MECHANICAL SPECIFICATIONS

PROVIDE EQUIPMENT INDICATED ON THE DRAWINGS, AND AS REQUIRED FOR A COMPLETE FUNCTIONING SYSTEM. DEFINITIONS: FURNISH MEANS TO SUPPLY AND DELIVER TO PROJECT SITE, READY FOR INSTALLATION. INSTALL MEANS TO PLACE IN POSITION AND MAKE CONNECTIONS FOR SERVICE OR USE. PROVIDE MEANS TO FURNISH AND INSTALL, COMPLETE AND READY FOR INTENDED USE. WARRANTY: PROVIDE LABOR AND MATERIALS TO REPAIR OR REPLACE DEFECTIVE PARTS AND MATERIALS AS REQUIRED FOR ONE YEAR AFTER SUBSTANTIAL COMPLETION OR OWNER ACCEPTANCE OF THE COMPLETED PROJECT. PROVIDE A SEPARATE LINE ITEM DEDUCT AMOUNT ON THE PROPOSAL FORM TO DELETE WARRANTY SERVICE, AT THE OWNER'S OPTION. PROVIDE OPERATION MANUALS, MAINTENANCE MANUALS AND SCHEMATICS FOR ALL MECHANICAL EQUIPMENT INSTALLED. COORDINATION: COORDINATE WITH THE WORK OF OTHER SECTIONS, EQUIPMENT FURNISHED BY OTHERS, REQUIREMENTS OF THE OWNER, AND WITH THE CONSTRAINTS OF THE EXISTING CONDITIONS OF THE PROJECT SITE. ROOF PENETRATIONS SHALL COMPLY WITH "SMACNA" AND "NRCA" STANDARDS, AND WITH THE REQUIREMENTS OF THE EXISTING ROOFING WARRANTY, IF APPLICABLE. DO NOT PERFORM ROOFING PENETRATIONS IN A MANNER WHICH WOULD VOID OR OTHERWISE LIMIT THE EXISTING ROOF WARRANTY. DUCT DIMENSIONS: UNLESS OTHERWISE NOTED, DUCT DIMENSIONS ON THE DRAWINGS ARE INSIDE CLEAR DIMENSIONS. SHEET METAL DUCTWORK: PROVIDE SHEET METAL DUCTWORK FABRICATED AND INSTALLED IN ACCORDANCE WITH ASHRAE AND SMACNA STANDARDS, FOR 1" W.G. PRESSURE CLASS, SEAL CLASS "A". SHEET METAL SHALL BE GALVANIZED SHEET STEEL OF LOCK FORMING QUALITY, WITH G90 ZINC COATING. SHEET STEEL SHALL COMPLY WITH ASTM A653 STANDARD SPECIFICATION FOR STEEL SHEET METAL, ZINC COATED (GALVANIZED) OR ZINC-IRON ALLOY-COATED (GALVANNEALED) BY THE HOT DIP PROCESS, AND A924 STANDARD SPECIFICATION FOR GENERAL REQUIREMENTS FOR SHEET, METALLIC-COATED BY THE HOT DIP PROCESS. ALL ANGLE IRON USED FOR SUPPORT SHALL BE GALVANIZED. CONNECTIONS TO WALLS OR FLOOR SHALL BE AIR TIGHT WITH ANGLE IRON AND CAULKING. SEAL ALL DUCT SEAMS, TRANSVERSE AND LONGITUDINAL, AIR TIGHT. PROVIDE TURNING VANES AT ALL 90º ELBOWS. TRAPEZE DUCT HANGERS: PROVIDE MINIMUM 1" X 2" X 1" X 18 GAUGE CHANNELS WITH MINIMUM 1" X 18 GAUGE STRAPS TO STRUCTURAL SUPPORT. ROUND SHEET METAL DUCT: PROVIDE SPIRAL SEAM (ALL SIZES) OR SNAP LOCK (DUCT SIZES UP TO 10") GALVANIZED STEEL COMPLYING WITH SMACNA STANDARDS. SPIRAL SEAM DUCTWORK SHALL HAVE SMACNA SEAM TYPE RL-1. FIBER GLASS DUCT BOARD IS AN ACCEPTABLE ALTERNATIVE IF APPROVED BY OWNER AND THE LOCAL BUILDING CODE OFFICIAL. PRODUCT AND INSTALLATION MUST MEET NAIMA STANDARDS AND OTHER APPLICABLE CODES AND REGULATIONS. EXPOSED DUCTWORK: EXPOSED DUCTWORK SHALL BE CLEANED OF DEBRIS AND OIL, THEN WIPED DOWN WITH VINEGAR OR OTHER SURFACE PREPARING CHEMICAL TO PREPARE DUCT FOR PAINT. DUCT SEALANT: PROVIDE POLYMERIC RUBBER TYPE SEALANT FOR USE ON BOTH INTERIOR LOCATED DUCTWORK AND DUCTWORK EXPOSED TO OUTDOOR CONDITIONS. SEALER SHALL HAVE HIGH BONDING STRENGTH FOR SURE, FIRST TIME SEALING OF JOINTS IN LOW, MEDIUM, AND HIGH PRESSURE DUCT SYSTEMS. SEALER SHALL BE HIGH IN SOLID CONTENT. PROVIDE A TWO PART TAPE SEALING SYSTEM, CONSISTING OF WOVEN FIBER TAPE IMPREGNATED WITH A GYPSUM MINERAL COMPOUND, AND A MODIFIED ACRYLIC/SILICONE ACTIVATOR THAT REACTS EXOTHERMICALLY WITH THE TAPE. TWO PART TAPE SEALING SYSTEM MUST BE RATED FOR BOTH INDOOR AND OUTDOOR APPLICATION. TAPE SHALL NOT CONTAIN ASBESTOS. DUCT INSULATION: MATERIAL FOR SUPPLY AND RETURN AIR DUCT ABOVE CEILING INSIDE THE BUILDING SHALL HAVE THE EQUIVALENT THERMAL RESISTANCE OF MINIMUM R-6. THE REQUIRED R VALUES ARE FOR INSTALLED INSULATION WITH 25% COMPRESSION AT THE CORNERS. PROVIDE PINS AND WASHERS IN ACCORDANCE WITH SMACNA REQUIREMENTS AND AS REQUIRED TO PREVENT INSULATION FROM SAGGING. PROVIDE ADEQUATE INSULATION AT THE SUPPLY AIR DIFFUSERS TO PREVENT CONDENSATION. FLEXIBLE DUCT : UL #181 LISTED, CLASS 1, AND CONTAIN A 0.1 PERM RATED POLYETHYLENE INNER LINER, WITH R-8 FIBERGLASS INSULATION. FLEXIBLE DUCTS SHALL BE SECURED TO RIGID SHEET METAL COLLARS AND AIR DIFFUSERS WITH NYLON TIES OR STAINLESS STEEL WORM GEAR STRAPS. SEAL ALL CONNECTIONS AND JOINTS AIRTIGHT. SUPPORT FLEXIBLE DUCTS FROM THE BUILDINGS STRUCTURE WITH MINIMUM 1" WIDE, 18 GAUGE, GALVANIZED STEEL STRAP AT MAXIMUM 4'-0" CENTERS. PROVIDE 4" WIDE SHEET METAL SADDLES AT EACH SUPPORT EACH STRAP. SAG OF FLEXIBLE DUCT BETWEEN HANGERS SHALL NOT EXCEED 1/2" PER FOOT OF SUPPORT SPACING. RADIUS FOR TURNS OF FLEXIBLE DUCTS SHALL BE A MINIMUM OF ONE DUCT DIAMETER. FLEXIBLE DUCT RUNS SHALL NOT EXCEED 10'-0" IN LENGTH AND SHALL BE THE SAME SIZE AS THE DIFFUSER NECK CONNECTION. ROUND VOLUME DAMPERS: PROVIDE MINIMUM 20 GAUGE GALVANIZED STEEL FRAME AND BLADES, MINIMUM 3/8" SQUARE STEEL AXLE, MOLDED SYNTHETIC BEARINGS, WITH LOCKING POSITION REGULATOR. REGULATOR SHALL BE POSITIONED WITH SHEET METAL BRACKET BEYOND DUCT COVERING. WHERE POSITIONING REGULATOR IS NOT ACCESSIBLE, PROVIDE COUPLING AND EXTENSION ROD WITH REGULATOR FOR CEILING OR WALL INSTALLATION, AS REQUIRED. RECTANGULAR VOLUME DAMPERS: PROVIDE MINIMUM 16 GAUGE GALVANIZED STEEL CHANNEL FRAME, 16 GAUGE GALVANIZED STEEL BLADES, MINIMUM ½" HEXAGONAL AXLE, BOLDED SYNTHETIC BEARINGS, WITH 3/8" SQUARE PLATED STEEL CONTROL SHAFT. LINKAGES SHALL BE CONCEALED IN THE FRAME. OPERATING SHAFT SHALL EXTEND BEYOND FRAME AND DUCT TO A LOCKING QUADRANT WITH ADJUSTABLE LEVER. MAXIMUM BLADE WIDTH SHALL NOT EXCEED 6".

DUCT TURNING VANES: PROVIDE FABRICATED TURNING VANES AND VANE RUNNERS, CONSTRUCTED IN ACCORDANCE WITH SMACNA "HVAC DUCT CONSTRUCTION STANDARDS". PROVIDE TURNING VANES CONSTRUCTED OF CURVED BLADES, SUPPORTED WITH BARS PERPENDICULAR TO BLADES, AND SET INTO SIDE STRIPS SUITABLE FOR MOUNTING IN DUCTWORK. FOLLOW SMACNA GUIDELINES FOR SPACING SUPPORT, AND CONSTRUCTION. ALL BLADES SHALL BE DOUBLE THICKNESS AIRFOIL TYPE. FLEXIBLE DUCT CONNECTORS: PROVIDE U.L. LABELED 30 OUNCE NEOPRENE COATED FIBERGLASS FABRIC DUCT CONNECTORS. DUCT ACCESS DOORS: PROVIDE HINGED ACCESS DOORS IN DUCTWORK WHERE REQUIRED FOR ACCESS TO EQUIPMENT. PROVIDE INSULATED ACCESS DOORS FOR INSULATED DUCTWORK. CONSTRUCT OF SAME OR THICKER GAUGE SHEET METAL AS DUCT IN WHICH IT IS INSTALLED. PROVIDE FLUSH FRAMES FOR UN-INSULATED DUCTS, AND EXTENDED FRAMES FOR EXTERNALLY INSULATED DUCTS. PROVIDE CONTINUOUS HINGE ON ONE SIDE, WITH ONE HANDLE-TYPE LATCH FOR ACCESS DOORS 12" HIGH AND SMALLER, AND TWO HANDLE-TYPE LATCHES FOR LARGER ACCESS DOORS. HVAC CONTROL SYSTEM: PROVIDE ALL THE NECESSARY CONTROLS AND CONTROL WIRING IN CONDUIT COMPATIBLE TO SYSTEMS SHOWN ON EQUIPMENT SCHEDULE M2.0. PROGRAMMABLE THERMOSTAT FOR EACH SYSTEM SHALL ENABLE THE SUPPLY FAN AND CYCLE THE COOLING AND HEATING STAGES TO MAINTAIN SPACE SET-POINT. SUPPLY FAN RUNS CONTINUOUSLY DURING THE OCCUPIED MODE. EACH THERMOSTAT SHALL HAVE A DEAD BAND OF AT LEAST 5 DEGREES (ADJ) WITHIN WHICH THE SUPPLY OF HEATING AND COOLING IS SHUT OFF, EACH THERMOSTAT SHALL HAVE SETBACK AND SET-UP CAPABILITY DURING THE UNOCCUPIED MODE. FOR SETBACK, THE HEATING SHALL RESTART AND TEMPORARILY OPERATE ACCORDING TO A SET-POINT ADJUSTABLE DOWN TO 55 DEGREES. FOR SET-UP, THE COOLING SHALL RESTART AND TEMPORARILY OPERATE ACCORDING TO A SET-POINT ADJUSTABLE UP TO 85 DEGREES OR TO PREVENT HIGH SPACE HUMIDITY LEVELS. EACH SYSTEM SHALL BE PROVIDED WITH A MOTORIZED OUTSIDE AIR DAMPER THAT WILL AUTOMATICALLY SHUT WHEN THE SYSTEM OR SPACES SERVED ARE NOT IN USE. VENTILATION OUTSIDE AIR DAMPERS SHALL BE CAPABLE OF AUTOMATICALLY CLOSING DURING PREOCCUPANCY BUILDING WARM-UP, COOL DOWN, AND SETBACK, EXCEPT WHEN VENTILATION REDUCES ENERGY COSTS (e.g., NIGHT PURGE) OR WHEN VENTILATION MUST BE SUPPLIED TO MEET CODE REQUIREMENTS. COMMISSIONING/VERIFICATION: HVAC CONTROL SYSTEM SHALL BE TESTED TO ENSURE THAT CONTROL ELEMENTS ARE CALIBRATED, ADJUSTED, AND IN PROPER WORKING CONDITION, AND THAT THE SYSTEM MEETS THE DESIGN REQUIREMENTS. TEST AND BALANCE: CONTRACT DIRECTLY A THIRD PARTY TO PROVIDE TEST AND BALANCE OF THE HVAC SYSTEM. THE GENERAL CONTRACTOR IS RESPONSIBLE FOR SCHEDULING. TEST AND ADJUST ALL MECHANICAL SYSTEM AND EQUIPMENT TO ASSURE PROPER BALANCE AND OPERATION. PERFORM TESTS IN ACCORDANCE WITH NEBB PROCEDURAL STANDARDS-1999 OR AABC 2002, AND ASHRAE STANDARD 111. ELIMINATE NOISE AND VIBRATION, AND ASSURE PROPER FUNCTION OF CONTROLS. SUBMIT COMPLETED TEST AND BALANCE REPORT TO OWNER'S REPRESENTATIVE. BALANCING CONTRACTOR SHALL BE INDEPENDENT AND CERTIFIED WITH NEBB OR AABC. BALANCE ALL SYSTEMS WITHIN 5% OF AIR FLOW INDICATED ON DRAWINGS, AND REPORT ALL DISCREPANCIES TO THE HVAC CONTRACTOR FOR CORRECTION. MARK FINAL BALANCE POSITIONS ON DAMPERS WITH PERMANENT MARKER. COMPLETION REQUIREMENTS: THE CONTRACTOR SHALL PROVIDE, WITHIN 90 DAYS AFTER THE DATE OF SYSTEM ACCEPTANCE, RECORD DRAWINGS AND AN OPERATING AND MAINTENANCE MANUAL TO THE BUILDING OWNER OR THE DESIGNATED REPRESENTATIVE OF THE OWNER. THE RECORD DRAWING SHALL BE OF THE ACTUAL INSTALLATION AND INCLUDE AS A MINIMUM THE LOCATION AND PERFORMANCE DATA ON EACH PIECE OF EQUIPMENT, GENERAL CONFIGURATION OF DUCT AND PIPE DISTRIBUTION SYSTEM INCLUDING SIZES, AND THE TERMINAL AIR OR WATER DESIGN FLOW RATES. THE OPERATING AND MAINTENANCE MANUALS SHALL BE IN ACCORDANCE WITH INDUSTRY-ACCEPTED STANDARDS AND SHALL INCLUDE, AT A MINIMUM, THE FOLLOWING; (A) SUBMITTAL DATA STATING EQUIPMENT SIZE AND SELECTED OPTIONS FOR EACH PIECE OF EQUIPMENT REQUIRING MAINTENANCE; (B) OPERATION MANUALS AND MAINTENANCE MANUALS FOR EACH PIECE OF EQUIPMENT REQUIRING MAINTENANCE, EXCEPT EQUIPMENT NOT FURNISHED AS PART OF THE PROJECT. REQUIRED ROUTINE MAINTENANCE ACTIONS SHALL BE CLEARLY IDENTIFIED; (C) NAMES AND ADDRESSES OF AT LEAST ONE SERVICE AGENCY; (D) HVAC CONTROLS SYSTEMS MAINTENANCE AND CALIBRATION INFORMATION, INCLUDING WIRING DIAGRAMS, SCHEMATICS, AND CONTROL SYSTEM SEQUENCE DESCRIPTIONS. DESIRED OR FIELD-DETERMINED SET-PIONTS SHALL BE PERMANENTLY RECORDED ON CONTROL DRAWINGS AT CONTROL DEVICES OR, FOR DIGITAL CONTROL SYSTEMS, IN PROGRAMMING COMMENTS; (E) A COMPLETE NARRATIVE OF HOW EACH SYSTEM EACH SYSTEM IS INTENDED TO OPERATE, INCLUDING SET-POINTS.

HVAC GENERAL NOTES

1. THE INTENT OF THESE PLANS AND SPECIFICATIONS IS TO INCLUDE ALL LABOR, EQUIPMENT, MATERIALS, AND SERVICES NECESSARY TO FURNISH, INSTALL, TEST, AND ADJUST A COMPLETE WORKABLE HEATING, VENTILATION, AND AIR CONDITIONING SYSTEM AS SHOWN, PRESCRIBED, OR REASONABLY IMPLIED BUT NOT LIMITED TO THAT EXPLICITLY INDICATED IN THE CONTRACT DOCUMENTS, BUT NECESSARY FOR THE PROPER EXECUTION AND COMPLETION OF THE INTENT THEREOF.
2. THE ENTIRE INSTALLATION SHALL CONFORM TO THE APPLICABLE CODES AND REGULATIONS REQUIRED BY AUTHORITIES HAVING JURISDICTION. IN THE EVENT OF CONFLICT BETWEEN SPECIFICATIONS, CODES, AND REGULATIONS, THE MORE RESTRICTIVE SHALL APPLY.
3. DRAWINGS FOR HVAC WORK ARE DIAGRAMATIC SHOWING THE GENERAL LOCATION, TYPE, LAYOUT, AND EQUIPMENT REQUIRED. THE DRAWINGS SHALL NOT BE SCALED FOR EXACT MEASUREMENT, REFER TO ARCHITECTURAL DRAWINGS FOR DIMENSIONS. PROVIDE ALL DUCTWORK, MATERIALS, CONNECTIONS, ACCESSORIES, FITTINGS, OFFSETS, TRANSITIONS, DAMPERS AS REQUIRED FOR A COMPLETE WORKABLE SYSTEM.
4. ALL EQUIPMENT SHALL BE INSTALLED IN STRICT ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS AND APPROVED LISTING. ALL EQUIPMENT, PIPING AND SUPPORTS SHALL BE RESTRAINED IN ACCORDANCE WITH THE LATEST EDITION OF THE "GUIDLINES FOR SEISMIC RESTRAINTS OF MECHANICAL SYSTEMS AND PLUMBING PIPING SYSTEMS" BY THE SHEET METAL AND AIR CONDITIONING CONTRACTORS NATIONAL ASSOCIATION (SMACNA). ALL EQUIPMENT SHALL BE ANCHORED TO RESIST THE LATERAL FORCE REQUIREMENTS OF CHAPTER 16 OF THE 2012 INTERNATIONAL BUILDING CODE.
5. COORDINATE THE INSTALLATION OF THE HVAC SYSTEM WITH ALL OTHER TRADES PRIOR TO FABRICATION OR INSTALLATION. COORDINATE THE LOCATIONS OF PENETRATIONS AND FINAL LOCATION OF ALL EQUIPMENT WITH THE GENERAL CONTRACTOR. PROVIDE EQUIPMENT WEIGHTS, EQUIPMENT DIMENSIONS, PLATFORM SIZES & LOCATIONS, CURB SIZES & LOCATIONS, CONCRETE PAD SIZES AND LOCATIONS AST REQUIRED. COORDINATE LOCATIONS OF GAS & CONDENSATE LINES WITH PLUMBING CONTRACTOR. COORDINTAE LOCATIONS OF POWER, DISCONNECTS, AND CONTROL CONDUIT WITH THE ELECTICAL CONTRACTOR. COORDINATE LOCATIONS OF ALL DIFFUSERS, REGISTERS, AND GRILLES WITH ARCHITECTURAL PLANS, ELECTRICAL LIGHTING PLANS AND ARCHITECTURAL ELEVATIONS.
6. DETAILS FOR EQUIPMENT PADS, PLATFORMS, AND FLASHINGS SHALL BE AS INDICATED BY THE ARCHITECTURAL/STRUCTURAL/CIVIL DRAWINGS, UNLESS NOTED OTHERWISE.
7. ALL EQUIPMENT, DUCTS, PIPING, SUPPORTS, AND OTHER DEVICES OUTSIDE OF THE BUILDING OR EXPOSED TO WEATHER, SHALL BE COMPLETELY WEATHER-PROOFED.
8. OUTSIDE AIR INTAKES SHALL BE AT LEAST 10 FT. AWAY OR 3 FT. BELOW ANY VENT OR EXHAUST DISCHARGE.
9. ALL DUCT SIZES ARE CLEAR INSIDE DIMENSIONS. DUCTWORK SHALL BE CONSTRUCTED, ERECTED, INSULATED AND TESTED IN ACCORDANCE CHAPTER 6 OF THE 2012 INTERNATIONAL MECHANICAL CODE.
10. ALL EXHAUST FANS SHALL BE EQUIPED WITH A BACK DRAFT DAMPER.
11. DUCT AND AIR TRANSFER PENETRATIONS THRU BUILDING ASSEMBLIES REQUIRING PROTECTION SHALL BE PROTECTED WITH FIRE DAMPERS, SMOKE DAMPERS, COMBINATION SMOKE/FIRE DAMPERS AND CEILING RADIATION DAMPERS IN ACCORDANCE WITH SECTION 607 OF THE INTERNATIONAL MECHANICIAL CODE. DUCTS NOT REQUIRING DAMPERS SHALL COMPLY WITH SECTION 714 & 717 OF THE 2019 CALIFORNIA BUILDING CODE.
12. INSTALL SMOKED DETECTORS AND PROVIDE FOR SMOKE DETECTION AND AUTOMATIC SHUT-OFF OF ALL AIR HANDLING EQUIPMENT IN ACCORDANCE WITH SECTION 606 OF THE 2019 CALIFORNIA MECHANICAL CODE.
13. UNLESS NOTED OTHERWISE, ALL LINE VOLTAGE WIRING, CONDUIT, FINAL CONNECTIONS, DISCONNECTS, STARTERS, AND OVER CURRENT PROTECTION DEVICES SHALL BE FURNISHED AND INSTALLED BY THE ELECTRICAL CONTRACTOR AS INDICATED ON THESE MECHANICAL DRAWINGS AND/OR ELECTRICAL DRAWINGS AND/OR ELECTRICAL SECTION OF THE SPECIFICATIONS.
14. INSTALL ALL LOW VOLTAGE HVAC CONTROL WIRE AND DEVICES PER PLAN. ALL WIRE SHALL BE IN CONDUIT PROVIDED AND INSTALLED BY THE ELECTICAL CONTRACTOR UNLESS NOTEDED OTHERWISE.
15. PROVIDE OWNER WITH THREE COPIES OF A CERTIFIED AIR BALANCE REPORT PREPARED IN BY A THIRD PARTY CERTIFIED BY THE AABC OR NEBB. TEST, ADJUST AND BALANCE THE HVAC SYSTEM IN ACCORDANCE WITH AABC OR NEBB PROCEDURES. PROVIDE START-UP/TEST REPORTS FOR ALL AIR HANDLING EQUIPMENT, FANS, AND REFRIGERATION EQUIPMENT. TEST AND VERIFY PROPER OPERATION OF ALL MAKE-UP AIR/EXHAUST AIR INTERLOCK SYSTEMS AND THIER SEQUENCES OF OPERATION. BALANCE ALL AIR FLOWS WITHIN 5% OF DESIGN VALUES. PERMANENTLY MARK BALANCE POSITION OF ALL REGULATING DEVICES.
16. PROVIDE OWNER WITH THREE SETS OF AS-BUILT PLANS AND OPERATIONS AND MAINTENANCE MANUALS. CLEARLY IDENTIFY ALL EQUIPMENT WITH PERMANENT PLASTIC OR METAL LABELS/TAGS (PEN MARKING NOT ACCEPTABLE).
17. PROVIDE ONE YEAR WARRANTY ON ALL LABOR, PARTS AND MATERIALS.
18. ANY CHANGE OR DEVIATION FROM THESE PLANS OR SPECIFICATIONS SHALL REQUIRE THE WRITTEN APPROVAL OF THE ENGINEER PRIOR TO COMMENCEMENT OF SUCH WORK. 19.0

a) DUCTS FOR DEMAND CONTROLLED VENTILATION SYSTEMS SHALL BE INSTALLED IN ACCORDANCE WITH THE FAN MANUFACTURER'S INSTALLATION INSTRUCTIONS, THE PROVISIONS ASHRAE 62.2, TABLE 5.3, OR THE AIRFLOW SHALL BE MEASURED AS REQUIRED BY AND IN COMPLIANCE WITH ASHRAE 62.2, 5.4.

1) DUCTS FOR KITCHEN COOKTOPS OR RANGES SHALL BE SHOWN OF METAL WITH A SMOOTH INTERIOR.

a) DUCTS FOR DOMESTIC CLOTHES DRYERS SHALL BE INSTALLED IN ACCORDANCE WITH CMC 504.0.

b) DUCTS FOR DOMESTIC CLOTHES DRYERS SHALL BE RIGID METALLIC DUCTS WITH A MINIMUM MILL THICKNESS OF 16 (0.016-INCH), SHALL HAVE A MINIMUM 4-INCH DIAMETER AND A SMOOTH INTERIOR. THE COMBINED HORIZONTAL AND VERTICAL LENGTH OF THE DUCTS OF THE DUCTS SHALL BE 14-FEET, WHICH SHALL BE REDUCED BY 2-FEET FOR EVERY 90-DEGREE ELBOW IN EXCESS OF TWO ELBOWS.

c) LISTED CLOTHES DRYER TRANSITION DUCTS NOT MORE THAN 6-FEET IN LENGTH SHALL BE PERMITTED TO CONNECT THE DRYER TO THE EXHAUST DUCTS AS LONG AS THEY ARE NOT CONCEALED WITHIN CONSTRUCTION, AND THEY ARE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S INSTALLATION INSTRUCTIONS.

LEGEND

AxB		DUCT WORK (WIDTHxDEPTH)
AxB		LINED DUCT WORK (WIDTHxDEPTH DIMENSIONS ARE FOR I.D.)
		SUPPLY DUCT, SECTION
		RETURN DUCT, SECTION
		EXHAUST DUCT, SECTION
R. OR D.		RISE OR DROP IN DIRECTION OF AIR FLOW
	FLEX. CONN.	FLEXIBLE CONNECTION
		DUCT TRANSITION, ROUND AND RECTANGULAR
		SPLITTER DAMPER
		EXTRACTOR AT BRANCH DUCT
		TURNING VANES
		FLEXIBLE DUCT
		SINGLE LINE DUCT WORK
	AVD	AUTOMATIC VOLUME DAMPER
	MVD	MANUAL VOLUME DAMPER
	BDD	BACKDRAFT DAMPER
	MD	MODULATING DAMPER
	AFD	AUTOMATIC FIRE DAMPER
	AD	ACCESS DOOR
	SD	SUPPLY DIFFUSER
	RR	RETURN REGISTER
	ER	EXHAUST REGISTER
	SWR	SIDE WALL SUPPLY REGISTER
	SWE	SIDE WALL RETURN OR EXHAUST
	LD	LINEAR DIFFUSER
D.L.	DL	DOOR LOUVER
U.C.	UC	UNDER CUT DOOR
	VAV	VARIABLE AIR VOLUME
T		THERMOSTAT
S		DUCT SMOKE DECTECTOR
	T/B	TO BELOW
	F/B	FROM BELOW
	T/A	TO ABOVE
	F/A	FROM ABOVE

SPECIAL NOTICE TO CONTRACTORS

1. ALL CONTRACTORS (GENERAL CONTRACTOR AND SUB-CONTRACTORS) BIDDING THIS PROJECT ARE REQUIRED TO VISIT THE JOB SITE AND VERIFY THE EXISTING CONDITIONS PRIOR TO SUBMITTING THEIR BID. CONTRACTORS ARE TO CAREFULLY REVIEW ALL CONSTRUCTION DOCUMENTS AND NOTE ANY DISCREPANCIES BETWEEN THE CONSTRUCTION DOCUMENTS AND THE CONDITIONS OBSERVED AT THE JOB SITE PRIOR TO SUBMISSION OF ANY BID. THE BUILDING OWNER REPRESNENTATIVE LISTED BELOW MAY BE CONTACTED FOR ACCESS TO THE JOB SITE.
2. CONTRACTORS ARE RESPONSIBLE FOR VERIFYING THE LOCATION AND CONDITION OF ALL POINTS OF CONNECTION, LOCATION AND CONDITION OF ALL BUILDING (ROOF/FLOOR/CEILING) PENETRATIONS, LOCATION AND CONDITION OF ALL UTILITIES AND BUILDING SYSTEMS INCLUDING, BUT NOT LIMITED TO, GAS, WATER, SEWER, VENT, ELECTRICAL, BUILDING MECHANICAL SYSTEMS, DUCT CONNECTIONS, EXHAUST/OUTSIDE AIR CONNECTIONS, SECURITY, FIRE ALARM, DATA, AND PHONE PRIOR TO SUBMISSION OF THEIR BID.
3. ANY DISCREPANCIES BETWEEN THE CONSTRUCTION DOCUMENTS AND THE CONDITIONS OBSERVED SHALL BE BROUGHT TO THE ATTENTION, IN WRITING, TO THE ARCHITECT AND/OR ENGINEER PRIOR TO PROCEEDING WITH CONSTRUCTION.
4. NO WORK SHALL BE DONE ON ANY PART OF THE BUILDING BEYOND THE POINT INDICATED IN EACH SUCCESSIVE INSPECTION WITHOUT FIRST OBTAINING THE WRITTEN APPROVAL OF THE CODE OFFICIAL. NO CONSTRUCTION SHALL BE CONCEALED WITHOUT BEING INSPECTED AND APPROVED.

MECHANICAL LIST OF DRAWINGS (LoD):

SHEET TAG	TITLE	SCALE
M 0.01	MECH GENERAL NOTES AND SPECIFICATIONS.	NTS
M 1.01	MAIN FLOOR - MECHANICAL LAYOUT.	3/16"=1'-0"
M 2.01	MECHANICAL EQUIPMENT SCHEDULE.	NTS
M 3.01	HEAT LOADS CALCULATIONS.	NTS
M 4.01	MECHANICAL EQUIPMENT DATA SHEETS.	NTS
M 5.01	MECHANICAL GENERAL DETAILS.	NTS

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3. THE CONTRACTOR MUST CHECK ALL DIMENSION AT SITE BEFORE COMMENCING WORK.
4. THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING ALL NECESSARY TEMPORARY SUPPORT TO THE BUILDING AND ANY ADJACENT STRUCTURES.

REV. NO.	DESCRIPTION	DATE	BY

PROJECT:

SUNLAND CULTIVATION

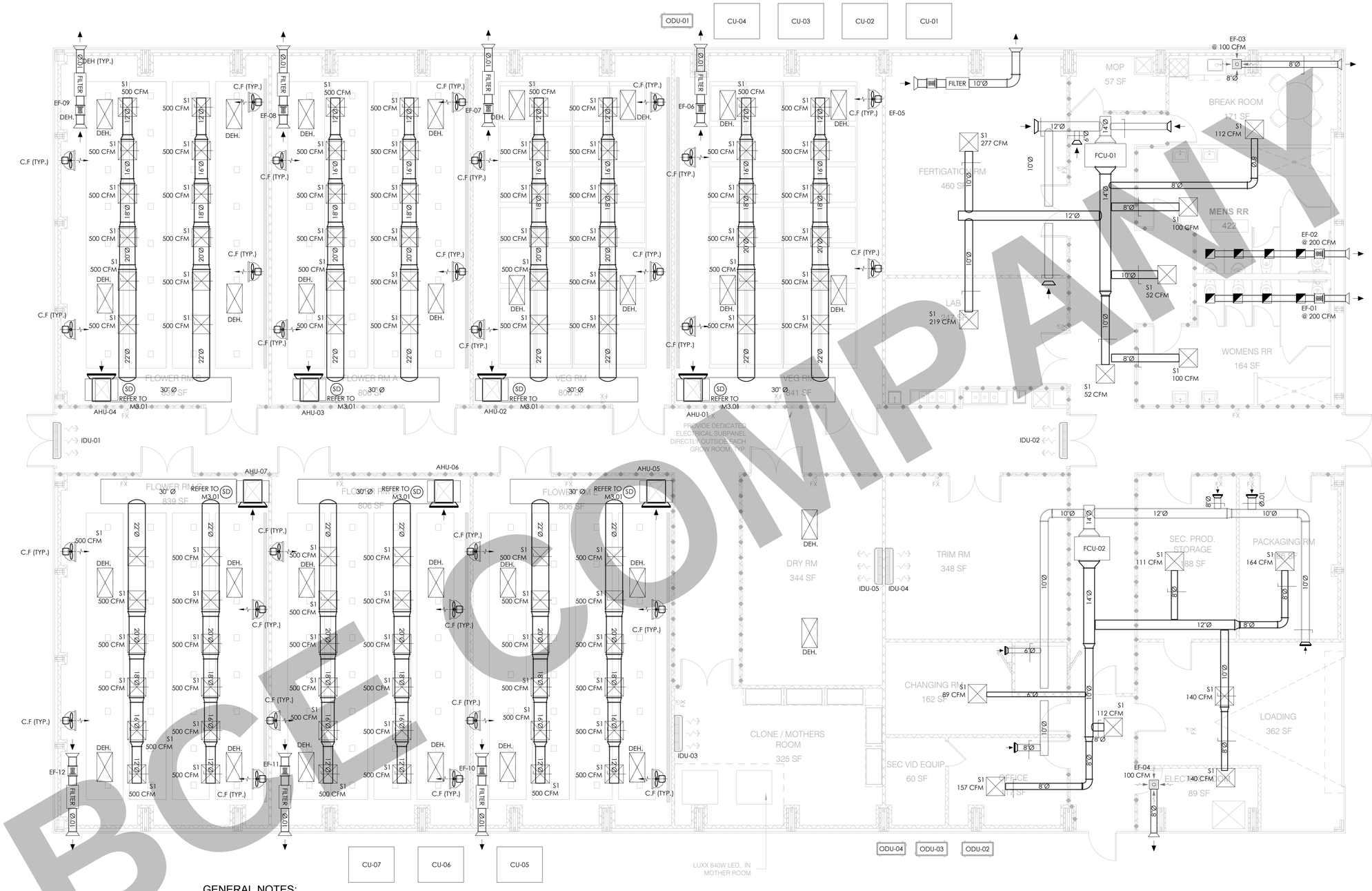
TITLE:

MECH GENERAL NOTES AND SPECIFICATIONS

PROJ. NO.	PROJ. ENGR.	SCALE @ 24X36:
		NTS

DRAWING NO.: **M 0 . 0 1**

REV.:



ВСЕ СОМПАНУ

GENERAL NOTES:

1. MECHANICAL CONTRACTOR TO COORDINATE ROUTING AND LOCATION OF MECHANICAL COMPONENTS AND EQUIPMENT WITH ALL OTHER TRADES AND EXISTING FIELD CONDITIONS PRIOR TO PERFORMING WORK.
2. CONTRACTOR TO CUT AND PATCH AS REQUIRED TO PERFORM THE WORK.
3. ACCESS DOORS ARE REQUIRED FOR ANY COMPONENT REQUIRING ACCESS ABOVE HARD LID CEILINGS. COORDINATE SIZE, LOCATION AND FINISH WITH ARCHITECT PRIOR TO PERFORMING WORK.
4. REFER TO THE DIAGRAMS THAT APPLY TO THIS SHEET WHICH PROVIDE GENERAL GUIDANCE FOR INSTALLATION THOUGH NOT ALL COMPONENTS AND ACCESSORIES MAY BE SHOWN.
5. PRIOR TO INSTALLATION, CONFIRM SPECIFIC LOCATION FOR ALL THERMOSTATS / SENSORS WITH ARCHITECT. MOUNT AT 48" A.F.F. OR IN ACCORDANCE WITH ADA REQUIREMENTS. PROVIDE LOCKING COVERS.
6. COORDINATE AND CONFIRM BORDER, FRAME, FINISH, AND LOCATION WITH ARCHITECT PRIOR TO ORDERING.
7. ANY PENETRATIONS THROUGH WALL STUDS, FLOOR JOISTS, OR ROOF TO BE IN ACCORDANCE WITH THE LATEST ADOPTED BUILDING CODE.
8. DUCT DIMENSIONS SHOWN ARE CLEAR INSIDE DIMENSIONS.
9. CONTRACTOR TO CONFIRM ADEQUATE RETURN AIR PATH BACK TO MAIN AIR HANDLING UNIT.

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3. THE CONTRACTOR MUST CHECK ALL DIMENSION AT SITE BEFORE COMMENCING WORK.
4. THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING ALL NECESSARY TEMPORARY SUPPORT TO THE BUILDING AND ANY ADJACENT STRUCTURES.

REV. NO.	DESCRIPTION	DATE	BY

PROJECT:
SUNLAND CULTIVATION

TITLE:
MECH. LAYOUTS AND EQUIPMENT SCHEDULE.

PROJ. NO.	PROJ. ENGR.	SCALE @ 24X36:
		3/16"=1'-0"

DRAWING NO.
M1.01

REV.

SCHEDULE No. 1
HEAT PUMP INDOOR UNIT

TAG	AHU-01 TO AHU-07	FCU-01,02,03	IDU-01,02	IDU-03,04,05
TYPE	FLOOR MOUNT	CEILING MOUNT	WALL MOUNT MULTIZONE	WALL MOUNT MULTIZONE
SERVING	FLOWER AND VEG.	COMMON AREAS	CORRIDOR	CORRIDOR
MANUFACTURER	CARRIER	CARRIER	CARRIER	CARRIER
INDOOR MODEL	40RUQ-16	40MBDQ36---3	40MPHAQ09XA3	40MPHBQ12XA3
AIR FLOW RATE (CFM)	6,000	910	-	-
NOMINAL CAPACITY (TONS)	15.0	3.0	0.75	1.0
POWER SUPPLY	230/3/60	208/1/60	208/1/60	208/1/60
MCA (A)	13.0	2.45	-	-
FUSE BREAKER (A)	20.0	-	-	-
DIMENSIONS (HxWxD) (IN.)	56x82.75x28	9.8x5354x30.47	-	-

SCHEDULE No. 2
HEAT PUMP OUTDOOR UNIT

TAG	CU-01 TO CU-07	ODU-01,02	ODU-03	ODU-04
SERVING	AHU-01 TO AHU -07	FCU-01,02	IDU-01,02 (MULTIZONE)	IDU-03,04,05
MANUFACTURER	CARRIER	CARRIER	CARRIER	CARRIER
INDOOR MODEL	38AUD16	38MBRB36	40MPHAQ09XA3	38MARBQ35AA3
POWER SUPPLY	208/3/60	230/1/60	230/1/60	230/1/60
MAXIMUM CURRENT (A)	68.0	30.0	18.0	28.0
MOP (A)	80.0	45.0	30.0	35.0
NOMINAL CAPACITY (TONS)	15.0	3.0	1.5	1.5

SCHEDULE No. 3
DEHUMIDIFIER SCHEDULE

TAG	DEH. | QTY = 30
SERVING	FLOWER AND VEG.
MANUFACTURER	ANDEN
MODEL	A 210V1
POWER SUPPLY	220/1/60
CURRENT (A)	7.1
POWER (WATTS)	1,500
AIR FLOW RATE (CFM)	525 CFM @ 0.0" W.G

SCHEDULE No. 4
INLINE EXHAUST AIR FAN SCHEDULE

TAG	INLINE EF-01,02	INLINE EF-05 TO 12 w/ CARBON FILTER
LOCATION	MEN'S AND WOMEN'S RR	FLOWER, VEG AND LAB.
SUPPLY VOLUME (CFM)	200 CFM	1,082
PRESSURE DROP (INCH W.C.)	0.55	0.0
ELECTRICAL (V / PH / HZ)	120/1/60	120/1/60
MAX AMPS	0.75	2.12
RPM	2970	2970
POWER (WATTS)	80	232
MANUFACTURER	VORTEX FLOW	VORTEX FLOW
MODEL	VTX-400	S-1000

SCHEDULE No. 5
CEILING MOUNT FAN SCHEDULE

TAG	EF-03,04
LOCATION	BREAK, ELEC.
SUPPLY VOLUME (CFM)	100
PRESSURE DROP (INCH W.C.)	0.5
ELECTRICAL (V / PH / HZ)	115 / 1 / 60
MAX Amps	0.3
MAX WATTS	24.5
MOTOR SPEED (RPM)	820
FAN TYPE	CEILING-MOUNT FAN
MANUFACTURER	BROAN
MODEL	AE80K FLEX

NOTES:

1. PROVIDE UL LISTING.
2. PROVIDE ENERGY STAR COMPLIANCE.
3. INTERLOCK WITH WALL SWITCH.
4. PROVIDE MOTOR WITH THERMAL OVERLOADS.

SCHEDULE No. 6
CIRCULATION FAN SCHEDULE

TAG	CF | QTY = 28
LOCATION	GROW ROOMS
SUPPLY VOLUME (CFM)	1,790
PRESSURE DROP (INCH W.C.)	0.0
ELECTRICAL (V / PH / HZ)	115/1/60
HP	0.1
RPM	1,600
FAN TYPE	HORIZONTAL
MANUFACTURER	ATLAS
MODEL	HAF 18"

BCE COMPANY

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4. THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING ALL NECESSARY TEMPORARY SUPPORT TO THE BUILDING AND ANY ADJACENT STRUCTURES.

REV. NO.	DESCRIPTION	DATE	BY

PROJECT:
SUNLAND CULTIVATION

TITLE:
MECHANICAL EQUIPMENT SCHEDULE.

PROJ. NO.	PROJ. ENGR.	SCALE @ 24X36:
		NTS

DRAWING NO.
M 2 . 0 1

REV.

Air System Sizing Summary for AHU-01

Project Name: Sunland - Cultivation
Prepared by: MJ
10/18/2022
05:57PM

Air System Information

Air System Name	AHU-01	Number of zones	1
Equipment Class	PKG VERT	Floor Area	853.0 ft²
Air System Type	SZCAV	Location	Alamogordo, New Mexico

Sizing Calculation Information

Calculation Months	Jan to Dec	Zone CFM Sizing	Sum of space airflow rates
Sizing Data	Calculated	Space CFM Sizing	Individual peak space loads

Central Cooling Coil Sizing Data

Total coil load	10.1	Tons	Load occurs at	Jul 1400
Total coil load	121.4	MBH	OA DB / WB	97.1 / 62.7 °F
Sensible coil load	121.1	MBH	Entering DB / WB	75.9 / 63.2 °F
Coil CFM at Jul 1400	7634	CFM	Leaving DB / WB	58.8 / 57.6 °F
Max block CFM	7634	CFM	Coil ADP	56.7 °F
Sum of peak zone CFM	7634	CFM	Bypass Factor	0.100
Sensible heat ratio	0.997		Resulting RH	52 %
CFM/Ton	754.9		Design supply temp.	58.0 °F
ft²/Ton	84.3		Zone T-stat Check	1 of 1 OK
BTU/(hr·ft²)	142.3		Max zone temperature deviation	0.0 °F
Water flow @ 10.0 °F rise	N/A			

Central Heating Coil Sizing Data

Max coil load	4.3	MBH	Load occurs at	Des Htg
Coil CFM at Des Htg	7634	CFM	BTU/(hr·ft²)	5.1
Max coil CFM	7634	CFM	Ent. DB / Lvg DB	70.2 / 70.8 °F
Water flow @ 20.0 °F drop	N/A			

Supply Fan Sizing Data

Actual max CFM	7634	CFM	Fan motor BHP	0.00 BHP
Standard CFM	6570	CFM	Fan motor kW	0.00 kW
Actual max CFM/ft²	8.95	CFM/ft²	Fan static	0.00 in wg

Outdoor Ventilation Air Data

Design airflow CFM	0	CFM	CFM/person	0.00 CFM/person
CFM/ft²	0.00	CFM/ft²		

Zone Sizing Summary for AHU-01

Project Name: Sunland - Cultivation
Prepared by: MJ
10/18/2022
05:57PM

Air System Information

Air System Name	AHU-01	Number of zones	1
Equipment Class	PKG VERT	Floor Area	853.0 ft²
Air System Type	SZCAV	Location	Alamogordo, New Mexico

Sizing Calculation Information

Calculation Months	Jan to Dec	Zone CFM Sizing	Sum of space airflow rates
Sizing Data	Calculated	Space CFM Sizing	Individual peak space loads

Zone Terminal Sizing Data

Zone Name	Design Supply Airflow (CFM)	Minimum Supply Airflow (CFM)	Zone CFM/ft²	Reheat Coil Load (MBH)	Reheat Coil Water gpm @ 20.0 °F	Zone Htg Unit Coil Load (MBH)	Zone Htg Unit Water gpm @ 20.0 °F	Mixing Box Fan Airflow (CFM)
Zone 1	7634	7634	8.95	0.0	-	0.0	-	0

Zone Peak Sensible Loads

Zone Name	Zone Cooling Sensible (MBH)	Time of Peak Sensible Cooling Load	Zone Heating Load (MBH)	Zone Floor Area (ft²)
Zone 1	120.6	Jul 1400	3.7	853.0

Space Loads and Airflows

Zone Name / Space Name	Mult.	Cooling Sensible (MBH)	Time of Peak Sensible Load	Air Flow (CFM)	Heating Load (MBH)	Floor Area (ft²)	Space CFM/ft²
Zone 1							
FLOWER RM A	1	120.6	Jul 1400	7634	3.7	853.0	8.95

Air System Sizing Summary for AHU-02

Project Name: Sunland - Cultivation
Prepared by: MJ
10/18/2022
05:57PM

Air System Information

Air System Name	AHU-02	Number of zones	1
Equipment Class	PKG VERT	Floor Area	865.0 ft²
Air System Type	SZCAV	Location	Alamogordo, New Mexico

Sizing Calculation Information

Calculation Months	Jan to Dec	Zone CFM Sizing	Sum of space airflow rates
Sizing Data	Calculated	Space CFM Sizing	Individual peak space loads

Central Cooling Coil Sizing Data

Total coil load	10.3	Tons	Load occurs at	Jul 1300
Total coil load	123.2	MBH	OA DB / WB	94.7 / 62.0 °F
Sensible coil load	122.9	MBH	Entering DB / WB	75.9 / 63.2 °F
Coil CFM at Jul 1300	7739	CFM	Leaving DB / WB	58.8 / 57.6 °F
Max block CFM	7739	CFM	Coil ADP	56.9 °F
Sum of peak zone CFM	7739	CFM	Bypass Factor	0.100
Sensible heat ratio	0.997		Resulting RH	52 %
CFM/Ton	753.9		Design supply temp.	58.0 °F
ft²/Ton	84.3		Zone T-stat Check	1 of 1 OK
BTU/(hr·ft²)	142.4		Max zone temperature deviation	0.0 °F
Water flow @ 10.0 °F rise	N/A			

Central Heating Coil Sizing Data

Max coil load	7.1	MBH	Load occurs at	Des Htg
Coil CFM at Des Htg	7739	CFM	BTU/(hr·ft²)	8.2
Max coil CFM	7739	CFM	Ent. DB / Lvg DB	70.1 / 71.1 °F
Water flow @ 20.0 °F drop	N/A			

Supply Fan Sizing Data

Actual max CFM	7739	CFM	Fan motor BHP	0.00 BHP
Standard CFM	6661	CFM	Fan motor kW	0.00 kW
Actual max CFM/ft²	8.95	CFM/ft²	Fan static	0.00 in wg

Outdoor Ventilation Air Data

Design airflow CFM	0	CFM	CFM/person	0.00 CFM/person
CFM/ft²	0.00	CFM/ft²		

Zone Sizing Summary for AHU-02

Project Name: Sunland - Cultivation
Prepared by: MJ
10/18/2022
05:57PM

Air System Information

Air System Name	AHU-02	Number of zones	1
Equipment Class	PKG VERT	Floor Area	865.0 ft²
Air System Type	SZCAV	Location	Alamogordo, New Mexico

Sizing Calculation Information

Calculation Months	Jan to Dec	Zone CFM Sizing	Sum of space airflow rates
Sizing Data	Calculated	Space CFM Sizing	Individual peak space loads

Zone Terminal Sizing Data

Zone Name	Design Supply Airflow (CFM)	Minimum Supply Airflow (CFM)	Zone CFM/ft²	Reheat Coil Load (MBH)	Reheat Coil Water gpm @ 20.0 °F	Zone Htg Unit Coil Load (MBH)	Zone Htg Unit Water gpm @ 20.0 °F	Mixing Box Fan Airflow (CFM)
Zone 1	7739	7739	8.95	0.0	-	0.0	-	0

Zone Peak Sensible Loads

Zone Name	Zone Cooling Sensible (MBH)	Time of Peak Sensible Cooling Load	Zone Heating Load (MBH)	Zone Floor Area (ft²)
Zone 1	122.3	Jul 1400	6.7	865.0

Space Loads and Airflows

Zone Name / Space Name	Mult.	Cooling Sensible (MBH)	Time of Peak Sensible Load	Air Flow (CFM)	Heating Load (MBH)	Floor Area (ft²)	Space CFM/ft²
Zone 1							
FLOWER RM B	1	122.3	Jul 1400	7739	6.7	865.0	8.95

Air System Sizing Summary for AHU-03

Project Name: Sunland - Cultivation
Prepared by: MJ
10/18/2022
05:57PM

Air System Information

Air System Name	AHU-03	Number of zones	1
Equipment Class	PKG VERT	Floor Area	865.0 ft²
Air System Type	SZCAV	Location	Alamogordo, New Mexico

Sizing Calculation Information

Calculation Months	Jan to Dec	Zone CFM Sizing	Sum of space airflow rates
Sizing Data	Calculated	Space CFM Sizing	Individual peak space loads

Central Cooling Coil Sizing Data

Total coil load	10.3	Tons	Load occurs at	Aug 1400
Total coil load	123.9	MBH	OA DB / WB	97.1 / 62.7 °F
Sensible coil load	123.6	MBH	Entering DB / WB	75.7 / 63.0 °F
Coil CFM at Aug 1400	7782	CFM	Leaving DB / WB	58.6 / 57.4 °F
Max block CFM	7782	CFM	Coil ADP	56.7 °F
Sum of peak zone CFM	7782	CFM	Bypass Factor	0.100
Sensible heat ratio	0.997		Resulting RH	52 %
CFM/Ton	753.5		Design supply temp.	58.0 °F
ft²/Ton	83.8		Zone T-stat Check	1 of 1 OK
BTU/(hr·ft²)	143.3		Max zone temperature deviation	0.0 °F
Water flow @ 10.0 °F rise	N/A			

Central Heating Coil Sizing Data

Max coil load	7.3	MBH	Load occurs at	Des Htg
Coil CFM at Des Htg	7782	CFM	BTU/(hr·ft²)	8.4
Max coil CFM	7782	CFM	Ent. DB / Lvg DB	70.3 / 71.3 °F
Water flow @ 20.0 °F drop	N/A			

Supply Fan Sizing Data

Actual max CFM	7782	CFM	Fan motor BHP	0.00 BHP
Standard CFM	6698	CFM	Fan motor kW	0.00 kW
Actual max CFM/ft²	9.00	CFM/ft²	Fan static	0.00 in wg

Outdoor Ventilation Air Data

Design airflow CFM	0	CFM	CFM/person	0.00 CFM/person
CFM/ft²	0.00	CFM/ft²		

Zone Sizing Summary for AHU-03

Project Name: Sunland - Cultivation
Prepared by: MJ
10/18/2022
05:57PM

Air System Information

Air System Name	AHU-03	Number of zones	1
Equipment Class	PKG VERT	Floor Area	865.0 ft²
Air System Type	SZCAV	Location	Alamogordo, New Mexico

Sizing Calculation Information

Calculation Months	Jan to Dec	Zone CFM Sizing	Sum of space airflow rates
Sizing Data	Calculated	Space CFM Sizing	Individual peak space loads

Zone Terminal Sizing Data

Zone Name	Design Supply Airflow (CFM)	Minimum Supply Airflow (CFM)	Zone CFM/ft²	Reheat Coil Load (MBH)	Reheat Coil Water gpm @ 20.0 °F	Zone Htg Unit Coil Load (MBH)	Zone Htg Unit Water gpm @ 20.0 °F	Mixing Box Fan Airflow (CFM)
Zone 1	7782	7782	9.00	0.0	-	0.0	-	0

Zone Peak Sensible Loads

Zone Name	Zone Cooling Sensible (MBH)	Time of Peak Sensible Cooling Load	Zone Heating Load (MBH)	Zone Floor Area (ft²)
Zone 1	123.0	Aug 1300	6.7	865.0

Space Loads and Airflows

Zone Name / Space Name	Mult.	Cooling Sensible (MBH)	Time of Peak Sensible Load	Air Flow (CFM)	Heating Load (MBH)	Floor Area (ft²)	Space CFM/ft²
Zone 1							
FLOWER RM C	1	123.0	Aug 1300	7782	6.7	865.0	9.00

INSTALLATION AND MAINTENANCE INSTRUCTIONS

Innovair flex

D4120 Duct Smoke Detector
D4S Sensor Component
D4P120 Power Board Component

SYSTEM SENSOR®
3825 Ohio Avenue, St. Charles, Illinois 60174
1-800-SENSOR2, FAX: 630-377-6495
www.systemsensor.com

156-2967-002R

NOTE: The D4120 duct detector consists of D4P120 Power Board component and the D4S Sensor component.

SPECIFICATIONS

Operating Temperature:	D4120 & D4S: -4° to 158° F (-20° to 70° C) D4P120: -40° to 158° F (-40° to 70° C)		
Storage Temperature:	D4120 & D4S: -22° to 158° F (-30° to 70° C) D4P120: -40° to 158° F (-40° to 70° C)		
Humidity:	0% to 95% Relative Humidity Non-condensing		
Air Velocity:	100 to 4000 ft./min. (0.5 to 20.3 m/sec.)		
D4120 Footprint Dimensions:	Rectangular - 14.38 in L x 5 in W x 2.5 in D (37cm L x 12.7cm W x 6.36cm D) Square - 7.75 in L x 9 in W x 2.5 in D (19.7cm L x 22.9cm W x 6.35cm D)		
D4S/D4P120 Footprint Dimensions:	7.75 in L x 5 in W x 2.5 in D (19.7cm L x 12.7cm W x 6.35cm D)		
D4120 Weight:	2.5 pounds; 1.14 kg		
Electrical			
Power supply voltage:	20-29 VDC	24 VAC 50-60 Hz	120 VAC 50-60 Hz
Input capacitance:	270 µF max.	270 µF max.	N/A
Reset Voltage:	3.0 VDC min.	2.0 VAC min.	10 VAC min.
Reset Time (with RTS451):	.03 to 0.3 sec.	.03 to 0.3 sec.	.03 to 0.3 sec.
Reset Time (by power down):	0.6 sec. max.	0.6 sec. max.	0.6 sec. max.
Power Up Time:	35 sec. max.	35 sec. max.	35 sec. max.
Alarm response time:	15 sec.	15 sec.	15 sec.
Sensitivity Test:	See detector label	See detector label	See detector label
Current Requirements (Using No Accessories)			
Max. standby current	21 mA @ 24 VDC	65 mA RMS @ 24VAC 60Hz	20 mA RMS @ 120 VAC 60 Hz
Max. alarm current	65 mA @ 24 VDC	135 mA RMS @ 24 VAC 60 Hz	35 mA RMS @ 120 VAC 60 Hz

CONTACT RATINGS	
Alarm initiation contacts (SPST)	2.0A @ 30 VDC (resistive)
Alarm auxiliary contacts (DPDT)	10A @30 VDC (resistive) 10A @250 VAC (resistive) ½ HP @240 VAC ¼ HP @120 VAC
NOTE: Alarm auxiliary contacts shall not be connected to initiating circuits of control panels. Use the alarm initiation contact for this purpose.	
Supervisory Contacts (SPDT)	2.0A @ 30 VDC (resistive) 2.0A @ 125 VAC (resistive)

ACCESSORY CURRENT LOADS AT 24 VDC			
DEVICE	STANDBY	TROUBLE	ALARM
APA151/APA451	12.5mA	n/a	30mA Max.
MHMMW	0mA	n/a	29mA Max.
RA400Z	0mA	n/a	12mA Max.
RTS451	0mA	n/a	12mA Max.
RTS451KEY	12mA	n/a	12mA Max.
SSK451	8mA Max.	16mA Max.	40mA Max.

NOTE: Any combination of accessories may be used such that the given accessory loads are: 110mA or less at the Aux output, and 50mA or less at the Alarm output.

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BEFORE INSTALLING

Read the System Sensor *Guide for Proper Use of Smoke Detectors in Duct Applications* (ADS-1004), which provides information on detector spacing, placement, zoning, wiring, and special applications. This manual is available online at www.systemsensor.com. NFPA Standards 72 and 90A should also be referenced for detailed information.

NOTICE: This manual shall be left with the owner/user of this equipment.

IMPORTANT: This detector must be tested and maintained regularly following NFPA 72 requirements. The detector should be cleaned at least once a year.

[1] LIMITATIONS OF DUCT SMOKE DETECTORS

⚠WARNING

The National Fire Protection Association has established that DUCT DETECTORS MUST NOT BE USED AS A SUBSTITUTE FOR OPEN AREA DETECTOR PROTECTION as a means of providing life safety. Nor are they a substitute for early warning in a building's regular fire detection system.

System Sensor supports this position and strongly recommends that the user read NFPA Standards 90A, 72, and 101. The D4120 Air Duct Smoke Detectors are listed per UL 268A.

This device will not operate without electrical power. Fire situations may cause an interruption of power. The system safeguards should be discussed with your local fire protection specialist.

This device will not sense smoke unless the ventilation system is operating and the cover is installed.

For this detector to function properly, it MUST be installed according to the instructions in this manual. Furthermore, the detector MUST be operated within ALL electrical and environmental specifications listed in this manual. Failure to comply with these requirements may prevent the detector from activating when smoke is present in the air duct.

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REV. NO.	DESCRIPTION	DATE	BY

PROJECT:
SUNLAND CULTIVATION

TITLE:
MECHANICAL HEAT LOADS CALCULATIONS-1

PROJ. NO.	PROJ. ENGR.	SCALE @ 24X36:
		NTS

DRAWING NO.
M 3 . 0 1

REV.

BCE COMPANY

Air System Sizing Summary for AHU-05

Project Name: Sunland - Cultivation
Prepared by: MJ
10/18/2022
05:57PM

Air System Information

Air System Name: AHU-05
Equipment Class: PKG VERT
Air System Type: SZCAV

Number of zones: 1
Floor Area: 853.0 ft²
Location: Alamogordo, New Mexico

Sizing Calculation Information

Calculation Months: Jan to Dec
Sizing Data: Calculated

Zone CFM Sizing: Sum of space airflow rates
Space CFM Sizing: Individual peak space loads

Central Cooling Coil Sizing Data

Total coil load: 10.2 Tons
Total coil load: 122.2 MBH
Sensible coil load: 121.8 MBH
Coil CFM at Aug 1300: 7660 CFM
Max block CFM: 7660 CFM
Sum of peak zone CFM: 7660 CFM
Sensible heat ratio: 0.997
CFM/Ton: 752.5
ft²/Ton: 83.8
BTU/(hr·ft²): 143.2
Water flow @ 10.0 °F rise: N/A

Load occurs at: Aug 1300
OA DB / WB: 94.7 / 62.0 °F
Entering DB / WB: 75.9 / 63.2 °F
Leaving DB / WB: 58.8 / 57.6 °F
Coil ADP: 56.9 °F
Bypass Factor: 0.100
Resulting RH: 52 %
Design supply temp.: 58.0 °F
Zone T-stat Check: 1 of 1 OK
Max zone temperature deviation: 0.0 °F

Central Heating Coil Sizing Data

Max coil load: 4.1 MBH
Coil CFM at Des Htg: 7660 CFM
Max coil CFM: 7660 CFM
Water flow @ 20.0 °F drop: N/A

Load occurs at: Des Htg
BTU/(hr·ft²): 4.8
Ent. DB / Lvg DB: 70.0 / 70.6 °F

Supply Fan Sizing Data

Actual max CFM: 7660 CFM
Standard CFM: 6593 CFM
Actual max CFM/ft²: 8.98 CFM/ft²

Fan motor BHP: 0.00 BHP
Fan motor kW: 0.00 kW
Fan static: 0.00 in wg

Outdoor Ventilation Air Data

Design airflow CFM: 0 CFM
CFM/ft²: 0.00 CFM/ft²

CFM/person: 0.00 CFM/person

Zone Sizing Summary for AHU-05

Project Name: Sunland - Cultivation
Prepared by: MJ
10/18/2022
05:57PM

Air System Information

Air System Name: AHU-05
Equipment Class: PKG VERT
Air System Type: SZCAV

Number of zones: 1
Floor Area: 853.0 ft²
Location: Alamogordo, New Mexico

Sizing Calculation Information

Calculation Months: Jan to Dec
Sizing Data: Calculated

Zone CFM Sizing: Sum of space airflow rates
Space CFM Sizing: Individual peak space loads

Zone Terminal Sizing Data

Zone Name	Design Supply Airflow (CFM)	Minimum Supply Airflow (CFM)	Zone CFM/ft²	Reheat Coil Load (MBH)	Reheat Coil Water gpm @ 20.0 °F	Zone Htg Unit Coil Load (MBH)	Zone Htg Unit Water gpm @ 20.0 °F	Mixing Box Fan Airflow (CFM)
Zone 1	7660	7660	8.98	0.0	-	0.0	-	0

Zone Peak Sensible Loads

Zone Name	Zone Cooling Sensible (MBH)	Time of Peak Sensible Cooling Load	Zone Heating Load (MBH)	Zone Floor Area (ft²)
Zone 1	121.0	Aug 1300	3.7	853.0

Space Loads and Airflows

Zone Name / Space Name	Mult.	Cooling Sensible (MBH)	Time of Peak Sensible Load	Air Flow (CFM)	Heating Load (MBH)	Floor Area (ft²)	Space CFM/ft²
Zone 1							
FLOWER RM E	1	121.0	Aug 1300	7660	3.7	853.0	8.98

Air System Sizing Summary for AHU-06

Project Name: Sunland - Cultivation
Prepared by: MJ
10/18/2022
05:57PM

Air System Information

Air System Name: AHU-06
Equipment Class: PKG VERT
Air System Type: SZCAV

Number of zones: 1
Floor Area: 854.0 ft²
Location: Alamogordo, New Mexico

Sizing Calculation Information

Calculation Months: Jan to Dec
Sizing Data: Calculated

Zone CFM Sizing: Sum of space airflow rates
Space CFM Sizing: Individual peak space loads

Central Cooling Coil Sizing Data

Total coil load: 11.2 Tons
Total coil load: 134.9 MBH
Sensible coil load: 134.9 MBH
Coil CFM at Jul 1400: 8505 CFM
Max block CFM: 8505 CFM
Sum of peak zone CFM: 8505 CFM
Sensible heat ratio: 1.000
CFM/Ton: 756.4
ft²/Ton: 76.9
BTU/(hr·ft²): 158.0
Water flow @ 10.0 °F rise: N/A

Load occurs at: Jul 1400
OA DB / WB: 97.1 / 62.7 °F
Entering DB / WB: 75.9 / 62.2 °F
Leaving DB / WB: 58.8 / 58.5 °F
Coil ADP: 56.9 °F
Bypass Factor: 0.100
Resulting RH: 100 %
Design supply temp.: 58.0 °F
Zone T-stat Check: 1 of 1 OK
Max zone temperature deviation: 0.0 °F

Central Heating Coil Sizing Data

Max coil load: 3.7 MBH
Coil CFM at Des Htg: 8505 CFM
Max coil CFM: 8505 CFM
Water flow @ 20.0 °F drop: N/A

Load occurs at: Des Htg
BTU/(hr·ft²): 4.3
Ent. DB / Lvg DB: 69.9 / 70.3 °F

Supply Fan Sizing Data

Actual max CFM: 8505 CFM
Standard CFM: 7320 CFM
Actual max CFM/ft²: 9.96 CFM/ft²

Fan motor BHP: 0.00 BHP
Fan motor kW: 0.00 kW
Fan static: 0.00 in wg

Outdoor Ventilation Air Data

Design airflow CFM: 0 CFM
CFM/ft²: 0.00 CFM/ft²

CFM/person: 0.00 CFM/person

Zone Sizing Summary for AHU-06

Project Name: Sunland - Cultivation
Prepared by: MJ
10/18/2022
05:57PM

Air System Information

Air System Name: AHU-06
Equipment Class: PKG VERT
Air System Type: SZCAV

Number of zones: 1
Floor Area: 854.0 ft²
Location: Alamogordo, New Mexico

Sizing Calculation Information

Calculation Months: Jan to Dec
Sizing Data: Calculated

Zone CFM Sizing: Sum of space airflow rates
Space CFM Sizing: Individual peak space loads

Zone Terminal Sizing Data

Zone Name	Design Supply Airflow (CFM)	Minimum Supply Airflow (CFM)	Zone CFM/ft²	Reheat Coil Load (MBH)	Reheat Coil Water gpm @ 20.0 °F	Zone Htg Unit Coil Load (MBH)	Zone Htg Unit Water gpm @ 20.0 °F	Mixing Box Fan Airflow (CFM)
Zone 1	8505	8505	9.96	0.0	-	0.0	-	0

Zone Peak Sensible Loads

Zone Name	Zone Cooling Sensible (MBH)	Time of Peak Sensible Cooling Load	Zone Heating Load (MBH)	Zone Floor Area (ft²)
Zone 1	134.4	Jul 1400	3.7	854.0

Space Loads and Airflows

Zone Name / Space Name	Mult.	Cooling Sensible (MBH)	Time of Peak Sensible Load	Air Flow (CFM)	Heating Load (MBH)	Floor Area (ft²)	Space CFM/ft²
Zone 1							
VEG RM	1	134.4	Jul 1400	8505	3.7	854.0	9.96

Air System Sizing Summary for AHU-08

Project Name: Sunland - Cultivation
Prepared by: MJ
10/18/2022
05:57PM

Air System Information

Air System Name: AHU-08
Equipment Class: PKG VERT
Air System Type: SZCAV

Number of zones: 1
Floor Area: 951.0 ft²
Location: Alamogordo, New Mexico

Sizing Calculation Information

Calculation Months: Jan to Dec
Sizing Data: Calculated

Zone CFM Sizing: Sum of space airflow rates
Space CFM Sizing: Individual peak space loads

Central Cooling Coil Sizing Data

Total coil load: 2.6 Tons
Total coil load: 31.4 MBH
Sensible coil load: 31.4 MBH
Coil CFM at Aug 1400: 1957 CFM
Max block CFM: 1957 CFM
Sum of peak zone CFM: 1957 CFM
Sensible heat ratio: 1.000
CFM/Ton: 748.4
ft²/Ton: 363.7
BTU/(hr·ft²): 33.0
Water flow @ 10.0 °F rise: N/A

Load occurs at: Aug 1400
OA DB / WB: 97.1 / 62.7 °F
Entering DB / WB: 77.2 / 65.1 °F
Leaving DB / WB: 60.1 / 59.8 °F
Coil ADP: 58.1 °F
Bypass Factor: 0.100
Resulting RH: 43 %
Design supply temp.: 58.0 °F
Zone T-stat Check: 0 of 1 OK
Max zone temperature deviation: 0.1 °F

Central Heating Coil Sizing Data

Max coil load: 6.7 MBH
Coil CFM at Des Htg: 1957 CFM
Max coil CFM: 1957 CFM
Water flow @ 20.0 °F drop: N/A

Load occurs at: Des Htg
BTU/(hr·ft²): 7.0
Ent. DB / Lvg DB: 68.6 / 73.2 °F

Supply Fan Sizing Data

Actual max CFM: 1957 CFM
Standard CFM: 1684 CFM
Actual max CFM/ft²: 2.06 CFM/ft²

Fan motor BHP: 0.00 BHP
Fan motor kW: 0.00 kW
Fan static: 0.00 in wg

Outdoor Ventilation Air Data

Design airflow CFM: 63 CFM
CFM/ft²: 0.07 CFM/ft²

CFM/person: 21.01 CFM/person

Zone Sizing Summary for AHU-08

Project Name: Sunland - Cultivation
Prepared by: MJ
10/18/2022
05:57PM

Air System Information

Air System Name: AHU-08
Equipment Class: PKG VERT
Air System Type: SZCAV

Number of zones: 1
Floor Area: 951.0 ft²
Location: Alamogordo, New Mexico

Sizing Calculation Information

Calculation Months: Jan to Dec
Sizing Data: Calculated

Zone CFM Sizing: Sum of space airflow rates
Space CFM Sizing: Individual peak space loads

Zone Terminal Sizing Data

Zone Name	Design Supply Airflow (CFM)	Minimum Supply Airflow (CFM)	Zone CFM/ft²	Reheat Coil Load (MBH)	Reheat Coil Water gpm @ 20.0 °F	Zone Htg Unit Coil Load (MBH)	Zone Htg Unit Water gpm @ 20.0 °F	Mixing Box Fan Airflow (CFM)
Zone 1	1957	1957	2.06	0.0	-	0.0	-	0

Zone Peak Sensible Loads

Zone Name	Zone Cooling Sensible (MBH)	Time of Peak Sensible Cooling Load	Zone Heating Load (MBH)	Zone Floor Area (ft²)
Zone 1	30.7	Aug 1300	3.6	951.0

Space Loads and Airflows

Zone Name / Space Name	Mult.	Cooling Sensible (MBH)	Time of Peak Sensible Load	Air Flow (CFM)	Heating Load (MBH)	Floor Area (ft²)	Space CFM/ft²
Zone 1							
CLONNE/MOTHERS RM	1	22.4	Sep 1300	1419	2.5	332.0	4.27
DRY RM	1	4.2	Jun 1300	294	0.6	348.0	0.85
TRIM RM	1	3.8	Jun 1300	243	0.5	271.0	0.90

Air System Sizing Summary for AHU-09

Project Name: Sunland - Cultivation
Prepared by: MJ
10/18/2022
05:58PM

Air System Information

Air System Name: AHU-09
Equipment Class: UNDEF
Air System Type: SZCAV

Number of zones: 1
Floor Area: 3815.0 ft²
Location: Alamogordo, New Mexico

Sizing Calculation Information

Calculation Months: Jan to Dec
Sizing Data: Calculated

Zone CFM Sizing: Sum of space airflow rates
Space CFM Sizing: Individual peak space loads

Central Cooling Coil Sizing Data

Total coil load: 5.7 Tons
Total coil load: 67.8 MBH
Sensible coil load: 67.8 MBH
Coil CFM at Jul 1400: 4019 CFM
Max block CFM: 4019 CFM
Sum of peak zone CFM: 4019 CFM
Sensible heat ratio: 1.000
CFM/Ton: 710.9
ft²/Ton: 674.8
BTU/(hr·ft²): 17.8
Water flow @ 10.0 °F rise: 13.58 gpm

Load occurs at: Jul 1400
OA DB / WB: 97.1 / 62.7 °F
Entering DB / WB: 77.2 / 59.5 °F
Leaving DB / WB: 59.7 / 53.4 °F
Coil ADP: 51.0 °F
Bypass Factor: 0.100
Resulting RH: 40 %
Design supply temp.: 58.0 °F
Zone T-stat Check: 1 of 1 OK
Max zone temperature deviation: 0.0 °F

Central Heating Coil Sizing Data

Max coil load: 37.8 MBH
Coil CFM at Des Htg: 4019 CFM
Max coil CFM: 4019 CFM
Water flow @ 20.0 °F drop: 3.78 gpm

Load occurs at: Des Htg
BTU/(hr·ft²): 9.9
Ent. DB / Lvg DB: 65.6 / 75.7 °F

Supply Fan Sizing Data

Actual max CFM: 4019 CFM
Standard CFM: 3459 CFM
Actual max CFM/ft²: 1.05 CFM/ft²

Fan motor BHP: 0.00 BHP
Fan motor kW: 0.00 kW
Fan static: 0.00 in wg

Outdoor Ventilation Air Data

Design airflow CFM: 340 CFM
CFM/ft²: 0.09 CFM/ft²

CFM/person: 26.15 CFM/person

Zone Sizing Summary for AHU-09

Project Name: Sunland - Cultivation
Prepared by: MJ
10/18/2022
05:58PM

Air System Information

Air System Name: AHU-09
Equipment Class: UNDEF
Air System Type: SZCAV

Number of zones: 1
Floor Area: 3815.0 ft²
Location: Alamogordo, New Mexico

Sizing Calculation Information

Calculation Months: Jan to Dec
Sizing Data: Calculated

Zone CFM Sizing: Sum of space airflow rates
Space CFM Sizing: Individual peak space loads

Zone Terminal Sizing Data

Zone Name	Design Supply Airflow (CFM)	Minimum Supply Airflow (CFM)	Zone CFM/ft²	Reheat Coil Load (MBH)	Reheat Coil Water gpm @ 20.0 °F	Zone Htg Unit Coil Load (MBH)	Zone Htg Unit Water gpm @ 20.0 °F	Mixing Box Fan Airflow (CFM)
Zone 1	4019	4019	1.05	0.0	0.00	0.0	0.00	0

Zone Peak Sensible Loads

Zone Name	Zone Cooling Sensible (MBH)	Time of Peak Sensible Cooling Load	Zone Heating Load (MBH)	Zone Floor Area (ft²)
Zone 1	62.5	Jul 1400	21.5	3815.0

Space Loads and Airflows

Zone Name / Space Name	Mult.	Cooling Sensible (MBH)	Time of Peak Sensible Load	Air Flow (CFM)	Heating Load (MBH)	Floor Area (ft²)	Space CFM/ft²
Zone 1							
BREAK RM	1	3.0	Jul 1400	187	1.4	135.0	1.38
CHANGING RM	1	2.5	Jun 1300	156	0.3	139.0	1.12
CLOSET	1	1.6	Jul 1400	100	0.6	30.0	3.32
CORRIDOR 1	1	3.1	Aug 1300	198	0.9	165.0	1.20
CORRIDOR 2	1	7.9	Jul 1400	498	1.9	610.0	0.82
CORRIDOR 3	1	10.9	Jun 1300	688	2.4	919.0	0.75
FERTIGATION RM	1	8.2	Jul 1500	522	4.3	458.0	1.14
LAB	1	6.5	Jul 1500	413	2.3	400.0	1.03
LOADING	1	7.8	Aug 1500	495	3.8	419.0	1.18
OFFICE	1	2.9	Sep 1300	181	1.1	109.0	1.66
PACKAGING RM	1	4.6	Jul 1600	289	1.8	200.0	1.44
SEC VID EQUIP	1	1.5	Sep 1300	97	0.3	31.0	3.12
SEC. PROD. STORAGE	1	3.1	Jun 1300	196	0.4	200.0	0.98

Air System Sizing Summary for AHU-04

Project Name: Sunland - Cultivation
Prepared by: MJ
10/18/2022
05:57PM

Air System Information

Air System Name: AHU-04
Equipment Class: PKG VERT
Air System Type: SZCAV

Number of zones: 1
Floor Area: 853.0 ft²
Location: Alamogordo, New Mexico

Sizing Calculation Information

Calculation Months: Jan to Dec
Sizing Data: Calculated

Zone CFM Sizing: Sum of space airflow rates
Space CFM Sizing: Individual peak space loads

Central Cooling Coil Sizing Data

Total coil load: 10.2 Tons
Total coil load: 122.2 MBH
Sensible coil load: 121.8 MBH
Coil CFM at Aug 1300: 7660 CFM
Max block CFM: 7660 CFM
Sum of peak zone CFM: 7660 CFM
Sensible heat ratio: 0.997
CFM/Ton: 752.5
ft²/Ton: 83.8
BTU/(hr·ft²): 143.2
Water flow @ 10.0 °F rise: N/A

Load occurs at: Aug 1300
OA DB / WB: 94.7 / 62.0 °F
Entering DB / WB: 75.9 / 63.2 °F
Leaving DB / WB: 58.8 / 57.6 °F
Coil ADP: 56.9 °F
Bypass Factor: 0.100
Resulting RH: 52 %
Design supply temp.: 58.0 °F
Zone T-stat Check: 1 of 1 OK
Max zone temperature deviation: 0.0 °F

Central Heating Coil Sizing Data

Max coil load: 4.1 MBH
Coil CFM at Des Htg: 7660 CFM
Max coil CFM: 7660 CFM
Water flow @ 20.0 °F drop: N/A

Load occurs at: Des Htg
BTU/(hr·ft²): 4.8
Ent. DB / Lvg DB: 70.0 / 70.6 °F

Supply Fan Sizing Data

Actual max CFM: 7660 CFM
Standard CFM: 6593 CFM
Actual max CFM/ft²: 8.98 CFM/ft²

Fan motor BHP: 0.00 BHP
Fan motor kW: 0.00 kW
Fan static: 0.00 in wg

Outdoor Ventilation Air Data

Design airflow CFM: 0 CFM
CFM/ft²: 0.00 CFM/ft²

CFM/person: 0.00 CFM/person

Zone Sizing Summary for AHU-04

Project Name: Sunland - Cultivation
Prepared by: MJ
10/18/2022
05:57PM

Air System Information

Air System Name: AHU-04
Equipment Class: PKG VERT
Air System Type: SZCAV

Number of zones: 1
Floor Area: 853.0 ft²
Location: Alamogordo, New Mexico

Sizing Calculation Information

Calculation Months: Jan to Dec
Sizing Data: Calculated

Zone CFM Sizing: Sum of space airflow rates
Space CFM Sizing: Individual peak space loads

Zone Terminal Sizing Data

Zone Name	Design Supply Airflow (CFM)	Minimum Supply Airflow (CFM)	Zone CFM/ft²	Reheat Coil Load (MBH)	Reheat Coil Water gpm @ 20.0 °F	Zone Htg Unit Coil Load (MBH)	Zone Htg Unit Water gpm @ 20.0 °F	Mixing Box Fan Airflow (CFM)
Zone 1	7660	7660	8.98	0.0	-	0.0	-	0

Zone Peak Sensible Loads

Zone Name	Zone Cooling Sensible (MBH)	Time of Peak Sensible Cooling Load	Zone Heating Load (MBH)	Zone Floor Area (ft²)
Zone 1	121.0	Aug 1300	3.7	853.0

Space Loads and Airflows

Zone Name / Space Name	Mult.	Cooling Sensible (MBH)	Time of Peak Sensible Load	Air Flow (CFM)	Heating Load (MBH)	Floor Area (ft²)	Space CFM/ft²
Zone 1							
FLOWER RM D	1	121.0	Aug 1300	7660	3.7	853.0	8.98

Air System Sizing Summary for AHU-07

Project Name: Sunland - Cultivation
Prepared by: MJ
10/18/2022
05:57PM

Air System Information

Air System Name: AHU-07
Equipment Class: PKG VERT
Air System Type: SZCAV

Number of zones: 1
Floor Area: 854.0 ft²
Location: Alamogordo, New Mexico

Sizing Calculation Information

Calculation Months: Jan to Dec
Sizing Data: Calculated

Zone CFM Sizing: Sum of space airflow rates
Space CFM Sizing: Individual peak space loads

Central Cooling Coil Sizing Data

Total coil load: 11.2 Tons
Total coil load: 134.9 MBH
Sensible coil load: 134.9 MBH
Coil CFM at Jul 1400: 8505 CFM
Max block CFM: 8505 CFM
Sum of peak zone CFM: 8505 CFM
Sensible heat ratio: 1.000
CFM/Ton: 756.4
ft²/Ton: 76.9
BTU/(hr·ft²): 158.0
Water flow @ 10.0 °F rise: N/A

Load occurs at: Jul 1400
OA DB / WB: 97.1 / 62.7 °F
Entering DB / WB: 75.9 / 62.2 °F
Leaving DB / WB: 58.8 / 58.5 °F
Coil ADP: 56.9 °F
Bypass Factor: 0.100
Resulting RH: 100 %
Design supply temp.: 58.0 °F
Zone T-stat Check: 1 of 1 OK
Max zone temperature deviation: 0.0 °F

Central Heating Coil Sizing Data

Max coil load: 3.7 MBH
Coil CFM at Des Htg: 8505 CFM
Max coil CFM: 8505 CFM
Water flow @ 20.0 °F drop: N/A

Load occurs at: Des Htg
BTU/(hr·ft²): 4.3
Ent. DB / Lvg DB: 69.9 / 70.3 °F

Supply Fan Sizing Data

Actual max CFM: 8505 CFM
Sum of peak zone CFM: 8505 CFM
Actual max CFM/ft²: 9.96 CFM/ft²

Fan motor BHP: 0.00 BHP
Fan motor kW: 0.00 kW
Fan static: 0.00 in wg

Outdoor Ventilation Air Data

Design airflow CFM: 0 CFM
CFM/ft²: 0.00 CFM/ft²

CFM/person: 0.00 CFM/person

Zone Sizing Summary for AHU-07

Project Name: Sunland - Cultivation
Prepared by: MJ
10/18/2022
05:57PM

Air System Information

Air System Name: AHU-07
Equipment Class: PKG VERT
Air System Type: SZCAV

Number of zones: 1
Floor Area: 854.0 ft²
Location: Alamogordo, New Mexico

Sizing Calculation Information

Calculation Months: Jan to Dec
Sizing Data: Calculated

Zone CFM Sizing: Sum of space airflow rates
Space CFM Sizing: Individual peak space loads

Zone Terminal Sizing Data

Zone Name	Design Supply Airflow (CFM)	Minimum Supply Airflow (CFM)	Zone CFM/ft²	Reheat Coil Load (MBH)	Reheat Coil Water gpm @ 20.0 °F	Zone Htg Unit Coil Load (MBH)	Zone Htg Unit Water gpm @ 20.0 °F	Mixing Box Fan Airflow (CFM)
Zone 1	8505	8505	9.96	0.0	-	0.0	-	0

Zone Peak Sensible Loads

Zone Name	Zone Cooling Sensible (MBH)	Time of Peak Sensible Cooling Load	Zone Heating Load (MBH)	Zone Floor Area (ft²)
Zone 1	134.4	Jul 1400	3.7	854.0

Space Loads and Airflows

Zone Name / Space Name	Mult.	Cooling Sensible (MBH)	Time of Peak Sensible Load	Air Flow (CFM)	Heating Load (MBH)	Floor Area (ft²)	Space CFM/ft²
Zone 1							
VEG RM 2	1	134.4	Jul 1400	8505	3.7	854.0	9.96

CLIENT:

ADDRESS:

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REV. NO.	DESCRIPTION	DATE	BY

PROJECT:
SUNLAND CULTIVATION

TITLE:
MECHANICAL HEAT LOADS CALCULATIONS-2

PROJ. NO.	PROJ. ENGR.	SCALE @ 24X36:
		NTS

DRAWING NO.
M 3 . 0 2

REV.

COMPANY

Carrier
Turn to the experts

Product Data

Commercial Split Systems
Air Conditioning Condensing Units
6 to 20 Tons

38AUZ07,08,12,14 Shown

38AUZ, AUD 07-25 Single and Dual Circuit Condensing Units with Puron® R-410A Refrigerant

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AHRI capacity ratings

Carrier

AHRI CAPACITY RATINGS

UNIT	COOLING STAGES	NOMINAL CAPACITY (MBH)	NET COOLING CAPACITY (MBH)	TOTAL POWER (kW)	EER	IEER	IEER WITH 2-SPEED VFD
38AUZ(A,B)07408*U07	1	7.5	90.0	8.1	11.1	12.2	12.9
38AUZ(A,B)08408*U08	1	7.5	92.0	8.2	11.2	11.8	12.9
38AUZ*12408U12	1	10.0	117.0	11.4	10.3	12.0	12.9
38AUZ*12408U14	1	10.0	117.0	10.4	11.2	N/A	12.3
38AUZ*14408U14	1	12.5	148.0	13.5	11.0	12.0	12.4
38AUZ*14408U16	2	15.0	184.0	16.4	11.2	13.2	14.3
38AUZ*20408U20	2	20.0	240.0	21.8	11.0	12.5	13.6
38AUZ(D,E)*14408U07	2	6.0	70.0	5.8	12.0	12.9	14.0
38AUZ(D,E)08408U08	2	7.5	92.0	8.2	11.2	13.3	14.0
38AUD*12408U12	2	10.0	117.0	11.4	10.3	11.6	13.0
38AUD*12408U14	2	10.0	117.0	10.4	11.2	N/A	13.0
38AUD*14408U14	2	12.5	148.0	13.5	11.0	12.0	12.3
38AUD*16408U16	2	15.0	184.0	16.4	11.2	11.9	12.6
38AUD*20408U25	2	20.0	240.0	21.8	11.0	11.2	12.0

LEGEND

AHRI — Air Conditioning, Heating, and Refrigeration
ASHRAE — American Society of Heating, Refrigeration, and Air-Conditioning, Inc.
EER — Energy Efficiency Ratio
IEER — Integrated Energy Efficiency Ratio

NOTES:
1. Rated in accordance with AHRI Standard 340/360, as appropriate.
2. Ratings are based on:
Cooling (Standard): 80°F (27°C) db, 67°F (19°C) wb Indoor air temp and 95°F (35°C) db outdoor air temp.

AHRI CERTIFIED
Certified Reference Number: 8111111

SOUND POWER LEVELS, dB

UNIT	COOLING STAGES	A-WEIGHT OCTAVE OUTDOOR SOUND (dB)								
		TOTAL	63	125	250	500	1000	2000	4000	8000
38AUZ07	1 & 2	84.6	65.1	68.9	75.4	79.9	80.2	76.4	72.0	64.9
38AUZ08	1 & 2	84.8	63.1	68.3	75.4	79.5	80.2	76.4	72.0	64.9
38AUZ12	1	83.2	60.4	66.8	77.1	76.9	77.1	75.8	70.2	64.7
38AUZ13	2	83.8	62.9	66.8	74.4	77.9	76.3	76.1	70.7	61.1
38AUZ14	1	82.6	60.5	65.1	70.3	77.2	76.0	75.4	71.2	63.9
38AUZ14	2	85.2	64.8	68.9	77.4	82.8	79.0	74.2	69.0	61.9
38AUZ16	2	84.2	60.1	69.7	72.8	76.7	79.5	76.3	72.5	67.8
38AUZ16	1	82.6	55.5	64.8	73.8	77.2	76.2	74.8	70.7	64.3
38AUZ25	2	82.6	60.5	65.1	70.3	77.2	76.0	75.4	71.2	63.9
38AUD25	2	85.2	64.8	68.9	77.4	82.8	79.0	74.2	69.0	61.9

LEGEND

dB — Decibel

NOTE: Outdoor sound data is measured in accordance with AHRI standard 270-2008.

Physical data (cont)

Carrier

38AU*12-25 PHYSICAL DATA

UNIT	MODELS WITH RTPF — ROUND TUBE/PLATE FIN COIL DESIGN					
	38AUD12	38AUD14	38AUZ14	38AUD16	38AUZ25	38AUD25
Refrigeration System						
# Circuits / # Comp. / Type	2 / 2 / Scroll	2 / 2 / Scroll	1 / 2 / Scroll	2 / 2 / Scroll	1 / 2 / Scroll	2 / 2 / Scroll
Refrigerant Type	Puron® R-410A					
R-410A Shipping Charge A/B (lbs, oz)	9.0 / 9.0	9.0 / 9.0	9.0	9.0 / 9.0	9.0	9.0 / 9.0
Oil Charge	5/5	5/5	—	5/5	—	5/5
System Charge w/ Fan Coil* (60 Hz)	11.0 / 11.5	22.0 / 22.0	43.0	22.0 / 22.0	38.0	19.0 / 19.0
Metering Device	TXV	TXV	TXV	TXV	TXV	TXV
High-Press. Trip / Reset (psig)	630 / 505	630 / 505	630 / 505	630 / 505	630 / 505	630 / 505
Low-Press. Trip / Reset (psig)	54 / 117	54 / 117	54 / 117	54 / 117	54 / 117	54 / 117
Compressor						
Model	ZP51 (2)	ZP67 (2)	ZP83 (2)	ZP83 (2)	ZP104 (2)	ZP104 (2)
Oil Charge A/B (oz)	42 / 42	56 / 56	80 / 80	80 / 80	110 / 110	110 / 110
Speed (rpm, 60 Hz)	3500 / 2900	3500 / 2900	3500	3500 / 2900	3500	3500 / 2900
Condenser Coil						
Material	Al/Cu	Al/Cu	Al/Cu	Al/Cu	Al/Cu	Al/Cu
Coil Type	RTPF	RTPF	RTPF	RTPF	RTPF	RTPF
Rows / FPI	2 / 17	3 / 17	2 / 17	2 / 17	2 / 17	2 / 17
Total Face Area (ft²)	35.1	31.8	23.5 x 3	29.5 x 3	25.0 x 2	25.0 x 2
Condenser Fan / Motor						
Qty / Motor Drive Type	2 / Direct	2 / Direct	3 / Direct	3 / Direct	4 / Direct	4 / Direct
Nominal Rpm	1(4 / 1100	1(4 / 1100	1(4 / 1100	1(4 / 1100	1(4 / 1100	1(4 / 1100
Fan Diameter (in.)	22	22	22	22	22	22
Nominal Airflow (cfm)	6,000	6,000	9,000	9,000	12,000	12,000
Watts (total)	610	610	970	970	1150	1150
Piping Connections						
Qty / Suction (in. ODS)	2 / 1-1/8	2 / 1-3/8	1 / 1-3/8	2 / 1-3/8	1 / 1-5/8	2 / 1-3/8
Qty / Liquid (in. ODS)	2 / 3/8	2 / 1/2	1 / 5/8	2 / 1/2	1 / 5/8	2 / 1/2

Carrier
Turn to the experts

Product Data

Split System Heat Pump
7-25 Nominal Tons, 60 Hz

40RUQ 07-12 (shown)

Puron

40RUQ 07-25 Split System Heat Pump
Indoor Unit (Air-Handling) with Puron® Refrigerant

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Physical data (cont)

Carrier

FAN MOTOR DATA
STANDARD MOTOR — SINGLE SPEED

UNIT	40RUQ*07	40RUQ*08	40RUQ*12	40RUQ*16	40RUQ*25
208/230-1-60					
Speed (rpm)	1725	1725	—	—	—
Hp	2.4	2.4	—	—	—
Frame (NEMA)	56HY	56Y	—	—	—
Shaft Dia (in.)	5/8	5/8	—	—	—
230-3-60 and 460-3-60					
Speed (rpm)	1750	1750	1750	1750	1755
Hp	2.4	2.4	2.4	3.7	5.0
Frame (NEMA)	56Y	56Y	56Y	56HZ	184T
Shaft Dia (in.)	5/8	5/8	5/8	7/8	1-1/8
575-3-60					
Speed (rpm)	1750	1750	1750	1750	1755
Hp	2.4	2.4	2.4	3.7	5.0
Frame (NEMA)	56Y	56Y	56Y	56HZ	184T
Shaft Dia (in.)	5/8	5/8	5/8	7/8	1-1/8

LEGEND

NEMA — National Electrical Manufacturers Association (U.S.A.)

FAN MOTOR DATA
ALTERNATE MOTOR — SINGLE SPEED

UNIT	40RUQ*07	40RUQ*08	40RUQ*12	40RUQ*16	40RUQ*25
208/230-1-60					
Speed (rpm)	1725	1725	—	—	—
Hp	2.4	2.4	—	—	—
Frame (NEMA)	56Y	56Y	—	—	—
Shaft Dia (in.)	5/8	5/8	—	—	—
230-3-60 and 460-3-60					
Speed (rpm)	1750	1750	1750	1755	1760
Hp	2.9	2.9	3.7	5.0	7.5
Frame (NEMA)	56Y	56Y	56HZ	184T	213T
Shaft Dia (in.)	7/8	7/8	7/8	1-1/8	1-3/8
575-3-60					
Speed (rpm)	1725	1725	1725	1765	1760
Hp	2.0	3.0	3.5	6.0	7.5
Frame (NEMA)	56HZ	56HZ	56HZ	184T	213T
Shaft Dia (in.)	7/8	7/8	7/8	1-1/8	1-3/8

LEGEND

NEMA — National Electrical Manufacturers Association (U.S.A.)

MOTOR EFFICIENCY 40RUQ — SINGLE SPEED MOTOR

MOTOR HP	EPACT MINIMUM	MOTOR EFFICIENCY
1.5*	—	70.00%
2.4	—	70.80%
2.9	—	77.10%
3.7	—	81.50%
5.0	89.50%	99.25%
7.5	91.70%	91.70%
10.0	91.70%	91.70%

LEGEND

EPACT — Energy Policy and Conservation Act of 1992

*Single-phase only.

Physical data (cont)

Carrier

FAN MOTOR DATA
STANDARD MOTOR — 2-SPEED

UNIT	40RUQ*07	40RUQ*08	40RUQ*12	40RUQ*16	40RUQ*25
208/230-3-60 and 460-3-60					
Speed (rpm)	1680	1680	1680	1750	1755
Hp	2.4	2.4	1.7	3.7	5.0
Frame (NEMA)	56HY	56HY	56HY	56HY	184T
Shaft Dia (in.)	5/8	5/8	5/8	7/8	1-1/8
575-3-60					
Speed (rpm)	1680	1680	1665	1710	1755
Hp	2.4	2.4	1.7	3.7	5.0
Frame (NEMA)	56HY	56HY	56HY	56HY	184T
Shaft Dia (in.)	5/8	5/8	5/8	7/8	1-1/8

FAN MOTOR DATA
ALTERNATE MOTOR — 2-SPEED

UNIT	40RUQ*07	40RUQ*08	40RUQ*12	40RUQ*16	40RUQ*25
208/230-3-60 and 460-3-60					
Speed (rpm)	1750	1750	1725	1755	1760
Hp	3.7	3.7	3.71	5.0	7.5
Frame (NEMA)	56HY	56HY	56HY	184T	213T
Shaft Dia (in.)	7/8	7/8	7/8	1-1/8	1-3/8
575-3-60					
Speed (rpm)	1710	1710	1710	1755	1750
Hp	3.7	3.7	3.7	5.0	7.5
Frame (NEMA)	56HY	56HY	56HY	184T	213T
Shaft Dia (in.)	7/8	7/8	7/8	1-1/8	1-3/8

†High Efficiency Motor

MOTOR EFFICIENCY 40RUQ — 2-SPEED MOTOR

MOTOR HP	EPACT MINIMUM	MOTOR EFFICIENCY
1.7	—	82.0%
2.4	—	80.0%
2.9	—	86.5%
3.7	—	83.8%
3.7†	—	87.5%
5.0	89.5%	89.5%
7.5	91.7%	91.7%
10.0	91.7%	91.7%

LEGEND

EPACT — Energy Policy and Conservation Act of 1992

†High Efficiency Motor.

CLIENT:

ADDRESS:

CONFIDENTIALITY STATEMENT:

ALL DRAWINGS AND WRITTEN MATERIALS APPEARING HEREIN CONSTITUTE THE ORIGINAL AND UNPUBLISHED WORK OF THE DESIGNER AND THE SAME MAY NOT BE DUPLICATED, USED OR DISCLOSED WITHOUT CONSENT OF THE DESIGNER.

NOTES:

1. ALL DIMENSIONS HEREIN ARE IN IMPERIAL UNITS UNLESS STATED OTHERWISE.
2. THESE DRAWINGS ARE TO BE READ IN CONJUNCTION WITH ALL RELEVANT DESIGNER, ENGINEER OR SPECIALIST DRAWINGS AND SPECIFICATIONS.
3. THE CONTRACTOR MUST CHECK ALL DIMENSION AT SITE BEFORE COMMENCING WORK.
4. THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING ALL NECESSARY TEMPORARY SUPPORT TO THE BUILDING AND ANY ADJACENT STRUCTURES.

REV. NO.	DESCRIPTION	DATE	BY

PROJECT:

SUNLAND CULTIVATION

TITLE:

MECHANICAL EQUIPMENT DATA SHEETS.

PROJ. NO.	PROJ. ENGR.	SCALE @ 24X36:
		NTS

DRAWING NO.

M 4 . 0 1

REV.

Single Zone

INFINITY® SERIES
38MPRA OUTDOOR UNIT

Infinity® Heat Pump With Basepan Heater

Heat Pump With Basepan Heater
Inverter Compressor
Up to 42.0 SEER
Up to 15.0 HSPF
Sizes 09 / 12 / 18 / 24
All Systems are ENERGY STAR® certified

FEATURES OUTDOOR

- 100% cooling capacity at -22° F (-30° C) without additional kit
- Available in 208/230V
- Built-in basepan heater
- Auto-restart function
- Refrigerant leakage detection
- Quiet outdoor operation, as low as 55 dB(A)
- Anti-corrosive fin coating
- Piping length 98 ft. (30m.)
- Cooling operating range -22° - 122° F (-30° – 50° C)
- Heating operating range -22° – 66° F (-30° – 30° C)

COMPATIBLE WITH:

- 40MPHA High Wall (p 24)

INFINITY® SERIES

High Wall

KEY FEATURES

Extra-Low Temperature Heating
Heat output up to 75% of rated capacity down to -22° F (-30° C), so when it's cold outside, it will be warm inside, making this a primary heat source and eliminating the need for a backup heat source.

Stepless Frequency Adjustment
Precise control maintains stable and constant room temperature while reducing sound level, and saving energy.

INFINITY® SERIES
38MPRA OUTDOOR UNIT

SPECIFICATIONS:

38MPRA Outdoor Unit

Size		9	12	18	24
Outdoor Model		38MPRA09A5A3	38MPRA12A5A3	38MPRA18A5A3	38MPRA24A5A3
		Electrical			
Voltage, Phase, Cycle	V/Ph/Hz	208/230-1-60	208/230-1-60	208/230-1-60	208/230-1-60
MCA	A	13	20	30	30
MOCP - Fuse Rating	A	15	25	35	35
		Operating Range			
Cooling Outdoor DB Min - Max	°F (°C)	-20 -(-29) / 80 -(26)	-20 -(-29) / 80 -(26)	-20 -(-29) / 80 -(26)	-20 -(-29) / 80 -(26)
Heating Outdoor DB Min - Max	°F (°C)	-22 -(-30) / 65 -(18)	-22 -(-30) / 65 -(18)	-22 -(-30) / 65 -(18)	-22 -(-30) / 65 -(18)
		Piping			
Total Piping Length	ft (m)	98 (30)	98 (30)	98 (30)	98 (30)
Piping Lift*	ft (m)	49 (15)	49 (15)	65 (20)	65 (20)
Pipe Connection Size - Liquid	in (mm)	3/8 (9.52)	3/8 (9.52)	3/8 (9.52)	3/8 (9.52)
Pipe Connection Size - Suction	in (mm)	5/8 (16)	5/8 (16)	5/8* (16)	5/8* (16)
		Refrigerant			
Type		R410A	R410A	R410A	R410A
Charge	lb (kg)	3.5 (1.58)	3.5 (1.58)	5.7 (2.6)	6.5 (2.95)
		Compressor			
Type		Rotary Inverter	Rotary Inverter	Rotary Inverter	Rotary Inverter
		Outdoor			
Unit Width	in (mm)	33.07 (840)	33.07 (840)	37.24 (946)	37.24 (946)
Unit Height	in (mm)	27.64 (702)	27.64 (702)	31.89 (810)	31.89 (810)
Unit Depth	in (mm)	14.29 (363)	14.29 (363)	16.14 (410)	16.14 (410)
Net Weight	lb (kg)	107.39 (48.9)	108.47 (49.2)	135.4 (61.4)	140.1 (63.6)
Airflow	cfm	1,360	1,360	2,236	2,236
Sound Pressure	dB(A)	59.5	60.2	61.5	62.2

*Condensing unit above or below indoor unit

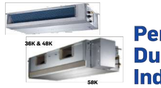
COMPATIBILITY:

Indoor Unit		Outdoor Unit			
		38MPRA09A5A3	38MPRA12A5A3	38MPRA18A5A3	38MPRA24A5A3
High Wall	40MPHA09A5A3	•			
	40MPHA12A5A3		•		
	40MPHA18A5A3			•	
	40MPHA24A5A3				•

Indoor Model		40MPHA09A5A3	40MPHA12A5A3	40MPHA18A5A3	40MPHA24A5A3
Cooling System Tons		0.75	1.0	1.5	1.8
Cooling Rated Capacity	Btu/h	9,000	12,000	18,000	22,000
Cooling Cap. Range Min - Max	Btu/h	5,000–17,000	5,800–19,000	8,888–30,511	7,440–30,644
SEER		42.0	32.0	26.2	23.5
EER		16.0	13.5	14.5	13.85
Heating Rated Capacity (47° F)	Btu/h	10,000	12,000	16,000	24,000
Heating Rated Capacity (17° F)	Btu/h	7,200	8,860	12,300	15,400
Heating Max Capacity (17° F)	Btu/h	15,000	17,070	22,000	22,000
Heating Max Capacity (0° F)	Btu/h	13,000	13,800	18,000	24,000
Heating Max Capacity (-13° F)	Btu/h	8,872	9,792	16,572	19,799
Heating Cap. Range Min - Max	Btu/h	3,500–19,100	3,500–21,000	10,935–28,414	12,000–32,272
HSPF		10.0	14.0	14.0	12.0
COP (47° F)	W/W	4.69	4.24	4.12	3.89
COP (17° F)	W/W	3.29	2.84	3.20	3.00
COP (0° F)	W/W	2.69	2.60	2.60	2.60

Light Commercial

PERFORMANCE™ SERIES
40MBQ DUCTED:



Performance™ Ducted Indoor Unit

Sizes 36 / 48 / 58

KEY FEATURES

Vertical or Horizontal Installation
Designed for maximum installation flexibility. The secondary drain built-in allows the unit to be mounted vertically allowing either a floor or ceiling-concealed installation depending on existing conditions. (Sizes 36 and 48 only.)

Built-in Condensate Lift Pump
Supplied with a condensate lift pump that is capable of lifting the water 29.5in. (750mm.) above the top of the unit.

CONTROLS
Wireless Remote Controller included with indoor unit

Wired Remote Controller (7-Day Programmable) included with indoor unit

Standard Wired Controller (7-Day Programmable) KSACN0701AAA

Wireless Remote Controller

ACCESSORIES
Wi-Fi® Smartphone control kit KSAIFI0401AAA
24V interface for third-party thermostat compatibility KSAIO3301230

- Up to 0.8 in W.C.
- Rear or bottom return
- Outside air intake
- Built-in condensate lift pump
- *Follow Me* (senses temperature at handheld remote)
- Heating Setback (48° F Heating Mode)
- Quiet indoor operation, as low as 38.5 dB(A)
- Anti-corrosive fin coating

COMPATIBLE WITH:

- 38MBR Outdoor Unit (p 62)
- 38MBRB Outdoor Unit (p 64)

Performance SERIES

Light Commercial

PERFORMANCE™ SERIES
40MBQ DUCTED:

SPECIFICATIONS:

Size		36	48	58
Indoor Model		40MBQD36–3	40MBQD48–3	40MBQD58–3
		Electrical		
Voltage, Phase, Cycle	V/Ph/Hz	208/230-1-60	208/230-1-60	208/230-1-60
Power Supply		Indoor Unit Powered From Outdoor Unit		
MCA	A	2.45	3.2	3.65
		Controls		
Wireless Remote Controller (F / F / C Convertible)		Standard	Standard	Standard
Wired Remote Controller (F / F / C Convertible)		Standard	Standard	Standard
		Operating Range		
Cooling Indoor DB Min - Max	°F (°C)	63–90 (17–32)	63–90 (17–32)	63–90 (17–32)
Heating Indoor DB Min - Max	°F (°C)	32–86 (0–30)	32–86 (0–30)	32–86 (0–30)
		Piping		
Pipe Connection Size – Liquid	in (mm)	3/8 (9.52)	3/8 (9.52)	3/8 (9.52)
Pipe Connection Size – Suction	in (mm)	5/8 (16)	5/8 (16)	3/4 (19)
		Indoor		
Unit Width	in (mm)	30 (762)	47.24 (1,200)	55.12 (1,400)
Unit Height	in (mm)	9.8 (249)	11.81 (300)	17.32 (440)
Unit Depth	in (mm)	30.47 (774)	34.41 (874)	33.78 (858)
Net Weight	lb (kg)	106.48 (48.3)	119.71 (54.3)	163 (74)
Number of Fan Speeds		3	3	3
Airflow (lowest to highest)	cfm	700/910/1,080	700/1,020/1,230	1,260/1,710/2,150
Sound Pressure (lowest to highest)	dB(A)	38.5/42/45.5	49/49.5/50.5	51/54/57
Max Static Pressure	in W.C.	0.64	0.64	0.80
Field Drain Pipe Size O.D.	in (mm)	1.05 (4)	1.05 (4)	1.05 (4)

Performance may vary based on the compatible outdoor unit. See respective pages for performance data.

COMPATIBILITY:

Indoor Unit	40MBQD36–3	40MBQD48–3	40MBQD58–3
Outdoor Unit Single Zone	38MBR(B)36A–3	38MBR(B)48A–3	38MBR(B)58A–3

Backward compatible with 38MBQ Single Zone Systems.

Light Commercial

PERFORMANCE™ SERIES
38MBRB OUTDOOR UNIT

Performance™ Commercial Heat Pump

Heat Pump with Basepan Heater
Inverter Compressor
Up to 18.0 SEER
Up to 11.5 HSPF
Sizes 36 / 48

KEY FEATURES

Flexible Installation
Piping flexibility up to a total piping length of 213 ft. (65 m).

Low Ambient Cooling

FEATURES OUTDOOR

- Built-in basepan heater
- Condenser high-temperature protection
- Refrigerant leakage detection
- Quiet outdoor operation
- Anti-corrosive fin coating
- Piping length 213 ft. (65 m)
- Cooling operating range -13° – 122° F (-25° – 50° C)
- Heating operating range -22° – 66° F (-30° – 30° C)

COMPATIBLE WITH:

- 40MBAA Air Handler (p 74)
- 40MBCQ Cassette (p 68)
- 40MBDQ Ducted (p 70)
- 40MBFQ Floor Console (p 72)

Performance SERIES

Air Handler Size 36 / 48

Cassette

Ducted

Floor Console

38MBRB OUTDOOR UNIT

SPECIFICATIONS:

Size		36	48
Outdoor Model		38MBR(B)36A3	38MBR(B)48A3
		Electrical	
Voltage–Phase–Cycle	V-Ph-Hz	208/230-1-60	208/230-1-60
MCA	A	15	20
MOCP – Fuse Rating	A	25	30
		Operating Range	
Cooling Outdoor DB Min – Max	°F (°C)	-13–122 (-25–50)	-13–122 (-25–50)
Heating Outdoor DB Min – Max	°F (°C)	-22–66 (-30–30)	-22–66 (-30–30)
		Piping	
Total Piping Length	ft (m)	213 (65)	213 (65)
Piping Lift*	ft (m)	98 (30)	98 (30)
Pipe Connection Size – Liquid	in (mm)	3/8 (9.52)	3/8 (9.52)
Pipe Connection Size – Suction	in (mm)	5/8 (16)	5/8 (16)
		Refrigerant	
Type		R410A	R410A
Charge	lb (kg)	7.93 (3.7)	9.97 (4.5)
		Compressor	
Type		Rotary Inverter	Rotary Inverter
		Outdoor	
Unit Width	in (mm)	41.7 (1,060)	40.5 (1,030)
Unit Height	in (mm)	31.9 (810)	52.4 (1,330)
Unit Depth	in (mm)	17.5 (445)	17.8 (440)
Net Weight	lb (kg)	155.43 (70.5)	218.14 (98.6)
Airflow	CFM	2,119	4,500
Sound Pressure	dB(A)	61.7	62.9

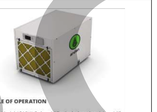
*Condensing unit above or below indoor unit.

COMPATIBILITY:

Indoor Unit		Outdoor Unit	
		38MBR(B)36A3	38MBR(B)48A3
40MBQ	40MBQD36–3	•	
Ducted	40MBQD48–3		•
40MBAA	40MBAA(D)036	•	
Air Handler	40MBAA(D)048		•
40MBFQ	40MBFQ36–3	•	
Floor Console	40MBFQ48–3		•
40MBCQ Cassette	40MBCQ36–3	•	
	40MBCQ48–3		•

anden

High-Capacity Grow-Optimized Dehumidifier
Model A210V1 | Specification Sheet



SPECIFICATIONS

Capacity** PPD AT 85°/50%RH	210
Energy Factor**	3.0 L/kWh 6.3 pints/kWh
Voltage, Phase, Frequency	208–240VAC, 1 Phase, 60 Hz
Current draw(amps)*	7.1
Power (watts)**	1,450
Btu/h**	4,950
Power cord type and length	SJT, 6-15P, 10ft
Hardware	Field-configurable
Breaker size	15 amp
CFM	520*
Dimensions:	Width: 19¾" Height: 16¾" Length: 30¾"
Weight	118 lbs.
Operating range Temp/RH	60/50 to 85/80

*Tested operating and drawing the 4,000 Btu/h and cool comfort at 80°F/60%RH in accordance with AHAM DH-1 (2008) at 80°F/60%RH at the inlet air at 6.9 DSR. (208 VAC.
**Total cooling load at 80°F/60%RH.

FEATURES

Control	Onboard digital with diagnostics
Air supply orientation	Horizontal
Filter	14"x18"x2" MERV 11
Refrigerant	R410A
Coil type	Copper tube/ Aluminum fin with I-coat
Drain connection	¾" BSPT
P-Trap required	No
Leveling feet	Included
Hanging brackets	Included
Warranty	5 Years on all parts including refrigeration system

INCLUDED ITEMS

Control	Model A77
Drain fittings	¾" MNPT x ¾" BARB
Drain tubing (length, ID)	10' – ¾" ID
Thermostat wire	30' 20 gauge 4-wire

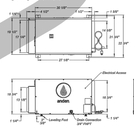
PRINCIPLE OF OPERATION

The Anden Model A210V1 Dehumidifier is designed to dehumidify the air coming into the unit by passing the incoming air over an evaporator coil to drop the air temperature below the dew point of the air. Moisture is removed from the air and drained out of the unit to a common floor or sump drain. The air is then reheated in the condenser coil and exits the unit.

Dehumidification occurs until the set point is reached, then shuts off until the control determines a need for operation.

APPLICATION

The Anden Model A210V1 Dehumidifier is the perfect solution for the precise management of humidity required in an indoor growing environment.



Intertek

USA
DESIGNED, ENGINEERED & ASSEMBLED in America

5 YEAR

VORTEX POWERFANG
Higher performance Axial Fans

Model VTX400

The inline ventilation fan shall have an externally mounted 120vac 60hz motor with automatic reset thermal reset overload protection. Fan and Motor must have permanently lubricated sealed bearings, Fan body must be of metal construction with a hammer-tone finish and have a grey powder-coat finish to reduce fan noise making it durable and rust resistant. Fan shall be configurable to allow bracket mounting on wall or ceiling mount. Mount must be included.

Fan must be suitable for air-stream temperatures up to 140F (60C) Fan must be ETL listed and must be 100% speed controllable. Product must conform to AMCA Standards and have the AMCA certified rating label affixed.

(Fan airflow performance shall be based on tests conducted in accordance with AMCA Standard 211 and shall be licensed to bear the AMCA Certified label)

Fan must have a 10 year warranty from the manufacturer.

Fan shall be a Vortex Powerfan Model VTX400 available in duct diameter of 4"

200 CFM @ 0.2" Specifications for fan must be:

ALL VTX PRODUCTS INCORPORATE MOTORS SUITABLE FOR USE ON 50/60Hz ELECTRICAL SUPPLY ONLY

Duct Dia.	RPM	Watts	Rated Watts	Max Watts	Static Pressure Inches Water Column							Max Cfm
					0"	.125"	.25"	.375"	.5"	.625"	.75"	
4"	12000	1.90	.98	4.75	1.90	1.88	1.85	1.81	1.76	1.70	1.62	314

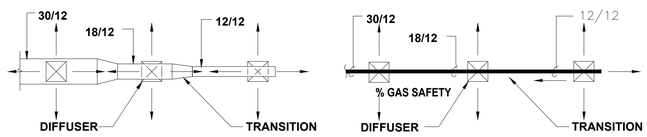
Performance certified to AMCA Standard 210-07 and ANSI/ASHRAE Standard 51-07. Performance ratings do not include performance of any appurtenances that may be connected to the fan's inlet or outlet. Fan's performance is rated at the standard air density of 0.075 lbs/ft³. Performance ratings do not include the effects of appurtenances (accessories) that may be connected to the fan's inlet and outlet. Outlet Duct

GENERAL NOTES

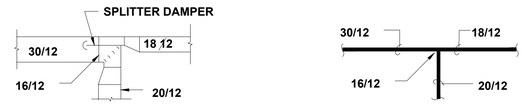
1. MECHANICAL CONTRACTOR SHALL EXAMINE ALL OTHER SPECIFICATIONS, DRAWINGS AND ALL FEATURES OF BUILDING CONSTRUCTION WHICH MAY AFFECT HIS WORK AND SHALL B GOVERNED BY THESE AND OTHER SPECIFICATIONS, INCLUDIN THE GENERAL CONDITIONS AND PARTICULAR INSTRUCTIONS T ALL BIDDER AND SUPPLIERS
2. ALL WORK SHALL BE EXECUTED AND INSPECTED IN STRICT ACCORDANCE WITH ALL LOCAL CODES AND/OR STATE CODES, LAWS, ORDINANCES, RULES AND REGULATIONS APPLICABLE TO THIS PARTICULAR CLASS OF WORK, AND EACH CONTRACTOR SHALL INCLUDE IN HIS PRICE ALL APPLICABLE SERVICE CHARGES, FEES, PERMITS, TAXES, AND OTHER SIMILAR COSTS IN CONNECTION THEREWITH
3. PRIOR TO FABRICATION OF DUCTWORK, THE MECHANICAL CONTRACTOR SHALL EXAMINE AND VERIFY ALL CONDITIONS ABOVE AND BELOW THE CEILING WHICH MAY INTERFERE WITH THE DUCT SYSTEM AND NOTIFY THE ARCHITECT OF ANY CONFLICT ENCOUNTERED CONTRACTOR SHALL PROVIDE ALL OFFSETS, ETC WHICH MAY BE REQUIRED, WITHOUT ADDITIONAL COST TO THE OWNER
4. ALL SHEET METAL DUCT CONSTRUCTION SHALL BE IN STRICT ACCORDANCE WITH "SMACNA" LOW PRESSURE DUCT CONSTRUCTION STANDARD
5. TURNING VANES SHALL BE INSTALLED IN ALL BENDS IN RECTANGULAR DUCT EXCEEDING 30"
6. ALL DUCTS SHALL BE SUPPORTED WITH 1"WIDE, 16 GAUGE, GALVANIZED STEEL BANDS
7. ALL RECTANGULAR DUCT SHALL BE INSULATED WITH A MIN OF 1"INTERNAL LINER, 2 LBS DENSITY R-60 ALL ROUND DUCTS AND DIFFUSER TOPS SHALL HAVE A MIN 2" THICK OF FOIL BACKED BLANKET TYPE INSULATION R=4-4 2, WITH ALL JOINTS BUTTED AND TAPED
8. ALL DUCT DIMENSIONS SHOWN ON PLANS ARE INTERNAL
9. THE MECHANICAL CONTRACTOR SHALL COORDINATE THE LOCATION OF SUPPLY AND RETURN AIR REGISTERS, DUCTS, GRILLES AND DIFFUSERS WITH LIGHTING AND CEILING PATTERNS
10. PROVIDE LATERAL BRACING OF ALL DUCTS AND PIPES AS REQUIRED BY CODE
11. INSULATE AND SEAL ALL DUCTWORK PER CHAPTER 10 OF THE STATE MECHANICAL CODE
12. MOUNT ALL THERMOSTATS AT 48" ABOVE FINISHED FLOOR
13. ALL BRACING OF DUCTS AND PIPING SHALL BE INSTALLED IN ACCORDANCE WITH SMACNA GUIDELINES
14. WHERE BRACING DETAILS ARE NOT SHOWN ON THE DRAWINGS OR IN THE GUIDELINES, THE FIELD INSTALLATION SHALL BE SUBJECT TO THE APPROVAL OF THE ARCHITECT AND THE MECHANICAL ENGINEER
15. DUCT SMOKE DETECTOR SHALL BE INSTALLED BELOW THE ROOF
16. ALL MECHANICAL EQUIPMENT AND SYSTEMS INSTALLED AS PART OF PROJECT SHALL COMPLY WITH ALL REQUIREMENTS OF THE 2013 CALIFORNIA MECHANICAL CODE AND THE 2013 CALIFORNIA BUILDINGCODE AND THE 2013 CALIFORNIA BUILDING ENERGY EFFICIENCY STANDARDS
17. OUTSIDE AIR FOR A HEATING OR COOLING SYSTEM SHALL NOT BE TAKEN FROM CLOSER THAN 10 FEET FROM AN APPLIANCE VENT OUTLET, VENT OPENING OF A PLUMBING SYSTEM, OR THE DISCHARGE OUTLET OF EXHAUST FAN, UNLESS THE OUTLET IS 3 FT ABOVE THE OUTSIDE AIR INLET
18. PROVIDE 120 VOLT ELECTRICAL OUTLETS WITHIN 25 FT OF ALL MECH EQUIPT
19. HEATING,VENTILATING,ANDAIR CONDITIONING SYSTEMS SHALL BE BALANCED IN ACCORDANCE WITH ONE OF THE FOLLOWING METHODS IN ACCORDANCE WITH CMC 317 1 REQUIREMENTS
    - A. AABC NATIONAL STANDARDS FOR TOTAL SYSTEM BALANCE
    - B. ACCA MANUAL B
    - C. ASHRAE 111
    - D. NEBB PROCEDURAL STANDARDS FOR TESTING,ADJUSTING ADJUSTING BALANCING OF ENVIRONMENTAL SYSTEMS
    - E. SMACNA HVAC TESTING,ADJUSTING,AND BALANCING
20. MATERIALS EXPOSED WITHIN DUCTS OR PLENUMS SHALL BE NON COMBUSTIBLE OR SHALL HAVE A FLAME SPREAD INDEX NOT TO EXCEED 25 AND A SMOKE DEVELOPED INDEX NOT TO EXCEED 50 WHERE TESTED AS A COMPOSITE PRODUCT IN ACCORDANCE WITH ASTM E84 OR UL 723

DUCTWORK SYMBOLS LEGEND

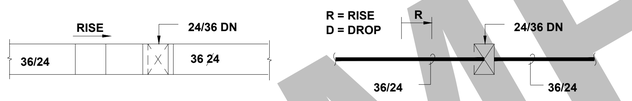
TRANSITIONS



MAIN BRANCH TAKE-OFFS

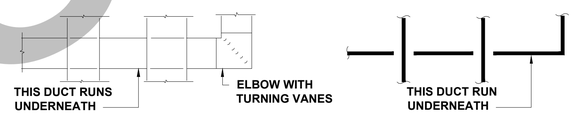


RISERS

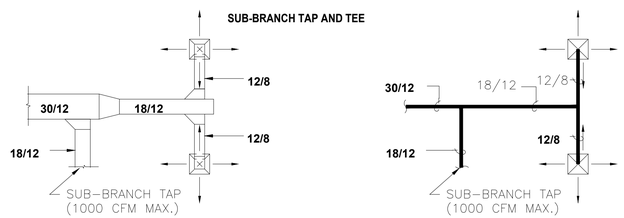


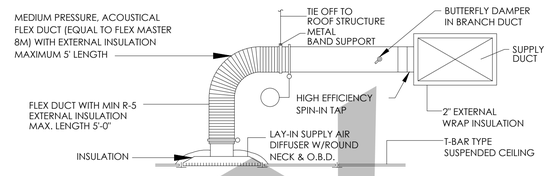
SIDEWALL REGISTERS

DUCT CROSSOVERS

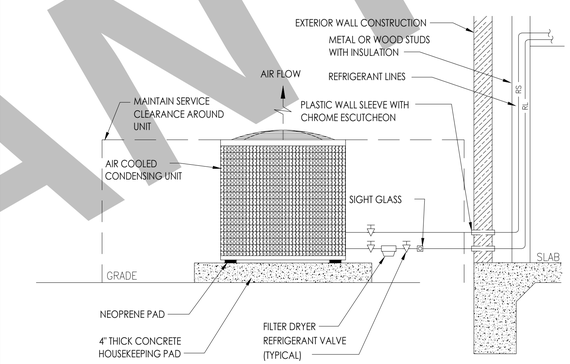


SUB-BRANCH TAP AND TEE

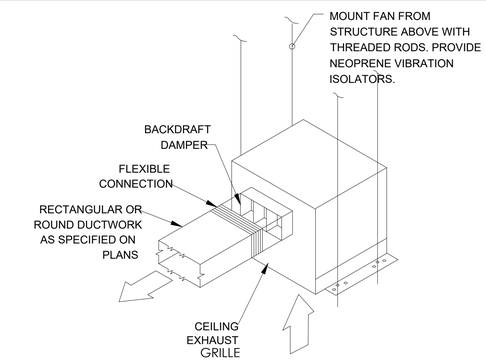




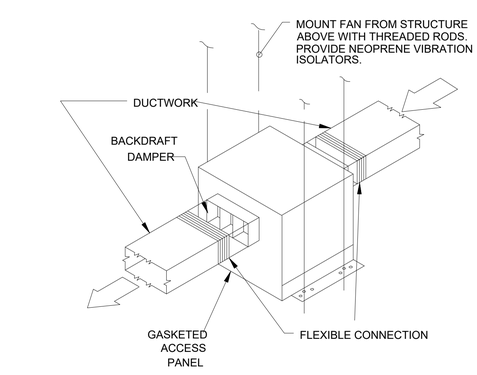
SUPPLY AIR DIFFUSER CONNECTION



OUTSIDE AIR CONDITIONER



CEILING EXHAUST FAN DETAIL



IN-LINE FAN DETAIL

CLIENT:

ADDRESS:

CONFIDENTIALITY STATEMENT:

ALL DRAWINGS AND WRITTEN MATERIALS APPEARING HEREIN CONSTITUTE THE ORIGINAL AND UNPUBLISHED WORK OF THE DESIGNER AND THE SAME MAY NOT BE DUPLICATED, USED OR DISCLOSED WITHOUT CONSENT OF THE DESIGNER.

NOTES:

1. ALL DIMENSIONS HEREIN ARE IN IMPERIAL UNITS UNLESS STATED OTHERWISE.
2. THESE DRAWINGS ARE TO BE READ IN CONJUNCTION WITH ALL RELEVANT DESIGNER, ENGINEER OR SPECIALIST DRAWINGS AND SPECIFICATIONS.
3. THE CONTRACTOR MUST CHECK ALL DIMENSION AT SITE BEFORE COMMENCING WORK.
4. THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING ALL NECESSARY TEMPORARY SUPPORT TO THE BUILDING AND ANY ADJACENT STRUCTURES.

REV. NO.	DESCRIPTION	DATE	BY

PROJECT:

SUNLAND CULTIVATION

TITLE:

MECHANICAL GENERAL DETAILS.

PROJ. NO.	PROJ. ENGR.	SCALE @ 24X36:
		NTS

DRAWING NO.

M 5 . 0 1

REV.

COMPANY

GENERAL ELECTRICAL NOTES

#	DESCRIPTION
1	GENERAL CONTRACTOR SHALL VERIFY FIELD CONDITIONS BEFORE SUBMITTING BID.
2	ALL WORK SHALL BE DONE IN ACCORDANCE WITH 2017 NMEC
3	GENERAL CONTRACTOR SHALL OBTAIN AND PAY FOR ALL PERMITS, CERTIFICATES, ETC. REQUIRED.
4	GENERAL CONTRACTOR SHALL OBTAIN AND PAY FOR BOTH ROUGH AND FINAL UNDER-WRITERS OR OTHER APPROVED INSPECTION AGENCY CERTIFICATES "ELECTRICAL INSPECTION". THESE CERTIFICATES SHALL BE PRESENTED WITH REQUEST FOR FINAL PAYMENT.
5	IT IS THE INTENT OF THESE PLANS TO PROVIDE A COMPLETE OPERATING ELECTRICAL SYSTEM. THIS CONTRACTOR SHALL FURNISH AND INSTALL ALL WIRING, EQUIPMENT, MATERIAL, ETC. REQUIRED, EXCEPT WHERE SPECIFICALLY NOTED AS BEING FURNISHED BY OTHERS. SHOULD THERE BE ANY QUESTIONS CONCERNING RESPONSIBILITY, THEY SHALL BE ADDRESSED TO ARCHITECT PRIOR TO BID. NO EXTRA CHARGES WILL BE ALLOWED.
6	ELECTRICAL SERVICE SHALL BE COORDINATED WITH THE EXISTING FIELD CONDITIONS.
7	CONTRACTOR SHALL MAKE ALL FINAL CONNECTIONS TO ALL CONTROLS, OWNER-SUPPLIED EQUIPMENT, MECHANICAL AND PLUMBING EQUIPMENT AS REQUIRED.
8	REFER TO ARCHITECTURAL DRAWINGS FOR ELEVATION DETAILS. ALL FIXTURE AND DEVICE LOCATIONS SHOWN ON ARCHITECTURAL DRAWINGS SUPERSEDE THOSE SHOWN ON ELECTRICAL PLANS.
9	CIRCUIT NUMBER ON THE DRAWINGS ARE FOR IDENTIFICATION ONLY AND DO NOT INDICATE THE POSITION ON THE PANEL BOARD. CONNECT THE CIRCUITS WITH THE LIGHTEST LOADS AND THE RECEPTACLE CIRCUITS NEAR THE TOP OF THE PANEL, AND THE MORE HEAVILY LOADED CIRCUITS NEAR THE BOTTOM. BALANCE ALL CIRCUITS EVENLY BETWEEN PHASE SO THAT FEEDER WIRES CARRY APPROXIMATELY EQUAL CURRENT. ALL PHASES MUST BE BALANCED WITHIN 10% OR LESS. G.C. SHALL REBALANCE IF NECESSARY.
10	BRANCH CIRCUIT CONDUCTOR INSULATION SHALL BE COLOR CODED AND SHALL BE 600 VOLT. TYPE THHN/THWN.
11	CABLES IN HIGH TEMPERATURE AREAS SHALL HAVE INSULATION TYPE SUITABLE FOR THE TEMPERATURE. CABLES USED IN SPACES FOR ENVIRONMENTAL AIR SHALL CONFORM WITH APPLICABLE NMEC REQUIREMENTS.
12	ALL WIRING USED IN RETURN OR DISCHARGE AIR PLENUMS SHALL BE PLENUM RATED OR INSTALLED PER METHODS APPROVED BY NMEC
13	ALL WIRE AND CABLE CONDUCTORS SHALL BE COPPER WITH INSULATION RATED 600V. CONDUCTORS SIZED #10 AWG AND SMALLER SHALL BE SOLID OD STRANDED, AND CONDUCTORS SIZED LARGER THAN #10 AWG SHALL BE STRANDED WIRE.
14	BRANCH CIRCUITS FOR POWER AND LIGHTING SHALL NOT BE LESS THAN #12 AWG. OR AS NOTED. WIRES ARE TO BE SIZED FOR THE APPROPRIATE VOLTAGE DROPS. SEE WIRE SIZE SCHEDULE ON THIS SHEET.
15	ALL DATA CABLES SHALL BE CAT6, PLENUM RATED. TO BE PROVIDED BY OWNER SELECTED VENDOR. ELECTRICAL WORK SHALL BE TO PROVIDE OUTLET BOXES AND "RING AND STRING" FOR PULLING OF CABLES IN CONCEALED SPACES.
16	CONTROL WIRING SHALL NOT BE LESS THAN #14 AWG UNLESS OTHERWISE NOTED.
17	HOMERUNS SHOWN ARE SCHEMATIC. CONTRACTOR MAY ORIGINATE HOMERUNS FROM DIFFERENT LOCATIONS. ALL WIRE INCLUDING HOMERUNS SHALL BE DELINEATED ON AS-BUILT DRAWINGS.
18	ALL WIRING INSTALLED UNDER THIS CONTRACT SHALL BE TESTED FOR PROPER CONNECTIONS AND SHORT CIRCUITS PRIOR TO THE TURNING OVER OF WORK AS A COMPLETE UNIT.
19	PROVIDE ALL ELECTRICAL SYSTEM GROUNDING IN ACCORDANCE WITH N.E.C. REQUIREMENTS EVEN IF IT IS NOT SHOWN ON THE DRAWINGS. INCLUDE ADDITIONAL GROUNDING CONDUCTORS IN ALL RACEWAYS EVEN THOUGH THE DRAWINGS SHOW ONLY CIRCUIT AND/OR NEUTRALS CONDUCTORS. THE PLUMBING AND PIPING SYSTEM SHALL NOT BE USED AS A GROUND. ALL TRANSFORMER NEUTRALS SHALL BE GROUNDED TO BUILDING STEEL IN ACCORDANCE WITH NMEC 250-70.
20	ALL CONDUITS PASSING THROUGH PARTITIONS ARE TO BE APPROPRIATELY SLEEVED AND SEALED.
21	FURNISH AND INSTALL ALL CONDUIT WITH PULL WIRES AS REQUIRED. ALL OUTLET BOXES SHALL BE STEEL, EXTRA DEEP WITH GROUNDING PIGTAILS. GROUNDING PUSH-CLIPS ARE NOT ACCEPTABLE.
22	ALL PENETRATIONS SHALL BE INSTALLED AND SEALED PER NATIONAL STATE AND LOCAL CODES
23	DO NOT MAKE ANY CHANGES OR SUBSTITUTIONS WITHOUT SPECIFIC WRITTEN APPROVAL FROM THE ARCHITECT OR ENGINEER.
24	GUARANTEE ALL WORK, MATERIAL AND EQUIPMENT FOR A PERIOD OF ONE YEAR FROM THE DATE OF APPROVAL AND FINAL ACCEPTANCE.
25	THIS DESIGN IS BASED ON INITIAL DESIGN DATA. GENERAL CONTRACTOR TO SUPPLY AND INSTALL FEEDERS, FUSES AND CIRCUIT BREAKERS TO MATCH THE NAMEPLATE RATING OF ALL EQUIPMENT. THIS SHALL BE INCLUDED IN THE INITIAL BID PROPOSAL AND NO EXTRAS SHALL BE ENTERTAINED.
26	LABEL ALL JUNCTION BOXES, OUTLETS, LIGHT SWITCH, ETC. WITH CIRCUIT NUMBER ON INTERIOR ON COVER PLATE. USE SELF-ADHESIVE "DYMO" LABEL 1/8" HIGH LETTERS.
27	GENERAL CONTRACTOR SHALL PROVIDE SEISMIC RESTRAINTS AND SUPPORTS FOR ALL FLOOR, WALL, AND CEILING MOUNTED ELECTRICAL EQUIPMENT TO RESIST EARTHQUAKE EFFECTS DETERMINED IN ACCORDANCE WITH THE BUILDING CODE.
28	THE G.C. SHALL PROVIDE ALL EQUIPMENT, MATERIALS AND LABOR TO COMPLETE ALL ELECTRICAL WORK IN A NEAT AND WORKMANLIKE MANNER AND IN ACCORDANCE WITH GOOD COMMERCIAL PRACTICE INCLUDING THE INSTALLATION OF ALL THE EQUIPMENT MATERIALS AND SYSTEMS AND THE FINAL CONNECTIONS TO THE OWNER'S EQUIPMENT AND FIXTURES AS REQUIRED BY THE OWNER. THE G.C. SHALL ALSO FURNISH TEMPORARY WIRING AND LIGHTING TO PROVIDE A MINIMUM OF 25 FC IN WORK AREAS FOR USE OF ALL THE TRADES DURING CONSTRUCTION AND THE INSTALLATION OF THE OWNERS FIXTURES. THE G.C. IS RESPONSIBLE TO REMOVE ALL TEMPORARY WIRING UPON COMPLETION OF CONSTRUCTION OF ALL TRADES.
29	THIS CONTRACTOR SHALL BE RESPONSIBLE TO PROVIDE AND INSTALL ALL SUPPLEMENTARY SUPPORT, INCLUDING SUPPORT STEEL AS REQUIRED TO HANG ALL EQUIPMENT AND LIGHTING FROM THE EXISTING STRUCTURE IN ACCORDANCE WITH THE ARCHITECTURAL/STRUCTURAL SUPPORT AND LOADING CRITERIA.
30	IT IS THE RESPONSIBILITY OF THIS CONTRACTOR TO PROVIDE FULLY DIMENSIONED COORDINATION DRAWINGS FOR ALL OF HIS RESPECTIVE WORK. THESE DRAWINGS MUST BE FULLY COORDINATED WITH ALL EXISTING CONDITIONS. ALL HVAC, PLUMBING, FIRE PROTECTION, ELECTRICAL, LIGHTING, STRUCTURAL AND ARCHITECTURAL SYSTEMS PRIOR TO PREPARING COMPOSITE MULTI DISCIPLINE COORDINATION DRAWINGS.
31	ALL DISCONNECTING MEANS AND EQUIPMENT INDICATED ON THE DRAWING SHALL BE IDENTIFIED BY NAMEPLATE IN COMPLIANCE WITH NMEC 110-22.
32	ALL WIRING FOR THE EMERGENCY LIGHTING AND EMERGENCY SYSTEMS SHALL BE INSTALLED IN ACCORDANCE WITH THE REQUIREMENTS OF NMEC ARTICLE 700.
33	THE WIRING METHODS AND MATERIALS INDICATED IN THE SPECIFICATIONS AND ON THE DRAWINGS SHALL BE INSTALLED AND CONNECTED IN ACCORDANCE WITH THE REQUIREMENTS OF THE NMEC ARTICLE 300.

GENERAL ELECTRICAL NOTES

#	DESCRIPTION
33	THE WIRING METHODS AND MATERIALS INDICATED IN THE SPECIFICATIONS AND ON THE DRAWINGS SHALL BE INSTALLED AND CONNECTED IN ACCORDANCE WITH THE REQUIREMENTS OF THE NMEC ARTICLE 300.
34	THE ELECTRICAL SERVICE AND DISTRIBUTION SYSTEM AS INDICATED ON THE RISER DIAGRAM AND MATERIALS INDICATED IN THE SPECIFICATIONS SHALL BE IN COMPLIANCE WITH THE REQUIREMENTS OF THE NMEC ARTICLE 230, SERVICES.
35	ALL OVER CURRENT PROTECTION SHALL BE IN COMPLIANCE WITH NMEC CODE SECTION 240, OVERCURRENT PROTECTION.
36	ALL GROUNDING REQUIREMENTS OF THE COMPLETE ELECTRICAL DISTRIBUTION SYSTEM AND AS INDICATED IN THE SPECIFICATIONS SHALL BE IN ACCORDANCE WITH THE NMEC CODE ARTICLE 250, GROUNDING AND BONDING.
37	PRIOR TO ANY REQUIRED CUTTING AND PATCHING OF CONCRETE FLOOR AND/OR CUTTING OF ROOF, CONTRACTOR SHALL COORDINATE WITH BUILDING ENGINEER.
38	FOR ALL LIGHTING FIXTURES MOUNTED IN HUNG CEILING THE GENERAL CONTRACTOR SHALL PROVIDE AND INSTALL INDIVIDUAL SUPPORT AT EACH CORNER OF RECESSED LIGHTING TROFFER CONNECTED TO BUILDING STEEL ABOVE ALL CONDUIT AND MC CABLE MOUNTED ABOVE HUNG CEILING SHALL BE INDIVIDUALLY SUPPORTED IN THE SAME FASHION AS PER NEC REQUIREMENTS.
39	DO NOT SCALE FROM THESE DRAWINGS.
40	PLANS ARE PREPARED WITH REQUIRED BRANCH CIRCUITS INDICATED BY CIRCUITS NUMBERS. PROVIDE AND INSTALL ALL CONDUITS, CONDUCTORS, BOXES, MISCELLANEOUS FITTINGS, ETC. FOR A COMPLETE AND OPERABLE SYSTEM (HOME RUN SHOWN). BRANCH CIRCUIT INSTALLATION SHALL COMPLY WITH SPECIFICATIONS AND NMEC
41	ELECTRICAL RECEPTACLE, SWITCH AND CONTROL HEIGHTS (NM COMM. BLDG CODE 1136A.1). RECEPTACLE HEIGHTS: ELECTRICAL RECEPTACLE OUTLETS ON BRANCH CIRCUITS OF 30 AMPERES OR LESS AND COMMUNICATION SYSTEM RECEPTACLES SHALL BE LOCATED NO MORE THAN 48 INCHES (1219MM) MEASURED FROM THE TOP OF THE RECEPTACLE OUTLET BOX OR RECEPTACLE HOUSING NOR LESS THAN 15 INCHES (381MM) MEASURED FROM THE BOTTOM OF THE RECEPTACLE OUTLET BOX OR RECEPTACLE HOUSING TO THE LEVEL OF FINISHED FLOOR OR WORKING FLATFORM. IF THE REACH IS OVEN AN OBSTRUCTION (FOR EXAMPLE, A KITCHEN BASE CABINET) BETWEEN 20 AND 25 INCHES (508 AND 635MM) IN DEPTH, THE MAXIMUM HEIGHT MEASURED AT THE BOX IS REDUCED TO 44 INCHES (1118MM) FOR FORWARD APPROACH, OR 46 INCHES (1168MM) FOR SIDE APPROACH, PROVIDED THE OBSTRUCTION IS NO MORE THAN 24 INCHES (610MM) IN DEPTH. OBSTRUCTION SHALL NOT EXCEED MORE THAN 25 INCHES (635MM) FROM THE WALL BENEATH THE RECEPTACLE.
42	SWITCH AND CONTROL HEIGHTS: (NM COMM. BLDG CODE 1136A.2:) CONTROL OR SWITCHES INTENDED TO BE USED BY THE OCCUPANT OF THE ROOM OR AREA TO CONTROL LIGHTING AND RECEPTACLE OUTLETS, APPLIANCES, ALARMS OR COOLING, HEATING AND VENTILATING EQUIPMENT SHALL BE LOCATED NO MORE THAN 48 INCHES (1219MM) MEASURED FROM THE TOP OF THE OUTLET BOX NOR LESS THAN 15 INCHES (381MM) MEASURED FROM THE BOTTOM OF THE OUTLET BOX TO THE LEVEL OF THE FINISHED FLOOR OR WORKING PLATFORM. IF THE REACH IS OVER A PHYSICAL BARRIER OR AN OBSTRUCTION (FOR EXAMPLE, A KITCHEN BASE CABINET) BETWEEN 20 AND 25 INCHES (508 AND 635MM) IN DEPTH, THE MAXIMUM HEIGHT IS REDUCED TO 44 INCHES (1118MM) FOR FORWARD APPROACH, OR 46 INCHES (1168MM) FOR SIDE APPROACH, PROVIDED THE OBSTRUCTION IS NO MORE THAN 24 INCHES (610MM) IN DEPTH. PHYSICAL BARRIERS OR OBSTRUCTIONS SHALL NOT EXTEND MORE THAN 25 INCHES (635MM) FROM THE WALL BENEATH A CONTROL.

LIGHTING FIXTURE SCHEDULE

Type	Symbol	Type Location Description	Mfr. Catalog #	Lamps	Watts	Voltage	Notes
L1		Ceiling Recessed led (6" round)	"Lithonia Ltg" LDN6 40/05 L06AR LD	LED	20W	120/ 277V	New dimmable lighting fixture
L1E		Ceiling Recessed led (6" round) EM	"Lithonia Ltg" LDN6 40/05 L06AR LD	LED	20W	120/ 277V	New dimmable EM lighting fixture
L2		Surface mtd. 1'W X 4'L lighting fixture	"Lithonia lighting"ZL1N-L4 6-3000LM-35K-MVOLT	LED	25W	120/ 277V	New dimmable lighting fixture
EX		Surface mtd. 1'W X 4'L lighting fixture WITH 90 MIN BATTERY	"Lithonia lighting"ZL1N-L4 6-3000LM-35K-MVOLT-EM	LED	25W	120/ 277V	New EM SIGN lighting fixture
L3		Wall mounted FIXTURE HIGH EFFICIENCY	"Lithonia Ltg" FMABFL 14 20840 F20	LED	20W	120/ 277V	New dimmable lighting fixture
L4		2X4Recessed led	"Lithonia "2TL4-48L-LP83 5	LED	40W	120/ 277V	New dimmable lighting fixture
L5		2X4Recessed led WITH 90 MIN BATTERY	"Lithonia "2TL4-48L-LP83 5-EM	LED	40W	120/ 277V	New dimmable lighting fixture
L6			Luxx 1000 DE 480v	LED	1032W	480V	New dimmable lighting fixture
L7			Luxx 645W LED Pro 120-277v		645W	120/ 277V	New dimmable lighting fixture
L8	EXIT	EXIT SIGN WITH COMBO UNIT	"Lithonia lighting" QUANTUM LED EMERGENCY COMBO (ONE HEAD ONLY)	LED	1.5 W	120	New dimmable lighting fixture
		LED GREEN LIGHT 15.8 WATTS 4' T8 TUBE 95 + CRI					

ELECTRICAL LEGEND

SYMBOL	DESCRIPTION
$	SINGLE POLE SWITCH AND BOX, WALL MOUNTED +44" AFF. LOWER CASE LETTER INDICATES CIRCUIT CONTROLLED BY SWITCH WITH OCCUPANCY SENSOR
D	WALL MOUNTED DIMMER SWITCH, 0-10V DIMMING WITH ON-OFF SWITCH.
$LV	WALL MOUNTED 3 WAY ON, CENTER OFF LOW VOLTAGE SWITCH FOR LCP CONTROLLER LIGHTS.
	RECEPTACLE, DUPLEX 20A, 120V GRD, NEMA 5-20R +18"AFF U.O.N.(WP=WEATHERPROOF, GFCI=GROUND FAULT CIRCUIT INTERRUPTER)
D	DEDICATE RECEPTACLE, DUPLEX 20A, 120V GRD, NEMA 5-20R +18"AFF U.O.N. (WP=WEATHERPROOF, GFI=GROUND FAULT CIRCUIT INTERRUPTER)
USB	USB RECEPTACLE, DUPLEX 20A, 120V GRD, NEMA 5-20R +42"AFF U.O.N.
	RECEPTACLE, SINGLE, 20A, 120V GRD, NEMA 5-20R +18"AFF UON.
	RECEPTACLE, DOUBLE DUPLEX (2) 20A, 120V, GRD - NEMA (2) 5-20R +18"AFF U.O.N.
	RECEPTACLE DUPLEX 20A, 120V GRD NEMA 5-20R FLOOR MOUNTED.
	RECEPTACLE DOUBLE DUPLEX (2) 20A, 120V GRD, NEMA 5-20R UON. FLOOR MOUNTED.
CNT TC BP	CONTROL PANELS FOR FLOWER ROOMS, CONTROL SCENARIO TO BE PROGRAMMED BY THE SPECIALIST
TV	TV OUTLET, WALL MOUNT +60" AFF PROVIDE RING & STRING TO PULL CABLES THRU HOLLOW WALL.
DV	COMBINATION 4-PLEX RECEPTACLE, NEMA 5-20R DOUBLE DUPLEX (1 DUPLEX AUTO CONTROLLED BY OCCUPANCY SENSOR PER T24, (1) DUPLEX UNCONTROLLED), & TYPE 6 VOICE/DATA OUTLET, FLOOR MOUNTED. PROVIDE MIN. 3/4" TEL/DATA CONDUIT WITH PULL WIRES.
	4-PLEX RECEPTACLE, NEMA 5-20R DOUBLE DUPLEX (1 DUPLEX AUTO CONTROLLED BY OCCUPANCY SENSOR PER T24, (1) DUPLEX UNCONTROLLED), +18"AFF, U.O.N. SEE NOTE 2.
	DUPLEX RECEPTACLE, NEMA 5-20R OCCUPANCY SENSOR CONTROLLED, +18"AFF. SEE NOTE 2.
GFCI	GFCI DUPLEX RECEPTACLE ABOVE COUNTER LEVEL, NEMA 5-20R.
GFCI	GFCI DUPLEX RECEPTACLE ABOVE COUNTER LEVEL, VACANCY SENSOR CONTROLLED, NEMA 5-20R.
	SPECIAL PURPOSE CONNECTION FOR ELECTRICAL EQUIPMENT. VERIFY CONNECTION TYPE AND WIRING REQUIREMENTS PRIOR TO ROUGH-IN.
EP	CLASS 1, DIVISION 1 RATED EXPLOSION-PROOF OUTLET. SEE ADDITIONAL NOTES ON SHEET E.3.1.
	RECEPTACLE, 120V/240V, 3PH, 4W, GRD, RATING AS INDICATED IN PLANS.
	RECEPTACLE 20A, 480V, 3PH, 4W, GRD, NEMA L22-20R, +18"AFF UON.
	DUPLEX RECEPTACLE 20A, 120V, GND (5-20R U.O.N), SUSPENDED BY TYPE S.O. CORD WITH GRIPS AT EACH END.
	DOUBLE DUPLEX RECEPTACLE 20A, 120V, GND (5-20R U.O.N), SUSPENDED BY TYPE S.O. CORD WITH GRIPS AT EACH END.
	TWIST-LOCK RECEPTACLE 20, 250V, SINGLE PHASE (L6-20R U.O.N), SUSPENDED BY TYPE S.O. CORD WITH GRIPS AT EACH END.
OS	OCCUPANCY SENSOR LOW VOLTAGE CEILING MOUNTED FOR ROOM CONTROLLER.
OS	OCCUPANCY SENSOR LOW VOLTAGE WALL MOUNTED FOR ROOM CONTROLLER.
DS	CEILING MOUNTED DAYLIGHT SENSOR.
J	JUNCTION BOX CEILING MOUNTED, SIZE TO CODE, TAPE AND TAG WIRES.
J	JUNCTION BOX WALL MOUNTED, SIZE TO CODE, TAPE AND TAG WIRES.
	ELECTRICAL PANELBOARD, SURFACE OR FLUSH MOUNTED (277/480V).
	ELECTRICAL PANELBOARD, SURFACE OR FLUSH MOUNTED (120/208V).
	SPECIAL PURPOSE ELECTRICAL PANELBOARD, SURFACE OR FLUSH MOUNTED.
	TRANSFORMER - DRY TYPE.
	FUSED DISCONNECT SWITCH WITH DUAL ELEMENT FUSES. SWITCH AND FUSES RATING PER NAMEPLATE OF SERVED UNIT.
	NON-FUSED DISCONNECT SWITCH, RATING PER NAMEPLATE OF SERVED UNIT.
	MAGNETIC MOTOR STARTER, NEMA RATING AS REQUIRED PER SERVED UNIT.
P	WALL MOUNTED JUNCTION BOX FOR PRE-WIRED FURNITURE POWER SYSTEM CONNECTION. PROVIDE POWER WHIP WITH TERMINATION PLUG TO MATCH FURNITURE SYSTEM CONNECTOR. LOCATE BOX AS LOW AS POSSIBLE. FIELD COORDINATE FINAL LOCATION.
C	COMBINATION TELEPHONE AND DATA OUTLET, WALL MOUNTED AS LOW AS POSSIBLE FOR FLEXIBLE CONNECTION TO FURNITURE SYSTEM.
C P	FLOOR MOUNTED FURNITURE FEEDS W/POWER & TELE/DATA PORT CAPACITY FOR ELECTRIFIED DESKS PER CLIENT'S REQUIREMENTS.
C P	POWER POLES W/POWER & TELE/DATA PORT CAPACITY FOR ELECTRIFIED DESKS PER CLIENT'S REQUIREMENTS.
SD	Smoke Detector
C	Carbon Monoxide Detector
	LEGEND NOTES: 1. MOUNTING HEIGHT INDICATED ARE AFF TO CENTER OF PLATE. INCASE OF CONFLICT, GENERAL NOTES 41 & 42 SHALL PREVAIL. 2. NOT ALL SYMBOLS AND ABBREVIATIONS ARE NECESSARILY USED IN THIS PROJECT.

WIRE SCHEDULE AND NOTES

LOAD PER PH (KVA)	WIRE SIZE (AWG)	MAXIMUM LENGTH OF BRANCH CIRCUIT PER UTILIZATION VOLTAGE (120, 1PH, MAX V.D. 3%)	(240, 1PH, MAX V.D. 3%)	(240, 3PH, MAX V.D. 3%)	NOTES AND REMARKS
< 1.92	#12	56 FT	85 FT	98 FT	5
	#10	94 FT	141 FT	163 FT	5
	#8	144 FT	217 FT	250 FT	5
	#6	230 FT	345 FT	398 FT	5
< 1.44	#12	75 FT	113 FT	130 FT	5
	#10	125 FT	188 FT	217 FT	5
	#8	192 FT	289 FT	334 FT	5
	#6	306 FT	460 FT	531 FT	5
< 1.26	#12	86 FT	129 FT	149 FT	
	#10	143 FT	215 FT	248 FT	
	#8	220 FT	330 FT	381 FT	
< 1.08	#12	100 FT	150 FT	173 FT	
	#10	167 FT	250 FT	289 FT	
	#8	256 FT	385 FT	445 FT	
< 0.9	#12	120 FT	180 FT	240 FT	
	#10	200 FT	300 FT	347 FT	
<0.72	#12	150 FT	225 FT	260 FT	
	#10	250 FT	376 FT	434 FT	

#	NOTES
1	CONTRACTOR SHALL REFER TO THIS TABLE PRIOR TO START OF BRANCH CIRCUIT ROUGH-IN.
2	CONTRACTOR SHALL USE THE APPROPRIATE WIRE SIZE IN CONJUNCTION WITH THE LENGTH OF THE PROPOSED FIELD VERIFIED ROUTING OF BRANCH CIRCUIT WIRING (INCLUDING VERTICAL & LATERAL RUN, ROUTED PARALLEL/PERPENDICULAR TO THE BUILDING STRUCTURE).
3	SEE PANEL SCHEDULE FOR THE CORRESPONDING KVA LOAD PER PHASE OF A PARTICULAR BRANCH CIRCUIT.
4	RESISTANCE VALUES USED ARE FOR UNCOATED COPPER WIRES IN STEEL CONDUIT. 75 DEGREE C., OPERATING AT 60HZ.
5	THE VALUES IN "120V, 1PH" COLUMN IS TO BE USED FOR GENERAL PURPOSE RECEPTACLE LOADS.

ABBREVIATIONS AND TAGS

ABB.	DESCRIPTION	ABB.	DESCRIPTION
EWH	ELECTRIC WATER HEATER	SD	SMOKE DETECTOR
(E)	EXISTING TO REMAIN	TEL	TELEPHONE
EC	ELECTRICAL CONTRACTOR	TX	TRANSFORMER
FA	FIRE ALARM	TV	TELEVISION
FMT	FLEXIBLE METALLIC TUBING	UAC	UNDER ANOTHER CONTRACT
GC	GENERAL CONTRACTOR	UAS	UNDER ANOTHER SECTION
GFI	GROUND FAULT INTERUPTER	UON	UNLESS OTHERWISE NOTED
IG	ISOLATED GROUND	V.D.	VOLTAGE DROP
LL	LANDLORD	W	WIRE
LV	LOW VOLTAGE	WP	WEATHERPROOF
AC-1	MECHANICAL UNIT TAG. SEE MECHANICAL DRAWINGS FOR ADDITIONAL DESCRIPTION.	E-4 4	DETAIL TAG. REFER TO DETAIL 4 ON SHEET NUMBER E-4.

D S ONE WAY ONE GANG LIGHT SWITCH - WALL MOUNTED @ +48" A.F.F.L. D: DENOTES SWITCH WITH DIMMER

D S 3 TWO WAY ONE GANG LIGHT SWITCH - WALL MOUNTED @ +48" A.F.F.L. D: DENOTES SWITCH WITH DIMMER

F S ONE WAY ONE GANG SWITCH FOR TOILET EXHAUST FAN - WALL MOUNTED @ +48" A.F.F.L

CLIENT:

ADDRESS:

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3. THE CONTRACTOR MUST CHECK ALL DIMENSION AT SITE BEFORE COMMENCING WORK.
4. THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING ALL NECESSARY TEMPORARY SUPPORT TO THE BUILDING AND ANY ADJACENT STRUCTURES.

REV. NO.	DESCRIPTION	DATE	BY

PROJECT:
SUNLAND CULTIVATION

TITLE:
ELE. GENERAL NOTES AND SPECIFICATIONS

PROJ. NO.	PROJ. ENGR.	SCALE @ 24X36:
		NTS

DRAWING NO.
E 0 . 0 0

REV.

BOZZUTO

ELECTRICAL SPECIFICATIONS

PART 1 — GENERAL

1.01 SCOPE OF WORK:
Furnish and install all materials and equipment and provide all labor, tools, transportation, superintendence and services required and necessary to complete the work shown on the drawings and/or specified herein.
Also include all other work and miscellaneous items, not specifically mentioned, but reasonably inferred for a complete installation including all accessories and appurtenances required for testing the system. It is the intent of the drawings and specifications that all systems be complete, and ready for operation.

1.02 REGULATORY REQUIREMENTS:
Code compliance is mandatory. Nothing in these Drawings and Specifications work not conforming to these codes. Where work is shown to exceed minimum code requirements, comply with drawings and specifications. All work and materials shall comply with the latest rules, codes and regulations, including, but not limited to the following:
1. Occupational Safety and Health Act Standards (OSHA).
2. NFPA #70: National Electric Code (NEC).
3. NFPA #101: Life Safety Code.
4. State Fire Marshal.
5. Local Utilities Companies.

1.03 LICENSE, FEES AND PERMITS:
Electrical contractor shall pay for all licenses, permits and inspection fees required by the authority having jurisdiction and shall arrange for all required inspections.

1.04 SAFETY AND INDEMNITY:
The Contractor shall be solely and completely responsible for conditions of the job site, including safety of all persons and property during performance of work. This requirement will apply continuously and not be limited to normal working hours. No act, service, drawing review or construction review by the Owner, the Engineers or their Consultants, is intended to include review of the adequacy of the Contractor's safety measures, in, on, or near the construction site.

1.05 DRAWINGS AND SPECIFICATIONS:
All drawings and all Divisions of these specifications shall be considered as a whole and work of this Division shown anywhere therein shall be furnished under this Division. Drawings are diagrammatic and indicate the general arrangement of equipment and wiring. Most direct routing of conduits and wiring is not assured. Exact requirements shall be governed by conditions of the job. Consult all other drawings in preparation of the bid.
Extra lengths of wiring or addition of pull or junction boxes, etc., necessitate by such conditions shall be included in the bid.

1.06 CONDITIONS AT SITE:
The electrical contractor shall have examined the site and familiarized themselves with all discernible existing conditions. No extra payment will be allowed for work required because of these conditions, whether specifically mentioned or not.

1.07 WORKMANSHIP AND CONTRACTOR'S QUALIFICATIONS:
Only quality workmanship will be accepted. Haphazard or poor installation will be cause for rejection of work.

1.08 SHOP DRAWINGS AND MATERIALS LISTS:
Submit to Owner in a single package six (6) copies of complete shop drawings and materials list, as noted below, for review within fifteen (15) days after award of contract.
Submittals required as follows:
1. Wiring devices: switches, receptacles, device plates.
2. Enclosures for utility company metering.
3. Main fused disconnect switch.
4. Panelboards.
5. Disconnect switches.
6. Lighting fixtures, lamps and lighting control equipment.

1.09 SUBSTITUTIONS:
One or more makes of materials or methods may have been specified to establish the standard of quality, workmanship, finish and design required, but other materials or methods equal in quality, workmanship, finish, design, and guaranteed performance, will be accepted. However, all changes and substitutions shall be requested in letter form and shall be accompanied with a statement of the amount of money to be returned to the contract if the substitution is permitted.
No work involving materials submitted for substitution shall proceed until written acceptance is received from the Owner. The Owner is the sole judge of acceptability of preferred substitutions. If a substitution item is permitted, and any re-design effort is thereby necessitated, the required redesign shall be at the Contractor's expense.

1.10 COORDINATION:
Coordinate work with other trades to avoid conflict and to provide correct rough-in and connection for equipment furnished under other trades that require electrical connections. Inform Contractors of other trades of the required access to and clearances around electrical equipment to maintain service ability and code compliance.
Verify equipment dimensions and requirements with provisions specified under this Section. Check actual job conditions before fabricating work. Report necessary changes in time to prevent needless work. Changes or additions, subject to additional compensation, which are made without written authorization and an agreed price, shall be at the Contractor's risk and expense.

1.11 CUTTING AND PATCHING:
All cutting and patching required for work of this Division is included herein.
Coordination with General Contractor and other trades is imperative. Contractor shall bear the responsibility for and the added expense of adjusting for improper holes, supports, etc.

1.12 ACCEPTANCE DEMONSTRATION:
Upon completion of the work, at a time to be designated by the Owner, the Contractor shall demonstrate for the Owner the operation of the electrical installation including any and all special items installed by him or installed under his supervision. Properly set automatic time switches to perform switching operations in accordance with schedules provided by the Owner's representative, and demonstrate (using the manufacturer's operating instructions) how to override and/or test time switches programming.

1.13 RECORD DRAWINGS, EQUIPMENT DATA:
Maintain one set of clean working drawings at the job site and enter daily such "as-built" information as feeder and service routes, pull box locations and changes in layout or arrangement which occur during construction.
Deliver completed drawings to the Owner.
Deliver to the Owner's representative three copies of data sheets or other current manufacturers' publications for each item of electrical equipment furnished for the project including at least these data:
1. Technical description and replaceable parts list.
2. Physical description and installation instructions.
3. Main fused disconnect switch.
4. Manufacturer's Warranty.

1.14 CLEAN-UP:
Rid the premises of scrap materials, trash and debris both during construction and at completion of the project.
Leave the building and surrounding area in a clean and orderly condition.

1.15 GUARANTEE:
Guarantee the installation free from defects of workmanship and materials for a period of one year after Date of Certification of final payment and promptly remedy any defects developing during this period, without charge.

1.16 TEMPORARY SERVICES:
Provide adequate and safe temporary electrical power and lighting throughout the construction and finishing of the premises. In addition to special or unusual requirements, provide at least these items:
1. Three 20-amp circuits for construction power tools. Provide GFI temporary circuits with coverplates to meet OSHA requirements.
2. Three or more light strings suspended approximately one foot below the height of finish ceiling with lamps spaced not more than twelve feet on centers. Strings shall be run the length of the store space parallel to the demising walls, with one string within eight feet of each wall and one (or more) intermediate string(s) arranged to limit the spacing between rows to sixteen feet or less.
3. Flood lighting and task lighting for painting and other finish work. When permanent electrical service is operable, disconnect and remove from the premises the materials and equipment used for temporary power and lighting, and restore modifications and repair damage caused by the installation, use or removal of temporary service provisions.

PART 2 — PRODUCTS

2.01 MATERIAL APPROVAL:
All materials must be new and bear Underwriter's Laboratories label. Materials that are not covered by UL testing standards shall be tested and approved by an independent testing laboratory or a governmental agency.
Material not in accordance with these specifications may be rejected either before or after installation.

2.02 CONDUITS AND OTHER RACEWAYS:
A. Rigid Steel: Hot-dipped galvanized.
B. Intermediate Metal Conduit (IMC): Hot-dipped galvanized.
C. Electrical Metallic Tubing (EMT): Electro-galvanized.
D. Wireway: Code gauge steel, with knockouts and hinged cover, corrosion resistant gray baked enamel finish.
E. Provide fittings and accessories approved for the purpose equal in all respects to the conduit or raceway.
EMT connectors and couplings shall be steel setscrew type indoors and steel compression type in wet locations and outdoors.

2.03 WIRES AND CABLES:
A. For power and lighting system 600V or less:
1. Conductor: minimum size #12 AWG.
a. #12 and #10 AWG solid copper.
b. #8 AWG and larger shall be stranded copper.
2. Insulation type:
a. #12 to #1 AWG: THWN for wet or underground and THHN for dry locations.
b. #1/0 through #4/0 AWG: XHHW (55 mils).
c. #250 MCM and larger: XHHW (65 mils).
d. Green wire: TW.
B. For signal and communications circuit:
1. Special cables shall be as specified on drawings.
2. Conductors for general use shall be stranded copper conductor, #16 AWG minimum, with THWN insulation for underground or wet locations and THHN insulation for dry locations.
C. Acceptable Products: General Electric, Anaconda, Okonite, Paranite or Triangle products conforming or exceeding applicable IPCEA standards.

2.04 OUTLET BOXES, JUNCTION AND PULL BOXES:
A. Outlet boxes: 4" square x 1-1/2" deep (or larger) galvanized sheet steel KO-type with plaster ring and cover for general interior use and cast metal type FS or FD with matching screw covers for exterior and exposed interior locations (gasketed in damp or wet locations).
B. Junction boxes shall be same as outlet boxes up to 42 cu. in. and codegauge steel in larger sizes with surface or flush-type screw-mounted trim covers, hinged doors and covers inhibitor-primed and painted inside out.
C. Pull boxes shall be same as junction boxes unless indicated otherwise on the drawings, with covers.
D. Telephone outlet boxes shall be the type and size required by the serving telephone company but not smaller than 4-11/16" square x 2-1/8" deep with single-gang ring and Sierra #S-754N split plate bushing.

2.05 WIRING DEVICES AND PLATES:
Wiring devices and plates shall be by Pass and Seymour or approved equal.
1. Standard design:
a. Switch and receptacles devices shall be plastic bodies, color per architect.
b. Wall plates shall be metal type 430, stainless steel, color per architect.
c. Isolated ground receptacles shall be white with orange triangle as required per NEC, manufactured by "Leviton" # 5362-IGW or approved equal.

2.06 CONDUIT HANGERS:
For individual conduit runs not directly fastened to the structure, use rod hangers manufactured by Caddy, Unistrut or Powerstrut.
For multiple conduit runs, use Unistrut or Powerstrut trapeze type conduit support designed for maximum deflection not greater than 1/8".

2.07 WIRE CONNECTORS:
For wire sizes #8 AWG and smaller: Insulated pressure type (with live spring) rated 105 degrees C, 600V, for building wiring and 1000V in signs or fixtures, Scotchlok or Ideal. For wire size #6 AWG and larger: T & B or equivalent compression type with 3M #33+ or Plymouth "Slipknot Grey" tape insulation.

2.08 PANELBOARDS:
A. Construction: Cabinets shall be of code gauge, galvanized steel, surface or flush mounted as indicated. Doors shall be of cold-rolled steel with concealed hinges and flush catch and lock. All panels shall be keyed alike. Panels located adjacent to each other shall have identically sized enclosure and trims.
Minimum panel width shall be 20". Finish exposed part with one coat of primer and one coat of light grey enamel suitable for overpainting in field if desired.
B. Bus Bars: Provide ground block with full complement of terminals in addition to insulated neutral bus.
Future breaker spaces shall have complete provision including busses and connecting hardware.
C. Manufacturers: Panelboards shall be General Electric Type "AQ" or type "AE" or equivalent products of Eaton Cutler-Hammer, Square-D or Siemens-ITE.
D. Circuit Breakers: Shall be quick-make, quick-break, molded case type:
1. 120/240 Volt Panels: Shall be General Electric Type "Q" line, bolt-on type, with minimum symmetrical interrupting capacity as shown.
2. Provide multi-pole units with common trip element.
3. Circuit breakers used on "ON-OFF" control of fluorescent lighting (panelboard switching) shall be Underwriters' Laboratories listed and marked "SWD" to indicate their suitability.
E. Identification: Provide screwed-on (no adhesives) bakelite or photo-etched metallic nameplate identification on outside of each panel showing panel designation, voltage and phase in minimum 1/8" high letters. Each panel shall contain a metal-framed circuit directory inside cover, with plastic protector.
F. Complete shop drawings are required. See Article 1.08.

2.09 INDIVIDUALLY MOUNTED MOTOR CONTROLLERS:
A. For Polyphase Motors: Combination motor circuit protector and magnetic starter, with 3-leg overload protection. Provide two interlock contacts of the interchangeable open-close type. Provide hand-off-automatic selector switch, motor running pilot light and reset button in cover. Circuits 300V and over shall be provided with 120V control transformers.
B. Starters for fractional horsepower 120V motors shall be manual type unless shown otherwise, equipped with built-in overload protection.
C. Acceptable manufacturers: General Electric, Siemens, Square D, Eaton, and Allen Bradley.

2.10 LIGHTING:
A. Furnish and install all fixtures complete, including lamps and ballast ready for service.
B. Supports: Proper supports and mounting accessories, such as hangers, stems, yokes, plaster frames, etc. shall be provided as required by the type of ceiling installed. Where swivel canopies or ball aligners are specified, they shall couse fixture to hang plump regardless of ceiling slope.
C. Fixture Designation: Fixture types are designated on drawings. Where only one fixture designation is shown, it applies to all fixtures in that room or area. For exact fixture count and location refer to reflected ceiling plan.

2.11 MISCELLANEOUS MATERIALS:
A: Safety Switches:
Heavy duty type, 600V, horsepower rated for motors, fused or non-fused as required. Mount in enclosure with NEMA rating as required for the specific application General Electric, Square D or Eaton.

PART 2 — PRODUCTS

2.12 DRY TYPE TRANSFORMERS:
General:
Equipment shall conform to or exceed requirements of NEMA, ANSI Standard C89.2 for Dry Type Transformers for General Applications. Acceptable products are those of General Electric Company's "QL," Line or equivalent Square D, Siemens-ITE, or Eaton.
Electrical Ratings:
1. Secondary windings voltage: 480Y/277V Volts, 3-Phase, WYE Grounded.
Primary windings voltages: 208Y/120V Volts, 3-Phase .
Frequency: 60 Hz.
KVA rating: As shown on drawings.
Taps: Six (6) 2.5% full capacity taps; 2 above and 4 below, rated voltage.
Impedance: For transformers larger than 75 KVA, 4.5% minimum, 5.75% maximum.
2. Winding temperature rise shall be 150 degrees Centigrade in accordance with UL Specification Article 506.
3. Transformer shall be capable of operating at 100% of nameplate rating continuously while in an ambient temperature not exceeding 40 degrees Centigrade.
4. Transformer shall meet the daily overload requirements of ANSI Standard C57.96.
Vibration Isolation, Factory-Installed:
Provide neoprene rubber pads to isolate core and coil assembly from transformer enclosure.
Installation:
1. Anchor transformer securely with minimum 1/2" diameter bolts. Strength of bolts used to secure the transformer shall be sufficient to resist shear and uplift produced by force equal to 1/2 of the equipment mass applied horizontally at center of gravity.
2. Provide 1" thick high resiliency pads to isolate transformer from floor or platform. Korfund "Elasto Rib" or equivalent.
3. Use flexible conduits at least 24" long for electrical connections.
4. Provide grounding of each transformer secondary including all conduits, wires, and connectors in accordance with NEC 250-26 and any local additional regulations.

PART 3 — EXECUTION

3.01 GENERAL:
A: Electric system layouts indicated on the drawings are generally diagrammatic and shall be followed as closely as actual construction and work of other trades will permit. Govern exact routing of cable and wiring and the locations of outlets by the structure and equipment served. Take all dimensions from architectural drawings.
B. Consult all other drawings, verify scales and report any dimensional discrepancies or other conflicts with Owner before submitting bid.
C. All home runs to panelboards are indicated as starting from the outlet nearest the panel and continuing in the general direction of that panel. Continue such circuits to the panel as though the routes were completely indicated.
Terminate homeruns of signal, alarm, and communication systems in a similar manner.
D. Avoid cutting and boring holes through structure or structural members wherever possible. Obtain prior approval of Owner and conform to all structural requirements when cutting or boring the structure is necessary and permitted.
E. Furnish and install all necessary hardware, hangers, blocking, brackets, bracing, runners, etc. required for equipment specified under this Section.
F. Provide necessary backing required to insure rigid mounting of outlet boxes.

3.02 WIRING METHODS:
A. Install all wiring in raceway or use MC cable. Where approved by all Applicable codes.Conduit shall be rigid steel, IMC or EMT as follows:
1. Above ground: Use rigid steel, IMC or EMT.
a. Wet locations: Rigid steel or IMC only.
b. Locations subject to mechanical injury: Rigid steel or IMC only.
c. Dry locations and not subject to mechanical injury: EMT, IMC or rigid steel conduit.
2. Underground: Use rigid steel.
B. Use flexible conduits in the following applications:
1. Recessed lighting fixtures.
2. Motor connections.
3. At building joints.
At wet locations, flexible conduit shall be liquid tight type.

3.03 INSTALLATION OF CONDUITS:
A. General:
1. Run all conduit concealed unless otherwise noted or shown.
2. Run all conduit parallel to or at right angles to center lines of columns and beams.
3. Conduits above ceilings shall not obstruct removal of ceiling tiles, lighting fixtures, air diffusers, etc.
4. Conduits shall not cross any duct shaft or area designated as future duct shaft horizontally. Conduit risers when allowed in duct shaft must be coordinated with Mechanical work to avoid any conflict.
B. Conduit Supports:
1. Support conduits with Underwriter's Laboratories listed steel conduit supports at intervals required by the National Electric Code. Wires or sheet metal strips are not acceptable for conduit support. Use conduit hangers for all conduits not directly fastened to structure and for all multiple conduit runs. Do not attach any conduit to mechanical ducts or pipes.
2. Individual conduits 1/2" and 3/4" size for lighting may be supported from ceiling support wires with Caddy clips only if acceptable to local code. Only one conduit is permitted to be attached to any ceiling support wire. Hang such conduit so as not to affect level of ceiling.
3. Avoid attaching conduit to fan plenums. When it is necessary to support conduit from fan plenum, provide a length of flexible conduit between portion attached fan plenum and portion attached to the building to minimize transmission of vibration to the building structure.

3.04 CONNECTIONS TO EQUIPMENT:
A. General:
1. Furnish and install required power supply conduit and wiring to all equipment. See below for other wiring required.
2. Furnish and install a disconnect switch immediately ahead of and adjacent to each magnetic motor starter or appliance unless the motor appliance is located adjacent and within sight of the serving panelboard, circuit breaker or switch. Verify all equipment nameplate current ratings prior to installation.
3. Install all rough-in work for equipment from approved shop drawings to suit the specific requirements of the equipment.
4. Furnish and install manual thermal protection for all motors not integrally equipped with thermal protection.
5. Furnish 120 Volt power to each control panel and time switch requiring a source of power to operate.

3.05 WIRE COLOR CODE:
Color coding shall be continuous for wire #12 through #10 AWG. Phase conductors #8 and larger and nconductors of any size in cable assemblies may have colored phasing tape at terminations.
Color code wires as follows:

Voltage	Phase A	Phase B	Phase C	Neutral	Ground
120/208V	Black	Red	Blue	White	Green
277/480V	Brown	Orange	Yellow	Gray	Green

PART 3 — EXECUTION

3.06 INSTALLATION OF WIRES:
A. Pull no wire into any portion of the conduit system until all construction work which might damage the wire has been completed.
B. Install all wire continuous from outlet to outlet or terminal to terminal. Splices in cables when required shall be made in handholes, pull boxes or junction boxes.
Make branch circuit splices in outlet boxes with 8" of correctly color-coded tails left in the box.
C. Splices in wires and cables shall be made utilizing materials and methods described herein before.
D. Make all ground, neutral and line connections to receptacle and wiring device terminals as recommended by manufacture. Provide ground jumper from outlet box to ground terminal of devices when the device is not approved for grounding through the mounting screws.
E. Provide Brady wire markers where number of conductors in a box exceeds four.
F. Megger and record insulation resistance of all 600 Volt insulated conductors size #4/0 and larger using 500 Volt megger for one minute. Make tests with circuits isolated from source and load.

3.07 IDENTIFICATION:
A. Provide nameplates for switchgears, panelboards, and all similar devices.
Nameplates shall be screwed (no adhesives) engraved bakelite or photo-etched metallic nameplate identification showing panel designation, voltage and phase in minimum 1/4" high letters.
B. Provide Dymo labels on all lighting switches and convenience and special purpose receptacles to show panel and circuit number to which the device is connected.
C. Each panelboard shall contain a metal-framed circuit directory inside cover, with plastic protector.
D. Panelboard Schedule: After completion of work, provide typewritten updated panboard schedules for all panelboards.

3.08 REMODELING WORK:
A. Existing electrical wiring which will not be made obsolete and which will be disturbed due to construction changes required by this contract shall be restored to operating condition. Where construction changes require, outlets and conduit runs shall be relocated.
Extend conduits and pull in new wiring or install junction boxes and splice in new wiring.
B. Outlets from which fixtures, switches, receptacles, and/or other electrical devices are moved and which are not replaced or reused shall be removed, where outlets boxes, etc., are completely removed, the contractor shall cut off conduits and remove wiring.
C. Where conduits extending through floors are to be abandoned, the contractor shall cut and cap or plug conduit, and the conduit shall not protrude above the floor.
D. Where existing conduit is to be abandoned, the conduit shall be removed if it is exposed, in a crawl space or in accessible ceiling.
Where it is impossible to remove the conduit, it shall be cut off and capped or plugged.
E. Remove all existing wiring not reused or required to maintain continuity circuits to remain.
F. The contractor shall be held fully responsible for the proper restoration of all existing surfaces requiring patching, plastering, painting and/or other repairs due to the installation of electrical work under the terms of this specification.
Close all openings, repair all surfaces, etc., as required.
G. Maintain circuit continuity to areas outside of this work. Provide new conduit and conductors as required to maintain continuity and maintain area as existing.

3.09 GROUNDING:
A. Electrical service and separately derived alternating current system shall be grounded in accordance with NEC Article 250-3 to 250-26, inclusive.
B. Ground non-current carrying metal parts of electrical equipment enclosures, frames, conductor raceways or cable trays to provide a low impedance path for line-to-ground fault current and to band all non-current carrying metal parts together. Provide ground conductor in each raceway system in addition to conductors shown.
Equipment ground conductor shall be electrically and mechanically continuous from the electrical circuit source to the equipment to be grounded. Size ground conductors per NEC Article 250-95 unless larger conductors are shown on drawings.
C. Grounding conductors shall be identified with green insulation. Where green insulation is not available on larger sizes, black insulation shall be used and suitable identified with green tape at each junction box or device enclosure.

END OF SECTION

GENERAL COMMENTS:

1- ELECTRICAL DEVICE INSTALLATION SHALL COMPLY WITH ACCESSIBILITY CODES ADOPTED FOR NEW MEXICO. SPECIFICALLY; MOUNT APPLICABLE SWITCHES, RECEPTACLES, AND ENVIRONMENTAL CONTROLS SO THAT THEY ARE MOUNTED WITH THE TOP OF THE DEVICE NO HIGHER THAN FORTY-EIGHT INCHES (48INCHES) ABOVE THE FINISHED FLOOR AND THE BOTTOM OF THE DEVICE NO LOWER THAN FIFTEEN INCHES (15INCHES) ABOVE THE FINISHED FLOOR. ELECTRICAL DEVICES ABOVE A COUNTERTOP OR OTHER OBSTRUCTION SHOULD COMPLY WITH ICC/ANSI 117.1-2015 SECTION 308.

2- ABANDONED POWER WIRING WILL BE REMOVED BACK TO THE SOURCE. THE ACCESSIBLE PORTIONS OF ABANDONED CONDUIT/TUBING AND EQUIPMENT SHALL BE REMOVED. THE ACCESSIBLE PORTIONS OF ABANDONED CABLES (VOICE, DATA, VIDEO, ALARM, ETC.) SHALL BE REMOVED.

3- EMERGENCY EGRESS LIGHTING SHALL COMPLY WITH 2015 NEW MEXICO COMMERCIAL BUILDING CODE* (SECTION 1006) AND THE 2017 NEC 700.12(F).

4- LIGHTING CIRCUITING AND SWITCHING ARE COMPLYING WITH THE 2018 NEW MEXICO ENERGY CONSERVATION CODE

5-OUTDOOR LIGHTING OUT-OF-SCOPE, UNDER SEPARATE PERMIT FOR SITE IMPROVEMENTS

6-THE 'SHOW WINDOWS' MEP WORK WILL BE TENANT IMPROVEMENTS TO THE RETAIL SPACE AND ARE "OUT-OF-SCOPE, UNDER SEPARATE PERMIT FOR TENANT IMPROVEMENTS

COPY

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REV. NO.	DESCRIPTION	DATE	BY

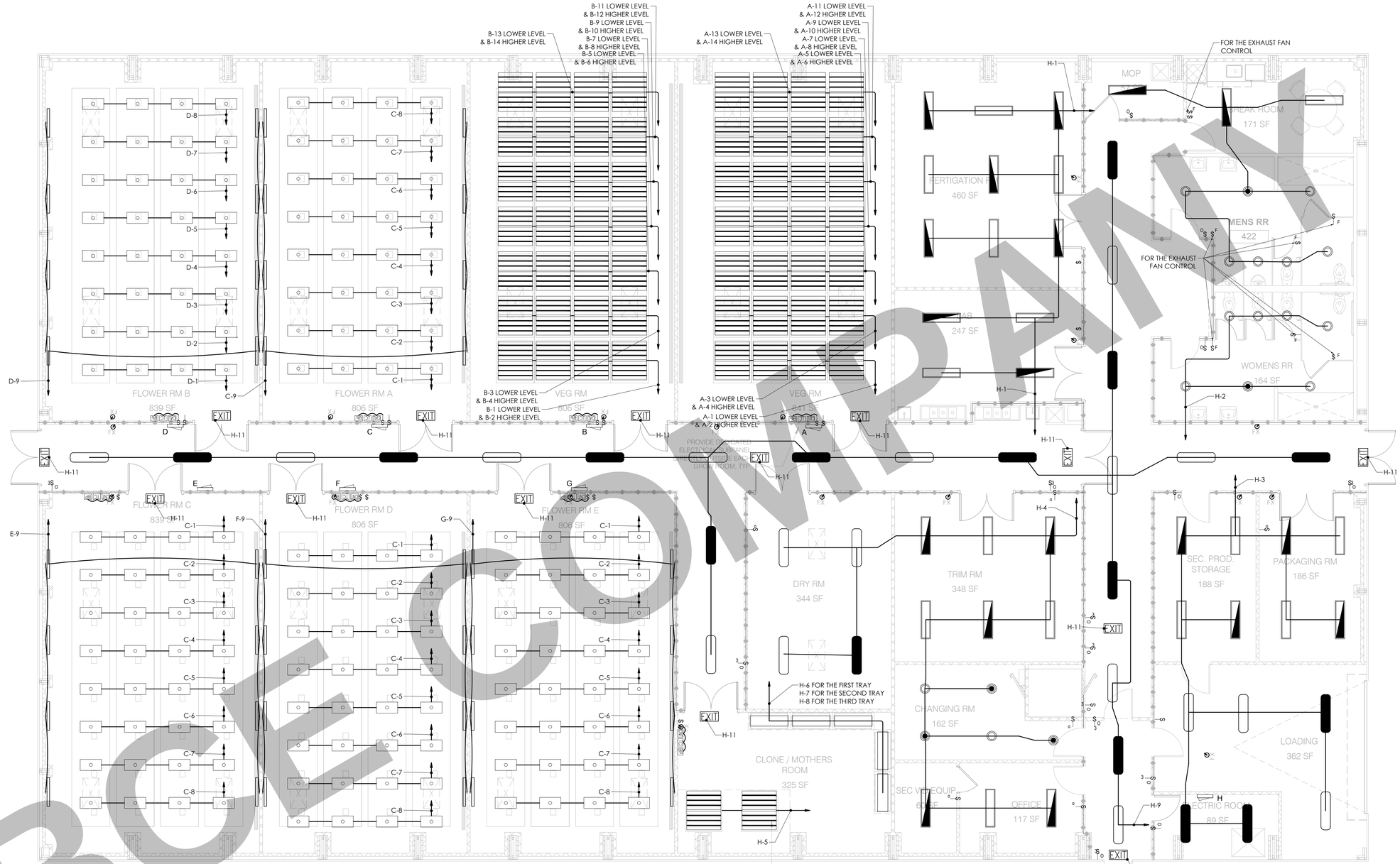
PROJECT:
SUNLAND CULTIVATION

TITLE:
ELEC. SPECIFICATIONS

PROJ. NO.	PROJ. ENGR.	SCALE @ 24X36:
		NTS

DRAWING NO.
E 0 . 0 1

REV.



LIGHTING WIRING DIAGRAM

GROW ROOMS LIGHTING CONTROL DIAGRAM

COMPANY

CLIENT:

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REV. NO.	DESCRIPTION	DATE	BY

PROJECT:

SUNLAND CULTIVATION

TITLE:

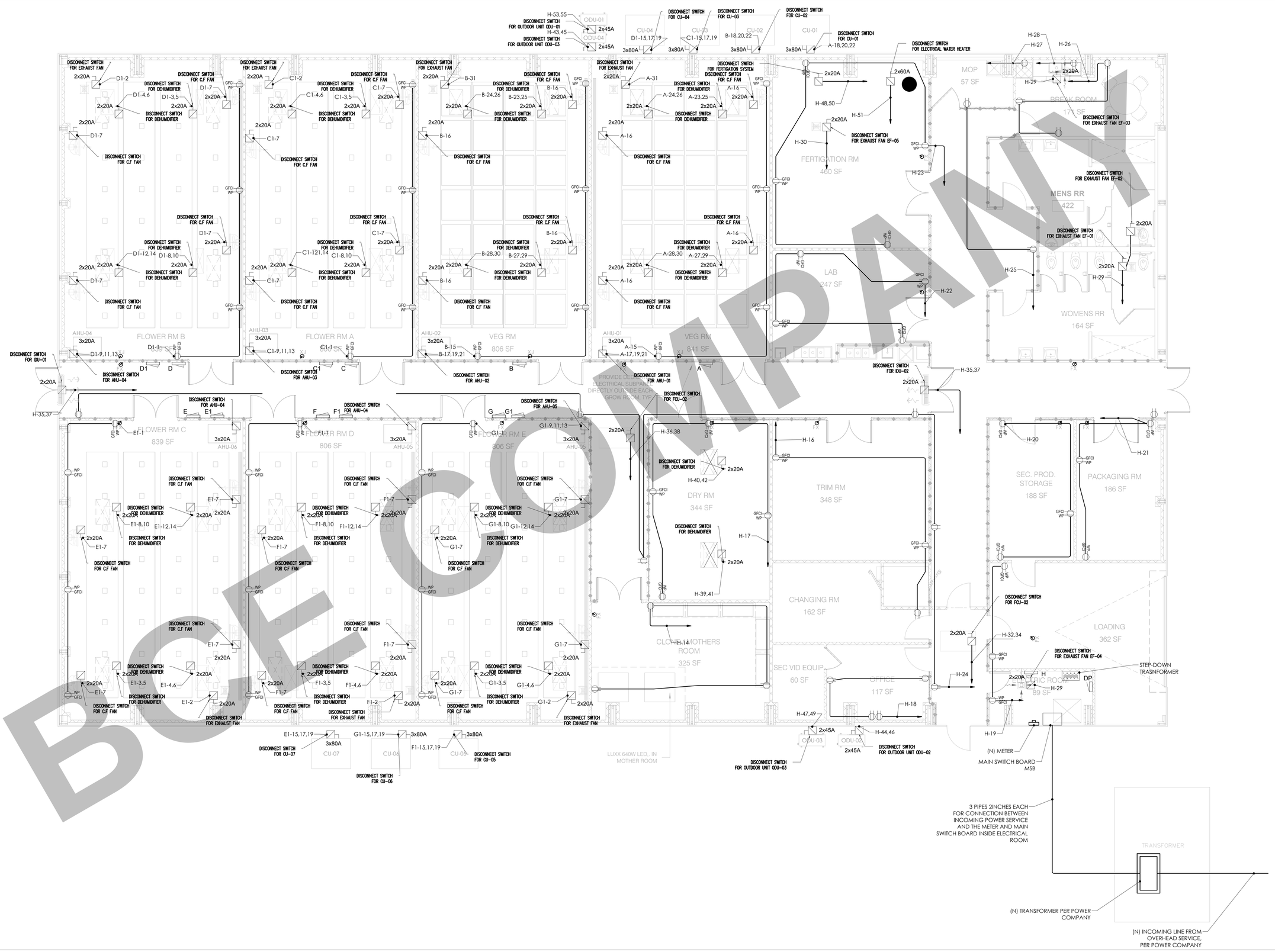
LIGHTING LAYOUTS

PROJ. NO.	PROJ. ENGR.	SCALE @ 24X36:
		3/16"=1'-0"

DRAWING NO.

E 1 . 0 1

REV.



BCE COMPANY

CLIENT:

ADDRESS:

CONFIDENTIALITY STATEMENT:

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3. THE CONTRACTOR MUST CHECK ALL DIMENSION AT SITE BEFORE COMMENCING WORK.
4. THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING ALL NECESSARY TEMPORARY SUPPORT TO THE BUILDING AND ANY ADJACENT STRUCTURES.

REV. NO.	DESCRIPTION	DATE	BY

PROJECT:

SUNLAND CULTIVATION

TITLE:

POWER LAYOUT

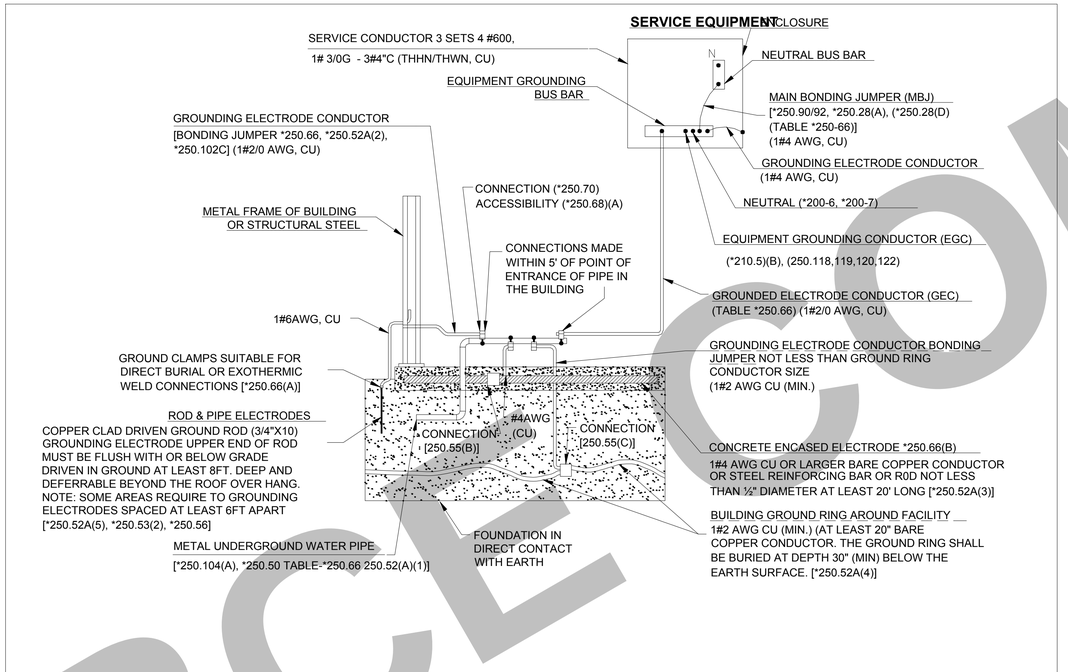
PROJ. NO.	PROJ. ENGR.	SCALE @ 24X36:
		NTS

DRAWING NO.

E 2 . 0 0

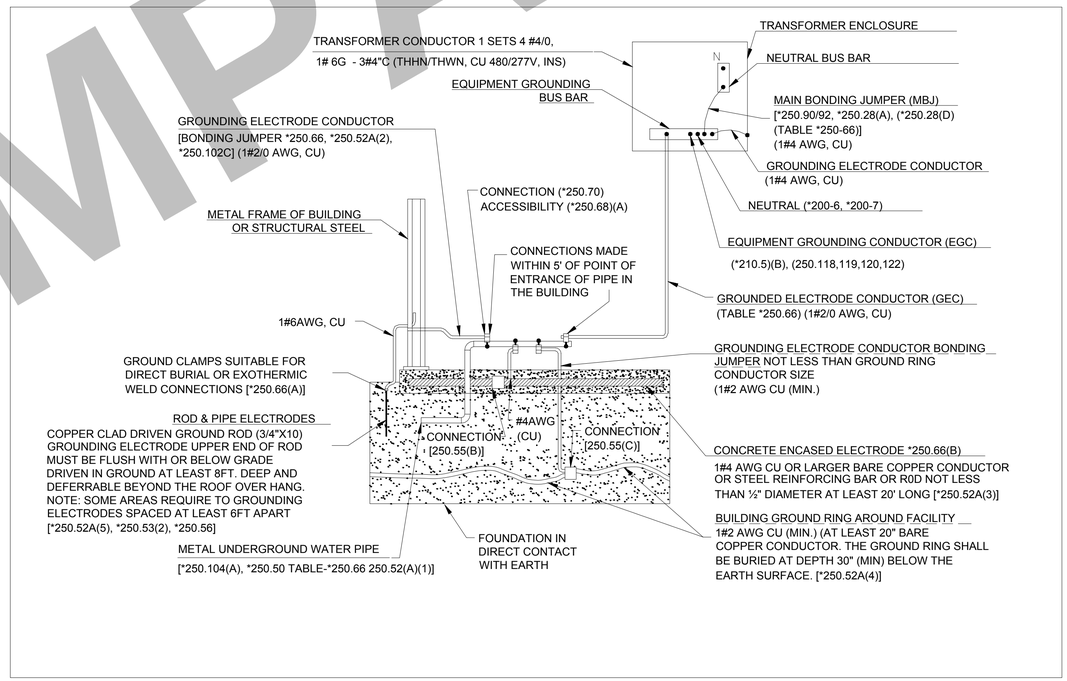
REV.

UFER GROUND NOTE :
ALL STEEL REBARS MEASURING 1/2 " OR MORE IN DIAMETER AND 20 ' OR LONGER IN LENGTH THAT IS ENCASED IN NOT LESS THAN 2 INCHES OF CONCRETE SHALL BE BONDED TO THE BUILDING'S GROUNDING ELECTRODE SYSTEM IN ACCORDANCE WITH CEC 250 (ELECTRICAL SUB CODE) SECTION 250.52(A)(3). THE "UFER" GROUND CAN BE 20 L.F. OF #2 OR #4 COPPER WIRING LAID INSIDE THE FOOTING AND THE SAME WIRE IS LONG ENOUGH TO REACH TO THE LOCATION OF THE MAIN ELECTRICAL PANEL OF THE HOUSE. UFER GROUND CAN BE (1) L-SHAPED PIECE OF #4 STEEL REBAR CONNECTED TO THE OTHER STEEL REBAR IN THE FOOTING AND STICKING OUT IN SUFFICIENT LENGTH FOR CONNECTION AT THE LOCATION OF THE MAIN ELECTRICAL PANEL OF THE HOUSE



DETAIL "G" OF GROUNDING ELECTRODE SYSTEM (*250.50) & GROUNDING ELECTRODES (*250.52) AS SERVICE

SCALE: NTS



DETAIL "H" GROUNDING ELECTRODE SYSTEM (*250.50) & GROUNDING ELECTRODES (*250.52) AS REQUIRED

SCALE: NTS

BCE COMPANY

CLIENT:

ADDRESS:

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3. THE CONTRACTOR MUST CHECK ALL DIMENSION AT SITE BEFORE COMMENCING WORK.
4. THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING ALL NECESSARY TEMPORARY SUPPORT TO THE BUILDING AND ANY ADJACENT STRUCTURES.

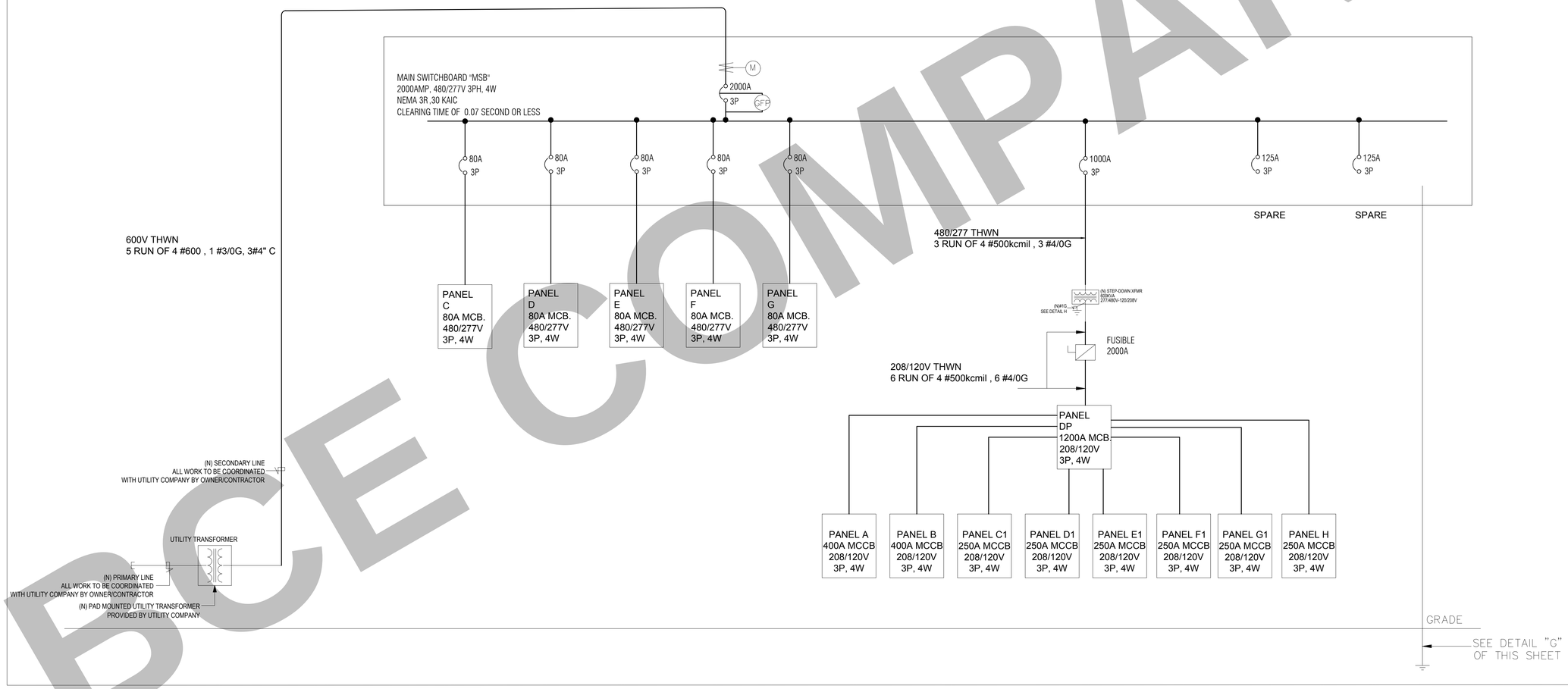
REV. NO.	DESCRIPTION	DATE	BY

PROJECT:
SUNLAND CULTIVATION

TITLE:
ELECTRICAL DETAIL

PROJ. NO.	PROJ. ENGR.	SCALE @ 24X36:
		NTS

DRAWING NO.	REV.
E 3 . 0 0	



BCE COMPANY

CLIENT:

ADDRESS:

CONFIDENTIALITY STATEMENT:

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4. THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING ALL NECESSARY TEMPORARY SUPPORT TO THE BUILDING AND ANY ADJACENT STRUCTURES.

REV. NO.	DESCRIPTION	DATE	BY

PROJECT:

SUNLAND CULTIVATION

TITLE:

ELECTRICAL RISER SINGLE LINE DIAGRAM

PROJ. NO.	PROJ. ENGR.	SCALE @ 24X36:
		NTS

DRAWING NO.

E 4 . 0 0

REV.

Location: ELBC

*	LOAD SUMMARY	CL	DF	CONNECTED LOAD A	B	C	DEMAND TOTAL
L	Lighting		1.25				
R	Convenience Recept						
H	Heating (Space)		1.25				
C	Cooling		1.00				
A	HVAC		1.00				
P	Process		1.00				
O	Other Continuous		1.25				
K	Kitchen		0.65				
N	Noncontinuous	747.50	1.00	252.60	249.60	245.30	747.50
M	Motor		1.00				
	Total	**747.50**		252.60	249.60	245.30	747.50

Total Demand Load (KVA)	747.50
Total Demand Current (A)	899.10
Min. Feeder Ampacity (A)	1123.88

PANEL MSB

PANELBOARD DESIGNATION

SYSTEM VOLTAGE	480/277V, 3Φ, 4W
BUS SIZE	2000
SYSTEM TYPE	NORMAL
FEEDER PROT	800A-3P C/B Bus Plug
CONDUCTOR SIZE	600-kcmil - #1/0G CU
CONDUCTOR/PHASE	4
MAINS	1200A MCB
SCCR	SERIES RATED
MCB RATING	80%
GROUND FAULT	NO
FEEDER LENGTH (FT)	50
FEEDER V. DROP (%)	0.116
FAULT CURRENT	
KAIC RATING	22
ENCLOSURE	TYPE 3R

	DESCRIPTION	*	WIRE	GRD	CB	KVA	A	B	C	KVA	CB	WIRE	GRD	DESCRIPTION	*	
1		N				17.60	25.90			8.30					N	2
3	PANEL C	N	4x 2 AWG - #6G		80A-3P	8.30		25.90		17.60	80A-3P	4x 2 AWG - #6G		PANEL D	N	4
5		N				9.30			18.60	9.30					N	6
7		N				8.30	25.90			17.60					N	8
9	PANEL E	N	4x 2 AWG - #6G		80A-3P	9.30		17.60		8.30	80A-3P	4x 2 AWG - #6G		PANEL F	N	10
11		N				17.60			26.90	9.30					N	12
13		N				8.30	8.30								N	14
15	PANEL G	N	4x 2 AWG - #6G		80A-3P	17.60		17.60			80A-3P			SPARE	N	16
17		N				9.30			9.30						N	18
19		N				188.00	192.50			3.50					N	20
21	DP	N	4x 500-kcmil - #4/0G		2000A-3P	185.00		188.50		3.50	45A-3P	4x 8 AWG - #8G		Outdoor Lighting	N	22
23		N				187.00			190.50	3.50					N	24
25																26
27	SPARE				125A-3P											28
29																30
	(KVA)															
	Total Connected Load					252.60	249.60	245.30								

Location: ELBC

*	LOAD SUMMARY	CL	DF	CONNECTED LOAD A	B	C	DEMAND TOTAL
L	Lighting	35.49	1.00	17.68	8.45	9.36	35.49
R	Convenience Recept						
H	Heating (Space)		1.25				
C	Cooling		1.00				
A	HVAC		1.00				
P	Process		1.00				
O	Other Continuous		1.25				
K	Kitchen		0.65				
N	Noncontinuous		1.00				
M	Motor		1.00				
	Total	**35.49**		17.68	8.45	9.36	35.49

Total Demand Load (KVA)	35.49
Total Demand Current (A)	42.69
Min. Feeder Ampacity (A)	53.36

PANEL C

PANELBOARD DESIGNATION

SYSTEM VOLTAGE	480/277V, 3Φ, 4W
BUS SIZE	80
SYSTEM TYPE	NORMAL
FEEDER PROT	100A-3P C/B Bus Plug
CONDUCTOR SIZE	2 AWG - #6G CU
CONDUCTOR/PHASE	1
MAINS	80A MCB
SCCR	SERIES RATED
MCB RATING	80%
GROUND FAULT	NO
FEEDER LENGTH (FT)	15
FEEDER V. DROP (%)	0.084
FAULT CURRENT	
KAIC RATING	22
ENCLOSURE	TYPE 3R

	DESCRIPTION	*	WIRE	GRD	CB	KVA	A	B	C	KVA	CB	WIRE	GRD	DESCRIPTION	*	
1	LIGHTING AT FLOWER ROOM	L	2X 10 AWG - #10G		30A-1P	4.16	8.32			4.16	30A-1P	2X 10 AWG - #10G		LIGHTING AT FLOWER ROOM	L	2
3	LIGHTING AT FLOWER ROOM	L	2X 10 AWG - #10G		30A-1P	4.16		8.32		4.16	30A-1P	2X 10 AWG - #10G		LIGHTING AT FLOWER ROOM	L	4
5	LIGHTING AT FLOWER ROOM	L	2X 10 AWG - #10G		30A-1P	4.16			9.36	5.20	30A-1P	2X 10 AWG - #10G		LIGHTING AT FLOWER ROOM	L	6
7	LIGHTING AT FLOWER ROOM	L	2X 10 AWG - #10G		30A-1P	4.16	9.36			5.20	30A-1P	2X 10 AWG - #10G		LIGHTING AT FLOWER ROOM	L	8
9	Green Light	L	2X 12 AWG - #12G		20A-1P	0.13			0.13		30A-1P			SPARE		10
11	SPARE				30A-1P						30A-1P			SPARE		12
13	SPARE				30A-1P						30A-1P			SPARE		14
15	SPARE				30A-1P						30A-1P			SPARE		16
17	SPARE				30A-1P						30A-1P			SPARE		18
19	SPARE				30A-1P						30A-1P			SPARE		20
21	SPARE				30A-1P						30A-1P			SPARE		22
23	SPARE				30A-1P						30A-1P			SPARE		24
25	SPARE				30A-1P						30A-1P			SPARE		26
27	SPARE				30A-1P						30A-1P			SPARE		28
29	SPARE				30A-1P						30A-1P			SPARE		30
31	SPARE				30A-1P						20A-1P			SPARE		32
33	SPARE				20A-1P						20A-1P			SPARE		34
35	SPARE				20A-1P						20A-1P			SPARE		36
37	SPARE				20A-1P						20A-1P			SPARE		38
39	SPARE				20A-1P						20A-1P			SPARE		40
41	SPARE				20A-1P						20A-1P			SPARE		42
	(KVA)															
	Total Connected Load					17.68	8.32	9.36								

Location: ELBC

*	LOAD SUMMARY	CL	DF	CONNECTED LOAD A	B	C	DEMAND TOTAL
L	Lighting	35.49	1.00	17.68	8.45	9.36	35.49
R	Convenience Recept						
H	Heating (Space)		1.25				
C	Cooling		1.00				
A	HVAC		1.00				
P	Process		1.00				
O	Other Continuous		1.25				
K	Kitchen		0.65				
N	Noncontinuous		1.00				
M	Motor		1.00				
	Total	**35.49**		17.68	8.45	9.36	35.49

Total Demand Load (KVA)	35.49
Total Demand Current (A)	42.69
Min. Feeder Ampacity (A)	53.36

PANEL D

PANELBOARD DESIGNATION

SYSTEM VOLTAGE	480/277V, 3Φ, 4W
BUS SIZE	80
SYSTEM TYPE	NORMAL
FEEDER PROT	100A-3P C/B Bus Plug
CONDUCTOR SIZE	2 AWG - #6G CU
CONDUCTOR/PHASE	1
MAINS	80A MCB
SCCR	SERIES RATED
MCB RATING	80%
GROUND FAULT	NO
FEEDER LENGTH (FT)	15
FEEDER V. DROP (%)	0.084
FAULT CURRENT	
KAIC RATING	22
ENCLOSURE	TYPE 3R

	DESCRIPTION	*	WIRE	GRD	CB	KVA	A	B	C	KVA	CB	WIRE	GRD	DESCRIPTION	*	
1	LIGHTING AT FLOWER ROOM	L	2X 10 AWG - #10G		30A-1P	4.16	8.32			4.16	30A-1P	2X 10 AWG - #10G		LIGHTING AT FLOWER ROOM	L	2
3	LIGHTING AT FLOWER ROOM	L	2X 10 AWG - #10G		30A-1P	4.16		8.32		4.16	30A-1P	2X 10 AWG - #10G		LIGHTING AT FLOWER ROOM	L	4
5	LIGHTING AT FLOWER ROOM	L	2X 10 AWG - #10G		30A-1P	4.16			9.36	5.20	30A-1P	2X 10 AWG - #10G		LIGHTING AT FLOWER ROOM	L	6
7	LIGHTING AT FLOWER ROOM	L	2X 10 AWG - #10G		30A-1P	4.16	9.36			5.20	30A-1P	2X 10 AWG - #10G		LIGHTING AT FLOWER ROOM	L	8
9	Green Light	L	2X 12 AWG - #12G		20A-1P	0.13			0.13		30A-1P			SPARE		10
11	SPARE				30A-1P						30A-1P			SPARE		12
13	SPARE				30A-1P						30A-1P			SPARE		14
15	SPARE				30A-1P						30A-1P			SPARE		16
17	SPARE				30A-1P						30A-1P			SPARE		18
19	SPARE				30A-1P						30A-1P			SPARE		20
21	SPARE				30A-1P						30A-1P			SPARE		22
23	SPARE				30A-1P						30A-1P			SPARE		24
25	SPARE				30A-1P						30A-1P			SPARE		26
27	SPARE				30A-1P						30A-1P			SPARE		28
29	SPARE				30A-1P						30A-1P			SPARE		30
31	SPARE				30A-1P						20A-1P			SPARE		32
33	SPARE				20A-1P						20A-1P			SPARE		34
35	SPARE				20A-1P						20A-1P			SPARE		36
37	SPARE				20A-1P						20A-1P			SPARE		38
39	SPARE				20A-1P						20A-1P			SPARE		40
41	SPARE				20A-1P						20A-1P			SPARE		42
	(KVA)															
	Total Connected Load					17.68	8.32	9.36								

Location: ELBC

*	LOAD SUMMARY	CL	DF	CONNECTED LOAD A	B	C	DEMAND TOTAL
L	Lighting	35.49	1.00	17.68	8.45	9.36	35.49
R	Convenience Recept						
H	Heating (Space)		1.25				
C	Cooling		1.00				
A	HVAC		1.00				
P	Process		1.00				
O	Other Continuous		1.25				
K	Kitchen		0.65				
N	Noncontinuous		1.00				
M	Motor		1.00				
	Total	**35.49**		17.68	8.45	9.36	35.49

Total Demand Load (KVA)	35.49
Total Demand Current (A)	42.69
Min. Feeder Ampacity (A)	53.36

PANEL E

PANELBOARD DESIGNATION

SYSTEM VOLTAGE	480/277V, 3Φ, 4W
BUS SIZE	80
SYSTEM TYPE	NORMAL
FEEDER PROT	100A-3P C/B Bus Plug
CONDUCTOR SIZE	2 AWG - #6G CU
CONDUCTOR/PHASE	1
MAINS	80A MCB
SCCR	SERIES RATED
MCB RATING	80%
GROUND FAULT	NO
FEEDER LENGTH (FT)	15
FEEDER V. DROP (%)	0.084
FAULT CURRENT	
KAIC RATING	22
ENCLOSURE	TYPE 3R

	DESCRIPTION	*	WIRE	GRD	CB	KVA	A	B	C	KVA	CB	WIRE	GRD	DESCRIPTION	*	
1	LIGHTING AT FLOWER ROOM	L	2X 10 AWG - #10G		30A-1P	4.16	8.32			4.16	30A-1P	2X 10 AWG - #10G		LIGHTING AT FLOWER ROOM	L	2
3	LIGHTING AT FLOWER ROOM	L	2X 10 AWG - #10G		30A-1P	4.16		8.32		4.16	30A-1P	2X 10 AWG - #10G		LIGHTING AT FLOWER ROOM	L	4
5	LIGHTING AT FLOWER ROOM	L	2X 10 AWG - #10G		30A-1P	4.16			9.36	5.20	30A-1P	2X 10 AWG - #10G		LIGHTING AT FLOWER ROOM	L	6
7	LIGHTING AT FLOWER ROOM	L	2X 10 AWG - #10G		30A-1P	4.16	9.36			5.20	30A-1P	2X 10 AWG - #10G		LIGHTING AT FLOWER ROOM	L	8
9	Green Light	L	2X 12 AWG - #12G		20A-1P	0.13			0.13		30A-1P			SPARE		10
11	SPARE				30A-1P						30A-1P			SPARE		12
13	SPARE				30A-1P						30A-1P			SPARE		14
15	SPARE				30A-1P						30A-1P			SPARE		16
17	SPARE				30A-1P						30A-1P			SPARE		18
19	SPARE				30A-1P						30A-1P			SPARE		20
21	SPARE				30A-1P						30A-1P			SPARE		22
23	SPARE				30A-1P						30A-1P			SPARE		24
25	SPARE				30A-1P						30A-1P			SPARE		26
27	SPARE				30A-1P						30A-1P			SPARE		28
29	SPARE				30A-1P						30A-1P			SPARE		30
31	SPARE				30A-1P						20A-1P			SPARE		32
33	SPARE				20A-1P						20A-1P			SPARE		34
35	SPARE				20A-1P						20A-1P			SPARE		36
37	SPARE				20A-1P						20A-1P			SPARE		38
39	SPARE				20A-1P						20A-1P			SPARE		40
41	SPARE				20A-1P						20A-1P			SPARE		42
	(KVA)															
	Total Connected Load					17.68	8.32	9.36								

Location: ELBC

*	LOAD SUMMARY	CL	DF	CONNECTED LOAD A	B	C	DEMAND TOTAL
L	Lighting	35.49	1.00	17.68	8.45	9.36	35.49
R	Convenience Recept						
H	Heating (Space)		1.25				
C	Cooling		1.00				
A	HVAC		1.00				
P	Process		1.00				
O	Other Continuous		1.25				
K	Kitchen		0.65				
N	Noncontinuous		1.00				
M	Motor		1.00				
	Total	**35.49**		17.68	8.45	9.36	35.49

Total Demand Load (KVA)	35.49
Total Demand Current (A)	42.69
Min. Feeder Ampacity (A)	53.36

PANEL F

PANELBOARD DESIGNATION

SYSTEM VOLTAGE	480/277V, 3Φ, 4W
BUS SIZE	80
SYSTEM TYPE	NORMAL
FEEDER PROT	100A-3P C/B Bus Plug
CONDUCTOR SIZE	2 AWG - #6G CU
CONDUCTOR/PHASE	1
MAINS	80A MCB
SCCR	SERIES RATED
MCB RATING	80%
GROUND FAULT	NO
FEEDER LENGTH (FT)	15
FEEDER V. DROP (%)	0.084
FAULT CURRENT	
KAIC RATING	22
ENCLOSURE	TYPE 3R

	DESCRIPTION	*	WIRE	GRD	CB	KVA	A	B	C	KVA	CB	WIRE	GRD	DESCRIPTION	*	
1	LIGHTING AT FLOWER ROOM	L	2X 10 AWG - #10G		30A-1P	4.16	8.32			4.16	30A-1P	2X 10 AWG - #10G		LIGHTING AT FLOWER ROOM	L	2
3	LIGHTING AT FLOWER ROOM	L	2X 10 AWG - #10G		30A-1P	4.16		8.32		4.16	30A-1P	2X 10 AWG - #10G		LIGHTING AT FLOWER ROOM	L	4
5	LIGHTING AT FLOWER ROOM	L	2X 10 AWG - #10G		30A-1P	4.16			9.36	5.20	30A-1P	2X 10 AWG - #10G		LIGHTING AT FLOWER ROOM	L	6
7	LIGHTING AT FLOWER ROOM	L	2X 10 AWG - #10G		30A-1P	4.16	9.36			5.20	30A-1P	2X 10 AWG - #10G		LIGHTING AT FLOWER ROOM	L	8
9	Green Light	L	2X 12 AWG - #12G		20A-1P	0.13			0.13		30A-1P			SPARE		10
11	SPARE				30A-1P						30A-1P			SPARE		12
13	SPARE				30A-1P						30A-1P			SPARE		14
15	SPARE				30A-1P						30A-1P			SPARE		16
17	SPARE				30A-1P						30A-1P			SPARE		18
19	SPARE				30A-1P						30A-1P			SPARE		20
21	SPARE				30A-1P						30A-1P			SPARE		22
23	SPARE				30A-1P						30A-1P			SPARE		24
25	SPARE				30A-1P						30A-1P			SPARE		26
27	SPARE				30A-1P						30A-1P			SPARE		28
29	SPARE				30A-1P						30A-1P			SPARE		30
31	SPARE				30A-1P						20A-1P			SPARE		32
33	SPARE				20A-1P						20A-1P			SPARE		34
35	SPARE				20A-1P						20A-1P			SPARE		36
37	SPARE				20A-1P						20A-1P			SPARE		38
39	SPARE				20A-1P						20A-1P			SPARE		40
41	SPARE				20A-1P						20A-1P			SPARE		42
	(KVA)															
	Total Connected Load					17.68	8.32	9.36								

Location: ELBC

*	LOAD SUMMARY	CL	DF	CONNECTED LOAD A	B	C	DEMAND TOTAL
L	Lighting	35.49	1.00	17.68	8.45	9.36	35.49
R	Convenience Recept						
H	Heating (Space)		1.25				
C	Cooling		1.00				
A	HVAC		1.00				
P	Process		1.00				
O	Other Continuous		1.25				
K	Kitchen		0.65				
N	Noncontinuous		1.00				
M	Motor		1.00				
	Total	**35.49**		17.68	8.45	9.36	35.49

Total Demand Load (KVA)	35.49
Total Demand Current (A)	42.69
Min. Feeder Ampacity (A)	53.36

PANEL G

PANELBOARD DESIGNATION

SYSTEM VOLTAGE	480/277V, 3Φ, 4W
BUS SIZE	80
SYSTEM TYPE	NORMAL
FEEDER PROT	100A-3P C/B Bus Plug
CONDUCTOR SIZE	2 AWG - #6G CU
CONDUCTOR/PHASE	1
MAINS	80A MCB
SCCR	SERIES RATED
MCB RATING	80%
GROUND FAULT	NO
FEEDER LENGTH (FT)	15
FEEDER V. DROP (%)	0.084
FAULT CURRENT	
KAIC RATING	22
ENCLOSURE	TYPE 3R

	DESCRIPTION	*	WIRE	GRD	CB	KVA	A	B	C	KVA	CB	WIRE	GRD	DESCRIPTION	*	
1	LIGHTING AT FLOWER ROOM	L	2X 10 AWG - #10G		30A-1P	4.16	8.32			4.16	30A-1P	2X 10 AWG - #10G		LIGHTING AT FLOWER ROOM	L	2
3	LIGHTING AT FLOWER ROOM	L	2X 10 AWG - #10G		30A-1P	4.16		8.32		4.16	30A-1P	2X 10 AWG - #10G		LIGHTING AT FLOWER ROOM	L	4
5	LIGHTING AT FLOWER ROOM	L	2X 10 AWG - #10G		30A-1P	4.16			9.36	5.20	30A-1P	2X 10 AWG - #10G		LIGHTING AT FLOWER ROOM	L	6
7	LIGHTING AT FLOWER ROOM	L	2X 10 AWG - #10G		30A-1P	4.16	9.36			5.20	30A-1P	2X 10 AWG - #10G		LIGHTING AT FLOWER ROOM	L	8
9	Green Light	L	2X 12 AWG - #12G		20A-1P	0.13			0.13		30A-1P			SPARE		10
11	SPARE				30A-1P						30A-1P			SPARE		12
13	SPARE				30A-1P						30A-1P			SPARE		14
15	SPARE				30A-1P						30A-1P			SPARE		16
17	SPARE				30A-1P						30A-1P			SPARE		18
19	SPARE				30A-1P						30A-1P			SPARE		20
21	SPARE				30A-1P						30A-1P			SPARE		22
23	SPARE				30A-1P						30A-1P			SPARE		24
25	SPARE				30A-1P						30A-1P			SPARE		26
27	SPARE				30A-1P						30A-1P			SPARE		28
29	SPARE				30A-1P						30A-1P			SPARE		30
31	SPARE				30A-1P						20A-1P			SPARE		32
33	SPARE				20A-1P						20A-1P			SPARE		34
35	SPARE				20A-1P						20A-1P			SPARE		36
37	SPARE				20A-1P						20A-1P			SPARE		38
39	SPARE				20A-1P						20A-1P			SPARE		40
41	SPARE				20A-1P						20A-1P			SPARE		42
	(KVA)															
	Total Connected Load					17.68	8.32	9.36								

BCE COMPANY

CLIENT:

ADDRESS:

CONFIDENTIALITY STATEMENT:

ALL DRAWINGS AND WRITTEN MATERIALS APPEARING HEREIN CONSTITUTE THE ORIGINAL AND UNPUBLISHED WORK OF THE DESIGNER AND THE SAME MAY NOT BE DUPLICATED, USED OR DISCLOSED WITHOUT CONSENT OF THE DESIGNER.

NOTES:

1. ALL DIMENSIONS HEREIN ARE IN IMPERIAL UNITS UNLESS STATED OTHERWISE.
2. THESE DRAWINGS ARE TO BE READ IN CONJUNCTION WITH ALL RELEVANT DESIGNER, ENGINEER OR SPECIALIST DRAWINGS AND SPECIFICATIONS.
3. THE CONTRACTOR MUST CHECK ALL DIMENSION AT SITE BEFORE COMMENCING WORK.
4. THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING ALL NECESSARY TEMPORARY SUPPORT TO THE BUILDING AND ANY ADJACENT STRUCTURES.

REV. NO.	DESCRIPTION	DATE	BY

PROJECT:

SUNLAND CULTIVATION

TITLE:

PANEL BOARD SCHEDULE SHEET 1 OF 3

PROJ. NO.	PROJ. ENGR.	SCALE @ 24X36:
		NTS

DRAWING NO.

E 5 . 0 0

REV.

Location: ELEC

*	LOAD SUMMARY	CL	DF	CONNECTED LOAD A	B	C	DEMAND TOTAL
L	Lighting		1.25				
R	Convenience Recept		1.25				
H	Heating (Space)		1.25				
C	Cooling		1.00				
A	HVAC		1.00				
P	Process		1.00				
O	Other Continuous		1.25				
K	Kitchen		0.65				
N	Noncontinuous	562.06	1.00	189.27	185.63	187.16	562.06
M	Motor		1.00				
	Total	**562.06**		189.27	185.63	187.16	562.06

Total Demand Load (KVA)	562.06
Total Demand Current (A)	1590.12
Min. Feeder Ampacity (A)	1950.15

PANEL DP

PANELBOARD DESIGNATION

SYSTEM VOLTAGE	208/120V, 3Φ, 4W
BUS SIZE	2000A
SYSTEM TYPE	NORMAL
FEEDER PROT	2000A-3P CB Bus Plug
CONDUCTOR SIZE	500-kcmil - #4/0G CU
CONDUCTOR/PHASE	6
MAINS	2000A MCB
SCCR	FULLY RATED
MCB RATING	80%
GROUND FAULT	NO
FEEDER LENGTH (FT)	50
FEEDER V. DROP (%)	0.358
FAULT CURRENT	
KAIC RATING	22
ENCLOSURE	TYPE 1

	DESCRIPTION	*	WIRE	GRD	CB	KVA	A	B	C	KVA	CB	WIRE	GRD	DESCRIPTION	*	
1		N				34.00	64.00			30.00					N	2
3	PANEL A	N	4x 500-kcmil - #4/0G		400A-3P	31.00		62.00		31.00	400A-3P	4x 500-kcmil - #4/0G		PANEL B	N	4
5		N				30.00			64.00	34.00					N	6
7		N				19.00	38.00			19.00					N	8
9	PANEL C1	N	4x 4/0 AWG - #2/0G		250A-3P	19.00		38.00		19.00	250A-3P	4x 4/0 AWG - #2/0G		PANEL D1	N	10
11		N				21.60			43.20	21.60					N	12
13		N				21.60	40.60			19.00					N	14
15	PANEL E1	N	4x 4/0 AWG - #2/0G		250A-3P	19.00		40.60		21.60	250A-3P	4x 4/0 AWG - #2/0G		PANEL F1	N	16
17		N				19.00			38.00	19.00					N	18
19		N				19.00	38.80			19.80					N	20
21	PANEL G1	N	4x 4/0 AWG - #2/0G		250A-3P	21.60		36.60		15.00	250A-3P	4x 4/0 AWG - #2/0G		PANEL H	N	22
23		N				19.00			34.80	15.80					N	24
25		N				7.87	7.87								N	26
27	SPARE	N			250A-3P	8.43		8.43			450A-3P			SPARE	N	28
29		N				7.16			7.16						N	30
	(KVA)															
	Total Connected Load					189.27	185.63	187.16								

Location: ELEC

*	LOAD SUMMARY	CL	DF	CONNECTED LOAD A	B	C	DEMAND TOTAL
L	Lighting	36.12	1.25	15.48	10.32	10.32	45.15
R	Convenience Recept	1.08			1.08		1.08
H	Heating (Space)		1.25				
C	Cooling	50.53	1.00	16.84	16.84	16.85	50.53
A	HVAC		1.00				
P	Process		1.00				
O	Other Continuous		1.25				
K	Kitchen		0.65				
N	Noncontinuous	8.27	1.00	2.53	2.74	3.00	8.27
M	Motor		1.00				
	Total	**96.00**		34.85	30.98	30.17	105.03

Total Demand Load (KVA)	105.03
Total Demand Current (A)	291.53
Min. Feeder Ampacity (A)	364.41

PANEL A

PANELBOARD DESIGNATION

SYSTEM VOLTAGE	208/120V, 3Φ, 4W
BUS SIZE	400
SYSTEM TYPE	NORMAL
FEEDER PROT	400A-3P CB Bus Plug
CONDUCTOR SIZE	500-kcmil - #4/0G CU
CONDUCTOR/PHASE	2
MAINS	400A MCB
SCCR	SERIES RATED
MCB RATING	80%
GROUND FAULT	NO
FEEDER LENGTH (FT)	28
FEEDER V. DROP (%)	0.120
FAULT CURRENT	
KAIC RATING	22
ENCLOSURE	TYPE 3R

	DESCRIPTION	*	WIRE	GRD	CB	KVA	A	B	C	KVA	CB	WIRE	GRD	DESCRIPTION	*	
1	Lighting Veg Room	L	2X 10 AWG - #10G		30A-1P	2.58	5.16			2.58	30A-1P	2X 10 AWG - #10G		Lighting Veg Room	L	2
3	Lighting Veg Room	L	2X 10 AWG - #10G		30A-1P	2.58		5.16		2.58	30A-1P	2X 10 AWG - #10G		Lighting Veg Room	L	4
5	Lighting Veg Room	L	2X 10 AWG - #10G		30A-1P	2.58		5.16		2.58	30A-1P	2X 10 AWG - #10G		Lighting Veg Room	L	6
7	Lighting Veg Room	L	2X 10 AWG - #10G		30A-1P	2.58		5.16		2.58	30A-1P	2X 10 AWG - #10G		Lighting Veg Room	L	8
9	Lighting Veg Room	L	2X 10 AWG - #10G		30A-1P	2.58		5.16		2.58	30A-1P	2X 10 AWG - #10G		Lighting Veg Room	L	10
11	Lighting Veg Room	L	2X 10 AWG - #10G		30A-1P	2.58		5.16		2.58	30A-1P	2X 10 AWG - #10G		Lighting Veg Room	L	12
13	Lighting Veg Room	L	2X 10 AWG - #10G		30A-1P	2.58		5.16		2.58	30A-1P	2X 10 AWG - #10G		Lighting Veg Room	L	14
15	Receptacles Veg Room	R	2X 12 AWG - #12G		20A-1P	1.08		2.32		1.24	20A-1P	2X 12 AWG - #12G		C.F FAN (4 FANS)	N	16
17	AHU-01	C				2.70			16.85	14.14					C	18
19		C	4X 12 AWG - #12G		20A-3P	2.70	16.84			14.14	80A-3P	4X 4 AWG - #6G		Outdoor unit CU-01	C	20
21		C				2.70		16.84		14.14					C	22
23	DEHUMIDIFIER Veg Room	N				0.75			1.50	0.75					N	24
25		N	2X 10 AWG - #10G		30A-1P	0.75	1.50			0.75	20A-1P	2X 12 AWG - #12G		DEHUMIDIFIER Veg Room	N	26
27	DEHUMIDIFIER Veg Room	N				0.75		1.50		0.75					N	28
29		N	2X 10 AWG - #10G		30A-1P	0.75			1.50	0.75	20A-1P	2X 12 AWG - #12G		DEHUMIDIFIER Veg Room	N	30
31	Exhaust Fan	N	2X 12 AWG - #12G		20A-1P	1.03	1.03				20A-1P			SPARE		32
33	SPARE				20A-1P						20A-1P			SPARE		34
35	SPARE				20A-1P						20A-1P			SPARE		36
37	SPARE				20A-1P						20A-1P			SPARE		38
39	SPARE				20A-1P						20A-1P			SPARE		40
41	SPARE				20A-1P						20A-1P			SPARE		42
	(KVA)															
	Total Connected Load					24.53	30.98	19.86								

Location: ELEC

*	LOAD SUMMARY	CL	DF	CONNECTED LOAD A	B	C	DEMAND TOTAL
L	Lighting	36.12	1.25	15.48	10.32	10.32	45.15
R	Convenience Recept	1.08			1.08		1.08
H	Heating (Space)		1.25				
C	Cooling	50.53	1.00	16.84	16.84	16.85	50.53
A	HVAC		1.00				
P	Process		1.00				
O	Other Continuous		1.25				
K	Kitchen		0.65				
N	Noncontinuous	8.27	1.00	2.53	2.74	3.00	8.27
M	Motor		1.00				
	Total	**96.00**		34.85	30.98	30.17	105.03

Total Demand Load (KVA)	105.03
Total Demand Current (A)	291.53
Min. Feeder Ampacity (A)	364.41

PANEL B

PANELBOARD DESIGNATION

SYSTEM VOLTAGE	208/120V, 3Φ, 4W
BUS SIZE	400
SYSTEM TYPE	NORMAL
FEEDER PROT	400A-3P CB Bus Plug
CONDUCTOR SIZE	500-kcmil - #4/0G CU
CONDUCTOR/PHASE	2
MAINS	400A MCB
SCCR	SERIES RATED
MCB RATING	80%
GROUND FAULT	NO
FEEDER LENGTH (FT)	28
FEEDER V. DROP (%)	0.120
FAULT CURRENT	
KAIC RATING	22
ENCLOSURE	TYPE 3R

	DESCRIPTION	*	WIRE	GRD	CB	KVA	A	B	C	KVA	CB	WIRE	GRD	DESCRIPTION	*	
1	Lighting Veg Room	L	2X 10 AWG - #10G		30A-1P	2.58	5.16			2.58	30A-1P	2X 10 AWG - #10G		Lighting Veg Room	L	2
3	Lighting Veg Room	L	2X 10 AWG - #10G		30A-1P	2.58		5.16		2.58	30A-1P	2X 10 AWG - #10G		Lighting Veg Room	L	4
5	Lighting Veg Room	L	2X 10 AWG - #10G		30A-1P	2.58		5.16		2.58	30A-1P	2X 10 AWG - #10G		Lighting Veg Room	L	6
7	Lighting Veg Room	L	2X 10 AWG - #10G		30A-1P	2.58		5.16		2.58	30A-1P	2X 10 AWG - #10G		Lighting Veg Room	L	8
9	Lighting Veg Room	L	2X 10 AWG - #10G		30A-1P	2.58		5.16		2.58	30A-1P	2X 10 AWG - #10G		Lighting Veg Room	L	10
11	Lighting Veg Room	L	2X 10 AWG - #10G		30A-1P	2.58		5.16		2.58	30A-1P	2X 10 AWG - #10G		Lighting Veg Room	L	12
13	Lighting Veg Room	L	2X 10 AWG - #10G		30A-1P	2.58		5.16		2.58	30A-1P	2X 10 AWG - #10G		Lighting Veg Room	L	14
15	Receptacles Veg Room	R	2X 12 AWG - #12G		20A-1P	1.08		2.32		1.24	20A-1P	2X 12 AWG - #12G		C.F FAN (4 FANS)	N	16
17	AHU-02	C				2.70			16.85	14.14					C	18
19		C	4X 12 AWG - #12G		20A-3P	2.70	16.84			14.14	80A-3P	4X 4 AWG - #6G		Outdoor unit CU-02	C	20
21		C				2.70		16.84		14.14					C	22
23	DEHUMIDIFIER Veg Room	N				0.75			1.50	0.75					N	24
25		N	2X 10 AWG - #10G		30A-1P	0.75	1.50			0.75	20A-1P	2X 12 AWG - #12G		DEHUMIDIFIER Veg Room	N	26
27	DEHUMIDIFIER Veg Room	N				0.75		1.50		0.75					N	28
29		N	2X 10 AWG - #10G		30A-1P	0.75			1.50	0.75	20A-1P	2X 12 AWG - #12G		DEHUMIDIFIER Veg Room	N	30
31	Exhaust Fan	N	2X 12 AWG - #12G		20A-1P	1.03	1.03				20A-1P			SPARE		32
33	SPARE				20A-1P						20A-1P			SPARE		34
35	SPARE				20A-1P						20A-1P			SPARE		36
37	SPARE				20A-1P						20A-1P			SPARE		38
39	SPARE				20A-1P						20A-1P			SPARE		40
41	SPARE				20A-1P						20A-1P			SPARE		42
	(KVA)															
	Total Connected Load					24.53	30.98	19.85								

Location: ELEC

*	LOAD SUMMARY	CL	DF	CONNECTED LOAD A	B	C	DEMAND TOTAL
L	Lighting		1.00				
R	Convenience Recept	1.08		1.08			1.08
H	Heating (Space)		1.25				
C	Cooling	50.52	1.00	16.84	16.84	16.84	50.52
A	HVAC		1.00				
P	Process		1.00				
O	Other Continuous		1.25				
K	Kitchen		0.65				
N	Noncontinuous	8.27	1.00	3.77	2.25	2.25	8.27
M	Motor		1.00				
	Total	**59.87**		21.69	19.09	19.09	59.87

Total Demand Load (KVA)	59.87
Total Demand Current (A)	166.18
Min. Feeder Ampacity (A)	207.72

PANEL C1

PANELBOARD DESIGNATION

SYSTEM VOLTAGE	208/120V, 3Φ, 4W
BUS SIZE	250
SYSTEM TYPE	NORMAL
FEEDER PROT	250A-3P CB Bus Plug
CONDUCTOR SIZE	4/0 AWG - #2/0G CU
CONDUCTOR/PHASE	1
MAINS	250A MCB
SCCR	SERIES RATED
MCB RATING	80%
GROUND FAULT	NO
FEEDER LENGTH (FT)	15
FEEDER V. DROP (%)	
FAULT CURRENT	
KAIC RATING	22
ENCLOSURE	TYPE 3R

	DESCRIPTION	*	WIRE	GRD	CB	KVA	A	B	C	KVA	CB	WIRE	GRD	DESCRIPTION	*	
1	Receptacles Flower ROOM	R	2X 12 AWG - #12G		20A-1P	1.08	2.11			1.03	20A-1P	2X 12 AWG - #12G		Exhaust Fan	N	2
3	DEHUMIDIFIER Flower ROOM	N				0.75		1.50		0.75					N	4
5		N	2X 10 AWG - #10G		30A-1P	0.75			1.50	0.75	30A-1P	2X 10 AWG - #10G		DEHUMIDIFIER Flower ROOM	N	6
7	C/A FAN	N	2X 12 AWG - #12G		20A-1P	1.24	1.99			0.75					N	8
9	AHU-03	C				2.70		3.45		0.75	30A-1P	2X 10 AWG - #10G		DEHUMIDIFIER Flower ROOM	N	10
11		C	4X 12 AWG - #12G		20A-3P	2.70			3.45	0.75					N	12
13		C				2.70	3.45			0.75	30A-1P	2X 10 AWG - #10G		DEHUMIDIFIER Flower ROOM	N	14
15	CU-03	C				14.14		14.14			20A-1P			SPARE		16
17		C	4X 4 AWG - #6G		80A-3P	14.14			14.14		20A-1P			SPARE		18
19		C				14.14	14.14				20A-1P			SPARE		20
21	SPARE				20A-1P						20A-1P			SPARE		22
23	SPARE										30A-1P			SPARE		24
25					20A-3P						30A-1P			SPARE		26
27											30A-1P			SPARE		28
29	SPARE				30A-1P						30A-1P			SPARE		30
31	SPARE				30A-1P						20A-1P			SPARE		32
33	SPARE				20A-1P						20A-1P			SPARE		34
35	SPARE				20A-1P						20A-1P			SPARE		36
37	SPARE				20A-1P						20A-1P			SPARE		38
39	SPARE				20A-1P						20A-1P			SPARE		40
41	SPARE				20A-1P						20A-1P			SPARE		42
	(KVA)															
	Total Connected Load					21.69	19.09	19.09								

Location: ELEC

*	LOAD SUMMARY	CL	DF	CONNECTED LOAD A	B	C	DEMAND TOTAL
L	Lighting		1.00				
R	Convenience Recept	1.08		1.08			1.08
H	Heating (Space)		1.25				
C	Cooling	50.52	1.00	16.84	16.84	16.84	50.52
A	HVAC		1.00				
P	Process		1.00				
O	Other Continuous		1.25				
K	Kitchen		0.65				
N	Noncontinuous	8.27	1.00	3.77	2.25	2.25	8.27
M	Motor		1.00				
	Total	**59.87**		21.69	19.09	19.09	59.87

Total Demand Load (KVA)	59.87
Total Demand Current (A)	166.18
Min. Feeder Ampacity (A)	207.72

PANEL D1

PANELBOARD DESIGNATION

SYSTEM VOLTAGE	208/120V, 3Φ, 4W
BUS SIZE	250
SYSTEM TYPE	NORMAL
FEEDER PROT	250A-3P CB Bus Plug
CONDUCTOR SIZE	4/0 AWG - #2/0G CU
CONDUCTOR/PHASE	1
MAINS	250A MCB
SCCR	SERIES RATED
MCB RATING	80%
GROUND FAULT	NO
FEEDER LENGTH (FT)	15
FEEDER V. DROP (%)	
FAULT CURRENT	
KAIC RATING	22
ENCLOSURE	TYPE 3R

	DESCRIPTION	*	WIRE	GRD	CB	KVA	A	B	C	KVA	CB	WIRE	GRD	DESCRIPTION	*	
1	Receptacles Flower ROOM	R	2X 12 AWG - #12G		20A-1P	1.08	2.11			1.03	20A-1P	2X 12 AWG - #12G		Exhaust Fan	N	2
3	DEHUMIDIFIER Flower ROOM	N				0.75		1.50		0.75					N	4
5		N	2X 10 AWG - #10G		30A-1P	0.75			1.50	0.75	30A-1P	2X 10 AWG - #10G		DEHUMIDIFIER Flower ROOM	N	6
7	C/A FAN	N	2X 12 AWG - #12G		20A-1P	1.24	1.99			0.75					N	8
9	AHU-04	C				2.70		3.45		0.75	30A-1P	2X 10 AWG - #10G		DEHUMIDIFIER Flower ROOM	N	10
11		C	4X 12 AWG - #12G		20A-3P	2.70			3.45	0.75					N	12
13		C				2.70	3.45			0.75	30A-1P	2X 10 AWG - #10G		DEHUMIDIFIER Flower ROOM	N	14
15	CU-04	C				14.14		14.14			20A-1P			SPARE		16
17		C	4X 4 AWG - #6G		80A-3P	14.14			14.14		20A-1P			SPARE		18
19		C				14.14	14.14				20A-1P			SPARE		20
21	SPARE				20A-1P						20A-1P			SPARE		22
23	SPARE										30A-1P			SPARE		24
25					20A-3P						30A-1P			SPARE		26
27											30A-1P			SPARE		28
29	SPARE				30A-1P						30A-1P			SPARE		30
31	SPARE				30A-1P						20A-1P			SPARE		32
33	SPARE				20A-1P						20A-1P			SPARE		34
35	SPARE				20A-1P						20A-1P			SPARE		36
37	SPARE				20A-1P						20A-1P			SPARE		38
39	SPARE				20A-1P						20A-1P			SPARE		40
41	SPARE				20A-1P						20A-1P			SPARE		42
	(KVA)															
	Total Connected Load					21.69	19.09	19.09								

Location: ELEC

*	LOAD SUMMARY	CL	DF	CONNECTED LOAD A	B	C	DEMAND TOTAL
L	Lighting		1.00				
R	Convenience Recept	1.08		1.08			1.08
H	Heating (Space)		1.25				
C	Cooling	50.52	1.00	16.84	16.84	16.84	50.52
A	HVAC		1.00				
P	Process		1.00				
O	Other Continuous		1.25				
K	Kitchen		0.65				
N	Noncontinuous	8.27	1.00	3.77	2.25	2.25	8.27
M	Motor		1.00				
	Total	**59.87**		21.69	19.09	19.09	59.87

Total Demand Load (KVA)	59.87
Total Demand Current (A)	166.18
Min. Feeder Ampacity (A)	207.72

PANEL E1

PANELBOARD DESIGNATION

SYSTEM VOLTAGE	208/120V, 3Φ, 4W
BUS SIZE	250
SYSTEM TYPE	NORMAL
FEEDER PROT	250A-3P CB Bus Plug
CONDUCTOR SIZE	4/0 AWG - #2/0G CU
CONDUCTOR/PHASE	1
MAINS	250A MCB
SCCR	SERIES RATED
MCB RATING	80%
GROUND FAULT	NO
FEEDER LENGTH (FT)	15
FEEDER V. DROP (%)	
FAULT CURRENT	
KAIC RATING	22
ENCLOSURE	TYPE 3R

	DESCRIPTION	*	WIRE	GRD	CB	KVA	A	B	C	KVA	CB	WIRE	GRD	DESCRIPTION	*	
1	Receptacles Flower ROOM	R	2X 12 AWG - #12G		20A-1P	1.08	2.11			1.03	20A-1P	2X 12 AWG - #12G		Exhaust Fan	N	2
3	DEHUMIDIFIER Flower ROOM	N				0.75		1.50		0.75					N	4
5		N	2X 10 AWG - #10G		30A-1P	0.75			1.50	0.75	30A-1P	2X 10 AWG - #10G		DEHUMIDIFIER Flower ROOM	N	6
7	C/A FAN	N	2X 12 AWG - #12G		20A-1P	1.24	1.99			0.75					N	8
9	AHU-05	C				2.70		3.45		0.75	30A-1P	2X 10 AWG - #10G		DEHUMIDIFIER Flower ROOM	N	10
11		C	4X 12 AWG - #12G		20A-3P	2.70			3.45	0.75					N	12
13		C				2.70	3.45			0.75	30A-1P	2X 10 AWG - #10G		DEHUMIDIFIER Flower ROOM	N	14
15	CU-05	C				14.14		14.14			20A-1P			SPARE		16
17		C	4X 4 AWG - #6G		80A-3P	14.14			14.14		20A-1P			SPARE		18
19		C				14.14	14.14				20A-1P			SPARE		20
21	SPARE				20A-1P						20A-1P			SPARE		22
23	SPARE										30A-1P			SPARE		24
25					20A-3P						30A-1P			SPARE		26
27											30A-1P			SPARE		28
29	SPARE				30A-1P						30A-1P			SPARE		30
31	SPARE				30A-1P						20A-1P			SPARE		32
33	SPARE				20A-1P						20A-1P			SPARE		34
35	SPARE				20A-1P						20A-1P			SPARE		36
37	SPARE				20A-1P						20A-1P			SPARE		38
39	SPARE				20A-1P						20A-1P			SPARE		40
41	SPARE				20A-1P						20A-1P			SPARE		42
	(KVA)															
	Total Connected Load					21.69	19.09	19.09								

BCIT COMPANY

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REV. NO.	DESCRIPTION	DATE	BY

PROJECT:

SUNLAND CULTIVATION

TITLE:

PANEL BOARD SCHEDULE SHEET 2 OF 3

PROJ. NO.	PROJ. ENGR.	SCALE @ 24X36:
		NTS

DRAWING NO.

E 5 . 0 1

REV.

PANEL F1

PANELBOARD DESIGNATION

SYSTEM VOLTAGE	208/120V, 3Φ, 4W
BUS SIZE	250
SYSTEM TYPE	NORMAL
FEEDER PROT	250A-3P CB Bus Plug
CONDUCTOR SIZE	4/0 AWG - #2/0G CU
CONDUCTOR/PHASE	1
MAINS	250A MCB
SCCR	SERIES RATED
MCB RATING	80%
GROUND FAULT	NO
FEEDER LENGTH (FT)	15
FEEDER V. DROP (%)	
FAULT CURRENT	
KAIC RATING	22
ENCLOSURE	TYPE 3R

Location: ELEC

*	LOAD SUMMARY	CL	DF	CONNECTED LOAD A	B	C	DEMAND TOTAL
L	Lighting		1.00				
R	Convenience Recept	1.08		1.08			1.08
H	Heating (Space)		1.25				
C	Cooling	50.52	1.00	16.84	16.84	16.84	50.52
A	HVAC		1.00				
P	Process		1.00				
O	Other Continuous		1.25				
K	Kitchen		0.65				
N	Noncontinuous	8.27	1.00	3.77	2.25	2.25	8.27
M	Motor		1.00				
	Total	**59.87**		21.69	19.09	19.09	59.87

Total Demand Load (KVA)	59.87
Total Demand Current (A)	166.18
Min. Feeder Ampacity (A)	207.72

	DESCRIPTION	*	WIRE	GRD	CB	KVA	A	B	C	KVA	CB	WIRE	GRD	DESCRIPTION	*	
1	Receptacles Flower ROOM	R	2X 12 AWG - #12G		20A-1P	1.08	2.11			1.03	20A-1P	2X 12 AWG - #12G		Exhaust Fan	N	2
3	DEHUMDIFIER Flower ROOM	N	2X 10 AWG - #10G		30A-1P	0.75		1.50		0.75	30A-1P	2X 10 AWG - #10G		DEHUMDIFIER Flower ROOM	N	4
5		N				0.75			1.50	0.75					N	6
7	C/A FAN	N	2X 12 AWG - #12G		20A-1P	1.24	1.99			0.75	30A-1P	2X 10 AWG - #10G		DEHUMDIFIER Flower ROOM	N	8
9	AHU-05	C				2.70		3.45		0.75					N	10
11		C	4X 12 AWG - #12G		20A-3P	2.70			3.45	0.75	30A-1P	2X 10 AWG - #10G		DEHUMDIFIER Flower ROOM	N	12
13		C				2.70	3.45			0.75					N	14
15	CU-05	C				14.14		14.14			20A-1P			SPARE		16
17		C	4X 4 AWG - #6G		80A-3P	14.14			14.14		20A-1P			SPARE		18
19		C				14.14	14.14				20A-1P			SPARE		20
21	SPARE				20A-1P						20A-1P			SPARE		22
23	SPARE				20A-3P						30A-1P			SPARE		24
25											30A-1P			SPARE		26
27											30A-1P			SPARE		28
29	SPARE				30A-1P						30A-1P			SPARE		30
31	SPARE				30A-1P						20A-1P			SPARE		32
33	SPARE				20A-1P						20A-1P			SPARE		34
35	SPARE				20A-1P						20A-1P			SPARE		36
37	SPARE				20A-1P						20A-1P			SPARE		38
39	SPARE				20A-1P						20A-1P			SPARE		40
41	SPARE				20A-1P						20A-1P			SPARE		42
	(KVA)															
	Total Connected Load					21.69	19.09	19.09								

PANEL G1

PANELBOARD DESIGNATION

SYSTEM VOLTAGE	208/120V, 3Φ, 4W
BUS SIZE	250
SYSTEM TYPE	NORMAL
FEEDER PROT	250A-3P CB Bus Plug
CONDUCTOR SIZE	4/0 AWG - #2/0G CU
CONDUCTOR/PHASE	1
MAINS	250A MCB
SCCR	SERIES RATED
MCB RATING	80%
GROUND FAULT	NO
FEEDER LENGTH (FT)	15
FEEDER V. DROP (%)	
FAULT CURRENT	
KAIC RATING	22
ENCLOSURE	TYPE 3R

Location: ELEC

*	LOAD SUMMARY	CL	DF	CONNECTED LOAD A	B	C	DEMAND TOTAL
L	Lighting		1.00				
R	Convenience Recept	1.08		1.08			1.08
H	Heating (Space)		1.25				
C	Cooling	50.52	1.00	16.84	16.84	16.84	50.52
A	HVAC		1.00				
P	Process		1.00				
O	Other Continuous		1.25				
K	Kitchen		0.65				
N	Noncontinuous	8.27	1.00	3.77	2.25	2.25	8.27
M	Motor		1.00				
	Total	**59.87**		21.69	19.09	19.09	59.87

Total Demand Load (KVA)	59.87
Total Demand Current (A)	166.18
Min. Feeder Ampacity (A)	207.72

	DESCRIPTION	*	WIRE	GRD	CB	KVA	A	B	C	KVA	CB	WIRE	GRD	DESCRIPTION	*	
1	Receptacles Flower ROOM	R	2X 12 AWG - #12G		20A-1P	1.08	2.11			1.03	20A-1P	2X 12 AWG - #12G		Exhaust Fan	N	2
3	DEHUMDIFIER Flower ROOM	N	2X 10 AWG - #10G		30A-1P	0.75		1.50		0.75	30A-1P	2X 10 AWG - #10G		DEHUMDIFIER Flower ROOM	N	4
5		N				0.75			1.50	0.75					N	6
7	C/A FAN	N	2X 12 AWG - #12G		20A-1P	1.24	1.99			0.75	30A-1P	2X 10 AWG - #10G		DEHUMDIFIER Flower ROOM	N	8
9	AHU-05	C				2.70		3.45		0.75					N	10
11		C	4X 12 AWG - #12G		20A-3P	2.70			3.45	0.75	30A-1P	2X 10 AWG - #10G		DEHUMDIFIER Flower ROOM	N	12
13		C				2.70	3.45			0.75					N	14
15	CU-05	C				14.14		14.14			20A-1P			SPARE		16
17		C	4X 4 AWG - #6G		80A-3P	14.14			14.14		20A-1P			SPARE		18
19		C				14.14	14.14				20A-1P			SPARE		20
21	SPARE				20A-1P						20A-1P			SPARE		22
23	SPARE				20A-3P						30A-1P			SPARE		24
25											30A-1P			SPARE		26
27											30A-1P			SPARE		28
29	SPARE				30A-1P						30A-1P			SPARE		30
31	SPARE				30A-1P						20A-1P			SPARE		32
33	SPARE				20A-1P						20A-1P			SPARE		34
35	SPARE				20A-1P						20A-1P			SPARE		36
37	SPARE				20A-1P						20A-1P			SPARE		38
39	SPARE				20A-1P						20A-1P			SPARE		40
41	SPARE				20A-1P						20A-1P			SPARE		42
	(KVA)															
	Total Connected Load					21.69	19.09	19.09								

PANEL H

PANELBOARD DESIGNATION

SYSTEM VOLTAGE	208/120V, 3Φ, 4W
BUS SIZE	250
SYSTEM TYPE	NORMAL
FEEDER PROT	250A-3P C/B Bus Plug
CONDUCTOR SIZE	4/0 AWG - #2/0G CU
CONDUCTOR/PHASE	1
MAINS	250A MCB
SCCR	SERIES RATED
MCB RATING	80%
GROUND FAULT	NO
FEEDER LENGTH (FT)	50
FEEDER V. DROP (%)	
FAULT CURRENT	
KAIC RATING	22
ENCLOSURE	TYPE 3R

Location: ELEC

*	LOAD SUMMARY	CL	DF	CONNECTED LOAD A	B	C	DEMAND TOTAL
L	Lighting	8.11	1.25	3.20	1.59	3.32	10.14
R	Convenience Recept	11.07		3.78	2.79	4.59	10.54
H	Heating (Space)	0.25	1.25		0.25		0.31
C	Cooling		1.00				
A	HVAC	26.97	1.00	13.48	8.74	8.74	26.97
P	Process		1.00				
O	Other Continuous		1.25				
K	Kitchen	0.52	0.65		2.25		0.34
N	Noncontinuous	8.00	1.00	2.50	1.50	4.00	8.00
M	Motor	0.52	1.00			0.27	0.27
	Total	**55.43**		22.96	15.33	18.93	56.56

Total Demand Load (KVA)	56.56
Total Demand Current (A)	156.99
Min. Feeder Ampacity (A)	198.23

	DESCRIPTION	*	WIRE	GRD	CB	KVA	A	B	C	KVA	CB	WIRE	GRD	DESCRIPTION	*	
1	Lighting Lab & Fertigation room	L	2X 12 AWG - #12G		20A-1P	0.71	1.04			0.33	20A-1P	2X 12 AWG - #12G		Lighting Shower Break Room	L	2
3	Ltg. Package, Storage, Elec. & Loading Rooms	L	2X 12 AWG - #12G		20A-1P	0.55		1.12		0.56	20A-1P	2X 12 AWG - #12G		Ltg. Office, Trim, DRY & Changing Rooms	L	4
5	Ltg. Clone/Mother Room	L	2X 12 AWG - #12G		20A-1P	1.94			3.02	1.08	20A-1P	2X 12 AWG - #12G		Lighting Propagation - Clone	L	6
7	Lighting Propagation - Clone	L	2X 12 AWG - #12G		20A-1P	1.08	2.16			1.08	20A-1P	2X 12 AWG - #12G		Lighting Propagation - Clone	L	8
9	Ltg. Corridor	L	2X 12 AWG - #12G		20A-1P	0.48		0.48			20A-1P			SPARE		10
11	EXIT Light	L	2X 12 AWG - #12G		20A-1P	0.31			0.31		20A-1P			SPARE		12
13	SPARE				20A-1P			0.81		0.81	20A-1P	2X 10 AWG - #10G		Receptacles Clone / Mothers	R	14
15	SPARE				20A-1P				0.81	0.81	20A-1P	2X 10 AWG - #10G		Receptacles Changing & TRIM Room	R	16
17	Receptacles Dry Room	R	2X 10 AWG - #10G		20A-1P	1.08			2.16	1.08	20A-1P	2X 10 AWG - #10G		Receptacles Office	R	18
19	Receptacles Elec. & Loading Area	R	2X 10 AWG - #10G		20A-1P	0.81	1.62			0.81	20A-1P	2X 10 AWG - #10G		Receptacles Storage Room	R	20
21	Receptacles Packaging Room	R	2X 12 AWG - #12G		20A-1P	0.81		1.89		1.08	20A-1P	2X 10 AWG - #10G		Receptacles Lab	R	22
23	Receptacles Fertigation Room	R	2X 12 AWG - #12G		20A-1P	1.08			2.43	1.35	20A-1P	2X 10 AWG - #10G		Receptacles Corridor	R	24
25	Receptacles Corridor	R	2X 12 AWG - #12G		20A-1P	0.54	1.35			0.81	20A-1P	2X 12 AWG - #12G		Receptacles Kitchen	R	26
27	Fridge	K	2X 12 AWG - #12G		20A-1P	0.75		2.25		1.50	20A-1P	2X 12 AWG - #12G		Oven	K	28
29	Toilet Exhaust Fan EF-01, 02, 04 & Kitchen EF-03	M	2X 12 AWG - #12G		20A-1P	0.25			0.52	0.27	20A-1P	2X 12 AWG - #12G		Exhaust Fan EF-05	M	30
31	FCU-01	A	2X 12 AWG - #12G		20A-2P	0.25	0.50			0.25	20A-2P	2X 12 AWG - #12G		FCU-02	A	32
33		A				0.25		0.50		0.25					A	34
35	IDU-01 & 02	A	2X 12 AWG - #12G		20A-2P	0.25			0.50	0.25	20A-2P	2X 12 AWG - #12G		FCU-03	A	36
37		A				0.25	0.50			0.25					A	38
39	DEHUMIDIFIER DRY Room	N	2X 12 AWG - #12G		20A-2P	0.75		1.50		0.75	20A-2P	2X 10 AWG - #10G		DEHUMIDIFIER DRY Room	N	40
41		N				0.75			1.50	0.75					N	42
43	Outdoor Unit ODU-04	A	2X 6 AWG - #6G		45A-2P	3.12	6.24			3.12	45A-3P	2X 6 AWG - #6G		Outdoor Unit ODU-03	A	44
45		A				3.12		6.24		3.12					A	46
47	Outdoor Unit ODU-02	A	2X 6 AWG - #6G		45A-2P	3.12			5.62	2.50	20A-2P	2X 10 AWG - #10G		Fertigation System	N	48
49		A				3.12	5.62			2.50					N	50
51	Electrical Water Heater	H	2X 6 AWG - #6G		60A-1P	0.25		0.25			20A-1P			SPARE		52
53	Outdoor Unit ODU-01	A	2X 6 AWG - #6G		45A-2P	3.12			3.12		20A-1P			SPARE		54
55		A				3.12	3.12				20A-1P			SPARE		56
57	SPARE				20A-1P						20A-1P			SPARE		58
59	SPARE				20A-1P						20A-1P			SPARE		60
61	SPARE				20A-1P						20A-1P			SPARE		62
63	SPARE				20A-1P						20A-1P			SPARE		64
65	SPARE				20A-1P						20A-1P			SPARE		66
	(KVA)															
	Total Connected Load					22.96	15.93	19.17								

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REV. NO.	DESCRIPTION	DATE	BY

PROJECT:

SUNLAND CULTIVATION

TITLE:

PANEL BOARD SCHEDULE SHEET 3 OF 3

PROJ. NO.	PROJ. ENGR.	SCALE @ 24X36:
		NTS

DRAWING NO.

E 5 . 0 2

REV.

PLUMBING SPECIFICATIONS

THE WORK INCLUDES MODIFICATION TO THE EXISTING PLUMBING SYSTEM AND PROVIDING NEW MATERIALS, FITTINGS AND ACCESSORIES NECESSARY FOR A COMPLETE FUNCTIONING PLUMBING SYSTEM. THE WORK ALSO INCLUDES ROUGH-IN AND FINAL CONNECTIONS TO FOOD SERVICE EQUIPMENT AND BEVERAGE DISPENSING EQUIPMENT PROVIDED BY OTHERS. ALL WORK SHALL BE IN ACCORDANCE WITH LOCAL CODES AND/OR ORDINANCES AND IS SUBJECT TO INSPECTION. HOOK-UP CHARGES, PERMITS AND ALL OTHER EXPENSES RELATED TO A COMPLETE AND FUNCTIONING PLUMBING SYSTEM ARE INCLUDED AS A PART OF THIS SECTION. WARRANTY: PROVIDE LABOR AND MATERIALS TO REPAIR OR REPLACE DEFECTIVE PARTS AND MATERIALS AS REQUIRED FOR ONE YEAR AFTER SUBSTANTIAL COMPLETION OR OWNER ACCEPTANCE OF THE COMPLETED PROJECT. PROVIDE A SEPARATE LINE ITEM DEDUCT AMOUNT ON THE PROPOSAL FORM TO DELETE WARRANTY SERVICE, AT THE OWNER'S OPTION. THE INTENT OF THE DRAWINGS IS TO INDICATE THE GENERAL EXTENT OF WORK REQUIRED FOR THE PROJECT. THE DRAWINGS FOR PLUMBING WORK ARE DIAGRAMMATIC, SHOWING THE GENERAL LOCATION, TYPE, FIXTURES AND EQUIPMENT REQUIRED. THE DRAWINGS SHALL NOT BE SCALED FOR EXACT MEASUREMENTS. REFER TO MANUFACTURER'S STANDARD ROUGH-IN DRAWINGS FOR PLUMBING FIXTURE INSTALLATION REQUIREMENTS. COMPLY WITH ALL APPLICABLE ADA INSTALLATION REQUIREMENTS. COORDINATE WITH THE WORK OF OTHER SECTIONS, EQUIPMENT FURNISHED BY OTHERS, AND WITH THE CONSTRAINTS OF THE EXISTING CONDITIONS OF THE PROJECT SITE. PIPING SYSTEMS - GENERAL: ALL PIPING SHALL BE RUN PARALLEL TO BUILDING LINES AND SUPPORTED AND ANCHORED AS REQUIRED TO FACILITATE EXPANSION AND CONTRACTION. ALL PIPING SHALL BE CONCEALED EXCEPT IN UNFINISHED SPACES. INSTALL AS REQUIRED TO MEET ALL CONSTRUCTION CONDITIONS AND TO ALLOW FOR INSTALLATION OF OTHER WORK SUCH AS DUCTS AND ELECTRICAL CONDUIT. AT ALL CONNECTIONS BETWEEN FERROUS PIPING AND NONFERROUS PIPING, PROVIDE AN ISOLATING DIALECTIC UNION. ALL HANGERS SHALL BE COMPATIBLE WITH PIPING MATERIAL TO PREVENT CORROSION. PROVIDE ALL FITTINGS, ACCESSORIES, OFFSETS, AND MATERIALS NECESSARY TO FACILITATE THE PLUMBING SYSTEM'S FUNCTIONING AS INDICATED BY THE DESIGN AND THE EQUIPMENT INDICATED. FIXTURES/EQUIPMENT FURNISHED BY OTHERS: PLUMBING CONTRACTOR SHALL PROVIDE UTILITY CONNECTIONS REQUIRED SUCH AS WATER, GAS, AIR, SUPPLIES, WASTE OUTLET, TRAPS, ETC. AT ALL PLUMBING TYPE FIXTURES OR EQUIPMENT FURNISHED BY OWNER, GENERAL CONTRACTOR, FOOD SERVICE CONTRACTOR, EQUIPMENT SUPPLIER, ETC. INCLUDED ARE STOP VALVES, ESCUTCHEONS, AND CHROME PLATED BRASS TUBING WITH COMPRESSION FITTINGS. SEWER AND WASTE PIPING: PROVIDE ALL DRAINS AND SEWERS WITHIN THE SPACE WITH CONNECTION TO THE EXISTING DRAINAGE SYSTEMS ON-SITE. SANITARY DRAINAGE PIPING ABOVE FLOOR SHALL BE CO-EXTRUDED PVC DWV (SCHEDULE 40) PIPE, FITTINGS AND CONNECTIONS. SANITARY DRAINAGE PIPING BELOW GRADE SHALL BE CO-EXTRUDED PVC DWV (SCHEDULE 40) PIPE WITH SOLVENT WELD FITTINGS MAY BE USED (WHERE PERMITTED BY CODE/LOCAL AUTHORITIES). ALL DRAINAGE PIPING SHALL BE UNIFORMLY PITCHED, 1/4" PER FOOT UNLESS OTHERWISE REQUIRED BY EXISTING CONDITIONS, OR INDICATED ON THE DRAWINGS. VENTS: PROVIDE A COMPLETE SYSTEM OF STANDARD WEIGHT CAST IRON NO-HUB VENT RISERS WHERE THE CEILING SPACE IS USED AS A RETURN AIR PLENUM OR USE CO-EXTRUDED PVC DWV (SCHEDULE 40) PIPE (WHERE PERMITTED BY CODE/LOCAL AUTHORITIES) WHERE THERE IS A DUCTED RETURN AIR SYSTEM. DO NOT USE PVC PIPE IN RETURN AIR PLENUM SPACES. THE VENT SYSTEM SHALL BE CARRIED THROUGH THE ROOF WITH APPROPRIATE FLASHING. CONDENSATE AND INDIRECT DRAIN PIPING:PIPING ABOVE FLOOR SHALL BE CO-EXTRUDED PVC DWV (SCHEDULE 40) PIPE, FITTINGS AND CONNECTIONS. PIPING BELOW GRADE SHALL BE CO-EXTRUDED PVC DWV(SCHEDULE 40) PIPE WITH SOLVENT WELD FITTINGS. CLEANOUTS: PROVIDE CLEANOUTS AT THE END OF EACH HORIZONTAL RUN, AND AT THE BASE OF ALL VERTICAL WASTE AND DRAIN PIPES. CLEANOUTS SHALL BE OF THE SAME SIZE AS THE PIPES THEY SERVE, CONFORMING TO CODE REQUIREMENTS. PROVIDE SUITABLE WALL OR FLOOR CLEANOUTS WITH ACCESSORIES TO OBSCURE FROM VIEW. WATER DISTRIBUTION PIPING: LAYOUT WATER PIPING SO THAT THE ENTIRE SYSTEM CAN BE DRAINED. HOT AND COLD WATER PIPING SHALL BE 1/2" MIN. CPVC PIPE WITH SOLVENT FITTING. PROVIDE WATER HAMMER ARRESTERS AT EACH FIXTURE OR GROUP OF FIXTURES AS REQUIRED. INSTALL CHROME PLATED BRASS ESCUTCHEON PLATES AT ALL PENETRATIONS THROUGH FINISHED SURFACES (INCLUDING CABINET INTERIORS). PIPE INSULATION: INSULATE (AS ALLOWED BY CODE) ALL LISTED SERVICE PIPING AS FOLLOWS. DOMESTIC COLD/HOT WATER, HOT WATER RETURN, STORM WATER PIPING. PROVIDE 1" PREFORMED FIBERGLASS, ASJ/SS-11, FLAME SPREAD 25, SMOKE DEVELOPED 50, ASTM C-547. FOR CONDENSATE PIPING PROVIDE 1/2" THICK INSULATION OF SAME CHARACTERISTICS AS LISTED FOR 1" ABOVE. WHERE PERMITTED BY LOCAL CODES, PROVIDE 1/2" SELF-ADHESIVE UNICELLULAR FOAM PIPE INSULATION WITH PRE-FORMED PVC FITTING COVERS - EQUAL TO SELF-ADHESIVE ARMSTRONG 2000 WITH K FACTOR OF 0.27 AT 75 DEGREES MEAN TEMPERATURE. INSULATE ANY EXPOSED CONDENSATE PIPING WITH WASTE TEMPERATURE BELOW 60 DEGREES F. SHUTOFF VALVES, WITH UNIONS SHALL BE PROVIDED FOR SERVICE TO EACH PLUMBING FIXTURE, FOOD SERVICE EQUIPMENT ITEM OR OTHER EQUIPMENT ITEM, TO FACILITATE ISOLATION FOR REPAIR OR REPLACEMENT. VALVES SHALL BE EQUAL TO JENKINS #902-T BALL VALVE, CHROME-FINISHED BRONZE, TEFLON SEATS AND PACKING, 400 LB. W.O.G., SOLDER END. ACCESS PANELS SHALL BE PROVIDED WHERE CONCEALED CONTROL DEVICES, VALVES, ETC. ARE CONCEALED WITHIN WALLS. WHERE ACCESS FOR ADJUSTMENT AND MAINTENANCE IS POSSIBLE THROUGH LAY-IN SUSPENDED CEILINGS, ACCESS PANELS ARE NOT REQUIRED. PIPING SYSTEM- PVC SCHEDULE 40, SCHEDULE 80 AND CPVC PIPE WITH SOLVENT FITTINGS SHALL BE USED WHERE PEMITTED BY CODE/LOCAL AUTHORITIES. INSTALLATION: THOROUGHLY CLEAN ITEMS BEFORE INSTALLATION. CAP PIPE OPENINGS TO EXCLUDE DIRT UNTIL FIXTURES ARE INSTALLED AND FINAL CONNECTIONS HAVE BEEN MADE. PROCEED AS RAPIDLY AS CONSTRUCTION WILL PERMIT. SET FIXTURES LEVEL AND IN PROPER ALIGNMENT. INSTALL SUPPLIES IN PROPER ALIGNMENT WITH FIXTURES. INSTALL SILICONE SEALANT BETWEEN FIXTURES AND ADJACENT MATERIAL, FOR SANITARY JOINT, AND OMIT ESCUTCHEONS. REPAIR EXISTING PLUMBING SYSTEM COMPONENTS DAMAGED BY CONSTRUCTION OPERATIONS AND RESTORE TO ORIGINAL CONDITIONS. TEST WATER SYSTEM UNDER 150 PSIG HYDROSTATIC PRESSURE, FOR FOUR (4) HOURS MINIMUM. WHEN TESTING INDICATES MATERIALS OR WORKMANSHIP IS DEFICIENT, REPLACE OR REPAIR AS REQUIRED, AND REPEAT TEST UNTIL STANDARDS ARE ACHIEVED. ROOF PENETRATIONS SHALL COMPLY WITH "SMACNA" AND "NRCA" STANDARDS, AND WITH THE REQUIREMENTS OF THE EXISTING ROOFING WARRANTY, IF APPLICABLE. DO NOT PERFORM ROOFING PENETRATIONS IN A MANNER WHICH WOULD VOID OR OTHERWISE LIMIT THE EXISTING ROOFING WARRANTY.

GENERAL NOTES

1. THE INTENT OF THESE PLANS AND SPECIFICATIONS IS TO INCLUDE ALL LABOR, EQUIPMENT, MATERIALS, AND SERVICES NECESSARY TO FURNISH, INSTALL, TEST, AND ADJUST A COMPLETE WORKABLE PLUMBING INSTALLATION AS SHOWN, PRESCRIBED, OR REASONABLY IMPLIED BUT NOT LIMITED TO THAT EXPLICITLY INDICATED IN THE CONTRACT DOCUMENTS, BUT NECESSARY FOR THE PROPER EXECUTION AND COMPLETION OF THE INTENT THEREOF.
2. THE ENTIRE INSTALLATION SHALL CONFORM TO THE REQUIREMENTS OF THE 2006 UNIFORM PLUMBING CODE, 2006 INTERNATIONAL BUILDING CODE, 2006 INTERNATIONAL ENERGY CONSERVATION CODE AND ALL OTHER APPLICABLE CODES AND REGULATIONS REQUIRED BY AUTHORITIES HAVING JURISDICTION. IN THE EVENT OF CONFLICT BETWEEN SPECIFICATIONS, CODES, AND REGULATIONS, THE MORE RESTRICTIVE SHALL APPLY.
3. COORDINATE ENTIRE INSTALLATION OF THE PLUMBING SYSTEM WITH THE WORK OF OTHER TRADES PRIOR TO ANY FABRICATION OR INSTALLATION. FIELD VERIFY ALL DIMENSIONS AND CONDITIONS.
5 REPORT ANY DISCREPANCIES, IN WRITING, TO THE ENGINEER PRIOR TO COMMENCEMENT OF WORK.
4. CONTRACTOR SHALL PROVIDE AS-BUILT DRAWINGS WITH ALL CHANGES NOTED THEREON AT THE COMPLETION OF THE PROJECT IN ACCORDANCE WITH THE SPECIFICATIONS. PROVIDE ONE YEAR WARRANTY ON ALL PARTS AND LABOR.
6. THE DRAWINGS ARE DIAGRAMMATIC AND INTENDED TO SHOW SCOPE. CONTRACTOR SHALL COORDINATE HIS WORK WITH OTHER TRADES TO PROVIDE THE BEST ARRANGEMENT OF ALL DUCT, PIPE, CONDUIT, ETC.
7. ALL CUTTING AND PATCHING OF THE EXISTING STRUCTURE SHALL BE PROVIDED UNDER OTHER SECTIONS OF THE WORK. PROVIDE NECESSARY REQUIREMENTS TO THE PROJECT SUPERINTENDENT.
8. ALL HOT WATER PIPING AND RECIRCULATION PIPING (EXCEPT RUNOUTS 12 FT. OR SHORTER TO INDIVIDUAL FIXTURES) SHALL BE INSULATED TO MEET THE REQUIREMENTS OF THE 2006 INTERNATIONAL ENERGY CONSERVATION CODE
9. CONDENSATE DRAINS SHALL BE PROVIDED FOR EACH AIR CONDITIONING UNIT. HORIZONTAL CONDENSATE DRAINS ABOVE ANY CEILING SHALL BE INSULATED WITH MIN. 3/8" THICK CLOSED CELL INSULATION.
10. PIPING:

A. WASTE, VENT, AND STORM DRAIN PIPING SHALL BE CO-EXTRUDED PVC SCHEDULE 40) PIPE
B. WATER PIPE SHALL BE CPVC PIPE
C. CONDENSATE PIPING SHALL BE CO-EXTRUDED PVC (SCHEDULE 40) PIPE
D. INSIDE GAS PIPING SHALL BE BLACK IRON SCHEDULE 40 WITH MALLEABLE IRON FITTINGS. OUTSIDE SHALL BE GALVANIZED IRON SCHEDULE 40 WITH GALVANIZED FITTINGS. GAS LINE TO BE PAINTED GRAY IN COLOR. A 24 HOUR METERED GAS TEST SHALL BE REQUIRED.
E. ALL PIPING NOT ENCLOSED IN CONDITION SPACE OR AT EXTERIOR WALLS SHALL BE INSULATED.
F. PIPING: PVC SCHEDULE 40, SCHEDULE 80 AND CPVC PIPING WITH SOLVENT WELD FITTINGS SHALL BE USED WHERE PERMITTED BY CODE/LOCAL AUTHORITIES

11. ALL VENTS OR EXHAUSTS SHALL BE AT LEAST 10 FT. AWAY OR 3 FT. ABOVE ANY WINDOW, DOOR, OPENING, OR AIR INTAKE.
12. CLEANOUTS SHALL BE INSTALLED PER THE UNIFORM PLUMBING CODE.
13. PROVIDE WATER TIGHT FLASHINGS WHEREVER PIPES PASS THROUGH EXTERIOR WALLS, ROOFS, OR FLOORS.
14. PROVIDE ISOLATION FOR ALL PIPES THAT COME IN CONTACT WITH THE STRUCTURE.
15. LOCATION OF EXISTING UTILITIES AND POINTS OF CONNECTION ARE APPROXIMATE. CONTRACTOR SHALL VERIFY EXACT LOCATIONS AND DEPTHS OF EXISTING UTILITIES AND SERVICES PRIOR TO STARTING WORK OF THIS SECTION. IF INDICATED POINTS OF CONNECTION CANNOT BE MADE TO EXISTING UTILITIES AS FOUND, THE CONTRACTOR SHALL NOTIFY THE ENGINEER PRIOR TO INSTALLING ANY WORK WHICH MAY BE AFFECTED.
16. VALVES SHALL BE NIBCO, JENKINS, HAMMOND, RED & WHITE OR APPROVED EQUAL. SERVICE PRESSURE SHALL BE SUITABLE FOR SERVICE INTENDED. THE MAIN WATER SHUT OF VALVE SHALL BE A FULL PORT BALL TYPE AND APPROVED FOR SERVICE INTENDED.
17. CONTRACTOR SHALL PROVIDE ALL SHUT OFF VALVES AS NECESSARY TO ISOLATE ANY EQUIPMENT, PLUMBING ITEMS, OR FIXTURES, THAT MAY NEED SERVICING OR ARE SUBJECT TO FAILURE WHETHER OR NOT SUCH VALVES ARE SHOWN ON THE DRAWINGS.
18. PROVIDE HANGERS AND SUPPORTS AS REQUIRED. PLUMBERS TAPE AND WIRE ARE NOT ACCEPTABLE.
19. CONTRACTOR IS RESPONSIBLE FOR HIS OWN TRENCHING, BACKFILL, AND COMPACTION OF TRENCHES NECESSARY TO COMPLETE HIS SCOPE OF WORK. BACKFILLED TRENCHES SHALL BE RETURNED TO THEIR ORIGINAL GRADE UNLESS NOTED OTHERWISE.
20. CONTRACTOR SHALL AFFIX A MAINTENANCE LABEL TO ALL EQUIPMENT REQUIRING ROUTINE MAINTENANCE AND SHALL PROVIDE MAINTENANCE AND OPERATIONAL MANUALS IN ACCORDANCE WITH THE SPECIFICATIONS.
21. ALL EQUIPMENT THAT REQUIRES KEYS OR SPECIAL TOOLS TO OPERATE SHALL SUPPLY THE OWNER WITH TWO OF ANY SUCH KEYS OR TOOLS FOR EACH PIECE OF EQUIPMENT THAT REQUIRE THE SAME.
25. ANY CHANGE OR DEVIATION FROM THESE PLANS OR SPECIFICATIONS SHALL REQUIRE THE APPROVAL, IN WRITING, OF THE ENGINEER PRIOR TO COMMENCEMENT OF SUCH WORK.
26. ALL PLUMBING, ELECTRICAL, AND GAS LINES SHALL BE CONCEALED WITHIN THE THE BUILDING STRUCTURE TO AS GREAT EXTENT AS POSSIBLE. ALL LINES NOT CONCEALED SHALL BE SECURED 6" OFF THE FLOOR AND 3/4" FROM THE WALLS USING STANDOFF BRACKETS
27. AN APPROVED BACKFLOW PREVENTOR SHALL BE PROPERLY INSTALLED UPSTREAM OF ANY POTENTIAL HAZARD BETWEEN THE POTABLE WATER SUPPLY AND SOURCE OF COMTAMINATION.
28. WATER SUPPLY CARBONATORS SHALL BE PROTECTED BY AN APPROVED REDUCED PRESSURE PRINCIPLE BACKFLOW PREVENTOR. THE RELIEF VALVE SHALL DRAIN IN-DIRECTLY TO A FLOOR SINK WITH A 1" MIN. AIR GAP.

PLUMBING LEGEND

SYMBOL	ABBRV.	DESCRIPTION
	SS or W	NEW SEWER OR WASTE
	V	NEW VENT
	CW	NEW COLD WATER
	HW	NEW HOT WATER
	G	NEW GAS
	CD	NEW CONDENSATE DRAIN
CA	CA	COMPRESSED AIR
	FCO	FLOOR CLEANOUT
	WCO	WALL CLEANOUT
	FD	FLOOR DRAIN
	FS	FLOOR SINK
	TP	TRAP PRIMER & TRAP PRIMER PIPING
	SOV	SHUT-OFF VALVE
	CV	CHECK VALVE
	PRV	BACKFLOW PREVENTER W SOV'S
	T & P	
	DN	PIPE DOWN
	UP	PIPE UP
	POC	POINT OF CONNECTION
7	-	PLUMBING NOTE CALL-OUT
	ABV	ABOVE
	AFF	ABOVE FINISH FLOOR
	AP	ACCESS PANEL
	BEL	BELOW
	BLDG	BUILDING
	CLG	CEILING
	CONT	CONTINUATION
	EL	ELEVATION
	FIN	FINISH
	FL	FLOOR
	GR	GRADE
	NTS	NOT TO SCALE
	OC	ON CENTER
	S=%	SLOPE AT A PERCENTAGE
	SHT	SHEET
	TYP	TYPICAL
	VTR	VENT THRU ROOF

PLUMBING / GENERAL NOTES

BATHTUBS AND WHIRLPOOL BATHTUBS. THE MAX. HOT WATER TEMPERATURE DISCHARGING SHALL BE LIMITED TO 120 DEGREES.

BATHTUBS WASTE OPENING IN FLOOR OVER CRAWL SPACES SHALL BE PROTECTED BY A METAL SCREEN NOT EXCEEDING 12" OR SOLID COVER.

SHOWERS AND TUB-SHOWERS COMBINATIONS IN ALL BUILDINGS SHALL BE PROVIDED WITH INDIVIDUAL CONTROL VALVES OF THE PRESSURE BALANCE, THERMOSTATIC, OR COMBINATION OF BOTH THAT PROVIDE SCALD AND THERMAL SHOCK PROTECTION. VALVES SHALL BE ADJUSTED TO DELIVER A MAXIMUM MIXED WATER
SETTING OF 120 DEGREES FAHRENHEIT. THE WATER HEATER THERMOSTAT SHALL NOT BE CONSIDERED A SUITABLE CONTROL FOR MEETING THIS PROVISION.
VERIFY AND WHERE WATER PRESSURE EXCEEDS 80 PSI AN APPROVED PRESSURE REGULATOR PRECEDED BY AN ADEQUATE STRAINER SHALL BE INSTALLED
1-INSTALL TEMPERATURE AND PRESSURE RELIEF VALVE WITH MINIMUM 34" DRAIN PIPE AND TERMINATE TO THE EXTERIOR OF THE BUILDING OVER WINDOW, DOOR OR VISIBLE LOCATION. DISCHARGE FROM A RELIEF VALVE INTO A WATER HEATER PAN SHALL BE PROHIBITED
.
2-PROVIDE (ON THE PLANS) A GAS PIPING DIAGRAM OF THE GAS PIPING SYSTEM THAT INCLUDES ALL PIPE SIZES, PIPE LENGTHS AND BTU RATINGS.

3-SUBMIT GAS LOAD CALCULATIONS IN ACCORDANCE WITH CPC TABLE 12-8 TO VERIFY THE PIPE SIZES ARE ADEQUATE FOR THE MAXIMUM DELIVERY CAPACITY OF CUBIC FEET OF GAS PER HOUR.
4- A WHOLE HOUSE HAS TEST IS REQUIRED UPON COMPLETION OF THE INSTALLATION, ALTERATION, OR REPAIR OF ANY GAS PIPING.
THE CITY SHALL BE NOTIFIED WHEN GAS PIPING IS READY FOR INSPECTION.
5- 2 GPM SHOWER FIXTURE, MAX.1.5 GPM BATHROOM FAUCET, MAX. 2 GPM KITCHEN FAUCET, AND MAX 1.28 WATER CLOSET TO CONFORM TO CITY GREEN REQUIREMENTS.
BATHROOMS: PROVIDE AN EXHAUST FAN (AT LEAST 50 CFM) DUCTED TO THE OUTSIDE (MINIMUM 4" DIAMETER FLEX DUCT WITH A MAXIMUM LENGTH OF 70")WITH A MINIMUM VENTILATION RATE OF 100 CFM, IDENTIFY THE REQUIREMENT FOR A BACKDRAFT DAMPER ON THE DUCT, AN ENERGY STAR COMPLIANT EXHAUST FAN THAT IS CONTROLLED BY A HUMIDITY SENSOR THAT IS CAPABLE OF BEING ADJUSTED BETWEEN ≤ 50-PERCENT TO 80-PERCENT HUMIDITY; AND A SEPARATE SWITCH FROM THE LIGHT UNLESS THE FAN IS ALLOWED TO OPERATE WITH THE LIGHT SWITCHED OFF.

6-NOTE THAT ALL PLUMBING VENTS SHALL TERMINATE NOT LESS THAN 6" ABOVE ROOF NOR LESS THAN 1' FROM ANY VERTICAL SURFACE. VENTS SHALL TERMINATE NOT LESS THAN 10" FROM OR 3' ABOVE ANY WINDOW, DOOR OPENING AIR INTAKE, OR VENT SHAFT NOR 3' FROM LOT LINE.
IF WATER PRESSURE EXCEEDS 80 PSI, AND EXPANSION TANK AND AN APPROVED PRESSURE REGULATOR SHALL BE INSTALLED.
NON-REMOVABLE BACK FLOW PRE-VENTER OR BIBB-TYPE VACUUM BREAKER WILL BE INSTALLED ON ALL EXTERIOR HOSE BIBS. HOT WATER RE-CIRCULATING SYSTEM IS INSTALLED, THE ENTIRE LENGTH OF HOT WATER PIPES SHALL BE INSULATED.

NOTES:
1-Projects which disturb less than one acre of soil shall manage storm water drainage during construction by one of the following: A. Retention basins. B. Where storm water is conveyed to a public drainage system, water shall be filtered by use of a barrier system, wattle or other approved method.
2-Site grading or drainage system will manage all surface water flows to keep water from entering buildings (swales, water collection, French drains, etc.). CGC Section 4.106.3. Exception: Additions not altering the drainage path.
3-When a shower is provided with multiple shower heads, the sum of flow to all the heads shall not exceed 1.8 gpm @ 80 psi, or the shower shall be designed so that only one head is on at a time. CGC Section 4.303.1.3.2.
4-Landscape irrigation water use shall have weather or soil based controllers. CGC Section 4.304.1.
5-The plans that a minimum of 65% of construction waste is to be recycled. CGC Section 4.408.1.
6-The contractor shall submit a Construction Waste Management Plan, per CGC Section 4.408.2.
7-The builder is to provide an operation manual (containing information for maintaining appliances, etc.) for the owner at the time of final inspection. CGC Section 4.410.1.
8-The gas fireplace(s) shall be a direct-vent sealed- combustion type. Woodstove or pellet stoves must be US EPA Phase II rated appliances. CGC Section 4.503.1.

WATER SAVING STANDARDS.

THE WATER SAVING PERFORMANCE STANDARDS FOR A PLUMBING FIXTURE ARE THOSE ESTABLISHED BY THE AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI), CURRENT REVISION, OR THE FOLLOWING STANDARDS, WHICHEVER ARE THE MORE RESTRICTIVE
1-THE MAXIMUM FLOW FROM A SINK OR LAVATORY FAUCET OR A FAUCET AERATOR SHALL NOT EXCEED 0.5 GALLONS OF WATER PER MINUTE AT A PRESSURE OF 60 POUNDS PER SQUARE INCH WHEN TESTED IN ACCORDANCE WITH ANSI TESTING PROCEDURES. 2- THE MAXIMUM VOLUME OF WATER PER FLUSH FROM A TOILET SHALL NOT EXCEED AN AVERAGE OF 1.28 GALLONS WHEN TESTED IN ACCORDANCE WITH ANSI TESTING PROCEDURES
3- THE MAXIMUM VOLUME OF WATER PER FLUSH FROM A URINAL AND THE ASSOCIATED FLUSH VALVE, IF ANY, SHALL NOT EXCEED AN AVERAGE OF ONE GALLON WHEN TESTED IN ACCORDANCE WITH ANSI TESTING PROCEDURES

SPECIAL NOTICE TO CONTRACTORS

1. ALL CONTRACTORS (GENERAL CONTRACTOR AND SUB-CONTRACTORS) BIDDING THIS PROJECT ARE REQUIRED TO VISIT THE JOB SITE AND VERIFY THE EXISTING CONDITIONS PRIOR TO SUBMITTING THEIR BID. CONTRACTORS ARE TO CAREFULLY REVIEW ALL CONSTRUCTION DOCUMENTS AND NOTE ANY DISCREPANCIES BETWEEN THE CONSTRUCTION DOCUMENTS AND THE CONDITIONS OBSERVED AT THE JOB SITE PRIOR TO SUBMISSION OF ANY BID. THE BUILDING OWNER REPRESENTATIVE LISTED BELOW MAY BE CONTACTED FOR ACCESS TO THE JOB SITE.
2. CONTRACTORS ARE RESPONSIBLE FOR VERIFYING THE LOCATION AND CONDITION OF ALL POINTS OF CONNECTION, LOCATION AND CONDITION OF ALL BUILDING (ROOF/FLOOR/CEILING) PENETRATIONS, LOCATION AND CONDITION OF ALL UTILITIES AND BUILDING SYSTEMS INCLUDING, BUT NOT LIMITED TO, GAS, WATER, SEWER, VENT, ELECTRICAL, BUILDING MECHANICAL SYSTEMS, DUCT CONNECTIONS, EXHAUST/OUTSIDE AIR CONNECTIONS, SECURITY, FIRE ALARM, DATA, AND PHONE PRIOR TO SUBMISSION OF THEIR BID.
3. ANY DISCREPANCIES BETWEEN THE CONSTRUCTION DOCUMENTS AND THE CONDITIONS OBSERVED SHALL BE BROUGHT TO THE ATTENTION, IN WRITING, TO THE ARCHITECT AND/OR ENGINEER PRIOR TO PROCEEDING WITH CONSTRUCTION.

PLUMBING LIST OF DRAWINGS (LoD):

SHEET TAG	TITLE	SCALE
P 0.00	PLUMBING GENERAL NOTES AND SPECIFICATIONS.	NTS
P 1.01	MAIN FLOOR - WATER SUPPLY LAYOUT.	3/16"=1'-0"
P 2.01	MAIN FLOOR - SEWER LAYOUT.	3/16"=1'-0"
P 3.01	MAIN FLOOR - FERTIGATION SYSTEM	3/16"=1'-0"
P 3.02	FERTIGATION SYSTEM SINGLE LINE DIAGRAM	NTS
P 4.01	HOT WATER CALCULATION AND DATASHEET	NTS
P 5.01	PLUMBING GENERAL DETAILS	NTS

CLIENT:

ADDRESS:

CONFIDENTIALITY STATEMENT:

ALL DRAWINGS AND WRITTEN MATERIALS APPEARING HEREIN CONSTITUTE THE ORIGINAL AND UNPUBLISHED WORK OF THE DESIGNER AND THE SAME MAY NOT BE DUPLICATED, USED OR DISCLOSED WITHOUT CONSENT OF THE DESIGNER.

NOTES:

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2. THESE DRAWINGS ARE TO BE READ IN CONJUNCTION WITH ALL RELEVANT DESIGNER, ENGINEER OR SPECIALIST DRAWINGS AND SPECIFICATIONS.
3. THE CONTRACTOR MUST CHECK ALL DIMENSION AT SITE BEFORE COMMENCING WORK.
4. THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING ALL NECESSARY TEMPORARY SUPPORT TO THE BUILDING AND ANY ADJACENT STRUCTURES.

REV. NO.	DESCRIPTION	DATE	BY

PROJECT:
SUNLAND CULTIVATION

TITLE:
PLUMBING GENERAL NOTES AND SPECIFICATIONS

PROJ. NO.	PROJ. ENGR.	SCALE @ 24X36:
		NTS

DRAWING NO.
P 0.00

REV.

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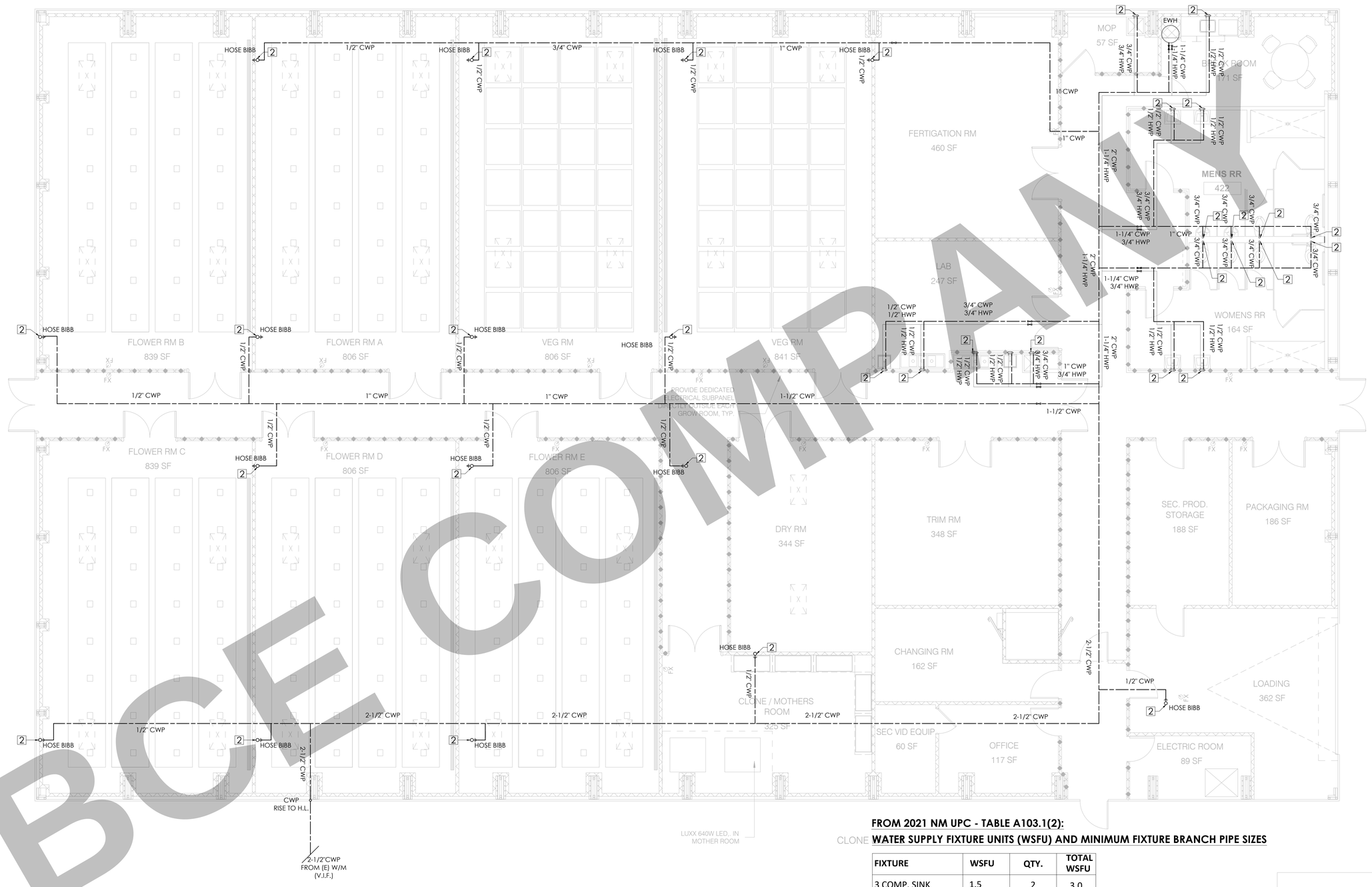

BCE COMPANY

GENERAL NOTES:

1. PRIOR TO PERFORMING WORK, CONTRACTOR TO COORDINATE EXACT PIPE SIZES, INVERT ELEVATIONS, PRESSURES FOR LOCATIONS OF ANY SEWER, WATER PIPING AND WATER METER WITH CIVIL UTILITIES DRAWINGS, AND ANY OTHER ENGINEER AS APPLICABLE.
2. PRIOR TO PERFORMING WORK, CONTRACTOR TO COORDINATE PIPE ROUTING WITH ALL OTHER TRADES AND EXISTING FIELD CONDITIONS.
3. REFER TO MECHANICAL PLANS FOR PLUMBING SPECIFICATION OF MATERIAL, INSULATION AND INSTALLATION REQUIREMENTS.
4. CONTRACTOR IS RESPONSIBLE FOR ROUGH-IN COORDINATION AND LOCATIONS. REFER TO ARCHITECTURAL PLANS FOR LOCATIONS AND FIXTURES.
5. CONTRACTOR IS RESPONSIBLE FOR ANY REQUIRED CUTTING AND PATCHING.
6. ALL NOTCHING, BORING, AND CUTTING OF HOLES IN WALL STUDS AND FLOOR JOISTS SHALL BE PERFORMED BASED ON THE LATEST ADOPTED AND APPROVED EDITION OF THE BUILDING CODE.
7. ALL PLUMBING FIXTURES SHALL BE OF WATER CONSERVATION TYPE AS REQUIRED BY LOCAL AUTHORITY HAVING JURISDICTION.
8. ALL WATER PIPING SHALL BE INSTALLED ON INTERIOR SIDE OF THE BUILDING WALL INSULATION.
9. CONTRACTOR SHALL PROVIDE VALVES LOCATED ABOVE LAY-IN CEILING OR 24"x24" CEILING ACCESS PANEL COORDINATE FINAL LOCATION AND SIZE WITH ARCHITECT. PROVIDE BALANCING VALVES FOR HOT WATER RETURN SYSTEM AS REQUIRED.
10. ALL SANITARY DRAINAGE PIPING 3" AND SMALLER SHALL BE SLOPED AT $\frac{1}{4}$" PER FOOT. PIPING 4" AND LARGER SHALL BE SLOPED AT $\frac{1}{8}$" PER FOOT.
11. ALL CONDENSATE DRAIN PIPING SHALL BE SLOPED AT $\frac{1}{8}$" PER FOOT AND PROVIDE ACCESSIBLE CLEANOUTS AT ALL CHANGES OF DIRECTION.
12. VENTS THAT TERMINATE AT THE ROOF SHALL BE A MINIMUM OF 10' FROM ANY FRESH AIR INTAKE.
13. REFER TO THE PLUMBING DIAGRAMS FOR GUIDANCE OF INSTALLATION INTENT. CONTRACTOR IS TO PROVIDE ALL COMPONENTS NECESSARY TO MEET THE DESIGN INTENT, WHETHER SHOWN IN DIAGRAM OR NOT.

WATER SUPPLY SHEET NOTES:

1 - DCW, DHW RISE TO HIGH LEVEL.
2 - DCW & DHW DROP IN WALL.
3 - DCW FROM BELOW GRADE UP IN WALL.
4 - DHW DOWN TO BELOW GRADE.
5 - DCW/DHW/RHW TO FIXTURE CONNECTION.

FROM 2021 NM UPC - TABLE A103.1(2):

CLONE **WATER SUPPLY FIXTURE UNITS (WSFU) AND MINIMUM FIXTURE BRANCH PIPE SIZES**

FIXTURE	WSFU	QTY.	TOTAL WSFU
3 COMP. SINK	1.5	2	3.0
MOP SINK	3.0	2	6.0
URINAL	4.0	2	8.0
WASHUP SINK	2.0	3	6.0
HOSE BIBB	2.5	15	37.5
WATER CLOSET	2.5	6	15.0
LAVATORY	1.0	4	4.0
SHOWER	2.0	2	4.0
TOTAL BUILDING WSFU =			**83.5**

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4. THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING ALL NECESSARY TEMPORARY SUPPORT TO THE BUILDING AND ANY ADJACENT STRUCTURES.

REV. NO.	DESCRIPTION	DATE	BY

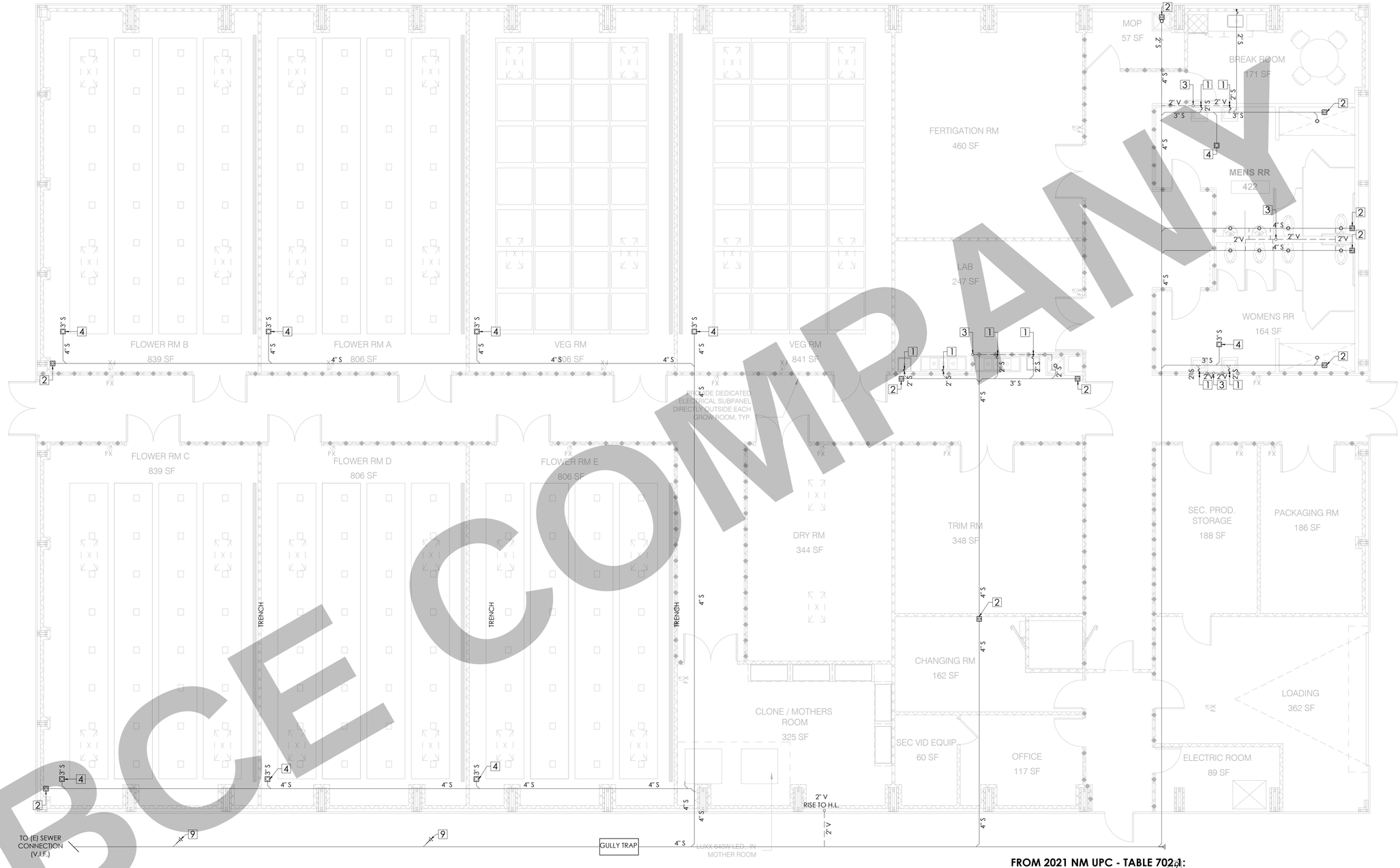
PROJECT:
SUNLAND CULTIVATION

TITLE:
MAIN FLOOR WATER SUPPLY LAYOUT

PROJ. NO.	PROJ. ENGR.	SCALE @ 24X36:
		3/16"=1'-0"

DRAWING NO.
P 1 . 0 1

REV.



BCE COMPANY

GENERAL NOTES:

1. PRIOR TO PERFORMING WORK, CONTRACTOR TO COORDINATE EXACT PIPE SIZES, INVERT ELEVATIONS, PRESSURES FOR LOCATIONS OF ANY SEWER, WATER PIPING AND WATER METER WITH CIVIL UTILITIES DRAWINGS, AND ANY OTHER ENGINEER AS APPLICABLE.
2. PRIOR TO PERFORMING WORK, CONTRACTOR TO COORDINATE PIPE ROUTING WITH ALL OTHER TRADES AND EXISTING FIELD CONDITIONS.
3. REFER TO MECHANICAL PLANS FOR PLUMBING SPECIFICATION OF MATERIAL, INSULATION AND INSTALLATION REQUIREMENTS.
4. CONTRACTOR IS RESPONSIBLE FOR ROUGH-IN COORDINATION AND LOCATIONS. REFER TO ARCHITECTURAL PLANS FOR LOCATIONS AND FIXTURES.
5. CONTRACTOR IS RESPONSIBLE FOR ANY REQUIRED CUTTING AND PATCHING.
6. ALL NOTCHING, BORING, AND CUTTING OF HOLES IN WALL STUDS AND FLOOR JOISTS SHALL BE PERFORMED BASED ON THE LATEST ADOPTED AND APPROVED EDITION OF THE BUILDING CODE.
7. ALL PLUMBING FIXTURES SHALL BE OF WATER CONSERVATION TYPE AS REQUIRED BY LOCAL AUTHORITY HAVING JURISDICTION.
8. ALL WATER PIPING SHALL BE INSTALLED ON INTERIOR SIDE OF THE BUILDING WALL INSULATION.
9. CONTRACTOR SHALL PROVIDE VALVES LOCATED ABOVE LAY-IN CEILING OR 24"x24" CEILING ACCESS PANEL COORDINATE FINAL LOCATION AND SIZE WITH ARCHITECT. PROVIDE BALANCING VALVES FOR HOT WATER RETURN SYSTEM AS REQUIRED.
10. ALL SANITARY DRAINAGE PIPING 3" AND SMALLER SHALL BE SLOPED AT $\frac{1}{4}$" PER FOOT. PIPING 4" AND LARGER SHALL BE SLOPED AT $\frac{1}{8}$" PER FOOT.
11. ALL CONDENSATE DRAIN PIPING SHALL BE SLOPED AT $\frac{1}{8}$" PER FOOT AND PROVIDE ACCESSIBLE CLEANOUTS AT ALL CHANGES OF DIRECTION.
12. VENTS THAT TERMINATE AT THE ROOF SHALL BE A MINIMUM OF 10' FROM ANY FRESH AIR INTAKE.
13. REFER TO THE PLUMBING DIAGRAMS FOR GUIDANCE OF INSTALLATION INTENT. CONTRACTOR IS TO PROVIDE ALL COMPONENTS NECESSARY TO MEET THE DESIGN INTENT, WHETHER SHOWN IN DIAGRAM OR NOT.

SANITARY SHEET NOTES:

1. WASTE DROP AND 2" VENT RISE.
2. 4" FLOOR CLEAN-OUT.
3. 3" VENT STACK TO ABOVE.
4. 3" FLOOR DRAIN.
5. 4" SOIL DROP FROM ABOVE.
6. WASTE DROP
7. SOIL DROP AND 4"VENT RISE.
8. INDIRECT WASTE

FROM 2021 NM UPC - TABLE 702.1:
DRAINAGE FIXTURE UNIT VALUES (DFU)

FIXTURE	D.F.U	QTY.	TOTAL D.F.U
SERVICE OR MOP SINK	3.0	2	6.0
3 COMP. SINK	2.0	2	2.0
WASHUP SINK	2.0	3	6.0
WATER CLOSET	4.0	6	24.0
LAVATORY	1.0	4	4.0
URINAL	2.0	2	4.0
FLOOR DRAIN	2.0	7	14.0
TOTAL BUILDING DFU =			**60.0**

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REV. NO.	DESCRIPTION	DATE	BY

PROJECT:
SUNLAND CULTIVATION

TITLE:
MAIN FLOOR SEWER LAYOUT

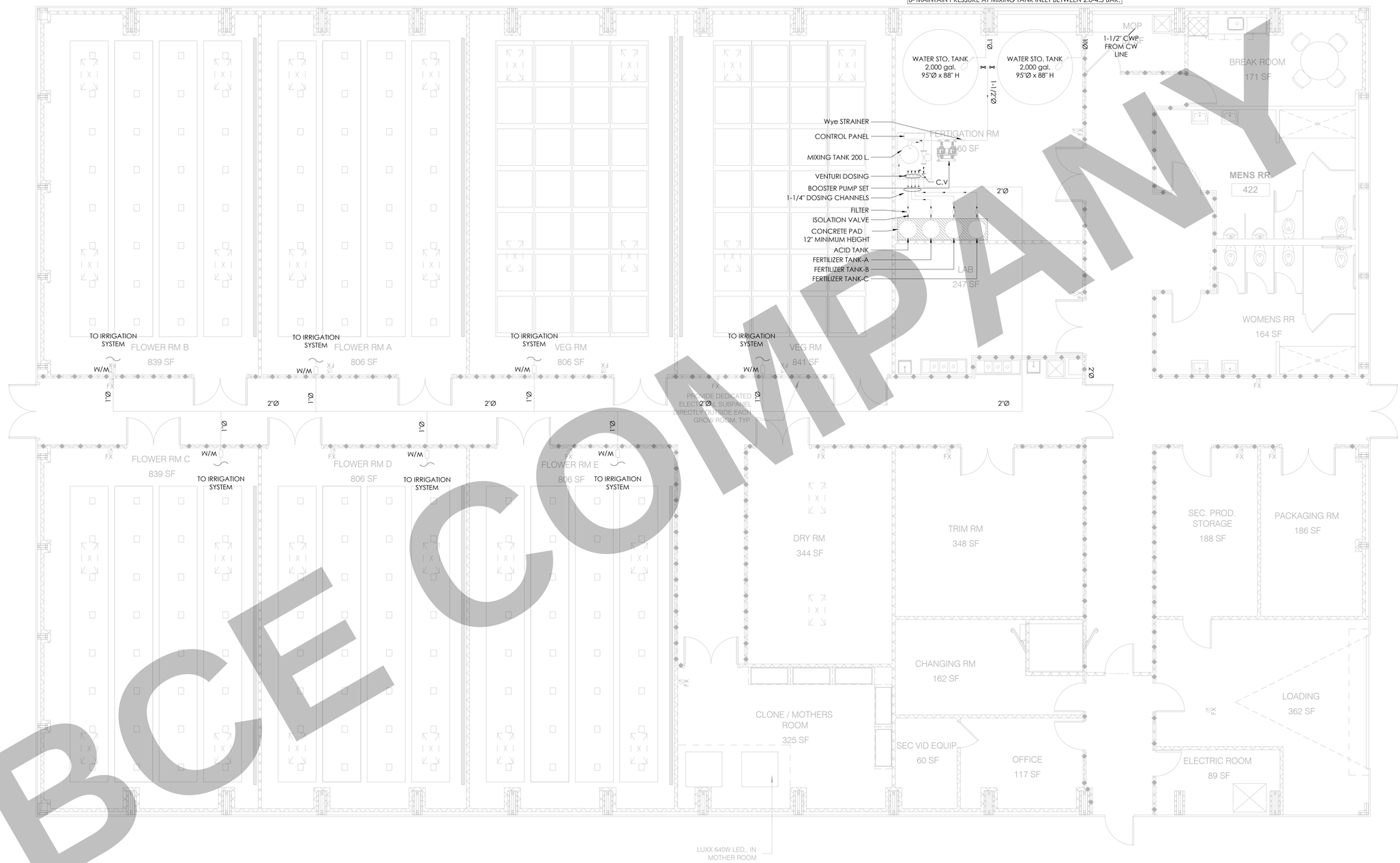
PROJ. NO.	PROJ. ENGR.	SCALE @ 24X36:
		3/16"=1'-0"

DRAWING NO.
P 2 . 0 1

REV.

FERTIGATION SYSTEM LIMITATIONS:

1- CHANNEL PIPING MAX. LENGTH: 33 ft.
2- DOSING CHANNEL PIPE Ø: 1-1/4".
3- ACID/FERTILIZER TANK MIN. HEIGHT: 12".
4- UPSTREAM SPACING FROM WATER METER: 10 x PIPE DIA.
5- DOWNSTREAM SPACING FROM WATER METER: 5 x PIPE DIA.
6- MAINTAIN PRESSURE AT MIXING TANK INLET BETWEEN 2.0-4.5 BAR.



BCE COMPANY

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REV. NO.	DESCRIPTION	DATE	BY

PROJECT:
SUNLAND CULTIVATION

TITLE:
FERTIGATION SYSTEM LAYOUT.

PROJ. NO.	PROJ. ENGR.	SCALE @ 24X36:
		3/16"=1'-0"

DRAWING NO.	REV.
P 3 . 0 1	

FERTIGATION SYSTEM LIMITATIONS:

1- CHANNEL PIPING MAX. LENGTH: 33 ft.
2- DOSING CHANNEL PIPE Ø: 1-1/4".
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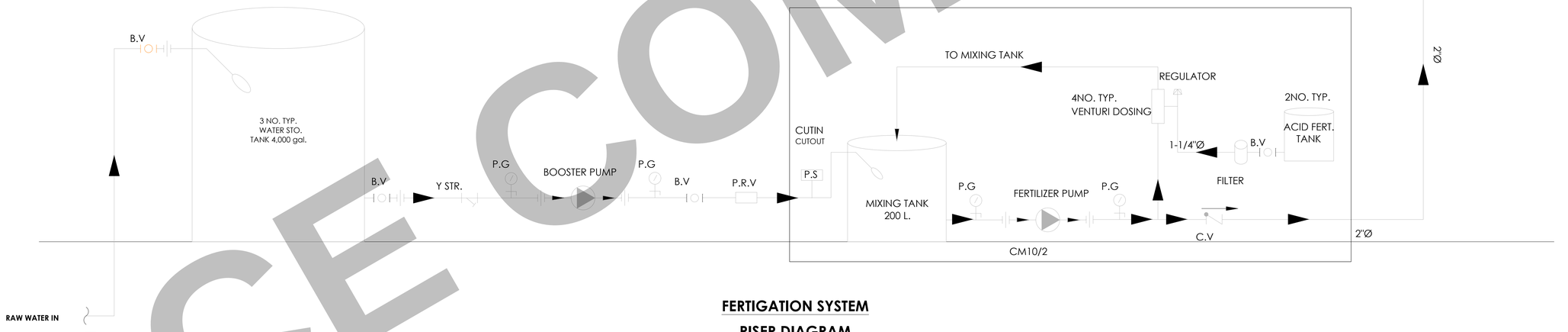

FERTIGATION SYSTEM
RISER DIAGRAM

BCE COMPANY

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REV. NO.	DESCRIPTION	DATE	BY

PROJECT:
SUNLAND CULTIVATION

TITLE:
FERTIGATION SYSTEM SINGLE LINE DIAGRAM.

PROJ. NO.	PROJ. ENGR.	SCALE @ 24X36:
		NTS

DRAWING NO.	REV.
P 3 . 0 2	

Design calculation sheet

Project no:	Date: 2022.10.21	Sheet no.: 1 of 1	Computed by: A.H.
Subject: Afifa 08 2nd Avenue			Checked by: M.J.
Hot Water Calculation			Approved by: M.N.

Application Type: Industrial Plant

Water Temperature

Tin	=	50	°F	=	10	°C
Tout	=	140	°F	=	60	°C
⌂T	=	90	°F	=	50	°C

Fixture	GPH		QTY.			
Kitchen Sink	20	x	3	=	60	gph
Service Sink	20	x	3	=	60	gph
Basin, Public lavatory	12	x	4	=	48	gph

Showers	GPH		Shower Factor		GPH		QTY.			
Showers	225	x	1	=	225	x	2	=	450	gph

Other	GPH	QTY.

Maximum Possible Demand	=	618	gph
Demand Factor **(Custom)**	=	0.3	gph
Maximum Probable Demand	=	185.4	gph
Maximum Probable Demand	=	3.09	gpm
	=	0.19	L/s
Heater Recovery Capacity	=	3.09	gpm
Storage Factor **(Custom)**	=	0.3	
Storage Tank Capacity	=	55.62	gal
		210.3	liters
Actual Selection		211	Liters

Heater or Coil	=	500	x	gpm	x	⌂T	/	Efficiency		
Capacity	=	500	x	3.09	x	90	/	0.9	=	154,500 btu/hr
									=	45.3 kW
								Actual Selection	=	46 kW

SCHEDULE No. 1
ELECTRIC WATER HEATER SCHEDULE

TAG	EWH
LOCATION	FERTIGATION RM.
MANUFACTURER	AOMSITH
MODEL	DEN-66
TYPE	ELECTRICAL
RATED STORAGE (GAL.)	60.0
NUMBER OF ELEMENTS	2
POWER (KW)	2x3.0 = 6.0
POWER SUPPLY	120/1/60
APPROX. WEIGHT (lbs)	176
HEIGHT x DIAM. (IN.)	60.75x21.75
WATER CONNECTION SIZE	3/4"

A.O. Smith | Commercial Electric Water Heaters

DURA-POWER™

Designed for use as a recovery heater having its own storage tank. Available in upright standard models (DEN) and lowboy models (DEL).

GLASSLINED TANK
- Thirteen sizes; 6 thru 119 gallon capacity. Tank interior is coated with glass specially designed by A. O. Smith for water heater use.

ELEMENTS
- Zinc plated copper sheaths for longer life. Medium watt density means lower surface temperature to minimize scale build-up and more surface to heat water. Element sizes from 1.5 to 6.1 KW. Maximum input KW (see chart).

STANDARD VOLTAGES
- 120, 277 single phase and 208, 240 and 480V unbalanced three-phase delta; easily converted to single-phase at terminal block with limited exceptions. Single element heaters, single-phase only.

TERMINAL BLOCK
- Factory-installed. Just bring the service to heater and connect to block. Terminal block not supplied on 120V & 277 volt models. (No junction box on DEL6-20)

CONTROLS
- Temperature control (adjustable through a range of 110° to 170°F on single element and 120° to 181°F on dual element) and manual reset high temperature cutoff per element

CSA CERTIFIED AND ASME RATED T&P RELIEF VALVE

SIMPLIFIED CIRCUITRY, COLOR CODED FOR EASE OF SERVICE

ANODE ROD FOR MAXIMUM CORROSION PROTECTION

CABINET HAS BONDERIZED UNDERCOAT WITH BAKED ENAMEL FINISH

TOP INLET AND OUTLET OPENINGS

DRAIN VALVE (EXCLUDES DEL 6-20)

UL APPROVED FIELD CONVERSION PROGRAM

COMPLIANCE
- Meets the standby loss Requirements of the U.S. Department of Energy and current edition of ASHRAE/IES 90.1

LIMITED WARRANTY OUTLINE
- If the tank should leak any time during the first three years, under the terms of the warranty, A. O. Smith will furnish a replacement heater; installation, labor, handling and local delivery extra. THIS OUTLINE IS NOT A WARRANTY. For complete information consult the written warranty or A. O. Smith Water Products Company.

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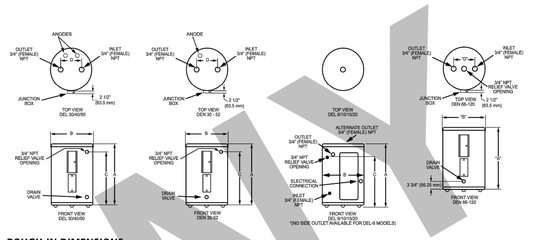
A.O. Smith | Commercial Electric Water Heaters



ROUGH-IN DIMENSIONS

Models	UEF	No. of Elements	Nominal Capacity	Rated Storage Volume	A		B		C		D		Shipping Weight	
					Inches	mm	Inches	mm	Inches	mm	Inches	mm	lbs.	Kg.
DEL-6	N/A	1	6	6	15-1/2	394	14-1/4	362	11	279	N/A	N/A	35	15.9
DEL-10	N/A	1	10	10	18-1/4	464	18	457	12-1/2	318	N/A	N/A	54	24.5
DEL-15	N/A	1	15	15	26	660	18	457	20-1/2	521	N/A	N/A	58	26.3
DEL-20	N/A	1	20	19	22-1/4	565	21-3/4	552	15-3/8	391	N/A	N/A	73	33.1
DEL-30	0.92	2	36	33	32	813	24	610	24	610	8	203	118	53.5
DEL-40**	0.92	2	38	35	32	813	23	584	24	610	8	203	118	53.5
DEL-50	0.92	2	51	48	36	914	26-1/2	673	25	635	8	203	172	78
DEN-30	0.92	2	40	37	49-3/4	1264	20-1/2	521	53-1/4	1353	8	203	118	53.5
DEN-40	0.92	2	50	46	59	1499	20-1/2	521	51-1/4	1302	8	203	125	56.7
DEN-52	0.92	2	55	55	56-1/2	1435	24	610	48-1/2	1232	8	203	145	65.8
DEN-66	N/A	2	66	60	60-3/4	1543	21-3/4	552	N/A	N/A	8	203	176	79.8
DEN-80	N/A	2	80	76	59-3/8	1508	24	610	N/A	N/A	8	203	211	95.7
DEN-120	N/A	2	120	108	62-7/16	1586	29-3/8	746	N/A	N/A	8	203	326	147.9

U.S Gallons/HR and Litres/HR at Temperature Rise Indicated													
Element Wattage (Upper/Lower)	Input KW	F°	36 F°	40 F°	54 F°	60 F°	72 F°	80 F°	90 F°	100 F°	108 F°	120 F°	126 F°
		C°	20 C°	22.2 C°	30 C°	33.3 C°	40 C°	44.4 C°	50 C°	55.5 C°	60 C°	66.6 C°	70 C°
6100/6100**	12.2	GPH	138	124	92	82	69	62	55	49	46	41	39
		LPH	522	469	348	310	261	235	208	184	174	153	146

*No side outlet available on DEL-6 Model
**Blanket model
Note: All 66, 80, 120 models can only be ordered 277V, 240V, or 480V

A.O. Smith | Commercial Electric Water Heaters

ELEMENT AVAILABILITY CHART (LIGHT-DUTY COMMERCIAL ELECTRIC)

Models & Elements	Voltage	Wiring	kW Input Available									
6-Gallon Models Single-Element	120V	-	1.5	2	2.5	3						
	208V	-	1.5	2	2.5	3						
	240V	-	1.5	2	2.5	3						
	277V	-	1.5	2	2.5	3						
	480V	-		2	2.5	3						
10-Gallon through 20-Gallon Models Single-Element	120V	-	1.5	2	2.5	3						
	208V	-	1.5	2	2.5	3	3.5	4	4.5	5	5.5	6
	240V	-	1.5	2	2.5	3	3.5	4	4.5	5	5.5	6
	277V	-	1.5	2	2.5	3		4	4.5	5		6
	480V	-		2	2.5	3		4	4.5	5	5.5	6

6 gallon model not available above 3kW
6/10/15/20 gallon models all A6 circuit (2 wire) only

Model	Element Wattage					
		120V	208V	240V	277V	480V
DEL-30	Min Watts	N/A	4500	4500	4500	4500
	Max Watts	N/A	6000 (*)	6000 (*)	6000	6000
DEL-40	Min Watts	N/A	4500	4500	4500	4500
	Max Watts	N/A	6000 (*)	6000 (*)	6000	6000
DEL-50	Min Watts	N/A	4000	4000	4000	4000
	Max Watts	N/A	6000 (*)	6000 (*)	6000	6000
DEN-30	Min Watts	N/A	4500	4500	4500	4500
	Max Watts	N/A	6000 (*)	6000 (*)	6000	6000
DEN-40	Min Watts	3000 (*)	3000	3000	3000	3000
	Max Watts	3000 (*)	6000 (*)	6000 (*)	6000	6000
DEN-52	Min Watts	2500	2500	2500	2500	2500
	Max Watts	3000 (*)	6000 (*)	6000 (*)	6000	6000

Additional limitations apply to 120V, 208V, and 240V - Simultaneous Operation are not available (*) for these voltages.
3 phase only on 240 6000 watt for simultaneous operation

A.O. Smith | Commercial Electric Water Heaters

RECOVERY CAPACITIES

Element Wattage (Upper/ Lower)	Input	U. S. Gallons/Hr and Litres/Hr at Temperature Rise Indicated											
		F°	36	40	54	60	72	80	90	100	108	120	126
	kW	C°	20	22.2	30	33.3	40	44.4	50	55.5	60	66.6	70
Non-Simulataneous Operation													
/1500	1.5	GPH	17	15	11	10	8	8	7	6	6	5	5
		LPH	64	58	43	38	32	29	26	23	21	19	18
/2000	2	GPH	23	20	15	14	11	10	9	8	8	7	6
		LPH	85	77	57	51	43	38	34	31	28	26	24
/2500	2.5	GPH	28	25	19	17	14	13	11	10	9	8	8
		LPH	107	96	71	64	53	48	43	38	36	32	30
3000/3000	3	GPH	34	30	23	20	17	15	14	12	11	10	10
		LPH	128	115	85	77	64	58	51	46	43	38	37
4000/4000	4	GPH	45	41	30	27	23	20	18	16	15	14	13
		LPH	170	153	114	102	85	77	68	61	57	51	49
4500/4500	4.5	GPH	51	46	34	30	25	23	20	18	17	15	14
		LPH	192	173	128	115	96	86	77	69	64	58	55
5000/5000	5	GPH	56	51	38	34	28	25	23	20	19	17	16
		LPH	213	192	142	128	107	96	85	77	71	64	61
6000/6000	6	GPH	68	61	45	41	34	30	27	24	23	20	19
		LPH	256	230	170	153	128	115	102	92	85	77	73
Simulataneous Operation													
3000/3000	6	GPH	68	61	45	41	34	30	27	24	23	20	19
		LPH	256	230	170	153	128	115	102	92	85	77	73
4000/4000	8	GPH	90	81	60	54	45	41	36	32	30	27	26
		LPH	341	307	227	205	170	153	136	123	114	102	97
4500/4500	9	GPH	101	91	68	61	51	46	41	36	34	30	29
		LPH	384	345	256	230	192	173	153	138	128	115	110
5000/5000	10	GPH	113	101	75	68	56	51	45	41	38	34	32
		LPH	426	384	284	256	213	192	170	153	142	128	122
6000/6000	12	GPH	135	122	90	81	68	61	54	49	45	41	39
		LPH	511	460	341	307	256	230	205	184	170	153	146

Recovery capacities at 100° F rise equal: for non-simultaneous element operation = 4.1 gal. x kW of one element; for simultaneous element operation = 4.1 gal. x 2/3 kW of both elements.
For other rises multiply element kW as previously explained by 410 and divide by temperature rise. Full load current for single phase = total watts/voltage.

SPECIFICATION

The water heaters(s) shall be Dura-Power™ Model(s) No. _____ as manufactured by A. O. Smith or an approved equal. Heater(s) shall be rated at _____kW, _____volts, _____-phase, 60 cycle AC, and listed by Underwriters' Laboratories. Models shall meet the standby loss requirements of the U.S. Department of energy and current edition of ASHRAE/IES 90.1. Tank(s) shall be _____gallon capacity. Heater(s) shall have 150 psi working pressure and be equipped with extruded high density anode rod. All internal surfaces of the heater(s) exposed to water shall be glasslined with an alkaline borosilicate composition that has been fused-to-steel by firing at a temperature range of 1400°F to 1600°F. Electric heating elements shall be medium watt density with zinc plated copper sheath. Each element shall be controlled by an individually mounted thermostat and high temperature cutoff switch. The outer jacket shall be of backed enamel finish and shall enclose the tank with foam insulation. Electrical junction box with heavy duty terminal block shall be provided (except on 120V & 277V (no junction box on DEL-6 thru 20)). The drain valve shall be located in the front for ease of servicing. Heater tank shall have a three year limited warranty as outlined in the written warranty. Fully illustrated instruction manual to be included.

For technical information, call 800-527-1953. A. O. Smith Corporation reserves the right to make product changes or improvements without prior notice.

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REV. NO.	DESCRIPTION	DATE	BY

PROJECT:
SUNLAND CULTIVATION

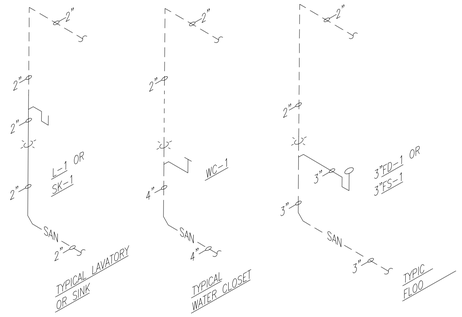
TITLE:
HOT WATER CALCULATION AND DATA SHEETS.

PROJ. NO.	PROJ. ENGR.	SCALE @ 24X36:
		NTS

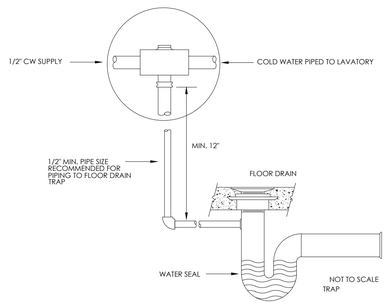
DRAWING NO.: **P 4 . 0 1**

REV.:

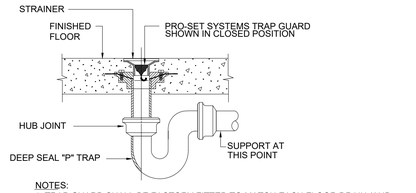
BCE COPY



1 **TYPICAL WASTE AND VENT RISERS**
SCALE: NONE

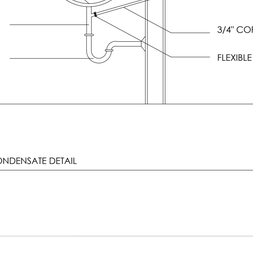


2 TRAP PRIMER

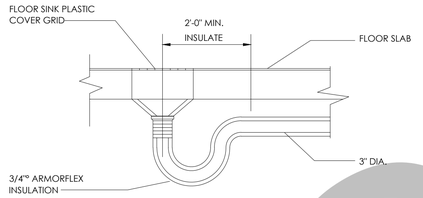


NOTES:
1. TRAP GUARD SHALL BE FACTORY FITTED TO MATCH EACH FLOOR DRAIN (AND FLOOR SINK) BY SIZE, MODEL, AND MANUFACTURER.
2. FLOOR SINK/HUB DRAIN TRAP GUARD INSTALLATION IS SIMILAR.
3. INSTALLATION OF TRAP GUARD TO BE IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.
4. INSERT TRAP GUARD ONLY AFTER FINAL RODDING OF DRAINS. INSTALL TRAP GUARD WITH CLEAR SILICONE CAULK FOR GAS TITE SEAL. FOR DRAIN RODDING AFTER INSTALLATION, INSERT SEWER TAPE THROUGH LIGHTLY GREASED 1-1/2" PVC PIPE TO PROTECT TRAP GUARD.

3 **FLOOR DRAIN WITH TRAP SEAL PROTECTION**
SCALE: NONE



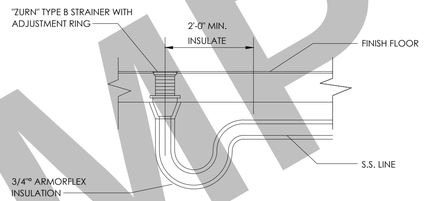
ANTI-SCALD MIXING VALVE
NO SCALE



CONTRACTOR TO REFER TO PLUMBING DRAWINGS FOR SIZE AND LOCATION OF SANITARY SEWER LINE.

NOTE:
G.C. TO INSULATE ANY DRAIN OR P-TRAP UNDER SLAB THAT NORMALLY HOLDS WATER

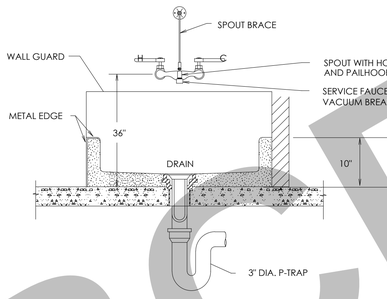
FLOOR SINK DETAIL
NO SCALE



CONTRACTOR TO REFER TO PLUMBING DRAWINGS FOR SIZE AND LOCATION OF SANITARY SEWER LINE.

NOTE:
G.C. TO INSULATE ANY DRAIN OR P-TRAP UNDER SLAB THAT NORMALLY HOLDS WATER

FLOOR DRAIN DETAIL
NO SCALE



MOP SINK DETAIL
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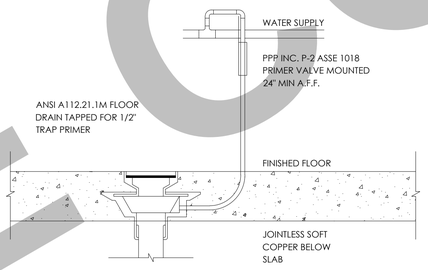

TRAP PRIMER DETAIL
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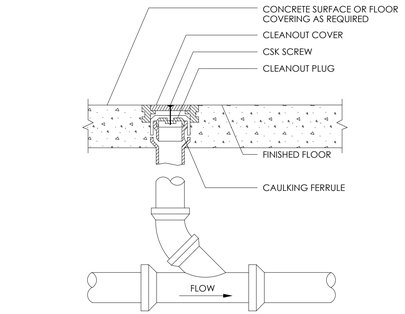
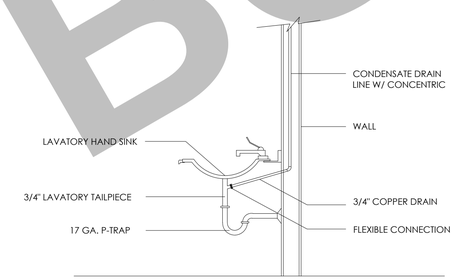


FLOOR CLEANOUT DETAIL
NO SCALE



CONDENSATE DETAIL
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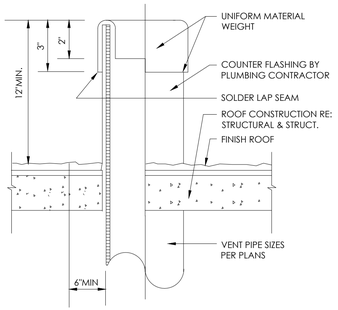

VENT THRU ROOF DETAIL
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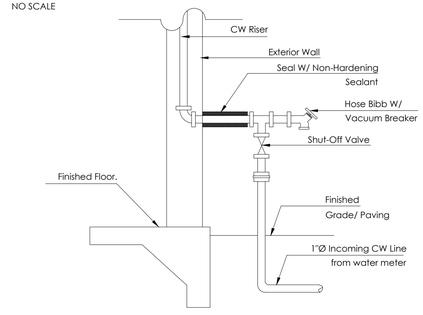
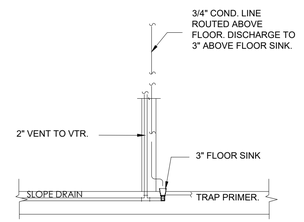


WATER ENTRY DETAIL
NO SCALE



COND. ON FLOOR SINK DETAIL
NO SCALE

BCE COMPANY

CLIENT:

ADDRESS:

CONFIDENTIALITY STATEMENT:

ALL DRAWINGS AND WRITTEN MATERIALS APPEARING HEREIN CONSTITUTE THE ORIGINAL AND UNPUBLISHED WORK OF THE DESIGNER AND THE SAME MAY NOT BE DUPLICATED, USED OR DISCLOSED WITHOUT CONSENT OF THE DESIGNER.

NOTES:

1. ALL DIMENSIONS HEREIN ARE IN IMPERIAL UNITS UNLESS STATED OTHERWISE.
2. THESE DRAWINGS ARE TO BE READ IN CONJUNCTION WITH ALL RELEVANT DESIGNER, ENGINEER OR SPECIALIST DRAWINGS AND SPECIFICATIONS.
3. THE CONTRACTOR MUST CHECK ALL DIMENSION AT SITE BEFORE COMMENCING WORK.
4. THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING ALL NECESSARY TEMPORARY SUPPORT TO THE BUILDING AND ANY ADJACENT STRUCTURES.

REV. NO.	DESCRIPTION	DATE	BY

PROJECT:
SUNLAND CULTIVATION

TITLE:
PLUMBING GENERAL DETAILS.

PROJ. NO.	PROJ. ENGR.	SCALE @ 24X36:
		NTS

DRAWING NO.
P 5 . 0 1

REV.