Technical Memorandum

January 05, 2022

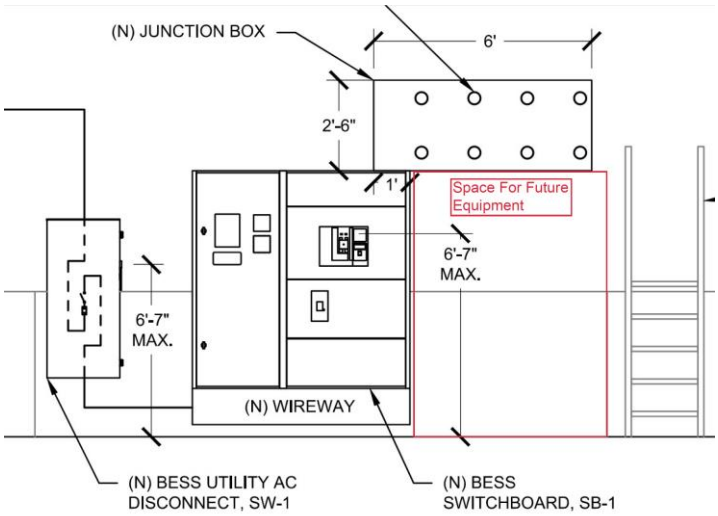
To	John Friedenbach, HBMWD	**Tel**	(707) 523-1010
Copy to	Dale Davidsen, HBMWD; Nathan Stevens, GHD	**Email**	chris.richards@ghd.com
From	Chris Richards, GHD	**Ref. No.**	12559211
Subject	Current Tesla TRF BESS Project Coordination with Future Generator Project		

GHD worked with Humboldt Bay Municipal Water District (HBMWD or District) and Tesla to develop a plan to coordinate the current Tesla battery energy storage system (BESS) project at the District's Turbidity Reduction Facility (TRF) with a future planned generator installation project. The plan is intended to minimize inefficiencies and prepare a clear path forward for the future work and outline the design for that future project. This memorandum and the attached coordination sketch will outline the current project, provide the assumptions made for the future project, and provide an outline for the future project to follow to best integrate with existing and current work.

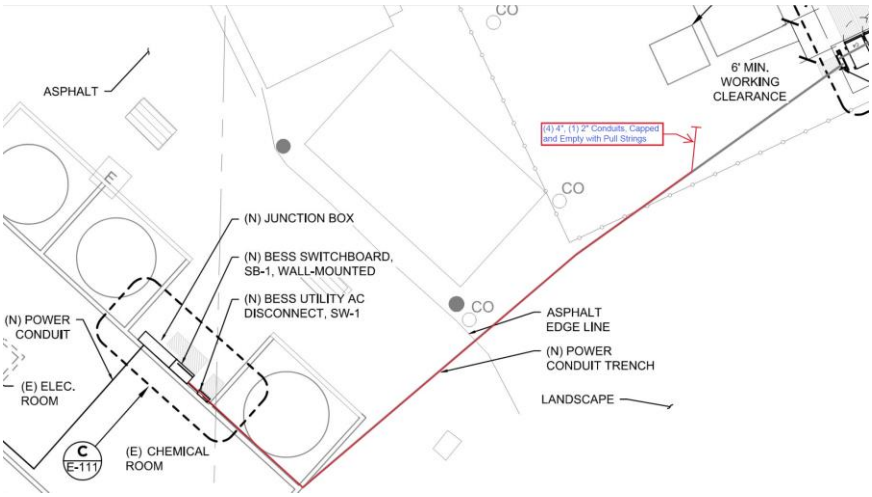
1. Current Tesla Battery Energy Project

Tesla is currently engaged with the District to install a BESS consisting of a Controlling switchboard and a remote battery storage array. To accommodate future work, Tesla has provided the following:

1. Allocated space for a future Automatic Transfer Switch (ATS) (from Tesla drawing E-111):



2. Underground conduits from the Storage System area to the future generator location: (4) 4-inch conduits for power circuits, and (1) 2-inch conduit for control wiring (from Tesla drawing E-101).



2. Future Generator Project Assumptions

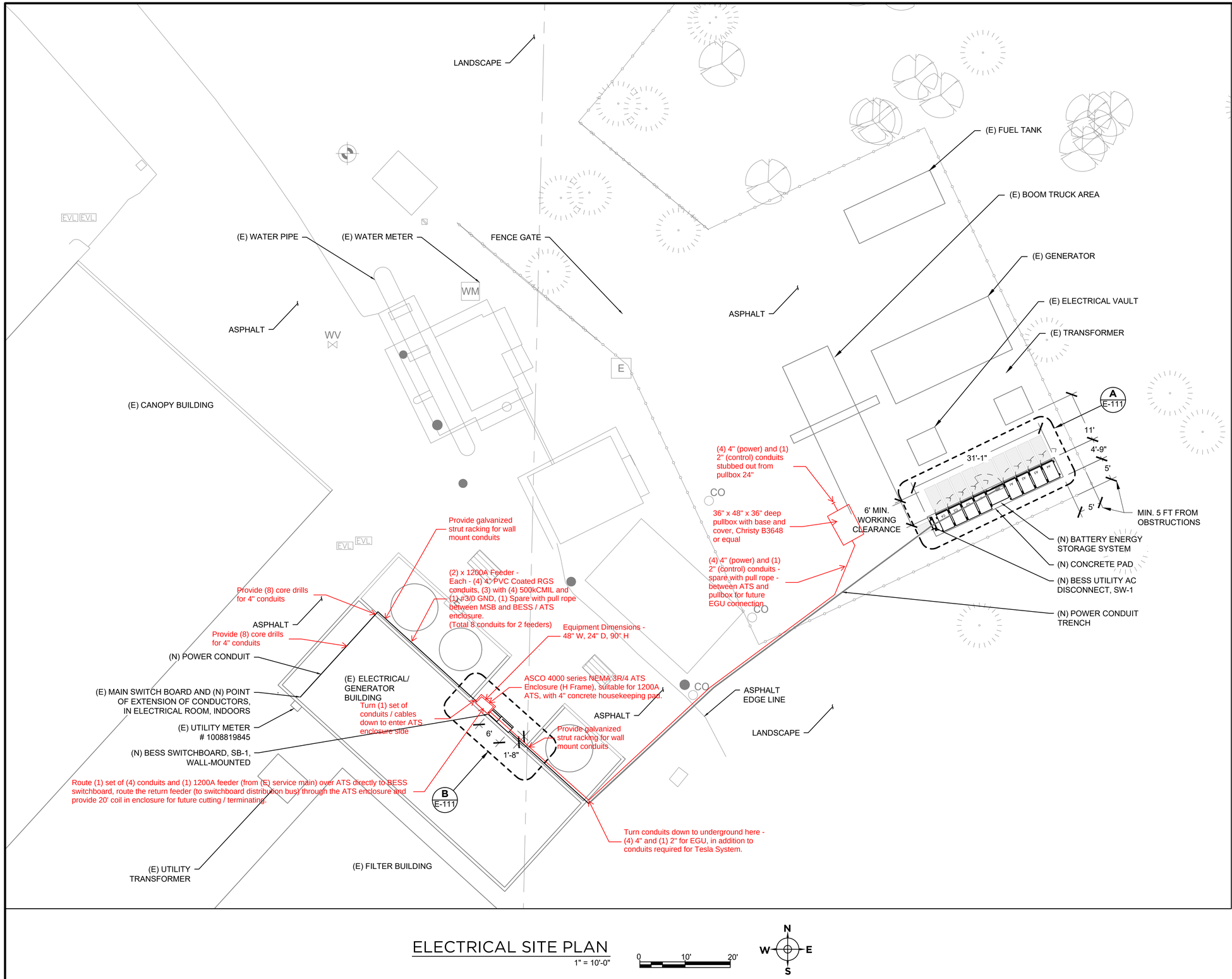
Based on discussions with the District and general engineering practice, a rough concept of the future generator project has been sketched out as a planning effort for the District. These are the basic assumptions of that planning effort:

1. The existing 1,200-amp, 480-volt service is operating and is anticipated to be sufficient for the known future.
2. Presently, there is a 100-kW generator that is connected to support select critical loads, but it does not allow the plant to operate larger plant systems that may be necessary in an extended utility outage, including backwash operations. As this is the case, future plans include the addition of a larger (initially calculated at 750-kW) diesel generator sized to operate the plant at its normal operating capacity.
3. As the existing 100-kW generator is in functional condition, we recommend leaving it in its current location. Once the future generator is installed, the existing can serve as an emergency fallback in case of generator failure, or it can serve to operate its current set of critical loads when the overall plant load does not warrant operating the larger unit. This will require a procedural change as we recommend the smaller generator be manually locked out of operating under normal conditions, and only used under plant personnel supervision.
4. Provisions will be made now to account for space for the future automatic transfer switch and generator power and control feeders as noted above. Note that there is a spare 4-inch conduit included in the underground run due to the low differential cost of adding spares at this time. It is anticipated that the 1,200-amp feeder will only require (3) of (4) power conduits.

3. Proposed Outline for Future Generator Project

The intent of the current work is to facilitate the design, construction, and integration of the future generator. As such, we recommend the following approach to that future project:

1. Review the load calculations and operating parameters of the plant to validate the preliminary generator sizing of 750-kW. Review future plans and validate the viability of the existing 1,200-amp service as well. Adjust the generator and if necessary, the service equipment sizing.
2. Review the final installed condition of the Tesla project work to coordinate with this outline.
3. Provide a new automatic transfer switch (ATS) to mount adjacent to the Tesla BESS. Ensure that the specified ATS includes an externally operable “Hand-Off-Auto” selector switch for procedural lockout as desired by the District. Provide conduit chase connections to the large pullbox above the equipment.
4. Provide and install the new generator, extending the spare conduits in 1.2 above to the final point of generator connection. GHD recommends installing a pullbox in this area to aid installation.
5. Intercept the BESS outgoing power feeder and extend as follows:
    a. Provide a new feeder from the BESS output terminals to the ATS “Normal” power input. In this configuration, either the Utility or the BESS can serve as the power source for the plant, with only the failure of both showing as a power outage to the ATS (a short transfer time delay on the ATS may be required).
    b. Reconnect the wiring previously connected to the BESS outgoing terminal (to the Main Service Switchboard) to the ATS “Load” power output. This will switch the existing plant between Utility/BESS power and generator power.
6. Provide a new power feeder from the generator to the ATS via the spare conduits installed in 1.2 above.
7. Review and establish an operating procedure with the District to prevent operating both generators at the same time. GHD recommends locking out the smaller transfer switch and manually transferring the critical loads only when either the main generator has failed, or when the critical loads connected to the small generator are needed, but full plant operation is not warranted (this saves wear on the larger generator and fuel costs). Coordinate ATS operational scheme(s) with the District to include the lockout of either or both generators to meet plant operational needs.



SITE LEGEND

- (N) POWERPACK AND POWERPACK INVERTERS
- PROPERTY LINE
- (N) UNDERGROUND CONDUIT FOR POWER
- (N) CONDUIT FOR POWER
- WORKING GLEARANCE
- SITE BENCHMARK
- AREAS OF INTEREST
- (E) CLEANOUT
- (E) STORM INLET (RECTANGLE)
- (E) WATER VALVE
- (E) WATER METER
- (E) ELECTRIC BOX
- (E) ELECTRIC VAULT
- (E) TREE
- (E) FENCE
- (E) BUILDING COLUMN

ELECTRICAL SITE PLAN

1" = 10'-0"

0 10' 20'

N W E S

TESLA
3500 DEER CREEK RD.
PALO ALTO, CA 94304
(650) 681-5000

ORIGINAL SIZE 24"X36"
SHEET SIZE ARCH "D"

0 ½" 1"

HUMBOLDT BAY MUNICIPAL WATER DISTRICT
PIPELINE ROAD - ENERGY STORAGE SYSTEM
HUMBOLDT BAY MUNICIPAL WATER DISTRICT
444 END OF PIPELINE RD.
ARCATA, CA 95521, US

NO.	REVISION	DATE

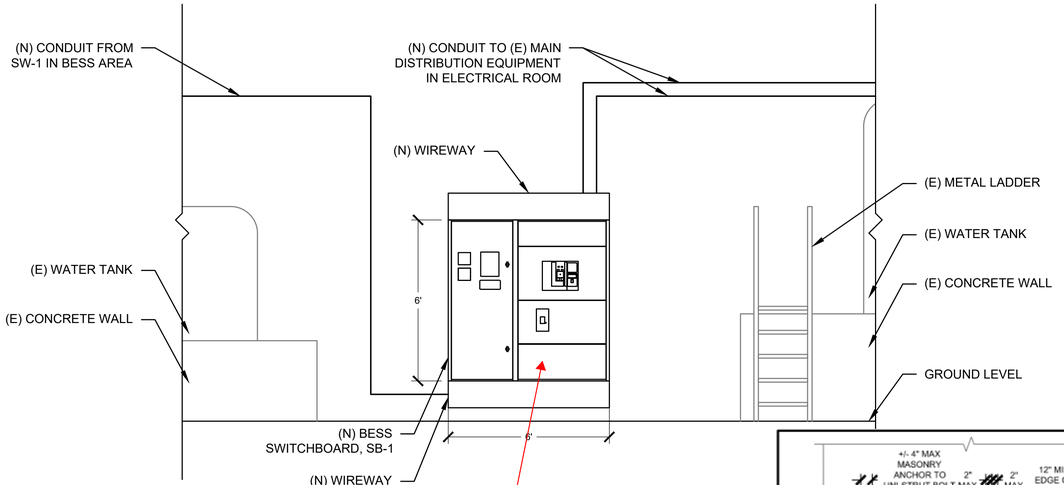
ELECTRICAL SITE PLAN

E-101

JB-955143-00

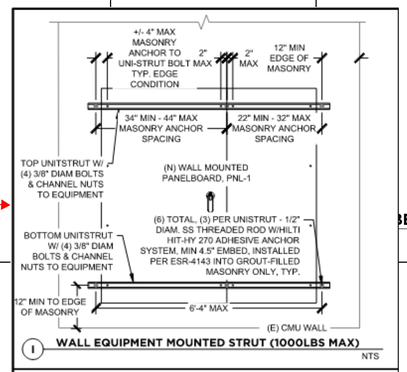
REV: 0 | IFP

PROPRIETARY AND CONFIDENTIAL

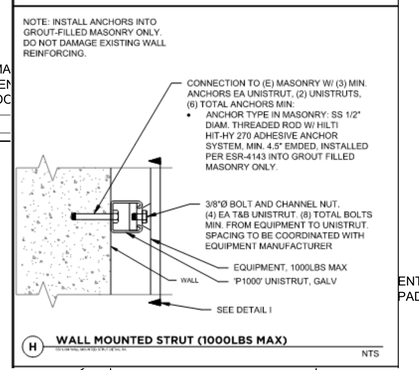


D **SB-1 - ELEVATION VIEW**
SCALE: 3/8" = 1'-0"

WILL EQUIPMENT HAVE ISSUES DUE TO EXISTING CONDUITS? MOUNTING DETAILS HERE->



I **WALL EQUIPMENT MOUNTED STRUT (1000LBS MAX)**
NTS



H **WALL MOUNTED STRUT (1000LBS MAX)**
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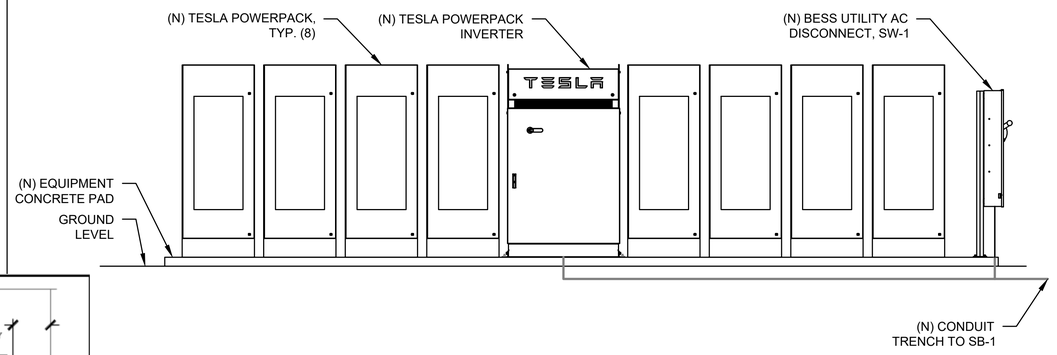
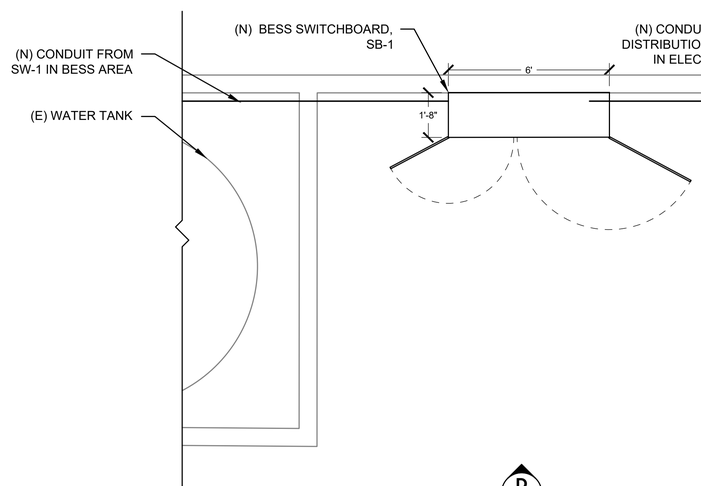
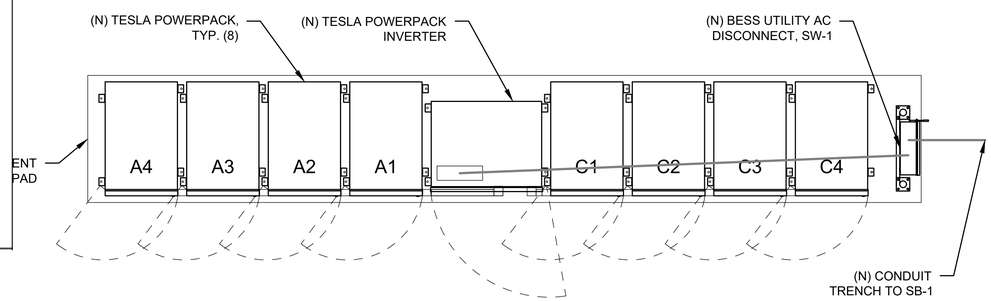


BESS - ELEVATION VIEW
SCALE: 3/8" = 1'-0"



C **SB-1 - PLAN VIEW**
SCALE: 3/8" = 1'-0"



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