PETERSBURG MEDICAL CENTER

Replacement Hospital Master Plan

Volume 2 Appendix

January 31, 2020

NAC ARCHITECTURE

Integrity

Professionalism

Dignity

Quality

Teamwork

Petersburg Medical Center

Table of Contents

Seismic Evaluation . . . . . .

Inundation Study . . . . . .

Navigant Financial Analysis . . . . . .

Numeric Program . . . . . .

System Narratives . . . . . .

- **Architectural**
- **Civil**
- **Structural**
- **Mechanical**
- **Electrical**

Cost Estimates . . . . . .

- **Downtown Scheme**
- **Greenfield Scheme 7A**
- **Greenfield Scheme 7B**

Seismic Evaluation

Petersburg Medical Center

Seismic Evaluation Report

July 2019

kpff Consulting Engineers

Seismic Evaluation Report

July 2019

Prepared for:

NAC Architecture
2025 First Avenue, Suite 300
Seattle, WA 98121

Prepared by:

KPFF Consulting Engineers
1601 Fifth Avenue, Suite 1600
Seattle, WA 98101
Phone: (206) 622-5822
KPFF Job No. 10041900308.10

Table of Contents

1. Executive Summary 1
Overview 1
Background 1
Seismic Evaluation 1
2. Building Description 2
Long Term Care Wing 3
Hospital 4
Building Conditions 6
3. ASCE 41 Tier 1 Seismic Evaluation 7
Assessment Criteria 7
Building Type and Checklists 8
Information Collected 8
Potential Seismic Deficiencies 9
4. Conclusions 10

List of Tables

Table 3-1: Spectral Response Acceleration Values for BSE-1N and BSE-1E 8
Table 3-2: Required Checklists for Tier 1 Evaluation 8

List of Figures

Figure 2-1: Building Layout Plan 2
Figure 2-2: Long Term Care Wing Floor Plan 3
Figure 2-3: Hospital Floor Plan 5
Figure 2-4: Settlement at Long Term Care Wing Exterior Stair 6
Figure 2-5: Cladding Damage at Long Term Care Wing Exterior Sun Room 7

Appendices

Appendix A – Figures
Appendix B – Tier 1 Checklists
Appendix C – Seismic Hazard Data

This page intentionally left blank.

1. Executive Summary

OVERVIEW

KPFF Consulting Engineers (KPFF) performed a seismic evaluation of the Petersburg Medical Center using American Society of Civil Engineers Standard 41-13 (ASCE 41). There were building components that were flagged as noncompliant per the Tier 1 checklists found in ASCE 41. This report summarizes the Tier 1 evaluation performed by KPFF and could be used as the basis for future evaluation of the structure.

BACKGROUND

The Petersburg Medical Center consists of three buildings: the Long Term Care Wing constructed in 1967, the Hospital building constructed in 1983, and a Clinic constructed in the 1990s. The Long Term Care Wing is a two-story building, with an attic that was added in 1983. The lateral force-resisting system consists of concrete shear walls. The Hospital building is a two-story building with an attic. Its lateral force-resisting system consists of steel moment frames. The Clinic consists of wood-framed modules on a concrete base. The Clinic was probably designed according to the 1991 Uniform Building Code (UBC), which is prior to the edition of the UBC that would enable this building to satisfy the benchmark provisions of ASCE 41, so that a seismic evaluation need not be performed. Construction drawings for the Clinic were not available, and it is not included in this seismic evaluation.

SEISMIC EVALUATION

KPFF performed a Tier 1 evaluation of the structures in accordance with ASCE 41. A Tier 1 evaluation is an initial screening of a building for potential seismic deficiencies in the event of an earthquake of specified intensity. Items found noncompliant with the requirements of the Tier 1 evaluation trigger a Tier 2 deficiency-based analysis to determine whether the structural component is deficient and requires strengthening, or if the calculated capacity of the component is sufficient to meet ASCE 41 Tier 2 requirements. No Tier 2 evaluations were performed, as they were beyond the scope of this study.

KPFF evaluated the seismic structural systems of the Long Term Care Wing and the Hospital building for a Target Building Performance Level of I-B, Immediate Occupancy, and the corresponding Structural Performance Level of S-1. This Target Building Performance Level, which is applicable to buildings considered to be essential facilities, corresponds to a building seismic response where only limited structural damage has occurred. Continued use of the building may be limited by damage or disruption to nonstructural elements, such as light fixtures, plumbing, and equipment. Evaluation of these nonstructural elements was not included in this study.

Seismic demands were evaluated using a Basic Safety Earthquake-1 for existing buildings (BSE-1E). This corresponds to a lower seismic hazard level than would be used for new construction (BSE-1N) of a similar building. Traditionally, existing buildings have been evaluated at this somewhat reduced seismic hazard level, for reasons described in Section C2.2.1 of ASCE 41.

2. Building Description

Petersburg Medical Center is located in Petersburg, Alaska, in the city block bounded by First Street, North Second Street, Excel Street, and Fram Street. The medical center consists of the main hospital, a long term care wing, and a clinic. The original hospital building, built in the northeast corner of the block in 1955, has been demolished. See Figure 2-1 below for a plan of the facility layout.

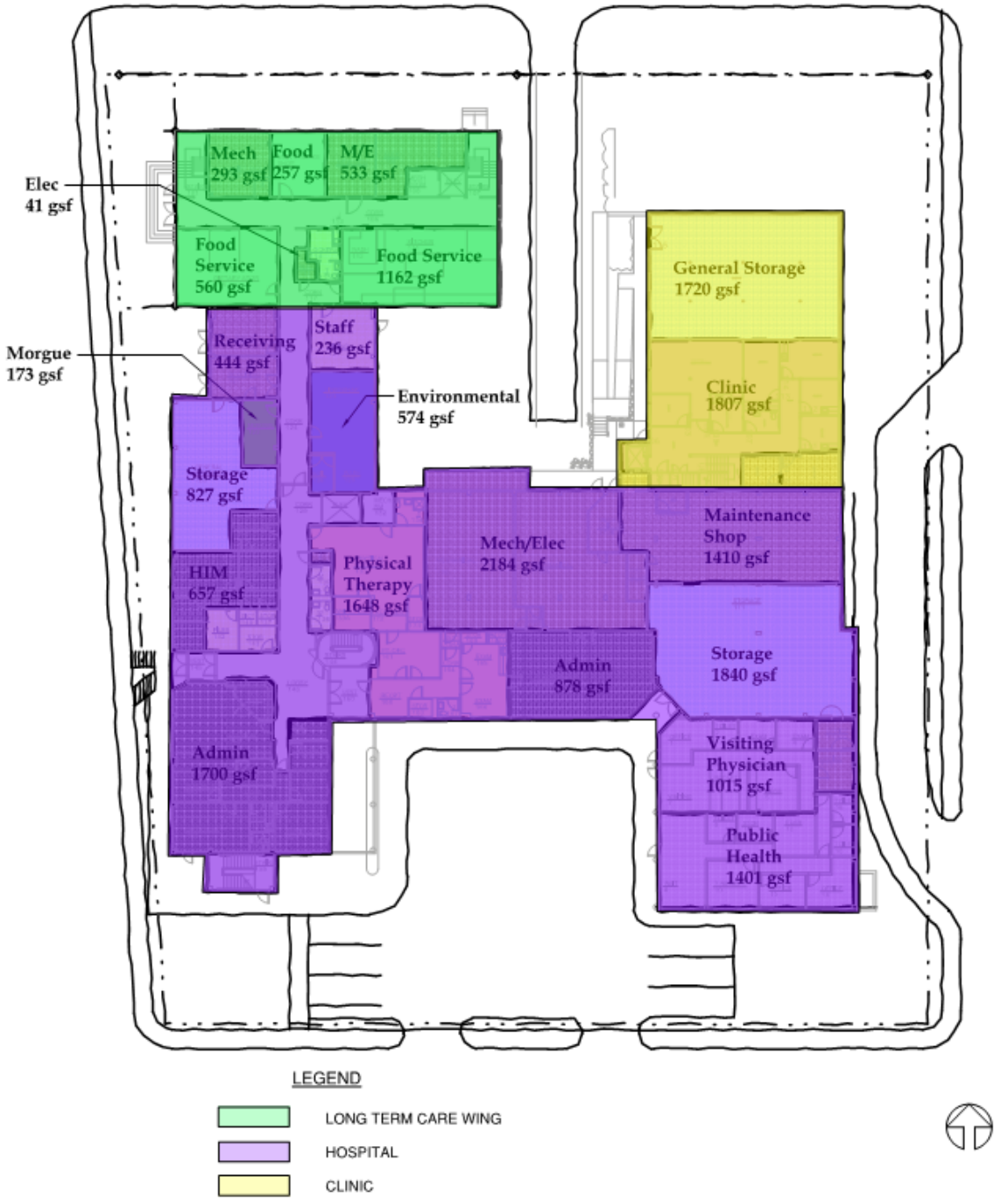


Figure 2-1: Building Layout Plan

LONG TERM CARE WING

The Long Term Care Wing was built as an addition to the original hospital building in 1967. It was constructed as a two-story building. An attic was added on top of the building when the Hospital was built in 1983.

The Long Term Care Wing consists of cast-in-place, two-way concrete slabs at the first floor, spanning to concrete grade beams and concrete pile caps. The second floor and the original building roof consist of reinforced concrete slabs on steel form deck, supported by open web bar joists. The joists span to cast-in-place concrete bearing walls at the exterior and at some interior walls at stairs and elevators. Other interior supports are reinforced concrete masonry-bearing walls or steel wide flange beams and columns.

The attic framing consists of a combination of WTs and Z-purlins at the roof and light gage channel purlins at the attic floor spanning to trusses. The trusses span to the exterior concrete walls. The trusses are composed of wide flange top and bottom chords with steel pipe diagonals. At limited areas of the attic floor, there is concrete slab on steel form deck for equipment support and to provide a walking surface within the attic. There is no structural steel deck at the attic roof or floor, except for the areas with concrete slab. The attic floor at this building is located just above the original concrete roof slab.

The lateral force-resisting system for the Long Term Care Wing consists of the concrete bearing walls acting as reinforced concrete shear walls. The concrete slabs at the second floor and the roof act as rigid diaphragms distributing lateral loads to the shear walls. At the attic roof there are light gage diagonal channels laid flat between roof framing members to serve as horizontal bracing to the exterior shear walls.

The foundation system for the Long Term Care Wing consists of cedar piling. The piles are battered underneath the exterior concrete walls in the direction parallel to the plane of the wall. The exterior grade is at or near the first floor elevation.

Figure 2-2 shows the second floor framing plan of the Long Term Care Wing.

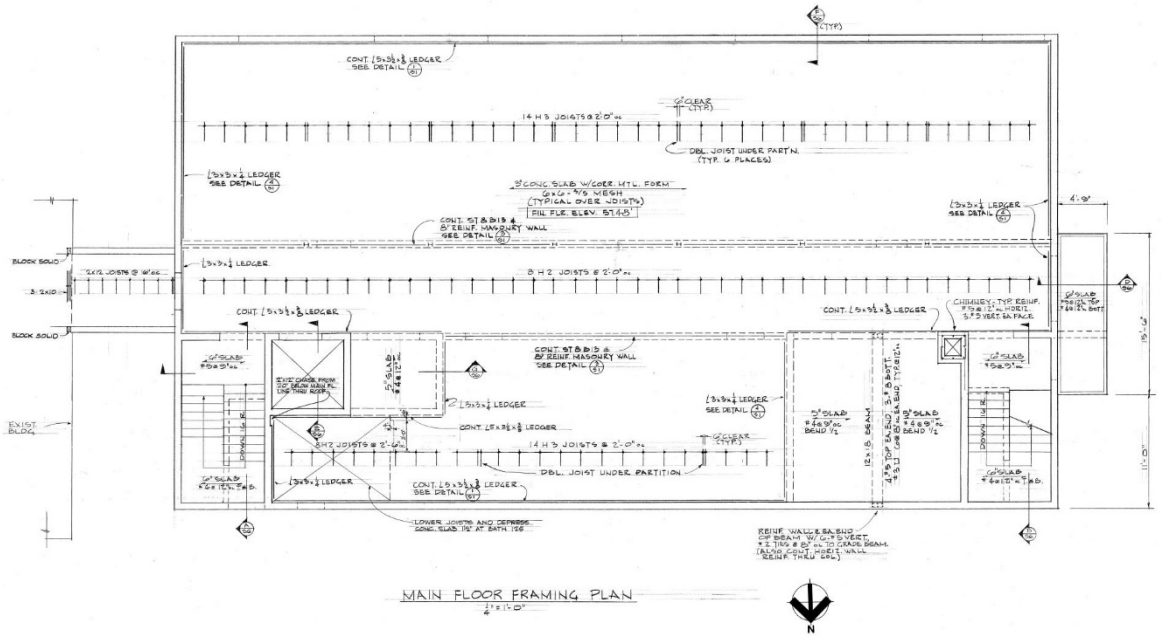


Figure 2-2: Long Term Care Wing Floor Plan

HOSPITAL

The Hospital building is a two-story building with an attic that was built in 1983. Originally, the southwest area of the first floor was covered parking. This area was later enclosed.

The first floor of the Hospital consists of concrete slabs-on-grade. The second floor consists of reinforced concrete slabs spanning to composite-designed steel beams and girders, which are supported by steel wide flange columns. The attic framing consists of a combination of WTs and Z-purlins at the roof and wide flanges and light gage channel purlins at the attic floor spanning to trusses. The trusses span to the exterior steel wide flange columns. The trusses are composed of wide flange top and bottom chords with steel pipe diagonals. At limited areas of the attic floor there is concrete slab on steel form deck for equipment support and to provide a walking surface within the attic. There is no structural steel deck at the attic roof or floor, except for the areas with concrete slab.

The lateral force-resisting system for the Hospital consists of steel moment-resisting frames. The specific bays of steel moment frame are not clearly defined on the structural drawings, and are generally assumed to occur where the framing matches or is similar to the limited locations where the steel moment frame details are indicated on the framing plans. The concrete slabs at the second floor act as rigid diaphragms distributing lateral loads to the moment frames. At the attic floor and roof there are light gage diagonal channels laid flat adjacent to the attic floor and roof framing members to serve as horizontal bracing to the exterior moment frames.

The foundation system for the Hospital consists of concrete spread footings. Continuous concrete grade beams act as continuous spread footings at the grids with steel moment frames. The exterior grade transitions from the first floor to the second floor from the southeast corner to the northeast corner of the Hospital. It transitions back down to the first floor within a short distance along the north elevation of the Hospital from the northeast corner.

Figure 2-3 shows the second floor framing plan of the Hospital.

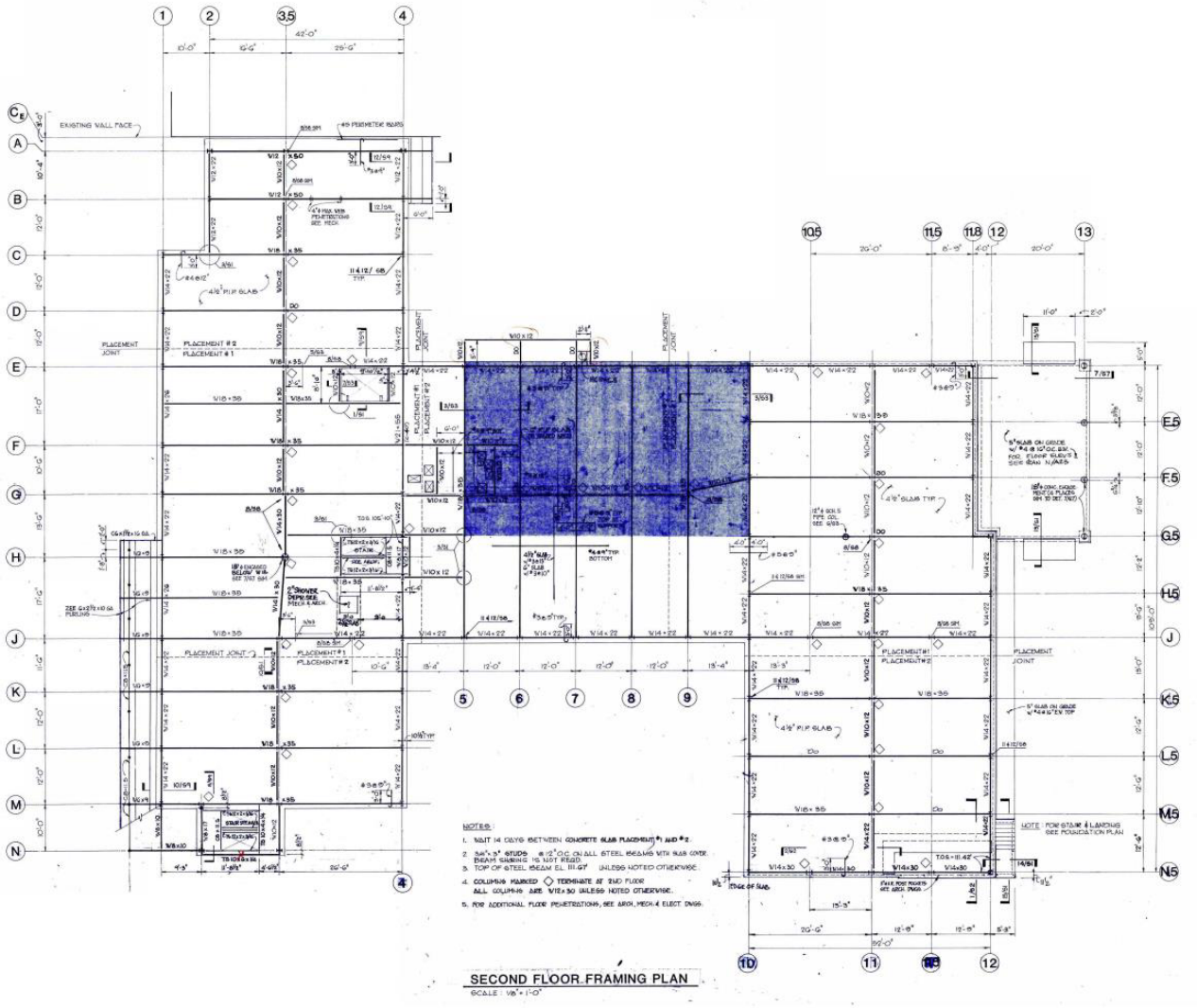


Figure 2-3: Hospital Floor Plan

BUILDING CONDITIONS

During KPFF's site visit in June 2019, the condition of the structural systems that could be observed appeared to be in good repair. No damage to the structural systems was noted. At the Long Term Care Wing, some additional openings in the exterior concrete walls had been added for windows, doors, or louvers. These additional openings were considered in the seismic evaluation.

Minor settlement of the exterior stair on the west side of the building relative to the building was noted at the Long Term Care Wing. See Figure 2-4. If these concrete stairs are supported on spread footings, whereas the building is pile supported, that could account for the settlement.

The cladding at the sun room at the west side of the Long Term Care Wing is damaged, likely due to weather and water penetration issues. See Figure 2-5. There is no apparent damage to the building structure in this area.

Minor cracking was observed in some exposed exterior concrete walls. At some locations, this cracking appeared to coincide with construction joint locations. The cracking is not considered to be evidence of any structural issues.

Figure 2-4: Settlement at Long Term Care Wing Exterior Stair

Figure 2-5: Cladding Damage at Long Term Care Wing Exterior Sun Room

3. ASCE 41 Tier 1 Seismic Evaluation

ASCE 41 provides a three-tiered evaluation approach: a Screening Phase (Tier 1), an Evaluation Phase (Tier 2), and a Detailed Evaluation Phase (Tier 3). A Tier 1 evaluation consists of checklists that allow for a rapid evaluation of the structural elements of the building and site conditions. The purpose of the Tier 1 procedure is to screen building components per the provisions of ASCE 41 to identify potential deficiencies. If non-compliant checklist items are identified for a building during the Tier 1 evaluation, a Tier 2 Deficiency-Based Evaluation is required for further evaluation. Tier 3 includes a more detailed evaluation of deficiencies. Neither a Tier 2 nor Tier 3 evaluation was within the scope of this study.

ASSESSMENT CRITERIA

Earthquake accelerations for use in ASCE 41 seismic evaluation are based on data provided by the United States Geological Survey (USGS) and are adjusted for site-specific soil conditions. Table 3-1 lists the acceleration response spectrum parameters for both the Basic Safety Earthquake-1 for new construction (BSE-1N) and for the Basic Safety Earthquake-1 for existing construction (BSE-1E). The BSE-1N values were used solely to determine the Level of Seismicity at the building site (High, Moderate, Low, or Very Low Seismicity) in accordance with Section 2.5 of ASCE 41. The BSE-1E values were used to evaluate seismic demands on the structure when evaluating the Tier 1 checklists. See Appendix C for a summary of the USGS seismic hazard parameters for the BSE-1N and BSE-1E earthquakes at this site.

Table 3-1: Spectral Response Acceleration Values for BSE-1N and BSE-1E

Spectral Response Acceleration Parameter	BSE – 1N	Spectral Response Acceleration Parameter	BSE – 1E
S_{DS}	0.299 g	S_{XS}	0.197 g
S_{D1}	0.342 g	S_{X1}	0.267 g

The site soil properties were assumed to be such that the site would be classified as Site Class D. This is the default site classification if soil properties are not known in sufficient detail to determine the site class. Based on the acceleration parameters, this site is classified as having a high level of seismicity.

The Hospital building is considered an essential facility, and is therefore categorized as Risk Category IV per the 2015 International Building Code. Due to its potential use as part of the hospital environment, it was determined that the Long Term Care Unit would also be considered an essential facility and be categorized as Risk Category IV. Table 2-1 of ASCE 41 states that buildings categorized as Risk Category IV for the Tier 1 evaluation shall use Immediate Occupancy Performance Level checklists.

BUILDING TYPE AND CHECKLISTS

The Tier 1 screening was conducted with the appropriate hazard checklists, based on the building type, the level of seismicity, and the required level of performance. The descriptions associated with each building type are found in ASCE 41. The Long Term Care Unit is classified as Type C2 for concrete shear walls with stiff diaphragms, and Type S4 for the attic framing with its steel, horizontally braced diaphragm system. The checklists used in the Tier 1 evaluation are listed below in Table 3-2. Refer to Appendix B for the completed checklists.

Table 3-2: Required Checklists for Tier 1 Evaluation

Required Tier 1 Checklist	ASCE 41 Reference
1. Basic Configuration – Immediate Occupancy	Section 16.1.2IO
2. Long Term Care Wing: Building Type C2 – Immediate Occupancy	Section 16.10IO
3. Long Term Care Wing: Building Type S4 – Immediate Occupancy	Section 16.7IO
4. Hospital: Building Type S1 – Immediate Occupancy	Section 16.4IO

INFORMATION COLLECTED

KPFF reviewed the original construction drawings by Olsen and Sands for the Long Term Care Wing, dated August 1967, and the original construction drawings by Ackley Jensen for the Hospital and the addition of the attic to the Long Term Care Wing, dated April 1983. The Long Term Care Wing building was designed according to the 1967 Uniform Building Code, and the Hospital building was designed according to the 1979 Uniform Building Code.

Documentation defining the geologic site hazards was not available. However, a report by the United States Department of the Interior Geological Survey, "Reconnaissance Engineering Geology of the Petersburg Area, Southeastern Alaska, with Emphasis on Geologic Hazards," dated 1978, was available from the Alaska Division of Geological and Geophysical Surveys. This report noted a low likelihood of liquefaction, slope failures, or surface fault ruptures in Petersburg, and was used as the basis for the geologic site hazard responses indicated in the checklists.

A site visit was conducted on June 18, 2019, to identify variances between the record drawings and the visible building structures, as well as to observe the condition of the buildings.

POTENTIAL SEISMIC DEFICIENCIES

The Tier 1 checklist identifies building components that may be deficient in an earthquake based on the specific building type, the level of seismicity in the region, and the desired level of performance. The completed Tier 1 checklists are included in Appendix B. A summary of noncompliant items is listed below.

Long Term Care Wing

- **Building Type C2 - Foundation Dowels:** Concrete shear wall vertical reinforcement dowel embedment lengths into the foundations are less than that required to develop the strength of the walls. For reference, see Section F/S-3 shown in Appendix A, Figure A1.
- **Building Type C2 - Deep Foundations/Connections:** Cedar pile tension capacities unknown. No tension connection between piles and pile caps to resist uplift. No top reinforcement in pile caps. For reference, see Section 1E/S-2 shown in Appendix A, Figure A2.
- **Building Type S4 – Connections:** Attic horizontal bracing system has insufficient capacity to transfer lateral forces to concrete shear walls.

Hospital

- **Basic Configuration – Load Path:** Steel moment frame locations unclear. Some areas of the building do not have a complete, well-defined load path to the steel moment frames. The diaphragm at the attic level is incomplete.
- **Building Type S1 – Drift Check:** Some of steel moment frames do not meet the drift limit.
- **Building Type S1 – Transfer to Steel Frames:** Attic horizontal bracing system has insufficient capacity to transfer lateral forces to steel moment frames.
- **Building Type S1 – Steel Columns:** Connections of moment frame columns to foundations insufficient to develop tensile capacity of columns. For reference, see Section 4/S-7 shown in Appendix A, Figure A3.
- **Building Type S1 – Moment-Resisting Connections:** Based on information provided on the drawings, it cannot be verified and is considered unlikely that moment frame connections are able to develop the strength of the beams. For reference, see Sections 11/S-8 and 12/S-8 shown in Appendix A, Figure A4.
- **Building Type S1:** Compact Members: Moment frame members do not meet compact section requirements.
- **Building Type S1:** Girder Flange Continuity Plates: There are no girder flange continuity plates at the moment frame joints. For reference, see Sections 11/S-8 and 12/S-8 shown in Appendix A, Figure A4.

- **Building Type S1:** Bottom Flange Bracing: Moment frame beam flanges are not braced out-of-plane at the attic level.
- **Building Type S1 – Plan Irregularities:** Based on the information provided on the drawings, there may be insufficient tensile capacity in the steel framing and connections to develop the diaphragm tensile forces at floor- and attic-level re-entrant corners.

ASCE 41 also includes an extensive checklist for nonstructural components, such as HVAC equipment and systems, ceilings, and cladding, particularly for a Risk Category IV facility like a hospital. These nonstructural components were not reviewed as part of this seismic evaluation. However, given when these systems were constructed, it is expected that many of the nonstructural components would not be compliant.

4. Conclusions

It was found that the Long Term Care Wing and the Hospital building have noncompliant components according to an ASCE 41 Tier 1 evaluation. These noncompliant components are mainly related to the concrete shear wall foundations at the Long Term Care Wing, the steel moment frames at the Hospital building, and the attic diaphragms at both buildings. A Tier 2 or Tier 3 evaluation would be required for further review of these components, but it is expected that some components would still be determined to be deficient and would require strengthening and/or retrofitting. In addition, it is expected that some of the nonstructural building components would also require retrofitting or replacement.

Appendix A

Figures

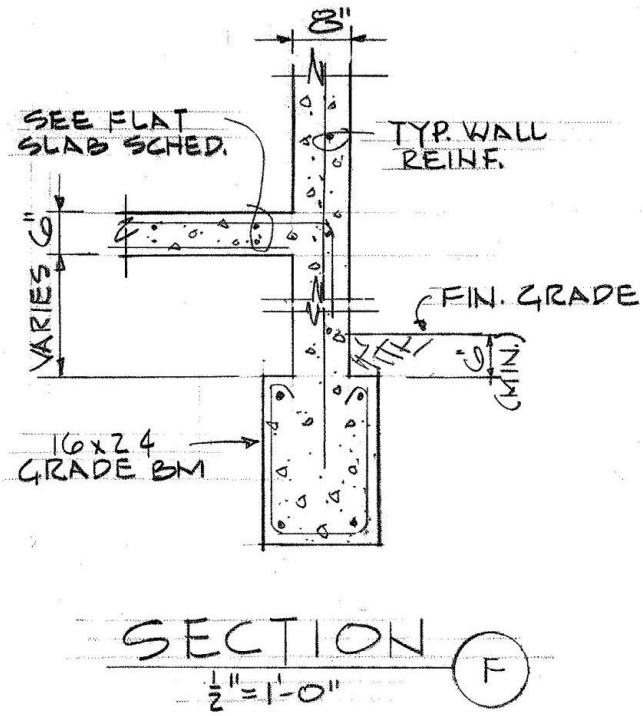


Figure A1: Long Term Care Wing – Foundation Dowels (Section F/S-3)

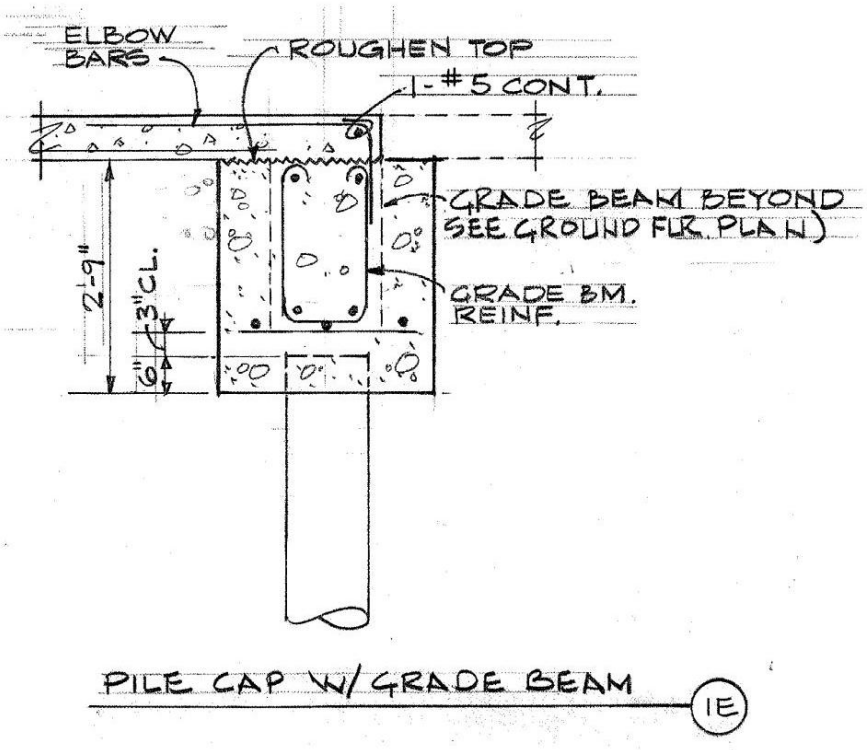


Figure A2: Long Term Care Wing – Deep Foundations/Connections (Section 1E/S-2)

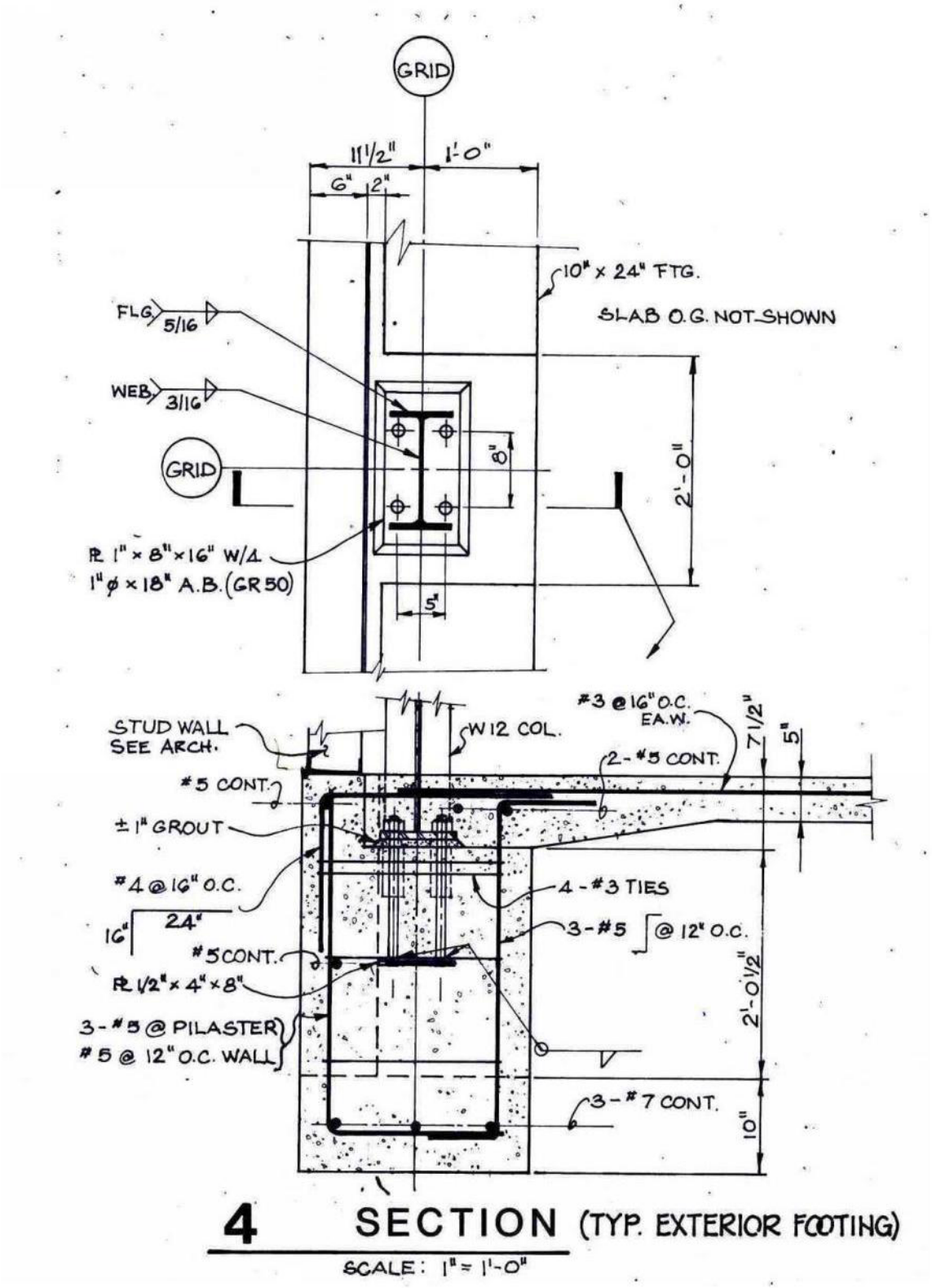


Figure A3: Hospital – Steel Columns (Section 4/S-7)

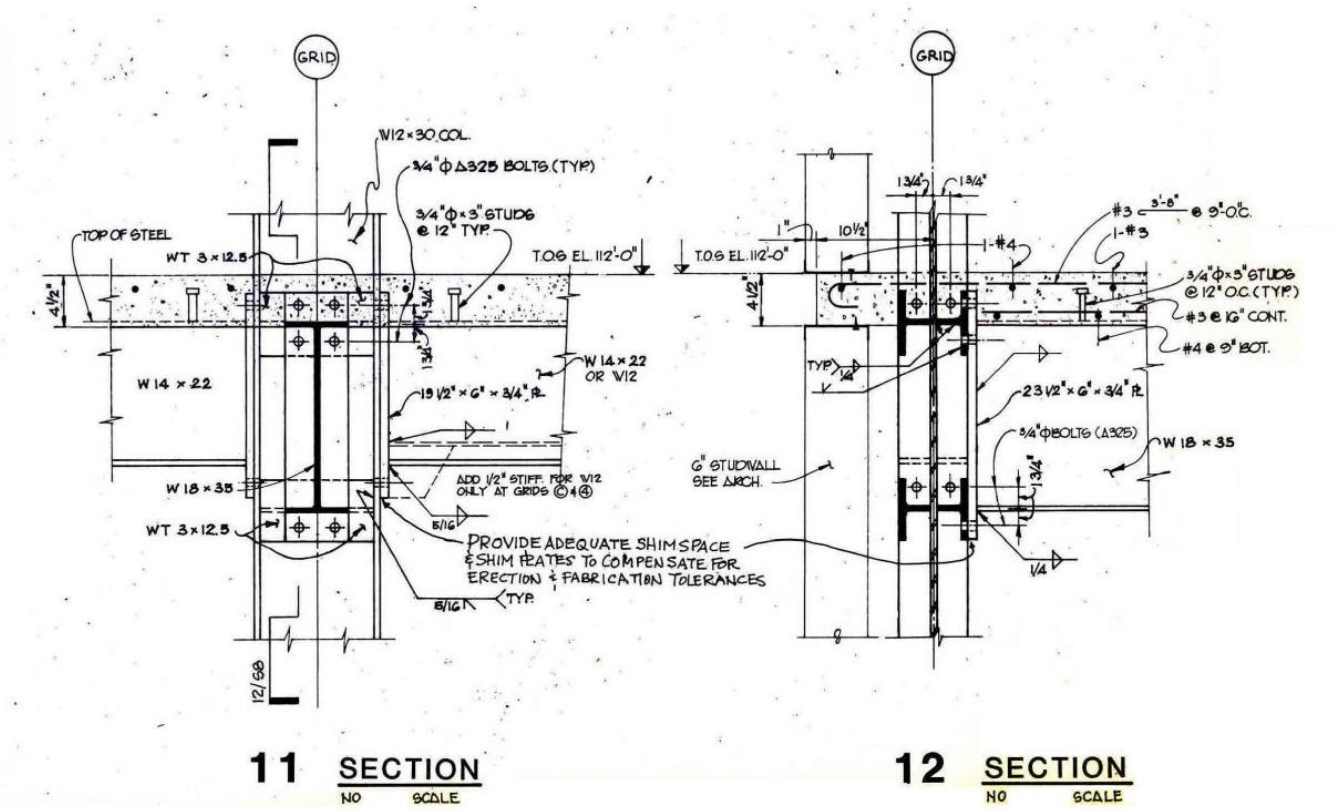


Figure A4: Hospital – Moment-Resisting Connections/Girder Flange Continuity Plates (Section 11/S-8 and 12/S-8)

Appendix B

Tier 1 Checklists

Refer to the following pages for Tier 1 Checklists associated with our study of the Petersburg Medical Center. Tier 1 Checklists were based on Immediate Occupancy Structural Performance Level (S-1). Each of the evaluation statements are marked as follows:

C – Compliant

NC – Noncompliant

N/A – Not Applicable

U – Unknown

Very Low Seismicity

Building System

General

(C) NC N/A U — LOAD PATH: The structure shall contain 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 4% of the height of the shorter building. This statement need not apply for the following building types: W1, W1A, and W2. (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 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 shall not be 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 shall not be 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)

(C) NC N/A U — MASS: There is no change in effective mass 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 shall not exist in the foundation soils at depths within 50 feet 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 sufficiently remote from potential earthquake-induced slope failures or rockfalls to be 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 Very Low and 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)

IMMEDIATE OCCUPANCY – STRUCTURAL CHECKLIST FOR BUILDING TYPE C2 AND TYPE C2A

Building: PETERSBURG MCMP - LTC

KPFF Project No.: 1900308

Very Low Seismicity

Seismic-Force-Resisting System

(C) NC N/A U — COMPLETE FRAMES: Steel or concrete frames classified as secondary components form a complete vertical-load-carrying system. (Commentary: Sec. A.3.1.6.1. Tier 2: Sec. 5.5.2.5.1)

(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 concrete shear walls, calculated using the Quick Check procedure of Section 4.5.3.3, is less than the greater of 100 psi or $2\sqrt{f'_c}$. (Commentary: Sec. A.3.2.2.1. Tier 2: Sec. 5.5.3.1.1)

(C) NC N/A U — REINFORCING STEEL: The ratio of reinforcing steel area to gross concrete area is not less than 0.0012 in the vertical direction and 0.0020 in the horizontal direction. The spacing of reinforcing steel is equal to or less than 18 inches. (Commentary: Sec. A.3.2.2.2. Tier 2: Sec. 5.5.3.1.3)

Connections

C NC (N/A) U — WALL ANCHORAGE AT FLEXIBLE DIAPHRAGMS: Exterior concrete or masonry walls that are dependent on flexible 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 adequate strength to resist the connection force calculated in the Quick Check procedure of Section 4.5.3.7. (Commentary: Sec. A.5.1.1. Tier 2: Sec. 5.7.1.1)

(C) NC N/A U — TRANSFER TO SHEAR WALLS: Diaphragms are connected for transfer of loads 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 — FOUNDATION DOWELS: Wall reinforcement is doweled into the foundation and the dowels are able to develop the lesser of the strength of the walls or the uplift capacity of the foundation. (Commentary: Sec. A.5.3.5. Tier 2: Sec. 5.7.3.4)

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)

(C) NC N/A U — SLOPING SITES: The difference in foundation embedment depth from one side of the building to another shall 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 — DEFLECTION COMPATIBILITY: Secondary components have the shear capacity to develop the flexural strength of the components and are compliant with the following items: COLUMN-BAR SPLICES, BEAM-BAR SPLICES, COLUMN-TIE SPACING, STIRRUP SPACING, and STIRRUP AND TIE HOOK in the Immediate Occupancy Structural Checklist for Building Type C1. (Commentary: Sec. A.3.1.6.2. Tier 2: Sec. 5.5.2.5.2)

(C) NC N/A U — FLAT SLABS: Flat slabs/plates not part of the seismic-force-resisting system have continuous bottom steel through the column joints. (Commentary: Sec. A.3.1.6.3. Tier 2: Sec. 5.5.2.5.3)

C NC (N/A) U — COUPLING BEAMS: The stirrups in coupling beams over means of egress are spaced at or less than d/2 and are anchored into the confined core of the beam with hooks of 135 degrees or more. The ends of both walls to which the coupling beam is attached are supported at each end to resist vertical loads caused by overturning. Coupling beams have the capacity in shear to develop the uplift capacity of the adjacent wall. (Commentary: Sec. A.3.2.2.3. Tier 2: Sec. 5.5.3.2.1)

(C) NC N/A U — OVERTURNING: All shear walls have aspect ratios less than 4-to-1. Wall piers need not be considered. (Commentary: Sec. A.3.2.2.4. Tier 2: Sec. 5.5.3.1.4)

(C) NC N/A U — CONFINEMENT REINFORCING: For shear walls with aspect ratios greater than 2-to-1, the boundary elements are confined with spirals or ties with spacing less than $8d_b$. (Commentary: Sec. A.3.2.2.5. Tier 2: Sec. 5.5.3.2.2)

(C) NC N/A U — WALL REINFORCING AT OPENINGS: There is added trim reinforcement around all wall openings with a dimension greater than three times the thickness of the wall. (Commentary: Sec. A.3.2.2.6. Tier 2: Sec. 5.5.3.1.5)

(C) NC N/A U — WALL THICKNESS: Thickness of bearing walls are not less than 1/25 the unsupported height or length, whichever is shorter, nor less than 4 inches. (Commentary: Sec. A.3.2.2.7. Tier 2: Sec. 5.5.3.1.2)

Connections

C (NC) N/A U — UPLIFT AT PILE CAPS: Pile caps shall have top reinforcement and piles are anchored to the pile caps, and the pile cap reinforcement and pile anchorage are able to develop the tensile capacity of the piles. (Commentary: Sec. A.5.3.8. Tier 2: Sec. 5.7.3.5)

Diaphragms (Flexible or Stiff)

(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 OPENINGS AT SHEAR WALLS: Diaphragm openings immediately adjacent to the shear walls are less than 15% of the wall length. (Commentary: Sec. A.4.1.4. Tier 2: Sec. 5.6.1.3)

(C) NC N/A U PLAN IRREGULARITIES: There is tensile capacity to develop the strength of the diaphragm at re-entrant corners or other locations of plan irregularities. (Commentary: Sec. A.4.1.7. Tier 2: Sec. 5.6.1.4)

(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 feet 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 shall have horizontal spans less than 30 feet 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 NON-CONCRETE FILLED DIAPHRAGMS: Untopped metal deck diaphragms or metal deck diaphragms with fill other than concrete consist of horizontal spans of less than 40 feet 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: The diaphragm does 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)

IMMEDIATE OCCUPANCY – STRUCTURAL CHECKLIST FOR BUILDING TYPE S4

Building: PETERSBURG MCMP - LTC ATTIC FRAMING

KPFF Project No.: 1900308

Very Low Seismicity

Seismic-Force-Resisting System

(C) NC N/A U — COLUMN AXIAL STRESS CHECK: The axial stress caused by gravity loads in frame columns subjected to overturning forces is less than $0.10F_y$. Alternatively, the axial stress caused by overturning forces alone, calculated using the Quick Check procedure of Section 4.5.3.6, is less than $0.30F_y$. (Commentary: Sec. A.3.1.3.2. Tier 2: Sec. 5.5.2.13.)

C NC (N/A) U — BRACE AXIAL STRESS CHECK: The axial stress in the diagonal braces, calculated using the Quick Check procedure of Section 4.5.3.4 and neglecting the steel moment frame, is less than $0.50F_y$. (Commentary: Sec. A.3.3.1.2. Tier 2: Sec. 5.5.4.1)

(C) NC N/A U — COMPLETE FRAMES: Steel frames classified as secondary components form a complete vertical-load-carrying system. (Commentary: Sec. A.3.1.6.1. Tier 2: Sec. 5.5.2.5.1)

C NC (N/A) U — SHEAR STRESS CHECK: The shear stress in the concrete shear walls, calculated using the Quick Check procedure of Section 4.5.3.3 and neglecting the steel moment frame, is less than the greater of 100 psi or $2\sqrt{F'_c}$. (Commentary: Sec A.3.2.2.1. Tier 2: Sec. 5.5.3.1.1)

C NC (N/A) U — REINFORCING STEEL: The ratio of shear wall reinforcing steel area to gross concrete area is not less than 0.0012 in the vertical direction and 0.0020 in the horizontal direction. The spacing of reinforcing steel is equal to or less than 18 inches. (Commentary: Sec. A.3.2.2.2. Tier 2: Sec. 5.5.3.1.3)

Connections

C NC (N/A) U — STEEL COLUMNS: The columns in seismic-force-resisting frames are anchored to the building foundation. (Commentary: Sec. A.5.3.1. Tier 2: Sec. 5.7.3.1)

C (NC) N/A U — TRANSFER TO SHEAR WALLS: Diaphragms are connected for transfer of seismic forces to the shear walls. (Commentary: Sec. A.5.2.1. Tier 2: Sec. 5.7.2)

C NC (N/A) U — FOUNDATION DOWELS: Wall reinforcement is doweled into the foundation, and the dowels are able to develop the lesser of the strength of the walls or the uplift capacity of the foundation. (Commentary: Sec. A.5.3.5. Tier 2: Sec. 5.7.3.4)

Low Seismicity *(Complete the following items in addition to the items for Very Low Seismicity)*

Seismic-Force-Resisting System

C NC (N/A) U DRIFT CHECK: The drift ratio of the steel moment frames acting alone, calculated using the Quick Check procedure of Section 4.5.3.1 using 25% of V_c, is less than 0.015. (Commentary: Sec. A.3.1.3.1. Tier 2: Sec. 5.5.2.1.2)

C NC (N/A) U REDUNDANCY: The number of lines of braced frames or shear walls in each principal direction is greater than or equal to 2. The number of braced bays in each line is greater than 3. (Commentary: Sec. A.3.2.1.1. and A.3.1.1.1.
Tier 2: Sec. 5.5.1.1)

C NC (N/A) U INTERFERING WALLS: All concrete and masonry infill walls placed in moment frames are isolated from structural elements. (Commentary: Sec. A.3.1.2.1. Tier 2: Sec. 5.5.2.1.1)

Connections

C NC (N/A) U TRANSFER TO STEEL FRAMES: Diaphragms are connected for transfer of seismic forces to the steel frames, and the connections are able to develop the lesser of the strength of the frames or the diaphragms. (Commentary: Sec. A.5.2.2. Tier 2: Sec .5.7.2)

Moderate Seismicity *(Complete the following items in addition to the items for Very Low and Low Seismicity)*

Seismic-Force-Resisting System

C NC (N/A) U MOMENT-RESISTING CONNECTIONS: All moment connections are able to develop the strength of the adjoining members based on the specified minimum yield stress of the steel. (Commentary: Sec. A.3.1.3.4.
Tier 2: Sec. 5.5.2.2.1). Note more restrictive requirements for High Seismicity.

C NC (N/A) U PANEL ZONES: All panel zones shall have the shear capacity to resist the shear demand required to develop 0.8 times the sum of the flexural strengths of the girders framing in at the face of the column. (Commentary: Sec. A.3.1.3.5. Tier 2: Sec. 5.5.2.2.2)

C NC (N/A) U COLUMN SPLICES: All column splice details located in moment frames include connection of both flanges and the web, and the splice develops the strength of the column. (Commentary: Sec. A.3.1.3.6. Tier 2: Sec. 5.5.2.2.3)

C NC (N/A) U STRONG COLUMN/WEAK BEAM: The percentage of strong column/ weak beam joints in each story of each line of moment frames is greater than 50%. (Commentary: Sec. A.3.1.3.7. Tier 2: Sec. 5.5.2.1.5)

C NC (N/A) U BEAM PENETRATIONS: All openings in frame-beam webs are less than 1/4 of the beam depth and are located in the center half of the beams. (Commentary: Sec. A.3.1.3.9. Tier 2: Sec. 5.5.2.2.5)

C NC (N/A) U GIRDER FLANGE CONTINUITY PLATES: There are girder flange continuity plates at all moment-resisting frame joints. (Commentary: Sec. A.3.1.3.10. Tier 2: Sec. 5.5.2.2.6)

C NC (N/A) U OUT-OF-PLANE BRACING: Beam-column joints are braced out-of-plane. (Commentary: Sec. A.3.1.3.11. Tier 2: Sec. 5.5.2.2.7)

C NC (N/A) U BOTTOM FLANGE BRACING: The bottom flanges of beams are braced out-of-plane. (Commentary: Sec. A.3.1.3.12. Tier 2: Sec. 5.5.2.2.8)

C NC (N/A) U COMPACT MEMBERS: All brace elements meet section requirements set forth by AISC 360, Table B4.1. (Commentary: Sec. A.3.3.1.7. Tier 2: Sec. 5.5.4).

C NC (N/A) U COLUMN SPLICES: All column splice details located in braced frames develop 100% of the tensile strength of the column. (Commentary: Sec. A.3.3.1.3. Tier 2: Sec. 5.5.4.2)

C NC (N/A) U SLENDERNESS OF DIAGONALS: All diagonal elements required to carry compression shall have Kl/r ratios less than 200. (Commentary: Sec. A.3.3.1.4. Tier 2: Sec. 5.5.4.3)

C NC (N/A) U CONNECTION STRENGTH: All the brace connections develop the buckling capacity of the diagonals. (Commentary: Sec. A.3.3.1.5. Tier 2: Sec. 5.5.4.4).

C NC (N/A) U OUT-OF-PLANE BRACING: Braced frame connections attached to beam bottom flanges located away from beam-column joints are braced out-of-plane at the bottom flange of the beams. (Commentary: Sec. A.3.3.1.6. Tier 2: Sec. 5.5.4.5)

C NC (N/A) U K-BRACING: The bracing system does not include K-braced bays. (Commentary: Sec. A.3.3.2.1. Tier 2: Sec. 5.5.4.6)

C NC (N/A) U TENSION-ONLY BRACES: Tension-only braces do not comprise more than 70% of the total seismic-force-resisting capacity in structures more than two stories high. (Commentary: Sec.3.3.2.2. Tier 2: Sec. 5.5.4.7)

C NC (N/A) U CHEVRON BRACING: Beams in chevron, or V-braced, bays are capable of resisting the vertical load resulting from the simultaneous yielding and buckling of the brace pairs. (Commentary: Sec. A.3.3.2.3. Tier 2: Sec. 5.5.4.6)

C NC (N/A) U CONCENTRICALLY BRACED FRAME JOINTS: All the diagonal braces frame into the beam-column joints concentrically. (Commentary: Sec. A.3.3.2.4. Tier 2: Sec. 5.5.4.8)

C NC (N/A) U COUPLING BEAMS: The stirrups in coupling beams over means of egress are spaced at or less than d/2 and are anchored into the confined core of the beam with hooks of 135 degrees or more. All coupling beams shall comply with the requirements above and shall have the capacity in shear to develop the uplift capacity of the adjacent wall. (Commentary: Sec. A3.2.2.3. Tier 2: Sec. 5.5.3.2.1)

C NC (N/A) U OVERTURNING: All shear walls shall have aspect ratios less than 4-to-1. Wall piers need not be considered. (Commentary: Sec. A.3.2.2.4. Tier 2: Sec. 5.5.3.1.4)

C NC (N/A) U CONFINEMENT REINFORCING: For shear walls with aspect ratios greater than 2-to-1, the boundary elements are confined with spirals or ties with spacing less than $8d_b$. (Commentary: Sec. A.3.2.2.5. Tier 2: Sec. 5.5.3.2.2)

C NC (N/A) U WALL REINFORCING AT OPENINGS: There is added trim reinforcement around all wall openings with a dimension greater than three times the thickness of the wall. (Commentary: Sec. A.3.2.2.6. Tier 2: Sec. 5.5.3.1.5)

C NC (N/A) U WALL THICKNESS: Thickness of bearing walls is not less than 1/25 the unsupported height or length, whichever is shorter, nor less than 4 inches. (Commentary: Sec. A.3.2.2.7. Tier 2: Sec. 5.5.3.1.2)

Diaphragms

C NC (N/A) U OPENINGS AT SHEAR WALLS: Diaphragm openings immediately adjacent to the shear walls are less than 15% of the wall length. (Commentary: Sec. A.4.1.4. Tier 2: Sec. 5.6.1.3)

C NC (N/A) U OPENINGS AT FRAMES: Diaphragm openings immediately adjacent to the braced frames or moment frames extend less than 15% of the frame length. (Commentary: Sec. A.4.1.5. Tier 2: Sec. 5.6.1.3)

C NC (N/A) U PLAN IRREGULARITIES: There is tensile capacity to develop the strength of the diaphragm at re-entrant corners or other locations of plan irregularities. (Commentary: Sec. A.4.1.7. Tier 2: Sec. 5.6.1.4)

C NC (N/A) U DIAPHRAGM REINFORCEMENT AT OPENINGS: There is reinforcing around all diaphragm openings larger than 50 percent 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 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)

High Seismicity

(Complete the following items in addition to the items for Very Low, Low, and Moderate Seismicity)

Seismic-Force-Resisting System

C NC (N/A) U MOMENT-RESISTING CONNECTIONS: All moment connections are able to develop the strength of the adjoining members or panel zones based on 110% of the expected yield stress of the steel per AISC 341, Section A3.2. (Commentary: Sec. A.3.1.3.4. Tier 2: Sec. 5.5.2.2.1)

C NC (N/A) U COMPACT MEMBERS: All moment and braced frame columns and beams shall meet section requirements set forth by AISC 341, Table D1.1 for highly ductile members. Braced frame beams meet section requirements for moderately ductile members. (Commentary: Sec. A.3.3.1.7 and A.3.3.1.8. Tier 2: Sec. 5.5.2.2.4 and 5.5.4)

C NC (N/A) U CONNECTION STRENGTH: All the brace connections develop the yield capacity of the diagonals. (Commentary: Sec. A.3.3.1.5. Tier 2: Sec. 5.5.4.4)

Connections

C NC (N/A) U STEEL COLUMNS: The columns in seismic-force-resisting frames are anchored to the building foundation, and the anchorage is able to develop the least of the tensile capacity of the column, the tensile capacity of the lowest level column splice (if any), or the uplift capacity of the foundation. (Commentary: Sec. A.5.3.1. Tier 2: Sec. 5.7.3.1)

Very Low Seismicity

Building System

General

C (NC) N/A U — LOAD PATH: The structure shall contain 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 4% of the height of the shorter building. This statement need not apply for the following building types: W1, W1A, and W2. (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 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 shall not be 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 shall not be 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)

(C) NC N/A U — MASS: There is no change in effective mass 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 shall not exist in the foundation soils at depths within 50 feet 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 sufficiently remote from potential earthquake-induced slope failures or rockfalls to be 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 Very Low and 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)

IMMEDIATE OCCUPANCY - STRUCTURAL CHECKLIST FOR BUILDING TYPE S1 AND TYPE S1A

Building: PETERSBURG MCMP - HOSPITAL

KPFF Project No.: 1900308

Very Low Seismicity

Seismic-Force-Resisting System

C (NC) N/A U — DRIFT CHECK: The drift ratio of the steel moment frames, calculated using the Quick Check procedure of Section 4.5.3.1, is less than 0.015. (Commentary: Sec. A.3.1.3.1. Tier 2: Sec. 5.5.2.1.2)

(C) NC N/A U — COLUMN AXIAL STRESS CHECK: The axial stress caused by gravity loads in columns subjected to overturning forces is less than $0.10F_y$. Alternatively, the axial stress caused by overturning forces alone, calculated using the Quick Check procedure of Section 4.5.3.6, is less than $0.30F_y$. (Commentary: Sec. A.3.1.3.2. Tier 2: Sec. 5.5.2.1.3)

(C) NC N/A U — FLEXURAL STRESS CHECK: The average flexural stress in the moment frame columns and beams, calculated using the Quick Check procedure of Section 4.5.3.9 is less than F_y. Columns need not be checked if the Strong Column/Weak Beam checklist item is compliant. (Commentary: Sec. A.3.1.3.3. Tier 2: Sec. 5.5.2.1.2)

Connections

(C) NC N/A U — STEEL COLUMNS: The columns in seismic-force-resisting frames are anchored to the building foundation. (Commentary: Sec. A.5.3.1. Tier 2: Sec. 5.7.3.1)

Low Seismicity

(Complete the following items in addition to the items for Very Low Seismicity)

Seismic-Force-Resisting System

(C) NC N/A U — REDUNDANCY: The number of lines of moment frames in each principal direction is greater than or equal to 2. The number of bays of moment frames in each line is greater than or equal to 3. (Commentary: Sec. A.3.1.1.1. Tier 2: Sec. 5.5.1.1)

(C) NC N/A U — INTERFERING WALLS: All concrete and masonry infill walls placed in moment frames are isolated from structural elements. (Commentary: Sec. A.3.1.2.1. Tier 2: Sec. 5.5.2.1.1)

Connections

C (NC) N/A U — TRANSFER TO STEEL FRAMES: Diaphragms are connected for transfer of seismic forces to the steel frames, and the connections are able to develop the lesser of the strength of the frames or the diaphragms. (Commentary: Sec. A.5.2.2. Tier 2: Sec. 5.7.2)

C (NC) N/A U STEEL COLUMNS: The columns in seismic-force-resisting frames are anchored to the building foundation, and the anchorage is able to develop the least of the tensile capacity of the column, the tensile capacity of the lowest level column splice (if any), or the uplift capacity of the foundation. (Commentary: Sec. A.5.3.1. Tier 2: Sec. 5.7.3.1)

Moderate Seismicity *(Complete the following items in addition to the items for Very Low and Low Seismicity)*

Seismic-Force-Resisting System

C (NC) N/A U MOMENT-RESISTING CONNECTIONS: All moment connections are able to develop the expected strength of the adjoining members based on the specified minimum yield stress of the steel. (Commentary: Sec. A.3.1.3.4. Tier 2: Sec. 5.5.2.2.1). Note more restrictive requirements for High Seismicity.

(C) NC N/A U PANEL ZONES: All panel zones shall have the shear capacity to resist the shear demand required to develop 0.8 times the sum of the flexural strengths of the girders framing in at the face of the column. (Commentary: Sec. A.3.1.3.5. Tier 2: Sec. 5.5.2.2.2)

C NC (N/A) U COLUMN SPLICES: All column splice details located in moment-resisting frames include connection of both flanges and the web, and the splice develops the strength of the column. (Commentary: Sec. A.3.1.3.6. Tier 2: Sec. 5.5.2.2.3)

(C) NC N/A U STRONG COLUMN/WEAK BEAM: The percentage of strong column/ weak beam joints in each story of each line of moment-resisting frames is greater than 50%. (Commentary: Sec. A.3.1.3.7. Tier 2: Sec. 5.5.2.1.5)

C (NC) N/A U COMPACT MEMBERS: All frame elements meet section requirements set forth by AISC 341, Table D1.1, for highly ductile members. (Commentary: Sec. A.3.1.3.8. Tier 2: Sec. 5.5.2.2.4)

(C) NC N/A U BEAM PENETRATIONS: All openings in frame-beam webs are less than ¼ of the beam depth and are located in the center half of the beams. (Commentary: Sec. A.3.1.3.9. Tier 2: Sec. 5.5.2.2.5)

C (NC) N/A U GIRDER FLANGE CONTINUITY PLATES: There are girder flange continuity plates at all moment frame joints. (Commentary: Sec. A.3.1.3.10. Tier 2: Sec. 5.5.2.2.6)

(C) NC N/A U OUT-OF-PLANE BRACING: Beam-column joints are braced out-of-plane. (Commentary: Sec. A.3.1.3.11. Tier 2: Sec. 5.5.2.2.7)

C (NC) N/A U BOTTOM FLANGE BRACING: The bottom flanges of beams are braced out-of-plane. (Commentary: Sec. A.3.1.3.12. Tier 2: Sec. 5.5.2.2.8)

Diaphragms (Stiff of Flexible)

C (NC) N/A U — PLAN IRREGULARITIES: There is tensile capacity to develop the strength of the diaphragm at re-entrant corners or other locations of plan irregularities. (Commentary: Sec. A.4.1.7. Tier 2: Sec. 5.6.1.4)

C NC (N/A) U — DIAPHRAGM REINFORCEMENT AT OPENING: 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 — OPENINGS AT MOMENT FRAMES: Diaphragm openings immediately adjacent to the moment frames extend less than 15 percent of the total frame length. (Commentary: Sec. A.4.1.5. Tier 2: Sec .5.6.1.3)

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 shall 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 feet 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 feet 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 — NON-CONCRETE FILLED DIAPHRAGMS: Untopped metal deck diaphragms or metal deck diaphragms with fill other than concrete consist of horizontal spans of less than 40 feet 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: The diaphragm does 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)

High Seismicity

(Complete the following items in addition to the items for Very Low, Low, and Moderate Seismicity)

Seismic-Force-Resisting System

C (NC) N/A U — MOMENT-RESISTING CONNECTION: All moment connections are able to develop the strength of the adjoining members or panel zones based on 110 percent of the expected yield stress of the steel per AISC 341, Section A3.2. (Commentary: Sec. A.3.1.3.4. Tier 2: Sec. 5.5.2.2.1)

Foundation System

C NC (N/A) U — DEEP FOUNDATIONS: Piles and piers are capable of transferring the seismic forces between the structure and the soil. (Commentary: Sec. A.6.2.3)

(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)

Appendix C

Seismic Hazard Data

Hazards by Location

Search Information

Coordinates: 56.8129, -132.9555

Elevation: 41 ft

Timestamp: 2019-07-12T14:27:55.921Z

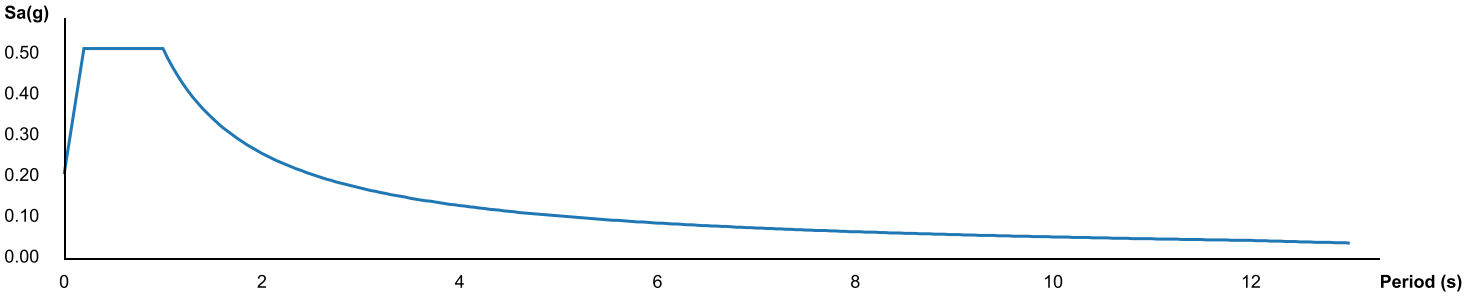
Hazard Type: Seismic

Reference Document: ASCE41-13

Site Class: D

Custom Probability:

Horizontal Response Spectrum - Hazard Level BSE-2N



Hazard Level BSE-2N

Name	Value	Description
SsUH	0.249	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
CR_S	1.144	Coefficient of risk (0.2s)
SsRT	0.285	Probabilistic risk-targeted ground motion (0.2s)
SsD	1.5	Factored deterministic acceleration value (0.2s)
S_S	0.285	MCE_R ground motion (period=0.2s)
F_a	1.572	Site amplification factor at 0.2s
S_{XS}	0.448	Site modified spectral response (0.2s)
S1UH	0.27	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
CR_1	1.03	Coefficient of risk (1.0s)
S1RT	0.278	Probabilistic risk-targeted ground motion (1.0s)
S1D	0.6	Factored deterministic acceleration value (1.0s)
S_1	0.278	MCE_R ground motion (period=1.0s)
F_v	1.844	Site amplification factor at 1.0s
S_{X1}	0.513	Site modified spectral response (1.0s)

Hazard Level BSE-1N

Name	Value	Description
S_{XS}	0.299	Site modified spectral response (0.2s)
S_{X1}	0.342	Site modified spectral response (1.0s)

Hazard Level BSE-2E

Name	Value	Description

S_S	0.197	MCE_R ground motion (period=0.2s)
F_a	1.6	Site amplification factor at 0.2s
S_{XS}	0.316	Site modified spectral response (0.2s)
S_1	0.203	MCE_R ground motion (period=1.0s)
F_v	1.994	Site amplification factor at 1.0s
S_{X1}	0.405	Site modified spectral response (1.0s)

Hazard Level BSE-1E

Name	Value	Description
S_S	0.123	MCE_R ground motion (period=0.2s)
F_a	1.6	Site amplification factor at 0.2s
S_{XS}	0.197	Site modified spectral response (0.2s)
S_1	0.114	MCE_R ground motion (period=1.0s)
F_v	2.344	Site amplification factor at 1.0s
S_{X1}	0.267	Site modified spectral response (1.0s)

T_L Data

Name	Value	Description
T_L	12	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.

Inundation Study

July 16, 2019

Dan Jardine, Principal
NAC Architecture
2025 1st Avenue, Suite 300
Seattle, WA 98121-3131

Subject: Petersburg Medical Center Inundation Analysis

Dear Mr. Jardine:

This letter documents an inundation analysis to support the master planning process for the Petersburg Medical Center (PMC) in Petersburg, Alaska. Per direction you provided, the inundation analysis focuses on the potential for tsunamis to inundate and impact the PMC. Due to the PMC being a regional medical center, it is important that it be located away from areas at risk of inundation, including rare events like tsunamis. In addition to examining tsunami inundation, we also agreed that we would briefly address sea level rise and storm surge as it applies to potential locations of the PMC.

Geographic Setting

Petersburg is located on the north end of Mitkof Island in the southeast Alaska archipelago. It is bordered to the north and west by Wrangell Narrows and to the east by the larger and deeper Fredrick Sound. The PMC is currently located on a single city block at elevations between 40 and 55 feet above mean lower low water (MLLW) (Ackley Jensen Architects, Inc. 1983).

Project Understanding

A recent Facility Condition Assessment of the PMC indicates that some of the building components and systems are nearing the end of their useful life. Accordingly, PMC has begun to explore renovation versus new construction alternatives. The alternative locations under consideration, along with the existing location of the PMC, are shown in Figure 1. Elevation is a key parameter for all of the location alternatives, at least with respect to inundation. Therefore, Table 1 lists the approximate elevations of the existing PMC site and the alternative sites.

Alternatives 1 through 3 all exhibit a similar inundation hazard profile because the sites are all immediately upslope of the existing PMC and at comparable elevations. Alternative 4 is somewhat distinct in that its site is upslope of the northeast end of Petersburg and at an elevation only slightly higher than the existing PMC. The relatively low elevation of the Alternative 4 site subjects this location to an increased probability of inundation, particularly associated with tsunami and storm surge events originating in Frederick Sound.

Figure 1. Map of the existing PMC and proposed alternative locations (from NAC Architecture). Small red H denotes the location of the existing PMC, while the numbered red circles indicate the alternative locations.

Table 1. Approximate Elevations of the Existing PMC Site and Proposed Alternative Sites.

Location	Elevation range in feet above MLLW
Existing PMC	40-55*
Alternative 1	80-90
Alternative 2	75-90
Alternative 3	70-80
Alternative 4	50-70

*From Ackley Jensen Architects, Inc. (1983)

Sea Level Rise

Sea level rise is an important consideration for a critical facility located close to marine waters, as is the case with the PMC. A key component in estimating future sea level rise is vertical land movement (Sweet et al. 2017). There is no vertical land movement data for Petersburg, but there is for Ketchikan. Ketchikan has not experienced any sea level rise in the historical record due to this effect (NOAA 2019b). The lack of historical sea level rise is a result of tectonic uplift associated with the collision of the Pacific and North American plates. Although Ketchikan is over 100 miles away from Petersburg, given its similar location with respect to the plate boundaries, it is expected that tectonic uplift will also mitigate some of the effects of sea level rise at Petersburg.

Even if no tectonic uplift occurs in Petersburg, the ground elevation at the existing PMC site is sufficient to avoid even the most extreme projected sea level scenarios prior to year 2150 (Sweet et al. 2017). The latest predictions suggest that even the most extreme predictions in 2200 will only inundate portions of the existing PMC. The other alternatives are higher than even the worst-case values in 2200.

Storm Surge

Storm surge refers to elevated sea level associated with wind and low atmospheric pressure. Waves often contribute to storm surge, but wave heights are modest in the Wrangell Narrows. Like other protected passages in the Pacific Northwest (Finlayson 2006), waves are mostly generated by local winds and boat wakes and are only a few feet high at the windiest times.

Storm surge is typically estimated from analyses of tide gages. Although a temporary gage was installed to understand the relationship between the tides at Petersburg compared to its reference station at Ketchikan (NOAA 2019a), none of that data is publicly available. The best data available for assessing storm surge at Petersburg are from the Ketchikan tide gage (NOAA 2019b). From this data, NOAA (2019b) estimates the 100-year (1% chance of exceedance in a

given year) water level to be approximately 21 feet above MLLW. Because the lowest elevation of the existing PMC is 40 feet above MLLW, at least 19 feet of sea level rise is required to inundate the existing PMC in relation to atmospheric and oceanographic processes. Substantially more sea level rise would need to occur to inundate the alternative PMC sites.

TSUNAMIS

Many tsunamis have occurred within the last 100 years in Southeast Alaska. Even more have occurred in recent geologic time. Therefore, the threat of tsunami-induced inundation of a critical facility, such as a hospital, in southeast Alaska is real and serious. There are several mechanisms by which a tsunami could impact the Petersburg area. Each mechanism generates a different type of tsunami and the probability of each mechanism is dramatically different. Therefore, each mechanism is discussed separately below.

Earthquake Generated Tsunamis

The most common type of tsunami is generated by large, distant (outside the northeast Pacific Ocean) earthquakes. These types of tsunamis occur every few years on average. The most recent large tsunami of this type occurred in March 2011 as a result of the Tohoku event in Japan (Allan et al. 2012). However, as detailed by Suleimani et al. (2018), interior portions of Southeast Alaska, like Ketchikan, are protected from these events by large islands to the west. In the 2011 Tohoku event, the tsunami height at Ketchikan was only 0.11 meter (0.4 foot). Like Ketchikan, Petersburg is much more protected from open ocean tsunamis than other Southeast Alaska locations, so it is likely that the tsunami height at Petersburg stemming from the Tohoku event was smaller than the small tsunamis observed in outer Southeast Alaska (e.g., at Craig where it was approximately 1 foot high). Since the Tohoku event occurred due to the fourth largest earthquake in recorded history, and it is highly unusual for earthquakes to be any larger than that earthquake, it is impossible for a standard, distant tectonic event to produce a tsunami that could inundate the existing PMC.

Considerable modeling has been performed recently on local subduction earthquakes in Southeast Alaska. Unlike distant earthquakes such as the Tohoku event off the coast of Japan, local subduction earthquakes can produce significant tsunamis in the area. In particular, Suleimani et al. (2018) provide insight into the propagation of tsunami waves from these local events. Although the focus of their study was at Port Alexander, Craig and Ketchikan and did not include Petersburg, Suleimani et al. (2018) document a range of simulations that indicate earthquake tsunamis can be produced that exceed 10 feet in height in developed areas of outer Southeast Alaska, where tsunamigenic (tsunami producing) earthquakes occur. However, for protected interior areas, such as Petersburg, tsunami heights generated by these types of earthquakes are much smaller. Suleimani et al. (2018) ultimately use a maximum runup height of 1.43 meters (or slightly less than 5 feet) for Ketchikan. Since Petersburg is at least as protected

as Ketchikan, it is not possible for a local subduction earthquake to generate a tsunami that would inundate the existing PMC.

Pro-glacial Tsunamis

Pro-glacial tsunamis occur when a large landslide or ice sheet calving occurs amid a tidewater glacier. The wave generated by the landslide and/or ice displacing sea water causes run-up of sea water on to nearby land. A recent pro-glacial tsunami occurred in 2015 in Taan Fiord, an arm of Icy Bay, approximately 375 miles northwest of Petersburg (Higman et al. 2018). The maximum run-up of this tsunami was 192 meters (approximately 630 feet). The glacial landslide occurred due to rapid retreat of Tyndall Glacier, a tidewater glacier, in addition to the melting of permafrost on adjacent slopes, causing those slopes to destabilize (Higman et al. 2018). The giant 1958 Lituya Bay tsunami, which produced the largest runup of any historical tsunami known, was also a pro-glacial tsunami (Higman et al. 2018), though its initiation mechanism was somewhat complex because the landslide was triggered by a large earthquake (Doser 2010).

As pointed out by recent analysis of the Taan Fiord event, these types of events are probable and likely to increase in frequency with climate change (Higman et al. 2018). The nearest tidewater glaciers to Petersburg are the Baird Glacier in Thomas Bay and the Le Conte Glacier in Le Conte Bay. Both are approximately the same distance from Petersburg (about 20 miles) and both are geographically similar to Tyndall Glacier. There is an ongoing risk of a tsunami occurring near the terminus of either glacier within the confines of either bay.

Based upon the analogy with the Taan Fiord tsunami, it is likely that if a tsunami were to occur in either of these bays, inundation in Petersburg would be minimal. In the absence of modeling both the landslide and the tsunami, it is difficult to speculate about inundation extents, but the tsunami generated in Taan Fiord did not propagate far into Icy Bay, despite its exceptionally large peak runup in Taan Fiord. This is understandable because Icy Bay is large and deep and capable of dissipating even large waves in a smaller arm of the bay. In fact, the tsunami impacts were unidentifiable just 5 kilometers (about 3 miles) from the mouth of Taan Fiord (Higman et al. 2018). The equivalent in the case of both possible pro-glacial tsunami source areas in Thomas Bay and Le Conte Bay would be impacts no more than 3 miles from the mouths of these bays into Frederick Sound. Frederick Sound is even larger and deeper than Icy Bay and Petersburg is more than 12 miles from the mouths of either bay. Therefore, a tsunami generated in either Thomas or Le Conte bay would have to be orders of magnitude larger than the Taan Fiord event to even reach Petersburg, let alone to inundate the existing PMC. It is thus highly unlikely that a pro-glacial tsunami would inundate the existing PMC or any of the alternative PMC sites.

Subaerial Landslide Generated Tsunamis

Landslide-generated tsunamis in the absence of recent deglaciation are extremely rare but have been known to occur. Although the cause of the tsunami event in 1958 Lituya Bay is considered

to be a pro-glacial landslide, the mechanism by which it was generated (i.e., earthquake-triggered liquefaction) could occur anywhere where there is seismicity and steep terrain, like Petersburg.

At Petersburg, Petersburg Mountain is probably the only source of a landslide sufficient to produce a tsunami that could potentially impact the existing PMC. The mountain rises over 2700 feet in approximately one mile distance from Wrangell Narrows. The steepness of the mountain indicates potential for a catastrophic slope failure that could generate a large landslide mass, but the likelihood of such a failure is entirely unknown and speculative. Unlike at Lituya Bay, which has seen two different tsunami events in historical time (Higman et al. 2018), there is no evidence for past catastrophic landsliding on Petersburg Mountain. There is also no evidence of past flank collapses anywhere on the mountain (either in historical time or in the geologic past), and there are no mapped landslides in the geologic map of the area (Brew et al. 1984). Therefore, a flank collapse at Petersburg Mountain would be an unexpected event and highly unlikely to occur. If it were to occur, it could inundate the entire populated area of Petersburg, including the existing PMC and all proposed alternatives.

Submarine Landslide Generated Tsunamis

A final possibility for a tsunami mechanism in the Petersburg area is a submarine landslide, like the one that occurred in Skagway in 1994 (Suleimani and Dickson 2018). However, submarine landslides are highly unlikely in the Wrangell Narrows. Unlike Taiya Inlet near Skagway, Wrangell Narrows is relatively shallow (between 20 and 30 feet deep for the reach adjacent to Petersburg: National Ocean Survey 1978). The shallow water depth does not allow for a significant mass of submarine sediment to move laterally at fast speed. Also, the dominant sediment supply to this portion of the Wrangell Narrows, Petersburg Creek, is modest compared to the Skagway River. The type of tsunami that occurred in Taiya Inlet in 1994 requires a large accumulation of recently deposited sediment to suddenly slump into deeper water. In the Wrangell Narrows, sediment is well dispersed and does not form a large delta. While it is possible that a failure of a submarine slope into deep portions of Fredrick Sound could produce a tsunami, it is unlikely. The potential for an event of this type to generate a tsunami height that could reach the elevation of the existing PMC or any of the alternative PMC sites is negligible.

Conclusions

Table 2 summarizes the threats of inundation to the existing PMC and the proposed alternative PMC locations. The risk of inundation, particularly with respect to other locations in southeast Alaska, is extremely low at the current location of the PMC. While some of the alternative locations (Alternatives 1 through 3 in Figure 1) provide a modest reduction in probability of inundation due to their higher ground elevations relative to the existing PMC site, the most severe type of tsunami that could occur in the Petersburg area (a tsunami generated from a

large flank collapse of Petersburg Mountain that is seemingly extremely unlikely) could cause inundation of all the proposed alternative sites.

Table 2. Inundation Analysis Summary

Event	Probability of Occurrence	Inundation at Site		
		Existing PMC	Alternatives 1-3	Alternative 4
Sea level rise and storm surge	Certain	None before 2150	None before 2200	None before 2200
Distant earthquake tsunami	Certain and frequent	None	None	None
Local earthquake tsunami	Certain but infrequent	None	None	None
Pro-glacial tsunami	Possible	Highly unlikely	Extremely unlikely	Highly unlikely
Petersburg Mountain flank collapse tsunami	Highly unlikely	Total inundation potential	Total inundation potential	Total inundation potential
Submarine landslide tsunami	Highly unlikely	Highly unlikely	Extremely unlikely	Highly unlikely

CAVEATS TO THE ANALYSIS

This analysis was based on an examination of the scientific literature and publicly available information. Tsunamis and other geophysical processes are fundamentally unpredictable phenomena. No on-site survey was performed of the south flank of Petersburg Mountain, the primary area where a large-scale landslide could conceivably occur that could in turn initiate a tsunami capable of inundating the existing PMC. Minor flooding from local surface water runoff was not considered but could easily occur at the existing PMC site if not addressed, particularly in light of aging stormwater infrastructure and anticipated sea level rise.

Please let me know if you have any questions regarding the information presented in this letter.

Sincerely,

Herrera Environmental Consultants, Inc.

Jeff Parsons, PhD, PE
Geomorphologist

REFERENCES

Ackley Jensen Architects, Inc. 1983. Petersburg General Hospital Plans. Prepared for City of Petersburg. April 1983.

Allan, J.C., P.D. Komar, P. Ruggiero, and R. Witter. 2012. The March 2011 Tōhoku Tsunami and Its Impacts along the U.S. West Coast. Journal of Coastal Research 28(5):1142-1153.

Brew, D.A., A.T. Ovenshine, S.M. Karl, and S.J. Hunt. 1984. Preliminary Reconnaissance Geologic Map of Petersburg and Parts of the Port Alexander and Sumdum 1:250,000 Quadrangles, Southeastern Alaska. USGS Open File Report 84-405.

Doser, D.I. 2010. A Reevaluation of the 1958 Fairweather, Alaska Earthquake Sequence. Bulletin of the Seismological Society of America 100(4):1792–1799.

Finlayson, D. 2006. The Geomorphology of Puget Sound Beaches. PhD Thesis. University of Washington, Seattle.

Higman, B., D.H. Shugar, C.P. Stark, G. Ekström, M.N. Koppes, P. Lynett, A. Dufresne, P.J. Haeussler, M. Geertsema, S. Gulick, A. Mattox, J.G. Venditti, M.A.L. Walton, N. McCall, E. Mckittrick, B. MacInnes, E.L. Bilderback, H. Tang14, M.J. Willis, B. Richmond, R.S. Reece, C. Larsen, B. Olson, J. Capra, A. Ayca, C. Bloom, H. Williams, D. Bonno, R. Weiss, A. Keen, V. Skanavis, and M. Loso. 2018. The 2015 landslide and tsunami in Taan Fiord, Alaska.

Miller, I.M., H. Morgan, G. Mauger, T. Newton, R. Weldon, D. Schmidt, M. Welch, and E. Grossman. 2018. Projected Sea Level Rise for Washington State – A 2018 Assessment. A collaboration of Washington Sea Grant, University of Washington Climate Impacts Group, Oregon State University, University of Washington, and US Geological Survey. Prepared for the Washington Coastal Resilience Project.

NOAA. 2019a. Petersburg, AK Gage #9451439 Tides and Currents website. Available at: https://tidesandcurrents.noaa.gov/stationhome.html?id=9451439.

NOAA. 2019b. Ketchikan, AK Gage # 9450460 Tides and Currents website. Available at: https://tidesandcurrents.noaa.gov/stationhome.html?id=9450460.

National Ocean Survey. 1978. Alaska, Wrangell Narrows Hydrographic Survey H-9791.

Suleimani, E. and I. Dickson. 2018. Landslide tsunamis: Why they're different and how to prepare. Alaska Earthquake Center website. Available at: <https://earthquake.alaska.edu/landslide-tsunamis-why-theyre-different-and-how-prepare>. June 10, 2018.

Suleimani, E., D.J. Nicholsky and R.D. Koehler. 2018. DRAFT Regional Tsunami Hazard Assessment for the Communities of Port Alexander, Craig and Ketchikan in Southeast Alaska. Available at: <http://earthquake.alaska.edu/sites/default/files/SE_Report_v0_FORMATTED_10-24-18.pdf>.

Sweet, W.V., R.E. Kopp, C.P. Weaver, J. Obeysekera, R.M. Horton, E.R. Thieler, and C. Zervas. 2017. Global and Regional Sea Level Rise Scenarios for the United States. NOAA Technical Report NOS CO-OPS 083. January.

Navigant Financial Analysis

PETERSBURG MEDICAL CENTER MFP MARKET ANALYSIS

SEPTEMBER 2019

NAVIGANT

TABLE OF CONTENTS

Agenda Item
1. Setting the State & Industry Trends
2. Petersburg Market Assessment
3. PMC Internal Situation Assessment
4. Bed Demand Modeling
5. Financial Projections and Debt Capacity
6. Next Steps
7. Appendix

 / ©2019 NAVIGANT CONSULTING, INC. ALL RIGHTS RESERVED

SETTING THE STAGE & INDUSTRY TRENDS

NAVIGANT

THE CHANGING NATIONAL HEALTHCARE LANDSCAPE

The"7 Cs" impacting healthcare

1. ***Changes to regulations*** *are uncertain*
2. ***Contraction*** *of inpatient volumes*
3. ***Chronic Disease and Care Management*** across the continuum
4. ***Consolidation*** *of providers*
5. ***Compression*** *of margins*
6. ***Consumerism*** *comes to healthcare*

7. Competing on value

 / ©2019 NAVIGANT CONSULTING, INC. ALL RIGHTS RESERVED

NAVIGANT

THE CHANGING NATIONAL HEALTHCARE LANDSCAPE

National trends are presenting challenges to all hospitals

National Trends	Implications for All Hospitals
Changes to regulations *are uncertain*	• Create flexibility in strategies to account for uncertainty
Contraction *of inpatient volumes*	• Think outside of the (hospital) "box"
Chronic Disease and Care Management across the continuum	• Focus on outpatient strategy, primary care, & improved care coordination will be critical
Consolidation *of providers*	• Pursue partnerships/affiliations and collaboration to support mission and vision
Compression *of margins*	• Focus on cost reduction and revenue enhancement opportunities
Consumerism *comes to healthcare*	• Deliver a differentiated patient experience that extends beyond acute care (e.g. virtual care and convenient access to care)
Competing *on value*	• Focus on providing high quality, patient-oriented, low cost care

 / ©2019 NAVIGANT CONSULTING, INC. ALL RIGHTS RESERVED

CHANGES TO REGULATIONS ARE UNCERTAIN

Growth of uncompensated care is a significant threat to CAHs

"According to the Urban Institute's analysis, repealing the ACA without a replacement would cause 30 million people (22.5 million due to loss of subsidies, Medicaid expansion, and the individual requirement to have health insurance, and 7.3 million due to ripple effects of market upheavals) to lose their healthcare, a number that would jump to 59 million by 2019."

Regulatory Uncertainty Impact by Segment and Implication for CAHs

Patients

- Potential loss of individual mandate and changes in essential benefits

- Increased patient financial responsibility may cause delays in patients seeking treatment and increased bad debt due to difficulties collecting from patients

Payers

- Uncertainty of the future of the insurance exchanges prompts payers to leave the Exchange

- Fewer payers in the Exchange increases payer concentration resulting in more challenging payer negotiations

Providers

- Potential changes in policy on Medicaid expansion, cost based reimbursement, DSH payments, and 340B

- As ~60% of CAH revenue comes from Medicare and Medicaid, there is a risk of growth in uncompensated care coupled with declining government payments

Source: Rural Impact Study 2017, CMS.gov. DSH: disproportionate share hospital.

 / ©2019 NAVIGANT CONSULTING, INC. ALL RIGHTS RESERVED

NAVIGANT

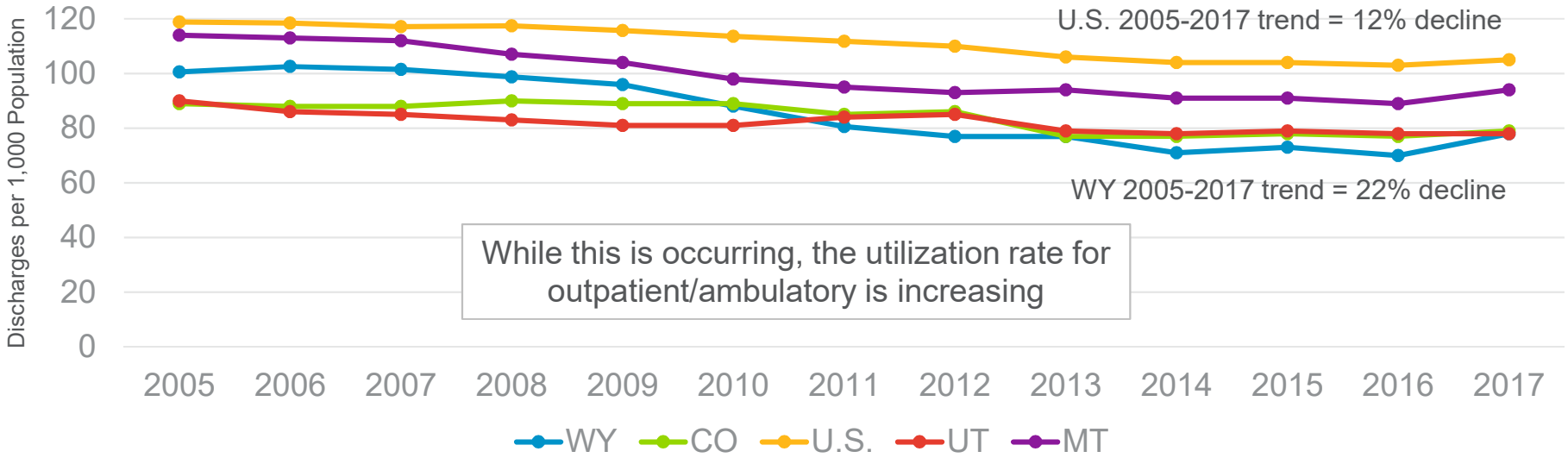
CONTRACTION OF INPATIENT VOLUMES

As inpatient use rates continue to decline, it will become even more difficult for CAHs to maintain critical mass for inpatient services

What's behind the decline in inpatient use rates?

- Advanced technology enables shorter length of stay and more services to be offered OP vs. IP (e.g. more minimally invasive procedures, telehealth, new drugs, etc.)
- Changes in payment models incentivizes providers to reduce length of stay and hospital readmissions
- Shift to population health management & improvements in care management (e.g. home health)

National and Regional Inpatient Use Rate Trends
(2005 – 2017)



Source: Kaiser Family Foundation; Navigant research and analysis.

 / ©2019 NAVIGANT CONSULTING, INC. ALL RIGHTS RESERVED

NAVIGANT

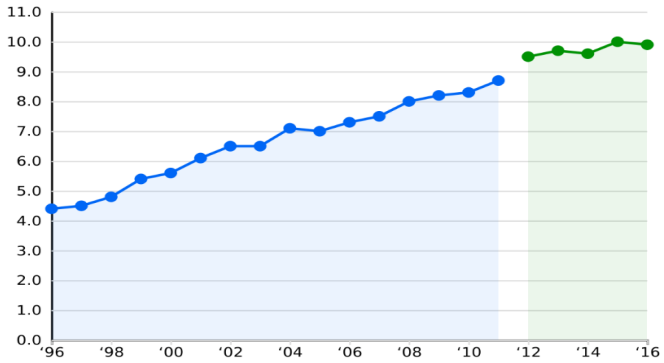
CHRONIC DISEASE AND CARE MANAGEMENT

Aging and chronic disease are inadequately addressed

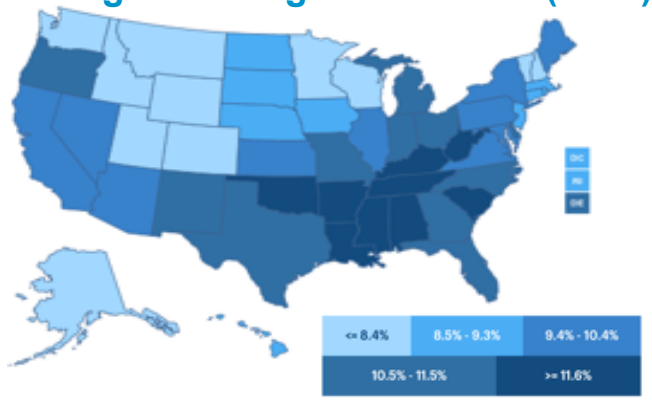
There are 10,000 new Medicare beneficiaries every day (1 every 7 seconds!)

- Chronic conditions account for a majority of Medicare spending growth
- 25% of Medicare beneficiaries have 5 or more chronic conditions
- Five chronic diseases—heart disease, cancers, stroke, COPD and diabetes—account for two-thirds of all deaths in the United States and chronic diseases account for 75% of national total health care costs
- Current health care infrastructure, which is designed to treat acute illness, is not effective at treating chronic illness and addressing personal behaviors associated with poor health

Adults living with Diagnosed Diabetes in the U.S. (1996 – 2016)



Prevalence of Diagnosed Diabetes Among Adults Aged 18+ Years (2016)



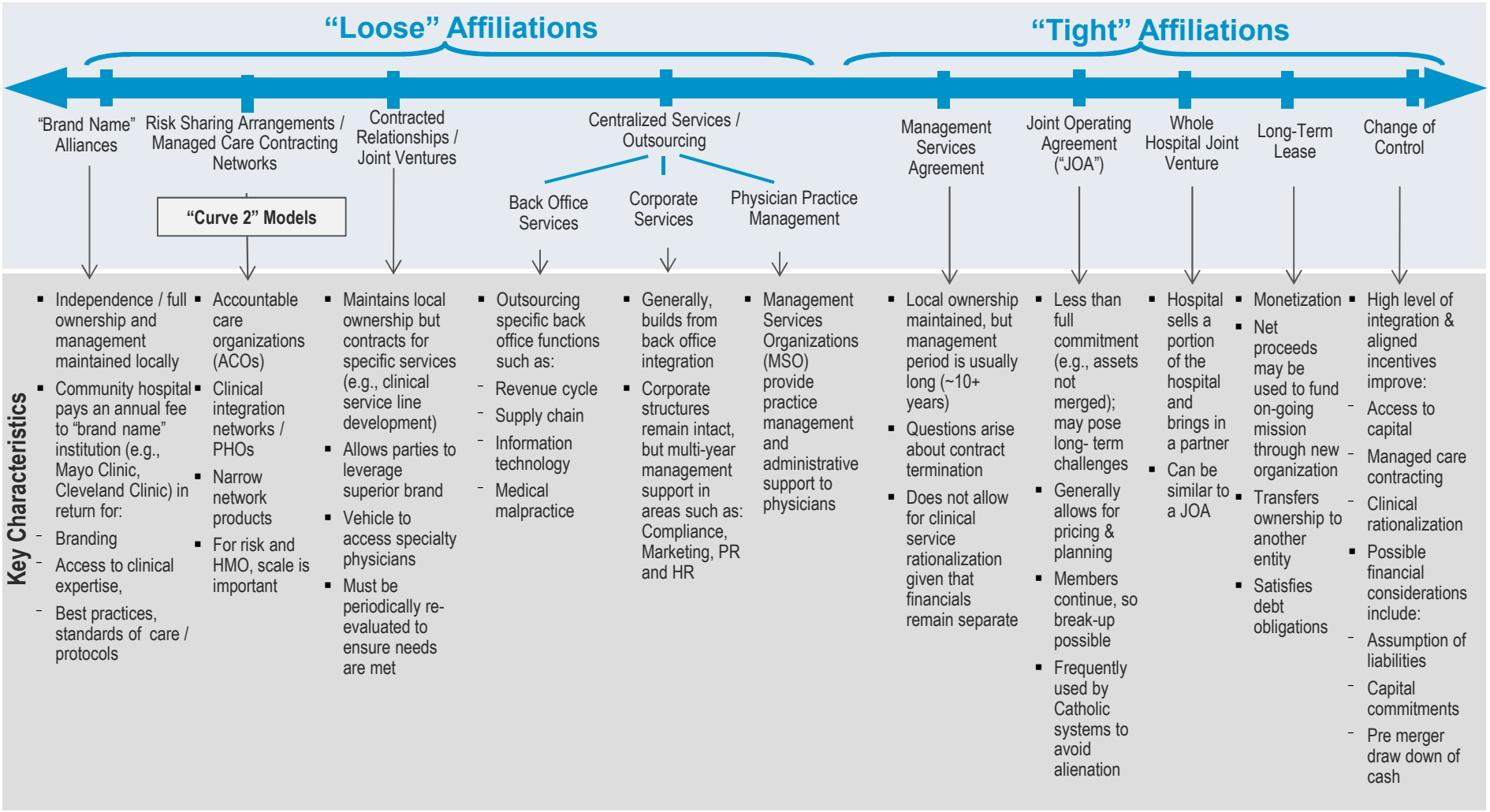
Sources: www.americashealthrankings.org; US Census Bureau; AHA Cost of Caring Report, AMA Health Care Trends, CDC

 / ©2019 NAVIGANT CONSULTING, INC. ALL RIGHTS RESERVED

NAVIGANT

CONSOLIDATION OF PROVIDERS

Nationally and regionally, providers are consolidating and pursuing a variety of affiliations



 / ©2019 NAVIGANT CONSULTING, INC. ALL RIGHTS RESERVED

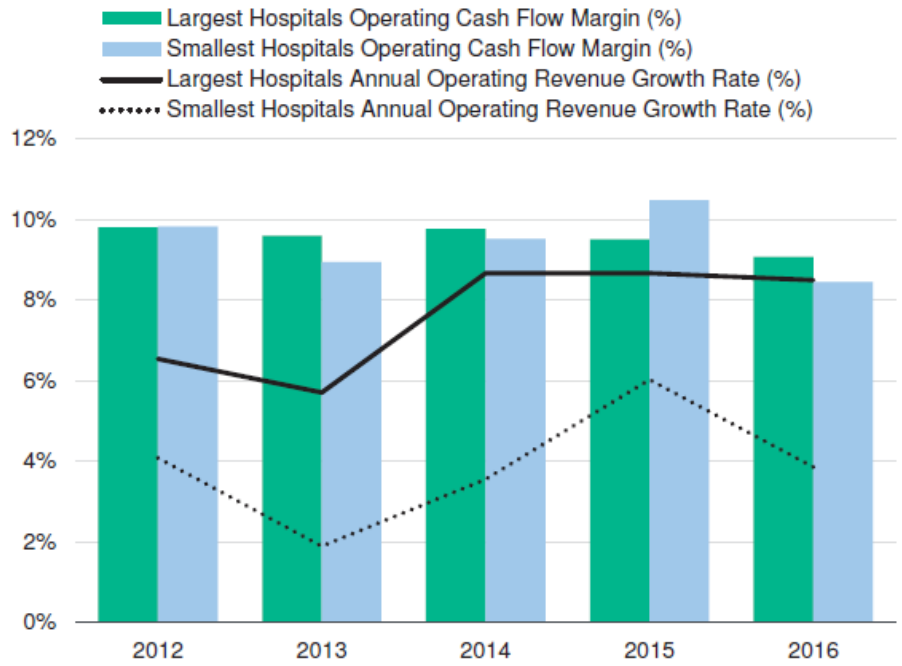
NAVIGANT

COMPRESSION OF MARGINS

Tighter margins will continue to weigh on CAHs going forward as reimbursement pressures remain and expenses increase

- Smaller hospitals saw operating cash flow margins decrease from 10.5% in 2015 to 8.5% in 2016, while larger hospitals saw a smaller drop from 9.5% to 9.1%.
- Factors contributing to margin declines include:
  - Continued shift to lower-reimbursed outpatient settings
  - Growing costs due to higher pharmaceutical costs, nursing shortages, rising pension contributions, investments in EMR/ other HIT, and increasing need to employ and/or align clinicians to meet requirements of population health management
- Given the majority of CAHs have negative net operating profit margins and low days cash on hand, continued margin pressure makes CAHs particularly vulnerable

Median Margins & Revenue Growth for 50 Smallest and 50 Largest Hospitals
(2012 – 2016)



Source: Fitch Ratings, Moody's. Note: 50 smallest and 50 largest not-for-profit and public hospitals were included in terms of total revenue were examined in the Moody's report.

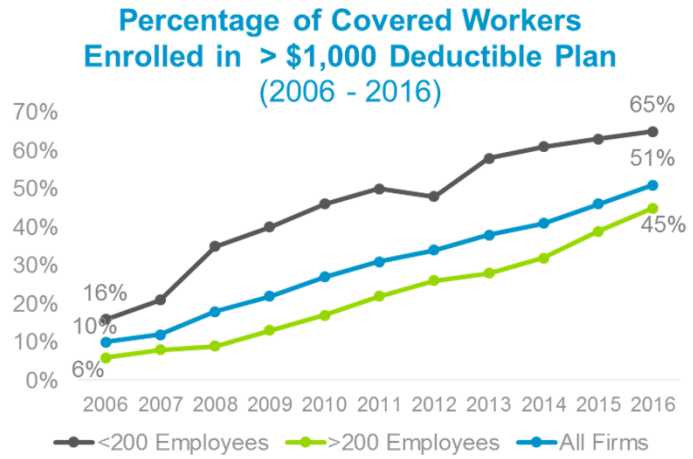
 ©2019 NAVIGANT CONSULTING, INC. ALL RIGHTS RESERVED

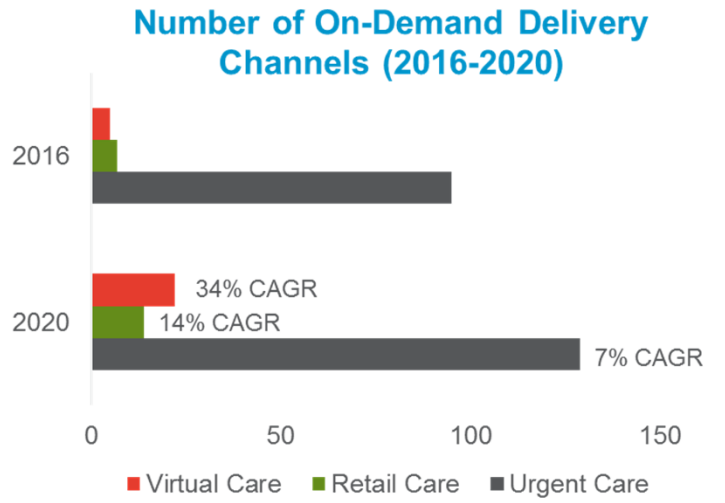
NAVIGANT

CONSUMERISM (FINALLY) COMES TO HEALTHCARE

Out-of-pocket costs rise for consumers, retail and "virtual" will matter…a lot!

- The importance of convenience, access, and the empowerment of consumers in directing their own healthcare will fuel "on demand" delivery channels
- This trend will address the fact that people under 40 are 50% more likely to not have an established primary care physician relationship and instead access primary care through on-demand providers such as urgent care, retail clinics or "virtual" providers





Source: Kaiser Family Foundation, Zipnosis

 ©2019 NAVIGANT CONSULTING, INC. ALL RIGHTS RESERVED

NAVIGANT

ASCENT OF CONSUMERISM

HALF of all people with employer provided coverage have a deductible of at least $1,000

Average family deductible for silver plans in the exchanges

$8,292

39% of large employers today offer their provided coverage staff **ONLY** high-deductible health plans

There were an estimated **22.2 MILLION HSA** accounts as of the end of 2017; **73%** have been opened since 2014

FOUR IN 10 ADULTS in 2017 would either **borrow, sell something, or unable to pay** if faced with a $400 emergency expense

Sources: Kaiser Family Foundation, Forbes, National Business Group on Health, Federal Reserve, EBRI

Rise of the high-deductible health plan has materially accelerated consumerism in the healthcare industry. Patients and payers are expending more energy on identifying and utilizing low cost, high quality access points in lieu of the traditional access points.

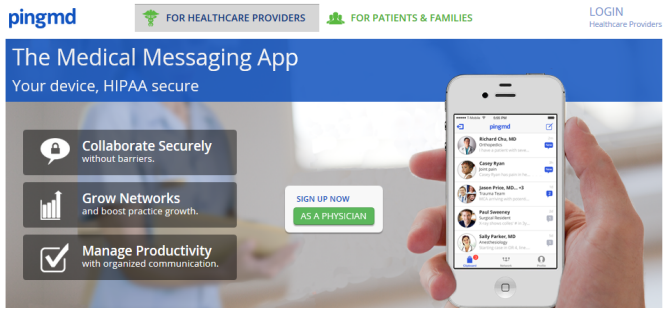
 ©2019 NAVIGANT CONSULTING, INC. ALL RIGHTS RESERVED

CONFIDENTIAL INFORMATION: NOT TO BE DISTRIBUTED.

CONNECTIVITY BETWEEN PATIENTS/FAMILIES & PROVIDERS

There is an explosion in patient demand for access to health data

- 21% of Americans are already tracking their health on some kind of electronic device
- There are more than 150 mobile apps on the market that can track or capture user-entered health data
- The Veterans Health Administration launched a home monitoring system in the mid 2000s. More than 144,000 high risk vets were monitored in 2013 for chronic conditions. A recent study showed a 25% reduction in hospital bed days and a 19% reduction in admissions.
- IHS, a data and analytics firm, projects the telemedicine market will grow at a rate of more than 50% a year, from $240 million in 2013 to $1.9 billion by 2018.



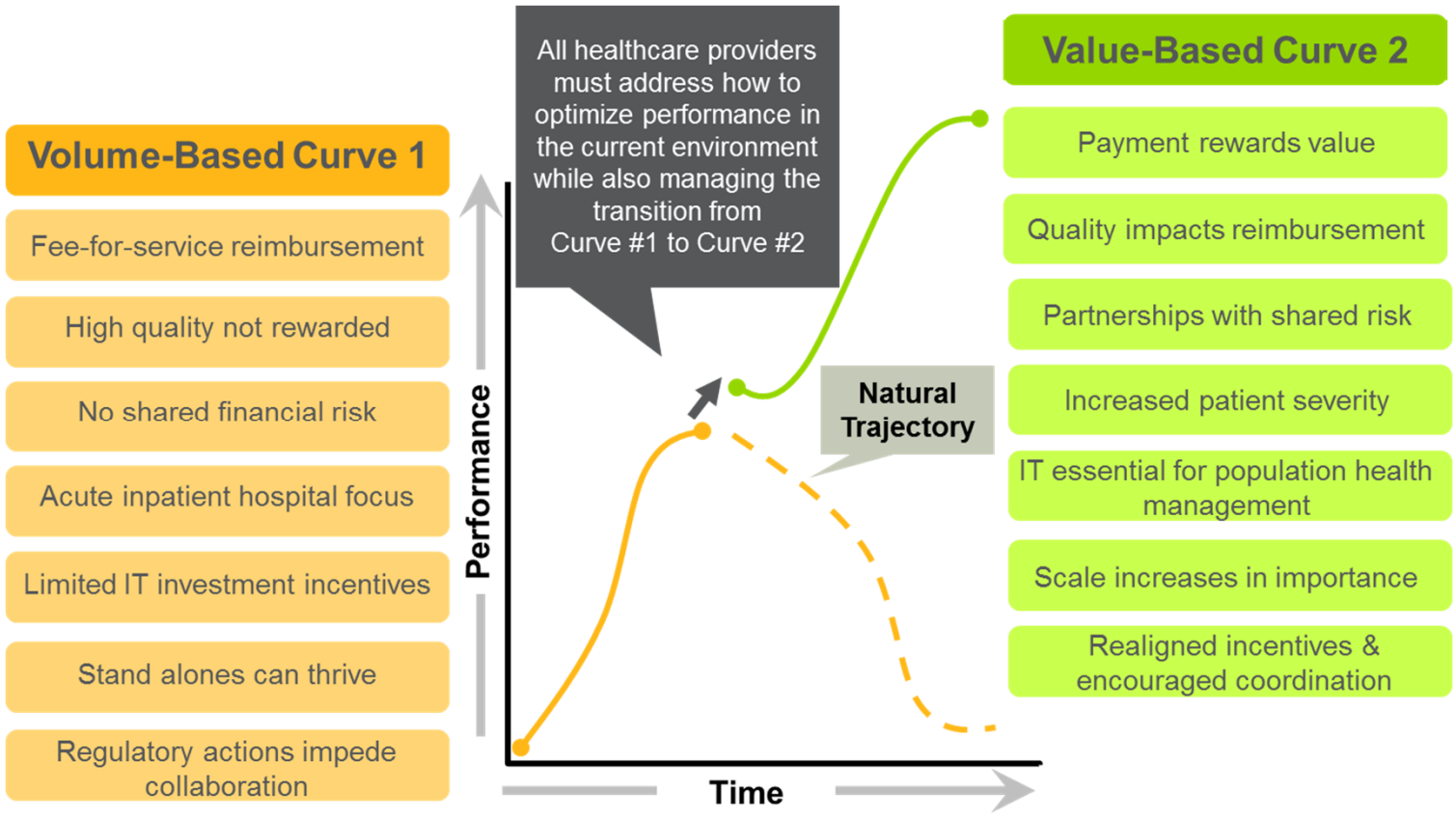
U.S. Department of Veterans Affairs

Sources: Pew Foundation, IMS Institute for Healthcare Informatics, IHS

 / ©2019 NAVIGANT CONSULTING, INC. ALL RIGHTS RESERVED

NAVIGANT

COMPETING ON VALUE



 / ©2019 NAVIGANT CONSULTING, INC. ALL RIGHTS RESERVED

NAVIGANT

MARKET FORCES ARE PUTTING CRITICAL ACCESS HOSPITALS AT RISK

- National trends will impact critical access hospitals (CAH), however specific trends will have greater implications given CAH's small scale, limited volume, and challenging market characteristics as well as a disproportionate reliance on government payments results in many having modest assets and financial reserves

Changes to regulations are uncertain

Contraction of inpatient volumes

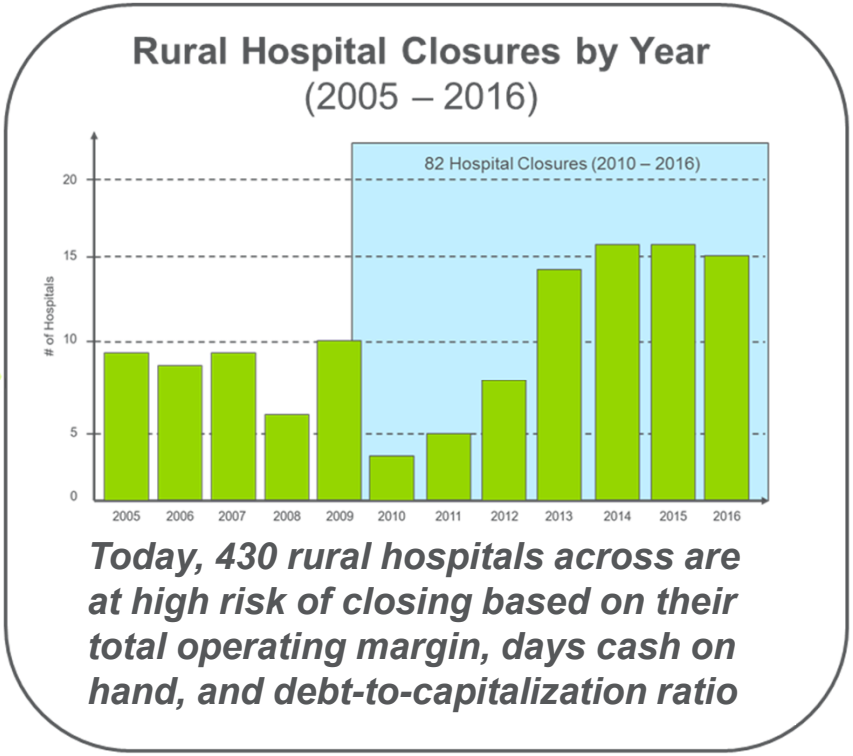
Chronic Disease and Care Management across the continuum

Consolidation of providers

Compression of margins

Consumerism comes to healthcare

Competing on value



Today, 430 rural hospitals across are at high risk of closing based on their total operating margin, days cash on hand, and debt-to-capitalization ratio

Source: AHA 2017, CMS.gov, HFMA, Navigant research and analysis. Note: Years in chart are non-sequential.

 ©2019 NAVIGANT CONSULTING, INC. ALL RIGHTS RESERVED

NAVIGANT

BE PART OF THE SOLUTION FOR NEW PATHWAYS TO GROWTH

BECKER'S HOSPITAL REVIEW

"The No. 1 takeaway from the 2019 JP Morgan Healthcare Conference: It's the platform, stupid"

January 11, 2019

"…***Moving from Being a Healthcare Provider to Creating a Platform for Health and Healthcare in Your Community***…

Your Action Plan — 6 Ideas from 25 Healthcare Delivery Systems on How to Leverage Your "Platform"

1. ***Create the Digital Front Door*** — or Someone Else Will
2. ***Drive Affordability and Reduce Cost*** — or Risk Being the Problem
3. ***Tackle Social Determinants of Health*** — or You Won't Be the Hub for Health in Your Community
4. ***Create Partnerships for Healthcare Innovation*** — or Lose the Upside
5. ***Become the Hub for Targeted Services and Chronic Conditions*** — or They Will Go Elsewhere
6. ***Leverage Applied Analytics*** — or You'll Lose Your Way

…While leveraging a platform as a business strategy is new to healthcare providers, the good news is that building blocks are already in place. It's time to leverage that platform to drive better outcomes and more affordable care in the community. And now is the time to get started."

 ©2019 NAVIGANT CONSULTING, INC. ALL RIGHTS RESERVED

WHAT ARE SUCCESSFUL CRITICAL ACCESS HOSPITALS DOING?

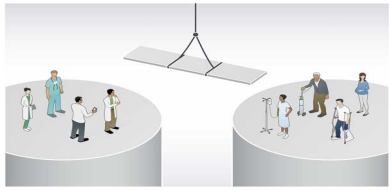
- Building capabilities across the care continuum to drive a more holistic approach to care and promote population health
- Developing new staffing models focused on top of license care
- Pursuing partnerships/affiliations with organizations to attract critical mass of lives, provide high quality care, and manage the health of their communities

 / ©2019 NAVIGANT CONSULTING, INC. ALL RIGHTS RESERVED

BUILDING CAPABILITIES ACROSS THE CARE CONTINUUM

In order to manage population health, providers are building their capabilities across the care continuum

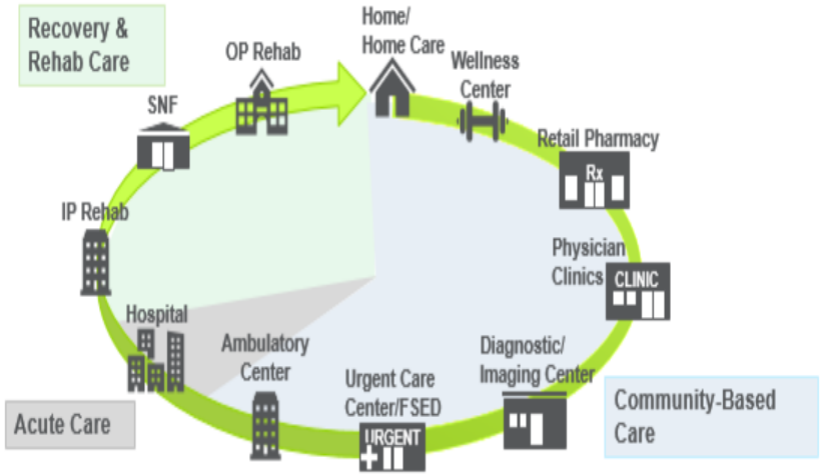
Healthcare of Yesterday: Acute Care Focus



- Acute care focus
- Volume-driven incentives
- Little attention paid to quality of life
- Limited quality and price transparency
- Limited coordination across care continuum
- Expensive

Healthcare of the Future: Focus on Managing Health Across the Care Continuum

- Reduce lifetime burden of illness by delaying the onset of chronic illness
- Minimize interactions with the acute care system & incorporate prevention and disease management into clinical care plan
- Focus on interventions in the community



Source: Navigant research and analysis.

 / ©2019 NAVIGANT CONSULTING, INC. ALL RIGHTS RESERVED

NAVIGANT

BUILDING CAPABILITIES ACROSS THE CARE CONTINUUM

CAH's are redesigning care by implementing initiatives to reduce healthcare costs, improve quality and population health management

CAH Care Redesign Strategies

Medical Homes

- As one of the primary sources of care in their local delivery system, rural and critical access hospitals are positioned to take the lead in patient-centered medical home (PCMH) initiatives
- PCMHs address some of the unique challenges that rural hospitals face such as staffing shortages, limited resources, and patient populations that are low-income or uninsured

Telehealth

- CAHs expand service offerings through telehealth by providing local access to specialty care
- Telehealth benefits:
  - Provides better access
  - Improves patient compliance
  - Lowers costs
- Examples of current telehealth at a CAH:
  - Digital mammography
  - Cardiologist follow-up appointments
  - Complex emergency cases

Prevention & Chronic Disease Management

- Prevention and chronic disease management are critical components of value-based care delivery
- Wellness and prevention initiatives range from the development of employee wellness programs to broader community health initiatives
- Chronic disease management programs are focused on heart failure and COPD to reduce readmission penalties. Innovative approaches include shared medical appointments and Nurse Practitioner led clinics.

Source: The Role of Hospitals in Medical Home Initiatives and Strategies to Secure Their Support and Participation. www.aha.org.

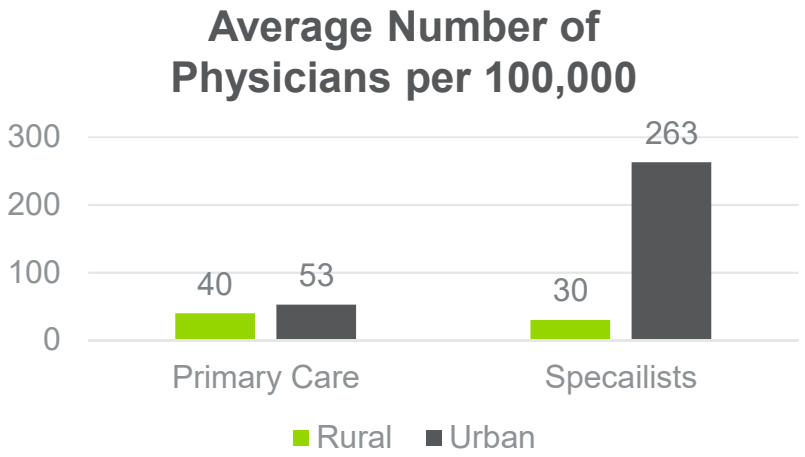
 ©2019 NAVIGANT CONSULTING, INC. ALL RIGHTS RESERVED

NAVIGANT

TOP OF LICENSE CARE

Rural physician shortages are a key driver in the development of new staffing models focused on top of license care

- The Association of American Medical Colleges (AAMC) projects shortages in both primary care and specialty physicians by 2025 and rural regions are expected to be the most impacted by these projected shortages
  - Average physician density in rural areas is much lower than in urban areas
- Top of license care can help address the impact of physician shortages
  - Research suggests advanced practice providers (APPs) lower costs and deliver guideline-based care
  - Cost of care for patients with nurse practitioner primary care provider was 11-29% less than the patients with a physician primary care provider
  - Researchers found that APPs were more likely to follow guidelines for COPD care, prescribing short-acting inhalers or oxygen therapy



Sources: AAMC, HRSA.gov, Ruralhealthweb.org.

 / ©2019 NAVIGANT CONSULTING, INC. ALL RIGHTS RESERVED

NAVIGANT

PARTNERSHIPS/AFFILIATIONS

Successful CAHs have pursued a variety of partnerships to attract critical mass of lives, provide high quality care & manage population health

1 Collaborating with Local Community Organizations

Objective: Coordinate community health initiatives

Example:

- Kossuth Regional Healthcare (CAH in IA) developed the Kossuth Wellness Initiative by bringing together community employers, city officials, hospital board members and staff, and other community leaders to plan strategies and initiatives to improve the health of the community
- The Wellness Initiative includes health fairs, walking trails, and health screenings

2 Partnering with Local Providers

Objective: Coordinate transitions of care and address underlying health care needs

Example:

- Abbeville Area Medical Center (CAH in SC) formed a joint venture with Abbeville County EMS and The SC Office of Rural Health to develop a Community Paramedicine program
- The program provides care coordination and home-based monitoring for patients in the community to reduce readmissions and ER visits

3 Affiliating with Regional/National Health Systems

Objective: Gain economies of scale

Examples:

- ~50% of CAHs are affiliated with an Integrated Delivery Network
- Example affiliations from Top 20 CAH list:
  - Carrington Health Center (ND) owned by Catholic Health Initiatives
  - Livingston HealthCare (MT) managed by Billings Clinic
  - Aspirus Ironwood Hospital & Clinics, Inc. (MI) and Aspirus Langlade Hospital (WI) owned by Aspirus System

Sources: iVantage Health Analytics 2017, Population Health Strategies of Critical Access Hospitals 2016, Definitive Healthcare.

 / ©2019 NAVIGANT CONSULTING, INC. ALL RIGHTS RESERVED

NAVIGANT

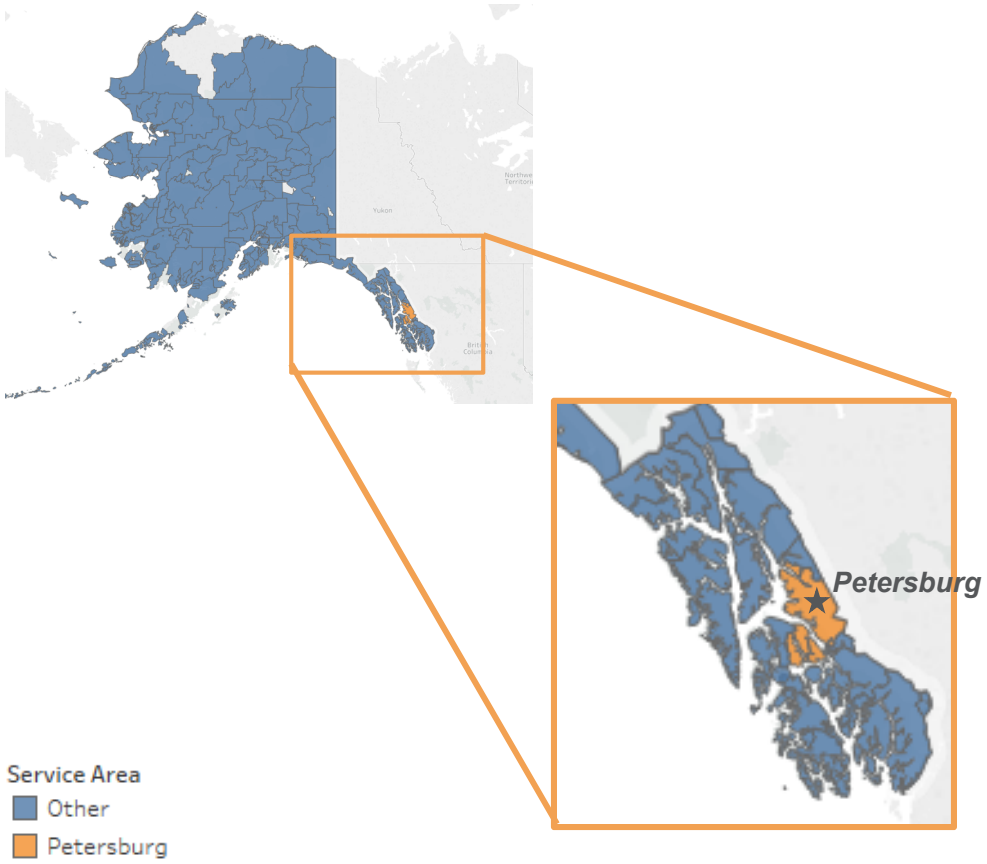
MARKET ASSESSMENT

NAVIGANT

PMC'S SERVICE AREA IS EXPECTED TO SEE A 3% INCREASE IN % OF POPULATION 65+ IN THE NEXT 5 YEARS

Petersburg Service Area Definition

Zip = 99833 (Petersburg, AK)



Service Area Market Demographics

2019 - 2024

Metric	2019	2024
Total Pop.	3,201	3,234
% Pop. 65+	15.4%	18.4%
IP Use Rate	66.5	68.5
% Pop. Unemployed	3.9%	N/A
Average Household Income	$85,235	$84,938
# of Households	1,368	1,392

 / ©2019 NAVIGANT CONSULTING, INC. ALL RIGHTS RESERVED

Source: Calritas Demographics (2019-2024). Truven Inpatient Estimates (2018).

NAVIGANT

PETERSBURG IS EXPECTED TO EXPERIENCE SLOWER POPULATION GROWTH, RELATIVE TO THE STATE

Service Area Market Demographics

2019-2024

Service Area Population by Age Cohort	2019	2024	5 Year Growth No.	5 Year Growth Percent	5 Year Growth CAGR
Age 0-17	721	733	*12*	*1.7%*	*0.3%*
Age 18-44	1,046	1,026	*(20)*	*-1.9%*	*-0.4%*
Age 45-64	940	879	*(61)*	*-6.5%*	*-1.3%*
Age 65-84	456	557	*101*	*22.1%*	*4.1%*
Age 85+	38	39	*1*	*2.6%*	*0.5%*
Service Area Total	**3,201**	**3,234**	***33***	***1.0%***	***0.2%***
Female Age 15-44	**540**	**535**	***(5)***	***-0.9%***	***-0.2%***

Service Area Population by Gender	2019	2024	5 Year Growth No.	5 Year Growth Percent	5 Year Growth CAGR
Female	1,515	1,539	*24*	*1.6%*	*0.3%*
Male	1,686	1,695	*9*	*0.5%*	*0.1%*
Service Area Total	**3,201**	**3,234**	***33***	***1.0%***	***0.2%***

Service Area Population Density	2019	2024
Service Area Population	3,201	3,234
Service Area Square Miles	3,552.0	3,552.0
Population Density (Persons per Sq Mile)	0.9	0.9

Alaska Market Demographic Comparison

2019-2024

Statewide Population by Age Cohort	2019	2024	5 Year Growth No.	5 Year Growth Percent	5 Year Growth CAGR
Age 0-17	185,752	187,260	*1,508*	*0.8%*	*0.2%*
Age 18-44	285,201	283,961	*(1,240)*	*-0.4%*	*-0.1%*
Age 45-64	183,447	177,040	*(6,407)*	*-3.5%*	*-0.7%*
Age 65-84	80,985	101,967	*20,982*	*25.9%*	*4.7%*
Age 85+	6,508	7,284	*776*	*11.9%*	*2.3%*
Total	**741,893**	**757,512**	***15,619***	***2.1%***	***0.4%***
Female Age 15-44	**146,069**	**146,201**	***132***	***0.1%***	***0.0%***

State Population by Gender	2019	2024	5 Year Growth No.	5 Year Growth Percent	5 Year Growth CAGR
Female	354,459	363,360	*8,901*	*2.5%*	*0.5%*
Male	387,434	394,152	*6,718*	*1.7%*	*0.3%*
Service Area Total	**741,893**	**757,512**	***15,619***	***2.1%***	***0.4%***

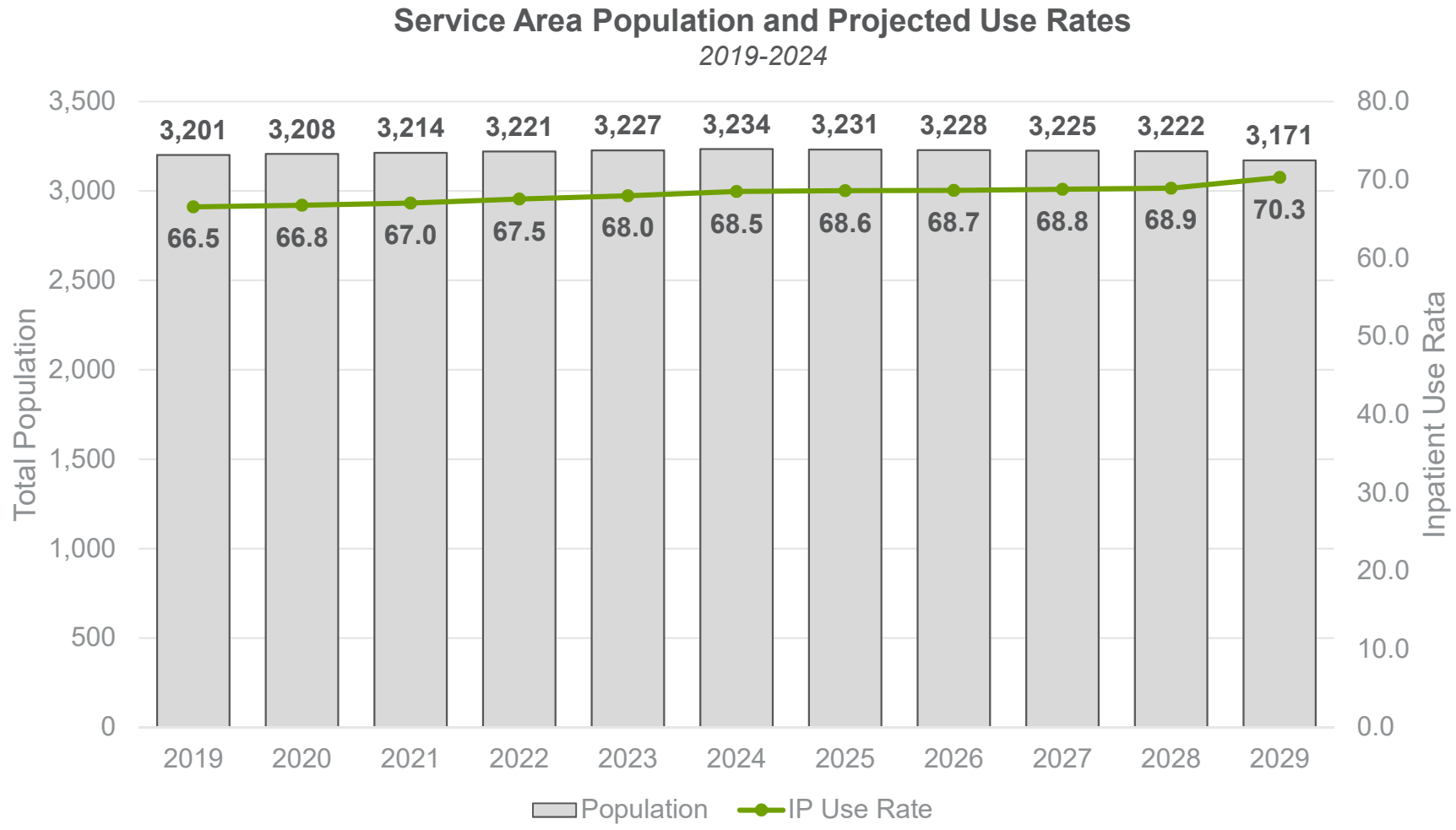
State Population Density	2019	2024
Service Area Population	741,893	757,512
Service Area Square Miles	574,136	574,136
Population Density (Persons per Sq Mile)	1.3	1.3

 / ©2019 NAVIGANT CONSULTING, INC. ALL RIGHTS RESERVED

Source: Calritas Demographics (2019-2024).

NAVIGANT

PETERSBURG POPULATION AND INPATIENT USE RATES ARE PROJECTED TO REMAIN RELATIVELY STAGNANT



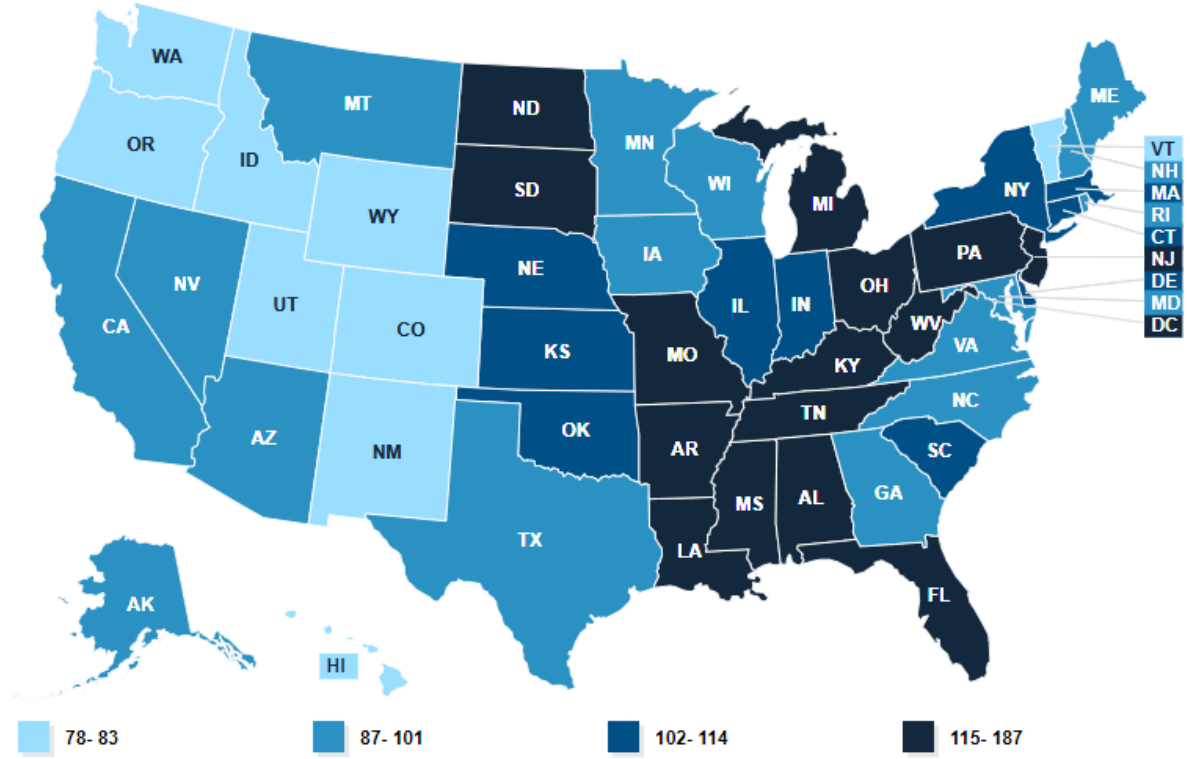
 / ©2019 NAVIGANT CONSULTING, INC. ALL RIGHTS RESERVED

NAVIGANT

PETERSBURG SERVICE AREA INPATIENT USE RATES ARE LOW RELATIVE TO STATE AND NATIONAL BENCHMARKS

- Alaska inpatient use rates per 1K population declined from 85 in 2008 to 69 in 2016.
- Petersburg inpatient use rates are relatively low compared to state and national benchmarks (90 and 105 respectively).

Hospital Admissions (IP Use Rates) per 1,000 Population
2017



AK IP Use Rate per 1K (2017)	90
Petersburg IP Use Rate per 1K (2019)	67

 / ©2019 NAVIGANT CONSULTING, INC. ALL RIGHTS RESERVED

NAVIGANT

PMC IS THE ONLY PROVIDER IN THE REMOTE SERVICE AREA HOWEVER OPPORTUNITY EXISTS TO ALIGN WITH SITES IN NEIGHBORING COMMUNITIES

PMC's Competitive Landscape

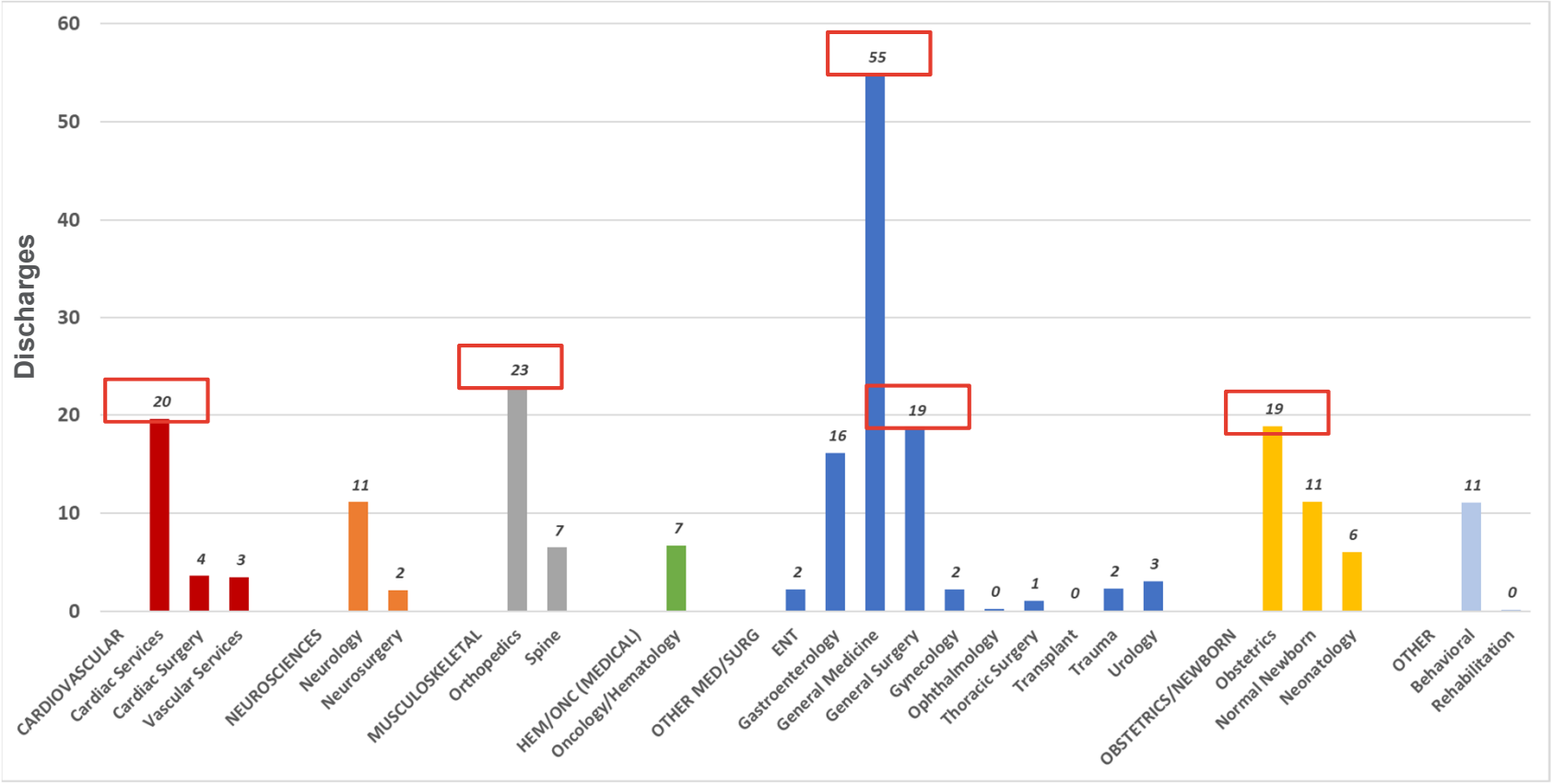
- PMC is the **only provider in the remote service area**.
- Due to the remote location of Mitkof island, there is **no direct competition for acute primary care, urgent care, emergency or inpatient services**.
- However, the following list of facilities are **possible competitors for chronic care management and post acute care**:
  - Wrangell Medical Center (Wrangell, AK)
  - Ketchikan Medical Center (Ketchikan, AK)
  - Bartlett Regional Hospital (Juneau, AK)
  - Swedish Medical Group (Seattle, WA)
  - Virginia Mason Medical Center (Seattle, WA)

 / ©2019 NAVIGANT CONSULTING, INC. ALL RIGHTS RESERVED

NAVIGANT

GENERAL MEDICINE, ORTHOPEDICS, CARDIAC, OB AND GENERAL SURGERY ARE THE HIGHEST IP VOLUME DRIVERS IN THE SERVICE AREA

Service Area Estimated Inpatient Market Volume by Service
2019



 / ©2019 NAVIGANT CONSULTING, INC. ALL RIGHTS RESERVED

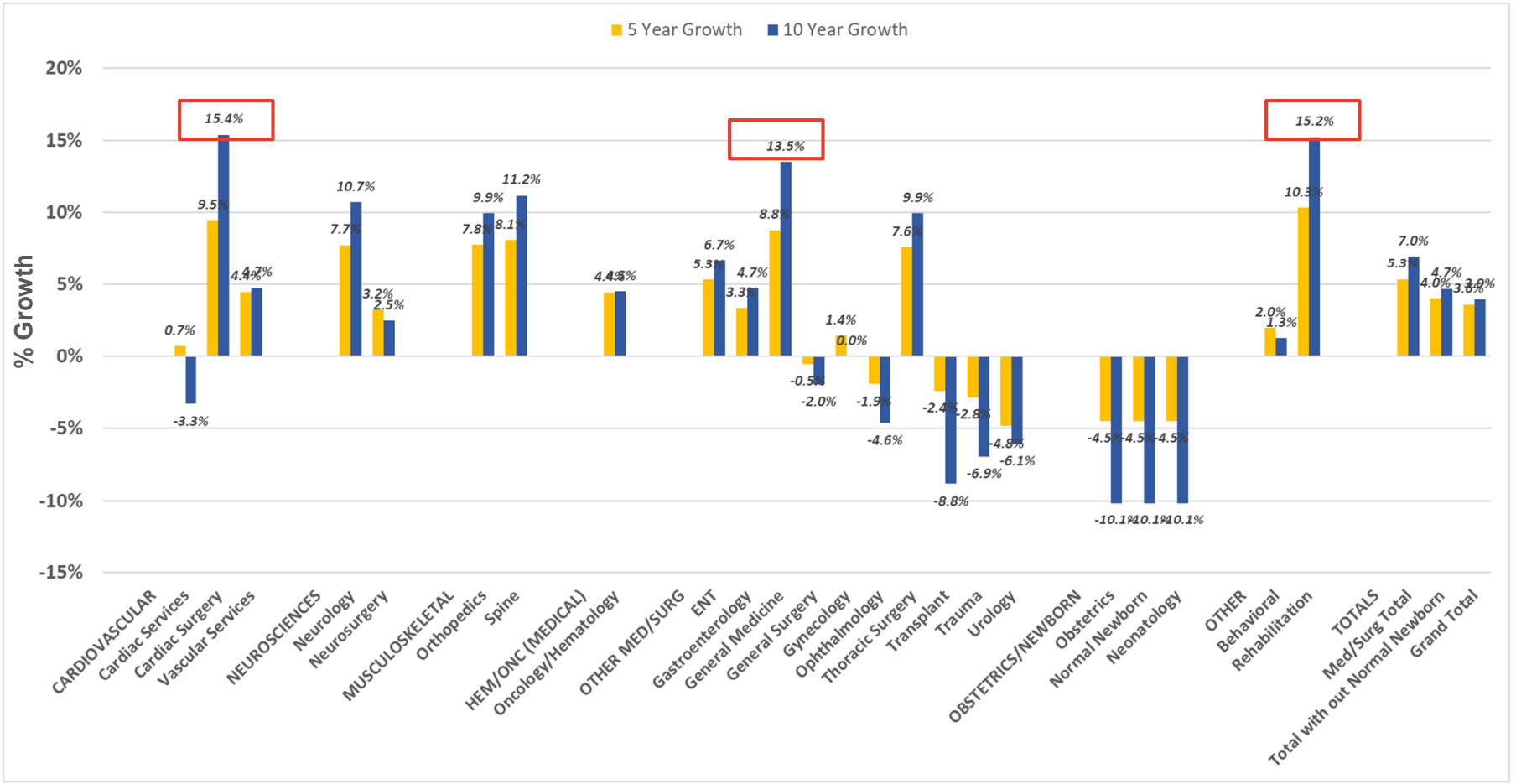
Source: Truven Data Analytics (2019)

NAVIGANT

THE INPATIENT MARKET IS EXPECTED TO GROW LESS THAN 1% PER YEAR – DUE TO AN AGING POPULATION AND RELATIVELY FLAT POPULATION GROWTH

Service Area Estimated Inpatient Market Growth by Service Line

2019-2029



 / ©2019 NAVIGANT CONSULTING, INC. ALL RIGHTS RESERVED

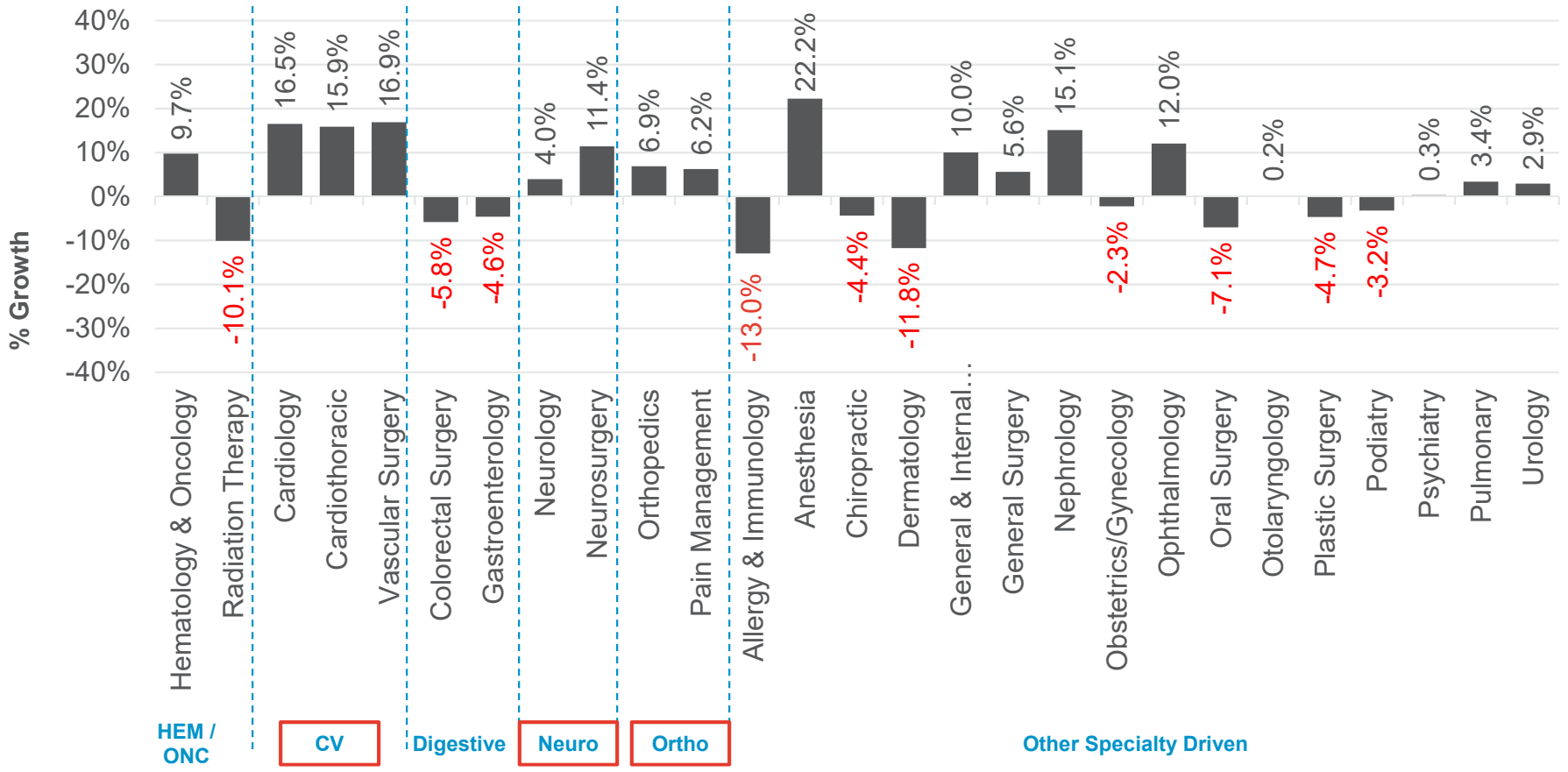
Source: Truven Data Analytics (2019)

NAVIGANT

OVERALL OUTPATIENT VOLUME WILL GROW SLIGHTLY MORE THAN INPATIENT VOLUME IN THE NEXT 5 YEARS

Petersburg Estimated Outpatient 10-Year Volume Growth by Service

2018-2028



 / ©2019 NAVIGANT CONSULTING, INC. ALL RIGHTS RESERVED

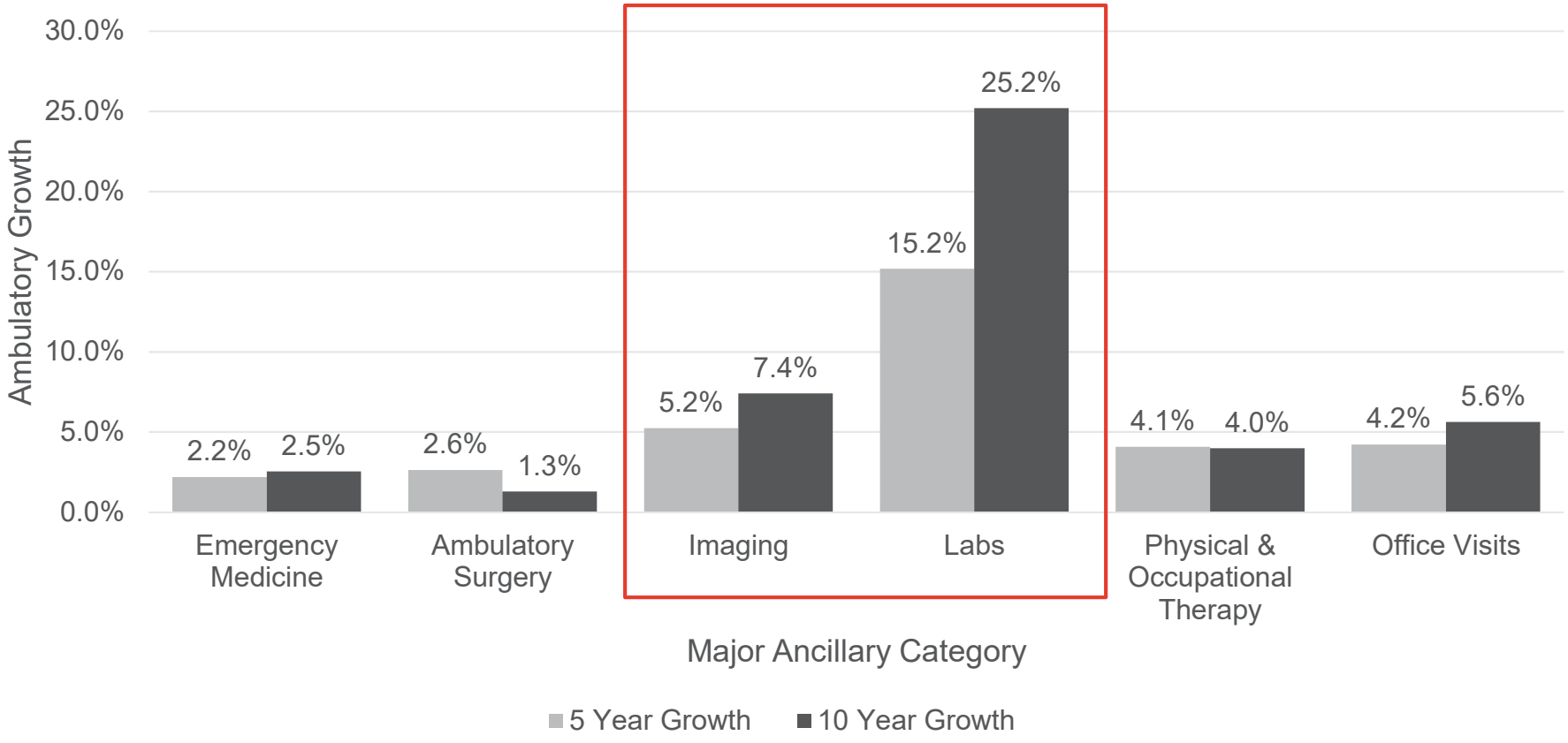
Source: Truven Data Analytics (2018)

NAVIGANT

LABS AND IMAGING ARE EXPECTED TO EXPERIENCE SIGNIFICANT GROWTH OVER THE NEXT 5-10 YEARS

PMC PSA Estimated OP 5 & 10 Year Volume Growth by Major Ancillary Category

2018-2028



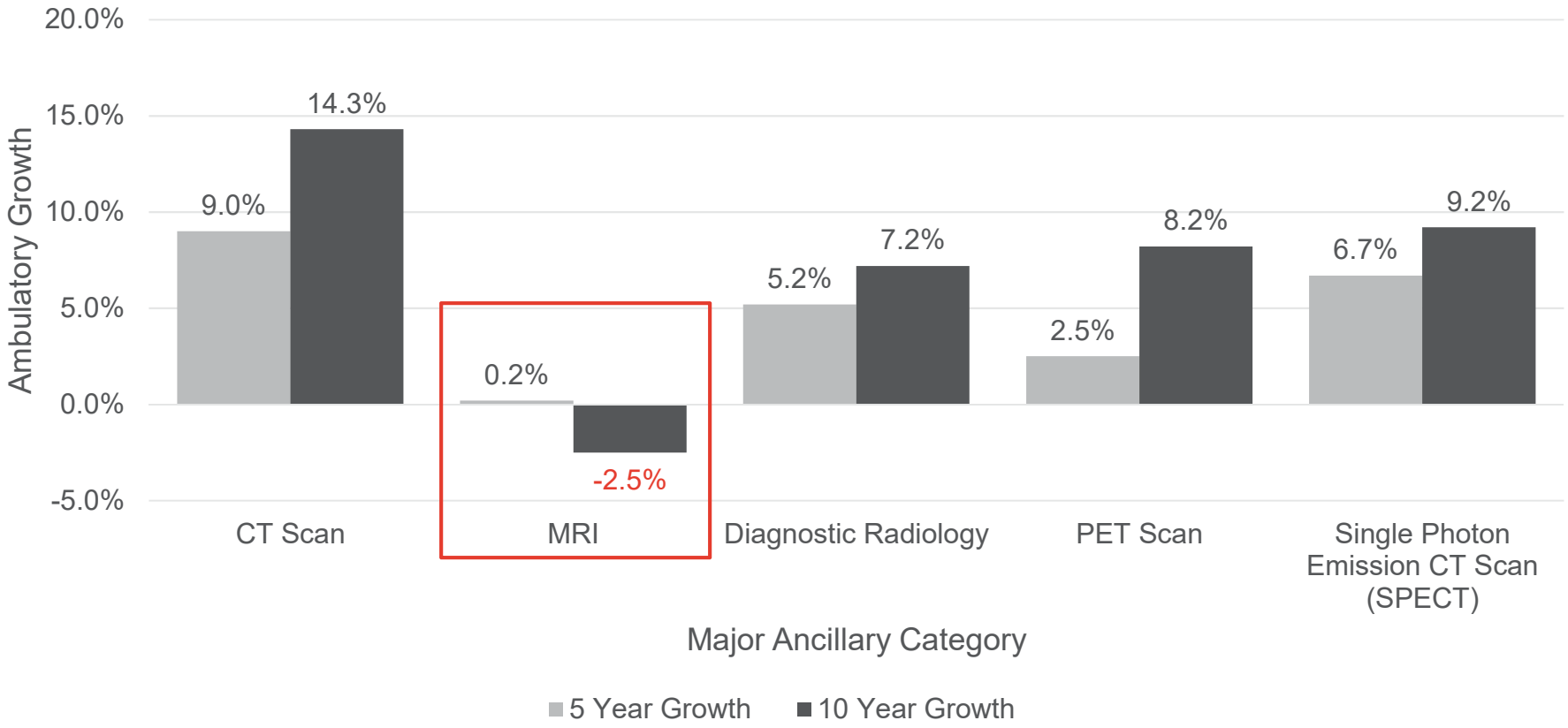
 / ©2019 NAVIGANT CONSULTING, INC. ALL RIGHTS RESERVED

Source: Truven Data Analytics (2018)

NAVIGANT

MAJORITY OF IMAGING / DIAGNOSTIC VOLUME WILL CONTINUE TO INCREASE, HOWEVER MRI SCANS ARE PROJECTED TO DECLINE OVER THE NEXT 10 YEARS

PMC PSA Estimated OP 5 & 10 Year Volume Growth by Imaging / Diagnostic X-Ray Modality
2018-2028



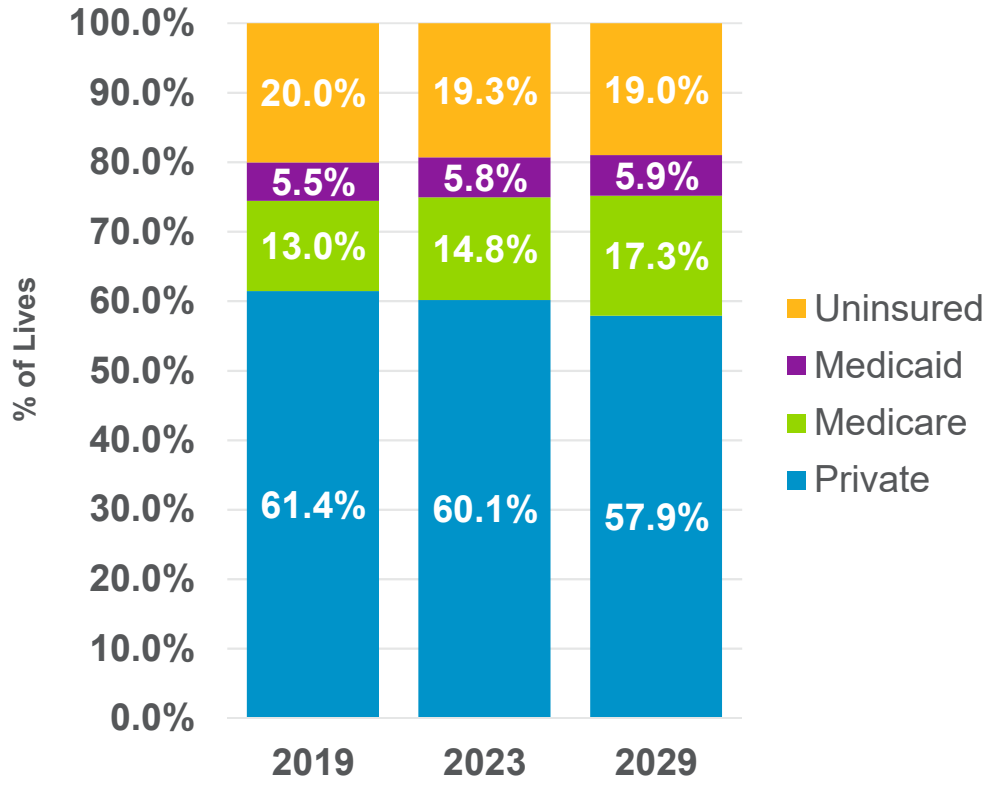
 / ©2019 NAVIGANT CONSULTING, INC. ALL RIGHTS RESERVED

Source: Truven Data Analytics (2018)

NAVIGANT

% OF MEDICARE PATIENTS IS PROJECTED TO GROW IN THE SERVICE AREA, IN LINE WITH AN AGING POPULATION

Service Area Insurance Coverage by Payer Type
2019-2019



Payer Group	5 Year Point Change	10 Year Point Change
Uninsured	(0.9%)	(1.3%)
Medicaid	0.2%	0.6%
Medicare	2.3%	2.2%
Private	(1.6%)	(1.6%)

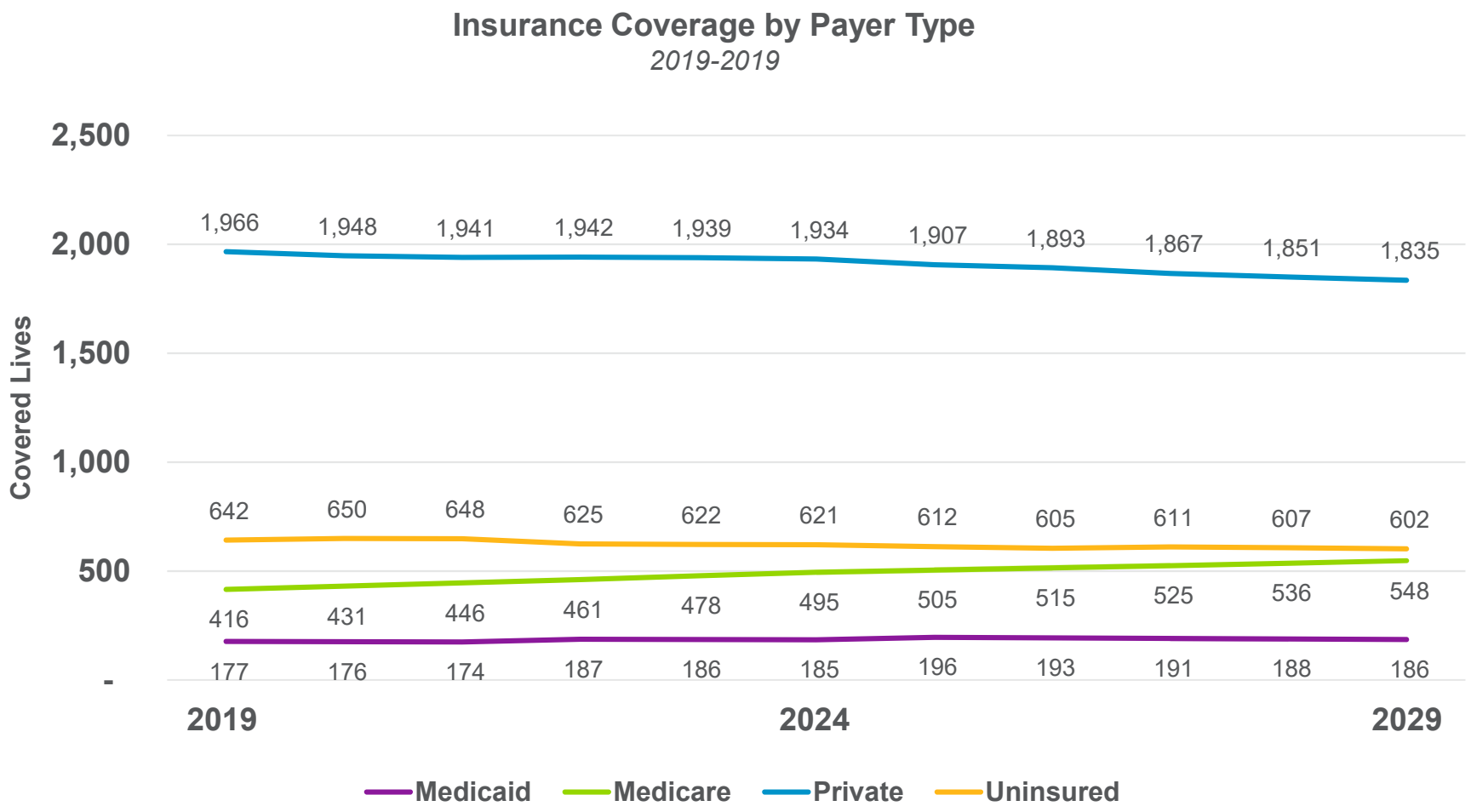
 / ©2019 NAVIGANT CONSULTING, INC. ALL RIGHTS RESERVED

Source: Truven Data Analytics (2018).

Note: Payer inclusions: Private (Direct, ESI, Exchange), Medicare (Medicare, Dual Eligible).

NAVIGANT

THE NUMBER OF PRIVATE LIVES IS PROJECTED TO DECREASE BY OVER 100 LIVES IN 10 YEARS



 / ©2019 NAVIGANT CONSULTING, INC. ALL RIGHTS RESERVED

Source: Truven Data Analytics (2018).

Note: Payer inclusions: Private (Direct, ESI, Exchange), Medicare (Medicare, Dual Eligible).

NAVIGANT

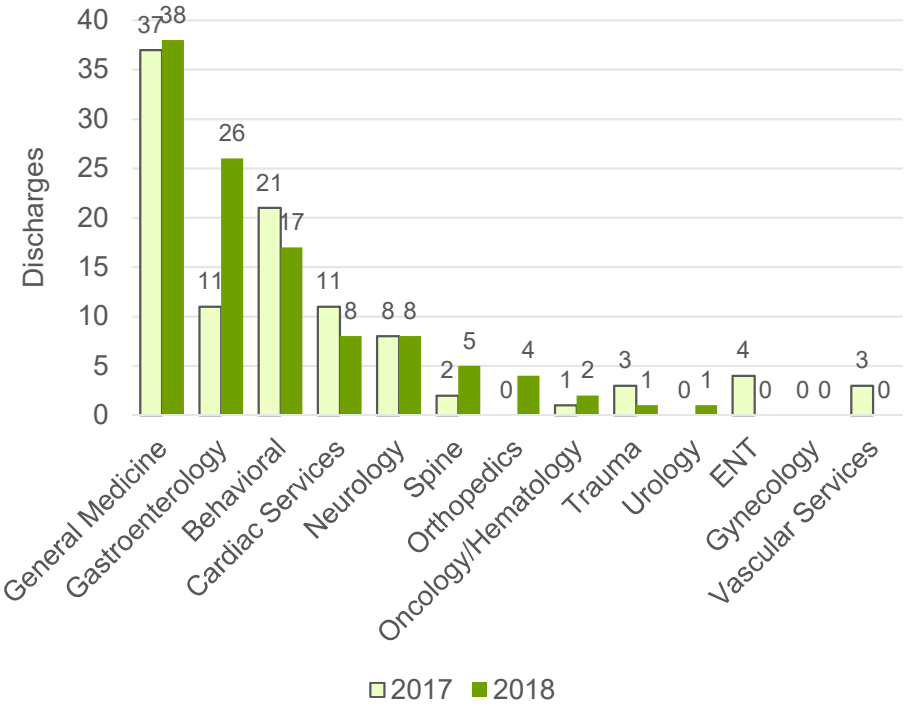
INTERNAL SITUATION ASSESSMENT

NAVIGANT

GENERAL MEDICINE, GI, BEHAVIORAL HEALTH, AND CARDIAC SERVICES REPRESENT THE HIGHEST INPATIENT VOLUME SERVICE LINES

PMC Inpatient Volume by Service Line
2017-2018

Service Line	Volume		% of Total PMC Volume	
	2017	2018	2017	2018
General Medicine	37	38	36.6%	34.5%
Gastroenterology	11	26	10.9%	23.6%
Behavioral	21	17	20.8%	15.5%
Cardiac Services	11	8	10.9%	7.3%
Neurology	8	8	7.9%	7.3%
Spine	2	5	2.0%	4.5%
Orthopedics	0	4	0.0%	3.6%
Oncology/Hematology	1	2	1.0%	1.8%
Trauma	3	1	3.0%	0.9%
Urology	0	1	0.0%	0.9%
ENT	4	0	4.0%	0.0%
Gynecology	0	0	0.0%	0.0%
Vascular Services	3	0	3.0%	0.0%
Total	**101**	**110**	**100.0%**	**100.0%**



 / ©2019 NAVIGANT CONSULTING, INC. ALL RIGHTS RESERVED

Source: PMC Inpatient Data (2017-2018).

NAVIGANT

GI, NEPHROLOGY, SUBSTANCE ABUSE, AND PULMONOLOGY REPRESENT THE LARGEST % OF PMC'S INPATIENT VOLUME

PMC Inpatient Volume by Detailed Service Line - *2017-2018*

Service Line	Volume		% of Total Volume	
	2017	2018	2017	2018
Gastroenterology	11	26	10.9%	23.6%
Nephrology	5	13	5.0%	11.8%
Substance Abuse	15	13	14.9%	11.8%
Pulmonology	17	11	16.8%	10.0%
Medical Spine	2	5	2.0%	4.5%
Stroke/Cerebrovascular	6	5	5.9%	4.5%
Medical Cardiology - Heart Failure	6	4	5.9%	3.6%
Psychiatry	6	4	5.9%	3.6%
Dermatology	5	3	5.0%	2.7%
Endocrinology	4	3	4.0%	2.7%
Infectious Disease	2	3	2.0%	2.7%
Other General Medicine	2	3	2.0%	2.7%
Epilepsy/Headache	0	2	0.0%	1.8%
General Medical Orthopedics	0	2	0.0%	1.8%
Medical Cardiology - AMI	2	2	2.0%	1.8%
Medical Cardiology - Other	3	2	3.0%	1.8%
Medical Trauma (Orthopedics)	0	2	0.0%	1.8%
Oncology (Medical)	1	2	1.0%	1.8%
Rheumatology	2	2	2.0%	1.8%
Body Injuries	3	1	3.0%	0.9%
Degenerative Disorders	2	1	2.0%	0.9%
Urinary System (Medical)	0	1	0.0%	0.9%
Other Vascular	3	0	3.0%	0.0%
Otology	4	0	4.0%	0.0%
Total	**101**	**110**	**100.0%**	**100.0%**

 / ©2019 NAVIGANT CONSULTING, INC. ALL RIGHTS RESERVED

Source: PMC Inpatient Data (2017-2018).

NAVIGANT

ANCILLARY SERVICES STATISTICS

PMC Ancillary Volume by Service
2017-2018

Service	2017	2018	Volume Difference 2017-2018	% Difference 2017-2018
Ultrasound Exams	434	-	N/A	N/A
Mammography Exams	193	178	-15	-8.4%
X-Ray	1,143	1,130	-13	-1.2%
CTs	285	314	29	9.2%
Physical Therapy	10,453	12,196	1,743	14.3%
Home Health	245	1,145	900	78.6%
ER Outpatient	744	773	29	3.8%
ER Observation	113	107	-6	-5.6%
Surgery	55	51	-4	-7.8%
Clinic Visits	9,677	9,674	-3	0.0%
Treatment Room Visits	473	647	174	26.9%

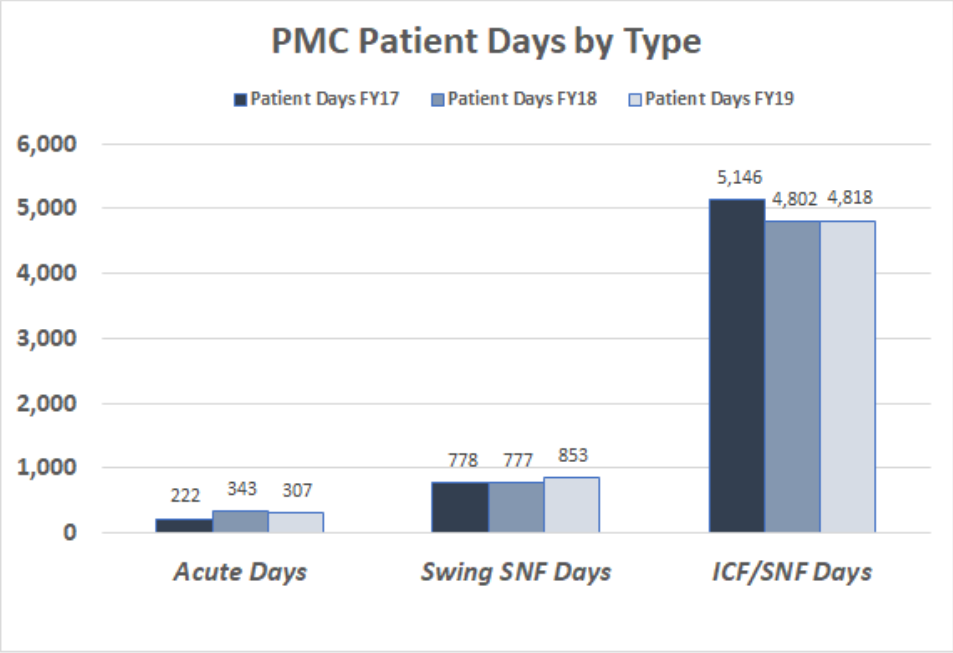
 ©2019 NAVIGANT CONSULTING, INC. ALL RIGHTS RESERVED

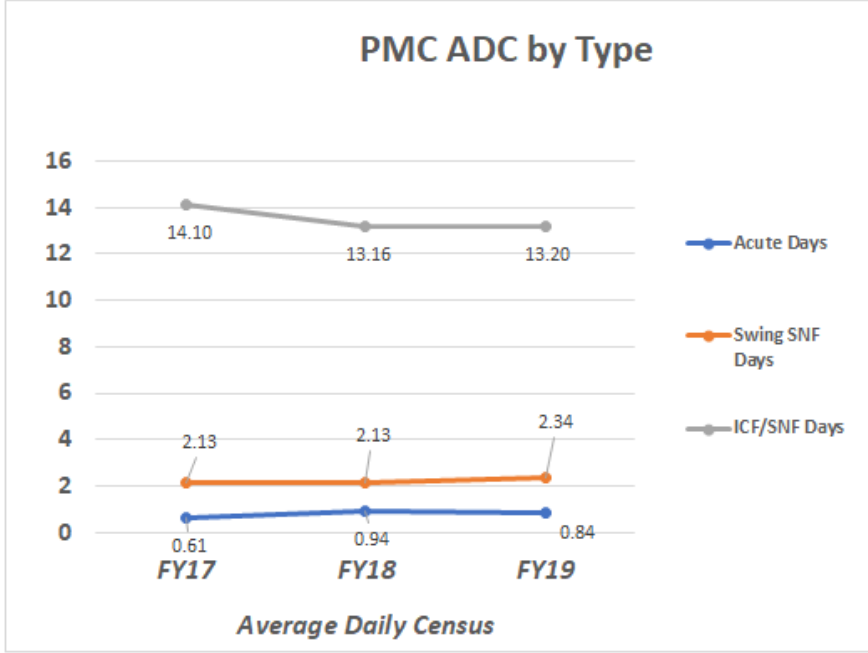
Source: PMC Internal Data (2017-2018)

NAVIGANT

PATIENTS DAYS HAVE SLIGHTLY INCREASED RECENTLY, BUT ACUTE ADC IS STILL BELOW 1.0

- The majority of patient days at PMC are long-term care days
- Acute ADC has remained below 1.0





 / ©2019 NAVIGANT CONSULTING, INC. ALL RIGHTS RESERVED

Source: PMC Community Health Needs Assessment (FY2018)

NAVIGANT

PROVIDER SUMMARY

Provider Summary
July 2019

Total Number of Providers	**13** *(7 MD, 5 DO, 1 PA)*
Number of Specialists	**2** *(1 Orthopedic Surgery, 1 General Surgery Endoscopy)*
# of Providers Representing 85% of Total PMC Admissions	**4**

 / ©2019 NAVIGANT CONSULTING, INC. ALL RIGHTS RESERVED
Source: PMC Provider Roster

NAVIGANT

PMC COMMUNITY HEALTH NEEDS ASSESSMENT – EXECUTIVE SUMMARY (FY 2018)

Strengths	• PMC is a vital function in the community and provides quality care • PMC is in a stable state and is an important employer in the community • PMC provides uncompensated health benefits
Weaknesses	• Ambivalence in the “replace” vs. “remodel” decision • Borough relationship is unclear • Financing under Borough umbrella constraining • Satisfaction with PMC vs. other Borough services is not high • Concerns with care & management • Borough population in decreasing and economy lacks diversity • AK is not in a strong financial position
Opportunities	• Transparency appreciated during interviews • Land potentially available that could be used for a building site • Build the hospital we want • Consider adding services that could expand market demand • Opportunities for old building
Opportunities & Threats	• PMC is thought of a “Band Aid” facility • Wrangell Medical Center is also working towards replacement • Consider affiliation partner • Consider change in scope of service
Threats	• Petersburg Borough not supportive of increase in taxes and new buildings • Medicaid funding at risk • Petersburg residents often leave town for healthcare
Recommendations	• Strategic analysis of PMC operations • Develop and implement a community engagement plan • Develop a financing proposal • Develop preliminary facility design • Develop a timeline for remodel/replacement process

 / ©2019 NAVIGANT CONSULTING, INC. ALL RIGHTS RESERVED

Source: PMC Community Health Needs Assessment (FY2018)

Findings directly reflect CHNA and were not confirmed in Navigant’s assessment

NAVIGANT

BED NEED FORECAST

NAVIGANT

PMC BED NEED FORECAST (ACUTE + SWING)

PMC currently operates 12 acute + swing beds

- PMC current acute ADC is approximately 0.8
- Swing bed census is approximately 2.5

FY19 data used

PMC Total ALL AREAS											
	Average Daily Census										
Service Line	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
	Actual	Projected									
Service Line											
Med/Surg	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.8	0.8	0.8
Ob	-	-	-	-	-	-	-	-	-	-	-
Newborn	-	-	-	-	-	-	-	-	-	-	-
Behavioral	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Total	**0.8**	**0.8**	**0.8**	**0.9**	**0.9**	**0.9**	**0.9**	**0.9**	**0.9**	**0.9**	**0.9**
Swing Bed Days	**2.3**	**2.4**	**2.4**	**2.4**	**2.4**	**2.4**	**2.5**	**2.5**	**2.5**	**2.5**	**2.5**
Total	**3.2**	**3.2**	**3.2**	**3.3**	**3.3**	**3.3**	**3.3**	**3.3**	**3.3**	**3.3**	**3.4**

Navigant's forecast suggest a very slight increase in acute + swing bed need over the next several years; the current 12 bed complement appears to be sufficient

 / ©2019 NAVIGANT CONSULTING, INC. ALL RIGHTS RESERVED

Source: PMC Values – Logo.

NAVIGANT

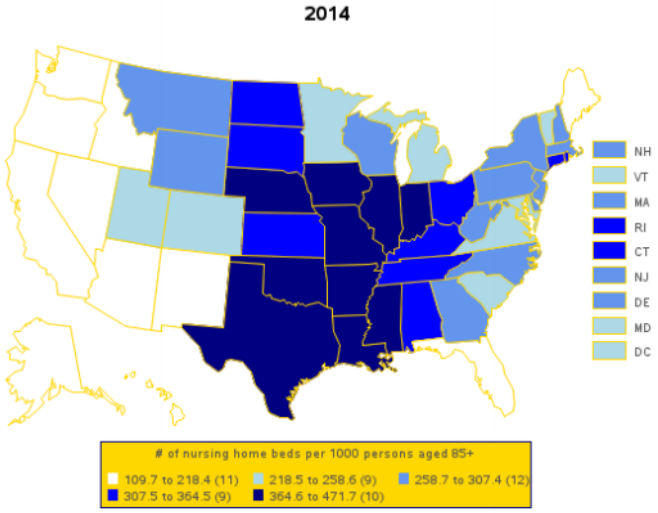
PMC BED NEED FORECAST (SNF)

- PMC currently operates a 15 bed SNF

  - Current ADC is 13.2, suggesting the SNF is at/near capacity

- Alaska, in general, has a relatively low number of SNF Beds Per 1,000 suggesting potential for unmet need (as well as low utilization)

- Given the fairly unusual community dynamics in Petersburg (low IP utilization, high degree of isolation), Navigant has chosen to grow SNF bed need by growing it at the same rate as the 65+ Population in Petersburg



Source: CASPER, U.S. Census
Numbers in parentheses in legend indicate number of states in a given category
Boxes to the right of the map indicate color categories for small Eastern states

 / ©2019 NAVIGANT CONSULTING, INC. ALL RIGHTS RESERVED
Source: PMC Values – Logo.

NAVIGANT

PMC BED NEED FORECAST (SNF)

- Unconstrained by current facility size, Navigant forecasts SNF ADC to grow to nearly 20 by 2029:

PMC Total ALL AREAS											
	Bed Need										
Bed Type	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
	Projected										
Petersburg SNF											
Patient Days	4,818	5,002	5,194	5,392	5,599	5,813	6,035	6,266	6,506	6,755	7,013
Average Daily Census	***13.2***	***13.7***	***14.2***	***14.8***	***15.3***	***15.9***	***16.5***	***17.2***	***17.8***	***18.5***	***19.2***
Population Age 65+ in Petersburg	494	513	533	553	574	596	619	642	667	693	719
Year over Year Change		3.8%	3.8%	3.8%	3.8%	3.8%	3.8%	3.8%	3.8%	3.8%	3.8%

 / ©2019 NAVIGANT CONSULTING, INC. ALL RIGHTS RESERVED

Source: PMC Values – Logo.

PMC BED NEED FORECAST (SUMMARY)

- Acute + Swing bed need is estimated at 5 (suggesting the current 12 bed unit is more than sufficient)

- SNF bed need is forecast to grow to 22 by 2029

PMC Total ALL AREAS											
	Bed Need										
Bed Type	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
	Projected										
Desired Occupancy											
Acute + Swing	4	4	5	5	5	5	5	5	5	5	5
(80% occupancy used)											
SNF	15	16	16	17	18	18	19	20	20	21	22
(90% occupancy used)											

 / ©2019 NAVIGANT CONSULTING, INC. ALL RIGHTS RESERVED

Source: PMC Values – Logo.

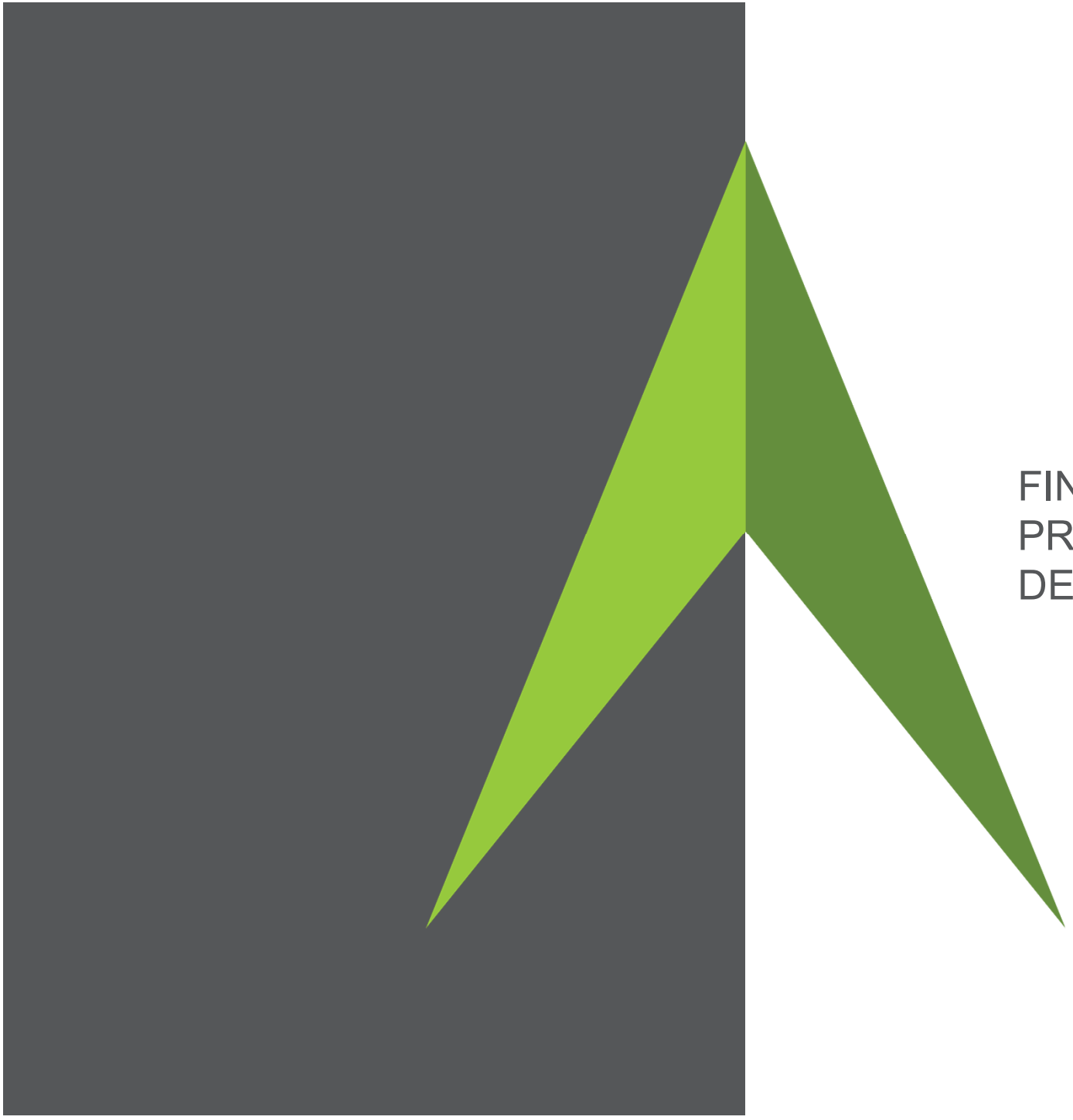
ANCILLARY ROOM NEED

Modality	Current Year Procedure Volume	10 Year % Growth	10 Year Procedure Volume	Procedure Time (min)	Daily Utilization	Hours per Day	Days Per Year	Total Capacity per Room/ Machine Per Year	Actual Room/ Machine Need
CT	323	14.3%	369	60	80%	9	252	1,814	1
Mammography	217	2.0%	221	30	80%	9	252	3,629	1
Ultrasound	434	4.7%	455	60	80%	9	252	1,814	1
X-Ray	1,140	7.2%	1,222	15	80%	9	252	7,258	1
DEXA Bone Density	47	12.3%	53	60	80%	9	252	1,814	1
ED*	870	2.5%	892	n/a	n/a	n/a	n/a	1,300	1
OP Surgery	51	3.9%	53	120	80%	10	252	1,008	1
Endoscopy**	61	2.1%	62	90	80%	10	252	1,344	1

*ED, Including Observation
**Data Unavailable, Market Total was used representing 100% Market Share

 / ©2019 NAVIGANT CONSULTING, INC. ALL RIGHTS RESERVED

NAVIGANT



FINANCIAL PROJECTIONS AND DEBT CAPACITY

NAVIGANT

FINANCIAL FORECAST AND DEBT CAPACITY - OVERVIEW

- Navigant has made a baseline financial model to estimate debt capacity; This model uses a constant market share model to estimate patient volumes into the future

- Expense and revenue ratios rely on recent historical financial performance to forecast near term financial performance

- The FY20 Budget provided by PMC is used as the base year for the financial projections. It is slightly below breakeven from an operating margin perspective (-2.1%) and approximately breakeven (-0.4%) from a total margin perspective. This level of financial performance, in general, represents a slight improvement over recent years.

 / ©2019 NAVIGANT CONSULTING, INC. ALL RIGHTS RESERVED

Source: PMC Values – Logo.

FINANCIAL FORECAST AND DEBT CAPACITY – FINANCIAL CONSIDERATIONS

- PMC's assets are nearly fully depreciated, so a **debt issuance of any size is likely to quickly put any typical leverage ratios into unfavorable ranges**
- For this reason, Navigant's analysis of debt capacity focuses on two areas:
  - What the **interest payments will do to PMC's operating income/margin**, and
  - How **easily PMC can afford the debt service** (principal and interest) required by the level of debt assumed
- For the purpose of estimating debt capacity, **it is assumed that the contemplated capital project will be entirely funded with debt** (PMC has ~100 days cash on hand and a limited assets balance of $3.4M, so PMC has the ability to fund some of any project from funds on hand, but for purposes of this analysis 100% of project cost is estimated to funded through debt)
- Based on recent work in the CAH segment, Navigant is assuming 30 year term on debt at 5.5%, beginning in 2021

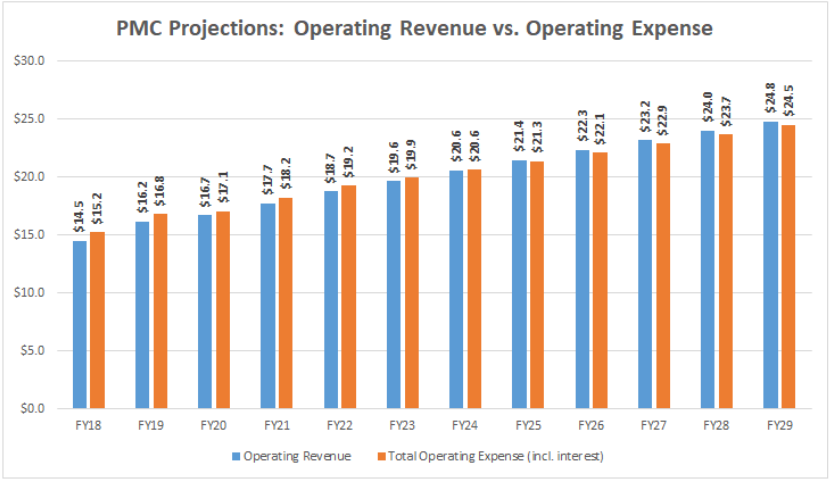
 / ©2019 NAVIGANT CONSULTING, INC. ALL RIGHTS RESERVED

Source: PMC Values – Logo.

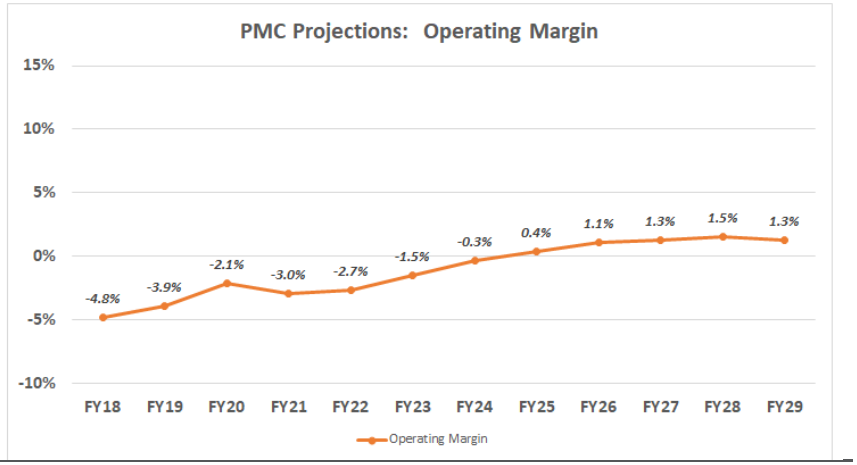
BASELINE FINANCIAL FORECAST RESULTS: INCOME STATEMENT AND MARGIN

Baseline Financial Model **No Additional Debt**

- To help estimate PMC's debt capacity, Navigant has developed **a baseline financial model** to project PMC's performance
- This baseline model **assumes constant market share and no new debt**
- This model results in **slightly but consistently increasing margins** over the next few years
- FY2020 budget was used as the basis, although breakeven performance was not assumed – some of the large estimated decreases in operating expenses assumed in the budget were moderated
- EBIDTA is positive throughout the projection period



	FY18	FY19	FY20	FY21	FY22	FY23	FY24	FY25	FY26	FY27	FY28	FY29
Operating Margin	-17.9%	-4.8%	-3.9%	-2.1%	-3.0%	-2.7%	-1.5%	-0.3%	0.4%	1.1%	1.3%	1.5%
EBITDA	$1.4	$1.7	$1.8	$1.9	$2.0	$2.3	$2.6	$2.9	$3.1	$3.3	$3.5	$3.5



 / ©2019 NAVIGANT CONSULTING, INC. ALL RIGHTS RESERVED

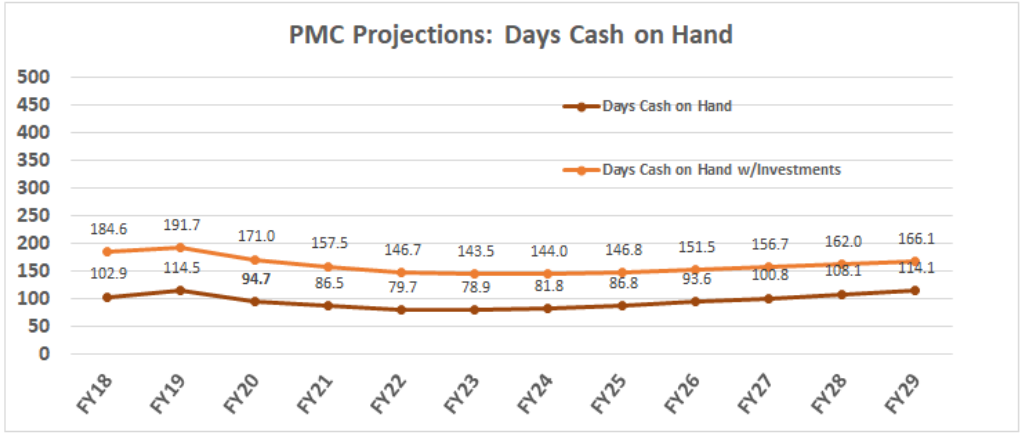
Source: PMC Values – Logo.

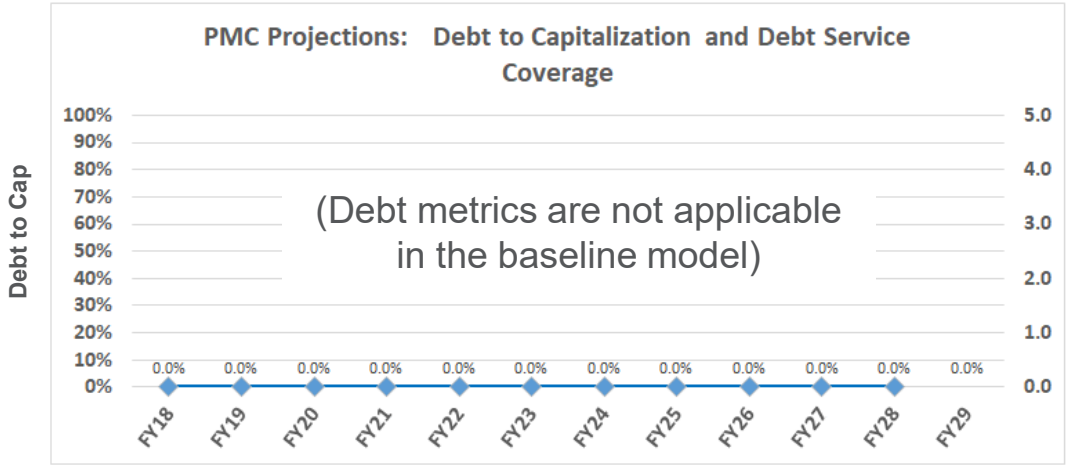
NAVIGANT

BASELINE FINANCIAL FORECAST RESULTS: KEY METRICS

Baseline Financial Model **No Additional Debt**

- Days cash slowly builds through this baseline scenario and is on a positive trajectory
- Limited capital spending (continuation of recent levels) is assumed in this baseline model





	Moody's Aa	Moody's Baa
Debt to Capitalization	TBD	TBD
Debt Service Coverage Ratio	7.7	3.1

 / ©2019 NAVIGANT CONSULTING, INC. ALL RIGHTS RESERVED

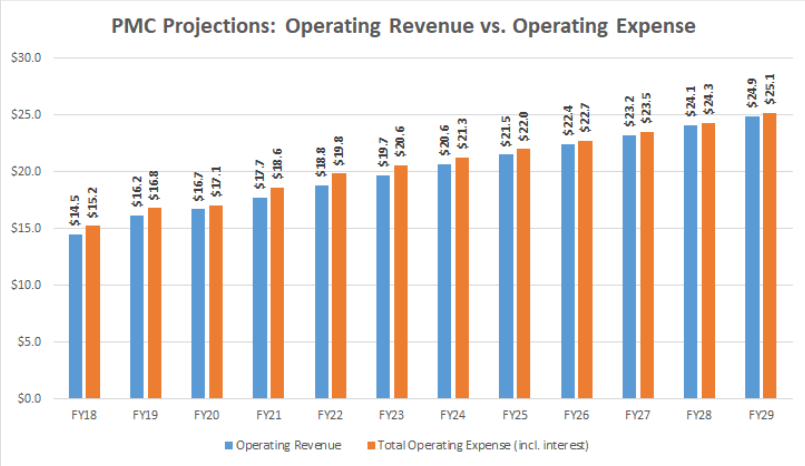
Source: PMC Values – Logo.

NAVIGANT

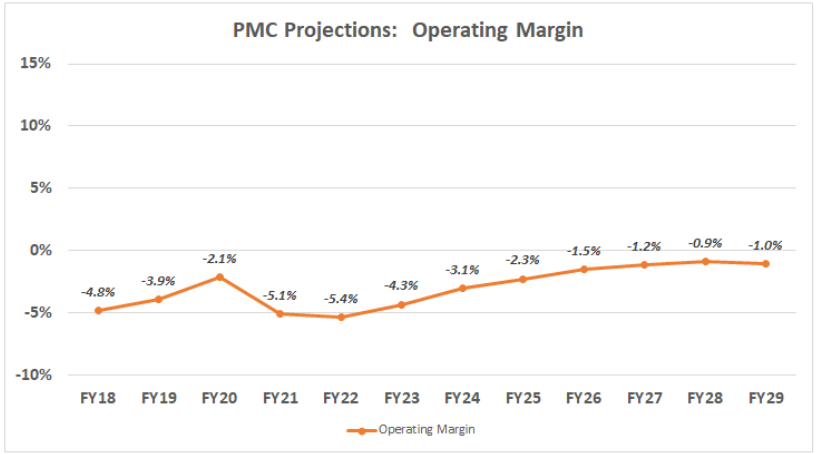
FINANCIAL FORECAST AND DEBT CAPACITY RESULTS: INCOME STATEMENT AND MARGIN

Debt Model
$5.0M Debt assumed

- **Navigant's estimate of PMC's debt capacity is $5.0M**
- This results in negative operating margins initially after debt is issued, but these margins recover on a positive trajectory with the baseline assumptions (that assume no financial "bump" from the new facility project(s)
- EBITDA stays positive throughout the projection period



	FY18	FY19	FY20	FY21	FY22	FY23	FY24	FY25	FY26	FY27	FY28	FY29
Operating Margin	-17.9%	-4.8%	-3.9%	-2.1%	-5.1%	-5.4%	-4.3%	-3.1%	-2.3%	-1.5%	-1.2%	-0.9%
EBITDA	$1.4	$1.7	$1.8	$1.5	$1.5	$1.7	$2.1	$2.3	$2.6	$2.7	$2.9	$2.9



Financial projections include $5.0M debt issue in FY21

 / ©2019 NAVIGANT CONSULTING, INC. ALL RIGHTS RESERVED

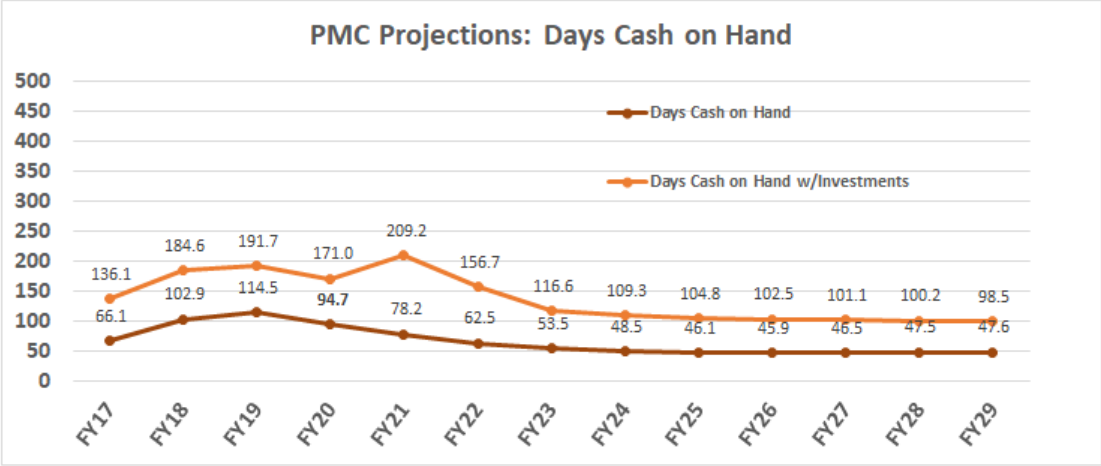
Source: PMC Values – Logo.

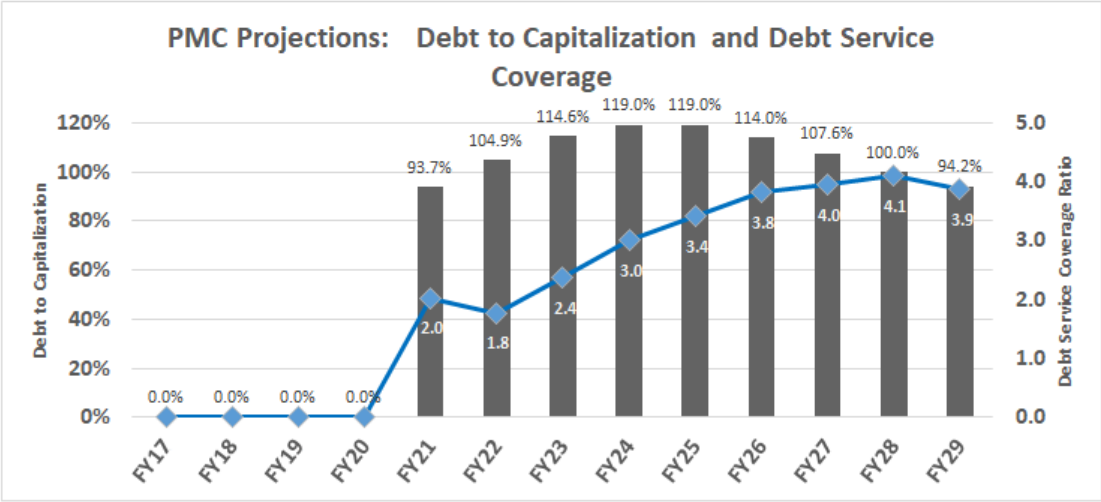
NAVIGANT

FINANCIAL FORECAST AND DEBT CAPACITY RESULTS: KEY RATIOS

Debt Model
$5.0M Debt assumed

- **Navigant's updated estimate of PMC's debt capacity is $5.0M**
- Days cash drops initially but recovers to a positive trajectory in this scenario; including investments, it stays above 100
- Debt to capitalization ratio is going to be unfavorable because PMC's assets are mostly depreciated; debt service coverage is above 2.0 for the majority of the projection period





Financial projections include $5.0M debt issue in FY21

 / ©2019 NAVIGANT CONSULTING, INC. ALL RIGHTS RESERVED

Source: PMC Values – Logo.

NAVIGANT

NEXT STEPS

NAVIGANT

NEXT STEPS FOR CONSIDERATION

After the execution of facility and financial analytics, PMC leadership transitioned to forward-thinking discussions regarding strategies on future funding opportunities.

- PMC met with Navigant's Dave Mosley to discuss interest in increased funding and cost saving scenarios
- Dave pursued conversations with the state to confirm interest in innovative solutions for PMC
- Dave Mosley to guide PMC in outlining ideas and related metrics, and engage with the state to cover the evaluation process.

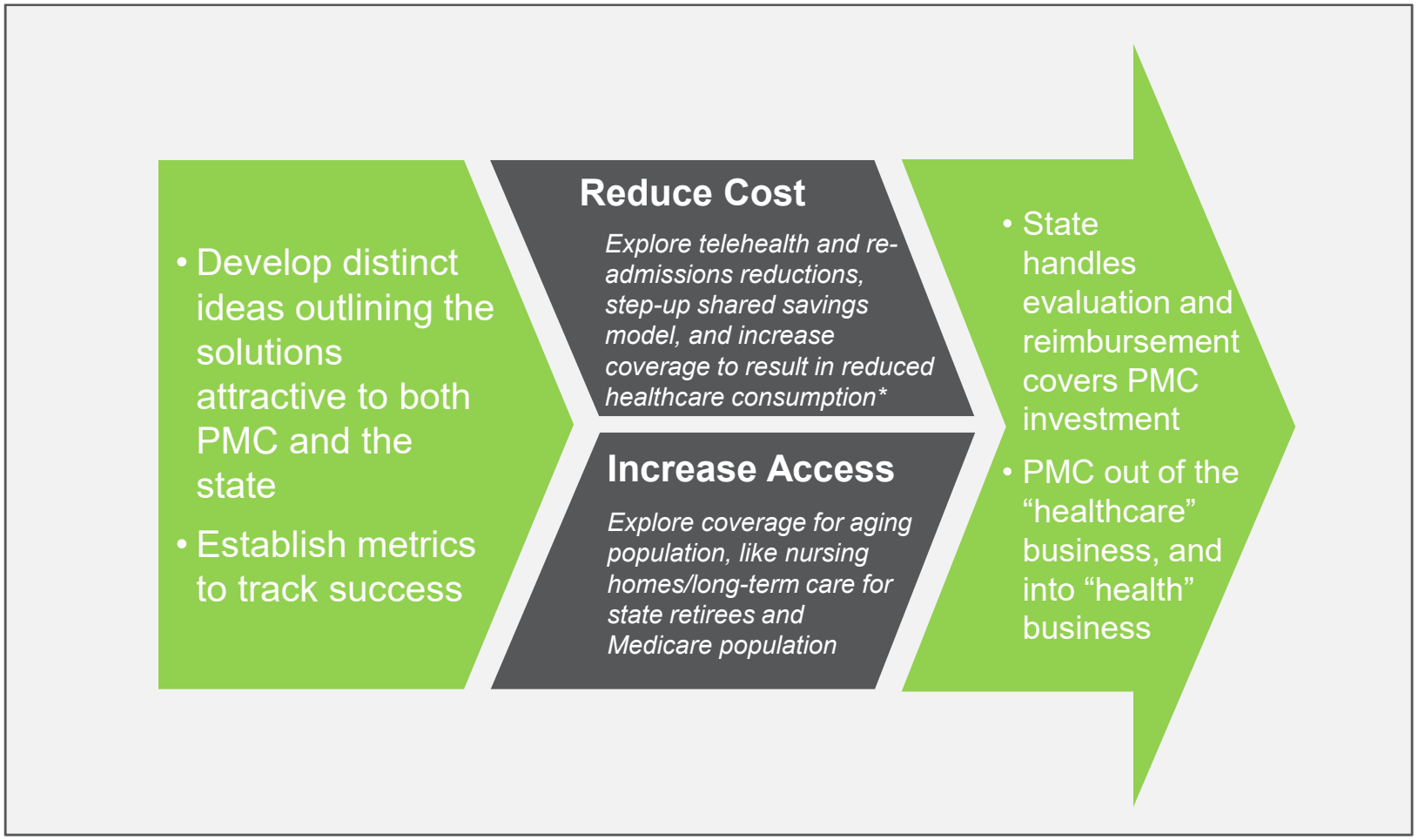
Dave Mosley

Managing Director

david.mosley@navigant.com

 / ©2019 NAVIGANT CONSULTING, INC. ALL RIGHTS RESERVED

NEXT STEPS FOR CONSIDERATION (CONTINUED)



 / ©2019 NAVIGANT CONSULTING, INC. ALL RIGHTS RESERVED

NAVIGANT

*PMC has data showing costs decreased when coverage by Medicare increased.

APPENDIX

NAVIGANT

BASELINE FINANCIAL FORECAST RESULTS: INCOME STATEMENT DETAIL

Baseline Financial Model **No Additional Debt**

Petersburg Medical Center
Financial Modeling
Projected Income Statement

	Actual Internal	Actual Internal	Modified Budget	Projected									
	FY18	FY19	FY20	FY21	FY22	FY23	FY24	FY25	FY26	FY27	FY28	FY29	FY30
Operating Revenues													
Net Patient Service Revenue	$13,737,544	$15,088,269	$15,594,973	$16,525,373	$17,512,532	$18,338,130	$19,203,809	$20,014,407	$20,860,474	$21,638,058	$22,445,969	$23,171,845	$23,922,618
Other Operating Revenue	778,911	1,064,285	1,100,027	1,165,654	1,235,286	1,293,521	1,354,584	1,411,761	1,471,440	1,526,289	1,583,277	1,634,478	1,687,436
Total Operating Revenues	**14,516,455**	**16,152,554**	**16,695,000**	**17,691,027**	**18,747,818**	**19,631,651**	**20,558,393**	**21,426,168**	**22,331,915**	**23,164,347**	**24,029,246**	**24,806,323**	**25,610,053**
Operating Expenses													
Salaries and Wage	7,634,622	7,964,981	8,164,106	8,712,814	9,253,439	9,581,303	9,920,783	10,272,292	10,636,254	11,013,112	11,403,321	11,807,357	12,225,707
Benefits	2,669,853	3,104,577	3,250,000	3,497,184	3,744,719	3,909,019	4,080,260	4,258,728	4,444,721	4,638,547	4,840,528	5,050,999	5,270,307
Supplies	940,285	1,356,289	1,396,978	1,484,972	1,578,794	1,633,202	1,689,499	1,747,752	1,808,029	1,870,400	1,934,939	2,001,721	2,070,825
Pharmacy	446,273	492,195	500,000	505,869	530,924	549,466	568,657	588,522	609,084	630,366	652,396	675,198	698,800
Purchased Services	1,010,983	1,042,511	930,000	957,900	986,637	1,016,236	1,046,723	1,078,125	1,110,469	1,143,783	1,178,096	1,213,439	1,249,842
Utilities/Facility	781,819	824,809	880,000	906,400	933,592	961,600	990,448	1,020,161	1,050,766	1,082,289	1,114,758	1,148,200	1,182,646
Other Expense	1,076,833	1,295,875	1,180,602	1,419,302	1,504,086	1,574,993	1,649,343	1,718,962	1,791,628	1,858,411	1,927,800	1,990,143	2,054,624
Depreciation	658,752	704,281	750,000	731,250	712,969	695,145	677,766	660,822	644,301	628,194	612,489	597,177	582,247
Interest				-	-	-	-	-	-	-	-	-	-
Total Operating Expenses	**15,219,420**	**16,785,518**	**17,051,685**	**18,215,692**	**19,245,160**	**19,920,963**	**20,623,480**	**21,345,364**	**22,095,251**	**22,865,101**	**23,664,326**	**24,484,233**	**25,334,998**
Operating Income	**(702,965)**	**(632,964)**	**(356,685)**	**(524,665)**	**(497,342)**	**(289,311)**	**(65,087)**	**80,804**	**236,664**	**299,246**	**364,919**	**322,091**	**275,055**
Operating Margin	*-4.8%*	*-3.9%*	*-2.1%*	*-3.0%*	*-2.7%*	*-1.5%*	*-0.3%*	*0.4%*	*1.1%*	*1.3%*	*1.5%*	*1.3%*	*1.1%*
Non-Operating Revenues	**180,184**	**383,092**	**281,638**	**500,000**	**500,000**	**500,000**	**500,000**	**500,000**	**500,000**	**500,000**	**500,000**	**500,000**	**500,000**
Overall Change in Net Position	**(522,781)**	**(249,872)**	**(75,047)**	**(24,665)**	**2,658**	**210,689**	**434,913**	**580,804**	**736,664**	**799,246**	**864,919**	**822,091**	**775,055**
Total Margin	*-3.6%*	*-1.5%*	*-0.4%*	*-0.1%*	*0.0%*	*1.1%*	*2.1%*	*2.7%*	*3.3%*	*3.5%*	*3.6%*	*3.3%*	*3.0%*

 / ©2019 NAVIGANT CONSULTING, INC. ALL RIGHTS RESERVED

Source: PMC Values – Logo.

NAVIGANT

BASELINE FINANCIAL FORECAST RESULTS: BALANCE SHEET

Baseline Financial Model **No Additional Debt**

	Actual Internal	Actual Internal	Modified Budget	Projected									
	FY18	FY19	FY20	FY21	FY22	FY23	FY24	FY25	FY26	FY27	FY28	FY29	FY30
Assets													
Current Assets													
Cash and Cash Equivalents	$ 4,105,198	$ 5,044,238	$ 4,231,497	$ 4,141,799	$ 4,046,714	$ 4,156,308	$ 4,467,949	$ 4,916,690	$ 5,500,645	$ 6,141,097	$ 6,828,142	$ 7,468,963	$ 8,045,237
Account Receivable	3,158,950	2,103,267	2,173,900	2,303,596	2,441,203	2,556,290	2,676,963	2,789,958	2,907,898	3,016,291	3,128,912	3,230,097	3,334,753
Inventory	210,499	225,007	231,757	246,355	261,920	270,947	280,286	289,950	299,950	310,298	321,004	332,083	343,548
Prepaid Expense and Other	343,809	157,718	167,236	178,652	188,748	195,376	202,266	209,346	216,701	224,251	232,090	240,131	248,475
Total Current Assets	**7,818,456**	**7,530,230**	**6,804,391**	**6,870,402**	**6,938,586**	**7,178,921**	**7,627,465**	**8,205,945**	**8,925,194**	**9,691,937**	**10,510,148**	**11,271,275**	**11,972,012**
NonCurrent Assets													
Capital Assets	21,265,616	21,852,352	22,552,352	23,252,352	23,952,352	24,652,352	25,352,352	26,052,352	26,752,352	27,452,352	28,152,352	28,852,352	29,552,352
Accum Dep	(16,907,266)	(17,597,777)	(18,347,777)	(19,079,027)	(19,791,996)	(20,487,140)	(21,164,906)	(21,825,728)	(22,470,029)	(23,098,223)	(23,710,712)	(24,307,888)	(24,890,136)
Capital Assets, net	4,358,350	4,254,575	4,204,575	4,173,325	4,160,356	4,165,212	4,187,446	4,226,624	4,282,323	4,354,129	4,441,640	4,544,464	4,662,216
Assets Limited as to Use	3,257,046	3,403,734	3,403,734	3,403,734	3,403,734	3,403,734	3,403,734	3,403,734	3,403,734	3,403,734	3,403,734	3,403,734	3,403,734
Total non-Current Assets	**7,615,396**	**7,658,309**	**7,608,309**	**7,577,059**	**7,564,090**	**7,568,946**	**7,591,180**	**7,630,358**	**7,686,057**	**7,757,863**	**7,845,374**	**7,948,198**	**8,065,950**
Total Assets	**15,433,852**	**15,188,539**	**14,412,700**	**14,447,461**	**14,502,676**	**14,747,866**	**15,218,645**	**15,836,303**	**16,611,251**	**17,449,800**	**18,355,522**	**19,219,473**	**20,037,963**
Liabilities and Net Assets													
Current Liabilities													
Accounts Payable	$ 569,164	$ 679,006	$ 444,596	$ 474,946	$ 501,787	$ 519,408	$ 537,725	$ 556,547	$ 576,099	$ 596,172	$ 617,010	$ 638,388	$ 660,570
Salaries and Wages Payable	381,119	419,293	425,942	455,018	480,734	497,615	515,163	533,195	551,927	571,158	591,122	611,603	632,854
Accrued Vacation/Sick Leave	601,480	719,578	719,578	719,578	719,578	719,578	719,578	719,578	719,578	719,578	719,578	719,578	719,578
Due to 3rd Partry Payers	272,000	528,080	528,080	528,080	528,080	528,080	528,080	528,080	528,080	528,080	528,080	528,080	528,080
Current Portion of Capital Lease	119,977	124,896	-	-	-	-	-	-	-	-	-	1	2
Current Portion of LTD	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Current Liabilities	**1,943,740**	**2,470,853**	**2,118,196**	**2,177,622**	**2,230,179**	**2,264,681**	**2,300,546**	**2,337,400**	**2,375,684**	**2,414,987**	**2,455,790**	**2,497,650**	**2,541,085**
Non-Current Liabilities													
Long term Portion of Capital Lease	280,269	155,373	-	-	-	-	-	-	-	-	-	-	-
Long Term Debt	-	-	-	-	-	-	-	-	-	-	-	-	-
Net Pension and OPEB Liability	10,281,573	11,593,911	11,593,911	11,593,911	11,593,911	11,593,911	11,593,911	11,593,911	11,593,911	11,593,911	11,593,911	11,593,911	11,593,911
Total Non Current Liabilities	**10,561,842**	**11,749,284**	**11,593,911**	**11,593,911**	**11,593,911**	**11,593,911**	**11,593,911**	**11,593,911**	**11,593,911**	**11,593,911**	**11,593,911**	**11,593,911**	**11,593,911**
Total Liabilities	**12,505,582**	**14,220,137**	**13,712,107**	**13,771,533**	**13,824,090**	**13,858,592**	**13,894,457**	**13,931,311**	**13,969,595**	**14,008,898**	**14,049,701**	**14,091,561**	**14,134,996**
Net Assets	**2,928,270**	**968,402**	**700,593**	**675,928**	**678,586**	**889,275**	**1,324,188**	**1,904,992**	**2,641,656**	**3,440,902**	**4,305,821**	**5,127,912**	**5,902,967**
Total Liabilities and Net Assets	**15,433,852**	**15,188,539**	**14,412,700**	**14,447,461**	**14,502,676**	**14,747,866**	**15,218,645**	**15,836,303**	**16,611,251**	**17,449,800**	**18,355,522**	**19,219,473**	**20,037,963**

 / ©2019 NAVIGANT CONSULTING, INC. ALL RIGHTS RESERVED

Source: PMC Values – Logo.

NAVIGANT

DEBT CAPACITY MODEL RESULTS: INCOME STATEMENT DETAIL

Debt Model
$5M Debt assumed

Petersburg Medical Center
Financial Modeling
Projected Income Statement

	Actual Internal	Actual Internal	Modified Budget	Projected									
	FY18	FY19	FY20	FY21	FY22	FY23	FY24	FY25	FY26	FY27	FY28	FY29	FY30
Operating Revenues													
Net Patient Service Revenue	$13,737,544	$15,088,269	$15,594,973	$16,554,796	$17,575,978	$18,403,797	$19,271,774	$20,084,411	$20,932,578	$21,711,965	$22,521,723	$23,249,115	$24,001,433
Other Operating Revenue	778,911	1,064,285	1,100,027	1,167,730	1,239,761	1,298,153	1,359,378	1,416,699	1,476,526	1,531,502	1,588,620	1,639,929	1,692,995
Total Operating Revenues	**14,516,455**	**16,152,554**	**16,695,000**	**17,722,526**	**18,815,739**	**19,701,950**	**20,631,152**	**21,501,110**	**22,409,105**	**23,243,467**	**24,110,343**	**24,889,043**	**25,694,428**
Operating Expenses													
Salaries and Wage	7,634,622	7,964,981	8,164,106	8,778,978	9,394,760	9,727,593	10,072,217	10,429,049	10,798,523	11,181,086	11,577,203	11,987,352	12,412,031
Benefits	2,669,853	3,104,577	3,250,000	3,523,742	3,801,909	3,968,702	4,142,542	4,323,717	4,512,530	4,709,295	4,914,338	5,127,998	5,350,628
Supplies	940,285	1,356,289	1,396,978	1,495,161	1,600,664	1,655,841	1,712,935	1,772,012	1,833,141	1,896,395	1,961,848	2,029,576	2,099,659
Pharmacy	446,273	492,195	500,000	509,516	538,637	557,450	576,922	597,078	617,940	639,534	661,886	685,022	708,969
Purchased Services	1,010,983	1,042,511	930,000	957,900	986,637	1,016,236	1,046,723	1,078,125	1,110,469	1,143,783	1,178,096	1,213,439	1,249,842
Utilities/Facility	781,819	824,809	880,000	906,400	933,592	961,600	990,448	1,020,161	1,050,766	1,082,289	1,114,758	1,148,200	1,182,646
Other Expense	1,076,833	1,295,875	1,180,602	1,421,829	1,509,535	1,580,633	1,655,180	1,724,975	1,797,820	1,864,759	1,934,306	1,996,779	2,061,393
Depreciation	658,752	704,281	750,000	781,250	812,969	845,145	827,766	810,822	794,301	778,194	762,489	747,177	732,247
Interest				247,500	244,083	240,478	236,675	232,663	228,430	223,965	219,253	214,283	209,039
Total Operating Expenses	**15,219,420**	**16,785,518**	**17,051,685**	**18,622,276**	**19,822,786**	**20,553,678**	**21,261,408**	**21,988,601**	**22,743,922**	**23,519,300**	**24,324,176**	**25,149,825**	**26,006,455**
Operating Income	**(702,965)**	**(632,964)**	**(356,685)**	**(899,750)**	**(1,007,047)**	**(851,728)**	**(630,256)**	**(487,491)**	**(334,817)**	**(275,833)**	**(213,833)**	**(260,782)**	**(312,028)**
Operating Margin	*-4.8%*	*-3.9%*	*-2.1%*	*-5.1%*	*-5.4%*	*-4.3%*	*-3.1%*	*-2.3%*	*-1.5%*	*-1.2%*	*-0.9%*	*-1.0%*	*-1.2%*
Non-Operating Revenues	**180,184**	**383,092**	**281,638**	**500,000**	**500,000**	**500,000**	**500,000**	**500,000**	**500,000**	**500,000**	**500,000**	**500,000**	**500,000**
Overall Change in Net Position	**(522,781)**	**(249,872)**	**(75,047)**	**(399,750)**	**(507,047)**	**(351,728)**	**(130,256)**	**12,509**	**165,183**	**224,167**	**286,167**	**239,218**	**187,972**
Total Margin	*-3.6%*	*-1.5%*	*-0.4%*	*-2.3%*	*-2.7%*	*-1.8%*	*-0.6%*	*0.1%*	*0.7%*	*1.0%*	*1.2%*	*1.0%*	*0.7%*

 / ©2019 NAVIGANT CONSULTING, INC. ALL RIGHTS RESERVED

Source: PMC Values – Logo.

NAVIGANT

DEBT CAPACITY MODEL RESULTS: BALANCE SHEET

Debt Model
$5M Debt assumed

	Actual Internal	Actual Internal	Modified Budget	Projected									
	FY18	FY19	FY20	FY21	FY22	FY23	FY24	FY25	FY26	FY27	FY28	FY29	FY30
Assets													
Current Assets													
Cash and Cash Equivalents	$ 4,105,198	$ 5,044,238	$ 4,231,497	$ 3,823,666	$ 3,257,181	$ 2,890,711	$ 2,717,862	$ 2,675,222	$ 2,760,594	$ 2,894,676	$ 3,067,209	$ 3,184,737	$ 3,228,535
Account Receivable	3,158,950	2,103,267	2,173,900	2,307,697	2,450,047	2,565,443	2,686,437	2,799,717	2,917,949	3,026,594	3,139,472	3,240,868	3,345,740
Inventory	210,499	225,007	231,757	248,046	265,549	274,702	284,174	293,975	304,116	314,610	325,469	336,705	348,331
Prepaid Expense and Other	343,809	157,718	167,236	180,212	192,020	199,223	206,202	213,373	220,822	228,471	236,411	244,557	253,010
Total Current Assets	**7,818,456**	**7,530,230**	**6,804,391**	**6,559,621**	**6,164,797**	**5,930,080**	**5,894,675**	**5,982,287**	**6,203,481**	**6,464,350**	**6,768,561**	**7,006,867**	**7,175,617**
NonCurrent Assets													
Capital Assets	21,265,616	21,852,352	22,552,352	24,752,352	26,952,352	29,152,352	29,852,352	30,552,352	31,252,352	31,952,352	32,652,352	33,352,352	34,052,352
Accum Dep	(16,907,266)	(17,597,777)	(18,347,777)	(19,129,027)	(19,941,996)	(20,787,140)	(21,614,906)	(22,425,728)	(23,220,029)	(23,998,223)	(24,760,712)	(25,507,888)	(26,240,136)
Capital Assets, net	4,358,350	4,254,575	4,204,575	5,623,325	7,010,356	8,365,212	8,237,446	8,126,624	8,032,323	7,954,129	7,891,640	7,844,464	7,812,216
Assets Limited as to Use	3,257,046	3,403,734	3,403,734	6,403,734	4,903,734	3,403,734	3,403,734	3,403,734	3,403,734	3,403,734	3,403,734	3,403,734	3,403,734
Total non-Current Assets	**7,615,396**	**7,658,309**	**7,608,309**	**12,027,059**	**11,914,090**	**11,768,946**	**11,641,180**	**11,530,358**	**11,436,057**	**11,357,863**	**11,295,374**	**11,248,198**	**11,215,950**
Total Assets	**15,433,852**	**15,188,539**	**14,412,700**	**18,586,680**	**18,078,887**	**17,699,026**	**17,535,855**	**17,512,645**	**17,639,538**	**17,822,213**	**18,063,935**	**18,255,065**	**18,391,567**
Liabilities and Net Assets													
Current Liabilities													
Accounts Payable	$ 569,164	$ 679,006	$ 444,596	$ 479,093	$ 510,484	$ 529,635	$ 548,187	$ 567,252	$ 587,056	$ 607,389	$ 628,498	$ 650,155	$ 672,627
Salaries and Wages Payable	381,119	419,293	425,942	465,174	495,162	513,420	531,098	549,263	568,131	587,499	607,605	628,229	649,627
Accrued Vacation/Sick Leave	601,480	719,578	719,578	719,578	719,578	719,578	719,578	719,578	719,578	719,578	719,578	719,578	719,578
Paryroll Taxes Payable	272,000	528,080	528,080	528,080	528,080	528,080	528,080	528,080	528,080	528,080	528,080	528,080	528,080
Current Portion of Capital Lease	119,977	124,896	-	-	-	-	-	-	-	-	-	1	2
Current Portion of LTD	-	-	-	62,124	65,541	69,146	72,949	76,961	81,194	85,660	90,371	95,341	100,585
Total Current Liabilities	**1,943,740**	**2,470,853**	**2,118,196**	**2,254,050**	**2,318,845**	**2,359,858**	**2,399,892**	**2,441,134**	**2,484,039**	**2,528,206**	**2,574,131**	**2,621,384**	**2,670,499**
Non-Current Liabilities													
Long term Portion of Capital Lease	280,269	155,373	-	-	-	-	-	-	-	-	-	-	-
Long Term Debt	-	-	-	4,437,876	4,372,335	4,303,189	4,230,240	4,153,279	4,072,085	3,986,425	3,896,055	3,800,713	3,700,128
Net Pension and OPEB Liability	10,281,573	11,593,911	11,593,911	11,593,911	11,593,911	11,593,911	11,593,911	11,593,911	11,593,911	11,593,911	11,593,911	11,593,911	11,593,911
Total Non Current Liabilities	**10,561,842**	**11,749,284**	**11,593,911**	**16,031,787**	**15,966,246**	**15,897,100**	**15,824,151**	**15,747,190**	**15,665,996**	**15,580,336**	**15,489,966**	**15,394,624**	**15,294,039**
Total Liabilities	**12,505,582**	**14,220,137**	**13,712,107**	**18,285,837**	**18,285,091**	**18,256,958**	**18,224,043**	**18,188,324**	**18,150,035**	**18,108,542**	**18,064,097**	**18,016,008**	**17,964,538**
Net Assets	**2,928,270**	**968,402**	**700,593**	**300,843**	**(206,204)**	**(557,932)**	**(688,188)**	**(675,679)**	**(510,496)**	**(286,329)**	**(162)**	**239,057**	**427,029**
Total Liabilities and Net Assets	**15,433,852**	**15,188,539**	**14,412,700**	**18,586,680**	**18,078,887**	**17,699,026**	**17,535,855**	**17,512,645**	**17,639,538**	**17,822,213**	**18,063,935**	**18,255,065**	**18,391,567**

 ©2019 NAVIGANT CONSULTING, INC. ALL RIGHTS RESERVED

Source: PMC Values – Logo.

NAVIGANT

PARKING DETAIL

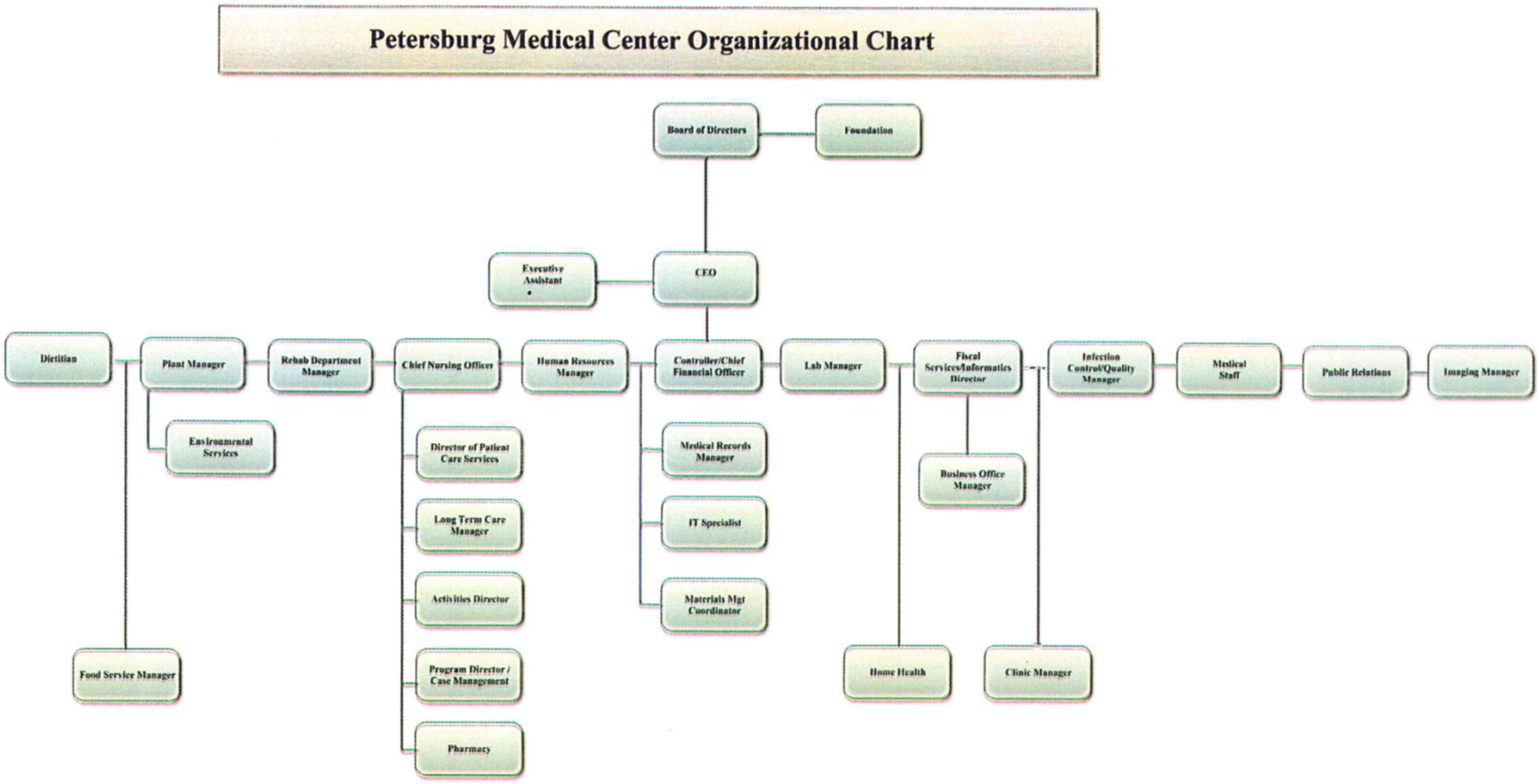
Parking Detail by Location
June 2019

Location	# of Spaces
Business Office	13
Clinic	11
Upper Parking Lot	34
Total	**58**

 / ©2019 NAVIGANT CONSULTING, INC. ALL RIGHTS RESERVED
Source: PMC Parking Detail

NAVIGANT

PMC ORG CHART



 / ©2019 NAVIGANT CONSULTING, INC. ALL RIGHTS RESERVED

Source: PMC Organizational Chart

NAVIGANT

PMC LOGO WITH VALUES

 / ©2019 NAVIGANT CONSULTING, INC. ALL RIGHTS RESERVED

Source: PMC Values – Logo.

NAVIGANT

Numeric Program

NAC
ARCHITECTURE

Space Planning Program - Total Departments

Project Petersburg Medical Center Master Plan
Date 10/24/2019
NAC No. 121-19016

		EXISTING			PROPOSED			
	SPACE	NSF	GF	DSF	NSF	GF	DSF	REMARKS
DEPARTMENTS								
	MAIN ENTRY RECEPTION	875	1.10	966	**2,525**	**1.15**	**2,904**	
	ADMINISTRATION	2,183	1.18	2,578	**1,200**	**1.35**	**1,620**	
	INFORMATION TECHNOLOGY	0	0	0	**1,140**	**1.25**	**1,425**	
	BUSINESS/MED. RECORDS	884	1.19	1,051	**1,120**	**1.25**	**1,400**	
	LONG TERM CARE	4,430	1.38	6,094	**8,460**	**1.50**	**12,690**	
	CLINIC	2,736	1.95	5,342	**6,430**	**1.40**	**9,002**	
	ACUTE CARE	3,578	1.20	4,295	**5,990**	**1.20**	**7,188**	
	EMERGENCY DEPARTMENT	954	1.10	1,053	**1,440**	**1.50**	**2,160**	
	LABORATORY	1,683	1.12	1,881	**2,060**	**1.25**	**2,575**	
	IMAGING	1,437	1.48	2,126	**3,470**	**1.50**	**5,205**	
	PHARMACY	117	1.00	117	**640**	**1.20**	**768**	
	SURGERY	1,045	1.46	1,522	**1,810**	**1.60**	**2,896**	
	CENTRAL STERILE	480	1.09	523	**760**	**1.30**	**988**	
	PHYSICAL THERAPY	1,096	1.14	1,253	**2,682**	**1.25**	**3,353**	
	HOME HEALTH	1,672	1.44	2,416	**440**	**1.40**	**616**	
	MAINTENANCE	2,376	1.26	3,000	**2,376**	**1.15**	**2,580**	
	DIETARY	1,656	1.21	2,000	**2,940**	**1.30**	**3,822**	
	CENTRAL SUPPLY	5,012	1.20	6,000	**4,840**	**1.30**	**6,292**	
	OTHER SUPPORT SPACES	4,660	0.00	0	**0**	**0.00**	**0**	
	TOTAL DEPARTMENT GROSS SQUARE FOOTAGE			**36,217**			**61,191**	
	Building grossing factor			1.35			1.30	
	TOTAL DEPARTMENT GROSS SQUARE FOOTAGE			**49,000**			**79,549**	

BUILDING GROSSING FACTOR

Exterior walls, public corridors, mechanical and electrical services, stairs and elevators

NAC
ARCHITECTURE

Space Planning Program - Main Entry Reception

Project Petersburg Medical Center Master Plan
Date 10/24/2019
NAC No. 121-19016

SPACE	EXISTING QTY	EXISTING AREA	EXISTING TOTAL	PROPOSED QTY	PROPOSED AREA	PROPOSED TOTAL	REMARKS
MAIN ENTRY RECEPTION			**875**			**2,525**	
VESTIBULE 1	1	53	53	1	150	150	Entry, large enough for wheelchair storage
VESTIBULE 2	1	135	135			0	
LOBBY	1	380	380	1	600	600	Allow for Welcoming and Wayfinding
FRONT RECEPTION DESK & ADMITTING	1	57	57	1	100	100	Assume 2 staff (50 sfx 2)
WAITING ROOM L1	1	73	73	1	150	150	Assume 5 seats (30sf x 5)
CHILDREN'S PLAY AREA			0	1	60	60	Contiguous with waiting
MULTI-PURPOSE EDUCATION ROOM			0	1	800	800	Divisible into two rooms
HEALTH EDUCATION KIOSK			0	1	25	25	Brochures
LACTATION ROOM			0	1	80	80	With a sink and refrigerator
QUIET ROOM (CHAPEL)			0	1	200	200	
PUBLIC TOILET ROOM L1 - 1	1	44	44			0	
PUBLIC TOILET ROOM L1 - 2	1	43	43			0	
PUBLIC TOILET ROOMS L2	2	45	90			0	
FAMILY RESTROOM				1	80	80	
MEN'S RESTROOM				1	130	130	Urinal and ADA stall
WOMEN'S RESTROOM				1	150	150	Standard and ADA stalls
SUBTOTAL NSF			875			2,525	
DEPARTMENTAL GROSS SF			966			2,904	
GROSSING FACTOR			1.10			1.15	
TOTAL DEPARTMENT GROSS SQUARE FOOTAGE			**966**			**2,904**	

DEPARTMENT GROSSING FACTOR
Interior walls, partitiions, corridors, hallways, specific to each department

Notes
1. Intended as central entry to hospital and clinic.

NAC
ARCHITECTURE

Space Planning Program - Administration

Project Petersburg Medical Center Master Plan
Date 10/24/2019
NAC No. 121-19016

	EXISTING			PROPOSED			
SPACE	**QTY**	**AREA**	**TOTAL**	**QTY**	**AREA**	**TOTAL**	**REMARKS**
ADMINISTRATION			**2,183**			**1,200**	
CEO OFFICE	1	255	255	1	280	280	CEO
CFO OFFICE	1	181	181				CFO with Business Office
CNO OFFICE	1	79	79		100	0	On nursing floor
HUMAN RESOUCES DIR.	1	75	75	1	100	100	
ADMINISTRATIVE ASSISTANT	1	94	94	1	100	100	
OFFICE MANAGER	1	66	66	1	80	80	
PROJECT MANAGER	1	66	66	1	80	80	
CONFERENCE ROOM (COMBINED)	1	817	817		150	0	Not required. Mtgs in CEO office
WORK ROOM (CLERICAL)	1	479	479	1	500	500	4 workstations and copier
STAFF TOILET	1	25	25	1	60	60	
HOUSEKEEPING	1	46	46			0	
SUBTOTAL NSF			2,183			1,200	
DEPARTMENTAL GROSS SQUARE FEET			2,578			1,620	
GROSSING FACTOR			1.18			1.35	
TOTAL DEPARTMENT GROSS SQUARE FOOTAGE			**2,578**			**1,620**	

DEPARTMENT GROSSING FACTOR
Interior walls, partitiions, corridors, hallways, specific to each department

NAC
ARCHITECTURE

Space Planning Program - Information Technology

Project Petersburg Medical Center Master Plan
Date 10/24/2019
NAC No. 121-19016

		EXISTING			PROPOSED			
	SPACE	QTY	AREA	TOTAL	QTY	AREA	TOTAL	REMARKS
INFORMATION TECHNOLOGY				**0**			**1,140**	
	OFFICE			0	1	100	100	IT Director
	WORKSTATIONS			0	4	60	240	Repair and configuration
	SERVER ROOM			0	1	200	200	
	STORAGE			0	1	200	200	
	Training				1	400	400	Dedicated training stations
	SUBTOTAL NSF			0			1,140	
	DEPARTMENTAL GROSS SQUARE FEET						1,425	
	GROSSING FACTOR						1.25	
	TOTAL DEPARTMENT GROSS SQUARE FOOTAGE			**0**			**1,425**	

DEPARTMENT GROSSING FACTOR
Interior walls, partitiions, corridors, hallways, specific to each department

Notes
1. Existing accommodations for IT were not identified

NAC
ARCHITECTURE

Space Planning Program - Business Office/Medical Records

Project Petersburg Medical Center Master Plan
Date 10/24/2019
NAC No. 121-19016

SPACE	EXISTING QTY	EXISTING AREA	EXISTING TOTAL	PROPOSED QTY	PROPOSED AREA	PROPOSED TOTAL	REMARKS
BUSINESS OFFICE/MEDICAL RECORDS			**884**			**1,120**	
CFO OFFICE	1	181	181	1	180	180	
CFO ADMINISTRATIVE ASST.			0		70	0	None listed
BUSINESS OFFICE MANAGER			0		120	0	None listed
PATIENT ACCOUNTS			0	4	80	320	Patient Billing Consultation
RECEPTION AND WAITING			0	1	120	120	Open office
COPY AND STORAGE			0	1	180	180	
MED REC. OFFICE	1	120	120	1	120	120	Manager
MED REC. OFFICE	1	102	102		80	0	Not needed
MEDICAL RECORDS STORAGE	1	173	173	1	200	200	Compact shelving
COPIER/SUPPLIES	1	110	110		180	0	Shared with Bus. Office
DICTATION	1	18	18		30	0	Not needed
STORAGE 1	1	22	22			0	Combined above
STORAGE 2	1	63	63			0	Combined above
FILE STORAGE	1	95	95			0	Combined above
SUBTOTAL NSF			884			1,120	
DEPARTMENTAL GROSS SQUARE FEET			1,051			1,400	
GROSSING FACTOR			1.19 existing			1.25	
TOTAL DEPARTMENT GROSS SQUARE FOOTAGE			**1,051**			**1,400**	

DEPARTMENT GROSSING FACTOR
Interior walls, partitions, corridors, hallways, specific to each department

Notes

NAC
ARCHITECTURE

Space Planning Program - Long Term Care

Project Petersburg Medical Center Master Plan
Date 10/24/2019
NAC No. 121-19016

		EXISTING			PROPOSED			
	SPACE	**QTY**	**AREA**	**TOTAL**	**QTY**	**AREA**	**TOTAL**	**REMARKS**
LONG TERM CARE				**4,430**			**8,460**	
	PRIVATE LONG TERM PATIENT ROOM	9	208	1,868	16	350	5,600	ADA + includes shower/toilet room
	PRIVATE LONG TERM PATIENT TOILET	9	25	223				
	SEMI PRIVATE LTC PATIENT ROOM	3	204	612	1	375	375	For Doubles/Couples
	CENTRAL STAFF STATION					120	0	Not necessary
	ACTIVITY ROOM	1	459	459	1	500	500	TV, music, recitals
	DINING	1	542	542	1	600	600	
	QUIET ACTIVITY				1	120	120	Reading, puzzles
	LTC DIRECTOR OFFICE	1	143	143	1	120	120	
	HAIRWASH/SALON	1	137	137	1	120	120	beauty parlor
	STORAGE	1	113	113	3	100	300	10 sf per room
	HOUSEKEEPING	1	33	33	1	50	50	
	BATH 1	1	69	69	1	120	120	for assisted bathing
	BATH 2	1	48	48			0	
	BATH 3	1	83	83			0	
	LINEN	1	100	100	1	100	100	clean supply + linen room
	STAFF BREAK				1	80	80	
	STAFF LOCKER ROOM					80	0	Shared with Surgery
	STAFF TOILET					60	0	Shared with Surgery
	SOIL UTILITY ROOM				1	100	100	
	PRIVATE FAMILY CONFERENCE ROOM				1	120	120	
	KITCHEN - SERVERY				1	75	75	15 foot long kitchenette facing Activity
	PANTRY				1	80	80	
	SUBTOTAL NSF			4,430			8,460	
	DEPARTMENTAL GROSS SQUARE FEET			6,094			12,690	
	GROSSING FACTOR			1.38			1.50	
	TOTAL DEPARTMENT GROSS SQUARE FOOTAGE			**6,094**			**12,690**	

DEPARTMENT GROSSING FACTOR

Interior walls, partitions, corridors, hallways, specific to each department

Notes

1. Existing patient room size is based on an average for the room type

NAC
ARCHITECTURE

Space Planning Program - Clinic

Project Petersburg Medical Center Master Plan
Date 10/24/2019
NAC No. 121-19016

		EXISTING			PROPOSED			
	SPACE	**QTY**	**AREA**	**TOTAL**	**QTY**	**AREA**	**TOTAL**	**REMARKS**
CLINIC				**2,736**			**6,430**	
	EXAM ROOM	8	98	94	15	120	1,800	
	MINOR PROCEDURE ROOM L1 - 1	3	148	443	2	180	360	One with a treadmill
	VISITING SPECIALIST ROOM				1	180	180	Cardiology, ENT, Dermatology
	NURSE STATION L1	2	135	270	8	60	480	In collabortive workstations
	WAITING ROOM L2 - 1	2	184	249	1	100	100	
	PHYSICIAN OFFICES L2 - 1	4	71	284	4	80	320	Glass walls, near MA workstations
	PSYCHOLOGIST/PSYCHIATRIST				1	120	120	Space for consultation in office
	DICTATION/TELEMEDICINE				2	80	160	Enclosed rooms
	CONSULTATION/CONFERENCE				2	100	200	Rooms for patient/family consultation
	OPTOMETRY OFFICE				1	100	100	For 2 physicians
	OPTOMETRY SUPPORT/STORAGE				1	80	80	
	OPTHAMOLOGY						0	Shared with Optometry office
	AUDIOLOGY TESTING				1	180	180	With modular sound booth
	DENTAL HYGIENE STATIONS				2	100	200	Future build out
	DENTAL TREATMENT ROOM				1	120	120	Future build out, exam for now
	DENTAL LAB				1	80	80	Future build out
	NUTRITIONIST OFFICE				1	60	60	Office in collaborative space
	DIETICIAN/WELLNESS COORD.				1	60	60	Office in collaborative space
	NUTRITION EDUCATION						0	In consult room
	WELLNESS CONSULTING						0	Standard exam room
	GERIATRICIAN CONSULTATION						0	In consult room
	INTERNAL ADULT HEALTH						0	Office in collaborative space
	CARDIOLOGIST						0	Office in collaborative space
	DERMATOLOGIST						0	Office in collaborative space
	DERMATOLOGIST LAB				1	80	80	
	CANCER TREATMENT/CHEMO					80	0	In Acute Care
	CANCER TREATMENT/CHEMO					80	0	In Acute Care
	ENT EXAM ROOM					120	0	In visiting specialist room
	ENT PROCEDURE ROOM						0	In Minor Treatment Room
	DAYCARE CENTER				1	600	600	Open play room with care amenities
	OFFICE MANAGER	1	109	109	1	120	120	
	CODING	1	43	43			0	In business office/Medical Records
	TRANSCRIPTION	1	84	84			0	Not needed
	VITALS ALCOVES			0	2	20	40	
	PATIENT TOILET L1	1	53	53	2	60	120	
	PATIENT TOILET L2	1	57	57			0	
	CLINICAL LAB STATIONS	1	60	60	2	60	120	
	COFFEE	1	26	26				In staff lounge
	BUSINESS OFFICE	1	373	373		300	0	In business office/Medical Records
	STAFF LOUNGE/MEETING ROOM	1	392	392	1	200	200	
	RAD VIEW	1	51	51		80	0	Not needed
	STORAGE	1	25	25	2	200	400	
	GAS STORAGE	1	17	17	1	30	30	
	STAFF TOILET L2 - 1	1	55	55	2	60	120	
	STAFF TOILET L2 - 2	1	51	51			0	
	SUBTOTAL NSF			2,736			6,430	
	DEPARTMENTAL GROSS SQUARE FEET			5,342			9,002	
	GROSSING FACTOR			1.95			1.40	
	TOTAL DEPARTMENT GROSS SQUARE FOOTAGE			**5,342**			**9,002**	

DEPARTMENT GROSSING FACTOR

Interior walls, partitions, corridors, hallways, specific to each department

Notes

1. Room size for existing exam, waiting, nurse, and office is average of existing room sizes.

NAC
ARCHITECTURE

Space Planning Program - Acute Care

Project Petersburg Medical Center Master Plan
Date 10/24/2019
NAC No. 121-19016

	SPACE	EXISTING QTY	EXISTING AREA	EXISTING TOTAL	PROPOSED QTY	PROPOSED AREA	PROPOSED TOTAL	REMARKS
ACUTE CARE				**3,578**			**5,990**	
	PATIENT ROOM - Private	1	177	177	8	350	2,800	Including 5-6 swing beds, 2 isolation
	ACUTE PR 2	1	296	296	2	350	700	BH/Observation
	ACUTE PR 3	1	167	167	2	350	700	ICU
	ACUTE PR 4	1	280	280			0	
	ACUTE PR 5	1	164	164			0	
	ACUTE PR 6	1	275	275			0	
	TOILET/SHOWER	6	25	150			0	
	BIRTHING ROOM TOILET	1	34	34			0	
	BIRTHING ROOM	1	321	321		325	0	Separate room not required
	POST PARTUM	1	175	175			0	
	POST PARTUM BATH	1	57	57			0	
	NURSERY	1	98	98		120	0	Not required.Baby will stay with mom
	GOWN	1	72	72			0	
	CHIEF NURSE OFFICE				1	120	120	Prefer to be on nursing floor
	NURSE OFFICE				2	80	160	
	NURSES WORK ROOM	1	220	220	1	250	250	Break and Shift Change
	NURSE STATION	1	184	184	1	200	200	Shared with LTC
	PHYSICIAN DICTATION			0	1	60	60	
	MEDS ROOM	1	82	82	1	120	120	
	NOURISHEMENT	1	75	75	1	80	80	
	CCU	1	178	178			0	In BH/Observation
	CCU TOILET	1	18	18			0	In BH/Observation
	CLEAN SUPPLY	1	190	190	1	200	200	
	(ISOLATION/PSYCH) ANTE	1	43	43	1	60	60	Outside 1 Patient Room
	ISOL/PSY TOILET ROOM	1	34	34			0	
	ISOL/PSY	1	130	130			0	In BH/Observation
	VISITOR LOUNGE			0	1	200	200	
	SOILED HOLDING			0	1	80	80	
	CRASH CART ALCOVE			0	1	20	20	
	EQUIPMENT / SUPPLIES	1	16	16	1	120	120	
	DOCTORS WORK ROOM	1	118	118		120	0	None needed
	STAFF TOILET			0	1	60	60	ADA - Can be shared with other depts.
	HOUSEKEEPING	1	24	24	1	60	60	1 large housekeeping for all services
	SUBTOTAL NSF			3,578			5,990	
	DEPARTMENTAL GROSS SQUARE FEET			4,295			7,188	
	GROSSING FACTOR			1.20			1.20	
	TOTAL DEPARTMENT GROSS SQUARE FOOTAGE			**4,295**			**7,188**	

DEPARTMENT GROSSING FACTOR
Interior walls, partitiions, corridors, hallways, specific to each department

NAC
ARCHITECTURE

Space Planning Program - Emergency Department

Project Petersburg Medical Center Master Plan
Date 10/24/2019
NAC No. 121-19016

	SPACE	EXISTING QTY	EXISTING AREA	EXISTING TOTAL	PROPOSED QTY	PROPOSED AREA	PROPOSED TOTAL	REMARKS
EMERGENCY DEPARTMENT				**954**			**1,440**	
	PUBLIC WAITING	1	60	60	1	100	100	
	TRIAGE			0		120	0	Not needed
	TREATMENT	1	128	128	2	180	360	
	SEMI-PRIVATE EXAM ROOM	1	101	101			0	
	OPEN EXAM ROOM w/ CURTAINS	1	68	68			0	
	OPEN EXAM ROOM w/ CURTAINS 2	1	68	68			0	
	EXAM ROOM	1	96	96	2	120	240	Enclosed room
	NURSE STATION	1	265	265	1	80	80	Satellite of Acute nurse station
	MEDS	1	23	23		80	0	Secure storage cabinets
	PATIENT TOILET	1	23	23	1	60	60	
	CONSULTATION / BEREAVEMENT			0		80	0	Not needed
	CLEAN SUPPLY	1	77	77	1	80	80	
	SOILED HOLDING	1	45	45	1	60	60	
	CRASH CART ALCOVE			0	1	20	20	
	EQUIPMENT STORAGE			0	1	100	100	
	SECURITY/EMT ROOM			0	1	60	60	Workstation for EMT reports
	DECONTAMINATION / GURNEY WASH			0	1	100	100	
	AMBULANCE ENTRANCE VESTIBULE			0	1	180	180	sized large for wheelchairs
	STAFF TOILET			0		60	0	Could be shared with other dept.
	HOUSEKEEPING			0		80	0	Shared with Surgery?
	SUBTOTAL NSF		894	954			1,440	
	DEPARTMENTAL GROSS SQUARE FEET			1,053			2,160	
	GROSSING FACTOR			1.10			1.50	
	TOTAL DEPARTMENT GROSS SQUARE FOOTAGE			**1,053**			**2,160**	

DEPARTMENT GROSSING FACTOR
Interior walls, partitions, corridors, hallways, specific to each department

NAC
ARCHITECTURE

Space Planning Program - Laboratory

Project Petersburg Medical Center Master Plan
Date 10/24/2019
NAC No. 121-19016

		EXISTING			PROPOSED			
	SPACE	**QTY**	**AREA**	**TOTAL**	**QTY**	**AREA**	**TOTAL**	**REMARKS**
LABORATORY				**1,683**			**2,060**	
	LAB WORK SPACE	1	832	832	1	900	900	Based on similar processes
	RECEPTIONIST	1	92	92	1	100	100	
	WAIT	1	50	50	1	80	80	
	SPECIMENT TOILET	1	53	53	1	60	60	ADA with specimen pass-through
	BACTERIOLOGY	1	149	149	1	180	180	
	STORAGE			0	1	100	100	
	LOUNGE/LOCKER/BREAK	1	111	111	1	150	150	
	STAFF TOILET				1	60	60	For lab staff
	OFFICE	1	101	101	1	120	120	
	BLOOD DRAW	1	88	88	2	80	160	
	HISTOLOGY	1	147	147	1	150	150	
	PATIENT TOILET 1	1	25	25		60	0	1 specimen toilet room is sufficient
	PATIENT TOILET 2	1	35	35			0	
	BLOOD BANK				1	120	120	
	SUBTOTAL NSF			1,683			2,060	
	DEPARTMENTAL GROSS SQUARE FEET			1,881			2,575	
	GROSSING FACTOR			1.12			1.25	
	TOTAL DEPARTMENT GROSS SQUARE FOOTAGE			**1,881**			**2,575**	

DEPARTMENT GROSSING FACTOR
Interior walls, partitions, corridors, hallways, specific to each department

Notes

NAC
ARCHITECTURE

Space Planning Program - Imaging

Project Petersburg Medical Center Master Plan
Date 10/24/2019
NAC No. 121-19016

		EXISTING			PROPOSED			
	SPACE	**QTY**	**AREA**	**TOTAL**	**QTY**	**AREA**	**TOTAL**	**REMARKS**
IMAGING				**1,437**	**1.20**		**3,470**	
	X-RAY (RF)	1	330	330	1	350	350	
	R/F EFG PULM FUNC	1	249	249	1	380	380	
	BONE DENSITOMETRY/DEXA			0	1	140	140	
	ULTRASOUND	1	192	192	1	200	200	
	ULTRASOUND TOILET			0	1	60	60	
	MAMMOGRAPHY			0	1	200	200	
	CT ROOM			0	1	450	450	
	CT CONTROL ROOM			0	1	180	180	
	CT TOILET			0	1	60	60	ADA toilet
	MRI SCAN ROOM				1	500	500	Shell space for future
	MRI EQUIPMENT ROOM				1	180	180	Shell space for future
	MRI CONTROL ROOM				1	160	160	Shell space for future
	C-ARM ROOM					120	0	Not needed
	FILES	1	161	161	1	150	150	
	RAD OFFICE	1	108	108	1	180	180	Shared - Director + 2 techs
	IMAGE VIEW	1	62	62		180	0	Not needed
	R/F DARK ROOM	1	89	89			0	Not needed
	TELEMEDICINE					120	0	In Clinic
	ECHOCARDIOGRAPHY					120		In Clinic
	DRESSING ROOM	4	20	80	2	50	100	1 ADA
	PATIENT TOILET	1	22	22	1	60	60	ADA toilet
	CLEAN SUPPLY			0		100	0	Shared with Emergency
	SOILED HOLDING			0		80	0	Shared with Emergency
	STORAGE	1	144	144	1	120	120	Equipment
	STAFF TOILET			0		60	0	At common shared staff changing area
	SUBTOTAL NSF			1,437			3,470	
	DEPARTMENTAL GROSS SQUARE FEET			2,126			5,205	
	GROSSING FACTOR			1.48			1.50	
	TOTAL DEPARTMENT GROSS SQUARE FOOTAGE			**2,126**			**5,205**	

DEPARTMENT GROSSING FACTOR
Interior walls, partitions, corridors, hallways, specific to each department

Notes

NAC
ARCHITECTURE

Space Planning Program - Pharmacy

Project Petersburg Medical Center Master Plan
Date 10/24/2019
NAC No. 121-19016

		EXISTING			PROPOSED			
	SPACE	**QTY**	**AREA**	**TOTAL**	**QTY**	**AREA**	**TOTAL**	**REMARKS**
PHARMACY				**117**			**640**	
	PHARMACY WORK AREA	1	117	117	1	200	200	Assembly and packaging
	DISPENSING			0		100	0	Not needed
	OFFICE			0	1	80	80	Drug coordinator
	RECEIVING/BREAKOUT			0	1	80	80	Controlled acces
	PHARMACY STORAGE			0	1	80	80	Controlled acces
	USP 800 W/ ANTEROOM			0	1	130	130	Chemo prep
	IV HOOD			0	1	70	70	Sterile prep
	SUBTOTAL NSF			117			640	
	DEPARTMENTAL GROSS SQUARE FEET			117			1.20	
	GROSSING FACTOR			1.00			768	
	TOTAL DEPARTMENT GROSS SQUARE FOOTAGE			**117**			**768**	

DEPARTMENT GROSSING FACTOR
Interior walls, partitions, corridors, hallways, specific to each department

Notes
1. Assumes PMC inpatient and outpatient service only

NAC
ARCHITECTURE

Space Planning Program - Surgery

Project Petersburg Medical Center Master Plan
Date 10/24/2019
NAC No. 121-19016

SPACE	EXISTING QTY	EXISTING AREA	EXISTING TOTAL	PROPOSED QTY	PROPOSED AREA	PROPOSED TOTAL	REMARKS
SURGERY/CENTRAL STERILE			**1,045**			**1,810**	
CONSULT ROOM			0		120	0	Not needed
PATIENT DRESSING			0			0	In Acute Care room
PATIENT TOILET			0			0	Not required
NURSE WORK AREA			0	1	80	80	Near stage 1 recovery
PRE- & POST-OP			0		125	0	In Acute Care room
WORK/ROOM STORAGE	1	99	99		80	0	Don't need anesthesia work room
DELIVERY/PROCEDURE	1	405	405	1	600	600	Orthopedic Operating Room
SCRUB	1	55	55	1	40	40	next to procedure room
SOIL	1	57	57	1	80	80	
LOCKER 1	1	70	70	1	320	320	Men locker shower-shared by all staff
LOCKER 2	1	77	77	1	320	320	Wom. locker shower-shared by all staff
LOCKER TOILET 1	1	40	40	1	60	60	Men
LOCKER TOILET 2	1	31	31	1	60	60	Women
STAGE 1 RECOVERY	1	129	129	1	100	100	
RECOVERY TOILET	1	32	32			0	See above
JANITOR 1	1	34	34	1	30	30	Could be shared location
JANITOR 2	1	16	16			0	
ON-CALL SLEEPING ROOM			0	1	120	120	
SUBTOTAL NSF			1,045			1,810	
DEPARTMENTAL GROSS SQUA			1,522			2,896	
GROSSING FACTOR			1.46			1.60	
TOTAL DEPARTMENT GROSS SQUARE FOOTAGE			**1,522**			**2,896**	

DEPARTMENT GROSSING FACTOR
Interior walls, partitions, corridors, hallways, specific to each department

Notes

NAC
ARCHITECTURE

Space Planning Program - Central Sterile

Project Petersburg Medical Center Master Plan
Date 10/24/2019
NAC No. 121-19016

SPACE	EXISTING QTY	EXISTING AREA	EXISTING TOTAL	PROPOSED QTY	PROPOSED AREA	PROPOSED TOTAL	REMARKS
SURGERY/CENTRAL STERILE			**480**			**760**	
STER SUPPLY	1	188	188	1	300	300	
SORT & PACK	1	120	120	1	200	200	
CART WASH			0		120	0	Outside department
DECONTAMINATION	1	109	109	1	180	180	
STERILIZATION	1	63	63	1	80	80	
SUBTOTAL NSF			480			760	
DEPARTMENTAL GROSS SQUA			523			988	
GROSSING FACTOR			1.09			1.30	
TOTAL DEPARTMENT GROSS SQUARE FOOTAGE			**523**			**988**	

DEPARTMENT GROSSING FACTOR
Interior walls, partitions, corridors, hallways, specific to each department

NAC
ARCHITECTURE

Space Planning Program - Physical Therapy

Project Petersburg Medical Center Master Plan
Date 10/6/2019
NAC No. 121-19016

		EXISTING			PROPOSED			
	SPACE	**QTY**	**AREA**	**TOTAL**	**QTY**	**AREA**	**TOTAL**	**REMARKS**
PHYSICAL THERAPY				**1,096**			**2,682**	
	RECEPTIONIST			0	1	80	80	
	WAITING AREA	1	50	50	1	100	100	waiting room for 5 people x 20
	WHEELCHAIR STORAGE			0	1	30	30	
	PT DIRECTOR OFFICE			0	1	120	120	
	PT OFFICE	1	198	198	1	120	120	2 therapist workstations
	EXAM ROOM	1	96	96	2	120	240	PT Evaluation and Treatment room
	THERAPY POOL	1	89	89			0	Pool not required?
	PATIENT TOILET 1	1	55	55	1	60	60	ADA Toilet room
	PATIENT TOILET 2	1	28	28	1	60	60	Staff toilet
	WORK AREA	1	480	480	1	500	500	Open shared therapy space
	TREATMENT STATIONS			0	4	80	320	Open bays with curtains
	TREATMENT ROOM PRIVATE			0	2	110	220	Pediatric, Women, Acupuncture
	STORAGE (4 small rooms existing)	4	25	100	1	100	100	one large equipment room
	OT OFFICE			0	1	80	80	
	OT EXAM			0	1	120	120	
	ST OFFICE			0	1	80	80	
	ST EXAM			0	1	120	120	Enclosed room
	MASSAGE THERAPY			0	1	80	80	Dedicated with table
	CHIROPRACTIC THERAPY			0	1	100	100	Dedicated with chiropractic table
	TREADMILL			0			0	Located in Work Area
	WOUND CARE			0	1	140	140	With shower?
	CRASH CART ALCOVE			0	1	12	12	
	SUBTOTAL NSF			1,096			2,682	
	DEPARTMENTAL GROSS SQUARE FEET			1,253 existing			3,353	projected
	GROSSING FACTOR			1.14			1.25	
	TOTAL DEPARTMENT GROSS SQUARE FOOTAGE			**1,253**			**3,353**	

DEPARTMENT GROSSING FACTOR

Interior walls, partitions, corridors, hallways, specific to each department

NOTES

1. Therapy pool not included. Is one desired?
2. Two private multi-use therapy rooms shared
3. Is a shower stall desired for wound care treatment?

NAC
ARCHITECTURE

Space Planning Program - Home Health

Project Petersburg Medical Center Master Plan
Date 10/24/2019
NAC No. 121-19016

SPACE	EXISTING QTY	EXISTING AREA	EXISTING TOTAL	PROPOSED QTY	PROPOSED AREA	PROPOSED TOTAL	
HOME HEALTH			**1,672**			**440**	
Visiting Physicians							
RECEPTIONIST 1	1	115	115				In Clinic
WAITING AREA	1	155	155				In Clinic
OFFICE 1	1	130	130				In Clinic
EXAM ROOM	1	76	76				In Clinic
EXAM ROOM	1	80	80				In Clinic
EXAM ROOM	1	152	152				In Clinic
PATIENT TOILET 1	1	51	51				In Clinic
STAFF TOILET	1	49	49				In Clinic
Public Health & Home Health							
RECEPTIONIST 1	1	168	168		150	0	Not needed
WAITING AREA	1	155	155		100	0	Not needed
OFFICE 1	1	107	107	1	320	320	Shared w
OFFICE 2	1	141	141		120	0	
EXAM ROOM	1	119	119		120	0	Not needed
STORAGE	1	69	69	1	120	120	Home hea
PATIENT TOILET	1	56	56		60	0	Not needed
STAFF TOILET	1	49	49		60	0	Not needed
SLEEP ROOMS			0		80	0	Not needed
SLEEP SUPPORT			0		100	0	Not needed
SUBTOTAL NSF			1,672			440	
DEPARTMENTAL GROSS SQUARE FEET			2,416			616	
GROSSING FACTOR			1.44			1.40	
TOTAL DEPARTMENT GROSS SQUARE FOOTAGE			**2,416**			**616**	

DEPARTMENT GROSSING FACTOR

Interior walls, partitions, corridors, hallways, specific to each department

NOTES

1. Public health nurse office located with clinic.
2. Visiting physician exams and offices are included in Clinic program.

NAC
ARCHITECTURE

Space Planning Program - Maintenance

Project Petersburg Medical Center Master Plan
Date 10/24/2019
NAC No. 121-19016

		EXISTING			PROPOSED			
	SPACE	QTY	AREA	TOTAL	QTY	AREA	TOTAL	REMARKS
MAINTENANCE				**2,376**			**2,967**	
	LAUNDRY	1	469	469	1	500	500	
	SOILED LINEN HOLDING	1	61	61	1	300	300	
	HOUSEKEEPING			0	1	120	120	Assume 4 housekeeping carts
	LOCKER / SHOWER / TOILET			0		120	0	At shared facility
	MAINTENANCE OFFICE			0	1	120	120	Incl. plan storage and BIM Control Stn.
	MAINTENANCE SHOP	1	1,281	1,281	1	900	900	Active repair and Maintenance Supplies
	ELECTRICAL ROOM	1	280	280			0	
	MECH. / GENERATOR	1	216	216	1	400	400	Hospital and Clinic generators
	OXYGEN STORAGE	1	61	61	1	120	120	Oxygen generator
	OUTSIDE MAINTENANCE EQUIPMENT			0			0	
	HOUSEKEEPING L1	1	8	8	2	60	120	Assume 2 in the hospital
	SUBTOTAL NSF			2,376			2,580	
	DEPARTMENTAL GROSS SQUARE FEET			3,000			2,967	
	GROSSING FACTOR			1.26			1.15	
	TOTAL DEPARTMENT GROSS SQUARE FOOTAGE			**3,000**			**2,967**	

DEPARTMENT GROSSING FACTOR
Interior walls, partitions, corridors, hallways, specific to each department

Notes
1. Laundry area includes washing, drying, folding and holding on carts
2. Mechanical and Electrical rooms included in Building GSF factor
3. Will likely need a maintenance shed somewhere on the site for vehicles.

NAC
ARCHITECTURE

Space Planning Program - Dietary

Project Petersburg Medical Center Master Plan
Date 10/24/2019
NAC No. 121-19016

		EXISTING			PROPOSED			
	SPACE	**QTY**	**AREA**	**TOTAL**	**QTY**	**AREA**	**TOTAL**	**REMARKS**
DIETARY				**1,656**			**2,940**	
	OFFICE			0	1	160	160	2 people shared
	STORAGE	1	237	237	1	800	800	Dry and cold storage
	KITCHEN	1	691	691	1	1,000	1,000	Food prep and cart loading
	STORAGE	1	518	518		250	0	
	JANITOR	1	20	20			0	
	DISHWASHING	1	100	100	1	120	120	
	LOCKERS	1	50	50	1	80	80	Dietary Staff
	TOILET	1	40	40	1	60	60	Dietary Staff
	SERVICE LINE				1	120	120	Staff and visitors
	CAFETERIA				1	600	600	Staff and visitors
	SUBTOTAL NSF			1,656			2,940	
	DEPARTMENTAL GROSS SQUARE FEET			2,000			3,822	
	GROSSING FACTOR			1.21			1.30	
	TOTAL DEPARTMENT GROSS SQUARE FOOTAGE			**2,000**			**3,822**	

DEPARTMENT GROSSING FACTOR
Interior walls, partitions, corridors, hallways, specific to each department

Notes
1. Dietary will serve staff and visitors as well as patients.

NAC
ARCHITECTURE

Space Planning Program - Central Supply

Project Petersburg Medical Center Master Plan
Date 10/24/2019
NAC No. 121-19016

SPACE	EXISTING QTY	EXISTING AREA	EXISTING TOTAL	PROPOSED QTY	PROPOSED AREA	PROPOSED TOTAL	REMARKS
CENTRAL SUPPLY			**5,012**			**4,840**	
STORAGE 1	1	787	787	1	4,000	4,000	1 large storage facility
STORAGE 2	1	1,762	1,762			0	
STORAGE 3	1	1,615	1,615			0	
RECEIVING/BREAKDOWN	1	223	223	1	240	240	
TRASH	1	190	190	1	200	200	
OFFICE	1	80	80	1	80	80	
CLEAN STORAGE	1	200	200			0	Included above
WASH ROOM				1	120	120	With hose bib and drain
MORGUE	1	155	155	1	200	200	Near loading dock
SUBTOTAL NSF			5,012			4,840	
DEPARTMENTAL GROSS SQUARE FEET			6,000			6,292	
GROSSING FACTOR			1.20			1.30	
TOTAL DEPARTMENT GROSS SQUARE FOOTAGE			**6,000**			**6,292**	

DEPARTMENT GROSSING FACTOR
Interior walls, partitions, corridors, hallways, specific to each department

Notes
1. Assuming generous storage to accommodate shipping realities.
2. Morgue included in this department because of proximity to loading dock.

NAC
ARCHITECTURE

Space Planning Program - Other Support Spaces

Project Petersburg Medical Center Master Plan
Date 10/24/2019
NAC No. 121-19016

SPACE	EXISTING QTY	EXISTING AREA	EXISTING TOTAL	PROPOSED QTY	PROPOSED AREA	PROPOSED TOTAL	REMARKS
OTHER SUPPORT SPACES			**4,660**			**0**	
EMPLOYEE LOUNGE	1	269	269			0	With Dietary
LOCKER ROOM 1	1	90	90			0	With Dietary
LOCKER ROOM 2	1	49	49			0	With Surgery
LOCKER ROOM 3	1	49	49			0	With Surgery
STAFF CLOSET	1	38	38			0	
OFFICE 1	1	214	214			0	Assigned to departments
OFFICE 2	1	108	108			0	Assignedc to departments
OFFICE 3	1	113	113			0	Assignedc to departments
OFFICE STORAGE	1	23	23			0	Assignedc to departments
STAFF DINING AREA	1	283	283			0	With Dietary - common dining room
HOUSEKEEPING L1	1	8	8			0	With Maintenance
HOUSEKEEPING L2	1	14	14			0	With Maintenance
GYM FOR STAFF						0	Assume use of community facilities
SWIMMING POOL FOR STAFF						0	Assume use of community facilities
TRAINING/EDUCATION ROOM						0	With Administrative Area
CONFERENCE ROOM						0	With Administrative Area
PUBLIC HEALTH NURSE ACCOMODATION						0	With Clinic
MECHANICAL ROOM 1	1	861	861			0	Oth
MECHANICAL ROOM 2	1	906	906			0	In building grossing factor
MECHANICAL ROOM 3	1	71	71			0	In building grossing factor
MECHANICAL ROOM 4	1	266	266			0	In building grossing factor
MECHANICAL ROOM 5	1	56	56			0	In building grossing factor
MECHANICAL ROOM 6	1	114	114			0	In building grossing factor
ELECTRICAL CLOSET L1 - 1	1	280	280			0	In building grossing factor
ELECTRICAL CLOSET L1- 2	1	36	36			0	In building grossing factor
ELEVATOR AND MACHINE ROOM 1	1	105	105			0	In building grossing factor
ELEVATOR 2	1	44	44			0	In building grossing factor
ELEVATOR 3	1	80	80			0	In building grossing factor
STAIRS 1	1	133	133			0	In building grossing factor
STAIRS 2	1	133	133			0	In building grossing factor
STAIRS 3	1	156	156			0	In building grossing factor
STAIRS 4	1	161	161			0	In building grossing factor
SUBTOTAL NSF		4,660	4,660			0	
DEPARTMENTA						0	
GROSSING FACTOR			0.00				
TOTAL DEPARTMENT GROSS SQUARE FOOTAGE			**0**			**0**	

DEPARTMENT GROSSING FACTOR

Interior walls, partitions, corridors, hallways, specific to each department

Notes

1. These existing spaces have been picked up in other departments or are accounted for in building grossing factor.

System Narratives

NAC
ARCHITECTURE

Architectural Design Narrative

Petersburg Medical Center

December 1, 2019

Introduction

In order to order to inform the budgeting process it is necessary to define some basic assumptions regarding the structure, building envelope materials and interior finishes. These assumptions are based on appropriate strategies for the typical weather and site conditions in Southeast Alaska. It should be noted however that these are not design decisions at this point. They are simply a base line placeholder to assure that sufficient allowances are built into the budget to afford design flexibility as the project moves forward with greater definition.

Site and Building Organization

The two sites will significantly influence the building organization, and this is reflected in the site diagrams for each. The limited space available at the downtown location forces a multi-story approach with the structural engineering and seismic restraint required to support that solution. However the site is largely developed with good utility services so site preparation scope is minimized. The nature of the location will also limit the amount of onsite paving and landscaping required.

At the Haugen Drive site there is enough space to allow for a single story solution which will tend to mitigate structural and seismic costs. Utilities are available at the adjacent Haugen drive and side streets allowing convenient extension of water and sewer services to the facility. However the site is otherwise undeveloped, requiring more extensive site preparation and improvement including excavation of unsuitable materials and placement of structural fill to provide a solid building pad, and extensive paving for access roads and parking.

Project Approach

As a general guide the facility will be planned as a 50-year building. At either site the approach to building envelope will incorporate robust rain management at the roofs, durable materials that can withstand the marine environment with minimal maintenance, and thermal performance to meet or exceed energy code requirements. To provide a healing environment windows, clerestories and skylights will be incorporated to maximize daylight harvesting and provide inspiring views out to the natural surroundings. Subtle landscaping using native species will be incorporated at select outdoor settings accessible from the proposed café and long term care unit.

Exterior Closure

The predominant exterior cladding material will potentially be prefinished metal panels or cement shingles with some masonry or stone veneer features. The cladding will be attached with metal furring

channels over an air space cavity. The building side of the airspace cavity will have continuous rigid polyisocyanurate insulation 1.5 inches thick over a rain screen membrane and exterior fiberglass-mat gypsum sheathing attached to metal stud wall framing. The interior side of the metal stud wall framing system will have spray applied foam insulation with painted gypsum wallboard at the exposed interior face. Exterior metal panels will be complemented with stone veneer at selected locations near entries and ground planes to provide a more natural, tactile visual character.

Roofing will be primarily sloped standing seam metal roofing over a water and ice barrier on minimum R-30 rigid insulation adhered to moisture resistant sheathing. Soffits at roof overhangs will be integrally colored cement fiber board panels. Any low slope roof areas will be an exposed membrane with a continuous vapor barrier adhered to structural deck. Minimum R-30 rigid insulation boards will be adhered to the vapor barrier, with ¼" cover board adhered to rigid insulation and single ply membrane adhered to cover board. Walk pads installed where required at roof access paths and mechanical equipment service areas.

Aluminum Curtain Wall, Storefront, Windows and Doors

The main entrance lobby will utilize a prefinished aluminum curtain wall window framing system with insulated glazing wherever it extends more than a single story in height. Prefinished aluminum storefront window framing with insulated glazing will be incorporated in openings less than 10' tall at corridors along exterior walls and at openings facing outdoor activity areas. Prefinished aluminum windows with insulated glazing will be used at all other punched window openings.

Entrance systems will be tailored to the hospital programmatic needs. Swing doors will be heavy duty type to support automatic opener hardware. All door glazing will be insulated, laminated safety glass. Exterior utility doors will be galvanized metal with an insulated core and a powder coat painted finish.

Interior Construction

Structural steel framing beams and columns will have spray-applied fireproofing throughout. Code required fire and smoke stopping materials will be installed at all rated wall and floor assemblies. Where exposed heavy timber structure is used wood will be sealed and connectors will be painted.

Partitions
Typical interior partitions will be framed with metal studs full height to underside of structure, acoustical insulation and sheathed with abuse resistant (mold resistant) gypsum board with level 4 finish at painted exposed surfaces, level 3 finish where wall coverings are applied. Selected offices, clinic areas and rooms with gypsum board ceilings will have partitions with gypsum board that extends 6" above finished ceilings.

Doors and Openings
Typical interior doors will be solid core wood with plastic laminate finish. Frames will be painted hollow metal, except stainless steel at elevator entrance frames and selected surgery department openings. Finish hardware will be heavy duty mortise type with lever ADA handles. Hardware brand and keyway systems will comply with PMC standards.

Interior Finishes

Wall finishes in staff and patient care areas will have fiberglass reinforced laminate (FRL) wall protection wainscots and stainless steel corner guards. Selected areas will have wall protection bumpers for equipment and mobile cart protection.

Floor finishes in waiting areas, conference rooms and offices will be carpet. Corridors will be sheet vinyl or vinyl composition tile (VCT) where heavy rolling equipment loads are anticipated. Cleanable walkoff mats will be located at all entries.

Window treatment at offices and exam rooms will be standard horizontal blinds.

Ceilings will be washable acoustical lay-in tile with suspended metal T-bar grid throughout.
Selected exam and treatment rooms will have painted gypsum board ceilings. Toilet rooms will have painted gypsum board ceilings. Selected waiting and reception areas will have feature ceilings with wood laminated panels and fabric-wrapped acoustical wall panels with wood trim accents between panels.

Admitting offices will have fabric wrapped acoustical wall panels on one wall with wood trim accents between panels.

Surgery
Operating room will have aseptic resinous epoxy flooring and integral coved base, painted gypsum board ceilings, solid surface wall protection wainscot full height to ceiling with welded seams.

Clinics
Clinical exam and treatment rooms will have sheet vinyl flooring, washable acoustical lay-in tile ceilings with suspended metal T-bar grid. Casework at patient and exam areas will be standard plastic laminate with solid surface countertops and backsplashes.

Imaging
X-ray and fluoroscopy rooms will have lead lined gypsum walls with painted finish. All rooms will have sheet vinyl flooring typically and acoustical lay tile with suspended metal t bar grid ceilings. Dressing areas will have carpet flooring.

Public Areas
Lobby and reception areas will have stone tile and carpet floors. Public lobby and reception areas walls will have laminated wood panels and wall coverings. Waiting and reception areas will have feature ceilings with wood laminated panels, fabric wrapped acoustical wall panels with wood trim accents between panels.
Propane fuel fireplace in main entrance lobby will have cultured stone veneer.

Service Areas
Service areas will have sealed concrete floors.

Conveying Systems (at multi-floor schemes)
Passenger and service elevators will be MRL 350 FPM, 3500 lb. capacity. Passenger cab finishes –plastic laminate wall panels, stainless steel wainscot and sheet vinyl flooring. Service elevator cab finishes – stainless steel, wall protection, VCT flooring.

N:\121-19016\08_Deliverables_Final\Architectural Narrative.docx

TECHNICAL MEMO

Date: January 24, 2020

To: Dan Jardine, NAC Architecture

From: Martin Chase, PE

Subject: Petersburg Medical Center Master Plan
Civil Engineering Narrative

INTRODUCTION

The following narrative is largely a compilation of information gathered from documents provided by others. These documents include:

- Google Maps
- Utility Map and utility/soils information provided by Petersburg Utility Director Karl Hagerman
- Predesign Schemes by NAC
- 2018 Petersburg Development Code

DEMOLITION AND EARTHWORK

The downtown site obviously has many structures and surface improvements requiring demolition, whereas, the Greenfield site will require logging, clearing and grubbing efforts.

Muskeg organic material present at either site would need to be removed and replaced with structural fill where building, road and parking footprints are proposed. How much muskeg needs to be removed has not been determined at the time of this memo as no geotechnical investigations have been performed. The existing hospital is currently on piles, so there is likely muskeg present at the downtown site, which could be anywhere between 0-feet to 5-feet deep. The recent construction of the fire station at Haugen Drive and N. 12th Street required removal of Muskeg between 6.5-feet and 9-feet deep. As this is our best data for the Greenfield site, we recommend accounting for 9-feet of Muskeg removal and structural fill import as the Greenfield site may actually have a deeper Muskeg profile.

It will be important to minimize draining of the muskeg to remain surrounding the sites as well as the adjacent properties as this would cause unintended settlement. A strategy to minimize settlement, therefore, this would be to remove only the amount of muskeg that can be replaced by structural fill in one day. This would add costs over excavating the entire site before replacing with structural fill, however. Once the structural fill is placed, the groundwater should act in a steady state. Foundation drains, if implemented, should be as high as possible.

Stone columns, if local expertise is available, could be an alternative to replacing muskeg or conventional piles. A geotechnical engineer would need to confirm this assumption.

Utilities constructed within the muskeg layer have the potential to settle. To mitigate this cost, utilities should be routed as much as possible near building footprints or within vehicle traveled

areas where muskeg is to be removed anyway. Instances where this is not feasible, the utility trenches would need to be backfilled with native material or geofoam that is similar in weight to the material removed in order to minimize settlement potential. Utilities may also need locking or flexible connections at pipe joints to be able to move with the ground if settlement does occur. Flexible or telescoping connections between muskeg and structural fill sections will be required due to differential settlement.

Utility trenches, if backfilled with material other than native material, should have bentonite check dams every 50-feet to avoid becoming a conduit for draining the surrounding muskegr.

The structural fill would be locally available material conforming to ADOT Standard Specifications. The Borough has its own quarry pit that is used for public projects.

SITE ACCESS/STREET IMPROVEMENTS

Downtown Site:

Borough Development Standards would require new curb, gutter and sidewalk be installed around the full development blocks. Additionally, we would also recommend half street improvements on all street frontages given that existing streets are unpaved and those that are may not survive construction of the medical center. The half street improvements would include new full depth street pavement section and new stormwater infrastructure, see Storm Drainage section below.

Greenfield Site:

Proposed on-site access drives and parking are shown on the NAC concept plan, Scheme 7. These drives would need to be designed with heavy pavement sections to accommodate the weight of emergency, delivery and garbage trucks.

Off-site improvements would require new curb, gutter and sidewalk along the Haugen Drive frontage and perhaps as far as N. 8th Street to comply with the Petersburg Development Code requirement of a Continuous Walkway System. Off-site improvements would also include constructing N. 9th Street and extending Fram Street to serve the proposed ambulance and loading areas. New streets shall be constructed per Commercial Street Standards outlined in Table 3.6.020.C of the Borough Development Code.

STORM DRAINAGE

In general, Petersburg does not provide stormwater infrastructure rather relying on overland surface flow. Stormwater detention or water quality systems are generally not required.

Downtown Site:

The downtown site has an existing 18-inch CMP in Fram Street starting at Second Street and running west. Providing roof and site drainage conveyance to this pipe is preferable to discharging to the street curb and gutter system unless new stormwater infrastructure is provided as part of new street infrastructure with the medical center development.

Greenfield Site:

The Greenfield site generally slopes from the north end of the site towards the south. Haugen Drive is built up on a prism adjacent to the site so access drives would need to be filled adjacent to Haugen with culverts to allow stormwater runoff to migrate. The site will require rainwater pipes and area drains to convey to surface swales that convey stormwater towards Haugen Drive. Since there is no stormwater infrastructure in Haugen Drive, the swale areas should be maximized on site to allow natural drainage infiltration and/or absorption to occur. Maintaining as much of the depressed areas adjacent to Haugen drive would be ideal. Planter and swale soils should contain at least 18-inches of organic bioretention soil to maximize on-site infiltration. Stormwater detention may be required if during design and permitting, it is determined that the stormwater runoff would have adverse impacts downstream of the site.

SANITARY SEWER

There is one wastewater treatment plant serving Petersburg with pumps and distributive piping delivering wastewater to the plant where it is treated to NPDES standards and discharged to Frederick Sound.

Downtown Site:

The existing hospital is served by a side sewer connected to an 8-inch PVC sewer main in First Street that drains towards the existing 8-inch PVC sewer main in Fram Street, which drains west. There are also 8-inch PVC sewer mains in Excel Street, Second Street and Third Street adjacent to the site.

The sewer infrastructure appears adequate to serve the proposed medical center development except that the existing sewer main in Second Street, if conveying wastewater beyond the site, would need to be relocated as it will be demolished as part of the proposed street vacation. Otherwise no new sanitary sewer infrastructure is required except for new side sewers for the proposed hospital and medical office building.

Greenfield Site:

There is an existing 8-inch PVC sanitary sewer main in Haugen Drive on the opposite side of the road from the Greenfield site. There is also an 8-inch asbestos cement (AC) pipe sewer main in Fram Street and a sewer main in Excel Street of unknown size and material type.

Since the site slopes towards Haugen Drive and the sewer main in Haugen Drive is PVC (newer than AC), we recommend that the medical center sanitary side sewers be routed to the sewer main in Haugen Drive. This will require a new side sewer crossing the entire width of Haugen Drive.

POTABLE WATER

The source of Petersburg water is from two reservoirs Cabin Creek (primary) and City Creek (back-up), which provide a reliable source of potable water. According to the Petersburg's 2018 Annual Water Quality Report, water quality within the potable water system meets both state and federal standards.

Downtown Site:

Existing water main infrastructure surrounds the downtown site:

- 8-inch ductile iron pipe (DI) in First Street
- 8-inch high density polyethylene pipe (HDPE) in Second Street
- 4-inch asbestos cement pipe (AC) in Third Street
- 10-inch DI in Fram Street from First to Second Street
- 10-inch AC in Fram Street from Second to Third Street
- 10-inch DIP in Excel Street

Existing fire hydrants are present at all the adjacent intersections except for 2nd and Fram.

Three separate fire hydrant flow tests conducted in 2016 in Nordic Drive, one block west of the site, resulted in flow rates ranging from approximately 3,800 GPM to 4,800 GPM at a residual pressure of 20 PSI, and static pressures around 100 PSI, which are robust.

The existing water infrastructure appears to be adequate to serve the domestic and fire suppression needs of the proposed medical center development at this site except that with the vacation of Second Street, the existing 8-inch HDPE water main will be removed from the water grid. We would expect Public Works to require a new 8-inch water main to be installed in Third Street and remove the old 4-inch AC water main. The 10-inch AC water main in Fram may need to be replaced with DI pipe if construction impacts require replacing. AC pipe is typically old and brittle and would be prudent to replace at the time of construction of the hospital phase.

The development will require new domestic and fire services. The domestic line will include a new meter and the fire service will need a backflow preventer which would most likely be in the fire sprinkler riser room and a fire department connection for each building in separate phases. The FDC may be wall mounted on the building if the local fire chief allows it.

Greenfield Site

Existing water main infrastructure is available on the south and west sides of the site and partially on the north side:

- 14-inch DI in Haugen Drive
- 10-inch DI in the unimproved but platted N. 9th Street
- 10-inch DI in Fram Street extending approximately 240-feet east of N. 9th Street

Nearby existing fire hydrants are in N. 8th Street at Haugen Drive and at Excel Street as well as at the Mountain View Manor apartments.

A fire hydrant flow test was conducted in 2013 resulting in a flow of 2300 GMP at a residual pressure of 20 PSI. We recommend that is fire hydrant be tested to verify current flow and pressure.

The existing water infrastructure appears adequate to serve the domestic and fire suppression needs of the proposed medical center development at this site except that Public Works may require a new water main be installed to provide a loop around the medical center for redundancy. This loop could be to extend the 10-inch water main in Fram Street east then

southeast to connect to the existing water main in 12th Street. For planning purposes, assume three new fire hydrants will be required. The medical center will also require new domestic service and meter and a new fire suppression service with backflow preventer in the fire sprinkler riser room, most likely off of the existing 10-inch main in either unimproved N. 9th Street or Fram Street. A fire department connection standpipe will need to be installed as well but may be wall mounted if allowed by the fire marshall.

NATURAL GAS

Natural gas infrastructure is not available in Petersburg. Properties using gas are supplied by propane trucks to individual onsite tanks.

POWER AND COMMUNICATIONS

See Electrical Engineering Narrative

TECHNICAL MEMO

Date: December 17, 2019

To: Dan Jardine, NAC Architecture

From: David Arndt, PE

Subject: Petersburg Medical Center Master Plan
Structural Engineering Narrative

GENERAL

The anticipated potential structural systems for the proposed schemes are applicable to all the schemes. They consist of gravity framing systems of structural steel, mild-reinforced concrete, or heavy timber, or some combination thereof. It's expected that a concrete-framed structure would be more expensive than a steel-framed or timber structure, due to 1) the need to transport much of the material for the concrete to Petersburg for this size of building and 2) the associated labor force requirements. In addition, a steel-framed structure is more easily modified for future changes, such as the addition of hung medical equipment, than a concrete or timber structure and can generally be constructed more quickly than a concrete-framed structure.

STEEL FRAMING

For a steel-framed building, the likely gravity floor framing system for elevated floors would be concrete on steel deck slabs supported by steel wide flange beams and columns. The columns would preferably be spaced not more than about 30 feet on center in both directions to avoid more expensive or deeper framing to meet the desired vibration performance. The likely gravity roof framing system would be steel deck supported by steel wide flange beams and columns. However, if a steel roof deck would need to be fireproofed, a concrete slab on metal deck roof without fireproofing may be preferable.

LATERAL BRACING

Potential candidates for the lateral framing system for a steel-framed building include steel moment frames and steel braced frames. Steel moment frames are generally more expensive than steel braced frames, but the moment frames provide for greater flexibility for future modifications by not creating "hard" wall locations.

FOUNDATION

The columns would most likely be supported by concrete spread footings, with concrete slabs on grade. Due to the typical soil conditions in Petersburg with a layer of muskeg overlaying suitable bearing material, it is likely that muskeg would need to be removed and replaced with structural fill to accommodate spread footings. Pile foundations with concrete grade beams are another foundation option, in order to avoid the need for removal of muskeg under the building footprint but using a deep foundation system of this type is expected to be a more expensive approach. In general, Petersburg does not provide stormwater infrastructure rather relying on overland surface flow. Stormwater detention or water quality systems are generally not required.

MEMO

SINGLE VS. MULTI-STORY

Due to the likely need to remove and replace the layer of muskeg, building schemes with smaller footprints may be determined to have lower total costs. However, the reduction in cost for a smaller footprint building scheme may be offset by the cost of some structured floors in multi-story areas of the building.

COFFMAN ENGINEERS

Mechanical System Design Narrative

Petersburg Medical Center

Fire Sprinkler System

Summary

The facility will be fully fire-sprinklered with a conventional wet-pipe system. Dry sprinkler heads served from the wet system or a separate dry-pipe system will be included as needed to protect areas subject to freezing. Conventional steel piping and semi-recessed quick-response sprinkler heads anticipated in most areas. The water utility will be the primary water supply with conventional pumper connections for additional water supply. Depending on utility water pressure and reliability at the selected site, an electric fire pump and/or on-site water storage may be needed.

Plumbing System

Summary

The facility will have a conventional "hospital-grade" plumbing system. The following attributes are anticipated:

- Copper domestic water piping. Cast iron sanitary and roof drainage piping.
- Institutional-grade vitreous china plumbing fixtures. Wall hung water closets as default except floor-mount will be considered for bariatric reasons in certain areas. Field-repairability and durability will be important for faucets and flush valves.
- Dual, fuel-fired domestic water heaters will provide 140-degree hot water for kitchen and CS areas and to central thermostatic mixing valves that will temper water circulated to patient areas to 118 degrees. Hot water piping systems will be circulated with extra provisions to minimize dead-legs and provide rapid hot water response to fixtures.
- Water softening and other methods of treatment will be provided as appropriate for local water quality.
- Conventional hospital-grade medical gas systems will be included, design to NFPA standards and plumbing code requirements. Oil-free "claw" type vacuum pumps anticipated. Oil-free reciprocating medical air compressors with full air quality conditioning/monitoring anticipated. Indoor manifolds for piped gasses anticipated.
- Fuel piping systems and tanks will be provided to serve boilers, water heaters and emergency generators.
- Propane tank and piping will be provided to serve fireplaces.

Heating, Ventilating and Air Conditioning (HVAC) System

Considerations

HVAC systems in medical facilities must perform multiple functions simultaneously and reliably, giving rise to a demanding array of expectations, including:

E1 Ventilation (air-change) rates must meet standards in most healthcare areas.

E2 Heating and cooling must meet strict temperature standards with individual control in many areas.
E3 High efficiency air filtration must be used to avoid circulation of harmful contaminants by the system.
E4 Certain rooms must be pressurized to minimize migration of contaminants to/from adjacent rooms.
E5 Systems must continue partial (essential) service when normal sources of energy are not available.
E6 Systems must be rugged enough to continue partial operation after component failure or earthquake.
E7 Systems should perform above standards to improve comfort and further minimize odors.
E8 Systems should be long-lived and economical to maintain to minimize operating/replacement costs.
E9 Systems should be energy efficient to minimize operating cost and environmental impact.
E10 Systems should be economical to construct.

The ultimate selection of a system and its associated equipment can be complicated as some options meet certain expectations very well but underperform on others. Any system considered needs to meet the "must-haves," specifically expectations E1-E6. This narrows the choices down to very few options and means decisions must be based on weighting of E7-E10.

Expectation E8 (long-lived and economical to maintain) is very dependent on local conditions. Coastal locations can be very hard on exterior equipment, for example, reducing longevity. Complicated packaged equipment, requiring out-of-town specialists for maintenance and repair, can be a difficult choice for remote locations like Petersburg even though complicated equipment often performs well with E9 and E10.

The following four HVAC system options have been identified as good contenders for the new Petersburg Medical Center considering the size of the facility, the semi-remote location, the climate, and the fact that it is new construction and not needing to mesh into an existing (sub-standard) facility. With each of these options, operable windows in patient rooms are optional with (if desired) wired switches to deactivate heating/cooling in that room whenever a window is opened.

Option A – Variable Air Volume (VAV) with Hydronic Heating and Air-cooled Central Chillers
Central air handlers with associated return and exhaust fans located in mechanical rooms that each provide air to large portions of the building. Energy recovery will transfer heat from exhaust air to incoming fresh air. Hydronic heating water loop with fuel-fired (and possible electric) boilers supplying up to 180-degree water to convection/radiant heaters in patient rooms (acute and LTC) and to reheat coils at VAV terminal units (conventional and fan-powered) serving areas where heaters are not desired. Chilled water (glycol) system providing cooling to air handlers with outdoor, air-cooled chillers having multiple sections so failure of one section will not prevent continued operation with reduced capacity.

> **E7 Benefits:** Convection/radiant heating in patient rooms can feel more comfortable as heating is provided without significant air movement near floor level.

E8 Benefits: Most equipment is located inside the building, away from coastal environment and weather, and of a type that is generally long-lived (only the cooling equipment needs to be located outside.) Air handlers are few, simple and durable with field-replaceable parts. Boilers and pumps are well understood by regional service providers. Virtually all equipment is located away from patient care areas, simplifying maintenance. It may be beneficial to include an electric resistance boiler in the heating plant, which could reduce energy cost depending on the prevailing cost of heating oil.
E9 Benefits: Average energy efficiency. This system is generally not energy efficient since air delivered to many spaces must be reheated with boiler energy after being (unnecessarily) cooled. Long duct runs require more motor energy for fans. To minimize inefficiency, the use of exhaust air heat recovery will reduce heating energy, "economizer" cooling (increasing the percentage of outdoor air) will reduce chiller energy. Also, the use of radiant/convective heating in patient rooms can further reduce heating and cooling energy by minimizing the amount of air supply (that would need reheating) to patient rooms when cooling is not needed.
E10 Benefits: This system is not inexpensive mechanically due to the higher cost of the hydronic heating system, the central chiller system, exhaust heat recovery and the cost of long runs of larger ductwork. Some offsetting cost advantages of this option include the ability to locate cooling equipment at grade, remotely from air handlers, providing architectural (visual) benefits and reducing general construction costs to accommodate noise, structural support and visual screening issues associated with what otherwise usually becomes multiple smaller AC units across the roof.

Option B – Variable Air Volume (VAV) with Hydronic Heating and DX Cooling
Same as Option A except use roof-mounted split system direct-expansion (DX) cooling units for each handler instead of the central chiller plant.

E7 Benefits: Same as Option A
E8 Benefits: Same as Option A. Multiple DX cooling units will require about the same amount of maintenance as fewer chillers with a separate hydronic piping system.
E9 Benefits: Same as Option A
E10 Benefits: Similar to Option A except DX cooling will cost less than a central chiller plant. As noted, above, additional general construction cost may be needed to accommodate multiple roof-mounted DX units.

Option C –Fan Coil System with DOAS Units and Hydronic Heating/Cooling
Roof-mounted, packaged dedicated outside air systems (DOAS) supply ventilation air (outside and exhaust air) to large portions of the building. Outside air from the DOAS system is injected into fan coil units located in patient rooms and most other spaces. The fan coil units do most of the air conditioning (heating and cooling) with recirculating room air. Filtered return air grilles can be used where its important to limit necessity to access the ceiling for filter maintenance. Ventilation air is generally a small percentage of the total air supply needed for heating and cooling, so distribution ductwork across the building is much smaller than ductwork associated with the options above.

The hydronic water loop with boilers only need to supply up to 115-degree water to fan coil units and terminal units when the system is in heating mode since multi-row coils are used. A split-system chiller

plumbed into the same (2-pipe) hydronic loop provides cold water when the system is in cooling mode. This chiller plant will be smaller than the Option A plant since the DOAS units will provide part of the total cooling needed. When in heating mode, the DOAS will supply extra-cool ventilation air to the fan coils for optimum humidity control and to delay the need to switch the hydronic system to cooling mode. Some fan coil units will be equipped with small electric heating coils to accommodate zones that still need some heating when the hydronic system eventually shifts to cooling mode.

Areas that need high ventilation rates, cooling during winter, or high-efficiency filtration (surgery, for example) will be served directly from a DOAS unit with electric reheat terminal units.

E7 Benefits: Comfortable indoor humidity during mild, rainy days. Odors generated in one area are less likely to be recirculated to other areas. Smaller central air handling equipment results in less noise near equipment.
E8 Benefits: Fan coil units are very small and simple in concept. A fan coil unit failure only takes a small area out of service. Multiple, small DOAS units can serve a common distribution system so a unit failure does not take any space out of service. Stocking of spare parts on site is very practical. Less return ductwork means less duct cleaning. Otherwise, maintenance cost will be higher due to the location and quantity of fan coil units and the roof mounted DOAS units will have a reduced life expectation.
E9 Benefits: This system is generally efficient since the need for reheating is minimal and fan energy is reduced. Efficiency will be further enhanced since the DOAS units will have heat recovery and economizer cooling.
E10 Benefits: Mechanical costs may be similar to Option A. Offsetting cost advantages will include smaller ductwork allowing a lower ceiling-to-structure space (reduced general construction cost) fewer mechanical rooms will allow a smaller building (reduced general construction cost).

Option D – Fan Coil System with DOAS Units and Hydronic Ground Source Heat Pump

Same as Option C except the chiller would be replaced with a water-to-water ground source heat pump system sized for the summer cooling load. Since a ground source system has limited ability to provide heat in a climate that is heavily dominated by heating needs, boilers will still be required but slightly smaller in size. The external bore field will be sized appropriately for the total summer heat contribution from cooling.

E7 Benefits: Same as Option C
E8 Benefits: Same as Option C but with increased maintenance associated with the ground source system.
E9 Benefits: Reduced energy consumption since some of the heating energy will be provided by the ground source heat pump. Cooling energy may not be much different since the Option C air cooled chiller will be very efficient with the low summer outside air temperature.
E10 Benefits: This should be considered a relatively expensive system to install.

Other HVAC Systems

- Controls: Conventional DDC controls are anticipated. A fully-loaded/licensed central work station and separate laptop computer (for off-site monitoring) will be included. Full building

graphics, monitoring and adjusting capabilities via either computer. Manufacturer training for at least two individuals.

- Humidification: Electric humidifiers with duct-mounted, short-dispersion manifolds will be needed for each VAV air handler or DOAS unit.
- High efficiency filtration: MERV 14 downstream filtration will be required for each VAV air handler or DOAS unit. DOAS filtration will be about 35% of the sized needed for VAV air handlers.
- Steam: Steam boilers are not anticipated. It is assumed that CS and kitchen equipment will be electric.
- Miscellaneous ventilation and heating: Convention wall exhausters and unit heaters in utility rooms. Electric or hydronic heaters in entrance vestibules.

NAC
ENGINEERING

D50 - ELECTRICAL SYSTEMS – Downtown Site

Electrical Service:

Electrical Distribution

- Primary medium voltage service from the utility company location will be as directed by utility company. Primary underground will be extended from nearest power source on the street which is overhead to the new service yard that will enclose the padmounted transformer. The existing primary overhead distribution system currently routes down 2nd street where the new hospital and clinics main entrance will be located. Therefore, this primary distribution line will need to be relocated. This line appears to feed the high school further down the street. Pending discussions with Alaska Power and Telephone, it is anticipated that the line will need to be intercepted at 2nd and Fram street, rerouted over to 3rd street and then back to 2nd at Excel street.
- Main electrical service to be a single 480Y/277 VAC 3-phase 4-wire main switchboard with a single main overcurrent breaker. Preliminary size based on building square footage and assuming electric heating will be 4,000 amps. This service will be dedicated to the new hospital construction. The existing service will be maintained to operate the hospital during the phased construction of the hospital. Once construction is completed, the existing hospital will be demolished. A new temporary service may be necessary to maintain the clinic's operation while the existing hospital is demolished. It is believed that the clinic is currently served by the main switchboard in the hospital.
- Dry type low voltage transformers will be used to step the voltage down to from 480Y/277 volt to 208Y/120 volt systems. These transformers will be aluminum wound with 115 degree C rise NEMA 2 enclosures and located in select electrical rooms.
- Demand metering is to be provided on the main service disconnecting breaker via Power Logic, or compatible equipment.
- Surge protection is to be provided at the main service entrance and on load side of dry-type transformers that supply 208-volt panelboards serving sensitive loads such as computer centers and IT equipment. All Life Safety, Critical branch, and legally required panelboards will be provided with Surge Protective Device (SPD) protection.
- 208Y/120 VAC panelboards for lighting circuits will be distributed throughout the building and generally located in electrical rooms. Panelboards for spaces such as the kitchen will be locally located in the space.

- 208Y/120 VAC distribution panelboards and motor control equipment for mechanical equipment circuits will be specified for mechanical equipment and located in the area being served where space allows.
- 208Y/120 VAC panel boards for receptacle and miscellaneous circuits will be specified using a radial distribution system with local of distribution boards. Panelboards and transformers will be located in electrical rooms and closets. Each floor devices shall be feed from a Panelboard located on that floor. Emergency loads will be feed from alternate floor located panels due to the limited number of circuits needed.
- Panelboards will be tin-plated aluminum bussed.
- Distribution feeders will be generally routed underground to each wing.
- Feeders 100 Amp and greater from the main electrical room to the wings will use compact aluminum feeders with hydraulically applied connection pin in the base bid. Other feeders will be based on copper conductors. All feeders will be based on copper provided as an alternate if the budget can support this expense.

Fire Pump Service:

- No fire pump service will be provided.

Emergency Electrical System:

- Main Hospital - A redundant (N+1) standby diesel generator(s) , located on the ground level, three 4-pole automatic transfer switches (ATS) and distribution panels rated at 208Y/120 volt are to be provided consisting of a dedicated life-safety branch, a critical branch, and an equipment branch. Paralleling gear will be designed to support the two generators. This Emergency Power Supply System (EPSS) is anticipated as being a level-01system where failure of the equipment to perform could result in loss of human life or serious injury. The EPSS equipment will be located in a separate 2-hour room and separated from the main electrical distribution equipment. Fuel will be #2 non-bio diesel with a minimum of 96-hours of run time. Due to the gallons required, a separate main tank with double wall construction will be needed with a transfer pump system to the day tank located in the generator room. A fuel polishing system will be required. A stationary load bank will be design to allow for automatic exercising of the generators on a monthly basis.
- Existing Hospital – existing EPSS will remain in operation during the phase of construction of the new hospital. Once complete, existing EPSS infrastructure shall be demolished. Existing 80kW and 250kW shall be salvaged. The existing 250kW generator will be considered for re-use for the new clinic. Re-use of generator will depend on whether it meets current EPA Tier emission regulations and provides adequate capacity for the buildings NEC 700 Life Safety and NEC 702 Optional Standby electrical demand.
- Clinic – A separate standby diesel generator will be used to feed the NEC-700 life safety system and the NEC-702 optional standby system. This system will have two dedicated ATSs. The EPSS is

anticipated as being a level-02 system where failure of the EPSS to perform is less critical to human life and safety. Re-use of the existing 250kW generator will be evaluated for use of the new clinic. If it does not pass the EPA Tier emission requirements or provide adequate capacity, a new generator will be planned for this building. A portable load bank can be used for annual testing. Fuel will be #2 non-bio diesel with a minimum of 24-hours of run time. It is estimated that this tank can be located below the generator in a belly tank configuration. A fuel polishing system will be not be required.

- A second generator output breaker for the clinic generator system will be specified for the generator system for an annual portable load bank for load test of the generator. This system will have a Trystar or similar generator bypass switch to allow for automatic disconnection of the load bank should utility power be lost during maintenance testing.
- Distribution and branch panels are to be provided for 120-volt loads. The generator unit to be provided with a base tank for minimum 8-hour operation. This generator is initially sized at 500 – 750 kW based on rough order of magnitude main hospital building square footage. The clinic will require a generator of rough order of magnitude of 200 – 350kW based on the clinic square footage and the desire to maintain full use of the facility. The generators are to be controlled for monthly testing via the building energy management control system.
- Generator will be fueled with #2 non-bio diesel. Bio-fuel can be investigate if so desired, but the generator manufacturers' have limitations on the level of bio-fuel that can be effectively used.
- Generation is to comply with NEC article 517 (Health Care Facility) for the main hospital and NEC articles 700, 701, 702 for the Clinic. These systems will serve life safety emergency exit and egress lighting, fire alarm system, security system, communication rooms, building automated control (BAC) panels, air conditioning for communications rooms, and walk-in coolers. Distribution is via feeders, with branch panels for life safety, and optional equipment loads. A dedicated generator branch will be used to serve select IT equipment, IT air-handling, walk-in coolers and areas that require ventilation.
- Sound levels are to be in accordance with local *maximum environmental noise level requirements and restrictions where applicable and local city ordinances. The generator system will be located exterior to the building and have a sound attenuated enclosure.

Emergency Life-Safety Loads

Egress lighting & exit signage, alarm and alerting systems, communication systems	Generator power. Additional battery packs provided in main electrical room where Automatic Transfer Switch (ATS) is located per NFPA-110 (Generator) Code.

Critical Loads

Equipment necessary for operation	Patient Bed/Critical Care

Telephone	Main switch and related equipment
Nurse-call/Code Blue system	Main equipment and supporting apparatus
Nurse-assist system	Main equipment and supporting apparatus
Misc equipment	Equipment and components as determined by the facility manager that are essential to operations. This can include things such as coffee makers, computer systems, etc.

Standby/Equipment Loads

Hydronic circulating pumps	Boiler and AC loops, include control circuits for any gas fired boilers
Owner data network	Power and equipment for all IDFs and MDF; include spare receptacles & A/C
BMS system	DDC controls
Fire Sprinkler & Alarm system	FACP, NAC panels, dry system compressors, magnetics locks, & any other associated device requiring power.
Generator accessories	Block heater and battery charger
Heat trace	Any heat trace installed to prevent system freezing
HVAC control system	Some items on this list would not operate w/o BMS controls
Phone system	Believed to be part of IT system. Dedicated circuits to phone headend will be provided
Security system	Includes intrusion, CCTV, card access system, front-door intercom, components may be scattered through the building(s)
Sump Pumps (if applicable)	For sub-grade drainage or sewage
Walk-in cooler/freezer	Optional per Owner request. Generally, these will hold cold for several hours and the large additional increase in generator may not be warranted.
Lighting	All restrooms, area light by generator for refueling, electrical room(s), mechanical room(s), MDF room and demarc room

Convenience outlets:	
- Health type rooms	Medical refrigerator(s)
- Facility manager office	phone / laptop / computer / emerg. radio / security computer / etc.
- Operations Manager	phone / computer / radio
- Security office, if desired	computer / radios / security camera head-end
- Kitchen/Food Service	Microwave and other select items as directed by the Owner
- Custodial office	HVAC/BMS computer/radio
- Additional areas	Common spaces, emergency storage & generator

Note: All generator backed receptacles to be red/orange in color for easy identification

- Select lighting for commons areas where kids may be held while being picked up during a power outage
- Mechanical DDC system

Uninterruptible Power System:

- No UPS equipment will be provided.
- If communication rooms are to have local UPS units at equipment racks, they will be provided by the Owner.
- X-ray and related equipment to be provided with UPS if so desired by the equipment supplier.

Grounding:

- The grounding system is to be in accordance with the National Electrical Code. The building ground is to consist of a UFER ground system with other grounding electrodes consisting of water service, and building steel. Interior metallic systems will be bonded together per NEC requirements. A telecommunication grounding riser will be provided with copper ground bars located as each telecommunication room. Driven ground rods will be provided for separately derived systems where other grounding means are not available.
- Grounding of raceway systems and distribution equipment cabinets is to consist of an insulated green equipment grounding conductor routed with the phase conductors and bonded at each panelboard and at intermediate pull boxes. The raceway system will not be used as the sole means of grounding.

- Cable trays throughout the building are to be bonded to building steel at multiple locations to create a low impedance signal ground in addition to being grounded at the main service. A bare copper ground wire will be routed with the cable tray and bonded to each section of the tray.
- A communication grounding system is to be provided per TIA/EIA-607 standards bonding all communications rooms to service ground and building steel. Ground bus bars are to be provided in each communication room.
- An isolated ground distribution system and isolated ground receptacles will be specified for patient care areas.

Lightning Protection:

- A lightning protection system will not be provided, but should be looked at.

Power:

- Wall receptacles are to be provided in offices, computer rooms, and room spaces. Floor boxes are to be located only where normal wall service would not accommodate the need such as teaching podiums. Tamper-resistant receptacle will be used in public accessible locations.
- Lab benches are to be provided with dual channel aluminum surface metal raceways. Single and three phase 208-volt receptacles are to be provided in laboratory spaces. Dedicated circuits shall be provided to serve equipment areas.
- 120-volt receptacles are to be provided on the building exterior for future electric vehicle charging and general Owner usage if directed by the Owner.
- Power poles are not to be used unless wall or floorbox service is not possible or there exists a need for easy relocation of power items.
- Receptacles in corridors will be placed on a maximum spacing of 50-ft for janitorial use.
- Display cases, if desired, will be provided with one duplex receptacle for general usage.
- General spacing of receptacles will be a maximum of 12-ft on-center with dedicated receptacles located for items such as vending machines, copy/fax machines, computers, and other like equipment.
- Receptacles on reception desk counters and like spaces will be on 4-ft centers. Where possible, receptacle for counter computer stations will be located below counter in the knee space with grommeted openings for cabling.
- Dedicated power will be provided for door control systems such as powered doors or door locking systems.
- Branch circuit wiring will be based on health-care rated MC cable with copper conductors and separate neutrals. Homeruns will be hard-piped back to the local panelboards from a distribution junction box in the vicinity of the loads being served. Additional concealed and

accessible junction boxes will be provided with hard-pipe interconnection to form a distribution backbone that can support future conductor additions from the room to the panelboard. MC cable will be radially connected to these distribution junction boxes following a spoke and hub design.

- The State of Alaska does not have a state code and follows the 2012 International Energy Conservation Code (IECC). We feel that energy conservation is an important aspect of facility longevity, sustainability and general good practice energy conservation. Hence we recommend following the Washington State Energy Code (WSEC) as it has proven to provide better performance than the IECC and is relatively cost effective since we will primarily be using LED style lighting. Per the current WSEC - At least 50 percent of all 125 volt 15- and 20-ampere receptacles installed in private offices, open offices, conference rooms, rooms used primarily for printing and/or copying functions, break rooms, individual workstations and rooms, including those installed in modular partitions and modular office workstation systems, shall be controlled as required by this section. In rooms larger than 200 square feet (19 m 2), a controlled receptacle shall be located within 72 inches (1.8 m) of each uncontrolled receptacle. Controlled receptacles shall be visibly differentiated from standard receptacles and shall be controlled by one of the following automatic control devices:
    - 1. An occupant sensor that turns receptacle power off when no occupants have been detected for a maximum of 20 minutes. This is the option we plan to use.
    - 2. Alternate approach - A time-of-day operated control device that turns receptacle power off at specific programmed times and be programmed separately for each day of the week. The control device shall be configured to provide an independent schedule for each portion of the building not to exceed 5,000 square feet (465 m2) and not to exceed one full floor. The device shall be capable of being overridden for periods of up to two hours by a timer accessible to occupants. Any individual override switch shall control the controlled receptacles for a maximum area of 5,000 square feet (465 m2). Override switches for controlled receptacles are permitted to control the lighting within the same area. This option can be used if so directed by the Owner.

Interior Lighting:

- The lighting system will be designed primarily based on use of lay-in 4500 to 5400 lumen volumetric style LED luminaires with electronic, high power factor, low harmonic served at 277 volts.
- Lamp color shall be the Owner standard. It is believed to be 3500ºK with a minimum CRI of 80.
- Human centric lighting will be explored in patient care areas. This requires special luminaires and more complicated controls to mimic circadian rhythms. It does add around $3/sft to the cost of the initial building design and does not use any additional energy as compared to a conventional on/off daylight harvesting system.

- Exit lights with LED lamps and emergency egress pathway lighting are to be provided and connected to the emergency distribution system. Exit lights shall be no more than 5 watts. Exit lights shall be red letters on a white face.
- The lighting system shall meet current 2015 Washington State NREC energy code.
- Indirect LED volumetric troffers are to be used in offices and other similar areas.
- LED grid volumetric/lensed luminaires are to be used in corridors and controlled via local low-voltage wall switches interconnected with the DDC and lighting control system. Local switches provide an over-ride of the system for a short period of time. The system selected should be specified to ignore the switches during scheduled times of day to avoid undesired switching.
- Life safety exit and egress lighting to remain on 24/7 as that is the intended use of the facilities.
- Direct/indirect (volumetric) lay-in grid-mounted linear LED fixtures with lenses on the direct downlight component in offices, laboratories, and conference rooms.
- Recessed LED accent down lighting to be used where applicable.
- Multi-level daylight zone controls for laboratories, and office lighting are to be provided. System will be digital and distributed.
- Automatic daylight harvesting has been interfaced with the localized digital control system in each room.
- Building interior lighting in common areas is to be controlled by DDC via a low voltage control system with computer control, relay panels and local low voltage switching, for compliance with energy code. Controls will be located at the nurse's station to allow for night-time dimming of corridors.
- Lighting control system will be based on an nLight system with luminaire level controls. Common/central core areas will be controlled from centralized network panels that are interconnected. The system would be specified to allow at least 3 different manufacturer's to bid.
- Occupancy sensors will be used in offices, conference/work rooms, corridors and restrooms per energy code requirements.
- Excessive brightness and glare shall be controlled in all instructional areas.
- Lighting levels will follow Washington Administrative Code (WAC) and Illuminating Engineering Society of North America (IESNA) recommended levels. Follow are the general guidelines:

    a. Lighting levels in patient rooms will be 20 - 30 foot-candles.
        i. Examinations will be designed for 100 foot-candles
    b. Lighting levels in offices will be 30 - 40 foot-candles.
    c. Lighting levels at the nurse's station will be 30-50 foot-candles.
    d. Lighting levels at the pharmacy will be 70-90 foot-candles.
    e. Lighting levels in stairwells and corridors will be 10 - 20 foot-candles.
    f. Lighting levels in mechanical equipment and electrical rooms will be 40 - 50 foot-candles.
    g. Lighting levels in telecommunications rooms will be 40 - 50 foot-candles.

h. Lighting levels in labs will be 50 - 60 foot-candles.
i. Lighting levels in the surgical rooms will be approximately 150 foot-candles and require dedicate examination lights.
j. Lighting levels in examination rooms will be 50 – 70 foot-candles.
k. Lighting levels in soiled and clean utility type rooms will be 30 - 40 foot-candles.
l. Lighting levels in food service/kitchen area will be 50 - 60 foot-candles.
m. Lighting levels at building exterior entrances will be 2 – 5 foot-candles.
n. Lighting levels at building exterior pathways will be 1 – 2 foot-candles.

Exterior Lighting:

- Site lighting will be tightly controlled to areas of egress, pedestrian paths and parking areas. Luminaires will be LED with dusk-to-dawn full operation. Luminaires will be dark sky compliant, with distribution types carefully controlled to avoid light trespass and light pollution.
- Exterior lighting will be automatically controlled. Lighting will generally be wall-mounted LED for building perimeter. Other area lighting around building, pedestrian pathways, and within parking area will be pole-mounted LED.
- Building egress and entrances will be connected to the standby generator per Code requirements.

Fire Alarm System:

- Existing fire alarm systems will be maintained for both the hospital and clinic for the duration of construction. Upon completion of each of construction, the fire alarm system in its entirety shall be demolished. Retention of any existing equipment shall be at the discretion of the owner. The existing fire alarm main panel will need to be relocated to the clinic during the demolition and construction of the new hospital. Once the new hospital portion is operational, the existing clinic can be demolished and the new clinic can be interfaced with the new system provided in the hospital.
- Multiplexed, addressable fire alarm system with mylar speakers and strobes to comply with ADA and local codes.
- Corridor and common area smoke detection will be specified as a minimum. If there are a significant number of duct smoke detectors required by the mechanical system layout, then total area coverage will be used instead.
- Raised floor areas will require detection below the floor in addition to the room space per NFPA 72 requirements. None are envisioned at this time.
- Fire separation doors will have 120 VAC electro-magnetic hold open devices which will be released by the fire alarm system.
- Building is equipped with an elevator so connections for elevator recall are needed.

- Fire/smoke dampers will be a zoned shutoff system. Position switches to confirm open for motorized dampers will not be provided.
- System will be a voice alarm system to allow paging and emergency announcements throughout the building.
- Fire alarm system will be based on the Owner fire alarm system standard. Currently this is unknown.
- 24-hour battery backup for the fire alarm system will be required in addition to generator backup.
- The contractor will provide the necessary programming of the fire alarm control panel.
- Building exterior notification devices, with amber visual signals, will be provided to identify building lockdown activation.
- 100% area detection is being considered for the Windsor site as the local AHJ has indicated that employing 100% area detection could reduce the fire water storage tank size. Cost evaluations are underway to see if there is an economic advantage of the 100% detection. The building is fully sprinkled.

Telecommunications:

- In addition to the overhead primary power distribution line there is fiber optic distribution on the same poles as the power and this would also require relocation to accommodate the new main entry for the hospital and clinic.
- The existing telecommunication infrastructure shall be maintained for both the hospital and clinic for the duration of construction. Upon completion of each of construction phase, the telecommunication network infrastructure in its entirety shall be demolished. Retention of any existing equipment shall be at the discretion of the owner. The existing MDF will need to be relocated to the clinic side to keep the clinic in operation while the hospital is demolished. It is intended that the MDF will reside in the new hospital and a new IDF will be provided in the clinic.
- Voice services will be copper and originate from the servicing utility companies demarcation cabinet located in the Main Distribution Frame (MDF) on the basement or first floor. A temporary new incoming service will be required to feed the clinic during the demolision and construction of the new hospital building.
- Copper and optical fiber horizontal distribution system within the building to support voice and data networks. A Telephone\Data Main Distribution Frame (MDF) entrance room shall be provided on the first level with access to the first floor pathways. Distributed communication Intermediate Distribution Frame (IDF) rooms shall be provided to minimize cable runs to 90 meters. This 90 meter length to be total length including patch cords of up to 5 meters. Connection between the MDF and IDF closets will be via underground raceway systems.

- IDF communication rooms shall be located toward the center of the building wings and not at the edges of each floor where possible. IDF communications rooms will be dedicated rooms located on the catwalk level.
- Each floor wing will be configured such that the station cables are terminated on the floor/wing that serve the corresponding Work Area Outlet (WAO) except where space does not allow for an IDF room per wing. In those locations, WAO station cables will terminate at the closest IDF or MDF. Jack and cable color and labeling will be per the Owner Standards.
- A complete telephone and data cabling system shall be provided throughout the facility. System shall be installed in accordance with TIA/EIA 568B standards, and in general will include Category 6A cable runs to all workstations and printer locations, terminated at station outlet jacks patch panels using RJ45 connections at the IDF communication rooms. The system will be designed to support 10 GB/s distribution.
- Fiber optic backbone cable will be provided between the entrance room and all distributed communication rooms. 8.3 micron SM Fiber optic cables will also be provided to server rooms and certain dedicated workstations where higher level of future bandwidth is anticipated. 6-strand MM OM3 50-micron and/or 8.3 micron SM fiber optic cabling will be designed between MDF and IDF rooms. Currently, the Owner has chosen 6-strand MM OM3 and 6-strand SM cabling. Terminations will be based on TeraSPEED SM duplex LC adapters.
- Color code for cables shall be as follows unless otherwise directed by the Owner:
    - Blue: Data and Voice
    - White: Security Cameras, Meters, Facilities
    - Violet/Purple: IP Clocks and Intercoms
    - Orange: Wireless Access
    - Black: Access Control
- Standard station outlets will include cabling for two (2) RJ-45 jacks on a common single-gang stainless steel faceplate. Faceplate colored icons shall be as follows:
    - Top Left – white
    - Top Right – Orange
    - Bottom Left – Blue
    - Bottom Right – Blank
- Labeling scheme will use MDF/IDF destination name. Examples - IDF_200 1-3; HS_406 1-3
- A complete wire-basket cable tray, ladder runway, and raceway system shall be provided for the facility. Cable tray will be routed in the mezzanine level. Underground raceways with a minimum of (1) 4" spare will be provided from the MDF to each IDF and (1) 4" spare from each IDF to the adjacent IDF to form a ring. This is a precaution for future additions or cable repair. It also affords the Owner the ability to create a self-healing network backbone.

- Cable tray and conduit shall be routed from the MDF entrance room to all distributed IDF communication rooms. Distribution cable tray shall be run from distributed communication rooms to areas with large concentrations of outlets or through main corridors as to provide easy access with minimal occupant disruption. Where possible, cabling shall be routed below raised floors and rated for the environment. Cable tray system will be based around a wire basket style tray with a maximum of 30% fill. Minimum size will be 12"W with a 4" loading depth.
- Raceways shall be provided from cable trays to all outlets. Ladder rack shall be provided in all communication rooms.
- Telephone handsets, and personal computers will be provided by the Owner.
- WiFi LAN system based on 802.11b standards will be required for interior hallways, common spaces and other select rooms that require wireless access points (WAPs) for wireless networking primarily used by the students. Offices will generally not be provided with wireless provisions. Some offices rooms may be able to utilize the wireless system based on the distribution locations for the WAPs. The wireless network will use power over Ethernet (PoE) for powering the WAPs. System to be designed around Aruba 7205 with Aruba AP-205 components.
- 2 data cables to each WAP will be provided.
- Category 6A augmented copper UTP with bonded pairs cabling will be used for horizontal cabling. Some select locations will be provided with fiber optic data ports as directed by the Owner's IT department. Wall locations may use Category 6A as dictated by the Owner's IT department.
- Horizontal and Vertical wire management will be provided at each rack/cabinet. Wire management will be 6" wide for vertical support on both sides of the rack with a common/shared vertical wire management where racks adjoin. Between each 48-port patch panel a 2RU wire management unit will be shown. Between each 24-port patch panel a 1RU wire management unit will be shown.
- A 50-pair Cat 3 phone backbone will be provided between the MDF and the IDF rooms. This cable will punch down on 110 blocks and can be used for cross-connects for older analog equipment that the Owner may want to re-use that is not IP-based at current time.
- Owner standard manufacturer is unknown.

The follow is a table of items to discuss to determine what is to be provided in the contract and what will be an FF&E item:

System ID		Description	Contractor Furnished Contractor Installed (CFCI)	Owner Furnished Contractor Installed (OFCI)	Owner Furnished Owner Installed (OFOI)
1		***Telecommunications Distribution System***			

	.01	Device conduit rough-in	x		
	.01	Open cabling supports / Cable Tray	x		
	.03	Category 6A cabling for Work Area Outlets (WAO)	x		
	.04	Category 6A cabling for wireless access points	x		
	.05	Wireless Access Points			x
	.06	Optical fiber & copper back bone cabling	x		
	.07	IT equipment racks & ladder rack	x		
	.08	Fiber & conduit to High MDF demarc	x		
	.09	UPS in Telecommunications Room		x	
	.10	PDU's in Telecommunications Room		x	
	.11	Power receptacles for telecommunications rooms	x		
	.12	HVAC cooling equipment for telecommunications rooms	x		
	.13	IT grounding & Bonding infrastructure	x		
	.14	Firestopping for IT pathways	x		
2		***IP Centralized Clock System***			
	.01	Device conduit rough-in	x		
	.02	IP clock combo device & patch cord (device end only)	x		
	.03	IP clock specialty back box	x		
	.04	IP digital clocks	x		
	.05	Analog speakers, zone controllers and paping amplifiers	x		
	.06	Analog speaker specialty back box	x		
	.07	Analog speaker cabling & connectivity	x		
	.08	software licenses			x
	.09	software, servers and programming			x
3		***Audio Visual System***			
	.01	Device conduit rough-in	x		

	.02	Interactive ultra short throw LCD video projector		x	
	.03	Video projector mount and mast	x		
	.04	VGA (video)/audio input device and cabling	x		
	.05	HDMI device and cabling	x		
	.06	Audio Video network switcher	x		
	.07	Sound enhancement speaker system (per room)	x		
	.08	Audio Video network software	x		
	.09	USB switcher, extender and input device	x		
	.10	Wireless microphone, base charger and IR sensor	x		
4		***Telephone System***			
	.01	Telephone Devices (handsets)			x
	.02	Telephone servers, programming, and licensing			x
5		***Network System***			
	.01	PC workstations and monitors			x
	.02	Network electronics			x
	.03	Category 6 patch cords for telecommunications room & workstations			x
	.04	Network programming and QOS scheduling			x
	.05	Network servers, programming and licensing			x
	.06	Ethernet switches (PoE and non-PoE)			x
6		***Security - Access Control System***			
	.01	Device conduit rough-in	x		
	.02	Electrical connections	x		

	.03	Low voltage cabling, security devices and terminations	x		
	.04	Access control equipment & programming	x		
7		***Security - IP Surveillance System***			
	.01	Device conduit rough-in	x		
	.02	IP surveillance cameras & patch cords (device end only)	x		
	.03	Software, cameras and licenses	x		
	.04	Physical servers and storage - NVR	x		
	.05	VMS programming			x
7		***Nurse Call System***			
	.01	Device conduit rough-in	x		
	.02	Devices	x		
	.03	Headend equipment	x		
	.04	Cabling, devices and terminations	x		
	.05	Programming and testing	x		
8		***Distributed Antenna System (Required?)***			
	.01	Device conduit rough-in	?		
	.02	Headend equipment	?		
	.03	Cabling, devices and terminations	?		
	.04	Programming and testing	?		
10		***Audio Visual Distribution Systems***			
	.01	Recessed AV wallbox and device conduit rough-in	x		
	.02	LCD flat panel display			x
	.03	Universal wall mount		x	
	.04	Network media player, licenses and software			x
	.05	Programming			x

CATV System:

- A coax style CATV system will not be provided as IPTV has replaced most TV distribution systems. IPTV systems generally run over the data network. Devices will be located in each patient area and in waiting rooms.

CCTV System:

- Existing CCTV system shall be maintained for both the hospital and clinic for the duration of construction. Upon completion of each of construction phase, the CCTV infrastructure in its entirety shall be demolished. Retention of any existing equipment shall be at the discretion of the owner.
- A limited security CCTV system will be required. This system will be remotely monitored and will include network video recorders (NVR). The NVRs will be located in the telecommunications rooms and configured for connectivity to the Ethernet network. Monitoring of the system will be via a Windows-based software package installed on a dedicated computer for the Security Resource Officer (SRO) usage.
- The security CCTV system will be continuously monitored. Software triggers can be implemented to reduce the recording data amount.
- Cameras for the security CCTV system may require TCP/IP addressing capability.
- A security surveillance type system with cameras and monitors is to be included for corridors and entry doors and elevator.
- Active components will be furnished by the Owner. This includes cameras and head-end equipment such as network video recorders and storage. Cabling will be part of the building infrastructure contract.
- Anticipated camera locations are the main entrances, waiting areas, and potentially parking lots.

Audio/Video:

- Mediated training rooms shall be equipped with presentation systems consisting of a video/graphics projection system and multimedia sources, including document camera, VCR's, DVD/CD players and connections for personal computers or laptops. All mediated rooms shall be provided with program audio systems and larger meeting/community rooms shall also be provided with voice reinforcement systems.
- Mediated rooms shall be provided with control systems based on the Owner standards. Multimedia sources shall be located in the Instructor's podium and/or media.

- Video projectors will be based primarily around an Ultra-Short Throw projection system without interactive capability. These will be wall mounted above the front teaching whiteboard. Dalite style projection boards will be used over standard whiteboards for better visibility and contrast.
- There will be either flat panel display or ultra-short throw projectors with screens in the commons for daily events display. Cost comparisons between the two options are in progress.
- Assistive listening systems shall be provided in all rooms with 40 seats or more, if such space is applicable. Headsets are checked out to individual users by the Instructor.

Intercommunication/Public Address System:

- Existing intercom system shall be maintained for both the hospital and clinic for the duration of construction. Upon completion of each of construction phase, the intercom system infrastructure in its entirety shall be demolished. Retention of any existing equipment shall be at the discretion of the owner.
- The building interior and exterior will be provided with a public address system consisting of speakers and interconnections to sound re-enforcement system using a priority override. Paging capability will be combined with the room clock/speakers system, locker rooms, commons, corridors and similar general usage spaces.
- Paging will be provided for a minimum of 10 zones with expandability to a minimum of 16 zones.
- System will be based on Owner Standards. This is believed to be a Rauland Telecenter.
- The Owner furnished VoIP telephone system will be interfaced to this system to allow for room-to-room communication or general announcement broadcasting.

Clock System:

- Individual room and the nurse's station clocks with synchronization using SNTP will be specified. Size is expected to be based on standard 12" digital-style clocks.
- Surgical rooms will have standard time of day clocks and additional procedure clocks.
- Commons area will be provided with 12" or larger analog-style clocks.
- The clock system will use SNTP for synchronization and will be Ethernet-based. The clocks will connect to the Rauland Telecenter system using network/Ethernet style cabling.

Access Control:

- Existing access control system shall be maintained for both the hospital and clinic for the duration of construction. Upon completion of each of construction phase, the access control

infrastructure in its entirety shall be demolished. Retention of any existing equipment shall be at the discretion of the owner.

- The building requires an exterior access control system for selected doors. Access control will be via proximity cards. The system will be based on Owner standards.
- Keypads will be located at select main entry points for arming/disarming the system.
- The building will be configured for multiple zones to allow kitchen staff to enter and leave without disruption of the overall building protection. Zone discussions will be required between the Engineer and the Owner so these can properly be indicated on the construction documents.
- 24-hour battery backup in addition to generator power will be required for the access control system. This system will be feed from the NEC 702 optionally standby system.
- Perimeter doors are to be provided with door switches and proximity card reader access control.
- Intrusion detection will also be provided in the corridors and select perimeter rooms classified as "High Risk" areas such as computer labs, science rooms, etc.
- The Owner is currently working with their vendor of choice on a system design. Once selected, the vendor and the engineer will work together to depict the system installation on the construction documents.

LEED Credits (if LEED Certification is desired):

- Following is a list of Leadership in Energy and Environmental Design (LEED) points that will be sought after:
    - Sustainable Site – Outdoor Lighting – Light Pollution Reduction (1 pt)
    - Energy and Atmosphere – Superior Energy Performance (1 pt)
    - Energy and Atmosphere – Green Power and Carbon Offsets (0 pt), Generally an expensive item
    - Indoor Environment Quality – Electric Light Quality (1 pt)

NAC
ENGINEERING

D50 - ELECTRICAL SYSTEMS – Greensfield Site

Electrical Service:

Electrical Distribution

- Primary medium voltage service from the utility company location will be as directed by utility company. Primary underground will be extended from nearest power source to the new service yard that will enclose the padmounted transformer.
- Main electrical service to be a single 480Y/277 VAC 3-phase 4-wire main switchboard with a single main overcurrent breaker. Preliminary size based on building square footage and assuming electric heating will be 4,000 amps.
- Dry type low voltage transformers will be used to step the voltage down to from 480Y/277 volt to 208Y/120 volt systems. These transformers will be aluminum wound with 115 degree C rise NEMA TP1 enclosures and located in select electrical rooms.
- Demand metering is to be provided on the main service disconnecting breaker via Power Logic, or compatible equipment.
- Surge protection is to be provided at the main service entrance and on load side of dry-type transformers that supply 208-volt panelboards serving sensitive loads such as computer centers and IT equipment. All Life Safety, Critical branch, and legally required panelboards will be provided with Surge Protective Device (SPD) protection.
- 208Y/120 VAC panelboards for lighting circuits will be distributed throughout the building and generally located in electrical rooms. Panelboards for spaces such as the kitchen will be locally located in the space.
- 208Y/120 VAC distribution panelboards and motor control equipment for mechanical equipment circuits will be specified for mechanical equipment and located in the area being served where space allows.
- 208Y/120 VAC panel boards for receptacle and miscellaneous circuits will be specified using a radial distribution system with local of distribution boards. Panelboards and transformers will be located in electrical rooms and closets. Each floor devices shall be feed from a Panelboard located on that floor. Emergency loads will be feed from alternate floor located panels due to the limited number of circuits needed.
- Panelboards will be tin-plated aluminum bussed.
- Distribution feeders will be generally routed underground to each wing.

- Feeders 100 Amp and greater from the main electrical room to the wings will use compact aluminum feeders with hydraulically applied connection pin in the base bid. Other feeders will be based on copper conductors. All feeders will be based on copper provided as an alternate if the budget can support this expense.

Fire Pump Service:

- No fire pump service will be provided.

Emergency Electrical System:

- Main Hospital - A redundant (N+1) standby diesel generator(s) , located on ground level, three 4-pole automatic transfer switches (ATS) and distribution panels rated at 208Y/120 volt are to be provided consisting of a dedicated life-safety branch, a critical branch, and an equipment branch. Paralleling gear will be designed to support the two generators. This Emergency Power Supply System (EPSS) is anticipated as being a level-01system where failure of the equipment to perform could result in loss of human life or serious injury. The EPSS equipment will be located in a separate 2-hour room and separated from the main electrical distribution equipment. Fuel will be #2 non-bio diesel with a minimum of 96-hours of run time. Due to the gallons required, a separate main tank with double wall construction will be needed with a transfer pump system to the day tank located in the generator room. A fuel polishing system will be required. A stationary load bank will be design to allow for automatic exercising of the generators on a monthly basis.
- Clinic – A separate standby diesel generator will be used to feed the NEC-700 life safety system and the NEC-702 optional standby system. This system will have two dedicated ATSs. The EPSS is anticipated as being a level-02 system where failure of the EPSS to perform is less critical to human life and safety. A portable load bank can be used for annual testing. Fuel will be #2 non-bio diesel with a minimum of 24-hours of run time. It is estimated that this tank can be located below the generator in a belly tank configuration. A fuel polishing system will be not be required.
- A second generator output breaker for the clinic generator system will be specified for the generator system for an annual portable load bank for load test of the generator. This system will have a Trystar or similar generator bypass switch to allow for automatic disconnection of the load bank should utility power be lost during maintenance testing.
- Distribution and branch panels are to be provided for 120-volt loads. The generator unit to be provided with a base tank for minimum 8-hour operation. This generator is initially sized at 500 – 750 kW based on rough order of magnitude main hospital building square footage. The clinic will require a generator of rough order of magnitude of 200 – 350kW based on the clinic square footage and the desire to maintain full use of the facility. The generators are to be controlled for monthly testing via the building energy management control system.
- Generator will be fueled with #2 non-bio diesel. Bio-fuel can be investigate if so desired, but the generator manufacturers' have limitations on the level of bio-fuel that can be effectively used.

- Generation is to comply with NEC article 517 (Health Care Facility) for the main hospital and NEC articles 700, 701, 702 for the Clinic. These systems will serve life safety emergency exit and egress lighting, fire alarm system, security system, communication rooms, building automated control (BAC) panels, air conditioning for communications rooms, and walk-in coolers. Distribution is via feeders, with branch panels for life safety, and optional equipment loads. A dedicated generator branch will be used to serve select IT equipment, IT air-handling, walk-in coolers and areas that require ventilation.
- Sound levels are to be in accordance with local *maximum environmental noise level requirements and restrictions where applicable and local city ordinances. The generator system will be located exterior to the building and have a sound attenuated enclosure.

Emergency Life-Safety Loads

Egress lighting & exit signage, alarm and alerting systems, communication systems	Generator power. Additional battery packs provided in main electrical room where Automatic Transfer Switch (ATS) is located per NFPA-110 (Generator) Code.

Critical Loads

Equipment necessary for operation	Patient Bed/Critical Care
Telephone	Main switch and related equipment
Nurse-call/Code Blue system	Main equipment and supporting apparatus
Nurse-assist system	Main equipment and supporting apparatus
Misc equipment	Equipment and components as determined by the facility manager that are essential to operations. This can include things such as coffee makers, computer systems, etc.

Standby/Equipment Loads

Hydronic circulating pumps	Boiler and AC loops, include control circuits for any gas fired boilers
Owner data network	Power and equipment for all IDFs and MDF; include spare receptacles & A/C
BMS system	DDC controls
Fire Sprinkler & Alarm system	FACP, NAC panels, dry system compressors, magnetics locks, & any other associated device requiring power.
Generator accessories	Block heater and battery charger
Heat trace	Any heat trace installed to prevent system freezing
HVAC control system	Some items on this list would not operate w/o BMS controls
Phone system	Believed to be part of IT system. Dedicated circuits to phone headend will be provided
Security system	Includes intrusion, CCTV, card access system, front-door intercom, components may be scattered through the building(s)
Sump Pumps (if applicable)	For sub-grade drainage or sewage
Walk-in cooler/freezer	Optional per Owner request. Generally, these will hold cold for several hours and the large additional increase in generator may not be warranted.
Lighting	All restrooms, area light by generator for refueling, electrical room(s), mechanical room(s), MDF room and demarc room
Convenience outlets:	
- Health type rooms	Medical refrigerator(s)
- Facility manager office	phone / laptop / computer / emerg. radio / security computer / etc.
- Operations Manager	phone / computer / radio
- Security office, if desired	computer / radios / security camera head-end
- Kitchen/Food Service	Microwave and other select items as directed by the Owner
- Custodial office	HVAC/BMS computer/radio

- Additional areas	Common spaces, emergency storage & generator

Note: All generator backed receptacles to be red/orange in color for easy identification

- Select lighting for commons areas where kids may be held while being picked up during a power outage
- Mechanical DDC system

Uninterruptible Power System:

- No UPS equipment will be provided.
- If communication rooms are to have local UPS units at equipment racks, they will be provided by the Owner.
- X-ray and related equipment to be provided with UPS if so desired by the equipment supplier.

Grounding:

- The grounding system is to be in accordance with the National Electrical Code. The building ground is to consist of a UFER ground system with other grounding electrodes consisting of water service, and building steel. Interior metallic systems will be bonded together per NEC requirements. A telecommunication grounding riser will be provided with copper ground bars located as each telecommunication room. Driven ground rods will be provided for separately derived systems where other grounding means are not available.
- Grounding of raceway systems and distribution equipment cabinets is to consist of an insulated green equipment grounding conductor routed with the phase conductors and bonded at each panelboard and at intermediate pull boxes. The raceway system will not be used as the sole means of grounding.
- Cable trays throughout the building are to be bonded to building steel at multiple locations to create a low impedance signal ground in addition to being grounded at the main service. A bare copper ground wire will be routed with the cable tray and bonded to each section of the tray.
- A communication grounding system is to be provided per TIA/EIA-607 standards bonding all communications rooms to service ground and building steel. Ground bus bars are to be provided in each communication room.
- An isolated ground distribution system and isolated ground receptacles will be specified for patient care areas.

Lightning Protection:

- A lightning protection system will not be provided, but should be looked at.

Power:

- Wall receptacles are to be provided in offices, computer rooms, and room spaces. Floor boxes are to be located only where normal wall service would not accommodate the need such as teaching podiums. Tamper-resistant receptacle will be used in public accessible locations.
- Lab benches are to be provided with dual channel aluminum surface metal raceways. Single and three phase 208-volt receptacles are to be provided in laboratory spaces. Dedicated circuits shall be provided to serve equipment areas.
- 120-volt receptacles are to be provided on the building exterior for future electric vehicle charging and general Owner usage if directed by the Owner.
- Power poles are not to be used unless wall or floorbox service is not possible or there exists a need for easy relocation of power items.
- Receptacles in corridors will be placed on a maximum spacing of 50-ft for janitorial use.
- Display cases, if desired, will be provided with one duplex receptacle for general usage.
- General spacing of receptacles will be a maximum of 12-ft on-center with dedicated receptacles located for items such as vending machines, copy/fax machines, computers, and other like equipment.
- Receptacles on reception desk counters and like spaces will be on 4-ft centers. Where possible, receptacle for counter computer stations will be located below counter in the knee space with grommeted openings for cabling.
- Dedicated power will be provided for door control systems such as powered doors or door locking systems.
- Branch circuit wiring will be based on health-care rated MC cable with copper conductors and separate neutrals. Homeruns will be hard-piped back to the local panelboards from a distribution junction box in the vicinity of the loads being served. Additional concealed and accessible junction boxes will be provided with hard-pipe interconnection to form a distribution backbone that can support future conductor additions from the room to the panelboard. MC cable will be radially connected to these distribution junction boxes following a spoke and hub design.
- The State of Alaska does not have a state code and follows the 2012 International Energy Conservation Code (IECC). We feel that energy conservation is an important aspect of facility longevity, sustainability and general good practice energy conservation. Hence we recommend following the Washington State Energy Code (WSEC) as it has proven to provide better performance than the IECC and is relatively cost effective since we will primarily be using LED style lighting. Per the current WSEC - At least 50 percent of all 125 volt 15- and 20-ampere receptacles installed in private offices, open offices, conference rooms, rooms used primarily for printing and/or copying functions, break rooms, individual workstations and rooms, including those installed in modular partitions and modular office workstation systems, shall be controlled

as required by this section. In rooms larger than 200 square feet (19 m 2), a controlled receptacle shall be located within 72 inches (1.8 m) of each uncontrolled receptacle. Controlled receptacles shall be visibly differentiated from standard receptacles and shall be controlled by one of the following automatic control devices:

- 1. An occupant sensor that turns receptacle power off when no occupants have been detected for a maximum of 20 minutes. This is the option we plan to use.
- 2. Alternate approach - A time-of-day operated control device that turns receptacle power off at specific programmed times and be programmed separately for each day of the week. The control device shall be configured to provide an independent schedule for each portion of the building not to exceed 5,000 square feet (465 m2) and not to exceed one full floor. The device shall be capable of being overridden for periods of up to two hours by a timer accessible to occupants. Any individual override switch shall control the controlled receptacles for a maximum area of 5,000 square feet (465 m2). Override switches for controlled receptacles are permitted to control the lighting within the same area. This option can be used if so directed by the Owner.

Interior Lighting:

- The lighting system will be designed primarily based on use of lay-in 4500 to 5400 lumen volumetric style LED luminaires with electronic, high power factor, low harmonic served at 277 volts.
- Lamp color shall be the Owner standard. It is believed to be 3500ºK with a minimum CRI of 80.
- Human centric lighting will be explored in patient care areas. This requires special luminaires and more complicated controls to mimic circadian rhythms. It does add around $3/sft to the cost of the initial building design and does not use any additional energy as compared to a conventional on/off daylight harvesting system.
- Exit lights with LED lamps and emergency egress pathway lighting are to be provided and connected to the emergency distribution system. Exit lights shall be no more than 5 watts. Exit lights shall be red letters on a white face.
- The lighting system shall meet current 2015 Washington State NREC energy code.
- Indirect LED volumetric troffers are to be used in offices and other similar areas.
- LED grid volumetric/lensed luminaires are to be used in corridors and controlled via local low-voltage wall switches interconnected with the DDC and lighting control system. Local switches provide an over-ride of the system for a short period of time. The system selected should be specified to ignore the switches during scheduled times of day to avoid undesired switching.
- Life safety exit and egress lighting to remain on 24/7 as that is the intended use of the facilities.
- Direct/indirect (volumetric) lay-in grid-mounted linear LED fixtures with lenses on the direct downlight component in offices, laboratories, and conference rooms.

- Recessed LED accent down lighting to be used where applicable.
- Multi-level daylight zone controls for laboratories, and office lighting are to be provided. System will be digital and distributed.
- Automatic daylight harvesting has been interfaced with the localized digital control system in each room.
- Building interior lighting in common areas is to be controlled by DDC via a low voltage control system with computer control, relay panels and local low voltage switching, for compliance with energy code. Controls will be located at the nurse's station to allow for night-time dimming of corridors.
- Lighting control system will be based on an nLight system with luminaire level controls. Common/central core areas will be controlled from centralized network panels that are interconnected. The system would be specified to allow at least 3 different manufacturer's to bid.
- Occupancy sensors will be used in offices, conference/work rooms, corridors and restrooms per energy code requirements.
- Excessive brightness and glare shall be controlled in all instructional areas.
- Lighting levels will follow Washington Administrative Code (WAC) and Illuminating Engineering Society of North America (IESNA) recommended levels. Follow are the general guidelines:

    a. Lighting levels in patient rooms will be 20 - 30 foot-candles.
        i. Examinations will be designed for 100 foot-candles
    b. Lighting levels in offices will be 30 - 40 foot-candles.
    c. Lighting levels at the nurse's station will be 30-50 foot-candles.
    d. Lighting levels at the pharmacy will be 70-90 foot-candles.
    e. Lighting levels in stairwells and corridors will be 10 - 20 foot-candles.
    f. Lighting levels in mechanical equipment and electrical rooms will be 40 - 50 foot-candles.
    g. Lighting levels in telecommunications rooms will be 40 - 50 foot-candles.
    h. Lighting levels in labs will be 50 - 60 foot-candles.
    i. Lighting levels in the surgical rooms will be approximately 150 foot-candles and require dedicate examination lights.
    j. Lighting levels in examination rooms will be 50 – 70 foot-candles.
    k. Lighting levels in soiled and clean utility type rooms will be 30 - 40 foot-candles.
    l. Lighting levels in food service/kitchen area will be 50 - 60 foot-candles.
    m. Lighting levels at building exterior entrances will be 2 – 5 foot-candles.
    n. Lighting levels at building exterior pathways will be 1 – 2 foot-candles.

Exterior Lighting:

- Site lighting will be tightly controlled to areas of egress, pedestrian paths and parking areas. Luminaires will be LED with dusk-to-dawn full operation. Luminaires will be dark sky compliant, with distribution types carefully controlled to avoid light trespass and light pollution.

- Exterior lighting will be automatically controlled. Lighting will generally be wall-mounted LED for building perimeter. Other area lighting around building, pedestrian pathways, and within parking area will be pole-mounted LED.
- Building egress and entrances will be connected to the standby generator per Code requirements.

Fire Alarm System:

- Multiplexed, addressable fire alarm system with mylar speakers and strobes to comply with ADA and local codes.
- Corridor and common area smoke detection will be specified as a minimum. If there are a significant number of duct smoke detectors required by the mechanical system layout, then total area coverage will be used instead.
- Raised floor areas will require detection below the floor in addition to the room space per NFPA 72 requirements. None are envisioned at this time.
- Fire separation doors will have 120 VAC electro-magnetic hold open devices which will be released by the fire alarm system.
- Building is equipped with an elevator so connections for elevator recall are needed.
- Fire/smoke dampers will be a zoned shutoff system. Position switches to confirm open for motorized dampers will not be provided.
- System will be a voice alarm system to allow paging and emergency announcements throughout the building.
- Fire alarm system will be based on the Owner fire alarm system standard. Currently this is unknown.
- 24-hour battery backup for the fire alarm system will be required in addition to generator backup.
- The contractor will provide the necessary programming of the fire alarm control panel.
- Building exterior notification devices, with amber visual signals, will be provided to identify building lockdown activation.
- 100% area detection is being considered for the Windsor site as the local AHJ has indicated that employing 100% area detection could reduce the fire water storage tank size. Cost evaluations are underway to see if there is an economic advantage of the 100% detection. The building is fully sprinkled.

Telecommunications:

- Voice services will be copper and originate from the servicing utility companies demarcation cabinet located in the Main Distribution Frame (MDF) on the basement or first floor.
- Copper and optical fiber horizontal distribution system within the building to support voice and data networks. A Telephone\Data Main Distribution Frame (MDF) entrance room shall be provided on the first level with access to the first floor pathways. Distributed communication Intermediate Distribution Frame (IDF) rooms shall be provided to minimize cable runs to 90 meters. This 90 meter length to be total length including patch cords of up to 5 meters. Connection between the MDF and IDF closets will be via underground raceway systems.
- IDF communication rooms shall be located toward the center of the building wings and not at the edges of each floor where possible. IDF communications rooms will be dedicated rooms located on the catwalk level.
- Each floor wing will be configured such that the station cables are terminated on the floor/wing that serve the corresponding Work Area Outlet (WAO) except where space does not allow for an IDF room per wing. In those locations, WAO station cables will terminate at the closest IDF or MDF. Jack and cable color and labeling will be per the Owner Standards.
- A complete telephone and data cabling system shall be provided throughout the facility. System shall be installed in accordance with TIA/EIA 568B standards, and in general will include Category 6A cable runs to all workstations and printer locations, terminated at station outlet jacks patch panels using RJ45 connections at the IDF communication rooms. The system will be designed to support 10 GB/s distribution.
- Fiber optic backbone cable will be provided between the entrance room and all distributed communication rooms. 8.3 micron SM Fiber optic cables will also be provided to server rooms and certain dedicated workstations where higher level of future bandwidth is anticipated. 6-strand MM OM3 50-micron and/or 8.3 micron SM fiber optic cabling will be designed between MDF and IDF rooms. Currently, the Owner has chosen 6-strand MM OM3 and 6-strand SM cabling. Terminations will be based on TeraSPEED SM duplex LC adapters.
- Color code for cables shall be as follows unless otherwise directed by the Owner:
    - Blue: Data and Voice
    - White: Security Cameras, Meters, Facilities
    - Violet/Purple: IP Clocks and Intercoms
    - Orange: Wireless Access
    - Black: Access Control
- Standard station outlets will include cabling for two (2) RJ-45 jacks on a common single-gang stainless steel faceplate. Faceplate colored icons shall be as follows:
    - Top Left – white
    - Top Right – Orange
    - Bottom Left – Blue

  - Bottom Right – Blank

- Labeling scheme will use MDF/IDF destination name. Examples - IDF_200 1-3; HS_406 1-3
- A complete wire-basket cable tray, ladder runway, and raceway system shall be provided for the facility. Cable tray will be routed in the mezzanine level. Underground raceways with a minimum of (1) 4" spare will be provided from the MDF to each IDF and (1) 4" spare from each IDF to the adjacent IDF to form a ring. This is a precaution for future additions or cable repair. It also affords the Owner the ability to create a self-healing network backbone.
- Cable tray and conduit shall be routed from the MDF entrance room to all distributed IDF communication rooms. Distribution cable tray shall be run from distributed communication rooms to areas with large concentrations of outlets or through main corridors as to provide easy access with minimal occupant disruption. Where possible, cabling shall be routed below raised floors and rated for the environment. Cable tray system will be based around a wire basket style tray with a maximum of 30% fill. Minimum size will be 12"W with a 4" loading depth.
- Raceways shall be provided from cable trays to all outlets. Ladder rack shall be provided in all communication rooms.
- Telephone handsets, and personal computers will be provided by the Owner.
- WiFi LAN system based on 802.11b standards will be required for interior hallways, common spaces and other select rooms that require wireless access points (WAPs) for wireless networking primarily used by the students. Offices will generally not be provided with wireless provisions. Some offices rooms may be able to utilize the wireless system based on the distribution locations for the WAPs. The wireless network will use power over Ethernet (PoE) for powering the WAPs. System to be designed around Aruba 7205 with Aruba AP-205 components.
- 2 data cables to each WAP will be provided.
- Category 6A augmented copper UTP with bonded pairs cabling will be used for horizontal cabling. Some select locations will be provided with fiber optic data ports as directed by the Owner's IT department. Wall locations may use Category 6A as dictated by the Owner's IT department.
- Horizontal and Vertical wire management will be provided at each rack/cabinet. Wire management will be 6" wide for vertical support on both sides of the rack with a common/shared vertical wire management where racks adjoin. Between each 48-port patch panel a 2RU wire management unit will be shown. Between each 24-port patch panel a 1RU wire management unit will be shown.
- A 50-pair Cat 3 phone backbone will be provided between the MDF and the IDF rooms. This cable will punch down on 110 blocks and can be used for cross-connects for older analog equipment that the Owner may want to re-use that is not IP-based at current time.
- Owner standard manufacturer is unknown.

The follow is a table of items to discuss to determine what is to be provided in the contract and what will be an FF&E item:

System ID		Description	Contractor Furnished Contractor Installed (CFCI)	Owner Furnished Contractor Installed (OFCI)	Owner Furnished Owner Installed (OFOI)
1		***Telecommunications Distribution System***			
	.01	Device conduit rough-in	x		
	.01	Open cabling supports / Cable Tray	x		
	.03	Category 6A cabling for Work Area Outlets (WAO)	x		
	.04	Category 6A cabling for wireless access points	x		
	.05	Wireless Access Points			x
	.06	Optical fiber & copper back bone cabling	x		
	.07	IT equipment racks & ladder rack	x		
	.08	Fiber & conduit to High MDF demarc	x		
	.09	UPS in Telecommunications Room		x	
	.10	PDU's in Telecommunications Room		x	
	.11	Power receptacles for telecommunications rooms	x		
	.12	HVAC cooling equipment for telecommunications rooms	x		
	.13	IT grounding & Bonding infrastructure	x		
	.14	Firestopping for IT pathways	x		
2		***IP Centralized Clock System***			
	.01	Device conduit rough-in	x		
	.02	IP clock combo device & patch cord (device end only)	x		
	.03	IP clock specialty back box	x		
	.04	IP digital clocks	x		
	.05	Analog speakers, zone controllers and paping amplifiers	x		
	.06	Analog speaker specialty back box	x		

	.07	Analog speaker cabling & connectivity	x		
	.08	software licenses			x
	.09	software, servers and programming			x
3		***Audio Visual System***			
	.01	Device conduit rough-in	x		
	.02	Interactive ultra short throw LCD video projector		x	
	.03	Video projector mount and mast	x		
	.04	VGA (video)/audio input device and cabling	x		
	.05	HDMI device and cabling	x		
	.06	Audio Video network switcher	x		
	.07	Sound enhancement speaker system (per room)	x		
	.08	Audio Video network software	x		
	.09	USB switcher, extender and input device	x		
	.10	Wireless microphone, base charger and IR sensor	x		
4		***Telephone System***			
	.01	Telephone Devices (handsets)			x
	.02	Telephone servers, programming, and licensing			x
5		***Network System***			
	.01	PC workstations and monitors			x
	.02	Network electronics			x
	.03	Category 6 patch cords for telecommunications room & workstations			x
	.04	Network programming and QOS scheduling			x
	.05	Network servers, programming and			x

		licensing			
	.06	Ethernet switches (PoE and non-PoE)			x
6		***Security - Access Control System***			
	.01	Device conduit rough-in	x		
	.02	Electrical connections	x		
	.03	Low voltage cabling, security devices and terminations	x		
	.04	Access control equipment & programming	x		
7		***Security - IP Surveillance System***			
	.01	Device conduit rough-in	x		
	.02	IP surveillance cameras & patch cords (device end only)	x		
	.03	Software, cameras and licenses	x		
	.04	Physical servers and storage - NVR	x		
	.05	VMS programming			x
7		***Nurse Call System***			
	.01	Device conduit rough-in	x		
	.02	Devices	x		
	.03	Headend equipment	x		
	.04	Cabling, devices and terminations	x		
	.05	Programming and testing	x		
8		***Distributed Antenna System (Required?)***			
	.01	Device conduit rough-in	?		
	.02	Headend equipment	?		
	.03	Cabling, devices and terminations	?		
	.04	Programming and testing	?		
10		***Audio Visual Distribution Systems***			

	.01	Recessed AV wallbox and device conduit rough-in	x		
	.02	LCD flat panel display			x
	.03	Universal wall mount		x	
	.04	Network media player, licenses and software			x
	.05	Programming			x

CATV System:

- A coax style CATV system will not be provided as IPTV has replaced most TV distribution systems. IPTV systems generally run over the data network. Devices will be located in each patient area and in waiting rooms.

CCTV System:

- A limited security CCTV system will be required. This system will be remotely monitored and will include network video recorders (NVR). The NVRs will be located in the telecommunications rooms and configured for connectivity to the Ethernet network. Monitoring of the system will be via a Windows-based software package installed on a dedicated computer for the Security Resource Officer (SRO) usage.
- The security CCTV system will be continuously monitored. Software triggers can be implemented to reduce the recording data amount.
- Cameras for the security CCTV system may require TCP/IP addressing capability.
- A security surveillance type system with cameras and monitors is to be included for corridors and entry doors and elevator.
- Active components will be furnished by the Owner. This includes cameras and head-end equipment such as network video recorders and storage. Cabling will be part of the building infrastructure contract.
- Anticipated camera locations are the main entrances, waiting areas, and potentially parking lots.

Audio/Video:

- Mediated training rooms shall be equipped with presentation systems consisting of a video/graphics projection system and multimedia sources, including document camera, VCR's, DVD/CD players and connections for personal computers or laptops. All mediated rooms shall be provided with program audio systems and larger meeting/community rooms shall also be provided with voice reinforcement systems.

- Mediated rooms shall be provided with control systems based on the Owner standards. Multimedia sources shall be located in the Instructor's podium and/or media.
- Video projectors will be based primarily around an Ultra-Short Throw projection system without interactive capability. These will be wall mounted above the front teaching whiteboard. Dalite style projection boards will be used over standard whiteboards for better visibility and contrast.
- There will be either flat panel display or ultra-short throw projectors with screens in the commons for daily events display. Cost comparisons between the two options are in progress.
- Assistive listening systems shall be provided in all rooms with 40 seats or more, if such space is applicable. Headsets are checked out to individual users by the Instructor.

Intercommunication/Public Address System:

- The building interior and exterior will be provided with a public address system consisting of speakers and interconnections to sound re-enforcement system using a priority override. Paging capability will be combined with the room clock/speakers system, locker rooms, commons, corridors and similar general usage spaces.
- Paging will be provided for a minimum of 10 zones with expandability to a minimum of 16 zones.
- System will be based on Owner Standards. This is believed to be a Rauland Telecenter.
- The Owner furnished VoIP telephone system will be interfaced to this system to allow for room-to-room communication or general announcement broadcasting.

Clock System:

- Individual room and the nurse’s station clocks with synchronization using SNTP will be specified. Size is expected to be based on standard 12” digital-style clocks.
- Surgical rooms will have standard time of day clocks and additional procedure clocks.
- Commons area will be provided with 12” or larger analog-style clocks.
- The clock system will use SNTP for synchronization and will be Ethernet-based. The clocks will connect to the Rauland Telecenter system using network/Ethernet style cabling.

Access Control:

- The building requires an exterior access control system for selected doors. Access control will be via proximity cards. The system will be based on Owner standards.
- Keypads will be located at select main entry points for arming/disarming the system.

- The building will be configured for multiple zones to allow kitchen staff to enter and leave without disruption of the overall building protection. Zone discussions will be required between the Engineer and the Owner so these can properly be indicated on the construction documents.
- 24-hour battery backup in addition to generator power will be required for the access control system. This system will be feed from the NEC 702 optionally standby system.
- Perimeter doors are to be provided with door switches and proximity card reader access control.
- Intrusion detection will also be provided in the corridors and select perimeter rooms classified as "High Risk" areas such as computer labs, science rooms, etc.
- The Owner is currently working with their vendor of choice on a system design. Once selected, the vendor and the engineer will work together to depict the system installation on the construction documents.

LEED Credits (if LEED Certification is desired):

- Following is a list of Leadership in Energy and Environmental Design (LEED) points that will be sought after:
    - Sustainable Site – Outdoor Lighting – Light Pollution Reduction (1 pt)
    - Energy and Atmosphere – Superior Energy Performance (1 pt)
    - Energy and Atmosphere – Green Power and Carbon Offsets (0 pt), Generally an expensive item
    - Indoor Environment Quality – Electric Light Quality (1 pt)

Cost Estimates

PETERSBURG MEDICAL CENTER
GREENFIELD SCHEME 7A
Concept Estimate
1/20/2020

Building	$	55,894,542
Sitework	$	10,119,728
ESTIMATED CONSTRUCTION COST TOTAL BUILDING & SITE ESTIMATE	**$**	**66,014,270**

Off Site Allowance:

(Street improvements, curb, sidewalk, gutter, grade, landscape)	$	1,320,000

Petersburg Medical Center Greenfield Scheme 7A

Estimate Documents:

The concept estimate is based on documents, emails, and narratives provided by:

NAC Architecture

Bidding Assumptions:

The project will be competively bid.
With multiple subcontractors covering in all major categories. Public prevailing wage/union wage rates.

Unit pricing is based in December 2019 and costs are escalated 8.4% up to NTP.

EXCLUSIONS:

STATE SALES TAX
TESTING AND INSPECTIONS
CONSTRUCTION CONTINGENCY
ARCHITECT/ENGINEERING FEES
PERMITS
TOXIC SOILS/MATERIALS REMOVAL
PILING, GEO PIERS
EQUIPMENT & FURNISHINGS NOT LISTED; MEDICAL EQUIPMENT
UTILITY COMPANY CHARGES/ JURISDICTIONAL FEES
CONSTRUCTION MANAGEMENT FEES
BUILERS RISK INSURANCE
MARKET CONTINGENCY
LAND PURCHASE

Petersburg Medical Pre Design
Concept

Greenfield Scheme 7A Building Level 2 Summary

Gross Floor Area: 72,463 SF
Rates Current At December 2019

Description			Cost/SF	Total Cost
A10	**Foundations**		**$48.47**	**$3,512,321**
B10	**Superstructure**		**$40.58**	**$2,940,785**
B20	**Exterior Enclosure**		**$45.56**	**$3,301,667**
B30	**Roofing**		**$42.87**	**$3,106,590**
C10	**Interior Construction**		**$45.39**	**$3,289,085**
C30	**Interior Finishes**		**$37.54**	**$2,719,951**
D20	**Plumbing**		**$28.42**	**$2,059,100**
D30	**HVAC**		**$75.32**	**$5,457,735**
D40	**Fire Protection**		**$5.79**	**$419,881**
D50	**Electrical**		**$49.89**	**$3,615,500**
E10	**Equipment**		**$3.00**	**$217,389**
E20	**Furnishings**		**$10.99**	**$796,577**
	ESTIMATED NET COST		**$433.83**	**$31,436,581**
MARGINS & ADJUSTMENTS				
Location Factor		25.0 %		$7,859,145
General Conditions		7.5 %		$2,947,179
Design Contingency-Buildings		8.0 %		$3,379,432
Added Design / Market Contingency MEP Systems		2.6 %		$1,173,561
Contractors Overhead & Profit		7.5 %		$3,509,692
Escalation to NTP (average 4.8%/year)		8.4 %		$4,225,670
Per diem / Imported labor		2.5 %		$1,363,282
	ESTIMATED TOTAL COST		**$771.35**	**$55,894,542**

Petersburg Medical Pre Design
Concept

Greenfield Scheme 7A Building Level 3 Detail

Gross Floor Area: 72,463 SF
Rates Current At December 2019

Description		Unit	Qty	Rate	Total Cost
A1010	**Standard Foundations**				
1	Footing drains	LF	2,030	20.00	40,600
2	Standard foundation excavation/backfill (sfa)	SF	72,463	1.75	126,810
3	Standard foundations-continuous footings, column footings (sfa)	SF	72,463	16.00	1,159,408
4	Add for stem wall/foundation wall-below grade	SF	8,120	45.00	365,400
5	Add for brace frame footings (sfa)	SF	72,463	1.60	115,941
7	Dampproofing / insul/ drainage-foundation	SF	10,658	8.00	85,264
	Standard Foundations			***$26.13/SF***	***$1,893,423***
A1020	**Special Foundations**				
8	Excavate-haul muskeg @ bldg footprint	CY	21,471	18.00	386,478
9	Import fill @ bldg footprint	CY	21,471	25.00	536,775
	Special Foundations			***$12.74/SF***	***$923,253***
A1030	**Slab on Grade**				
10	Slab on grade	SF	72,463	8.00	579,704
11	Gravel at slab	SF	72,463	0.85	61,594
12	Slab depressions/ blockouts/columns	SF	72,463	0.75	54,347
	Slab on Grade			***$9.60/SF***	***$695,645***
B1020	**Roof Construction**				
20	Roof structure-beams, columns, brace frames, joists, decking	SF	84,613	28.00	2,369,164
21	Fireproofing roof structure and decking	SF	84,613	5.50	465,371
22	Allowance for canopies, drop off canopy	SF	850	125.00	106,250
	Roof Construction			***$40.58/SF***	***$2,940,785***
B2010	**Exterior Walls**				
23	Exterior wall-framing, metal stud, insulations, wrb, sheath, furrings, gwb	SF	30,450	28.95	881,527
24	Metal wall panels-55% above grade framed exterior wall area	SF	22,330	35.00	781,550
25	Stone veneer-20% above grade framed exterior wall area	SF	8,120	52.00	422,240
26	Misc. exterior wall flash, trim, caulk (ext. gross wall area)	SF	40,600	3.50	142,100
	Exterior Walls			***$30.74/SF***	***$2,227,417***
B2020	**Exterior Windows**				
27	Windows, storefront, curtain wall-25% above grade gross ext. wall area	SF	10,150	95.00	964,250
	Exterior Windows			***$13.31/SF***	***$964,250***

Petersburg Medical Pre Design
Concept

Greenfield Scheme 7A Building Level 3 Detail

Gross Floor Area: 72,463 SF
Rates Current At December 2019

Description		Unit	Qty	Rate	Total Cost
B2030	**Exterior Doors**				
28	Exterior doors-allow	LS	1	110,000.00	110,000
	Exterior Doors			***$1.52/SF***	***$110,000***
B3010	**Roof Coverings**				
30	Temp roof dry in	SF	84,613	2.85	241,147
31	Standing seam metal roofing system-complete 85% roof area	SF	71,921	32.00	2,301,472
32	Membrane roofing system-complete 15% roof area	SF	12,692	24.00	304,608
33	Furring, cladding of roof overhangs	SF	8,526	20.00	170,520
34	Roofing rough carpentry	SF	84,613	0.65	54,998
35	Roofing accessories, ladders, hatch, snow block, walk pads	SF	84,613	0.40	33,845
36	Fall protection-excluded	SF	84,613		Excl.
	Roof Coverings			***$42.87/SF***	***$3,106,590***
C1010	**Partitions**				
37	Interior partitions-metal stud, gwb ea. side	SF	101,449	13.50	1,369,562
38	Misc. blocking/bracing	SF	101,449	0.50	50,725
39	Add for wall types -stud thickness, gwb layers, insulation	SF	55,797	3.00	167,391
40	X-ray shielding wall / door / relite assemblies (sfa)	SF	5,205	55.00	286,275
	Partitions			***$25.86/SF***	***$1,873,953***
C1020	**Interior Doors**				
41	Interior doors/ frames/hardware	EA	290	2,600.00	754,000
42	Interior special doors-coiling, sliding	LS	1	35,000.00	35,000
43	Added hardware-card readers, electric, ADA	LS	1	50,000.00	50,000
44	Interior relites, sidelites, glazed walls-allow	SF	3,624	60.00	217,440
	Interior Doors			***$14.58/SF***	***$1,056,440***
C1030	**Specialties**				
45	Specialities-signage/wayfinding ,toilet/shower accessories, marker boards	SF	72,463	4.95	358,692
	Specialties			***$4.95/SF***	***$358,692***
C3010	**Wall Finishes**				
47	Wall finishes-Tile, FRL, Wood, misc. other	SF	72,463	9.00	652,167
93	Add for fireplace surround / finishes	LS	1	25,000.00	25,000
48	Interior painting / sealing	SF	72,463	3.25	235,505
51	Add surgery-solid surface wall protection	SF	3,186	80.00	254,880
52	Acoustical wall panel allowance	SF	1,500	26.00	39,000
	Wall Finishes			***$16.65/SF***	***$1,206,552***

Petersburg Medical Pre Design
Concept

Greenfield Scheme 7A Building Level 3 Detail

Gross Floor Area: 72,463 SF
Rates Current At December 2019

Description		Unit	Qty	Rate	Total Cost
C3020	**Floor Finishes**				
49	Flooring-mix of carpet / resilient	SF	55,395	8.00	443,160
50	Flooring-surgery, aseptic resinous epoxy	SF	2,896	20.00	57,920
53	Flooring-tile @ rr's allow	SF	2,800	22.00	61,600
54	Flooring-stone tile @ reception / lobby	SF	2,500	28.00	70,000
55	Flooring-sealed concrete	SF	8,872	0.85	7,541
56	Base allowance-mix of tile, coved, standard, wood	SF	72,463	1.05	76,086
	Floor Finishes			***$9.89/SF***	***$716,307***
C3030	**Ceiling Finishes**				
57	Ceilings-mix of hard and soft, including vertical soffits/transitions	SF	72,463	8.50	615,935
58	Allowance for ceiling upgrades / acoustics	SF	72,463	2.50	181,157
	Ceiling Finishes			***$11.00/SF***	***$797,092***
D2090	**Other Plumbing Systems**				
60	Plumbing systems-see PIKA sfa estimate	LS	1	2,059,100.00	2,059,100
	Other Plumbing Systems			***$28.42/SF***	***$2,059,100***
D3090	**Other HVAC Systems and Equipment**				
68	HVAC-see PIKA sfa estimate	LS	1	5,457,735.00	5,457,735
	Other HVAC Systems and Equipment			***$75.32/SF***	***$5,457,735***
D4090	**Other Fire Protection Systems**				
64	Fire Protection-see PIKA sfa estimate	LS	1	419,881.00	419,881
	Other Fire Protection Systems			***$5.79/SF***	***$419,881***
D5090	**Other Electrical Services**				
72	Electrical building power systems-see PIKA sfa estimate	LS	1	814,837.00	814,837
73	Electrical building lighting & receptacles-see PIKA sfa estimate	LS	1	1,424,450.00	1,424,450
74	Electrical building special systems, comm.-see PIKA sfa estimate	LS	1	764,842.00	764,842
75	Electrical building fire alarm, security-see PIKA sfa estimate	LS	1	611,371.00	611,371
	Other Electrical Services			***$49.89/SF***	***$3,615,500***
E1090	**Other Equipment**				
88	Misc. building equipment / FOIC	SF	72,463	3.00	217,389
	Other Equipment			***$3.00/SF***	***$217,389***
E2010	**Fixed Furnishings**				
89	Casework allowance	SF	72,463	8.50	615,935

Petersburg Medical Pre Design
Concept

Greenfield Scheme 7A Building Level 3 Detail

Gross Floor Area: 72,463 SF
Rates Current At December 2019

	Description	Unit	Qty	Rate	Total Cost
90	Manual shades / blinds @ exterior glazing	SF	10,150	11.00	111,650
91	Manual blinds @ interior glazing	SF	3,624	8.00	28,992
92	Add for electric blinds	LS	1	40,000.00	40,000
	Fixed Furnishings			***$10.99/SF***	***$796,577***
	ESTIMATED NET COST			***$433.83/SF***	***$31,436,581***

Petersburg Medical Pre Design
Concept

Greenfield Scheme 7A Site Work Level 2 Summary

Gross Floor Area: 325,000 SF
Rates Current At December 2019

Description			Cost/SF	Total Cost
G10	**Site Preparations**		**$6.63**	**$2,153,846**
G20	**Site Improvements**		**$3.77**	**$1,225,059**
G30	**Site Civil/Mechanical Utilities**		**$2.86**	**$928,750**
G40	**Site Electrical Utilities**		**$3.62**	**$1,175,000**
		ESTIMATED NET COST	**$16.87**	**$5,482,655**
MARGINS & ADJUSTMENTS				
Location Factor		25.0 %		$1,370,664
General Conditions		7.5 %		$513,999
Design Contingency-Site Work		15.0 %		$1,105,097
Added Design / Market Contingency MEP Systems		0.0 %		
Contractors Overhead & Profit		7.5 %		$635,431
Escalation to NTP (average 4.8%/year)		8.4 %		$765,059
Per diem / Imported labor		2.5 %		$246,823
		ESTIMATED TOTAL COST	**$31.14**	**$10,119,728**

Petersburg Medical Pre Design
Concept

Greefield Scheme 7A Site Work Level 3 Detail

Gross Floor Area: 325,000 SF
Rates Current At December 2019

Description		Unit	Qty	Rate	Total Cost
G1020	**Site Demolition & Relocations**				
103	Site Clear & grub, misc. demo	SF	325,000	0.40	130,000
127	Demo existing hospital	SF	53,205	15.00	798,075
	Site Demolition & Relocations			***$2.86/SF***	***$928,075***
G1030	**Site Earthwork**				
104	Remove muskeg at drives, parking, loading,parking plant islands,walks	CY	22,547	18.00	405,846
105	Import fill at drives, paking, loading, parking plant islands,walks	CY	22,547	25.00	563,675
106	Misc. site grading/earthwork-allowance	LS	1	175,000.00	175,000
107	Erosion control allowance	SF	325,000	0.25	81,250
	Site Earthwork			***$3.77/SF***	***$1,225,771***
G2020	**Parking Lots**				
108	Heavy duty pavement-drives	SF	33,178	10.00	331,780
109	Normal duty pavement-parking	SF	34,966	7.00	244,762
110	Loading / ambulance area hardscape	SF	3,475	10.00	34,750
111	Wheel stops	EA	102	125.00	12,750
112	Signage, striping, detectable warnings	SF	71,619	0.35	25,067
113	Curbing allowance	LS	1	25,000.00	25,000
	Parking Lots			***$2.07/SF***	***$674,109***
G2030	**Pedestrian Paving**				
114	Pedestrian paving onsite	SF	3,500	7.00	24,500
	Pedestrian Paving			***$0.08/SF***	***$24,500***
G2040	**Site Development**				
115	Site furnishings allowance	LS	1	35,000.00	35,000
117	Misc. loading / receiving development (dock)	LS	1	75,000.00	75,000
	Site Development			***$0.34/SF***	***$110,000***
G2050	**Landcaping**				
118	Landscape allowance	LS	1	65,000.00	65,000
149	Landscape-minor development allowance extg. hospital site	SF	63,900	5.50	351,450
	Landcaping			***$1.28/SF***	***$416,450***
G3010	**Water Supply**				
119	Water system allowance-new loop 10", hydrants, dbl detector valve, fire, domestic	LS	1	485,000.00	485,000

Petersburg Medical Pre Design
Concept

Greefield Scheme 7A Site Work Level 3 Detail

Gross Floor Area: 325,000 SF
Rates Current At December 2019

Description		Unit	Qty	Rate	Total Cost
120	Road patch allowance for water line extension	LS	1	150,000.00	150,000
	Water Supply			***$1.95/SF***	***$635,000***
G3020	**Sanitary Sewer**				
121	Sanitary side sewer to Haugen Drive	LS	1	35,000.00	35,000
122	Road patch allowance for side sewer cross Haugen Drive	LS	1	15,000.00	15,000
	Sanitary Sewer			***$0.15/SF***	***$50,000***
G3030	**Storm Sewer**				
123	Storm collection, draingage, culverts	SF	325,000	0.75	243,750
	Storm Sewer			***$0.75/SF***	***$243,750***
G4090	**Other Site Electrical Utilities**				
124	Site electrical-see PIKA estimate	LS	1	1,175,000.00	1,175,000
	Other Site Electrical Utilities			***$3.62/SF***	***$1,175,000***
	ESTIMATED NET COST			***$16.87/SF***	***$5,482,655***

PETERSBURG MEDICAL CENTER
GREENFIELD SCHEME 7B
Concept Estimate
1/20/2020

Building	$	59,429,763
Sitework	$	9,641,267
ESTIMATED CONSTRUCTION COST TOTAL BUILDING & SITE ESTIMATE	**$**	**69,071,030**

Off Site Allowance:

(Street improvements, curb, sidewalk, gutter, grade, landscape)	$	1,320,000

Petersburg Medical Center Greenfield Scheme 7B

Estimate Documents:

The concept estimate is based on documents, emails, and narratives provided by:

NAC Architecture

Bidding Assumptions:

The project will be competively bid.
With multiple subcontractors covering in all major categories. Public prevailing wage/union wage rates.

Unit pricing is based in December 2019 and costs are escalated 8.4% up to NTP.

EXCLUSIONS:

STATE SALES TAX
TESTING AND INSPECTIONS
CONSTRUCTION CONTINGENCY
ARCHITECT/ENGINEERING FEES
PERMITS
TOXIC SOILS/MATERIALS REMOVAL
PILING, GEO PIERS
EQUIPMENT & FURNISHINGS NOT LISTED; MEDICAL EQUIPMENT
UTILITY COMPANY CHARGES/ JURISDICTIONAL FEES
CONSTRUCTION MANAGEMENT FEES
BUILERS RISK INSURANCE
MARKET CONTINGENCY
LAND PURCHASE

Petersburg Medical Pre Design
Concept

Greenfield Scheme 7B Building Level 2 Summary

Gross Floor Area: 80,170 SF
Rates Current At December 2019

Description			Cost/SF	Total Cost
A10	**Foundations**		**$47.37**	**$3,797,835**
B10	**Superstructure**		**$39.80**	**$3,191,030**
B20	**Exterior Enclosure**		**$38.28**	**$3,068,975**
B30	**Roofing**		**$41.83**	**$3,353,409**
C10	**Interior Construction**		**$44.90**	**$3,599,782**
C30	**Interior Finishes**		**$37.08**	**$2,972,903**
D20	**Plumbing**		**$26.30**	**$2,108,720**
D30	**HVAC**		**$73.06**	**$5,857,000**
D40	**Fire Protection**		**$5.72**	**$458,730**
D50	**Electrical**		**$48.83**	**$3,915,002**
E10	**Equipment**		**$3.00**	**$240,510**
E20	**Furnishings**		**$10.69**	**$857,027**
		ESTIMATED NET COST	**$416.88**	**$33,420,923**
MARGINS & ADJUSTMENTS				
Location Factor		25.0 %		$8,355,231
General Conditions		7.5 %		$3,133,211
Design Contingency-Buildings		8.0 %		$3,592,749
Added Design / Market Contingency MEP Systems		2.6 %		$1,253,535
Contractors Overhead & Profit		7.5 %		$3,731,673
Escalation to NTP (average 4.8%/year)		8.4 %		$4,492,936
Per diem / Imported labor		2.5 %		$1,449,505
		ESTIMATED TOTAL COST	**$741.30**	**$59,429,763**

Petersburg Medical Pre Design
Concept

Greenfield Scheme 7B Building Level 3 Detail

Gross Floor Area: 80,170 SF
Rates Current At December 2019

Description		Unit	Qty	Rate	Total Cost
A1010	**Standard Foundations**				
1	Footing drains	LF	1,882	20.00	37,640
2	Standard foundation excavation/backfill (sfa)	SF	80,170	1.75	140,298
3	Standard foundations-continuous footings, column footings (sfa)	SF	80,170	16.00	1,282,720
4	Add for stem wall/foundation wall-below grade	SF	7,528	45.00	338,760
5	Add for brace frame footings (sfa)	SF	80,170	1.60	128,272
7	Dampproofing / insul/ drainage-foundation	SF	9,881	8.00	79,048
	Standard Foundations			***$25.03/SF***	***$2,006,738***
A1020	**Special Foundations**				
8	Excavate-haul muskeg @ bldg footprint	CY	23,755	18.00	427,590
9	Import fill @ bldg footprint	CY	23,755	25.00	593,875
	Special Foundations			***$12.74/SF***	***$1,021,465***
A1030	**Slab on Grade**				
10	Slab on grade	SF	80,170	8.00	641,360
11	Gravel at slab	SF	80,170	0.85	68,144
12	Slab depressions/ blockouts/columns	SF	80,170	0.75	60,128
	Slab on Grade			***$9.60/SF***	***$769,632***
B1020	**Roof Construction**				
20	Roof structure-beams, columns, brace frames, joists, decking	SF	92,083	28.00	2,578,324
21	Fireproofing roof structure and decking	SF	92,083	5.50	506,456
22	Allowance for canopies, drop off canopy	SF	850	125.00	106,250
	Roof Construction			***$39.80/SF***	***$3,191,030***
B2010	**Exterior Walls**				
23	Exterior wall-framing, metal stud, insulations, wrb, sheath, furrings, gwb	SF	28,230	28.95	817,259
24	Metal wall panels-55% above grade framed exterior wall area	SF	20,702	35.00	724,570
25	Stone veneer-20% above grade framed exterior wall area	SF	7,528	52.00	391,456
26	Misc. exterior wall flash, trim, caulk (ext. gross wall area)	SF	37,640	3.50	131,740
	Exterior Walls			***$25.76/SF***	***$2,065,025***
B2020	**Exterior Windows**				
27	Windows, storefront, curtain wall-25% above grade gross ext. wall area	SF	9,410	95.00	893,950
	Exterior Windows			***$11.15/SF***	***$893,950***

Petersburg Medical Pre Design
Concept

Greenfield Scheme 7B Building Level 3 Detail

Gross Floor Area: 80,170 SF
Rates Current At December 2019

Description		Unit	Qty	Rate	Total Cost
B2030	**Exterior Doors**				
28	Exterior doors-allow	LS	1	110,000.00	110,000
	Exterior Doors			***$1.37/SF***	***$110,000***
B3010	**Roof Coverings**				
30	Temp roof dry in	SF	92,083	2.85	262,437
31	Standing seam metal roofing system-complete 85% roof area	SF	78,271	32.00	2,504,672
32	Membrane roofing system-complete 15% roof area	SF	13,813	24.00	331,512
33	Furring, cladding of roof overhangs	SF	7,905	20.00	158,100
34	Roofing rough carpentry	SF	92,083	0.65	59,855
35	Roofing accessories, ladders, hatch, snow block, walk pads	SF	92,083	0.40	36,833
36	Fall protection-excluded	SF	92,083		Excl.
	Roof Coverings			***$41.83/SF***	***$3,353,409***
C1010	**Partitions**				
37	Interior partitions-metal stud, gwb ea. side	SF	112,238	13.50	1,515,213
38	Misc. blocking/bracing	SF	112,238	0.50	56,119
39	Add for wall types -stud thickness, gwb layers, insulation	SF	61,731	3.00	185,193
40	X-ray shielding wall / door / relite assemblies (sfa)	SF	5,205	55.00	286,275
	Partitions			***$25.48/SF***	***$2,042,800***
C1020	**Interior Doors**				
41	Interior doors/ frames/hardware	EA	321	2,600.00	834,600
42	Interior special doors-coiling, sliding	LS	1	35,000.00	35,000
43	Added hardware-card readers, electric, ADA	LS	1	50,000.00	50,000
44	Interior relites, sidelites, glazed walls-allow	SF	4,009	60.00	240,540
	Interior Doors			***$14.47/SF***	***$1,160,140***
C1030	**Specialties**				
45	Specialities-signage/wayfinding ,toilet/shower accessories, marker boards	SF	80,170	4.95	396,842
	Specialties			***$4.95/SF***	***$396,842***
C3010	**Wall Finishes**				
47	Wall finishes-Tile, FRL, Wood, misc. other	SF	80,170	9.00	721,530
93	Add for fireplace surround / finishes	LS	1	25,000.00	25,000
48	Interior painting / sealing	SF	80,170	3.25	260,553
51	Add surgery-solid surface wall protection	SF	3,207	80.00	256,560
52	Acoustical wall panel allowance	SF	1,500	26.00	39,000
	Wall Finishes			***$16.25/SF***	***$1,302,643***

Petersburg Medical Pre Design
Concept

Greenfield Scheme 7B Building Level 3 Detail

Gross Floor Area: 80,170 SF
Rates Current At December 2019

Description		Unit	Qty	Rate	Total Cost
C3020	**Floor Finishes**				
49	Flooring-mix of carpet / resilient	SF	62,786	8.00	502,288
50	Flooring-surgery, aseptic resinous epoxy	SF	2,915	20.00	58,300
53	Flooring-tile @ rr's allow	SF	3,000	22.00	66,000
54	Flooring-stone tile @ reception / lobby	SF	2,500	28.00	70,000
55	Flooring-sealed concrete	SF	8,969	0.85	7,624
56	Base allowance-mix of tile, coved, standard, wood	SF	80,170	1.05	84,178
	Floor Finishes			***$9.83/SF***	***$788,390***
C3030	**Ceiling Finishes**				
57	Ceilings-mix of hard and soft, including vertical soffits/transitions	SF	80,170	8.50	681,445
58	Allowance for ceiling upgrades / acoustics	SF	80,170	2.50	200,425
	Ceiling Finishes			***$11.00/SF***	***$881,870***
D2090	**Other Plumbing Systems**				
61	Plumbing systems-see PIKA sfa estimate	LS	1	2,108,720.00	2,108,720
	Other Plumbing Systems			***$26.30/SF***	***$2,108,720***
D3090	**Other HVAC Systems and Equipment**				
69	HVAC-see PIKA sfa estimate	LS	1	5,857,000.00	5,857,000
	Other HVAC Systems and Equipment			***$73.06/SF***	***$5,857,000***
D4090	**Other Fire Protection Systems**				
65	Fire Protection-see PIKA sfa estimate	LS	1	458,730.00	458,730
	Other Fire Protection Systems			***$5.72/SF***	***$458,730***
D5090	**Other Electrical Services**				
76	Electrical building power systems-see PIKA sfa estimate	LS	1	877,427.00	877,427
77	Electrical building lighting & receptacles-see PIKA sfa estimate	LS	1	1,542,146.00	1,542,146
78	Electrical building special systems, comm.-see PIKA sfa estimate	LS	1	842,704.00	842,704
79	Electrical building fire alarm, security-see PIKA sfa estimate	LS	1	652,725.00	652,725
	Other Electrical Services			***$48.83/SF***	***$3,915,002***
E1090	**Other Equipment**				
88	Misc. building equipment / FOIC	SF	80,170	3.00	240,510
	Other Equipment			***$3.00/SF***	***$240,510***
E2010	**Fixed Furnishings**				
89	Casework allowance	SF	80,170	8.50	681,445

Petersburg Medical Pre Design
Concept

Greenfield Scheme 7B Building Level 3 Detail

Gross Floor Area: 80,170 SF
Rates Current At December 2019

	Description	Unit	Qty	Rate	Total Cost
90	Manual shades / blinds @ exterior glazing	SF	9,410	11.00	103,510
91	Manual blinds @ interior glazing	SF	4,009	8.00	32,072
92	Add for electric blinds	LS	1	40,000.00	40,000
	Fixed Furnishings			***$10.69/SF***	***$857,027***
	ESTIMATED NET COST			***$416.88/SF***	***$33,420,923***

Petersburg Medical Pre Design
Concept

Greenfield Scheme 7B Site Work Level 2 Summary

Gross Floor Area: 325,000 SF
Rates Current At December 2019

Description		Cost/SF	Total Cost
G10	**Site Preparations**	**$6.16**	**$2,003,389**
G20	**Site Improvements**	**$3.43**	**$1,116,295**
G30	**Site Civil/Mechanical Utilities**	**$2.86**	**$928,750**
G40	**Site Electrical Utilities**	**$3.62**	**$1,175,000**
	ESTIMATED NET COST	**$16.07**	**$5,223,434**
MARGINS & ADJUSTMENTS			
Location Factor	25.0 %		$1,305,859
General Conditions	7.5 %		$489,697
Design Contingency-Site Work	15.0 %		$1,052,849
Added Design / Market Contingency MEP Systems	0.0 %		
Contractors Overhead & Profit	7.5 %		$605,388
Escalation to NTP (average 4.8%/year)	8.4 %		$728,887
Per diem / Imported labor	2.5 %		$235,153
	ESTIMATED TOTAL COST	**$29.67**	**$9,641,267**

Petersburg Medical Pre Design
Concept

Greenfield Scheme 7B Site Work Level 3 Detail

Gross Floor Area: 325,000 SF
Rates Current At December 2019

Description		Unit	Qty	Rate	Total Cost
G1020	**Site Demolition & Relocations**				
103	Site Clear & grub, misc. demo	SF	325,000	0.40	130,000
127	Demo existing hospital	SF	53,205	15.00	798,075
	Site Demolition & Relocations			***$2.86/SF***	***$928,075***
G1030	**Site Earthwork**				
104	Remove muskeg at drives, parking, loading,parking plant islands,walks	CY	19,048	18.00	342,864
105	Import fill at drives, paking, loading, parking plant islands,walks	CY	19,048	25.00	476,200
106	Misc. site grading/earthwork-allowance	LS	1	175,000.00	175,000
107	Erosion control allowance	SF	325,000	0.25	81,250
	Site Earthwork			***$3.31/SF***	***$1,075,314***
G2020	**Parking Lots**				
108	Heavy duty pavement-drives	SF	25,883	10.00	258,830
109	Normal duty pavement-parking	SF	32,263	7.00	225,841
110	Loading / ambulance area hardscape	SF	2,338	10.00	23,380
112	Signage, striping, detectable warnings	SF	60,484	0.35	21,169
113	Curbing allowance	LS	1	25,000.00	25,000
125	Wheel stops	EA	89	125.00	11,125
	Parking Lots			***$1.74/SF***	***$565,345***
G2030	**Pedestrian Paving**				
114	Pedestrian paving onsite	SF	3,500	7.00	24,500
	Pedestrian Paving			***$0.08/SF***	***$24,500***
G2040	**Site Development**				
115	Site furnishings allowance	LS	1	35,000.00	35,000
117	Misc. loading / receiving development (dock)	LS	1	75,000.00	75,000
	Site Development			***$0.34/SF***	***$110,000***
G2050	**Landcaping**				
118	Landscape allowance	LS	1	65,000.00	65,000
149	Landscape-minor development allowance extg. hospital site	SF	63,900	5.50	351,450
	Landcaping			***$1.28/SF***	***$416,450***
G3010	**Water Supply**				
119	Water system allowance-new loop 10", hydrants, dbl detector valve, fire, domestic	LS	1	485,000.00	485,000

Petersburg Medical Pre Design
Concept

Greenfield Scheme 7B Site Work Level 3 Detail

Gross Floor Area: 325,000 SF
Rates Current At December 2019

Description		Unit	Qty	Rate	Total Cost
120	Road patch allowance for water line extension	LS	1	150,000.00	150,000
	Water Supply			***$1.95/SF***	***$635,000***
G3020	**Sanitary Sewer**				
121	Sanitary side sewer to Haugen Drive	LS	1	35,000.00	35,000
122	Road patch allowance for side sewer cross Haugen Drive	LS	1	15,000.00	15,000
	Sanitary Sewer			***$0.15/SF***	***$50,000***
G3030	**Storm Sewer**				
123	Storm collection, draingage, culverts	SF	325,000	0.75	243,750
	Storm Sewer			***$0.75/SF***	***$243,750***
G4090	**Other Site Electrical Utilities**				
124	Site electrical-see PIKA estimate	LS	1	1,175,000.00	1,175,000
	Other Site Electrical Utilities			***$3.62/SF***	***$1,175,000***
	ESTIMATED NET COST			***$16.07/SF***	***$5,223,434***

RLB Robinson

PETERSBURG MEDICAL CENTER
DOWNTOWN SCHEME
Concept Estimate
1/20/2020

Building Phase 1	$	50,657,699
Sitework Phase 1	$	5,128,233
Building Phase 2	$	18,604,553
Sitework Phase 2	$	4,537,137
ESTIMATED CONSTRUCTION COST TOTAL BUILDING & SITE ESTIMATE	**$**	**78,927,622**

Off Site Allowance (curb, sidewalk, gutter, grade, landscape)	$	348,300

Petersburg Medical Center Downtown Scheme

Estimate Documents:

The concept estimate is based on documents, emails, and narratives provided by:

NAC Architecture

Bidding Assumptions:

The project will be competively bid.
With multiple subcontractors covering in all major categories. Public prevailing wage/union wage rates.

Unit pricing is based in December 2019 and costs are escalated 8.4% up to NTP.

EXCLUSIONS:

STATE SALES TAX
TESTING AND INSPECTIONS
CONSTRUCTION CONTINGENCY
ARCHITECT/ENGINEERING FEES
PERMITS
TOXIC SOILS/MATERIALS REMOVAL
PILING, GEO PIERS
EQUIPMENT & FURNISHINGS NOT LISTED; MEDICAL EQUIPMENT
UTILITY COMPANY CHARGES/ JURISDICTIONAL FEES
CONSTRUCTION MANAGEMENT FEES
BUILERS RISK INSURANCE
MARKET CONTINGENCY
LAND PURCHASE

Petersburg Medical Pre Design
Concept

Downtown Phase 1 Building Level 2 Summary

Gross Floor Area: 68,577 SF
Rates Current At December 2019

Description			Cost/SF	Total Cost
A10	**Foundations**		**$31.73**	**$2,176,197**
A20	**Basement Construction**		**$2.55**	**$175,000**
B10	**Superstructure**		**$56.60**	**$3,881,417**
B20	**Exterior Enclosure**		**$40.58**	**$2,782,559**
B30	**Roofing**		**$27.31**	**$1,872,935**
C10	**Interior Construction**		**$45.28**	**$3,104,878**
C20	**Stairs**		**$1.87**	**$128,000**
C30	**Interior Finishes**		**$38.11**	**$2,613,271**
D10	**Conveying**		**$2.26**	**$155,000**
D20	**Plumbing**		**$25.92**	**$1,777,745**
D30	**HVAC**		**$73.75**	**$5,057,335**
D40	**Fire Protection**		**$5.72**	**$392,444**
D50	**Electrical**		**$49.82**	**$3,416,839**
E10	**Equipment**		**$3.00**	**$205,731**
E20	**Furnishings**		**$10.63**	**$728,826**
		ESTIMATED NET COST	**$415.13**	**$28,468,177**
MARGINS & ADJUSTMENTS				
Location Factor		25.0 %		$7,117,044
General Conditions		7.5 %		$2,668,892
Design Contingency-Buildings		8.0 %		$3,060,329
Added Design / Market Contingency MEP Systems		2.7 %		$1,097,080
Contractors Overhead & Profit		7.5 %		$3,180,864
Escalation to NTP (average 4.8%/year)		8.4 %		$3,829,760
Per diem / Imported labor		2.5 %		$1,235,553
		ESTIMATED TOTAL COST	**$738.70**	**$50,657,699**

Petersburg Medical Pre Design
Concept

Downtown Phase 1 Building Level 3 Detail

Gross Floor Area: 68,577 SF
Rates Current At December 2019

Description		Unit	Qty	Rate	Total Cost
A1010	**Standard Foundations**				
1	Footing drains	LF	1,358	20.00	27,160
2	Standard foundation excavation/backfill (sfa)	SF	34,588	1.75	60,529
3	Standard foundations-continuous footings, column footings (sfa)	SF	34,588	16.00	553,408
4	Add for stem wall/foundation wall-below grade	SF	15,824	45.00	712,080
5	Add for brace frame footings (sfa)	SF	34,588	1.60	55,341
6	Elevator pit	LS	1	20,000.00	20,000
7	Dampproofing / insul/ drainage-foundation	SF	17,522	8.00	140,176
	Standard Foundations			***$22.87/SF***	***$1,568,694***
A1020	**Special Foundations**				
8	Excavate-haul muskeg @ bldg footprint	CY	6,406	18.00	115,308
9	Import fill @ bldg footprint	CY	6,406	25.00	160,150
	Special Foundations			***$4.02/SF***	***$275,458***
A1030	**Slab on Grade**				
10	Slab on grade	SF	34,588	8.00	276,704
11	Gravel at slab	SF	34,588	0.85	29,400
12	Slab depressions/ blockouts/columns	SF	34,588	0.75	25,941
	Slab on Grade			***$4.84/SF***	***$332,045***
A2010	**Basement Excavation**				
13	Add for basement excavation / backfill of taller foundation walls	LS	1	175,000.00	175,000
	Basement Excavation			***$2.55/SF***	***$175,000***
B1010	**Floor Construction**				
16	Floor structure-beams, columns, brace frames, decking, topping	SF	33,989	52.00	1,767,428
17	Fireproofing floor structural steel and decking	SF	33,989	5.50	186,939
	Floor Construction			***$28.50/SF***	***$1,954,367***
B1020	**Roof Construction**				
20	Roof structure-beams, columns, brace frames, joists, decking	SF	44,179	28.00	1,237,012
21	Fireproofing roof structure and decking	SF	44,179	5.50	242,985
22	Allowance for canopies, drop off canopy	SF	850	125.00	106,250
95	Add for structure-beams,columns, brace frames, joists, decking Patient Courtyard	SF	5,927	52.00	308,204
96	Fireproofing Patient courtyard structure and decking	SF	5,927	5.50	32,599
	Roof Construction			***$28.10/SF***	***$1,927,050***

Petersburg Medical Pre Design
Concept

Downtown Phase 1 Building Level 3 Detail

Gross Floor Area: 68,577 SF
Rates Current At December 2019

Description		Unit	Qty	Rate	Total Cost
B2010	**Exterior Walls**				
23	Exterior wall-framing, metal stud, insulations, wrb, sheath, furrings, gwb	SF	25,497	28.95	738,138
24	Metal wall panels-55% above grade framed exterior wall area	SF	18,698	35.00	654,430
25	Stone veneer-20% above grade framed exterior wall area	SF	6,800	52.00	353,600
26	Misc. exterior wall flash, trim, caulk (ext. gross wall area)	SF	33,996	3.50	118,986
	Exterior Walls			***$27.20/SF***	***$1,865,154***
B2020	**Exterior Windows**				
27	Windows, storefront, curtain wall-25% above grade gross ext. wall area	SF	8,499	95.00	807,405
	Exterior Windows			***$11.77/SF***	***$807,405***
B2030	**Exterior Doors**				
28	Exterior doors-allow	LS	1	110,000.00	110,000
	Exterior Doors			***$1.60/SF***	***$110,000***
B3010	**Roof Coverings**				
30	Temp roof dry in	SF	44,179	2.85	125,910
31	Standing seam metal roofing system-complete 85% roof area	SF	37,552	32.00	1,201,664
32	Membrane roofing system-complete 15% roof area	SF	6,627	24.00	159,048
33	Furring, cladding of roof overhangs	SF	6,624	20.00	132,480
34	Roofing rough carpentry	SF	44,179	0.65	28,716
35	Roofing accessories, ladders, hatch, snow block, walk pads	SF	44,179	0.40	17,672
36	Fall protection-excluded	SF	44,179		Excl.
126	Patient courtyard deck coating/pavers / development	SF	5,927	35.00	207,445
	Roof Coverings			***$27.31/SF***	***$1,872,935***
C1010	**Partitions**				
37	Interior partitions-metal stud, gwb ea. side	SF	96,008	13.50	1,296,108
38	Misc. blocking/bracing	SF	96,008	0.50	48,004
39	Add for wall types -stud thickness, gwb layers, insulation	SF	52,805	3.00	158,415
40	X-ray shielding wall / door / relite assemblies (sfa)	SF	5,221	55.00	287,155
	Partitions			***$26.10/SF***	***$1,789,682***
C1020	**Interior Doors**				
41	Interior doors/ frames/hardware	EA	275	2,600.00	715,000
42	Interior special doors-coiling, sliding	LS	1	35,000.00	35,000
44	Interior relites, sidelites, glazed walls-allow	SF	3,429	60.00	205,740

Petersburg Medical Pre Design
Concept

Downtown Phase 1 Building Level 3 Detail

Gross Floor Area: 68,577 SF
Rates Current At December 2019

	Description	Unit	Qty	Rate	Total Cost
99	Added hardware - card readers, electric, ADA	LS	1	20,000.00	20,000
	Interior Doors			***$14.23/SF***	***$975,740***
C1030	**Specialties**				
45	Specialities-signage/wayfinding ,toilet/shower accessories, marker boards	SF	68,577	4.95	339,456
	Specialties			***$4.95/SF***	***$339,456***
C2010	**Stair Construction**				
46	Stairs/rails-per floor	EA	4	32,000.00	128,000
	Stair Construction			***$1.87/SF***	***$128,000***
C3010	**Wall Finishes**				
47	Wall finishes-Tile, FRL, Wood, misc. other	SF	68,577	9.00	617,193
93	Add for fireplace surround / finishes	LS	1	25,000.00	25,000
48	Interior painting / sealing	SF	68,577	3.25	222,875
51	Add surgery-solid surface wall protection	SF	3,194	80.00	255,520
52	Acoustical wall panel allowance	SF	1,000	26.00	26,000
	Wall Finishes			***$16.72/SF***	***$1,146,588***
C3020	**Floor Finishes**				
49	Flooring-mix of carpet / resilient	SF	56,297	8.00	450,376
50	Flooring-surgery, aseptic resinous epoxy	SF	2,903	20.00	58,060
53	Flooring-tile @ rr's allow	SF	2,650	22.00	58,300
54	Flooring-stone tile @ reception / lobby	SF	2,500	28.00	70,000
55	Flooring-sealed concrete	SF	4,227	0.85	3,593
56	Base allowance-mix of tile, coved, standard, wood	SF	68,577	1.05	72,006
	Floor Finishes			***$10.39/SF***	***$712,335***
C3030	**Ceiling Finishes**				
57	Ceilings-mix of hard and soft, including vertical soffits/transitions	SF	68,577	8.50	582,905
58	Allowance for ceiling upgrades / acoustics	SF	68,577	2.50	171,443
	Ceiling Finishes			***$11.00/SF***	***$754,348***
D1010	**Elevators and Lifts**				
59	3 stop MRL 350 fpm, 3500 lb elevator	LS	1	155,000.00	155,000
	Elevators and Lifts			***$2.26/SF***	***$155,000***

Petersburg Medical Pre Design
Concept

Downtown Phase 1 Building Level 3 Detail

Gross Floor Area: 68,577 SF
Rates Current At December 2019

Description		Unit	Qty	Rate	Total Cost
D2090	**Other Plumbing Systems**				
62	Plumbing systems-see PIKA sfa estimate	LS	1	1,777,745.00	1,777,745
	Other Plumbing Systems			***$25.92/SF***	***$1,777,745***
D3090	**Other HVAC Systems and Equipment**				
70	HVAC-see PIKA sfa estimate	LS	1	5,057,335.00	5,057,335
	Other HVAC Systems and Equipment			***$73.75/SF***	***$5,057,335***
D4090	**Other Fire Protection Systems**				
66	Fire Protection-see PIKA sfa estimate	LS	1	392,444.00	392,444
	Other Fire Protection Systems			***$5.72/SF***	***$392,444***
D5090	**Other Electrical Services**				
80	Electrical building power systems-see PIKA sfa estimate	LS	1	781,797.00	781,797
81	Electrical building lighting & receptacles-see PIKA sfa estimate	LS	1	1,322,752.00	1,322,752
82	Electrical building special systems, comm.-see PIKA sfa estimate	LS	1	745,365.00	745,365
83	Electrical building fire alarm, security-see PIKA sfa estimate	LS	1	566,925.00	566,925
	Other Electrical Services			***$49.82/SF***	***$3,416,839***
E1090	**Other Equipment**				
88	Misc. building equipment / FOIC	SF	68,577	3.00	205,731
	Other Equipment			***$3.00/SF***	***$205,731***
E2010	**Fixed Furnishings**				
89	Casework allowance	SF	68,577	8.50	582,905
90	Manual shades / blinds @ exterior glazing	SF	8,499	11.00	93,489
91	Manual blinds @ interior glazing	SF	3,429	8.00	27,432
102	Add for electric blinds	LS	1	25,000.00	25,000
	Fixed Furnishings			***$10.63/SF***	***$728,826***
	ESTIMATED NET COST			***$415.13/SF***	***$28,468,177***

Petersburg Medical Pre Design
Concept

Downtown Phase 1 Site Work Level 2 Summary

Gross Floor Area: 78,100 SF
Rates Current At December 2019

Description		%	Cost/SF	Total Cost
G10	**Site Preparations**	**20.7 %**	**$13.62**	**$1,063,538**
G20	**Site Improvements**	**1.6 %**	**$1.04**	**$81,330**
G30	**Site Civil/Mechanical Utilities**	**11.4 %**	**$7.47**	**$583,500**
G40	**Site Electrical Utilities**	**20.5 %**	**$13.44**	**$1,050,000**
	ESTIMATED NET COST	**54.2 %**	**$35.57**	**$2,778,368**
MARGINS & ADJUSTMENTS				
Location Factor		25.0 %		$694,592
General Conditions		7.5 %		$260,472
Design Contingency-Site Work		15.0 %		$560,015
Added Design / Market Contingency MEP Systems		0.0 %		
Contractors Overhead & Profit		7.5 %		$322,009
Escalation to NTP (average 4.8%/year)		8.4 %		$387,698
Per diem / Imported labor		2.5 %		$125,079
	ESTIMATED TOTAL COST		**$65.66**	**$5,128,233**

Petersburg Medical Pre Design
Concept

Downtown Phase 1 Sitework Level 3 Detail

Gross Floor Area: 78,100 SF
Rates Current At December 2019

Description		Unit	Qty	Rate	Total Cost
G1020	**Site Demolition & Relocations**				
103	Site Clear & grub, misc. demo	SF	78,100	0.40	31,240
128	Demo existing structures, site features	SF	78,100	4.25	331,925
139	Demo abandandon / cap utilites	LS	1	10,000.00	10,000
	Site Demolition & Relocations			***$4.78/SF***	***$373,165***
G1030	**Site Earthwork**				
104	Remove muskeg at drives, parking, loading,parking plant islands,walks	CY	278	18.00	5,004
105	Import fill at drives, paking, loading, parking plant islands,walks	CY	278	25.00	6,950
107	Erosion control allowance	SF	78,100	0.25	19,525
129	Remove muskeg at balance of site area (not bldg foot print)	CY	8,058	18.00	145,044
130	Import fill at balance of site area (not bldg foot print)	CY	8,058	25.00	201,450
132	Misc. site grading/earthwork-allowance	SF	78,100	4.00	312,400
	Site Earthwork			***$8.84/SF***	***$690,373***
G2020	**Parking Lots**				
108	Heavy duty pavement-drives	SF	1,083	10.00	10,830
	Parking Lots			***$0.14/SF***	***$10,830***
G2030	**Pedestrian Paving**				
114	Pedestrian paving onsite	SF	1,500	7.00	10,500
	Pedestrian Paving			***$0.13/SF***	***$10,500***
G2040	**Site Development**				
136	Site furishings allowance	LS	1	20,000.00	20,000
	Site Development			***$0.26/SF***	***$20,000***
G2050	**Landcaping**				
138	Landscape allowance	LS	1	40,000.00	40,000
	Landcaping			***$0.51/SF***	***$40,000***
G3010	**Water Supply**				
140	New water main on 3rd to replace abandoned , with road patch	LF	300	350.00	105,000
142	Replacement water main along Fram, with road patch	LF	505	385.00	194,425
143	Misc. water system-vaults, meters, backflow preventers, valves, connections	LS	1	75,000.00	75,000
	Water Supply			***$4.79/SF***	***$374,425***
G3020	**Sanitary Sewer**				
144	Side sewer allowance	LS	1	35,000.00	35,000

Petersburg Medical Pre Design
Concept

Downtown Phase 1 Sitework Level 3 Detail

Gross Floor Area: 78,100 SF
Rates Current At December 2019

Description		Unit	Qty	Rate	Total Cost
145	Replace sewer line abandoned, with road patch	LF	300	385.00	115,500
	Sanitary Sewer			***$1.93/SF***	***$150,500***
G3030	**Storm Sewer**				
146	Storm collection, drainage allowance	SF	78,100	0.75	58,575
	Storm Sewer			***$0.75/SF***	***$58,575***
G4090	**Other Site Electrical Utilities**				
147	Site electrical-see PIKA estimate	LS	1	1,050,000.00	1,050,000
	Other Site Electrical Utilities			***$13.44/SF***	***$1,050,000***
	ESTIMATED NET COST			***$35.57/SF***	***$2,778,368***

Petersburg Medical Pre Design
Concept

Downtown Phase 2 Building Level 2 Summary

Gross Floor Area: 26,837 SF
Rates Current At December 2019

Description			Cost/SF	Total Cost
A10	**Foundations**		**$46.57**	**$1,249,678**
A20	**Basement Construction**		**$2.98**	**$80,000**
B10	**Superstructure**		**$47.21**	**$1,266,886**
B20	**Exterior Enclosure**		**$42.85**	**$1,150,026**
B30	**Roofing**		**$28.56**	**$766,465**
C10	**Interior Construction**		**$51.68**	**$1,386,946**
C20	**Stairs**		**$2.38**	**$64,000**
C30	**Interior Finishes**		**$27.63**	**$741,514**
D20	**Plumbing**		**$22.08**	**$592,665**
D30	**HVAC**		**$59.43**	**$1,594,975**
D40	**Fire Protection**		**$5.35**	**$143,685**
D50	**Electrical**		**$38.67**	**$1,037,780**
E10	**Equipment**		**$3.00**	**$80,511**
E20	**Furnishings**		**$12.74**	**$341,889**
		ESTIMATED NET COST	**$391.14**	**$10,497,020**
MARGINS & ADJUSTMENTS				
Location Factor		25.0 %		$2,624,255
General Conditions		7.5 %		$984,096
Design Contingency-Buildings		8.0 %		$1,128,430
Added Design / Market Contingency MEP Systems		2.2 %		$342,259
Contractors Overhead & Profit		7.5 %		$1,168,205
Escalation to NTP (average 4.8%/year)		8.4 %		$1,406,518
Per diem / Imported labor		2.5 %		$453,770
	ESTIMATED TOTAL COST		**$693.24**	**$18,604,553**

Petersburg Medical Pre Design
Concept

Downtown Phase 2 Building Level 3 Detail

Gross Floor Area: 26,837 SF
Rates Current At December 2019

Description		Unit	Qty	Rate	Total Cost
A1010	**Standard Foundations**				
1	Footing drains	LF	687	20.00	13,740
2	Standard foundation excavation/backfill (sfa)	SF	16,704	1.75	29,232
3	Standard foundations-continuous footings, column footings (sfa)	SF	16,704	16.00	267,264
4	Add for stem wall/foundation wall-below grade	SF	6,828	45.00	307,260
5	Add for brace frame footings (sfa)	SF	16,704	1.60	26,726
7	Dampproofing / insul/ drainage-foundation	SF	7,687	8.00	61,496
	Standard Foundations			***$26.30/SF***	***$705,718***
A1020	**Special Foundations**				
8	Excavate-haul muskeg @ bldg footprint	CY	3,094	18.00	55,692
9	Import fill @ bldg footprint	CY	3,094	25.00	77,350
94	Demo /cut down piling-portion under new bldg footprint	SF	16,704	15.00	250,560
	Special Foundations			***$14.29/SF***	***$383,602***
A1030	**Slab on Grade**				
10	Slab on grade	SF	16,704	8.00	133,632
11	Gravel at slab	SF	16,704	0.85	14,198
12	Slab depressions/ blockouts/columns	SF	16,704	0.75	12,528
	Slab on Grade			***$5.98/SF***	***$160,358***
A2010	**Basement Excavation**				
14	Add for basement excavation / backfill of taller foundation walls	LS	1	80,000.00	80,000
	Basement Excavation			***$2.98/SF***	***$80,000***
B1010	**Floor Construction**				
16	Floor structure-beams, columns, brace frames, decking, topping	SF	10,133	52.00	526,916
17	Fireproofing floor structural steel and decking	SF	10,133	5.50	55,732
	Floor Construction			***$21.71/SF***	***$582,648***
B1020	**Roof Construction**				
20	Roof structure-beams, columns, brace frames, joists, decking	SF	20,425	28.00	571,900
21	Fireproofing roof structure and decking	SF	20,425	5.50	112,338
	Roof Construction			***$25.50/SF***	***$684,238***
B2010	**Exterior Walls**				
23	Exterior wall-framing, metal stud, insulations, wrb, sheath, furrings, gwb	SF	10,542	28.95	305,191
24	Metal wall panels-55% above grade framed exterior wall area	SF	7,731	35.00	270,585
25	Stone veneer-20% above grade framed exterior wall area	SF	2,812	52.00	146,224

Petersburg Medical Pre Design
Concept

Downtown Phase 2 Building Level 3 Detail

Gross Floor Area: 26,837 SF
Rates Current At December 2019

	Description	Unit	Qty	Rate	Total Cost
26	Misc. exterior wall flash, trim, caulk (ext. gross wall area)	SF	14,056	3.50	49,196
	Exterior Walls			***$28.74/SF***	***$771,196***
B2020	**Exterior Windows**				
27	Windows, storefront, curtain wall-25% above grade gross ext. wall area	SF	3,514	95.00	333,830
	Exterior Windows			***$12.44/SF***	***$333,830***
B2030	**Exterior Doors**				
97	Exterior doors - allow	LS	1	45,000.00	45,000
	Exterior Doors			***$1.68/SF***	***$45,000***
B3010	**Roof Coverings**				
30	Temp roof dry in	SF	20,425	2.85	58,211
31	Standing seam metal roofing system-complete 85% roof area	SF	17,361	32.00	555,552
32	Membrane roofing system-complete 15% roof area	SF	3,064	24.00	73,536
33	Furring, cladding of roof overhangs	SF	2,886	20.00	57,720
34	Roofing rough carpentry	SF	20,425	0.65	13,276
35	Roofing accessories, ladders, hatch, snow block, walk pads	SF	20,425	0.40	8,170
36	Fall protection-excluded	SF	20,425		Excl.
	Roof Coverings			***$28.56/SF***	***$766,465***
C1010	**Partitions**				
37	Interior partitions-metal stud, gwb ea. side	SF	37,572	13.50	507,222
38	Misc. blocking/bracing	SF	37,572	0.50	18,786
39	Add for wall types -stud thickness, gwb layers, insulation	SF	20,665	3.00	61,995
	Partitions			***$21.91/SF***	***$588,003***
C1020	**Interior Doors**				
41	Interior doors/ frames/hardware	EA	77	2,600.00	200,200
44	Interior relites, sidelites, glazed walls-allow	SF	7,515	60.00	450,900
98	Added hardware - card readers, electric, ADA	LS	1	15,000.00	15,000
	Interior Doors			***$24.82/SF***	***$666,100***
C1030	**Specialties**				
45	Specialities-signage/wayfinding ,toilet/shower accessories, marker boards	SF	26,837	4.95	132,843
	Specialties			***$4.95/SF***	***$132,843***

Petersburg Medical Pre Design
Concept

Downtown Phase 2 Building Level 3 Detail

Gross Floor Area: 26,837 SF
Rates Current At December 2019

Description		Unit	Qty	Rate	Total Cost
C2010	**Stair Construction**				
46	Stairs/rails-per floor	EA	2	32,000.00	64,000
	Stair Construction			***$2.38/SF***	***$64,000***
C3010	**Wall Finishes**				
100	Wall finishes-Tile, FRL, Wood, misc. other	SF	26,837	6.50	174,441
48	Interior painting / sealing	SF	26,837	3.25	87,220
52	Acoustical wall panel allowance	SF	500	26.00	13,000
	Wall Finishes			***$10.23/SF***	***$274,661***
C3020	**Floor Finishes**				
49	Flooring-mix of carpet / resilient	SF	13,621	8.00	108,968
53	Flooring-tile @ rr's allow	SF	1,100	22.00	24,200
55	Flooring-sealed concrete	SF	12,116	0.85	10,298
56	Base allowance-mix of tile, coved, standard, wood	SF	26,837	1.05	28,179
	Floor Finishes			***$6.40/SF***	***$171,645***
C3030	**Ceiling Finishes**				
57	Ceilings-mix of hard and soft, including vertical soffits/transitions	SF	26,837	8.50	228,115
58	Allowance for ceiling upgrades / acoustics	SF	26,837	2.50	67,093
	Ceiling Finishes			***$11.00/SF***	***$295,208***
D2090	**Other Plumbing Systems**				
63	Plumbing systems-see PIKA sfa estimate	LS	1	592,665.00	592,665
	Other Plumbing Systems			***$22.08/SF***	***$592,665***
D3090	**Other HVAC Systems and Equipment**				
71	HVAC-see PIKA sfa estimate	LS	1	1,594,975.00	1,594,975
	Other HVAC Systems and Equipment			***$59.43/SF***	***$1,594,975***
D4090	**Other Fire Protection Systems**				
67	Fire Protection-see PIKA sfa estimate	LS	1	143,685.00	143,685
	Other Fire Protection Systems			***$5.35/SF***	***$143,685***
D5090	**Other Electrical Services**				
84	Electrical building power systems-see PIKA sfa estimate	LS	1	212,080.00	212,080
85	Electrical building lighting & receptacles-see PIKA sfa estimate	LS	1	453,180.00	453,180
86	Electrical building special systems, comm.-see PIKA sfa estimate	LS	1	213,933.00	213,933

Petersburg Medical Pre Design
Concept

Downtown Phase 2 Building Level 3 Detail

Gross Floor Area: 26,837 SF
Rates Current At December 2019

Description		Unit	Qty	Rate	Total Cost
87	Electrical building fire alarm, security-see PIKA sfa estimate	LS	1	158,587.00	158,587
	Other Electrical Services			***$38.67/SF***	***$1,037,780***
E1090	**Other Equipment**				
88	Misc. building equipment / FOIC	SF	26,837	3.00	80,511
	Other Equipment			***$3.00/SF***	***$80,511***
E2010	**Fixed Furnishings**				
89	Casework allowance	SF	26,837	8.50	228,115
90	Manual shades / blinds @ exterior glazing	SF	3,514	11.00	38,654
91	Manual blinds @ interior glazing	SF	7,515	8.00	60,120
101	Add for electric blinds	LS	1	15,000.00	15,000
	Fixed Furnishings			***$12.74/SF***	***$341,889***
	ESTIMATED NET COST			***$391.14/SF***	***$10,497,020***

Petersburg Medical Pre Design
Concept

Downtown Phase 2 Sitework Level 2 Summary

Gross Floor Area: 63,900 SF
Rates Current At December 2019

Description			Cost/SF	Total Cost
G10	**Site Preparations**		**$28.27**	**$1,806,737**
G20	**Site Improvements**		**$4.75**	**$303,463**
G30	**Site Civil/Mechanical Utilities**		**$2.47**	**$157,925**
G40	**Site Electrical Utilities**		**$2.97**	**$190,000**
		ESTIMATED NET COST	**$38.47**	**$2,458,125**
MARGINS & ADJUSTMENTS				
Location Factor		25.0 %		$614,531
General Conditions		7.5 %		$230,449
Design Contingency-Site Work		15.0 %		$495,466
Added Design / Market Contingency MEP Systems		0.0 %		
Contractors Overhead & Profit		7.5 %		$284,893
Escalation to NTP (average 4.8%/year)		8.4 %		$343,011
Per diem / Imported labor		2.5 %		$110,662
		ESTIMATED TOTAL COST	**$71.00**	**$4,537,137**

Petersburg Medical Pre Design
Concept

Downtown Phase 2 Site Work Level 3 Detail

Gross Floor Area: 63,900 SF
Rates Current At December 2019

	Description	Unit	Qty	Rate	Total Cost
G1020	**Site Demolition & Relocations**				
103	Site Clear & grub, misc. demo	SF	63,900	0.40	25,560
127	Demo existing hospital	SF	53,205	15.00	798,075
	Site Demolition & Relocations			***$12.89/SF***	***$823,635***
G1030	**Site Earthwork**				
104	Remove muskeg at drives, parking, loading,parking plant islands,walks	CY	4,144	18.00	74,592
105	Import fill at drives, paking, loading, parking plant islands,walks	CY	4,144	25.00	103,600
107	Erosion control allowance	SF	63,900	0.25	15,975
129	Remove muskeg at balance of site area (not bldg foot print)	CY	8,740	18.00	157,320
130	Import fill at balance of site area (not bldg foot print)	CY	8,740	25.00	218,500
131	Demo /cut down piling-allow at balance extg. hospital footprint	SF	10,501	15.00	157,515
132	Misc. site grading/earthwork-allowance	SF	63,900	4.00	255,600
	Site Earthwork			***$15.39/SF***	***$983,102***
G2020	**Parking Lots**				
133	Curbing allowance	LS	1	15,000.00	15,000
109	Normal duty pavement-parking	SF	15,878	7.00	111,146
110	Loading / ambulance area hardscape	SF	3,914	10.00	39,140
112	Signage, striping, detectable warnings	SF	19,792	0.35	6,927
134	Wheel stops	EA	46	125.00	5,750
	Parking Lots			***$2.79/SF***	***$177,963***
G2030	**Pedestrian Paving**				
114	Pedestrian paving onsite	SF	1,500	7.00	10,500
	Pedestrian Paving			***$0.16/SF***	***$10,500***
G2040	**Site Development**				
117	Misc. loading / receiving development (dock)	LS	1	75,000.00	75,000
135	Site furnishings allowance	LS	1	15,000.00	15,000
	Site Development			***$1.41/SF***	***$90,000***
G2050	**Landcaping**				
137	Landscape allowance	LS	1	25,000.00	25,000
	Landcaping			***$0.39/SF***	***$25,000***

Petersburg Medical Pre Design
Concept

Downtown Phase 2 Site Work Level 3 Detail

Gross Floor Area: 63,900 SF
Rates Current At December 2019

Description		Unit	Qty	Rate	Total Cost
G3010	**Water Supply**				
143	Misc. water system-vaults, meters, backflow preventers, valves, connections	LS	1	75,000.00	75,000
	Water Supply			***$1.17/SF***	***$75,000***
G3020	**Sanitary Sewer**				
144	Side sewer allowance	LS	1	35,000.00	35,000
	Sanitary Sewer			***$0.55/SF***	***$35,000***
G3030	**Storm Sewer**				
146	Storm collection, drainage allowance	SF	63,900	0.75	47,925
	Storm Sewer			***$0.75/SF***	***$47,925***
G4090	**Other Site Electrical Utilities**				
148	Site electrical-see PIKA estimate	LS	1	190,000.00	190,000
	Other Site Electrical Utilities			***$2.97/SF***	***$190,000***
	ESTIMATED NET COST			***$38.47/SF***	***$2,458,125***