CIVITAS
Extraction Oil & Gas, Inc.

Substantially Equivalent Light Mitigation Plan

This document is being submitted as a substantially equivalent Light Mitigation Plan for the Washington Pad Form 2A. This light mitigation plan was developed as a part of the operator agreement process with City of Thornton. This document complies with all requirements outlined in Colorado Oil and Gas Conservation Commission Rule 304.c.(3). For this reason, Extraction believes this satisfies the substantially equivalent information requirements and requests that it is accepted pursuant to Rule 304.e.

CIVITAS
Extraction Oil & Gas, Inc.

Proposed Best Management Practices

1. Minimizing lighting when not needed using timers or motion sensors ("use only the lights you need").
2. Operator will use lighting colors that reduce light intensity.
3. Operator will use low-glare and no-glare lighting.
4. Operator shall direct site lighting downward and inward, such that no light shines above a horizontal plane passing through the center point of the light source, with lights hidden by the sound wall.
5. Operator will place bulbs within fixtures that obscure, block, or diffuse the light to reduce light intensity outside the boundaries of the oil and gas location.
6. Operator will not install permanent production lighting.

Thornton Operator Agreement Application Materials

Section 18 - 870

Section f (2)

Photometric Lighting Study

Washington Pad

EXTRACTION OIL & GAS

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1.0 INTRODUCTION

The following document provides Extraction Oil & Gas, Inc.'s ("Extraction", "Operator", or "The Operator") photometric lighting study associated with the proposed development of minerals within the municipal boundaries of the City and County of Thornton ("Thornton", "City", or "The City") at the location described as the proposed Washington Pad Site ("Washington", "The Development").

Thornton sets forth the content requirements for vicinity maps in Thornton City Code, Article X, Division 2, Section18-870(2) as follows:

> *A photometric study to include a plan for installation of lighting. The plan shall show how the applicant will mitigate light pollution and spillover onto properties within 1000 feet of the well site, and meet the glare requirements of Section 38-442 of the Code unless another type of lighting is necessary for public and occupational safety*

This document fulfills these review requirements and is submitted as part of the application materials in support of Thornton municipal development approval.

2.0 PHOTMETRIC LIGHT STUDY

WASHINGTON PAD
EXTRACTION OIL & GAS

Lumens Per Square Foot		
	PASS/FAIL:	PASS
Criteria		
Zone	LZ-1	
Construction Allowance (lm/sqft)	12	
Production Allowance (lm/sqft)	1.25	
Site Sqft	250576	
Construction Allowance (lm)	3006912	
Production Allowance (lm)	313220	
Lumens / phase	**Lumens**	**Pass / Fail**
Drilling (lm)	451052	PASS
Completion (lm)	1395260	PASS
Production (lm)	0	PASS

1 OVERALL AREA MAP
SCALE: NTS

DRAWINGS

NUMBER	DESCRIPTION
L-0.00	L - LIGHTING COVERSHEET
L-1.01	L - LIGHTING SITE MAP
L-2.01	L - DRILLING FIXTURES
L-2.02	L - DRILLING PHOTOMETRIC
L-2.03	L - DRILLING PHOTOMETRIC SCHEDULES
L-3.01	L - COMPLETION FIXTURES
L-3.02	L - COMPLETION PHOTOMETRIC
L-3.03	L - COMPLETION PHOTOMETRIC SCHEDULES
ATTACHMENT A	FIXTURE CUT SHEETS

GENERAL NOTES

1. COORDINATE EXACT EQUIPMENT LOCATIONS WITH OWNER PRIOR TO ROUGH-INS. REVIEW ENTIRE PROJECT PACKAGE INCLUDING OTHER TRADE DRAWING FOR COMPLETE UNDERSTANDING OF DESIGN.
2. THE OWNER AND ENGINEER ARE NOT RESPONSIBLE FOR THE CONTRACTOR'S SAFETY PRECAUTIONS OR TO MEANS, METHODS TECHNIQUES CONSTRUCTION SEQUENCES OR PROCEDURES REQUIRED TO PERFORM THE WORK.
3. THE INTENT OF THE DRAWINGS IS TO PROVIDE CLARIFICATION OF THE PLAN OF INSTALLATION OF LIGHTING RELATIVE TO SITE LAYOUT FOR RULE 424 PLAN SUBMISSION REVIEW AND COMPLIANCE. OWNER & OPERATOR ARE RESPONSIBLE TO ENSURE COMPLIANCE WITH THE CODE REQUIREMENTS AND OPERATIONS AS DESCRIBED HEREIN.
4. DIMENSIONS - CONTRACTOR/CUSTOMER TO VERIFY ALL DIMENSIONS AND REPORT ANY DISCREPANCIES TO ENGINEER IMMEDIATELY.
5. ALL ELECTRICAL INSTALLATIONS ARE TO BE PER ELECTRICAL ENGINEERING DRAWINGS AND SPECIFICATIONS AS PROVIDED BY OTHERS. THESE DRAWINGS ARE NOT ELECTRICAL ENGINEERING DESIGN AND ARE INTENDED FOR PLAN REVIEW AND OPERATIONAL PRESCRIPTION PURPOSES ONLY.
6. VERIFY ALL FIXTURE MODEL, HEIGHT, TILT, AIMING, SHIELDING AND LOCATION AS SHOWN HEREIN PRIOR TO ROUGH-IN OR INSTALLATION.
7. SITE FIXTURES TO BE FULL CUTOFF AS DEFINED BY MUNICIPAL CODE, NOT EMITTING LIGHTING ABOVE 90° FROM NADIR. SEE EXAMPLES OF FULL CUTOFF.
8. REFER TO ELECTRICAL DRAWINGS FOR CONDUIT SIZING, WIRING, AND OTHER ELECTRICAL. REFER TO OWNER/OPERATOR FOR FIXTURE POLE COLOR AND FINISH.
9. ALL EXTERIOR LIGHTING TO BE SWITCHED WITH DUSK TO DAWN PHOTOCELL AND FIXTURE MOUNTED OCCUPANCY SENSORS WITH 15 MINUTE TO 1 HOUR TIMED OFF SINCE LAST OCCUPANCY SENSED BY ANY SENSOR OR AS OTHERWISE DESCRIBED ON THE ELECTRICAL DRAWINGS. SENSORS TO BE TIED TOGETHER SO THAT ANY SENSING ON ONE SENSORS TURN ON ALL LIGHTS IN THAT AREA.
13. INSTALLATION MUST BE COMPLIANT WITH APPLICABLE CURRENT LOCAL, STATE, AND FEDERAL BUILDING AND ENERGY CONSERVATION CODES: INTERNATIONAL BUILDING CODE 2018, INTERNATIONAL ENERGY CONSERVATION CODE 2018, NATIONAL ELECTRICAL CODE (NEC) NFPA 70 2020.
15. CONTRACTOR PROVIDE TO OWNER DOCUMENTATION REGARDING OPERATIONS AND MAINTENANCE OF THE LIGHTING SYSTEM AND COMPONENTS INCLUDING MANUFACTURERS' INFORMATION, SPECIFICATIONS, PROGRAMMING PROCEDURES AND MEANS OF ILLUSTRATING TO OWNER HOW BUILDING, EQUIPMENT AND SYSTEMS ARE INTENDED TO BE INSTALLED, MAINTAINED AND OPERATED.
16. PER OGEB DIRECTOR THE SITE IS LIMITED TO THE FOLLOWING:
    16.1.1. LZ-1 1.25 LUMENS / SQUARE FOOT OF HARDSCAPE PER WELD COUNTY, ALL LZs ARE ALLOWED UP TO 12 LUMENS PER SQUARE FOOT OF HARD SCAPE DURING CONSTRUCTION (DRILLING AND COMPLETION).
    16.1.2. DURING PRODUCTION THERE WILL BE NO PERMANENT LIGHTING ONSITE DURING PRODUCTION.
17. BEST MANAGEMENT PRACTICES TO BE EMPLOYED DURING THE PHASES OF THE FACILITY OPERATION WILL BE DISCUSSED ON THE RELATIVE PHOTOMETRIC ANALYSIS SHEETS.
18. PORTABLE LIGHT PLANTS WILL BE USED DURING THE CONSTRUCTION PHASES TO PROVIDE SUFFICIENT LIGHTING FOR SAFE WORK PRACTICES. LIGHTING STANDARDS. OPERATORS SHALL ADHERE TO THE FOLLOWING LIGHTING STANDARDS AT ALL OIL AND GAS LOCATIONS DURING ALL PHASES OF OIL AND GAS OPERATIONS:
    18.1. OPERATORS SHALL DIRECT SITE LIGHTING DOWNWARD AND INWARD, SUCH THAT NO LIGHT SHINES ABOVE A HORIZONTAL PLANE PASSING THROUGH THE CENTER POINT OF THE LIGHT SOURCE, WITH LIGHTS HIDDEN BY THE SOUND WALL IF ONE IS PRESENT.
    18.2. OPERATORS WILL PLACE BULBS WITHIN FIXTURES THAT OBSCURE, BLOCK, OR DIFFUSE THE LIGHT TO REDUCE LIGHT INTENSITY OUTSIDE THE BOUNDARIES OF THE OIL AND GAS LOCATION.
    18.3. OPERATORS WILL USE BMPS INCLUDING, BUT NOT LIMITED TO:
        18.3.1. MINIMIZING LIGHTING WHEN NOT NEEDED USING TIMERS OR MOTION SENSORS ("USE ONLY THE LIGHTS YOU NEED")
        18.3.2. USING FULL CUT-OFF LIGHTING
        18.3.3. USING LIGHTING COLORS THAT REDUCE LIGHT INTENSITY
        18.3.4. USING LOW-GLARE AND NO-GLARE LIGHTING.
    18.4. MOBILE LIGHTING SUCH AS LIGHT STANDS AND LIGHT PLANTS ARE NOT INCLUDED IN THE PHOTOMETRIC MODELS. THEY ARE INCLUDED IN THE LUMEN/SQFT CALCULATIONS. LOCATIONS SHOWN ON PLAN ARE NOT FINAL. SUBJECT TO REGULAR RELOCATION POSSIBILITY BASED UPON OPERATOR DECISION.
20. ANALYSIS PERFORMED INCLUDES THE FOLLOWING:
    20.1. STANDARD ILLUMINATION CALCULATIONS TO INDICATE THE LIGHTING LEVELS ON THE SURFACE OF THE FACILITY AND LUMENS PER SQUARE FOOT TO MEET COUNTY CODES AND MODEL LIGHTING ORDINANCE.
    20.2. OBTRUSIVE LIGHTING CALCULATIONS AT A SET DISTANCE OUTSIDE THE PAD AND SOUND WALL TO SHOW COMPLIANCE WITH COGCC REQUIREMENTS. NUMBERS ARE ALSO USED TO ADDRESS IMPACTS TO SPECIAL HABITATS. NUMBERS ARE REPRESENTED IN THE OBTRUSIVE-ILL RESULTS IN THE CALCULATION TABLES. COGCC HAS SET THIS VALUE AT 0.3176 FC (4 LUX) FOR RESIDENTIAL IMPACTS.
    20.3. GLARE CALCULATIONS FOR VEHICULAR TRAFFIC ALONG THE ROADWAYS IN THE LOCAL AREA TO THE SITE REPRESENTED BY THE TI CALCULATION IN THE TABLES. INTERNATIONAL STANDARDS SET A TYPICAL MAX VALUE AT 10% FOR TI.
21. ANALYSIS COMPLETED FOR DRILLING AND COMPLETION PHASES. PRODUCTION PHASE WILL NOT HAVE LIGHTING ON SITE.
22. **DISCLAIMER:** THESE CALCULATIONS HEREIN HAVE BEEN PERFORMED WITH EVERY INTENT TO MEET CODE REQUIREMENTS ACCORDING TO IES STANDARDS AND GOOD PRACTICE USING MANUFACTURER PUBLISHED IES FILES AND CUTSHEETS. THERE MAY BE DISCREPANCIES BETWEEN THE RESULTS PRESENTED HEREIN AND ACTUAL FIELD MEASUREMENTS BASED ON THE EXTENT FIELD CONDITIONS VARY FROM INPUT DATA. EXAMPLE CONDITIONS INCLUDE SURFACE REFLECTANCES, SURFACE COLORS, FIXTURE AIMING, MOUNTING HEIGHTS, VOLTAGE, TEMPERATURE, ATMOSPHERIC CONDITIONS, LUMINARY POSITIONS, STRUCTURES OR OTHER EQUIPMENT LOCATIONS, EQUIPMENT TOLERANCES, MEASUREMENT METHODS, PRESENCE OF DIRT OR OTHER FOREIGN MATTER, DIRTY OR OBSCURED OPTICS. ENGINEER NOT RESPONSIBLE FOR ANY ERRORS IN MANUFACTURER PUBLISHED INFORMATION. ALL DIMENSIONS, CUTSHEETS, SITE LAYOUTS, DRAWINGS AND IMAGES ARE PROVIDED FOR PHOTOMETRIC REFERENCE AND NOT FOR CONSTRUCTION. OPERATOR IS RESPONSIBLE FOR ONGOING MAINTENANCE AND COMPLIANCE WITH THE APPROVED LIGHTING ANALYSIS PROVIDED HEREIN AND APPLICABLE MUNICIPAL, COUNTY, STATE AND FEDERAL CODES.
23. RESOURCES POSSIBLY USED IN DEVELOPMENT
    23.1. FROM DRCOG REGIONAL DATA CATALOG
        23.1.1. (https://data.drcog.org CC BY 3.0 http://creativecommons.org/licenses/by/3.0)
    23.2. FROM COLORADO HAZARD MAPPING AND RISK MAP PORTAL
        23.2.1. (https://coloradohazardmapping.com/lidarDownload)
    23.3. THESE SOURCES MAY HAVE BEEN USED TO SUPPORT, SUPPLEMENT, ADVISE, PROVIDE CONTEXT, AS SOURCE DATA FOR A DERIVATION, OR OTHERWISE UTILIZED DURING OR FOR THIS PROJECT BY COR ENGINEERING LLC., THE CREATORS OF THE LIDAR PRODUCTS MENTIONED DO NOT HAVE RESPONSIBILITY FOR ANY INCONSISTENCIES IN COR ENGINEERING LLC PROVIDED CALCULATIONS OR DATA.
    23.4. IF YOU HAVE ANY QUESTIONS PLEASE CONTACT COR ENGINEERING LLC. AT ys@cor-e.com.

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UTILITIES SHOWN ARE BASED ON THE INFORMATION AVAILABLE TO THE ENGINEER. THERE IS NO GUARANTEE ALL FACILITIES ARE SHOWN OR THAT THE LOCATION, DEPTH, AND SIZE OF EACH FACILITY IS CORRECT. THE CONTRACTOR IS RESPONSIBLE FOR LOCATING ALL UTILITIES AND SERVICE LINES PRIOR TO CONSTRUCTION.

REV	DATE	DESCRIPTION
0	2022.06.22	THORNTON SUBMITTAL

WARNING
0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE.
DRAWING INTENDED FOR 22x34

COLORADO LICENSED
RYAN W. E. SCHNEIDER
2021-0157
0048556
PROFESSIONAL ENGINEER
2022.06.22
APPLIES ONLY TO LIGHTING SHOWN ON THIS PLAN INDICATING THAT THE ANALYSIS WAS PERFORMED UNDER THE SUPERVISION OF A LICENSED ELECTRICAL ENGINEER

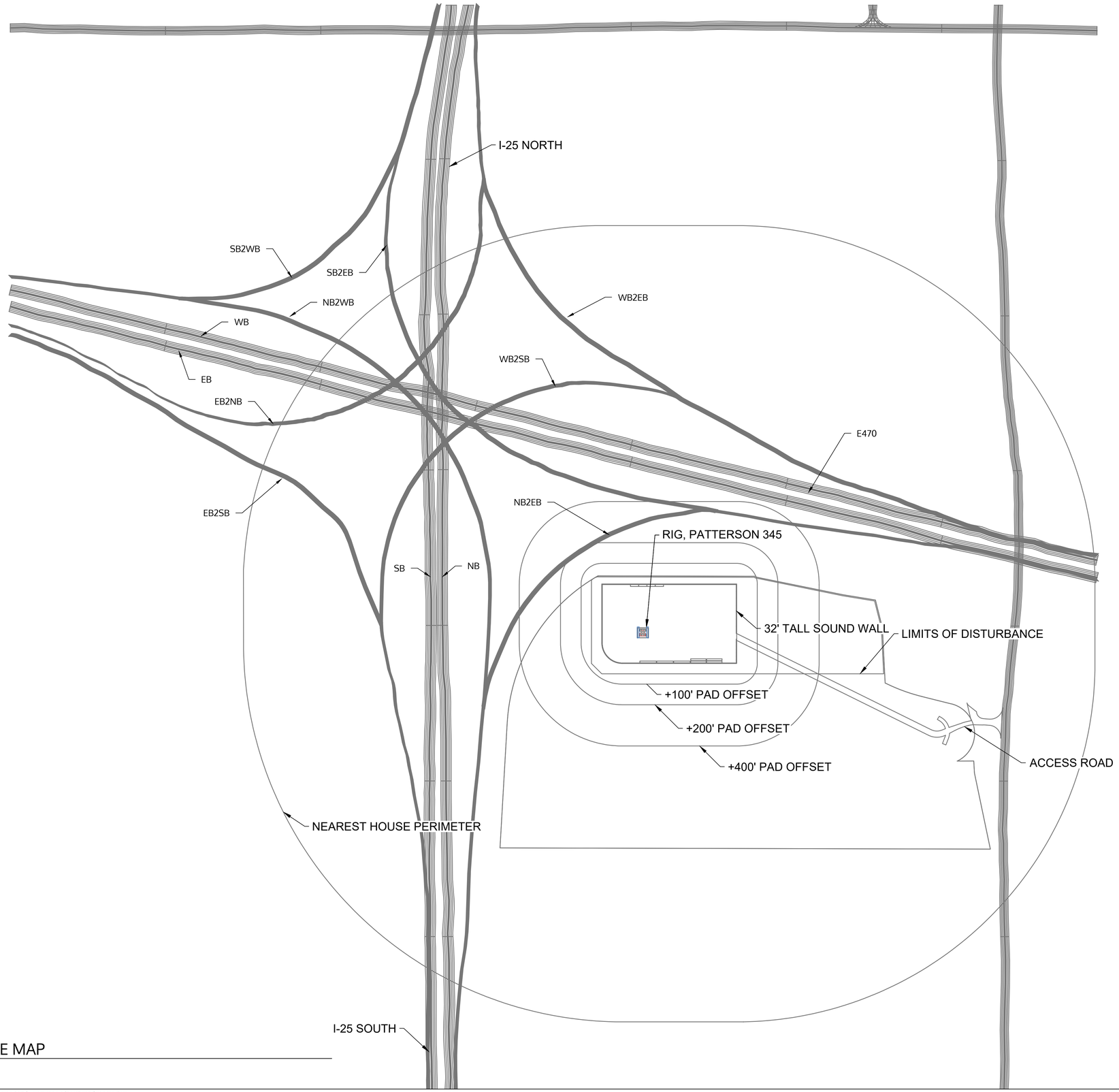
COR Engineering LLC
FORT COLLINS, CO 80525 970.658.9887 YS@COR-E.COM

WASHINGTON PAD
EXTRACTION OIL & GAS
LIGHTING COVER SHEET
ISSUE FOR REVIEW

2021-0157

L-0.00

COR ENGINEERING PROJECT NUMBER: 2021-0157



1 LIGHTING SITE MAP
SCALE: 1:3,000

REV	DATE	DESCRIPTION
0	2022.06.22	THORNTON SUBMITTAL

WARNING

0 1/2 1

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WASHINGTON PAD
EXTRACTION OIL & GAS
LIGHTING SITE MAP
ISSUE FOR REVIEW

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2021-0157

L-1.01

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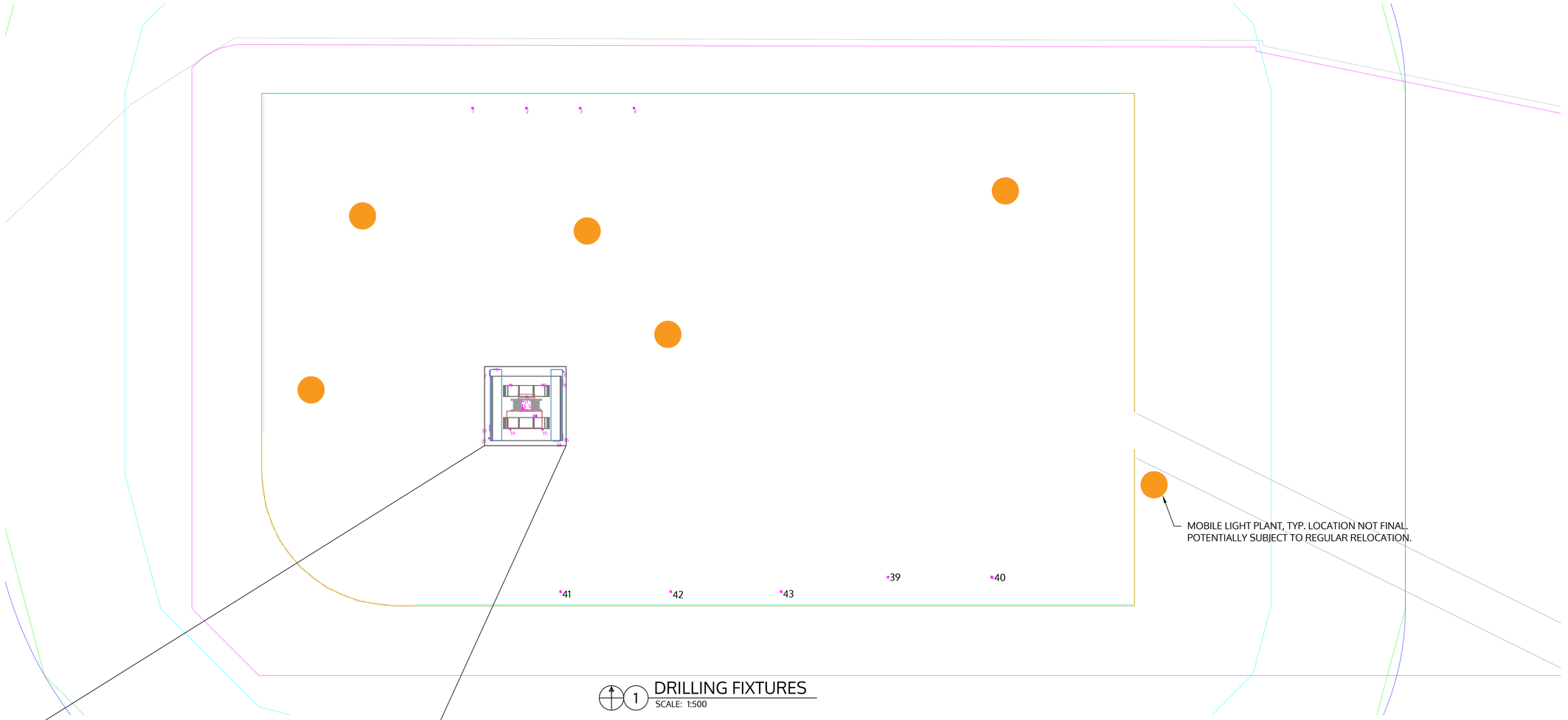

1 DRILLING FIXTURES
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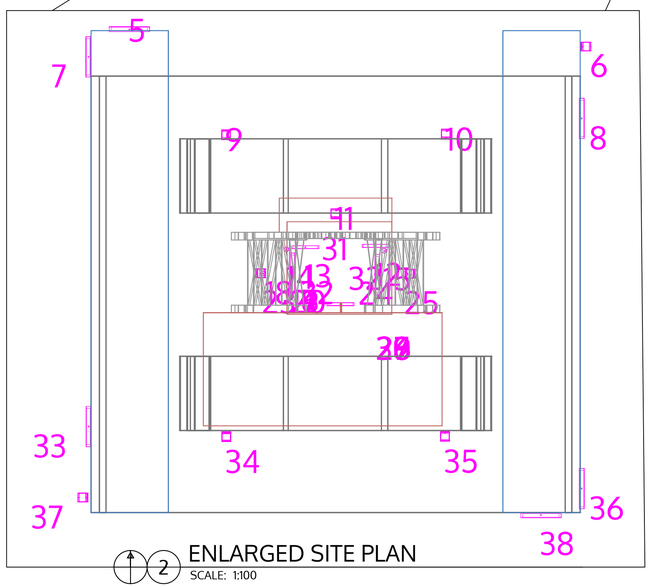
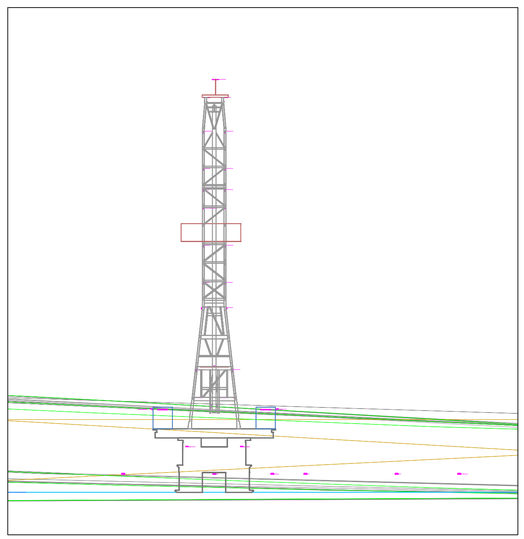
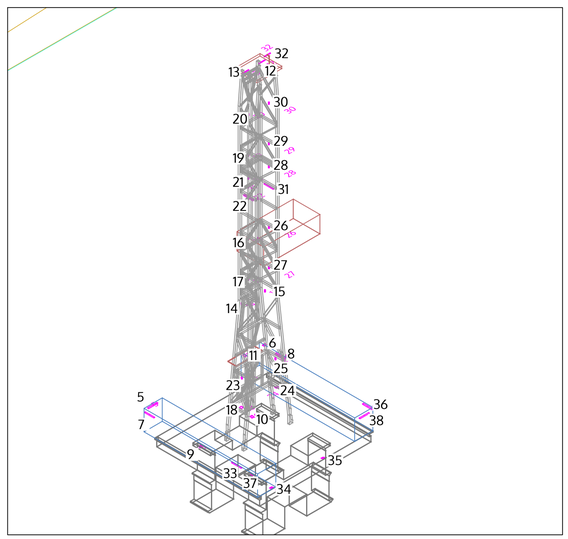


2 ENLARGED SITE PLAN
SCALE: 1:100



3 ELEVATION SITE PLAN
SCALE:1:400



3 ISOMETRIC SITE PLAN
SCALE:1:400

REV	DATE	DESCRIPTION
0	2022.06.22	THORNTON SUBMITTAL

WARNING

0 1/2 1

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DRAWING INTENDED FOR 22x34

COLORADO LICENSED
TYLER E. SCHNEIDER
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2022.06.22

APPLIES ONLY TO LIGHTING SHOWN ON THIS PLAN INDICATING THAT THE ANALYSIS WAS PERFORMED UNDER THE SUPERVISION OF A LICENSED ELECTRICAL ENGINEER

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WASHINGTON PAD
EXTRACTION OIL & GAS
DRILLING FIXTURES
ISSUE FOR REVIEW

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2021-0157

L-2.01

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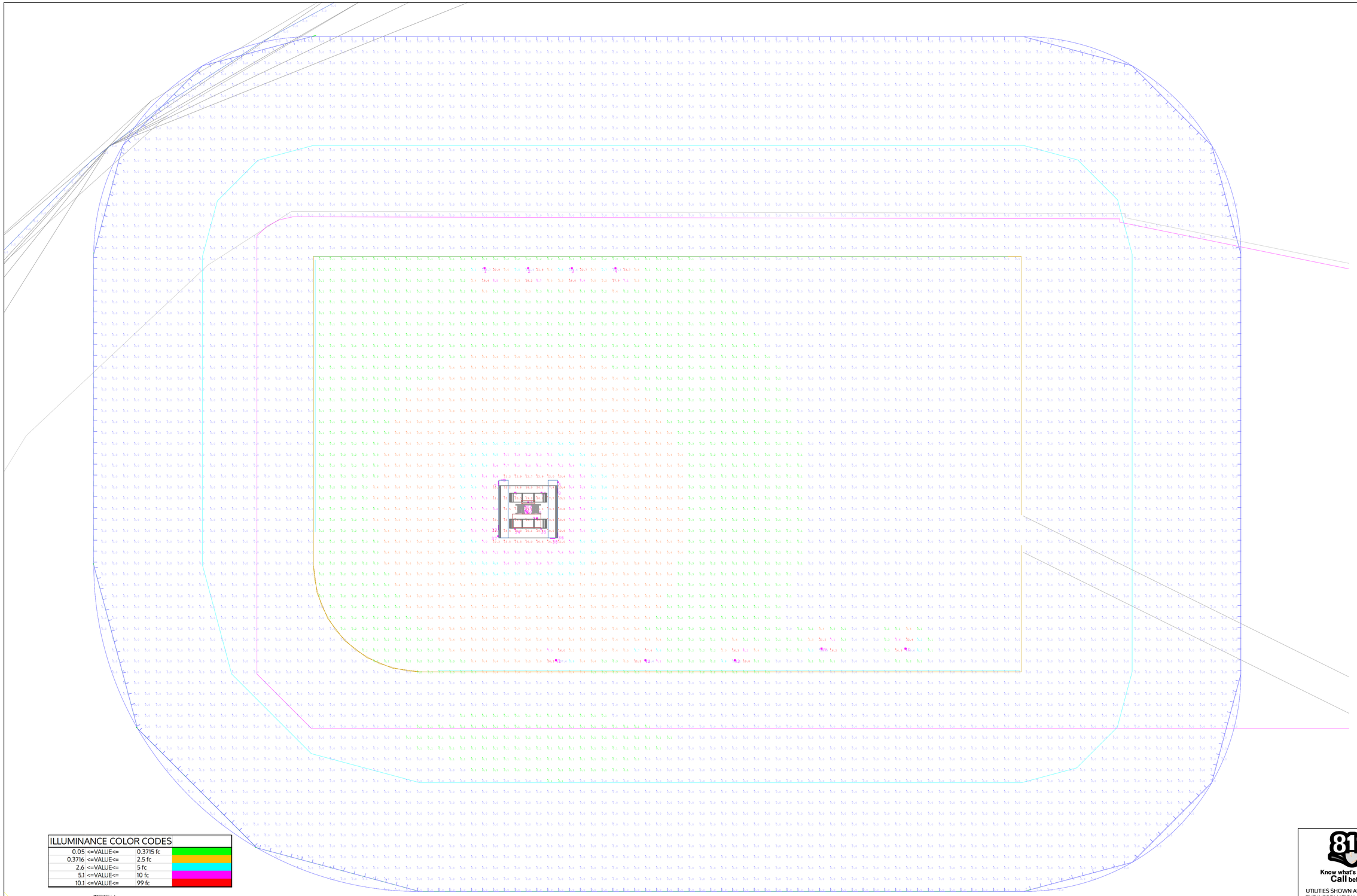

ILLUMINANCE COLOR CODES		
0.05	<=VALUE<=	0.3715 fc
0.3716	<=VALUE<=	2.5 fc
2.6	<=VALUE<=	5 fc
5.1	<=VALUE<=	10 fc
10.1	<=VALUE<=	99 fc

Obtained= = 1
Average = 88
Maximum = 88

1 DRILLING PHOTOMETRIC
SCALE: 1:500

REV	DATE	DESCRIPTION
0	2022.06.22	THORNTON SUBMITTAL

WARNING

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2021-0157

L-2.02

COR ENGINEERING PROJECT NUMBER: 2021-0157

F:\COR Dropbox\COR E Docs\Projects\2021-0157 - CIVI - Washington Pad\2021-0157 - CIVI - Washington Pad\3 - CAD\157-L-2.02-Drilling Photometric.dwg

Plot Date 2022/07/07 10:28:10

Luminaire Schedule

Scene: 1-Drilling — 451052

Tag	Symbol	Qty	Label	Arrangement	LLF	Description	Luminaire Watts	Total Watts	[MANUFAC]	Luminaire Lumens	BUG Rating	Total Lumens
A	Ceiling Surface -- Circular	14	dll2-unv1-s903_1	SINGLE	1	DLL2_UNV1 S903	32.2	450.8	COOPER CROUSE-HINDS	3639	B2-U2-G1	50946
C	1X4 DOWN	8	ZPLA4-UNV1_1	SINGLE	1	ZPLA4_UNV1	62	496	EATON CROUSE-HINDS	7621	B3-U0-G0	60968
B	Ceiling Surface -- Rectangular	3	VMV9L2A-UNV1-S903_1	SINGLE	1	VMV9L2A_UNV1-S903 - Type 5 Optics	73.1	219.3	COOPER CROUSE-HINDS	8328	B3-U1-G0	24984
D	flood-6	9	pfm11lwyunv176_1	SINGLE	1	PFM11LWYUNV176	99	891	COOPER CROUSE-HINDS	9045	N.A.	81405
WX	Wall Surface -- Rectangular 2	9	LF100BZ-110-277	Single	1	LF100BZ-110-277 - 13200 LM, LED, CRI 72, Bronze	105.37	948.33	LUMATEQ LIGHTING	13801	B4-U0-G1	124209
LP		12	pfm11lwyunv176_1	Dual Head	1	PFM11LWYUNV176	99	1089	COOPER CROUSE-HINDS	9045	N.A.	108540

NOTE: LUMINAIRE LP IS A PORTABLE TRAILER STYLE LIGHT PLANT THAT IS EXEMPT FROM MODELING AS THEIR LOCATION AND ARRANGEMENT IS TASK SPECIFIC AND VARIES DAY TO DAY. DURING COMPLETION, THERE WILL BE NO LIGHTING AT THE PAD SITE OTHER THAN THESE LIGHT PLANTS LISTED HERE.

Luminaire Location Summary

Scene: 1-Drilling

LumNo	Label	Orient	Tilt	Z	Tag (Qty)
1	LF100BZ-110-277	270	15	8	WX (1)
2	LF100BZ-110-277	270	15	8	WX (1)
3	LF100BZ-110-277	270	15	8	WX (1)
4	LF100BZ-110-277	270	15	8	WX (1)
5	ZPLA4-UNV1_1	90	15	36.479	C (1)
6	pfm11lwyunv176_1	360	15	36.479	D (1)
7	ZPLA4-UNV1_1	180	15	36.479	C (1)
8	ZPLA4-UNV1_1	360	15	36.479	C (1)
9	pfm11lwyunv176_1	90	15	19.989	D (1)
10	pfm11lwyunv176_1	90	15	19.989	D (1)
11	pfm11lwyunv176_1	90	15	55.182	D (1)
12	VMV9L2A-UNV1-S903_1	270	0	173.672	B (1)
13	VMV9L2A-UNV1-S903_1	270	0	173.672	B (1)
14	dll2-unv1-s903_1	270	0	81.24	A (1)
15	dll2-unv1-s903_1	270	0	81.24	A (1)
16	dll2-unv1-s903_1	270	0	108.625	A (1)
17	dll2-unv1-s903_1	270	0	92.292	A (1)
18	pfm11lwyunv176_1	360	15	41.521	D (1)
19	dll2-unv1-s903_1	270	0	142.458	A (1)
20	dll2-unv1-s903_1	270	0	158.792	A (1)
21	dll2-unv1-s903_1	270	0	133.125	A (1)
22	ZPLA4-UNV1_1	360	15	124.969	C (1)
23	dll2-unv1-s903_1	270	0	53.964	A (1)
24	pfm11lwyunv176_1	180	15	41.521	D (1)
25	dll2-unv1-s903_1	270	0	53.964	A (1)
26	dll2-unv1-s903_1	270	0	108.625	A (1)
27	dll2-unv1-s903_1	270	0	92.292	A (1)
28	dll2-unv1-s903_1	270	0	133.125	A (1)
29	dll2-unv1-s903_1	270	0	142.458	A (1)
30	dll2-unv1-s903_1	270	0	158.792	A (1)
31	ZPLA4-UNV1_1	180	0	124.969	C (1)
32	VMV9L2A-UNV1-S903_1	360	0	181.621	B (1)
33	ZPLA4-UNV1_1	180	15	36.479	C (1)
34	pfm11lwyunv176_1	270	15	19.989	D (1)
35	pfm11lwyunv176_1	270	15	19.989	D (1)
36	ZPLA4-UNV1_1	360	15	36.479	C (1)
37	pfm11lwyunv176_1	180	15	36.479	D (1)
38	ZPLA4-UNV1_1	270	15	36.479	C (1)
39	LF100BZ-110-277	90	15	8	WX (1)
40	LF100BZ-110-277	90	15	8	WX (1)
41	LF100BZ-110-277	90	15	8	WX (1)
42	LF100BZ-110-277	90	15	8	WX (1)
43	LF100BZ-110-277	90	15	8	WX (1)

Calculation Summary

Scene: 1-Drilling — Maximum Illuminance = 0.3176fc (4lux); Maximum TI = 10%

Label	CalcType	Units	Avg	Max	Min	Pass / Fail
Sound Wall +200'_ILL_Seg1	Obtrusive - Ill	Fc	0.1	0.1	0	PASS
Sound Wall +200'_ILL_Seg10	Obtrusive - Ill	Fc	0	0	0	PASS
Sound Wall +200'_ILL_Seg11	Obtrusive - Ill	Fc	0	0	0	PASS
Sound Wall +200'_ILL_Seg12	Obtrusive - Ill	Fc	0	0	0	PASS
Sound Wall +200'_ILL_Seg13	Obtrusive - Ill	Fc	0	0	0	PASS
Sound Wall +200'_ILL_Seg14	Obtrusive - Ill	Fc	0	0	0	PASS
Sound Wall +200'_ILL_Seg15	Obtrusive - Ill	Fc	0	0	0	PASS
Sound Wall +200'_ILL_Seg16	Obtrusive - Ill	Fc	0.1	0.2	TO E	PASS
Sound Wall +200'_ILL_Seg17	Obtrusive - Ill	Fc	0.1	0.1	0	PASS
Sound Wall +200'_ILL_Seg2	Obtrusive - Ill	Fc	0.1	0.1	0	PASS
Sound Wall +200'_ILL_Seg3	Obtrusive - Ill	Fc	0	0.1	0	PASS
Sound Wall +200'_ILL_Seg4	Obtrusive - Ill	Fc	0.1	0.1	0	PASS
Sound Wall +200'_ILL_Seg5	Obtrusive - Ill	Fc	0.1	0.1	0	PASS
Sound Wall +200'_ILL_Seg6	Obtrusive - Ill	Fc	0.1	0.1	0	PASS
Sound Wall +200'_ILL_Seg7	Obtrusive - Ill	Fc	0.1	0.1	0	PASS
Sound Wall +200'_ILL_Seg8	Obtrusive - Ill	Fc	0.1	0.2	0	PASS
Sound Wall +200'_ILL_Seg9	Obtrusive - Ill	Fc	0	0.1	0	PASS
G-160TH-EB	Obtrusive - TI	%	0	0	0	PASS
G-160TH-WB	Obtrusive - TI	%	0	0	0	PASS
G-EB	Obtrusive - TI	%	0	0	0	PASS
G-EB2NB	Obtrusive - TI	%	0	0	0	PASS
G-EB2SB	Obtrusive - TI	%	0	0	0	PASS
G-NB	Obtrusive - TI	%	0	0	0	PASS
G-NB2EB	Obtrusive - TI	%	0	0	0	PASS
G-NB2WB	Obtrusive - TI	%	0	0	0	PASS
G-SB	Obtrusive - TI	%	0	0	0	PASS
G-SB2EB	Obtrusive - TI	%	0	0	0	PASS
G-SB2WB	Obtrusive - TI	%	0	0	0	PASS
G-WASHINGTON-NB	Obtrusive - TI	%	0	0	0	PASS
G-WASHINGTON-SB	Obtrusive - TI	%	0	0	0	PASS
G-WB	Obtrusive - TI	%	0	0	0	PASS
G-WB2NB	Obtrusive - TI	%	0	0	0	PASS
G-WB2SB	Obtrusive - TI	%	0	0	0	PASS

CALCULATION NOTES:
Passing criterion are defined as the following:
1. Maximum Illuminance < 0.3176 fc (4 lux) per COGCC
2. Maximum TI per international standards to 10%

REV	DATE	DESCRIPTION
0	2022.06.22	THORNTON SUBMITTAL

WARNING

0 1/2 1

IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE.
DRAWING INTENDED FOR 22x34

COLORADO LICENSED
TYANNY E. SCHNEIDER
2021-0157
0048556
PROFESSIONAL ENGINEER
2022.06.22

APPLIES ONLY TO LIGHTING SHOWN ON THIS PLAN INDICATING THAT THE ANALYSIS WAS PERFORMED UNDER THE SUPERVISION OF A LICENSED ELECTRICAL ENGINEER

COR Engineering LLC
FORT COLLINS, CO 80525 970.658.9887 YS@COR-E.COM

WASHINGTON PAD

EXTRACTION OIL & GAS

DRILLING PHOTOMETRIC SCHEDULES

ISSUE FOR REVIEW

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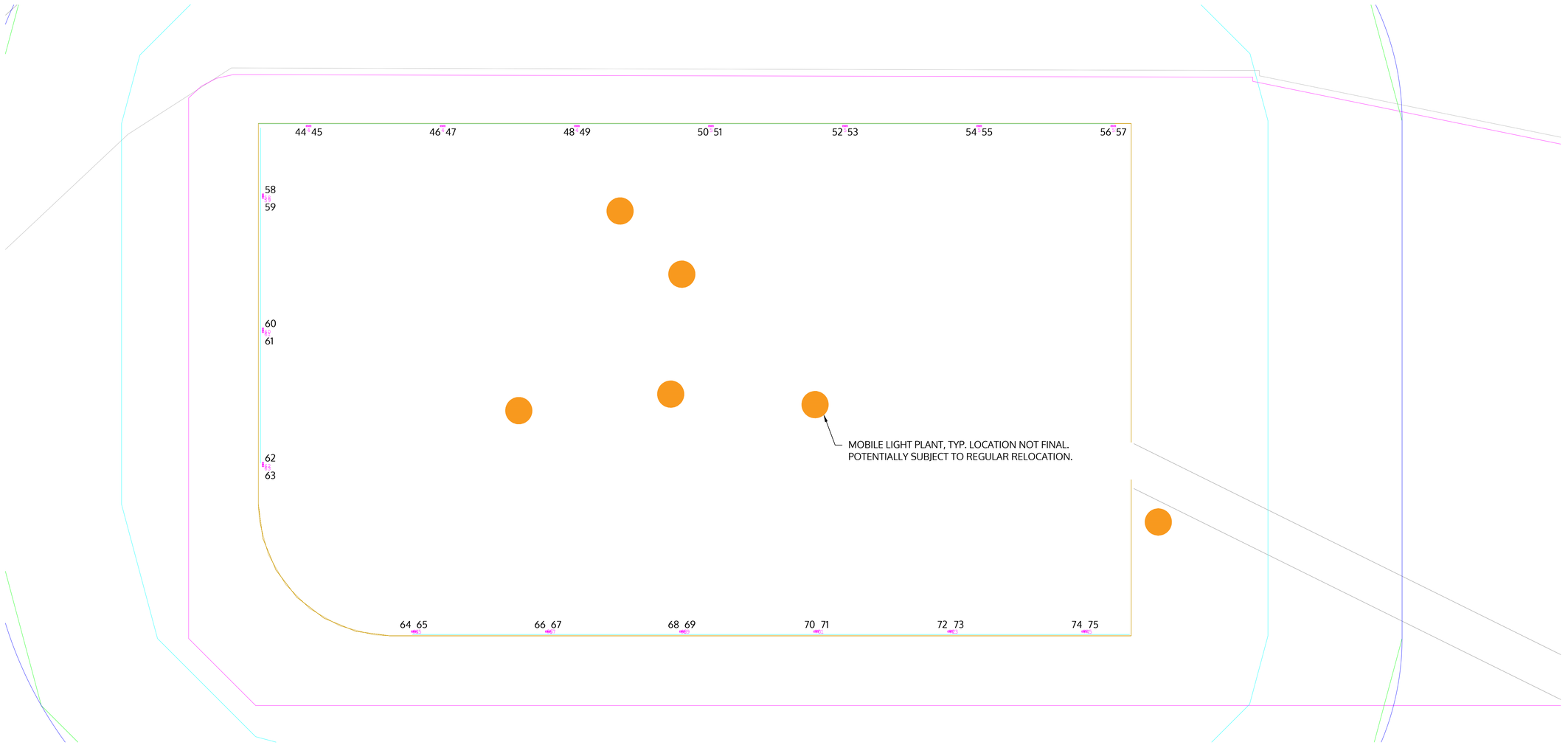
2021-0157

L-2.03

COR ENGINEERING PROJECT NUMBER: 2021-0157

F:\COR Dropbox\COR E Docs\Projects\2021-0157 - CIVI - Washington Pad\2021-0157 - CIVI - Washington Pad\3 - CAD\157-L-2.03-Drilling Photometric Schedules.dwg

Plot Date 2022-07-07 00:28:27



1 COMPLETION FIXTURES
SCALE: 1:500

REV	DATE	DESCRIPTION
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2021-0157

L-3.01

COR ENGINEERING PROJECT NUMBER: 2021-0157

ILLUMINANCE COLOR CODES			
0.05	<=VALUE<=	0.3715 fc	(green)
0.3716	<=VALUE<=	2.5 fc	(orange)
2.6	<=VALUE<=	5 fc	(cyan)
5.1	<=VALUE<=	10 fc	(magenta)
10.1	<=VALUE<=	99 fc	(red)

Obtrusive Illuminance Intensity (Cd)
Average = [illegible]
Maximum = [illegible]
Minimum = 0.0

1 COMPLETION PHOTOMETRIC
SCALE: 1:500

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2021-0157
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2021-0157

L-3.02

COR ENGINEERING PROJECT NUMBER: 2021-0157

Luminaire Schedule
Scene: 2-Completion — 1395260

Tag	Symbol	Qty	Label	Arrangement	LLF	Description	Luminaire Watts	Total Watts	[MANUFAC]	Luminaire Lumens	BUG Rating	Total Lumens
F	General -- Rectangular Down	32	300W T4	Single	1	SBOX300FL 300 Watt LED Flood, 3000K	298.8	9561.6	ENERGY LIGHT INC.	40210	B4-U3-G5	1286720
LP	NOT SHOWN	12	pfm11lwyunv176_1	Dual Head	1	PFM11LWYUNV176	99	1089	COOPER CROUSE-HINDS	9045	B3-U1-G1	108540

Luminaire Location Summary
Scene: 2-Completion

LumNo	Label	Orient	Tilt	Z	Tag (Qty)
44	300W T4	270	0	30	F (1)
45	300W T4	270	0	30	F (1)
46	300W T4	270	0	30	F (1)
47	300W T4	270	0	30	F (1)
48	300W T4	270	0	30	F (1)
49	300W T4	270	0	30	F (1)
50	300W T4	270	0	30	F (1)
51	300W T4	270	0	30	F (1)
52	300W T4	270	0	30	F (1)
53	300W T4	270	0	30	F (1)
54	300W T4	270	0	30	F (1)
55	300W T4	270	0	30	F (1)
56	300W T4	270	0	30	F (1)
57	300W T4	270	0	30	F (1)
58	300W T4	0	0	30	F (1)
59	300W T4	0	0	30	F (1)
60	300W T4	0	0	30	F (1)
61	300W T4	0	0	30	F (1)
62	300W T4	0	0	30	F (1)
63	300W T4	0	0	30	F (1)
64	300W T4	90	0	30	F (1)
65	300W T4	90	0	30	F (1)
66	300W T4	90	0	30	F (1)
67	300W T4	90	0	30	F (1)
68	300W T4	90	0	30	F (1)
69	300W T4	90	0	30	F (1)
70	300W T4	90	0	30	F (1)
71	300W T4	90	0	30	F (1)
72	300W T4	90	0	30	F (1)
73	300W T4	90	0	30	F (1)
74	300W T4	90	0	30	F (1)
75	300W T4	90	0	30	F (1)

Calculation Summary
Scene: 2-Completion — Maximum Illuminance = 0.3176fc (4lux); Maximum TI = 5%

Label	CalcType	Units	Avg	Max	Min	Pass / Fail
Sound Wall +200'_Ill_Seg1	Obtrusive - Ill	Fc	0.1	0.2	0	PASS
Sound Wall +200'_Ill_Seg10	Obtrusive - Ill	Fc	0.1	0.2	0	PASS
Sound Wall +200'_Ill_Seg11	Obtrusive - Ill	Fc	0.1	0.1	0	PASS
Sound Wall +200'_Ill_Seg12	Obtrusive - Ill	Fc	0	0.1	0	PASS
Sound Wall +200'_Ill_Seg13	Obtrusive - Ill	Fc	0.1	0.1	0	PASS
Sound Wall +200'_Ill_Seg14	Obtrusive - Ill	Fc	0.1	0.2	0	PASS
Sound Wall +200'_Ill_Seg15	Obtrusive - Ill	Fc	0.1	0.1	0	PASS
Sound Wall +200'_Ill_Seg16	Obtrusive - Ill	Fc	0.1	0.3	0	PASS
Sound Wall +200'_Ill_Seg17	Obtrusive - Ill	Fc	0.1	0.2	0	PASS
Sound Wall +200'_Ill_Seg2	Obtrusive - Ill	Fc	0.1	0.2	0	PASS
Sound Wall +200'_Ill_Seg3	Obtrusive - Ill	Fc	0.1	0.2	0	PASS
Sound Wall +200'_Ill_Seg4	Obtrusive - Ill	Fc	0.1	0.2	0	PASS
Sound Wall +200'_Ill_Seg5	Obtrusive - Ill	Fc	0.1	0.1	0	PASS
Sound Wall +200'_Ill_Seg6	Obtrusive - Ill	Fc	0.1	0.1	0	PASS
Sound Wall +200'_Ill_Seg7	Obtrusive - Ill	Fc	0.1	0.3	0	PASS
Sound Wall +200'_Ill_Seg8	Obtrusive - Ill	Fc	0.1	0.2	0	PASS
Sound Wall +200'_Ill_Seg9	Obtrusive - Ill	Fc	0.1	0.2	0	PASS
G-160TH-EB	Obtrusive - TI	%	0	0	0	PASS
G-160TH-WB	Obtrusive - TI	%	0	0	0	PASS
G-EB	Obtrusive - TI	%	0	0	0	PASS
G-EB2NB	Obtrusive - TI	%	0	0	0	PASS
G-EB2SB	Obtrusive - TI	%	0	0	0	PASS
G-NB	Obtrusive - TI	%	0	0	0	PASS
G-NB2EB	Obtrusive - TI	%	0	0	0	PASS
G-NB2WB	Obtrusive - TI	%	0	0	0	PASS
G-SB	Obtrusive - TI	%	0	0	0	PASS
G-SB2EB	Obtrusive - TI	%	0	0	0	PASS
G-SB2WB	Obtrusive - TI	%	0	0	0	PASS
G-WASHINGTON-NB	Obtrusive - TI	%	0	0	0	PASS
G-WASHINGTON-SB	Obtrusive - TI	%	0	0	0	PASS
G-WB	Obtrusive - TI	%	0	0	0	PASS
G-WB2NB	Obtrusive - TI	%	0	0	0	PASS
G-WB2SB	Obtrusive - TI	%	0	0	0	PASS

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2021-0157

L-3.03

COR ENGINEERING PROJECT NUMBER: 2021-0157