UNLV

SEP CHILLER #3

INSTALLATION

UNIVERSITY OF NEVADA LAS VEGAS
4505 S. MARYLAND PKWY.
LAS VEGAS, NEVADA 89154

DESIGNER OF RECORD AND MECHANICAL ENGINEER

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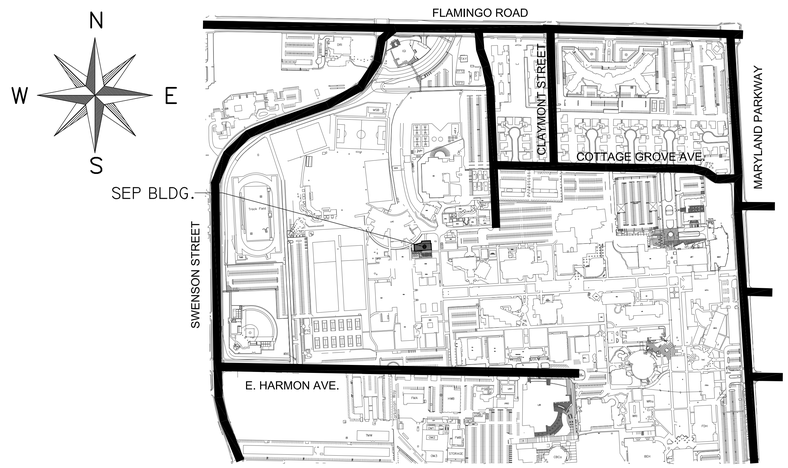
VICINITY MAP



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DATE: 05/14/14
EXP. DATE: 06/30/14

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UNLV
UNIVERSITY OF NEVADA LAS VEGAS
4505 S. MARYLAND PKWY.
LAS VEGAS, NEVADA 89154
PROJECT: UNLV SEP CHILLER #3 INSTALLATION

REVISIONS :

NO.	DATE	ISSUE

DRAWING TITLE :

PROJECT COVER SHEET

All dimensions, levels, layouts and field conditions shall be verified at the site by the contractor before proceeding with the work.

SIGMA'S Project No.	376dc1414
Consultant Project No.	-
Date:	05-19-2014

Drawn By	Checked By	Approved By
J.M.	F.S.	B.S.

File Name:

G1.01

CONSTRUCTION

MECHANICAL LEGEND, NOTES, SPECIFICATIONS AND SCHEDULES

SYMBOLS

Symbol	Label	Description
——CD——		CONDENSATE DRAIN
—— D ——	D	DRAIN
———	CAP	CAP
——⋈——	SOV	SHUT-OFF VALVE (GENERIC).
		CIRCUIT SETTER
		MOTOR ACTUATED SHUT-OFF VALVE.
		STRAINER
		ECCENTRIC REDUCER
		CONCENTRIC INCREASER
M		METER
		PRESSURE GAUGE
		UNION
		THROTTLING VALVE
		FLEXIBLE PIPE CONNECTION
		CHECK VALVE
		TRIPLE DUTY VALVE
—CHWS→	CHWS	CHILLED WATER SUPPLY
—CHWR→	CHWR	CHILLED WATER RETURN
— CWS →	CWS	CONDENSER WATER SUPPLY
— CWR →	CWR	CONDENSER WATER RETURN
—HHWS→	HHWS	HEATING HOT WATER SUPPLY
—HHWR→	HHWR	HEATING HOT WATER RETURN
—(E)CHWS→	(E)CHWS	EXISTING CHILLED WATER SUPPLY
—(E)CHWR→	(E)CHWR	EXISTING CHILLED WATER RETURN
—(E)HHWS→	(E)HHWS	EXISTING HEATING HOT WATER SUPPLY
—(E)HHWR→	(E)HHWR	EXISTING HEATING HOT WATER RETURN
—— ——	(E)	EXISTING DUCTWORK
—— ——	(E)	EXISTING
///// /////	(E)	EXISTING PIPING TO BE REMOVED
	(E)	EXISTING EQUIP. TO BE REMOVED
———	(N)	NEW
	P.O.D.	POINT OF DISCONNECT
	P.O.C.	POINT OF CONNECTION
XXX		NOTE REFERENCE

DETAIL / REFERENCE

XX / XX — DETAIL/ TAG; SHEET NUMBER

EQUIPMENT IDENTIFICATION SYMBOL

XX / XX — EQUIPMENT TYPE; EQUIPMENT IDENTIFIER

ABBREVIATIONS

Abbr.	Meaning
ABV.	ABOVE
AD	ACCESS DOOR
AFF	ABOVE FINISHED FLOOR
AP	ACCESS PANEL
ARCH	ARCHITECTURAL
AS	AUTOMATIC FIRE SPRINKLER PIPING
ASS'Y.	ASSEMBLY
BEL	BELOW
BHP	BRAKE HORSEPOWER
BOT	BOTTOM
BTU	BRITISH THERMAL UNIT
BTUH	BTU PER HOUR
BV	BALANCING VALVE
C	CONVERTOR
CFF	CAPPED FOR FUTURE
C.F.H.	CUBIC FEET PER HOUR
CLG.	CEILING
CONN	CONNECTION/ CONNECT
CFM	CUBIC FEET PER MINUTE
CONC	CONCRETE
COND	CONDENSATE
CONN	CONNECTION
CONT	CONTINUATION
CONTR.	CONTRACTOR
COTG	CLEANOUT TO GRADE
CU FT	CUBIC FEET
CU IN	CUBIC INCHES
CW	DOMESTIC COLD WATER
DIA	DIAMETER
DB	DRY BULB TEMPERATURE
DN.	DOWN
DR	DRAIN
DWG.	DRAWING
(E)	EXISTING
EA	EACH
EA	EXHAUST AIR
EF	EXHAUST FAN
EL	ELEVATION
ELEC	ELECTRICAL
ENT	ENTERING
EQUIP.	EQUIPMENT
EWC	ELECTRIC WATER COOLER
F	FIRE MAIN PIPING
FCO	FLOOR CLEANOUT
FCV	FLOW CONTROL VALVE
FD	FLOOR DRAIN
FDC	FIRE DEPARTMENT CONNECTION
FIN.FLR.	FINISH FLOOR
FLR.	FLOOR
FPM	FEET PER MINUTE
FS	FLOOR SINK
FT	FEET
F.U.	FIXTURE UNIT
GA	GAUGE
GAL	GALLON
G.D.	GARBAGE DISPOSER
GPM	GALLON PER MINUTE
GV	GATE VALVE
H	HIGH
HB	HOSE BIBB
H.C.	HANDICAP
HP	HORSEPOWER
HW	DOMESTIC HOT WATER PIPING
HWR	DOMESTIC HOT WATER RETURN PIPING
HX	HEAT EXHANGER
HZ	HERTZ
I.E.	INVERT ELEVATION

Abbr.	Meaning
IN	INCHES
INT.	INTEGRAL
IW	INDUSTRIAL WATER
KW	KILOWATT
LAV	LAVATORY
LBS	POUND
LVG	LEAVING
MAX	MAXIMUM THOUSAND
MBH	BTU PER HOUR
MCC	MOTOR CONTROL CENTER
MECH	MECHANICAL
MFR	MANUFACTURER
MH	MANHOLE
MIN	MINIMUM
MTD.	MOUNTED
(N)	NEW
NC	NORMALLY CLOSED
N.I.C.	NOT IN CONTRACT
NO	NORMALLY OPEN
NO.	NUMBER
NTS	NOT TO SCALE
OFD	OVERFLOW DRAINAGE PIPING
OPER.WT.	OPERATING WEIGHT
OPNG	OPENING
O.S&Y	OUTSIDE STEM AND YOKE
GV	GATE VALVE
P	PUMP
PD	PRESSURE DROP
PG	PRESSURE GAUGE
PIV	POST INDICATING VALVE
PM	PROJECT MANAGER
POC	POINT OF CONNECTION
POD	POINT OF DISCONNECT
PRV	PRESSURE REDUCING VALVE ASSEMBLY
PSI	POUNDS PER SQUARE IN.
PSIG	PSI GAUGE
QTY	QUANTITY
RAD	RETURN AIR DUCT
RD	ROOF DRAIN
R.I.&C.	ROUGH-IN & CONNECT
RL	REFRIGERANT LINE
RPPA	REDUCED PRESSURE PRINCIPLE ASSEMBLY
RPM	REVOLUTIONS PER MINUTE
S	SINK
S or W	SOIL OR WASTE PIPING
SAD	SUPPLY AIR DUCT
SD	STORM DRAIN
SL	SUCTION LINE
SP	STATIC PRESSURE
SQ.FT.	SQUARE FEET
SS	SERVICE SINK
TEMP	TEMPERATURE
TSP	TOTAL STATIC PRESSURE
TYP	TYPICAL
UR	URINAL
UTR	UP THRU ROOF
V	SANITARY VENT PIPING
V.B.	VACUUM BREAKER
VEL	VELOCITY
VTR	VENT THROUGH ROOF
WB	WET BULB TEMPERATURE
WC	WATER CLOSET
WCO	WALL CLEAN OUT
WG	WATER GAGE
WH	WATER HEATER
W/	WITH

GENERAL NOTES

1. ALL WORK SHALL BE IN STRICT ACCORDANCE WITH THE APPROVED ENFORCED BUILDING, MECHANICAL AND PLUMBING CODES, AND AUTHORITIES HAVING JURISDICTIONS.
2. THE CONSTRUCTION IS WORK OF COMPLEX NATURE WHICH WILL REQUIRE ACCURATE PLANNING, CAREFUL PREPARATION AND EXECUTION TO DETAIL AND CLOSE SUPERVISION BY THE CONTRACTOR WHO WILL BE REQUIRED TO DO THIS WORK IN FULL COOPERATION WITH THE OTHER TRADES.
3. THE CONTRACTOR SHALL VERIFY ALL EQUIPMENT, DUCTWORK AND PIPING LOCATIONS, SIZE, PRESSURE AND AVAILABILITY PRIOR TO START OF ANY WORK.
4. CONTRACTOR SHALL VERIFY ALL EQUIPMENT MODEL NUMBERS, CAPACITIES, SIZES, VOLTAGES, AND ALL OTHER SCHEDULED INFORMATION WITH ALL OTHER APPLICABLE TRADES AND WITH THE MANUFACTURER PRIOR TO INSTALLATION.
5. ALL SUPPLY, AND RETURN AND EXHAUST, REGISTER CONNECTIONS TO DUCTWORK SHALL BE PROVIDED WITH ACCESSIBLE MANUAL VOLUME DAMPERS. ALTERNATIVELY, ACCESSIBLE MANUAL VOLUME DAMPERS MAY BE PROVIDED IN DUCTWORK FEEDER LINES SERVING INDIVIDUAL REGISTERS.
6. IN THE EVENT THERE IS A CONFLICT BETWEEN THE CONTRACT DRAWINGS AND THE SPECIFICATIONS, THE SPECIFICATIONS SHALL GOVERN, UNLESS INSTRUCTED OTHERWISE.
7. DO NOT CUT OR NOTCH ANY STRUCTURAL MEMBERS WITHOUT STRUCTURAL ENGINEER'S APPROVAL.
8. REFER TO ARCHITECTURAL, STRUCTURAL AND ELECTRICAL DRAWINGS FOR DETAILS OF NEW WORK.
9. THE CONTRACTOR SHALL COORDINATE FOR CLEARANCES PRIOR TO START OF ANY WORK.
10. THESE DRAWINGS ARE ESSENTIALLY DIAGRAMMATIC AND ARE NOT INTENDED TO INDICATE ALL NECESSARY OFFSETS OF PIPING. THE CONTRACTOR SHALL INSTALL MATERIAL AND EQUIPMENT IN A MANNER AS TO CONFORM TO STRUCTURE, AVOID OBSTRUCTIONS, PRESERVE HEADROOM, AND KEEP OPENINGS AND PASSAGEWAYS CLEAR. ALL INSTALLATIONS SHALL BE CONSISTENT WITH NORMALLY ACCEPTABLE INDUSTRY STANDARDS. CONTRACTOR SHALL NOTIFY THE OWNER'S REPRESENTATIVE IN WRITING OF ANY DISCREPANCIES OR CONFLICTS THAT WOULD AFFECT THE SYSTEM PERFORMANCE OR WHICH WOULD INCUR ADDITIONAL COSTS. THIS NOTIFICATION SHALL BE MADE PRIOR TO THE INSTALLATION OF THE ITEMS CONCERNED.
11. EQUIPMENT INDICATED ON THIS DRAWING IS SHOWN IN APPROXIMATE POSITION(S). CONTRACTOR SHALL VERIFYALL CONDITIONS INCLUDING EQUIPMENT LOCATIONS, P.O.C.'S, AND STRUCTURAL MEMBERS PRIOR TO INSTALLATION. IN ALL CASES, ADEQUATE ACCESS (PER MANUFACTURERS RECOMMENDATIONS AND CODE COMPLIANCE) FOR MAINTENANCE AND REPLACEMENT OF EQUIPMENT SHALL BE PROVIDED.
12. ALL WORK SHALL BE DONE IN ACCORDANCE WITH ALL APPLICABLE CODES. NOTHING SHOWN IN THE PLANS OR STATED IN THE SPECIFICATIONS IS INTENDED TO INDICATE THAT THE INSTALLATION OR CONNECTIONS OF ANY ITEM OR DEVICE SHOULD BE DONE CONTRARY TO MANUFACTURERS INSTRUCTIONS AND ALL APPLICABLE CODES AND REGULATIONS. THE CONTRACTOR IS RESPONSIBLE TO INSURE THAT THE INSTALLATIONS AND CONNECTIONS OF ALL ITEMS AND DEVICES CONFORMS TO MANUFACTURERS INSTRUCTIONS AND TO ALL APPLICABLE CODES AND REGULATIONS.
13. ALL EQUIPMENT, MATERIAL, AND ALL CONNECTIONS THERE TO SHALL BE INSTALLED COMPLETE PER MANUFACTURERS INSTRUCTIONS TO PROVIDE A COMPLETE AND FULLY OPERATIONAL SYSTEM.
14. IF THE CONTRACTORS' USE OF SUBSTITUTE MATERIALS, EQUIPMENT OR METHODS OF INSTALLATION REQUIRES ANY CHANGES IN OTHER TRADES WORK FROM THAT SHOWN ON THE DRAWINGS, THE EXTRA COST OF THE OTHER TRADES WORK SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR INITIATING THE SUBSTITUTION.
15. SUBMITTALS: APPROVAL OF SUBMITTALS DOES NOT RELEASE THE CONTRACTOR FROM OBLIGATIONS TO FULLY COMPLY WITH ALL REQUIREMENTS OF THE CONSTRUCTION DOCUMENTS OR APPLICABLE CODE REGULATIONS.
16. BEFORE SUBMITTING BIDS FOR THE WORK THE CONTRACTOR SHALL MAKE A THOROUGH FIELD SURVEY OF THE WORK TO DETERMINE ANY INTERFERENCES THAT MAY AFFECT THE INSTALLATION OF THE WORK.
17. THE CONTRACTOR SHALL FURNISH ALL MATERIAL, LABOR, EQUIPMENT, APPURTENANCES, AND OTHER CONTRACTUAL ITEMS REQUIRED FOR THE COMPLETE INSTALLATION OF THE PLUMBING WORK TO THE SATISFACTION OF THE OWNER AND ENGINEER.
18. THE CONTRACTOR SHALL OBTAIN AND PAY FOR ALL PERMITS, LICENSES AND INSPECTIONS REQUIRED TO COMPLETE THE MECHANICAL WORK.
19. SEISMIC NOTE: SEISMIC BRACING AND ANCHORAGE OF PIPES SHALL BE PER IBC AND SMACNA SEISMIC MANUAL, "GUIDELINES FOR SEISMIC RESTRAINTS OF MECHANICAL SYSTEMS".
20. MAINTENANCE LABEL SHALL BE AFFIXED TO ALL EQUIPMENT AND A MAINTENANCE MANUAL SHALL BE PROVIDED TO OWNER.

DEMOLITION NOTES

1. CONTRACTOR SHALL VISIT THE SITE AND MAKE HIMSELF THOROUGHLY FAMILIAR WITH THE EXISTING CONDITIONS AND VERIFY THE EXISTING SITE CONDITIONS PRIOR TO BIDDING.
2. ALL WORK REQUIRED TO CHANGE THE EXISTING HVAC INSTALLATION AS INDICATED SHALL BE PROVIDED.
3. REMOVE ALL DUCT WORK, MISCELLANEOUS ITEMS AND PIPING THAT INTERFERES WITH NEW CONSTRUCTION. EXTEND AND RECONNECT ANY INTERRUPTED SYSTEM TO OTHER EXISTING SYSTEMS WHICH REMAIN.
4. EXCEPT AS MAY BE SPECIFICALLY INDICATED OTHERWISE, ALL MATERIALS AND EQUIPMENT REMOVED FROM THE EXISTING INSTALLATION IN THE COURSE OF PERFORMING THE INDICATED WORK (AND NOT INDICATED TO BE REUSED) SHALL BE TREATED AS FOLLOWS:
   A. ALL ABANDONED DUCTS, PIPES, BOXES, FITTINGS AND DIFFUSERS SHALL BECOME THE PROPERTY OF THE CONTRACTOR AND SHALL BE REMOVED FROM THE SITE.
   B. ALL OTHER ITEMS REMOVED SHALL BE TURNED OVER TO THE OWNER, OR DISPOSED OF AS DIRECTED BY OWNER.
5. CONTRACTOR SHALL CLEAN ALL REMAINING ITEMS THAT ARE TO BE REUSED OR ARE TO REMAIN.
6. CONTRACTOR SHALL REMOVE ALL DUCT-WORKS AND EXPOSED PIPES THAT ARE NOT IN USE.
7. CONTRACTOR SHALL PROVIDE ALL NECESSARY WORK AND MATERIALS TO MAINTAIN ALL EXISTING HVAC SYSTEMS IN OPERATION DURING AND AFTER CONSTRUCTION.
8. ALL EXISTING SYSTEMS INCLUDING EQUIPMENT, DUCTS, PIPES, AND OTHER ITEMS WHICH ARE NOT TO BE DEMOLISHED SHALL REMAIN IN SERVICE THROUGHOUT THE CONSTRUCTION PERIOD.
9. UNLESS OTHERWISE NOTED ON DRAWINGS, ALL EXISTING DUCTS, PIPES, BOXES, AND OTHER HVAC SYSTEMS IN AREAS WHERE NEW WORK OCCURS SHALL BE REMOVED, EXCEPT WHEN SUCH ITEMS ARE REQUIRED TO MAINTAIN SERVICES TO OTHER AREAS. IN SUCH CASES, CONTRACTOR SHALL RELOCATE THESE ITEMS AND PROVIDE DUCTS, PIPES, DAMPER, BOXES, AND CONTROL WHERE REQUIRED TO ACCOMMODATE THE NEW WORK. CONTRACTOR SHALL REMOVE ANY EXISTING ITEM, WHEN SUCH ITEM IS CONCEALED AND DOES NOT INTERFERE WITH NEW WORK.
10. ALL ABANDONED DUCTS, PIPES, BOXES, DIFFUSER SHALL BE REMOVED COMPLETELY BACK TO THE SOURCE; CAPPING OFF STUBS THAT MAY REMAIN.
11. INFORMATION GIVEN ON THE DRAWINGS ABOUT EXISTING INSTALLATIONS HAS BEEN OBTAINED FROM THE EXISTING CONDITION, BUT CANNOT BE GUARANTEED ACCURATE IN ALL RESPECTS. VERIFY ALL SUCH INFORMATION BEFORE PROCEEDING WITH ANY NEW WORK THAT MAY BE AFFECTED. INCLUDE AS PART OF THE CONTRACT ALL WORK REQUIRED TO PRODUCE THE INDICATED RESULT. THE CONTRACTOR SHALL OBTAIN ANY "AS-BUILT" DRAWINGS DIRECTLY FROM THE OWNER.
12. THESE DEMOLITION NOTES REFER TO ALL MECHANICAL SHEETS WHERE DEMOLITION WORK IS BEING CARRIED OUT.
13. NEW AND/OR EXISTING EQUIPMENT INDICATED ON THIS DRAWING IS SHOWN IN APPROXIMATE POSITION(S). CONTRACTOR SHALL FIELD VERIFY ALL EXISTING CONDITIONS INCLUDING EQUIPMENT LOCATIONS, P.O.C.'S, AND STRUCTURAL MEMBERS PRIOR TO INSTALLATION. IN ALL CASES, ADEQUATE ACCESS (PER MANUFACTURERS RECOMMENDATIONS AND CODE COMPLIANCE) FOR MAINTENANCE AND REPLACEMENT OF EQUIPMENT SHALL BE PROVIDED.
14. CONTRACTOR SHALL VERIFY ALL LOCATIONS, SIZES, P.O.C.'S, AND AVAILABILITY OF ALL EXISTING ITEMS (I.E. DUCTWORK ETC.) PRIOR TO INSTALLATION OF ANY MATERIAL OR EQUIPMENT.

INSTRUCTIONS TO BIDDERS

A. THE CONTRACTOR'S FORCES SHALL NOT HAVE ACCESS TO THE SITE'S EXISTING RESTROOM FACILITIES AND ELEVATORS FOR THEIR USE. PROVIDE AND MAINTAIN REQUIRED FACILITIES AND ENCLOSURES. MINIMUM OF ONE (1) PORTABLE RESTROOM FOR EACH 10 WORKMEN. THE USE OF THE UNLV FACILITIES IS PROHIBITED.

B. CONTRACTOR SHALL CLEAN AND MAINTAIN CONSTRUCTION SITE FREE OF DEBRIS ON A DAILY BASIS.

C. ANY REQUEST FOR PRODUCT SUBSTITUTION SHALL BE SUBMITTED BY CONTRACTOR IN WRITING AND BE APPROVED BY OWNER AND ENGINEER PRIOR TO FINAL ADDENDUM DATE.

MECHANICAL INDEX

M0.01 MECHANICAL LEGEND, NOTES, SPECIFICATIONS AND SCHEDULES

M1.01 MECHANICAL FLOOR PLANS AND SECTIONS

CH #3 INSTALLATION NOTES

CONTRACTOR SHALL INSTALL NEW CHILLER AS SPECIFIED ON EXISTING CONCRETE PAD, IN PROPER LOCATION TO BE ABLE TO PERFORM CHILLED AND CONDENSER WATER PIPING AND THEIR CONNECTIONS TO EXISTING TAPS PROPERLY. ALL REQUIRED AND NECESSARY COMPONENTS AND APPURTENANCE (PIPING, FITTINGS, VALVES, ELECTRICAL AND CONTROL PANELS AND DEVICES, REFRIGERANT PURGE PIPING, ETC.) SHALL BE PROVIDED FOR COMPLETE INSTALLATION AND FOR OPERATION UP TO MAXIMUM CAPACITY LISTED IN THIS SCHEDULE.

CONTRACTOR SHALL INSTALL NEW REFRIGERANT MONITORING SYSTEM FOR NEW CH-3 PROVIDE AND INSTALL COMPLETE REFRIGERANT MONITORING SYSTEM WITH ALL NECESSARY CONTROLS, SENSORS, AND CONNECT TO EXISTING ALARM SYSTEM (HORN AND STROBES, LOCAL AND REMOTE ALARMS, ETC) FOR COMPLETE INSTALLATION.

ADJUST EMERGENCY PURGE EXHAUST FAN AS SHOWN IN THESE DRAWINGS. EXHAUST FAN ALREADY IS EQUIPPED WITH A BREAK-GLASS TYPE SWITCH PROVIDING "ON" ONLY CONTROL IMMEDIATELY AND ADJACENT TO THE DOOR ENTERING/EXITING THE CHILLER ROOM.

ALL CHILLERS (EXISTING AND NEW) IN THE CHILLER ROOM SHALL BE CONNECTED TO THE EXISTING BREAK-GLASS TYPE SWITCH PROVIDING "OFF" ONLY CONTROL THAT IS LOCATED IMMEDIATELY AND ADJACENT TO THE OUTSIDE OF THE MAIN ENTRANCE DOOR ENTERING THE CHILLER ROOM. SEE ELECTRICAL DRAWINGS FOR MORE DETAILS.

RUN FULL SIZE REFRIGERANT RELIEF LINES TO EXTERIOR OF THE BUILDING IN AN APPROVED MANNER. REFRIGERANT PIPING SHALL BE COLLECTED AND COMBINED PER CHILLER #3 MANUFACTURE'S RECOMMENDATION AND BE CONNECTED TO EXISTING PIPE BELOW ROOF, AS SHOWN IN THESE DRAWINGS.

FURNISH AND INSTALL FLOW SWITCH ON BOTH CONDENSER AND EVAPORATOR PIPING AS REQUIRED BY THE CH-3 MANUFACTURER.

CHILLER MANUFACTURER (YORK INTERNATIONAL), DOES NOT REQUIRE HEAD PRESSURE CONTROL VALVE ON CONDENSER WATER PIPING.

SCOPE OF WORK

CONTRACTOR TO CAREFULLY REVIEW ALL DOCUMENTS IN ORDER TO DEVELOP THE FULL SCOPE OF WORK FOR THIS PROJECT. THESE NOTES INDICATE THE MAJOR AREAS OF WORK AND DO NOT INTEND TO COVER THE ENTIRE DETAILS OF SCOPE OF WORK FOR THIS PROJECT.

1. INSTALL NEW CHILLER (CH#3), RUN CHILLED AND CONDENSER WATER PIPING TO EXISTING VALVED TAPS AS SHOWN IN THESE DRAWINGS. INSTALL ALL ACCESSORIES AND CONTROLS AS SHOWN. LEAVE CONTROL ISOLATION VALVE AT FULL OPEN POSITION FOR FUTURE CONNECTION TO PLANT CENTRAL CONTROLS SYSTEM.
2. FLUSH AND CLEAN NEW PIPING INSTALLATION AND CHILLER AS PER SPECIFICATION.
3. PAINT CONDENSER WATER PIPING TO MATCH EXISTING, IN CENTRAL PLANT.
4. INSULATE CHILLED WATER PIPING TO MATCH EXISTING, IN CENTRAL PLANT.
5. PERFORM ALL ELECTRICAL WORK AS SHOWN IN ELECTRICAL DRAWINGS.
6. ANCHOR NEW CHILLER TO CONCRETE PAD AS SHOWN AFTER THE PIPING AND ELECTRICAL CONNECTIONS ARE COMPLETED.
7. INSTALL REFRIGERANT PURGE SYSTEM PIPING AND MAKE CONNECTION TO EXISTING RELIEF PIPE THRU ROOF AS INDICATED IN THESE DRAWINGS.
8. INSTALL REFRIGERANT LEAK DETECTION SYSTEM AND CONNECT TO EXISTING EMERGENCY SWITCH (LOCATED OUTSIDE OF THE BUILDING, AT EXTERIOR WALL) FOR EMERGENCY SHUT DOWN. CONNECT TO EXISTING ALARM SYSTEM FOR PROPER NOTIFICATION.
9. ADJUST EXISTING EXHAUST FAN FOR DESIGN CFM INDICATED IN THESE DRAWINGS.
10. PROVIDE LABEL FOR EQUIPMENT AND PIPING. NEW LABELS SHALL MATCH EXISTING LABEL AND STANDARDS.
11. SEE SEQUENCE OF OPERATION AND CONTROLS. (1)

SPECIFIC NOTES

1. ALL PENETRATIONS THRU WALLS, CEILING, AND FLOOR SHALL BE SEALED AIR, WATER AND SOUND TIGHT WITH PROPER MATERIALS AND METHODS. DO NOT LEAVE ANY PORTION OF THE DEMOLISHED PIPING AND ACCESSORIES IN PLACE, EXPOSED OR VISIBLE IN ANY LOCATION. PATCH AND PAINT THE SURFACE TO MATCH EXISTING CONDITION. TYPICAL FOR EVERY AND ALL PENETRATIONS.
2. SEAL ALL PIPING PENETRATIONS THRU RATED WALLS, FLOORS AND CEILINGS TO MAINTAIN FIREPROOF RATINGS, AS APPLICABLE.
3. INSTALL INSULATION FOR EQUIPMENT VALVES AND FITTINGS REQUIRING ACCESS FOR MAINTENANCE, REPAIR, OR CLEANING, IN SUCH A MANNER THAT IT CAN BE EASILY REMOVED AND REPLACED WITHOUT DAMAGE.
4. ALL PIPING AND ACCESSORIES SHALL BE SEAMLESS AND BE MANUFACTURED IN US AND BE. ALL FITTINGS SHALL BE MANUFACTURED FITTINGS. FIELD FABRICATED FITTINGS ARE NOT ACCEPTABLE.
5. INSTALL DRAIN VALVE WITH DRAIN VALVE AND CAP AT EACH CHILLED WATER AND CONDENSER WATER BUNDLE OF THE NEW CHILLER AS INDICATED IN THESE DRAWINGS. INSTALL DRAINS AT ALL LOW POINTS OF PIPING. TYPICAL FOR ALL.
6. INSTALL AIR VENT AT TOP OF EACH CHILLED WATER AND CONDENSER WATER BUNDLE OF THE NEW CHILLER. INSTALL AIR VENT AT HIGH POINTS OF PIPING. TYPICAL FOR ALL.
7. ALL UN-INSULATED PIPING (CONDENSER WATER, ETC.) SHALL BE PRIMED AND PAINTED.

WATER AND AIR BALANCE NOTES

THE SERVICES DESCRIBED HEREIN SHALL BE PERFORMED BY THE AABC CERTIFIED TEST AND BALANCE AGENCY (TABA).TABA SHALL BE CONTRACTED SEPARATELY AND DIRECTLY BY THE OWNER(UNLV). THIS AGENCY SHALL BE A COMPANY SPECIALIZING IN THE ADJUSTING AND BALANCING OF SYSTEMS SPECIFIED IN THIS SECTION WITH MINIMUM THREE YEARS DOCUMENTED EXPERIENCE CERTIFIED BY AABC. WORK SHALL BE PERFORMED UNDER SUPERVISION OF AABC CERTIFIED TEST AND BALANCE ENGINEER AND REGISTERED ENGINEER.

1. CHILLED WATER AND CONDENSER WATER FLOW, SHALL BE TESTED AND ADJUSTED TO THE VALUES INDICATED IN THE CHILLER SCHEDULE. CHILLERS AND PUMPS SHALL BE BALANCED PER GPM INDICATED IN SCHEDULES. ACCURACY OF THE FLOW METER READINGS SHALL BE VERIFIED AND CONFIRMED BY TABA.
2. ENSURE ENTIRE CHILLED AND CONDENSER WATER SYSTEMS, PIPING AND EQUIPMENT ARE FILLED WITH WATER, AND AIR IS RELEASED FROM SYSTEM IN CENTRAL PLANT AND IN BUILDINGS. RUN PRIMARY PUMPS AND CONFIRM DESIGN FLOW RATES WHEN EACH SET OF CHILLER AND PRIMARY PUMP ARE RUNNING. THEN PERFORM THE TEST WHEN TWO CHILLERS AND PRIMARY PUMPS ARE RUNNING.
3. CONTRACTOR TO TEST AND DOCUMENT THE DESIGN FLOW RATE FOR THE CHILLERS AND PUMPS, MEASURE PRESSURE DROP, READ AND DOCUMENT THE TEMPERATURES AT BOTH SUPPLY AND RETURN PIPING IN BOTH CONDENSER WATER LOOP AND IN PRIMARY CHILLED WATER LOOP.
4. CONTRACTOR TO PERFORM AIR FLOW TEST AND BALANCE EXISTING EXHAUST FAN-1, ADJUST AND REGISTER AIR FLOW, STATIC PRESSURE AND ELECTRICAL CHARACTERISTICS PER DATA LISTED IN THE FAN SCHEDULE.

SEQUENCE OF OPERATION AND CONTROLS

GENERAL

BAS AND SEQUENCE OF OPERATION IN SEP SHALL REMAIN AS-IS, EXCEPT AS NOTED BELOW. THE EXISTING CHILLERS AND PRIMARY PUMPS, AS WELL AS CONDENSER WATER SYSTEM AND SECONDARY CHILLED WATER PUMPING SYSTEM, ETC. SHALL START, FUNCTION (INCLUDING LEAD-LAG OPERATION), STOP, AND BE MONITORED AS IT CURRENTLY IS, BY BAS.

EXISTING OPERATION

BAS, AFTER CONFIRMING CONDENSER WATER SYSTEM OPERATION (AS-IS) AND ITS REQUIRED FLOW, INITIATES THE START OF CHILLED WATER PRIMARY PUMP(S), THEN AFTER A SHORT DELAY (ADJUSTABLE) OPENS THE LEAD CHILLER'S ISOLATION VALVE, AND THEN START LEAD CHILLER (I.E. CH-1, AS THE PRIMARY CHILLER) AFTER FLOW IS CONFIRMED THROUGH THE LEAD CHILLER. THEN BAS FOLLOWING THE SAME PROCESS STARTS THE LAG CHILLER (I.E. CH-2, AS THE LAG-1 CHILLER) TO MAINTAIN PRIMARY CHILLED WATER LOOP SUPPLY TEMPERATURE SET POINT, AS NEEDED. "LEAD" AND "LAG-1" CHILLERS SHALL OPERATE AT AT EQUAL CAPACITY TO SATISFY THE LOAD. CHILLERS' INTERNAL CONTROLS SHALL RAMP UP THE CHILLER MAINTAIN LEAVING WATER TEMPERATURE FROM THE CHILLER, AS THE NEED FOR COOLING RISES. CHILLER LOADING REVERSES AS THE LOAD DECREASE. THEREFORE, THE ABOVE SEQUENCE REVERSES WHEN THE LOAD IS SATISFIED, AS FOLLOWS. WHEN ONE CHILLER CAN ADEQUATELY RESPOND TO THE LOAD, THE "LAG-1" CHILLER SHALL BE DISABLED FIRST, THEN ITS CONTROL ISOLATION VALVE WILL SHUT CLOSE AFTER A SHORT TIME DELAY (ADJUSTABLE) AND THEN THE RESPECTIVE PRIMARY CHILLED WATER PUMP SHALL DISABLE. BAS SHALL PROVIDE LEAD-LAG CAPABILITY AND FUNCTION FOR BOTH ELECTRIC CHILLERS (CH-1 AND 2) AND PRIMARY PUMPS. BAS SHALL MONITOR EACH PUMP THROUGH A CURRENT SENSOR AND AUTOMATICALLY ENERGIZES THE OTHER PUMP IF THE RUN PUMP FAILS.

CH-3 INSTALLATION

THE CURRENT PROGRAM AND SOFTWARE SHALL BE MODIFIED AND UPGRADED TO INCLUDE CH-3 IN THE SEQUENCE OF OPERATION, AS DESCRIBED BELOW. BAS SHALL INCLUDE THE 3RD CHILLER IN ITS WEEKLY ROTATION, AND IN A STANDBY ORDER. LEAD AND LAG-1 CHILLERS SHALL REMAIN IN ROTATION AS LONG AS THEY ARE FUNCTIONAL AND ARE NOT IN THE ALARM MODE. LAG-2 CHILLER SHALL REMAIN IN STANDBY MODE UNLESS ONE OF THE TWO CHILLERS IN OPERATION FAILS. THE 3RD CHILLER SHALL NEVER START AS LONG AS THE OTHER TWO CHILLERS ARE INITIATED AND ARE FUNCTIONING. UNTIL FUTURE PLANT UPGRADE (INSTALLATION OF THE 3RD TOWER, ADDITIONAL CONDENSER AND PRIMARY CHILLED WATER PUMPS), AND UNDER NO CIRCUMSTANCES, BAS SHALL NOT ALLOW SIMULTANEOUS OPERATION/INITIATION OF MORE THAN TWO CHILLERS IN THIS PLANT.

WHEN A CHILLER (LEAD OR LAG-1) FAILS IN ALARM CONDITION, IT SHALL BE ISOLATED BY MEANS OF CLOSING ITS CONTROL VALVE. HOWEVER, ITS RESPECTIVE PRIMARY CHILLED WATER PUMP SHALL NOT SHUTDOWN AND SHALL SUPPORT THE LAG-2 CHILLER. CONTROL SEQUENCE SHALL ALLOW AND MAKE ANY CHILLER OPERATE WITH ANY PRIMARY CHILLED WATER PUMP. CONTROLLER SHALL AUTOMATICALLY ALTERNATE ALL THREE(3) CHILLERS AND THEIR PRIMARY PUMPS TO PROVIDE EQUAL OPERATING TIME FOR EACH PIECE OF EQUIPMENT(I.E. WEEKLY ROTATION).

THE NEW CHILLER'S BACNET INTERFACE MUST BE UTILIZED WITH HARDWIRE BACKUP FOR ALARMS. BAS CONTRACTOR (HONEYWELL) SHALL INCLUDE IN ITS CONTRACT, THE COST FOR CONTACTING, COMMUNICATION AND OBTAINING THE BACNET DATA FROM THE CHILLER MANUFACTURER (YORK INTERNATIONAL) AND SHALL CONSULT AND COORDINATE WITH UNLV TO DETERMINE WHICH POINTS SHOULD BE MAPPED INTO THE EXISTING BAS SYSTEM FOR MONITORING.

PROGRAMMING AND GRAPHICS SHALL BE UPDATED TO INCLUDE ALL THREE (3) CHILLERS, AND PRESENT THE UPGRADED/MODIFIED SEQUENCE OF OPERATION AT EMCS FRONT END.

CONTROL CONTRACTOR SHALL WORK, COORDINATE AND COOPERATE ALONG WITH TEST AND BALANCE CONTRACTOR AND VERIFY, MODIFY, REGISTER, AND CONTROL THE CHILLED WATER AND CONDENSER WATER FLOW THRU ALL CHILLERS (CH-1, 2, AND 3).

MECHANICAL SPECIFICATIONS

PART 1 - GENERAL:

1.THE CONTRACTOR SHALL FURNISH ALL MATERIAL, LABOR, EQUIPMENT, APPURTENANCES, AND OTHER CONTRACTUAL EXPENSES REQUIRED FOR THE COMPLETE INSTALLATION OF THE MECHANICAL WORK TO THE SATISFACTION OF THE OWNER, ARCHITECT, AND ENGINEER.

2.THE MECHANICAL WORK SHALL COMPLY WITH AND BE INSTALLED IN ACCORDANCE WITH ALL LEGALLY CONSTITUTED AUTHORITIES AND CODES HAVING JURISDICTION. NO WORK INDICATED ON DRAWINGS OR SPECIFICATIONS SHALL BE PERFORMED WITHOUT PLAN CHECK APPROVAL AND VALID PERMITS.

3.THE CONTRACTOR SHALL GUARANTEE ALL EQUIPMENT, APPARATUS, ACCESSORIES (I.E., THE ENTIRE INSTALLATION) AS FURNISHED BY HIM FOR A PERIOD OF ONE YEAR. THE CONTRACTOR SHALL REPAIR OR REPLACE ANY ITEM WHICH MAY PROVE DEFECTIVE WITHIN ONE (1) YEAR FROM THE DATE THE APPARATUS IS ACCEPTED AND PLACED IN OPERATION WITHOUT ANY ADDITIONAL COST TO THE OWNER.

4.THE CONTRACTOR SHALL OBTAIN AND PAY FOR ALL PERMITS, LICENSES, AND INSPECTIONS REQUIRED TO COMPLETE THE MECHANICAL WORK.

5.THE DRAWING INDICATES IN DIAGRAMMATIC FORM ARRANGEMENTS DESIRED FOR PRINCIPAL APPARATUS, PIPING CONDUIT, ETC., AND SHALL BE FOLLOWED AS CLOSELY AS POSSIBLE. SCALED AND FIGURED DIMENSIONS ARE APPROXIMATE AND ARE GIVEN FOR ESTIMATE PURPOSES ONLY. BEFORE PROCEEDING WITH ANY WORK, CHECK AND VERIFY EXISTING CONDITIONS, DIMENSIONS, SIZES AND ASSUME FULL RESPONSIBILITY FOR FITTING-IN OF EQUIPMENT, MATERIALS, AND ADJUSTMENT OF ANY EXISTING DUCTWORK AND PIPING (INCLUDING PROVISION FOR OFFSETS, BENDS, ELBOWS, ETC.).

6.THE CONTRACTOR SHALL MAKE A THOROUGH FIELD SURVEY TO DETERMINE ANY EXISTING CONDITION THAT MAY AFFECT THE INSTALLATION OF THE WORK. BY THE ACT OF SUBMITTING A BID, THE CONTRACTOR IS DEEMED TO HAVE MADE FIELD SURVEY AND HAS ACCEPTED THE EXISTING CONDITIONS THAT MAY AFFECT HIS WORK. APPOINTMENTS FOR FIELD SURVEY SHALL BE MADE THROUGH THE OWNER REPRESENTATIVE.

7.THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL CUTTING, AND PATCHING TO COMPLETE THE INSTALLATION OF THE MECHANICAL WORK. ALL EXPOSED FINISHED AREAS THAT ARE DAMAGED AS A RESULT OF THIS WORK SHALL BE REPAIRED TO MATCH THE EXISTING CONDITIONS AT NO ADDITIONAL COST TO THE OWNER.

8.ALL CONSTRUCTION SITES SHALL BE PROPERLY PROTECTED WITH BARRICADES, WARNING FLAGS, FENCING, AND LIGHTS AS REQUIRED BY CODE AND THE OWNER'S SECURITY DEPARTMENT. PROVIDE SHORING, BRACING, AND ACCESS LADDERS AS REQUIRED BY CODE. TAKE EXTRA CARE TO INSTRUCT ALL PERSONNEL ON SAFETY PROCEDURES. TAKE CARE TO AVOID DAMAGE TO ADJACENT DUCTWORK, PIPING AND ELECTRIC SERVICES.

9.ALL UTILITY SHUT-DOWNS SHALL BE SCHEDULED AT LEAST TWO (2) DAYS IN ADVANCE THROUGH THE OWNER. PROVIDE CONTINUOUS "FIRE WATCH GUARD" TO ALL AREAS AFFECTED BY SHUT-DOWN OF ANY FIRE PROTECTION WATER SERVICE. THE CONTRACTOR'S OPERATION SHALL CAUSE NO UNNECESSARY INCONVENIENCE TO THE BUILDING'S PREMISES. THE ACCESS RIGHTS TO THE PUBLIC SHALL BE CONSIDERED AT ALL TIMES.

10.SHOP DRAWINGS AND MATERIAL LISTS SHALL BE SUBMITTED TO THE ENGINEER FOR REVIEW AT LEAST THIRTY (30) DAYS PRIOR TO THE START OF ANY WORK. NO WORK INDICATED ON ANY OF THE PLANS OR SHOP DRAWINGS SHALL BE PERFORMED, UNTIL THE SHOP DRAWINGS HAVE BEEN REVIEWED BY THE ENGINEER.

11.IF THE CONTRACTORS' USE OF SUBSTITUTE MATERIALS, EQUIPMENT OR METHODS OF INSTALLATION REQUIRES ANY CHANGES IN OTHER TRADES WORK FROM THAT SHOWN ON THE DRAWINGS, THE EXTRA COST OF THE OTHER TRADES WORK SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR INITIATING THE SUBSTITUTION.

12.APPROVAL OF THE SUBMITTALS DOES NOT RELEASE THE CONTRACTOR FROM OBLIGATIONS TO FULLY COMPLY WITH ALL REQUIREMENTS OF THE CONSTRUCTION DOCUMENTS OR APPLICABLE CODES.

13.THE CONTRACTOR SHALL SUBMIT TWO (2) COMPLETE SETS OF AS-BUILT DRAWINGS, OPERATIONAL AND MAINTENANCE MANUALS TO THE OWNER AS PERMANENT RECORDS AT SUCCESSFUL COMPLETION OF WORK, BEFORE FINAL PAYMENT CAN BE APPROVED BY THE OWNER REPRESENTATIVE.

PART 2 - MATERIALS:

1. CHILLER #3 IS ALREADY PURCHASED BY OWNER (UNLV) AND IS PROVIDED FOR CONTRACTOR'S COMPLETE INSTALLATION AND CONNECTION TO EXISTING CHILLED WATER AND CONDENSER WATER HEADERS.

2.PIPING AND FITTINGS SHALL BE MANUFACTURED IN USA AND BE PROVIDED AS FOLLOWS, OR APPROVED EQUALS:
A. ALL PIPING, EXCEPT WHERE EXISTING PIPING IS INDICATED TO BE REUSED, SHALL BE NEW SEAMLESS PIPING MATERIALS. PIPING SCHEDULE, MATERIALS, CONSTRUCTION, SUPPORT, SEISMIC RESTRAINT, AND INSTALLATION SHALL BE IN ACCORDANCE WITH THE MECHANICAL CODE, IBC, AND SMACNA "GUIDELINES FOR THE RESTRAINT OF MECHANICAL SYSTEMS AND PLUMBING PIPING SYSTEMS". PIPING AND FITTINGS MATERIALS AND METHODS SHALL MATCH EXISTING PIPING MATERIAL: STEEL PIPE, ASTM A53 OR A106, SCHEDULE 40 BLACK STEEL PIPING; WITH ANSI/ASTM B16.3, MALLEABLE IRON OR ASTM A234, FORGED STEEL WELDING TYPE FITTINGS; AND WITH WELDED JOINTS.
B. CONTRACTOR TO FURNISH AND INSTALL REFRIGERANT PIPING PER MANUFACTURER'S SPECIFICATIONS AND REQUIREMENTS. USE SILFOS/BRAZED JOINT ONLY. SOLDER-JOINTS ARE NOT ACCEPTABLE.
C. FIRE RATED PENETRATION SEALS FOR FLOORS, CEILING AND WALLS SHALL BE PROSET SYSTEM "A" FOR COPPER AND STEEL PIPING.
D. PROVIDE PIPE SLEEVES AND ESCUTCHEON PLATES FOR PIPES RUNNING THROUGH WALLS, PARTITIONS, CEILING AND FLOORS EXPOSED TO VIEW. ESCUTCHEON PLATES SHALL BE CHROME PLATED BRASS OR STAINLESS STEEL.

3.VALVES AND PIPING SPECIALTIES SHALL BE MANUFACTURED IN USA AND PROVIDED AS FOLLOWS:
A.BALL VALVES 2" AND SMALLER SHALL BE 2-PIECE BRONZE WITH STAINLESS STEEL BALL, TFE SEAT, AND LEVER OPERATOR FOR SCREWED, OR SOLDERED CONNECTION BY NIBCO OR STOCKHAM. PROVIDE LEVER ARM EXTENSION TO CLEAR INSULATION ON ALL CHILLED AND HOT WATER SERVICE VALVES.
B. BALANCING COCKS 2" AND SMALLER SHALL BE BRONZE BODY, CLASS 150 BY NIBCO OR ARMSTRONG.
C. STRAINERS 2" AND SMALLER SHALL BE "Y" PATTERN, CLASS 150, BRONZE BODY, STAINLESS STEEL PLUG, SCREWED BY NIBCO OR ARMSTRONG.
D. FLOW CONTROL VALVES SHALL BE 2 PSI MAXIMUM PRESSURE DROP, THREADED OR THREADED FLANGE.
E. PRESSURE AND TEMPERATURE TAPS (PETE'S PLUG II) SHALL BE BRASS BODY AND CAP, 1/4" NPT BY PETERSON EQUIPMENT.
F. DIELECTRIC UNIONS SHALL BE PROVIDED TO JOIN DISSIMILAR MATERIALS TO PREVENT GALVANIC CORROSION BY NIBCO OR WATTS.

4.THERMAL INSULATION FOR ABOVE GRADE PIPING SHALL BE PROVIDED AS FOLLOWS:
A.. PIPE INSULATION: PIPE INSULATION SHALL BE MULTISERVICE-TYPE SUITABLE FOR ALL LINES OPERATING FROM -20° TO 500° F. INSULATION SHALL BE RIGID, TYPE A, CLOSED CELL FOAM INSULATION, TRYMER 1800 OR APPROVED EQUAL, 0.19 180 DAY AGED K-FACTOR AT 75 DEG. F MEAN.
B. THERMAL CONDUCTIVITY (BTU/HOUR SQUARE FOOT DEGREES F./INCH) SHALL NOT EXCEED:
AT 75° F. MEAN TEMPERATURE 0.22
AT 100° F. MEAN TEMPERATURE 0.23
AT 200° F. MEAN TEMPERATURE 0.25
C. VAPOR BARRIER JACKET FOR ABOVE GRADE PIPING SHALL BE HEAVY DUTY ALL SERVICE JACKET (ASJ) CONSISTING OF LAMINATED ALUMINUM FOIL, GLASS REINFORCING AND WHITE BUILDING PAPER. PERM RATING SHALL BE 0.01. VAPOR BARRIER TO FORM A VAPOR TIGHT SYSTEM.
D. PREMOLDED PIPE FITTING COVERS: INTERIOR USED COVERS SHALL BE FACTORY-PREMOLDED ONE-PIECE POLYVINYL CHLORIDE (PVC-FR). COVERS SHALL HAVE A SNOW-WHITE FINISH AND SHALL WITHSTAND SURFACE OPERATING TEMPERATURES FROM 35 TO 150 DEGREES F. CONTINUOUS USAGE. ALL COVERS SHALL CONFORM TO FEDERAL SPECIFICATION L-P-535, COMPOSITION A, TYPE II, AND SHALL BE CEEL-CO. SERIES 100, CERTAINTEED "SNAP-FORM," ZESTON.

5. PIPES AND/OR CONDUITS PASSING THROUGH WALL, FLOORS, ROOF AND PARTITIONS SHALL BE PROVIDED WITH SLEEVES. SLEEVES PASSING THROUGH WATER PROOFING OF DAMP PROOFING SHALL BE WATER TIGHT. SLEEVES PASSING THROUGH FIRE RATED CONSTRUCTION SHALL BE FIRE PROOFED WITH MATERIAL APPROVED FOR THE RATING OF THE STRUCTURE AND U.L. LISTED.

PART 3 - EXECUTION:

1.THE DRAWING INDICATES IN DIAGRAMMATIC FORM ARRANGEMENTS DESIRED FOR PRINCIPAL APPARATUS, PIPING CONDUIT, ETC., AND SHALL BE FOLLOWED AS CLOSELY AS POSSIBLE. SCALED AND FIGURED DIMENSIONS ARE APPROXIMATE AND ARE GIVEN FOR ESTIMATE PURPOSES ONLY. OFFSET AND TRANSITION TO AVOID OBSTRUCTIONS IN PATH OF DUCTWORK AND PIPING INDICATED ON PLANS. BEFORE PROCEEDING WITH ANY WORK, CHECK AND VERIFY EXISTING CONDITIONS, DIMENSIONS, SIZES AND ASSUME FULL RESPONSIBILITY FOR FITTING-IN OF EQUIPMENT AND MATERIALS, (INCLUDING PROVISION FOR OFFSETS, BENDS, ELBOWS, ETC.).

2.EQUIPMENT, AND PIPING SHALL BE INSTALLED TO RUN PARALLEL OR PERPENDICULAR TO THE BUILDING STRUCTURE AND SHALL BE ARRANGED TO FORM NEAT SYMMETRICAL PATTERNS TO ASSURE THE BEST POSSIBLE APPEARANCE. HANGERS ON PARALLEL ADJACENT PIPING SHALL BE IN LINE WITH EACH OTHER AND PARALLEL TO THE LINES OF THE BUILDING STRUCTURE. ALL PIPING SHALL BE SUPPORTED FROM THE BUILDING STRUCTURE ONLY, NO PIPING SHALL BE SUPPORTED FROM OTHER PIPING OR AIR CONDITIONING DUCTWORK.

3.HOLD PIPING TIGHT TO UNDERSIDE OF STRUCTURE ABOVE TO MAXIMIZE FREE SPACE IN CEILING. COORDINATE LOCATION OF PIPING TO AVOID CREATING INTERFERENCES WITH OTHER TRADES SUCH AS PLUMBING, ELECTRICAL, LIGHTING, ETC.

4.PROVIDE HANGERS TO SUPPORT PIPING AND EQUIPMENT. PIPE HANGER CONSTRUCTION, MATERIALS, ATTACHMENT TO THE STRUCTURE, AND OVERALL INSTALLATION SHALL BE IN ACCORDANCE WITH THE MECHANICAL CODE, PLUMBING CODE, AND SMACNA "GUIDELINES FOR THE RESTRAINT OF MECHANICAL SYSTEMS AND PLUMBING PIPING SYSTEMS".

5. INSTALL NEW LABELS ON CHILLED AND CONDENSER WATER PIPING TO MATCH THE DESIGNATORS INDICATED IN THESE DRAWINGS.

6.PIPING AND COMPONENTS SHALL BE SPACED SO THAT A THREADED PIPE FITTING MAY BE REMOVED BETWEEN ADJACENT PIPES. NOT LESS THAN 1/2-INCH OF CLEAR SPACE SHALL EXIST BETWEEN THE FINISHED SURFACE AND OTHER WORK, AND BETWEEN FINISHED SURFACE OF PARALLEL ADJACENT PIPING.

7.ELECTRICAL CONTRACTOR SHALL PROVIDE CONDUIT AND PULL WIRING FOR CONTROLS. FINAL CONNECTION TO CONTROLS SHALL BE BY MECHANICAL CONTRACTOR.

8.FIRE RATED SEALS SHALL BE PROVIDED AT ALL PENETRATIONS THROUGH FIRE RATED AREAS.

9.TEST ALL NEW CONDENSER AND CHILLED WATER PIPING HYDROSTATICALLY AT 125 PSI FOR 8-HOURS WITH NO CIRCULATING LOSS OF PRESSURE. RESEAL AND RETEST UNTIL THE ENTIRE PIPING SYSTEM PASSES.

10.BALANCE AND ADJUST ALL FANS, FOR SPECIFIED AIR DISTRIBUTION RATES. SUBMIT AIR BALANCE REPORT TO THE ENGINEER FOR REVIEW.

11.AT THE COMPLETION OF THE WORK, ALL PARTS OF THE INSTALLATION SHALL BE THOROUGHLY CLEANED. ALL FIXTURES, VALVES, PIPES, AND FITTINGS SHALL BE CLEANED OF GREASE, METAL CUTTINGS, SLUDGE, AND OTHER DEBRIS THAT MAY HAVE ACCUMULATED DURING INSTALLATION.

12.TINSTALL DRAINS AT ALL LOW AND AIR VENTS AT HIGH POINTS OF PIPING. TYPICAL FOR ALL.

13. PRIME AND PAINT UN-INSULATED PIPING.

SCHEDULES

CHILLER SCHEDULE

ITEM	MANUFACTURER & MODEL NO.	LOCATION	CAP. TONS	EVAPORATOR REFRIGERANT TYPE	EVAPORATOR REFRIGERANT WEIGHT (LBS.)	EVAPORATOR WATER TEMP. (DEG.F.) ENT.	EVAPORATOR WATER TEMP. (DEG.F.) LVG.	EVAPORATOR DESIGN GPM	EVAPORATOR MAXIMUM PRESSURE DROP (FT.)	CONDENSER WATER TEMP. (DEG.F.) ENT.	CONDENSER WATER TEMP. (DEG.F.) LVG.	CONDENSER GPM	CONDENSER MAXIMUM PRESSURE DROP (FT.)	ELECTRICAL TOTAL KW INPUT	ELECTRICAL VOLT	ELECTRICAL PHRASE	ELECTRICAL HZ	OPER. WEIGHT (LBS.)	REMARKS
(E)CH-1	CARRIER 19XR-8082564EK56	CHILLER ROOM	1,100	R-134A	2,340	58	42	1,650	9.4	85	95	3,300	14.9	651	460	3	60	N/A	1. EXISTING HERMETIC CENTRIFUGAL WATER CHILLER. NO WORK SHALL BE PERFORMED ON THIS EQUIPMENT, AS PART OF THIS PROJECT.
(E)CH-2	CARRIER 19XR-8082564EK56	CHILLER ROOM	1,100	R-134A	2,340	58	42	1,650	9.4	85	95	3,300	14.9	651	460	3	60	N/A	1. EXISTING HERMETIC CENTRIFUGAL WATER CHILLER. NO WORK SHALL BE PERFORMED ON THIS EQUIPMENT, AS PART OF THIS PROJECT.
CH 3	YORK YKP5PRK2-CZG	CHILLER ROOM	1,100	R-134A	2,884	58	42	1,650	6.2	85	95	3,300	14.1	632	460	3	60	54,500	1. NEW OWNER FURNISHED CONTRACTOR INSTALLED CENTRIFUGAL WATER CHILLER. SEE THESE DRAWINGS FOR DETAILS OF WORK.

EXHAUST FAN SCHEDULE (EXISTING)

SYMBOL	MANUFACTURER & MODEL NO.	LOCATION	SERVICE	TYPE	EXISTING CFM	EXISTING S.P. (IN)	NEW CFM	NEW S.P. (IN)	RPM	ELECTRICAL HP	ELECTRICAL VOLT	ELECTRICAL ø	OPER. WEIGHT (LBS)	REMARKS
(E)EF-1	GREENHECK CUBE-200-20	CHILLER ROOM	EMERGENCY VENTILATION	ROOF EXHAUST	5,200	0.625	5,400	AS ACHIEVABLE	---	1½	480	3	---	1. EXISTING EMERGENCY EXHAUST FAN SHALL REMAIN. MAKE ADJUSTMENT AND INCREASE AIR FLOW OF THE EXISTING EMERGENCY EXHAUST FAN ON ROOF (CHANGE PULLEY, SHEAVES OR ADJUST FAN RPM) AND ACHIEVE THE NEW CFM LISTED IN THIS SCHEDULE.

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SEAL:

STATE OF NEVADA
BIJAN SALIMI
MECHANICAL
NO. 13897
PROFESSIONAL ENGINEER

DATE: 05/14/14
EXP. DATE: 06/30/14

CONSULTANT:

UNLV
UNIVERSITY OF NEVADA LAS VEGAS
4505 S. MARYLAND PKWY.
LAS VEGAS, NEVADA 89154

PROJECT: UNLV SEP CHILLER #3 INSTALLATION

REVISIONS :

NO.	DATE	ISSUE
1	7/28/14	Owner's Changes

DRAWING TITLE :

MECHANICAL LEGEND, NOTES, SPECIFICATIONS AND SCHEDULES

All dimensions, levels, layouts and field conditions shall be verified at the site by the contractor before proceeding with the work.

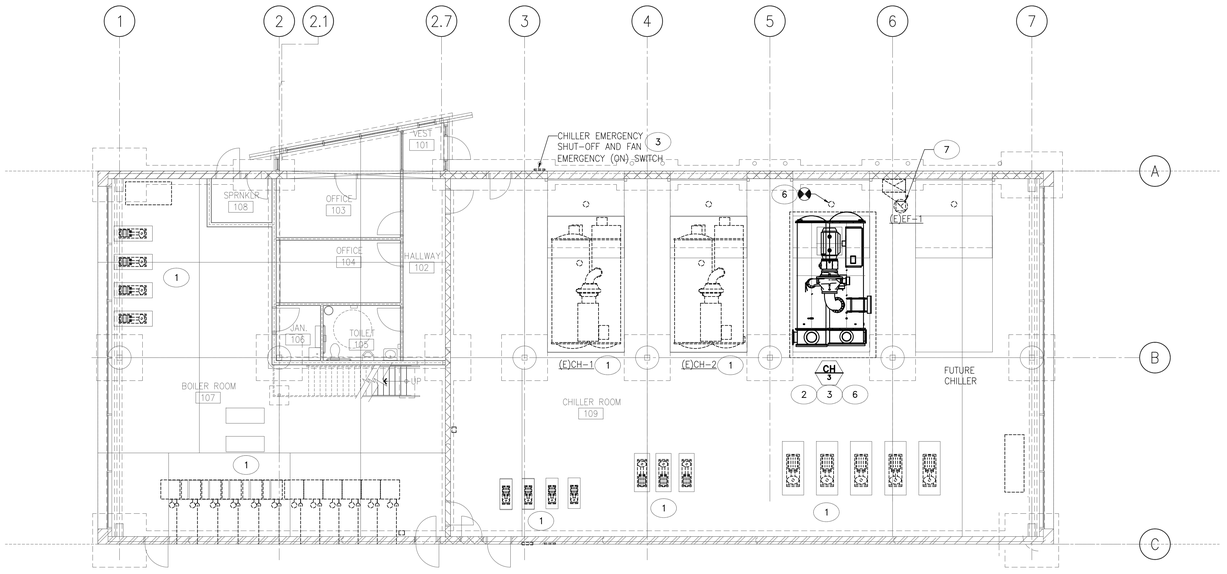
SIGMA'S Project No. 376dc1414
Consultant Project No. -
Date: 05-19-2014

Drawn By	Checked By	Approved By
J.M.	F.S.	B.S.

File Name:

M0.01

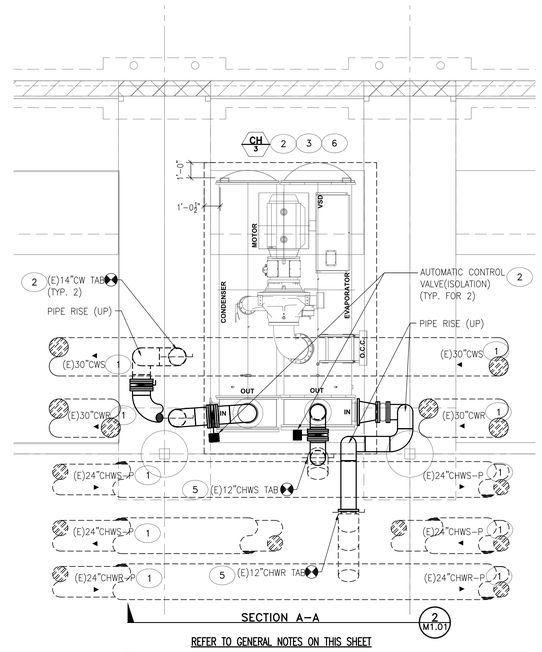
CONSTRUCTION



REFER TO GENERAL NOTES ON THIS SHEET

3 M1.01 **EQUIPMENT LAYOUT**

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



REFER TO GENERAL NOTES ON THIS SHEET

1 M1.01 **FLOOR PLAN - CH#3**

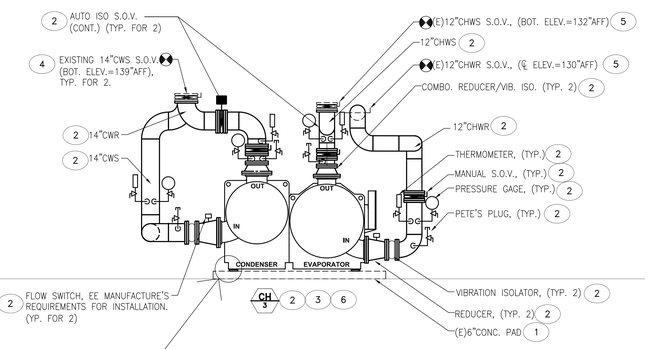
SCALE: 1/4" = 1'-0"

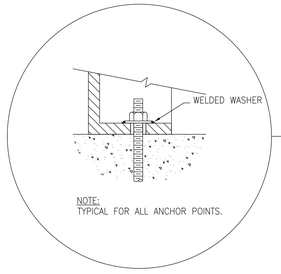
GENERAL NOTES

A. FLUSH AND CLEAN ALL NEW PIPING AND CHILLER(S) PER SPECIFICATION.
B. PRIME AND PAINT ALL NEW CONDENSER WATER PIPING TO MATCH EXISTING.
C. INSULATE ENTIRELY ALL NEW CHILLED WATER PIPING, MATCH EXISTING.
D. INSTALL AIR VENTS AT EACH CHILLED WATER AND CONDENSER WATER BUNDLE OF NEW CHILLER.
E. INSTALL DRAIN VALVE AT EACH CHILLED WATER AND CONDENSER WATER BUNDLE TERMINATE WITH HOSE BIBBS, CHAIN AND END CAP.
F. ANCHOR CHILLER TO CONCRETE PAD AS SHOWN IN **2/M1.01**.
G. SEE ELECTRICAL DRAWINGS FOR ALL ELECTRICAL SUPPORT WORK.

MECHANICAL NOTES (#)

1. EXISTING CHILLER, PUMP, PIPING, ACCESSORIES, ETC. TO REMAIN.
2. INSTALL NEW CHILLER (CH#3) AND NEW CHWS, CHWR, CWS,AND CWR PIPING WITH ALL ACCESSORIES AS SHOWN. CONNECT AND RUN ALL REFRIGERANT VENT PIPING(FULL SIZE) AND ROUTE TO EXISTING RELIEF. SEE ELECTRICAL DWGS FOR ELECTRICAL WORK. ANCHOR TO CONCRETE PAD AFTER PIPING AND ELECTRICAL CONNECTIONS ARE COMPLETE.
3. INSTALL REFRIGERANT LEAK DETECTION SYSTEM FOR CH-3 AND CONNECT TO EXISTING EMERGENCY SWITCH FOR EMERGENCY SHUTDOWN. CONNECT TO EXISTING ALARM SYSTEM FOR PROPER/REQUIRED NOTIFICATION. REFER TO NEW CHILLER MANUFACTURER RECOMMENDATIONS AND GUIDELINES FOR INSTALLATION OF SENSORS AS REQUIRED AND PROVIDED BY THE MANUFACTURER.
4. P.O.C., CONNECT NEW CW, CWR, AND ACCESSORIES TO EXISTING AS SHOWN.
5. P.O.C., CONNECT NEW CHWS, CHWR, AND ACCESSORIES TO EXISTING AS SHOWN.
6. P.O.C., CONNECT FULL SIZE REFRIGERANT LEAK PIPING TO NEW CHILLER AND CONNECT PIPING TO (E)RELIEF PIPE THROUGH ROOF. SEE **3/M1.01** FOR APPROXIMATE LOCATION OF PIPE STUB THRU ROOF. USE BRAZED-JOINT ONLY. SOLDER-JOINTS ARE NOT ACCEPTABLE. PIPE SIZING SHALL BE PER CHILLER MANUFACTURE'S RECOMMENDATION AND SHALL ALWAYS EQUAL OR EXCEED TOTAL CROSS AREA OF THE COMBINED PIPING.
7. ADJUST EXISTING EXHAUST FAN FOR DESIGN CFM. SEE EXH. FAN SCHEDULE IN SHEET **M0.01.**



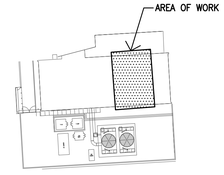


NOTE:
TYPICAL FOR ALL ANCHOR POINTS.

REFER TO GENERAL NOTES ON THIS SHEET

2 M1.01 **SECTION A-A**

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



KEY PLAN

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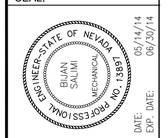
SEAL:



DATE: 05/14/14
EXP. DATE: 06/30/14

CONSULTANT:

UNLV

UNIVERSITY OF NEVADA LAS VEGAS
4505 S. MARYLAND PKWY.
LAS VEGAS, NEVADA 89154

PROJECT : UNLV SEP CHILLER #3 INSTALLATION

REVISIONS :

NO.	DATE	ISSUE

DRAWING TITLE :

MECHANICAL FLOOR PLANS AND SECTIONS

All dimensions, levels, layouts and field conditions shall be verified at the site by the contractor before proceeding with the work.

SIGMA'S Project No.	376dc1414
Consultant Project No.	-
Date:	05-19-2014

Drawn By	Checked By	Approved By
J.M.	F.S.	B.S.

File Name:

M1.01

CONSTRUCTION

SPECIFICATIONS

SCOPE OF WORK

FURNISH AND INSTALL A COMPLETELY WIRED AND OPERATIONAL ELECTRICAL SYSTEM AS SHOWN ON THE DRAWINGS AND SPECIFIED HEREIN, INCLUDING BUT NOT LIMITED TO, THESE MAJOR ITEMS.

1. PAD MOUNTED SWITCH/FUSE CABINET
2. PAD MOUNTED OIL-FILLED 12.47KV-480/277V TRANSFORMER.
3. 480V DISTRIBUTION SWITCHBOARD
4. 15KV CABLING AND CONNECTIONS
5. CONNECTION TO NEW CHILLER
6. REMOVAL AND REPLACEMENT OF CONCRETE AS NECESSARY.

RELATED WORK BY OTHERS

THE ELECTRICAL CONTRACTOR SHALL COORDINATE THE INSTALLATION OF THE ELECTRIC SYSTEM FOR THIS PROJECT WITH THE INSTALLATION OF MECHANICAL EQUIPMENT WITH THE MECHANICAL CONTRACTOR. FINAL CONNECTIONS SHALL BE PER EQUIPMENT MANUFACTURERES REQUIREMENTS.

CODES, REGULATIONS, AND STANDARDS

THE INSTALLATION SHALL COMPLY WITH APPLICABLE LOCAL AND STATE CODES AND ORDINANCES, WITH THE REGULATIONS OF THE LATEST ADOPTED EDITION OF THE NATIONAL ELECTRIC CODE.

THE FOLLOWING INDUSTRY STANDARDS, SPECIFICATIONS AND CODES ARE MINIMUM REQUIREMENTS:

1. THE NATIONAL ELECTRICAL MANUFACTURER'S ASSOCIATION STANDARDS.
2. THE NATIONAL ELECTRICAL CODE AND LOCAL AMENDMENTS, LATEST ADOPTED EDITIONS.
3. UNDERWRITER LABORATORIES INCORPORATED STANDARDS.
4. AMERICAN NATIONAL STANDARDS INSTITUTE.
5. THE INTERNATIONAL BUILDING CODE, LATEST ADOPTED EDITION.

INSPECTION OF SITE

PRIOR TO SUBMITTING A BID FOR ELECTRICAL WORK THE CONTRACTOR SHALL VISIT THE SITE OF THE PROPOSED CONSTRUCTION AND SHALL THOROUGHLY ACQUAINT HIMSELF WITH EXISTING UTILITIES AND WORKING CONDITIONS, ETC. TO BE ENCOUNTERED. ALLOWANCE WILL NOT BE MADE FOR NONCOMPLIANCE
WITH THIS CONDITION AFTER BIDDING.

STORAGE AND HANDLING OF MATERIAL

DELIVER MATERIALS AND EQUIPMENT TO THE PROJECT IN THE MANUFACTURER'S ORIGINAL, UNOPENED, LABELED CONTAINERS, PROTECT AGAINST MOISTURE, TAMPERING, OR DAMAGE FROM IMPROPER HANDLING OR STORAGE. CONTRACTOR SHALL PROTECT AND BE RESPONSIBLE FOR ANY DAMAGE TO WORK OR MATERIALS UNTIL FINAL ACCEPTANCE BY THE OWNER AND SHALL MAKE GOOD WITHOUT COST TO THE OWNER ANY DAMAGE OR LOSS THAT MAY OCCUR DURING THIS PERIOD.

ARRANGE FOR TIMELY DELIVERY OF MATERIALS AND EQUIPMENT TO THE JOB SITE IN ORDER TO MINIMIZE THE LENGTH OF TIME BETWEEN DELIVERY AND INSTALLATION.

COVER AND PROTECT ANY MATERIAL WHICH MAY BE AFFECTED BY THE WEATHER WHILE IN TRANSIT OR STORED AT THE PROJECT SITE. ANY MATERIAL FOUND DEFECTIVE OR NOT INSTALLED IN ACCORDANCE WITH THE CONTRACT DOCUMENTS MAY BE REJECTED BY THE ENGINEER.

CLEAN-UP

KEEP THE PREMISES FREE FROM ACCUMULATION OF WASTE MATERIALS, OR RUBBISH CAUSED BY EMPLOYEES OR WORK UNDER THIS DIVISION OF THE SPECIFICATIONS. AT THE COMPLETION OF THE WORK, REMOVE ALL SURPLUS MATERIALS, TOOLS, ETC., AND LEAVE THE PREMISES "BROOM-CLEAN".

EXCAVATION AND BACKFILL

PERFORM ALL EXCAVATION AND BACKFILLING REQUIRED FOR WORK PERFORMED UNDER THIS DIVISION OF THE SPECIFICATIONS. TRENCH BOTTOMS SHALL BE GRADED TRUE AND FREE FROM STONES OR SOFT SPOTS. USE EXCAVATED MATERIALS FOR BACKFILL UNLESS OFF-SITE MATERIALS ARE DEEMED NECESSARY BY THE ARCHITECT. TRENCHING AND BACKFILLING FOR ELECTRICAL AND TELEPHONE UTILITY SERVICES TO BUILDING SHALL BE PROVIDED BY THIS CONTRACTOR.

DRAWINGS

THE DRAWINGS INDICATE THE GENERAL ARRANGEMENT AND LOCATIONS OF THE ELECTRICAL WORK. DATA PRESENTED ON THESE DRAWINGS ARE AS ACCURATE AS PLANNING CAN DETERMINE, BUT FIELD VERIFICATION OF ALL DIMENSIONS, LOCATIONS, LEVELS, ETC. TO SUIT FIELD CONDITIONS IS REQUIRED. REVIEW ALL ARCHITECTURAL, STRUCTURAL AND MECHANICAL DRAWINGS AND ADJUST ALL WORK TO MEET THE REQUIREMENTS OF CONDITIONS SHOWN. THE ARCHITECTURAL DRAWINGS SHALL TAKE PRECEDENCE OVER ALL OTHER DRAWINGS. DISCREPANCIES BETWEEN DIFFERENT PLANS, OR BETWEEN
DRAWINGS AND SPECIFICATION, OR REGULATIONS AND CODES GOVERNING THE INSTALLATION SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER IN WRITING BEFORE THE DATE OF BID OPENING. IF DISCREPANCIES ARE NOT REPORTED, THE CONTRACTOR SHALL BID THE GREATER QUANTITY OR BETTER QUALITY, AND APPROPRIATE ADJUSTMENTS WILL BE MADE AFTER CONTRACT AWARD. CONTRACTOR SHALL BE RESPONSIBLE TO FIELD MEASURE AND CONFIRM MOUNTING HEIGHTS AND LOCATION OF ELECTRICAL EQUIPMENT WITH RESPECT TO COUNTERS, RADIATION, ETC. DO NOT SCALE DISTANCES OFF THE ELECTRICAL DRAWINGS. USE ACTUAL BUILDING DIMENSIONS.

IN ALL CASES SWITCHES CONTROLLING LIGHTING ARE TO BE LOCATED ON THE STRIKE SIDE OF DOORS. LOCATION INDICATED FOR SWITCHES AND OUTLETS ARE APPROXIMATE. OWNER MAY MAKE MINOR RELOCATIONS AT NO ADDITIONAL CHARGE.

CUTTING AND FITTING

PERFORM THE CUTTING, FITTING, REPAIRING AND FINISHING OF THE WORK NECESSARY FOR THE INSTALLATION OF THE EQUIPMENT OF THIS SECTION, HOWEVER, NO CUTTING OF THE WORK OF OTHER TRADES OR OF ANY STRUCTURAL MEMBER SHALL BE DONE WITHOUT THE CONSENT OF THE ARCHITECT.

COOPERATION WITH OTHER CONTRACTORS

COOPERATE WITH THE OTHER TRADES SO THAT THE INSTALLATION OF THE ELECTRICAL OUTLETS AND EQUIPMENT WILL BE PROPERLY COORDINATED. CONDUIT, FIXTURES, AND OTHER EQUIPMENT LOCATIONS SHALL BE CHECKED WITH THE OTHER TRADES TO AVOID CONFLICT WITH THE PIPING, DUCTWORK, STEEL, BEAMS, OR OTHER OBSTRUCTIONS.

CAREFULLY CHECK THE LOCATIONS OF THE OUTLET BOXES AND DETERMINE THAT THEY HAVE NOT BEEN DISTURBED DURING THE INSTALLATION OF MATERIALS OF OTHER TRADES.

COORDINATE THE LOCATION OF TRENCHES AND CONDUITS FOR ELECTRIC AND TELEPHONE UTILITY SERVICES WITH THE GENERAL CONTRACTOR.

MATERIALS

ALL MATERIALS SHALL BE NEW AND OF QUALITY AS SPECIFIED ON THE PLANS OR SPECIFICATIONS AND MUST CARRY THE UNDERWRITER'S LABORATORIES APPROVAL COVERING THE PURPOSE FOR WHICH THEY ARE USED, IN ADDITION TO MEETING ALL REQUIREMENTS OF THE CURRENT APPLICABLE CODES AND REGULATIONS.

CONDUIT

RGS AND IMC MAY BE USED IN ALL AREAS. EMT MAY BE USED IN INDOOR LOCATIONS NOT IN CONTACT WITH EARTH, NOT IN CONCRETE SLAB OR WALLS AND NOT SUBJECT TO DAMAGE. UNDERGROUND CONDUIT SHALL BE SCHEDULE 40 PVC WITH PROPERLY CEMENTED JOINTS. FMC SHALL BE USED FOR FINAL CONNECTION TO MECHANICAL EQUIPMENT NOT TO EXCEED 36" AND TO RECESSED REMOVABLE LIGHTING FIXTURES NOT TO EXCEED 72". FMC SHALL NOT BE USED EXCEPT AS NOTED HERE WITHOUT PRIOR APPROVAL FROM THE ENGINEER. LIQUIDTITE FMC SHALL BE USED FOR FINAL CONNECTION TO MOTORS
IN OUTDOOR LOCATIONS. MC CABLE SHALL NOT BE USED FOR THIS PROJECT. CONDUIT FITTINGS SHALL BE OF THE COMPRESSION TYPE. ALL EMPTY CONDUIT SYSTEMS SHALL HAVE 200 LB. TEST PULL CORD TO FACILITATE INSTALLATION OF WIRE IN FUTURE. CONDUITS AND OUTLETS SHALL BE CONCEALED WITHIN THE BUILDING STRUCTURE; EXCEPT THAT CERTAIN MOTOR AND LIGHTING FEEDER CONDUITS MAY BE RUN EXPOSED IN CERTAIN AREAS AS INDICATED ON THE DRAWINGS. CONDUIT SHOWN TO BE INSTALLED IN CABINETS, COUNTERS, AND
CASEWORK SHALL BE INSTALLED AS DIRECTED BY THE ARCHITECT.

OUTLET, PULL AND JUNCTION BOXES

EACH SWITCH, LIGHT, RECEPTACLE OR OTHER OUTLET SHALL BE PROVIDED WITH A CODE GAUGE, GALVANIZED STEEL OUTLET BOX. JUNCTION BOXES SHALL BE CODE GAUGE, GALVANIZED STEEL. OUTLET BOXES SHALL BE OF THE ONE PIECE, KNOCKOUT TYPE, IN GENERAL 4" SQUARE WITH PLASTER RING. PLASTER RINGS SHALL BE SET TO PROVIDE NOT MORE THAN 1/8" FROM WALL SURFACE TO RING. IN NO CASE SHALL PLASTER RING PROJECT BEYOND SURFACE OF WALL. SINGLE GANG RINGS SIMILAR TO STEEL CITY 52050 SHALL BE USED FOR 4" BOXES IN UNFINISHED BRICK. #180 BOXES
MAY BE USED FOR UNFINISHED MASONRY FLUSH WALL OUTLETS. CENTER ALL OUTLET BOXES IN BLOCK COURSE. ALL BOXES SHALL BE IDENTIFIED BY A PERMANENT MEANS, APPROVED BY THE JURISDICTION, SPECIFY SOURCE PANEL, BREAKER, AND SYSTEM VOLTAGE.

WIRE - 600V OR LESS

UNLESS OTHERWISE SPECIFIED, ALL WIRE SHALL BE TYPE THWN, THHN FOR INDOOR AND THW OR XHHW FOR ALL OUTDOOR AND UNDERGROUND FEEDERS. ALL WIRING SHALL BE COPPER. ALUMINUM WIRE IS NOT ALLOWED FOR THIS PROJECT. THE WIRES SHALL BE MARKED WITH COLOR TO SIMPLIFY CIRCUIT IDENTIFICATION. UNLESS OTHERWISE REQUIRED BY LOCAL ORDINANCES EQUIPMENT GROUND CONDUCTORS SHALL BE GREEN. GROUNDED CONDUCTOR SHALL BE WHITE (120V) AND GREY (277V) AND UNGROUNDED CONDUCTORS SHALL BE BLACK (PHASE A), RED PHASE B), AND BLUE (PHASE C) FOR 208Y/120V, SYSTEM; AND BROWN (PHASE A), ORANGE (PHASE B) AND YELLOW (PHASE C) FOR 480Y/277V, SYSTEM, THE WIRE SHALL BE #12 AWG UNLESS OTHERWISE INDICATED. NO WIRE SHALL BE INSTALLED IN THE CONDUIT SYSTEM UNTIL THE CONDUIT SYSTEM IS COMPLETE. USE MINERALAC #100 OR EQUIVALENT AS A LUBRICANT TO FACILITATE THE INSTALLATION OF THE CONDUCTORS IN THE CONDUIT SYSTEM.

WIRE - 15KV

SCOPE: THIS SPECIFICATION COVERS SINGLE CONDUCTOR EPR (ETHYLENE PROPYLENE RUBBER) INSULATED, SHIELDED, THERMOPLASTIC JACKETED POWER CABLE FOR USE IN AERIAL, DIRECT BURIAL, CABLE TRAYS, CONDUIT AND UNDERGROUND DUCT INSTALLATIONS. THE CABLE SHALL BE CAPABLE OF OPERATING CONTINUOUSLY AT A CONDUCTOR TEMPERATURE NOT IN EXCESS OF 105ºC FOR NORMAL OPERATION, 140ºC FOR EMERGENCY OVERLOAD CONDITIONS, AND 250ºC FOR SHORT CIRCUIT CONDITIONS, AND IS RATED AT 15,000V, 133% INSULATION LEVEL (UNGROUNDED SYSTEM).
STANDARDS: UL STANDARD 1072 FOR MEDIUM VOLTAGE POWER CABLE AND ICEA S-93-639 (NEMA WC74) 5-46 KV SHIELDED POWER CABLE FOR USE IN THE TRANSMISSION & DISTRIBUTION OF ELECTRIC ENERGY.
CONDUCTOR: THE CONDUCTOR SHALL BE CLASS BE COMPRESSED SOFT OR ANNEALED COPPER IN ACCOURDANCE WITH ASTM SPECS B3 AND B8 AND ICEA PART 2, SECTION 2,1 AND 2.5.
CONDUCTOR SHIELD: THE CONDUCTOR SHALL BE SHIELDED WITH AN EXTRUDED SEMI-CONDUCTING THERMOSETTING POLYMERIC LAYER OVER THE CONDUCTOR, APPLIED IN TANDEM WITH AND FIRMLY BONDED TO THE INSULATION.
INSULATION: THE INSULATION SHALL BE EPR (ETHYLENE PROPYLENE RUBBER) MEETING THE REQUIREMENTS OF THE REFERENCED STANDARDS. THE NOMINAL THICKNESS SHALL BE 0.220"
INSULATION SHIELD: THE INSULATION SHALL BE SHIELDED WITH AN EXTRUDED LAYER OF SEMI-CONDUCTING THERMOSETTING MATERIAL WHICH SHALL BE IDENTIFIED AS BEING SEMI-CONDUCTING. OVER THIS LAY SHALL BE APPLIED A HELICALLY-WRAPPED 5-MIL COPPER TAPE WITH 25" OVERLAP.
JACKET: THE CABLE SHALL BE PROVIDED WITH A JACKET OF BLACK SUNLIGHT RESISTANT PVC CONFORMING TO THE REQUIREMENTS SPECIFIED FOR POLYVINYL CHLORIDE JACKETS IN ICEA. THE AVERAGE THICKNESS SHALL BE IN ACCORDANCE WITH TABLE 7-3 OF ICEA. OPTIONAL SOLONON LOW SMOKE, NON HALOGEN POLYOLEFIN JACKETS WITH CPE JACKETS ARE AVAILABLE UPON REQUEST.
IDENTIFICATION: CABLE SHALL BE IDENTIFIED BY SURFACE PRINTING ON THE JACKET.

WIRING DEVICES

SWITCHES: WALL SWITCHES SHALL BE COMMERCIAL SPECIFICATION GRADE AC SILENT TYPE SWITCHES, 20A, 120/277 VOLTS. SINGLE POLE SWITCHES SHALL BE HUBBELL CS120I OR APPROVED EQUAL. 3-WAY SWITCHES SHALL BE HUBBELL CS320I OR APPROVED EQUAL. RECEPTACLES: SHALL BE COMMERCIAL SPECIFICATION GRADE, DUPLEX TYPE, NEMA 5-15R, 15 AMPERE, 125V, GROUNDED TYPE. OUTLETS SHALL BE HUBBELL CR15I OR APPROVED EQUAL. SPECIAL APPLICATION RECEPTACLES SHALL BE AS INDICATED ON PLANS. GFCI RECEPTACLES: SHALL BE COMMERCIAL SPECIFICATION GRADE, NEMA 5-15R; HUBBELL GF5252IA, WEATHERPROOF RECEPTACLES; SHALL BE HUBBELL WP26 WITH RECEPTACLE OUTLET OR EQUAL. DEVICE PLATES SHALL BE SMOOTH IVORY NYLON, ALL WIRING DEVICES SHALL HAVE A PROVISION, BY THE MANUFACTURER, FOR AN EQUIPMENT GROUNDING CONDUCTOR SO THAT ALL NON CURRENT CARRYING METAL IS BONDED TO THE GROUND ELECTRODE SYSTEM.

SAFETY SWITCHES

SAFETY SWITCHES, UNLESS OTHERWISE INDICATED ON THE DRAWINGS, SHALL BE HEAVY DUTY TYPE, 600 OR 250 VOLT, OF THE NUMBER OF POLES REQUIRED. SAFETY SWITCHES FOR AIR CONDITIONING UNITS SHALL BE OF THE FUSIBLE TYPE WHERE RECOMMENDED BY EQUIPMENT MANUFACTURER. THE SWITCH SIZE SHALL BE AS REQUIRED BY CODE AND AS INDICATED ON THE DRAWINGS. WHERE OUTSIDE THE BUILDING, THE SWITCHES SHALL BE RAINTIGHT TYPE NEMA 3R. ALL SWITCHES SHALL BE LOCKABLE. ALL SAFETY SWITCHES SHALL HAVE A PROVISION, BY THE MANUFACTURER, FOR AN EQUIPMENT GROUNDING CONDUCTOR SO THAT ALL NON CURRENT CARRYING METAL IS BONDED. ALL SAFETY SWITCH ENCLOSURES OR COVERS SHALL BE IDENTIFIED BY A PERMANENT MEANS, APPROVED BY THE JURISDICTION. SPECIFUING SOURCE PANEL, BREAKER, AND SYSTEM VOLTAGE.

FUSES

FUSES SHALL BE OF THE TYPE, SIZE, AND RATING AS INDICATED ON THE DRAWINGS, ALL FUSES SHALL BE BY BUSSMAN MFG. COMPANY, OR GOULD SHAWMUT. VERIFY FUSE AND SWITCH REQUIREMENTS WITH THE EQUIPMENT SUPPLIED.

DISTRIBUTION SWITCHBOARDS

THE EQUIPMENT SHALL BE AS INDICATED ON THE DRAWINGS AS MANUFACTURED BY SIEMENS, SQUARED, EATON OR GENERAL ELECTRIC. EQUIPMENT SHALL CARRY THE UL LABEL AND SHALL CONFORM TO THE POWER COMPANY REGULATIONS WHERE APPLICABLE. THE EQUIPMENT SHALL BE LISTED, APPROVED, AND SUITABLE FOR USE. IT SHALL BEAR WARNING LABELS, AND THE REQUIRED ARC FLASH PROTECTION FOR PERSONNEL. THE EQUIPMENT ENCLOSURES SHALL BE IDENTIFIED BY A PERMANENT MEANS, APPROVED BY THE JURISDICTION. SPECIFYING PHASE, AMPERAGE AND SYSTEM VOLTAGE AND AIC RATING.

PANELBOARDS

CIRCUIT BREAKER TYPE PANELBOARDS SHALL BE GENERAL ELECTRIC, SQUARE D, SIEMENS OR EATON WITH VOLTAGE, SIZES AND RATINGS AS INDICATED ON DRAWINGS. DO NOT USE LOADCENTERS. THE CIRCUIT BREAKERS SHALL BE OPERABLE IN ANY POSITION AND BE REMOVABLE FROM THE FRONT OF THE PANELBOARD WITHOUT DISTURBING THE ADJACENT UNITS. BRANCH BREAKERS SHALL BE OF SUCH DESIGN THAT ANY COMBINATION OF SINGLE-POLE, DOUBLE-POLE AND THREE-POLE BREAKERS MAY BE ASSEMBLED ON THE SAME PANEL. EACH BRANCH CIRCUIT SHALL BE CLEARLY NUMBERED. BRANCH AND MAIN TERMINALS SHALL BE OF THE SOLDERLESS TYPE. HANDLE TIES TO FORM MULTIPOLE BREAKERS ARE NOT ACCEPTABLE. CIRCUIT BREAKERS SHALL BE OF THE BOLT-ON TYPE. PROVIDE A TYPEWRITTEN CIRCUIT INDEX BEHIND CLEAR PLASTIC COVER ON INSIDE OF DOOR. INFORMATION SHALL INCLUDE ROOM AND TYPE OF LOAD SERVED. ALL CIRCUIT BREAKERS SHALL BE IDENTIFIED, INCLUDING SPARES. INDEX CARD HOLDER SHALL BE SECURED TO DOOR. WHERE PANELBOARDS ARE INSTALLED FLUSH WITH THE WALLS, EXTEND EMPTY CONDUITS FROM THE PANELBOARD TO AN ACCESSIBLE SPACE ABOVE OR BELOW. PROVIDE 3/4" (MINIMUM SIZE) CONDUIT FOR EVERY THREE SINGLE SPARE CIRCUIT BREAKERS OR SPACE OR EQUIVALENT MULTI-POLE ARRANGEMENT, OR FRACTION THEREOF, BUT NOT LESS THAN TWO CONDUITS FOR EACH PANELBOARD. ALL PANEL BOARD ENCLOSURES OR COVERS SHALL BE IDENTIFIED BY A PERMANENT MEANS, APPROVED BY THE JURISDICTION. SPECIFUING PHASE, AMPERAGE AND SYSTEM VOLTAGE.

MOTOR WIRING

ALL MOTORS SHALL BE WIRED TO CONFORM WITH MANUFACTURERS RECOMMENDATIONS AND WITH APPLICABLE CODES. FURNISH NECESSARY MATERIALS SUCH AS WIRE, CONDUIT, FITTINGS, ETC. REQUIRED BY THE SUPPLIER OF THE DRIVEN EQUIPMENT. VERIFY EQUIPMENT LOCATION AND SIZES WITH THE TRADE SUPPLYING THE MOTOR BEFORE INSTALLING THE CONDUIT OR OUTLETS. USE COPPER WIRE FOR MOTOR CONNECTIONS.

TRANSFORMERS - 600V OR LESS

TRANSFORMERS SHALL BE AS MANUFACTURED BY GE, SQUARE D, SIEMENS OR EQUAL. TRANSFORMERS SHALL BE THREE PHASE GENERAL PURPOSE DRY-TYPE, TWO WINDING, SELF COOLING, WITH THE RATINGS AND VOLTAGES AS INDICATED ON THE DRAWINGS. TRANSFORMERS SHALL HAVE SIX 2.5% FULL CAPACITY TAPS-FOUR 2.5% BELOW NORMAL AND TWO 2.5% ABOVE NORMAL TO COMPENSATE FOR VARIATIONS IN PRIMARY LINE VOLTAGES. INSULATION SYSTEM SHALL BE 185 DEG. C WITH 150 DEG. C TEMPERATURE RISE. TRANSFORMER AVERAGE SOUND LEVELS SHALL NOT EXCEED DECIBEL LEVELS LISTED IN NEMA AND ANSI STANDARDS FOR SELF-COOLED RATINGS. ALL TRANSFORMER ENCLOSURES OR COVERS SHALL BE IDENTIFIED BY A PERMANENT MEANS, APPROVED BY THE JURISDICTION. SPECIFYING PHASE, AMPERAGE AND SYSTEM VOLTAGE.

POWER OUTAGE

NOTIFY OWNER SEVEN (7) WORKING DAYS PRIOR TO ANY POWER OUTAGE.
CONTRACTOR SHALL PROVIDE TEMPORARY DIESEL GENERATOR TO FULLY BACKUP THE SYSTEMS/EQUIPMENT THAT WILL HAVE POWER OUTAGE. CONTRACTOR SHALL BE RESPONSIBLE FOR RENTAL, DELIVERY/PICKUP, SET UP, FUEL, PERMITS, ETC.

GUARANTEE

GUARANTEE ALL MATERIAL FURNISHED AND ALL WORKMANSHIP PERFORMED FOR A PERIOD OF ONE YEAR FROM THE DATE OF FINAL ACCEPTANCE OF THE WORK. ANY DEFECTS DEVELOPING WITHIN THIS PERIOD, TRACEABLE TO MATERIAL FURNISHED AS A PART OF THIS SECTION OR WORKMANSHIP PERFORMED HEREUNDER, SHALL BE MADE GOOD AT NO EXPENSE TO THE OWNER.

FIRE RATING

CONTRACTOR SHALL BE RESPONSIBLE FOR THE FOLLOWING REQUIREMENTS AS THEY RELATE TO THE WORK PERFORMED UNDER THIS SECTION OF THE SPECIFICATION.

1. ALL FIRE-RATED ASSEMBLY PENETRATIONS SHALL COMPLY WITH UBC SECTIONS 709 AND 710.
2. ALL FIRE-RATED ASSEMBLY THRU AND MEMBRANE PENETRATIONS SHALL UTILIZE LISTED FIRESTOP SYSTEMS THAT MAINTAIN THE RATING OF THE WALL, FLOOR OR CEILING PENETRATED, FIRESTOP SYSTEMS SHALL BE PROPERLY INSTALLED PER MANUFACTURER'S INSTRUCTIONS.

SHOP DRAWINGS AND APPROVALS

THE ITEMS SPECIFIED HEREIN AND ON DRAWINGS ARE USED AS A STANDARD OF QUALITY. ANY MATERIALS OF EQUAL QUALITY AND AESTHETIC VALUE WILL BE GIVEN CONSIDERATION AS A SUBSTITUTE FOR THE MATERIALS SPECIFIED. NO APPROVAL WILL BE GIVEN TO A SPECIFIC CATALOG NUMBER, MODEL OR TYPE OF EQUIPMENT, PRIOR TO BIDDING. AFTER BIDDING, THE DECISION OF THE ARCHITECT AND/OR ENGINEER, DETERMINING EQUAL MATERIALS, WILL BE FINAL. THE CONTRACTOR SHALL SUBMIT SIX (2) IDENTICAL BOUND SETS AND IN PDF FORMAT OF SHOP DRAWINGS AND I ON THE FOLLOWING ITEMS:

1. OUTLINE DRAWINGS AND DATA SHEETS OF EACH DISTRIBUTION SWITCHBOARD EQUIPMENT.
2. OUTLINE DRAWINGS AND DATA SHEET OF ALL TRANSFORMERS.
3. OUTLINE DRAWINGS AND DATA SHEET OF PRIMARY SWITCH CABINET
4. DATA SHEETS OF ALL WIRING DEVICES, FUSES AND DISCONNECTS.
5. DATA SHEETS OF ALL 15KV CABLES AND CONNECTORS.
6. DATA SHEET AND WIRING DIAGRAM OF CUSTOMER METERING EQUIPMENT

WHERE MATERIALS AND EQUIPMENT ARE SPECIFIED OR INDICATED BY THE NAME OF THE MANUFACTURER OR BY ACCEPTED TRADE DESIGNATION, SUBSTITUTION WILL BE CONSIDERED. WHERE TWO (2) OR MORE ITEMS ARE FURNISHED UNDER THE SAME SPECIFICATION, THEY SHALL BE OF THE SAME MANUFACTURER AND BE IDENTICAL AND INTERCHANGEABLE.

ELECTRICAL LEGEND

S	SINGLE POLE WALL SWITCH @ +46"
S_3	THREE WAY WALL SWITCH @ +46
S_4	FOUR WAY WALL SWITCH @ +46
S_K	SINGLE POLE LOCK TYPE SWITCH @ +46"
S_P	SINGLE POLE SWITCH WITH PILOT LIGHT @ +46"
S_D	SINGLE POLE SLIDE TYPE DIMMER, RATING AND LOAD TYPE AS REQUIRED OR INDICATED
S_M	SINGLE POLE MANUAL MOTOR STARTER SWITCH WITH OVERLOAD ELEMENT
S_F	DUAL SLIDE TYPE FAN SPEED/LIGHT LEVEL CONTROL SWITCH
S_T	AUTO SHUT-OFF TIMER SWITCH, VERIFY TIME CYCLE WITH OWNER
	PUSHBUTTON SWITCH
	DUPLEX RECEPTACLE @ +18"
	DOUBLE DUPLEX RECEPTACLE @ +18"
IG	ISOLATED GROUND TYPE DUPLEX RECEPTACLE @ +18"
	SINGLE RECEPTACLE, CLOCKHANGER TYPE @ +78"
	SPLIT-WIRED DUPLEX RECEPTACLE @ +18" HALF-SWITCHED OR TWO CIRCUIT
	GFCI TYPE DUPLEX RECEPTACLE
	50A, 250V RANGE RECEPTACLE
	SPECIAL PURPOSE RECEPTACLE AS NOTED ON PLANS
	BOX AROUND SYMBOL INDICATES FLUSH FLOOR OUTLET
	PLUGMOLD MULTIOUTLET SYSTEM, WIRING AND OUTLET CONFIGURATION AS NOTED ON PLANS.
	FLUORESCENT STRIP FIXTURE
	FLUORESCENT LIGHT FIXTURE
	RECESSED LIGHT FIXTURE
	RECESSED WALL WASHER OR DIRECTIONAL LIGHT FIXTURE
	WALL MOUNT LIGHT FIXTURE
	HALF SHADED FIXTURE INDICATES EMERGENCY LIGHT FIXTURE OR UNSWITCHED NIGHT LIGHT.
A	UPPER CASE LETTER INDICATES FIXTURE TYPE, LOWER CASE LETTER INDICATES SWITCHING GROUP
	POLE MOUNTED LIGHT FIXTURE
	EXIT SIGN, SHADED QUADRANT INDICATES LIGHTED FACE
	COMBINATION EXIT SIGN/EMERGENCY LIGHTING UNIT WITH TWIN HEADS
	EMERGENCY LIGHTING UNIT WITH TWIN HEADS
	TELEPHONE OUTLET @ +18"
	COMPUTER/DATA OUTLET @ +18"
	COMBINATION VOICE/DATA OUTLET @ +18"
	BOX AROUND SYMBOL INDICATES FLUSH FLOOR OUTLET
	JUNCTION BOX, MOUNTING AS REQUIRED, SIZE PER NEC.
H	JUNCTION BOX WALL MOUNTED, SIZE PER NEC.
	SAFETY SWITCH, F SCRIBED INSIDE INDICATES FUSIBLE
	CONTACTOR, DESCRIPTION AS NOTED ON PLANS
	COMBINATION MOTOR STARTER AS NOTED ON PLANS.
	CIRCUIT BREAKER
	FUSIBLE SWITCH
	TRANSFORMER, TYPE AND SIZE AS NOTED (DIAGRAMMATIC)
	PANEL BOARD OR CABINET
	SWITCHBOARD OR MOTOR CONTROL CENTER
M	METER
ST	SHUNT TRIP ELEMENT
TC	TIME CLOCK
S_D	SELF CONTAINED SMOKE DETECTOR
D	DUCT SMOKE DETECTOR
T	THERMOSTAT
PC	PHOTOCELL
CH	CHIME
T	TRANSFORMER (IN PLAN)
	ELECTRIC MOTOR, HP SCRIBED INSIDE
X/X	MECHANICAL EQUIPMENT DESIGNATION
	WIRING CONCEALED IN WALL OR CEILING
	WIRING IN FLOOR SLAB OR UNDERGROUND
	CIRCUIT HOMERUN
///	NO SLASHES = 2#12, NUMBER OF SLASHES = NUMBER OF CONDUCTORS OTHER THAN 2

NOTES:
1. DIMENSIONS INDICATED ARE TO CENTERLINE OF DEVICE OR OUTLET FROM FINISHED FLOOR OR FINISHED GRADE.
2. ALL SYMBOLS MAY NOT BE USED ON THIS PROJECT.

ABBREVIATIONS

A	AMPERE(S)
ABV	ABOVE
A/C	AIR CONDITIONING
AL	ALUMINUM
AMP	AMPERE
ANN	ANNUNCIATOR
AUTO	AUTOMATIC
AWG	AMERICAN WIRE GAUGE
BC	BARE COPPER
BKBD	BACKBOARD
BLDG	BUILDING
CAB	CABINET
CKT BKR	CIRCUIT BREAKER
CLG	CEILING
C	CONDUIT
CU	COPPER
CW	COLD WATER
DN	DOWN
DPDT	DOUBLE POLE DOUBLE THROW
EF	EXHAUST FAN
ELEC	ELECTRIC
EM	EMERGENCY
EQUIP	EQUIPMENT
EXIST	EXISTING
4W	FOUR WIRE
F	FUSE
FUT	FUTURE
GFCI	GROUND FAULT CIRCUIT INTERRUPTER
GRD	GROUND
HP	HORSEPOWER
J-BOX	JUNCTION BOX
LTG	LIGHTING
MTR	MOTOR
NC	NORMALLY CLOSED
NEC	NATIONAL ELECTRICAL CODE
NO	NORMALLY OPEN
PNL	PANEL
RECEPT	RECEPTACLE
RM	ROOM
SPDT	SINGLE POLE DOUBLE THROW
STR	STARTER
SWBD	SWITCHBOARD
TEL	TELEPHONE
T-STAT	THERMOSTAT
XFMR	TRANSFORMER
V	VOLT(S)
W	WATT(S)
WP	WEATHERPROOF

ELECTRICAL DRAWING INDEX

E0.01	ELECTRICAL LEGEND AND SPECIFICATIONS
E0.02	ONE-LINE DIAGRAMS
E1.01	ELECTRICAL SITE PLAN
E2.01	ELECTRICAL PLANS

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PROJECT: UNLV SEP CHILLER #3 INSTALLATION

REVISIONS :

NO.	DATE	ISSUE

DRAWING TITLE :

ELECTRICAL LEGEND AND SPECIFICATIONS

All dimensions, levels, layouts and field conditions shall be verified at the site by the contractor before proceeding with the work.

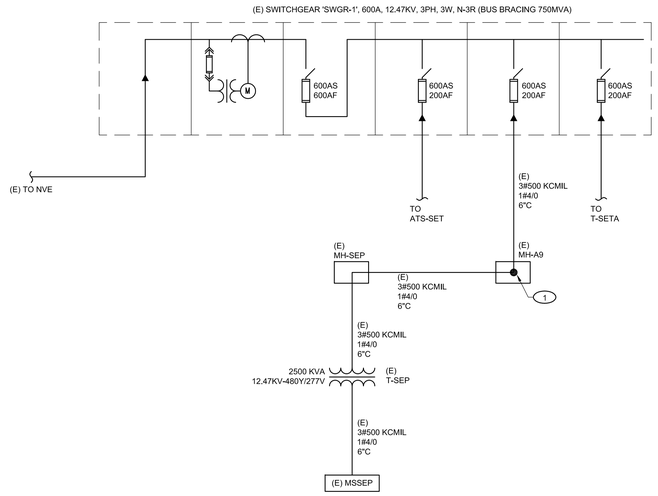
SIGMA'S Project No.	376dc1414
Consultant Project No.	sig1306
Date:	05-19-2014

Drawn By	Checked By	Approved By
J.R.E.	N.R.	N.R.

File Name:

E0.01

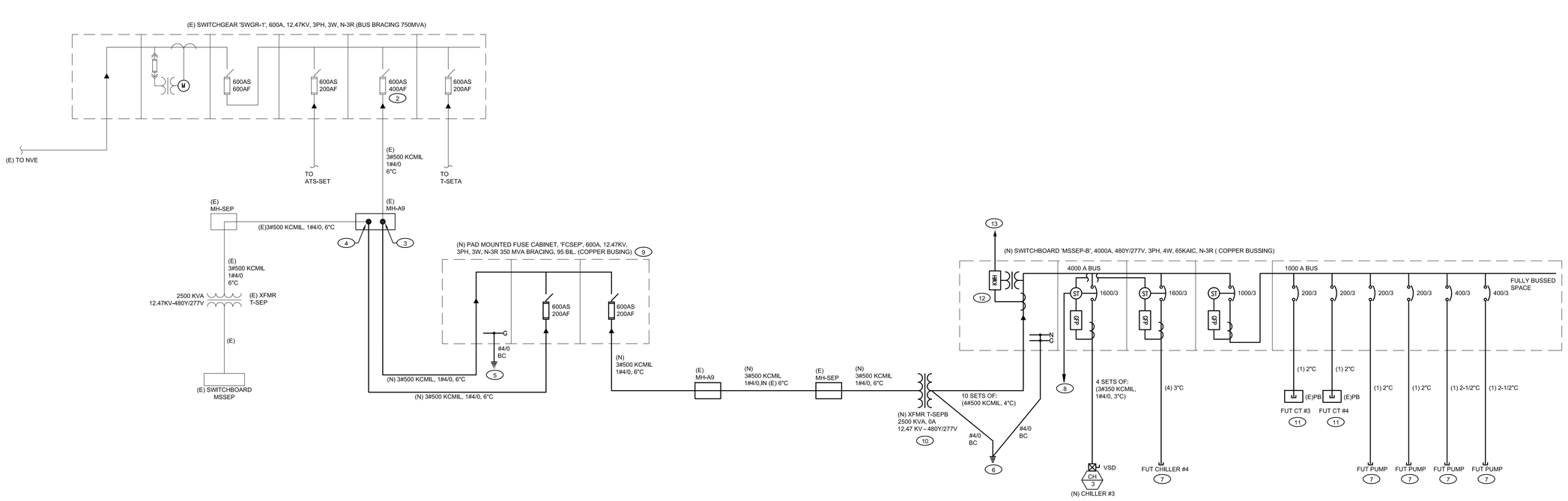
CONSTRUCTION



1 E0.02 **ONE-LINE DIAGRAM - EXISTING**

KEY NOTES: (#)

1. INTERCEPT EXISTING FEEDER CONDUCTORS AND MAKE READY FOR EXTENSION TO NEW FUSE CABINET.
2. REMOVE EXISTING 200A FUSES AND PROVIDE NEW FUSES AS SHOWN TO MATCH EXISTING.
3. SPLICE FEEDERS AND EXTEND TO NEW PAD MOUNTED FUSE CABINET AS SHOWN.
4. SPLICE NEW FEEDER TO EXISTING FEEDER AS SHOWN.
5. CONNECT TO EXISTING GROUNDING SYSTEM IN MH-A9.
6. REFER TO GROUNDING PLAN ON SHEET E2.01.
7. STUB CONDUIT FOR FUTURE EQUIPMENT. SEE ELECTRICAL PLANS FOR LOCATIONS.
8. PROVIDE CONDUIT AND WIRING AND CONNECT TO EXISTING CENTRAL PLANT SHUT-DOWN SYSTEM.
9. PROVIDE EQUIPMENT MANUFACTURED BY S&C ELECTRIC TYPE PMH-7. NO SUBSTITUTIONS ALLOWED.
10. PROVIDE OIL-FILLED SELF-COOLED PAD MOUNTED TRANSFORMER AS MANUFACTURED BY ABB. NOS SUBSTITUTION ALLOWED. PAINTED GREEN LOW VOC CORROSION CLASS C3.
11. STUB CONDUIT TO (E) CORRESPONDING PULL BOX IN COOLING TOWER YARD FOR FUTURE USE.
12. POWER METERING SHALL BE SQUARE D POWER-LOGIC PM5000. NO SUBSTITUTION ALLOWED.
13. PROVIDE 3/4"C WITH CAT 6 CABLE TO CLOSEST NETWORK SWITCH/PORT . VERIFY LOCATION WITH OWNER.



2 E0.02 **ONE-LINE DIAGRAM - MODIFIED**

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PROJECT: UNLV SEP CHILLER #3 INSTALLATION

REVISIONS :

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ONE-LINE DIAGRAMS

All dimensions, levels, layouts and field conditions shall be verified at the site by the contractor before proceeding with the work.

SIGMA'S Project No.	376dc1414
Consultant Project No.	sig1306
Date:	05-19-2014

Drawn By	Checked By	Approved By
J.R.E.	N.R.	N.R.

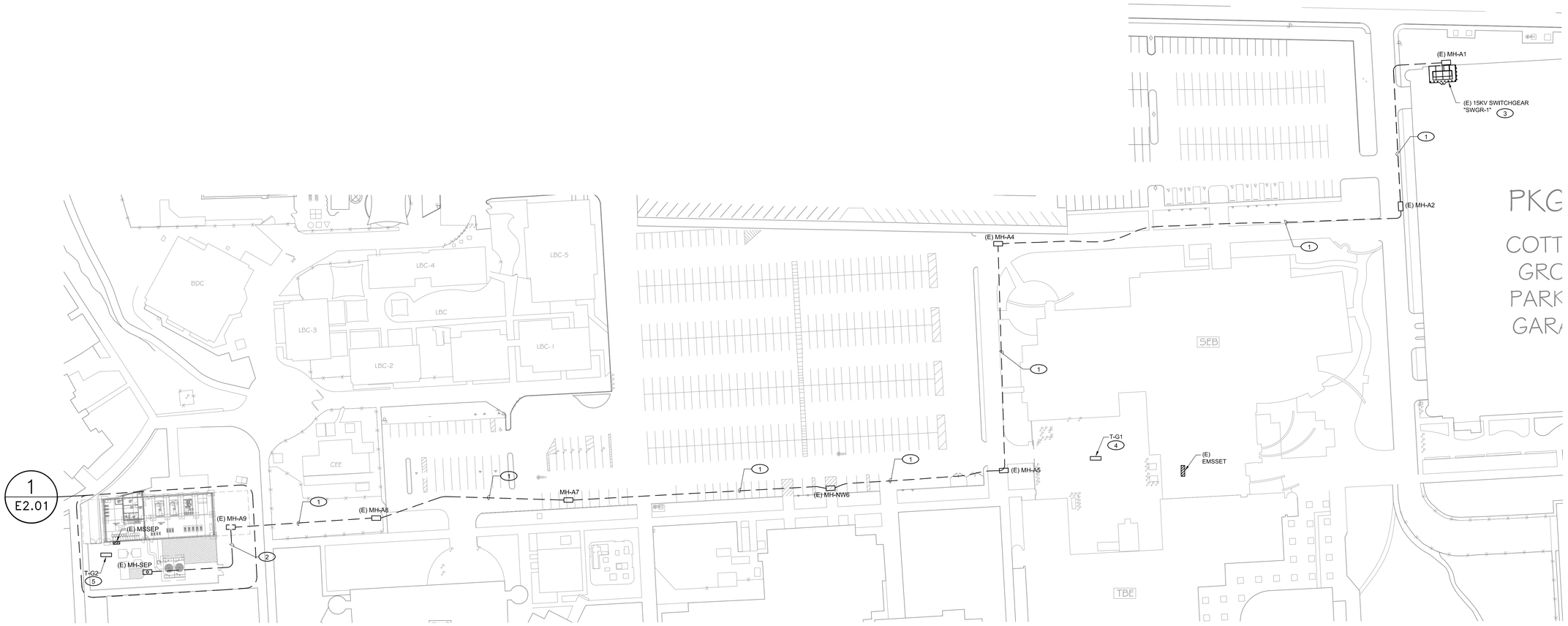
File Name:

E0.02

CONSTRUCTION

KEY NOTES: (#)

1. EXISTING CONDUIT AND WIRING TO REMAIN. SEE ONE-LINE DIAGRAM FOR ADDITIONAL INFORMATION.
2. EXISTING CONDUITS TO REMAIN. WIRING SHALL BE MODIFIED. REFER TO SHEETS E0.02 AND E2.01 FOR ALL REQUIREMENTS
3. EXISTING EQUIPMENT. REFER TO ONE-LINE DIAGRAM FOR REQUIRED WORK.
4. PROVIDE A TEMPORARY GENERATOR RATED AT 1500KW/1875KVA, 480Y/277V TO FEED (E) EMSSET DURING POWER OUTAGE. COORDINATE LOCATION OF TEMP GENERATOR WITH OWNER.
5. PROVIDE A TEMPORARY GENERATOR RATED AT 2000KW/2500KVA, 480Y/277V TO FEED (E) MSSEP DURING POWER OUTAGE.COORDINATE LOCATION OF TEMP GENERATOR WITH OWNER.



1 E1.01 ELECTRICAL SITE PLAN - EXISTING

SCALE: 1" = 50'-0"

NORTH

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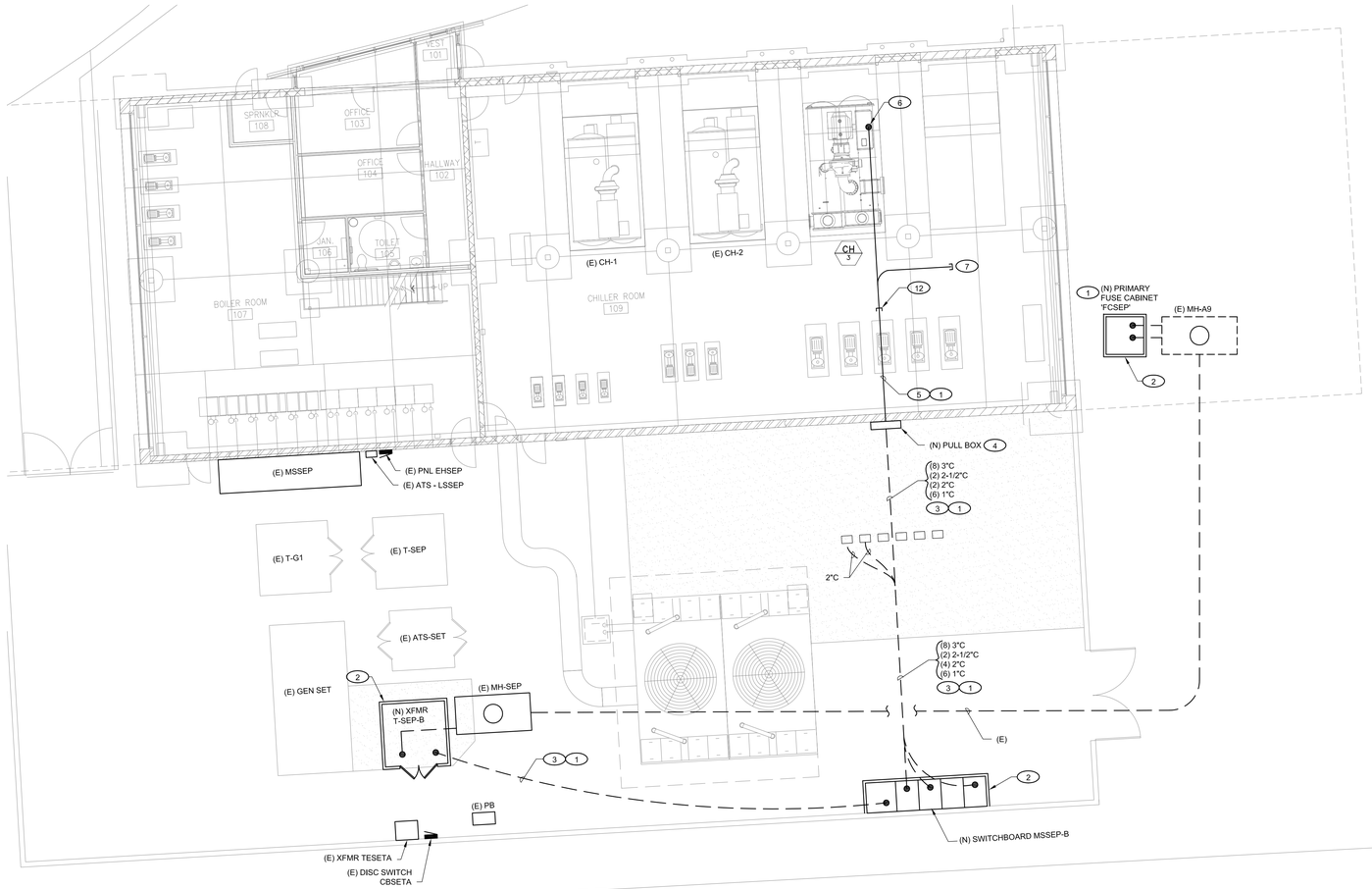
Date:	05-19-2014

Drawn By	Checked By	Approved By
J.R.E.	N.R.	N.R.

File Name:

E1.01

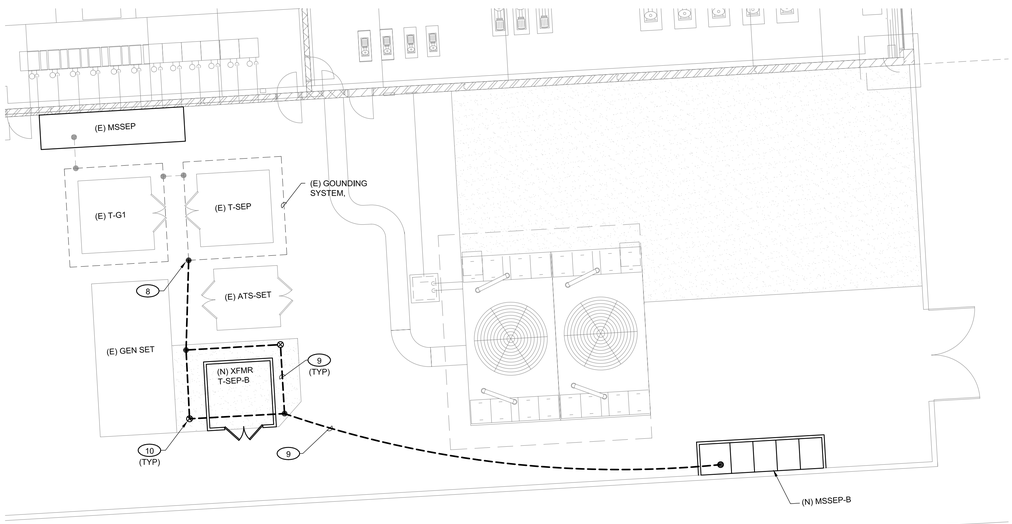
CONSTRUCTION



1 E2.01 ELECTRICAL PLAN - SEP BLDG

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

NORTH



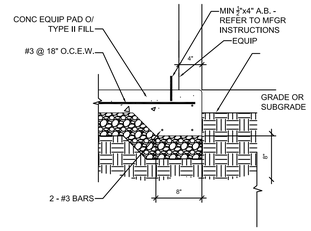
2 E2.01 GROUNDING PLAN

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

NORTH

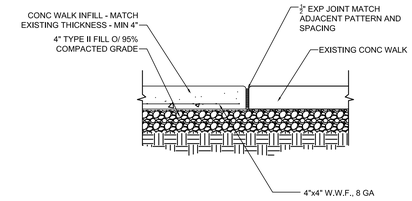
KEY NOTES:#

1. REFER TO ONE-LINE DIAGRAM FOR ADDITIONAL INFORMATION AND REQUIREMENTS.
2. PROVIDE CONCRETE EQUIPMENT PAD. REFER TO DETAIL 3/E2.01
3. APPROXIMATE LOCATION OF UNDERGROUND CONDUIT. REMOVE AND REPLACE PORTION OF WALKWAY BACK TO NEAREST CONTROL JOINT. REFER TO DETAIL 4/E2.01. ALL EXCAVATIONS IN THIS AREA SHALL BE PERFORMED BY HAND. (NO EXCEPTIONS)
4. PROVIDE A 48" X 48" X12" N-3R PULL BOX ON WALL AS HIGH AS PRACTICAL AND MAKE PENETRATION THRU WALL AS NEEDED. OBTAIN OWNERS APPROVAL OF LOCATION OF PULL BOX BEFORE INSTALLING. CONDUIT RISERS SHALL NOT PENETRATE BUILDING FOOTING. OFF SET AS NEEDED TO INSTALL ABOVE FOOTING.
5. ROUTE CONDUIT OVERHEAD ABOVE EXISTING HYDRONIC PIPING. OBTAIN OWNERS APPROVAL OF ROUTING BEFORE INSTALLATION.
6. PROVIDE 24" MAX FLEXIBLE CONDUIT AND CONNECT TO CHILLER MOUNTED VSD. VERIFY EXACT LOCATION.
7. STUB AND CAP (4) 3"C FOR FUTURE CHILLER #4.
8. CADWELD TO EXISTING GROUNDING SYSTEM.
9. PROVIDE #4/0 BC IN GROUND AT 36" BELOW GRADE.
10. PROVIDE 3/4" X 10' GROUND ROD AND GROUND TEST WELL.
11. APPROXIMATE LOCATION OF EXISTING PULL BOXES FOR FUTURE COOLING TOWER EQUIPMENT. ROUT PROPOSED CONDUIT FROM NEW SWITCHGEAR TO CORRESPONDING PULL BOX FOR COOLING TOWER FAN.
12. STUB AND CAP REMAINING SPARE CONDUITS AT THIS LOCATION FOR FUTURE USE.



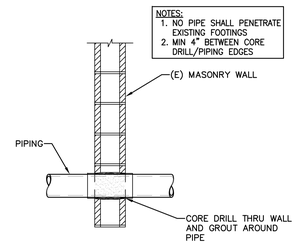
3 E2.01 EQUIPMENT CONCRETE PAD DETAIL

SCALE: NOT TO SCALE



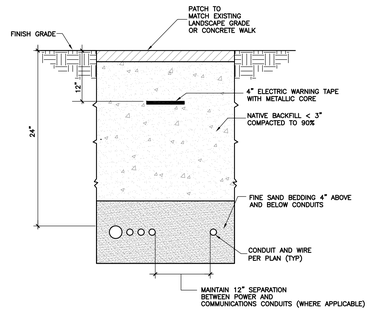
4 E2.01 CONCRETE WALK INFILL DETAIL

SCALE: NOT TO SCALE



5 E2.01 WALL PENETRATION DETAIL

SCALE: NOT TO SCALE



6 E2.01 TYPIAL TRENCH DETAIL

SCALE: NOT TO SCALE

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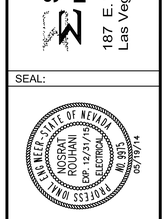

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Consultant Project No.	sig1306
Date:	05-19-2014

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File Name:

E2.01

CONSTRUCTION