

ENGINEERING THE
FUTURE

SUCCESS THROUGH > SYNERGY >

MAXIMIZING VALUE WITH
INFRASTRUCTURE MASTER PLANNING:
A STRATEGIC IMPERATIVE



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BLANCHARD VALLEY
HEALTH SYSTEM



Learning Objectives

1. **Use master planning as a strategic tool** to meet current healthcare needs and prepare for future growth and challenges.
2. **Avoid costly delays and infrastructure failures** through proactive planning that ensures operational continuity.
3. **Extend asset lifespans and boost ROI** by making informed decisions that deliver long-term economic value.
4. **Integrate planning principles into your organization** to achieve sustainable, financially sound outcomes

The Challenge

(Why Infrastructure Master Planning)

Unplanned Failures

Rising Costs

Limited Capital



Visible Beauty vs Hidden Risk

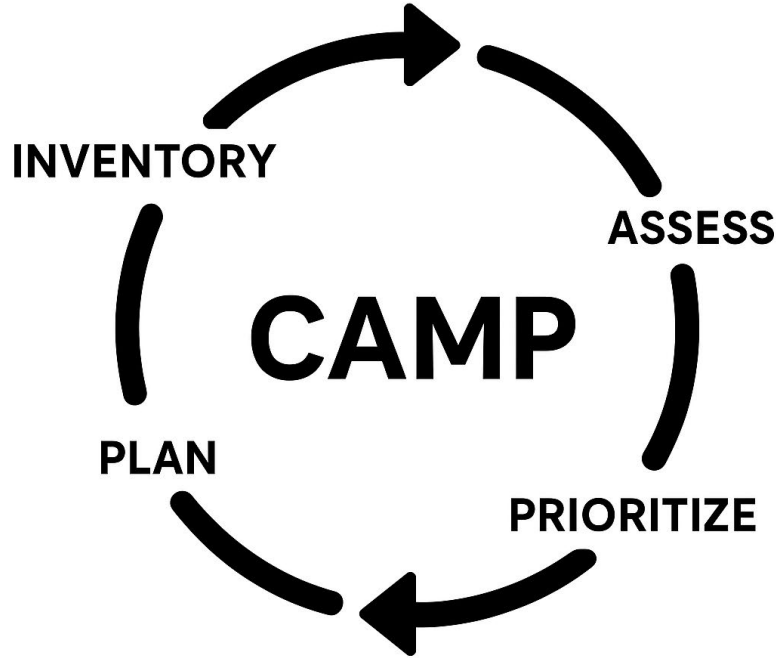


Infrastructure Master Planning Goals

- Know the assets
- Infrastructure planning
- Renovation/Construction/Long-term growth planning
- Consolidating infrastructure information
- Passing on campus knowledge
- Event response (pandemic or other)
- Living documentation that is continually updated over time.



The Solution

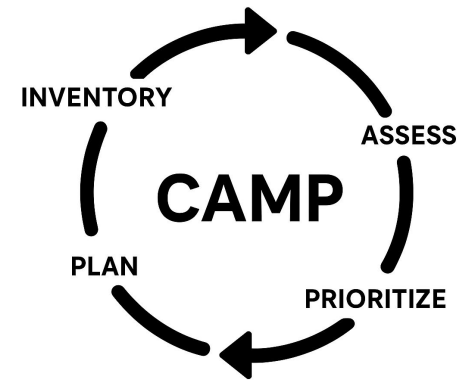
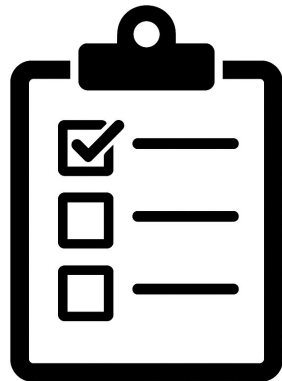


A proactive, living
strategy for
infrastructure



Campus Asset Management Plan (CAMP) vs Facility Condition Assessment (FCA)

- FCA: Point-in-time snapshot.
- CAMP: Living, evolving strategy.



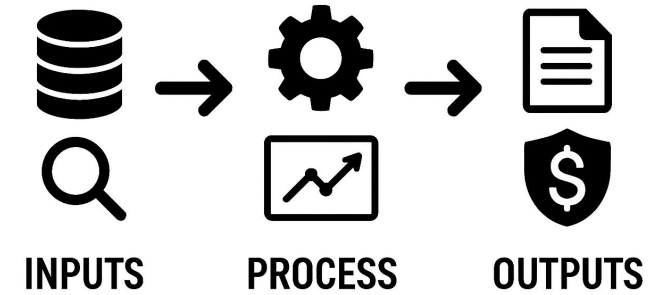
How CAMP Works

Inputs → Process → Outputs

Inputs: Data, Assessments, History

Process: Analysis, Prioritization

Outputs: Strategic Plan, Risk Management,
Capital Planning



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Examples of CAMP and Master Planning

Air Handling Equipment

Components:

A: OA Volume Measurement Station	H: Run around pump on Preheat	O: Final Filters (HEPA)	V: Electronic Air Filter
B: OA Economizer Cycle	I: Cooling Coil	P: SA Fan	W: VFD/S on fans
C: Pre- Filters (Merv 8)	J: Pump for Cooling Coil	Q: RA Fan	X: CW 3-way valve
D: Pre-Filters (Merv 11)	K: Humidifier	R: Dual Wall Construction	Y: HW 3-way valve
E: Pre-Filters (Merv 13)	L: Heating Coil	S: Exposed Liner	Z: Rumaround Coil
F: EA/Rel. Fan	M: Run around Pump on Htg. Coil	T: Roll Pre-Filter	AA: UVGI Lights
G: Preheat Coil	N: Final Filters (Merv 14)	U: HEPA Upstream of Coil	AB: Desiccant Wheel

Color Code Key	
Past ASHRAE Service Life	
1-6 yrs. of Service Life Remaining	
More than 6 yrs. of Service Life Remaining	
Current Year	2024
AJ: DX Cooling	AN: Enthalpy Wheel
AK: Direct, Gas Fired Heating	AO: 100% OA
AL: Barometric Relief	AP: Air Blender
AM: Remote RA/Rel. Fan	AQ: Carbon filters

Rating System		
1	Poor	
2	Fair	
3	Good	
4	Very Good	
5	Excellent	

Unit Tag	Location	Room Number	MFG	Area(s) Served	Year Installed	CFM Design (Balance)	Minimum Outside Air %	Cooling Capacity (MBtu/hr.) / GPM	Heating Capacity (MBtu/hr.) / GPM	SA Fan HP	RA Fan HP	Components	Comments	ASHRAE Expected Life (yrs)	Current Age (yrs)	Status/Years Remaining	Rating System of Equipment				Importance Level
																	Age	Condition	Operational or Mechanical Issues	Average	
<u>S-1G1</u>	Ground Floor	GC E 02	Indus. Airsys.	Ground Floor - C Wing - Radiology	1995				435.3 /	10	-	B, C, G, I, J, P, W, X, Y		20	29	Past Median Service Life	2	3	4	3.0	High
<u>S-1G2</u>	Ground Floor	-	McQuay	Ped CATH Lab	2013	7,675	35	325 / 55	285.5 / 297 lbs/hr	10	1.5	B, C, G, I, K, N, P, W, AA, AF, AM	Steam preheat coil and humidifier	20	11	9	4	5	5	4.7	High
<u>S-1RG1</u>	Ground Floor	-	Enviro Tech	ACC Basement Mechanical Room	2020	8,700	-	347.2 / 69.7	-	7.5	-	C, I, J, P		20	4	16	5	5	5	5.0	Low
<u>S-2G1</u>	Ground Floor	-	Indus. Airsys.	Ground Floor B-Wing - GI Unit	1992					10	-	B, C, I, J, P, AF	Heating coil piping removed.	20	32	Past Median Service Life	1	3	4	2.7	Medium
<u>S-5G1</u>	Ground Floor	G-33	Marlo	EVS, Transport, Respiratory, Med Records, Gift Shop	1964	13,355		449 / 61	225 / 7.5	7.5	-	B, C, G, I, P, AM		20	60	Past Median Service Life	1	3	1	1.7	Medium
<u>S-5G2</u>	Ground Floor	G-33	Trane	Dialysis, Respiratory Clean Supply	1974	4,000		140 / ?		3	-	B, C, G, H, I, P, X, AF		20	50	Past Median Service Life	1	3	2	2.0	Medium
<u>S-6G2</u>	Ground Floor	-	Trane	Morgue	2005	1,520	100	94 / 16	107 / 3# Steam	1.5	-	C, G, I, J, K, N, P, X, AO	Steam preheat coil and humidifier	20	19	1	2	3	3	2.7	Medium
<u>S-7G1</u>	Ground Floor	EQR7G1	Marlo	Environmental Services	1964	2,200		86 / 12	180 / 6	1.5	-	B, C, G, I, P, Y, AF		20	60	Past Median Service Life	1	2	1	1.3	Low
<u>S-7G2</u>	Ground Floor	EQR7G1	McQuay	Main Floor Dietary Office, Dish Room, Serving	2008	10,750	37	518.5 / 69	262.7 / 13	15	-	B, C, G, I, P, AF		20	16	4	4	4	4.0	Medium	
<u>S-7G3</u>	Ground Floor	EQR7G1	Trane	Main Floor Cafeteria Dining Room	1987	9,200	16	276 / 48	165 / 8	7.5	-	C, G, I, J, P, S	No outside air connection.	20	37	Past Median Service Life	1	3	3	2.3	Low
<u>S-1M1</u>	Main Floor	-	Industrial Airsystems	Main Floor Old ER Trauma Rooms	1994				274.2 / ?	10	-	B, C, G, I, J, K, N, P, AF	Steam humidifier	20	30	Past Median Service Life	2	3	3	2.7	High
<u>S-1M2</u>	Main Floor Roof (Above S-1M1)	-	Daikin	Main Floor Old ER C-Wing	2014	9,200	?	318 / 64	364 / N/A?	(2) 7.5	(2) 3	B, C, G, I, K, N, P, Q, W, AC, AF, AH, AI	Steam preheat coil and humidifier	20	10	10	4	4	4	4.0	High
<u>S-2M1</u>	Main Floor	-	Dunham-Bush	Main Floor B-Wing Eye Clinic	1977	9,510	25	384 / 77	-	20	-	B, C, I, J, K, N, P, AF	Steam humidifier	20	47	Past Median Service Life	1	2	1	1.3	High
<u>S-2M2</u>	Main Floor	-	Trane	Main Floor Lobby Hallway by ACC	1986	2,600	-	64 / 11	85 / 7	1.5	-	C, G, I, P		20	38	Past Median Service Life	1	3	2	2.0	Low
<u>S-4M1</u>	Main Floor	EQR4M1	Industrial Airsystems	Main Floor Dr. Lounge & Med Records	1992	5,100	10	352 / 60	-	5	-	B, C, I, J, P, S	Plenum return.	20	32	Past Median Service Life	1	3	3	2.3	Medium
<u>S-14M1</u>	Main Floor	-	Webco	Surgery, PACU/Pre-Op, and SPD	1990	42,000	21	1,500 / 250	-	75	25	B, G, I, J, K, N, P, Q, W, AA, AB, AE, AF, AH, AI	Blow through type unit. Steam humidifier.	20	34	Past Median Service Life	1	2	3	2.0	High

Paralleling Gear, Medium Voltage Equipment, Unit Substations, Automatic Transfer Switches

Color Code Key	
Past Service Life	
1-6 yrs. of Service Life Remaining	
More than 6 yrs. of Service Life Remaining	
Current Year:	2023

Rating System		
1	Poor	
2	Fair	
3	Good	
4	Very Good	
5	Excellent	

Unit Tag	Nameplate / Serves	Location	Branch	MFG	Catalog Number	Voltage	Rating	Year Installed	Expected Life (Years)	Current Age (Years)	Status/Years Remaining	Rating System of Equipment				Importance Level	Notes
												Age	Physical Condition	Serviceability & Parts Availability	Average		
69 kV Equipment	Majority of Hospital Normal Power	Employee Lot	Normal	N/A - This includes the equipment from the A frame to the 10 MVA transformer.		69 kV	N/A	2007	30	16	14	3	4	4	3.7	High	
10 MVA Trans.	Majority of Hospital Normal Power	Employee Lot	Normal	Niagara	Serial No. S31690	69kV to 12.47 kV	10 MVA	2007	30	16	14	3	4	4	3.7	High	
15 kV Board	Majority of Hospital Normal Power	Employee Lot	Normal	SQ D	Factory Order No. 17-22512740-005; Model No. V5D6133Y000	69,000V	1200A	2007	30	16	14	4	4	4	4.0	High	
PSM-X36	15 KV Switchgear	Powerhouse - Indoors	Normal	Westinghouse	Identification No. 71Y2282	13,200V	1200A	1985	30	38	Past Expected Life	1	2	1	1.3	High	Date is approximate. Replacement parts are available, but due to the age and issues with the board, it is recommended for replacement.
GCP1M-Aa40 / GCP2M-Aa40 / GCP3M-Aa40	Generator / Steam Turbine Paralleling Gear	Powerhouse	Emergency	Russelectric	Drawing No. 18658-D-110586	480Y/277V	Horz.-6000A Vert.-2000A	1991	30	32	Past Expected Life	2	2	2	2.0	High	Per Bob, this is being replaced under the CUP project. No costs have been provided for this reason.
SUBM-V34	Laundry	Powerhouse - Outdoors	Normal	GE Trans. & Unknown Dist.	GE Trans. Model No. E693590	12,470V to 480Y/277V	1000 kVA	1969	30	54	Past Expected Life	1	1	1	1.0	Low	
PCBM-W33	Capacitor Bank	Powerhouse - Outdoors	Normal	American Switchgear	No Nameplate	No Nameplate	No Nameplate	1985	30	38	Past Expected Life	2	2	1	1.7	Low	Date is approximate. Parts are likely hard to come by.
SUBM-W36	Powerhouse Double Ended Substation	Central Utility Plant - Outdoors	Normal	Westinghouse Trans. & Unknown Dist.	Westinghouse Trans. Serial No. PAL6167-0101	12,470V to 480Y/277V	2000 kVA	1985	30	38	Past Expected Life	2	2	1	1.7	Medium	
SUBM-X35				Westinghouse Trans. & Unknown Dist.	Westinghouse Trans. Serial No. PAT1398-0101	12,470V to 480Y/277V	2000 kVA	1985	30	38	Past Expected Life	2	2	1	1.7	Medium	
SUB-M-Pa26	E-BLDG Double Ended Substation	E-BLDG Electrical Room	Normal	Westinghouse	Westinghouse Trans. Serial No. PCW3796-0102	12,470V to 480Y/277V	2000 kVA	1989	30	34	Past Expected Life	2	2	1	1.7	Medium	
SUB-M-Sa26				Westinghouse	Westinghouse Trans. Serial No. PCW3796-0101	12,470V to 480Y/277V	2000 kVA	1989	30	34	Past Expected Life	2	2	1	1.7	Medium	
SUB-M-Ua57	Main Hospital Double Ended Substation	Main Hospital	Normal	Westinghouse	Westinghouse Trans. Serial No. PCW 1399-0101	12,470V to 480Y/277V	1500 kVA	1985	30	38	Past Expected Life	2	2	1	1.7	Medium	
SUB-M-Va58				SQ D	SQ D Trans. Serial No. 29116008-002-01	12,470V to 480Y/277V	1500 kVA	2012	30	11	19	4	5	5	4.7	Medium	
SUB-G-Sh32	Main Hospital Double Ended Substation	Main Hospital	Normal	Park Detroit	Model No. PM315-15-95; Serial No. 45107	12,470V to 480Y/277V	750 kVA	2011	30	12	18	4	4	4	4.0	Medium	
SUB-G-Th31				Park Detroit	Model No. PM315-15-95; Serial No. 45107	12,470V to 480Y/277V	750 kVA	2011	30	12	18	4	4	4	4.0	Medium	
SUB-G-Fc51	ACC Wing Double Ended Substation	Main Hospital ACC Building	Normal	GE	Transformer No. L 248941; Job No. 182-69688	12,470V to 480Y/277V	1500 kVA	1982	30	41	Past Expected Life	2	3	3	2.7	Medium	
SUB-G-Fc52			Normal	GE	Transformer No. L 248942; Job No. 182-69698	12,470V to 480Y/277V	1500 kVA	1982	30	41	Past Expected Life	2	3	3	2.7	Medium	
SUB-EM	Heart Pavilion	Heart Pavilion Main Electrical Room	Emergency	Siemens	Serial No. 49961-A00040	12,470V to 480Y/277V	2000 kVA	2006	30	17	13	3	4	4	3.7	Medium	

Plumbing Equipment Cost Breakdown

Equipment Tag	Location	Service	Average Rating	Importance Level	Comments	2024 Order of Magnitude Capital Budget	2025 Order of Magnitude Capital Budget	2026 Order of Magnitude Capital Budget	2027 Order of Magnitude Capital Budget	2028 Order of Magnitude Capital Budget	2029 Order of Magnitude Capital Budget
SWHX - Domestic Water Heater	Mechanical Room adjacent to Power House	Medical Center Complex	1.3	High	New Digital Mixing Valve Cost	\$120,000	\$140,000	\$160,000	\$180,000	\$200,000	\$220,000
SWHX - Domestic Water Heater	Mechanical Room adjacent to Power House	Medical Center Complex	1.3	High	New Water Softener to feed Water Heaters to prevent scaling	\$70,000	\$80,000	\$90,000	\$100,000	\$110,000	\$130,000
SWHX - Domestic Water Heater	Mechanical Room adjacent to Power House	Medical Center Complex	1.3	High	New Hot Water Recirculation Pump/Booster pump.	\$160,000	\$180,000	\$200,000	\$220,000	\$250,000	\$280,000
SWHX - Domestic Water Heater	Mechanical Room adjacent to Power House	Medical Center Complex	1.3	High	New Hycleen Automation system Phase 1 replacement in A, B and C wings.	\$90,000	\$100,000	\$110,000	\$130,000	\$150,000	\$170,000
Medical Air Compressor	Heart Center Main Floor Mechanical Room	Heart Center	2.0	Low		\$250,000	\$280,000	\$310,000	\$350,000	\$390,000	\$430,000
SWHX - Domestic Water Heater	MOB 2 Basement Mechanical Room	MOB 2	2.0	Medium	New indirect fired water heaters and digital mixing valve.	\$200,000	\$220,000	\$250,000	\$280,000	\$310,000	\$350,000
Domestic Water Booster System	Mechanical Room adjacent to Power House	Main Building Complex	2.3	Low	Replace larger pump with smaller triplex pump.	\$120,000	\$140,000	\$160,000	\$180,000	\$200,000	\$220,000
Carbon Dioxide Manifold	E Bldg Main Floor Mechanical Room	Main Building Complex	2.7	Medium		N/A	N/A	N/A	N/A	N/A	N/A
Nitrous Oxide Manifold	E Bldg Main Floor Mechanical Room	Main Building Complex	2.7	High		N/A	N/A	N/A	N/A	N/A	N/A
Nitrogen Manifold	E Bldg Main Floor Mechanical Room	Main Building Complex	2.7	Medium		N/A	N/A	N/A	N/A	N/A	N/A
Water Softener Assembly	Mechanical Room adjacent to Power House	TBD	2.7	Low		N/A	N/A	N/A	N/A	N/A	N/A
RO System	Main Mechanical Room	TBD	2.7	Low		N/A	N/A	N/A	N/A	N/A	N/A
Nitrogen Manifold	Heart Center Main Floor Mechanical Room	Heart Center	3.0	Medium		N/A	N/A	N/A	N/A	N/A	N/A
Carbon Dioxide Manifold	Heart Center Main Floor Mechanical Room	Heart Center	3.0	Medium		N/A	N/A	N/A	N/A	N/A	N/A
Nitrous Oxide Manifold	Heart Center Main Floor Mechanical Room	Heart Center	3.0	High		N/A	N/A	N/A	N/A	N/A	N/A
Medical Air Compressor	Room off of Main Tunnel near IT adjacent to F	Main Building Complex	3.0	Low		N/A	N/A	N/A	N/A	N/A	N/A
Medical Vacuum Pump	Level 9 Mechanical Room	Main Building Complex	3.0	Medium		N/A	N/A	N/A	N/A	N/A	N/A
SWHX - Domestic Water Heater	Heart Center Basement Mechanical Room	Heart Center	3.0	Medium		N/A	N/A	N/A	N/A	N/A	N/A
Domestic Water Booster System	Basement Mechanical Room	Heart Center	3.0	Low		N/A	N/A	N/A	N/A	N/A	N/A
SWHX - Domestic Water Heater	MOB 1 Basement Mechanical Room	MOB 1	3.0	Medium		N/A	N/A	N/A	N/A	N/A	N/A
Fire Pump	Fire Pump Room	Heart Center	3.0	High		N/A	N/A	N/A	N/A	N/A	N/A
SWHX - Domestic Water Heater	AAC Mechanical Room	AAC	3.3	Medium		N/A	N/A	N/A	N/A	N/A	N/A
Medical Vacuum Pump	Heart Center Main Floor Mechanical Room	Heart Center	4.0	Medium		N/A	N/A	N/A	N/A	N/A	N/A
Water Softener Assembly	Dialysis Water Room	Dialysis	4.0	Low		N/A	N/A	N/A	N/A	N/A	N/A
RO System	Dialysis Water Room	Dialysis	4.0	Low		N/A	N/A	N/A	N/A	N/A	N/A
Fire Pump	Fire Pump Room AAC	Main Building Complex	5.0	High		N/A	N/A	N/A	N/A	N/A	N/A
Total Red		BETWEEN 0.0 - 1.4				\$440,000	\$500,000	\$560,000	\$630,000	\$710,000	\$800,000
Total Orange		BETWEEN 1.5 - 2.4				\$570,000	\$640,000	\$720,000	\$810,000	\$900,000	\$1,000,000
Overall Total		BETWEEN 0.0 - 5.0				\$1,010,000	\$1,140,000	\$1,280,000	\$1,440,000	\$1,610,000	\$1,800,000

Example Health System - Priority List

Location #1			
Priority	Equipment Tag	Order of Magnitude Capital Budget Based On Year	Year of Project
1	C4-AHU-1 and VAV Boxes	\$760,000	2023
2	SB-3 & SB-4	\$1,200,000	2024
3	C4-AHU-3 and VAV Boxes	\$890,000	2024
4	K2-AHU-8 and Reheat Coils	\$590,000	2025
5	K3RCH01 and K3RCT03	\$600,000	2025
6	ECCT02	\$520,000	2026
7	SWHX Water Heaters	\$200,000	2026
8	K2-AHU-2B	\$570,000	2027
9	K2-AHU-2 and Reheat Coils	\$900,000	2027
10	Domestic Water Booster System #3	\$130,000	2027
11	K2-AHU-1	\$810,000	2028
12	K3-AHU-54	\$1,020,000	2028
1	ATS-11	\$376,000	2023
2	PC#4	\$170,000	2025
3	PC#1	\$110,000	2025
4	PC#2	\$110,000	2025
5	PC#3	\$110,000	2025
6	SWGR1	\$830,000	2026
7	ATS-10	\$460,000	2027
8	GEN,2	\$530,000	2028
9	T-MPD-RAD	\$170,000	2028
Total 2023 Order of Magintude:		\$1,136,000	100%
Total 2024 Order of Magintude:		\$2,090,000	57%
Total 2025 Order of Magintude:		\$1,690,000	45%
Total 2026 Order of Magintude:		\$1,550,000	38%
Total 2027 Order of Magintude:		\$2,060,000	59%
Total 2028 Order of Magintude:		\$2,530,000	79%

Location #2			
Priority	Equipment Tag	Order of Magnitude Capital Budget Based On Year	Year of Project
1	AHU-1 (Med Surg)	\$350,000	2024
2	RT-1	\$240,000	2025
3	AHU-1 and VAV Boxes (LDR)	\$780,000	2026
1	ATS-2	\$130,000	2024
2a	GEN 1	\$310,000	2025
2b	Fuel Oil Tank #1	\$50,000	2025
3	ATS-3	\$80,000	2026
Total 2023 Order of Magintude:		\$0	0%
Total 2024 Order of Magintude:		\$480,000	13%
Total 2025 Order of Magintude:		\$600,000	16%
Total 2026 Order of Magintude:		\$860,000	21%
Total 2027 Order of Magintude:		\$0	0%
Total 2028 Order of Magintude:		\$0	0%

Facility Breakdown		
Facilities	Total Order of Magnitude	% of Budget
2023 Location #1	\$1,136,000	100%
2023 Location #2	\$0	0%
2023 Location #3	\$0	0%
2023 Location #4	\$0	0%
2023 Location #5	\$0	0%
2023 Location #6	\$0	0%
2023 Location #7	\$0	0%
2023 Location #8	\$0	0%
2024 Location #1	\$2,090,000	57%
2024 Location #2	\$480,000	13%
2024 Location #3	\$530,000	14%
2024 Location #4	\$370,000	10%
2024 Location #5	\$200,000	5%
2024 Location #6	\$0	0%
2024 Location #7	\$0	0%
2024 Location #8	\$0	0%
2025 Location #1	\$1,690,000	45%
2025 Location #2	\$600,000	16%
2025 Location #3	\$490,000	13%
2025 Location #4	\$370,000	10%
2025 Location #5	\$0	0%
2025 Location #6	\$450,000	12%
2025 Location #7	\$0	0%
2025 Location #8	\$180,000	5%
2026 Location #1	\$1,550,000	38%
2026 Location #2	\$860,000	21%
2026 Location #3	\$420,000	10%
2026 Location #4	\$290,000	7%
2026 Location #5	\$0	0%
2026 Location #6	\$0	0%
2026 Location #7	\$250,000	6%
2026 Location #8	\$660,000	16%
2027 Location #1	\$2,060,000	59%
2027 Location #2	\$0	0%
2027 Location #3	\$490,000	14%
2027 Location #4	\$460,000	13%
2027 Location #5	\$0	0%
2027 Location #6	\$0	0%
2027 Location #7	\$0	0%
2027 Location #8	\$490,000	14%
2028 Location #1	\$2,530,000	79%
2028 Location #2	\$0	0%
2028 Location #3	\$490,000	15%
2028 Location #4	\$200,000	6%
2028 Location #5	\$0	0%
2028 Location #6	\$0	0%
2028 Location #7	\$0	0%
2028 Location #8	\$0	0%
2023 Order of Magnitude:	\$1,136,000	
2024 Order of Magnitude:	\$3,670,000	
2025 Order of Magnitude:	\$3,780,000	
2026 Order of Magnitude:	\$4,030,000	
2027 Order of Magnitude:	\$3,500,000	
2028 Order of Magnitude:	\$3,220,000	

Location #3			
Priority	Equipment Tag	Order of Magnitude Capital Budget Based On Year	Year of Project
1	Heat Pumps	\$290,000	2024
2	RTU-1,30,31,32,33,34	\$240,000	2024
3	PTAC-1, WH-1,2,3,4,5,6	\$490,000	2025
4	WH-7,8,9,15,16,17,18	\$420,000	2026
5	RTU-23,24,25,26,27,28,29	\$490,000	2027
6	RTU-2,37,38,50,51	\$400,000	2028
7	PTAC-2	\$90,000	2028
Total 2023 Order of Magintude:		\$0	0%
Total 2024 Order of Magintude:		\$530,000	14%
Total 2025 Order of Magintude:		\$490,000	13%
Total 2026 Order of Magintude:		\$420,000	10%
Total 2027 Order of Magintude:		\$490,000	14%
Total 2028 Order of Magintude:		\$490,000	15%

Location #4			
Priority	Equipment Tag	Order of Magnitude Capital Budget Based On Year	Year of Project
1	AHU-12,14	\$250,000	2024
2	CH-2,3,4	\$210,000	2025
3	AHU-7,8,9,10 & WH-1,2	\$160,000	2025
4	AHU-1,3,5,6,11 & PTAC-1	\$290,000	2026
5	BLR 1 THRU 6	\$460,000	2027
6	AHU-4,13,15	\$200,000	2028
1	ATS1 & GEN1	\$120,000	2024
Total 2023 Order of Magintude:		\$0	0%
Total 2024 Order of Magintude:		\$370,000	10%
Total 2025 Order of Magintude:		\$370,000	10%
Total 2026 Order of Magintude:		\$290,000	7%
Total 2027 Order of Magintude:		\$460,000	13%
Total 2028 Order of Magintude:		\$200,000	6%

Location #5			
Priority	Equipment Tag	Order of Magnitude Capital Budget Based On Year	Year of Project
1	Humidifiers	\$200,000	2024
Total 2023 Order of Magintude:		\$0	0%
Total 2024 Order of Magintude:		\$200,000	5%
Total 2025 Order of Magintude:		\$0	0%
Total 2026 Order of Magintude:		\$0	0%
Total 2027 Order of Magintude:		\$0	0%
Total 2028 Order of Magintude:		\$0	0%

Location #6			
Priority	Equipment Tag	Order of Magnitude Capital Budget Based On Year	Year of Project
1	CU-1	\$450,000	2025
Total 2023 Order of Magintude:		\$0	0%
Total 2024 Order of Magintude:		\$0	0%
Total 2025 Order of Magintude:		\$450,000	12%
Total 2026 Order of Magintude:		\$0	0%
Total 2027 Order of Magintude:		\$0	0%
Total 2028 Order of Magintude:		\$0	0%

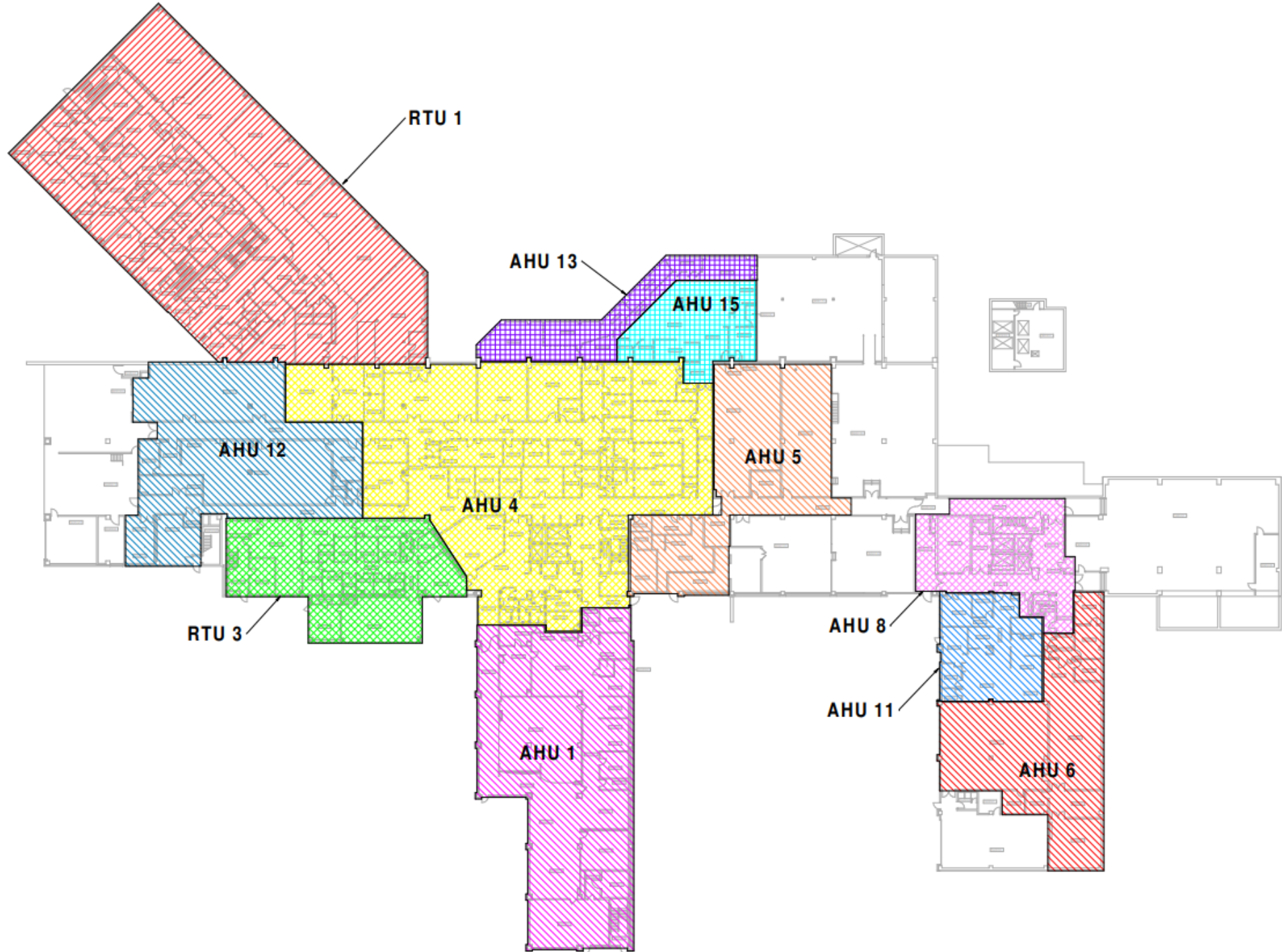
Location #7			
Priority	Equipment Tag	Order of Magnitude Capital Budget Based On Year	Year of Project
1	RTU-2	\$250,000	2026
Total 2023 Order of Magintude:		\$0	0%
Total 2024 Order of Magintude:		\$0	0%
Total 2025 Order of Magintude:		\$0	0%
Total 2026 Order of Magintude:		\$250,000	6%
Total 2027 Order of Magintude:		\$0	0%
Total 2028 Order of Magintude:		\$0	0%

Location #8			
Priority	Equipment Tag	Order of Magnitude Capital Budget Based On Year	Year of Project
1	BLR-1	\$160,000	2025
2	Domestic Water Heater 1	\$20,000	2025
3	RTU-1	\$660,000	2026
4	RTU-2	\$490,000	2027
Total 2023 Order of Magintude:		\$0	0%
Total 2024 Order of Magintude:		\$0	0%
Total 2025 Order of Magintude:		\$180,000	5%
Total 2026 Order of Magintude:		\$660,000	16%
Total 2027 Order of Magintude:		\$490,000	14%
Total 2028 Order of Magintude:		\$0	0%

Examples of Master Planning Drawings

- Mechanical/Plumbing/FS:
 - AHU Zoning Plans
 - Pipe Distribution Plans (Hot water, steam, chilled water, med gas, domestic water, sprinkler mains/areas covered, sanitary mains, storm mains, natural gas/fuel oil, etc.)
 - Pressurization Drawings
- Electrical:
 - Master Single Line
 - Emergency Lighting
 - Fire Alarm, Nurse Call, Voice/Data, Security



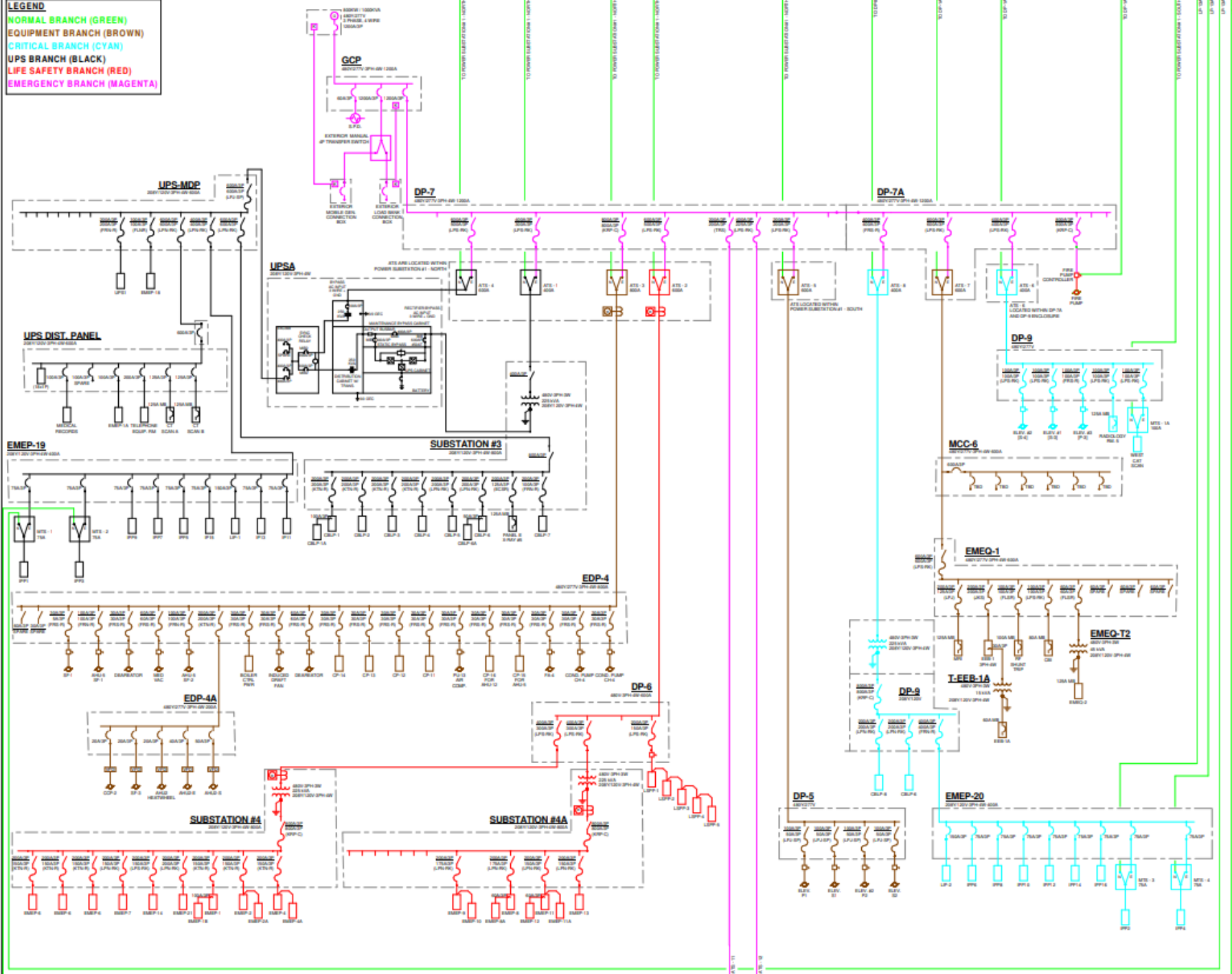




- NEGATIVE BY AIR BALANCE.
- POSITIVE BY AIR BALANCE.
- NEGATIVE BY PRESSURE CONTROL.
- POSITIVE BY PRESSURE CONTROL.

LEGEND
SCALE: NONE

LEGEND
 NORMAL BRANCH (GREEN)
 EQUIPMENT BRANCH (BROWN)
 CRITICAL BRANCH (CYAN)
 UPS BRANCH (BLACK)
 LIFE SAFETY BRANCH (RED)
 EMERGENCY BRANCH (MAGENTA)



DATE: 10/11

SCALE: 1/8"

Blanchard Valley Health System

- Master Planning Implementation:
 - Blanchard Valley Hospital
 - Bluffton Hospital
 - Findlay Surgery Center
 - Birchaven Village – LTC
 - Independence House – LTC
 - Armes Family Cancer Care Center
 - Eastern Woods Outpatient Center
 - Physicians Plus



Findlay Surgery Center



Eastern Woods Outpatient Center



Physicians Plus



Blanchard Valley Hospital (BVH)
150 Bed Acute Care Facility



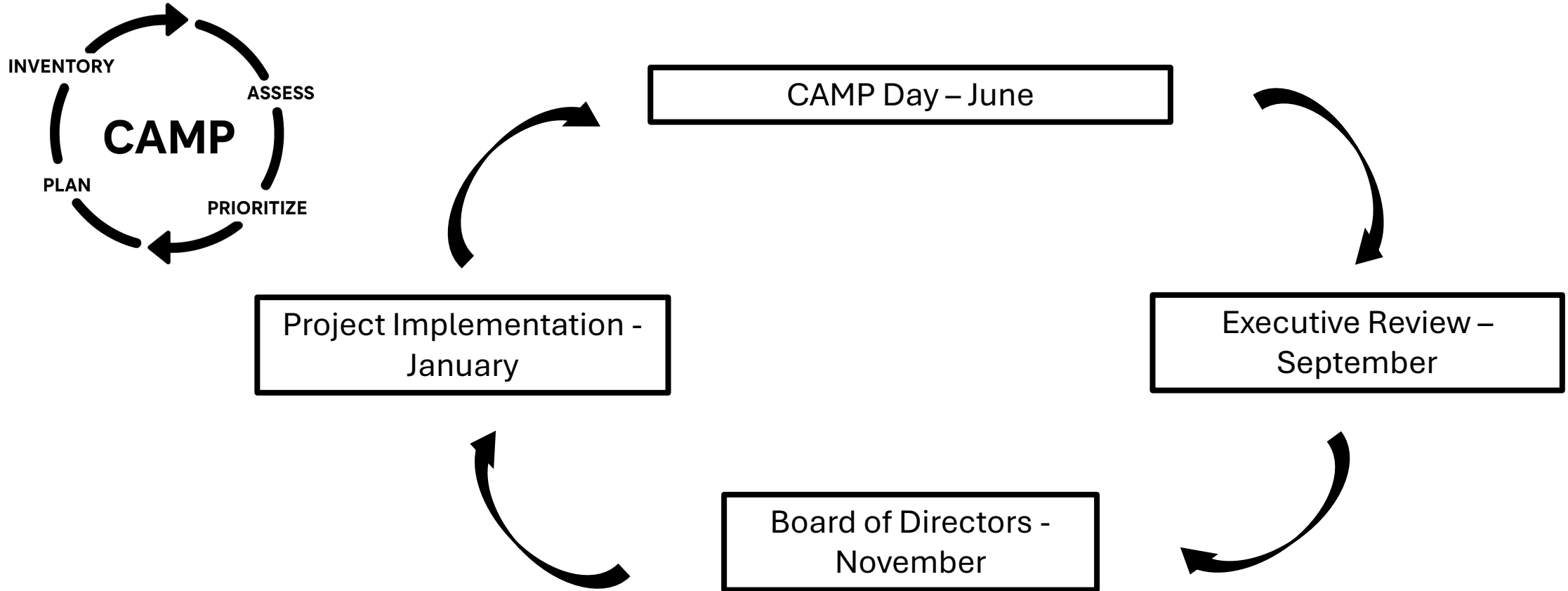
Bluffton Hospital (BH)
25 Bed Critical Access Facility

CAMP at BVHS

- Long Term Capital Planning
- Project Development
- New Employee Orientation



Long Term Capital Planning



Long Term Capital Planning

Location Priority

Blanchard Valley Hospital			
Priority	Equipment Tag	Order of Magnitude Capital Budget Based On Year	Year of Project
1	Ruse Chiller (R4CH03)	\$500,000	2025
2	ECCT02	\$500,000	2025
3	ATS-10	\$500,000	2025
4	C4-AHU-3 and VAV Boxes	\$1,500,000	2025
5	Critical Water	\$500,000	2026
6	Roof (Kose Helipad)	\$500,000	2026
7	Trauma Elevator Upgrade	\$500,000	2026
8	PC#4	\$500,000	2026
9	Domestic Water Heaters & Booster	\$500,000	2026
10	Parking Lot #2 - Repaving	\$500,000	2026
11	K1-AHU-9,10,13 (One new DX rooftop unit)	\$500,000	2026
12	PC#1	\$500,000	2027
13	PC#2	\$500,000	2027
14	PC#3	\$500,000	2027
15	K3RCH01 and K3RCT03	\$500,000	2027
16	CDS Elevator Modification	\$1,500,000	2027
17	K2-AHU-8 and Reheat Coils	\$1,500,000	2027
18	SWGR1	\$500,000	2028
19	Roof (S&R HR)	\$500,000	2028
20	K2-AHU-2 and Reheat Coils	\$1,500,000	2029
21	Roof (Ruse)	\$500,000	2029
22	K2-AHU-1	\$500,000	2030
23	K3-AHU-S4	\$500,000	2030

Facility Services Manager
 Long Term Care Manager
 Facility Supervisors
 HVAC Technicians
 Electrician
 Fire Safety Specialist
 HEAPY Engineering



Evaluate previous year CAMP
 Review unexpected conditions
 Technology changes
 Regulatory changes
 Modify CAMP
 Establish new Priority Ranking

Organization Priority

2026 BVHS Capital Plan		
Equipment	Cost	Priority
Roof (Kose Helipad) - BVH	\$500,000	1
Trauma Elevator Upgrade - BVH	\$500,000	2
Critical Water - FSC	\$500,000	3
Critical Water - BVH	\$500,000	4
Critical Water - BH	\$500,000	5
K1-AHU-9,10,13 (new DX rooftop unit) - BVH	\$1,500,000	6
Domestic Water Heaters & Booster - BVH	\$500,000	7
Humidifiers (Duct Mounted Steam) - FSC	\$500,000	8
Roof - EWOC	\$500,000	9
Parking Lot #2 - Repaving - BVH	\$500,000	10
Clark's W&C Parking Lot	\$500,000	11
PC#4 - BVH	\$500,000	12
WH-7,8,9,17,18 - BIRCH	\$500,000	13
WH-1,2,3,4,5,6 - BIRCH	\$500,000	14
Heights Window Replacement - BIRCH	\$500,000	15
Pool Area HVAC (RTU-37,38) - BIRCH	\$1,500,000	16
BLR 1 THRU 6 - IH	\$500,000	17
AHU-14 - IH	\$500,000	18
Humidifier - AFCCC	\$500,000	19



Project Development

- New service line or expansion
 - Condition / Age of equipment
 - Capacity – CFM, BTUs, Tons
 - Redundancy

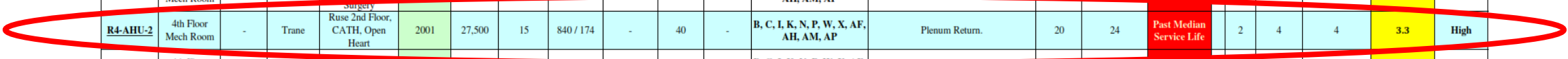
Components:

A: OA Volume Measurement Station H: Run around pump on Preheat O: Final Filters (HEPA) V: Electronic Air Filter AC: Fan Wall
 B: OA Economizer Cycle I: Cooling Coil P: SA Fan W: VFD'S on fans AD: Steam Face & Bypass
 C: Pre- Filters (Merv 8) J: Run around Pump on Cooling Q: RA Fan X: CW 3-way valve AE: Sound Attenuator
 D: Pre- Filters (Merv 9) K: Humidifier R: Dual Wall Construction Y: HW 3-way valve AF: Mixing Box
 E: Pre- Filters (Merv 13) L: Heating Coil S: Exposed Liner/Insulation Z: Runaround Coil AG: Cooling Face & Bypass
 F: EA/Rel. Fan M: Final Filters (Merv 13) T: Roll Pre-Filter AA: UVGI Lights AH: Discharge Plenum
 G: Preheat Coil N: Final Filters (Merv 14) U: HEPA Upstream of Coil AB: Desiccant Wheel AI: Return Plenum

Color Code Key	
Past ASHRAE Service Life	
1-6 yrs. of Service Life Remaining	
More than 6 yrs. of Service Life Remaining	
Current Year	2025

Rating System		
1	Poor	
2	Fair	
3	Good	
4	Very Good	
5	Excellent	

Unit Tag	Location	Room Number	MFG	Area(s) Served	Year Installed	CFM Design (Balance)	Minimum Outside Air %	Cooling Capacity (MBtu/hr.) / GPM	Heating Capacity (MBtu/hr.) / GPM	SA Fan HP	RA Fan HP	Components	Comments	ASHRAE Expected Life (yrs)	Current Age (yrs)	Status/Years Remaining	Rating System of Equipment				
																	Age	Condition	Operational or Mechanical Issues	Average	Importance Level
R1-AC-1	MRI Equip. Room		Liebert	Ruse 1st Floor MRI	2002	2,800	-	98.1 / 19.7	-	1.5	-	C, I, P		20	23	Past Median Service Life	3	4	3	3.3	High
R4-AHU-1	4th Floor Mech Room	-	Trane	Ruse 1st Floor, ER, Same Day Surgery	2001	33,200	17.2	1,080 / 221	-	40	-	B, C, I, K, N, P, W, X, AF, AH, AM, AP	Plenum Return.	20	24	Past Median Service Life	2	4	4	3.3	High
R4-AHU-2	4th Floor Mech Room	-	Trane	Ruse 2nd Floor, CATH, Open Heart	2001	27,500	15	840 / 174	-	40	-	B, C, I, K, N, P, W, X, AF, AH, AM, AP	Plenum Return.	20	24	Past Median Service Life	2	4	4	3.3	High
R4-AHU-3	4th Floor Mech Room	-	Trane	Ruse 3rd Floor, Radiology	2001	27,500	15	840 / 174	-	40	-	B, C, I, K, N, P, W, X, AF, AH, AM, AP	Plenum Return.	20	24	Past Median Service Life	2	4	4	3.3	High
R4-AHU-4	2nd Floor - Above Ceiling		Trane	Ruse 2nd Floor Connecting Hall	2001	2,400	0	75.6 / 15	91 / 9	1	-	C, G, I, P	Plenum Return.	20	24	Past Median Service Life	2	4	3	3.0	Low



New Employee Orientation

- Quick reference materials for new associates
 - Air Handler Zones
 - Domestic Water Piping
 - Med Gases
 - Electrical Single Line
 - Chilled Water Piping
 - Steam Piping



Ongoing Development

Hospitals	Mechanical						Electrical			Plumbing					
	CAMP	AHU Zoning	Chilled Water Piping	Hot Water Piping	Steam Piping	Pressurization Drawings	CAMP	Master Single Line	Emergency Lighting	CAMP	Med Gas	Domestic Cold Water	Domestic Hot Water	Sprinkler Mains/ Area Covered	Natural Gas/Fuel Oil
Blanchard Valley Hospital	X	X	X		X		X	X		X	X				
Bluffton Hospital	X						X			X					
Birchaven Village	X						X			X					
Independence House	X						X			X					
Findlay Surgery Center	X						X			X					
Cancer Center	X						X			X					
EWOC	X						X			X					
Physicians Plus	X						X			X					

X = Completed



ENGINEERING THE
FUTURE

SUCCESS THROUGH > SYNERGY >

QUESTIONS?

