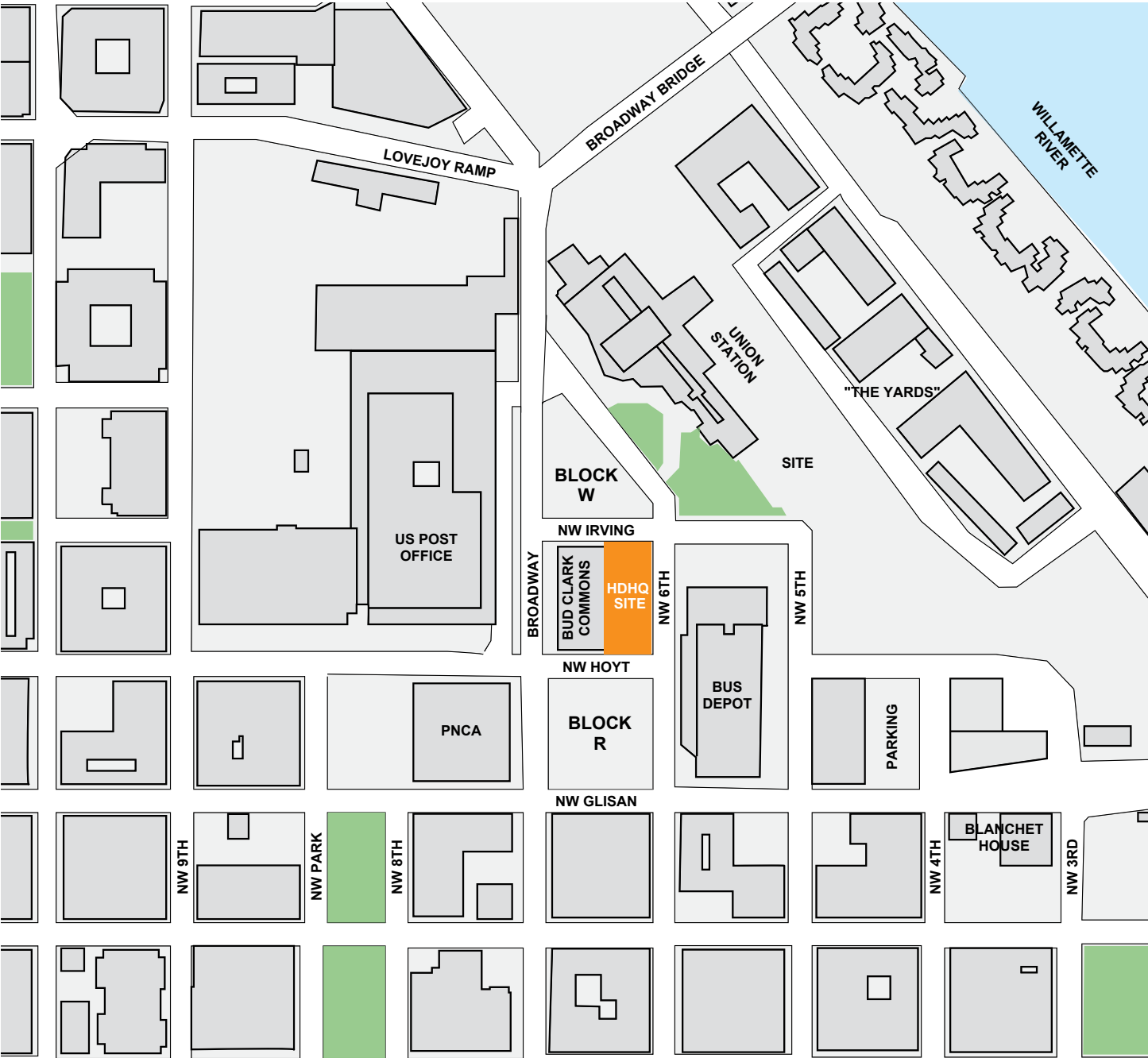


Building Program Summary

| SERVICE AREA / DIVISION | Net Square Feet (NSF) | Grossing Factor ³ | Square Footage (DGSF) | Number of Staff | Comments |
|--|-----------------------|------------------------------|-----------------------|-----------------|--|
| DEPUTY DIRECTOR | | | | | |
| Emergency Preparedness and Response | 2,114 | 1.40 | 2,960 | 3 | |
| Director / Administrative Offices | 1,288 | 1.40 | 1,803 | 6 | |
| Health Department Shared Spaces | 9,983 | 1.22 | 12,179 | 0 | Conf rms, break rms, coffee stations, lactation, client stor |
| BUSINESS, FINANCIAL & QUALITY SERVICES | | | | | |
| Business Services | 7,929 | 1.40 | 11,101 | 94 | |
| Vaccine Depot (Immunization Storage) | 433 | 1.10 | 476 | 0 | |
| Mental Health and Addictions Contracts | 752 | 1.40 | 1,053 | 6 | Added program |
| COMMUNITY HEALTH SERVICES (CHS) | | | | | |
| CHS/CES/ECS | 1,469 | 1.40 | 2,057 | 16 | |
| STD/HIV/Hep C | 8,236 | 1.50 | 12,354 | 60 | SF includes waiting function |
| Communicable Disease Services | 8,083 | 1.50 | 11,316 | 58 | includes waiting / queuing function |
| Mental Health | 752 | 1.40 | 1,053 | 6 | |
| DIRECTOR OF NURSING PRACTICE | | | | | |
| Director of Nursing | 944 | 1.40 | 1,322 | 8 | |
| HEALTH OFFICER | | | | | |
| Health Officer/EMS/HPO | 1,932 | 1.40 | 2,705 | 20 | |
| HUMAN RESOURCES & WORKFORCE DEVELOPMENT | | | | | |
| Workforce Development (HR & Training) | 3,244 | 1.40 | 4,542 | 27 | |
| INTEGRATED CLINICAL SERVICES (ICS) | | | | | |
| Health Center Business Operation (Call Center) | 0 | 1.40 | 0 | 0 | |
| Health Information Services (Medical Records) | 868 | 1.40 | 1,215 | 10 | |
| Clinical System Information (Elec Health Records) | 2,105 | 1.40 | 2,947 | 19 | |
| ICS Administration | 5,345 | 1.40 | 7,483 | 61 | |
| Central Laboratory | 4,684 | 1.40 | 6,558 | 10 | |
| Pharmacy Administration | 735 | 1.40 | 1,029 | 7 | |
| Pharmacy | 1,420 | 1.25 | 1,775 | 6 | includes waiting/queuing function |
| HIV Clinic | 9,237 | 1.50 | 12,932 | 50 | Revised 7-30-2015 includes waiting / queuing |
| PUBLIC HEALTH & COMMUNITY INITIATIVES | | | | | |
| Public Health & Initiative | 1,459 | 1.40 | 2,043 | 10 | |
| Health Equity Initiative | 1,564 | 1.40 | 2,190 | 18 | |
| PUBLIC HEALTH | | | | | |
| Program Design & Evaluation Services (PDES) | 0 | 1.40 | 0 | 0 | Program maynot be located in the building |
| FACILITIES | | | | | |
| Lobby | 440 | 1.10 | 484 | 2 | Includes waiting, reception, security, ATM, coffee |
| Building Support ² | | | 24,095 | 0 | Includes building core support elements, i.e. restrooms, janitor, MEP rooms. |
| Growth Space | | | 3,581 | 0 | |
| SUBTOTAL | | | 131,250 | 497 | |
| Grossing Factor (DGSF to BGSF) ¹ | | 1.18 | 23,625 | | includes circulation, shell, stairs and elev. shafts |
| BUILDING GROSS SQUARE FEET (BGSF) | | | 154,875 | | |

Site Plans

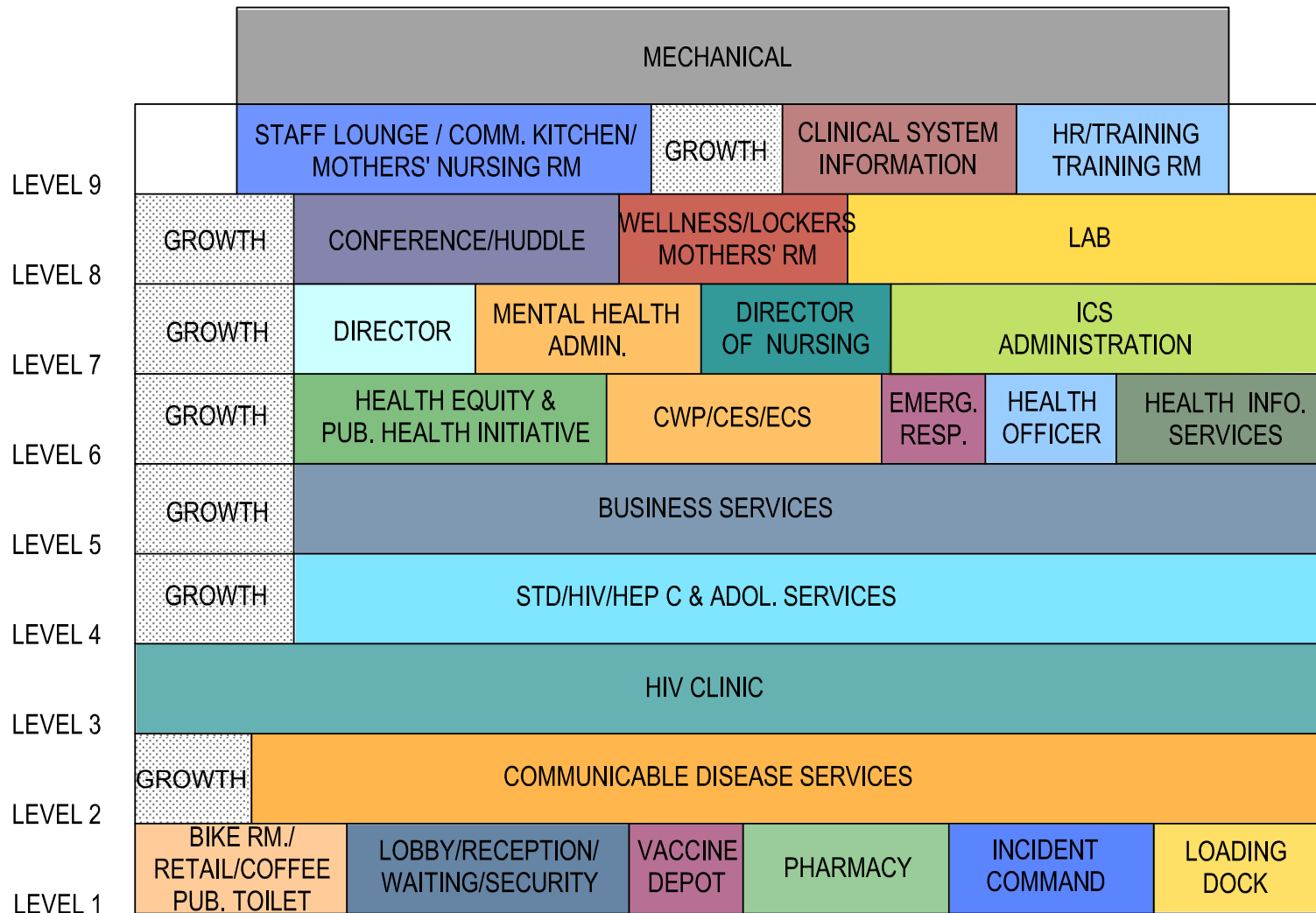


Multnomah County Health Department Headquarters

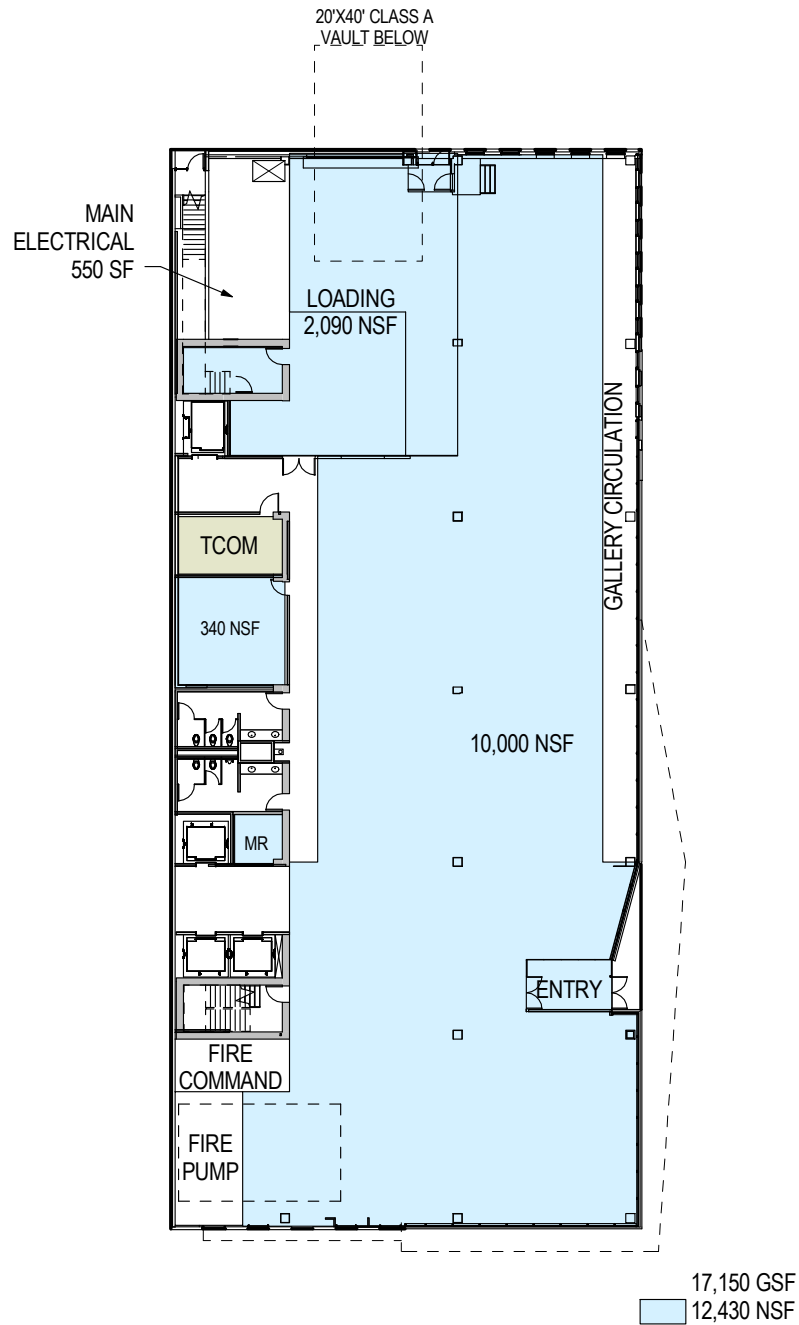
September 03, 2015

Horizontal Stacking Diagram

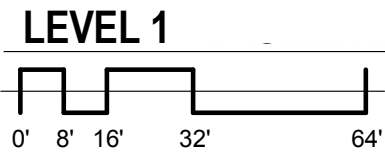
**MCHDHQ
BLOCKING /STACKING DIAGRAM
8-24-2015**

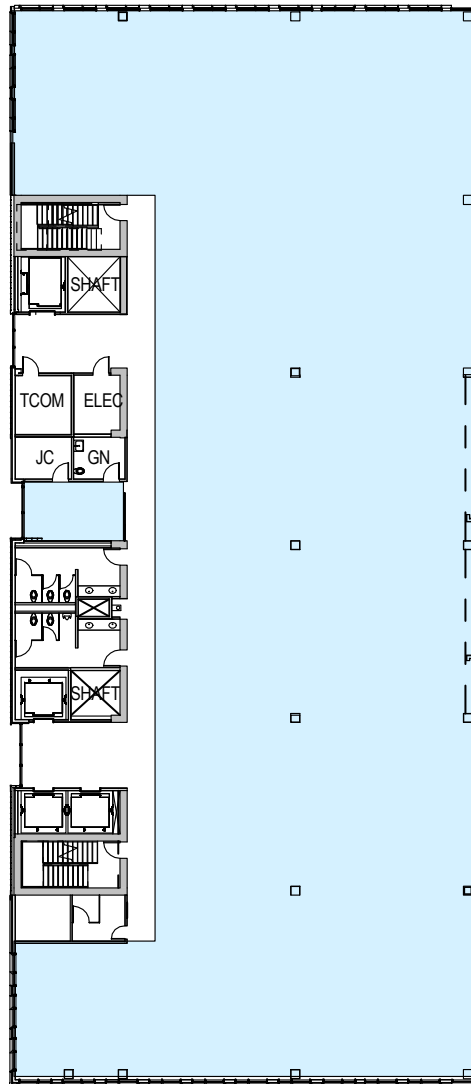


Baseline Plans



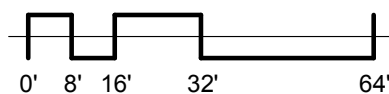
ZGF
ZIMMER GUNSUL FRASCA ARCHITECTS LLP

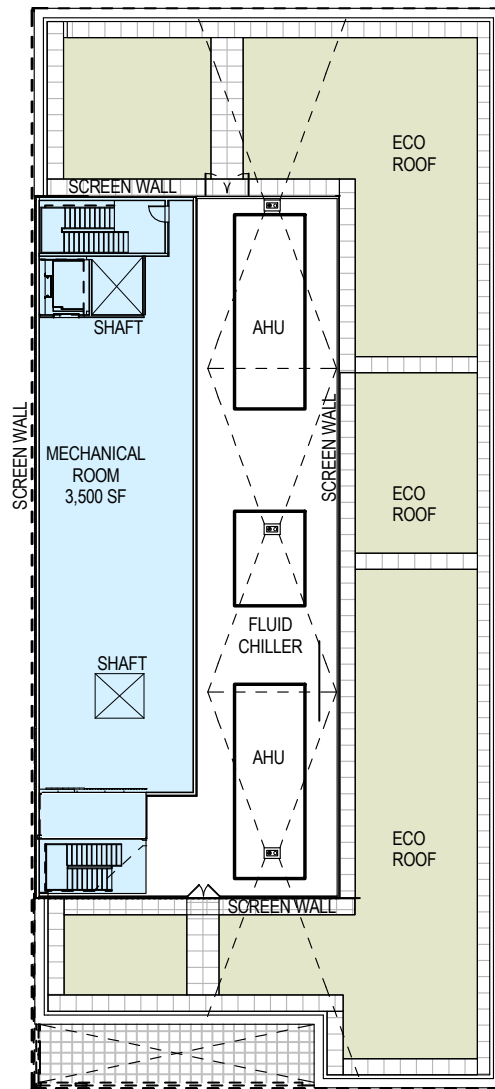




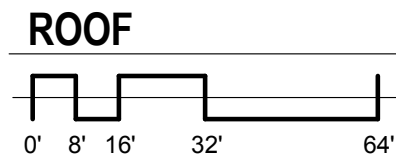
17,200 GSF
 13,350 NSF

TYPICAL UPPER LEVEL





3,500 GSF
 6,150 GSF



Architectural & Site Assessment Narrative

Architectural Narrative

I. Background

Multnomah County currently owns the Gladys McCoy Building in Downtown Portland, which is occupied by the Multnomah County Health Department. The building is aging and not well configured for the current Health Department operations and mission as a headquarters and services facility. Additionally, the Health Department relies on supplemental lease space in the Lincoln Building for conference and administrative functions which would be best collocated within one facility.

This document builds on previous efforts in 2013 and 2014 and represents an initial look at how the project can take advantage of an increased maximum site floor area ratio (FAR) and building height.

II. Building Program

The program provided in this document illustrates approximately 157,000 building gross square feet and includes some contingency for space allocation during design and future growth. The intent of the draft program stacking plan diagrams and section demonstrate one possible scenario for fitting the building functions into the available gross square feet. It is expected that other possible stacking options and plan adjacencies are possible and will be identified and tested in subsequent phases of the project with the full participation of the relevant stakeholders.

Please note that during earlier Program Phase investigations in 2013, the need for an Emergency Operations Center (EOC) within the building was discussed with the Health Department, and later this function was clarified/redefined as an Incident Command Center (ICC). The definition of the Incident Command Center operations impacts the way in which the structure may be classified as an Essential Facility, and hence be subject to the criteria by which the HDHQ building is designed and constructed to a more rigorous, and significantly more costly, performance standard.

In the course of program analysis, it was determined by Multnomah County that no elements to be located within the Headquarters Building will be designated as "Essential Facilities" (*Designated emergency preparedness, communications and operations centers and other facilities required for emergency response*), as defined in the Oregon Structural Specialties Code.

The intent is that the County will develop a contingency plan such that if the building is disrupted in an emergency event, all emergency operation/response functions will be performed at another location within the County. Incident Command Center rooms, when emergency drills are not occurring, will serve as conference rooms and exercise space.

III. Building Design

The building design will build upon the previous efforts of the project in 2014. As defined in the Vision Statement, expectations for building design include:

- **Aesthetic design excellence.** The project will be designed to be a timeless civic building that complements and enhances the district's architecture.
- **Durability.** Design decisions will be made with the goal of a minimum 80 years life expectancy for the building. This means that choices about the kinds of exterior materials, hardware, mechanical systems, roofing and other important elements will be made in the context of maximizing longevity.
- **Sustainability.** The project seeks to minimize environmental impact within an urban environment and has specifically set significant goals with respect to multiple performance benchmarks including LEED and Architecture 2030. Please refer to the PAE's sustainability narrative for more information.
- **Functionality.** To project's functional goal is to meet Health Department functional needs now and, to the extent possible, in the future. This means designing for maximum flexibility: floor-to-floor heights will be set to help accommodate changes in above-ceiling mechanical and electrical systems; major mechanical and electrical systems will be located to allow for facilities maintenance and change in a way that minimizes disruption to the program functions of the building; structural systems and column placement will be arranged in a way that accommodates changes in interior layouts to the extent possible within the constraints of the project budget and site.
- **Cost efficiency.** The goal is to realize best value and operational efficiency for the citizens of Multnomah County.

Floor-to-floor Heights: The typical floor-to-floor height is assumed to be 14'-6" in order to best balance the needs for a flexible and easily maintained mechanical plenum space and a reasonable ceiling height for the office environment. A ground floor height of 18'-0" is anticipated in order to accommodate the loading area, lobby, mechanical equipment and other spaces with high clearance requirements.

Building materials: The project is anticipated to be primarily clad with a modular brick rainscreen system to be timeless, durable, high performance and budget conscious. The brick tone and detailing will be specified to be complementary to the historic context of the district. Metal panel will be used as a secondary material.

Windows: Tall windows will be arranged in a regular pattern that helps to accommodate interior changes over the life of the building. The windows will be scaled to relate to the buildings of the district's historic fabric and nearby civic architecture. The glazing will be tall to promote daylighting within the office environment. The ground floor will be designed with floor-to ceiling storefront glazing to promote transparency along the street edge in keeping with the design guidelines of the district. A canopy at the building entry area is anticipated to help shelter people arriving and waiting at the drop-off area.

IV. Site Context

As defined in the Site Assessment, the building site shares the east portion of one city block with Bud Clark Commons. The size of the program suggests that the building be built to the property-lines on all boundaries and to the maximum allowable height. Primary site constraints include:

- The power utility serving this area may require an increased service "step" facility to this site (480V service). If this requirement holds the project will need to accommodate a large electrical vault on the north end of the site. Access to this vault will need to be provided to the utility company and coordinated with the building's loading area. Please see the Electrical Narrative for more information on the electrical service.
- The west site boundary is shared with the east boundary of the Bud Clark Commons property; opportunities for setback along this side are guided by the desire to preserve daylight to Bud Clark Commons courtyard spaces, respect views facing residential units, and to respect west facing window opportunities. For flexibility of providing glazing on the west building elevation, a legal view easement over the east boundary of Bud



ZIMMER GUNSUL FRASCA ARCHITECTS LLP

Clark Commons is suggested. If this is not possible, the west facing windows will require sprinkler protection to the extent allowable by code.

- Vehicular drop-off will most likely occur along 6th Avenue. An existing drop-off zone reserved for taxis serving bus station traffic is anticipated to be relocated to the south side of Hoyt Street.

V. Future Steps

This FAC-1 Amended Project Plan, once approved, is the basis for the subsequent Schematic Design and Design Development phase activities, during which programming area will be test fit into schematic building designs. Schematic building designs, including the study of massing, interior plans, exterior envelope, building systems, will first be developed and examined, and a selected option will be priced for conformance with the project cost allowance prior to commencing with Design Development. Future project phases will include:

- Schematic Design
- Design Development
- Construction Documents
- Bidding and Negotiation
- Construction Administration
- Post Construction Warranty-phase Service

Site Assessment

The property is approximately 87.5 feet by 200 feet with a maximum building height of 150 feet accommodating a 9 to 10-story, 157,500 square feet building. The property is located between Irving and Hoyt in north to south direction and between Broadway Street and 6th Avenue. The Portland bus station is to the east of the site and the train Union Station is located to the northeast from the site. The light rail runs north to south on 6th Avenue and there is an existing taxi parking area on the east side of the site

Portland Zoning Code Summary for U2 site:

| | | |
|---------------------------|---|--|
| Land-use Zoning | | CXd |
| Plan District | | Central City |
| Design Guidelines | | River District – Union Station Area |
| Base FAR | | 6:1 (105,000 sq. ft.) |
| Maximum Bonus FAR | | 3:1 (52,500 sq. ft.) |
| Maximum Total FAR | | 9:1 |
| Maximum Developable Area | | 157,500 sq. ft. (w/ FAR Bonuses) |
| Maximum Height | | 150' (120' base with 30' bonus height) |
| Maximum Building Coverage | | No limit |
| Minimum Landscaped Area | | None |
| Set Backs | | Min Max |
| East | 0 | 10' (*) |
| West | 0 | None |
| North | 0 | 10' |
| South | 0 | 10' (*) |

| | | |
|---|---|--------------------------|
| Required Building Lines Apply? | (*) | Along 6th and along Hoyt |
| Building must extent to street lot line at least 75% of lot or extends to within 12' of lot line for 75% of lot | | |
| Ground Floor Active Use Required? | Yes | |
| 50% of ground floor walls that front onto public area must meet standard, require 12' clear and 25' deep | | |
| Ground Floor Window Standard? | Yes | |
| Windows must be 50% of length and 25% of ground level wall area | | |
| Entry Requirement | Main entry within 25' of transit street | |
| Must either face Transit Street or be at 45 angles | | |
| Pedestrian Standards? | Yes | |
| Mechanical Unit Required Screening? | No | |
| Parking Access Restricted | Prohibited along 6th | |
| Parking Required | None | |
| Loading Required | Two 35'd x 10'w x 13'h bays per Code | |

Multnomah County Health Department Headquarters

Architectural Narrative

FAC-1 Amended Project Plan

ZGF Architects LLP

August 5, 2015

Page 5

Structural Systems Narrative



Multnomah County Health Department Headquarters

Structural Narrative

Concept Design

August 5, 2015

Scope

The proposed 9-story building containing office, clinic, and lab spaces, is anticipated to be framed with structural steel with a concrete shear wall lateral system and concrete-topped metal deck floor and roof diaphragms. Story heights are anticipated to be 18'-0" at the first floor and 14'-6" at upper floors. The rectangular building layout features three bays in the E-W direction varying from about 21 feet wide to 32 feet wide, and six bays in the N-S direction varying from 32 feet to 34 feet wide.

Foundations

Based on review of the draft geotechnical report by APEX, dated September 30, 2013, as well as upon subsequent correspondence with APEX, deep foundations are anticipated to be required for the building. To limit noise and vibration impacts in the area, the foundation system for the structure is anticipated to be composed of 18" diameter augercast piles extending down approximately 65 feet below bottom of pile caps to be founded in the dense gravel layer. The interior columns on grid C are anticipated to have isolated pile caps, while the exterior of the building is anticipated to have a continuous pile cap/grade beam with piles spaced at intervals around the perimeter of the structure. Enlarged pile cap mats will be provided at the base of the concrete shear walls. Approximately 18" square grade beams are anticipated to be provided between adjacent foundation elements to tie the building foundation together. A 4" thick slab on grade is anticipated at the ground floor level. It is anticipated that where possible the building's structural piles will be utilized for a geothermal loop heating/cooling system.

The west edge of the building will be immediately adjacent to the approximately 18 foot tall wall on the east face of the Bud Clark Commons development, with minimal spacing as required for property line clearance, constructability, and anticipated lateral displacement. Along the west face of the structure at the lowest level, a 10" thick concrete wall is anticipated along the full length of the building adjacent to the Bud Clark Commons, which will be used to distribute lateral overturning forces to piles along that gridline.

While the MCHD HQ building is not currently designed with a subgrade basement level, limited temporary shoring is anticipated adjacent to the Bud Clark Commons development at deeper excavations, such as pile caps below elevator pits, and around the perimeter of the building to allow for construction of the perimeter grade beams. Because the Bud Clark Commons structure is pile supported, the shoring would not be expected to need to resist significant structural surcharge loads.

A crane foundation may be required on-site. Depending on the required configuration, it may be possible to utilize foundation piles for support, or alternatively, additional piles may be required.

Floor Framing

The floor framing will consist of composite steel beams and girders supporting 3 inch deep 20 gage composite floor deck with 2-1/2 inch normal weight concrete topping. The concrete topping will be reinforced with reinforcing bar. The steel framing is anticipated to range from 16" to 21" deep and will require welded headed studs at approximately 12" o.c. at beams, with potentially closer spacing at some girders. The floor beams in the E-W direction will typically be W16 between grids B-D, except at exterior beams, where W18's are anticipated for brick cladding support. At the short span between grids A-B, W14 beams are anticipated. W18 (maximum) girders are expected in the N-S direction on grids A, B, and C, and W21 edge girders are anticipated on grid D as required for brick claddings support. At grid B between the shear walls at grids 2-6, W16 girders are anticipated to maximize MEP routing flexibility. This framing will be typical at floor and Roof levels. An approximately 4" thick green roof system is anticipated over the majority of the building roof surfaces, including the roof penthouse.

Steel beam penetrations are anticipated at regular spacings in high-density MEP routing zones in order to accommodate piping for hydronic and sprinkler systems.

Roof Penthouse and Mechanical Screen-Wall Framing

An approximately 3500 square foot one-story steel framed rooftop mechanical penthouse is anticipated near the middle of the building on the west side. This structure is anticipated to consist of steel HSS post framing with WF roof beams girders supporting 3 inch thick 20 gage roof deck with no topping. The steel could be sloped for drainage or tapered insulation could be used.

At the mechanical screen-wall, HSS posts with horizontal z-girts are anticipated to support metal panels. Our understanding is that height may be in the range of 12' to 14'. Diagonal kicker braces may be required at posts for this height of screen wall.

Lateral Force Resisting System

The lateral system consists of special reinforced concrete shear walls, which are concentrated along grid B in the N-S direction, and at cores around the stairways near grids 2 and 6 in the E-W direction. The required wall thicknesses are estimated to be approximately 16" for pricing purposes. The maximum inelastic seismic displacement is estimated to be approximately 6" at the roof level, and is anticipated to be less than 2" at the level 2 interface adjacent to the Bud Clark Commons development.

Exterior Cladding Support

Exterior steel studs will enclose the perimeter and provide support for the brick veneer. Large windows are proposed, with limited regions of brick in most locations. Built-up stud box beams and jambs will likely be required around openings, forming the majority of exterior framing. Stud sizes are anticipated to be 6 inches in depth. Ledger angle supports are anticipated at brick cladding continuous around perimeter at all elevated floors, as well as over window openings.

Miscellaneous Structural Items

A canopy is proposed on the southern and eastern sides of the building between level 1 and level 2. It is anticipated to be constructed with cantilevered HSS framing, metal stud infill, and architectural cladding.

Exit stairs in cores are anticipated to be bidder-designed steel stairs.

Design Criteria

- 2014 Oregon Structural Specialty Code (OSSC), based on 2012 International Building Code (IBC)
- Occupancy Category II
- Seismic Design Category D
- Site Class D
- Spectral Accelerations $S_s = 0.982$, $S_1 = 0.343$
- Seismic Importance Factor, $I_E = 1.00$
- Wind: 120 miles per hour (3 second gust), Exposure C
- Wind Importance Factor, $I_w = 1.00$
- Floor Live Load: 100 psf (Reducible), including partitions and 2,000 pound concentrated load
- Roof Live Load: 25 psf minimum snow load, higher at areas of drift potential
- Snow Load Importance Factor $I_s = 1.0$
- Frost Depth, 18 inches
- Vibration Criteria – Typical Office Building Design Criteria per AISC Design Guide 11, “Floor Vibrations Due to Human Activity”, Chapter 4 “Design for Walking Excitation”.

MEP Systems Narrative

Multnomah County Health Department HQ: High Rise MEP Concept Design Narrative

October 23, 2015

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Project Directory

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Multnomah County

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1.0 Project Description

1.1 General Building Description

The project will be on the same city block directly east of the Bud Clark Commons and developed by Home Forward. The building will house specialty clinics for communicable disease and immunizations, a pharmacy, and office and meeting spaces for the Multnomah County Health Department (MCHD).

| Multnomah County Health Department HQ | |
|---------------------------------------|---|
| Size: | 157,000 sf |
| Number of Floors: | Nine (9) |
| Number of Occupants: | 2,100 |
| Function: | Mixed Use: Office space, exam rooms, pharmacy |

Table 1: Building Description

1.1 Sustainability Goals

1.1.1 Steps Toward a Sustainable Building



Set Inspiring Goals: This may seem obvious but in fact, failure to establish clear goals – especially aggressive ones – is one of the surest ways to limit your achievements in sustainable design. The building will be designed to meet the requirements for a USGBC LEED® Gold certification and Architecture 2030. A platinum certification will be evaluated as the design progresses to see if it can be achieved within the project budget.



Analyze the Climate: We carefully analyze the local climate, looking beyond the hottest summer or coldest winter days to consider weather data for all 8,760 hours in a year. We look for diurnal temperature swings and temperature “bins” to determine how many hours per year the temperature falls within given ranges, solar radiation, rainfall data, wind velocities, relative humidity, and other factors. This careful analysis reveals opportunities for passive heating and cooling, potential options for renewable energy generation, and envelope designs that result in low “balance point temperatures”, among others.



Reduce Energy Use: In order to save energy, the design team needs to know where in the building energy is most likely to be used. The largest four



energy uses in the building are heating, fans, lights and plug loads. The next section of this report outlines how to reduce these loads.



Choose Efficient Systems: By carefully completing the first three steps, we can typically reduce the size of the mechanical systems.



Opt for Renewables: We will optimize the design for onsite renewable energy sources including daylighting, passive heating and passive cooling.



Verify Performance: The only way to determine if a building or system has achieved high levels of efficiency is to measure its actual performance. The building will have special metering systems to provide specific energy use feedback to the owner and will be fully commissioned.

1.1.2 Climate Analysis

Weather data for Portland, Oregon is indicated in the table below to illustrate the number of hours within varying temperature ranges.

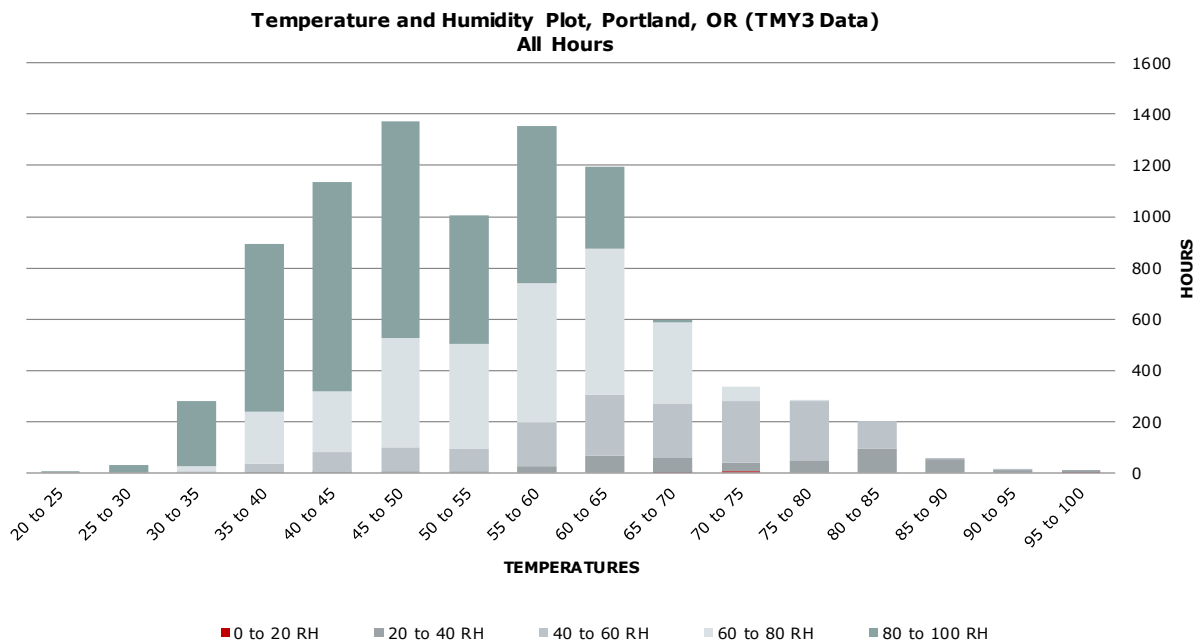


Figure 1: Temperature / Humidity Weather Data (Portland, OR)



1.1.3 Energy Use Analysis

Based on 2003 CBECS, the average baseline for this building type is 92 kBtu/sf/year. The target energy use to meet Architecture 2030 is 27 kBtu/sf/year. Architecture 2030 includes provisions for renewable energy to be purchased to offset 20% of the required energy savings. If the full extent of renewables are purchased the effective building energy use to comply with Architecture 2030 is 40 kBtu/sf/year.

1.1.4 Net Zero Energy

PAE also analyzed what it would take to achieve net zero energy of the target building energy performance. The initial calculations indicate that it would take approximately 950 kW of PV to generate all the energy a building of this size would use at an energy use index of (EUI) of approximately 27 kBtu/sf/year. Unfortunately, a PV array that large would need approximately three times as much area as the entire roof, so it is not practical with a nine story building on this site.



1.2 Codes and Standards

2014 Oregon Structural Specialty Code

2014 Oregon Mechanical Specialty Code

2014 Oregon Energy Efficiency Specialty Code

2014 Oregon Fire Code

2014 Oregon Plumbing Specialty Code

2014 Oregon Electrical Specialty Code

2014 National Electrical Code

ASHRAE Standard 62.1-2013 – Ventilation for Acceptable Indoor Air Quality

ASHRAE Standard 55-2013 – Thermal Environmental Conditions for Human Occupancy

ASHRAE Standard 90.1-2007: Energy Standard for Buildings except Low-Rise Residential Buildings

ADA or Uniform Federal Accessibility Standards

National Fire Protection Association (NFPA) Standards

USGBC LEED Green Building Rating System for New Construction (LEED v3 2009)

National Electrical Manufacturers Association (NEMA)

National Electrical Contractors Association (NECA)

American National Standards Institute (ANSI)

Institute of Electrical and Electronic Engineers (IEEE)

Underwriters Laboratories (UL)



2.0 Building Envelope

2.1 General

The performance of the building envelope will be critical both to the energy efficiency of the building and to the thermal comfort level of the occupants. The proposed mechanical systems and preliminary equipment sizing are based on the following minimum performance for each envelope component:

| Component | Category | Oregon Code OEECS 2014 | IECC 2012 (4c) Non-Residential | ASHRAE 90.1-2013 (4c) | Recommended |
|--|-------------------------|---------------------------|-----------------------------------|---------------------------|----------------------------|
| | | Non-Residential | Non-Residential | Non-Residential | |
| Roofs | Insulation Above Deck | R-20ci | R-25ci | R-30ci | R-30ci |
| Wall, Above Grade | Metal Framed | R-13+R-7.5ci (U-0.064) | R-13+R-7.5ci (U-0.064) | R-13+R-7.5ci (U-0.064) | R-21 +R-8.4ci (U-0.052) |
| Floors | Mass | R-10ci | R-10ci | R-14.6ci | R-10ci |
| Slab on Grade Floors | Unheated Slabs | NR | R-10 for 24in | F-0.843 | R-10 for 24in |
| | Heated Slabs | R-15 for 24in | R-15 for 36in | R-20 for 24in | R-15 for 36in |
| Opaque Doors | Swinging | U-0.70 | U-0.37 | U-0.5 | U-0.37 |
| | Roll-up or Sliding | U-0.50 | R-4.75 | U-0.5 | R-4.75 |
| Vertical Fenestration | Maximum Percent of Wall | 30% | ² 40% | 40% | 30% - 35% |
| | Non-Metal Framing | U-0.35 (R-2.9) | Fixed U-0.38 (R-2.6) | U-0.35 (R-2.5) | U-0.30 (R-3.3) |
| | Curtain Wall/Storefront | U-0.45 (R-2.2) | Operable U-0.45 (R-2.2) | U-0.42 (R-2.0) | U-0.30 (R-3.3) |
| | Metal Frame Entrance | U-0.80 (R-1.3) | U-0.77 (R-1.3) | U-0.77 (R-1.2) | U-0.30 (R-3.3) |
| | Metal Frame (Other) | U-0.46 (R-2.2) | - | U-0.50 (R-1.8) | U-0.30 (R-3.3) |
| | SHGC (All Frames) | 0.40 | 0.40 | 0.40 | 0.40 |
| | | | | | |
| Infiltration | | NA | NA | NA | 0.25 cfm/sf @ 75 pascals |
| Notes / Assumptions: | | | | | |
| 1. Climate Zone 4c (Portland, OR) | | | | | |
| 2. Requires daylighting controls, see C402.3.1 | | | | | |

Table 2: Envelope Recommendations



3.0 Mechanical

3.1 HVAC Systems

3.1.1 Design Criteria

| Outdoor Conditions | Summer | Winter |
|--|----------------------|--------|
| ASHRAE 0.4% Summer and 99.6% Winter Data | 91.4°F DB/ 67.3°F WB | 25.2°F |

Table 3: Outdoor Conditions

| Indoor Conditions | Summer | Winter |
|-------------------------------|------------|------------|
| Offices and Conference Rooms | 75°F ±2°F | 70°F ±2°F |
| Nursing Stations and Exercise | 75°F ±2°F | 75°F ±2°F |
| Exam and Treatment Rooms | 75°F ±2°F | 75°F ±2°F |
| Storage | 78°F ±2°F | 60°F ±2°F |
| Circulation and Restrooms | 78°F ±2°F | 68°F ±2°F |
| Relative Humidity | <50% ±5%RH | No control |

Table 4: Indoor Conditions



| Low-Pressure Ductwork | |
|--------------------------|--|
| Static Pressure Loss | Maximum 0.1 inches WC per 100 feet |
| Main Velocity | Maximum 1,500 feet per minute |
| Branch Velocity | Maximum 1,200 fpm |
| Flexible Ducts | Maximum length 7 feet/ minimize total 90° bends. |
| Medium-Pressure Ductwork | |
| Static Pressure Loss | Maximum 0.2 inches WC per 100 feet |
| Main Velocity | Maximum 2,000 feet per minute |
| Branch Velocity | Maximum 1,800 fpm |
| Hydronic Piping | |
| Static Pressure Loss | Maximum 4 feet WC per 100 feet |
| Velocity | Maximum 8 feet per second |

Table 5: Duct and Pipe Sizing Criteria

3.1.2 Table : Distribution / Air Handling Systems

Dedicated Outside Air System with Radiant Panels

A dedicated outside air system (DOAS) will supply dehumidified ventilation air to all occupied areas, except for the level 1 wellness, lobby and pharmacy rooms on the south half of the building. The DOAS includes central, factory fabricated, variable air volume air handling units located on the roof of the building. These units will be equipped with pre-filters and MERV 13 final filters, hot water heating coils, chilled water cooling coils, and supply and exhaust fans with variable speed drives. The units will also have a fixed plate heat exchanger with economizer bypass dampers. All non-specialty exhaust air from the building will be directed through these units and the heat recovered. Each DOAS unit is sized for a capacity of 27,000 CFM (54,000 CFM total) for delivery of 0.4 CFM/SF across the entire building gross area. The air volumes supplied will be controlled by occupancy and CO2 levels to maintain good indoor air quality.

The ventilation air will be distributed throughout the building. Medium pressure air will be ducted down shafts from the rooftop DOAS air handling units, through ductwork and terminal units in the ceiling, and discharged into occupied spaces at multiple locations. Shafts are located to best suit the building footprint and maintain even distribution over the entire building. Return/exhaust air will be fully ducted with acoustically lined (as specified), ducted inlets distributed at each floor. Each shaft penetration will require fire/smoke dampers. The air will be delivered throughout the building typically at a neutral temperature, and cooler during dehumidification operation when the building zones are nearly all in a cooling mode.



The DOAS air handler system is coupled with 2-pipe radiant ceiling heating and cooling panels for space temperature control (Refer to Figure 2). A thermostat will signal to the control valve, which will vary the flow of hot water or chilled water provided to the associated panel. There will be one hot water control valve, and one chilled water control valve for each temperature zone.

Radiant panels create a uniform temperature within a space which creates a more comfortable environment. Our bodies sense temperature gradients of surfaces within a space compared to our bodies (such as a cold window) which is interpreted as discomfort or the sense of losing heat. Radiant panels radiate to those surfaces that our bodies will sense thus creating that comfortable feeling. This method of heating and cooling is an improvement over a conventional VAV system because air volumes (and potential drafts) are reduced to minimum levels to provide only the supply air required for code ventilation and humidity control.

Architectural spaces that will have ceiling finishes that are wood slatted are not conducive to radiant panels, therefore these areas will utilize active chilled beams to minimize the impact to the ceiling appearance. The active chilled beams will be a 4-pipe type with heating and chilled water coils and will have duct connection downstream of a terminal unit.

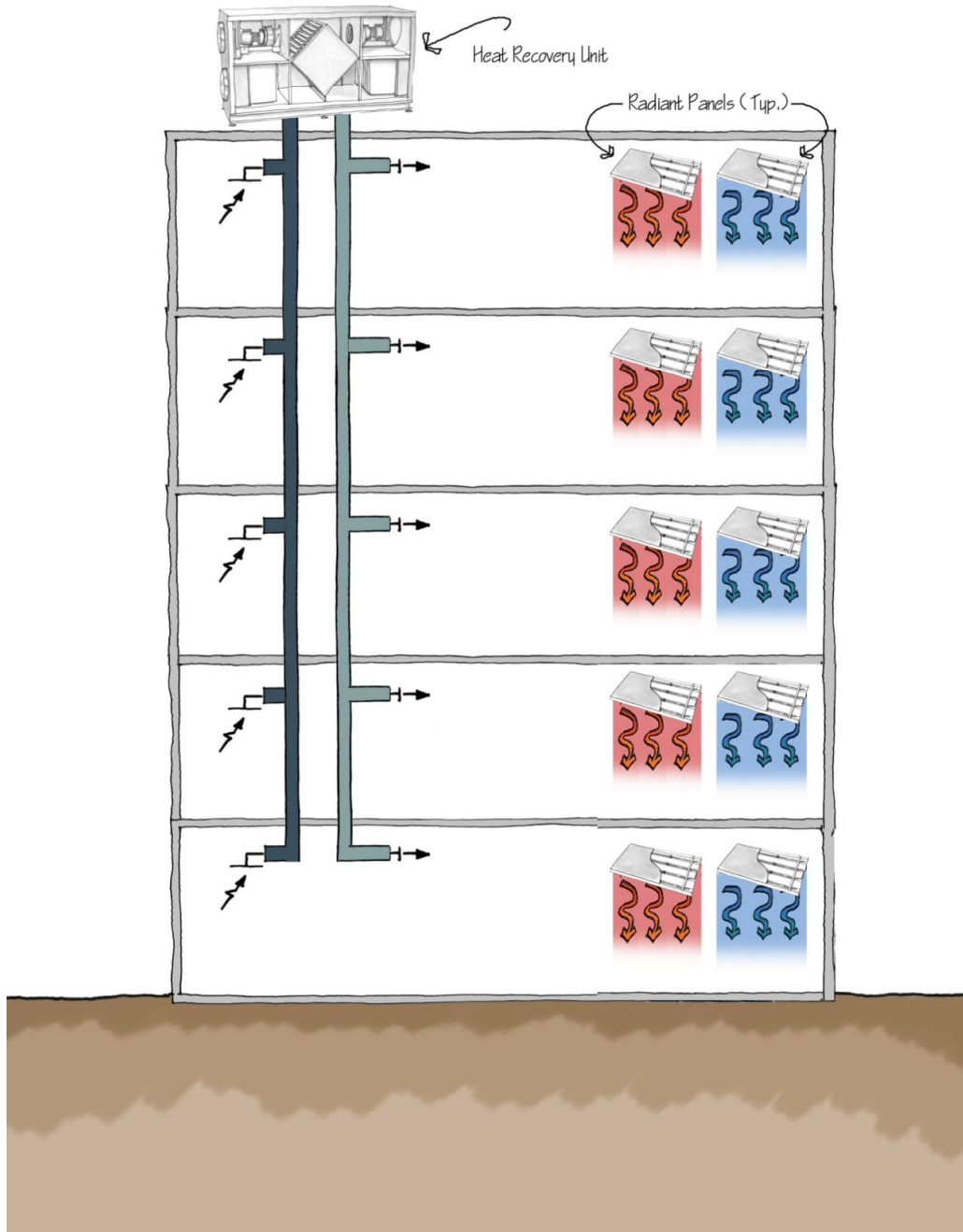


Figure 2: DOAS with Radiant Heating/Cooling



3.1.3 Central Plant Heating / Cooling Systems

Geothermal Heat Recovery Chiller

A geothermal pile system will be used to absorb or reject heat from the ground. This closed loop piping system will be embedded in the structural concrete augered piles, making them significantly less expensive in the installation than traditional geothermal exchange systems. The activated piles will be distributed as much as possible to maximize the geothermal potential. The current design includes one-hundred-fifteen (115), 70 ft piles being utilized as geothermal wells. The total geothermal system length is therefore 8,050 ft, which with an assumed output of ~40 BTU/LF, is estimated to provide ~322,000 BTU/h or 27 tons.

A 300-ton heat recovery chiller will be used to transfer energy between the chilled water and heating water. The heating water will be distributed via variable flow pumps to air handling unit heating coils, and radiant panels. Heating water pumps will be provided on the secondary piping loop to distribute heating water throughout the building. Heating water will be supplied at 120F with a 20F temperature drop. Heating water to radiant panels will be reset to the lowest temperature to maintain space temperature.

Chilled water will be distributed via variable flow primary pumping to air handling unit cooling coils, with a secondary pumping system to deliver higher temperature water to radiant panels to control condensation. The heat recovery chiller and pumps will be located in the penthouse mechanical room. Chilled water will be supplied at 42F with a 20F temperature drop for the air handlers and 57F for the radiant panels. Supply water temperatures to the radiant panels will be reset to the highest value necessary to meet load. A high humidity override will also be provided to prevent condensation on the panels.

Three (3) 2,000 MBH high efficiency condensing boilers will be located in penthouse mechanical room to provide supplemental heat for the geothermal loop. The boiler plant will be furnished with an independent boiler sequencing and control panel connected to the building management system. Each boiler will have a constant volume primary water pump and individual flue up through the roof.

A 315-ton fluid cooler will be used to reject additional heat to assist the geothermal system during peak cooling. The fluid cooler will be located on the roof.

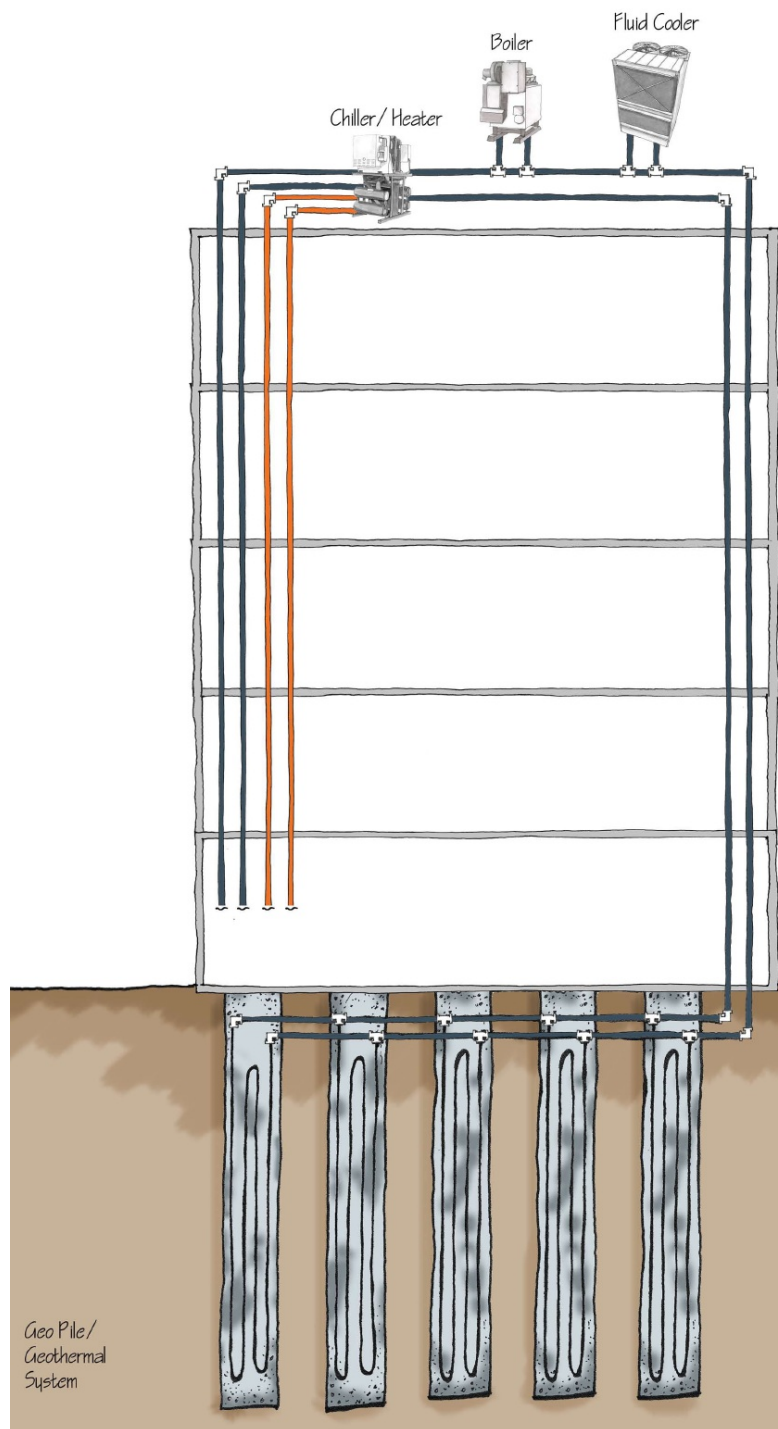


Figure 3: Central System - Geothermal/Heat Pump



3.1.4 Separate HVAC Systems

Level 1

The Level 1 Wellness, Pharmacy, and Lobby spaces are expected to have wider occupancy schedules than the rest of the building. To avoid operating the entire central plant outside of the normal occupancy schedule, we will utilize heat pump variable volume air handling units and water to water heat pumps for space conditioning, which will reject and absorb heat directly from the geothermal well system.

The Wellness Center on the ground level of the building will be served by a dedicated air handling system as well as a separate system for the Lobby, Pharmacy and associated adjoin spaces. Separate variable volume air handling units for Wellness and Pharmacy/Lobby/etc. will be located above the bike storage room, and each will be comprised of a supply fan, return fan, DX heat pump coil, compressors, air side economizer and filtration. Air will be distributed to the space via overhead distribution system of ductwork and grilles. A water to water heat pump and a pair of heating water pumps will distribute heating water to terminal unit reheat coils.

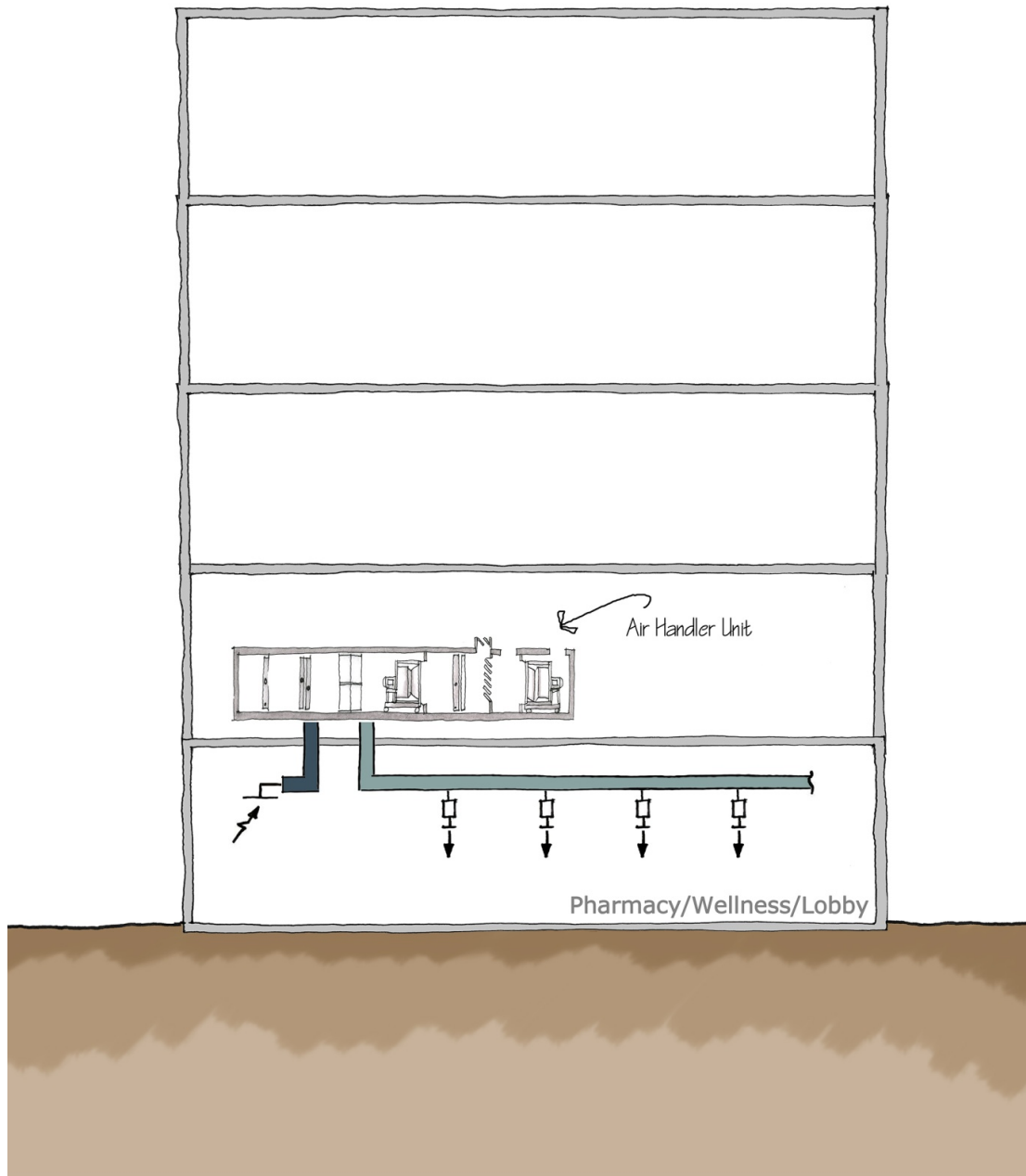


Figure 4: Wellness VAV Air Handler and Pharmacy/Lobby VAV Air Handler



3.1.5 Technology Cooling Systems

Cooling for IDF and MDF rooms will be by outdoor air economizer cooling and split systems. The economizer system will be comprised of a low louvered intake into each room with motorized damper and filter, and a high exhaust louver with an exhaust fan and motorized damper. Supplemental cooling will be provided via one rooftop condensing unit tied to separate fan coils, one for each technology room. Fan coils will range from 1 ton for upper level rooms and 1-½ tons on level 1. There will be one room per floor.

3.1.6 Exhaust Systems

General building exhaust and toilet room exhaust will be ducted back to heat recovery rooftop DOAS unit supplying the building with ventilation air. Heat will be recovered and transferred into the supply air stream for energy savings.

Specialty exhaust systems are anticipated for lab spaces, and a 16-inch duct has been located to handle around 2,000 CFM.

3.1.7 Generator Ventilation / Exhaust

The emergency generator ventilation exhaust will be ducted from the generator radiator fan to an outside air louver with automatic dampers located in the side-wall of the generator room. The intake air will be introduced through architectural louvers with internal isolation dampers. Combustion air exhaust will be piped through the side wall of the generator room and terminate at least 10' above grade.

3.1.8 Stairwell Pressurization

The building stairwells will be individually pressurized. Each stairwell will have a roof mounted pressurization fan and ductwork that will distribute and inject air at every 3rd floor. The stairwell pressurization fans and associated dampers shall be controlled by the fire alarm system. Stair pressure relief dampers will be located in corridor.

3.1.9 Elevator Pressurization

Elevator hoistway pressurization is not anticipated to be required, due to either lobbies being provided at each level or curtains at each hoistway door.

3.1.10 Water Heater Flue

Duct water heater flue to roof. Material to be in accordance with the manufacturer's recommendation and the local code. Contractor to verify that flue length with elbows does not exceed maximum distance requirements for the water heater. If the distance requirements are



exceeded, a flue booster fan shall be provided. Provide combustion air make up to water heater room.

3.1.11 Radon Exhaust

The structure is provided with a passive radon venting system to the roof per code.



3.1.12 Controls

A direct digital control (DDC) system will be provided to control and monitor all HVAC equipment and systems. Valve and damper actuation will be electric type. The control system will allow full control and monitoring from a remote existing operator's terminal located in the penthouse. The control system will perform all required control functions, including optimization of equipment and system performance, reliability, equipment life and energy consumption.

An extensive measurement and verification system is anticipated to carefully monitor all of the building's energy use. Measurement and Verification will meet LEED v3 (2009) Energy & Atmosphere Credit 5.

Monitoring Building Energy Use at this level provides the following benefits:

1. Continuous optimization of building performance
2. Education of building occupants
3. Serves as a case study for other building designs, helping the greater community of the built environment

LEED v3 (2009) Measurement & Verification Requirements:

Separate monitoring of the following end use loads:

1. Lighting
2. Receptacles
3. Heating
4. Fans
5. Cooling
6. Pumps
7. Elevator
8. Water – Total Building Use
9. Water – Irrigation (Temp usage for green roof)
10. Domestic Hot Water

In addition, a measurement & verification plan will be developed to analyze the building energy and water use after occupancy to optimize the building performance.



3.2 Plumbing Systems

3.2.1 Design Criteria

| Domestic Water Piping | |
|------------------------|---|
| Minimum Pressure | 35 PSI at most remote outlet |
| Maximum Pressure | 80 PSI |
| Static Pressure Loss | Maximum 6 psi per 100 feet |
| Velocity | Maximum 8 feet per second (Cold Water) Maximum 5 feet per second (Hot Water) |
| Storm Drainage | |
| Rainfall Rate | Maximum 1.3 Inch/hr |
| Piping Slope | Minimum 1/8" per foot |
| Waste and Vent Piping | |
| Sizing | |
| Piping Slope | Minimum 1/4" per foot |
| Solar Hot Water Piping | |
| Static Pressure Loss | Maximum 6 psi per 100 feet |
| Velocity | Maximum 5 feet per second |

Table 6: Plumbing Piping Sizing Criteria

3.2.2 Plumbing Fixtures

Commercial grade fixtures will be provided where indicated on the architectural drawings. Refer to table below for representative flow rates for each type of fixture.

| Fixture Type | Code Flow | Low Flow | Ultra-low Flow | Proposed |
|-------------------------|---------------|--------------------------|-----------------|----------------|
| Water Closet | 1.6 Gal/Flush | 1.28 Gal/Flush | 1.00 Gal/Flush | 1.28 Gal/Flush |
| Urinal | 1.0 Gal/Flush | 0.5 Gal/Flush | 0.125 Gal/Flush | 0.5 Gal/Flush |
| Lavatory | 2.5 GPM | 0.5 GPM | 0.5 GPM | 0.5 GPM |
| Shower | 2.5 GPM | 1.75 GPM | 1.5GPM | 1.75 GPM |
| Sink Faucets | 2.5 GPM | 2.0 GPM | 1.5 GPM | 1.5 GPM |
| GPF = Gallons per Flush | | GPM = Gallons per Minute | | |

Table 7: Fixture Options and Alternates

Low flow plumbing fixtures will be used throughout the building in order to reduce potable water consumption.

Hands free, hard-wired fixtures will be provided for the water closets, urinals, and lavatories.



3.2.3 Domestic Cold Water System

A new water main located in Hoyt Street will serve the domestic water system. A utility room located within the building will house the backflow device on the incoming domestic water supply. The domestic water system shall be provided with positive means to control backflow, with appropriate backflow preventers at sources of possible contamination within the building, such as mechanical equipment or industrial cold/hot water systems.

Cold water will be distributed to the plumbing fixtures, retail spaces, and other areas requiring water. Refer to Architectural Drawings for plumbing fixtures and room locations. Freeze-proof hose bibs to be distributed around perimeter of building at every 100 feet, and be provided for the recycle room, trash room and on the roof of the building.

Street water pressure will serve approximately the first (4) floors. For floors above, a multi-pump domestic booster pump package (with each pump sized for approximately 1/3 of the demand) will be provided to supply adequate water pressure.

The main water service size is estimated to have a demand of 150 GPM, which will require a 4 inch service.

Vertical domestic water risers will be provided which will serve valved horizontal distribution piping at each floor.

Irrigation: A backflow device will be provided for the irrigation system within the water service room. Irrigation piping will be stubbed out of the building for the landscape use. Refer to the landscape narrative for more information on irrigations requirements for roof plantings.

3.2.4 Domestic Hot Water System

New high efficiency condensing gas fired water heaters will provide domestic hot water to the building. A re-circulating hot water loop with a hot water circulation pump will be provided. The water heaters will produce 140F for health and equipment efficiency purposes. A master mixing valve assembly will be utilized at water heaters to temper the hot water for plumbing fixture use to deliver 120°F hot water. Expansion tanks will be provided on hot water systems at water heaters to eliminate pressure buildup when the system is not being used. One small electric water heater will be selected and located in the lower level to maintain lower level pressure zone.

The two main water heaters will be located in the penthouse mechanical room will serve all the floors. Each high efficiency gas water heater will be selected with (2) remote burner units, each sized for 75% of the demand. A separate storage tank will be used in conjunction with the water heater.



3.2.5 Storm Drain System

A roof and overflow drain system will be provided as required by code. Overflow storm drain system will daylight utilizing downspout nozzles at the first floor level above grade. The storm water piping shall be routed to storm water planters on Level 2.

The roof area is approximately 16,000 square feet. The size of the storm drain leaving the building will be 8 inches. Refer to Civil narrative for additional information.

3.2.6 Sanitary Sewer System

Sanitary waste and vent piping will be provided toilet rooms and other spaces as required. There are no provisions intended for an acid waste and vent system. Sanitary waste piping leaving the site will connect to a combination sewer in NW 6th Street. Sanitary waste piping will run parallel to the storm water and be connected together near the curb line. This will allow the sewers to connect to their appropriate separate (sanitary & storm) sewer systems in the future. Sump pumps will be provided for elevator shafts, and connected to the gravity sanitary system within the building.

While the number of plumbing fixtures is still being determined, it is anticipated an 8 inch sanitary drain will be required for the building. Refer to Civil narrative for additional information.

3.2.7 Natural Gas System

A new natural gas service will be provided from a gas main located at Hoyt Street. Gas piping up to, and including the gas meters will be by NW Natural.

Natural gas will be extended to serve the new boilers and water heaters. Connection to the gas meter and installation of the house gas piping shall be per local gas company and OSSC requirements.

3.3 Fire Protection Systems

3.3.1 Wet Pipe Sprinkler System

A 6-inch fire service will be provided and enter the building at the Riser Room at Hoyt Street.

The entire building will be totally sprinklered in accordance with NFPA 13. A detector double check assembly will be provided for the fire service by the Civil in an exterior buried vault. The fire department connection (FDC) will be located adjacent to the backflow device vault.

The fire sprinkler system shall comply with NFPA 13, and local Fire Marshal requirements. In general, the fire sprinkler system shall consist of connection to new water service, including electric fire pumps, jockey



pump, controllers, automatic transfer switch, main flow alarm station, zone control valves and flow indicators, alarm bell, fire sprinkler piping and heads. All related fire protection accessories as required will be provided. Coordinate location and type of tamper, flow, and pressure switches with the fire alarm system. All fire sprinkler piping to be concealed.

All required system isolation valves shall be provided with tamper switches. Each floor shall be provided with a zone isolation valves with tamper switches, flow switches, fire department test stations, and hose valves (as required). The fire department test drain shall terminate outside of the building. All fire protection system materials to be of a domestic manufacture.

Provide a Class II standpipe per the requirements of OSCC Section 905.1.2, local Fire Marshal requirements, and NFPA 14. Coordinate location of all hose valves in secure areas.

(2) Fully redundant horizontal split-case electric motor-driven fire pumps will be provided in accordance with applicable code and Fire Marshall Requirements.

Fire sprinkler heads to be chrome plated semi-recessed pendant type with polished chrome escutcheons in finished areas and upright rough brass finish type heads in unfinished areas. Horizontal dry sidewall sprinkler heads will be provided for overhangs, loading dock, and other perimeter areas subject to freezing. Quick-Response heads will be provided in all light hazard areas.

Provide a 60,000 gallon cast in place concrete fire reservoir water tank below fire pump room.

3.3.2 Dry Pipe Sprinkler System

Dry pipe sprinkler systems will be provided for areas subject to freezing. Dry pipe systems shall be galvanized inside and out, threaded or with cut grooves.



4.0 Electrical

4.1 Service and Distribution

4.1.1 Design Criteria

Load Densities: Power Systems

The following load allowances will be provided for the project:

| Area | Power Systems (W/sf) |
|-----------------------------|----------------------|
| Offices | 1.5 |
| Circulation/Transition | 0.5 |
| Lobby | 1.0 |
| Service Areas | 0.5 |
| Stairs | 0.5 |
| Restrooms | 1.0 |
| Storage | 0.5 |
| Mechanical/Electrical Areas | 0.5 |

Table 8: Power Load Densities

4.1.2 Service

Baseline: Two 2500 amp 208Y/120V, 3 phase, 4 wire electrical services will be provided by PGE. Primary service will be extended underground from an existing transformer vault located in the sidewalk area at the NW corner of Irving to the main electrical room. Secondary conduits from the existing vault to the main electrical room will be provided by the contractor. Secondary conductors and transformers will be provided by PGE.

Potentially Required Alternate: In lieu of baseline, one 3000A 480Y/277V, 3 phase, 4 wire electrical service will be provided by PGE. Primary service will be extended underground from a distribution vault to an owner provided PGE Class A "spot network" vault (20'x40') located in the sidewalk area and extending under the building. Access to the vault will be via a lift out slab and manhole in the sidewalk area. Exact requirements to be determined by PGE. Secondary conduits from the existing vault to the main electrical room will be provided by the contractor. Secondary conductors and transformers will be provided by PGE.



4.1.3 Distribution

Baseline (208/120V):

MDP1 switchboard will serve lighting, receptacle and mechanical loads on floors 1 thru 4.

MDP2 switchboard will serve lighting, receptacles and mechanical loads on floors 5 thru mechanical penthouse on roof.

Potentially required alternate (480/277V):

4MDP switchboard will serve mechanical and lighting loads on floor 1 thru mechanical penthouse on roof and a 2500A 2MDP via a 750KVA 480-208/120V dry type transformer. 2MDP will serve receptacle loads on floors 1 thru mechanical penthouse.

Metering: Utility meter will be provided for each service. Multnomah County owned sub-metering system will be provided to separate lighting, mechanical and receptacles loads at the panel level to track performance of building and to meet the requirements of the LEED Measurement and Verification credit. Variable frequency drives (VFD) on mechanical equipment will be specified with outputs to provide further resolution on how energy is used for fans, pumps, heating, cooling, etc. Sub-metering system and VFDs will be integrated into the building management system.

Main Electrical Room: The main electrical room will contain the main distribution equipment for each incoming service, PGE metering, step-down transformers as required, distribution panels to serve loads on the first floor and the centralized UPS. See one-line riser diagram and floor plans for more information.

Electrical Rooms: One electrical room will be centrally located on floors 2 thru 9. Each electrical room will contain normal, emergency, optional standby and UPS distribution panels to serve loads on that respective floor. Reference one-line riser diagram and floor plans for more information from previous design development drawing package, provide additional distribution on floors 7 thru 9.

Flexibility: All distribution panels will be provided with a minimum of 20% spare breaker capacity for future loads. Overhead (above ceilings) power distribution will be used in the majority of areas to provide accessibility for future remodels. Power poles will be integrated into furniture system to serve open office areas. Floorboxes or fire rated poke-thrus to be provided in areas where power poles are not possible and where flexibility is required.

Power Quality: Quality of power supply is affected by noise sources within a facility as well as outside (utility transferred). Surge Protection Devices (SPD) will be provided at the service entrance and at downstream distribution panels and branch panels. Surge protective



receptacles will be used for sensitive equipment in exam rooms. Loads types will be separated on panels to prevent general purpose power needs to share panels with critical operation loads.

Branch Circuit Wiring: Copper conductors in raceway for feeders to panels, large equipment connections, above inaccessible ceilings and homeruns for branch circuits. Non-Clinic Floors: Metal Clad (MC) cable will be used for branch circuiting downstream from homerun locations for lighting and receptacles. Clinic Floors: Hospital Grade Metal Clad (HCF MC) cable will be used for branch circuiting downstream from homerun locations for lighting and receptacles. All homerun junction box locations are to be located above accessible ceilings in area served, i.e., homeruns are not allowed from wall devices. Separate neutrals will be provided for each branch circuit.

Equipment Connections: Electrical power connections will be made to all mechanical equipment, to include providing all electrically associated devices such as disconnect switches, contactors, magnetic or manual starters, lock-out switches, etc., not furnished under Division 23. VFD's furnished under Division 23 and installed under Division 26.

Electrical power connections will be made to support miscellaneous equipment. Connections include disconnect safety switches and wiring to support interlocks to remote devices.

Electromechanical Interference (EMI): Provisions in layout of the electrical power system will be made to minimize the impact of electric fields on sensitive lab spaces. Equipment producing fields (transformers and motors) are to be located remote from sensitive loads. Large ampere feeds will be routed around sensitive equipment areas or contained within rigid steel conduits.

4.2 On-Site Power Systems

4.2.1 Emergency Generator

Generator: Life Safety, Legally Required and Optional Standby power will be provided by a 450KW diesel fired generator. Separate transfer switches are provided for life safety loads, optional/legally required standby loads and fire pump. Emergency loads will be those designated as life safety meeting the criteria of NEC 700. Optional/legally required standby loads will include the centralized UPS, telecom room cooling, passenger elevator per bay, service elevator, elevator machine room cooling, pressurization system, domestic water booster pump, ICP lighting, receptacle and equipment loads and other miscellaneous receptacle and equipment loads as determined by the Owner. Caterpillar is basis of design.



Fueling: Approximately 1,000 gallons of fuel storage via a day tank within the generator room will provide 24 hours of operation at full load. Remote fill station will be located at the entrance of the loading dock. Fuel pumping system at remote fill station is not required as pressure from fuel truck should be adequate.

Combination generator docking/load bank station:

Baseline (208/120V): Two 2500A docking station with cam style connections and kirk-key lock out provisions will be provided in the loading dock area to enable a portable generator(s) to serve each building service during extend utility outage. Additionally, one docking station will have load bank connections for testing the permanent generator. Trystar is basis of design.

Potential required alternate (480/277V): One 3000A docking station in lieu of baseline.

4.2.2 Uninterruptible Power Supply (UPS)

UPS power will be provided with a 180KVA double conversion unit. Battery back-up will be limited to 15 minutes as UPS is backed up by emergency generator. Battery monitoring system will be provided. Eaton Cellwatch is basis of design. UPS distribution panels will be located in each electrical room to serve telecom rack equipment, loads in the ICC, refrigeration controls and other critical loads that will be identified by the Owner. Eaton Powerware Series is basis of design.

4.2.3 Grounding System

Two grounding criteria will be addressed, safety and performance. A safe grounded power system will be provided in compliance with the 2014 NEC. This ground system consists of the building service ground (multiple ground rods, UFER ground in foundation and bonding to the water service and structure steel). The safe grounding system will be extended thru out all electrical systems in facility. All metallic systems will be grounded to the building grid.

Performance grounding includes a system of grounding conductors and busses to be used for telecom demarcation room, main telecom room (MDF), intermediate telecom rooms (IDF) and any other sensitive equipment areas. The performance ground system will tie into the code required safety grounding system at the main distribution panel ground bus.



4.3 Lighting

General

This is a schematic design lighting system narrative. The design of the lighting system is still in development. Spaces not directly identified in this narrative shall use similar space types for their basis of design. Light fixtures and specific controls have not been selected at this time. The electrical lighting systems will be designed in compliance with the State of Oregon Structural Specialty Code.

4.3.1 Lighting Design Criteria

| AREA | SOURCE | LIGHT LEVEL AMBIENT (avg FC) | LIGHT LEVEL TASK (avg FC) | LIGHT LEVEL EMERGENCY (avg) FC* | TARGET LPD W/SF |
|--|--------|------------------------------|---------------------------|---------------------------------|-----------------|
| Outdoor Entries | LED | 3 | N/A | 1 | .3 |
| Meeting/Conf. Rooms | LED | 1 to 45 | N/A | NA | .7 |
| Enclosed Stairs | LED | 10 to 15 | N/A | 1.0 | .5 |
| Hallways | LED | 15 | N/A | 1.0 | .3 |
| Support Spaces/Storage | LED | 30 | N/A | N/A | .5 |
| Elec/IT/Mech | LED | 50 | N/A | 1 | .5 |
| Restrooms | LED | 20 | 35 (vertical at mirror) | N/A | .6 |
| Open Office | LED | 30 | 45** | 1 | .5 |
| Clinic Offices/Small Enclosed Rooms | LED | 30 | 45** | N/A | .6 |
| Lab | LED | 40 | 50** | N/A | .95 |
| Pharmacy | LED | 40 | 50** | N/A | .95 |
| Lobby | LED | 15 to 30 | N/A | N/A | .6 |
| Exam Room | LED | 40 | 50** | N/A | .95 |
| <p>* Emergency Lighting: Emergency lighting system and panel capacity will be designed on the basis of 0.25 volt-amperes/sq. ft. of gross space. Exits sign assumption is an LED edge-lit type.</p> <p>** Variety of tasks within the same space may require specialty or local task lighting.</p> | | | | | |

Table 9: Lighting Design Criteria by Area



4.4 Exterior Lighting

Building lighting will be integrated with the building exterior features. Illumination will be provided for passage and security/safety, and to provide highlights to the exterior elements. All exterior luminaires will use cutoff optics to address light trespass issues to meet the requirements of the LEED Lighting pollution reduction credit.

4.5 Interior Lighting

Reference previous design development drawings for luminaire descriptions and layouts.

Energy efficient sources and automatic control technologies will be implemented to provide the most efficient and effective electric lighting system for the facility occupants and task. Controls will provide switching and dimming of the lighting to permit maximum use of the available natural light.

Daylighting will provide the first level of illuminations for the majority of the interior spaces along the perimeter. The next step will be to use energy efficient local task lighting where appropriate. When additional electrical lighting is required for building interior illumination, LED luminaires will be used. Designs will be based LED technology sources for linear luminaires and LED for point sources and recessed down lights. All ballasted luminaires will use electronic ballasts. The type of luminaire will be coordinated with area task. Illumination issues to be addressed include lighting levels, photo-sensitive areas, uniformity and glare.

Lighting Systems and Control

| AREA | LIGHTING TYPE |
|-------------------------------------|--|
| Outdoor Entries | Recessed LED lensed downlights. |
| Meeting/Conference Rooms | LED recessed luminaires. |
| Enclosed Stairs | Occupancy sensor integrated LED luminaires with hi/low switching ballasts will be used at each landing. |
| Hallways | LED recessed luminaires. |
| Support Spaces /Storage | LED recessed |
| Elec/IT/Mech | LED strip lights with wire guards |
| Restrooms | Linear LED lighting along wet wall with LED recessed downlights in walking area and LED sconces at mirror. |
| Open Office | LED recessed luminaires. One LED task light per defined desk/work area. |
| Clinic Offices/Small Enclosed Rooms | LED recessed luminaires. One LED task light per room. |
| Lobby | Allocate \$15/sf for lighting. |

Table 10: Lighting Systems by Area



| AREA | CONTROL METHOD |
|--|---|
| Outdoor Entries | LCP, TC : Dusk to Dawn operation |
| Meeting/Conference Rooms | OC, PC, MD: OS, PC, DRC: manual on, auto off functionality. When lights are turned on, photocell sets hi end light output based on available daylight, manual dimmer allows user to dim lower than PC set-point, full range dimming at night, OS turns lights off when space is unoccupied |
| Enclosed Stairs | OS (integral to fixture): occupancy sensors keep lights at 50% output when space is unoccupied and turn lights on to 100% when occupied. |
| Hallways | LCP, OS, TC, WS (keyed), PC: time clock turns normal and emergency lighting on at 6am, photocell turns off areas with available daylight (20 fc), time clock turns normal power lights off after 10pm and engages occupancy sensors, OS turn emergency lighting off after hours when space is unoccupied. When one OS senses movement, the entire corridor for that level turns on including the open stairs. |
| Support Spaces /Storage | WS, OS: manual on, auto off |
| Elec/IT/Mech | WS: manual on, manual off, no automatic controls allowed by code. |
| Restrooms | OS: auto on, auto off |
| Open Office | DRC, OS, PC, WS: manual on, auto off operation. Wall station turns lights on to preset level and allows raise/lower function. 3 zone dimming control. Photocell dims designated daylight zones, occupancy (vacancy) turns lights off when unoccupied. Task lighting manual. |
| Clinic Offices/Small Enclosed Rooms | OS, PC, MD: manual on, auto off functionality. When lights are turned on, photocell sets hi end light output based on available daylight, manual dimmer allows user to dim lower than PC set-point, full range dimming at night, OS turns lights off when space is unoccupied |



| AREA | CONTROL METHOD |
|--|---|
| Lobby | LCP, OS, WS: manual on, auto off operation. Wall station turns lights on/off when enabled. OS turn emergency lighting off after hours when space is unoccupied. When one OS senses movement, the entire corridor for that level turns on including the open stairs. |
| TC = Time Clock LCP = Lighting control panel PC = Photocell OC = Occupancy Sensor DRC = Zone Controller WS = Wall Station MD = Manual Dimmer (0-10v) MS = Manual switch (low or line voltage) | Blue Ridge Technologies Blue Ridge Technologies RP* Blue Ridge Technologies Wattstopper Blue Ridge Technologies ZC* Blue Ridge Technologies LVS Lutron Hubbell, Leviton |
| * Lighting control panel and zone controller will be integrated into building management system. | |

Table 11: Lighting Control Methods by Area

5.0 Signal Systems

5.1 Fire Alarm

Provide fire command center and all associated controls as required by OSSC section 911.

The Fire Alarm system will consist of a supervised addressable supervised, Class B hard wired system. Notifier is basis of design.

| Device | Coverage |
|-----------------------|--|
| Manual pull stations | Fire alarm control panel location |
| Smoke Detectors | Egress paths (hallways, lobbies, stairwells, open office aisles), Air handlers (>2,000CFM), Elevators lobbies, Elevator machine rooms, Elevator hoistways. |
| Fire Sprinkler | Tamper and Flow |
| Annunciation | Remote Annunciation at entry |
| Building Annunciation | Speaker and Strobe annunciation throughout the facility. |
| System output | Relay interface for mechanical system shut down and elevator recall. |
| Monitoring | Central Station Wireless Monitoring |

Table 12: Fire Alarm Device Coverage



5.2 Telephone/Data

Redundant service to the building will be provided by vaults located on Irving and Hoyt. Services will terminate in a demarcation room separate from Multnomah County telecom equipment.

The main telecom room will serve as the distribution point for low voltage services on the first floor.

Intermediate telecom rooms are centrally located on floor 2 thru 6. Each room will serve as the distribution point for low voltage services on that floor.

See included low voltage system matrix for scope. Multnomah County to provide additional design information on systems for pricing.

5.3 Security

See included low voltage system matrix for scope. Multnomah County to provide additional design information on systems for pricing.

5.4 Audio/Visual

See included low voltage system matrix for scope. Multnomah County to provide additional design information on systems for pricing.

5.5 Other Low Voltage Systems

See included low voltage system matrix for scope. Multnomah County to provide additional design information on systems for pricing.

October 23, 2015



| Item No. | System Description | Design By: | Document By: | Conduit & Box Furnished By: | Conduit & Box Install By: | Conduit & Box Cost Assigned To: | Cable Furnished By: | Cable Install By: | Cable Cost Assigned To: | Equipment Furnished By: | Equipment Install By: | Equipment Cost Assigned To: |
|----------|--|-------------|--------------|--------------------------------|------------------------------|------------------------------------|------------------------|-------------------|----------------------------|----------------------------|--------------------------|--------------------------------|
| 1.0 | Security Services | | | | | | | | | | | |
| 1.1 | CCTV (Security) | Owner | Design Team | Under Division 28 | Under Division 28 | Under Division 28 | Under Division 28 | Under Division 28 | Under Division 28 | Owner | Owner | Owner |
| 1.2 | Access Control | Owner | Design Team | Under Division 28 | Under Division 28 | Under Division 28 | Under Division 28 | Under Division 28 | Under Division 28 | Owner | Owner | Owner |
| 1.3 | Duress | Owner | Design Team | Under Division 28 | Under Division 28 | Under Division 28 | Under Division 28 | Under Division 28 | Under Division 28 | Owner | Owner | Owner |
| 1.4 | Intrusion Detection | Owner | Design Team | Under Division 28 | Under Division 28 | Under Division 28 | Under Division 28 | Under Division 28 | Under Division 28 | Owner | Owner | Owner |
| 2.0 | Telecommunications and Data Services | | | | | | | | | | | |
| 2.1 | Structured Cable | Owner | Design Team | Under Division 27 | Under Division 27 | Under Division 27 | Under Division 27 | Under Division 27 | Under Division 27 | Under Division 27 | Under Division 27 | Under Division 27 |
| 2.1 | Voice Over IP | Owner | Owner | n/a | n/a | n/a | n/a | n/a | n/a | n/a | n/a | n/a |
| 2.2 | Voice PBX | Owner | Owner | n/a | n/a | n/a | n/a | n/a | n/a | Owner | Owner | Owner |
| 2.3 | Phones | Owner | Design Team | Under Division 27 | Under Division 27 | Under Division 27 | Under Division 27 | Under Division 27 | Under Division 27 | Owner | Owner | Owner |
| 2.4 | Elevator Phone | Owner | Design Team | NIC | NIC | NIC | NIC | NIC | NIC | NIC | NIC | NIC |
| 2.5 | Wall Phones | Owner | Design Team | Under Division 27 | Under Division 27 | Under Division 27 | Under Division 27 | Under Division 27 | Under Division 27 | Owner | Owner | Owner |
| 2.6 | Cellular Phone System | Owner | Design Team | n/a | n/a | n/a | n/a | n/a | n/a | n/a | n/a | n/a |
| 2.7 | Public/Pay Phones | Owner | Design Team | n/a | n/a | n/a | n/a | n/a | n/a | n/a | n/a | n/a |
| 2.8 | Internal Reradiating System (DAS) | Owner | Design Team | n/a | n/a | n/a | n/a | n/a | n/a | n/a | n/a | n/a |
| 2.9 | Wireless LAN | Owner | Design Team | Under Division 27 | Under Division 27 | Under Division 27 | Under Division 27 | Under Division 27 | Under Division 27 | Owner | Owner | Owner |
| 2.1 | Active Network Equipment and Servers | Owner | Owner | n/a | n/a | n/a | n/a | n/a | n/a | Owner | Owner | Owner |
| 3.0 | Building Services | | | | | | | | | | | |
| 3.1 | Overhead Paging System | Owner | Design Team | Under Division 27 | Under Division 27 | Under Division 27 | Under Division 27 | Under Division 27 | Under Division 27 | Owner | Owner | Owner |
| 3.2 | Clocks (Primex GPS) | Owner | Design Team | Under Division 27 | Under Division 27 | Under Division 27 | Under Division 27 | Under Division 27 | Under Division 27 | Owner | Owner | Owner |
| 3.3 | Televisions | Owner | Design Team | Under Division 27 | Under Division 27 | Under Division 27 | Under Division 27 | Under Division 27 | Under Division 27 | Owner | Owner | Owner |
| 3.4 | AV systems | Owner | Design Team | Under Division 27 | Under Division 27 | Under Division 27 | Owner | Owner | Owner | Owner | Owner | Owner |
| 3.5 | Centralized UPS | Design Team | Design Team | Under Division 26 | Under Division 26 | Under Division 26 | Under Division 26 | Under Division 26 | Under Division 26 | Owner | Owner | Owner |
| 3.6 | Sound Masking System | Owner | Design Team | Under Division 27 | Under Division 27 | Under Division 27 | Under Division 27 | Under Division 27 | Under Division 27 | Owner | Owner | Owner |
| 3.7 | Building Automation System | Design Team | Design Team | Under Division 23 | Under Division 23 | Under Division 23 | Under Division 23 | Under Division 23 | Under Division 23 | Under Division 23 | Under Division 23 | Under Division 23 |
| 4.0 | Additional Systems | | | | | | | | | | | |
| 4.1 | Nurse Call | Owner | Design Team | Under Division 27 | Under Division 27 | Under Division 27 | Under Division 27 | Under Division 27 | Under Division 27 | Owner | Owner | Owner |
| 4.2 | Intercom System (exterior door to reception) | Owner | Design Team | Under Division 27 | Under Division 27 | Under Division 27 | Under Division 27 | Under Division 27 | Under Division 27 | Owner | Owner | Owner |
| 4.3 | Cellular antennae | Owner | Design Team | Under Division 27 | Under Division 27 | Under Division 27 | Under Division 27 | Under Division 27 | Under Division 27 | Owner | Owner | Owner |
| 4.4 | Badging | Owner | Design Team | Under Division 27 | Under Division 27 | Under Division 27 | Under Division 27 | Under Division 27 | Under Division 27 | Owner | Owner | Owner |
| 4.5 | Conference room Scheduling | Owner | Design Team | Under Division 27 | Under Division 27 | Under Division 27 | Under Division 27 | Under Division 27 | Under Division 27 | Owner | Owner | Owner |

Development Options Analysis

DEVELOPMENT OPTION ANALYSIS

To provide perspective for evaluation of the Amended Project Plan, an alternative development option analysis was conducted for consideration. The option conceptualizes an alternative involving a smaller building on the Block “U” site, together with a leased space in a conceptual location within or near the downtown core. The following is intended to frame the analysis parameters.

Development Options Analysis Parameters

The purpose of the analysis is to compare two development options: Option 1 is a “Single Building” and Option 2 is a “Single Building plus Leased Space”.

Option 1; “Single Building” is defined as: New construction on the Block “U” site of 9 stories and +/- 157,000 GSF to accommodate the full program needs for all MCHD departments housed in the McCoy Building and in the Lincoln Building.

Option 2; “Single Building plus Leased Space” is defined as: New construction on the Block “U” site of 6 stories of +/- 96,000 GSF plus a conceptual lease space of +/- 60,000 GSF, that together would include the same HD programs as Option 1.

There are many variables to the two – location configuration of Option 2, so to further solidify the analysis parameters, a number of assumptions must be established. These are as follows:

1. Scope of Option 2 includes a conceptual 6-story building constructed by Multnomah County on the block “U” site. This scope was selected because it resembles the previous project scope before it was placed on hold, and therefore reasonably reliable cost information can be utilized and modified as needed as an update. This model also presumably would still receive all the same City of Portland funding for projects in the River District.
2. The 6 – story building portion of Option 2 would contain about 96,000 GSF, and the remaining needs would be established in another location to accommodate the rest of the current MCHD Program.
3. The leased portion of Option 2 would need to provide about 60,000 GSF of additional space in a nearby location. Lease rates of several large Central Eastside spaces were utilized for this analysis. Current market lease rates were used. Tenant improvement (TI) costs were estimated with assistance from JE Dunn Construction.

Other Parameters

- A conceptual debt service analysis was prepared to show the net expense of both Options over a 20 – year period. A 20 – year period of analysis was selected because it equals the County’s intended debt term for new construction financing, and a 20-year term for a lease, though not guaranteed, is a possible term before substantial renovations or relocation should be expected.
- In addition to costs, other evaluation criteria are presented. These include considerations such as long-range operational flexibility, location, access for clients and employees, functionality, programmatic and operational efficiencies, and risk concerns.
- For the purpose of this analysis, it shall be assumed that an acceptable lease space of sufficient size exists and that an acceptable 20 - year lease agreement can be established. This study utilizes only cursory marketing information for Central Eastside area lease spaces and rates, and in no way assesses the likelihood of securing a suitable, single lease space in an acceptably located building.
- Cost comparison models for the Options were limited to 20 years, but a comparative model over the 80-year life of the building would show a significantly higher overall cost of ownership for Option 2 due to the leased component.

OPTION 1 – Single Building: 20 –Year Cost

| SINGLE BUILDING | | |
|--|-----|----------------|
| 9-story, 157,000 gsf bldg option | | |
| Approx. total project budget in 2016 dollars | +/- | \$91,300,000 |
| PDC IGA 2012: River District Tax Increment Funds (TIF) | | (\$26,948,460) |
| PDC IGA Amendment 2015: River District Tax Increment Funds (TIF) | | (\$9,449,409) |
| Approved "one time only" County funding | | (\$5,400,000) |
| Estimated McCoy building sale proceeds | +/- | (\$5,000,000) |
| Remaining required County capital investment | +/- | \$44,500,000 |
| Financing Costs | | |
| Per year rate for bond financing @ 4.0% over 20 years: | | \$3,236,000 |
| Total pay-out over 20 years | +/- | \$64,700,000 |
| NOTES: | | |
| 1. Estimated market value of built asset at year 20 approx. \$126M | | |

OPTION 2 – Single Building + Leased Space: 20 –Year Cost

| OPTION 2 - SINGLE BUILDING plus LEASED SPACE | | | 20 - YR LEASE COST CALCULATOR | | | | |
|---|-----|----------------|-------------------------------|----------|-------|--------|--------------|
| Part 1: 6-story, 96,000 gsf bldg (high rise) | | | YR | \$ / GSF | INFLA | GSF | LEASE/YR |
| Approx. total project budget in 2016 dollars | +/- | \$56,500,000 | 1 | \$23.00 | | 60,000 | \$1,380,000 |
| PDC IGA 2012: River District Tax Increment Funds (TIF) | | (\$26,948,460) | 2 | \$23.69 | 3% | 60,000 | \$1,421,400 |
| PDC IGA Amendment 2015: River District Tax Increment Funds (TIF) | | (\$9,449,409) | 3 | \$24.40 | 3% | 60,000 | \$1,464,042 |
| Approved "one time only" County funding | | (\$5,400,000) | 4 | \$25.13 | 3% | 60,000 | \$1,507,963 |
| Estimated McCoy building sale proceeds | +/- | (\$5,000,000) | 5 | \$25.89 | 3% | 60,000 | \$1,553,202 |
| Part 1 Sub-total: | +/- | \$9,700,000 | 6 | \$26.66 | 3% | 60,000 | \$1,599,798 |
| Part 2: Conceptual 60,000 gsf Tenant Improvement & Lease | | | 7 | \$27.46 | 3% | 60,000 | \$1,647,792 |
| TI construction costs including P&O, bond, insurance, fees, Multico | | | 8 | \$28.29 | 3% | 60,000 | \$1,697,226 |
| FF&E, Telephone & Data Infrastructure, Contingency, etc. | +/- | \$12,100,000 | 9 | \$29.14 | 3% | 60,000 | \$1,748,143 |
| Project Soft Costs | +/- | \$4,400,000 | 10 | \$30.01 | 3% | 60,000 | \$1,800,587 |
| Part 2 Sub-total: | +/- | \$16,500,000 | 11 | \$30.91 | 3% | 60,000 | \$1,854,605 |
| Total hard & soft costs: | +/- | \$26,200,000 | 12 | \$31.84 | 3% | 60,000 | \$1,910,243 |
| 20 - Year Financing Costs | | | 13 | \$32.79 | 3% | 60,000 | \$1,967,550 |
| Assume bond financing of \$26.2M @ 4.0 % over 20 years: | | | 14 | \$33.78 | 3% | 60,000 | \$2,026,577 |
| \$1.90 million / year X 20 yrs = | +/- | \$38,100,000 | 15 | \$34.79 | 3% | 60,000 | \$2,087,374 |
| 20 - Year Lease Costs | | | 16 | \$35.83 | 3% | 60,000 | \$2,149,995 |
| Lease Expense at \$23/sf, with 3% yearly rate inflation over 20 years | | \$37,100,000 | 17 | \$36.91 | 3% | 60,000 | \$2,214,495 |
| Total: | | | 18 | \$38.02 | 3% | 60,000 | \$2,280,930 |
| | +/- | \$75,200,000 | 19 | \$39.16 | 3% | 60,000 | \$2,349,358 |
| Notes: | | | 20 | \$40.33 | 3% | 60,000 | \$2,419,838 |
| 1. Maintenance costs not included in either Option - costs should be | | | | | | | \$37,081,117 |
| similar whether space is owned or leased | | | | | | | |
| 2. Lease Rates do not include potential TI Allowance reductions | | | | | | | |

Option Comparisons:

| DEVELOPMENT OPTION | TOTAL CAPITAL & FINANCING COST OVER 20 YEARS | VALUE OF BUILT ASSET AT 20 YEARS |
|--|--|----------------------------------|
| OPTION 1 - Single Building | \$64,700,000 | \$126,000,000 |
| OPTION 2 - Single Building + Lease Space | \$75,200,000 | \$79,000,000 |

20 – Year Cash Flow Analysis

| 20 Year Cash Flow Analysis | | | | | | |
|-------------------------------|----------------------------|----------------------|----------------|--|----------------------|----------------|
| | Option 1 - Own 153,500 GSF | | | Option 2 - Own 96,000 GSF/Lease 60,000 GSF | | |
| | debt service | capital expenditures | total | debt service | capital expenditures | total |
| Dev Funding | \$ (46,797,869) | | | \$ (46,797,869) | | |
| Year 1 | \$ (3,141,402) | \$ (155,000) | \$ (3,296,402) | \$ (1,905,202) | \$ (98,000) | \$ (3,314,202) |
| Year 2 | \$ (3,141,402) | \$ (158,875) | \$ (3,300,277) | \$ (1,905,202) | \$ (100,450) | \$ (3,355,982) |
| Year 3 | \$ (3,141,402) | \$ (162,847) | \$ (3,304,249) | \$ (1,905,202) | \$ (102,961) | \$ (3,399,003) |
| Year 4 | \$ (3,141,402) | \$ (166,918) | \$ (3,308,320) | \$ (1,905,202) | \$ (105,535) | \$ (3,443,303) |
| Year 5 | \$ (3,141,402) | \$ (171,091) | \$ (3,312,493) | \$ (1,905,202) | \$ (108,174) | \$ (3,488,918) |
| Year 6 | \$ (3,141,402) | \$ (175,368) | \$ (3,316,770) | \$ (1,905,202) | \$ (110,878) | \$ (3,535,888) |
| Year 7 | \$ (3,141,402) | \$ (179,752) | \$ (3,321,155) | \$ (1,905,202) | \$ (113,650) | \$ (3,584,255) |
| Year 8 | \$ (3,141,402) | \$ (184,246) | \$ (3,325,648) | \$ (1,905,202) | \$ (116,491) | \$ (3,634,058) |
| Year 9 | \$ (3,141,402) | \$ (188,852) | \$ (3,330,254) | \$ (1,905,202) | \$ (119,403) | \$ (3,685,341) |
| Year 10 | \$ (3,141,402) | \$ (193,574) | \$ (3,334,976) | \$ (1,905,202) | \$ (122,389) | \$ (3,738,148) |
| Year 11 | \$ (3,141,402) | \$ (198,413) | \$ (3,339,815) | \$ (1,905,202) | \$ (125,448) | \$ (3,792,525) |
| Year 12 | \$ (3,141,402) | \$ (203,373) | \$ (3,344,775) | \$ (1,905,202) | \$ (128,584) | \$ (3,848,517) |
| Year 13 | \$ (3,141,402) | \$ (208,458) | \$ (3,349,860) | \$ (1,905,202) | \$ (131,799) | \$ (3,906,174) |
| Year 14 | \$ (3,141,402) | \$ (213,669) | \$ (3,355,071) | \$ (1,905,202) | \$ (135,094) | \$ (3,965,544) |
| Year 15 | \$ (3,141,402) | \$ (219,011) | \$ (3,360,413) | \$ (1,905,202) | \$ (138,471) | \$ (4,026,679) |
| Year 16 | \$ (3,141,402) | \$ (224,486) | \$ (3,365,888) | \$ (1,905,202) | \$ (141,933) | \$ (4,089,631) |
| Year 17 | \$ (3,141,402) | \$ (230,098) | \$ (3,371,500) | \$ (1,905,202) | \$ (145,482) | \$ (4,154,454) |
| Year 18 | \$ (3,141,402) | \$ (235,851) | \$ (3,377,253) | \$ (1,905,202) | \$ (149,119) | \$ (4,221,204) |
| Year 19 | \$ (3,141,402) | \$ (241,747) | \$ (3,383,149) | \$ (1,905,202) | \$ (152,847) | \$ (4,289,938) |
| Year 20 | \$ (3,141,402) | \$ (247,791) | \$ (3,389,193) | \$ (1,905,202) | \$ (156,668) | \$ (4,360,716) |
| Net Sale Proceeds | \$ 126,549,224 | | \$ 126,549,224 | \$ 78,918,666 | 0 | \$ 78,918,666 |
| Totals | | | \$ 59,761,762 | | | \$ 3,084,186 |
| NPV of Cash Flow Differential | | | Discount Rate: | 4.00% | | \$26,179,493 |

Option 1 Considerations:

- A single, County-owned facility aligns with the FPM Strategic Plan, provides asset appreciation/equity, and over an 80-year life, will have significantly lower costs than leasing.
- A single facility maximizes operational and administrative efficiency and flexibility for both MCHD and FPM.
- Block U is a good downtown location for MCHD, both clinical and administration.
- The public is expecting the majority of MCHD to be located in the new facility.

Option 2 Considerations:

- Leasing shifts costs from one-time-only (or debt) to operational costs freeing up debt capacity.
- Leasing provides the opportunity to move the location if in 10 years the needs change.
- Leasing may provide more potential to manage growth.
- Most lease terms are 10 years; there may be higher costs over 20 years (and beyond) if there is a need/requirement to move due to rent escalation, etc.
- It is currently unknown whether 60,000 sq. ft. is available in a desirable location. This amount of space does not appear to be available downtown currently.
- Reworking the project to include a single building plus lease will prolong the project completion schedule.

Zoning Map Amendment

Multnomah County Health Department Headquarters Project

Amendment to Maximum Height Limit on Block “U”

Adopted by City Council June 24, 2015

Ordinance No. 187217

Effective July 24, 2015



Bureau of Planning and Sustainability

Innovation. Collaboration. Practical Solutions.

City of Portland, Oregon
Charlie Hales, Mayor • Susan Anderson, Director



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Appendix A: ESEE Analysis of Proposed Map Amendment

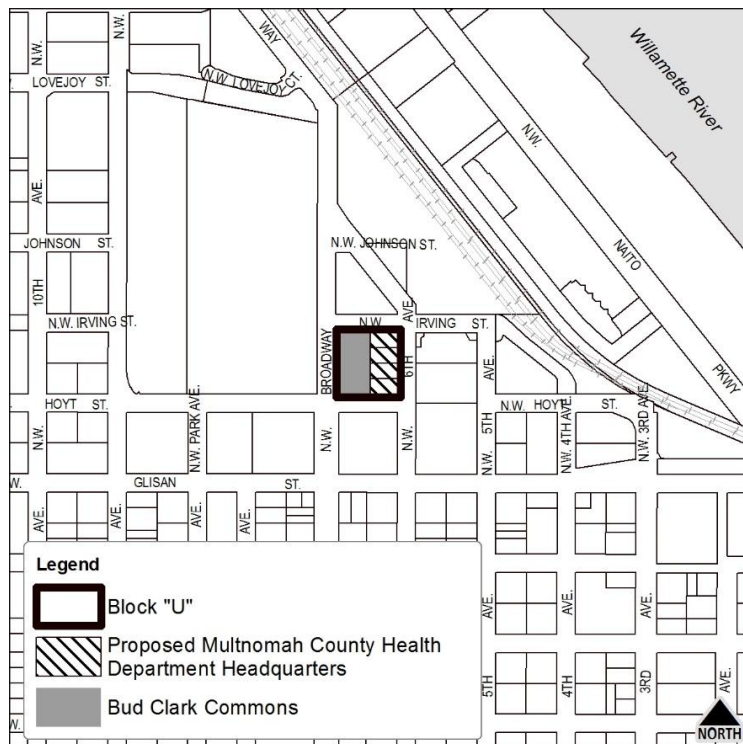
I. Project Summary

Multnomah County is proposing to construct a new headquarters facility for its Health Department in Portland's Old Town/Chinatown neighborhood. The site selected for the proposed facility is the eastern portion of Block U, located on NW 6th Ave, between NW Hoyt and NW Irving streets, within the River District of the Central City (see map below). Development of the Multnomah County Health Department (MCHD) Headquarters is a high priority project for the County. The need to replace existing unsafe, aged, inefficient and undersized facilities is urgent, and the demand for health services in Multnomah County is increasing.

The planned site for the MCHD Headquarters is subject to maximum height and floor area ratio (FAR) provisions contained in the Central City Plan District chapter of the Portland Zoning Code (33.510). The existing base maximum floor area ratio (FAR) is 6:1, with the potential for 3:1 in additional FAR through the use of various bonus and/or transfer options. The existing maximum height on the site is 75 feet, and it is not eligible for height bonuses.

In order to accommodate all the MCHD functions described in Section II of this report, the building will require an estimated 120,000 to 150,000 square feet and be between 105 and 150 feet in height. To accommodate a structure of this size on a site that is less than a half block in size, the maximum height allowance would need to be increased from its current 75 foot limit.

Therefore, the Bureau of Planning and Sustainability (BPS) is proposing to raise the height allowance on Block U to a maximum of 150 feet. This would be achieved through a combination of a base height increase from 75 feet to 105 feet plus making the site eligible for up to 45 feet of bonus height, which the County could earn through the use of FAR bonuses and/or transfers in return for various public benefits.



The *Scenic Resources Protection Plan* (BPS, 1991) and the *Union Station Clock Tower-Related FAR and Height Limitation Study* (BPS, 2000) identify the Union Station Clock Tower as a scenic resource and there are some protected views of the Clock Tower. The *Draft Central City Scenic Resources Inventory* (to be released April 2015) continues to identify the Clock Tower and views of the Clock Tower as scenic resources. Because the subject site is located near the Clock Tower an updated Economic, Social, Environmental and Energy (ESEE) analysis was undertaken to evaluate the potential effect of the proposed increases in height on protected views of the Clock Tower. As described in greater detail in Section III of this report, the effect of a potential "conflicting use" between a building of up to 150 feet on the undeveloped portion of Block U and preserving views of the Union Station Clock Tower is minor.

Additional height will not block or partially block the view of the clock tower and adequate air space around the tower is preserved along the identified views.

II. Background

1. Multnomah County Health Department Needs Assessment

The Multnomah County Health Department (MCHD) works in partnership with its diverse communities to promote and protect the health of county residents by providing essential public health services, including environmental health services, public health investigation and reporting, and chronic and communicable disease prevention. The department also provides high-quality medical and dental care to vulnerable populations throughout its primary-care, school-based health, and specialty clinics in many locations throughout the county.

The health department has outgrown the aging buildings—the McCoy Building (426 SW Stark Street) and its leased space in the Lincoln Building (421 SW Oak Street)—where most of its administrative functions now are located. Multnomah County recently analyzed a broad range of relocation and reconfiguration options before determining that construction of a large new headquarters building concentrating most of its administrative departments and some direct-service functions would be the most functional and cost-effective option. Initially, the County considered dispersing some functions into various other facilities. However, as the estimates of construction costs have risen, in part due to the upswing in the economy, the rationale for a single facility to centralize its activities has become increasingly apparent. The growing cost of continued occupation of the largely obsolete McCoy Building has especially contributed to a sense of urgency to relocate MCHD into a more energy-efficient facility built to contemporary seismic and safety standards.

To this end, the County has entered into a Disposition Agreement with the Portland Bureau of Housing to purchase the eastern portion of Block U, adjacent to the Bud Clark Commons. Through an initial programming exercise, the County identified a programmatic need greater than the site’s current maximum base development allowance of 105,000 square feet.

Throughout its decision-making process, the County engaged the public, including outreach to community residents and business leaders, formation of a Community Advisory Committee (CAC) and creation of a project website. As the design evolves, public outreach will continue, with broader public input sought at an open house to be convened in the near future. In addition to providing excellent public health services and using public resources wisely, Multnomah County is committed to meeting energy, climate and equity goals.

The Portland Development Commission has committed to a grant of approximately \$27 million in Tax Increment Financing (TIF). This will assist in bringing up to 350 of MCHD’s administrative and healthcare staff into the Old Town/Chinatown neighborhood and support many of the City’s policies to maximize mixed-use development in this portion of the Central City. It is anticipated that the County will commit the remainder of the projected budget through a combination of available County funding and other funding mechanisms. Because the new building is intended to be constructed to a LEED Gold standard, the savings from assumed reductions in operational costs will help offset the initial investment in the new facility.

2. Summary of Previous Planning

Planning efforts over the last four decades have spurred the transition of much of the River District from traditional industrial activities and warehousing to vibrant mixed-use neighborhoods that respond to the area's history, culture and setting. The City uses building envelop limitations (e.g. maximum height and bulk (FAR) standards) to preserve public views, protect open spaces from shadows and safeguard the scale of historic districts. The design review process, which is mandatory throughout the Central City Plan District, provides an additional way to evaluate the compatibility of new development with existing nearby development, including sensitive historic buildings. Instead of focusing solely on the building's development envelope, design review is an integrated approach that provides iterative and collaborative design oversight.

Downtown Plan (1972). This major planning effort to envision a new future for Downtown Portland identified the area between NW Glisan St and Union Station as an "opportunity site" for redevelopment as a mixed-use housing, office, retail and entertainment district anchored by a festival marketplace at the station. Maximum heights in the area were set at 460 feet.

Central City Plan (1988). Expanding the geographic extent of the Downtown Plan, the Central City Plan provides the policy framework for the establishment of the Central City Plan District and is the origin of the height, bulk (FAR), and bonus option regulations found in Chapter 33.510 of the Zoning Code described in more detail below. Building on the Downtown Plan, the CCP sought to "ensure that the Union Station Clock Tower remains the dominant visual landmark in the area" by limiting the building envelope along view corridors that lead to the station, such as NW 6th Ave.

River District Plan (1995). This document envisioned a "vital urban community of connected, diverse, and mixed use neighborhoods" for the River District which would capture much of Portland's expected population growth. The plan amended the CCP to create the River District Subdistrict. New policies for the district supported extending "downtown development throughout the River District that is highly urban in character" to accommodate a large residential population with supporting jobs, services and recreation.

The River District Design Guidelines (1996). This companion document to the River District Plan created subdistrict-wide design guidelines (to be applied with the *Central City Fundamental Design Guidelines*) to ensure development was particularly sensitive to the district's distinct history and character. Specifically, new development here is required to "reinforce the identity of the Union Station area" by "designing new development to focus on the station area as the area's centerpiece."

Old Town/Chinatown Vision and Development Plan (1997/1999). At a finer scale, this vision/development plan for Old Town/Chinatown examined the blocks leading up to Union Station. It encourages new office and retail uses with high quality design (especially for public-sponsored projects) that are compatible with historic resources such as Union Station. As one of the three "Trailways" blocks leading to Union Station, Block U was specifically called out as a focus of interest for this kind of development.

Scenic Resources Protection Plan (1991). The Scenic Resources Protection Plan identified a significant view of the Central City and the Union Station Clock Tower from the east bank of the Willamette River (the Eastbank Esplanade was not constructed at that time). The view is protected by a scenic resource (s) overlay zone with a 25 foot height limit extending from the viewpoint to the eastern edge of the Willamette River.

Union Station Clock Tower-Related FAR and Height Limitations Study (2000). This study focused on the land surrounding the Union Station Clock Tower: I-405 to the Willamette River; NW Hoyt St. to NW Lovejoy St. An inventory of views of the Clock Tower was developed and an ESEE analysis was performed, considering potential change to FAR and height. Significant views of the Clock Tower were identified at the NW 6th Ave Transit Mall; NW Johnson St at approximately NW 12th Ave; the east bank of the Willamette River (same location identified in the Scenic Resources Protection Plan); the Steel Bridge; and the Broadway Bridge. An ESEE Analysis was performed to consider the impacts of height on the views and the historic resources. The study recommended a maximum height of 75 feet and FARs that varied throughout the area from 4:1 to 6:1; the 6:1 FAR was applied to the subject site.

Central City Concept Plan (2012, updated 2015). As the first step in a major update of the 1988 Central City Plan, this plan developed a broad policy framework and urban design directives to guide the development of additional policies and implementation tools for the Central City. It includes an emphasis upon economic, housing and social goals, Willamette River enhancement and urban design excellence. This proposal supports the following Central City Concept Plan goals and policies:

Goal A: Focus on the Central City as the center of activity for “both the city and the region for commerce, employment, arts, culture, entertainment, tourism, education, and government” with policies for supporting higher employment densities, maintaining adequate safety and security, and fostering a resilient Central City, able to mitigate and respond to natural hazards.

Goal F: “Support the ability to meet human and health service needs of at-risk populations concentrated within the Central City.”

Goal K: “Encourage the development of diverse, high-density districts that feature spaces and a character that facilitate social interaction and expand activities unique to the Central City” through the maintenance of significant public views, establishment of “transitions between the Central City’s denser, taller, and more commercial and industrial land uses and adjacent neighborhoods, while highlighting key gateway locations,” and promotion of infill development while “enhancing the identity of historically, culturally, and architecturally significant buildings and places.”

Goal M: A focus on human health in the urban center combines a desire for green buildings, energy efficiency, and access to active modes of transportation in proximity to services and employment.

West Quadrant Plan (2015). This recently adopted plan adds to the direction of the Central City Concept Plan by specifying a number of additional goals including: embracing development while preserving historic and cultural resources; incorporating design elements that make each area distinct; and addressing climate change by encouraging innovative buildings that can serve as a model of sustainable development. A discussion of building heights and public views in the plan contains a concept map showing building height inclusive of all bonuses up to 250 feet on blocks adjacent to Block U. Plans for Old Town/Chinatown seek to leverage the area’s culturally-varied history to encourage visitors, accommodate new institutions and mixed-use developments with a target of adding 3,000 new jobs, and provide more amenities and services for residents and workers.

3. Existing Conditions, Zoning and Height Limits

The site of the proposed new MCHD facility is located on Block U, bounded by NW Broadway and NW 6th Ave between NW Hoyt and NW Irving Streets, one block south of Union Station in the Old Town/Chinatown neighborhood of the Central City's River District. The west side of the block is occupied by the Bud Clark Commons building, which includes 130 studio units for residents who have been experiencing homelessness, a transitional shelter and day center. Completed in 2011, this facility will likely not redevelop in the foreseeable future. The proposed site for the MCHD building lies on the easterly portion of the block, on vacant land currently owned by the Portland Housing Bureau.

CX Base Zone

Block U is zoned Central Commercial (CX) with the Design ("d") overlay. The CX base zone allows a broad range of retail, office, institutional and residential uses and...

... is intended to provide for commercial development within Portland's most urban and intense areas. A broad range of uses is allowed to reflect Portland's role as a commercial, cultural and governmental center. Development is intended to be very intense with high building coverage, large buildings, and buildings placed close together. Development is intended to be pedestrian-oriented with a strong emphasis on a safe and attractive streetscape. (Section 33.130.030.H)

Design Overlay

The Design ("d") overlay zone requires development projects to go through discretionary design review, administered by the Bureau of Development Services. The design review process reflects the special consideration paid to new development and redevelopment in the Central City and "promotes the conservation, enhancement, and continued vitality of areas of the City with special scenic, architectural, or cultural value."

The *Central City Fundamental Design Guidelines* and the *River District Design Guidelines* are the design review approval criteria for the site and provide a nuanced tool for shaping building design. A proposed building must respond to specific direction within the guidelines to enhance the area's identity, strengthen gateways, complement existing buildings, provide view areas, and reinforce the identity of the Union Station area.

Central City Plan District: Maximum FAR and Height

The site is also within the Central City Plan District, which applies a number of additional zoning regulations specific to the Central City and its subdistricts, including development standards that govern the height, massing and scale of new development. These regulations are contained in Zoning Code Chapter 33.510.

Maximum FAR. The overall bulk of buildings in the Central City are limited through maximum floor area ratios (FAR)—the amount of development allowed on a site expressed as a ratio of a building's total floor area to the size of the site. These FAR limits are shown on Map 510-2. Currently, the site has a maximum base FAR allowance of 6:1. An additional 3:1 of FAR could potentially be earned through the use of bonuses and/or transfers (described below) for a total of 9:1.

Maximum Heights. Maximum heights for development in the Central City are set for the purposes of:

... protecting views, creating a step down of building heights to the Willamette River, limiting shadows on public open spaces, ensuring building height compatibility and step downs to historical districts, and limiting shadows from new development on residential neighborhoods in and at the edges of the Central City. (Section 33.510.205.A)

The maximum building height on Block U is currently 75 feet, with no option to earn additional height through bonuses or transfers, as shown on the existing Map 510-3 (1 of 3) reproduced on the following page (arrow points to Block U).

Thus, the 17,500 square foot site would accommodate up to 105,000 gross square feet of developable area under the base 6:1 FAR allowance. A building of this size would be inadequate for locating MCHD's activities as described above into a single location. In addition, the maximum height of 75 feet would make it difficult to achieve the allowed FAR on the site. It should be noted that heights step-down precipitously in this area, with a 350 foot height allowance immediately to the south of Block U.

Height and FAR bonuses and transfers. Section 33.510.210 of the Zoning Code identifies FAR and height bonuses available in the Central City Plan District in exchange for social and environmental benefits such as housing, funds for affordable housing, daycare, roof-top gardens/eco-roofs, public art, and bicycle parking and locker rooms. As part of the ongoing CC2035 Plan project, an update of the 1988 Central City Plan, the bonus system is under review and will be re-tooled to better fit the City's current policy objectives. While the new bonus system is still under development, City Council has directed the Bureau of Planning and Sustainability to focus its work on prioritizing affordable housing development, historic preservation, seismic upgrades and publicly-accessible open space.

In designated areas illustrated on Map 510-3, bonus height is linked to the earned FAR bonus (Section 33.510.210.D). For example, providing amenities that equate to a bonus FAR of at least 2:1, but less than 3:1, earns a height bonus of 30 feet in addition to the base height, because additional height is the only way to accommodate increased FAR. The maximum bonus height that may be earned is 45 feet.

In addition to the various FAR bonuses, additional FAR above the base allowance may be used on a site through FAR transfers described in Zoning Code section 33.510.200 and in applicable base zone sections of the code. These include transfers from sites with designated historic landmarks and single room occupancy hotels. These transfers also earn bonus height under section 33.510.210.D, with a limit of 45 additional feet earned through any combination of FAR bonuses and transfers.

Currently, Block U is not included in the area eligible for increased height identified on Map 510-3. Therefore it would be difficult to achieve greater development capacity through the bonus mechanism. Designated areas eligible for height bonuses are:

... located such that increased height will not violate established view corridors, the preservation of the character of historical districts, the protection of public open spaces from shadow, and the preservation of the City's visual focus on important buildings (such as the Union Station Clock Tower). (Section 33.510.210.D)

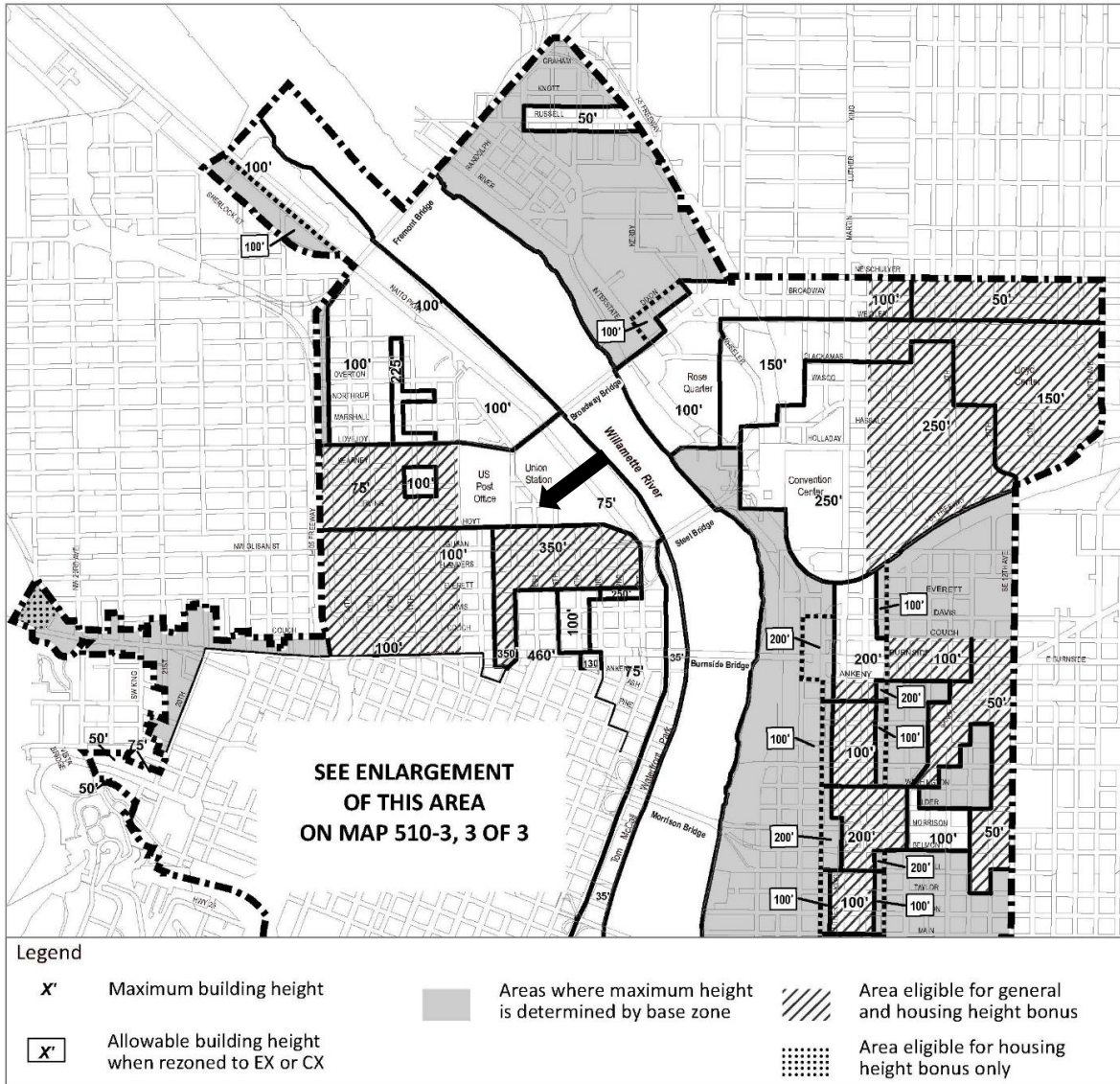
The existing restriction of 75 feet limits development on Block U quite dramatically relative to adjacent blocks. As illustrated in Map 510-3, the blocks immediately to the south of Block U have height limits that could result in buildings up to 350 feet.

Existing Maximum Heights

Map 510-3

Map 1 of 3

Map Revised March 1, 2015



III. Summary of ESEE Analysis: Views of the Union Station Clock Tower

The Draft Central City Scenic Resources Inventory to be released by the Bureau of Planning and Sustainability in April 2015 identifies the Union Station Clock Tower as a scenic resource. Because Block U is located near the Clock Tower, an Economic, Social, Environmental and Energy (ESEE) analysis was undertaken to evaluate the potential effect of the proposed MCHD structure on identified views of the Clock Tower. The complete ESEE Analysis is contained in Appendix A.

1. Identified Views

The following views of the historic Union Station Clock Tower were identified as significant relevant to the location of potential development on Block U¹:

- NW 6th Ave: A right-of-way policy adopted in 1982 identified the tower as a “visual focal point” from the “primary view corridor” along NW 6th Ave looking north. (View 1)
- East Bank of the Willamette – *The Scenic Views, Sites and Drives Inventory* identified a viewpoint from the east bank of the Willamette River on N. Thunderbird Way. (View 4)
- Views from the Broadway and Steel Bridges were identified in the *Central City Plan* urban design map. (View 3 and View 2)

For ESEE analysis, images were generated to illustrate potential building envelopes on the eastern half of Block U at 75, 105 and 150 feet from each of the identified viewpoints. These have been used to determine “conflicting uses” and the degree and nature of their potential adverse impacts on the preservation of scenic views of the Clock Tower.

As shown in the table below, the ESEE analysis determined that the use of the site consistent with the base zone and Central City Plan District regulations with maximum building heights of up to 150 feet creates minor conflicting uses when measured against protecting views of the identified scenic resource.

Conflicting Uses Associated with Various Maximum Building Heights on Block U

| Key Views | MAXIMUM HEIGHT | | |
|----------------------|----------------|---------|---------|
| | 75 ft. | 105 ft. | 150 ft. |
| 1. NW 6th and Glisan | None | None | None |
| 2. Steel Bridge | None | Minor | Minor |
| 3. Broadway Bridge | None | Minor | Minor |
| 4. N Thunderbird Way | None | None | None |

In the ESEE analysis, potential environmental, socio-economic and energy benefits are identified that would result from use of the site with greater building capacity, particularly if used for office or institutional use. The environmental analysis found minor impacts on the identified scenic resource, as

¹ Additional views of the Union Station Clock Tower were initially screened for potential impact from development on the subject site. It was determined that the subject site is located far enough away from the Clock Tower to have no impact on those views.

well as opportunities to mitigate for these impacts through the mandatory Design Review process and the provision of public amenities through bonuses and/or transfers.

2. Summary of ESEE Recommendations

Overall, the conflicting uses between a building of up to 150 feet in height on the undeveloped portion of Block U and preservation of scenic views of the Union Station Clock Tower are minor. Increasing the maximum building height to 105 feet has little effect on the prominence of the Clock Tower from identified viewpoints. Additional height up to a total of 150 feet, accrued through bonuses, increases the conflicts slightly, but is mitigated by the provision of socio-economic-, environmental- and energy-related benefits that fall within the scope of this analysis. The ESEE analysis recommended that the conflicting uses be limited by providing a maximum base height on the site of 105 feet and access to bonuses with a potential maximum of 150 feet of height. Building heights above 150 feet should be prohibited. This trade-off will retain the prominence of the significant scenic resource via a step-down in building heights, while allowing the benefits of greater development at this critical site in the downtown landscape.

3. ESEE Implementation Tools

The ESEE recommendation can be implemented through amendments to existing height regulations and the application of land use review procedures. The amendment of Map 510-3 of the Zoning Code will limit the base height on Block U to 105 feet. Forty-five feet of additional height may be earned through bonuses and/or transfers for a total maximum of 150 feet, with mitigation coming from provision of public benefits such as daycare, roof-top garden/eco-roof, public art, bicycle parking and locker room facilities, payments into an affordable housing fund, and/or FAR transfers from a historic landmark. As part of the recent West Quadrant Plan adoption process, City Council has directed the Bureau of Planning and Sustainability to focus its work in developing a new bonus system on prioritizing affordable housing development, historic preservation, seismic upgrades and publicly-accessible open space. The integration of any new building within established view corridors will be a component of the required Design Review, which would occur at the time a specific development proposal is submitted.

Image from ESEE analysis showing MCHDHQ facility at 150 ft. in relation to future development potential in the area and Union Station Clock Tower.

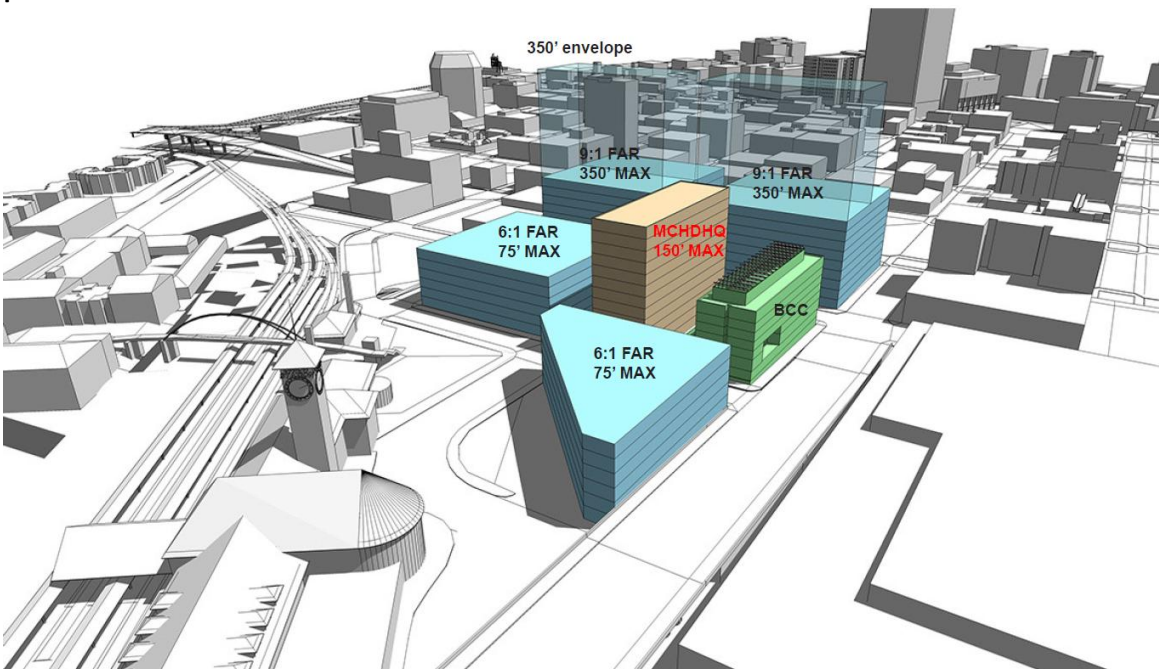


Image from ESEE analysis showing MCHDHQ facility at 150 ft. with view of Union Station along NW 6th Ave.



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IV. Proposed Amendment to Zoning Code Map 510-3

Commentary

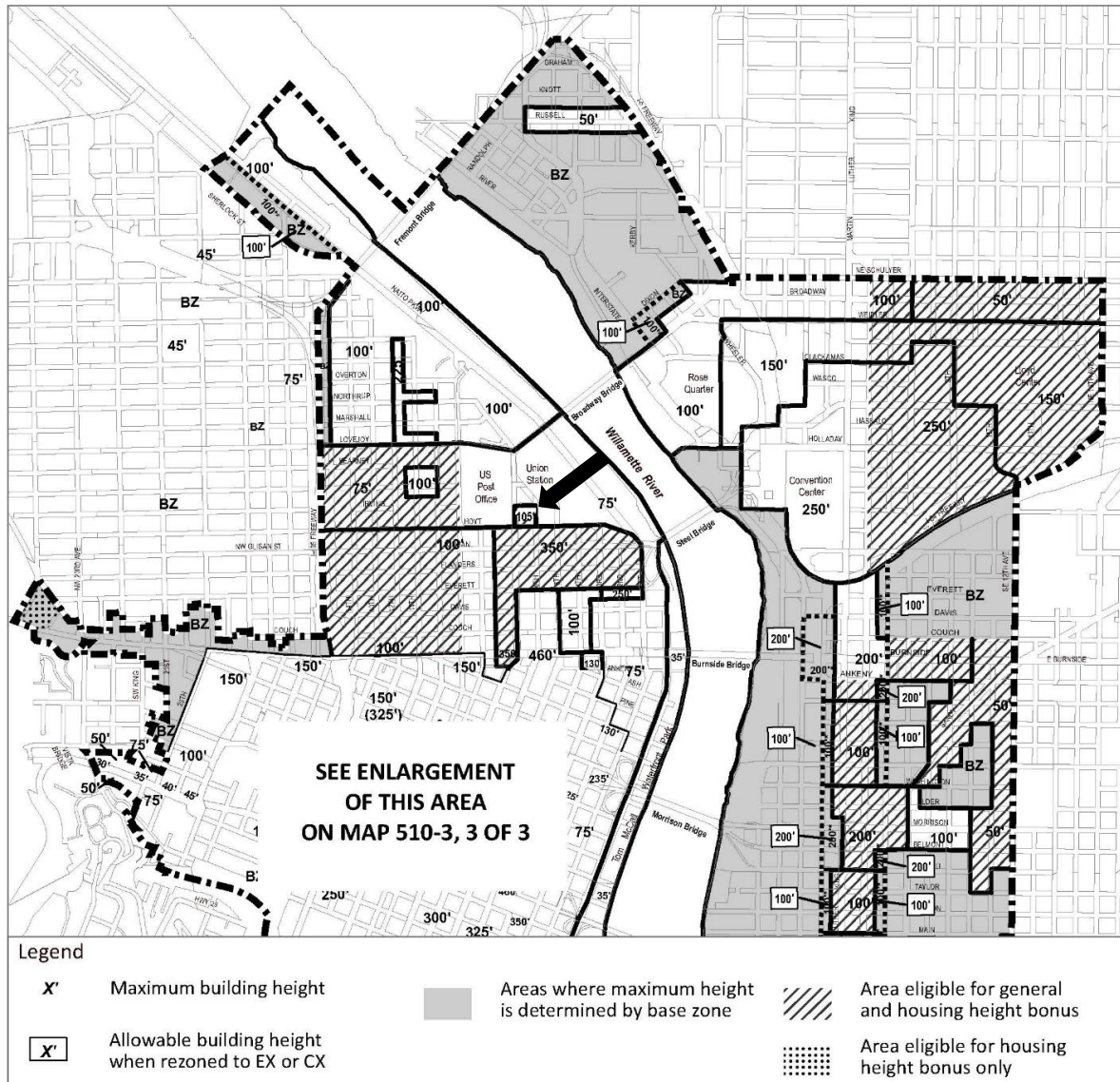
Two changes to Map 510-3, Maximum Heights of Zoning Code Chapter 33.510 are proposed. The amended map changes the maximum base building height on Block U, bounded by NW Broadway and NW 6th Avenues between NW Hoyt and NW Irving Streets, from 75' to 105'. It also adds Block U to the "Area eligible for general and housing height bonuses." This change will allow new development on the block to be built to a base height of 105' with the option of earning height bonuses of up to an additional 45'. Block U is indicated with an arrow, for identification purposes only.

Proposed Maximum Heights

Map 510-3

Map 1 of 3

Map Revised Xxxx X, 2015



**APPENDIX A: ESEE ANALYSIS FOR THE
PROPOSED MAP AMENDMENTS IMPACTING BLOCK U COUCH'S ADDITION
TO THE CITY OF PORTLAND**

April 1, 2015

1. INTRODUCTION

The purpose of this Economic, Social, Environmental and Energy (ESEE) analysis is to evaluate the trade-offs associated with different building envelope entitlements for Block U of the Couch's Addition in Old Town/Chinatown and their effect upon significant scenic resources. The ESEE Analysis informs the Portland City Council's decision regarding the proposed amendment of Map 510-3 of the Zoning Code.

This ESEE includes detailed descriptions of the issues that should be considered for each of the four topics: economic, social, environmental, and energy. The analysis explores the consequences of various building development standards that could have an adverse impact upon significant scenic resources identified in the City of Portland's Scenic Resources Inventory and Scenic Resources Protection Plan, printed separately and available online at <http://www.portlandoregon.gov/bps/article/89965> and <http://www.portlandoregon.gov/bps/article/359285>.

The ESEE is a qualitative decision-making tool that relies on existing information. Information is presented in narrative descriptions illustrated by massing and viewpoint studies which are appended to this document. For primary views, each of the six sections below describes the consequences of allowing, limiting or prohibiting conflicting uses and development allowances.

The final section includes a recommended decision that describes to what extent the different building envelope entitlements should be limited to protect significant scenic resources and provides programmatic tools that should be used to implement the decision.

1.a. Scope of This ESEE Analysis

This analysis looks at potential conflicts between allowing increased building envelope entitlements and protecting the scenic resource on the basis of economic, social, environmental, and energy consequences as required by the State of Oregon Administrative Rule for Statewide Planning Goal 5 (Natural Resources, Scenic and Historic Areas, and Open Spaces). This is accomplished by examining the uses and the proposed building development standards in the underlying zoning district to determine if they create a conflicting use, as defined by the administrative rule, which could adversely affect the identified scenic resource.

According to Goal 5, conflicting uses can be allowed despite the possible adverse impacts upon the scenic resource if the ESEE analyses "demonstrate that the conflicting use is of sufficient importance relative to the resource site, and must indicate why measures to protect the resource to some extent should not be provided" [660-023-0040 (5)(c)]. If the conflicting use and the resource are determined to be of comparable importance, then the conflicting use "should be allowed in a limited way that protects the resource site to a desired extent" [660-023-0045(5)(b)]. The ESEE Analysis may also determine that "the conflicting uses are so detrimental to the resource, that the conflicting uses should be prohibited" [660-023-0045(5)(a)].

1.b. Geographic Scope of the ESEE Analysis

The ESEE Analysis is being performed for Block U in the Old Town/Chinatown Neighborhood. Bounded by NW Broadway and NW 6th Avenues between NW Hoyt and NW Irving Streets, the west side of the block has recently been developed for the Bud Clark Commons, which for purposes of this ESEE analysis it is assumed will not redevelop in the foreseeable future. Block U lies within the Central City Plan District and is zoned Central Commercial (CX) with the Design (“d”) overlay.

1.c. Building Development Standards under Analysis

The proposal under consideration is to amend Map 510-3 of the Central City Plan District (Chapter 33.510) of the Portland Zoning Code to alter the development standards of Block U. Two categories of building development standard specified in Map 510-3 are proposed to be amended as follows:

- Increase the maximum base height allowance from 75’ to 105’.
- Include in the area eligible for general and housing height bonuses that would allow up to an additional 45’ of height, for a maximum of 150’.

As illustrated on Map 510-3, maximum height within the Central City is determined according to 33.510.205 for the purpose of:

...protecting views, creating a step down of building heights to the Willamette River, limiting shadows on public open spaces, ensuring building height compatibility and step downs to historical districts, and limiting shadows from new development on residential neighborhoods in and at the edges of the Central City. (33.510.205.A)

Also as illustrated on Map 510-3, height bonuses within the Central City are available in qualifying areas

...located such that increased height will not violate established view corridors, the preservation of the character of historical districts, the protection of public open spaces from shadow, and the preservation of the City's visual focus on important buildings (such as the Union Station Clock Tower). (33.510.210.D)

As shown on Map 510-3, there is a great disparity in potential building height in the vicinity of Block U. The blocks immediately to the south have a height limit with bonuses available that could result in buildings up to 350', considerably taller than the current maximum for Block U or that proposed by the map amendment.

1.d. Scenic Resources Related to Site Affected by Map Amendment

The development site, the eastern portion of Block U located at NW 6th Avenue and NW Hoyt Street in the Old Town/Chinatown Neighborhood, is ~400’ southwest of historic Union Station and is within the impact area for this designated scenic resource. Completed in 1896, the station has been a prominent landmark in downtown Portland for over a century. Due to the orientation of the station at an angle to the street grid, the station ‘faces’ downtown and its 150’ Clock Tower is aligned with NW 6th Avenue. In its 1989 Scenic Resources Inventory (SRI), the City recognized the tower as viewed from NW 6th Avenue as a “significant scenic resource”, identifying it as a primary feature of the Central City. Other views of

the tower from specific vantage points have been protected since the 1990 adoption of the Scenic Resources Protection Plan. These views were re-evaluated in 2000, resulting in updated regulations based on the *Union Station Clock Tower-related FAR and Height Limitations Study*. This analysis is the basis of the maximum heights and availability of FAR bonuses on Map 510-3. Currently the Bureau of Planning and Sustainability (BPS) is updating the SRI that forms the basis of current protections. This refinement of the Scenic Resources Inventory is in draft form, but provides an opportunity to re-evaluate the development restrictions in the immediate area.

1.e. Key Views Relative to Block U

The *Union Station Clock Tower-Related FAR and Height Limitations Study* (2000) provides an overview of policy and inventory documents that locate key views of the historic Union Station Clock Tower. Of these, the following are relevant to the location of Block U in the potential view-shed.

- NW 6th Avenue -- a right-of-way policy adopted in 1982 identified the tower as a “visual focal point” from the “primary view corridor” along NW 6th Avenue. (View 1, Figures 1-5)
- East Bank of the Willamette -- *The Scenic Views, Sites and Drives Inventory* identified a viewpoint from the east bank of the Willamette River on N. Thunderbird Way. (View 4, Figures 16-20)
- Views from the Broadway and Steel Bridges were identified in the *Central City Plan* urban design map. (View 3, figures 11-15 and View 2, Figures 6-10)

For this ESEE analysis, images have been created to illustrate the potential building envelopes at 75', 105' and 150', allowed by increasing maximum height with and without height bonuses, from each of the identified viewpoints. These have been used to determine “conflicting uses”, the degree and nature of adverse impacts of this expanded development capacity of the site on the preservation of the scenic views of the Clock Tower.

1.f. Brief Description of Multnomah County Health Department Headquarters

Although this ESEE does not consider a particular proposed use, the possible location of a new headquarters and clinic facility for the Multnomah County Health Department (MCHD) on the eastern portion of Block U immediately adjacent to the recently completed Bud Clark Commons building is used as an example of potential use of the site. Subject to design review approval, the new MCHD Headquarters would consist of approximately 120,000-150,000 gross square feet of building at 105'-150' in height. MCHD serves the 748,000 county residents and is the largest safety-net health care provider in Oregon with 33 primary care, school-based, dental and specialty clinics. This project will benefit the public by creating an efficient, centralized administration that includes the Department's leadership and additional services such as emergency preparedness and response for public health emergencies, the communicable disease program, specialty clinics, pharmacy and electronic medical records. The relocation will house up to 350 of the department's employees.

2. Conflicting Use Analysis

This ESEE Analysis considers conflicts between the range of uses available within the base zone with a generalized development built to the proposed amended development standards and the identified key views of the scenic resource.

2.a. Allowed Uses

As the site is zoned Central Commercial (CX), a wide range of uses is allowed by right within the Central City Plan District, which is intended to provide for intense commercial development with large buildings envelopes and extensive building coverage. Development on the site could include any combination of housing, retail, institutional, or office uses.

2.b. Conflicting Use Impacts

The allowed uses on Block U do not have a direct impact on the scenic resource, but the building resulting from the proposed development standards must be analyzed to determine the potential adverse impact upon identified key views of the Union Station Clock Tower. In turn, the determination of “conflicting uses” for the purposes of the ESEE analysis then include potential uses in the additional FAR made available by the proposed expansion of the building envelope. These scenarios can be separated into, 1) a base height allowance of 105’, and 2) access to an additional 45’ of height bonuses.

Potential conflicting uses are:

- Reduction in the visibility of the clock tower from an identified view corridor.
- Building height and mass next to or behind the clock tower that could make the tower less prominent.

The following Key Views are illustrated in the attached figures and a matrix is provided below that classifies whether the resulting building envelope constitutes a conflicting use.

View 1: NW 6th and Glisan. Because the Clock Tower is centered in the right-of-way, the view corridor as seen looking north up NW 6th Avenue is not altered by variations in the height of development allowed on the eastern half of Block U. As illustrated in Figure 2, the existing buildings in the foreground contribute to the view down NW 6th Avenue with mature street trees framing the Clock Tower in the distance. There is not a conflict in the proposed use at either 105' or 150' and in maintaining the primary view corridor.

View 2: Center of Steel Bridge looking Northwest. Any development on Block U will be prominent from this viewpoint, and increasingly so as the building height increases, but will not block the view of the Clock Tower. In the panorama shown in View 2, the additional height proposed for the site provides for a building that balances the tall towers either recently completed or under construction in the River District north of Union Station. The location of Block U in the foreground of the view provides adequate air space in and around the Clock Tower to preserve its prominence as viewed from this location. Any conflict between the use and the scenic resource is negligible at 105' and minor at 150'.

View 3: Center of Broadway Bridge looking Southwest. As shown in View 3, the additional height proposed, in proximity to the Clock Tower might make the tower less prominent, but would not exceed it in height at either 105' or 150'. Appropriate design of the facades could result in the building blending in with other downtown buildings in the background behind the tower; this could be assured through the required Design Review. There is minor conflict in the proposed use at both 105' and 150' in terms of the “scenic panorama”.

View 4: View from Old Thunderbird Site. In View 4, development on Block U appears to the left of the Clock Tower, but with sufficient distance to mitigate the effect on air space around the tower that could potentially make it appear less prominent. Since clusters of development and the West Hills already constitute the background, the view of the Clock Tower from this vantage point will not be in conflict with maintaining the scenic resource at either 105' or 150'.

Conflicting Uses

| Key Views | MAXIMUM HEIGHT | | |
|-------------------------|----------------|-------|-------|
| | 75' | 105' | 150' |
| 1. NW 6th and Glisan | None | None | None |
| 2. Steel Bridge | None | Minor | Minor |
| 3. Broadway Bridge | None | Minor | Minor |
| 4. Old Thunderbird site | None | None | None |

As shown in the figures and summarized in the table above, additional height, either 105' or 150', will not reduce the visibility of the Clock Tower from the key viewpoints. Therefore, for the purposes of this ESEE, the use of the site consistent with the base zone and Central City Plan District with allowable building heights up to 105' and 150' are minor conflicting uses when measured against maintaining the identified scenic resource.

3. Economic Analysis

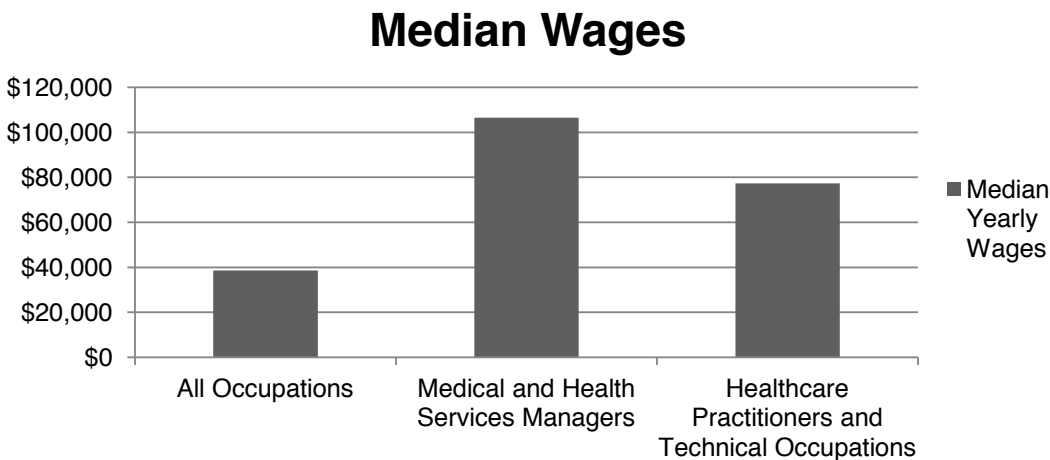
This section examines the economic consequences of allowing, limiting or prohibiting the previously - identified conflicting uses for Block U relative to protecting the Union Station Clock Tower, an identified scenic resource.

3.a. Development/Uses

- i. **Employment and Economic Services.** As the underlying zoning allows a wide variety of uses, the potential conflicting uses presented by increased development capacity has a variety of employment outcomes. If developed with housing, there is little effect on employment by limiting or prohibiting the conflicting use. However, if developed with retail, commercial, office or institutional uses, the reduced building capacity that results from limiting or prohibiting the uses will have a significant impact upon employment in the Central City. As a neighborhood adjacent to the Central Business District, Old Town/Chinatown has long suffered from fewer jobs than expected given its proximity to business activity, entertainment and transportation networks.

By way of example, the potential location of the Multnomah County Health Department Headquarters at this site would result in up to 350 administrative and health-care related jobs in the area. These are significantly better paying jobs than the regional average as shown in Table 1 below. Limiting or prohibiting the conflicting use would at a minimum reduce the number of jobs at the site, but also might result in the inability of a user to utilize the site because it lacks capacity to consolidate administrative and service-providing functions into a singular location.

Table 1: Median yearly wages by occupation class in the Portland-Vancouver-Hillsboro Area¹



ii. Economic efficiencies due to location. Designated for intense development, this site is located within a critical distance of the CBD-focused government, business and intuitional centers of activity that make additional building capacity for non-residential uses extremely beneficial . There are numerous economic benefits generated by the close proximity of commercial activities, institutions and industries. For client-focused industries such as medical clinics or retail uses, Block U is close to a variety of transit options – bus, streetcar and LRT -- and high-density housing would provide a significant locational advantage. On the other hand, limiting or prohibiting increased conflicting uses on Block U would reduce the potential economic benefits from these economic efficiencies and collaborative opportunities.

iii. Property values and rents. The conflicting uses accommodate additional building capacity that would increase property values and provide additional housing, retail, office or institutional space that would be rent- and property tax-generating. An increase in neighboring values and rents also could be anticipated. Limiting or prohibiting the conflicting uses would likely reduce this anticipated increase.

iv. Multiplier effect of development within district. If developed with housing, the increased proposed capacity would result in more residents in the Old Town/Chinatown District, in turn generating greater demand for nearby retail, social and entertainment services. For office and institutional uses, there is often a corresponding multiplier effect on job creation associated with economic stimulus and collaborative opportunities. For example, if the potential MCHD Headquarters was to be developed on the site, up to 350 employees would be relocated to the site that potentially would result in another 350 jobs created nearby. Given the downtown location and pedestrian-/transit-oriented nature of the built environment in Old Town/Chinatown, the concentration of jobs as a result of the multiplier effect similarly would be located in the Central

¹ Source: Bureau of Labor and Statistics. May 2013. *Metropolitan and Nonmetropolitan Area Occupational Employment and Wage Estimates*.

City. Limiting or prohibiting the conflicting uses would then necessarily reduce both the jobs directly created on the subject site as well as jobs in the area resulting from the multiplier effect.

3.b. Views and Tourism

In Portland, a significant amount of economic activity in the downtown neighborhoods is generated by tourism, and thus the protection of historic scenic resources is a critical component in maintaining a desirable and attractive Central City. As identified above, the primary view from NW 6th Avenue would not be affected by allowing additional building capacity on Block U. Other vantage points may be affected by the additional height allowances. However, these views are panoramic views of large portions of the Downtown and River Districts, with the West Hills as a backdrop. Regardless of the use of the building and its height at this location, proposed development will be subject to mandatory Design Review, which by its nature is concerned with aesthetics and scenic resources. Making the site eligible for height bonuses that accrue in exchange for the provision of such benefits as public art and water features would help to mitigate for conflicts that result from increased height.

4. Social

This section examines the social consequences of allowing, limiting or prohibiting conflicting uses for Block U.

4.a. Development/Uses

- i. **Employment.** The social benefits that accrue from an increased concentration of jobs within the Central City in proximity to transportation networks consist of reduced commute times, more opportunities for living close to work, more time for family and friends, and increased access to other entertainment and recreational opportunities in downtown Portland. As the building envelope expands, the potential for additional jobs on the site increases these social benefits. Limiting or prohibiting the expansion of the building envelope will, in turn, limit the accrual of these social benefits.
- ii. **Services provided and relationship to location.** Maximizing the intensity of development in locations well-served by Central City transit has been a cornerstone of multiple planning efforts including the current update of the Central City Plan. Providing workforce and affordable housing options adjacent to and within the Central City and/or creating new employment concentrations of office and institutional activities facilitate fuller use of transportation infrastructure in addition to increased opportunities to walk and bike. Additional activation of nearby retail, entertainment and related services would likely result from concentrations of workers at the site. Limiting the development capacity of these uses reduces the social benefits ascribed to increased density in the Central City, potentially increasing home-to-work commutes, and reducing recreation and family time.
- iii. **Security and safety.** Bringing up to 350 workers to this location would increase street level pedestrian activity and the “eyes on the street” that contributes to overall public safety by providing natural surveillance of the surrounding spaces. Additionally, many uses seek to control access to their buildings including housing, institutions or commercial users. Concentrating a variety of functions in a single building provides the opportunity for greater security in controlling access. For example, with enough building capacity, a large facility for MCHD can concentrate functions such as administrative offices, clinics and pharmacy on a single site, combining security

and access measures. Limiting the conflicting uses would reduce the building capacity and require institutions to disperse their functions across multiple structures potentially reducing security and safety for their employees and clients.

4.b. Views

- i. **Portland's imageability.** As a component of the broader panorama of Portland's skyline, allowing the conflicting uses above 150' could detract from the projected image of the building tower clusters that define the CBD from the River District and, in turn, from the South Waterfront District. Limiting the conflicting uses in buildings under 150' would allow such development to become an integral part of the cluster of buildings behind the Clock Tower that step up to greater heights as one moves southward. Limiting the uses to buildings below 105' would not result in a more defined image of the CBD, and could even create a more jarring transition from the lower building profile clustered around Union Station to the much taller buildings downtown.
- ii. **Historic and/or cultural importance.** Since its construction at the end of the 19th Century, Union Station has served as the north gateway to Portland's Central City. Situated astride the north end of NW 6th Avenue, the station served to connect train passengers to the local transportation network that brought visitors directly into Downtown. Thus, the Clock Tower defined the return route. As demonstrated above, limiting the conflicting uses to those that extend to only 150' will not block the view of the tower from NW 6th Avenue, so will not detract significantly from the cultural and historic importance placed on Central Station.
- iii. **Neighborhood Identity.** Although rail is no longer the predominant travel mode to Portland, it retains its historic and cultural importance, and, in so doing, defines the broader neighborhood as the scene of arrival. Even as many functions in the neighborhood have changed—for example, industrial and warehousing activities are no longer the leading activities—other historic activities remain. The neighborhood is still one of arrival, or stopovers, where services for those with few other options can be found. Its role as a node in various transportation networks is reinforced by the presence of the Bus Station and several LRT and streetcar routes that connect the Central City to outlying areas. Limiting the conflicting uses to buildings of 150' or less will not detract from the historic neighborhood identity as a transportation hub, and many uses that locate within the expanded building envelope would reinforce it. For example, creation of the MCHD Headquarters on Block U would continue the neighborhood's historic role of providing social- and health-related services to a broad component of Portland residents.
- iv. **Sense of place.** Union Station, with its distinctive Clock Tower, is historically designated, situated as it is at a critical juncture of the underlying street grid, giving it a distinct presence in the urban landscape. This sense of place is reinforced by the broad deference paid to the station by surrounding properties, which do not exceed the 150' Clock Tower, its highest element, in height and which are placed at some distance from its grounds. Limiting the conflicting uses on Block U would not detract significantly from the sense of place associated with Union Station.
- v. **Way-finding.** As a prominent view from many of the bridges over the Willamette River, the Clock Tower serves as a beacon in determining one's relative location within the west side of the Central City. Limiting the conflicting uses in buildings of up to 150' would contribute to this orientation role. The station's historic structure will continue to feature prominently in views as one approaches or moves through downtown even as nearby properties develop/redevelop.

- vi. **Air space.** As a prominent focal point from viewpoints in and around Downtown for more than a century, the Clock Tower is an important historical reminder of Union Station’s historic role and continuing presence in the urban landscape. Building height limitations in its immediate vicinity maintain sufficient views of the station from key corridors to retain its prominence as a scenic resource.

5. Environmental

This section examines the environmental consequences related to allowing, limiting or prohibiting conflicting uses for Block U.

5.a. Development/Uses

- i. **Efficiencies due to location.** Concentrating development activity in a location in the Downtown provides a number of environmental benefits related to creating efficiencies in transportation, building infrastructure, and heating and cooling. In contrast limiting or prohibiting the conflicting uses either limits the desirability of the site for redevelopment altogether or results in a limited amount of development that does not have the same level of efficiency. Additionally, it has often been suggested that the trade-off for protecting environmental resources within the Regional Urban Growth Boundary (UGB) is increased intensity of development in the Central City and other urban centers. Any reduction in the development capacity of Block U must necessarily increase development pressures in locations less ideally situated in the urban landscape.
- ii. **Heat Island.** The hard-scape of buildings in a predominately paved urban environment in combination with combustion engines and building heating and cooling systems create a net increase in ambient temperatures referred to as ‘heat island’. Potentially, a larger building with a larger, if more efficient, heating and cooling system will result in a larger contribution to overall heat island in the Central City. However, allowing the conflicting uses that result from access to building height bonuses would be more likely to result in buildings with green roofs that help to mitigate the heat island effect by limiting the reflectivity of roof-top surface materials. The required plantings actively cool the immediate environment through evapotranspiration.
- iii. **Stormwater.** Stormwater management is required of all new developments, but allowing the conflicting uses that result from access to building height bonuses would encourage the use of a rooftop garden that would also serve as a stormwater facility, slowing down and reducing the flow of rooftop-collected stormwater into the City’s stormwater system. Limiting or prohibiting the conflicting uses would reduce the incentives for providing rooftop stormwater management via an eco-roof.

5.b. Views

The following section discusses environmental components of the aesthetic experience of views.

- i. **Shadow.** Significant environmental consequence of allowing a larger building envelope include potential effects of shadow on neighboring properties, particularly designated open spaces. The nearest designated open space is more than 460’ from Block U (the North Park Blocks). Thus a 150’ building built on the developable portion of Block U would not diminish the experience of any designated open space. In addition, the long access of the proposed building is oriented north-south and the southern façade will be a maximum of 87.5’ in width, therefore the long shadows

created around the Winter Solstice will be very thin, falling largely on the parking lot adjacent to Union Station.

- ii. **Glare.** The proposed map amendment would increase the area of exterior building wall, that if clad in materials with high reflectivity could result in an increase in glare. These effects could be reduced by limiting or prohibiting the conflicting uses, but could be equally mitigated through the Design Review process that will mandate careful consideration of exterior materials in accordance with preserving scenic resources in the impact area.
- iii. **Wind tunnel.** Tall buildings in downtown locations often direct and funnel air currents creating a wind tunnel effect. In this location at the edge of the area of the central city where greater building heights are allowed, there would be little additional development of tall buildings that would reinforce the direction of air currents and affecting pedestrians in the area. This impact can also be addressed during the mandatory design review process.

6. Energy

This section examines the energy-related consequences from allowing, limiting or prohibiting conflicting uses for Block U.

6.a. Development/Uses

- i. **Efficiencies due to location.** Greater building capacity at a site such as Block U that is well-served by transit and near significant concentrations of jobs, services, and housing would increase energy efficiency. By way of example, the potential location of the MCHD Headquarters in this location would result in up to 350 administrative and health-care related jobs in the area, which are currently dispersed through the County. Co-locating these employees in single site provide a reduction in the amount of driving between job sites. Presumably, a similar efficiency would be created for clients who need to seek services and visit administrative offices in a single trip. Limiting or prohibiting the conflicting use would at a minimum reduce the efficiencies of concentrating a number of services at the site, but might result in the inability of a user to utilize the site because of the lack of opportunity to locate a number of a functions into a singular location.
- ii. **Construction and building materials.** Increasing building height and, therefore, building area on a site such as Block U increases the amount of building materials required but also maximizes the efficient use of structural elements and building services. Limiting or prohibiting uses in conflict with scenic views would reduce this efficiency.
- iii. **Heating and cooling.** Similarly, the economies of scale of heating and cooling a larger building result in greater energy efficiency. Limiting or prohibiting uses in conflict with scenic views would reduce this efficiency.

7. Recommendations

7.a. Recommended ESEE Decision

As demonstrated above, the conflicting uses between a building of up to 150' on the undeveloped portion of Block U and preservation of scenic views of the Union Station Clock Tower are minor.

Additional height, either 105' or 150' will not block or partially block the view of the Union Station Clock Tower. Increasing the building height to 105' has little effect on the prominence of the tower from identified viewpoints. The ability to accrue additional height through bonuses increases the conflicts slightly, but is mitigated by the provision of social, economic, environmental, and energy-related benefits that fall within the scope of this analysis. It is recommended that the conflicting uses be limited by providing a maximum base height on the site of 105' and access to bonuses with a potential maximum of 150' of height. Building heights above 150' should be prohibited to maintain the step down from larger buildings south of the site. This trade-off will retain the prominence of the significant scenic resource while allowing the benefits of greater development at this critical site in the downtown landscape.

7.b. Implementation Tools

The ESEE recommendation can be implemented using existing regulations and land use review procedures. The amendment of Map 510-3 of the Zoning Code will limit the base height of development on Block U to 105', with additional height bonuses creating the potential for greater height limited to 150' with mitigation coming from provision of a daycare center, rooftop garden and eco-roof, public art, funds for affordable housing, transfers from historic landmarks and/or locker room and bicycle parking facilities. The integration of any new building within the views from critical vistas throughout the downtown area will be a component of the required Design Review.

Referenced Documents

Central City Plan (1988)
Scenic Resources Protection Plan (Adopted 1990)
Scenic Resources Inventory: Central City (DRAFT – to be released April 2015)
Union Station Clock Tower-Related FAR and Height Limitations Study (2000)
Scenic Views, Sites, and Drives Inventory (1989)
Scenic Views, Sites, and Corridors (1991)
Encroachments in the Public Right-of-Way City-Wide Policy (1982)

Tables

Table 1: Median yearly wages by occupation class in the Portland-Vancouver-Hillsboro Area

Figures and Views (attached)

Figures 1-20: Views of Union Station Clock Tower: Existing and MCHDHQ at 75', 105', and 150'

- View 1: NW 6th and Glisan
- View 2: Center of Steel Bridge looking NW
- View 3: Center of Broadway Bridge looking SW
- View 4: View from Old Thunderbird site

Figures 21-23: MCHDHQ at 75', 105', and 150' in relation to adjacent development potential

VIEW CORRIDOR ANALYSIS

View 1: NW 6th and Glisan



Figure 1 / KEY PLAN



Figure 2 / EXISTING

Figure 3 / MCHDHQ @ 75'



Figure 4 / MCHDHQ @ 105'



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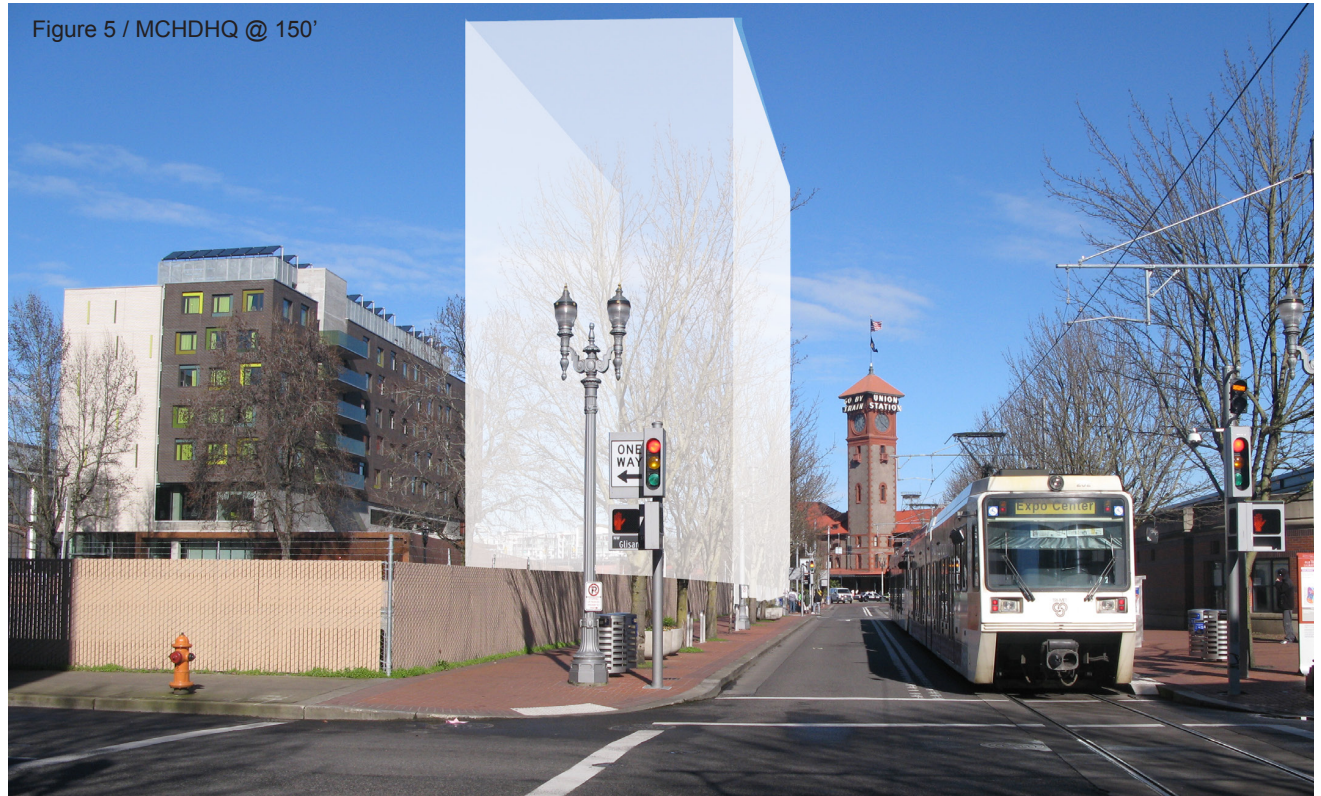
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View 1: NW 6th and Glisan

Figure 5 / MCHDHQ @ 150'



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View 2: Center of Steel Bridge looking NW



Figure 6 / KEY PLAN



Figure 7 / EXISTING

Figure 8 / MCHDHQ @ 75'



Figure 9 / MCHDHQ @ 105'



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View 2: Center of Steel Bridge looking NW

Figure 10 / MCHDHQ @ 150'



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View 3: Center of Broadway Bridge



Figure 11 / KEY PLAN



Figure 12 / EXISTING

Figure 13 / MCHDHQ @ 75'



Figure 14 / MCHDHQ @ 105'



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View 3: Center of Broadway Bridge



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View 4: Old Thunderbird Motel Site



Figure 16 / KEY PLAN



Figure 17 / EXISTING

Figure 18 / MCHDHQ @ 75'



Figure 19 / MCHDHQ @ 105'



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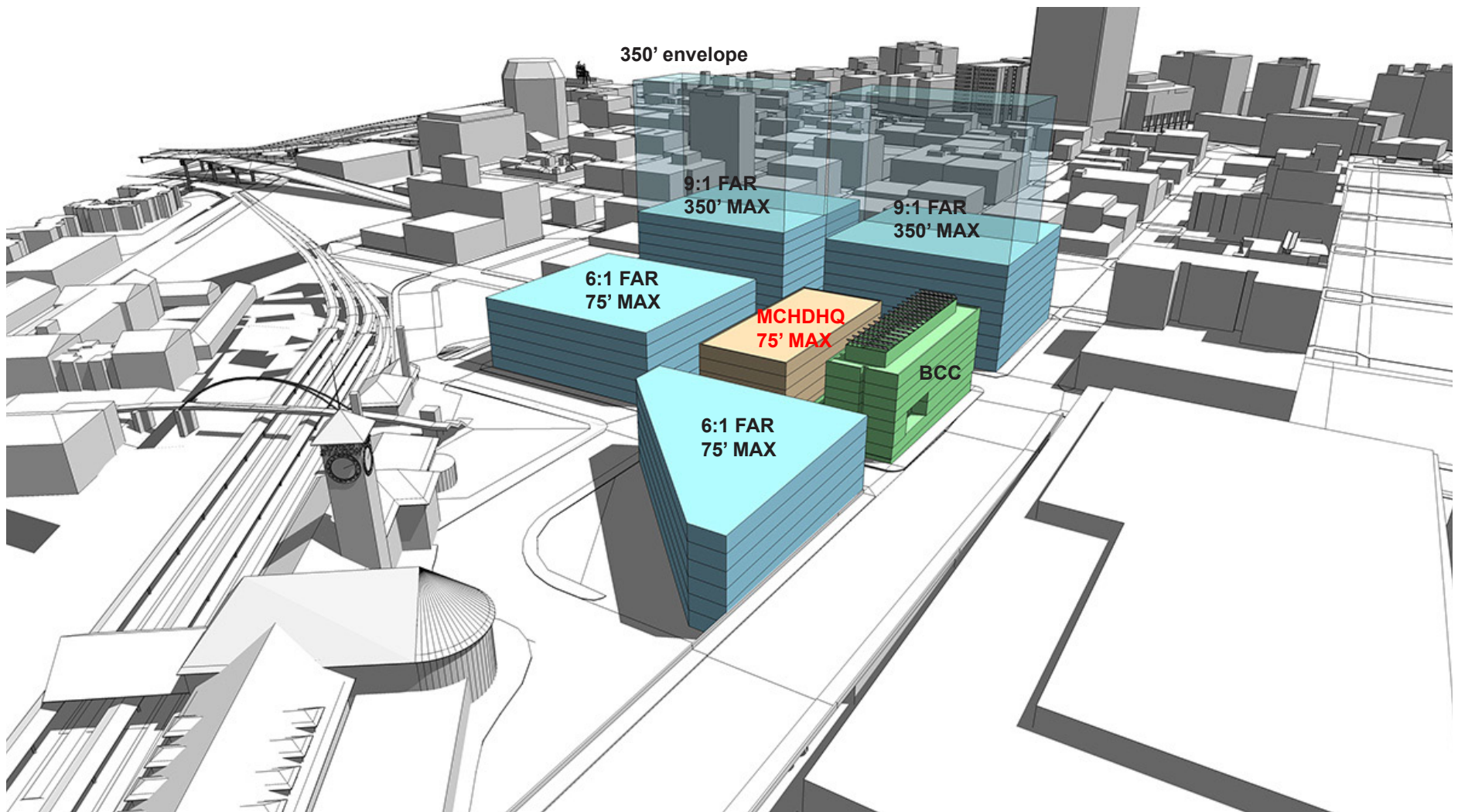
VIEW CORRIDOR ANALYSIS
View 4: Old Thunderbird Motel Site



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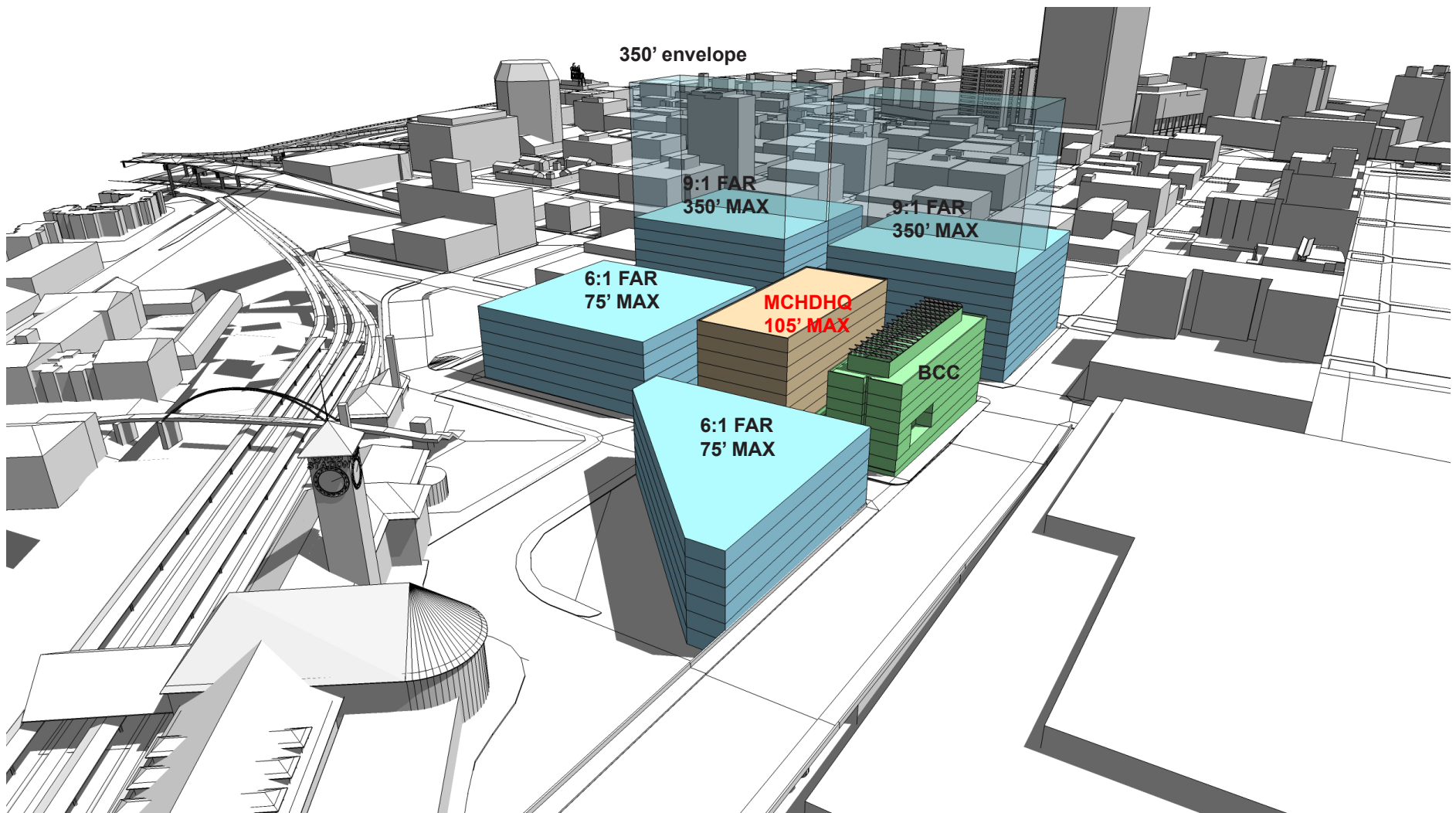
Figure 21 / MCHDHQ with 75' max height in relation to future development potential



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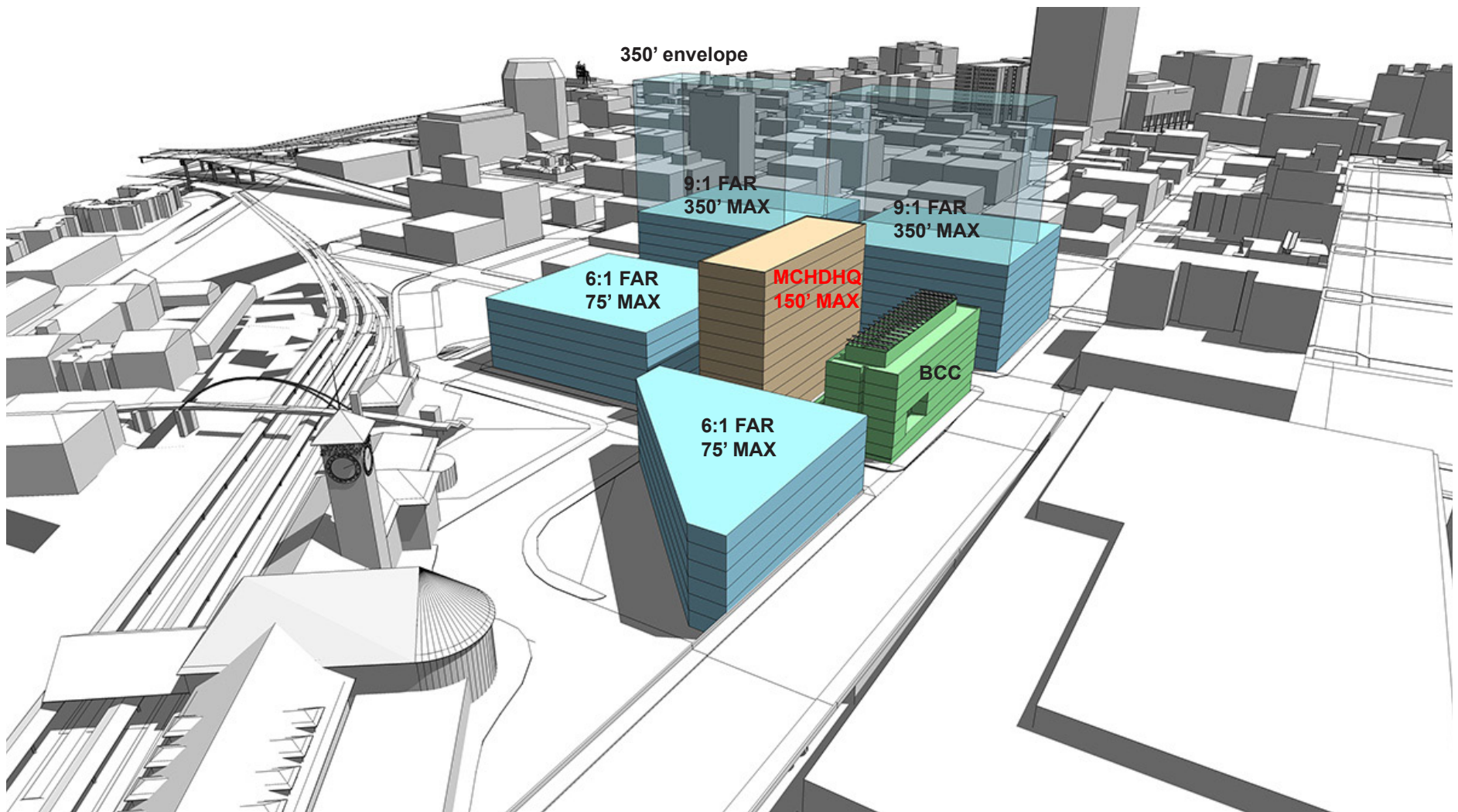
VIEW CORRIDOR ANALYSIS

Figure 22 / MCHDHQ with 105' max height in relation to future development potential



VIEW CORRIDOR ANALYSIS

Figure 23 / MCHDHQ with 150' max height in relation to future development potential



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