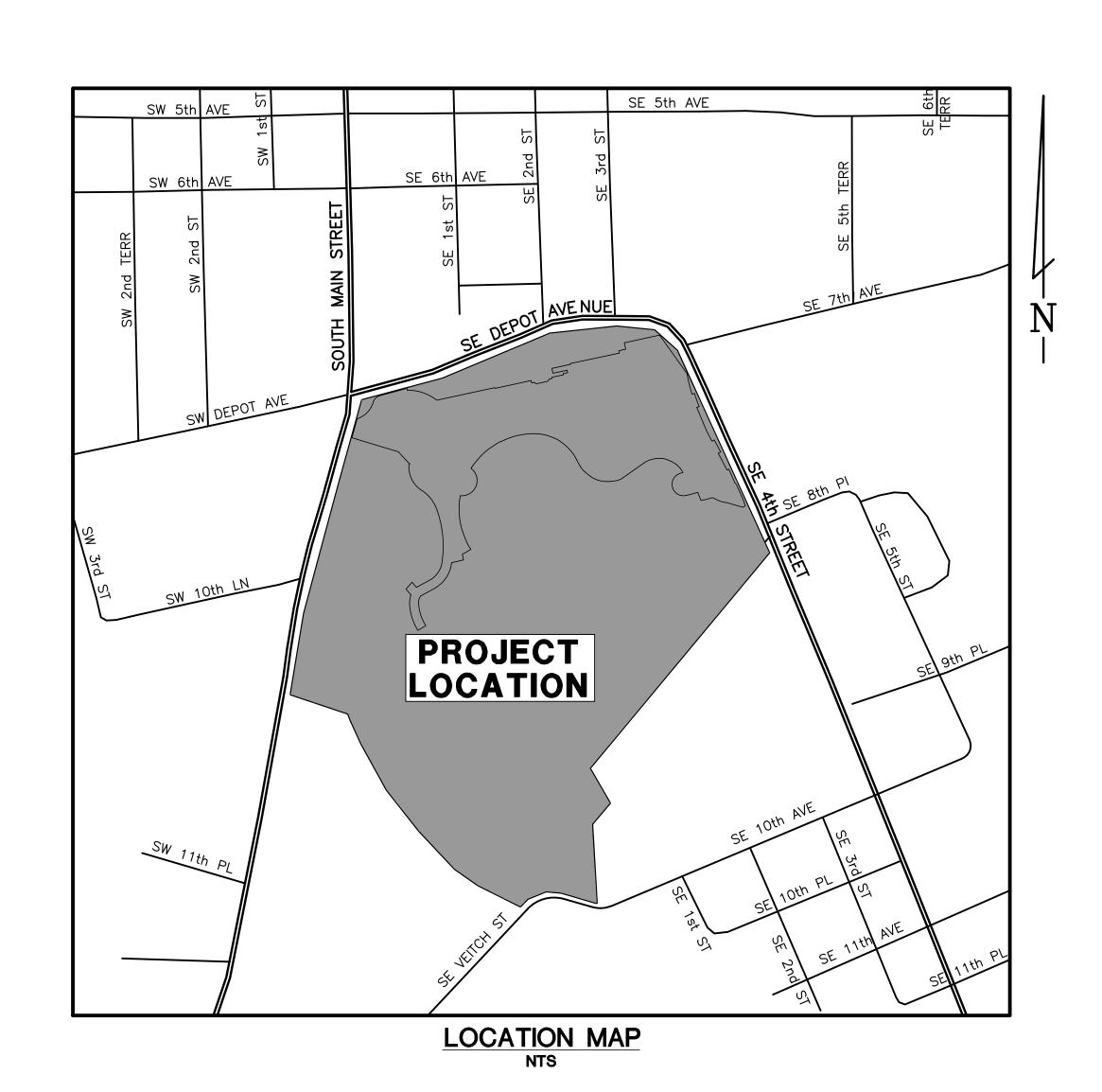
FINAL CONSTRUCTION DRAWINGS

DEPOT PARK ELECTRICAL IMPROVEMENTS

FOR

CITY OF GAINESVILLE



HIGH SKRINGS ALACHUA ALACHUA COUNTY GAINESVILLE HAWTHORNE
GENERALLOCATION
GENERAL COUNTYWIDE LOCATION MAP

EL	DEPOT PARK ECTRICAL IMPROVEMENTS
	SHEET INDEX
SHEET NO.	TITLE
C0.0	COVER SHEET
E0.1	ELECTRICAL LEGEND, DETAILS & SCHEDULES
E1.0	OVERALL ELECTRICAL KEY PLAN
E1.1	ELECTRICAL ENLARGED SITE PLAN — SOUTHWEST
E1.2	ELECTRICAL ENLARGED SITE PLAN — NORTHWEST
E1.3	ELECTRICAL ENLARGED SITE PLAN — NORTHEAST
E1.4	ELECTRICAL ENLARGED SITE PLAN — SOUTHEAST
E2.0	ELECTRICAL SCHEDULES
E2.1	ELECTRICAL SCHEDULES
E3.0	ELECTRICAL SPECIFICATIONS
E3.1	ELECTRICAL SPECIFICATIONS
P-1	PHOTOMETRIC CALCULATIONS
P-2	PHOTOMETRIC PLANS

SUBMITTAL S	SCHEDULE
MILESTONE	DATE
1. 50% CONSTRUCTION DOCUMENTS	JULY 8, 2019
2. 100% CONSTRUCTION DOCUMENTS	AUGUST 6, 2019
3. FINAL CONSTRUCTION DOCUMENTS	AUGUST 26, 2019

		REVISIONS					
10.	DATE	DESCRIPTION	DRWN	APPR			
コ					ENGINEER	SEE ELECTRICAL DRAWINGS	
ヿ					OF RECORD:	022 2220 M20 N2 21 M M21 N00	

JBrown
Professional Group Inc
CIVIL ENGINEERING • LAND SURVEYING • PLANNING Fla. Board of Professional Engineers CA No. 30495

3530 NW 43rd Street • Gainesville, Florida 32606 PHONE: (352) 375-8999 • FAX: (352) 375-0833 E-MAIL: contact@jbprogroup.com

COVER	S
DEPOT PARK GAINESVILLE, FL	PRO

ELECTRICAL IMPROVEMENTS AUGUST 2019 057-19-03

SOIL CONTAMINANTS:

DO NOT PERFORM ANY WORK WITHOUT COORDINATING WITH OWNER AND CONSTRUCTION MANAGER. UNDERGROUND WORK WILL REQUIRE TESTING FOR ENVIRONMENTAL CONTAMINANTS, AND MAY REQUIRE REMEDIATION.

FOR THE PURPOSES OF BIDDING, ASSUME ANY SOIL 24 INCHES OR MORE BELOW GRADE IS SUBJECT TO TESTING IF DISTURBED. ANY REMEDIATION SCOPE WILL BE NEGOTIATED WITH OWNER SUBSEQUENT TO POSITIVE TEST

COORDINATE WITH FDEP AND OWNER TO ESTABLISH PPE, TESTING, AND REMEDIATION PLAN PRIOR TO PROCEEDING WITH THE WORK.

GENERAL NOTES:

- ROUTE CONDUITS ALONG CONTOURS OF EXISTING WALKWAYS. UNDERMINE SIDEWALKS AS NEEDED FOR CROSSINGS. DO NOT CUT EXISTING HARDSCAPE WITHOUT PRIOR PERMISSION. MINIMIZE DAMAGE TO PLANTS, ROOTS, AND SOFTSCAPE. COORDINATE ALL DIGGING UNDER TREE CANOPIES WITH OWNER
- PRIOR TO PROCEEDING. THERE IS EXTENSIVE EXISTING ELECTRICAL, STORMWATER, AND OTHER UTILITIES THROUGHOUT THE SITE. COORDINATE LINE LOCATES PRIOR TO ALL DIGGING. HAND DIG ALL LOCATIONS WHERE AT RISK OF DAMAGING EXISTING SYSTEMS.
- CAREFULLY COORDINATE ALL ENVIRONMENTAL REQUIREMENTS FOR ALL DIGGING WITH FDEP. SEE SOIL CONTAMINANTS NOTE ON SHEET CONTRACTOR IS RESPONSIBLE FOR REPLACING ANY DAMAGED

MINIMUM 18" COVERAGE TO

DO NOT PERFORM IN-GROUND WORK WITHOUT

COORDINATING WITH OWNER AND CM. SITE MAY

REQUIRE ADDITIONAL ENVIRONMENTAL TESTING

AND REMEDIATION OF DISTURBED SOILS.

SIDEWALK, TRAIL, DRIVE,

PATH, OR SIMILAR -

TOP OF CONDUIT UNLESS

OTHERWISE NOTED.__

TT-30R OR 14-30R WITH IN-

MINIMUM 6" CONCRETE ON

ALL SIDES, INCLUDING RECEPTACLE BOX.

USE COVER. BASIS OF

✓

DESIGN: EATON OR GE.

LANDSCAPING AND TURF REPAIR/REPLACEMENT.

SEE TABLE BELOW FOR MAXIMUM NUMBER OF CURRENT CARRYING CONDUCTORS PER CONDUIT, PER 2014 NEC 310.15(B)(3)(a). THESE NUMBERS INCLUDE NEUTRALS, BUT NOT EGCs. SIZE ALL CONDUITS PER NEC ANNEX C. 120V 20A CIRCUITS: MAX HOTS+NEUTRALS PER CONDUIT WIRE SIZE

SHARED CONDUITS:

CARRYING CONDUCTORS.

4

3

2

MULTIPLE CIRCUITS MAY SHARE CONDUITS WHERE CODE

COMPLIANT. NO CONDUIT SHALL CONTAIN MORE THAN 12 CURRENT

6 # 4 120V 30A CIRCUITS (NEMA TT-30R): WIRE SIZE MAX HOTS+NEUTRALS PER CONDUIT # 3 # 2

208V 50A CIRCUITS: MAX HOTS+NEUTRALS PER CONDUIT WIRE SIZE # 8 # 6

SIDEWALK, TRAIL, DRIVE,

PATH, OR SIMILAR

UNDERGROUND RACEWAYS DETAIL

WHERE 30A OR 50A RECEPTACLE IS BEING

INSTALLED BESIDE EXISTING POLE LIGHT, PROVIDE 3000PSI 4" CONCRETE PAD AROUND NEW RECEPTACLE AND NEARBY POLE BASE.

- MINIMUM 24" COVERAGE -

TO TOP OF CONDUIT

WITHIN 24" OF ANY

N -CROSSING OF TRAILS, -DRIVES, PATHS, ETC.-

RESTORE SURFACE TO ORIGINAL

CONDITION OR BETTER.

TRENCH OR DIRECTIONAL DRILL TO INSTALL

UNDERGROUND CONDUITS. DO NOT CUT 🗥

SIDEWALKS, TRAILS, ETC. UNDERMINE OR

RECEPTACLE INSTALLATION DETAILS

DIRECTIONAL DRILL.

MAXIMUM WIRE LENGTHS:

PLAN ALL ROUTES AND VERIFY ALL RECEPTACLE CIRCUIT LENGTHS PRIOR TO PROCEEDING. FINAL ROUTING MAY DIFFER FROM THE ASSUMPTIONS MADE IN THIS DESIGN. ADJUST WIRE SIZES PER FINAL ROUTE AND THE FOLLOWING MAXIMUM LENGTHS FOR VARIOUS WIRE GAUGES.

(ALL LENGTHS ARE COPPER CONDUCTOR LENGTH, SINGLE PHASE CIRCUITS, FROM PANEL TO LOAD. SIZES ARE BASED ON 5% BRANCH CIRCUIT VOLTAGE DROP AT 100% LOAD, PER ANSI C84.1. RANGE A. FOR NON-LIGHTING LOADS. DO NOT USE THIS TABLE FOR WIRING WITHIN BUILDINGS.)

120V 20A CIRCUITS: WIRE SIZE MAXIMUM LENGTH #12 #10 # 8

6 300' # 4 120V 30A CIRCUITS (NEMA TT-30R): WIRE SIZE MAXIMUM LENGTH # 8 125' 190' # 6 300'

400' # 3 # 2 208V 50A CIRCUITS: WIRE SIZE MAXIMUM LENGTH # 8 # 6 210'

325'

415'

4

3

LEGEND

RECEPTACLE: DUPLEX RECEPTACLE. 18" AFF UNO. ALL EXTERIOR RECEPTACLES SHALL BE GFCI 'WR' TYPE IN WEATHERPROOF BOX WITH IN-USE COVER UNLESS OTHERWISE NOTED. WHERE INSTALLED

ON POLE, PROVIDE CURVED BOX BACKING MATCHING POLE DIAMETER. SPECIAL RECEPTACLE. SEE SUBSCRIPT FOR ADDITIONAL INFORMATION.

RECEPTACLE SUBSCRIPTS:

GFCI-TYPE RECEPTACLE. GFCI-TYPE POWER FROM BRANCH CIRCUIT BREAKER.

WEATHER RESISTANT WIRING DEVICE. WP RECEPTACLES SHALL BE GFCI TYPE WITH IN-USE COVERS. NEMA TT-30R RECEPTACLE. PROVIDE SINGLE-GANG DEVICE IN DEEP WEATHERPROOF BOX & WEATHERPROOF COVER.

COORDINATE BOX SIZE WITH WIRE BEND RADIUS. PROVIDE CURVED BOX BACKING MATCHING POLE DIAMETER. NEMA 14-50R RECEPTACLE. PROVIDE SINGLE-GANG DEVICE IN DEEP WEATHERPROOF BOX & WEATHERPROOF COVER. COORDINATE BOX SIZE WITH WIRE BEND RADIUS. PROVIDE CURVED BOX BACKING MATCHING POLE DIAMETER.

POWER EQUIPMENT AND CONNECTIONS: PANELBOARD.

ELECTRICAL CONNECTION TO EQUIPMENT. SEE ELECTRICAL EQUIPMENT SCHEDULE

(1) JUNCTION BOX.

SAFETY SWITCH. MOUNT AS INDICATED. 60" TO TOP UNO.

FUSED SAFETY SWITCH. MOUNT AS INDICATED. 60" TO TOP UNO. LIGHT FIXTURES:

LIGHT FIXTURES SHALL BE AS INDICATED IN LIGHT FIXTURE SCHEDULE. SEE LIGHT FIXTURE SCHEDULE.

LIGHT FIXTURES SUBSCRIPTS: a,b LOWERCASE LETTERS INDICATE SWITCHING/DIMMING ZONES.

LIGHT NOT SWITCHED BY OCCUPANCY SENSORS OR SWITCHES. PARTIAL SHADING OR 'EM' SUBSCRIPT INDICATES EMERGENCY FIXTURE. SEE LIGHT FIXTURE SCHEDULE.

LIGHTING CONTROLS:

120/277V 20A PHOTOCELL.

120/277V LIGHTING CONTACTOR. BOD: ENCLOSED SQUARE D CLASS 8903 WITH HOA SWITCH

120/277V ASTRONOMICAL TIME CLOCK, BOD; PARAGON SUNTRACKER II.

ANNOTATIONS: DEMOLITION SHEET NOTE.

ELECTRICAL SHEET NOTE

GENERAL SUBSCRIPTS (APPLY TO ALL CATEGORIES) **2P1A** ELECTRICAL EQUIPMENT TAG.

GCB FED FROM GFCI TYPE CIRCUIT BREAKER.

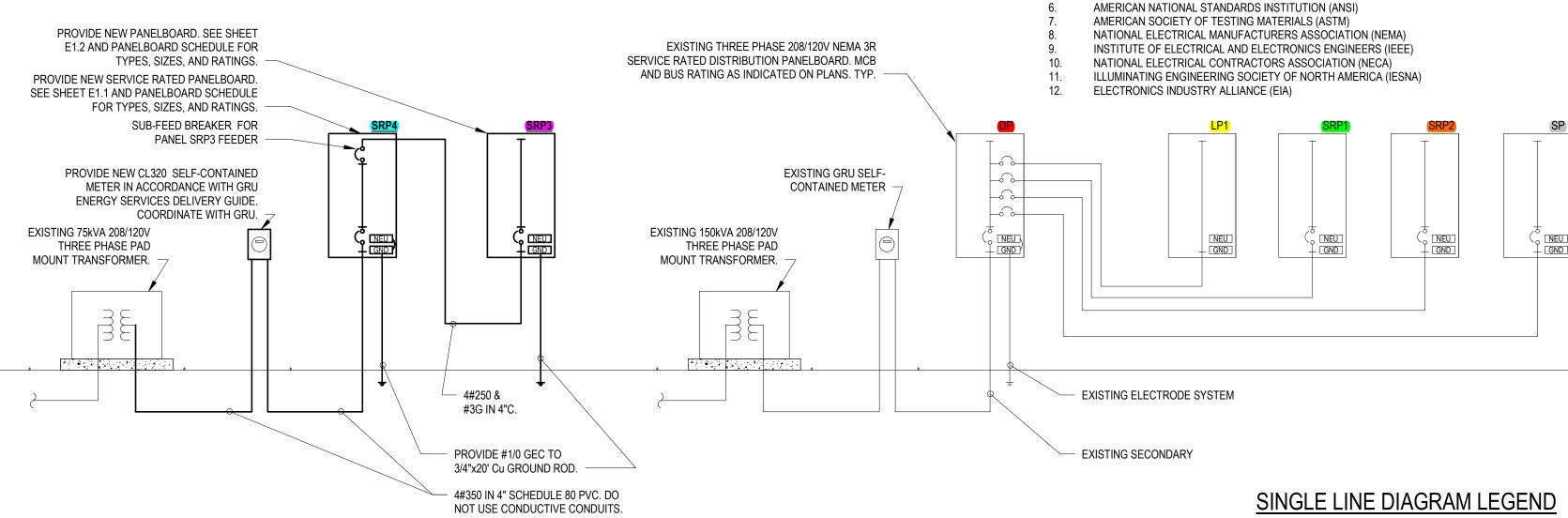
INDICATES HEIGHT OF FIXTURE, RECEPTACLE, BOX, CABINET, ETC. HEIGHT IS TO CENTERLINE UNLESS OTHERWISE INDICATED.

EX EXISTING TO REMAIN

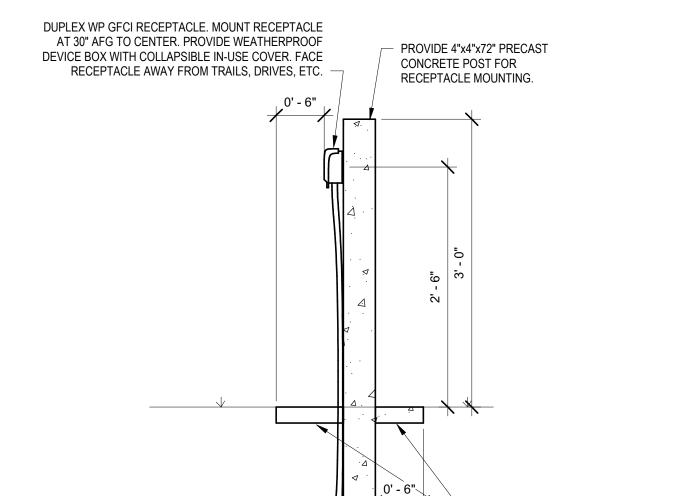
WEATHERPROOF INSTALLATION, WITH APPROPRIATELY LISTED OR INDICATED PRODUCTS.

ELECTRICAL HOME RUN TO PANELBOARD. UNDERLINED LABEL INDICATES

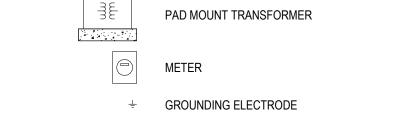
PANELBOARD NAME AND CIRCUIT NUMBER.



ELECTRICAL SINGLE LINE DIAGRAM



FREESTANDING 20A RECEPTACLE INSTALLATION DETAIL



→ CIRCUIT BREAKER

PANELBOARD

ABBREVIATIONS

AMERICAN WIRE GAUGE

CONTRACTOR FURNISHED, CONTRACTOR INSTALLED

CONTRACTOR FURNISHED, OWNER INSTALLED

GROUND, GROUND FAULT CIRCUIT INTERRUPTER

OWNER FURNISHED, CONTRACTOR INSTALLED

OWNER FURNISHED, OWNER INSTALLED

BASIS OF DESIGN

CIRCUIT BREAKER

DISTRIBUTION PANEL

ENGINEER OF RECORD

FUSED SAFETY SWITCH

GFCI CIRCUIT BREAKER

MOTOR CONTROL CENTER

POWER QUALITY METER

SURGE PROTECTION DEVICE

TELECOMMUNICATIONS ROOM

UNLESS NOTED OTHERWISE

TELECOMMUNICATIONS OUTLET

WEATHER PROOF / WEATHER RESISTANT

WEATHER PROOF / WEATHER RESISTANT

FLORIDA BUILDING CODE - SIXTH EDITION (2017)

NATIONAL ELECTRIC CODE (2014 NFPA 70).

UNDERWRITERS' LABORATORIES (UL)

FLORIDA FIRE PREVENTION CODE - SIXTH EDITION (2017)

FIRE CODE (NFPA 1 - 2015 FLORIDA EDITION)

ALL PROJECT WORK SHALL BE GOVERNED BY AND ADHERE TO THE FOLLOWING CODES AND STANDARDS.

FLORIDA BUILDING CODE - SIXTH EDITION (2017) - ENERGY CONSERVATION

LIFE SAFETY CODE (NFPA 101 - 2015 FLORIDA EDITION)

SIGNALING LINE CIRCUIT

HAND HOLE

PANELBOARD

POND PUMP

RECEPTACLE

SPLASH PAD

SWBD SWITCHBOARD

TYPICAL

SAFETY SWITCH

TO BE DETERMINED

WITH RESPECT TO

LIGHTING

LIGHTS

LIGHTING PANEL

EXISTING TO REMAIN

ENCLOSED CIRCUIT BREAKER

GAINESVILLE REGIONAL UTILITIES

CONDUIT

DIVISION

BOD

DIV

EOR

GCB

LTG

LTS

PBD

RCPT

TCR

SINGLE LINE DIAGRAM LINETYPES



NEW WORK

ISSUE: FINAL CONSTRUCTION DOCUMENTS ISSUE DATE:

OWNER:

CITY OF GAINESVILLE

874 SE 4TH STREET

GAINESVILLE, FL 32601

Gainesville.

Citizen centered People empowered

OWNER'S PROJECT NUMBER:

//C PROJECT

DESC

NUMBER: 19050

REVISIONS:

DATE

Mitchell Gulledge Engineering, Inc

FL License EB-31501 p.352.745.3991

Andrew P. McCaddin

PE - 83318

210 SW 4th Avenue

Gainesville, FL 32601

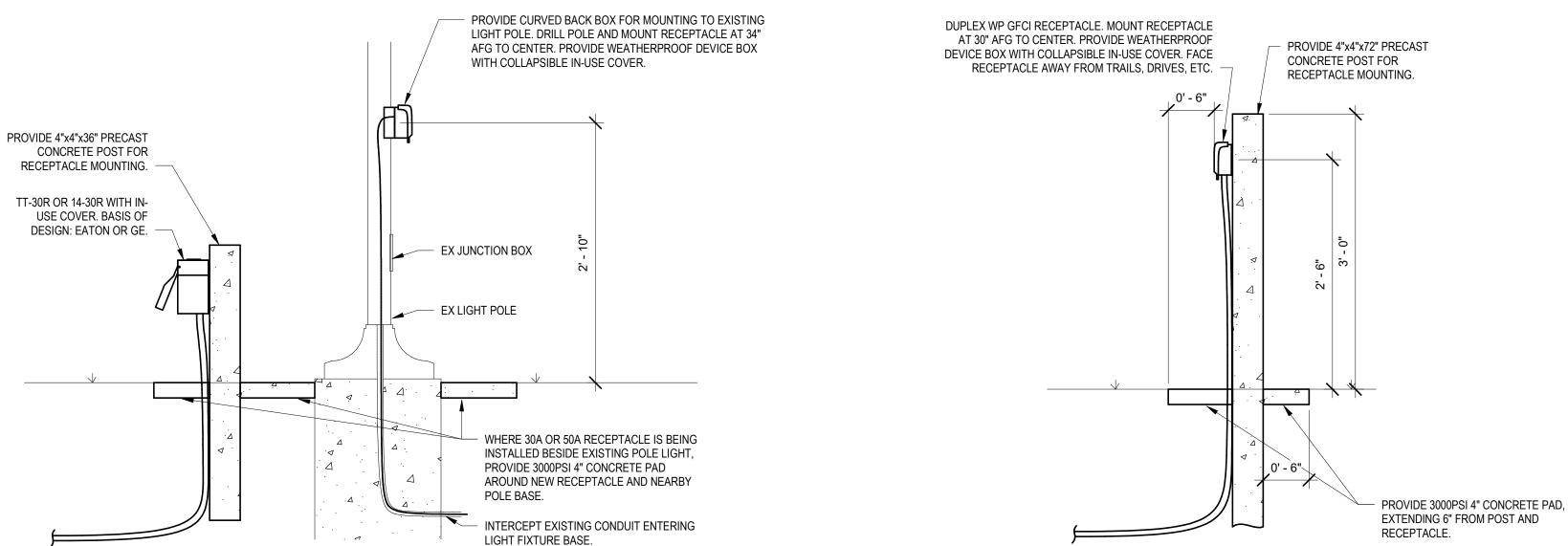
www.mitchellgulledge.com

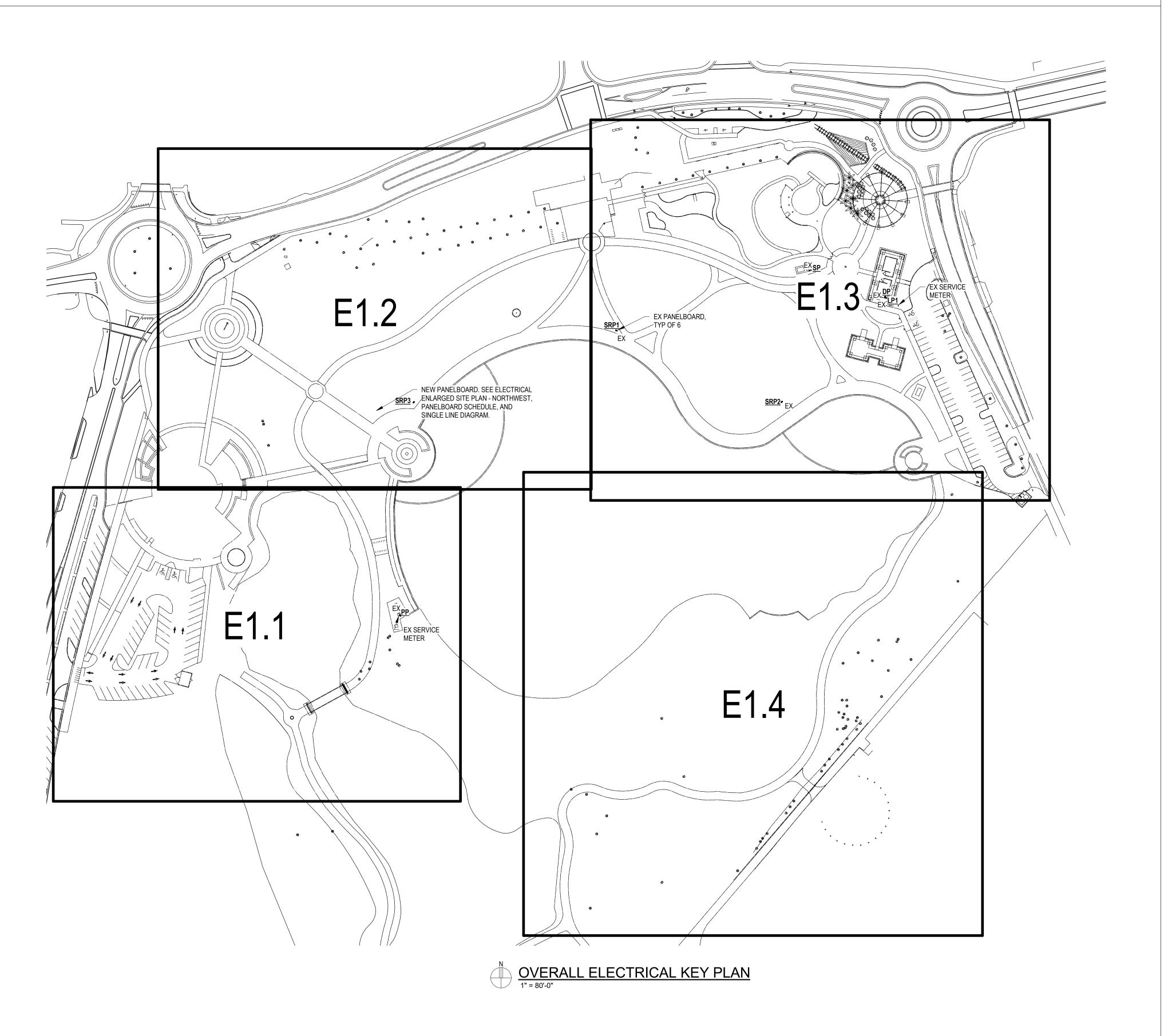
08/26/2019 CHECKED BY:

SHEET NUMBER:

SHEET TITLE **ELECTRICAL** LEGEND, DETAILS & SCHEDULES

E0.





mitchell + gulledge
engineering

Mitchell Gulledge Engineering, Inc.
210 SW 4th Avenue
Gainesville, FL 32601
FL License EB-31501 p.352.745.3991
www.mitchellgulledge.com

Andrew P. McCaddin PE - 83318

PROJECT NAME:

CITY OF GAINESVILLE

DEPOT PARK ELECTRICAL

OWNER: CITY OF GAINESVILLE

874 SE 4TH STREET GAINESVILLE, FL 32601

Gainesville.
Citizen centered
People empowered

OWNER'S PROJECT NUMBER:

PROJECT NUMBER: 19050

REVISIONS:

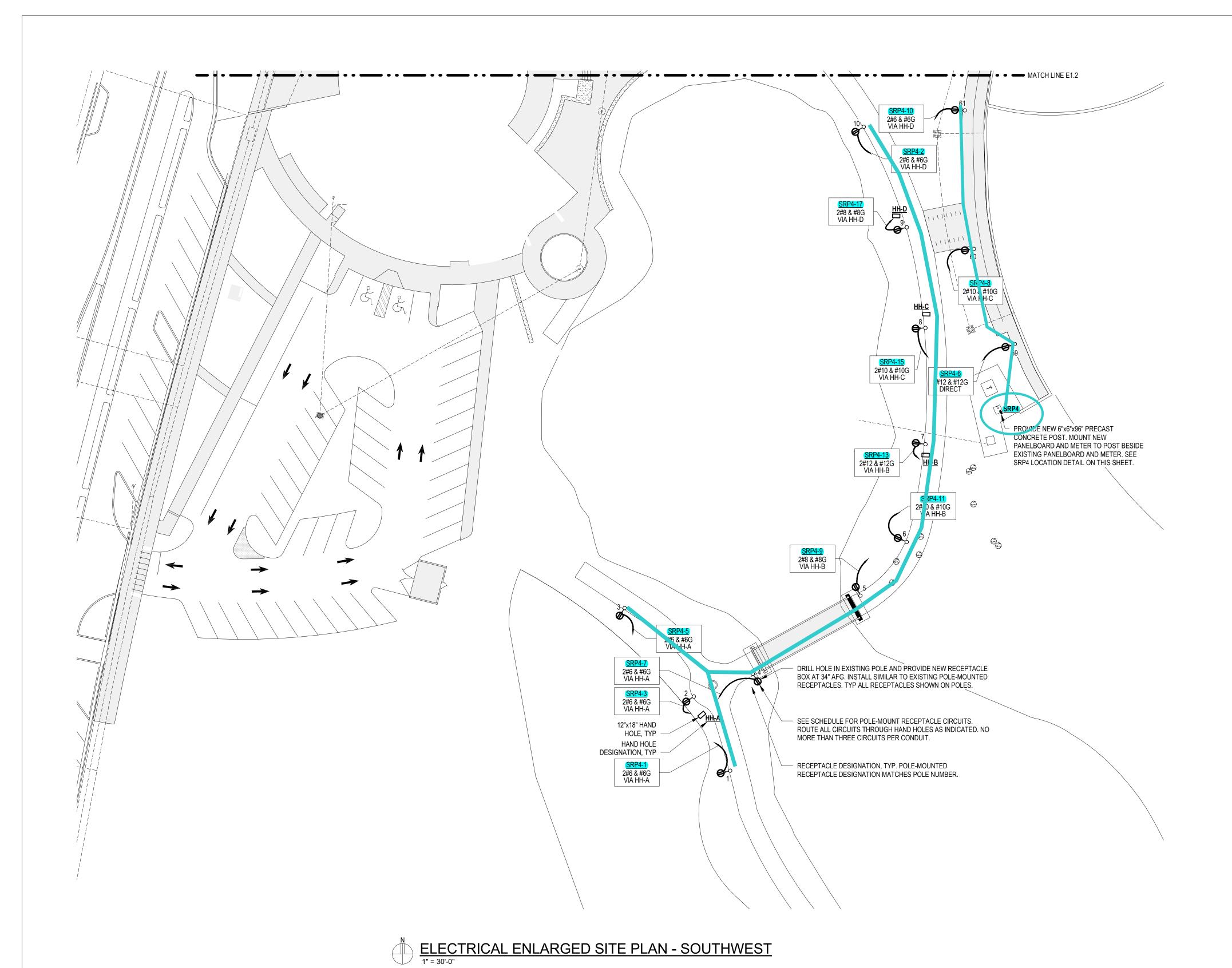
REV DESC DATE

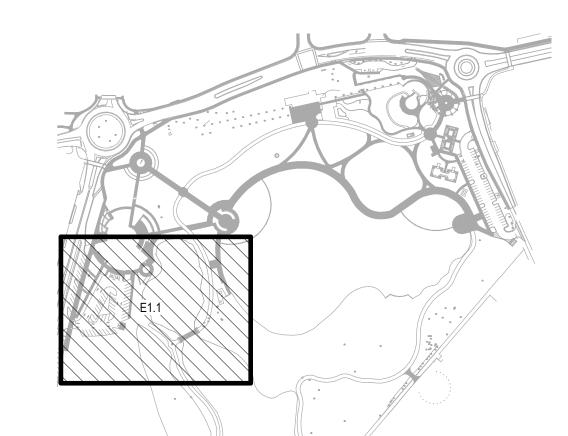
ISSUE: FINAL CONSTRUCTION DOCUMENTS

ISSUE DATE:

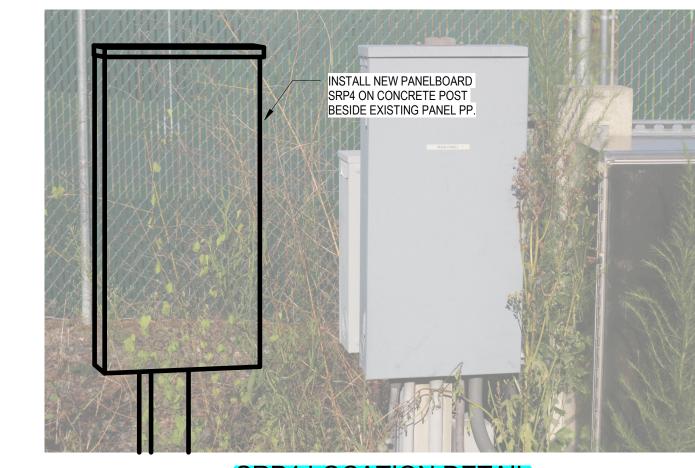
08/26/2019 CHECKED BY:

SHEET TITLE:
OVERALL
ELECTRICAL KEY
PLAN
SHEET NUMBER:





KEY PLAN SOUTHWEST



1 SRP4 LOCATION DETAIL
NOT TO SCALE

GENERAL NOTES

- ROUTE CONDUITS ALONG CONTOURS OF EXISTING WALKWAYS. UNDERMINE SIDEWALKS AS NEEDED FOR CROSSINGS. DO NOT CUT EXISTING HARDSCAPE WITHOUT PRIOR PERMISSION.

 MINIMIZE DAMAGE TO PLANTS ROOTS AND SOFTSCAPE COORDINATE ALL.
- 2. MINIMIZE DAMAGE TO PLANTS, ROOTS, AND SOFTSCAPE. COORDINATE ALL DIGGING UNDER TREE CANOPIES WITH OWNER PRIOR TO PROCEEDING.
- 3. THERE IS EXTENSIVE EXISTING ELECTRICAL, STORMWATER, AND OTHER UTILITIES THROUGHOUT THE SITE. COORDINATE LINE LOCATES PRIOR TO ALL DIGGING. HAND DIG ALL LOCATIONS WHERE AT RISK OF DAMAGING EXISTING SYSTEMS.
- 4. CAREFULLY COORDINATE ALL ENVIRONMENTAL REQUIREMENTS FOR ALL DIGGING WITH FDEP. SEE SOIL CONTAMINANTS NOTE ON SHEET E0.1.
- 5. CONTRACTOR IS RESPONSIBLE FOR REPLACING ANY DAMAGED LANDSCAPING AND TURF REPAIR/REPLACEMENT.

mitchell + guiledge
engineering
Mitchell Gulledge Engineering, Inc.
210 SW 4th Avenue
Gainesville, FL 32601
FL License EB-31501 p.352.745.3991
www.mitchellgulledge.com

Andrew P. McCaddin PE - 83318

> CITY OF GAINESVILLE DEPOT PARK ELECTRICAL

OWNER: CITY OF GAINESVILLE

874 SE 4TH STREET

GAINESVILLE, FL 32601

Gainesville. Citizen centered

People empowered

OWNER'S PROJECT NUMBER:

PROJECT NUMBER: 19050
REVISIONS:

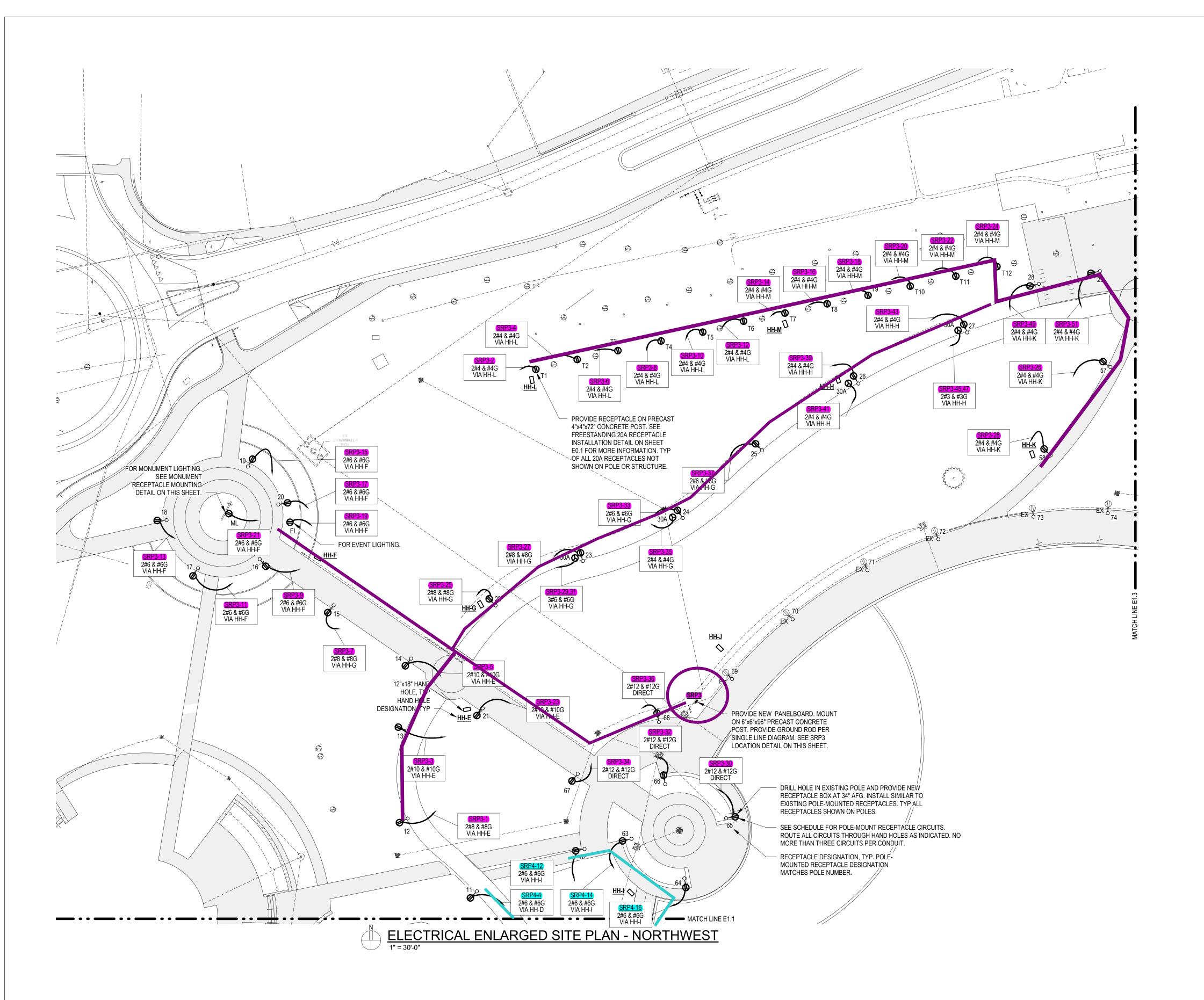
REVISIONS EV DESC DATE

> ISSUE: FINAL CONSTRUCTION DOCUMENTS

> > ISSUE DATE: 08/26/2019

CHECKED BY:

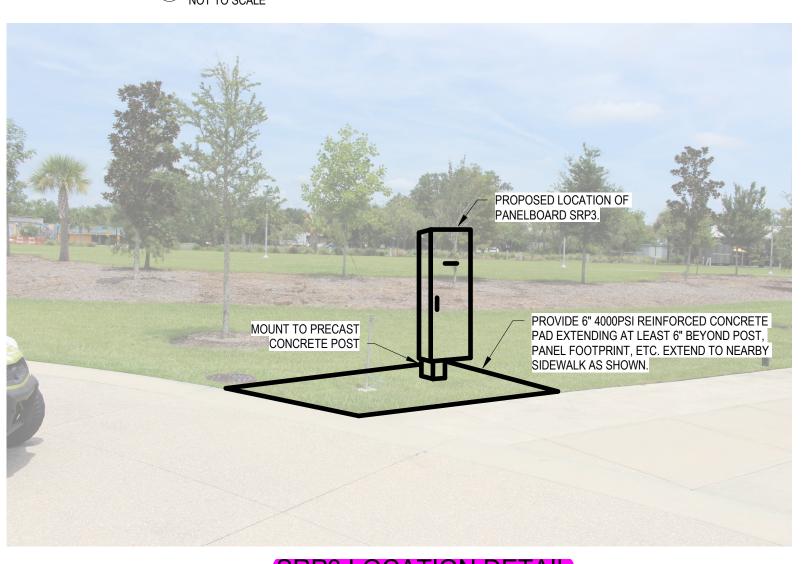
SHEET TITLE:
ELECTRICAL
ENLARGED SITE
PLAN - SOUTHWEST
SHEET NUMBER:







1 MONUMENT RECEPTACLE MOUNTING DETAIL NOT TO SCALE



2 SRP3 LOCATION DETAIL
NOT TO SCALE



Andrew P. McCaddin PE - 83318

> CITY OF GAINESVILLE DEPOT PARK ELECTRICAL

OWNER:
CITY OF GAINESVILLE

874 SE 4TH STREET GAINESVILLE, FL 32601

Gainesville.
Citizen centered
People empowered

OWNER'S PROJECT NUMBER:

PROJECT NUMBER: 19050

REVISIONS:

DESC DATE

ISSUE: FINAL CONSTRUCTION DOCUMENTS

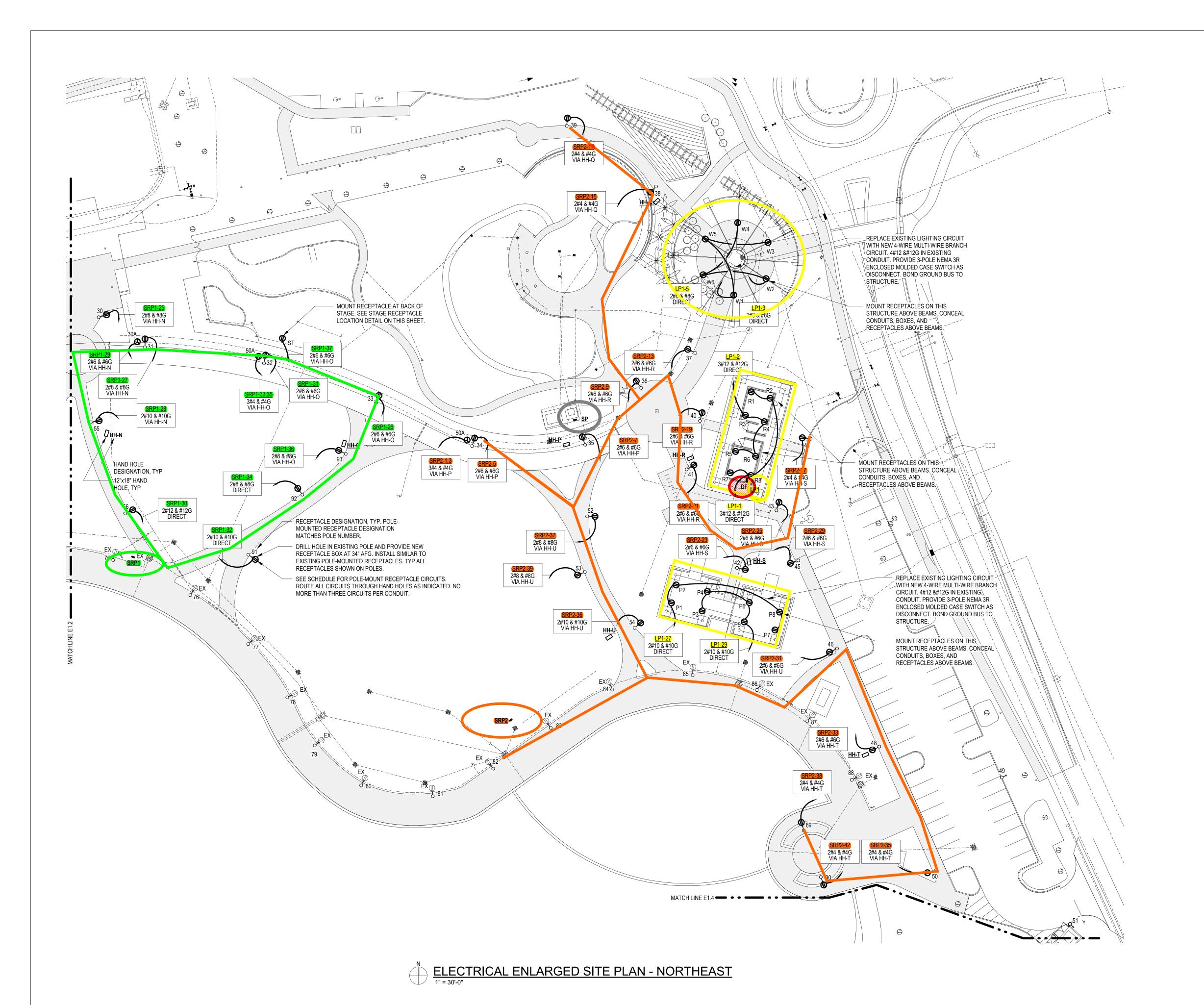
ISSUE DATE: 08/26/2019

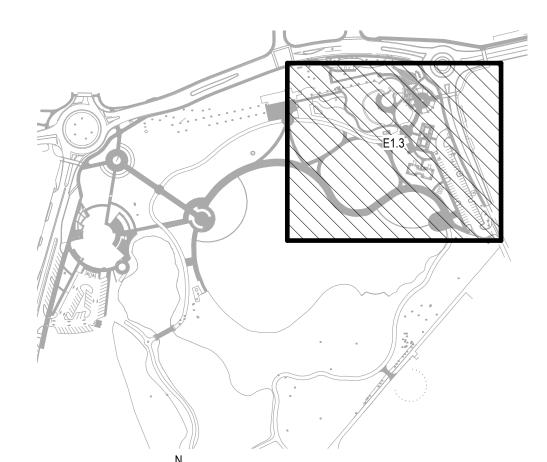
CHECKED BY:

SHEET TITLE:
ELECTRICAL
ENLARGED SITE
PLAN - NORTHWEST
SHEET NUMBER:



- ROUTE CONDUITS ALONG CONTOURS OF EXISTING WALKWAYS. UNDERMINE SIDEWALKS AS NEEDED FOR CROSSINGS. DO NOT CUT EXISTING HARDSCAPE WITHOUT PRIOR PERMISSION.
- MINIMIZE DAMAGE TO PLANTS, ROOTS, AND SOFTSCAPE. COORDINATE ALL DIGGING UNDER TREE CANOPIES WITH OWNER PRIOR TO PROCEEDING.
 THERE IS EXTENSIVE EXISTING ELECTRICAL, STORMWATER, AND OTHER
- THERE IS EXTENSIVE EXISTING ELECTRICAL, STORMWATER, AND OTHER UTILITIES THROUGHOUT THE SITE. COORDINATE LINE LOCATES PRIOR TO ALL DIGGING. HAND DIG ALL LOCATIONS WHERE AT RISK OF DAMAGING EXISTING SYSTEMS
- CAREFULLY COORDINATE ALL ENVIRONMENTAL REQUIREMENTS FOR ALL DIGGING WITH FDEP. SEE SOIL CONTAMINANTS NOTE ON SHEET E0.1.
- CONTRACTOR IS RESPONSIBLE FOR REPLACING ANY DAMAGED LANDSCAPING AND TURF REPAIR/REPLACEMENT.





KEY PLAN NORTHEAST



1 STAGE RECEPTACLE LOCATION DETAIL
1" = 1'-0"

GENERAL NOTES

- ROUTE CONDUITS ALONG CONTOURS OF EXISTING WALKWAYS. UNDERMINE SIDEWALKS AS NEEDED FOR CROSSINGS. DO NOT CUT EXISTING HARDSCAPE WITHOUT PRIOR PERMISSION.
- MINIMIZE DAMAGE TO PLANTS, ROOTS, AND SOFTSCAPE. COORDINATE ALL DIGGING UNDER TREE CANOPIES WITH OWNER PRIOR TO PROCEEDING. THERE IS EXTENSIVE EXISTING ELECTRICAL, STORMWATER, AND OTHER UTILITIES THROUGHOUT THE SITE. COORDINATE LINE LOCATES PRIOR TO
- ALL DIGGING. HAND DIG ALL LOCATIONS WHERE AT RISK OF DAMAGING EXISTING SYSTEMS.
- CAREFULLY COORDINATE ALL ENVIRONMENTAL REQUIREMENTS FOR ALL DIGGING WITH FDEP. SEE SOIL CONTAMINANTS NOTE ON SHEET E0.1.
- CONTRACTOR IS RESPONSIBLE FOR REPLACING ANY DAMAGED LANDSCAPING AND TURF REPAIR/REPLACEMENT.

Mitchell Gulledge Engineering, Inc. 210 SW 4th Avenue Gainesville, FL 32601 FL License EB-31501 p.352.745.3991 www.mitchellgulledge.com

Andrew P. McCaddin PE - 83318

OWNER: CITY OF GAINESVILLE

874 SE 4TH STREET GAINESVILLE, FL 32601

Gainesville. Citizen centered People empowered

OWNER'S PROJECT NUMBER:

PROJECT NUMBER: 19050 **REVISIONS**: DATE DESC

ISSUE:

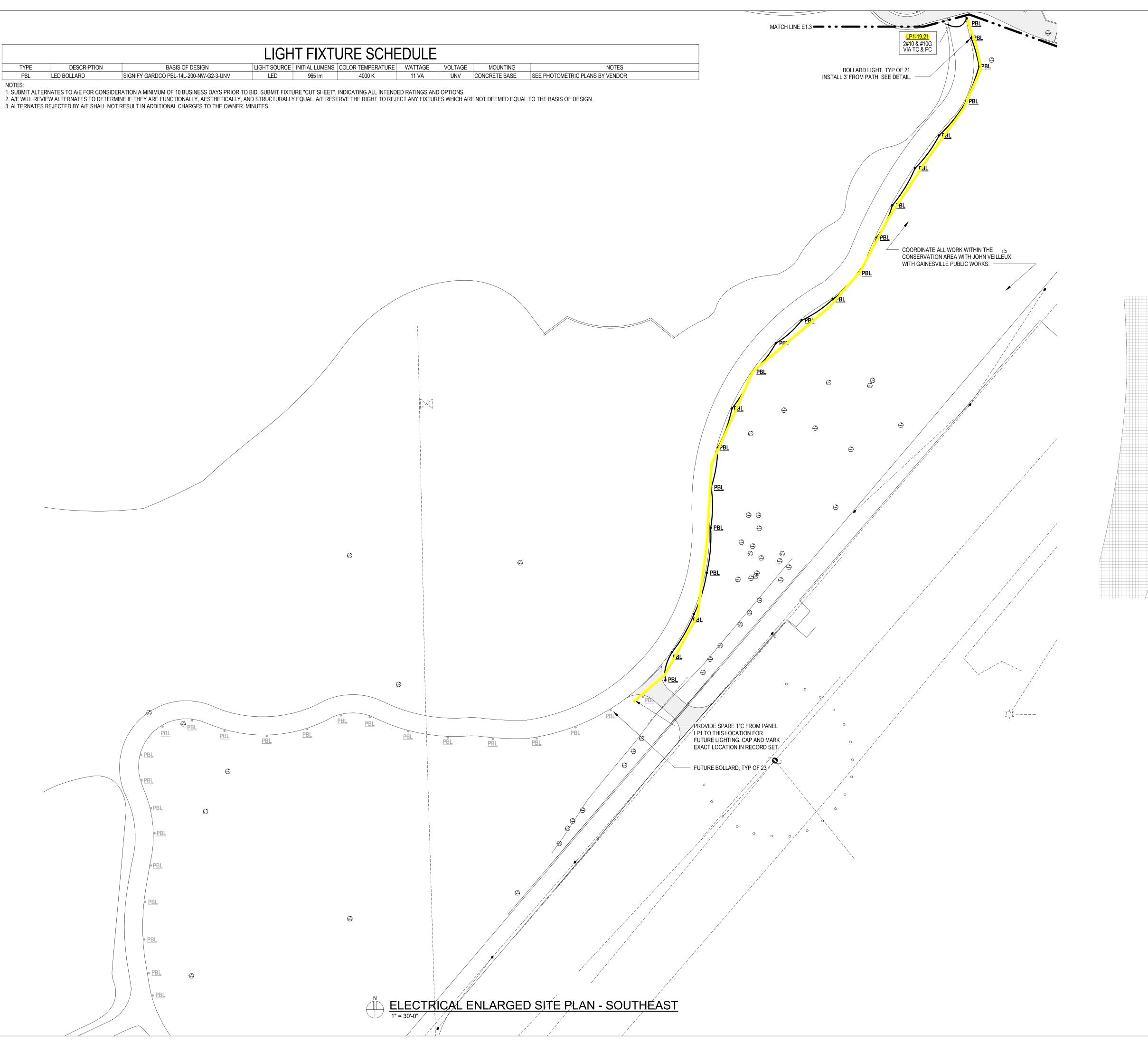
FINAL CONSTRUCTION DOCUMENTS ISSUE DATE:

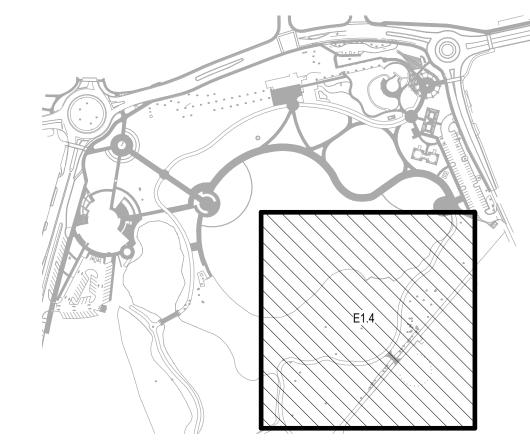
08/26/2019

CHECKED BY:

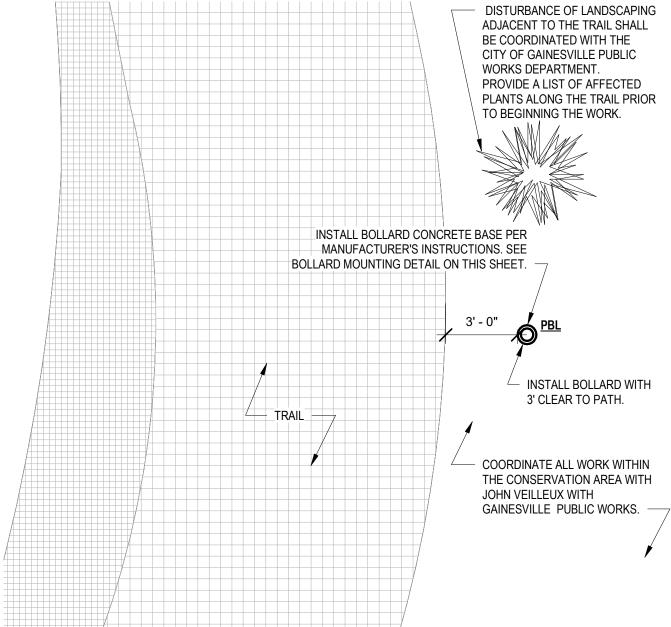
SHEET TITLE:

ELECTRICAL **ENLARGED SITE** PLAN - NORTHEAST SHEET NUMBER:

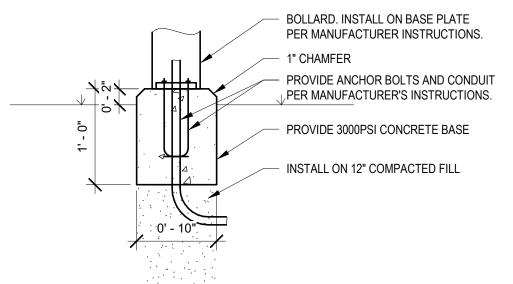




KEY PLAN SOUTHEAST 1" = 300'-0"



1) BOLLARD INSTALLATION DETAIL NOT TO SCALE



BOLLARD MOUNTING DETAIL NOT TO SCALE

GENERAL NOTES

- ROUTE CONDUITS ALONG CONTOURS OF EXISTING WALKWAYS. UNDERMINE SIDEWALKS AS NEEDED FOR CROSSINGS. DO NOT CUT EXISTING HARDSCAPE WITHOUT PRIOR PERMISSION.
- MINIMIZE DAMAGE TO PLANTS, ROOTS, AND SOFTSCAPE. COORDINATE ALL DIGGING UNDER TREE CANOPIES WITH OWNER PRIOR TO PROCEEDING.
- THERE IS EXTENSIVE EXISTING ELECTRICAL, STORMWATER, AND OTHER UTILITIES THROUGHOUT THE SITE. COORDINATE LINE LOCATES PRIOR TO ALL DIGGING. HAND DIG ALL LOCATIONS WHERE AT RISK OF DAMAGING
- EXISTING SYSTEMS. CAREFULLY COORDINATE ALL ENVIRONMENTAL REQUIREMENTS FOR ALL
- DIGGING WITH FDEP. SEE SOIL CONTAMINANTS NOTE ON SHEET E0.1.
- CONTRACTOR IS RESPONSIBLE FOR REPLACING ANY DAMAGED LANDSCAPING AND TURF REPAIR/REPLACEMENT.

Mitchell Gulledge Engineering, Inc. 210 SW 4th Avenue Gainesville, FL 32601 FL License EB-31501 p.352.745.3991 www.mitchellgulledge.com

> Andrew P. McCaddin PE - 83318

OWNER: CITY OF GAINESVILLE

874 SE 4TH STREET

GAINESVILLE, FL 32601

Gainesville. Citizen centered People empowered

OWNER'S PROJECT NUMBER:

PROJECT NUMBER: 19050 **REVISIONS**: DATE DESC

> ISSUE: FINAL CONSTRUCTION DOCUMENTS

> > ISSUE DATE: 08/26/2019

> > > CHECKED BY:

SHEET TITLE: **ELECTRICAL ENLARGED SITE** PLAN - SOUTHEAST SHEET NUMBER:

Ex Branch Panel: DP

Location: Supply From: Mounting: SURFACE Enclosure: NEMA 1 Basis of Design: NQ Service Rated: YES

Volts: 120/208 Wye Phases: 3 Wires: 4 **A.I.C. Rating:** 42,000 SPD: YES

PQM: NO

Phase Bus Rating: 400 A MCB Rating: 400 A Neutral Rating: 100% Feeder Ampacity: 400 A Feeder Phase Conductor: 3#600 Feeder Neutral Conductor: 1#600 Feeder Ground Conductor: N/A Feeder Conduit: 4"

Number of Parallel Runs: 1

				A	В	С	A	В	С				
CKT	Circuit Description	Trip	Poles							Poles	Trip	Circuit Description	CKT
1	SPACE ONLY			0 VA			1861 VA						2
3	LINUANONANI. COODDINIATE VAITU OVAINED				0 VA			1260 VA		3	100 A	LP1	4
5	UNKNOWN - COORDINATE WITH OWNER TO DETERMIN LOAD.	40 A	3			0 VA			1260 VA				6
7	10 52121 1111111 207.15.			0 VA			16940						8
9					0 VA			16607		3	200 A	SRP1	10
11	SP	100 A	3			0 VA			17231				12
13				0 VA			0 VA						14
15					21599			0 VA		3	60 A	SPD	16
17	SRP2	300 A	3			20351			0 VA				18
19				19436			0 VA					SPD	20
21	N/A				0 VA			0 VA				SPD	22
23						0 VA			0 VA			SPD	24
25	MAIN	400 A	3	0 VA			0 VA					SPD	26
27					0 VA			0 VA				SPD	28
29	N/A					0 VA			0 VA			SPD	30
		Tot	al Load:	3822	27 VA	3946	66 VA	3884	12 VA				
		Tota	al Amps:	31	9 A	33	0 A	32	4 A				

Ex Branch Panel: LP1

Location: Supply From: DP Mounting: SURFACE Enclosure: NEMA 1 Basis of Design: NQ Service Rated: YES

Volts: 120/208 Wye Phases: 3 Wires: 4 **A.I.C. Rating:** 65,000 SPD: NO

PQM: NO

Phase Bus Rating: 150 A MCB Rating: 150 A Neutral Rating: 100% Feeder Ampacity: 150 A Feeder Phase Conductor: 3#1/0 **Feeder Neutral Conductor:** 1#1/0 Feeder Ground Conductor: #6 Feeder Conduit: 2" Number of Parallel Runs: 1

FOOD TRUCKS LOAD IS CALCULATED AT 80% OF NOMINAL BREAKER RATING, WITH 65% FACTOR APPLIED FOR THERMOSTATICALLY CONTROLLED KITCHEN EQUIPMENT (2014 NEC TABLE NEW WORK IS INIDCATED IN BOLD. PROVIDE NEW CIRCUIT BREAKERS WHERE BOLD.

VERIFY ALL EXISTING LOADS AND UPDATE PANEL DIRECTORY ACCORDINGLY.
PLACE EX MENS ROOM AND WOMENS ROOM RECEPTACLES ON SINGLE BREAKER #22.

PLACE ALL EX WAGON WHEEL LIGHTS ON SINGLE BREAKER #17.

				A	В	С	A	В	С				
СКТ	Circuit Description	Trip	Poles							Poles	Trip	Circuit Description	CKT
1	RCPT - ABOVE RESTROOM	20 A	1	720 VA			720 VA			1	20 A	RCPT - ABOVE RESTROOM	2
3	RCPT - WAGON WHEEL	20 A	1		540 VA			0 VA		2	20 A	UNKOWN (SEE NOTES)	4
5	RCPT - WAGON WHEEL	20 A	1			540 VA			0 VA		20 A	ONKOWN (SEE NOTES)	6
7	POLE LIGHTS	30 A	2	0 VA			0 VA			2	20 A	POLE LIGHTS	8
9	FOLL LIGITIS	30 A			0 VA			0 VA			20 A	FOLL LIGITIS	10
11	POLE LIGHTS	20 A	2			0 VA			0 VA	2	100 A	WATER HEATER	12
13	FOLL LIGITIS	20 A		0 VA			0 VA				100 A	WATERTIER	14
15	PAVILION LIGHTS	20 A	1		0 VA			0 VA		1	20 A	RCPT - ELECTRICAL ROOM	16
17	WAGON WHEEN LIGHTS *** (ABSORB	20 A	1			0 VA			0 VA	1	20 A	LTS - ELECTRICAL ROOM	18
19	SOUTHEAST TRAIL LIGHTS	20 A	2	456 VA			0 VA			1	20 A	RCPT - RESTROOMS	20
21	300 IIILAST INAIL LIGITIS	20 A			0 VA			0 VA		1	20 A	MEN'S ROOM LIGHTS	22
23	LIGHTING CONTROLS	20 A	1			0 VA			0 VA	1	20 A	RCPT - MOP ROOM	24
25	DRINKING FOUNTAIN	20 A	1	0 VA			0 VA					SPACE ONLY	26
27	RCPT - PAVILION	20 A	1		720 VA			0 VA				SPACE ONLY	28
29	RCPT - PAVILION	20 A	1			720 VA			0 VA			SPACE ONLY	30
		Tota	al Load:	186	1 VA	1260) VA	1260) VA				

Ex Branch Panel: SRP1

Location: Supply From: DP Mounting: CONCRETE POST & STRUT Enclosure: N4X SS

Basis of Design: NQ Service Rated: NO

Volts: 120/208 Wye Phases: 3 Wires: 4 **A.I.C. Rating:** 10,000 SPD: YES

PQM: NO

Phase Bus Rating: 200 A MCB Rating: 200 A Neutral Rating: 100% Feeder Ampacity: 200 A Feeder Phase Conductor: 3#3/0 Feeder Neutral Conductor: 3#3/0 Feeder Ground Conductor: #6 Feeder Conduit: 2" Number of Parallel Runs: 1

DEMOLISH EXISTING SPD. PROVIDE NEW 100kA EXTERNAL NEMA 4X SPD WITH 50kA MOVs. BOD: ASCO 430. CONNECT VIA 5#6. EXISTING LOADS ARE INCLUDED AS A LUMP SUM, BASED ON 125% OF PEAK 12 MONTH DEMAND PER 2014 NEC 220.87.

FOOD TRUCKS LOAD IS CALCULATED AT 80% OF NOMINAL BREAKER RATING, WITH 65% FACTOR APPLIED FOR THERMOSTATICALLY CONTROLLED KITCHEN EQUIPMENT (2014 NEC TABLE

NEW WORK IS INIDCATED IN BOLD. PROVIDE NEW CIRCUIT BREAKERS WHERE BOLD. VERIFY ALL EXISTING LOADS AND UPDATE PANEL DIRECTORY ACCORDINGLY.

				Α	В	С	Α	В	С				
CKT	Circuit Description	Trip	Poles							Poles	Trip	Circuit Description	CKT
1				0 VA			10700			1	30 A	30A RCPT #1	2
3	UNKOWN (SEE NOTES)	20 A	3		0 VA			10700		1	30 A	30A RCPT #2	4
5						0 VA			10700	2	50 A	30A RCPT #3	6
7				0 VA			0 VA			2	50 A	30A ROP1 #3	8
9	RCPT @ POLES 71,72,73	20 A	3		0 VA			0 VA		2	50 A	30A RCPT #4	10
11						0 VA			0 VA	2	50 A	30A RCP1 #4	12
13				0 VA			0 VA			1	20 A	UNKOWN (SEE NOTES)	14
15	RCPT @ POLES 74,75,76	20 A	3		0 VA			0 VA		1	20 A	UNKOWN (SEE NOTES)	16
17						0 VA			0 VA	1	20 A	UNKOWN (SEE NOTES)	18
19				0 VA			0 VA						20
21	RCPT @ POLES 77,78,79	20 A	3		0 VA			0 VA		3	30 A	RCPT @ POLES 68,69,70	22
23						0 VA			0 VA				24
25	RCPT @ POLE 30	20 A	1	1248 VA			1248 VA			1	20 A	RCPT @ POLE 33	26
27	RCPT @ POLE 31	20 A	1		1248 VA			1248 VA		1	20 A	RCPT @ POLE 55	28
29	30A RCPT @ POLE 31	30 A	1			1872 VA			1248 VA	1	20 A	RCPT @ POLE 56	30
31	RCPT @ POLE 32	20 A	1	1248 VA			1248 VA			1	20 A	RCPT @ POLE 91	32
33	FAA DODT @ DOUE AA	50.4	_		2163 VA			1248 VA		1	20 A	RCPT @ POLE 92	34
35	50A RCPT @ POLE 32	50 A	2			2163 VA			1248 VA	1	20 A	RCPT @ POLE 93	36
37	RCPT @ POLE PLAY STAGE	20 A	1	1248 VA			0 VA						38
39	SPARE	20 A	1		0 VA			0 VA		3	60 A	SPD	40
41	SPARE	20 A	1			0 VA			0 VA				42
		Tot	tal Load:	1694	0 VA	1660	7 VA	1723	1 VA		I		
		Tota	al Amps:	14:	2 A	138	8 A	14	4 A	I			

Ex Branch Panel: SRP2

Location: Supply From: DP Mounting: CONCRETE POST & STRUT Enclosure: N4X SS Basis of Design: NQ Service Rated: NO

Volts: 120/208 Wye Phases: 3 Wires: 4 **A.I.C. Rating:** 10,000 SPD: YES PQM: NO

Phase Bus Rating: 300 A MCB Rating: 300 A Neutral Rating: 100% Feeder Ampacity: 300 A Feeder Phase Conductor: 3#350 Feeder Neutral Conductor: 1#350 Feeder Ground Conductor: #4 Feeder Conduit: 3" Number of Parallel Runs: 1

EXISTING LOADS ARE INCLUDED AS A LUMP SUM, BASED ON 125% OF PEAK 12 MONTH DEMAND PER 2014 NEC 220.87.

FOOD TRUCKS LOAD IS CALCULATED AT 80% OF NOMINAL BREAKER RATING, WITH 65% FACTOR APPLIED FOR THERMOSTATICALLY CONTROLLED KITCHEN EQUIPMENT (2014 NEC TABLE NEW WORK IS INIDCATED IN BOLD. PROVIDE NEW CIRCUIT BREAKERS WHERE BOLD. VERIFY ALL EXISTING LOADS AND UPDATE PANEL DIRECTORY ACCORDINGLY.

				Α	В	С	Α	В	С				
KT	Circuit Description	Trip	Poles							Poles	Trip	Circuit Description	CKT
1	50A RCPT @ POLE 34	50 A	2	2163 VA			10700						2
3					2163 VA			10700		3	20 A	RCPT - POLES (UNKNOWN #, SEE NOTES)	4
5	RCPT @ POLE 34	20 A	1			1248 VA			10700				6
7	RCPT @ POLE 35	20 A	1	1248 VA			0 VA			2	50 A	UNKNOWN (SEE NOTES)	8
9	RCPT @ POLE 36	20 A	1		1248 VA			0 VA				(*************************************	10
1	RCPT - POLES (UNKNOWN #, SEE	20 A	1			0 VA			0 VA	2	50 A	UNKNOWN (SEE NOTES)	12
3	RCPT @ POLE 37	20 A	1	1248 VA			0 VA					0.1111101111 (022110120)	14
5	RCPT @ POLE 38	20 A	1		1248 VA			0 VA		2	50 A	UNKNOWN (SEE NOTES)	16
7	RCPT @ POLE 39	20 A	1			1248 VA			0 VA			Grantoviii (GEE NOTES)	18
9	RCPT @ POLE 40	20 A	1	1248 VA			0 VA			2	50 A	STAGE HYDRAULICS	20
1	RCPT @ POLE 41	20 A	1		1248 VA			0 VA			30 A		22
3	RCPT @ POLE 42	20 A	1			1248 VA			0 VA	1	20 A	RCPT - POLES (UNKNOWN #, SEE	24
5	RCPT @ POLE 43	20 A	1	1248 VA			0 VA			1	20 A	RCPT - POLES (UNKNOWN #, SEE	26
7	RCPT @ POLE 44	20 A	1		1248 VA			0 VA		2	50 A	STAGE HYDRAULICS	28
9	RCPT @ POLE 45	20 A	1			1248 VA			0 VA	2	30 A	STAGE HTDRAULICS	30
1	RCPT @ POLE 46	20 A	1	1248 VA			0 VA			1	20 A	RCPT - POLES (UNKNOWN #, SEE	32
3	RCPT @ POLE 48	20 A	1		1248 VA			0 VA		1	20 A	RCPT - POLES (UNKNOWN #, SEE	34
5	RCPT @ POLE 50	20 A	1			1248 VA			1248 VA	1	20 A	RCPT @ POLE 54	36
7	RCPT @ POLE 52	20 A	1	1248 VA			1248 VA			1	20 A	RCPT @ POLE 89	38
9	RCPT @ POLE 53	20 A	1		1248 VA			0 VA		1	20 A	RCPT - POLES (UNKNOWN #, SEE	40
1	SPARE	20 A	1			0 VA			1248 VA	1	20 A	RCPT @ POLE 90	42
3	SPD			0 VA			0 VA					SPD	44
5	SPD				0 VA			0 VA				SPD	46
7	SPD					0 VA			0 VA			SPD	48
9	SPD			0 VA			0 VA					SPD	50
1	SPD				0 VA			0 VA				SPD	52
3	SPD					0 VA			0 VA			SPD	54
		Tota	al Load:	2159	9 VA	2035	1 VA	1943	6 VA				

engineering Mitchell Gulledge Engineering, Inc. 210 SW 4th Avenue Gainesville, FL 32601 FL License EB-31501 p.352.745.3991 www.mitchellgulledge.com

> Andrew P. McCaddin PE - 83318

OWNER: CITY OF GAINESVILLE

874 SE 4TH STREET GAINESVILLE, FL 32601

Gainesville. Citizen centered People empowered

OWNER'S PROJECT NUMBER:

PROJECT NUMBER: 19050 **REVISIONS:** DESC

FINAL CONSTRUCTION DOCUMENTS

ISSUE DATE: 08/26/2019

CHECKED BY:

SHEET TITLE:

ELECTRICAL SCHEDULES

SHEET NUMBER: E2.0

New Branch Panel: SRP3

Location: Supply From: SRP4 Mounting: CONCRETE POST & STRUT Enclosure: N4X SS Basis of Design: NQ

Service Rated: YES

Volts: 120/208 Wye Phases: 3 Wires: 4 **A.I.C. Rating:** 10,000 SPD: YES PQM: NO

Phase Bus Rating: 225 A MCB Rating: 225 A Neutral Rating: 100% Feeder Ampacity: 225 A Feeder Phase Conductor: 3#250 Feeder Neutral Conductor: 1#250 Feeder Ground Conductor: #3 Feeder Conduit: 4" Number of Parallel Runs: 1

PROVIDE 100kA EXTERNAL NEMA 4X SPD WITH 50kA MOVs. BOD: ASCO 430. CONNECT VIA 5#6.
FOOD TRUCKS LOAD IS CALCULATED AT 80% OF NOMINAL BREAKER RATING, WITH 65% FACTOR APPLIED FOR THERMOSTATICALLY CONTROLLED KITCHEN EQUIPMENT (2014 NEC TABLE

				A	В	С	A	В	С				
СКТ	Circuit Description	Trip	Poles		_					Poles	Trip	Circuit Description	СКТ
1	RCPT @ POLE 12	20 A	1	1248 VA			1248 VA			1	20 A	RCPT @ FOOT PATH T1	2
3	RCPT @ POLE 13	20 A	1		1248 VA			1248 VA		1	20 A	RCPT @ FOOT PATH T2	4
5	RCPT @ POLE 14	20 A	1			1248 VA			1248 VA	1	20 A	RCPT @ FOOT PATH T3	6
7	RCPT @ POLE 15	20 A	1	1248 VA			1248 VA			1	20 A	RCPT @ FOOT PATH T4	8
9	RCPT @ POLE 16	20 A	1		1248 VA			1248 VA		1	20 A	RCPT @ FOOT PATH T5	10
11	RCPT @ POLE 17	20 A	1			1248 VA			1248 VA	1	20 A	RCPT @ FOOT PATH T6	12
13	RCPT @ POLE 18	20 A	1	1248 VA			1248 VA			1	20 A	RCPT @ FOOT PATH T7	14
15	RCPT @ POLE 19	20 A	1		1248 VA			1248 VA		1	20 A	RCPT @ FOOT PATH T8	16
17	RCPT @ POLE 20	20 A	1			1248 VA			1248 VA	1	20 A	RCPT @ FOOT PATH T9	18
19	RCPT @ EVENT LIGHTING	20 A	1	1248 VA			1248 VA			1	20 A	RCPT @ FOOT PATH T10	20
21	RCPT @ MONUMENT	20 A	1		1248 VA			1248 VA		1	20 A	RCPT @ FOOT PATH T11	22
23	RCPT @ POLE 21	20 A	1			1248 VA			1248 VA	1	20 A	RCPT @ FOOT PATH T12	24
25	RCPT @ POLE 22	20 A	1	1248 VA			1248 VA			1	20 A	RCPT @ POLE 57	26
27	RCPT @ POLE 23	20 A	1		1248 VA			1248 VA		1	20 A	RCPT @ POLE 58	28
29		50.4				2163 VA			1248 VA	1	20 A	RCPT @ POLE 65	30
31	50A RCPT @ POLE 23	50 A	2	2163 VA			1248 VA			1	20 A	RCPT @ POLE 66	32
33	RCPT @ POLE 24	20 A	1		1248 VA			1248 VA		1	20 A	RCPT @ POLE 67	34
35	30A RCPT @ POLE 24	30 A	1			1872 VA			1248 VA	1	20 A	RCPT @ POLE 68	36
37	RCPT @ POLE 25	20 A	1	1248 VA			0 VA			1	20 A	SPARE	38
39	RCPT @ POLE 26	20 A	1		1248 VA			0 VA		1	20 A	SPARE	40
41	30A RCPT @ POLE 26	30 A	1			1872 VA			0 VA	1	20 A	SPARE	42
43	RCPT @ POLE 27	20 A	1	1248 VA			0 VA			1	20 A	SPARE	44
45	504 DODT O DOL 5 07	50.4			2163 VA			0 VA		1	20 A	SPARE	46
47	50A RCPT @ POLE 27	50 A	2			2163 VA			0 VA	1	20 A	SPARE	48
49	RCPT @ POLE 28	20 A	1	1248 VA			0 VA						50
51	RCPT @ POLE 29	20 A	1		1248 VA			0 VA		3	60 A	SPD	52
53	SPARE	20 A	1			0 VA			0 VA				54
		Tot	al Load:	1963	5 VA	1963	35 VA	2055	0 VA				1
		Tota	l Amps:	16	4 A	16	4 A	17	1 A	,			

New Branch Panel: SRP4

Supply From: Mounting: CONCRETE POST & STRUT Enclosure: N4X SS Basis of Design: NQ Service Rated: YES

Volts: 120/208 Wye Phases: 3 Wires: 4 **A.I.C. Rating:** 22,000 SPD: YES PQM: NO

Phase Bus Rating: 300 A MCB Rating: 300 A **Neutral Rating: 100%** Feeder Ampacity: 300 A Feeder Phase Conductor: 3#350 Feeder Neutral Conductor: 1#350 Feeder Ground Conductor: N/A Feeder Conduit: 4" Number of Parallel Runs: 1

PROVIDE 100kA EXTERNAL NEMA 4X SPD WITH 50kA MOVs. BOD: ASCO 430. CONNECT VIA 5#6.
FOOD TRUCKS LOAD IS CALCULATED AT 80% OF NOMINAL BREAKER RATING, WITH 65% FACTOR APPLIED FOR THERMOSTATICALLY CONTROLLED KITCHEN EQUIPMENT (2014 NEC TABLE 220.56). REMOVE EXISTING POLE LIGHTS FROM PANEL PP AND CONNECT TO NEW CIRCUIT BREAKER IN THIS PANEL. RE-WORK RACEWAY AND WIRING S NEEDED. DO NOT ROUTE CIRCUIT VIA PANEL PP.

OKT	Circuit Decemention	Tuin	Dalaa	Α	В	С	Α	В	С	Dalaa	Tuin	Circuit Decembries	CKT
CKT	Circuit Description	Trip	Poles							Poles	Trip	Circuit Description	СКТ
1	RCPT @ POLE 1	20 A	1	1248 VA			1248 VA			1	20 A	RCPT @ POLE 10	2
3	RCPT @ POLE 2	20 A	1		1248 VA			1248 VA		1	20 A	RCPT @ POLE 11	4
5	RCPT @ POLE 3	20 A	1			1248 VA			1248 VA	1	20 A	RCPT @ POLE 59	6
7	RCPT @ POLE 4	20 A	1	1248 VA			1248 VA			1	20 A	RCPT @ POLE 60	8
9	RCPT @ POLE 5	20 A	1		1248 VA			1248 VA		1	20 A	RCPT @ POLE 61	10
11	RCPT @ POLE 6	20 A	1			1248 VA			1248 VA	1	20 A	RCPT @ POLE 62	12
13	RCPT @ POLE 7	20 A	1	1248 VA			1248 VA			1	20 A	RCPT @ POLE 63	14
15	RCPT @ POLE 8	20 A	1		1248 VA			1248 VA		1	20 A	RCPT @ POLE 64	16
17	RCPT @ POLE 9	20 A	1			1248 VA			0 VA			SPACE ONLY	18
19	SPARE	20 A	1	0 VA			0 VA			-		SPACE ONLY	20
21	SPARE	20 A	1		0 VA			0 VA		-		SPACE ONLY	22
23	SPARE	20 A	1			0 VA			0 VA	-		SPACE ONLY	24
25	SPARE	20 A	1	0 VA			0 VA					SPACE ONLY	26
27	SPARE	20 A	1		0 VA			0 VA		-		SPACE ONLY	28
29	SPARE	20 A	1			0 VA			0 VA	-		SPACE ONLY	30
31	SPARE	20 A	1	0 VA			0 VA			-		SPACE ONLY	32
33	SPARE	20 A	1		0 VA			0 VA				SPACE ONLY	34
35	SPARE	20 A	1			0 VA			0 VA			SPACE ONLY	36
37				0 VA			0 VA						38
39	POLE LIGHTS	30 A	3		0 VA			0 VA		3	60 A	SPD	40
41						0 VA			0 VA				42
43				19635		J 171	0 VA		J 17.			NOT A SPACE	44
45	SRP3 (SUB-FEED)	300 A	3	10000	19635		J 7/1	0 VA				NOT A SPACE	46
47	314 0 (005 1 225)	000 A	J		10000	20550		5 V/ (0 VA			NOT A SPACE	48
		Tota	al Load:	2712	3 VA		3 VA	2679				110171017101	1 70
			l Amps:	220			3 A	223					

Mitchell Gulledge Engineering, Inc. 210 SW 4th Avenue Gainesville, FL 32601 FL License EB-31501 p.352.745.3991 www.mitchellgulledge.com

> Andrew P. McCaddin PE - 83318

OWNER: CITY OF GAINESVILLE

874 SE 4TH STREET GAINESVILLE, FL 32601 Gainesville.

Citizen centered People empowered

OWNER'S PROJECT NUMBER: PROJECT NUMBER: 19050

REVISIONS: DESC DATE

> ISSUE: FINAL CONSTRUCTION DOCUMENTS

ISSUE DATE: 08/26/2019

CHECKED BY:

SHEET TITLE:

ELECTRICAL SCHEDULES

SHEET NUMBER:

THE WORK COVERED BY THIS DIVISION CONSISTS OF PROVIDING ALL LABOR, EQUIPMENT AND MATERIALS AND PERFORMING ALL OPERATIONS NECESSARY FOR THE INSTALLATION OF THE ELECTRICAL WORK AS HEREIN CALLED FOR AND SHOWN ON THE DRAWINGS. ALL MATERIALS AND EQUIPMENT SHALL BE INSTALLED AND COMPLETED IN A FIRST-CLASS WORKMANLIKE MANNER AND IN ACCORDANCE WITH THE BEST MODERN METHODS AND PRACTICE. ANY MATERIALS INSTALLED WHICH DO NOT PRESENT AN ORDERLY AND REASONABLY NEAT AND/OR WORKMANLIKE APPEARANCE, OR DO NOT ALLOW ADEQUATE SPACE FOR MAINTENANCE, SHALL BE REMOVED AND REPLACED WHEN SO DIRECTED BY THE ARCHITECT/ENGINEER.

- PROVIDE: FURNISH AND INSTALL, COMPLETE AND READY FOR INTENDED USE. FURNISH: SUPPLY AND DELIVER TO PROJECT SITE, READY FOR SUBSEQUENT REQUIREMENTS. INSTALL: OPERATIONS AT PROJECT SITE, INCLUDING UNLOADING, UNPACKING, ASSEMBLY, ERECTION, PLACING, ANCHORING, APPLYING, WORKING TO DIMENSION, FINISHING, CURING, PROTECTING,
- CLEANING, AND SIMILAR REQUIREMENTS. 1.2 PERMITS AND FEES: CONTRACTOR SHALL OBTAIN ALL NECESSARY PERMITS, METERS, AND INSPECTIONS REQUIRED FOR HIS WORK AND PAY ALL FEES AND CHARGES INCIDENTAL THERETO. 1.3 <u>VERIFICATION OF OWNER'S DATA</u>: PRIOR TO COMMENCING ANY WORK THE CONTRACTOR SHALL SATISFY HIMSELF

AS TO THE ACCURACY OF ALL DATA AS INDICATED IN THESE PLANS AND SPECIFICATIONS AND/OR AS PROVIDED BY THE OWNER. SHOULD THE CONTRACTOR DISCOVER ANY INACCURACIES, ERRORS, OR OMISSIONS IN THE DATA, HE SHALL IMMEDIATELY NOTIFY THE ARCHITECT/ENGINEER IN ORDER THAT PROPER ADJUSTMENTS CAN BE ANTICIPATED AND ORDERED. COMMENCEMENT BY THE CONTRACTOR OF ANY WORK SHALL BE HELD AS AN ACCEPTANCE OF THE DATA BY HIM AFTER WHICH TIME THE CONTRACTOR HAS NO CLAIM AGAINST THE OWNER RESULTING FROM ALLEGED ERRORS, OMISSIONS OR INACCURACIES OF THE SAID DATA.

1.4 <u>DELIVERY AND STORAGE OF MATERIALS</u>: MATERIALS DELIVERED TO SITE SHALL BE INSPECTED FOR DAMAGE, UNLOADED, AND STORED WITH A MINIMUM OF HANDLING. ALL MATERIAL SHALL BE STORED TO PROVIDE PROTECTION FROM THE WEATHER AND ACCIDENTAL DAMAGE.

1.5 EXTENT OF WORK IS INDICATED BY THE DRAWINGS, SCHEDULES, AND THE REQUIREMENTS OF THE SPECIFICATIONS. SINGULAR REFERENCES SHALL NOT BE CONSTRUCTED AS REQUIRING ONLY ONE DEVICE IF MULTIPLE DEVICES ARE SHOWN ON THE DRAWINGS OR ARE REQUIRED FOR PROPER SYSTEM OPERATION.

FIELD MEASUREMENTS AND COORDINATION THE INTENT OF THE DRAWINGS AND SPECIFICATIONS IS TO OBTAIN A COMPLETE AND SATISFACTORY INSTALLATION. SEPARATE DIVISIONAL DRAWINGS AND SPECIFICATIONS SHALL NOT RELIEVE THE CONTRACTOR OR SUBCONTRACTORS FROM FULL COMPLIANCE OF WORK OF HIS TRADE INDICATED ON ANY OF THE DRAWINGS OR IN

VERIFY ALL FIELD DIMENSIONS AND LOCATIONS OF EQUIPMENT TO INSURE CLOSE, NEAT FIT WITH OTHER TRADES' WORK. MAKE USE OF ALL CONTRACT DOCUMENTS AND APPROVED SHOP DRAWINGS TO VERIFY EXACT DIMENSION AND LOCATIONS.

COORDINATE WORK IN THIS DIVISION WITH ALL OTHER TRADES IN PROPER SEQUENCE TO ENSURE THAT THE TOTAL WORK IS COMPLETED WITHIN CONTRACT TIME SCHEDULE AND WITH A MINIMUM CUTTING AND PATCHING LOCATE ALL APPARATUS SYMMETRICAL WITH ARCHITECTURAL ELEMENTS. INSTALL TO EXACT HEIGHT AND LOCATIONS WHEN SHOWN ON ARCHITECTURAL DRAWINGS. WHEN LOCATIONS ARE SHOWN ONLY ON ELECTRICAL DRAWINGS, BE GUIDED BY ARCHITECTURAL DETAILS AND CONDITIONS EXISTING AT JOB AND CORRELATE THIS WORK

INSTALL WORK AS REQUIRED TO FIT STRUCTURE, AVOID OBSTRUCTIONS, AND RETAIN CLEARANCE, HEADROOM, OPENINGS AND PASSAGEWAYS. CUT NO STRUCTURAL MEMBERS WITHOUT WRITTEN APPROVAL CAREFULLY EXAMINE ANY EXISTING CONDITIONS, PIPING, AND PREMISES. COMPARE DRAWINGS WITH EXISTING CONDITIONS. REPORT ANY OBSERVED DISCREPANCIES. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO PROPERLY COORDINATE THE WORK AND TO IDENTIFY PROBLEMS IN A TIMELY MANNER. WRITTEN INSTRUCTIONS WILL BE ISSUED TO RESOLVE DISCREPANCIES.

THE CONTRACTOR SHALL GUARANTEE LABOR, MATERIALS AND EQUIPMENT FOR A PERIOD OF ONE (1) YEAR FROM SUBSTANTIAL COMPLETION, OR FROM OWNER'S OCCUPANCY, WHICHEVER IS EARLIER. CONTRACTOR SHALL MAKE GOOD ANY DEFECTS AND SHALL INCLUDE ALL NECESSARY ADJUSTMENTS TO AND REPLACEMENT OF DEFECTIVE ITEMS WITHOUT EXPENSE TO THE OWNER.

APPROVAL SUBMITTALS SUBMITTALS SHALL BE PROVIDED FOR ALL SPECIFIED PRODUCTS AND SYSTEMS. PROPERLY IDENTIFIED BY A COVER SHEET SHOWING THE PROJECT NAME, ARCHITECT AND ENGINEER NAMES, SUBMITTAL CONTROL NUMBER, SPECIFICATION SECTION, A LIST OF PRODUCTS OR ITEM NAMES WITH MODEL NUMBERS IN THE ORDER THEY APPEAR IN THE PACKAGE, AND SPACES FOR APPROVAL STAMPS.

THE ELECTRICAL DESIGN SHOWN ON THE DRAWINGS SUPPORTS THE EQUIPMENT BASIS OF DESIGN SPECIFICATIONS AT THE TIME OF DESIGN. IF EQUIPMENT IS SUBMITTED WITH DIFFERENT ELECTRICAL REQUIREMENTS, IT IS THE RESPONSIBILITY OF THE EQUIPMENT-FURNISHING CONTRACTOR TO RESOLVE ALL REQUIRED ELECTRICAL DESIGN CHANGES (WIRE AND CONDUIT SIZE, TYPE OF DISCONNECT OR OVERLOAD PROTECTION, POINT(S) OF CONNECTION, ETC.) AND CLEARLY SHOW THE NEW ELECTRICAL DESIGN ON THE EQUIPMENT SUBMITTAL WITH A WRITTEN STATEMENT THAT THIS CHANGE WILL BE PROVIDED AT NO ADDITIONAL COST. EQUIPMENT SUBMITTALS MADE WITH NO WRITTEN REFERENCE TO THE ELECTRICAL DESIGN WILL BE PRESUMED TO WORK WITH THE ELECTRICAL DESIGN. ANY CORRECTIONS REQUIRED WILL BE AT NO ADDITIONAL

IF THE SHOP DRAWINGS SHOW VARIATION FROM THE REQUIREMENTS OF CONTRACT BECAUSE OF STANDARD SHOP PRACTICE OR OTHER REASONS, THE CONTRACTOR SHALL MAKE SPECIFIC MENTION OF SUCH VARIATION IN WRITING IN HIS LETTER OF TRANSMITTAL AND ON THE SUBMITTAL COVER SHEET IN ORDER THAT, IF ACCEPTABLE, CONTRACTOR WILL NOT BE RELIEVED OF THE RESPONSIBILITY FOR EXECUTING THE WORK IN ACCORDANCE WITH THE CONTRACT.

TEST REPORTS AND VERIFICATION SUBMITTALS: SUBMIT TEST REPORTS, CERTIFICATIONS AND VERIFICATION LETTERS AS CALLED FOR IN OTHER SECTIONS. CONTRACTOR SHALL COORDINATE THE REQUIRED TESTING AND DOCUMENTATION OF SYSTEM PERFORMANCE SUCH THAT SUFFICIENT TIME EXISTS TO PREPARE THE REPORTS, SUBMIT THE REPORTS, REVIEW THE REPORTS AND TAKE CORRECTIVE ACTION WITHIN THE SCHEDULED CONTRACT TIME. 1.10 <u>O&M DATA SUBMITTALS</u>: SUBMIT OPERATION AND MAINTENANCE DATA AS CALLED FOR IN OTHER SECTIONS. WHEN A COPY OF APPROVAL SUBMITTALS IS INCLUDED IN THE O&M MANUAL, ONLY THE FINAL "APPROVED" OR "APPROVED AS NOTED" COPY SHALL BE USED. CONTRACTOR SHALL ORGANIZE THESE DATA IN THE O&M MANUALS TABBED BY SPECIFICATION NUMBER. PREPARE O&M MANUALS AS REQUIRED BY DIVISION 1 AND AS DESCRIBED HEREIN. SUBMIT MANUALS AT THE SUBSTANTIAL COMPLETION INSPECTION.

PART 2 - GENERAL PRODUCTS

2.1 ALL MATERIALS SHALL BE NEW OR OWNER-SUPPLIED REUSED AS SHOWN ON THE DRAWINGS, THE BEST OF THEIR RESPECTIVE KINDS, SUITABLE FOR THE CONDITIONS AND DUTIES IMPOSED ON THEM AT THE BUILDING AND SHALL BE OF REPUTABLE MANUFACTURERS. THE DESCRIPTION, CHARACTERISTICS, AND REQUIREMENTS OF MATERIALS TO BE USED SHALL BE IN ACCORDANCE WITH QUALIFYING CONDITIONS ESTABLISHED IN THE FOLLOWING SECTIONS. **EQUIPMENT AND MATERIALS:**

ALL EQUIPMENT AND MATERIALS SHALL BE NEW AND THE MOST SUITABLE GRADE FOR THE PURPOSE INTENDED. EQUIPMENT FURNISHED UNDER THIS DIVISION SHALL BE THE PRODUCT OF A MANUFACTURER REGULARLY ENGAGED IN THE MANUFACTURE OF SUCH ITEMS FOR A PERIOD OF THREE YEARS. WHERE PRACTICAL, ALL OF THE COMPONENTS SHALL BE PRODUCTS OF A SINGLE MANUFACTURER IN ORDER TO PROVIDE PROPER COORDINATION AND RESPONSIBILITY. WHERE REQUIRED, CONTRACTOR SHALL FURNISH PROOF OF INSTALLATION OF SIMILAR UNITS OR EQUIPMENT.

B. EACH ITEM OF EQUIPMENT SHALL BEAR A NAME PLATE SHOWING THE MANUFACTURER'S NAME, TRADE NAME, MODEL NUMBER, SERIAL NUMBER, RATINGS AND OTHER INFORMATION NECESSARY TO FULLY IDENTIFY IT. THIS PLATE SHALL BE PERMANENTLY MOUNTED IN A PROMINENT LOCATION AND SHALL NOT BE CONCEALED, INSULATED OR PAINTED.

C. THE LABEL OF THE APPROVING AGENCY, SUCH AS UL OR FM, BY WHICH A STANDARD HAS BEEN

ESTABLISHED FOR THE PARTICULAR ITEM SHALL BE IN FULL VIEW. THE EQUIPMENT SHALL BE ESSENTIALLY THE STANDARD PRODUCT OF A MANUFACTURER REGULARLY ENGAGED IN THE PRODUCTION OF SUCH EQUIPMENT AND SHALL BE A PRODUCT OF THE MANUFACTURER'S LATEST

A SERVICE ORGANIZATION WITH PERSONNEL AND SPARE PARTS SHALL BE AVAILABLE WITHIN TWO HOURS FOR EACH TYPE OF EQUIPMENT FURNISHED. INSTALL IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS. PLACE IN SERVICE BY A FACTORY

TRAINED REPRESENTATIVE WHERE REQUIRED. MATERIALS AND EQUIPMENT ARE SPECIFIED HEREIN BY A SINGLE OR BY MULTIPLE MANUFACTURERS TO INDICATE QUALITY, MATERIAL AND TYPE OF CONSTRUCTION DESIRED. MANUFACTURER'S PRODUCTS SHOWN ON THE DRAWINGS HAVE BEEN USED AS BASIS FOR DESIGN; IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO

ASCERTAIN THAT ALTERNATE MANUFACTURER'S PRODUCTS, OR THE PARTICULAR PRODUCTS OF NAMED MANUFACTURERS, MEET THE DETAILED SPECIFICATIONS AND THAT SIZE AND ARRANGEMENT OF EQUIPMENT ARE SUITABLE FOR INSTALLATION.

PART 3 - GENERAL EXECUTION

3.1 <u>CUTTING AND PATCHING</u>: NOTIFY GENERAL CONTRACTOR TO DO ALL CUTTING AND PATCHING OF ALL HOLES, CHASES, SLEEVES, AND OTHER OPENINGS REQUIRED FOR INSTALLATION OF EQUIPMENT FURNISHED AND INSTALLED UNDER THIS SECTION. UTILIZE EXPERIENCED TRADES FOR CUTTING AND PATCHING. OBTAIN PERMISSION FROM ARCHITECT/ENGINEER BEFORE CUTTING ANY STRUCTURAL ITEMS.

3.2 <u>EQUIPMENT SETTING</u>: BOLT EQUIPMENT DIRECTLY TO CONCRETE PADS OR VIBRATION ISOLATORS AS REQUIRED, USING HOT-DIPPED GALVANIZED ANCHOR BOLTS, NUTS AND WASHERS. LEVEL EQUIPMENT. 3.3 PAINTING: TOUCH-UP FACTORY FINISHES ON EQUIPMENT LOCATED INSIDE AND OUTSIDE SHALL BE DONE UNDER DIVISION 22. OBTAIN MATCHED COLOR COATINGS FROM THE MANUFACTURER AND APPLY AS DIRECTED. IF CORROSION IS FOUND DURING INSPECTION ON THE SURFACE OF ANY EQUIPMENT, CLEAN, PRIME, AND PAINT, AS REQUIRED.

3.4 CLEAN-UP: THOROUGHLY CLEAN ALL EXPOSED PARTS OF APPARATUS AND EQUIPMENT OF CEMENT, PLASTER, AND OTHER MATERIALS AND REMOVE ALL OIL AND GREASE SPOTS. REPAINT OR TOUCH UP AS REQUIRED TO LOOK LIKE NEW. DURING PROGRESS OF WORK, CONTRACTOR IS TO CAREFULLY CLEAN UP AND LEAVE PREMISES AND ALL PORTIONS OF BUILDING FREE FROM DEBRIS AND IN A CLEAN AND SAFE CONDITION. RECORD DRAWINGS:

DURING THE PROGRESS OF THE WORK THE CONTRACTOR SHALL RECORD ON THEIR FIELD SET OF DRAWINGS THE EXACT LOCATION, AS INSTALLED, OF ALL PIPING, DUCTWORK, EQUIPMENT, AND OTHER SYSTEMS WHICH ARE NOT INSTALLED EXACTLY AS SHOWN ON THE CONTRACT DRAWINGS. B. UPON COMPLETION OF THE WORK, RECORD DRAWINGS SHALL BE PREPARED AS DESCRIBED IN THE GENERAL CONDITIONS, SUPPLEMENTARY CONDITIONS, AND DIVISION 1 SECTIONS.

PART 4 - GROUNDING AND BONDING 4.1 GROUNDING AND BONDING SYSTEM

PROVIDE COMPLETE GROUNDING AND BONDING ASSEMBLIES, INCLUDING, BUT NOT LIMITED TO,

CABLES/WIRES, CONNECTORS.

SOLDERLESS LUG TERMINALS GROUNDING ELECTRODES AND PLATE ELECTRODES,

BONDING JUMPER BRAID,

SURGE ARRESTERS, AND ADDITIONAL ACCESSORIES NEEDED FOR A COMPLETE INSTALLATION.

GROUNDING AND BONDING

UNLESS OTHERWISE INDICATED, PROVIDE ELECTRICAL GROUNDING CONDUCTORS FOR GROUNDING SYSTEM CONNECTIONS THAT MATCH POWER SUPPLY WIRING MATERIALS AND ARE SIZED

ACCORDING TO NEC. BONDING PLATES, CONNECTORS, TERMINALS AND CLAMPS:

PROVIDE ELECTRICAL BONDING PLATES, CONNECTORS, TERMINALS, LUGS AND CLAMPS AS RECOMMENDED BY BONDING PLATE, CONNECTOR, TERMINAL AND CLAMP MANUFACTURERS FOR INDICATED APPLICATIONS.

GROUNDING ELECTRODES GROUNDING ELECTRODES SHALL CONSIST OF MINIMUM THREE 3/4"X 20'-0" LONG COPPER CLAD RODS ARRANGED IN A TRIANGLE CONFIGURATION WITH GROUND RODS PLACED AT LEAST TEN FEET APART. a. PROVIDE CONCRETE BOX (FLUSH IN GRADE) WITH CAST IRON COVER. CONCRETE BOX TO

HOUSE EACH INDIVIDUAL GROUND ROD FOR TESTING. CAST IRON COVER TO HAVE THE WORDS "GROUND ROD" INSCRIBED ON TOP. INSTALLATION OF ELECTRICAL GROUNDING AND BONDING SYSTEMS

A. GENERAL: INSTALL ELECTRICAL GROUNDING AND BONDING SYSTEMS AS INDICATED, IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS AND APPLICABLE PORTIONS OF CURRENT NEC, NECA'S "STANDARD OF INSTALLATION", AND IN ACCORDANCE WITH RECOGNIZED INDUSTRY PRACTICES TO ENSURE THAT PRODUCTS COMPLY WITH REQUIREMENTS.

COORDINATE WITH OTHER ELECTRICAL WORK AS NECESSARY TO INTERFACE INSTALLATION OF ELECTRICAL GROUNDING AND BONDING SYSTEM WORK WITH OTHER WORK. PROVIDE ALL CIRCUITS WITH AN INSULATED EQUIPMENT GROUNDING CONDUCTOR. UNDER NO

CIRCUMSTANCES SHALL RACEWAYS BE THE SOLE EQUIPMENT GROUNDING CONDUCTOR. TERMINATE INSULATED EQUIPMENT GROUNDING CONDUCTORS WITH GROUNDING LUG, BUS, OR BUSHING. CONDUCTORS SHALL NOT BE LOOPED UNDER SCREW OR BOLT HEADS.

GROUNDING ELECTRODE SYSTEM & GROUNDING ELECTRODE CONDUCTOR: GROUNDING ELECTRODE SYSTEM FOR MAIN SERVICE AND SEPARATELY DERIVED SYSTEMS: GROUNDING ELECTRODE CONDUCTORS SHALL BE SIZED ACCORDING TO 2011 NEC 250.66 AND SHALL BE CONNECTED TO THE FOLLOWING ELECTRODES: METAL COLD WATER PIPE, CONCRETE ENCASED ELECTRODES, BUILDING STEEL, AND THREE ROD ELECTRODES.

GROUNDING ELECTRODE REQUIREMENTS: CONCRETE ENCASED ELECTRODES SHALL BE ENCASED IN AT LEAST THREE INCHES OF CONCRETE FOOTING OR FOUNDATION THAT IS IN DIRECT CONTACT WITH THE EARTH, CONSISTING OF A CONTINUOUS 5/8"X20'-0" REBAR WITH A 20'-0" SECTION OF BARE COPPER WIRE CONNECTED TO THE REBAR BY EXOTHERMIC WELDING AND EXTENDED 4'-0" ABOVE THE SLAB AND SLEEVED WITH SCH 40 PVC AT SLAB PENETRATION. THIS SIZE WIRE IS CONSTANT AS INDICATED ON SINGLE LINE DIAGRAM; IT IS NOT TO BE SIZED BY 2011 NEC 250.66. THE EXPOSED CONDUCTOR ABOVE THE SLAB SHALL BE PROTECTED FROM CONCRETE, PAINT, DIRT, ETC. ROD ELECTRODES SHALL CONSIST OF THREE (MINIMUM) 3/4"X20'-0" (MINIMUM) COPPER

CONFIGURATION. NO ALUMINUM RODS ARE PERMITTED. GROUNDING ELECTRODE CONDUCTORS SHALL BE SPLICED ONLY BY MEANS OF:

INSULATION IF #6 OR SMALLER, GREEN MARKING TAPE IF #4 OR LARGER.

LISTED EXOTHERMIC WELDING PROCESS, OR LISTED IRREVERSIBLE CRIMP CONNECTION. NOTE: IRREVERSIBLE CRIMP CONNECTIONS SHALL NOT BE UTILIZED EXCEPT WHERE APPLIED WITH THE INDICATED CRIMPING TOOL, WHERE SUCH TOOL CONTAINS AN EMBOSSING DIE WHICH LEAVES UL MARK.

CLAD RODS WITH THREADED CONNECTIONS, PLACED AT LEAST TEN FEET APART IN A TRIANGULAR

BUILDING STEEL SHALL BE EFFECTIVELY GROUNDED THROUGH DIRECT CONNECTIONS FROM FOOTER REINFORCING TO I-BEAM OR BAR JOISTS WITH COPPER CONDUCTORS SIZED TO MATCH GROUNDING ELECTRODE CONDUCTOR.

CONNECT TOGETHER SERVICE EQUIPMENT ENCLOSURES, EXPOSED NONCURRENT CARRYING METAL

PARTS OF ELECTRICAL EQUIPMENT, METAL RACEWAY SYSTEMS, GROUNDING CONDUCTOR IN RACEWAYS AND CABLES. RECEPTACLE GROUND CONNECTORS. AND PLUMBING SYSTEMS. PROVIDE MINIMUM #12 AWG EQUIPMENT GROUNDING CONDUCTOR IN EACH CONDUIT UNLESS OTHERWISE INDICATED. EQUIPMENT GROUNDING CONDUCTOR SHALL HAVE CONTINUOUS GREEN

EQUIPMENT GROUNDING CONDUCTOR SHALL BE CONNECTED TO GROUND BUSES IN EQUIPMENT ENCLOSURES. EQUIPMENT GROUNDING CONDUCTOR BONDED TO ALL OUTLET, PULL, AND JUNCTION BOXES BY A LUG OR SCREW APPROVED FOR THE PURPOSE BEFORE INSTALLATION OF THE BOXES. GROUND PIGTAILS

AND/OR GROUND CLIPS ARE NOT ACCEPTABLE. TIGHTEN GROUNDING AND BONDING CONNECTORS AND TERMINAL, INCLUDING SCREWS AND BOLTS, IN ACCORDANCE WITH MANUFACTURER'S PUBLISHED TORQUE TIGHTENING VALUES FOR CONNECTORS AND BOLTS WHERE MANUFACTURER'S TORQUING REQUIREMENTS ARE NOT INDICATED, TIGHTEN CONNECTIONS TO COMPLY WITH TIGHTENING TORQUE VALUES SPECIFIED IN UL 486A TO ASSURE PERMANENT AND EFFECTIVE GROUNDING. INSTALL CLAMP-ON CONNECTORS ON CLEAN METAL CONTACT SURFACES, TO ENSURE ELECTRICAL CONDUCTIVITY AND CIRCUIT INTEGRITY. ALL GROUND CLAMPS AND LUGS SHALL BE LISTED FOR APPLICATION AND SHALL BE MADE COMPLETELY OF BRONZE OR BRASS.

FIELD QUALITY CONTROL

GROUND RESISTANCE TEST: UPON COMPLETION OF INSTALLATION OF ELECTRICAL GROUNDING AND BONDING SYSTEMS, TEST GROUND RESISTANCE WITH GROUND RESISTANCE TESTER WHILE THE GROUND CONDUCTOR DISCONNECTED FROM THE EQUIPMENT.

WHERE TESTS SHOW RESISTANCE TO GROUND IS OVER FIVE (5) OHMS: REDUCE RESISTANCE TO FIVE (5) OHMS OR LESS BY DRIVING ADDITIONAL GROUND RODS.

RETEST AFTER MITIGATION TO DEMONSTRATE COMPLIANCE. ANY NECESSARY ADDITIONAL GROUND RODS SHALL BE PROVIDED AT NO COST TO

PROVIDE OWNER AND ENGINEER 72 HOURS NOTICE PRIOR TO GROUND RESISTANCE TESTING. COORDINATE WITH OWNER AND/OR ENGINEER, IF OWNER AND/OR ENGINEER INDICATE A DESIRE TO

PART 5 - WIRES AND CABLES

5.1 BUILDING WIRES: PROVIDE FACTORY FABRICATED WIRES OF SIZES, AMPACITY RATINGS, AND MATERIALS FOR APPLICATIONS AND SERVICES INDICATED. DUAL-LISTED THHN/THWN-2: FOR DRY AND DAMP LOCATIONS.

ALL WIRING FOR CONVENTIONAL DEVICES SHALL BE STRANDED WIRE WITH THE EXCEPTIONS AS NOTED ON THE ELECTRICAL DRAWINGS.

MC CABLE AND OTHER PREFABRICATED CABLES ARE NOT PERMITTED, EXCEPT AS CALLED FOR IN WRITING BY ENGINEER. PREFABRICATED LIGHT FIXTURE WHIPS SHALL BE PERMITTED. CONDUCTOR MATERIAL: UNLESS OTHERWISE NOTED, ALL WIRING SHALL BE COPPER, WITH CONDUCTIVITY OF NOT

LESS THAN 98% AT 20°C (68°F).

5.3 COLOR CODING: THE FOLLOWING SYSTEMS OF COLOR CODING SHALL BE STRICTLY ADHERED TO. THERE SHALL BE NO COLOR CHANGE FOR SWITCH LEGS. SWITCH LEGS SHALL BE MARKED AT ALL JUNCTIONS WITH COLORED TAPE ON EACH WIRE WITH TAPE OF CONTRASTING COLOR. THREE WAY TRAVELERS SHALL BE PURPLE. IN CASES WHERE MORE THAN ONE SET OF TRAVELERS ARE IN THE SAME CONDUIT, TRAVELERS SHALL BE MARKED WITH CIRCUIT NUMBER AND COLORED TAPE. COLORED TAPE SHALL BE SAME COLOR AS CORRESPONDING SWITCH LEG MARKING.

A. 120/208V WYE PHASE A: BLACK PHASE B: RED

PHASE C: BLUE **NEUTRAL: WHITE**

EGC (GROUND): GREEN

THE COLOR CODE ASSIGNED TO EACH PHASE WIRE SHALL BE CONSISTENTLY FOLLOWED THROUGHOUT. INSTALLATION OF WIRES AND CABLES GENERAL: INSTALL ELECTRICAL CABLES, WIRES AND WIRING CONNECTORS IN COMPLIANCE WITH APPLICABLE REQUIREMENTS OF NEC, NEMA, UL, AND NECA'S "STANDARD OF INSTALLATION" AND IN ACCORDANCE WITH

RECOGNIZED INDUSTRY PRACTICES. UNLESS OTHERWISE NOTED, ALL BRANCH CIRCUIT CONDUCTORS SHALL BE 12 AWG MINIMUM. INSTALL ALL LINE VOLTAGE WIRING IN CONDUIT, UNLESS OTHERWISE INDICATED IN WRITING BY ENGINEER. PULL CONDUCTORS SIMULTANEOUSLY WHERE MORE THAN ONE IS BEING INSTALLED IN SAME RACEWAY.

USE LUBRICANT FOR PULLING CONDUCTORS. USE ONLY PRODUCTS INDICATED FOR THE PURPOSE BY THE MANUFACTURER. USE PULLING MEANS INCLUDING, FISH TAPE, CABLE, ROPE AND BASKET WEAVE WIRE/CABLE GRIPS WHICH WILL NOT DAMAGE CABLES OR RACEWAY. CONDUCTORS OF SYSTEMS OF DIFFERENT VOLTAGES OR TYPES SHALL NOT ENTER THE SAME CONDUIT OR

JUNCTION BOX. THE NUMBER OF CURRENT CARRYING CONDUCTORS AND TOTAL NUMBER OF CONDUCTORS TO BE INSTALLED IN CONDUITS SHALL BE AS NOTED BELOW. SINGLE PHASE 120V CIRCUITS: LIMIT THREE PER RACEWAY.

ALL OTHER CIRCUITS: DEDICATED RACEWAY. DEVIATION OF INSTALLATION AS IDENTIFIED ABOVE REQUIRES PRIOR WRITTEN APPROVAL FROM

MULTIWIRE BRANCH CIRCUITS ARE PROHIBITED. ALL 120V AND 277V CIRCUITS SHALL BE PROVIDED A

DEDICATED NEUTRAL CONDUCTOR. FIELD QUALITY CONTROL PRIOR TO ENERGIZATION OF CIRCUITRY, CHECK INSTALLED FEEDER WIRES AND CABLES WITH MEGOHMMETER TO DETERMINE INSULATION RESISTANCE LEVELS TO ENSURE REQUIREMENTS ARE FULFILLED. A LIST OF FEEDERS TESTED SHALL BE SUBMITTED TO THE ENGINEER INDICATING THE INSULATION RESISTANCE LEVEL FOR

EACH CABLE. OWNER SHALL BE GIVEN THE OPTION TO WITNESS ALL TESTS. PRIOR TO ENERGIZATION, TEST WIRES AND CABLES FOR ELECTRICAL CONTINUITY AND FOR SHORT CIRCUITS. SUBSEQUENT TO WIRE AND CABLE HOOK UPS. ENERGIZE CIRCUITRY AND DEMONSTRATE FUNCTIONING IN ACCORDANCE WITH REQUIREMENTS. WHERE NECESSARY, CORRECT MALFUNCTIONING UNITS, AND THEN RETEST TO DEMONSTRATE COMPLIANCE.

PART 6 - RACEWAYS PRODUCTS - METAL CONDUIT AND TUBING

GENERAL: PROVIDE METAL CONDUIT, TUBING AND FITTINGS OF APPROPRIATE TYPES, GRADES, SIZES AND WEIGHTS (WALL THICKNESSES) FOR EACH INDICATED USE.

MINIMUM SIZE CONDUIT SHALL BE 1/2" FOR ALL SYSTEMS. MINIMUM SIZE FLEXIBLE CONDUIT SHALL BE 1/2" FOR ALL SYSTEMS (3/8" FOR LIGHT FIXTURE WHIPS). MAXIMUM LENGTH SHALL BE 6 FEET. MINIMUM LENGTH SHALL BE 4 FEET.

CAST ZINC CONDUIT FITTINGS ARE PROHIBITED. ANY CAST ZINC FITTING INSTALLED BY THIS PROJECT SHALL BE REPLACED AT CONTRACTOR'S EXPENSE.

E. ELECTRICAL METALLIC TUBING (EMT): CONDUIT: SHALL BE MILD STEEL, ELECTRICALLY WELDED, GALVANIZED, AND PRODUCED TO ANSI SPECIFICATION C80.3 AND FEDERAL SPECIFICATION WW-C-563, LATEST REVISIONS AND SHALL BE LABELED WITH THE UNDERWRITER'S LABORATORIES MARKING. 2. FITTINGS: COUPLINGS AND CONNECTORS FOR CONDUIT SHALL BE SET SCREW TYPE, STEEL OR

MALLEABLE IRON. RIGID STEEL CONDUIT CONDUIT: SHALL BE MILD STEEL, MANUFACTURED, HOT-DIPPED GALVANIZED AND PRODUCED TO ANSI SPECIFICATIONS C80.1 AND FEDERAL SPECIFICATION WW-C 581, LATEST REVISIONS, AND SHALL BE

LABELED WITH THE UNDERWRITERS' LABORATORIES MARKING. FITTINGS: CAST MALLEABLE IRON, GALVANIZED OR CADMIUM PLATED. G. FLEXIBLE METAL CONDUIT: CONDUIT: UL 1. FORMED FROM CONTINUOUS LENGTH OF SPIRALLY WOUND, INTERLOCKED ZINC

COATED STRIP STEEL FITTINGS: FLEXIBLE METAL CONDUIT FITTINGS: PROVIDE CONDUIT FITTINGS FOR USE WITH FLEXIBLE STEEL CONDUIT OF THREADLESS HINGED CLAMP TYPE. INSIDE TYPE FITTINGS ARE NOT

LIQUID TIGHT FLEXIBLE METAL CONDUIT: CONDUIT: PROVIDE LIQUID TIGHT FLEXIBLE METAL CONDUIT; CONSTRUCT OF SINGLE STRIP, FLEXIBLE, CONTINUOUS, INTERLOCKED, AND DOUBLE WRAPPED STEEL; GALVANIZED INSIDE AND OUTSIDE; COAT WITH LIQUID TIGHT JACKET OF FLEXIBLE POLYVINYL CHLORIDE (PVC). FITTINGS: PROVIDE CADMIUM PLATED, MALLEABLE IRON FITTINGS WITH COMPRESSION TYPE STEEL FERRULE AND NEOPRENE GASKET SEALING RINGS, WITH INSULATED, OR NONINSULATED THROAT. NO ENT, CORRUGATED FLEXIBLE CONDUIT, OR MT CABLE SHALL BE INSTALLED OR REUSED.

NO INTERMEDIATE METAL CONDUIT (IMC) SHALL BE INSTALLED. CONDUIT BODIES: PROVIDE GALVANIZED CAST-METAL CONDUIT BODIES OF TYPES, SHAPES, AND SIZES AS REQUIRED TO FULFILL JOB REQUIREMENTS AND NEC REQUIREMENTS. CONSTRUCT CONDUIT BODIES WITH THREADED CONDUIT-ENTRANCE ENDS, REMOVABLE COVERS, EITHER CAST OR OF GALVANIZED STEEL, AND CORROSION-RESISTANT SCREWS. SLB TYPE ARE NOT PERMITTED.

PRODUCTS - NONMETALLIC CONDUIT AND DUCTS A. GENERAL: PROVIDE NONMETALLIC CONDUIT, DUCTS AND FITTINGS OF APPROPRIATE TYPES, SIZES AND WEIGHTS FOR EACH INDICATED USE B. 90°C, UL RATED, CONSTRUCTED OF POLYVINYL CHLORIDE. FOR DIRECT BURIAL, UL LISTED AND IN

CONDUIT, AND TUBING ACCESSORIES: PROVIDE CONDUIT, TUBING AND ACCESSORIES OF TYPES, SIZES, AND MATERIALS, COMPLYING WITH MANUFACTURER'S PUBLISHED PRODUCT INFORMATION, WHICH MATE AND MATCH CONDUIT AND TUBING.

PROVIDE RACEWAYS FOR EACH INSTALLATION LOCATION AS FOLLOWS:

BELOW GRADE: PVC WITHIN CONCRETE: PVC

EXTERIOR ABOVE-GRADE LOCATIONS: RIGID GALVANIZED STEEL DAMP AND WET LOCATIONS: RIGID GALVANIZED STEEL INTERIOR LOCATIONS SUBJECT TO PHYSICAL ABUSE: RIGID GALVANIZED STEEL

INTERIOR LOCATIONS NOT SUBJECT TO PHYSICAL ABUSE: EMT UTILIZE 48" TO 72" OF FLEXIBLE METALLIC CONDUIT FOR THE FOLLOWING PURPOSES: WHIPS TO LIGHT FIXTURES. CONNECTIONS TO ANY VIBRATING OR MECHANICALLY ACTIVE EQUIPMENT.

CONNECTION TO ANY EQUIPMENT SUBJECT TO MOVEMENT. NO OTHER APPLICATIONS WITHOUT WRITTEN CONSENT FROM ENGINEER. USE LIQUID TIGHT FLEXIBLE CONDUIT WHERE FLEXIBLE CONDUIT WILL BE SUBJECTED TO ONE OR MORE OF THE FOLLOWING CONDITIONS:

EXTERIOR LOCATION. MOIST OR HUMID ATMOSPHERE WHERE CONDENSATION CAN BE EXPECTED TO OCCUR OR ACCUMULATE.

SUBJECTED TO WATER SPRAY OR DRIPPING OIL, WATER OR GREASE (E.G. KITCHEN AREAS). RACEWAY SIZE: SIZES OF RACEWAYS SHALL BE NOT LESS THAN NEC REQUIREMENTS USING THHN/THWN2 FOR SIZING AND SHALL NOT IN ANY CASE BE LESS THAN INDICATED ON THE DRAWINGS. B. LARGER SIZE RACEWAYS AND/OR PULL BOXES SHALL BE INSTALLED IF THERE IS EXCESSIVE LENGTH OF

UNBROKEN RUN OR EXCESSIVE NUMBER OF BENDS. GENERAL EXECUTION: INSTALL CONDUITS WITHOUT DAMAGING OR PENETRATING STRUCTURAL MEMBERS. METALLIC CONDUIT IN CONTACT WITH CONCRETE, GROUT, MORTAR, OR OTHER CEMENTITIOUS PRODUCTS SUCH AS GROUTED CELLS, HEADERS, LINTELS, ETC. SHALL BE PROVIDED A BITUMINOUS COATING BEFORE

C. CONNECT TO ELECTRICAL BOXES, FITTINGS AND CABINETS TO PROVIDE EFFECTIVE ELECTRICAL CONTINUITY AND RIGID MECHANICAL ASSEMBLY. RACEWAY PENETRATIONS OF FIRE RATED WALLS AND/OR FLOORS SHALL BE SEALED TO MAINTAIN THE RATING(S). ALL RELEVANT MATERIALS, AND METHODS SHALL BE PER A UL DETAIL SATISFYING NFPA RATING

REQUIREMENTS. PROVIDE NYLON PULL CORD IN EMPTY CONDUITS. ANY CONDUIT WITH KINKS, TEARS, OR OTHER MATERIAL DAMAGE SHALL BE REPLACED AT CONTRACTOR'S EXPENSE.

COMPLETE INSTALLATION OF ELECTRICAL RACEWAYS BEFORE STARTING INSTALLATION OF CABLES/WIRES WITHIN RACEWAYS. 6.6 SPECIAL EMT REQUIREMENTS:

EMT SHALL NOT BE INSTALLED BELOW 8" AFF. EMT SHALL NOT BE INSTALLED EXPOSED BELOW 72" AFF. EMT SHALL BE INSTALLED IN DRY AND INDOOR LOCATIONS ONLY. CONDUITS INSTALLED BELOW GRADE:

A. PROVIDE MARKING TAPE WITH TRACER WIRE 24" ABOVE ANY BELOW-GRADE SERVICE CONDUIT AND ANY OTHER CONDUIT INSTALLED IN A TRENCH. ALL RIGID METAL CONDUIT BELOW GRADE SHALL BE PROVIDED A BITUMINOUS COATING

METALLIC RACEWAYS INSTALLED BELOW GRADE SHALL HAVE CONDUIT THREADS PAINTED WITH COLD GALVANIZING PAINT. REMOVE OIL AND CLEAN PRIOR TO PAINTING. DRAW UP COUPLING AND CONDUIT SUFFICIENTLY TIGHT TO ENSURE WATER TIGHTNESS. INSTALL ALL UNDERGROUND CONDUITS A MINIMUM OF 42" BELOW FINISHED GRADE (TO TOP OF CONDUIT).

EXCEPT WHERE BELOW BUILDING FOUNDATION. UNDERGROUND CONDUIT SHALL BE INSPECTED AND APPROVED PRIOR TO BACKFILLING. PRIMARY RACEWAY SHALL BE BURIED 48" TO TOP OF CONDUIT. CONDUIT BELOW CONCRETE SLABS AND FOOTERS UNDER OR INSIDE BUILDING FOUNDATIONS SHALL BE MINIMUM OF 6" BELOW BOTTOM OF CONCRETE AND/OR AT AN ADEQUATE DEPTH TO CONCEAL RADIUS OF BENDS.

CONDUITS WITHIN CONCRETE SLABS OR ENCASED IN CONCRETE: NO CONDUIT SHALL BE INSTALLED WITHIN SLABS WITHOUT PRIOR WRITTEN APPROVAL FROM STRUCTURAL ENGINEER. PROVIDE STRUCTURAL ENGINEER WITH WHATEVER DESCRIPTION AND DRAWINGS OF THE PROPOSED INSTALLATION WHICH STRUCTURAL ENGINEER MAY REQUIRE.

CONDUITS ABOVE GRADE: INSTALL EXPOSED CONDUITS AND ALL CONDUIT ABOVE GRADE AND EXTENSIONS FROM CONCEALED CONDUIT SYSTEMS NEATLY, PARALLEL WITH, OR AT RIGHT ANGLES TO WALLS AND BUILDING STRUCTURE.

CONDUIT SHALL NOT BE INSTALLED ON ROOF TOPS OR WALKWAY COVERS. FLEXIBLE METAL CONDUIT SHALL NOT BE INSTALLED IN DAMP OR WET LOCATIONS, THROUGH WALLS, OR USED AS A RACEWAY IN CONCEALED OR INACCESSIBLE AREAS. IT SHALL BE SUPPORTED WITHIN 12" OF CONNECTORS AND AT LEAST ONCE EVERY 54".

6.10 PVC CONDUITS: PVC SUBJECT TO PHYSICAL DAMAGE SHALL BE SCHEDULE 80. ALL OTHER PVC SHALL BE HEAVY WALL TYPE (SCHEDULE 40) CONDUIT B. PVC CONDUIT SHALL BE INSTALLED WITH RIGID STEEL ELBOWS AND RISERS. (EXCEPTION: LOW VOLTAGE

WITH INNER DUCTS MAY BE PVC) INSTALLATION SHALL BE SUCH THAT WIRE PULLING ROPE OR CABLE WILL NOT DAMAGE ELBOWS. CONDUIT, ELBOWS, AND RISERS SHALL BE INSTALLED FOR ALL PRIMARY SERVICES SUBJECT TO UTILITY

ALL PRIMARY ELBOWS SHALL BE RMC, EXCEPT WHERE REQUIRED OTHERWISE BY UTILITY. ALL PRIMARY RISERS SHALL BE RMC, EXCEPT WHERE REQUIRED OTHERWISE BY UTILITY. 6.11 GENERAL CONDUIT FITTING REQUIREMENTS:

PROVIDE EITHER PLASTIC BUSHINGS OR PLASTIC INSULATING THROATS FOR ALL FITTINGS PRIOR TO B. INSTALL INSULATED-TYPE BUSHINGS FOR TERMINATING CONDUITS 1" AND LARGER. BUSHINGS ARE TO HAVE FLARED BOTTOM AND RIBBED SIDES. UPPER EDGE SHALL HAVE PHENOLIC INSULATING RING MOLDED INTO BUSHING. BUSHINGS SHALL BE INSTALLED DURING ROUGH-IN AND BEFORE INSTALLING CONDUCTORS.

SNAP-ON BUSHINGS ARE PROHIBITED.

7.1 PRODUCTS - FABRICATED MATERIALS

OUTLET BOXES: OUTLET WIRING BOXES SHALL BE GALVANIZED COATED FLAT ROLLED SHEET STEEL, OF SHAPES, VOLUMES, AND DIMENSIONS AS INDICATED, SUITABLE FOR INSTALLATION AT RESPECTIVE LOCATIONS. OUTLET BOXES SHALL BE CONSTRUCTED WITH MOUNTING HOLES, AND WITH CABLE AND CONDUIT SIZE KNOCKOUT OPENINGS IN BOTTOM AND SIDES.

CEILING BOXES SHALL BE FOUR INCH (4") SQUARE OR OCTAGONAL, ONE AND ONE-HALF INCH (1-1/2") DEEP FOR

EXPOSED WORK OR FURRED CEILING WORK, AND b. THREE INCHES (3") DEEP FOR CONCRETE WORK.

PLASTER RINGS AND/OR FIXTURE STUDS SHALL BE PROVIDED WHERE REQUIRED. FLUSH-MOUNTED BOXES SHALL BE PROVIDED WITH EXTENSION RINGS AND/OR COVERS WITH SUFFICIENT DEPTH TO BRING THE COVERS FLUSH WITH THE FINISHED WALL. 6. OUTLET BOXES FOR EXPOSED WALL MOUNTING SHALL BE CAST METAL TYPE "FS" OR "FD" BOXES WITH SUITABLE CAST ALUMINUM COVERS.

FXTERIOR BOXES: ALL EXTERIOR BOXES SHALL BE APPROPRIATELY LISTED OR INDICATED FOR THE USE. BOXES FOR EXTERIOR RECEPTACLES SHALL BE PROVIDED WITH IN-USE WEATHERPROOF RECEPTACLE COVERS. SUCH COVERS SHALL HAVE SPRING HINGED LIDS. WEATHERPROOF COVERS SHALL MEET CODE REQUIREMENTS FOR COVERS INTENDED

FOR USE WITH ATTACHMENT PLUGS. SECTIONAL OR GANGABLE BOXES SHALL NOT BE INSTALLED. THROUGH-WALL BOXES SHALL NOT BE INSTALLED.

BOX EXTENSIONS OR "GOOFINGS" SHALL NOT BE INSTALLED.

"HANDY" BOXES, ETC. SHALL NOT BE PERMITTED. ALL PULL BOXES USED OUTSIDE AND UNDERGROUND SHALL BE PRE-CAST CONCRETE POLYMER, WITH CONCRETE POLYMER COVER. SUCH BOXES SHALL BE OF SUFFICIENT SIZE TO MAKE ALL ENTRANCES AND EXITS

FROM BOX IN ONE HORIZONTAL PLANE. JUNCTION AND PULL BOXES: PROVIDE GALVANIZED CODE GAUGE SHEET STEEL JUNCTION AND PULL BOXES, WITH SCREW ON COVERS; OF TYPES, SHAPES AND SIZES, TO SUIT EACH RESPECTIVE LOCATION AND INSTALLATION; WITH WELDED SEAMS AND EQUIPPED WITH STAINLESS STEEL NUTS, BOLTS, SCREWS AND WASHERS.

GENERAL EXECUTION: INSTALL ALL ELECTRICAL BOXES AND FITTINGS AS INDICATED, IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS, APPLICABLE CODE, AND RECOGNIZED INDUSTRY PRACTICES, TO FULFILL PROJECT REQUIREMENTS. COORDINATE INSTALLATION OF ELECTRICAL BOXES AND FITTINGS WITH WIRE/CABLE, WIRING DEVICES, AND

RACEWAY INSTALLATION WORK. PROVIDE WEATHERPROOF OUTLETS FOR INTERIOR AND EXTERIOR LOCATIONS EXPOSED TO WEATHER OR

ALL OUTLET AND DEVICE BOXES SHALL BE INDEPENDENTLY SUPPORTED FROM STRUCTURE

ORIENT ALL BOXES FOR EASE OF ACCESSIBILITY. INSTALL OVERHEAD BOXES COVER-DOWN UNLESS OTHERWISE DIRECTED.

COORDINATE ALL BOXES WITH OTHER TRADES. SECURE ELECTRICAL BOXES FIRMLY AND RIGIDLY TO STRUCTURE, OR SOLIDLY EMBED ELECTRICAL BOXES IN CONCRETE OR MASONRY

PROTECT INSTALLED BOXES FROM CONSTRUCTION DEBRIS AND DAMAGE. ALL OUTSIDE, ABOVE GRADE PULL BOXES SHALL BE GALVANIZED. ALL FLUSH MOUNTED BOXES, REGARDLESS OF SYSTEM OR VOLTAGE, SHALL BE INSTALLED FLUSH WITHIN 1/8" OF WALL FINISH OR FINISHED FACE OF TACKBOARDS, SOUND BOARDS, CABINETS, ETC. BOX EXTENSION OR GOOF RINGS SHALL NOT BE INSTALLED.

EXTERIOR BOXES: UNLESS OTHERWISE NOTED, EXTERIOR BOXES ON WALLS SHALL BE INSTALLED FLUSH WITH WALL. COORDINATE WITH MASONRY AS REQUIRED. PROVIDE SUITABLE INSTALLATION FOR EACH APPLICATION, INCLUDING FACE PLATE GASKETS AND

CORROSION RESISTANT PLUGS AND FASTENERS. MAINTAIN ALL FIRE AND HEAT RATINGS BY INSTALLING BOXES IN RATED PARTITIONS ACCORDING TO A UL DETAIL FOR AN ACCEPTABLE PRODUCT. NO UL RATING DETAIL SHALL BE USED PRIOR TO APPROVAL BY ARCHITECT.

ALL BOXES INSTALLED IN RATED WALLS SHALL BE RIGIDLY SECURED TO STRUCTURE. ALL VOIDS BETWEEN BOXES AND SURROUNDING WALL SURFACES SHALL BE COMPLETELY FILLED WITH AN APPROVED MATERIAL POSITION RECESSED OUTLET BOXES ACCURATELY TO ALLOW FOR SURFACE FINISH THICKNESS.

SET FLOOR BOXES LEVEL AND FLUSH WITH FINISH FLOORING MATERIAL. OUTLET BOX ACCESSORIES: PROVIDE COMPATIBLE OUTLET BOX ACCESSORIES AS REQUIRED FOR INSTALLATION, INCLUDING:

BOX SUPPORTS, BONDING ACCESSORIES, MOUNTING EARS AND BRACKETS, WALLBOARD HANGERS BOX EXTENSION RINGS.

FIXTURE STUDS, CABLE CLAMPS, AND METAL STRAPS FOR SUPPORTING OUTLET BOXES.

7.5 IDENTIFICATION: BOX LIDS AND CONDUIT COUPLINGS SHALL BE COLOR CODED AS FOLLOWS: 120/208V WYE: BLACK FIRE ALARM: RED

ALL OTHERS: PAINT A UNIQUE COLOR. PART 8 - ELECTRICAL IDENTIFICATION 8.1 ELECTRICAL IDENTIFICATION MATERIALS

SPECIFICATION SECTIONS.

TELECOM: BLUE

ENGRAVED PLASTIC LAMINATE SIGNS: PROVIDE ENGRAVING STOCK MELAMINE PLASTIC LAMINATE, IN SIZE AND THICKNESS INDICATED. ENGRAVE WITH ENGRAVER'S STANDARD LETTER STYLE, OF SIZES AND WORDING INDICATED. DEFAULT COLOR SHALL BE WHITE FACE WITH BLACK CORE PLIES, RESULTING IN BLACK LETTERS ON A FIELD OF WHITE. PROVIDE ALTERNATIVE COLORS AS INDICATED ON PLANS OR IN OTHER

SIGNS FOR FIRE ALARM WARNING SYSTEMS SHALL BE RED FACE AND WHITE CORE PLIES, RESULTING IN WHITE LETTERS ON A FIELD OF RED. THICKNESS: MINIMUM ONE-SIXTEENTH INCH (1/16"), EXCEPT AS OTHERWISE INDICATED. FASTENERS: SELF-TAPPING STAINLESS STEEL SCREWS, EXCEPT CONTACT TYPE PERMANENT

ADHESIVE WHERE SCREWS CANNOT OR SHOULD NOT PENETRATE SUBSTRATE. LETTERING AND GRAPHICS GENERAL: COORDINATE NAMES, ABBREVIATIONS AND OTHER DESIGNATIONS USED IN ELECTRICAL IDENTIFICATION WORK WITH CORRESPONDING DESIGNATIONS SHOWN, SPECIFIED OR SCHEDULED. PROVIDE NUMBERS, LETTERING AND WORDING AS INDICATED, OR, IF NOT OTHERWISE INDICATED, AS

RECOMMENDED BY MANUFACTURER OR AS REQUIRED FOR PROPER IDENTIFICATION AND OPERATION/MAINTENANCE OF ELECTRICAL SYSTEMS AND EQUIPMENT. APPLICATION AND INSTALLATION GENERAL INSTALLATION REQUIREMENTS: INSTALL ELECTRICAL IDENTIFICATION PRODUCTS AS INDICATED, IN ACCORDANCE WITH

MANUFACTURER'S WRITTEN INSTRUCTIONS, AND REQUIREMENTS OF NEC.

TRANSFORMERS

ON ACCESS PANEL,

INSTALL IDENTIFICATION AFTER COMPLETION OF PAINTING. REGULATIONS: COMPLY WITH GOVERNING REGULATIONS AND REQUESTS OF GOVERNING AUTHORITIES FOR IDENTIFICATION OF ELECTRICAL WORK. EQUIPMENT/SYSTEM IDENTIFICATION: PROVIDE ENGRAVED PLASTIC LAMINATE SIGNS WITH TEXT MATCHING TERMINOLOGY AND

COORDINATION: WHERE IDENTIFICATION IS TO BE APPLIED TO SURFACES WHICH REQUIRE FINISH,

NUMBERING OF THE CONTRACT DOCUMENTS. PROVIDE SIGNS FOR EACH UNIT OF THE FOLLOWING CATEGORIES OF ELECTRICAL WORK: PANELBOARDS, ELECTRICAL CABINETS, DISCONNECT ENCLOSURES, CONTACTORS,

TERMINAL CABINETS, FIRE ALARM CONTROL PANELS. FIRE ALARM EXTENDER PANELS, ANY OTHER ENCLOSURE HOUSING ACTIVE COMPONENTS. UNLESS OTHERWISE NOTED, INSTALL SIGNS AND LABELS TO MAXIMIZE VISIBILITY AND READABILITY WITHOUT INTERFERENCE WITH OPERATION AND MAINTENANCE OF EQUIPMENT. ALL POWER JUNCTION BOX COVERS SHALL BE MARKED WITH PANEL NAME AND CIRCUIT NUMBERS. ALL OTHER (FIRE ALARM, INTERCOM, ETC.) JUNCTION BOX COVERS SHALL BE MARKED ACCORDING TO SYSTEM TYPE. THESE MARKINGS SHALL BE MADE WITH A PERMANENT TYPE MARKER.

PANEL SCHEDULES SHALL BE TYPED, AND SHALL INDICATE ROOM NUMBERS AND LOAD INFORMATION. ABOVE CEILING IDENTIFICATION: TO ELECTRICAL EQUIPMENT INSTALLED ABOVE FINISHED CEILING, IDENTIFICATION SHALL BE PLACED:

NEXT TO ACCESS PANEL, OR ON TO A PERMANENT PART OF THE CEILING SYSTEM, SUCH AS A TEE-BAR OF A LAY-IN SECURE ALL LABELS AND SIGNS TO SUBSTRATE WITH APPROVED FASTENERS, UNLESS FASTENERS WOULD VIOLATE LISTINGS OR CREATE AN UNSAFE CONDITION. WHERE FASTENERS CANNOT

BE USED, UTILIZE APPROVED PERMANENT ADHESIVE MEANS OF ATTACHMENT.

Mitchell Gulledge Engineering, Inc 210 SW 4th Avenue

FL License EB-31501 p.352.745.3991

www.mitchellgulledge.com

Andrew P. McCaddin PE - 83318

OWNER: CITY OF GAINESVILLE

874 SE 4TH STREET

GAINESVILLE, FL 32601 Gainesville. Citizen centered

People empowered OWNER'S PROJECT NUMBER:

PROJECT 🗂 NUMBER: 19050. **REVISIONS:** DESC DATE

> FINAL CONSTRUCTION DOCUMENTS

> > ISSUE DATE: 08/26/2019

> > > CHECKED BY:

SHEET NUMBER:

SHEET TITLE: **ELECTRICAL SPECIFICATIONS**

```
ELECTRICAL SPECIFICATIONS (CONTINUED)
9.1 MANUFACTURERS
      A. APPROVED MANUFACTURERS: ALL PANELBOARD PRODUCTS SHALL BE THE PRODUCE OF ONE OF THE
                  SIEMENS
            BASIS OF DESIGN:
9.2 MATERIALS AND COMPONENTS
            GENERAL:
             BREAKER
            BUSES:
            CIRCUIT BREAKERS:
            ENCLOSURES:
            GROUNDING:
            IDENTIFICATION:
            MISCELLANEOUS:
     INSTALLATION
      ON THE DRAWINGS.
     FIELD QUALITY CONTROL
       GROUNDING.
      PROTECTION
```

```
GROUND FAULT CIRCUIT INTERRUPTERS
              SQUARE D (SCHNEIDER ELECTRIC)
                                                                                                                         SWITCHES
              GENERAL ELECTRIC
                                                                                                                        WALL PLATES
              CUTLER HAMMER (EATON)
                                                                                                                ACCEPTABLE MANUFACTURERS
                                                                                                                        MANUFACTURERS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, MANUFACTURERS PROVIDING WIRING
                                                                                                                 DEVICES WHICH MAY BE INCORPORATED IN THE WORK INCLUDE, BUT ARE NOT LIMITED TO, THE FOLLOWING (FOR EACH
             ITEMS SPECIFIED ARE TO ESTABLISH A STANDARD OF QUALITY FOR DESIGN, FUNCTION,
                                                                                                                 TYPE AND RATING OF WIRING DEVICE):
       MATERIALS, AND APPEARANCE.
                                                                                                                                HUBBELL, INC.
              EQUIVALENT PRODUCTS BY OTHER MANUFACTURERS ARE ACCEPTABLE.
                                                                                                                                LEVITON MANUFACTURING CO., INC.
              THE DESIGN PROFESSIONAL WILL BE THE SOLE JUDGE OF THE BASIS OF WHAT IS EQUIVALENT.
                                                                                                                                PASS AND SEYMOUR, INC.
              ANY ADJUSTMENTS REQUIRED TO MEET EQUIVALENCY REQUIREMENTS SHALL BE AT
                                                                                                                               EATON, INC.
       CONTRACTOR'S EXPENSE.
                                                                                                         10.3 FABRICATED WIRING DEVICES
      5. SEE DRAWINGS FOR SCHEDULES INDICATING ADDITIONAL BASIS OF DESIGN INFORMATION.
                                                                                                                       GENERAL: PROVIDE FACTORY FABRICATED WIRING DEVICES, IN TYPES, COLORS, AND ELECTRICAL RATINGS
                                                                                                                 FOR APPLICATIONS INDICATED AND WHICH COMPLY WITH NEMA STDS. PUB/NO. WD
                                                                                                                                NORMAL POWER: PROVIDE WHITE COLOR DEVICES EXCEPT AS OTHERWISE INDICATED.
              ALL RATINGS SHALL MEET OR EXCEED THE VALUES INDICATED ON THE DRAWINGS.
                                                                                                                                RECEPTACLES:
                                                                                                                                     RECEPTACLES SHALL BE SPECIFICATION GRADE, WITH BACK-FED WIRING CONNECTIONS AND
              PANELBOARDS SHALL BE SUITABLE FOR USE AS SERVICE EQUIPMENT WHEN APPLICATION
       REQUIREMENTS COMPLY WITH UL 67 AND NEC ARTICLE 230.
                                                                                                                                 CLAMPING MECHANISMS ON ALL TERMINALS.
      FEEDER CONNECTION(S):
                                                                                                                                       ALL RECEPTACLES SHALL BE DUPLEX NEMA 5-20R UNLESS INDICATED OTHERWISE.
                                                                                                                                       BASE RECEPTACLE SHALL BE NEMA 5-20R SHALL BE HUBBELL 5362 OR LEVITON 5362. LEVITON
              INTERIORS SHALL BE FIELD CONVERTIBLE FOR TOP OR BOTTOM INCOMING FEED.
              MAIN CIRCUIT BREAKERS SHALL BE VERTICALLY MOUNTED.
                                                                                                                                 'S' SERIES (E.G. 5362-SW) IS NOT ACCEPTABLE. PROVIDE ADDITIONAL FEATURES AS DESCRIBED
              SUB-FEED CIRCUIT BREAKERS SHALL BE VERTICALLY MOUNTED.
              MAIN LUG INTERIORS UP TO 400 AMPERES SHALL BE FIELD CONVERTIBLE TO MAIN CIRCUIT
                                                                                                                                      WEATHERPROOF: ALL RECEPTACLES MARKED 'WP' ON PLANS SHALL BE WEATHERPROOF-
                                                                                                                                 TYPE, AND SHALL BE MARKED 'WP'. SUCH RECEPTACLES SHALL ALSO BE GFCI TYPE UNLESS
                                                                                                                                 OTHERWISE INDICATED.
              PROVIDE ONE CONTINUOUS BUS BAR PER PHASE.
                                                                                                                                    GFCI: ALL RECEPTACLES MARKED 'G' OR 'WP' ON PLANS SHALL BE GFCI TYPE, SELF TESTING,
              EACH BUS BAR SHALL HAVE SEQUENTIALLY PHASED BRANCH CIRCUIT CONNECTORS SUITABLE
                                                                                                                                CONFORMING TO CURRENT UL REQUIREMENTS. "LATE MODEL" GFCIs NOT SATISFYING CURRENT UL
       FOR PLUG-ON OR BOLT-ON BRANCH CIRCUIT BREAKERS.
                                                                                                                                REQUIREMENTS ARE FORBIDDEN. "SLIM" MODELS ARE FORBIDDEN.
              THE BUSING SHALL BE FULLY RATED.
                                                                                                                               SNAP: PROVIDE TOGGLE SWITCHES, RATED 20 AMPS AT 120/277 VOLTS, QUIET TYPE, UL L WITHOUT
              BUSING SHALL BE PLATED COPPER.
              BUS BAR PLATING SHALL RUN THE ENTIRE LENGTH OF THE BUS BAR.
                                                                                                                         DERATING FOR TUNGSTEN LAMP LOADS OR INDUCTIVE LOADS. "SLIM" SERIES (E.G. 1221S) ARE FORBIDDEN. THE
                                                                                                                        FOLLOWING CATALOG NUMBERS ARE BASIS OF DESIGN LEVITON/HUBBELL
              SOLID NEUTRAL(S) SHALL BE PLATED AND LOCATED IN THE MAINS COMPARTMENT UP TO 225
       AMPERES SO INCOMING NEUTRAL CABLE MAY BE OF THE SAME LENGTH.
                                                                                                                                a. SINGLE POLE: 1221
              INTERIOR PHASE BUS SHALL BE PRE-DRILLED TO ACCOMMODATE FIELD INSTALLABLE OPTIONS
                                                                                                                                b. TWO POLE: 1222
       (I.E., SUB-FEED LUGS, SUB-FEED CIRCUIT BREAKERS, THRU-FEED LUGS, ETC.).
                                                                                                         10.4 WIRING DEVICE ACCESSORIES
                                                                                                                       WALL PLATES:
             CIRCUIT BREAKERS SHALL BE UL-LISTED WITH AMPERAGE RATINGS. INTERRUPTING RATINGS. AND
                                                                                                                              UNLESS OTHERWISE INDICATED, WALL PLATE MATERIAL SHALL BE AS FOLLOWS:
       NUMBER OF POLES AS INDICATED AND SCHEDULED ON THE DRAWINGS.
                                                                                                                                       INTERIOR FINISHED SPACES: NYLON, EXCEPT WHERE INDICATED AS 'WP'.
             TWO-POLE AND THREE-POLE CIRCUIT BREAKERS SHALL HAVE COMMON TRIPPING OF ALL POLES.
                                                                                                                                       INTERIOR UNFINISHED SPACES: GALVANIZED, EXCEPT WHERE INDICATED AS 'WP'.
                                                                                                                                       EXTERIOR OR 'WP': COVER AS PART OF WEATHERPROOF ASSEMBLY.
       CIRCUIT BREAKER FRAME SIZES ABOVE 100 AMPERES SHALL HAVE A SINGLE MAGNETIC TRIP ADJUSTMENT
       LOCATED ON THE FRONT OF THE CIRCUIT BREAKER THAT SHALL ALLOW THE USER TO SIMULTANEOUSLY
                                                                                                                              PROVIDE COMMERCIAL SPECIFICATION GRADE WALL PLATES FOR SINGLE AND COMBINATION WIRING
       SELECT THE DESIRED TRIP LEVEL OF ALL POLES. CIRCUIT BREAKERS SHALL HAVE A PUSH-TO-TRIP BUTTON
                                                                                                                         DEVICES, OF TYPES, SIZES, AND WITH GANGING AND CUTOUTS AS INDICATED. SELECT PLATES WHICH MATE
       FOR MAINTENANCE AND TESTING PURPOSES.
                                                                                                                         AND MATCH WIRING DEVICES. CONSTRUCT WITH METAL SCREWS FOR SECURING PLATES TO DEVICES: SCREW
            CIRCUIT BREAKERS SHALL HAVE AN OVERCENTER, TRIP-FREE, TOGGLE MECHANISM WHICH SHALL
                                                                                                                         HEADS TO MATCH FINISH OF PLATES.
                                                                                                         10.5 INSTALLATION OF WIRING DEVICES
       PROVIDE QUICK-MAKE, QUICK-BREAK CONTACT ACTION.
       4. CIRCUIT BREAKERS SHALL HAVE A PERMANENT TRIP UNIT WITH THERMAL AND MAGNETIC TRIP
                                                                                                                A. INSTALL WIRING DEVICES AS INDICATED, IN ACCORDANCE WITH MANUFACTURER'S WRITTEN INSTRUCTIONS,
                                                                                                                 APPLICABLE REQUIREMENTS OF NEC AND NECA'S "STANDARD OF INSTALLATION", AND IN ACCORDANCE WITH
       ELEMENTS IN EACH POLE.
             MAIN CIRCUIT BREAKER THERMAL ELEMENTS SHALL BE TRUE RMS SENSING AND SHALL BE
                                                                                                                 RECOGNIZED INDUSTRY PRACTICES TO FULFILL PROJECT REQUIREMENTS.
                                                                                                                       INSTALL WIRING DEVICES ONLY IN ELECTRICAL BOXES WHICH ARE CLEAN; FREE FROM EXCESS BUILDING
       FACTORY CALIBRATED TO OPERATE IN A 40 DEGREE C AMBIENT ENVIRONMENT.
              CIRCUIT BREAKER HANDLE AND FACEPLATE SHALL INDICATE RATED AMPACITY.
                                                                                                                 MATERIALS, DIRT, AND DEBRIS,
              STANDARD CONSTRUCTION CIRCUIT BREAKERS SHALL BE CSA AND UL-LISTED FOR REVERSE
                                                                                                                        REAR WIRE ALL WIRING DEVICE CONNECTIONS. SIDE TERMINATIONS ARE FORBIDDEN.
       CONNECTION WITHOUT RESTRICTIVE LINE OR LOAD MARKINGS.
                                                                                                                        TIGHTEN CONNECTORS AND TERMINALS, INCLUDING SCREWS AND BOLTS, IN ACCORDANCE WITH EQUIPMENT
            CIRCUIT BREAKER ESCUTCHEON SHALL HAVE INTERNATIONAL I/O MARKINGS, IN ADDITION TO
                                                                                                                 MANUFACTURER'S PUBLISHED TORQUE TIGHTENING VALUES FOR WIRING DEVICES. WHERE MANUFACTURER'S
       STANDARD ON/OFF MARKINGS.
                                                                                                                 TORQUEING REQUIREMENTS ARE NOT INDICATED, TIGHTEN CONNECTORS AND TERMINALS TO COMPLY WITH
            CIRCUIT BREAKER HANDLE ACCESSORIES SHALL PROVIDE PROVISIONS FOR LOCKING HANDLE IN
                                                                                                                 TIGHTENING TORQUES SPECIFIED IN UL STDS 486A AND B. USE PROPERLY SCALED TORQUE INDICATING HAND TOOL.
       THE ON OR OFF POSITION.
                                                                                                                       ORIENT ALL RECEPTACLES WITH THE GROUND PIN UP, EXCEPT:
       10. CIRCUIT BREAKERS SHALL BE UL-LISTED FOR USE WITH THE FOLLOWING ACCESSORIES, AND
                                                                                                                                WHERE RECEPTACLE SERVES EQUIPMENT WHICH MAY HAVE A 90° PLUG, ORIENT RECEPTACLE
       SHALL BE PROVIDED SUCH ACCESSORIES AS INDICATED AND SCHEDULED ON THE DRAWINGS:
                                                                                                                         GROUND PIN DOWN.
                     SHUNT TRIP.
                                                                                                                         2. ORIENT HORIZONTALLY INSTALLED RECEPTACLES (E.G. RECEPTACLES IN SURFACE RACEWAY) WITH
                      UNDER VOLTAGE TRIP
                                                                                                                         THE NEUTRAL PIN UP.
                      GROUND FAULT SHUNT TRIP
                                                                                                         10.6 GROUNDING
                                                                                                                       PROVIDE EQUIPMENT GROUNDING CONNECTIONS FOR ALL WIRING DEVICES, UNLESS OTHERWISE INDICATED.
                      AUXILIARY SWITCH.
                                                                                                                 TIGHTEN CONNECTIONS TO COMPLY WITH TIGHTENING TORQUES SPECIFIED IN UL STD 486A TO ASSURE PERMANENT
                      ALARM SWITCH.
                      COMPRESSION LUG KITS.
                                                                                                                 AND EFFECTIVE GROUNDS. GROUNDING CONDUCTOR SHALL BE BONDED TO ALL BOXES WITH A SEPARATE SCREW.
                                                                                                                 SCREWS USED TO SUPPORT BOXES ARE NOT TO BE USED FOR GROUNDING. BONDING SCREWS SHALL BE INSTALLED IN
              THE EXPOSED FACEPLATES OF BRANCH CIRCUIT BREAKERS SHALL BE FLUSH WITH ONE ANOTHER.
                                                                                                                 BOX DURING ROUGH-IN INSTALLATION. BONDING SCREWS SHALL BE GREEN HEXAGONAL TYPE.
              MOLDED CASE BRANCH CIRCUIT BREAKERS SHALL HAVE BOLT-ON TYPE BUS CONNECTORS.
              BREAKER SHALL BE UL LISTED WITH THE FOLLOWING RATINGS: (15-125A) HEATING, AIR
       CONDITIONING, AND REFRIGERATION (HACR), (15-30A) HIGH INTENSITY DISCHARGE (HID), (15-20A) SWITCH
                                                                                                         PART 11 - SAFETY SWITCHES
       DUTY (SWD), (15-50A) EQUIPMENT PROTECTION DEVICE (EPD) (480Y/277VAC MAXIMUM).
                                                                                                                MANUFACTURERS
                                                                                                                       APPROVED MANUFACTURERS: ALL SAFETY SWITCH PRODUCTS SHALL BE THE PRODUCE OF ONE OF THE
              TYPE 1 BOXES:
                    BOXES SHALL BE HOT-DIP ZINC GALVANIZED STEEL CONSTRUCTED IN ACCORDANCE WITH
                                                                                                                                SQUARE D (SCHNEIDER ELECTRIC)
              UL 50 REQUIREMENTS. UNPAINTED GALVANNEALED STEEL IS NOT ACCEPTABLE.
                                                                                                                                BUSSMANN (EATON)
                     BOXES SHALL HAVE REMOVABLE ENDWALLS WITH KNOCKOUTS LOCATED ON ONE END.
                                                                                                                                GENERAL ELECTRIC
              BOXES SHALL HAVE WELDED INTERIOR MOUNTING STUDS. INTERIOR MOUNTING BRACKETS ARE
                                                                                                                                SIEMENS
                                                                                                         11.2 MATERIALS AND COMPONENTS
                  BOXES IN FIRE AND/OR TEMPERATURE RATED WALLS SHALL BE PROVIDED WITH A LISTED
              MAT OR WRAP INSTALLED PER AN APPLICABLE UL DETAIL. 3M INTERAM ENDOTHERMIC MAT OR
                                                                                                                             MINIMUM RATINGS SHALL BE AS INDICATED ON THE DRAWINGS.
                                                                                                                        SWITCH INTERIOR:
              TYPE 1 FRONTS:
                                                                                                                              ALL SWITCHES SHALL HAVE SWITCH BLADES WHICH ARE VISIBLE WHEN THE SWITCH IS OFF AND THE
                      FRONT SHALL MEET STRENGTH AND RIGIDITY REQUIREMENTS PER UL 50 STANDARDS.
                      FRONT SHALL HAVE GREY ENAMEL ELECTRODEPOSITED OVER CLEANED PHOSPHATIZED
                                                                                                                                LUGS SHALL BE FRONT REMOVABLE AND UL LISTED FOR 75°C CONDUCTORS.
                                                                                                                                 ALL CURRENT CARRYING PARTS SHALL BE PLATED TO RESIST CORROSION.
                      FRONTS SHALL BE HINGED ONE-PIECE WITH DOOR, OR DOOR-IN-DOOR.
                                                                                                                                 SWITCHES SHALL HAVE REMOVABLE ARC SUPPRESSORS TO FACILITATE EASY ACCESS TO LINE SIDE
                      MOUNTING SHALL BE FLUSH OR SURFACE AS INDICATED AND SCHEDULED ON THE
                                                                                                                                SWITCHES SHALL HAVE PROVISIONS FOR A FIELD INSTALLABLE ELECTRICAL INTERLOCK.
                    PANELBOARDS SHALL HAVE MONO-FLAT FRONTS WITH CONCEALED DOOR HINGES AND
                                                                                                                       GROUNDING:
              MOUNTED WITH TRIM SCREWS.
                                                                                                                              A SOLIDLY BONDED COPPER EQUIPMENT GROUND BAR SHALL BE PROVIDED.
                     FRONT SHALL NOT BE REMOVABLE WITH THE DOOR LOCKED.
                                                                                                                       IDENTIFICATION:
                      DOORS ON FRONT SHALL HAVE ROUNDED CORNERS AND EDGES SHALL BE FREE OF
                                                                                                                               NAMEPLATES SHALL CONTAIN PRODUCT INFORMATION AND CATALOG NUMBER OR FACTORY ORDER
                                                                                                                         NUMBER. CSA AND UL-LISTED LABEL, AND SHORT CIRCUIT CURRENT RATING SHALL BE DISPLAYED ON THE
                     FRONT SHALL HAVE CYLINDRICAL TUMBLER TYPE LOCK WITH CATCH AND SPRING-
              LOADED STAINLESS STEEL DOOR PULL.
                                                                                                                       SWITCH MECHANISM:
                      LOCK ASSEMBLIES SHALL BE KEYED ALIKE.
                                                                                                                               SWITCH OPERATING MECHANISM SHALL BE QUICK-MAKE, QUICK-BREAK SUCH THAT, DURING NORMAL
                      ONE KEY SHALL BE PROVIDED WITH EACH LOCK.
                                                                                                                         OPERATION OF THE SWITCH, THE OPERATION OF THE CONTACTS SHALL NOT BE CAPABLE OF BEING
                     A CLEAR PLASTIC DIRECTORY CARDHOLDER SHALL BE MOUNTED ON THE INSIDE OF
                                                                                                                         RESTRAINED BY THE OPERATING HANDLE AFTER THE CLOSING OR OPENING ACTION OF THE CONTACTS HAS
                                                                                                                                THE OPERATING HANDLE SHALL BE AN INTEGRAL PART OF THE BOX, NOT THE COVER.
             A SOLIDLY BONDED COPPER EQUIPMENT GROUND BAR SHALL BE PROVIDED.
                                                                                                                                PROVISIONS FOR PADLOCKING THE SWITCH IN THE OFF POSITION WITH A PADLOCK SHALL BE
              NAMEPLATES SHALL CONTAIN SYSTEM INFORMATION AND CATALOG NUMBER OR FACTORY ORDER
                                                                                                                        4. THE HANDLE POSITION SHALL TRAVEL AT LEAST 90 BETWEEN OFF AND ON POSITIONS TO CLEARLY
       NUMBER. INTERIOR WIRING DIAGRAM, NEUTRAL WIRING DIAGRAM, UL-LISTED LABEL, AND SHORT CIRCUIT
                                                                                                                         DISTINGUISH AND INDICATE HANDLE POSITION.
       CURRENT RATING SHALL BE DISPLAYED ON THE INTERIOR OR IN A BOOKLET FORMAT.
                                                                                                                             ALL SWITCHES SHALL HAVE A DUAL COVER INTERLOCK MECHANISM TO PREVENT UNINTENTIONAL
                                                                                                                         OPENING OF THE SWITCH COVER WHEN THE SWITCH IS ON AND PREVENT TURNING THE SWITCH ON WHEN THE
              CURRENT CARRYING PARTS SHALL BE INSULATED FROM GROUND AND PHASE-TO-PHASE BY HIGH
                                                                                                                         COVER IS OPEN. THE COVER INTERLOCK MECHANISM SHALL HAVE AN EXTERNALLY OPERATED OVERRIDE BUT
       DIELECTRIC STRENGTH THERMOPLASTIC.
                                                                                                                         THE OVERRIDE SHALL NOT PERMANENTLY DISABLE THE INTERLOCK MECHANISM. THE TOOL USED TO OVERRIDE
             INTERIOR TRIM SHALL BE OF DEADFRONT CONSTRUCTION TO SHIELD USER FROM ENERGIZED
                                                                                                                         THE COVER INTERLOCK MECHANISM SHALL NOT BE REQUIRED TO ENTER THE ENCLOSURE IN ORDER TO
       PARTS. DEADFRONT TRIM SHALL HAVE FILLER PLATES COVERING UNUSED MOUNTING SPACES.
                                                                                                                         OVERRIDE THE INTERLOCK.
                                                                                                                        SWITCH ENCLOSURE:
              INTERIOR LEVELING PROVISIONS SHALL BE PROVIDED FOR FLUSH-MOUNTED APPLICATIONS.
              THE ENTIRE PANELBOARD SHALL BE LISTED AS A SYSTEM, INCLUDING ALL BREAKERS, BUSSES,
                                                                                                                                a. ALL SWITCHES SHALL HAVE PROVISIONS TO ACCEPT UP TO THREE 3/8 IN HASP PADLOCKS TO
       ENCLOSURE, COVER, ETC.
                                                                                                                                 LOCK THE OPERATING HANDLE IN THE OFF POSITION.
             LUGS SHALL BE UL-LISTED TO ACCEPT SOLID OR STRANDED COPPER CONDUCTORS.
                                                                                                                                       THE ENCLOSURE SHALL HAVE ON AND OFF MARKINGS STAMPED INTO THE COVER.
              LUGS SHALL BE SUITABLE FOR 90 DEGREE C RATED WIRE, SIZED ACCORDING TO THE 75 DEGREE C
                                                                                                                                       THE OPERATING HANDLE SHALL BE PROVIDED WITH A DUAL COLORED, RED/BLACK POSITION
       TEMPERATURE RATING PER NEC TABLE 310-15(B)(16). BRANCH CIRCUIT BREAKERS RATED 30 AMPERES AND
       BELOW MAY BE UL-LISTED TO ACCEPT 60 DEGREE C RATED WIRE
                                                                                                                                TYPE 1:
           LUG BODY SHALL BE BOLTED IN PLACE. SNAP-IN DESIGNS ARE NOT ACCEPTABLE.
                                                                                                                                       TYPE 1 SWITCH COVERS SHALL BE ATTACHED WITH WELDED PIN-TYPE HINGES.
                                                                                                                                       TYPE 1 ENCLOSURES SHALL BE FINISHED WITH GREY BAKED ENAMEL PAINT WHICH IS
A. GENERAL: INSTALL PANELBOARDS AND ACCESSORIES IN ACCORDANCE WITH REVIEWED PRODUCT DATA,
                                                                                                                                 ELECTRODEPOSITED ON CLEANED, PHOSPHATE PRE-TREATED STEEL
FINAL SHOP DRAWINGS, MANUFACTURER'S WRITTEN INSTRUCTIONS AND RECOMMENDATIONS, AND AS INDICATED
                                                                                                                                     TYPE 1 ENCLOSURES FOR SWITCHES RATED 30-200A SHALL BE PROVIDED WITH TANGENTIAL
                                                                                                                                 KNOCKOUTS TO FACILITATE EASE OF CONDUIT ENTRY.
            INSTALL PANELBOARDS IN ACCORDANCE WITH MANUFACTURER'S WRITTEN INSTRUCTIONS, NEMA
       PB 1.1, AND NEC STANDARDS.
                                                                                                                                    NEMA 3R SWITCH COVERS SHALL BE TOP HINGED, ATTACHED WITH REMOVABLE SCREWS AND
                                                                                                                                 SECURABLE IN THE OPEN POSITION (TYPE 3R)
     INSPECT COMPLETE INSTALLATION FOR PHYSICAL DAMAGE, PROPER ALIGNMENT, ANCHORAGE, AND
                                                                                                                                      TYPE 3R ENCLOSURES SHALL BE FINISHED WITH GREY BAKED ENAMEL PAINT WHICH IS
                                                                                                                                 ELECTRODEPOSITED ON CLEANED, PHOSPHATE PRE-TREATED GALVANNEALED STEEL.
B. MEASURE STEADY STATE LOAD CURRENTS AT EACH PANELBOARD FEEDER. REARRANGE CIRCUITS IN THE
                                                                                                                                      TYPE 3R ENCLOSURES FOR SWITCHES RATED 30-200A SHALL BE PROVIDED WITH TANGENTIAL
PANELBOARD TO BALANCE THE PHASE LOADS WITHIN 20 PERCENT OF EACH OTHER. MAINTAIN PROPER PHASING
                                                                                                                                KNOCKOUTS TO FACILITATE EASE OF CONDUIT ENTRY.
FOR MULTI-WIRE BRANCH CIRCUITS.
                                                                                                                                 d. TYPE 3R ENCLOSURES THROUGH 200 AMPERE SHALL HAVE PROVISIONS FOR
C. CHECK TIGHTNESS OF BOLTED CONNECTIONS AND CIRCUIT BREAKER CONNECTIONS USING CALIBRATED
                                                                                                                                 INTERCHANGEABLE BOLT-ON HUBS IN THE TOP ENDWALL.
TORQUE WRENCH OR TORQUE SCREWDRIVER PER MANUFACTURER'S WRITTEN SPECIFICATIONS.
                                                                                                                       GENERAL: INSTALL SAFETY SWITCHES AND ACCESSORIES IN ACCORDANCE WITH REVIEWED PRODUCT DATA,
     PROVIDE FINAL PROTECTION AND MAINTAIN CONDITIONS IN A MANNER ACCEPTABLE TO THE INSTALLER.
                                                                                                                 FINAL SHOP DRAWINGS, MANUFACTURER'S WRITTEN INSTRUCTIONS AND RECOMMENDATIONS, AND AS INDICATED ON
THAT SHALL ENSURE THAT THE PANELBOARDS SHALL BE WITHOUT DAMAGE AT TIME OF SUBSTANTIAL COMPLETION.
                                                                                                                 THE DRAWINGS.
                                                                                                                PROTECTION
```

PART 10 - WIRING DEVICES

RECEPTACLES

10.1 TYPES OF ELECTRICAL WIRING DEVICES IN THIS SECTION INCLUDE THE FOLLOWING:

A. PROVIDE FINAL PROTECTION AND MAINTAIN CONDITIONS IN A MANNER ACCEPTABLE TO THE INSTALLER, THAT

SHALL ENSURE THAT THE SAFETY SWITCHES SHALL BE WITHOUT DAMAGE AT TIME OF SUBSTANTIAL COMPLETION.

Mitchell Gulledge Engineering, Inc. 210 SW 4th Avenue Gainesville, FL 32601 FL License EB-31501 p.352.745.3991 www.mitchellgulledge.com

> Andrew P. McCaddin PE - 83318

CITY OF GAINESVILLE 874 SE 4TH STREET GAINESVILLE, FL 32601

OWNER:

Gainesville. Citizen centered

People empowered **OWNER'S PROJECT NUMBER:**

//C PROJECT **MUMBER:** 19050 **REVISIONS:**

DESC DATE

> FINAL CONSTRUCTION DOCUMENTS

ISSUE DATE: 08/26/2019

CHECKED BY:

SHEET TITLE: ELECTRICAL **SPECIFICATIONS**

SHEET NUMBER:

NOTES:

- 1. MOUNTING HEIGHT OF ALL FIXTURE TYPES = 5' AFG, MEASURED FROM BOTTOM OF FIXTURE.
- 2. FC POINTS ARE PLACED ON THE GROUND.
- 3. FC POINTS LAID OUT IN 10' x 10' GRID.

Luminaire Schedule									
Symbol	Qty	Label	Arrangement	Mounting	LLF	Description	Lum. Watts	Mounting Height	
\odot	20	D	SINGLE	Bollard	0.900	Signify PBL-14L-200-NW-G2-3-UNV	10.6	5'	

Calculation Summary											
Label	CalcType	Units	Avg	Max	Min	Avg/Min	Max/Min				
EMERGENCY & MAINTENANCE ROUTE	Illuminance	Fc	1.82	6.2	0.4	4.55	15.50				
EXTENT 1	Illuminance	Fc	0.41	5.8	0.0	N.A.	N.A.				
EXTENT 2	Illuminance	Fc	0.02	0.5	0.0	N.A.	N.A.				
PATHWAY	Illuminance	Fc	1.68	5.8	0.3	5.60	19.33				
PROPERTY LINE	Illuminance	Fc	0.00	0.1	0.0	N.A.	N.A.				
VERTICAL CALCS	Illuminance	Fc	0.00	0.0	0.0	N.A.	N.A.				

8110 Cypress Plaza Dr., Suite 301 Jacksonville, Florida 32256 tel. 904.509.5629 Salesman: Jimmy Nix, LC



DEPOT PARK EMERGENCY & MAINTENANCE ROUTE

Project Name: