



SAN MATEO-FOSTER CITY SCHOOL DISTRICT

# HVAC & AIR FILTRATION IMPLEMENTATION STUDY

---

## BOARD OF TRUSTEES PRESENTATION

JANUARY 21, 2021

# Content

- **Process for Preparing Study**
- **Existing Conditions**
- **Recommendations:**
  - Mechanical
  - Electrical
- **Cost Summary**
- **Recommended Implementation Plan**
- **Energy-positive and Fossil Fuel-free Future**

# Process for Preparing Study

- Facilities Master Plan (FMP) is the basis for this study
- Reviewed District data
- Site visits
- Predominant conditions
- Analyze options
- Prepare cost estimates
- Cost estimate peer review
- DSA consultation
- Recommended Implementation Plan





# Existing Conditions in the District - Mechanical

- Predominant conditions (Fig. 2):
  - Wing-style (finger floor plan) classrooms
  - In-classroom furnace units inside sheet metal enclosures without AC
- Packaged rooftop HVAC equipment (Fig. 1)
- VRF (Variable Refrigerant Flow) (Fig. 4)
- Heat pumps (Fig. 3)
- Miscellaneous equipment types
- Most sites have a mix of systems



Fig. 1



Fig. 2



Fig. 3



Fig. 4

# Options - Mechanical

- 2 main options for predominant conditions:
- In-classroom units (Option 1):
  - Easiest, fastest and least expensive to implement
  - Take up classroom space and in-classroom maintenance
- Rooftop units (Option 2):
  - Free up classroom space; ease of maintenance
  - Expensive and may trigger structural upgrade
  - May impact future rooftop solar panels
- Mixed fuel (gas heating + electric cooling) or all-electric



# Recommendations - Mechanical

- In-classroom units (Option 1)
- All-electric Equipment
- Replace with same-types at same-locations:
  - Rooftop HVAC packaged units
  - Change HVAC equipment at some administration buildings to VRF (Variable Refrigerant Flow)
  - Heat pump units
- Upgrade to MERV-13 air filters
- Supplement with stand-alone air purifiers with HEPA filters



# Existing Conditions in the District – Electrical

- Most sites require electrical service upgrade to support new AC
- Planned Multi-purpose Buildings also require service upgrade
- Equipment at a few sites require replacement due to rust and age
- Power distribution also needs to be upgraded
- All-electric systems eliminate requirement for CO sensors
- HVAC upgrade does not trigger fire alarm upgrade or other unrelated site requirements by DSA

# Recommendations - Electrical

- Upgrade electrical service at most sites
- Start the PG&E process as soon as possible
- Plan service upgrade jointly with Multi-purpose Building design teams
- Electrical service upgrade is sized to accommodate future water heaters
- Future solar installation to offset increased electricity usage and cost



# Cost Summary

Current Estimates: **\$69,335,188** (Construction); **\$93,602,503** (Total Project)

FMP Projections: **\$95,142,900** (Construction); **\$128,442,915** (Total Project)

- Site by site cost estimates are included in the Report
- These estimates are more refined than FMP
- Calculated HVAC cost per space (classroom)
- Calculated electrical cost per site
- General Contractor mark-up of 22.5%
- Design contingency of 20%
- No escalation is included
- Costs are below FMP projections



# Recommended Implementation Plan

- Expanding the District's project management capacity:
- Project Delivery Methods:
- **Combining, Bundling and Packaging Projects**
- **Project Scheduling**
- Pre-procurement of equipment



# Combining, Bundling and Packaging Projects

- Criteria for Grouping:
  - Based on similarity of HVAC systems
  - Each group has approximately a similar size of scope
  - Does NOT imply scheduling priority
- 4 Groups Total
- GROUP 1: Filtration Replacement Program, All Sites
- GROUP 2: Sites with “Finger Plan,” with in-classroom Furnaces
  - College Park ES
  - George Hall ES
  - Laurel ES
  - Meadow Heights ES
  - North Shoreview Montessori
- GROUP 3: Sites with “Pod Plan,” with rooftop HVAC; and Larger Sites
  - Audubon ES
  - San Mateo Park ES
  - Borel MS
  - Abbott MS

# Combining, Bundling and Packaging Projects (continued)

- GROUP 4: Sites with Hybrid Systems and/or special conditions:
  - Bayside Academy
  - Baywood ES
  - Foster City ES
  - LEAD ES
  - Parkside Montessori School
  - Beresford ES
- Sites NOT include in above groups, but are getting filtration upgrades:
  - Bayside Theater
  - Brewer Island ES
  - Fiesta Gardens International School
  - Highlands ES
  - Sunnybrae ES

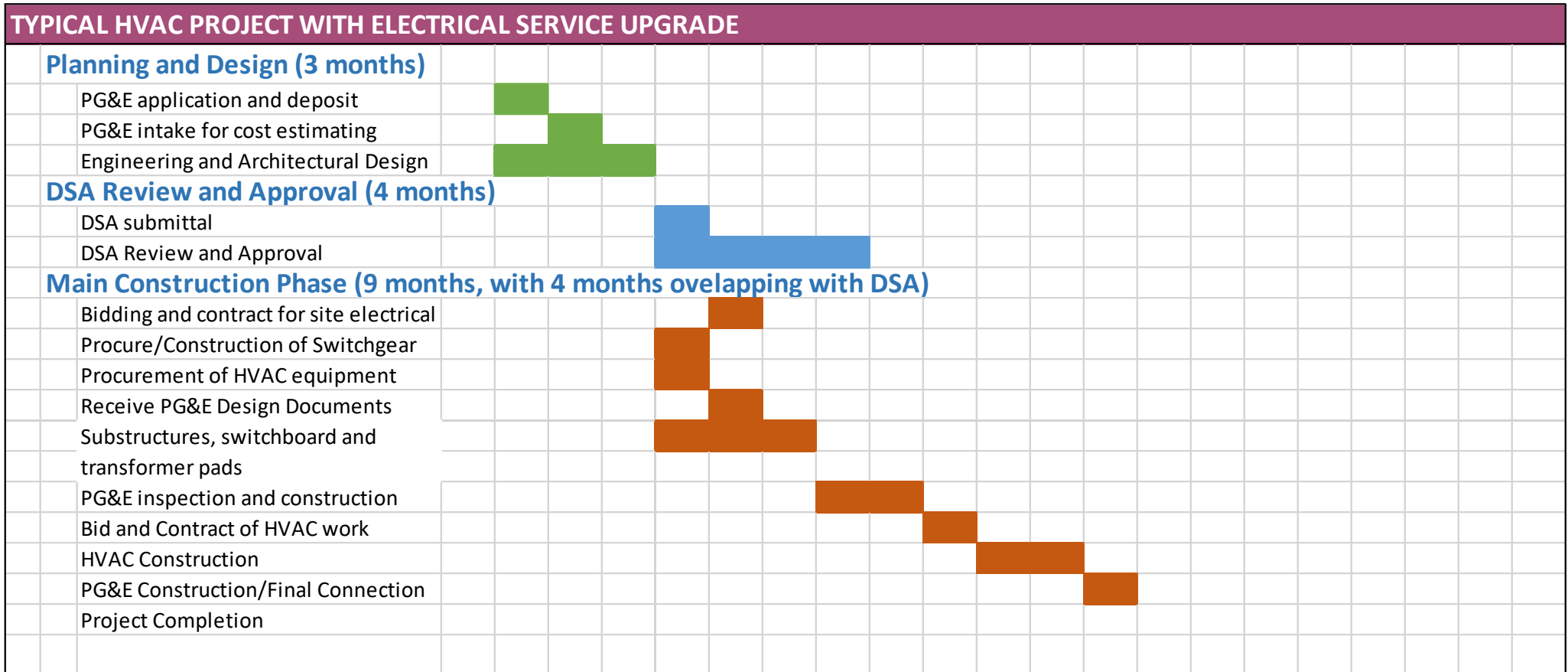


# Project Scheduling

- Typically, a 12-month process from start to finish
- PG&E process is time-consuming and unpredictable
- DSA (Division of the State Architect) process is time-consuming and unpredictable
- Recommend staggering Groups 1 through 4 to account for capacity of District staff, design teams and contractors



# Project Scheduling



# Energy-positive and Fossil Fuel-Free Future

- The Board of Trustees' goal to become Zero-Net-Energy
- All-electric is preferred
- Most sites require electrical service upgrade regardless of types of energy
- Solar power is important to offset increased electricity usage and cost
- Important that the District is initiating a solar power analysis for options for implementation in the District

