

From: [Andrew Breyer](#)
To: [Benabente, Julie](#)
Cc: [Paul Dunne](#); [O'Connor, Kevin](#); asimt@google.com; [Struyk, Zachary](#); [Cindy Muller](#); [Nathanael Miksis](#); [Barry Flynn](#); [Doug Boccignone](#)
Subject: Re: Follow-up Prior to 12/16 meeting
Date: Monday, December 9, 2019 2:25:37 PM
Attachments: [First set of Question to Google LLC 11012019 \(3\).pdf](#)

[External Email]

Hi Julie,

I am attaching a copy of Google's response to the questions you sent over. In terms of next steps for our meeting on the 16th the wider Google group has expressed interest for SJCE/the City and Flynn to create a brief agenda focused mostly on schedule regarding physical deliverability. We believe that we have included everything asked to date that would inform the study that Flynn is performing. At this point Google needs to understand whether or not a newly formed municipal provider would be able to deliver the microgrid as expressed to date and where things have moved since we last met.

We look forward to seeing a draft agenda ahead of our meeting next week,

Thanks,
Andrew

On Tue, Nov 26, 2019 at 8:52 AM Benabente, Julie <Julie.Benabente@sanjoseca.gov> wrote:

Hi Paul,

You'll see that I rescheduled the next Energy Working Session to 12/16 from 9:30-11am. I'll be adding a room and call-in line to the invitation. Prior to that meeting, we are hoping that:

1. Your team could respond to the questions that I previously sent (attached) to inform Flynn's analysis. In particular, we would like a response to #3 re: the single line diagram and 115 kV undergrounding plans/timing/discussions with PG&E/CAISO. It would also be helpful to have a diagram of the physical layout of the customer substation, switching station, and Station A if available.
2. We can schedule a phone call with your team in the next two weeks to go through these any any other questions that arise to allow for us both to move forward on this analysis.

On item #2, please coordinate the phone call scheduling with Kevin O'Connor (cc'd) and also keep him in the loop on any question responses. Thanks Paul!

Julie Benabente

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Questions for Google LLC:

1. Do you have a critical path document you could share with the City/FlynnRCI? Is the 115kV connection for and the construction of the 115/12kV customer substation on the critical path? Has any investigation been made of the potential to connect to Substation A at the 12kV level as an interim option?

a. A critical path document has not yet been produced as we are still in the early planning phase. The development schedule broadly aligns with the power data we shared during the previous meeting and is provided below.

2019

- October 10th - Planning Application Submittal
- October 23rd - NOP
- November 1st - ADEIR-1 Submittal

2020

- January ADEIR-2 Submittal
- March - Draft EIR Published
- September - Final Development Agreement
- October - City Council Approval

2021

- March - Start of Construction

2023/2024

- Service required date

Year	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Phasing Percentage	0%	0%	12%	37%	37%	48%	71%	71%	81%	100%

- b. Due to construction beginning in 2021, we would expect that construction power is likely going to be provided from the existing 12kV distribution network. We have been informed that there is approximately 5MW of capacity remaining at the San Jose A 12kV network and loads will be removed as existing buildings are demolished. We anticipate around 7.5MW of construction power.

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2. What was the criteria for sizing the onsite resources (generation and storage) as part of the currently envisioned advanced Microgrids? What is the capacity of the biogas generation? Was the capability to serve critical loads when the microgrid/s is/are separated from the main PG&E/CAISO grid considered?

Please elaborate.

- a. The initial sizes of the generation and storage has been based on space allocation assumptions for the project in conjunction with the project architect and an economic assessment that has been carried out against PG&E's E20-T tariff. These sizes were presented at our last meeting as well as via courier and are included below. Biogas generation has not yet been sized, but is not expected to be of a significant quantity to materially affect the below results.

	Scenarios modelled				
	Case 1	Case 2	Case 3	Case 4	Case 5
Total floor area (sqft)	14,633,700	11,410,000	11,410,000	11,410,000	11,410,000
Total grid annual demand (kWh/year)	246,397,210	197,510,436	192,638,450	182,239,967	169,218,222
PV					
Total PV capacity (kWp)	0	-	2,534	7,850	7,850
Total PV generation (kWh/year)	-	-	3,418,779	14,446,088	14,446,088
Battery size					
Battery energy (kWh)	-	0	5,069	20,155	22,175
Battery power (kW)	-	0	2,534	10,078	11,088
Battery Hours of storage	-	0	2	2	2

- b. The vertical program and massing of the buildings has yet to be completed. As such, loads are not yet identified. We would expect within the boundary of the microgrid that as design is undertaken priority loads are identified. It is not expected that all of the Google loads are priority loads and that the development has to operate as normal in island mode with no load shedding. The microgrid can then be designed to serve these priority loads in the event of an outage. This will be via a microgrid control system and not via traditional hardwired systems such as automatic transfer switches. The battery storage sizing we have done to date has been an economic, not resilience

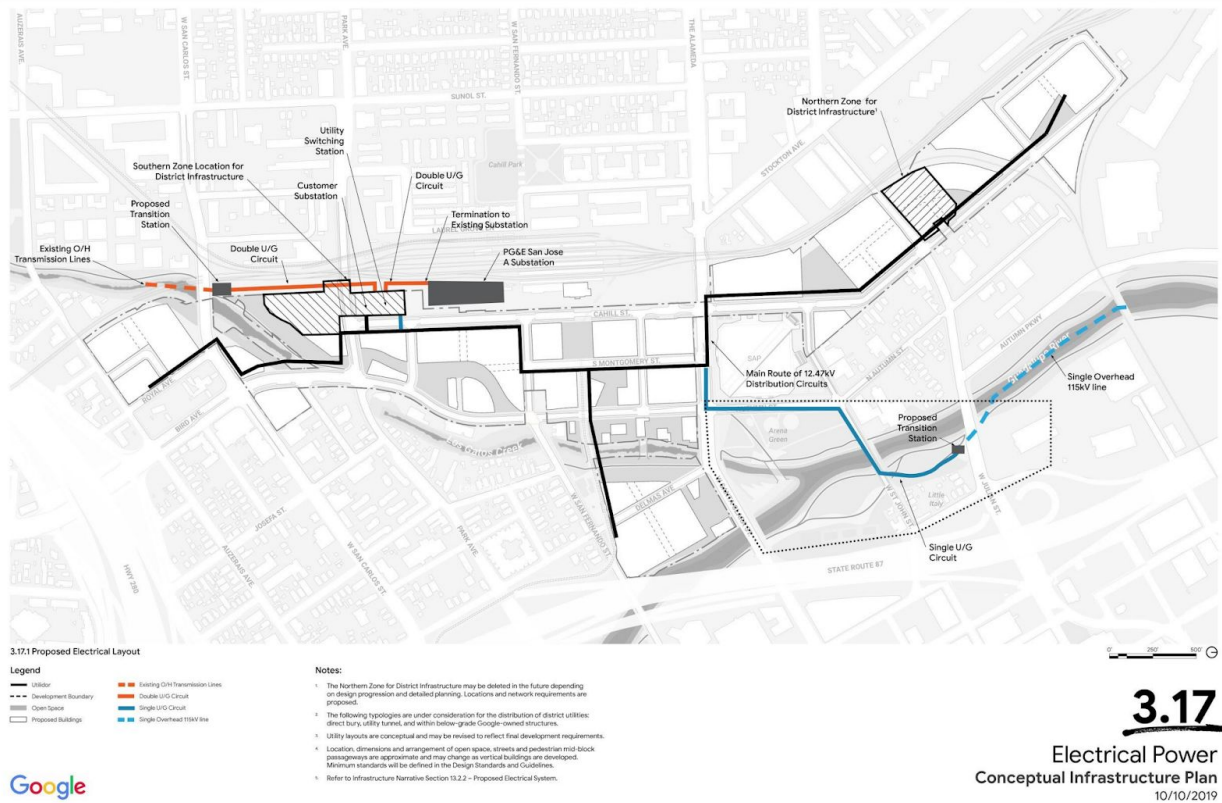
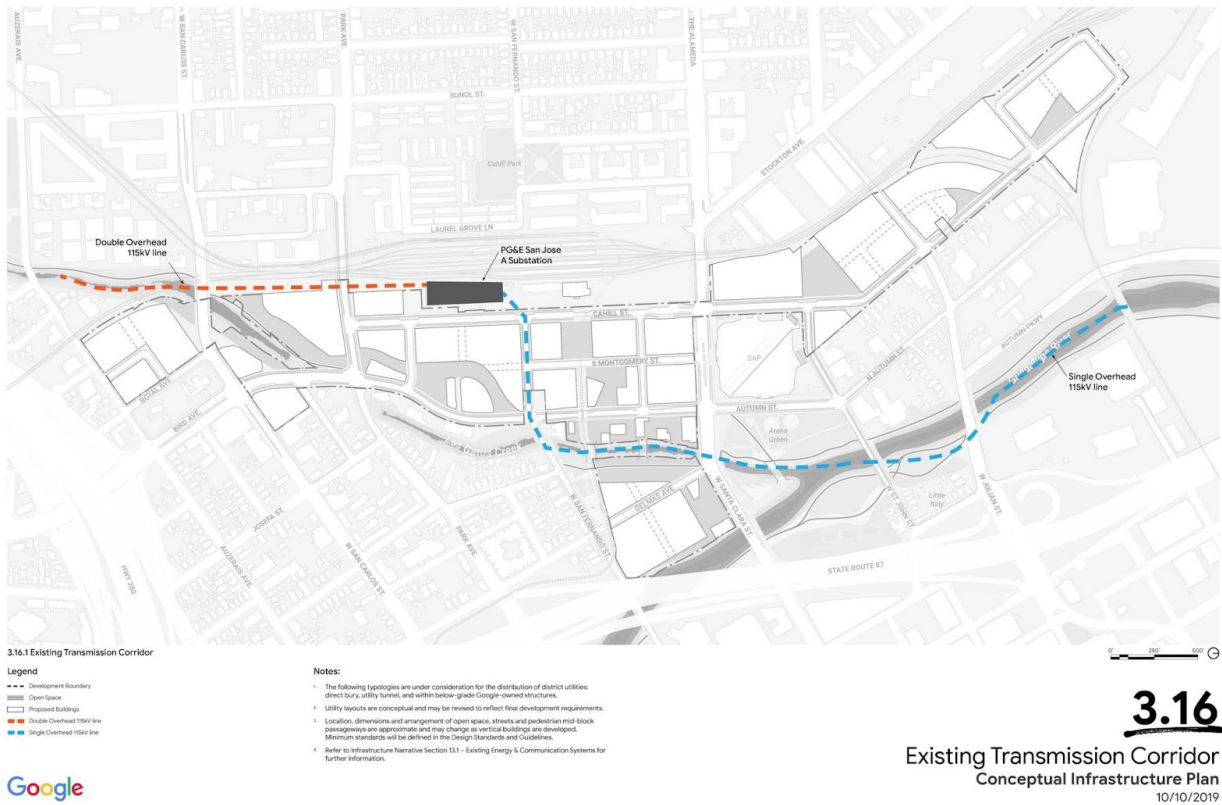
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assessment. Should we identify key loads to be served that exceed the capacity of the generation we have identified above, we would consider alternatives such as increasing the hourly storage of the batteries.

3. Please delineate the considerations that have occurred and any communications with PG&E (or CAISO) that has occurred and led to the current plan to underground the 115kV overhead lines within the development. Also please elaborate on the timing of that part of the DSA service plan. Please share a proposed single line diagram of Substation A, the envisioned customer substation and 12kV circuits.
 - a. We have made PG&E aware of the intent to underground the existing 115kV services that cross the development site and we have included the boundaries of this within our planning application. The drawings below define the extent of this.

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- b. PG&E have provided a very preliminary single line diagram of how we may connect to their system. This has been shared with us under an NDA so we can not share drawings that were not produced by Google.

We can however provide the below description which was included within our planning application:

San José A Substation

- Construct new ancillary control building with associated battery building
- Install new protective devices
- Remove redundant protective relays
- Install telecommunication equipment
- Install two 115kV overhead to underground transition risers

El Patio Substation

- Install new protective devices
- Remove redundant protective relays
- Replace an existing circuit breaker

San José B Substation

- Install new protective devices
- Remove redundant protective relays
- Install telecommunication equipment

New Switching Station

- Construct a GIS Switching Station with the following:

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- Install a gas-insulated substation (GIS) two-bay, three (3) circuit breaker, 115kV Breaker-and-a-Half (BAAH) layout operated as a ring bus. Property is required to expand to a 2-Bay BAAH and an ultimate configuration of a 4-Bay BAAH (property dimensions of 150' x 100').

New Project area Customer Substation

- Construct a transmission voltage to distribution substation with the following:
 - Gas insulated high voltage 115kV incoming switchgear, arranged in a redundant configuration with utility metering
 - Two 45MVA, fan assisted transformers to provide redundant power to the district
 - 12.47kV distribution switchgear

Customer Power Distribution

- Install a 12.47kV distribution network to provide power to all project areas.
- Each individual building, or groups of buildings would then contain step-down transformers to provide building level 480V power.

4. Please describe any design considerations that have gone into serving the load within the DSA that is outside the Google Project? If some considerations have been made, was the service to those loads from the planned new electrical infrastructure? Was the acquisition of any existing PG&E owned infrastructure part of the plan of service to the loads outside the Google Project boundaries?

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- a. Google is not part of the wider DSAP plan electrically and this work is being led by others. For the sake of informing stakeholders about the potential load of the wider DSAP, Google's consultants provided a very high level estimate of the load that such a development may consume. No other work has been completed.