATTSTOPPER DW-311)	48" AFF
OS	CEILING MOUNTED OCCUPANCY SENSOR SWITCH. 120/277V. (WATTSTOPPER DT-355)	
M	MOTOR-RATED TOGGLE SWITCH	AS REQUIRED
M2	MOTOR-RATED, TWO-POLE TOGGLE SWITCH	AS REQUIRED
S 30/3/F	DISCONNECT SWITCH (FRAME/POLES/FUSE-IF REQUIRED)	
	COMBINATION MOTOR STARTER (VFD)/DISCONNECT SWITCH (PROVIDED BY DIVISION 23)	
	MOTOR STARTER (PROVIDED BY DIVISION 23)	
HP	MOTOR - NUMBER INDICATES HORSEPOWER (F=FRACTIONAL)	
M	MOTOR-OPERATED DAMPER (PROVIDED BY DIVISION 23)	
	EXIT SIGN - CEILING, WALL MOUNTED	
○	FLUORESCENT OR LED LIGHT FIXTURE.	
●	FLUORESCENT OR LED LIGHT FIXTURE ON BATTERY BACKUP (90 MINUTE).	
	FLUORESCENT OR LED STRIP LIGHT FIXTURE.	
CR	CARD READER DEVICE - PROVIDE JUNCTION BOX WITH 3/4" CONDUIT, WITH PULLSTRINGS, TO 2-GANG JUNCTION BOX LOCATED ABOVE ACCESSIBLE CEILING ON SECURE SIDE. PROVIDE 3/4" CONDUIT, WITH PULLSTRINGS, FROM 2-GANG JUNCTION BOX TO I.T. ROOM. THE "F" IN PARENTHESIS SHOWN FLOOR PLANS DENOTES AS A FUTURE DEVICE. COORDINATE EXACT LOCATION AND REQUIREMENTS WITH SECURITY VENDOR. PROVIDE ALL CONDUITS AND INFRASTRUCTURE REQUIRED FOR A COMPLETE AND OPERABLE SYSTEM.	
RX	REQUEST TO EXIT DEVICE - PROVIDE JUNCTION BOX WITH 3/4" CONDUIT, WITH PULLSTRINGS, TO 2-GANG JUNCTION BOX LOCATED ABOVE ACCESSIBLE CEILING. THE "F" IN PARENTHESIS SHOWN FLOOR PLANS DENOTES AS A FUTURE DEVICE. COORDINATE EXACT LOCATION AND REQUIREMENTS WITH SECURITY VENDOR. PROVIDE ALL CONDUITS AND INFRASTRUCTURE REQUIRED FOR A COMPLETE AND OPERABLE SYSTEM.	
	SECURITY CAMERA - PROVIDE CEILING MOUNTED JUNCTION BOX A 3/4" CONDUIT, WITH PULLSTRINGS, TO ABOVE NEAREST ACCESSIBLE CEILING. COORDINATE EXACT LOCATION AND REQUIREMENTS WITH SECURITY VENDOR. SEE SECURITY DRAWINGS FOR ADDITIONAL INFORMATION.	
TWC	TWO-WAY COMMUNICATION PANEL	
U.N.O.	UNLESS NOTED OTHERWISE	
AFF/AFG	ABOVE FINISHED FLOOR/ABOVE FINISHED GRADE	
BC	BELOW CEILING	
AC	ABOVE COUNTER	
WP	WEATHER PROOF	

NOTES:
① PROVIDE ALL ACCESSORIES AND FITTINGS NEEDED FOR COMPLETE INSTALLATION
② COORDINATE EXACT MOUNTING HEIGHT AND REQUIREMENTS WITH ARCHITECT.

GENERAL NOTES:
1. EACH MULTIWIRE BRANCH CIRCUIT SHALL BE PROVIDED WITH A MEANS THAT WILL SIMULTANEOUSLY DISCONNECT ALL UNGROUNDED CONDUCTORS AT THE POINT WHERE THE BRANCH CIRCUIT ORIGINATES PER NEC 210.4(B).

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BWA Project #: 2024-1025

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architecture/interiors

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Print Record	Drw.	Chk.
14 OCT 24 | ISSUED FOR PERMIT		

Revisions	

Date: 10/14/2024
Project No.: 2023362.00

Sheet Title
ELECTRICAL LEGEND, NOTES, & DETAILS

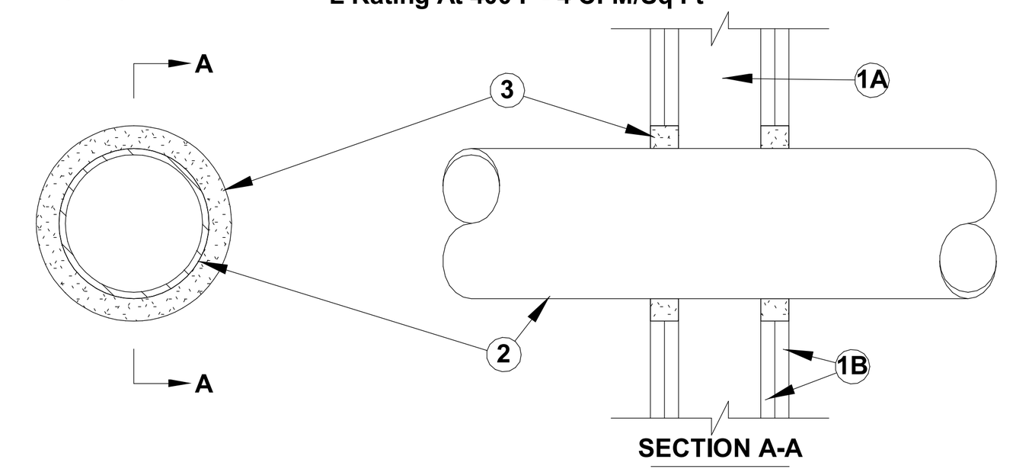
Sheet No.
E-001

■ Released for Construction
□ Not Released for Construction

C UL US
Classified by Underwriters Laboratories, Inc. to UL 1479

System No. W-L-1054

F Ratings - 1 and 2 Hr (See Items 1 and 3)
T Rating - 0 Hr
L Rating At Ambient - Less Than 1 CFM/Sq Ft
L Rating At 400 F - 4 CFM/Sq Ft



1. Wall Assembly -- The 1 or 2 hr fire-rated gypsum wallboard/stud wall assembly shall be constructed of the materials and in the manner specified in the individual U300 or U400 Series Wall and Partition Designs in the UL Fire Resistance Directory and shall include the following construction features:
   A. Studs -- Wall framing may consist of either wood studs or steel channel studs. Wood studs to consist of nom 2 by 4 in. lumber spaced 16 in. OC. Steel studs to be min 2-1/2 in. wide and spaced max 24 in. OC. When steel studs are used and the diam of opening exceeds the width of stud cavity, the opening shall be framed on all sides using lengths of steel stud installed between the vertical studs and screw-attached to the steel studs at each end. The framed opening in the wall shall be 4 to 6 in. wider and 4 to 6 in. higher than the diam of the penetrating item such that, when the penetrating item is installed in the opening, a 2 to 3 in. clearance is present between the penetrating item and the framing on all four sides.
   B. Gypsum Board* -- 5/8 in. thick, 4 ft wide with square or tapered edges. The gypsum board type, thickness, number of layers, fastener type and sheet orientation shall be as specified in the individual U300 or U400 Series Design in the UL Fire Resistance Directory. Max diam of opening is 32-1/4 in. for steel stud walls. Max diam of opening is 14-1/2 in. for wood stud walls. The F Rating of the firestop system is equal to the fire rating of the wall assembly.
2. Through-Penetrants -- One metallic pipe, conduit or tubing to be installed either concentrically or eccentrically within the firestop system. The annular space shall be min 0 in. to max 2-1/4 in. Pipe may be installed with continuous point contact. Pipe, conduit or tubing may be installed at an angle not greater than 45 degrees from perpendicular. Pipe, conduit or tubing to be rigidly supported on both sides of wall assembly. The following types and sizes of metallic pipes, conduits or tubing may be used:
   A. Steel Pipe -- Nom 30 in diam (or smaller) Schedule 10 (or heavier) steel pipe.
   B. Iron Pipe -- Nom 30 in. diam (or smaller) cast or ductile iron pipe.
   C. Conduit -- Nom 4 in diam (or smaller) steel electrical metallic tubing or 6 in. diam steel conduit.
   D. Copper Tubing -- Nom 6 in. diam (or smaller) Type L (or heavier) copper tubing.
   E. Copper Pipe -- Nom 6 in. diam (or smaller) regular (or heavier) copper pipe.
3. Fill, Void or Cavity Material* -- Sealant -- Min 5/8 in. thickness of fill material applied within the annulus, flush with both surfaces of wall. At the point or continuous contact locations between pipe and wall, a min 1/2 in. diam bead of fill material shall be applied at the pipe wall interface on both surfaces of wall .
   HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC -- FS-One Sealant

*Bearing the UL Classification Mark

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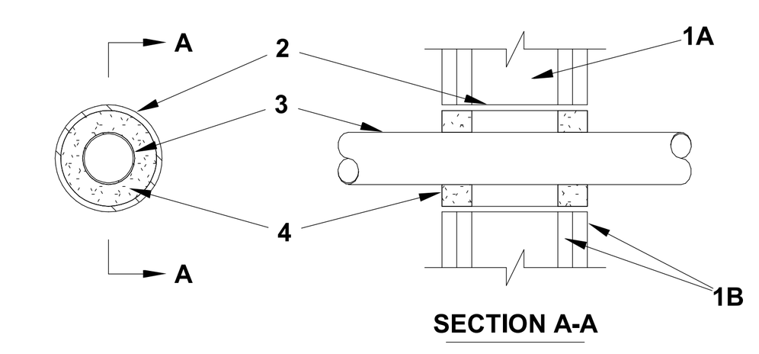
Underwriters Laboratories, Inc.
December 4, 2002

UL
Underwriters Laboratories, Inc. to UL 1479

System No. W-L-2075

F Ratings - 1 & 2 Hr (See Item 4)
T Ratings - 0 and 2 Hr (see Item 4)
L Rating At Ambient - Less Than 1 CFM/Sq Ft
L Rating At 400 F - 4 CFM/Sq Ft



1. Floor or Wall Assembly -- The fire-rated gypsum wallboard/stud wall assembly shall be constructed of the materials and in the manner specified in the individual U300 or U400 Series Wall and Partition Designs in the UL Fire Resistance Directory and shall include the following construction features:
   A. Studs -- Wall framing may consist of either wood studs or steel channel studs. Wood studs to consist of nom 2 by 4 in. lumber spaced 16 in. OC. Steel studs to be min 2-1/2 in. wide and spaced max 24 in. OC.
   B. Gypsum Board* -- Nom 5/8 in. thick gypsum wallboard, as specified in the individual Wall and Partition Design. Max diam of opening is 4 in.
2. Metallic Sleeve -- (Optional) -- Nom 4 in. diam (or smaller) Schedule 40 (or thinner) steel pipe cast into wall assembly with joint compound and installed flush with wall surfaces.
3. Electrical Nonmetallic Tubing+ -- Nom 2 in. diam (or smaller) corrugated wall electrical nonmetallic tubing (ENT) constructed of polyvinyl chloride (PVC). Tubing to be rigidly supported on both sides of wall assembly. A nom annular space of 3/4 in. is required within the firestop system.
   See Electrical Nonmetallic Tubing (FKHU) category in the Electrical Construction Materials Directory for names of manufacturers.
4. Fill, Void or Cavity Material* -- Sealant -- Installed symmetrically on both sides of the wall. The hourly F Rating of the firestop system is equal to the hourly fire rating of the wall assembly in which it is installed. Fill material applied within the annulus, flush with each end of the steel sleeve at the thickness shown in the table below:

F Rating Hr	T Rating Hr	Fill Mtl Depth In.
1	0	5/8
2	2	1-1/4

HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC -- FS-One Sealant
+Bearing the UL Listing Mark
*Bearing the UL Classification Marking

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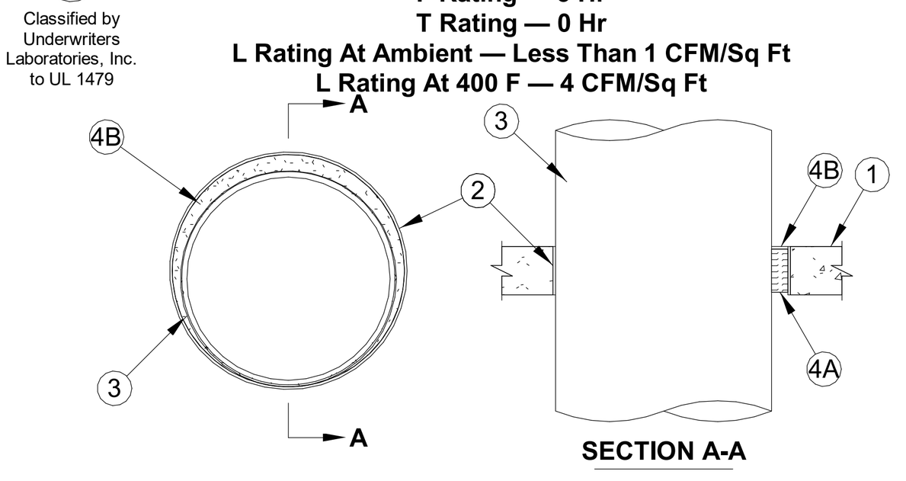
Underwriters Laboratories, Inc.
January 9, 2003

C UL US
Classified by Underwriters Laboratories, Inc. to UL 1479

System No. C-AJ-1226

F Rating — 3 Hr
T Rating — 0 Hr
L Rating At Ambient — Less Than 1 CFM/Sq Ft
L Rating At 400 F — 4 CFM/Sq Ft



1. Floor or Wall Assembly — Min 4-1/2 in. thick reinforced lightweight or normal weight (100-150 pcf) concrete. Wall may also be constructed of any UL Classified Concrete Blocks*. Max diam of opening is 32 in.
2. Metallic Sleeve — (Optional) Nom 32 in. diam (or smaller) Schedule 40 (or heavier) steel sleeve cast or grouted into floor or wall assembly, flush with floor or wall surfaces or extending a max of 3 in. above floor or beyond both surfaces of wall.

2A. Sheet Metal Sleeve — (Optional) Max 6 in. diam, min 26 ga galv steel provided with a 26 ga galv steel square flange spot welded to the sleeve at approx mid-height, or flush with bottom of sleeve in floors, and sized to be a min of 2 in. larger than the sleeve diam. The sleeve is to be cast in place and may extend a max of 4 in. below the bottom of the deck and a max of 1 in. above the top surface of the concrete floor.

2B. Sheet Metal Sleeve — (Optional) - Max 12 in. diam, min 24 ga galv steel provided with a 24 ga galv steel square flange spot welded to the sleeve at approx mid-height, or flush with bottom of sleeve in floors, and sized to be a min of 2 in. larger than the sleeve diam. The sleeve is to be cast in place and may extend a max of 4 in. below the bottom of the deck and a max of 1 in. above the top surface of the concrete floor.

3. Through-Penetrant — One metallic pipe, tube or conduit to be installed either concentrically or eccentrically within the firestop system. The annular space between penetrant and periphery of opening shall be min 0 in. (point contact) to max 1-7/8 in. Penetrant may be installed with continuous point contact. Penetrant to be rigidly supported on both sides of floor or wall assembly. The following types and sizes of metallic penetrants may be used:
   A. Steel Pipe — Nom 30 in. diam (or smaller) Schedule 10 (or heavier) steel pipe.
   B. Iron Pipe — Nom 30 in. diam (or smaller) cast or ductile iron pipe.
   C. Copper Pipe — Nom 6 in. diam (or smaller) Regular (or heavier) copper pipe.
   D. Copper Tubing — Nom 6 in. diam (or smaller) Type L (or heavier) copper tubing.
   E. Conduit — Nom 6 in. diam (or smaller) steel conduit.
   F. Conduit — Nom 4 in. diam (or smaller) steel electrical metallic tubing (EMT).
4. Firestop System — The firestop system shall consist of the following:
   A. Packing Material — Min 4 in. thickness of min 4 pcf mineral wool batt insulation firmly packed into opening as a permanent form. Packing material to be recessed from top surface of floor or sleeve or from both surfaces of wall or sleeve as required to accommodate the required thickness of fill material.
   B. Fill, Void or Cavity Material* — Sealant — Min 1/4 in. thickness of fill material applied within the annulus, flush with top surface of floor or sleeve or with both surfaces of wall or sleeve. At the point or continuous contact locations between penetrant and concrete or sleeve, a min 1/4 in. diam bead of fill material shall be applied at the concrete or sleeve/ pipe penetrant interface on the top surface of floor and on both surfaces of wall.
   HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — FS-One Sealant

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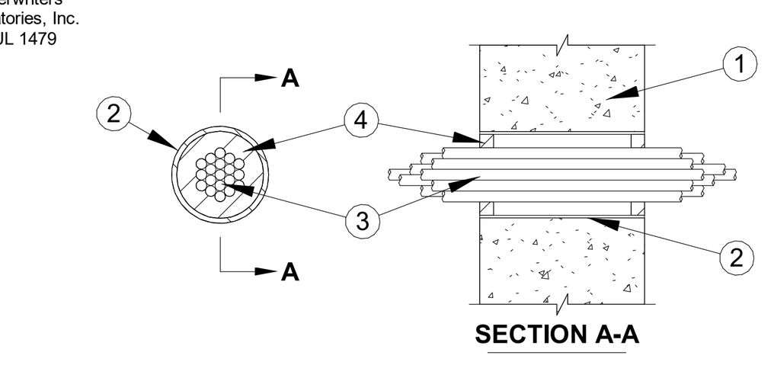
Underwriters Laboratories, Inc.
June 27, 2007

C UL US
Classified by Underwriters Laboratories, Inc. to UL 1479

System No. W-J-3060

F Rating - 2 Hr
T Rating - 0 Hr



1. Wall Assembly — Min 5 in. (127 mm) thick reinforced lightweight or normal weight (100-150 pcf or 1600-2400kg/m³) concrete. Wall may also be constructed of any UL Classified Concrete Blocks*. Max diam of opening is 4 in (102 mm). Max diam of opening is 5-1/2 in. (138 mm) when sleeve (Item 2) is employed.
   See Concrete Blocks (CAZT) category in the Fire Resistance Directory for names of manufacturers.
2. Steel Sleeve — (Optional) — Nom 4 in. (102 mm) diam (or smaller) steel electrical metallic tubing (EMT) of Schedule 5 (or heavier) steel pipe or min 0.016 thick (28 MSG or 0.4 mm) galv steel sleeve friction fit or cast into wall flush with wall surfaces. When Schedule 5 steel pipe or EMT is used, sleeve may extend up to 18 in. (457 mm) beyond the wall surfaces. As an option when Schedule 5 steel pipe or EMT is used, sleeve may extend continuously beyond one wall surface.
3. Cables — Aggregate cross sectional area of cables to be max 45 percent of the cross sectional area of the opening. Cables installed either concentrically or eccentrically within the firestop system. The annular space between cables and the periphery of the opening shall be min 0 in. (point contact) to max 1 in. (25 mm). Cables to be rigidly supported on both sides of wall assembly. The following types of cables may be used:
   A. 7/C No. 12 AWG cable with PVC insulation and outer jacket.
   B. Max 25 pair No. 24 AWG telephone cable with PVC insulation and outer jacket.
   C. Max RG 59 (or smaller) coaxial cable with polyethylene insulation and PVC jacket.
   D. Max RG 6/U coaxial cable with fluorinated ethylene insulation and jacketing.
   E. Multiple 24 fiber optic communication cable with PVC jacket, have a max outside diam of 5/8 in. (16 mm).
   F. Max four pair No. 22 AWG Cat 5 or Cat 6 computer cables.
   G. Through Penetrating Product*—Max three copper connector No. 8 AWG Metal-clad Cable+.
   AFC CABLE SYSTEMS INC
   H. Through Penetrating Product* — Any cables, Metal-Clad Cable+ or Armored Cable+ currently Classified under the Through Penetrating Products category.
   See Through Penetrating Product (XHLY) category in the Fire Resistance Directory for names of manufacturers.
4. Fill, Void or Cavity Material* — Sealant — Min 5/8 in. (16 mm) thickness of fill material applied within annulus, flush with both surfaces of wall assembly. An additional 1/2 in. (13 mm) bead of fill material shall be applied around the perimeter of sleeve on both sides of the wall when sleeve extends beyond surface of wall.
   HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — CP601S Sealant, CP606 Sealant, FS-ONE Sealant or CP618 Putty

*Bearing the UL Classification Mark
+Bearing the UL Listing Mark

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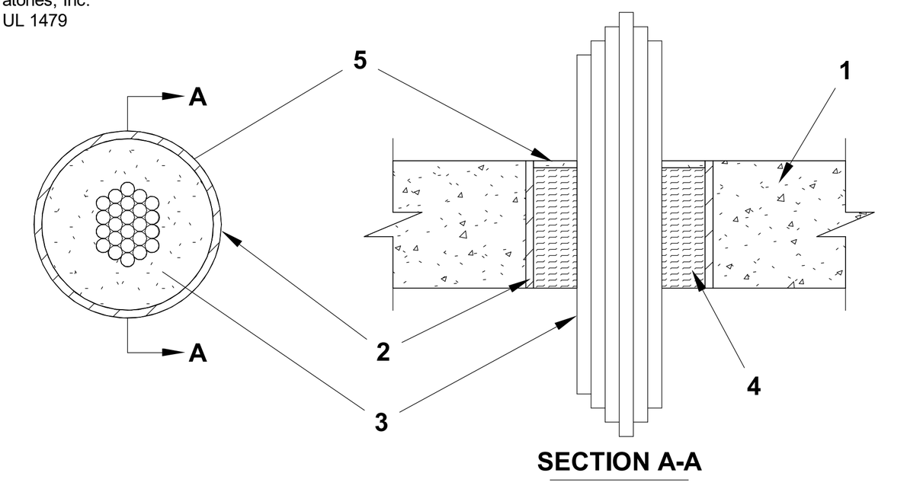
July 18, 2011

C UL US
Classified by Underwriters Laboratories, Inc. to UL 1479

System No. C-AJ-3180

F Rating - 3 Hr
T Rating = 0 Hr



1. Floor or Wall Assembly — Min 4-1/2 in. (114 mm) thick reinforced lightweight or normal weight (100-150 pcf or 1600 2400 kg/m3) concrete floor or min 4-3/4 in. (121 mm) thick reinforced lightweight or normal weight concrete wall. Wall may also be constructed of any UL Classified Concrete Blocks*. Max diam of opening is 6 in.(152 mm).
   See Concrete Blocks (CAZT) category in the Fire Resistance Directory for names of manufacturers.
2. Steel Sleeve — (Optional) — Nom 6 in. (152 mm) diam (or smaller) Schedule 40 (or heavier) steel pipe cast or grouted into floor or wall assembly, flush with floor or wall surfaces.
3. Cables — Aggregate cross-sectional area of cables in opening to be max 45 percent of the aggregate cross-sectional area of the opening. Cables to be rigidly supported on both sides of floor or wall assembly. Any combination of the following types and sizes of metallic conductor or fiber optic cable may be used:
   A. Max 500 kcmil single copper connector power cable with thermoplastic insulation and polyvinyl chloride (PVC) jacket.
   B. Max 300 pair No. 24 AWG copper conductor telecommunication cables with polyvinyl chloride (PVC) insulation and jacket material.
   C. Max 7/C copper conductor No. 12 AWG multiconductor power and control cables with polyvinyl chloride (PVC) or cross-linked polyethylene (XLPE) insulation and PVC jacket.
   D. Multiple fiber optical communication cables jacketed with PVC and having a max outside diam of 1/2 in. (13 mm).
   E. Max 3/C copper conductor No. 12 AWG with bare aluminum ground, polyvinyl chloride (PVC) insulated steel, Metal-clad cable.
   F. Max 3/C with ground 2/0 AWG copper conductor SER cable with cross-linked polyethylene (XLPE) insulation and polyvinyl chloride (PVC) jacket.
   G. RG/U coaxial cable with polyethylene (PE) insulation and polyvinyl chloride (PVC) jacket having a max outside diameter of ½ in. (13 mm)
   H. Fire Resistive Cables* - Max 1-1/4 in. (32 mm) diam single conductor or multi conductor Type MI cable. A min 1/8 in. (3 mm) separation shall be maintained between MI cables and any other types of cable.
4. Packing Material — Min 4-1/4 in. (108 mm) thickness of min 4 pcf (64 kg/m3) mineral wool batt insulation firmly packed into opening as a permanent form. Packing material to be recessed from top surface of floor to accommodate the required thickness of fill material.
5. Fill, Void or Cavity Material* — Sealant — Min 1/4 in. (6.4 mm) thickness of fill material applied within the annulus, flush with top surface of floor or with both surfaces of wall.
   HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — FS-One Sealant.

*Bearing the UL Classification Mark

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October 23, 2006

SCHEDULES OF THROUGH PENETRATION FIRESTOP SYSTEMS

GYPSUM WALLBOARD ASSEMBLIES

TYPE OF PENETRANT	F-RATING	UL-CLASSIFIED SYSTEM
METAL PIPES OR CONDUIT	1	WL 1054
	2	WL 1054
NON-METALLIC PIPE OR CONDUIT	1	WL 2075
	2	WL 2075
SINGLE OR BUNDLED CABLES	1	WL 3065
	2	WL 3065
MIXED PENETRANTS	1	WL 8013
	2	WL 8013

CONCRETE OR BLOCK WALLS

TYPE OF PENETRANT	F-RATING	UL-CLASSIFIED SYSTEM
SINGLE METAL PIPES OR CONDUIT	1	CAJ 1226
	2	CAJ 1226
	3	CAJ 1226
SINGLE OR BUNDLED CABLES	1	WJ 3060
	2	WJ 3060
	3	CAJ 3180
MIXED PENETRANTS	1	CAJ 8143
	2	CAJ 8143

NOTES:

1. **Jobsite conditions of each through-penetration firestop system must meet ALL details of the UL-Classified System selected.**
2. **Where more than one applicable UL-Classified System is listed in the schedules, choose the UL System which is most economical for each through-penetration firestop system.**
3. **Coordinate work with other trades to assure that penetration opening sizes are appropriate for penetrant locations, and vice versa.**

C UL US
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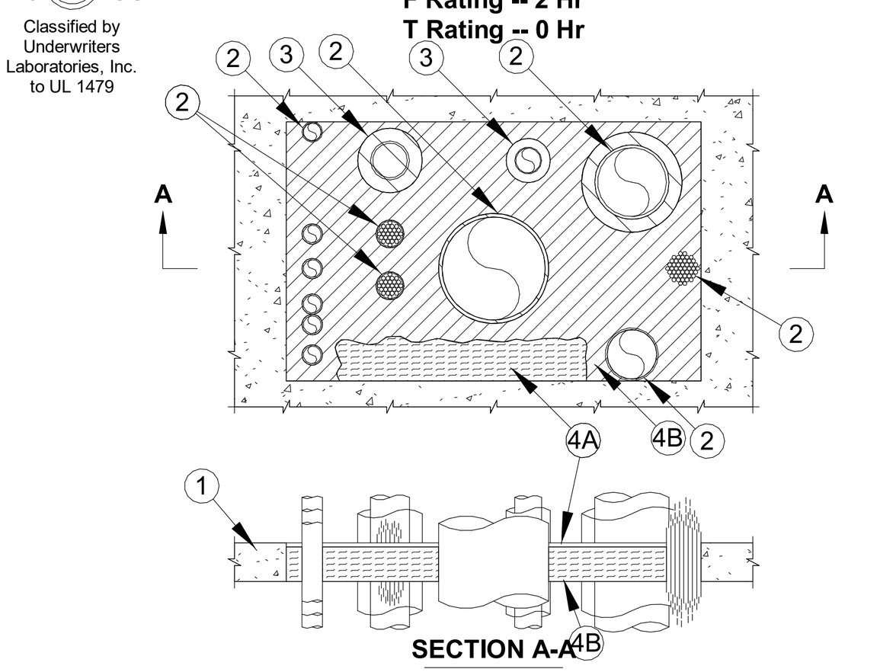
System No. C-AJ-8143

F Rating -- 2 Hr
T Rating -- 0 Hr



1. Floor or Wall Assembly — Min 4-1/2 in. (114 mm) thick reinforced lightweight or normal weight (100-150 pcf or 1600-2400 kg/m³) concrete floor. Min 5 in. (127 mm) thick reinforced lightweight or normal weight (100-150 pcf or 1600-2400 kg/m³) concrete wall. Wall may also be constructed of any UL Classified Concrete Blocks*. Max size of opening is 1440 in.2 (9,290 cm2) with a max dimension of 48 in. (1219 mm).
   See Concrete Blocks (CAZT) category in the Fire Resistance Directory for names of manufacturers.
2. Through-Penetrant — One cable tray and one or more pipes, tubes or cable bundles may be installed within the opening. The total number of through-penetrants is dependent on the size of the opening and the types and sizes of the penetrants. Any combination of the penetrants described below may be used provided that the following parameters relative to the annular spaces are maintained. The annular space between cable tray and all other penetrants shall be min 3 in. (76 mm). The annular space between individual cables and cable bundles shall be a min 1/2 in. (13 mm). The annular space between individual cables and cable bundles and other penetrants shall be a min 1/2 in. (13 mm) except that a min 2 in. (51 mm) shall be maintained between the cables and copper pipes and tubes greater than a nom 3 in. (76 mm) diam and steel and iron pipes and conduits greater than a nom 4 in. (102 mm) diam. The annular space between metallic pipes, conduit and tubes and insulated pipes and tubes shall be a min 2 in. (51 mm). The annular space between nom 3 in (76mm) diam (and smaller) copper pipes and tubes and between nom 4 in (102mm) diam (and smaller) steel and iron pipes and conduits shall be min 1/2 in. (13 mm). The annular space between nom 2 in. (51 mm) diam (and smaller) metallic pipes and conduits shall be min 0 in. (point contact). The annular space between insulated penetrants or the cable tray and the periphery of opening shall be min 1/2 in. (13 mm). The annular space between all other penetrants and the periphery of opening shall be min 0 in. (point contact). A max annular space in the system shall be 12 in. (305 mm). Penetrants to be rigidly supported on both sides of floor or wall assembly. The following types and sizes of penetrants may be used.
   A. Metallic Pipes — The following types of metallic pipes, tubes or conduits may be used:
      1. Copper Tubing — Nom 6 in. (152 mm) diam (or smaller) Type L (or heavier) copper tube.
      2. Copper Pipe — Nom 6 in. (152 mm) diam (or smaller) Regular (or heavier) copper pipe.
      3. Steel Pipe — Nom 24 in. (610 mm) diam (or smaller) Schedule 40 (or heavier) steel pipe.
      4. Iron Pipe — Nom 24 in. (610 mm) diam (or smaller) cast or ductile iron pipe.
      5. Conduit — Nom 4 in. (102 mm) diam (or smaller) electric metallic tubing (EMT) or nom 6 in. (152 mm) diam (or smaller) rigid steel conduit.
   B. Cables Bundles — Max 4 in. (102 mm) diam tightly bundled cables. Any combination of the following types and sizes of cables may be used:
      1. Max 500 kcmil single copper or aluminum conductor power cable with thermoplastic insulation and polyvinyl chloride (PVC) jacket.
      2. Max 300 pair No. 24 AWG copper conductor telecommunication cables with PVC insulation and jacket material.
      3. Max 7/C copper conductor No. 12 AWG multi-conductor power and control cables with PVC or cross-linked polyethylene (XLPE) insulation and PVC jacket.
      4. Multiple fiber optical communication cables jacketed with PVC and having a max outside diam of 1/2 in.
      5. Max 3/C No. 12 AWG steel clad cable with copper conductors and PVC insulation material.
   C. Individual Cables — Any of the following types and sizes of individual (non-bundled) cables may be used:
      1. Max 3/C No. 2/0 AWG (or smaller) copper conductor PVC jacketed aluminum clad or steel clad TECK 90 cable.
      2. Through Penetrating Product* — Any cables, Armored Cable+ or Metal Clad Cable+ currently Classified under the Through Penetrating Product category.
      See Through Penetrating Product (XHLY) category in the Fire Resistance Directory for names of manufacturers.
      3. Max 500 kcmil single copper or aluminum conductor power cable with thermoplastic insulation and polyvinyl chloride (PVC) jacket.
      4. Max 300 pair No. 24 AWG copper conductor telecommunication cables with PVC insulation and jacket material.
      5. Max 7/C copper conductor No. 12 AWG multi-conductor power and control cables with PVC or cross-linked polyethylene (XLPE) insulation and PVC jacket.
      6. Multiple fiber optical communication cables jacketed with PVC and having a max outside diam of 1/2 in.
      7. Max 3/C No. 12 AWG steel clad cable with copper conductors and PVC insulation material.
      8. Max 4C/750 kcmil (or smaller) aluminum or copper conductor metal clad cable with aluminum or steel armor, with or without PVC jacket.
   D. Cable Tray* — (Not Shown) — Max 24 in. (610 mm) wide by 6 in. (152 mm) deep open-ladder steel or aluminum cable tray. Aggregate cross-sectional area of cable tray to be max 40 percent of the cross-sectional area of the cable tray based on a max 3 in. cable loading depth. Any combination of the types and sizes of cables described in Item 2B may be used. Cable tray to be rigidly supported on both sides of floor or wall assembly.
3. Pipe Insulation — (Optional) - Pipes and tubes of the sizes noted below may be provided with one of the following types of pipe insulations::
   A. Pipe Covering* — Nom 1-1/2 in. (38 mm) thick (or thinner) hollow cylindrical heavy density glass fiber units jacketed on the outside with an all service jacket for pipes with a nom diam of 8 in. (203 mm) (or smaller) or tubes with a nom diam of 4 in. (102 mm) (or smaller). Longitudinal joints sealed with metal fasteners or factory-applied self-sealing lap tape. Transverse joints secured with metal fasteners or with butt tape supplied with the product.
   See Pipe and Equipment Covering - Materials (BRGU) category in the Building Materials Directory for names of manufacturers. Any pipe covering material meeting the above specifications and bearing the UL Classification Marking with a Flame Spread Index of 25 or less and a Smoke Developed Index of 50 or less may be used.
   B. Pipe Covering* — Nom 2 in. (51 mm) thick (or thinner) hollow cylindrical heavy density glass fiber units jacketed on the outside with an all service jacket for pipes or tubes with a nom diam of 2 in. (51 mm) (or smaller). Longitudinal joints sealed with metal fasteners or factory-applied self-sealing lap tape. Transverse joints secured with metal fasteners or with butt tape supplied with the product.
   See Pipe and Equipment Covering - Materials (BRGU) category in the Building Materials Directory for names of manufacturers. Any pipe covering material meeting the above specifications and bearing the UL Classification Marking with a Flame Spread Index of 25 or less and a Smoke Developed Index of 50 or less may be used.
   C. Tube Insulation-Plastics+ — Nom 1 in. (25 mm) thick (or thinner) acrylonitrile butadiene/polyvinyl chloride (AB/PVC) flexible foam furnished in the form of tubing for pipes or tubes with a nom diam of 2 in. (51 mm) (or smaller).
   See Plastics (QMFZ2) category in the Plastics Recognized Component Directory for names of manufacturers. Any Recognized Component tube insulation material meeting the above specifications and having a UL 94 Flammability Classification of 94-5VA may be used.
4. Firestop System — The firestop system shall consist of the following:
   A. Packing Material — Min 4 in. (102 mm) thickness of 4 pcf (64 kg/m³) mineral wool batt insulation tightly packed into the opening as a permanent form. Packing material to be recessed from top surface of floor or both surfaces of wall to accommodate the required thickness of fill material.
   B. Fill, Void or Cavity Material - Sealant* — Min 1/2 in. (13 mm) thickness of fill material applied within the annulus flush with the top surface of the floor or both surfaces of the wall.
   HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — FS-ONE Sealant

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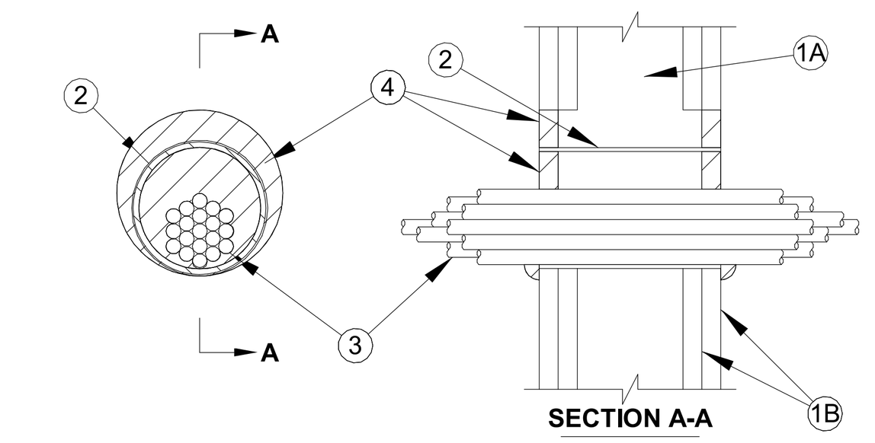
July 18, 2011

C UL US
Classified by Underwriters Laboratories, Inc. to UL 1479

System No. W-L-3065

F Ratings — 1 and 2 Hr (See Item 1)
T Rating — 0 and ¾ Hr (See item 3)



1. Wall Assembly — The 1 or 2 fire-rated gypsum wallboard/stud wall assembly shall be constructed of the materials and in the manner specified in the individual U300, U400 or V400 Series Wall and Partition Designs in the UL Fire Resistance Directory and shall include the following construction features:
   A. Studs — Wall framing may consist of either wood studs or steel channel studs. Wood studs to consist of nom 2 by 4 in. (51 by 102 mm) lumber spaced 16 in. (406 mm) OC. Steel studs to be min 2-1/2 in. (64 mm) wide and spaced max 24 in. (610 mm) OC.
   B. Gypsum Board* — Nom 5/8 in. (16 mm) thick gypsum board, with square or tapered edges. The gypsum board type, thickness, number of layers, fastener type and sheet orientation shall be as specified in the individual U300, U400 or V400 Series Design in the UL Fire Resistance Directory. Max diam of opening is 5-1/2 in. (138 mm) when sleeve (Item 2) is employed. Max diam of opening is 4 in. (102 mm) when sleeve (Item 2) is not employed.
   The F Rating of the firestop system is equal to the fire rating of the wall assembly.
2. Metallic Sleeve — (Optional) - Nom 4 in. (102 mm) diam (or smaller) steel electrical metallic tubing (EMT) or Schedule 5 (or heavier) steel pipe or min 0.016 in. thick (0.41 mm, No. 28 ga) galv steel sleeve installed flush with wall surfaces. The annular space between steel sleeve and periphery of opening shall be min 0 in. (0 mm, point contact) to max 1 in. (25mm). When Schedule 5 steel pipe or EMT is used, sleeve may extend up to 18 in. (457 mm) beyond the wall surfaces. As an option when Schedule 5 steel pipe or EMT is used, sleeve may extend continuously beyond one wall surfaces. When cable bundle penetrates wall assembly at an angle of 45 degrees, no metallic sleeve is used.
3. Cables — Aggregate cross-sectional area of cable in opening to be max 45 percent of the cross-sectional area of the opening. The annular space between the cable bundle and the periphery of the opening to be min 0 in. (0 mm, point contact) to max 1 in. (25 mm) Cables to be rigidly supported on both sides of the wall assembly. Cable bundle, using cables described below, may penetrate the wall at an angle not greater than 45 degrees. Any combination of the following types and sizes of copper conductor cables may be used:
   A. Max 7/C No. 12 AWG with polyvinyl chloride (PVC) insulation and jacket.
   B. Max 25 pair No. 24 AWG telephone cable with PVC insulation and jacket.
   B1. Max 4 pr No. 22 AWG Cat 5 or Cat 6 computer cables.
   C. Type RG/U coaxial cable with polyethylene (PE) insulation and PVC jacket having a max outside diameter of ½ in. (13 mm).
   C1. Max RG 6/U coaxial cable with fluorinated ethylene insulation and jacketing.
   D. Multiple fiber optical communication cable jacketed with PVC and having a max OD of 5/8 in. (16 mm).
   E. Through Penetrating Products*— Max three copper conductor No. 8 AWG .Metal-Clad Cable+.
   AFC CABLE SYSTEMS INC
   F. Max 3/C (with ground)(or smaller) No. 8 AWG copper conductor cable with PVC insulation and jacketing.
   G. Max 3/4 in. (19 mm) diam copper ground cable with or without a PVC jacket.
   H. Fire Resistive Cables* - Max 1-1/4 in. (32 mm) diam single conductor or multi conductor Type MI cable. A min 1/8 in. (3 mm) separation shall be maintained between MI cables and any other types of cable.
   I. Max 4/C with ground 300 kcmil (or smaller) aluminum SER cable with PVC insulation and jacket.
   J. Through Penetrating Product* - Any cables, Metal-Clad Cable+ or Armored Cable+ currently Classified under the Through Penetrating Products category.
   K. Maximum 3/C No. 8 AWG metal-clad cable.
   L. Maximum 5/8 diam fiber-optic cable with PVC jacket.
   For cable bundle penetrating the wall assembly at an angle of 45 degrees, the T rating is ¾ hr for a 2 hr wall assembly.
   See Through Penetrating Product (XHLY) category in the Fire Resistance Directory for names of manufacturers.
4. Fill, Void or Cavity Material*— Sealant or Putty — Fill material applied within the annulus, flush with each end of the steel sleeve or wall surface. Fill material installed symmetrically on both sides of the wall. A min 5/8 in. (16 mm) thickness of sealant is required for the 1 or 2 hr F Rating . An additional 1/2 in. (13 mm) diam bead of fill material shall be applied around the perimeter of sleeve on both sides of the wall when sleeve extends beyond surface of wall.
   HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — CP601S, CP606, FS-One Sealants or CP618 Putty

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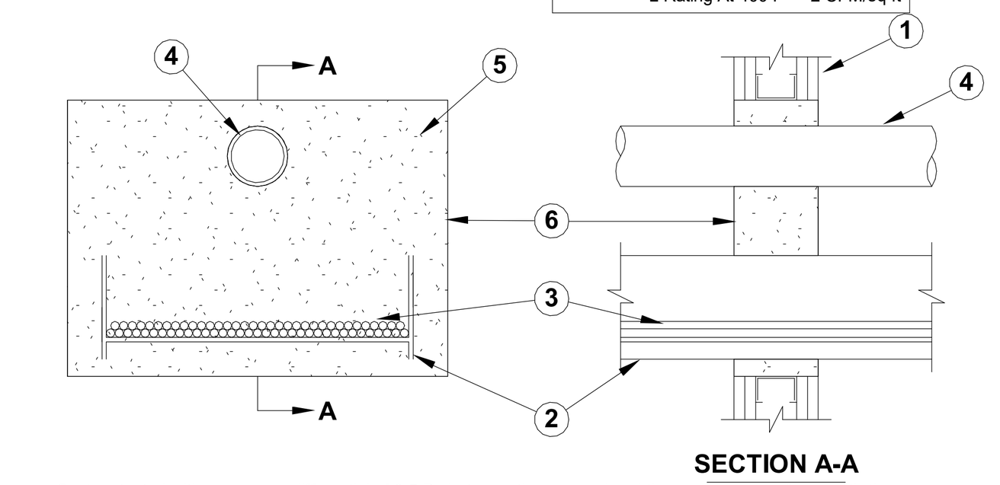
March 15, 2012

C UL US
Classified by Underwriters Laboratories, Inc. to UL 1479

System No. W-L-8013

ANSI/UL1479 (ASTM E814)	CAN/ULC S115
F Ratings — 1 and 2 Hr (See Item 1)	F Ratings — 1 and 2 Hr (See Item 1)
T Rating — 0 Hr	FT Rating — 0 Hr
L Rating At Ambient — 5 CFM/sq ft	FH Ratings — 1 and 2 Hr (See Item 1)
L Rating At 400 F — 2 CFM/sq ft	FTH Rating — 0 Hr
	L Rating At Ambient — 5 CFM/sq ft
	L Rating At 400 F — 2 CFM/sq ft



System tested with a pressure differential of 2.5 Pa between the exposed and the unexposed surfaces with the higher pressure on the exposed side.

1. Wall Assembly — The 1 or 2 hr fire-rated gypsum board/stud wall assembly shall be constructed of the materials and in the manner specified in the individual U300, U400, V400 or W400 Series Wall and Partition Designs in the UL Fire Resistance Directory and shall include the following construction features:
   A. Studs — Wall framing may consist of either wood studs or steel channel studs. Wood studs to consist of nom 2 in. (51 mm) by 4 in. (102 mm) lumber spaced 16 in. (406 mm) OC. Steel studs to be min 2-1/2 in. (64 mm) wide and spaced max 24 in. (610 mm) OC. Additional studs installed to completely frame the opening.
   B. Gypsum Board* — 5/8 in. (16 mm) thick, 4 ft (1219 mm) wide with square or tapered edges. The gypsum board type, thickness, number of layers, fastener type and sheet orientation shall be as specified in the individual Wall and Partition Design. Max area of opening is 352 sq in. (2271 sq cm) with max dimension of 22 in. (559 mm) wide.
   The hourly F and FH Ratings of the firestop system are equal to the hourly fire rating of the wall assembly in which it is installed.
2. Cable Tray* — Max 18 in. (457 mm) wide by max 6 in. (152 mm) deep open-ladder or solid-back cable tray with channel-shaped side rails formed of 0.065 in. (1.65 mm) thick aluminum or 0.060 in. (1.52 mm) thick steel and with 1-1/2 in. (38 mm) wide by 1 in. (25 mm) channel shape rungs spaced 9 in. (229 mm) OC or a 0.029 in. (0.74 mm) thick steel solid back, respectively. One cable tray to be installed in the opening. The max annular space between the cable tray and the periphery of the opening shall be min 1 in. (25 mm) to max 7 in. (178 mm) Cable tray to be rigidly supported on both sides of floor or wall assembly.
3. Cables — Aggregate cross-sectional area of cables in cable tray to be max 30 percent of the cross-sectional area of the cable tray. Any combination of the following types and sizes of copper conductor cables may be used:
   A. 7/C No. 12 AWG with polyvinyl chloride (PVC) insulation and PVC jacket.
   B. 100 pair - No. 24 AWG cable with PVC insulation and jacket.
   C. 1/C, 750 kcmil (or smaller) with PVC insulation and jacket.
4. Through-Penetrants — One or more pipe or tube to be installed within the opening. The total number of through-penetrants is dependent on the size of the opening and types and sizes of the penetrants. Any combination of the penetrants described below may be used provided that the following parameters relative to the annular spaces and the spacings between the pipes are maintained. The space between the pipe or tube and the periphery of the opening shall be min 1-1/2 in. (38 mm) to max 9-1/4 in. (235 mm). Pipe or tube to be rigidly supported on both sides of floor or wall assembly. The following types and sizes of non-metallic or metallic pipes, or tubes may be used:
   A. Polyvinyl Chloride (PVC) Pipe — Max 3 in. (76 mm) diam Schedule 40 solid core PVC pipe (or smaller) for use in closed (process or supply) or vented (drain, waste or vent) piping system.
   B. Steel Pipe — Nom 6 in. (152 mm) diam (or smaller) Schedule 40 (or heavier) steel pipe.
   C. Conduit — Nom 4 in. (102 mm) diam (or smaller) steel electrical metallic tubing or 6 in. (152 mm) diam steel conduit.
   D. Copper Pipe — Nom 4 in. (102 mm) diam (or smaller) Regular (or heavier) copper pipe.
   E. Copper Tube — Nom 4 in. (102 mm) diam (or smaller) Type L (or heavier) copper tube.

4A. Pipe Covering — (Not Shown) Nom 1-1/2 in. (38 mm) thick hollow cylindrical heavy density (min 3.5 pcf) (56kg/m³) glass fiber units jacketed on the outside with an all service jacket. Longitudinal joints sealed with metal fasteners or factory applied self-sealing lap tape. Transverse joints secured with metal fasteners or with butt tape supplied with the product.
   See Pipe and Equipment Covering and Materials (BRGU) category in the Building Materials Directory for names of manufacturers. Any pipe covering material meeting the above specifications and bearing the UL Classification Marking with a Flame Spread Index of 25 or less and a Smoke Developed Index of 50 may be used.

5. Cables — Max 1-1/2 in. (38 mm) diam tight bundle of cables installed within the opening and rigidly supported on both surfaces of wall. The space between the cables and periphery of the opening shall range from 1-3/16 in. (30.2 mm) min to a max of 1-1/2 in. (38 mm). Any combination of the following types and sizes of cables may be used:
   A. 7/C No. 12 AWG with polyvinyl chloride (PVC) insulation and jacket.
   B. 25 pair — No. 24 AWG cable with PVC insulation and jacket.
   C. Type R GU59 coaxial cable with PVC outer jacket.
   D. 24 fiber optic cable with PVC sub unit and outer jacket.
6. Firestop System — The firestop system shall consist of the following:
   A. Fill, Void or Cavity Material* — Fire Blocks For walls incorporating max 3-5/8 in. (92 mm) steel studs or max 2 (51 mm) by 4 in. (102 mm) wood studs, fire block installed with 5 in. (127 mm) dimension projecting through and centered in opening. For walls constructed of larger steel or wood studs, fire block installed with long dimension passing through and centered in opening. Blocks may or may not be cut flush with both surfaces of wall. When multiple layers of gypsum board are used, blocks may be recessed 1/2 in. (13 mm) from surface of wall. Blocks to be firmly packed in opening. Either one or a combination of the block types specified below may be used.
   HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — FS 657 Fire Block or CFS-BL Firestop Block
   B. Fill, Void or Cavity Material* — Sealant or Putty - Fill material to be forced into interstices of cables, between cables and cable trays, around each penetrant and where obvious voids are observed to max extent possible on both surfaces of the penetration.
   HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — FS-One Sealant, CP 618 Putty Stick or CP620 Fire Foam

*Bearing the UL Classification Mark

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January 13, 2012

BW&A Barrett, Woodyard & Associates, Inc.
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BWA COA# 13267
BWA Project #: 2024-1025

YEARS
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A TENANT ADDITION

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Print Record		Drw.	Chk.
14 OCT 24	ISSUED FOR PERMIT		

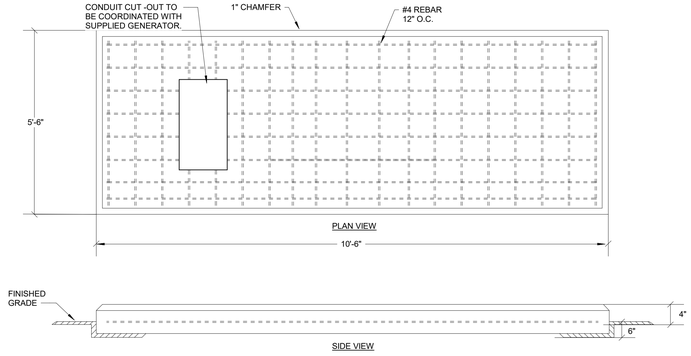
Revisions

Date: 10/14/2024
Project No.: 2023362.00

Sheet Title
PENETRATION DETAILS

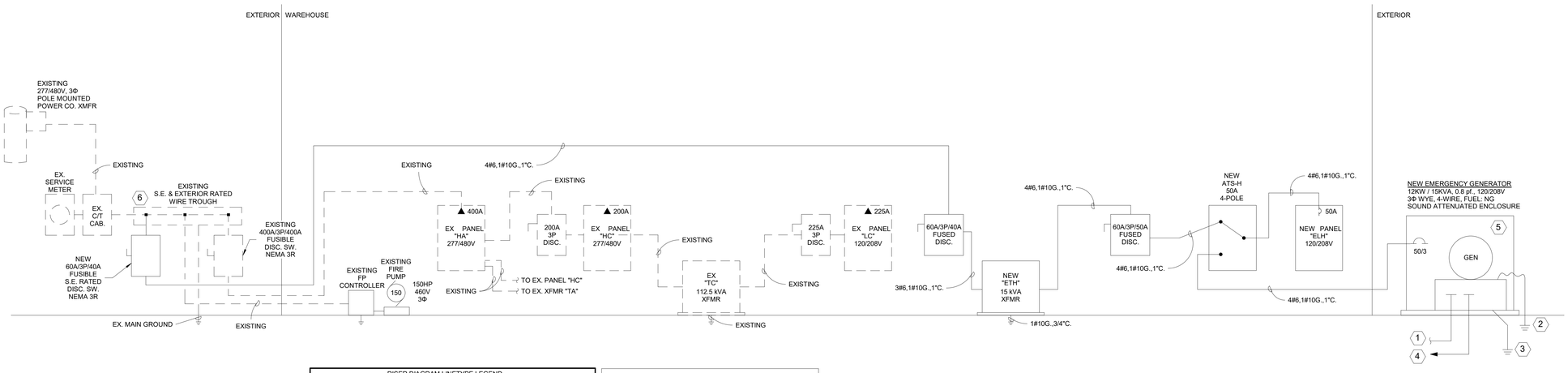
Sheet No.
E-002

■ Released for Construction
☐ Not Released for Construction



NOTES:
1. CONFIRM GENERATOR DIMENSION WITH SUPPLIED MANUFACTURER.
2. EXACT LOCATIONS OF FEEDER CONDUIT FROM THE GENERATOR SHALL BE CONFIRMED WITH THE SUPPLIED MANUFACTURER.

2 GENERATOR PAD DETAIL
NOT TO SCALE



RISER DIAGRAM LINETYPE LEGEND	
SYMBOL	DESCRIPTION
- - - - - -	EXISTING CONDUCTORS AND CONDUIT TO REMAIN
———	NEW CONDUCTORS AND CONDUIT, SIZE AS INDICATED

NOTE: PROVIDE U.L. SERIES RATINGS FOR A.I.C. VALUES INDICATED. WHERE NO VALUES ARE SHOWN , ASSUME MINIMUM RATINGS OF 14,000 A.I.C. FOR 480V/3Φ AND 10,000 A.I.C. FOR 208V/3Φ.

GENERAL NOTES:
(APPLY THIS SHEET ONLY)

1. RISER DIAGRAM BASED ON VISUAL OBSERVATION AND AVAILABLE AS-BUILT INFORMATION ONLY. CONTRACTOR SHALL CONFIRM ALL EXISTING FEEDER SIZES AND EXACT ROUTING.
2. PROVIDE PERMANENT PLAQUE WITH A.I.C. RATING AT EXISTING SERVICE.
3. ALL GROUNDING EXISTING TO REMAIN.

KEYED NOTES:
(APPLY THIS SHEET ONLY)

1. PROVIDE (1) 1" CONDUIT TO ATS-H FOR CONTROL WIRING.
2. GROUND PER NEC ARTICLE 250. CONNECT TO MAIN SERVICE GROUND.
3. BOND NEUTRAL TO GROUND.
4. PROVIDE A 120V/1P, 20A CIRCUIT FOR BATTERY CHARGER.
5. PROVIDE REMOTE EMERGENCY POWER OFF BUTTON FOR SHUT DOWN OF GENERATOR. EPO BUTTON SHALL COMPLY WITH NFPA 110 5.6.5.6 AND NEC 445.18(C).
6. PROVIDE TAP AT EXISTING WIRE TROUGH FOR NEW 60A DISCONNECT SWITCH.

1 ELECTRICAL RISER DIAGRAM
NOT TO SCALE

PANEL ELH

FED FROM:
LOCATION: Level 01
PHASE CREATED: New Construction
VOLTAGE: 120/208 Wye
PHASE: 3
WIRE: 4
AMP: 50 A
MAIN: MCB

Notes:

CKT	Circuit Description	Trip	Pole	A		B		C		Pole	Trip	Circuit Description	CKT
1	FACP	20 A	1	1.00	0.28					3	20 A	EF-1	2
3	LTS - H-ROOM	20 A	1			0.30	0.28						4
5	MAU-1	20 A	2					0.56	0.28				6
7				0.56	--					1	--	SPACE	8
9	SPARE	20 A	1			0.00	--			1	--	SPACE	10
11	SPARE	20 A	1					0.00	--	1	--	SPACE	12
13	SPACE	--	1	--	--					1	--	SPACE	14
15	SPACE	--	1			--	--			1	--	SPACE	16
17	SPACE	--	1					--	--	1	--	SPACE	18
		TOTAL LOAD:		1.84 kVA		0.58 kVA		0.84 kVA					
		TOTAL AMPS:		16 A		5 A		7 A					

Legend:

Load Classification	Connected Load	Demand Factor	Estimated Demand	Panel Totals	
HVAC	1.96 kVA	100.00%	1.96 kVA		
Lighting	0.3 kVA	125.00%	0.38 kVA	**Total Conn. Load:**	3.26 kVA
Miscellaneous	1 kVA	100.00%	1 kVA	**Total Est. Demand:**	3.34 kVA
				Total Conn.:	9 A
				Total Est. Demand:	9 A

Notes:

PANEL LC

FED FROM:
LOCATION:
PHASE CREATED: Existing
VOLTAGE: 120/208 Wye
PHASE: 3
WIRE: 4
AMP: 225 A
MAIN: MLO

Notes:

CKT	Circuit Description	Trip	Pole	A		B		C		Pole	Trip	Circuit Description	CKT
1	WH-1	20 A	1	0.18	0.50					1	20 A	EXISTING*	2
3	REC - GFCI WP	20 A	1			0.18	0.50			1	20 A	EXISTING*	4
5	SPACE	--	1					--	0.50	1	20 A	EXISTING*	6
7	EXISTING*	20 A	1	0.50	--					1	--	SPACE	8
9	EXISTING*	20 A	1			0.50	--			1	--	SPACE	10
11	EXISTING*	20 A	1					0.50	--	1	--	SPACE	12
13	SPACE	--	1	--	0.50					1	20 A	EXISTING*	14
15	SPACE	--	1			--	0.50			1	20 A	EXISTING*	16
17	EXISTING*	20 A	1					0.50	0.50	1	20 A	EXISTING*	18
19	EXISTING*	20 A	1	0.50	--					1	--	SPACE	20
21	EXISTING*	20 A	1			0.50	--			1	--	SPACE	22
23	EXISTING*	20 A	1					0.50	--	1	--	SPACE	24
25	EXISTING*	20 A	1	0.50	0.50					1	20 A	EXISTING*	26
27	SPACE	--	1			--	0.50			1	20 A	EXISTING*	28
29	EXISTING*	20 A	1					0.50	0.50	1	20 A	EXISTING*	30
31	EXISTING*	20 A	1	0.50	--					1	--	SPACE	32
33	EXISTING*	20 A	1			0.50	--			1	--	SPACE	34
35	EXISTING*	20 A	1					0.50	--	1	--	SPACE	36
37	EXISTING*	20 A	1	0.50	--					1	--	SPACE	38
39	EXISTING*	20 A	1			0.50	--			1	--	SPACE	40
41	EXISTING*	20 A	1					0.50	--	1	--	SPACE	42
		TOTAL LOAD:		4.18 kVA		3.68 kVA		4.5 kVA					
		TOTAL AMPS:		35 A		31 A		38 A					

Legend:

Load Classification	Connected Load	Demand Factor	Estimated Demand	Panel Totals	
Receptacles	0.36 kVA	100.00%	0.36 kVA		
Miscellaneous	12 kVA	100.00%	12 kVA	**Total Conn. Load:**	12.36 kVA
				Total Est. Demand:	12.36 kVA
				Total Conn.:	34 A
				Total Est. Demand:	34 A

Notes:

RANDALL PAULSON architects
Roswell . Nashua

STATE OF TEXAS
CHADWICK J. VICKERY
96738
LICENSED
PROFESSIONAL ENGINEER

Date Signed: 10/14/2024

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architecture/interiors

A TENANT ADDITION

at

SRS DISTRIBUTION, INC. - ROCKWALL, TEXAS (H-ROOM)

for

SRS Distribution

2065 KRISTY LN
ROCKWALL, TEXAS 75032

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ELECTRICAL RISER DIAGRAM & PANEL SCHEDULES

Sheet No.
E-003

■ Released for Construction
□ Not Released for Construction

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1255 Crescent Green
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Phone: 919-747-9884
BWA COA# 13267

BWA Project #: 2024-1025

SECTION 260500 – COMMON REQUIREMENTS FOR ELECTRICAL

1.1 SCOPE

A. DIVISION 26 INCLUDES ALL SPECIFICATIONS IN THE 260000 SERIES AND THE ACCOMPANYING ELECTRICAL DRAWINGS. PROVIDE ALL LABOR, MATERIALS AND EQUIPMENT, AND ALL NECESSARY OPERATIONS TO PROVIDE THE COMPLETE SCOPE OF THE ELECTRICAL SYSTEMS INTENDED UNDER THIS DIVISION. DIVISION 26 IS NOT A STAND-ALONE DOCUMENT, BUT A PART OF THE COMPLETE PROJECT DOCUMENTS.

B. ATTENTION IS CALLED TO THE FACT THAT THERE ARE MANY INTERFACES BETWEEN THE WORK REQUIRED IN THIS DIVISION AND THE WORK REQUIRED IN OTHER DIVISIONS. PROVIDE THE NECESSARY INTERFACE AND COORDINATION WITH OTHER DIVISIONS TO PROVIDE A COMPLETE PROJECT.

1.2 EXISTING CONDITIONS

A. ATTENTION IS CALLED TO THE FACT THAT THE WORK IS TO BE PERFORMED WITHIN AN EXISTING, OPERATIONAL FACILITY. PRIOR TO THE SUBMISSION OF BIDS, EACH BIDDER SHALL VISIT THE PROJECT SITE, THOROUGHLY INVESTIGATE AND BE FAMILIAR WITH ALL EXISTING CONDITIONS, WHICH WILL AFFECT THEIR WORK; ESPECIALLY THE WORK TO BE PERFORMED ABOVE THE EXISTING CEILINGS.

B. WHEN THIS PROJECT IS FINISHED, THE WORK UNDER THIS DIVISION SHALL BE COMPLETE IN EVERY RESPECT, COMPLETELY INTEGRATED WITH ALL THE EXISTING SYSTEMS, AND LEFT IN PERFECT OPERATING CONDITION. THE ELECTRICAL SERVICE TO THE BUILDING SHALL NOT BE INTERRUPTED AT ANY TIME WITHOUT WRITTEN COORDINATION OF THE BUILDING'S OWNER. ALL EXISTING ELECTRICAL EQUIPMENT REMOVED DURING THE PROJECT SHALL BE REMOVED FROM THE SITE AFTER INSPECTION OF THE BUILDING'S OWNER. ALL EXISTING ELECTRICAL SYSTEMS REQUIRED TO BE OPERATING AT THE PROJECT'S COMPLETION OR REQUIRED TO REMAIN IN USE DURING THE PROJECT SHALL BE RECONNECTED, REPLACED, REROUTED OR OTHERWISE MADE TO FIT WITH PROPER WORKMANSHIP TECHNIQUES AND LEFT IN SAFE WORKING ORDER.

C. CONNECT NEW WORK TO EXISTING WORK IN A NEAT AND WORKMANLIKE MANNER. WHERE AN EXISTING STRUCTURE MUST BE CUT OR EXISTING UTILITIES INTERFERE, SUCH OBSTRUCTIONS SHALL BE BYPASSED, REMOVED, REPLACED OR RELOCATED, PATCHED AND REPAIRED. WORK DISTURBED OR DAMAGED SHALL BE REPLACED OR REPAIRED TO ITS PRIOR CONDITION.

1.3 CODES AND REGULATIONS

A. ALL WORK UNDER THIS DIVISION SHALL COMPLY WITH ALL LOCAL BUILDING CODES, LAWS, REGULATIONS, ORDINANCES AND THE REQUIREMENTS OF THE 2020 NATIONAL ELECTRICAL CODE.

B. WHERE CONFLICTS OF INSTALLATION REQUIREMENTS OCCUR BETWEEN THE AFOREMENTIONED CODES, REGULATIONS OR THE CONTRACT DOCUMENTS, THE MOST RESTRICTIVE SHALL GOVERN.

C. OBTAIN ALL PERMITS AND LICENSES AND PAY ALL FEES REQUIRED BY LOCAL AUTHORITIES. ARRANGE FOR ALL NECESSARY INSPECTIONS REQUIRED BY THE AUTHORITIES HAVING JURISDICTION AND PROVIDE WRITTEN CERTIFICATES OF APPROVAL TO THE PROJECT OWNER OR HIS DESIGNATED REPRESENTATIVE.

1.4 DEFINITIONS

A. CONTRACT DOCUMENTS: THE COMPLETE SET OF PROJECT DRAWINGS AND SPECIFICATIONS.

B. PROVIDE: FURNISH, INSTALL AND CONNECT.

C. WORK: ALL MATERIALS INSTALLED, INCLUDING ALL LABOR TO PROVIDE COMPLETE SYSTEM.

D. WIRING OR WIRED: ALL WIRE OR CABLE INSTALLED IN CONDUIT FROM PANELBOARD TO EQUIPMENT AND CONNECTED AT BOTH ENDS WITH ALL REQUIRED BOXES, CONNECTORS, COUPLINGS, ETC.

E. CONDUIT: RIGID STEEL CONDUIT INTERMEDIATE METAL CONDUIT (I.M.C.), ELECTRICAL METALLIC TUBING (EMT) PLASTIC CONDUIT (PVC), ELECTRICAL NON-METAL TUBING (ENT), OR FLEXIBLE STEEL CONDUIT.

1.5 DRAWINGS AND SPECIFICATIONS

A. THE DRAWINGS AND SPECIFICATIONS TOGETHER ARE TO BE CONSIDERED AS THE CONTRACT DOCUMENTS. ANY WORK SHOWN IN ONE AND NOT SHOWN IN THE OTHER, OR IMPLIED BY EITHER, SHALL BE PROVIDED TO GIVE A COMPLETE PROJECT.

B. SHOULD ANY CONFLICTS EXIST BETWEEN THE DRAWINGS AND SPECIFICATIONS OR THERE IS AN ITEM SHOWN/CALLED FOR WHICH IS NOT CLEARLY DEFINED, IMMEDIATELY SUBMIT A REQUEST FOR CLARIFICATION. NO ADDITIONAL MONIES WILL BE GRANTED LATER WHEN A CONFLICT IS RESOLVED OR AN ITEM IS MORE CLEARLY DEFINED.

C. THE DRAWINGS ARE SCHEMATIC AND ARE NOT INTENDED TO SHOW THE EXACT LOCATION OF OUTLETS, ETC. OR THE ROUTING OF CONDUIT.

D. THE EXACT LOCATION OF EQUIPMENT REQUIRING ELECTRICAL CONNECTIONS (MECHANICAL EQUIPMENT, ELEVATORS, LIGHTS, ETC.) SHALL BE AS LOCATED BY OTHER DIVISIONS OF THE CONTRACT DOCUMENTS. REFER TO THE ARCHITECTURAL, STRUCTURAL AND MECHANICAL DOCUMENTS FOR DIMENSIONS AND DETAILS OF BUILDING CONSTRUCTION AND PROVIDE WORK DESCRIBED IN THIS DIVISION SO THAT IT CONFORMS TO THE DETAILS OF THE PROJECT. THE RIGHT IS RESERVED TO RELOCATE ANY RECEPTACLE, SWITCH OR OTHER OUTLET A MAXIMUM OF 10'-0" BEFORE IT IS PERMANENTLY INSTALLED WITHOUT INCURRING ADDITIONS TO THE CONTRACT AMOUNT.

1.6 SITE VISIT

A. VISIT THE SITE AND BECOME FAMILIAR WITH ALL ASPECTS OF THE SITE AND EXISTING CONDITIONS BEFORE SUBMITTING CONTRACT PRICE.

B. NO ALLOWANCE WILL BE MADE FOR LACK OF KNOWLEDGE OF EXISTING CONDITIONS.

1.7 DEVIATIONS

A. NO DEVIATIONS FROM THE CONTRACT DOCUMENTS SHALL BE MADE WITHOUT THE FULL KNOWLEDGE AND WRITTEN CONSENT OF THE ARCHITECT.

B. IF THE EXISTING CONDITIONS MAKE IT DESIRABLE TO MODIFY THE CONTRACT DOCUMENTS IN REGARD TO ANY ITEM, PROVIDE A WRITTEN REQUEST TO THE ARCHITECT.

2.1 STANDARDS FOR MATERIALS AND WORKMANSHIP

A. ALL MATERIALS USED SHALL BE NEW AND SHALL BE STAMPED WITH THE LABEL OF UNDERWRITERS LABORATORIES, INC. (UL).

B. ALL MATERIALS SHALL MEET THE STANDARDS OF THE FOLLOWING ASSOCIATIONS AND INSTITUTES WHERE APPLICABLE:

1. NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)
2. AMERICAN SOCIETY OF TESTING MATERIALS (ASTM)
3. AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)
4. NATIONAL ELECTRICAL MANUFACTURER'S ASSOCIATION (NEMA)
5. INSTITUTE OF ELECTRICAL AND ELECTRONIC ENGINEERS (IEEE)

C. MANUFACTURER'S NAMES AND CATALOG NUMBERS SPECIFIED HEREIN ARE INTENDED TO DESCRIBE THE MATERIAL AND SET THE STANDARD OF QUALITY. ALL BIDS SHALL BE BASED ON MATERIAL SPECIFIED. REQUESTS FOR APPROVAL OF MATERIAL NOT SPECIFIED SHALL BE CONSIDERED IF THE REQUEST IS IN WRITTEN FORM AND SUBMITTED TO THE ARCHITECT NO LATER THAN FOURTEEN (14) DAYS BEFORE BID DATE. ALL REQUESTS SHALL CONFORM WITH THE PROVISIONS OF THE GENERAL AND SUPPLEMENTARY CONDITIONS.

D. SAMPLES OF MATERIALS REQUESTED TO BE SUBSTITUTED SHALL BE FURNISHED UPON THE REQUEST OF THE ARCHITECT.

2.2 SHOP DRAWINGS AND SUBMITTAL

A. THE ENGINEER'S REVIEW OF SHOP DRAWINGS OR SUBMITTALS IS A CURSORY REVIEW TO CHECK FOR GENERAL COMPLIANCES OF SUBMITTALS WITH THE DESIGN INTENT OF THE CONTRACT DOCUMENTS. THE ENGINEER'S REVIEW DOES NOT RELIEVE THE CONTRACTOR OF HIS RESPONSIBILITY OF COMPLYING WITH THE CONTRACT DOCUMENTS. ALL COORDINATION OF THE WORK IN STRICT COMPLIANCE WITH THE CONTRACT DOCUMENTS IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR.

B. THE FOLLOWING ITEMS SHALL BE SUBMITTED FOR REVIEW:

1. CONDUIT AND WIRE
2. DEVICES
3. COVERPLATES
4. PANELBOARDS
5. TRANSFORMERS
6. FUSES
7. OVERCURRENT DEVICES
8. DISCONNECT SWITCHES
9. LIGHTING FIXTURES
10. MOTOR STARTERS
11. GENERATOR
12. TRANSFER SWITCH

C. ALL SHOP DRAWINGS AND SUBMITTALS SHALL BE SUBMITTED IN COMPLIANCE WITH THE REQUIREMENTS OF THE GENERAL AND SUPPLEMENTARY CONDITIONS. NO MORE THAN FOUR (4) COPIES OF SUBMITTAL DATA WILL BE REVIEWED. ANY ADDITIONAL COPIES WILL BE RETURNED UNMARKED. THE RESPONSIBILITY OF COPYING REVIEW COMMENTS ON ANY ADDITIONAL COPIES WILL REST SOLELY WITH THE CONTRACTOR.

D. ALL SUBMITTALS SHALL BEAR THE NAME OF THE MANUFACTURER TO BE USED.

E. ALL SHOP DRAWINGS AND SUBMITTALS SHALL INCLUDE A STAMPED INDICATION SIGNIFYING THAT THE SUBMITTAL HAS BEEN REVIEWED FOR COMPLIANCE WITH THE CONTRACT DOCUMENTS BY THE CONTRACTOR. THIS STAMPED INDICATION ALSO REPRESENTS THE FACT THAT THE CONTRACTOR HAS CHECKED THIS SUBMITTAL FOR ITS INTERACTION WITH ALL OTHER DIVISIONS AND CERTIFIES BY HIS SIGNATURE OR INITIALS THAT ALL COORDINATION HAS TAKEN PLACE. THE STAMP SHALL INCLUDE THE DATE, NAME OF THE CONTRACTING FIRM, THE SIGNATURE OF THE CONTRACTOR, CERTIFICATION OF COMPLIANCE AND APPROVAL. THIS STAMP SHALL BE ON THE SUBMITTAL BEFORE THE ENGINEER WILL REVIEW IT.

F. THE ENGINEER WILL REVIEW AN INDIVIDUAL SUBMITTAL NOT MORE THAN TWICE. IF THE SUBMITTAL IS REJECTED AGAIN ON THE SECOND REVIEW, THE CONTRACTOR WILL BARE ALL RESPONSIBILITY FOR PAYING FOR THE ENGINEER'S TIME FOR ADDITIONAL REVIEWS. SUCH PAYMENTS TO THE ENGINEER SHALL BE WITHHELD FROM THE NEXT MONTHLY PAY APPLICATION.

2.3 RECORD (AS-BUILT) DRAWINGS AND MAINTENANCE MANUALS

A. AT JOB COMPLETION, SUBMIT TO THE ARCHITECT, A SET OF PRINTS SHOWING ALL DEVIATIONS FROM THE CONTRACT DOCUMENTS. THE DRAWINGS SHALL ALSO HAVE DIMENSIONS LOCATING ALL UNDERGROUND CONDUITS.

B. AT JOB COMPLETION, SUBMIT TO THE ARCHITECT, THREE (3) SETS OF MAINTENANCE AND INSTRUCTION MANUALS FOR ALL EQUIPMENT FURNISHED ON THE PROJECT.

3.1 COORDINATION

A. COORDINATE ALL SPACE REQUIREMENTS WITH ALL OTHER DIVISIONS BEFORE INSTALLING ANY WORK. INSTALL WORK SUCH THAT ADEQUATE SPACE WILL BE ALLOTTED FOR ALL OTHER WORK FROM OTHER DIVISIONS TO BE INSTALLED AND ALSO WILL ALLOW ROOM FOR FUTURE ACCESS FOR REPAIR AND MAINTENANCE.

B. ANY WORK INSTALLED WITHOUT PROPER COORDINATION SHALL BE RELOCATED AT THE ARCHITECT'S DIRECTION WITHOUT INCREASING THE CONTRACT PRICE.

C. DURING THE BIDDING PROCESS OR THE PRICING FOR A GUARANTEED MAXIMUM PRICE, COORDINATE WITH ALL OTHER DIVISIONS FOR THE TOTAL AMOUNT OF WORK REQUIRED IN DIVISION 26. ANY WORK SHOWN OR IMPLIED IN ANOTHER DIVISION REQUIRING WORK IN DIVISION 26 SHALL BE INCLUDED IN THE CONTRACT PRICE REGARDLESS OF WHETHER OR NOT IT IS ADDRESSED IN DIVISION 26.

3.2 PROTECTION OF MATERIALS

A. ALL EQUIPMENT SHALL HAVE THE ORIGINAL FINISH WHEN THE BUILDING IS TURNED OVER TO THE OWNER.

B. PROTECT EQUIPMENT DURING CONSTRUCTION FROM DIRT, WATER, CHEMICAL, MECHANICAL DAMAGE, ETC. PROTECT ALL CONDUIT OPENINGS SO THAT NO FOREIGN MATERIAL WILL ENTER THE CONDUIT.

3.3 CORING, CUTTING AND PATCHING

A. SET SLEEVES FOR CONDUIT ACCURATELY BEFORE THE CONCRETE FLOORS ARE POURED, OR SET BOXES ON THE FORMS SO AS TO LEAVE OPENINGS IN THE FLOORS IN WHICH THE REQUIRED SLEEVES CAN BE SUBSEQUENTLY LOCATED. FILL IN THE VOIDS AROUND THE SLEEVES WITH CONCRETE.

B. SHOULD THE PERFORMANCE OF THIS PRELIMINARY WORK BE NEGLECTED AND SHOULD CUTTING BE REQUIRED IN ORDER TO INSTALL CONDUIT, THEN THE EXPENSE OF THE CUTTING AND RESTORING OF SURFACES TO THEIR ORIGINAL CONDITIONS SHALL BE ACCOMPLISHED WITHOUT INCURRING ADDITIONS TO THE CONTRACT.

3.4 CONNECTION TO EQUIPMENT

A. EQUIPMENT FURNISHED BY THE OWNER OR UNDER OTHER SECTIONS, SUCH AS MECHANICAL EQUIPMENT, ELEVATORS, ESCALATORS, SIGNS, KITCHEN EQUIPMENT, ETC., WILL BE INSTALLED BY OTHERS. PROVIDE ELECTRICAL SERVICE AND MAKE THE ELECTRICAL CIRCUIT CONNECTION TO THIS EQUIPMENT.

B. PROVIDE PVC INSULATED FLEXIBLE CORD SETS FOR ALL CORD AND PLUG CONNECTED BUILDING APPLIANCES AND EQUIPMENT. CORDS SHALL BE SIZED IN ACCORDANCE WITH ELECTRICAL CIRCUITS INDICATED. MULTIPLE CONDUCTOR CORDS SHALL BE "SO" CABLE WITH PVC JACKET AND GREEN INSULATED GROUND CONDUCTOR.

3.5 EQUIPMENT ANCHORING

A. ALL ITEMS OF ELECTRICAL EQUIPMENT, SUCH AS SWITCHBOARDS, MOTOR CONTROL CENTERS, TRANSFORMERS, STANDBY GENERATOR, ETC., SHALL BE SECURELY ANCHORED TO THE BUILDING STRUCTURE. THE ANCHORING SHALL BE ACCOMPLISHED BY UTILIZING A MINIMUM SIZE OF 3/8" STEEL ANCHOR BOLTS IN THE STRUCTURE AND TO THE ITEM OF EQUIPMENT. A MINIMUM OF TWO (2) ANCHOR BOLTS SHALL BE PROVIDED ON EACH SIDE OF EACH ITEM OF EQUIPMENT WITH THE FOLLOWING EXCEPTIONS:

EXCEPTION NO. 1: IF THE EQUIPMENT MANUFACTURER INCLUDES MORE THAN TWO (2) ANCHOR HOLES PER SIDE IN THE BASE OR BASE FRAME OF THE EQUIPMENT ITEM, THEN THERE SHALL BE ONE ANCHOR FOR EACH ANCHOR HOLE.

EXCEPTION NO. 2: IF THE EQUIPMENT MANUFACTURER RECOMMENDS A PARTICULAR QUANTITY GREATER THAN TWO (2) PER SIDE, THEN THAT QUANTITY OF ANCHORS SHALL BE PROVIDED.

3.6 TESTS, DEMONSTRATION AND INSTRUCTIONS

A. TEST ALL SYSTEMS DESCRIBED IN THIS DIVISION IN THE PRESENCE OF THE OWNER OR A DESIGNATED REPRESENTATIVE UPON COMPLETION OF THE WORK. DEMONSTRATE THAT THE INSTALLATION IS IN ACCORDANCE WITH CONTRACT DOCUMENTS.

B. ANY WORK FOUND NOT TO BE IN COMPLIANCE WITH THE CONTRACT DOCUMENTS SHALL BE REPAIRED OR REPLACED WITHOUT INCURRING ANY ADDITIONS TO THE CONTRACT PRICE.

C. PROVIDE TO THE OWNER, ALL INSTRUCTION ON MAINTENANCE AND OPERATION OF ALL SYSTEMS AND EQUIPMENT PROVIDED UNDER THIS DIVISION. PROVIDE ALL NECESSARY TOOLS AND PERSONNEL TO THOROUGHLY PRESENT THESE INSTRUCTIONS.

3.7 GUARANTEE

A. ALL SYSTEMS, EQUIPMENT, COMPONENTS, WORK, ETC. PROVIDED UNDER THIS DIVISION SHALL BE COVERED BY A ONE YEAR GUARANTEE STARTING AT THE TIME OF FINAL ACCEPTANCE OF THE WORK BY THE OWNER. ANY DEFECTS IN THE WORK, SYSTEMS, EQUIPMENT OR COMPONENTS FOUND DURING THIS YEAR SHALL BE CORRECTED AT NO CHARGE. THE GUARANTEE SHALL INCLUDE PROVIDING ALL NECESSARY CUTTING, PATCHWORK, REPAINTING, ETC. TO MAKE THE WORK COMPLETE AND NEW.

B. PRESENT THIS GUARANTEE AND ANY ADDITIONAL WARRANTIES OR GUARANTEES ON FURNISHED EQUIPMENT OR SYSTEMS TO THE ARCHITECT. ALL EQUIPMENT OR SYSTEM GUARANTEES ARE IN ADDITION TO THE GENERAL GUARANTEE.

END OF SECTION 26050

SECTION 260519 – LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES (600 V AND LESS)

1.1 DESCRIPTION

A. ALL WORK SPECIFIED IN THIS SECTION SHALL COMPLY WITH THE PROVISIONS OF SECTION 260500.

B. THIS SECTION DESCRIBES THE BASIC MATERIALS AND INSTALLATION METHODS THAT ARE ACCEPTABLE AND APPLICABLE TO DIVISION 26.

2.1 CONDUCTORS

A. CONDUCTORS SHALL BE COPPER OF 98% CONDUCTIVITY, 600 VOLT INSULATION. SIZES SPECIFIED ARE AMERICAN WIRE GAUGE (AWG) FOR NO. 4/0 AND SMALLER AND CIRCULAR MILS (MCM) FOR ALL SIZES LARGER THAN NO. 4/0. CONDUCTORS NO. 10 AWG AND SMALLER SHALL BE SOLID AND TYPE "THHN" OR "THWN" INSULATION. NO. 8 AND LARGER SHALL BE STRANDED AND TYPE "THW" OR "XHHW" INSULATION.

3.1 WIRING

A. ALL CONDUCTORS SHALL BE INSTALLED IN CONDUIT. NO CONDUCTORS SHALL BE PULLED INTO THE CONDUIT UNTIL THE CONDUIT SYSTEM IS COMPLETE AND PLASTER HAD DRIED. WIRE PULLING LUBRICANTS SHALL BE GARDNER-BENDER "WIREAIDE" OR IDEAL "YELLOW 77".

B. CONDUCTORS SHALL BE CONTINUOUS FROM OUTLET TO OUTLET AND FROM OUTLET TO JUNCTION BOX OR PULL BOX. ALL SPLICES AND JOINTS SHALL BE CAREFULLY AND SECURELY MADE TO BE MECHANICALLY AND ELECTRICALLY SOLID WITH PRESSURE TYPE CONNECTORS, GARDNER BENDER "WINGGARD" OR IDEAL "WINGNUT". TAPE SHALL BE "SCOTCH" NO. 33 FOR INDOOR AND NO. 88 FOR OUTDOOR OR GARDNER BENDER NO. 95-661. WHERE CONNECTION IS MADE TO ANY TERMINALS OF MORE THAN 30 AMPERES CAPACITY AND WHERE CONDUCTORS LARGER THAN NO. 10 ARE CONNECTED TO ANY TERMINAL, COPPER TERMINAL LUGS SHALL BE BOLTED TO THE CONDUCTORS. WHERE MULTIPLE CONNECTIONS ARE MADE TO THE SAME TERMINAL, INDIVIDUAL LUGS FOR EACH CONDUCTOR SHALL BE USED.

C. ALUMINUM CONDUCTORS, IF USED FOR SERVICE CONDUCTORS, SHALL BE MADE WITH HIGH COMPRESSION LUGS AS MANUFACTURED BY SQUARE D, IDEAL OR MAC.

D. EACH CONDUIT SHALL HAVE A MINIMUM OF TWO (2) CONDUCTORS PULLED IN UNLESS THAT PARTICULAR CONDUIT IS NOTED AS BEING FOR SYSTEMS OTHER THAN ELECTRICAL CIRCUITRY AND/OR FUTURE USE OR UNLESS NOTED OTHERWISE.

E. CONDUCTORS FOR LIGHTING AND RECEPTACLE CIRCUITS SHALL HAVE COLOR CODED JACKETS. THE WIRING SHALL BE COLOR CODED WITH THE SAME COLOR USED WITH ITS RESPECTIVE PHASE THROUGH THE ENTIRE JOB AS FOLLOWS:

208/120 VOLT SYSTEM	480/277 VOLT SYSTEM
PHASE A – BLACK	PHASE A – BROWN
PHASE B – RED	PHASE B – ORANGE
PHASE C – BLUE	PHASE C – YELLOW
NEUTRAL – WHITE	NEUTRAL – GRAY
GROUND – GREEN	GROUND – GREEN

F. THE FEEDER AND SERVICE ENTRANCE CONDUCTORS SHALL BE COLOR CODED BY THE USE OF COLORED PLASTIC TAPE APPLIED WITHIN 6" OF EACH CONDUCTOR END.

G. BRANCH CIRCUIT CONDUCTORS SHALL NOT BE SMALLER THAN NO. 12 AND WHERE THE HOME RUN FROM CENTER OF LOAD EXCEEDS 100'-0", THE CONDUCTORS FROM HOME RUN OUTLET TO PANEL SHALL BE NO. 10 MINIMUM.

H. FOR BRANCH CIRCUITS TERMINATING IN OUTLET WITHOUT DEVICE, LEAVE MINIMUM OF 12" OF SLACK WIRE COILED FOR CONNECTION OF EQUIPMENT. ALL CONDUCTORS SHALL BE IDENTIFIED WITH PROPER CIRCUIT NUMBERS AT TERMINALS, JUNCTION BOXES AT PANELBOARDS WITHIN 6" OF CONDUCTOR ENDS.

END OF SECTION 260519

SECTION 260526 – GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

1.1 DESCRIPTION

A. ALL WORK SPECIFIED IN THIS SECTION SHALL COMPLY WITH THE PROVISIONS OF SECTION 260500.

B. THIS SECTION DESCRIBES THE BASIC GROUNDING MATERIALS AND INSTALLATION METHODS THAT ARE ACCEPTABLE AND APPLICABLE TO DIVISION 26.

2.1 MANUFACTURERS

A. ALL GROUND CONNECTIONS IN THE BUILDING SYSTEM GROUND SHALL BE DONE WITH CADWELD.

3.1 GROUNDING

A. GROUND CONNECTIONS SHALL BE IN ACCORDANCE WITH THE 2020 NATIONAL ELECTRICAL CODE.

B. PROVIDE AN INSULATED GREEN BONDING JUMPER FROM THE GROUNDING LUG OF ALL RECEPTACLES TO A STEEL CITY "GEE" CLIP OR A SHEET METAL MACHINE SCREW IN THE OUTLET BOX. THE GROUND WIRE INSTALLED BEHIND THE DEVICE MOUNTING SCREWS WILL NOT BE ACCEPTABLE.

C. PROVIDE ONE (1) NO. 6 AWG IN A 3/4" CONDUIT FROM THE SYSTEM GROUND TO THE TELEPHONE COMPANY MAIN DISTRIBUTION FRAME OR SERVICE CABINET AND TO EACH TELEPHONE BACKBOARD.

END OF SECTION 260526

SECTION 260534 – CONDUIT

1.1 DESCRIPTION

A. ALL WORK SPECIFIED IN THIS SECTION SHALL COMPLY WITH THE PROVISIONS OF SECTION 260500.

B. THIS SECTION DESCRIBES THE BASIC ELECTRICAL MATERIALS AND INSTALLATION METHODS THAT ARE ACCEPTABLE AND APPLICABLE TO DIVISION 26.

2.1 MANUFACTURERS

A. STEEL CONDUIT APPROVED MANUFACTURERS ARE ALLIED, TRIANGLE AND REPUBLIC.

B. PVC AND ENT CONDUIT APPROVED MANUFACTURERS ARE CARLON AND TRIANGLE.

C. CONDUIT FITTINGS APPROVED MANUFACTURERS ARE RACO, STEEL CITY, O.Z. GEDNEY, THOMAS & BETTS AND APPLETON.

2.2 CONDUIT

A. GALVANIZED RIGID STEEL CONDUIT SHALL BE LOW CARBON, HOT-DIPPED GALVANIZED BOTH INSIDE AND OUT WITH THREADED JOINTS.

B. INTERMEDIATE METAL CONDUIT (IMC) SHALL BE STEEL, GALVANIZED BOTH INSIDE AND OUT WITH THREADED JOINTS.

C. ELECTRICAL METALLIC TUBING (EMT) SHALL BE STEEL, GALVANIZED BOTH INSIDE AND OUT.

D. PLASTIC CONDUIT (PVC) SHALL BE SCHEDULE 40 PVC HEAVY WALL TYPE. A GROUNDING CONDUCTOR SHALL BE PROVIDED.

E. ELECTRICAL NON-METALLIC TUBING (ENT) SHALL BE OF SUCH MATERIAL THAT IT IS RESISTANT TO MOISTURE, CHEMICAL ATMOSPHERES AND IS FLAME RETARDANT. A GROUNDING ELECTRODE CONDUCTOR SHALL BE PROVIDED.

F. FLEXIBLE METAL CONDUIT SHALL BE FLEXIBLE STEEL CONDUIT TUBING AND SHALL MEET UNDERWRITERS LABORATORIES STANDARD FOR FLEXIBLE STEEL CONDUIT.

G. LIQUID-TIGHT FLEXIBLE METAL CONDUIT AND LIQUID-TIGHT NON-METALLIC CONDUITS SHALL BE LIQUID-TIGHT AND SUNLIGHT RESISTANT.

2.3 CONDUIT FITTINGS

A. RIGID CONDUIT AND IMC CONDUIT FITTINGS SHALL BE ZINC-COATED, FERROUS METAL AND TAPER THREADED TYPE.

B. EMT FITTINGS SHALL BE ZINC-COATED STEEL AND HEXNUT COMPRESSION OR SET-SCREW TYPE. EMT CONNECTORS SHALL HAVE INSULATED THROATS.

C. PVC FITTINGS, ELBOWS AND CEMENT SHALL BE PRODUCED BY THE SAME MANUFACTURER. ALL JOINTS SHALL BE SOLVENT WELDED IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.

D. CONDUIT CONNECTIONS TO SWITCHBOARDS, MOTOR CONTROL CENTERS, TRANSFORMERS, PANEL CABINETS, AND PULL BOXES SHALL HAVE GROUNDING WEDGE LUGS BETWEEN THE BUSHING AND THE BOX OR LOCKNUTS DESIGNED TO BITE INTO THE METAL.

E. EACH CONDUIT END SHALL BE PROVIDED WITH EITHER AN INSULATED THROAT CONNECTOR OR SEPARATE LOCKNUT AND INSULATED BUSHING. BUSHING SHALL BE INSTALLED BEFORE ANY WIRE IS PULLED.

F. EXPANSION FITTINGS SHALL BE PROVIDED IN ALL CONDUIT WHICH CROSSES AND EXPANSION JOINT.

2.4 SMOKE AND FIRE STOP FITTINGS

A. SMOKE AND FIRE STOP FITTINGS SHALL BE UL LISTED FOR THAT PURPOSE. THE FITTINGS USED TO SEAL CONDUIT EITHER ON THE OUTSIDE OF THE CONDUIT OR INTERNALLY SHALL HAVE HEAT ACTIVATED INTUMESCENT MATERIAL, WHICH EXPANDS TO FILL ALL VOIDS.

B. SMOKE AND FIRE STOP FITTINGS SHALL BE O.Z./GEDNEY "FIRE-SEAL" OR DOW CORNING SILICONE RTV FOAM WITH AN HOURLY FIRE-RATING EQUAL TO OR HIGHER THAN THE RATING OF THE FLOOR, CEILING OR WALL THROUGH WHICH THE CONDUIT PASSES. THE SEALS FOR CONDUIT SHALL BE OF THE FLANGED TYPE.

3.1 CONDUIT

A. RIGID STEEL (OR IMC) SHALL BE USED FOR SERVICE ENTRANCE AND ALL FEEDERS AND BRANCH CIRCUITS WHERE EXPOSED TO DAMAGE.

B. EMT SHALL BE USED FOR BRANCH CIRCUITS, FIRE ALARM AND TELEPHONE WHEN NOT UNDERGROUND OR IN CONCRETE IN CONTACT WITH THE EARTH.

C. SCHEDULE 40 PVC MAY BE USED FOR ALL UNDERGROUND FEEDERS, SERVICE ENTRANCE CONDUCTORS WHEN ENCASED IN 4" OF CONCRETE ON ALL SIDES, OR UNDER THE LOWEST FLOOR SLAB.

D. CONDUIT SHALL BE CONTINUOUS FROM OUTLET TO OUTLET, FROM OUTLET TO CABINET, JUNCTION BOX AND PULL BOX. CONDUIT SHALL ENTER AND BE SECURED TO ALL BOXES, ETC., IN SUCH A MANNER THAT EACH SYSTEM WILL BE ELECTRICALLY CONTINUOUS FROM SERVICE TO ALL OUTLETS SUCH THAT A GOOD GROUND IS PROVIDED. ALL CONDUIT FROM CABINETS AND JUNCTION BOXES SHALL TERMINATE IN APPROVED OUTLET BOXES OR CONDUIT FITTINGS. CONDUIT CONNECTIONS TO ANY BOX WHICH HAS NO THREADED HUB SHALL BE DOUBLE LOCKNUTTED.

E. PROVIDE JUNCTION BOXES OR PULL BOXES WHERE SHOWN AND WHERE NECESSARY TO AVOID EXCESSIVE RUNS OR TOO MANY BENDS BETWEEN OUTLETS. THE CONDUIT SIZES SHOWN MAY INCREASE IF DESIRED TO FACILITATE THE PULLING OF CABLES.

F. ALL CONDUIT SHALL BE CONCEALED UNLESS INDICATED OTHERWISE. INSTALL EXPOSED CONDUIT PARALLEL WITH OR AT RIGHT ANGLES TO THE BUILDING WALLS AND SUPPORT FROM WALLS OR CEILINGS AT INTERVALS REQUIRED BY CODE WITH APPROVED GALVANIZED IRON CLAMPS OR HANGERS. CONCEALED CONDUIT ABOVE THE CEILING SHALL BE SUPPORTED INDEPENDENT OF CEILING CONSTRUCTION. WHERE CEILINGS OF LAY-IN TYPE ARE USED, CONDUIT MUST BE INSTALLED HIGH ENOUGH TO PERMIT REMOVAL OF CEILING PANELS AND LIGHTING FIXTURES. USE THREADED RODS AND HANGERS FOR SUPPORTING SINGLE CONDUIT. USE TRAPEZE HANGERS CONSISTING OF DOUBLE-NUTTED THREADED RODS AND "UNISTRUT" CHANNELS OR ANGLES OF 12 GAUGE MINIMUM STEEL FOR SUPPORTING MULTIPLE CONDUIT.

G. MINIMUM SIZE CONDUIT FOR BRANCH CIRCUITS SHALL NOT BE SMALLER THAN 1/2". HOME RUNS SHALL EXTEND FROM OUTLETS SHOWN TO PANEL DESIGNATED. HOME RUNS SHOWN SHALL NOT BE COMBINED. HOME RUN CONDUIT SHALL NOT BE SMALLER THAN 3/4".

H. AT COUPLINGS, CONDUIT ENDS SHALL BE THREADED SO THAT THEY MEET IN THE COUPLING. RIGHT AND LEFT HAND COUPLINGS SHALL NOT BE USED; CONDUIT COUPLINGS OF THE ERIKSON TYPE SHALL BE USED AT LOCATIONS REQUIRING SUCH JOINTS.

I. ALL CONDUIT FOR FUTURE USE, FOR TELEPHONE WIRE, OR FOR DATA COMMUNICATION CABLE, SHALL BE LEFT WITH NO. 16 GAUGE WIRE PULLED IN THEM OR A PULL LINE AS MANUFACTURED BY IDEAL, AND THE ENDS SECURELY CORKED OR CAPPED.

J. EXPANSION FITTINGS SHALL BE INSTALLED IN ALL CONDUIT WHICH PASS THROUGH THE CROSS-SECTIONAL AREA OF EXPANSION JOINTS.

K. PROVIDE NON-HARDENING ELASTIC TYPE DUCT SEAL COMPOUND, NEER NO. DC., 3M CO. "SCOTCHFIL", OR GARDNER BENDER DUCT SEAL, FOR EACH CONDUIT ENTERING THE BUILDING FROM OUTSIDE AND FOR EACH CONDUIT PASSING FROM ONE SPACE INTO ANOTHER WHICH IS NORMALLY AT A LOWER TEMPERATURE.

L. PROVIDE WATERTIGHT CONDUIT HUBS ON CONDUIT TERMINATING IN A BOX OR CABINET EXPOSED TO THE WEATHER.

M. SPACE IN SLEEVES OR AROUND CONDUIT THAT PASS THROUGH FIRE RESISTIVE OR FIRE RATED WALLS, PARTITIONS, FLOORS OR CEILINGS SHALL BE CLOSED BY PACKING WITH AN UNLABELED FIRE RESISTIVE MATERIAL THAT WILL MAINTAIN THE RATING OF THE BARRIER PENETRATED.

3.2 FLEXIBLE CONDUIT

A. PVC EXTRUDED COVER FLEXIBLE CONDUIT SHALL BE USED IN MAKING SHORT FLEXIBLE CONNECTIONS TO ROTATING OR VIBRATING MACHINERY OR EQUIPMENT. THE FLEXIBLE CONDUIT AT THESE LOCATIONS SHALL BE AS SHORT AS POSSIBLE, BUT SHALL HAVE A MINIMUM LENGTH OF 12".

B. A GREEN STRANDED BONDING JUMPER SHALL BE INSTALLED OUTSIDE OF ALL FLEXIBLE CONDUIT THAT EXTENDS DIRECTLY FROM A NON-FLEX CONDUIT TO A ROTATING OR VIBRATING MACHINE. WHERE A JUNCTION BOX IS USED, THE GREEN STRANDED BONDING JUMPER SHALL BE INSTALLED INSIDE THE FLEXIBLE CONDUIT AND ATTACHED TO THE JUNCTION BOX AND TO THE MACHINE. WHEN THE BONDING JUMPER IS INSTALLED OUTSIDE OF THE FLEXIBLE CONDUIT, PLASTIC WIRE STRAPS SHALL BE USED 6" O.C. TO SECURE THE JUMPER TO THE FLEXIBLE CONDUIT.

C. FLEXIBLE METAL (MC) CONDUIT SYSTEM MAY BE UTILIZED WHERE CONCEALED IN WALLS AND/OR MILLWORK ONLY. MC CABLE SHALL RUN FROM POINT OF EXIT FROM WALL OR MILLWORK TO NEAREST STRUCTURALLY SUPPORT JUNCTION BOX. MC CABLE WILL NOT BE PERMITTED TO BE INSTALLED IN THE ABOVE CEILING SPACE AND SHALL NOT PASS THROUGH A FIRE RATED PARTITION. CONDUCTOR COLORS OF THE MC CABLE SHALL COMPLY WITH 260519, 3.1, E.

3.3 LOW VOLTAGE CONDUIT SYSTEM

A. TELEPHONE SERVICE SHALL INCLUDE PLYWOOD BACKBOARDS AND EQUIPMENT CABINETS WITH SERVICE ENTRANCE CONDUIT AS SHOWN IN MDF/IDF ROOM LOCATIONS.

B. TELEPHONE SERVICE ENTRANCE CABLE, ALL BRANCH CABLING AND TELEPHONE INSTRUMENTS SHALL BE PROVIDED BY THE TELEPHONE EQUIPMENT VENDOR.

C. PROVIDE AN OUTLET AND CONDUIT SYSTEM FOR CABLING OF LOW VOLTAGE SYSTEMS (I.E. TELEPHONES, DATA, A/V, SECURITY) AS SHOWN AND LEAVE THE SAME IN READINESS FOR WIRING BY OTHERS. PROVIDE PULL LINE IN ALL EMPTY LOW VOLTAGE CONDUIT. TERMINATE ALL CONDUIT AT A UNIFORM HEIGHT WITH SMOOTH INSULATED BUSHINGS AT THE TELEPHONE PLYWOOD BACKBOARDS.

D. TELEPHONE, DATA, OR A/V WALL OUTLETS SHALL BE PRESSED STEEL SECTIONAL SWITCH BOXES, WALL MOUNTED AT THE LOCATIONS INDICATED.

E. TELEPHONE, DATA, OR A/V FLOOR OUTLETS SHALL BE FLOOR BOXES AS SPECIFIED AT THE LOCATIONS INDICATED.

END OF SECTION 260534

SECTION 260537 – BOXES

1.1 DESCRIPTION

A. ALL WORK SPECIFIED IN THIS SECTION SHALL COMPLY WITH THE PROVISIONS OF SECTION 260500.

B. THIS SECTION DESCRIBES THE BASIC ELECTRICAL MATERIALS AND INSTALLATION METHODS THAT ARE ACCEPTABLE AND APPLICABLE TO DIVISION 26.

2.1 MANUFACTUERS

A. OUTLET BOX APPROVED MANUFACTURERS ARE APPLETON, RACO, STEEL CITY, OR CROUSE-HINDS.

2.2 OUTLET BOXES

A. OUTLET BOXES AND COVERS SHALL BE OF SUCH FORM AND DIMENSIONS AS TO BE ADAPTED TO THEIR SPECIFIED USAGE, LOCATIONS, SIZE AND QUANTITY OF CONDUIT, AND SIZE AND QUANTITY OF CONDUCTORS ENTERING THE BOXES. IN SPECIAL "FIRE RATED" PARTITIONS, OUTLETS SHALL COMPLY WITH ASTM NO. E119.

B. FLUSH CEILING OUTLETS FOR SURFACE OR PENDANT MOUNTED LIGHTING FIXTURES SHALL BE ONE-PIECE 4" SQUARE OR OCTAGONAL PRESSED STEEL BOXES. BOXES FOR DEVICES IN UNFINISHED MASONRY WALLS OR STUD WALLS SHALL BE PRESSED STEEL, SQUARE CORNER, SECTIONAL SWITCH BOXES, OR SHALL BE 4" SQUARE BOX WITH A SQUARE CORNERED TILE WALL COVER, SET FLUSH WITH MASONRY CONSTRUCTION. BOXES IN CONCRETE CEILING SLAB SHALL BE OCTAGONAL, SHALLOW CONCRETE BOXES. WELDED BOXES ARE NOT ACCEPTABLE.

C. ALL OUTLET BOXES IN PLASTER OR MASONRY WALLS OR CEILING SHALL BE PROVIDED WITH PLASTER RINGS.

2.3 COVERPLATES

A. JUNCTION BOXES AND ALL OUTLETS NOT INDICATED AS CONTAINING WIRING DEVICES OR LIGHTING FIXTURES SHALL HAVE COVERS. COVERS FOR OUTLETS IN WALLS SHALL BE AS SPECIFIED FOR WALL SWITCHES AND RECEPTACLES.

B. OUTLET BOXES EXPOSED TO THE WEATHER AND OUTLET BOXES FOR VAPORTIGHT LIGHTING FIXTURES AND DEVICES SHALL BE OF CAST IRON CORROSION RESISTANT TYPE. COVERPLATES FOR EXTERIOR DEVICES SHALL BE WEATHERPROOF "WHILE-IN-USE".

3.1 INSTALLATION

A. PROVIDE GALVANIZED STEEL OR CAST TYPE BOXES FOR ALL OUTLETS.

B. WHERE OUTLET BOXES ARE USED TO SUPPORT LIGHTING FIXTURES, THE OUTLET BOX SHALL BE ANCHORED TO THE STRUCTURAL MEMBERS OF THE BUILDING PER NEC 314.23.

C. OUTLET BOXES SHALL BE FLUSH MOUNTED UNLESS THEY ARE SPECIFICALLY SHOWN AS BEING USED WITH EXPOSED CONDUIT OR ARE LOCATED ABOVE A CEILING.

D. WHERE OUTLETS ARE SUPPLIED FROM CONDUIT RUN IN OR BELOW FLOOR SLABS, THE CONDUIT SHALL BE STUBBED UP AT THE LOCATION SHOWN AND THE WALL BUILT UP AROUND THE CONDUIT.

E. CUTS FOR OUTLET BOXES IN MASONRY WALLS SHALL BE MADE SO THAT THE COVERPLATE WILL COMPLETELY COVER THE CUT. THE MOUNTING HEIGHT OF SWITCH, RECEPTACLE AND OTHER OUTLETS MAY BE VARIED SLIGHTLY, WITH THE ARCHITECTS APPROVALS, SO THAT THE OUTLET BOX, TOP OR BOTTOM, WILL OCCUR AT A MASONRY JOINT.

F. THE EDGE OF ALL OUTLET BOXES SHALL BE FLUSH WITH THE SURFACE IN WHICH THEY ARE RECESSED. THE DEVICES THAT FIT INTO THE OUTLET BOXES SHALL BE SCREWED TIGHT BEFORE THE COVERPLATE IS INSTALLED AND THE COVERPLATE SHALL NOT BE USED AS A MEANS OF TIGHTENING THE DEVICES IN PLACE.

G. WHERE OUTLETS ARE SHOWN AS BEING ADJACENT AND DIFFERENT MOUNTING HEIGHTS ARE SPECIFIED FOR EACH, THEY SHALL BE MOUNTED ONE DIRECTLY OVER THE OTHER, ON THE CENTERLINE OF THE GROUP.

3.2 COVERPLATES

A. ALL JUNCTION BOXES, OUTLET BOXES, MULTI-GANG SWITCH BOXES, UTILITY BOXES, ETC., SHALL BE COVERED WITH A COVERPLATE. THE COVERPLATE SHALL BE A FINISHED PLATE AS SPECIFIED UNLESS DESIGNATED OTHERWISE.

B. COVERPLATES SHALL BE MOUNTED VERTICALLY UNLESS DESIGNATED OTHERWISE.

END OF SECTION 260537

SECTION 260553 – IDENTIFICATION FOR ELECTRICAL SYSTEMS

1.1 DESCRIPTION

A. ALL WORK SPECIFIED IN THIS SECTION SHALL COMPLY WITH THE PROVISIONS OF SECTION 260500.

B. THIS SECTION DESCRIBES THE BASIC ELECTRICAL MATERIALS AND INSTALLATION METHODS THAT ARE ACCEPTABLE AND APPLICABLE TO DIVISION 26.

2.1 MATERIALS

A. NAMEPLATES SHALL HAVE 3/8" HIGH ENGRAVED LETTERS.

B. 120 OR 208 VOLTS: WHITE CORE LAMINATED BAKELITE WITH BLACK FINISH.

C. 277 OR 480 OR HIGHER VOLTS: WHITE CORE LAMINATED BAKELITE WITH RED FINISH.

3.1 INSTALLATION

A. PROVIDE SPECIFIED NAMEPLATES ON THE MAIN SWITCHBOARD, DISTRIBUTION PANELS, FEEDER SWITCHES, FEEDER BREAKERS, PANELBOARDS MOTOR CONTROL CENTERS, DISCONNECT SWITCHES, CONTACTORS, STARTERS, TRANSFORMERS, BUS-PLUGS, START-STOP PUSH BUTTONS AND MOTOR SWITCHES.

B. PROVIDE NAMEPLATES ON EVERY DEVICE IN THE MAIN SWITCHBOARD, DISTRIBUTION PANELS AND MOTOR CONTROL CENTERS.

C. NAMEPLATES FOR SURFACE MOUNTED EQUIPMENT SHALL BE INSTALLED ON THE EXTERIOR OF EQUIPMENT WITH SHEETMETAL SCREWS. NAMEPLATES FOR FLUSH OR RECESSED MOUNTED EQUIPMENT SHALL BE INSTALLED ON THE INSIDE OF THE PANEL DOOR OR COVER WITH EPOXY CEMENT.

END OF SECTION 260553

SECTION 262200 – LOW-VOLTAGE TRANSFORMERS

1.1 DESCRIPTION

A. ALL WORK SPECIFIED IN THIS SECTION SHALL COMPLY WITH THE PROVISIONS OF SECTION 26 05 00.

B. SHOP DRAWINGS FOR EQUIPMENT SPECIFIED IN THIS SECTION SHALL SHOW THAT ALL SPECIFIED REQUIREMENTS HAVE BEEN INCORPORATED.

2.1 MANUFACTURERS

A. TRANSFORMERS SHALL BE AS MANUFACTURED BY SQUARE D, SIEMENS, OR EATON.

B. ALL DISTRIBUTION SWITCHGEAR (BRANCH CIRCUIT PANELBOARDS, SWITCHBOARD, DISTRIBUTION PANELBOARDS, TRANSFORMERS, BUSWAY, SWITCHES, ETC.) SHALL BE THE UNIT RESPONSIBILITY OF ONE MANUFACTURER. ALL COMPONENT PARTS OF THE ABOVE LISTED ITEMS SHALL BE OF THE SAME MANUFACTURER EXCEPT WHERE A WRITTEN REQUEST FOR DEVIATION FROM THIS REQUIREMENT HAS BEEN APPROVED PRIOR TO BID DATE.

2.2 TRANSFORMERS

A. BRANCH CIRCUIT AND DISTRIBUTION TRANSFORMERS SHALL BE THE DRY TYPE AND SHALL HAVE THE RATINGS INDICATED.

B. SINGLE PHASE TRANSFORMERS SHALL BE 480 VOLT PRIMARY AND 120/208 VOLT SECONDARY. THREE PHASE TRANSFORMERS SHALL BE 480 VOLT DELTA PRIMARY AND 120/208 VOLT GROUNDED TYPE SECONDARY. TRANSFORMERS 25 KVA AND LARGER SHALL HAVE A MINIMUM OF 4 1/2% FULL CAPACITY PRIMARY TAPS.

C. TRANSFORMERS SHALL HAVE A U.L. RECOGNIZED 220 DEGREE INSULATION SYSTEM AND SHALL BE DESIGNED SO THAT UNDER FULL LOAD, THE AVERAGE CONDUCTOR TEMPERATURE RISE DOES NOT EXCEED 115 DEGREE C. RISE ABOVE A 40 DEGREE C. AMBIENT AND THE ENCLOSURE DOES NOT EXCEED A 50 DEGREE C. RISE AT ANY POINT.

D. TRANSFORMER COILS SHALL BE OF THE CONTINUOUS WOUND CONSTRUCTION AND SHALL BE IMPREGNATED WITH NON-HYGROSCOPIC, THERMOSETTING VARNISH. ALL CORES TO BE CONSTRUCTED OF HIGH GRADE, NON-AGING SILICON STEEL WITH HIGH MAGNETIC PERMEABILITY, AND LOW HYSTERSESIS AND EDDY CURRENT LOSSES. MAGNETIC FLUX DENSITIES SHALL BE KEPT WELL BELOW THE SATURATION POINT. THE CORE LAMINATIONS SHALL BE CLAMPED TOGETHER WITH STRUCTURAL STEEL ANGLES. THE COMPLETED CORE AND COIL SHALL THEN BE BOLTED TO THE BASE OF THE ENCLOSURE BUT ISOLATED THEREFROM BY MEANS OF RUBBER, VIBRATION-ABSORBING MOUNTS. THERE SHALL BE NO METAL-TO-METAL CONTACT BETWEEN THE CORE AND COIL AND THE ENCLOSURE. ON TRANSFORMERS 500 KVA AND SMALLER, THE VIBRATION ISOLATING SYSTEM SHALL BE DESIGNED TO PROVIDE A PERMANENT FASTENING OF THE CORE AND COIL TO THE ENCLOSURE. SOUND ISOLATING SYSTEMS REQUIRING THE COMPLETE REMOVAL OF ALL FASTENING DEVICES WILL NOT BE ACCEPTABLE. SOUND LEVELS SHALL BE GUARANTEED BY THE MANUFACTURER NOT TO EXCEED THE FOLLOWING: 25 TO 50 KVA – 45 DB; 51 TO 150 KVA – 50 DB; 151 TO 300 KVA – 55 DB; 301 TO 500 KVA – 60 DB.

E. TRANSFORMERS 24 KVA AND LARGER SHALL BE IN A HEAVY GAUGE, SHEET STEEL, VENTILATED ENCLOSURE. THE VENTILATING OPENINGS SHALL BE DESIGNED TO PREVENT ACCIDENTAL ACCESS TO LIVE PARTS IN ACCORDANCE WITH UL, NEMA, AND NATIONAL ELECTRICAL CODE STANDARD FOR VENTILATED ENCLOSURES. TRANSFORMERS 25 KVA THROUGH 112.5 KVA SHALL BE DESIGNED SO THAT THEY CAN BE EITHER FLOOR OR WALL MOUNTED. ABOVE 112.5 KVA, THEY SHALL BE FLOOR-MOUNTED DESIGN. THE ENTIRE TRANSFORMER ENCLOSURE SHALL BE DEGREASED, CLEANED, PHOSPHATIZED, PRIMED AND FINISHED WITH GRAY, BAKED ENAMEL.

F. TRANSFORMERS SHALL BE COMPLIANT WITH THE 2016 DOE EFFICIENCY STANDARDS:

TABLE I.6--ELECTRICAL EFFICIENCIES FOR ALL LOW-VOLTAGE DRY-TYPE DISTRIBUTION TRANSFORMER EQUIPMENT CLASSES

EQUIPMENT CLASS 4 (THREE-PHASE)

kVA	%
15	97.89
45	98.40

3.1 INSTALLATION

A. PROVIDE ALL NECESSARY HARDWARE TO LEVEL AND SECURE THE TRANSFORMERS AS REQUIRED BY THE MANUFACTURER'S INSTRUCTIONS. MAKE ALL ELECTRICAL CONNECTIONS FOR SUPPLY AND LOAD CIRCUITS AND LEAVE IN OPERATING CONDITION.

B. CLEAN ENCLOSURE OF ALL TRANSFORMERS OF ALL FOREIGN MATTER, INCLUDING DUST.

C. REMOVE ALL RUST MARKS AND REPAINT TO LEAVE TRANSFORMERS IN NEW CONDITION.

D. TRANSFORMERS THAT ARE OF THE FLOOR-MOUNTED TYPE SHALL BE MOUNTED ON A 4" HIGH CONCRETE PAD WITH KORFUND VIBRATION ELIMINATORS OF THE PAD TYPE.

END OF SECTION 262200

SECTION 262416 – PANELBOARDS

1.1 DESCRIPTION

A. ALL WORK SPECIFIED IN THIS SECTION SHALL COMPLY WITH THE PROVISIONS OF SECTION 260500.

B. PROVIDE A COMPLETE ELECTRICAL DISTRIBUTION SYSTEM. THE SYSTEM SHALL INCLUDE THE SERVICE ENTRANCE, MAIN SWITCHBOARD, FEEDERS, TRANSFORMERS, DISTRIBUTION PANELS, PANELBOARDS, BUSWAY, REMOTE CONTROL SWITCHES, CONTACTORS, ETC., TO PROVIDE A COMPLETE SYSTEM.

C. SHOP DRAWINGS FOR EQUIPMENT SPECIFIED IN THIS SECTION SHALL SHOW THAT ALL SPECIFIED REQUIREMENTS HAVE BEEN INCORPORATED.

2.1 MANUFACTURERS

A. PANELBOARDS SHALL BE AS MANUFACTURED BY GENERAL ELECTRIC, SQUARE D, SIEMENS, OR EATON.

B. ALL DISTRIBUTION SWITCHGEAR (BRANCH CIRCUIT PANELBOARDS, DISTRIBUTION PANELBOARDS, TRANSFORMERS, BUSWAY, SWITCHES, ETC.) SHALL BE THE UNIT RESPONSIBILITY OF ONE MANUFACTURER. ALL COMPONENT PARTS OF THE ABOVE LISTED ITEMS SHALL BE OF THE SAME MANUFACTURER EXCEPT WHERE A WRITTEN REQUEST FOR DEVIATION FROM THIS REQUIREMENT HAS BEEN APPROVED PRIOR TO BID DATE.

2.2 BRANCH CIRCUIT PANELBOARDS

A. PANELBOARDS (PANELS) SHALL BE GENERAL PURPOSE ENCLOSURES AND SHALL BE SURFACE OR FLUSH MOUNTED AS INDICATED. PANELS SHALL BE OF THE AUTOMATIC CIRCUIT BREAKER TYPE, FACTORY ASSEMBLED BY THE MANUFACTURER OF THE CIRCUIT BREAKERS. PANELS SHALL BE FOR THE VOLTAGE INDICATED WITH THE QUANTITY OF POLES AND AMPACITY OF CIRCUIT BREAKERS SHOWN.

B. BOXES AND TRIM SHALL BE MADE FROM CODE GAUGE STEEL. BOXES SHALL BE SUFFICIENT SIZE TO PROVIDE A MINIMUM GUTTER SPACE OF 4" ON ALL SIDES. BOXES SHALL BE MINIMUM 20" WIDTH AND 5 3/4" DEPTH.

C. HINGED DOOR COVERING ALL DEVICE HANDLES SHALL BE INCLUDED IN ALL PANEL TRIM. DOORS SHALL HAVE FLUSH-TYPE CYLINDER LOCK AND CATCH, EXCEPT THAT DOORS OVER 48" IN HEIGHT SHALL HAVE AUXILIARY FASTENERS AT TOP AND BOTTOM OF DOOR IN ADDITION TO FLUSH-TYPE CYLINDER LOCK AND CATCH. DOOR HINGES SHALL BE CONCEALED. ALL LOCKS SHALL BE KEYED ALIKE. DIRECTORY FRAME AND CARD HAVING A TRANSPARENT COVER SHALL BE FURNISHED EACH PANEL DOOR.

D. TRIMS FOR FLUSH PANELS SHALL OVERLAP THE BOX BY AT LEAST 3/4" ALL AROUND. SURFACE TRIMS SHALL HAVE THE SAME WIDTH AND HEIGHT AS THE BOX. TRIMS SHALL BE MOUNTABLE BY A SCREWDRIVER WITHOUT THE NEED FOR SPECIAL TOOLS. AFTER INSTALLATION, TRIM MOUNTING MECHANISM OR HARDWARE SHALL NOT BE ACCESSIBLE WHEN PANEL DOOR IS CLOSED AND LOCKED.

E. ALL EXTERIOR AND INTERIOR STEEL SURFACES OF THE TRIM SHALL BE CLEANED AND FINISHED WITH GRAY PAINT OVER A RUST-INHIBITING PHOSPHATIZED COATING.

F. ALL INTERIORS SHALL BE COMPLETELY FACTORY ASSEMBLED WITH PROTECTIVE DEVICES, WIRE CONNECTORS, ETC. ALL WIRE CONNECTORS, EXCEPT SCREW TERMINALS, SHALL BE OF THE ANTI-TURN SOLDERLESS TYPE AND ALL SHALL BE SUITABLE FOR COPPER OR ALUMINUM WIRE.

G. INTERIORS SHALL BE SO DESIGNED THAT DEVICES CAN BE REPLACED WITHOUT DISTURBING ADJACENT UNITS AND WITHOUT REMOVING THE MAIN BUS CONNECTORS, AND SHALL BE SO DESIGNED THAT DEVICES MAY BE CHANGED WITHOUT MACHINING, DRILLING OR TAPPING.

H. BUS BARS FOR THE MAINS SHALL BE OF COPPER SIZED IN ACCORDANCE WITH U.L. STANDARDS. FULL SIZE BARS SHALL BE INCLUDED. BUS BAR TAPS FOR PANELS WITH SINGLE POLE BRANCHES SHALL BE ARRANGED FOR SEQUENCE PHASING OF THE BRANCH CIRCUIT DEVICES.

I. PHASE BUSSING SHALL BE FULL HEIGHT WITHOUT REDUCTION. CROSS AND CENTER CONNECTORS SHALL BE OF THE SAME MATERIAL AS THE BUS.

J. THE NEUTRAL BUS SHALL UTILIZE SETSCREWS TO BOND THE NEUTRAL WIRE TO THE NEUTRAL BUS THROUGH HOLES DRILLED IN THE NEUTRAL BAR. A SHEET COPPER NEUTRAL BUS UTILIZING FLATHEAD SCREWS TO HOLD THE NEUTRAL WIRES WILL NOT BE ACCEPTABLE.

K. SPACES FOR FUTURE DEVICES SHALL BE INCLUDED AS INDICATED AND SHALL BE BUSSED FOR THE MAXIMUM RATED DEVICE THAT CAN BE FITTED INTO THEM.

L. ALL CIRCUIT BREAKERS SHALL BE MANUALLY OPERATED, THERMAL-MAGNETIC, AUTOMATIC, OF THE AMPACITY AND POLES AS INDICATED. THEY SHALL BE QUICK-MAKE, QUICK-BREAK, BOTH ON MANUAL AND AUTOMATIC OPERATION. BREAKERS SHALL BE OVER-THE-CENTER TOGGLE OPERATING TYPE, WITH THE HANDLE GOING TO A POSITION BETWEEN ON AND OFF TO INDICATE AUTOMATIC TRIPPING. ALL MULTI-POLE BREAKERS SHALL HAVE INTERNAL COMMON TRIP. BREAKERS SHALL HAVE A MINIMUM OF 10,000 RMS SYMMETRICAL AMPERES INTERRUPTING CAPACITY UNLESS DESIGNATED OTHERWISE. THE BREAKERS FURNISHED SHALL BE DETERMINED BY THE SPECIFICATIONS AND BY THE MINIMUM U.L. LABELED RMS SYMMETRICAL AMPERES INTERRUPTING CAPACITY AT CIRCUIT VOLTAGE. ALL CIRCUIT BREAKERS SHALL BE BOLTED ON AND RIGIDLY BRACED.

M. PANELS HAVING SUB-FEED LUGS FOR FEEDING THROUGH SHALL HAVE 8" MINIMUM EXTRA GUTTER SPACE AT THE LUG END AND ON ONE SIDE.

N. EACH PANEL AS A COMPLETE UNIT SHALL HAVE A SHORT-CIRCUIT CURRENT RATING EQUAL TO OR GREATER THAN THE EQUIPMENT RATING INDICATED.

2.3 DISTRIBUTION PANELBOARDS

A. DISTRIBUTION PANELBOARDS (PANELS) SHALL BE OF THE CIRCUIT BREAKER TYPE, FACTORY ASSEMBLED BY THE MANUFACTURER OF THE CIRCUIT BREAKERS, COMPLETE WITH FRONT DOOR COVER. THE MAIN BREAKER AND THE BRANCH CIRCUIT BREAKERS SHALL BE AS INDICATED. THE MAIN BUS SHALL BE 98% CONDUCTIVITY SILVER PLATED COPPER, RATED AS AND OF CAPACITY EQUAL TO OR GREATER THAN THE RATING OR SETTING OF THE OVER-CURRENT PROTECTIVE DEVICE NEXT BACK IN THE LINE. PANEL SHALL BE SUITABLE FOR THE VOLTAGE AND PHASE INDICATED. PROVIDE 25% GROUND BUS.

B. PANELS SHALL BE FLUSH OR SURFACE MOUNTED AS INDICATED, WITH BAKED-ON ENAMEL TRIM, ADJUSTABLE TRIM CLAMPS AND DOOR WITH CHROMIUM PLATED COMBINATION CYLINDER LOCK AND CATCH, ALL LOCKS KEYED ALIKE. PROVIDE A SPECIFIED NAMEPLATE FOR EACH DEVICE AND A BLANK (NOT ENGRAVED) NAMEPLATE FOR EACH SPARE BREAKER OR SPACE.

C. THE NEUTRAL BUS SHALL UTILIZE SETSCREWS TO BOND THE NEUTRAL BUS THROUGH HOLES DRILLED IN THE NEUTRAL BAR. A SHEET COPPER NEUTRAL BUS UTILIZING FLATHEAD SCREWS TO HOLD THE NEUTRAL WIRES WILL NOT BE ACCEPTABLE.

D. ALL CIRCUIT BREAKERS SHALL BE MANUALLY OPERATED, THERMAL-MAGNETIC, AUTOMATIC, OF THE AMPACITY AND POLES AS INDICATED. THEY SHALL BE QUICK-MAKE, QUICK-BREAK BOTH ON MANUAL AND ON AUTOMATIC OPERATION. BREAKERS SHALL BE OVER-THE-CENTER TOGGLE OPERATING TYPE, WITH THE HANDLE GOING TO A POSITION BETWEEN "ON" AND "OFF" TO INDICATE AUTOMATIC TRIPPING. ALL MULTI-POLE BREAKERS SHALL HAVE INTERNAL COMMON TRIP.

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E. THE INTERRUPTING CAPACITY OF THE BREAKERS FURNISHED SHALL BE 10,000 RMS SYMMETRICAL UNLESS INDICATED OTHERWISE.

F. ALL MAIN CIRCUIT BREAKERS SHALL BE MOLDED CASE AND VERTICALLY MOUNTED. ALL VERTICALLY MOUNTED MOLDED CASE CIRCUIT BREAKERS SHALL BE MOUNTED SO THAT THE HANDLE IS UP FOR "ON" AND DOWN FOR "OFF", WHEN VIEWED FROM THE NORMAL STANDING POSITION. ALL VERTICALLY MOUNTED MOLDED CASE MAIN CIRCUIT BREAKERS SHALL BE UL APPROVED FOR FEEDING IN THE BOTTOM AND OUT THE TOP.

G. ALL CIRCUIT BREAKERS, INCLUDING ANY CONNECTORS TO THE MAIN BUS, SHALL BE BOLTED AND RIGIDLY BRACED.

H. SPACES FOR FUTURE INSTALLATION OF MOLDED CASE CIRCUIT BREAKERS ARE SPECIFICALLY BY RANGE OF TRIP RATHER THAN A SINGLE TRIP SIZE OR FRAME SIZE. THE SPACES SO SCHEDULED SHALL BE COMPLETE WITH ALL BUS AND REQUIRED BUS CONNECTORS SUCH THAT FUTURE BREAKERS CAN BE INSTALLED WITHOUT ADDING OR CHANGING BUS CONNECTORS ON THE MAIN BUS AND WITHOUT USING A LARGER (FRAME SIZE) OR MORE EXPENSIVE BREAKER THAN THE TRIP SIZE AND INTERRUPTING CAPACITY WOULD REQUIRE. IF THE BUS CONNECTORS FURNISHED ON THE MAIN BUS WILL NOT COVER THE TRIP RANGE SPECIFIED, THEN DUPLICATE SETS OF CONNECTORS SHALL BE FURNISHED ON THE MAIN BUS FOR EACH FRAME SIZE REQUIRED.

3.1 INSTALLATION

A. PROVIDE A TYPEWRITTEN DIRECTORY UNDER PLASTIC FOR ALL PANELBOARDS WITH SPARES MARKED IN PENCIL.

B. PROVIDE ALL NECESSARY HARDWARE TO LEVEL AND SECURE THE PANELBOARDS AS REQUIRED BY THE MANUFACTURER'S INSTRUCTIONS. MAKE ALL ELECTRICAL CONNECTIONS FOR SUPPLY AND LOAD CIRCUITS AND LEAVE IN OPERATING CONDITION.

C. CLEAN ENCLOSURE OF ALL PANELBOARDS OF ALL FOREIGN MATTER, INCLUDING DUST.

D. REMOVE ALL RUST MARKS AND REPAINT TO LEAVE PANELBOARDS IN NEW CONDITION.

E. ALL FLOOR MOUNTED DISTRIBUTION EQUIPMENT SHALL BE MOUNTED ON A 4" HIGH CONCRETE PAD.

END OF SECTION 262416

SECTION 262419 – MOTOR CONTROLS AND WIRING

1.1 SCOPE

A. ALL WORK SPECIFIED IN THIS SECTION SHALL COMPLY WITH THE PROVISIONS OF SECTION 260500.

B. ALL MOTORS SHALL BE PROVIDED UNDER DIVISION 23.

C. A MOTOR STARTER SHALL BE PROVIDED UNDER THIS SECTION FOR EACH MOTOR EXCEPT FOR THOSE SPECIFIED IN DIVISION 23 TO BE FURNISHED WITH INTEGRAL STARTERS. MOTOR STARTERS SHALL BE INSTALLED SEPARATELY MOUNTED ADJACENT TO THE MOTOR SERVED.

D. MOTOR POWER WIRING IS DEFINED AS THOSE CONDUCTORS BETWEEN THE ENERGY SOURCE AND THE MOTOR. THIS POWER WIRING SHALL BE TERMINATED AT THE MOTOR TERMINALS.

E. ALL CONTROL WIRING REQUIRED FOR AUTOMATIC STARTING AND STOPPING OF MOTORS SHALL BE PROVIDED UNDER DIVISION 23 UNLESS SPECIFICALLY SHOWN ON THE ELECTRICAL DRAWINGS.

F. POWER WIRING SHALL BE CONNECTED THROUGH ALL LINE VOLTAGE CONTROL DEVICES SUCH AS FIRESTATS AND THERMOSTATS.

2.1 MOTOR STARTERS

A. STARTERS FOR MOTORS 1/3 HORSEPOWER OR SMALLER SHALL BE MANUAL UNLESS REMOTE OR AUTOMATIC STARTING IS REQUIRED, IN WHICH CASE THE STARTERS SHALL BE MAGNETIC, FULL VOLTAGE, NON-REVERSING, SINGLE-SPEED, UNLESS OTHERWISE INDICATED. ALL OTHER STARTERS SHALL BE MAGNETIC.

B. EACH STARTER FOR A THREE-PHASE MOTOR SHALL BE FURNISHED WITH THREE (3) OVERLOAD RELAYS SIZED FOR THE FULL LOAD RUNNING CURRENT OF THE MOTOR ACTUALLY PROVIDED. PROVIDE AN EXTERNAL "HAND-OFF-AUTO" SELECTOR SWITCH WITH GREEN "RUNNING" LIGHT. PROVIDE A RED PILOT LIGHT TO INDICATE MOTOR "STOPPED". EACH PILOT LIGHT SHALL HAVE A LEGEND PLATE INDICATING REASON FOR SIGNAL.

C. EACH OVERLOAD RELAY SHALL HAVE A NORMALLY OPEN ALARM CONTACT WHICH WILL CLOSE ONLY WHEN ACTUATED BY AN OVERLOAD (NOT TO BE CONFUSED WITH N.O. OR N.C. AUXILIARY CONTACTS). THESE CONTACTS SHALL BE PROPERLY WIRED TO THEIR RESPECTIVE BLUE PILOT LIGHT PROVIDED ON THE STARTER FRONT COVER AND HAVING A "TRIPPED" LEGEND PLATE.

D. INDIVIDUALLY MOUNTED MOTOR STARTERS SHALL BE IN A NEMA TYPE 1 GENERAL PURPOSE ENCLOSURE IN UNFINISHED AREAS AND SHALL BE FLUSH MOUNTED IN ALL FINISHED AREAS. ALL STARTERS MOUNTED IN EXTERIOR AREAS SHALL HAVE A NEMA 3R ENCLOSURE. EACH STARTER SHALL HAVE A LAMINATED NAMEPLATE TO INDICATE DIVISION 23 UNIT NUMBER, FUNCTION AND CIRCUIT NUMBER.

E. A CONTROL POWER TRANSFORMER SHALL BE PROVIDED AT EACH MOTOR STARTER FOR CONNECTION TO THE CONTROLS PROVIDED UNDER DIVISION 23. THE CONTROL POWER TRANSFORMER SHALL BE MOUNTED INSIDE THE MOTOR STARTER ENCLOSURE. ALL CONTROL TRANSFORMERS AT 50 VA OR GREATER SHALL HAVE PRIMARY FUSING. COORDINATE ALL CONTROL EQUIPMENTS WITH DIVISION 23 AND EQUIPMENT MANUFACTURERS.

F. ALL MOTOR STARTERS, PUSH BUTTONS AND PILOT LIGHTS SHALL BE OF THE SAME MANUFACTURER AS THE SWITCHBOARD AND SHALL BE GENERAL ELECTRIC, SQUARE D, SIEMENS, JOSLYN CLARK CONTROLS OR CUTLER-HAMMER.

2.2 COMBINATION STARTERS

A. COMBINATION STARTERS SHALL CONSIST OF A CIRCUIT BREAKER AND A MOTOR STARTER MOUNTED IN A COMMON NEMA TYPE 1 GENERAL PURPOSE ENCLOSURE.

B. THE MOTOR STARTER COMPONENTS SHALL BE AS SPECIFIED IN PARAGRAPH 2.1 FOR MOTOR STARTERS.

C. THE CIRCUIT BREAKER COMPONENT SHALL BE A MINIMUM 22,000 RMS INTERRUPTING CAPACITY AND SHALL BE AS REQUIRED IN SECTION 262413.

3.1 INSTALLATION

A. PROVIDE POWER WIRING TO AND INSTALL ALL MOTOR STARTERS, UNLESS INTEGRALLY FACTORY MOUNTED ON A PIECE OF EQUIPMENT.

B. PROVIDE POWER WIRING TO ALL MOTORS EXCEPT PACKAGED UNITS THAT ARE PREWIRED BETWEEN THE STARTER AND MOTOR.

C. WHERE LINE VOLTAGE CONTROL DEVICES ARE MOUNTED AT, ON OR INSIDE A UNIT, SUCH AS AQUASTATS, FIRESTAT FOR SINGLE PHASE DEVICES, ETC., THE POWER WIRING TO THE UNIT SHALL BE CONNECTED THROUGH SUCH A CONTROL DEVICE.

D. ON FINAL INSPECTION, IT SHALL BE DEMONSTRATED TO THE ARCHITECT OR HIS REPRESENTATIVE, THAT EACH OVERLOAD RELAY CONTROL CIRCUIT IS PROPERLY WIRED AND FUNCTIONING CORRECTLY BY MANUALLY TRIPPING EACH OVERLOAD RELAY INDIVIDUALLY, ONE AT A TIME. THIS INSPECTION PROCEDURE SHALL NOT INVOLVE REMOVING ANY WIRING OR DISCONNECTING ANY CURRENT CARRYING PARTS.

END OF SECTION 262419

SECTION 262726 – WIRING DEVICES

1.1 DESCRIPTION

A. ALL WORK SPECIFIED IN THIS SECTION SHALL COMPLY WITH THE PROVISIONS OF SECTION 260500.

B. THIS SECTION DESCRIBES THE BASIC ELECTRICAL MATERIALS AND INSTALLATION METHODS THAT ARE ACCEPTABLE AND APPLICABLE TO DIVISION 26.

2.1 WALL SWITCHES

A. WALL SWITCHES SHALL BE PLASTIC, TOTALLY ENCLOSED, QUIET TYPE, SELF-GROUNDING, 277 VOLT, 20 AMP RATING AND SHALL MATCH EXISTING IF POSSIBLE AND EQUAL THE FOLLOWING:

1. SINGLE POLE: HUBBELL NO. CS1221, OR EQUAL BY LEVITON, P&S, OR COOPER.
2. DOUBLE POLE:HUBBELL NO. CS1222, OR EQUAL BY LEVITON, P&S, OR COOPER.
3. THREE-WAY: HUBBELL NO. CS1223, OR EQUAL BY LEVITON, P&S, OR COOPER.
4. FOUR-WAY: HUBBELL NO. CS1224, OR EQUAL BY LEVITON, P&S, OR COOPER.

B. COLOR SHALL BE AS SELECTED BY ARCHITECT.

C. FLUSH MOTOR SWITCHES WITH RED PILOT LIGHT AND WITH OVERLOAD PROTECTION FOR FRACTIONAL HORSEPOWER MOTORS SHALL BE HUBBELL NO. HBL1221PL OR APPROVED EQUAL BY P&S, OR LEVITON.

D. KEY SWITCHES SHALL BE HUBBELL NO. HBL1221L 20A SERIES OR APPROVED EQUAL BY P&S, OR LEVITON.

2.2 WALL MOUNTED OCCUPANCY SWITCHES

A. THE PASSIVE INFRARED SENSOR SHALL BE A COMPLETELY SELF-CONTAINED CONTROL SYSTEM THAT REPLACES A STANDARD TOGGLE SWITCH. SENSOR SHALL HAVE GROUND WIRE FOR SAFETY. SWITCHING MECHANISM SHALL BE A LATCHING AIR GAP RELAY, COMPATIBLE WITH ELECTRONIC BALLASTS, COMPACT FLUORESCENT AND INDUCTIVE LOADS. TRIAC AND OTHER HARMONIC GENERATING DEVICES SHALL NOT BE ALLOWED.

B. SENSOR SHALL COVER UP TO 1000 SQ. FT. FOR WALKING MOTION, WITH A FIELD OF VIEW OF 180 DEGREES.

C. SENSOR SHALL HAVE SYSTEM WHICH PROVIDES SUPERIOR 180 DEGREE COVERAGE.

D. SENSOR SHALL OPERATE AT 120 VAC OR 277 VAC.

E. SENSOR SHALL HAVE NO MINIMUM LOAD REQUIREMENT AND SHALL BE CAPABLE OF SWITCHING FROM 0 TO 500 WATT INCANDESCENT; 0 TO 800 WATTS FLUORESCENT OR 1/6 HP @ 120 VAC, 60 HZ; AND 0 TO 1200 WATTS FLUORESCENT OR 1/3 HP @ 277 VAC, 60 HZ.

F. FOR ACCURACY AND CONSISTENCY, SENSOR SHALL HAVE A DIP SWITCH CONTROLLED, DIGITAL TIME DELAY ADJUSTABLE FROM 15 SECONDS TO 30 MINUTES.

G. SENSOR SHALL HAVE STANDARD 5 YEAR WARRANTY AND SHALL BE UL AND CUL LISTED.

H. SENSOR SHALL BE WATTSTOPPER WI SERIES, LEVITON DECORA SERIES, OR APPROVED EQUAL BY ENGINEER.

2.3 RECEPTACLES

A. DUPLEX RECEPTACLES SHALL BE PLASTIC, TWO-POLE, THREE WIRE, SELF-GROUNDING, SIDE WIRED, 125 VOLT, 15 AMP RATING AND SHALL MATCH EXISTING IF POSSIBLE AND BE EQUAL TO THE FOLLOWING:

1. DUPLEX RECEPTACLES SHALL BE HUBBELL NO. 5262A SERIES, OR EQUAL BY LEVITON, P&S, OR COOPER.
2. TAMPER RESISTANT TYPE SHALL BE HUBBELL NO. CR15*TR SERIES, OR EQUAL BY LEVITON, P&S, OR COOPER.
3. ISOLATED GROUND TYPE SHALL BE HUBBELL NO. CR5252IG SERIES, OR EQUAL BY LEVITON, P&S, OR COOPER.
4. HOSPITAL GRADE (HG) TYPE SHALL BE HUBBELL NO. HBL8200 SERIES, OR EQUAL BY LEVITON, P&S, OR COOPER.

B. SINGLE RECEPTACLES SHALL BE TWO-POLE, THREE WIRE, SELF-GROUNDING, SIDE WIRED, 125 VOLTS AND 20A RATING AND SHALL BE EQUAL TO THE FOLLOWING:

1. SINGLE RECEPTACLES SHALL BE HUBBELL NO. HBL5361 SERIES, OR EQUAL BY LEVITON, P&S, OR COOPER.
2. ISOLATED GROUND TYPE TO BE HUBBELL NO. IG-5361 SERIES, OR EQUAL BY LEVITON, P&S, OR COOPER.

C. GROUND FAULT CIRCUIT INTERRUPT (GFI) RECEPTACLES SHALL BE WEATHER RESISTANT TYPE (WR) HUBBELL GFWRST20, OR EQUAL BY P&S, LEVITON, OR COOPER. PROVIDE WITH "WHILE-IN-USE" WEATHERPROOF EXTRA DUTY COVER.

D. COLOR SHALL BE AS SELECTED BY THE ARCHITECT.

2.4 COVERPLATES

A. COVERPLATES FOR FLUSH MOUNTED DEVICES SHALL BE STANDARD SIZE (COLOR OR FINISH TO BE SELECTED BY ARCHITECT), HUBBELL "P" SERIES OR EQUAL BY LEVITON, P&S, OR COOPER.

B. TELEPHONE OUTLET COVERPLATES SHALL HAVE SAME FINISH AS ABOVE AND HAVE A BRUSHED HOLE IN THE CENTER.

C. COVERPLATES FOR EXTERIOR DEVICES SHALL BE DIE CAST ALUMINUM WEATHERPROOF "WHILE-IN-USE", HUBBELL WP26M OR EQUAL BY LEVITON, P&S, OR COOPER.

3.1 WALL SWITCHES AND RECEPTACLES

A. WHERE MORE THAN ONE DEVICE IS INDICATED AT A LOCATION, THE DEVICES SHALL BE GANG-MOUNTED IN COMBINED MULTI-GANG BOXES AND COVERED JOINTLY BY A COMMON COVERPLATE. PROVIDE BARRIERS AS REQUIRED BY THE DEVICES AND VOLTAGES BEING USED.

3.2 COVERPLATES

A. ALL JUNCTION BOXES, OUTLET BOXES, MULTI-GANG SWITCH BOXES, UTILITY BOXES, ETC., SHALL BE COVERED WITH A COVERPLATE. THE COVERPLATE SHALL BE A FINISHED PLATE AS SPECIFIED UNLESS DESIGNATED OTHERWISE.

B. COVERPLATES SHALL BE MOUNTED VERTICALLY UNLESS DESIGNATED OTHERWISE.

END OF SECTION 262726

SECTION 262813 – FUSES

1.1 DESCRIPTION

A. ALL WORK SPECIFIED IN THIS SECTION SHALL COMPLY WITH THE PROVISIONS OF SECTION 260500.

B. THIS SECTION DESCRIBES THE BASIC ELECTRICAL MATERIALS AND INSTALLATION METHODS THAT ARE ACCEPTABLE AND APPLICABLE TO DIVISION 26.

2.1 MANUFACTURERS

A. ACCEPTABLE MANUFACTURERS ARE COOPER BUSSMANN, LITTELFUSE, OR FERRAZ SHAWMUT.

2.2 FUSES

A. PROVIDE ALL FUSES FOR THE PROJECT. ALL FUSES SHALL BE OF THE SAME MANUFACTURER. ALL FUSES SHALL BE OF THE HIGH INTERRUPTING RATING (200,000 AMPS), CURRENT LIMITING TYPE AND MANUFACTURED BY COOPER BUSSMANN. FUSES SHALL BE PROVIDED FOR EACH FUSE CUTOUT AND THE SPECIFIED QUANTITY OF FUSES SHALL BE FURNISHED FOR SPARES.

B. CIRCUITS 0 TO 600 AMPERE SHALL BE PROTECTED BY REJECTION TYPE, CURRENT LIMITING BUSSMANN LOWPEAK DUAL ELEMENT FUSES LPN-RK (250 VOLTS) OR LPS-RK (600 VOLTS). ALL DUAL-ELEMENT FUSES SHALL HAVE SEPARATE OVERLOAD AND SHORT-CIRCUIT CLEARING CHAMBER. THE FUSE MUST HOLD 500% OF RATED CURRENT FOR A MINIMUM OF 10 SECONDS AND BE LISTED BY UNDERWRITER'S LABORATORIES, INC., WITH AN INTERRUPTING RATING OF 200,000 AMPERES RMS SYMMETRICAL. THE FUSES SHALL BE UL CLASS RK-1.

C. CIRCUITS 601 TO 6000 AMPERE SHALL BE PROTECTED BY CURRENT LIMITING BUSSMANN HI-CAP TIME-DELAY FUSES KRP-C. FUSES SHALL EMPLOY "O" RINGS AS POSITIVE SEALS BETWEEN THE END BELLS AND THE GLASS MELAMINE FUSE BARREL. THE TERMINALS SHALL BE OPENED. FUSES SHALL BE TIME-DELAY AND MUST HOLD 500% OF RATED CURRENT FOR A MINIMUM OF 4 SECONDS, CLEAR 20 TIMES RATED CURRENT IN 0.1 SECONDS OR LESS AND BE LISTED BY UNDERWRITER'S LABORATORIES, INC., WITH AN INTERRUPTING RATING OF 200,000 AMPERES RMS SYMMETRICAL. THE FUSES SHALL BE UL CLASS L.

3.1 INSTALLATION

A. FURNISH AND TURN OVER TO THE OWNER A MINIMUM OF ONE (1) SET OF SPARE FUSES (SET CONSISTING OF THREE FUSES) FOR EACH TYPE AND RATING OF FUSE USED. WHEN THE NUMBER OF FUSE SETS OF THE SAME TYPE AND RATING ACTUALLY INSTALLED EXCEEDS FIVE (5) SETS, FURNISH AN ADDITIONAL SPARE SET OF FUSES FOR EACH FIVE (5) OR FRACTION THEREOF.

B. PROVIDE A CABINET IN WHICH TO STORE ALL SPARE FUSES, COOPER BUSSMANN CATALOG NO. SFC-FUSE-CAB.

END OF SECTION 262813

SECTION 262818 – ENCLOSED SWITCHES

1.1 DESCRIPTION

A. ALL WORK SPECIFIED IN THIS SECTION SHALL COMPLY WITH THE PROVISIONS OF SECTION 260500.

B. THIS SECTION DESCRIBES THE BASIC ELECTRICAL MATERIALS AND INSTALLATION METHODS THAT ARE ACCEPTABLE AND APPLICABLE TO DIVISION 26.

1.2 RELATED SECTIONS

A. SECTION 262813 – FUSES

2.1 MANUFACTURERS

A. ENCLOSED SWITCHES SHALL BE AS MANUFACTURED BY GENERAL ELECTRIC, SQUARE D, SIEMENS, OR CUTLER-HAMMER.

B. ALL DISTRIBUTION SWITCHGEAR (BRANCH CIRCUIT PANELBOARDS, SWITCHBOARD, DISTRIBUTION PANELBOARDS, TRANSFORMERS, BUSWAY, SWITCHES, ETC.) SHALL BE THE UNIT RESPONSIBILITY OF ONE MANUFACTURER. ALL COMPONENT PARTS OF THE ABOVE LISTED ITEMS SHALL BE OF THE SAME MANUFACTURER EXCEPT WHERE A WRITTEN REQUEST FOR DEVIATION FROM THIS REQUIREMENT HAS BEEN APPROVED PRIOR TO BID DATE.

2.2 DISCONNECT SWITCHES

A. DISCONNECT SWITCHES SHALL BE "HEAVY-DUTY" TYPE, ENCLOSED SWITCHES OF QUICK-MAKE, QUICK-BREAK CONSTRUCTION. SWITCHES SHALL BE HORSEPOWER RATED FOR 600 VOLTS AC AS REQUIRED. LUGS SHALL BE UL LISTED FOR COPPER AND ALUMINUM.

B. SWITCHES SHALL BE FURNISHED IN NEMA I GENERAL PURPOSE ENCLOSURE UNLESS NOTED OTHERWISE. SWITCHES LOCATED ON THE EXTERIOR OF THE BUILDING OR IN "WET" LOCATIONS SHALL HAVE NEMA 3R ENCLOSURES.

C. FUSED DISCONNECT SWITCHES SHALL HAVE REJECTION TYPE FUSE CLIPS WITH DUAL ELEMENT, CURRENT LIMITING FUSES OF RATING SHOWN.

3.1 INSTALLATION

A. DISCONNECT SWITCHES SHALL BE MOUNTED TO STRUCTURE. DISCONNECT SWITCHES SHALL NOT BE MOUNTED TO MECHANICAL EQUIPMENT OR DUCTWORK.

B. PADLOCKING PROVISIONS SHALL BE PROVIDED FOR PADLOCKING IN THE OFF POSITION.

END OF SECTION 262818

SECTION 26 32 13 – ENGINE GENERATOR

1.1 DESCRIPTION

A. ALL WORK SPECIFIED IN THIS SECTION SHALL COMPLY WITH THE PROVISIONS OF SECTION 26 05 00.

B. PROVIDE ALL LABOR AND MATERIAL NECESSARY TO INSTALL A STANDBY NATURAL GAS ENGINE GENERATOR SET IN A COMPLETE AND OPERATING CONDITION.

C. THE ENGINE GENERATOR SET SHALL BE SUITABLE FOR OUTDOOR USE AND COMPLETE WITH SOUND ATTENUATED ENCLOSURE AND COMPONENTS.

1.2 SUBMITTALS

A. FURNISH INFORMATION SHOWING MANUFACTURERS' MODEL NUMBERS, DIMENSIONS AND WEIGHTS FOR THE ENGINE, GENERATOR AND MAJOR AUXILIARY EQUIPMENT.

B. SUBMIT COPIES OF PERTINENT DRAWINGS AND SCHEMATIC DIAGRAMS FOR APPROVAL AND INCLUDE THE FOLLOWING:
1. ENGINE GENERATOR SET INCLUDING PLANS AND ELEVATIONS CLEARLY INDICATING ENTRANCE POINTS FOR EACH OF THE INTERCONNECTIONS REQUIRED.
2. ENGINE GENERATOR/EXCITER CONTROL CUBICLE.
3. FUEL CONSUMPTION RATE AT VARIOUS LOADS, VENTILATION AND COMBUSTION CFM REQUIREMENTS.
4. CRITICAL GRADE EXHAUST MUFFLERS AND VIBRATION ISOLATORS.
5. BATTERY CHARGER, BATTERY AND BATTERY RACKS.
6. AUTOMATIC LOAD TRANSFER CONTROL SWITCH.
7. ACTUAL ELECTRICAL DIAGRAMS INCLUDING SCHEMATIC DIAGRAMS AND INTER-CONNECTION WIRING DIAGRAMS FOR ALL EQUIPMENT TO BE PROVIDED.
8. LEGENDS FOR ALL DEVICES ON ALL DIAGRAMS.
9. SOUND ATTENUATED HOUSING.

C. THE SPECIFIED STANDBY KW SHALL BE FOR CONTINUOUS ELECTRICAL SERVICE DURING INTERRUPTION OF THE NORMAL UTILITY SOURCE AND SHALL BE CERTIFIED BY THE MANUFACTURER FOR THE ACTUAL UNIT SUPPLIED.

1.3 QUALITY ASSURANCE

A. SET SHALL BE UL 2200 TESTED AND LABELED.

B. UNIT SHALL BE MINIMUM TIER 2 AS REQUIRED TO MEET EPA/CARB LOW EMISSIONS ENGINE REQUIREMENTS.

C. UL 142 FUEL TANKS ABOVE GROUND (DIESEL GENSETS).

D. UL 2085 FIRE RATED WHERE REQUIRED BY LOCAL AUTHORITIES AND CODES.

E. EMERGENCY POWER SYSTEM SHALL BE A MINIMUM TYPE 10, CLASS 1.5, LEVEL 1 PER NFPA 110.

1.4 RELATED SECTIONS

A. SECTION 26 36 00 – TRANSFER SWITCHES

PART 2 – PRODUCTS

2.1 MANUFACTURER

A. THE EQUIPMENT SHALL BE AS MANUFACTURED BY CUMMINS, GENERAC, CATERPILLAR, OR KOHLER OF THE SIZE AND RATINGS INDICATED.

B. EQUIPMENT SHALL INCLUDE A LEVEL 2 SOUND ATTENUATED HOUSING FOR OUTDOOR USE.

2.2 ENGINE

A. THE ENGINE SHALL BE A MAXIMUM OF TWELVE CYLINDERS LIQUID COOLED, FOUR-STROKE CYCLE SPARK IGNITED. THE ENGINE SHALL BE EQUIPPED WITH LUBE OIL AND INTAKE AIR FILTERS, LUBE OIL COOLER, ENGINE DRIVEN WATER PUMP AND UNIT MOUNTED INSTRUMENTS, WATER TEMPERATURE GAUGE, LUBRICATION OIL PRESSURE GAUGE AND BATTERY CHARGING AMMETER. THE GAS TRAIN SHALL BE AGA CERTIFIED.

B. A GEAR DRIVEN HYDRAULIC GOVERNOR SHALL MAINTAIN FREQUENCY REGULATION NOT TO EXCEED 3% TO 5% FROM NO LOAD TO FULL RATED LOAD. GENERATOR SETS ABOVE 150 KW SHALL HAVE AN ELECTRONIC ISOCHRONOUS TYPE GOVERNOR.

C. THE UNIT SHALL BE MOUNTED ON A STRUCTURAL STEEL SUB-BASE AND SHALL BE PROVIDED WITH SUITABLE ISOLATORS.

D. SAFETY SHUT-OFF FOR HIGH WATER TEMPERATURE, LOW OIL PRESSURE OVERSPEED AND ENGINE OVERCRANK, WITH ALARM FOR LOW WATER TEMPERATURE SHALL BE PROVIDED. ALARMS PER NFPA-110 LEVEL 1.

E. GUARDS SHALL BE PROVIDED OVER ALL EXPOSED MOVING PARTS AS REQUIRED BY OSHA.

2.3 GENERATOR

A. THE GENERATOR SHALL BE RATED FOR CONTINUOUS STANDBY SERVICE AT RATINGS INDICATED WITH 0.8 POWER FACTOR, 120/208 VOLTS, THREE-PHASE, FOUR-WIRE, 60 HERTZ, 1800 RPM. ENGINE BMEP SHALL NOT EXCEED 140 PSI.

B. THE GENERATOR SHALL BE A THREE PHASE, 60 HERTZ, SINGLE BEARING, ROTATING FIELD, SYNCHRONOUS TYPE BUILT TO NEMA STANDARDS. A VOLTAGE REGULATOR SHALL BE PROVIDED TO MATCH THE CHARACTERISTICS OF THE GENERATOR AND ENGINE. VOLTAGE REGULATION SHALL BE +/- 2% FROM NO LOAD TO FULL RATED LOAD. READILY ACCESSIBLE VOLTAGE DROOP, VOLTAGE LEVEL AND VOLTAGE GAIN CONTROLS SHALL BE PROVIDED. VOLTAGE LEVEL ADJUSTMENT SHALL BE A MINIMUM OF +/- 5%. GENERATOR AND EXCITER SHALL BE INHERENTLY CAPABLE OF PARALLEL OPERATION WITH OTHER POWER SOURCES OF EQUIVALENT ELECTRICAL CHARACTERISTICS, AND STATOR SHALL INCLUDE A TWELVE LEAD, RECONNECTABLE BUS SYSTEM FOR EACH LOAD RECONNECTION. GENERATOR SHALL BE BRUSHLESS PERMANENT MAGNET, AND SHALL SUSTAIN SHORT CIRCUIT CURRENT AT 300% OF RATED CURRENT UP TO 10 SECONDS.

2.4 COOLING SYSTEM

A. A RADIATOR WITH BLOWER TYPE FAN SHALL BE PROVIDED TO MAINTAIN SAFE OPERATION AT 110 DEGREES F. AMBIENT TEMPERATURE. AIR FLOW RESTRICTION FROM THE RADIATOR SHALL NOT EXCEED 0.5" H20. PROVIDE DUCTWORK WITH FLEXIBLE CONNECTING SECTION BETWEEN RADIATOR AND DISCHARGE LOUVER FRAME. PROVIDE AN ENGINE COOLANT HEATER WITH THERMOSTAT TO MAINTAIN COOLANT TEMPERATURE AT NOT LOWER THAN 60 DEGREES F. HEATER SHALL OPERATE ON 120 VAC. HEATER SHALL HAVE AN OIL PRESSURE DISCONNECT TO TURN HEATER OFF WHEN ENGINE IS OPERATING.

B. THE ENGINE COOLING SYSTEM SHALL BE PRETREATED BY THE SYSTEM SUPPLIER FOR THE INHIBITION OF INTERNAL CORROSION AND FREEZING. OBTAIN NECESSARY CONNECTION TO HEATER FROM BASE BUILDING PANEL IN CORE (HM OR L AS NECESSITATED BY VOLTAGE REQUIRED).

2.5 FUEL SYSTEM

A. NATURAL GAS PIPING TO GENERATORS WILL BE UNDER THE PLUMBING SUBCONTRACT.

2.6 OUTDOOR HOUSING AND EXHAUST MUFFLER

A. HOUSING SHALL CONSIST OF AN ENCLOSURE TO COMPLETELY ENCLOSE THE ENGINE GENERATOR AND ACCESSORIES. HOUSING SHALL PROTECT THE ENGINE GENERATOR FROM THE ENVIRONMENT, YET BE CONDUCIVE TO EASY MAINTENANCE. HOUSING SHALL HAVE REMOVABLE SWING DOORS ON EACH SIDE AND LOCKABLE REAR DOOR FOR ACCESS TO METERS AND CONTROLS. SIDE DOORS SHALL HAVE A MEANS TO LOCK. CONSTRUCTION OF HOUSING SHALL BE OF A MINIMUM 14 GAUGE SHEET STEEL AND PAINTED MANUFACTURER'S STANDARD COLOR.

B. EXHAUST MUFFLER SHALL BE MOUNTED ON TOP OF HOUSING. THE EXHAUST MUFFLER SHALL BE A CRITICAL GRADE MUFFLER. MUFFLER SHALL BE FACTORY INSTALLED SO THAT ITS WEIGHT IS NOT SUPPORTED BY THE ENGINE. A FLEXIBLE EXHAUST FITTING SHALL BE SUPPLIED AND INSTALLED BETWEEN THE MUFFLER AND EXHAUST MANIFOLD. ALL ACCESSORIES SHALL BE FACTORY INSTALLED. THIS INCLUDES FLANGES, MUFFLER, TAIL PIPE AND RAINCAP.

2.7 AUTOMATIC STARTING SYSTEM

A. A DC ELECTRIC STARTING SYSTEM WITH POSITIVE ENGAGEMENT SHALL BE PROVIDED. THE MOTOR VOLTAGE SHALL BE AS RECOMMENDED BY THE ENGINE MANUFACTURER.

B. FULLY AUTOMATIC GENERATOR SET START-STOP CONTROLS IN THE GENERATOR CONTROL PANEL SHALL BE PROVIDED. CONTROLS SHALL PROVIDE SHUTDOWN FOR LOW OIL PRESSURE, HIGH WATER TEMPERATURE, OVERSPEED AND OVERCRANK. CONTROLS SHALL INCLUDE A 45 SECOND SINGLE CRANKING CYCLE LIMIT WITH LOCKOUT.

C. A BELT DRIVEN BATTERY CHARGING ALTERNATOR SHALL BE PROVIDED WITH TRANSISTORIZED VOLTAGE REGULATOR. VOLTAGE SHALL MATCH THE ELECTRIC STARTING SYSTEM.

D. A LEAD-ACID STORAGE BATTERY SET OF THE HEAVY DUTY STARTING TYPE SHALL BE PROVIDED. BATTERY VOLTAGE SHALL BE COMPATIBLE WITH THE STARTING SYSTEM. THE BATTERY SET SHALL BE RATED AS REQUIRED BY GENERATOR MANUFACTURER IN AMP HOURS. NECESSARY CABLES AND CLAMPS SHALL BE PROVIDED.

E. BATTERY RACKS SHALL BE PROVIDED FOR EACH BATTERY AND SHALL CONFORM TO NEC 480-7,A,1. THEY SHALL BE CONSTRUCTED OF METAL AND SO TREATED AS TO BE RESISTANT TO DETERIORATING ACTION BY BATTERY ELECTROLYTE. FURTHER, CONSTRUCTION SHALL BE SUCH THAT NON-CONDUCTING INSULATION MATERIAL DIRECTLY SUPPORTS THE CELLS.

F. A CURRENT LIMITING BATTERY CHARGER SHALL BE PROVIDED TO AUTOMATICALLY RECHARGE BATTERIES. IT SHALL INCLUDE OVERLOAD PROTECTION, SILICON DIODE FULL WAVE RECTIFIERS, VOLTAGE SURGE SUPPRESSOR, DC AMMETER, DC VOLTMETER, EQUALIZE TIMER AND FUSED AC INPUT. AC INPUT VOLTAGE SHALL BE 120 VOLTS, SINGLE PHASE. AMPERAGE OUTPUT SHALL BE NO LESS THAN 10 AMPERES. ALARM SHALL BE PROVIDED FOR LOW-BATTERY VOLTAGE AND BATTERY CHARGER FAULT IN THE CHARGER. CONTROL CIRCUIT SHALL BE WIRED FROM CHARGER TO GENERATOR CONTROL PANEL BY ELECTRICAL CONTRACTOR FOR INDICATION ON CONTROL PANEL. OBTAIN POWER FOR BATTERY CHARGER FROM BASE BUILDING PANEL IN CORE (HM OR L AS NECESSITATED BY VOLTAGE REQUIRED).

2.8 GENERATOR CONTROL PANEL

A. A GENERATOR MOUNTED NEMA 1 TYPE VIBRATION ISOLATION CONTROL PANEL SHALL BE PROVIDED. PANEL SHALL CONTAIN, BUT SHALL NOT BE LIMITED TO, THE FOLLOWING EQUIPMENT:

1. FREQUENCY METER, 3 1/2", DIAL TYPE.
2. VOLTMETER, 3 1/2", 2% ACCURACY.
3. AMMETER, 3 1/2", 2% ACCURACY.
4. AMMETER/VOLTMETER PHASE SELECTOR SWITCH.
5. AUTOMATIC STARTING CONTROLS AS SPECIFIED.
6. VOLTAGE LEVEL ADJUSTMENT RHEOSTAT.
7. CONTACTS FOR REMOTE ALARMS WIRED TO TERMINAL STRIPS.
8. INDIVIDUAL FAULT INDICATOR LIGHTS FOR LOW OIL PRESSURE, HIGH WATER TEMPERATURE, OVERSPEED, OVERCRANK AND LOW WATER TEMPERATURE.
9. THREE POSITION FUNCTION SWITCH MARKED, RUN-STOP AND REMOTE.
10. RUNNING TIME METER, OIL PRESSURE, BATTERY CHARGING AMMETER AND WATER TEMPERATURE GAUGES.

2.9 MAIN LINE CIRCUIT BREAKERS

A. PROVIDE MAIN-LINE, MOLDED CASE CIRCUIT BREAKERS SIZED AS SHOWN AND MOUNTED UPON THE GENERATOR. THE OUTPUTS OF THE GENERATOR SHALL BE PROTECTED BY LOAD CIRCUIT INTERRUPTING AND PROTECTION DEVICES. THEY SHALL OPERATE BOTH MANUALLY FOR NORMAL SWITCHING FUNCTIONS AND AUTOMATICALLY DURING OVERLOAD AND SHORT-CIRCUIT CONDITIONS.

B. THE TRIP UNIT FOR EACH POLE SHALL HAVE ELEMENTS PROVIDING INVERSE TIME DELAY DURING OVERLOAD CONDITIONS AND INSTANTANEOUS MAGNETIC TRIPPING FOR SHORT CIRCUIT PROTECTION. THE CIRCUIT BREAKER SHALL MEET STANDARDS AS ESTABLISHED BY U.L., NEMA AND THE N.E.C.

2.10 SOUND ATTENUATED ENCLOSURE

A. ENCLOSURE AND ALL OTHER ITEMS TO BE DESIGNED AND BUILT BY MANUFACTURER AS AN INTEGRAL PART OF THE ENTIRE GENERATOR SET AND BE DESIGNED TO PERFORM WITHOUT OVERHEATING IN THE AMBIENT TEMPERATURE OF THE AREA INSTALLED. CONSTRUCTED OF 14- AND 18- GAUGE SHEET METAL, SUITABLY REINFORCED TO BE VIBRATION FREE IN THE OPERATING MODE. FOUR HINGED DOORS PROVIDE COMPLETE ACCESS WITHOUT THEIR REMOVAL. EACH DOOR TO HAVE AT LEAST TWO LATCH-BEARING POINTS. SIDE AND REAR PANELS TO BE COMPLETELY AND SIMPLY REMOVABLE TO MAJOR SERVICE ACCESS. ROOF TO BE PEAKED TO ALLOW DRAINAGE OF RAIN WATER. ENCLOSURE DOORS SHALL BE LOCKABLE FROM THE ENCLOSURE MANUFACTURER.

B. PROVIDE BAKED ENAMEL FINISH WITH PRIMER AND FINISH COAT TO BE PAINTED BEFORE ASSEMBLY. ALL FASTENERS TO BE RUST RESISTANT. UNIT SHALL HAVE SUFFICIENT GUARDS TO PREVENT ENTRANCE BY SMALL ANIMALS. BATTERIES TO FIT INSIDE ENCLOSURE AND ALONGSIDE THE ENGINE. BATTERIES UNDER THE GENERATOR ARE NOT ACCEPTABLE.

C. UNIT SHALL HAVE COOLANT AND OIL DRAINS OUTSIDE THE UNIT TO FACILITATE MAINTENANCE. EACH DRAIN LINE IS TO HAVE A HIGH QUALITY VALVE LOCATED NEAR THE FLUID SOURCE. FUEL FILTER MUST BE INSIDE THE BASE PERIMETER AND LOCATED SO SPILLED FUEL CANNOT FALL ON HOT PARTS OF ENGINE OR GENERATOR. A CLEANABLE PRIMARY FUEL STRAINER SHALL BE USED TO COLLECT WATER AND SEDIMENT BETWEEN TANK AND MAIN ENGINE FUEL FILTER. CRANKCASE FUMES DISPOSAL SHALL TERMINATE IN FRONT OF THE RADIATOR TO PREVENT OIL FROM COLLECTING ON THE RADIATOR CORE AND REDUCING COOLING CAPACITY.

PART 3 – EXECUTION

3.1 INSTALLATION

A. MOUNT GENERATOR ON 4 INCH THICK RE-ENFORCED 3000 PSI CONCRETE PAD. CONCRETE SHALL BE ONE (1) FOOT LARGER IN ALL DIRECTIONS THAN FOOTPRINT OF GENERATOR.

B. PROVIDE ANCHORING OF GENERATOR PER SECTION 260500, 3.5.

3.2 MANUFACTURING

A. THE UNIT SHALL BE SHIPPED TO THE JOB BY THE MANUFACTURER'S AUTHORIZED DEALER HAVING A PARTS AND SERVICE FACILITY WITHIN A 120 MILE RADIUS OF THE JOB. IN ADDITION, AND IN ORDER NOT TO PENALIZE THE OWNER FOR UNNECESSARY OR PROLONGED PERIODS OF TIME FOR SERVICE OR REPAIRS TO THE EMERGENCY SYSTEM, THE BIDDING GENERATOR SET SUPPLIER MUST HAVE REPLACEMENT PARTS IN STOCK AT ALL TIMES. CERTIFIED PROOF OF THIS REQUIREMENT SHALL BE AVAILABLE FROM THE DEALER AND A PERSONAL INSPECTION OF THE DEALER'S FACILITIES MAY BE MADE BY THE ARCHITECT OR HIS APPOINTED REPRESENTATIVE TO SUBSTANTIATE CLAIMS MADE BY THE GENERATOR SET SUPPLIER.

3.3 TESTING

A. PRIOR TO ACCEPTANCE OF THE INSTALLATION, EQUIPMENT SHALL BE TESTED TO SHOW IT IS FREE OF ANY DEFECTS AND WILL START AUTOMATICALLY AND BE SUBJECTED TO FULL LOAD TEST THROUGH THE USE OF PORTABLE, DRY-TYPE LOAD BANKS SUPPLIED FOR THIS PURPOSE AT THE JOB BY THE GENERATOR SET SUPPLIER.

B. THE LOAD BANK SHALL BE CAPABLE OF DEFINITE AND PRECISE INCREMENTAL LOADING AND SHALL NOT BE DEPENDENT ON THE GENERATOR CONTROL INSTRUMENTATION TO READ AMPERAGE AND VOLTAGE OF EACH PHASE. RATHER, THE TEST INSTRUMENTATION WILL SERVE AS A CHECK OF THE GENERATOR SET METERS.

C. SALTWATER BRINE TANKS OR THOSE LOAD BANKS REQUIRING WATER AS A SOURCE FOR COOLING ARE NOT ACCEPTABLE FOR THIS PURPOSE AND ARE DISALLOWED AND SHALL NOT BE UTILIZED FOR THIS TEST.

D. LOAD BANK TESTING SHALL BE DONE IN THE PRESENCE OF THE OWNER OR HIS APPOINTED REPRESENTATIVE ONLY AFTER THE UNIT IS PERMANENTLY INSTALLED IN ACCORDANCE WITH THE CONTRACT DOCUMENTS. TESTING SHALL BE FOR A PERIOD OF FOUR (4) HOURS UNDER FULL LOAD.

3.4 START UP AND INSTRUCTIONS

A. ON COMPLETION OF THE INSTALLATION, START-UP SHALL BE PERFORMED BY THE ENGINE MANUFACTURERS' TRAINED DEALER SERVICE REPRESENTATIVE.

B. OPERATING AND MAINTENANCE INSTRUCTION MANUAL SHALL BE FURNISHED AND PROCEDURES EXPLAINED TO OPERATING PERSONNEL.

3.5 SYSTEM SERVICE CONTRACT

A. THE SUPPLIER OF THE STANDBY POWER SYSTEM MUST FURNISH A COPY OF, AND MAKE AVAILABLE TO THE OWNER, HIS STANDARD SERVICE CONTRACT WHICH, AT THE OWNER'S OPTION, MAY BE ACCEPTED OR REFUSED. THIS CONTRACT WILL ACCOMPANY ANY DOCUMENTS, DRAWINGS, CATALOG CUTS, SPECIFICATION SHEETS, WIRING, OR OUTLINE DRAWINGS, ETC. SUBMITTED FOR APPROVAL. THIS CONTRACT SHALL BE FOR THE COMPLETE POWER SYSTEM.

3.6 GUARANTEE

A. EQUIPMENT PROVIDED UNDER THIS SECTION SHALL BE GUARANTEED AGAINST DEFECTIVE PARTS AND WORKMANSHIP UNDER TERMS OF THE MANUFACTURER'S AND THE DEALER'S STANDARD WARRANTY. BUT IN NO EVENT SHALL IT BE FOR A PERIOD OF LESS THAN FIVE (5) YEARS FROM DATE OF INITIAL START-UP OF THE SYSTEM AND SHALL INCLUDE LABOR AND TRAVEL TIME FOR NECESSARY REPAIRS AT THE JOB.

END OF SECTION 26 32 13

SECTION 263600 – TRANSFER SWITCHES

PART 1 – GENERAL

1.1 DESCRIPTION

A. ALL WORK SPECIFIED IN THIS SECTION SHALL COMPLY WITH THE PROVISIONS OF SECTION 26 05 00.

B. PROVIDE ALL LABOR AND MATERIAL NECESSARY TO INSTALL AN AUTOMATIC TRANSFER SWITCH FOR STANDBY ENGINE-GENERATOR SET IN A COMPLETE AND OPERATING CONDITION.

1.2 SUBMITTALS

A. FURNISH INFORMATION SHOWING MANUFACTURER'S MODEL NUMBERS, DIMENSIONS AND SPECIFIED OPTIONS.

B. SUBMIT COPIES OF PERTINENT DRAWINGS AND SCHEMATIC DIAGRAMS FOR APPROVAL.

PART 2 – PRODUCTS

2.1 MANUFACTURER

A. THE EQUIPMENT SHALL BE AS MANUFACTURED BY ASCO OF THE SIZE AND RATINGS INDICATED.

2.2 AUTOMATIC LOAD TRANSFER SWITCHES

A. THE AMPERAGE RATING OF THE AUTOMATIC LOAD TRANSFER SWITCH SHALL BE AS SHOWN.

B. THE AUTOMATIC TRANSFER SWITCH SHALL BE MECHANICALLY HELD ON BOTH THE EMERGENCY AND THE NORMAL SIDE. THE SWITCH SHALL BE DOUBLE THROW WITH THE MAIN CONTACTS RIGIDLY AND MECHANICALLY INTERLOCKED TO INSURE ONLY TWO POSSIBLE POSITIONS: NORMAL OR EMERGENCY. A MANUAL OPERATOR MUST BE PROVIDED TO ENABLE MANUAL OPERATION WITHOUT HAVING TO ASSEMBLE THE HANDLE.

C. THE AUTOMATIC LOAD TRANSFER CONTROL SHALL BE RATED FOR CONTINUOUS DUTY WHEN ENCLOSED IN A NON-VENTILATED NEMA 1 ENCLOSURE. IT SHALL BE RATED FOR ALL CLASSES OF LOAD, INCLUDING INDUCTIVE AND NON-INDUCTIVE, AT 600 VOLTS AND TUNGSTEN LAMP LOAD AT 250 VOLTS. THE TRANSFER SWITCH PORTION OF THE CONTROL SHALL BE DESIGNED, BUILT AND TESTED TO CLOSE ON AN INRUSH CURRENT UP TO AND INCLUDING TWENTY (20) TIMES THE CONTINUOUS RATING OF THE SWITCH WITHOUT WELDING OR EXCESSIVE BURNING OF THE CONTACTS. THE TRANSFER SWITCH SHALL BE CAPABLE OF ENDURING SIX THOUSAND (6000) CYCLES OF OPERATION, AT RATED CURRENT, AT A RATE OF SIX (6) CYCLES PER MINUTE, WITHOUT FAILURE. ONE CYCLE SHALL CONSIST OF ONE COMPLETE OPENING AND CLOSURE OF BOTH SETS OF CONTACTS ON AN INRUSH CURRENT OF TEN (10) TIMES THE CONTINUOUS RATING OF THE SWITCH.

D. THE TRANSFER SWITCH SHALL BE AS LISTED UNDER U.L. 1008. SWITCH UTILIZING REVERSING CONTACTOR MECHANISMS AS A MEANS TO TRANSFER LOAD ARE DISALLOWED AND WILL NOT BE CONSIDERED.

E. THE AUTOMATIC LOAD TRANSFER SWITCH SHALL INCLUDE THE FOLLOWING ACCESSORIES:
1. ENGINE STARTING CONTACTS TO PROVIDE FOR GENERATOR STARTING.
2. FULL PHASE PROTECTION. THREE-PHASE RELAYS SHALL BE FIELD ADJUSTABLE, CLOSE DIFFERENTIAL TYPE WITH 92-95% PICKUP AND 82-85% DROP OUT. RELAYS ARE TO BE CONNECTED ACROSS LIVE LINES.
3. TEST SWITCH, TO SIMULATE A POWER OUTAGE.
4. ADJUSTABLE TIME DELAY ON ENGINE STARTING TO OVERRIDE MOMENTARY OUTAGES AND NUISANCE VOLTAGE DIPS.
5. ADJUSTABLE TIME DELAY ON TRANSFER OF LOAD TO EMERGENCY SOURCE. ADJUSTABLE TIME DELAY TO OPEN TRANSFER SWITCH CONTACT TO ALLOW MOTOR LOADS TO DECAY.
6. ADJUSTABLE TIME DELAY ON RETRANSFER OF LOAD TO NORMAL WITH 5 MINUTE COOL-DOWN TIMER WHEREIN THE GENERATOR SET RUNS UNLOADED AFTER TRANSFER TO LINE.
7. PLANT EXERCISER TO START AND RUN THE GENERATOR SET WITH OR WITHOUT LOAD EACH 168 HOURS FOR A 30 MINUTE INTERVAL. SELECTOR SWITCH WILL BE PROVIDED FOR WITH-LOAD OR WITHOUT-LOAD TESTING.
8. ONE AUXILIARY CONTACT CLOSED ON EMERGENCY AND ONE AUXILIARY CONTACT OPEN ON EMERGENCY.
9. PILOT LIGHTS TO INDICATE THE NORMAL AND EMERGENCY POSITION OF THE TRANSFER SWITCH.
10. ISOLATED (UNDERGROUND) NEUTRAL BAR.
11. DISCONNECT PLUG.

PART 3 – EXECUTION

3.1 INSTALLATION

A. TRANSFER SWITCHES SHALL BE MOUNTED TO STRUCTURE. TRANSFER SWITCHES SHALL NOT BE MOUNTED TO MECHANICAL EQUIPMENT OR DUCTWORK.

3.2 TESTING

A. REFER TO SECTION 26 32 13.

3.3 START UP AND INSTRUCTIONS

A. ON COMPLETION OF THE INSTALLATION, START-UP SHALL BE PERFORMED BY THE ENGINE MANUFACTURERS' TRAINED DEALER SERVICE REPRESENTATIVE.

B. OPERATING AND MAINTENANCE INSTRUCTION MANUAL SHALL BE FURNISHED AND PROCEDURES EXPLAINED TO OPERATING PERSONNEL.

3.4 SYSTEM SERVICE CONTRACT

A. THE SUPPLIER OF THE STANDBY POWER SYSTEM MUST FURNISH A COPY OF, AND MAKE AVAILABLE TO THE OWNER, HIS STANDARD SERVICE CONTRACT WHICH, AT THE OWNER'S OPTION, MAY BE ACCEPTED OR REFUSED. THIS CONTRACT WILL ACCOMPANY ANY DOCUMENTS, DRAWINGS, CATALOG CUTS, SPECIFICATION SHEETS, WIRING, OR OUTLINE DRAWINGS, ETC. SUBMITTED FOR APPROVAL. THIS CONTRACT SHALL BE FOR THE COMPLETE POWER SYSTEM.

3.5 GUARANTEE

A. EQUIPMENT PROVIDED UNDER THIS SECTION SHALL BE GUARANTEED AGAINST DEFECTIVE PARTS AND WORKMANSHIP UNDER TERMS OF THE MANUFACTURER'S AND THE DEALER'S STANDARD WARRANTY. BUT IN NO EVENT SHALL IT BE FOR A PERIOD OF LESS THAN FIVE (5) YEARS FROM DATE OF INITIAL START-UP OF THE SYSTEM AND SHALL INCLUDE LABOR AND TRAVEL TIME FOR NECESSARY REPAIRS AT THE JOB.

END OF SECTION 26 36 00

SECTION 265100 – LIGHTING

1.1 DESCRIPTION

A. ALL WORK IN THIS SECTION SHALL COMPLY WITH THE PROVISIONS OF SECTION 260500.

B. PROVIDE ALL LIGHTING FIXTURES AND LAMPS AS SPECIFIED HEREIN AND AS SHOWN ON THE DRAWINGS.

C. CONFIRM EXACT LOCATIONS OF ALL LIGHTING FIXTURES BY COORDINATION WITH THE ARCHITECT'S REFLECTED CEILING PLANS AND MECHANICAL EQUIPMENT ABOVE OR ON THE CEILING.

D. CONFIRM ALL CEILING TYPES BEFORE ORDERING LIGHTING FIXTURES.

E. EACH LIGHTING FIXTURE SHALL HAVE BEEN TESTED AND CERTIFIED FOR PROPER OPERATION BY THE FIXTURE MANUFACTURER FOR THE TYPE MOUNTING AND CEILING ON/IN, WHICH IT IS INSTALLED.

2.1 LIGHTING FIXTURES

A. EACH LIGHTING FIXTURE SHALL BE AS SPECIFIED IN THE LIGHTING FIXTURE SCHEDULE CORRESPONDING WITH ITS FIXTURE TYPE INDICATION (LETTER).

B. MOST LIGHTING OUTLETS ARE LETTERED OR GROUPS OF OUTLETS ARE INDICATED BY A LETTER.

C. EACH LIGHTING FIXTURE SHALL HAVE A MANUFACTURER'S LABEL AFFIXED AND SHALL COMPLY WITH THE REQUIREMENTS OF ALL AUTHORITIES HAVING JURISDICTION.

D. THE LIGHTING FIXTURES THAT ARE INDICATED BY THE LETTERS SHALL BE AS INDICATED ON THE LIGHTING FIXTURE SCHEDULE.

2.2 LAMPS

A. THE TYPE LAMPS SHALL BE AS SPECIFIED FOR EACH LIGHTING FIXTURE IN THE LIGHTING FIXTURE SCHEDULE.

B. THE LAMP CATALOG NUMBER IS THE CATALOG NUMBER IS GENERALLY FOR SYLVANIA LIGHTING AND IS GIVEN AS A STANDARD OF THE QUALITY AND PERFORMANCE REQUIRED. EQUAL LAMPS BY GENERAL ELECTRIC OR PHILIPS WILL BE ACCEPTABLE. WHEN A LAMP MANUFACTURER'S NAME IS USED ALONG WITH THE CATALOG NUMBER IN THE LIGHTING FIXTURE SCHEDULE, IT IS CONSIDERED UNEQUALED BY ANY OTHER LAMP AND SHALL NOT BE SUBSTITUTED FOR. THE LAMP PERFORMANCE WITH ENERGY CONSERVING BALLASTS FURNISHED UNDER THIS SECTION SHALL BE CERTIFIED BY A NATIONALLY RECOGNIZED INDEPENDENT TESTING LABORATORY.

2.3 LED LIGHTING FIXTURES

A. LED LAMPS FOR INTERIOR USE SHALL BE 4000K, CRI 80 (MIN.), UNLESS NOTED OTHERWISE. COLOR TEMPERATURE CHROMATICITY OVER THE LIFETIME OF THE PRODUCT SHALL BE WITHIN 0.007 ON THE CIE 1976 (U',V') DIAGRAM.

B. SYSTEM SHALL BE RATED AT A MINIMUM FOR 50,000 HOURS (MIN.) AT 70% LUMEN MAINTENANCE (L80).

C. SYSTEM SHALL COMPLY WITH THE FOLLOWING:
1. ENERGY STAR® SSL REQUIREMENTS FOR LUMINAIRES
2. IESNA LM-16
3. IESNA LM-58-94
4. IESNA LM-79
5. IESNA LM-80
6. ANSI C82.2-2002
7. ANSI C82.77-2002
8. ANSI C78.377-2008
9. CIE 13.3-1995
10. CIE 15-2002
11. ANSI/UL 153
12. UL 1598

D. LED DRIVERS SHALL BE ELECTRONIC, THERMALLY PROTECTED AND HAVE AN INPUT VOLTAGE AT 120VAC, 60HZ WITH A POWER FACTOR OF >0.90.

E. LED BOARDS AND DRIVERS SHALL BE PROVIDED WITH PLUG-IN CONNECTIONS FOR TOOL-LESS REPLACEMENT OF COMPONENTS.

F. COMPATIBILITY OF DIMMING SWITCHES FOR CONTROL OF DIMMABLE LED DRIVERS SHALL BE CONFIRMED WITH LED FIXTURE MANUFACTURER.

2.4 EMERGENCY BATTERY LIGHTING

A. LIGHTING FIXTURES INDICATED ON THE DRAWINGS TO BE PROVIDED WITH AN EMERGENCY BATTERY BALLAST SHALL PROVIDE EMERGENCY LIGHTING BY USING A STANDARD FLUORESCENT LAMP OR LAMPS AND AN EMERGENCY BATTERY BALLAST. THE BALLAST SHALL CONSIST OF A FIELD REPLACEABLE HIGH TEMPERATURE, MAINTENANCE FREE NICKEL CADMIUM BATTERY, CHARGER AND ELECTRONIC CIRCUITRY CONTAINED IN ONE METAL CASE. PROVIDE A SOLID STATE CHARGING INDICATOR LIGHT TO MONITOR THE CHARGER AND BATTERY, DOUBLE POLE TEST SWITCH AND INSTALLATION HARDWARE. THE BATTERY BALLAST SHALL PROVIDE POWER TO THE FLUORESCENT LAMP UPON FAILURE OF THE NORMAL SUPPLY TO THE FIXTURE.

B. THE TEST BUTTON AND INDICATOR LIGHT SHALL BE INTEGRAL IN THE FIXTURE REFLECTOR AND SHALL BE POSITIONED WITHIN OR ON THE SURFACE OF THE FIXTURE SO AS TO BE ACCESSIBLE AND IDENTIFIABLE.

C. UNDER NORMAL MODE THE BATTERY BALLAST SHALL KEEP THE BATTERIES AT FULL CHARGE. UPON LOSS OF NORMAL POWER THE BATTERY BALLAST SHALL OPERATE THE FLUORESCENT LAMP OR LAMPS FOR 90 MINUTES.

D. BATTERY RECHARGE TIME SHALL NOT EXCEED 16 HOURS TO FULLY RECHARGE AND SHALL NOT EXCEED 225 MILLIAMPERES CHARGING CURRENT

E. THE LUMEN OUTPUT OF THE LAMP OR LAMPS POWERED BY BATTERY UNIT SHALL BE NOT LESS THAN 1,100 LUMENS INITIALLY FOR A FOUR-FOOT FLUORESCENT LAMP.

F. THE BATTERY BALLAST SHALL MEET OR EXCEED ALL THE REQUIREMENTS SET FORTH IN UL924 "EMERGENCY LIGHTING AND POWER EQUIPMENT" AND SHALL BE UL LISTED FOR INSTALLATION ON TOP OF OR REMOTE FROM THE FIXTURE. EMERGENCY ILLUMINATION SHALL MEET OR EXCEED THE REQUIREMENTS SET FORTH IN THE NATIONAL ELECTRIC CODE, LIFE SAFETY CODE AND UL 90-MINUTE REQUIREMENTS.

3.1 SUPPORT OF LIGHTING FIXTURES

A. ALL LIGHTING SHALL BE SUPPORTED FROM THE BUILDING STRUCTURE. THE FIXTURES SHALL BE SUPPORTED IN A MANNER THAT WILL INSURE THE FIXTURE WEIGHT BEING EQUALLY DISTRIBUTED FROM EACH SUPPORT AND THE FIXTURE REMAINING IN A LEVEL POSITION.

B. FLUORESCENT FIXTURES INSTALLED IN OR ON ANY CEILING OTHER THAN A SUSPENDED CEILING SYSTEM SPECIFICALLY MENTIONED ABOVE SHALL BE SUPPORTED WITH CONCEALED STEEL RODS. RODS SHALL BE 1/4" DIAMETER MINIMUM AND SHALL BE LOCATED WHERE RECOMMENDED BY THE FIXTURE MANUFACTURER. PROVIDE A MINIMUM OF TWO (2) SUPPORTS FOR EACH 4' OR 8' FIXTURE CHASSIS. SUPPORTS SHALL BE MAXIMUM OF 48" CENTERS. FOR INCANDESCENT FIXTURES, STEEL HANGING WIRE MAY BE USED BY ATTACHING THE WIRE TO THE FIXTURE MOUNTING FRAME.

3.4 FINAL PREPARATION

A. ALL PLASTIC COVERS SHALL BE REMOVED FROM FLUORESCENT FIXTURES.

B. CLEAN ALL LENS AND REFLECTORS FROM DEBRIS, FINGERPRINTS, DUST, ETC.

C. ALL LAMPS SHALL BE OPERATING AT THE TIME OF THE FINAL INSPECTION AND FOR A PERIOD OF SIX (6) MONTHS AFTER THE FINAL ACCEPTANCE OF THE PROJECT BY THE OWNER.

END OF SECTION 265100

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A TENANT ADDITION

at

SRS DISTRIBUTION, INC. - ROCKWALL, TEXAS (H-ROOM)

for

SRS Distribution

2065 KRISTY LN
ROCKWALL, TEXAS 75032

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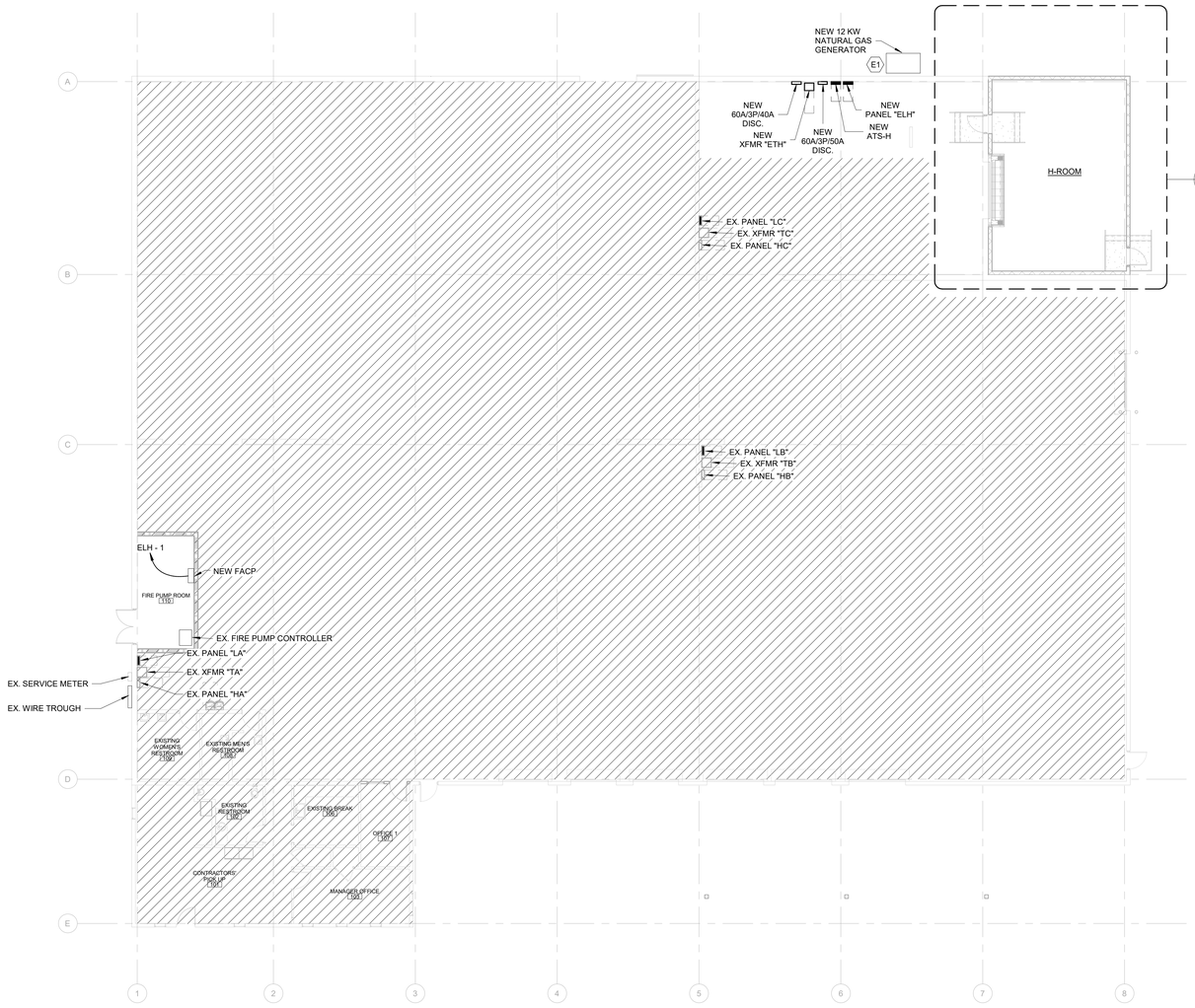
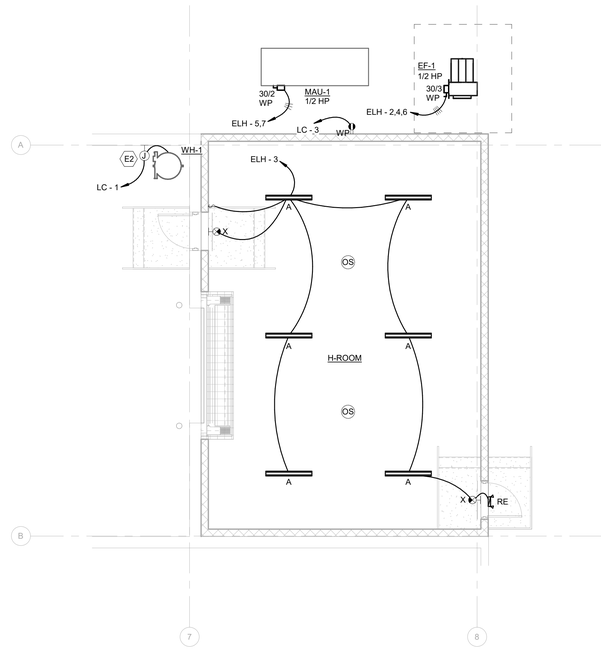
ELECTRICAL SPECIFICATIONS

Sheet No.
E-005

■ Released for Construction
☐ Not Released for Construction



1 OVERALL FLOOR PLAN - ELECTRICAL
3/32" = 1'-0"



2 H-ROOM PLAN - ELECTRICAL
3/16" = 1'-0"

KEY NOTES

E1 COORDINATE EXACT GENERATOR LOCATION AND ALL NATURAL GAS CONNECTIONS WITH CIVIL TEAM.

E2 PROVIDE 120V CIRCUIT FOR GAS WATER HEATER AS REQUIRED.

GENERAL NOTES

1. "EX" INDICATES EXISTING DEVICE TO REMAIN. "RE" INDICATES EXISTING DEVICE TO BE INSTALLED IN NEW LOCATION. ALL OTHER DEVICES SHALL BE CONSIDERED NEW.
2. COORDINATE EXACT LOCATION AND MOUNTING HEIGHT OF ALL NEW DEVICES WITH ARCHITECTURAL DRAWINGS AND OTHER TRADES PRIOR TO INSTALLATION. CENTER ALL RECEPTACLES ON WALLS U.O.N.
3. PROVIDE CONTINUOUS, UNSWITCHED HOT TO ALL EMERGENCY FIXTURES AND EXIT SIGNS.
4. CEILING MOUNTED OCCUPANCY SENSORS ARE TO CONTROL ROOM / AREA WHERE INDICATED. SWITCHES SHALL OVERRIDE SENSOR CONTROL WHEN IN OFF POSITION. PROVIDE ALL COMPONENTS REQUIRED FOR A COMPLETE INSTALLATION OF SENSORS AND ZONES.
5. SHADED AREAS ARE NOT IN SCOPE.
6. RECEPTACLES SHALL BE INSTALLED PER ANSI A117.1.
7. ALL ELECTRICAL CIRCUITS SHALL BE PROVDED WITH A SEPARATE AND DEDICATED NEUTRAL FOR EACH INDIVIDUAL CIRCUIT.
8. EMT CONDUIT SHALL BE UTILIZED IN EXPOSED CEILING AREAS AND FOR HOMERUNS TO THE PANELBOARDS. MC SHALL BE UTILIZED IN ALL WALLS AND CONCEALED CEILING AREAS.
9. RELOCATE EXISTING J-BOXES SERVING ELECTRICAL, FIRE ALARM, AND OTHER SYSTEMS TO AN ACCESSIBLE LOCATIONS WHERE NEW CEILINGS ARE SCHEDULED THAT RENDER THE J-BOXES INACCESSIBLE (I.E. GYP CEILINGS, SPECIALTY CEILINGS). EXTEND/MODIFY EXISTING CONDUIT, CABLING, ETC. AS REQUIRED FOR RELOCATION.
10. COORDINATE THE EXACT LOCATIONS OF ALL RELOCATED MECHANICAL EQUIPMENT, TERMINAL UNITS, ETC. WITH DIVISION 23. MODIFY/EXTEND THE EXISTING CIRCUIT SERVING THE RELOCATED EQUIPMENT AND RECONNECT AT NEW LOCATION.
11. ALL ELECTRICAL DEVICES, FIXTURES, BOXES, AND WIRING WITHIN H-ROOM SHALL BE CLASS 1, DIVISION 1 RATED IN ACCORDANCE WITH NEC SECTION 501 REQUIREMENTS.

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FLOOR PLAN - ELECTRICAL

Sheet No.
E-100

■ Released for Construction
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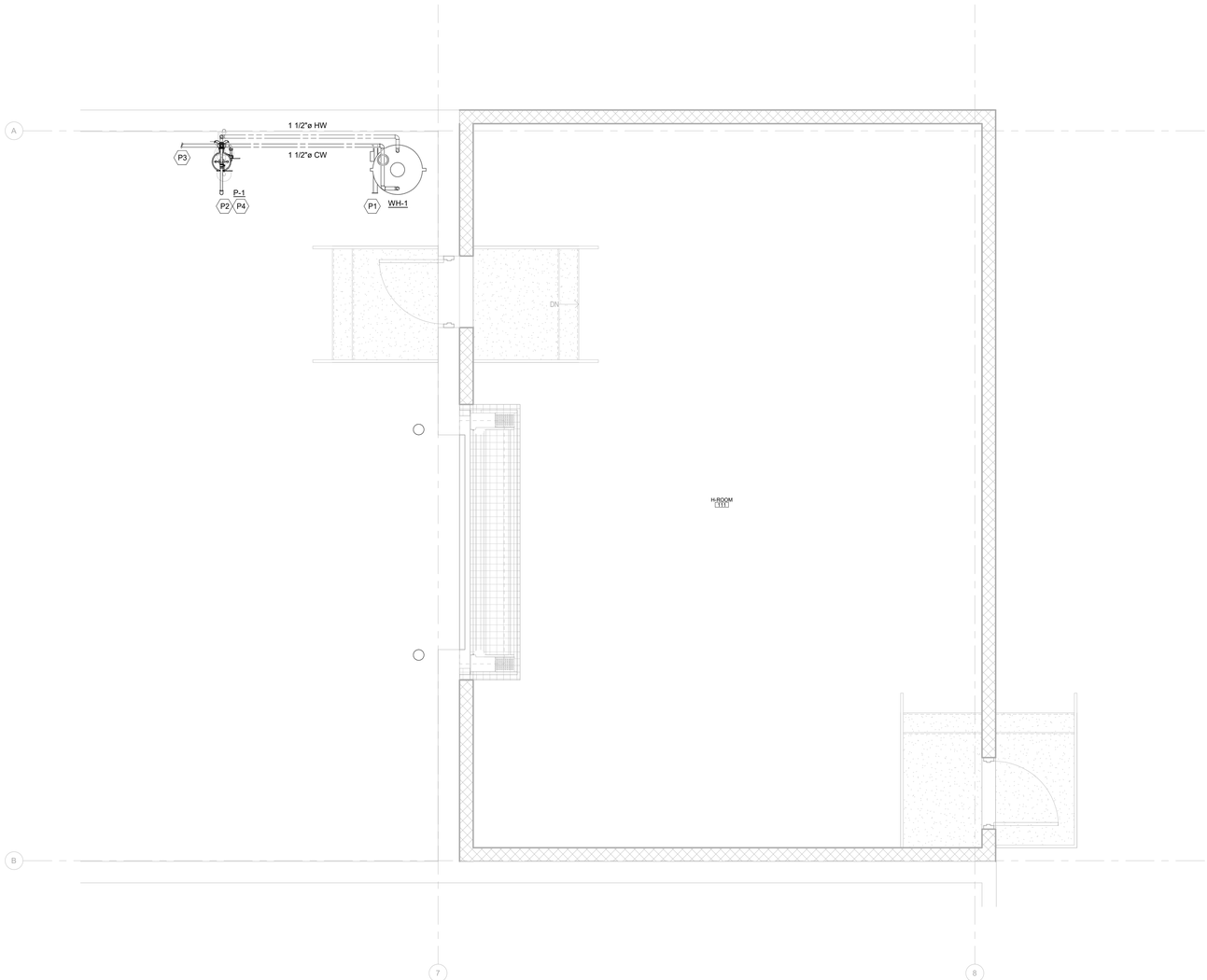

1 Plumbing Plan - H Room
3/8" = 1'-0"

KEY NOTES

P1 PROVIDE AND INSTALL NEW WATER HEATER AS SCHEDULED ON P-001. SEE DETAIL 1/P-001.

P2 PROVIDE AND INSTALL PLUMBING FIXTURE AS SCHEDULED ON P-001. SEE DETAIL 2/P-001.

P3 CONNECT NEW PIPING TO PIPING OF EQUAL OR GREATER SIZE. CONTRACTOR TO VERIFY CONNECTION LOCATION PRIOR TO BEGINNING CONSTRUCTION.

P4 NO DRAIN PROVIDED. EYEWASH, SHOWER, OR WATER HEATER WILL CAUSE A SPILL. PROVIDE ADD ALTERNATE PRICE: PROVIDE AND INSTALL DEDICATED 4" FLOOR DRAIN FOR AREA DRAINAGE. CONNECT TO EXISTING BELOW SLAB PIPING. CONNECT 2" VENT AND TRAP PRIMER TO EXISTING PIPING. NOTE THAT FLOOR DRAIN IS NOT EXPECTED TO CAPTURE ALL SPILLAGE. COORDINATION WITH SLAB SLOPING IS RECOMMENDED.

GENERAL NOTES

1 CONTRACTOR SHALL VISIT SITE PRIOR TO BID AND ASCERTAIN ALL EXISTING CONDITIONS. NO ALLOWANCES WILL BE PROVIDED FOR LACK OF KNOWLEDGE OF EXISTING CONDITIONS. CONTRACTOR SHALL DEMO ALL NON-ESSENTIAL DUCTWORK AND PIPING WHICH IS NOT REQUIRED FOR THIS INSTALLATION. COORDINATE ALL DEMO WITH BUILDING REP BEFORE DEMO WORK COMMENCES.

2 EXISTING WORK SHOWN HERE IS BASED ON SITE VISIT AND/OR PROVIDED INFORMATION. THESE DRAWINGS ARE NOT NECESSARILY ACCURATE FOR EXISTING MATERIALS AND SHOULD NOT BE INTERPRETED TO BE A STRICT REPRESENTATION OF AS-BUILT CONDITIONS.

3 ALL PIPING SHOWN IS SCHEMATIC IN NATURE AND DOES NOT REFLECT ALL OFFSETS, CHANGES IN ELEVATION, ETC. COORDINATION BETWEEN TRADES IS NECESSARY. OFFSET AS NEEDED.

4 FIELD COORDINATE INSTALLATION OF PIPING, FIXTURES, EQUIPMENT, ETC. WITH ALL OTHER TRADES.

5 SLOPE ALL SANITARY, WASTE, & VENT PIPING AT 1/8" PER FOOT UNLESS NOTED OTHERWISE.

6 CONTRACTOR TO VERIFY ALL PLUMBING EQUIPMENT AND FIXTURES ARE IN PROPER WORKING CONDITION. IF NOT, REPLACE WITH NEW, MATCHING BASE BUILDING STANDARDS.

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architecture/interiors

A TENANT ADDITION

at

SRS DISTRIBUTION, INC. - ROCKWALL, TEXAS (H-ROOM)

for

SRS Distribution

2065 KRISTY LN
ROCKWALL, TEXAS 75032

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Sheet Title
PLUMBING PLAN - H ROOM

Sheet No.
P-102

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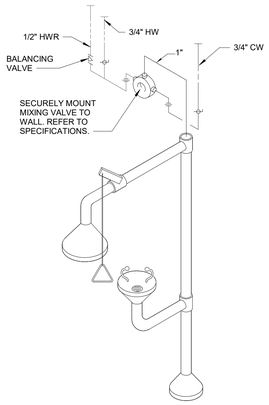
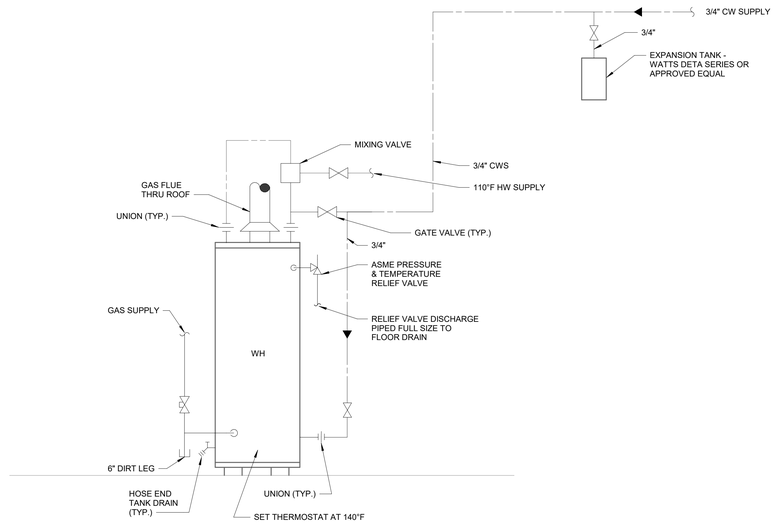


2 EYE WASH DETAIL



1 WATER HEATER DETAIL

ABBREVIATIONS

A/C	ABOVE CEILING	HWRR	HOT WATER REVERSE RETURN
AAV	AIR ADMITTANCE VALVE	HWS	HOT WATER SUPPLY
AD	ACCESS DOOR		
ADJ	ADJUSTABLE	ID	INSIDE DIMENSION
AFF	ABOVE FINISHED FLOOR	IE	INVERTED ELEVATION
AUTO	AUTOMATIC	IN	INCHES
B/G	BELOW GRADE	KW	KILOWATTS
B/S	BELOW SLAB		
BAL	BALANCING	LB	POUNDS
BCO	BASE CLEANOUT	LP	LIQUID PROPANE GAS
BHP	BRAKE HORSEPOWER	LWR	LOOP WATER RETURN
BOD	BASIS OF DESIGN	LWS	LOOP WATER SUPPLY
CO	CLEANOUT	MAX	MAXIMUM
COND	CONDENSATE	MIN	MINIMUM
CW	COLD WATER (DOMESTIC)	MFR	MANUFACTURER
DN	DOWN	NC	NORMALLY CLOSED
DR	DRAIN	NFGH	NON-FREEZE GROUND HYDRANT
DWG	DRAWING	NFWH	NON-FREEZE WALL HYDRANT
		NG	NATURAL GAS
EA	EACH	NO	NORMALLY OPEN
ECC	ECCENTRIC	NOM	NOMINAL
EFF	EFFICIENCY		
EOD	EMERGENCY OVERFLOW DRAIN	OD	OUTSIDE DIMENSION
		OD	OVERFLOW DRAIN
EWT	ENTERING WATER TEMP.		
EX	EXISTING	PSI	POUNDS PER SQUARE INCH
F	FAHRENHEIT	RAD	RADIUS
FCO	FLOOR CLEANOUT	RED	REDUCER
FD	FLOOR DRAIN		
FLR	FLOOR	SAN	SANITARY
FOB	FLAT ON BOTTOM	SQ	SQUARE
FOT	FLAT ON TOP	ST	STORM
FPM	FEET PER MINUTE		
FPS	FEET PER SECOND	TEMP	TEMPERATURE
FT	FEET	TYP	TYPICAL
G	GATE	UON	UNLESS OTHERWISE NOTED
GA	GAUGE		
GCO	GRADE CLEANOUT	V	VENT
GL	GLOBE	VA	VALVE
GPM	GALLONS PER MINUTE	VTR	VENT THRU ROOF
GW	GREASE WASTE		
		WC	WATER COLUMN
HD	HUB DRAIN	WCO	WALL CLEANOUT
HP	HORSEPOWER	WHA	WATER HAMMER ARRESTOR
HW	HOT WATER (DOMESTIC)	WT	WEIGHT
HWR	HOT WATER RETURN	W	WASTE

PLUMBING LEGEND

	COLD WATER
	HOT WATER
	HOT WATER RECIRCULATION
	SANITARY
	GREASE
	VENT
	GAS
	EXISTING (TYPE NOT SPECIFIED)
	WORK TO BE REMOVED
	CONNECT TO EXISTING
	FLOOR DRAIN
	FLOOR SINK
	FLOOR CLEAN-OUT
	WALL CLEAN-OUT
	HOSE BIBB U.O.N.
	SHUT-OFF VALVE
	BACKFLOW/BACKWATER VALVE
	MOTOR ACTUATED GATE VALVE
	MOTOR ACTUATED 3-WAY VALVE
	CIRCUIT SETTER
	PRESSURE GAUGE
	GAUGE COCK
(#)	KEYNOTE

PLUMBING FIXTURE SCHEDULE

TAG	FIXTURE	CW	HW	SAN/ WASTE	VENT	REMARKS
P-1	EMERGENCY SHOWER/EYE WASH	1"	1"	--	--	
Bradley Model S19314SBFW. 3 1/10" diameter yellow impact-resistant plastic showerhead. Shower valve shall be chrome-plated brass 1" ips stay-open ball valve operated by a 37" pull rod with handle. Eye wash heads and chrome-plated circular spray ring for supplemental face spray. Eye wash valve shall be a chrome-plated ½" ips stay-open ball valve, hand operated by stainless steel push flag handle. Frame shall be 1¼" yellow galvanized steel pipe with floor flange. Emergency shower/eye wash shall be tested and comply with ANSI Z358.1. Provide with emergency thermostatic mixing valve meeting ASSE1071. Bradley Navigator S19-2150 EFX20 or equal. Mixing valve shall deliver tepid water to the emergency fixture.					

GAS WATER HEATER SCHEDULE

I.D. TAG	TYPE OF WATER HEATER	TANK CAPACITY (GALLONS)	RECOVERY @ 100°F (GPH)	POWER INPUT (MBH)	MINIMUM EFFICIENCY	FUEL	VOLTS/ PHASE	BASIS OF DESIGN	REMARKS
WH-A	STORAGE	100	242	250	80%	NAT. GAS	120/1	AO SMITH BTR250(A)	1, 2

(1) PROVIDE EXPANSION TANK ON CW INLET; WATTS SERIES PLT OR EQUAL SIZED PER MANUFACTURER'S RECOMMENDATIONS.
(2) SEE DETAIL1/P-001.

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PLUMBING LEGEND, ABBREVIATIONS, DETAILS, SCHEDULES

Sheet No.
P-001

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BWA Project #: 2024-1025

SECTION 22 05 00

COMMON WORK RESULTS FOR PLUMBING

1.0 GENERAL

1.01 DESCRIPTION

A. This Division 22 and the accompanying drawings cover the provision of all labor, equipment, appliances, and materials and performing all operations in connection with the construction of the plumbing systems as specified herein and as shown.

B. All work specified in this Section is governed by the Common Work Results for Plumbing 22 05 00.

C. The General Provisions and Division 1, including the general, supplementary and other conditions and other Divisions, as appropriate, apply to work specified in this Division.

1.02 EXISTING CONDITIONS

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

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

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

1.03 INTENT OF DRAWINGS AND SPECIFICATIONS

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

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

1.04 SPACE PRIORITY

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

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

C. The work of this Division 22 shall not obstruct access for installation, operation and maintenance of the work of any other Division.

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

1.05 COORDINATION

A. Coordinate all work under this Division 22 with work under all other Divisions, providing adjustment as necessary.

B. Coordination of space requirements with respect to Division 26 shall be performed such that:

1. No equipment, piping or ductwork, other than electrical, shall be installed within 42" of switchboards or panelboards.
2. No piping or ductwork which ever operates at a temperature in excess of 120°F shall be installed within 3" of any electrical conductor.

C. All items mounted in or below the ceiling, and all items penetrating the ceiling, shall be coordinated with the architectural reflected ceiling plans. If any items are not shown on these plans, or any items need to be relocated for coordination purposes, prepare a reflected ceiling plan and submit it to the Architect for approval.

1.06 CODE COMPLIANCE

A. All workmanship and materials provided under this Division 22 shall comply with all laws, ordinances, codes and regulations of all Federal, State and Local Authorities Having Jurisdiction.

B. All fire suppression, plumbing, heating, ventilating, and air conditioning materials and workmanship shall comply with all local, state, and federal codes and the following standards as minimum requirements.
1. National Electrical Code – 2020 Edition
2. International Building Code (w/ Local Amendments) – 2021 Edition
3. International Mechanical Code (w/ Local Amendments) – 2021 Edition
4. International Plumbing Code (w/ Local Amendments) – 2021 Edition
5. International Fuel Gas Code (w/ Local Amendments) – 2021 Edition
6. International Energy Conservation Code (w/ Local Amendments) – 2021 Edition
7. International Fire Code (w/ Local Amendments) – 2021 Edition
8. NFPA 101 Life Safety Code – 2003 Edition
9. Texas Accessibility Standards – 2012 Edition
10. American with Disabilities Act, January 26, 1992
11. American National Standard Handicapped Code, A117.1 – 1986 Edition
12. ASME A17.1 Safety Code Elevators and Escalators, 2013 Edition

C. Secure and pay all fees associated with all permits and licenses required for execution of the Contract. Arrange for all inspections required by City, County, State, and other Authorities Having Jurisdiction, and deliver certificates of approval to the Architect.

D. The code requirements are strictly a minimum and shall be met without incurring additions to the Contract. Where requirements of the drawings or specifications exceed the code requirements, the work shall be provided in accordance with these drawings or specifications. In the event of conflict or ambiguity between the various codes, the most stringent requirement shall govern.

1.07 ELECTRICAL REQUIREMENTS AND INTERFACE

A. All electrical equipment and wiring provided under this Division 22 shall comply with the electrical system characteristics indicated on the electrical drawings and specified in Division 26.

B. Electric controls, contactors, starters, pilot lights, push buttons, etc., shall be provided complete as part of the motor, heater or other equipment which it operates. All electrical components shall be in conformance with the requirements of the National Electrical Code and Division 26. Starters shall be wye-delta, closed transition type. Reference Division 26 and the electrical engineering drawings for those motor starters provided under that Division 26. All starters not shown shall be provided under this Division 22. Unless specified otherwise under other individual equipment Sections, motor starters shall conform to the following minimum requirements:

1. Starters for motors 1/3 horsepower or smaller shall be manual unless remote or automatic starting is required, in which case the starters shall be magnetic, full voltage, non-reversing, single-speed, unless otherwise indicated. All other starters shall be magnetic.

2. Each starter for a three-phase motor shall be furnished with three (3) overload relays sized for the full load running current of the motor actually provided. Provide an external "HAND-OFF-AUTO" selector switch with red "RUNNING" light. Provide a green pilot light to indicate motor "STOPPED". Each pilot light shall have a legend plate indicating reason for signal.

3. Each overload relay shall have a normally open alarm contact which will close only when actuated by an overload (not to be confused with N.O. or N.C. auxiliary contacts). These contacts shall be properly wired to their respective blue pilot light provided on the starter front cover and having a "TRIPPED" legend plate.

4. Individually mounted motor starters shall be in a NEMA Type 1 general purpose enclosure in unfinished areas and shall be flush mounted in all finished areas. All starters mounted in exterior areas shall have a NEMA 3R enclosure. Each starter shall have a laminated nameplate to indicate equipment unit number, function and circuit number.

5. All motor starters, push buttons and pilot lights shall be of the same manufacturer as the switchboard and shall be General Electric, Square D, Siemens I.T.E., or Westinghouse.

C. Motor starters for the following equipment shall be provided under this Division 22 by the Manufacturer of the equipment:
1. Other equipment hereinafter specified in other Sections to be provided with integral starters

D. All power wiring and final connections to equipment shall be provided under Division 26.

E. Control components, all interlocks (control valves, leak sensors, etc.) and control wiring (120 volt, single phase and less) shall be provided under this Division 22 as required to achieve the specified control sequences.

F. All control wiring over 30 volts shall be installed by a Licensed Electrician working under this Division 22.

1.08 SLEEVES, SEALS AND ESCUTCHEONS

A. Sleeves shall be provided through all pipe penetrations of concrete or masonry walls, elevated floors and roofs, except those plumbing piping penetrations for fixtures, vents, etc.

B. Sleeves shall be fabricated from Schedule 40 steel pipe through 10" and Standard Wall steel pipe for sleeve sizes 12" and larger. All sleeves penetrating exterior walls, underground walls, pit or vault walls shall be provided with a 3" x 3/8" thick waterstop ring welded completely to the midpoint of the sleeve.

C. All sleeves penetrating exterior walls, underground walls, pit or vault walls and elevated floors shall be packed and sealed watertight.

D. Sleeves through roofs shall extend above the roof surface and be flashed watertight.

E. Sleeves through walls shall be cut and finished flush with each surface of the wall in which they are installed.

F. Sleeves through elevated floors shall extend at least ½" above the finished floor and be sealed waterproof between the sleeve and slab.

G. Sleeves shall be sized to provide a minimum of 1/2" clearance between the inside surface of the sleeve and the outside finished surface of the pipe plus any insulation specified.

H. Provide round, chrome-plated escutcheons on all exposed piping penetrations passing through walls, floors, partitions, and ceilings.

1.09 IDENTIFICATION OF PIPING

A. All valves shall be identified with the appropriate service designation and valve number brass valve tags. Each valve tag shall be 19 gauge brass with 1/4" black-filled letters over 1/2" black-filled numbers. Tags shall be fastened to valves with brass "S" hooks or brass jack chain. Brass tags and fasteners shall be as manufactured by Seton Name Plate Corporation.

B. Provide charts of all valves. Valve charts shall include the following items:
1. Valve identification Number
2. Location
3. Purpose/Material

2.0 PRODUCTS

2.01 BID BASIS AND SUBSTITUTION PROCEDURES

A. Manufacturer names, series, and model numbers, as noted or specified, are for the purpose of describing type, capacity, and quality of equipment, materials and products to be used. Unless "or equal" is specifically stated, bids shall be based only on the specified "basis of design" Manufacturer. The listing of a particular manufacturer as an "equal" or "acceptable substitute" manufacturer shall not be misconstrued as approving, nor allowing the substitution of, that Manufacturer's standard product in place of the basis of design. No consideration will be given to a product which would require dimensional, spatial or aesthetic changes to the project. "Acceptable substitute" and "equal" manufacturers shall only bid those products which exactly match the size and other characteristics of the specified basis of design. Any changes to other disciplines and trades of work required by an "or equal" or "substitute" product shall be duly considered and priced accordingly prior to bidding or pricing. The decision as to whether or not a proposed substitute or "equal" product is actually equal to that specified shall rest solely with the Architect.

B. Requests to provide "equal" products in lieu of those specified shall be submitted to the Architect in writing at least ten (10) days prior to final pricing and execution of the Contract. No consideration will be given to substitute products after final pricing and execution of the Contract.

C. Any "or equal" product or proposed product substitution which will cause a change in the appearance, dimensions or design of any part of the building, structure, electrical system, or any other engineered systems shall be accompanied by a scaled drawing and written description of the required change(s) for approval by the Architect. If deemed necessary by the Architect, design changes shall be signed and sealed by a registered Professional Engineer, currently licensed in this State. This shall be performed under the Contractor selecting the substitution's scope.

D. Any and all changes due to a substitution of basis of design equipment including but not limited to electrical connection, physical size, access, piping connections, controls, etc. shall be solely the responsibility of Contractor selecting the substitution.

2.02 MINIMUM STANDARDS

A. Every piece of energy consuming equipment, all fire suppression products and life safety equipment shall comply with the following standards as applicable; especially in regard to prevailing codes:
1. Factory Mutual Laboratories (FM)
2. Industrial Risk Insurers (IRI)
3. Underwriters Laboratories, Inc. (UL)
4. ADC: Air Diffusion Council
5. ADA: American Gas Association
6. AMCA: Air Moving and Conditioning Association, Inc.
7. ANSI: American National Standards Institute
8. API: American Petroleum Institute
9. AHRI: Air Conditioning, Heating, and Refrigeration Institute
10. ASHRAE: American Society of Heating, Refrigerating and Air Conditioning Engineers
11. ASME: American Society of Mechanical Engineers
12. ASTM: American Society of Testing and Materials
13. AWWA: American Water Works Association
14. IBR: Institute of Boiler and Radiator Manufacturers
15. MSS: Manufacturers Standardization Society
16. NBBPVI: National Board of Boiler and Pressure Vessel Inspectors
17. NEMA: National Electrical Manufacturer's Association
18. OSHA: Occupational Safety & Health Administration
19. PDI: Plumbing Drainage Institute
20. PPI: Plastic Pipe Institute
21. CISPI: Cast Iron Soil Piping Institute

2.03 PIPE HANGERS AND SUPPORTS

A. Pipe hangers, hanger rods, trapeze type hangers, upper attachments and other supports shall be selected based on pipe size (plus insulation of pipes specified to be insulated) and the weight of the medium being transported or the medium used for testing, whichever is greater. Provide all hangers and rods, turnbuckles, angles, channels, and other structural supports to support the piping systems. Rods for pipe hangers shall be full size of the Hanger Manufacturer's catalog listed rod size for each type hanger specified. Hangers and supports shall be Michigan, ITT Grinnell or B-Line.

B. All material utilized for the hanging and support of the piping systems shall be manufactured products which are specifically intended for the purpose of hanging piping systems. The use of wire, steel straps, plastic ties, etc. is strictly prohibited.

C. Pipe hangers selected for supporting horizontal insulated piping shall be sized to fit around the outside of the pipe insulation. Insulated piping shall be supported on galvanized shields.

1. Shields shall be as follows:
a. Pipes 2" and smaller: 18 gauge x 12" long
b. Pipes 2 1/2" and larger: 16 gauge x 18" long

2. Shields shall be 180 degrees around the lower half of the pipe at all pipe hangers, except that on trapeze hangers, pipe racks and floor supported horizontal pipes, shields shall be 360 degrees around the entire pipe.

D. Pipe hangers touching copper piping shall be copper plated or the piping shall be dielectrically isolated from any steel hangers or clamps that are used. Note the requirement for domestic water piping requires the hangers to be installed over the insulation.

E. Steel rods, framing and clamps shall be plated or primed to prevent rust formation.

3.0 EXECUTION

3.01 GENERAL

A. All piping, valves, and fittings shall be products of a domestic Manufacturer and made in the USA.

B. Provide and install shut-off valves at any and all equipment including water heaters, etc. and at any locations required by code, such as branch lines from risers serving more than one fixture. Shut-offs shall be in addition to those specifically shown or noted in the Contract Documents.

3.02 SUBMITTALS

A. Before preparing submittals, study all Contract Drawings and specifications in detail, obtain manufacturer's recommended instructions, and have submittals prepared based on specific equipment and material proposed for installation. An officer of the contracting firm shall sign all shop drawings (certifying conformance with plans and specifications) before submitting to the Architect or releasing to the field.

B. The submittal process shall not be utilized as an avenue to substitute products after the execution of the contract. Should an unspecified or unequal product be submitted, it will be rejected. If a second attempt at substitution is made during the resubmittal of the same product, then no more reviews of that product will be performed without direct compensation to the Engineer being paid for the additional services required for the third review and any further reviews.

C. All submittals shall be submitted and returned electronically.

D. Submittals will not be accepted for review unless they:
1. Comply with the requirements of Division 1.
2. Include complete information pertaining to all appurtenances and accessories.
3. Are submitted as complete packages which pertain to all related items in Division 22. Separate packages shall be submitted as follows:
a. All plumbing equipment, piping, specialties, and components
b. All plumbing fixtures
4. Are properly marked with equipment, service or function identification as related to the project and are marked with pertinent specification paragraph number.

E. Submit catalog information, factory assembly drawings, field installation drawings and certifications as required for complete explanation and description of all items of equipment. The submittal data shall provide ample, unquestionable compliance with the Contract Documents.

F. Review of submittals shall not be construed as authorizing any deviations from the plans and specifications unless such deviations are clearly identified and separately submitted in the form of a letter that is enclosed with the submittals.

G. Submittals are required on all manufactured equipment, especially energy consuming equipment. Submittals shall include, but are not limited to, the following items of equipment:
1. Piping and Piping Specialties
2. Insulation
3. Water Heaters
4. Plumbing Fixtures

3.03 EXCAVATION, TRENCHING AND BACKFILLING

A. Perform all excavation, trenching and backfilling for underground work under this Division 22. During excavation, the excavated material shall be piled back from the banks of the trench to avoid overloading, slides or cave-ins. Do not exceed the angle of repose unless written approval is obtained in advance from the Architect for shoring, bracing or other alternate excavation methods. All excavated material not used for backfilling shall be removed from the building and disposed of as indicated or directed by the Architect. Take measures to prevent surface water from flowing into trenches and other excavations and any water accumulating therein shall be removed by pumping. All excavation shall be made by open cut. Tunneling shall not be allowed.

B. The bottom of all trenches shall be evenly graded to provide firm support and an even bearing surface. Pipe shall be laid on firm soil, laid in straight lines and on uniform grades. Provide bell holes so that the barrel of the pipe rests evenly on the bottom of the trench along the entire length of the pipe.

C. Pipe shall be inspected and tested prior to backfilling. Trench shall be handfilled to a minimum of 12" above the top of pipe with suitable earth (free of rocks, trash, large clods and organic material) and compacted to a minimum 95% proctor. After the first layer is completed, subsequent layers shall be filled and compacted the same as the first layer. Settling the backfill with water shall not be permitted.

3.04 INSTALLATION REQUIREMENTS

A. All equipment shall be installed in strict conformance with the recommendations of the Equipment Manufacturer, as indicated on the Drawings, and as specified.

B. Provide installation manuals for each piece of equipment. Submit in separately bound volumes after review of submittals.

C. Provide supplementary steel framing and welded steel equipment support stands as required for proper hanging and support of the plumbing systems. Steel angles, channels and tubing utilized for such framing shall be selected for a maximum deflection of 1/360th of the span.

3.05 CLEANING, LUBRICATION AND ADJUSTMENT

A. The exterior surfaces of all plumbing equipment, piping, conduit, etc., shall be cleaned and free of all dirt, grease, oil, paint splatter, and other construction debris.

B. Bearings that require lubrication shall be lubricated in strict accordance with the manufacturer's recommendations.

C. All control equipment, valves, equipment settings, pressure tanks, etc. shall be adjusted to the settings required for the performance specified.

D. All materials, equipment, etc. subject to weather, corrosion, dust, debris, water etc. to be installed or utilized for the project shall be fully protected. This is inclusive of piping and duct openings and internal fan ventilation intakes and discharges. This Division's scope includes protection and remediation of any and all Division materials, etc. including cleaning, vacuuming, dusting, etc. required for a clean system and operation. Insulation and equipment with electrical connections subject to water shall be replaced in their entirety. Coordinate with all other trades and schedules.

3.06 PAINTING

A. All uncoated and uninsulated steel surfaces exposed to sight inside the building, such as piping, equipment hangers and supports, which are not provided with factory prime coat or galvanizing, shall be cleaned and painted with one coat of rust inhibiting primer. In addition, all surfaces in finished spaces shall also be painted with two coats of finish paint in a color selected by the Architect.

B. Steel items exposed outside the building, such as equipment supports, uninsulated piping and hangers which are not factory painted or galvanized shall be cleaned and painted with one coat of rust inhibiting primer and two coats of asphaltic base aluminum paint. Insulated steel pipes outside the building shall be cleaned and painted with one coat of rust inhibiting primer before installing insulation.

C. Factory painted equipment that has been scratched or marred shall be repainted to match the original factory color.

3.07 PIPING LEAK TESTING

A. Sanitary, waste, and vent piping shall be tested with water before installing fixtures. Water test shall be applied to the system either in its entirety or to the individual sections. Each opening except the highest opening of the section under test shall be plugged, and the section shall be filled with water and tested with a head of water of at least ten (10) feet above the highest point in the system. The water shall be kept in the portion under test, for at least thirty (30) minutes; no drop in the water level will be acceptable.

B. The water piping systems shall be tested at a minimum pressure of 125 psi, or 1.5 times the system operating conditions, whichever is greater, and proved tight at this pressure for not less than thirty (30) minutes or longer if required to permit inspection of all joints. No loss in pressure will be permitted.

C. All leaks shall be repaired by tightening, remaking joints, or replacing pipe and fittings. Caulking of joints shall not be permitted.

3.08 RECORD (AS-BUILT) DRAWINGS

A. At the completion of the project, provide a set of reproducible prints to the Architect which reflects all changes, deviations and revisions made to the original design documents. Locations of all underground piping and utilities shall be clearly shown and dimensioned from permanent reference points such as building column lines. Record drawings shall be produced in electronic format compatible with AUTOCAD. Furnish electronic copies of all drawings in dwg. format, and two (2) bond copies of all drawing sheets. As-Builts for electronic incorporation by the Design Team, as applicable, shall be redline mark-ups of the Construction Documents.

3.09 OPERATING AND MAINTENANCE MANUALS AND INSTRUCTIONS

A. Complete operating and maintenance manuals shall be provided to the Owner. Four copies shall be provided. Each copy shall be bound in a separate 3-ring, loose leaf notebook. Operating instructions shall be provided for each plumbing system, and shall each include a brief system description, a simple schematic and a sequence of operation. Operating and maintenance instructions shall be provided for each piece of equipment. A control system wiring diagram shall be included in each operating and maintenance manual.

B. Prior to final acceptance or beneficial occupancy, provide the services of a Competent Technician for not less than one (1) day to instruct the Owner in the operation of the plumbing systems.

3.10 MINIMUM HANGER SPACING

A. Pipe hangers or supports shall be provided within 18" of each horizontal fitting, equipment connection, valve, etc. and within 18" of the centerline of horizontal or vertical changes in direction summing to 90° or more. Specific attention is called to turns into vertical risers.

B. Piping supports shall be provided, at a minimum, in accordance with the greater of the below or code minimum. Where the below or code does not address support for specific piping, supports shall be in accordance with manufacturer's requirements.

Piping Material	Max. Horz. Spacing	Max. Vert. Spacing
Cast-iron pipe	5'	15'
Copper pipe	12'	10'
Copper tubing ≤ 1-1/4" dia.	6'	10'
Copper tubing ≥ 1-1/2" dia.	10'	10'
PVC pipe	4'	10'*

*Midstory guide required for piping 2" diameter and smaller

3.11 WARRANTY

A. All work provided under this Division 22 shall be subject to a minimum one year warranty. The warranty shall include prompt repair or replacement of equipment or system failures and shall include all parts and labor. In addition, all compressors shall carry an additional four year parts-only warranty. Extended warranties shall be provided on all other equipment so specified in other Sections.

3.12 BID REQUIREMENTS

A. The Contractor shall include all systems, equipment and accessories shown on the plans and specifications.

B. The Contractor is responsible for providing all Contract Documents to all SubContractors. All systems, equipment and accessories shall be included in the bid, whether shown on the SubContractor applicable plans or other design documents.

C. Should any discrepancy occur in the Contract Documents, the Contractor shall provide a request for clarification prior to bid or note the discrepancy in the bid and provide an appropriate cost allowance in the bid.

D. The Contractor shall acknowledge that the Contract Documents are diagrammatic and shall provide all systems, equipment and accessories required for a complete facility. Any areas that appear to be void of systems or inappropriate systems shall be noted in the bid. No post bid change order shall be considered for areas or discrepancies not noted in the bid.

E. All installation coordination and means and methods and labor and materials required for proper system installation shall be included.

F. These requirements are in addition to bid procedures and requirements of the RFP or general specifications.

END OF SECTION

SECTION 22 07 00

PLUMBING INSULATION

1.0 GENERAL

1.01 DESCRIPTION

A. All work specified in this Section is governed by the Common Work Results for Plumbing Section 22 05 00.

B. This Section 22 07 00 and the accompanying drawings cover the provision of all labor, equipment, appliances, and materials and performing all operations in connection with the insulation of the plumbing systems as specified herein and as shown. These systems include, but are not limited to, the following:
1. Sanitary waste and vent systems
2. Domestic water systems

1.02 INTENT

A. It is the intent of this Section of the specifications to provide complete and operable plumbing systems complete with insulation, which are free of unreasonable noise, vibration and sweating, and fabricated so as to fit the space allotted.

B. The word "piping" is defined to mean all piping, fittings, joints, hangers, coatings, valves, cocks, insulation and accessories necessary for the plumbing systems described, shown and specified.

1.03 ACCEPTABLE MANUFACTURERS

A. Insulation products shall be as manufactured by Owens Corning, Knauf, Manville, Certainteed, Dow, Armacell, or Armstrong.

2.0 PRODUCTS

2.01 PLUMBING INSULATION

A. All pipe insulation products shall have a permanent composite insulation, jacket and adhesive fire and smoke hazard rating as tested by procedure ASTM-84, NFPA 255 and UL 723 not exceeding Flame Spread 25 or Smoke Developed 50.

B. Preformed insulation for all domestic hot water piping shall be minimum 1-1/2" thick for piping less than or equal to 1-1/2" diameter, preformed fiberglass pipe insulation with white all-service jacket. All longitudinal joints shall be lapped, self-sticking type with all butt joints, tears, etc. sealed with a matching white vapor barrier tape. Elbows shall be mitered or may be Zeston covers filled with equivalent fiberglass insulation. The maximum conductivity (k-value) of the insulation shall be 0.23 BTU per inch/h·ft²·°F at 75°F.

C. Preformed insulation for all domestic cold water piping, except trap primer piping underground, shall be minimum 1" thick, preformed fiberglass pipe insulation with white all-service jacket. All longitudinal joints shall be lapped, self-sticking type with all butt joints, tears, etc. sealed with a matching white vapor barrier tape. Elbows shall be mitered or may be Zeston covers filled with equivalent fiberglass insulation. The maximum conductivity (k-value) of the insulation shall be 0.23 BTU per inch/h·ft²·°F at 75°F.

D. Insulation shall be continuous over all valve bodies, fittings, and wall and floor penetrations. Do not insulate unions on hot water piping; nor instruments, gauges, valve handwheels, etc. on any piping.

E. All piping shall be run within the insulated and vapour barrier of the project scope.

F. Closed-cell insulation shall be provided over all piping called to have insulation that is installed below ground. Closed-cell piping insulation shall match the thicknesses for above ground piping, 25/50 Armaflex or Rubatex. All glues and coatings shall be products of the same manufacturer as the insulation. The insulation shall be installed by the slip-on method; slitting of the insulation is prohibited and shall be cause for rejection.

3.0 EXECUTION

3.01 ARRANGEMENT

A. Follow the general piping layout, arrangement, schematics and details. Provide all offsets, vents, drains and connections necessary to accomplish the installation. Fabricate piping accurately to measurements established at the project site to avoid interference with ductwork, other piping, equipment, openings, electrical conduits and light fixtures. Make suitable provision for expansion and contraction with expansion loops and offsets.

3.02 INSULATION INSTALLATION

A. Provide insulation over all above ground hot and cold water piping, except that no insulation is required on cold water lines installed inside interior plumbing chases (those chases with no exterior wall). In addition, no insulation is required for cold water piping outside the building vapor barrier and designed to be drained down for freeze-protection, such as parking deck hose bibbs for washdown.

1. All joints and tears shall be sealed with matching white vapor barrier tape.

END OF SECTION

SECTION 22 10 00

PLUMBING PIPING

1.0 GENERAL

1.01 DESCRIPTION

A. All work specified in this Section is governed by the Common Work Results for Plumbing Section 22 05 00.

B. This Section 22 10 00 and the accompanying drawings cover the provision of all labor, equipment, appliances, and materials and performing all operations in connection with the construction of the plumbing systems as specified herein and as shown. These systems include, but are not limited to, the following:
1. Sanitary, waste, and vent systems
2. Domestic water systems

C. Provide all final plumbing connections to all equipment furnished by Owner.

D. Provide isolation valve and reduced pressure backflow preventer or vacuum breaker at the service entrance and at those connections (especially to kitchen equipment) required by local plumbing code.

1.02 INTENT

A. It is the intent of this Section of the specifications to provide complete and operable plumbing systems as shown and specified which are free of leaks, properly vented, free of unreasonable noise, vibration and sweating, and fabricated so as to fit the space allotted and to exhibit a minimum resistance to fluid flow.

B. The word "piping" is defined to mean all piping, fittings, joints, hangers, coatings, valves, cocks, insulation and accessories necessary for the plumbing systems described, shown and specified.

1.03 GENERAL REQUIREMENTS

A. Provide all reducing fittings, flanges, couplings and unions of the size and type of material to match the piping connections at each fixture, piece of equipment, valve and accessory.

B. Union joints, couplings or flanges shall be provided in each pipe connected to each piece of equipment, fixture and elsewhere as indicated and specified. Unions shall match the piping system in which they are installed.

C. Unions or flanges shall be provided between all copper to steel connections. These unions shall be dielectric, insulating type.

D. All changes in direction and branches shall be made with manufactured fittings.

E. The use of offset-type reducers is strictly prohibited in any piping system.

F. In all water piping systems, changes in horizontal pipe sizes shall be made with eccentric reducers installed flat on top for proper air venting. Reducing tees, reducing elbows and concentric reducers shall only be allowed in water piping systems for changing pipe sizes in vertical risers and for making connections to equipment and accessories from vertical risers.

G. All pipe joints shall be cut square and all burrs shall be removed.

H. Open ends of pipes not currently being handled shall be plugged during installation to keep dirt, water, and foreign material out of the system.

I. Sanitary, waste, and vent piping shall slope down in the direction of flow as shown on the drawings or as prescribed by Code, but not less than 1 percent.

J. All vents through roof (VTRs) shall be offset just below the roof such that their termination points are at least 15 ft from any outside air intake of any HVAC unit.

K. Trap primers shall be provided at all floor drains and hub drains. Route water piping from nearest cold-water line and as allowed by code. Trap primer shall be tapped off the top of the horizontal line, have an isolation valve, and be at least 1' in elevation above the connection for every 20' of downstream piping.

L. All piping, valves, and fittings shall be provided by a domestic Manufacturer and manufactured in the USA.

2.0 PRODUCTS

2.01 SANITARY WASTE AND VENT SYSTEMS

A. All underground sanitary, waste, and vent piping shall be service weight hub and spigot cast iron soil pipe with lead and oakum or neoprene double-seal compression gaskets in sizes up to 12". All cast iron soil pipe and fittings shall bear the collective trademark of the Cast Iron Soil Pipe Institute and listed by NSF International or receive prior approval by the Architect.
1. Piping shall be gray cast iron and conform to ASTM A 74.
2. Compression gaskets shall be manufactured from an elastomer meeting the requirements of ASTM C 564.

B. Joints on hubless cast iron soil pipe shall be made with neoprene couplings and stainless-steel clamps. Gaskets shall conform to ASTM C 564. Couplings and gaskets shall be produced by the same manufacturer and shall be installed in accordance with the manufacturer's recommendations, including band tightening sequence and torque. All couplings shall be manufactured to the CISPI 310 standard, ASTM C 1277, ASTM C 150, FM Standard 1680 Class I and certified by NSF International. Coupling shall be as follows:
1. 1 ½" to 3" – Two (2) stainless steel bands
2. 4" to 8" – Four (4) stainless steel bands
3. 10" to 15" – Heavy duty coupling with six (6) stainless steel bands. Heavy duty couplings shall conform to ASTM C 1540.

C. All offsets on 8" pipe and larger shall have metal restraining straps by Holdrite or approved equal.

D. Cleanouts shall be provided at the locations indicated and, as a minimum, where required by Code. Floor cleanouts shall be a minimum of 4" and shall be complete with a flush plug and removable, scoriated bronze floor plate. Provide carpet buttons in carpeted areas. Wall cleanouts shall be threaded cleanout tees and plugs with polished stainless steel coverplate with centerset screw.

E. All cleanouts located in areas that are subject to vehicular traffic shall be heavy duty, traffic rated, JR Smith Model 4253, with bronze cover or equal product by Josam or Zurn.

F. Floor drains in toilets and finished areas shall be JR Smith 2000 Series with 6" Type B square adjustable strainers finished in satin nickel bronze or equal products by Josam or Zurn. Provide vandalproof secured tops.

G. Floor drains in mechanical rooms and unfinished concrete floors shall be JR Smith 2131 Series with round 11 3/4" cast iron grate, sediment bucket and deep-seal P-trap; or equal products by Josam or Zurn. Provide vandalproof secured tops.

H. Hub drains (HD) shall be made with a reducer fitting with opening at least one nominal size larger than the connected piping as scheduled. HDs shall be sized to receive all discharges without splashing.

2.02 DOMESTIC WATER SYSTEM

A. All underground copper branch lines (1/2" and 3/4" only) shall be continuous lengths of soft Type K copper tubing with no joints allowed underground.

B. Aboveground domestic water system piping 3" in size and smaller shall be Type L hard drawn copper tubing with wrought copper fittings and soldered joints.

C. All valves in potable water systems shall be "lead-free" type.

D. All valves ¼" and smaller shall be "full-port" type, and greater than ¼" may be "reduced-port" type.

E. Ball valves:

1. Valves 2 inch and smaller shall be two-piece bronze body, full port with solid, smooth bore chrome plated brass ball, meeting MSS-SP110 and rated for no less than 300 psi. Seats shall be reinforced TFE with Teflon packing ring and threaded adjustable packing nut. Valves on insulated lines will be provided with stem extensions to provide clearance for two inches of pipe insulation. Valves to be Apollo Valves 77C, Hammond/Milwaukee UP8301, or Watts B-6080.

F. Check valves:

1. Valves in water systems shall be NSF/ANSI 61/372 certified and suitable for potable water applications. Valve shall be swing-type, bronze body, brass seat, Apollo Valves 161S-LF up to 200 psi CWP, or equal by Milwaukee UP968 or Hammond.

G. See plan notes. If needed, backflow preventer at water service entrance shall be Watts Series LF009 or LF909 reduced pressure zone (RPZ) principle backflow preventer complete with strainer and shut-off valves. RPZ air gap drain shall be sized for the larger of the manufacturer's recommendation or the requirements of the AHJ and shall be piped to the nearby janitor's sink.

H. Water connections to appliances shall be made with flexible copper tubing or commercial grade double-reinforced stainless steel braided hose, no less than 3/8" in size, or the connections size of the appliance, whichever is greater.

I. Soldered joints shall be made with tin-antimony/silver solder. Solder containing lead shall not be permitted.

J. Saddle valves and "T" fittings that rely on puncturing the piping main are disallowed.

3.0 EXECUTION

3.01 ARRANGEMENT

A. Follow the general piping layout, arrangement, schematics and details. Provide all offsets, vents, drains and connections necessary to accomplish the installation. Fabricate piping accurately to measurements established at the project site to avoid interference with ductwork, other piping, equipment, openings, electrical conduits and light fixtures. Make suitable provision for expansion and contraction with expansion loops and offsets.

B. Cleanouts shall be provided at the base of all sanitary and storm risers and as required by code.

C. Fittings, unions, joints, couplings (including no-hub couplings), etc. shall not be within slabs.

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A TENANT ADDITION

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for

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D. All potable domestic water connections to equipment shall be provided with backflow prevention as required by the specification section and code.

E. Pressure gauges and thermometers called to be permanently installed shall be easily visible from a standing position on the ground.

3.02 UNDERGROUND WATER PIPING

A. All copper water lines, or other material subject to corrosion, shall be protected from corrosion with a continuous plastic sheathing or coating and wrapping. This sheathing or coating and wrapping shall be extended 6" to 12" above finished floor. The protection shall be installed on the outside of any insulation required.

3.03 PIPING INSTALLATION ABOVE CEILINGS

A. All domestic hot and cold-water piping installed above the insulated ceilings shall be installed just above (within 2") of the top of the finished ceiling with the building insulation over the piping to avoid freeze-up.

3.04 DISINFECTION

A. All domestic water piping installed under this Division shall be disinfected with chlorine before it is placed into operation. The chlorinating material shall be liquid chlorine conforming to Federal Specification BB-C-120 and shall be introduced to the system by experienced operators only. The chlorine solution applied to the piping sections or system shall contain at least fifty parts per million of available chlorine and shall remain in the sections or system for a period of not less than sixteen (16) hours. During the disinfection period, all valves shall be opened and closed at least four times. After the disinfection period, the chlorinated water shall be flushed from the system with clear water until the residual chlorine content is not greater than two-tenths parts per million (0.2 PPM). Submit certification to the Architect that the system was disinfected.

END OF SECTION

SECTION 22 30 00

PLUMBING EQUIPMENT

1.0 GENERAL

1.01 DESCRIPTION

A. All work specified in this Section is governed by the Common Work Results for Plumbing Section 22 05 00.

B. This Section 22 30 00 and the accompanying drawings cover the provisions of all labor, equipment, appliances, and materials and performing all operations in connection with the construction of the water heating systems as specified herein and as shown. These systems include, but are not limited to, the following:
1. Water Heaters

1.02 GENERAL REQUIREMENTS

A. All plumbing equipment installed in locations with a water hardness of 25 grains per gallon or more, shall be resistant to corrosion. Where copper materials are in the water stream, it shall be Cupro-Nickel of not more than 90% copper.

B. All water heaters shall be NSF/ANSI 61 certified "lead free" for potable water service.

C. All water heaters shall have ASME rated temperature and pressure relief valve(s). Valve(s) shall be provided by the Manufacturer and sized for the discharge location noted in the plans.

D. All water heaters and tanks shall be glass-lined, 1600°F fired, with a working pressure of 150 psi, a test pressure of 300 psi, or the system pressure at the installation location, whichever is greater, and shall have magnesium anodes for electrolytic protection. Separate storage tanks may also be cement-lined. Tanks shall be ASTM stamped.

E. All water heaters shall meet or exceed the energy efficiency requirements of the latest version of ASHRAE 90.1.

F. All water heaters and pumps shall be UL approved and labeled, and be AGA certified where applicable.

G. All water heaters and pumps shall be NEMA rated appropriate for the installation location in which they are installed.

H. Water heater controls shall include an operating thermostat and manual reset high limit control for each heating element or burner. The safety high limit control shall prevent over heating in the event of a thermostat failure.

I. All controls shall be factory-wired and require no external power source.

J. Water heaters and tanks shall have drain with external access and hose end connection.

2.0 PRODUCTS

2.01 WATER HEATER

A. The water heater shall be as scheduled. Acceptable substitute manufacturers are AO Smith, Lochinvar, Raypak, Rheem, and Bradford White, subject to substitution requirements.

B. Water heater shall be gas-fired with full modulation firing down to 20% of rated input with a turn down ratio of 5:1. The tank shall have two or more magnesium anodes to provide electrolytic protection.

C. Controls shall include an operating thermostat, automatic reset high limit, secondary overheat control, and gas valve with 100% safety pilot feature.

D. Water heater shall be provided with handhole cleanouts and slide-out burner tray for ease of inspection, cleaning and servicing.

E. Where applicable, the water heater shall have a replaceable combustion air filter.

3.0 EXECUTION

3.01 INSTALLATION

A. The water heaters and accessories shall be installed in strict accordance with the manufacturer's recommendations and the Contract Documents.

B. All temperature and pressure relief valves shall be piped full size to an indirect waste such as the nearest floor drain, service sink, sink tailpiece, etc. Piping shall be in accordance with specification 22 10 00 for DWV services. Size shall be in accordance with manufacturer's requirements.

C. All water heaters shall have internal heat traps or shall have heat traps installed in the cold water and hot water piping. Instantaneous water heaters shall be provided with heat traps unless manufacturer documentation specifically allows exclusion.

D. Water heaters shall be completely encased in high density insulation of sufficient value to meet the energy efficiency standards of latest version of ASHRAE 90.1, or shall be factory insulated with non-CFC polyurethane closed-cell foam insulation. Provide removable insulation panels to maintain access to all required components.

E. All water heaters or boilers subject to condensing under normal steady-state operating conditions shall be provided and installed with accessory condensate neutralization kits.

3.02 WARRANTY

A. Provide 5-year limited warranty on all tanks, and 1-year limited warranty on parts unless otherwise noted.

END OF SECTION

SECTION 22 40 00

PLUMBING FIXTURES

1.0 GENERAL

1.01 DESCRIPTION

A. All work specified in this section is governed by the Common Work Results for Plumbing Section 22 05 00.

B. This Section 22 40 00 and the accompanying drawings cover the provisions of all labor, fixtures, equipment, appliances and materials, and performing all operations in connection with the construction and installation of the plumbing fixtures and trim as specified herein and as shown.

C. All finishes shall be as selected by the Architect. Where the Architect does not have a preference, finishes shall be in accordance with this specification.

D. All exposed piping, valves, stops, P-traps, etc. shall be chrome-plated. Also, all exposed piping penetrations through walls, floors or ceilings shall be provided with chrome-plated cast brass escutcheons.

E. All P-traps shall be minimum 17-gauge brass.

F. All exposed P-traps subject to contact, such as those below wall-mounted or counter-mounted lavatories, shall be provided with insulated covers as required.

G. All exposed supply stops for hot water, such as those below wall-mounted or counter-mounted lavatories, shall be provided with insulated covers as required. Where there are hot and cold water supply stops together, cold water supply stops shall match insulated cover of hot water supply stop.

H. Provide all final connections to all equipment and fixtures furnished by Owner.

I. Unless otherwise specified in an individual fixture description, all enameled cast-iron and porcelain fixtures shall be white.

J. All lavatories and other hand-washing fixtures shall be provided and installed with ASSE 1070 point-of-use mixing valve on the hot water connection. Mixing valve shall be set to provide no more than 110°F hot water.

1.02 INTENT

A. It is the intent of this Section of the specifications to provide complete, operable, adjusted, clean plumbing fixtures as shown and specified, which are free of leaks, noise, air, vibration and waterflow fluctuations.

1.03 BASIS OF DESIGN

A. The basis of design is as outlined for each fixture in the 2.0 PRODUCTS subsection. Any proposed substitutions shall be proven equal in all respects to the equipment specified as the basis of design.

1.04 ACCEPTABLE MANUFACTURERS

A. Acceptable fixture manufacturers for each type of fixture is as follows:
1. Emergency Shower and Eyewash – Acorn, Bradley, and Guardian

2.0 PRODUCTS

2.01 EMERGENCY SHOWER/EYE WASH

A. Fixture P-1 shall be a barrier free combination drench shower and eye/face wash unit, Bradley Model S19-310SBFW. Showerhead shall be 3" diameter yellow impact-resistant plastic. Shower valve shall be chrome-plated brass 1" lps stay-open ball valve operated by a 37" pull rod with handle. Eye wash heads and chrome-plated circular spray ring for supplemental face spray. Eye wash valve shall be a chrome-plated ½" lps stay-open ball valve, hand operated by stainless steel push flag handle. Frame shall be 1¼" yellow galvanized steel pipe with floor flange. Emergency shower/eye wash shall be tested and comply with ANSI Z358.1.

2.02 All fixtures shall be as scheduled.

3.0 EXECUTION

3.01 INSTALLATION

A. Units shall be installed as indicated and in conformance with the manufacturer's recommendations. Coordinate the actual units to be provided with all trades.

B. All plumbing fixtures shall be free of leaks, provided completely finished, trimmed, adjusted, cleaned and ready for use. They shall be properly secured to the structure by the use of thru-bolting, backplates, carriers, expansion shields (for floor mounting only) or toggle bolts.

C. Fixtures on steel stud walls shall have a 1/4" x 4" wide steel backplate wired with 1/16" steel wire to the studs. Bolts not less than 3/8" shall secure the fixtures through the fixture hanger and the backplate.

D. All mounting holes provided in fixtures shall be used for support. In addition to the main hangers, 1/4" toggle bolts shall secure the bottom of all wall hung fixtures at each drilling provided for this purpose.

E. Mount wall-hung fixtures at the heights indicated on the Architectural Drawings or as prescribed by local code. Special attention is called to the installation requirements of the ANSI Handicap Code.

3.02 CLEANING AND ADJUSTMENT

A. The units shall be cleaned, tested and field-adjusted to provide optimum flow and drainage. Specific attention is called to adjustment of automatic flush valves and faucets for empirical conditions.

B. All flush valves, diaphragms, strainers, aerators, etc. shall be fully cleaned after all piping and fixture flushing.

END OF SECTION

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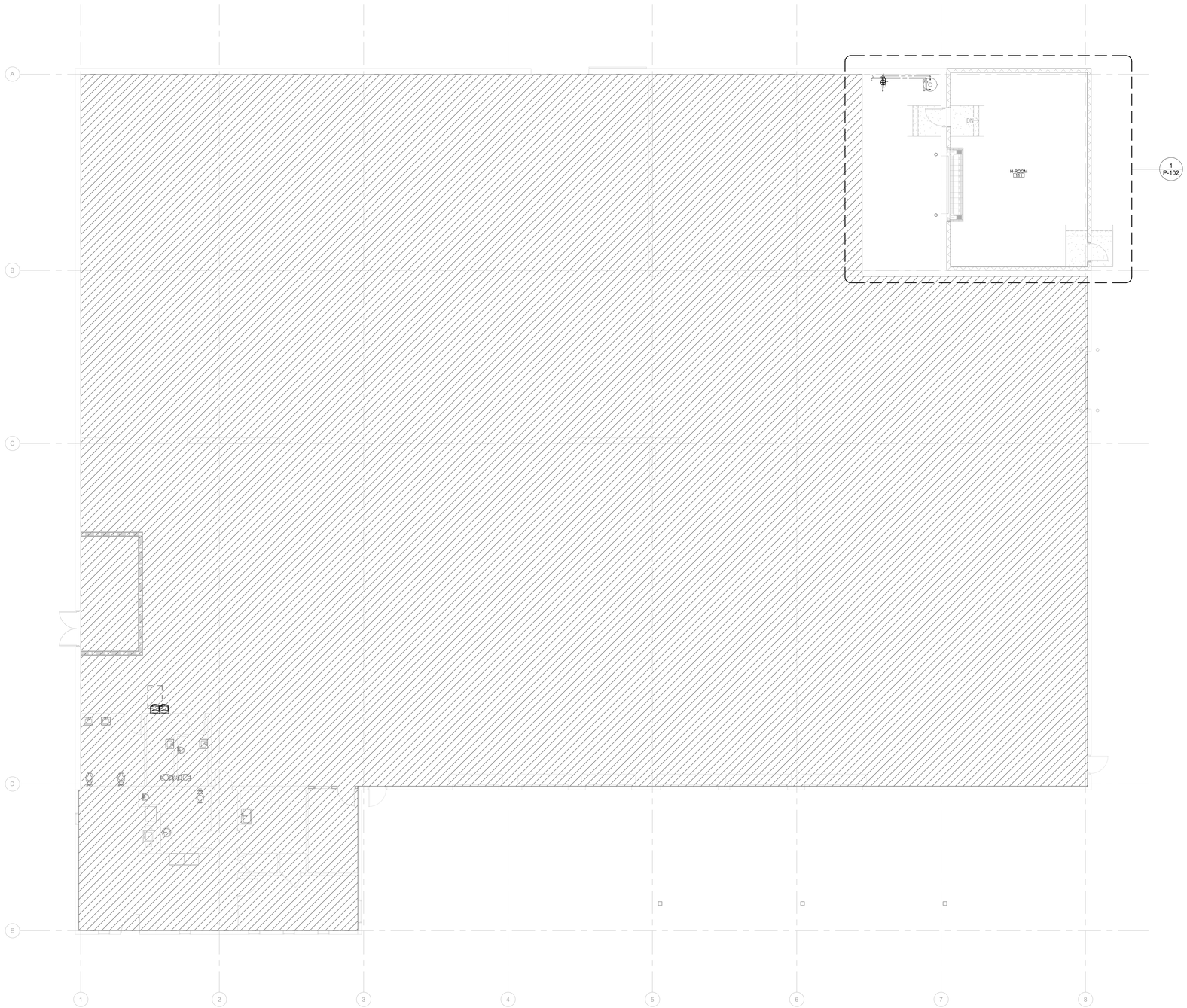

1 Plumbing Plan - Overall
1/8" = 1'-0"

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FIRE ALARM SYSTEM INPPUT/OUTPUT MATRIX

SYSTEM OUTPUTS: FACP ANNUNCIATION (A–I) · NOTIFICATION (J–L) · REQUIRED FIRE SAFETY CONTROL (M–Y)

A = ACTUATE COMMON ALARM SIGNAL INDICATOR
B = ACTUATE AUDIBLE ALARM SIGNAL
C = ACTUATE COMMON SUPERVISORY SIGNAL INDICATOR
D = ACTUATE AUDIBLE SUPERVISORY SIGNAL
E = ACTUATE COMMON TROUBLE SIGNAL INDICATOR
F = ACTUATE AUDIBLE TROUBLE SIGNAL
G = ACTUATE ZONE OR DEVICE ADDRESS ALARM INDICATOR
H = ACTUATE GENERAL EVACUATION SIGNAL
I = DISPLAY CHANGE OF STATUS
J = TRANSMIT FIRE ALARM SIGNAL TO CENTRAL STATION
K = TRANSMIT SUPERVISORY SIGNAL TO CENTRAL STATION
L = TRANSMIT TROUBLE SIGNAL TO CENTRAL STATION
M = RELEASE MAGNETICALLY HELD DOORS
N = ACTUATE WARNING TO ELEVATOR CABS
O = DELAYED REMOVAL OF POWER FROM ELEVATOR
P = UNLOCK EXITS AND CONTROL DOORS
Q = SHUT DOWN RESPECTIVE AIR HANDLING EQUIPMENT
R = ---
S = ---
T = ---
U = ---

	SYSTEM INPUTS	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	
1	FIRE ALARM SYSTEM AC POWER FAILURE			●	●							●															1
2	FIRE ALARM SYSTEM LOW BATTERY					●	●						●														2
3	OPEN CIRCUIT					●	●						●														3
4	GROUND FAULT					●	●						●														4
5	NOTIFICATION APPLIANCE SHORT CIRCUIT					●	●						●														5
6	BUILDING MANUAL PULL STATIONS	●	●					●	●	●	●			●			●										6
7	CORRIDOR SMOKE DETECTORS	●	●					●	●	●	●			●			●										7
8	AREA SMOKE DETECTORS	●	●					●	●	●	●			●			●										8
9	HVAC AIR DUCT SMOKE DETECTORS			●	●			●				●						●									9
10	SPRINKLER TAMPER SWITCH			●	●			●				●															10
11	SPRINKLER WATER FLOW IN BUILDING	●	●					●	●	●	●			●			●										11
12	SPRINKLER WATER FLOW IN ELEV EQUIP RM OR SHAFT	●	●	●	●			●	●	●	●	●		●	●	●	●										12
13	FIRE PUMP POWER FAILURE/PHASE REVERSAL			●	●			●				●															13
14	FIRE PUMP RUNNING	●	●					●	●	●	●			●			●										14
15	FIRE PUMP SYSTEM NOT IN AUTOMATIC			●	●			●				●															15
16	AREA OF REFUGE TWO-WAY COMMUNICATIONS STATUS			●	●			●				●															16
17																											17
18																											18
19																											19
20																											20
21																											21
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25																											25
26																											26
27																											27
		A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	

FIRE ALARM GENERAL NOTES:

1. ALL NEW FIRE ALARM DEVICES SHALL BE ADA APPROVED. DEVICE FINISH SHALL BE WHITE. PROVIDE ANY ADDITIONAL POWER AMPLIFIERS REQUIRED BY ADA APPROVED DEVICES.
2. COORDINATE FIRE ALARM SYSTEM REPROGRAMMING WITH LANDLORD. AT THE CONCLUSION OF THIS PROJECT, THE FIRE ALARM SYSTEM SHALL BE TESTED IN ACCORDANCE WITH THE 2016 EDITION OF NFPA 72 SECTION 10.4.1.2, "REACCEPTANCE TESTING", INCLUDING THE REQUIREMENT FOR TESTS OF RANDOMLY SELECTED EXISTING DEVICES LOCATED OUTSIDE THE AREA OF CONSTRUCTION.
3. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO KEEP THE BUILDING FIRE ALARM SYSTEM FUNCTIONAL DURING THE PERFORMANCE OF THIS PROJECT. ANY FIRE ALARM SHUT DOWN SHALL BE CONDUCTED ONLY ON INDIVIDUAL ZONES AND NOT THE ENTIRE SYSTEM. IF A WHOLE BUILDING-WIDE FIRE ALARM SHUTDOWN IS REQUIRED, THE CONTRACTOR SHALL NOTIFY THE LANDLORD AND SUBMIT A FIRE WATCH PLAN TO THE LOCAL FIRE MARSHAL AT LEAST ONE WEEK IN ADVANCE. THE CONTRACTOR MUST RECEIVE APPROVAL FROM THE OWNER PRIOR TO SHUTTING DOWN THE FIRE ALARM SYSTEM.
4. THE TECHNICIANS WHO MAKE ANY CONNECTIONS TO (OR PERFORM ANY PROGRAMMING FOR) THE FIRE ALARM SYSTEM SHALL BE TRAINED AND INDIVIDUALLY CERTIFIED BY THE MANUFACTURER OF THE FACP MODEL/SERIES BEING INSTALLED. THIS TRAINING AND CERTIFICATION MUST HAVE OCCURRED WITHIN THE MOST RECENT 24 MONTHS.
5. "EX' DENOTES EXISTING DEVICE TO REMAIN. 'RE' DENOTES EXISTING DEVICE TO BE REUSED/RELOCATED.
6. OFFER ALL MATERIALS, FIXTURES, AND EQUIPMENT REMOVED AS PART OF THIS DEMOLITION WORK UNDER THIS CONTRACT AND NOT NOTED TO BE REUSED TO THE OWNERS REPRESENTATIVE PRIOR TO DISPOSAL.
7. ROUTE CABLING AS REQUIRED FOR OPEN CEILING AESTHETIC.
8. ALL EXISTING POWER DISTRIBUTION, FIRE ALARM, ETC. JUNCTION BOXES SHALL BE RELOCATED IF LOCATED OVER A CEILING SCHEDULED TO BE GYPSUM BOARD. ALL EXISTING JUNCTION BOXES SHALL BE RELOCATED IF NECESSARY TO AN ACCESSIBLE LOCATION. WHERE AN EXISTING JUNCTION BOX LOCATION IS NOT ABLE TO BE RELOCATED, PROVIDE A RECESSED ACCESS PANEL IN THE CEILING FOR ACCESS. ACCESS PANEL TO MATCH CEILING FINISH. COORDINATE EXACT LOCATION OF ACCESS PANELS WITH ARCHITECT PRIOR TO INSTALLATION.
9. ALL WIRING IN OPEN CEILING AREA SHALL BE IN CONDUIT AND ROUTED IN PARALLEL / PERPENDICULAR WITH THE STRUCTURE. EMT CONDUIT SHALL BE UTILIZED IN EXPOSED CEILINGS, SURFACE MOUNTED WALL AREAS AND FOR HOMERUNS TO THE PANELBOARDS. MC CAN BE UTILIZED IN ALL WALLS AND CONCEALED CEILING AREAS. ALL EXPOSED CONDUIT AND BOXES SHALL BE PAINTED TO MATCH THE SURFACE WHERE INSTALLED IF REQUIRED BY ARCHITECT.

FIRE ALARM SYMBOL LEGEND

SYMBOL	DESCRIPTION	ON CENTER MTG. HT.
F ( ) cd / F ( ) cd	FIRE ALARM ADA APPROVED WALL MOUNTED HORN/STROBE ALARM. ENTIRE LENS SHALL NOT BE LESS THAN 80" AND NOT GREATER THAN 96" AFF. ( ) cd = CANDELA RATING INDICATED ON PLAN	80" A.F.F.
V ( ) cd	FIRE ALARM ADA APPROVED WALL MOUNTED VISUAL ALARM. ENTIRE LENS SHALL NOT BE LESS THAN 80" AND NOT GREATER THAN 96" AFF. ( ) cd = CANDELA RATING INDICATED ON PLAN	80" A.F.F.
F ( ) cd	FIRE ALARM ADA APPROVED CEILING MOUNTED HORN/STROBE ALARM. ENTIRE LENS SHALL NOT BE GREATER THAN 10'-0" AFF. ( ) cd = CANDELA RATING INDICATED ON PLAN	
V ( ) cd	FIRE ALARM ADA APPROVED CEILING MOUNTED VISUAL ALARM. ( ) cd = CANDELA RATING INDICATED ON PLAN	
FACP	FIRE ALARM CONTROL PANEL	
FAA	FIRE ALARM ANNUNCIATOR	
FABP	FIRE ALARM BOOSTER PANEL	
H	HEAT DETECTOR	
D D	FIRE ALARM SMOKE DETECTOR - WALL MTD., CEILING MTD.	12" BC
F	FIRE ALARM PULL STATION	48" A.F.F.
D	DUCT MOUNTED SMOKE DETECTOR	
D	SMOKE DETECTOR OR DUCT MOUNTED SMOKE DETECTOR IN RETURN AIR PATH PER NFPA.	
M	FIRE ALARM MAGNETIC DOOR HOLD. COORDINATE WITH ARCHITECT.	
* F	FIRE ALARM CONNECTION TO SPRINKLER FLOW SWITCH	
* T	FIRE ALARM CONNECTION TO SPRINKLER TAMPER SWITCH	
FSD	FIRE/SMOKE DAMPER - COORDINATE WITH DIVISION 23	

LEGEND NOTES:

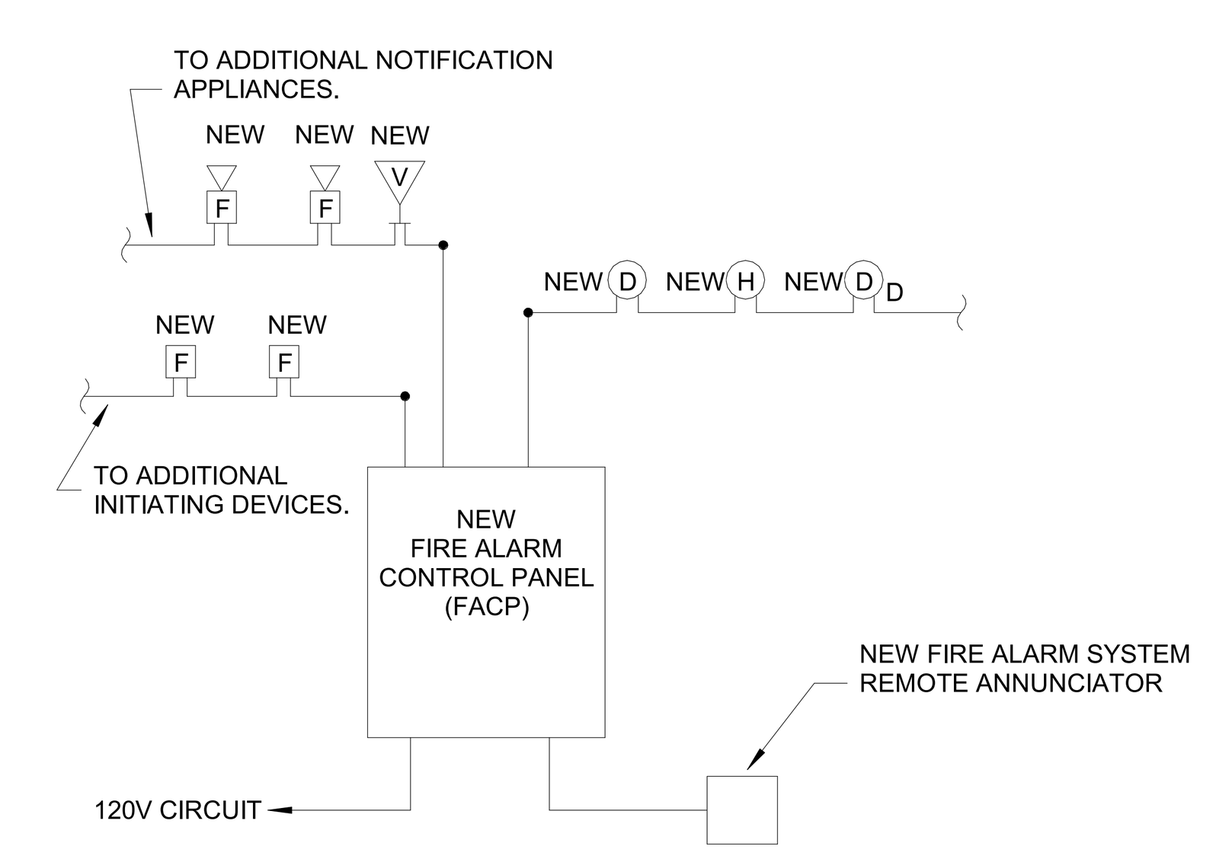
- DEVICE BOXES IN RATED WALLS SHALL MEET STANDARD BUILDING CODE SECTION 705.4.
- COORDINATE DEVICE HEIGHTS WITH ARCHITECT'S PLANS AND ELEVATIONS.
- ALL FIRE ALARM DEVICES SHALL BE 110 CD AND 75 DBA UNLESS NOTED OTHERWISE.
- ALL FIRE HORNS AND STROBES SHALL BE WHITE UNLESS DIRECTED OTHERWISE BY OWNER AND ARCHITECT.

*NOTE: CONTRACTOR SHALL COORDINATE THE LOCATION AND QUANTITY OF ALL FLOW SWITCHES AND TAMPER SWITCHES WITH SPRINKLER SHOP DRAWINGS. PROVIDE CONNECTIONS WHERE REQUIRED.

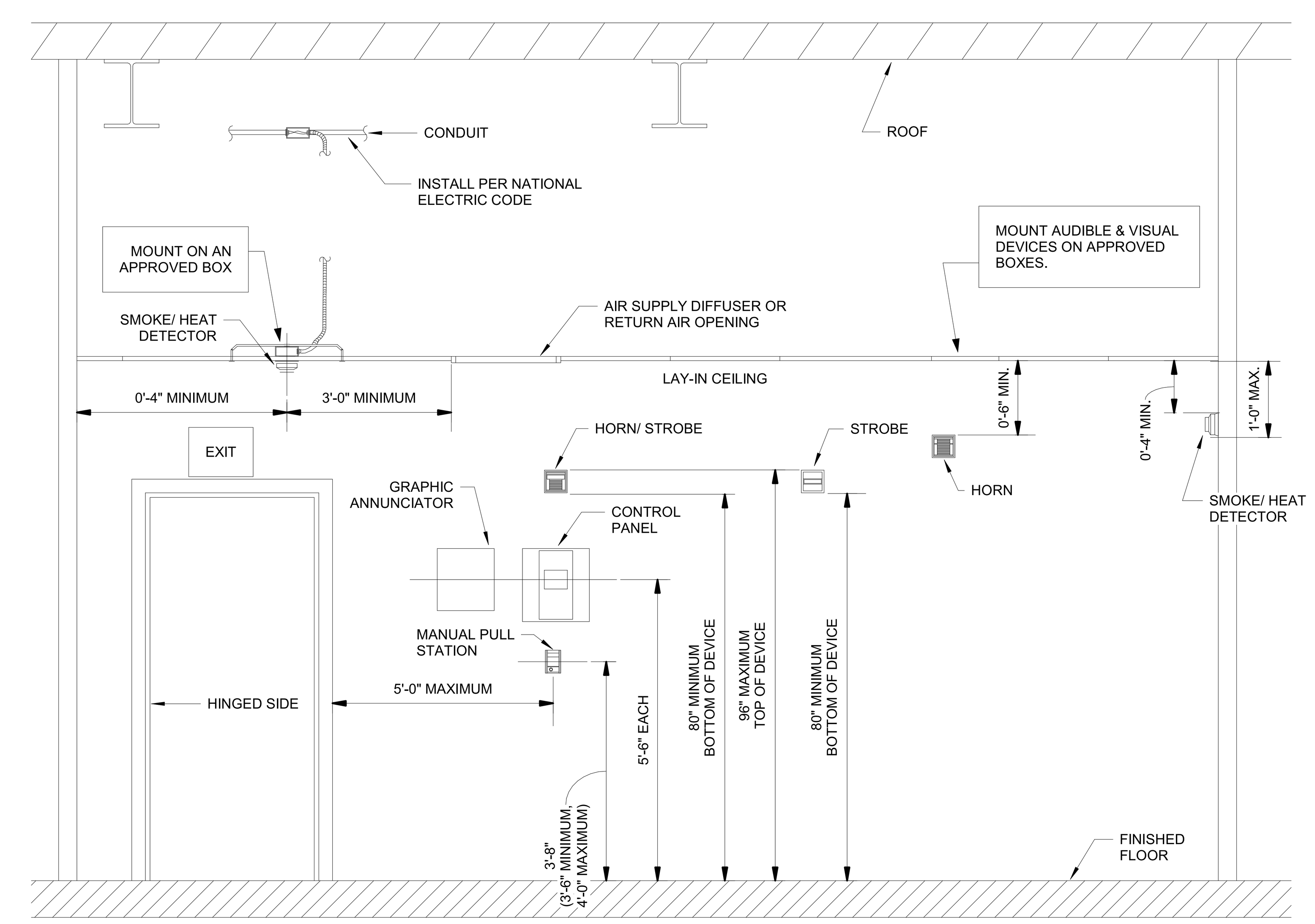
FIRE ALARM STATEMENT:

THIS SET OF FIRE ALARM DESIGN DRAWINGS IS NOT APPROVED FOR CONSTRUCTION. CITY OF ROCKWALL APPROVED SHOP DRAWINGS ARE REQUIRED ON SITE PRIOR TO INSTALLATION OF THE FIRE ALARM SYSTEM. ENGINEER SHALL REVIEW SHOP DRAWINGS PRIOR TO SUBMITTAL TO THE CITY OF ROCKWALL. FAILURE TO OBTAIN APPROVED SHOP DRAWINGS PRIOR TO INSTALLATION WILL RESULT IN ISSUANCE OF A "STOP WORK ORDER."

NFPA 72 AND ADA DEVICE INSTALLATION REQUIREMENTS



1 FIRE ALARM RISER
NOT TO SCALE



2 FIRE ALARM DEVICE MOUNTING DETAIL
NOT TO SCALE

RANDALL PAULSON architects
Roswell . Nashua

STATE OF TEXAS
CHADWICK M. VICKERY
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FIRE ALARM LEGEND, NOTES, & DETAILS

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BWA Project #: 2024-1025

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FA-001

■ Released for Construction
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FIRE DETECTION AND ALARM

SECTION 283100 – FIRE DETECTION AND ALARM

PART 1 – GENERAL

1.1 DESCRIPTION

A. This section of the specification includes the, installation, connection and testing of the microprocessor controlled, intelligent reporting fire alarm equipment required to form a complete, operative, and coordinated system.

B. The fire alarm system shall comply with requirements of the NFPA Standard 72 for Protected Premises Signaling Systems and all local codes and regulations. The system shall be electrically supervised and monitor the integrity of all conductors.

C. Alarm, trouble and supervisory signals from all intelligent reporting devices shall be encoded onto the Signaling Line Circuits.

D. The system shall be an active/interrogative type system where each transponder is repetitively scanned, causing a signal to be transmitted to the local fire alarm control panel/node indicating that the transponder and its associated initiating device and notification appliance circuit wiring is functional. Loss of this signal at the local FACP shall result in a trouble indication on both the FACP display and at the network display, as specified hereinafter for the particular input.

E. The system shall be arranged such that not less than 20 percent additional transponders may be inserted into any network communication loop.

F. The installing company shall employ NICET (minimum Level II Fire Alarm Technology) technicians on site. To guide the final checkout and to ensure the systems integrity, the submitting company shall employ NICET Level IV minimum managers and engineers. Proof of NICET level training shall be included as part of submittal package and kept on site with personnel.

G. The Contractor shall make arrangements and pay all fees in connection with the testing of the Life Safety System. All system devices shall be tested for their correct operation, except non-restorable type heat detectors which shall be sample tested. All tests carried out shall meet the requirements of the local authority having jurisdiction.

1.2 SCOPE

A. A new intelligent reporting, microprocessor controlled fire detection system shall be installed in accordance to the project specifications and drawings.

B. Basic Performance
1. Each SLC loop shall be wired NFPA 72 Class B, Style 4.
2. Initiation Device Circuits (IDC) shall be wired (NFPA Class B, Style B) as part of an addressable device connected by the SLC circuit.
3. Notification Appliance Circuits (NAC) shall be wired (NFPA Class B, Style Y) as part of an addressable device connected by the SLC circuit or a panel circuit.
4. NAC speaker circuits and control equipment shall be arranged such that loss of any one (1) speaker circuit will not cause the loss of any other speaker circuit in the system.
5. Two-way telephone communication circuits shall be supervised for open and short circuit conditions. Phone circuits shall be wire (NFPA Style Y) and wired so that each vertical riser is a single circuit.

C. Basic System Functional Operation
1. As part of the fire alarm and voice communication system; when a fire alarm condition is detected and reported by one of the system initiating devices (except the smoke detectors located in air supply path of the stairwell and/or elevator shaft pressurization fans), the following functions shall immediately occur:
a. FACP will sound and display the alarm condition showing the device address, location, zone information, time/date, and device type.
b. The remote annunciator will sound and display the same information as shown on the FACP display unit.
c. The speaker outputs for the floor of the alarm shall be activated for alarm evacuation message until silenced. All speakers shall sound the fire alerting tone followed by an evacuation message. When the message ends, the alerting tone shall resume. Other sequences for alarm evacuation messaging may be directed by drawings.
d. All strobes with activated speaker outputs shall flash in a synchronized pattern.
e. Operation of the fire alarm microphone must immediately override either the message or the fire alerting tone without moving any switches except the one on the microphone. The voice communication system shall also function as a public address communication system and shall operate on a selective and general basis from the Fire Alarm Control Panel.
f. Release all magnetically held smoke doors.
g. Provide signals to the mechanical controls including smoke dampers to shut down or reroute air-handling systems to prevent the recirculation of smoke and to start the stair and elevator shaft pressurization fans.
h. Activate signals to the stairwell electric door locks as applicable.
i. Provide a DACT (Digital Alarm Communicator Transmitter) and a signal via DACT for connection to a central station or local municipal fire department (connection and leased line, if required, shall be provided by building owner).
j. Initiate a preprogrammed timing sequence.
m. Additionally, actuation of any smoke detector located in the air handling units and/or equipment rooms shall activate signals to the mechanical controls indicating the floor of occurrence.
n. The fire alerting tone shall be a low to high "slow whoop" from 200 Hz to 830 Hz lasting 2.5 seconds. Operation of the hand held microphone button shall override the alarm tone.
o. It shall be possible to silence the alarm signals by operating the signal silence switch. However, the activation of another zone shall repeat the entire alarm process, thus causing the signals to resound.
p. Each speaker circuit will have a manual selector switch. Operation of this switch will activate the speakers and fire lights associated with that circuit.
q. Silencing the alarm shall cause all speakers to silence. Firelights will continue to flash.
r. Fire pump normal power availability, fire pump phase reversal and fire pump run status shall be monitored. Loss of normal power, phase reversal shall annunciate as supervisory alarms and pump running shall annunciate as an alarm.
2. Fire Department Communication System
a. Provide a two-way Voice Communication system between the Central Control, Emergency Phones and Emergency Phone Jacks. All wires between the Central Control and remote units shall be continuously supervised. Any fault which occurs shall be reported visually and audibly at the Central Control.
b. Removal of any phone from its normal hook position or the act of plugging a portable phone into a system jack shall cause its indicator LED to flash and an audible device to beep at the Central Control. Picking up the master phone and operation of the switch for the activated circuit shall silence the beeping signal, cause the LED for the active circuit to remain on steady and, connect the remote phone to the Central Control's master phone to provide direct and private communication between the remote phone and the master phone.
c. The fire department communication system shall be capable of handling single or simultaneous conversations with maximum of 10 phones connected into the system. The phone system circuits shall be so designed to prevent static, hum or other interference to clear, intelligible two-way conversation between maximum of 10 phones of the system.
d. The system shall indicate to the person attempting to use a remote phone, by a beeping busy signal, that the signal is being received at the Central Control and that the lines are intact. Two or more phones shall be capable of being connected into the active conversation at the discretion of the person at the Central Control.
e. At the discretion of the person at the Central Control, any remote phone shall be capable of broadcasting over any selected speaker circuits.
f. Replacement of all remote telephones or removal from their jacks and returning the related circuit acknowledge switch to normal shall restore the circuits to their normal supervised condition.
3. General Operation
a. Power failures, opens, grounds or any disarrangement of the system wiring or components shall be indicated by a visual and audible trouble signal. The audible trouble signal may be silenced, however, the trouble LED shall remain lit until the system has been returned to normal operating condition.
b. All manual controls shall be supervised so that all switches must be returned to the normal automatic position to clear system supervisory signal.
c. Each independently supervised circuit shall include discrete amber "Trouble" LED to indicate disarrangement conditions per circuit.
d. Supervise the incoming power to the system so that any power failure shall be audibly and visually indicated at both the control panel and the graphic annunciator.
e. Provide low/high air supervisory signal for dry automatic sprinkler system.
f. Provide running, power fault, and phase reversal trouble signals for fire pump.
g. Provide running and power fault trouble signals for the generator.
h. Provide signal circuit and auxiliary function disconnect capability by disconnect switch or keypad to facilitate testing without disruption.

1.3 SUBMITTALS

A. General
1. Copies of all submittals shall be submitted to the Architect/Engineer for review prior to acceptance of system.
2. All references to manufacturer's model numbers and other pertinent information herein is intended to establish minimum standards of performance, function and quality.
3. The authority having jurisdiction shall be notified prior to installation of equipment and wiring. Complete information regarding the system including specifications, wiring diagrams, battery and power supply calculations, floor plans and graphics shall be submitted for approval.
4. If submittals, upon review by the Owner and/or the Owners Representative, are found not to conform with the performance, type and quality of products as well as all other requirements of these specifications; the Contractor shall be required to resubmit. The Contractor shall be responsible for the Owner's extra expenses for subsequent review(s) of rejected submittals. Such extra fees shall be deducted from payments by the Owner to the Contractor. Approval of the submittals by the Owner shall, in no case, relieve the Contractor of the responsibility to meet the requirements of this specification.

B. Shop Drawings
1. Drawings shall include the following minimum requirements for submittal:
a. Point-to-point wiring/conduit layout for all devices on 1/8" scale.
b. Device placement showing all addresses and device ID.
c. All panel and equipment terminations.
d. All circuit voltage drop and current calculations spread sheets.
2. All battery calculation spreadsheets.
3. Legend reflecting device description, manufacturer, model number, and back-box requirement.
4. Wiring legend reflecting wire function, type, and recommended manufacturer's port number.
5. Full sequence of operations.
6. Power supply and amplifier calculations.
7. Specification data sheets on each individual system component.

C. Data Sheets
1. Submit simultaneously with the shop drawings, complete manufacturer's technical data sheets showing product description, listings, and specs.
2. Copies of NICET II and IV certifications.
3. Copy of company UL listing certificate.

1.4 APPLICABLE STANDARDS AND SPECIFICATIONS:

A. The specifications and standards listed below form a part of this specification. The system shall comply with the latest standards.
1. National Fire Protection Association (NFPA), USA:
NFPA 13 Sprinkler Systems
NFPA 17A Wet Chemical Extinguishing Systems
Clean Agent Extinguishing Systems
NFPA 70 National Electrical Code
Specifically Article 760
NFPA 72 National Fire Alarm Code
NFPA 101 Life Safety Code
2. North Carolina State Building Code
3. American National Standard A17.1-1980
4. Underwriter's Laboratories Fire Resistance Directory
5. Local and State Building Codes
6. ADA Public Law 101-336
7. All requirements of the Authority Having Jurisdiction (AHJ)

1.5 APPROVALS

A. The system shall have proper listing, approval and labeling from the following nationally recognized agencies:
1. FM Factory Mutual Systems
2. UL Underwriters Laboratories

1.6 SYSTEM FEATURES

A. The system shall include the following features as a minimum:
1. During an alarm condition, the LCD annunciator shall display the activated alarm until acknowledged. This shall allow determination of where the last alarm has taken place.
2. Ground fault detection in wiring on either plus or minus side.
3. Separate alarm and trouble shall be displayed on the LCD annunciator.
4. Resound feature
5. "Dead Front" design control panel with all LED alarm trouble and power on indicators and all switches located behind a locked tempered glass door.
6. Solid state construction.
7. All alarm initiating circuit wiring, signal circuit wiring, speaker circuit wiring and emergency phone circuit wiring shall be supervised.
8. Automatic transfer to standby generator upon power failure.
9. Lightning and surge protection.

PART 2 – PRODUCTS

2.1 MANUFACTURER

A. The FACP and peripheral devices shall be manufactured by:
1. Simplex
2. Notifier
3. Edwards
4. Siemens

B. Equipment manufacturer shall maintain factory trained personnel within 50 miles of the project site and shall be available 24-hours per day.

C. Material and equipment shall be new and UL listed.

2.2 CONDUIT AND WIRE

A. Conduit shall be installed as required by specification Sections 260519 and 260534.

B. Wiring shall be in accordance with local, state and National codes (e.g., NEC Article 760) and as recommended by the manufacturer of the fire alarm system.

C. NAC circuits shall be protected from the point at which they exit the control unit until they enter the notification zone they serve. Protection shall be via Tyco Pyrotenax 2-hour fire cable installed in minimum ½" EMT conduit.

D. All fire alarm wiring shall be installed in ½" EMT conduit within walls, ceilings and where exposed to physical damage. Open cabling may be utilized in accessible ceiling areas where allowed by the authority having jurisdiction. Fire alarm cabling installed in plenum areas shall be plenum rated.

E. All wire and cable shall be listed and/or approved by a recognized testing agency for use with a protective signaling system. No point wires or diode code matrix will be used for annunciation.

F. The fire alarm control panel shall be connected to a separate dedicated branch circuit, maximum 20 amperes from the generator power source. Provide locking circuit breaker.

G. Conduit and wire installations shall meet the survivability requirements of NFPA 72.

H. All conduit and junction boxes utilized for fire alarm cabling shall be painted red.

2.3 MAIN FIRE ALARM CONTROL PANEL

A. The FACP shall be completely microprocessor based.

B. System Capacity and General Operation:
1. Configure size of panel to operate number of SLC circuits in a fashion so that each circuit handles no greater than 70% load of capacity or a maximum of 5 floors per circuit.
2. The fire alarm control panel shall include a full-featured operator interface and backlit 80-character Liquid Crystal Display (LCD).
3. The system shall be fully field programmable from the display panel. Panels requiring the use of external keyboards for programming and changes are not acceptable.
4. The FACP shall provide the minimum following features:
a. Drift compensation to extend detector accuracy over life.
b. Detector sensitivity test, per NFPA 72, Chapter 7.
c. Maintenance alert, to warn of excessive smoke detector dirt or dust accumulation.
d. Multiple sensitivity levels for alarm, selected by detector.
e. System status reports to display and printer. Provide printer.
f. Alarm verification, with verification counters.
g. Cross zoning with the capability of counting two detectors in alarm.
h. Walk test.
i. UL-1076 security monitor points.
j. Control-by-time with holiday schedules.
k. Day/night automatic adjustment of detector sensitivity.
l. Device blink control for sleeping areas.
m. Releasing capability.
n. Pre-Alarm.
o. Selectable sensitivity levels, three minimum.
p. History Storage, with a minimum of 400 events.
q. Point Enable/Disable.
r. Point Read (status and level of obscuration).
s. Output point for connection to any building EMS.
t. Generator monitoring functions to include generator running, generator fault and generator switch not on automatic.
t. Disconnect switches to disable notification, audible appliances, visual strobes, and auxiliary function points for testing purposes.
u. Alarm sensitivity testing at the FACP.
v. Provide all zones or alphanumeric point of address designations in property operation's terminology.

C. Signaling Line Circuits (SLC)
1. Each SLC interface shall provide power to communicate with 99 intelligent detectors (ionization, photoelectric or thermal) and 99 intelligent modules (monitor or control).
2. Each SLC circuit shall not exceed 70%, load capacity or cover more than 5 floors.

D. Serial Interface
1. The system shall include two serial EIA-232 interfaces. Each interface shall be a means of connecting UL Listed Electronic Data Processing (EDP) peripherals.
a. One serial port shall support a serial printer.
b. One serial port shall support a CRT/NRT device.
c. The system shall include an EIA-485 port for the serial connection of annunciators and remote LCD displays.

E. Voice Telephone Command Center (VTCC)
1. The Voice Telephone Command Center (VTCC) shall contain equipment required for all audio control, telephone system control, signaling and supervisory functions. This shall include:
a. Tone generators.
b. Digital voice units.
c. Microphone for manual paging/all call.
d. Main telephone handset.
e. Speaker/phone circuit annunciation and control modules for manual activation of each individual speaker circuit and each individual microphone/annunciator circuit.
f. Integral Digital Message Generator with a capacity of up to 60 seconds. The Digital Message Generator shall be capable of primary and secondary messages (30 seconds each). These messages shall be field programmable without the use of additional equipment.
g. Built in alert tone generators with steady, slow whoop, high/low and chime tone field programmable.
h. Provide list of evacuation pre-recorded messages and pre-alert tones to owner before ordering for selection.
i. The Voice Control Panel shall have the ability to transmit up to 4 simultaneous evacuation message channels.
2. The one-way voice communications system shall be comprised of a local microphone, single channel audio controller/tone generator/digital message player and, if shown on the plans up to eight (8) remote microphone/annunciator panels.
3. Provide individual selector switches and indicator lights for each speaker circuit at the fire command center and at each remote microphone/annunciator.
4. Provide amplifiers. Size the amplifiers to accommodate each speaker being set at a one-watt tap with twenty watts reserve per floor.
5. The two-way telephone system shall be comprised of a master telephone at the main fire alarm panel and remote master telephone as shown on the plans.
6. Provide switch and LED modules for control of individual telephone circuits at the main fire alarm control panel and at any remote locations.

F. Field Charging Power Supply (FCPS): The FCPS is a device designed for use as either a remote 24-volt power supply or used to power Notification Appliances.
1. The FCPS shall offer up to 6.0 amps (4.0 amps continuous) of regulated 24-volt power. It shall include an integral charger designed to charge 7.0 amp hour batteries. Provide batteries to support 60-hour standby with ten minutes of alarm indication at the end of this period. Battery charger shall be capable of recharging all batteries to seventy percent capacity in twelve hours.
2. The Field Charging Power Supply shall have four outputs (two Style Y/Z and two Style Y) shall be available for connection to the Notification devices.
3. Provide 20-watt spare capacity in each electrical room on each floor for tenant audible circuits. Locate in a junction box clearly labeled "tenant fire alarm audible circuits."
4. Provide two (2) each Field Charging Power Supply (DC) per floor to allow for tenant build-out expansion of NAC devices. At no time shall there exceed 70% load capacity of any FCPS on any of the common levels. Provide power capacity as follows:

Floor Size	Capacity
<25,000 gross sq. ft.	6 amps DC
25,001 to 35,000 gross sq. ft.	10 amps DC
35,001 gross sq. ft. and greater	consult manufacturer

5. Locate audible (where required) and visual power supplies adjacent to one another and in a location within each room approved by the engineer.
6. Provide battery capacity and amplifier capacity in the main fire control panel for addition of tenant devices described above.

G. Audio Amplifiers
1. The audio amplifiers will provide audio power (@ 25 Volts RMS) for distribution to the speaker circuits.
2. The amplifier shall include audio input and amplified output supervision; back up input, and automatic switchover to back up (if primary amplifier should fail).
3. Amplifiers shall be available in 30, 100, and 120-watt versions.
4. Provide amplifiers sized to accommodate each speaker being set at a one-watt tap with twenty watts reserve per floor.
5. Hardwired indicating appliance circuits (fire lights and speakers) shall be Style Y per NFPA 72. Provide one light circuit per floor and provide one speaker circuit per floor, one speaker circuit per stairwell and, one speaker circuit per elevator cab.
6. Hardwired telephone circuits shall be Style Y per NFPA 72. Provide one fire fighters telephone circuit per elevator, one per elevator lobby, one per stairwell and one for the fire pump room.
7. Provide at least two on board relays to operate door holders etc.
8. Provide necessary modules to operate remote supervised relays for fan control, elevator control, etc.

2.4 SYSTEM COMPONENTS

A. Speakers
1. Audible and visual devices shall be located to comply with the American Disabilities Act. The minimum audible level of an alarm signal shall be 70 db. Where required due to high noise levels, the alarm shall achieve a db level of 15 above the ambient conditions of normal use or occupancy.
2. All speakers shall operate on 25 VRMS or with field selectable output taps from 0.25 to 2.0 Watts.
3. Speakers in corridors and public spaces shall produce a nominal sound output of 84 dBA at 10 feet (3m) when set at one watt as measured per UL Standard 1480.
4. Frequency response shall be a minimum of 400 HZ to 4000 HZ.
5. The back of each speaker shall be sealed to protect the speaker cone from damage and dust.
6. Speakers shall be bone white in color.
7. Provide a unit cost to add two speakers per 25,000 sq.ft. This unit cost shall be applied to additional speakers that may be required at the request of the fire marshal during field inspections.

B. Strobe Lights
1. All Strobe Lights shall meet the requirements of the ADA, UL Standard 1971.
2. Strobe intensity and flash rate shall meet the requirements of UL 1971, ADA and NFPA 72.
3. Strobe unit shall mount to a four inch square electrical outlet box. The strobe light shall have a white lens with red "FIRE" imprinted on it. When the unit is combination speaker/strobe, the speaker portion shall comply with the requirements stated in A. above.
4. All strobes shall have selectable output intensities from 15 to 110 cd. The intensity selected shall meet NFPA 72 requirements for the layout shown on the drawings.
5. Strobe spacing shall be as follows:
a. Strobes shall be spaced a maximum of 100'-0" apart in corridors and within 15'-0" of the end of every corridor to comply with the requirements of NFPA 72.
b. Strobes in open areas shall be provided to comply with NFPA 72.
c. Provide strobes in public spaces such as restrooms, kitchens, breakrooms, cafeterias, conference rooms, training rooms and any other space where six or more people are likely to gather.
6. Provide a unit cost to add five strobes including required signal circuits per 25,000 sq.ft. This unit cost shall be applied to additional strobes that may be required at the request of the fire marshal during field inspections.

C. Manual Fire Alarm Pull Stations
1. Manual fire alarm pull stations shall be dual-action, non-coded, non-break glass type, equipped with key lock so that they may be tested without operating the handle.
2. Pull stations must be designed such that after an actual activation, they cannot be restored to normal except by key reset. Units shall be master keyed with control equipment.
3. An operated pull station shall automatically condition itself so as to be visually detected, as operated, at a minimum distance of 100 feet (30.5 m) front or side. This shall be achieved with the pull lever remaining at a right angle to the station body until reset.
4. The pull station body shall be constructed so that chips and scratches will not expose metal.
5. Manual fire alarm pull stations shall be located as required by NFPA 101 and the Building Code. Manual pull stations shall be installed at all exit doors and outside of each stairwell door on each floor.

D. Duct Smoke Detectors
1. Duct smoke detectors shall be addressable type with visual alarm and power indicators. Provide remote LED/test stations where duct detectors are mounted in non-visible areas such as above ceiling.
2. Each detector shall be installed upon the composite supply/return air duct(s), with properly sized air sampling tubes where required. Provide smoke detectors in each return air path of any mechanical equipment that moves air in excess of 2000 CFM to meet the requirements of NFPA 72 and 90A. Provide smoke detectors in each supply and return air path of any mechanical equipment that moves air in excess of 15,000 CFM to meet the requirements of NFPA 72 and 90A. Confirm quantities of smoke detectors required for mechanical equipment with Division 23. Room detectors may be used to accomplish smoke detection in the supply/return air paths if the application permits.
3. Each duct detector shall be installed along with addressable control module as needed for fan shutdown and/or smoke control. Detectors zoned with other devices shall be capable of operating its control module even if all other devices on their circuit have gone into alarm.
4. Duct detectors shall be installed by the mechanical contractor and electrically connected to the fire alarm system by the electrical contractor.

E. Smoke Dampers
1. Smoke dampers shall be provided by Division 23.
2. Provide a smoke detector at each smoke damper location to meet the requirements of NFPA 72. Confirm quantities of smoke detectors required for smoke dampers with Division 23. Provide 120 volt power as required for operation of smoke dampers.

F. Carbon Monoxide Detectors
1. Provide carbon monoxide detectors in mechanical rooms containing gas fired water heaters and in residential units, public spaces, and any location with gas fired fireplaces or other gas appliances. Connect so that detectors provide Supervisory alarm at Fire Alarm Control Panel (FACP).
2. Provide carbon monoxide detectors in parking garage. Provide signal to actuate garage exhaust fans.

G. LCD Alphanumeric Display Remote Annunciator
1. The alphanumeric display annunciator shall be a supervised, backlit LCD display containing a minimum of eighty, (80) characters for alarm annunciation in clear English text. Annunciator shall be located as shown on the drawings or at the location selected by the local fire department.
2. The LCD annunciator shall display all alarm, supervisory, and trouble conditions from the FACP via the serial card.

H. Portable Emergency Telephone Handset Jack (FPJ)
1. Portable emergency telephone handset jacks shall be flush mounted on stainless steel plates stamped and engraved in red identifying them as "Fire Emergency Phone" jacks.
2. Provide a minimum one (1) per enclosed exit stairwell per floor and elevator lobby on each level and other locations as specified by code. Locate a permanent phone one in main sprinkler control room/fire pump room.
3. Insertion of a portable handset plug into a jack shall send a signal to the fire command center (VTCC), which shall audibly and visually indicate the on-line condition, and shall sound a "ring" indication in the handset.
4. The two-way emergency telephone system shall support a minimum of ten (10) handsets on line without degradation of the signal.
5. Furnish storage cabinet with minimum six (6) ea. handsets near VTCC panel.

I. Portable Handsets
1. Provide six (6) portable, pluggable phones. This phone shall be red in color and constructed of Cycolat type T (a thermal ABS material). A complete assembly shall include a five foot coiled line cord and jack.
2. These phones shall be stored in a red metal cabinet located at the fire command center.
3. Telephone Cabinet: Furnish Emergency Phone enclosure with hardwired handset on the lowest floor and every fifth floor above the lowest floor in each locked stairwell. A call shall be annunciated at an approved emergency service which operates continuously by lifting handset from cradle. This emergency telephone cabinet shall be red in color with the words "Local Emergency Phone" silk screened in white on the door. Pulling the door handle shall break a plastic rod allowing the door to open. A lock shall be provided to allow authorized service entry without breaking the rod. The emergency telephone shall be black in color and shall have an armored cable.

2.5 SYSTEM COMPONENTS – ADDRESSABLE DEVICES

A. Addressable Devices – General
1. Detectors shall be intelligent (analog) and addressable, and shall connect with two wires to the fire alarm control panel signaling line circuits.
2. Addressable photoelectric smoke and thermal detectors shall provide alarm and power/polling LEDs. LED(s) shall flash under normal conditions and LED(s) shall be placed into steady illumination by the control panel, indicating an alarm condition.
3. The fire alarm control panel shall permit detector sensitivity adjustment through field programming of the system.
4. Detectors will operate in an analog fashion, where the detector simply measures its designed environment variable and transmits an analog value to the FACP based on real-time measured values. The FACP software, not the detector, shall make the alarm/normal decision, thereby allowing the sensitivity of each detector to be set in the FACP program and allowing the system operator to view the current analog value of each detector.
5. All field wiring is to be terminated on the detector base, not on the sensor head. Addressing of detectors shall be via integral decade switches built into sensor. Devices requiring separate addressing means will not be accepted.
6. Any additional equipment required to program devices are not acceptable.

B. Intelligent Photoelectric Smoke Detector
1. The detectors shall use the photoelectric (light-scattering) principal to measure smoke density and shall, on command from the control panel, send data to the panel representing the analog level of smoke density.
2. Provide photoelectric smoke detector heads with bases as required. Detectors shall be of the solid state photoelectric type utilizing a stable LED light source and a silicone photo diode as the receiving element to form a highly accurate means of smoke detection. Internal detector circuits shall be shielded against electrical interference and resistant to transients, noise and, RF interference. Detector shall be low profile, the complete unit including base shall not exceed 1.875 inches in depth. Detector shall have a dual purpose red LED that flashes continuously to show that the device is operating and, that comes on steady to show that the device is in alarm.
3. Nominal detector sensitivity shall be 1.4% per foot obscuration with a range of 1% to 1.84%. Regardless of sensitivity settings, the detector's stability shall be unaffected by high air velocity. No radioactive materials shall be used.

C. Linear Beam Smoke Detector
1. Each beam shall be comprised of a solid state infrared (IR) transmitter, photodiode receiver and microprocessor based control module. Should IR output be attenuated below the desired alarm obscuration level as a result of smoke interference an alarm will be annunciated. Total obscuration of the beam is annunciated as a beam blockage trouble signal. All wiring from the control module to the transmitter and receiver heads is supervised.
2. The projected beam smoke detector system shall have an operating range of 10 meter (33 ft.) to 100 meter (330 ft.) and be listed for spacing the beam 30 ft. from a wall and 60 ft. on center. The transmitter and receiver optical elements shall be adjustable +/- 90 degrees horizontally and +/- 30 degrees vertically. The sensitivity shall be field selectable from 7% to 50% obscuration.

D. Intelligent Thermal Detectors
1. Thermal detectors shall be intelligent addressable devices rated at 135 degrees Fahrenheit (58 degrees Celsius) and have a rate-of-rise element rated at 15 degrees F (9.4 degrees C) per minute. It shall connect via two wires to the fire alarm control panel signaling line circuit.

E. Addressable Dry Contact Monitor Module
1. Addressable monitor modules shall be provided to connect one supervised IDC zone of conventional alarm initiating devices (any N.O. dry contact device such as flow, tamper, release systems, etc.) to one of the fire alarm control panel SLCs.
2. The IDC zone shall be suitable for Style D or Style B operation. An LED shall be provided that shall flash under normal conditions, indicating that the monitor module is operational and in regular communication with the control panel.
3. For difficult to reach areas, the monitor module shall be available in a miniature package and shall be no larger than 2-3/4 inch (70 mm) x 1-1/4 inch (31.7 mm) x 1/2 inch (12.7 mm). This version need not include Style D or an LED.
4. Monitor module shall be provided for all sprinkler flow and tamper switches. Switches are furnished and installed by others and electrically connected to the fire alarm system by the electrical contractor. Verify quantities and coordinate installation of devices required with fire protection shop drawings. Provide connections to devices per fire protection shop drawings.

F. Addressable Control Module
1. Addressable control modules shall be provided to supervise and control the operation of one conventional NACs of compatible, 24 VDC powered, polarized audio/visual notification appliances. For fan shutdown and other auxiliary control functions, the control module may be set to operate as a dry contract relay. Each relay shall have a red LED mounted on its cover to indicate if that relay has been activated.
2. The control module NAC may be wired for Style Z or Style Y (Class A/B) with up to 1 amp of inductive A/V signal, or 2 amps of resistive A/V signal operation, or as a dry contact (Form-C) relay. The relay coil shall be magnetically latched to reduce wiring connection requirements, and to insure that 100% of all auxiliary relay or NACs may be energized at the same time on the same pair of wires.

PART 3 – EXECUTION

3.1 INSTALLATION

A. Provide all equipment, wiring, conduit and outlet boxes required for the erection of a complete and operating system in accordance with applicable local, state and national codes, the manufacturer's recommendations, these plans and specifications. Color code shall be used throughout.

B. Provide necessary materials and appurtenances, including coordination with the Owner concerning a complete and timely central system tie-in between the fire alarm system and the local fire department or jurisdictional authority when required by Public Authorities. A functional test of the tie-in shall be demonstrated during the final fire alarm system testing.

C. Sprinkler flow and tamper switches will be furnished and installed under Division 21. The Electrical subcontractor shall be responsible for wiring and connection to sprinkler switches.

D. Cover smoke detectors to prevent contamination by dust, and keep covered until Substantial Completion.

E. Fire alarm sub-contractor shall provide a binder of floor plate diagrams to accompany the remote annunciator panel. Floor plate diagram graphics shall be developed by the fire alarm sub-contractor and submitted for approval to the architect, the engineer and the local Fire Marshal prior to installation. Floor plate diagrams shall be located adjacent to the remote annunciator panel with final location to be approved by the architect and Fire Marshal.

3.2 TEST

A. The manufacturer's authorized representative shall provide supervision of final system panel connections, perform a complete functional test of the system and submit a written report to the contractor attesting to the proper operation of the system.

B. The fire alarm system shall be pre-tested and certified by the fire alarm vendor per NFPA 72 (National Fire Alarm Code) prior to acceptance testing. A copy of the manufacturer representative's certification report shall be made available to the owner's representative and Code Official prior to the acceptance test.

C. Test completed system in the presence of the Public Authority and owner.

3.3 FINAL INSPECTION

A. Upon completion of the installation, the electrical contractor shall provide to the architect, with a copy to the manufacturer's representative, a signed written statement attesting that all system equipment was installed in accordance with these specifications and in accordance with wiring diagrams, instructions and directions provided to the contractor by the manufacturer.

3.4 INSTRUCTION

A. Instruction shall be provided as required for operating the system. Hands-on demonstrations of the operation of all system components shall be provided and shall include one session for a period of 8 hours. Additional time that may be required for end-user training will be at added cost to owner.

B. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain units. Train Owner's maintenance personnel on procedures and schedules for troubleshooting, servicing, and maintaining system.

3.5 GUARANTEE

A. All equipment and wiring shall be guaranteed against defects in materials and workmanship for a two year period from the start up and beneficial use of the system. Warranty service for the equipment shall be provided by the manufacturer's factory trained representative during normal working hours, Monday through Friday excluding holidays. Emergency service provided at times other than as stipulated above shall be available from the same source at additional cost to the owner.

3.6 INSPECTIONS

A. Upon satisfactory completion of the system test, the manufacturer's representative shall present for the owner's consideration, a proposal to provide semi-annual inspection and tests of the system.

END OF SECTION 283100

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architecture/interiors

A TENANT ADDITION

at

SRS DISTRIBUTION, INC. - ROCKWALL, TEXAS (H-ROOM)

for

SRS Distribution

2065 KRISTY LN
ROCKWALL, TEXAS 75032

Print Record		Drw.	Chk.
14 OCT 24	ISSUED FOR PERMIT		

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10/14/2024	2023362.00

Sheet Title
FIRE ALARM SPECIFICATIONS

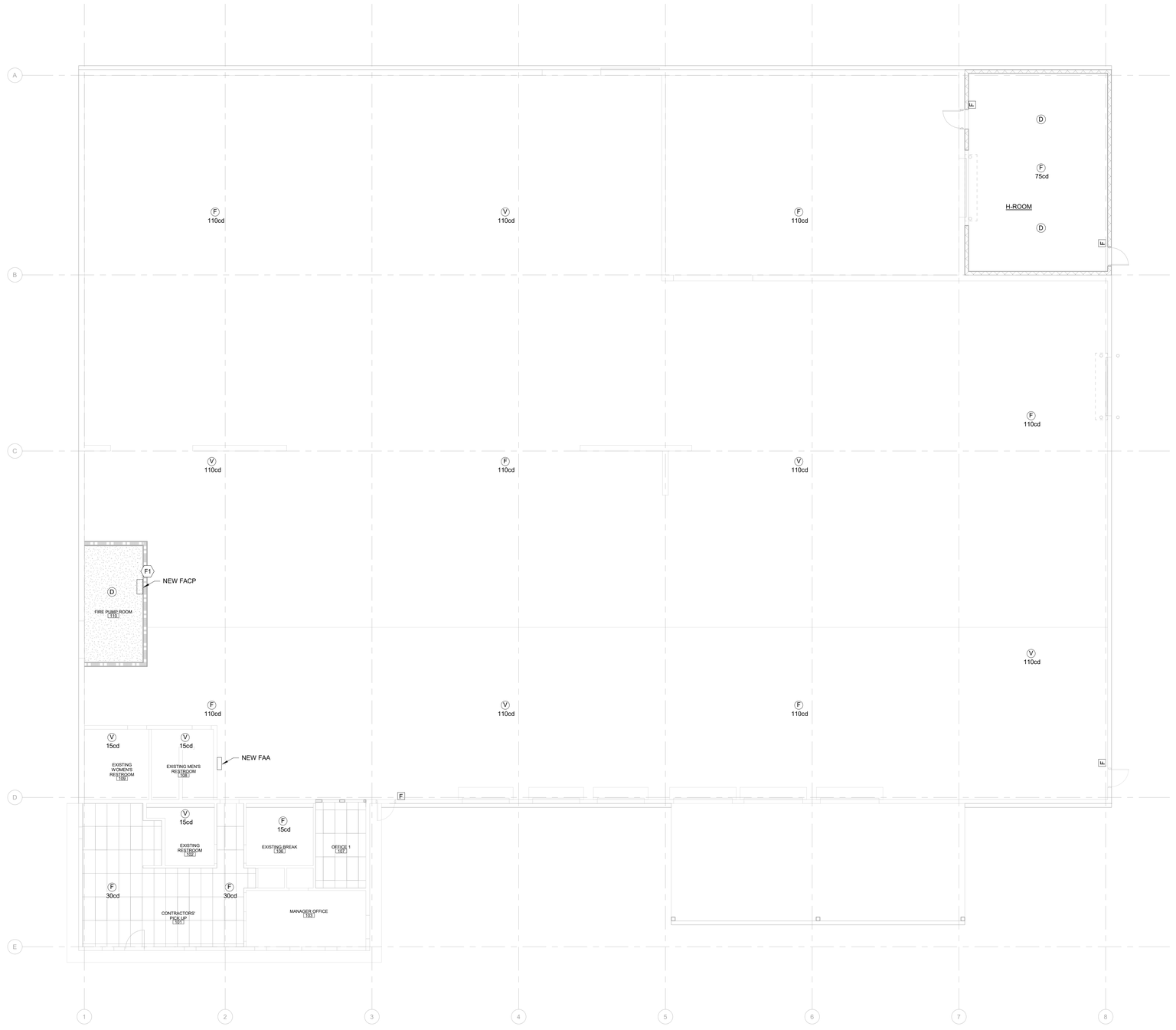
BW&A Barrett, Woodyard & Associates, Inc.
1255 Crescent Green
Ste. 230 | Cary, NC 27518
Phone: 919-747-9884

BWA COA# 13267

BWA Project #: 2024-1025

Sheet No.
FA-002

■ Released for Construction
□ Not Released for Construction



1 OVERALL FLOOR PLAN - FIRE ALARM
1/8" = 1'-0"

KEY NOTES

F1 NEW FIRE ALARM CONTROL PANEL AND SYSTEM SHALL BE BACKED-UP BY NEW EMERGENCY STAND-BY GENERATOR AS REQUIRED BY IFC 2021 SECTION 5004.7. ALL OCCUPANTS IN THE BUILDING SHALL BE ALERTED IN THE EVENT OF AN EMERGENCY INVOLVING HAZARDOUS MATERIALS STORED IN THE H-ROOM.

GENERAL NOTES

1 COORDINATE EXACT LOCATION OF ALL FIRE ALARM DEVICES WITH ARCHITECTURAL PLANS AND OTHER TRADES PRIOR TO INSTALLATION.
2 SHADED AREAS ARE NOT IN SCOPE.
3 ALL FIRE ALARM DEVICES, BOXES, AND WIRING WITHIN H-ROOM SHALL BE CLASS 1, DIVISION 1 RATED IN ACCORDANCE WITH NEC SECTION 501 REQUIREMENTS.

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FLOOR PLAN - FIRE ALARM

Sheet No.
FA-100

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□ Not Released for Construction