CITY OF LAKE HAVASU CITY

ELECTRICAL UPGRADES
WELLS #2 AND #9

LAKE HAVASU CITY, ARIZONA

JULY 7, 2021

ISSUED FOR BID

2021 CITY COUNCIL MEMBERS

Cal Sheehy, Mayor
Jeni Coke, Vice Mayor
David Lane
JIm Dolan
Nancy Campbell
Michele Lin
Cameron Moses
Jess Knudson, City Manager
J. Greg Froslie, PE, - Public Works Director, City Engineer

SHEET INDEX

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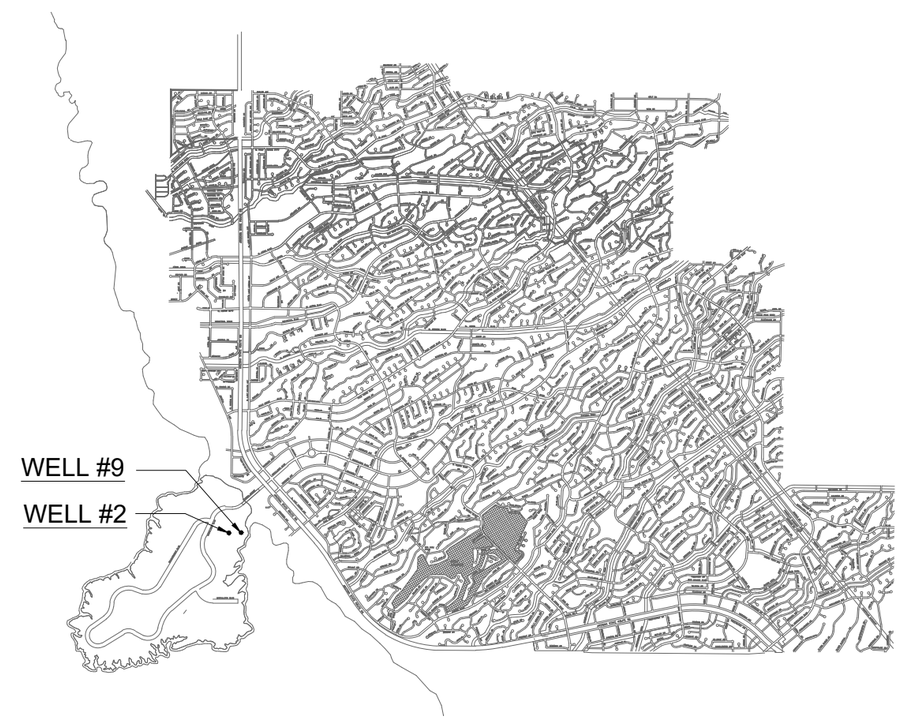
6	E-202	DETAILS, GENERATOR DETAILS



VICINITY MAP

ENGINEERS INC
North Dakota : Arizona

315 North 5th Street Suite 100
Fargo, North Dakota 58102
Phone: 701.365.0917
Fax: 701.365.0920
jk-engineers.com

32187 JOEL A. KATH 7-14-2021 Date Signed ARIZONA, U.S.A. Expires 3-31-2022

THIS DOCUMENT WAS ORIGINALLY ISSUED AND SEALED BY JOEL A. KATH, ARIZONA REGISTRATION NUMBER PE-32187 ON 07/14/2021. THE ORIGINAL DOCUMENTS ARE STORED AT THE OFFICE OF JK ENGINEERS 315 N 5TH STREET, #100 FARGO, ND. 58102.

CITY OF LAKE HAVASU CITY
ELECTRICAL UPGRADES
CITY WELLS #2 AND #9

LAKE HAVASU CITY, AZ

ISSUED FOR BID

REV	DESCRIPTION	DATE

JKE NO: 21-004.01
DATE: July 14, 2021
DESIGNED BY: JAK
DRAWN BY: RLB
CHECKED BY: JAK

DO NOT SCALE DRAWINGS

SHEET CONTENTS
COVER SHEET

SHEET NO. 1 of 6

COV-1

C:\USERS\JOELI\PROOF DROPS\OWNER TURNQUIST\PROJECTS\2021\21-004 LHC WELL #2 AND #9\DATA\DWG\ELECTRICAL PLANS\21-004 FOR BID 7-15-2021.DWG
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STANDARD ONE LINE DIAGRAM LEGEND

500KVA 4.16KV Δ–480Y/277V	TRANSFORMER WITH PRIMARY AND SECONDARY VOLTAGE, AND KVA RATING AS NOTED.
20 — 22: 3#8,#10G,2"	CIRCUIT NO.22 WITH 3#8 INSULATED CONDUCTORS, 1#10, GROUND WIRE ALL IN 2" CONDUIT TO 20 HP MOTOR.
AUX. ITEMS MAY NOT BE SHOWN COMPLETELY.	ONE-LINE SHOWING POWER AND CONTROL TO A PACKAGE UNIT, AS FOR EXAMPLE A RESIDUAL ANALYZER OR A PUMP CONTROL DIRECTOR, SHALL IMPLY THAT ANY AND ALL ASSOCIATED EQUIPMENT SHALL ALSO BE INSTALLED AND WIRED AS REQUIRED BY THE EQUIPMENT FURNISHED.
52	HIGH VOLTAGE DRAWOUT CIRCUIT BREAKER.
3P–20	LOW VOLTAGE AIR CIRCUIT BREAKER, 3 POLE, 20 AMPERE
S4	SIZE 4 COMBINATION MAGNETIC MOTOR STARTER
	HIGH VOLTAGE DRAWOUT CONTACTOR
	FUSE AND DISCONNECT
	POTENTIAL TRANSFORMER
	CURRENT TRANSFORMER
	DEADBREAK TERMINATOR
	STRESS CONE TERMINATOR
	POWER FACTOR CORRECTION CAPACITOR

CONDUIT & WIRING INSTALLATION LEGEND

CONDUIT & WIRING INSTALLATION LEGEND

	CONDUIT EXPOSED
	CONDUIT CONCEALED
	SHORT DASH FOR EACH PHASE CONDUCTOR. LONG DASH FOR NEUTRAL CONDUCTOR. CIRCULAR DASH FOR GROUND WIRE.
PPHS1–5	TYPICAL HOME RUN TO BE ROUTED TO PANEL PPHS1 & CONNECTED TO CIRCUIT #5

N

1 COV2 ENLARGED VICINITY PLAN

0 50' 100'
SCALE 1"=50'

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COVER SHEET

SHEET NO. 2 of 6

COV-2

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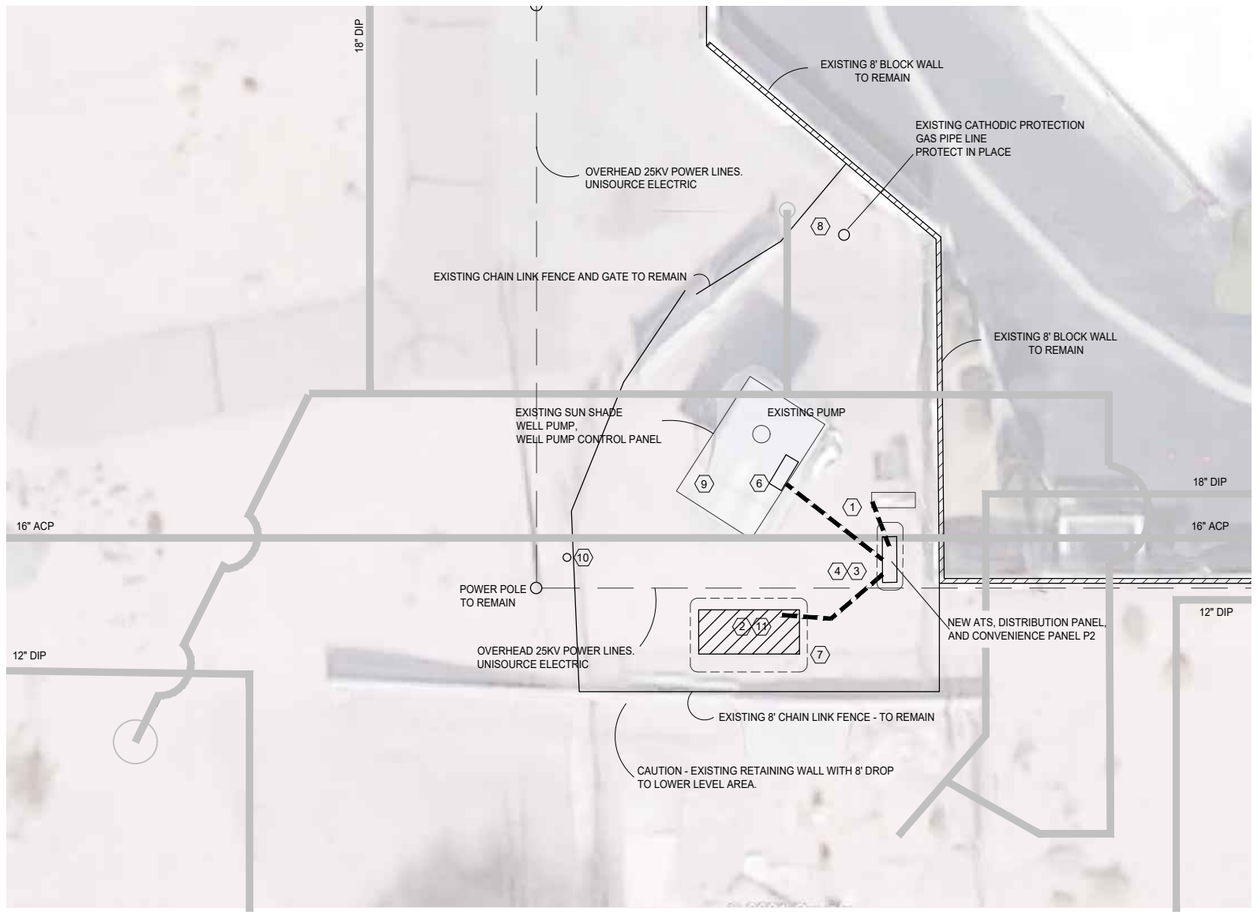

N

1
E101
WELL #2 ELECTRICAL PLAN

0 10' 20'
SCALE 1"=10'

GENERAL NOTES

REFER TO ONE-LINE DIAGRAMS FOR FEEDER AND CONDUCTOR SIZES AND QUANTITIES.

ALL UNDERGROUND CONDUIT AND FEEDERS TO HAVE SAND BACKFILL AROUND CONDUIT AND CONCRETE CAP FOR PHYSICAL PROTECTION. SEE TRENCH DETAIL

PLAN VIEWS DO NOT INDICATE ALL CONDUITS. REFER TO ONE-LINE DIAGRAMS, EQUIPMENT SPECIFICATIONS, AND EQUIPMENT SHOP DRAWINGS FOR BRANCH CIRCUITRY, CONTROL, INSTRUMENTATION, POWER, AND COMMUNICATION CONDUIT AND CONDUCTORS. COORDINATE FIELD PLACEMENT OF INSTRUMENTATION CONDUIT AND CONDUCTORS WITH SYSTEMS INTEGRATOR.

PLAN NOTES

1. EXISTING SES TO REMAIN. SEE ONE-LINE DIAGRAM FOR MODIFICATIONS
2. PROVIDE GENERATOR AND CONCRETE PAD PER DETAILS. SEE ONE-LINE DIAGRAMS FOR CONDUIT AND CONNECTION DETAILS. PROVIDE CONTROL INTERCONNECTION BETWEEN AUTOMATIC TRANSFER SWITCH, GENERATOR, AND WELL PUMP PANEL. SEE GENERATOR SCHEMATIC AND ONE-LINE DIAGRAM. PROVIDE FINAL CONNECTIONS PER MANUFACTURER SHOP DRAWINGS.
3. PROVIDE AUTOMATIC TRANSFER SWITCH AND DISTRIBUTION PANEL NEAR EXISTING SES. INTERCEPT FEED TO WELL PUMP STARTER. SEE ONE-LINE DIAGRAM FOR MODIFICATIONS.
4. MOUNT CONVENIENCE POWER PANEL AND TRANSFORMER ON STRUT SUPPORT. LOCATE ADJACENT TO DISTRIBUTION PANEL..
5. PROVIDE 6" CONCRETE HOUSEKEEPING PAD UNDER , AUTOMATIC TRANSFER SWITCH, DISTRIBUTION PANEL AND CONVENIENCE PANEL EQUIPMENT.
6. PROVIDE CONNECTION TO WELL PUMP PANEL.
7. #4/0 BARE COPPER GROUND RING. BURY 12" B.G. PROVIDE 1/2" X 10' COPPER CLAD GROUND ROD AT EACH CORNER. PROVIDE EXO-THERMIC CONNECTION TO GROUND RODS. CONNECT TO SUPPLEMENTAL EQUIPMENT GROUND AT GENERATOR AND ATS.
8. EXISTING UNISOURCE CATHODIC PROTECTION STANDPIPE AND EQUIPMENT. PROTECT IN PLACE.
9. EXISTING NATURAL GAS ENGINE TO BE ABANDONED BY CITY.
10. EXISTING NATURAL GAS METER TO BE ABANDONED BY CITY.
11. NEW GENERATOR AND CONCRETE PAD. NOMINAL 15'L X 6'W X 10'H

EXISTING UTILITY COORDINATION

CONTRACTOR IS RESPONSIBLE TO BLUE STAKE AND LOCATE ALL EXISTING UTILITIES.

COORDINATE EXACT PLACEMENT OF CONCRETE PADS WITH ENGINEER/OWNER PRIOR TO CONSTRUCTION OF CONCRETE PADS.

OVERHEAD POWER LINES - CAUTION

CONTRACTOR IS RESPONSIBLE TO PROVIDE ALL SAFETY PRECAUTIONS AND COORDINATE RESTRICTIONS WITH UNISOURCE DUE TO PROXIMITY OF OVERHEAD POWER LINES.

NOTE: CRANE PLACEMENT OF GENERATOR IS SEVERELY RESTRICTED AND MAY NOT BE ALLOWED BY UTILITY.

EXISTING CHAIN LINK FENCE

CONTRACTOR MAY REMOVE AND RE-INSTALL PORTIONS OF THE EXISTING CHAIN LINK FENCE IN ORDER TO GAIN ACCESS FOR GENERATOR INSTALLATION.

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KATH
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Date Signed
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CITY OF LAKE HAVASU CITY
ELECTRICAL UPGRADES
CITY WELLS #2 AND #9

LAKE HAVASU CITY, AZ

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SHEET CONTENTS
WELL #2
SITE PLAN

SHEET NO. 3 of 6

E-101

C:\USERS\JOELI\PROOF DROPS\OVAMIE TURNQUIST\PROJECTS\2021 21-004 LHC WELL #2 AND #9\DATA\DWG\ELECTRICAL PLANS\21-004 FOR BID 7-15-2021.DWG
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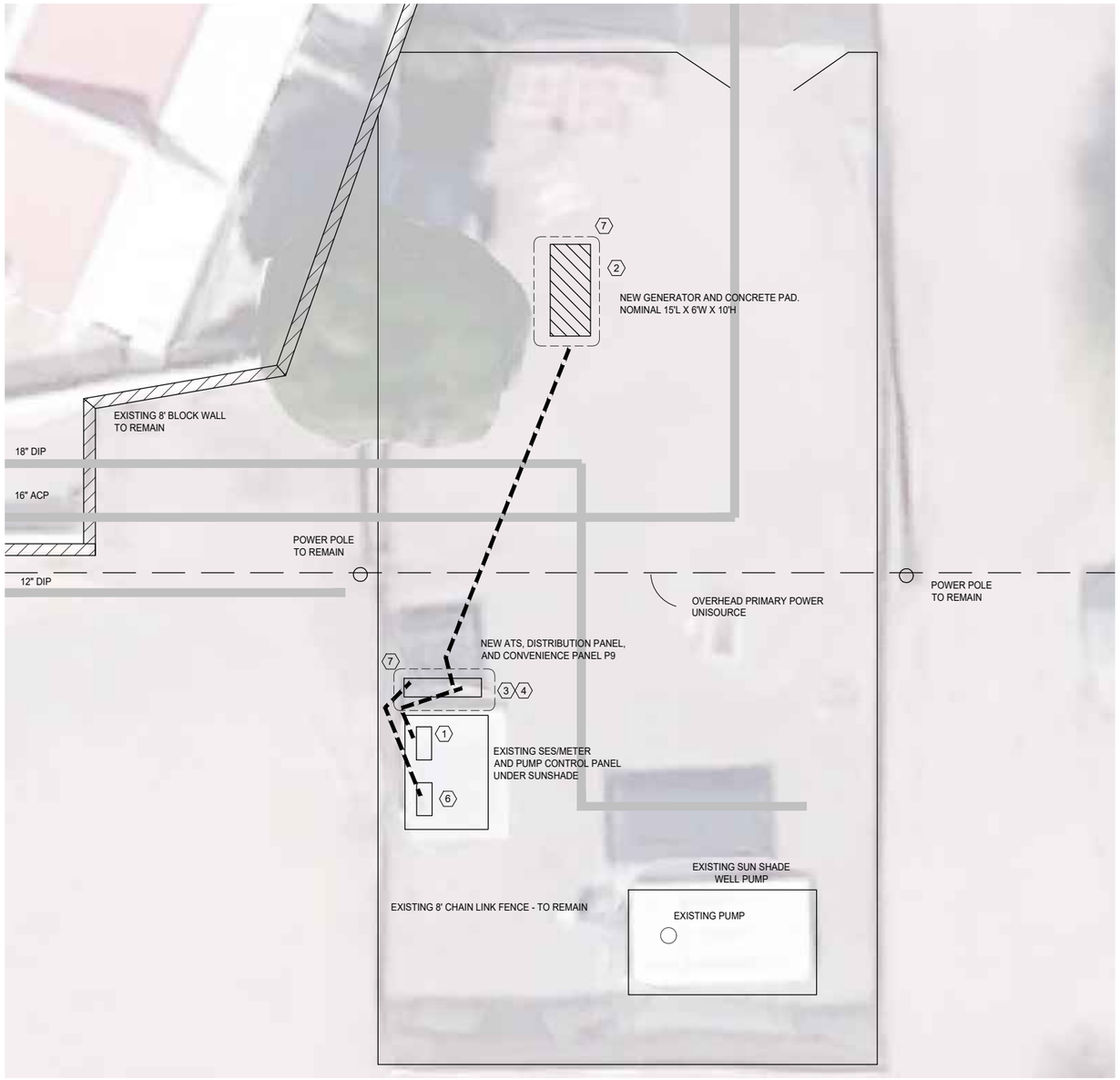

N

1
E102
WELL #9 ELECTRICAL PLAN

0 10' 20'
SCALE 1"=10'

GENERAL NOTES

REFER TO ONE-LINE DIAGRAMS FOR FEEDER AND CONDUCTOR SIZES AND QUANTITIES.

ALL UNDERGROUND CONDUIT AND FEEDERS TO HAVE SAND BACKFILL AROUND CONDUIT AND CONCRETE CAP FOR PHYSICAL PROTECTION. SEE TRENCH DETAIL

PLAN VIEWS DO NOT INDICATE ALL CONDUITS. REFER TO ONE-LINE DIAGRAMS, EQUIPMENT SPECIFICATIONS, AND EQUIPMENT SHOP DRAWINGS FOR BRANCH CIRCUITRY, CONTROL, INSTRUMENTATION, POWER, AND COMMUNICATION CONDUIT AND CONDUCTORS. COORDINATE FIELD PLACEMENT OF INSTRUMENTATION CONDUIT AND CONDUCTORS WITH SYSTEMS INTEGRATOR.

PLAN NOTES

1. EXISTING SES TO REMAIN. SEE ONE-LINE DIAGRAM FOR MODIFICATIONS
2. PROVIDE GENERATOR AND CONCRETE PAD PER DETAILS. SEE ONE-LINE DIAGRAMS FOR CONDUIT AND CONNECTION DETAILS. PROVIDE CONTROL INTERCONNECTION BETWEEN AUTOMATIC TRANSFER SWITCH, GENERATOR, AND WELL PUMP PANEL. SEE GENERATOR SCHEMATIC AND ONE-LINE DIAGRAM. PROVIDE FINAL CONNECTIONS PER MANUFACTURER SHOP DRAWINGS.
3. PROVIDE AUTOMATIC TRANSFER SWITCH AND DISTRIBUTION PANEL NEAR EXISTING SES. INTERCEPT FEED TO WELL PUMP STARTER. SEE ONE-LINE DIAGRAM FOR MODIFICATIONS.
4. MOUNT CONVENIENCE POWER PANEL AND TRANSFORMER ON STRUT SUPPORT. LOCATE ADJACENT TO DISTRIBUTION PANEL..
5. PROVIDE 6" CONCRETE HOUSEKEEPING PAD UNDER , AUTOMATIC TRANSFER SWITCH, DISTRIBUTION PANEL AND CONVENIENCE PANEL EQUIPMENT.
6. PROVIDE CONNECTION TO WELL PUMP PANEL.
7. #4/0 BARE COPPER GROUND RING. BURY 12" B.G. PROVIDE 1/2" X 10' COPPER CLAD GROUND ROD AT EACH CORNER. PROVIDE EXO-THERMIC CONNECTION TO GROUND RODS. CONNECT TO SUPPLEMENTAL EQUIPMENT GROUND AT GENERATOR AND ATS.

EXISTING UTILITY COORDINATION

CONTRACTOR IS RESPONSIBLE TO BLUE STAKE AND LOCATE ALL EXISTING UTILITIES.

COORDINATE EXACT PLACEMENT OF CONCRETE PADS WITH ENGINEER/OWNER PRIOR TO CONSTRUCTION OF CONCRETE PADS.

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ELECTRICAL UPGRADES
CITY WELLS #2 AND #9

LAKE HAVASU CITY, AZ

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SHEET CONTENTS
WELL #9
SITE PLAN

SHEET NO. 4 of 6

E-102

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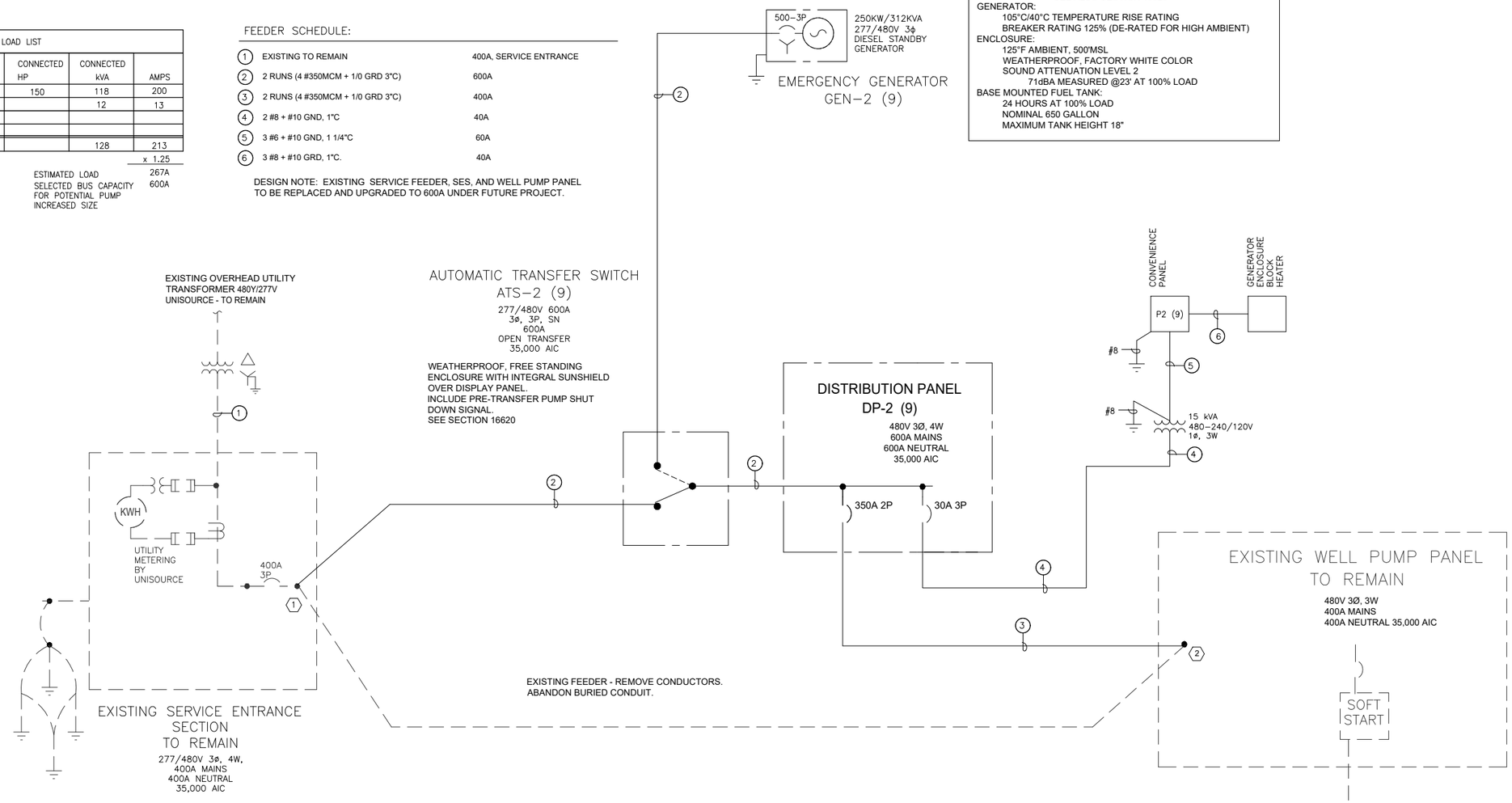
ESTIMATED LOAD LIST			
LOAD	CONNECTED HP	CONNECTED kVA	AMPS
WELL PUMP	150	118	200
CONVENIENCE PANEL		12	13
TOTAL:		128	213
			x 1.25
ESTIMATED LOAD			267A
SELECTED BUS CAPACITY FOR POTENTIAL PUMP INCREASED SIZE			600A

FEEDER SCHEDULE:

1	EXISTING TO REMAIN	400A, SERVICE ENTRANCE
2	2 RUNS (4 #350MCM + 1/0 GRD 3"C)	600A
3	2 RUNS (4 #350MCM + 1/0 GRD 3"C)	400A
4	2 #8 + #10 GND, 1"C	40A
5	3 #6 + #10 GND, 1 1/4"C	60A
6	3 #8 + #10 GRD, 1"C.	40A

DESIGN NOTE: EXISTING SERVICE FEEDER, SES, AND WELL PUMP PANEL TO BE REPLACED AND UPGRADED TO 600A UNDER FUTURE PROJECT.

SEE ALSO SECTION 16620
GENERATOR:
105°C/40°C TEMPERATURE RISE RATING
BREAKER RATING 125% (DE-RATED FOR HIGH AMBIENT)
ENCLOSURE:
125°F AMBIENT, 500'MSL
WEATHERPROOF, FACTORY WHITE COLOR
SOUND ATTENUATION LEVEL 2
71dBA MEASURED @23' AT 100% LOAD
BASE MOUNTED FUEL TANK:
24 HOURS AT 100% LOAD
NOMINAL 650 GALLON
MAXIMUM TANK HEIGHT 18"



POWER SUPPLY: 120/240 VAC, 1PH, 3W
BUS RATING: 100A, 10K A.I.C.
MAIN BREAKER - 60A-3P

LOCATION: EXTERIOR WP NEMA 4
MOUNTING: SURFACE
NAME: P2 (9)

DESCRIPTION	CCT BKR AMP	VA	CCT No	PHASE A	PHASE B	CCT No	CCT BKR AMP	VA	DESCRIPTION
CANOPY LIGHTS - FUTURE	20/1	500	1			2	20/1	360	CONVENIENCE OUTLETS
GENERATOR ENCLOSURE - BLOCK HEATER	30/2	5000	3			4	20/1	360	CONVENIENCE OUTLETS
			5			6	20/1	500	PLC CONTROL PANEL - FUTURE
WELL PUMP PANEL AIR CONDITIONER - FUTURE	20/1	1500	7			8	20/1	180	VALVE POWER - FUTURE
GENERATOR BATTERY CHARGER	20/2	1500	9			10	20/1	500	FLOW METER POWER - FUTURE
			11			12	20/2		SPARE
PLC PANEL AIR CONDITIONER - FUTURE	20/1	1500	13			14			
SPARE	20/1		15			16	20/1		SPARE
SPARE	20/1		17			18	20/1		SPARE
									ESTIMATED CONNECTED LOAD 11.9KVA

NOTE: COMBINATION TRANSFORMER WITH POWER ZONE PANEL MAY BE SUBSTITUTED IN LIEU OF SEPARATE COMPONENTS..

1 / E-201 POWER ONE-LINE DIAGRAM : WELL #2
NOTE: SAME AS WELL #9

ONE-LINE NOTES:

1. REMOVE FEEDER FROM EXISTING MAIN BREAKER. PROVIDE NEW LUGS AS REQUIRED FOR FEEDER SIZE TO TERMINATE NEW FEEDER TO ATS.
2. REMOVE FEEDER CONNECTION WELL PUMP PANEL. PROVIDE NEW LUGS AS REQUIRED TO TERMINATE NEW FEEDER TO WELL PUMP PANEL.

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CITY OF LAKE HAVASU CITY ELECTRICAL UPGRADES CITY WELLS #2 AND #9

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SHEET CONTENTS
ELECTRICAL
POWER ONE-LINE
DIAGRAM
WELL #2 AND WELL #9

SHEET NO. 5 of 6

E-201

C:\USERS\JOEL\PROOF DROPBOX\NAME TURNQUIST\PROJECTS\2021\21-004 LHC WELL #2 AND #9\DATA\DWG\SE\ELECTRICAL PLAN\E21-004 FOR BID 7-15-2021.DWG
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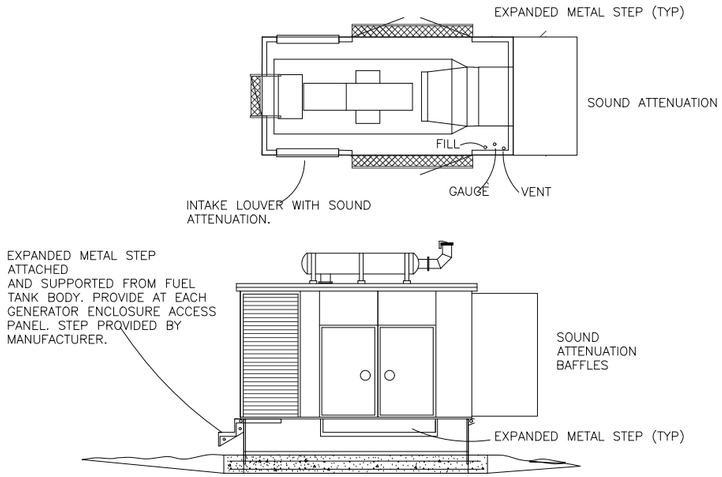
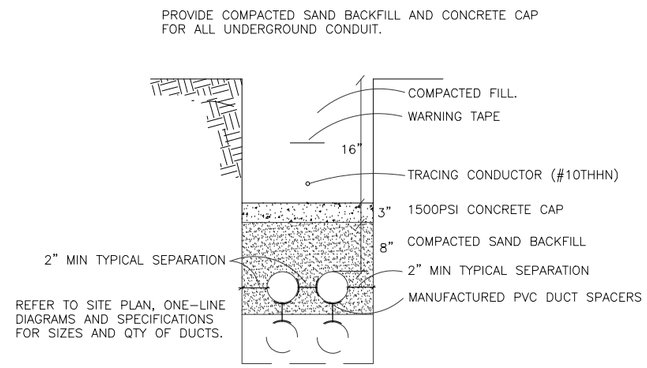
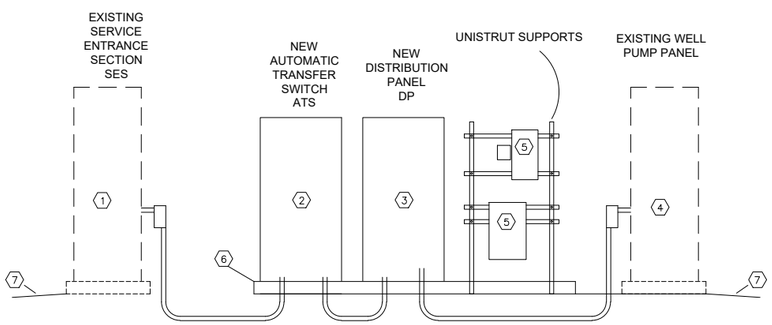


1 / E-202 GENERATOR ENCLOSURE DETAILS
NO SCALE

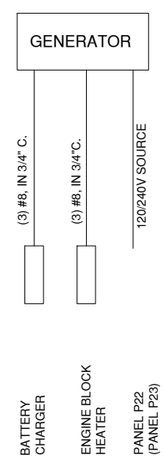


2 / E-202 UNDERGROUND DUCT TRENCH DETAIL
NO SCALE



1. EXISTING SERVICE ENTRANCE SECTION AND METER.
2. NEW AUTOMATIC TRANSFER SWITCH FREESTANDING NEMA4 ENCLOSURE
3. NEW DISTRIBUTION PANEL. NEMA4 ENCLOSURE, SHOWN AS FREESTANDING
4. EXISTING WELL PUMP PANEL
5. NEW CONVENIENCE PANEL, STEP DOWN TRANSFORMER AND (2) WP GFCI RECEPTACLES.
6. PROVIDE 6" CONCRETE HOUSEKEEPING PAD FOR ATS, DISTRIBUTION PANEL, AND CONVENIENCE PANEL.
7. NATIVE GRAVEL / DIRT GRADE

3 / E-202 ELECTRICAL EQUIPMENT ELEVATION
NO SCALE



4 / E-202 GENERATOR CONNECTIONS
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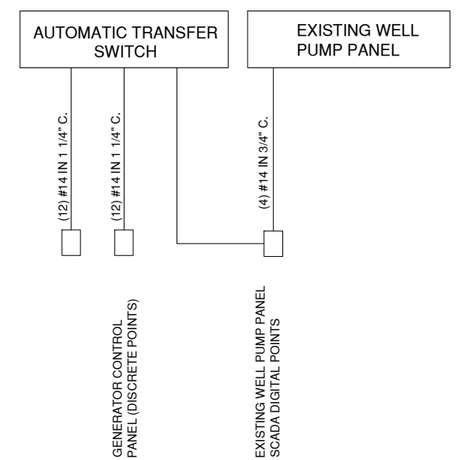

5 / E-202 ELECTRICAL EQUIPMENT ONE-LINE DIAGRAMS
NO SCALE

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ELECTRICAL DETAILS

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E-202

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7/15/2021 9:30:24 PM