Appendix A2: Photometric Analysis

Prepared by MD Acoustics

CEQ 220011

Salvador Solar
Uniun Energy Management Services

CA Office 4960 S. Gilbert Road, Ste 1-461 Chandler, AZ 85249 p. (602) 774-1950

1197 Los Angeles Avenue, Ste C-256 Simi Valley, CA 93065 p. (805) 426-4477

www.mdacoustics.com

April 25, 2022

Mr. Fred Nobles Wintec Energy, LTD 2045 E.Tahquitz Canyon Way Palm Springs, CA 92262

Subject: Nobles Solar Project – Lighting Plan Study, County of Riverside, CA

Dear Mr. Nobles:

MD Acoustics, LLC (MD) has completed the photometric analysis for the lighting plan proposed for the Noble Solar Project located over the area encompassed by APNs 651-130-062 through -065, 651-140-039 through -042, and 651-140-017 through -025 in the County of Riverside, California. This letter report contains the photometric analysis of the security lights proposed and their impact on the County's lighting general development standards (Title 8, Chapter 8.80). Appendix A contains lighting definitions.

1.0 Assessment Overview

MD prepared the photometric evaluation from the proposed lighting plan. The proposed lighting plan consists of shield security lights located at the substation corners and the battery storage platform corners, as shown in exhibits A, B, and C. Lightning spill conditions are compared to the requirements outlined by the County's Outdoor lighting code, Chapter 8.80.

Per the County of Riverside Western Coachella Valley Area Plan Land Use Plan, the site has a current land use classification of Rural Residential. Land uses surrounding the site include vacant medium residential to the west, vacant rural residential to the north and east, and industrial to the south.

2.0 County of Riverside Lighting Requirements

Chapter 8.80 Outdoor Lighting outlines the following as it relates to minimum lighting requirements:

8.80.050 - Standard.

All outdoor luminaries in shall be located, adequately shielded, and directed such that no direct light falls outside the parcel of origin, or onto the public right-of-way. Outdoor luminaries shall not blink, flash or rotate.

8.80.060 - Exemptions.

The following outdoor luminaries shall be exempt from the provisions of this chapter when properly installed and in compliance with all county ordinances.

- A. Luminaries used or otherwise required by law enforcement or other emergency personnel.
- B. Luminaries used to illuminate publicly-owned property, including but not limited to, parks, recreation areas, schools, street, street signs and sidewalks.
- C. Luminaries used to illuminate authorized public and private monuments.

- D. Luminaries authorized by a provision of state or federal law as long as that lighting conforms to the requirements of the state of federal law.
- E. Luminaries used for holiday decorations.
- F. Luminaries producing light directly by the combustion of fossil fuels (such as kerosene lanterns, and gas lamps).
- G. Neon luminaries.
- H. Luminaries used to illuminate agricultural activities, operations or facilities as defined in Section 5 of Riverside County Ordinance No. 625.

8.80.080. Security Lighting. Security lighting triggered by motion or noise shall be allowed subject to all the provisions this chapter.

Therefore, the project lights shall not generate direct light that falls outside the property line, as outlined in Appendix B.

3.0 Evaluation and Findings

MD calculated the lighting levels in foot-candles at the illuminated areas across the project property (see Exhibit A, B, C), which considers the light from the proposed security pole lights shown in the exhibits. The potential nearest sensitive receptors are the vacant residential land uses beyond the property lines.

The photometric calculations show that light levels would range between 0.0 to 4.5 foot-candles at the substation and battery storage platforms with a spill below 45 feet. All light levels are within the expected range since the project will utilize nighttime lighting for security purposes only.

The photometric analysis showed no potential impact of light trespass on any roadways or sensitive receptors in the vicinity of the project site. The proposed lighting plan analyzed complies with the County Code requirements.

5.0 Conclusions

MD is pleased to provide this evaluation. If you have any questions regarding this analysis, please don't hesitate to call us at (805) 426-4477.

Sincerely,

MD Acoustics, LLC

Francisco Irarrazabal Acoustical Consultant

five (5) lights Ō.1 Ō.3 5.1 5.2 5.3 5.3 5.2 5.2 9 t.9 t.5 t.3 t.1 t.0 t.0 t.0 t.0 t.0 <u>5.2</u> 5.4 5.6 5.7 5.5 5.3 1.5 1.4 5.8 5.4 5.2 5.1 5.0 5.0 5.0 5.0 5.4 5.8 1.4 1.3 5.8 5.4 5.8 1.7 2.6 2.3 1.3 5.6 ž.4 ž.5 1.5 b.6 b.2 b.1 b.0 b.0 b.0 b.0 4 3.7 2.5 1.2 5.5 5.2 5.1 5.1 5.0 5 1.7 3.0 3.9 3.1 1.8 5.6/ 4.4 3.7 2.1 5.9 5.4 5.2 5.1 5.1 5.0 2.9 4.3 4.3 3.2 1.4 0.2 4.0 4.5 3.2 1.7 b.7 b.3 b.1 b.1 b.0 b.0 b.0 b.0 b.1 b.1 / b.3 b.6 1.5 2.7 4.2 4.2 4.0 2.4 ø.2 b.0 to to the total transfer transfer to the total transfer transf 208.5 ft

Exhibit A

Photometric Analysis for the Substation Area



IMAGE, DIMENSIONS ARE APPROXIMATE,

PHOTOMETRIC EVALUATION NOT FOR CONSTRUCTION

Based on the information provided, all dimensions and luminaire locations shown represent recommended positions. The engineer and/or architect must determine the applicability of the layout to existing or future field conditions.

This lighting plan represents illumination levels calculated from laboratory data taken under controlled conditions in accordance with The Illuminating Engineering Society (IES) approved methods. Actual performance of any manufacturer's luminaires may vary due to changes in electrical voltage, tolerance in lamps/LED's and other variable field conditions. Calculations do not include obstructions such as buildings, curbs, landscaping, or any other architectural elements unless noted. Fixture nomenclature noted does not include mounting hardware or poles. This drawing is for photometric evaluation purposes only and should not be used as a construction document or as a final document for ordering product.

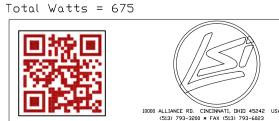
Calculation Summary							
Label	CalcType	Units	Avg	Max	Min	Avg/Min	Max/Min
ALL CALCS @ GRADE	Illuminance	Fc	0.71	4.5	0.0	N.A.	N.A.
PLATFORM AREA	Illuminance	Fc	0.73	4.5	0.0	N.A.	N.A.

Luminaire Sched	kule								
Symbol	Qty	Label	Arrangement	Description	LLD	LDD	LLF	Arr. Lum. Lumens	Arr. Watts
	5	А	SINGLE	SLM-LED-18L-SIL-FT-30-70CRI-IL-22' MH	1.000	1.000	0.950	11803	135

Total Project Watts_1



SCALE: 1"=20'



LD-155448A LIGHTING PROPOSAL NOBLE SOLAR FARM RIVERSIDE, CA DATE:5/25/22 REV:

See heig 250 ft <u>2</u>5 4.0 4.4 2.9 1.5 b.6 b.3∖ b.1 b.1 b.0 b.0 b.0 b.0 b.0 b.0 b.0 b.0 b.1 b.1 / b.3 b.7 1.6 2.8 4.1 4.1 3.66

Exhibit B

Photometric Analysis for the Battery Storage Area (Typ)



IMAGE, DIMENSIONS ARE APPROXIMATE.

PHOTOMETRIC EVALUATION NOT FOR CONSTRUCTION

Based on the information provided, all dimensions and luminaire locations shown represent recommended positions. The engineer and/or architect must determine the applicability of the layout to existing or future field conditions.

This lighting plan represents illumination levels calculated from laboratory data taken under controlled conditions in accordance with The Illuminating Engineering Society (IES) approved methods. Actual performance of any manufacturer's luminaires may vary due to changes in electrical voltage, tolerance in lamps/LED's and other variable field conditions. Calculations do not include obstructions such as buildings, curbs, landscaping, or any other architectural elements unless noted. Fixture nomenclature noted does not include mounting hardware or poles. This drawing is for photometric evaluation purposes only and should not be used as a construction document or as a final document for ordering product.

Calculation Summary							
Label	СаІсТуре	Units	Avg	Max	Min	Avg/Min	Max/Min
ALL CALCS @ GRADE	Illuminance	Fc	0.49	4.5	0.0	N.A.	N.A.
PLATFORM	Illuminance	Fc	0.39	4.5	0.0	N.A.	N.A.

Luminaire Sched	dule								
Symbol	Qty	Label	Arrangement	Description	LLD	LDD	LLF	Arr. Lum. Lumens	Arr. Watts
— 	4	А	SINGLE	SLM-LED-18L-SIL-FT-30-70CRI-IL-22' MH	1.000	1.000	0.950	11803	135

Total Project Watts_1

Total Watts = 540





LIGHTING PROPOSAL NOBLE SOLAR FARM RIVERSIDE, CA

DATE:5/25/22 SCALE: 1"=20'



0° 0° 80 0°

Exhibit C Photometric Analysis for the Parking Lot Area



DRAWING SCALED OR CONVERTED FROM PDF FILE OR SCANNED / SUBMITTED IMAGE. DIMENSIONS ARE APPROXIMATE.

PHOTOMETRIC EVALUATION NOT FOR CONSTRUCTION

Based on the information provided, all dimensions and luminaire locations shown represent recommended positions. The engineer and/or architect must determine the applicability of the layout to existing or future field conditions.

This lighting plan represents illumination levels calculated from laboratory data taken under controlled conditions in accordance with The Illuminating Engineering Society (IES) approved methods. Actual performance of any manufacturer's luminaires may vary due to changes in electrical voltage, tolerance in lamps/LED's and other variable field conditions. Calculations do not include obstructions such as buildings, curbs, landscaping, or any other architectural elements unless noted. Fixture nomenclature noted does not include mounting hardware or poles. This drawing is for photometric evaluation purposes only and should not be used as a construction document or as a final document for ordering product.

Calculation Summary							
Label	CalcType	Units	Avg	Max	Min	Avg/Min	Max/Min
ALL CALCS @ GRADE	Illuminance	Fc	0.32	4.3	0.0	N.A.	N.A.
PARKING AREA ONLY	Illuminance	Fc	2.96	4.3	1.2	2.47	3.58

Luminaire ScheduleSymbolQtyLabelArrangementDescriptionLLDLDDLLFArr. Lum. LumensArr. Watts2ASINGLESLM-LED-18L-SIL-FT-30-70CRI-IL-22' MH1.0001.0000.95011803135







LIGHTING PROPOSAL LO-155448C

NOBLE SOLAR FARM
RIVERSIDE, CA

BY:AHK DATE:5/25/22 REV: SHEET 1

SCALE: 1"=20'

0

20

Appendix A

Glossary of Lighting Terms

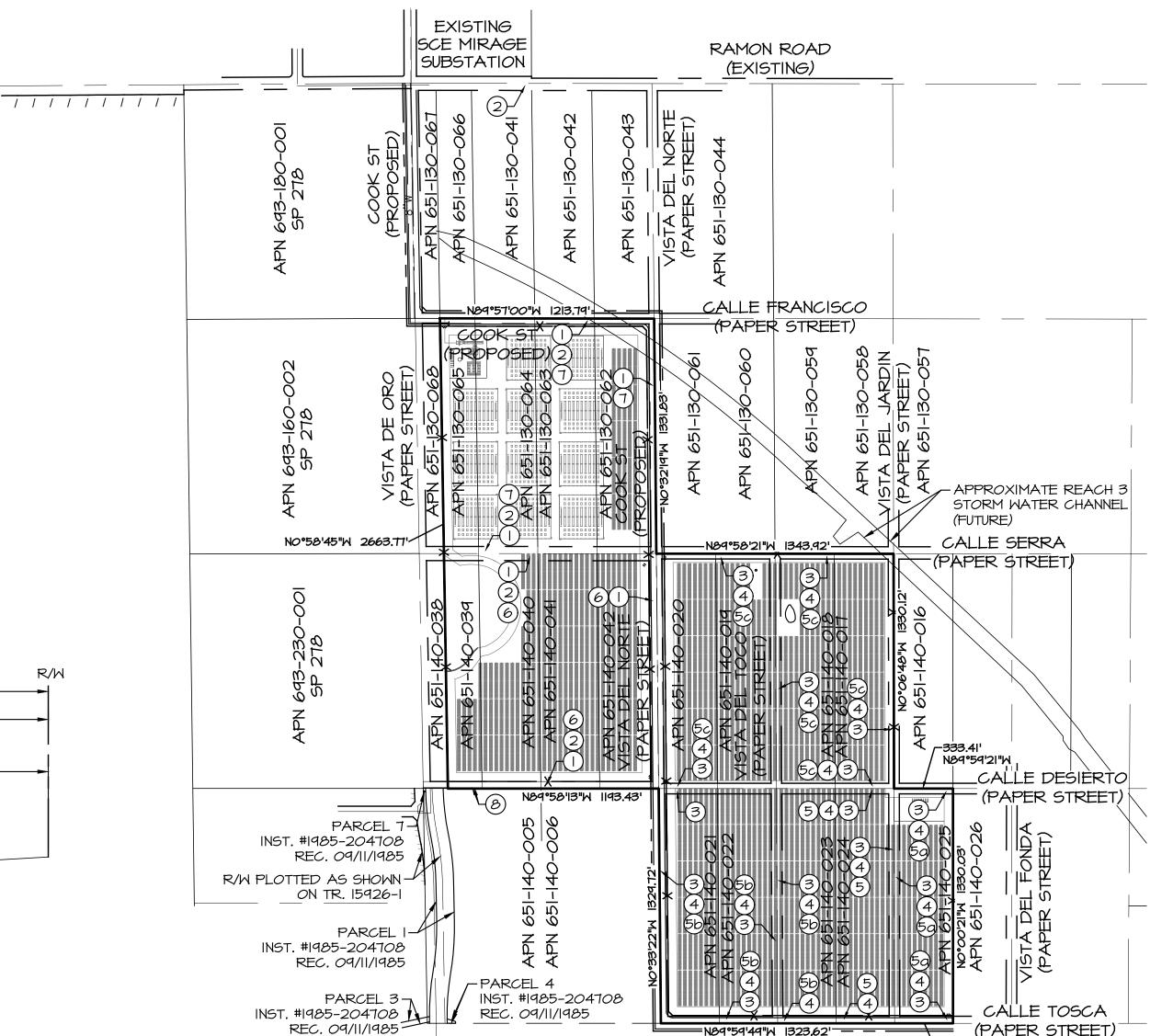
Glossary of Terms

<u>Foot-Candle</u> is a unit of illumination (now little used) equal to that given by a source of one candela at a distance of one foot (equivalent to one lumen per square foot or 10.764 lux).

<u>Lumen</u> is a measure of the total amount of visible light (to the human eye) from a lamp or light source. The higher the lumen rating the "brighter: the lamp will appear (Integral LED, 2015). This light, as low as 0.1 lumens is visible to the human eye, and the average household lightbulb (60 watts) emits approximately 800 lumens (at the source).

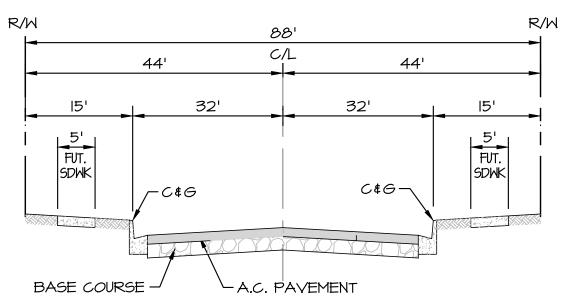
<u>Lux</u> is the SI unit of illuminance, equal to one lumen per square meter.

Appendix BProject Site Plan (from preliminary CUP)

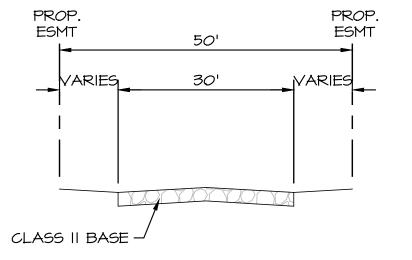


C/L 44' 44' 29' 29' CLASS II BASE

COOK STREET (INTERIM) MODIFIED SECONDARY HIGHWAY (88' R/W) N.T.S.



COOK STREET (FUTURE) MODIFIED SECONDARY HIGHWAY MODIFIED STD. NO. 94 (88' R/W) N.T.S.



PERIMETER ACCESS ROAD (ONSITE) EMERGENCY ACCESS EASMENT OVER PERIMETER ACCESS ROAD N.T.S.

PROJECT DESCRIPTION

A CHANGE OF ZONE FOR THE PROJECT PROPOSES TO MODIFY THE ENTIRE PROJECT SITE FROM SINGLE-FAMILY RESIDENTIAL ZONE (R-I) TO REGULATED DEVELOPMENT AREA (R-D). A CONDITIONAL USE PERMIT (CUP) AND DEVELOPMENT AGREEMENT (DA) PROPOSES THE DEVELOPMENT OF A 400-MEGAWATT (MW) BATTERY AND 60-150 MW UNMANNED SOLAR FACILITY AND ASSOCIATED IMPROVEMENTS ON A 166± ACRE SITE, LOCATED SOUTH OF RAMON ROAD AND EAST OF INTERSTATE IO (I-IO) IN THOUSAND PALMS IN THE UNINCORPORATED COUNTY OF RIVERSIDE. THE BATTERY FACILITY WOULD CONSIST OF 400 SELF-CONTAINED ONE MW STORAGE BATTERIES TO BE INSTALLED ON ELEVATED METAL PLATFORMS. GRADING AND PAVING WOULD BE MINIMAL DUE TO USING ROAD BASE GRAVEL FOR ROAD. PHOTOVOLTAIC (PV) ROWS WOULD CONSIST OF 96 MODULES EACH, 2 X 48 SINGLE AXIS TRACKERS, BIFACIAL PASSIVATED EMITTER REAR CELL (PERC) TECHNOLOGY.

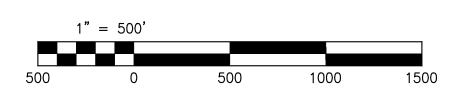
APN 694-060-023

APN 694-050-005

FIRE ACCESS WILL BE PROVIDED FROM RAMON ROAD TO THE PROJECT SITE. WATER SERVICES TO THE PROJECT SITE WOULD BE PROVIDED BY COACHELLA VALLEY WATER DISTRICT (CYMD) VIA AN EXISTING WATER LINE BENEATH RAMON ROAD TO ENSURE SOLAR PANEL MAINTENANCE AND POTENTIAL LANDSCAPING CARE ALONG THE PERIMETER OF THE SITE. NO SEWAGE OR STORM DRAIN FACILITIES WOULD BE NEEDED FOR THE PROPOSED PROJECT. ALL PROJECT RUNOFF WOULD BE DRAINED VIA CONTOUR GRADING, WHICH WOULD MATCH THE HISTORICAL DRAINAGE PLAN OF THE SITE, A PUBLIC USE PERMIT (PUP) WOULD BE REQUIRED TO ALLOW FOR AN APPROXIMATELY 1,400 FOOT POWER LINE EXTENSION FROM THE PROJECT SITE TO NORTH OF RAMON ROAD TO CONNECT TO THE SOUTHERN CALIFORNIA EDISON (SCE) MIRAGE SUBSTATION NORTH OF RAMON ROAD.

APPROXIMATE EARTHWORK QUANTITY ESTIMATE

CUT- 174,200 CU. YDS. FILL- 138,030 CU. YDS. SHRINKAGE- 26,130 CU. YDS. SUBSIDENCE- 10,040 CU. YDS. NET- O CU. YDS. (BALANCED)



N&9°59'38"E 330.91'

APN 694-050-006

GENERAL INFORMATION

- THOMAS BROS. MAP BOOK PAGE 788 GRID: G2, G3, G4, H3 & H4. PROJECT IS WITHIN THE WESTERN COACHELLA VALLEY AREA PLAN.
- PROJECT IS NOT WITHIN A SPECIFIC PLAN.
- PROJECT IS NOT WITHIN A COMMUNITY SERVICE AREA 5. EASEMENTS OF RECORD ARE PLOTTED HEREON.
- THERE IS AN EXISTING WELL ON THE PROPERTY. (PERMIT #30838) WELL TO REMAIN, PROTECT IN PLACE.
- ALL SLOPES ARE 3:1 RATIO MAX, UNLESS OTHERWISE NOTED.
- 8. LAND IS NOT WITHIN A SPECIAL STUDIES ZONE. LAND HAS MODERATE LIQUEFACTION POTENTIAL
- IO. SUBSURFACE SEPTIC SEWAGE DISPOSAL IS NOT INTENDED
- NO EXISTING STRUCTURES OR DWELLINGS ON SITE.
- 12. THE PROJECT WILL COMPLY WITH NPDES REQUIREMENTS AS REQUIRED BY NPDES SUPPLEMENT "A". (WHITEWATER WATERSHED) 13. FLOOD ZONE AO, AREA OF ALLUVIAL FAN FLOODPLAINS (1-2' DEPTH), PER FEMA PANEL 06065CI6I5G (EFFECTIVE DATE AUGUST

AREA SUMMARY

28, 2008).

PROPOSED	SQUARE FEET (SF)	ACREAGE (AC,
SOLAR PANELS	4,717,415.7	108.3
BATTERY FACILITY	994,599.5	22.8
ONSITE SUBSTATION	73,203	1.7
ONSITE PERIMETER ACCESS ROAD	799,387	18.4
NET AREA		151.2
CULTURAL AREA	208,013	4.8
ROW DEDICATION	403,126.7	9.3
GROSS AREA		165.2

EASEMENT NOTES

- (I.) AN EASEMENT SHOWN OR DEDICATED ON THE MAP OF RECORD OF SURVEY RECORDED NOVEMBER 23, 1954 AND ON FILE IN BOOK 22, PAGE 3, OF RECORD MAPS FOR ROADS, UTILITY AND INCIDENTAL
- (2) AN OFFER OF DEDICATION FOR PUBLIC HIGHWAY AND INCIDENTAL PURPOSES, RECORDED OCTOBER 2, 1956 AS BOOK 1980, PAGE 125 OF OFFICIAL RECORDS, TO COUNTY OF RIVERSIDE.
- (3) AN EASEMENT SHOWN OR DEDICATED ON THE MAP OF RECORD OF SURVEY RECORDED OCTOBER 16, 1956 AND ON FILE IN BOOK 25, PAGE 44, OF RECORD MAPS FOR ROADS, UTILITY AND INCIDENTAL PURPOSES.
- (4) AN OFFER OF DEDICATION FOR PUBLIC HIGHWAY AND INCIDENTAL PURPOSES, RECORDED OCTOBER 18, 1956 AS BOOK 1987, PAGE 431 OF OFFICIAL RECORDS, TO COUNTY OF RIVERSIDE.
- (5) AN EASEMENT FOR ROADWAY AND PUBLIC PURPOSES TO BE USED IN COMMON WITH OTHERS AND INCIDENTAL PURPOSES, RECORDED MARCH II, 1958 IN BOOK 2236 PAGE 248 [5]; APRIL 18, 1958 AS INSTRUMENT NO. 28370 IN BOOK 2257, PAGE 460 [5A]; SEPTEMBER 24, 1959 AS INSTRUMENT NO. 82091 [5B]; AND MARCH 28, 1960 AS INSTRUMENT NO. 27115 IN BOOK 2663 PAGE 345 [5C], ALL OF OFFICIAL RECORDS, IN FAVOR OF TITLE INSURANCE AND TRUST COMPANY.
- (6) AN EASEMENT FOR ROADWAY, PUBLIC UTILITIES TO BE USED IN COMMON WITH OTHERS AND INCIDENTAL PURPOSES, RECORDED MARCH 28, 1960 AS INSTRUMENT NO. 27114 IN BOOK 2663 PAGE 344 OF OFFICIAL RECORDS, IN FAVOR OF TITLE INSURANCE AND TRUST COMPANY.
- (7.) AN EASEMENT FOR ROADWAY, PUBLIC UTILITIES TO BE USED IN COMMON WITH OTHERS AND INCIDENTAL PURPOSES, RECORDED FEBRUARY 14, 1964 AS INSTRUMENT NO. 19009 IN BOOK 3611 PAGE 4 OF OFFICIAL RECORDS, IN FAVOR OF TITLE INSURANCE AND TRUST COMPANY.

DATE:

DESIGNED:

CHECKED:

PLN CK REF:

(8) A 4.00' WIDE EASEMENT FOR SEWER, WATER, TELEPHONE AND POWER LINES AND FOR OTHER UTILITY AND FOR ROADWAY AND RIGHT-OF-WAY PURPOSES AND FOR INGRESS AND EGRESS AND INCIDENTAL PURPOSES, RECORDED NOVEMBER 20, 1968 AS INSTRUMENT NO. 111526 OF OFFICIAL RECORDS.

ALBERT A.

ASSOCIATES

PLOT DATE: 1-Feb-22

ENGINEERING CONSULTANTS

3788 McCRAY STREET

RIVERSIDE CA. 92506

PH. (951) 686-1070

FAX (951) 788-1256

OWNER

THOUSAND PALMS 278, LLC P.O. BOX 12950 PALM DESERT, CA 92255 CONTACT: FRED NOBLE PHONE: (760) 323-9490 FAX: (760) 537-7284

SOILS ENGINEER

PETRA GEOSCIENCES, INC. 42-240 GREEN WAY, SUITE E PALM DESERT, CA 92211 CONTACT: ALAN PACE, CEG PHONE: (760) 340-5303 FAX: (760) 340-5096

<u>A.P.N.</u>

651-130-062 THRU -065 651-140-017 THRU -025 651-140-039 THRU -042

ACREAGE

165.2 GROSS ACRES 151.2 NET ACRES

SCHOOL DISTRICT

PALM SPRINGS UNIFIED SCHOOL DISTRICT

UTILITY PROVIDERS

WATER	COACHELLA VALLEY WATER DISTRIC
SEWER	
ELECTRICAL	IMPERIAL IRRIGATION DISTRICT
GAS	SOUTHERN CALIFORNIA FAS COMPAN
TELEPHONE	FRONTIER
CABLE T.V	CHARTER COMMUNICATIONS

RAMON RD

<u>VICINITY MAP</u>

UNIUN ENERGY MANAGEMENT SERVICES, LLC

ENGINEER / REPRESENTATIVE

EXISTING/PROPOSED GENERAL PLAN LAND USE:

MEDIUM DENSITY RESIDENTIAL (MDR) AND RURA

EXISTING ZONING: R-I RESIDENTIAL (ALL APNS)

2045 E. TAHQUITZ CANYON WAY

ALBERT A. WEBB ASSOCIATES

CONTACT: SANDY CHANDLER

LAND USE AND ZONING

EXISTING LAND USE: YACANT LOT

PROPOSED ZONING: R-D REGULATED

PALM DESERT, CA 92262

PHONE: (760) 323-9490

CONTACT: FRED NOBLE

FAX:(760) 537-7284

3788 MCCRAY STREET

RIVERSIDE, CA 92506

PHONE: (951) 686-1070

FAX: (951) 788-1256

RESIDENTIAL (RR)

DEVELOPMENT (ALL APNS)

APPLICANT

PROJECT

LEGAL DESCRIPTION

PARCEL I

PARCELS 21, 22, 23, 24, 25, 26, 27 AND 28, IN THE COUNTY OF RIVERSIDE STATE OF CALIFORNIA, AS SHOWN ON THE RECORDS OF SURVEY, FILED IN BOOK 22, PAGE 3 OF RECORDS OF SURVEY, IN THE OFFICE OF THE COUNTY RECORDER OF SAID COUNTY.

EXCEPT THEREFROM THE WESTERLY 140.00 FEET OF SAID PARCELS 24 AND 25 AS CONVEYED TO SOUTHERN CALIFORNIA EDISON COMPANY BY THE DEED RECORDED AUGUST 7, 1984 AS INSTRUMENT NO. 172083, OFFICIAL RECORDS.

PARCEL IA:

AN EASEMENT FOR ROADWAY AND PUBLIC UTILITY PURPOSES TO BE USE IN COMMON WITH OTHER OVER VARIOUS STRIPS OF LAND DESIGNATED OF LAND DESIGNATED AS "ROAD EASEMENTS" AS SHOWN ON THE RECORD OF SURVEY FILED IN BOOK 22, PAGE 3 OF RECORDS OF SURVEY, RIVERSIDE COUNTY RECORDS.

PARCEL 2:

PARCELS 41, 42, 43, 44, 45, 46, 47, 48, AND 49, IN THE COUNTY OF RIVERSIDE STATE OF CALIFORNIA, AS SHOWN ON THE RECORD OF SURVEY FILED IN BOOK 25, PAGE 44 OF RECORDS OF SURVEY, IN THE OFFICE OF THE COUNTY RECORDER OF SAID COUNTY.

PARCEL 2A:

AN EASEMENT FOR ROADWAY AND PUBLIC UTILITY PURPOSES TO BE USED IN COMMON WITH OTHERS OVER VARIOUS STRIPS OF LAND DESIGNATED AS "ROAD EASEMENTS" AS SHOWN ON THE RECORD OF SURVEY FILED IN BOOK 25, PAGE 44 OF RECORDS OF SURVEY, RIVERSIDE COUNTY RECORDS.

DESCRIPTION INDEX MAP DETAILS CONCEPTUAL GRADING

CONDITIONAL USE PERMIT NO. SALVADOR SOLAR

W.O. 2021-0235 SHEET OF 4 SHEET DWG. NO.

INDEX MAP

