Owner's Project Requirements Document for ELS Remodel to a Molecular Laboratory Washington State Public Health Laboratories

Washington State Department of Health

1.0 Executive Summary

The intent of the OPR (Owner's Project Requirements Document), is to detail the functional requirements of the proposed capital improvement project and the expectations for the building's use and operation. The OPR is considered a "living" document during the design phase of the project, and as such is subject to change as the design progresses. By establishing the project goals in a single document, the OPR becomes a record by which the Owner, and other parties involved in the project, can judge the degree of success in meeting the Owner's defined objectives and criteria. The Owner's Project Requirements form the basis from which all design, construction, acceptance, and operational decisions are made. The OPR is a document that evolves through each project phase.

The Washington State Public Health Laboratories (PHL) developed a 20-year master plan for the long-term development of the Shoreline DOH campus. The master plan development involved state and City of Shoreline leaders, community members, and agency staff. This 20-year blueprint detailed the DOH and PHL program needs including laboratory and administrative facilities. This project represents activities and facilities called for in Phase III of that plan.

The current Environmental Sciences Laboratory Wing (ELS) is approximately 10,342 gsf. The Public Health Laboratory's (PHL) master plan calls for the current ELS wing to be converted into a new molecular laboratory as part of the Microbiology Department with ELS moving to the new South Laboratory Addition. Most of what was office space in the original building design has been converted to laboratory space due to additional testing and testing requirements and the influx of equipment required to do the testing. Additional testing and equipment have made the current Microbiology laboratory space inefficient and without flexibility to change as testing requirements grow. This project will renovate approximately 10,342 gsf of Laboratory space into a new Molecular Laboratory and add approximately 4,000 gsf. of office space and small to moderate conference rooms between the current C & E-wings.

The Microbiology Molecular laboratory will be broken into Molecular Testing Suites, Next Generation Sequencing, Sexually Transmitted Disease Testing, Bacteriology Testing, .

The new Administration and office space will have open office space for laboratory microbiologists, lab technicians, and administrative assistants, desks for upper-level microbiologists and, offices for supervisors and managers. Also included will be several moderate and small meeting spaces and space for records storage.

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2.0 Introduction

This Owner's Project Requirements (OPR) document outlines functional requirements of the project and expectations of how the facility and its systems will be used and operated.

This project will add renovate approximately 10,340 gsf of laboratory space and add approximately 4,000 gsf of new office and administrative space. The intent is that the new microbiology molecular wing will be located in the existing E-wing and the new Office and Administrative space will be built between the current C & E-wings. There will be a certain amount of infrastructure work such as laboratory and waste drainage revisions where the office/admin addition will be located.

The Owner will develop and update the OPR through program verification and schematic design, or until the Cx consultant is selected. The Cx consultant will then assume responsibility for refining and augmenting the OPR throughout programming, design, construction, and post-occupancy period of one year following Substantial Completion of construction. As decisions are made during the life of the project, this document shall be updated to reflect the current requirements of the Public Health Labs.

The Owner is the Washington State Department of Health, Washington State Public Health Laboratories. Terry Williams, Capital Project Coordinator, will be the Owner's representative. Primary users and stakeholders include the Microbiology Office staff, IT staff, Agency & Laboratory Administration, and the laboratory's maintenance staff. The laboratory's maintenance staff will be responsible for operations and maintenance of the new areas.

It is also the Owner's intent that the new addition will meet ZNE or ZNE-C certification, be a minimum LEED Silver certified, and use sustainable energy sources, and building materials to the extent that the program funding allows.

3.0 Owner's Key Project Requirements

This section, Owner's Key Project Requirements, will be broken into two parts. This is due to the fact that the final Microbiology Office's footprint will consist of not only E-wing and the new office space that are part of this project, but a later C-wing remodel. The first section describes the Microbiology Section and gives a brief description of the requirements of each laboratory section. The second section will give a detailed description of the laboratory sections that will be installed in E-wing and the Office Addition that are a part of this project. When thinking about the design for this project it helps to understand how the full Microbiology group works and how the later project will affect the current project.

Key Project Requirements for the Microbiology Office:

General Requirements:

Laboratory flexibility is the most important feature for all remodeled laboratories. The ability to move workbenches to different locations as program needs change and to have the utility infrastructure in place to support those changes without needing to be reconstructed is imperative. At least one walk-in refrigerator and freezer in each wing is needed to replace the many stand-alone refrigerators and freezers that are scattered around the laboratory wings taking up valuable laboratory space. A true separation between laboratory space and staff office space where lab staff can go to do computer work outside of the laboratory. The desks in the offices should be adjustable and the area should also have space to store their personal effects. The meeting spaces should vary in size to accommodate three to six staff members for impromptu meetings. If possible, the spaces should have moveable walls so that the meeting rooms could be combined to hold 15 staff. PPE storage should be available within the laboratories and should also include cart storage. Storage spaces should be high density with adjustable storage options in each

segment. All spaces should be aesthetically pleasing and comfortable to work in. This would include being environmentally comfortable with natural light, well lit, have low ambient noise and a color scheme that is soothing to work in 8 hours a day.

Molecular Diagnostic Testing:

Molecular diagnostic testing provides rapid results to improve patient outcomes and provide valuable information to public health officials to help interrupt disease transmission. For this reason, molecular testing has expanded into almost every facet of the Microbiology laboratory. The Microbiology Office needs to greatly increase access to molecular testing suits that maintain proper directional air flow. Clean and dirty (Pre and post amplification) spaces should be distant from one another (at least one wall and no connecting door). There should be redundancy built in so that contamination within one suite does not shut down the entire operation. An integrated UPS system should be in place to ensure analytical runs and instruments are protected from power surges and even brief power fluctuations.

Next Generation Sequencing:

The introduction of high-speed, low-cost sequencing is revolutionizing disease surveillance. It is likely that over the next 10 years, nearly all infectious diseases of public health concern will benefit from NGS informed surveillance. Dedicated space is required to support the expected scale of testing at the WAPHL. This will require controlled airflow suites. Ample room for large fluidics platforms and sequencing platforms. An integrated UPS system should be in place to ensure analytical runs and instruments are protected from power surges and even brief power fluctuations. There should be redundancy built in so that contamination within one suite does not shut down the entire operation. Benches for instruments should be without cabinets or drawers and built to insulate instruments from vibrations. Adequate ventilation is needed as instrument density may be high and can lead to heat buildup.

STD Testing:

Testing for STD's tends to utilize high throughput screening instruments coupled with lower throughput confirmatory tests. This lab section will need versatile lab space able to accommodate very large floor model instruments, medium sized bench top instruments and open bench space to accommodate manual lab procedures.

Bacteriology Testing:

There are several groups performing BSL2 level bacteriology. While the pathogens and assays may vary from group to group, the infrastructure and resources are very similar. To maximize efficiency, the bacteriology groups should be clustered together. This will allow for sharing of key instruments and safety equipment. This lab section will require access to many Biological Safety Cabinets. Open flexible lab space with a few smaller closed lab spaces for work with more dangerous pathogens like N. meningitidis and H. influenzae. A small number of chemical fume hoods for some chemical manipulation and O&P processing. A microscopy area able to accommodate light and dark room conditions. Large expanses of open bench for traditional microbiology work including culture media prep for GC work. Separate storage for supplies and samples. Bacteriology isolations are odor producing tests; appropriate ventilation (analogous to restaurant food preparation) should be investigated.

Virology:

This lab currently performs testing for several conditions that are likely to be involved in large outbreaks. The space should include large amounts of bench space to facilitate serological assays which require many manual manipulations. There should be space for large, automated platforms for molecular and serological assays. BSL2+ spaces with controlled airflow and BSC's for rabies and high path flu/ unexplained death specimens is needed. There should be access to several Biological Safety Cabinets for processing routine specimens and to expand into in a surge event. It may be wise to place the virology lab adjacent to the Surge/High throughput space below. This would allow the Virology team to spill over into the surge space when needed.

Surge/High Throughput Space:

When large outbreaks occur, the WAPHL needs a significant amount of lab space to grow into for the duration of the response. The space needs to be open and flexible. Able to accommodate high throughput instrumentation, enhanced safety features such as BSCs and ample refrigeration and freezer space. The space should have a dedicated supply storage area. The space should be conveniently located near central accessioning since there will be high volumes of samples moving between the spaces. There should be dedicated administrative spaces to accommodate high volumes of staff during emergency situations.

Key Project Requirements for the Current Project:

The following criteria are the Owner's Key Project Requirements for the current project which is the remodel of the existing E-wing and the addition of new office space for all microbiology staff. All microbiology staff will be located in the new office area allowing for the existing E-wing to be completely filled with lab or support space as required.

General Project Requirements:

- Provide a state-of-the-art laboratory space that meets the current needs of the Microbiology Office as well as any program expansion needs over the next twenty years. Throughout the expansion project, the Microbiology Office will need to maintain all routine lab operations. As the first remodel phase is completed, it is likely that all of Microbiology will move into the new space while remodeling occurs in C-wing. Once that is completed, the Microbiology Office will be able to fully decompress. As such, the E-wing remodel design will be more generalized to allow for flexible use with an eye towards the intended use once the entire project is completed. C-wing will be designed specifically for the labs that will reside there once work is completed. The final office occupancy will need to accommodate the staff numbers below.
    - Final E-wing Occupancy:
        - Biowatch/Bioterrorism (9 FTE)
        - ARLN/Reference (13 FTE)
        - Enterics (3 FTE)
        - FoodLab (4 FTE)
        - Parasitology (1 FTE)
    - Final C-wing Occupancy:
        - Advanced Molecular detection (6 FTE)
        - TB (5 FTE)
        - STI (5 FTE)
        - Virology (6 FTE)
    - Unknown Occupancy (Possible to remain in Q wing)
        - The High Throughput Laboratory (COVID) (Up to 40 FTE)
            - This Space may be combined with Virology

General Laboratory Requirements:

- The last 20 years at the PHL have demonstrated over and over the need for flexibility. Our current lab cabinetry is made up almost exclusively of built-in benches and workspaces. As technology changes and public health demand shifts, it has been exceedingly difficult for our space to adapt with us. We often need to contract with contractors to perform costly renovations. There is a need for as much flexibility as possible with regard to benches, electrical access, IT cable access and internet ports. Ceiling access for power (110 and 220) and data connections are preferred. In addition, the PHL needs to install a centralized large walk-in refrigerator and freezer. As of this writing, the Microbiology office maintains dozens of the smaller individual units. These units are typically of low quality and require constant repair and or replacement.

Centralized walk-in refrigerators and freezers, with redundant refrigeration systems, will be more economical and more stable. Reagent costs within some failure prone units can be as high as $100,000. There are also needs to have a hard separation between office and lab space. Currently, due to a lack of space, staff are required to keep personal effects in the laboratories. This is a safety issue and a poor use of expensive lab space. PPE storage within the lab should be available and allow staff to keep their equipment separate. This space should be immediately adjacent to the lab or just inside the doors. All lab sections should have cart storage locations out of high traffic areas. All lab sections should have several sit-stand desks for performing data entry and other lab related computer-based activities.

Molecular Diagnostic Testing:

- Molecular diagnostic testing provides rapid results to improve patient outcomes and provide valuable information to public health officials to help interrupt disease transmission. For this reason, molecular testing has expanded into almost every facet of the Microbiology laboratory. This space used to be considered specialized and is now ubiquitous. The Microbiology Office needs to greatly increase access to molecular testing suits that maintain proper directional air flow. Clean and dirty (Pre and post amplification) spaces should be distant from one another (at least one wall and no connecting door). There should be redundancy built in so that contamination within one suite does not shut down the entire operation. An integrated UPS system should be in place to ensure analytical runs and instruments are protected from power surges and even brief power fluctuations. The space should be easily accessible to all lab sections.
    - Equipment list
        - 20 realtime PCR platforms
        - 2 dPCR platforms
        - 2 plate spinners
        - 6BSC's
        - MP96
        - 2 King fishers
        - 2 large extraction platforms (TBD)
        - 1-Qiacube
        - 1-Bead Beater (TB)
        - 6-Bench top centrifuges
        - Building vacuum or vacuum pump
        - DI
        - 2 large Master mix prep spaces (5 PCR stations in each plus room for automation)
            - Equivalent of 3 –20 Freezers (in each room)
            - Equivalent of 2 refrigerators (in each room)
            - Milli-Q
        - 2 large template addition rooms with a refrigerated pass through to the adjacent mastermix room. (5 PCR stations in each plus room for automation)
            - Equivalent of 3 –80 Freezers.
            - Equivalent of 2 –20 Freezers
            - Equivalent of 2 refrigerators
            - Plate spinner (Bench top)
        - 4- Sit stand computer stations for PCR activities

Bacteriology testing:

- There are several groups performing BSL2 level bacteriology. While the pathogens and assays may vary from group to group, the infrastructure and resources are very similar. To maximize efficiency, the bacteriology groups should be clustered together. This will allow for sharing of key instruments and safety equipment. This lab section will require access to many Biological Safety Cabinets. Open flexible lab space with a few smaller closed lab spaces for work with more dangerous pathogens like N. meningitidis and H. influenzae. A small number of chemical fume hoods for some chemical manipulation and O&P processing. A microscopy area able to accommodate light and dark room conditions. Large expanses of open bench for traditional microbiology work including culture media prep for GC work. Separate storage for supplies and samples. Bacteriology isolations are odor producing tests; appropriate ventilation (analogous to restaurant food preparation) should be considered.
    - Food/Enterics/Parasitology:
        - Equipment list:
            - 5-Incubators
            - Equivalent of 5 –80 Freezers.
            - Equivalent of 4 –20 Freezers
            - Equivalent of 12 refrigerators
            - 1-Shaking incubator
            - 1 Microaerophilic incubator
            - 1floor model centrifuge
            - 1 bench model centrifuge
            - 1 fluorescent microscope
            - 1 light microscope
            - 1 dissecting microscope
            - 1 MP96
            - 1 King Fisher
            - 3 Realtime PCR platforms ABI 7500 or Quantstudios.
            - 1 Biofire
            - 1 Maldi-TOF
            - Vacuum lines or vacuum pump
            - DI water
            - 1 BSC
            - 1 fume hood
            - 2 Air Clean PCR stations
            - Shellfish shucking sinks
            - Small glassware washing station
    - Reference/ARLN:
        - Equipment list
            - 7 big regular incubators
            - 1 CO2 incubator
            - 4 mini-incubators
            - 2 Shaking incubators
            - 2 Quanstudio-5
            - 1 Maldi tof
            - Autoclave for media prep

- 2 Cepheid
- 1 MP96
- 1 King Fisher
- 1 BD MAX
- 1 light microscope
- DI water
- 6 BSC
- Access to a small fume hood
- Equivalent of 5 –80 Freezers.
- Equivalent of 2 –20 Freezers
- Equivalent of 6 refrigerators
- Small glassware washing station

- BT/Biowatch*(May group with Molecular):
  - Equipment list
    - Equivalent of 2 –20 Freezers
    - Equivalent of 3 refrigerators
    - 1 Maldi-TOF
    - Large bead beater
    - 4 air clean PCR stations
    - 4 ABI 7500's
    - Printing station for the DMS system
    - DI water
    - 3 BSC's (With DMS connection points)
    - Small glassware washing station

General Design Requirements:

- Provide storage spaces for Microbiology that will handle current space needs and still have room for 20% growth over the next 20 years. The records storage area should be high density. There should be space for storing extra back up equipment that is not in use. Adequate ambient supply storage should be located in each laboratory.
- Provide office space to accommodate 125 staff in the new administrative addition. The office space for general lab staff should be aesthetically pleasing and flexible. Small desks/cubes and computers for each staff member. Bull pen style offices for Leads and single occupancy offices for supervisors and Admin support staff. The space must contain a printer/admin space for staff. The space should contain a small coffee bar/lounge for staff to use throughout the day. The office space should be located adjacent to the lab spaces but physically separated.
- The space must contain a reasonable size conference room that can be divided to create several smaller spaces for team meetings. The small meeting spaces, when opened up, should accommodate up to 15 staff. AV hookups and connections should be available in all meeting spaces.
- Provide lab spaces that are aesthetically pleasing and comfortable to work in. This would include being environmentally comfortable, with natural light if possible, well lit, low ambient noise, and a color scheme that is comfortable to be in eight hours a day. The space should be designed to accommodate the easy movement of lab carts. This includes wide doors, smooth floors etc.
- External glass tinting for security and patient confidentiality, multiple internal access points from office areas to laboratory spaces to reduce staff funneling.

- Ensure that design and construction are of the highest quality. The PHL will only get one shot at constructing this major remodel and addition and it must be completed to last for 50 years with normal maintenance.
- Complete the project on time and on budget. The budget was developed during the previous biennium and construction costs are rising in the Seattle area due to the high volume of building projects. The State's capital budgets do not recognize the need for more money to build a project. The cost estimates developed during this pre-design will be used as the basis for the legislative request for design and construction.
- Construction will take place within and around a fully functioning, 24/7 laboratory building. Design should think about how construction will affect the staff continuing to work during the construction process.
- Mechanical systems should be as efficient and sustainable as possible. Systems such as the AirCuity DCV system and chilled beams should be employed where possible to bring down operating costs. The State of Washington is moving toward a Zero Net Energy policy for all new state buildings. The addition needs to be ZNE or ZNE-C.
- Electrical systems, such as lighting, should use as little energy as possible. LED lighting, lighting controls and other energy saving devices should be incorporated into the design.
- Security should include CCTV cameras, card readers, and glass breaks that match the PHL's existing system. Fire notification devices should meet all code requirements.
- Lab design should be as flexible as possible to meet changing program needs without needing to add additional space. This would include movable casework and adequate infrastructure to accommodate such changes to the lab space.
- Lab finishes should follow the latest BMBL guidelines for BSL2 laboratories. This would include such items as sheet vinyl flooring with self-cove base, adequate lighting for all activities, sinks and eyewashes, and cleanable surfaces and spaces. Storage areas to also have sheet vinyl flooring with coved base.
- Conference room finishes to have carpet tiles with rubber base, adjustable lighting levels, and painted walls.
- The exterior shell of the building should exceed the energy code as a major component of meeting the ZNE requirements. Retrofit of the exterior walls in the existing E-wing should be designed to save as much energy as possible. Aesthetically the outside walls of the new office addition should blend with the existing building but give the building a modern feel, possibly through the use of glass. Glazing should be installed to allow light into the buildings, especially in the new office additions. South and West facing glazing should have sunscreens of some type.
- Landscaping should blend with the existing. Swales, and other sustainable landscaping devices should be utilized. The existing irrigation system should be modified as required but native and low water plants should be used to conserve water.

4.0 Occupancy Requirements

The new lab area will be occupied seven days a week from approximately 6:00 am to 7:00 pm. During large scale public health events such as the current COVID-19 pandemic, the lab may operate over multiple shifts up to 24 hours/day. Due to the critical nature of the screening that takes place in the wing, all systems should perform in all seasons to keep staff comfortable and allow work to continue in all climate conditions. Currently there are 102 staff in the Microbiology program. Staff breakdown is as follows:

1 - office director
2 – Deputy Office Director/Lab Branch Manager
2 - Administration assistants
9 - Supervisors
24 - Leads/Fellows/Bioinformaticist
64 - Bench Staff.

The Microbiology Office expects staff to grow by 20% over the next 20 years.

Small to moderate size conference room space for Microbiology will be located in the in the new Microbiology Office Wing. There should be some casual breakout space in the open office area and 2 to 3 smaller enclosed meeting areas for confidential or private conversations. These smaller "Focus Room" should be approximately 100 sf in size and accommodate 3 to 4 staff members at a time. There should be one conference room that will accommodate 15 staff at one time. It is acceptable to have this space be the same space as the smaller "Focus Rooms" with operable walls that can be opened to create the larger space.

5.0 Performance and Design Criteria

5.1 The project will be designed to Local, State, Federal, and Association codes that apply. These codes include but are not limited to:

- City of Shoreline latest codes and local amendments
- State of Washington codes, per the Washington State Legislature
- Federal Codes including ADA & OSHA
- National Fire Protection Association (NFPA) Codes, Standards and Recommended Practices
- American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc (ASHRAE) standards, handbook series, and recommendations.
- IBC codes

5.2 Environmental Conditions

- Environmental equipment should be as energy efficient as possible and contribute to the overall ZNE goals for the building. Environmental guidelines such as *ANSI Z9.5 American National Standards for Laboratory Ventilation, ASHRAE Standard 90.1, and any other relevant performance standards that affect energy consumption* should be used.
- Building temperature set points to be between 68° ± to 72° ± with a RH of 50% year-round. Room-by-room design conditions, including temperature set points, pressure relationships and minimum ventilation rates, and humidity to be finalized during basis of design development.
- HVAC to be provided by the existing mechanical system. If required, a new separate system is to be provided to provide HVAC for the new office addition. Low ACH should be incorporated into the entire wing if possible. Safety for lower ACHs to include expansion of the Laboratory's Aircuity system. Chilled beams are to be used for heating/cooling in new areas where appropriate. The system is a one pass system, VAV for all ventilated areas. The new Heat Recovery Unit (HRU) will have hot water heating coils with the hot water supplied by the new central plant now being designed. The ventilation system uses 100% outside air and is a one pass system.
- Controls for the HVAC system will be direct digital control (DDC) with the current Allerton system to be expanded to control the new system. The PHL's Skyspark monitoring system will be expanded to monitor the new system.
- The new HVAC system will be zoned to separate space types with distinct conditioning demands, ensuring that comfort is provided while maximizing energy efficiency. HVAC systems shall maintain comfort conditions that meet the criteria stated in ANSI/ASHRAE Standard 55-2013. Systems that support space conditioning for occupant comfort in offices and conference areas shall be separate for systems utilized to meet laboratory conditioning and air filtration demands.
- Any new HVAC systems shall be installed in a mechanical penthouse along with associated pumps, valves, ducting, and electrical components necessary to run the system.

- HVAC-related background sound not to exceed NC 35 in office/conference areas and NC 45 in laboratory areas. Provide wall designs to address noise concerns at areas sensitive to noise transmission.
- New fume hoods and associated exhaust fans will be required in the new space. New hoods to be energy efficient with nighttime setback features. Locate BSCs and fume hoods following best practices such as away from doors, air supply diffusers, or exit paths.
- Minimum face velocity for low flow/high performance CFHs is 75 FPM. Minimum face velocity for traditional CFHs is 100 FPM. BSCs should be low flow if possible.

5.3 Chilled Water System

- Cooling is provided by two York 200-ton variable speed screw type chillers which provide chilled water flow, and utilize R143, a refrigerant operating in a lead/lag mode. These chillers were installed and commissioned in 2007.
- A secondary chilled water system was installed in 2011 to provide chilled water for the chilled beams installed during the HVAC upgrades of the C & E-wings. The system consists of 2-variable speed pumps, a heat exchanger, piping and valves connecting to the existing cooling towers system, and 2 thermal tanks to increase overall system volume. The loop maintains 56°F chilled water to serve the chilled beams. Where possible this system is to be expanded into the new addition.

5.4 Building Automation System (BAS)

- Control system, panels, conduit and wiring for the BAS, fire alarm, smoke management, security systems and lighting controls must tie into the existing system for the building. The current BAS system is Allerton Compass provided by ATS technologies

5.5 Electrical Systems

- Indoor lighting to be LED. Fixtures to match existing in N-Wing. Controls will be vacancy-sensing with manual override. The lighting/dimming system should be able to "harvest" lighting in all perimeter areas. Lumens and Color should be appropriate for installed space. Lighting to be 277V. Outdoor lighting should match existing LED lights or be design appropriate. Levels and color will be agreed upon during BOD development. Evaluate the feasibility of daylight harvesting when designing lighting solutions.
- Design lighting circuits and controls to allow scheduled time-based shutdown with occupancy override.
- All task lighting shall be LED-based and have individual controls.
- Provide 208VAC and 20A 120VAC to all locations as required for equipment hookups. Exact requirements for equipment will be based on the equipment inventory worksheets provided by lab staff.
- Provide 20A 120 VAC in office/conference areas as required. Provide smart or switchable outlets for all plug loads that can be power-saved during periods of non-occupancy. Locations should facilitate flexibility of use of the space.
- Provide outlets in storage spaces as defined during the predesign process. Minimum requirements to be as defined in the electrical code.
- Electrical panels, sub-panels, lighting panels to be located for ease of access by maintenance staff.
- Identify with staff during pre-design any non-standard power requirements.
- Provide expansion of existing Skyspark metering system to new wing. System shall track all major energy uses and equipment loads in the new wing. Verify with owner current systems currently monitored. Modify existing/new Skyspark system to allow remote access, extraction and anaylysis of energy data by the building operations staff.

- Electrical consultant to identify any possible Seattle City Light rebates for the project.

5.6 Plumbing

- The existing DI water system is to be modified to the new lab configuration. Piping, pressures, etc. to match the existing system recently installed.
- Provide sinks as required for lab processes. All sinks to have "WaterSaver", deck mounted faucets with wrist blade handles and foot-operated mixing valves. Each sink to also have Guardian emergency eyewash.
- Install backflow preventer, such as an anti-siphon vacuum breaker, on all lab sinks, to avoid contamination from lab activities.

5.7 Sustainability Goals

- This project will be designed to be Zero-Net-Energy (ZNE) or Zero-Net-Energy Capable (ZNE-C) and will be verified through 12 months of performance measurement through use of the International Living Future Institutes (ILFI) Zero Energy certification program or some similar certification program.
- It is the intent that the PHL will utilized a solar photovoltaic(PV) energy system for this project if possible. (see McKinstry 2019 Preliminary Solar energy study-Rev.2)
- All Laboratory equipment specified as part of this project is to be purchased with energy efficiency as a primary consideration. *Energy Star* rated equipment will be given priority where applicable.

6.0 Building Site

6.1 General

- Utilize existing site infrastructure whenever available, at location closest to service entrance.
- Design utility pathways to allow for installation, maintenance, commissioning, replacement and decommissioning of equipment per manufacturer's recommended O&M requirements.
- Research and identify existing underground elements such as utilities, vaults, tunnels, etc. to avoid unscheduled damage during construction. The PHL has current drawings of the utilities in the area.
- All new wing utilities will connect to existing utilities within the existing building if possible.

6.2 Fire Protection

- Existing fire supply lines enter the building in M-wing. A PIV valve is located on the east side of the building. Connect new lines to existing fire system.
- Fire protection system to include horns, strobes, and horn/strobes as called out per code and the Shoreline Fire Department.
- Any room/area that will be used for high-cost electronic equipment will have a Novec 1230 fire protection system instead of a traditional wet, sprinkler system. These area will be determined during the pre-design process.

6.3 Steam

- Currently the PHL is designing a new central boiler plant to replace the Fircrest steam system. The new heating system will be hot water. The new plant will be a ground source heat pump. All current steam systems will be replaced to accommodate hot water.

6.4 Water/Sewer

- Water enters the building on the east side of M-wing at the same location as the fire protection main. Connect waste to existing PHL waste system on the west side of the building. Use chemical resistant piping for lab waste. Label laboratory waste piping "Lab Wastewater". An existing Acid Neutralization Tank (ANT) is installed on the west side of the wing. All lab waste runs to the ANT before it enters the public sewer system. The ANT has a PH monitor attached to the tank to monitor

PH levels. The monitor should be checked for accuracy and recalibrated or replaced if not performing.

6.5 Landscape

- Provide tree protection at drip line and critical root zones during construction period if applicable. Verify tree requirements with Shoreline Building Dept. (See Master Plan tree retention plan)
- Limit impervious cover and removal of native vegetation to allow for increased filtration and infiltration of storm water run-off. Substitute or replace lost capacity. Extend existing swales and other water mitigation elements for added building square footage.
- Utilize native and adapted planting to reduce watering requirements
- Repair/replace/modify irrigation system where affected by building additions. Provide options for using grey water in the irrigation system if feasible.
- Provide new pedestrian pathways to replace any paths disrupted by new additions.

7.0 Transportation and Parking

7.1 Work with PHL administration to determine additional parking requirements and location of new parking if required.

7.2 Understand and mitigate project's impact on parking and vehicular circulation if any.

7.3 Meet ADA requirements as part of project design and during construction.

8.0 Building Envelope

8.1 General – The building envelope for the office addition shall be designed to endure for at least 50 years. The design and construction shall provide an appropriate level of quality to ensure continued use of the facility over that time period with the application of reasonable preventative maintenance and repairs that would be industry acceptable. The design should be compatible with the existing wings.

8.2 Goals – The building envelope is crucial to ensuring an energy efficient building. The building envelope or facility's shell consists of exterior walls, roof, foundation, doors, windows, dampers, other openings. While the project is mostly the renovation of an existing wing and small office addition the objectives for the building shell and addition are still valid if appropriate.

- Foundations to be concrete with slab on grade floors.
- The outside wall should aesthetically blend with the existing building and be compatible with future projects in the master plan. (see N-Wing addition)
- Glazing should be installed to allow light into the building spaces and allow occupants to view the outside. This is especially true in the new office area. The glazing should have tinting with protective film. Windows should have a low U-value.
- The exterior shell of the building should exceed the energy code. All exterior envelope elements will be a major element in obtaining NZE or NZE-C certification
- The wall system should minimize infiltration, both outside leaking in and conditioned air leaking out to reduce conductive energy transfer through the building shell. The wall system should also minimize conductive energy transfer to the outside.
- Control humidity by maintaining proper movement of water vapor in and out of the building.
- Roofs are assumed to be flat (low slope) with roofing products that match existing. New construction should not invalidate the existing roof warranty.
- Framing should match existing building if logical. Tube steel columns with wide flange beams, and open- web steel roof joists. Infill wall studs are 16-gauge steel.
- Any exterior window systems and entries to have reflective coating.

9.0 Interior Finishes

9.1 General – Interior lab finishes should be selected with aesthetics and quality in mind while still meeting BMBL requirements.

9.2 Floors – Laboratory floors should be sheet vinyl with a self-cove base. Self-cove base should have metal termination strip at top of base. Office/Conference areas to have glue-down sheet carpet or carpet tiles. Carpet adhesives to be non-toxic, low odor and VOC, solvent free. Rubber base to be utilized in office/conference areas.

9.3 Walls – Laboratory, office, and conference room walls to be 5/8" Type "X" GWB with level 4 finish if exposed to view or level 5 finish if dark paint is used.

9.4 Ceilings – Laboratory, office and conference room ceilings to be acoustical tile. Storage areas may be left open. A decision will be made during pre-design if ceiling are to be installed. Ceilings in rooms with the Novec fire system to be 5/8" GWB.

9.5 Casework – wood or laminate faced cabinets (to be decided during pre-design) with full depth shelves, flush faced, 100 lbs. full extension ball bearing glides, stainless steel hinges and pulls with Durcon 1" epoxy resin countertops. All casework to be plywood.

10.0 Emergency or Backup Power

10.1 Emergency power is supplied by a 1500KVa diesel powered generator connected to a 5,000 gal. fuel tank. The generator has the ability to run the lab fully for a week on 5,000 gallons.

10.2 A full wing UPS system should be considered and installed if feasible.

11.0 Telecommunications and A/V Systems

11.1 General - DOH/HTS telecommunication standards apply to all installations. IT will determine and assign all IP addresses. If approved by HTS, wireless systems will be employed in all office/conference locations.

11.2 All staff workstations to have duplex outlet with R45 jacks. An adaptable data system will be employed in open office areas to provide flexibility for future requirements.

11.3 Wiring to be CAT6, Plenum rated, labeled and neatly installed with access for maintenance. All wiring over hard ceilings to be in conduit.

11.4 Provide Speakers in all locations for mass notifications. Paging system to match existing system used throughout the PHL.

11.5 Ensure coordination of A/V design and installation/integration in new conference rooms.

12.0 Safety & Security

12.1 Access Control systems – The PHL uses the Lenel access control system. All new access controls to match existing system.

12.2 Access cards or proximity readers shall restrict access into the building and into certain rooms. Exact locations of proximity readers to be determined during design development.

12.3 Security Cameras – The PHL uses the Avigilon security camera system. The current system uses IP cameras and the building LAN system. HTS will assign IP addresses to the cameras.

13.0 Hazardous Materials

13.1 Building materials – The original building was built in 1985 after asbestos was outlawed. The new addition to have low VOC or no-VOC materials.

13.2 Acids are sent by lab waste to the dilution tank where they are monitored for PH and then sent to the sewer system in a balanced state

13.3 Hazardous materials are stored in the wings in small quantities. They are removed from PHL by a certified agent. See WSPHL Chemical Inventory list – latest version.

14.0 Furnishings and Equipment

14.1 Contractor furnished and installed equipment types (including but not limited to):

- Chemical Fume Hoods
- BioSafety Cabinets
- Laboratory Casework and Shelving. This includes moveable casework and shelving.
- Storage room shelving and counters.
- High density records storage and shelving
- DI water system
- Network electronics (Data closet)

14.2 Owner Furnished, Contractor Installed equipment types. (including but not limited to):

- To be determined during design

14.3 Owner Furnished, Owner Installed equipment types. (including but not limited to):

- Computers and Office machines
- Telephone handsets
- Moveable furniture (stools, chairs, free standing tables, file cabinets)
- Staff workstations (may be included in construction contract)
- Large laboratory equipment

15.0 Commissioning, Inspection, and Q.A.

The Commissioning (Cx) consultant will be hired by the owner and independent of the design and construction teams and will be responsible for maintenance of this OPR. The scope of work will include

- OPR and BOD review
- Documents Design Review
- Design intent Document
- Commissioning Plan Development
- Construction Observation including pre-functional and functional testing.
- Commissioning Meetings and Commissioning Administration
- Commissioning on Site Inspections and Testing
- Review of Owner testing and O&M Manuals
- Final Commissioning Report

16.0 Construction Completion and Turnover

- Inspection, testing, and commissioning culminates in a declaration of Substantial Completion by E&AS. (see final completion checklist) This date establishes both the beginning of the warranty period and commencement of operation and maintenance by the PHL maintenance staff. Move-in of staff and their personal belongings will not take place until all "punchlist" items are completed.
- Final project acceptance is not completed until the E&AS project checklist is completed and the project is accepted by the Department of Health and E&AS with notification sent to the contractor.

17.0 Facilities Requirements

- Project documentation requirements – in order to properly install, start-up, operate, troubleshoot and maintain the systems for the useful life of the building accurate and accessible documentation is required. The PHL requires all documentation to be electronic and tailored to the specific components installed. The timing of completion of key documentation is essential
    - Draft System manual within 30 days of 50% construction completion
    - Training Material 30 days prior to the system start-up
    - Final Systems manual 30 days after construction completion.
- Warranties for systems shall not be for less than one year after substantial completion. Building Automation System service agreement to be provided to the PHL for two years.
- Spare parts to be provided at the turnover of this project shall be determined during DD
- Training will be provided by the construction team prior to building turnover and shall consist of
    - Classroom sessions, which shall provide instruction on system overview/theory of operation and also provide an overview of the operation and maintenance manuals.
    - Hands-on sessions, which shall provide instruction at the actual equipment including demonstration of startup, shut-down, safeties, maintenance procedures, and setup and use of building automation system trend reports.
- Engineer shall instruct the facilities staff on the design and operation intent, sequences of operation, setpoints and alarms.

18.0 Owner Training

- Onsite training for the Owner's operators and users shall include a description and overview of systems, not just the components and equipment that comprise each system.
- Training – held in conjunction with commissioning – should include general orientation and reviews of the written O&M instructions, relevant health and safety issues or concerns, operation in all possible modes, preventative maintenance, and common troubleshooting problems & solutions.
- Building systems that operators or users will be trained include:
    - HVAC systems
    - BAS/controls
    - Electrical systems
    - Lighting controls
    - Security systems
    - Laboratory equipment such as CFHs
    - Fire alarm system and Fire protection system
    - Other systems not yet identified

19.0 Energy Efficiency Goals

- The project is to be constructed as a ZNE or a ZNE-C certified building. It is the State's desire to reduce greenhouse gases, use low embodied carbon material alternatives, and how building design will affect future energy use.
- Provide energy generation through the use of solar PV to lower the EUI as much as possible.
- Achieve LEED Silver certification or higher.

20.0 Post Occupancy & Warranty

The Cx consultant, GC, and all subcontractors whose systems were commissioned shall meet with the Owner's O&M staff quarterly during the first year after Substantial Completion to offseason test, optimize, and otherwise troubleshoot all commissioned systems.

Also, an onsite meeting will be conducted 11 months after Substantial Completion to review performance and quality of the facility with all affected parties – Owner and Users, the design team, and the GC and subs.

21.0 Owner's Project Requirements: Version History

The following is a summary of the changes made to the Owner's Project Requirement document throughout Pre-Design, Design, Construction, and Occupancy and Operations. This information is critical to understand and documents the trade-offs made and the resulting impact on the project.

Rev. No.	Date	Description of Revisions
0	4/22/2022	Original Draft of "Owner's Project Requirements" Document
1	5/03/2022	Revisions to OPR – Pre-consultant selection.
2		
3		
4		
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