



FIRCREST SCHOOL

Campus Master Plan Phase III

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Department of Social and Health Services

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1.0 EXECUTIVE SUMMARY

The Fircrest School Campus is an approximately 90-acre State-owned property in Shoreline, Washington. The property is home to the Fircrest School which provides support to approximately 200 individuals with intellectual disabilities in a residential setting. The school programs include (i) long term nursing care for individuals with intellectual disabilities, (ii) intermediate care for individuals with an intellectual disability and (iii) an adult training program (ATP) for individuals with intellectual disabilities on campus. The campus includes several program and accessory operational buildings to support the Fircrest School function; several other buildings are located on the property that service a larger population such as the church, ATP building, and DSHS laboratories. The campus has a large number of mature trees and several forested areas.

- Under direction of the State Legislature, a 2010 Master Plan was developed that applies to approximately 83 acres of the Campus. The remaining 7 acres are currently utilized by the Washington State Department of Health (DOH) for its public health laboratory. The property has several areas on the property that are underutilized by the Fircrest School function and provide substantial opportunities for future uses.
- This Master Plan explores alternatives to maintain the same level of service to Fircrest School residents through building improvements and construction options. Future development under the Master Plan is intended (a) to continue the long-term care for Fircrest School patients/residents and (b) to identify opportunity areas for future uses.

1.1 – PAST, PRESENT AND FUTURE PLANNING

Previous Work –Phase I & II

A Phase I Master plan was completed dated 1/24/08 in response to ESHB 1092, Section 2037 Chapter 520, Laws of 2007, (Capital Budget proviso), requiring the Department of Social and Health Services (DSHS) to complete a master plan of the portion of the Fircrest School campus not utilized by the Fircrest School or the Department of Health (DOH).

The Legislature authorized Phase 2 planning during the 2008 Supplemental Legislative Session, by amending the Capital Budget proviso to direct DSHS to prepare a more detailed plan based on the recommended Hybrid Option. ESHB 2765, Section 2004 (Chapter 328, Laws of 2008) requires that DSHS complete the Master Plan for the future of the property, and that:

- The Hybrid Option as described in the Fircrest School excess property report dated January 14 [sic], 2008, must be used for the purposes of the master plan.
- The development of the master plan must not prohibit the potential future expansion of the Public Health Laboratory by the Department of Health.
- The Department must report to the appropriate committees of the Legislature and the Office of Financial Management by December 1, 2010.

Current Project –Phase III

This Master Plan updates the 2010 Fircrest School Campus Excess Property Master Plan by identifying the needs of the Fircrest School facility to determine its ability to efficiently implement the programmatic and preservation needs of the program, and develops a plan to systematically coordinate all capital projects at the facility over the next 10 years. This is essential to making sound decisions regarding all facilities work and coordinating work to be done in a logical, efficient sequence. The plan proposes a coordinated approach towards other major projects that will result in significantly improved facilities and improve operation efficiencies. The plan reduces the current number of buildings, building area, and campus area dedicated to the program, reduces operating costs and identifies space on the campus that could be utilized for future uses.

Future Project –Phase IV

Funding for the final Phase IV of this planning effort has been requested in the 2017-19 DSHS Capital Budget, and will be to advance the conclusions and recommendations from the previous phases to formally establish a Master Plan (with any needed zoning changes) with the City of Shoreline and receive formal approval from the Legislature. This plan will be the basis of all work on the campus moving forward.

1.2 – BUILDING ASSESSMENTS

PAT N – Nursing Program

The Fircrest School Residential Habilitation Center (aka PAT N) in Shoreline provides housing facilities for individuals with intellectual disabilities. The Fircrest School campus has six buildings totaling 83,200sf that provide long term nursing care for patients with developmental disabilities. Each building has the capacity for 16 residents. The buildings are sometimes referred to as the “Y” Buildings. Five of the buildings are used at any given time with one building being left vacant and available should one of the occupied buildings become unavailable. Opportunities exist to improve efficiency in delivering care to these patients by consolidating the program into one building (see cost option #3 below). By consolidating the program into one building, there is a space and cost savings over renovating the six “Y” buildings as each building requires duplicate spaces and staff for the patients it houses.

Program Certification: 93 residents

Current Facility:

- Six (6) individual “Y” Buildings
(Five in use, One reserve)
- 16 resident capacity each building

Needed Repairs:

- **Structural:** Does not meet seismic requirements, requires additional structural elements
- **HVAC (heating):** New boilers in each building basement; no damper controls to adjust air volumes.
- **Plumbing:** Waste plumbing is deteriorating; there is also asbestos insulation on the above grade piping in the walls.
- **Fire Sprinkler System:** The buildings have fire sprinkler systems; the campus wide water system is not adequate to serve all six buildings.
- **Building Exterior:** The exterior windows are aluminum frame, single-glazed windows without thermal breaks; the windows need to be replaced in all six buildings.
- **Energy Code:** There is little to no insulation in the exterior brick walls and roof.
- **Building Functions:** The current buildings do not provide the number of toilets required. Separate buildings require separate staff.

Costs:

- **Option #1: Renovate the Existing “Y” Buildings (All 6 Buildings):**
Renovate existing 6 buildings: 83,200 SF @ \$225/SF = \$18,720,000
- **Option #2: Relocate Nursing Facility to Building #66 (Requires Construction of New ATP Building):**

Renovate Building #66:	51,650 SF @ \$200 /SF	=	\$ 10,330,000
Expanded First Floor	10,200 SF @ \$325 /SF	=	<u>\$ 3,315,000</u>
	TOTAL	=	\$ 13,615,000

- **Option #3: Construct a New Single Story Building on Campus:**

New Building:	39,650 SF @ \$325 /SF	=	\$ 12,900,000
Site Improvements:		=	<u>\$ 2,500,000</u>
		TOTAL =	\$ 15,400,000

PAT A – Residential

The Fircrest School campus also has 10 buildings that function as Intermediate Care Facilities for Individuals with Intellectual Disabilities (ICF/ID) (aka PAT A). These facilities are commonly referred to as ‘the cottages’. These facilities have 24-hour supervision, and medical/nursing services for Medicaid eligible clients who are in need of the active treatment services. They also provide individualized habilitative services that support and enhance individual skills and strengths for patients with intellectual disabilities. The facilities have a total of 160 beds, but currently house 133 patients with intellectual disabilities, which are considered full capacity. The ten buildings have essentially the same floor plan with some variations in the bedroom configurations.

Program Certification: 160 residents

Current Facility:

- 10 individual cottages
- 16 resident capacity each building

Needed Repairs:

- **Structural:** past roof leaking
- **HVAC (heating):** Heated from central steam plant, no thermostat controls (on OR off)
- **Plumbing:** Current issues with water heaters; reported issues with drinking water (bottled water is provided to residents)
- **Electrical:** buildings are served by a single emergency generator
- **Energy Code:** There is little to no insulation in the exterior brick walls and roof

Costs:

- **Option #1 / Address Deferred Maintenance and Construct One New Cottage:**

Remodel existing cottages:	\$65,000 x 10 cottages	=	\$650,000
Construct new cottage:	6,400 SF @ \$275 /SF	=	<u>\$1,760,000</u>
		TOTAL =	\$ 2,410,000

- **Option #2 / Address Deferred Maintenance and Reduce Census to Vacate One Cottage:**

Remodel existing cottages:	\$65,000 x 10 cottages	=	\$650,000
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ATP – Adult Training Program

The ATP Building provides Adult Training Programs for individuals with intellectual disabilities on campus. The 52,633 SF wood frame building was built in 1942 as a part of the original construction as a Navy hospital. A little over half of the building space is devoted to Adult Training Programs. Non-ATP office functions occupy the residual space.

Program Certification: 100 individuals

Current Facility:

- 1 Building \ 52,633-sf wood frame \ 1-Story
- Adult Training Programs PLUS misc. Offices

Needed Repairs:

- **Structural:** Does not meet seismic requirements, has open crawl space. Requires structural elements.
- **HVAC (heating):** Heated from central steam plant, no thermostat controls (on OR off).
- **Fire Sprinkler System:** The building does NOT have fire sprinklers.
- **Building Exterior:** Wooden exterior siding and asphalt shingles. Most windows are wooden, single-glazed.
- **Energy Code:** There is little to no insulation in the exterior walls and roof.
- **Building Functions:** Disjointed building configuration; houses ATP and misc. offices.

Costs:

- **Option #1 / Relocate ATP Operations to Building #66 (Requires Construction of New Nursing Facility):**

Renovate Building #66: 22,833 SF @ \$225 /SF = \$ 5,137,425

- **Option #2 / Construct New ATP Building (to Allow Relocation of Nursing Facilities to Building #66):**

New Building: 23,800 SF @ \$325 /SF = \$ 7,735,000

- **PLUS (in addition to Option #1 and #2 above)**

Relocate non-ATP Operations (to Building #65):

Renovate Building #65: 18,356 SF @ \$225 /SF = \$ 4,130,000

1.3 – MASTER PLAN ALTERNATIVES

The Fircrest School programs can be improved according to two distinct master plan alternatives. Both alternatives will consolidate the Fircrest School operations making way for excess property and future uses. Given the current building conditions and associated renovation challenges, these alternatives also assume that the existing 'Y' Buildings and ATP building are closed and eventually demolished.

Alternative A-1

The first alternative plans for PAT 'N' to be relocated to Building #66; this will include a complete building retrofit and an addition. The ATP operations will be moved to a new building in the northeast portion of the campus. The non-ATP functions (in the current ATP building) are planned to be located to the ground floor of Building #65. A new cottage will be constructed for the PAT 'A' program. (See Section 6.3)

Alternative A-2

The second alternative plans for the Adult Training Program (ATP) to be relocated to Building #66; this will include a complete building retrofit and using two floors. Like the first alternative, the non-ATP functions (in the current ATP building) are planned to be located to the ground floor of Building #65. The PAT 'N' program will be moved to a new building in the northeast portion of campus; this will be phased after the existing ATP is demolished. A new cottage will be constructed for the PAT 'A' program. (See Section 6.3)

2.0 MISSIONS & HISTORY

2.1 - AGENCY OPERATIONS

The Fircrest School Campus is currently managed by two state agencies: Washington State Department of Social and Health Services (DSHS) and Washington State Department of Natural Resources (DNR). Approximately 53 acres of the Campus are managed by DNR for the Charitable, Education, Penal and Reformatory Institutions (CEP&RI) Trust. Trust land must be managed for the Trust beneficiaries, although the land could be exchanged or sold under appropriate circumstances. The CEP&RI land is currently leased to DSHS for the Fircrest School.

DSHS manages approximately 30 additional acres (non CEP&RI Trust land) for Fircrest School operations. This *Master Plan* does not change how the Campus is managed, however implementation would likely require changes to the lease agreements between DNR and DSHS. DOH has undertaken a separate master planning effort to plan for further growth of the Public Health Laboratory.

Fircrest School Residential Habilitation Center (RHC)

Washington's Enabling Act 10 provides for the establishment of a trust for the support of institutions such as those now managed by the Department of Social and Health Services and the Department of Corrections. The Enabling Act calls for the state support of such institutions by designating certain lands as Charitable, Educational, Penal and Reformatory Institutions (CEP&RI) trust lands and then using those lands to generate income for the institutions, for example through timber sales or agricultural leases. The Department of Natural Resources (DNR) manages the state's CEP&RI trust lands as well as other state trust lands. DNR has certain fiduciary duties with regard to how these trust lands are managed; in general, the lands are managed for the benefit of the beneficiaries of the trust.

Most trust lands provide support for their beneficiaries through the generation of income from the property. However, in this particular situation, one of the RHCs (Fircrest School) is actually located on CEP&RI trust land. The land at the Fircrest School site was originally designated as common school trust land, granted to the state through the Enabling Act for the support of the state's K-12 schools. Prior to World War II, the U.S. Navy took over the land to construct a hospital. After the war, the Navy conveyed the property to King County to use as a tuberculosis hospital. The state of Washington reminded King County that the property did, in fact, belong to the state, and the land was conveyed back to the state shortly thereafter.

Fircrest School opened on the site in 1958. The property was still, however, designated as common school trust land. To help remedy this situation, DNR and DSHS arranged for a land exchange, trading approximately 36 acres of the Fircrest School site for a large parcel of DSHS land west of the Lakeland Village campus in Medical Lake. In 1987, DNR exchanged the remaining 51 acres of common school trust land at Fircrest School for CEP&RI trust lands elsewhere in the state in order to change the trust designation of the Fircrest School land. So, while DSHS owns a portion of the Fircrest School site, the remaining portion (51 of the 87 acres) remains in CEP&RI trust status.

2.2 - AGENCY MISSION AND CORE OBJECTIVES

Department of Social and Health Services (DSHS)

As a Department, DSHS is tied together by a single mission: to transform lives. DSHS also has overarching visions that guide its work, with the goal that people are healthy, safe, and supported, and that taxpayer resources are guarded. Each administration within DSHS has a refined focus on this mission and vision.

Developmental Disabilities Administration (DDA)

The mission of DDA is to transform lives by providing support and fostering partnerships that empower people to live the lives they want. Fully realized, this creates the department's vision: Individuals with developmental disabilities will live in, contribute to and participate in their communities; will realize their greatest potential; and will be healthy and safe.

Residential Habilitation Centers (RHC)

Residential Habilitation Centers (RHCs) are large state-operated residential settings that provide 24-hour support and habilitation training. An RHC may be certified as an Intermediate Care Facility for Individuals with Intellectual Disabilities and/or licensed as a Nursing Facility. There are four RHCs in Washington State.

2.3 - PRIOR USES

The Fircrest School has been located the Fircrest School campus since 1959. Prior to that, the campus was home to a U.S. Navy Hospital in Seattle, established in 1942, and then a Tuberculosis Sanatorium, established in 1949. The DOH public health laboratory, which also currently occupies a portion of the campus, was built in 1985.

The current layout of the campus' roads and buildings is a remnant of historical uses. It is based on both topography and typical Navy planning from the 1940s, which included a parade ground and a series of single-story buildings. The Fircrest School Nursing Home buildings ("Y" buildings") were built in the 1960s with a dormitory-style layout. The internal layouts of these buildings is inefficient for the delivery of services necessary for their use (i.e. wheelchair movement can be difficult on the sloped areas around the buildings). The existing Adult Training Program (ATP) building was built as part of the WWII Navy Hospital and has aged beyond its useful life.

Continued use of this layout during incremental changes to Campus buildings has resulted in redundant circulation and inefficient use of land. As the campus is improved in the future, there is opportunity to cure the somewhat awkward site layout and create a working facility that is conducive to its land uses and adopted program.



Figure 1: Fircrest Campus circa 1950



Figure 2: Fircrest Campus circa 2016

3.0 PROJECT OVERVIEW

3.1 - SCOPE OF STUDY

The project intent is to review the Residential Health Center operational needs and to identify potential modifications and efficiencies to better deliver patient service. It is anticipated that the current program operations do not require the total amount of land available on the campus, and that the area and nature of the buildings may not match the program needs. The Phase III Master Plan includes the following review components:

- analyzing the current operations of the Program,
- assessing how the program is delivered in the current facilities,
- evaluating the current facility needs of the program, and
- identifying possible facility changes.

The study then evaluates how the program may change in the upcoming years, and identifies how the facilities could be further modified to support these changes. The goal of the proposed changes to buildings and land use is to identify a consolidated footprint for the program that meets its needs and is cost effective to operate. Land and buildings not needed for the current and future program operations, will be evaluated for possible alternative compatible uses that can generate income in support of the DSHS mission.

3.2 - PROJECT OBJECTIVES

This Master Plan serves to address the specific objects that will help guide future planning, funding, and operations on the property. In addition, this Plan may be used (i) to secure future land use entitlements with the City of Shoreline and (ii) to receive approval from the State legislature on the capital project needs for the next 10 years.

- *Objective A - Improve the service and care for Fircrest School residents.*
It is the desire of the Fircrest School Residential Habilitation Center to provide the upmost in care and service for the approximately 200 individuals with intellectual disabilities who reside at the Fircrest School campus. Through the selection of one of the master plan “alternatives” outlined in Section 6.3 of this *Master Plan*, improvements to existing buildings and infrastructure, the construction of new facilities, and improvements to the circulation and access of the Fircrest School campus seek to improve upon the care and service provided to the individuals who reside at Fircrest School.
- *Objective B - Address building and service deficiencies.*
Through this master planning process, deficiencies in the existing buildings and services provided at Fircrest School have been identified, and potential improvements have been evaluated in Part 5 of this *Master Plan*. Through the elimination of redundancies of services provided in multiple buildings, consolidation of facilities into fewer buildings, and enhancements to the site and circulation the Fircrest School can improve on its quality of care.

- Objective C - Identify potential programming and building operation efficiencies.
 Programming at the Fircrest School campus is one of the most crucial components of the care provided to the individuals who reside there. However, the campus is spread out and confusing and many of the areas of campus that could be providing beneficial programming (the recreation building, courtyard, trails, etc.) are underutilized and inaccessible to the residents. In addition, building operation efficiencies could be improved such that support services are consolidated into fewer buildings, and the circulation, parking and access to these buildings for staff and visitors is improved.
- Objective D - Build upon existing assets.
 The Fircrest School campus has many existing assets; this includes buildings, infrastructure, and natural areas. This objective will involve identifying existing buildings that have the potential to be repurposed to support new or expanded services. This also includes portions of the site that could be reassigned to third parties and other public purpose (e.g. the Chapel, the open space areas, etc.)
 The independent living cottages, while needing some improvements to layout and energy efficiency, are in good condition and are well equipped to serve those residents. Building 66, which mirrors building 65, the administration/medical services building, when renovated could be used as a replacement for the nursing facilities located in the "Y" buildings at the northwest end of campus.
- Objective E - Provide flexible site programming.
 One of the most attractive elements of the Fircrest School campus in regards to programming is the Adult Training Program (ATP) building. While this building has fulfilled its useful lifespan, a similar building could be constructed that provides programming for residents as well as vocational training for nonresidents in the Shoreline community. ADA and safety improvements should be made to the courtyard and trails to allow residents to fully take advantage of the campus and the natural beauty that this wooded site has to offer.
- Objective F - Identify excess properties.
 A major objective and component of this *Master Plan* is the consolidation of the Fircrest School buildings and programming to allow excess properties to be sold/leased out by the Washington State Department of Social and Health Services. The *Fircrest School Excess Property Master Plan* developed in 2010 identified excess properties, but fell short on the objective of addressing building and service deficiencies on the Fircrest School campus that could be improved through the consolidation of the campus and improving the efficiency of the support services and programming associated with the Fircrest School. By defining a "core campus" area for the Fircrest School, the master plan "alternatives" for the Fircrest School campus in Section 6.3 of this *Master Plan* identify excess property that may be sold or developed into complementary uses that can become an asset to the campus as well as the region.
- Objective G – Maintain current level of service for patient care.
 The project is intended to identify methods to maintain the current level of service for the Pat 'N', ATP, and Pat 'A' program through facility rehab, new construction, and/or repurposing existing structures.

3.3 - STAKEHOLDERS AND WORKING GROUPS

For this planning process, Department of Social and Health Services staff have been the primary stakeholder group identifying facility improvements needed for school buildings such that the schools programming can continue to function or can be improved. This group of staff comprises the “staff steering committee”, however, over the course of previous phases, a multitude of community groups, agencies and DSHS staff have been engaged in the planning for the Fircrest School and Fircrest School Campus. It is anticipated that a future phase will be explored to marry the findings of this *Master Plan* with previous planning efforts into a consolidated plan for the property; in that event, a broader stakeholders group will be convened.

Project Stakeholders

- Briarcrest Neighborhood
- City of Shoreline
- Department of Archeological and Historical Preservation (DAHP)
- Department of Ecology
- Department of Health
- Department of Natural Resources (DNR)
- Developmental Disabilities Administration (DD)
- Developmental Disabilities Council (DDC)/ Association of Retarded Citizens (ARC)
- Employees Unions
- Fircrest School
- Friends of Fircrest School (FOF)/ Action DD
- North Shore Water District
- Puget Sound Natural Gas
- Shoreline Neighborhood Council (NOC)
- Recreation Building Focus Group
- Ridgecrest Neighborhood
- Ronald Waste Water
- Seattle City Light
- Shoreline School District
- State/Legislative

**these stakeholders are identified as participants in past data gathering and campus planning efforts.

3.4 - PREVIOUS PLANNING INITIATIVES

The Fircrest School Campus as experiences multiple planning initiatives in the recent years; this *Master Plan* continues the planning focus. Thus far, two phases of planning for this project have been completed.

- PHASE I:** The first planning phase for this project occurred in 2007, culminating with a report to the Legislature being issued in January, 2008 that included a master plan for the portion of the Fircrest School Campus not utilized by the Fircrest School or the Department of Health. That plan focused on identifying new uses to be located on the excess property of the Fircrest School Campus, including a recommended “hybrid option” for development of the excess property with a mix of uses such as a mixed-use residential neighborhood with a variety of unit types for all income levels. Other uses proposed in this document include mixed-use residential uses above neighborhood-serving retail, market rate townhouses, governmental offices and public services. In addition, the recommended “hybrid option” also includes an open space area adjacent to Hamlin Park that would serve both Fircrest School residents and the broader community. Excluding land for new roads, under the recommended “hybrid option”, approximately 20.3 acres of land would be developable for new uses.

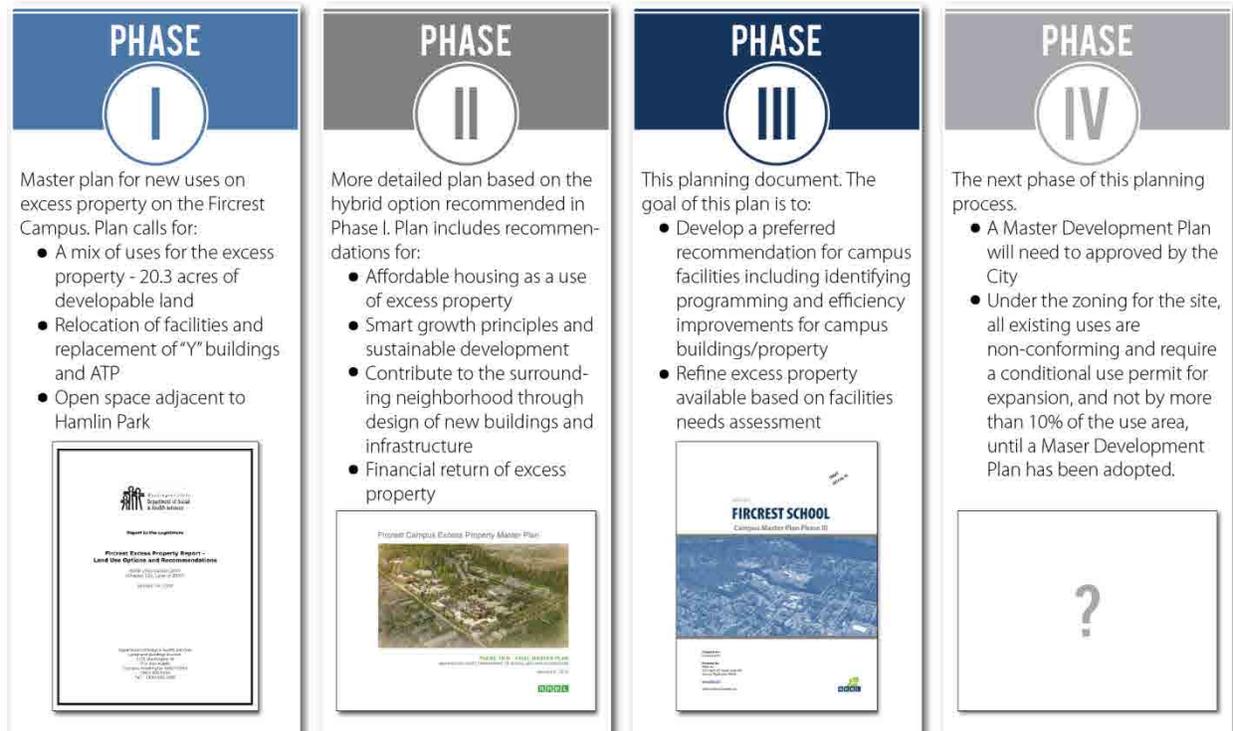


Figure 3: Previous Planning Phases

- **PHASE II:** A second phase of planning for this project occurred in 2008 following the report to the Legislature in Phase I, which was presented to the Legislature in January, 2010. This phase included a master plan that was prepared under the Legislatures direction to prepare a more detailed plan based on the “hybrid option” presented in Phase I. This Master Plan fulfills the Legislatures direction to focus on sustainability and community benefit. This plan includes provisions for green infrastructure, an emphasis on providing affordable housing on the excess property, use of smart growth principles and sustainable development techniques, in addition to creating a financial return from the sale/lease of the excess property to DSHS.
- **PHASE III:** This document constitutes the third phase of this project, which is intended to serve as a facilities *Master Plan* for the buildings and programs contained within the Fircrest School. Within this document, two master plan alternatives will be prepared for campus facilities improvements, including recommendations for relocating programs and improving the efficiency of campus buildings and operations. This document will also refine the excess property available on campus by focusing on improvements to buildings and circulation that helps to create a more efficient and sustainable campus. This document will provide the campus management and leadership group to make informed recommendations on future capital improvements and request specific funding.
- **FUTURE PHASE(S):** The subsequent phase(s) of this project will require a formal Master Development Plan to be submitted to the City of Shoreline, who has jurisdiction over the Fircrest School Campus, identifying permitted uses that may be constructed without the submittal of a conditional use permit as is currently required without an approved Master Development Plan.

4.0 FACILITIES & OPERATIONS ASSESSMENT

4.1 - CURRENT FACILITIES OVERVIEW

Fircrest School is a +/-90-acre State-owned property in the City of Shoreline, Washington. The Fircrest School Residential Health Center occupies approximately 83-acres and the Department of Health occupies the residual area.

Fircrest School provides support to approximately 200 individuals with intellectual disabilities in a residential setting. PAT 'N', which includes six buildings that provide long term nursing care for patients with developmental disabilities, is certified for 93 residents. PAT 'A', which includes 10 buildings that function as Intermediate Care Facilities for Individuals with Intellectual Disabilities (ICF/ID) is certified for 160 residents. Also included with the School is the ATP building which provides adult training programs for the individuals with intellectual disabilities on campus and has capacity for 100 residents and 25 staff.



Figure 4: Current Facilities Map

Neighborhood Context

The Fircrest School Campus is located in the City of Shoreline off of 15th Ave NE between NE 150th St and NE 160th St. This site is located in an urbanized area, adjacent to a major arterial street and served by bus transit, and adjacent to a large park and two schools. The surrounding neighborhood includes a mix of single-family and multi-family residential, office, commercial, school, park and institutional uses. A commercial corridor with supermarkets, restaurants and a variety of retail uses extends south from the Campus along 15th Avenue NE. It is important to consider the surrounding neighborhood context when exploring options for reuse planning on the site's periphery.

- **Southwest Corner:** There is a cluster of multifamily and limited nonresidential uses located at the intersection of 15th Avenue NE and 150th Street. Single-family homes are located on the blocks beyond.
- **Western Edge:** A mix of institutional (places of worship), multi-family and single-family are located cross 15th Avenue NE from the campus. The corridor transitions to single-family neighborhoods further to the west.
- **Eastern Edge:** The South Woods Park and Shorecrest High School immediately abut the campus to the west; these uses provide large spans of open space and tree canopies. The school has sports fields and recreational areas. More single-family residential neighborhoods are located further to the east.
- **Northern Edge:** Hamlin Park abuts the site to the north; the park has extensive tree canopies and some play fields and turf areas.



Figure 5: Regional Context Map

Land Use / Zoning

The existing zoning of the Fircrest School Campus is Fircrest School Campus Zone (FCZ). FCZ allows all existing uses on the Fircrest School Campus through a City-approved Master Development Plan. New uses other than what currently exist on the Campus require an amendment to both the Comprehensive Plan and Development Regulations prior to Master Development Plan adoption. The DOH property is zoned Public Health Laboratory Zone (PHZ), which is also a subzone of the Campus.

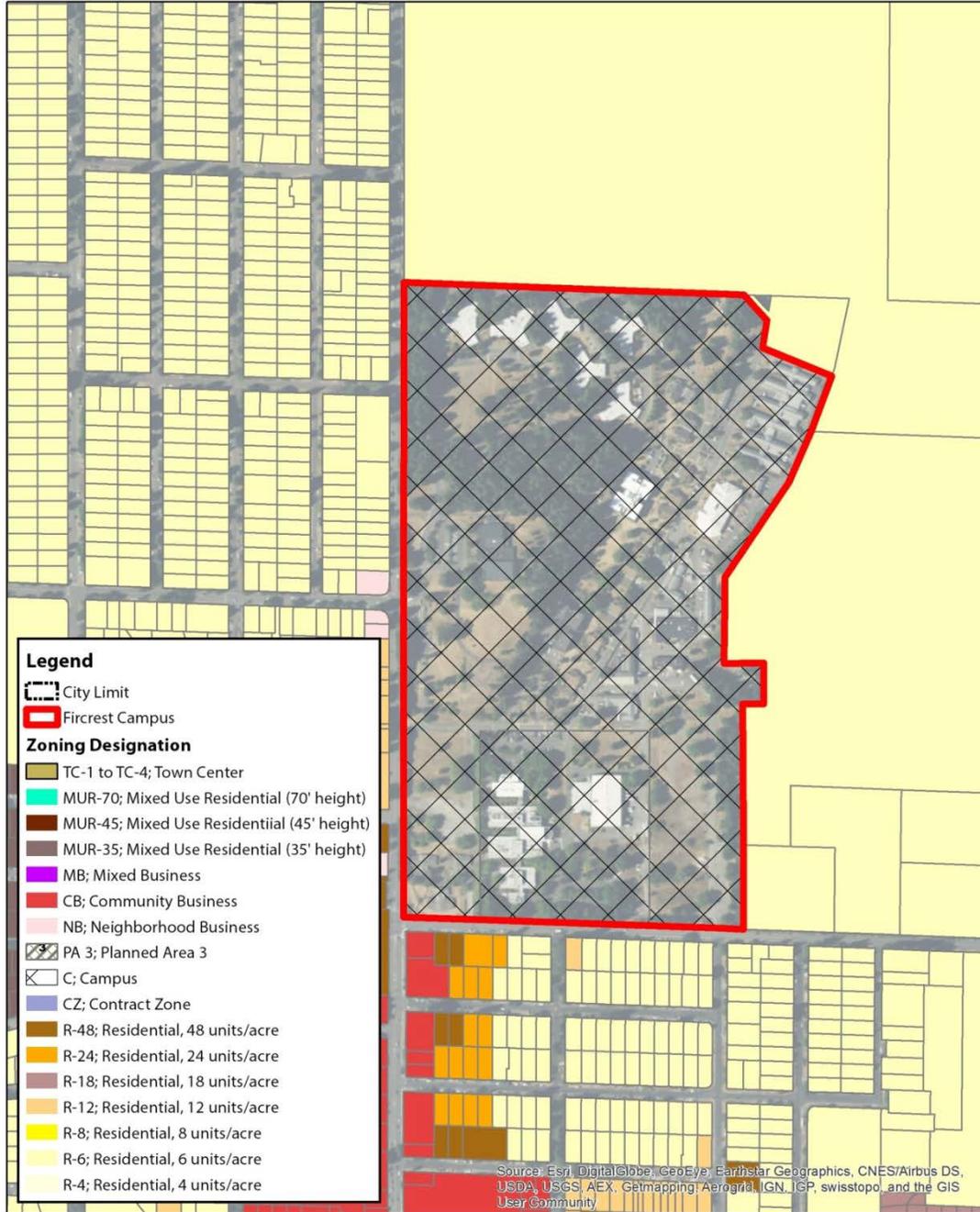


Figure 6: Fircrest Campus Zoning

Current Facilities and Uses

Current uses on the Fircrest School Campus include buildings associated with the Fircrest School, one of five Residential Habilitation Centers (RHCs) for the developmentally-disabled operated by DSHS, and two non-profit organizations which lease buildings from DSHS. In addition to its residential, administrative and support facilities, the Fircrest School includes an Activities Building and a Chapel; the Chapel is open to the public, and the Activities Building has previously been open for public use but has been closed due to State budgetary considerations. The Washington State Department of Health (DOH) operates a public health laboratory on 7 acres that is no longer a part of the Fircrest School Campus and not a part of the site for this *Master Plan*. The DOH completed a master plan for their campus in 2010 and this *Master Plan* seeks to complement and build upon the uses currently existing as well as planned for the DOH campus property.

Fircrest School Campus Existing Facilities			
<i>Color Code</i>	<i>Facility / Operation</i>	<i>Building(s)</i>	<i>Uses/Description</i>
Yellow	PAT 'N' ("Y" Buildings)	55, 56, 57, 58, 59, 60	6 buildings used for nursing
Pink	Adult Training Program (ATP)	85, 86, 87, 88, 89, 90	52,633 SF, built in 1942
Blue	PAT 'A'	44, 45, 46, 47, 48, 49, 50, 51, 52, 53	10 Residential cottages
Lt Brown	Commissary	24	Campus receiving and distribution facility
Green	Steam Plant	28	Centralize steam/heat production facility
Green	Laundry	31	Centralized laundry facility
Green	Kitchen	39	Dining Hall for Fircrest School Village and associated uses. Seating capacity for 600
Green	Chapel	64	Place of Worship, Events
Green	Administrative/Medical	65, 66	Administrative/Medical Offices and Vacant building
Green	Activities Building	67	Leisure Activities, Event
Purple	Maintenance and Storage Buildings	25 -27, 34, 35, 43, 91	Maintenance, repair, and storage activities
Dk Brown	Sheltered Workshop	22	Leased building
Dk Brown	Food Lifeline	20	Leased building
Orange	Court C	76, 77, 78	Vacant

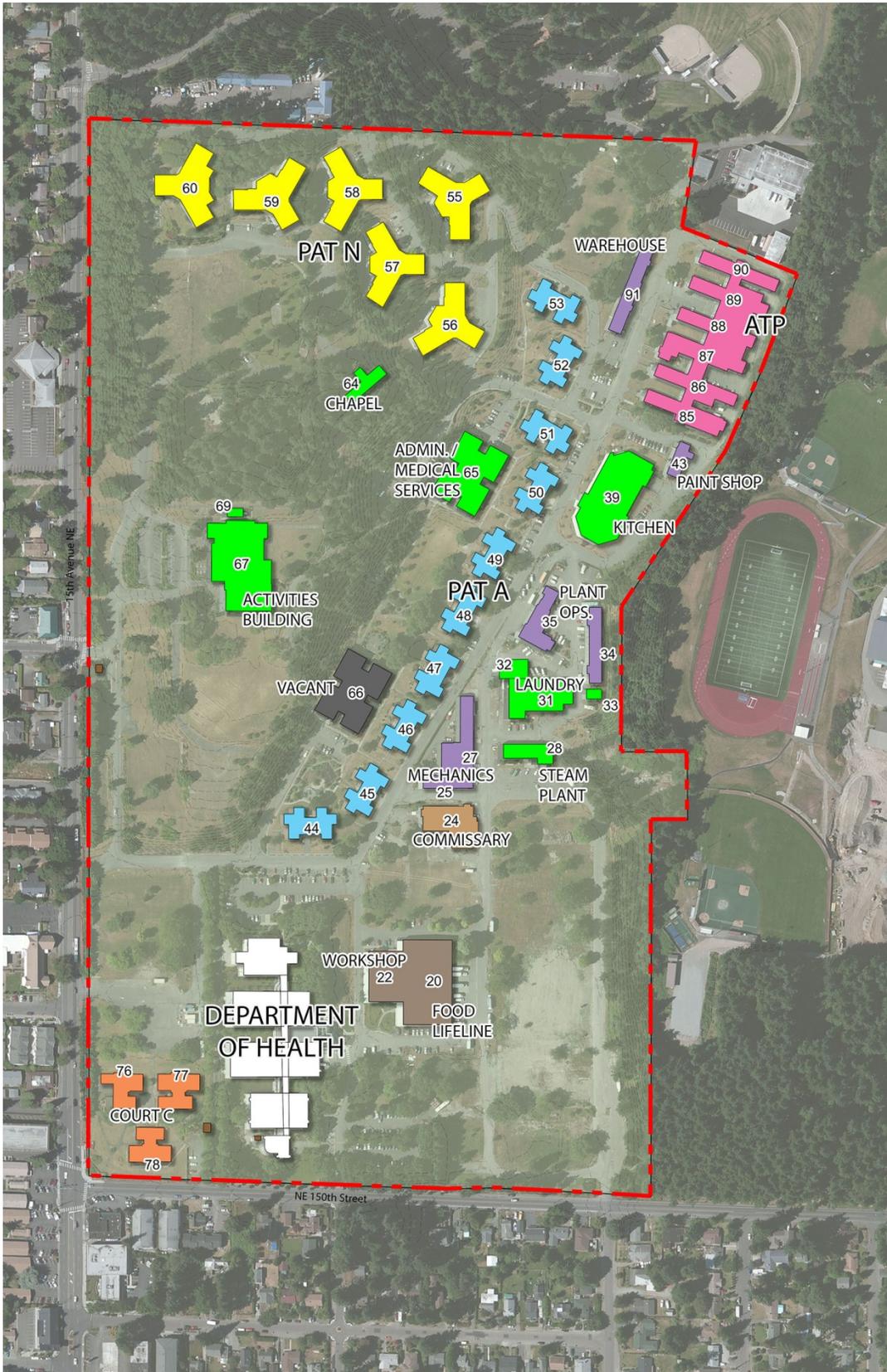


Figure 7: Existing Campus Plan

4.2 - BUILDING EVALUATION

The purpose of this section is to evaluate the existing buildings on the Fircrest School campus, identify necessary improvements, and opportunities for increases in efficiencies. The condition of many of the buildings on the campus is that of disrepair, and their layout is inefficient and confusing, resulting in duplication of services and efforts. An opportunity exists through the implementation of this *Master Plan* to enhance the flow of the campus, and create a more secure, centralized layout by relocating several of the facilities, including the “Y” buildings and combining some of the support services into fewer buildings. The building staff and programming are described in Appendix B; the existing floorplans are provided in Appendix C. Though multiple buildings are evaluated, this *Master Plan* will focus on the PAT ‘N’, Adult Training Program (ATP), and the PAT ‘A’ programs and facilities.

PAT ‘N’ (Nursing Facilities) Evaluation

The Fircrest School Residential Habilitation Center in Shoreline provides housing facilities for individuals with intellectual disabilities. The Fircrest School campus has six buildings that provide long term nursing care for patients with developmental disabilities. Each building has the capacity for 16 residents. The buildings are sometimes referred to as the “Y” Buildings. Five of the buildings are used at any given time with one building being left vacant and available should one of the occupied buildings become unavailable. Currently, the Birch Building (#56) is slated for repair and is not available for use. The following is an evaluation of the current condition of the “Y” Buildings:

- ***Structural:*** The buildings are constructed of structural clay brick with wood frame flat roofs. The buildings are in a “Y” configuration. The buildings are single floor with basement mechanical and electric rooms in one wing. The brick is unreinforced. Although there has not been a formal structural evaluation of the buildings it is reasonable to conclude that the buildings do not meet current building code seismic requirements. In order to meet current building code seismic requirements there will need to be additional structural elements added to the building walls (likely interior and exterior) and the roof structure. The seismic upgrades could significantly impact the building configuration.
- ***HVAC:*** The buildings are individually heated by steam from boilers in the basement mechanical room. The boilers in all six buildings have recently been replaced. There is air conditioning in one of the building. The buildings are heated with forced air distributed through an underfloor plenum system between concrete floor slabs with floor registers at the building perimeter.



Figure 8: PAT ‘N’ Aerial View

There are no damper controls to adjust air volumes other than the floor registers resulting in uneven heating in the rooms. There are transfer grilles in the walls of the plumbing chases in the bathrooms that allow air flow through pipe spaces containing piping insulated with asbestos.

- HVAC (continued): In 2016, repairs were made in the Birch Building to the underfloor sewer lines that had rusted through. The leaking pipes have allowed sewage to leak into the underfloor air distribution system creating a significant air quality problem. It can be assumed that similar problems exist in the other "Y" Buildings. From a comfort and air quality standpoint the current HVAC system is not adequate to serve the needs of the building occupants. A new HVAC system will need to be installed in the building and the existing under floor system abandoned. The upgrade of the heating system should include air conditioning and adequate ventilation.
- Plumbing: As discussed in the HVAC section above the underslab waste piping system is currently badly deteriorated. There is also asbestos insulation on the above grade piping in the walls. The current waste piping will need to be replaced and the asbestos insulation will need to be mitigated.
- Fire Sprinkler System: The buildings all currently have fire sprinkler systems, although the campus wide water system is not adequate to serve all six buildings.
- Electrical: The building electrical systems appear to be adequate for the building needs. The buildings have emergency power. There is a current study being conducted to upgrade the electrical distribution system on campus including emergency power.
- Building Exterior: The exterior windows are aluminum, single-glazed windows without thermal breaks. Some of the glazing has been replaced with Plexiglas. Some window glazing beads are missing. The windows need to be replaced in all six buildings.
- Energy Code: There is no insulation in the exterior brick walls. The roof has little if any insulation. The exterior windows are single pane. It is safe to assume that no perimeter insulation exists at the building perimeter. Attic ventilation is a source of heat loss from the buildings. The Washington State University Energy program has done a preliminary energy analysis of the Y-Buildings, located in Appendix A.
- Building Functions: State regulations for Nursing Homes (WAC 388-97-340) require a toilet room directly accessible from each resident's room that serves no more than two residents. The current buildings do not provide the number of toilets required. The current building staff typically transport residents to the toilet and bath facilities and do not anticipate the need for the number of toilet facilities required. This issue needs to be addressed with regulatory agencies for future remodeling of the facilities or the construction of new facilities. Adding additional toilets to the existing buildings would be very difficult and likely reduce the resident capacity of the building.
- Costs: The cost to renovate the six buildings is significant. Virtually every element of the buildings need to be addressed; the structure, HVAC, plumbing, the building envelope and energy issues. They represent code issues and as well as the functionality of the building and comfort of the patients in the building. The preliminary estimated cost to renovate the six buildings is \$18,720,000. The cost assumes a cost of \$225 per square foot.
- Summary: The "Y" Buildings are in serious disrepair and in need of upgrades in every aspect; structural, HVAC, plumbing and energy efficiency. Housing the residents in five separate buildings requires additional staff and movement of residents to other buildings on campus for treatment not available in the individual "Y" buildings. Given the estimated costs and building functional constraints, it may be infeasible to renovate the buildings.

Adult Training Programs (ATP) Evaluation

The ATP Building provides Adult Training Programs for the individuals with intellectual disabilities on campus. (See the attached floor plan for the building located in the Appendix of this document). The 52,633 SF wood frame building was built in 1942 as a part of the original construction as a Navy hospital. The building consists of a long central corridor with six narrow wings off each side. The configuration

contributes to a large percentage (29%) of the space dedicated to corridor and circulation space making it an inefficient space for the training function it currently houses.

A little over half of the building space is devoted to Adult Training Programs. The spaces are primarily used for workshops where individuals with intellectual disabilities

perform simple tasks such as shredding documents, creating coaxial cables, recycling, etc. The building also provides space for offices, administration and support services. The functions use the rooms that are available rather than having spaces that fit the function. As a result, the rooms are very inefficient with more actual square footage devoted to the uses than necessary. (See the attached square footage summary.)

Almost half of the building is occupied by functions that are not related to the Adult Training Programs. While many of the function are services that directly help the clients on campus, there are some functions such as Human Resources that do not provide services for the Fircrest School campus. These services are on the Fircrest School campus just because the space is available.

- ***Structural:*** The building is wood frame construction with pitched roofs with asphalt shingles. The building has a crawl space with the floors and walls support by wood posts on pier blocks. There are no concrete footings to support the structure. As a result, there is significant settling of the floor in the building. The exterior sides of the crawl spaces are enclosed with vertical wood siding. There are gaps and openings providing easy access for rodents and various other animals such as rabbits that inhabit the campus. While no structural analysis has been done it is readily apparent that the building does not meet current building code standards for wind or seismic and possibly snow loads.
- ***HVAC:*** The building is heated by steam from the central steam plant on campus. There are no heating controls; the system is either on or off. There is no air conditioning. Ventilation is only available through openable windows.



Figure 9: Existing ATP Building

- **Fire Sprinkler System:** The building does not have a fire sprinkler system.
- **Electrical:** The building electrical systems appear to be adequate for the building needs. There is a current study being conducted to upgrade the electrical distribution system on campus including emergency power.
- **Building Exterior:** The building has painted horizontal wood siding. The roof is asphalt shingles. Most of the exterior windows are wood, single-glazed, double-hung windows, but there are some vinyl windows in the main central corridor. The building has area separation walls that extend above the roof line by 2 feet. The floor is approximately 30" above the surrounding grade. The resulting crawl space is enclosed with vertical wood siding, but is in disrepair.
- **Energy Code:** There is no insulation in the exterior wood walls. The roof has little if any insulation in the attic. The exterior windows are single pane. The crawl space, while enclosed, is essentially open to the outside air. There doesn't appear to be any floor insulation.
- **Building Functions:** The building does not serve the need of the users. It is very disjointed with long hallways making access between functions very inefficient. ATP functions are spread out all over the building. Functions are put into rooms just because they are there, not because they function well in the space or the size is appropriate. The non-ATP functions are located in the building again because the spaces are available, not because it was the best solution to serve the needs of the individual functions.
- **Summary:** The building was built almost 75 years ago. It was not intended to serve the functions it currently houses. Given the building's state of repair it is not practical to attempt any upgrades to the building to meet current building codes.



Figure 10: Existing north end of the ATP Building

PAT 'A' (Independent Living Cottages) Evaluation

The Fircrest School campus also has 10 buildings that function as Intermediate Care Facilities for Individuals with Intellectual Disabilities (ICF/ID). These facilities are commonly referred to as 'the cottages'. These facilities have 24-hour supervision, and medical/nursing services for Medicaid eligible clients who are in need of the active treatment services. They also provide individualized habilitative services that support and enhance individual skills and strengths for patients with intellectual disabilities. The facilities have a total of 160 beds, but currently house 133 clients, which are considered full capacity. The ten buildings have essentially the same floor plan with some variations in the bedroom configurations. The following is an evaluation of the current condition of the PAT "A" buildings: (See attached floors plans for all 10 buildings located in the Appendix).

- *Structural:* The buildings are constructed of structural brick with interior walls fully sheathed with lath and plaster or wallboard. The roof structure is wood framed with cedar shingles above the brick and asphalt shingles roofing. The buildings have clerestory windows and skylights. There have been issues with leaking roofs.
- *HVAC:* The cottages have individual heating systems running off the campus wide steam system. The heating equipment is past its serviceable life and will need to be replaced. The buildings do not have central air conditioning, although there are some portable air conditioners that have been purchased by patients. The buildings have trouble maintaining consistency room temperature; it is often too hot or too cool.
- *Plumbing:* The buildings have had problems with the water heaters. The campus in general has problems with the quality of the drinking water. The campus provides bottled water for the buildings.
- *Fire Sprinkler System:* The buildings are protected by a 13-D fire sprinkler system in the living areas and an automatic fire alarm system with corridor smoke detectors.
- *Electrical:* The buildings are served by a single emergency generator.
- *Building Exterior:* The buildings have exterior patios at the rear of the duplexes for limited outdoor activities for the patients.
- *Energy Code:* The buildings do not have wall insulation, although the structural brick does have a plaster or wallboard on the interior face. It is assumed there is minimal attic insulation. The buildings do not meet the current energy code.
- *Summary:* The buildings are adequate to serve the function they are designed for, but need upgraded HVAC, roof repairs, water heater repairs, and general upgrade of the interior building finishes. Some reorganization of the existing layout could provide for a more independent living style. Some of the functions could be more efficient, including the duplication of some spaces such as the kitchen (a commercial kitchen prepares meals for residents), laundry, and trash enclosures that provide an unsightly appearance from the exterior.

Commissary Building Evaluation

The Commissary Building (Building #24) houses the purchasing and distribution center for all consumable good for the campus.

- **Structural:** The building is a dock high, slab on grade, wood frame construction with a pitched roof with asphalt shingles. The building is broken up into a number of spaces which do not function well for a warehouse with a lot of wasted space. The building is in poor condition. While no structural analysis has been done it is readily apparent that the building does not meet current building code standards for wind or seismic and possibly snow loads.
- **HVAC:** The building is heated by steam from the central steam plant on campus. There are no heating controls; the system is either on or off. There is no air conditioning. Ventilation is only available through operable windows and doors.
- **Fire Sprinkler System:** The building does not have a fire sprinkler system.
- **Electrical:** The building electrical systems appear to be adequate for the building needs. There is a current study being conducted to upgrade the electrical distribution system on campus including emergency power
- **Building Exterior:** The building has painted wood siding. The roof is asphalt shingles. The exterior windows are wood framed, single-glazed, double-hung windows. The building has loading docks on the east west sides of the building.
- **Energy Code:** There is no insulation in the exterior wood walls. The roof has no insulation. The exterior windows are single pane.
- **Summary:** The building was built almost 75 years ago. It was not intended to serve the function it currently serves. The functions and storage spaces are used because the space is available. Given the building's state of repair it would take a fair amount of work to upgrade the building to meet current building and energy codes.



Figure 11: Existing Commissary Building (far left) and several support services buildings

Support Services Evaluation

There are a number of buildings on the Fircrest School Campus that provide support services for the patients that reside on campus and the associated buildings. The following is an evaluation summary of these buildings:

- Steam Plant (Building #28):** The Steam Plant provides the centralized heating system for most of the buildings on campus; the exception being the “Y” Buildings that have been converted to individual boilers in each building. This includes the PAT ‘A’ residences, 500 Building, 200 Building, ATP, kitchen, laundry, all the maintenance shops, commissary, and the DOH Public Health Lab. The plant has four steam boilers; whereas, one boiler has been decommissioned. The functioning boilers are sized for 33%, 66% and 100% of full load. They appear to be well maintained. The building is in poor condition, but the Steam Plant needs to be maintained until another heating source is created for the individual buildings.
- Laundry Building (Building #31):** The Laundry building provides centralized laundry services for the residential buildings on campus. The residential buildings on campus do have individual washers and dryers, but do not handle the daily bedding and linen laundry needs of the buildings. The laundry facility is functional, but the current layout is ineffective for controlling contamination from the dirty clothes to the clean clothes, and inefficient for workflow. The Laundry building is in poor condition, but as with the Steam Plant building needs to continue to operate to serve the needs of the campus residential population.
- Kitchen (Building #39):** The kitchen building was built in 1987 and is the newest building on the campus. It is a 21,050 SF pre-engineered metal building. It provides food services and dining facilities for the campus residents. Most of the campus residents eat their meals in the kitchen building; however the Kitchen does deliver meals to residents that are not physically able to get to the Kitchen, mainly in the “Y” Buildings. The Kitchen has a meal capacity of about twice the meals it currently serves on a daily basis. The main freezer and coolers in the Kitchen have recently been replaced.



Figure 12: Existing Kitchen Building (middle) and Steam Plant (bottom center)



Figure 13: Existing Kitchen Building

- Chapel (Building #64): The Chapel is open for services every Sunday morning. The Chaplain also maintains office hours on a somewhat irregular schedule. Services are attended by Fircrest School residents and some family members. The Chapel is eligible for the National Register of Historic Places (NRHP) and could potentially be designated a State landmark and/or added to the NRHP if a separate process is pursued by DSHS or another entity.
- Administration Building (Building #65): The administration building is a 3-story concrete and brick building that houses the campus administrative and support services for the campus. The first floor is vacant. The building has a ramp to provide second and third floor access to grade, but also has elevators. The building has had an upgraded HVAC installed. The building is in good condition.
- Activities Building (Building #67): The Activity Building is currently being used for ATP training and other programming. The brick building has a swimming pool and a gymnasium along with offices and activity spaces. The Fircrest School Campus does not currently have the funds available to operate the pool for its residents or the greater community. The pool is in good condition, but the heating, ventilation and filtration systems need to be upgraded. The remainder of the building is in good condition, although it has suffered from not being maintained for several years.

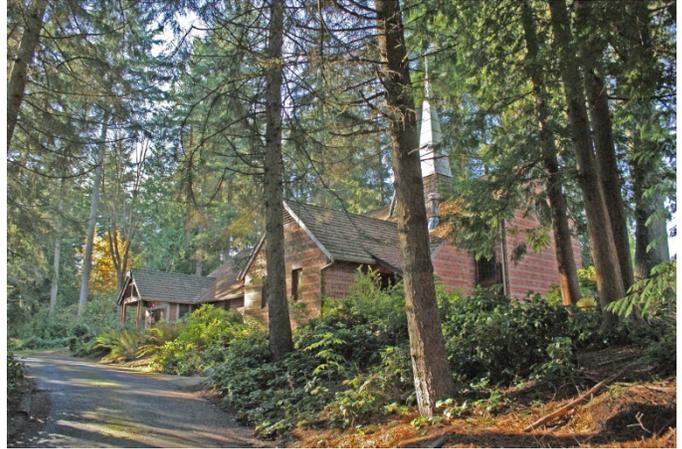


Figure 14: Chapel



Figure 15: Administration Building



Figure 16: Activities Building

Maintenance & Storage Evaluation

There are a number of buildings on the Fircrest School Campus that provide maintenance and storage services for the Fircrest School Residential Habilitation Center operations. There are five buildings that were part of the original construction on the site in 1942. The buildings house the maintenance and storage functions that support the campus operations and they are associated with the Commissary function on campus.

- *Building Functions*
 - *Plant Mechanics Shop (Buildings #25 - #27) and Warehouse (Building #91):* The Plant Mechanics Shop and the Warehouse buildings store equipment and appliances required for building operations.
 - *Carpentry & Plumbing Shop (Building #34) and Paint Shop (Building #43):* The Carpentry & Plumbing Shop and the Paint Shop store materials and parts necessary to keep the buildings and infrastructure operating.
 - *Plant Operations (Building #35):* The Plant Operations building houses the staff that maintains the physical facilities for the campus. The building also contains the motor pool that maintains the campus vehicles.
- *Shingle/Roofing:* The Carpentry and Plumbing Shop building and the Plant Operations are dock high facilities, while the remaining three buildings and the motor pool are slab on grade structures. The buildings are in poor condition. While no structural analysis has been done it is readily apparent that the buildings do not meet current building code standards for wind or seismic and possibly snow loads.
- *HVAC:* The buildings are heated by steam from the central steam plant on campus. There are no heating controls; the system is either on or off. There is no air conditioning. Ventilation is only available through operable windows.
- *Fire Sprinkler System:* The buildings do not have fire sprinkler systems.
- *Electrical:* The building electrical systems appear to be adequate for the building needs. There is a current study being conducted to upgrade the electrical distribution system on campus including emergency power.
- *Building Exterior:* The buildings have painted wood siding. The roofs are asphalt shingles. Most of the exterior windows are wood, single-glazed, double-hung windows. The Paint Shop and the Warehouse have area separation walls that extend above the roof line by 2 feet.
- *Energy Code:* There is no insulation in the exterior wood walls. The roof and/or attic have little if any insulation. The exterior windows are single pane. There doesn't appear to be any floor insulation in the crawl space of the Carpentry & Plumbing Shop
- *Summary:* The buildings were built almost 75 years ago. They were not intended to serve the functions they currently serve. The functions and storage spaces are used because the space is available. Given the building's state of repair it is not practical to attempt any upgrades to the buildings to meet current building and energy codes.

Food Lifeline Warehouse Evaluation

The Food Lifeline Warehouse was constructed in 1991 as a storage and distribution center for Food Lifeline. Food Lifeline provides 90,000 meals to persons in need throughout Western Washington by delivering donated food to food pantries, food banks and food assistance programs. Food Lifeline has recently relocated its operation to south Seattle. The former warehouse building is currently being used for temporary storage of office equipment for DSHS.

- *Structural:* The building is a dock high pre-engineered metal building with a 2-story 3,172 SF office space in the southwest corner. The building contains a 2,420 SF freezer and a 1,440 SF cooler with an under floor air circulation system to prevent freezing. The building has a 24' eave height. A 520 SF modular conference room has been added in the warehouse space.
- *HVAC:* The building's office space is heated by the campus supplied steam system with unit heaters in the warehouse spaces. A separate heating system has been added for the warehouse conference room. The building walls and ceiling are insulated.
- *Fire Sprinkler System:* The building has an automatic fire sprinkler system.
- *Electrical:* The building is served by an 800-amp, 208/120 volt, 3-phase electrical system.
- *Building Exterior:* The building exterior consists of metal wall and roof panels typical of pre-engineered metal buildings. The dock high building has four sets of stairs and two ramps for ADA access and truck access. There are seven overhead doors with a dock leveler at one of the doors. The overhead doors have a canopy for rain protection.
- *Energy Code:* The building was insulated to meet the energy code in 1991, but does not meet the current energy code requirements.
- *Summary:* The building is reasonably good condition, but shows the typical wear for a 25-year old pre-engineered metal building. It is reasonable to assume it can continue to function as a warehouse office space for Fircrest School campus uses.

Site Infrastructure Evaluation

The preliminary site infrastructure evaluation was conducted as part of the long-range planning for the campus. Generally speaking, water, sewer, and electric are distributed across the campus and services individual buildings. The current system design is somewhat challenging in the event future, third party users are introduced to the property; it is important to upgrade the systems so that Fircrest School is on its own systems and other users have their own meters.

Stormwater Management

The existing site is developed, and there are no known stormwater flow control facilities on site. This is verified by a discussion with a city planner at the City of Shoreline's Planning and Community Development Department. With the recent redevelopment of the DOH Public Health Lab, the storm infrastructure would have been updated to current drainage code. Portions of the existing site are served by an underground storm system. It is assumed that the storm system generally follows along the southerly topography and discharges to a public storm system in NE 150th Street. The remainder of the site appears to sheet flow to roadside ditches or flat lawn areas.

Geotechnical analyses conducted in 2002 as part of a prior planning process identified that that poor soil infiltration results in standing water in many of the flat areas of the Campus, especially in low-lying areas, during storm events. Future site improvements will require stormwater management facilities to comply with current requirements. The City has adopted the 2012 Stormwater Management Manual for Western Washington amended in 2014, which requires Flow Control, Water Quality Treatment as well as Onsite Stormwater Management (aka Low Impact Development / LID). This should be considered as part of any major building renovations and new site construction proposals. Furthermore, there is an opportunity to develop separate stormwater management systems for Fircrest School and other third party users.

Water

North City Water District (NCWD) is the service provider and the existing system was reviewed with district staff. The site is served presently by a water system that is looped through the site with 8" and 6" water mains. The existing system is owned by DSHS and not NCWD. The district has stated that they believe the existing water system is leaking and will need to be replaced and/or upgraded. New water improvements will be owned and maintained by NCWD with an easement granted to the purveyor. The district would also require storage tanks to be installed to ensure proper fire protection flows. The current system leaves little opportunity to assign water service separately between the Fircrest School and future third party users. There is opportunity to develop a new system that allows Fircrest School to be on its own service while resolving the water leakage issues.

Sanitary Sewer

The site is served by an existing sewer main owned and maintained by the Ronald Wastewater District (RWWD). This is verified through staff interviews with RWWD's Planning and Development Department. RWWD purchased the sewer lines from the State approximately 5 to 6 years ago. When RWWD bought the system, it was in poor condition and many maintenance procedures were performed, mostly cleaning. The campus has excellent coverage with sufficient capacity. Some system modifications are needed to place the Fircrest School on a separate system so that potential future third party users can have their own services.

Electrical Service

Electrical service extends from NE 150th Street and is distributed to the site accordingly. Seattle City Light is the electricity purveyor. DSHS currently has a comprehensive plan being developed by other consultants for current system mapping and future system needs. This includes rewiring and installing an emergency backup system. A comprehensive electrical system capital improvement plan is being studied concurrent with this report.

Natural Gas

Natural gas exists on the property and is serviced by Puget Sound Energy (PSE). A study of future needs has not been completed as a part of this master plan. Natural gas extensions will occur on an as needed basis as a result of Fircrest School and third party development.

4.3 WSU ENERGY AUDIT

Washington State University Energy Program prepared an Energy Assessment Walkthrough of the Fircrest School Campus dated July 28, 2016. They evaluated the energy inefficiencies of the school relative to similar sites in Seattle, Washington. According to the report, the maintenance and operations of the campus appear to be exceptional, especially given the age of the facility. **A copy of the full report is located in the Appendices.

However, the team from the WSU Energy Program that visited the school in July 2016 emphasize that the infrastructure is failing beyond repair. Further, it might be time to consider a complete needs assessment of those who work or live at the facility, and the best options to meet these needs. The facility has not aged well, and continuing to patch problems may not be the best path at this juncture.

This facility uses significantly more energy that it should, which provides great opportunities to save energy and reduce pollution. For comparison:

- The Fircrest School is a 440,639 square foot facility and uses about 300 kBtu/sf/yr
- The national average for a small hotel in Seattle is 69 kBtu/sf/yr
- The national average for an apartment is 38 kBtu/sf/yr
- The national average for a hospital is 139 kBtu/sf/yr

5.0 FACILITY IMPROVEMENT OPPORTUNITIES

Nearly all of the buildings on the Fircrest School campus require some level of improvement for their ongoing use as a Residential Habilitation Center. Many of the buildings date back to the 1940s; the buildings were originally designed to serve previous uses but have been incrementally modified to serve their current functions. In many cases, the building adaptive reuse has not been effectively implemented, thus, creating awkward building layouts and operations. Most buildings require some work to conform to current building codes and to increase the efficient use of the structure.

5.1 - BUILDING IMPROVEMENT SOLUTIONS/OPTIONS

The Fircrest School buildings were analyzed to determine the specific capital improvements necessary to continue to provide the intended level of service and operations well into the future. For some buildings, there are multiple options to maintain and improve upon the operations. For others, there is one recommended action for said facility based (i) operational changes that have occurred over the years or (ii) the building conditions are such that no other reasonable options are available (e.g. substantial disrepair, building code deficiencies). The following subsections provide options and recommended actions for each building to address the findings from Part 4 of this report.

PAT 'N' Potential Facility Improvements

The PAT 'N' operations that currently occur in the "Y" Buildings could be greatly improved upon with some facility improvements. Currently, there is a list of deferred maintenance items that need to occur in the near future. The administration can choose to make the capital improvements or pursue other options. There are three possible options to continue to operate long term nursing care for the residents at Fircrest School:

- **Option #1 / Renovate the Existing "Y" Buildings (All 6 Buildings):** The "Y" Buildings have serious deficiencies and are in need of upgrades in every aspect; structural, HVAC, plumbing and energy efficiency. Housing the residents in five separate buildings requires additional staff and movement of residents to other buildings on campus for treatment not available in the individual "Y" Buildings.

The renovation of the existing "Y" Buildings is the most expensive option. Regardless of the cost, this option is less desirable because of the separation of the facilities and requirement to transport residents to other buildings on campus for services. Because of space restrictions in the buildings, staff that provide services within the "Y" Buildings have offices elsewhere on campus. This option is the least desirable choice to house the residents currently in the "Y" Buildings.

- **Option #2 / Relocate Nursing Facility to Building #66 (Requires Construction of New ATP Building):** Building #66 is an un-used 3-story brick and concrete building on campus that is the same floor plan as Building #65 that was previously remodeled to provide administrative offices on campus. The 3-story building has two elevators, but also has ramp access to grade on the second and third floors. The building consists of four wings with an open core. The building can be enclosed to provide 51,650 SF of space. Interior brick bearing walls provide some limitations for functions, but a preliminary layout of spaces (*see floor plans on the following pages*) in the building indicate that the building can serve the needs of a nursing facility to replace the "Y" Buildings. Some openings will have to be made in bearing walls to accommodate circulation. Because of the WAC requirements for residents' room and Day

Rooms to be on an exterior wall, the existing building is limited to 68 beds versus the 90 beds of the current "Y" buildings. The plans assume the requirement for toilets will remain. Additional residents can be accommodated if an exception to the toilet requirements can be achieved.

In order to provide space for the 90 beds currently provided by the existing "Y" Buildings it will be necessary to expand the building to add 22 beds. The logical expansion on the first floor is to the north. The expansion provides the required exterior wall exposure required for patient rooms and day rooms. The addition provides 10,200 square feet of new space.

The renovation of Building #66 is the least expensive option. It has the advantages of providing a single building for the nursing facilities and it uses an existing building on campus that is currently vacant. Although the building has more square footage than required (much of it is open space), it has limited exterior wall space to provide the number of beds and day rooms required to replace the "Y" Building capacity. Even though this is a 3-story building it does have ground floor access with ramps at the second and the third floors. The operation of a single building may result in a reduction in staffing costs, pending a more detailed review of staffing needs.

- Option #3 / Construct a New Single Story Building on Campus:** There are two preliminary plan options that have been developed (See attached floor plan #1 and #2). As with the remodeling of Building #66, the toilet requirement has been met. The plans are preliminary and only represent space allocation of functions for the purposes of developing gross square footages for costing. The layouts reflect the WAC requirements to have residents' rooms and Day Rooms on exterior walls. Option #1 provides 39,000 SF and Option #2 has 39,650 SF.

The construction of a new building on one level satisfies all of the needs for the replacement of the "Y" Buildings. It provides a single building that can house all of the staff and functions required for the long term care of the residents. If cost were not an issue this would be the preferred option. The operation of a single building may result in a reduction in staffing costs, pending a more detailed review of staffing needs.

Costs: Preliminary estimated maximum allowable construction costs for the three options are based on 2016 SF costs. These costs do not include soft costs such as consulting fees, permitting, sales tax, etc. The square footages came from the existing building drawings included in this report and the preliminary designs prepared for the remodeled Building #66 and the new building designs.

- Option #1: Renovate the Existing "Y" Buildings (All 6 Buildings):**

Renovate existing 6 buildings: 83,200 SF @ \$225/SF = \$18,720,000

- Option #2: Relocate Nursing Facility to Building #66 (Requires Construction of New ATP Building):**

Renovate Building #66:	51,650 SF @ \$200 /SF	=	\$ 10,330,000
Expanded First Floor	10,200 SF @ \$325 /SF	=	<u>\$ 3,315,000</u>
	TOTAL	=	\$ 13,615,000

- Option #3: Construct a New Single Story Building on Campus:**

New Building:	39,650 SF @ \$325 /SF	=	\$ 12,900,000
Site Improvements:		=	<u>\$ 2,500,000</u>
	TOTAL	=	\$ 15,400,000

Recommendations/Considerations:

- Option #1:** The renovation of the existing “Y” Buildings is the most expensive option. Regardless of the cost, this option is less desirable because of the separation of the buildings and requirement to transport residents to other buildings on campus for services. Because of space restrictions in the buildings, the PAT ‘N’ staff has offices elsewhere on campus. This option is the least desirable choice to house the residents currently in the “Y” Buildings, and if chosen, will require the construction to be phased over six phases to allow the buildings to be renovated one by one, with current patients housed in the empty building.
- Option #2:** The renovation of Building #66 is the least expensive option. It has the advantages of providing a single building and it uses an existing building on campus that is currently vacant. The building has additional square footage that cannot be used for client rooms and day rooms because of limited exterior wall exposure to provide the number of beds and day rooms required to replace the “Y” Building capacity. In order to provide the required 90 beds to replace the “Y” Buildings, an additional 10,200 SF of space needs to be added on the first floor. Even though this is a 3-story building it does have ground floor access with ramps at the second and the third floors. The operation of a single building may result in a reduction in staffing costs, pending a more detailed review of staffing needs.
- Option #3:** The construction of a new building on one level satisfies all of the needs for the replacement of the “Y” Buildings. It provides a single building that can house all of the staff and functions required for the long term care of the clients. If cost were not an issue this would be the preferred option. The operation of a single building may result in a reduction in staffing costs, pending a more detailed review of staffing needs.

Potential Floor Plans:



Figure 17: PAT ‘N’ Potential Improvements - Option 2 - Building #66 Remodel
First Floor General Layout



Figure 18: PAT 'N' Potential Improvements - Option 2 - Building #66 Remodel
Second and Third Floors General Layout

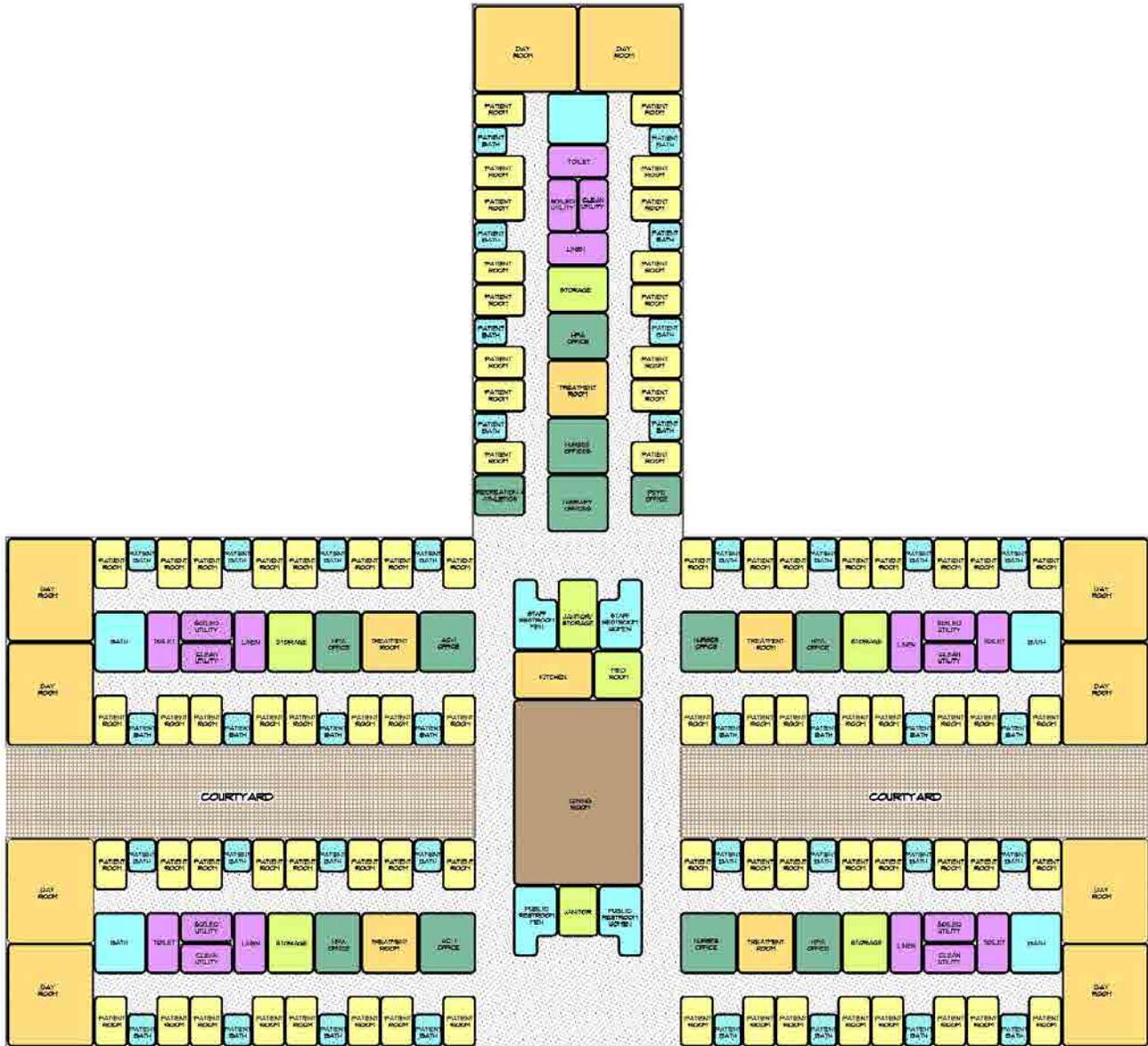


Figure 19: PAT 'N' Potential Improvements - Option 3 - New Building - Alternative A

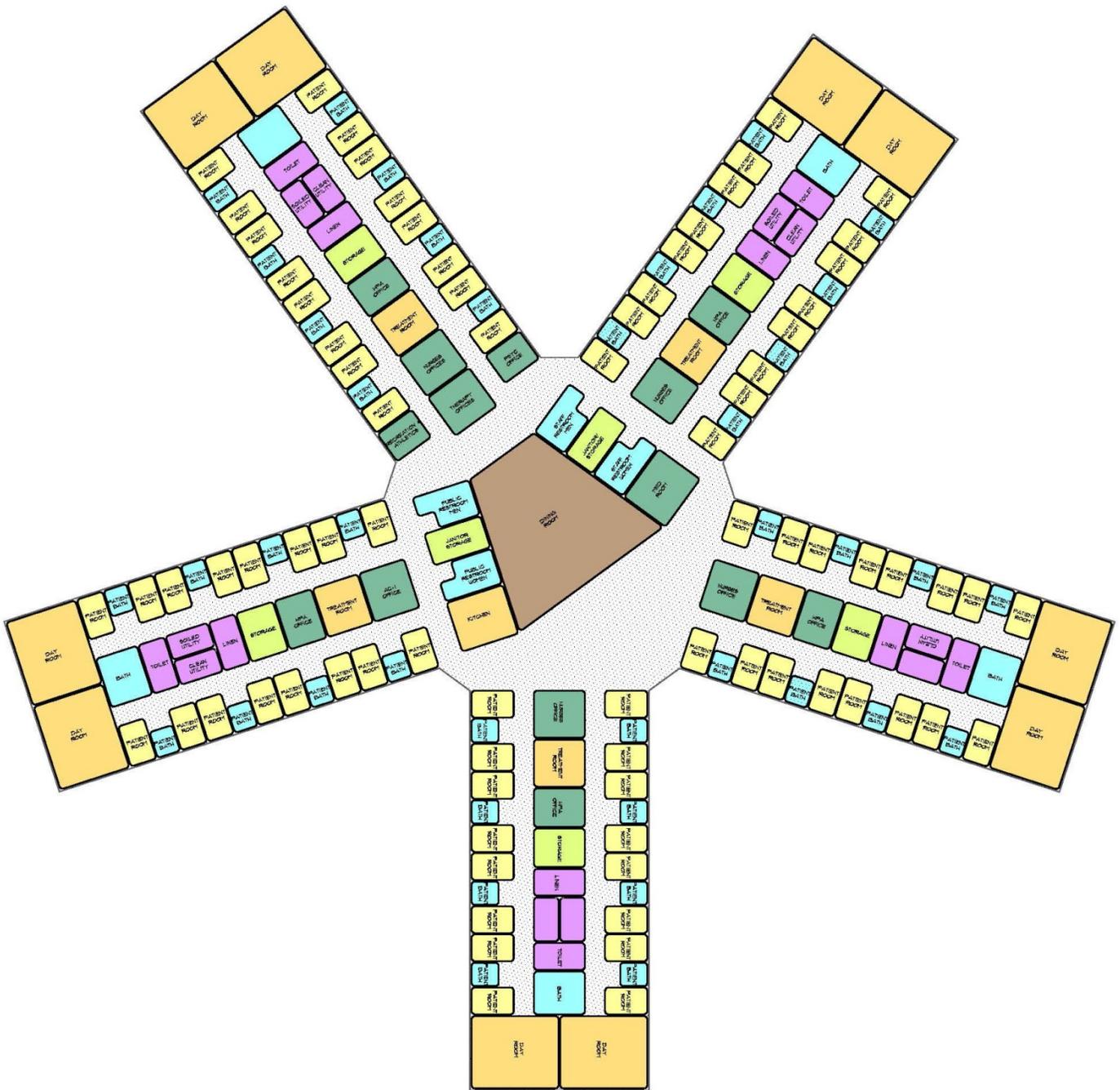


Figure 20: PAT 'N' Potential Improvements - Option 3 - New Building - Alternative B

Adult Training Programs (ATP) Potential Facility Improvements

The existing 52,633 sf ATP Building, as discussed before, is inadequate to serve the needs of the Adult Training Program. The Adult Training Program currently occupies 19,982 square feet in the existing building. The square footage is very inefficient because of the way the usage is spread out in the building in mostly small spaces. The existing building also exhibits inefficiencies as they relate to service programming and heating/cooling.

The existing ATP Building provides space for the following ATP related functions.

- **Workshops** – The workshops provide space for Fircrest School clients to perform basic tasks such as shredding documents, creating coaxial cables, recycling, etc. The workshops work best in smaller configurations allowing more individual control with ATP staff.
- **Administrative** – Space for ATP administrative office staff, contract services and office space for staff working with individual workshops.
- **Support Services** - Includes dining, laundry, classrooms, housekeeping, staff spaces, etc.
- **Storage**
- **Restrooms**

The existing ATP Building also provides space for ten additional non-ATP related functions. These non-ATP functions take up 17,430 square feet in the existing buildings. With the exception of Human Resources, all of the functions are necessary services to be provided on the Fircrest School campus.

- | | | |
|--------------------|------------------------------------|---------------------------|
| • Human Resources | • Staff Training | • Classroom |
| • Combined Therapy | • Wheelchair Repair Donation Store | • Assessment Office |
| • Audiology | • Housekeeping / Laundry | • Misc. Offices (Non-ATP) |

Potential Facility Improvements for ATP related functions:

When considering the existing operational needs and the current building deficiencies, it is assumed that the most viable option would be to move current operations to other buildings and decommission the existing building. Given the building’s age, condition and awkward layout, it is assumed that an option to retrofit the existing building would be vastly cost prohibitive; thus, a renovation analysis was not conducted. The options below lay out the facility improvements that would be necessary to move the ATP functions to an existing building on campus (Building #66) or to construct a new building to house the ATP functions. In both options, the non-ATP functions would be relocated to Building #65 (*more analysis for the non-ATP functions is in the following subsection*).

- **Option #1 / Construct New ATP Building (to Allow Relocation of Nursing Facilities to Building #66):** Rather than construct a new building there is an opportunity to use the space available in the existing vacant Building #66 on campus. The building is a 3-story brick structure similar to Building #65 that house Fircrest School’s administrative services. To provide the space necessary for the ATP function it would require using two of the three floors in the building. The building has two elevators, but the building is configured with the second floor provided at grade access by the way of ramps on the west side of the building. This is important with the limited mobility of Fircrest School’s clients.
- **Option #2 / Construct New ATP Building (to Allow Relocation of Nursing Facilities to Building #66):** A new building could be constructed to support the existing and expanded adult training programs. With a new building, additional space could provide the opportunity to develop additional adult training programs. For planning purposes, it should be assumed that a new ATP Building would need approximately 23,000 square feet to meet their current and future needs.

Costs: Preliminary estimated costs for the two options are based on 2016 SF costs. The square footages came from the existing building drawings included in this report and the preliminary designs prepared for the relocating and remodeling part of Building #65 and the new building designs.

- **Option #1 / Construct New ATP Building (to Allow Relocation of Nursing Facilities to Building #66):** The estimated cost to remodel the first and second floors of Building #66 to provide space for the ATP functions should cost in the range of \$225 per square foot. The total cost to remodel the two floors of Building #66 would be \$5,137,425 for the 22,833 square foot space.

Renovate Building #66: 22,833 SF @ \$225 /SF = \$ 5,137,425

- **Option #2 / Construct New ATP Building (to Allow Relocation of Nursing Facilities to Building #66):** The estimated cost to construct a new 23,800 square foot building on campus to provide a facility for the Adult Training Program should cost in the range of \$325 per square foot or \$7,735,000.

New Building: 23,800 SF @ \$325 /SF = \$ 7,735,000

Recommendations: The age, condition and configuration of the existing ATP Building make it unsuitable to serve the current and future needs of the Adult Training Program as well as the non-ATP related functions currently residing in the building. To properly serve the Adult Training Program’s current and future needs it is recommended Building #66 be remodeled to provide a new space for the ATP functions. A savings of over \$2.5 million and the use of an existing vacant building located centrally on campus makes this option the best choice.

Potential Facility Improvements for non-ATP related functions:

The non-ATP functions take up 17,430 square feet in the existing buildings. With the exception of Human Resources, all of the functions have a relationship with services provided on the Fircrest School campus. Rather than construct a new building on campus, Building #65, the current administration building, has a vacant first floor with 18,356 square feet of available space. The building would require remodeling, but it would be the more cost-feasible solution to provide space for these non-ATP functions.

- **Option #1 / Relocate non-ATP Operations (to Building #65):** The non-ATP operations could be relocated and consolidated in the ground floor of Building #65 / Administration Building. The first floor is vacant with 18,356 square feet of available space. The building would require remodeling, but it would be a feasible solution to provide space for these non-ATP functions.

Costs: Preliminary estimated maximum allowable construction costs for the three options are based on 2016 SF costs. These costs do not include soft costs such as consulting fees, permitting, sales tax, etc. The square footages came from the existing building drawings included in this report and the preliminary designs prepared for the relocating and remodeling part of Building 65 and the new building designs.

- **Option #1 / Relocate non-ATP Operations (to Building #65):** The estimated cost to remodel the first floor of Building #65 to provide space for the non-ATP functions in the current building should cost in the range of \$225 per square foot. The total cost to remodel the first floor of Building #65 would be \$4,130,000 for the 18,356 square foot space.

Renovate Building #65: 18,356 SF @ \$225 /SF = \$ 4,130,000

Recommendations: The ten (10) non-ATP functions can be relocated to a remodeled first floor of the existing Building #65. This will allow the new ATP building to serve the current and future needs of the Adult Training Program. The location on the first floor of the Administration Building works well for the relationship with administration and is closer to clients some of these functions serve.

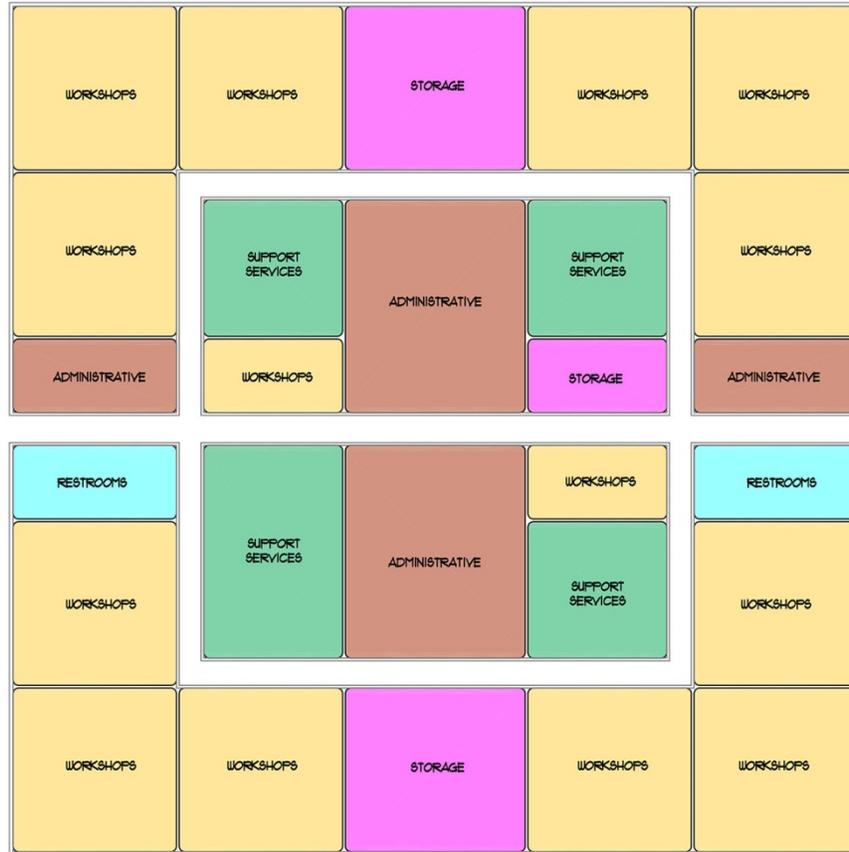
Potential Floor Plans:



Figure 21: ATP Potential Improvements – ATP Functions - Option 1 – Potential Expansion of Building #66
General First Floor Layout



Figure 22: ATP Potential Improvements – ATP Functions - Option 1 – Potential Expansion of Building #66
General Second Floor Layout



NEW ATP BUILDING

	WORKSHOPS	11,486 SF
	ADMINISTRATIVE SPACES	3,380 SF
	SUPPORT SERVICES	7,905 SF
	STORAGE	2,323 SF
	RESTROOMS	808 SF
	CIRCULATION	2,261 SF
	TOTAL	<u>23,844 SF</u>

Figure 23: ATP Potential Improvements – ATP Functions - Option 2 – New ATP Building



Figure 24: ATP Potential Improvements – Non-ATP Functions - Option 1 – Relocate Non-ATP Functions

PAT 'A' Potential Facility Improvements

The cottages currently house 133 individuals with intellectual disabilities, which is considered full capacity. The buildings are an important part of function of the Fircrest School Residential Habilitation Center operations. It is imperative that they remain to continue the program. However, they need to be upgraded to provide the level of care expected on the campus. The buildings need the following upgrades:

- Replace the HVAC systems
- Reroof the buildings (8 of 10 buildings; 2 buildings were reroofed in 2017)
- Replace the water heaters
- General upgrade of the building finishes

During the remodel of the existing Cottages it will be necessary to either provide a new Cottage to temporarily house the patients from the Cottages being remodeled or to lower the census enough to vacate one cottage completely. A new Cottage will provide additional capacity for the Pat "A" function once the cottage remodeling is completed. In addition, there may be residents that require special living conditions that require more personal space and separation of other residents. A new cottage will allow for this program flexibility.

- **Option #1 / Address Deferred Maintenance and Construct One New Cottage:** This option includes several action items of deferred maintenance that should be conducted to keep these buildings in good working condition. The following actions are needed to maintain the PAT 'A' facilities:
 - **Action #1 / Replace the HVAC systems**
 - **Action #2 / Reroof the buildings**
 - **Action #3 / Replace the water heaters**
 - **Action #4 / General upgrade of the building finishes**
 - **Action #5 / Construct one new cottage**
- **Option #2 / Address Deferred Maintenance and Reduce Census to Vacate One Cottage**
This option includes several action items of deferred maintenance that should be conducted to keep these buildings in good working condition. The following actions are needed to maintain the PAT 'A' facilities:
 - **Action #1 / Replace the HVAC systems**
 - **Action #2 / Reroof the buildings**
 - **Action #3 / Replace the water heaters**
 - **Action #4 / General upgrade of the building finishes**

Costs: The estimated maximum allowable construction cost to remodel the Cottages is \$60,000 to \$70,000 per cottage for a total of \$600,000 to \$700,000 for the ten buildings. A new Cottage with a gross square footage of 6,400 SF is estimated to cost \$275 per square foot for a total cost of \$1,760,000. These costs do not include soft costs such as consulting fees, permitting, sales tax, etc.

Recommendations: It is recommended to keep the existing cottages. In doing so, it is recommended that DSHS address the deferred maintenance, upgrade the HVAC and utility elements. In addition, it is recommended that DSHS construct one new cottage to temporarily house patients whose cottages are being remodeled so as not to disrupt the level of care being provided and/or inconvenience patients and their families by relocating them to another facility. In addition, a benefit of constructing a new cottage is that the capacity of the program can be expanded once all of the renovations are completed.

Potential Floor Plans:

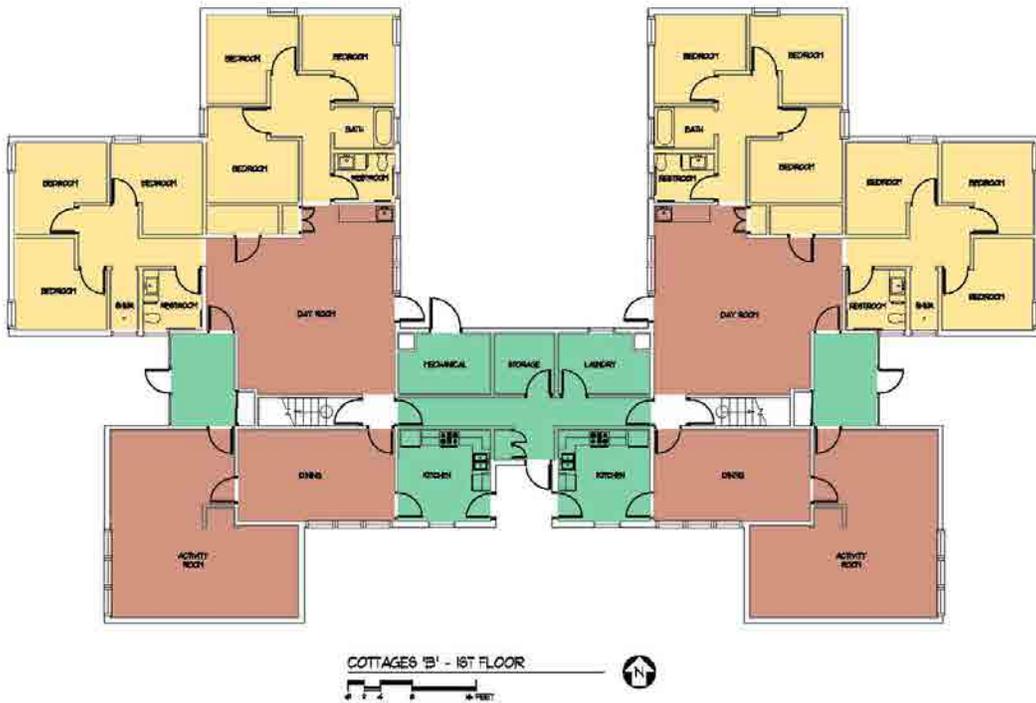
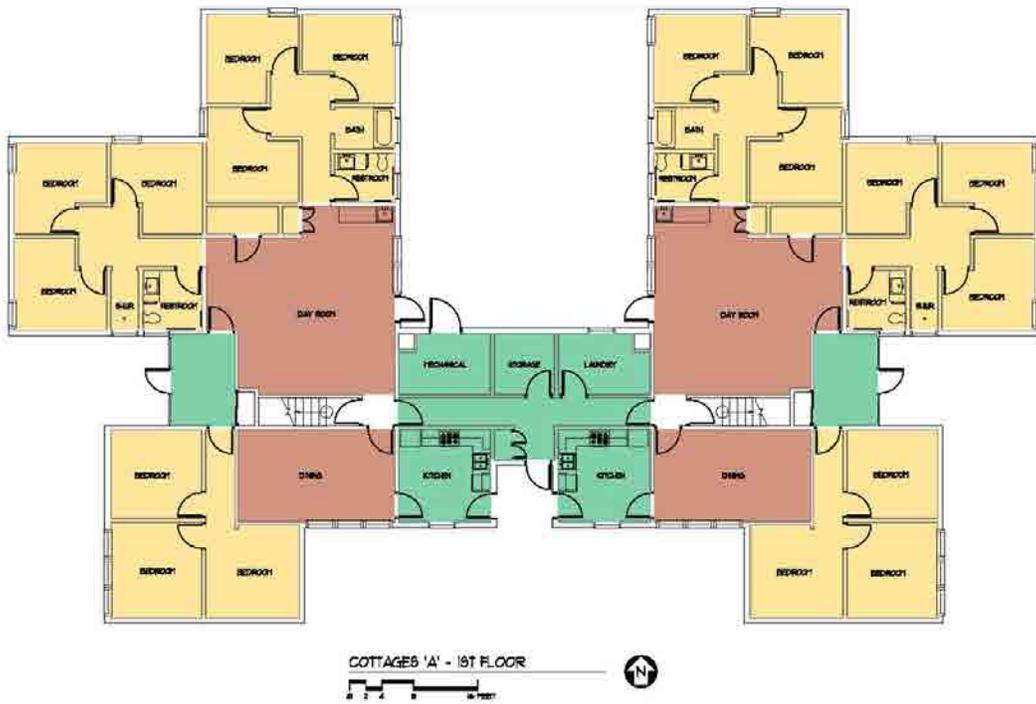
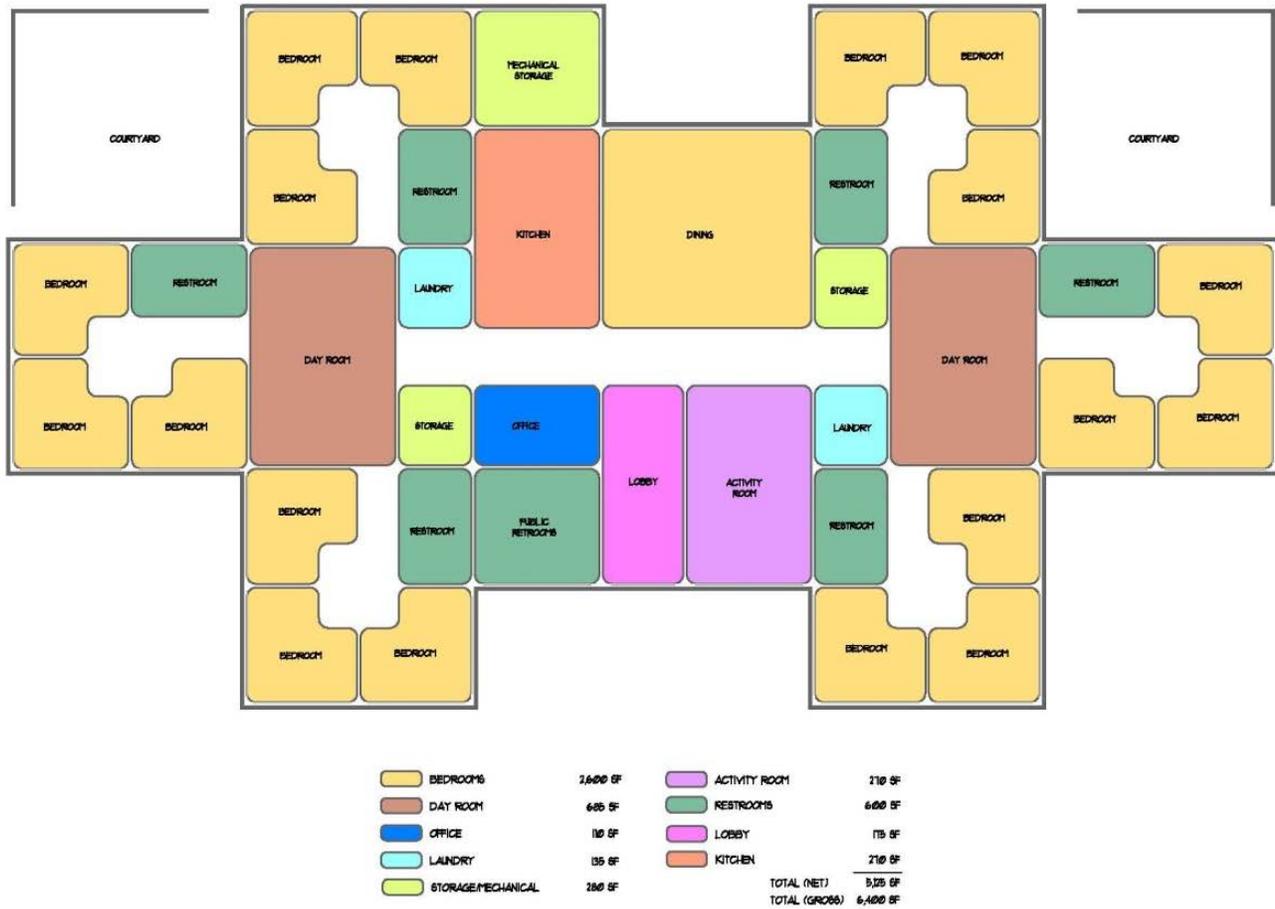


Figure 25: PAT 'A' Potential Improvements – Option 1 – Renovated Cottage Floor Plans (Cottages A & B)



NEW PAT "A" COTTAGE

Figure 26: PAT 'A' Potential Improvements – Option 1 – New Cottage Floor Plan

Commissary Potential Facility Improvements

The existing Commissary Building is a 75-year old building that is inefficient for the function it serves on campus due to its layout. Many of the support buildings on campus for maintenance store material and equipment that should be in the Commissary Building for inventory control, however as the space is broken up into a number of spaces it does not function well for a warehouse and results in a lot of wasted space. To reuse the Commissary building, it would require bringing the building up to current building code standards for wind, seismic, and possibly snow loads.

Costs: The cost to relocate the Commissary would be part of the larger renovation of the Lifeline Warehouse. It is estimated to cost \$200,000.

Recommendation: It is recommended that structural improvements occur to bring the Commissary building up to current building codes.

Support Services Potential Facility Improvements

The following is an evaluation of the potential future for the support buildings on the Fircrest School Campus:

- **Steam Plant (Building #28):** For the short-term the Steam Plant will need to remain in operation to serve the buildings on the campus. There is a potential to remove some campus buildings from the centralized steam system with their own HVAC systems. The building and boilers will continue to need maintenance and repair. There is also the possibility to provide a combined heat and power (CHP) system for the campus. The potential for a CHP system is discussed in the Energy Program developed by Washington State University (WSU) included in the appendix of this *Master Plan*.
- **Laundry Building (Building #31):** The Laundry building needs to remain to provide laundry services for the residential facilities on campus. The amount of service provided may be reduced if the "Y" buildings are replaced and laundry services become a part of any new or replaced facilities. The building and equipment will need continued maintenance and repair.
- **Kitchen (Building #39):** The Kitchen building is in good condition and is anticipated to continue to operate as it currently does. It is unlikely the Kitchen will increase the number of meals it serves to Fircrest School clients. The building and equipment will need ongoing maintenance and repair.
- **Chapel (Building #64):** The Chapel needs a new roof in addition to normal maintenance. If the Chapel is placed on the National Historical Register it will have to remain in use without significant changes.
- **Administration Building (Building #65):** The Administration Building will continue to serve its administrative function, but as with the other support buildings on campus will need normal routine maintenance and repair. It has been recommended by this *Master Plan* that the vacant/underutilized first floor be remodeled to house the non-ATP functions currently located in the ATP Building that is recommended to be demolished.
- **Activities Building (Building #67):** Fircrest School may continue to use the Activities Building; however State budgetary considerations have forced the swimming pool to be closed. The City of Shoreline would like to have the facility available to the public. It is hopeful that the Activities Building can be made available to Fircrest School and the public through a joint partnership between DSHS and the City or another State agency in the future. Further planning is recommended to determine the long-term use for the Activities Building.

Maintenance & Storage Potential Improvements

The maintenance & storage buildings include the Plant Mechanics Shop, Carpentry & Plumbing Shop, Plant Operations, Paint Shop and Warehouse. These buildings were a part of the original construction in 1942 and have been retrofitted to serve their existing uses. The buildings are not in good condition and do not effectively serve the functions they house. Prior to this study, the Fircrest School administration decided to consolidate the storage functions of these buildings into the Commissary function on campus. Given the age, condition, and layout of the existing buildings, an option to upgrade the current facilities was not explored.

Costs: The estimated maximum allowable construction cost to construct a new building for the maintenance & storage functions would be in the range of \$2.8 to \$3.0 million dollars. These costs do not include soft costs such as consulting fees, permitting, sales tax, etc.

Recommendation: It is recommended that the material receiving and storage operations be transferred to the Commissary building. In the long-term, the maintenance functions should be consolidated into a single new building on campus. The five buildings currently total 32,700 SF of space. Since much of the storage will be moved to the Commissary building, it is estimated that a new 15,000 SF building could house all of the five functions of the support services on campus.

Food Lifeline Warehouse Potential Improvements

The Food Lifeline Warehouse is no longer being used by Food Lifeline. It is the intent of DSHS to use the building for two State facilities. The warehouse function will be split roughly in 60/40 for warehouse space for the Facilities Maintenance Surplus Services for DSHS and the two-story office space in the building will be occupied by the State Department of Health which currently has their lab and office facilities on the Fircrest School site. The remodeling will include the demolition of the existing freezer and cooler in the building. Since the building conversion has already been decided, other no other options were explored for the building.

Costs: It is estimated to cost in the range of \$200,000 to remodel the space to house the three functions.

Recommendation: It is recommended that the Facilities Maintenance Surplus Services use the Food Lifeline Warehouse until another tenant is found.

5.2 – SITE INFRASTRUCTURE SOLUTIONS/OPTIONS

The Fircrest School site infrastructure was further assessed to identify potential improvements or operational modifications that would create more efficiency for the Fircrest School operations. The assessment explored opportunities to correct service deficiencies to each of the facilities and also to create a central grid that could better managed in the future years. An overarching goal is to plan for site infrastructure improvements that allow the Fircrest School facilities and any potential future third-party users to obtain utility services on their own systems. Appendix D illustrates potential improvements for stormwater, sewer, water, and electrical infrastructure.

Stormwater Management – Potential Improvements

Future site improvements on the Fircrest School property will require proportional compliance with current stormwater standards. In many cases, additional impervious site coverage will necessitate stormwater management facilities; this may include additional building footprints and parking areas. As the property is redeveloped each development area will require conformance to the current drainage code at the time of application. Currently, the City has adopted the 2014 update to the 2012 Stormwater Management Manual for Western Washington. Based on experience, new development should plan on 18,000 cubic feet of stormwater retention per acre of developed area. The current stormwater codes also generate low impact development features at a rate of about 5% of the total site area.

The future approach to stormwater management will include drainage pipes and stormwater ponds. Stormwater management plans must consider (a) the user (Fircrest School OR third-party users) and (b) the site's individual drainage basins. Considering the probable Fircrest School redevelopment, two stormwater ponds may be needed to accommodate the anticipated development; one in the North Campus and one within the Service and Maintenance area. Storm pipes will allow drainage to the outfall to the public system to the south. Future third-party users will be required to develop their own individual stormwater management systems. This will be explored in the future as part of individual site development proposals.

- Opinion of Cost Estimate: \$3,700,000 ***site construction only, these costs do not include soft costs such as consulting fees, permitting, sales tax, etc.*

Water – Potential Improvements

Consider the long-term capital improvement desires for the Fircrest School and the need to develop individual systems for the property's users, the water service requires a comprehensive upgrade. This will include new water infrastructure with new 12" main, and provide a looped system. Individual services could be connected to the different uses as the site develops. NCWD will also require additional storage tanks to be constructed on site with booster pump stations to mitigate the water needs of the site. This is especially important to maintain adequate pressure for fire protection.

- Opinion of Cost Estimate: \$1,700,000 for site improvements (pipe installation) PLUS \$2,100,000 for the storage tanks ***site construction only, these costs do not include soft costs such as consulting fees, permitting, sales tax, etc.*

Sanitary Sewer – Potential Improvements

Ronald Wastewater District (RWWD) has no concern of future capacity issues. As the campus develops, the sewer can be retained; however upgrades may be warranted depending on existing pipe connections. RWWD indicated that a standard developer extension agreement would be required at every application of a building permit.

- Opinion of Cost Estimate: \$400,000 for site improvements (pipe installation) ***site construction only, these costs do not include soft costs such as consulting fees, permitting, sales tax, etc.*

Electrical – Potential Improvements

A separate and concurrent capital improvements study is being conducted to explore/plan for electrical upgrades to the Fircrest School. This study includes both standard wiring and emergency backup. The finding of this separate report has not been completed; thus, specifics have been omitted from this plan.

Natural Gas

Natural gas exists on the property and is serviced by Puget Sound Energy (PSE). A study of future needs has not been completed as a part of this master plan; thus specifics have been omitted from this plan.

5.3 - ENERGY EFFICIENCY

Once a facility reaches a point of dilapidation, consideration of all options is prudent. We believe the site can be overhauled to better meet the needs of the residents, reduce greenhouse gas and utility costs, and exceed current regulations as they relate to the functions at this site. Given the state of the infrastructure, we believe the overhaul would also actually cost less than patching failures as they continue to occur.

The first decision must be a commitment to either maintain the central plant concept or convert to decentralize mechanical systems. The team from the WSU Energy Program advocates maintaining a central plant concept.

Converting to decentralized mechanical systems is a huge undertaking and can be very disruptive to the tenants. The existing steam boilers can only be operated at part load to a point. Beyond that, heat will need to be rejected to atmosphere, wasting energy during the transition from central to decentralized HVAC. A decentralized HVAC system means that maintenance must be performed all over the site, which would require more staff time. And the total HVAC capacity would be about 30% higher due to the inability to account for diversity of loads at any given time.

Hospitals and campuses typically choose a central system for good reasons. A summary of the advantages of a central plant include:

- Reduced maintenance costs
- Reduce utility costs
- Longer equipment life
- Diversity of loads, which allow for reduced overall capacity (on the order of 70%)
- The ability to integrate CHP, which opens the potential to:
 - Reduce pollution by 30% to 50%
 - Provide better power and thermal reliability
 - Provide thermal and power redundancy
 - Reduce utility costs

Recommendations: WSU recommends further analysis to address the best path that would include these items. Energy conservation opportunities/methods will be explored for each facility when (a) substantial facility upgrades are planned OR (b) when a new building is designed.

6.0 FIRCREST SCHOOL MASTER PLAN

This *Master Plan* is intended to illustrate the long-term property buildout and future uses of the Fircrest School Campus. The main purpose of this *Master Plan* is to provide a long-range vision and strategy document for the Washington State Department of Social and Health Service and to establish facility improvements necessary to continue the use of the Fircrest School Campus for DSHS functions.

An additional function this *Master Plan* serves is to establish future land uses and circulation for the development on the campus for the use of third-party users. This will help to formulate a Master Development Plan for the submittal of a Master Development Plan Permit (MDPP) as discussed in Section 4.1 (Land Use and Zoning) of this *Master Plan*, which is required in the City of Shoreline for the development of any new uses on a campus zoned site. A future Phase IV of this project, should it be funded in the 2017-19 DSHS Capital Budget, will further develop this concept and formally establish a *Master Plan* with the City of Shoreline that reflects public input gained during this phase of the project as well as the earlier phases and identifies improvements necessary for the development of the Fircrest School and its excess property.

6.1 – DESCRIPTION OF MASTER PLANNING PROCESS

This section describes/outlines the concept for the *Master Plan*, which is the result of the work done under the previous two phases of this project, which will fulfill the legislature’s directive for identifying the needs of the Fircrest School and determining improvements necessary to efficiently implement the program. However, it also provides a long-term vision for the property areas not needed for the operations of the Fircrest School and how that property may benefit both the campus and the community.

Previous sections of this *Master Plan* have analyzed the existing buildings on the Fircrest School Campus and identified potential improvements or new facilities that may be necessary to help continue the use of the Fircrest School Campus as a residential habilitation center. By consolidating and eliminating facilities, DSHS has the opportunity to put to use some of the other areas on the site that is underutilized or inconsequential to the use of the campus as an RHC.

Two master plan “alternatives” have then been formulated that depict development scenarios that incorporate the recommendations from Part 5. Overall these alternatives create a forward vision to (i) consolidate and collocate the Fircrest School Campus function and operations in the central location, (ii) eliminate antiquated buildings, and (iii) identify unused campus land that can be use leveraged with third party users to help finance long-term viability on the Fircrest School operations.

Through the selection of a master plan alternative outlined in this *Master Plan*, improvements to existing buildings and infrastructure, the construction of new facilities, and improvements to circulation and access within the Fircrest School campus seek to provide a plan for the Department of Social and Health Service to improve upon the care and service provided to the individuals who reside at Fircrest School.

6.2 – FUTURE PLANS BY MASTER PLAN AREA

Fircrest School Core Campus/North School Area

Future plans for the Fircrest School Core Campus and North School Area include improvements to the core functions of the School, including the long term nursing care facilities as well as the independent living cottages, administrative building and vocational training facility (ATP Building).

In order to address the goals of improving the service and care for Fircrest School residents and addressing building and service deficiencies, the proposed layout for the Fircrest School Core Campus/North School focuses on centralizing the schools facilities, eliminating redundancies in services, and simplifying the campus layout and organization.

- **Nursing Facilities:** The nursing facilities, or PAT “N” of the Fircrest School, are envisioned to be a part of the Fircrest School Core Campus/North School Area. Two alternatives are being considered and are discussed in Section 6.3 of this *Master Plan*. The first option is renovating building 66 to allow the nursing facilities to be relocated into the Core Campus Area which allows the facility to be closer to the administration and medical services provided on campus. The layout of this building could be modified for use as a nursing facility, and can allow for some increases in efficiencies through consolidating staff that is currently spread out throughout six buildings. The second option is to build a new nursing facility building within the North School Area. This option provides the ability to house all of the staff and functions required for the long term care of the residents in one, new, state of the art facility.
- **Independent Living Cottages:** The cottages in PAT “A” of the Fircrest School are in good condition aside from some necessary upgrades to the HVAC systems and roofs of the buildings. Some additional improvements are necessary to maintain the buildings and improvements could be made by altering the layout of these buildings to create more independent living spaces rather than bedrooms centralized around one living area. Construction of an additional cottage is proposed within the North School Area to allow for the residents of the cottage being renovated to be housed during construction and to provide housing environments for residents with unique living needs.
- **Administration:** The top two floors of the administration building have been recently renovated; these floors are proposed to continue to serve their administrative function for the school. Additional work will be necessary to renovate the first floor to house some non-ATP functions currently located in the ATP building that is recommended to be demolished.
- **Vocational Training:** The ATP building on campus is outdated and antiquated. Two options exist for replacing the ATP building and its functions. The first option is relocating the ATP-related functions to Building #66. The second option is constructing a new building to house the ATP-related functions. Non-ATP related functions are proposed to be relocated to the first floor of Building #65 (administration).

Community Dining

The community dining hall (Building #39) is a relatively new building necessary to the functions of the Fircrest School and thus makes sense to preserve its current operations. There is potential to open the dining hall and commercial kitchen up to the greater Shoreline community, potentially being used as a dining option for people who work nearby or for events. There is also potential for the kitchen to support future uses on the campus.

Service & Maintenance

- **Maintenance:** Maintenance facilities for the Fircrest School are spread throughout many buildings, resulting in a waste of space and energy; many of the buildings are nearing the end of their life-cycle. A new maintenance building should eventually be constructed to house all of the facilities necessary for the maintenance & storage building functions on campus. Cost estimates have been included in Part 5 of this *Master Plan* for future construction; however this has been excluded from the scope of this *Master Plan* for the purpose of developing a preferred alternative.
- **Laundry:** Eventually a new laundry building could be constructed to house all of the Fircrest Schools laundry needs in a consolidated area with other support services. This has been excluded from the scope of this *Master Plan* for the purpose of developing a preferred alternative.
- **Power:** A new power building needs to be constructed to facilitate the necessary electrical improvements for the Fircrest School (including emergency backup). Opinions of cost have not yet been conducted as a concurrent study is being conducted.

Chapel

The Chapel will be preserved and maintained to complement other uses on the campus and the greater City. No changes are proposed other than the construction of a new roof at some point in addition to normal maintenance. The Chapel is eligible to be placed on the National Historical Register.

Community Recreation Area – Area 2a

The Recreation Buildings (Buildings #67 & #69) will remain in their respective master plan areas, with improvements proposed to update the recreation building in conjunction with the City of Shoreline. It is intended in the future for this building to serve both the Fircrest School and residents of the City of Shoreline with the provision of an indoor community pool, basketball court and community spaces that can be reserved by groups for events. Further planning with the community should be explored to identify the terms and logistics.

Future Use Areas 1, 2b, 2c, 3, 4 and 5

After consolidating the Fircrest School uses, the unused areas of the property may be reserved for future uses by the State and/or third-party users. These areas are intended for uses that would complement the other services on campus, but will be further explored during the preparation of a Master Development Plan for the City of Shoreline during the future Phase IV of this master planning process.

Greenway

A greenway is planned along the historical Hamlin Creek that runs along the eastern property line. The Greenway is envisioned to provide creek buffering and also allow for future trail connections between surrounding uses and Hamlin Park. Future stream restoration and revegetation is also envisioned for the greenway corridor.

6.3 – MASTER PLAN ALTERNATIVES

The Fircrest School patient programs can be improved according to two distinct master plan alternatives. Generally speaking, the two alternatives are centered on what program is moved to the vacant Building #66; if one particular program is designated for Building #66, then a new facility will be consulted for the other program. Both alternatives will consolidate the Fircrest School operations making way for excess property and future uses. These alternatives also assume that the existing ‘Y’ Buildings and ATP building are closed and eventually demolished.

Fircrest School Campus General Use Area <i>(same for both alternatives)</i>	
Master Plan Area	Size (ac)
<i>Fircrest School Operations Areas</i>	
Core Campus	11.35
North Campus	8.65
Chapel	1.6
Community Dining	1.7
Service & Maintenance	6.6
Greenway	3.8
<i>Non-Fircrest School Operation Areas</i>	
Area 1 – Future Use	11.7
Area 2a	4.4
Area 2b	4.55
Area 2c	3.0
Area 3	5.3
Area 4 / Department of Health	-
Area 5	4.9

Alternative A-1

The first alternative plans for PAT ‘N’ to be relocated to Building #66; this will include a complete building retrofit and an addition. The ATP operations will be moved to a new building in the northeast portion of the campus. The non-ATP functions (in the current ATP building) are planned to be located to the ground floor of Building #65. A new cottage will be constructed for the PAT ‘A’ program.

Alternative A-2

The second alternative plans for the Adult Training Program (ATP) to be relocated to Building #66; this will include a complete building retrofit and using two floors. Like the first alternative, the non-ATP functions (in the current ATP building) are planned to be located to the ground floor of Building #65. The PAT ‘N’ program will be moved to a new building in the northeast portion of campus; this will be phased after the existing ATP is demolished. A new cottage will be constructed for the PAT ‘A’ program.

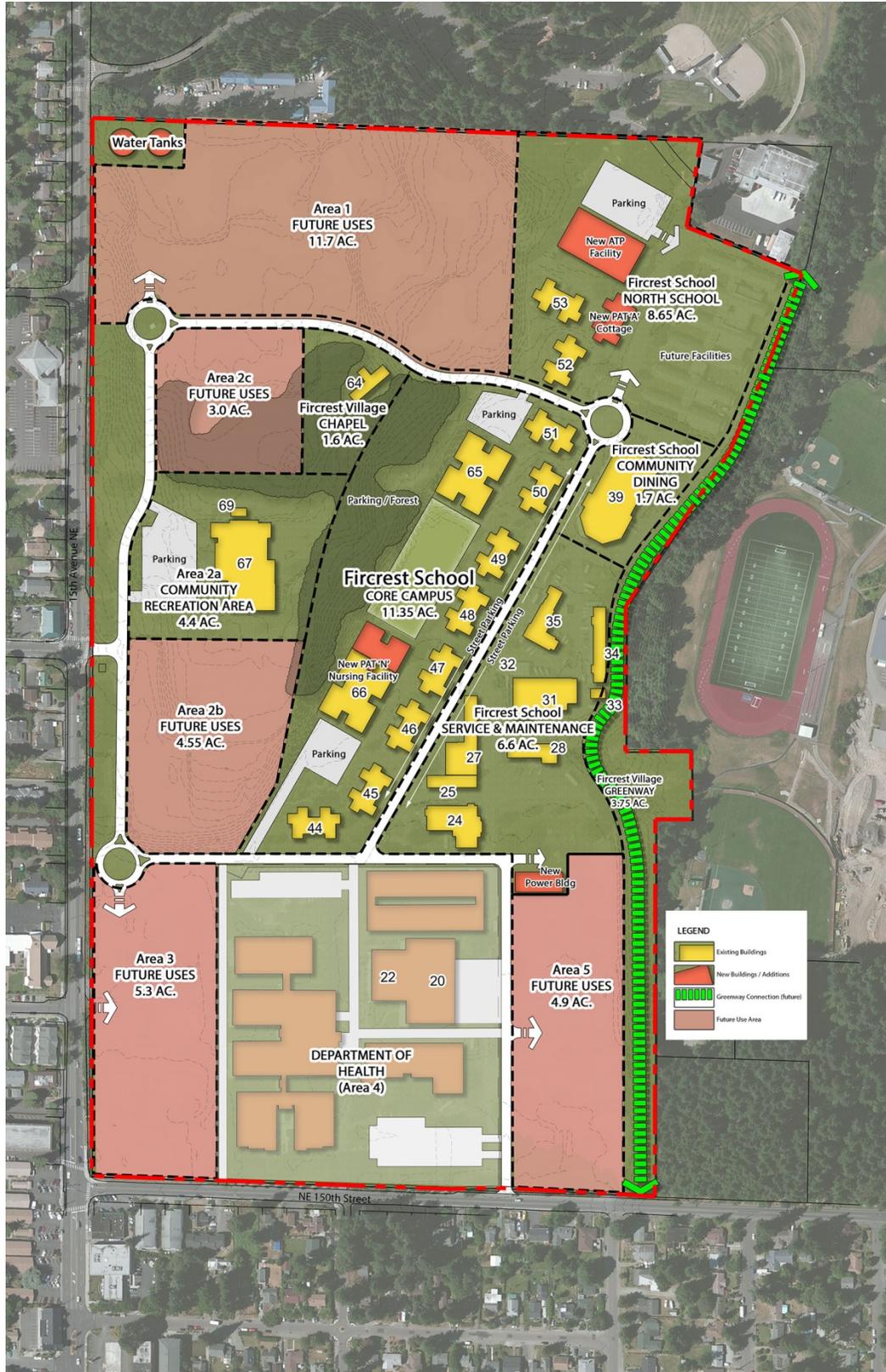


Figure 27: Alternative A.1

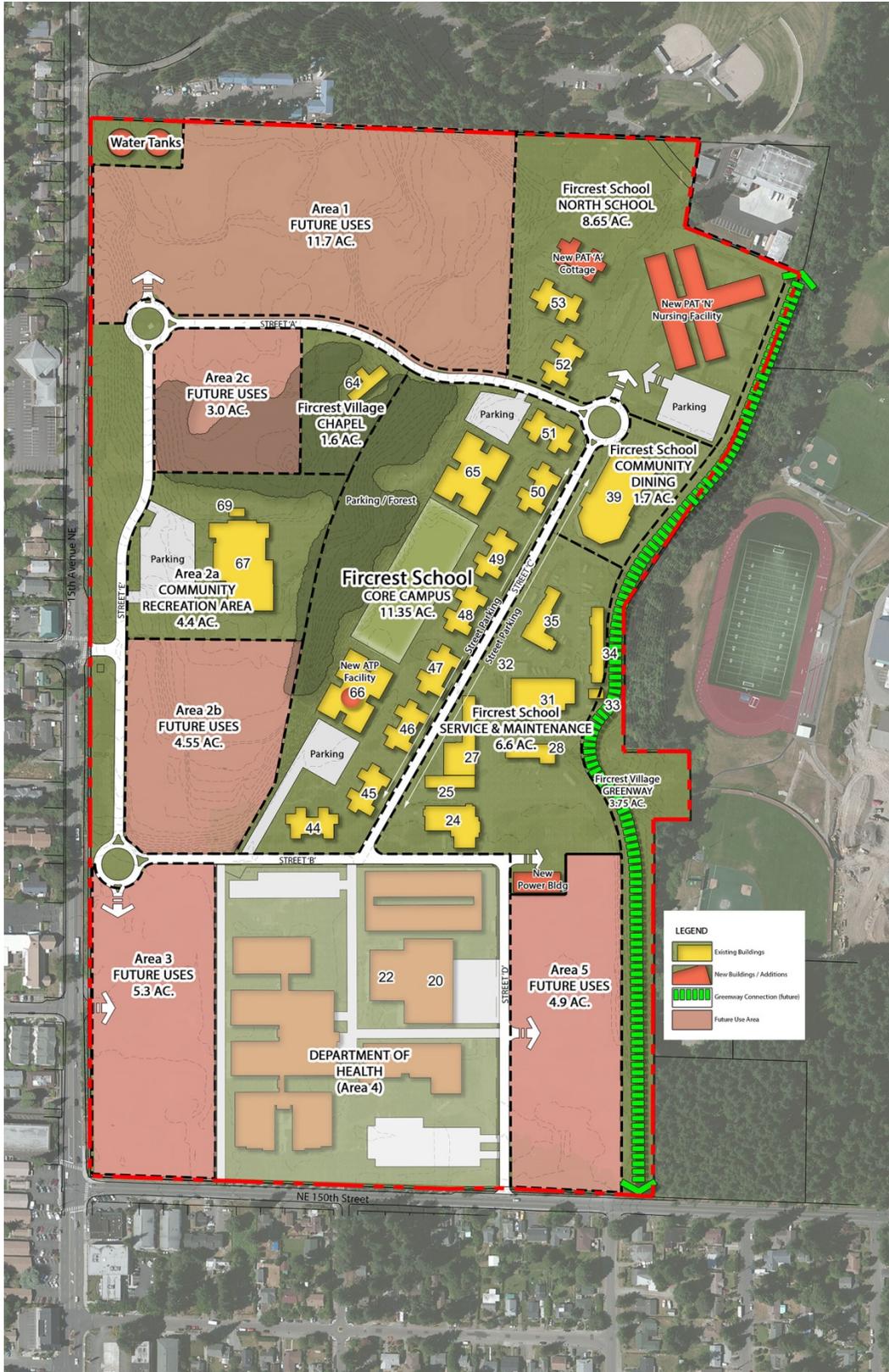


Figure 28: Alternative A.2

6.4 – OPINIONS OF COST ESTIMATES

The following table summarizes the opinions of cost for the facility improvements discussed in Chapter 5 for each master plan alternative. The opinion of cost for construction of a new power building has been excluded as a concurrent study is being conducted. All costs are broad estimates of construction and should only be used for planning purposes. Detailed cost estimates are normally explored as separate project-specific feasibility studies conducted closer to the intended construction date.

Alternative A.1	
New ATP Facility	
(A new building on campus with a gross square footage of 23,800 SF is estimated to cost \$325 per square foot)	\$7,735,000.00
Relocate non-ATP Functions to Building #65	
(Renovating the first floor of Building #65 with a gross square footage of 18,356 is estimated to cost \$225 per square foot)	\$4,130,100.00
Remodel 10 PAT 'A' Cottages	
(Estimated cost to remodel the Cottages is \$60,000 to \$70,000 per cottage)	\$650,000.00
Construct 1 New PAT 'A' Cottage	
(A new cottage with a gross square footage of 6,400 SF is estimated to cost \$275 per square foot)	\$1,760,000.00
Relocate PAT 'N' Nursing Facility to Building #66 + Addition to Expand First Floor	
(Renovating 51,650 SF of Building #66 is estimated to cost \$200 per square foot)	\$10,330,000.00
(Addition to expand first floor of Building #66 with a gross square footage of 10,200 SF is estimated to cost \$325 per square foot)	\$3,315,000.00
New Power Building	
(TBD, see concurrent study)	-
TOTAL (plus Site Infrastructure below)	\$27,920,100.00

Alternative A.2	
Relocate ATP Functions to Building #66	
(Remodeling the two floors of Building #66 with a gross square footage of 22,833 is estimated to cost \$225 per square foot)	\$5,137,425.00
Relocate non-ATP Functions to Building #65	
(Renovating the first floor of Building #65 with a gross square footage of 18,356 is estimated to cost \$225 per square foot)	\$4,130,100.00
Remodel 10 PAT 'A' Cottages	
(Estimated cost to remodel the Cottages is \$60,000 to \$70,000 per cottage)	\$650,000.00
Construct 1 New PAT 'A' Cottage	
(A new cottage with a gross square footage of 6,400 SF is estimated to cost \$275 per square foot)	\$1,760,000.00
New PAT 'N' Nursing Facility	
(A new single story building on campus with a gross square footage of 39,650 SF is estimated to cost \$375 per square foot)	\$12,886,250.00
(Site improvements necessary for the new building)	\$2,500,000.00
New Power Building	
(TBD, see concurrent study)	-
TOTAL (plus Site Infrastructure below)	\$27,063,775.00

Site infrastructure costs are anticipated regardless of Alternative chosen to upgrade the property in accordance with new stormwater, health and construction code regulations due to the scope of the redevelopment on the property and to allow for the introduction of third-party users on the excess campus property.

Site Infrastructure	
Stormwater Management	
(Drainage pipes and storm ponds to comply with current stormwater standards for future site improvements)	\$3,700,000.00
Water	
(Comprehensive upgrade of water system including a new 8" main and looped system)	\$1,700,000.00
(Additional storage tanks with booster pump stations)	\$2,100,000.00
Sanitary Sewer	
(System upgrades to separate sewer system for introduction of third party users onto property)	\$400,000.00
Electrical	
(TBD, see concurrent study)	-
TOTAL	\$7,900,000.00

7.0 – REVIEW OF 10-YR CAPITAL BUDGET PROJECTS

Agency Priority	Subproject Priority	Facility	Project	Estimated Total	2017-19 Request	2019-21 Request	2021-23 Request	2023-25 Request	2025-27 Request
2	42	Fircrest School	Minor Works 30003743 FS-Bldg 65: Elevators Replacement	725,000	725,000				
2	63	Fircrest School	Minor Works 30003748 FS-Kitchen: Plumbing Repairs	625,000	625,000				
2	75	Fircrest School	Minor Works 30003751 FS-Steam Plant: Steam Pit Drainage and Boiler Control Upgrade	375,000	375,000				
2	86	Fircrest School	Minor Works 30003749 FS-Rec Bldg: Mech Sys Repairs & Replace	900,000	900,000				
2	87	Fircrest School	Minor Works 30003750 FS-Plant Mechanics & Garden Shop: Roofing Replacement	375,000	375,000				
2	128	Fircrest School	Minor Works 30003745 FS-Chapel: Roofing Replacement	375,000		375,000			
2	145	Fircrest School	Minor Works 30003746 FS-Campus: Hazardous Tree Trimming and Removal	325,000		325,000			
11		Fircrest School	30002755 Fircrest School-Nursing Facilities: Replacement	17,415,000	17,415,000				
12		Statewide	30002746 Statewide: Telecommunication Systems Modernization*	220,000					
19		Fircrest School	30003574 Fircrest School: Land Transfer to the Department of Health	1,000	1,000				
21		Fircrest School	30003601 Fircrest School: Campus Master Plan & Rezone	200,000	200,000				
44		Statewide	30003250 Statewide: Hazards Abatement & Demolition	350,000					
57		Fircrest School	30002771 Fircrest School-Adult Training Program: Building Replacement	8,900,000	800,000	8,100,000			
76		Fircrest School	30003605 Fircrest School-Campus: Site Improvements	4,000,000		4,000,000			
79		Fircrest School	30002753 Fircrest School-Infrastructure: HVAC Decentralization	5,600,000	500,000	5,100,000			
85		Fircrest School	30002766 Fircrest School-Laundry: New Construction	6,700,000		600,000	6,100,000		
88		Fircrest School	30003609 Fircrest School-Eight Duplexes: Roofing Replacement	1,800,000		1,800,000			

APPENDICES

APPENDIX A -

WASHINGTON STATE UNIVERSITY ENERGY ASSESSMENT WALKTHROUGH, JULY 28, 2016

Fircrest School, Shoreline, WA – Energy Assessment Walkthrough on July 28, 2016



Prepared for:

Washington State Department of Social and Health Services

Prepared by:

Washington State University Energy Program



Energy Program

WASHINGTON STATE UNIVERSITY

September 13, 2016

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Acronyms and Abbreviations

cfm	cubic foot/feet per minute
CHP	Combined heat and power
DOAS	Dedicated outdoor air system
DSHS	Washington State Department of Social and Health Services
GHG	Greenhouse gas
HVAC	Heating, ventilation, and air conditioning
kBtu/sf/yr	thousand British thermal units per square foot per year
LCCAT	Life Cycle Cost Analysis Tool developed by the Washington State Office of Financial Management
SCC	Social cost of carbon
VRF	Variable refrigerant flow
WSU	Washington State University

Introduction

Washington State University (WSU) Energy Program staff attended a one-day walkthrough of the Washington State Department of Social and Health Services (DSHS) Fircrest School in Shoreline, WA, on July 28, 2016. Accompanied by Mr. Casey Moore, DSHS Facilities, and Mr. Garry Moore, Calvin Jordan Associates, we walked through the campus, which is used to support rehabilitation and care for the residents. The historical and detailed knowledge offered by Casey and Garry was invaluable to understanding the needs of the facility. Casey had in-depth knowledge of and familiarity with the deficiencies of the site, and Garry offered great historical insights about the conditions because he was involved in the design of some of the buildings.

Fircrest School is at a crossroads. Two possible yet very different avenues forward include 1) continuing to invest millions of dollars in an infrastructure that is well past useful life, or 2) making infrastructure changes to ensure that the facility:

- Is healthy and provides for a significantly higher level of comfort and quality for the residents
- Has significantly lower energy consumption
- Reduces up to 30% of greenhouse gas emissions on marginal energy generation
- Reduces maintenance-intensive technologies, and
- Has lower operating cost.

The Fircrest School is 440,639 square feet in area and uses over 300 kBtu/sf/yr. From ASHRAE (<http://cms.ashrae.biz/EUI/>) we find the Energy Use Index for many types of buildings for all the climates in the United States. **Table 1** provides a summary of how energy inefficient Fircrest is relative to similar sites in Seattle, WA.

Table 1. Energy Use Index for Similar Occupancies

Energy Use Index EUI (kBtu/sf/yr)	
Apartment	38
Small Hotel	69
Hospital	139
Outpatient Facility	247
Fircrest Rehabilitation.	>300

The first step is to decide whether to continue with a centralized mechanical and plumbing system or converting to decentralized systems. This decision will affect all other infrastructure improvement decisions.

Converting to decentralized mechanical systems is a huge undertaking and will be very disruptive to the tenants. The existing steam boilers can be operated at part load only – to a point. Beyond that, heat will need to be rejected to the atmosphere, which wastes energy during the transition from central to decentralized HVAC. A decentralized HVAC system requires maintenance over the whole site and requires more staff time. A decentralized HVAC design increases the total HVAC capacity by about 30% due to the inability to account for diversity of loads at any given time.

Hospitals and campuses typically choose a centralized system for good reasons, including:

- Reduced maintenance costs
- Reduce utility costs
- Longer equipment life
- Diversity of loads, which allow for reduced overall capacity, on the order of 70%
- The ability to integrate combined heat and power (CHP), which opens the potential to:
 - Reduce pollution by 30% to 50% on the marginal power generation

- Provide better power and thermal reliability
- Provide thermal and power redundancy
- Reduce utility costs

Table 2 provides estimates on five options. Based on research provided by the Rocky Mountain Institute of maintenance cost per square foot for a variety of building types.¹ The costs for repair and maintenance average about \$2.00 per square foot.

Table 2. Estimated Costs for Options to Maintain Central Plant or Decentralize

Option	Description of Primary Equipment	Estimated First Cost	Estimated Annual Maintenance Cost	Estimated Annual Energy Costs (1)
1	Baseline	$\$20/\text{sf} \times 440,639 + 1,000,000 = \mathbf{\$9,800,000}$	\$180,000	\$1,200,000
2	Retain steam boilers and upgrade controls, fix deficiencies in steam and potable HW	$\$20/\text{sf} \times 440,639 + 1,000,000 = \mathbf{\$9,800,000}$	\$180,000	\$1,080,000
3	Replace all but one boiler with Combined Heat and Power and fix deficiencies in steam and potable HW	$\$20/\text{sf} \times 440,639 + 2,750,000 = \mathbf{\$11,600,000}$	\$120,000	\$1,010,000
4	Decentralize HVAC - Gas Packs	$\$30/\text{sf} \times 440,639 \text{ sf} = \mathbf{\$13,200,000}$	$\$1.75/\text{sf} \times 440,639 \text{ sf} = \$770,000$	\$1,080,000
5	Decentralize HVAC and Potable HW	$\$45/\text{sf} \times 440,639 = \mathbf{\$19,800,000}$	$\$2.00/\text{sf} \times 440,639 \text{ sf} = \$880,000$	\$1,080,000

(1) Based on \$0.65/therm

For the purpose of this analysis, we assume a natural gas rate of \$0.65/therm for all scenarios, including baseline. Available utility information shows only \$0.10/therm, but that is not likely.

The financial benefit based on these estimates shows that maintaining the central system offers the most future benefit for this campus-type facility and also offers other benefits as noted above. Campuses are typically set up with a central plant.

¹ It is recommended that the ESCO perform an in-depth site assessment to provide more accurate numbers (http://www.rmi.org/RFGraph-commercial_building_category_expenses).

Site History

Fircrest School provides care to about 200 residents, including many with serious developmental disabilities. The facilities for these residents are well maintained, but they are very old. The facility was originally built as a naval hospital during World War II, and was later used as a tuberculosis sanitarium. Local older residents recall playing basketball in the gymnasium with the residents when the facility was used to house troubled youth. The facility is now used to provide housing, individualized rehabilitative services, and 24 hour nursing care.

Building Use and Condition

The site's buildings are used to perform the following functions (described in detail below):

- Central Plant
- Laundry
- Dining
- Independent housing ("300-buildings")
- Skilled nursing, special care ("Y-buildings")
- Olympic pool, a 40 foot x 20 foot hot tub, and gymnasium
- Public health laboratory
- Chapel
- Administration
- Workshops

Central Plant

The central plant has four steam boilers. One boiler was decommissioned about 15 years ago and would be a suitable location for a gas turbine CHP system. The other 3 boilers are sized for 1/3rd, 2/3rd and 100% of full load. They appear to be well maintained.

Laundry

The laundry facility is functional, but the current layout is ineffective for controlling contamination from the dirty clothes to the clean clothes, and inefficient for workflow.

Dining

The dining building is a very large facility with capacity to feed over 200 people, although it is underused. Recently, variable speed drives on the exhaust and heated make-up air fans were added to the kitchen hood over the cooking operation so the fans would only operate at the level needed to keep the temperature below 90°F under the hood. Given the approximate 20-foot length of two hoods, and at the code-required exhaust rate of 300 cfm/foot, this system was exhausting about 12,000 cfm for 10 hours per day. To heat this much air to 65°F in the Seattle climate would consume about 8,000 therms per year. Now, with the new drives on the blowers, the new rate should be reduced to less than half.

Independent Housing

The independent housing buildings are well maintained. However, there are many relatively inefficient window-mounted air conditioning units. The cost to convert these buildings to variable refrigerant flow (VRF) with a dedicated outside air unit is estimated at \$20/sf. The VRF system will provide independent control of temperature in each person's room, and provide improved ventilation and odor control in the spaces for the occupants. VRF is a decentralized type of HVAC. We recommend adding a natural gas generator to meet the potable hot water needs associated with multi-family housing. This technology, CHP, is ideal for buildings with a thermal need all year. (A more detailed explanation of CHP is provided later in this report.)

Skilled Nursing

The nursing care buildings appear to be extremely inadequate for this use. For these buildings to meet the minimum requirements of a modern nursing facility, they would need to have 10 new bathrooms, new HVAC, seismic upgrades, and additional square footage.

- The exterior envelope is clay brick without structural reinforcement.
- Permits for the sprinkler system noting adequate water supply and pressure were not available.
- There are problems with power distribution, indicated by breakers tripping frequently.
- With six buildings, services for the patients are spread out and inefficient. Relocating this function into a single building would benefit the residents and the staff.
- The waste, heating, and potable water piping is past the useful life; they are blocked and corroded (**Figure 1**), and toilet waste has been found to enter the supply air plenum.

Detailed information and recommendations for the nursing buildings are provided under Priority #1 later in this report.

Figure 1. Waste Pipe from Skilled Nursing Building



Pool and Gymnasium

The Olympic-sized swimming pool, large hot tub, and gymnasium could benefit the residents and community, but these facilities are currently unused. Overall, the facility appears to be in good shape.

- We recommend further inspection into the thermal components because there does not appear to be attic ventilation, which could cause the insulation to mold. Attic ventilation is needed since the dew point will occur in the insulation and the moisture needs to be able to evaporate.
- The heating and potable cold and hot water piping should be inspected because all the piping on site appears to be near the end of life.
- We recommend installing a natural gas generator to serve the hot water and pool heating thermal needs, and to serve the power needs for lighting, pumps, etc. CHP technology is ideal for buildings with a thermal need all year.

Public Health Laboratory

The public health laboratory is an independent facility that is not owned by DSHS; however, it is still connected to the main campus' utilities. It is being assessed for removal from the Fircrest facilities. Doing so will very likely enable the Fircrest School to use about 30% less energy, reduce greenhouse gas emissions, and save operating budget while improving thermal and electric facility reliability. However, this is of no consequence to DSHS.

Chapel

The chapel is on the historic register. The shake roof is in need of immediate attention, but because the school is prioritizing patient health, this project is at the bottom of the list.

Administration

The administration building (called building 200) is a great example of how a three-story California style building can be improved for the Pacific NW climate. For example, the open air core has been enclosed with storefront glazing, the ramps have non-skid surfaces for the Pacific NW climate, and the atrium has solar blinds. There is ample space, it is aesthetically comfortable, and HVAC had been added to bring in fresh air. The HVAC equipment is, however, near the end of useful life and consideration could be given to upgrading to a VRF/dedicated outdoor air system (DOAS), which would significantly improve energy efficiency and comfort, or, adding to the central system.

There is a second building of this same design (called Building 500) that has not been improved for the Pacific NW climate. Building 500 is unused, but could potentially make for a suitable skilled nursing building should the existing skilled nursing buildings prove to be too costly to upgrade to current federal and state standards. Moving the skilled nursing functions to a single building will allow for better control for the staff, reduced heating costs, and an economical design for better air quality and code-compliant amenities. For example, the 9-foot ceilings in Building 500 allow for plumbing to accommodate the required “one restroom per two occupants,” and there appears to be enough space to provide the required 115 sf/person.

Workshops

The workshop buildings are large open spaces that could be used for a variety of community functions.

Projects Currently Under Consideration

Expenditures are being considered to fix the following systems in the skilled nursing/special care buildings (Y-buildings):

- Repair and replace piping infrastructure that is past the useful life.
- Replace the underfloor HVAC with an aboveground system that is not contaminated with toilet waste.
- Boiler controls upgrades

Additional projects are being considered to replace the electrical transformer and redistribute site power.

Next Steps

We recommend a holistic study where the functions at the facility and the integrity of the buildings are considered together. While considering options, thought must be given to:

- Maintenance
- Environmental stewardship
- Energy costs
- Power reliability
- First costs

A study such as this typically takes many turns as information is gathered. Based on our site visit, we are inclined to start with four priorities:

1. Priority #1 – Nursing buildings
2. Priority #2 – Decommission one boiler and replace with CHP
3. Priority #3 – Replace heating with VRF and electronic controls
4. Priority #4 – Reopen the pool using a CHP system to provide heat and energy

Priority #1

WSU Energy Program staff believes the first consideration needs to address the skilled nursing facility. The nursing staff currently provides services to the residents in six different buildings, which adds a significant and noteworthy level of complexity to providing good care. We understand funding is in place to repair the below slab waste piping. However, the buildings have deteriorated to the point that demolishing and rebuilding the nursing facility, or relocating nursing services to Building 500, should be considered rather than continuing to try to repair systems that are well beyond the useful life.

Cost and scope-of-work estimates to repair and retrofit the six buildings currently used for nursing services to the appropriate codes and regulations are listed below. The square footage of the six buildings is about 12,000 sf each. RS Means data for the single story medical office building and \$230/sf was used for the estimates. These figures are only estimates, based on RS Means square foot estimates for new construction. (further analysis is needed to substantiate these estimates):

1. **HVAC:** The waste piping has deteriorated under the floor slab, **causing waste products to get into the supply air plenum**. The plenum cannot be cleaned because the space is only 6 inches high and is sandwiched between two layers of concrete. Therefore, the buildings must be equipped throughout with a new HVAC system, and the existing underfloor supply system must be sealed and abandoned. Estimated cost for this is \$20/sf, \$240,000 per building, and \$1,440,000 for all six buildings.
2. **PLUMBING:** The waste piping is beyond repair and all the piping should be replaced. The cost to install all new waste piping is estimated at \$662,000 per building, \$3,980,000 for all six buildings (at 3% for demo and 7% for install, or 10% of new construction, plus 6% for all new concrete floors).
3. **WINDOWS:** The large storefront window systems are single pane, non-thermally broken aluminum. Some of the panes are Plexiglas that can be popped out with very little force. The cost to replace these is estimated at \$414,000 per building, \$2,484,000 for all six buildings.
4. **EXTERIOR WALLS:** The opaque exterior façade is unreinforced clay brick with no structural integrity. The buildings need a complete seismic upgrade. This upgrade is estimated to cost \$2,000,000. This estimate is based on discussion with a structural engineer who has not seen the site; however, he has been involved in seismic upgrades in our region so the order of magnitude should be within 50%.
5. **STRUCTURAL UPGRADE:** The structural upgrade will consume usable floor space. Because the available space is currently inadequate to meet state requirements for skilled nursing facilities, additional square footage would need to be built to meet the minimum floor space required per occupant and the additional bathrooms. Estimating 25% more square footage needed to meet the space requirements, or 3,000 sf per building, is estimated to cost \$1,035,000 per building, and \$6,210,000 for all six buildings.
6. **SQUARE FOOTAGE:** State and federal requirements for skilled nursing mandate one bathroom for two occupants. Therefore, 50 new bathrooms will need to be built. There is also a required minimum square footage per patient that cannot be met in the existing buildings' footprints. Additional square footage would be needed. Assume 3,000 sf/building at \$230/sf for six buildings = \$4,140,000.

Again, we recommend further analysis to provide cost estimates based on actual site conditions and not just RS Means square foot cost data. In order to be code compliant, the buildings need to be completely gutted, including interior surfaces for the seismic upgrade, the slab on grade for the waste piping, code-compliant HVAC, envelope thermal upgrades, and plumbing installation. Additional square footage

needs to be added to meet the minimum regulatory requirements. Furthermore, there are problems with the electrical distribution, resulting in breakers tripping frequently, which has not been assessed.

Based on input from Mr. Garry Moore, AIA, we believe the unused Building 500 can be retrofitted for a fraction of the cost to retrofit the existing skilled nursing buildings, while programmatically providing for significantly better care and function for the residents and staff. The options are:

1. Continue to try to stay ahead of the repairs
2. Demolish and rebuild
3. Relocate to Building 500

Options 1 and 2 would be the most disruptive to the tenants. Other items to consider include first costs, operating costs, maintenance costs, and energy efficiency. **Table 3** summarizes these estimated values.

Table 3. Summary of Path Considerations for Skilled Nursing Facility Improvements

Description	Estimated First Cost	Estimated Annual Maintenance Cost	Estimated EUI (kBtu/sf/yr)	Estimated Annual Energy Costs	Estimated CO2e Emissions (tonnes)
Fix deficiencies as noted in items 1-6 above	\$20,254,000	Highest	300	\$250,000	10,000
Demolish and rebuild(1)	\$24,840,000	Lowest	150	\$116,667	5,000
Relocate to the '500 Building' (2)	\$18,000,000	Low-Mid	150	\$116,667	5,000

(1) - New construction at \$230/sf, 90,000 sf. Demolition at 20% of New Construction

(2) - \$200/sf, 90,000 sf

Priority #2

To provide power reliability as mandated by the Center for Medicare and Medicaid Services (CMS) and reduce maintenance and operating costs, WSU Energy Program staff recommend replacing the decommissioned #4 boiler with a 1,000 kW CHP system. This technology is commonplace on the East Coast and California, where power costs are well over \$0.10/kWh. Highlights of applying CHP technology at the Fircrest School include:

1. Elimination of the diesel generators and all on-site fuel oil storage and associated maintenance,
2. Reduction in utility costs by about \$300,000 per year,
3. Reduction in greenhouse gas emissions of over 30% from the marginal power generation,
4. A simple payback of about 7 years, and
5. Installed cost estimated at under \$3,000,000.

We recommend integrating CHP into the facility to replace the potable hot water systems and provide backup power for the site. CHP technology can also help meet space heating loads. An article that provides a good overview of CHP can be found in this article: "Combined Heat & Power Really is the Answer," *Engineered Systems*, October 2015 (<http://www.esmagazine.com/articles/97365-combined-heat-power-really-is-the-answer>).

Priority #3

The heating systems appear to be inadequate and somewhat non-functional in every building, though priority should be given to the skilled nursing, administration, and resident housing buildings. There is unregulated and excessive heat in the winter and too much heat in the summer, when heat is unnecessary. Many spaces have too much heat in the winter, requiring residents to open doors and windows. There does not appear to be an effective way for building occupants to control the heat. Most controls are part of an outdated pneumatic system; starting about 40 years ago, pneumatic controls in the HVAC industry are being upgraded to electric controls.

We recommend a systematic replacement of steam radiators and fan coils. The technology to be considered should include VRF if decentralized systems are chosen, and/or two-pipe hydronic if the central plant is maintained. The most energy-efficient HVAC technology is the VRF coupled with a DOAS, which is used in about 90% of the commercial buildings in Japan, China, and Europe. When this technology was introduced in the United States, the market experienced double-digit growth due to the ease of installation, superior energy efficiency, and excellent tenant comfort. The price is very competitive and can be installed with very minimal disruption to the tenants in the buildings. For example, the Building Division for Centralia, WA, actually maintained operations while retrofitting rooftop gas/DX with VRF. Their energy use dropped by over 30% and they were much more comfortable with this HVAC technology.

Two articles that provide a good overview of VRF can be found at these links:

- “VRF Heat Pumps in the Real World,” *Engineered Systems*, September 2013 (<http://www.esmagazine.com/articles/95945-vrf-heat-pumps-in-the-real-world>)
- “VRF is Evolving,” *Engineered Systems*, February 2015 (<http://www.esmagazine.com/articles/96976-vrf-is-evolving>)

Priority #4

The pool and gymnasium are good candidates for CHP. A functioning pool would provide a constant thermal load all year that includes showers, pool heating, and heating the huge hot tub that is approximately 40 feet x 40 feet. Many hotels with indoor pools, on-site laundry, and showers have made the conversion to CHP and integrated the technology into their existing infrastructure. They do this instead of using boilers, water heaters, and/or diesel generators.

We understand the community would be very interested in having this pool recommissioned, and see it as a benefit to the community as well as the residents.

Utility Profile

Natural Gas and Electric Use

Energy costs by month for both the utility gas and electricity meters are summarized in **Figures 2 and 3**. **Table 4** summarizes the utility consumptions for CY15. This information is obtained from the Portfolio Manager database. Note that natural gas use is extremely seasonal while the electric consumption is very uniform across the year. It appears the laundry and potable hot water loads comprise about half of the peak heating season load. Such a profile is great for maximizing the benefits of CHP. We recommend analyzing actual bills to assess demand charges that can be offset with the use of CHP technology to further reduce the payback period.

Figure 2. Boiler Natural Gas Consumption for Fircrest

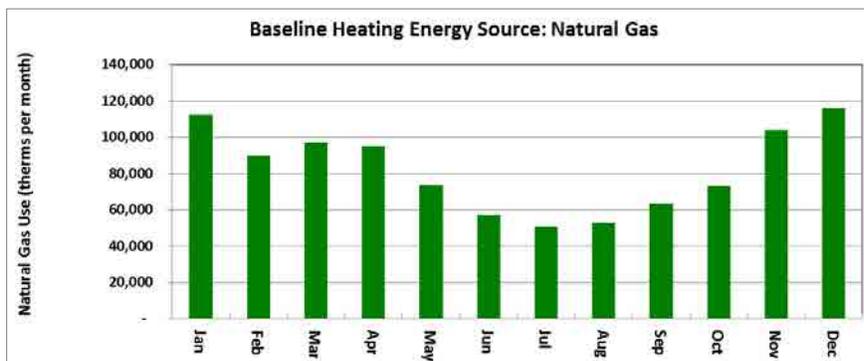


Figure 3. Monthly Electric Consumption for Fircrest

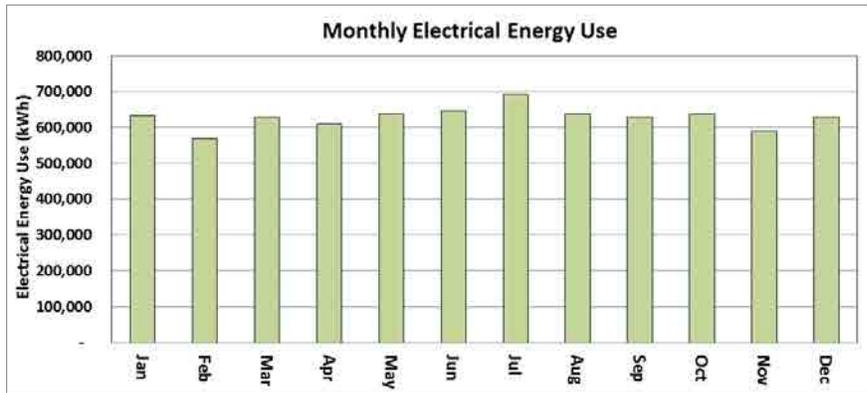


Table 4. Monthly Power and Thermal Consumption for Fircrest

ENERGY USE AND COSTS FROM BILLING RECORDS					
	Total Electricity Costs (Demand & Energy)		Natural Gas		Total Costs (\$)
	(\$)	(kWh)	(\$)	(therms)	
Jan	\$39,679	569,503	\$9,220	89,922	\$48,899
Feb	\$43,561	628,059	\$9,641	97,304	\$53,202
Mar	\$42,588	610,186	\$9,522	95,211	\$52,109
Apr	\$43,796	636,246	\$8,288	73,893	\$52,084
May	\$45,221	645,710	\$7,321	57,061	\$52,542
Jun	\$48,089	691,500	\$6,983	51,094	\$55,072
Jul	\$44,518	637,459	\$7,101	53,162	\$51,618
Aug	\$43,513	627,003	\$7,698	63,712	\$51,211
Sep	\$45,081	636,387	\$8,265	73,458	\$53,346
Oct	\$41,035	589,507	\$10,131	104,106	\$51,167
Nov	\$44,168	627,725	\$10,830	116,160	\$54,998
Dec	\$45,326	615,027	\$10,899	114,116	\$56,225
Annual Totals	\$526,574	7,514,312	\$105,900	989,198	\$632,473

CHP Feasibility

CHP is an efficient approach for generating power and useful thermal energy (heating or cooling) from a single fuel source at the point of use. Instead of purchasing electricity from the local utility and using fuel in an onsite boiler or furnace to produce needed thermal energy, the Fircrest facility can use CHP to provide both services onsite in one energy-efficient step. By recovering the heat normally wasted in power generation and avoiding transmission and distribution losses when delivering electricity from the power plant to the user, CHP reduces overall energy use, which reduces emissions and operating costs, and increases reliability for the end user.

With CHP, energy normally lost in the prime mover’s hot exhaust and/or cooling systems at the power generating facility is recovered to provide process heat, hot water, or space heating/cooling for the site. Common thermal loads for CHP applications can be cooling, heating, and humidity control systems for buildings; or domestic hot water for showers, pool heating, laundry, and other potable hot water loads.

CHP reduces pollution, reduces utility costs, and provides better power reliability. Significant evidence points to the fact that equipment needed for emergency scenarios is significantly more reliable when part of the non-emergency operation.

CHP at Fircrest

WSU Energy Program staff conducted a first-cut CHP system qualification screening for CHP equipment selection and economic viability at the Fircrest campus. Based on review of monthly electric energy and natural gas consumption along with other qualitative information, we have determined that the Fircrest School may qualify as a candidate for CHP. CHP has the potential to meet the campus' long-term energy savings, carbon emissions reduction, and other environmental impact goals while improving physical comfort levels for those who live or work at the school.

The following factors are the basis for our analysis favoring the installation and operation of a CHP system:

- The gas rate initially provided to us was \$0.1/therm. This is such a good rate that we expect there to be an error. We modeled the CHP system using a more typical gas rate of \$0.65/therm. A typical CHP system in the size range matched to meet energy requirements at Fircrest School could have an estimated simple payback of 30 years, and even lower if avoided costs are included (14 years at \$0.085/kWh and 9.7 years at \$0.10/kWh).
- Concern about electrical energy and natural gas cost increases.
- Concurrent seasonal electric and thermal loads (8,760 annual hours of operation).
- Washington State's commitment to reducing its carbon footprint through additional energy efficiency measures, including CHP.

Following are site considerations and assumptions that have been made in the analysis:

- The estimated costs for implementing future energy conservation measures were not included in this analysis. However, electricity prices are projected to increase significantly in 2020 as coal-fired plants are taken off line, the cap and trade bill becomes more fully implemented, and utilities move away from coal for power generation.
- The nameplate generation capacity of equipment (1,000 kW), fuel type (natural gas), and estimated electricity required for service loads.
- There are no estimates of avoided costs associated with any end-of life equipment replacement, or incentives that would favorably impact the financial picture of CHP. However, we understand a boiler upgrade is being discussed, and allocating funds for that project toward CHP technology will reduce the payback period. (6.8 years at \$0.10/kWh)

Description of CHP Project Appropriate for Fircrest School

One CHP alternative has been analyzed with three different potential scenarios: a CHP system at current electric rates (\$0.070/kWh), and a CHP system with electric rates increased to \$0.085/kWh and \$0.010/kWh. All scenarios assume a natural gas rate of \$0.65/therm.

The proposed CHP system would have five 200 kW micro turbines operating at 100% of rated power and designed to meet approximately 37% of the site thermal needs (100% when equipped with a duct burner with outside air firing) and 100% of emergency electricity needs.

This option allows for heat and electrical energy to be provided during a power outage. **Table 5** provides a summary of the results of this initial screening that reflects the inclusion of each aspect of the three scenarios described (prices per kWh were rounded up). The duct burner with outside air firing will allow the CHP plant to provide all the steam needs at about 92% efficiency (existing boilers are about 80% efficient), and act as a backup boiler if the power generation is completely down. **Table 5** also provides financial information.

Table 5. Fircrest Estimated Operating Savings and Simple Payback with CHP

	Baseline	5-200 kW Gas Turbines at CY15 energy rate (\$0.07/kWh)	5-200 kW Gas Turbines at \$0.085/kWh	5-200 kW Gas Turbines at \$0.10/kWh
Electricity Energy Cost	\$526,002	\$10,520	\$12,774	\$15,029
Electricity Demand Cost, Baseline	\$0	\$0	\$0	\$0
CHP Fuel Cost	\$0	\$610,572	\$610,572	\$610,572
Seattle Steam / Residual Boiler Fuel	\$642,979	\$415,427	\$415,427	\$415,427
Duct Burner (GT)/ Boiler (Engine), Supplemental Fuel Use		\$12,860	\$12,860	\$12,860
Boiler (Back Up), Back Up Fuel Use		\$402,567	\$402,567	\$402,567
COST SAVINGS				
Electricity Energy and Demand Cost Savings		\$515,482	\$625,942	\$736,403
Fuel Costs Increase		\$383,021	\$383,021	\$383,021
Total Annual O&M Costs		\$58,912	\$58,912	\$58,912
Total Operating Savings		\$73,549	\$184,009	\$294,470
SIMPLE PAYBACK				
Installation Costs		\$2,750,000	\$2,750,000	\$2,750,000
Avoided Costs		\$500,000	\$500,000	\$500,000
Incentives		\$0	\$0	\$0
Total Operating Savings		\$73,549	\$184,009	\$294,470
Payback (years), Before Incentives		30.6	12.2	7.6

Figure 4 provides the graphical representation of the payback as energy rates inflate. **Figure 5** depicts the CHP performance as its load follows on the electric load. In this capacity, it only meets about 28% of the thermal load. Therefore, we added the duct burner with outside air firing, which provides the entire thermal load needed to load follow with the duct burner. The thermal profile is depicted in **Figure 6**.

Figure 4. Simple Payback Based on Electric Rates and Incentives at Fircrest School

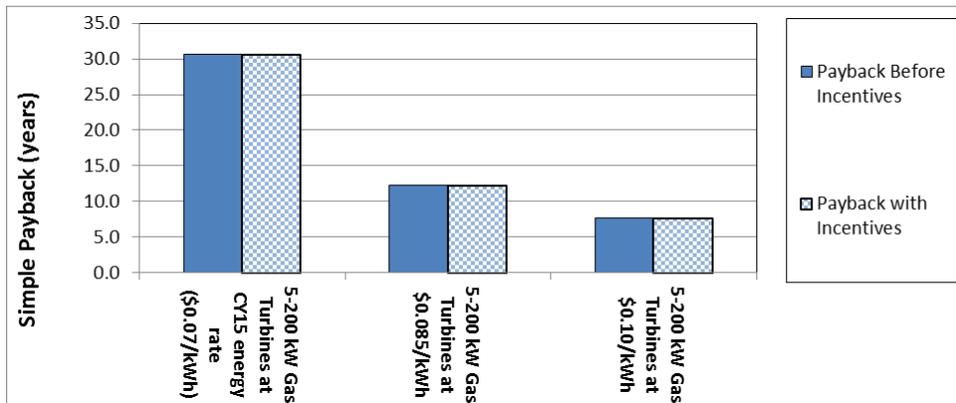


Figure 5. Monthly Electric Load and CHP Output at Fircrest School

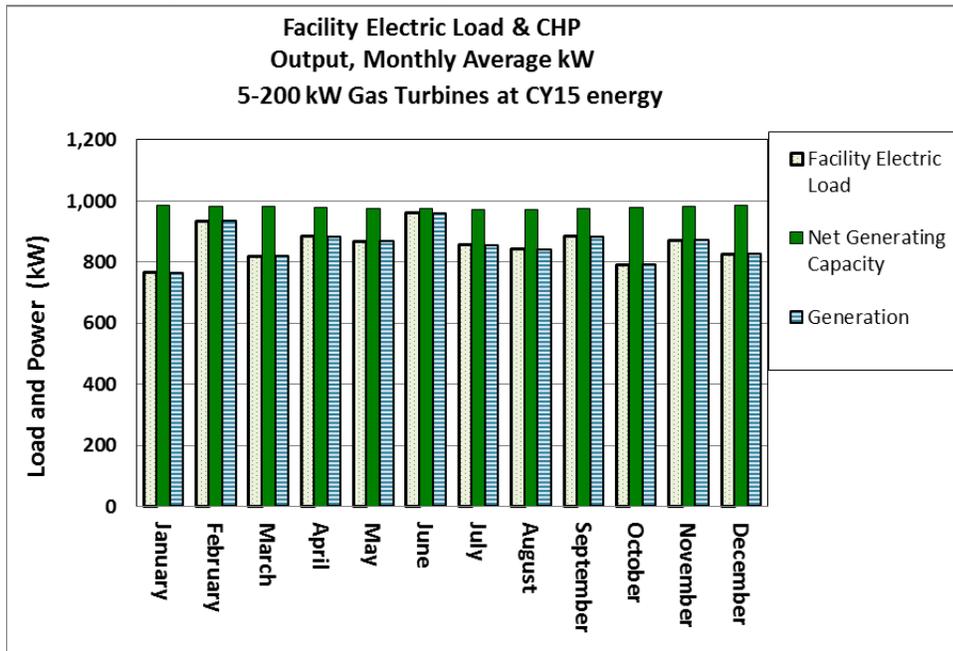
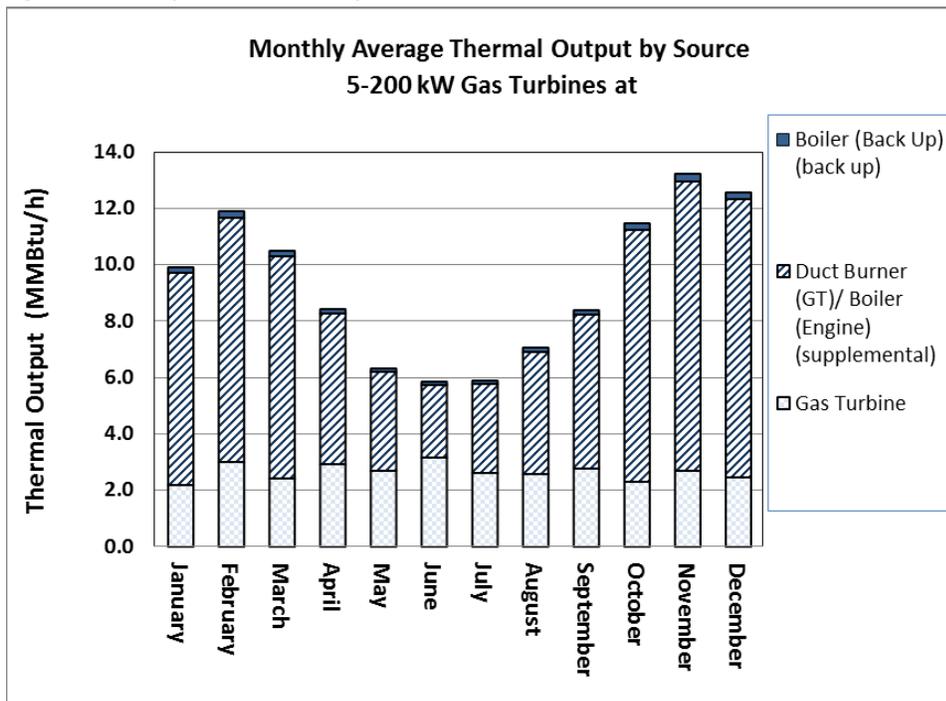


Figure 6. Monthly Thermal Consumption for Fircrest School



Specifying a 1,000 kW CHP unit instead of the 1,000 kW diesel generator will reduce pollution significantly at Fircrest School, as detailed in **Table 6**. CHP will reduce greenhouse gas emissions by almost 30%, NOx by 34%, and almost eliminate SOx emissions.

Table 6. Pollution and Greenhouse Gas Reduction Potential with CHP at Fircrest School

	Current Operation	1,000 kW CHP
Carbon Dioxide Equivalent of GHG Emissions (metric tonnes per year)		
CO2e Emissions	11,969	8,457
CO2e Emissions Reductions		3,512
Percent CO2e Emissions Reductions		29%
Number of Passenger Cars Removed **		747
Criteria Pollutants (metric tonnes per year)		
NOx Emissions	7.0	4.6
Percent NOx Emissions Reductions		34%
SOx Emissions	2.8	0.07
Percent SOx Emissions Reductions		97.4%

Based on the information currently available, further analysis is recommended. This investigation of CHP viability could include a feasibility assessment to further explore the campus’ seasonal or hourly energy usage and requirements, including overall facility planning and/or goals. The detailed site information needed for the feasibility analysis includes daily and seasonal electric and thermal load profiles, and site-specific details of any proposed expansion plans, and energy consumption increases expected by that expansion, or other factors that may impact CHP system selection or sizing. Several CHP technology or system options may be evaluated, with budgetary pricing and economic analysis developed for each option.

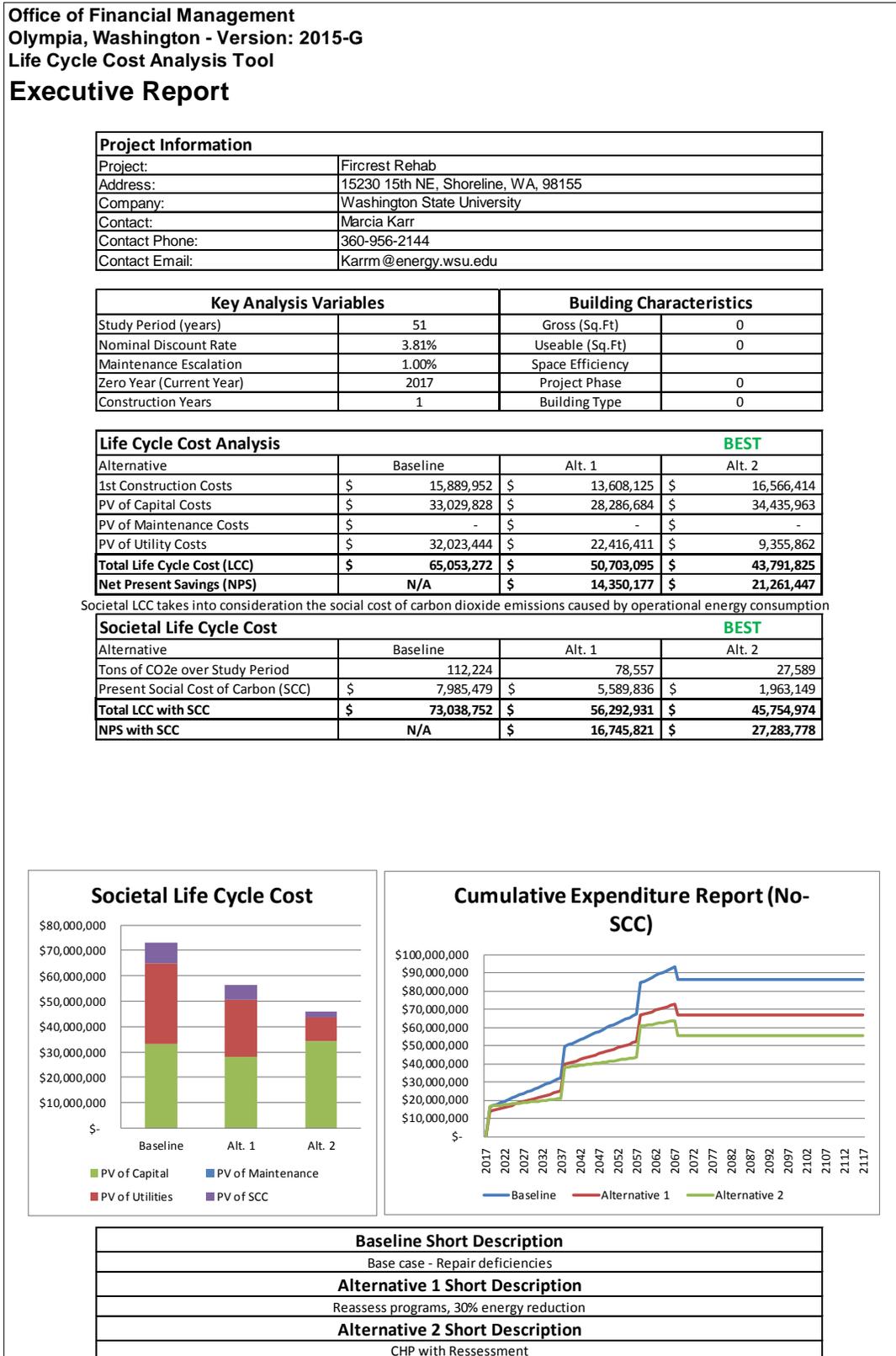
The results of the assessment will provide a more refined sense of how compelling the estimated economic and operational benefits of CHP might be to Fircrest School, and provide the information needed to make a decision about next steps, which could include the expenditure of funds for an investment grade analysis. We look forward to continuing to discuss your facility’s CHP opportunity and the next steps.

Life Cycle Cost and Societal Benefit

A Department of Commerce interagency memo from Brian Bonlender, Director, on the social cost of carbon describes the direction our state is going when making decisions on capital expenditures. On April 29, 2014, Governor Inslee signed Executive Order 14-04 on Washington Carbon Pollution Reduction and Clean Energy Action. Executive Order 14-04 requires public acquisition processes to consider the social cost of carbon (SCC) emissions. The energy efficiency section of Executive Order 14-04 stipulates that facilities managers for public buildings must “Ensure the cost-benefit tests for energy-efficiency improvements include full accounting for the external cost of greenhouse gas emissions.”

This report for the Fircrest School uses the tool created by the Washington State Office of Financial Management to show compliance with Executive Order 14-04. This tool, called the Life Cycle Cost Analysis Tool (LCCAT), accounts for the societal benefit of the proposed project. **Figure 7** is a screen shot of the results based on the assumptions noted throughout this report. Data will be re-entered into this tool after the next level of analysis occurs, but this preliminary assessment is provided here to encourage the direction of reprogramming some buildings and adding CHP.

Figure 7. Fircrest School Life Cycle Analysis



The first alternative modeled reflects a 30% reduction in electric and thermal energy use. This will result in reducing the EUI as shown in **Table 7**. Integrating CHP into the site will further reduce the EUI.

Table 7. Energy Use Index for Similar Occupancies

Energy Use Index EUI (kBtu/sf/yr)	
Apartment	38
Small Hotel	69
Hospital	139
Outpatient Facility	247
Fircrest Rehabilitation Present	300
Fircrest Rehabilitation, 30% energy	210

Conclusion

The Fircrest School performs a necessary function for residents, where people with disabilities appear to be well cared for. The maintenance and operations of the campus appear to be exceptional, especially given the age of the facility.

However, the team from the WSU Energy Program that visited the school in July 2016 emphasize that the infrastructure is failing beyond repair. Further, it might be time to consider a complete needs assessment of those who work or live at the facility, and the best options to meet these needs. The facility has not aged well, and continuing to patch problems may not be the best path at this juncture.

This facility uses significantly more energy that it should, which provides great opportunities to save energy and reduce pollution. For comparison:

- The Fircrest School is a 440,639 square foot facility and uses about 300 kBtu/sf/yr
- The national average for a small hotel in Seattle is 69 kBtu/sf/yr
- The national average for an apartment is 38 kBtu/sf/yr
- The national average for a hospital is 139 kBtu/sf/yr

Have we got an opportunity for improvement!

Once a facility reaches a point of dilapidation, consideration of all options is prudent. We believe the site can be overhauled to better meet the needs of the residents, reduce GHG and utility costs, and exceed current regulations as they relate to the functions at this site. Given the state of the infrastructure, we believe the overhaul would also actually cost less than patching failures as they continue to occur.

The first decision must be a commitment to either maintain the central plant concept or convert to decentralize mechanical systems. The team from the WSU Energy Program advocates maintaining a central plant concept.

Converting to decentralize mechanical systems is a huge undertaking and can be very disruptive to the tenants. The existing steam boilers can only be operated at part load to a point. Beyond that, heat will need to be rejected to atmosphere, wasting energy during the transition from central to decentralized HVAC. A decentralized HVAC system means that maintenance must be performed all over the site, which would require more staff time. And the total HVAC capacity would be about 30% higher due to the inability to account for diversity of loads at any given time.

Hospitals and campuses typically choose a central system for good reasons. A summary of the advantages of a central plant include:

- Reduced maintenance costs

- Reduce utility costs
- Longer equipment life
- Diversity of loads, which allow for reduced overall capacity (on the order of 70%)
- The ability to integrate CHP, which opens the potential to:
 - Reduce pollution by 30% to 50%
 - Provide better power and thermal reliability
 - Provide thermal and power redundancy
 - Reduce utility costs

We suggest further analysis to address the best path that would include these items.

Thank you for this opportunity to support your goals.

APPENDIX B - PAT "N" ("Y" BUILDINGS) BUILDING PROGRAMMING AND STAFF CALCULATIONS

Typical Pat "N" Building Programming							
#	Space		Building Staff	Patients	Rotating Staff	Visitors	Remarks
1A	Day Room	615	●	●			
1B	Day Room	497	●	●			
2	Room	135	●	●			
3	Toilet Room	164	●	●			Only one water closet
4	Storage	41	●				
5	Bath Room	188	●	●			
6	Dormitory	637	●	●		●	9 Patients - Does not meet State standards *
7	Vestibule	100	●				
8	Dormitory	636	●	●		●	9 Patients - Does not meet State standards *
9	Clean Utility	56	●		●		
10	Soiled Utility	90	●		●		
11	Medication Room	159			●		
12A	Day Room	615	●	●	●	●	
12B	Day Room	632	●	●	●	●	
13	Toilet Room	145	●	●			Only one water closet
14	Soiled Utility	92	●				
15	Clean Utility	57	●				
16	Bath Room	188	●	●			
17	Dormitory	632	●	●			9 Patients - Does not meet State standards *
18	Vestibule	100	●				
19	Dormitory	636	●	●			9 Patients - Does not meet State standards *
20	Storage	41	●		●		
21	Room	135	●	●			
22	Linen	231	●		●		
23	Toilet Room - Women	15	●				
23A	Water Closet	14	●				
24	Toilet Room - Men	33				●	
25	Toilet Room - Staff	32				●	
26	RN/LPN Office	176	●		●		Revolving staff also use this space
27	Dining Room	765	●	●	●		Used by building & revolving staff for mtgs.
28	Kitchen	241	●		●		Kitchen is under utilized
29	Soiled Linen	120	●		●		
30	Laundry	65	●		●		
31	Janitor	59			●		
34	ACM/HPA Office	193	●		●		
35	Foyer	563	●	●		●	Report desk with computer

Pat "N" Typical Occupied Area (per building)		
Total Occupied Space	9,098	80%
Circulation, Storage & Structure	2,340	20%
Gross Sq. Footage per Typical Building	11,438 **	
<ul style="list-style-type: none"> ▪ **Does not include Basement or exterior patios ▪ State Standards (WAC 388-97-340) require 80 SF per bed in existing facilities. 110 SF required for new multi-bed facilities ▪ Standards also require 1 toilet facility directly accessible to residents, per every 2 residents 		

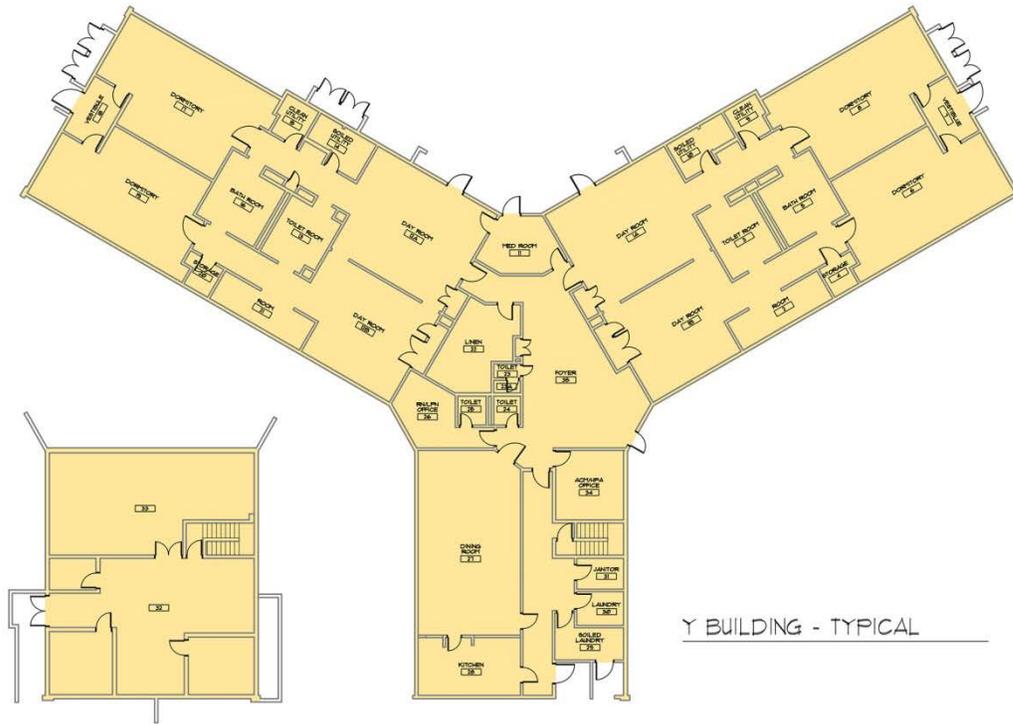
- **Pat "N" Building Staff Calculations:** The following tables provide an inventory and calculation of building staff that occupy the Pat "N" operations. Each building is assigned specific staff members that are needed to care for the residents of said buildings; these staff members work one of three daily shifts. Additionally, several staff members are rotating practitioners and provide service to all buildings.

<i>Pat "N" Building Staff Calculations Table</i>						
#55 Hickory - Building Staff				Staff Per Shift		
Total Staff				AM	PM	Night
1	Attendant Counselor Manager	ACM	Permanent in the Building	1	-	-
10	Attendant Counselor -1	AC 1	Permanent in the Building	4	4	2
5	Attendant Counselor -2	AC 2	Permanent in the Building	2	2	1
3	Attendant Counselor -3	AC 3	Permanent in the Building	1	1	1
1	Registered Nurse	RN	Permanent in the Building	1	-	-
1	Habilitation Plan Administrator	HPA	Permanent In the Building	1	-	-
#56 Junkin (Birch) - Building Staff				Staff Per Shift		
Total Staff				AM	PM	Night
1	Attendant Counselor Manager	ACM	Permanent in the Building	1	-	-
11	Attendant Counselor -1	AC 1	Permanent in the Building	5	4	2
5	Attendant Counselor -2	AC 2	Permanent in the Building	2	2	1
3	Attendant Counselor -3	AC 3	Permanent in the Building	1	1	1
0	Nursing assistant	NA	Permanent in the Building	-	-	-
1	Registered Nurse	RN	Permanent in the Building	1	-	-
1	Recreation & Athletics	RA	Permanent in the Building	1	-	-

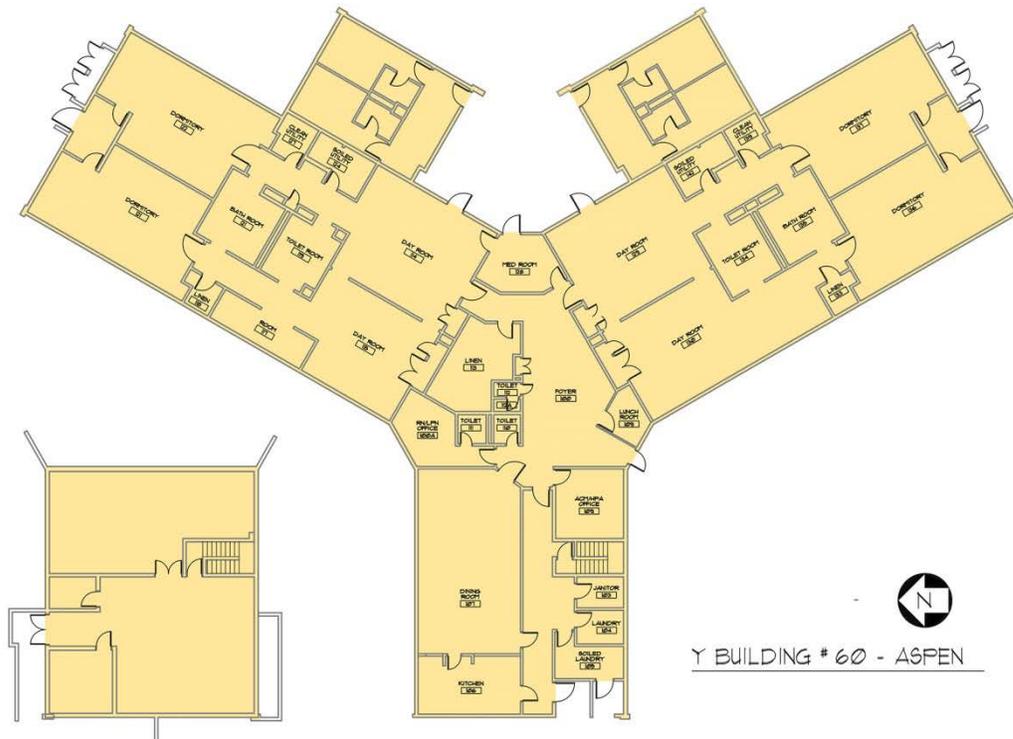
<i>Pat "N" Building Staff Calculations Table (continued)</i>						
#57 Elm - Building Staff				Staff Per Shift		
Total Staff				AM	PM	Night
1	Attendant Counselor Manager	ACM	Permanent in the Building	1	-	-
10	Attendant Counselor -1	AC 1	Permanent in the Building	4	4	2
5	Attendant Counselor -2	AC 2	Permanent in the Building	2	2	1
3	Attendant Counselor -3	AC 3	Permanent in the Building	1	1	1
1	Registered Nurse	RN	Permanent in the Building	1		
1	Recreation & Athletics	RA	Permanent in the Building	1	-	-
#58 Cherry - Building Staff				Staff Per Shift		
Total Staff				AM	PM	Night
1	Attendant Counselor Manager	ACM	Permanent in the Building	1	-	-
11	Attendant Counselor -1	AC 1	Permanent in the Building	5	4	2
5	Attendant Counselor -2	AC 2	Permanent in the Building	2	2	1
3	Attendant Counselor -3	AC 3	Permanent in the Building	1	1	1
1	Registered Nurse	RN	Permanent in the Building	1	-	-
1	Habilitation Plan Administrator	HPA	Permanent in the Building	1	-	-
1	Recreation & Athletics	RA	Permanent in the Building	1	-	-
#58 Cherry - Building Staff				Staff Per Shift		
Total Staff				AM	PM	Night
1	Attendant Counselor Manager	ACM	Permanent in the Building	1	-	-
11	Attendant Counselor -1	AC 1	Permanent in the Building	5	4	2
5	Attendant Counselor -2	AC 2	Permanent in the Building	2	2	1
3	Attendant Counselor -3	AC 3	Permanent in the Building	1	1	1
1	Registered Nurse	RN	Permanent in the Building	1	-	-
1	Habilitation Plan Administrator	HPA	Permanent in the Building	1	-	-
Revolving Staff in all Buildings				Staff Per Shift		
Total Staff				AM	PM	Night
23	Licensed Practical Nurse	LPN	Rotates through all Buildings	9	10	4
3	Habilitation Plan Administrator	HPA	Rotates through all Buildings	3	-	-
4	Recreation & Athletics	RA	Rotates through all Buildings	4	-	-
2	Occupational Therapist	OT	Rotates through all Buildings	2	-	-
1	Occupational Therapist Assistant	OT	Rotates through all Buildings	1	-	-
2	Physical Therapist	PT	Rotates through all Buildings	2	-	-
3	Therapy Aid	TA	Rotates through all Buildings	3	-	-
2	Speech Pathologist	SP	Rotates through all Buildings	2	-	-
Pat "N" Total				Staff Per Shift		
				AM	PM	Night
149				80	45	24

APPENDIX C - EXISTING BUILDING LAYOUTS

C.1 – PAT 'N' Typical Building



Y BUILDING - TYPICAL

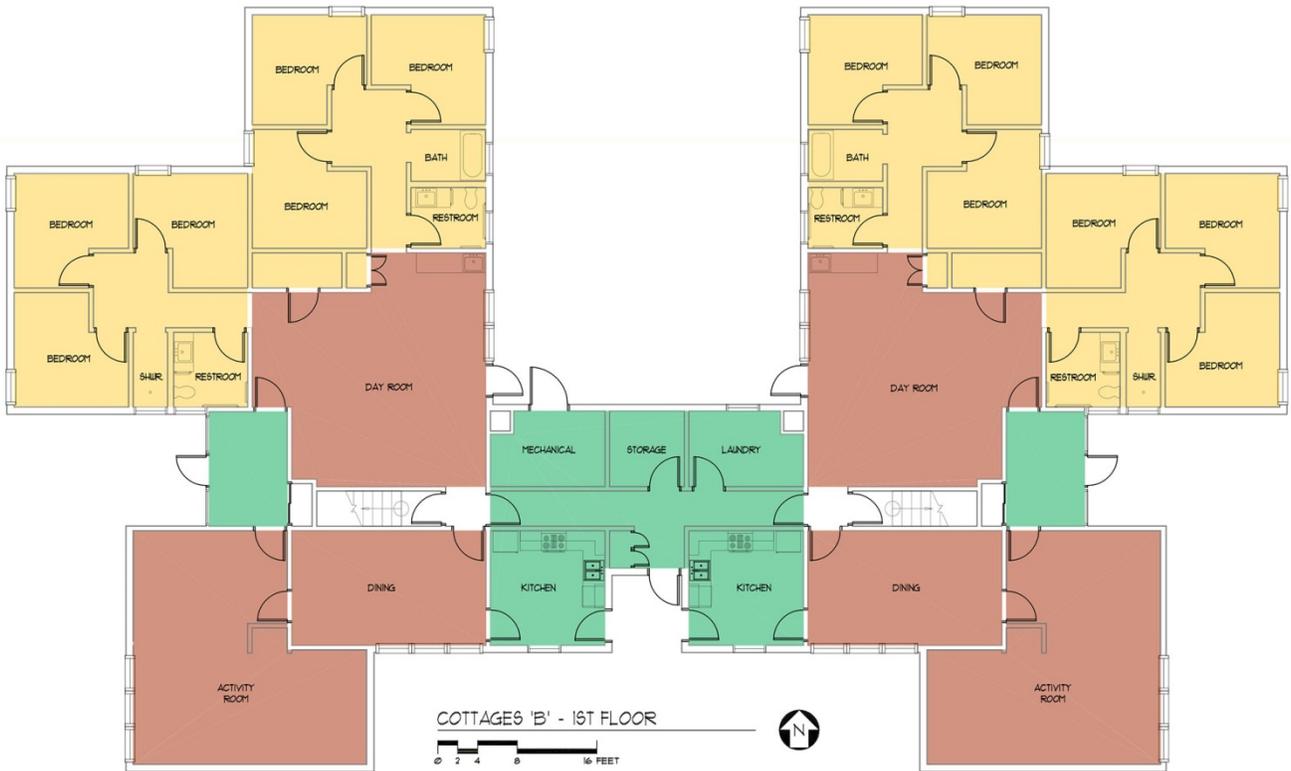
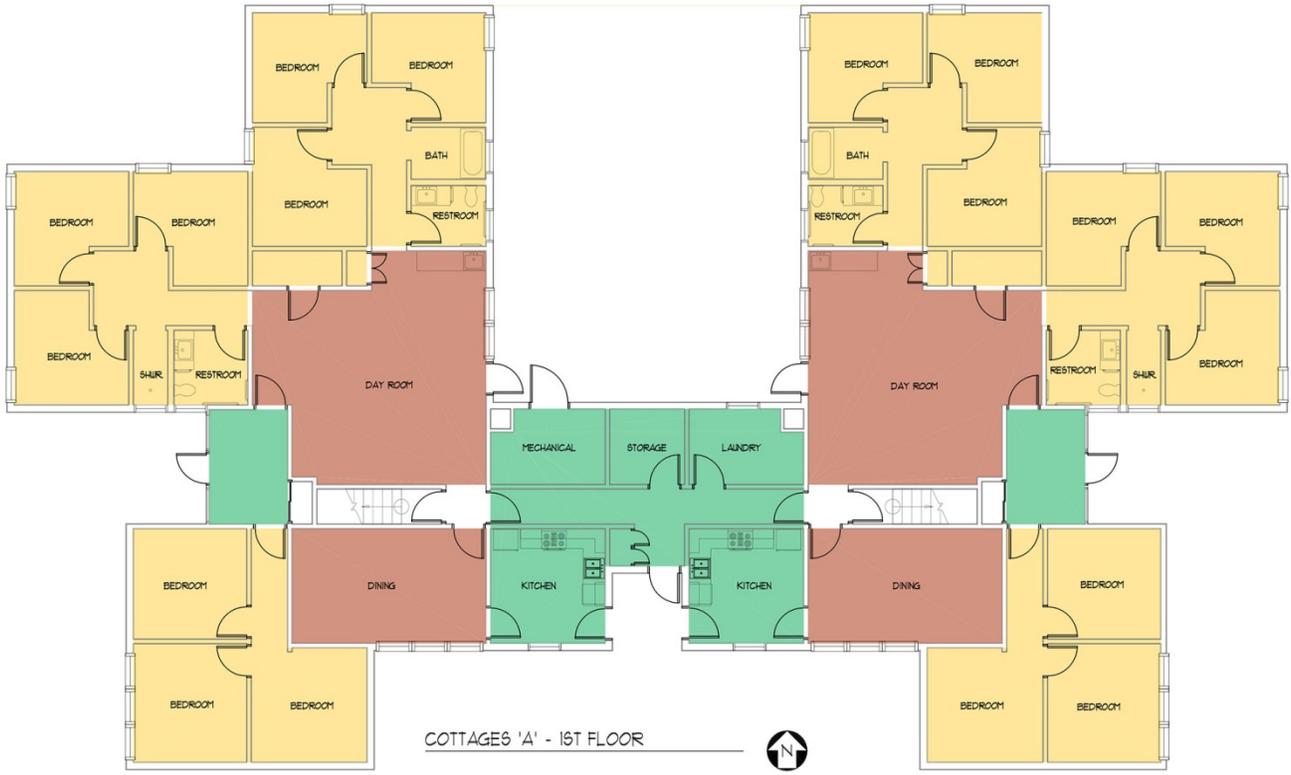


Y BUILDING #60 - ASPEN

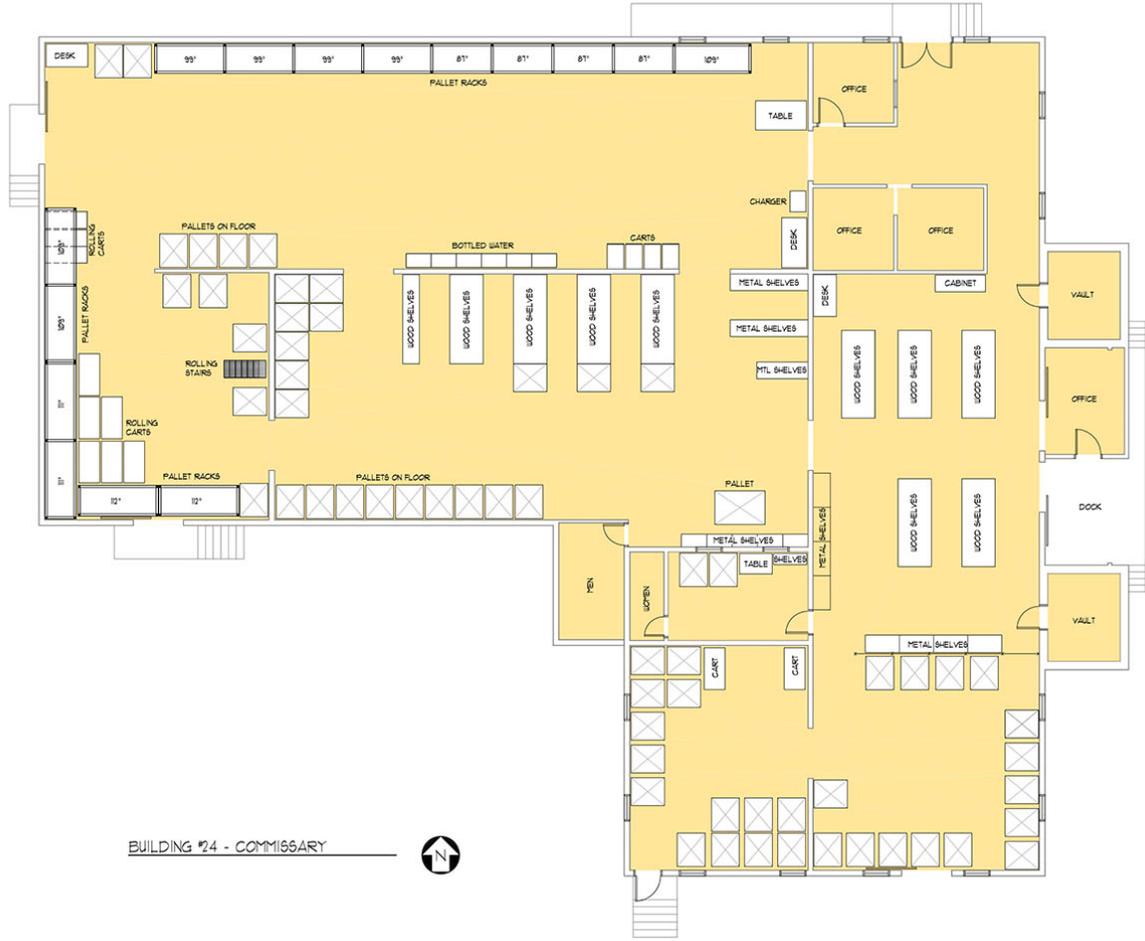
C.2 – Adult Training Program (ATP) Building



C.3 – PAT 'A' Building

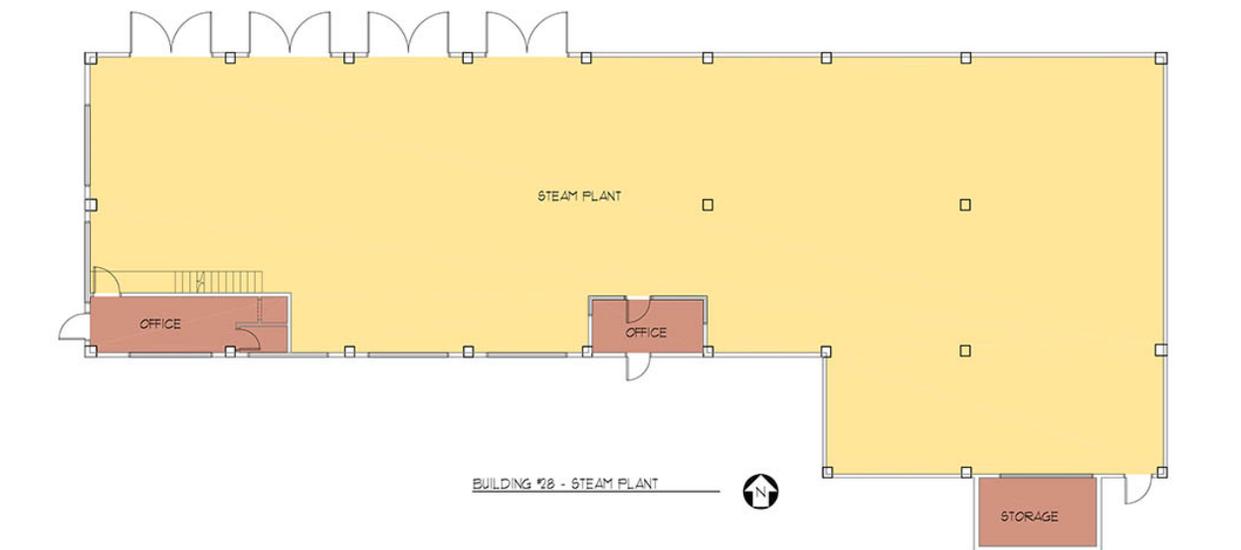
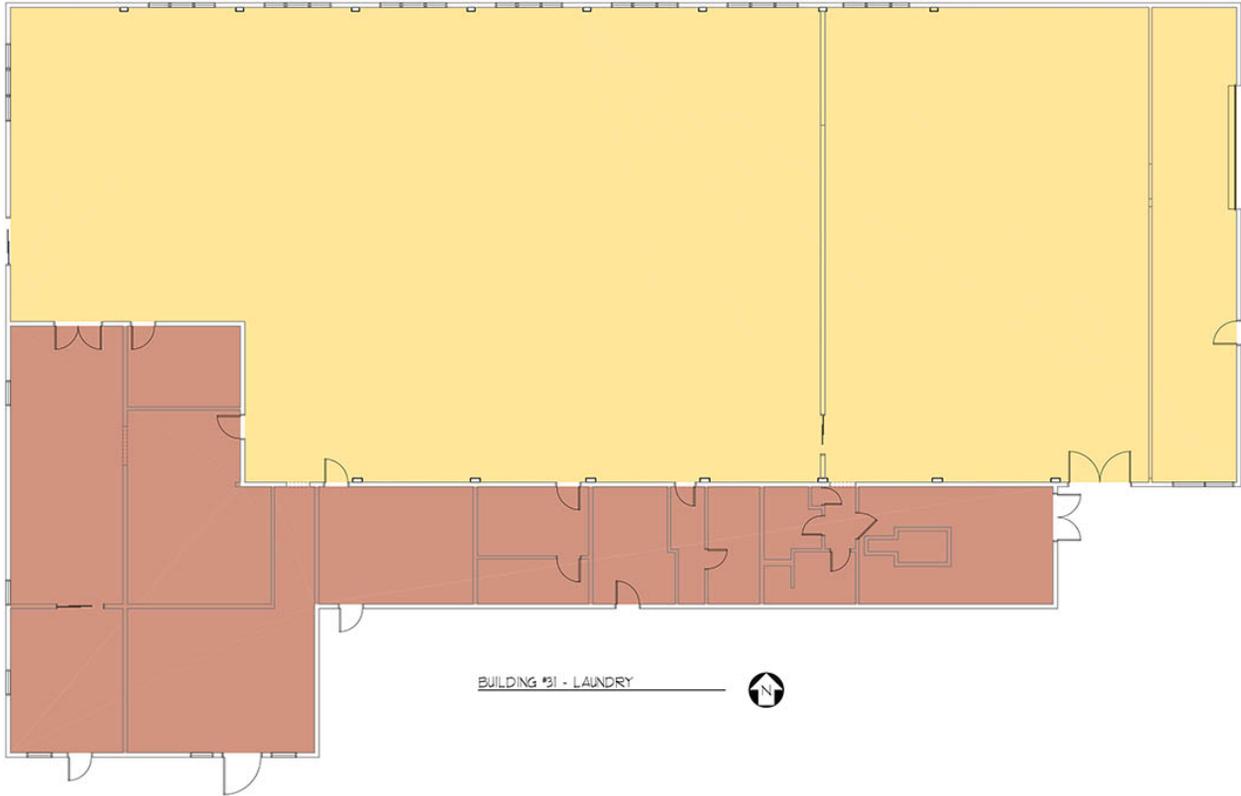


C.4 – Commissary Building

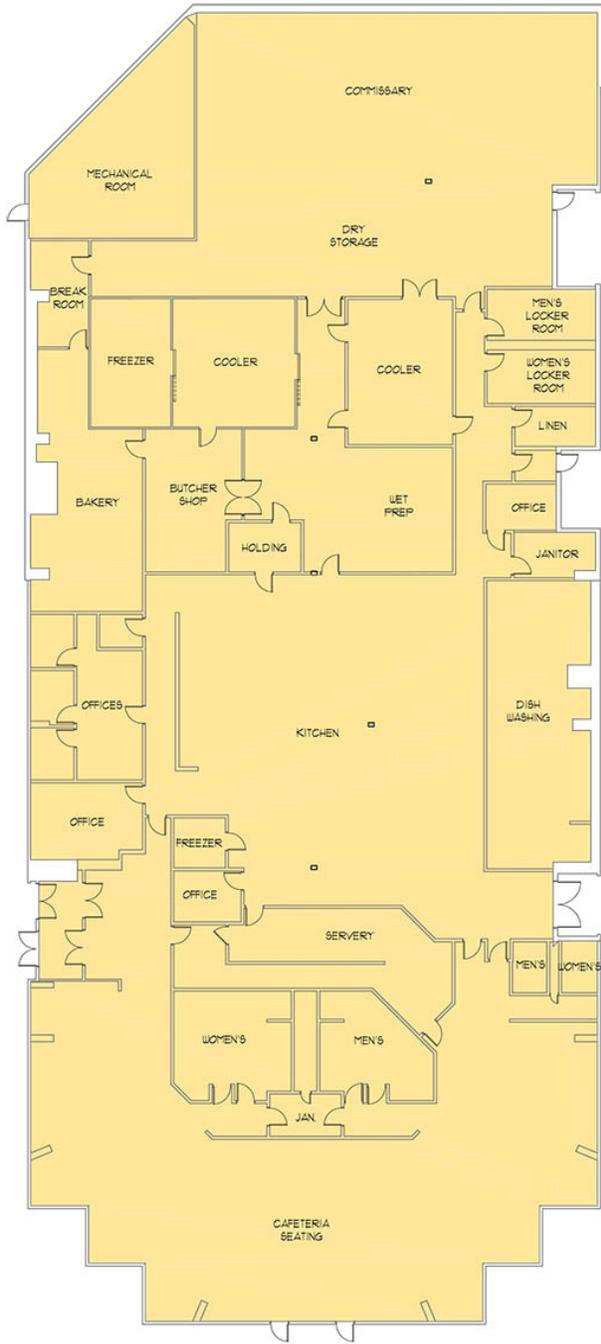


C.3 – Support Services Building Layouts

C.3.1 – Steam Plant (Building #28) and Laundry (Building #31)



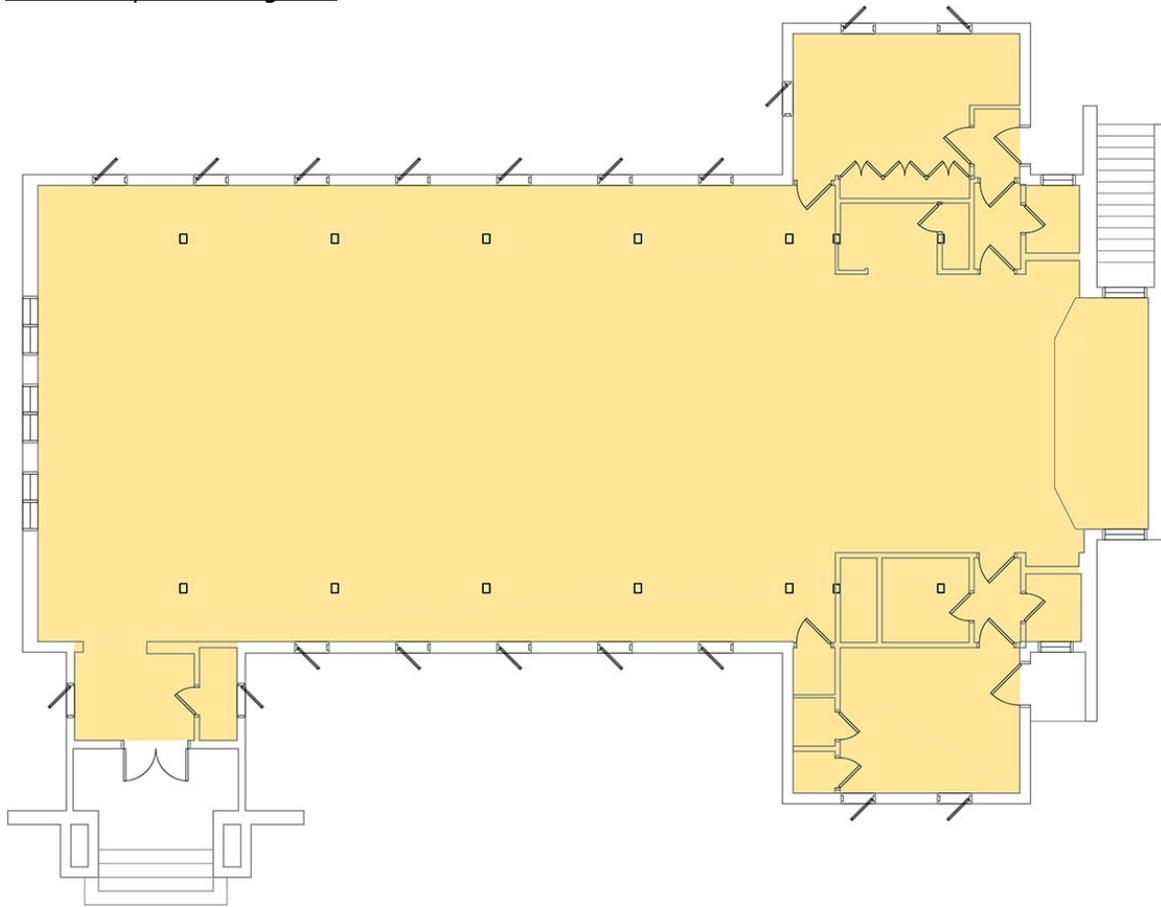
C.3.2 – Kitchen (Building #39)



BUILDING #39 - KITCHEN



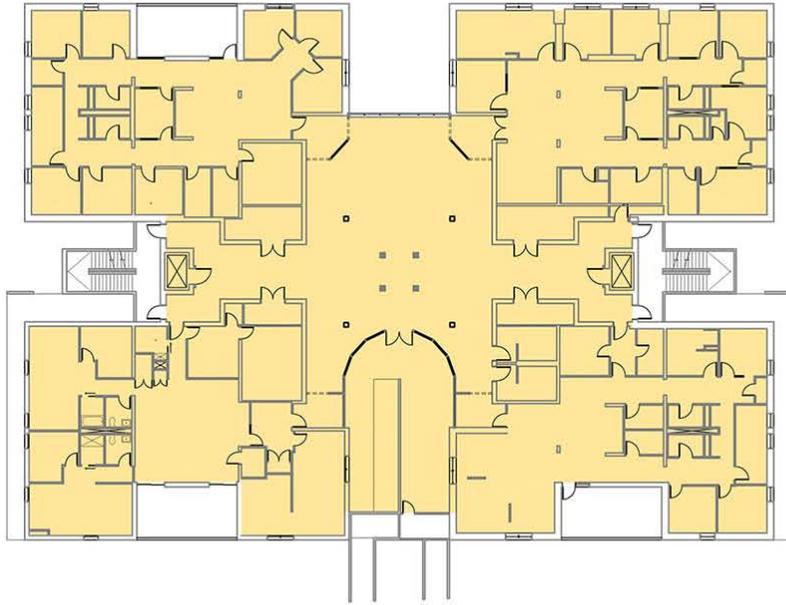
C.3.3 – Chapel (Building #64)



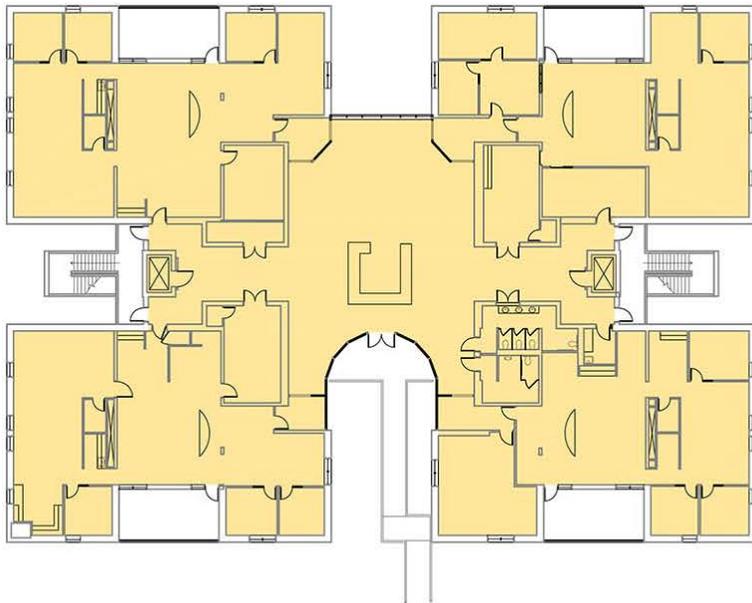
BUILDING #64 - CHAPEL



C.3.4 – Administration & Medical Services (Building #65)

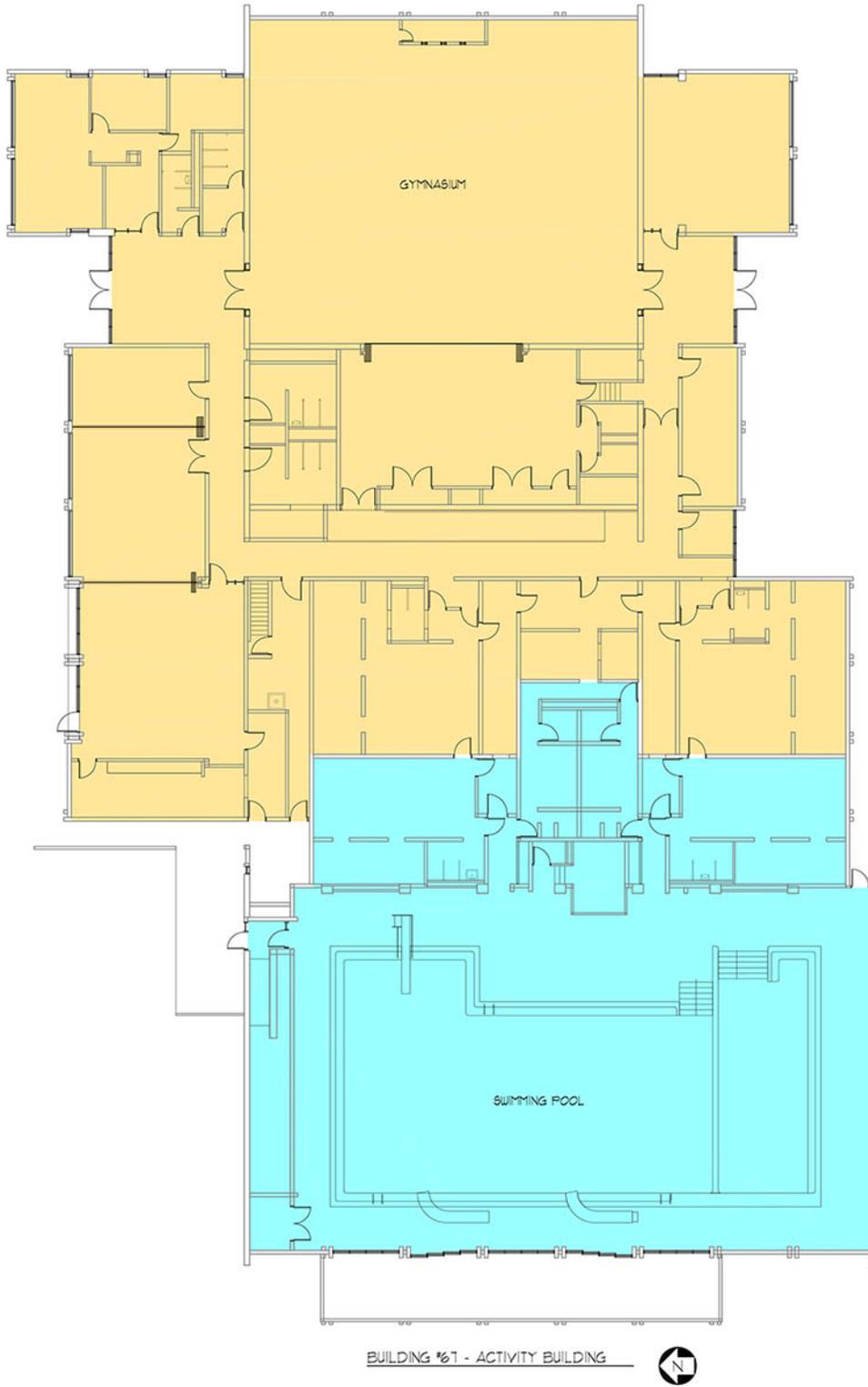


BUILDING #65 - ADMIN & MED SVCS
SECOND FLOOR



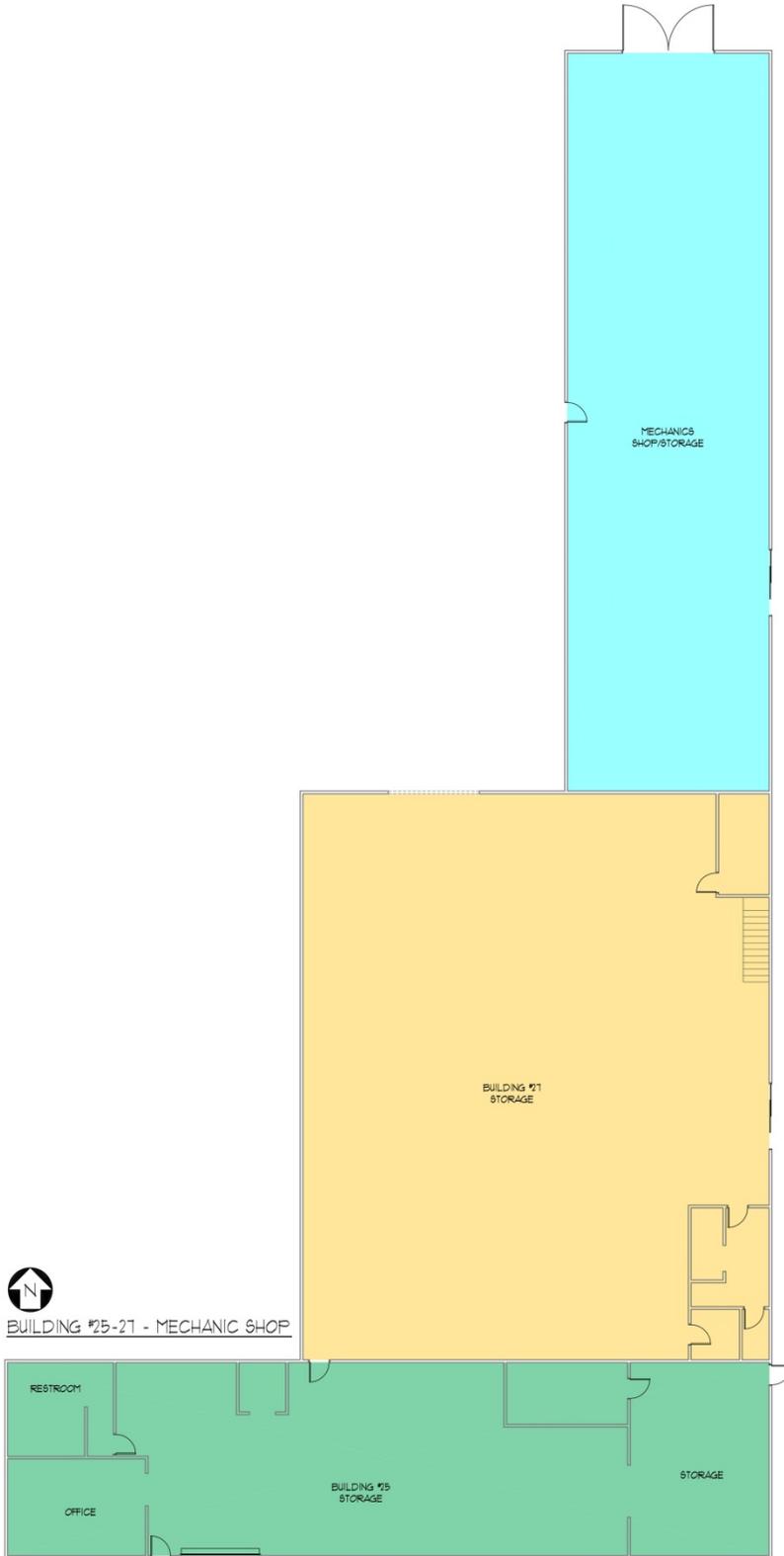
BUILDING #65 - ADMIN & MED SVCS
THIRD FLOOR

C.3.5 – Activities Building (Building #67)



C.4 – Maintenance and Storage Building Layouts

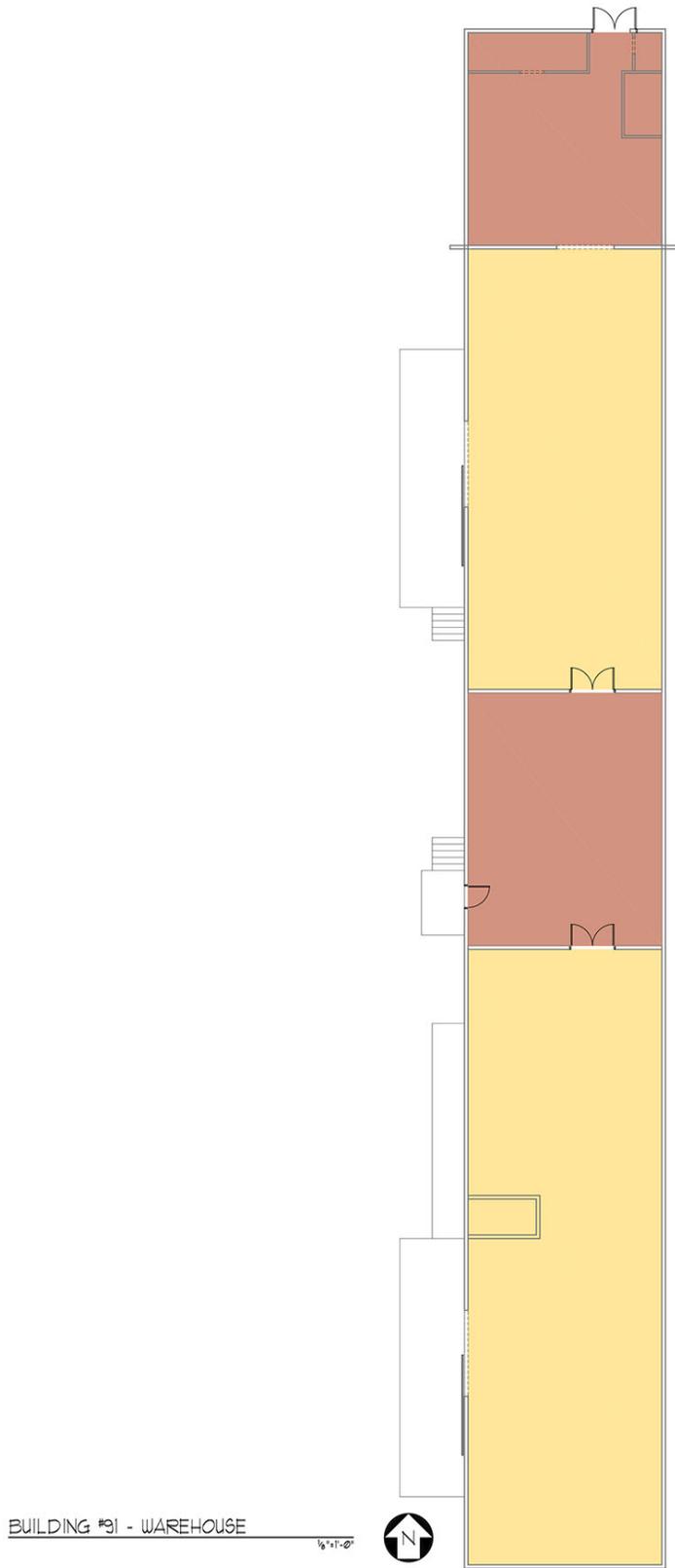
C.4.1 – Mechanics Shop (Buildings #25 - 27)



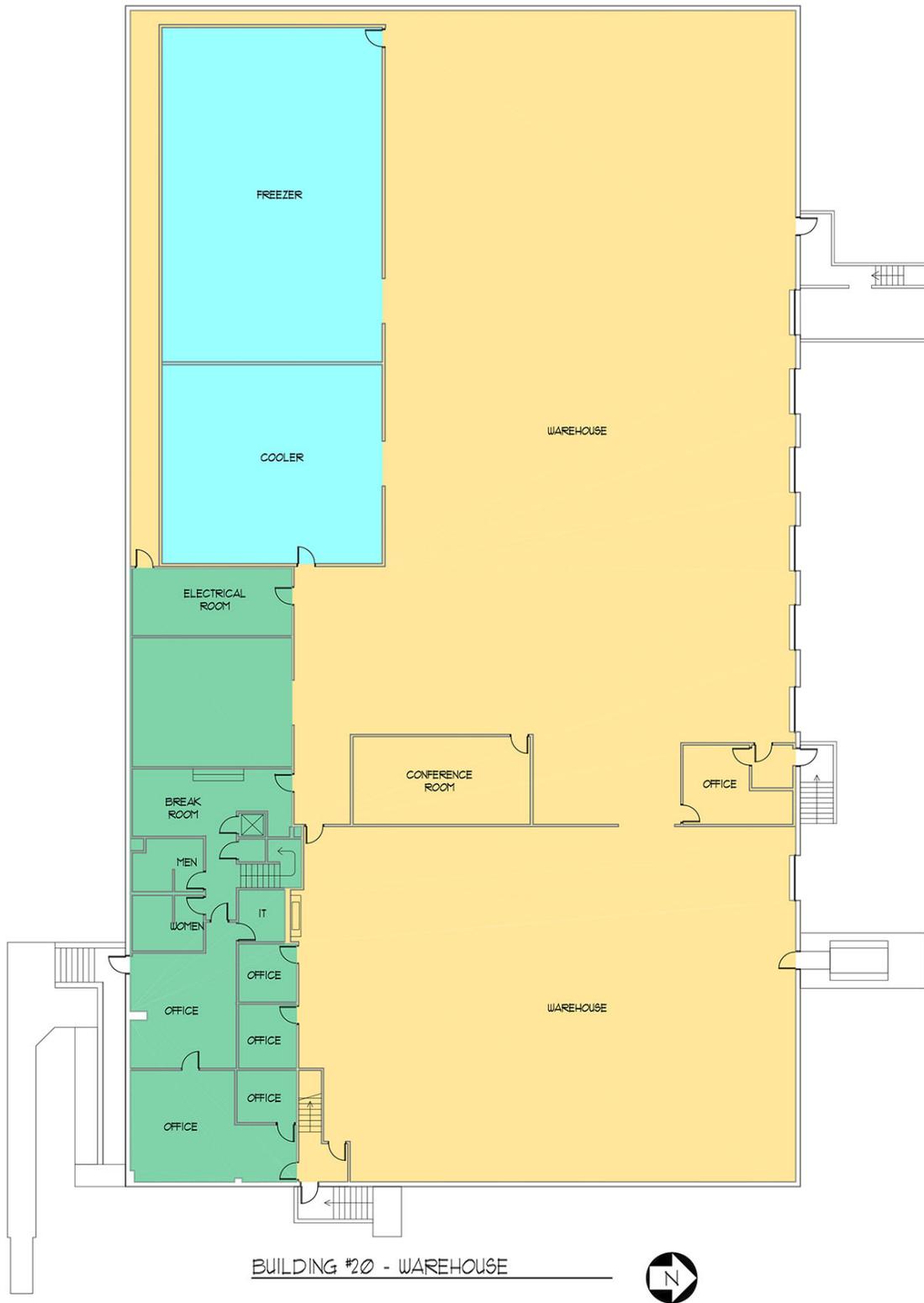
C.4.2 – Paint Shop (Building #43) and Carpentry/Plumbing (Building #34)



C.4.3 – Warehouse (Building #91)



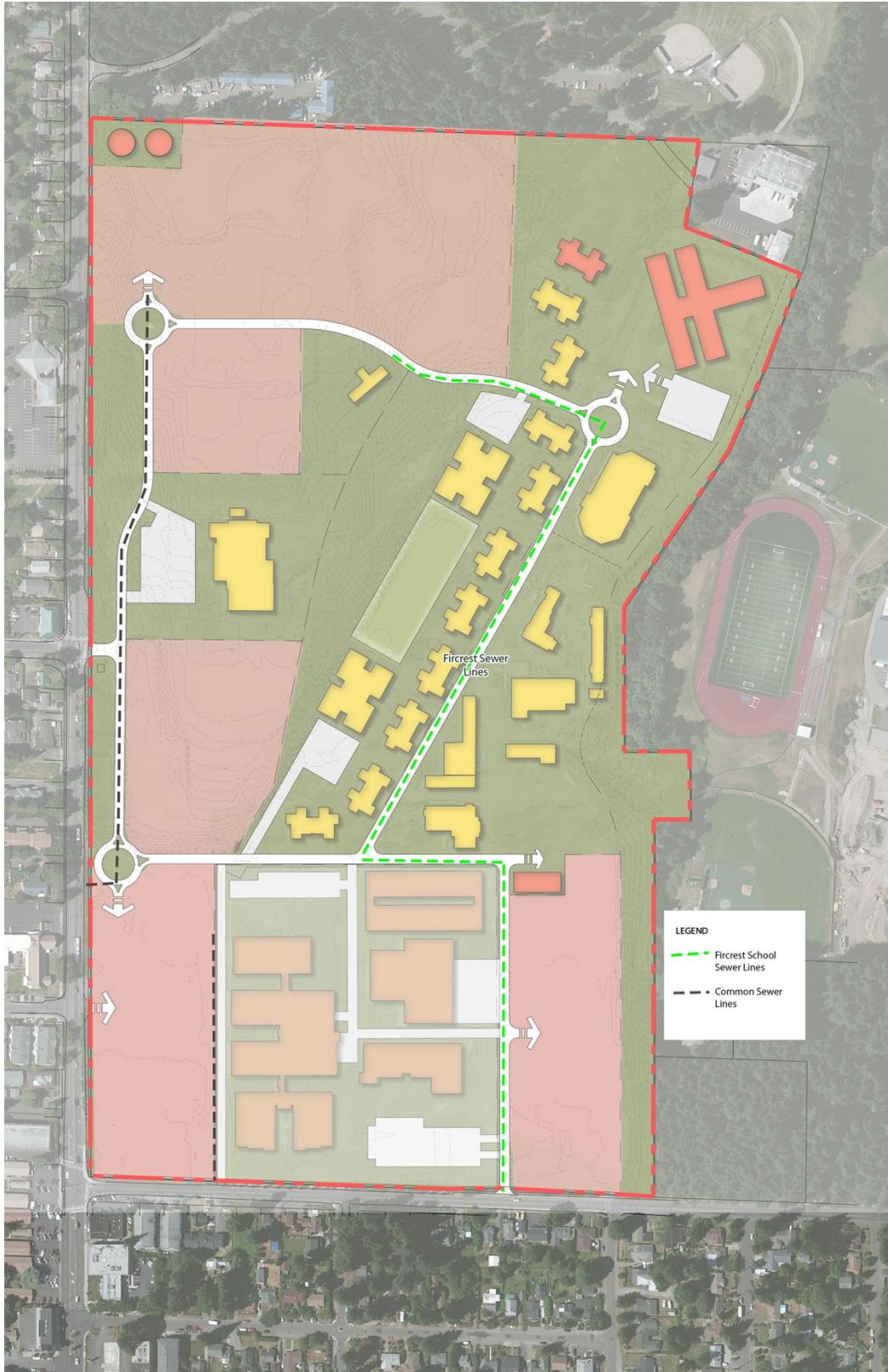
C.5 – Food Lifeline Building Layout



APPENDIX D - SITE INFRASTRUCTURE – POTENTIAL IMPROVEMENTS

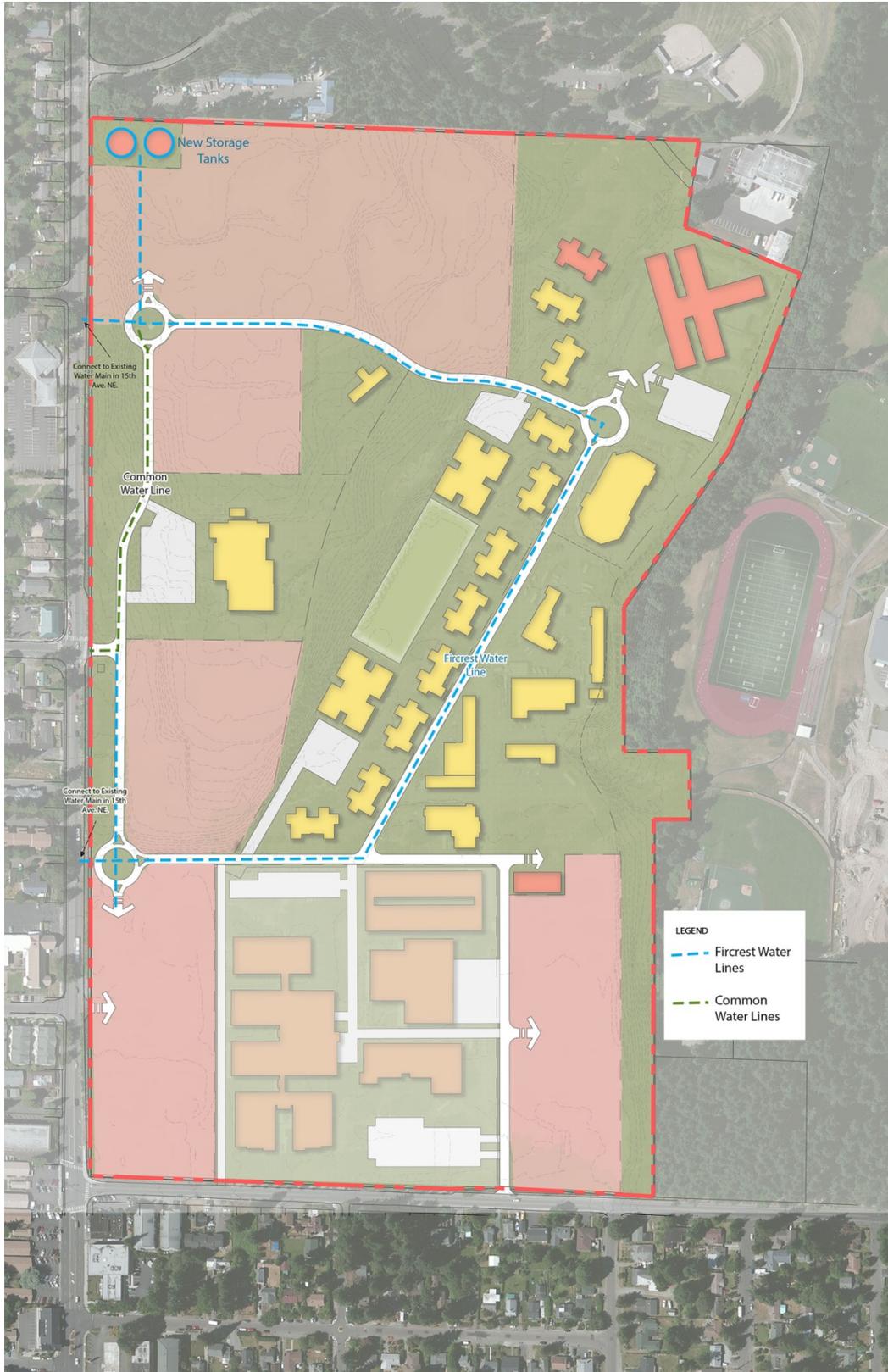


Stormwater Management – Potential Improvement Plan



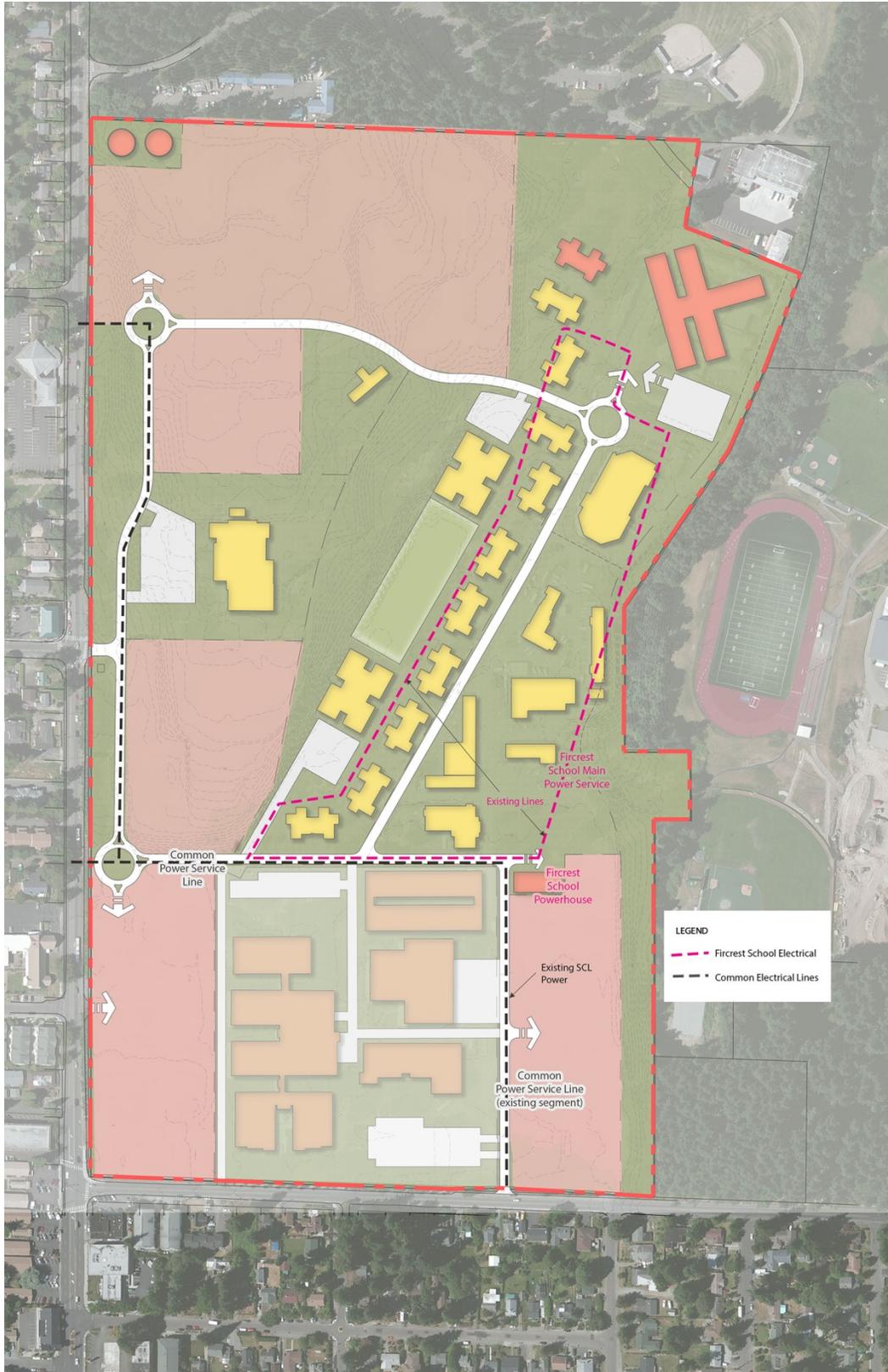
Sanitary Sewer – Potential Improvement Plan

FIRCREST SCHOOL - Campus Master Plan Phase III



Water – Potential Improvement Plan

FIRCREST SCHOOL - Campus Master Plan Phase III



Electrical- Potential Improvement Plan