

Willapa Harbor Hospital
Master Facilities Plan
March 2022



**Willapa Harbor
Hospital** 

The Healthcare
Collaborative Group

Executive Summary

In the summer of 2021, The Healthcare Collaborative Group was engaged by Willapa Harbor Hospital (WHH) to complete a Master Facilities Plan. The intent of the engagement was to evaluate the current facility, forecast demand, evaluate options for facility solutions to the forecast demand, and identify a path for WHH to follow.

In evaluating the current facility the consultant team (architects and engineers) reviewed existing drawings, as well as conducted an onsite review/inspection. It is clear WHH has significant facility issues to address, especially as it relates to the original 1954 building.

If WHH were to address the infrastructure issues identified in this report, they would likely be considering a \$20 Million expenditure, which would only update their current facility and not address growth needs.

As the team of Board members, WHH Leadership, and the Consultant team evaluated all the options, it was determined the preferred option was to develop a replacement facility in a new location rather than attempt a phased development on the current site. The key to this option is to find and secure suitable land for development. A minimum 5 acre site is needed for this development.

The replacement facility is projected to cost approximately \$52 Million, all-in. Once suitable land is acquired, a clear financing strategy, with a combination of multiple financing tools, will be critical. As some of this may require a public bond, a community engagement program will be important.

One thing is for certain, ‘standing pat’ with the existing facility is not an option for the future of WHH. A new facility with an emphasis on ambulatory services will be the platform for WHH to sustain current services as well as help grow new market opportunities identified.

Overall process review

The Team

The following individuals were participants in the MFP Process and represent the “team” engaged in completing our work:

WHH Board Members

Gary Schwiesow
Toni Williams

WHH Leadership Team

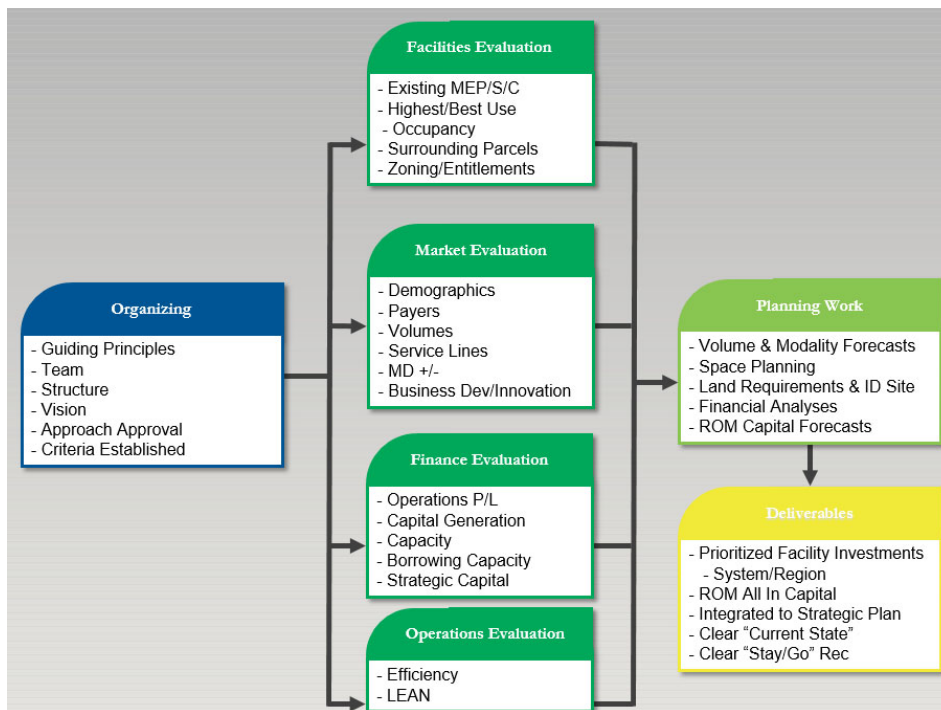
Matt Kempton, CEO
Scot Attridge CFO
Renee Clements, COO
Chelsea MacIntyre, CNO
Gary Spoor, Director of Facilities
Paula Lorenz, Executive Assistant

MFP Consultants

Joe Kunkel, The Healthcare Collaborative Group
Jon Anderson AIA The Healthcare Collaborative Group
Dave Williams, PAE Consulting Engineers
Brian Phair & Luke Heath, PCS Structural Solutions
Jody Carona, Health Facilities Planning and Development
Eric Volk, Wipfli

MFP Process

MFP process is outlined below, and has generally been followed by the team.



Guiding Principles Development

At the outset of the process, the team spent time evaluating, discussing and reaching consensus on a set of Guiding Principles that would guide the master facilities planning process. The following were the guiding principles:

- Of/By/For Local Community
- Exceptional Patient/Family Experience
- Flexibility

- Expandability
- Patient-Centered
- Healing Environment
- Efficient
- Safety for All
- Reflective of Local Environment
- Depicts Excellence
- Appropriate Resource Utilization

Facility studies

To initiate the MFP process, THCG conducted facility assessments through their sub-consultants PAE (Mechanical/Electrical Engineers) and PCS Structural (Structural engineers). The team spent time on site evaluating the conditions in the field, interviewing staff, and subsequently reviewing as-built documents for the current facility. The full reports of both firms can be found in Appendix A and Appendix B.

In a nutshell, the original WHH was constructed in 1954, and is approaching its useful life. WHH will need to consider significant investments to upgrade the existing facility or invest in new facilities.

Mechanical/Electrical

The mechanical/electrical systems in the current hospital have served their “useful life” and are in need of repair/replacement. The following dashboard summarizes the key findings of the study. Items that appear in RED are in need of immediate attention, while items in YELLOW should be addressed in the next 5 years. Items appearing in GREEN are in reasonable condition and do not warrant immediate attention.

Risk Register

System	Impact Level	Risk/Impact Description and Notes
Mechanical Systems		
Ventilation	6	Decentralized cooling system with portions past their rated life, energy code concerns. Areas are difficult to access and maintain. Aging equipment
Cooling	8	DX Cooling Only, Energy Code and DOH Long Term Concerns
Heating	3	Centralized, Proper Code redundancy, Single Fuel Source. Equipment near its rated life, but not past.
Controls	4	System issued are currently being addressed. Controls are being upgraded and improved
Plumbing Systems		
Domestic HW, CW, and ICW	9	Lack of readily available hot water noted in areas. Age of Piping and distribution systems concern, Access to piping for ongoing repair.
Plumbing Fixtures	5	Older vintage fixtures working fine. May require replacement or difficulty getting parts
Medical Gas	3	Proper Code Setup and operation. Newer Equipment
Sanitary Sewer, Vent and Storm	9	Documented blockages in the existing system. Aging piping and access issues
Fire Protection	2	Code compliant system and distribution.
Electrical Systems		
Utility Service	5	Any modifications to the 208V main service switchboard itself may trigger code required addition of main service breaker.
Generator & Essential Electrical System	8	Capacity and code deficiencies mean a remodel or expansion will likely trigger major modifications to this system.
Electrical Distribution	4	Aging existing distribution will likely require upgrade or replacement within area of remodel.
Lighting & Lighting Controls	2	Aging existing lighting and lighting controls will likely require replacement within areas of remodel.
Signal Systems	2	Aging existing signal systems will likely require replacement within areas of remodel.

Structural Evaluation

While the current facility structure is not at risk for collapse, the facility as it stands today would not be suitable for 'immediate occupancy' after a seismic event.

The structural evaluation can be summarized as follows:

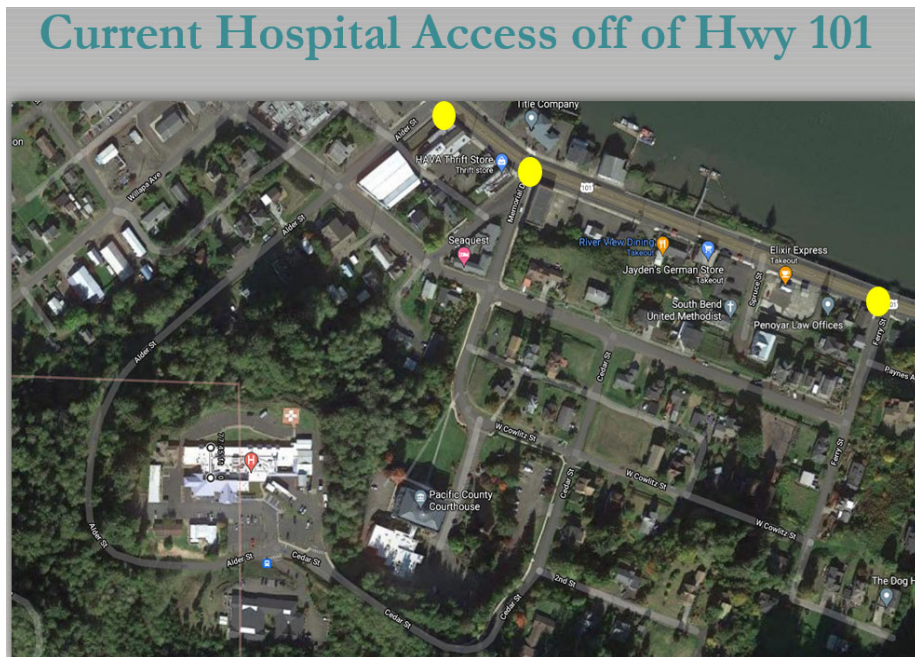
- 1954 Building would need complete seismic upgrade (new plywood shear walls and plywood roof sheathing)
- Bracing of masonry, piping and integrating (tying) to roof systems
- New addition in good shape

- Current building ‘grandfathered’ in, but understand likely not ‘immediate occupancy’ upon event

Land Evaluation

The initial land evaluation focused on the safety/risk of the current site. The land use maps for floods and tsunami are attached in Appendix C. The current site is not at risk for a tsunami nor a flood. That said, roadways in South Bend that lead to the hospital may be compromised.

Where the hospital resides currently is sufficient in size for operations. The recent closer of the Alder House provides additional potential space for expansion. The access to the current site, however is not ideal. The facility is not visible from the main road through town (101), and the feeder roads from 101 are narrow and clearly more ‘residential’ in nature.



Forecasting Demand

Health Facilities Planning and Development was contracted to understand current market demographics, forecast utilization of services, and translate those into basic modality needs for WHH. The full set of HFPD data is available in Appendix D. The fundamental building block for this work are the underlying demographics of the community and the trends forecast in those

demographics. The demographics drive forecasts for utilization of resources and therefore space needs to accommodate that demand.

Consistent with the [WipFli](#) strategic plan and based on patient origin data, the service area is assumed to be the district boundaries. The District is older (25% age 65+; compared to the State at 16%). The only growth is expected in the 65+ age cohort.

	2010	% of Tot Pop	2020 Est	% of Tot Pop	% Chg 2010-2020	2025 Proj	% of Tot Pop	% Chg 2020-2025
Tot. Pop.	9,022	100.0%	9,287	100.0%	2.9%	9,547	100.0%	2.8%
Pop. By Age								
0-17	1,971	21.8%	1,801	19.4%	-8.6%	1,820	19.1%	1.1%
18-44	2,448	27.1%	2,615	28.2%	6.8%	2,663	27.9%	1.8%
45-64	2,755	30.5%	2,521	27.1%	-8.5%	2,434	25.5%	-3.5%
65-74	992	11.0%	1,401	15.1%	41.2%	1,616	16.9%	15.3%
75-84	595	6.6%	673	7.2%	13.1%	718	7.5%	6.7%
85+	261	2.9%	276	3.0%	5.7%	296	3.1%	7.2%
Tot. 0-64	7,174	79.5%	6,937	74.7%	-3.3%	6,917	72.5%	-0.3%
Tot. 65+	1,848	20.5%	2,350	25.3%	27.2%	2,630	27.5%	11.9%
Hispanic	1,018	11.3%	1,403	15.1%	37.8%	1,629	17.1%	16.1%
Fem. 15-44	1,371	15.2%	1,409	15.2%	2.8%	1,446	15.1%	2.6%

Source: Claritas

On any given Day, approximately 10 patients from the District are hospitalized in OR and WA hospitals.

Service Line	2015	2016	2017	2018	2019	Willapa Market Share (2019)	2020	Willapa Market Share (2020)
General Medicine	216	249	214	238	225	50.7%	188	51.1%
Orthopedics	130	109	112	138	118	4.2%	97	9.3%
Cardiology	60	59	66	52	77	19.5%	70	24.3%
Gastroenterology	57	88	64	83	75	33.3%	57	47.4%
General Surgery	82	72	71	67	75	0.0%	74	1.4%
OB/Delivery	83	83	96	83	65	0.0%	83	0.0%
Neurosciences	45	52	43	26	29	27.6%	45	28.9%
Other	16	50	40	30	28	28.6%	29	17.2%
Oncology	19	37	37	42	27	18.5%	20	35.0%
Psychiatry	32	36	19	20	27	0.0%	24	0.0%
Interventional Cardiology	19	25	14	27	24	0.0%	26	0.0%
Urology	5	12	12	9	15	0.0%	12	0.0%
Cardiac Surgery	14	12	17	21	14	0.0%	21	0.0%
Other OB	9	5	8	5	6	0.0%	7	0.0%
Gynecology	4	2	7	3	4	0.0%	1	0.0%
Rehabilitation	10	11	3	2	2	0.0%	6	0.0%
Total	801	902	823	846	811	22.2%	760	23.0%

Also for the District, the largest volume of outpatient services are PT and imaging.

Service	Estimated 2020 Volumes	Estimated 2025 Volumes	Estimated 2030 Volumes
Lab Tests	76,655	78,801	81,294
Physical Therapy sessions	11,815	12,146	12,530
X-Ray Procedures	6,550	6,734	6,947
CT Procedures	2,069	2,127	2,195
Ultrasound	1,845	1,897	1,957
Outpatient Surgery procedures	1,571	1,615	1,666
Mammography Procedures	1,176	1,209	1,248
MRI Procedures	748	769	794
Gastroentero Endoscopy Procedures	676	695	717
Echocardiography	549	565	583
Chemotherapy visits	468	481	497
Cardiac Rehab visits	408	420	433
Dexa	179	184	189
Nuclear Medicine	145	149	154
Occupational Therapy sessions	105	108	112

Current and New Services

When evaluating services being provided, the bottom line was understanding the need for inpatient services is fairly flat, and not seen as an area for growth. The beds, however, can be used for “swing bed” patients. The primary emphasis for growth and stability is in the outpatient and ambulatory services, and this is where WHH should be focusing their resources.

After reviewing all the available data, the team felt the following ‘Strategic Space Drivers’ were the most important:

- New Programs
 - Swing Beds
 - Infusion
 - Physical Therapy
 - Fixed Magnet MRI
 - Visiting Specialists
- Growth of Current Programs
 - Increase ER Points of Care
 - Increase Primary Care Points of Care
 - Increase Surgery capacity

Space Requirements

Using the volume and modality forecasts from HFPD, THCG then developed a square footage requirement (aka “Program”) that would be necessary as a result. A comparison of current and projected square footage is as follows:

To best serve the community, a facility of approximately 56,000 square feet will be required. This will provide not only space for the hospital but for the clinics as well. We believe WHH

will best be served by an integrated campus that allows both the hospital and clinics to utilize common support and infrastructure. This makes the option of upgrading the current facility less viable as it only addresses current code deficits and not future program development.

Key Space Drivers include the following (full program in Appendix E):

Inpatient/Swing Beds	10
ER Exam Rooms	8 Rooms + 1 Trauma + 1 “Safe” Room
Operating Rooms	1 OR, 1 GI/Procedure Room
Physical Therapy Onsite	
Infusion	4 Bays
Primary & Specialty Care	20 Exam Rooms + 1 Procedure Room
CT	1
MRI	1
X-Ray	1
Mammography	1
Dexa Scanner	1
Ultrasound	1
Nuclear Medicine	1

Willapa Harbor Hospital Program Comparison			
	Current	Proposed	Comments
Hospital	36,000	47,000	Inc Admin, Bus Ofc
RHC	6,300	9,000	Clinic Only. Inc OP PT
TOTAL	42,300	56,000	

This summarizes the need for a 56,000 square foot facility.

Land Required

For the development of a new facility, a 5-acre parcel is needed, as calculated here:

- 272 Stalls (128 +/- Currently)(4/1000)
- Acreage Calculation:
 - Hospital 56,000sf
 - Helipad 2,500sf
 - Bulk O2 400sf
 - Parking 95,200sf

TOTAL 154,100sf

Landscape/setbacks (30%) = 46,230

GRAND TOTAL: 200,330sf or Approx 5 Acres

When considering available land, the following criteria should be evaluated:

- Size (for future)
- Location – accessibility
- Location – Market Reach
- Visibility
- Tsunami/Earthquake/Flood Avoidance
- Infrastructure Nearby
- CAH Implications (Proximity to other providers)

Option development

Having pulled together the evaluation of the current facility and the space needs for the future, the team set about creating 3 primary options for consideration. A brief description and pro/con list for each is listed below:

Option 1: Perform the necessary upgrades to the current facility as outlined in the engineering studies.

Pro: No new property required

Con: Disruption of operations during remodels
Loss of revenue/capacity during remodel
Lack of development of new programs
Location still a challenge for access
Long duration of remodel

Option 2: Replace the current facility on the current site, in a phased approach.

Pro: New program development can be accommodated as campus grows
No new land required
New facility for recruitment/retention

Con: Phased development will be disruptive
Phase development more costly than single-phase
Location still a challenge for access
Likely requires remodel/use of Alder House

Option 3: Replace the current facility on a new site, in a single phase.

Pro: New program development accommodated
Single-phase development more economical than phased
Opportunity to address visibility/accessibility
Does not require remodel/use of Alder House

Con: Availability of suitable land for development
Cost of land/infrastructure

In evaluating the options, the team spent time developing a set of criteria against which the options would be ranked. Those criteria included:

1. CODE COMPLIANCE
2. EXISTING PROGRAM GROWTH
3. NEW PROGRAM DEVELOPMENT
4. EFFICIENCY/OPERATIONS
5. PATIENT EXPERIENCE
6. SAFETY OF PATIENTS/STAFF/COMMUNITY
7. RECRUITMENT/RETENTION OF PROVIDERS/STAFF

- Escalation (5% per year)
- Program
 - 31,000 sf hospital
 - 25,000 sf ambulatory

Using these assumptions, the cost estimates for the options are as follows. Also included is a ‘sensitivity analysis’ showing different options for development in terms of ‘ambulatory space’ v. ‘hospital space’. This reflects the difference in construction costs for different levels of space.

	Phased Replacement on Site	New Site Development
Land Purchase	\$100,000	\$1,650,000
Off-Site Improvements	\$0	\$1,500,000
Sitework	\$500,000	\$500,000
Demolition Costs	\$250,000	\$0
Direct Construction	\$34,350,000	\$34,350,000
Soft Costs	\$13,740,000	\$13,740,000
Escalation	\$7,326,000	\$4,859,000
Total Costs	\$55,416,000	\$52,949,000

When the options are scored against the criteria outlined at the outset of the process, the team ranked the options as follows. Clearly, a new site is significantly preferred.

Option Comparison			
Criteria	Phased Replacement	New Site	Remodel Current
Code Compliance	10	10	8
Existing Program Growth	10	10	5
New Program Development	8	10	5
Efficiency/Operations	8	10	5
Patient Experience	10	10	5
Safety of Patients/Staff/Community	10	10	8
Recruitment/Retention	8	10	3
Other			

Financing Options

Wipfli conducted a series of analyses (found in Appendix F) evaluating the options available to WHH in terms of funding the development of a new facility. In general terms, the ‘capital stack’ evaluated included:

1. Reserves
2. Projected Margin from Operations
3. Debt Capacity – Government (USDA)
4. Debt Capacity – Private
5. Voted Debt
6. Philanthropy

The key ‘take away’ from Wipfli’s analysis is that no one single financing option will suffice to fund the development; it will require a combination. The debt capacity showed it could potentially support a \$30 Million debt, which would place the remaining need on the other options available. Most promising of these would be going to the voters for a bond levy to support the new facility.

Preferred option – size, location, phasing

After considering all the elements of demand, operations, land use, costs and financing, the team reached the consensus Option 3 (Replacement on new site) represents the best option for WHH to pursue. With that being said, it is imperative WHH secure suitable property in the near future to enable specific feasibility studies to be conducted, financing to be secured, and the development process to be initiated. The projected cost of this option is approximately \$52,000,000. Of course, this is tied to the schedule, as escalation past the preferred schedule will need to be adjusted as the actual schedule unfolds.

If the availability of suitable land proves to be too onerous or difficult, WHH should give serious consideration to Option 2 (replacement on-site). While not as efficient as developing a new facility in one stage, away from current operations, it is still far superior to Option 1 (remodel the current facility).

Appendices:

- A. MEP Evaluation
- B. Structural Evaluation
- C. Land Use Maps
- D. Demographic/Market Data

- E. Detailed SF Program
- F. Capital Budget Forecast
- G. Financing Options

APPENDIX A



Willapa Harbor Hospital

Mechanical, Electrical, and Plumbing Systems Assessment Report

January 15, 2021

pae-engineers.com

This page intentionally left blank



Table of Contents

1.0	Executive Summary	1
1.1	General Building Description.....	1
1.2	Mechanical & Plumbing Systems	1
1.3	Electrical Systems.....	2
1.4	Risk Register	3
2.0	Mechanical Systems	4
2.1	Ventilation System	4
2.2	Cooling	5
2.3	Heating.....	5
2.4	Controls.....	6
3.0	Plumbing	7
3.1	Domestic Hot, Cold, and Industrial Cold Water.....	7
3.2	Plumbing Fixtures	7
3.3	Propane.....	7
3.4	Medical Gas.....	8
3.5	Sanitary Sewer, Vent and Storm	8
3.6	Fire Protection	9
4.0	Electrical.....	10
4.1	Utility Service	10
4.2	Generator & Essential Electrical System	11
4.3	Electrical Distribution.....	13
4.4	Lighting & Lighting Controls.....	14
4.5	Signal Systems.....	14



Project Directory

Owner	Willapa Harbor Hospital
Owner Rep	Healthcare Collaborative Group 1430 SE 3rd Ave. Suite 21 Portland, Oregon 97214 Joe Kunkel President
Mechanical and Electrical Engineer	PAE 522 SW 5th Avenue Suite 1500 Portland, Oregon 97204 503-226-2921 Dave Williams, PE, LEED AP Mechanical dave.williams@pae-engineers.com Matt Jones, PE, LEED AP Electrical matt.jones@pae-engineers.com Chelsea Cassady, CDT Assistant Project Manager chelsea.cassady@pae-engineers.com



1.0 Executive Summary

1.1 General Building Description

The Willapa Harbor Hospital (WHH) building is a 35,000 sqft hospital with 25 beds located in South Bend, WA and serving the regional area. The building was original built in the early 1950s and has had major additions and a variety of remodels over the years. Most notably was the recent upgrade and expansion completed in the year 2000 which included a new Emergency Department and expansion of the Laboratory and Admissions area.

1.2 Mechanical & Plumbing Systems

The mechanical system at WHH has been maintained well over the years, however much of the equipment is nearing or past its useful life. Much of the HVAC equipment is associated only with the area that was added on or remodeled and the heating plant is the only centralized system the facility.

Also, it was noted that in general access for maintenance and operation purposes seemed difficult. Penthouses on the roof were difficult to access, many pipes and systems were direct buried and inaccessible. This coupled with the age of systems this access becomes of greater concern.

The heating plant is a code compliant plant with onsite fuel, redundancy at the boilers and pumps, and meets code. However, it is not a dual fuel system so if propane were lost there would be no ability to have a backup heating source, many hospitals utility gas and onsite fuel.

In a major remodel or addition, the cooling system would be required to be upgraded to a more central system with some emergency power considerations or redundancy measures per ASHRAE 170 and the new energy code. With the packaged DX units this could be difficult, in addition new energy codes would require most likely a shift to a more central system like chilled water. Packaged DX cooling, in room cooling also don't provide as tight of thermal comfort control or energy efficiency as a chilled water system

The medical gas and cold-water systems appear to be in good working order and compliant. Some of the fixtures and outlets appear older and nearing their useful life. The plumbing system hot water generation system is in good working order; however, the distribution was noted as taking long times provide hot water at the fixture. Portions of the hospital have original piping that is 70 years old and most likely has large internal scale built up restricting the flow. In addition, the hot water piping has been noted as failing with pin hole leaks. Access to fix them is difficult and as the pipe ages these failures will most likely continue.

The sewer system has been noted to be backing up in recent years. The tie in from the new lobby bathrooms to the old system is the main point of concern, requiring multiple unclogging in the last couple years. The 6" pipe and the main piping in the north corridor near 70 years old and most likely has some scaling or potential blockage over time which is contributing to these backups.



1.3 Electrical Systems

The electrical utility service and distribution at WHH has undergone many modifications and expansions over the decades. The main service gear and front end of the distribution system were installed as part of the 2000 upgrade and are in good condition with no operational or capacity issues reported. The remaining distribution gear and branch circuiting downstream are in varying levels of repair and portions are well past their service life. Updates to the electrical code within the past twenty years have also rendered portions of these systems out of compliance with current requirements. It is likely that any significant remodel within the facility will trigger rewiring and replacement of existing distribution equipment within that area back to the main service gear.

The standby generator system was also installed as part of the 2000 upgrade. While it is still within its service life and regularly maintained, there are reported issues with available capacity. Additionally, there are several code deficiencies within this system that make it highly likely that any significant remodel would trigger extensive upgrades to this system to meet current code requirements. It is recommended that a new generator plant and distribution be planned for ahead of any major remodel or expansion.



1.4 Risk Register

System	Impact Level	Risk/Impact Description and Notes
Mechanical Systems		
Ventilation	6	Decentralized cooling system with portions past their rated life, energy code concerns. Areas are difficult to access and maintain. Aging equipment
Cooling	8	DX Cooling Only, Energy Code and DOH Long Term Concerns
Heating	3	Centralized, Proper Code redundancy, Single Fuel Source. Equipment near its rated life, but not past.
Controls	4	System issued are currently being addressed. Controls are being upgraded and improved
Plumbing Systems		
Domestic HW, CW, and ICW	9	Lack of readily available hot water noted in areas. Age of Piping and distribution systems concern, Access to piping for ongoing repair.
Plumbing Fixtures	5	Older vintage fixtures working fine. May require replacement or difficulty getting parts
Medical Gas	3	Proper Code Setup and operation. Newer Equipment
Sanitary Sewer, Vent and Storm	9	Documented blockages in the existing system. Aging piping and access issues
Fire Protection	2	Code compliant system and distribution.
Electrical Systems		
Utility Service	5	Any modifications to the 208V main service switchboard itself may trigger code required addition of main service breaker.
Generator & Essential Electrical System	8	Capacity and code deficiencies mean a remodel or expansion will likely trigger major modifications to this system.
Electrical Distribution	4	Aging existing distribution will likely require upgrade or replacement within area of remodel.
Lighting & Lighting Controls	2	Aging existing lighting and lighting controls will likely require replacement within areas of remodel.
Signal Systems	2	Aging existing signal systems will likely require replacement within areas of remodel.



2.0 Mechanical Systems

2.1 Ventilation System

GENERAL CONDITIONS

The main building is served by multiple packaged rooftop air handlers. Some air handlers are ventilation only with remote coils, and some are packaged type with integral heating and DX cooling. Air handlers are located on the roof or inside enclosed roof penthouses. The age and condition vary on them, but in general the older equipment appeared to be more worn.

Access to equipment did appear to be difficult. Specifically, in the small roof attics/penthouses. Some items are buried and will require major building access modifications to get to the devices and distribution piping.

Outside air is drawn in at the roof and supplied down to the space. All rooftop equipment appears to have economizer capabilities. Systems are fully ducted supply and return based on site observations. Some locations of roof air intakes would not meet current code.

The far east penthouse contains the kitchen air handling unit. The main hospital area, including patient rooms, operating room, sterile processing, medical records and support space and admin office are served by three (3) rooftop air heating and ventilation handlers located above the middle penthouse. Duct work from those units is supplied down below through heating coils and DX cooling zone cooling coils. There are no final filters downstream of the DX coils, there are some upstream. The west most penthouse contains ductwork for the CT Scan RTU located just outside of it on the roof and second smaller RTU serving office space, which is approximately 1.5 tons. The CT scan unit is approximately 3 tons and was recently replaced in the last few years.

The 1999 expansion provided four (4) new RTU's for the hospital. Adding approximately 40 tons of cooling and 14,000 CFM of air.

Sizes and service of the units from the 1999 expansion are shown in the table below:

- AC-2: Year Built 1999, 2,000 CFM, 5 tons, Cafeteria
- AC-3: Year Built 1999, 4,200 CFM, 10 tons, SW Patient Area
- AC-7: Year Built 1999, 2,000 CFM, 5 tons, Radiology
- AC-9: Year Built 1999, 6,000 CFM, 18 tons, Lobby

The 1984 addition currently serving as an endoscopy suite is served by a vertical unit located adjacent to the space. It is original to the build and is accessed in an exterior mechanical closet.

All units appear to have final filtration, some internal to the units, some in ductwork. The three ventilation units serving the main hospital have final filtration, but not downstream of the cooling coils. The units are all in good working order, but most are past their rated life and will have been requiring upgrades more frequently as time goes on.

Distribution of air to the building is accomplished with galvanized sheet metal ductwork. Ductwork is routed within the penthouses and on the roof. Quite a bit of the ductwork is fully exposed, and areas of the rooftop ductwork have become rusty. The supply air is routed to either the single zone the unit serves or to fan powered terminal units on the larger zones.



Supply air is introduced through overhead supply or side wall grilles.

Return air appears to be fully ducted back to the air handlers.

Building Exhaust Fans

There are multiple exhaust fans on the roof and in the attic serving various rooms in the hospitals. Based on review and as-built count there are 27 total installed in the hospital. Most of them are small and in the 100 to 200 CFM range. 12 of the fans were installed in the 1999 addition/remodel. Of those 12 about half of them have failed and been replaced in the last 5 years. They serve the lab, microbiology, toilet rooms, soiled holding, decontamination. The kitchen area is served with a Type 1 dedicated grease hood exhaust fan. The endoscopy rooms have a dedicated exhaust fan and was replaced around 2000. Most of the fans appear to be in ok shape, but near the end of their life as they are around 20 years old.

The rooftop exhaust air ductwork is fully exposed, and areas of the rooftop ductwork have become rusty.

2.2 Cooling

GENERAL CONDITIONS

The building is cooled by a variety of packaged DX refrigerant systems. There is no centralized system, which will make future compliance with ASHRAE 170 and the State Energy Code difficult if a major remodel or upgrade of the hospital were to occur.

The rooftop RTU units from the 1999 expansion each have an integral DX unit serving the space.

The CT scan RTU also has an integral package DX unit serving the space.

The office and admin spaces each have an indoor wall mounted in room cooling unit.

Six (6) rooftop condensing units serve various cooling coils in the space. Spaces include a 5-ton unit for the lab area, a 2.5-ton for the lobby. In addition, some smaller rooftop condensing units serve the lab spaces. The 3 main air handling units do not have integral cooling but rely on DX cooling coils and the office and admin in room cooling units to cool the areas they ventilate and heat.

2.3 Heating

GENERAL CONDITIONS

The boiler plant served by three Weil McClain heating water boilers. The two smaller boilers (B-1,2) were converted from steam boilers to heating water boilers in 2000. The third largest boiler was installed in 2000. One of the smaller boilers was replaced in 2015 with a similar size unit.

The boilers capacity is as follows.

- B-1: 650 MBH Input, 526.5 MBH Output, Heating Water, Weil McClain LGB-6
- B-2: 650 MBH Input, 526.5 MBH Output, Heating Water, Weil McClain LGB-6
- B-3: 1,300 MBH Input, 1,053 MBH Output, Heating Water, Weil McClain LGB-6



Heating water is circulated in a primary, secondary arrangement, pumps circulate water internally at each boiler, then two in line centrifugal pumps circulate water out to the main hospital. Pump details are as follows:

- PMP-1: 212 GPM, 55' HD, 5 HP
- PMP-2: 212 GPM, 55' HD, 5 HP
- PMP-3: 40 GPM, 20' HD, 1/4 HP
- PMP-4: 40 GPM, 20' HD, 1/4 HP
- PMP-5: 80 GPM, 20' HD, 3/4 HP

4-inch heating water piping is circulated out to the rest of the hospital. In general, the piping looked to be in good shape from what was visible, with no known reports of leaks. Piping was mostly installed during the 1999 addition and is around 20 years old.

The plant is served by an external propane tank. Medium pressure 2-inch Propane piping runs under the parking lot up adjacent through a pad mounted atomizer and increases in size to and extends into the boiler room and serves both the boilers and the Hot Water heaters. The tank is approximately 1,800 gallons and gets refilled approximate once per week in the winter and slightly less in the summer. There was a pipe break in the parking lot in 2007, which was repaired.

2.4 Controls

The existing system building controls system is a Honeywell DDC system. The pneumatic controls have been removed from the building and none are currently present. The building is going through some updates to repair communication loss between some of their older controllers and systems and their main headend controller. It is currently being upgraded systematically around the hospital. Sound Energy is tuning the system communications interface and replacing older failed controls to get equipment operating more efficiently and properly.



3.0 Plumbing

3.1 Domestic Hot, Cold, and Industrial Cold Water

GENERAL CONDITIONS

Cold water enters the building in the boiler room. The main line is 4-inch and the routes out to the parking lot on the south side of the building. There are two 4-inch backflow preventer devices serve the water main located in the boiler room.

The hot water heaters are located in the same room as the backflow devices. There are two hot water heaters. Both are propane fired, one is 250 MBH input and the other is 325 MBH input.

There is an additional backflow device for the ICW systems that supplies make up water to the boiler systems.

There are also two backflow devices serving the laundry building as well.

DISTRIBUTION

For the expansion the piping is copper and appears to be in good shape. In the original building, especially on the west end the piping appears to be older galvanized and take a long time to warm up. Most likely pipe is corroded and severely reduce in interior size. Lack of ability to get readily available hot water is a code concern.

3.2 Plumbing Fixtures

GENERAL CONDITIONS

The plumbing fixtures are typical hospital grade type. Either wrist blade or foot pedal type noted in patient areas and standard fixtures in main area. No major issues were noted for the existing fixtures.

3.3 Propane

GENERAL CONDITIONS

Propane is routed from the 1,800-gallon tank across the parking lot to two water heaters, all three boilers and to the laundry building 305 MBH water heater and two (2) 165 MBH dryers. Total connected load is 4,262 MBH.



3.4 Medical Gas

OXYGEN

The 1500-gallon bulk oxygen tank is located on the on the south east side of the site near the maintenance building. Oxygen piping runs over to the south side of the hospital to the main medical gas room. The 2-inch piping routes in a buried 6-inch PVC containment pipe under the parking lot west to the main medical gas room. A BeaconMedaes oxygen manifold connects the bypass to an 8-bottle reserve main to oxygen backup supply. In addition, an exterior emergency oxygen connection is installed.

VACUUM

The current vacuum pump is a duplex, 7.5 HP system located in the boiler room. The vent discharges out to the top and is 3-inch in size. The main vacuum piping exits to the west and north. The system is approximately 20 years old and was installed in the 1999 expansion project.

MEDICAL AIR

Medical Air is provided by high pressure H tank bottles. System is a 3x3 BeaconMadaes manifold located in the main medical gas room on the south side of the hospital. Piping main routes from the main tank room to the hospital.

No other central system gases are installed. Any other medical gas usage is done in localized bottles.

3.5 Sanitary Sewer, Vent and Storm

GENERAL CONDITIONS

The building is served by two mains. A 6-inch main on the north side in the middle of the building exists out to the north. The second main is a newer sewer connection existing out the west side of the building that serves the 1999 expansion.

The original 6-inch waste piping was noted to have issues draining at times. Specifically, around the new lobby room toilets that tie into the existing waste piping in the X-ray and CT-scan room. Over time piping has most likely developed internal scale or adjustments to internal slope.

There is a 40-gallon grease trap located below the pot sink in the kitchen area.

There are multiple storm drains that drop down around the building and route out to a perimeter storm drain loop and footing drain. The majority of the storm drain piping routes to the north and exits as 4-inch at multiple points.



3.6 Fire Protection

GENERAL CONDITIONS

The building is currently fully sprinkled. A 6-inch main enters the main boiler room on the south side of the hospital. The double check assembly is located in the boiler room as well. Sprinkler zone valves test valves and main items are located in the room.

Sprinkler heads are standard surface mount heads. The exterior walkway between the laundry and the hospital does not appear to be sprinkled. The main hospital canopy has a dry sprinkler system.



4.0 Electrical

4.1 Utility Service

DESCRIPTION

The hospital is served by two separate utility padmount transformers, both located exterior near the southeast corner of the main building. These are both owned and maintained by Pacific County PUD. The primary service to these transformers originates from a utility vault located adjacent to Cedar St. towards the SE corner of the hospital property.

The easternmost PUD transformer provides 277/480V, 3-phase service to a single 150A panel 'MDP-H1' located in the NE corner of the boiler room. The CT cabinet and meter for this service are located on the exterior of the building in the NW corner of the yard containing the PUD transformers. This panel serves the MRI Trailer receptacle, CT Scanner Equipment, RF Room Equipment, Rad Room Equipment, and an Autoclave.

The westernmost PUD transformer provides 120/208V, 3-phase service to main service switchboard 'MDP-1' located in the Main Electrical Room. The CT and meter for this service is located within an NEMA 3R metering section located on the exterior of the building just west of the PUD transformer. Main switchboard 'MDP-1' in turn serves sub-distribution switchboard 'MDP-2'; panels 'N', 'NMDP', '1N1B'; and transfer switches 'ATS-1' and 'ATS-2' for a total of six (6) service disconnects. There is no main breaker in 'MDP-1'.

The 120/208V PUD transformer has two additional taps on its secondary serving two additional metered services. One supplies Panel 'M' located in the Receiving building. The other supplies panel '1LL' in the Laundry building and the Shop panel located in the Facilities Out-building.

GENERAL CONDITIONS

The main service gear was installed as part of the 2000 expansion which significantly reworked the existing utility service. The PUD transformers were both relocated to their current locations and a new exterior metering section was installed for the main service. The new service gear 'MDP-1' and its sub-distribution board 'MDP-2' were installed to backfeed existing electrical distribution. The previous existing main switchboards 'MDP L-1' and 'MDP L-2' were both converted into junction boxes and their downstream loads were re-fed from the new service gear.

The service equipment appears to be in good condition and no issues were reported with either the operation of the gear or shortages on capacity.

CODE ISSUES

No code issues were observed, although it should be noted that main service switchboard 'MDP-1' does not have a main breaker. Previously, this arrangement with a maximum of six (6) disconnects in the service gear was permitted under the NEC. Starting with the 2020 edition of the NEC, though, this exception has been modified and is no longer permitted. This service met current requirements at the time of its installation, but any future modifications to this switchgear would need to address this deficiency.



RECOMMENDATIONS

Maintain a regular schedule of infrared scanning of service distribution gear to provide early indication of components or terminations that are nearing failure, address where required. Periodically shutdown distribution gear in order to inspect, clean, and retorque all terminations to manufacturers specifications. Periodically exercise and test all feeder breakers to ensure proper operation. Coordinate with the PUD regarding testing and maintenance of the service transformers.

4.2 Generator & Essential Electrical System

DESCRIPTION

The hospital is supported by a single 150kW/187.5kVA, 120/208V standby generator, Katolight model D150FPJ4. This system was installed as part of the 2000 upgrade and is located exterior on the east side of the Maintenance Office in a weatherproof enclosure. Adjacent to the generator is a 550 gallon above-grade fuel tank, and the generator enclosure contains a 380-gallon base tank for a total of 930 gallons of on-site fuel storage.

As part of the 2000 upgrade, the generator originally supplied a single 400A Automatic Transfer Switch (ATS) located on the east wall of the Main Electrical Room. The load side of this ATS is then tapped to serve three separate panelboards, one for each of the NEC branches of the Essential Electrical System. These three panelboards are located on the north wall of the Main Electrical Room. Panel '1X1' is part of the Life Safety branch and serves generator accessories, fire alarm panel, med gas alarm panel, and downstream branch panels supporting emergency loads (e.g. egress lighting and exit signs). Panel 'YDP' is part of the Critical Branch and generally serves downstream branch panels supporting patient care areas. Panel '1E1A' is part of the Equipment Branch and generally serves essential HVAC loads including boilers, pumps, medical vacuum pump, and downstream branch panels.

In 2007, an additional 100A ATS-2 was added using a tap off the generator feeder. This in turn supplies two-section panel 'GB' located in the SE corner of the Boiler room. These panels generally serve Equipment Branch loads including Kitchen equipment, Pharmacy equipment, Imaging equipment, and HVAC equipment.

GENERAL CONDITIONS

The generator was installed as part of the 2000 upgrade, appears to be in fair condition, and no operational issues were reported. It was noted that it is exercised weekly and operated under load for an hour every month. The ATSs and main distribution gear are also of the same vintage and appear to be in good condition.

Facilities operations noted that the generator is near maximum capacity there is no spare room for any additional loads to be added to the generator.

CODE ISSUES

In general, the generator and essential electrical system it serves appear to be meeting the intent of NFPA 99/NEC as far as division into the code required separate branches (Life Safety, Critical, and Equipment). A thorough survey of all branch circuits was not conducted, but spot checks show that the appropriate loads appear to be segregated onto their appropriate branches.



One notable potential code deficiency is with the quantity of ATSs. NEC requires that there be a separate, dedicated ATS for each branch of the essential electrical system, for a minimum of three ATSs. There is an exception for a single ATS (such as the current arrangement at WHH) where the continuous load on the ATS is 120kW/150kVA or less. Since the existing generator is 150kW/187.5kVA and reported to be near or at capacity, it is possible the existing load is large enough to not qualify for the exception.

Another notable code deficiency is a lack of selective coordination of the overcurrent protective devices (OCPDs, e.g. circuit breakers) within the essential electrical system. Per NEC requirements, these OCPDs must fully selectively coordinate such that the breaker nearest to a fault trips before any upstream device, thereby isolating the fault and minimizing outages in other areas of the building. It is highly likely that this deficiency is present given the low ratios of trip ratings for several circuit breakers arranged in series, no breakers with adjustable trip units being observed, and no selective coordination study having been performed. Full selective coordination was not a requirement back in 2000 when this system was installed, but any modifications to this system would be required to meet current codes. The risk present is that a relatively minor fault has a greater chance of triggering a larger outage throughout the system due to undesirable tripping of breaker further upstream.

Regarding the generator fuel system, it is estimated that there is enough fuel stored on-site for around 85hrs of runtime at full load. NFPA 110 and Joint Commission guidelines generally recommend storing enough fuel on-site for at least 96hrs of runtime in an area of high seismic risk like the Northwest. Alternatively, priority fuel resupply arrangements could be made with a local fuel delivery service, knowing that there is a risk that road access may be impaired.

RECOMMENDATIONS

Based on the limited remaining capacity of the existing generator, recommend starting to plan for a new generator plant. A likely solution would involve a new, larger generator; a new generator distribution switchboard lineup with separate sections for each essential branch; provisions for temp gen/load bank connections; and new dedicated ATSs for each essential branch. As part of this upgrade, additional on-site fuel storage could be added. The new distribution gear would be provided with electronic trip breakers which would enable selective coordination for the OCPDs in at least the newer part of the system.

In the meantime, recommend continued regular maintenance of the generator in accordance with NFPA 110 including monthly exercising of ATSs and periodic testing under load. Additionally, maintain a regular schedule of infrared scanning of distribution gear to provide early indication of components or terminations that are nearing failure, address where required. Periodically shutdown distribution gear in order to inspect, clean, and retorque all terminations to manufacturers specifications. Periodically exercise and test all feeder breakers to ensure proper operation. Arrange for priority fuel delivery with local fuel supply company. Have an available fault, selective coordination, and arc flash hazard study performed for the electrical distribution system. Based on the results of the study, replace deficient gear, address selective coordination issues, and apply arc flash hazard labels throughout.



4.3 Electrical Distribution

PANEL AND FEEDERS

Description

The hub of the existing electrical distribution system is the Main Electrical room in the south end of the Boiler room. From this room, feeders extend out to large equipment and branch panels throughout the facility that are typically recessed in corridor walls. These branch panels in turn supply branch circuits to small equipment, lighting, and receptacles.

General Conditions

The distribution in the facility including feeders and panelboards are of a variety of vintages, some dating back to the original build. In general, branch panels were observed to be in good, fair, or sometimes poor condition, depending mostly on age. The condition of the feeders is unknown but many are likely of older vintage, potentially lack an equipment ground, and have major splice points based on the extensive upgrade in 2000. No operational issues were reported by the facilities operations group.

CODE ISSUES

No code issues were observed during the assessment.

RECOMMENDATIONS

Maintain a regular schedule of infrared scanning of distribution gear to provide early indication of components or terminations that are nearing failure, address where required. Periodically shutdown distribution gear in order to inspect, clean, and retorque all terminations to manufacturers specifications. Periodically exercise and test all feeder breakers to ensure proper operation.

When remodels occur in areas with older distribution equipment or panels, recommend replacing with new equipment. Inspect existing feeders and either perform megger test to ensure performance or replace completely including adding a dedicated equipment grounding conductor.

BRANCH CIRCUITS & DEVICES

Description

Branch circuits represent the portion of the circuit from the final OCPD to the device or equipment. Typically, these are fed out of branch panels such as the ones located in the corridors throughout this facility.

General Conditions

Branch circuits and devices throughout this facility are of varying vintages, some likely date back 50 years or more. The condition of branch wiring is unknown. Devices were observed to be in good to fair condition. No issues were reported by the facilities operations group.

Code Issues

Given the age of some portions of the facility, it is likely that the branch wiring is not up to current code requirements. One example of this would be the presence of multiwire branch



circuits where the neutral conductor is shared three different circuits. An update to the NEC prohibited this installation method without using multipole breakers and it is not permitted for serving patient care rooms. Another example would be the NEC requirement to have two paths ground paths for branch circuits serving patient care areas, typically in the form of an insulated grounding conductor in addition to a raceway that qualifies as a grounding conductor. Both scenarios likely weren't required when the circuits were installed, and any updates to this branch circuiting would trigger and upgrade.

Recommendations

Test existing receptacles within patient care areas per the recommendations of NFPA 99 for physical condition, ground pin retention, polarity, grounding continuity. Address any deficiencies based on the results of the tests. During any remodels, replace older branch wiring and devices with new to bring up to current code requirements.

4.4 Lighting & Lighting Controls

DESCRIPTION

Lighting throughout the facility is of varying vintages and primarily consists of linear fluorescent fixtures and compact fluorescent downlights. Minimal automatic lighting controls were observed and there is no central lighting control system.

GENERAL CONDITIONS

The condition of light fixtures in the facility ranges from good to fair, typically correlating with the age of installation. No major operational issues were reported by the facilities operations group.

CODE ISSUES

The existing installation likely does not meet the requirements of the WA State Energy Code, mainly in the area of required automatic controls. Additionally, there could be some portions of the facility that have a higher lighting power density than is currently allowed by Energy Code. Further, some areas of the hospital may not meet IES recommended light levels. The existing lighting and controls likely met requirements at the time of installation, any alterations to the system may trigger bringing them up to current requirements.

RECOMMENDATIONS

During any remodel, replace existing fluorescent fixtures with new LED source fixtures and add automatic controls per the requirements of WA State Energy Code. Consider planning for either a central or otherwise networked lighting control system. Both improvements will reduce the energy consumed in the building and improve the quality of light for occupants.

4.5 Signal Systems

DESCRIPTION

The existing fire alarm system is a Simplex installation consisting of a control panel located in the boiler room and initiation and notification devices throughout the facility.

The existing Nurse Call System is a TekTone with components and devices through the facility.



GENERAL CONDITIONS

Like most system in the building, these two systems have been modified and expanded through the years as part of various remodels. The condition of the devices is commensurately varied and range from good to poor. Some replacement parts or components may no longer be available. No major operational issues were reported by the facilities operations group.

CODE ISSUES

No code issues were noted. While a detailed survey was not performed, it is likely that due the age of installation, there are some patient care areas which do not have the required nurse call devices per FGI requirements. Similarly, fire alarm notification devices may not meet current ADA requirements.

RECOMMENDATIONS

Replace any obsolete devices or those that are beyond their service life. During any remodels, replace all devices, cabling, and equipment where the existing is outdated. Add nurse call devices in areas where FGI requirements are not currently met. Similarly, add fire alarm notification devices in areas where ADA requirements are not currently met.

APPENDIX B

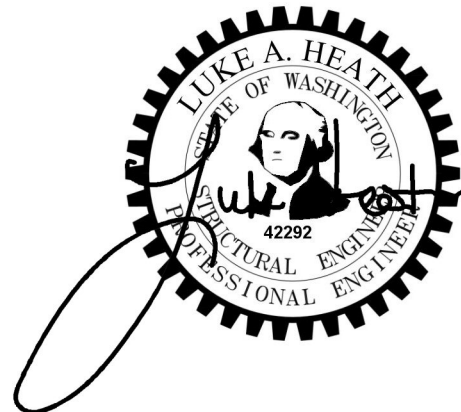


**STRUCTURAL EVALUATION
FOR**

**WILLAPA HARBOR HOSPITAL
800 ALDER STREET
SOUTH BEND, WASHINGTON**

**PREPARED BY
PCS STRUCTURAL SOLUTIONS**

**DECEMBER 23, 2020
21-055**



V. APPENDIX A – PHOTOGRAPHS



Original Hospital Boiler Room with unbraced piping

TABLE OF CONTENTS

	Page
I. PREFACE	<i>ii</i>
II. EXECUTIVE SUMMARY	<i>iii</i>
III. INTRODUCTION	
A. Scope of Work	<i>iv</i>
B. West Coast Seismicity	<i>v</i>
C. Methodology	<i>vi</i>
IV. STRUCTURAL EVALUATION	
A. Type of Construction/Structural Systems	1
B. Observations and Comments	2
C. Recommendations	2
D. Conclusion	4
E. Recommended Best Use Practices	4
V. APPENDIX A - PHOTOS	
VI. APPENDIX B - PLANS/ELEVATIONS	
VII. APPENDIX C - ASCE 41-17 CHECKLISTS	
VIII. APPENDIX D - COMMON SEISMIC TERMINOLOGY	

I. PREFACE

The structural evaluation in this report will focus on the main building of Willapa Harbor Hospital and will not address additional buildings on the campus. The original building was constructed in 1951 and then in 1999 a building addition was added along with some renovations to the original building. The ASCE 41-17 “Seismic Evaluation and Retrofit of Existing Buildings” Tier 1 methodology and checklists, addressing the Immediate Occupancy Performance Level, were used as a guideline.

This report identifies the major structural concerns for the main hospital building being evaluated. Assumptions were made where building information was limited.

II. EXECUTIVE SUMMARY

The Willapa Hospital is a single-story building constructed primarily with wood framing bearing on conventional concrete foundations. As-built drawings for the building were available for review.

Overall, the structural concerns noted for the buildings are common for their age and type of construction. From a gravity load standpoint, the building appears to have performed well over the years. We did not observe significant signs of structural distress or differential settlement. The majority of the structural concerns identified relate to the buildings' global lateral resisting systems, details of construction not consistent with current seismic detailing and the general deterioration of the structural elements due to age and environmental factors.

Building codes and construction methods have changed over the years, incorporating lessons learned from past experience in relation to vertical and lateral (wind and seismic) design. The current state of the art in structural design is focused on performance based design. An Immediate seismic performance objective level was used in determining the recommended structural upgrades to the buildings under evaluation. This level of performance addresses the ability of the hospital to become operational after the event of a moderate earthquake. Some minor damage may occur to the building, but the goal for the performance of this building is to be able to serve the community with minimal disruption to the operation of the building.

The recommendations provided in this report are intended to preserve the safety of the building occupants, and limit the potential for loss of life due to structural failure. They are consistent with currently accepted strengthening methods, and while not intended to bring the buildings into compliance with current building codes, should greatly improve the performance of the buildings.

III. INTRODUCTION

A) SCOPE OF WORK

a) Field Investigation

- Walked through the complex, looking for signs of structural distress, differential settlement, or deterioration.
- Visually verified vertical and lateral systems.
- Reviewed structural concerns identified in the ASCE 41-17 Checklist along with field observations identified in the checklists.
- Viewed structure wherever visible.
- Testing or selective demolition was not completed at this time.

b) Initial Review of Construction Drawings

- Reviewed available construction drawings.
- Utilized the ASCE 41-17 Building Checklists as a guideline to help identify common structural deficiencies for the building.
- Where no drawings were available, or the drawings did not adequately describe as-built conditions, recommendations were based on field investigation and observations.

c) Report Preparation and Further Construction Drawing Review

- Further evaluated drawings with respect to structural concerns identified in the initial review or field investigation.
- Brainstormed conceptual ideas to mitigate structural concerns identified.
- Structural Report
 - Described vertical and lateral load resisting system for each building.
 - Summarized visual observations of building condition, signs of structural distress, and differential settlement.
 - Identified structural concerns from observations and ASCE 41-17 checklists.
 - Provided a summary of the structural recommendations.
 - Identified areas where additional analysis is warranted to verify assumptions made beyond the scope of this evaluation.

B) WEST COAST SEISMICITY

The Puget Sound is considered a seismically active region. Within this region, there are three basic types of earthquake that can occur:

- Shallow crustal earthquakes
- Benioff Zone (intra-plate) earthquakes
- Subduction zone (inter-plate) earthquakes

Movement of tectonic plates creates the mechanism that drives all three types of earthquake, as the Juan de Fuca Plate, comprising the bottom of the Pacific Ocean floor several miles off the Washington and Oregon coasts, is forced into and below the North American Plate. The level of seismic hazard assigned to any particular building is related to the type of earthquake that may occur in the region, and can vary significantly based on the magnitude of earthquake and proximity of a given site to the epicenter.

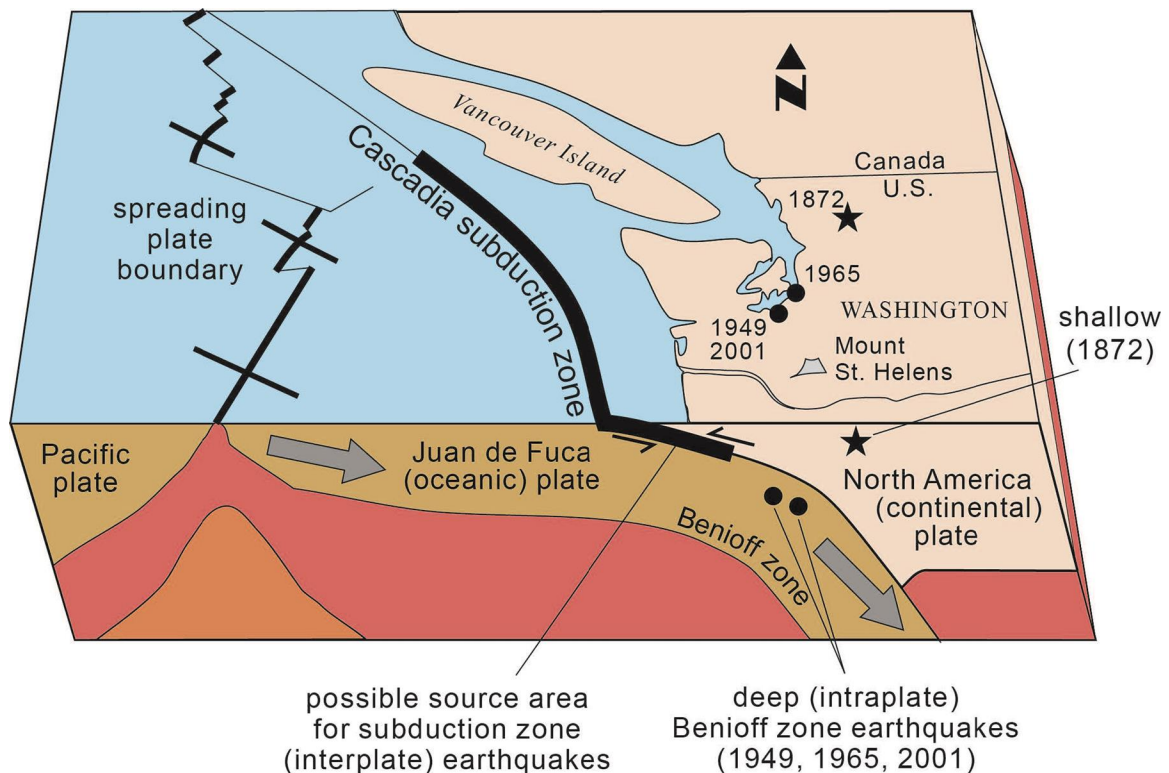


Figure A: Cross Section of the Cascadia Subduction Zone
(Source: Washington State Department of Natural Resources)

Shallow crustal earthquakes occur in the overriding North American plate and are generally at depths less than 25 miles. There are at least six significant faults that have been identified in the Puget Sound region with concentrations in three primary locations; Seattle, Tacoma, and South Whidbey Island. These groupings of faults run generally in an east-west orientation and cut across the heavily populated zones of the region. These earthquakes have a relatively long average recurrence interval at approximately 330 years and are capable of generating moderate to large events registering M5.5-M7 on the Richter scale. This type of earthquake is generally expected to be of shorter duration and more localized as it relates to strong ground motions.

Intra-plate earthquakes occur in the portion of the Juan de Fuca plate that moves beneath the overriding North American plate. This type of earthquake occurs deep below the ground surface (typically 25 to 40 miles) and has the ability to generate moderate to large events of M6-M7 on the Richter scale. They have a much shorter recurrence interval of approximately 35 to 50 years on average. Earthquakes of this variety tend to have shorter durations, but can still generate significant ground shaking over large areas of land.

Inter-plate earthquakes, also known as subduction zone earthquakes, occur directly at the interface of two plates and are more likely to be large magnitude events. They have the potential of registering upwards of M9 on the Richter scale, with a relatively long average time of approximately 500 years between occurrences. These earthquakes are generally expected to have long durations, and can generate significant ground shaking over very large areas.

C) METHODOLOGY

Evaluation

The Willapa Harbor Hospital was evaluated using the methodology of the ASCE 41-17 “Seismic Evaluation and Retrofit of Existing Buildings” Tier 1 evaluation, addressing the Immediate Occupancy Performance level. The ASCE 41-17 document provides building checklists that identifies common seismic concerns for typical building types (i.e., Concrete Shear Walls Buildings with Flexible Diaphragms, Concrete Shear Walls Buildings with Stiff Diaphragms, Unreinforced Masonry Bearing Wall Buildings with Flexible Diaphragms, etc.). Each question on the checklist may be answered by “compliant”, “non-compliant” or “not applicable”. For those items that are non-compliant, additional evaluation or mitigation of the structural concern is recommended. Detailed calculations were not performed for this study.

The ASCE 41-17 is a performance based design/evaluation manual with varying performance objectives. The performance objective is selected based upon the acceptable level of risk, as well as the tier level used in the evaluation. In general, there are three primary performance levels for existing buildings:

Immediate Occupancy: a higher level performance that focuses on maintaining building functionality after an earthquake. Light damage is anticipated in the event of a major earthquake; however, the building function is expected to be maintained with little to no disruption in service. Fire Stations, Hospitals, Police Stations and other critical facilities are buildings that are designed for this level.

Life Safety: focuses on protecting the occupants of the building. This is the most common level of performance for building design. In the event of a major earthquake, the building may suffer moderate damage with a small margin of total or partial collapse. The facility may be unusable after an earthquake, with low overall risk of injury from structural damage.

Collapse Prevention: a low level of performance, where the damage to the building after a moderate earthquake may be severe. The lateral resisting system would have little residual strength, and large permanent deformations would occur. The building would likely be near collapse.

Once the Performance Level is selected it can be determined which procedural tier review to use in the evaluation:

- Tier 1 is a screening process utilizing Building Checklists to help identify common structural deficiencies for typical buildings types. The owner/designer has the option of possibly mitigating the structural concern identified by Tier 1 or performing a more detailed analysis outlined in Tiers 2 and 3.
- Tier 2 is a deficiency-based evaluation and renovation procedure. This methodology includes analyzing specific elements or areas within a building to determine if potential deficiencies identified in a Tier 1 review actually require mitigation. Analysis of the entire building may not be necessary. This tier can be used for both evaluation and retrofit.
- Tier 3 is a systematic evaluation and retrofit procedure, and involves a computationally extensive approach towards a complete analysis of the facility. The performance of the building as structural elements begin to yield, also known as a non-linear analysis, is considered. This tier is applicable for both the evaluation and retrofit of a facility.

Local Jurisdiction Requirements

While it is our recommendation that all of the seismic deficiencies identified in this evaluation be incorporated into building renovations, it is understood that only the local jurisdiction has the authority to require seismic improvements. With this in mind, it is important to understand typical “triggers” that many jurisdictions have for requiring seismic strengthening work.

There are a few common circumstances under which a jurisdiction will require upgrades. One is related to the dollar value of planned renovation work as it relates to the overall value of the building. Jurisdictions will often require seismic improvements if the cost of planned renovation work ranges between about 40% and 60% of the value of the building. Another circumstance is when additions or alterations are made to the facility that significantly increases the mass of the facility or decreases its lateral resisting capacity.

While these two conditions are most common, there may be other circumstances that act as triggers in a given jurisdiction, and it is important to communicate directly with the Building Department to understand the specifics of their requirements. It also should be noted that many jurisdictions are open to accepting partial implementation of seismic improvements if there are extenuating circumstances which make full implementation impractical.

Structural Recommendations

The recommendations provided are based on our past experience in renovating similar structures in the Western Washington, utilizing ASCE 41-17 upgrade guidelines and are similar to those required for the International Existing Building Code (IEBC).

DECEMBER 23, 2020

IV. STRUCTURAL EVALUATION

WILLAPA HARBOR HOSPITAL SOUTH BEND, WA

The Willapa Harbor Hospital was evaluated using the methodology of the ASCE 41-17 “Seismic Evaluation and Retrofit of Existing Buildings” Tier 1 evaluation, addressing the Immediate Occupancy Performance level. Non-structural checklists were referenced, limited to addressing unreinforced masonry partitions, stair construction, parapets, and appendages. A full non-structural review was not performed, as evaluation of other non-structural components such as ceilings, partitions, lights, mechanical piping, and equipment are beyond the scope of this evaluation.

A. TYPE OF CONSTRUCTION/STRUCTURAL SYSTEM

The hospital was originally constructed in 1951 and then in 1999, a renovation and addition were performed. The architectural and structural drawings were available for review. See Appendix A for representative photos.

SYSTEM DESCRIPTIONS

Vertical Load Resisting System:

The original 1951 building is constructed with tongue and groove 2x decking supported by 2x wood joists, wood beams and wood wall studs. Conventional continuous concrete foundations are used to support the walls. At the boiler room, 8” unreinforced masonry walls support a wood roof.

At the 1999, pre-manufactured wood trusses and pre-engineered wood I-joists support 5/8” plywood sheathing. The roof is supported by 2x wood stud walls. Conventional continuous concrete foundations are used to support the walls.

Lateral Force Resisting System:

The original 1951 building relies on the tongue and groove wood roof diaphragm. Loads are transferred to the gypsum wall board sheathed walls. There is a 2” seismic joint between the existing building and the building addition.

The 1999 building addition uses the 5/8” plywood roof sheathing to transfer the diaphragm forces to the 1/2” plywood shear walls.

**STRUCTURAL EVALUATION FOR
WILLAPA HARBOR HOSPITAL
SOUTH BEND, WA**

B. OBSERVATIONS AND COMMENTS

- The hospital appears to have been well maintained. We observed no signs of significant structural distress, structural deterioration, or differential settlement.
- The boiler rooms are constructed with unreinforced masonry walls. Unreinforced masonry walls typically do not perform well in a seismic event. Connections to the lower flexible roof diaphragms are prone to separate and cause roof collapses.
- The masonry walls are tall and exceed the recommended height to thickness ratios. Typically backing the walls with steel columns or wood studs can be done to strengthen the walls.
- The original building doesn't have sheathing on the roof and relies on straight sheathing to transfer lateral forces. Adding plywood to the original roof should be done in the next re-roof of the project.
- The original building doesn't have plywood shear walls to resist lateral forces, instead they rely on gypsum wall board. Gypsum wall board typically doesn't function well in a seismic event. A seismic retrofit would include adding plywood sheathing throughout the original building.
- The 1999 addition appears to meet the requirements of the Tier 1 checklist, indicating that the building will perform adequately in seismic event. A seismic upgrade to this portion of the building would likely be unnecessary.
- There appeared to be a number inadequately unbraced elements throughout the hospital such as ceilings, mechanical and electrical piping, mechanical equipment, etc. A more thorough review was beyond the scope of this report. The ability for a hospital to become operational after an earthquake can often also be affected by damage occurred by non-structural elements disrupting services necessary for operations.

C. RECOMMENDATIONS

The issues and recommendations noted below outline the work anticipated to mitigate structural concerns related to the anticipated seismic performance of the existing building. Recommendations are based on a walk-through evaluation; review of available construction drawings when available; and on experience in renovations of similar building types in Western Washington Area. The ASCE 41-17 structural checklists were used as guidelines to identify building deficiencies that have historically resulted in damage or collapse of structures under seismic loading. The following issues are a summary of deficiencies identified for the entire building campus (see Appendix B for plan/elevation reference):

Item	Structural Concern	Structural Recommendation
1	At the original building, the shear walls rely on the gypsum wall board to resist lateral loads. These walls are overstressed.	Provide plywood sheathing to select wood stud walls throughout the building. Where it makes sense, the work can be done at interior or exterior shear walls to minimize disruption to the occupancy of the building. Holdowns, new concrete foundations and anchors in the sill plate will be required.

**STRUCTURAL EVALUATION FOR
WILLAPA HARBOR HOSPITAL
SOUTH BEND, WA**

Item	Structural Concern	Structural Recommendation
2	At the original building, the 2x T&G decking does not have plywood sheathing. The existing roof diaphragm is overstressed.	Provide 3/8" or 1/2" plywood sheathing over the entire roof. Steel light gage straps and anchorage should be added around openings.
3	At the boiler room, the existing unreinforced masonry walls are too tall and not adequately braced into the wood roof diaphragm.	Provide structural steel columns or wood backed walls to brace the masonry walls. Tie the walls into the roof diaphragm with light gage steel straps and steel angles to resist in plane and out of plane seismic loads.
4	At the original building, the masonry veneer likely doesn't have any veneer ties into the wood stud walls. Veneer ties help restrain the masonry from falling away from the wall in the event of an earthquake.	Provide galvanized helical ties into the mortar joints that tie into the wood stud wall.
5	At the original hospital, non-structural items such as suspended ceilings, plumbing, electrical, cabinets and the like do not appear to be seismically braced, which could be damaged in the event of an earthquake.	Non-structural items should be braced to remain operational after an earthquake.

STRUCTURAL EVALUATION FOR WILLAPA HARBOR HOSPITAL SOUTH BEND, WA

D. CONCLUSION

Overall, the building appears to be well designed and detailed for the era in which it was constructed. The 1999 building was designed using 1997 building codes, which is about 7% less than the current building codes, but will likely perform well in the event of an earthquake. The original 1951 hospital does not meet the strength and detailing requirements of a building designed to current code standards and it would likely not perform well in a seismic event. The gypsum shear walls historically have not performed well in a seismic event and are expected to be overstressed. A seismic upgrade or a new building if desired is strongly encouraged. The boiler room will require some upgrades as well and could disrupt critical operational services in the event of an earthquake.

The lateral seismic concerns noted are common for buildings of the given age and type of construction. The primary concern with the deficiencies is the overall anticipated seismic performance of the building, primarily in isolated areas. The intent of the ASCE 41-17 immediate occupancy safety provisions is to upgrade the building to current code standards. With the incorporation of the recommendations noted above to mitigate the current building deficiencies as identified, the immediate occupancy performance of the building will be improved for a seismic event.

E. RECOMMENDED BEST USE PRACTICES

Please note that this report addresses seismic and overall structural concerns only. When considering upgrades to a building, other factors should be considered such as cost to benefit ratios, life cycle cost models, system upgrades, building energy conservation, day lighting and critical access pathways to the building. Many of the systems have been upgraded, but current energy codes are requiring additional insulation and more efficient systems.

When weighing cost replacement costs of a hospital versus renovations of the existing building, it is typically good practice to consider replacing the hospital when the renovations exceed more than 50% of the building value. Current site locations doesn't appear to accommodate a new hospital buildout due to the tight site. Additional sites should be considered if a new buildout is to be pursued. Geological factors such as liquefaction, flood zones, landslide concerns and tsunami zones should be considered. Selecting a site that reduces these risks lowers construction costs and allows the hospital to be resilient after a catastrophic event. We would recommend that an engineer be apart of these discussions if this avenue is being considered.

If renovations are being considered, areas of the hospital will need to be phased to limit disruption to the operations of the hospital. Renovations can take longer and cost more than a new build due to extended construction schedules to accommodate phasing and sequencing.



Original Hospital North and West Wall Exterior



West View of Original and 1999 Hospital Addition



Front Entry of 1999 Building Addition



Original Hospital Exterior Wall with missing header and wood fiber wall sheathing at West wall

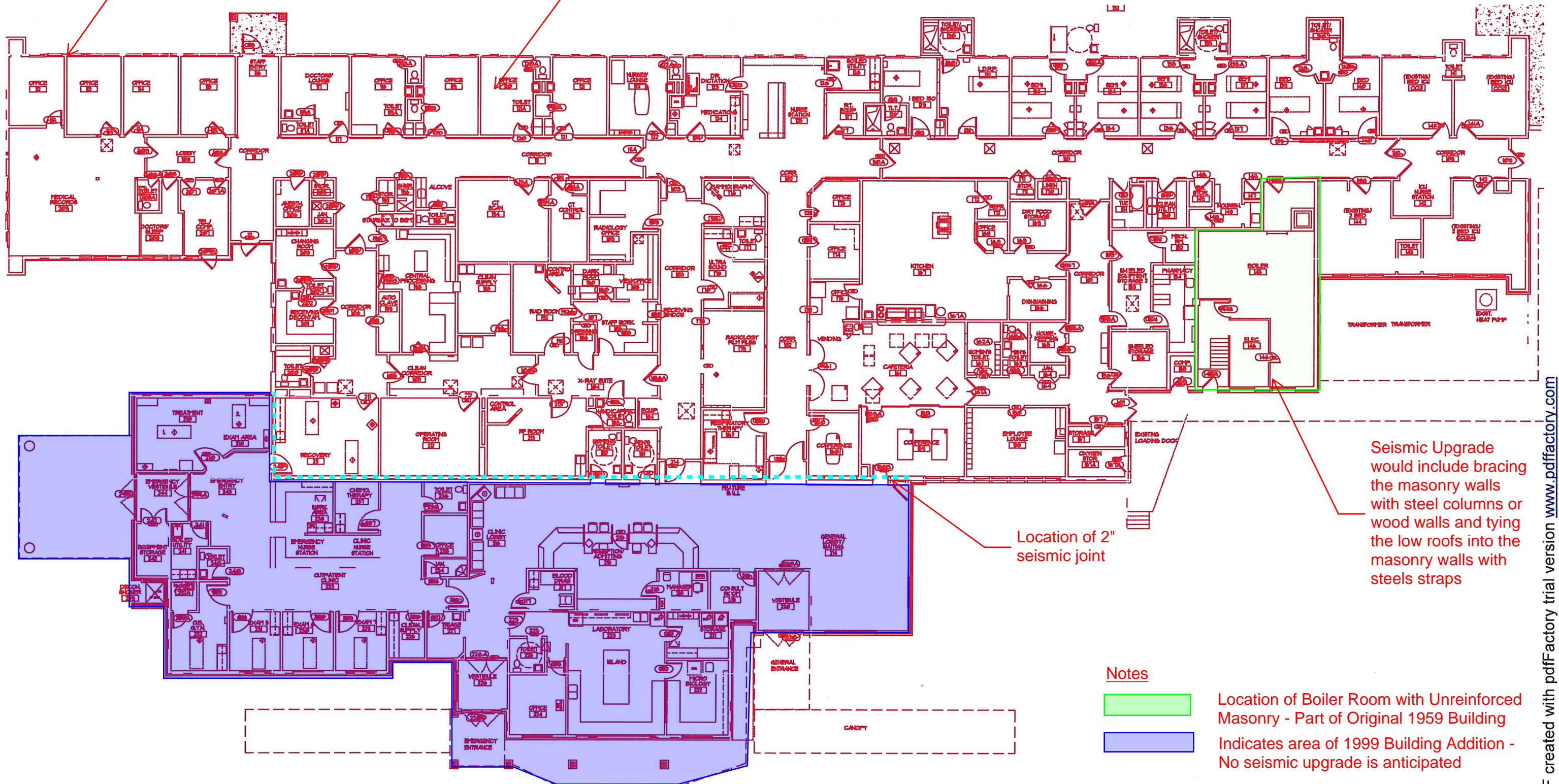


Boiler Room and Original Hospital at Southeast Corner

VI. APPENDIX B – PLANS AND ELEVATIONS

At masonry veneer, helical ties would need to be tied into the existing masonry walls - typical at exterior of building

Original 1951 Hospital Building - A complete seismic upgrade would be needed at this building - New plywood shear walls throughout the building and new plywood roof sheathing over the entire roof



Location of 2" seismic joint

Seismic Upgrade would include bracing the masonry walls with steel columns or wood walls and tying the low roofs into the masonry walls with steels straps

Notes

- Location of Boiler Room with Unreinforced Masonry - Part of Original 1959 Building
- Indicates area of 1999 Building Addition - No seismic upgrade is anticipated

Overall Hospital Plan

VI. APPENDIX C – ASCE 41-17 CHECKLISTS

Project Name _____
Project # _____

ASCE 41-17 Tier 1 Checklists

FIRM:	
PROJECT NAME:	
PROJECT NUMBER:	
SEISMICITY LEVEL:	
COMPLETED BY:	
DATE COMPLETED	
REVIEWED BY:	
REVIEWED DATE:	

Note: C = Compliant, NC = Noncompliant, N/A = Not Applicable, and U = Unknown.

Table 17-3. Immediate Occupancy Basic Configuration Checklist

Status	Evaluation Statement	Comments
Very Low Seismicity		
Building System—General		
C NC N/A U	LOAD PATH: The structure contains a complete, well-defined load path, including structural elements and connections, that serves to transfer the inertial forces associated with the mass of all elements of the building to the foundation. (Commentary: Sec. A. 2.1.1. Tier 2: Sec. 5.4.1.1)	
C NC N/A U	ADJACENT BUILDINGS: The clear distance between the building being evaluated and any adjacent building is greater than 0.5% of the height of the shorter building in low seismicity, 1.0% in moderate seismicity, and 3.0% in high seismicity. (Commentary: Sec. A.2.1.2. Tier 2: Sec. 5.4.1.2)	
C NC N/A U	MEZZANINES: Interior mezzanine levels are braced independently from the main structure or are anchored to the seismic-force-resisting elements of the main structure. (Commentary: Sec. A.2.1.3. Tier 2: Sec. 5.4.1.3)	
Building System—Building Configuration		
C NC N/A U	WEAK STORY: The sum of the shear strengths of the seismic-force-resisting system in any story in each direction is not less than 80% of the strength in the adjacent story above. (Commentary: Sec. A.2.2.2. Tier 2: Sec. 5.4.2.1)	
C NC N/A U	SOFT STORY: The stiffness of the seismic-force-resisting system in any story is not less than 70% of the seismic-force-resisting system stiffness in an adjacent story above or less than 80% of the average seismic-force-resisting system stiffness of the three stories above. (Commentary: Sec. A.2.2.3. Tier 2: Sec. 5.4.2.2)	
C NC N/A U	VERTICAL IRREGULARITIES: All vertical elements in the seismic-force-resisting system are continuous to the foundation. (Commentary: Sec. A.2.2.4. Tier 2: Sec. 5.4.2.3)	
C NC N/A U	GEOMETRY: There are no changes in the net horizontal dimension of the seismic-force-resisting system of more than 30% in a story relative to adjacent stories, excluding one-story penthouses and mezzanines. (Commentary: Sec. A.2.2.5. Tier 2: Sec. 5.4.2.4)	

Note: C = Compliant, NC = Noncompliant, N/A = Not Applicable, and U = Unknown.

ASCE 41-17 TIER 1 CHECKLISTS

Project Name _____

Project # _____

Status	Evaluation Statement	Comments
C NC N/A U	MASS: There is no change in effective mass of more than 50% from one story to the next. Light roofs, penthouses, and mezzanines need not be considered. (Commentary: Sec. A.2.2.6. Tier 2: Sec. 5.4.2.5)	
C NC N/A U	TORSION: The estimated distance between the story center of mass and the story center of rigidity is less than 20% of the building width in either plan dimension. (Commentary: Sec. A.2.2.7. Tier 2: Sec. 5.4.2.6)	
Low Seismicity (Complete the Following Items in Addition to the Items for Very Low Seismicity)		
Geologic Site Hazards		
C NC N/A U	LIQUEFACTION: Liquefaction-susceptible, saturated, loose granular soils that could jeopardize the building's seismic performance do not exist in the foundation soils at depths within 50 ft (15.2 m) under the building. (Commentary: Sec. A.6.1.1. Tier 2: Sec. 5.4.3.1)	
C NC N/A U	SLOPE FAILURE: The building site is located away from potential earthquake-induced slope failures or rockfalls so that it is unaffected by such failures or is capable of accommodating any predicted movements without failure. (Commentary: Sec. A.6.1.2. Tier 2: Sec. 5.4.3.1)	
C NC N/A U	SURFACE FAULT RUPTURE: Surface fault rupture and surface displacement at the building site are not anticipated. (Commentary: Sec. A.6.1.3. Tier 2: Sec. 5.4.3.1)	
Moderate and High Seismicity (Complete the Following Items in Addition to the Items for Low Seismicity)		
Foundation Configuration		
C NC N/A U	OVERTURNING: The ratio of the least horizontal dimension of the seismic-force-resisting system at the foundation level to the building height (base/height) is greater than $0.6S_a$. (Commentary: Sec. A.6.2.1. Tier 2: Sec. 5.4.3.3)	
C NC N/A U	TIES BETWEEN FOUNDATION ELEMENTS: The foundation has ties adequate to resist seismic forces where footings, piles, and piers are not restrained by beams, slabs, or soils classified as Site Class A, B, or C. (Commentary: Sec. A.6.2.2. Tier 2: Sec. 5.4.3.4)	

Note: C = Compliant, NC = Noncompliant, N/A = Not Applicable, and U = Unknown.

Project Name _____
Project # _____

ASCE 41-17 Tier 1 Checklists

FIRM:	
PROJECT NAME:	
PROJECT NUMBER:	
SEISMICITY LEVEL:	
COMPLETED BY:	
DATE COMPLETED	
REVIEWED BY:	
REVIEWED DATE:	

Note: C = Compliant, NC = Noncompliant, N/A = Not Applicable, and U = Unknown.

Table 17-7. Immediate Occupancy Checklist for Building Type W2

Status	Evaluation Statement	Comments
Very Low Seismicity		
Seismic-Force-Resisting System		
C NC N/A U	REDUNDANCY: The number of lines of shear walls in each principal direction is greater than or equal to 2. (Commentary: Sec. A.3.2.1.1. Tier 2: Sec. 5.5.1.1)	
C NC N/A U	SHEAR STRESS CHECK: The shear stress in the shear walls, calculated using the Quick Check procedure of Section 4.4.3.3, is less than the following values: Structural panel sheathing 1,000 lb/ft (14.6 kN/m) Diagonal sheathing 700 lb/ft (10.2 kN/m) Straight sheathing 100 lb/ft (1.5 kN/m) All other conditions 100 lb/ft (1.5 kN/m) (Commentary: Sec. A.3.2.7.1. Tier 2: Sec. 5.5.3.1.1)	
C NC N/A U	STUCCO (EXTERIOR PLASTER) SHEAR WALLS: Multi-story buildings do not rely on exterior stucco walls as the primary seismic-force-resisting system. (Commentary: Sec. A.3.2.7.2. Tier 2: Sec. 5.5.3.6.1)	
C NC N/A U	GYPSUM WALLBOARD OR PLASTER SHEAR WALLS: Interior plaster or gypsum wallboard is not used for shear walls on buildings more than one story high with the exception of the uppermost level of a multi-story building. (Commentary: Sec. A.3.2.7.3. Tier 2: Sec. 5.5.3.6.1)	
C NC N/A U	NARROW WOOD SHEAR WALLS: Narrow wood shear walls with an aspect ratio greater than 2-to-1 are not used to resist seismic forces. (Commentary: Sec. A.3.2.7.4. Tier 2: Sec. 5.5.3.6.1)	
C NC N/A U	WALLS CONNECTED THROUGH FLOORS: Shear walls have an interconnection between stories to transfer overturning and shear forces through the floor. (Commentary: Sec. A.3.2.7.5. Tier 2: Sec. 5.5.3.6.2)	
C NC N/A U	HILLSIDE SITE: For structures that are taller on at least one side by more than one-half story because of a sloping site, all shear walls on the downhill slope have an aspect ratio less than 1-to-2. (Commentary: Sec. A.3.2.7.6. Tier 2: Sec. 5.5.3.6.3)	

Note: C = Compliant, NC = Noncompliant, N/A = Not Applicable, and U = Unknown.

ASCE 41-17 TIER 1 CHECKLISTS

Project Name _____

Project # _____

Status	Evaluation Statement	Comments
C NC N/A U	CRIPPLE WALLS: Cripple walls below first-floor-level shear walls are braced to the foundation with wood structural panels. (Commentary: Sec. A.3.2.7.7. Tier 2: Sec. 5.5.3.6.4)	
C NC N/A U	OPENINGS: Walls with openings greater than 80% of the length are braced with wood structural panel shear walls with aspect ratios of not more than 1.5-to-1 or are supported by adjacent construction through positive ties capable of transferring the seismic forces. (Commentary: Sec. A.3.2.7.8. Tier 2: Sec. 5.5.3.6.5)	
C NC N/A U	HOLD-DOWN ANCHORS: All shear walls have hold-down anchors attached to the end studs constructed in accordance with acceptable construction practices. (Commentary: Sec. A.3.2.7.9. Tier 2: Sec. 5.5.3.6.6)	
Connections		
C NC N/A U	WOOD POSTS: There is a positive connection of wood posts to the foundation. (Commentary: Sec. A.5.3.3. Tier 2: Sec. 5.7.3.3)	
C NC N/A U	WOOD SILLS: All wood sills are bolted to the foundation. (Commentary: Sec. A.5.3.4. Tier 2: Sec. 5.7.3.3)	
C NC N/A U	GIRDER-COLUMN CONNECTION: There is a positive connection using plates, connection hardware, or straps between the girder and the column support. (Commentary: Sec. A.5.4.1. Tier 2: Sec. 5.7.4.1)	
Foundation System		
C NC N/A U	DEEP FOUNDATIONS: Piles and piers are capable of transferring the lateral forces between the structure and the soil. (Commentary: Sec. A.6.2.3)	

Note: C = Compliant, NC = Noncompliant, N/A = Not Applicable, and U = Unknown.

ASCE 41-17 TIER 1 CHECKLISTS

Project Name _____

Project # _____

Status	Evaluation Statement	Comments
C NC N/A U	SLOPING SITES: The difference in foundation embedment depth from one side of the building to another does not exceed one story high. (Commentary: Sec. A.6.2.4)	
Low, Moderate, and High Seismicity (Complete the Following Items in Addition to the Items for Very Low Seismicity)		
Seismic-Force-Resisting System		
C NC N/A U	NARROW WOOD SHEAR WALLS: Narrow wood shear walls with an aspect ratio greater than 1.5-to-1 are not used to resist seismic forces. (Commentary: Sec. A.3.2.7.4. Tier 2: Sec. 5.5.3.6.1)	
Diaphragms		
C NC N/A U	DIAPHRAGM CONTINUITY: The diaphragms are not composed of split-level floors and do not have expansion joints. (Commentary: Sec. A.4.1.1. Tier 2: Sec. 5.6.1.1)	
C NC N/A U	ROOF CHORD CONTINUITY: All chord elements are continuous, regardless of changes in roof elevation. (Commentary: Sec. A.4.1.3. Tier 2: Sec. 5.6.1.1)	
C NC N/A U	DIAPHRAGM REINFORCEMENT AT OPENINGS: There is reinforcing around all diaphragm openings larger than 50% of the building width in either major plan dimension. (Commentary: Sec. A.4.1.8. Tier 2: Sec. 5.6.1.5)	
C NC N/A U	STRAIGHT SHEATHING: All straight-sheathed diaphragms have aspect ratios less than 1-to-1 in the direction being considered. (Commentary: Sec. A.4.2.1. Tier 2: Sec. 5.6.2)	
C NC N/A U	SPANS: All wood diaphragms with spans greater than 12 ft (3.6 m) consist of wood structural panels or diagonal sheathing. (Commentary: Sec. A.4.2.2. Tier 2: Sec. 5.6.2)	

Note: C = Compliant, NC = Noncompliant, N/A = Not Applicable, and U = Unknown.

ASCE 41-17 TIER 1 CHECKLISTS

Project Name _____

Project # _____

Status	Evaluation Statement	Comments
C NC N/A U	DIAGONALLY SHEATHED AND UNBLOCKED DIAPHRAGMS: All diagonally sheathed or unblocked wood structural panel diaphragms have horizontal spans less than 30 ft (9.2 m) and have aspect ratios less than or equal to 3-to-1. (Commentary: Sec. A.4.2.3. Tier 2: Sec. 5.6.2)	
C NC N/A U	OTHER DIAPHRAGMS: The diaphragms do not consist of a system other than wood, metal deck, concrete, or horizontal bracing. (Commentary: Sec. A.4.7.1. Tier 2: Sec. 5.6.5)	
Connections		
C NC N/A U	WOOD SILL BOLTS: Sill bolts are spaced at 4 ft or less with acceptable edge and end distance provided for wood and concrete. (Commentary: Sec. A.5.3.7. Tier 2: Sec. 5.7.3.3)	

Note: C = Compliant, NC = Noncompliant, N/A = Not Applicable, and U = Unknown.

Project Name _____

Project # _____

ASCE 41-17 Tier 1 Checklists

FIRM:	
PROJECT NAME:	
PROJECT NUMBER:	
SEISMICITY LEVEL:	
COMPLETED BY:	
DATE COMPLETED	
REVIEWED BY:	
REVIEWED DATE:	

Note: C = Compliant, NC = Noncompliant, N/A = Not Applicable, and U = Unknown.

Table 17-37. Immediate Occupancy Structural Checklist for Building Types URM and URMa

Status	Evaluation Statement	Comments
Very Low Seismicity		
Seismic-Force-Resisting System		
C NC N/A U	REDUNDANCY: The number of lines of shear walls in each principal direction is greater than or equal to 2. (Commentary: Sec. A.3.2.1.1. Tier 2: Sec. 5.5.1.1)	
C NC N/A U	SHEAR STRESS CHECK: The shear stress in the unreinforced masonry shear walls, calculated using the Quick Check procedure of Section 4.4.3.3, is less than 30 lb/in. ² (0.21 MPa) for clay units and 70 lb/in. ² (0.48 MPa) for concrete units. (Commentary: Sec. A.3.2.5.1. Tier 2: Sec. 5.5.3.1.1)	
Connections		
C NC N/A U	WALL ANCHORAGE: Exterior concrete or masonry walls that are dependent on the diaphragm for lateral support are anchored for out-of-plane forces at each diaphragm level with steel anchors, reinforcing dowels, or straps that are developed into the diaphragm. Connections have strength to resist the connection force calculated in the Quick Check procedure of Section 4.4.3.7. (Commentary: Sec. A.5.1.1. Tier 2: Sec. 5.7.1.1)	
C NC N/A U	WOOD LEDGERS: The connection between the wall panels and the diaphragm does not induce cross-grain bending or tension in the wood ledgers. (Commentary: Sec. A.5.1.2. Tier 2: Sec. 5.7.1.3)	
C NC N/A U	TRANSFER TO SHEAR WALLS: Diaphragms are connected for transfer of seismic forces to the shear walls, and the connections are able to develop the lesser of the shear strength of the walls or diaphragms. (Commentary: Sec. A.5.2.1. Tier 2: Sec. 5.7.2)	
C NC N/A U	GIRDER-COLUMN CONNECTION: There is a positive connection using plates, connection hardware, or straps between the girder and the column support. (Commentary: Sec. A.5.4.1. Tier 2: Sec. 5.7.4.1)	

Note: C = Compliant, NC = Noncompliant, N/A = Not Applicable, and U = Unknown.

ASCE 41-17 TIER 1 CHECKLISTS

Project Name _____

Project # _____

Status	Evaluation Statement	Comments
C NC N/A U	DIAPHRAGM REINFORCEMENT AT OPENINGS: There is reinforcing around all diaphragm openings larger than 50% of the building width in either major plan dimension. (Commentary: Sec. A.4.1.8. Tier 2: Sec. 5.6.1.5)	
Flexible Diaphragms		
C NC N/A U	CROSS TIES: There are continuous cross ties between diaphragm chords. (Commentary: Sec. A.4.1.2. Tier 2: Sec. 5.6.1.2)	
C NC N/A U	STRAIGHT SHEATHING: All straight-sheathed diaphragms have aspect ratios less than 1-to-1 in the direction being considered. (Commentary: Sec. A.4.2.1. Tier 2: Sec. 5.6.2)	
C NC N/A U	SPANS: All wood diaphragms with spans greater than 12 ft (3.6 m) consist of wood structural panels or diagonal sheathing. (Commentary: Sec. A.4.2.2. Tier 2: Sec. 5.6.2)	
C NC N/A U	DIAGONALLY SHEATHED AND UNBLOCKED DIAPHRAGMS: All diagonally sheathed or unblocked wood structural panel diaphragms have horizontal spans less than 30 ft (9.2 m) and aspect ratios less than or equal to 3-to-1. (Commentary: Sec. A.4.2.3. Tier 2: Sec. 5.6.2)	
C NC N/A U	NONCONCRETE FILLED DIAPHRAGMS: Untopped metal deck diaphragms or metal deck diaphragms with fill other than concrete consist of horizontal spans of less than 40 ft (12.2 m) and have aspect ratios less than 4-to-1. (Commentary: Sec. A.4.3.1. Tier 2: Sec. 5.6.3)	
C NC N/A U	OTHER DIAPHRAGMS: Diaphragms do not consist of a system other than wood, metal deck, concrete, or horizontal bracing. (Commentary: Sec. A.4.7.1. Tier 2: Sec. 5.6.5)	

Note: C = Compliant, NC = Noncompliant, N/A = Not Applicable, and U = Unknown.

ASCE 41-17 TIER 1 CHECKLISTS

Project Name _____

Project # _____

Status	Evaluation Statement	Comments
Connections		
C NC N/A U	STIFFNESS OF WALL ANCHORS: Anchors of concrete or masonry walls to wood structural elements are installed taut and are stiff enough to limit the relative movement between the wall and the diaphragm to no greater than 1/8 in. (3 mm) before engagement of the anchors. (Commentary: Sec. A.5.1.4. Tier 2: Sec. 5.7.1.2)	
C NC N/A U	BEAM, GIRDER, AND TRUSS SUPPORTS: Beams, girders, and trusses supported by unreinforced masonry walls or pilasters have independent secondary columns for support of vertical loads. (Commentary: Sec. A.5.4.5. Tier 2: Sec. 5.7.4.4)	

Note: C = Compliant, NC = Noncompliant, N/A = Not Applicable, and U = Unknown.

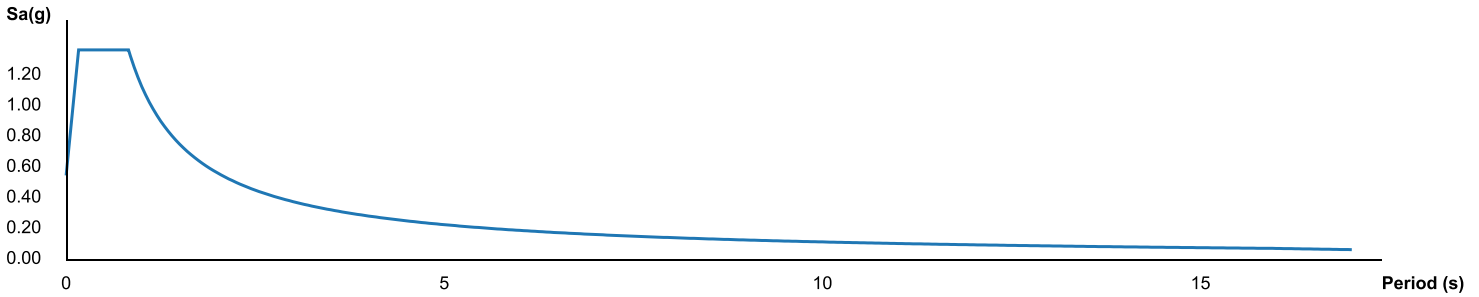
Search Information

Address: South Bend, WA, USA
Coordinates: 46.66315489999999, -123.8046063
Elevation: 92 ft
Timestamp: 2020-12-08T22:38:19.658Z
Hazard Type: Seismic
Reference Document: ASCE41-17
Site Class: D



Custom Probability:

Horizontal Response Spectrum - Hazard Level BSE-2N



Hazard Level BSE-2N

Name	Value	Description
SsUH	1.565	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
CR _S	0.872	Coefficient of risk (0.2s)
SsRT	1.364	Probabilistic risk-targeted ground motion (0.2s)
SsD	1.832	Factored deterministic acceleration value (0.2s)
S _S	1.364	MCE _R ground motion (period=0.2s)
F _a	1	Site amplification factor at 0.2s
S _{Xs}	1.364	Site modified spectral response (0.2s)
S1UH	0.771	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
CR ₁	0.859	Coefficient of risk (1.0s)
S1RT	0.662	Probabilistic risk-targeted ground motion (1.0s)
S1D	0.956	Factored deterministic acceleration value (1.0s)
S ₁	0.662	MCE _R ground motion (period=1.0s)
F _v	1.7	Site amplification factor at 1.0s
S _{X1}	1.125	Site modified spectral response (1.0s)

Hazard Level BSE-1N

Name	Value	Description
S _{Xs}	0.91	Site modified spectral response (0.2s)
S _{X1}	0.75	Site modified spectral response (1.0s)

Hazard Level BSE-2E

Name	Value	Description
------	-------	-------------

Name	Value	Description
S _S	0.953	MCE _R ground motion (period=0.2s)
F _a	1.119	Site amplification factor at 0.2s
S _{X_S}	1.066	Site modified spectral response (0.2s)
S ₁	0.438	MCE _R ground motion (period=1.0s)
F _v	1.862	Site amplification factor at 1.0s
S _{X₁}	0.815	Site modified spectral response (1.0s)

Hazard Level BSE-1E

Name	Value	Description
S _S	0.327	MCE _R ground motion (period=0.2s)
F _a	1.538	Site amplification factor at 0.2s
S _{X_S}	0.504	Site modified spectral response (0.2s)
S ₁	0.103	MCE _R ground motion (period=1.0s)
F _v	2.393	Site amplification factor at 1.0s
S _{X₁}	0.247	Site modified spectral response (1.0s)

T_L Data

Name	Value	Description
T _L	16	Long-period transition period (s)

The results indicated here DO NOT reflect any state or local amendments to the values or any delineation lines made during the building code adoption process. Users should confirm any output obtained from this tool with the local Authority Having Jurisdiction before proceeding with design.

Disclaimer

Hazard loads are provided by the U.S. Geological Survey [Seismic Design Web Services](#).

While the information presented on this website is believed to be correct, ATC and its sponsors and contributors assume no responsibility or liability for its accuracy. The material presented in the report should not be used or relied upon for any specific application without competent examination and verification of its accuracy, suitability and applicability by engineers or other licensed professionals. ATC does not intend that the use of this information replace the sound judgment of such competent professionals, having experience and knowledge in the field of practice, nor to substitute for the standard of care required of such professionals in interpreting and applying the results of the report provided by this website. Users of the information from this website assume all liability arising from such use. Use of the output of this website does not imply approval by the governing building code bodies responsible for building code approval and interpretation for the building site described by latitude/longitude location in the report.

Review 1997 VBC Code forces for 1999 Addition

$$k = 1.25 \quad C_a = 0.36 \quad R_w = 5.5 \quad Z = 0.3$$

$$V = \frac{C_v I}{R T} W = \frac{0.94 (1.25)}{5.5 (0.15)} W = 0.818$$

$$T = C_t h_n^{3/4} = 0.02 (15)^{3/4} = 0.65 \text{ sec.}$$

$$C_v = 0.54$$

$$V_{\text{max}} = \frac{2.5 C_a I W}{R} = \frac{2.5 (0.36) 1.25}{5.5} = \frac{1.125}{5.5} = 0.205 W$$

↙ Controls

Review 2018 IBC seismic forces

$$R = 6.5, \quad k = 1.5, \quad S_{DS} = 0.91$$

$$C_s = \frac{0.95 (1.5)}{6.5} = 0.219$$

Comparison of VBC & IBC forces

$$\frac{0.219}{0.205} = 7\% \text{ increase in forces for current building code forces.}$$

TOTAL MASS OF BUILDING

$$\text{Roof} = 20,673 \text{ FT}^2 \times 25 \text{ PSF} = 717 \text{ K}$$

MASS OF ADDITION ONLY

$$\text{Roof} = 25 \text{ PSF} \times 7500 \text{ FT}^2 = 187 \text{ K}$$

Mass of original building

$$717 - 187 = 530 \text{ K}$$

$$C = 1.3 \quad \text{Table 4-8}$$

TIER 1 ANALYSIS

$$V = S_a \cdot C \cdot W \quad \text{EQ 4-1}$$

$$S_a = \frac{S_x \cdot 1}{T} = \frac{0.75}{.1 \text{ sec}} = 7.5$$

$$S_{x5} = 0.94 \leftarrow \text{Controls}$$

$$V_{\text{ADDITION}} = 1.3 (0.91) 187 \text{ K} = 221 \text{ K}$$

$$V_{\text{ORIGINAL}} = 1.3 (0.91) 530 \text{ K} = 626 \text{ K}$$

REVIEW SHEAR STRESS IN SHEAR WALL

Eq 4-9
$$v_j^{avg} = \frac{1}{M_s} \left(\frac{V_j}{A_w} \right) = \frac{1}{4}$$

$M_s = 2.0$ - Table 4-9 for wood sheathed walls

1999 BUILDING

$$v_j^{avg} = \frac{1}{2} \left(\frac{221^k}{154} \right) = 0.717 \text{ klf} < 1000 \text{ plf} \quad \text{§4.4.3.3}$$

 addition
 N/S direction

$$v_j^{avg} = \frac{1}{2} \left(\frac{221^k}{100} \right) = 0.013 \text{ klf} < 1000 \text{ plf} \quad \text{§4.4.3.3}$$

 addition
 E/W

∴ 1999 BUILDING IS OKAY

CHECK ORIGINAL BUILDING

$$v_j^{avg} = \frac{1}{2} \left(\frac{626^k}{670} \right) = 461 \text{ plf} > 100 \text{ plf}, \text{ NO GOOD}$$

 N/S

$$v_j^{avg} = \frac{1}{2} \left(\frac{626}{446} \right) = 710 \text{ plf} > 100 \text{ plf}, \text{ NO GOOD}$$

 E/W

RENEW URM WALL -

CHECK LOADS - OF MASONRY BOILER ROOM

$$\text{ROOF SLAB} = 50 \text{ PSF} \times 8'00 \text{ FT}^2 + \frac{10}{12} \times 1 \times 150 \times 24 \times 4 = 80.8 \text{ k}$$

$$\text{WALLS} = 55 \text{ PSF} \times 1' \times 42 \times 2 = 34.9 \text{ k}$$

TOTAL = 118 k

$$V = 1.0 \times .91 (118) = \underline{107 \text{ k}}$$

Check shear stress =

$$\tau = \frac{1}{1} \left(\frac{107 \text{ k}}{41 \times 1.25' \times 2 \times 2} \right) = 52 \text{ psi} > 30 \text{ psi} - \text{no good}$$

VIII. COMMON SEISMIC TERMINOLOGY – SEISMIC PERFORMANCE GOALS

Major Earthquake: Also known as the “Design” earthquake since its criteria is used for most codes. It is an earthquake that produces ground motions (shaking) at the site under consideration that have a 10% probability of being exceeded in 50 years. A 30% of gravity (0.3g) ground acceleration would be anticipated in the Puget Sound area.

Moderate Earthquake: An earthquake that produces ground motions (shaking) at the site under consideration that have a 50% probability of being exceeded in 50 years. The 1949, 1965 and 2001 earthquakes in the Puget Sound area are classified as moderate earthquakes.

Minor Earthquake: An earthquake that produces ground motions (shaking) at the site under consideration less than a moderate earthquake and would be short in duration. The recent Richter scale 5.5 earthquakes in the Puget Sound area would be considered minor earthquakes.

Probability of Exceedance: The probability that the ground shaking level or damage level will be exceeded.

International Building Code (IBC): The IBC is a comprehensive set of national regulations for building systems consistent with and inclusive of the scope of originally regional legacy codes. The IBC is the current nationally recognized building code and has been adopted by a majority of states and building jurisdictions.

Anticipated Seismic Performance of New Construction Built to Comply with the International Building Code:

1. Resist a minor level earthquake ground motion without structural or nonstructural damage.
2. Resist moderate level of earthquake ground motion without structural damage, but possibly experience some nonstructural damage.
3. Resist a major level of earthquake ground motion having an intensity equal to the strongest either experienced or forecast for the building site, without collapse, but possibly with some structural, as well as nonstructural damage.
4. Essential facilities are designed for force levels 25% to 50% greater than standard buildings. The building is intended to have minimal structural and nonstructural damage after a major earthquake. The repair of the damage that has occurred would generally not be required prior to re-occupancy, or in other words, be in an operable condition after a major earthquake. Hospitals, Police and Fire Stations are common essential facilities.

International Existing Building Code (IEBC): Building Code Standard that addresses older buildings not constructed under current codes and specifically older unreinforced masonry buildings, concrete tilt-up building, wood buildings and concrete buildings. Its provisions for rehabilitation of unreinforced masonry buildings are less stringent requirements than are demanded for new construction, and were developed considering and balancing the expense of retrofit, the value of the existing building stock and the desired reduction in seismic risk.

ASCE 41-17 – Seismic Evaluation and Retrofit of Existing Buildings: A comprehensive standard based on performance based design, it identifies areas of seismic vulnerability with each common building type based on past seismic performance. The performance level design criteria include Collapse Prevention, Life Safety, Immediate Occupancy and Operational (the last for new construction only). ASCE 41-17 has become the accepted standard in the building industry.

Anticipated Seismic Performance of Building Renovated to International Existing Building Code or ASCE 41-17 Life/Safety Performance Level: The seismic performance would be less than that of new construction. The goal is to reduce life/safety hazards as best as possible with available resources. This code is directed at insuring a coherent load path for lateral loads, reduction of out-of-plane wall failures, reduction of loss of support for floors and roofs and reduction of falling parapets or ornamentation. Anticipated post-earthquake condition would be similar to life/safety design performance for moderate earthquakes and near collapse for major earthquakes as described below.

Immediate Occupancy Seismic Performance Level: Post-earthquake condition of the building would be such that only limited structural damage has occurred. The basic vertical and lateral load resisting systems of the building retain nearly all of their pre-earthquake strength and stiffness. The risk of life-threatening injury as a result of structural damage is very low, although some minor structural repairs may be appropriate; these would generally not be required prior to re-occupancy.

Life/Safety Performance Level: The post-earthquake condition of the building would be that the building may suffer significant structural damage with some anticipated margin against either partial, or total structural collapse. Injuries may occur during the earthquake; however, it is expected that the overall risk of life-threatening injury as a result of structural damage is low. It should be possible to repair the structure; however, for economic reasons this may not be practical. While the damaged structure is not an imminent collapse risk, it would be prudent to implement structural repairs or install temporary bracing prior to re-occupancy.

Collapse Prevention Seismic Performance Level: The post-earthquake condition of the building would be such that the building would be on the verge of experiencing partial or total collapse. Substantial damage to the structure has occurred, potentially including significant degradation in stiffness and strength of the lateral force resisting system, large permanent lateral deformation of the structure and to a more limited extent, degradation in the vertical load carrying capacity. The primary vertical gravity load resisting system should still be able to support its load demand. Significant risk of injury due to falling hazards from structural debris may exist. The structure may not be technically practical to repair and is not safe for re-occupancy, as aftershock activity could induce collapse.

Hazard Reduction/Mitigation of Seismic Hazard: Objective is met with the removal or strengthening of elements of the building which have commonly performed poorly in past earthquakes or presents a life/safety threat to the building occupants.

Structural Damage: Damage to the structural elements of the building. A building with structural damage may require evacuation after an earthquake until structural components are repaired.

Nonstructural Damage: Damage to architectural, mechanical, electrical or building components that do not affect the overall structural integrity of the building. Examples are window breakage, shelves overturning, and ceilings falling down. This is the most common and may be the most expensive damage caused by an earthquake.

Lateral Force Resisting System: Those elements of the structure that provide its basic lateral strength and stiffness (to resist lateral forces due to wind or earthquake motion), and without which the structure would be laterally unstable.

Vertical Load Resisting System: Those elements of the structure that provide a load path for the gravity loads to the foundation.

Ductility: A measure of the ability of a material, elements or system to deform beyond yield. (Yielding after material, element, system has exceeded its initial design strength without a significant loss in load-carrying capacity).

Redundancy: The presence of multiple structural support systems, such that if one or several elements have substantial strength or stiffness loss, continuing lateral displacement and vertical loads may be resisted by the other structural or nonstructural elements in the system.

Brittle Systems: Systems that do not have a defined yield phase (ductility) and that have a significant strength degradation immediately after the displacement associated with peak strength. (Unreinforced clay tile and brick masonry bearing wall systems would be considered brittle systems.)

Diaphragm: A horizontal, or nearly horizontal system designed to transmit lateral forces to vertical elements (shear walls, braced frames, etc.) of the lateral-force-resisting system. Common diaphragm types are plywood sheathing, reinforced concrete, metal decking or concrete topping over metal decking.

Shear Wall: A wall designed to resist lateral forces acting in the plane of the wall (parallel to the wall). Common shear wall types are plywood, reinforced masonry or concrete walls.

Braced Frame: An essentially vertical truss, or its equivalent. Two common braced frame types are concentric (members meet at a common point) or eccentric (to resist lateral loads, some members do not meet at common point). Braced frames are most commonly constructed of steel members.

Redundant Load Path: Secondary load path, normally independent of primary load path, to provide vertical support of floors and roof, if bearing walls or vertical frame fail.

Unreinforced Masonry Wall: Masonry walls, such as solid brick masonry, hollow clay tile or concrete masonry unit (CMU), that rely on the tensile strength of masonry units, mortar and grout to provide structural support. (Current code (IBC) requires reinforced masonry walls to resist tensile forces in our seismic risk zone.)

Unreinforced Concrete Wall: Concrete walls lacking reinforcing that rely on the tensile strength of the concrete to provide structural support. Nominally or minimally reinforced concrete walls act in a similar manner. (Current code (IBC) requires reinforcing steel to resist tensile forces in our seismic risk zone.)

Shotcrete: Concrete that is pneumatically sprayed on vertical, or near vertical, surfaces typically with a minimum use of concrete form work.

Re-Entrant Corner: Plan irregularity in a building, such as an extending wing, plan inset or E, T, X, and L shaped configuration, where large tensile and compression forces can develop at “inside corner configurations”.

Strong Back System: A secondary system, such as a wood or steel frame wall or columns, used to provide out-of-plane support to an unreinforced or under-reinforced masonry wall.

Sub-Diaphragm: A portion of a larger diaphragm used to distribute loads between members. Sub-diaphragms are commonly used to distribute tension loads from anchorage of masonry or concrete walls to tension ties (crossies) across the building.

Crosstie: A beam, girder, or other structural member that accumulates tension loads from wall anchorage and distributes them over the entire width of the building (diaphragm).

Richter Scale: A measurement of the amount of energy released in an earthquake. It utilizes a base-10 logarithmic scale, so every magnitude level increase (i.e M6 to M7) corresponds to 10 times the energy released.

Interplate/Subduction Zone Earthquake: An earthquake that occurs directly at the interface of two tectonic plates. They typically have long reoccurrence levels (500 years or more), and have the ability to produce the largest magnitude earthquakes, upwards of M9 on the Richter Scale.

Intraplate Subduction Zone Earthquake: A deep earthquake, with an epicenter typically 25 to 40 miles below the surface, that has the ability to produce large magnitude earthquakes, upward of M6 to M7 on the Richter Scale. They have a short reoccurrence level, often in the 35 to 50 year range.

Shallow Earthquake: An earthquake that occurs at depths less than 25 miles. While they may release less energy than other earthquake (M5.5 to perhaps M7 on the Richter Scale), they shallow nature of the earthquake can often lead to more ground disruption, and therefore more geographically isolated damage.

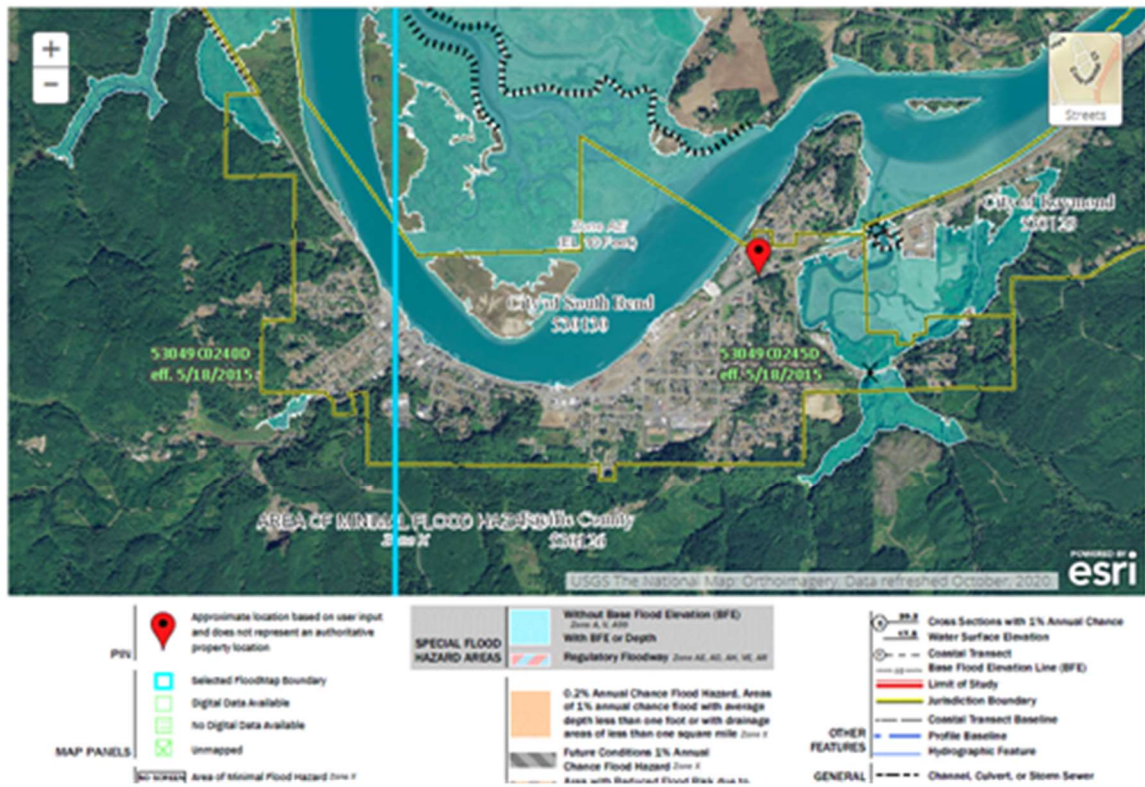
APPENDIX C

Land Maps – Tsunami and Flood Plain



You can choose a new flood map or move the location pin by selecting a different location on the locator map below or by entering a new location in the search field above. It may take a minute or more during peak hours to generate a dynamic FIR/ette. If you are a person with a disability, are blind, or have low vision, and need assistance, please contact a map specialist.

[Go To NFHL Viewer »](#)



APPENDIX D

Master Planning – May 2021

Initial Data and Assumptions
Review –FIRST DRAFT



Background and Methodology/Process:

- Willapa Harbor Hospital retained Health Facilities Planning & Development (HFPD) to support its master planning efforts following completion of its strategic plan. This effort was expected to:
 - By service/department:
 - Review rate of growth/change last 4 years (2017-2020)
 - Collect volume data by patient origin
 - Calculate resident use rates and Willapa current market share. Outpatient use rate data generally Truven Health Analytics.
 - Project volumes assuming projected population, current market share and in-migration (this reflects volume due to population growth/aging only)
 - Conduct sensitivity test on volumes
 - Convert volumes to space drivers, considering scheduled hours of operation, throughput and turnaround time.
 - Even if the current number of rooms/spaces are sufficient; HFPD does not know if they are sized correctly for today's health care environment.

Consistent with the WipFli strategic plan and based on patient origin data, the service area is assumed to be the district boundaries. The District is older (25% age 65+; compared to the State at 16%). The only growth is expected in the 65+ age cohort.

	2010	% of Tot Pop	2020 Est	% of Tot Pop	% Chg 2010-2020	2025 Proj	% of Tot Pop	% Chg 2020-2025
Tot. Pop.	9,022	100.0%	9,287	100.0%	2.9%	9,547	100.0%	2.8%
Pop. By Age								
0-17	1,971	21.8%	1,801	19.4%	-8.6%	1,820	19.1%	1.1%
18-44	2,448	27.1%	2,615	28.2%	6.8%	2,663	27.9%	1.8%
45-64	2,755	30.5%	2,521	27.1%	-8.5%	2,434	25.5%	-3.5%
65-74	992	11.0%	1,401	15.1%	41.2%	1,616	16.9%	15.3%
75-84	595	6.6%	673	7.2%	13.1%	718	7.5%	6.7%
85+	261	2.9%	276	3.0%	5.7%	296	3.1%	7.2%
Tot. 0-64	7,174	79.5%	6,937	74.7%	-3.3%	6,917	72.5%	-0.3%
Tot. 65+	1,848	20.5%	2,350	25.3%	27.2%	2,630	27.5%	11.9%
Hispanic	1,018	11.3%	1,403	15.1%	37.8%	1,629	17.1%	16.1%
Fem. 15-44	1,371	15.2%	1,409	15.2%	2.8%	1,446	15.1%	2.6%

Source: Claritas

For the District, on any given day, about 10 patients are hospitalized in a WA or OR hospital.

Inpatient Discharges by Service Line, 2015-2020

Service Line	2015	2016	2017	2018	2019	Willapa Market Share (2019)	2020	Willapa Market Share (2020)
General Medicine	216	249	214	238	225	50.7%	188	51.1%
Orthopedics	130	109	112	138	118	4.2%	97	9.3%
Cardiology	60	59	66	52	77	19.5%	70	24.3%
Gastroenterology	57	88	64	83	75	33.3%	57	47.4%
General Surgery	82	72	71	67	75	0.0%	74	1.4%
OB/Delivery	83	83	96	83	65	0.0%	83	0.0%
Neurosciences	45	52	43	26	29	27.6%	45	28.9%
Other	16	50	40	30	28	28.6%	29	17.2%
Oncology	19	37	37	42	27	18.5%	20	35.0%
Psychiatry	32	36	19	20	27	0.0%	24	0.0%
Interventional Cardiology	19	25	14	27	24	0.0%	26	0.0%
Urology	5	12	12	9	15	0.0%	12	0.0%
Cardiac Surgery	14	12	17	21	14	0.0%	21	0.0%
Other OB	9	5	8	5	6	0.0%	7	0.0%
Gynecology	4	2	7	3	4	0.0%	1	0.0%
Rehabilitation	10	11	3	2	2	0.0%	6	0.0%
Total	801	902	823	846	811	22.2%	760	23.0%

Source: CHARS Data, excludes observation, newborns and swing

For the District, the largest outpatient services are lab tests, PT and imaging.

Service	Estimated 2020 Volumes	Estimated 2025 Volumes	Estimated 2030 Volumes
Lab Tests	76,655	78,801	81,294
Physical Therapy sessions	11,815	12,146	12,530
X-Ray Procedures	6,550	6,734	6,947
CT Procedures	2,069	2,127	2,195
Ultrasound	1,845	1,897	1,957
Outpatient Surgery procedures	1,571	1,615	1,666
Mammography Procedures	1,176	1,209	1,248
MRI Procedures	748	769	794
Gastroentero Endoscopy Procedures	676	695	717
Echocardiography	549	565	583
Chemotherapy visits	468	481	497
Cardiac Rehab visits	408	420	433
Dexa	179	184	189
Nuclear Medicine	145	149	154
Occupational Therapy sessions	105	108	112

Initial 2025 Space Needs:

Service	WH 2019 Volumes	Current Space	Estimated WH 2025 Space Needs	Sensitivity Analysis/Notes
Med/Surg Inpatient	1.75 ADC	10 beds (confirm)	4 beds (+2 beds for observation)	At current use rate and market share
Swing Beds	0.0 ADC	0		No data for WH in CHARS
ED	4,183	4 exam rooms, 1 trauma room (2 bays)	4 exam rooms, 1 trauma room (2 bays), safe room	
Chemotherapy/Infusion	NA	3 rooms in ED		
Surgery	66 (OP) + IP	1 OR	1 OR	
GI	223 (OP) + IP	1 Procedure Room	1 Procedure Room	

Initial 2025 Space Needs-Imaging:

Service	WH 2019 Volumes	Current Space	Estimated WH 2025 Space Needs	Sensitivity Analysis/Notes
CT	1,947 +4-5% IP	1	1	
Swing Beds	0.0 ADC	0		No data for WH in CHARS
Radiography (no fluoroscopy)	2,191 +1% IP	1	1	
Ultrasound	747 +4-5% IP	1	1	
Mammography	498	1	1	
MRI	342	1	1	1 day/week
Nuclear Med	18	1		1 day/week
Dexa	NA	None	1	Very little estimated volume


Initial 2025 Space Needs-Clinics:

Specialty	No. of Providers	Rooms/Provider	Estimated WH 2025 Space Needs	Sensitivity Analysis/Notes
Primary Care	5 FT	2	10 rooms	
Visiting specialists	Podiatry (1 day/month) and surgery (3 days/week)	2	2 rooms	
Cardiac Rehab			1	

Med/Surg: (additional 1.0 ADC historically for observation patients). WH acute care market share was 21% in 2015.

How many beds now?


More than 5 swing beds likely to require certificate of need review and approval.

Key Assumptions: Med/Surg	
2015-2019 District Resident Inpatient Trend (CHARS); +15%	
2019 (2020) District ADC	10.4 (10.8,+4%)
WH 2019 ADC (2020) ALOS (2020)	1.7 (1.5) 3.00 (2.76)
WH 2019 % of volume from District (2020)	85.4% (91.5%)
WH Market Share of District (days)	14.1% (12.5%)
Est. Hours of Operation/Week	24/7

Space Needs- Med/Surg	
2025 District ADC	11.2
WH 2025 ADC (at current use rate and market share)	1.9
2025 Space Needed (at 50% occupancy)	3.8
2030 District ADC	11.9
WH 2030 Volumes (at current use rate and market share)	2.1
2030 Space Needed	4.2
At peak market share bed need in 2025 (2030) is about 50% higher:	5.8 (6.2)


ED:
Volumes
generally flat.

How much
higher is peak
census day?
For the infusion
patients, how
long is
treatment time?

Key Assumptions	
2017-2019 WH Trend (-1% decline)	
2019 (2020) WH Volumes	4,183 (3,481, -17%)
Est. Hours of Operation/Week	24/7
Assumed Throughput	120 minutes
Peak Census:	
Notes/ Findings	


Space Needs	
Current Space	4 exam rooms, 1 trauma room (2 bays); no psych/safe room
Current Utilization	1,048 patients/room
Benchmark	1,500 patients per year x 4 rooms = 6,000 visits
WH 2025 Volumes (2030 Volumes)	
2025 Key Space Needed	4 treatment rooms
2030 Key Space Needed	4 treatment rooms
Sensitivity Test	

Surgery:
Is there a
plan to
recruit
provider?

Key Assumptions	
2017-2019 WH Trend (-27% decline)	
2019 (2020) WH Volumes	66 (29, -56%) + XX% for IP
Est. Hours of Operation/Week	
Assumed Throughput	
Notes/ Findings	


Space Needs	
Current Space	1 OR
Benchmark	900-1,000 per IP OR and 1,250-1,500 per OP OR
WH 2025 Volumes (2030 Volumes)	
2025 Key Space Needed	1 OR
2030 Key Space Needed	1 OR
Sensitivity Test	

GI:
Recommended
age for screening
now 45+.

Key Assumptions	
2017-2019 WH Trend (0% change)	
2019 (2020) WH Volumes	223 (233, +4.5%) + XX% for IP
Est. Hours of Operation/Week	
Assumed Throughput	minutes
Notes/ Findings	


Space Needs	
Current Space	1 procedure room
Benchmark	1,250 to 1,500 per procedure room
WH 2025 Volumes (2030 Volumes)	
2025 Key Space Needed	1
2030 Key Space Needed	1
Sensitivity Test	

CT:

Key Assumptions	
2017-2019 WH Trend (24% increase)	
2019 (2020) WH Volumes	1,947 (1,983, +1.8%) + 4-5% for IP
Est. Hours of Operation/Week	
Assumed Throughput	60 minutes
Notes/ Findings	


Space Needs	
Current Space	1 CT
Benchmark	8,000 (industry standard)
WH 2025 Volumes (2030 Volumes)	
2025 Key Space Needed	1 CT
2030 Key Space Needed	1 CT
Sensitivity Test	Volumes could triple and 1 machine sufficient.

R&F (only radiography now)

Key Assumptions	
2017-2019 WH Trend (-6% decrease)	
2019 (2020) WH Volumes	2,191 (1,868, - 14.7%) + 1% for IP
Est. Hours of Operation/Week	
Assumed Throughput	20 minutes
Notes/ Findings	


Space Needs	
Current Space	1
Benchmark	5,500 per machine
WH 2025 Volumes (2030 Volumes)	
2025 Key Space Needed	1
2030 Key Space Needed	1
Sensitivity Test	

Ultrasound:

Key Assumptions	
2017-2019 WH Trend (24.5% increase)	
2019 (2020) WH Volumes	747 (665, -11.0%) + 4-5% for IP
Est. Hours of Operation/Week	
Assumed Throughput	30 minutes
Notes/ Findings	


Space Needs	
Current Space	1
Benchmark	2,000
WH 2025 Volumes (2030 Volumes)	
2025 Key Space Needed	
2030 Key Space Needed	
Sensitivity Test	Volumes could double before 2 nd US machine needed

Mammography:

Key Assumptions	
2017-2019 WH Trend (+11% increase)	
2019 (2020) WH Volumes	498 (477, -4.2%)
Est. Hours of Operation/Week	
Assumed Throughput	20 minutes
Notes/ Findings	


Space Needs	
Current Space	1 3D machine
Benchmark	5,500
WH 2025 Volumes (2030 Volumes)	
2025 Key Space Needed	
2030 Key Space Needed	
Sensitivity Test	

MRI:

Key Assumptions	
2017-2019 WH Trend (+24% increase)	
2019 (2020) WH Volumes	342 (270, -4.2%)
Est. Hours of Operation/Week	1 day per week
Assumed Throughput	60 minutes (confirm)
Notes/ Findings	

Space Needs	
Current Space	1 mobile unit
Benchmark	4,000
WH 2025 Volumes (2030 Volumes)	
2025 Key Space Needed	1
2030 Key Space Needed	1
Sensitivity Test	

Nuclear Medicine:

Key Assumptions	
2017-2019 WH Trend (+50% increase; numbers very small)	
2019 (2020) WH Volumes	747 (665, -11.0%) + 4-5% for IP
Est. Hours of Operation/Week	1 day/week (Tuesdays)
Assumed Throughput	40-75 minutes
Notes/ Findings	

Space Needs	
Current Space	
Benchmark	1,200
WH 2025 Volumes (2030 Volumes)	
2025 Key Space Needed	
2030 Key Space Needed	
Sensitivity Test	

Cardiac Rehabilitation:
Any plans to add other cardiac services?


Key Assumptions	
2019 WH	Established in 2019
2019 (2020) WH Volumes	379 (332, -12.4%)
Est. Hours of Operation/Week	
Assumed Throughput	
Notes/ Findings	
Cardiac rehab space could be shared with PT or other users of equipment	

Space Needs	
Current Space	1
Benchmark	NA (need exercise equipment)
WH 2025 Volumes (2030 Volumes)	
2025 Key Space Needed	1
2030 Key Space Needed	1
Sensitivity Test	

Primary and Specialty Care Clinics:

How much of volume was weekend urgent care?

Are there plans to recruit additional providers?

Key Assumptions	
2017-2019 WH Trend (+95%)	
2019 (2020) WH Volumes	9,973 (11,541, +15.7%)
Est. Hours of Operation/Week	
Notes/ Findings	

Space Needs	
Current Space	4 rooms
Benchmark	2 rooms/provider
WH 2025 Volumes (2030 Volumes)	
2025 Key Space Needed	10-12 rooms
2030 Key Space Needed	
Sensitivity Test	

Master Planning – June 8, 2021

MD Need-DRAFT



2020 estimated supply and need for primary care in the District

Using various physician to population ratios adjusted for local demographics, includes the 5 full time providers in the District plus a .2 FTE (one day per week) AND assuming 100% of District residents stayed locally for care, another 3.6 PCP could be needed. Does not include FQHC in Raymond (Valley View).

Specialty	2020
Family Practice	3.8
Internal Medicine	4.2
Pediatrics	1.1
SUM: All Primary Care	9.1
Supply –Willapa Hospital only	5.2
Net Need	3.6

2021 estimated need
for specialty care in
the District

Using various physician to population ratios
adjusted for local demographics AND assuming
100% of District residents stayed locally for care,
the following specialists could be supported.

Specialty	2020
Cardiology	1.1
Ophthalmology	1.1
General Surgery	0.9
OB/GYN	0.9
Orthopedics	0.7
Psychiatry	0.7
Oncology	0.6
Urology	0.6

APPENDIX E

Function Hospital Program Outline

	L		D	=	area	x	quantity	=	total
Public Spaces									
Patient Drop Off Canopy	20.5	x	30.5	=	625.25	x	1	=	625.25
Vestibule	12.5	x	14.5	=	181.25	x	1	=	181.25
Lobby/Waiting		x		=	35	x	20	=	700.00
Public Restrooms	8.5	x	10.5	=	89.25	x	2	=	178.50
Reception	10.5	x	16.5	=	173.25	x	1	=	173.25
Patient Registration	8.5	x	10.5	=	89.25	x	2	=	178.50
Patient Education/Conference Rooms	12.5	x	16.5	=	206.25	x	2	=	412.50
									subtotal 2,449.25
									Net to Gross Factor 30% 734.78
									department total 3,184.03
Administrative Support Programs									
	8.5	x	10.5	=	89.25	x	1	=	89.25
Hospital Administration									
CEO Office	10.5	x	16.5	=	173.25	x	1	=	173.25
CFO Office	10.5	x	14.5	=	152.25	x	1	=	152.25
CNO Office	10.5	x	14.5	=	152.25	x	1	=	152.25
Administrative Assistant	8.5	x	10.5	=	89.25	x	1	=	89.25
Administrative Storage	8.5	x	10.5	=	89.25	x	1	=	89.25
Administrative Conference Room	16.5	x	20.5	=	338.25	x	1	=	338.25
									subtotal 994.50
									Net to Gross Factor 30% 298.35
									department total 1,292.85
Finance Services									
Finance Office	10.5	x	14.5	=	152.25	x	1	=	152.25
Finance Work Stations	6.5	x	6.5	=	42.25	x	4	=	169.00
Work Room	8.5	x	10.5	=	89.25	x	1	=	89.25
Storage Room	8.5	x	10.5	=	89.25	x	1	=	89.25
									subtotal 499.75
									Net to Gross Factor 30% 149.93
									649.68
Business Services									
Business Office	10.5	x	14.5	=	152.25	x	1	=	152.25
Business Work Stations	6.5	x	6.5	=	42.25	x	4	=	169.00
Work Room	8.5	x	10.5	=	89.25	x	1	=	89.25
Storage Room	8.5	x	10.5	=	89.25	x	1	=	89.25
									subtotal 499.75
									Net to Gross Factor 30% 149.93
									department total 649.68
Human Resource Services									
Human Resource Office	10.5	x	14.5	=	152.25	x	1	=	152.25
HR Work Stations	6.5	x	6.5	=	42.25	x	4	=	169.00
Work Room	8.5	x	10.5	=	89.25	x	1	=	89.25
Storage Room	8.5	x	10.5	=	89.25	x	1	=	89.25
									subtotal 499.75
									Net to Gross Factor 30% 149.93
									department total 649.68
Staff Support Services									
Staff Private Dining	12.5	x	20.5	=	256.25	x	0	=	0.00
Staff Dress Room/Lockers	6.5	x	6.5	=	42.25	x	4	=	169.00
Staff Toilet	7.5	x	8.5	=	63.75	x	2	=	127.50
Staff Shower	7.5	x	8.5	=	63.75	x	2	=	127.50
Secured Bicycle Storage	10.5	x	12.5	=	131.25	x	0	=	0.00
									subtotal 424.00
									Net to Gross Factor 30% 127.20
									department total 551.20

Patient Support Programs**Patient Rooms**

Single Patient Rooms - Acuity Adaptable	14.5	x	14.5	=	210.25	x	0	=	0.00
Patient Wet Bathrooms	7.5	x	8.5	=	63.75	x	0	=	0.00
All Single Patient Rooms - Acuity Adaptable	14.5	x	14.5	=	210.25	x	0	=	0.00
All Patient Wet Bathrooms	7.5	x	8.5	=	63.75	x	0	=	0.00
Patient Care Station	10.5	x	16.5	=	173.25	x	0	=	0.00
Code Cart/Equipment Alcove	3.5	x	12.5	=	43.75	x	0	=	0.00
Charge Nurse Office	8.5	x	10.5	=	89.25	x	0	=	0.00
Clean Supply/Meds Zone	10.5	x	14.5	=	152.25	x	0	=	0.00
Soiled Utility	8.5	x	10.5	=	89.25	x	0	=	0.00
Clean Supply Storage	10.5	x	16.5	=	173.25	x	0	=	0.00
EV Closet	6.5	x	8.5	=	55.25	x	0	=	0.00
Dietary Dish Cart Alcove	3.5	x	6.5	=	22.75	x	0	=	0.00
								subtotal	0.00
								Net to Gross Factor 45%	0.00
								department total	0.00
									0.00

Inpatient & Swing Beds Nursing Unit

Skilled Nursing Patient Rooms	15.5	x	16.5	=	255.75	x	10	=	2,557.50
Skilled Nursing Patient Wet Bathrooms	8.5	x	10.5	=	89.25	x	10	=	892.50
Storage for Medical Equipment	2.5	x	2.5	=	6.25	x	10	=	62.50
Support Space for Families	5.5	x	5.5	=	30.25	x	10	=	302.50
Dining	4.5	x	4.5	=	20.25	x	10	=	202.50
Solon/Hair Care	10.5	x	10.5	=	110.25	x	1	=	110.25
Physical Rehab	10.5	x	12.5	=	131.25	x	1	=	131.25
Patient Care Station	10.5	x	16.5	=	173.25	x	1	=	173.25
Code Cart/Equipment Alcove	3.5	x	12.5	=	43.75	x	1	=	43.75
Clean Supply/Meds Zone	10.5	x	14.5	=	152.25	x	1	=	152.25
Soiled Utility	8.5	x	10.5	=	89.25	x	1	=	89.25
Clean Supply Storage	10.5	x	16.5	=	173.25	x	1	=	173.25
EV Closet	6.5	x	8.5	=	55.25	x	1	=	55.25
Dietary Dish Cart Alcove	3.5	x	6.5	=	22.75	x	1	=	22.75
								subtotal	4,968.75
								45%	2,235.94
								department total	7,204.69
									1,440.94

Emergency Department

Patient Entrance Vestibule	8.5	x	14.5	=	123.25	x	1	=	123.25
Security Station	8.5	x	8.5	=	72.25	x	1	=	72.25
ED Waiting	7.5	x	8.5	=	63.75	x	3	=	191.25
Patient Care Team Station	10.5	x	14.5	=	152.25	x	1	=	152.25
ED Provider Work Stations	6.5	x	6.5	=	42.25	x	3	=	126.75
Triage Room	10.5	x	10.5	=	110.25	x	2	=	220.50
Trauma Room	12.5	x	30.5	=	381.25	x	1	=	381.25
Treatment Rooms	10.5	x	12.5	=	131.25	x	8	=	1,050.00
Safe Room	10.5	x	16.5	=	173.25	x	1	=	173.25
ED Patient Toilets	7.5	x	8.5	=	63.75	x	2	=	127.50
Clean Supply/Meds Zone	10.5	x	14.5	=	152.25	x	1	=	152.25
Soiled Utility	8.5	x	10.5	=	89.25	x	1	=	89.25
Clean Supply/Equipment Storage	10.5	x	14.5	=	152.25	x	1	=	152.25
EV Closet	6.5	x	8.5	=	55.25	x	1	=	55.25
Ambulance Canopy	10.5	x	16.5	=	173.25	x	1	=	173.25
EMT Work/Storage	10.5	x	12.5	=	131.25	x	1	=	131.25
ED Staff Lounge	12.5	x	18.5	=	231.25	x	1	=	231.25
ED Staff Restroom	7.5	x	8.5	=	63.75	x	2	=	127.50
Call Room	10.5	x	12.5	=	131.25	x	1	=	131.25
Call Room Bathroom	8.5	x	10.5	=	89.25	x	1	=	89.25
								subtotal	3,951.00
								Net to Gross Factor 45%	1,777.95
								department total	5,728.95

Infusion Services

Patient Care Team Station	9.5	x	10.5	=	99.75	x	1	=	99.75
Infusion Stations	10.5	x	12.5	=	131.25	x	3	=	393.75
Private Infusion Station	8.5	x	10.5	=	89.25	x	1	=	89.25
Patient Toilet	7.5	x	8.5	=	63.75	x	1	=	63.75
Nourishment Station	8.5	x	10.5	=	89.25	x	1	=	89.25
Infusion Office	8.5	x	10.5	=	89.25	x	1	=	89.25
<i>Other support programs shared with Emergency Department</i>									
								subtotal	825.00
								Net to Gross Factor 45%	371.25
								department total	1,196.25
Respiratory Therapy									
RT Office	10.5	x	10.5	=	110.25	x	1	=	110.25
RT Work/ Storage	12.5	x	14.5	=	181.25	x	1	=	181.25
								subtotal	291.50
								Net to Gross Factor 35%	102.03
								department total	393.53
Pharmacy									
Pharmacy Office	10.5	x	10.5	=	110.25	x	1	=	110.25
General Pharmacy	12.5	x	14.5	=	181.25	x	1	=	181.25
Ante Room	8.5	x	10.5	=	89.25	x	1	=	89.25
Negative Clean Room	10.5	x	10.5	=	110.25	x	1	=	110.25
Positive Clean Room	10.5	x	12.5	=	131.25	x	1	=	131.25
Medication Storage	8.5	x	10.5	=	89.25	x	1	=	89.25
								subtotal	711.50
								Net to Gross Factor 35%	249.03
								department total	960.53
Laboratory									
Lab Office	10.5	x	10.5	=	110.25	x	1	=	110.25
General Lab	12.5	x	14.5	=	181.25	x	1	=	181.25
Microbiology	10.5	x	12.5	=	131.25	x	1	=	131.25
Negative Clean Room	10.5	x	10.5	=	110.25	x	1	=	110.25
Positive Clean Room	10.5	x	12.5	=	131.25	x	1	=	131.25
Medication Storage	8.5	x	10.5	=	89.25	x	1	=	89.25
								subtotal	753.50
								Net to Gross Factor 35%	263.73
								department total	1,017.23
Surgery Department									
Surgical Locker/Dress/Shower/Toilet	12.5	x	16.5	=	206.25	x	2	=	412.50
Operating Room	20.5	x	22.5	=	461.25	x	1	=	461.25
Procedure Room (Endo)	16.5	x	20.5	=	338.25	x	1	=	338.25
Pre/Post Rooms	10.5	x	12.5	=	131.25	x	6	=	787.50
Scrub Sink Alcove	3.5	x	4.5	=	15.75	x	1	=	15.75
Sub Sterile	8.5	x	10.5	=	89.25	x	1	=	89.25
Sterile Storage	10.5	x	14.5	=	152.25	x	1	=	152.25
EV Closet	6.5	x	8.5	=	55.25	x	1	=	55.25
Scope Cleaning Room	10.5	x	12.5	=	131.25	x	1	=	131.25
Surgery Sub waiting	8.5	x	10.5	=	89.25	x	1	=	89.25
								subtotal	2,532.50
								Net to Gross Factor 45%	1,139.63
								department total	3,672.13
Sterile Processing Department									
Decontamination	10.5	x	20.5	=	215.25	x	1	=	215.25
Sterilization	16.5	x	22.5	=	371.25	x	1	=	371.25
Sterilizer Equipment Room	8.5	x	10.5	=	89.25	x	1	=	89.25
Ante Room	10.5	x	16.5	=	173.25	x	1	=	173.25
SPD Manager Office	10.5	x	12.5	=	131.25	x	1	=	131.25
								subtotal	980.25
								Net to Gross Factor 45%	441.11
								department total	1,421.36
Imaging Department									
Radiography Room/Control	14.5	x	20.5	=	297.25	x	1	=	297.25

CT Scan/Control	16.5	x	22.5	=	371.25	x	1	=	371.25
MRI (4 Zones?)/Control	20.5	x	30.5	=	625.25	x	1	=	625.25
Nuclear Medicine	12.5	x	16.5	=	206.25	x	1	=	206.25
Ultra Sound	10.5	x	12.5	=	131.25	x	1	=	131.25
US Patient toilet	7.5	x	8.5	=	63.75	x	1	=	63.75
Mammography	10.5	x	12.5	=	131.25	x	1	=	131.25
Clean Supply/Meds Zone	10.5	x	14.5	=	152.25	x	1	=	152.25
Soiled Utility	8.5	x	10.5	=	89.25	x	1	=	89.25
Clean Supply/Equipment Storage	10.5	x	14.5	=	152.25	x	1	=	152.25
EV Closet	6.5	x	8.5	=	55.25	x	1	=	55.25
Surgery Sub waiting	8.5	x	10.5	=	89.25	x	1	=	89.25
ID Manager Office	10.5	x	12.5	=	131.25	x	1	=	131.25
Tech Work Area	10.5	x	14.5	=	152.25	x	1	=	152.25
PACS Reading Room	10.5	x	14.5	=	152.25	x	1	=	152.25

subtotal 2,800.25

Net to Gross Factor 45% 1,260.11

department total 4,060.36

Hospital System Support Programs

Dietary Services

Kitchen/Storage/EVS	20.5	x	30.5	=	625.25	x	1	=	625.25
Serveries	10.5	x	16.5	=	173.25	x	1	=	173.25
Dining	20.5	x	30.5	=	625.25	x	1	=	625.25
Tray Return Dishwashing	10.5	x	14.5	=	152.25	x	1	=	152.25
Vending Alcove	3.5	x	12.5	=	43.75	x	1	=	43.75

subtotal 1,619.75

Net to Gross Factor 40% 647.90

department total 2,267.65

Technology/IT Services

IT Manager Office	10.5	x	10.5	=	110.25	x	1	=	110.25
Training/Lab Room	10.5	x	10.5	=	110.25	x	1	=	110.25
IT/DATA Demarcation Room	10.5	x	12.5	=	131.25	x	1	=	131.25
IT/DATA Remote Closets	6.5	x	8.5	=	55.25	x	2	=	110.50
IT Storage	10.5	x	12.5	=	131.25	x	1	=	131.25

subtotal 593.50

Net to Gross Factor 35% 207.73

department total 801.23

Materials Management

MM Office	10.5	x	10.5	=	110.25	x	1	=	110.25
MM Receiving Rooms	10.5	x	16.5	=	173.25	x	1	=	173.25
MM Breakdown Room	10.5	x	10.5	=	110.25	x	1	=	110.25
MM Storage	15.5	x	20.5	=	317.75	x	1	=	317.75

subtotal 711.50

Net to Gross Factor 40% 284.60

department total 996.10

Environmental Services

EV Office	10.5	x	10.5	=	110.25	x	1	=	110.25
EV Supply Storage	10.5	x	20.5	=	215.25	x	1	=	215.25
EV Equipment Room	10.5	x	20.5	=	215.25	x	1	=	215.25

subtotal 540.75

Net to Gross Factor 40% 216.30

department total 757.05

Laundry and Linen Services

LL Office	10.5	x	10.5	=	110.25	x	1	=	110.25
Washer Room	8.5	x	12.5	=	106.25	x	1	=	106.25
Dryer Room	10.5	x	16.5	=	173.25	x	1	=	173.25
Folding Room	8.5	x	12.5	=	106.25	x	1	=	106.25
Clean Linen Storage	10.5	x	16.5	=	173.25	x	1	=	173.25

subtotal 669.25

Net to Gross Factor 40% 267.70

department total 936.95

Facilities Management

FM Office/Main Fire Alarm Panel	10.5	x	10.5	=	110.25	x	1	=	110.25
FM Shop	10.5	x	20.5	=	215.25	x	1	=	215.25
FM Storage Room	10.5	x	16.5	=	173.25	x	1	=	173.25

subtotal 498.75

Net to Gross Factor 30% 149.63

									department total	648.38
Facility Management - Physical Plant										
Boiler Room	12.5	x	20.5	=	256.25	x	1	=	256.25	
Chiller Room	12.5	x	20.5	=	256.25	x	1	=	256.25	
Hot water/Steam	10.5	x	12.5	=	131.25	x	1	=	131.25	
Vacuum Room	10.5	x	16.5	=	173.25	x	1	=	173.25	
Medical Gas Room	10.5	x	12.5	=	131.25	x	1	=	131.25	
Main Electrical Room (Switchgear)	10.5	x	16.5	=	173.25	x	1	=	173.25	
ATS Room	8.5	x	10.5	=	89.25	x	1	=	89.25	
Emergency Generator Room	14.5	x	20.5	=	297.25	x	1	=	297.25	
Sprinkler Riser Room	8.5	x	10.5	=	89.25	x	1	=	89.25	
Landscape Maintenance Equipment	8.5	x	10.5	=	89.25	x	1	=	89.25	
									subtotal	1,686.50
									Net to Gross Factor 40%	674.60
									department total	2,361.10
subtotal all Hospital Departments										39,989.81
DGSF to BGSF 20%										7,997.96
ESTIMATED TOTAL HOSPITAL BUILDING AREA										47,987.78
										4,798.78

Site - Physical Plant										
Bulk Oxygen Secured Fenced Enclosed Area										tbd
Helipad										tbd

Ambulatory Patient Services										
Cardiac Rehab (in hospital)	20.5	x	10.5	=	215.25	x	1	=	215.25	
Physical Therapy	20.5	x	30.5	=	625.25	x	1	=	625.25	
									subtotal	840.50
									Net to Gross Factor 40%	336.20
									department total	1,176.70

Primary Care & Specialty Care										
Vestibule	12.5	x	14.5	=	181.25	x	1	=	181.25	
Lobby/Waiting		x		=	35	x	20	=	700.00	
Public Restrooms	8.5	x	10.5	=	89.25	x	2	=	178.50	
Reception	8.5	x	12.5	=	106.25	x	1	=	106.25	
Work Room/Chart Prep	10.5	x	10.5	=	110.25	x	1	=	110.25	
Clinic Manager Office	10.5	x	10.5	=	110.25	x	1	=	110.25	
Provider Offices	8.5	x	10.5	=	89.25	x	8	=	714.00	
Exam Rooms	10.5	x	10.5	=	110.25	x	20	=	2,205.00	
Procedure Room	12.5	x	14.5	=	181.25	x	1	=	181.25	
Patient Care Team Station	8.5	x	12.5	=	106.25	x	2	=	212.50	
Patient Toilet	7.5	x	8.5	=	63.75	x	2	=	127.50	
Clean Utility/Med Zone	10.5	x	14.5	=	152.25	x	1	=	152.25	
Soiled Utility/Hold	10.5	x	12.5	=	131.25	x	1	=	131.25	
Clean Supply Storage	7.5	x	8.5	=	63.75	x	1	=	63.75	
Environmental Closet	6.5	x	8.5	=	55.25	x	1	=	55.25	
Staff Lounge/Lockers	12.5	x	16.5	=	206.25	x	1	=	206.25	
Staff Toilet	7.5	x	8.5	=	63.75	x	2	=	127.50	
Mech/Elec Room	10.5	x	12.5	=	131.25	x	1	=	131.25	
									subtotal	5,694.25
									Net to Gross Factor 35%	1,992.99
									department total	7,687.24

APPENDIX F



Willapa Harbor Hospital

Debt Capacity Analysis | New Project

December 7, 2021

For WHH's internal use only. Not to be distributed to any third parties.

WIPFLI

Today's agenda

01. Overall Basis
02. Revenue, Expense, and Project Cost Summaries
03. Summary of Key Financial Results
04. Financial Forecasts – New Project
05. Financing Scenarios
06. Summary and Next Steps
07. Appendix – Forecast Assumptions

01. Overall Basis

Overall Basis for the Forecast

- Prepared forecasted financial statements for the Hospital (2021 to 2028) based on the following:
 - ▶ Historical operating results from 2016 through 2020
 - ▶ Utilized YTD July 2021, annualized, as the primary basis for the 2021 forecasted income statement
 - ▶ Applied the 2021 budget for operating revenues and taxation for M&O
 - ▶ Applied inflationary increases and other assumptions as discussed with management
 - ▶ Incorporated debt financing for the new project
 - ▶ Prepared forecasted income statements to assess debt capacity of Hospital. The estimated debt capacity is not currently associated with a specific capital project.

Overall Basis for the Forecast

WHH experienced significant operational changes in FY 2020 and FY 2021:

- ▶ The COVID-19 pandemic has impacted the financial performance of healthcare providers across the country, resulting in providers losing patient volumes and revenues, and incurring additional expenses to respond to the pandemic. The pandemic is still ongoing and the full extent of its financial impact on healthcare providers is not yet known.
- ▶ Added a primary care physician and family nurse practitioner in FY20
- ▶ The Alder House assisted living facility shut down in FY 2021 due to continued operating losses attributed to declining Medicaid payment rates and declining resident admissions as a result of the COVID-19 pandemic.

02. Revenue, Expense, and Project Cost Summaries

Revenue Summary - Historical

<i>Operating revenue</i>	Historical				
	2016	2017	2018	2019	2020
Net patient service revenue	\$ 18,580,425	\$ 19,154,360	\$ 20,445,608	\$ 20,490,085	\$ 20,058,124
Other operating revenue	178,045	236,252	148,307	505,333	873,668
Grants	30,259	36,903	103,754	-	-
Total operating revenue	\$ 18,788,729	\$ 19,427,515	\$ 20,697,669	\$ 20,995,418	\$ 20,931,792
Change in net patient service revenue		3.1%	6.7%	0.2%	-2.1%
Change in total operating revenue		3.4%	6.5%	1.4%	-0.3%

Revenue Summary - Forecasted

<i>Operating revenue</i>	2021	2022	2023	2024	2025	2026	2027	2028
Net patient service revenue	\$ 22,259,776	\$ 22,935,452	\$ 23,646,067	\$ 24,382,354	\$ 25,366,813	\$ 26,685,276	\$ 28,273,687	\$ 29,295,200
Other operating revenue	600,000	618,000	636,540	655,636	675,305	695,564	716,431	737,924
Total operating revenue	\$ 22,859,776	\$ 23,553,452	\$ 24,282,607	\$ 25,037,990	\$ 26,042,118	\$ 27,380,840	\$ 28,990,118	\$ 30,033,124
Change in net patient service revenue	11.0%	3.0%	3.1%	3.1%	4.0%	5.2%	6.0%	3.6%
Change in total operating revenue	9.2%	3.0%	3.1%	3.1%	4.0%	5.1%	5.9%	3.6%

Operating Expense Summary - Historical

Operating expenses	Historical					
	2016	2017	2018	2019	2020	
Salaries and wages	\$ 10,625,019	\$ 11,071,695	\$ 11,223,939	\$ 11,345,264	\$ 12,004,821	
Employee benefits	3,261,161	3,347,263	3,080,133	3,081,956	3,360,172	
Other post employment benefits	-	-	1,986,046	217,905	251,003	
Professional fees	1,004,484	1,122,131	1,329,409	1,411,404	1,879,513	
Supplies	1,269,135	1,180,205	1,452,686	1,404,434	1,782,136	
Purchased services	1,227,374	1,298,911	1,666,116	2,137,020	1,780,223	
Utilities	284,251	311,505	350,204	350,541	387,094	
Repairs and maintenance	107,690	96,766	79,192	86,904	96,764	
Insurance	109,742	92,158	66,998	79,179	112,269	
Other	511,877	573,853	575,329	558,990	641,080	
Rent	108,524	109,069	110,569	147,632	148,920	
Depreciation and amortization	929,877	676,466	560,325	551,277	529,774	
Total operating expenses	\$ 19,439,134	\$ 19,880,022	\$ 22,480,946	\$ 21,372,506	\$ 22,973,769	
Change in salaries, wages, benefits, and other noncapital operating expenses			3.7%	15.0%	-5.4%	7.5%
Change in total operating expenses			2.3%	13.1%	-4.9%	7.5%

Operating Expense Summary - Forecasted

Operating expenses	2021	2022	2023	2024	2025	2026	2027	2028
Salaries and wages	\$ 12,477,663	\$ 12,851,993	\$ 13,237,553	\$ 13,634,680	\$ 14,043,720	\$ 14,465,032	\$ 14,898,983	\$ 15,345,952
Employee benefits	3,662,371	3,772,242	3,885,409	4,001,972	4,122,031	4,245,692	4,373,063	4,504,254
Other post employment benefits	300,000	309,000	318,270	327,818	337,653	347,783	358,216	368,962
Professional fees	1,969,450	2,028,534	2,089,390	2,152,072	2,216,634	2,283,133	2,351,627	2,422,176
Supplies	1,602,374	1,650,445	1,699,958	1,750,957	1,803,486	1,857,591	1,913,319	1,970,719
Purchased services	1,698,838	1,749,803	1,802,297	1,856,366	1,912,057	1,969,419	2,028,502	2,089,357
Utilities	453,929	467,547	481,573	496,020	510,901	526,228	542,015	558,275
Repairs and maintenance	83,995	86,515	89,110	91,783	94,536	97,372	100,293	103,302
Insurance	108,456	111,710	115,061	118,513	122,068	125,730	129,502	133,387
Other	568,155	585,200	602,756	620,839	639,464	658,648	678,407	698,759
Rent	149,436	153,919	158,537	163,293	168,192	173,238	178,435	183,788
Depreciation and amortization	626,186	664,720	729,751	803,168	759,996	1,734,579	1,687,210	1,663,541
Total operating expenses	\$ 23,700,853	\$ 24,431,628	\$ 25,209,665	\$ 26,017,481	\$ 26,730,738	\$ 28,484,445	\$ 29,239,572	\$ 30,042,472
Change in salaries, wages, benefits, and other noncapital operating expenses	3.4%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%
Change in total operating expenses	3.2%	3.1%	3.2%	3.2%	2.7%	6.6%	2.7%	2.7%

Project Assumptions and Sources/Uses of Funding

Project size	\$	30,000,000
Construction timeline (months)		18
Completion date		October 2026
Debt interest rate		3.00%
Debt annual payments (P+I)	\$	1,517,775
Debt issuance cost %		1.50%
Debt term (years)		30

Sources of funding

Debt	\$	30,000,000
------	----	------------

Uses of funding

Construction		29,550,000
Debt issuance costs		450,000
Total uses	\$	30,000,000

03. Summary of Key Financial Results

Debt Service Coverage - \$30 Million Project

Debt service coverage	2021	2022	2023	2024	2025	2026	2027	2028
Change in net position	\$ 2,071,555	\$ (70,354)	\$ (100,417)	\$ (133,705)	\$ (280,763)	\$ (382,554)	\$ (334,918)	\$ 8,404
Plus: OPEB	300,000	309,000	318,270	327,818	337,653	347,783	358,216	368,962
Plus: Interest expense	30,930	24,009	13,689	3,194	(73)	145,694	961,330	867,400
Plus: Depreciation and amortization expense	626,186	664,720	729,751	803,168	759,996	1,734,579	1,687,210	1,663,541
Less: CARES funding recognized	(2,366,200)	-	-	-	-	-	-	-
Total funds available for debt service	662,471	927,375	961,293	1,000,475	816,813	1,845,502	2,671,838	2,908,307
Principal payments	692,275	287,649	269,221	277,307	213,792	107,268	629,603	648,753
Interest expense	35,269	24,246	13,911	3,419	-	145,694	888,172	869,022
Annual debt service	727,544	311,895	283,132	280,726	213,792	252,962	1,517,775	1,517,775
Debt service coverage	0.91	2.97	3.40	3.56	3.82	7.30	1.76	1.92

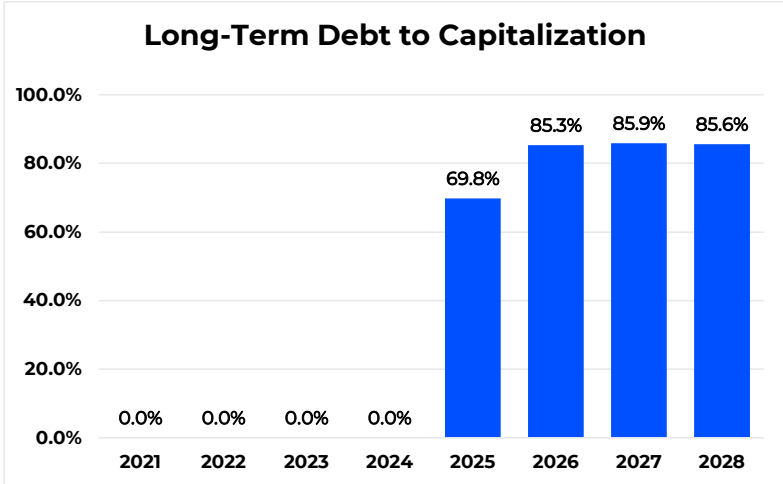
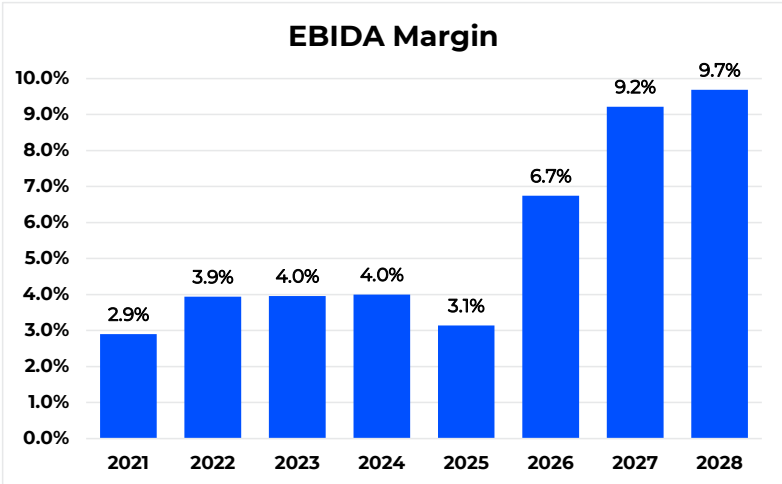
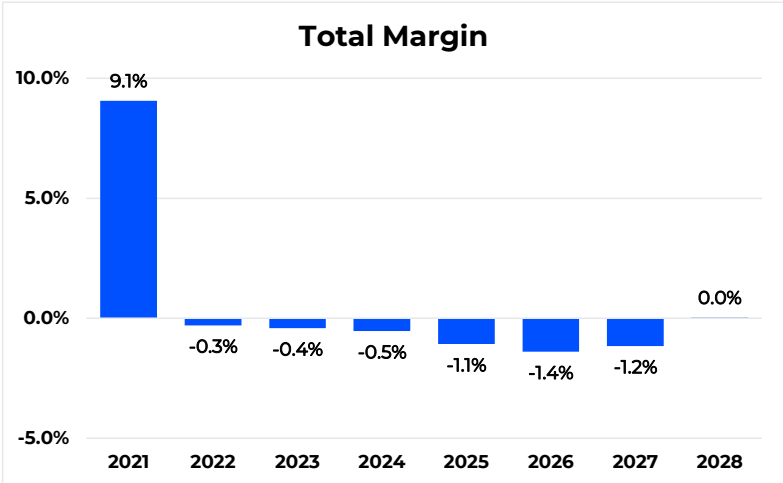
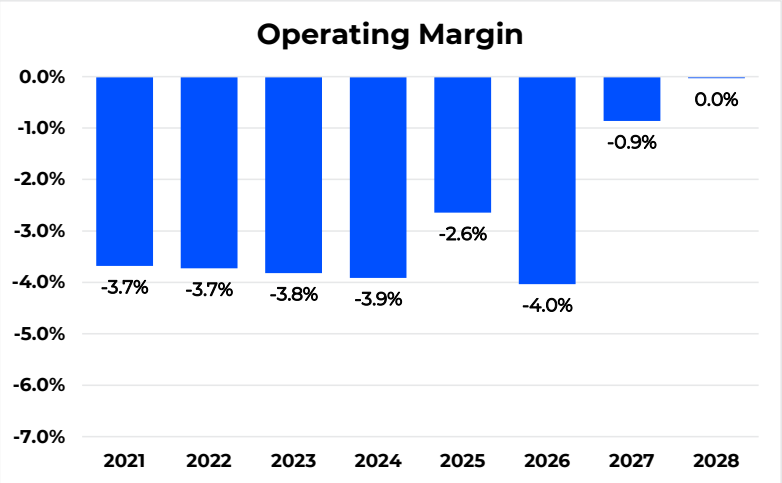
Debt service coverage - Excluding investment income	2021	2022	2023	2024	2025	2026	2027	2028
Change in net position	\$ 2,071,555	\$ (70,354)	\$ (100,417)	\$ (133,705)	\$ (280,763)	\$ (382,554)	\$ (334,918)	\$ 8,404
Plus: OPEB	300,000	309,000	318,270	327,818	337,653	347,783	358,216	368,962
Plus: Interest expense	30,930	24,009	13,689	3,194	(73)	145,694	961,330	867,400
Plus: Depreciation and amortization expense	626,186	664,720	729,751	803,168	759,996	1,734,579	1,687,210	1,663,541
Less: CARES funding recognized	(2,366,200)	-	-	-	-	-	-	-
Less: Investment income	(18,905)	(19,472)	(20,056)	(20,658)	(21,278)	(21,916)	(22,573)	(23,250)
Total funds available for debt service	643,566	907,903	941,237	979,817	795,535	1,823,586	2,649,265	2,885,057
Principal payments	692,275	287,649	269,221	277,307	213,792	107,268	629,603	648,753
Interest expense	35,269	24,246	13,911	3,419	-	145,694	888,172	869,022
Annual debt service	727,544	311,895	283,132	280,726	213,792	252,962	1,517,775	1,517,775
Debt service coverage - Excluding investment income	0.88	2.91	3.32	3.49	3.72	7.21	1.75	1.90

Days Cash on Hand - \$30 Million Project

Days cash on hand - Short term sources	2021	2022	2023	2024	2025	2026	2027	2028
Cash and cash equivalents	\$ 12,978,526	\$ 11,929,183	\$ 7,821,150	\$ 8,094,034	\$ 8,225,741	\$ 9,371,773	\$ 9,980,728	\$ 10,899,721
Operating expenses	23,700,853	24,431,628	25,209,665	26,017,481	26,730,738	28,484,445	29,239,572	30,042,472
Less: Depreciation	(626,186)	(664,720)	(729,751)	(803,168)	(759,996)	(1,734,579)	(1,687,210)	(1,663,541)
Adjusted expenses	23,074,667	23,766,908	24,479,914	25,214,313	25,970,742	26,749,866	27,552,362	28,378,931
Expenses per day	63,218	65,115	67,068	68,892	71,153	73,287	75,486	77,538
Days cash on hand - Short-term	205.3	183.2	116.6	117.5	115.6	127.9	132.2	140.6

Days cash on hand - All sources	2021	2022	2023	2024	2025	2026	2027	2028
Cash and cash equivalents	\$ 12,978,526	\$ 11,929,183	\$ 7,821,150	\$ 8,094,034	\$ 8,225,741	\$ 9,371,773	\$ 9,980,728	\$ 10,899,721
Noncurrent cash	1,443,931	1,443,931	1,443,931	1,443,931	1,443,931	1,443,931	1,443,931	1,443,931
Total	\$ 14,422,457	\$ 13,373,114	\$ 9,265,081	\$ 9,537,965	\$ 9,669,672	\$ 10,815,704	\$ 11,424,659	\$ 12,343,652
Expenses per day	63,218	65,115	67,068	68,892	71,153	73,287	75,486	77,538
Days cash on hand - All sources	228.1	205.4	138.1	138.4	135.9	147.6	151.3	159.2

Other Key Financial Results - \$30 Million Project



Other Key Financial Results - \$30 Million Project

	Historical				
	2016	2017	2018	2019	2020
EBIDA Ratio	8.5%	6.1%	8.5%	7.7%	-1.4%
Debt service coverage (DSC)	1.87	2.06	3.06	2.81	(0.55)
Days cash on hand (DCOH)	64	56	75	98	292
Operating margin	-3.5%	-2.3%	-8.6%	-1.8%	-9.8%
Total margin	3.0%	2.2%	-4.1%	4.7%	6.6%
Debt to capitalization	43.3%	32.3%	33.3%	13.5%	0.1%

Other Key Financial Results - \$30 Million Project

	2021	2022	2023	2024	2025	2026	2027	2028
EBIDA Ratio	2.9%	3.9%	4.0%	4.0%	3.1%	6.7%	9.2%	9.7%
Debt service coverage (DSC)	0.91	2.97	3.40	3.56	3.82	7.30	1.76	1.92
Days cash on hand (DCOH)	228	205	138	138	136	148	151	159
Operating margin	-3.7%	-3.7%	-3.8%	-3.9%	-2.6%	-4.0%	-0.9%	0.0%
Total margin	9.1%	-0.3%	-0.4%	-0.5%	-1.1%	-1.4%	-1.2%	0.0%
Debt to capitalization	0.0%	0.0%	0.0%	0.0%	69.8%	85.3%	85.9%	85.6%

04. Financial Forecasts – New Project

Historical Income Statement – \$30 Million Project

Income Statement	Historical				
	2016	2017	2018	2019	2020
Operating revenue:					
Net patient service revenue	\$ 18,580,425	\$ 19,154,360	\$ 20,445,608	\$ 20,490,085	\$ 20,058,124
Other operating revenue	178,045	236,252	148,307	505,333	873,668
Grants	30,259	36,903	103,754	-	-
Total operating revenue	18,788,729	19,427,515	20,697,669	20,995,418	20,931,792
Operating expenses:					
Salaries and wages	10,625,019	11,071,695	11,223,939	11,345,264	12,004,821
Employee benefits	3,261,161	3,347,263	3,080,133	3,081,956	3,360,172
Other post employment benefits	-	-	1,986,046	217,905	251,003
Professional fees	1,004,484	1,122,131	1,329,409	1,411,404	1,879,513
Supplies	1,269,135	1,180,205	1,452,686	1,404,434	1,782,136
Purchased services	1,227,374	1,298,911	1,666,116	2,137,020	1,780,223
Utilities	284,251	311,505	350,204	350,541	387,094
Repairs and maintenance	107,690	96,766	79,192	86,904	96,764
Insurance	109,742	92,158	66,998	79,179	112,269
Other	511,877	573,853	575,329	558,990	641,080
Rent	108,524	109,069	110,569	147,632	148,920
Depreciation and amortization	929,877	676,466	560,325	551,277	529,774
Total operating expenses	19,439,134	19,880,022	22,480,946	21,372,506	22,973,769
Loss from operations	(650,405)	(452,507)	(1,783,277)	(377,088)	(2,041,977)
Nonoperating revenues (expenses):					
Property taxes for maintenance and op	823,934	442,819	429,110	589,082	512,140
Timber taxes	19,615	259,339	416,596	432,161	311,169
Property taxes for bond principal and ir	455,854	229,599	65,874	64,751	64,000
Contributions	6,163	1,207	1,256	14,669	27,541
Grants	-	-	-	180,315	2,500,000
Interest income	13,816	26,795	84,197	132,724	55,096
Interest expense	(102,917)	(86,664)	(72,169)	(47,323)	(53,695)
Financing costs	-	-	-	-	-
Total nonoperating revenues - Net	1,216,465	873,095	924,864	1,366,379	3,416,251
Change in net position	\$ 566,060	\$ 420,588	\$ (858,413)	\$ 989,291	\$ 1,374,274

Forecasted Income Statement – \$30 Million Project, 3%

Income Statement	2021	2022	2023	2024	2025	2026	2027	2028
Operating revenue:								
Net patient service revenue	\$ 22,259,776	\$ 22,935,452	\$ 23,646,067	\$ 24,382,354	\$ 25,366,813	\$ 26,685,276	\$ 28,273,687	\$ 29,295,200
Other operating revenue	600,000	618,000	636,540	655,636	675,305	695,564	716,431	737,924
Total operating revenue	22,859,776	23,553,452	24,282,607	25,037,990	26,042,118	27,380,840	28,990,118	30,033,124
Operating expenses:								
Salaries and wages	12,477,663	12,851,993	13,237,553	13,634,680	14,043,720	14,465,032	14,898,983	15,345,952
Employee benefits	3,662,371	3,772,242	3,885,409	4,001,972	4,122,031	4,245,692	4,373,063	4,504,254
Other post employment benefits	300,000	309,000	318,270	327,818	337,653	347,783	358,216	368,962
Professional fees	1,969,450	2,028,534	2,089,390	2,152,072	2,216,634	2,283,133	2,351,627	2,422,176
Supplies	1,602,374	1,650,445	1,699,958	1,750,957	1,803,486	1,857,591	1,913,319	1,970,719
Purchased services	1,698,838	1,749,803	1,802,297	1,856,366	1,912,057	1,969,419	2,028,502	2,089,357
Utilities	453,929	467,547	481,573	496,020	510,901	526,228	542,015	558,275
Repairs and maintenance	83,995	86,515	89,110	91,783	94,536	97,372	100,293	103,302
Insurance	108,456	111,710	115,061	118,513	122,068	125,730	129,502	133,387
Other	568,155	585,200	602,756	620,839	639,464	658,648	678,407	698,759
Rent	149,436	153,919	158,537	163,293	168,192	173,238	178,435	183,788
Depreciation and amortization	626,186	664,720	729,751	803,168	759,996	1,734,579	1,687,210	1,663,541
Total operating expenses	23,700,853	24,431,628	25,209,665	26,017,481	26,730,738	28,484,445	29,239,572	30,042,472
Loss from operations	(841,077)	(878,176)	(927,058)	(979,491)	(688,620)	(1,103,605)	(249,454)	(9,348)
Nonoperating revenues (expenses):								
Property taxes for maintenance and op	517,600	522,776	528,004	533,284	538,617	544,003	549,443	554,937
Timber taxes	250,000	200,000	200,000	200,000	200,000	200,000	200,000	200,000
Property taxes for bond principal and ir	-	-	-	-	-	-	-	-
Contributions	(209,143)	(130,417)	(134,330)	(138,360)	(142,511)	(146,786)	(151,190)	(155,726)
Grants	2,366,200	220,000	226,600	233,398	240,400	247,612	255,040	262,691
Interest income	18,905	19,472	20,056	20,658	21,278	21,916	22,573	23,250
Interest expense	(30,930)	(24,009)	(13,689)	(3,194)	73	(145,694)	(961,330)	(867,400)
Financing costs	-	-	-	-	(450,000)	-	-	-
Total nonoperating revenues - Net	2,912,632	807,822	826,641	845,786	407,857	721,051	(85,464)	17,752
Change in net position	\$ 2,071,555	\$ (70,354)	\$ (100,417)	\$ (133,705)	\$ (280,763)	\$ (382,554)	\$ (334,918)	\$ 8,404

Historical Balance Sheet – \$30 Million Project

Balance Sheet - Assets	Historical				
	2016	2017	2018	2019	2020
Current assets					
Cash and cash equivalents	\$ 1,757,417	\$ 1,633,751	\$ 3,459,020	\$ 4,868,586	\$ 16,442,956
Receivables:					
Patient accounts - Net	1,939,851	2,355,829	2,240,834	2,213,593	2,127,308
Estimated third-party payor settlements	-	385,038	43,722	153,239	437,268
Taxes receivable	85,232	74,801	59,377	49,771	41,346
Other	54,831	49,656	132,343	32,893	31,061
Inventories	160,114	156,465	164,308	182,196	178,304
Prepaid expenses	45,685	42,908	64,201	68,629	103,775
Total current assets	4,043,130	4,698,448	6,163,805	7,568,907	19,362,018
Noncurrent assets:					
Cash and cash equivalents - Designated for capital acquisitions	130,000	130,000	-	-	-
Cash and cash equivalents - Restricted for debt service and capital acquisition	1,487,308	1,338,742	1,035,590	723,229	1,443,931
Capital assets:					
Nondepreciable capital assets	-	-	34,261	71,859	74,920
Depreciable capital assets - Net	3,214,085	2,785,715	2,334,328	1,980,228	1,991,651
Capital assets - Net	3,214,085	2,785,715	2,368,589	2,052,087	2,066,571
Total assets	8,874,523	8,952,905	9,567,984	10,344,223	22,872,520
Deferred outflows of resources:					
Pension plan	274,855	397,409	316,759	286,414	376,941
Other post employment benefits (OPEB)	-	-	5,089	10,351	479,811
Deferred charge on debt refunding	26,875	21,455	15,357	9,936	4,516
Total deferred outflows of resources	301,730	418,864	337,205	306,701	861,268
Total assets and deferred outflows of resources	9,176,253	9,371,769	9,905,189	10,650,924	23,733,788

Historical Balance Sheet – \$30 Million Project

<i>Balance Sheet - Liabilities and Net Position</i>	Historical				
	2016	2017	2018	2019	2020
Current liabilities:					
Current maturities - Long-term debt	\$ 362,582	\$ 373,252	\$ 383,262	\$ 383,842	\$ 393,322
Current maturities - New long-term debt	-	-	-	-	-
Current portion - Capital lease obligations	135,140	142,313	133,870	94,641	298,953
Current portion - Accrued compensated absences	716,019	741,842	899,819	899,820	416,236
Payroll and related liabilities	491,921	485,695	511,866	582,756	196,757
Accounts payable	115,766	193,204	192,170	357,573	444,597
Refundable advance - Current portion	-	-	-	-	2,023,221
Accrued interest	4,872	3,952	3,063	2,329	5,097
Unearned revenue	-	-	-	-	2,508,012
Estimated third-party payor settlements - Net payable	82,905	-	46,627	-	-
Total current liabilities	1,909,205	1,940,258	2,170,677	2,320,961	6,286,195
Existing long-term debt - Less current maturities	\$ 1,522,895	\$ 1,155,184	\$ 776,624	\$ 397,539	\$ 4,608
New long-term debt - Less current maturities	-	-	-	-	-
Capital lease obligations - Less current maturities	375,369	233,255	102,154	80,496	1,043,361
Accrued compensated absences - Less current portion	231,658	406,594	270,052	274,116	1,045,682
Refundable advance - Net of current portion	-	-	-	-	3,372,034
Paycheck Protection Program loan	-	-	-	-	2,366,200
Net pension liability	3,097,975	2,993,264	2,718,439	2,610,012	2,642,120
OPEB liability	-	-	1,991,135	2,075,446	2,808,507
Total long-term liabilities	\$ 5,227,897	\$ 4,788,297	\$ 5,858,404	\$ 5,437,609	\$ 13,282,512
Total liabilities	7,137,102	6,728,555	8,029,081	7,758,570	19,568,707
Deferred inflows of resources					
Pension plan	43,232	226,707	318,014	216,464	127,515
OPEB	-	-	-	128,505	115,907
Total deferred inflows of resources	43,232	226,707	318,014	344,969	243,422
Net position:					
Net investment in capital assets	840,102	899,214	984,973	1,095,569	334,257
Restricted	1,520,311	1,363,843	1,050,145	729,849	1,443,931
Unrestricted	(364,494)	153,450	(477,024)	721,967	2,143,471
Total net position	1,995,919	2,416,507	1,558,094	2,547,385	3,921,659
Total liabilities, deferred inflows of resources, and net assets	\$ 9,176,253	\$ 9,371,769	\$ 9,905,189	\$ 10,650,924	\$ 23,733,788

Forecasted Balance Sheet – \$30 Million Project

Balance Sheet - Assets	2021	2022	2023	2024	2025	2026	2027	2028
Current assets:								
Cash and cash equivalents	\$ 12,978,526	\$ 11,929,183	\$ 7,821,150	\$ 8,094,034	\$ 8,225,741	\$ 9,371,773	\$ 9,980,728	\$ 10,899,721
Receivables:								
Patient accounts - Net	2,367,277	2,439,134	2,514,706	2,585,924	2,697,703	2,837,919	3,006,843	3,106,966
Estimated third-party payor settlements	486,594	501,364	516,898	531,536	554,513	583,334	618,056	638,637
Taxes receivable	55,237	52,011	52,387	52,623	53,151	53,539	53,930	54,177
Other	31,061	31,061	31,061	31,061	31,061	31,061	31,061	31,061
Inventories	160,758	165,581	170,548	175,185	180,935	186,363	191,953	197,172
Prepaid expenses	102,688	106,048	109,867	113,581	116,357	133,309	135,902	138,549
Total current assets	16,182,141	15,224,382	11,216,617	11,583,944	11,859,461	13,197,298	14,018,473	15,066,283
Noncurrent assets:								
Cash and cash equivalents - Restricted for debt service and capital acquisition	1,443,931	1,443,931	1,443,931	1,443,931	1,443,931	1,443,931	1,443,931	1,443,931
Capital assets:								
Nondepreciable capital assets	74,920	74,920	74,920	74,920	12,574,920	74,920	74,920	74,920
Depreciable capital assets - Net	1,865,465	2,200,745	1,970,994	1,667,826	1,407,830	30,173,251	28,986,041	27,822,500
Capital assets - Net	1,940,385	2,275,665	2,045,914	1,742,746	13,982,750	30,248,171	29,060,961	27,897,420
Total assets	19,566,457	18,943,978	14,706,462	14,770,621	27,286,142	44,889,400	44,523,365	44,407,634
Deferred outflows of resources:								
Pension plan	376,941	376,941	376,941	376,941	376,941	376,941	376,941	376,941
Other post employment benefits (OPEB)	479,811	479,811	479,811	479,811	479,811	479,811	479,811	479,811
Deferred charge on debt refunding	4,516	4,516	4,516	4,516	4,516	4,516	4,516	4,516
Total deferred outflows of resources	861,268	861,268	861,268	861,268	861,268	861,268	861,268	861,268
Total assets and deferred outflows of resources	20,427,725	19,805,246	15,567,730	15,631,889	28,147,410	45,750,668	45,384,633	45,268,902

Forecasted Balance Sheet – \$30 Million Project

Balance Sheet - Liabilities and Net Position	2021	2022	2023	2024	2025	2026	2027	2028
Current liabilities:								
Current maturities - Long-term debt	\$ 4,608	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Current maturities - New long-term debt	-	-	-	-	-	629,603	648,753	668,485
Current portion - Capital lease obligations	283,041	269,221	277,307	213,792	-	-	-	-
Current portion - Accrued compensated absences	438,430	451,583	465,130	477,775	493,456	508,260	523,508	537,740
Payroll and related liabilities	207,248	213,466	219,869	225,847	233,260	240,257	247,465	254,193
Accounts payable	430,606	445,131	462,155	478,900	489,144	581,274	590,623	600,650
Refundable advance - Current portion	4,343,118	-	-	-	-	-	-	-
Accrued interest	758	521	299	73	-	-	73,157	71,533
Unearned revenue	-	-	-	-	-	-	-	-
Estimated third-party payor settlements - Net payable	-	-	-	-	-	-	-	-
Total current liabilities	5,707,809	1,379,922	1,424,760	1,396,387	1,215,860	1,959,394	2,083,506	2,132,601
Existing long-term debt - Less current maturities								
New long-term debt - Less current maturities	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Capital lease obligations - Less current maturities	760,320	491,099	213,792	-	12,500,000	29,263,129	28,614,376	27,945,891
Accrued compensated absences - Less current portion	1,101,438	1,134,481	1,168,515	1,200,282	1,239,678	1,276,868	1,315,174	1,350,928
Refundable advance - Net of current portion	723,853	4,343,118	-	-	-	-	-	-
Paycheck Protection Program loan	-	-	-	-	-	-	-	-
Net pension liability	2,789,162	2,872,837	2,959,022	3,039,466	3,139,227	3,233,404	3,330,406	3,420,945
OPEB liability	3,108,507	3,417,507	3,735,777	4,063,595	4,401,248	4,749,031	5,107,247	5,476,209
Total long-term liabilities	\$ 8,483,280	\$ 12,259,042	\$ 8,077,106	\$ 8,303,343	\$ 21,280,153	\$ 38,522,432	\$ 38,367,203	\$ 38,193,973
Total liabilities	14,191,089	13,638,964	9,501,866	9,699,730	22,496,013	40,481,826	40,450,709	40,326,574
Deferred inflows of resources								
Pension plan	127,515	127,515	127,515	127,515	127,515	127,515	127,515	127,515
OPEB	115,907	115,907	115,907	115,907	115,907	115,907	115,907	115,907
Total deferred inflows of resources	243,422	243,422	243,422	243,422	243,422	243,422	243,422	243,422
Net position:								
Net investment in capital assets	891,658	1,514,824	1,554,516	1,528,881	13,982,750	30,248,171	28,987,804	27,825,887
Restricted	1,443,931	1,443,931	1,443,931	1,443,931	1,443,931	1,443,931	1,443,931	1,443,931
Unrestricted	3,657,625	2,964,105	2,823,995	2,715,925	(10,018,707)	(26,666,681)	(25,741,232)	(24,570,911)
Total net position	5,993,214	5,922,860	5,822,442	5,688,737	5,407,974	5,025,421	4,690,503	4,698,907
Total liabilities, deferred inflows of resources, and net assets	\$ 20,427,725	\$ 19,805,246	\$ 15,567,730	\$ 15,631,889	\$ 28,147,409	\$ 45,750,669	\$ 45,384,634	\$ 45,268,903

05. Financing Scenarios –
\$17 million project w/
UTGO Bond

Debt Service Coverage - \$17 Million Project

Debt service coverage	2021	2022	2023	2024	2025	2026	2027	2028
Change in net position	\$ 2,071,555	\$ (70,354)	\$ (100,417)	\$ (133,705)	\$ (219,242)	\$ (279,565)	\$ (131,746)	\$ 193,043
Plus: OPEB	300,000	309,000	318,270	327,818	337,653	347,783	358,216	368,962
Plus: Interest expense	30,930	24,009	13,689	3,194	9,536	134,323	501,991	491,100
Plus: Depreciation and amortization expense	626,186	664,720	729,751	803,168	759,996	1,275,579	1,228,210	1,204,541
Less: CARES funding recognized	(2,366,200)	-	-	-	-	-	-	-
Total funds available for debt service	662,471	927,375	961,293	1,000,475	887,943	1,478,120	1,956,671	2,257,646
Principal payments	692,275	287,649	269,221	277,307	219,748	68,407	357,188	368,052
Interest expense	35,269	24,246	13,911	3,419	8,549	93,069	502,884	492,020
Annual debt service	727,544	311,895	283,132	280,726	228,297	161,476	860,072	860,072
Debt service coverage	0.91	2.97	3.40	3.56	3.89	9.15	2.28	2.62
Debt service coverage - Excluding investment income	2021	2022	2023	2024	2025	2026	2027	2028
Change in net position	\$ 2,071,555	\$ (70,354)	\$ (100,417)	\$ (133,705)	\$ (219,242)	\$ (279,565)	\$ (131,746)	\$ 193,043
Plus: OPEB	300,000	309,000	318,270	327,818	337,653	347,783	358,216	368,962
Plus: Interest expense	30,930	24,009	13,689	3,194	9,536	134,323	501,991	491,100
Plus: Depreciation and amortization expense	626,186	664,720	729,751	803,168	759,996	1,275,579	1,228,210	1,204,541
Less: CARES funding recognized	(2,366,200)	-	-	-	-	-	-	-
Less: Investment income	(18,905)	(19,472)	(20,056)	(20,658)	(21,278)	(21,916)	(22,573)	(23,250)
Total funds available for debt service	643,566	907,903	941,237	979,817	866,665	1,456,204	1,934,098	2,234,396
Principal payments	692,275	287,649	269,221	277,307	219,748	68,407	357,188	368,052
Interest expense	35,269	24,246	13,911	3,419	8,549	93,069	502,884	492,020
Annual debt service	727,544	311,895	283,132	280,726	228,297	161,476	860,072	860,072
Debt service coverage - Excluding investment income	0.88	2.91	3.32	3.49	3.80	9.02	2.25	2.60

Days Cash on Hand - \$17 Million Project

Days cash on hand - Short term sources	2021	2022	2023	2024	2025	2026	2027	2028
Cash and cash equivalents	\$ 12,978,526	\$ 11,929,183	\$ 7,821,150	\$ 8,094,034	\$ 8,979,010	\$ 10,028,814	\$ 11,054,930	\$ 12,402,592
Operating expenses	23,700,853	24,431,628	25,209,665	26,017,481	26,730,738	28,025,445	28,780,572	29,583,472
Less: Depreciation	(626,186)	(664,720)	(729,751)	(803,168)	(759,996)	(1,275,579)	(1,228,210)	(1,204,541)
Adjusted expenses	23,074,667	23,766,908	24,479,914	25,214,313	25,970,742	26,749,866	27,552,362	28,378,931
Expenses per day	63,218	65,115	67,068	68,892	71,153	73,287	75,486	77,538
Days cash on hand - Short-term	205.3	183.2	116.6	117.5	126.2	136.8	146.5	160.0
Days cash on hand - All sources	2021	2022	2023	2024	2025	2026	2027	2028
Cash and cash equivalents	\$ 12,978,526	\$ 11,929,183	\$ 7,821,150	\$ 8,094,034	\$ 8,979,010	\$ 10,028,814	\$ 11,054,930	\$ 12,402,592
Noncurrent cash	1,443,931	1,443,931	1,443,931	1,443,931	1,443,931	1,443,931	1,443,931	1,443,931
Total	\$ 14,422,457	\$ 13,373,114	\$ 9,265,081	\$ 9,537,965	\$ 10,422,941	\$ 11,472,745	\$ 12,498,861	\$ 13,846,523
Expenses per day	63,218	65,115	67,068	68,892	71,153	73,287	75,486	77,538
Days cash on hand - All sources	228.1	205.4	138.1	138.4	146.5	156.5	165.6	178.6

Forecasted Income Statement – \$17 Million Project

Income Statement	2021	2022	2023	2024	2025	2026	2027	2028
Operating revenue:								
Net patient service revenue	\$ 22,259,776	\$ 22,935,452	\$ 23,646,067	\$ 24,382,354	\$ 25,243,943	\$ 26,317,893	\$ 27,558,520	\$ 28,644,540
Other operating revenue	600,000	618,000	636,540	655,636	675,305	695,564	716,431	737,924
Total operating revenue	22,859,776	23,553,452	24,282,607	25,037,990	25,919,248	27,013,457	28,274,951	29,382,464
Operating expenses:								
Salaries and wages	12,477,663	12,851,993	13,237,553	13,634,680	14,043,720	14,465,032	14,898,983	15,345,952
Employee benefits	3,662,371	3,772,242	3,885,409	4,001,972	4,122,031	4,245,692	4,373,063	4,504,254
Other post employment benefits	300,000	309,000	318,270	327,818	337,653	347,783	358,216	368,962
Professional fees	1,969,450	2,028,534	2,089,390	2,152,072	2,216,634	2,283,133	2,351,627	2,422,176
Supplies	1,602,374	1,650,445	1,699,958	1,750,957	1,803,486	1,857,591	1,913,319	1,970,719
Purchased services	1,698,838	1,749,803	1,802,297	1,856,366	1,912,057	1,969,419	2,028,502	2,089,357
Utilities	453,929	467,547	481,573	496,020	510,901	526,228	542,015	558,275
Repairs and maintenance	83,995	86,515	89,110	91,783	94,536	97,372	100,293	103,302
Insurance	108,456	111,710	115,061	118,513	122,068	125,730	129,502	133,387
Other	568,155	585,200	602,756	620,839	639,464	658,648	678,407	698,759
Rent	149,436	153,919	158,537	163,293	168,192	173,238	178,435	183,788
Depreciation and amortization	626,186	664,720	729,751	803,168	759,996	1,275,579	1,228,210	1,204,541
Total operating expenses	23,700,853	24,431,628	25,209,665	26,017,481	26,730,738	28,025,445	28,780,572	29,583,472
Loss from operations	(841,077)	(878,176)	(927,058)	(979,491)	(811,490)	(1,011,987)	(505,621)	(201,009)
Nonoperating revenues (expenses):								
Property taxes for maintenance and o	517,600	522,776	528,004	533,284	538,617	544,003	549,443	554,937
Timber taxes	250,000	200,000	200,000	200,000	200,000	200,000	200,000	200,000
Property taxes for bond principal and	-	-	-	-	-	-	-	-
Contributions	(209,143)	(130,417)	(134,330)	(138,360)	(142,511)	(146,786)	(151,190)	(155,726)
Grants	2,366,200	220,000	226,600	233,398	240,400	247,612	255,040	262,691
Tax revenue - UTGO	-	-	-	-	430,036	430,036	430,036	430,036
Interest income	18,905	19,472	20,056	20,658	21,278	21,916	22,573	23,250
Interest expense	(30,930)	(24,009)	(13,689)	(3,194)	(9,536)	(134,323)	(501,991)	(491,100)
Financing costs	-	-	-	-	(256,000)	-	-	-
Total nonoperating revenues - Net	2,912,632	807,822	826,641	845,786	1,022,284	1,162,458	803,911	824,088
Change in net position	\$ 2,071,555	\$ (70,354)	\$ (100,417)	\$ (133,705)	\$ 210,794	\$ 150,471	\$ 298,290	\$ 623,079

05. Financing Scenarios –
\$46 million project w/
UTGO Bond

Forecasted Income Statement – \$Levy Rates

Hospital	Assessed Value	1/2 Project Cost Bond Amount	Levy	Personal Property Value	
				250k	550K
Willapa Harbor Hospital	1,228,594,743	8,500,000	430,036	(88)	(193)
Willapa Harbor Hospital	1,228,594,743	23,000,000	1,163,627	(237)	(521)
Dayton Hospital	1,012,498,778	NA	354,776	(88)	(193)
Dayton Hospital	1,012,498,779	NA	337,256	(83)	(183)
Columbia Basin Hospital (Ephrata)	1,050,089,437	NA	1,077,229	(256)	(564)
Klickitat Valley Health (Goldendale)	1,306,288,761	NA	577,668	(111)	(243)
Morton Health	1,259,765,626	NA	572,958	(114)	(250)
North Valley Hospital (Tonasket)	1,053,132,122	NA	768,634	(182)	(401)
Mid-Valley Hospital (Omak)	1,013,936,525	NA	371,855	(92)	(202)
Newport Hospital	1,290,635,707	NA	657,269	(127)	(280)
Whitman Hospital (Colfax)	1,024,158,484	NA	1,005,049	(245)	(540)

Forecasted Income Statement – \$Levy Rates

Hospital	Assessed Value	1/2 Project Cost Bond Amount	Levy	Personal Property Value	
				250k	550K
Willapa Harbor Hospital	1,228,594,743	8,500,000	430,036	(88)	(193)
Dayton Hospital	1,012,498,778	NA	430,036	(106)	(234)
Dayton Hospital	1,012,498,779	NA	430,036	(106)	(234)
Columbia Basin Hospital (Ephrata)	1,050,089,437	NA	430,036	(102)	(225)
Klickitat Valley Health (Goldendale)	1,306,288,761	NA	430,036	(82)	(181)
Morton Health	1,259,765,626	NA	430,036	(85)	(188)
North Valley Hospital (Tonasket)	1,053,132,122	NA	430,036	(102)	(225)
Mid-Valley Hospital (Omak)	1,013,936,525	NA	430,036	(106)	(233)
Newport Hospital	1,290,635,707	NA	430,036	(83)	(183)
Whitman Hospital (Colfax)	1,024,158,484	NA	430,036	(105)	(231)

Forecasted Income Statement – \$Levy Rates

Hospital	Assessed Value	1/2 Project Cost Bond Amount	Levy	Personal Property Value	
				250k	550K
Willapa Harbor Hospital	1,228,594,743	23,000,000	1,163,627	(237)	(521)
Dayton Hospital	1,012,498,778	NA	1,163,627	(287)	(632)
Dayton Hospital	1,012,498,779	NA	1,163,627	(287)	(632)
Columbia Basin Hospital (Ephrata)	1,050,089,437	NA	1,163,627	(277)	(609)
Klickitat Valley Health (Goldendale)	1,306,288,761	NA	1,163,627	(223)	(490)
Morton Health	1,259,765,626	NA	1,163,627	(231)	(508)
North Valley Hospital (Tonasket)	1,053,132,122	NA	1,163,627	(276)	(608)
Mid-Valley Hospital (Omak)	1,013,936,525	NA	1,163,627	(287)	(631)
Newport Hospital	1,290,635,707	NA	1,163,627	(225)	(496)
Whitman Hospital (Colfax)	1,024,158,484	NA	1,163,627	(284)	(625)

Debt Service Coverage - \$46 Million Project

Debt service coverage	2021	2022	2023	2024	2025	2026	2027	2028
Change in net position	\$ 2,071,555	\$ (70,354)	\$ (100,417)	\$ (133,705)	\$ (369,998)	\$ (560,521)	\$ (552,870)	\$ (223,870)
Plus: OPEB	300,000	309,000	318,270	327,818	337,653	347,783	358,216	368,962
Plus: Interest expense	30,930	24,009	13,689	3,194	25,927	363,461	1,358,330	1,328,859
Plus: Depreciation and amortization expense	626,186	664,720	729,751	803,168	759,996	2,299,579	2,252,210	2,228,541
Less: CARES funding recognized	(2,366,200)	-	-	-	-	-	-	-
Total funds available for debt service	662,471	927,375	961,293	1,000,475	753,578	2,450,302	3,415,886	3,702,492
Principal payments	692,275	287,649	269,221	277,307	229,907	185,102	966,508	995,906
Interest expense	35,269	24,246	13,911	3,419	23,132	251,833	1,360,746	1,331,349
Annual debt service	727,544	311,895	283,132	280,726	253,039	436,935	2,327,254	2,327,255
Debt service coverage	0.91	2.97	3.40	3.56	2.98	5.61	1.47	1.59

Debt service coverage - Excluding investment income	2021	2022	2023	2024	2025	2026	2027	2028
Change in net position	\$ 2,071,555	\$ (70,354)	\$ (100,417)	\$ (133,705)	\$ (369,998)	\$ (560,521)	\$ (552,870)	\$ (223,870)
Plus: OPEB	300,000	309,000	318,270	327,818	337,653	347,783	358,216	368,962
Plus: Interest expense	30,930	24,009	13,689	3,194	25,927	363,461	1,358,330	1,328,859
Plus: Depreciation and amortization expense	626,186	664,720	729,751	803,168	759,996	2,299,579	2,252,210	2,228,541
Less: CARES funding recognized	(2,366,200)	-	-	-	-	-	-	-
Less: Investment income	(18,905)	(19,472)	(20,056)	(20,658)	(21,278)	(21,916)	(22,573)	(23,250)
Total funds available for debt service	643,566	907,903	941,237	979,817	732,300	2,428,386	3,393,313	3,679,242
Principal payments	692,275	287,649	269,221	277,307	229,907	185,102	966,508	995,906
Interest expense	35,269	24,246	13,911	3,419	23,132	251,833	1,360,746	1,331,349
Annual debt service	727,544	311,895	283,132	280,726	253,039	436,935	2,327,254	2,327,255
Debt service coverage - Excluding investment income	0.88	2.91	3.32	3.49	2.89	5.56	1.46	1.58

Days Cash on Hand - \$46 Million Project

Days cash on hand - Short term sources	2021	2022	2023	2024	2025	2026	2027	2028
Cash and cash equivalents	\$ 12,978,526	\$ 11,929,183	\$ 7,821,150	\$ 8,094,034	\$ 9,942,877	\$ 11,977,820	\$ 13,667,119	\$ 15,728,195
Operating expenses	23,700,853	24,431,628	25,209,665	26,017,481	26,730,738	29,049,445	29,804,572	30,607,472
Less: Depreciation	(626,186)	(664,720)	(729,751)	(803,168)	(759,996)	(2,299,579)	(2,252,210)	(2,228,541)
Adjusted expenses	23,074,667	23,766,908	24,479,914	25,214,313	25,970,742	26,749,866	27,552,362	28,378,931
Expenses per day	63,218	65,115	67,068	68,892	71,153	73,287	75,486	77,538
Days cash on hand - Short-term	205.3	183.2	116.6	117.5	139.7	163.4	181.1	202.8
Days cash on hand - All sources	2021	2022	2023	2024	2025	2026	2027	2028
Cash and cash equivalents	\$ 12,978,526	\$ 11,929,183	\$ 7,821,150	\$ 8,094,034	\$ 9,942,877	\$ 11,977,820	\$ 13,667,119	\$ 15,728,195
Noncurrent cash	1,443,931	1,443,931	1,443,931	1,443,931	1,443,931	1,443,931	1,443,931	1,443,931
Total	\$ 14,422,457	\$ 13,373,114	\$ 9,265,081	\$ 9,537,965	\$ 11,386,808	\$ 13,421,751	\$ 15,111,050	\$ 17,172,126
Expenses per day	63,218	65,115	67,068	68,892	71,153	73,287	75,486	77,538
Days cash on hand - All sources	228.1	205.4	138.1	138.4	160.0	183.1	200.2	221.5

Forecasted Income Statement – \$46 Million Project

Income Statement	2021	2022	2023	2024	2025	2026	2027	2028
Operating revenue:								
Net patient service revenue	\$ 22,259,776	\$ 22,935,452	\$ 23,646,067	\$ 24,382,354	\$ 25,544,578	\$ 27,290,076	\$ 29,017,735	\$ 30,089,385
Other operating revenue	600,000	618,000	636,540	655,636	675,305	695,564	716,431	737,924
Total operating revenue	22,859,776	23,553,452	24,282,607	25,037,990	26,219,883	27,985,640	29,734,166	30,827,309
Operating expenses:								
Salaries and wages	12,477,663	12,851,993	13,237,553	13,634,680	14,043,720	14,465,032	14,898,983	15,345,952
Employee benefits	3,662,371	3,772,242	3,885,409	4,001,972	4,122,031	4,245,692	4,373,063	4,504,254
Other post employment benefits	300,000	309,000	318,270	327,818	337,653	347,783	358,216	368,962
Professional fees	1,969,450	2,028,534	2,089,390	2,152,072	2,216,634	2,283,133	2,351,627	2,422,176
Supplies	1,602,374	1,650,445	1,699,958	1,750,957	1,803,486	1,857,591	1,913,319	1,970,719
Purchased services	1,698,838	1,749,803	1,802,297	1,856,366	1,912,057	1,969,419	2,028,502	2,089,357
Utilities	453,929	467,547	481,573	496,020	510,901	526,228	542,015	558,275
Repairs and maintenance	83,995	86,515	89,110	91,783	94,536	97,372	100,293	103,302
Insurance	108,456	111,710	115,061	118,513	122,068	125,730	129,502	133,387
Other	568,155	585,200	602,756	620,839	639,464	658,648	678,407	698,759
Rent	149,436	153,919	158,537	163,293	168,192	173,238	178,435	183,788
Depreciation and amortization	626,186	664,720	729,751	803,168	759,996	2,299,579	2,252,210	2,228,541
Total operating expenses	23,700,853	24,431,628	25,209,665	26,017,481	26,730,738	29,049,445	29,804,572	30,607,472
Loss from operations	(841,077)	(878,176)	(927,058)	(979,491)	(510,855)	(1,063,805)	(70,406)	219,837
Nonoperating revenues (expenses):								
Property taxes for maintenance and o	517,600	522,776	528,004	533,284	538,617	544,003	549,443	554,937
Timber taxes	250,000	200,000	200,000	200,000	200,000	200,000	200,000	200,000
Property taxes for bond principal and	-	-	-	-	-	-	-	-
Contributions	(209,143)	(130,417)	(134,330)	(138,360)	(142,511)	(146,786)	(151,190)	(155,726)
Grants	2,366,200	220,000	226,600	233,398	240,400	247,612	255,040	262,691
Tax revenue - UTGO	-	-	-	-	1,163,627	1,163,627	1,163,627	1,163,627
Interest income	18,905	19,472	20,056	20,658	21,278	21,916	22,573	23,250
Interest expense	(30,930)	(24,009)	(13,689)	(3,194)	(25,927)	(363,461)	(1,358,330)	(1,328,859)
Financing costs	-	-	-	-	(691,000)	-	-	-
Total nonoperating revenues - Net	2,912,632	807,822	826,641	845,786	1,304,484	1,666,911	681,163	719,920
Change in net position	\$ 2,071,555	\$ (70,354)	\$ (100,417)	\$ (133,705)	\$ 793,629	\$ 603,106	\$ 610,757	\$ 939,757

05. Financing Scenarios – Varying Interest Rates

Forecasted Income Statement – \$30 Million Project, 2.5%

Income Statement	2021	2022	2023	2024	2025	2026	2027	2028
Operating revenue:								
Net patient service revenue	\$ 22,259,776	\$ 22,935,452	\$ 23,646,067	\$ 24,382,354	\$ 25,366,813	\$ 26,666,417	\$ 28,148,543	\$ 29,181,206
Other operating revenue	600,000	618,000	636,540	655,636	675,305	695,564	716,431	737,924
Total operating revenue	22,859,776	23,553,452	24,282,607	25,037,990	26,042,118	27,361,981	28,864,974	29,919,130
Operating expenses:								
Salaries and wages	12,477,663	12,851,993	13,237,553	13,634,680	14,043,720	14,465,032	14,898,983	15,345,952
Employee benefits	3,662,371	3,772,242	3,885,409	4,001,972	4,122,031	4,245,692	4,373,063	4,504,254
Other post employment benefits	300,000	309,000	318,270	327,818	337,653	347,783	358,216	368,962
Professional fees	1,969,450	2,028,534	2,089,390	2,152,072	2,216,634	2,283,133	2,351,627	2,422,176
Supplies	1,602,374	1,650,445	1,699,958	1,750,957	1,803,486	1,857,591	1,913,319	1,970,719
Purchased services	1,698,838	1,749,803	1,802,297	1,856,366	1,912,057	1,969,419	2,028,502	2,089,357
Utilities	453,929	467,547	481,573	496,020	510,901	526,228	542,015	558,275
Repairs and maintenance	83,995	86,515	89,110	91,783	94,536	97,372	100,293	103,302
Insurance	108,456	111,710	115,061	118,513	122,068	125,730	129,502	133,387
Other	568,155	585,200	602,756	620,839	639,464	658,648	678,407	698,759
Rent	149,436	153,919	158,537	163,293	168,192	173,238	178,435	183,788
Depreciation and amortization	626,186	664,720	729,751	803,168	759,996	1,734,579	1,687,210	1,663,541
Total operating expenses	23,700,853	24,431,628	25,209,665	26,017,481	26,730,738	28,484,445	29,239,572	30,042,472
Loss from operations	(841,077)	(878,176)	(927,058)	(979,491)	(688,620)	(1,122,464)	(374,597)	(123,342)
Nonoperating revenues (expenses):								
Property taxes for maintenance and o	517,600	522,776	528,004	533,284	538,617	544,003	549,443	554,937
Timber taxes	250,000	200,000	200,000	200,000	200,000	200,000	200,000	200,000
Property taxes for bond principal and	-	-	-	-	-	-	-	-
Contributions	(209,143)	(130,417)	(134,330)	(138,360)	(142,511)	(146,786)	(151,190)	(155,726)
Grants	2,366,200	220,000	226,600	233,398	240,400	247,612	255,040	262,691
Interest income	18,905	19,472	20,056	20,658	21,278	21,916	22,573	23,250
Interest expense	(30,930)	(24,009)	(13,689)	(3,194)	73	(121,404)	(800,152)	(720,582)
Financing costs	-	-	-	-	(450,000)	-	-	-
Total nonoperating revenues - Net	2,912,632	807,822	826,641	845,786	407,857	745,341	75,714	164,570
Change in net position	\$ 2,071,555	\$ (70,354)	\$ (100,417)	\$ (133,705)	\$ (280,763)	\$ (377,123)	\$ (298,883)	\$ 41,228

Debt Service Coverage - \$30 Million Project, 2.5%

<i>Debt service coverage</i>	2021	2022	2023	2024	2025	2026	2027	2028
Change in net position	\$ 2,071,555	\$ (70,354)	\$ (100,417)	\$ (133,705)	\$ (280,763)	\$ (377,123)	\$ (298,883)	\$ 41,228
Plus: OPEB	300,000	309,000	318,270	327,818	337,653	347,783	358,216	368,962
Plus: Interest expense	30,930	24,009	13,689	3,194	(73)	121,404	800,152	720,582
Plus: Depreciation and amortization expense	626,186	664,720	729,751	803,168	759,996	1,734,579	1,687,210	1,663,541
Less: CARES funding recognized	(2,366,200)	-	-	-	-	-	-	-
Total funds available for debt service	662,471	927,375	961,293	1,000,475	816,813	1,826,643	2,546,695	2,794,313
Principal payments	692,275	287,649	269,221	277,307	213,792	115,669	683,119	700,394
Interest expense	35,269	24,246	13,911	3,419	-	121,404	739,316	722,041
Annual debt service	727,544	311,895	283,132	280,726	213,792	237,073	1,422,435	1,422,435
Debt service coverage	0.91	2.97	3.40	3.56	3.82	7.70	1.79	1.96

<i>Debt service coverage - Excluding investment income</i>	2021	2022	2023	2024	2025	2026	2027	2028
Change in net position	\$ 2,071,555	\$ (70,354)	\$ (100,417)	\$ (133,705)	\$ (280,763)	\$ (377,123)	\$ (298,883)	\$ 41,228
Plus: OPEB	300,000	309,000	318,270	327,818	337,653	347,783	358,216	368,962
Plus: Interest expense	30,930	24,009	13,689	3,194	(73)	121,404	800,152	720,582
Plus: Depreciation and amortization expense	626,186	664,720	729,751	803,168	759,996	1,734,579	1,687,210	1,663,541
Less: CARES funding recognized	(2,366,200)	-	-	-	-	-	-	-
Less: Investment income	(18,905)	(19,472)	(20,056)	(20,658)	(21,278)	(21,916)	(22,573)	(23,250)
Total funds available for debt service	643,566	907,903	941,237	979,817	795,535	1,804,727	2,524,122	2,771,063
Principal payments	692,275	287,649	269,221	277,307	213,792	115,669	683,119	700,394
Interest expense	35,269	24,246	13,911	3,419	-	121,404	739,316	722,041
Annual debt service	727,544	311,895	283,132	280,726	213,792	237,073	1,422,435	1,422,435
Debt service coverage - Excluding investment income	0.88	2.91	3.32	3.49	3.72	7.61	1.77	1.95

Days Cash on Hand - \$30 Million Project, 2.5%

Days cash on hand - Short term sources	2021	2022	2023	2024	2025	2026	2027	2028
Cash and cash equivalents	\$ 12,978,526	\$ 11,929,183	\$ 7,821,150	\$ 8,094,034	\$ 8,225,741	\$ 9,371,773	\$ 9,980,728	\$ 10,899,721
Operating expenses	23,700,853	24,431,628	25,209,665	26,017,481	26,730,738	28,484,445	29,239,572	30,042,472
Less: Depreciation	(626,186)	(664,720)	(729,751)	(803,168)	(759,996)	(1,734,579)	(1,687,210)	(1,663,541)
Adjusted expenses	23,074,667	23,766,908	24,479,914	25,214,313	25,970,742	26,749,866	27,552,362	28,378,931
Expenses per day	63,218	65,115	67,068	68,892	71,153	73,287	75,486	77,538
Days cash on hand - Short-term	205.3	183.2	116.6	117.5	115.6	127.9	132.2	140.6

Days cash on hand - All sources	2021	2022	2023	2024	2025	2026	2027	2028
Cash and cash equivalents	\$ 12,978,526	\$ 11,929,183	\$ 7,821,150	\$ 8,094,034	\$ 8,225,741	\$ 9,371,773	\$ 9,980,728	\$ 10,899,721
Noncurrent cash	1,443,931	1,443,931	1,443,931	1,443,931	1,443,931	1,443,931	1,443,931	1,443,931
Total	\$ 14,422,457	\$ 13,373,114	\$ 9,265,081	\$ 9,537,965	\$ 9,669,672	\$ 10,815,704	\$ 11,424,659	\$ 12,343,652
Expenses per day	63,218	65,115	67,068	68,892	71,153	73,287	75,486	77,538
Days cash on hand - All sources	228.1	205.4	138.1	138.4	135.9	147.6	151.3	159.2

Forecasted Income Statement – \$30 Million Project, 5%

Income Statement	2021	2022	2023	2024	2025	2026	2027	2028
Operating revenue:								
Net patient service revenue	\$ 22,259,776	\$ 22,935,452	\$ 23,646,067	\$ 24,382,354	\$ 25,366,813	\$ 26,760,732	\$ 28,776,328	\$ 29,756,157
Other operating revenue	600,000	618,000	636,540	655,636	675,305	695,564	716,431	737,924
Total operating revenue	22,859,776	23,553,452	24,282,607	25,037,990	26,042,118	27,456,296	29,492,759	30,494,081
Operating expenses:								
Salaries and wages	12,477,663	12,851,993	13,237,553	13,634,680	14,043,720	14,465,032	14,898,983	15,345,952
Employee benefits	3,662,371	3,772,242	3,885,409	4,001,972	4,122,031	4,245,692	4,373,063	4,504,254
Other post employment benefits	300,000	309,000	318,270	327,818	337,653	347,783	358,216	368,962
Professional fees	1,969,450	2,028,534	2,089,390	2,152,072	2,216,634	2,283,133	2,351,627	2,422,176
Supplies	1,602,374	1,650,445	1,699,958	1,750,957	1,803,486	1,857,591	1,913,319	1,970,719
Purchased services	1,698,838	1,749,803	1,802,297	1,856,366	1,912,057	1,969,419	2,028,502	2,089,357
Utilities	453,929	467,547	481,573	496,020	510,901	526,228	542,015	558,275
Repairs and maintenance	83,995	86,515	89,110	91,783	94,536	97,372	100,293	103,302
Insurance	108,456	111,710	115,061	118,513	122,068	125,730	129,502	133,387
Other	568,155	585,200	602,756	620,839	639,464	658,648	678,407	698,759
Rent	149,436	153,919	158,537	163,293	168,192	173,238	178,435	183,788
Depreciation and amortization	626,186	664,720	729,751	803,168	759,996	1,734,579	1,687,210	1,663,541
Total operating expenses	23,700,853	24,431,628	25,209,665	26,017,481	26,730,738	28,484,445	29,239,572	30,042,472
Loss from operations	(841,077)	(878,176)	(927,058)	(979,491)	(688,620)	(1,028,149)	253,188	451,609
Nonoperating revenues (expenses):								
Property taxes for maintenance and o	517,600	522,776	528,004	533,284	538,617	544,003	549,443	554,937
Timber taxes	250,000	200,000	200,000	200,000	200,000	200,000	200,000	200,000
Property taxes for bond principal and	-	-	-	-	-	-	-	-
Contributions	(209,143)	(130,417)	(134,330)	(138,360)	(142,511)	(146,786)	(151,190)	(155,726)
Grants	2,366,200	220,000	226,600	233,398	240,400	247,612	255,040	262,691
Interest income	18,905	19,472	20,056	20,658	21,278	21,916	22,573	23,250
Interest expense	(30,930)	(24,009)	(13,689)	(3,194)	73	(242,876)	(1,608,704)	(1,461,087)
Financing costs	-	-	-	-	(450,000)	-	-	-
Total nonoperating revenues - Net	2,912,632	807,822	826,641	845,786	407,857	623,869	(732,838)	(575,935)
Change in net position	\$ 2,071,555	\$ (70,354)	\$ (100,417)	\$ (133,705)	\$ (280,763)	\$ (404,280)	\$ (479,650)	\$ (124,326)

Debt Service Coverage - \$30 Million Project, 5%

Debt service coverage	2021	2022	2023	2024	2025	2026	2027	2028
Change in net position	\$ 2,071,555	\$ (70,354)	\$ (100,417)	\$ (133,705)	\$ (280,763)	\$ (404,280)	\$ (479,650)	\$ (124,326)
Plus: OPEB	300,000	309,000	318,270	327,818	337,653	347,783	358,216	368,962
Plus: Interest expense	30,930	24,009	13,689	3,194	(73)	242,876	1,608,704	1,461,087
Plus: Depreciation and amortization expense	626,186	664,720	729,751	803,168	759,996	1,734,579	1,687,210	1,663,541
Less: CARES funding recognized	(2,366,200)	-	-	-	-	-	-	-
Total funds available for debt service	662,471	927,375	961,293	1,000,475	816,813	1,920,958	3,174,480	3,369,264
Principal payments	692,275	287,649	269,221	277,307	213,792	79,217	446,662	469,515
Interest expense	35,269	24,246	13,911	3,419	-	242,876	1,485,895	1,463,043
Annual debt service	727,544	311,895	283,132	280,726	213,792	322,093	1,932,557	1,932,558
Debt service coverage	0.91	2.97	3.40	3.56	3.82	5.96	1.64	1.74

Debt service coverage - Excluding investment income	2021	2022	2023	2024	2025	2026	2027	2028
Change in net position	\$ 2,071,555	\$ (70,354)	\$ (100,417)	\$ (133,705)	\$ (280,763)	\$ (404,280)	\$ (479,650)	\$ (124,326)
Plus: OPEB	300,000	309,000	318,270	327,818	337,653	347,783	358,216	368,962
Plus: Interest expense	30,930	24,009	13,689	3,194	(73)	242,876	1,608,704	1,461,087
Plus: Depreciation and amortization expense	626,186	664,720	729,751	803,168	759,996	1,734,579	1,687,210	1,663,541
Less: CARES funding recognized	(2,366,200)	-	-	-	-	-	-	-
Less: Investment income	(18,905)	(19,472)	(20,056)	(20,658)	(21,278)	(21,916)	(22,573)	(23,250)
Total funds available for debt service	643,566	907,903	941,237	979,817	795,535	1,899,042	3,151,907	3,346,014
Principal payments	692,275	287,649	269,221	277,307	213,792	79,217	446,662	469,515
Interest expense	35,269	24,246	13,911	3,419	-	242,876	1,485,895	1,463,043
Annual debt service	727,544	311,895	283,132	280,726	213,792	322,093	1,932,557	1,932,558
Debt service coverage - Excluding investment income	0.88	2.91	3.32	3.49	3.72	5.90	1.63	1.73

Days Cash on Hand - \$30 Million Project, 5%

Days cash on hand - Short term sources	2021	2022	2023	2024	2025	2026	2027	2028
Cash and cash equivalents	\$ 12,978,526	\$ 11,929,183	\$ 7,821,150	\$ 8,094,034	\$ 8,225,741	\$ 9,368,425	\$ 10,010,470	\$ 10,981,143
Operating expenses	23,700,853	24,431,628	25,209,665	26,017,481	26,730,738	28,484,445	29,239,572	30,042,472
Less: Depreciation	(626,186)	(664,720)	(729,751)	(803,168)	(759,996)	(1,734,579)	(1,687,210)	(1,663,541)
Adjusted expenses	23,074,667	23,766,908	24,479,914	25,214,313	25,970,742	26,749,866	27,552,362	28,378,931
Expenses per day	63,218	65,115	67,068	68,892	71,153	73,287	75,486	77,538
Days cash on hand - Short-term	205.3	183.2	116.6	117.5	115.6	127.8	132.6	141.6
Days cash on hand - All sources	2021	2022	2023	2024	2025	2026	2027	2028
Cash and cash equivalents	\$ 12,978,526	\$ 11,929,183	\$ 7,821,150	\$ 8,094,034	\$ 8,225,741	\$ 9,368,425	\$ 10,010,470	\$ 10,981,143
Noncurrent cash	1,443,931	1,443,931	1,443,931	1,443,931	1,443,931	1,443,931	1,443,931	1,443,931
Total	\$ 14,422,457	\$ 13,373,114	\$ 9,265,081	\$ 9,537,965	\$ 9,669,672	\$ 10,812,356	\$ 11,454,401	\$ 12,425,074
Expenses per day	63,218	65,115	67,068	68,892	71,153	73,287	75,486	77,538
Days cash on hand - All sources	228.1	205.4	138.1	138.4	135.9	147.5	151.7	160.2

Forecasted Income Statement – \$30 Million Project, 7.5%

Income Statement	2021	2022	2023	2024	2025	2026	2027	2028
Operating revenue:								
Net patient service revenue	\$ 22,259,776	\$ 22,935,452	\$ 23,646,067	\$ 24,382,354	\$ 25,366,813	\$ 26,855,070	\$ 29,407,596	\$ 30,339,692
Other operating revenue	600,000	618,000	636,540	655,636	675,305	695,564	716,431	737,924
Total operating revenue	22,859,776	23,553,452	24,282,607	25,037,990	26,042,118	27,550,634	30,124,027	31,077,616
Operating expenses:								
Salaries and wages	12,477,663	12,851,993	13,237,553	13,634,680	14,043,720	14,465,032	14,898,983	15,345,952
Employee benefits	3,662,371	3,772,242	3,885,409	4,001,972	4,122,031	4,245,692	4,373,063	4,504,254
Other post employment benefits	300,000	309,000	318,270	327,818	337,653	347,783	358,216	368,962
Professional fees	1,969,450	2,028,534	2,089,390	2,152,072	2,216,634	2,283,133	2,351,627	2,422,176
Supplies	1,602,374	1,650,445	1,699,958	1,750,957	1,803,486	1,857,591	1,913,319	1,970,719
Purchased services	1,698,838	1,749,803	1,802,297	1,856,366	1,912,057	1,969,419	2,028,502	2,089,357
Utilities	453,929	467,547	481,573	496,020	510,901	526,228	542,015	558,275
Repairs and maintenance	83,995	86,515	89,110	91,783	94,536	97,372	100,293	103,302
Insurance	108,456	111,710	115,061	118,513	122,068	125,730	129,502	133,387
Other	568,155	585,200	602,756	620,839	639,464	658,648	678,407	698,759
Rent	149,436	153,919	158,537	163,293	168,192	173,238	178,435	183,788
Depreciation and amortization	626,186	664,720	729,751	803,168	759,996	1,734,579	1,687,210	1,663,541
Total operating expenses	23,700,853	24,431,628	25,209,665	26,017,481	26,730,738	28,484,445	29,239,572	30,042,472
Loss from operations	(841,077)	(878,176)	(927,058)	(979,491)	(688,620)	(933,811)	884,455	1,035,144
Nonoperating revenues (expenses):								
Property taxes for maintenance and o	517,600	522,776	528,004	533,284	538,617	544,003	549,443	554,937
Timber taxes	250,000	200,000	200,000	200,000	200,000	200,000	200,000	200,000
Property taxes for bond principal and	-	-	-	-	-	-	-	-
Contributions	(209,143)	(130,417)	(134,330)	(138,360)	(142,511)	(146,786)	(151,190)	(155,726)
Grants	2,366,200	220,000	226,600	233,398	240,400	247,612	255,040	262,691
Interest income	18,905	19,472	20,056	20,658	21,278	21,916	22,573	23,250
Interest expense	(30,930)	(24,009)	(13,689)	(3,194)	73	(364,379)	(2,421,741)	(2,212,647)
Financing costs	-	-	-	-	(450,000)	-	-	-
Total nonoperating revenues - Net	2,912,632	807,822	826,641	845,786	407,857	502,366	(1,545,875)	(1,327,495)
Change in net position	\$ 2,071,555	\$ (70,354)	\$ (100,417)	\$ (133,705)	\$ (280,763)	\$ (431,445)	\$ (661,420)	\$ (292,351)

Debt Service Coverage - \$30 Million Project, 7.5%

Debt service coverage	2021	2022	2023	2024	2025	2026	2027	2028
Change in net position	\$ 2,071,555	\$ (70,354)	\$ (100,417)	\$ (133,705)	\$ (280,763)	\$ (431,445)	\$ (661,420)	\$ (292,351)
Plus: OPEB	300,000	309,000	318,270	327,818	337,653	347,783	358,216	368,962
Plus: Interest expense	30,930	24,009	13,689	3,194	(73)	364,379	2,421,741	2,212,647
Plus: Depreciation and amortization expense	626,186	664,720	729,751	803,168	759,996	1,734,579	1,687,210	1,663,541
Less: CARES funding recognized	(2,366,200)	-	-	-	-	-	-	-
Total funds available for debt service	662,471	927,375	961,293	1,000,475	816,813	2,015,296	3,805,747	3,952,799
Principal payments	692,275	287,649	269,221	277,307	213,792	55,150	280,832	302,633
Interest expense	35,269	24,246	13,911	3,419	-	364,379	2,236,340	2,214,539
Annual debt service	727,544	311,895	283,132	280,726	213,792	419,529	2,517,172	2,517,172
Debt service coverage	0.91	2.97	3.40	3.56	3.82	4.80	1.51	1.57

Debt service coverage - Excluding investment income	2021	2022	2023	2024	2025	2026	2027	2028
Change in net position	\$ 2,071,555	\$ (70,354)	\$ (100,417)	\$ (133,705)	\$ (280,763)	\$ (431,445)	\$ (661,420)	\$ (292,351)
Plus: OPEB	300,000	309,000	318,270	327,818	337,653	347,783	358,216	368,962
Plus: Interest expense	30,930	24,009	13,689	3,194	(73)	364,379	2,421,741	2,212,647
Plus: Depreciation and amortization expense	626,186	664,720	729,751	803,168	759,996	1,734,579	1,687,210	1,663,541
Less: CARES funding recognized	(2,366,200)	-	-	-	-	-	-	-
Less: Investment income	(18,905)	(19,472)	(20,056)	(20,658)	(21,278)	(21,916)	(22,573)	(23,250)
Total funds available for debt service	643,566	907,903	941,237	979,817	795,535	1,993,380	3,783,174	3,929,549
Principal payments	692,275	287,649	269,221	277,307	213,792	55,150	280,832	302,633
Interest expense	35,269	24,246	13,911	3,419	-	364,379	2,236,340	2,214,539
Annual debt service	727,544	311,895	283,132	280,726	213,792	419,529	2,517,172	2,517,172
Debt service coverage - Excluding investment income	0.88	2.91	3.32	3.49	3.72	4.75	1.50	1.56

Days Cash on Hand - \$30 Million Project, 7.5%

<i>Days cash on hand - Short term sources</i>	2021	2022	2023	2024	2025	2026	2027	2028
Cash and cash equivalents	\$ 12,978,526	\$ 11,929,183	\$ 7,821,150	\$ 8,094,034	\$ 8,225,741	\$ 9,353,231	\$ 9,973,092	\$ 10,949,009
Operating expenses	23,700,853	24,431,628	25,209,665	26,017,481	26,730,738	28,484,445	29,239,572	30,042,472
Less: Depreciation	(626,186)	(664,720)	(729,751)	(803,168)	(759,996)	(1,734,579)	(1,687,210)	(1,663,541)
Adjusted expenses	23,074,667	23,766,908	24,479,914	25,214,313	25,970,742	26,749,866	27,552,362	28,378,931
Expenses per day	63,218	65,115	67,068	68,892	71,153	73,287	75,486	77,538
Days cash on hand - Short-term	205.3	183.2	116.6	117.5	115.6	127.6	132.1	141.2
<i>Days cash on hand - All sources</i>	2021	2022	2023	2024	2025	2026	2027	2028
Cash and cash equivalents	\$ 12,978,526	\$ 11,929,183	\$ 7,821,150	\$ 8,094,034	\$ 8,225,741	\$ 9,353,231	\$ 9,973,092	\$ 10,949,009
Noncurrent cash	1,443,931	1,443,931	1,443,931	1,443,931	1,443,931	1,443,931	1,443,931	1,443,931
Total	\$ 14,422,457	\$ 13,373,114	\$ 9,265,081	\$ 9,537,965	\$ 9,669,672	\$ 10,797,162	\$ 11,417,023	\$ 12,392,940
Expenses per day	63,218	65,115	67,068	68,892	71,153	73,287	75,486	77,538
Days cash on hand - All sources	228.1	205.4	138.1	138.4	135.9	147.3	151.2	159.8

06. Summary and Next Steps

Financial Risks

- Financial risk factors and considerations include:
 - ▶ Achieving forecasted volume growth
 - ▶ Estimated construction costs to expand Hospital capacity could be understated
 - ▶ Increases in operating costs to be considered once the new projects are more clearly defined (utilities, staffing, etc.)
 - ▶ Maintain levels of salaries and wages as a percentage of gross patient service revenue
 - 2020 was 60% and 2021 is forecasted at 56.1%
 - ▶ Maintain levels of benefits as a percentage of salaries. 2021 is forecasted at 29.4%
 - ▶ Profitability implications of future project
 - Capital costs associated with the new financing is spread evenly to all services currently due to project scope not being fully defined
 - ▶ Project details have yet to be refined between asset classes. Depreciation expense based on asset class will be refined in future phases of the analysis

Considerations

- Forecasted strong cash position
 - ▶ Potential requirement for equity contribution due to forecasted cash levels
 - ▶ New debt terms may require establishment of reserve funds, which would impact days cash on hand
- Timing of projects matters
 - ▶ Prioritize and stagger projects; more certainty, maintaining financials
 - ▶ Management to determine minimum levels of financial ratios for internal goals
 - ▶ Implementation of new programs is intensive, and profitability is highly dependent on ramp-up of providers, full capacity

Potential Next Steps

- Identify specific construction projects to pursue /prioritize further
- Deeper dive on scenario modeling
- Scenarios with different interest rates
- Deeper dive on financial analysis
- Real market/refining of
 - ▶ Obtaining provider services
 - ▶ Timeline
 - ▶ Sources of financing (debt, grants/contributions, equity, etc.)
 - ▶ Refining cost of construction

07. Appendix – Forecast Assumptions

Revenue Assumptions

- Net patient service revenue (NPSR) includes an annual reimbursement inflation for each payor and are forecasted as follows:
 - ▶ Medicare and Medicaid reimbursement includes an annual inflation change from 3.06% in 2021 to 2.85% in 2028
 - ▶ Reimbursement from all other payors are forecasted at an annual inflation rate of 3%
 - ▶ The new project is forecasted to be reimbursed at 56.4% of total project cost
- NPSR incorporates volume increases of 3% and 4% for payors other than Medicare and Medicaid in 2027 and 2028, respectively
- Other operating revenue is forecasted to increase 3.0% annually
- Nonoperating revenues are forecasted as follows:
 - ▶ Recognized full amount of PPP loan of \$2.37 million in 2021
 - ▶ Forecasting timber taxes to decline to \$250k in 2021 and \$200k thereafter
 - ▶ Forecasted decreased contributions as the AL facility closed in 2021
 - ▶ Interest income is forecasted to increase by 3% annually

Operating Expense Assumptions

- Salaries and wages forecasted based on the following:
 - ▶ Analyzed historical levels
 - ▶ Applied annual inflation of 3%
- Benefits are forecasted based on historical experience, management discussions and anticipated cost adjustments
 - ▶ Benefit ratio is assumed at 29.4% of salaries and wages
- Other operating expenses are forecasted at a high level with annual inflation rate of 3%

Capital Expense Assumptions

- Depreciation is based on the following:
 - ▶ Existing assets – Depreciation is estimated based on historical information.
 - ▶ Future ongoing routine additions
 - \$500k in 2021 and \$1 million in 2022 based on discussions with management
 - \$500k thereafter
 - Routine additions are related to building and equipment, average 30-year and 10-year depreciable life, respectively
 - ▶ New Project Construction
 - Useful life of 30 years
 - ▶ Interest expense is based on the following:
 - Future debt associated with New Project Construction
 - 3% interest rate
 - 30-year amortization period
 - ▶ No additional patient volumes are forecasted for potential market share gains or other utilization increases related to the new building

Key Balance Sheet Assumptions

- Balance sheet assumptions are forecasted based on YTD February FY 2021 and discussions with management:

Balance sheet item	Basis	Assumption
Cash and cash equivalents - Current*	Days expense in cash and cash equivalents - current	228.1
Patient accounts receivable - Net	Days net patient service revenue in accounts receivable	38.8
Estimated third-party payor settlements	Days net patient service revenue in third-party settlements	8.0
Taxes receivables	Days property taxes expense in receivables	26.3
Other receivables	Average % change	0.0%
Inventory	Days supplies expense in inventory	36.6
Prepays	Days expense less salaries, benefits, deprec., and interest	5.2
Accounts payable	Days expense less salaries, benefits, deprec., and interest	29.7
Accrued salaries and benefits	Days salaries and benefits accrued	24.9
Net pension liability	Days salaries and benefits in pension liability	61.9

*Excess cash is forecasted to be transferred into short-term investments.

- Medicare advanced payment recoupment is forecasted to pay back \$724k and \$4.3 million in 2021 and 2022, respectively.

Thank you!

- Your Service Team:
 - ▶ Eric Volk, Partner
 - ▶ Tammy Staeden, Senior Manager
 - ▶ Meranda Pfaff, Senior Consultant



WIPFLI

www.wipfli.com/healthcare

Regarding the Use of this Presentation



- The contents of this presentation is for Willapa Harbor Hospital's internal use only and is not to be distributed to any outside parties.
- The forecasted financial statements presented herein are not intended to be presented in accordance with Generally Accepted Accounting Principles (GAAP).
- Wipfli did not perform an examination-level or compilation-level, feasibility analysis as a part of this engagement and, as such, does not provide any assurance on the financial information presented herein.