AVOCA MAINTENANCE GARAGE, ELECTRICAL UPGRADE

1110 N CHESTNUT ST.
AVOCA, IA 51521

INDEX OF DRAWINGS

EG001 ELECTRICAL LEGEND AND NOTES

EP001 ELCTRICAL PLAN - SHEET 1

EP002 ELECTRICAL PLAN SHEET 2

EP003 ELECTRICAL PHOTOS

EP004 ELECTRICAL SCHEDULES AND ONE-LINE DIAGRAM

PROJECT: BG-1A41 (015)--80-78

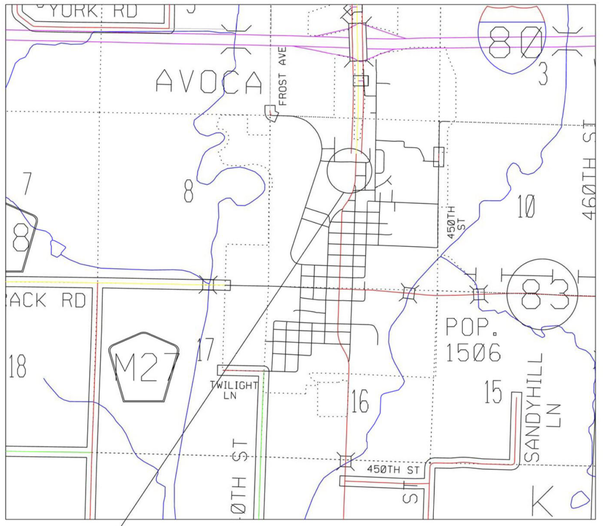
IOWA DOT

SMARTER | SIMPLER | CUSTOMER DRIVEN

CONSULTANT:

STANLEY CONSULTANTS CO
225 Iowa Avenue
MUSCATINE, IA

OFFICE OF SUPPORT SERVICES
800 LINCOLN WAY
AMES, IOWA 50010



PROJECT LOCATION

7/8/2022 3:12:53 PM

GROUNDING

- GROUND CONDUCTOR
- LIGHTNING PROTECTION CONDUCTOR
- GROUND
- GROUND ROD
- LIGHTNING PROTECTION AIR TERMINAL
- LIGHTNING PROTECTION SPHERE
- THROUGH ROOF TERMINAL
- GROUNDING CONNECTION TO STRUCTURE
- FLUSH GROUND PLATE
- GROUND CONDUCTOR CONNECTION
- GROUNDING PIGTAIL

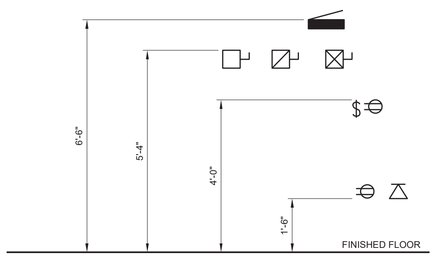
CATHODIC PROTECTION

- XX — CATHODIC PROTECTION TEST STATION NUMBER XX
- CATHODIC PROTECTION ANODE
- RE — CATHODIC PROTECTION UNDERGROUND REFERENCE ELECTRODE
- XX — CATHODIC PROTECTION RECTIFIER NUMBER XX

RACEWAY

- CONDUIT
- CONDUIT STUB WITH CAP
- CONDUIT:
  - DUCTBANK
  - EMBEDDED
  - EXPOSED
  - UNDERGROUND DIRECT BURIAL
- MEDIUM VOLTAGE POTHEAD TERMINATION
- MEDIUM VOLTAGE STRESS CONE TERMINATION
- C — CONDUIT TURN-DOWN
- CONDUIT TURN-UP
- CONDUIT TEE BELOW
- J — JUNCTION BOX

ELECTRICAL DEVICE MOUNTING HEIGHT



POWER

- T — TRANSFORMER
- NON-FUSED DISCONNECT SWITCH
- FUSED DISCONNECT SWITCH
- COMBINATION DISCONNECT WITH STARTER
- $ HP — HORSEPOWER RATED DISCONNECT SWITCH
- PANELBOARD, 480Y/277V OR 480V
- PANELBOARD, 208Y/120V OR 120/240V
- SERVICE ENTRANCE METER
- XFR — TRANSFER SWITCH (AUTOMATIC OR MANUAL)
- M — MOTOR
- GEN — GENERATOR
- LOCAL CONTROL PANEL
- SPECIAL PURPOSE RCPT OR CONNECTION, 480V
- SPECIAL PURPOSE RCPT OR CONNECTION, 240V
- MH — MANHOLE
- HH — HANDHOLE
- * — SINGLE RECEPTACLE
- * — DUPLEX RECEPTACLE
- * — FOURPLEX RECEPTACLE
- * — FLOOR RECEPTACLE

* RECEPTACLE OPTIONS, IF REQUIRED:
- GFI = GROUND FAULT INTERRUPTING
- IG = ISOLATED GROUND
- S = SWITCH AND OUTLET
- WP = WEATHERPROOF
- XP = EXPLOSIONPROOF
- ARC = AUTOMATIC RECEPTACLE CONTROL

- POWER SERVICE POLE
- COMBINATION TELE-POWER SERVICE POLE
- J — SURFACE RACEWAY (WIREMOLD)
- T — THERMOSTAT

LIGHTING

(SEE NOTE 3)

- X — RECESSED FIXTURE
- X — SURFACE/PENDANT MOUNTED FIXTURE
- X — EMERGENCY RECESSED FIXTURE
- X — EMERGENCY SURFACE/PENDANT MOUNTED FIXTURE
- X — CEILING/RECESSED DOWNLIGHT
- X — WALL MOUNTED DOWNLIGHT
- X — POLE MOUNTED DOWNLIGHT
- X — EXTERIOR WEATHERPROOF CUTOFF FIXTURE WALL MOUNT AS INDICATED BY WALL MOUNT SYMBOL
- EMERGENCY BATTERY OPERATED UNIT
- EXIT SIGN, SINGLE FACE, CEILING MOUNT SHOWN, WALL MOUNT AS INDICATED BY WALL MOUNT SYMBOL
- EXIT SIGN, DOUBLE FACE, CEILING MOUNT SHOWN, WALL MOUNT AS INDICATED BY WALL MOUNT SYMBOL
- EXIT SIGN, ARROW INDICATES DIRECTION
- WALL MOUNT
- * — DS = DAYLIGHT SENSOR; OC = OCCUPANCY SENSOR
- * — LIGHTING CONTROL: LC = LIGHTING CONTACTOR; PE = PHOTOELECTRIC CELL; TC = TIME CLOCK
- $ * — SWITCH, SINGLE POLE, LINE VOLTAGE

* LINE VOLTAGE SWITCH OPTIONS:
- 3 = THREE-WAY
- 4 = FOUR-WAY
- D = DIMMER
- K = KEY OPERATED
- P = PILOT
- T = TIMER
- a,b,c = DENOTES SWITCHING CONTROL

- $ S — DIGITAL SMART SWITCH WALL STATION, CAT-5E (SEE NOTE 5)

COMMUNICATION

- TEL — TELEPHONE PANEL
- TTB — TELEPHONE TERMINAL BOARD
- AMP — AMPLIFIER
- TELEPHONE OUTLET, WALL
- DATA OUTLET, WALL
- COMBINATION TELEPHONE/DATA OUTLET, WALL
- TELEPHONE OUTLET, FLOOR
- DATA OUTLET, FLOOR
- COMBINATION TELEPHONE/DATA OUTLET, FLOOR
- TELECOMMUNICATIONS SERVICE POLE
- TV — TELEVISION OUTLET, WALL
- C — CLOCK
- S — PUBLIC ADDRESS SPEAKER
- M — PUBLIC ADDRESS MICROPHONE OUTLET
- V — PUBLIC ADDRESS VOLUME CONTROL
- I — INTERCOM
- PUSHBUTTON
- B — BUZZER
- A — DOOR ALARM CONTACT
- D — DOOR OPENER
- R — DOOR RELEASE
- K — CARD KEY ACCESS
- I — INTRUSION SENSOR
- CCTV SURVEILLANCE CAMERA, FIXED
- CCTV SURVEILLANCE CAMERA, PAN/ZOOM/TILT
- WALL MOUNT

GENERAL NOTES

1. ALL SYMBOLS AND ABBREVIATIONS SHOWN ON THIS LEGEND MAY NOT APPEAR ON THIS SET OF DRAWINGS.
2. FOR GENERAL LEGEND AND ABBREVIATIONS, SEE "GG" DRAWINGS.
3. FIXTURE SIZES MAY VARY ON PLANS. X ON FIXTURE SYMBOL DENOTES FIXTURE TYPE DESIGNATION. SEE FIXTURE SCHEDULE. SEE LIGHTING PLANS
4. USE DIRECTIONAL ARROW ON EXIT SIGNS AS REQUIRED.
5. SEE TYPICAL WIRING SCHEMATIC PLANS FOR DIGITAL SMART SWITCH REQUIREMENTS PER ROOM.

FIRE ALARM

- EOL = END OF LINE RESISTOR
- * = FACP = FIRE ALARM CONTROL PANEL; FAA = FIRE ALARM ANNUNCIATOR; FTR = FIRE ALARM TRANSPONDER OR TRANSMITTER; ESR = ELEVATOR STATUS/RECALL; FAC = FIRE ALARM COMMUNICATOR; MIC = REMOTE MIC; EVAC = VOICE EVACUATION PANEL; AMP = AMPLIFIER RACK; BATT = BATTERY PACK AND CHARGER
- FSCP X — FIRE SYSTEM CONTROL PANEL

  WHERE X: CO_2 - CARBON DIOXIDE; DC - DRY CHEMICAL; FO - FOAM; WC - WET CHEMICAL; CA - CLEAN AGENT
- RSFACU X — RELEASING SERVICE FIRE ALARM CONTROL UNIT

  WHERE X: CO_2 - CARBON DIOXIDE; DC - DRY CHEMICAL; FO - FOAM; WC - WET CHEMICAL; CA - CLEAN AGENT; WM - WATER MIST; DL - DELUGE SPRINKLER
- ET — EMERGENCY TEXTUAL VISIBLE APPLIANCE
- * = F = MANUAL PULL STATION; CO_2 = MANUAL PULL STATION - CARBON DIOXIDE; DC = MANUAL PULL STATION - DRY CHEMICAL; FO = MANUAL PULL STATION - FOAM; WC = MANUAL PULL STATION - WET CHEMICAL; CA = MANUAL PULL STATION - CLEAN AGENT; WM = MANUAL PULL STATION - WATER MIST; DL = MANUAL PULL STATION - DELUGE SPRINKLER
- * = BLANK = FIRE SERVICE OR EMERGENCY TELEPHONE STATION; A = FIRE SERVICE OR EMERGENCY TELEPHONE STATION - ACCESSIBLE; H = FIRE SERVICE OR EMERGENCY TELEPHONE STATION - HANDSET
- * = BLANK = ABORT SWITCH; CO_2 = ABORT SWITCH - CARBON DIOXIDE; DC = ABORT SWITCH - DRY CHEMICAL; FO = ABORT SWITCH - FOAM; WC = ABORT SWITCH - WET CHEMICAL; CA = ABORT SWITCH - CLEAN AGENT; WM = ABORT SWITCH - WATER MIST; DL = ABORT SWITCH - DELUGE SPRINKLER; PRE = ABORT SWITCH - PREACTION SYSTEM; EPO = ABORT SWITCH - EMERGENCY POWER OFF
- X — HEAT DETECTOR - COMBINATION: RATE OF RISE AND FIXED TEMPERATURE

  WHERE X: R/F - COMBINATION; RATE OF RISE AND FIXED TEMPERATURE; R/C - RATE COMPENSATION; F - FIXED TEMPERATURE; R - RATE OF RISE ONLY; TSS - TEMPERATURE SUPERVISORY SWITCH
- HEAT DETECTOR - LINE TYPE DETECTOR (HEAT-SENSITIVE CABLE)
- R — SMOKE/HEAT DETECTOR
- X — SMOKE DETECTOR

  WHERE X: P - PHOTOELECTRIC PRODUCTS OF COMBUSTION DETECTOR; I - IONIZATION PRODUCTS OF COMBUSTION DETECTOR; BT - BEAM TRANSMITTER; BR - BEAM RECEIVER; ASD - AIR SAMPLING
- SMOKE DETECTOR FOR DUCT
- GAS DETECTOR
- X — FLAME DETECTOR

  WHERE X: F - FLAME; UV - ULTRAVIOLET; IR - INFRARED; UV/IR - COMBINATION ULTRAVIOLET INFRARED; VR - VISIBLE RADIATION
- * = WF = FLOW DETECTOR/SWITCH; PS = PRESSURE DETECTOR/SWITCH; LS = LEVEL DETECTOR/SWITCH; TS = VALVE TAMPER SWITCH
- VS — VALVE WITH VALVE SUPERVISORY SWITCH
- X — X = R = OUTPUT RELAY; HT = TEMPERATURE SWITCH - HIGH TEMPERATURE; LT = TEMPERATURE SWITCH - LOW TEMPERATURE
- X — X = BLANK = GONG; V = BELL - VIBRATING; VS = BELL - VIBRATING/STROBE; G = BELL - SINGLE STROKE GONG; GS = BELL - SINGLE STROKE GONG/STROBE
- ROTATING BEACON TO INDICATE EMERGENCY RESPONSE POINTS
- RTS — REMOTE ALARM INDICATING AND TEST SWITCH
- AIM — ADDRESSABLE INPUT MODULE
- AOM — ADDRESSABLE OUTPUT MODULE
- * X — * = H = HORN; S = SPEAKER; V = STROBE; SS = SPEAKER/STROBE; HS = HORN/STROBE

  WHERE X: X - CANDELA RATING

AT FULL SIZE

0 1 2 3 IN

0 1 2 3 4 5 6 7 8 cm

LICENSED PROFESSIONAL ENGINEER — LANE E. INGRAM 17368 — IOWA

I HEREBY CERTIFY THAT REVISION 0 TO THIS ENGINEERING DOCUMENT WAS PREPARED BY ME OR UNDER MY DIRECT PERSONAL SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF IOWA.

LANE E INGRAM 04-15-2022

LICENSE NUMBER: 17368
MY LICENSE RENEWAL DATE IS 12-31-2022
PAGES OR SHEETS COVERED BY THIS SEAL: ALL SHEETS

NO.	REVISIONS	DSGN	CHKD	APVD	DATE

Stanley Consultants co.
225 Iowa Avenue, Muscatine, Iowa 52761-3764
www.stanleyconsultants.com

IOWA DEPARTMENT OF TRANSPORTATION
WO 30 AVOCA ELECTRICAL UPGRADES
XXX, IOWA

ELECTRICAL LEGEND AND NOTES

DESIGNED BA WACHTEL
DRAWN BW DEEN
CHECKED
APPROVED LE INGRAM
APPROVED
DATE APRIL 15, 2002

SCALE: NONE
NO. 30093.30
REV. 0
EG001

© STANLEY CONSULTANTS

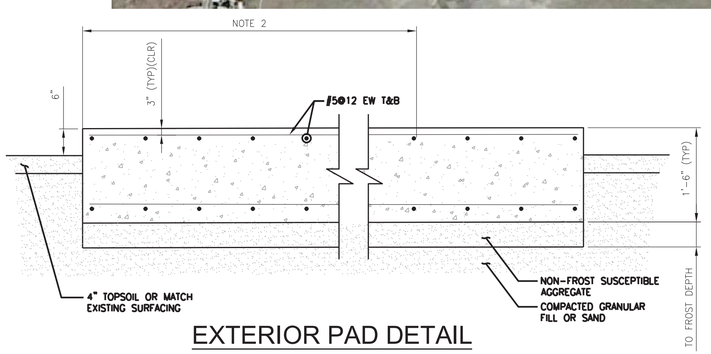
CADD D3-R5

NOTES:

1. NEW 600A ATS AND 600A SERVICE ENTRANCE DISCONNECT. PAD MOUNT ATS BESIDE EXISTING UTILITY SERVICE ENTRANCE.
2. PROVIDE 2 - 500 KCMIL, #3 GND, 4"C FROM NEW GENERATOR TO NEW ATS AND PROVIDE 2-500KCMIL, #3 GND, 4"C FROM UTILITY CONNECTION IN JUNCTION BOX TO NEW ATS.
3. NEW 75KW NATURAL GAS DRIVEN PAD MOUNTED GENERATOR IN A SOUND ATTENUATING ENCLOSURE. SEE PANEL B, PANEL SCHEDULE FOR GENERATOR AUX POWER CONNECTION.
4. NEW GAS PIPING SHALL BE SUITABLE FOR DIRECT BURY APPLICATIONS.
5. CONTRACTOR TO CONSTRUCT GENERATOR PAD TO GENERATOR MANUFACTURES RECOMMENDED.

LEGEND:

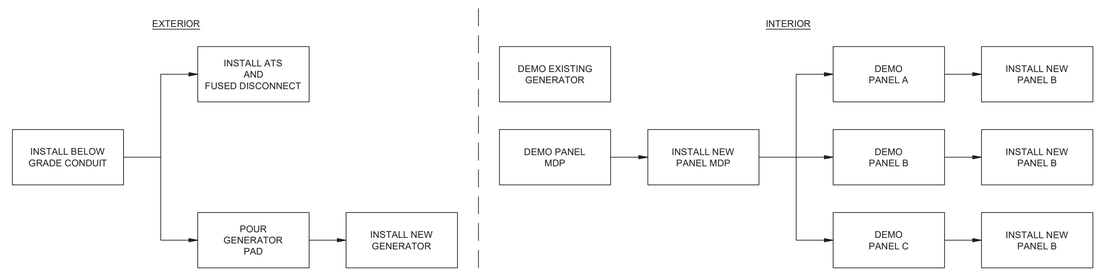
TIE POINT INTO AN EXISTING SYSTEM



EXTERIOR PAD DETAIL

NOTES :

1. COORDINATE WITH ELECTRICAL CONTRACTOR FOR DINAL DIMENSIONS BEFORE POURING PAD.
2. CONCRETE PAD SHALL BE SIZED FOR THE GENERATOR EXTENTS PLUS 6" ON EACH SIDE.
3. PROVIDE VIBRATION ISOLATORS WITH GENSET.
4. CONCRETE COMPRESSIVE STRENGTH SHALL BE A MINIMUM OF 4500 PSI.
5. REBAR YIELD STRENGTH SHALL BE A MINIMUM OF 60 KSI.
6. ANCHOR EQUIPMENT TO FOUNDATION WITH POST INSTALLED ADHESIVE ANCHOR WITH 6" MINIMUM EMBEDMENT. ANCHOR SIZE, QTY, AND LOCATION PER MANUFACTURE REQUIREMENTS.



CONSTRUCTION PHASING

AT FULL SIZE

0 1 2 3 IN

0 1 2 3 4 5 6 7 8 cm

I HEREBY CERTIFY THAT REVISION 0 TO THIS ENGINEERING DOCUMENT WAS PREPARED BY ME OR UNDER MY DIRECT PERSONAL SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF IOWA.

LICENSED PROFESSIONAL ENGINEER LANE E. INGRAM 17368 IOWA

LANE E INGRAM 04-15-2022
LICENSE NUMBER: 17368
MY LICENSE RENEWAL DATE IS 12-31-2022
PAGES OR SHEETS COVERED BY THIS SEAL:
ALL SHEETS

NO.	REVISIONS	DSGN	CHKD	APVD	DATE

Stanley Consultants co.
225 Iowa Avenue, Muscatine, Iowa 52761-3764
www.stanleyconsultants.com

IOWA DEPARTMENT OF TRANSPORTATION
WO 30 AVOCA ELECTRICAL UPGRADES
XXX, IOWA

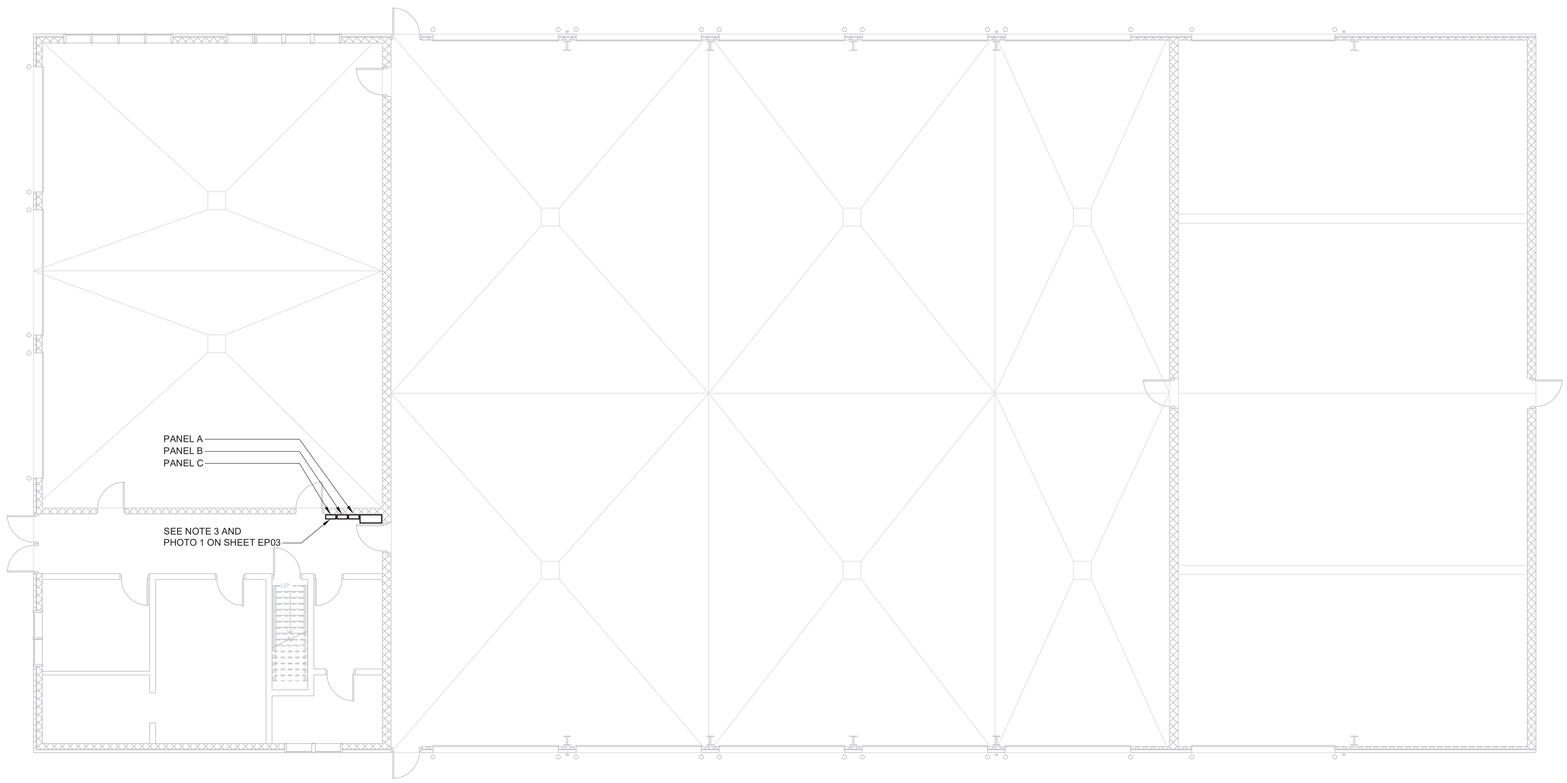
ELECTRICAL
ELECTRICAL PLAN - SHEET 1

DESIGNED BA WACHTEL
DRAWN BW DEEN
CHECKED
APPROVED LE INGRAM
APPROVED
DATE APRIL 15, 2002

SCALE: NONE
NO. 30093.30
EP001
REV. 0

© STANLEY CONSULTANTS

CADD D3-R5



NOTES:

1. DIMENSIONS SHOWN ARE ESTIMATES. CONTRACTOR TO COORDINATE EQUIPMENT DIMENSIONS CIRCUIT LENGTHS IN THE ALL ROUTING SHOWN IS SCHEMATIC IN NATURE AND SHALL BE FIELD ROUTED BY THE CONTRACTOR. COORDINATE OUTAGES WITH THE OWNER.
2. ALL WORK PERFORMED SHALL BE IN ACCORDANCE WITH THE NEC AND LOCAL CODES.
3. DEMO EXISTING PANELS A, B AND, C, MDP, & ATS. PROTECT EXISTING CIRCUITS FOR RELOCATION TO NEW PANELS A, B AND C. REROUTE CIRCUITS TO NEW PANELS A, B AND C, SEE PANEL SCHEDULES ON SHEET EP04. INSTALL NEW CABLE TROUGH FOR REQUIRED SPLICES TO MAKE NEW PANEL CONNECTIONS BELOW PANEL A, B AND C.
4. DEMO EXISTING GENERATOR ON SECOND FLOOR AND REMOVE CONDUIT CABLING TO SOURCE. PATCH AND FILL ANY OPENINGS LEFT AFTER GENERATOR DEMOLITION INCLUDING INSTALLATION OF NEW CMUS FOR WALL..
5. COORDINATE OUTAGE WITH OWNER. UTILIZE TEMPORARY PANELS TO KEEP SERVICE ENERGIZED WHILE WORK IS BEING PERFORMED TO MINIMIZE OUTAGES.
6. CONTRACTOR TO PATCH AND REPAIR ALL UNUSED CONDUIT OPENINGS AND MODIFIED FINISH SURFACES. PATCHING AND REPAIRS SHALL MATCH MATERIALS, FINISH, AND TEXTURE OF ADJACENT SURFACES.
7. CONTRACTOR TO PROVIDE CONDUIT EXPANSION FITTINGS WHEN CROSSING EXPANSION JOINTS.
8. CONTRACTOR SHALL MAINTAIN ALL FIRE RATINGS WHEN MAKING WALL PENETRATIONS. PROVIDE FIRE PROOFING MATERIAL AS REQUIRED TO MAINTAIN RATING.

AT FULL SIZE

0 1 2 3 IN

0 1 2 3 4 5 6 7 8 cm

LICENSED PROFESSIONAL ENGINEER
LANE E. INGRAM
17368
IOWA

I HEREBY CERTIFY THAT REVISION 0 TO THIS ENGINEERING DOCUMENT WAS PREPARED BY ME OR UNDER MY DIRECT PERSONAL SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF IOWA.

LANE E INGRAM 04-15-2022
LICENSE NUMBER: 17368
MY LICENSE RENEWAL DATE IS 12-31-2022
PAGES OR SHEETS COVERED BY THIS SEAL:
ALL SHEETS

NO.	REVISIONS	DSGN	CHKD	APVD	DATE

Stanley Consultants co.

225 Iowa Avenue, Muscatine, Iowa 52761-3764
www.stanleyconsultants.com

IOWA DEPARTMENT OF TRANSPORTATION
WO 30 AVOCA ELECTRICAL UPGRADES
XXX, IOWA

ELECTRICAL
ELECTRICAL PLAN - SHEET 2

DESIGNED BA WACHTEL
DRAWN BW DEEN
CHECKED
APPROVED LE INGRAM
APPROVED
DATE APRIL 15, 2002

SCALE: 1/4" = 1'-0"
NO. 30093.30
EP002
REV. 0

© STANLEY CONSULTANTS

CADD D3-R5

PHOTO 1

PHOTO 2

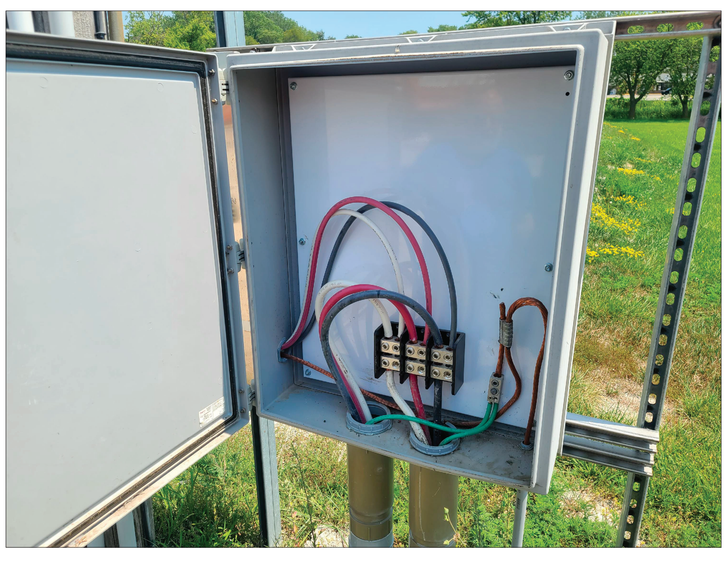


PHOTO 3

(NOTE 2)

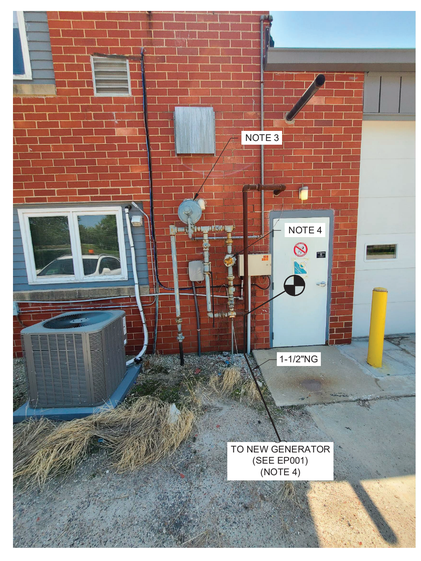


PHOTO 4

NOTES:

1. CAP EXISTING GAS LINE TO EXISTING GENERATOR.
2. CONTRACTOR TO IDENTIFY MAINTENANCE GARAGE CIRCUIT AND DEMO EXISTING CIRCUIT. INSTALL NEW CIRCUIT AS SHOWN ON SHEET EP04. INSTALL NEW TERMINATION BLOCKS TO ACCOMMODATE THE EXTRA CABLES AND INCREASED SIZE.
3. COORDINATE WITH NATURAL GAS UTILITY PROVIDER TO ADJUST GAS PRESSURE TO 2PSI.
4. PROVIDE AND INSTALL PRESSURE REGULATOR SUITABLE FOR NATURAL GAS SERVICE. SET PRESSURE REGULATOR TO 11"WG.

LEGEND:

DEMOLITION

AT FULL SIZE

0 1 2 3 IN

0 1 2 3 4 5 6 7 8 cm

LICENSED PROFESSIONAL ENGINEER
LANE E. INGRAM
17368
IOWA

I HEREBY CERTIFY THAT REVISION 0 TO THIS ENGINEERING DOCUMENT WAS PREPARED BY ME OR UNDER MY DIRECT PERSONAL SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF IOWA.

LANE E INGRAM 04-15-2022
LICENSE NUMBER: 17368
MY LICENSE RENEWAL DATE IS 12-31-2022
PAGES OR SHEETS COVERED BY THIS SEAL:
ALL SHEETS

NO.	REVISIONS	DSGN	CHKD	APVD	DATE

Stanley Consultants co.

225 Iowa Avenue, Muscatine, Iowa 52761-3764
www.stanleyconsultants.com

IOWA DEPARTMENT OF TRANSPORTATION
WO 30 AVOCA ELECTRICAL UPGRADES
XXX, IOWA

ELECTRICAL
ELECTRICAL PHOTOS

DESIGNED BA WACHTEL
DRAWN BW DEEN
CHECKED
APPROVED LE INGRAM
APPROVED
DATE APRIL 15, 2002

SCALE: NONE
NO. 30093.30
EP003
REV. 0

© STANLEY CONSULTANTS

CADD D3-R5

PANEL: PANEL A — LOCATION: MAINTENANCE GARAGE HALLWAY

VOLTAGE (V):	120/240	PHASE:	1	WIRE SERVICE:	3
BUS RATING (A):	600	GROUND BUS:	YES	ENCLOSURE TYPE:	1
MAIN BREAKER (A):	600	IG BUS:	NO	MOUNTING:	SURFACE
MINIMUM AIC (kA):	65				

SERVICE ENTRANCE: YES
FEED THRU LUGS: NO
PANEL SOURCE: OUTSIDE ATS
SOURCE LOCATION: OUTSIDE ATS
SPD (L-N,L-G, N-G): YES

NOTES	WIRING REQUIREMENT	BRANCH CIRCUIT LOAD DESCRIPTION	CONN. LOAD (VA)	CIRCUIT BREAKERS CB	SPACE #		CB	CONN. LOAD (VA)	BRANCH CIRCUIT LOAD DESCRIPTION	WIRING REQUIREMENT	NOTES
A		PANEL A - CKT 1, 3		20/2	1	2	100/2		PANEL C - CKT 27, 29		A
A		I			3	4			I		A
A		PANEL B - CKT 25,27		30/2	5	6	100/2		PANEL C - CKT 28, 30		A
A		I			7	8			I		A
A		PANEL C - CKT 23, 25		80/2	9	10	40/2		PANEL C - CKT 24, 26		A
A		I			11	12			I		A
A		PANEL C - CKT 9, 11		40/2	13	14	30/2		PANEL C - CKT 19, 21		A
A		I			15	16			I		A
A		PANEL C - CKT 20, 22		20/2	17	18	15/1		PANEL A - CKT 2		A
A		I			19	20	15/1		PANEL A - CKT 4		A
A		PANEL A - CKT 5		15/1	21	22	15/1		PANEL A - CKT 6		A
A		PANEL A - CKT 7		20/1	23	24	20/1		PANEL A - CKT 8		A
A		PANEL A - CKT 9		20/1	25	26	15/1		PANEL A - CKT 10		A
A		PANEL A - CKT 11		20/1	27	28	20/1		PANEL A - CKT 12		A
A		PANEL A - CKT 13		30/1	29	30	15/1		PANEL A - CKT 14		A
A		PANEL A - CKT 15		15/1	31	32	15/1		PANEL A - CKT 16		A
A		PANEL A - CKT 17		20/1	33	34	15/1		PANEL A - CKT 18		A
A		PANEL A - CKT 19		15/1	35	36	15/1		PANEL A - CKT 20		A
A		PANEL A - CKT 21		15/1	37	38	15/1		PANEL A - CKT 22		A
	3-500KCMIL, #3 GND, 4"C	PANEL C		400/2	39	40	400/2		PANEL B	3-500KCMIL, #3 GND, 4"C	
	I	I			41	42			I	I	
					TOTAL (KVA)						
		SUB-TOTAL LEFT SIDE (KVA)							SUB-TOTAL RIGHT SIDE (KVA)		

LOAD TYPES	DEMAND (KVA)	DEMAND FACTOR (DF)	PANEL DEMAND (KVA)
UNASSIGNED LOAD TYPE			
L = LIGHTING LOAD			
R = RECEPTACLE LOAD			
A = APPLIANCE LOAD			
H = HEATING LOAD			
M = MOTOR LOAD			
E = EQUIPMENT LOAD			
S = SUB-PANEL LOAD			
FT = FEED THRU LOAD			
O = OTHER LOAD			
TOTAL			

TOTAL CONNECTED LOAD: KVA
PANEL DEMAND: KVA
PANEL DF:
MIN. PANEL AMPACITY: A
DESIGN MARGIN: 15.00 %
MIN. DESIGN AMPACITY: A

NOTES:
(A) CIRCUIT DESCRIPTIONS DEPICT OLD PANEL LOCATION ONLY AND SHALL NOT BE PUT ON PANEL SCHEDULES.
CONTRACTOR TO FILL OUT PANEL SCHEDULE DESCRIPTIONS IN THE FIELD.

SPD RATINGS (WHEN INDICATED YES):
SURGE CURRENT RATING PER PHASE (8X20uS): 60KA
UL 1449 SUPPRESSION VOLTAGE RATINGS (SVR): 400V

PANEL: PANEL B — LOCATION: MAINTENANCE GARAGE HALLWAY

VOLTAGE (V):	120/240	PHASE:	1	WIRE SERVICE:	3
BUS RATING (A):	400	GROUND BUS:	YES	ENCLOSURE TYPE:	1
MAIN BREAKER (A):	400	IG BUS:	NO	MOUNTING:	SURFACE
MINIMUM AIC (kA):	65				

SERVICE ENTRANCE: NO
FEED THRU LUGS: YES
PANEL SOURCE: PANEL A
SOURCE LOCATION: SHOP HALLWAY
SPD (L-N,L-G, N-G): YES

NOTES	WIRING REQUIREMENT	BRANCH CIRCUIT LOAD DESCRIPTION	CONN. LOAD (VA)	CIRCUIT BREAKERS CB	SPACE #		CB	CONN. LOAD (VA)	BRANCH CIRCUIT LOAD DESCRIPTION	WIRING REQUIREMENT	NOTES
A		PANEL A - CKT 24		15/1	1	2	15/1		PANEL A - CKT 23		A
A		PANEL A - CKT 26		20/1	3	4	20/1		PANEL A - CKT 25		A
A		PANEL B - CKT 1		20/1	5	6	15/1		PANEL B - CKT 2		A
A		PANEL B - CKT 3		20/1	7	8	20/1		PANEL B - CKT 4		A
A		PANEL B - CKT 5		20/1	9	10	20/1		PANEL B - CKT 6		A
A		PANEL B - CKT 7		15/1	11	12	15/1		PANEL B - CKT 8		A
A		PANEL B - CKT 9		20/1	13	14	15/1		PANEL B - CKT 10		A
A		PANEL B - CKT 11		15/1	15	16	20/1		PANEL B - CKT 12		A
A		PANEL B - CKT 13		15/1	17	18	15/1		PANEL B - CKT 14		A
A		PANEL B - CKT 15		15/1	19	20	15/1		PANEL B - CKT 16		A
A		PANEL B - CKT 17		15/1	21	22	15/1		PANEL B - CKT 18		A
A		PANEL B - CKT 19		15/1	23	24	15/1		PANEL B - CKT 20		A
A		PANEL B - CKT 21		15/1	25	26	15/1		PANEL B - CKT 22		A
A		PANEL B - CKT 23		15/1	27	28	15/1		PANEL B - CKT 24		A
A		PANEL B - CKT 29		20/1	29	30	20/1		PANEL B - CKT 26		A
	2#12, #12 GND, 1"C	GENERAL AUX POWER		20/1	31	32	15/1		PANEL B - CKT 28		
		SPARE		20/1	33	34	20/1		PANEL B - CKT 30		
		SPARE		20/1	35	36	20/1		SPARE		
		SPARE		20/1	37	38	20/1		SPARE		
		SPARE		20/1	39	40	20/1		SPARE		
		SPARE		20/1	41	42	20/1		SPARE		
					TOTAL (KVA)						
		SUB-TOTAL LEFT SIDE (KVA)							SUB-TOTAL RIGHT SIDE (KVA)		

LOAD TYPES	DEMAND (KVA)	DEMAND FACTOR (DF)	PANEL DEMAND (KVA)
UNASSIGNED LOAD TYPE			
L = LIGHTING LOAD			
R = RECEPTACLE LOAD			
A = APPLIANCE LOAD			
H = HEATING LOAD			
M = MOTOR LOAD			
E = EQUIPMENT LOAD			
S = SUB-PANEL LOAD			
FT = FEED THRU LOAD			
O = OTHER LOAD			
TOTAL			

TOTAL CONNECTED LOAD: KVA
PANEL DEMAND: KVA
PANEL DF:
MIN. PANEL AMPACITY: A
DESIGN MARGIN: 15.00 %
MIN. DESIGN AMPACITY: A

NOTES:
(A) CIRCUIT DESCRIPTIONS DEPICT OLD PANEL CIRCUIT ONLY AND SHALL NOT BE PUT ON PANEL SCHEDULES.
CONTRACTOR TO FILL OUT PANEL SCHEDULE DESCRIPTIONS IN THE FIELD TO MATCH LOAD DESCRIPTION.

SPD RATINGS (WHEN INDICATED YES):
SURGE CURRENT RATING PER PHASE (8X20uS): 60KA
UL 1449 SUPPRESSION VOLTAGE RATINGS (SVR): 400V

PANEL: PANEL C — LOCATION: MAINTENANCE GARAGE HALLWAY

VOLTAGE (V):	120/240	PHASE:	1	WIRE SERVICE:	3
BUS RATING (A):	400	GROUND BUS:	YES	ENCLOSURE TYPE:	1
MAIN BREAKER (A):	400	IG BUS:	NO	MOUNTING:	SURFACE
MINIMUM AIC (kA):	65				

SERVICE ENTRANCE: NO
FEED THRU LUGS: YES
PANEL SOURCE: PANEL A
SOURCE LOCATION: SHOP HALLWAY
SPD (L-N,L-G, N-G): YES

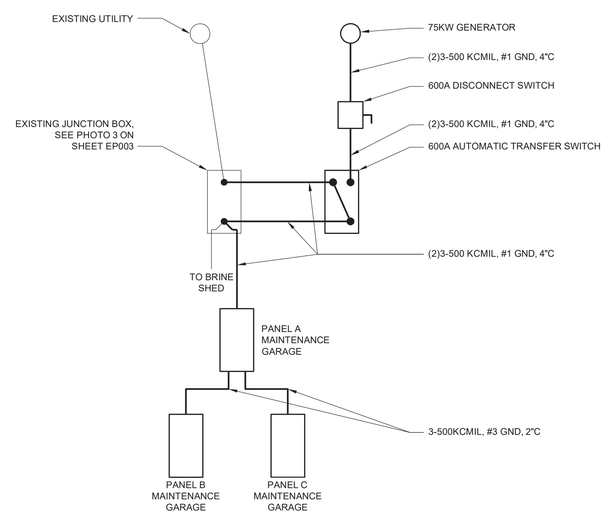
NOTES	WIRING REQUIREMENT	BRANCH CIRCUIT LOAD DESCRIPTION	CONN. LOAD (VA)	CIRCUIT BREAKERS CB	SPACE #		CB	CONN. LOAD (VA)	BRANCH CIRCUIT LOAD DESCRIPTION	WIRING REQUIREMENT	NOTES
A		PANEL C - CKT 1		15/1	1	2	20/1		PANEL C - CKT 17		A
A		PANEL C - CKT 3		15/1	3	4	20/1		PANEL C - CKT 2		A
A		PANEL C - CKT 5		20/1	5	6	15/1		PANEL C - CKT 4		A
A		PANEL C - CKT 7		15/1	7	8	15/1		PANEL C - CKT 6		A
A		PANEL C - CKT 13		15/1	9	10	20/1		PANEL C - CKT 8		A
A		PANEL C - CKT 15		15/1	11	12	20/1		PANEL C - CKT 10		A
A		PANEL C - CKT 17		20/1	13	14	30/1		PANEL C - CKT 14		A
		SPARE		20/1	15	16	20/1		PANEL C - CKT 16		A
		SPARE		20/1	17	18	20/1		PANEL C - CKT 18		A
		SPARE		20/1	19	20	20/1		SPARE		
		SPARE		20/1	21	22	20/1		SPARE		
		SPARE		20/1	23	24	20/1		SPARE		
					25	26	20/1		SPARE		
					27	28	20/1		SPARE		
					29	30					
					31	32					
					33	34					
					35	36					
					37	38					
					39	40					
					41	42					
					TOTAL (KVA)						
		SUB-TOTAL LEFT SIDE (KVA)							SUB-TOTAL RIGHT SIDE (KVA)		

LOAD TYPES	DEMAND (KVA)	DEMAND FACTOR (DF)	PANEL DEMAND (KVA)
UNASSIGNED LOAD TYPE			
L = LIGHTING LOAD			
R = RECEPTACLE LOAD			
A = APPLIANCE LOAD			
H = HEATING LOAD			
M = MOTOR LOAD			
E = EQUIPMENT LOAD			
S = SUB-PANEL LOAD			
FT = FEED THRU LOAD			
O = OTHER LOAD			
TOTAL			

TOTAL CONNECTED LOAD: KVA
PANEL DEMAND: KVA
PANEL DF:
MIN. PANEL AMPACITY: A
DESIGN MARGIN: 15.00 %
MIN. DESIGN AMPACITY: A

NOTES:
(A) CIRCUIT DESCRIPTIONS DEPICT OLD PANEL CIRCUIT ONLY AND SHALL NOT BE PUT ON PANEL SCHEDULES.
CONTRACTOR TO FILL OUT PANEL SCHEDULE DESCRIPTIONS IN THE FIELD TO MATCH LOAD DESCRIPTION.

SPD RATINGS (WHEN INDICATED YES):
SURGE CURRENT RATING PER PHASE (8X20uS): 60KA
UL 1449 SUPPRESSION VOLTAGE RATINGS (SVR): 400V



ONE-LINE DIAGRAM

AT FULL SIZE
0 1 2 3 IN
0 1 2 3 4 5 6 7 8 cm

LICENSED PROFESSIONAL ENGINEER — LANE E. INGRAM 17368 — IOWA

I HEREBY CERTIFY THAT REVISION 0 TO THIS ENGINEERING DOCUMENT WAS PREPARED BY ME OR UNDER MY DIRECT PERSONAL SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF IOWA.

LANE E INGRAM 04-15-2022
LICENSE NUMBER: 17368
MY LICENSE RENEWAL DATE IS 12-31-2022
PAGES OR SHEETS COVERED BY THIS SEAL: ALL SHEETS

NO.	REVISIONS	DSGN	CHKD	APVD	DATE

Stanley Consultants co.
225 Iowa Avenue, Muscatine, Iowa 52761-3764
www.stanleyconsultants.com

IOWA DEPARTMENT OF TRANSPORTATION
WO 30 AVOCA ELECTRICAL UPGRADES
XXX, IOWA

ELECTRICAL
ELECTRICAL SCHEDULES AND ONE-LINE DIAGRAM

DESIGNED BA WACHTEL
DRAWN BW DEEN
CHECKED
APPROVED LE INGRAM
APPROVED
DATE APRIL 15, 2002

SCALE: NONE
NO. 30093.30
EP004
REV. 0

© STANLEY CONSULTANTS

CADD D3-R5