



# Fleet Building Life Cycle Cost Analysis

*Presented by*

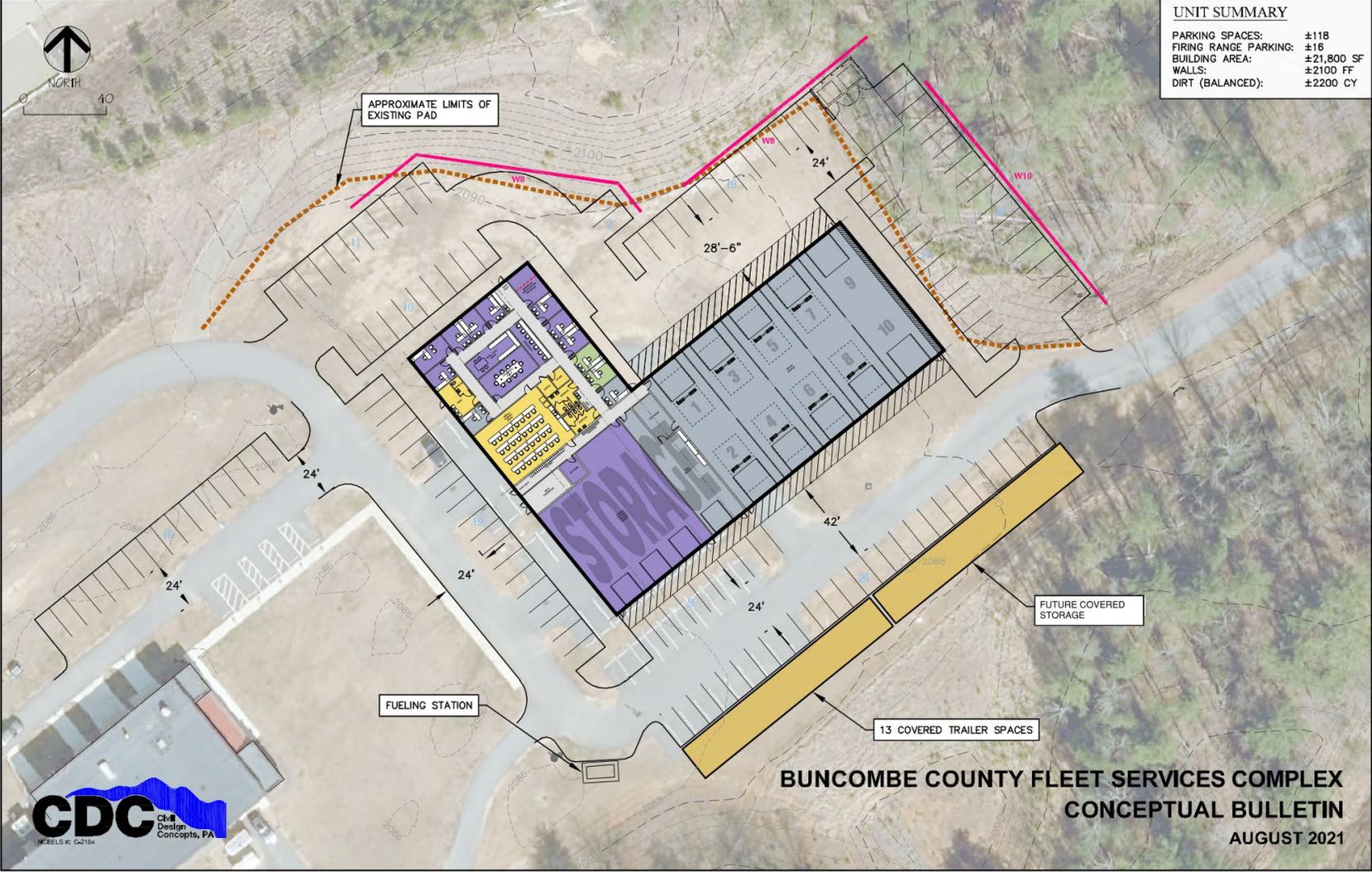
Scott Metcalf



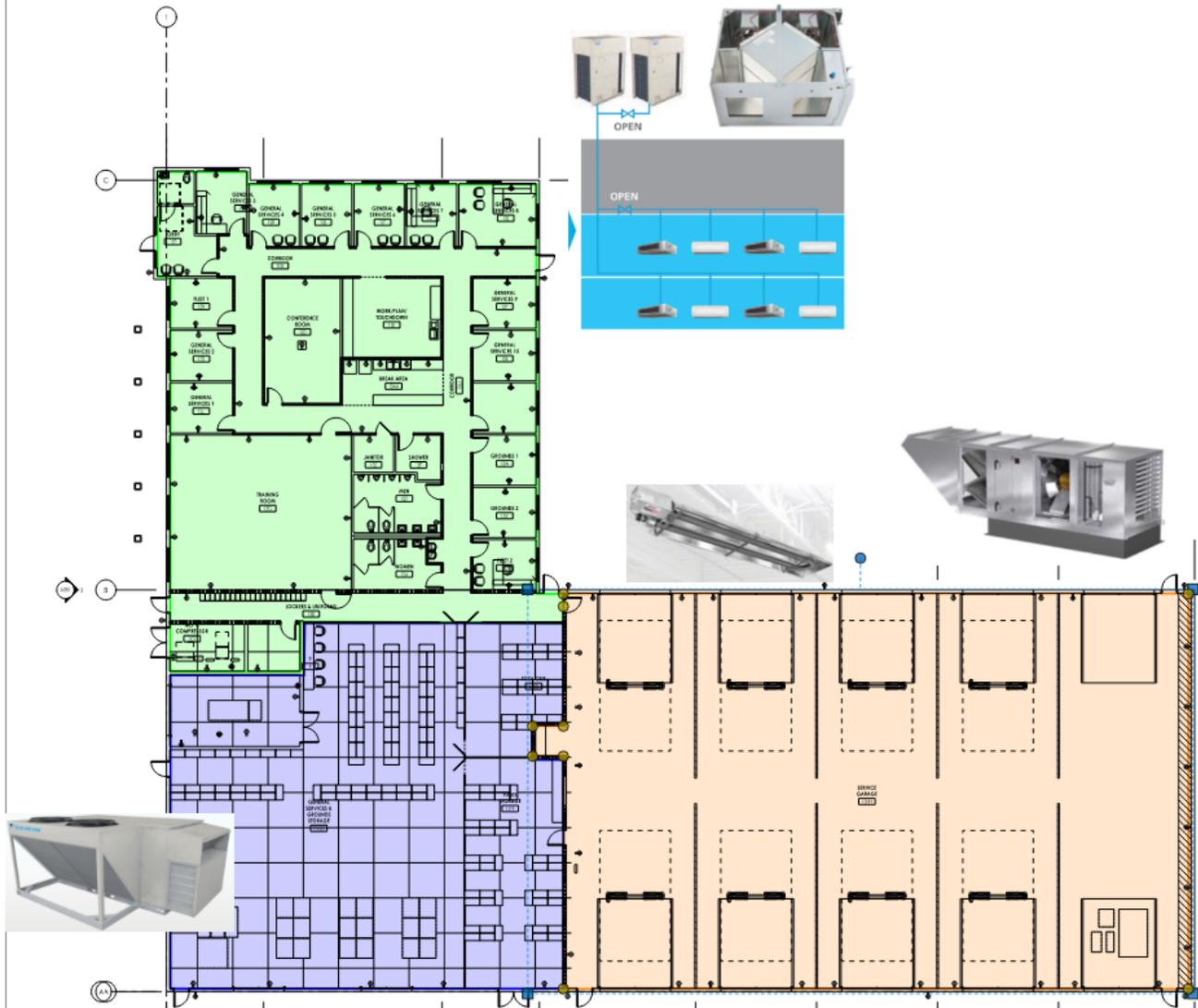
BUNCOMBE COUNTY



# Fleet Services Building



# Fleet Services Building – HVAC Systems Overview



## Office Area

VRF/VRV with energy recovery ventilator.

## Storage Area

Heated, ventilated and cooled by ground mounted air handling unit.

- DX heat pump for efficient heating and cooling.
- Natural gas backup for low ambient conditions and redundancy. Potentially utilize electric resistance heat in place of natural gas.

## Garage Area

- Vehicle exhaust detection system.
- Gas-fired AHU, no cooling.
- Reduced ventilation rates unless makeup is needed for vehicle exhaust or ventilation is required to disperse vehicle exhaust.
- Vehicle exhaust capture systems.
- Gas-fired infrared heaters.
- **Potentially utilize electric resistance heat in place of natural gas.**



# Fleet Services Building – Life Cycle Cost Analysis

<b>*25-YEAR LIFECYCLE COST ANALYSIS</b>				
Item	Estimated Costs			
	NG (Solar Ready)	Full Electrification (Solar Ready)	NG (w/142 kW Solar PV)	Full Electrification (w/142 kW Solar PV)
<b>UPFRONT COSTS</b>				
Gas Distribution	\$ 35,389	\$ -	\$ 35,389	\$ -
Electrical Service	\$ 75,000	\$ 128,000	\$ 75,000	\$ 128,000
HVAC Equipment (AHU's and IR Heaters)	\$ 82,585	\$ 83,173	\$ 82,585	\$ 83,173
Solar Equipment	\$ -	\$ -	\$ 355,000	\$ 355,000
<b>Upfront Subtotal</b>	<b>\$ 192,974</b>	<b>\$ 211,173</b>	<b>\$ 547,974</b>	<b>\$ 566,173</b>

<b>OPERATING COSTS</b>				
****Annual Solar Operations And Maintenance	\$ -	\$ -	\$ 2,107	\$ 2,107
Total 25-year Solar Operations And Maintenance	\$ -	\$ -	\$ 52,682	\$ 52,682
**Annual Utility Energy	\$ 18,800	\$ 19,200	\$ 3,301	\$ 4,921
-Electricity Component	\$ 16,900	\$ 19,200	\$ 2,500	\$ 4,800
-Natural Gas Component	\$ 1,900	\$ -	\$ 1,900	\$ -
***Total 25-year utility lifecycle energy cost	\$ 685,434	\$ 700,018	\$ 160,421	\$ 175,004
<b>Operating Cost Subtotal</b>	<b>\$ 685,434</b>	<b>\$ 700,018</b>	<b>\$ 213,103</b>	<b>\$ 227,686</b>

<b>TOTAL 25-YEAR LIFECYCLE COST COMPARISON</b>				
<b>Total 25-Year Lifecycle Costs</b>	<b>\$ 878,408</b>	<b>\$ 911,191</b>	<b>\$ 761,077</b>	<b>\$ 793,859</b>

\*Building Owners and Managers Association (BOMA) Preventative Maintenance Guidebook Average Useful Life of Solar Panels is 20-years. Typical performance warranty of 25-30 years.  
 \*\*Based on Medium General Service rates from Duke Progress and Dominion. 3% annual escalation.  
 \*\*\*Includes 3% annual escalation.  
 \*\*\*\*Based on the National Renewable Energy Laboratory's 2020 study rate of \$18.55/kWdc/yr for roof mounted commercial solar.



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## 25-YEAR LIFECYCLE COMPARISON

