



IV. Design Program - Narratives

1.0 PRIOR PLANNING

A. Project Origination

This project originated with the desire to replace the historic Tacoma Armory with a new facility better suited for modern Army National Guard training. Need was underscored with the 2004 WAARNG Readiness Center Comprehensive Plan undertaken by the State of Washington Office of Financial Management (OFM) which recommended divestment of the existing Tacoma Armory and relocation of its housed units. Washington Army National Guard's (WAARNG) subsequent 2012 25-Year Statewide Facilities Plan again recommended divestment of the Tacoma Armory, and construction of a new Pierce County Readiness Center (PCRC). The assigned units vacated the Tacoma Armory in 2011 and the facility was sold to a private developer in 2013. Also in 2013, action by the United States Congress resulted in funding for the new Pierce County Readiness Center contingent on the Washington Military Department (WMD) executing a construction contract no later than September 30, 2014. The WMD selected Design/Build project delivery in response to this requirement. The funding legislation calls for 80 percent of National Guard Bureau-authorized project costs (not including land acquisition) to be reimbursed by the federal government.

The proposed project provides a modern regional training center that meets the multi-level training and operational requirements for the assigned Army National Guard units. It will be an efficient, technology-driven training facility that offers highly standardized and cost-effective training for the State Military Department. As a secondary function, the Pierce County Readiness Center will be available for community use on a rental basis, and function as an emergency response center and shelter.

This project conforms to WMD's 2012 25-Year Statewide Facilities Plan and represents the WMD's commitment to its new regional training facility model. The facility proposed herein fully conforms to the policies, goals and objectives established by this long-range planning document.

Building life expectancy is a minimum of 50 years.



2.0 BASIC CODE & REGULATORY REQUIREMENTS

A. Design Guides

The underlying regulatory governance establishing the authorization for National Guard readiness centers is Title 10, U.S. Code, Chapter 1803 "Facilities for Reserve Components." Facility program standards and requirements for National Guard Readiness Centers are established by the U.S. Army National Guard Bureau and are published in the following Regulations and Guidelines:

1. Design Guide (DG) 415-1, Army National Guard Readiness Centers Design Guide; 1 June 2011: Provides general design and functional planning requirements for readiness centers. See Appendices.
2. National Guard Pamphlet (NG PAM) 415-12, Army National Guard Facilities Allowances; 1 June 2011: Establishes minimum/maximum space allowances for specific National Guard units. See Appendices.
3. Modified Table of Organization & Equipment (MTOE): Establishes the specific organization of personnel and minimum equipment for each military unit including all units to be housed in the subject project. See Appendices.
4. Department of Defense Form 1390S/1391: Establishes broad project requirements for the specific readiness center project.
5. In turn, these publications reference other publications which regulate specific aspects of the planning, design, and construction of readiness centers [e.g. federal-level antiterrorism measures, progressive collapse requirements, and information security standards as identified through Unified Facilities Criteria (UFCs), Department of the Army Technical Instructions (TIs), and Army Regulations (ARs)]. Beyond these secondary publications, specialty disciplines have additional requirements as described elsewhere in this RFP.

B. Codes

Design and construction shall also adhere to the latest applicable codes, unless stated otherwise. Current applicable codes include:

1. 2012 International Building Code as adopted by 17C.20.010 of Pierce County Code
2. 2012 International Fire Code as adopted by 17C.60 of Pierce County Code
3. 2012 International Mechanical Code as adopted by 17C.40 of Pierce County Code
4. 2012 Uniform Plumbing Code as adopted by 17C.50 of Pierce County Code
5. 2012 National Electrical Code
6. 2012 International Fuel Gas Code
7. ANSI A17.1 - Safety Code for Elevators and Escalators
8. ICC/ANSI A117.1-2009 Accessible and Usable Buildings and Facilities
9. 2009 Washington State Energy Code (WSEC)



10. Washington State Ventilation and Indoor Air Quality Code

Upon request by the Owner or authorities having jurisdiction, the Design-Build team shall provide calculations supporting the design and the adherence to codes, regulations and requirements.



3.0 SITE NARRATIVE

A. Site Context

The Pierce County Readiness Center site is a previously-developed parcel at the heart of the 226-acre Camp Murray, formerly containing a Combined Support Maintenance Shop (CSMS) complex.

The site is directly accessible from the main gate of Camp Murray, which itself is directly accessed from the Berkeley Avenue/Interstate 5 interchange within the city limits of Lakewood. It is bounded by Infantry Drive to the north, 41st Division Way to the east, and Field Artillery Trail to the west. The site is presently bisected by Ordnance Corp Way. The south perimeter of the property abuts an irregular parcel under control of the Air National Guard. The PCRC development covers approximately 12.5 acres and includes adequate space for future development of a 140,000 gsf Joint Force Headquarters (JFHQ) on the east side of the site. The site is under the regulatory jurisdiction of Pierce County.

Demolition of the existing CSMS complex is underway and projected to be complete by May 1, 2014. Demolition work includes removal of all existing structures and paving including Ordnance Corps Way.





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1. Topography

The site in general slopes slightly to the south. The predominant site elevation is approximately 264 feet above sea level. A site survey conducted in preparation for CSMS demolition project is attached to this RFP. A revised survey showing utilities and topographic conditions at the conclusion of demolition work will be issued to all Finalists by addendum.

2. Climate

The site experiences climatic conditions typical to the south Puget Sound. Prevailing winds come from the south. Based on climate and solar access the preferred orientation for the readiness center structure is east-west with administrative functions oriented to the south.

3. Soils

Soil conditions on Camp Murray are well-documented. The soils that predominate consist of slightly silty, sandy, gravel and cobbles (alternatively described as extremely gravelly, sandy loam). This soil type is characterized by good drainage and bearing capacity. These soils will provide the minimum bearing capacity of 4000 psf. Test pits will be dug at the conclusion of CSMS demolition activities to verify soil conditions and infiltration capacity. The test pit results will be issued to all Finalists by addendum.

4. Environmental

According to the Pierce County GIS database there are no wetlands on the site.

The WMD has identified controlled or hazardous materials in various locations in the CSMS complex. The separate CSMS demolition contract (currently underway) includes abatement of all known controlled or hazardous materials. It is WMD's intent that this abatement work is completed by May 1, 2014, and that a letter of "No Further Action" will be issued prior to the start of construction of the PCRC. Nonetheless, the area comprising Camp Murray has seen active military use for well over 100 years and the successful D/B Contractor is expected to exercise due diligence during site operations.

5. Easements

A 16 inch AC waterline owned and operated by Joint Base Lewis McChord (JBLM) travels across the east edge of the site. As shown in the concept site diagram included in Part 5 of this RFP, the east side of the site is reserved for future development of a Joint Force Headquarters. Due to the probable JFHQ location with respect to standoff distances and parking lots, this easement is also not considered inhibitive of site development.

6. Historical/Cultural

In accordance with Governor's Order 05-05, the WMD has reviewed available documents and determined that the site is unlikely to have historic or archeological importance. The Department of Archaeology & Historic Preservation (DAHP) concurs with WMD's Determination of No Historic Properties Affected. In the event that



archaeological or historic materials are discovered during project activities, work in the immediate vicinity must stop, the area secured, and DAHP notified.

B. Architectural Site Context

Camp Murray’s building inventory exhibits a great variety of architectural styles with an equally broad range of design and construction quality. Buildings in the immediate vicinity of the project site are industrial in nature. In general, each structure on Camp Murray directly speaks to the design preferences of its time, budget, and use, without regard for any unifying theme.

Camp Murray contains two buildings of architectural significance, Building 1, which contains the WMD administrative headquarters, and Building 2, which now functions as a museum containing National Guard artifacts. Both are found in the historic core of Camp Murray due east of the PCRC site.



Building 1, Camp Murray



Building 2 (The Arsenal Museum), Camp Murray

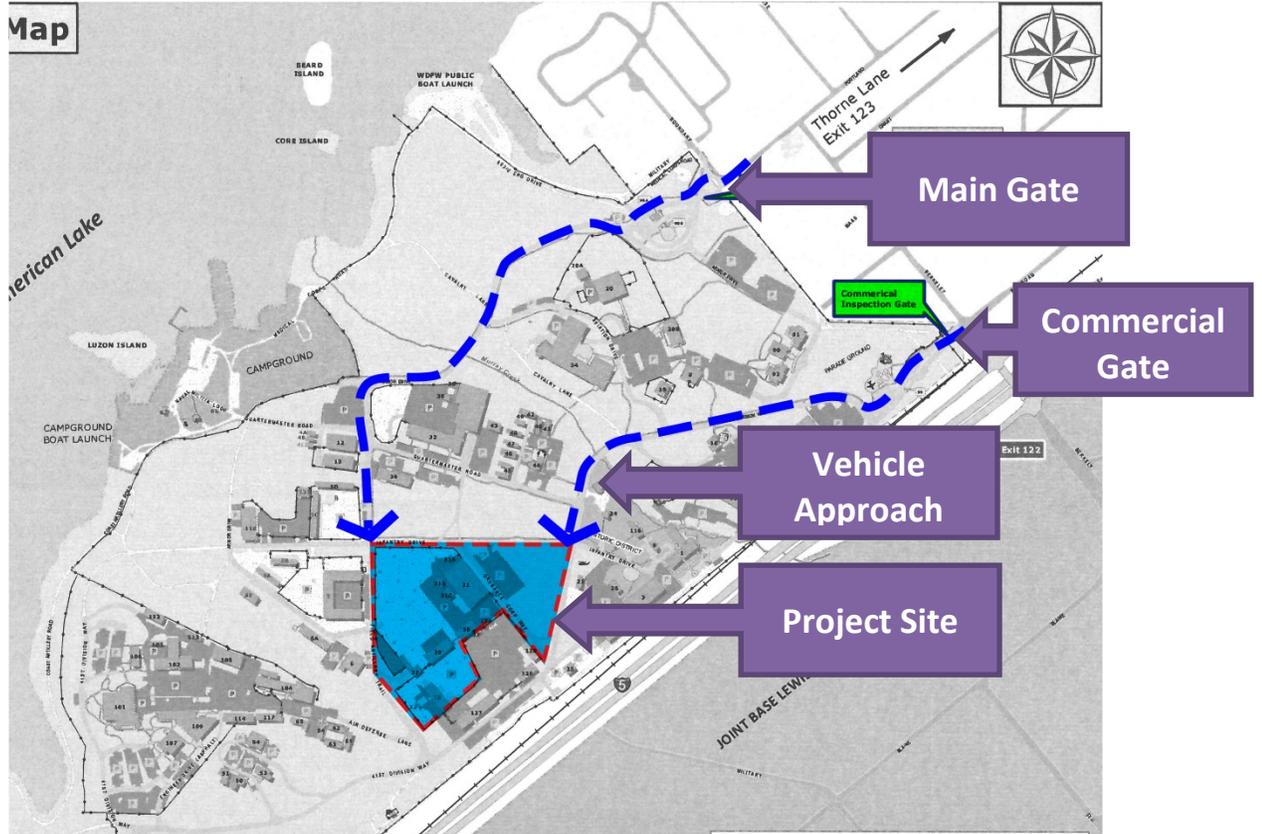
C. Site Design

1. The WMD has identified a number of preferences influencing development of the PCRC site:
 - a. Existing facilities to the south and west are industrial in nature. The primary facades of buildings to the east (comprising Camp Murray's Historic District and including Buildings 1 & 2), face away from the PCRC site, and those facilities to the east that are visible from the project site are surrounded by haphazard parking lots and driveways. The preferred public face of the PCRC is to the north, facing an existing wooded area. By contrast, the preferred location of back-of-house functions such as military vehicle parking, the unheated vehicle storage facility, and fuel dispensing are to the south and west.
 - b. The PCRC development must be compact with the goal of preserving as much of the eastern portion of the site as possible for future development of the Joint Force Headquarters. Compactness will require minimizing Conventional Construction



Standoff Distances which will directly influence – as a result of UFC 4-010-01 – allowable exterior wall/structure construction.

- c. Primary public access will come from the main gate via Field Artillery Trail. Commercial vehicles will come from the commercial gate via 41st Division Way.
 - d. AT/FP measures should be as unobtrusive as possible. The building should be welcoming both to the housed units and to visitors.
 - e. Site development must reasonably encourage pedestrian movement through central Camp Murray. Possible strategies include landscaped sidewalks and tie-ins to existing off-site pathways and amenities.
 - f. The facility must comply with the Washington State Military Department Design Manual and Standard as it pertains to site development standards.
 - g. The visual image conveyed by the building is defined by its architectural character as well as its site design. Site development requires an entry plaza at the primary building entrance suitably scaled for circulation, passive recreation, and events.
2. A predesign for this facility was conducted in Fall 2013 and its salient recommendations are reflected in this RFP. The predesign effort included a series of workshops with the units intended to be housed in the PCRC. These workshops included discussions of preferred site layouts including incorporation of the future Joint Force Headquarters. The site plan diagram included in Part V of this RFP resulted from these efforts and while the arrangements it portrays are not mandatory they are the result of due consideration.



Project Site Entry – Main Gate vs. Commercial Gate



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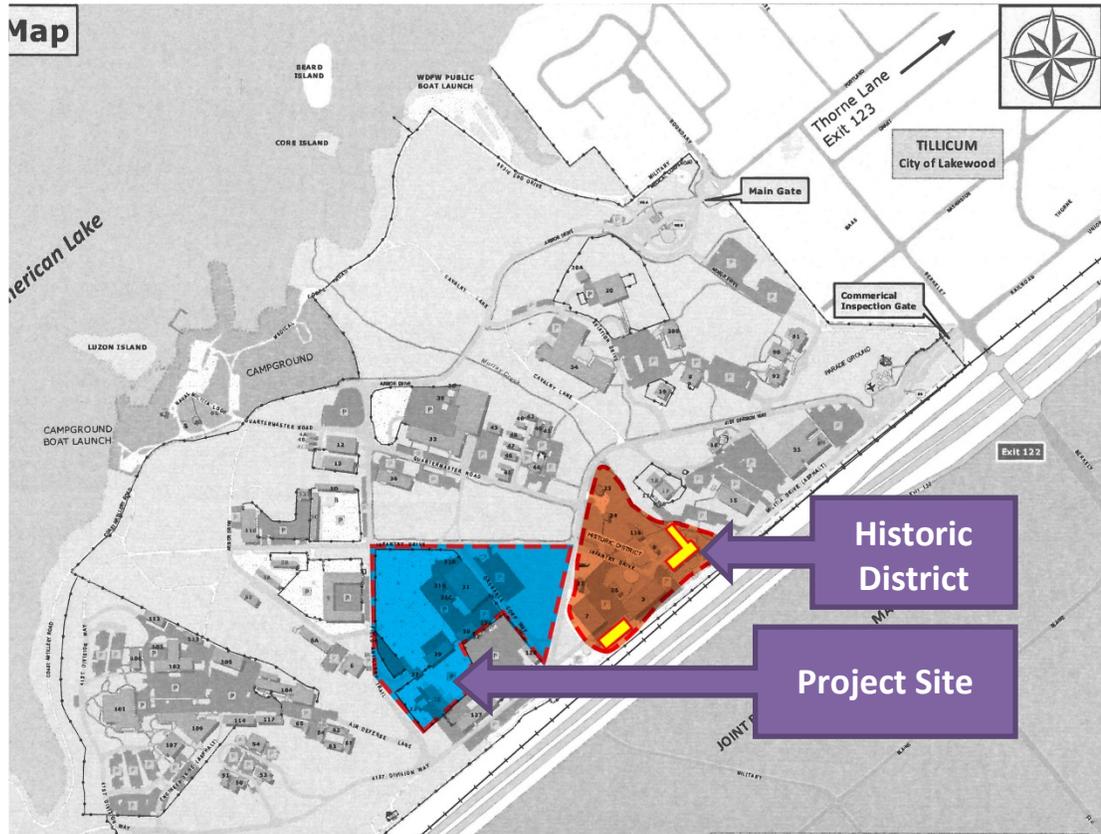


Project Site – adjacent wooded area



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Project Site – Historic District w/ Buildings 1 & 2



4.0 SUSTAINABILITY & LEED NARRATIVE

The Military Department and the National Guard are committed to creating high performance facilities that will ensure the optimal health and productivity of occupants and buildings users. They also support and will comply with all State of Washington LEED compliance mandates.

The Pierce County Readiness Center will be certified LEED Silver by the United States Green Building Council (USGBC) in accordance with Chapter 39.35d RCW “High Performance Public Buildings” and Department of Defense requirements. Sustainability was discussed in detail during an eco-charrette held during the programming process and the resulting checklist of targeted credits is presented in the Appendix of this RFP. The design/build team will be required to perform an eco-charrette during Schematic Design to further explore sustainability goals and opportunities. As the building design and construction progresses, additional credits may be identified for possible incorporation into the project. While not required, achieving LEED Gold certification may benefit the WMD in the long term provided it can be achieved without added cost; this is worthy of further discussion with the selected design/build team.

A. Architectural LEED

The facility will be designed and constructed to achieve LEED Silver certification under LEED 2009 BD+C. A preliminary eco-charrette was conducted with the housed units during the pre-design process in October, 2013. At this charrette, various strategies were discussed for achieving LEED Silver. It was WMD’s ultimate decision to permit the D/B Contractor to assume full responsibility for selecting and achieving the credits necessary for successful LEED Silver certification, with six exceptions:

1. The D/B Contractor must achieve the following optional credits:
 - a. EA-c3 – Enhanced Commissioning
 - b. EA-c5 – Measurement & Verification
 - c. IEQ-8.1 – Daylight and Views – Daylight
 - d. IEQ-8.2 – Daylight and Views - Views
2. The D/B Contractor must NOT achieve the following optional credits:
 - a. WE-c2 – Innovative Wastewater Technologies
 - b. IEQ-c6.2 – Controllability of Systems

The successful Finalist is expected to conduct a follow-up eco-charrette early in the design process.



For use in determining LEED strategy, Finalists should note that the building site qualifies as a brownfield to the extent necessary for achieving credit SS-c3, and that WMD buys green power to the extent necessary for achieving credit EA-c6 – Green Power in its entirety.

Importantly, the WMD views its commitment to sustainability – which it expects its D/B Contractor to uphold – as more than a collection of LEED credits. Fundamental to WMD’s conception is that its facilities be:

1. planned to work with, not against, nature;
2. timeless, simple, durable, and flexible to assure long life without the need for significant capital, maintenance, and operations expenditures;
3. designed to foster occupant well-being.

The Military Department conceives these sustainable principles not just as secondary add-ons but rather as strong design elements that reveal the agency’s environmental commitment while creating aesthetic delight and operational efficiencies. Strategies include abundant use of controlled natural light, preference for locally-sourced materials such as concrete block and brick, native and drought-tolerant plantings, robust well-insulated and – sealed exterior wall and roof assemblies, and highly efficient mechanical and lighting systems.

B. Landscape LEED

1. The use of plant material on the site promotes the sustainability of the project. The irrigation system shall promote sustainability.

C. Site / Civil LEED

The following is a list of site / civil LEED credits that were considered achievable during the pre-design eco-charrette.

1. SS Prereq 1 – Construction Activity Pollution Prevention – the civil site plans and specifications will include an erosion control plan and Stormwater pollution prevention plan as standard protocol to address and achieve this required item.
2. SS6.1 Stormwater Design – Quantity Control – the site is located in an area that contains well-draining soils. Based on our current understanding of the site soils the runoff from the entire site will be able to be infiltrated onsite. Infiltration of the site runoff will achieve this point.
3. SS6.2 Stormwater Design – Quality Control - the site is located in an area that contains well-draining soils. Based on our current understanding of the site soils the runoff from the entire site will be able to be infiltrated onsite. Infiltration of the site runoff will



achieve this point since infiltration will satisfy the requirement to treat all of the site's impervious storm runoff.

D. Mechanical LEED

The Design-Build proposer shall incorporate a sensibly sustainable design for the new facility. The Design-Build proposer should submit a design and design options for a building that cost effectively conserves energy and water. The project must achieve, at minimum, LEED Silver certification. The contractor is responsible for providing all required LEED paperwork and submission.

Design the Building Envelope, Lighting, other end use systems, and HVAC to maximize Building Operations, Maintenance and Energy Performance. At a minimum, the project should be designed to achieve a required minimum energy savings of 20% energy use (kBtu) over Washington State Energy Codes in effect at the time of project permitting, in addition to the LEED Silver Certification requirements including a minimum 5pts for EA Credit 1 for a 20% energy cost (\$) savings.

The Building Performance Criteria will be established in accordance with LEED-NC 2009, EA, Credit 1, Optimize Energy Performance, Option 1, Whole Building Simulation achieving a minimum required 5pts for a total of 20% energy cost savings. Resultant savings shall be analyzed for proposed design as compared to ASHRAE standard 90.1-2007, which establishes minimum requirements for Energy Efficient Design of Buildings for LEED EA Credit 1.

E. Electrical LEED

1. Provide lighting controls to meet LEED requirements.
2. Review lighting design options that reduce the lighting watts per square to various levels below energy code.
3. Provide a lighting design that minimizes offsite glare.
4. Provide cut-off fixtures outside, but also keep in mind any campus standard fixture.
5. Provide electric car charging stations as required by the LEED checklist. Stations shall be compatible with all Electric Vehicle Supply Equipment (EVSE) Standards and Recommended Practices, including SAE J1772 NEC 625, UL 2231 and UL 2594. Provide 40 amp, 208 volt, single phase systems. Enclosure shall be rated NEMA Type 4 Watertight. Also provide 20 amp, 120 volt receptacles with dedicated circuits at each designated parking stall.

F. Lighting LEED



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Energy usage for lighting will target a 30% improvement over ASHRAE 90.1 2007, which is the baseline for LEED 2009 documentation. Should the credit for Sustainable Sites SSc8 be pursued, no light may trespass beyond the property line. Low mercury lamps may be used to achieve additional credit but only one manufacturer produces a product that meets the requirements (Philips). Enhanced controls may be considered in executive offices as well as open office areas.



5.0 ARCHITECTURAL NARRATIVE

A. Architectural Design: Overarching Criteria

The WMD views development of the Pierce County Readiness Center, and the future Joint Force Headquarters facility with which it will share a site, as an opportunity to establish a design and quality standard for Camp Murray. With that goal in mind, the WMD has established architectural requirements and preferences for consideration by the Finalists. The following shall be considered in the development of concept and design work:

1. Provide a modern, functional, and efficient facility that nonetheless:
 - a. Respects the architectural style, scale, and spatial structure of the historic buildings on Camp Murray;
 - b. Reflects the traditions of the Army National Guard; and
 - c. Expresses the armory/readiness center typology.
2. Design of the primary facility's public face and its related site elements should form an organic whole and convey a sense of strength and formal design rigor. While overt reference to the architectural styles of historic Buildings 1 and 2 is not preferred, aspects of the architectural qualities of these historic district buildings and in particular Building 1 including (a) careful balance of vertical and horizontal elements, (b) texture and rhythm defined by repetitive, deeply recessed fenestration and other openings, (c) celebrated primary entries, (d) close integration of landscape elements, and (e) clear hierarchy of scale from the global to the human, are very much preferred.
3. Upon completion of the future Joint Force Headquarters, which as an addition to the Pierce County Readiness Center is expected to more than double the PCRC's size, the combined facility will serve as the administrative heart of not just Camp Murray but the statewide Washington Military Department. The PCRC must reflect the programmatic significance of this future project.
4. At the same time, predominant development within the site vicinity is small-scaled. Understanding that a facility as large as the PCRC has potential to overwhelm its neighbors, the most appropriate design response may be to utilize techniques that reduce the building's apparent scale.
5. The future JFHQ is intended to share the Lobby, Assembly Hall, Kitchen, and possibly the Physical Fitness facilities of the PCRC. These functions must be located in direct or close proximity to the location designated for the future addition in the site plan diagram in Part V of this RFP. In particular, the PCRC Lobby will function as the future JFHQ lobby and this must be accommodated through the quality of its design and construction, through its scale, and through its location.
6. Based on predesign workshops with the housed units, and other project goals such as compactness and generous access to natural light, the WMD prefers a three story



solution. Floor plan diagrams, developed during predesign workshops and included in Part V of this RFP, demonstrate – without mandating a specific solution – preferred locations and adjacencies of various building functions.

7. The facility must comply to the extent applicable with the Washington State Military Department Design Manual and Standard Specifications. Please note that this document does not anticipate construction on the scale of the Pierce County Readiness Center, and that aspects of the standards – such as preferences for wood and stucco siding and pitched roofs – may be inappropriate for the PCRC. Design solutions used at recent WMD readiness centers at Yakima, Bremerton, Spokane, and Joint Base Lewis McChord, adapted to the Camp Murray color and texture palette, are preferred.
8. WMD prefers that occupied interior spaces receive natural light wherever possible. In spaces not permitted to have traditional window openings, this may include appropriately protected skylight assemblies. In private offices within open administration suites, this may include borrowed lights with views to shared windows. That windows be operable is similarly preferred.
9. WMD expressively prohibits any exterior wall assembly system that relies for its water resistance on the exterior face of the assembly. Examples of prohibited exterior wall assemblies include single wythe masonry and EIFS.
10. Consider that one face of the building have a more refined “public face” and the “back of house” be more utilitarian.
11. Evaluate the opportunity for framing or establishing vistas, axis and views into, through and from the site.
12. Concepts shall reflect a hierarchy of formal/ceremonial to utility functions. This hierarchy shall be addressed in both exterior and interior spaces.
13. Consider the various approach sequences to the project site and building; specifically from the Main Gate and Commercial Gate.
14. Shared use spaces such as conference rooms and elevator lobbies that may be accessed most often by visitors should present a positive, welcoming image.

Detailed discussion on tenant needs, access, layout, organization and other functional issues is summarized in Section V. Design Program – Space Program, Room Data Sheets, Drawings and Diagrams.

B. Building Exterior / Interior Finishes, Materials and Furnishings

Materials and finishes should be robust and of good quality, contributing to an overall appearance of strength without extravagance.



Materials and finishes should reflect the variety of functions performed in this facility and take into consideration characteristics such as durability, ease of maintenance, appropriateness, and sound transmission.

Throughout the facility, materials, finishes and furnishings should reflect project and WMD sustainability goals in terms of material choices, means of assembly, location of manufacturer, etc.

Open offices areas will be furnished with both conventional office furniture and a component furniture system. Furnishings will be WMD's responsibility, but coordination with the overall building design, utilities and communications is required.

All materials, finishes and furnishings shall meet life-cycle cost analysis standards and established sustainability goals. Building life expectancy is a minimum of 50 years.

The following is a partial list of preferred architectural finishes and material systems:

1. Exterior Enclosure

a. Primary Façade:

Institutional-grade construction, with double wythe masonry or similar robust construction indicative of a significant public building. Veneer shall at minimum consist of concrete or concrete masonry units with preference for brick at major public programmatic elements. Prefinished steel metal panels with Kynar-type coating is acceptable as an accent material. Wall assembly must include infiltration and vapor barriers, drainage pathways to discharge moisture to the outdoors, and insulation required to meet energy code and performance objectives.

b. Secondary Façade:

Same as primary façade, but other than a masonry or concrete protective wainscot a higher percentage of prefinished steel metal panels with Kynar-type coating and concealed fasteners or equivalent is acceptable.

c. Windows:

Extruded aluminum thermally-broken frames, with fixed and operable sash sections. Extended flange for blast protection. Color- or clear-anodized aluminum finish. Clear insulated low-E glass, with laminated inner pane for blast protection.

d. Storefront/Curtain Wall:

Extruded aluminum thermally-broken frames. Extended flange for blast protection. Color- or clear-anodized aluminum finish. Clear insulated low-E glass, with laminated inner pane for blast protection. Safety glazing where required. Main entrance doors at storefront to be medium-stile standard aluminum with concealed closers and custom pulls glazed with low-E glass, with laminated inner pane for blast



protection. ADA automatic push button operators are required at one leaf at primary entries.

e. Hollow Metal Doors and Frames:

Typical exterior personnel doors to be minimum 16-gauge insulated flush galvanized hollow metal with 14-gauge frames, solid grouted. Frames and hinges wired for access control systems. Field-applied paint to be spray-applied only.

f. Overhead Doors:

Motor-operated, overhead sectional panels with insulated 16-gauge steel curtain. Field-applied paint to be spray-applied only. Sizes as follows:

i. 14' high x 16' wide @ Assembly Hall, Unheated Vehicle Storage & General Purpose Training Bay

ii. 8' high x 8' wide @ Unit Storage & Maintenance

g. Exterior Hardware:

Heavy-duty, commercial-grade, lever-handle cylindrical locksets, satin chrome finish, ADA compliant, with "Best" removable cores keyed to Military Department standard keying system. Exit devices on primary entrances and at all doors required by code. Integrated with access control system.

2. Roofing

a. Low Slope (1/2 inch/ft minimum):

60 mil minimum TPO single-ply membrane, 20 year system warranty. At exposed interior roof decking at public areas, including the Assembly Hall, either fully adhere roofing system or control screw penetrations both in spacing and alignment. Provide polystyrene (Type IV minimum) insulation required to meet energy code and performance objectives.

b. Pitched Roofs:

Mechanically-locked standing seam metal panels with no exposed fasteners, 22-gauge minimum prefinished metallic-coated steel sheet metal panels with Kynar-type coating. Provide polystyrene (Type IV minimum) insulation required to meet energy code and performance objectives.

c. Skylights:

Aluminum-framed skylights or monitors. Color- or clear-anodized aluminum finish. Clear insulated low-E glass, with laminated inner pane for blast protection. Locate to minimize energy use.

To reduce dependence on electric lighting, provide factory-assembled commercial-quality tubular skylight assemblies, Solatube or equal, in select spaces not adequately served by natural light.



3. Interior Construction

a. Partitions:

All walls are to be constructed full height to structure above.

At ground floor bearing walls and non-bearing walls requiring abuse resistance, provide grouted concrete masonry units. At upper floors requiring abuse resistance, such as corridors, provide grouted concrete masonry units or veneer plaster on metal studs.

For non-bearing walls not requiring abuse resistance, provide 5/8-inch minimum Type X gypsum wallboard on metal studs. Provide acoustic batt insulation at all private offices, classrooms and conference rooms. Provide veneer plaster at all exposed framed wall surfaces in toilet and shower rooms and corridors. Provide fiberglass-mat-faced gypsum wallboard with water-resistant core at wall surfaces receiving ceramic tile.

Vaults will be 8-in cast-in-place concrete with double-mat reinforcing steel per NGB criteria, see AR 190-11 Physical Security of Arms, Ammunition & Explosives.

b. Interior Doors:

Minimum 18-gauge full flush hollow metal door in 16-gauge welded hollow metal frame, solid-grouted. Include transom or sidelights to provide daylight and views to spaces without windows.

Interior wood doors shall be solid core & FSC certified.

Vault doors to be Class-V security type without day gates..

Provide acoustic isolation doors at Training / Simulation room.

SIPRNET room doors – Lockmaster LKM7003A – see appendix 2 F

c. Interior Hardware:

Heavy-duty, commercial-grade, lever-handle cylindrical locksets, satin chrome finish, ADA compliant, with “Best” removable cores keyed to Military Department standard keying system. Exit devices and surface-mounted closers at all doors required by code. Integrate exterior doors with access control system. Kick plates at all doors with closers. Low energy automatic operators on all doors to high-traffic public spaces.

At 22 locations, provide key pad cypher locks in lieu of typical cylindrical lock.

Hardware at SIPRNET room doors is integral to door - Lockmaster LKM7003A – see appendix 2 F

d. Interior Glazing:



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Fire-rated glass or safety glazing in hollow metal frames with steel stops at rated walls.

4. Flooring
 - a. Exposed Concrete:

Exposed slab with clear liquid hardener/sealer at most locations. Provide pigmented dry-shake floor hardener at assembly hall and vehicle training workbays.
 - b. Tile Flooring:

Provide porcelain or terrazzo tile at primary lobby.
 - c. Carpet:

2-foot-square nominal carpet tile with recycled-content backing in offices and classrooms.
 - d. Sheet Flooring:

At support spaces and upper level corridors, with heat-welded seams. No vinyl permitted.
 - e. Epoxy:

Liquid-applied, at kitchen and kitchen support spaces. Provide embedded quartz granules for slip-resistance.
 - f. Base:

Rubber: 4-inch rubber top set at all non-tile floors. Provide tile base at tile floors.
 - g. Raised Floor:

Low profile raised access floor at Training Simulator
5. Walls
 - a. Painted:

2-coats over primer or block filler. Provide architectural best grade satin-sheen acrylic enamel except semi-gloss at toilet rooms and building maintenance rooms.
 - b. Ceramic Tile:
 - c. Glazed tile to 5 feet at all toilet rooms, full height at showers.
6. Stairs and Railings:
 - a. Stairs:

Steel stairs system, with sealed precast concrete treads/risers with anti-slip inserts.
7. Ceilings:
 - a. Acoustic Tile:

At administrative office spaces and classrooms, 2-foot-square non-rated fine-textured acoustical tile with a tegular edge in a 9/16-inch suspended metal grid.



Mylar-coated scrubbable acoustical tile on 15/16-inch grid in kitchen and associated support spaces.

b. Gypsum Wallboard:

Water-resistant horizontal-grade gypsum wallboard on suspended metal framing at toilet and shower rooms.

c. Exposed Structure:

Where no ceiling is provided, paint exposed steel structure, ducts and conduit.

8. Specialties:

a. Toilet Accessories:

Surface-mounted, stainless steel accessories consisting of dispensers for soap (one per lavatory), toilet seat covers; receptacles for napkins; grab bars (one set per accessible toilet); and one mirror (24 inches x 48 inches) per lavatory. Provide Dyson Air Blade or World Dryer Vmax hot air hand dryers. Provide two large capacity toilet paper dispensers for each toilet.

b. Toilet Partitions:

Ceiling-mounted HDPE or similar.

c. Signage:

Plastic interior signage with room names and numbers with raised letters, numbers, and Braille. Signage system includes: Building directory and maps with removable inserts, room identification, and dedication.

d. Fire Extinguisher Cabinets:

Recessed cabinets with stainless steel finish, glass doors, and cast "Fire" handle at 100 feet maximum spacing.

e. Casework:

All casework to be modular. At each classroom provide podium for instructional media. At workrooms and coffee stations provide upper and lower cabinets.

f. Architectural Casework:

Architectural casework to be utilized for trash and recycling collection stations, display cases, and shelving.

g. Marker boards:

Dry-erase marker board with lifetime porcelain enamel finish, cork map rail, map hooks and chalk tray. Marker boards to have 4-feet by 8 feet module.

h. Tack boards:

Tackable linoleum surface, 4 feet by 4 feet, at each classroom. Provide 8 feet by 4 feet in workrooms and corridors.

i. Projection Screens:



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Motor-operated, 8-foot wide tensioned screen format. Provide one per classroom and conference room unless otherwise indicated. Integrate into framed ceiling soffit.

j. Window Treatment:

Manual roller shades in the offices and classrooms. 90 percent shade except 95 percent at classrooms. Provide complete valence or pockets.

k. Acoustic Panels:

Abuse-resistant, Class A fire-rated. Provide at assembly hall and as required for acoustic control.

l. Entrance Mats:

Minimum two-zone system comprised of exterior recessed slip-resistant stainless steel foot grilles and interior recessed walk-off mats. 12 lineal feet path of travel minimum.

m. Corner Guards:

Stainless steel, for use at all outside corners in kitchen and associated support spaces.

n. Lockers:

Large lockable, all-welded, ventilating lockers sized for storage of personnel equipment, field gear, etc. Lyon 2 Tier 1100TA50 or equal.

C. Public Art

As a State of Washington project, funds have been reserved for public art at the PCRC. While the D/B Contractor will not participate in artist selection, the public art process thrives when the objects are genuinely integrated into the facility. To that end, the D/B contractor should anticipate participation with the selected artist during design of the PCRC, and coordination with the artist during installation.

D. Re-use of Historical Elements

The Washington State Military Department has artifacts which may, at the proposer's option, be incorporated into the new Pierce County Readiness Center. Adaptive reuse of these is encouraged. These items include, but are not limited to:

1. Memorial trees and shrubs on Camp Murray
2. Large, solid-wood column covers
3. Large, solid-wood fireplace mantels
4. Solid-wood newel posts and handrails



5. Cast concrete Eagle sculpture

See appendix H.2.g – Historic Artifacts - for a collection of current and historical photos of the elements.



6.0 LANDSCAPE NARRATIVE

The landscape design includes the selection and placement of plant material on the site, as well as, the design of the irrigation system. Traditional landscape design principles must be pursued while adhering to the ATRP regulations regarding standoff distances and visual continuity around the building perimeter.

The visual image conveyed by the Readiness Center is not defined just by the architectural character and site organization, but also by an attractive, organized landscape design. The presence of plant material on the site greatly enhances the visual character & environmental quality of the building; the irrigation system provides water essential for plant material growth.

A. Landscape Objectives

The overall purpose of plant materials on the site is to improve the physical and psychological well-being of the people who work or visit the building. This is achieved through the following objectives:

1. Security – Landscaping should be integrated with the security requirements of UFC 4-010-01. Any site element or plant material may be larger than 6” in any dimension.
2. Simplicity – Landscape plans are to be broad and simple in form to limit / eliminate maintenance by grouping in beds with simple shapes. Avoid small lawn areas that are difficult to mow. Eliminate the use of annual beds because of the high maintenance involved.
3. Improve the overall visual quality of the site by the use of native and indigenous plant material.
4. Provide scale and comfort to pedestrian environments.
5. Screen unsightly views.
6. Buffer incompatible uses.
7. Minimize water usage by specifying draught tolerant native plant materials that require less maintenance to survive.

B. Sustainable Landscape Development & Irrigation System Design

(See Section IV., 4.0 SUSTAINABILITY & LEED NARRATIVE for complete project LEED summary.)

1. The use of plant material on the site promotes the sustainability of the project. The irrigation system shall promote sustainability.



7.0 SITE/CIVIL DESIGN

A. Codes & Standards

The following codes/guidelines must be adhered to:

1. 2008 General Administration Facilities Design Guidelines and Construction Standards.
2. 2012 Pierce County Stormwater and Site Development Manual.
3. WSDOH Water System connections and work.
4. WSDOE Criteria for Sewage Works Design
5. USGBC LEED Version 2009 BD+C
6. 2014 WSDOT Standard Specifications for Road, bridge, and Municipal construction 2014 and WSDOT standard details (most current versions).
7. 2008 EPA National Pollution Discharge Elimination System (NPDES) / DOE Construction Stormwater Permit
8. DOD Accessibility Standards
9. UFC 1-200-01 General Building Requirements*
10. UFC 3-200-10N, Civil Engineering*
11. UFC 3-600-01, Fire Protection Engineering for Facilities*
12. UFC 4-010-01 DoD Minimum Antiterrorism Standards for Buildings*

Astricks denote a military code.

Where conflicts exist, the stricter code/standard shall govern.

B. Narrative and Systems Overview

1. Existing Site Conditions

The site is located in the Camp Murray. The site is bordered on the north, east and west sides by existing roads. Infantry Drive to the North, 41st Division Road to the East and Field Artillery Trail to the West. Building #127 and its yard border the site to the south. The site was previously the CSMS site. The CSMS structures are currently being demolished under a separate project. Upon completion of the project the site will be free of structures and consist of an open gravel yard. The building service utilities will have been demolished but utility main lines will remain.

In general, the site is relatively flat.

No improvements are proposed to the adjacent streets except as necessary to connect to utilities and to restore any street cuts that but the project.

The design build contractor shall provide record drawings for all improvements. Utilities shall be as built by a Washington State licensed surveyor. Record Drawings shall be provided in paper, pdf, and AutoCAD formats.

2. Topographic Survey

A site topographic survey has been completed for the ongoing demolition project. Upon completion of the demolition project an updated topographic survey will be provided.



3. Geotechnical Report Findings

A geotechnical report will be provided by Addenda.

Contaminated soils are being mitigated as a part of the ongoing CSMS demolition project. The Geotechnical report will address what contaminated materials were encountered and what actions were taken.

4. Demolition

The ongoing CSMS demolition project will remove all the existing site structures. Additional demolition of site features will be necessary depending on the design builder's proposal and should be included.

Ordinance Corp Way currently bisects the west corner of the site. This road shall be removed as a part of the CSMS demolition project.

Demolished materials shall be disposed of in a legal manner.

5. Earthwork

The site shall be graded to direct runoff away from the building the proposed Stormwater facilities. The walkways shall be graded to meet all necessary accessibility requirements. The design shall balance the earthwork to the max extent feasible.

6. Water Supply System

The site is located within the service boundaries of the JBLM Water system. There are existing water mains located in Field Artillery Drive to the west and Infantry Drive to the north, 8-inch stubs to the site are provided off of the 8" line in Infantry Drive. An existing 16-inch water main crosses the eastern portion of the site. Any work impacting this line will need to be coordinated with JBLM. New fire service and domestic services shall be provided for the proposed structure and hydrants added as necessary off of a new onsite water main loop connecting into Infantry Dr. Fire protection for the new facility will require a fire line with double check valve assembly located inside (or outside) of the building. EV access shall be provided as required to the building. All water mains shall be ductile iron, CL-52.

7. Sanitary Sewer Systems

The site is located within the service boundaries of JBLM sanitary sewer system. A sanitary sewer lateral shall be constructed to connect the proposed building to existing sewer mains in 41st Division Road to the east. The vehicle bay drains will be required to be connected to the sanitary sewer system. The vehicle bay drains are required to drain to an oil/water separator prior to discharge to the sewer.

8. Storm Drainage

A storm drainage system shall be provided that collects, treats, and infiltrates runoff from the site in accordance with the *2012 Pierce County Stormwater and Site Development Manual*.



The site is located in an area of well-draining soils. The runoff from the site will be collected utilizing catch basins, area drains, and subsurface pipe systems to direct roof and surface drainage to a proposed infiltration system. Prior to infiltration, runoff from pollution generating surfaces such as the parking areas and vehicle storage areas shall be treated by an appropriate water quality facility. The Military Parking area exceeds the threshold for a "high use" site; therefore an oil/water separate will be necessary for Stormwater treatment from this area. The runoff from the roof and areas will not require storm water treatment facilities unless to provide for LEED points.

An existing infiltration system exists within the site. It is preferred that the contractor re use this facility. Re use of the facility will require the confirmation of the facility size and the confirmation that the system is in good working order via an infiltration test.

9. Gas, Telephone, Data and Power Utilities

These utilities currently serve the site and shall be extended onto the site as necessary to meet the proposed improvements needs.

10. Pavement

Provide asphalt concrete pavement for parking areas (military and POV), roadways as needed for utility patching, sidewalk construction patching, and vehicle access to building.

Pavement shall be designed for the appropriate design vehicle.

Permeable pavement is only permitted in POV parking stall areas.

Cement Concrete is required in fueling and repair areas.

11. Pavement Markings and Signage

Provide pavement marking for roadway as needed to replace and match existing markings disturbed or damaged during construction including crosswalk striping and lane markings.

Street name, parking, regulatory and warning signs shall be installed as required by the Camp Murray

12. Concrete Curb Gutter and Sidewalks

Provide concrete sidewalks as required for easy pedestrian access. New sidewalk and curb ramps shall be in accordance with WSDOT and meet DOD - ADA requirements. Walks may be permeable asphalt or concrete.

13. Illumination System

Site Lighting shall meet standards described in other sections of this document.

14. Helipad – (Alternate No.2)

Helipad paving information will follow in future addendum.

C. Quality of Materials and Systems



1. Earthwork
 - a. Structural fill shall meet the requirements determined by the geotechnical engineer.
 - b. Subgrade material for sidewalks and roadway shall be per the attached specifications.
2. Water Supply System
 - a. Potable water system shall be per WSDOT 7-09.
3. Sanitary Sewer Systems
 - a. Sanitary sewer system shall be per WSDOT 7-17.
4. Storm Drainage
 - a. Storm drainage pipe and drainage structures shall be per WSDOT 7-04.
5. Pavement
 - a. Pavement shall be per WSDOT 5-04.
6. Pavement Markings and Signage
 - a. Signs per WSDOT 8-21.
 - b. Pavement markings and signs per MUTCD & WSDOT 8-22.
7. Cement Concrete Curb Gutter and Sidewalks
 - a. Concrete per WSDOT 8-04 & 8-14.
 - b. Curb, sidewalk, and curb ramps shall be constructed per WSDOT Standard Details.

D. Special Considerations

1. Traffic Control

Traffic control and access around the site must be maintained in accordance with the MUTCD (Latest Edition). Coordinate with Camp Murray regarding temporary pedestrian access requirements and temporary sidewalk closures.
2. Construction Permits

The Design–Builder is responsible for obtaining all required permits as listed below and others as needed for the performance of the work. See Appendix, Section II, j. Design-Builder / Owner Responsibility Matrix.

 - a. DOE - NPDES Permit Construction Stormwater Discharge Permit. (Design-Builder procured and paid)
 - b. Building Permit. (Design-Builder procured and paid)
 - c. Pierce County Site Development Permit. (Design-Builder procured and paid)
 - d. DOE – UIC Permit (Design-Builder procured and paid)



E. Site / Civil LEED

The following is a list of site / civil LEED credits that were considered achievable during the pre-design eco-charrette.

(See Section IV. 4.0 SUSTAINABILITY & LEED NARRATIVE for complete project LEED summary.)

1. SS Prereq 1 – Construction Activity Pollution Prevention – the civil site plans and specifications will include an erosion control plan and Stormwater pollution prevention plan as standard protocol to address and achieve this required item.
2. SS6.1 Stormwater Design – Quantity Control – the site is located in an area that contains well-draining soils. Based on our current understanding of the site soils the runoff from the entire site will be able to be infiltrated onsite. Infiltration of the site runoff will achieve this point.
3. SS6.2 Stormwater Design – Quality Control - the site is located in an area that contains well-draining soils. Based on our current understanding of the site soils the runoff from the entire site will be able to be infiltrated onsite. Infiltration of the site runoff will achieve this point since infiltration will satisfy the requirement to treat all of the site's impervious storm runoff.



8.0 STRUCTURAL DESIGN CRITERIA

A. Narrative and Systems Overview

1. The facility provided shall be suitable for general office use with structural provisions for areas of increased loading for lobbies, meeting areas, computer rooms, egress facilities, light storage, loading docks, and other uses specified in the Section V. Design Program - Space Program, Room Data Sheets, Drawings and Diagrams. In addition to a requirement to meet minimum standards included in governing building codes, State of Washington facilities guidelines, and this RFP, the structural system should provide a comfortable working environment, serviceability, minimal maintenance requirements, flexibility to accommodate future expansion and changes in occupancy, and low life cycle costs.

B. General Code and State Requirements

1. Design and Construction shall be as per the listed or most current version of the following as modified by information in this RFP:
 - a. "2012 International Building Code" as adopted by the State of Washington (IBC 2012), and all referenced standards as listed in chapter 35 of this document
 - b. "Minimum Design Loads for Buildings and Other Structures" ASCE 7-10
 - c. "DOD Minimum Antiterrorism Standards for Bldgs, 1 October 2013", UFC 4-010-01
 - d. "DOD Minimum Standoff Distances for Bldgs", UFC 4-010-10
 - e. "DOD Minimum Antiterrorism Standoff Distances for Bldgs", UFC 4-010-02
 - f. "DOD Security Engineering Planning Manual (Draft)", UFC 4-011-01
 - g. "DOD Security Engineering Design Manual (Draft)", UFC 4-011-02
 - h. "Design of Buildings to Resist Progressive Collapse", UFC 4-023-03

C. User and Design Requirements

1. The structural design shall be in accordance with IBC 2012, ASCE 7-10, and TM 5-809-1 using criteria that include the following minimum loadings:
 - a. Dead load consisting of the estimated actual weights of structure, coverings, and permanent contents, including equipment.
 - b. Collateral load of 10 pounds per square foot on all roof and elevated floor framing, to account for suspended items such as ceilings, ductwork, piping and lights.
 - c. Roof live load of 20 pounds per square foot, reducible for elements with tributary areas greater than 200 square feet.



- d. Ground snow load of 18 pounds per square foot, 5psf rain on snow for qualifying flat roof locations, terrain category C, with considerations for drift and sliding snow.
- e. Minimum roof uniform snow load of 25 pounds per square foot (27.5 pounds per square foot with applied importance factor of 1.1).
- f. Floor live load
 - i. Classrooms / Office – 50 psf uniform load (reducible) + 20 psf partition and 2000 pound concentrated load
 - ii. Mechanical rooms – 125 psf (reducible) and 2000 pound concentrated load + weight of any mechanical equipment
 - iii. Upper corridors – 80 psf
 - iv. Lower floor corridors – 100 psf
 - v. Stairs – 100 psf and 300 pound concentrated load on tread
 - vi. Assembly Room – 100 psf
 - vii. Storage Rooms – 125 psf
- g. Wind loads for an ultimate wind speed (Vult) of 115 miles per hour, exposure C, in accordance with IBC section 1609 and ASCE 7 chapters 26 through 30.
- h. Earthquake loads for maximum considered ground motions $S_s=1.290$ g and $S_1=0.510$ g, site class D, seismic design category D1 / D2, importance factor = 1.5, and Risk Category IV (essential facility designation).

D. Quality of Materials and Systems

- 1. Any construction type that meets the requirements of applicable building codes and this RFP, and provides standards of serviceability, maintenance requirements, flexibility for future expansion and changes in occupancy, and low life cycle costs may be used.
- 2. Design and Construction to be as per specified or latest edition of the following:
 - a. Foundations, excavation, and subgrade preparation shall be as per Geotechnical Report, Prepared by Hart Crowser, Inc.
 - b. Concrete: ACI 318.
 - c. Masonry: TMS 402-08, 602-08/ACI 530-08, 530.1-08/ASCE 5-08, 6-08.
 - d. Structural Steel: AISC Specifications for Structural Steel Buildings AISC 360 and Seismic Design Manual AISC 341.
 - e. Cold Formed Steel: AISI North American Specification for the Design of Cold-Formed Steel Structural Members, 2007.
- 3. Use of non-standard construction types, materials, or construction methods will require approval by the State based on submitted evidence including testing, reports, calculations, and government and association approvals demonstrating that Code, State, and RFP requirements and intent are being met.



E. Special Considerations

1. Essential Facilities/Seismic Requirements

The facility is considered an Essential Facility, Risk Category IV, in accordance with IBC 2012 and ASCE 7-10 requirements.

2. Serviceability

Vertical deflection of framing members shall be limited to a maximum of 1/360th of the span under live load and 1/240th of the span length under the total load. A vibration analysis shall be required for members supporting rotating equipment such as ventilating fans and floor joists supporting walkable surfaces. Story drift shall be limited to values established by IBC or ASCE 7.

3. Flexibility for Future Expansion and Changes in Occupancy

For any structural system that will limit the ability for modifications (ie, post-tensioned concrete) for changes in tenants uses such as new plumbing penetrations or block-outs or areas allowing for future penetrations shall be provided and located on record drawings.

4. Compatibility with Non-Structural Elements

The structure and expected structural movements due to wind, seismic, and temperature fluctuation shall be compatible with non-structural components and their attachments to the structure. Sufficient separations shall be provided to preclude damage to non-structural components or unintended effects on the structure under code specified movements.

5. Antiterrorism/Force Protection (AT/FP)

The facility shall be designed to comply with referenced UFC standards.

It is anticipated that the risk level for this structure will be categorized as "Low". This implies that the potential structural damage is repairable. Minor deformations of non-structural elements and secondary structural members and no permanent deformation in primary structural members are permitted. Hazards will be limited such that glazing will break, but will remain in the window frame. Doors will stay in frames, but will not be reusable.

The requirements of ATFP as it relates to the structural aspects include:

- a. The new facility will be a primary gathering building, located within a controlled perimeter. Due to the constraints of the site, a maximum standoff distance of 30 feet is anticipated. Construction shall be in accordance with the requirements of UFC 4-010-01 (09 February 2012) for this required standoff distance.
- b. Windows and doors will be designed in accordance with Standards 10 and 12 contained within UFC 4-010-01 (09 February 2012).



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- c. Progressive collapse is considered to be a significant risk for buildings of three or more stories. This building will be three stories tall; therefore, the requirements of UFC 4-023-03 Design of Buildings to Resist Progressive Collapse shall be applied.



9.0 CONVEYANCE SYSTEMS

A. Narrative and Systems Overview

General: Provide manufacturer's standard elevator system with 2,500 lb capacity and 100 fpm speed, and designed for travel distances indicated. The elevator should be able to accept an emergency gurney. Where components are not otherwise indicated, provide standard components, published by manufacturer as included in standard pre-engineered elevator systems and as required for a complete system.

B. General Code Requirements

Vertical transportation design and installation should conform to all applicable standards including the following Codes, regulations and inspection processes:

1. Compliance with Regulatory Agencies: Comply with most stringent applicable provisions of following codes, laws, and/or authorities, including revisions and changes in effect:
 - a. Safety Code for Elevators and Escalators, ASME A17.1.
 - b. Guide for Inspection of Elevators, Escalators, and Moving Walks, ASME A17.2.
 - c. Elevator and Escalator Electrical Equipment, ASME A17.5.
 - d. Washington Administrative Code (WAC).
 - e. National Electrical Code, NFPA 70.
 - f. Americans with Disabilities Act, ADA and A117.1.
 - g. Local Fire Authority.
 - h. Requirements of most stringent provision of local authority having jurisdiction.
 - i. Life Safety Code, NFPA101.
 - j. International Building Code (IBC).
2. Acceptance Testing: On completion of elevator installation and before permitting elevator use (either temporary or permanent), perform acceptance tests as required and recommended by ASME A17.1/CSA B44 and by governing regulations and agencies. The State of Washington Labor and Industries elevator division is the applicable Code Authority having jurisdiction.
3. Advise Owner, Architect, and authorities having jurisdiction in advance of dates and times that tests are to be performed on elevators.
4. Check operation of each elevator with Owner's personnel present before date of Substantial Completion. Determine that operation systems and devices are functioning properly.



5. Provide a one year maintenance warranty

10.0 MECHANICAL SYSTEM GENERAL REQUIREMENTS

A. General Building Description

The purpose of this Request for Proposal (RFP) document is to establish the minimum performance and quality standards for the Pierce County Readiness Center on Camp Murray. The Design-Build contractors will use this RFP to prepare their designs for the building mechanical systems.

The selected mechanical subcontractor will be entirely responsible for the design, permitting, building, start-up and testing of all the mechanical, fire protection, and plumbing systems. The design shall be the responsibility of the mechanical engineers of record who shall be registered professional engineers in the State of Washington. The mechanical contractors shall provide complete and functional systems. All systems shall be provided with adequate service clearances. Equipment shall be easily maintainable and shall be easily accessible.

The mechanical Design-Build contractors shall provide a written guarantee for a period of one year from the date of substantial completion that covers the entire system including equipment, materials and workmanship.

All systems shall be designed and engineered with long term operational efficiency and cost performance in mind. The proposer is encouraged to propose the greatest performance energy savings. The Design-Build Contractor is encouraged to provide a proposal that exceeds the minimum required energy savings.

B. Codes and Standards

1. 2012 International Building Code with Washington State Amendments
2. 2012 International Mechanical Code with Washington State Amendments
3. 2012 International Energy Conservation Code with 2012 Washington State Amendments (WAC 51-11C)
4. 2012 International Fire Code with Washington State Amendments
5. 2012 Uniform Plumbing Code with Washington State Amendments
6. ASHRAE Standard 62.1-2007 – Ventilation Standard for Indoor Air Quality
7. ASHRAE Standard 55-2004 – Thermal Comfort
8. ASHRAE Standard 90.1-2007: Energy Standard for Buildings except Low-Rise Residential Buildings
9. 2009 LEED for New Construction
10. ADA or Uniform Federal Accessibility Standards
11. National Fire Protection Association (NFPA) Standards



12. National Electrical Manufacturers Association (NEMA)
13. National Electrical Contractors Association (NECA)
14. National Electric Code (NEC)
15. American National Standards Institute (ANSI)
16. Institute of Electrical and Electronic Engineers (IEEE)
17. Underwriters Laboratories (UL)
18. General Administration Facilities Design Guidelines & Construction Standards 2008
19. RCW 70.235.050 Green House Emission Limits for State Agencies

C. Mechanical LEED

(See Section IV., 4.0 SUSTAINABILITY & LEED NARRATIVE for complete project LEED summary.)

The Design-Build proposer shall incorporate a sensibly sustainable design for the new facility. The Design-Build proposer should submit a design and design options for a building that cost effectively conserves energy and water. The project must achieve, at minimum, LEED Silver certification. The contractor is responsible for providing all required LEED paperwork and submission.

Design the Building Envelope, Lighting, other end use systems, and HVAC to maximize Building Operations, Maintenance and Energy Performance. At a minimum, the project should be designed to achieve a required minimum energy savings of 20% energy use (kBtu) over Washington State Energy Codes in effect at the time of project permitting, in addition to the LEED Silver Certification requirements including a minimum 5pts for EA Credit 1 for a 20% energy cost (\$) savings.

The Building Performance Criteria will be established in accordance with LEED-NC 2009, EA, Credit 1, Optimize Energy Performance, Option 1, Whole Building Simulation achieving a minimum required 5pts for a total of 20% energy cost savings. Resultant savings shall be analyzed for proposed design as compared to ASHRAE standard 90.1-2007, which establishes minimum requirements for Energy Efficient Design of Buildings for LEED EA Credit 1.

D. Operations, Maintenance and Energy Performance Design Submittal Requirements

The Design-Build Contractor must provide the following documentation and calculations as part of the RFP response and submittal:

1. A narrative explanation of Design-Build Contractor's building environmental systems (i.e. lighting, envelope, HVAC, domestic hot water, electrical, telecommunications, special systems and others) that are proposed for achieving:
 - a. Operational and Maintenance efficiencies.



- b. Design-Build Contractor's Energy Savings Commitment offer, which must meet or exceed the Owner's desired energy savings (as listed above).
2. Description of calculation methods including modeling software, zoning, baseline assumptions, and proposed building assumptions used in preparing the analysis.
3. Submit a proposed ELCCA Work Plan adapted to Design-Build delivery and illustrating the ELCCA integration with the Design-Build process. For reference, review the Energy Life-cycle Cost Analysis Guidelines for Public Agencies in Washington State, November 2005, revised April 2013, Figure 2.1 and Chapter 4.
4. Submit building energy estimated results for both the baseline building and the proposed building design concept:
 - a. Annual energy usage breakdown by system category: HVAC, interior lighting, exterior lighting, plug and equipment loads, domestic hot water, miscellaneous.
 - b. Summary of annual natural gas (if applicable) and electrical energy usage and energy costs based on current utility rate schedules.
5. After contract award, the Design-Build Contractor must provide the following documentation and calculations as part of completing the final LEED submittal requirements and design phase services:
 - a. During the design phases, a life cycle cost analysis worksheet must be prepared for the proposed HVAC system, and any proposed energy alternatives. Utilize the Washington State DES Energy Life Cycle Cost Spreadsheet and established escalation and discount rates. The spreadsheet determines the cumulative costs (30 year life cycle costs) of ownership. Provide a description of any assumptions used in preparing this analysis.
 - b. Prepare an ELCCA Report as outlined in Chapter 6 of the Energy Life-cycle Cost Analysis Guidelines for Public Agencies in Washington State, November 2005, revised April 2013 and adapted to this Design-Build delivery.
6. The Design-Builder must develop and submit to USGBC in accordance with LEED submittal documentation requirements for EA Credit 1, and ultimately attain the proposed number of points for this credit. Additionally, for Energy Star compliance, the Design-Builder must submit all documentation at design completion to EPA energystar.gov.

E. Greenhouse Gas Emissions

Provide a description of how this project will reduce greenhouse gas emissions and help State agencies meet the requirements of RCW 70.235.050 Green House Emission Limits for State Agencies.



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11.0 PLUMBING DESIGN CRITERIA

A. General Code Requirements

Plumbing systems shall be designed and built to meet current codes. Provide for required permits, inspections, construction sequences, quality assurance, and safety practices.

B. Plumbing Design Criteria

Plumbing piping sizing criteria is listed below:

Domestic water Piping:

- Minimum pressure 35 PSI at most remote outlet
- Maximum pressure 80 at any location
- Maximum Static Pressure Loss 6psi/100'
- Maximum velocity is 8fps for cold water and 5fps for hot water

Waste and Vent Piping:

- Minimum ¼" per foot slope inside the building
- Size using tables in the Uniform Plumbing Code

C. Plumbing Fixtures

1. All plumbing fixtures including lavatories, sinks, floor drains, shall be commercial grade low flow fixtures complete with trim. The plumbing contractor will be required to connect to all equipment requiring plumbing connections. All sensor operated fixtures shall be hardwired, battery powered fixtures are not acceptable.
2. Water closets shall be automatic flush ultra low flow, with a manual push button override. Dual flush water closets are not desired. Waterless urinals are not acceptable for this project.
3. Trap Primers shall be electronic type and shall be provided to maintain a water seal for all traps. Standard trap primers that rely on a drop in water pressure to activate are not acceptable. Provide trap seals for traps in areas that are not climate controlled.
4. Emergency fixtures shall be provided where required.
5. Acceptable fixture manufacturers are summarized below. Plumbing fixture types and their minimum performance requirements are shown in Table 1 below.
6. Manufacturers are based on the following:
 - a. Fixtures: American Standard, Kohler.
 - b. Floor Drains/Sinks: J.R. Smith.
 - c. Trap Primers: J.R. Smith, PPP
 - d. Faucets: Delta Commercial, Chicago.
 - e. Flush valves: Sloan Royal, Zurn.



- f. Drainage products: JR Smith, Josam, Zurn, Wade, Watts.
- g. Refer to Table 2 below for minimum performance requirements of fixtures.

Plumbing Fixture Types and Minimum Performance Requirements					
Fixture	Location	Type	Control	Flow	Notes
Water Closet	Restrooms	Wall hung, vitreous china	Sensor Operated flush valve with manual override	1.28 GPF	ADA provided where required
Lavatory	Restrooms	Under Counter mounted, vitreous china	Sensor Operated	0.5 GPM	ADA provided where required
Urinal	Restrooms	Wall Hung, vitreous china	Sensor Operated flush valve with manual override	0.125 GPF	ADA provided where required
Sink	General	Self rimming, counter mounted, Stainless steel	Dual handle faucet, goose neck spout	1.5 GPM	ADA faucet Insta-hot at sink
Sink	Kitchenette	Self rimming, counter mounted, Stainless steel	Dual handle faucet, goose neck spout	1.5 GPM	ADA faucet Insta-hot at sink
Drinking fountain with bottle filler	Varies	Dual height with bottle filling station, stainless steel	Front push pad operation for drinking fountains and sensor operation at bottle filler	1.0 GPM Minimum at bottle filler	Refrigerated
Wall Hydrant	Bldg Exterior	Freezeproof – Recessed Box type	Manual		

Table 1: Plumbing Fixture Types and Minimum Performance Requirements

D. Narrative and Systems Overview

1. Quality of Materials and Systems

The Design-BUILDER proposal shall include a list of materials and equipment that will be used on the project. Where applicable the list shall include:



- a. Piping material used.
 - b. Allowable water heater manufactures.
 - c. Allowable pump manufacturers.
 - d. Piping test requirements.
 - e. Other equipment not included in this list that describes the quality of materials that will be provided.
2. Sanitary
A complete sanitary waste and vent system will be provided. Piping slope will be a minimum of ¼" per 1'. Waste and vent piping shall be no-hub cast iron. Underground piping shall use heavy duty couplers. Provide acid resistant polypropylene where required. Provide a grease interceptor in compliance with code for the appropriate fixtures in the kitchen area. Sand and oil separators shall be provided for the training bay and maintenance areas as required.
3. Storm Water
A roof and overflow drain system shall be provided as required by code. The overflow storm drain system will daylight utilizing downspout nozzles at the first floor level above grade. Storm piping shall be no-hub cast iron.
4. Natural Gas
Natural gas service is available to the site from Puget Sound Energy. Natural gas may be used for building or domestic water heating. If natural gas is used a single utility meter will be provided. Gas piping will be installed per Washington State codes and Puget Sound Energy requirements.
5. Domestic Cold Water
Potable water is available from the JBLM water system. There are existing water mains located in Field Artillery Drive to the west and Infantry Drive to the north. An existing 16-inch water main crosses the eastern portion of the site.
- The domestic water system shall be provided with positive means to control backflow, with a reduced pressure backflow preventer at the cold water header and 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. Freeze-proof hose bibs should be distributed around perimeter of building (at a 50' on center minimum), and be provided for the recycle rooms, trash room, near mechanical equipment, and where it may be required for cleaning or servicing of equipment. All distribution piping shall be copper.



Vertical domestic water risers shall be provided with isolation valves at each floor. Provide ball type isolation valves at all major branches and at all restroom groups and the kitchen.

Irrigation: A backflow device shall be provided for the irrigation system.

6. Domestic Hot Water

Domestic hot water can be provided by natural gas hot water heaters, heat pumps, solar hot water with gas backup, or another source that supports the project energy goals and budget. Domestic hot water will be distributed throughout the building with a water recirculation system or heat maintenance tape system. All distribution piping shall be copper. The domestic hot water system and components shall be controlled by the building management system. Ground water temperature used for domestic water heater sizing shall be based on 40°F. Water heater shall produce 140°F temperature water for health purposes and be delivered to the fixtures at a maximum of 110°F, with the exception of the kitchen fixtures. All public fixtures shall be protected by a device capable of limiting the water temperature to 110°F for scald prevention.

7. Industrial Cold and Hot Water (where required)

Industrial cold water may be provided for HVAC system makeup water. Industrial water systems will be isolated from the domestic water system by means of a reduced pressure backflow preventer.

8. Solar Water Heating

Solar water heating systems are acceptable but not required. System diagrams, freeze protection methods, controls, and other design considerations should be provided as part of the design-build proposal. The system shall include a backup heating water source. The anticipated energy savings and potential economic incentives available should also be provided with the design-build proposal. If a solar water heating system is not provided the contractor shall provide infrastructure for addition of a future solar hot water heating system.

E. Submittals

Provide product data sheets and/or prescriptive specifications for the following equipment as part of the RFP submission:

1. Plumbing Fixtures.
2. Plumbing Equipment.
3. Any special energy saving fixtures, equipment or materials.



12.0 HEATING, VENTILATING AND AIR CONDITIONING DESIGN CRITERIA

A. Thermal Comfort and Indoor Air Quality

Building HVAC systems will be designed to comply with ASHRAE Standard 55-2004 and 62.1-2007. The Design-Build proposer shall include a narrative description for how indoor environmental air quality will be achieved. The narrative should include where local exhaust will be included, use of operable windows, and thermal zoning to be utilized. Central air handling units shall be provided with MERV 13 filtration.

The table below summarizes the minimum zoning requirements.

Minimum Thermal Zoning Requirements	
Exterior Perimeter Enclosed Offices	≤250 sf/zone
Interior Enclosed Offices	≤ 500 sf/zone
Exterior Perimeter Corner Offices	Separately zoned
Conference Rooms	Separately zoned
Open Area Offices	≤1,000 sf/zone

B. Narrative and Systems Overview

1. General

The State requires that the mechanical systems are reliable, have a proven track record for operation and service, and are easily maintainable.

Provide complete and fully operational mechanical systems, including the coordination of work with other specification divisions. All work shall be completed in accordance with applicable codes. Provide all required permits, inspections, construction sequences, quality assurance, and safety practices.

All work is to be coordinated with other trades by General Contractor. All materials shall be new and of reputable quality. Contractor shall provide one year warranty for all work and materials. All equipment and systems installation shall provide for required maintenance space as recommended by manufacturer or code as a minimum.

2. Quality of Materials and Systems

The Design-Builder proposal shall include a list of materials and equipment that will be used on the project. Where applicable the list shall include:

- a. Piping material used.
- b. Allowable air handler manufactures.
- c. Allowable chiller manufacturers.
- d. Allowable boiler manufacturers.
- e. Allowable VRF system manufacturers.



- f. Allowable fan manufacturers.
- g. Allowable heat exchanger manufacturers.
- h. Allowable pump manufacturers.
- i. Ductwork materials and construction standards.
- j. Ductwork pressure testing requirements.
- k. Piping test requirements.
- l. Allowable terminal unit manufacturers.
- m. Allowable packaged equipment manufacturers.
- n. Any other equipment not included in this list that describes the quality of materials that will be provided.

3. Design Criteria and Considerations

All systems shall be provided in compliance with all code requirement. At a minimum the following data should also be taken into consideration in the design. Duct sizing shall be in accordance with ASHRAE and SMACNA requirements, taking into account noise considerations. Provisions for thermal expansion shall be provided. Supply diffusers and registers shall be selected for proper throw and noise criteria. Exhaust and return grilles shall be sized at a maximum of 500fpm. Air transfer grilles and louvers shall be sized at a maximum of 250fpm. Every grill, register, and diffuser shall be provided with a means of balancing in the ductwork, OBD's in the grilles are not an acceptable means of balancing for items connected to ductwork. Outside air louvers shall be sized to eliminate the possibility of water entrainment, typical maximum velocity shall be 500fpm.

Design Performance:

<u>Interior Conditions:</u>	<u>Heating</u>	<u>Cooling</u>
Occupied spaces	68°F	78°F
Mechanical/Support areas	68°F	78°F
Data/Communication Rooms	68°F	78°F
Electrical Rooms	55°F	-

<u>Outside Conditions:</u>	<u>Winter Design</u>	<u>Summer Design</u>
Outdoor Temp Design per WSEC	29°F	82°F db
Record Temperatures	-8°F	104°F

Minimum Ventilation (Outdoor Air) Requirements:

Classrooms	10 cfm/person
Shops	1.5 cfm/sq.ft.
Offices	10 cfm/person
Data/Communications Rooms	10 cfm/person
Conference Rooms	10 cfm/person



Corridors/Unit Storage	3 AC/hr
Restrooms	50 cfm exhaust per WC or urinal
Showers	1.0 cfm/sq.ft.
Assembly	10 cfm/person
Lockers	0.5 cfm/sq.ft.

4. Heating Systems

The building heating loads shall be calculated as required by the 2012 Washington State Energy Code. Consideration should be given to architectural systems that can reduce building heating load, coordinate with building architect. If boilers are used for space heating redundant boilers shall be used sized at a maximum of 70% of the building load. Hydronic building pumps shall be provided at 100% redundancy.

Include the following as part of the Deign-Builder proposal:

- a. Narrative describing the heating system and methods used to improve efficiency.
- b. Conceptual heating system plan.
- c. Conceptual thermal zoning plan.
- d. List of specific major heating equipment.
- e. Cut sheets of recommended heating equipment.
- f. Allowable vendors for each type of equipment.

5. Cooling Systems

The building heating loads shall be calculated as required by the 2012 Washington State Energy Code. Consideration should be given to architectural systems that can reduce building cooling load, coordinate with building architect. Provide 100% redundant cooling water pumps.

Provide independent cooling systems for telecom, IDF, and MDF rooms.

Include the following as part of the Deign-Builder proposal:

- a. Narrative describing the cooling system, methods used to improve efficiency, description of how passive strategies are used if applicable.
- b. Conceptual cooling system diagram.
- c. Conceptual thermal zoning plan.
- d. List of specific major cooling equipment.
- e. Cut sheets of recommended cooling equipment.
- f. Allowable vendors for each type of equipment.

6. Air Handling Systems

The building loads shall be calculated as required by the 2012 Washington State Energy Code and Washington State Mechanical Code. Energy recovery should be used where practical.



Include the following as part of the Design-Builder proposal:

- a. Narrative describing the air handling system, methods used to improve efficiency, locations of independent local exhaust.
- b. Conceptual air handling system diagram.
- c. List of specific major air handling equipment.
- d. Cut sheets of recommended air handling equipment.
- e. Allowable vendors for each type of equipment.

Specialty systems

Provide all specialty systems as required by code. Some systems are listed below.

Provide a vehicle exhaust system, complete with exhaust fan(s) and hose reels to serve the vehicle training workbays. Provide roof mounted indirect fired kitchen makeup air unit with up-blast exhaust fan for the kitchen hood.

7. Controls

A direct digital control (DDC) Bacnet compatible system shall be provided to control and monitor all HVAC equipment and systems. Controls shall be Delta by ESC Automation (425)487-8613. Valve and damper actuation will be electric type with Belimo as the preferred vendor. The control system will be complete and allow for full control and monitoring from the operator's terminal or from an off-location via the internet. The control system will perform all required control functions, including optimization of equipment and system performance, reliability, equipment life and energy consumption. All building services, gas, water, electricity etc, shall be monitored by the DDC system. A system that allows for an easy export of the metering data to Portfolio Manager shall be provided. The DDC system shall be certified and approved by the Building Network owners.

Provide demand controlled ventilation for all the spaces. As this building will typically not be fully occupied this should allow for energy savings.

An extensive measurement and verification system is anticipated to carefully monitor all of the building's energy use. Provide metering system to meet the WSEC, LEED EAc5, and to verify the energy performance requirements.



13.0 FIRE PROTECTION DESIGN CRITERIA

A. Design Criteria

The entire building will be totally sprinklered in accordance with NFPA 13. A double detector check assembly will be provided for the fire service.

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, as required. 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. Contractor shall verify water pressures and flows to determine if fire pumps will be required.

B. Narrative and Systems Overview

1. Wet Pipe Sprinkler System

The entire building will be sprinklered in accordance with NFPA 13. In general, system to consist of connection to new water service, including detector double check assembly, main flow alarm station, zone control valves and flow indicators, alarm bell, wet and combination standpipe, standpipe hose valves, fire department connection, roof outlets, wall and/or post type control valves for roof outlets, and sprinkler piping and heads. All required system isolation valves shall be provided with tamper switches.

Standpipes with required hose connections shall be provided where required within stairways in accordance with NFPA 14. The sprinkler system/combination standpipe system shall provide a fire protection system designed and installed in strict accordance with NFPA, IFC, and local Fire Marshal requirements.

The design-builder shall verify and if necessary provide sufficient fire hydrant locations to service the new building.

2. Dry Pipe Sprinkler System

Dry pipe sprinkler systems will be used where sprinklers are subject to freezing.

3. Pre-Action Fire Extinguishing System

Provide pre-action fire sprinkler system in areas housing computer, radio and telecommunications equipment (e.g., MDF, IDF and equipment rooms).

C. Quality of Materials and Systems

Sprinkler heads shall typically be concealed head type or sidewall type with polished chrome escutcheons and upright rough brass finish type heads in unfinished areas. Horizontal dry



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sidewall sprinkler heads shall be provided for overhangs, and other perimeter areas subject to freezing. Quick-Response heads will be provided in all light hazard areas.



14.0 ELECTRICAL – POWER DISTRIBUTION DESIGN CRITERIA

A. General Building Description

1. The Design-Build Contractors will use this Request for Proposal (RFP) narrative to prepare their designs for the building electrical systems.
2. The selected electrical subcontractor will be entirely responsible for the design, permitting, building, start-up and testing of all the electrical, emergency power, lighting, lighting controls, fire alarm, telecommunications, audio/visual, and other low-voltage systems as described throughout the RFP document. The design shall be the responsibility of the Electrical Engineer of Record who shall be a registered Professional Engineer in the State of Washington. The electrical contractors shall provide complete and functional systems.
3. The electrical design-build contractors shall provide a written guarantee for a period of one year from the date of substantial completion that covers the entire system including equipment, materials and workmanship.
4. The electrical system shall comply with the following:
 - a. National Electrical Code as amended and adopted by the local authority having jurisdiction.
 - b. National Electrical Safety Code (NESC).
 - c. NFPA 70E, Electrical Safety in the Workplace.
 - d. WAC 296-46B.
 - e. Washington State Energy Code, latest adopted edition.
 - f. GA Facility Design and Construction Standards, 2008 Edition.
 - g. NFPA 72, National Fire Alarm Code.
 - h. International Fire Code, latest adopted edition with local amendments.
 - i. American's with Disabilities Act Accessibility Guidelines (ADAAG).
 - j. LEED.

B. Quality of Materials and System

1. The Design-Build proposal shall include a submittal of materials and equipment that will be used on the project. Where applicable, the list shall include:
 - a. Underground vaults.
 - b. Main Switchboard load calculations.
 - c. Fire pump service as required.
 - d. Main Switchboard 480Y/277 volt section.
 - e. Main Switchboard main circuit breaker.
 - f. Main Switchboard feeder breakers.
 - g. Fire pump power design.
 - h. Metering at Main Switchboard for both incoming and output.



- i. Emergency generator (and enclosure, if exposed to outdoor temperatures).
- j. Remote annunciator for emergency generator.
- k. Generator fuel tank.
- l. Generator battery charger.
- m. Generator block heater.
- n. Generator silencer.
- o. Transfer switches.
- p. Short Circuit Study.
- q. Overcurrent Protective Device Selective Coordination Study.
- r. Arc flash study.
- s. Arc flash labels per NFPA 70E.
- t. Panelboards.
- u. Distribution panels.
- v. Transformers.
- w. Surge Protective Devices (SPDs).
- x. Power meters and metering network.
- y. Conduit.
- z. Wire.
- aa. Fittings.
- bb. Bushings.
- cc. Junction boxes.
- dd. Seismic bracing and support details per Structural criteria and manufacturers' requirements.
- ee. Ground bars.
- ff. Poke-through Devices and Electrical Floorboxes.
- gg. Conduit supports.
- hh. Lightning protection system.
- ii. Fire Alarm System.
- jj. Grounding components, including ground rod and ground bushings.
- kk. Labeling.
- ll. Lighting Controls:
 - i. Occupancy sensors.
 - ii. Vacancy sensors.
 - iii. Daylighting sensors.
 - iv. Room controllers.
 - v. Power packs.
 - vi. Relay packs.
 - vii. Scene controllers.
 - viii. Programmable lighting control panels.
 - ix. Typical lighting control wiring diagrams for each room type.
- mm. Electric car charging stations, where required.



- nn. Light Fixtures.
- oo. Lighting calculations (footcandles) for all spaces, interior and exterior.
- pp. Exit signs.
- qq. Emergency lighting units (bugeyes).
- rr. Emergency lighting inverters.

C. Secondary Normal Distribution

1. Size the main service for the following:
 - a. Lighting – 1 watt/sf.
 - b. Receptacles – 3 watts/sf.
 - c. Mechanical – 12 watts/sf.
 - d. Appliance Plug Load – 2.0 watts/sf.
 - e. Kitchen Equipment – 2.0 watts/sf.
 - f. Elevators – 40kW.
2. The low voltage sections shall be rated 600 volts, even though they are used at 480 volts.
3. The 480 volt sections shall have fully rated horizontal and vertical busses, matching the capacity of the main breaker.
4. All circuit breakers 225 amperes and above shall be fully adjustable LSI, with the main breaker having LSIG. All circuit breakers 100 amp to 200 amp shall have an instantaneous setting. The circuit breaker for the surge protective device may be non-adjustable molded case.
5. Provide phase loss, phase unbalance, and phase reversal protection on the main circuit breaker.
6. Provide fire pump service connection per NEC Article 695.5. Provide separate connection for the fire pump and jockey pump.
7. Square D, GE, or Eaton/Cutler-Hammer.

D. Emergency and Standby Power

1. Provide a diesel engine/generator for this project that serves Emergency, Legally Required, and Optional Standby loads as follows:
 - a. Emergency
 - i. Egress lighting.
 - ii. Exit signs.
 - iii. Fire alarm.
 - iv. All elevators that are part of the exit path, including stretcher sized elevators.



- b. Legally Required
 - i. Smoke pressurization.
 - ii. Smoke control.
 - iii. Fire Pump and jockey pump.
- c. Optional Standby
 - i. MDF / IDF Room power and air conditioning.
 - ii. Security system.
 - iii. Rooftop communications system components.
- d. ESD's Network Operation Center, Tier 3 Support, and Network Equipment rooms will need up to 4 terminals each with 24/7 power/phone/data/HVAC support for all racks.
- e. The power systems for Emergency and Legally Required shall be selectively coordinated per NEC Article 700.27 and 701.18.
- f. Normal, Emergency, Legally Required, and Optional Standby branch circuits and feeders shall be in separate raceway systems.
- g. The generator shall be manufactured by Cummins/Onan, Caterpillar and Kohler and have 72 hours of fuel at full load, located in a UL 2085 fuel tank, preferably sub-base. Provide dial type fuel gauge and calibrated dip stick.
 - i. Provide a design of the generator pad that restrains the generator per the manufacturer's recommendations. Design shall also be designed for anticipated seismic forces. Design shall be designed and stamped by a Registered Structural Professional Engineer in the State of Washington.
 - ii. Provide emissions mitigation per Puget Sound Air Quality standards and per Pierce County requirements. Contractor shall manage the application process for Pierce County and the Puget Sound Air Quality enforcement agency.
- h. Provide a separate circuit breaker for a load bank. The load bank circuit breaker shall be automatically tripped off in a power outage.
- i. Provide separate circuit breaker for the fire pump.
- j. The generator shall have the capability to shed optional standby loads only in the event of a generator overload via its control panel, which will tell the Automatic Transfer Switch (ATS) to go to the neutral/center-off position.
- k. Provide a BACNET output for remote monitoring of the generator.
- l. Provide a wired remote annunciator. Locate as directed.



- m. Automatic Transfer Switches shall be manufactured by Cummins/Onan. ATs shall have BACNET communications.
- n. Provide critical grade silencer and Schedule 10 stainless steel exhaust system.
- 2. Provide up to three ATs for the above branches. All ATs shall be time delay neutral style.
- 3. Provide an installation for the fire pump and jockey pump that meets the requirements of NEC Article 695.
- 4. The Emergency and Legally Required power systems shall use circuit breakers.
- 5. The generator shall be sized to provide a minimum of 35% of the required load of the building. This percentage will increase if the d/b contractor's HVAC design proposal calls for electrical mechanical units.

E. Power Studies

- 1. Provide short circuit study to determine the available fault current at each component of the electrical distribution system, including: power distribution equipment, switchboards, distribution panels, panelboards, motor control centers, disconnect switches, variable frequency drives, elevator controllers, UPSs, and mechanical equipment with feeders sized over 60 amps. Verify that equipment being provided is rated for the available fault current.
- 2. Provide an overcurrent protective device selective coordination study that determines settings of breakers to optimize selective coordination. Coordination study shall comply with requirements of NEC 700.27 and 701.18 for Emergency and Legally Required loads.
- 3. Provide an arc flash study for all equipment listed above per NFPA 70E requirements. Label all equipment with pre-printed labels that indicate the hazard risk category, incident energy at 18 inches, the flash protection boundary, recommended PPE, shock hazard circumstance, limited protection boundary, restricted protection boundary, prohibited protection boundary, and tool and glove requirements.

F. Panelboards

- 1. All panelboards shall use copper bussing. Circuit breakers shall be bolt-on type. Enclosures shall be hinged door-in-door type.
- 2. Panelboards shall be fully rated for the available fault current. Series rated systems are not allowed.
- 3. Feeders to panelboards shall meet or exceed the bussing rating of the panelboard, i.e. #4/0 wire to a 225 amp panel.



4. Panelboards feeding office areas, IDFs, labs, and server rooms, shall have 200% neutral bars. Feeders to these panelboards shall have 200% neutrals.
5. All main circuit breakers shall be individually mounted, molded case.
6. Provide 20% minimum spare breakers in each panelboard.
7. Provide typewritten panel schedules in all panels and switchboards.
8. Provide typewritten overcurrent device settings LSIG for panelboards and switchboards with adjustable overcurrent devices which match the settings reported in the overcurrent protective device selective coordination study.
9. Provide a 30A-3P breaker in the first panel on the output of a transformer for an externally mounted Surge Protective Device.
10. Square D, GE, or Eaton/Cutler-Hammer.

G. Transformers

1. Transformers shall be dry type with 220 degree C insulation.
2. Windings shall be copper.
3. NEMA TP-1.
4. Sound level shall not exceed 35dB.
5. 10kV BIL.
6. Provide k-13 transformers for all office and IT loads. All feeders on the output of k-13 transformers shall have 200% neutral conductors.

H. Uninterruptible Power Supply (UPS)

1. All UPS's shall be Owner Furnished, Contractor Installed. There shall be a UPS in the main server room, and one rack-mounted UPS in each IDF. Include feeders to the UPSs. Assume a separately mounted external maintenance bypass cabinet for the main server room UPS. Coordinate exact UPS size with Department of Enterprise Services (DES).
2. Assume 12 racks (4 post racks) in the MDF room, each requiring two L5-30R and two L6-30R receptacles.
3. Assume three racks in each IDF, each requiring two L5-30R and one L6-30R which will be obtained from the back of the UPS. Verify with Owner.

I. Power Metering



1. Provide metering per the Washington State Energy Code and as required by LEED. The meters shall be monitored by the Energy Monitoring System (typically Metasys) and use Bacnet as the communications protocol. Provide external gateway card for connection to outside source monitoring. Outside source monitoring is Echolon I .Lon Controller with Inlet Supervisor software.
2. Provide a meter on the server room UPS feed.
3. Provide a meter for each IDF UPS.
4. Provide separate meters for air conditioning associated with the server room and IDFs.

J. Wiring Methods

1. All wiring shall use conduit and wire as the wiring method. MC cable is not permitted.
2. PVC conduit (Schedule 80) shall only be used underground. Elbows and vertical conduit risers shall be Galvanized Rigid steel Conduit (GRC).
3. GRC conduit shall be used above ground outdoors and in areas subject to damage from vehicles or equipment.
4. EMT conduit shall be used indoors where not subject to damage. Minimum size shall be 3/4".
5. Couplings and connectors shall be *waterproof* steel compression-type only. Zinc-die-cast, malleable, setscrew, and indent couplings and connectors shall not be used.
6. All wiring shall be stranded copper only. No solid or aluminum wire. Minimum #12 for power and lighting circuits. #14 minimum for controls.
7. Insulation shall be THHN/THWN for interior branch circuits. Feeder conductor insulation shall be THHN/THWN or XHHW-2. Exterior branch circuit insulation shall be THWN-2.
8. Use threaded rod and/or a trapeze supported with threaded rod to support overhead raceway. Do not attach to the ceiling grid.
9. See Washington State standards for wire identification requirements.
10. If electrical poke-thrus are used, they shall be flush-only with the floor and have metal hinged covers. Walker, Hubbell, or approved equivalent.
11. If electrical floor boxes are used, they shall be flush and fully adjustable pre- and post-concrete pour. Cover shall protect and keep out water, dirt, and debris and shall also match adjacent floor type appearance. Wiremold/Legrand Evolution Series or approved equivalent.



K. Device Layouts

1. Locate receptacles and associated telecommunications outlets within 6 inches of each other.
2. Locate receptacles as follows:
 - a. Offices: One general and one isolated ground duplex each on three walls.
 - b. Conference Rooms: One isolated ground duplex every 8 feet. One general duplex near each door. Provide an electrical floor box centered below conference table where a connection to an under- or in-table powerstrip is being provided. Provide underneath the center of the table if a connection to the table will be at the center. Provide receptacles every four feet at banquets with dedicated utility circuits.
 - c. Computer Training Room: Provide double duplex around the perimeter of the room with two dedicated circuits each. Provide electrical poke-thrus or floor boxes as required to reach desks or tables that are not against the wall.
 - d. Corridors: One general duplex receptacle for housekeeping every 30 feet maximum along hallways and corridors. Provide receptacles adjacent to elevators and in stairwells at each landing.
 - e. Provide GFCI receptacles every 4 feet on countertops in kitchens.
 - f. Provide receptacles every 4 feet on office countertops.
 - g. Provide receptacles for each piece of equipment.
 - h. All utility, electrical, mechanical, janitor, and storage rooms shall have at least one general duplex receptacle near the door. Janitor's room must be GFCI if there is a mop sink.
 - i. Provide a receptacle within 25 feet of all mechanical equipment.
 - j. Provide GFCI receptacles in all bathrooms, kitchens, indoor wet locations, locker rooms and associated showering facilities, garages, service bays, at all countertops within 6 feet of sinks, and on rooftops and outdoors.
 - k. Provide exterior weatherproof GFCI receptacles near each exterior door, each with a dedicated utility circuit.
 - l. Provide exterior weatherproof GFCI receptacles within 25-feet of all exterior and rooftop mounted mechanical equipment with a dedicated utility circuit.

L. Circuiting Requirements

1. At most five receptacles shall be connected to a circuit where not designated otherwise in this section.
2. Provide dedicated 20 amp circuits for each the following. Dedicated circuit receptacles shall be identified with a red dot:
 - a. Photocopiers, using an isolated ground receptacle.
 - b. Laser printers, using an isolated ground receptacle.
 - c. Microwaves.
 - d. Vending machines.



- e. Coffee machine, provide with 12 hour timer receptacle.
 - f. Two at kitchenette counters.
 - g. Two at locker room counters
 - h. Toaster.
 - i. Refrigerator.
 - j. Dishwasher.
 - k. Equipment as needed.
3. Provide one circuit per four seats in meeting and conference rooms.
 4. Provide one circuit per two seats in the computer training room.
 5. Provide one circuit per 2 workstations maximum. Verify with Owner whether there are any high power users that may need their own dedicated circuit.
 6. Provide isolated ground (IG) for circuits that are for computer loads. Provide isolated grounding conductor in addition to equipment grounding conductor.
 7. Receptacles shall be Leviton 20 amp specification grade. Confirm with owner the style and type. Utility receptacles shall be ivory. Computer receptacles shall be orange with isolated ground.
 8. Stainless steel cover plates or plates with a color that matches the building décor shall be used.

M. Flexibility

1. Flexibility is a key feature of this project. Provide circuits in junction boxes that are strategically located in regular zones. Junction boxes shall be sized to provide additional wires and splices at a later date.

N. Labeling

1. Label all major pieces of electrical equipment, including switchboards, distribution panels, panelboards, transformers, disconnect switches, variable frequency drives, UPSs, PDUs, transfer switches. Labels shall indicate the equipment name, voltage, amperes, upstream source(s) and downstream loads, where applicable. Labels shall be 3-layer, and attached with screws, not just adhesive. Labelling shall meet additional WAC requirements, where applicable.
2. Label receptacles, switches, and furniture whips with panel name and circuit number. Use labeler to produce small letters and numbers. Use black letters with a clear background for general circuits and red letters with clear background for computer circuits.
3. Provide orange labels for emergency equipment.



4. Transformer labels shall be metal and engraved with information required.

O. Grounding

1. Ground per NEC Article 250. Soares book on grounding and IEEE "Recommended Practice for Grounding of Industrial and Commercial Power Systems" shall be used as guides.
2. Run all grounding electrodes to a ground bar within the main electrical room, which in turn connects to the main switchboard neutral bus.
3. Provide a UFER ground in addition to ground rods and bonding to water pipe at the main service.
4. All conduits shall have an equipment grounding conductor sized per Article 250.
5. Provide an isolated ground system for all office panels, configured as follows:
 - a. Provide isolated grounding receptacles where required, typically workstations for PCs.
 - b. Provide dedicated isolated grounding conductor back to panelboard, in addition to equipment grounding conductor.
 - c. Provide isolated ground bus in each panelboard that serves the computer loads.
 - d. Provide isolated grounding conductor to distribution panel upstream and its own isolated ground bus. The isolated grounding conductor in the feeder is separate from the equipment grounding conductor.
 - e. Run isolated ground feeder-conductor to main switchboard ground bar.
6. Provide a ground bar in each electrical room that is used for grounding transformers.
7. Provide a #4/0 ground riser in each stack of electrical rooms, which interconnects each the ground buses. The riser terminates on the main ground bar in the main electrical room.
8. Where lightning protection is required, bond grounding electrode system to the lightning protection system per NFPA 780 requirements.

P. Lighting Controls

1. Provide lighting controls per the current Washington State Energy Code and per LEED. This includes:
 - a. Occupancy sensors in all classrooms, conference rooms, meeting rooms, lunch and break rooms, offices, restrooms, warehouse spaces, storage rooms, janitor closets, and other spaces less than 300 square feet enclosed by floor-to-ceiling height partitions. Provide additional controls in other multi-occupant spaces as required by LEED.



- b. Coordinate with mechanical engineer if lighting control integration with the HVAC system is required. If the mechanical engineer requires lighting control integration, the ceiling mounted occupancy sensors shall shift the HVAC into an Unoccupied Mode of Operation after the room has been vacant for 15 minutes (AUTO OFF). The occupancy sensor shall either be equipped with an on-board relay contact or be programmed to operate one of the isolated relays in the digital control system module for use by a building management system for HVAC control. The occupancy sensor shall be programmed to operate the dedicated isolated contact closure in conjunction with the lighting controls. The occupancy sensor settings shall be high sensitivity and fixed time (not automatic learning). Contractor shall coordinate the specific manufacturer settings of the installed system to match the programming described above.
 - i. Conference Rooms
 - 1) The lighting fixtures in these rooms shall be controlled by a digital programmable wall box based dimming control system with the necessary control modules for the load types in each room. The dimming control system shall be provided with sufficient dimming channels to control each light fixture types individually as specified by the lighting designer.
 - 2) When a combined room is used in single mode lectern lighting is typically the fixture(s) furthest away from the operable partition. In combined mode the lectern lighting is typically the fixture(s) closest to the operable partition. Coordinate with architect which room's lectern should be active in combined mode.
 - 3) Each room shall have a minimum of one wall mounted remote button station with the buttons specifically programmed and labeled for the specific room per the matrix for button labeling and programming issued by the Lighting Designer or Architect. The remote button station shall have the capability to manually dim the currently activated scene up and down without additional fixtures, not included in the current scene, coming on. The dimming control panel shall also accept control signals from an audiovisual system to control lighting in each room where A/V systems are being provided; a RS232 serial interface port, shall be flush wall mounted behind the audio visual equipment rack location in each room. The key pad buttons for A/V control systems shall provide the users with full control of the room lighting levels including a minimum of four scenes: The scenes shall be similar to the following: Button 1: All On/Off; Button 2: Center On/Off; Button 3: Wall 1 On/Off; Button 4: Wall 2 On/Off; Button 5: Dim Up/Down.
 - ii. Automatic daylight zone control, using dimming ballasts/drivers not switching. Area of control shall not exceed 2,500 square feet per Washington State standards. The primary daylight zone shall be controlled separately from the



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secondary daylight zone. Controls shall only control luminaires within the daylight zone(s) and shall incorporate time-delay circuits to prevent cycling of light level changes of less than 3-minutes. Where there are multiple entries into the same lighting zone, provide a switch at each point of entry.

- iii. Automatic shutoff of permanently installed task lighting.
- iv. Manual light reduction controls.
- v. Controls shall be manufactured by Wattstopper, Lutron, HBA or LC&D, or approved equivalent. Manufacturer shall have been in the business of manufacturing and providing service for lighting control equipment for similar capabilities and size, under the same name and ownership, for a minimum of five years preceding bid date of the project. All components and assemblies shall be factory pre-tested prior to installation. Factory trained technicians shall be on site for start-up, commissioning and training. Factory trained technicians shall be available for telephone support twenty four (24) hours a day, seven (7) days a week. All equipment shall be U.L. listed.

- 2. Provide a programmable lighting control panel that automatically sweeps on and off lights at set times. Flicker warnings shall be provided before lights are turned off.
- 3. Provide manual override switches approximately every 50 feet along main corridors so that occupants can switch the lights back on for two hours before they automatically shut off again.
- 4. Panel shall store its programming for at least ten hours after loss of power.
- 5. Panel may control exterior lighting as well, but must use an astronomic and photocell combination input to turn the lights on and off.
- 6. Panel shall be manufactured by Wattstopper, Lutron, HBA or LC&D and have a BACNET interface.

Q. Surge Protective Devices (SPDs)

- 1. Provide externally mounted surge protective devices. They shall be connected to a circuit breaker within the equipment they are protecting.
- 2. SPDs shall be rated for the available fault current.
- 3. SPDs shall be UL Listed 1449, 3rd Edition.
- 4. The SPD at the main switchboard shall be rated 150kA, mode to mode.



5. SPDs at panelboards shall be rated 50kA, mode to mode. Provide for all panels feeding lighting, and the first panel on the output of each transformer that serves offices and IT loads. Provide for the panel that feeds the server room UPS.
6. Provide 60A-3P breakers for switchboard SPDs and 30A-3P breakers for panelboard SPDs.

R. Electrical LEED

(See Section IV., 4.0 SUSTAINABILITY & LEED NARRATIVE for complete project LEED summary.)

1. This project shall be LEED Silver (minimum).
2. Provide lighting controls to meet LEED requirements.
3. Review lighting design options that reduce the lighting watts per square to various levels below energy code.
4. Provide a lighting design that minimizes offsite glare.
5. Provide cut-off fixtures outside, but also keep in mind any campus standard fixture.
6. Provide electric car charging stations as required by the LEED checklist. Stations shall be compatible with all Electric Vehicle Supply Equipment (EVSE) Standards and Recommended Practices, including SAE J1772 NEC 625, UL 2231 and UL 2594. Provide 40 amp, 208 volt, single phase systems. Enclosure shall be rated NEMA Type 4 Watertight. Also provide 20 amp, 120 volt receptacles with dedicated circuits at each designated parking stall.

S. Lightning Protection System (if required by Owner)

1. Provide a UL Master Labeled Lightning Protection system per NFPA 780 requirements. The system shall consist of a ground ring around the building, air terminals, and down leads between the roof and the ground ring. Conductor materials shall be compatible with the roof material.

T. Fire Alarm System

1. Provide a Class A addressable fire alarm system per NFPA 72, consisting of speakers (not horns), strobes, valve and sprinkler flow monitors, smoke detectors, duct smoke detectors, elevator controls, fire pump monitoring, and other devices as required. Provide air handling shutdown as required. Provide smoke control and pressurization functionality if it is determined to be a requirement. Provide a remote annunciator at the main entrance if the fire alarm control panel is not located there.
2. Interface with a pre-action system within the main server room.



3. The fire alarm system shall be Monaco or approved equal.
4. Provide integrated mass notification system



15.0 ELECTRICAL – LIGHTING DESIGN CRITERIA

A. General Codes and Standards

1. Lighting shall be designed to meet or exceed the Washington State Energy Codes in effect at the time of project permitting. If Desired EUI Goal is required, lighting shall be designed to achieve Desired EUI Goal, see Article 1020.
2. Lighting levels shall meet the IESNA (Tenth Edition) recommended light levels (within the limits of the energy code watt restrictions).
3. Egress lighting levels shall meet the requirements of the International Building Code and International Fire Code, along with any local amendments.

B. Testing Agencies

1. All fixtures shall be UL and/or ETL listed. LED's shall be tested to LM-80-08 and LM-79-08. All lighting shall comply with NFPA, IBC, and ADA.

C. Light Levels and Maintained Footcandles

1. High Density Open Office and Collaborative spaces: 30-40 footcandles.
2. Executive Offices: 40-50 footcandles.
3. Lobby and Reception Areas: 15-20 footcandles.
4. Conference Rooms: 20-40 footcandles.
5. Support/Supply Rooms and Break Room: 10-30 footcandles.
6. Low Use Storage Rooms and Janitor closets: 10 footcandles.
7. Electrical/Mechanical, Server, Telecom Rooms: 20 footcandles.
8. Elevator Machine Rooms: 20 footcandles minimum.
9. Elevator Lobbies: 10 footcandles minimum.
10. Corridors, Restrooms and Phone Rooms: 10-15 footcandles.
11. Stairwells: 10 footcandles.
12. Kitchens: 40-50 footcandles.
13. Classrooms: 40-50 footcandles.
14. Assembly Hall: 30-50 footcandles
15. Personal Equipment Storage: 10-30 footcandles
16. Simulator: 30-50 footcandles

D. Lamp Types and Color Temperature

1. Linear fluorescent T5 and/or T8 lamps with combined energy efficient electronic ballasts. LED with Remote Phosphor Technology. Minimum performance criteria are: minimum 82 CRI, 80 LPW (or greater) and color temperature of 3500K. Rated life for linear fluorescent shall be a minimum of 40,000 hours and 50,000 hours for LED.
2. LEDs shall be used in high ceiling applications. Ceramic metal halide may be used in, but only if LEDs do not provide sufficient illumination for targeted light levels.



3. Compact fluorescent sources shall be avoided in order to reduce energy loads and extend maintenance.
4. High pressure sodium and mercury vapor sources shall not be used.
5. Every effort shall be made to limit the number of lamp types on the project. The goal should be roughly five types.

E. Ballasts

High efficiency electronic instant start ballasts shall be used throughout. When required for daylight response dimmed light levels, ballasts shall be 0-10v and dim to 10% of full output. Rooms with AV access shall include dimming ballast which dim from 100% to 1%.

F. Luminaire Efficiencies

Luminaire efficiency for all sources to be 80% or greater.

G. Emergency Egress

Selected fixtures from general lighting layouts will be provided in all public areas and along the path of egress and shall be backed up by the emergency generator and supplied from the NEC 700 distribution system so battery back-up is not required. Refer to Electrical narrative for more detailed information.

H. Exit Signs

All Exit signs shall be green LED. Edge-lit signs will be used in public spaces and aluminum housings in utilitarian areas. Bug-eyes shall not be used. All Exit signs shall be backed up by the emergency generator and supplied from the NEC 700 distribution system.

I. Lighting LEED

(See Section IV., 4.0 SUSTAINABILITY & LEED NARRATIVE for complete project LEED summary.)

Energy usage for lighting will target a 30% improvement over ASHRAE 90.1 2007, which is the baseline for LEED 2009 documentation. Should the credit for Sustainable Sites SSc8 be pursued, no light may trespass beyond the property line. Low mercury lamps may be used to achieve additional credit but only one manufacturer produces a product that meets the requirements (Philips). Enhanced controls may be considered in executive offices as well as open office areas.

J. Space by Space Lighting Concepts

1. All open office areas will utilize pendant direct/indirect linear fluorescent T5, T8, or LED light sources. Layouts will reinforce building architecture while remaining general



- enough to allow for future reconfigurations of work stations. Luminaires in daylight areas will have integrated photocells and 0-10VDC dimming ballasts.
2. Similarly, Executive offices will utilize pendant direct/indirect fixtures with T5, T8, or LED light sources. Room control devices will have integral occupancy sensors.
 3. Fixture selections need to be consistent from floor to floor to minimize number/variety of lamps required to have in stock
 4. Rooms with rows of shelving may include stack-integrated LED linear lighting to meet IES recommended vertical light levels on shelves. Supplemental lighting for general illumination may be fluorescent or LED pendant direct, indirect or direct/indirect.
 5. Copy rooms to have occupancy sensors so lights do not go out if in use after hours.
 6. In Conference rooms, the lighting will be ceiling recessed to avoid AV conflicts. Sources will be linear T8, T5 or LED and/or compact LED down lights and will dim from 100% to 1%. Presentation walls will be evenly washed with light. Provide 4-scene digital controllers that control dimming of each fixture type and fixture location type. Dim fixtures so that each of the following can be controlled separately: conference room table light, projection screen, side and rear wall, miscellaneous can lights, and podium.
 7. Reception desks and public lobby areas shall be illuminated with a combination of recessed LED downlights and pendant indirect fixtures to elevate the ceilings and highlight reception and seating groups. Recessed LED lensed wallwash fixtures will also highlight feature walls and/or signage.
 8. In Circulation Areas, general lighting shall be provided by recessed linear fluorescent or LED lighting to provide good general illumination on the walls.
 9. All restrooms are occupancy sensor activated.
 10. Public Stairs are to be illuminated in such a way that ladder-access for fixture maintenance will not be required. Sources may be LED or non-dim fluorescent.
 11. Exit Stairs are to be illuminated with ADA wall mounted fixtures that are two-lamp T8 or T5 with dual ballasts or LED with dimming driver for two levels of control. Fixtures shall also have integral occupancy sensors which will turn 50-percent of light off for energy savings when stairwells are unoccupied.
 12. Back of House spaces including all electrical, mechanical and storage rooms are to be provided with basic T8 or T5 fluorescent strips. Wire guards shall be provided on all fixtures.



13. Assembly Halls shall be ceiling mounted T5 HO with multilevel switching. Fixtures to be mounted as high as possible to avoid AV conflicts. Wall sconces should be provided on walls to highlight Architectural elements.
14. Simulator Rooms to be provided recessed, dimmable to 1%, T5, T8 or LED fixtures.
15. Personal Storage Rooms shall be illuminated with basic T8 or T5 florescent ships. Provide wire guards on all fixtures.

K. Exterior Lighting

1. Exterior lighting will include canopy or building mounted downlights at all exit doors. The primary entry doors will be featured with higher light levels. LED sources will direct light downward with full cut-off optics at all exit doors.
2. Outdoor path and shared public spaces shall be designed to minimize dark areas and promote a sense of security through use of high color-rendering sources at uniform light levels. Fixtures will be well shielded to avoid direct view to sources which add glare. Full cut-off luminaires will be used wherever possible to reduce upward-directed light and sky-glow. Limited and controlled directional uplighting may be used for signage and specialty features in limited locations and quantities. All exterior sources shall be LED.
3. Multi-level controls with combined photocell/time interface allow for reduced light levels and energy loads after office hours.
4. Selected fixtures from building egress doors to 10-feet away from building in path of egress shall be backed up by the emergency generator and supplied from the NEC 700 distribution system for egress lighting.

L. Special Considerations: Lighting Control Systems for Energy Conservation

1. Code required automatic shutoff controls shall be via occupancy sensors in all required rooms.
2. Code required lighting automatic shutoff controls shall be controlled by a lighting control panel system of time programmable low voltage relays to control lighting during unoccupied hours.
3. Code required light reduction controls shall be installed.
4. Light fixtures in daylight zones shall be dimmable, controlled by local daylight sensors for continuous daylight dimming.
5. Conference Room: Preset Control System with RS232 interface with all AV systems.
6. Exit stairwells shall be circuited and zoned to reduce light levels when unoccupied.



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16.0 INTEGRATED SECURITY SYSTEM DESIGN CRITERIA

The integrated security system consists of CCTV, ACS, IDS and cabling for these systems. The ISS will utilize the structured cabling system present throughout the building in the telecommunications design. The design shall follow the room data sheet requirements for access control.

All integrated security systems will utilize an IP based network for CCTV and ACS. Centralized equipment may reside in the MDF or IDF rooms as necessary to accommodate cabling requirements.

Security systems may share same pathways as other data networks within building.

All cabling routed through plenums shall be plenum-rated. Coordinate plenum locations and requirements with the mechanical design-build contractors.

A. Definitions

1. Closed Circuit Television (CCTV)
2. Integrated Security System (ISS)
3. Access Control System (ACS)

B. Base CCTV / Access Control Design

1. The core system shall have Access Control and CCTV at the below listed locations:
 - a. Card reader locations:
 - i. All exterior doors
 - ii. MDF and IDF's
 - iii. Main entry points to tenant spaces
 - b. Camera locations should cover
 - i. All exterior doors and loading dock
 - ii. Lobby area
 - iii. All hallways
 - iv. MDF

C. Quality of Materials and Systems

1. Monitoring platform will be manufactured by Elk and Pelco.
2. Door control system will be manufactured by Galaxy Access Control. Provide conduit for door control systems for 12 doors. The conduit shall go from the card reader location to the controller; from the request to exit device to the controller and from the controller to network location.



17.0 RADIO SYSTEM DESIGN CRITERIA

The building radio system will be designed to support first responder systems as the minimum requirement.

The design-build contractor will be responsible for identifying frequencies to be covered by distributed antenna system (DAS).

All DAS cabling will be coax and will follow structured cabling pathways from MDF through IDF's. DAS cabling will require an additional pathway from highest floor IDF to roof level. DAS cabling and antennas will be distributed throughout each floor from IDF space as necessary to provide adequate coverage. DAS equipment and other radio equipment will be located in a roof level room.

All cabling routed through plenums shall be plenum-rated. Coordinate plenum locations and requirements with the mechanical design-build contractors.

The DAS will be designed with the ability to support additional radio systems such as cellular and wifi.

A. General Codes and Standards Requirements

The radio system shall comply with local codes for emergency responder radio coverage.

B. Radio Communication Systems Coordination

System shall be designed with a bi-directional amplifier.

Radio systems to be incorporated include but are not limited to:

1. Pierce County VHF
2. HF dipole radio antenna



18.0 TELECOMMUNICATION INFRASTRUCTURE DESIGN CRITERIA

A. General Description

This section of the report is intended to define the standards, criteria and assumptions used for the design, documentation and specification of a telecommunications systems infrastructure.

1. The telecommunication Design-Build contractors shall provide a written guarantee for a period of one year from the date of substantial completion that covers the entire system including equipment, materials and workmanship.
2. The telecommunication system shall comply with the following:
 - a. National Electrical Code as amended and adopted by the local authority having jurisdiction
 - b. National Electrical Safety Code (NESC)
 - c. GA Facility Design and Construction Standards, 2008 Edition
 - d. Leased Space Requirements, Department of Enterprise Services, Real Estate Services, July 2005
 - e. NFPA 72, National Fire Alarm Code
 - f. NFPA 70-1996, National Electric Code (NEC)
 - g. ANSI/TIA/EIA 568-B.1, Commercial Building Telecommunications Cabling Standard Part 1: General Requirements
 - h. ANSI/TIA/EIA 568-B.2, Commercial Building Telecommunications Cabling Standard Part 2: Balanced Twisted-Pair Cabling Components
 - i. ANSI/TIA/EIA 568-B.3, Optical Fiber Cabling Components Standard
 - j. ANSI/TIA/EIA-569-A, Commercial Building Standards for Telecommunications Pathways and Spaces
 - k. ANSI/TIA/EIA-606, The Administration Standard for the Telecommunications Infrastructure of Commercial Buildings
 - l. ANSI/TIA/EIA-607-B, Commercial Building Grounding and Bonding Requirements for Telecommunications
 - m. BICSI TDMM, BICSI Telecommunications Distribution Methods Manual
 - n. Washington National Guard Telecommunications Planning Guides - Volume 1 (Pathways and Spaces) Volume 2 (Products and Installations) and Volume 3 (Outside Plant Products and Installation).

B. Telecommunication Systems

The Information Technology (IT) structured cabling design will provide a complete infrastructure to support all network-related services. This includes adequate space planning, security, power, cooling, and a high quality structured cabling system. The design contractor will be responsible for complying with the room data sheets provided to understand the size and complexity of the telecommunication system. The telecom



components will provide the foundation to support the building occupants' IT needs well into the future.

The structured cabling system will be provided as a certified cabling system. The manufacturer or manufacturers of the cable and termination components will qualify and warranty the performance of the entire system.

C. Definitions

1. Building Entrance Facility (EF): Located in MDF. Voice, data and video services are brought into the building in this room.
2. Main Distribution Frame (MDF): Building voice, data and video services are distributed to IDFs on all levels from this room.
3. Intermediate Distribution Frame (IDF): Used to distribute station cabling to workstation outlets and to house communications equipment.
4. Information Technology (IT): the service of providing data to support the business.
5. Backbone Cabling: Cables connecting EF to MDF and MDF to IDFs.
6. Horizontal Cabling: Cables connecting Standard Information Outlets to MDF, IDFs and consolidation points.
7. FO: Fiber Optic.
8. CO: Copper cabling.
9. Cable: Assembly of one or more conductors or optical fibers within enveloping sheath, constructed to permit the use of conductors singly or in groups.
10. Consolidation Point: Interconnection point within the horizontal cabling using ANSI/TIA/EIA-568-B.2 or ANSI/TIA/EIA-568-B.3 compliant connecting hardware installed in accordance with the requirements of clause 10 and rated for at least 200 cycles of reconnection.
11. Cross-connect: Group of connection points, wall or rack mounted, used to mechanically terminate and administer building wiring.
12. Intra-building: Within a single building
13. Inter-building: Between two or more buildings
14. Shielded Twisted Pair (STP): Balanced, 4-pair cable used for copper station cabling. Each pair is wrapped with a shielding material and the overall cable is also wrapped with a shielding material.



15. Unshielded Twisted Pair (UTP): Balanced, 4-pair cable used for copper station cabling and multi-pair copper backbone cables.
16. Telecommunications: Any transmission, emission, or reception of signs, signals, writings, images, sounds, or information of any nature by wire, radio, visual, optical, or other electromagnetic systems.
17. Local Area Network (LAN): Network or networks typically covering a small geographic area. Typically includes only client-owned cabling and equipment.
18. Wide Area Network (WAN): Network or networks typically covering a large geographic area. Typically includes client-owned and service provider-owned cabling and equipment.

D. Connectivity and Cabling Components

1. All data cabling to workstation areas will be Cat6A.
2. All cabling routed through plenums shall be plenum-rated. Coordinate plenum locations and requirements with the mechanical design-build contractors.
3. Comply with all DES Requirements.

E. Telecommunications Rooms

1. MDF
 - a. The building will contain one Main Distribution Frame which will act as a central telecom room and entrance facility for the building. Core telecommunications equipment supporting the entire building will be installed in this room.
 - b. The intra-building backbone fiber and copper cabling runs will be connected from this room to the IDF via conduit. The number of conduits from the MDF to IDF shall be the minimum required plus 100 % spare. Cat6A UTP, SM and OM-3 fiber cabling will be extended to the IDF room from the MDF.
 - c. This room size will accommodate a minimum of twelve (12) equipment cabinets. In all cases, a 4-foot service zone will be maintained at the front and rear of the equipment cabinets and at the end of each row of equipment cabinets. Space will be reserved in the MDF to add an additional equipment cabinet should this ever be necessary.
 - d. The walls of the room shall be covered with 3/4 inch fire resistant plywood painted on all sides with light color fire resistant paint. Care should be taken to assure that the fire rating stamp of the plywood be visible for inspection prior to installation. Horizontal cabling termination hardware will mount to the painted 3/4 inch fire-rated plywood backboard on the wall opposite the rear of the equipment cabinet(s)



facing the equipment cable connections. Entry door opens out, automatically closes, and is secured by an access-logging keycard entry system.

Typical MDF Telecommunications equipment includes:

- i. WAN routers
- ii. Core and Distribution switches
- iii. Access-Server switches
- iv. Access-User switches
- v. File servers
- vi. Terminal servers
- vii. PBX, Voice Gateways and other telephone-related equipment.
- viii. Voicemail System
- ix. Centralized UPS (if not located in an appropriate electrical room)
- x. Copper (UTP) termination hardware
- xi. Fiber Distribution Panel
- xii. Carrier equipment and termination hardware

2. IDF

- a. This is the room where telecommunications equipment supporting the horizontal distribution zone is installed. The building will contain IDF spaces such that:
 - i. All horizontal cable lengths from outlet to IDF are less than 250 feet.
 - ii. Area served by each IDF is less than 25,000 sq feet
 - iii. Horizontal network equipment fits in IDF racks with 50% spare rack space.
- b. The intra-building backbone fiber and copper cabling runs will be connected from this room to the MDF via conduit. The number of conduits from the MDF to IDF shall be the minimum required plus 100% spare. Cat6A UTP, SM and OM-3 fiber cabling will be extended to the MDF room. The SM and OM-3 fiber cabling will be plenum rated. The IDF will have 18 inch wide ladder type cable tray installed at 8 feet AFF installed around the perimeter of the room. The electrical distribution for the IDF will be from two panels located in the room, one normal utility and one from the generator system. Connected to each of these panels will be an overhead bus system for electrical distribution to the equipment cabinets. Within the equipment cabinets vertically mounted distributions units will provide the individual outlets for the equipment connections. Quad receptacle normal power convenience outlets will be installed on 6 foot centers along all permitted walls. Two stand-by power quad outlets will be provided on walls expected to support wall mounted active components.
- c. A 4-foot service zone will be maintained at the front and rear of the equipment cabinets and at the end of each row of equipment cabinets. Horizontal cabling



termination hardware will mount to the painted ¾ inch fire-rated plywood backboard on the wall opposite the rear of the equipment cabinet(s) facing the equipment cable connections. The walls of the room shall be covered with 3/4 inch fire resistant plywood painted on all sides with light color fire resistant paint. Care should be taken to assure that the fire rating stamp of the plywood be visible for inspection prior to installation. Entry door opens out, automatically closes, and is secured by an access-logging keycard entry system

- d. Typical IDF equipment includes:
 - i. Access-User switches
 - ii. Terminal servers
 - iii. Copper (UTP) termination hardware
 - iv. Fiber Distribution Panel

F. Structured Cabling System

- 1. The telecommunications cabling system shall be designed to conform to the requirements of EIA/TIA-568B, The Commercial Building Telecommunications Cabling Standard.
- 2. In conformance with the above referenced standard, the telecommunications cabling system shall be designed in a hierarchical star topology, with all cables meeting or exceed the mechanical and performance requirements of Section 10 of the standard.
- 3. All cabling routed through plenums shall be plenum-rated. Coordinate plenum locations and requirements with the mechanical design-build contractors.

G. Backbone System Cable

- 1. Twisted pair
 - a. All twisted pair cable shall be UTP Cat6A
 - b. All twisted pair cable lengths shall be less than 100m for network equipment connections
- 2. Single mode optical fiber
 - a. Cable shall be capable of a minimum 10 Gb/s transmission over distances of up to 2000m (OS1)
 - b. Quantity of fiber to be determined during design.
 - c. Cable shall be terminated with LC connectors
- 3. Multi-mode mode optical fiber
 - a. Cable shall be capable of a minimum 10 Gb/s transmission over distances of up to 300m (OM3)
 - b. Cable shall be sized to a minimum of 48-strands per IDF space
 - c. Cable shall be terminated with LC connectors



4. All cabling routed through plenums shall be plenum-rated. Coordinate plenum locations and requirements with the mechanical design-build contractors.

H. Horizontal Wiring

1. Horizontal system cable shall be Category 6A Unshielded Twisted Pair between the IDF and workstation spaces. Cable shall be run in cable tray pathways throughout the work area.
2. The term "horizontal wiring" refers to a number of cable types that run from a communications closet on a particular floor of a building to workstations, telephones, wireless access points, printers and other devices on that floor. Interconnection cables between closets on the same floor typically include some combination of copper and fiber optic cables. Careful design work on the horizontal cable pathways to minimize total cable length will help to lower wiring costs and in some cases might decrease the total number of wiring closets needed to serve a building.
3. All cables must be marked clearly and legibly at both ends with floor, room and jack number for easy identification.
4. All cabling routed through plenums shall be plenum-rated. Coordinate plenum locations and requirements with the mechanical design-build contractors.

I. Horizontal Pathways

1. Horizontal pathways shall be cable tray. Conduit shall be run from wall outlet and stubbed to ceiling, then j-hooked to cable tray. If copper and fiber share the same cable tray, a barrier shall be installed to separate cable types. Horizontal pathways should consider future use for tenant requirements. Horizontal cabling must be designed to accommodate diverse user applications, including Data communications and Building Automation Systems.
2. Ceilings used as distribution pathways for horizontal cabling shall meet the following conditions:
 - a. If a fixed ceiling has to be used as a cable route, or specialized oversized tile, a properly sized conduit or cable tray must be installed as a pass through. Where conduit is used, a pull string will be provided in each conduit. Pull boxes with access doors may be required depending on distance and design. Cables may not make 90 degree turns within the pull box. No direction transition may take place inside pull boxes.
 - b. Drop-ceilings of lay-in tiles which allow easy access to a suitable space above are recommended. Suitable space is defined as that which supports the installation and ready use of a 18 inch x 4 inch side wall basket type cable tray. These cable ladders should be installed in all hallways in the areas indicated on the construction



drawings. All areas along the cable tray pathway will be accessible. Per NEC code the maximum cable tray fill ratio is 40%.

- c. Pathway shall be sized to 100% spare capacity over initial usage.
 - d. Height of the cable ladder/raceway tray above the finished floor shall be no more than 11'. There must be at least 3 inches of clear space above the cable tray for access. At least 12 inches of clearance will be maintained between the cable tray and any lighting fixtures and at least 4 feet of clearance will be maintained between the cable tray and any other sources of electrical interference such as motors and generators.
 - e. No conduits, pipes, wires, threaded rod or any other obstruction may penetrate the interior area containing the cables or be mounted below the cable tray. Cable trays must be supported on each edge of the cable ladder; no center supports will be used.
 - f. Metal cable ladders/raceways shall be bonded to the building ground per applicable code (using a minimum of 6-gauge wire).
 - g. Ancillary low-voltage wiring may not be run within the same section of the cable tray or raceway as data cabling. All pathways shall allow for a minimum 3" of clear vertical space above the ceiling tiles and support channels to ensure accessibility. Design will coordinate pathways with mechanical, lighting, and other systems to maintain separation.
3. All horizontal pathways that penetrate fire-rated barriers must be fire stopped in accordance with applicable codes.

J. Entrance Facility

1. This is the area where telecommunications service providers deliver their services to the building. A minimum of eight (8) 4" conduits shall be run into the EF from each of two separate in-ground communications vaults to provide for diverse service entries from at least two separate providers. A provider is defined as a State agency or a telecommunications utility. The in-ground communications vaults shall be located close to the property line and separated by a minimum of 100 feet. Conduits extended from the in-ground communications vaults shall be routed so that maximum separation is maintained prior to entering the EF room. Vaults shall be owned by DES and be made available to all IT Vendors. All copper and fiber cabling for the building will terminate in the EF then be cross-connected to backbone cabling to MDF and IDF. The EF shall be located adjacent to the MDF room if space permits. If space is limited, the EF will be located in the MDF. Consideration shall be made for additional telecommunications utility services (T1 lines or similar) to utilize the EF.
2. In ground communications vaults need to be large enough to support large service loops for multiple fiber optic cables.



3. Copper cabling and any metallic elements that are part of the fiber cabling will be terminated onto building protection systems. All carrier equipment and termination hardware shall be located in the EF and these services extended to the MDF/IDF via cabling connections.

K. Outside Plant (OSP) Backbone and Pathways

1. The data system will use fiber optic cabling to bring data service into the building at the EF from either buried vault. The data backbone will be sized at a minimum of 36 total fiber optic strands per service, including 24 single mode strands and 12 multimode strands. All fiber strands will terminate on LC connectors in rack mounted patch panels in the EF.
2. All cabling shall rated for outside plant use. All outdoor inter-building pathways shall allow for 100% spare capacity over initially installed cabling.

L. Grounding and Bonding

1. A uniform telecommunications grounding and bonding system shall be provided in accordance with TIA Joint Standard-607-B, Grounding and Bonding Requirements for Telecommunications in Commercial Buildings. This system shall be designed in conjunction with the electrical power grounding system. The following guidelines are provided for the design of the system.
2. The telecommunications grounding backbone shall consist of solid copper busbar and copper conductors interconnected in the following manner:
 - a. Main electrical ground to the telecommunications main grounding busbar (TMGB) located in the MDF room.
 - b. The TMGB to individual telecommunications grounding busbars (TGBs) installed in the IDF rooms.
 - c. The telecommunications grounding busbar in each of these rooms to the nearest point of grounding building steel, if available.
 - d. Where the electrical power is located within the MDF and IDF rooms, the TGB shall be bonded to the panel board's alternating current equipment ground (ACEG).
 - e. The TMGB shall be pre-drilled, a minimum of 1/2-inch thick, 4-inch wide solid copper bar, electro-tin plated, and insulated from their supports by a 2-inch separation. The TGBs shall be pre-drilled for double lugs attachment, a minimum of 1/4-inch thick, 2-inches wide solid copper bar, electro-tin plated, and insulated from their supports by a 2-inch separation.
 - f. The telecommunication bonding backbone shall be sized at 2 kcmil per linear foot of conductor length up to a maximum size of 750 kcmil.



- g. All bonding conductors shall be a minimum #6 AWG copper conductors. The conductor jacket shall be green in color or marked appropriately, and installed in continuous lengths.
- h. All metallic raceways, racks and cabinets entering or located with a room with a TGB shall be bonded to the TGB.

M. Mechanical and Electrical Requirements

1. General

No piping or ductwork will pass over or through any IT support room, unless they are used to provide services to the support rooms. Piping and ductwork used to provide services to these rooms will be coordinated with the anticipated IT equipment layout within the rooms.

2. Electrical Requirements

IT support rooms will be connected to the building standby power source. Rack-mounted UPS equipment may be used to maintain system operation while the standby power source comes on-line. IT support rooms will be lit to a minimum of 50 footcandles between the equipment rack rows (measured at three feet above the floor) and will provide adequate vertical surface illumination to the bottom of racks. Access to IT support rooms will be controlled by the building access control system to allow the Owner to track access to the rooms.

3. Mechanical Requirements

IT support rooms will be maintained at between 68 and 80 degrees Fahrenheit with 30% to 50% relative humidity at all times (complying with TIA-569-C). If the building HVAC system cannot provide continuous operation or adequate capacity to meet these criteria, supplemental cooling units will be installed.

N. Special Materials Provisioning

All copper and fiber optic cabling should be manufactured by Corning or equivalent. Racks, cable management, and cable tray should be Corning or equivalent manufacture.



19.0 TELEVISION DISTRIBUTION DESIGN CRITERIA

Television service will be available throughout the building. Television service will terminate in IDF spaces on each floor and tenants will be responsible for connecting to television in the IDF. Dual coax backbone will be required from EF/MDF to all IDF's to provide redundancy within building. Amplification will be added as necessary on backbone to receive a clear signal at the IDF location.



20.0 TELEPHONE SYSTEM

A single PBX (analog/digital) system will feed the building. The PBX will be located in the MDF. PBX system will utilize minimum Cat6A cabling through structured cabling pathways to reach workstations throughout building.

A. Reference Guide

Washington Army National Guard – Telecommunications Guide (dated 1/2014)



21.0 AUDIO/VISUAL SPACES DESIGN CRITERIA

Audio/Visual spaces shall be designed to provide presentation and audio technologies to support the operations of the building. Each space shall be designed so that technologies aid in communication within the space and with connected spaces as required by the room. Refer to room data sheet for a listing of spaces and requirements.

A. General

1. Equipment shall be new, unused, and undamaged.
2. Materials shall be new, free from defects and shall be designed to insure satisfactory operation and operational life in the environmental conditions which will prevail where they are being installed.
3. Prior to ordering equipment, the Contractor shall coordinate the frequencies of all new in the facility to prevent unwanted interaction between devices and rooms. This includes, but is not limited to, wireless microphones, assisted listening system devices, wireless control panels, etc.
4. Accessories, including rack mounting hardware, power supplies, etc., shall be obtained from the original equipment manufacturer. Unless otherwise noted or specified, third party accessories shall not be used.
5. Equality
 - a. Other products of equal quality and function may be furnished, subject to approval by the Owner, Architect, and Owner's Representative.
 - b. Proof of equality rests with the submitter. The Owner shall be the final judge of equality.
6. Owner Furnished Furniture
 - a. Room furniture will be furnished by the Owner.
 - b. Free standing computer furniture will be furnished by the Owner. Built in cabinetry at conference rooms is by Design-Builder.
7. Manufacturer
 - a. Do not provide an assortment. For each category, provide products of the same manufacturer; for each item, provide the same model for all pieces.
8. Accessories
 - a. Any standard accessory or item supplied by the manufacturer as part of the system shall be turned over to the Owner as a loose item at the time of project acceptance.



B. Complete Systems

1. The systems mentioned shall be complete in every detail and fully operational upon completion of the project unless specifically noted otherwise. Mention of certain materials in these specifications shall not be construed as releasing the Contractor from furnishing such additional materials and performing all labor required to provide complete and fully operational systems.
2. The systems integrator will be responsible for determining the proper equipment compliment to provide complete and working systems, based on the operational requirements set forth in the specification.

C. Physical Installation

1. Equipment shall be firmly secured in place unless requirements of portability dictate otherwise.
2. Equipment shall have an engraved plaque permanently affixed, denoting its function.
3. Fastenings and supports shall be adequate to support their loads with a safety factor of at least three. Boxes, equipment, etc., shall be secured plumb and square.
4. In the installation of equipment and cable, consideration shall be given not only to operational efficiency, but also to overall aesthetic factors.
5. Equipment requiring power (such as line drivers) located in AV outlet boxes, shall be installed so that power is fed remotely from the main equipment location (i.e. AV Rack). Under no circumstances shall a remote device be powered from an adjacent receptacle unless permission has been granted by the Owner's Representative.

D. General Code Requirements

1. The following code and standards are referenced in the Division 27 specifications. Perform all work and provide materials and equipment in accordance with the latest referenced codes and standards of the following organizations:
 - a. American National Standards Institute (ANSI)
 - b. National Electrical Manufacturer's Association (NEMA)
 - c. National Fire Protection Association (NFPA)
 - d. Underwriter's Laboratories (UL)
 - e. American Disabilities Act of 2010
 - f. Current International Building Code (IBC)
2. Install the AV systems based on the following:
 - a. NFPA 70: National Electrical Code as adopted and amended by the Local Jurisdiction.
 - b. IBC: International Building Code as adopted and amended by the Local Jurisdiction.



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3. The referenced codes establish a minimum level of requirements. Where provision of the various codes conflict with each other, the more stringent provision shall govern. If any conflict occurs between referenced codes and this specification, the codes are to govern. Compliance with code requirements shall not be construed as relieving the Contractor from complying with any requirements of the drawings or specifications which may be in excess of requirements of the governing codes and rules and not contrary to same.

E. Quality of Materials and Systems

1. Materials and equipment supplied by the Contractor shall be new and shall meet or exceed the latest published specification of the manufacturer in all respects.
2. At the time of submittal the Contractor shall supply the latest model for each piece of equipment.
3. Equipment and enclosures shall be UL listed, or equivalent.

F. Room Types and Technology

1. Rooms containing AV systems will follow the room types and technologies laid out in Section V. Design Program - Space Program, Room Data Sheets, Drawings and Diagrams.