

TYPICAL APPLICATION FOR CONNECTION IN SINGLE PACKAGE/FILE (PDF FORMAT)

PERMANENT POWER CONNECTION PROCEDURE:

- A. All section on the application for connection to be filled, signed, and dated by Engineer of Record.
- B. **Application for connection need to be submitted at 60% design stage for Port's review and approval.** Submit application for connection at AVCommittees@portseattle.org via Port PM.
- C. A single packaged PDF document shall be provided for the application for connection. **File name contain Project number and name, Panel ID.** This PDF document should typically include the following:
 1. Application to Connect fully filled, signed, and dated by Engineer of Record.
 2. 7- and 30-day Metering Reading

Meter reading should be done on all phases of the panel and should be completed within 365 days of application to connect. The metering can be performed by the Port Electrical Shop or by the design team/contractor. If done by someone other than the Port Electrical Shop the output from the metering software shall not be modified in any way. If the done by someone other than the Port Electrical Shop additional requirements are need see list below.

 - a. Panel Name
 - b. Panel Location
 - c. Panel Voltage
 - d. Panel Phases/Wire
 - e. Panel Bussing
 - f. Panel Protection (either Main Circuit Break (MCB) or upstream breaker)
 - g. Equipment ID
 - h. Project Name
 - i. Project Number
 - j. Start date and time
 - k. End date and time
 - l. Peak Current for each phase of the panel with date and time associated
 - m. Low Current for each phase of the panel with date and time associated
 - n. Average Current for each phase of the panel
 - o. Meter Model
 - p. Meter Calibration Date
 - q. Sample Rate (not greater than 15 minutes)

Exception: A 7-day meter reading is acceptable, and designer should ensure MCB does not exceed 70% load and with an understanding that the application will need to be resubmitted at the completion of a 30-day meter reading. With the resubmitted application load less than 80% is acceptable of the MCB.

3. Applicable Branch/Feeder Information.

Branch/feeder circuit information can be incorporated into the contract document set or as a separate document. Information should include but not limited to:

- Conductor Size and QTY
- Equipment Ground Size
- Approximate Length
- Voltage Drop Calculation (**Feeder circuit – 2% and Branch circuit – 3%). Refer to below sample table:**

For Reference Only		VOLTAGE DROP CALCULATIONS										For Reference Only	
POINT A	POINT B	DISTANCE L (ft.)	VOLTAGE (V)/ PHASE (φ)	FEEDER TAG	MATERIAL (Cu or...)	CURRENT	LOAD (kVA)	CONDUCTOR SIZE	SETS	ALLOWABLE VD (%)	ACTUAL VD (%)		
A2-D4-A20L-2	A2-BC4-A19N-1	55	480 V / 3 φ	225 FEEDER	Cu	AC	143.8	#4/0	1	2	0.27		
A2-D4-A20L-2	A2-BC4-A19N-2	55	480 V / 3 φ	600 FEEDER	Cu	AC	116.3	350 kcmil	2	2	0.08		
A2-D4-A20L-2	A2CW-BC4-A24AC-2	165	480 V / 3 φ	225 FEEDER	Cu	AC	149.6	#4/0	1	2	0.86		
A2-D4-A20L-2	A2CW-BC4-A24AC-4	165	480 V / 3 φ	225 FEEDER	Cu	AC	278.4	#4/0	1	2	1.59		
A2-D4-A7AA-1	A2CW-BC4-A6AC-1	110	480 V / 3 φ	600 FEEDER	Cu	AC	250.1	350 kcmil	2	2	0.36		
A2-D4-A7AA-1	A2CW-BC4-A7J-1	300	480 V / 3 φ	400 FEEDER	Cu	AC	270.9	#3/0	2	2	1.66		
A2-D4-A7AA-1	A2CW-BC4-A8AC-1	105	480 V / 3 φ	400 FEEDER	Cu	AC	201.1	#3/0	2	2	0.43		
A2-D4-A7AA-2	A2CW-BC4-A6AC-2	110	480 V / 3 φ	600 FEEDER	Cu	AC	203.6	350 kcmil	2	2	0.29		
ABL-D4-A14AA-2A	A2CW-BC4-A8N-2	270	480 V / 3 φ	400 FEEDER	Cu	AC	117.2	#3/0	2	2	0.65		
ABL-D4-A14AA-2B	A2-BC4-A6H-1	205	480 V / 3 φ	400 FEEDER	Cu	AC	245.1	#3/0	2	2	1.03		

Exception: A voltage drop calculation is not required for circuits less than 100 feet, unless current exceeds **15** amps.

4. Site/Power Plan

The Site/Power plan should indicate location of panel for the application to connect. A conduit routing plan for all circuits exceeding **50** feet. All pertinent information should be highlighted.

5. One-Line Diagram

A one-line diagram showing electrical work in and around the panel for application to connect. One-line should be able to identify upstream and downstream connection. All pertinent information should be highlighted.

6. Panel Schedule

Panel schedule should be in Port standards excel format identifying existing and new loads. For existing panel, new loads shall be **highlighted and bold**, kVA and load description in the panel schedule. Remark section of panel schedule shall include project name and number, breaker number(s), date modified and electrical contractor on the project.

a. Load Calculation Summary

Load Calculation summary should include 30-day metering peak demand of existing load with date (date when actual metering data was collected), NEC 220.87 (2) demand factor, and additional new load both kVA and Ampere values. Load calculation summary to be provided in a tabular format on design drawing sheet. Preferred location on contract document on One-Line Diagram or panel schedule sheet. **Refer to below sample table for load summary:**

FOR REFERENCE ONLY

LOAD SUMMARY FOR		PANEL TAG ID			
PANEL RATED @		225A	208/120V	1PH	3W
FEEDER					
OVER CURRENT PROTECTION					225
	INPUTS				
VOLTAGE	208				
PHASE MULTIPLIER	1.732				
PEAK AMPS*	14.4				
30 DAYS DEMAND READING	5.19	KVA	14.40	A	
PER NEC 220.87(2) - 125% FACTOR	1.30	KVA	3.60	A	
SUB TOTAL	6.48	KVA	18.00	A	
LOAD REMOVED	2.88	KVA	7.99	A	
NEW LOAD AT PANEL	7.24	KVA	20.10	A	
TOTAL	10.84	KVA	46.09	A	

* 30 DAY DEMAND READING COMPLETED MM/DD/YYYY

- b. Circuit Breaker reservation request need to be forwarded to Port Electric shop via Port PM.
 - c. If new load is less than **200W** and require 15A/1P branch circuit breaker from existing panel, application for connection waiver may apply. **No modification or breaker replacement permitted on existing panel without F&I approval.** For such cases, Designer/contractor need provide necessary documentation for waiver and apply (by email) to F&I Electrical via Port PM for waiver. Designer/contractor still need to forward breaker reservation request to Port Electrical shop via Port PM.
7. Will there be a new meter within project:
- o If yes
 - Show and identify comm connection location for new meter on the Site/Power Plan.
 - **Provide meter connection details drawing as per Port standards.**
 - On meter detail provide a table something like below

Meter ID	Meter Type	Metered Panel	Comm Room Connection
XXXX (See note 1)			
Notes:			
1. Meter ID number shall be coordinate with port utility group.			
Meter Types are PXQ/PXE			

8. **For Tenant panels: if Tenant panels are going to be connected to Port Owned existing panel via branch breaker or Port owned existing transformer via disconnect switch, then design team/contractor need to submit an AFC package for existing Port panel that includes all documentation as specified above (Point 01 to 07). New Tenant panel schedule (new loads and branch breakers, SPD), power plan, conduit routing plan, voltage drop calculations, load summary, conduit and conductor sizing to be included within AFC package.**

9. If existing Port panels used/new Port panels added within ongoing projects.
- a. Additional new loads (kVA) for that project to be added on spare breaker or space. Design team/contractor need to submit updated and revised panel schedules (as per Port standard excel format including all information and calculations). Port's F&I Specifications for spare and space requirements to be met by individual Port project.
 - b. If existing loads data (kVA) on panel schedules not available/provided by Port, site investigation required by design team/contractor for panel/panels for individual project. After site investigation, complete analysis including application for connection for individual panel/panels for that project to be submitted for Port's F&I for review and approval.
 - c. After review and approval from Port F&I, design team/contractor will provide updated and revised panel schedule (as per Port standard excel format) with additional loads (kVA) to existing panel /panels including load summary calculations and meeting 7- and 30- metering requirement (metering to be recorded within a year) before "As Built" submission to Port.
 - d. New additional panel schedules for individual Port project to be included as per Port's standard excel format for design submission (90%) for Port F&I review and approval before "100%" design submission".
 - e. During construction phase, individual project (Contractor/design team) should keep track of any changes to individual panel (LV or MV) and inform any changes to Port F&I within 5 working days via RFI/email.
 - f. On final completion for individual project, new panels should meet Port's requirements for spare and space including panel schedule submitted to Port as per Port standard excel format.

TEMPORARY POWER CONNECTION PROCEDURE:

- A. All section on the application for connection to be filled, signed, and dated by Engineer of Record/contractor.
- B. Submit application for connection at AVCommittees@portseattle.org via Port PM.
- C. Circuit identification to be defined including temp power kVA values and temporary duration period on page 01 section 2 of application for connection. Also, include the Temp power duration (Month & year). After Port's review, Temp power application will be approved for max 06 Months. If contractor required power for more than 06 months, a fresh Temp power application need to be submitted to Port F&I via Port PM prior to previous temp application expiration date.
- D. A single packaged PDF document shall be provided for the application for connection. File name contain Project number and name, Panel ID, add suffix "Temp Power Application".
- E. This PDF document should typically include the following:

1. Application to Connect fully filled, signed, and dated by Engineer of Record/Contractor
2. 7- and 30-day Metering Reading

Meter reading should be done on all phases of the panel and should be completed within 365 days of application to connect. The metering can be performed by the Port Electrical Shop or by the design team/contractor. If done by someone other than the Port Electrical Shop the output from the metering software shall not be modified in any way. If the done by someone other than the Port Electrical Shop additional requirements are need see list below.

 - a. Panel Name
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 - n. Average Current for each phase of the panel
 - o. Meter Model
 - p. Meter Calibration Date
 - q. Sample Rate (not greater than 15 minutes)
 - r. Applicable Branch/Feeder Information.
3. Branch/feeder circuit information can be incorporated into the contract document set or as a separate document. Information should include but not limited to:
 - a. Conductor Size and QTY
 - b. Equipment Ground Size
 - c. Approximate Length
 - g. Voltage Drop Calculation **(Feeder circuit – 2% and Branch circuit – 3%). Refer to below sample table:**

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- a) Technical/Electrical detail info (highlighted) for temporary power equipment **(included but not limited to power skids, transformer, spider boxes, welding units)** to be included within application for connection package. Technical/Electrical info may be in form of data sheet/shop drawing/relevant document that provide evidence for Electrical details (kVA, voltage, and Ampere values).
- b) **Ground Fault protection in terms of breaker is required at point of connection (at existing Port panel) or at temporary power primary location. Ground fault protection related documentation to be included within the application for connection package.**
- c) Circuit Breaker reservation request need to be forwarded to Port Electric shop via Port PM.
- d) Load Calculation Summary
Load Calculation summary should include 30-day metering peak demand of existing load with date (date when actual metering data was collected), NEC 220.87 (2) demand factor, and additional new load both kVA and Ampere values. Load calculation summary to be provided in a tabular format on design drawing sheet. Preferred location on contract document on One-Line Diagram or panel schedule sheet. **Refer to below sample table for load summary:**

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NEW LOAD AT PANEL	7.24	KVA	20.10	A
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- e) Within existing Port panel, if branch breaker (Digitrip unit) needs to be replaced, then design team/contractor need to submit Coordination study including TCC and breaker settings for F&I review and approval.