



The San Mateo-Foster City School District educates, inspires and empowers every student in every school every day to live, lead and learn with integrity and joy.

ELECTRICAL ASSESSMENT REPORT

by American Consulting Engineers Electrical, Inc.

*San Mateo - Foster City
School District*

JANUARY 15, 2021

PREPARED BY:



ADDRESS

1590 The Alameda
Suite 200
San Jose, CA 95126
www.amceinc.com

PHONE

408.236.2312

ACEE PROJECT #

20137

Table of Contents

ABBOTT MIDDLE SCHOOL ELECTRICAL EVALUATION.....	3
AUDUBON ELEMENTARY SCHOOL ELECTRICAL EVALUATION	4
BAYSIDE STEM ELECTRICAL EVALUATION.....	6
BAYWOOD ELEMENTARY SCHOOL ELECTRICAL EVALUATION.....	7
BERESFORD ELEMENTARY SCHOOL ELECTRICAL EVALUATION	8
BOREL MIDDLE SCHOOL ELECTRICAL EVALUATION.....	10
BREWER ISLAND ELEMENTARY SCHOOL ELECTRICAL EVALUATION	11
COLLEGE PARK ELEMENTARY SCHOOL ELECTRICAL EVALUATION	12
FIESTA GARDENS INTERNATIONAL SCHOOL ELECTRICAL EVALUATION	13
FOSTER CITY ELEMENTARY SCHOOL ELECTRICAL EVALUATION	14
GEORGE HALL ELECTRICAL EVALUATION.....	15
HIGHLAND ELEMENTARY SCHOOL ELECTRICAL EVALUATION	16
LAUREL ELEMENTARY SCHOOL ELECTRICAL EVALUATION	18
LEAD ELECTRICAL EVALUATION	19
MEADOW HEIGHTS ELEMENTARY SCHOOL ELECTRICAL EVALUATION	21
NORTH SHOREVIEW ELECTRICAL EVALUATION	22
PARKSIDE ELECTRICAL EVALUATION	24
SAN MATEO PARK ELECTRICAL EVALUATION	25
SUNNYBRAE ELEMENTARY SCHOOL ELECTRICAL EVALUATION	26
TURNBULL CHILD DEVELOPMENT CENTER ELECTRICAL EVALUATION	27



ABBOTT MIDDLE SCHOOL ELECTRICAL EVALUATION

Existing Conditions

There are two electrical services on the site. The west electrical service is located at the north end of the multi-use building and is a 208/120V, 3-phase, 4-wire 2000A with a 2000A main circuit breaker (PG&E Meter #1009512478) and is fed from PG&E transformer #T1705. The east switchboard was recently installed on the new gym project and is located adjacent to the new gym building and is a 208/120V, 3-phase, 4-wire 2000A with a 2000A main circuit breaker. Both switchboards are in serviceable condition.

The existing building electrical panels have been upgraded within the last 25 years and are in good condition. There are minimal available breaker spaces in the panels to connect new equipment.

Load Analysis

The two existing services have the capacity for the addition of gas fired HVAC units or all electric HVAC units. Using 24.5 Watts per square foot (2 Watts per sqft lighting, 3 Watts per sqft receptacles, 17 Watts per sqft HVAC and 2.5 Watts per sqft electric water heaters), we performed a load analysis for the proposed HVAC upgrades. Based on the districts sustainability goals, the HVAC loads are based on an all-electric heat pump style system. The additional load for the added HVAC is 3198A@208/120V. The additional load will need to be split between the two electrical services.

Recommendations

Based on the load analysis and the current condition of the existing electrical service, we recommend connecting the new HVAC loads to the two existing electrical services. Due to the amount of additional load, the new loads should be evenly distributed between the two electrical services. A new 208/120V electrical panel will be provided for each building/wing to feed the new mechanical units and a feeder to connect the existing panel that serves the existing lighting and electrical loads to the new panel. We recommend providing spare conduits in the power trench for future low voltage system cables.

The existing fire alarm system is a Notifier NFS2-3030. If gas-fired equipment is used, then CO detection will be required in the classrooms. The existing panel is capable of accommodating CO detection functionality. To provide the required CO detection, additional power supplies, CO/Smoke detector combination devices and sounder bases must be provided in each classroom and the alarms will need to be displayed at the annunciator. If an all-electric HVAC is provided and there are no gas appliances in the classrooms, CO detection will not be required and no additional devices will need to be provided in the classrooms. The existing Notifier NFS2-3030 has enough available space to add the CO detection for the entire site. Upgrading the site to a fully automatic fire alarm system with voice evacuation as part of the HVAC upgrade project is not required. The existing Notifier NFS2-3030 has the capacity and capabilities to upgrade to fully automatic detection with voice evacuation notification. The NFS2-3030 is the current district standard for fire alarm panels.



AUDUBON ELEMENTARY SCHOOL ELECTRICAL EVALUATION

Existing Conditions

The electrical service is 480/277V, 3-phase, 4-wire 1200A with a 1200A main circuit breaker (PG&E Meter #1006733898). The switchgear is located in the electrical room of Pod B. The switchboard is fed from a PG&E transformer. The existing main switchboard was installed in 1968 and manufactured by ITE. The condition of the switchboard is good, but the gear is 52 years old and at the end of its service life.

Pod A, B, C, D and E electrical panels are the original electrical panels. The panels are 52 years old and at the end of their service life. Some new electrical panels have been added to accommodate additional loads and are connected back to the original panels. There are minimal available breaker spaces in the panels to connect new equipment. The 2-story building and the Multi-Use buildings have been installed within the last 10 years and the panels are in good condition and serviceable. There is an overhead electrical feed to the modular buildings that is routed through the courtyard between the 2-story building and Pod D.

Load Analysis

The existing service does not have the capacity for the addition of gas fired HVAC units or all electric HVAC units. Using 24.5 Watts per square foot (2 Watts per sqft lighting, 3 Watts per sqft receptacles, 17 Watts per sqft HVAC and 2.5 Watts per sqft electric water heaters), we performed a load analysis for the proposed HVAC upgrades. Based on the districts sustainability goals, the HVAC loads are based on an all-electric heat pump style system. The calculated load for the campus with HVAC added is 2065A@480/277V. The existing service is 480/277V and is recommended to minimize the cost and size of the building feeders.

Recommendations

Based on the load analysis and the current condition of the existing electrical service, we recommend upgrading the existing switchboard to 2500A, 480/277V. Due to the condition and age of the existing electrical system, it is recommended that all the existing electrical panels and transformers be replaced and upgraded. A new 480/277V electrical panel will be provided for each POD to feed the new mechanical units and a step-down transformer and panels will be provided to reconnect the existing electrical loads. The existing feeders for the 2-story building, the Multi-Use building and the modular buildings are routed across the roofs of the Pod buildings and can be reused to reconnect the buildings. The district may consider replacement of these feeders underground if desired. We recommend providing spare conduits in the power trench for future low voltage system cables. Due to the environmental conditions causing corrosion, we recommend that the new switchboard be installed with a stainless steel enclosure (5% added cost to the gear).

The existing fire alarm system is a Notifier NFS2-640. If gas-fired equipment is used, then CO detection will be required in the classrooms. The existing panel is capable of accommodating CO detection functionality. To provide the required CO detection, additional power supplies, CO/Smoke detector combination devices and sounder bases must be provided in each classroom and the alarms will need to be displayed at the annunciator. If an all-electric HVAC is provided and there are no gas appliances in the classrooms, CO detection will not be required and no additional devices will need to be provided in



the classrooms. The existing Notifier NFS2-640 has enough available space to add the CO detection for the entire site. Upgrade the sites to a fully automatic fire alarm system with voice evacuation as part of the HVAC upgrade project is not required. However, if the district elects to upgrade the system, the existing panel will need to be replaced with a new Notifier NFS2-3030 fire alarm panel with voice evacuation capability. The NFS2-3030 is the current district standard for fire alarm panels.



BAYSIDE STEM ELECTRICAL EVALUATION

Existing Conditions

The electrical service is 208/120V, 3-phase, 4-wire 2500A with a 2500A main circuit breaker (PG&E Meter #1010394486). The switchgear is located at the end of Building 3A. The switchboard is fed from PG&E transformer #T-5676. The existing main switchboard is in poor condition due to rust on both the exterior and interior of the switchboard.

The existing building electrical panels have been upgraded within the last 25 years and are in good condition. There are minimal available breaker spaces in the panels to connect new equipment.

Load Analysis

The existing service does not have the capacity for the addition of gas fired HVAC units or all electric HVAC units. Using 24.5 Watts per square foot (2 Watts per sqft lighting, 3 Watts per sqft receptacles, 17 Watts per sqft HVAC and 2.5 Watts per sqft electric water heaters), we performed a load analysis for the proposed HVAC upgrades. Based on the districts sustainability goals, the HVAC loads are based on an all-electric heat pump style system. The calculated load for the campus with HVAC added is 7525A@208/120V or 3261A@480/277V. The 480/277V service is recommended to minimize the cost and size of the building feeders.

Recommendations

Based on the load analysis and the current condition of the existing electrical service, we recommend upgrading the existing switchboard to 4000A, 480/277V. A new 480/277V electrical panel will be provided for each building/wing to feed the new mechanical units and a step-down transformer will be provided to reconnect the existing panel that serves the existing lighting and electrical loads. Due to the voltage change, the existing service may need to be refed or new feeders and transformers provided to service buildings not in the scope of the HVAC project. This decision will be made during the project design phase based on the project's scope and schedule/phasing. We recommend providing spare conduits in the power trench for future low voltage system cables. Due to the environmental conditions causing corrosion of the main switchboard, we recommend that the new switchboards and free-standing distribution panels be installed with a stainless steel enclosure (5% added cost to the gear).

The existing fire alarm system is a Notifier NFS2-640. If gas-fired equipment is used, then CO detection will be required in the classrooms. The existing panel is capable of accommodating CO detection functionality. To provide the required CO detection, additional power supplies, CO/Smoke detector combination devices and sounder bases must be provided in each classroom and the alarms will need to be displayed at the annunciator. If an all-electric HVAC is provided and there are no gas appliances in the classrooms, CO detection will not be required and no additional devices will need to be provided in the classrooms. The existing Notifier NFS2-640 has enough available space to add the CO detection for the entire site. Upgrade the sites to a fully automatic fire alarm system with voice evacuation as part of the HVAC upgrade project is not required. However, if the district elects to upgrade the system, the existing panel will need to be replaced with a new Notifier NFS2-3030 fire alarm panel with voice evacuation capability. The NFS2-3030 is the current district standard for fire alarm panels.



BAYWOOD ELEMENTARY SCHOOL ELECTRICAL EVALUATION

Existing Conditions

The electrical service is 208/120V, 3-phase, 4-wire 1600A with a 1600A main circuit breaker (PG&E Meter #1009886088). The switchgear is located in the electrical closet of the existing 2-story building and is less than 10 years old. The switchboard is fed from PG&E transformer #T-709. The existing main switchboard is in good condition and is serviceable. The new 2-story building has photovoltaic panels installed on the roof and connected to the main switchboard.

The existing building electrical panels have been upgraded within the last 25 years and are in good condition. There are minimal available breaker spaces in the panels to connect new equipment.

Load Analysis

The existing service does not have the capacity for the addition of gas fired HVAC units or all electric HVAC units. Using 24.5 Watts per square foot (2 Watts per sqft lighting, 3 Watts per sqft receptacles, 17 Watts per sqft HVAC and 2.5 Watts per sqft electric water heaters), we performed a load analysis for the proposed HVAC upgrades. Based on the districts sustainability goals, the HVAC loads are based on an all-electric heat pump style system. The calculated load for the campus with HVAC added is 4,410A@208/120V or 1911A@480/277V. The 480/277V service is recommended to minimize the cost and size of the building feeders.

Recommendations

Based on the load analysis of the existing electrical service, we recommend upgrading the existing switchboard to 2500A, 480/277V. A new 480/277V electrical panel will be provided for each building/wing to feed the new mechanical units and a step-down transformer will be provided to reconnect the existing panel that serves the existing lighting and electrical loads. The existing service equipment is still in good condition and will remain in place to feed the 2-story building. A new transformer and feeder will need to be provided to reconnect the existing service. We recommend providing spare conduits in the power trench for future low voltage system cables. Due to the environmental conditions causing corrosion of the main switchboard, we recommend that the new switchboard be installed with a stainless steel enclosure (5% added cost to the gear).

The existing fire alarm system is a Notifier NFS2-640. If gas-fired equipment is used, then CO detection will be required in the classrooms. The existing panel is capable of accommodating CO detection functionality. To provide the required CO detection, additional power supplies, CO/Smoke detector combination devices and sounder bases must be provided in each classroom and the alarms will need to be displayed at the annunciator. If an all-electric HVAC is provided and there are no gas appliances in the classrooms, CO detection will not be required and no additional devices will need to be provided in the classrooms. The existing Notifier NFS2-640 has enough available space to add the CO detection for the entire site. Upgrade the sites to a fully automatic fire alarm system with voice evacuation as part of the HVAC upgrade project is not required. However, if the district elects to upgrade the system, the existing panel will need to be replaced with a new Notifier NFS2-3030 fire alarm panel with voice evacuation capability. The NFS2-3030 is the current district standard for fire alarm panels.



BERESFORD ELEMENTARY SCHOOL ELECTRICAL EVALUATION

Existing Conditions

The electrical service is 208/120V, 3-phase, 4-wire 1600A with a 1600A main circuit breaker (PG&E Meter #1009513797). The switchgear is located at the northeastern corner of the site behind the modular classroom buildings. The switchboard is fed from PG&E transformer #T-5482. The existing main switchboard is in fair condition and is starting to show signs of rust and possible water intrusion.

The existing building electrical panels have been upgraded within the last 25 years and are in good condition. There are minimal available breaker spaces in the panels to connect new equipment.

Load Analysis

The existing campus already has HVAC installed with the exception of the multi-use. The existing classrooms have gas fired HVAC and the modular classrooms have all electric heat pumps. The additional load required for new HVAC units to be installed in the multi-use is 250A. The existing service peak demand will need to be verified with PG&E to determine the existing load calculation for the site. Based on the assumption of 750A for the existing peak demand, the estimated load for the site with the new HVAC installed in the multi-use is 1,188A.

If the district elects to convert the existing campus to all electric HVAC systems to meet the districts sustainability goals, the load calculation for the site is 1874A@208V Using 24.5 Watts per square foot (2 Watts per sqft lighting, 3 Watts per sqft receptacles, 17 Watts per sqft HVAC and 2.5 Watts per sqft electric water heaters).

Recommendations

Based on the load analysis for the existing electrical service, the existing electrical service is adequate for the additional multi-use HVAC loads. The existing panel feeder and distribution panel for the multi-use building is adequate for the additional HVAC loads. The existing main switchboard is in fair condition, but is showing signs of rust. If issues arise around the existing switchboard, the district should consider replacing the existing main switchboard with new.

If the district decides to upgrade the site from the gas fired HVAC units to all electrical heat pumps, a service upgrade may be needed. The PG&E peak demand loads should be obtained for the calculation and the actual HVAC equipment loads to determine if an upgrade is required. It is likely that the service would not need to be upgraded. If peak demand calculation does require a service upgrade, the new service size should be 2500A@208V. Due to the environmental conditions causing corrosion of the main switchboard, we recommend that if the switchboard is replaced the new switchboard be installed with a stainless steel enclosure (5% added cost to the gear).

The existing fire alarm system is a Notifier NFS2-640. If gas-fired equipment is used, then CO detection will be required in the classrooms. The existing panel is capable of accommodating CO detection functionality. To provide the required CO detection, additional power supplies, CO/Smoke detector combination devices and sounder bases must be provided in each classroom and the alarms will need to be displayed at the annunciator. Only classrooms in the scope of work would be required to be upgraded at the time of the project. If an all-electric HVAC is provided and there are no gas appliances in the classrooms, CO detection will not be required and no additional devices will need to be provided.



in the classrooms. The existing Notifier NFS2-640 has enough available space to add the CO detection for the entire site. Upgrade the sites to a fully automatic fire alarm system with voice evacuation as part of the HVAC upgrade project is not required. However, if the district elects to upgrade the system, the existing panel will need to be replaced with a new Notifier NFS2-3030 fire alarm panel with voice evacuation capability. The NFS2-3030 is the current district standard for fire alarm panels.



BOREL MIDDLE SCHOOL ELECTRICAL EVALUATION

Existing Conditions

The electrical service is 208/120V, 3-phase, 4-wire 2500A with a 2500A main circuit breaker (PG&E Meter #_). The switchgear is located adjacent to Building E locker building. The switchboard is fed from PG&E transformer #T-837670. The existing main switchboard is in new condition and has been recently installed.

The existing building electrical panels have been upgraded within the last 25 years and are in good condition. There are minimal available breaker spaces in the panels to connect new equipment.

Load Analysis

The existing service does not have the capacity for the addition of gas fired HVAC units or all electric HVAC units. Using 24.5 Watts per square foot (2 Watts per sqft lighting, 3 Watts per sqft receptacles, 17 Watts per sqft HVAC and 2.5 Watts per sqft electric water heaters), we performed a load analysis for the proposed HVAC upgrades. Based on the districts sustainability goals, the HVAC loads are based on an all-electric heat pump style system. The loads calculated took into account the newly installed Multi-Use building. The calculated load for the campus with HVAC added is 6,078A@208/120V or 2634A@480/277V. The 480/277V service is recommended to minimize the cost and size of the building feeders.

Recommendations

Based on the load analysis of the existing electrical service, we recommend upgrading the existing switchboard to 3000A, 480/277V. The existing service will need to be converted to a distribution panel and connected to the new service via a new transformer. A new 480/277V electrical panel will be provided for each building/wing to feed the new mechanical units and a step-down transformer will be provided to reconnect the existing panel that serves the existing lighting and electrical loads. We recommend providing spare conduits in the power trench for future low voltage system cables. Due to the environmental conditions causing corrosion, we recommend that the new switchboards and free-standing distribution panels be installed with a stainless steel enclosure (5% added cost to the gear).

The existing fire alarm system is a Notifier NFS2-3030 network, with a NFS2-3030 and an NFS2-320 FACP's installed. If gas-fired equipment is used, then CO detection will be required in the classrooms. The existing panel is capable of accommodating CO detection functionality. To provide the required CO detection, additional power supplies, CO/Smoke detector combination devices and sounder bases must be provided in each classroom and the alarms will need to be displayed at the annunciator. If an all-electric HVAC is provided and there are no gas appliances in the classrooms, CO detection will not be required and no additional devices will need to be provided in the classrooms. The existing Notifier Panels have enough available space to add the CO detection for the entire site. Upgrade the sites to a fully automatic fire alarm system with voice evacuation as part of the HVAC upgrade project is not required. The NFS2-3030 is the current district standard for fire alarm panels.



BREWER ISLAND ELEMENTARY SCHOOL ELECTRICAL EVALUATION

Existing Conditions

The electrical service is 480/277V, 3-phase, 4-wire 2000A with a 2000A main circuit breaker (PG&E Meter #1009503259). The switchgear is located in the southwestern corner of the site adjacent to the parking lot. The switchboard is fed from PG&E transformer #T-3626. The existing main switchboard is in fair condition and is starting to show signs of rust.

The existing building electrical panels have been upgraded within the last 25 years and are in good condition. There are minimal available breaker spaces in the panels to connect new equipment.

Load Analysis

The existing campus has existing HVAC installed in all buildings. The existing classrooms have gas fired HVAC and the modular classrooms have all electric heat pumps.

If the district elects to convert the existing campus to all electric HVAC systems to meet the districts sustainability goals, the load calculation for the site is 1514A@480V Using 24.5 Watts per square foot (2 Watts per sqft lighting, 3 Watts per sqft receptacles, 17 Watts per sqft HVAC and 2.5 Watts per sqft electric water heaters).

Recommendations

The existing HVAC equipment are gas fired units. There are no proposed additional loads. The existing main switchboard is in fair condition and is starting to show signs of rust. If issues arise around the existing switchboard, the district should consider replacing the existing main switchboard with new.

If the district decides to upgrade the site from the gas fired HVAC units to all electrical heat pumps, the existing service will be adequate and no upgrade will be needed. Building panels may need to be upgraded to accommodate the additional loads. Due to the environmental conditions causing corrosion of the main switchboard, we recommend that if the switchboard is replaced the new switchboard be installed with a stainless steel enclosure (5% added cost to the gear).

The existing fire alarm system is a Notifier NFS2-320. If gas-fired equipment is used, then CO detection will be required in the classrooms. The existing panel is capable of accommodating CO detection functionality. To provide the required CO detection, additional power supplies, CO/Smoke detector combination devices and sounder bases must be provided in each classroom and the alarms will need to be displayed at the annunciator. Only classrooms in the scope of work would be required to be upgraded at the time of the project. If an all-electric HVAC is provided and there are no gas appliances in the classrooms, CO detection will not be required and no additional devices will need to be provided in the classrooms. The existing Notifier NFS2-320 has enough available space to add the CO detection for the entire site. Upgrade the sites to a fully automatic fire alarm system with voice evacuation as part of the HVAC upgrade project is not required. However, if the district elects to upgrade the system, the existing panel will need to be replaced with a new Notifier NFS2-3030 fire alarm panel with voice evacuation capability. The NFS2-3030 is the current district standard for fire alarm panels.



COLLEGE PARK ELEMENTARY SCHOOL ELECTRICAL EVALUATION

Existing Conditions

The electrical service is 208/120V, 3-phase, 4-wire 2000A with a 2000A main circuit breaker (PG&E Meter #1010085026). The switchgear is located in the electrical closet of Wing #1. The switchboard is fed from PG&E transformer. The existing main switchboard is in good condition

The existing building electrical panels have been upgraded within the last 25 years and are in good condition. There are minimal available breaker spaces in the panels to connect new equipment.

Load Analysis

The existing service does not have the capacity for the addition of gas fired HVAC units or all electric HVAC units. Using 24.5 Watts per square foot (2 Watts per sqft lighting, 3 Watts per sqft receptacles, 17 Watts per sqft HVAC and 2.5 Watts per sqft electric water heaters), we performed a load analysis for the proposed HVAC upgrades. Based on the districts sustainability goals, the HVAC loads are based on an all-electric heat pump style system. The calculated load for the campus with HVAC added is 3789A@208/120V or 1642A@480/277V. The 480/277V service is recommended to minimize the cost and size of the building feeders.

Recommendations

Based on the load analysis of the existing electrical service, we recommend upgrading the existing switchboard to 2500A, 480/277V. A new 480/277V electrical panel will be provided for each building/wing to feed the new mechanical units and a step-down transformer will be provided to reconnect the existing panel that serves the existing lighting and electrical loads. Due to the voltage change, the existing service may need to be re-fed or new feeders and transformers provided to service buildings not in the scope of the HVAC project. This decision will be made during the project design phase based on the project's scope and schedule/phasing. We recommend providing spare conduits in the power trench for future low voltage system cables. Due to the environmental conditions causing corrosion, we recommend that the new switchboards and free-standing distribution panels be installed with a stainless steel enclosure (5% added cost to the gear).

The existing fire alarm system is a Notifier NFS2-3030. If gas-fired equipment is used, then CO detection will be required in the classrooms. The existing panel is capable of accommodating CO detection functionality. To provide the required CO detection, additional power supplies, CO/Smoke detector combination devices and sounder bases must be provided in each classroom and the alarms will need to be displayed at the annunciator. If an all-electric HVAC is provided and there are no gas appliances in the classrooms, CO detection will not be required and no additional devices will need to be provided in the classrooms. The existing Notifier NFS2-3030 has enough available space to add the CO detection for the entire site. The existing fire alarm system is a fully automatic fire alarm system with horn/strobe notification. The NFS2-3030 is the current district standard for fire alarm panels.



FIESTA GARDENS INTERNATIONAL SCHOOL ELECTRICAL EVALUATION

Existing Conditions

The electrical service is 208/120V, 3-phase, 4-wire 2000A with a 2000A main circuit breaker (PG&E Meter #10102828196). The switchgear is located in a closet at the south east corner of building 1. The switchboard is fed from a PG&E transformer. The existing main switchboard is in good condition.

The existing building electrical panels have been upgraded within the last 25 years and are in good condition. There are minimal available breaker spaces in the panels to connect new equipment.

Load Analysis

The existing campus has existing HVAC installed in all buildings. The existing classrooms have gas fired HVAC and the modular classrooms have all electric heat pumps.

If the district elects to convert the existing campus to all electric HVAC systems to meet the districts sustainability goals, the load calculation for the site is 1822A@480V Using 24.5 Watts per square foot (2 Watts per sqft lighting, 3 Watts per sqft receptacles, 17 Watts per sqft HVAC and 2.5 Watts per sqft electric water heaters).

Recommendations

The existing HVAC equipment are gas fired units. There are no proposed additional loads. The existing main switchboard is in good condition and does not require replacement.

If the district decides to upgrade the site from the gas fired HVAC units to all electrical heat pumps, the existing service will need to be upgraded to a 2500A@480V service. Building panels will need to be upgraded and the existing switchboard would be refed via a transformer. Due to the environmental conditions causing corrosion, we recommend that if the switchboard is replaced the new switchboard be installed with a stainless steel enclosure (5% added cost to the gear).

The existing fire alarm system is a Notifier NFS2-640. If gas-fired equipment is used, then CO detection will be required in the classrooms. The existing panel is capable of accommodating CO detection functionality. To provide the required CO detection, additional power supplies, CO/Smoke detector combination devices and sounder bases must be provided in each classroom and the alarms will need to be displayed at the annunciator. If an all-electric HVAC is provided and there are no gas appliances in the classrooms, CO detection will not be required and no additional devices will need to be provided in the classrooms. The existing Notifier NFS2-640 has enough available space to add the CO detection for the entire site. The existing fire alarm system is a fully automatic fire alarm system with horn/strobe notification. If the district elects to upgrade the notification to voice evacuation the NFS2-640 is not recommended and is recommended to be replaced with a NFS2-3030. The NFS2-3030 is the current district standard for fire alarm panels.



FOSTER CITY ELEMENTARY SCHOOL ELECTRICAL EVALUATION

Existing Conditions

The electrical service is 480/277V, 3-phase, 4-wire 1200A with a 1200A main circuit breaker (PG&E Meter #1008820031). The switchgear is located in the front parking lot. The switchboard is fed from a PG&E transformer. The existing main switchboard is in good condition.

The existing building electrical panels were installed within the last 10 years and are in good condition. There are minimal available breaker spaces in the panels to connect new equipment. Not all buildings on the campus have electrical panels installed. The feeders and branch circuits for these buildings are routed back to the panels in other buildings via the underside of the walkway canopies.

Load Analysis

The existing service does not have the capacity for the addition of gas fired HVAC units or all electric HVAC units. Using 24.5 Watts per square foot (2 Watts per sqft lighting, 3 Watts per sqft receptacles, 17 Watts per sqft HVAC and 2.5 Watts per sqft electric water heaters), we performed a load analysis for the proposed HVAC upgrades. Based on the districts sustainability goals, the HVAC loads are based on an all-electric heat pump style system. The calculated load for the campus with HVAC added is 1838A@480/277V. The 480/277V service is recommended to minimize the cost and size of the building feeders.

Recommendations

Based on the load analysis of the existing electrical service, we recommend upgrading the existing switchboard to 2500A, 480/277V. A new 480/277V electrical panel will be provided for each building/wing to feed the new mechanical units and a step-down transformer will be provided to reconnect the existing panel that serves the existing lighting and electrical loads. We recommend providing spare conduits in the power trench for future low voltage system cables. Due to the environmental conditions causing corrosion, we recommend that the new switchboards and free-standing distribution panels be installed with a stainless steel enclosure (5% added cost to the gear).

The existing fire alarm system is a Notifier NFS2-3030. If gas-fired equipment is used, then CO detection will be required in the classrooms. The existing panel is capable of accommodating CO detection functionality. To provide the required CO detection, additional power supplies, CO/Smoke detector combination devices and sounder bases must be provided in each classroom and the alarms will need to be displayed at the annunciator. If an all-electric HVAC is provided and there are no gas appliances in the classrooms, CO detection will not be required and no additional devices will need to be provided in the classrooms. The existing Notifier NFS2-3030 has enough available space to add the CO detection for the entire site. The existing fire alarm system is fully automatic with horn/strobe notification. The NFS2-3030 is the current district standard for fire alarm panels.



GEORGE HALL ELECTRICAL EVALUATION

Existing Conditions

The electrical service is 208/120V, 3-phase, 4-wire 1600A with a 1200A main circuit breaker (PG&E Meter #1008819751). The switchgear is located adjacent to the LGI building. The switchboard is fed from PG&E transformer #T-707. The existing main switchboard is in poor condition and water intrusion into the switchboard has been reported requiring the gear to be tarped.

The existing building electrical panels have been upgraded within the last 25 years and are in good condition. There are minimal available breaker spaces in the panels to connect new equipment.

Load Analysis

The existing service does not have the capacity for the addition of gas fired HVAC units or all electric HVAC units. Using 24.5 Watts per square foot (2 Watts per sqft lighting, 3 Watts per sqft receptacles, 17 Watts per sqft HVAC and 2.5 Watts per sqft electric water heaters), we performed a load analysis for the proposed HVAC upgrades. Based on the districts sustainability goals, the HVAC loads are based on an all-electric heat pump style system. The loads calculated took into account the future Multi-Use building currently in design. The calculated load for the campus with HVAC added is 3,745A@208/120V or 1623A@480/277V. The 480/277V service is recommended to minimize the cost and size of the building feeders.

Recommendations

Based on the load analysis and the current condition of the existing electrical service, we recommend upgrading the existing switchboard to 2500A, 480/277V. A new 480/277V electrical panel will be provided for each building/wing to feed the new mechanical units and a step-down transformer will be provided to reconnect the existing panel that serves the existing lighting and electrical loads. Due to the voltage change, the existing service may need to be re-fed or new feeders and transformers provided to service buildings not in the scope of the HVAC project. This decision will be made during the project design phase based on the project's scope and schedule/phasing. We recommend providing spare conduits in the power trench for future low voltage system cables. Due to the environmental conditions causing corrosion of the main switchboard, we recommend that the new switchboards and free-standing distribution panels be installed with a stainless steel enclosure (5% added cost to the gear).

The existing fire alarm system is a Notifier AFP-200. If gas-fired equipment is used, then CO detection will be required in the classrooms. The existing panel is not capable of accommodating CO detection functionality. To provide the required CO detection, the FACP needs to be upgraded to a Notifier NFS2-3030 and additional power supplies, CO/Smoke detector combination devices and sounder bases must be provided in each classroom and the alarms will need to be displayed at the annunciator. If an all-electric gas appliances in the classrooms, CO detection will not be required and no additional devices will need to be provided in HVAC is provided and there are no the classrooms. Upgrade the sites to a fully automatic fire alarm system with voice evacuation as part of the HVAC upgrade project is not required. However, if the district elects to upgrade the system, the existing panel will need to be replaced with a new Notifier NFS2-3030 fire alarm panel with voice evacuation capability. The NFS2-3030 is the current district standard for fire alarm panels.



HIGHLAND ELEMENTARY SCHOOL ELECTRICAL EVALUATION

Existing Conditions

The electrical service is 208/120V, 3-phase, 4-wire 1600A with a 1600A main circuit breaker (PG&E Meter #1009512505). The switchgear is located on the southwest side of the site in the playground area. The switchboard is fed from a PG&E transformer. The existing main switchboard is in fair condition and is starting to show signs of rust.

The existing building electrical panels have been upgraded within the last 25 years and are in good condition. There are minimal available breaker spaces in the panels to connect new equipment. Some HVAC units on the classroom buildings are fed from panels in the adjacent buildings.

Load Analysis

The existing campus has existing HVAC installed in all buildings. The existing classrooms have gas fired HVAC and the modular classrooms have all electric heat pumps.

To accommodate the future multi-use building and the district elects to convert the existing campus to all electric HVAC systems to meet the districts sustainability goals, the load calculation for the site is 1698A@480V Using 24.5 Watts per square foot (2 Watts per sqft lighting, 3 Watts per sqft receptacles, 17 Watts per sqft HVAC and 2.5 Watts per sqft electric water heaters). If the district elects to keep the HVAC as gas fired units, the load calculation for the site is 1495A@480V using 19.5 Watts per sqft (2 Watts per sqft lighting, 3 Watts per sqft receptacles, 12 Watts per sqft HVAC and 2.5 Watts per sqft electric water heaters) for the gas fired buildings and 24.5 Watts per sqft for the portable buildings and future multi-use building.

Recommendations

The existing HVAC equipment are gas fired units. There are no proposed additional loads. The existing main switchboard is in fair condition and is starting to show signs of rust. If issues arise around the existing switchboard, the district should consider replacing the existing main switchboard with new. If no new work is done the existing service is adequate.

The addition of a new multi-use building will require a new electrical service. The size of the new electrical service recommended is based on an all electrical HVAC systems for the entire campus. Based on the load analysis and the current condition of the existing electrical service, we recommend upgrading the existing switchboard to 2500A, 480/277V. If there are no plans to upgrade the existing HVAC units from gas to all electric, the recommended service size is 2000A, 480/277V. Due to the HVAC units being connected to panels in different buildings, when an HVAC upgrade is performed for this site it is recommended to upgrade the feeders to each building so that all HVAC units can be fed from the buildings panel. This should be done to prevent safety issues when maintaining the HVAC units. Due to the environmental conditions causing corrosion, we recommend that if the switchboard is replaced the new switchboard be installed with a stainless steel enclosure (5% added cost to the gear).

The existing fire alarm system is a Notifier AFP-200. If gas-fired equipment is used, then CO detection will be required in the classrooms. The existing panel is not capable of accommodating CO detection functionality. To provide the required CO detection, the FACP needs to be upgraded to a Notifier NFS2-3030 and additional power supplies, CO/Smoke detector combination devices and sounder bases must



be provided in each classroom and the alarms will need to be displayed at the annunciator. If an all-electric gas appliances in the classrooms, CO detection will not be required and no additional devices will need to be provided in HVAC is provided and there are no the classrooms. Upgrade the sites to a fully automatic fire alarm system with voice evacuation as part of the HVAC upgrade project is not required. However, if the district elects to upgrade the system, the existing panel will need to be replaced with a new Notifier NFS2-3030 fire alarm panel with voice evacuation capability. The NFS2-3030 is the current district standard for fire alarm panels.



LAUREL ELEMENTARY SCHOOL ELECTRICAL EVALUATION

Existing Conditions

The electrical service is 208/120V, 3-phase, 4-wire 1600A with a 1600A main circuit breaker (PG&E Meter #1003873700). The switchgear is located between the admin and multi-use buildings. The switchboard is fed from PG&E transformer #T-5674. The existing main switchboard is in poor condition due water draining to the panel from the grading around the gear.

The existing building electrical panels have been upgraded within the last 25 years and are in good condition. There are minimal available breaker spaces in the panels to connect new equipment.

Load Analysis

The existing service does not have the capacity for the addition of gas fired HVAC units or all electric HVAC units. Using 24.5 Watts per square foot (2 Watts per sqft lighting, 3 Watts per sqft receptacles, 17 Watts per sqft HVAC and 2.5 Watts per sqft electric water heaters), we performed a load analysis for the proposed HVAC upgrades. Based on the districts sustainability goals, the HVAC loads are based on an all-electric heat pump style system. The calculated load for the campus with HVAC added is 2,924A@208/120V or 1,267A@480/277V. The 480/277V service is recommended to minimize the cost and size of the building feeders.

Recommendations

Based on the load analysis and the current condition of the existing electrical service, we recommend upgrading the existing switchboard to 2000A, 480/277V. A new 480/277V electrical panel will be provided for each building/wing to feed the new mechanical units and a step-down transformer will be provided to reconnect the existing panel that serves the existing lighting and electrical loads. Due to the voltage change, the existing service may need to be refed or new feeders and transformers provided to service buildings not in the scope of the HVAC project. This decision will be made during the project design phase based on the project's scope and schedule/phasing. We recommend providing spare conduits in the power trench for future low voltage system cables. Due to the environmental conditions causing corrosion of the main switchboard, we recommend that the new switchboards and free-standing distribution panels be installed with a stainless steel enclosure (5% added cost to the gear).

The existing fire alarm system is a Notifier NFS2-640. If gas-fired equipment is used, then CO detection will be required in the classrooms. The existing panel is capable of accommodating CO detection functionality. To provide the required CO detection, additional power supplies, CO/Smoke detector combination devices and sounder bases must be provided in each classroom and the alarms will need to be displayed at the annunciator. If an all-electric HVAC is provided and there are no gas appliances in the classrooms, CO detection will not be required and no additional devices will need to be provided in the classrooms. The existing Notifier NFS2-3030 has enough available space to add the CO detection for the entire site. Upgrade the sites to a fully automatic fire alarm system with voice evacuation as part of the HVAC upgrade project is not required. However, if the district elects to upgrade the system, the existing panel will need to be replaced with a new Notifier NFS2-3030 fire alarm panel with voice evacuation capability. The NFS2-3030 is the current district standard for fire alarm panels.



LEAD ELECTRICAL EVALUATION

Existing Conditions

The electrical service is 208/120V, 3-phase, 4-wire 1600A with a 1600A main circuit breaker (PG&E Meter #1008821731). The switchgear is located adjacent to the LGI building. The switchboard is fed from PG&E transformer #T-704. The existing main switchboard is in fair condition and is starting to show signs of rust.

The existing building electrical panels have been upgraded within the last 25 years and are in good condition. There are minimal available breaker spaces in the panels to connect new equipment. The existing panel feeders and some branch circuiting is routed on the underside of the buildings walkway canopies.

Load Analysis

The existing service does not have the capacity for the addition of gas fired HVAC units or all electric HVAC units. Using 24.5 Watts per square foot (2 Watts per sqft lighting, 3 Watts per sqft receptacles, 17 Watts per sqft HVAC and 2.5 Watts per sqft electric water heaters), we performed a load analysis for the proposed HVAC upgrades. Based on the districts sustainability goals, the HVAC loads are based on an all-electric heat pump style system. The loads calculated took into account the future Multi-Use building. The calculated load for the campus with HVAC added is 3,999A@208/120V or 1,733A@480/277V. The 480/277V service is recommended to minimize the cost and size of the building feeders.

Recommendations

Based on the load analysis and the current condition of the existing electrical service, we recommend upgrading the existing switchboard to 2500A, 480/277V. A new 480/277V electrical panel will be provided for each building/wing to feed the new mechanical units and a step-down transformer will be provided to reconnect the existing panel that serves the existing lighting and electrical loads. Due to the voltage change, the existing service may need to be refed or new feeders and transformers provided to service buildings not in the scope of the HVAC project. This decision will be made during the project design phase based on the project's scope and schedule/phasing. We recommend providing spare conduits in the power trench for future low voltage system cables. Due to the environmental conditions causing corrosion, we recommend that the new switchboards and free-standing distribution panels be installed with a stainless steel enclosure (5% added cost to the gear).

The existing fire alarm system is a Notifier AFP-200. If gas-fired equipment is used, then CO detection will be required in the classrooms. The existing panel is not capable of accommodating CO detection functionality. To provide the required CO detection, the FACP needs to be upgraded to a Notifier NFS2-3030 and additional power supplies, CO/Smoke detector combination devices and sounder bases must be provided in each classroom and the alarms will need to be displayed at the annunciator. If an all-electric gas appliances in the classrooms, CO detection will not be required and no additional devices will need to be provided in HVAC is provided and there are no the classrooms. Upgrade the sites to a fully automatic fire alarm system with voice evacuation as part of the HVAC upgrade project is not required. However, if the district elects to upgrade the system, the existing panel will need to be



replaced with a new Notifier NFS2-3030 fire alarm panel with voice evacuation capability. The NFS2-3030 is the current district standard for fire alarm panels.



MEADOW HEIGHTS ELEMENTARY SCHOOL ELECTRICAL EVALUATION

Existing Conditions

The electrical service is 208/120V, 3-phase, 4-wire 1600A with a 1600A main circuit breaker (PG&E Meter #1003873778). The switchgear is located in the front kindergarten play area. The switchboard is fed from PG&E transformer #T-5507. The existing main switchboard is in fair condition and is starting to show signs of rust.

The existing building electrical panels have been upgraded within the last 25 years and are in good condition. There are minimal available breaker spaces in the panels to connect new equipment.

Load Analysis

There is a future multi-use building planned for this site. Taking the new multi-use into account, the existing service does not have the capacity for the addition of gas fired HVAC units or all electric HVAC units. Using 24.5 Watts per square foot (2 Watts per sqft lighting, 3 Watts per sqft receptacles, 17 Watts per sqft HVAC and 2.5 Watts per sqft electric water heaters), we performed a load analysis for the proposed HVAC upgrades. Based on the districts sustainability goals, the HVAC loads are based on an all-electric heat pump style system. The loads calculated took into account the future Multi-Use building. The calculated load for the campus with HVAC added is 2977A@208/120V or 1290A@480/277V. The 480/277V service is recommended to minimize the cost and size of the building feeders.

Recommendations

Based on the load analysis and the current condition of the existing electrical service, we recommend upgrading the existing switchboard to 2000A, 480/277V. A new 480/277V electrical panel will be provided for each building/wing to feed the new mechanical units and a step-down transformer will be provided to reconnect the existing panel that serves the existing lighting and electrical loads. Due to the voltage change, the existing service may need to be re-fed or new feeders and transformers provided to service buildings not in the scope of the HVAC project. This decision will be made during the project design phase based on the project's scope and schedule/phasing. We recommend providing spare conduits in the power trench for future low voltage system cables. Due to the environmental conditions causing corrosion, we recommend that the new switchboards and free-standing distribution panels be installed with a stainless steel enclosure (5% added cost to the gear).

The existing fire alarm system is a Notifier NFS2-3030. If gas-fired equipment is used, then CO detection will be required in the classrooms. The existing panel is capable of accommodating CO detection functionality. To provide the required CO detection, additional power supplies, CO/Smoke detector combination devices and sounder bases must be provided in each classroom and the alarms will need to be displayed at the annunciator. If an all-electric HVAC is provided and there are no gas appliances in the classrooms, CO detection will not be required and no additional devices will need to be provided in the classrooms. The existing Notifier NFS2-3030 has enough available space to add the CO detection for the entire site. Upgrade the sites to a fully automatic fire alarm system with voice evacuation as part of the HVAC upgrade project is not required. However, if the district elects to upgrade the system, the existing panel is adequate for voice evacuation. The NFS2-3030 is the current district standard for fire alarm panels.



NORTH SHOREVIEW ELECTRICAL EVALUATION

Existing Conditions

The electrical service is 208/120V, 3-phase, 4-wire 1600A with a 1600A main circuit breaker (PG&E Meter #1003873692). The switchgear is located on the south side of the site at the end of Building B. The switchboard is fed from a PG&E transformer. The existing main switchboard is in fair condition and is starting to show the signs of rust.

The existing building electrical panels have been upgraded within the last 25 years and are in good condition. There are minimal available breaker spaces in the panels to connect new equipment.

Load Analysis

The existing service does have the capacity for the addition of gas fired HVAC units and does not have the capacity for the addition of all electric HVAC units.

Assuming an existing peak demand from PG&E of 400A, the existing load plus the additional gas fired HVAC load (12 Watts per sqft) and the additional water heater loads (2.5 Watts per sqft) the total calculated load for the addition of gas fired HVAC units is 1461A@208V. The peak demand load should be confirmed with PG&E prior to moving forward with this option

Using 24.5 Watts per square foot (2 Watts per sqft lighting, 3 Watts per sqft receptacles, 17 Watts per sqft HVAC and 2.5 Watts per sqft electric water heaters), we performed a load analysis for the proposed HVAC upgrades. Based on the districts sustainability goals, the HVAC loads are based on an all-electric heat pump style system. The calculated load for the campus with HVAC added is 2134A@208/120V or 925A@480/277V. The 480/277V service is recommended to minimize the cost and size of the building feeders.

Recommendations

Based on the load analysis of the existing electrical service, we recommend connecting to the existing electrical service if gas fired HVAC units are utilized. A new 208/120V electrical panel will be provided for each building/wing to feed the new mechanical units and a feeder connection from the new panel to the existing panel serving the lighting and receptacle loads.

Based on the load analysis of the existing electrical system, we recommend upgrading the existing switchboard to 2000A, 480/277V if all electric units are utilized. A new 480/277V or 208/120V electrical panel will be provided for each building/wing to feed the new mechanical units and a step-down transformer will be provided to reconnect the existing panel that serves the existing lighting and electrical loads. Due to the voltage change, the existing service may need to be refed or new feeders and transformers provided to service buildings not in the scope of the HVAC project. This decision will be made during the project design phase based on the project's scope and schedule/phasing. Due to the environmental conditions, we recommend that the new switchboards and free-standing distribution panels be installed with a stainless steel enclosure (5% added cost to the gear).

We recommend providing spare conduits in the power trench for future low voltage system cables.

The existing fire alarm system is a Notifier AFP-200. If gas-fired equipment is used, then CO detection will be required in the classrooms. The existing panel is not capable of accommodating CO detection



functionality. To provide the required CO detection, the FACP needs to be upgraded to a Notifier NFS2-3030 and additional power supplies, CO/Smoke detector combination devices and sounder bases must be provided in each classroom and the alarms will need to be displayed at the annunciator. If an all-electric gas appliances in the classrooms, CO detection will not be required and no additional devices will need to be provided in HVAC is provided and there are no the classrooms. Upgrade the sites to a fully automatic fire alarm system with voice evacuation as part of the HVAC upgrade project is not required. However, if the district elects to upgrade the system, the existing panel will need to be replaced with a new Notifier NFS2-3030 fire alarm panel with voice evacuation capability. The NFS2-3030 is the current district standard for fire alarm panels.



PARKSIDE ELECTRICAL EVALUATION

Existing Conditions

The electrical service is 208/120V, 3-phase, 4-wire 1200A with a 1200A main circuit breaker (PG&E Meter #__). The switchgear is located on the north side of the site adjacent to the portable buildings. The switchboard is fed from PG&E transformer #T-6188. The existing main switchboard is in poor condition, is showing signs of rust and corrosion and the doors do not close and lock properly.

The existing building electrical panels have been upgraded within the last 25 years and are in good condition. There are minimal available breaker spaces in the panels to connect new equipment.

Load Analysis

The existing service does not have the capacity for the addition of gas fired HVAC units or all electric HVAC units. Using 24.5 Watts per square foot (2 Watts per sqft lighting, 3 Watts per sqft receptacles, 17 Watts per sqft HVAC and 2.5 Watts per sqft electric water heaters), we performed a load analysis for the proposed HVAC upgrades. Based on the districts sustainability goals, the HVAC loads are based on an all-electric heat pump style system. The loads calculated took into account the future Multi-Use building currently in design. The calculated load for the campus with HVAC added is 2,903A@208/120V or 1,258A@480/277V. The 480/277V service is recommended to minimize the cost and size of the building feeders.

Recommendations

Based on the load analysis and the current condition of the existing electrical service, we recommend upgrading the existing switchboard to 2000A, 480/277V. A new 480/277V electrical panel will be provided for each building/wing to feed the new mechanical units and a step-down transformer will be provided to reconnect the existing panel that serves the existing lighting and electrical loads. Due to the voltage change, the existing service may need to be refed or new feeders and transformers provided to service buildings not in the scope of the HVAC project. This decision will be made during the project design phase based on the project's scope and schedule/phasing. We recommend providing spare conduits in the power trench for future low voltage system cables. Due to the environmental conditions causing corrosion of the main switchboard, we recommend that the new switchboards and free-standing distribution panels be installed with a stainless steel enclosure (5% added cost to the gear).

The existing fire alarm system is a Notifier NFS2-640. If gas-fired equipment is used, then CO detection will be required in the classrooms. The existing panel is capable of accommodating CO detection functionality. To provide the required CO detection, additional power supplies, CO/Smoke detector combination devices and sounder bases must be provided in each classroom and the alarms will need to be displayed at the annunciator. If an all-electric HVAC is provided and there are no gas appliances in the classrooms, CO detection will not be required and no additional devices will need to be provided in the classrooms. The existing Notifier NFS2-640 has enough available space to add the CO detection for the entire site. Upgrade the sites to a fully automatic fire alarm system with voice evacuation as part of the HVAC upgrade project is not required. However, if the district elects to upgrade the system, the existing panel will need to be replaced with a new Notifier NFS2-3030 fire alarm panel with voice evacuation capability. The NFS2-3030 is the current district standard for fire alarm panels.



SAN MATEO PARK ELECTRICAL EVALUATION

Existing Conditions

The electrical service is 208/120V, 3-phase, 4-wire 1600A with a 1600A main circuit breaker (PG&E Meter #1009513806). The switchgear is located adjacent to the portable buildings. The switchboard is fed from PG&E transformer #T-384. The existing main switchboard is in fair condition and is starting to show signs of corrosion and rust.

The existing building electrical panels have been upgraded within the last 25 years and are in good condition. There are minimal available breaker spaces in the panels to connect new equipment.

Load Analysis

The existing service does not have the capacity for the addition of gas fired HVAC units or all electric HVAC units. Using 24.5 Watts per square foot (2 Watts per sqft lighting, 3 Watts per sqft receptacles, 17 Watts per sqft HVAC and 2.5 Watts per sqft electric water heaters), we performed a load analysis for the proposed HVAC upgrades. Based on the districts sustainability goals, the HVAC loads are based on an all-electric heat pump style system. The loads calculated took into account the future Multi-Use building currently in design. The calculated load for the campus with HVAC added is 2,730A@208/120V or 1,183A@480/277V. The 480/277V service is recommended to minimize the cost and size of the building feeders.

Recommendations

Based on the load analysis and the current condition of the existing electrical service, we recommend upgrading the existing switchboard to 2000A, 480/277V. A new 480/277V electrical panel will be provided for each building/wing to feed the new mechanical units and a step-down transformer will be provided to reconnect the existing panel that serves the existing lighting and electrical loads. Due to the voltage change, the existing service may need to be refed or new feeders and transformers provided to service buildings not in the scope of the HVAC project. This decision will be made during the project design phase based on the project's scope and schedule/phasing. We recommend providing spare conduits in the power trench for future low voltage system cables. Due to the environmental conditions causing corrosion, we recommend that the new switchboards and free-standing distribution panels be installed with a stainless steel enclosure (5% added cost to the gear).

The existing fire alarm system is a Notifier NFS2-640. If gas-fired equipment is used, then CO detection will be required in the classrooms. The existing panel is capable of accommodating CO detection functionality. To provide the required CO detection, additional power supplies, CO/Smoke detector combination devices and sounder bases must be provided in each classroom and the alarms will need to be displayed at the annunciator. If an all-electric HVAC is provided and there are no gas appliances in the classrooms, CO detection will not be required and no additional devices will need to be provided in the classrooms. The existing Notifier NFS2-640 has enough available space to add the CO detection for the entire site. Upgrade the sites to a fully automatic fire alarm system with voice evacuation as part of the HVAC upgrade project is not required. However, if the district elects to upgrade the system, the existing panel will need to be replaced with a new Notifier NFS2-3030 fire alarm panel with voice evacuation capability. The NFS2-3030 is the current district standard for fire alarm panels.



SUNNYBRAE ELEMENTARY SCHOOL ELECTRICAL EVALUATION

Existing Conditions

The electrical service is 208/120V, 3-phase, 4-wire 2500A with a 2500A main circuit breaker (PG&E Meter #1003872373). The switchgear is located adjacent to the LGI building. The switchboard is fed from PG&E transformer #T-786. The existing main switchboard is in good condition.

The existing building electrical panels have been upgraded within the last 25 years and are in good condition. There are minimal available breaker spaces in the panels to connect new equipment.

Load Analysis

There are all electric HVAC units serving all of the buildings. There are no additional HVAC loads. There are future plans to install a multi-use building on this campus. The existing PG&E peak demand for the campus is 239kVA (664A) at 208/120V. The additional load for the new multi-use building is 817A. The total calculated load for the existing main switchboard is 1647A at 208/120V.

Recommendations

Based on the load analysis and the current condition of the existing electrical service, the existing main switchboard is adequate for the existing loads and the future multi-use building loads. The existing switchboard may need to be extended if the new multi-use breaker does not fit in the available space. The PG&E transformer and secondary feeders will likely need to be upgraded to accommodate the new building loads. Because the service size is not changing PG&E will do the upgrade of the transformer and secondary conductors at no cost to the district. The PG&E upgrade will need to go through the normal application and design periods and 6 months should be planned from the time of application to the time of completion of the project.

The existing fire alarm system is a Notifier AFP-200. If gas-fired equipment is used, then CO detection will be required in the classrooms. The existing panel is not capable of accommodating CO detection functionality. To provide the required CO detection, the FACP needs to be upgraded to a Notifier NFS2-3030 and additional power supplies, CO/Smoke detector combination devices and sounder bases must be provided in each classroom and the alarms will need to be displayed at the annunciator. If an all-electric gas appliances in the classrooms, CO detection will not be required and no additional devices will need to be provided in HVAC is provided and there are no the classrooms. Upgrade the sites to a fully automatic fire alarm system with voice evacuation as part of the HVAC upgrade project is not required. However, if the district elects to upgrade the system, the existing panel will need to be replaced with a new Notifier NFS2-3030 fire alarm panel with voice evacuation capability. The NFS2-3030 is the current district standard for fire alarm panels.



TURNBULL CHILD DEVELOPMENT CENTER ELECTRICAL EVALUATION

Existing Conditions

The electrical service is 208/120V, 3-phase, 4-wire 1600A with a 1600A main circuit breaker (PG&E Meter #_). The switchgear is located adjacent to building #9. The switchboard is fed from a PG&E transformer. The existing main switchboard is in good condition.

The existing building electrical panels have been upgraded within the last 10 years and are in good condition. There are minimal available breaker spaces in the panels to connect new equipment.

Load Analysis

All buildings have a gas hybrid heat pump HVAC system installed. No additional HVAC loads are proposed for the site. Additional water heater loads to be added to the site calculated at 2.5 Watts per sqft is 240A total.

Recommendations

No additional HVAC loads are being installed as part of this project. Adding water heaters to the service will add 240A to the existing service. The existing service has adequate capacity to connect the new water heaters. Building feeders should be confirmed to accommodate the new loads and upsized if required to accommodate the new water heater loads.

The existing fire alarm system is a Notifier NFS2-3030. The existing units are gas-fired and will require CO detection to be installed when a project is done in the classrooms. The existing panel is capable of accommodating CO detection functionality. To provide the required CO detection, additional power supplies, CO/Smoke detector combination devices and sounder bases must be provided in each classroom and the alarms will need to be displayed at the annunciator. If an all-electric HVAC is provided and there are no gas appliances in the classrooms, CO detection will not be required and no additional devices will need to be provided in the classrooms. The existing Notifier NFS2-3030 has enough available space to add the CO detection for the entire site. The existing fire alarm system is a fully automatic fire alarm system with horn/strobe notification. The NFS2-3030 is the current district standard for fire alarm panels.

