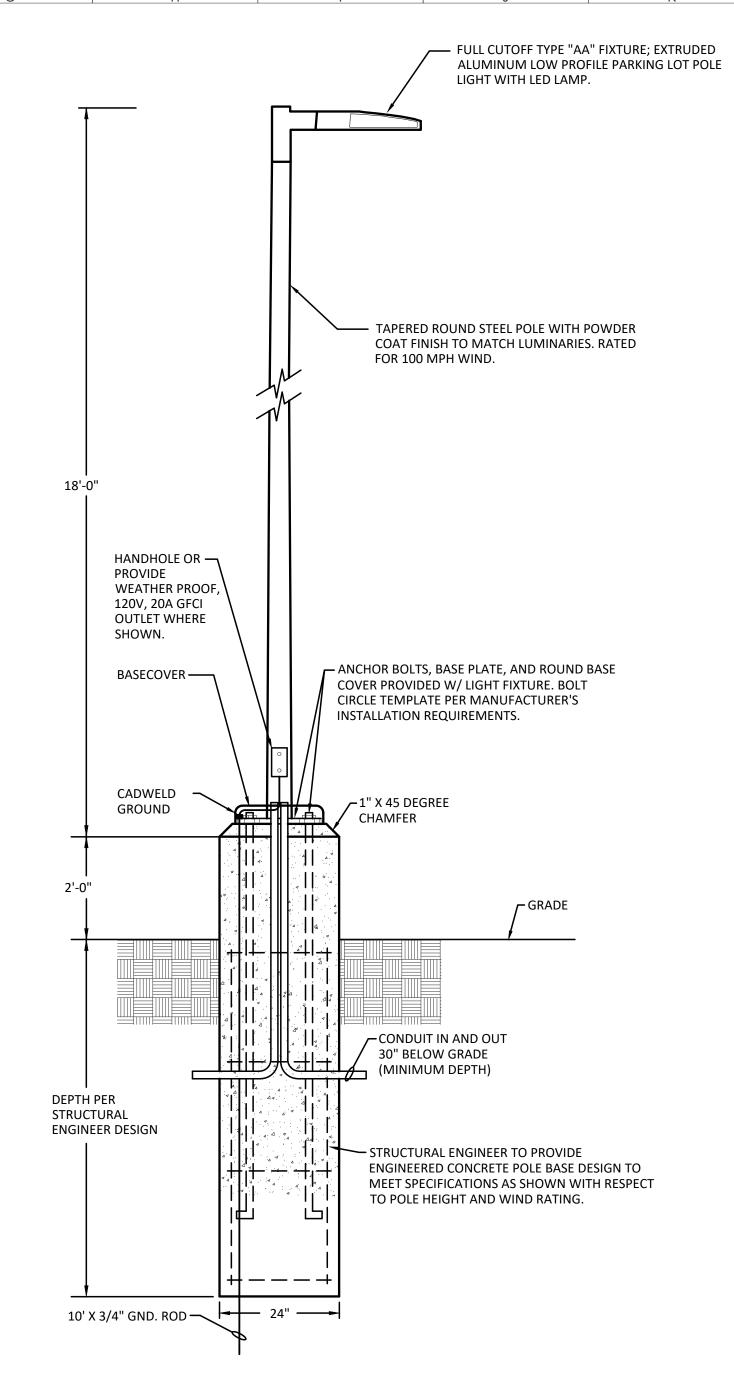
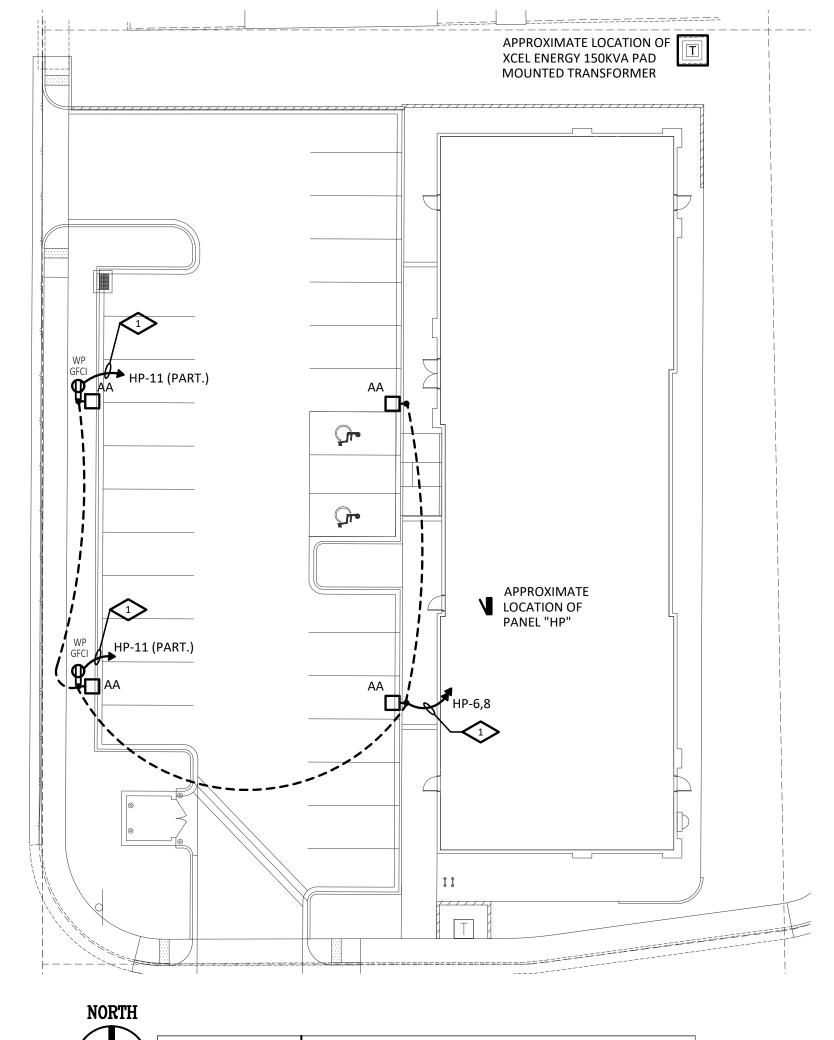
VOLTS: 208/120V,3P MAINS: 600A M.L.O. A.I.C.: 22KA	H,4\	W									V	MTG: FLUSH NEMA IFGR: CH/ITE/SQD/G TYPE: BOLT-OI
DESCRIPTION	1₹	KVA	BK	R	<b>√</b> 6	KT#	<u></u>	BK	R	KVA	Ł	DESCRIPTION
RTU-1	М	2.47	35A	$\angle$	1 •		2	35A	$\angle$	2.47	М	RT
-	М	2.47			3	•	4			2.47	М	
-	М	2.47		3P	5	<u></u> '	6		3P	2.47	М	
RTU-3	М	2.70	35A	$\angle$	7 •		8	35A		2.47	М	RT
-	М	2.70			9	•	10			2.47	М	
-	М	2.70		3P	11	•	12		3P	2.47	М	
RTU-5	М	2.47	35A		13 •		14	35A		2.70	Μ	RT
-	М	2.47			15	•	16			2.70	Μ	
-	М	2.47		3P	17	١,	18		3P	2.70	М	
RTU-7	М	2.70	35A		19 •		20	35A		2.47	Μ	RT
-	М	2.70			21	•	22			2.47	М	
-	М	2.70		3P	23	١,	24		3P	2.47	М	
RTU-9	М	2.47	35A		25 •	1	26	~~	~	~~~	7	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
-	М	2.47			27	+5	28					SP
-	М	2.47		3P	29	1)	30					SPA
SPACE	/	3	~	<i>_</i>	31	7	32					SP
SPACE					33	•	34					SPA
SPACE					35	١,	36					SPA
SPACE					37 •		38	200A	$\overline{}$	0.90	Р	SUBFEED
SPACE					39	•	40			0.72	Р	
SPACE					41		42		3P		Р	
LOAD KVA	RE		MTR		TOTAL							
CONNECTED	1.		68.8		70.5							
NEC DEMAND AMPS	1.	р	70.9		72.5 201							

			PAN	EL	<b>7</b> 1	'P2"	**				
VOLTS: 208/120V MAINS: 200A M.L A.I.C.: 22KA		W							N	MTG: FLUSH NEMA 1FGR: CH/ITE/SQD/G TYPE: BOLT-O	iΕ
DESCRIPTION	Т	KVA	BKR	С	K7	Г#	BKR	KVA	Т	DESCRIPTIO	N
ROOF RECS	R	0.90	20A1P	1 •		2	20A1P				PARI
ROOF RECS	R	0.72	20A1P	3	•	4	20A1P				PARI
SPARE			20A1P	5	+	• 6	20A1P				PARI
SPARE			20A1P	7 •	+	8	20A1P				PAR
SPARE			20A1P	9	•	10	20A1P				PAR
SPARE			20A1P	11	+	• 12	20A1P				PAR
SPARE			20A1P	13 •	T	14	20A1P			SF	PAR
SPARE			20A1P	15	•	16	20A1P			SF	PAR
SPARE			20A1P	17	T	• 18	20A1P			SF	PAR
SPARE			20A1P	19 •	T	20	20A1P			SF	PAR
SPARE			20A1P	21	•	22	20A1P				PAR
SPARE			20A1P	23	$\dagger$	• 24	20A1P				PAR
SPARE			20A1P	25 •		26	20A1P			SF	PAR
SPARE			20A1P	27	•	28	20A1P			SF	PAR
SPARE			20A1P	29		• 30	20A1P			SF	PAR
SPARE			20A1P	31 •		32	20A1P			SF	PAR
SPARE			20A1P	33	•	34	20A1P			SF	PAR
SPARE			20A1P	35	1	• 36	20A1P			SF	PAR
SPARE			20A1P	37 •	+	38	20A1P				PAF
SPARE			20A1P	39	•	40	20A1P				PAF
SPARE			20A1P	41	+	• 42	20A1P				PAR
SPARE			20A1P	43 •	+	44					PAC
SPARE			20A1P	45	•	46					PAC
SPARE			20A1P	47		• 48					PAC
SPARE			20A1P	49 •		50					PAC
SPARE			20A1P	51	•	52					PAC
SPARE			20A1P	53	$^{\dagger}$	• 54					PAC
SPARE			20A1P	55 •	$^{+}$	56					PAC
SPARE			20A1P	57	•	58					PAC
SPARE			20A1P	59		• 60					PAC
SPARE			20A1P	61 •	$^{\dagger}$	62					PAC
SPARE			20A1P	63	•	64					PAC
SPARE			20A1P	65	+	• 66					PAC
SPARE			20A1P	67 •	T	68					PAC
SPARE			20A1P	69	•	70				SF	PAC
SPARE			20A1P	71	1	• 72					PAC
SPARE			20A1P	73 •	+	74					PAC
SPARE			20A1P	75	•	76					PAC
SPARE			20A1P	77	$\dagger$	• 78					PAC
SPARE			20A1P	79 •	$\dagger$	80		1			PAC
SPARE			20A1P	81	•	82					PAC
SPARE	$\dashv \dashv$		20A1P	83	$\dagger$	• 84		1			PAC
LOAD KVA	RE		OTAL			'		•	•	-	_
CONNECTED	1.		1.6								
NEC DEMAND	1.0		1.6								
AMPS	<b></b> .	-	4								
					_						
PHASE KVA			Α		0.		_	= 0.7		C = 0.0	
PHASE IMBALANO	Æ (%)		A/B	=	25	5.0	B/C	= 0.0		C/A = 0.0	

<sup>\*\*</sup> PROVIDE SINGLE SECTION 84-CIRCUIT PANEL.



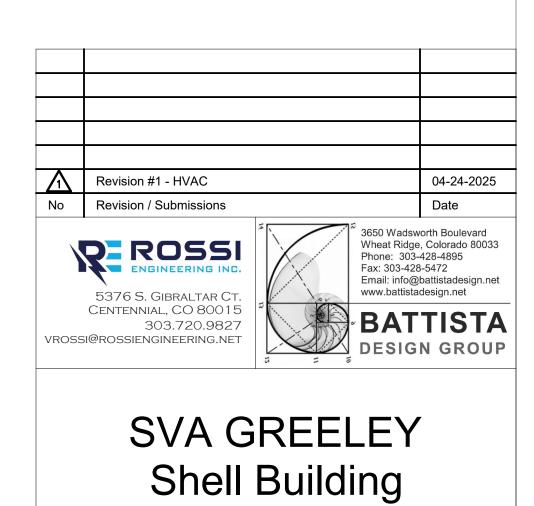




# DETAIL NOTES 1 PROVIDE (2 #10 THWN CU & #10 CU GND) 3/4"C. HOME RUN.

# FIXTURE TYPE "AA" POLE BASE DETAIL

				Light	Fixture Sched	ule					
Designation	La	amps	Fixture Characteristics		Fixture Mountir	g		Fixture Specification			
							Recess				
	# of lamps	Lamp Type	Description	Finish	Method	Ceiling Type	Depth	Manufacturer	Catalog #	Voltage	
AA	1	166W (21,598 Lumens) LED 5000K	20' Full Cutoff Site Pole Light With Type III Optics	Bronze	Pole Mounted: 18'-0" Pole With 2'-0" Base	N/A	N/A	McGraw Edison	GLEON SA3 C 750 U T3 BZ	208	
ВВ	1	12W (1,180 Lumens) LED 3000K	18" Decorative Exterior Wall Sconce - Full Cut-Off - Dark Sky Compliant	Satin Bronze	Wall @ 8'-6"	N/A	N/A	Lightway	618-LED-F2B-2-A-Z1	120	
CCE	1	14W LED 3000K	Full Cut-Off Exterior Egress Light With 90 Minutes of Battery Backup	Carbon Bronze	Above Door	N/A	N/A	Lumark	AXCS1A W BK	120	
FE	1	35W (4,718 Lumens) LED 4000K	4' LED Strip Light	White	Surface	N/A	N/A	Metalux	4SNLED-LD5-46SL-LC-UNV-L840-CD1-U-EL14W	120	
Х		LED	Universal Mount LED Exit Sign with 90 Minute Emegency Battery Backup	White/Green	Varies	Varies	N/A	Sure-Lites	LPX70GWH	120	



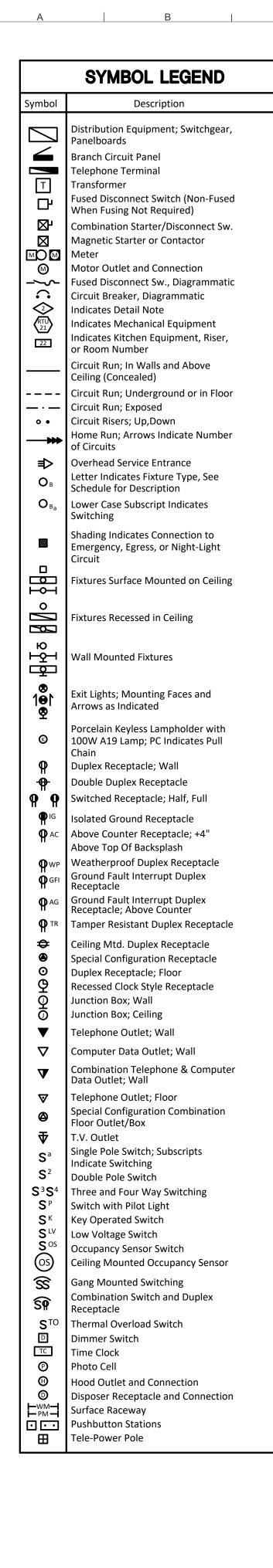
1911 59th AVENUE GREELEY, CO 80634

SITE ELECTRICAL PLAN, POLE BASE DETAIL & SCHEDULES



Designed: JH	Project Number: 25-010
Drawn: JH	Scale: As Shown
Checked: VJR	Drawing Number:
Reviewed: VRW	E1
<b>.</b> .	

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# **DETAIL NOTES**

(1) 4" CONDUIT WITH PULL ROPE RUN TO TELEPHONE PEDESTAL. VERIFY EXACT LOCATION OF TELEPHONE PEDESTAL PRIOR TO BID. 36" MINIMUM RADIUS SWEEPS. COORDINATE MAXIMUM LENGTHS AND PULL BOX REQUIREMENTS WITH PROVIDER PRIOR TO BIDS.

6-POLE MECHANICALLY HELD CONTACTOR IN NEMA-1 ENCLOSURE, TORK MODEL DGUM-200A (2-CHANNEL) AND TORK ROOF MOUNTED PHOTOCELL MODEL #EPC1. MOUNT PHOTOCELL ON ROOF AND FACE NORTH. LOCATE TIMECLOCK AS CLOSE AS POSSIBLE TO PANEL.

PROVIDE INTERSYSTEM BONDING TERMINATION (IBT) DEVICE PER 2015 NEC 250.94. IBT IS TO BE ACCESSIBLE FOR CONNECTION AND INSPECTION, SHALL CONSIST OF A SET OF TERMINALS WITH THE CAPACITY FOR CONNECTION OF NOT LESS THAN (3) INTERSYSTEM BONDING CONDUCTORS AND NOT INTERFERE WITH OPENING THE ENCLOSURE FOR A SERVICE, BUILDING OR STRUCTURE DISCONNECTING MEANS, OR METERING EQUIPMENT. CONNECT VIA #6 AWG CU CONDUCTOR TO NEUTRAL-GROUND CONNECTION IN MAIN DISCONNECT.

BUILDING MAIN TELEPHONE BOARD; REFER TO TELEPHONE RISER DETAIL ON THIS SHEET FOR ADDITIONAL INFORMATION. COORDINATE FINAL LOCATION WITH TENANT FINISH PLANS.

PROVIDE 120V CONNECTION FOR FIRE ALARM PANEL; COORDINATE EXACT LOCATION IN FIELD.

PROVIDE 120-VOLT, 20-AMP CONNECTION FOR IRRIGATION CONTROLLER. COORDINATE EXACT LOCATION WITH OWNER PRIOR TO INSTALLATION.

COORDINATE FINAL LOCATION OF PANEL "HP" WITH ARCHITECT PRIOR TO ROUGH-IN.

PROVIDE DUAL TECHNOLOGY WALL MOUNTED OCCUPANCY SENSOR FOR CONTROL OF FIXURES IN THE ROOM; WATTSTOPPER DW-100 OR EQUAL, (TYPICAL

PROVIDE WEATHERPROOF JUNCTION BOX ON EXTERIOR OF BUILDING FOR FUTURE TENANT SIGNAGE. SIGN TO BE POWERED FROM TENANTS PANEL. COORDINATE EXACT LOCATION WITH OWNER/ARCHITECT PRIOR TO ROUGH-IN.

EMERGENCY BATTERY PACK TO OPERATE ONLY UNDER POWER OUTAGE. FIXTURE TO OPERATE NORMALLY UNDER NORMAL CONDITIONS, (NOT A NIGHT LIGHT). RUN SWITCHED AND UNSWITCHED POWER TO BATTERY PACK.

CONNECT ALL SHADED FIXTURES AHEAD OF SWITCHING FOR CONTINUOUS EGRESS & NIGHTLIGHT FUNCTIONS, (TYPICAL).

LOCATE 120V, 20A, WP, GFCI RECEPTACLE ON HIGH TOWER ROOF; COORDINATE EXACT LOCATION WITH ARCHITECT PRIOR TO INSTALLATION.

			PA	N	Ξl		"H	P"				
VOLTS: 208/120V,3 MAINS: 100A M.L.C A.I.C.: 10KA		W										TG: SURFACE NEMA 1 IFGR: CH/ITE/SQD/GE TYPE: BOLT-ON
DESCRIPTION	Т	KVA	BKR		CK	T#		BKR		KVA	Τ	DESCRIPTION
IRRIGATION CNTRL	R	0.18	20A1P	1 4	•		2	20A /		1.50	Н	UH-1
TTB	R	0.36	20A1P	3	•	•	4		2P	1.50	Н	-
FACP	R	0.18	20A1P	5		•	6	20A /		0.33	L	PARKING LOT LTG
BUILDING RECS	R	0.54	20A1P	7 (			8		2P	0.33	L	ı
BUILDING RECS	R	0.54	20A1P	9	•	•	10	20A1	)	0.20	L	EXTERIOR BLDG LTG
EXTERIOR POLE RECS	R	0.36	20A1P	11		•	12	20A1F	)	0.18	R	HIGH TOWER ROOF RC
SPARE			20A1P	13 •			14	20A1F	)	0.18	R	HIGH TOWER ROOF RC
SPARE			20A1P	15	•	•	16	20A1F	)	0.18	R	HIGH TOWER ROOF RC
SPARE			20A1P	17		•	18	20A1F	)			SPARE
SPACE				19			20					SPACE
SPACE				21	•	•	22					SPACE
SPACE				23		•	24					SPACE
SPACE				25			26					SPACE
SPACE				27	•		28					SPACE
SPACE				29		•	30					SPACE
LOAD KVA CONNECTED NEC DEMAND AMPS	LT0 0. 1.	9	REC 2.7 2.7	HTR 3.0 3.0	)			AL 6.6 6.8 19				
PHASE KVA PHASE IMBALANCE	(%)		A A/B	=		.7 .6		B B/C	=	2.0	.9	C = 1.1 C/A = 159.7

**CHARACTERISTICS** 

LOAD

FLA 22.5 208

FLA 22.5 208

FLA 20.6 208

KVA 3.00 208

20.6 208

FLA 20.6 208 3 (3 # 10 THWN CU & 1

LOAD FORM

FLA

\*\* PROVIDE LOCKABLE BREAKER FOR FACP

DESCRIPTION

RTU-1 ROOFTOP UNIT

RTU-6 ROOFTOP UNIT

**ROOFTOP UNIT** 

ROOFTOP UNIT

**ROOFTOP UNIT** 

ELECTRIC UNIT HEATER

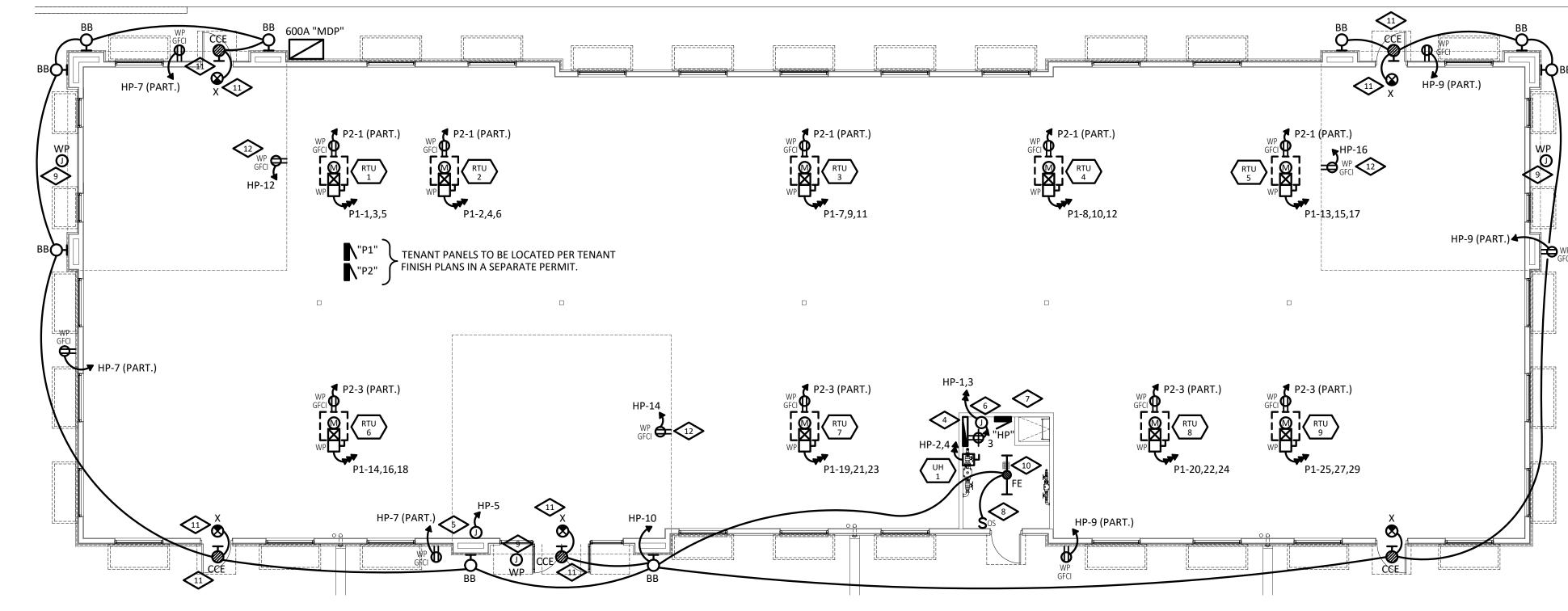
RTU

RTU-4

RTU-7

RTU-8

RTU-9



·	lsc	26,000	RMER (	ASSUMED);			
POINT #2, A	T THE NEW 600A	"MDP";					
	Length x 50 x 0.25					Wire Factor 42782	
M = 1 /	1+ f = 1 / 1 -	- 0.25	_ =	0.80			
lsc = M x	( lsc (source) =	0.80	_ x	26000	A =	20,755	A
POINT #3, A	T THE NEW PANE	L "HP";					
	Length x x 						
M = 1 /	1+ f = 1 / 1 -	7.12	_ =	0.12	_		
lsc = M x	( lsc (source) =	0.12	_ x	20755	_A =	2,556	A
POINT #4, A	T THE NEW PANE	L "P1";					
	Length x x 0.12	, ,				Wire Factor 37512	
M = 1 /	1+ f = 1 / 1 -	- 0.12	_ =	0.90			
lsc = M x	( lsc (source) =	0.90	x	20755	_ A =	18,613	A
POINT #5. A	T THE NEW PANE	L "P2";					

lsc = M x lsc (source) = \_\_\_\_0.94 x \_\_\_18613 A = \_\_\_\_

FIRE PROVISIONS

1200

1600

1200

1600

1200

DETECTION

COMMENTS

FEEDER

3 (3 # 10 THWN CU & 1

3 (3 # 10 THWN CU & 1

# 10 CU GND)1/2" C.

# 10 CU GND)1/2" C.

3 (3 # 10 THWN CU & 1

# 10 CU GND)1/2" C.

3 (3 # 10 THWN CU & 1

# 10 CU GND)1/2" C.

# 12 CU GND)1/2" C.

MECHANICAL EQUIPMENT SCHEDULE

SUPPLY DATA

CIRCUIT PROTECTION

35

FRN-R

FRN-R

FRN-R

FRN-R

35 T-STAT

35 T-STAT

35 T-STAT FRN-R

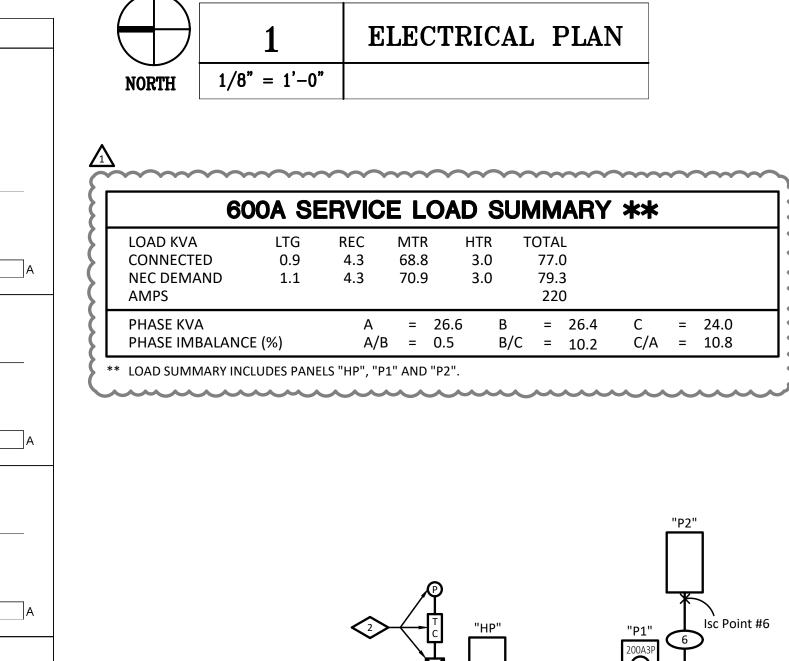
35A3P 60A3P

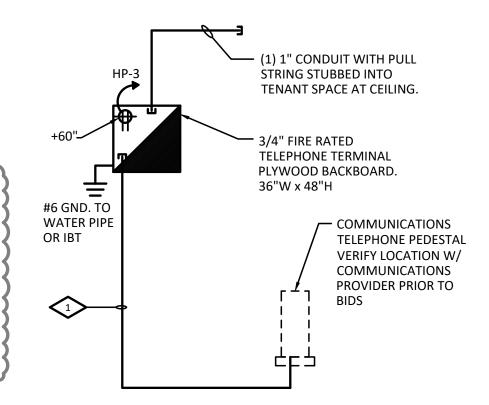
35A3P 60A3P

35A3P 60A3P

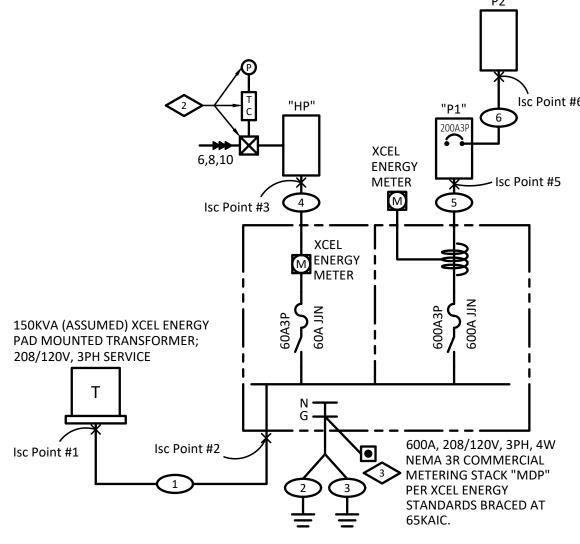
35A3P 60A3P

35A3P 60A3P





## TELEPHONE RISER



# **ONE-LINE DIAGRAM**

NOTE: ALL ITEMS ARE NEW

## FEEDER SCHEDULE

- 2 SETS OF (4-500 KCMIL XHHW AL) 4"C.
- 2 #2/0 CU GND TO BLDG STEEL, UFER & COLD WATER PIPE
- 3 #6 CU TO 5/8" X 8' CLAD STEEL GROUND ROD
- 4 (4 #6 THWN CU & #10 CU GND) 1"C.
- 5 2 SETS OF (4-500 KCMIL XHHW AL & #2/0 AL GND) 3"C.
- 6 (4-250 KCMIL XHHW AL & #4 AL GND) 2-1/2"C.

Revision #1 - HVAC 04-24-2025 Revision / Submissions Date ROSSI Wheat Ridge, Colorado 80033 Fax: 303-428-5472 Email: info@battistadesign.ne www.battistadesign.net CENTENNIAL, CO 80015 **BATTISTA** 303.720.9827

> **SVA GREELEY** Shell Building 1911 59th AVENUE GREELEY, CO 80634

SYMBOLS, ONE-LINE, ELECTRICAL PLAN, SCHEDULES & ISC CALCS



VROSSI@ROSSIENGINEERING.NET

Project Number: Designed: Drawn: Scale: As Shown Checked: Drawing Number: Reviewed: VRW

2 of 4

DESIGN GROUP

02/12/2025

#### **ELECTRICAL SYSTEMS**

PART 1 - GENERAL 1.01 CONDITIONS AND REQUIREMENTS

A. REFER TO THE GENERAL CONDITIONS, SUPPLEMENTARY GENERAL CONDITIONS, AND DIVISION 1 - GENERAL

B. PROVISIONS OF THIS SECTION SHALL APPLY TO ALL OF DIVISION 16 WORK.

#### 1.02 SCOPE OF WORK

A. FURNISH AND INSTALL ALL MATERIALS AND EQUIPMENT, AND PROVIDE ALL LABOR REQUIRED AND NECESSARY TO COMPLETE THE WORK SHOWN ON THE DRAWINGS AND/OR AS SPECIFIED IN DIVISION 16. AND ALL OTHER WORK AND MISCELLANEOUS ITEMS, NOT SPECIFICALLY MENTIONED, BUT REASONABLY INFERRED FOR A COMPLETE INSTALLATION INCLUDING ALL ACCESSORIES AND APPURTENANCES REQUIRED FOR OPERATING AND TESTING THE SYSTEM. IT IS THE INTENT OF THE DRAWINGS AND SPECIFICATIONS THAT ALL SYSTEMS BE COMPLETE AND READY FOR OPERATION.

#### 1.03 CODES, REGULATIONS, AND STANDARDS

A. ALL WORK SHALL BE IN STRICT ACCORDANCE WITH LOCAL BUILDING CODES, GOVERNING LAWS, ORDINANCES AND REGULATIONS, 2017 NATIONAL ELECTRICAL CODE, INTERNATIONAL BUILDING CODE, AND RULES AND REGULATIONS OF THE LOCAL POWER COMPANY.

#### 1.04 MATERIAL STANDARDS

A. ALL MATERIAL SUPPLIED SHALL BE NEW AND SHALL BE EQUAL TO OR EXCEED MINIMUM REQUIREMENTS OF NEMA, IEEE,

B. ALL MATERIALS SHALL BEAR THE UNDERWRITERS' LABORATORIES, INC., LABEL PROVIDED A STANDARD HAS BEEN ESTABLISHED FOR THE MATERIAL IN QUESTION.

A. THE CONTRACTOR SHALL OBTAIN AND PAY FOR ALL LOCAL FEES, PERMITS, AND SERVICES OF INSPECTION AUTHORITIES REQUIRED BY WORK HEREUNDER. THE CONTRACTOR SHALL COORDINATE FULLY WITH THE LOCAL UTILITY COMPANIES WITH RESPECT TO THEIR SERVICES.

### 1.06 CONSTRUCTION DRAWINGS

A. THE DRAWINGS ARE DIAGRAMMATIC AND INDICATE THE GENERAL ARRANGEMENT OF ELECTRICAL WORK. LOCATIONS ARE APPROXIMATE AND SHALL BE SUBJECT TO MINOR MODIFICATIONS AS DICTATED BY FIELD CONDITIONS AND AS DIRECTED BY ARCHITECT AND/OR ENGINEER.

### 1.07 COORDINATION OF WORK

A. CONTRACTOR SHALL BE RESPONSIBLE FOR EXACT FITTING OF ALL MATERIALS, EQUIPMENT, ETC., IN BUILDING. ALL DIMENSIONS SHALL BE VERIFIED ON JOB.

#### 1.08 SPECIFIED ITEMS AND BID ALTERNATES

A. EQUIPMENT OR MATERIALS SPECIFIED EXCLUSIVELY BY TRADE, NAME OF MANUFACTURER, OR BY CATALOG REFERENCE SHALL FORM BASIS OF WORK AND CONTRACT THEREFORE.

#### CONTRACTORS DESIRING TO USE ALTERNATE EQUIPMENT OR MATERIALS: MANUFACTURERS OR SUPPLIERS DESIRING TO FURNISH ALTERNATE MATERIALS OR EQUIPMENT IN LIEU OF THOSE SPECIFIED; SHALL SUBMIT REQUESTS FOR APPROVAL OF ALTERNATES TO ARCHITECT NOT LESS THAN SEVEN CALENDAR DAYS PRIOR TO SCHEDULED CLOSING DATE FOR RECEIPT OF BIDS OR PROPOSALS.

C. REQUESTS FOR APPROVAL OF PROPOSED ALTERNATES SHALL BE MADE IN WRITING AND SHALL INCLUDE COMPLETE DATA SHEETS, CATALOG CUTS, SAMPLES, AND APPROPRIATE CALCULATIONS.

D. CONTRACTOR SHALL BE RESPONSIBLE FOR PROPER INSTALLATION, COMPLETE IN ALL RESPECTS, AND OPERATION OF ALL EQUIPMENT OR MATERIALS USED AS RESULT OF APPROVAL OF REQUESTS TO SUBSTITUTE. NO ADDITIONAL PAYMENT WILL BE ISSUED DUE TO THE INCORPORATION OF APPROVED SUBSTITUTIONS.

A. FURNISH SIX COPIES OF SHOP DRAWINGS AND MATERIAL LISTS, AS HEREIN CALLED FOR, TO ARCHITECT PRIOR TO COMMENCEMENT OF WORK. MATERIAL LISTS SHALL INCLUDE CATALOG CUTS, DIAGRAMS AND OTHER DESCRIPTIVE MATERIAL, AND SHALL BE SUBMITTED AT THE SAME TIME IN BROCHURE ARRANGEMENT WITH ONE OF EACH REQUESTED ITEM IN EACH OF THE SIX BROCHURES. SHOP DRAWINGS SHALL BE SUBMITTED FOR THE FOLLOWING: PANELBOARDS

#### DISCONNECT SWITCHES LIGHTING FIXTURES

B. THE CONTRACTOR SHALL REVISE AND RESUBMIT SHOP DRAWINGS AND MATERIAL LISTS AS REQUIRED FOR APPROVAL.

#### 1.10 OPERATION AND MAINTENANCE MANUALS

A. PROVIDE TWO COPIES OF OPERATING AND MAINTENANCE MANUALS FOR ALL EQUIPMENT AND/OR SYSTEMS.

A. THE CONTRACTOR SHALL GUARANTEE ALL MATERIALS AND EQUIPMENT FURNISHED AND INSTALLED HEREUNDER AGAINST ALL DEFECTS AND FAULTY INSTALLATION FOR A PERIOD OF 365 CALENDAR DAYS FROM DATE OF FINAL ACCEPTANCE OF WORK BY OWNER.

### 1.12 AS-BUILT DOCUMENTS

A. THE CONTRACTOR SHALL MAINTAIN ON THE JOB AN UP-TO-DATE SET OF WORKING DRAWINGS AND SPECIFICATIONS, MARKED UP TO SHOW ELECTRICAL SYSTEMS AS INSTALLED. THESE DRAWINGS AND SPECIFICATIONS SHALL BE AVAILABLE FOR INSPECTION BY THE ARCHITECT OR THEIR REPRESENTATIVE.

B. UPON COMPLETION OF THE WORK, THE ELECTRICAL CONTRACTOR SHALL PROVIDE THE OWNER WITH ONE SET OF AS-BUILT DRAWINGS AND MARKED UP SPECIFICATIONS, CERTIFIED ACCURATE BY ENDORSEMENT.

A. THE ELECTRICAL CONTRACTOR SHALL EXAMINE PROJECT SITE AND ALL CONDITIONS THEREON AND SHALL TAKE INTO CONSIDERATION ALL SUCH CONDITIONS AS MAY AFFECT THE WORK HEREUNDER.

A. PROVIDE TEMPORARY POWER AND LIGHTING FOR CONSTRUCTION IN ACCORDANCE WITH STATE AND LOCAL SAFETY LAWS AND IN PARTICULAR FEDERAL OSHA REQUIREMENTS AND THE NATIONAL ELECTRICAL CODE.

1.15 SLEEVES, INSERTS, AND EMBEDDED ITEMS A. SLEEVES, INSERTS, HANGERS, ETC., FURNISHED UNDER THIS DIVISION AND INSTALLED UNDER ANOTHER DIVISION SHALL BE SUPPLIED IN SUCH MANNER AS WILL PERMIT ORDERLY PROGRESS OF WORK BY OTHERS.

A. THE ELECTRICAL CONTRACTOR SHALL CUT, CHANNEL, CHASE, AND/OR DRILL FLOORS, WALLS, PARTITIONS, CEILINGS, OR OTHER SURFACES AS REQUIRED FOR INSTALLATION, SUPPORT, ANCHORAGE, ETC., OF THE WORK. ALL PATCHING SHALL BE DONE BY THE GENERAL CONTRACTOR.

### 1.17 DELIVERY AND STORAGE

A. ELECTRICAL CONTRACTOR SHALL MAKE PROVISIONS FOR DELIVERY AND SAFE STORAGE OF MATERIALS FOR THIS CONTRACT AND SHALL ASSUME FULL RESPONSIBILITY FOR CONDITION AND/OR SAFEKEEPING OF MATERIALS FURNISHED BY OTHERS ON ACCEPTANCE OF MATERIALS.

### 1.18 INSPECTIONS AND TESTS

A. WORK SHALL BE SUBJECT TO INSPECTION BY ARCHITECT AND/OR ENGINEER AT ALL TIMES. B. AFTER ELECTRICAL INSTALLATION IS COMPLETED AND AT SUCH TIME AS THE ARCHITECT OR ENGINEER MAY DIRECT, THE CONTRACTOR SHALL CONDUCT AN OPERATING TEST FOR APPROVAL. INSTALLATION SHALL BE DEMONSTRATED TO BE IN ACCORDANCE WITH REQUIREMENTS OF THE DRAWINGS AND THIS SPECIFICATION. ANY DEFECTS REVEALED SHALL BE CORRECTED PROMPTLY AND THE TESTS RECONDUCTED.

C. THE CONTRACTOR SHALL REPAIR AND/OR REPLACE ALL DEFECTIVE AND/OR FAULTY WORKMANSHIP, MATERIALS, AND/OR EQUIPMENT AND SHALL REPAIR AND/OR REPLACE ALL OTHER WORK DAMAGED AS A RESULT OF SUCH DEFECTIVE AND/OR FAULTY INSTALLATION, MATERIALS AND/OR EQUIPMENT WITHOUT CHARGE TO OWNER DURING GUARANTEE PERIOD.

### D. PARTIAL OCCUPANCY OF SITE BY OWNER SHALL NOT BE CONSTRUED AS FINAL ACCEPTANCE OF WORK.

### PART 2 - PRODUCTS 2.01 BRANCH CIRCUIT PANELS

A. CIRCUIT BREAKER TYPE PANELBOARDS WITH MAIN LUGS OR MAIN CIRCUIT BREAKERS WHERE SHOWN, WITH NUMBER AND SIZE OF FULL WIDTH THERMAL MAGNETIC BOLTED BRANCH CIRCUIT BREAKERS WITH MINIMUM AIC RATING AS INDICATED. CIRCUIT BREAKERS SHALL BE LABELED FOR USE WITH CONDUCTORS WITH MINIMUM OF 75° INSULATION. PANELBOARDS ARE TO BE SURFACE OR FLUSH MOUNTED WITH SIZE OF BUS AS INDICATED. TWO AND THREE POLE BREAKERS SHALL HAVE COMMON TRIP AND SINGLE OPERATING HANDLE. PROVIDE SEPARATE GROUND BUS IN EACH

B. PANELBOARDS SHALL BE CONSTRUCTED OF CODE GAUGE GALVANIZED STEEL. FRONTS ARE TO BE COMPLETE WITH DOOR IN DOOR, LATCH AND MASTER-KEYED LOCKS. FRONTS SHALL HAVE ADJUSTABLE TRIM CLAMPS AND DIRECTORY FRAMES. LIGHTING AND MISCELLANEOUS POWER PANELS: 208V OR 240V, 3 PHASE 208/120V, SINGLE OR 3 PHASE 240/120V,

### 2.02 DISCONNECT SWITCHES

MAIN DISCONNECT SWITCHES RATED 800 AMPERES AND ABOVE SHALL BE BOLTED PRESSURE CONTACT TYPE,

SINGLE PHASE 10,000 AIC MINIMUM CUTLER-HAMMER TYPE PRL1 OR EQUIVALENT BY SQUARE D OR SIEMENS.

### CUTLER-HAMMER OR EQUAL BY SQUARE D OR SIEMENS.

PROVIDE ENCLOSED, HEAVY DUTY, FUSIBLE OR NON-FUSIBLE SAFETY SWITCHES WHERE REQUIRED. EACH ENCLOSURE SHALL BE NEMA TYPE SUITABLE FOR THE SURROUNDING AREA AND CONDITIONS, AND SHALL BE LABELED FOR USE WITH CONDUCTORS HAVING MINIMUM OF 75° INSULATION. CONSULT MECHANICAL DRAWINGS AND SPECIFICATIONS OF MECHANICAL EQUIPMENT. DISCONNECTS AS APPROPRIATE FOR ACTUAL EQUIPMENT PROVIDED TO THE PROJECT. ALL SWITCHES SHALL BE LABELED FOR FEEDER OR MOTOR SUPPLIED.

D. PROVIDE FUSE REJECTION KITS FOR ALL FUSIBLE SWITCHES RATED 600 AMPERES AND BELOW.

A. FUSES SHALL BE OF THE TIME DELAY TYPE; CLASS "R" WITH REJECTION FEATURE UP TO 600 AMPERES, BOLT-IN CLASS "L" ABOVE 600 AMPERES. "FUSETRON", "LOW PEAK", OR "HI-CAP" AS MANUFACTURED BY THE BUSSMAN MANUFACTURING COOMPANY OR EQUIVALENT BY GOULD. INC. (GOULD SHAWMUTT FUSES). THE CONTRACTOR SHALL FURNISH AND INSTALL ONE COMPLETE SET OF FUSES FOR ALL FUSE HOLDING DEVICES SIZED IN ACCORDANCE WITH THE ASSOCIATED MOTOR AND/OR CONDUCTORS TO BE PROTECTED. FURNISH TO OWNER A MINIMUM OF THREE SPARES FOR EACH SIZE INSTALLED. PROVIDE A SPARE FUSE CABINET MOUNTED IN MAIN ELECTRICAL ROOM FOR FUSE STORAGE. PROVIDE A NAMEPLATE ON THE CABINET WHICH READS "SPARE FUSES".

#### 2.04 CONDUIT AND FITTINGS

A. PROVIDE CONDUIT AND FITTINGS AS INDICATED AND AS REQUIRED PER PART 3 - INSTALLATION OF THIS SPECIFICATION. B. GALVANIZED RIGID STEEL CONDUIT (GRC): ZINC COATED, THREADED TYPE CONFORMING TO UL 6. PROVIDE ZINC

C. INTERMEDIATE METALLIC TUBING (IMC): ZINC COATED THREADED TYPE CONFORMING TO UL PROVIDE ZINC COATING

FUSED TO INSIDE AND OUTSIDE WALLS. PROVIDE CLOSED-END THREAD PROTECTORS. D. ELECTRIC METALLIC TUBING (EMT): COMPLY WITH UL 794.

COATING FUSED TO INSIDE AND OUTSIDE WALLS. PROVIDE CLOSED-END THREAD PROTECTORS.

E. PVC EXTERNALLY COATED RIGID STEEL CONDUIT (PVC COATED GRC): PROVIDE RIGID STEEL ZINC COATED WITH AN ADDITIONAL 40 MIL. THICK COATING OF PVC AND INTERNAL GALVANIZED SURFACE. PVC COATING SHALL BE BONDED TO

THE CONDUIT. EXTRUDED EXTERIOR COATING IS NOT ACCEPTABLE. F. FLEXIBLE STEEL CONDUIT: FORMED FROM CONTINUOUS LENGTH OF SPIRALLY-WOUND, INTERLOCKED ZINC-COATED STRIP

G. LIQUID-TIGHT, FLEXIBLE METAL CONDUIT: FORMED FROM A CONTINUOUS LENGTH OF FLEXIBLE. INTERLOCKED. AND DOUBLE-WRAPPED STEEL: GALVANIZED INSIDE AND OUTSIDE: COATED WITH LIQUID-TIGHT JACKET OF FLEXIBLE POLYVINYL

H. RIGID METAL CONDUIT FITTINGS: CAST-MALLEABLE IRON, GALVANIZED.

I. INTERMEDIATE METALLIC TUBING FITTINGS:

ELECTRIC METALLIC TUBING FITTINGS: STEEL OR IRON, COMPRESSION (SET SCREW). K. FLEXIBLE METALLIC CONDUIT FITTINGS: STEEL THREADLESS HINGED CLAMP TYPE.

### FLEXIBLE NON-METALLIC CONDUIT FITTINGS: PLASTIC

M. CONDUIT BODIES: GALVANIZED STEEL CONDUIT BODIES OF TYPES, SHAPES, AND SIZES AS REQUIRED TO FULFILL JOB REQUIREMENTS AND NEC REQUIREMENTS. CONDUIT BODIES SHALL HAVE THREADED CONDUIT ENTRANCE ENDS, REMOVABLE COVERS, EITHER CAST OR GALVANIZED STEEL, AND CORROSION-RESISTANT SCREWS.

A. UNLESS OTHERWISE INDICATED, ALL CONDUCTORS SHALL BE COPPER. THE USE OF ALUMINUM WILL BE ACCEPTED ONLY TO THE EXTENT SPECIFICALLY INDICATED ON THE DRAWINGS. CONDUCTORS SIZED #10 AWG AND SMALLER SHALL BE SOLID ANNEALED COPPER, #8 AWG AND LARGER SHALL BE STRANDED.

B. MINIMUM CONDUCTOR SIZES SHALL BE #12 AWG FOR WIRING AT 120 VOLTS AND ABOVE, AND #18 AWG FOR SIGNAL AND CONTROL CIRCUITS. FOR 120 VOLT CIRCUITS 75 FEET OR LONGER TO THE FIRST OUTLET, MINIMUM SIZE SHALL BE INCREASED TO #10 AWG (FOR 277 VOLT CIRCUITS 150 FEET).

C. CONDUCTORS SHALL HAVE INSULATION RATED AT 600 VOLTS UNLESS OTHERWISE NOTED. THE FOLLOWING INSULATION STANDARDS SHALL APPLY: 1. UNDERGROUND AND WET LOCATIONS: TYPE THW OR THWN FOR #8 AWG AND LARGER; TW OR THWN FOR #10 AWG AND

SMALLER. INDOORS: TYPE THW, THWN, OR THHN FOR #8 AWG AND LARGER; TW, THWN, OR THHN FOR #10 AWG AND SMALLER. 3. AMPACITIES: CONDUCTOR AMPACITIES SHALL BE APPLIED PER NEC TABLE 310-16. RATINGS FOR CONDUCTORS HAVING

75°C INSULATION SHALL NOT BE EXCEEDED REGARDLESS OF WHICH INSULATION TYPE IS USED. D. CONNECTORS SHALL BE 3-M "SCOTCHLOCK", BUCHANAN "B-CAPS", IDEAL "WING NUT", OR BUCHANAN SPLICE CAPS. ALL CONNECTORS SHALL BE RATED AT 600 VOLTS FOR GENERAL USE, OR 1000 VOLTS FOR USE WITHIN FLUORESCENT OR HIGH INTENSITY DISCHARGE (HID) LIGHTING FIXTURES.

#### 2.07 CABINETS AND WIREWAYS

A. CODE GAUGE GALVANIZED STEEL. CABINETS TO HAVE HINGED COVERS AND MASTER KEYED LOCKS. PROVIDE CABINET SIZES AS INDICATED, AND WIREWAY SIZED FOR APPLICATION PER NEC ARTICLE 362. PROVIDE APPROVED NEMA TYPE ENCLOSURE SUITABLE FOR LOCATION AND CONDITIONS ENCOUNTERED. FINISH SHALL BE ANSI 61 GRAY ENAMEL.

A. CAST METAL BOXES FOR EXPOSED CONDUIT AND IN EQUIPMENT ROOMS. ALL OUTLETS FOR EXTERIOR APPLICATION SHALL BE CAST, WEATHERPROOF TYPE, WITH GASKET AND CAST COVER PLATE. PROVIDE GALVANIZED OR ZINC COATED, COMPRESSED STEEL OUTLET BOXES FOR ALL OTHER APPLICATIONS. BOXES TO BE 4 INCHES SQUARE OR OCTAGONAL

UNLESS OTHERWISE REQUIRED FOR SPECIFIC OUTLET OR STRUCTURAL CONDITIONS, AND OF DEPTH AS REQUIRED.

2.09 WIRING DEVICES A. PROVIDE SPECIFICATION GRADE DEVICES IN ALL AREAS. HUBBELL, LEVITON, BRYANT, OR PASS AND SEYMOUR. ALL

DEVICES SHALL BE OF THE SAME MANUFACTURER. B. SWITCHES SHALL BE RATED FOR THE LOAD CONTROLLED. SWITCHES SHALL BE LEVITON #1201 (15 AMP) OR #1221 (20 AMP) OR EQUAL. ALL OTHER SWITCHES SHALL BE OF SIMILAR PREMIUM SPECIFICATION GRADE QUALITY.

C. THERMAL OVERLOAD SWITCHES SHALL BE PROPERLY SIZED OVERLOAD HEATER ELEMENTS. D. RECEPTACLES SHALL BE RATED FOR THE CIRCUIT LOAD SERVED. RECEPTACLES SHALL BE LEVITON #5252 (15 AMP) OR #5352 (20 AMP) OR EQUAL. ALL OTHER RECEPTACLES SHALL BE OF SIMILAR PREMIUM SPECIFICATION GRADE QUALITY.

E. PROVIDE STAINLESS STEEL COVERPLATES FOR ALL DEVICES IN KITCHEN AREAS AND AREAS WITH SURFACE MOUNTED RACEWAY AND BOXES. PROVIDE 0.140 INCH SMOOTH NYLON MATCHING COVERPLATES FOR ALL OTHER SWITCHES, RECEPTACLES, TELEPHONE, JUNCTION, AND UNUSED OUTLETS. DEVICE AND PLATE COLORS SHALL BE WHITE OR LIGHT COLOR ON LIGHT FINISHED SURFACES, AND BLACK, BROWN, OR OTHER DARK COLOR ON DARK FINISHED SURFACES. VERIFY COLOR OF DEVICES AND COVERPLATES WITH ARCHITECT BEFORE ORDERING.

### 2.10 LIGHTING FIXTURES AND LAMPS

A. ALL FIXTURES SHALL BEAR THE UNDERWRITERS LABORATORIES SEAL OF APPROVAL. B. FIXTURE TYPES ARE INDICATED ON THE DRAWINGS BY MEANS OF LETTERS. REFER TO THE FIXTURE SCHEDULE FOR FIXTURE SPECIFICATIONS. WHEN A FIXTURE TYPE IS INDICATED IN A ROOM OR AREA, ALL OTHER FIXTURES IN THE ROOM OR AREA SHALL BE OF THE SAME TYPE UNLESS NOTED OTHERWISE.

C. ALL FLUORESCENT LAMPHOLDERS SHALL BE WHITE PHENOLIC COMPOUND, POSITIVE SPRING ACTION TYPE. FLUORESCENT FIXTURES WITH RAPID START LAMPS SHALL BE EQUIPPED WITH HIGH POWER FACTOR ETL/CBM APPROVED ENERGY SAVING CLASS "P" BALLASTS (UNIVERSAL "SLH" OR ADVANCE MARK III). ALL BALLASTS SHALL BE GUARANTEED FOR TWO

D. CLASS P, CERTIFIED CBM, HIGH POWER FACTOR, PREMIUM LOW HEAT, HIGH FREQUENCY ELECTRONIC BALLAST WITH AUTOMATIC RESET THERMAL PROTECTION. BALLAST SHALL OPERATE AT 10 PERCENT OR LESS TOTAL HARMONIC DISTORTION. ADVANCE MARK V OR EQUAL BY MOTOROLA OR MAGNETEK.

E. FIXTURES EXPOSED TO COLD WEATHER AND COLD TEMPERATURE SHALL BE WEATHERPROOF AND OF THE LOW

TEMPERATURE TYPE SUITABLE FOR OPERATION AT CONDITIONS ENCOUNTERED. F. ALL FIXTURES SHALL BE SO MANUFACTURED THAT ALL METALLIC PARTS WILL BE CONTINUOUSLY GROUNDED. WHERE ACRYLIC LENSES ARE SPECIFIED, THICKNESS OF SUCH LENS SHALL BE NOMINAL 0.125 INCH.

G. INCANDESCENT LAMPS SHALL BE RATED 110 VOLTS. FLUORESCENT LAMPS SHALL BE F32T8 RAPID START TYPE OR AS NOTED ON DRAWINGS. NO SUBSTITUTIONS WILL BE ALLOWED FOR HIGH INTENSITY DISCHARGE (HID) AND FLUORESCENT LAMPS LISTED BY SPECIFIC MANUFACTURERS. ALL LAMPS SHALL BE GENERAL ELECTRIC, SYLVANIA, OR PHILLIPS UNLESS OTHERWISE NOTED.

### 2.11 FIRE ALARM SYSTEM

A. FURNISH AND INSTALL A COMPLETE DESIGN/BUILD, ELECTRICALLY SUPERVISED, CLASS B MULTIPLE-ZONE, CONTINUOUS RINGING FIRE ALARM SYSTEM AS DESCRIBED HEREIN PER LOCAL FIRE DEPARTMENT REQUIREMENTS. SYSTEM SHALL BE CAPABLE OF SUPPORTING ENTIRE BUILD-OUT OF FACILITY AND SHALL INCLUDE NECESSARY REQUIREMENTS FOR MEDICAL OFFICE TYPE TENANTS. ALL COMPONENTS OF THE ENTIRE SYSTEM SHALL BE NEW AND LISTED, LABELED, AND APPROVED FOR ITS APPLICATION AS FIRE ALARM EQUIPMENT FOR NFPA 72A BY UNDERWRITERS LABORATORIES, INC., AND FACTORY MUTUAL. ACTUATION OF ANY MANUAL OR AUTOMATIC ALARM INITIATING DEVICE SHALL CAUSE DESIGNATED ALARM SIGNALING UNITS TO RING CONTINUOUSLY, LIGHT THE RESPECTIVE ZONE ALARM LAMP ON THE REMOTE ANNUNCIATOR, AND PROVIDE AN ALARM SIGNAL SUITABLE FOR MONITORING BY AN APPROVED CENTRAL STATION.

B. PRIMARY POWER SHALL BE 120 VAC MONITORED, AND A POWER-ON LAMP SHALL BE PROVIDED. UPON POWER OUTAGE, THE SYSTEM SHALL LIGHT A POWER TROUBLE CONDITION LAMP, INDICATE A TROUBLE CONDITION, AND AUTOMATICALLY TRANSFER POWER SUPPLY TO STANDBY BATTERIES. THE CONTROL PANEL SHALL ALSO MONITOR THE BATTERIES, AND UPON A LOW BATTERY CONDITION, LIGHT THE LOW BATTERY LAMP AND INDICATE A TROUBLE CONDITION. UPON GROUND FAULT DETECTION, THE GROUND DETECTION LAMP SHALL LIGHT AND A TROUBLE SIGNAL SHALL BE INDICATED. PROVIDE A LAMP TEST SWITCH TO TEST ALL LAMPS ON THE CONTROL PANEL.

C. PROVIDE A MUNICIPAL TRIP CIRCUIT THAT IS A DISTINCT SEPARATE CIRCUIT UTILIZED FOR NO OTHER PURPOSE. A MUNICIPAL TRIP DISCONNECT TEST SWITCH SHALL BE PROVIDED. THE MUNICIPAL TRIP DISCONNECT LAMP SHALL INDICATE THAT THE MUNICIPAL TRIP IS DISCONNECTED.

D. MANUAL STATIONS SHALL BE DESIGNED FOR SEMI-FLUSH MOUNTING. PLASTIC STATIONS WILL NOT BE ACCEPTABLE STATIONS SHALL BE OF THE BREAK-GLASS DESIGN, AND MUST BE OPENED TO BE RESET. IT SHALL BE POSSIBLE, FOR TESTING PURPOSES, TO INITIATE AN ALARM WITHOUT BREAKING THE GLASS. PROVIDE A MINIMUM OF ONE SPARE GLASS ROD PER MANUAL STATION.

E. SMOKE DETECTORS SHALL BE LOW VOLTAGE, TWO WIRE, DUAL CHAMBER, IONIZATION TYPE. EACH DETECTOR SHALL BE SELF-COMPENSATING FOR THE EFFECTS OF AIR VELOCITY, TEMPERATURE, HUMIDITY AND ATMOSPHERIC PRESSURE. EACH DETECTOR SHALL CONTAIN AN INTEGRAL, VISUAL INDICATION OF ALARM VISIBLE FOR 360°

F. ALARM HORNS SHALL BE SUITABLE FOR INDOOR OR OUTDOOR APPLICATION. ALL HORNS SHALL BE 24 VDC POLARIZED. THE MINIMUM SOUND LEVEL SHALL BE 95 DB AT 10 FEET. HORNS SHALL BE SEMI-FLUSHED MOUNTED G. VISUAL SIGNALS SHALL BE PROVIDED WITH EACH FIRE SIGNALING DEVICE. ONE ENCLOSURE SHALL INCORPORATE BOTH

DEVICES. THE VISUAL SIGNAL SHALL FLASH ON ALARM OCCURRENCE. THE BEZEL SHALL EXTEND 1-1/2 INCHES MINIMUM FROM THE FINISHED WALL, AND BE APPROXIMATELY 3-1/2 INCHES BY 5 INCHES ENGRAVED "FIRE". H. EQUIPMENT SHALL BE AS FOLLOWS AS MANUFACTURED BY EDWARDS, INC., OR PRIOR APPROVED EQUAL:

CONTROL PANEL: 5751B

IONIZATION SMOKE DETECTOR: 5250B

3. THERMAL DETECTOR: 285A 4. ALARM HORN: 894B

REMOTE LIGHT: RL-85 REMOTE ANNUNCIATOR: G1344

### PART 3 - EXECUTION

A. ALL WIRING SHALL BE INSTALLED IN CONDUIT. CONDUIT SHALL BE OF SIZE REQUIRED BY NEC OR LARGER AS INDICATED ON DRAWINGS, AND SHALL BE INSTALLED ACCORDING TO NEC. BENDS SHALL BE MADE WITH AN APPROVED HICKEY OR CONDUIT BENDING MACHINE. FACTORY BENDS OVER 1-1/4 INCHES ARE APPROVED.

PREMIUM QUALITY COMPRESSION (SET SCREW) TYPE COUPLINGS. PROVIDE INSULATED BUSHINGS FOR ALL

B. EXPOSED CONDUIT SHALL NOT BE INSTALLED IN FINISHED AREAS UNLESS PRIOR APPROVED BY ARCHITECT. EXPOSED CONDUIT MAY BE INSTALLED IN EQUIPMENT ROOMS AND AT SURFACE MOUNTED EQUIPMENT. ALL EXPOSED CONDUIT SHALL BE RUN AT RIGHT ANGLES AND PARALLEL TO THE BUILDING LINES.

C. ALL UNDERGROUND CONDUIT SHALL BE INSTALLED AT A MINIMUM OF 30 INCHES BELOW FINISHED GRADE. CONDUITS INSTALLED BELOW CONCRETE SLABS SHALL BE A MINIMUM OF 12 INCHES BELOW SLAB. ALL UNDERGROUND CONDUITS SHALL BE INSTALLED IN SELECT BACKFILL IN ACCORDANCE WITH THE EARTHWORK SECTION OF THESE SPECIFICATIONS. ALL UNDERGROUND CONDUIT SHALL BE SCHEDULE 40 PVC, WITH PVC COATED GRC ELBOWS FOR ALL RADIUS BENDS. D. USE APPROVED TYPE COUPLINGS AND CONNECTORS IN ALL CONDUIT RUNS, AND MAKE ALL JOINTS TIGHT. PROVIDE

TERMINATIONS IN PIPE SIZES 1-1/4 INCHES AND LARGER. PROVIDE WEATHERPROOF FITTINGS FOR RUNS EXPOSED TO WEATHER AND HIGH HUMIDITY, AND CONCRETE TIGHT FITTINGS FOR CONDUITS INSTALLED IN CONCRETE SLABS. PROVIDE SEAL-OFF FITTINGS WHERE CONDUITS ENTER OR LEAVE HAZARDOUS WIRING AREA OR AREAS OF WIDELY

DIFFERENT TEMPERATURE AND/OR HUMIDITY. MAXIMUM CONDUIT SIZE FOR INSTALLATION IN CONCRETE SLABS OR WALLS SHALL BE 1 INCH.

PRIOR TO PULLING OF CONDUCTORS, CONDUITS SHALL BE CLEANED OF ALL FOREIGN MATTER. PROVIDE 200 POUND TEST NYLON PULL-LINES IN ALL CONDUITS INTENDED FOR FUTURE USE (E.G. TELEPHONE, ETC.). PROVIDE CONDUIT WITH APPROPRIATE FITTINGS INSTALLED AS REQUIRED PER THE FOLLOWING CRITERIA:

1. BELOW GRADE IN EARTH: USE PVC OR PVC COATED RIGID STEEL CONDUIT. GRC IS REQUIRED WHERE UNDERGROUND OR UNDERSLAB CONDUITS PENETRATE A CONCRETE SLAB OR FOUNDATION WALL.

ABOVE GRADE, EXTERIOR (EXCEPT ROOFS): USE GRC, IMC, OR EMT WITH WEATHERPROOF FITTINGS.

ON ROOFS: USE GRC.

4. ABOVE GRADE, INTERIOR: a. IN LOCATIONS SUBJECT TO DAMAGE: USE GRC WITH THREADED GRC FITTINGS.

b. IN WET OR DAMP LOCATIONS: USE GRC WITH WEATHERPROOF FITTINGS. IN HAZARDOUS LOCATIONS: USE GRC, IMC, OR EMT AS REQUIRED FOR THE CLASSIFICATION OR THE AREA WITH

MATCHING COMPRESSION OR THREADED FITTINGS. d. IN DRY LOCATIONS, BLOCK WALLS, OR CONCRETE WALLS: USE GRC, IMC, OR EMT WITH COMPRESSION (SET-SCREW)

FITTINGS. IN SLAB ON GRADE: USE PVC OR PVC COATED GRC.

6. IN CONCRETE SLABS ABOVE THE GROUND FLOOR: USE PVC, GRC, IMC, OR EMT. (ALT. -- NO CONDUITS ARE ALLOWED IN CONCRETE SLABS.)

USE FLEXIBLE METALLIC CONDUIT IN THE FOLLOWING APPLICATIONS:

a. RECESSED LIGHTING FIXTURES MOTOR CONNECTIONS

c. CONNECTION BETWEEN FAN PLENUM AND STRUCTURE

d. AT EXPANSION JOINTS e. AT TRANSFORMER AND OTHER EQUIPMENT WHICH PRODUCES VIBRATION

8. USE FLEXIBLE NON-METALLIC CONDUIT IN THE FOLLOWING APPLICATIONS: a. AT ALL LOCATIONS LISTED ABOVE FOR FLEXIBLE METALLIC CONDUIT WHERE EXPOSED TO MOISTURE IN WET OF DAMP

LOCATIONS. H. PROVIDE SLEEVES WHERE CONDUIT PENETRATES A FIRE RATED WALL. SLEEVE SHALL BE RATED AS REQUIRED TO

MAINTAIN THE FIRE RATING OF THE WALL THAT IS BEING PENETRATED. USE PVC COATED OR BITUMINOUS COATED GALVANIZED RIGID METAL ELBOWS FOR STUB UPS AND 900 BENDS IN UNDERGROUND CONDUITS AND FOR ALL RISERS TO GRADE AND ENTRY FROM BUILDING EXTERIOR.

#### 3.02 WIRING

A. NO WIRE SHALL BE INSTALLED PRIOR TO COMPLETION OF WORK WHICH MIGHT CAUSE DAMAGE TO CONDUCTORS. ALL SERVICE CONDUCTORS, FEEDERS, AND BRANCH CIRCUITS SHALL BE COLOR CODED IN ACCORDANCE WITH ARTICLE 210-5 OF THE NEC. COLOR CODING SHALL BE VIA COLORED INSULATION OR TAPE AT ALL TERMINATION LOCATIONS. WIRING FOR SPECIAL SYSTEMS SUCH AS MECHANICAL EQUIPMENT, ETC., SHALL BE IN ACCORDANCE WITH MANUFACTURERS

B. WIRING SHALL BE CONTINUOUS FROM OUTLET TO OUTLET OR JUNCTION BOX. SPLICES SHALL BE HELD TO A MINIMUM, AND SHALL BE MADE ONLY AT READILY ACCESSIBLE PULL BOX, JUNCTION BOX, OR OUTLET BOX. THE INSULATION VALUE OF THE JOINT SHALL EQUAL THAT OF THE CONDUCTOR. SPLICES AND CONNECTION SHALL BE MADE BY TWISTING TIGHT AND INSTALLING INSULATED PRESSURE OR WIRE NUT CONNECTORS FOR #10 AWG AND SMALLER, AND WITH STEEL

CRIMP-ON SLEEVES AND OVERALL NYLON INSULATOR FOR #8 AWG AND LARGER. WHERE ALUMINUM CONDUCTORS ARE INDICATED, ALL TERMINATIONS SHALL BE ACCOMPLISHED WITH APPROVED COMPRESSION TERMINATORS (BURNDY HYPLUG OR EQUAL). ALL ALUMINUM TERMINATIONS SHALL BE TREATED WITH

DEOXIDIZING SOLUTION (BURNDY PENETROX OR EQUAL). COLOR CODE ALL CONDUCTORS. WIRE SIZES #8 AWG OR SMALLER SHALL HAVE INTEGRAL COLOR-CODED INSULATION. WIRE SIZES #6 AWG AND LARGER MAY HAVE BLACK INSULATION BUT IDENTIFIED BY COLOR-CODED ELECTRICAL TAPE AT ALL JUNCTION, SPLICE, PULL, OR TERMINATION POINTS. COLOR TAPE SHALL BE APPLIED TO AT LEAST 6 INCHES OF THE

CONDUCTOR COLOR CODE WIRES AS FOLLOWS: 208/120 VOLTS PHASES: A-BLACK, B-RED, C-BLUE, NEUTRAL-WHITE,

GROUND-GREEN COLOR CODING OF WIRES USED FOR SIGNAL AND COMMUNICATION SYSTEMS ARE SPECIFIED UNDER THE RESPECTIVE SECTIONS FOR THESE SYSTEMS.

3.03 GROUNDING A. PROVIDE GROUNDING ELECTRODE CONDUCTORS SIZED IN ACCORDANCE WITH THE DRAWINGS BETWEEN THE SERVICE GROUND BUS AND THE FOLLOWING GROUNDING ELECTRODES FOR THE MAIN SERVICE GROUNDING SYSTEM:

DOMESTIC AND FIRE PROTECTION METALLIC WATER PIPES.

THE METAL FRAME OR STRUCTURE OF THE BUILDING. 3. A MINIMUM OF 20 INCHES OF #2 AWG BARE SOLID COPPER CONDUCTOR LOCATED NEAR THE BOTTOM OF THE CONCRETE FOUNDATION OR FOOTING THAT IS IN DIRECT CONTACT WITH EARTH. ELECTRODE SHALL BE CADWELDED, OR EQUAL, TO ALL VERTICAL REINFORCING BARS, AND SHALL BE ENCASED BY AT LEAST 2 INCHES OF CONCRETE.

B. THE SERVICE NEUTRAL SHALL BE CONNECTED TO THE GROUND BUS WITH AN UNSPLICED CLASS B STRANDED COPPER

CONDUCTOR SIZED PER NEC TABLE 250-66. PROVIDE AN EQUIPMENT BONDING JUMPER TO THE NON-CURRENT CARRYING PARTS OF THE MAIN SERVICE SIZED PER NEC TABLE 250-112. ALL ELECTRICAL NEUTRALS, RACEWAYS, AND NON-CURRENT CARRYING PARTS OF ELECTRICAL EQUIPMENT AND ASSOCIATED ENCLOSURES SHALL BE GROUNDED IN ACCORDANCE WITH NEC ARTICLE 250. AN IDENTIFIED GROUNDING CONDUCTOR SHALL BE INSTALLED IN ALL FLEXIBLE METALLIC OR PVC CONDUITS. CONNECT GROUND WIRE TO THE

GROUND TERMINAL OF ALL DEVICES. PROVIDE GROUND BOND JUMPER FROM GROUNDING TERMINAL TO OUTLET BOX

# WHERE GROUND WIRE IS NOT PULLED.

A. BOXES SHALL BE SUITABLE FOR REQUIREMENTS OF EACH OUTLET AND OF SUCH DIMENSIONS AS WILL FIT STRUCTURAL CONDITIONS. BOXES SHALL BE INSTALLED IN RIGID MANNER USING EXPANSION SHIELDS, POWER ACTUATED FASTENERS,

ETC., ON CONCRETE OR MASONRY AS REQUIRED. B. PROVIDE SINGLE GANG (OR AS REQUIRED FOR OUTLET) PLASTER OR TILE RINGS FOR ALL FLUSH OUTLETS INSTALLED AT

FINISHED WALL AND CEILING SURFACES (TILE, GYPSUM BOARD, PLASTER, ETC.). C. OUTLETS SHOWN "BACK-TO-BACK" ARE TO BE INSTALLED WITH A MINIMUM OF 6 INCHES HORIZONTAL SEPARATION TO MINIMIZE SOUND TRANSMISSION. "THROUGH-THE-WALL" TYPE BOXES ARE NOT PERMITTED.

A. WALL SWITCH OUTLETS SHOWN AT DOOR LOCATIONS SHALL BE INSTALLED ON LATCH SIDE OF DOOR. ALL DEVICES SHALL BE MOUNTED VERTICALLY. THE FOLLOWING MOUNTING HEIGHTS TO CENTERLINE OF DEVICE FROM FINISHED FLOOR

WALL SWITCH OUTLETS: 48" GENERAL PURPOSE RECEPTACLES: 16"

RECEPTACLE OUTLETS IN UTILITY AND EQUIPMENT ROOMS: 42" 4. TELEPHONE OUTLET: 16"

SHALL APPLY UNLESS OTHERWISE NOTED:

5. TELEPHONE OUTLET FOR WALL TELEPHONE: 54" B. PROVIDE COVERPLATES FOR ALL OUTLETS.

A. ALL LIGHTING FIXTURES AND EQUIPMENT AS INDICATED ON THE DRAWINGS AND AS DESCRIBED HEREIN SHALL BE FURNISHED AND INSTALLED. ALL FIXTURES SHALL BEAR THE UL SEAL OF APPROVAL.

B. ALL FIXTURES SHALL BE SECURELY SUPPORTED AND ALL OUTLETS SHALL BE SECURELY ANCHORED. FURNISH ALL SUPPORTS NECESSARY FOR INSTALLATION INCLUDING STRUCTURAL MEMBERS WHERE REQUIRED. C. PROVIDE SEPARATE JUNCTION BOX AND WIRE TO RECESSED FIXTURES, IN FLEXIBLE CONDUIT WITH TYPE AF WIRE UNLESS UL APPROVED PREWIRED FIXTURES ARE USED. OPENINGS CUT IN CEILINGS FOR RECESSED FIXTURES SHALL BE COMPLETELY CONCEALED AFTER FIXTURE TRIM IS INSTALLED. WHERE FLEXIBLE CONDUIT IS USED WITH THREE OR FOUR LAMP FLUORESCENT FIXTURES, PROVIDE SEPARATE LEADS FOR EACH BALLAST, WITH INBOARD LAMPS CONNECTED TO ONE BALLAST, AND OUTBOARD LAMP(S) CONNECTED TO THE OTHER BALLAST. ALL INTERIOR LIGHTING SHALL BE LOCALLY

3.07 FLOOR MOUNTED EQUIPMENT A. PROVIDE 4 INCH HIGH CONCRETE CURBS FOR ALL FLOOR MOUNTED EQUIPMENT IN ACCORDANCE WITH THE CONCRETE SECTION OF THESE SPECIFICATIONS. CURBS TO BE 2 INCHES LONGER, IN ALL DIMENSIONS, THAN EQUIPMENT MOUNTED

### 3.08 BRANCH CIRCUIT PANELS

A. A TYPED DIRECTORY, PROPERLY IDENTIFYING EACH CIRCUIT, SHALL BE MOUNTED IN EACH DIRECTORY FRAME. INSTALL PANELS UP 6 FOOT, 6 INCHES TO TOP OF TRIM OR AS DIRECTED BY ARCHITECT. FOR BRANCH CIRCUIT PANELS, PROVIDE ENGRAVED LAMINATED PLASTIC NAMEPLATES (1 INCH BY 3 INCHES WITH 1/4 INCH HIGH BLACK LETTERS ON WHITE BACKGROUND) LISTING NAME, VOLTAGE, AND AMPACITY RATING IN ACCORDANCE WITH IDENTIFICATIONS ON SERVING SWITCHBOARD. DOORS AND TRIM INSTALLED IN FINISHED AREAS SHALL BE PRIME COATED.

A. FURNISH AND INSTALL COMPLETE TELEPHONE RACEWAYS SYSTEM AS INDICATED ON THE DRAWINGS. INSTALLATION SHALL BE IN STRICT ACCORDANCE WITH ALL REQUIREMENTS AND RECOMMENDATIONS OF THE TELEPHONE COMPANY. PROVIDE PLASTIC BUSHINGS FOR ALL ROUGH CONDUIT TERMINATIONS, AND 200 POUND TEST NYLON PULL-LINES IN ALL CONDUITS INTENDED FOR FUTURE USE. VERIFY ALL CONDUIT SIZES, TERMINAL SIZES, AND LOCATIONS WITH THE TELEPHONE COMPANY. 3.10 WIRING FOR MECHANICAL EQUIPMENT

A. FURNISH AND INSTALL CIRCUITS, FEEDERS, DISCONNECT SWITCHES, OUTLETS AND MAKE ALL CONNECTIONS TO MOTORS AND/OR CONTROLS FOR HEATING, VENTILATING, AIR CONDITIONING, AND PLUMBING EQUIPMENT AS CALLED FOR IN THE DRAWINGS AND SPECIFICATIONS. B. FLEXIBLE CONDUIT SHALL BE USED FOR CONNECTIONS TO MOTORS AND/OR OTHER EQUIPMENT WHERE VIBRATION IS

ENCOUNTERED AND/OR AS CALLED FOR ON THE DRAWINGS. EVERY EFFORT SHALL BE MADE TO MAINTAIN A MAXIMUM

FLEXIBLE CONDUIT LENGTH OF 3 FEET. INSTALL AND CONNECT ALL MAGNETIC STARTERS AND LINE VOLTAGE CONTROLLERS, PUSHBUTTON STATIONS, THERMOSTATS, ETC., FURNISHED BY OTHERS. LOCATE AS DIRECTED BY MECHANICAL CONTRACTOR. REFER TO

D. LINE VOLTAGE CONTROL WIRING, INCLUDING INTERLOCKS WITH OTHER MECHANICAL EQUIPMENT, SHALL BE BY

MECHANICAL DRAWINGS AND SPECIFICATIONS FOR ALL POWER AND CONTROL OUTLETS AND REQUIRED WIRING.

ELECTRICAL CONTRACTOR, AT THE DIRECTION OF AND UNDER THE SUPERVISION OF THE MECHANICAL CONTRACTOR

E. PROVIDE WEATHERPROOF SWITCHES FOR ALL EQUIPMENT LOCATED ON ROOF OR WHERE EXPOSED TO WEATHER. **END OF SECTION 26000** 

# Revision / Submissions Wheat Ridge, Colorado 80033 Phone: 303-428-4895 Fax: 303-428-5472 Email: info@battistadesign.ne www.battistadesign.net

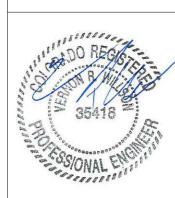
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### **ELECTRICAL SPECIFICATIONS**



Project Number: Designed: Drawn: Scale: As Shown Checked: Drawing Number Reviewed: VRW 02/12/2025 3 of 4

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