Appendix: Physical Assessment

Del Valle Sports & Fitness Clubhouse

2015-0123

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INTERFACE ENGINEERING

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Executive Summary

Interface Engineering assessed the existing mechanical, electrical, plumbing, and fire life-safety systems serving the Del Valle Clubhouse in Rossmoor, Walnut Creek, CA. The assessment was performed to assess the operations, current code compliance, reliability, and condition of the existing MEP/FLS systems and to provide recommendations for system upgrades or improvements as required for future renovations or expansion.

Investigation for this report includes a site visit conducted by engineers from Interface Engineering and an examination of existing drawings and records of the facility. The report is a description of the existing conditions for the MEP Systems observed from reviewing the existing drawings and documentation from our previous work. The observations were compared with available as-built drawings to confirm the accuracy of the as-built documentation for the facility. This report provides a description of the existing MEP conditions, observations, and recommendations.

Mechanical Systems

EXISTING CONDITIONS AND OBSERVATION

The building consists of a school gymnasium and fitness center built in 1959 for Del Valle High School. In 1993, the facility was renovated to serve the needs and interests of the Rossmoor Active Senior Living Community. The clubhouse has undergone several major renovations including the expansion of the fitness center and the enclosure of the pool facilities in 2007. The majority of the existing mechanical equipment was installed during the major clubhouse renovation in 1993, with some equipment demolished or replaced since that time.

MAIN CLUBHOUSE FACILITY

The building mechanical system consists of an existing central plant, installed during the 1993 clubhouse renovation with the exception of the boiler replacement in 2009, which provides chilled water and heating hot water to air handling units. The existing chilled water system consists of (2) air-cooled chillers (CH-1 & CH-2) located on the roof, with (2) constant volume chilled water distribution pumps (CWP-1 & CWP-2). Chilled water piping is routed along the rooftop to serve the existing rooftop air handling units, and along a pipe chase north of the gymnasium to serve air handling units AHU 14, AHU 15, & AHU 16, located in a mechanical room adjacent to the gymnasium. The heating hot water system consists of (1) gas-fired boiler (B-1) located in the boiler room that is east of the women's shower, with (2) heating hot water distribution pumps (HWP-3 & HWP-4). Heating hot water is distributed up to the roof to serve the existing rooftop air handling units, and along a pipe chase adjacent to the gymnasium to serve air handling units AHU 14, AHU 15, & AHU 16. By visual inspection the existing chilled water and hot water exposed piping is in poor condition. In some cases the insulation is missing and the pipe damaged and rusting.

Systems installed as part of the 1993 clubhouse renovation:

Space heating and cooling is provided to the auditorium by (3) constant volume air handling units (AHU-14, AHU-15, & AHU-16) located in a mechanical room adjacent to the gymnasium.

The first floor multi-use rooms are served by (2) constant volume rooftop air handling units (AHU-11 & AHU-12). (2) Rooftop exhaust fans (EF-7 & EF-8) are connected to the returns ducts of AHU-11 & AHU-12, respectively, for building relief. The mezzanine level multi-use room is served by a single constant volume rooftop air handling units (AHU-17). The clubhouse lobby is served by (2) constant volume rooftop air handling units (AHU-17 & AHU-18) which serve the lower portion of the lobby, while AHU-18 provides conditioned air above the lobby as well as the lobby stairwell up to the second floor mezzanine. (2) Rooftop exhaust fans (EF-10 & EF-11) are connected to the returns ducts of AHU-17 & AHU-18, respectively, for relief. The core of the kitchen contains (2) grease hoods which are exhausted by a single rooftop exhaust fan (EF-12). Make-up air is provided to the grease hood by a rooftop make-up air unit (MAU-1). Facilities noted the kitchen equipment is rarely used as food is most often catered. The women's shower, restrooms, and dressing rooms are served by a single rooftop air handling unit (AHU-1) and exhausted by a single rooftop exhaust fan (EF-1). The men's shower, restrooms, and dressing rooms are served by a single rooftop air handling unit (AHU-2) and exhausted by a single rooftop exhaust fan (EF-2). The fitness manager's office is served by an overhead ducted fan coil unit (AHU-5) connected to the building hot water/chilled water system. Single restrooms located throughout the facility contain typical ceiling exhaust fans (EF-13 & EF-14).

Systems installed as part of the 2001 fitness remodel:

Space heating and cooling is provided to the aerobics room by a rooftop variable air volume (VAV) air handling unit (AHU-1A). The men and women's restroom, located near the lobby, is served by a terminal unit with reheat (VAV-1) connected to AHU-1A. The men and women's restrooms are exhausted by (2) existing rooftop exhaust fans (EF-4 & EF-9). The fitness center and vestibule are served by (2) VAV rooftop air handling units (AHU-1B & AHU-1C). The guard office, check-in, and lobby are served by an overhead ducted fan coil unit (AHU-1D), which is connected to the building hot water/chilled water system. The massage room is also served by an overhead ducted fan coil unit (AHU-1E) connected to the building hot water/chilled water system and exhausted by an inline ceiling exhaust fan (CEF-1).

Systems installed as part of the 2007 Pool Enclosure addition:

Ventilation is provided to the pool enclosure by a packaged energy recovery unit (AH-1) located in a mechanical room adjacent to the pool enclosure. AH-1 contains a heat recovery pipe which loops between the return air duct and exhaust air duct to pre-cool or pre-heat the incoming outside air. However, AH-1 does not have temperature control and cannot condition the supply air to a controlled set point. AH-1 was also designed to have a greater exhaust airflow then supply in order to negatively pressurize the pool enclosure and remove chlorine odors. The facilities engineer noted that AH-1 operates on a timer, which is overridden to turn off during pool class time due to noise propagation. A single restroom added to the clubhouse during the addition is exhausted by a rooftop exhaust fan (EF-1) and served by existing air fan coil AHU-1E. The pool storage room is exhausted by a rooftop exhaust fan (EF-2). The pool equipment room is served by an existing rooftop gravity hood (CAI) connected to a centrifugal inline ventilator (CIV-1), which was reversed to provide space exhaust. The pool enclosure contains overhead operable panels, controlled by a manual switch, which were designed to slide down the roof enclosure and provide an opening for hot air relief.

CONTROLS

The existing building control system consists of a Johnson Controls Building Management System with direct digital controls. This system can be utilized for the future expansion or alteration of the clubhouse.

OCCUPANT THERMAL COMFORT & NOTED CHALLENGES

During the site visit, the following input from occupants and facilities were noted:

- The fitness center is too cold after entering from the hot pool enclosure.
- The pool enclosure can become too hot during the summer time and smell strongly of chlorine
- The hallway is too noisy during the operation of both chillers
- The existing restrooms/dressing rooms have poor ventilation
- Pool enclosure hard ducts are difficult to clean

EQUIPMENT SUMMARY

Below is a table that lists the major mechanical equipment that serves the building. This list is based on the as-built drawings available, items that were visible during a visit to the site, and information provided by the building facilities manager. A parenthesis in the remaining life column indicates the number of years the equipment has already exceeded the expected life. Life expectancies listed are based on a comparison of service life estimates provided by Table 4 in Chapter 37 of ASHRAE HVAC Applications Handbook.

MARK	EQUIP TYPE	MAKE & MODEL	CAPACITY	LOCATION	YEAR INSTALLED	LIFE EXPECTANCY	REM. LIFE
B-1	BOILER	RAYPAK HC-0902B	756 MBH	BOILER ROOM	2009	35	29
HWP-3 & HWP-4	HOT WATER PUMP	WEINMAN 2095CV-30P54	53 GPM	BOILER ROOM	1993	10	(12)
CH-1 &CH-2	CHILLER	MCQUAY ALR050C	45 TONS	ROOFTOP	1993	25	3
CWP-1 & CWP-2	CHILLED WATER PUMP	WEINMAN 2.5K2A75P140	206 GPM	ROOFTOP	1993	20	(2)
AHU-1A	AIR HANDLER	TEMTROL WF-RD18	4400 CFM	ROOFTOP	2001	15	1
AHU-1B	AIR HANDLER	TEMTROL WF-RD-18	4000 CFM	ROOFTOP	2001	15	1
AHU-1C	AIR HANDLER	TEMTROL WF-RD-18	4000 CFM	ROOFTOP	2001	15	1
AHU-1D	FAN COIL	TEMTROL FC-182	500 CFM	GUARD OFFICE	2001	20	6
AHU-1E	FAN COIL	PACE SCF-7A	400 CFM	STRETCH ROOM	2001	20	6
AHU-1	AIR HANDLER	PACE – CUSTOM	800 CFM	ROOFTOP	1993	15	(7)
AHU-2	AIR HANDLER	PACE- CUSTOM	800 CFM	ROOFTOP	1993	15	(7)
AHU-5	FAN COIL	PACE – CUSTOM	325 CFM	OFFICE 101	1993	20	(2)
AHU-11	AIR HANDLER	PACE – CUSTOM	1800 CFM	ROOFTOP	1993	15	(7)

MARK	EQUIP TYPE	MAKE & MODEL	CAPACITY	LOCATION	YEAR INSTALLED	LIFE EXPECTANCY	REM. LIFE
AHU-12	AIR HANDLER	PACE – CUSTOM	1100 CFM	ROOFTOP	1993	15	(7)
AHU – 13	AIR HANDLER	PACE – CUSTOM	1750 CFM	ROOFTOP	1993	15	(7)
AHU-14, AHU-15, & AHU-16	AIR HANDLER	PACE – CUSTOM	3400 CFM	MECHANICAL ROOM	1993	15	(7)
AHU-17	AIR HANDLER	PACE – CUSTOM	2150 CFM	ROOFTOP	1993	15	(7)
AHU-18	AIR HANDLER	PACE – CUSTOM	2400 CFM	ROOFTOP	1993	15	(7)
MAU-1	MAKE-UP AIR UNIT	ARES – 225NESS-5E1CK1E94395	3200 CFM	ROOFTOP	1993	24	2
AH-1	DEDICATED OUTDOOR AIR UNIT	DES CHAMPS – PV-MZP-8716/8-PV	16000 CFM SUPPLY, 18000 CFM EXHAUST	ROOFTOP	2007	15	7
EF-1 & EF-2	CENTRIFUGAL ROOF HOOD EXHAUST	GREENHECK LBP-10-R3	905 CFM	ROOFTOP	1993	25	3
EF-4	DOWNBLOAST EXHAUST	GREENHECK – G-75-D	310 CFM	ROOFTOP	1993	25	3
EF-7	DOWNBLAST EXHAUST	GREENHECK-G-75-D	379 CFM	ROOFTOP	1993	25	3
EF-8	UTILITY FAN	GREENHECK SFD-5-6B	338 CFM	ROOFTOP	1993	25	3
EF-9	DOWNBLOAST EXHAUST	GREENHECK G-80-D	379 CFM	ROOFTOP	1993	25	3
EF-10	ENTRIFUGAL ROOF HOOD EXHAUST	GREENHECK LDP-85-D	444 CFM	ROOFTOP	1993	25	3
EF-11	ENTRIFUGAL ROOF HOOD EXHAUST	GREENHECK LDP-80-D	363 CFM	ROOFTOP	1993	25	3
EF-12	UPBLAST EXHAUST	GREENHECK CUBE-200HP	3200 CFM	ROOFTOP	1993	25	3
EF-13	BATH CEILING EXHAUST	BROAN 688	50 CFM	BATHROOM	1993	25	3

MARK	EQUIP TYPE	MAKE & MODEL	CAPACITY	LOCATION	YEAR INSTALLED	LIFE EXPECTANCY	REM. LIFE
EF-14	BATH CEILING EXHAUST	GREENHECK SP-117	185 CFM	BAHTROOM	1993	25	3
CAI	FABRA HOOD	GREENHECK FHI	NA	ROOFTOP	2001	25	11
CIV-1	CENTRIFUGAL INLINE FAN	DAYTON 3C279	3200-3670 CFM	POOL EQUIPMENT RM.	2001	25	11
CEF	BATH CEILING EXHAUST	GREENHECK CSP-282	480 CFM	BATHROOM	2001	25	11
VAV-1	TERMINAL UNIT	TITUS DESV	VARIES	CEILING	2001	20	6
Ef-1 (POOL)	DOWNBLOAST EXHAUST	GREENHECK GB-091	380 CFM	ROOFTOP	2007	25	17
EF-2 (POOL)	DOWNBLAST EXHAUST	GREENHECK GB-071	120 CFM	ROOFTOP	2007	25	17
EF-3 (POOL)	SIDEWALL PROPELLER	GREENHECK SEI-8-440-D-1	350 CFM	SIDEWALL	2007	15	7

RECOMMENDATION

A majority of the existing equipment installed during the 1993 renovation has exceeded its expected service life, or within the next three years will be at or near the end of its service life. Although the new air handlers installed during the 2001 renovation are also nearing their estimated service life, based on ASHRAE, facilities personnel noted there have not been any major problems and they are operating consistently. We would recommend that a service professional perform an inspection of the units for preventative maintenance if they are to be used for an extended period.

If the clubhouse is to undergo major renovations or expansions, then a major mechanical system replacement should be considered. This would include replacing or demolishing the equipment and associated ducting and piping systems installed during the ’93 clubhouse renovation as necessary to serve the new renovation or expansion.

Minor additions or alterations could utilize the existing system and equipment could be replaced on an as needed basis.

Utilizing any existing unaltered equipment would not have any code implications. For items being altered or replaced, equipment and systems would have to comply with the current California Mechanical Code and Title 24 (California Energy Code). This could include the following implications:

- New equipment meeting current efficiency standards
- Dual-Max VAV controls
- Economizer controls
- Increased pipe insulation
- Demand control ventilation
- Occupant sensors for ventilation
- Economizer fault detection

Additional general energy conservation methods can include the following:

- Replace all equipment past its expected life expectancy with more efficient equipment
- Retrofit the existing heating hot water system into a primary/secondary system for variable flow
- Convert the chilled water system to variable volume flow
- Replace the existing chilled water and heating hot water piping with new piping and insulation
- Provide demand control ventilation in non-required spaces

It was mentioned that the existing pool enclosure becomes too hot during the summer hours. The pool enclosure consists of operable windows and roof panels that can be opened with an increase in space temperature. However, during pool hours, the roof panels are not always opened. The combination of keeping the operable windows closed and turning off the air handling unit during occupied hours results in a high space temperature and a strong odor of chlorine. Acoustical measures should be considered to mitigate the noise propagation from the ventilation unit to allow the unit to run during pool class time. It would be beneficial to explore other non-mechanical options to allow the operable windows to operate as originally designed. A supplemental HVAC system could be explored as an alternative for better space temperature and humidity control. However, this will include a high first cost and operating cost.

Plumbing Systems

EXISTING CONDITIONS AND OBSERVATION

DOMESTIC WATER SYSTEM

Based on the 1992 as-built drawings, the existing domestic cold water system is supplied by a 4” copper main originating from the water meter located on the sidewalk south of the fitness center building. It enters the building at the south wall of the fitness room. It supplies plumbing fixtures in the toilets, kitchen, fitness center and gym. There is a 2” branch to the pool room with a backflow preventer. Just downstream of the branch to the pool is a 2” branch with backflow preventer for irrigation. The presence of a pressure reducer upstream of the domestic water meter indicates there is good pressure from the street.

Domestic Water Meter in Vault

Irrigation Backflow Preventer

DOMESTIC HOT WATER SYSTEM

Domestic hot water is provided by two 100 gallon gas fired storage type commercial water heaters. Water heater WH-1 has an input rating of 275,000 BTUS per hour. It was recently installed on February 2, 2015. WH-2 has an input rating of 250,000 BTUS and was installed in April 1, 2002. Hot water circulation is provided by an inline circulating pump. Supply and return lines are insulated. Thermostatic mixing valves are provided to each shower room to provide tempered water. The heaters share the mechanical room with the boiler on the north side of the Fitness Center.

Existing Domestic Hot Water Heaters

NATURAL GAS SYSTEM

Natural gas is served from a rotary meter at the back of the Fitness Center (north) just outside the mechanical room and has a capacity of 5,0000,000 BTUS. Gas is delivered at standard pressure by a 5" main. No earthquake gas valve was observed. Pipe material is steel with galvanized steel for exterior locations and black steel inside the building. Gas is supplied to the water heaters, boiler, three pool heaters, make-up air unit and kitchen equipment. The existing gas load is approximately 4,500,000 BTUS.

Existing Gas Meter

Gas pipe supplies to mechanical and plumbing gas appliances are provided with shutoff valves, drip legs and either flexible gas pipe connector or hard coupling connections. The connections are currently code-compliant.

SANITARY SEWER SYSTEM

The underground sewer line runs west to east from the fitness center and exits approximately at the center of the east wall of the gym with a 6" main. Most of the pipes were installed during the original construction in 1959 except those installed during the 1992 and 2001 remodels and the 2007 addition. Pipe material is assumed to be hub and spigot cast iron in 1959 and hub-less cast iron pipes in the remodels and addition.

The kitchen addition in 1992 added a 4" grease waste system including a 1,250 gallon gravity grease interceptor under the service road north side of the fitness center building.

A 4" sewer main was added during the 2007 pool enclosure project that exits near the northeast corner. It is then connected to a 6" sewer main on site that runs west to east under the service road. The site main turns south outside northeast of the gym and picks up all sewer lines coming out of the buildings. The underground pipe condition was not verified but is assumed to be in good condition.

STORM DRAINAGE SYSTEM

Roof drainage is provided by several roof and overflow drains in the fitness center and pool enclosure. The roof drains and overflow drains are collected separately and exit with individual 6" lines southwest of the fitness center under the driveway. The gym is served by multiple roof drains with sidewall scuppers for overflow. Size and site connection for the storm serving the Gym were not determined. Domes of existing roof and overflow drains show signs of rusting but still are in fair condition. Piping material is assumed similar to the sanitary sewer system. System is considered to be in good condition.

Corrosion at drain domes

Condensate drain disconnected

PLUMBING FIXTURES

Most plumbing fixtures were installed during the 2001 remodel at the Fitness Center. Those installed in 1992 at the Gym remained. The older fixtures were non-water conserving while the newer ones were low flow types. These models do not meet current California Green Code standards for water flow rates but they all appear to be in fair condition.

Vitreous china fixtures are installed in the toilets. Public toilets have floor-mounted toilets with low flow sensor flush valves. Urinals in the men's rooms were wall-mounted low-flow fixtures with sensor flush valves. Lavatories were counter mount with low-flow sensor faucets. Staff toilets have wall-mounted toilets with manual flush valve and wall-mounted lavatories with a single handle manual faucet. Men's and women's shower rooms have anti-scale pressure balance shower systems. Dual height electric water coolers are located outside the two Men's restrooms. Handicap accessible fixtures are provided throughout the facility.

Floor Mount Public Toilet

Wall Mount Staff Toilet

The existing kitchen has a preparation sink, hand wash sink, and a double compartment pot wash sink. All are made of stainless steel and in good condition. The janitor's sink near the kitchen is wall-mounted enameled cast-iron type.

CONDENSATE DRAIN SYSTEM

The condensate drain lines serving the rooftop air handling units at the Fitness Center were intended to discharge to a roof drain. However, the main pipe was disconnected halfway through the run and pipes are not properly supported.

FIRE PROTECTION SYSTEM

The space is provided with an existing automatic wet fire sprinkler system with semi-recessed sprinkler heads. It is assumed the sprinkler is code compliant.

RECOMMENDATION

DOMESTIC WATER SYSTEM

The existing capacity of the domestic cold water system is adequate at this time. The capacity should be reevaluated for future remodels.

DOMESTIC HOT WATER SYSTEM

The existing domestic hot water system is adequate and in good condition especially with the recently replaced heater. The second water heater is 13 years in service and would be good for a few more years but the facility should plan for its replacement. Future remodels would require reevaluation of capacity.

NATURAL GAS SYSTEM

The existing natural gas supply has a spare capacity of 500,000 BTUS and with the planned re-use for the kitchen area, the spare capacity would increase to 1,250,000 BTUS. For added safety it is recommended to add an earthquake gas valve at the main line.

SANITARY SEWER SYSTEM

It is anticipated that the kitchen shall be relocated to another facility and it is recommended the existing grease interceptor be removed since it can deteriorate and contaminate the soil.

The regular sewer lines should be adequate and no upgrade is recommended at this point.

STORM DRAINAGE SYSTEM

Except for maintenance on the rusting domes, no additional work is needed at this point.

PLUMBING FIXTURES

The existing fixtures still function but for water conservation, it is recommended to replace fixtures or faucets with high water efficiency models with either manual or sensor controls. Control selection shall be made by the Owner.

CONDENSATE DRAIN SYSTEM

Condensate drain line on the Fitness Center roof should be repaired and properly supported.

FIRE PROTECTION SYSTEM

No revisions are anticipated to the existing fire sprinkler system.

Electrical Systems

EXISTING CONDITIONS AND OBSERVATION

POWER DISTRIBUTION SYSTEM

The existing clubhouse building was built in 1959 and renovated in 1985 and 1992. The pool area enclosure was added in 2007.

The existing supply is via a PG&E exterior pad-mounted transformer T-17168 located to the north of the Clubhouse building. It then runs to a pull box outside the main electrical closet to Main Switchboard “HM” rated at 800A, 277/480V, 3P, 4 Wire. A 200A 277/480V 3P, 4-wire tap off is taken from this switchboard to feed the pool enclosure. Another 800A 277/480V, 3P, 4-Wire feed to Main Distribution Panel “MH” is located in another external electrical closet to the north of the clubhouse. An exterior 225kVA transformer is mounted on structural support bracing adjacent to the closet for Panel ‘MH’. This transformer feeds Panel “ML” 800A, 120/208V 3P, 4-wire and is also located in the same exterior electrical closet as Panel ‘MH’. These two distribution panels feed the rest of the panels in the clubhouse.

Existing PG&E transformer

Existing Main Switchboard closet and distribution board closets.

The following table is a list of the building's distribution equipment for the Clubhouse with indication of ratings, manufacturer type, spares, and location:

TABLE 1: Branch circuit panel boards serving Clubhouse					
Name	**Voltage Rating**	**Ampere Rating**	**Spares/spaces**	**Location**	**Condition**
Main Switchboard 'HM'	277/480V	800A		Closet North of clubhouse	Looks to be original main switchboard. 40+ years.
Main Switchboard 'MH'	277/480V	800A	None	Closet North of clubhouse	20+ years.
Main Switchboard 'ML'	120/208V	800A	None	Closet North of clubhouse	20+ years.
Distribution Panel 'ACB'	277/480V	400A	2 spaces 3P	Roof	1991 modification 20+ years.
Panel 'ACL'	120/208V	100A	14 spaces IP	Roof	1991 modification 20+ years.
Panel 'ACA'	277/480V	300A	6 spaces 1P	Roof	1991 modification 20+ years.
Panel 'K'	120/208V	200A	7 spaces 1P	West corridor	1991 modification 20+ years.
Panel 'PW'	120/208V	200A	None	West corridor	1991 modification 20+ years.
Panel 'PX'	120/208V	100A	1 space 1P		1991 modification 20+ years.
Panel 'PE'	120/208V	200A	3 spaces 1P	East stair corridor	1991 modification 20+ years.
Panel 'LW'	120/208V	100A	3 spaces 1P	West corridor	1991 modification 20+ years.
Panel 'LE'	120/208V	100A	None	East stair corridor	1991 modification 20+ years.

The existing Pool enclosure area was built in 2007. A new 200A, 277/480V, 3P, 4-wire supply was taken from main switchboard "HM" and run to Panel "H" 200A, 277/480V located in the equipment room north of the pool area. Also located in this room is Panel "L" 120/208V, 3P, 4-wire and an Emergi-Lite Emergency lighting Inverter rated at 60A capacity and the lighting control panel for the whole clubhouse. Pool equipment is fed from panel "PEQ" 100A, 120/208V 3P, 4-wire located in the pool pump room.

The following table is a list of the building's distribution equipment for the Pool Area with indication of ratings, manufacturer type, spares, and location:

TABLE 1: Branch circuit panel boards serving Pool Area				
Name	**Voltage Rating**	**Ampere Rating**	**Spares/spaces**	**Location**
Panel 'H'	277/480V	200A	24 x single 20A spaces	Store north of pool area
Panel 'L'	120/208V	250A	22 x single 20A CB	Store north of pool area
Panel 'PEQ'	120/208V	100A	No spare spaces	Pool pump room

These panels are in good condition and have another 20+ years of life. Lighting Inverter and lighting control panel are also in good condition and can be reused.

BRANCH CIRCUITS AND FEEDERS

The existing feeders serve the original electrical equipment via receptacles, junction boxes and disconnects.

Existing receptacles are in antiquated condition, as they are over 25+ years old and appear to be faded. Where receptacles are located in areas to be remodeled, the receptacles should be replaced in lieu of relocation.

LIGHTING SYSTEM

The existing lighting in the Clubhouse consists of fluorescent fixtures. Lighting in each area is listed with observations below.

- Multi-use gym rooms consists of downlights, recessed 2'x4' troffers with motion sensor control. Troffers appear to have high glare and are not comfortable especially for elderly viewers.

- Corridor lighting consists of surface mounted strip lights and recessed downlights. It was observed that there was scalloping on the walls where downlights were installed. The surface mounted strip lights did not provide adequate lighting for the corridor.

- Main equipment gym room consists of recessed parabolic louver 2'x4' T-bar lighting. There are existing skylights in this room.

- Auditorium area consists of recessed florescent 2'x4'high output T-bar fixtures, recessed MH lamps and stage lighting.

- Pool enclosure has MH lamp rod mounted pendants. Powder coating is peeling and there is rusting in some fixtures.

Existing corridor lighting

Existing lighting showing scalloping on walls

Lighting control consists of time control to parking lot, pool and building exterior lighting. The existing lighting system consists of a contactor-based control via a lighting control panel. Motion sensors are located in the gym rooms. The auditorium lighting is controlled via rotary dimmers.

TELECOMMUNICATIONS

The existing server room located off the north corridor is the main point of entry for incoming service for voice and data systems to the clubhouse. The room contains an equipment rack with a fiber termination unit, patch panels and network equipment. The room also houses a plywood backboard mounted with 66 style punch down blocks for copper termination, enclosure for coax cabling distribution and security panels.

FIRE ALARM SYSTEM

Existing Fire-Lite fire alarm annunciator is located at the existing main entry to the gym foyer. Fire Control panel is in a Fire-Lite MS-9200 system. It is located with fire power supply panels in the storage room next to the multi-use rooms. Manual pull stations are provided throughout the building. All devices are in good condition.

RECOMMENDATION

POWER DISTRIBUTION SYSTEM

Based on the age and conditions of the existing switchboards, no further work is required on the power distribution system. All existing lighting is installed on 120/208V panel boards and new lighting will be selected to be compatible to this voltage. The majority of the panel boards were installed during the 1991 modification and have another 20 years of life.

Currently, the Del Valle clubhouse has power and lighting on the same panel boards, and in some cases, the plumbing items as well. We recommend reuse of the existing panel boards and panel board locations to avoid triggering new Title 24 circuit segregation and energy metering requirements. There is, however, benefit to installing separate panel boards for power, lighting, HVAC, and plumbing loads so that they can be monitored for energy use per system. This could be achieved with the addition of up to four additional panels. The HVAC is fed from their own panels on the roof.

For new renovation area we recommend providing controlled receptacles that will be activated via the motion sensors in the room. This is not only a current code requirement but is also an energy-saving improvement. Non-renovated spaces can also be fit with controlled receptacles to further improve energy savings, although this is not required by code.

BRANCH CIRCUITS AND FEEDERS

Where existing equipment and circuits are to be retained, the associated conduit, conductors, and junction boxes should be retained. In renovated areas, existing conduit exiting the panel to the ceiling spaces should be retained and new wiring and junction boxes should be installed. Per the current 2013 California Electrical Code, Article 210.8(B)(5), GFCI receptacles are required within 6’ of new sink locations.

LIGHTING SYSTEM

The existing lighting within the clubhouse is not optimal for senior occupants according to IESNA (The Illuminating Engineering Society of North America) standards. The recommended lighting levels for seniors are higher than those of other observers and should be sufficient in lighting quantity, direction of light, and good contrast without causing glare. Good lighting maintains an environment that promotes wellness, personal independence and reduces accidents. It was observed that many spaces were dark, not lit uniformly, and caused scalloping on walls. In addition, many of the fixtures create glare and contain non-energy saving globes. Energy improvements can be made from using LED sources and low glare fixtures. Higher lighting levels can be achieved from new lighting with higher lumen outputs and better color rendering. Task lighting can also be provided to specific task areas.

Existing controls are non-compliant to new Title 24 code requirements and where areas are to be renovated, new Title 24 code compliance will be triggered. New code compliance will require daylighting photocells and control to all skylight and window locations, motion sensors to all multipurpose, office, and corridor spaces will be required. Dimming control for any space greater than 100sq.ft and local switching to any individual space will also be required. These measures will improve energy consumption by turning off lighting when there is sufficient daylight and when no one is in the room.

A new lighting control system will be required to meet code requirements for using motion sensors for controlled receptacles and for dimming and automatic shut off of lighting.

TELECOMMUNICATIONS

Provide a comprehensive system for voice and data with pathways from the server room to all points in the building. A minimum conduit size of 3/4” shall be used and all outlet boxes shall be 4-11/16” square, by 2-1/8” deep. Provide a cable tray system to serve horizontal cabling raceway infrastructure.

FIRE ALARM SYSTEM

The existing strobes and horn type speakers are in locations that are required by code. Should modifications be required to the entries, exits, and paths of egress, fire alarm equipment will need to be either relocated or new. The existing fire alarm panels in the storage room should be retained if possible. If the main door is relocated, the main annunciator will need to be relocated to the new location.