NOTE: ALL GROUND ROD LOCATIONS ARE APPROXIMATE, AND SHALL BE FIELD VERIFIED.

CONSTRUCTION PLAN
NOT TO SCALE

CONSTRUCTION NOTES:

EQUIPMENT:
- DITCHWITCH RT12 (OR SIMILAR)
- HAND PICK
- SHOVEL
- JACKHAMMER
- 1-TON PICKUP TRUCK

EQUIPMENT DISTURBANCE AREA:
- SEE CONSTRUCTION PLAN VIEW
- 1' WIDE x 18" DEEP TRENCH

BACKFILL:
- PLACE 1' CEMENT SLURRY OVER GROUNDING CABLE
- INSTALL WARNING TAPE ON TOP OF THE SLURRY
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MODELING:

A NUMBER OF SCENARIOS WERE RUN IN WITH THE CDEGS SOFTWARE PLATFORM IN ORDER TO DETERMINE A GROUNDING CONFIGURATION THAT MEET THE REQUIRED, CALCULATED GROUNDING RESISTANCE. THE RESULTS THEN WERE RECOMMENDED TO ET&D FOR DESIGN & CONSTRUCTION.

ACCESS AREA:

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- DENSE VEGETATION, IF ANY, SHALL BE REMOVED, AS REQUIRED

DURATION:

1 DAY

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ZERO IN ON SAFETY

SAFETY PLEDGE

PG&E Applied Technology Services
3400 CROW CANYON ROAD, SAN RAMON, CALIFORNIA 94583
OFFICE TEL.# (925)866-5404 LXF@PGE.COM

REFERENCES:

6032674 – TUBULAR STEEL POLE (TSP)
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No.	DATE	DESCRIPTION	JOB No.	DWN	CHKD	SUPV	APPROVED BY
		REVISIONS					

APPROVED BY	
ORDER	
SUPV	
DSGN	
DWN	
CHKD	
OK	
DATE	2/9/2019
SCALES	N.T.S.

ARCING RISK MITIGATION REQUIREMENTS
GEYSERS 12&17- FULTON 230kV TRANSMISSION LINE
(23/101-FULTON SUB)

PACIFIC GAS & ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

JOB No.:	74017860-3201
DIVISION:	–
COUNTY:	–
MICROFILM –	–
BILL OF MATL:	– –
DWG LIST:	– –
SUPSDS:	– –
SUPSD BY:	– –
SHEET NO 1 OF 1 SHEETS	
74017860-3201	REV

CORROSION SERVICE COMPANY LIMITED
MITIGATION SUMMARY REPORT

CORROSION SERVICE

Pacific Gas & Electric Company
Arcing Study Report

February 05, 2019 CJ # 15999-00

Pacific Gas and Electric Company
6111 Bollinger Canyon Rd. Bldg Y
CA 94583

Structure Information

SAP	Tower Number	Location	Powerline Name	Powerline Rating (kV)	Fault Current (kA)
40761084	025/115	38.51090, -122.76025	GEYSERS #12-FULTON	230	14.02

Additional Information

Pipe Name	Pipe Depth (ft)	Shield Wire Count	Site Type	Structure-to-Pipe Distance (ft)
1307-02	5	0	Steel Pole	5.7

Calculation Summary

Fault Cause	Modelled Grounding Resistance (Ω)	Voltage Rise[E] (kV)	Arc Length (D_{Arc-L})[A] (ft)	Safe Distance (initiation) ($D_{Safe-I-L}$)[A] (ft)	Safe Distance (sustaining) (D_{Safe-S})[A] (ft)	Critical Safe Distance ($D_{Safe-C-L}$)[A] (ft)
Lightning	1.73	24.86	5.04	2.58[B]	9.39[C]	5.04[D]
Other	2.83	39.04	N/A	6.38	N/A	6.38

[A] - For explanation of the symbols - see Section 2 of "PGE (AFS2017) PRO-001"

[B] - CEA distance to initiate an arc plus the ionization radius

[C] - CEA distance to sustain an arc plus the ionization radius

[D] - Calculated as Min(Max(D_{Arc-L}, $D_{Safe-I-L}$), D_{Safe-S}) - see Paragraph 3.2 of "PGE (AFS2017) PRO-001"

[E] - Includes an additional 1 kV to account for induced voltage on the pipeline

Analysis Summary

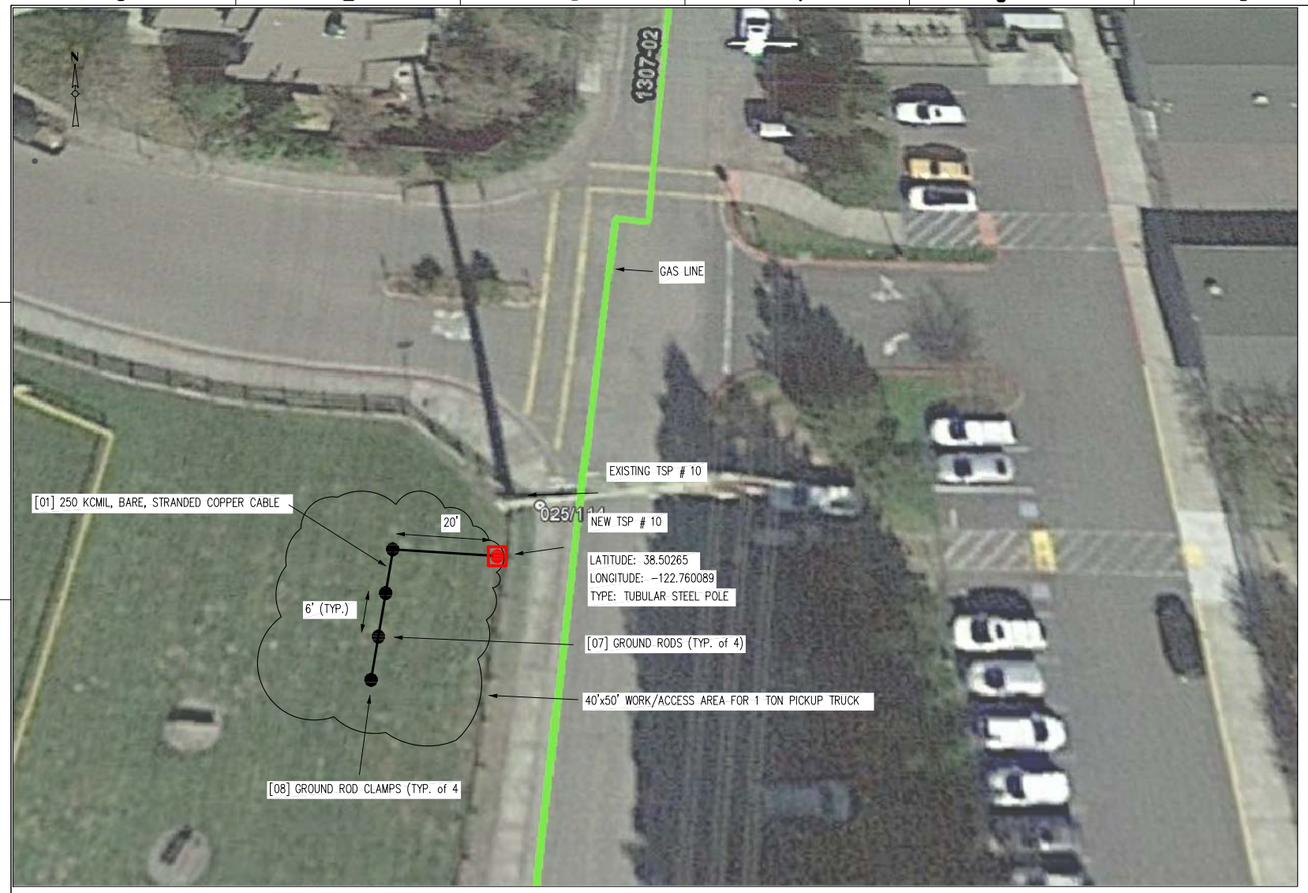
Fault Cause	Lightning Arc Reaches the Pipe?	60 Hz Arc Initiated?	60 Hz Arc Sustained?	Within Ionized Zone?	Diagnostic Conclusion
Lightning	No	No	N/A	No	Safe
Other	N/A	Yes	N/A	N/A	Fail

Mitigation Recommendations

The following table breaks down the mitigation options at the site:

1. Mitigation options for the Steel Pole:

Option Type	Details	Feasible?
Additional Grounding (Model)	A grounding system composed of 2 or more ground rod(s) (8 ft x 5/8 inch) will ensure the risk of a 60 Hz arc at this locatiion is mitigated. Any grounding system should be verified with CSCL before installation.	Yes
Relocate	Relocate the pole further than the critical distance.	Yes



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MITIGATION SUMMARY REPORT

CORROSION SERVICE

Pacific Gas & Electric Company
Arcing Study Report

February 05, 2019 CJ # 15999-00

Pacific Gas and Electric Company
6111 Bollinger Canyon Rd. Bldg Y
CA 94583

Structure Information

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Lightning	1.68	24.24	5.02	2.49[B]	9.2[C]	5.02[D]
Other	3.08	42.12	N/A	7.31	N/A	7.31

[A] - For explanation of the symbols - see Section 2 of "PGE (AFS2017) PRO-001"

[B] - CEA distance to initiate an arc plus the ionization radius

[C] - CEA distance to sustain an arc plus the ionization radius

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