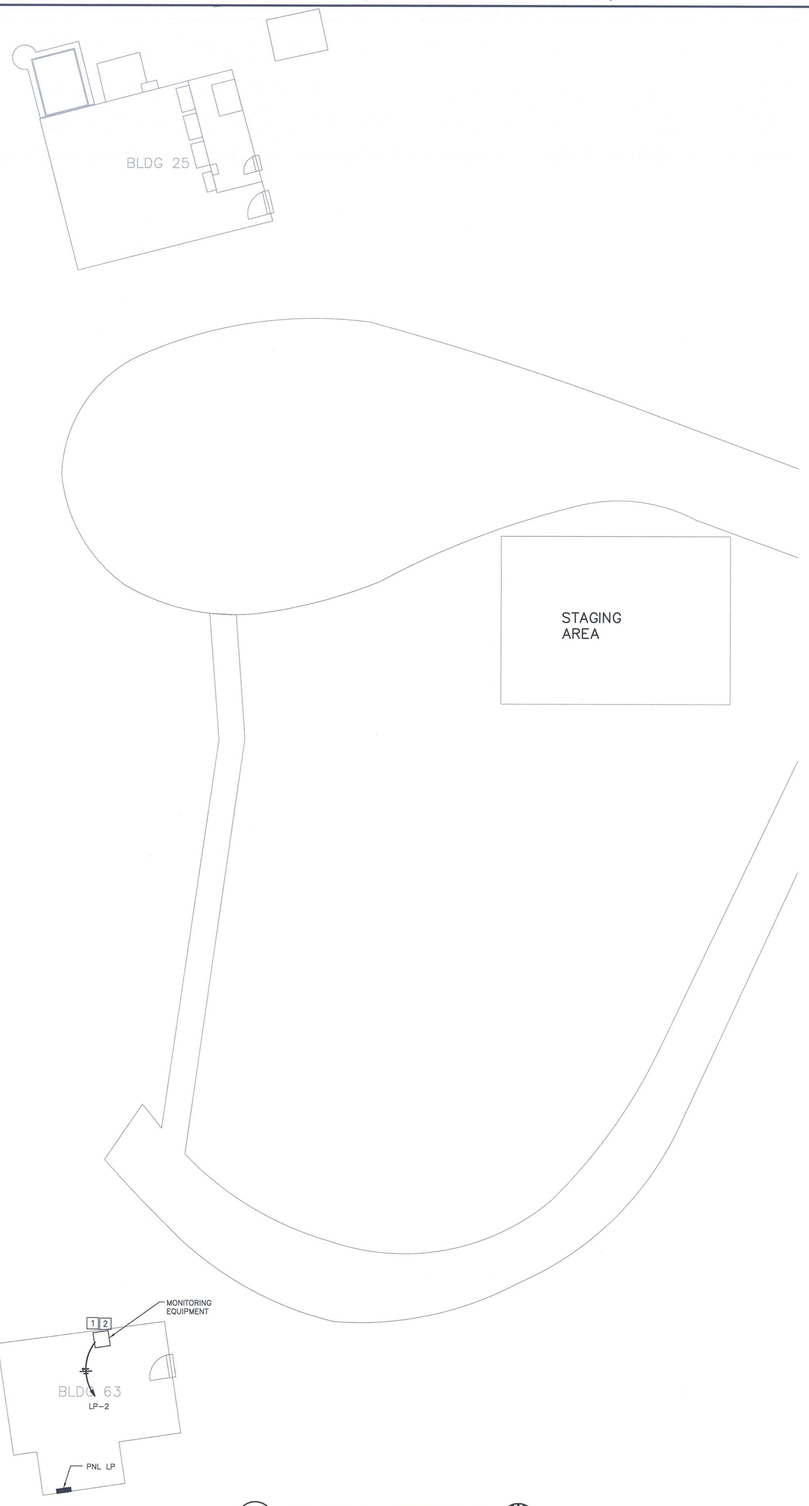
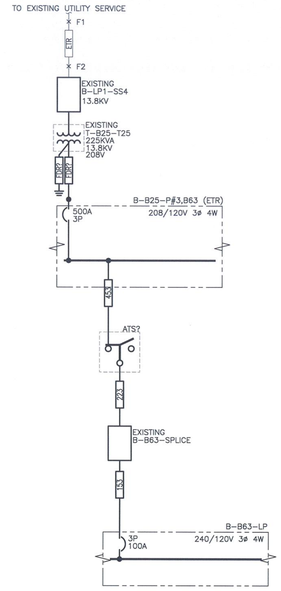


1 WELL HOUSE POWER PLAN
SCALE: 1/18"=1'-0"



CIRCUIT SCHEDULE:

ALL CONDUCTOR SIZES ARE BASED ON 75 DEG C RATED TERMINATION AND COPPER CONDUCTORS WITH TYPE THHN/THWN-2 INSULATION. WHERE ALUMINUM CONDUCTORS ARE ALLOWED PER SPECIFICATIONS AND FOR TERMINATION OR INSULATION TYPES RATED LESS THAN 75 DEG C, MODIFY SIZES ACCORDING TO NFPA 70.

- 153 — 150A, (3)#1/0, (1)#6G, 1-1/2" C
- 223 — 225A, (3)#4/0, (1)#4G, 2" C
- 453 — 450A, (2) 2" C, EACH W/ (3)#4/0, (1)#2G
- ETR — EXISTING TO REMAIN WIRE AND CONDUIT

2 ONE LINE DIAGRAM
SCALE: N.T.S.

POWER PLAN GENERAL NOTES:

A. REFER TO SHEET E-1 FOR ADDITIONAL GENERAL NOTES.

B. HOMERUN CIRCUIT INDICATION IS AS FOLLOWS: (LP#-#) INDICATES CIRCUIT IN 120/208V PANELBOARD 'LP#'

C. COORDINATE LOCATIONS, MOUNTING HEIGHTS AND FINISHES OF ALL WIRING DEVICES WITH ARCHITECTURAL PLANS, ELEVATIONS AND DETAILS PRIOR TO ROUGH-IN. NOTIFY ARCHITECT AND ENGINEER OF ANY CONFLICTS OR DISCREPANCIES PRIOR TO ROUGH-IN.

D. CONTRACTOR SHALL FIELD VERIFY ALL NOTED ELECTRICAL PANELS INDICATED FOR MONITORING EQUIPMENT USE FOR AVAILABLE CAPACITY.

POWER PLAN KEYNOTES:

1. WATER MONITORING EQUIPMENT SHALL BE INSTALLED WITHIN 5-FEET OF HEAT EXCHANGER
2. CONTRACTOR SHALL VERIFY MONITORING EQUIPMENT LOCATION WITH MECHANICAL, PLUMBING, AND ALL OTHER CORRESPONDING DOCUMENTS.

Short-Circuit and Voltage Drop Calculations v1.00

Distances are for calculation purposes only and shall not be used for contractor takeoffs nor bidding – Contractor shall notify Engineer of any field condition that results in a change of 10% or greater circuit distance

The following calculations are based on the "Point-by-Point" method where:

ISC (2) = ISC(1) x M(1) **M= 1/(1+f)**
ISC (1) = short circuit current at fault point 1
ISC (2) = short circuit current at fault point 2

Feeder: (3ø) = 1.732 x L x Isc / C x E
Feederf (1ø)= 2 x L x Isc / C x E

XFMR: f (3ø) = IP(sec)x Vp x 1.73 x %Z / 100,000 x KVA
XFMR: f (1ø)= IP(sec)x Vp x %Z / 100,000 x KVA

IS(sec)= Vp x M x IP(sec) / Vs

L = Length of circuit E = Line to line volts
C = "C" Factor from Bussman table where "C" = 1 / impedance per linear foot

Feeder Types =
NM – Non Magnetic Conduit, M – Magnetic Conduit, FB – Feeder Busway, PB – Plug-in Busway, TX – Transformer

IP = Primary short circuit current
Vp = Primary voltage
IS= Secondary short circuit current
Vs= Secondary voltage

VOLTAGE DROP (3ø):
%VD= ((R x cos(arccos(pf)) + X x sin (arccos(pf))) x L/# x I x 1.73) / E
VOLTAGE DROP (1ø):
%VD= ((R x cos(arccos(pf)) + X x sin(arccos(pf))) x 2 x L/# x I) / E

%VD CUM= Cumulative Voltage Drop from Fault Point 1 to Fault Point #
R= resistance in ohms per LF
X= reactances in ohms per LF

Fault Point (F#)	Bus/Feeder Description	Phase	Source (Fault Point)	Source Isc (amps)	Feeder Conduit Type/TX	Feeder Material CU or AL	#	Wire/Bus Size	Conductor "C" value	Busway C value	L-L Volts E	Circuit Length L	Load Power Factor(pf)	Circuit Load A	Conductor Resistance R	Conductor Reactance X	Conductor Impedance, Z/ Ø	Transformer Type	kVA	Degree Rise	Z	V sec	f	M	FAULT CURRENT Isc	VOLTAGE DROP %VD	TOTAL V.D. %VD CUM	Fault Point (F#)
1	Utility Service Point			2762	at the Service Entrance Switch				13800																			1
	Motor Contribution				The connected full load motor amps (includes compressors) on the system																				Source Isc + 6X Motor Contribution =	2762		
2	B-LP1-SS4	3		2762	M	CU	1	Set(s) of 1/0 AWG	8925		13800	875	0.9	245	0.000120	0.000055	0.451027						0.034	0.97	2671	0.36%	0.36%	2
3																												3
4	T-B25-T25	3	2	2671	TX						13800							Ext'g	225		6.1	208	17.309	0.05	9679		0.36%	4
5	B-B25-P#3+B63	3	4	9679	M	CU	2	Set(s) of 400 kcmil	20566		25	25	0.9	760	0.000035	0.000049	0.451027						0.408	0.71	6877	3.48%	3.83%	5
6	B-B63-ATS-CMN	3	5	6877	M	CU	1	Set(s) of 500 kcmil	22185		208	210	0.9	430	0.000029	0.000048	0.451027						0.542	0.65	4459	3.54%	7.37%	6
7	B-B63-SPLICE	3	6	4459	M	CU	1	Set(s) of 3/0 AWG	12844		208	15	0.9	225	0.000079	0.000052	0.451027						0.043	0.96	4274	0.26%	7.63%	7
8	B-B63-LP	3	7	4274	M	CU	1	Set(s) of 2 AWG	5907		208	15	0.9	130	0.000200	0.000057	0.451027						0.090	0.92	3920	0.33%	7.97%	8

PANELBOARD: LP (EXISTING)
BUS AMPS: 225A
MAIN SIZE/TYPE: MLO
VOLTS/PHASE: 240D/120V, 3PH, 4W
SECTION: 1

FAULT CURRENT: REFER TO ONE-LINE DIAGRAM
A/C RATING: FCA +10% MINIMUM, FULLY RATED
SERVES:
MOUNTING: SURFACE
LOCATION: BLDG 1, RM

CKT NO.	DESCRIPTION	VOLTAMPS/PHASE A	B	C	WIRE NO.	BKR AMP	P	P	BKR AMP	WIRE NO.	VOLTAMPS/PHASE A	B	C	DESCRIPTION	CKT NO.	
1		11,085					1	1	20		900			PWR: MONITORING EQUIPMENT	2	NL
3	MAIN		11,085		100	3								SPACE	4	
5				11,085			1						1,920	PWR: RECEPT	6	
7	LTG	1,920			20	1	1			1,920				PWR: BATTERY CHARGER	8	
9	SPACE													SPACE	10	
11	SPARE				20	1	1						1,920	LTG LOAD	12	
13	SPARE				20	1	1			1,920				PWR: RM VENT FANS	14	
15	SPACE													SPACE	16	
17	SPACE						2	20						PWR:	18	
19		2,217									2,217			GENERATOR WATER HEATER	20	
21	W. RM HEATER		2,217		20	3						2,217		SPACE	22	
23				2,217										SPACE	24	
25		2,217									2,217			PWR:	26	
27	E. RM HEATER		2,217		20	3	3	20				2,217		GENERATOR	28	
29				2,217									2,217	RADIATOR FAN	30	
31		2,217												SPACE	32	
33	CHLORINE PUMP		2,217		20	3								SPACE	34	
35				2,217										SPACE	36	
	SUBTOTAL	19,656	17,736	17,736							9,174	4,434	8,057	SUBTOTAL		

TOTAL PHASE A – VA	28,830	LOAD	CONN. VA	DF	LOAD	CONN. VA	DF		
AMPS	240	COOLING		1.00	REFRIGERATION		1.00		
TOTAL PHASE B – VA	22,170	HEATING		0	SIGN/DISPLAY		1.25		
AMPS	185	LIGHTING		1.25	KITCHEN		1.00		
TOTAL PHASE C – VA	23,793	RECEPTACLES		1.0/.5	EXISTING	73,893	1.00		
AMPS	198	MOTORS		1.00	LARGE MOTOR		1.25	TOTAL DEMAND	
TOTAL PNLBD – VA	74,793	SUPP. HEAT		1.00	SHOW WINDOW		1.25	74,793 VA	
AMPS	180	MISC EQUIP	900	1.00	LTG TRACK		1.00	180 A	

PANELBOARD NOTES
* ALL EXISTING LOADS ARE TAKEN AT 80% OF BREAKER VALUE
*N = NEW CIRCUIT BREAKER AS INDICATED, AIC RATING SHALL BE COORDINATED WITH EXISTING BREAKER
*NL= NEW LOAD, EXISTING BREAKER

LTG TRACK – TRACK LENGTH
SIGN/DISPLAY – SIGNAGE & DISPLAY CASE

20A WIRE SIZING SCHEDULE

THE FOLLOWING SCHEDULE IS TO BE USED TO SIZE WIRE FOR 20 AMP CIRCUITS (120 VOLT). LENGTHS (IN FEET) ARE INTENDED TO BE MAXIMUM.

120 VOLT	#12	#10	#8	#6
1–5 AMPS	200 FT.	325 FT.	490 FT.	770 FT.
6–10 AMPS	100 FT.	160 FT.	245 FT.	385 FT.
11–15 AMPS	70 FT.	110 FT.	165 FT.	255 FT.

KEY PLAN

20' 10' 0 20' 40'
1"=20'

Revisions	Date

VA FORM 08-6231

CONSULTANTS:

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ENGINEERS:

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OPS RESEARCH & CIVIL/ENV ENGINEERING
5580 S. FORT APACHE RD. #130
LAS VEGAS, NV 89148
OFFICE: (702) 202-6004 SBCHRISTCONSULTING.COM

Drawing Title: WELL HOUSE WATER MONITORING EQUIPMENT POWER PLANS

Approved: Project Director
APPROVED BY:
TITLE:
STATION:

Project Title: VAMC COATESVILLE
WATER SYSTEM CHEMICAL MONITORING & SCALD PROTECTION

Location: VAMC COATESVILLE, PA

Date: 2015 APRIL 22 | Checked: RJC | Drawn: VJA

Project Number: 542-13-115
Building Number: PUMPHOUSE
Drawing Number: E-18
Dwg. 40 of 41

Office of Construction and Facilities Management
Department of Veterans Affairs

DAVID D. HAAKE
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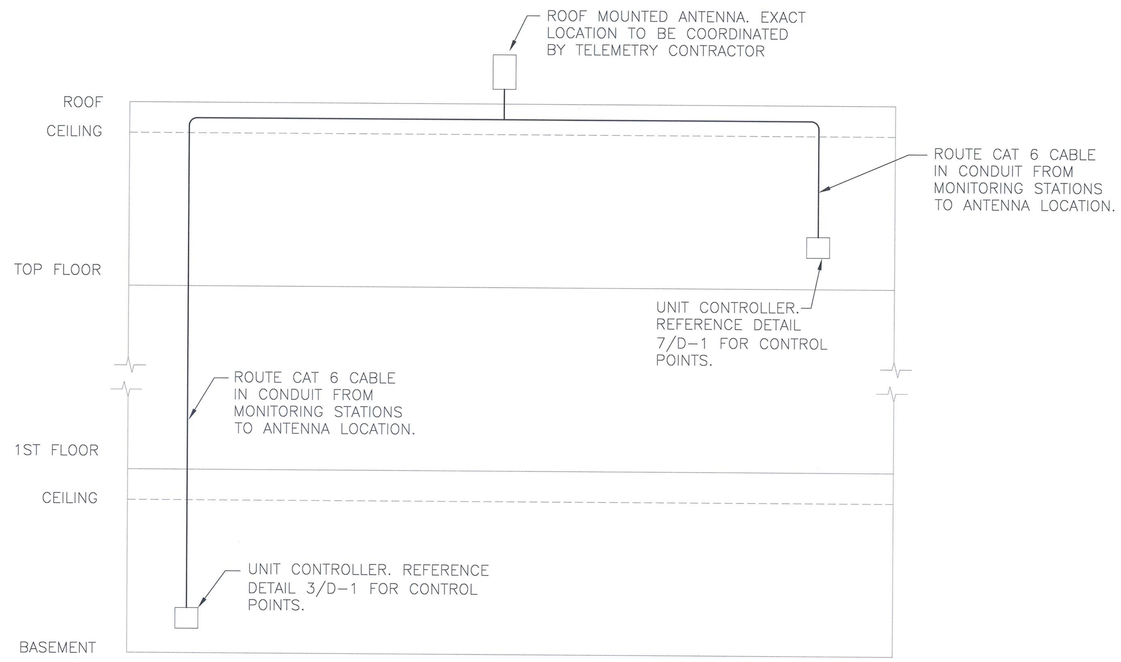

NOTE: REFER TO PLUMBING DRAWINGS FOR WATER SYSTEM CHEMICAL MONITORING AND SCALD PROTECTION EQUIPMENT LOCATIONS.

1 TYPICAL BUILDING TELEMETRY SCHEMATIC
SCALE: N.T.S.

KEY PLAN

Revisions	Date

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Drawing Title: BUILDING TELEMETRY SCHEMATIC

Approved: Project Director
APPROVED BY:
TITLE:
STATION:

Project Title: VAMC COATESVILLE
WATER SYSTEM CHEMICAL MONITORING & SCALD PROTECTION

Location: VAMC COATESVILLE, PA

Date: 2015 APRIL 22 | Checked: RJC | Drawn: VJA

Project Number: 542-13-115
Building Number: 000
Drawing Number: T-1
Dwg. 41 of 41

Office of Construction and Facilities Management
Department of Veterans Affairs

VA FORM 08-6231

PHILLIP G. MILLER
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