3-PHASE UNIT PANEL

PANEL "UNIT"
208 / 120 VOLTS, 3 PHASE, 4 WIRE
125 AMPS MLO
NEW, SURFACE
AIC: 22,000 OR SERIES
NOTES: MAX. 100 AMPS THIS PANEL

HUTCHISON-PAPESH ENGINEERING CORPORATION
CONSULTING ELECTRICAL ENGINEERS
V. 303.973.9779 F. 303.973.9759

CKT	CIRCUIT DESCRIPTION	VA	CIRCUIT BKR	PHASE A	PHASE B	PHASE C	CIRCUIT BKR	VA	CIRCUIT DESCRIPTION	CKT
1	RESTROOM LT, RCPT, FAN	312	20 GFI	O			20	1042	LIGHTING/FAN	2
3	LOWER LEVEL RECEPTS	1080	20 GFI		O		20	1800	WATER HEATER	4
5	LOWER LEVEL RECEPTS	1080	20 GFI			O	20	696	GARAGE DOOR	6
7	MEZZANINE RECEPTS	1260	20 GFI	O			20	696	GARAGE DOOR #2 (A113)	8
9	SPECIAL RCPT (#10,CU)	2000	30 GFI		O		20		SPARE	10
11	SPARE		20			O	20		SPARE	12
13	SPARE		20	O			20		SPARE	14
15	SPARE		20		O		20		SPARE	16
17	SPARE		20			O	20		SPARE	18
19				O			50/3	3718	"RTU-1"	20
21					O		/	3718	(3 #6,CU+G)	22
23						O	/	3718		24

PHASE A	PHASE B	PHASE C
7.0	8.6	5.5

	CONN. kVA	DEMAND %	DEMAND kVA
LIGHTING	0.0	125	0.0
RECEPTACLE LOADS < 10 kVA	3.7	100	3.7
RECEPTACLE LOADS > 10 kVA	0.0	50	0.0
LARGEST MOTOR LOAD	11.2	125	13.9
MOTOR LOADS	2.4	100	2.4
HEAT	1.8	100	1.8
MISCELLANEOUS LOAD 2	0.0	100	0.0
MISC DED CIRCUITS	2.0	100	2.0
MISCELLANEOUS LOAD 4	0.0	100	0.0

TOTAL kVA: 23.9 TOTAL AMPS: 66.4

1-PHASE UNIT PANEL

PANEL "UNIT"
208 / 120 VOLTS, 1 PHASE, 3 WIRE
125 AMPS MLO
NEW, SURFACE
AIC: 22,000 OR SERIES
NOTES: MAX 125A THIS PANEL

HUTCHISON-PAPESH ENGINEERING CORPORATION
CONSULTING ELECTRICAL ENGINEERS
V. 303.973.9779 F. 303.973.9759

CKT	CIRCUIT DESCRIPTION	VA	CIRCUIT BKR	PHASE A	PHASE B	CIRCUIT BKR	VA	CIRCUIT DESCRIPTION	CKT
1	RESTROOM LTS, RCPT, FAN	312	20 GFI	O		20	1042	LIGHTING / CLG FAN	2
3	LOWER LEVEL RECEPTS	720	20 GFI		O	20	1800	WATER HEATER	4
5	LOWER LEVEL RECEPTS	1080	20 GFI	O		20	696	GARAGE DOOR	6
7	MEZZANINE RECEPTS	1080	20 GFI		O	15/2	1000	ELEC WALL HEATER	8
9	SPECIAL RCPT (#10, CU)	2000	30 GFI	O		/	1000		10
11	SPARE		20		O	60/2	5000	UNIT HEATER	12
13	SPARE		20	O		/	5000	(2 #6,CU+G)	14
15	SPARE		20		O	-			16
17	SPARE		20	O		-			18
19			-		O	-			20
21			-	O		-			22
23			-		O	-			24

PHASE A	PHASE B
11130.0	9600.0

	CONN. kVA	DEMAND %	DEMAND kVA
LIGHTING	1.4	125	1.7
RECEPTACLES < 10 kVA	2.9	100	2.9
RECEPTACLES > 10 kVA	0.0	50	0.0
LARGEST MOTOR	0.7	125	0.9
MOTORS	0.0	100	0.0
HEAT	13.8	100	13.8
MISCELLANEOUS 2	0.0	100	0.0
MISCELLANEOUS 3	2.0	100	2.0
MISCELLANEOUS 4	0.0	100	0.0

TOTAL KVA: 21.2 TOTAL AMPS: 102.1

PANEL "HA"
240 / 120 VOLTS, 1 PHASE, 3 WIRE
125 AMPS M.L.O.
NEW, SURFACE
AIC: 10,000
NOTES: MAX 125A THIS PANEL

HUTCHISON-PAPESH ENGINEERING CORPORATION
CONSULTING ELECTRICAL ENGINEERS
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CKT	CIRCUIT DESCRIPTION	VA	CIRCUIT BKR	PHASE A	PHASE B	CIRCUIT BKR	VA	CIRCUIT DESCRIPTION	CKT
1	"EUH-2"	1500	20/2	O		20	412	IRRIGATION/LIGHT	2
3		1500	/		O	20	250	FACP	4
5	SPARE		20	O		20	812	EXTERIOR WALL LIGHTS	6
7	SPARE		20		O	20	190	POLE LIGHTS	8
9	SPARE		20	O		20		SPARE	10
11	SPARE		20		O	20		SPARE	12
13	SPARE		20	O		20		SPARE	14
15	SPARE		20		O	20		SPARE	16
17			-	O		-			18
19			-		O	-			20
21			-	O		-			22
23			-		O	-			24

PHASE A	PHASE B
2724.0	1940.0

	CONN. kVA	DEMAND %	DEMAND kVA
LIGHTING	1.0	125	1.3
RECEPTACLES < 10 kVA	0.7	100	0.7
RECEPTACLES > 10 kVA	0.0	50	0.0
LARGEST MOTOR	0.0	125	0.0
MOTORS	0.0	100	0.0
HEAT	3.0	100	3.0
MISCELLANEOUS 2	0.0	100	0.0
MISCELLANEOUS 3	0.0	100	0.0
MISCELLANEOUS 4	0.0	100	0.0

TOTAL KVA: 4.9 TOTAL AMPS: 20.5

600A "MS-3A" SERVICE LOAD CALC

LOAD DESIGNATION		LOAD (AMPS)
UNIT PANELS (23.9 KVA X 7)	=	167.3 KVA
SUB TOTAL	=	167.3 KVA
	=	464.9 AMPS @208V, 3PH

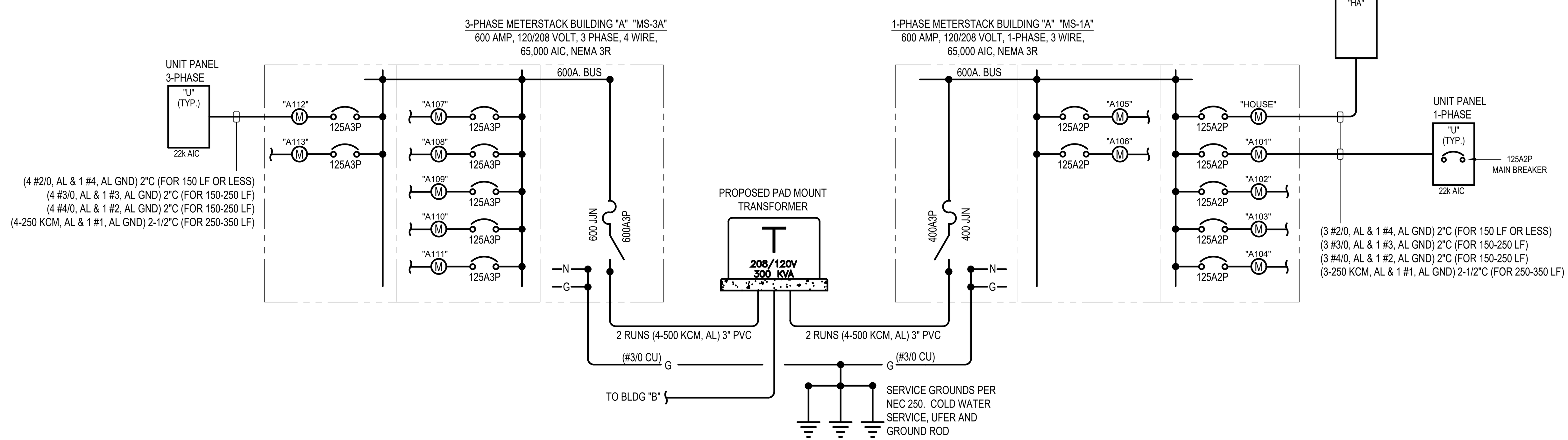
FAULT CURRENT CALCULATIONS (UTILIZES THE BUSSMAN CALCULATION METHOD AND TABLES)

CONTRACTOR IS RESPONSIBLE FOR ACTUAL FEEDER DISTANCES AND FIELD CONDITIONS IN PROJECT BID AND SCOPE.

Description	Voltage	Ph	Length (FT)	# of Run(s)	Conductor "C" value	Available Fault Current (ISC)
At Xcel Energy						52,000
At "MS-1A / 3A"	208	3	16	2	21390	44,760
At House Panel "HA"	208	1	276	1	12862	4,373
At Nearest Unit Panel	208	1	28	1	7301	16,887

600A "MS-1A" SERVICE LOAD CALC

LOAD DESIGNATION		LOAD (AMPS)
UNIT PANELS (21.2 KVA X 6)	=	127.2 KVA
HOUSE PANEL	=	4.9 KVA
SUB TOTAL	=	132.1 KVA
	=	367.1 AMPS @208V, 3PH



ELECTRICAL ONE LINE DIAGRAM

ELECTRICAL SPECIFICATIONS:

GENERAL:
THESE ELECTRICAL DRAWINGS ARE DIAGRAMMATIC AND REQUIRE TRADESMEN SKILLED IN THE COMMERCIAL ELECTRICAL INDUSTRY TO COORDINATE THE NECESSARY INSTALLATIONS WITH OTHER TRADES. PROVIDE THE NECESSARY MATERIALS AND METHODS FOR THESE INSTALLATIONS, ADDITIONAL BLOCKING FOR CORRECT LIGHTING OUTLET AND DEVICE LOCATIONS, ETC. AT NO ADDITIONAL COST.

PROVIDE ALL SERVICE CONDUITS FOR TELEPHONE SERVICE AND VERIFY LOCATION OF UTILITY PEDESTAL / MANHOLE WITH LOCAL UTILITY REP. PROVIDE INSTALLATIONS PER SERVICE PROVIDER'S REQUIREMENTS.

VERIFY ALL EXISTING SITE AND PROJECT CONDITIONS, UTILITY COMPANY SERVICES AND PROVIDE INSTALLATIONS IN COMPLIANCE WITH THESE CONDITIONS. FIELD VERIFY ALL CONDITIONS AND MAKE ALLOWANCES FOR THESE CONDITIONS IN FINAL PRICING. ANY DISCREPANCIES SHALL BE REPORTED TO THE ENGINEER TO RESOLUTION PRIOR TO FINAL PRICING.

PROVIDE ALL NECESSARY INSTALLATION PLANNING, MATERIALS AND LABOR TO ENSURE A COMPLETE AND OPERABLE SYSTEM FOR EACH SYSTEM DESIGN INDICATED ON THE DRAWINGS AND THESE SPECIFICATIONS. ENSURE ALL WORK IS IN COMPLIANCE WITH THE CURRENT LOCAL AND NATIONAL ELECTRICAL CODES, FIRE AND SAFETY CODES. FURNISH TO THE G.C. ALL REQUIRED INSPECTION CERTIFICATES. THE CONTRACTOR IS RESPONSIBLE FOR ALL PERMITS, FEES, ETC. AND SHALL ENFORCE WORKER'S IDENTIFICATION PER LOCAL AND STATE LAWS.

ALL WORK SHALL BE PERFORMED IN A NEAT AND WORKMANSHIP LIKE MANNER, USING NEW MATERIALS WITH A ONE-YEAR WARRANTY MINIMUM. VERIFY FINISHES OF DEVICES, COVER PLATES, TRIMS, ETC. VERIFY APPROVED ROUTING OF SURFACE CONDUITS WHERE APPLICABLE.

THIS CONTRACTOR IS RESPONSIBLE FOR ACTUAL DISTANCES FOR FEEDERS AND CIRCUIT ROUTES. DO NOT USE THE FAULT CURRENT CALCULATION FOR ORDERING OR BIDDING FEEDERS. CONTRACTOR IS RESPONSIBLE FOR FIXTURE COUNTS. DO NOT USE THE COMCHECK FOR BIDDING OR ORDERING LIGHTING FIXTURES.

MATERIALS AND METHODS:
ALL ELECTRICAL EQUIPMENT, DEVICES, LIGHT FIXTURES, CONTROLS, ETC. SHALL BE INSTALLED WITHIN MANUFACTURER'S REQUIREMENTS AND INSTRUCTIONS. ENSURE WORKING CLEARANCES FOR GEAR AND PANELS AND ACCESS TO CONNECTIONS OFF ALL TERMINATIONS.

BRANCH CIRCUITRY AND GROUNDING SHALL COMPLY WITH CODES FOR LOCATION, USE AND SPECIAL OCCUPANCIES. CONDUITS AND FITTINGS SHALL BE AS REQUIRED AND ALLOWED FOR EACH LOCATION.

COORDINATE WITH THE ARCHITECT AND ALL TRADES FOR INTENDED AND ACTUAL LOCATIONS OF EQUIPMENT, CEILING LAYOUTS AND MATERIALS, STRUCTURAL AND MECHANICAL EQUIPMENT AND DUCTS PRIOR TO ROUGH-IN AND ORDERING OF EQUIPMENT OR LIGHTING FIXTURES.

SUBMITTALS:
SUBMIT COMPLETE SHOP DRAWINGS OF ALL DISTRIBUTION GEAR, PANEL BOARDS AND LOAD CENTERS, FUSE TYPES AND BREAKERS WHERE SERIES RATING IS REQUIRED AND INDICATED ON THE DRAWINGS. CONTRACTOR TO CHECK AND CORRECT THE SUPPLIER'S SHOP DRAWINGS PRIOR TO SUBMITTING TO ENGINEER.

DISTRIBUTION GEAR AND PANELS:
PROVIDE A COMPLETE SERVICE DISTRIBUTION SYSTEM PER THE ONE LINE DIAGRAM. ENSURE CODE CLEARANCES, CONCRETE PADS, PROTECTION AND APPROVED LOCATIONS IN EQUIPMENT ROOMS. FUSES AND BREAKERS NOTED FOR SERIES RATING SHALL BE INSTALLED AS SPECIFIED TO ENSURE PROPER BREAKER BRACING PER THE FAULT CURRENT CALCS. CONTRACTOR IS RESPONSIBLE FOR ADDITIONAL ENGINEERING DUE TO SUBSTITUTIONS OF WIRE TYPES THAT AFFECT Isc CALCS AND SERIES RATED STUDIES. ALL GEAR SHALL BE LABELED WITH PLAQUES AND PANEL INDEXES TYPED WITH ACCURATE LOADS IDENTIFIED.

PROVIDE FUSED AND NON-FUSED (WHERE APPROVED) DISCONNECT SWITCHES, RATED FOR LOCATION AND USE FOR ALL MECHANICAL AND SPECIAL EQUIPMENT.

PROVIDE SERVICE GROUNDING PER THE CURRENT N.E.C ARTICLE 250. COORDINATE THE UFFER GROUNDING INSTALLATION PRIOR TO FOUNDATION POUR. ALL FEEDERS AND BRANCH CIRCUITS SHALL BE EQUIPPED WITH GROUNDING CONDUCTORS AND GROUNDED PER NEC 250. ENSURE GROUNDING JUMPERS AND BONDING THROUGHOUT THE SYSTEM.

ELECTRICAL DEVICES:
ALL DEVICES SHALL BE RATED FOR THE OVER CURRENT PROTECTION. VERIFY FINISHES AND DEVICE TYPES WITH ARCHITECT PRIOR TO ORDERING / BID. ENSURE GROUND FAULT DEVICES PER CODE AND ENSURE W.P. DEVICES ON EXTERIOR WALLS AND ON ROOF. ALL DEVICES SHALL BE RATED FOR USE IN SPECIAL OCCUPANCY USE AND LOCATIONS.

MECHANICAL EQUIPMENT:
REFER TO MECHANICAL AND PLUMBING DRAWINGS FOR EQUIPMENT LOCATIONS, EQUIPMENT SCHEDULE AND COORDINATE VOLTAGES AND NAMEPLATE OVER CURRENT PROTECTION. VERIFY UNITS FURNISHED WITH DISCONNECTS, STARTERS, ETC. ENSURE WIRE AND FUSE / BREAKER SIZES FOR UNITS. PROVIDE MAINTENANCE RECEPTACLES WHERE REQUIRED. ENSURE LIGHT, SWITCH AND GFI OUTLET IN ATTIC SPACES, CRAWL SPACES FOR MAINTENANCE.

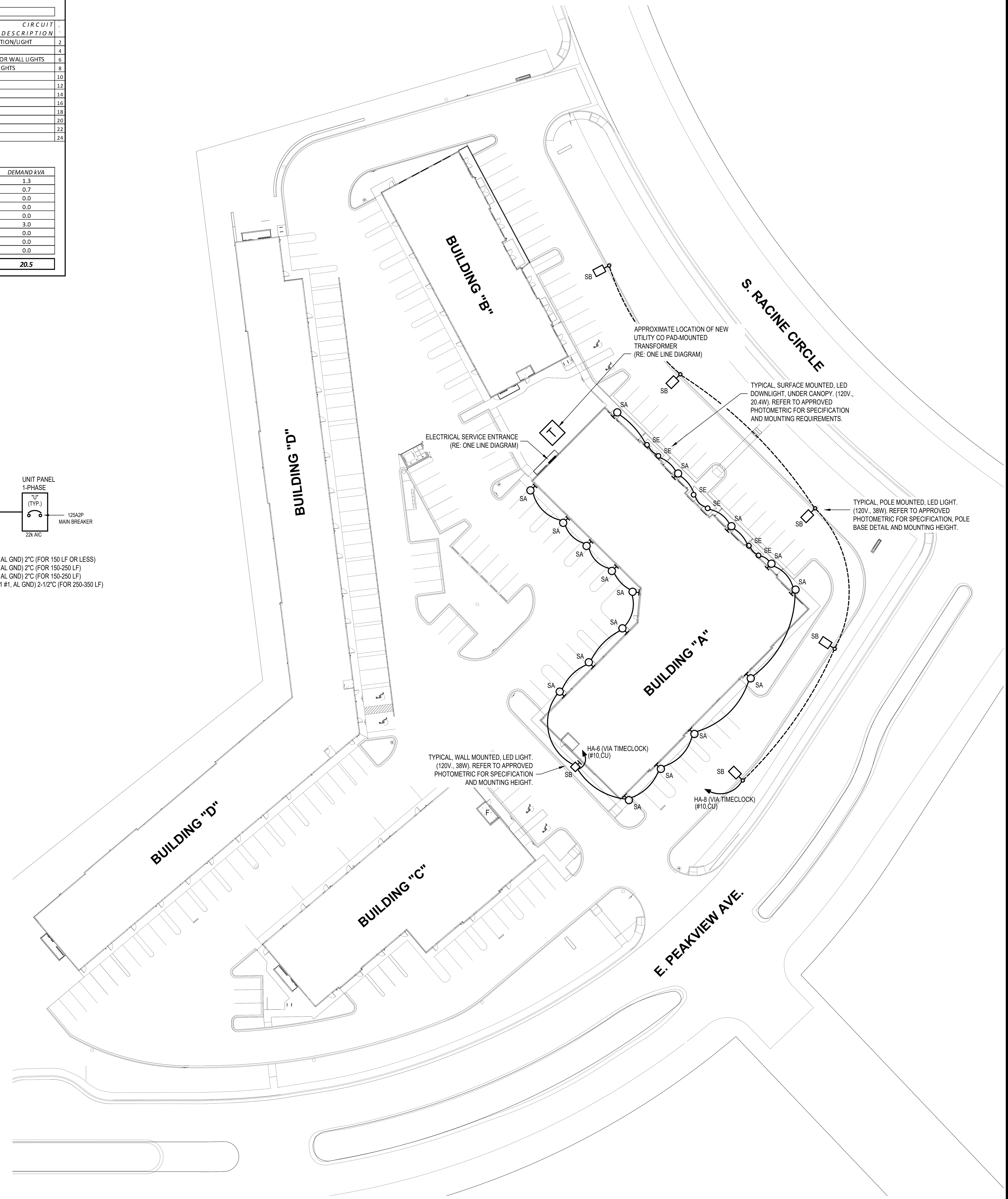
FIRE ALARM AND DETECTION:
FIRE ALARM SYSTEM AND DETECTION IS CONSIDERED AS DESIGN-BUILD WITH THE CONTRACTOR'S SELECTED EQUIPMENT SUPPLIER. PROVIDE SHOP DRAWINGS AND COORDINATE WITH THE LOCAL CODE OFFICIALS FOR THE BUILDING TYPE AND OCCUPANCY FOR THE REQUIRED SYSTEM RULING. WHERE A NEW SYSTEM IS REQUIRED, PROVIDE DEDICATED POWER SUPPLY AND PHONE LINE CONDUIT TO THE TELEPHONE BOARD.

GENERAL NOTES:

1. REFER TO THE ARCHITECTURAL PLANS FOR ADDITIONAL WORK AND CLARIFICATIONS.
2. ALL POWER AND LIGHTING DEVICE LOCATIONS AND CONTROLS ARE AS PER THE THE ARCHITECTURAL DRAWINGS. ENSURE THAT ALL LOCATIONS AND HEIGHTS ARE AS PER NEC AND ADA REQUIREMENTS. ALL CIRCUITRY SHALL BE AS PER NEC.
3. ENSURE ALL MATERIALS AND METHODS OF CONSTRUCTION TO COMPLY WITH CURRENT N.E.C. (2017), I.B.C. NFPA. I.E.C.C AND LOCAL ADOPTED OR AMENDED CODES.
4. COORDINATE WITH UTILITY COMPANY FOR FINAL TRANSFORMER SIZE, VOLTAGE, AND LOCATION. ANY DISCREPANCIES IN UTILITY TRANSFORMER SIZING AND / OR LOCATION SHALL BE REPORTED TO ENGINEER FOR REVISED FAULT CURRENT CALCULATIONS AND POSSIBLE RE-SPECIFICATION OF EQUIPMENT AIC RATINGS.
5. SUBMIT ELECTRICAL PLANS TO UTILITY COMPANY REPRESENTATIVE FOR FINAL REVIEW AND COORDINATION PRIOR TO WORK.
6. COORDINATE METERING INSTALLATION AND REQUIREMENTS WITH UTILITY COMPANY PRIOR TO WORK.
7. FIRE ALARM AND DETECTION DESIGN IS EXCLUDED. SUBMIT DRAWINGS TO FIRE PREVENTION CODE OFFICIALS FOR REVIEW AND SYSTEM DETERMINATION FOR THIS CONSTRUCTION AND CONDITIONS. IF REQUIRED, E.C. TO SUBMIT FIRE ALARM DETECTION AND NOTIFICATION SYSTEM DESIGN IN THE FORM OF SUPPLIER SHOP DRAWINGS FOR FIRE ALARM SEPARATE PERMIT.
8. CONTRACTOR SHALL COORDINATE DIRECTLY WITH LOW VOLTAGE CONSULTANT (TELE, DATA, A/V, SECURITY / BURGLAR ALARM, ETC.) FOR SPECIFIC REQUIREMENTS FOR EACH RESPECTIVE SYSTEM. ANY EMPTY RACEWAYS REQUIRED BY THESE SYSTEMS SHALL BE COORDINATED DIRECTLY WITH THE CONSULTANT / SUPPLIER. ANY ADDITIONAL LINE VOLTAGE POWER REQUIRED AND NOT SHOWN ON THESE DRAWINGS SHALL BE REPORTED AND COORDINATED WITH ELECTRICAL ENGINEER.
9. ELECTRICAL CONTRACTOR SHALL UPSIZE ALL 120V BRANCH CIRCUITS EXCEEDING 75 LINEAR FEET OF RUN LENGTH TO #10, CU TO ACCOMMODATE VOLTAGE DROP.

LEGEND

Ⓙ	JUNCTION BOX
$	SINGLE POLE SWITCH
$3	THREE WAY SWITCH
$OS	WALL-BOX OCCUPANCY SENSOR
⊖	DUPLEX RECEPTACLE MIN. STD. WALL HEIGHT
⊕	4-PLEX RECEPTACLE MIN. STD. WALL HEIGHT
⊘	SPECIAL PURPOSE RECEPTACLE
◁	TELECOMM / DATA OUTLET W/ 3/4" C. STUB-UP (CONDUIT, BOX AND MUDRING BY E.C)
◁|	T.V. COAX OUTLET PRE-WIRED BY SERVICE PROVIDER
⊙	MOTOR
☐	DISCONNECT-RATED FOR USE
WP	WEATHERPROOF
GFI	GROUND FAULT INTERRUPTER. PROTECT DOWNSTREAM
AC	ABOVE COUNTER
HOR	MOUNT RECEPTACLE HORIZONTALLY.



BUILDING "A" SITE ELECTRICAL PLAN

SCALE: 1"=40'-0"

Date	Submission / Revision
8/2/2021	FOR CONSTRUCTION

dcb construction company, inc.
909 East 62nd Avenue • Denver, Colorado 80216 • 303.287.5525 • Fax 303.287.3697 • www.dcb1.com

COLORADO REGISTERED BRENT A. PAPESH 43330 PROFESSIONAL ENGINEER
8/2/2021

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HUTCHISON-PAPESH ENGINEERING CORPORATION
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13986 W. BOWLES AVE., STE 102
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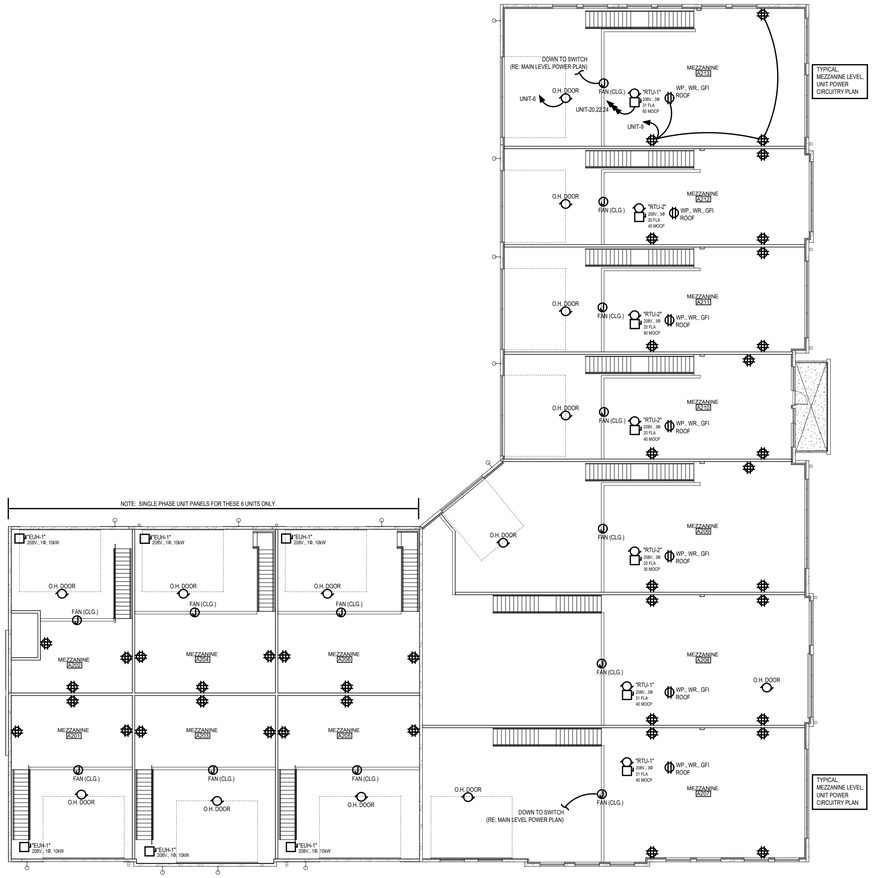
A NEW BUILDING FOR:
GARAGECONDOS at RACINE CIR.
SMALL BUSINESS SOLUTIONS
BUILDING A
6507 S. RACINE CIRCLE, CENTENNIAL CO 80111

Design Project No. 19-907

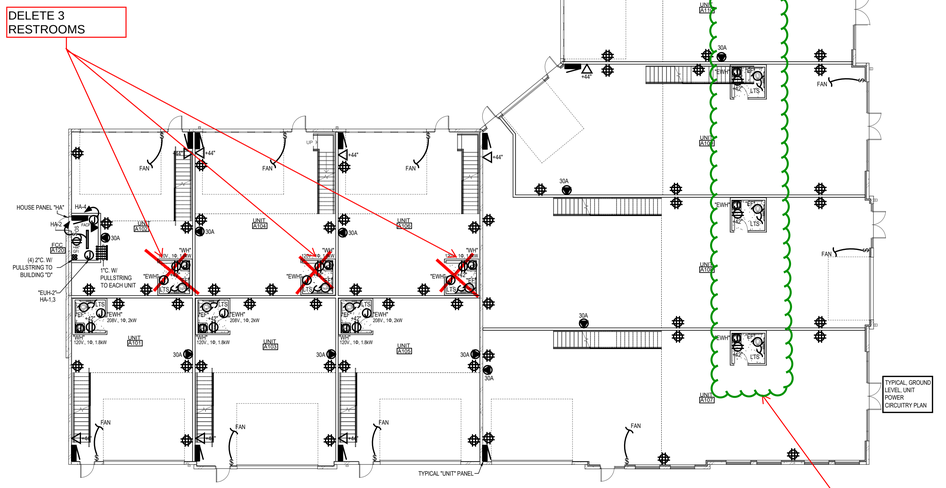
Drawing Title: BLDG "A" SITE ELEC & ONE LINE DIA.

Drawing No. **E1.0A**



MEZZANINE LEVEL POWER PLAN

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



GROUND LEVEL POWER PLAN

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

Date	Submission / Revision
8/2/2021	FOR CONSTRUCTION

dcb construction company, inc.
909 East 62nd Avenue - Denver, Colorado 80216 - 303.287.5505 - Fax 303.287.5897 - www.dcb1.com

COLORADO REGISTERED
BRENT A. PARESH
43330
PROFESSIONAL ENGINEER
8/2/2021

HUTCHISON-PARESH ENGINEERING CORPORATION
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A NEW BUILDING FOR:

GARAGECONDOS at RACINE CIR.

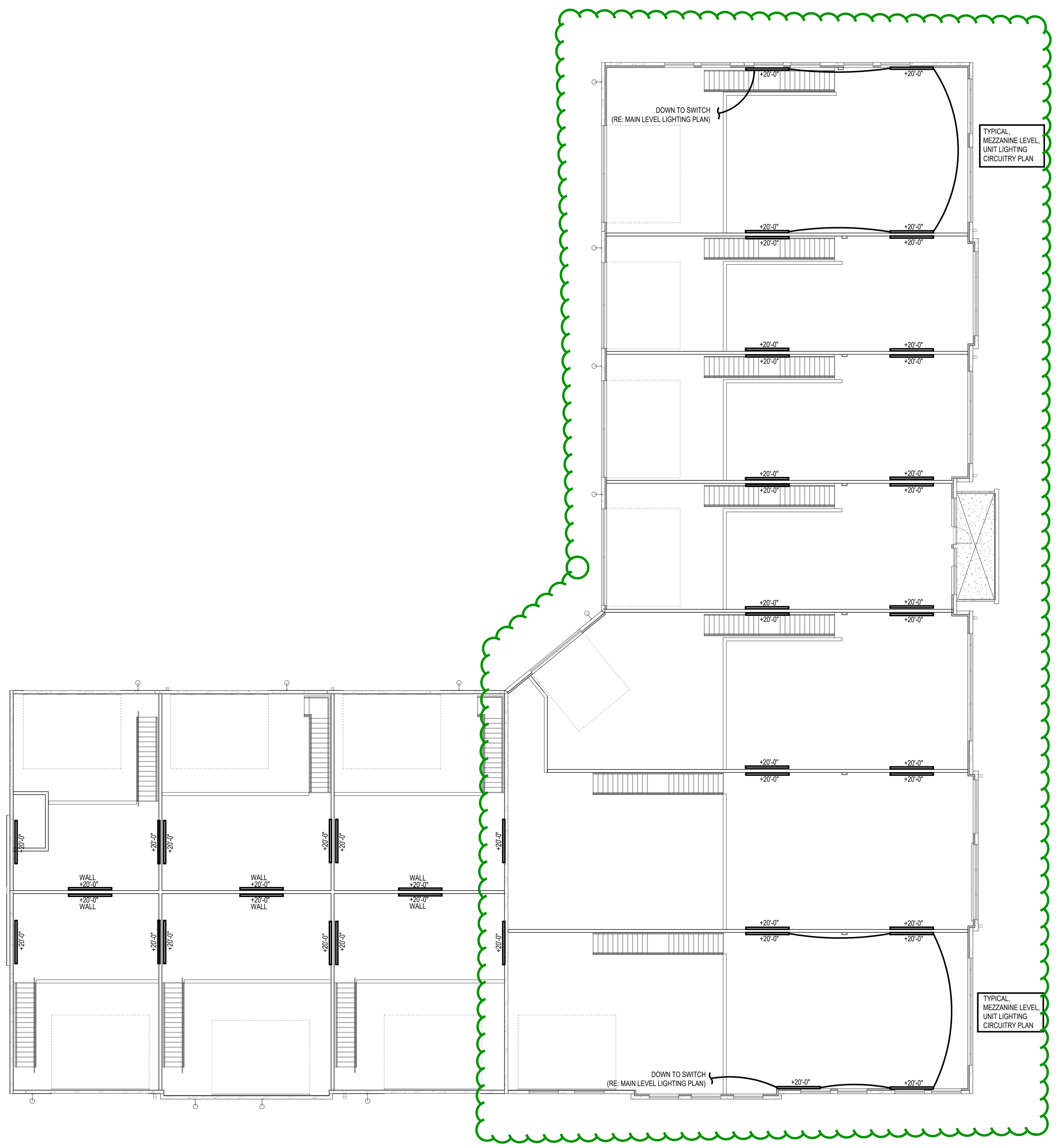
SMALL BUSINESS SOLUTIONS
BUILDING A

6507 S. RACINE CIRCLE, CENTENNIAL CO 80111

Design Project No.
19-907

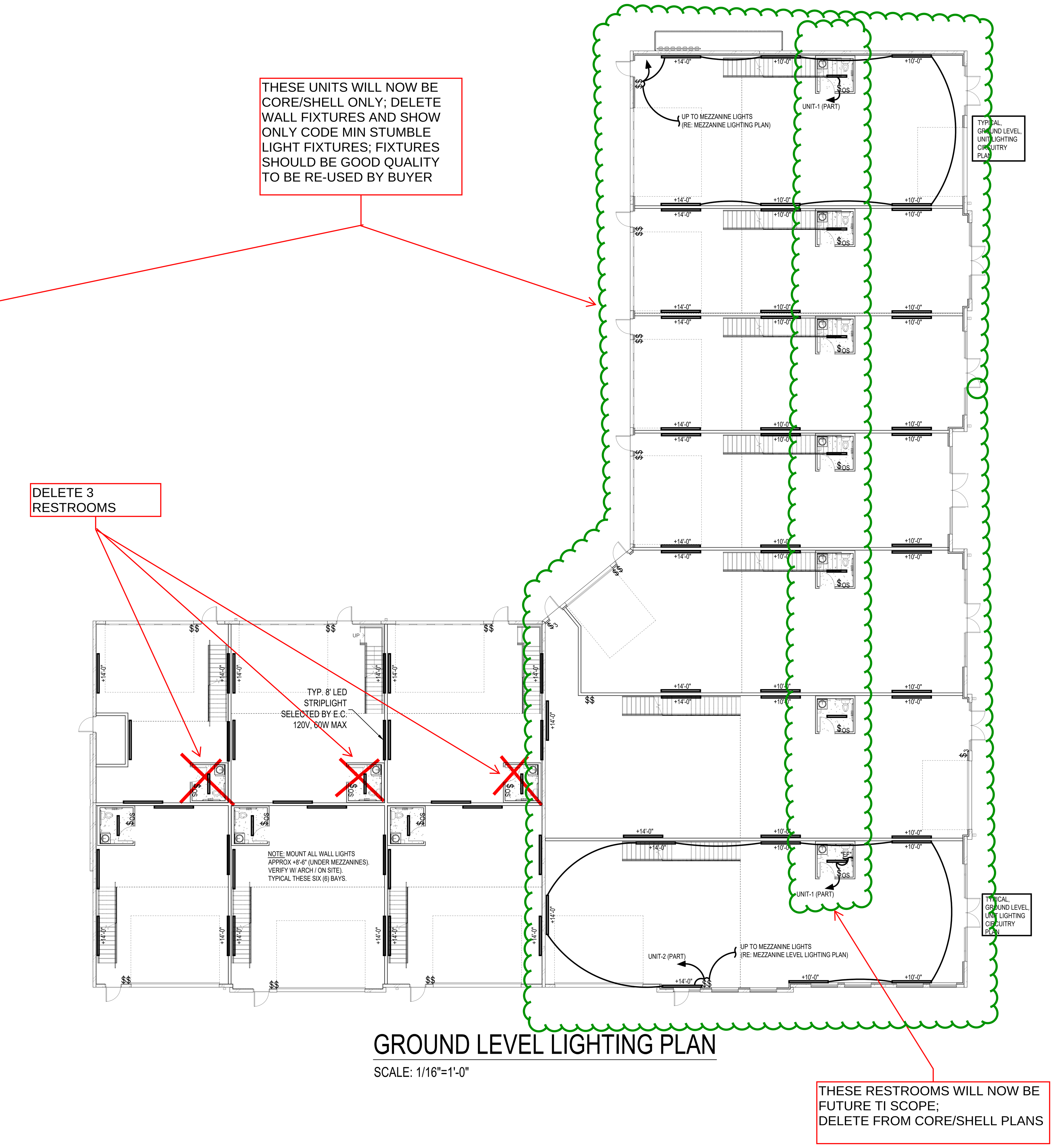
Drawing Title
BLDG "A"
POWER PLANS

Drawing No.
E2.0A


DOWN TO SWITCH
(RE: MAIN LEVEL LIGHTING PLAN)
TYPICAL, MEZZANINE LEVEL, UNIT LIGHTING CIRCUITRY PLAN
+20'-0"
WALL
THESE UNITS WILL NOW BE CORE/SHELL ONLY; DELETE WALL FIXTURES AND SHOW ONLY CODE MIN STUMBLE LIGHT FIXTURES; FIXTURES SHOULD BE GOOD QUALITY TO BE RE-USED BY BUYER

MEZZANINE LEVEL LIGHTING PLAN

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


DELETE 3 RESTROOMS
TYP. 8' LED STRIPLIGHT SELECTED BY E.C. 120V, 60W MAX
NOTE: MOUNT ALL WALL LIGHTS APPROX +8'-6" (UNDER MEZZANINES). VERIFY W/ ARCH / ON SITE). TYPICAL THESE SIX (6) BAYS.
UP TO MEZZANINE LIGHTS
(RE: MEZZANINE LIGHTING PLAN)
UNIT-1 (PART)
UNIT-2 (PART)
UP TO MEZZANINE LIGHTS
(RE: MEZZANINE LEVEL LIGHTING PLAN)
TYPICAL, GROUND LEVEL, UNIT LIGHTING CIRCUITRY PLAN
+14'-0"
+10'-0"
THESE RESTROOMS WILL NOW BE FUTURE TI SCOPE; DELETE FROM CORE/SHELL PLANS

GROUND LEVEL LIGHTING PLAN

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

Date	Submission / Revision
8/2/2021	FOR CONSTRUCTION

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COLORADO REGISTERED BRENT A. PAPESH 43330 PROFESSIONAL ENGINEER

8/2/2021

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BUILDING A
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Design Project No.
19-907

Drawing Title
BLDG "A" LIGHTING PLANS

Drawing No.
E3.0A