



**ADDENDUM #1**  
**HVAC REPLACEMENT**  
**ALF SORENSEN LOBBY & PRESCHOOL**  
**BID # 22/23-033 / PWP # WA-2023-311**  
**BIDS DUE NO LATER THAN: 1:45 PM ON MAY 10, 2023**  
**PUBLIC BID OPENING: 2:00 PM ON MAY 10, 2023**

This addendum is to notify all potential proposers of clarifications made to the Bid documents as stated below.

- A) **Bid Document Delivery** – Due to hybrid schedules and staff reductions, in-person staff availability is limited. Bidders wishing to physically deliver their bids on the bid due date shall note that the Purchasing Office will receive bids in the lobby of City Hall beginning at 1PM on May 10th. Bids are due no later than 1:45PM. Bids may also be delivered to the Purchasing Department physical dropbox/mailbox, also located in the lobby of City Hall.
- B) **Revised Plan Sheets** – Due to project items requiring clarification, stamps and signatures, the following plan sheets have been revised:
- a. T1.0 – Applicable Codes and Building Information added.
  - b. G1.1 – Note revised.
  - c. P2.3 – Note added.
  - d. E.01 – Stamped and signed.
  - e. E0.2 – Stamped and signed.
  - f. E0.3 – Stamped and signed.
  - g. E1.1 – Stamped and signed.
  - h. E2.1 – Stamped and signed and note added.
  - i. S0.1 – Stamped and signed.
  - j. S1.1 – Stamped and signed.
  - k. S2.1 – Stamped and signed.
  - l. S2.2 – Stamped and signed.
  - m. S3.0 – Stamped and signed.
- C) **Additional Bid Documents** – Structural Calculations required for construction have been included with this addendum.

Please note and adjust your bid according to the revisions, additions, deletions, clarifications or modifications as presented on this Addendum #1, which are made a part of this bid. NOTE: To avoid disqualification, this Addendum 1 (and any other addenda) must be signed by an authorized representative of the bidding firm in the space provided and must be submitted with your firm's sealed proposal. Failure to return this addendum, duly signed, may be cause for rejection of the bid. ALL

ADDENDA SHOULD BE SIGNED AND PLACED IN SEQUENTIAL ORDER AND ATTACHED TO THE FRONT OF THE BID PACKAGE, COMPLETE WITH ALL REQUIRED DOCUMENTS.

\_\_\_\_\_  
CONTRACTOR BUSINESS NAME

\_\_\_\_\_  
Dan Marran, C.P.M., CPPO  
Contracts and Risk Manager

X \_\_\_\_\_  
Authorized Signature

May 5, 2023

\_\_\_\_\_  
Printed Name of Person Signing



# ALF SORENSEN PRESCHOOL HVAC MODIFICATIONS

PWP# WA-2023-311  
 BID #22/23-033

## 1400 BARING BLVD SPARKS, NEVADA 89434



### DESIGN CONSULTANTS

**Kimley»Horn**  
 Expect More. Experience Better.

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 Matthew C. Myres, PE  
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 Kimley-Horn and Associates, Inc.  
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 (775) 656-1935

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 Expect More. Experience Better.

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MATTHEW C. MYRES, P.E.  
 M/E ENGINEERING

DATE: 04/10/2023

*Jon R. Erickson*  
 JON R. ERICKSON, P.E., P.T.C.E.  
 CITY ENGINEER

DATE: 05/05/2023

### SHEET INDEX

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### APPLICABLE CODES

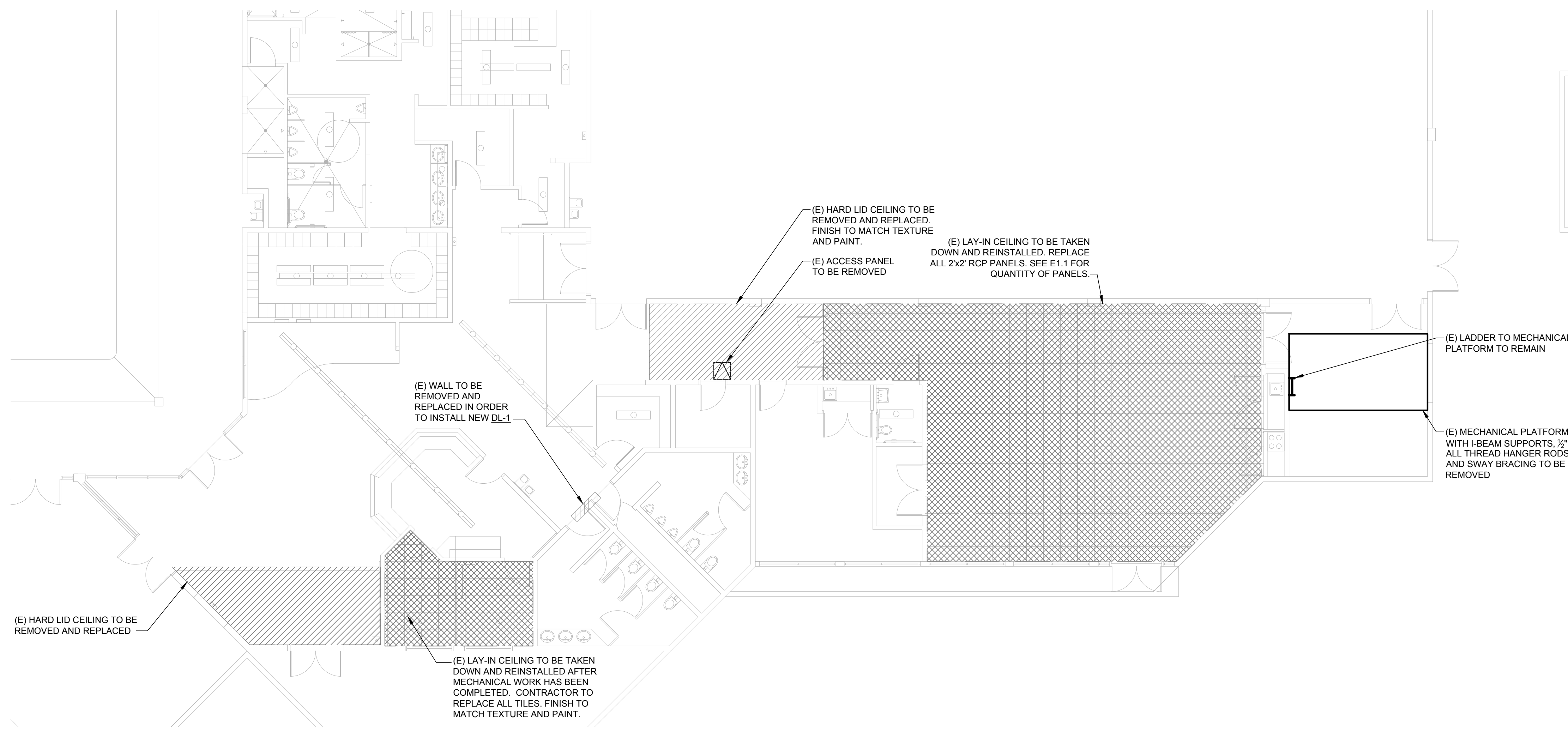
- 2018 INTERNATIONAL BUILDING CODE
- 2018 UNIFORM MECHANICAL CODE
- 2018 UNIFORM PLUMBING CODE
- 2018 INTERNATIONAL ENERGY CONSERVATION CODE
- 2018 INTERNATIONAL EXISTING BUILDING CODE
- 2017 NATIONAL ELECTRIC CODE

### BUILDING INFORMATION

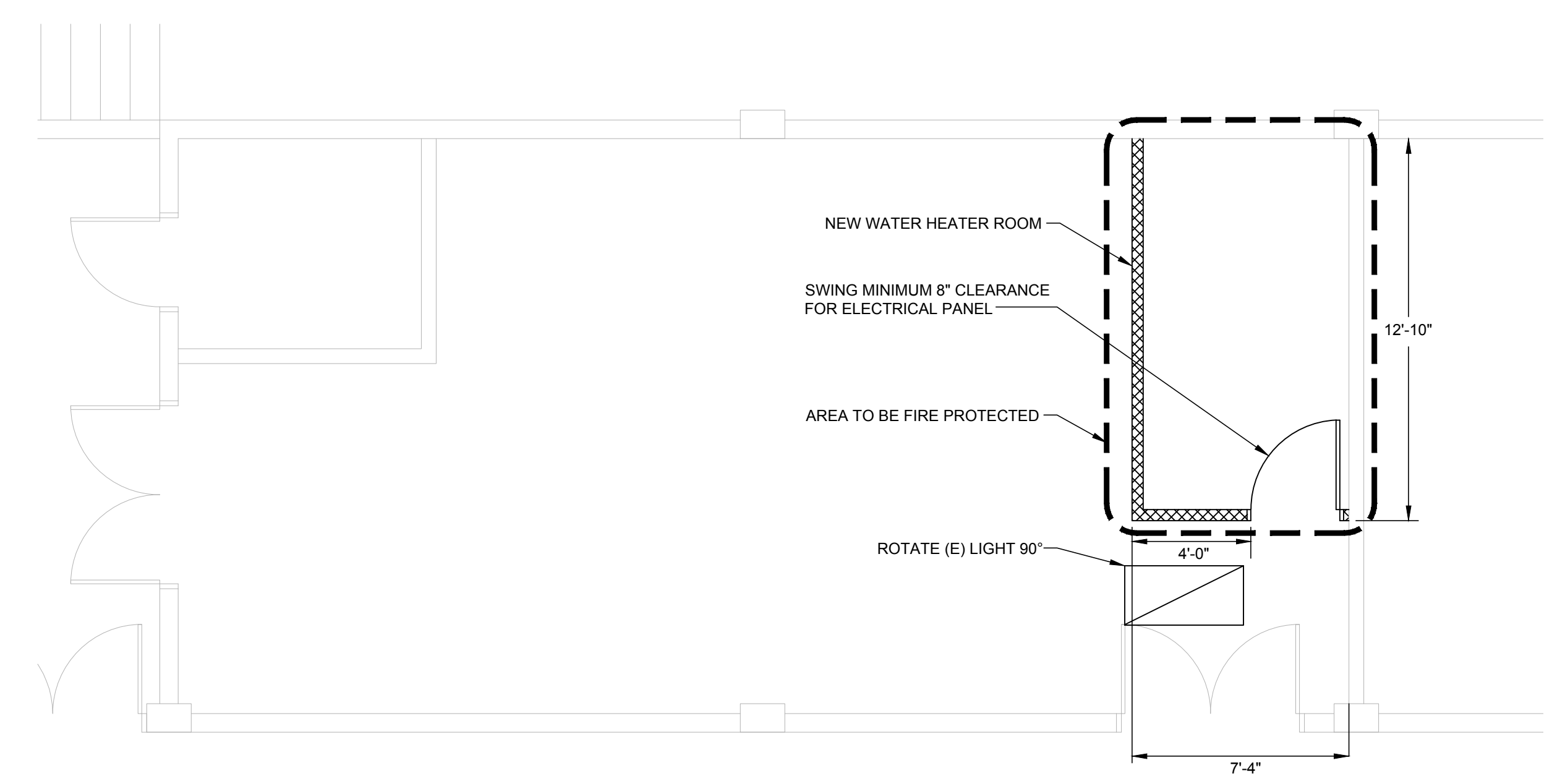
OCCUPANCY GROUP: A-3  
 CONSTRUCTION TYPE: SB



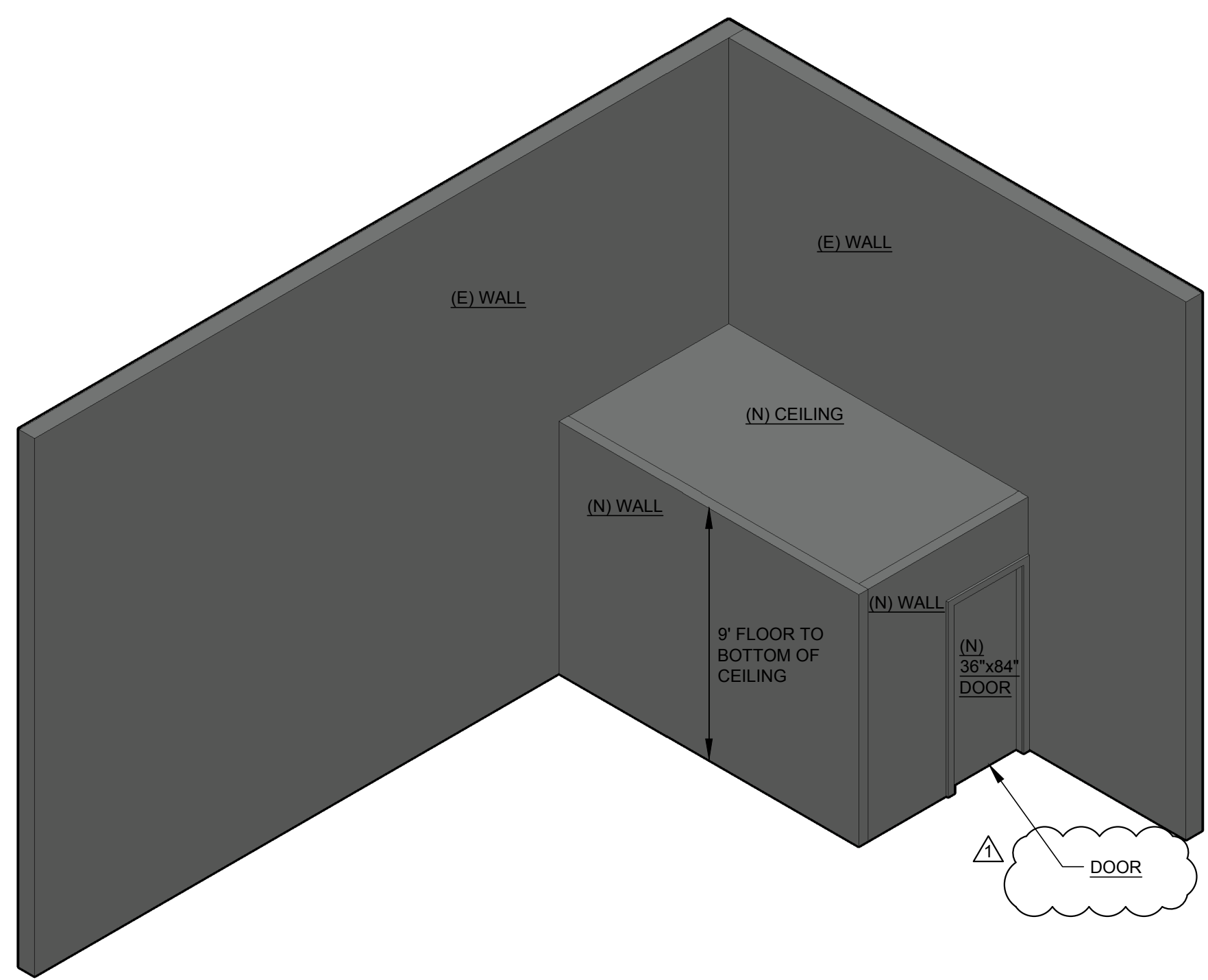
<b>Kimley»Horn</b> Expect More. Experience Better.	
<b>Kimley»Horn</b> Expect More. Experience Better.	
MATTHEW C. MYRES, P.E. M/E ENGINEERING	
DATE: 04/10/2023	
JON R. ERICKSON, P.E., P.T.C.E. CITY ENGINEER	
DATE: 05/05/2023	
<b>Kimley»Horn</b> © 2018 KIMLEY-HORN AND ASSOCIATES, INC. 7740 N. 16th STREET, SUITE 300, PHOENIX, AZ 85020 PHONE: 602-944-6500 FAX: 602-944-7423 WWW.KIMLEY-HORN.COM	
ALF SORENSEN PRESCHOOL HVAC MODIFICATIONS 1400 BARING BLVD SPARKS, NV 89434	
TITLE SHEET - GENERAL INFO	
<b>T1.0</b>	



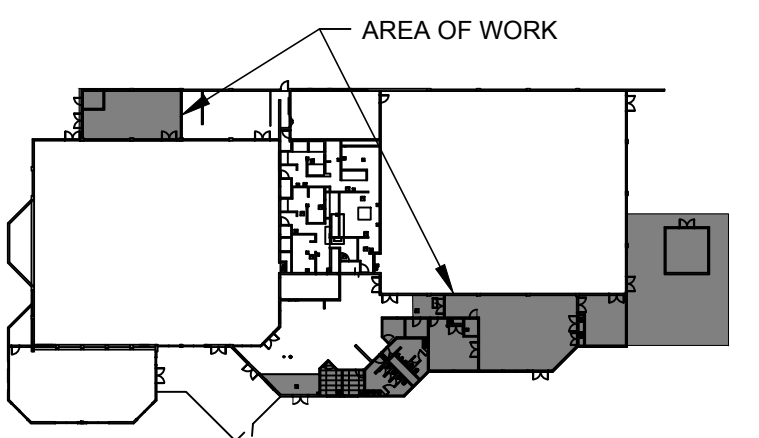
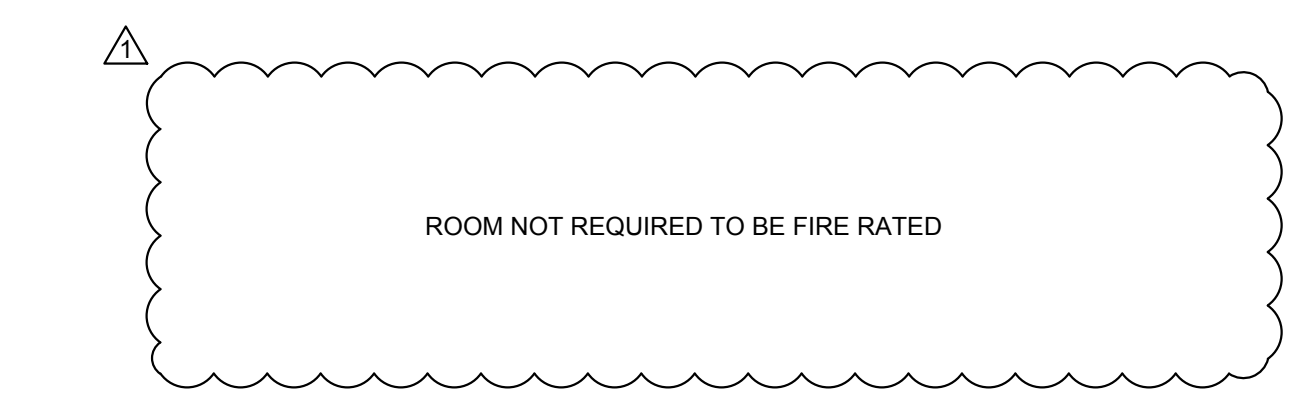
**1 FLOOR PLAN 1**  
 G1.1 SCALE: 1/8" = 1'-0" NORTH



**2 FLOOR PLAN 2**  
 G1.1 SCALE: 1/4" = 1'-0" NORTH



**3 FLOOR PLAN 3D VIEW**  
 G1.1 SCALE: 1/4" = 1'-0" NORTH



**KEY PLAN**

**GENERAL NOTE**

- ALL CEILINGS INDICATED ON THIS PLAN ARE TO BE REPLACED OR REINSTALLED AFTER MECHANICAL AND PLUMBING WORK HAS BEEN COMPLETED. CONTRACTOR TO REPLACE ALL TILES BROKEN DURING DEMOLITION. HARD LID CEILINGS ARE TO BE REPLACED COMPLETE.
- CONTRACTOR TO PROVIDE SHOP DRAWINGS FOR 1-HR RATED NEW WATER HEATER ROOM FOR APPROVAL.

**FIRE PROTECTION SPECIFICATIONS**

- THIS IS A PERFORMANCE SPECIFICATION AND THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING ALL PERMITS, FEES, DESIGN, MATERIAL, FABRICATION, STORAGE, INSTALLATION AND TESTING FOR A COMPLETE AND OPERABLE FIRE SPRINKLER SYSTEM.
- IT IS THE FIRE PROTECTION CONTRACTOR'S RESPONSIBILITY TO REVIEW ALL DOCUMENTS INCLUDING (BUT NOT LIMITED TO) ARCHITECTURAL, CIVIL, ELECTRICAL, PLUMBING, MECHANICAL, AND STRUCTURAL DISCIPLINES WHEN DESIGNING THE FIRE PROTECTION SYSTEM. THE FIRE PROTECTION CONTRACTOR SHALL ACKNOWLEDGE ON THEIR SHOP DRAWINGS THAT THEY HAVE REVIEWED ALL DESIGN DOCUMENTS AS PART OF THE PREPARATION OF THE FIRE PROTECTION SYSTEM DESIGN.
- SYSTEM SHALL MEET THE REQUIREMENTS OF NATIONAL FIRE PROTECTION ASSOCIATION (NFPA) 13, 24, THE NATIONAL ELECTRICAL CODE (NEC), AS WELL AS LOCAL BUILDING OFFICIALS, WATER DEPARTMENT AND STATE FIRE MARSHAL REQUIREMENTS AS APPLICABLE.
- SUBMIT COMPLETE SET OF SHOP DRAWINGS INCLUDING NECESSARY CALCULATIONS AND CATALOG CUTS OF MATERIALS TO THE ENGINEER AND THE AUTHORITY HAVING JURISDICTION FOR APPROVAL. OBTAIN APPROVAL PRIOR TO INSTALLATION. DRAWINGS AND CALCULATIONS SHALL BE CERTIFIED BY A MINIMUM NATIONAL INSTITUTE FOR CERTIFICATION ENGINEERING TECHNOLOGY LEVEL III TECHNICIAN.
- SYSTEM SHALL BE HYDRAULICALLY DESIGNED. CONTRACTOR SHALL OBTAIN LATEST WATER SUPPLY INFORMATION AND DETERMINE SPRINKLER HEAD SPACING AND DESIGN DENSITIES FOR HYDRAULIC CALCULATIONS. REQUIRED SYSTEM PRESSURE SHALL BE A MINIMUM OF 10% BELOW THE AVAILABLE PRESSURE AT SYSTEM DEMAND.
- PLANS FOR INSTALLATION OF ANY FIRE ALARM, OR FIRE SPRINKLER SYSTEM SHALL BE SUBMITTED UNDER SEPARATE PERMIT BY CONTRACTORS LICENSED BY THE NEVADA STATE FIRE MARSHAL'S OFFICE TO DO THIS WORK. A SEPARATE PERMIT IS REQUIRED FOR EACH TYPE OF SYSTEM.
- CONTRACTOR SHALL HOLD A VALID NEVADA CONTRACTORS LICENSE FOR THE TYPE OF WORK BEING PERFORMED.
- ALL PIPING SHALL BE SUSPENDED AND BRACED IN STRICT ACCORDANCE WITH NFPA 13, 2018 IBC, AND ASCE 7.
- CONTRACTOR SHALL VISIT THE JOB SITE PRIOR TO BID, IN ORDER TO DETERMINE THE EXACT SCOPE OF WORK.
- THE CONTRACTOR GUARANTEES THAT ALL WORK INSTALLED SHALL BE FREE OF ALL DEFECTS IN WORKMANSHIP AND MATERIAL FOR A PERIOD OF ONE YEAR FROM THE DATE OF THE CERTIFICATION OF COMPLETION AND ACCEPTANCE OF WORK.
- AFTER SYSTEM IS COMPLETELY INSTALLED, IT SHALL BE FILLED AND TESTED IN ACCORDANCE WITH LOCAL REQUIREMENTS, NFPA 13, AND THE REQUIREMENTS OF THE APPLICABLE NFPA BULLETINS.
- ALL SPRINKLER HEADS TO BE SEMI-RECESS TYPE WITH ESCUTCHEON. COORDINATE WITH ARCHITECT ON HEAD AND ESCUTCHEON COLORS. ALL PIPING IS TO BE CONCEALED ABOVE FINISH CEILING AREAS. SPRINKLER HEADS SHALL BE ALIGNED WITH LIGHTS, DIFFUSERS, AND OTHER EQUIPMENT SO AS TO PRESENT A NEAT AND SYMMETRIC APPEARANCE. SPRINKLER HEADS TO BE CENTERED IN CEILING TILE.
- IN LIEU OF RIGID PIPE OFFSETS OR RETURN BENDS FOR SPRINKLER DROPS, MULTIPLE-USE FLEXIBLE STAINLESS STEEL SPRINKLER DROP SYSTEM MAY BE USED TO LOCATE SPRINKLERS AS REQUIRED BY FINAL FINISHED CEILING TILES AND WALLS. THE DROP SYSTEM SHALL CONSIST OF A BRAIDED OR UNBRAIDED (CORRUGATED) TYPE 304 STAINLESS STEEL FLEXIBLE TUBE, A ZINC PLATED STEEL 1" NPT MALE THREADED NIPPLE FOR CONNECTION TO BRANCHLINE PIPING, AND A ZINC PLATED STEEL REDUCER WITH A 1/2" OR 3/4" NPT FEMALE THREAD FOR CONNECTION TO THE SPRINKLER HEAD. THE BRAIDED DROP SYSTEM SHALL BE FM APPROVED FOR SPRINKLER SERVICES TO 200 PSI AND CAN BE INSTALLED WITHOUT THE USE OF TOOLS, AND THE CORRUGATED SYSTEM SHALL BE UL LISTED FOR SPRINKLER SERVICES TO 175 PSI. ALL HOSES SHALL BE FACTORY-PRESSURE TESTED TO 400 PSI.

NO.	1	BUILDING DEPARTMENT COMMENTS
REVISIONS		
DATE	05/04/2023	

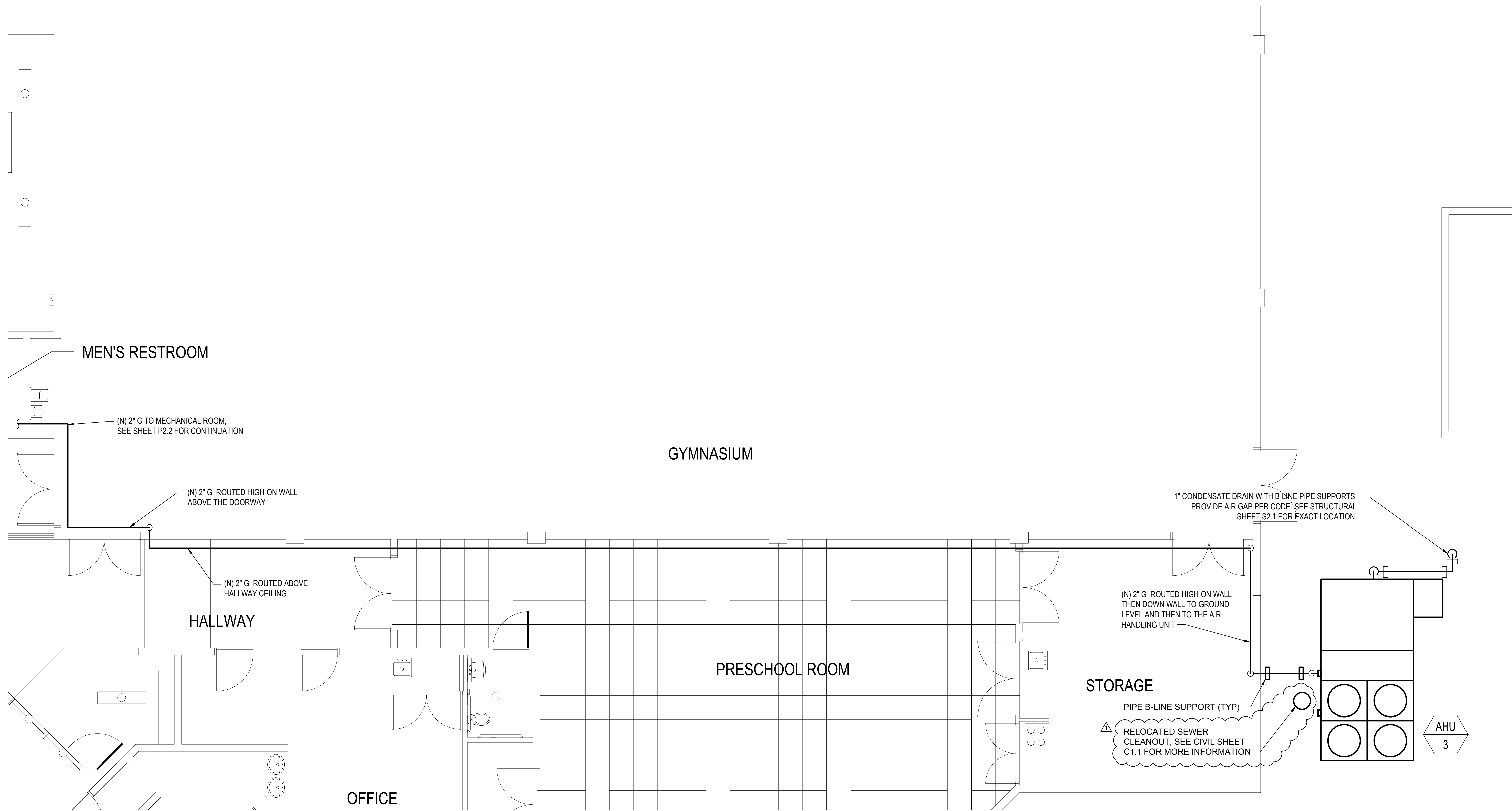
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**MATTHEW C. MYRES**  
 Exp. 12/31/23  
 MECHANICAL  
 No. 16816

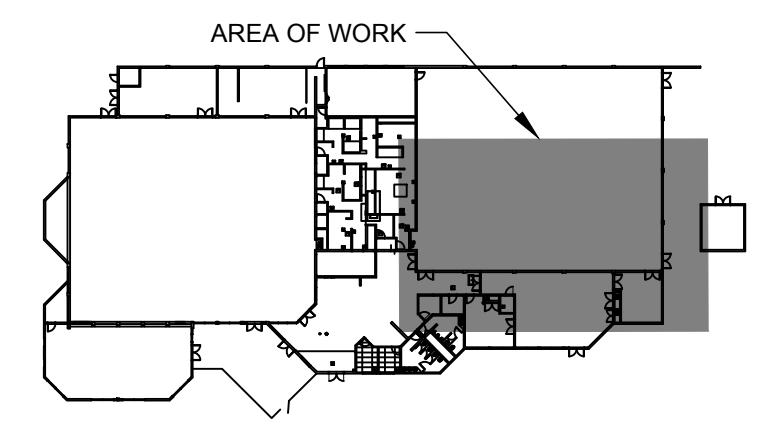
KH PROJECT NO.: 192079002  
 DRAWN BY: AS  
 REVIEWED BY: MCM  
 DATE: 04/12/2023

**ALF SORENSEN PRESCHOOL**  
**HVAC MODIFICATIONS**  
 1400 BARING BLVD  
 SPARKS, NV 89434

GENERAL INFORMATION  
**G1.1**



1  
P2.3 **PLUMBING FLOOR PLAN**  
SCALE: 1/4" = 1'-0"  
NORTH



**KEY PLAN**

NO.	REVISIONS	BUILDING DEPARTMENT COMMENTS	DATE
1			05/04/2023

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REVIEWED BY:			
DATE:			

ALF SORENSEN PRESCHOOL  
HVAC MODIFICATIONS  
1400 BARING BLVD  
SPARKS, NV 89434

ENLARGED PLUMBING FLOOR PLAN

**P2.3**

## ELECTRICAL SYMBOLS

CONDUIT AND RACEWAY	MOUNTING (UON)
	NA
	NA
	NA
	NA
	NA
	NA
	NA
	NA
	NA
	NA
	NA
	NA
POWER DEVICES	MOUNTING (UON)
	W
	W
	W, FVMH
	W
	W, FVMH
	W
	W
	C, FVMH
	FL
	W, FVMH
	W, FVMH
EQUIPMENT	MOUNTING (UON)
	W
	W
	W, FVMH
	W
	W, FVMH
	W
	W
	C, FVMH
	FL
	W, FVMH
	W, FVMH
	W, FVMH
	W, FVMH
	W, FVMH
	C
	NA
	FVM
	NA
	FVM
	NA

## ABBREVIATIONS

1P	ONE POLE
1PH	SINGLE PHASE
2/C	TWO-CONDUCTOR
2P	TWO POLE
3/C	THREE-CONDUCTOR
3P	THREE POLE
3PH	THREE PHASE
3W	THREE WIRE
4PDT	FOUR POLE DOUBLE THROW
4PST	FOUR POLE SINGLE THROW
4W	FOUR WIRE
A	AMPERE
A/C	AIR CONDITIONING
AC	ALTERNATING CURRENT
ADA	AMERICANS WITH DISABILITIES ACT
ADJ	ADJACENT
AFC	AVAILABLE FAULT CURRENT
AFF	ABOVE FINISHED FLOOR / GRADE
AIC	AMPERE INTERRUPTING CAPACITY
AL	ALUMINIUM
ALCP	AREA LIGHT CONTACTOR PANEL
ALT	ALTERNATE
AMP	AMPERE
APPROX	APPROXIMATE / APPROXIMATELY
AR	AS REQUIRED
ARCH	ARCHITECTURAL / ARCHITECT
ATS	AUTOMATIC TRANSFER SWITCH
AWG	AMERICAN WIRE GAUGE
BB	BUCK BOOST
BFB	BACK FEED BREAKER
BLDG	BUILDING
BRKR	BREAKER
BTU	BRITISH THERMAL UNIT
C	CEILING
CATV	COMMUNITY ANTENNA TELEVISION
CB	CIRCUIT BREAKER
CFBA	CUSTOM COLOR / FINISH SELECTED BY ARCHITECT
CFCI	CONTRACTOR FURNISHED CONTRACTOR INSTALLED
CFOI	CONTRACTOR FURNISHED OWNER INSTALLED
CKT	CIRCUIT
CL	CENTERLINE
CLG	CEILING
CO	CONVENIENCE OUTLET, RECEPTACLE
CU	COPPER
DA	DAMPER ACTUATOR
dB	DECIBEL, UNIT OF SOUND LEVEL
(X)	DEMOLITION
DEPT	DEPARTMENT
DF	DRINKING FOUNTAIN
DIA	DIAMETER
DIM	DIMENSION
DISC	DISCONNECT
DN	DOWN
DPDT	DOUBLE POLE DOUBLE THROW
DWG	DRAWINGS
E	EAST
EA	EACH
EC	EMPTY CONDUIT WITH PULL WIRE
EJ	EXPANSION JOINT
ELEC	ELECTRICAL
ELEV	ELEVATOR
EM	EMERGENCY
EMT	ELECTRICAL METALLIC CONDUIT

## ABBREVIATIONS

ENT	ELECTRICAL NONMETALLIC CONDUIT
EPO	EMERGENCY POWER OFF
EQUIP	EQUIPMENT
(E)	EXISTING TO REMAIN
FA	FIRE ALARM
FAA	FIRE ALARM ANNUNCIATOR
FACP	FIRE ALARM CONTROL PANEL
FBO	FURNISHED BY OTHERS
FLA	FULL LOAD AMPERES
FMC	FLEXIBLE METAL CONDUIT
FPEN	FUSE PER EQUIPMENT NAMEPLATE
FSD	FIRE SMOKE DAMPER
FVM	FIELD VERIFY MOUNTING
FVMH	FIELD VERIFY MOUNTING HEIGHT
FVNR	FULL VOLTAGE NON-REVERSING
FVR	FULL VOLTAGE REVERSING
G	GROUND
GALV	GALVANIZED
GEN	GENERATOR
GFCI	GROUND FAULT CIRCUIT INTERRUPTER
GFP	GROUND FAULT PROTECTION
GND	GROUND
HD	HEAVY DUTY
HID	HIGH INTENSITY DISCHARGE
HOA	HAND-OFF-AUTOMATIC
HP	HORSEPOWER
HPS	HIGH-PRESSURE SODIUM
HV	HIGH VOLTAGE
HVAC	HEATING, VENTILATION & AIR CONDITIONING
Hz	HERTZ, UNIT OF FREQUENCY
I/O	INPUT / OUTPUT
IG	ISOLATED GROUND
IMC	INTERMEDIATE METAL CONDUIT
INIS	INSULATED / ISOLATED
IR	INFRARED
KV	KILOVOLT
KVA	KILOVOLT AMPERE
KVAR	KILOVOLT AMPERE REACTIVE
KW	KILOWATT
KWH	KILOWATT HOUR
LED	LIGHT EMITTING DIODE
LFNC	LIQUID TIGHT FLEXIBLE NONMETALLIC CONDUIT
LPS	LOW-PRESSURE SODIUM
LRA	LOCKED ROTOR AMPERES
LTG	LIGHTING
LV	LOW VOLTAGE
MAX	MAXIMUM
MC	METAL CLAD
MCA	MINIMUM CIRCUIT AMPERES
MCB	MAIN CIRCUIT BREAKER
MCC	MOTOR CONTROL CENTER
MECH	MECHANICAL
MFR	MANUFACTURER
MH	MAN HOLE
MIN	MINIMUM
MISC	MISCELLANEOUS
MLO	MAIN LUGS ONLY
MOCP	MAXIMUM OVER-CURRENT PROTECTION
N	NORTH
NA	NOT APPLICABLE
NC	NORMALLY CLOSED
NEC	NATIONAL ELECTRIC CODE
NEMA	NATIONAL ELECTRIC MANUFACTURERS ASSOCIATION
NFC	NATIONAL FIRE CODE

## ABBREVIATIONS

NFPA	NATIONAL FIRE PROTECTION ASSOCIATION
(N)	NEW
NIC	NOT IN CONTRACT
NL	NIGHT LIGHT
NO	NORMALLY OPEN
NO.	NUMBER
NTS	NOT TO SCALE
OC	ON CENTER
OCF	OVER-CURRENT PROTECTION
OFCI	OWNER FURNISHED CONTRACTOR INSTALLED
OFOI	OWNER FURNISHED OWNER INSTALLED
OHD	OVERHEAD DOOR
OL	OVERLOAD
PF	POWER FACTOR
PH	PHASE
PNL	PANEL
PVC	POLYVINYL CHLORIDE
QTY	QUANTITY
R	REMOVE / DEMOLISH
RGP	REFLECTED CEILING PLAN
REF	REFRIGERATOR
REV	REVISIONS / REVISED
RGS	RIGID GALVANIZED STEEL CONDUIT
RMC	RIGID METAL CONDUIT
RNC	RIGID NONMETALLIC CONDUIT
RPM	REVOLUTIONS PER MINUTE
RR	REMOVE & RELOCATE
S	SOUTH
S/N	SWITCH NEUTRAL
S/S	START / STOP
SCA	SHORT CIRCUIT AMPERES
SF	SQUARE FOOT / FEET
SFBA	STANDARD FINISH / COLOR BY ARCHITECT
SPD	SURGE PROTECTION DEVICE
SPDT	SINGLE POLE DOUBLE THROW
SPEC	SPECIFICATION
SPST	SINGLE POLE SINGLE THROW
SQ	SQUARE
ST	SINGLE THROW
STRUCT	STRUCTURAL
SWBD	SWITCHBOARD
SWGR	SWITCHGEAR
TEMP	TEMPORARY
TL	TWIST LOCK
TP	TWISTED PAIR
TSP	TWISTED SHIELDED PAIR
TTB	TELEPHONE TERMINAL BOARD
TV	TELEVISION (CABLE)
TVSS	TRANSIENT VOLTAGE SURGE SUPPRESSOR
TYP	TYPICAL
UF	UNDERFLOOR / UNDERSLAB
UGND	UNDERGROUND
UNO	UNLESS NOTED OTHERWISE
UNSW	UNSWITCHED
UPS	UNINTERRUPTIBLE POWER SOURCE
V	VOLTS / VOLTAGE
VA	VOLT AMPERE
VFD	VARIABLE FREQUENCY DRIVE
W	WEST
W/	WITH
W/O	WITHOUT
WH	WATER HEATER
WP	WEATHER PROOF (NEMA 3R)
XFMR	TRANSFORMER
XP	EXPLOSION PROOF
Y	WYE

## SHEET LIST TABLE

SHEET NUMBER	SHEET TITLE
E0.1	ELECTRICAL SYMBOL LIST, ABBREVIATIONS
E0.2	ELECTRICAL SPECIFICATIONS
E0.3	ELECTRICAL SCHEDULES
E1.1	ELECTRICAL DEMO PLAN
E2.1	ELECTRICAL FLOOR PLAN

DATE
NO.
REVISIONS

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KH PROJECT NO.: 192079002  
 DRAWN BY: JPN  
 REVIEWED BY: DJC  
 DATE: 02/14/22

ALF SORENSEN PRESCHOOL  
 HVAC MODIFICATIONS  
 1400 BARING BLVD  
 SPARKS, NV 89434

ELECTRICAL SYMBOL LIST, ABBREVIATIONS

# E0.1

# ELECTRICAL SPECIFICATIONS

## PART ONE - GENERAL

- 1.1. **THE WORK:** ALL WORK SHALL BE NEW UNLESS OTHERWISE NOTED. THE CONTRACTOR SHALL PROVIDE THE WORK SHOWN ON THE DRAWINGS AND SPECIFIED FOR ITS INDIVIDUAL SECTIONS OF WORK. THE WORD "WORK" IS DEFINED AS ALL LABOR, TRANSPORTATION, MATERIAL, EQUIPMENT, TOOLS, INSTALLATION, SUPERVISION AND ANY OTHER INCIDENTAL ITEMS OR SERVICES NECESSARY FOR THE PROPER INSTALLATION AND OPERATION OF THE COMPLETE SYSTEMS, WHICH SHALL BE PROVIDED BY THIS CONTRACTOR WHETHER OR NOT SPECIFICALLY INDICATED OR NOTED.
  - 1.2. **RESPONSIBILITY:** THIS CONTRACTOR IS SOLELY RESPONSIBLE FOR THE ACTIONS OF ITS PERSONNEL, SUPPLIERS, AND SUB-CONTRACTORS. THIS CONTRACTOR SHALL BE RESPONSIBLE FOR THE PERFORMANCE OF ALL WORK AS MAY BE REQUIRED TO ACCOMMODATE OR SUPPORT THE ELECTRICAL WORK. EXAMPLES: PAINTING, STRUCTURAL SUPPORTS, CUTTING AND PATCHING, EXCAVATION AND BACKFILL, CONCRETE PADS, ROOF JACKS, ETC. REQUIRING THIS CONTRACTOR'S ENGAGEMENT OF APPROPRIATE TRADES TO PERFORM SUCH WORK FOR THE PROPER INSTALLATION AND OPERATION OF COMPLETE ELECTRICAL SYSTEMS.
  - 1.3. **MINIMUM REQUIREMENTS:** THESE SPECIFICATIONS ESTABLISH THE MINIMUM REQUIREMENTS FOR THE WORK AND MATERIALS, EQUIPMENT AND METHODS TO BE PROVIDED. THE DRAWINGS MAY INDICATE REQUIREMENTS WHICH EXCEED THESE MINIMUMS.
  - 1.4. **GENERAL CONDITIONS:** ALL GENERAL CONDITIONS, SPECIAL REQUIREMENTS OR GENERAL REQUIREMENTS OF THE CONSTRUCTION SPECIFICATIONS ARE MADE PART OF THIS SPECIFICATION AND HAVE THE SAME FORCE AND EFFECT AS IF COMPLETELY REPRODUCED.
  - 1.5. **DEFINITIONS:**
    - AHJ: AUTHORITY HAVING JURISDICTION.
    - ASSEMBLY: AN INSTALLATION OR SYSTEM OF MULTIPLE COMPONENTS REQUIRING MULTIPLE CONNECTIONS. (EXAMPLES: TRASH COMPACTOR, MOTORIZED DOOR, HVAC SPLIT SYSTEM, ETC.).
    - EQUAL: ACCEPTED BY THE ENGINEER AS EQUAL.
    - FF&E: FURNISHINGS, FIXTURES AND EQUIPMENT - PROVIDED BY OTHERS AT JOBSITE. RECEIVE, PROTECT, STORE, ASSEMBLE, INSTALL AND CONNECT. PROVIDE MINIMUM 5x STRUCTURAL BACKING. (EXAMPLES: CHANDELIERS, PROJECTORS, ETC.).
    - PROVIDE: FURNISH, INSTALL, ACTIVATE, AND COMMISSION.
  - 1.6. **CODES:** ALL WORK SHALL BE DONE IN ACCORDANCE WITH THE LATEST ADOPTED EDITIONS OF THE NATIONAL ELECTRICAL CODE (NEC) AND ALL OTHER APPLICABLE FEDERAL, STATE, AND LOCAL REGULATIONS.
  - 1.7. **PERMITS:** PAY ALL FEES AND OBTAIN ALL PERMITS AND INSPECTIONS REQUIRED FOR THE WORK.
  - 1.8. **DRAWINGS:** DRAWINGS ARE DIAGRAMMATIC AND SCHEMATIC IN NATURE, AND INDICATE THE TYPE, SIZE, ARRANGEMENT AND LOCATIONS OF MATERIALS AND EQUIPMENT. WORK INCLUDES CERTAIN COMPONENTS, SUCH AS PANELS, WHICH MAY NOT BE SHOWN. PROVIDE ALL NECESSARY ITEMS TO COMPLETE THE WORK ACCORDING TO INDUSTRY STANDARDS. IT IS THE INTENT OF THE DRAWINGS AND SPECIFICATIONS TO REQUIRE FINISHED WORK, TESTED AND READY FOR OPERATION. DO NOT SCALE DRAWINGS. ARRANGEMENT OF EQUIPMENT AND ROUTING OF FEEDERS AND BRANCH CIRCUITING SHALL BE PLUMB AND AT RIGHT ANGLES TO BUILDING CONSTRUCTION, AND MAY REQUIRE MODIFICATION DUE TO UNFORESEEN CONDITIONS REQUIRING ONSITE REVISIONS DURING CONSTRUCTION. (SEE ALSO "BIDDING").
  - 1.9. **COORDINATION:** THIS PROJECT REQUIRES A HIGH LEVEL OF COORDINATION AND COOPERATION WITH OWNER, ARCHITECT, OTHER TRADES, VENDORS, AND SPECIALTY CONTRACTORS. CAREFULLY EXAMINE ALL CONTRACT DOCUMENTS INCLUDING, BUT NOT LIMITED TO, SHOP DRAWINGS, ETC. FOR ALL GENERAL CONSTRUCTION, STRUCTURAL, MECHANICAL, PLUMBING, ELECTRICAL, AND SPECIALTY CONTRACTOR WORK. PRIOR TO ROUGH-IN, COORDINATE THE WORK WITH ALL OTHER TRADES, TAKING RESPONSIBILITY FOR THE PROPER FITTING OF MATERIAL INTO THE BUILDING AS PLANNED WITHOUT INTERFERENCE WITH OTHER WORK. ESTABLISH AND VERIFY LOCATIONS, HEIGHTS, CONNECTION METHODS, ETC. WITH EQUIPMENT INSTALLER (AND OWNER, ARCHITECT, AND/OR INTERIOR DESIGNER FOR FF&E ITEMS), AND MAKE REASONABLE MODIFICATIONS IN THE LAYOUTS NEEDED TO PREVENT CONFLICTS WITH OTHER TRADES IN ORDER TO PROVIDE ACCESS FOR THE PROPER EXECUTION OF THE WORK.
  - 1.10. **IDENTICAL:** ALL WORK REQUIRED FOR IDENTICAL ITEMS AND ASSEMBLIES OF THE PROJECT SHALL BE PROVIDED, ALTHOUGH EACH SPECIFIC IDENTICAL ITEM MAY NOT BE SHOWN IN DETAIL.
  - 1.11. **VERIFICATION:** CHECK AND VERIFY ALL SIZES, DIMENSIONS, AND CONDITIONS BEFORE STARTING ANY WORK. ANY DEVIATION(S) OR PROBLEM(S) SHALL BE TRANSMITTED TO THE ENGINEER FOR REVIEW.
  - 1.12. **CONNECTIONS:** CONNECT ALL EQUIPMENT, SYSTEMS, AND ASSEMBLIES PROVIDED BY OTHERS INCLUDING CONTROLS, SAFETY DEVICES AND INTERCONNECTIONS. EXCEPTION: DO NOT INTERCONNECT THE CONTROL SYSTEMS OF THOSE MECHANICAL AND PLUMBING SYSTEMS WHICH ARE SPECIFICALLY NOTED TO BE THE RESPONSIBILITY OF THOSE TRADES. PROVIDE FUSIBLE DISCONNECT SWITCHES AND MOTOR STARTERS FOR ALL EQUIPMENT EXCEPT THOSE ITEMS WHICH ARE SPECIFICALLY LISTED WITH INTEGRAL STARTERS/DISCONNECT SWITCHES. WHERE STARTERS AND/OR DISCONNECT SWITCHES ARE FURNISHED TOGETHER WITH EQUIPMENT, RECEIVE, INSTALL, AND CONNECT THOSE ITEMS.
  - 1.13. **SUBMITTAL:** SUBMIT TO THE ENGINEER COMPLETE ELECTRONIC SETS OF SHOP DRAWINGS AND TECHNICAL DATA SHEETS FOR ALL EQUIPMENT AND MATERIALS SPECIFIED HEREIN. THE ENGINEER SHALL REVIEW SHOP DRAWINGS AND TECHNICAL DATA SHEETS FOR CONFORMANCE WITH THE CONTRACT DOCUMENTS AND ISSUE A WRITTEN ASSESSMENT TO THE OWNER PRIOR TO COMMENCEMENT OF WORK. THE ENGINEER'S FAILURE TO PROJECT ERRORS IN THE SUBMITTAL SHALL NOT RELIEVE THE CONTRACTOR OF THE OBLIGATION TO PERFORM THE WORK AS SHOWN AND/OR SPECIFIED. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL ENGINEERING FEES NECESSARY TO CHANGE PROJECT DOCUMENTS BASED ON ALTERNATE SUBMITTAL PACKAGES/EQUIPMENT SUBSTITUTIONS.
  - 1.14. **OR-EQUAL SUBSTITUTIONS:** ALL PROPOSED "OR EQUAL" SUBSTITUTIONS SHALL BE SUBMITTED TO THE ENGINEER FOR CONSIDERATION PRIOR TO BIDDING AND AFTER ALL REQUIREMENTS ASSOCIATED WITH SUBSTITUTED EQUIPMENT AND/OR MATERIALS HAVE BEEN COORDINATED WITH OTHER BUILDING TRADES, INCLUDING ALL MECHANICAL, STRUCTURAL, AND/OR ARCHITECTURAL ELEMENTS. THE OWNER'S REPRESENTATIVE SHALL PRE-APPROVE ANY PROPOSED SUBSTITUTION IN WRITING. IDENTIFY AND ANNOTATE ALL REVISED REQUIREMENTS PER BUILDING TRADE ON THE SHOP DRAWINGS. ALSO IDENTIFY ALL COST DEBITS OR CREDITS IN WRITING FOR THE PROPOSED CHANGES PER BUILDING TRADE AND SUMMARIZE THESE AS A TOTAL NET-TO-OWNER CHARGE OR CREDIT FOR CONSIDERATION.
  - 1.15. **AS-BUILT:** UPON COMPLETION OF CONSTRUCTION, SUPPLY THE ENGINEER WITH AS-BUILT DOCUMENTS ACCURATELY SHOWING THE MATERIALS AND EQUIPMENT AS INSTALLED. PROVIDE OPERATION AND MAINTENANCE MANUALS CONTAINING APPROVED SHOP DRAWINGS, OPERATING AND MAINTENANCE INSTRUCTION FOR SWITCHGEAR, LIGHTING FIXTURES, CONTROLS, AND SPECIALTY EQUIPMENT.
  - 1.16. **GUARANTEE:** ALL MATERIALS AND WORKMANSHIP SHALL BE GUARANTEED FOR A MINIMUM OF ONE (1) YEAR FROM DATE OF ACCEPTANCE BY OWNER (LONGER IF REQUIRED BY GENERAL AND/OR SPECIAL CONDITIONS). IN ADDITION, THE INSTALLATION SHALL BE GUARANTEED TO PERFORM AS SPECIFIED AND FULFILL EACH AND EVERY REQUIREMENT OF THE DRAWINGS AND SPECIFICATIONS WHEN OPERATED IN ACCORDANCE WITH THE CONTRACTOR'S INSTRUCTIONS. SHOULD THE INSTALLATION IN ANY WAY FAIL TO DO SO, THE CONTRACTOR WILL, WITHOUT DELAY AND WITHOUT COST TO THE OWNER, PROVIDE WHATEVER ADDITIONAL EQUIPMENT, MATERIAL, AND LABOR REQUIRED TO CORRECT THE DEFICIENCY AND COMPLY WITH THE REQUIREMENTS OF THE DRAWINGS AND SPECIFICATIONS. WHERE SPECIFIED EQUIPMENT HAS A LONGER GUARANTEE PERIOD, THE TERMS OF THAT GUARANTEE SHALL GOVERN (EXAMPLE: LED SYSTEM WITH 5 YEAR GUARANTEE). INCANDESCENT LAMPS ARE EXEMPT BUT SHALL BE NEW AND UNUSED AT THE TIME OF FINAL ACCEPTANCE.
- IECC COMPLIANCE:** COMPLY WITH ALL REQUIREMENTS SET FORTH IN THE IECC COMPLIANCE CERTIFICATE INCLUDED IN THESE DOCUMENTS. HIRE A COMMISSIONING AGENT TO COMPLY WITH AND PERFORM ALL ASPECTS OF SECTION C408 OF THE 2018 IECC.

## BIDDING

- 1.17. **SITE VISIT:** CONTRACT DOCUMENTS INDICATE NEW WORK TO BE PERFORMED AND DO NOT PURPORT TO

- SHOW ALL EXISTING CONDITIONS. VISIT THE SITE PRIOR TO SUBMITTING A BID TO BECOME FAMILIAR WITH EXISTING CONDITIONS. COMPARE THE WORK SPECIFIED IN THE CONTRACT DOCUMENTS AGAINST EXISTING CONDITIONS, AND IDENTIFY AND ANNOTATE ALL WORK OR CONDITIONS THAT ARE DIFFERENT FROM THE CONTRACT DOCUMENTS OR THEIR INTENT. UPON DISCOVERY, IMMEDIATELY NOTIFY AND REPORT IN WRITING ANY DISCREPANCIES TO THE ENGINEER. NO EXTRAS OR CHANGE ORDERS WILL BE ALLOWED FOR FAILURE TO PERFORM THE PRE-BID SITE VISIT.
- 1.18. **BASIS OF PROPOSAL:** PROPOSAL SHALL BE BASED ON MANUFACTURERS AND MODELS AS LISTED UNLESS "OR EQUAL" IS INDICATED. PROVIDE SUBSTITUTION REQUESTS A MINIMUM OF FIVE (5) BUSINESS DAYS PRIOR TO BID DATE CLOSING TO ALLOW TIME FOR DUE CONSIDERATION OF PROPOSED ALTERNATE AND SUBSEQUENT NOTIFICATION TO ALL OTHER BIDDERS IN THE EVENT SUBSTITUTION IS DEEMED ACCEPTABLE. DETERMINATION OF SUBSTITUTION EQUALITY RESTS SOLELY WITH THE ENGINEER.
  - 1.19. **BIDDING:** THE CIVIL, ARCHITECTURAL, MECHANICAL, KITCHEN, AND/OR INTERIOR DRAWINGS CONTAIN DETAILED DESCRIPTIONS, CIRCUITING, AND CONNECTION REQUIREMENTS WHICH ARE PART OF THIS CONTRACTOR'S RESPONSIBILITIES. DO NOT SUBMIT BIDS ON THIS PROJECT PRIOR TO REVIEWING ALL PROJECT DRAWINGS, SPECIFICATIONS, AND ADDENDA.

## PART TWO - PRODUCTS

- 2.1. **MATCH EXISTING:** EXISTING EQUIPMENT AND SYSTEMS SHALL BE CONSIDERED A MINIMUM STANDARD TO BE MET. IF NOT OTHERWISE EXCEEDED BY THESE PLANS AND SPECIFICATIONS, NEW MATERIALS AND EQUIPMENT SHALL MATCH EXISTING IN APPEARANCE AND FUNCTION.
- 2.2. **EXISTING SWITCHGEAR:** CHANGES TO EXISTING PANELBOARDS AND DISTRIBUTION EQUIPMENT SHALL BE MADE WITH MATCHING COMPONENTS. NEW CIRCUIT PROTECTIVE DEVICES SHALL BE MANUFACTURER-CERTIFIED AS COMPATIBLE WITH EXISTING EQUIPMENT, AND SHALL EQUAL OR EXCEED EQUIPMENT FAULT CURRENT (AIC) RATINGS.
- 2.3. **EQUIPMENT STANDARDS:** ALL MATERIALS AND EQUIPMENT SHALL BE NEW AND OF THE HIGHEST QUALITY AVAILABLE ("SPECIFICATION GRADE"). EQUIPMENT SHALL BE CONSTRUCTED TO NEMA STANDARDS AND SHALL BE LABELED FOR THEIR INTENDED PURPOSE BY A RECOGNIZED TESTING AGENCY ACCEPTABLE TO THE AHJ (U.L., CSA, ETL, ETC.).
- 2.4. **ACCEPTABLE MANUFACTURERS AND SUPPLIERS:** WHERE EQUIPMENT AND MATERIALS ARE NOT SPECIFIED BY NAME THEY ARE DEEMED TO BE GENERIC, SUBJECT TO THE REQUIREMENTS LISTED HEREIN. THESE MANUFACTURERS ARE CONSIDERED CAPABLE OF OFFERING EQUIVALENT PRODUCTS. MINIMUM STANDARD IN ALL INSTANCES IS COMMERCIAL GRADE:
  - SWITCHGEAR: EATON, GENERAL ELECTRIC, SIEMENS, SQUARE D
  - LIGHT FIXTURES: ACUITY, COOPER, HUBBELL, THOMAS
  - WIRING DEVICES: HUBBELL, LEVITON, LEGRAND, WIREMOLD
- 2.5. **CIRCUITING:** ALL WIRING SHALL BE IN CONDUIT, CONCEALED EXCEPT WHERE NOTED. EMT WITH STEEL INSULATED THROAT SET SCREW FITTINGS MAY BE USED IN DRY, PROTECTED INTERIOR LOCATIONS. PVC SCHEDULE 40 SHALL BE USED BELOW GRADE AT MINIMUM "24" WRAPPED RIGID ELBOWS AND RISERS SHALL BE USED FOR ALL THROUGH-GRADE TRANSITIONS AND STUB-UPS. RGS OR IMC CONDUIT WITH THREADED FITTINGS SHALL BE USED IN ALL LOCATIONS WHERE EXPOSED TO THE ELEMENTS OR SUBJECT TO PHYSICAL DAMAGE. IMC OR RIGID CONDUIT BELOW GRADE SHALL BE HALF-LAP WRAPPED WITH 20 MIL PVC TAPE. TYPE ENT RACEWAY IS NOT ALLOWED. CONNECT RECESSED AND SUSPENDED LIGHTING FIXTURES, MOTORIZED AND/OR VIBRATING EQUIPMENT WITH STEEL FLEX OR SEALTITE CONDUIT. ALL CONDUIT SHALL HAVE PULL CORD IF OTHERWISE EMPTY.
- 2.6. **MC CABLE:** MC CABLE MAY BE USED IN LOCAL 1- AND 2-CIRCUIT APPLICATIONS ACCEPTABLE TO THE AHJ. HOMERUNS AND FEEDERS SHALL BE CONDUIT AND WIRE.
- 2.7. **WIRING:** ALL WIRE SHALL BE COPPER, STRANDED IN SIZES #8 AWG AND LARGER. INSULATION SHALL BE TYPE THWN OR THHN. SINGLE PHASE BRANCH CIRCUITS SHALL INCLUDE A SEPARATE NEUTRAL WIRE WITH EACH PHASE WIRE. NEUTRAL SHALL BE WHITE WITH COLOR STRIPE MATCHING COLOR OF PHASE WIRE.
- 2.8. **FUSES AND CIRCUIT BREAKERS:** FUSES AND CIRCUIT BREAKERS SHALL BE SIZED PER ACTUAL RESPECTIVE APPLICATION (i.e., MOTOR CIRCUIT PROTECTOR, GROUND FAULT CIRCUIT INTERRUPTER, ARC FAULT CIRCUIT INTERRUPTER, ETC.). FUSES SHALL BE DUAL ELEMENT, CURRENT-LIMITING, AND SHALL BE INTERCHANGEABLE BETWEEN FRAME SIZES WITH STANDARD FACTORY FUSE REDUCERS. PROVIDE LOCKABLE SPARE FUSE CABINET WITH (3) SPARE FUSES OF EACH SIZE USED.
- 2.9. **DISTRIBUTION SWITCHGEAR:** SWITCHGEAR SHALL HAVE COPPER BUS AND HEAVY GAUGE HOUSINGS. SWITCHGEAR IN LOCATIONS OTHER THAN LOCKED ELECTRIC ROOMS SHALL HAVE LOCKABLE COVERS. SWITCHGEAR SHALL HAVE NO LESS THAN 20% SPARE BUSSED AND USABLE SPACE, MEASURED AS A PERCENTAGE OF THE SPACE OCCUPIED BY SPECIFIED CIRCUIT BREAKERS, SWITCHES, ETC.
- 2.10. **SERVICE SWITCHGEAR:** IN ADDITION TO THE ABOVE, SERVICE SWITCHGEAR SHALL MEET THE REQUIREMENTS OF THE SERVING UTILITY.
- 2.11. **PANELBOARDS:** PANELS SHALL HAVE COPPER BUS AND HARDWARE. BOLT-ON CIRCUIT BREAKERS, FLUSH MONO-FLAT TRIM, PIANO HINGED DOORS AND COVER (DOOR-IN-DOOR) WITH LOCKABLE MASTER-KEYED FLUSH LATCHES. FLUSH-MOUNTED PANELS SHALL HAVE EMPTY CONDUITS STUBBED TO ACCESSIBLE ATTIC SPACE. (1) 3/4" CONDUIT FOR EACH THREE (3) SPARE SPACE CIRCUITS.
- 2.12. **SAFETY SWITCHES:** SWITCHES SHALL BE GENERAL DUTY UP TO 250 VOLTS, HEAVY DUTY ABOVE 250 VOLTS. FUSIBLE SWITCHES SHALL BE FUSED PER THE NAMEPLATE REQUIREMENTS OF THE EQUIPMENT BEING CONNECTED.
- 2.13. **MOTOR STARTERS:** STARTERS SHALL BE MINIMUM NEMA SIZE 1 WITH INTEGRAL CONTROL TRANSFORMER, RED NEON "RUN" PILOT LIGHT AND "ON-OFF-AUTO" SELECTOR SWITCH ON COVER. OVERLOAD DEVICES SHALL BE SIZED PER THE NAMEPLATE AMPERAGE OF THE EQUIPMENT BEING CONTROLLED.
- 2.14. **CONTACTORS:** CONTACTORS SHALL BE ELECTRICALLY HELD WITH "ON-OFF-AUTO" SELECTOR SWITCH ON COVER.
- 2.15. **RATINGS:** ALL ELECTRICAL EQUIPMENT SHALL BE FULLY RATED FOR BRACING IN EXCESS OF THE MAXIMUM AVAILABLE FAULT CURRENT CALCULATED AND SHOWN AT THE EQUIPMENT CONNECTION POINT WITHIN THE DISTRIBUTION SYSTEM. MINIMUM RATING SHALL BE 10K AIC.
- 2.16. **WIRING DEVICES:** WIRING DEVICES (SWITCHES, RECEPTACLES, ETC.) SHALL BE SPECIFICATION GRADE "DECORA" STYLE, MINIMUM 20-AMP RATED. COVER PLATES SHALL BE NYLON. DEVICE AND PLATE COLOR(S) SHALL BE AS SPECIFIED BY ARCHITECT OR INTERIOR DESIGNER. VERIFY PRIOR TO COMMENCEMENT OF WORK. WIRING DEVICES EXPOSED TO THE ELEMENTS SHALL HAVE WEATHERPROOF-IN-USE LOCKABLE COVERS. RAISED STEEL BOX COVERS MAY BE USED IN UTILITY AREAS.
- 2.17. **TRANSFORMERS:** TRANSFORMERS SHALL BE TYPE TP-1 MINIMUM, WITH ALUMINUM WINDINGS, RATED FOR 150°C RISE (UNLESS OTHERWISE NOTED), MOUNTED ON RUBBER-IN-SHEAR VIBRATION ISOLATORS, CONNECTED WITH FLEXIBLE CONDUIT. PUBLISHED AND MEASURED NOISE RATING SHALL NOT EXCEED NEMA TP-20 MAXIMUM.
- 2.18. **LIGHTING FIXTURES:** UNLESS OTHERWISE NOTED, LIGHT FIXTURES SHALL BE PROVIDED WITH ALL ASSOCIATED HARDWARE (HANGER BARS, PENDANTS, STEMS, RESTRAINTS, CHAINS, CORDS, LAMPS, ETC.). LENSES SHALL BE ACRYLIC, REFLECTORS SHALL BE ANODIZED, FLUORESCENT BALLASTS SHALL BE ELECTRONIC, PROGRAM RAPID START, THD LESS THAN 10%. FLUORESCENT LAMPS SHALL HAVE MINIMUM ORI OF 80%. INCANDESCENT LAMPS SHALL BE 130 VOLT, INSIDE FROST, MINIMUM 2000 HOUR LIFE. LOW VOLTAGE INCANDESCENT LAMPS SHALL BE HIR HALOGEN, MINIMUM 3000 HOUR LIFE. EXTERIOR LIGHTING FIXTURES SHALL BE INSTALLED TO PREVENT WATER, DUST AND INSECT INTRUSION, WITH GASKETING FOR DOORBACKPLATE AND SEALANT AT THE WIRING ENTRY POINT. REFER TO LIGHTING FIXTURE SCHEDULE WITHIN PLAN SET FOR ADDITIONAL REQUIREMENTS (LED CRITERIA, ETC.).
- 2.19. **TAMPERPROOF:** ALL EQUIPMENT AND CIRCUITING ACCESSIBLE BY THE PUBLIC SHALL BE DEMONSTRATED TO BE TAMPERPROOF AND VANDAL RESISTANT. OPENABLE DEVICES AND EQUIPMENT SHALL BE PAD LOCKABLE.

## PART THREE - EXECUTION

- 3.1. **GROUNDING:** GROUND ALL EQUIPMENT AND SYSTEM NEUTRAL IN ACCORDANCE WITH THE REQUIREMENTS OF NEC ARTICLE 250. PROVIDE CODE-SIZED EQUIPMENT GROUNDING CONDUCTOR IN ALL FEEDERS AND BRANCH CIRCUIT RACEWAYS. WHERE ISOLATED GROUNDS ARE INDICATED, PROVIDE INSULATED CONDUCTOR (GREEN WITH YELLOW STRIPE).

- 3.2. **DEMOLITION:** PROVIDE COMPLETE ELECTRICAL DEMOLITION - REMOVE EXISTING OUTLETS AND EQUIPMENT IN CONFLICT WITH NEW CONDITIONS. EXISTING CONDUITS REMOVED FROM SERVICE MAY BE ABANDONED IN PLACE IF IN A CONCEALED LOCATION. REMOVE ALL WIRE FROM ABANDONED RACEWAYS. CONTRACTOR SHALL ENSURE CONTINUITY OF EXISTING CIRCUITING PASSING THROUGH DEMOLITION AREAS - EXTEND AND/OR RELOCATE AS NECESSARY. SHIFT OR RELOCATE EXISTING EQUIPMENT AND CIRCUITING AS REQUIRED TO ACCOMMODATE NEW WORK.
- 3.3. **SALVAGE:** ALL EXISTING EQUIPMENT REMOVED DURING THE COURSE OF THIS PROJECT SHALL BE OFFERED TO OWNER FOR SALVAGE. ANY EQUIPMENT SELECTED BY OWNER SHALL BE DELIVERED TO OWNER ON SITE. ALL REMAINING EQUIPMENT BECOMES THE PROPERTY OF THIS CONTRACTOR AND SHALL BE REMOVED FROM THE SITE.
- 3.4. **EXISTING SWITCHGEAR:** REUSE EXISTING SWITCHGEAR AND PANELBOARDS IN PLACE WHERE SO INDICATED - MODIFY AS REQUIRED TO ACCOMMODATE NEW REQUIREMENTS. PROVIDE NEW CIRCUIT BREAKERS AND/OR FUSES AS REQUIRED WITH AIC RATING TO MEET OR EXCEED THAT OF EXISTING DEVICES. REARRANGE EXISTING CIRCUITS WITHIN PANELS TO AGREE WITH NEW PANEL SCHEDULES. TRACE AND IDENTIFY ALL EXISTING CIRCUITS ON NEW TYPED AS-BUILT PANEL SCHEDULES.
- 3.5. **EXISTING OUTLETS:** EXISTING OUTLETS AND CIRCUITING NOT IN CONFLICT WITH NEW CONDITIONS SHALL REMAIN. EXTEND OUTLETS TO NEW SURFACES, CAULK AND PROVIDE JUMBO PLATES AS REQUIRED TO PRESENT A SERVICEABLE AND FINISHED APPEARANCE.
- 3.6. **TEMPORARY CONSTRUCTION POWER:** PROVIDE TEMPORARY ELECTRICAL POWER DISTRIBUTION AND LIGHTING AS REQUIRED FOR ALL TRADES THAT REQUIRE SERVICE DURING THE COURSE OF THIS PROJECT IN COMPLIANCE WITH ALL NEC AND OSHA REQUIREMENTS. OWNER SHALL NOT BE RESPONSIBLE FOR TEMPORARY POWER CHARGES.
- 3.7. **LOCATIONS:** INDICATED LOCATIONS OF ALL OUTLETS AND EQUIPMENT ARE SUBJECT TO CHANGE. SHIFT/RELOCATE/RECONFIGURE ANY OUTLET, EQUIPMENT OR CONNECTION POINT UP TO 10' AS DIRECTED BY ENGINEER AT NO ADDED COST.
- 3.8. **WORKMANSHIP:** THE WORK SHALL BE INSTALLED PARALLEL AND AT RIGHT ANGLES TO THE BUILDING LINES, LEVEL AND PLUMB. THE WORK SHALL BE WELL SUPPORTED AND SOLIDLY MOUNTED. DRESS AND TIE WIRING IN PANELBOARDS AND SWITCHGEAR. THE WORK SHALL BE LEFT CLEAN WITH NO DIRT, DENTS, ABRASIONS, PAINT SPLATTERS, OR OTHER IRREGULARITIES.
- 3.9. **FIRE STOPPING:** ALL PENETRATED FIRE RATED SURFACES SHALL BE FIRE SEALED WITH APPROVED U.L. LISTED SEALANTS AS LISTED WITHIN ARCHITECTURAL SPECIFICATIONS. DO NOT EXCEED MAXIMUM ALLOWABLE SURFACE PENETRATIONS DEPENDENT ON RATING OF SURFACES. REFER TO ARCHITECTURAL DRAWINGS FOR DETERMINATION OF PENETRATION LOCATIONS THROUGH FIRE RATED ASSEMBLIES.
- 3.10. **SUPPORTS AND HANGERS:** PROVIDE 3" HIGH HOUSEKEEPING CONCRETE PAD BENEATH FLOOR MOUNTED EQUIPMENT. EXTENDING 3" BEYOND EQUIPMENT FOOTPRINT. SUPPORT AND ALIGN ALL RACEWAYS, CABINETS, BOXES, BACK BOXES, FIXTURES, AND EQUIPMENT FROM STRUCTURE. SECURE ALL SUPPORTING METHODS BY MEANS OF TOGGLE BOLTS IN HOLLOW MASONRY, EXPANSION BOLTS IN SOLID MASONRY, CONCRETE PRESET INSERTS OR EXPANSION BOLTS IN CONCRETE, MACHINE SCREWS OR BOLTS IN METAL, AND WOOD SCREWS IN WOOD CONSTRUCTION. ALL SUPPORTING SYSTEMS AND COMPONENTS SHALL BE RATED FOR A MINIMUM OF FIVE (5) TIMES THE ACTUAL LOAD.
- 3.11. **SLEEVES AND PENETRATIONS:** PENETRATIONS OF ALL SURFACES SHALL BE PROVIDED WITH SLEEVES THAT SHALL BE SEALED WITH LIKE MATERIALS AND SHALL BE FINISHED WITH ESCUTCHEON PLATES. PENETRATIONS BELOW GRADE LEVEL SHALL BE WATERTIGHT. PENETRATIONS AT EXTERIOR WALLS SHALL BE WEATHERPROOF. ROOF PENETRATIONS SHALL BE FLASHED AND COUNTER FLASHED.
- 3.12. **EXPANSION AND CONTRACTION:** RACEWAYS PASSING THROUGH BUILDING EXPANSION JOINTS, ON ROOF, AND IN AREAS OF TEMPERATURE VARIATIONS GREATER THAN 30°F SHALL BE INSTALLED WITH EXPANSION FITTINGS.
- 3.13. **IDENTIFICATION:** IDENTIFY ALL EQUIPMENT, SWITCHBOARD CIRCUITS AND ELECTRICALLY-CONNECTED EQUIPMENT WITH ENGRAVED NAMEPLATES. BOXES SHALL BE MARKED WITH PANEL AND CIRCUIT NUMBERS (PERMANENT PEN ACCEPTABLE ABOVE CEILING). NAMEPLATES SHALL BE FASTENED WITH A MINIMUM OF TWO (2) SCREWS. PANEL DIRECTORIES SHALL BE TYPED. CONDUCTORS SHALL BE TAGGED WITH CIRCUIT NUMBERS AT SOURCE, JUNCTION BOXES, AND ALL OUTLET BOXES WITH PERMANENT ADHESIVE MARKER STRIP. IDENTIFY WIRING DEVICES WITH SELF-ADHESIVE CLEAR SATIN FINISH LABELS WITH SOURCE AND CIRCUIT NUMBER.
- 3.14. **ELECTRIC ROOM CODE COMPLIANCE:** DUE TO THE DIAGRAMMATIC NATURE OF THE DESIGN DOCUMENTS (ELECTRICAL, MECHANICAL, PLUMBING, FIRE SPRINKLER, ETC.), COORDINATE WITH ALL OTHER SUBCONTRACTORS AT THE START OF THIS PROJECT TO INFORM AND VERIFY THAT NO FOREIGN SYSTEMS OR EQUIPMENT ARE MOUNTED ABOVE ELECTRICAL EQUIPMENT OR PASS THROUGH THE DESIGNATED ELECTRIC ROOMS, AND THAT A MINIMUM OF 7'-0" IS PROVIDED AS CLEAR HEADROOM ALONG ACCESS PATHS TO ELECTRIC ROOMS. ANY REROUTING OR RELOCATION OF SYSTEMS THAT A SUBCONTRACTOR FEELS WILL COMPROMISE THE DESIGN INTENT SHALL BE DESCRIBED IN WRITING AND FORWARDED TO THE DESIGN ENGINEER FOR FURTHER REVIEW. ALL PIPING TO HVAC UNITS THAT COOL ELECTRIC ROOMS SHALL BE LOCATED ABOVE ENTRY DOOR. THE SPRINKLER PIPING TO PROVIDE PROTECTION FOR THE ELECTRIC ROOM IS PREFERRED TO ENTER THE ROOM ABOVE THE ENTRY DOOR AND RUN DOWN THE AISLE SPACES OF THE ROOM. ALL INSTALLATIONS SHALL BE FULLY COORDINATED AMONGST ALL TRADES.
- 3.15. **ELECTRICALLY-OPERATED EQUIPMENT-VERIFICATION AND SUBSTITUTION:** FEEDERS AND OVER-CURRENT DEVICES (INCLUDING STARTERS, DISCONNECTS, ETC.) HAVE BEEN DESIGNED BASED ON INFORMATION PROVIDED BY THE RESPONSIBLE CONSULTANT AND/OR DESIGNATED SUPPLIER. PRIOR TO ROUGH-IN, COORDINATE WITH THE APPROPRIATE TRADE AND/OR INSTALLER TO DETERMINE THAT THE ACTUAL NAMEPLATE ELECTRICAL REQUIREMENTS MATCH THIS DESIGN. ALL ADDITIONAL ELECTRICAL COSTS RELATED TO THE CONNECTION OF EQUIPMENT WHICH VARIES FROM THE ORIGINAL SPECIFICATIONS SHALL BE RESOLVED WITHIN THE CONSTRUCTION TEAM AT NO ADDITIONAL COST TO THE OWNER.
- 3.16. **HOURS OF OPERATION:** CONDUCT WORK TO MINIMIZE DISRUPTION OF OWNER'S ONGOING BUSINESS OPERATIONS. PROVIDE BARRICADES, NOISE ABATEMENT, AND DUST CONTAINMENT MEASURES TO ENSURE THE SAFETY AND COMFORT OF PATRONS, STAFF, AND WORKERS. INTERRUPTIONS OF EXISTING POWER, COMMUNICATIONS, AND/OR FIRE ALARM SYSTEMS SHALL BE PERFORMED ONLY AT SUCH TIMES AS DIRECTED BY OWNER OR RESIDENT ENGINEER. OUTAGES SHALL BE MOMENTARY IN NATURE. EACH SUCH OUTAGE (OR OPERATION WHICH MAY POSE RISK OF AN ACCIDENTAL OUTAGE) SHALL BE SCHEDULED A MINIMUM OF FORTY-EIGHT (48) HOURS IN ADVANCE.
- 3.17. **COMMUNICATIONS SYSTEMS:** NOT IN SCOPE.

## PART FOUR - SPECIAL SYSTEMS

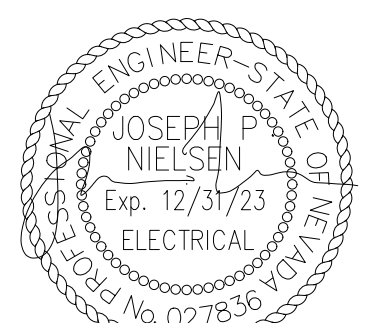
- 4.1. **THIRD PARTY TESTING:** PROVIDE ALL ASSOCIATED COSTS FOR THIRD PARTY TESTING OF ALL EQUIPMENT, CONDUCTORS, GROUND FAULT, GROUND FAULT COORDINATION STUDY WITH REPORT PREPARATION, ETC. AS REQUIRED BY THE NEC, AHJ AND ALL OTHER GOVERNING AUTHORITIES.

DATE

REVISIONS

NO

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KH PROJECT NO.:	192079002	02/14/22
DRAWN BY:	JPN	
REVIEWED BY:	DJC	
DATE:		02/14/22

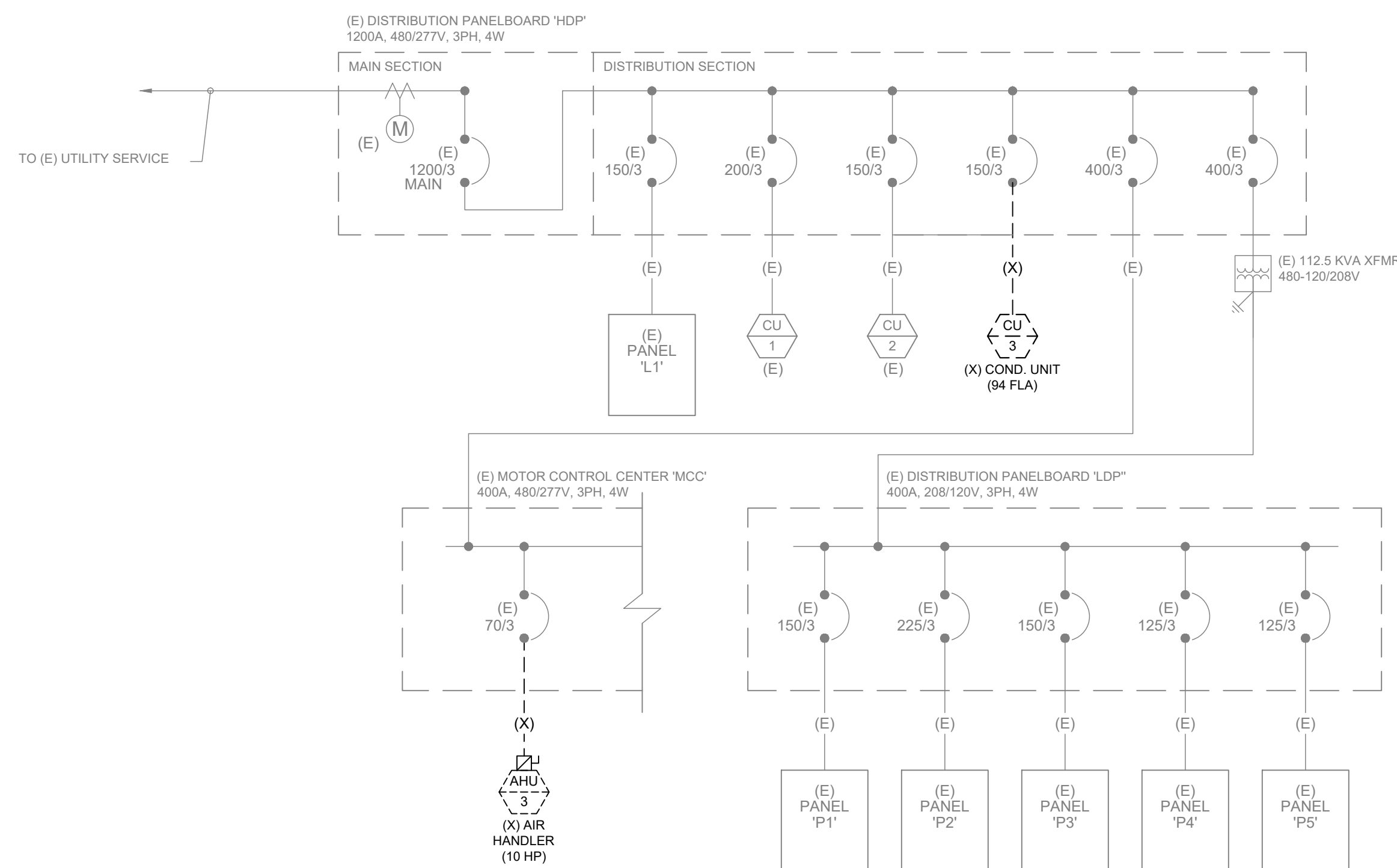
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1400 BARING BLVD  
SPARKS, NV 89434

ELECTRICAL  
SPECIFICATIONS

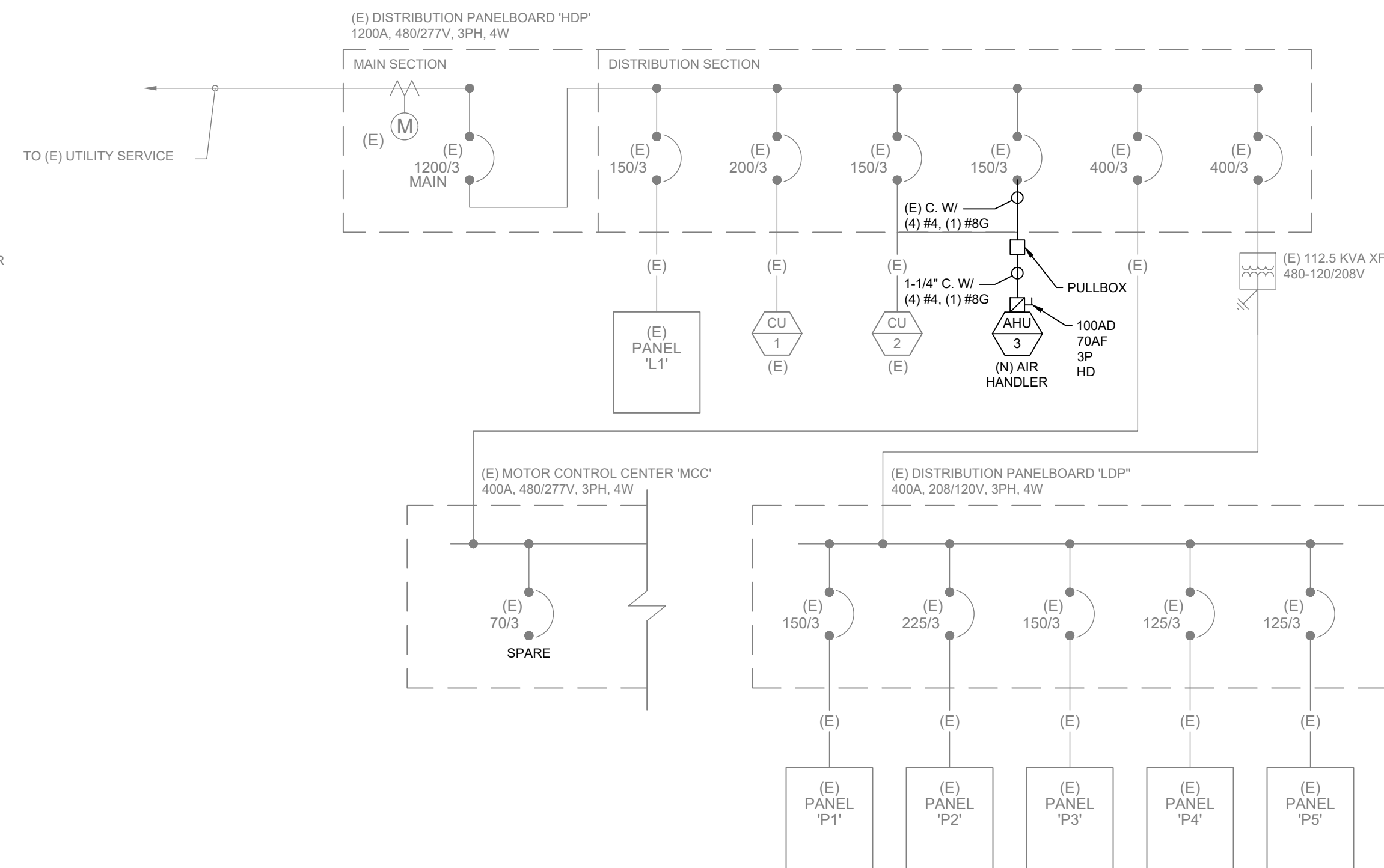
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## GENERAL NOTES

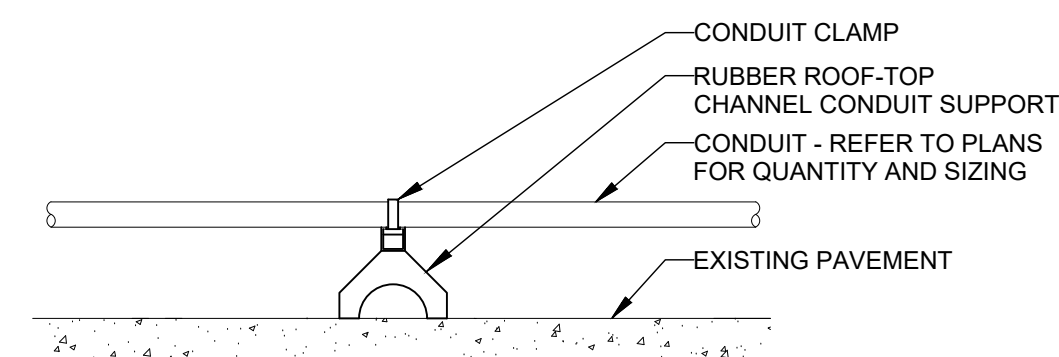
- IN LINE DIAGRAMS, HALF TONE AND/OR (E) INDICATES EXISTING EQUIPMENT TO REMAIN. FULL TONE AND/OR (N) INDICATES NEW WORK. FULL TONE DASHED AND/OR (X) INDICATES EXISTING TO BE DEMOLISHED.
- IN PANELBOARD DIRECTORIES, NORMAL FONT AND/OR (E) INDICATES EXISTING CIRCUITING TO REMAIN. BOLDED FONT AND/OR (N) INDICATES NEW WORK.



**1 PARTIAL SINGLE LINE DIAGRAM - DEMOLITION**  
E0.3 SCALE: NTS



**2 PARTIAL SINGLE LINE DIAGRAM - PROPOSED**  
E0.3 SCALE: NTS



**3 GROUND MOUNTED CONDUIT DETAIL**  
E0.3 SCALE: NTS

### ALF SORENSON RECREATION CENTER - LIGHTING CONTROL SEQUENCE OF OPERATIONS

- GENERAL
  - CONTRACTOR SHALL PROVIDE LIGHTING CONTROLS SHOP DRAWINGS FOR REVIEW BY THE ENGINEER PRIOR TO WORK.
  - ALL LIGHTING CONTROLS SHALL COMPLY WITH THE 2018 IECC.
  - ALL LIGHTING SHALL BE HIGH EFFICIENCY LED WITH DIMMING CONTROLS. OWNER SHALL HAVE THE ABILITY TO REDUCE TOTAL LUMEN OUTPUT TO NOT LESS THAN 80 PERCENT AS DESIRED.
  - ALL LIGHTING CONTROLS SHALL BE LOW VOLTAGE AND COMPATIBLE WITH THE LIGHTING FIXTURES.
- OCCUPANCY
  - LIGHTING IN LITTLE WONDERS ROOM SHALL BE CONTROLLED BY OCCUPANCY SENSORS TO AUTOMATIC OFF/MANUAL ON. CONTRACTOR SHALL SET DELAY TIMES FOR OCCUPANCY SENSORS TO A MAXIMUM OF 30 MINUTES..
- DAYLIGHTING
  - FIXTURES WITHIN DAYLIGHTING ZONES SHALL BE CONTROLLED BY PHOTOCELL TO AUTOMATICALLY DIM.

## LIGHTING CONTROL SEQUENCE OF OPERATIONS

**3**  
E0.3 SCALE: NTS

LIGHTING FIXTURE SCHEDULE							NOTES
FIXTURE ID	DESCRIPTION	SOURCE	VOLTAGE	LOADS	MOUNTING	MANUFACTURE & MODEL NUMBER	
X1	SINGLE HEAD	LED	120V	2VA	WALL, SURFACE	ELITE ELX-611-G-AL-1-MIRROR OR APPROVED EQUAL	
X3	TWIN HEAD	LED	120V	2VA	CEILING, RECESSED	ELITE ELX-LED-735-G-W OR APPROVED EQUAL	
L1	2X2 RECESSED	LED	120V	15VA	LAY-IN TROFFER, RECESSED	ELITE 22-FPL-BL-LED-2000/3000/4000L-DIM10-MVOLT-35K/40K/50K-85 OR APPROVED EQUAL	
L1S	2X2 RECESSED	LED	120V	15VA	GYPSBOARD CEILING, RECESSED	ELITE 22-FPL-BL-LED-2000/3000/4000L-DIM10-MVOLT-35K/40K/50K-85-24FK OR APPROVED EQUAL	
L2	2X4 RECESSED	LED	120V	30VA	LAY-IN TROFFER, RECESSED	ELITE 24-FPL-BL-LED-3000/4000/5000L-DIM10-MVOLT-35K/40K/50K-85 OR APPROVED EQUAL	
L3	4\"/>						

PANEL: (EXISTING) P2										
VOLTAGE: 120/208			PANEL BUS: 225 AMPS							
PHASE WIRES: 3Ø, 4W			MAIN: N/A BREAKER							
SCCR (AMPS): 10K			SOURCE: LDP							
DESCRIPTION	VA	CB	CKT	A	B	C	CKT	CB	VA	DESCRIPTION
(E) 102	750	20/1	1	13			2	20/2	750	(E) 102
(E) 102	750	20/1	3		13		4		750	
(E) 102	750	20/1	5			13	6	20/2	750	(E) 102
(E) 101, 103	750	20/1	7	13			8		750	
(E) 113, 105, 103, 100	1080	20/1	9		17		10	20/1	1000	(E) 100 VEND.
(E) 100	1080	20/1	11			17	12	20/1	1000	(E) 100 VEND.
(E) 100 VEND	4500	20/1	13	46			14	20/1	1000	(E) 100 VEND.
(E) 113, 115	1080	20/1	15		13		16	20/1	500	(E) 111
(E) D. KIT, 113	4500	60/2	17		45		18	20/1	900	(E) 107, 109, 115, 117
	4500		19	75			20		4500	
(E) DRINK FTN. 115	4500	60/2	21		75		22	60/2	4500	(E) D. KIT, 115
	4500		23			75	24		4500	
(E) BACKBD WINCH	800	20/1	25	44			26		1500	(E) DRINK FTN. 113
(E) EF-4	300	20/1	27		11		28	20/1	7200	(E) SOUND SYSTEM
(E) HVAC CONTROL	500	20/1	29		6	30	30	20/1	180	CO EXT AHU-3
EQ VAV-1, 2 LV XFMR	1000	20/1	31	8			32			(E) SPACE
(E) LOAD	1920	20/1	33		16		34			(E) SPACE
(E) SPACE			35			0	36			(E) SPACE
(E) SPACE			37	0			38			(E) SPACE
(E) SPACE			39		3		40	20/1	300	(E) 103, 105
(E) SPACE			41			0	42			(E) SPACE
TOTALS			198.3	147.3	155.5		AMPS			
LOAD CALCULATIONS: SUBTOTAL (VA): 60140 +25% PER NEC (VA): 15035 TOTAL (VA): 75175 @ 208V, 3Ø = 208.9 AMPS										

PANEL: (EXISTING) P4										
VOLTAGE: 120/208			PANEL BUS: 125 AMPS							
PHASE WIRES: 3Ø, 4W			MAIN: N/A BREAKER							
SCCR (AMPS): 10K			SOURCE: LDP							
DESCRIPTION	VA	CB	CKT	A	B	C	CKT	CB	VA	DESCRIPTION
EQ WH-1	600	20/1	1	18			2	20/2	1500	(E) HEATER CHLORINE RM.
(E) CONTROLLER	300	20/1	3				4	20/2	300	(E) VENTILATION CHLORINE RM.
(E) D.T. CONTROLLER	300	20/1	5		5		6	20/2	300	(E) GAS VALVE CHLORINE RM.
(E) ASH PUMP	200	20/1	7				8	20/2	500	(E) FILTER
(E) ASH AGITATOR	900	20/1	9		10		10	20/1	300	(E) WATER LEVEL CONTROL
(E) SUMP PUMP	1200	20/1	11			14	12	20/1	500	(E) HEAT EXCHANGER
(E) FILT RM EM LTG, RECEP*	1207	20/1	13	70			14		7200	
(E) SPARE			50/2				17		7200	
(E) BCS HW MONITOR	500	20/1	19	16			20	15/2	1440	(E) BLR #1
EQ WH-2	600	20/1	21		17		22	15/2	1440	(E) BLR #2
(E) HEAT TRACE	1920	20/1	23			16	24			(E) SPACE
EQ WH-3	600	20/1	25	5			26			(E) SPACE
(E) SPACE			27		0		28			(E) SPACE
EQ CP-1	600	20/1	29			5	30			(E) SPACE
TOTALS			114.6	92.0	100.2		AMPS			
LOAD CALCULATIONS: SUBTOTAL (VA): 36807 TOTAL (VA): 36807 @ 208V, 3Ø = 102.3 AMPS										

ELECTRICAL LOAD SUMMARY	
<b>PANEL 'P2'</b>	
EXISTING CONNECTED LOAD	58,960.00 VA
REMOVED LOAD	- VA
NEW LOAD	1,180.00 VA
TOTAL	60,140.00 VA
@ 208V, 3PH	167.06 A
LOAD DELTA	3.28 A
<b>PANEL 'P4'</b>	
EXISTING CONNECTED LOAD	34,200.00 VA
REMOVED LOAD	(1,200.00) VA
NEW LOAD	2,607.00 VA
TOTAL	35,607.00 VA
@ 208V, 3PH	98.91 A
LOAD DELTA	3.91 A
<b>DISTRIBUTION PANELBOARD 'HDP'</b>	
EXISTING LOAD UNKNOWN	- VA
REMOVED LOAD	(78,114.00) VA
NEW LOAD	51,854.00 VA
TOTAL	(26,260.00) VA
@ 480V, 3PH	(31.60) A
LOAD DELTA	(31.60) A
<b>MOTOR CONTROL CENTER 'MCC'</b>	
EXISTING LOAD UNKNOWN	- VA
REMOVED LOAD	(11,634.00) VA
NEW LOAD	- VA
TOTAL	(11,634.00) VA
@ 480V, 3PH	(14.00) A
LOAD DELTA	(14.00) A

DATE  
REVISIONS  
NO.

**Kimley»Horn**  
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REGISTERED PROFESSIONAL ENGINEER - STATE OF ARIZONA  
JOSEPH P. NIELSEN  
Exp. 12/31/23  
ELECTRICAL  
Professional Seal No. 027836

KH PROJECT NO.: 192079002  
DRAWN BY: JPN  
REVIEWED BY: DJC  
DATE: 02/14/22

ALF SORENSON PRESCHOOL  
HVAC MODIFICATIONS  
1400 BARING BLVD  
SPARKS, NV 89434

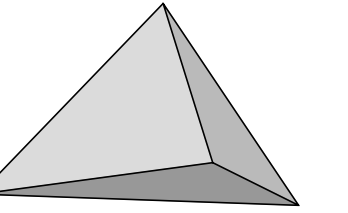
ELECTRICAL SCHEDULES

**E0.3**



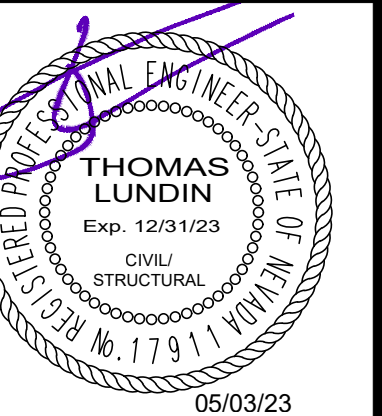






**STRUCTURAL SYSTEM SOLUTIONS INC.**  
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REV	DATE	DESCRIPTION	BID SET	APP'D	TJL
0	05/03/23				



05/03/23

CITY OF SPARKS  
ALF SORENSEN PRESCHOOL - HVAC MODIFICATIONS  
STRUCTURAL NOTES  
SPARKS  
NEVADA

DRAWN: T.J.L.  
CHECKED: T.J.L.  
DATE: 05/03/23  
SCALE: AS SHOWN  
PROJECT NO: 1482001

SHEET NO:  
**S0.1**

**1. GENERAL**

- 1.1 THE FOLLOWING STRUCTURAL NOTES SHALL APPLY TO ALL STRUCTURAL DRAWINGS UNLESS SPECIFICALLY SHOWN OR NOTED OTHERWISE.
- 1.2 PROMPTLY REPORT ANY DISCREPANCY FOUND AMONG THESE NOTES, DRAWINGS, SPECIFICATIONS, AND EXISTING CONDITIONS TO THE ENGINEER, WHO WILL CORRECT SUCH DISCREPANCIES IN WRITING. ANY WORK DONE BY THE CONTRACTOR AFTER THE DISCOVERY OF SUCH DISCREPANCY IS AT THE CONTRACTORS OWN RISK. VERIFY AND COORDINATE THE DIMENSIONS AMONG ALL DRAWINGS PRIOR TO PROCEEDING WITH ANY WORK OR FABRICATION. IT IS THE CONTRACTORS RESPONSIBILITY FOR THE REVIEW AND COORDINATION OF ALL DRAWINGS AND SPECIFICATIONS PRIOR TO THE START OF CONSTRUCTION.
- 1.3 DO NOT SCALE WORKING DIMENSIONS FROM THESE PLANS, SECTIONS, OR DETAILS. DIMENSIONS REFER TO ROUGH CONCRETE SURFACES, FACE OF STUDS, FACE OF CONCRETE BLOCK, TOP OF SHEATHING OR TOP OF SLAB UNLESS OTHERWISE INDICATED.
- 1.4 DETAILS OF THE CONSTRUCTION NOT FULLY SHOWN OR NOTED ON THE DRAWINGS NOR CALLED FOR IN THE SPECIFICATIONS SHALL BE OF THE SAME SIZE AND CHARACTER AS FOR SIMILAR CONDITIONS WHICH ARE SHOWN AND NOTED.
- 1.5 THE WORD "TYPICAL" SHALL MEAN THAT INFORMATION SHOWN SHALL BE APPLIED TO ALL SIMILAR CONDITIONS WHETHER OR NOT THE INFORMATION IS SPECIFICALLY REFERENCED, UNLESS OTHERWISE NOTED ON THE DRAWINGS.
- 1.6 MODIFICATIONS OR SUBSTITUTIONS TO THE DESIGN, MATERIALS, OR PRODUCTS SPECIFIED ON THE PLANS ARE PROHIBITED WITH OUT PRIOR WRITTEN APPROVAL BY THE ENGINEER.
- 1.7 THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR PROVIDING AND MAINTAINING A SAFE WORK ENVIRONMENT IN ACCORDANCE WITH ALL LOCAL, STATE, FEDERAL SAFETY AND HEALTH STANDARDS LAWS AND REGULATIONS. THE CONTRACTOR SHALL EXECUTE WORK TO ENSURE SAFETY OF PERSONS AND PROPERTY AGAINST DAMAGE AND SHALL PROVIDE ADEQUATE SHORING AND BRACING AS REQUIRED FOR STABILITY DURING ALL PHASES OF CONSTRUCTION.
- 1.8 THE CONTRACT DRAWINGS AND SPECIFICATIONS REPRESENT THE FINISHED STRUCTURE AND DO NOT INDICATE MEANS AND METHODS OF CONSTRUCTION. STRUCTURAL CALCULATIONS AS PROVIDED AS PART OF THE CONSTRUCTION DOCUMENTS ARE BASED ON A COMPLETED STRUCTURE. THE STRUCTURAL ADEQUACY OF THE PARTIALLY COMPLETED STRUCTURE TO RESIST APPLIED LOADS IS BEYOND THE SCOPE OF THESE STRUCTURAL DRAWINGS.
- 1.9 REFER TO THE MECHANICAL, PLUMBING, AND ELECTRICAL DRAWINGS FOR ADDITIONAL INFORMATION NOTE SHOWN.

**2. DESIGN CRITERIA**

- 2.1 DESIGN, MATERIALS, AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH THE "STANDARDS SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION (SSPWC), AND THE 2018 INTERNATIONAL BUILDING CODE (ASCE 7-16) AS AMENDED AND ADOPTED BY THE CITY OF SPARKS, NEVADA (2018 NORTHERN NEVADA AMENDMENTS).
- 2.2 ALL OTHER CODES AND STANDARDS SHALL BE THE MOST CURRENT ADOPTED EDITION AS OF THE DATE OF THESE DRAWINGS.
- 2.3 SNOW LOADS:
 

GROUND SNOW LOAD, Pg:	30	PSF	(ELEV. 4435')
-----------------------	----	-----	---------------
- 2.4 WIND DESIGN:
 

BASIC WIND SPEED, Vult:	120	MPH
NOMINAL WIND SPEED, Vasd:	93	MPH
RISK CATEGORY:	II	
WIND EXPOSURE:	C	
- 2.5 SEISMIC DESIGN:
 

RISK CATEGORY:	II
SEISMIC IMPORTANCE FACTOR, Is:	1.0
MAPPED SPECTRAL ACCELERATION, Ss:	1.42 g
SITE CLASS:	D
SPECTRAL RESPONSE COEFFICIENT, Sds:	1.13 g
SEISMIC DESIGN CATEGORY:	D

BASIC SEISMIC FORCE-RESISTING SYSTEM:	NON-STRUCTURAL COMPONENTS
SEISMIC DESIGN FORCE (Fp)	0.46
COMPONENT AMPLIFICATION FACTOR, ap	2.5
RESPONSE MODIFICATION FACTOR, R	2.5

**3. FOUNDATIONS**

- 3.1 ALLOWABLE LOAD-BEARING VALUES OF SOILS (IBC TABLE 1804.2):
 

ALLOWABLE FOUNDATION PRESSURE:	2000	PSF
LATERAL BEARING (PASSIVE):	150	PSF
LATERAL BEARING (ACTIVE):	35	PSF
LATERAL SLIDING:	0.25	
- 3.2 BEFORE COMMENCING EARTHWORK, THE CONTRACTOR SHALL INSPECT THE SITE FOR ANY EXISTING ITEMS THAT MAY INTERFERE WITH THE PROPOSED IMPROVEMENTS. IT SHALL BE THE DUTY OF THE CONTRACTOR TO VERIFY LOCATION OF ALL UTILITIES AND STRUCTURES. NOTIFY ENGINEER WHERE CONFLICTS EXIST. RELOCATE OR AVOID AS NECESSARY AS TO NOT DAMAGE OR INTERFERE WITH EXISTING TO REMAIN.
- 3.3 GENERAL SITE CLEARING SHALL INCLUDE THE REMOVAL OF ALL SURFACE DEBRIS, EXISTING CONCRETE, RUBBLE, AND VEGETATION AND ORGANICS AND AS DIRECTED BY THE ENGINEER OR CITY OF SPARKS.
- 3.4 SCARIFY THE SOILS EXPOSED TO EXCAVATION TO A DEPTH OF 6" AND RE-COMPACT TO 90% MAXIMUM DRY DENSITY (ASTM D-1557, METHOD C). WATER OR DRY MATERIALS AS NECESSARY TO OBTAIN PROPER MOISTURE CONTENT. FILL HOLES DUE TO THE REMOVAL OF LARGE ROCKS OR OVER-EXCAVATION WITH CONCRETE.
- 3.5 PLACE ALL SLABS AND EQUIPMENT BASES ON 6" MINIMUM OF TYPE II CLASS B AGGREGATE BASE COMPACTED TO 95% MIN OF MAXIMUM DRY DENSITY (ASTM D-1557).
- 3.6 FOOTING EXCAVATIONS SHALL BE NEAT AND TRUE, WITH ALL LOOSE MATERIAL AND STANDING WATER REMOVED BEFORE FOOTING CONCRETE IS PLACED.
- 3.7 ALL EXCAVATIONS, FORMS AND REINFORCING SHALL BE INSPECTED BY THE BUILDING OFFICIAL AND ENGINEER PRIOR TO PLACING CONCRETE.

**4. CAST-IN-PLACE CONCRETE**

- 4.1 CONCRETE MATERIALS AND CONSTRUCTION SHALL COMPLY WITH IBC CHAPTER 19, ACI 318, AND ACI 301.
- 4.2 CONTRACTOR SHALL SUBMIT ALL MIX DESIGNS FOR REVIEW AND APPROVAL.
- 4.3 CONCRETE PROPERTIES AND COMPOSITION (ASTM C94):

PROPERTY	CLASS A
28-DAY Fc (1)	4500 PSI
W/C	0.45
UNIT WT (2)	145 PCF
AIR (+/-) (3)	5%
SLUMP (MAX) (4)	4"
SHRINKAGE (5)	NR
CEMENT (6)	TYPE II
MIN CEMENT	520
FIBER REINF (7)	1.5 LB PCY

- NOTES:
- (1) SPECIAL INSPECTION IS NOT REQUIRED FOR NONSTRUCTURAL CONCRETE SLABS SUPPORTED ON GRADE (IBC 1705.3).
  - (2) NORMAL WEIGHT AGGREGATE PER ASTM C33
  - (3) AIR CONTENT PER ASTM C138, C173, OR C231 - NON-AIR-ENTRAINED (NAE) NOT TO EXCEED 3%
  - (4) SLUMPS ARE FOR UNPLASTICIZED CONCRETE. LARGER SLUMPS MAY BE ATTAINED THROUGH THE USE OF SUPERPLASTICIZER.
  - (5) SHRINKAGE AT 28 DAYS (IN/IN) PER ASTM C157. (NR = NO REQUIREMENT)
  - (6) CEMENT PER ASTM C150, C595, C1157 AS APPROPRIATE. FLY ASH AND POZZOLAN CONFORM WITH ASTM C618.
  - (7) SYNTHETIC MICRO FIBERS (ASTM C1116) 1/2 - 3/4" LONG, MINIMUM RATE INDICATED, RATE PER MANUFACTURERS WRITTEN INSTRUCTIONS.

CLASS A: EXTERIOR SLABS ON GRADE, EQUIPMENT PADS, FOOTINGS, UNO

- 4.4 ADMIXTURES SHALL COMPLY WITH: AIR ENTRAINMENT WITH ASTM C260, WATER REDUCING WITH ASTM C494, CORROSION INHIBITING WITH ASTM C1582.
- 4.5 MIXING WATER SHALL BE PER ASTM C1602.
- 4.6 HOT WEATHER CONCRETE OPERATIONS SHALL BE IN ACCORDANCE WITH ACI 306R.
- 4.7 APPROVAL MUST BE OBTAINED PRIOR TO PLACING CONCRETE FOR ANY OPENINGS, SLEEVES, OR OTHER ATTACHMENTS NOT SHOWN ON DRAWINGS.
- 4.8 PROVIDE CHAMFER OR RADIUS EDGE ON ALL EXPOSED CORNERS OF CONCRETE ABOVE GRADE.
- 4.9 ROUGHEN THE EXISTING CONCRETE SURFACE AT THE INTERFACE OF CONSTRUCTION JOINTS TO AN AMPLITUDE OF (+/-) 1/4" PRIOR TO PLACING NEW CONCRETE. THOROUGHLY WET THE INTERFACE SURFACE AND REMOVE AND STANDING WATER.
- 4.10 FORMS SHALL CONFORM TO ACI 347 AND SHALL BE PROPERLY CONSTRUCTED TO CONCRETE SURFACES AS SHOWN ON THE DRAWINGS. SUFFICIENT TIGHT TO PREVENT LEAKAGE, SUFFICIENTLY STRONG, AND BRACED TO MAINTAIN SHAPE AND ALIGNMENT.
- 4.11 FORMS AND SHORING SHALL NOT BE REMOVED UNTIL THE CONCRETE HAS ATTAINED SUFFICIENT STRENGTH TO WITHSTAND ALL LOADS TO BE IMPOSED WITHOUT EXCESS STRESS, CREEP OR DEFLECTION.
- 4.12 SLEEVES IN CONCRETE SHALL BE SPACED WITH ONE SLEEVE DIAMETER (2" MIN) CLEAR DISTANCE BETWEEN ADJACENT SLEEVES. SLEEVES SHALL NOT TOUCH REBAR. SLEEVES GREATER THAN 12" IN DIAMETER SHALL BE REVIEWED BY THE ENGINEER FOR APPROVAL AND MAY REQUIRE ADDITIONAL TRIM REINFORCEMENT.
- 4.13 PROTECT FRESHLY DEPOSITED CONCRETE FROM PREMATURE DRYING AND EXCESSIVE HOT OR COLD TEMPERATURES FOR A MINIMUM (7) DAYS.
- 4.14 PROVIDE LIQUID MEMBRANE-FORMING CURING COMPOUNDS COMPLYING WITH ASTM C309 TYPE 1 & 2. ON CONCRETE SURFACES EXPOSED TO SUN, HEAT REFLECTING WHITE PIGMENTED COMPOUNDS SHOULD BE USED. CONTRACTOR TO VERIFY THAT CURING COMPOUND IS COMPATIBLE WITH FLOOR FINISHES.

**5. CONCRETE REINFORCEMENT**

- 5.1 REINFORCEMENT SHALL CONFORM TO ACI 318, SECTION 3.5 AND ASTM A615, GRADE 60 (#4 AND LARGER) AND GRADE 40 (#3 BARS ONLY).
- 5.2 CONCRETE REINFORCEMENT DETAILS INCLUDING BAR SUPPORTS AND PLACING SHALL CONFORM TO ACI 315 AND THE CONCRETE REINFORCING STEEL INSTITUTE "MANUAL OF STANDARD PRACTICE." HOOKS SHALL BE PER ACI 318, SECTION 7.1 UNLESS DETAILED OTHERWISE.
- 5.3 PROVIDE THE FOLLOWING COVER ON REINFORCEMENT UNLESS NOTED OTHERWISE IN DRAWINGS. COVER SHALL BE TO FACE OF BAR, MECHANICAL COUPLER, OR WELDED HEADED BAR.
 

CAST-IN-PLACE CONCRETE	MINIMUM CONCRETE COVER
CAST AGAINST AND EXPOSED TO EARTH	3"
EXPOSED TO EARTH OR WEATHER	
#5 AND SMALLER	1 1/2"
CLEAR TO TOP FOR REINFORCEMENT IN SLAB-ON-GRADE	1 1/2"
- 5.4 LAP SPlice ALL BARS A MINIMUM OF 40 BAR DIAMETERS UNLESS OTHERWISE NOTED. STAGGER LAP SPLICES A MINIMUM OF 24 INCHES.
- 5.5 SECURELY TIE ALL REINFORCEMENT PRIOR TO PLACING CONCRETE INCLUDING LAP SPLICES. TIES SHALL BE SUFFICIENT TO MAINTAIN THEIR EXACT POSITION THROUGHOUT THE PLACEMENT OF CONCRETE.
- 5.6 SUBMIT SHOP DRAWINGS OF REINFORCEMENT LAYOUTS AND DETAILS FOR REVIEW PRIOR TO FABRICATION. SHOW ALL PROPOSED SPlice LOCATIONS, FABRICATE FROM APPROVED DRAWINGS ONLY.
- 5.7 BEND REINFORCING STEEL IN ACCORDANCE WITH ACI 301, SECTION 3.3.2.8. #3, #4, & #5 BARS MAY BE BENT COLD THE FIRST TIME PROVIDED TEMPERATURE OF BAR IS ABOVE 32F. FOR OTHER BAR SIZES PREHEAT REINFORCING BARS PRIOR TO BENDING.

**6. SLABS-ON-GRADE**

- 6.1 USE CONCRETE OF THE TYPE AND PROPORTION INDICATED IN SECTION 4 OF THESE NOTES.
- 6.2 LOCATE CONTROL JOINTS AS SHOWN ON PLANS (BUT NOT TO EXCEED 10' FOR PADS OR 6' FOR WALKWAYS). MAKE JOINTS AS SOON AS THE SLAB IS STRONG ENOUGH TO ACCEPT THE JOINT. PROVIDE JOINTS SO THAT PANEL LENGTH TO WIDTH DOES NOT EXCEED 1.5 TO 1 FOR ANY PANEL. THE CONTRACTOR SHALL SUBMIT A CONTROL JOINT LAYOUT TO THE ENGINEER FOR APPROVAL PRIOR TO BEGINNING CONSTRUCTION.
- 6.3 PROTECT FRESHLY DEPOSITED CONCRETE FROM PREMATURE DRYING AND EXCESSIVE HOT OR COLD TEMPERATURES FOR A MINIMUM (7) DAYS.
- 6.4 CONCRETE SLABS SHALL BE CONTINUOUSLY CURED FOR A MINIMUM OF (7) DAYS AFTER PLACING BY APPROPRIATE MEANS INCLUDING BUT NOT LIMITED TO, CURING COMPOUND OR PAPER.
- 6.5 DAMPEN BASE PRIOR TO PLACING CONCRETE.
- 6.6 CONSTRUCT EXTERIOR SLABS-ON-GRADE AS FOLLOWS:
 

BROOM FINISH FOR ALL EXTERIOR CONCRETE WORK
CONCRETE SLAB - MINIMUM THICKNESS AND REINFORCING PER PLAN
6" MINIMUM LAYER OF TYPE 2 CLASS B AGGREGATE BASE AND COMPACT TO 95%
FINISHED SLABS SHALL NOT BE USED TO STORE ANY CONSTRUCTION MATERIALS.

**7. ANCHORS TO CONCRETE**

- 7.1 CONCRETE EXPANSION ANCHORS SHALL BE HILTI KWIK-BOLT T22 (ICC ESR-4266) INSTALLED PER THE MANUFACTURERS WRITTEN INSTRUCTION. ANCHORS INSTALLED OUTSIDE SHALL BE 304 STAINLESS STEEL. INSTALLATION TORQUE FOR EXPANSION ANCHORS SHALL BE 60 FT-LBF TORQUE FOR 5/8" DIAMETER AND 40 FT-LBF FOR 1/2" DIAMETER.
- 7.2 EXPANSION ANCHORS AND SCREW ANCHORS SHALL NOT BE INSTALLED IN CONCRETE UNTIL IT ATTAINS THE SPECIFIED 28-DAY COMPRESSIVE STRENGTH BUT NOT LESS THAN 7 DAYS.
- 7.3 SCREW ANCHORS TO BE 304 SS TITEN HD (IAPMO UES ER-493) INSTALLED IN ACCORDANCE WITH THE MANUFACTURERS WRITTEN INSTRUCTIONS.
- 7.4 MINIMUM EMBEDMENT FOR POST-INSTALLED ANCHORS SHALL BE AS INDICATED ON THE PLANS BUT IN NO CASE LESS THEN SPECIFIED BY THE MANUFACTURER FOR THE DIAMETER. CLEAN ALL NUTS, WASHERS, AND BOLTS FROM CONTAMINANTS PRIOR TO INSTALLATION.

**8. STEEL CONSTRUCTION**

- 8.1 STRUCTURAL STEEL DETAILING, FABRICATION AND ERECTION SHALL CONFORM TO IBC CHAPTER 22 AND AISC 360, AISC 341, AND AISC 303.
- 8.2 PROVIDE SHOP DRAWINGS INCLUDING DETAILS FOR CUTS, HOLES AND WELDS FOR ALL FABRICATED PARTS FOR REVIEW AND APPROVAL PRIOR TO FABRICATION.
- 8.3 HSS STEEL TUBING SHALL BE ASTM A500, GR C (FY = 50 ksi).
- 8.4 STEEL PIPE SHALL BE ASTM A53, GRADE A.
- 8.5 PLATES, CHANNELS AND ANGLES SHALL BE ASTM A36, UNO.
- 8.6 THRU-BOLTS SHALL BE ASTM A307 GRADE A. PROVIDE HARDENED WASHERS (ASTM F436) UNDER THE HEAD OF ALL BOLTS AND HEX NUTS (ASTM A563-A).
- 8.7 ALL BOLTS, NUTS, AND WASHERS SHALL BE APPROPRIATELY GRADE MARKED AND GALVANIZED ASTM F2329.
- 8.8 BOLT HOLES SHALL COMPLY WITH RCSC SECTION 3.3. USE STANDARD HOLES UNLESS DETAILED OTHERWISE. HOLES MAY BE DRILLED, PUNCHED, OR THERMALLY CUT. MANUAL THERMAL CUTTING OF HOLES ARE NOT PERMITTED.
- 8.9 WELDING SHALL CONFORM TO AWS D1.1. CERTIFIED WELDERS SHALL PERFORM ALL WELDING.
- 8.10 USE LOW-HYDROGEN E7018 ELECTRODES WITH A MINIMUM CHARPY V-NOTCH TOUGHNESS OF 20 FT-LB AT 0°F.
- 8.11 ALL WELDS SHALL BE PRE-QUALIFIED AND SHALL BE PERFORMED IN STRICT CONFORMANCE WITH AN APPROVED WRITTEN WELD PROCEDURE SPECIFICATION (WPS) PER AWS D1.1. CONTRACTOR TO PROVIDE ENGINEER OF RECORD WELDING PROCEDURES TO BE REVIEWED AND APPROVED PRIOR TO BEGINNING ANY WELDING.
- 8.12 STRUCTURAL STEEL SHALL BE SHOP PRIMED (SHERWIN WILLIAMS PRO INDUSTRIAL PRO-CRYL) AND PAINTED (SHERWIN WILLIAMS PRO INDUSTRIAL SEMI-GLOSS ACRYLIC) TO THE GREATEST EXTENT POSSIBLE. AFTER INSTALLATION, CONTRACTOR SHALL FIELD PAINT ALL WELDED CONNECTIONS AND TOUCH-UP ANY DAMAGED COATING. CONTRACTOR TO PROVIDE PAINT SUBMITTAL FOR REVIEW AND APPROVAL.

- 9.1 COLD-FORMED STEEL LIGHT-FRAMED CONSTRUCTION SHALL COMPLY WITH IBC CHAPTER 22, AISI S100.
- 9.2 STRUT FRAMING SYSTEMS CONSISTING OF CONTINUOUS SLOT, BOLTED FRAMING CHANNELS, AND ASSOCIATED FITTINGS AND HARDWARE SHALL CONFORM WITH THE LATEST VERSION OF MFMA STANDARD PUBLICATION NUMBER MFMA-4.
- 9.3 EXTERIOR INSTALLATION SHALL USE HOT-DIP GALVANIZED STEEL OR STAINLESS STEEL. WHERE HOT-DIPPED GALVANIZED STEEL IS USED, ALL CUT SURFACES SHALL BE FIELD PAINTED PER ASTM A780.
- 9.4 CUT FRAMING COMPONENTS SQUARELY OR AT AN ANGLE TO FIT TIGHT AGAINST ABUTTING MEMBERS. HOLD FIRMLY IN POSITION UNTIL PROPERLY FASTENED.

**10. SPECIAL INSPECTIONS AND TESTING**

- 10.1 PROVIDE SPECIAL INSPECTIONS IN COMPLIANCE WITH IBC 1704 BY AN APPROVED INSPECTOR.
 

THE FOLLOWING ITEMS SHALL BE INSPECTED IN ACCORDANCE WITH THE APPROPRIATE SECTION IN THE IBC. THE INSPECTION AGENCY SHALL PROVIDE COPIES OF ALL INSPECTION REPORTS DIRECTLY TO THE ENGINEER. ANY CONSTRUCTION THAT FAILS TO COMPLY WITH THE APPROVED CONSTRUCTION DOCUMENTS SHALL BE IMMEDIATELY BROUGHT TO THE ATTENTION OF THE ENGINEER.
- 10.2 CONCRETE CONSTRUCTION, IBC 1705.3:
 

PERIODIC SPECIAL INSPECTION IS REQUIRED FOR POST-INSTALLED ANCHORS AS INDICATED IN THE CORRESPONDING RESEARCH REPORT ISSUED BY THE APPROVAL AGENCY.

**EROSION CONTROL NOTES:**



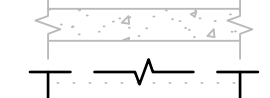
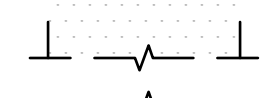

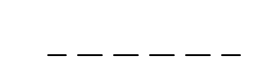
1. THE CONTRACTOR SHALL USE TEMPORARY EROSION CONTROL FACILITIES DURING CONSTRUCTION TO PREVENT DISCHARGE OF EARTHEN MATERIALS FROM THE SITE DURING PERIODS OF PRECIPITATION.
2. EACH WEEK THE CONTRACTOR AND OR THEIR AUTHORIZED AGENTS SHALL REMOVE ALL SEDIMENT, MUD, CONSTRUCTION DEBRIS, OR OTHER POTENTIAL POLLUTANTS THAT HAVE BEEN DISCHARGED AS A RESULT OF CONSTRUCTION ACTIVITIES ASSOCIATED WITH THIS PROJECT. SUCH MATERIALS SHALL BE PREVENTED FROM ENTERING THE STORM DRAIN SYSTEM.
3. ACCUMULATED SEDIMENT IN BMPS SHALL BE REMOVED PRIOR ANY ANTICIPATED STORM EVENT. SEDIMENT MUST BE REMOVED WHEN THE BMP DESIGN CAPACITY IS REDUCED BY MORE THAN 50%.
4. THE CONTRACTOR SHALL INSPECT ALL DISTURBED AREAS, AREAS USED FOR STORAGE, VEHICLE PATH, AND BMPS WEEKLY. PRIOR TO A FORECASTED RAIN EVENT AND WITHIN 24 HOURS OF AN ACTUAL RAIN EVENT. THE CONTRACTOR SHALL UPDATE OR MODIFY THE STORMWATER POLLUTION PREVENTION PLAN AS NECESSARY.
5. CONTRACTOR SHALL CONSTRUCT AND OR INSTALL TEMPORARY SEDIMENT AND EROSION CONTROL DEVICES PRIOR TO ANY GRADING ACTIVITY.
6. CONTRACTOR SHALL STOCKPILE EXISTING GRAVEL TO BE REAPPLIED AFTER COMPLETION OF GRADING.
7. ALL LOOSE PILES OF SOIL, SILT, CLAY, SAND, DEBRIS, OR EARTHEN MATERIALS SHALL BE PROTECTED IN A REASONABLE WAY TO PREVENT DISCHARGE.
8. AFTER COMPLETION OF EACH PHASE, ALL SURPLUS OR WASTE MATERIAL SHALL BE REMOVED FROM THE SITE AND DEPOSITED AT A LEGAL POINT OF DISPOSAL.
9. THE CONTRACTOR SHALL DEVELOP, PROPOSE, AND IMPLEMENT AN APPROPRIATE DUST CONTROL PROGRAM TO BE USED THROUGHOUT CONSTRUCTION. THE DUST CONTROL PLAN SHALL BE SUBMITTED TO THE CITY OF SPARKS BUILDING DEPARTMENT AND SHALL SATISFY ALL APPLICABLE STATE AND FEDERAL REQUIREMENTS. CONTRACTOR SHALL BE REQUIRED TO PAY ANY ASSOCIATED FEES TO SATISFY DUST CONTROL REQUIREMENTS. CONTRACTOR SHALL TAKE ALL NECESSARY STEPS TO CONTROL DUST IN CONSTRUCTION AND STAGING AREAS. SUFFICIENT WATER TRUCKS SHALL BE MADE AVAILABLE FOR DUST CONTROL PURPOSES. THE CONTRACTOR IS REQUIRED TO SUPPRESS DUST AT ALL TIMES, 24 HOURS A DAY, 7 DAYS A WEEK.

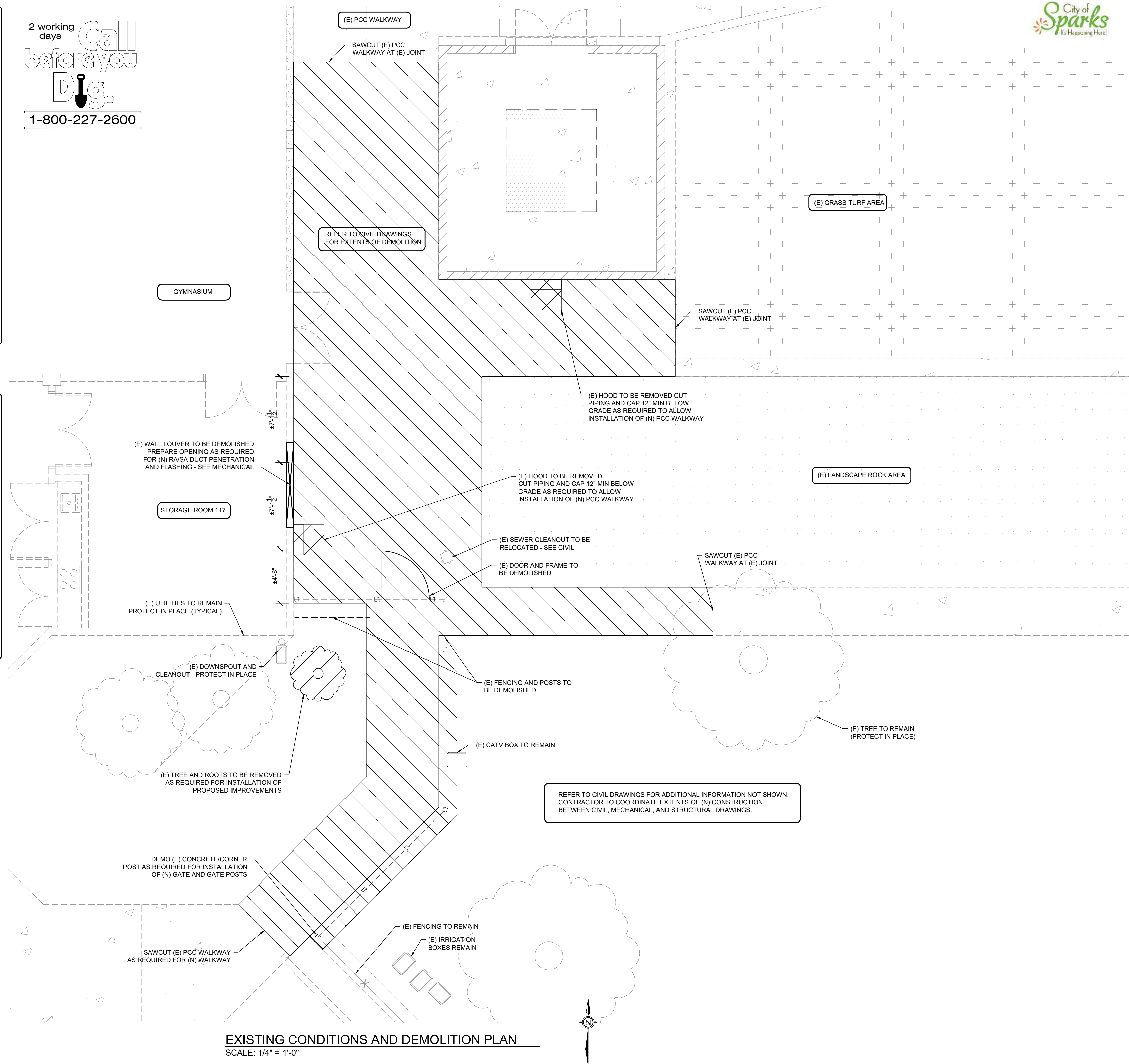
2 working days  
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**EXISTING CONDITIONS / DEMOLITION NOTES:**

1. CONTRACTOR SHALL INSPECT THE SITE FOR ANY EXISTING ITEMS THAT MAY INTERFERE WITH THE PROPOSED IMPROVEMENTS AND PROMPTLY REPORT ANY DISCREPANCIES FOUND AMONG THESE DRAWINGS AND SPECIFICATIONS TO THE ENGINEER. ALL DISCREPANCIES SHALL BE CORRECTED IN WRITING. ANY WORK DONE BY THE CONTRACTOR AFTER THE DISCOVERY OF SUCH DISCREPANCIES PRIOR TO RECEIVING WRITTEN DIRECTION FROM THE ENGINEER IS AT THE CONTRACTORS OWN RISK.
2. VERIFY AND COORDINATE ALL DIMENSIONS AND EXISTING CONDITIONS PRIOR TO BEGINNING ANY CONSTRUCTION.
3. THE UNDERGROUND UTILITIES SHOWN IN THESE DRAWINGS ARE APPROXIMATE. UTILITY LOCATIONS ARE BASED ON SURFACE FIELD TIES AND IMPROVEMENT PLAN MAPS FROM AS-BUILT DRAWINGS. ACTUAL LOCATIONS OF THE UTILITIES SHOWN HERE ON, NOR FOR ANY DAMAGES CAUSED BY ANY CONSTRUCTION OR EXCAVATION ON OR NEAR SAID UTILITIES. DAMAGE TO ANY EXISTING UTILITIES DURING CONSTRUCTION SHALL BE REPAIRED IMMEDIATELY IN ACCORDANCE WITH THE UTILITIES COMPANIES OR OWNERS REQUIREMENTS AND AT THE CONTRACTORS EXPENSE.
4. IT SHALL BE THE DUTY OF THE OF THE CONTRACTOR TO MAKE THE DETERMINATION AS TO THE LOCATION OF ALL EXISTING UTILITIES PRIOR TO BEGINNING ANY WORK. CONTACT USA AT 1-800-227-2900. PRIOR TO CONSTRUCTION THE CONTRACTOR SHALL NOTIFY THE APPROPRIATE UTILITY COMPANY/OWNER AND INFORM THEM OF ANY PLANNED DISTURBANCE TO OR AROUND EXISTING UTILITIES.
5. CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF ALL UTILITIES WITHIN THE PROJECT AREA FROM ACTIVITIES ASSOCIATED WITH THE CONSTRUCTION OF THIS PROJECT.
6. ALL SAWCUTTING OF CONCRETE SHALL BE NEAT AND STRAIGHT AS SHOWN.
7. ANY DAMAGE BY THE CONTRACTOR TO THE EXISTING IMPROVEMENTS TO REMAIN SHALL BE REMOVED AND REPLACED PER THE STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION, LATEST EDITION, AT THE CONTRACTORS EXPENSE.

**FOUNDATION DEMOLITION KEY**

-  (E) WALL TO REMAIN
-  (E) LOUVER TO BE REMOVED
-  (E) CONCRETE SLAB ON GRADE TO REMAIN
-  (E) MECHANICAL EQUIPMENT TO BE DEMOLISHED
-  (E) CONCRETE SLAB ON GRADE TO BE DEMOLISHED
-  (E) FENCING TO BE DEMOLISHED

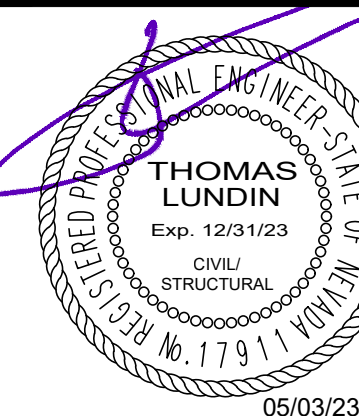


**EXISTING CONDITIONS AND DEMOLITION PLAN**  
 SCALE: 1/4" = 1'-0"



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CITY OF SPARKS  
 ALF SORENSEN PRESCHOOL - HVAC MODIFICATIONS  
**STRUCTURAL DEMOLITION PLAN**

NEVADA

SPARKS

DRAWN: TJL  
 CHECKED: TJL  
 DATE: 05/03/23  
 SCALE: AS SHOWN  
 PROJECT NO: 1482001

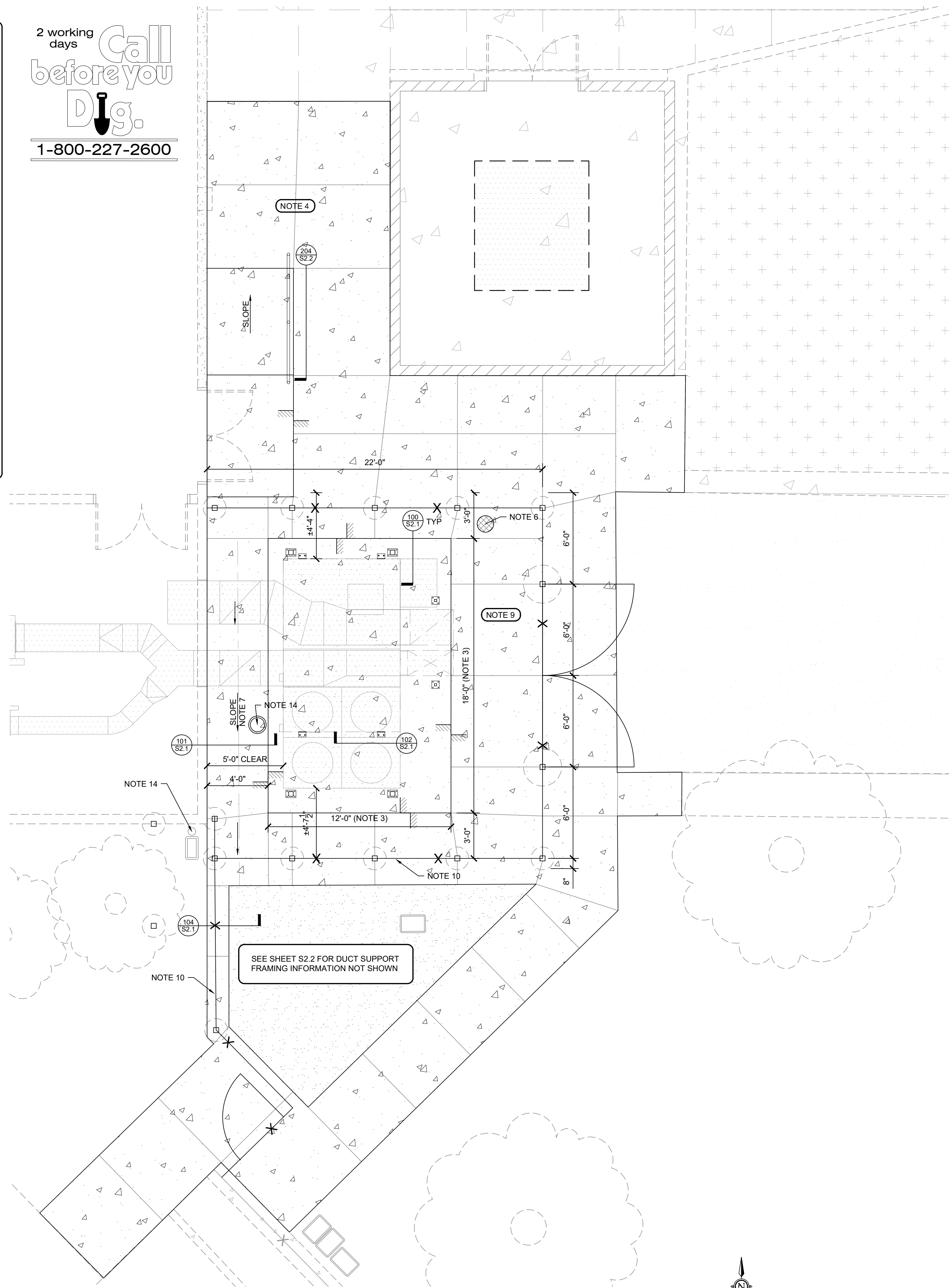
SHEET NO:

**S1.1**

- SITE NOTES:**
- MECHANICAL EQUIPMENT AND DUCTING ALIGNMENT SHOWN FOR REFERENCE ONLY - SEE MECHANICAL PLANS FOR ADDITIONAL REQUIREMENTS.
  - DESIGN AND LAYOUT IS BASED ON THE AHU SPECIFIED ON SHEET M0.3 OF THE MECHANICAL DRAWINGS (JOHNSON J25ZJ\*\*\*) ANY MODIFICATIONS OR SUBSTITUTIONS TO THE EQUIPMENT SPECIFIED THAT REQUIRES CHANGES TO THIS DESIGN OR LAYOUT SHALL BE AT THE CONTRACTOR EXPENSE.
  - (N) 8" THICK CONCRETE SLAB ON GRADE W/ #5 @ 12" EACH WAY. PROVIDE THICKENED SLAB EDGES ALL SIDES PER DETAIL 100/S2.1. SET TOP OF REINFORCING STEEL 2" CLEAR FROM TOP OF SLAB. PROVIDE 1" DEEP CONTROL JOINTS (SEE DETAIL 103/S2.1) AS REQUIRED (10'-0" MAX SPACING) AND TO AVOID POST INSTALLED ANCHORS. TOP OF CONCRETE SHALL BE LEVEL WITH MAX VARIATION IN TOP OF CONCRETE ELEVATION < 3/16". SET TOP OF CONCRETE EQUIPMENT SLAB TO MATCH (E) BUILDING FF ELEVATION.
  - (N) 5" THICK CONCRETE SLAB ON GRADE WALKWAYS. MAXIMUM CROSS SLOPE 50:1. PROVIDE LANDINGS WHERE SHOWN ON PLAN WITH MAXIMUM CROSS SLOPE 50:1 ALL DIRECTIONS. MAXIMUM RUNNING SLOPE BETWEEN LANDINGS 12:1. REFER TO CIVIL DRAWINGS FOR LAYOUT AND TOP OF CONCRETE ELEVATIONS. CONTRACTOR TO SUBMIT JOINTING LAYOUT FOR REVIEW AND APPROVAL.
  - TOP OF (N) CONCRETE WALKWAYS TO MATCH (E) - TYPICAL AT ALL SIDES. SLOPE (N) CONCRETE AWAY FROM (E) STRUCTURE AND TOWARDS (E) LANDSCAPE AREAS (TYP). CONTRACTOR SHALL COORDINATE ALL TOP OF CONCRETE ELEVATIONS WITH ENGINEER PRIOR TO FORMING CONCRETE.
  - CONDENSATE DRYWELL - FIELD LOCATE (14" DIAMETER X 24" DEEP MIN) W/ TRAFFIC GRADE PERFORATED STEEL COVER - SEE PLUMBING. LOCATE 2' MIN FROM EDGE OF (N) EQUIPMENT PAD.
  - PROVIDE CONCRETE VALLEY GUTTER BETWEEN (E) STRUCTURE AND (N) EQUIPMENT PAD - SLOPE TO DRAIN.
  - PROVIDE 4" MINIMUM CLEARANCE BETWEEN AHU AND (E) STRUCTURE AND (N) FENCING - TYPICAL ALL SIDES.
  - PROVIDE 4" THICK CONCRETE INFILL PATCHING.
  - 8' TALL COMMERCIAL ORNAMENTAL SECURITY FENCE TO MATCH (E) WITH MATCHING SWING GATES:  
 PICKETS: 0.75" SQ x 14 GA  
 RAILS: 1.4375" x 1.5" x 14 GA  
 LINE POSTS: 3" SQ x 14 GA  
 GATE POSTS: 4" SQ x 14 GA  
 DOUBLE 6' WIDE SWING GATES (MECHANICAL EQUIPMENT AREA) WITH DROP BAR  
 SINGLE 4' WIDE SWING GATE (WALKWAY) WITH PANIC HARDWARE (SECURE SIDE)  
 FINISH: GALVANIZED STEEL FRAMEWORK WITH EPOXY PRIMER AND ACRYLIC TOPCOAT.  
 FOOTINGS: 18" DIA x 3' DEEP (LINE POSTS)  
 24" DIA x 3' DEEP (GATE POSTS)  
 PROVIDE MATCHING EXPANDED METAL MESH INFILL TO PANELS ADJACENT TO GATES (TYP OF 2)
  - SUBMIT SHOP DRAWINGS SHOWING FABRICATED DUCT PLANS AND ELEVATIONS.
  - SUBMIT SHOP DRAWINGS FOR DUCT SUPPORT STEEL.
  - SUBMIT THE FOLLOWING FENCE SHOP DRAWINGS FOR REVIEW AND APPROVAL:  
 LOCATION OF CORNER POSTS, END POSTS, AND GATES  
 FENCE ASSEMBLY INCLUDING ACCESSORIES, FITTINGS AND HARDWARE  
 GATE ASSEMBLIES INCLUDING ACCESSORIES, LOCKS, AND COMPONENTS
  - RAISE TO FINISH GRADE/TOP OF CONCRETE ALL EXISTING VALVE BOXES, CLEAN OUTS, UTILITY STRUCTURES TO REMAIN. REPLACE TO MATCH (E) ANY DAMAGED STRUCTURES. REFER TO CIVIL DRAWINGS FOR RELOCATION OF (E) SEWER CLEANOUT.

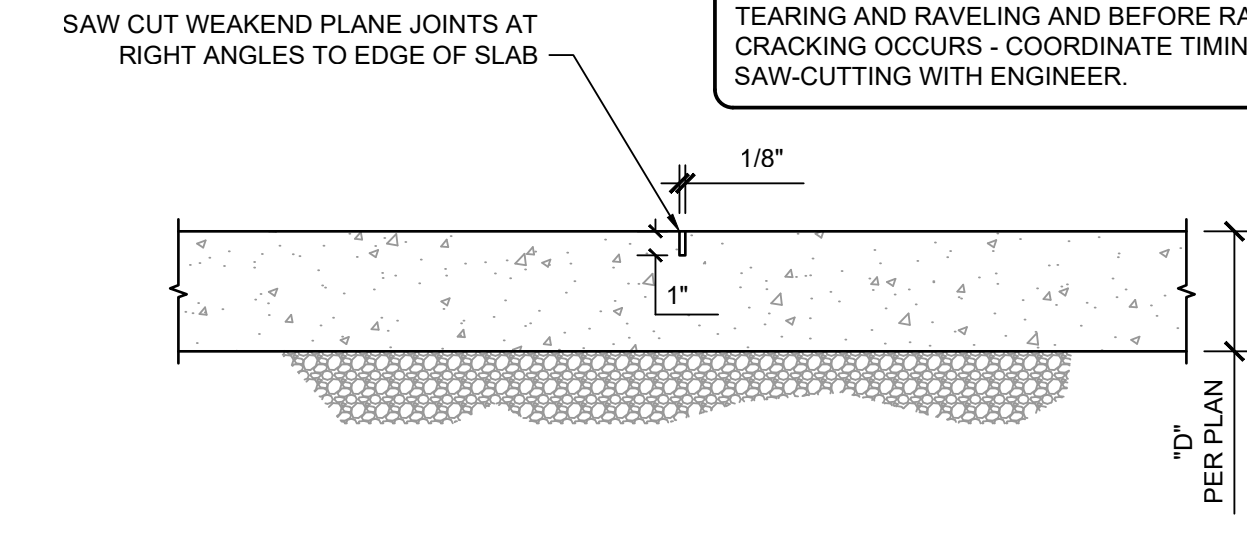
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- FRAMING KEY**
- (E) BUILDING STRUCTURE TO REMAIN (PROTECT IN PLACE)
  - (E) CONCRETE SLAB ON GRADE
  - (N) CONCRETE SLAB ON GRADE
  - (N) MECHANICAL DUCTING (RA/SA) - SEE MECHANICAL PLANS FOR SIZE, ALIGNMENT, AND ADDITIONAL REQUIREMENTS NOT SHOWN
  - (N) EXTERIOR DUCT SUPPORTS - SEE FRAMING S2.2
  - (N) 8' TALL SECURITY FENCING - TO MATCH (E)
  - FLOW LINE
  - 2" MIN OF (N) GRANITE DUST (3/8" MINUS) TO MATCH (E) LANDSCAPE AREAS

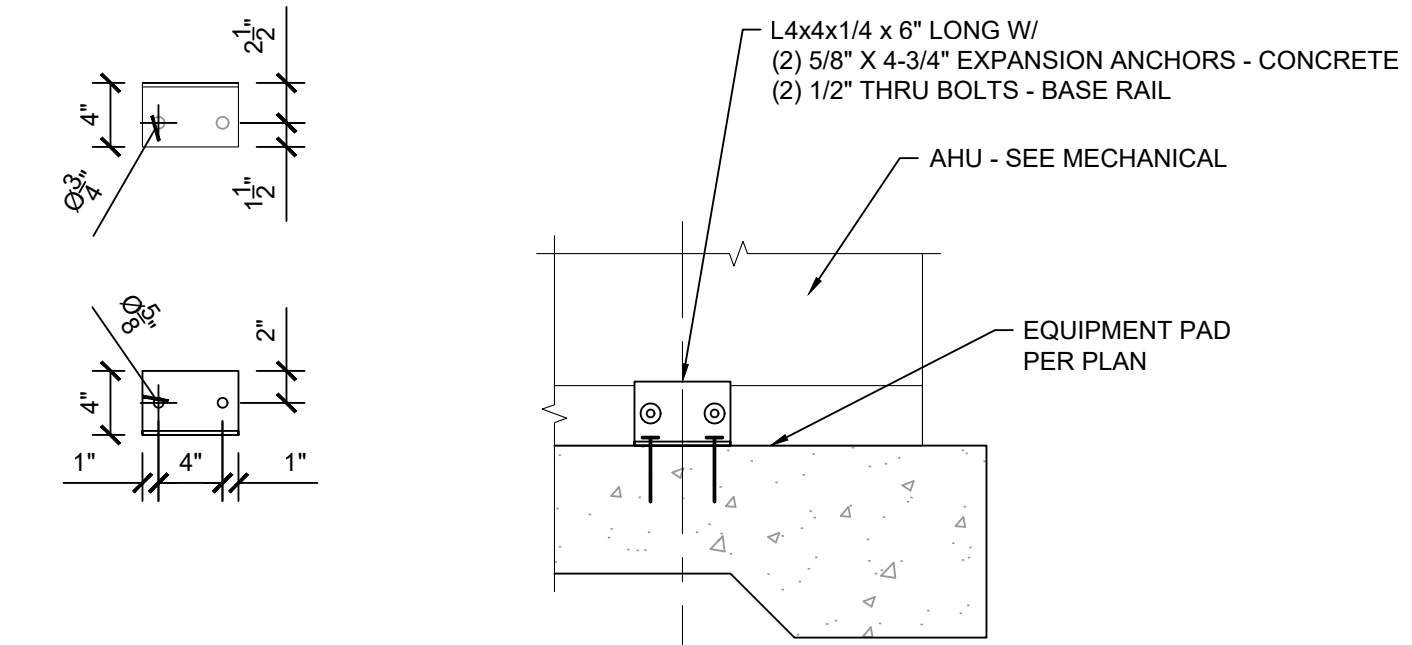


AFTER 7 DAYS, THOROUGHLY CLEAN ALL JOINTS IN EQUIPMENT SLAB AND FILL W/ WEATHER RESISTANT POLYURETHANE JOINT SEALANT (ASTM C-920, TYPE S)

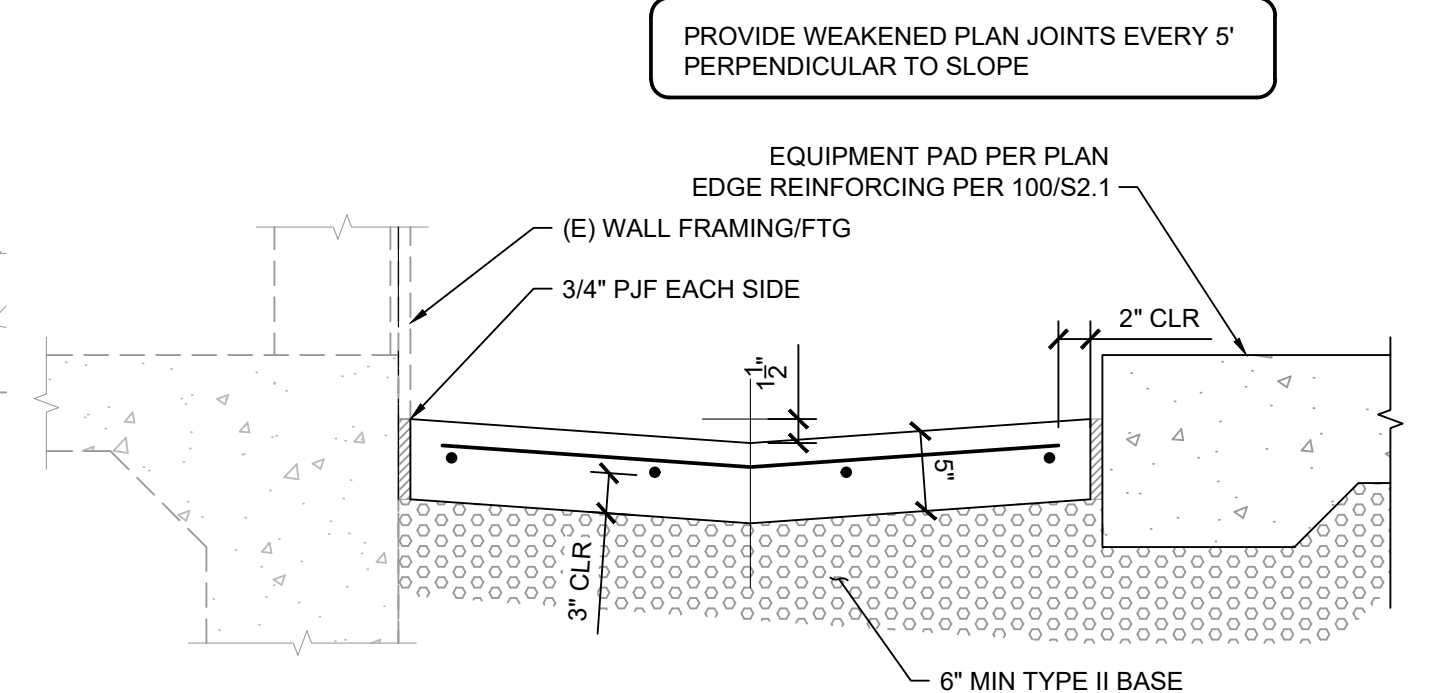
SAWCUT JOINTS AFTER FINISHING AND PRIOR TO CURING. JOINTS SHALL BE SAWCUT AS SOON AS CONCRETE IS SUFFICIENTLY HARD TO RESIST TEARING AND RAVELING AND BEFORE RANDOM CRACKING OCCURS - COORDINATE TIMING OF SAW-CUTTING WITH ENGINEER.



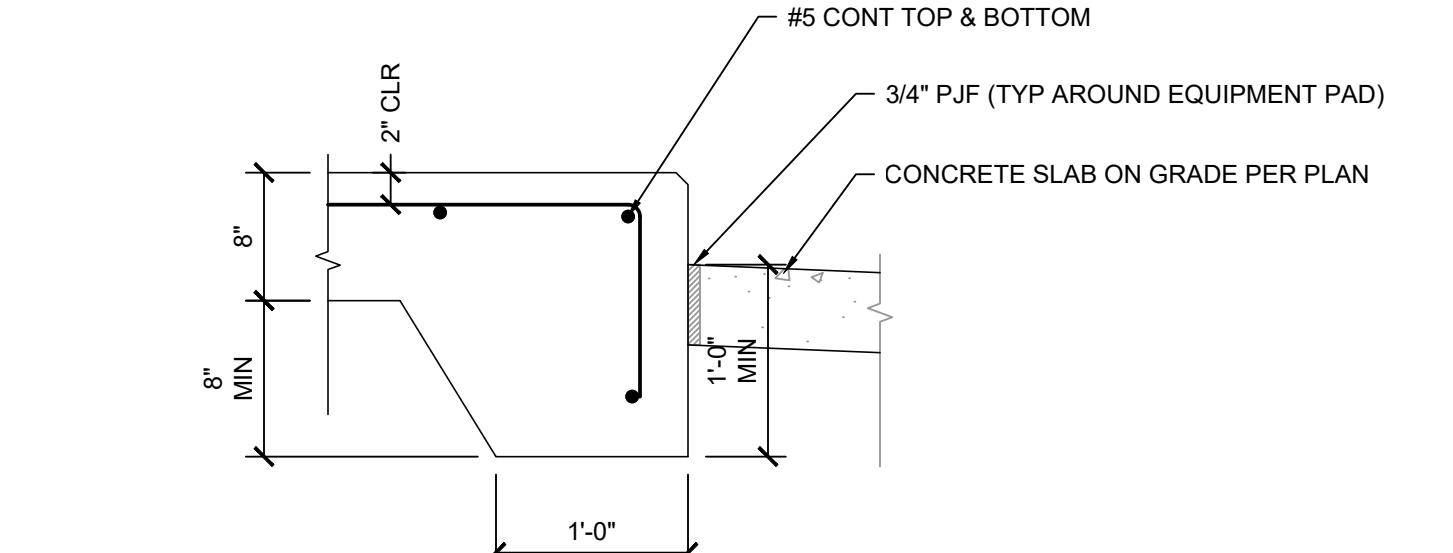
**TYPICAL EQUIPMENT PAD JOINTS**  
 NO SCALE



**BASE RAIL ANCHORAGE**  
 SCALE: 1" = 1'-0"

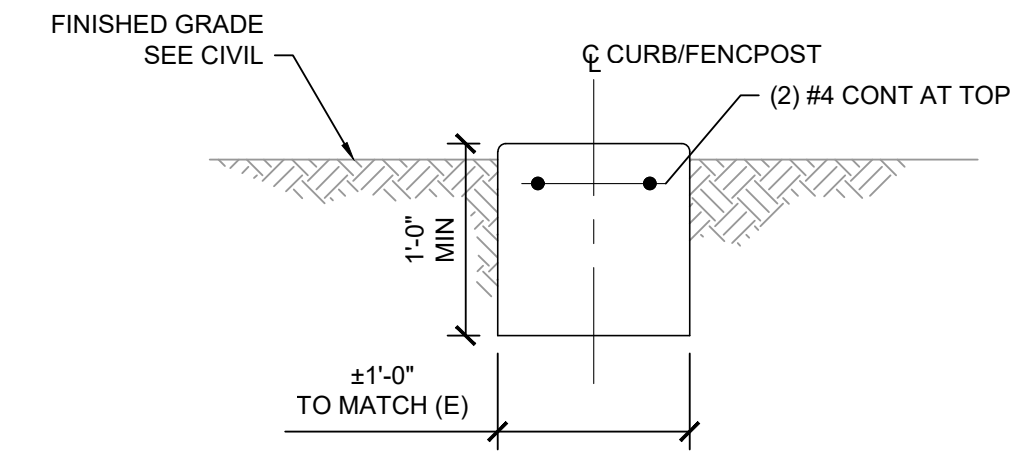


**CONCRETE VALLEY GUTTER**  
 SCALE: 1" = 1'-0"



**EQUIPMENT PAD - EDGE REINFORCING**  
 SCALE: 1" = 1'-0"

PLACE CURB CONCRETE MONOLITHICALLY OVER TOP OF FENCE POST FOOTINGS (TYP)



**CONTINUOUS FENCE CURB**  
 SCALE: 1" = 1'-0"

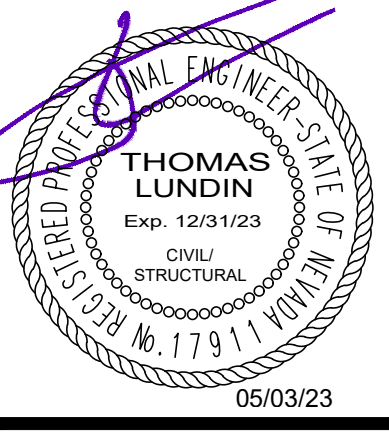
**STRUCTURAL SITE PLAN**  
 SCALE: 1/2" = 1'-0"

SHEET SIZE: 36" x 24" (ARCH D)



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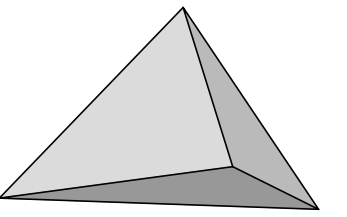


CITY OF SPARKS  
 ALF SORENSEN PRESCHOOL - HVAC MODIFICATIONS  
**STRUCTURAL SITE PLAN**  
 SITE DETAILS  
 SPARKS NEVADA

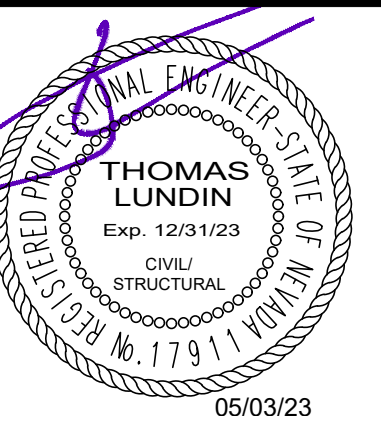
DRAWN: TJL  
 CHECKED: TJL  
 DATE: 05/03/23  
 SCALE: AS SHOWN  
 PROJECT NO: 1482001

SHEET NO:  
**S2.1**





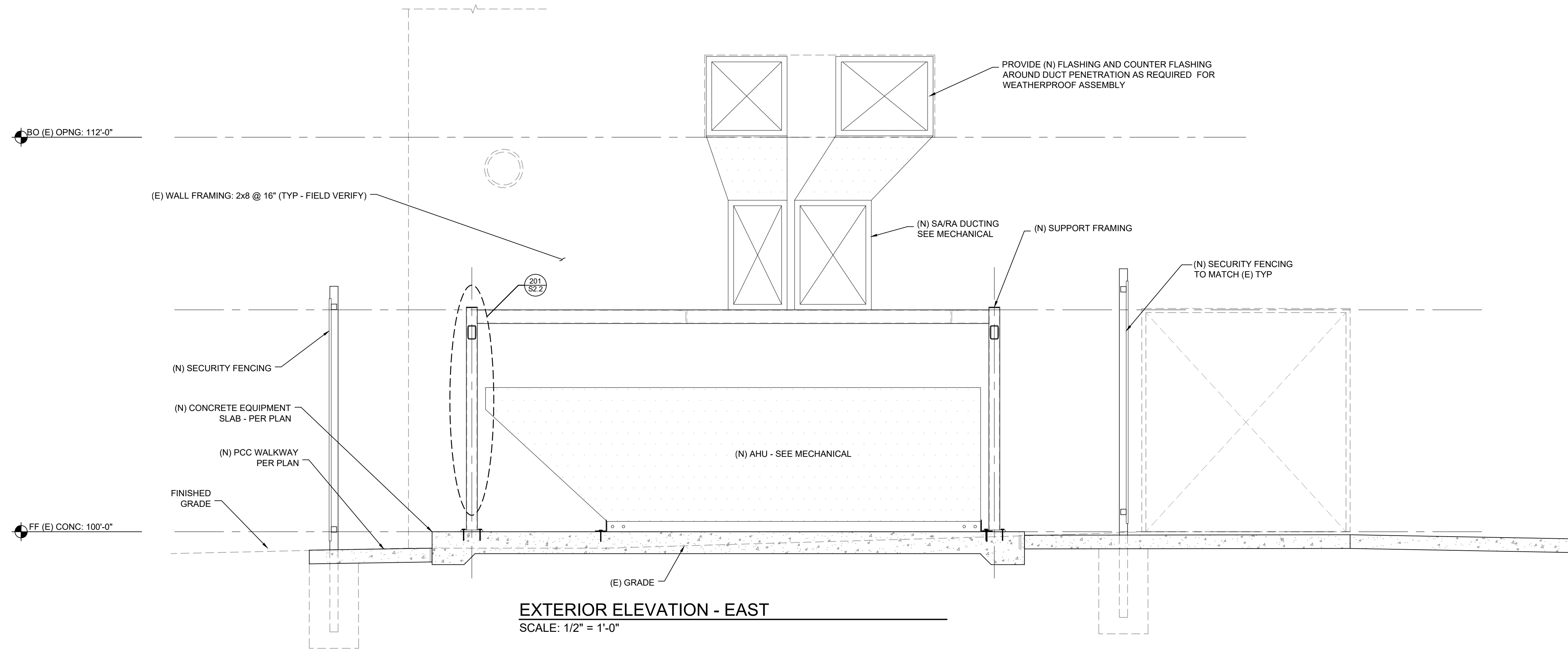
REV	DATE	DESCRIPTION	BID SET
0	05/03/23		



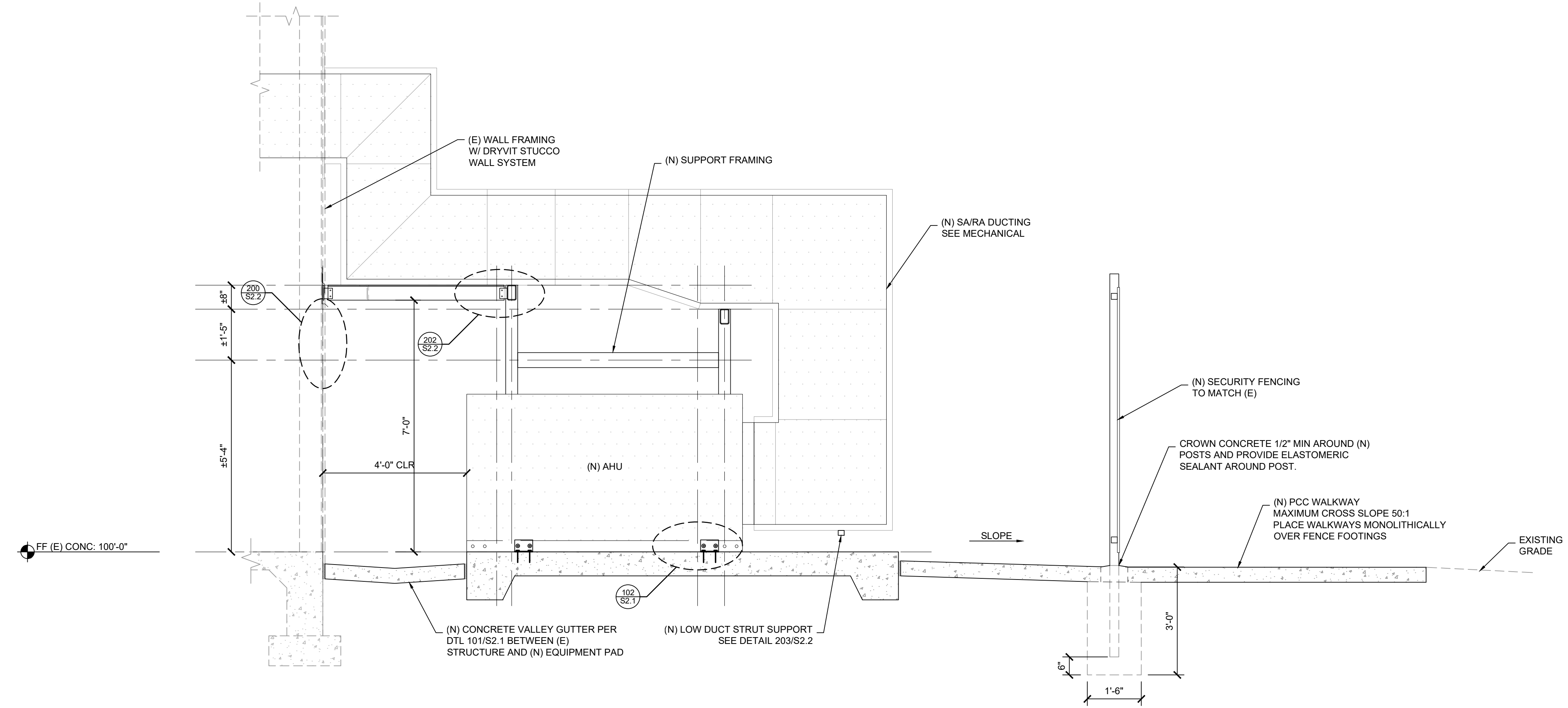
CITY OF SPARKS  
 ALF SORENSEN PRESCHOOL - HVAC MODIFICATIONS  
 FRAMING ELEVATIONS  
 SPARKS NEVADA

DRAWN: T.J.L.  
 CHECKED: T.J.L.  
 DATE: 05/03/23  
 SCALE: AS SHOWN  
 PROJECT NO: 1482001

SHEET NO:  
**S3.0**



**EXTERIOR ELEVATION - EAST**  
SCALE: 1/2" = 1'-0"



**EXTERIOR ELEVATION - SOUTH**  
SCALE: 1/2" = 1'-0"

---

# STRUCTURAL CALCULATIONS

## CITY OF SPARKS

### ALF SORENSEN PRESCHOOL HVAC MODIFICATIONS

#### BID SET

---

#### DESIGN CRITERIA

**Design Codes:** 2018 International Building Code  
ASCE 7-16

**Structure Parameters:**

Mean Duct Height:  $h_m := 10 \cdot \text{ft}$

**Soil Properties:**

Bearing Pressure  $\sigma_{\text{soil}} := 2000 \cdot \text{psf}$

*Dead Load*

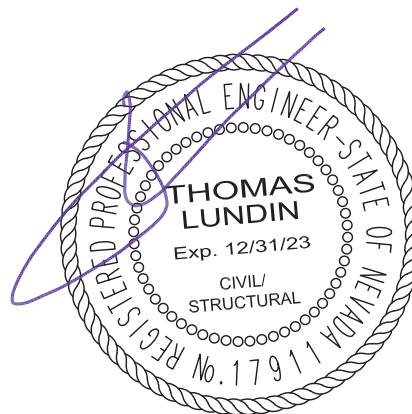
Coefficient of Friction  $\mu_{\text{soil}} := 0.25$

Lateral Bearing  $\sigma_{b\_soil} := 150 \cdot \text{psf}$

**Material Properties:**

Steel Yield Stress:  $F_y := 36 \cdot \text{ksi}$

Concrete Unit Weight:  $\rho_c := 145 \cdot \text{pcf}$



05/03/23



<b>Wind:</b>	Basic Wind Speed:	$V_{ult} := 120 \cdot \text{mph}$	<i>Risk Category II - 3-Second Gust</i>
	Directionality Factor:	$K_d := 0.85$	<i>ASCE 7-16, Table 26.6-1</i>
	Exposure Category:	<b>C</b>	<i>ASCE 7-16, Section 26.7.3</i>
	Terrain Exp. Constants:	$\alpha := 7.0$ $z_g := 1200 \cdot \text{ft}$	<i>ASCE 7-16, Table 26.11-1</i>
	Velocity Pressure Coefficient:	$K_z(z) := 2.01 \cdot \left( \frac{\max(z, 15 \cdot \text{ft})}{z_g} \right)^{\frac{2}{\alpha}}$	<i>ASCE 7-16, Table 26.10-1</i>
		$z := (15 \ 20 \ 25 \ 30 \ 40 \ 50 \ 60 \ 70 \ 80 \ 90 \ 100)^T \cdot \text{ft}$	
		$K_z^T = (0.57 \ 0.62 \ 0.67 \ 0.7 \ 0.76 \ 0.81 \ 0.85 \ 0.89 \ 0.93 \ 0.96 \ 0.99)$	
	Topographic Factor: <i>ASCE 7-10, 26.8.1</i>	$K_{zt} := 1.0$	
	Velocity Pressure:	$q_z(h) := 0.00256 \cdot K_z(h) \cdot K_{zt} \cdot K_d \cdot \left( \frac{V_{ult}}{\text{mph}} \right)^2 \cdot (\text{psf})$	<b>X</b> <i>ASCE 7-16, Eq. (26.10-1)</i>
	Velocity Pressure at Mean Height:	$q_h := q_z(h_m) = 18.008 \cdot \text{psf}$	
	Gust Effect Factor:	$G := 0.85$	<i>ASCE 7-16, Sec. 26.11.1</i>
	Force Coefficient:	$C_f := 1.3$	<i>ASCE 7-16, Sec 29.4-1</i>

<b>Seismic:</b>	Location:	LAT := 39.56·deg	LONG := -119.72·deg
	Occupancy Category:	II	
	Importance Factor:	$I_E := 1.0$	
	Mapped 0.2-sec Spectral Acceleration:	$S_s := 1.424$	
	Mapped 1-sec Spectral Acceleration:	$S_1 := 0.497$	
	Site Class:	D	
	Site Coefficients:	$F_a := 1.2$	
	Adjusted Spectral Response Accelerations:	$S_{MS} := F_a \cdot S_s = 1.709$	
	Design Spectral Response Accelerations:	$S_{DS} := \frac{2}{3} \cdot S_{MS} = 1.139$	
	Seismic Design Category:	D	ASCE 7-16, Section 11.6

⚠ This is a beta release of the new ATC Hazards by Location website. Please [contact us](#) with feedback.

🔗 The ATC Hazards by Location website will not be updated to support ASCE 7-22. [Find out why.](#)

## ATC Hazards by Location

### Search Information

**Coordinates:** 39.55897762503668, -119.7184681892395  
**Elevation:** 4424 ft  
**Timestamp:** 2023-05-03T23:03:06.746Z  
**Hazard Type:** Seismic  
**Reference Document:** ASCE7-16  
**Risk Category:** II  
**Site Class:** D-default



### Basic Parameters

Name	Value	Description
$S_S$	1.424	$MCE_R$ ground motion (period=0.2s)
$S_1$	0.497	$MCE_R$ ground motion (period=1.0s)
$S_{MS}$	1.709	Site-modified spectral acceleration value
$S_{M1}$	* null	Site-modified spectral acceleration value
$S_{DS}$	1.139	Numeric seismic design value at 0.2s SA
$S_{D1}$	* null	Numeric seismic design value at 1.0s SA

\* See Section 11.4.8

### Additional Information

Name	Value	Description
SDC	* null	Seismic design category
$F_a$	1.2	Site amplification factor at 0.2s
$F_v$	* null	Site amplification factor at 1.0s
$CR_S$	0.897	Coefficient of risk (0.2s)
$CR_1$	0.9	Coefficient of risk (1.0s)
PGA	0.586	$MCE_G$ peak ground acceleration
$F_{PGA}$	1.2	Site amplification factor at PGA
$PGA_M$	0.703	Site modified peak ground acceleration
$T_L$	6	Long-period transition period (s)
$SsRT$	1.424	Probabilistic risk-targeted ground motion (0.2s)
$SsUH$	1.587	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
$SsD$	1.5	Factored deterministic acceleration value (0.2s)
$S1RT$	0.497	Probabilistic risk-targeted ground motion (1.0s)
$S1UH$	0.553	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
$S1D$	0.6	Factored deterministic acceleration value (1.0s)
$PGAd$	0.586	Factored deterministic acceleration value (PGA)

\* See Section 11.4.8

The results indicated here DO NOT reflect any state or local amendments to the values or any delineation lines made during the building code adoption process. Users should confirm any output obtained from this tool with the local Authority Having Jurisdiction before proceeding with design.

Please note that the ATC Hazards by Location website will not be updated to support ASCE 7-22. [Find out why.](#)

### Disclaimer

Hazard loads are provided by the U.S. Geological Survey [Seismic Design Web Services](#).

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## MECHANICAL DUCT ANCHORAGE

### Non-Structural Component Seismic Loading (ASCE 7-16: 13.3.1):

Importance Factor:	$I_p := 1.0$	ASCE 7-16: 13.1.3
Seismic Coefficients:	$a_p := 2.5$	
	$R_p := 6$	
Overstrength:	$\Omega_o := 2$	
Height of Attachment:	$h_r := 0 \cdot \text{ft}$	
	$z := h_r$	
Force at C.G.: (Ultimate Level)	$F_{cg} := \frac{0.4 \cdot a_p \cdot S_{DS} \cdot I_p}{R_p} \cdot \left( 1 + 2 \cdot \frac{z}{h_r} \right)$	$F_{cg} = 0.19$
Minimum Force: (Ultimate Level)	$F_{min} := 0.3 \cdot S_{DS} \cdot I_p$	$F_{min} = 0.342$
Max Req'd Force: (Ultimate Level)	$F_{max} := 1.6 \cdot S_{DS} \cdot I_p$	$F_{max} = 1.823$
Component Seismic Design Force: (Ultimate Level)	$F_p := \min(\max(F_{cg}, F_{min}), F_{max})$	$F_p = 0.342$
<b>Horizontal Seismic Load Effect:</b> (Ultimate Force Level)	$E_h(W) := F_p \cdot (W)$	ASCE 7-16: Eq. (13.3-1)
<b>Vertical Seismic Load Effect:</b> (Ultimate Force Level)	$E_v(W) := 0.2 \cdot S_{DS} \cdot W$	ASCE 7-16: Eq. (13.3-1)

## DUCT LOADS

Sheet Steel Weight:  $w_{\text{steel}_{22}} := 1.41 \cdot \text{psf}$  *22 Ga Galvanized*

Insulation Weight:  $\rho_{r2} := 2.0 \cdot \text{pcf}$

$t_{\text{insul}} := 2 \cdot \text{in}$

$w_{r2} := \rho_{r2} \cdot t_{\text{insul}} = 0.333 \cdot \text{psf}$

Duct Dimensions:  $b_{\text{duct}} := 36 \cdot \text{in}$   $L_{\text{duct}} := 16 \cdot \text{ft}$  *Assumes 36" Square, A=1296 sq in*

Unit Weight Duct:

$$w_{\text{duct}_{34}} := b_{\text{duct}} \cdot 4 \cdot w_{\text{steel}_{22}} + b_{\text{duct}} \cdot 2 \cdot w_{r2} + 2(b_{\text{duct}} + 2 \cdot t_{\text{insul}}) \cdot w_{r2} + (b_{\text{duct}} + 2 \cdot t_{\text{insul}}) \cdot w_{\text{steel}_{22}} = 25.842 \cdot \text{plf}$$

Gravity Support Spacing:  $s_{\text{duct}} := 10 \cdot \text{ft}$  *Max Distance Between Supports - Assumed*

Gravity Support Reaction:  $F_{\text{typ}} := s_{\text{duct}} \cdot w_{\text{duct}_{34}} = 258.422 \cdot \text{lbf}$

Total Seismic Weight:  $W_{\text{duct}} := L_{\text{duct}} \cdot w_{\text{duct}_{34}} = 413.476 \cdot \text{lbf}$

$$E_h(W_{\text{duct}}) = 141.309 \cdot \text{lbf} \quad E_v(W_{\text{duct}}) = 94.206 \cdot \text{lbf}$$

$$W_h := b_{\text{duct}} \cdot s_{\text{duct}} \cdot C_f \cdot G \cdot q_h = 596.982 \cdot \text{lbf} \quad \textit{Wind Controls...}$$

Lateral Braces Provided:  $N_{\text{seismic}} := 4$

Duct Mounting Height:  $h_{\text{duct}} := 84 \cdot \text{in}$  *Distance above Concrete*

Duct CG:  $h_{\text{cg}} := h_{\text{duct}} + \frac{b_{\text{duct}}}{2} = 102 \cdot \text{in}$

Duct OTM:  $M_{\text{max}} := \frac{W_h \cdot h_{\text{cg}}}{N_{\text{seismic}}} = 1.269 \cdot \text{ft} \cdot \text{kip}$

$$V_{\text{max}} := \frac{W_h}{N_{\text{seismic}}} = 0.149 \cdot \text{kip}$$

### PIPE SUPPORT TO BASE PLATE:

$$t_{\text{weld}} := \frac{3}{16} \cdot \text{in} = 0.187 \cdot \text{in}$$

*Fillet Weld*

$$r_{\text{pipe}} := \frac{2.375}{2} \cdot \text{in}$$

*2" Schedule 40 Pipe*

$$S_{\text{weld}} := \pi \cdot r_{\text{pipe}}^2 \cdot t_{\text{weld}} = 0.831 \cdot \text{in}^3$$

$$A_{\text{weld}} := \frac{t_{\text{weld}}}{\sqrt{2}} \cdot 2 \cdot \pi \cdot r_{\text{pipe}} = 0.989 \cdot \text{in}^2$$

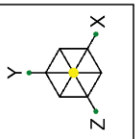
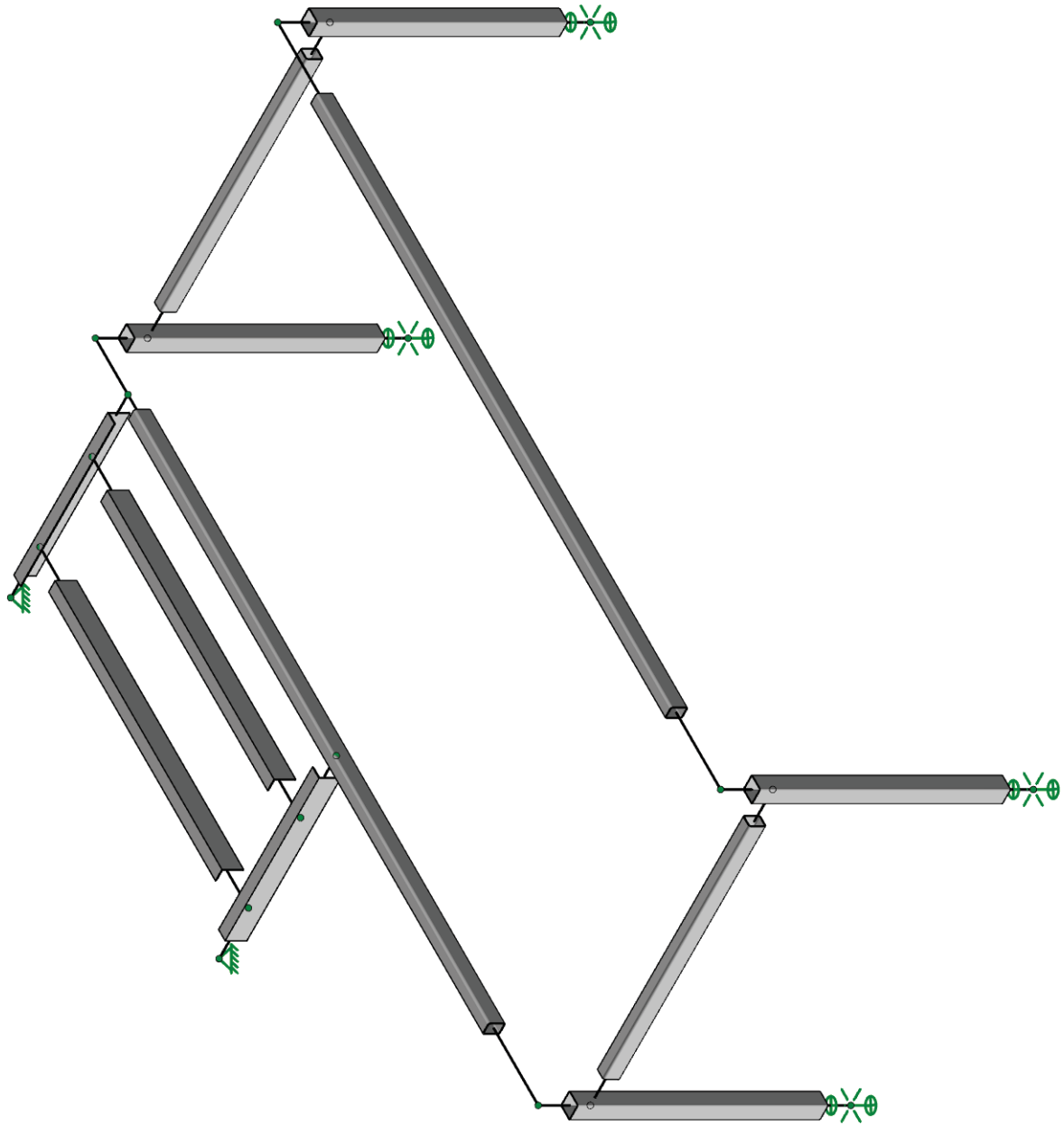
$$R_{u\_weld} := \frac{V_{\text{max}}}{A_{\text{weld}}} + \frac{M_{\text{max}}}{S_{\text{weld}}} = 18.478 \cdot \text{ksi}$$

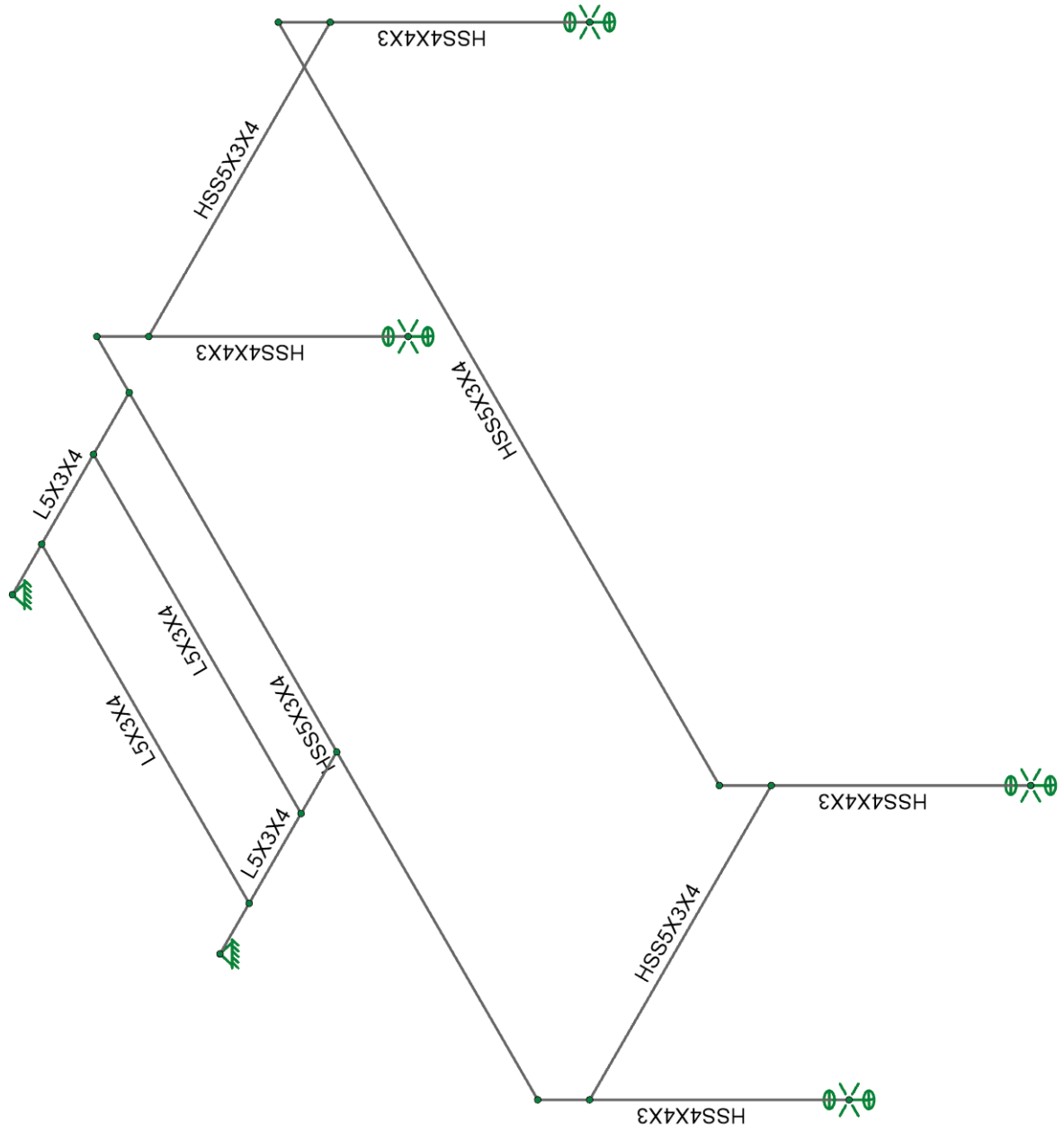
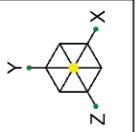
$$\phi_{\text{welds}} := 0.75$$

$$F_{\text{EXX}} := 70 \cdot \text{ksi}$$

$$\phi R_{n\_weld} := \phi_{\text{welds}} \cdot 0.6 \cdot F_{\text{EXX}} = 31.5 \cdot \text{ksi}$$

$$\frac{R_{u\_weld}}{\phi R_{n\_weld}} = 0.587$$







## Detail Report: M5

Load Combination: LC 1: 1.2 DL + 1.6 LL

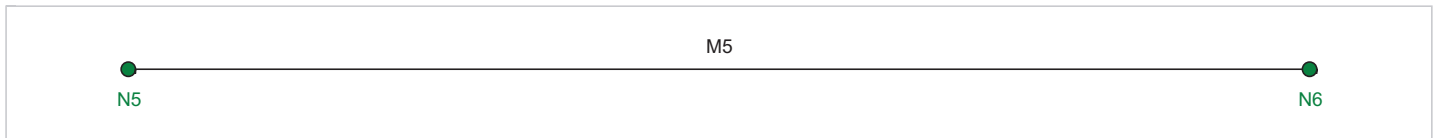
Code check: 0.106 (axial/bending)

	Input Data			
	<b>Shape:</b>	HSS5X3X4	<b>I Node:</b>	N5
	<b>Member Type:</b>	Beam	<b>J Node:</b>	N6
	<b>Length (ft):</b>	17	<b>I Release:</b>	Fixed
	<b>Material Type:</b>	Hot Rolled Steel	<b>J Release:</b>	Fixed
	<b>Design Rule:</b>	Typical	<b>I Offset:</b>	N/A
	<b>Internal Sections:</b>	97	<b>J Offset:</b>	N/A
	<b>Design Code:</b>	AISC 15th (360-16): LRFD	<b>T/C Only:</b>	Both Way

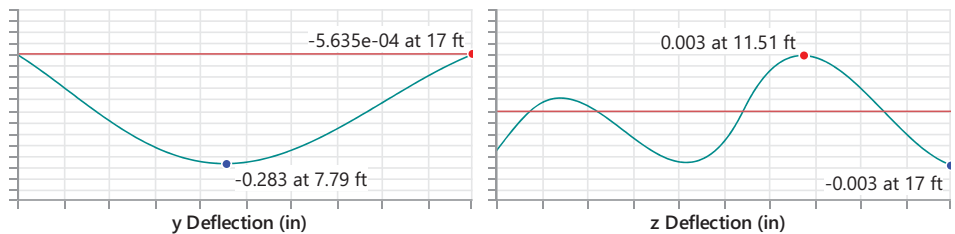
Material Properties			
<b>Material:</b>	A500 Gr.B Rect	<b>Therm. Coeff. (/1E5 F):</b>	0.65
<b>E (ksi):</b>	29000	<b>Density (k/ft<sup>3</sup>):</b>	0.527
<b>G (ksi):</b>	11154	<b>F<sub>y</sub> (ksi):</b>	46
<b>Nu:</b>	0.3	<b>R<sub>y</sub>:</b>	1.4
		<b>F<sub>u</sub> (ksi):</b>	58
		<b>R<sub>t</sub>:</b>	1.3

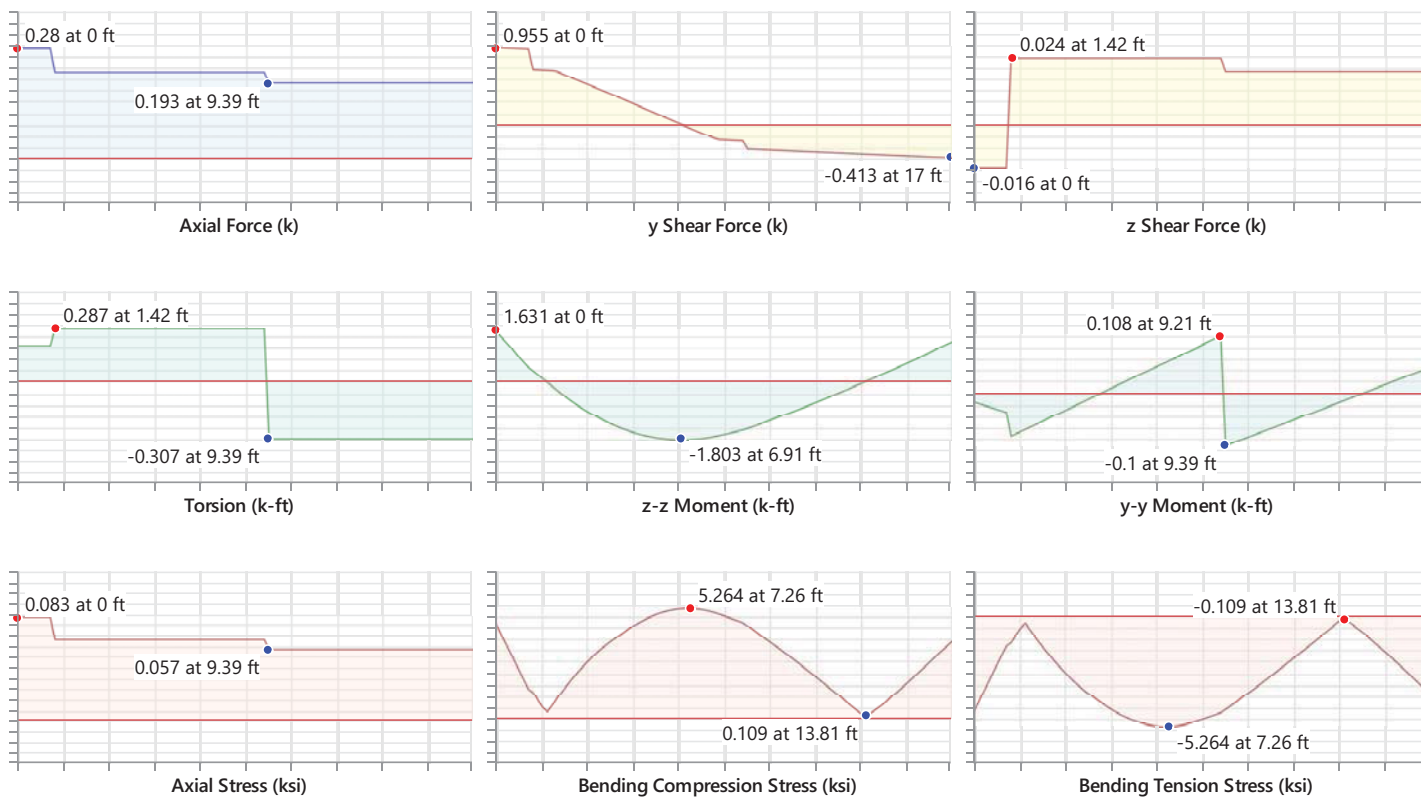
Shape Properties			
<b>d (in):</b>	5	<b>I<sub>yy</sub> (in<sup>4</sup>):</b>	4.81
<b>b<sub>f</sub> (in):</b>	3	<b>I<sub>zz</sub> (in<sup>4</sup>):</b>	10.7
<b>t (in):</b>	0.233	<b>Area (in<sup>2</sup>):</b>	3.37
		<b>J (in<sup>4</sup>):</b>	11

Design Properties			
<b>L<sub>b y-y</sub> (ft):</b>	17	<b>K<sub>y-y</sub>:</b>	1
<b>L<sub>b z-z</sub> (ft):</b>	17	<b>K<sub>z-z</sub>:</b>	1
<b>L<sub>comp top</sub>:</b>	L <sub>byy</sub>	<b>y sway:</b>	No
<b>L<sub>comp bot</sub> (ft):</b>	17	<b>z sway:</b>	No
<b>L<sub>torque</sub> (ft):</b>	17	<b>Function:</b>	Lateral
		<b>Seismic DR:</b>	None
		<b>Max Defl Ratio:</b>	L/723
		<b>Max Defl Location:</b>	7.792
		<b>Span:</b>	1
		<b>τ<sub>b</sub>:</b>	1



**Diagrams:**





### AISC 15th (360-16): LRFD Code Check

Limit State	Required	Available	Unity Check	Result
Applied Loading - Bending/Axial	-	-	-	-
Applied Loading - Shear + Torsion	-	-	-	-
Axial Tension Analysis	0 k	139.518 k	-	-
Axial Compression Analysis	0.22 k	26.111 k	-	-
Flexural Analysis (Strong Axis)	1.797 k-ft	18.561 k-ft	-	-
Flexural Analysis (Weak Axis)	0.061 k-ft	13.007 k-ft	-	-
Shear Analysis (Major Axis y)	1.806 k	49.786 k	0.036	PASS
Shear Analysis (Minor Axis z)	0.625 k	26.635 k	0.023	PASS
Bending & Axial Interaction Check (UC Bending Max)	-	-	0.106	PASS
Torsional Analysis	0.287 k-ft	12.622 k-ft	0.023	PASS

TYPICAL DUCT SUPPORT - WIND LOAD WITH SEISMIC REDUCTION FACTORS APPLIED - CONSERVATIVE

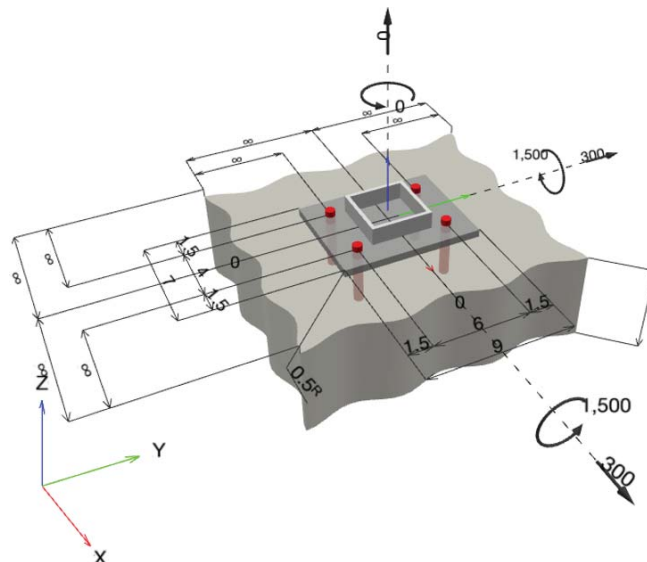
**1 Input data**

<b>Anchor type and diameter:</b>	<b>Kwik Bolt TZ2 - SS 304 5/8 (3 1/4) hnom2</b>
Item number:	2210279 KB-TZ2 5/8x6 SS304
Effective embedment depth:	$h_{ef,act} = 3.250$ in., $h_{nom} = 3.750$ in.
Material:	AISI 304
Evaluation Service Report:	ESR-4266
Issued I Valid:	12/17/2021   12/1/2023
Proof:	Design Method ACI 318-14 / Mech
Stand-off installation:	$e_b = 0.000$ in. (no stand-off); $t = 0.500$ in.
Anchor plate <sup>R</sup> :	$l_x \times l_y \times t = 7.000$ in. x $9.000$ in. x $0.500$ in.; (Recommended plate thickness: not calculated)
Profile:	Square HSS (AISC), HSS4X4X.25; (L x W x T) = $4.000$ in. x $4.000$ in. x $0.250$ in.
Base material:	cracked concrete, 2500, $f'_c = 2,500$ psi; $h = 6.000$ in.
<b>Installation:</b>	<b>hammer drilled hole, Installation condition: Dry</b>
Reinforcement:	tension: condition B, shear: condition B; no supplemental splitting reinforcement present
	edge reinforcement: > No. 4 bar
Seismic loads (cat. C, D, E, or F)	Tension load: yes (17.2.3.4.3 (d))
	Shear load: yes (17.2.3.5.3 (c))



<sup>R</sup> - The anchor calculation is based on a rigid anchor plate assumption.

**Geometry [in.] & Loading [lb, ft.lb]**





**1.1 Design results**

Case	Description	Forces [lb] / Moments [ft.lb]	Seismic	Max. Util. Anchor [%]
1	Combination 1	N = 0; $V_x = 300$ ; $V_y = 300$ ; $M_x = 1,500.000$ ; $M_y = 1,500.000$ ; $M_z = 0.000$ ;	yes	89

---

## 2 Proof I Utilization (Governing Cases)

Loading	Proof	Design values [lb]		Utilization	Status
		Load	Capacity	$\beta_N / \beta_V$ [%]	
Tension	Concrete Breakout Failure	4,451	5,056	89 / -	OK
Shear	Pryout Strength	424	19,621	- / 3	OK

Loading	$\beta_N$	$\beta_V$	$\zeta$	Utilization $\beta_{N,V}$ [%]	Status
Combined tension and shear loads	0.880	0.022	1.000	76	OK

## 3 Warnings

- Please consider all details and hints/warnings given in the detailed report!

**Fastening meets the design criteria!**

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## AHU ANCHORAGE

### Non-Structural Component Seismic Loading (ASCE 7-10: 13.3.1): Air Handling Unit

Importance Factor:	$I_p := 1.0$	ASCE 7-16: 13.1.3
Seismic Coefficients:	$a_p := 2.5$	
	$R_p := 2.5$	
Overstrength:	$\Omega_o := 2$	
Height of Attachment:	$h_r := 0 \cdot \text{ft}$	
	$z := h_r$	
Force at C.G.: (Ultimate Level)	$F_{cg} := \frac{0.4 \cdot a_p \cdot S_{DS} \cdot I_p}{R_p} \cdot \left( 1 + 2 \cdot \frac{z}{h_r} \right)$	$F_{cg} = 0.456$
Minimum Force: (Ultimate Level)	$F_{min} := 0.3 \cdot S_{DS} \cdot I_p$	$F_{min} = 0.342$
Max Req'd Force: (Ultimate Level)	$F_{max} := 1.6 \cdot S_{DS} \cdot I_p$	$F_{max} = 1.823$
Component Seismic Design Force: (Ultimate Level)	$F_p := \min(\max(F_{cg}, F_{min}), F_{max})$	$F_p = 0.456$

**Horizontal Seismic Load Effect:**  $E_h(W) := F_p \cdot (W)$  ASCE 7-16: Eq. (13.3-1)  
(Ultimate Force Level)

**Vertical Seismic Load Effect:**  $E_v(W) := 0.2 \cdot S_{DS} \cdot W$  ASCE 7-16: Eq. (13.3-1)  
(Ultimate Force Level)

Maximum Unit Weight:  $W_{achps} := 4000 \cdot \text{lb} \cdot \text{ft}$  Design

$W^i_{achps} := 3220 \cdot \text{lb} \cdot \text{ft}$  Per Mech Drawings

Required Anchorage Force:  $\frac{\Omega_o \cdot E_h(W_{achps})}{2} = 1822.72 \cdot \text{lb} \cdot \text{ft}$

$\Omega_o \cdot E_v(W_{achps}) \cdot 42 \cdot \text{in} - 0.9 \cdot W^i_{achps} \cdot 30 \cdot \text{in} = -865.48 \cdot \text{ft} \cdot \text{lb} \quad \text{No Net Uplift}$

Assumes Full Seismic Force to be resisted by (2) Anchors - (4) Anchors Provided.

AHU ANCHORAGE

Specifier's comments:

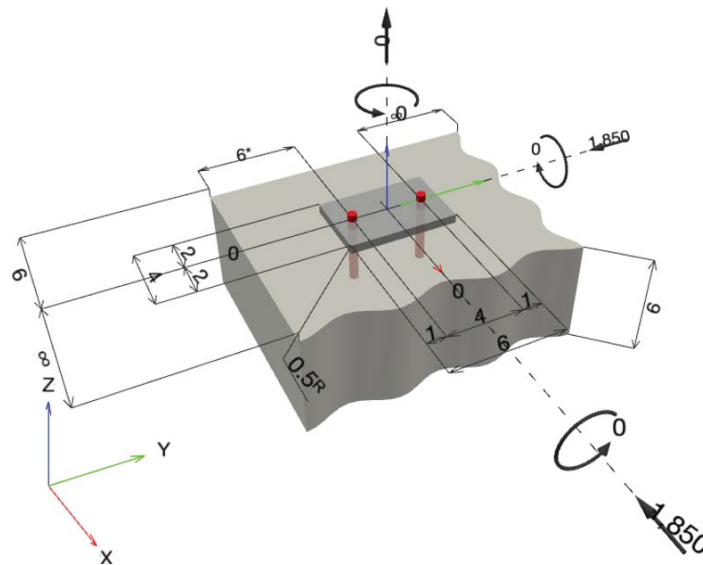
1 Input data

<b>Anchor type and diameter:</b>	<b>Kwik Bolt TZ2 - SS 304 1/2 (3 1/4 ) hnom3</b>
Item number:	2210262 KB-TZ2 1/2x5 1/2 SS304
Effective embedment depth:	$h_{ef,act} = 3.250$ in., $h_{nom} = 3.750$ in.
Material:	AISI 304
Evaluation Service Report:	ESR-4266
Issued I Valid:	12/17/2021   12/1/2023
Proof:	Design Method ACI 318-14 / Mech
Stand-off installation:	$e_b = 0.000$ in. (no stand-off); $t = 0.500$ in.
Anchor plate <sup>R</sup> :	$l_x \times l_y \times t = 4.000$ in. x $6.000$ in. x $0.500$ in.; (Recommended plate thickness: not calculated)
Profile:	no profile
Base material:	cracked concrete, 2500, $f'_c = 2,500$ psi; $h = 6.000$ in.
<b>Installation:</b>	<b>hammer drilled hole, Installation condition: Dry</b>
Reinforcement:	tension: condition B, shear: condition B; no supplemental splitting reinforcement present
	edge reinforcement: > No. 4 bar
Seismic loads (cat. C, D, E, or F)	Tension load: yes (17.2.3.4.3 (d))
	Shear load: yes (17.2.3.5.3 (c))



<sup>R</sup> - The anchor calculation is based on a rigid anchor plate assumption.

Geometry [in.] & Loading [lb, ft.lb]







**1.1 Design results**

Case	Description	Forces [lb] / Moments [ft.lb]	Seismic	Max. Util. Anchor [%]
1	Combination 1	N = 0; $V_x = -1,850$ ; $V_y = -1,850$ ; $M_x = 0.000$ ; $M_y = 0.000$ ; $M_z = 0.000$ ;	yes	97

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## 2 Proof I Utilization (Governing Cases)

Loading	Proof	Design values [lb]		Utilization	Status
		Load	Capacity	$\beta_N / \beta_V$ [%]	
Tension	-	-	-	- / -	N/A
Shear	Concrete edge failure in direction y-	2,616	2,721	- / 97	OK

Loading	$\beta_N$	$\beta_V$	$\zeta$	Utilization $\beta_{N,V}$ [%]	Status
Combined tension and shear loads	-	-	-	-	N/A

## 3 Warnings

- Please consider all details and hints/warnings given in the detailed report!

**Fastening meets the design criteria!**



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Company:		Page:	4
Address:		Specifier:	
Phone   Fax:		E-Mail:	
Design:	Concrete - May 3, 2023	Date:	5/3/2023
Fastening point:			

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