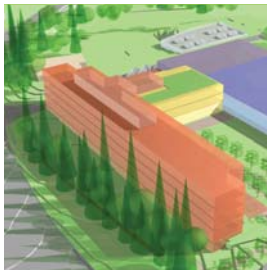
Washington State Department of
**Information Services**

# Data Center and Office Building

Pre-design Report
*18 April 2007*



PERKINS
+ WILL

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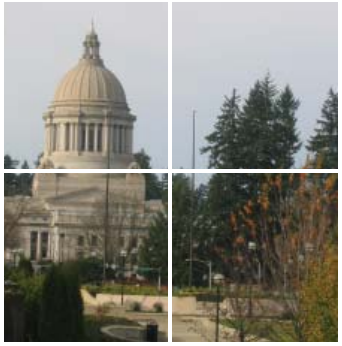

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## 1.0 Executive Summary

The Washington State Department of Information Services currently leases space in 10 different facilities in Olympia and around the area. The main data center is located on the Capitol Campus in Office Building 2 (OB2). The main functions for which DIS is responsible include:

- Providing enterprise level IT services for state and local agencies, education sector, tribal organizations, and non-profit groups
- Leading planning, use, and management of technology for the state
- Joint responsibility for implementing large computing systems
- Processing business transactions for citizens and state agencies

DIS is outgrowing its current capacity for both office space and data storage information technology. Continued growth is expected as a result of the Governor's Initiative as well as successful business development for data storage from various agencies around the state. With ongoing and increased data storage requirements, DIS must ensure that the data center is equipped to maintain security and reliability into the future. It is not currently capable of meeting space needs, environmental support, or security requirements.

Another challenge facing DIS is its dispersion among multiple locations. Departments within DIS work together and need to be in closer proximity to each other and their client base. To be most efficient and effective with their time and provide quality service, it is recommended that DIS be collocated in a single site.

This studies scope includes analyzing two main alternatives: renovate the existing data center in OB2 or construct a new facility. It was determined that it is it is not financially viable to renovate the OB2 data center given the level of in-place renovation that would need to be done to bring this facility up to both the space and security requirements of DIS. This study recommends a new facility on the Wheeler Site of the East Capitol Campus. This site is preferred because it rates significantly higher on critical considerations such as development cost, utility infrastructure, capacity, proximity to major customers, and security.

Information documented within this report includes a full programming effort, site and building concept designs, parking strategies, data center criteria, and a cost estimate. Additionally, an eco-charrette was conducted and sustainability goals were integrated into the design and cost estimate.

# 2.0 Project Analysis


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## 2.1 Operational Needs

### State's Full Service Technology Agency

The Department of Information Services (DIS), led by the agency director and state Chief Informational Officer, provides technology leadership for government organizations across Washington. DIS was formed through the consolidation of the state's four independent data processing and communications systems in 1987. A cabinet-level agency, DIS provides leadership, policy and service choices for the use of information technology within state and local agencies, the education sector, tribal organizations and qualifying non-profit groups.

Always seeking to provide the most competitive value for its customers, DIS is authorized to sets its rates with the review of its Customer Advisory Board and approval of the Office of Financial Management. In fact, in a 2000 study of DIS rates conducted by Gartner Inc., DIS rates for services such as computing and long distance telephone averaged 16 percent below comparable private sector services.

### Statewide Enterprise Services

DIS provides its customers a wide range of information technology services including:

- Data Networks: Internet connectivity for public sector customers, the state government Campus Fiber Network, and stakeholder networks such as K-20 Education Network and the Intergovernmental Network.
- Disaster Recovery & Business Continuity: Backup, recovery and remote operation of customers' critical processing systems in the event of a data center evacuation.
- Education networks: The high-speed K-20 Education Network that delivers Internet and live, two-way video-conferencing to Washington's public education systems.
- Enterprise data storage: 25 terabytes (terabyte = one trillion characters) total disc and tape storage for applications in mainframe and server environments.
- Mainframe computing: DIS processes more than three million daily transactions in the DIS Data Center – one of the largest in the Pacific Northwest.
- Master contracts: Easy-to-use contracts for a wide variety of proprietary technology services, including industry research and Web-based customer support.
- Security for networks: DIS protects the integrity of data traffic on public networks, and gives secure access to field workers, telecommuters and others who use state computing systems from outside network firewalls.
- Security for Web transactions: A single, secure gateway to transaction-based applications that are offered by many government agencies.

- Server, application, & Web site hosting: A myriad of cost-effective hosting options for large and small organizations, supported on a 24x7 basis and secured around-the-clock in the DIS Data Center.
- Technology brokering: DIS helps agencies find the right software, desktop computers and cellular equipment from industry-leading suppliers at cost-efficient pricing. DIS provides very competitive pricing for well-known brands of personal computers, laptops, servers and printers.
- Telecommunication: More than 50,000 local telephone lines, and long distance services (SCAN and SCAN Plus) for more than 150,000 individual users in 500 public organizations.
- Video production, broadcast, & webcasts: Professional, high-quality educational and public service programs, and interactive training materials. DIS can film in-studio or in the field, and broadcast from DIS studios using traditional television methods or webcasting.
- Web management: Access Washington™, the state Internet portal which provides public access to government information and services. DIS also designs and develops Web sites.

**Statutory Authority**

The legislative intent in creating DIS was to make government information and services more available, accessible and affordable. The Legislature also created the Information Services Board (ISB) to provide coordinated planning and management of state information technology services. DIS provides staff support to the ISB, and acts to oversee compliance with ISB policy in agency technology operations and investments. Chapter 43.105 RCW establishes the ISB structure and outlines DIS' statutory authority.

**DIS Powers and Duties**

- To provide technology services on a cost-recovery basis to state agencies, local governments and public benefit nonprofit entities; these services are for discretionary rather than mandatory use by customer organizations
- To perform work delegated by the ISB, including the review of agency portfolios, the review of agency investment plans and requests, and implementation of statewide and interagency policies, standards and guidelines
- To review and make recommendations on agencies' funding requests for technology projects and to monitor the progress of those projects after they receive funding
- To review and approve standards and common specifications for new or expanded telecommunications networks proposed by agencies, public post-secondary institutions, educational service districts or statewide or regional providers of K-12 information technology services
- To collaborate with the ISB and agencies in the preparation of a statewide strategic technology plan and its related Washington State Digital Government Plan
- To prepare, with direction from the ISB, a biennial state performance report on information technology

**The DIS Strategic Plan: Mission, Vision and Goals**
DIS mission, vision and goals have been developed with an enterprise-wide view. The enterprise approach means leading agencies to common solutions for their information technology needs. Common solutions mean efficiency for the state and quality, reliable IT operations. The enterprise approach also means making wise technology choices that will serve the state well in the long-run.

**Mission**
Deliver quality information technology products and services to customers through proactive and timely technology leadership.

**Vision**
DIS is the trusted technology leader.

**Goals**
**Leadership**: Provide innovative technology leadership.
**Enterprise approach**: Build, create, establish and adopt enterprise solutions.
**Service delivery**: Deliver high-quality and reliable services.
**IT accountability**: Implement successful DIS and state IT projects and infrastructure.
**Satisfied employees**: Promote a valued and satisfied workforce.
**Financial sustainability**: Ensure financial sustainability.

**DIS Strategic Plan**
The DIS 2007-2009 Strategic Plan also addresses the departments facility challenges:

> **Facilities Problems Affect Goal Attainment**
> DIS is faced with two major problems that a new facility will mitigate. First, the data center in Office Building 2 (OB2) is a major risk factor for DIS and the state. Second, the dispersed location of DIS office facilities, comprising ten facilities in Thurston County, results in inefficiencies and productivity problems.
>
> **Existing Data Center**
> The data center houses the mainframe computing services that process millions of business transactions each day for citizens and state agencies in the areas of social services, employment, corrections, business regulation, finance and retirement systems, health care, and natural resources.
>
> The existing data center was first constructed in 1975 and most recently remodeled in 1991. The current data center is 31 years old and suffers from age related service outages.
>
> The data center was designed for a main frame computer environment that is being superseded by a rack and server environment. Current electrical and cooling systems are difficult and costly to adapt to this new environment. The 1975 facility layout does not accommodate the new hosted and ala carte (designed for agency staff access to manage their server farms) services our clients are demanding.

Other key data center problems include:

- Seismic integrity -- OB2 was constructed under the seismic standards of the 1970 Uniform Building code.

- Security -- the existing data center surrounds a public auditorium. A recent Federal audit for a DSHS program found minimum protection standards were not met for the DIS computer facility.

- Energy use - a new facility will be constructed to efficiency standards in excess of current codes.

- Layout - the current data center configuration (horse shoe shape) does not allow for efficient use of space. In addition, the basement location is not easy to expand for future growth.

**Dispersed Office Facilities**

DIS currently has nearly 500 FTE staff housed in ten separate buildings in Olympia, West Olympia, Lacey, and Tumwater. DIS leases a total of 130,000 square feet from private landlords and 80,000 square feet for the current data center. Not only is the agency spread in ten separate locations, but agency divisions are also in as many as four locations resulting in inefficiencies and higher costs.

Productivity problems with ten locations include the following issues:

- DIS is currently fragmented in ten buildings in Thurston County. Customer service suffers due to this fragmentation

- Current office space is in smaller, older buildings with inefficient floor plans

- Loss of staff time resulting from unusual amount of travel

- Facility duplication such as reception, lunch rooms, meeting rooms, mail rooms, building manager, etc.

- Inappropriate unit adjacencies

- Poor staff communication and lost team building opportunities

**Dolan Report**

These business problems were identified in a 1991 study of DIS effectiveness commissioned by the Information Services Board. The effectiveness review conducted by Dolan Associates identified seven strategic recommendations one of which states;

"DIS should be supported in its efforts to acquire a new data center and integrated office facilities.

The current DIS data center, located in OB2, is marginal at best and not capable of meeting the department's current and projected needs for space,

environmental support and security. Department staff is spread across seven other facilities in Olympia as well; further complicating management, communications and team-building. DIS has recently requested permission to fund, out of its "retained earnings", a feasibility study for a new data center and integrated office complex that, if approved, would be ready for occupancy in 1995-1996. DIS should be encouraged in this effort and should evaluate alternatives that would yield results before 1995."

DIS along with other central service agencies needs to be in a location to facilitate interaction with its clients and that location is the capitol campus. The business of DIS is accomplished by meeting with clients (agency staff) to work out business problems and information needs. In order to perform that business DIS needs to be centrally located to be effective. One of the most important determinants of success is how the state handles information and technology into the future.

## 2.2 Prior Planning and History

In response to the Dolan Report, DIS moved forward with a pre-design study for a Headquarter and Data Center done by NBBJ Architecture, Design and Planning. The pre-design study was completed in January 1992. No project was forthcoming from this action.

## 2.3 Alternatives

The following facility alternatives have been evaluated as a part of this predesign report.

1. Do Nothing
2. Remodel OB2 for DIS
3. New facility - Lacey satellite campus sites
4. New facility - Tumwater satellite campus sites
5. New facility - East Capitol Campus site – Wheeler Avenue parking lot

### Do Nothing

This option is considered unacceptable because it requires DIS to continue to add office facilities as space is needed. Continue to use a 31 year old data center and as space is needed add a second data center. The do nothing alternative continues to exacerbate the two major business problems facing DIS: risk associated with the current data center and the inefficiency of being dispersed among ten facilities.

### Remodel OB2 Options

Renovation of the current data center in OB2 was rejected for the following reasons:

- OB2 and earthquake safety and continuity of operation – If the data center were to stay in OB2 the building would need to be brought up to current earthquake safety standards. There are several floors above the data center each with water pipes that could break in an earthquake event.

  Current GA design and planning for earthquake repairs to OB2 have

declared the building non-essential (GA assumes the data center is not in OB2) thus allowing them to use a lesser FEMA building standard in the renovation of the upper floors. The FEMA standard allows the use of the building skin as part of the structure. At a meeting attended by Paul Clemens, GA staff and GA consultants, the question if the building were determined to be essential the cost of repairs to the upper floors would increase up to seven times current estimates.

- OB2 security – A recent federal audit of the data center (DSHS) found major security issues with the service drive adjacent to the data center.
- OB2 data center expansion – Current planning calls for 60,000 sf of raised floor data hall, the current data center has 24,000 sf of data hall. The only realistic expansion possibility is converting the current auditorium to data hall. This could be difficult because of the current sloping floor in the auditorium and the lack of data infrastructure (generator, ups, battery storage, electrical switching, etc.) to support the added data hall.
- Significant ***cost*** to renovate the data center in OB2 - To upgrade a 31 year old facility, 42% of the data center costs are electrical, 20% are mechanical (cooling and fire suppression / detection), and the cost of the building shell is about 10-12% of the total cost of the facility. DIS would only save shell costs by staying in OB2.

**New Facility Lacey Satellite Campus**

This option was not chosen. For further detail refer to Section 4.

**New Facility Tumwater Satellite Campus**

This option was not chosen. For further detail refer to Section 4.

## 2.4 Preferred Alternative

The preferred alternative is to build a new facility on the Wheeler Avenue parking lot located on the East Capitol Campus. This site is identified in the 2006 Capitol Campus Master Plan as future development opportunity site #9. Refer to Section 4 for a detailed analysis of why this alternative was selected.

## 2.5 Scope and Project Description of Preferred Alternative

The project is the construction of a new state owned data center and office building. The facility is proposed to be approximately 441,200 gross square feet overall: 115,100 sf office building, 166,500 sf data center, and 160,000 sf of underground parking (430 cars). It will be constructed on the Wheeler Avenue Parking Lot with materials and systems to provide an expected life of 50 to 100 years. The facility will be constructed to compliment the existing Capitol Campus and respect the surrounding neighborhood.

## 2.6 Issue Identification

Several issues surfaced during the preparation of the predesign that will need to be explored further after the predesign and during the project design phase. Only three months have been allotted for predesign and some issues need added analysis.

These issues include the following:

- Power cogeneration using gas fired generators as the first line of power for the data center. This is discussed in greater detail in Section 3.7.
- Parking and traffic flow are two issues that need more analysis. Existing campus parking, campus visitor and DASH parking, an aggressive transportation demand management program for DIS, and other issues make parking a difficult question that deserves thorough study.
- Due to space requirements, General Administration has requested an additional 175,000 sf of office space to be located on the Wheeler Site. DIS, Perkins+Will and the GA have developed a conceptual plan to allow this increase in office building space. Further development of this expansion option should be performed.
- The State mandates a minimum LEED rating of Silver. Additional strategies could be implemented to better the LEED rating, given that the cost is minimal and that a possible payback is evident.

## 2.7 Stakeholders

Customers for DIS services include state agencies, Local Governments, and Indian Tribes. These customers will all experience enhanced levels of service performance from DIS whether they are data center or staff service users or both.

The DIS data center houses the mainframe computing services that process millions of business transactions each day for citizens and state agencies in the areas of social services, employment, corrections, licensing, business regulation, finance and retirement systems, health care, and natural resources.

The largest customers for DIS data center services are:

| | |
|---|---|
| DSHS | 40% |
| DIS | 15% |
| LNI | 10% |
| ESD | 10% |
| DOL | 10% |
| All Other | 15% |

Recent customers include King County who entered into an agreement for business continuity service and is exploring other data center services.

Stakeholders as a result of the Wheeler Avenue site being selected as the preferred site include:
City of Olympia
South Capitol Neighborhood
Puget Sound Energy

## 2.8 Project Description

Refer to section 5.3 for Form C-4; Predesign Capital Project Request Report Summary.

## 2.9 Implementation Approach

There are several public works contracting methods for project delivery:
Small Works Roster
Job Order Contracting
Lease Options
Design – Bid – Build
Design – Build
General Contractor / Construction Manager (GC/CM)

The first two project delivery methods deal with much smaller projects than the Data Center Office Building project. The various leasing options of project delivery are more for straight forward office building projects and are not suitable for complex data center projects. The remaining project delivery methods; Design – Bid – Build, Design – Build, and GC/CM are discussed below.

**Design – Bid – Build**
Design – Bid – Build is the traditional contracting method used for most projects and is undertaken in distinct phases. Under this process, an agency contracts with an architectural and engineering firm to design a facility. Once the plans and specifications for the facility are complete, the project is bid and the construction contract is awarded in a lump sum to the lowest responsive bidder.

**Design – Build**
Design – Build is a multi-step competitive process to award a contract to a single firm for both design and construction. The agency develops an RFP for the project. The agency forms an evaluation committee that will select finalist firms that are invited to submit final proposals. The proposals are evaluated and the agency negotiates a contract with the firm with the highest scoring proposal.

**GC/CM**
The agency enters into two contracts; one with an architectural form for design of the facility, and one with a GC/CM firm to assist in developing and evaluating the facility design and to manage the construction project. The GC/CM firm guarantees the construction cost. The agency establishes an evaluation committee to review proposals.

The data center and office building project is large both in terms of dollars and square feet. In addition, the data center component of the project is extremely complex. The project schedule is very aggressive to reduce the effects of inflation and to meet the business needs of DIS. DIS would also like to transfer some of the project risk to the firm building the project. For these reasons we recommend the GC/CM as the best delivery for this project. The cost estimate for this predesign reflects a design/bid/build approach and will need adjustment to reflect a GC/CM delivery method if this implementation approach is selected.

## 2.10 Project Management

The project will be managed jointly by the Department of Information Services (DIS) and the Department of General Administration (GA). The GA Division of Engineering and Architectural Services will provide contract management and project oversight. DIS has established a project manager that will jointly manage the project with GA staff.

DIS has established a core project management group that will work with the consultant team to develop the design and provide program oversight.

Guidance and oversight will be provided by the State Capitol Committee, the Capitol Campus Design Advisory, GA, and DIS executive management.

## 2.11 Schedule

DIS is proposing an aggressive project schedule in order to alleviate the business problems with the current agency housing situation. We also want to reduce the effects of construction inflation on the project. In order to achieve the proposed schedule DIS will need financing authority from the 2007 or the 2008 legislature. A summary of major project milestones is below:

**DIS Data Center and Office Building Schedule**

| Date | | Milestone |
|---|---|---|
| Start | End | |
| 1-Dec-06 | 30-Apr-07 | Predesign -- Perkins+Will |
| 1-Jun-07 | 1-Dec-08 | Design + Permitting |
| 1-Jan-09 | 1-Nov-10 | Construction |

The project budget analysis (section 5) and the detailed cost estimate (section 9.2) reflect the schedule above. DIS would prefer a more aggressive schedule that completes the design and begins construction in June of 2009. If this can be accomplished it would result in savings in project escalation costs.

# 3.0 Program Analysis

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Overall Architectural Narrative

Structural Narrative

Office Building and Parking Garage
- Mechanical
- Electrical
- Telecommunications
- Studio Program
- Sustainability

Data Center Building
- Mechanical
- Electrical
- Cogeneration Option
- Sustainability

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## 3.1 Assumptions

Programming interviews were held for each department within DIS. The interviews were separated into the Data Center and Office Building, this distinction remains for the rest of this section.

### Office Building

Growth was determined as 2% per year for 8 years (after the governor's budget which projects growth for the next two years). This was applied to the current FTE count and distributed across the six divisions proportionally. Three standard sizes were assumed for the office spaces: Cubicles at 8' x 8', Manager's offices at 120 sqft, Assistant and Deputy Director's offices at 150 sqft and the Director's office at 200 sqft. Public access is needed for the board room and classroom for public hearings and board meetings. The K-20 group also has a need for public access to their web conference room. Other special use spaces for the office building are employee lockers and showers, a lunch/ break room, wellness room and library.

### Data Center

The Data Center will be a tier 3 facility (refer to page 64 for facility classification) with four data halls, two will be fully built out, and two will be the building shell only and allow for future growth. The data halls and back of house support spaces will be built to eventually accommodate 150 watts per square foot, however, initial build out will be lower. This will be discussed in greater detail in the Data Center portion in section 3.4 below. The Data center program also includes a production facility, a warehouse, a television studio for the Interactive Technologies Division and a public "showroom" for potential customers.

### Parking Garage

Per the parking requirements for the City of Olympia, 3.5 spaces are required per 1,000 sf outside the central business district. For such a location, at 115,000 sf, the office building will yield 400 parking stalls. Certain criteria, including an effective TDM program, can allow a 40% reduction, bringing the total number of stalls to 242. 70 stalls are required for DASH and visitor parking, 20 are added for DIS visitors, and the Data Center parking is estimated at 60 stalls. The minimum requirement for parking spaces is 392, rounded up to 425 for the purposes of this predesign report. For a more accurate calculation, further analysis is needed.

**Phasing**

For the purposes of this predesign report the DIS facility is assumed to be built as a single phase construction project. However, it was determined during interviews with DIS that the design of the new facility may require the project to be built in two distinct phases. This is to allow the greatest amount of flexibility to DIS and the State funding cycle. A phased design option illustrated as Cost Model Alternate 7 in this report assumes that Phase One (priority one scope) includes the build-out of the Data Center and related program components mentioned above with an associated temporary surface parking lot. Phase Two (priority two scope) is assumed to start one year after the start of Phase One and includes the Office Building and the 425 stall underground parking garage.

## 3.2 Existing Facilities Inventory

The Department of Information Services has staff located in 10 different facilities. The locations of these facilities, the FTE's associated with each one and the area associated with each are shown in Figure 3a. A complete list of these facilities is also included below. One of the goals of the proposed facility is to consolidate the 10 different locations into one location.

**a) 512 Building+**
512 12th Avenue SE, Olympia, WA 98501
23,155 leased square feet, 79 FTE's
State Operations, Technical Services Division (Telephony & Admin, Telecom & Project Support) and Billing are located in this building.

**b) Forum Building**
605 11th Ave SE,
Olympia, WA 98501
13,954 leased square feet of office space, 43 FTE's
684 leased square feet of storage
Management and Oversight of Strategic Technologies Division and Interactive Technologies are located in this building.

**c) Office Building 2 (OB2)**
About 67,190 (estimated) square feet, 85 FTE's
1115 Washington St. SE, Olympia, WA 98501
The data center and its related functions are all housed in this building.

**d) DIS Multimedia Productions Facility and Web Usability Lab & K-20 Educational Network Offices**
710 Sleater Kinney Road SE, Suite Q, Lacey, WA 98503
10,773 leased square feet, 17 FTE's
Interactive Technologies and K-20 groups are located within this building.

**e) Adams Building**
1310 Jefferson Street SE, Olympia, WA 98501
25,086 leased square feet, 96 FTE's
Computer Services Division and Management Services Division are located in this building.

**f) Warehouse Operations**
7827 Arab Dr. SE, Suite A, Olympia, WA 98501
9,827 leased square feet of warehouse space
2,921 leased square feet of office space, 7 FTE's

**g) Jefferson Building**
1110 Jefferson St. SE, Olympia, WA 98501
24,878 leased square feet, 63 FTE's
Management and Oversight of Strategic Technologies Division, Directors Office and Management Services Division are located in this building.

**h) Chandler Court Building**
2411 Chandler Court, Olympia, WA 98502
Technology Services Division is located in this building.

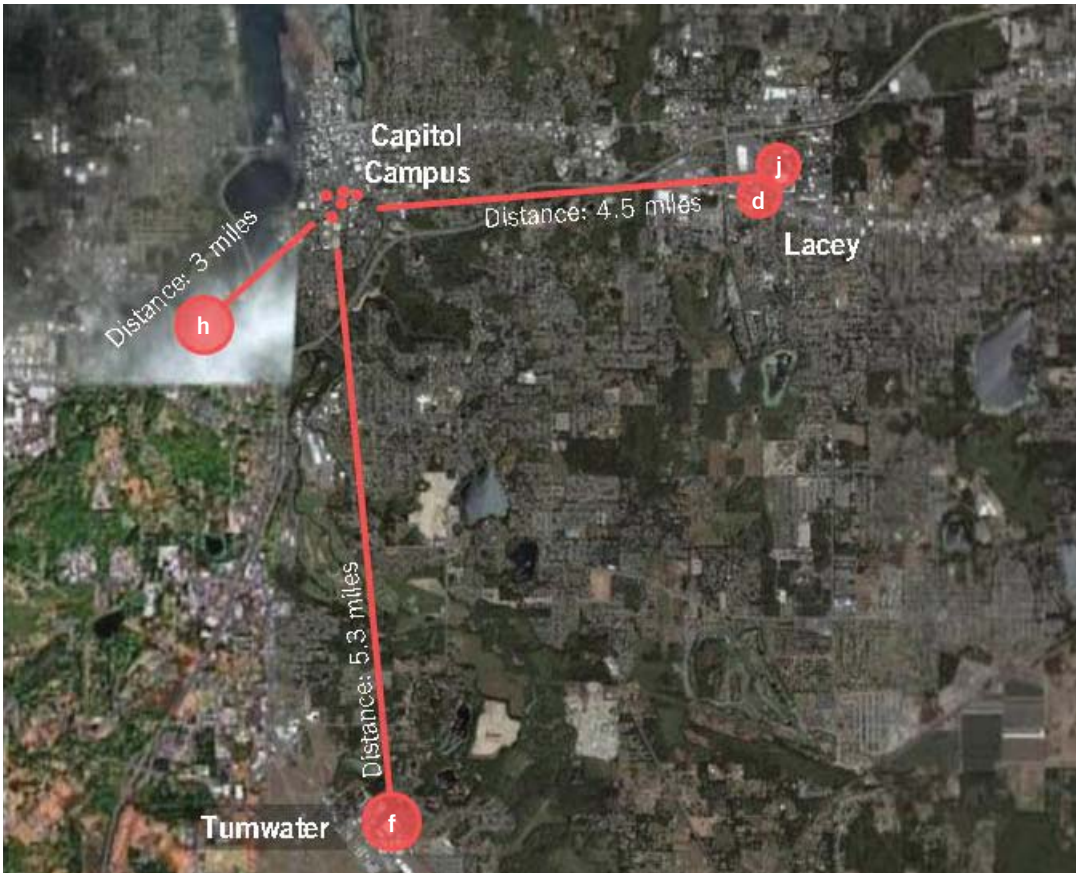
**i) Republic Building**
505 Union Ave E Ste. 150, Olympia, WA 98504-2445
5,560 leased square feet, 23 FTE's
Computer Services Division and Interactive Technologies are located in this building.

**j) Lacey Network Center**
4224 6th Ave. S.E., Lacey, WA 98503
3861 leased square feet
Telecom Services Division Node Site

## Figure 3a

Existing DIS facilities in Olympia's Capitol Campus.

Current DIS locations outside Olympia.



### 3.3 Space Needs Assessment

The office component has a projected growth of about 2% per year over an 8 year period, based on estimated staff needs for the operation of DIS. Standardized office and cubicle sizes, in addition to efficiencies inherent in the consolidation of all FTE's in one building will increase the overall efficiency of the use of office space. The data center growth is being projected at about 10%, which is conservative, considering recent activity in the "ala carte services." Such activity has seen recent rates of growth between 20% and 30%. Supporting MEP functions (called data infrastructure in the program), which are required to operate the data center halls and all associated use, are shown at the size which can provide the recommended capacity after 10 years, per the conservative 10% growth rate. Also reflected is the desired level of security, which accommodates the recommended level of redundancy.

Figure 3b below summarizes the existing size of the DIS facilities and the proposed facility. Figure 3c (next page) summarizes the various divisions within DIS their current FTE count and projected FTE count.

## Figure 3b

Total Building Space Identification for Comparison

| Existing | | Proposed | |
|---|---|---|---|
| Total Work Areas | 59,983 | Total Work Areas | 56,858 |
| Total Reception/Lobby/Common Areas | 5,334 | Total Reception/Lobby/Common Areas | 13,908 |
| Total Conference Areas | 11,322 | Total Conference Areas * | 24,055 |
| Storage | 7,136 | Storage | 8,652 |
| Special Use | 10,241 | Special Use (Tape Area, Production Studio, Print Shop, etc) | 5,431 |
| Warehouse | 9,322 | Warehouse | 6,500 |
| Data Halls | 18,812 | Data Halls | 60,000 |
| Support Areas | 2,160 | Support Areas | 4,207 |
| Data Infrastructure | 8,906 | Data Infrastructure** | 53,334 |
| Total Unassigned Space | 133,216 | Total Unassigned Space | 232,945 |
| Circulation & Unassignable Areas | 50,822 | Circulation & Unassignable Areas | 48,670 |
| Total Gross Rentable Area | 184,038 | Total Gross Rentable Area | 281,615 |

*Area will be reduced by consolidating conference rooms
**Includes space provided for equipment to support 4 fully operational data halls.

### 3.4 Space Requirements

The list of of spaces and their areas on the following pages represent the result of the existing facility inventory, space needs assessment, and interviews with the divisions of DIS. The program is also followed by a graphic representation of the major spaces.

# Master Organization Chart

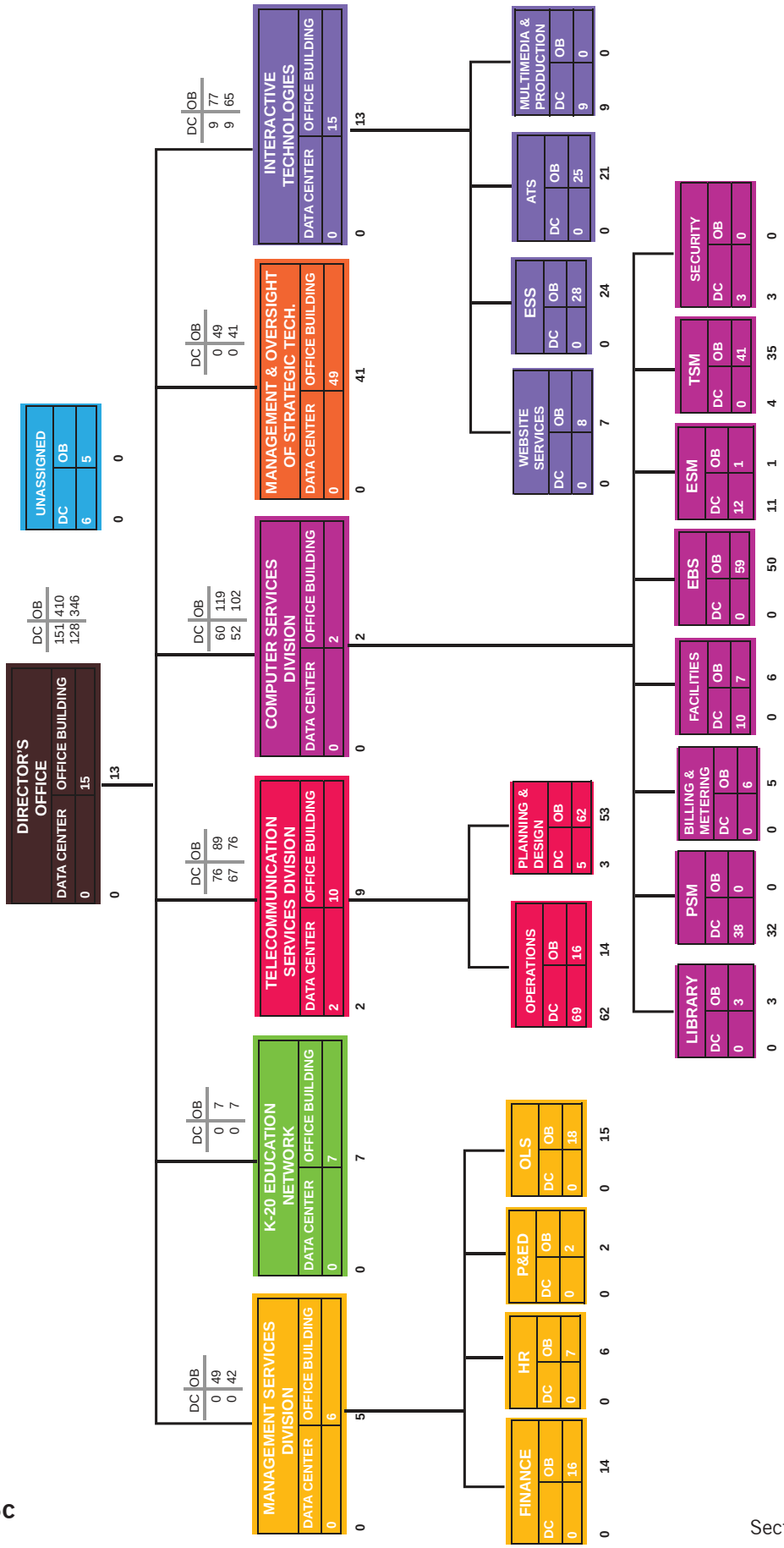



Figure 3c

## Program Summary

| *Priority 1 Scope (data center)* | Total Net Area (sf) | Total Circulation (sf) | | | Total Gross Area (sf) | FTE Count |
|---|---|---|---|---|---|---|
| Data Infrastructure Basement | 43,584 | 0 | | | 43,584 | 0 |
| Data Infrastructure off-site | 9,750 | 0 | | | 9,750 | 0 |
| Data Center Halls | 60,000 | 6,000 | | | 66,000 | 0 |
| Tape Storage & Management | 1,470 | 147 | | | 1,617 | 0 |
| Storage | 1,600 | 160 | | | 1,760 | 0 |
| Loading Dock | 500 | 50 | | | 550 | 0 |
| Production | 8,293 | 829 | | | 9,122 | 38 |
| Warehouse | 6,500 | 650 | | | 7,150 | 0 |
| Studio | 5,347 | 535 | | | 5,882 | 9 |
| General Facilities | 3,660 | 366 | | | 4,026 | 0 |
| Telecommunication Services Division (offices) | 12,124 | 1,212 | | | 13,336 | 76 |
| Computer Services Division (offices) | 2,868 | 287 | | | 3,155 | 22 |
| Unassigned FTE's Data Center | 480 | 48 | | | 528 | 6 |
| **TOTAL** | **156,176** | **10,284** | | | **166,460** | **151** |

| *Priority 2 Scope: (office building)* | Total Net Area (sf) | Total Circulation (sf) | Assignable Space Required | Non-Assignable Areas | Total Gross Area (sf) | FTE Count |
|---|---|---|---|---|---|---|
| Cafeteria/lunch room | 3,500 | 875 | 4,375 | 875 | 5,250 | 0 |
| Large common conference room | 2,500 | 625 | 3,125 | 625 | 3,750 | 0 |
| Lobby/reception area | 2,000 | 500 | 2,500 | 500 | 3,000 | 0 |
| Showers/Lockers | 200 | 50 | 250 | 50 | 300 | 0 |
| Wellness room | 800 | 200 | 1,000 | 200 | 1,200 | 0 |
| Board room | 2,000 | 500 | 2,500 | 500 | 3,000 | 0 |
| Classroom | 1,300 | 325 | 1,625 | 325 | 1,950 | 0 |
| Library | 400 | 100 | 500 | 100 | 600 | 0 |
| Mail room | 500 | 125 | 625 | 125 | 750 | 0 |
| K-20 office area | 1,200 | 300 | 1,500 | 300 | 1,800 | 7 |
| K-20 public interface | 1,700 | 425 | 2,125 | 425 | 2,550 | 0 |
| Telecommunication Services Division | 13,850 | 3,463 | 17,313 | 3,463 | 20,776 | 89 |
| Computer Services Division | 15,424 | 3,856 | 19,280 | 3,856 | 23,136 | 120 |
| Management & Oversight of Strategic Technologies | 6,400 | 1,600 | 8,000 | 1,600 | 9,600 | 49 |
| Interactive Technologies | 10,400 | 2,600 | 13,000 | 2,600 | 15,600 | 77 |
| Management Services Division | 10,725 | 2,681 | 13,406 | 2,681 | 16,087 | 49 |
| Director's Office Group | 3,550 | 888 | 4,438 | 888 | 5,326 | 15 |
| Unassigned FTE's Office Building | 320 | 80 | 400 | 80 | 480 | 4 |
| **TOTAL** | **76,769** | **19,193** | **95,962** | **19,193** | **115,155** | **410** |

| *Priority 2 Scope (parking garage)* | Area Per Car (sf) | | | | Total Gross Area (sf) | Number of Cars |
|---|---|---|---|---|---|---|
| Below Grade Garage | 399 | | | | 159,536 | 400 |
| **TOTAL** | | | | | **159,536** | **400** |

| | |
|---|---|
| **TOTAL BUILDING GROSS AREA (sf)** | **441,151** |
| **TOTAL FTE's** | **561** |

# Data Center Program

| *Data Infrastructure (basement)* | 2010 Number of Rooms Units | 2010 Number FTE's | Projected Number of Rooms Units | Projected Number FTE's | Room Unit Area (sf) | Total Net Area (sf) |
|---|---|---|---|---|---|---|
| Data Infrastructure | 1 | 0 | 1 | 0 | 43,584 | 43,584 |
| **TOTAL** | | **0** | | **0** | | **43,584** |

| *Data Infrastructure (off-site)* | 2010 Number of Rooms Units | 2010 Number FTE's | Projected Number of Rooms Units | Projected Number FTE's | Room Unit Area (sf) | Total Net Area (sf) |
|---|---|---|---|---|---|---|
| Generators | 1 | 0 | 1 | 0 | 9,750 | 9,750 |
| **TOTAL** | | **0** | | **0** | | **9,750** |

| *Data Center Halls* | 2010 Number of Rooms Units | 2010 Number FTE's | Projected Number of Rooms Units | Projected Number FTE's | Room Unit Area (sf) | Total Net Area (sf) |
|---|---|---|---|---|---|---|
| Data Center Hall | 4 | 0 | 4 | 0 | 15,000 | 60,000 |
| **TOTAL** | | **0** | | **0** | | **60,000** |

| *Tape Storage & Management* | 2010 Number of Rooms Units | 2010 Number FTE's | Projected Number of Rooms Units | Projected Number FTE's | Room Unit Area (sf) | Total Net Area (sf) |
|---|---|---|---|---|---|---|
| Tape Room | 1 | 0 | 1 | 0 | 750 | 750 |
| Tape Library | 1 | 0 | 1 | 0 | 200 | 200 |
| STK Service Area | 1 | 0 | 1 | 0 | 312 | 312 |
| Tape Cleaning | 1 | 0 | 1 | 0 | 208 | 208 |
| **TOTAL** | | **0** | | **0** | | **1,470** |

| *Storage* | 2010 Number of Rooms Units | 2010 Number FTE's | Projected Number of Rooms Units | Projected Number FTE's | Room Unit Area (sf) | Total Net Area (sf) |
|---|---|---|---|---|---|---|
| Storage | 1 | 0 | 1 | 0 | 1,600 | 1,600 |
| **TOTAL** | | **0** | | **0** | | **1,600** |

| *Loading Dock* | 2010 Number of Rooms Units | 2010 Number FTE's | Projected Number of Rooms Units | Projected Number FTE's | Room Unit Area (sf) | Total Net Area (sf) |
|---|---|---|---|---|---|---|
| Loading Dock | 1 | 0 | 1 | 0 | 500 | 500 |
| **TOTAL** | | **0** | | **0** | | **500** |

| *Production area* | 2010 Number of Rooms Units | 2010 Number FTE's | Projected Number of Rooms Units | Projected Number FTE's | Room Unit Area (sf) | Total Net Area (sf) |
|---|---|---|---|---|---|---|
| Print Shop | 1 | 0 | 1 | 0 | 2,355 | 2,355 |
| Warrant Vault | 1 | 0 | 1 | 0 | 140 | 140 |
| Manager's Office | 1 | 1 | 1 | 1 | 120 | 120 |
| Cubicles (PSM) | 31 | 31 | 37 | 37 | 80 | 2,960 |
| Customer Bin Area | 1 | 0 | 1 | 0 | 608 | 608 |
| Paper Storage | 1 | 0 | 1 | 0 | 2,110 | 2,110 |
| **TOTAL** | | **32** | | **38** | | **8,293** |

| *Warehouse* | 2010 Number of Rooms Units | 2010 Number FTE's | Projected Number of Rooms Units | Projected Number FTE's | Room Unit Area (sf) | Total Net Area (sf) |
|---|---|---|---|---|---|---|
| Warehouse | 1 | 0 | 1 | 0 | 6,500 | 6,500 |
| **TOTAL** | | **0** | | **0** | | **6,500** |

| *Studio* | 2010 Number of Rooms Units | 2010 Number FTE's | Projected Number of Rooms Units | Projected Number FTE's | Room Unit Area (sf) | Total Net Area (sf) |
|---|---|---|---|---|---|---|
| Offices | 1 | 1 | 1 | 1 | 110 | 110 |
| Edit Suites | 1 | 0 | 1 | 0 | 670 | 670 |
| Control Room | 1 | 2 | 1 | 2 | 300 | 300 |
| Technical Operations Room | 1 | 0 | 1 | 0 | 212 | 212 |
| Production Studio | 1 | 0 | 1 | 0 | 1,014 | 1,014 |
| Conference Room | 1 | 0 | 1 | 0 | 420 | 420 |
| Equipment Storage Closet | 1 | 0 | 1 | 0 | 50 | 50 |
| Tape Storage Closet | 1 | 0 | 1 | 0 | 48 | 48 |
| Workroom | 1 | 2 | 1 | 2 | 176 | 176 |
| Telecom Office | 1 | 1 | 1 | 1 | 184 | 184 |
| Production Storage Area | 1 | 0 | 1 | 0 | 780 | 780 |
| Open Plan Workstation/Files | 1 | 3 | 1 | 3 | 780 | 780 |
| Van Park | 1 | 0 | 1 | 0 | 420 | 420 |
| Room | 1 | 0 | 1 | 0 | 183 | 183 |
| **TOTAL** | | **9** | | **9** | | **5,347** |

| *General Facilities* | 2010 Number of Rooms Units | 2010 Number FTE's | Projected Number of Rooms Units | Projected Number FTE's | Room Unit Area (sf) | Total Net Area (sf) |
|---|---|---|---|---|---|---|
| Lobby/Reception | 1 | | 1 | | 450 | 450 |
| Copy/Mail Room | 1 | | 1 | | 250 | 250 |
| Restrooms (include showers?) | 1 | | 1 | | 880 | 880 |
| Janitor's Closet | 1 | | 1 | | 50 | 50 |
| Electrical | 1 | | 1 | | 930 | 930 |
| Mechanical | 1 | | 1 | | 1100 | 1,100 |
| **TOTAL** | | **0** | | **0** | | **3,660** |

| *Telecommunication Services Division (offices)* | 2010 Number of Rooms Units | 2010 Number FTE's | Projected Number of Rooms Units | Projected Number FTE's | Room Unit Area (sf) | Total Net Area (sf) |
|---|---|---|---|---|---|---|
| Manager's Office | 2 | 2 | 2 | 2 | 120 | 240 |
| Cubicles (Operations) | 44 | 44 | 52 | 52 | 80 | 4,160 |
| Cubicles (Planning & Design) | 3 | 3 | 4 | 4 | 80 | 320 |
| Cubicles (future FTE's) | 2 | 2 | 2 | 2 | 80 | 160 |
| Locker room | 1 | | 1 | | 351 | 351 |
| Restroom | 1 | | 1 | | 64 | 64 |
| Voice/LAN | 1 | | 1 | | 263 | 263 |
| Conference Room | 1 | | 1 | | 300 | 300 |
| Break Room | 1 | | 1 | | 746 | 746 |
| Network Control Center | 1 | 3 | 1 | 3 | 900 | 900 |
| Command Center | 1 | 13 | 1 | 13 | 2,860 | 2,860 |
| War/Demo Room | 1 | | 1 | | 600 | 600 |
| Learning Center | 1 | | 1 | | 1,160 | 1,160 |
| **TOTAL** | | **67** | | **76** | | **12,124** |

| *Computer Services Division (offices)* | 2010 Number of Rooms Units | 2010 Number FTE's | Projected Number of Rooms Units | Projected Number FTE's | Room Unit Area (sf) | Total Net Area (sf) |
|---|---|---|---|---|---|---|
| Cubicles (Facility Services) | | 6 | 7 | 7 | 80 | 560 |
| Cubicles (Enterprise Storage) | 7 | 7 | 8 | 8 | 80 | 640 |
| Small conference room | | | 1 | | 300 | 300 |
| IBM FE Staff & Storage | 1 | 2 | 1 | 2 | 330 | 330 |
| UNISYS FE Staff & Storage | 1 | 2 | 1 | 2 | 330 | 330 |
| Security Office | 1 | 3 | 1 | 3 | 408 | 408 |
| Facility Status Room | 1 | | 1 | | 240 | 240 |
| Storage/supply closet | 2 | | 2 | | 30 | 60 |
| **TOTAL** | | **20** | | **22** | | **2,868** |

| *Unassigned FTE's* | 2010 Number of Rooms Units | 2010 Number FTE's | Projected Number of Rooms Units | Projected Number FTE's | Room Unit Area (sf) | Total Net Area (sf) |
|---|---|---|---|---|---|---|
| Unassigned FTE's Data Center | 0 | 0 | 6 | 6 | 80 | 480 |
| **TOTAL** | | **0** | | **6** | | **480** |

| | 2010 Number FTE's | | Projected Number FTE's | | Total Net Area (sf) |
|---|---|---|---|---|---|
| **Data Center** | 128 | | 151 | | 156,176 |
| **TOTAL** | **128** | | **151** | | **156,176** |

## Office Program

| *Cafeteria/lunch room* | 2010 Number of Rooms Units | 2010 Number FTE's | Projected Number of Rooms Units | Projected Number FTE's | Room Unit Area (sf) | Total Net Area (sf) |
|---|---|---|---|---|---|---|
| Cafeteria/lunch room | 1 | | 1 | | 3,500 | 3,500 |
| **TOTAL** | | **0** | | **0** | | **3,500** |

| *Large common conference room* | 2010 Number of Rooms Units | 2010 Number FTE's | Projected Number of Rooms Units | Projected Number FTE's | Room Unit Area (sf) | Total Net Area (sf) |
|---|---|---|---|---|---|---|
| Large common conference room | 0 | | 1 | | 2,500 | 2,500 |
| **TOTAL** | | **0** | | **0** | | **2,500** |

| *Lobby/reception area* | 2010 Number of Rooms Units | 2010 Number FTE's | Projected Number of Rooms Units | Projected Number FTE's | Room Unit Area (sf) | Total Net Area (sf) |
|---|---|---|---|---|---|---|
| Lobby/reception area | 1 | 0 | 1 | 0 | 2,000 | 2,000 |
| **TOTAL** | | **0** | | **0** | | **2,000** |

| *Showers/Lockers* | 2010 Number of Rooms Units | 2010 Number FTE's | Projected Number of Rooms Units | Projected Number FTE's | Room Unit Area (sf) | Total Net Area (sf) |
|---|---|---|---|---|---|---|
| Showers/Lockers | 2 | 0 | 2 | 0 | 100 | 200 |
| **TOTAL** | | **0** | | **0** | | **200** |

| *Wellness room* | 2010 Number of Rooms Units | 2010 Number FTE's | Projected Number of Rooms Units | Projected Number FTE's | Room Unit Area (sf) | Total Net Area (sf) |
|---|---|---|---|---|---|---|
| Wellness room | 0 | | 1 | | 800 | 800 |
| **TOTAL** | | **0** | | **0** | | **800** |

| *Board room* | 2010 Number of Rooms Units | 2010 Number FTE's | Projected Number of Rooms Units | Projected Number FTE's | Room Unit Area (sf) | Total Net Area (sf) |
|---|---|---|---|---|---|---|
| Board room | 1 | | 1 | | 2,000 | 2,000 |
| **TOTAL** | | **0** | | **0** | | **2,000** |

| *Classroom* | 2010 Number of Rooms Units | 2010 Number FTE's | Projected Number of Rooms Units | Projected Number FTE's | Room Unit Area (sf) | Total Net Area (sf) |
|---|---|---|---|---|---|---|
| Classroom | 1 | | 1 | | 1,300 | 1,300 |
| **TOTAL** | | **0** | | **0** | | **1,300** |

| *Library* | 2010 Number of Rooms Units | 2010 Number FTE's | Projected Number of Rooms Units | Projected Number FTE's | Room Unit Area (sf) | Total Net Area (sf) |
|---|---|---|---|---|---|---|
| Library | 1 | 0 | 1 | 0 | 400 | 400 |
| **TOTAL** | | **0** | | **0** | | **400** |

| *Mail room* | 2010 Number of Rooms Units | 2010 Number FTE's | Projected Number of Rooms Units | Projected Number FTE's | Room Unit Area (sf) | Total Net Area (sf) |
|---|---|---|---|---|---|---|
| Mail room | 1 | | 1 | | 500 | 500 |
| **TOTAL** | | **0** | | **0** | | **500** |

| *K-20 Office Area* | 2010 Number of Rooms Units | 2010 Number FTE's | Projected Number of Rooms Units | Projected Number FTE's | Room Unit Area (sf) | Total Net Area (sf) |
|---|---|---|---|---|---|---|
| Manager's Office | 1 | 1 | 1 | 1 | 150 | 150 |
| 2 person office | 3 | 6 | 3 | 6 | 250 | 750 |
| Copy/printer area | 1 | 0 | 1 | 0 | 150 | 150 |
| Program Storage | 1 | 0 | 1 | 0 | 150 | 150 |
| **TOTAL** | | **7** | | **7** | | **1,200** |

| *K-20 Public Interface* | 2010 Number of Rooms Units | 2010 Number FTE's | Projected Number of Rooms Units | Projected Number FTE's | Room Unit Area (sf) | Total Net Area (sf) |
|---|---|---|---|---|---|---|
| Useability lab | 1 | 0 | 1 | 0 | 700 | 700 |
| Web Conference Room | 1 | 0 | 1 | 0 | 1,000 | 1,000 |
| **TOTAL** | | **0** | | **0** | | **1,700** |

| *Telecommunication Services Division* | 2010 Number of Rooms Units | 2010 Number FTE's | Projected Number of Rooms Units | Projected Number FTE's | Room Unit Area (sf) | Total Net Area (sf) |
|---|---|---|---|---|---|---|
| Assistant Director's Office | 1 | 1 | 1 | 1 | 150 | 150 |
| Manager's office | 5 | 5 | 6 | 6 | 120 | 720 |
| Cubicles (general) | 7 | 7 | 8 | 8 | 80 | 640 |
| Cubicles (Operations) | 6 | 6 | 7 | 7 | 80 | 560 |
| Cubicles (Planning & Design) | 50 | 50 | 59 | 59 | 80 | 4,720 |
| Cubicles (future FTE's) | 7 | 7 | 8 | 8 | 80 | 640 |
| Large conference room | 2 | | 3 | | 700 | 2,100 |
| Medium conference room | 0 | | 3 | | 450 | 1,350 |
| Small conference room | 5 | | 5 | | 240 | 1,200 |
| File storage | 0 | | 5 | | 80 | 400 |
| Copy/printer area | 6 | | 7 | | 150 | 1,050 |
| Printer station | 4 | | 5 | | 40 | 200 |
| Coffee Station | 1 | | 3 | | 40 | 120 |
| **TOTAL** | | **76** | | **89** | | **13,850** |

| *Computer Services Division* | 2010 Number of Rooms Units | 2010 Number FTE's | Projected Number of Rooms Units | Projected Number FTE's | Room Unit Area (sf) | Total Net Area (sf) |
|---|---|---|---|---|---|---|
| Assistant Director's Office | 1 | 1 | 1 | 1 | 150 | 150 |
| Manager's office | 7 | 7 | 8 | 8 | 120 | 960 |
| Cubicles (general) | 1 | 1 | 1 | 1 | 80 | 80 |
| Cubicles (Billing & Metering) | 4 | 4 | 5 | 5 | 80 | 400 |
| Cubicles (Facilities) | 5 | 5 | 6 | 6 | 80 | 480 |
| Cubicles (EBS) | 43 | 43 | 51 | 51 | 80 | 4,080 |
| Cubicles (TSM) | 34 | 34 | 40 | 40 | 80 | 3,200 |
| Cubicles (Library Services) | 2 | 2 | 2 | 2 | 80 | 160 |
| Cubicles (contractor/vendor) | 5 | 5 | 6 | 6 | 80 | 480 |
| Large conference room | 2 | | 2 | | 700 | 1,400 |
| Medium conference room | 0 | | 3 | | 450 | 1,350 |
| Small conference room | 4 | | 4 | | 240 | 960 |
| File storage | 2 | | 8 | | 80 | 640 |
| Copy/printer/coffee area | 3 | | 4 | | 150 | 540 |
| Coffee Station | 3 | | 4 | | 40 | 144 |
| Printer station | 3 | | 6 | | 40 | 240 |
| Test Lab (server closet) | 2 | | 2 | | 80 | 160 |
| **TOTAL** | | **102** | | **120** | | **15,424** |

| *MOSTD* | 2010 Number of Rooms Units | 2010 Number FTE's | Projected Number of Rooms Units | Projected Number FTE's | Room Unit Area (sf) | Total Net Area (sf) |
|---|---|---|---|---|---|---|
| Deputy Director's Office | 1 | 1 | 1 | 1 | 150 | 150 |
| Manager's Office | 5 | 4 | 5 | 5 | 120 | 600 |
| Cubicles | 26 | 25 | 30 | 30 | 80 | 2,400 |
| Cubicles (future FTE's) | 11 | 11 | 13 | 13 | 80 | 1,040 |
| Large conference room | 0 | | 1 | | 700 | 700 |
| Small conference room | 1 | | 2 | | 240 | 480 |
| Huddle rooms | 0 | | 2 | | 175 | 350 |
| Program Storage | 0 | | 3 | | 150 | 450 |
| Coffee Station | 1 | | 1 | | 40 | 40 |
| Copy/printer area | 1 | | 1 | | 150 | 150 |
| Printer station | 0 | | 1 | | 40 | 40 |
| **TOTAL** | | **41** | | **49** | | **6,400** |

| *IT* | 2010 Number of Rooms Units | 2010 Number FTE's | Projected Number of Rooms Units | Projected Number FTE's | Room Unit Area (sf) | Total Net Area (sf) |
|---|---|---|---|---|---|---|
| Assistant Director's Office | 1 | 1 | 1 | 1 | 150 | 150 |
| Manager's office | 3 | 3 | 4 | 4 | 120 | 480 |
| Cubicles (general) | 6 | 6 | 7 | 7 | 80 | 560 |
| Cubicles (Website Services) | 6 | 6 | 7 | 7 | 80 | 560 |
| Cubicles (ESS) | 17 | 17 | 20 | 20 | 80 | 1,600 |
| Cubicles (Business Technology) | 20 | 20 | 24 | 24 | 80 | 1,920 |
| Cubicles (vendors) | 1 | 1 | 1 | 1 | 80 | 80 |
| Cubicles (future FTE's) | 11 | 11 | 13 | 13 | 80 | 1,040 |
| Large conference room | 2 | | 2 | | 700 | 1,400 |
| Medium conference room | 0 | | 1 | | 450 | 450 |
| Small conference room | 2 | | 2 | | 240 | 480 |
| Breakout area (web services) | 0 | | 1 | | 100 | 100 |
| program storage | 1 | | 3 | | 150 | 450 |
| File storage | 3 | | 4 | | 80 | 320 |
| Copy/printer/coffee area | 2 | | 2 | | 150 | 300 |
| Printer station | 2 | | 2 | | 40 | 80 |
| Coffee Station | 2 | | 2 | | 40 | 80 |
| Test Lab office (security) | 1 | | 1 | | 150 | 150 |
| Test Lab (ATS) | 1 | | 1 | | 100 | 100 |
| Test Lab (web design room) | 1 | | 1 | | 100 | 100 |
| **TOTAL** | | **65** | | **77** | | **10,400** |

| *MSD* | 2010 Number of Rooms Units | 2010 Number FTE's | Projected Number of Rooms Units | Projected Number FTE's | Room Unit Area (sf) | Total Net Area (sf) |
|---|---|---|---|---|---|---|
| Assistant Director's Office | 1 | 1 | 1 | 1 | 150 | 150 |
| Manager's office | 4 | 4 | 5 | 5 | 120 | 600 |
| Office Legal | 6 | 6 | 7 | 7 | 120 | 840 |
| Office HR | 4 | 4 | 5 | 5 | 120 | 600 |
| Office Finance | 1 | 1 | 1 | 1 | 120 | 120 |
| Cubicles (general) | 3 | 3 | 4 | 4 | 80 | 320 |
| Cubicles (Legal) | 8 | 8 | 9 | 9 | 80 | 720 |
| Cubicles (HR) | 1 | 1 | 1 | 1 | 80 | 80 |
| Cubicles (Finance) | 9 | 9 | 11 | 11 | 80 | 880 |
| Cubicles (P&ED) | 1 | 1 | 1 | 1 | 80 | 80 |
| Cubicles (contractor/vendor) | 2 | 2 | 2 | 2 | 80 | 160 |
| Large conference room | 1 | | 1 | | 700 | 700 |
| Small conference room | 2 | | 4 | | 240 | 960 |
| Small interview room | 0 | | 1 | | 175 | 175 |
| Payroll room (2 FTE's) | 1 | 2 | 1 | 2 | 200 | 200 |
| Legal Storage Room | 2 | | 1 | | 200 | 200 |
| Finance Storage Room | 1 | | 1 | | 150 | 150 |
| HR Storage | 0 | | 1 | | 80 | 80 |
| File storage | 7 | | 5 | | 80 | 400 |
| Coffee Station | 1 | | 2 | | 40 | 80 |
| Copy/printer area | 4 | | 5 | | 150 | 750 |
| Scanner area (cubicle in Finance) | 1 | | 1 | | 80 | 80 |
| Training Room | 1 | | 2 | | 1,200 | 2,400 |
| **TOTAL** | | **42** | | **49** | | **10,725** |

| *Director's Office* | 2010 Number of Rooms Units | 2010 Number FTE's | Projected Number of Rooms Units | Projected Number FTE's | Room Unit Area (sf) | Total Net Area (sf) |
|---|---|---|---|---|---|---|
| Director's Office | 1 | 1 | 1 | 1 | 200 | 200 |
| Deputy Director's Office | 1 | 1 | 1 | 1 | 150 | 150 |
| Manager's Office | 6 | 6 | 7 | 7 | 120 | 840 |
| Cubicles | 5 | 5 | 6 | 6 | 80 | 480 |
| Large conference room | 0 | | 1 | | 700 | 700 |
| Small conference room | 1 | | 3 | | 240 | 720 |
| Program Storage | 0 | | 1 | | 150 | 150 |
| File storage | 0 | | 1 | | 80 | 80 |
| Copy/printer area | 1 | | 1 | | 150 | 150 |
| Printer station | 0 | | 1 | | 40 | 40 |
| Coffee Station | 0 | | 1 | | 40 | 40 |
| **TOTAL** | | **13** | | **15** | | **3,550** |

| *Unassigned FTE's* | 2010 Number of Rooms Units | 2010 Number FTE's | Projected Number of Rooms Units | Projected Number FTE's | Room Unit Area (sf) | Total Net Area (sf) |
|---|---|---|---|---|---|---|
| Unassigned FTE's Office Building | 0 | 0 | 5 | 5 | 80 | 400 |
| **TOTAL** | | **0** | | **5** | | **400** |

| | 2010 Number FTE's | Projected Number FTE's | Total Net Area (sf) |
|---|---|---|---|
| **Office Building** | 346 | 410 | 76,769 |
| **TOTAL** | **346** | **410** | **76,769** |

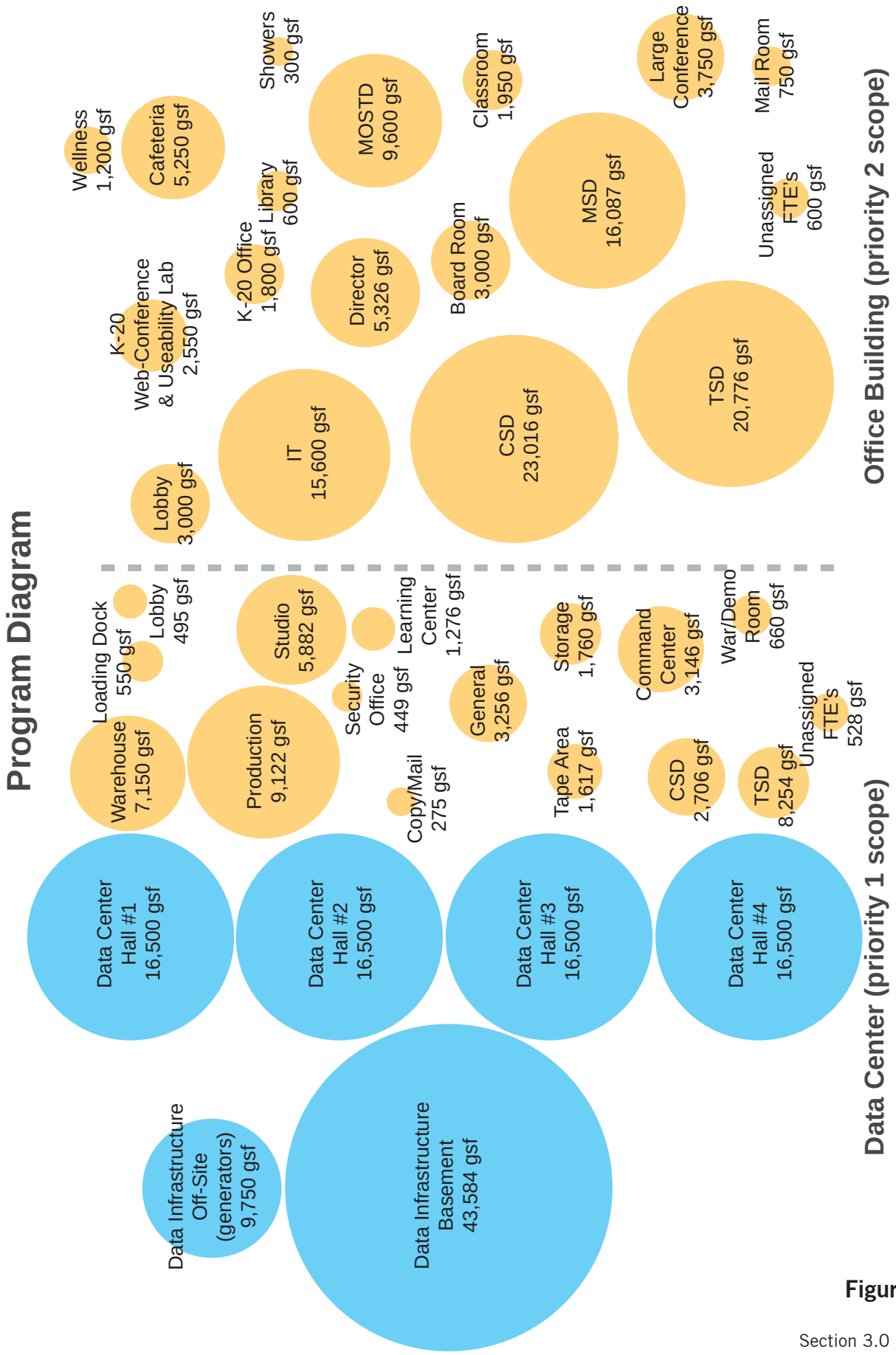

Program Diagram
Data Center (priority 1 scope)
Office Building (priority 2 scope)
Data Infrastructure Off-Site (generators) 9,750 gsf
Data Infrastructure Basement 43,584 gsf
Data Center Hall #1 16,500 gsf
Warehouse 7,150 gsf
Loading Dock 550 gsf
Lobby 495 gsf
Data Center Hall #2 16,500 gsf
Production 9,122 gsf
Studio 5,882 gsf
Security Office 449 gsf
Learning Center 1,276 gsf
Copy/Mail 275 gsf
Data Center Hall #3 16,500 gsf
General 3,256 gsf
Storage 1,760 gsf
Tape Area 1,617 gsf
Data Center Hall #4 16,500 gsf
CSD 2,706 gsf
Command Center 3,146 gsf
War/Demo Room 660 gsf
TSD 8,254 gsf
Unassigned FTE's 528 gsf
Lobby 3,000 gsf
IT 15,600 gsf
CSD 23,016 gsf
TSD 20,776 gsf
K-20 Web-Conference & Useability Lab 2,550 gsf
Wellness 1,200 gsf
Cafeteria 5,250 gsf
K-20 Office 1,800 gsf
Library 600 gsf
Showers 300 gsf
Director 5,326 gsf
MOSTD 9,600 gsf
Board Room 3,000 gsf
Classroom 1,950 gsf
MSD 16,087 gsf
Large Conference 3,750 gsf
Unassigned FTE's 600 gsf
Mail Room 750 gsf

**Figure 3d**

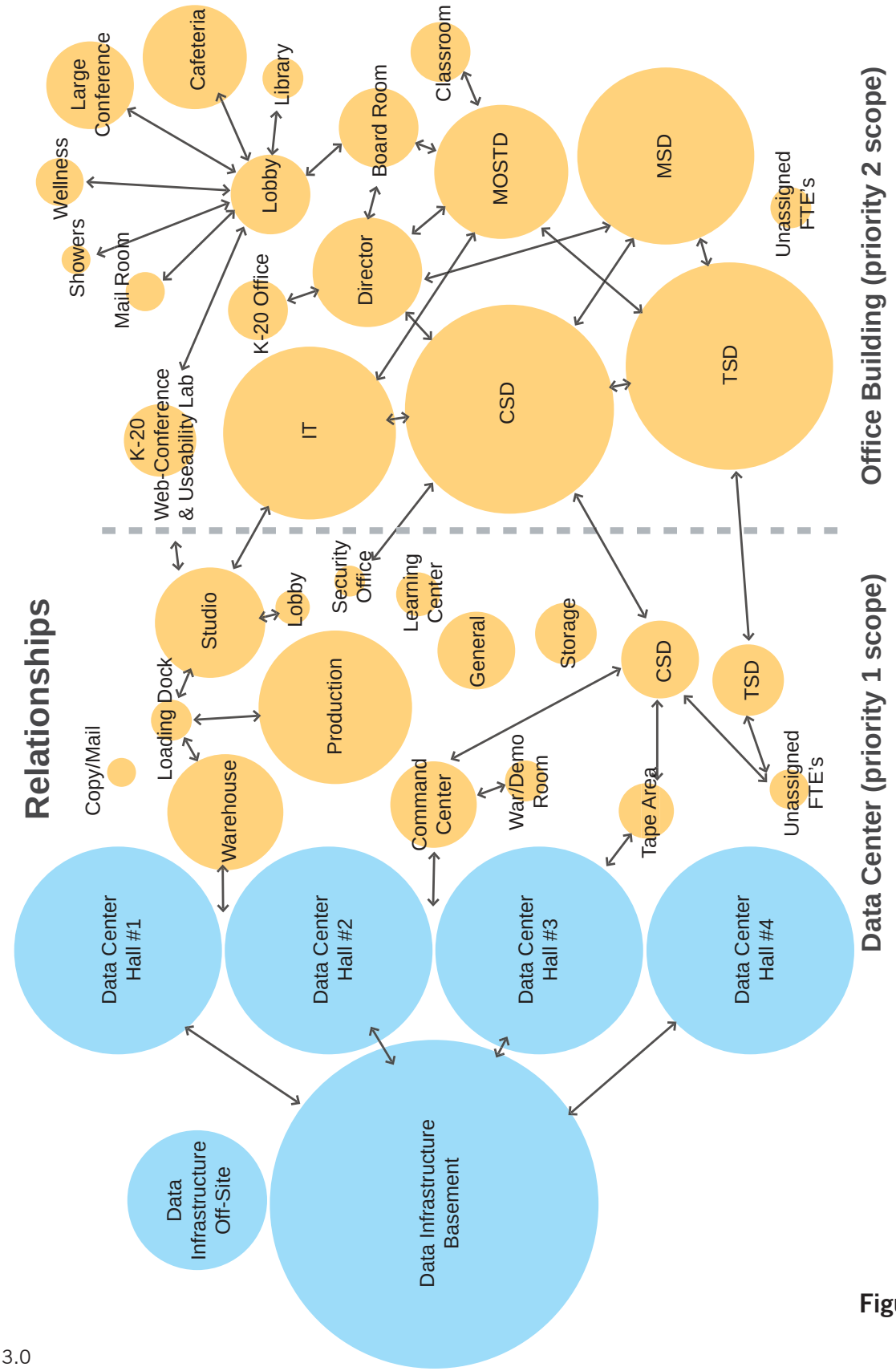

Relationships
Data Center (priority 1 scope)
Office Building (priority 2 scope)
Data Center Hall #1
Data Center Hall #2
Data Center Hall #3
Data Center Hall #4
Data Infrastructure Off-Site
Data Infrastructure Basement
Copy/Mail
Loading Dock
Warehouse
Studio
Lobby
Production
Security Office
Learning Center
General
Storage
Command Center
War/Demo Room
CSD
Tape Area
TSD
Unassigned FTE's
K-20 Web-Conference & Useability Lab
IT
K-20 Office
Director
CSD
MOSTD
Board Room
Classroom
TSD
MSD
Unassigned FTE's
Mail Room
Showers
Wellness
Large Conference
Lobby
Cafeteria
Library

Figure 3e

### 3.5 Future Needs and Flexibility

Future growth has been incorporated into the program discussion above for both the Office Building and Data Center. For the Office Building component, flexibility is achieved primarily through open office floor plans and uniform program area sizes. Flexibility for the Data Center is discussed below in section 3.6.

### 3.6 Interrelationships and Adjacencies of Functions

The Department of Information Services consists of seven major divisions. The interrelationships and adjacencies of these divisions and their associated spaces are detailed below and are diagrammed in figure 3d above.

**Director's Office**

Located entirely within the office building this Division consists of the Director and leadership for the Department including Public Information Officers, Government Relations and the Deputy Director for Operations.

**Management and Oversight of Strategic Technologies**

MOSTD will be located entirely within the office building. The Division is responsible for policy, oversight, working frequently with the Director's Office. MOSTD are responsible for scheduling the public meeting rooms, including the board room and the classroom so necessitating a close adjacency to those areas.

**Management Services Division**

This division would be located entirely within the office building. They are comprised of legal services, finance and budget, human resources and performance and employee development. This division also has interaction with the Director's office although they do not have to be adjacent to them.

**Telecommunication Services Division**

This division is split between the data center and the office building. The operations group and planning and design group would be located in the data center. Portions of these groups will also be located within the office building. This division does not have any need to be adjacent to the other divisions.

**Computer Services Division**

This division is split between the office and data center buildings. Enterprise business solutions, library services, billing and metering, enterprise storage and technical services will be located in the office building. Facility services, security, enterprise storage and production services will be located in the data center. The division does not need to be adjacent to the other divisions, although they do have some interaction with Interactive Technologies.

**Interactive Technologies**

This division has functions including website services, enterprise security services and business technology solutions, which will be located in the office building. The television production studio and the local area network support group will be located in the data center. The division does not need to be adjacent to the other divisions.

**K-20**

This division will be located within the office building. This group works closely with the Director's Office group, hosting web conferences and working in the usability lab for K-20 educational programs.

## 3.7 Systems Narratives

**Architectural Narrative**

The program above has been distributed into the facility in the following building components. Additional site analysis and conceptual approach to each of these components is discussed in section 4 below.

**Office Building**

The office building component is five stories and 115,000 square-feet, located on the north part of the site along 14th Avenue. It is located on the portion of the site furthest away from the South Capitol Neighborhood and on the lowest part of the site to reduce its overall impact. It will contain the majority of the DIS groups along with the larger shared spaces for the facility such as cafeteria, boardroom, and large conference space. The shared conference rooms will be distributed throughout building on each floor. A raised floor system will be utilized with the open office floor plans to increase energy efficiency (through under-floor air distribution) and reduce future renovation and maintenance costs.

**Data Center Offices / Studio / Production**

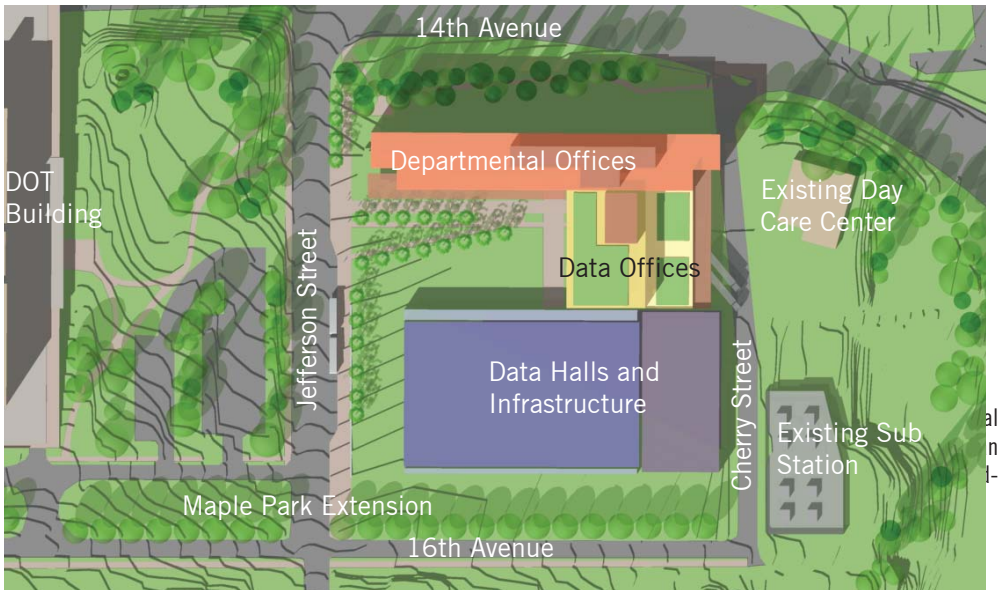
This portion of the project provides the "link" between the office component and the data halls. It is three stories with a basement level. The first floor contains the production facility, Studio, and loading dock. The upper floors contain office space related specifically to the data hall operations. A warehouse is located in the basement connected to the first floor and loading dock with a heavy-duty freight elevator.

**Data Halls / Infastructure**

The third component of the facility contains the main raised floor computing facility for the DIS and the infrastructure/mechanical spaces to support the equipment contained within. Four 15,000 sf data halls are provided, three on the first floor and one located in the basement level with the remaining floor area in the basement containing the UPS system, batteries, chillers, and switch gear. Cooling towers and emergency generators are located on the first floor on the east side of the building next to the loading dock and existing electrical sub-station.

**Parking Garage**

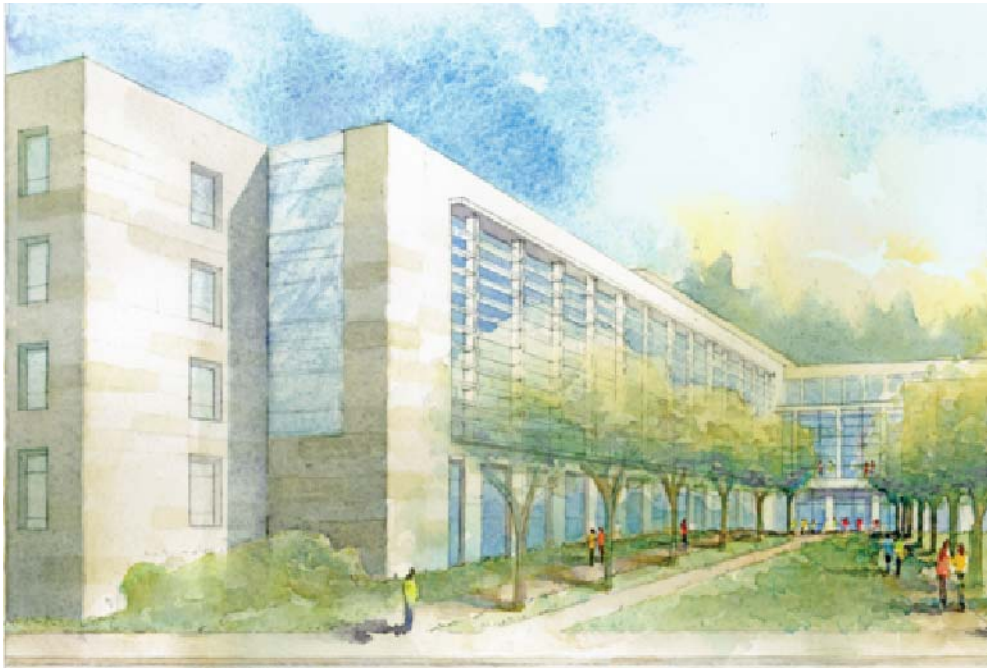
A below grade parking garage for 400 cars is provided underneath the office building component. It contains 160,000 square foot and has four levels. It is connected to the office building by passenger elevators and stairs. Ingress and egress to the garage is located off of Jefferson Street to the west. This will contain all the employee and visitor parking with some spaces reserved for the Dash system parking that is currently on the site.




Site Plan

**Exterior Design**

The Buildings are located at a gateway to Olympia and the Capitol Campus and are designed to enhance this experience. The primary elements are scaled to relate to the existing campus buildings and to respect the character of the historic west campus buildings. The primary exterior materials are stone and/or architectural pre-cast to match the color and texture of the Wilkinson sandstone of the west campus buildings. Consistent with the master plan guidelines for the campus major facades will incorporate the use of vertically expressed curtain-wall with “clear” glazing. These grand scale areas meant to evoke the large scale elements of the historic buildings while creating a building design that appears open and accessible and is “of its time”. The use of smaller windows on minor areas of the facades will provide balance and hierarchy that will create richness and scale, a hallmark of the historic campus. All window frames, curtain-wall, accent metalwork, and accent stonework will be of neutral tones per the campus guidelines.



Conceptual Approach to Exterior Materials

The opportunity of the buildings to respond to the sun and other external environmental conditions is an important aspect of the siting and configuration of the building components, as noted in the site analysis section below. Beyond achieving a sustainability rating by meeting LEED criteria, the building is designed to improve the workplace environment, affecting the productivity and satisfaction of all of the users, while minimizing energy required to maintain these improved conditions.

The main office components are oriented to optimize the controllability of heat gain, light, and glare, key components of workplace comfort and satisfaction. The south façade of the building, where the sunlight is most intense are shaded with external shades that bounce light deep into the workplace while shading the glass from the heat of direct sunlight. Small openings on the east and west facades restrict the amount of low sunlight, minimizing glare in the morning and afternoons. Additional study of solar shading for these openings will be investigated in detailed design. Because the north facade gets direct sun only in the early morning and the late afternoon it is an ideal location to have large windows that allow light to penetrate deep into the office space. This façade is designed with a series of vertical fins that will eliminate glare late in the day and bounce daylight deep into the office space.

The Data Halls are low buildings that have few windows. The exteriors are conceived as garden walls that create a backdrop for the open-spaces that are created within the project, simple walls that create the edge of the courtyard and the limit of “Maple Park”. These walls are of quality, substantial materials, complimentary to the cladding of the rest of the project. Much of the data hall building component is below grade which minimizes the exposure to heat gain and reduces the energy required to service these rooms.

## Structural Narrative

### Introduction

The proposed Washington State Department of Information Services facility includes the following project components:

Three levels of below-grade parking and five levels of office space in the north tower

A warehouse, studio and production facility, command center, and two levels of office space in the center of the development

Four large data halls and associated support space (for generators, UPS, batteries, etc.) to the south

### Codes and Design Standards

The criteria presented below are based on complying with the 2006 IBC. According to the IBC, the data center and command center program components are assigned to Occupancy Category IV and, as such, are designated as "Essential Facilities." The office and parking program components of the north tower are assigned to Occupancy Category II, which applies to standard occupancy conditions.

### Design Criteria

### Gravity Loads

| | |
|---|---|
| Parking | 40 psf LL |
| Office | 80 psf LL |
| Warehouse | 200 psf LL |
| Lobby/Studio/Production | 100 psf LL |
| Data center support space | 400 psf LL |
| Data floors | 150 psf LL |
| Special Building Features | 60 psf for roofing and landscaping (at connecting building only), not accessible to the public |
| Roof | 25 psf snow load |
| Snow Load Importance Factor | I = 1.2 for data & command center structural systems<br>I = 1.0 for other structural systems |

**Seismic Loads**

| | |
|---|---|
| Site Location | 47.034˚N, 122.895˚W |
| Short Period Spectral Response | $S_S = 1.16$ |
| Spectral Response at 1.0 sec | $S_1 = 0.43$ |
| Site Class | D |
| Importance Factor (Building) structural systems | $I_E = 1.5$ for data & command center<br>$I_E = 1.0$ for other structural systems |
| Importance Factor (Elements) components | $I_P = 1.5$ for data & command center A/M/E<br>$I_P = 1.0$ for other A/M/E components |

**Wind Loads**

| | |
|---|---|
| Design Wind Speed | 85 mph (3-second gust) |
| Exposure Category | B |
| Importance Factor (Building) systems | $I_W = 1.15$ for data & command center structural<br>$I_W = 1.0$ for other structural systems |

**Blast Loads**

Blast-resistant design is not included in the program.

**Structural System Description**

The structural systems for the north tower and central connecting building are of cast-in-place concrete. The south data center program component uses precast floor and roof systems and cast-in-place columns and walls. A brief discussion of the systems is presented below.

**Foundations and Slabs on Grade**

Preliminary geotechnical information prepared by PanGeo indicates that very stiff to hard soil deposits occur at a depth of about 25 feet and are overlain by soft to medium stiff clay and medium dense sand and gravel. PanGeo's preliminary recommendations are that spread footings founded on the hard soils at depth may be designed using an allowable bearing pressure of 8 ksf, and that 18-inch-diameter augercast piles extending 30 feet into the hard soils should support allowable loads of 200 kips in compression and 170 kips in tension. Based on these recommendations and the

present architectural program, spread footings will be used for the north tower and augercast piles will support the central and south program components. Slabs on grade will be 8 inches thick at the data center support areas and 6 inches thick elsewhere.

### Basement Walls

Given the present architectural program, basement wall conditions occur at several locations. Such walls will be designed to carry the tributary vertical gravity loads, lateral soil pressure, and seismic loads. Basement walls supported by floor slabs will be designed for at-rest soil pressures. Cantilevered retaining walls will be designed for active soil pressures. All basement walls and retaining walls will be designed for drained conditions and will include footing drains.

### Floor and Roof Framing

The architectural program for the north tower and central program components dictates a structural system arranged on a grid of about 30 feet in each direction. In order to accommodate the lower level parking with this grid, the space programmed for parking is offset by half a grid in the north and south directions. Floor framing comprises concrete slabs (6 inches thick) spanning to beams (24 inches wide by 24 inches deep) spanning to girders (24 inches wide by 27 inches deep). To minimize columns within the data bays, the grid spacing at the south portion is 45 feet in the east-west direction and 32 feet in the north-south direction. Floors and roofs are framed with 24-inch deep precast double-tees spanning to precast beams.

### Seismic-Force-Resisting System

For the north tower, concrete shear walls may be located to resist lateral forces in the north-south direction without compromising the office or parking programs. Lateral forces in the east-west direction are resisted by concrete moment resisting frames at all levels. Transfer of loads to east-west basement walls at the parking levels eliminates the need for additional below-grade beams to stiffen column foundations. At present, the same system (shear walls in the north-south direction and moment frames in the east-west direction) is assumed for use in the central program component. For the data center at the south, perimeter basement walls and interior shear walls between data bays will be used to resist lateral forces in both directions.

### Quantities

| Element | Mild reinforcement |
|---|---|
| Shear walls | 300 #/cy |
| Basement walls | 180 #/cy |
| Columns | 550 #/cy |
| 6” slabs on grade | 70 #/cy |
| 8” slabs on grade | 100 #/cy |
| Beams/girders/slabs | 5.5 psf |
| Column and wall footings | 100 #/cy |
| Mat footings | 150 #/cy |

| | |
|---|---|
| Piles (18" dia by 65' long, augercast) | 200 #/cy |
| Pile caps | 125 #/cy |

## OFFICE BUILDING MECHANICAL SYSTEMS

### Environmental Design Conditions

**Heating Systems**
The heating system will be designed upon the ASHRAE 0.6% design temperature of 17°F. Our design will be based on a heating season indoor temperature of 68°F.

**Cooling Systems**
The cooling system will be based upon the ASHRAE 0.5% design condition temperatures for Olympia, Washington of 85°F dry bulb and 66°F wet bulb. Our design will be based on a cooling season indoor air temperature of 75°F.

**Ventilation Rates**
Ventilation, pressurization and air change rates will be provided in accordance with ASHRAE standard 62-2004 (Ventilation for Acceptable Indoor Air Quality) as well as the 2006 Washington State Ventilation Code.

**Humidification**
Humidity control will not be provided in the office building.

### Office Building and Production Studio Loads

- Occupant densities will be based on programmed space, coordinated with the architect.
- Lighting loads will be coordinated with the electrical consultant. Lighting loads will be in the approximate range of 0.5 to 1.0 watts/sf depending on space usage. Daylighting zones will be incorporated, reducing the heat gain to spaces during daylight hours (solar heat load and daylight zone lighting load are not coincident).
- Miscellaneous loads as required (office equipment, etc.)
- Office Computers (pc's) at 150 watts each with a load factor to account for occupant diversity (current technology assumption)

### Applicable Codes and Standards

2006 International Building Code
2006 International Fire Code
2006 International Mechanical Code
2006 Uniform Plumbing Code
Americans with Disabilities Act (ADA)
Applicable National Fire Protection Agency Regulations

Local Codes:
State of Washington Fire Code Amendments
State of Washington Plumbing Code Amendments

2004 Washington State Energy Code
2004 Washington State Ventilation and Air Quality Code

Standards:
American Society of Heating, Refrigeration and Air Conditioning Engineers (ASHRAE)
American Society of Plumbing Engineers (ASPE)
Sheet Metal and Air Conditioning Contractors' National Association (SMACNA)

**Heating Systems**

- Heating water will be generated for the office spaces through heat recovered from the data center. During economizer operation a heat recovery coil on the exhaust air would heat water. Heat pumps would pull heat from that water to provide heating hot water for the building. On moderate days, when the data center chillers are operating, the condenser water could be used for this as well.
- Space heating to perimeter spaces will be provided through an underfloor VAV air handling system. Underfloor VAV boxes will heat plenum air, which will be supplied to the space.
- The heating water system will include a pot feeder to enable continuing maintenance of system chemical treatment.
- The heating water system will consist of a main distribution hot water supply and return loop. Constant speed heating water pumps and piping will supply heating water to the building.
- All piping will be installed parallel with building lines. The entire system shall be drainable and high points shall be equipped with air vents.
- All piping will be insulated as required by the Energy Code (minimum 1" pipe insulation with all service jacketing.)
- Two-way control valves will be utilized on the majority of heating elements, with three-way valves provided at the most hydraulically remote locations.
- Balancing devices will be installed on main branches and main pump circuit.
- Spring-loaded check valves will be installed on discharge side of pumps.

**Cooling Systems**

- A central chilled water plant will be provided to supply chilled water to both the data center and the office building. The chiller plant will use high efficiency variable speed centrifugal or screw chillers. The initial chillers will be sized to accommodate a load of 30 watts per square foot in two data halls, and a 10% extra capacity to allow for initial growth. An extra chiller will also be provided so that a redundancy of N+1 is available. The redundant chiller will operate if needed to cool the office building. In the event of chiller failure cooling will be cut off from the office building, if necessary, so that the data center cooling will be maintained. The central plant will be designed with sufficient space and piping capacity so that additional chillers and pumps can easily be installed. This extra space will be enough to allow an eventual total of 150 watts per square foot in all data halls and an N+1 redundancy.
- The variable volume chilled water system will consist of a main distribution cold water supply and return loop.

- General office spaces will be cooled via the underfloor air plenum. Underfloor variable air volume boxes will modulate to accommodate varying space loads; occupants can also adjust floor swirl diffusers for more precise comfort control in individual workstations. Air handling units will provide cooled air to all spaces. Perimeter variable air volume boxes will modulate airflow to meet space temperature requirements.

**Ventilation Systems**

- Air handling units, located in mechanical rooms, will serve all areas. These units are sized to provide sufficient air to ventilate and condition the building. These units will supply 63-degree air as required by each zone. Perimeter VAV boxes will modulate airflow and provide heating to match zone heating and cooling requirements.
- Natural ventilation will also be integrated into the design through incorporation of operable windows around the perimeter that are interlocked with mechanical ventilation. Users will have the option of either using natural ventilation or mechanical ventilation. The use of natural ventilation, in conjunction with radiant floor heating and cooling, may also be incorporated into larger non-office common areas such as lobby spaces.
- General exhaust will also be provided to service the following spaces: restrooms, janitor's closet, office work rooms (i.e. copy rooms) and mechanical/electrical rooms.
- Vibration isolation will be provided for any required air handling and exhaust equipment. Seismic restraints will be provided in conformance to the UBC.

**Advantages of Proposed Mechanical System**

- The underfloor system in the office building will save energy over a conventional overhead ducted system by extending the use of air-side economizers, more effectively ventilating the spaces, and providing a more pleasant and satisfactory work environment for the occupants.
- By integrating a natural ventilation component into office spaces through operable windows, occupants will be able to enjoy the benefits of direct access to fresh air for ventilation and cooling. This reduces fan energy use during times of year when natural ventilation is effective, which constitutes the majority of hours during the cooling season because of the moderate climate in Olympia. Full mechanical ventilation will still be available for those times it is needed.

**Temperature Control Systems**

- A single direct digital control (DDC) system will be provided for monitoring and controlling the central plant, data center, and office spaces. The DDC will fully interface with HVAC equipment control modules. The system will use a fully open communications protocol (BACnet or Lonworks). This will be a secure system accessible by data center personnel so that alarms and issues can be dealt with quickly.

## Exterior Plumbing Systems

### General

Exterior service beyond 5 ft from the building are covered within the scope of the Civil Engineer on this project. At this predesign phase of the project, based on the proposed building layout and loads, the following plumbing systems and site services are required:

- Sanitary sewer, 4”
- Storm sewer
- Natural gas supply, connection to building to be sized by Puget Sound Energy
- Water service, 2”

## Interior Plumbing Systems

### Domestic Cold Water Systems

The domestic cold water system will consist of:

- Double check valve type backflow preventer
- Distribution system
- Zone isolation valves

### Domestic Hot Water Systems

The domestic hot water system will consist of:

- A gas-fired domestic hot water heater
- A domestic hot water recirculation system will be provided and distributed in a manner to ensure that fixtures and equipment that require hot water will have it readily available. This will be accomplished by means of an in-line recirculating all bronze pump controlled by an aquastat. The aquastat will shut down the recirculating pump when hot water within the system is at proper temperature to conserve energy.

### Natural Gas System

The natural gas service will consist of distribution piping from a utility supplied meter to:

- Heating water boiler
- Domestic hot water heater

### Storm Drainage System

The storm drainage system will consist of interior downspouts and overflow drains routed through the building. The drains will be collected underground and routed out of the building. The downspouts and below grade piping will all be sized to meet the requirements of the Uniform Plumbing Code.

### Sanitary Waste and Vent Systems

A gravity cast iron sanitary drainage system will be provided to serve all plumbing fixtures, floor drains and equipment which discharge sanitary waste. The sanitary waste piping will be limited in horizontal runs to maximize ceiling height and space with multiple drops to the foundation plan. This piping will be collected with a horizontal main and piped out to the site sanitary sewer system. The vertical drops will be located inside the plumbing walls behind toilets. Sanitary vents will follow the same route as the sanitary waste piping and discharge to atmosphere above the roof level.

### General Interior Plumbing Requirements

All internal domestic hot water and metallic storm piping shall be insulated as required by the Energy Code (minimum 1" thick). All domestic water systems shall be chemically cleaned to AWWA requirements.

- All standard plumbing fixtures and trim shall be selected with water conservation in mind, with fixture types coordinated with the Architect.
- Sinks will be provided with domestic hot and cold water.
- All plumbing systems shall be pressure tested.
- All piping shall be identified and color-coded as required with appropriate labels and flow arrows.
- Non-freeze hose bibbs will be provided around the exterior of the buildings.
- All piping systems shall be designed to incorporate earthquake restraints as required by the Uniform Building Code.
- Hose bibbs in equipment rooms will be provided with vacuum breakers.
- Floor drains will be provided in mechanical rooms and janitor closets.
- For water systems, manufactured shock absorbers will be provided for each group of plumbing fixtures or remotely located plumbing fixture.

### Fire Protection Systems

- The office areas will be fully sprinkled with a wet system within the building thermal envelope. A dry system will be provided in areas subject to freezing, such as in the parking garage and beneath overhangs. Pendant recessed sprinkler heads will be provided for finished areas and brass upright sprinkler heads for unfinished areas such as mechanical rooms. The system will be complete with supervisory and tamper switches on all main isolation valves, backflow prevention, flow switches, and sprinkler floor control valve assemblies for each floor.
- A duplex fire department connection for the sprinkler system will be provided.
- Firewater service line size is expected to be 6".

## OFFICE BUILDING ELECTRICAL SYSTEMS

### Codes and Design Standards

National Electrical Code 2005 (or current edition) as amended by the City of Olympia; Washington State Administrative Code (WAC); American Disabilities Act;

and International Building and Fire Codes 2003 as amended by the City of Olympia; and other local ordinances.

**Building Profile**

The project includes a new 5 story office building comprising of approximately 115,000 square feet with a three level parking garage below, comprising approximately 160,000 square feet. In addition there is a 5,800 square foot broadcast studio area.

**Building Power Service**

**Normal Power System**

We anticipate feeding the building from the 12.47kV switchgear that is being provided as part of the data center project. This will require that we provide two 2000kVA 12.47kV-480Y/277 volt step-down transformers, either as a padmounted transformer outside the building or inside the building as part of secondary unit substations. The two main 480V switchboards will be sized at 3000 Amps.

This new service entrance electrical room will be about 50' x 30' and will house two service entrance switchboards rated 3000 Amps each at a secondary voltage of 480Y/277 volts, 3ø, 4 wire grounded Wye. This room will house distribution panels, transformers, and branch circuit panels. In the office building, a centralized and stacked electrical room will be provided on each of the upper floors. Two electrical rooms will be required to serve the floors with large footprints. Normal 480V electrical power risers will be routed to these rooms. The room will house 480V panels, transformation to the 208 volt system and 208 volt distribution panels. The 208 volt branch circuit panels will be distributed on the floor(s) and located flush mounted in the corridor walls. These rooms will contain 480V panels, transformation to 208V and 208V distribution and branch circuit panels.

At the main switchboard, metering shall be provided with the ability to meter voltage, current, KWH, and KW/KVA demand. Submetering for LEED "Measurement and Verification" compliance will be provided for monitoring energy consumption for various building system loads.

**Building Loads**

| | |
|---|---|
| Office | |
| Receptacle | 3 VA/SF |
| Lighting | 1.25 VA/SF |
| Mechanical/Cooling | 6 VA/SF |
| Miscellaneous | 2 VA/SF |
| HVAC | 7.75 VA/SF |
| Total | 20 VA/SF @ 115,000 sf = 2300 kVA |

| | |
|---|---|
| Parking | |
| Lighting | 0.8 VA/SF |

| | |
|---|---|
| Miscellaneous | 0.5 VA/SF |
| HVAC | 3 VA/SF |
| Total | 4.3 VA/SF @ 144,000 sf = 620 kVA |

Approximate building load:

| | |
|---|---|
| Office | 2300 kVA |
| Cafeteria | 230 kVA |
| Parking | 620 kVA |
| Total | 3150 kVA |

Service Entrance = 3795 A @ 480V - 3Ph
The service to the new building will be sized for a total of 4000A at 480V-3Ph.

**Emergency Power System**

Emergency power will be provided for all life safety, legally required, and optional standby loads. It is anticipated that emergency service will be provided via the generators that are being provided for the data center. The emergency service will initially be sized at 800 amps and will be extended to an emergency electrical room within the building. A remote generator annunciator panel would be located in this room. The data center project will provide the feed.
The separate emergency electrical room will be located on the lower level and will contain emergency house distribution equipment. Transfer switches at 480Y/277 volts 3ø will be provided for each branch of emergency power; one for the Life Safety Branch, one for Legally Required loads, and one for the Optional Equipment Branch. The life safety branch will serve exit and pathway lighting and alarm systems. The legally required branch will serve stair, elevator pressurization, and smoke exhaust fans in the garage. The optional equipment branch will serve other loads deemed by the owner to be on emergency power. Upon loss of normal power, automatic transfer switches will send a start signal to the generator and transfer to the emergency power system. The electrical distribution equipment on the life safety branch will be selectively coordinated per the NEC. Circuit breakers with adjustable trips or fusible equipment will be provided.
Emergency power distribution will serve the following loads:

Life Safety Branch:

Exit & egress lighting
Power for Emergency Communications Equipment
Alarm systems
Automatic doors (egress)

Legally Required Branch:

Pressurization Fans
Garage Fans
Smoke control

Optional Equipment Branch, Optional Standby Loads:

Selected Equipment (HVAC)

**Phasing**

In the event that the project is built in two phases, the first phase would likely be comprised of the data center, production, warehouse and studio components. The second phase would be the office building. If the first phase is built first, it is likely that the production, warehouse and studio would be powered by the data center project. If the office building is also constructed at the same time, then the production, warehouse and studio would be fed by the office building instead.

**Building Power Systems**

In general, building loads will be served by a 480Y/277 volt, 3 phase, 4 wire grounded Wye system. The majority of the mechanical system and elevators will be fed by 480V 3 phase, and lighting loads will be served at 277 Volts. In general, mechanical loads will be on a dedicated feeder/distribution system.

Office and other loads will be served by a 208Y/120 volt 3ø 4 wire power system derived from K-13 rated step-down transformers located in the electrical distribution rooms on the each floor level.
Receptacle circuits will be loaded to a maximum of 6 receptacles in office areas. Flush floor boxes or poke-through service fittings will be provided to serve landscape furniture located in the open office areas. Custodial receptacles in corridors shall be on separate circuits from those receptacles in adjacent rooms. Ground fault circuit interrupter receptacles shall be provided within 5' of sinks.

Noise (electrical) generating equipment such as variable frequency drives (VFD's) and electronic lighting ballasts will be specified with low total harmonic distortion (THD) requirements to reduce the negative influence on the building electrical system.

Electrical service to the studio will be provided via a separate transformer and distribution equipment to provide a source of "clean" power to the AV and technical equipment.

**Building Expansion**

Spare capacity of 30% of demand load will be provided on general 120/208 volt power distribution, and 25% on mechanical and lighting power systems. Individual branch circuit panelboards will be provided with a minimum of 40% spares/spaces. These shall be distributed evenly throughout the branch circuit panel distribution system.

**UPS Systems**

No UPS systems for computers or equipment are currently anticipated within the Office Building, other than small Owner-provided rack-mounted systems within data equipment rooms.

**Surge Protection**

Surge suppression devices will be provided for 208Y/120 volt emergency distribution panels and for the data equipment room panels.

**Voltage Fluctuations**

Primary sources of voltage fluctuations in a building power system are the starting inrush currents of large motor and compressor loads. To minimize effects of these inrush currents reduced voltage starting as well as sequence start of loads will be employed for motors rated above 20 HP for loads which are not controlled by VFD's.

**Protective Device Coordination**

The emergency life safety overcurrent devices selected will be selectively coordinated so the overcurrent device nearest the fault will clear the faulted circuit. Protective devices shall be of the same manufacture to prevent unacceptable coordination between overcurrent devices. Panelboards will not be series rated. This is a relatively new Code requirement that adds cost and increases space requirements.

**Lightning Protection System**

A lightning protection system is not anticipated for this building.

**Grounding System**

The grounding system will be in accordance with the National Electrical Code. The building ground will consist of a 250 kcmil loop around the building perimeter bonded to ground rods, building reinforcing steel, and excavation retaining wall steel. Ground rods will be provided around the building perimeter at approximately 75' intervals. Grounding of conduit systems and panelboards will consist of a pathway through the conduit system with a redundant insulated green grounding conductor bonded at each panelboard and at intermediate pull boxes. Cable trays throughout the building will be bonded to the building reinforcing steel at multiple locations to create a low impedance signal ground in addition to being grounded at the main service. Insulated green ground wires will be installed to all receptacles. In all tele/data communication closets and rooms, a separate ground bus shall be provided. Each of these buses shall be tied together via a ground conductor and extended to building ground.

**Motor Controls**

In general, grouped motor controls (Motor Control Centers) will be provided in mechanical rooms.

**Snow Melt System**

A snow melting and anti-icing system is not anticipated to be provided in the facility.

**Lighting**

Lighting will be designed to meet the 2005 (or current adopted) edition of the Washington State Energy Code, and the lighting design levels will be based on the Illuminating Engineering Society (IESNA) standards for average maintained levels in foot-candles. In order to maximize LEED points, the design will also strive to be less than what is required by ASHRAE 90.1 (2004) in order to assist in minimizing the overall energy consumption of the building. In general, interior lighting will be lighted with pendant mounted indirect/direct fluorescent fixtures using either T-5 or T-8 lamps, 3500 degree Kelvin (white) and electronic ballasts. Triple-tube compact fluorescent lamps will be used in recessed downlights. Undercabinet lighting will be provided where fixed casework is located over work areas and sinks.

Exterior lighting using high pressure sodium lamped fixtures will be provided around the perimeter of the building and at all walkways. The parking levels will be lighted either using metal halide fixtures or linear fluorescent (strip) fixtures. Entries of the building will be lighted using either metal halide lamped fixtures or using compact fluorescent fixtures. The roadway and surface parking areas shall be lighted to IESNA lighting levels. Power will also be extended to exterior signage. Landscape and grounds lighting will be provided.

Lighting Design Levels: IESNA standards for average maintained levels of lighting measured in foot-candles will be used as a design guide. Lower levels will be considered for areas utilizing indirect ambient or task oriented lighting systems.

a. Offices, work areas, etc: 35 - 60 fc
b. Lobbies, restrooms, mechanical/electrical rooms: 15 - 20 fc

Minimum Maintained Foot-candles:

a. Corridors, passageways, stairways adjacent to spaces with more than 50 fc: 15 fc
b. Corridors, passageways, stairways, storerooms: 10 fc
c. Walkways: 0.5 fc (or as required for security per IES recommendations)

Emergency Egress Lighting: Emergency egress and exit lighting will be provided throughout the facility. These will be served from the life safety branch of the emergency distribution system. In addition, selected fixtures shall be provided with battery back-up in the main Electrical Rooms.

**Lighting Control System**

Occupancy sensors will be provided as required by the State Energy Code. Dimming and daylight harvesting controls will be provided where required by the Energy Code and for LEED credit. Automatic shutoff controls will be provided with low voltage override control switching during after hours setback. Corridor lighting will be provided with a night setback feature. Photocell control will be provided for the lighting of daylit areas.

The entries to the covered parking area will be controlled for dual levels of lighting to compensate for increased daylighting levels. In general, the lighting in the covered area will be designed to be on 24 hours/day and 7 days/week.

Outdoor plaza & terrace lighting shall be controlled by a photocell on the roof. Selected outdoor lighting zones shall be turned off under timer control and turned on by photoelectric control. Control of exterior signage shall also be included.

**Low Voltage Systems**

Miscellaneous communications equipment cabinets such as fire alarm, card access/security system, etc. will be located in the electrical rooms or in separate communications closets on each floor.

**Fire Alarm System**

The fire alarm system will comply with the International Fire Code as amended by the City of Olympia, ADA requirements and applicable codes. The system shall be an addressable, analog system. The main fire alarm panel will be located on Level 1, with terminal cabinets located on each floor. System conductors shall be installed in metallic raceways, junction boxes, and terminal cabinets. Wiring will be Class B.

Each initiation device will have its own address. Zoning shall be by building floor, with separate zones for smoke detectors, manual pull stations, and water flow devices. Smoke detection will be provided in all corridors and in air-handling systems over 2,000 cfm. Smoke detection will be provided at main return and exhaust air plenum of each air handling system, at each connection to vertical duct system serving more than one floor, each elevator lobby, and at other locations required by the Fire Code. Total coverage smoke detection will be considered in lieu of duct smoke detection required for fire/smoke dampers per the Building Code. Manual stations will be located on each floor at exit stair entry, and at intervals in corridors required by code. Smoke detection will be provided in the elevator lobbies and elevator machine room. When these smoke detectors are activated, they shall initiate Phase One elevator recall. Smoke and heat detection per elevator code will be provided in elevator shaft(s) when sprinklers are provided.

Evacuation alarm horns and strobes (visual alarms) will be provided throughout the facility. All public areas, conference rooms and offices housing 2 or more people will be provided with a strobe device. LCD style annunciators will be provided at the main access points for the Olympia Fire Department (Level 1). In addition, annunciation or building alarm indication will be provided to a reporting agency via a phone dialer.

**Card Access/Security System (conduit only)**

Raceway and power infrastructure will be provided for an electronic card access/ security system serving a limited number of areas/entries. In addition, monitoring of perimeter areas and special function areas will be provided by Others.

**Preliminary Electrical Rooms Summary**

**Lower Level(s)**

| | |
|---|---|
| Main Electrical Room: | **50' x 30'** |
| Housing: | Two main 480V Service Switchboards with dry type transformers (secondary unit subs) 2000kVA<br>(1) 480V Distribution Panel<br>(2) 480V Branch Panels<br>(2) 208V Transformers<br>(2) 208V Distribution Panels<br>(3) 208V Branch Panels<br>(1) Exterior Lighting Control |
| Emergency Electrical Room: | **20' x 30'** |
| Housing: | (3) Automatic Transfer Switches<br>(3) 480V Distribution Switchboards<br>(3) 208V Transformers<br>(3) 208V Branch Panels |
| Mechanical (Pump) Room: | Motor Control Center(s)<br>480V Branch Panel(s)<br>208V Branch Panel(s) |

**Typical Floor Level**

| | |
|---|---|
| **(1) to (2)** Electrical Rooms: | **10' deep x 15' long (each)** |
| Housing: | 480V Distribution Panel<br>480V Normal Lighting Panel<br>Lighting Control Panel<br>480 to 208V transformation<br>208V Distribution Panel<br>208V Branch Circuit Panel(s) |

**Elevator Penthouse**

| | |
|---|---|
| Housing: | Distribution Panel<br>Branch Circuit Panel |

## OFFICE BUILDING TELECOMMUNICATION SYSTEMS

### Introduction

This section is intended to define the standards, criteria and assumptions used for the design, documentation and specification of a telecommunications system to support the new Washington State Department of Information Services (DIS) Office Building and Production and Studio Building at the Wheeler Site. This narrative will form the basis for the design for the telecommunications system.

This basis of design shall address pathways, spaces and transport media designs to support various information transport systems, including an administrative telephone system to support voice and voice grade services, local area network (LAN) systems, wide area network (WAN) systems and video distribution systems.

The specific areas covered by this section of this report are as follows:

1. Definition of a campus pathway system to connect the building to the new DIS Data Center Building
2. Definition of a building pathway and space system to house the network communications, computing and their associated telecommunications cabling system
3. Definition of building backbone cables and their distribution and termination methods
4. Definition of workstation cables and their distribution and termination methods
5. Definition of patching philosophies and methodologies
6. Definition of a unified signal grounding system

Discussions related to the following systems are currently not included in this section and are covered elsewhere unless otherwise noted:

1. Communication network systems (telephony PBX, radio, cellular, dictation) - Provided By Owner
2. Local and wide area data network systems (servers, switches, routers, etc.) - Provided By Owner
3. Audio/visual system
4. Rooftop antenna systems - Not In Project Scope
5. Internal re-radiating systems - Not In Project Scope
6. Security/access control and surveillance systems
7. Building management / building automation / energy management systems
8. Fire alarm / life safety systems

**Telecommunications Systems Related Codes and Standards**

In addition to the previously noted codes and standards that have been adopted and/or amended by the State of Washington, the telecommunications systems will also be designed in accordance with the following codes and standards;

1. Telecommunications Distribution Infrastructure Standard (TDIS)
2. American National Standards Institute (ANSI)
3. National Electrical Manufacturers Association (NEMA)
4. Telecommunications Industry Association / Electronics Industries Association (TIA/EIA)
5. Building Industry Consulting Service International (BICSI)
6. Institute of Electrical and Electronics Engineers (IEEE)
7. Underwriters Laboratories (UL)
8. American Standards Association (ASA)
9. Federal Communications Commission (FCC)
10. American Society of Testing Materials (ASTM)

**Telecommunications Entrance Pathways and Spaces**
Telephone and data network services from the new Data Center Building will service the Office Building and Production and Studio Building from underground facilities extending from the Data Center to a main telecommunications room in the Office Building. To provide campus network backbone cabling pathway, a minimum of four 4-inch conduits shall be provided between the Data Center and the Office Building.

**Telecommunications Outside Plant Cabling**
Telephone and data network connectivity to the Data Center will be provided by outside plant cabling consisting of a minimum of 500-pair copper UTP cables, 48-strands 50µm laser enhanced multimode optical fiber and 48-strands singlemode optical fiber.

**Main Telecommunications Room (MTR)**
A main telecommunications room shall be provided on the main level of the Office Building. Depending on the final determination of equipment to be housed within the room, the room shall be sized at minimum 400 square feet. A room with dimensions of 20' x 20' is recommended. The MTR will serve as the central networking, communications and computing center for the building and shall support network operations functions. The room does not account for space for printers and paper storage.

The MTR shall be fully protected from water infiltration by ensuring that all water, glycol and drainage piping serving air conditioners, lavatories, roof drains, etc. shall be run outside the MTR walls. They shall only penetrate the room where necessary to serve equipment.

The MTR walls shall be of slab-to-slab construction to facilitate the outfitting of the room for environmental conditioning and fire protection / isolation of slab-to-slab construction. All penetrations of rated wall shall be fire-stopped in an approved manner to prevent the passage of flames, smoke and gases. A minimum 2-hour fire rated wall construction is recommended for the MTR.

Walls and doors shall be configured and located to provide secured access. The

number of entrances shall be minimized and provide for smooth operation and safety egress for personnel working within the space. At a minimum all doors should be provided with card key activated locks. The main entrance door shall be sized to accommodate the passage of equipment to be housed in this space.

The MTR should be constructed without a suspended, lay-in ceiling so as to avoid the constraints of a fixed grid structure and its limitations on locating and installing overhead cable trays and light fixtures.

Air conditioning shall be provided with units specifically designed to serve the heat loads and humidity control requirements of the MTR. Units shall be sized to maintain a temperature of 65-72 degrees Fahrenheit at 20-55 percent relative humidity. Environmental conditions shall be maintained on a 24 hour-a-day, 7 days-a-week basis. The MTR shall also be quipped with hi-temperature alarms that report to the security and/or building management systems panels. Sensors shall be placed 60" AFF.

Power requirements for the MTR shall be based on equipment lists provided by DIS; however, load density shall be based on an average of 40-50 watts per square foot. This number is based on a low density of file servers. Loads may escalate significantly should a larger concentration of high density file servers be located within the MTR.

Lighting requirements shall be a minimum of 50 foot-candles maintained at 36" AFF. Lighting fixtures, motors, air conditioners, etc. shall not be powered from the same electrical distribution panel as the telecommunications equipment in the room.

The MTR shall be protected in accordance with all applicable codes and ordinances. A pre-action fire suppression system shall be provided. Portable fire extinguishers shall be provided at strategic locations within the MTR and shall be rated for all types of fires. A fire alarm annunciator panel shall be located at the main entrance to the room. At the first activation of any sensor, both audible and visual alarms shall be sent to multiple areas within the MTR, positioned so that once installed they can be noticed from anywhere, in addition to strategic locations outside the MTR. A manual override shall be provided at the entrance to the room enabling an operator to delay charging of the sprinkler pipes by a fixed time interval in order to attempt to extinguish the fire manually.

A solid copper ground busbar shall be provided for signal ground connections. The ground busbar shall be bonded to the appropriate ground conductor as described herein.

**Telecommunications Room (TR)**

Telecommunications rooms shall be provided on each floor to facilitate distribution of voice and data station cables to the work area outlet. The rooms shall be stacked vertically through the building. In addition, they shall be located in an area on the floor plate which will ensure that the length of the installed workstation cables does not exceed 90 meters per TIA/EIA standards for telecommunications cabling. If workstation cables can not be kept to within TIA/EIA standards, a second floor serving TR shall be provided.

Each telecommunication room shall be a minimum of 150 square feet in area. A room with dimensions of 10' x 15' is recommended. Each TR shall support the horizontal distribution of station cables. The dimensions indicated will provide space for up to four free standing telecommunications equipment racks with vertical wire managers.

The TR's shall be fitted to support the following types of systems and equipment:

1. Termination and patching facilities for workstation cables
2. Termination and patching facilities for UTP backbone cables
3. Termination and patching facilities for optical fiber backbone cabling
4. Hardware and racking for LAN switches
5. Hardware for any wireless based telecommunications systems
6. Wall space for mounting other low voltage systems such as CATV distribution components, security and access control, paging, etc.

A typical TR shall be of slab to slab construction to facilitate the outfitting of the rooms for environmental conditioning and fire protection / isolation. A suspended ceiling should not be installed in the TR. All penetrations shall be sealed to prevent the passage of fire, smoke and gas. A minimum 1-hour fire rated wall construction is recommended for each of the TR's.

TR's shall be provided with sprinkler heads mounted on the sidewalls. Sprinkler heads shall be provided with cages. Wet pipes, run either overhead or along the walls shall not traverse the rooms.

Telecommunication rooms shall be furnished with 3/4" plywood on all designated walls installed 6-inches AFF. Plywood shall be void free and treated on both sides with two coats of fire resistant paint. Finishes in the room shall be light in color to enhance lighting. Finishes shall be applied before room fit out. Concrete floors and walls shall be sealed and cured to eliminate dust. Floors shall be covered with anti-static vinyl tiles

Telecommunication rooms shall be furnished with a single lockable door of at least 36" wide by 80" high.

Environmental conditions shall be maintained on a 24-hours-a-day, 7-days-a-week basis. Environmental limits for the telecommunication rooms are 64-75 degrees Fahrenheit and 30-55 percent relative humidity, non-condensing. Telecommunication rooms shall be equipped with high-temperature alarms that report to the security and/or BMS console. Positive pressure shall be maintained within the room, with a minimum of one air change per hour.

Lighting levels within the telecommunication rooms shall be a minimum of 50 foot candles maintained at 36" AFF.

Power circuits for all telecommunications equipment located within any given telecommunication room shall be fed from an electrical panel dedicated to these loads and located within the TR. The panel shall be fed from the stand-by generator power system. UPS backup, if required, shall be fed from stand alone UPS units mounted within the equipment racks. Power circuit requirements for the room shall be based on equipment lists provided by DIS, however a minimum of one 20A circuit shall be provided for each equipment rack installed within the room, plus

one spare. Allowing for future equipment requirements, room load density may be estimated at a minimum of 40 watts per square foot. Circuits may be brought to the equipment racks overhead and attached to overhead cable tray, then stubbed down to a location coordinated with DIS.

In addition to outlets dedicated to telecommunications equipment, electrical convenience outlets (120V, 20A duplex receptacles) shall be provided at 6-foot intervals within the telecommunication rooms. A maximum of four duplex outlets shall be fed from a single 20A circuit. All branch circuiting shall include a ground wire from the distribution panel's ground busbar to all electrical outlets in the room. The outlets shall be used for testing equipment and power tools only, and not for network transport electronics.

Lighting fixtures, motors, air conditioning, etc shall not be powered from the same electrical distribution panel as the telecommunications equipment in the telecommunication rooms. Electrical transformers shall not be located within the room.

A solid copper ground bar shall be provided in each telecommunication room, for signal ground connections. The ground busbar shall be bonded to the appropriate ground conductor, as described herein.

**Building Backbone and Workstation Pathway Systems**

All pathways shall be designed to provide the capacity and capability to properly install high performance unshielded twisted pair and optical fiber cables to support the initial and subsequent requirements of the occupants.

All pathway routes shall be coordinated with other building services (electrical, mechanical, plumbing, etc. to assure proper clearances and accessibility.

The workstation cable distribution pathways shall be designed to accommodate cable changes as well as minimize building occupant disruption when such pathways and spaces are accessed.

The pathway system shall be coordinated with the electrical distribution system in order to maintain a minimum 48" separation from motors or transformers, 12" separation between parallel runs of telecommunication and electrical cabling and 5" separation from fluorescent lights. Where 12" separation is not possible; the telecommunication cabling shall be separated from electrical cables by a ferrous material to minimize potential interference. Where electrical and telecommunication cabling cross, it shall be at right angles only.

A minimum of six 4" conduits shall be provided between the MTR and lower level TR. On floors with more than one TR, a minimum of four 4" conduits shall be provided between the two TR's.

A minimum of six 4" sleeves shall be provided between each stacked TR. Sleeves shall extend a minimum of 3" above the finished floor.

A minimum of four 4" conduits shall be provided in the side walls of each TR for the routing of workstation cables to the workstation areas. Conduits shall extend to the nearest cable tray located in the corridor ceiling space.

A minimally sized 24"W x 4"D cable tray will be provided in the corridor ceiling space to support installation of workstation cables. 4" conduits may be needed in the ceiling areas of the building to create zones where cables are express routed from the zone back to the telecommunications room. EZ path sleeves will also be utilized in areas where fire rated walls are penetrated.

12" and 24" ladder type cable trays shall be provided in the ceiling areas of the MTR's and TR's to support the distribution of cables within the room.

Wall mounted telecommunications outlets (for voice/data) shall be provided with a 4" by 4" electrical box at the bottom of the minimum sized 1" conduit stub-up. Where stub up extend horizontally more than 60", 1-1/4" conduit stub ups shall be substituted. Wall mounted telephone outlets, located at +48" AFF shall be furnished with a 2" by 4" electrical box. A 3/4" conduit stub-up may be substituted for wall mounted telephone outlets.

Due to conduit fill ratios and stressing of the cables during installation, conduits shall be limited to a total of 180 degrees of bends or 100" between pulling points.

**Telecommunications Cabling System**

The telecommunications cabling system shall be designed to conform to the requirements of TIA/EIA-568, The Commercial Building Telecommunications Cabling Standard.

Building backbone cabling shall consist of the following.

1. A 200-pair Category 3 UTP cable will run from the MTR to each TR. Each end of the cable shall be terminated onto wall mounted 110-style termination blocks.
2. At a minimum, a 48-strand multi-mode optical fiber cable and a 24-strand single mode optical fiber cable shall be provided from the MTR to each TR. Optical fibers shall be terminated with connectors mounted in optical fiber patch panels at each end. The connector type will need to be determined in conjunction with DIS.

Workstation cabling shall consist of the following.

1. Workstation outlet locations shall be provided with a standard cable set consisting of TIA/EIA 568B, 4-pair, UTP Category 6 cables. All cables shall be terminated at the workstation utilizing Category 6, 8-pin, modular connectors with either T568A or T568B pinning at the workstation faceplate. Cables for voice network applications shall be terminated onto 110 termination blocks at the telecommunication rooms. Cables for data network applications shall be terminated onto equipment rack mounted, 8-pin, modular patch panels in the telecommunication rooms. In order to establish an applications-independent cabling system, all cables may be

terminated onto rack mounted, 8-pin, modular patch panels.
2. All wall phone locations shall be provided with one Category 6 cable.
3. Cable set for all other locations shall be coordinated with the building's programming requirements.

Patching and cross connects between cable terminations and transport electronics shall be accommodated with the least amount of termination and cross connect hardware that is practical. When feasible, connections between horizontal cable terminations and transport electronics will be made directly, through the use of an appropriate patch cord. Where necessary, connections between UTP cables terminated on rack mounted hardware and remote rack or wall-mounted equipment shall be made via the use of an intermediate "tie" field adjacent to the rack mounted cabling terminations.

Connection between horizontal termination fields and tie fields, and from patch panels to equipment ports shall be made through the use of pre-manufactured patch cords or punch down cross connect wire.

**Uniform Telecommunications Grounding System**

A uniform telecommunications grounding and bonding system shall be provided in accordance with J-STD-607-A, 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.

The telecommunications grounding backbone shall consist of solid copper busbar and copper conductors interconnected in the following manner:

1. Main electrical ground to the telecommunications main grounding busbar (TMGB) located in the MTR
2. The TMGB to individual telecommunications grounding busbars (TGB) in each TR
3. The telecommunications grounding busbar in each of these rooms to the nearest point of grounding building steel, if available
4. Where an electrical power panel board is located within the MTR or TR, the TGB shall be bonded to the panel board's alternating current equipment ground (ACEG).
5. All bonding conductors shall be at a #3 AWG copper conductors. The conductor jacket shall be green in color or marked appropriately, and installed in continuous lengths. A grounding riser shall be provided up the telecommunication room riser path.
6. The TMGB shall be pre-drilled, a minimum of 1/2" thick x 4" wide solid copper bar, electro-tin-plated, and insulated from their supports by a 2" separation. The TGB's shall be pre-drilled, a minimum of 1/4" thick x 2" wide solid copper bar, electro-tin-plated and insulated from their supports by a 2" separation.
7. All metallic raceways, racks and cabinets entering or located within a room with a TGB shall be bonded to the TGB via a minimum #6 AWG bare copper conductor.

**Pathways, Spaces and Media Identification**

An identification system shall be developed to uniquely identify each equipment rack, pathway segment, telecommunications room, rack, patch panel, and cable installed in the building.

All horizontal and backbone cables shall be assigned a unique alphanumeric designation for identification purposes. Appropriately marked labels shall be provided at each end of each cable.

Labels having the appropriate cable designation shall be provided in the following locations for each cable:

1. On the outlet faceplate in the work area
2. On the termination block or patch panels in the MTR or TR

Cable designations shall be designed for easy identification of serving closet and termination location.

Cable termination information shall form the basis for the development of a telecommunications / facilities administration system database.

**Other Low Voltage Systems**

Several other low voltage systems related to the telecommunications system will be installed as part of this project. These systems include;

**Wireless Local Area Network (WLAN)**
Provisions for a wireless local area network system will be provided as part of the telecommunications infrastructure. Provisions shall include Cat-6 cabling to be provided at regular intervals throughout a given floor plate to facilitate the placement of DIS provided wireless access points (WAP). Cabling shall be installed from the floor serving TR out to the floor and left coiled up in the ceiling space. Access points will be located approximately 60 feet on center throughout any given floor. All access points will be provided by Owner.

**Community Access Television (CATV)**
Raceway infrastructure shall be provided for cable television signal outlets. Amplifiers, cabling, channel selector device, and receptacle devices will be provided by the Contractor and include coaxial cabling installed from the TR locations to each CATV outlet location. Locations for CATV will be determined by DIS.

## Broadcast Studio Program

### Introduction

This Programming Report describes audiovisual, broadcast, production and editing systems capabilities and equipment costs for the Washington State Department of Information Services (DIS). This report is not a technical specification and does not provide details such as manufacturer or model number. The information supplied herein is at the conceptual design level of analysis. This information will help finalize architectural and infrastructure decisions, as well as validate any current assumptions about cost planning.

### Infrastructure vs. Equipment

The project team should be clear about the difference between providing infrastructure and purchasing equipment. If proper infrastructure provisions have been made from the start, equipment may easily be added or upgraded later as additional funding becomes available, without jeopardizing the integrity of the overall audiovisual systems design.

> **"Infrastructure"** refers to the necessary base building provisions such as power outlets, conduit, junction boxes, floorboxes, projection screens, etc., needed to use with audiovisual equipment.
>
> **"Equipment"** refers to particular devices that have specific costs and capabilities associated with them.

Infrastructure must be planned and provided for in initial occupancy, whether the audiovisual equipment is purchased or not. Equipment can be thought of as furniture - various choices can be made about its' quality and quantity. Some equipment can be purchased for initial occupancy, while other equipment purchases can be deferred.

### Equipment Installation Designations

Video, audio, and control system features are each described separately, with an overview of the significant pieces of equipment in each system. The information supplied is a summation to be combined with the budget material in order to make financial project and audiovisual capabilities decisions. We refer to the equipment as having one of the following installation designations: dedicated, portable or future provisions.

> **"Dedicated"** indicates that the equipment will likely be used frequently and is permanently dedicated or installed in a specific room. Items with this designation appear in the budget of that space.
>
> **"Portable"** indicates that the equipment is needed less frequently and can be shared with other rooms and stored in a central Equipment Pool. Only a few items with this designation appear in the budget.

**"Future Provisions"** indicates that the capability may not be required initially, but infrastructure and systems design provisions should be made to adapt to equipment at some time in the future. Items with this designation do not appear in the budget, as we do not anticipate their immediate purchase.

**"Existing"** indicates that the equipment is owner furnished. Items with this designation may not appear in the budget.

**General**

The Audiovisual systems described in this report stem from the Department of Information Service relocation. This relocation will require a new studio space and production control room. Along with these spaces several support and specialty suites will be needed. These specialized spaces will include an audio recording and editing suite with vocal booth, multiple video editing suites, and an encoding suite.

All of the spaces listed above will be pathway connected to and be functionally supported by the main equipment or machine room. This room should be a centrally located room. The equipment / machine room should be acoustically isolated from the studio, control rooms and suites surrounding the room. Also located near the equipment / machine room and with simple access to all other technical spaces should be the studio engineer's work space. This space will need to be acoustically isolated from the production spaces yet will need to have ties into each technical space for routing of test signals.

The studio and production control room will be designed to support HD broadcast resolutions (720 and prepared for 1080). Signals will be down converted for analog broadcast or encoded for web or pod casting. All input and audio and video signals from the plant will be routed through the Machine room. A central router system will allow audio and video to be routed to any technical suite in the facility to be worked on. Digital storage devices will be located in the machine room. Archived and existing master tape storage will need to be located on site in a secure, climate controlled, fire resistant vault.

**Production Studio**

The production studio requires technical flexibility. It is possible for sets to be assembled in any configuration in the studio. Connectivity to the machine room must be accessible in any room configuration with a minimal cable run length. A minimum of one connection panel should be mounted on each wall. Connection panels will consists of camera signals, intercom signals, return video tie lines, teleprompter connections and audio signals. These connection panels should be located in such a way that cable runs do not cross walk ways, door ways or be visible on the set.

The following capabilities have been identified for this room:

**Video Systems**
- Video Patch Panel (BNC, Triax, RJ-45 connections); dedicated
- Video Distribution Amplifiers; dedicated
- Source Preview Monitors; portable

**Audio Systems**
- Audio Patch Panels (XLR, Locking 1/4" or RJ-45 connections); dedicated
- Speaker Connections; dedicated
- Monitor Speakers; portable
- Intercom connections for IDF and production Intercom; dedicated

**Production Control Room**

The production control room in the DIS studio is an open control room for all disciplines and clients in the space. Communication and workflow amongst the operators is critical and needs to be as unobstructed as possible. The control room will need a video wall; the video wall will need to be user configurable, for layout and source signal. The video wall will need to support multiple users and configurations.

**Video Systems**
- Production control Switcher
- Router control panels
- Video wall control panel
- QC Monitors
- Video Wall

**Audio Systems**
- Audio Mixer
- Audio Patch Bays (1/4" or RJ-45 connections)
- Powered monitor Speakers
- Room Monitor Speakers
- Router control panel

## Figure 3e

| | Decription | Units | WA DC Site Baseline Existing | | WA DC Site Option 1 (Tier 3) | | WA DC Site Option 3 CES | |
|---|---|---|---|---|---|---|---|---|
| | | | Day One | Final | Day One | Final | Day One | Final |
| 1 | ***Power Densities*** | | | | | | | |
| 2 | Equipment Power Density over Gross Raised Floor Area | Watts/SF | 35 | 75 | 75 | 150 | 75 | 150 |
| 3 | Raised Floor Area (i.e. Data Center, NOC, etc.) | Square Feet | 21,600 | 21,600 | 27,000 | 54,000 | 27,000 | 54,000 |
| 4 | Admin Area | Square Feet | 30,960 | 30,960 | 31,789 | 31,789 | 31,789 | 31,789 |
| 5 | Infrastructure Support Area | Square Feet | 30,300 | 30,300 | 48,000 | 55,000 | 32,000 | 47,000 |
| | Building Circulation | 10% | | | 10,679 | 14,079 | 9,079 | 13,279 |
| 6 | Overall Building Size | Square Feet | 82,860 | 82,860 | 117,468 | 154,868 | 99,868 | 146,068 |
| 7 | ***Electrical*** | | | | | | | |
| 8 | Service | Selection | N | N | 2N | 2N | N | N |
| 9 | Generator | Selection | N+1 | N+1 | N+1 | N+1 | N+1 | N+1 |
| 10 | Exterior Sound Attenuated Enclosure | Yes/No | No | No | No | No | No | No |
| 11 | Sub-Base Fuel Take or Day Tank | Sub/Day | Day | Day | Day | Day | Day | Day |
| 12 | Generator Distribution | Selection | N | N | N | N | N | N |
| 13 | UPS Topology | Selection | N+1 | N+1 | N+1 | N+1 | N+1 | N+1 |
| 14 | Battery Time | Minutes | 15 | 15 | 15 | 15 | 15 | 15 |
| 15 | Type of Battery | VRLA/Flooded | Flooded | Flooded | Flooded | Flooded | Flooded | Flooded |
| 16 | Mechanical Equipment on UPS | Yes/No | No | No | No | No | No | No |
| 17 | | Selection | No | No | No | No | No | No |
| 18 | PDU | Selection | N | N | 2N | 2N | N | N |
| 19 | RPP | Selection | N | N | 2N | 2N | N | N |
| 20 | ***Mechanical*** | | | | | | | |
| 21 | Water Service (Primary) | Selection | City | City | City | City | City | City |
| 22 | Water Source (Redundant) | Selection | None | None | Well/Tank | Well/Tank | Well/Tank | Well/Tank |
| 23 | Cooling System #1 | | | | | | | |
| 24 | Central Plant #1 Type | Selection | Chilled Water | Chilled Water | Chilled Water | Chilled Water | Chilled Water | Chilled Water |
| 25 | Central Plant Redundancy | Selection | N+1 | N+1 | N+1 | N+1 | N+1 | N+1 |
| 26 | Heat Rejection | Selection | Cooling Towers | Cooling Towers | Cooling Towers | Cooling Towers | Cooling Towers | Cooling Towers |
| 27 | Cooling Towers | Selection | Wood | Wood | Stainless Steel | Stainless Steel | Stainless Steel | Stainless Steel |
| 28 | Makeup Water Storage | Hours | 0 | 0 | 24 | 24 | 24 | 24 |
| 29 | Distribution Piping | Selection | Single Loop | Single Loop | Single Loop | Single Loop | Single Loop | Single Loop |
| 30 | Thermal Storage | Minutes | 0 | 0 | 0 | 0 | 0 | 0 |
| 31 | Cooling System #2 | | | | | | | |
| 32 | Central Plant #2 Type | Selection | None | None | Chilled Water | Chilled Water | None | None |
| 33 | Central Plant #2 Redundancy | Selection | N/A | N/A | N+1 | N+1 | N/A | N/A |
| 34 | Heat Rejection | Selection | N/A | N/A | Cooling Towers | Cooling Towers | N/A | N/A |
| 35 | Cooling Towers | Selection | N/A | N/A | Stainless Steel | Stainless Steel | N/A | N/A |
| 36 | Makeup Water Storage | Hours | N/A | N/A | 24 | 24 | N/A | N/A |
| 37 | Distribution Piping | Selection | N/A | N/A | Single Loop | Single Loop | N/A | N/A |
| 38 | Thermal Storage | Hours | N/A | N/A | 0 | 0 | N/A | N/A |
| 39 | Air Distribution (CRACs/CRAHs) | Selection | CRACs | CRACs | CRAH's | CRAH's | CRAH's | CRAH's |
| 40 | Air Distribution (CRACs/CRAHs) - Redundancy % | N+(X)% | 25% | 25% | 25% | 25% | 25% | 25% |
| 41 | Humidification | Selection | Centralized | Centralized | Centralized | Centralized | Centralized | Centralized |
| 42 | FM-200 or Gas Protection | Yes/No | Yes | Yes | Yes | Yes | Yes | Yes |
| 43 | Pre-action Sprinkler System | Yes/No | Yes | Yes | Yes | Yes | Yes | Yes |
| 44 | Fuel Storage | Hours | 24 | 24 | 48 | 48 | 72 | 72 |

**Equipment / Machine Room**

The Equipment / Machine room is the location where all the equipment will be installed. This room requires additional HVAC and technical power. Cable routing in this space is critical and accessibility to racks and equipment for maintenance is required. Future cable pathways should be planned for as well as accessibility for upgrading systems.

The following capabilities have been identified for this room:

**Video Systems**
- Digital video router
- Production switcher
- Distribution amplifiers
- QC station
- Digital Video storage
- Vide Play back Decks
- Patchbays
- Video Scalers
- Scan Converters
- Encoders

**Audio Systems**
- Digital Audio Router
- Digital Audio Storage
- Distribution Amplifiers
- Phone interfaces
- Intercom System
- PA Amplifier

**Control Systems**
- Network hubs
- Control system

**Audio Recording and Editing Suite**

The Audio Suite will be set up for the operation of ProTools or a similar audio editing software system. The suite will need to have connections to the audio router. The Audio Suite with also have connections to the vocal booth so that vocal tracks can be recorded directly into the ProTools systems. Equipment to support the audio editing system will be installed in a rack in the Equipment / Machine room. A small outboard rack and patchbay will be required in the operator's work area for outboard gear and routing.

**Video Systems**
- Monitor fed by the router; dedicated
- Input/output tie-lines; dedicated

**Audio Systems**
- ProTools system including I/O, computer and primary storage; dedicated
- Monitor speakers; dedicated
- Patchbays and tie-lines; dedicated

**Control Systems**
- Router control panel; dedicated
- Access to the control network

**Audio / Voice Booth**

The Audio / Voice Booth is an acoustically isolated space that can be used to record vocal or instrument tracks. The space will work in conjunction with the audio recording and editing booth. This space will also have tie-lines to the control room via the router so that this space can be used as a production space.

The following capabilities have been identified for this room:

**Video Systems**
- Monitor fed by the router; dedicated
- Input/output tie-lines; dedicated

**Audio Systems**
- Tie-lines; dedicated
- Headphone amplifier; dedicated

**Video Editing Suites**

The video editing suite is an acoustically isolated space that will be used to work on a non-linear video editing system. The space will be set up around the operator's use of a computer based editor. This work space should be comfortable to be in as well as comfortable to operate the editor in. Isolating the equipment rack from this space to reduce equipment noise is desirable. If possible the tape transfer to hard drive should be in another room or an isolated rack within the user's reach. Unrestricted internet access is required for the acquisition of source material that may be used in final products.

The following capabilities have been identified for this room:

**Video Systems**
- Tie-lines to the main router; dedicated
- Non-liner video editing system; dedicated
- Router control panel; dedicated
- QC monitor

**Audio Systems**
- Tie-lines to the main audio router; dedicated
- Speakers for program playback and critical listening; dedicated
- Speakers for "real world" playback and actual product quality control; dedicated

**Control Systems**
- Access to control network
- Access to the media storage network
- If record decks are remotely located, control via network or control system

**Encoding Suite**

The Encoding Suite is used to convert the final production into a portable format for web or pod casting. Since encoding is not a "real time" operation the monitoring of the encoding task may interfere or be interfered with by other production spaces. The encoding suite will need to be acoustically isolated from the production areas and machine room.

The following capabilities have been identified for this room:

**Video Systems**
- Preview monitor; dedicated
- Ties to the main video router; dedicated

**Audio Systems**
- Preview speakers; dedicated
- Ties to the main audio router; dedicated

**Control Systems**
- Router control panel; dedicated
- Access to the control network
- Access to the media storage network
- Access to the internet

**Engineering Tech Room**

The Engineering Tech Room is the local repair space. This space will need to be acoustically isolated from the rest of the plant. The tech space will require increased ventilation and the ability to perform work such as soldering and use of other heat sources. The Tech Room will require a tech bench with isolated / tech power. The work bench location will also need to have access to the internet and an internet capable computer. Storage for parts and gear waiting to be repaired is required. This space should also have a building standard work station.

The following capabilities have been identified for this room:

**Video Systems**
- Tie-lines to the main router
- Test Monitor; dedicated
- Waiveform Monitor; dedicated
- Test gear.

**Audio Systems**
- Monitor Speakers; dedicated
- Waveform Monitor; dedicated
- Tie-lines to the plant audio router

**Control Systems**
- Router control panel; dedicate
- Access to all control and storage networks

**Sustainable Design: Mechanical and Electrical**

Specific heating and ventilation schemes and modes have been (and will continue

to be) explored to reduce energy consumption throughout the year. Other areas will be explored as well, including water efficiency inside the buildings. All measures explored are evaluated not only with respect to the sustainablity and comfort, but also to capital and operational costs.

The following will be incorporated for the office building and studio:

- Building Envelope will hve thermal efficiency of wall, roof, glass and other building components. Alternate window glass types will be considered with respect to varying solar loads on each face of the building.
- Equipment Selection – Heating, cooling and pumping equipment are selected for optimum operating efficiencies. Air economizers will be used to minimize the amount of time that chillers will operate.
- Energy Efficient Motors - High efficiency motors will be used where suitable on mechanical equipment.
- Control System - A state of the art D.D.C. Control System will be used to provide maximum operating efficiency for the mechanical systems.
- Plumbing - Low consumption water fixtures will be used throughout the building.
- Solar Shading - Various ways of reducing the solar load in the building are incorporated. These include low E and tinted glass, shading devices and building overhangs.
- Commissioning is recognized by the USGBC's LEED rating system as an important element in sustainable design to help ensure design intent is realized in the actual building. Towards that end, the hiring of an independent commissioning agent is recommended. System and equipment to be commissioned will be determined by the commissioning agent, who will be responsible for creating and executing a commissioning plan. Testing services to support the commissioning agent is generally provided by the contractor.
- Measurement and verification – to help ensure continued high performance of the building after it is put into operation, instrumentation will be included to monitor operating characteristics and efficiencies of major mechanical and electrical systems. Whole building energy, gas and water interval meter data will also be collected in accordance with LEED requirements. This information can be used by building staff and service contractors to help "continually commission" the building to keep it operating at high efficiency to identify negative trends in equipment and system performance and address them before they ultimately lead to mechanical failures.

## DATA CENTER MECHANICAL AND ELECTRICAL SYSTEMS
**Programming Basis of Design**

**Tier 3**

As a premier State data center, the design will need to be geared toward a Tier 3 data center. The Uptime Institute has developed a tiered classification approach to site infrastructure functionality that addresses the need for a common benchmarking standard. It defines a Tier 3 data center as possessing the following; multiple power and cooling distribution paths (but only one active path), redundant components, being concurrently maintainable and having 99.982% availability.

Some of the other attributes for a Tier 3 and Tier 4 classed data centers are noted below:

| Attributes | Tier III | Tier IV |
|---|---|---|
| Number of Delivery Paths | 1 Active<br>1 Passive | 2 Active |
| Redundant Components | N+1 | 2(N+1) or<br>S + S |
| Support Space to Raised Floor | 80 – 90% | 100% |
| Initial watts / SF | 40 – 60 | 50 – 80 |
| Ultimate watts / SF | 100 – 150 | 150 + |
| Raised Floor Height | 30 – 36” | 30 – 36” |
| Utility Voltage | 12 – 15 kV | 12 –15 kV |

**Power Density**

The power density is projected to be 150 W/sf. The challenge is to choose a power density design point to cover a large number of customers. Most customers require between 150 W/sf to 200 W/sf. Certain customers require 300 W/SF which require special treatment at their facilities. Generally, the 300 W/sf requirement is limited to certain isolated sections of the data center. Our experience shows that the economic design point is around 150 W/sf.

**Power & Cooling Requirements**

Preliminary sizing of electrical power and cooling equipment ratings were made. The projected power required by the data center and adjacent office/support space will be about 11 MW and about 2,600 tons of cooling.

**Critical Data Center Infrastructure**

For secure power and cooling for the Data Center, this report assumes the traditional/conventional method: static UPS, standby generators and electrical centrifugal chillers for this type of data center in a Tier 3 configuration. This report explores below the option of using a Critical Energy System which employs the cogeneration principles in a unique configuration using onsite generation and adsorption chillers.

**Utility Power**

The primary site is located adjacent to a PSE substation. Because the ultimate power demand is projected at 11 MW, the Utility incoming voltage will need to be at medium voltage in the 15 kV class of equipment to accommodate commercially available power distribution equipment. This voltage level provides several advantages to the WA DIS, more economical utility rates than 480 V incoming service and higher reliability than 480 V incoming service.

**Phased Construction / Modular Design**

A phased approach is recommended in order to satisfy the need for time to market, to avoid stranded assets, and to accommodate the long lead times for delivery of equipment. As noted above, the design of the data center will be modular in nature including the raised floor buildout and the supporting mechanical and electrical equipment. The ultimate buildout will support a power density of 150 W/sf.

**Design Overview - Conceptual Layout**

The data center complex and its supporting infrastructure consist of four elements:

Data halls – This area consists of the raised data floor area.

Office/NOC/Storage area – This area is support office areas for the data center, tape storage, DIS NOC and production facilities located between the office building and data halls.

Low Voltage Power Distribution – This area contains the 480 power distribution, UPS, battery strings and cooling system for each data hall. This area is tucked under the data halls.

Main Power Distribution/Central Plant Area – This area contains main medium voltage switchgear which inter-ties the utility power/metering and onsite generation to its data center and office loads. This area also contains chillers (electrical centrifugal / adsorption), pumps, cooling towers and associated ancillary equipment. These elements are located both underneath the data halls with the low voltage items above and also located in a separate building on site. Refer to the program summary spreadsheet (Figure 3e) which compares the existing data center, a traditional Tier 3 data center and a CES configured data center.

**Traditional Tier 3 Equipment List**

The equipment list for the traditional tier 3 is shown below with initial build-out and the ultimate build-out. This is to facilitate the development of the life cycle cost model.

| First Install | Final Install (assume yr 7) |
|---|---|
| MECHANICAL EQUIPMENT | |
| 3 - 500 Ton Centrifugal Chillers | 6 - 500 Ton Centrifugal Chillers |
| 3 - 1200 GPM, 100' Head Primary Chilled Water Pumps | 6 - 1200 GPM, 100' Head Primary Chilled Water Pumps |
| 2 - Two pump Variable Volume Pump Skid, 2- 1200 GPM pumps, 100' Head | 4 - Two pump Variable Volume Pump Skid, 2- 1200 GPM pumps, 100' Head |
| 3 - Condenser Pumps, 1500 GPM, 100' Head | 6 - Condenser Pumps, 1500 GPM, 100' Head |
| 3 - Cooling Towers, Stainless Steel | 6 - Cooling Towers, Stainless Steel |
| 30 - 30 Ton Computer Room Air Handling Units - Liebert Type, Chilled Water | 90 - 30 Ton Computer Room Air Handling Units - Liebert Type, Chilled Water |
| Loop Piping sized to 150 watts per SF, welded, steel, sch 40 for two data halls. | Loop Piping sized to 150 watts per SF, welded, steel, sch 40 for four data halls. |
| 3 - 16,000gal underground fuels tanks with submersible pumps, double wall | 3 - 16,000gal underground fuel tanks with submersible pumps, double wall |
| Two - Fuel pump skids each with two fuel oil pumps and controls. | Two - Fuel pump skids each with two fuel oil pumps and controls. |
| Fuel System leak Detection and inventory monitoring | Fuel System leak Detection and inventory monitoring |
| 3 - 2.2 MVA Tier 2 diesel engine generators complete with controls and fuel oil day tanks, dual starter motors, and duel starter batteries | 7 - 2.2 MVA Tier 2 diesel engine generators complete with controls and fuel oil day tanks, dual starter motors, and duel starter batteries |
| ELECTRICAL EQUIPMENT | |
| 2 - 12 MVA Oil filled transformers | 2 - 12 MVA Oil filled transformers |
| 3 - 2000 kW UPS Systems complete with fully rated static switch, and maintenance bypass section. | 5- 2000 kW UPS Systems complete with fully rated static switch, and maintenance bypass section. |
| 9 - Flooded Cell battery Strings complete with stands and base containment | 15- Flooded Cell battery Strings complete with stands and base containment |
| One Battery Monitoring System | One Battery Monitoring System |

**Cogeneration (Critical Energy System) Option**

One idea proposed by the design team that would lower project costs and provide operational flexibility over the life of the building would be to use on-site generation to provide 100% of the power required for the data center and office building. Waste heat would be leveraged to improve the economics of on-site generation and dramatically reduce the environmental impact. This option is currently under consideration by DIS, and is described here as a potential alternate to the basis of design described above.

This system (shown in Figure 3f) would consist of one diesel engine generator and multiple natural gas engine generators that will provide both electrical power and heat for the entire facility. The generators would be low emissions type rated for continuous duty and matched to the electrical load, with n + 1 generators installed to provide redundancy to match the reliability requirements of a tier 3 data center. Jacket and exhaust waste heat from the generation process would be used to power adsorption chillers, provide heat to the office spaces, to heat domestic hot water and potentially to provide excess heat to the capital campus district heating system.

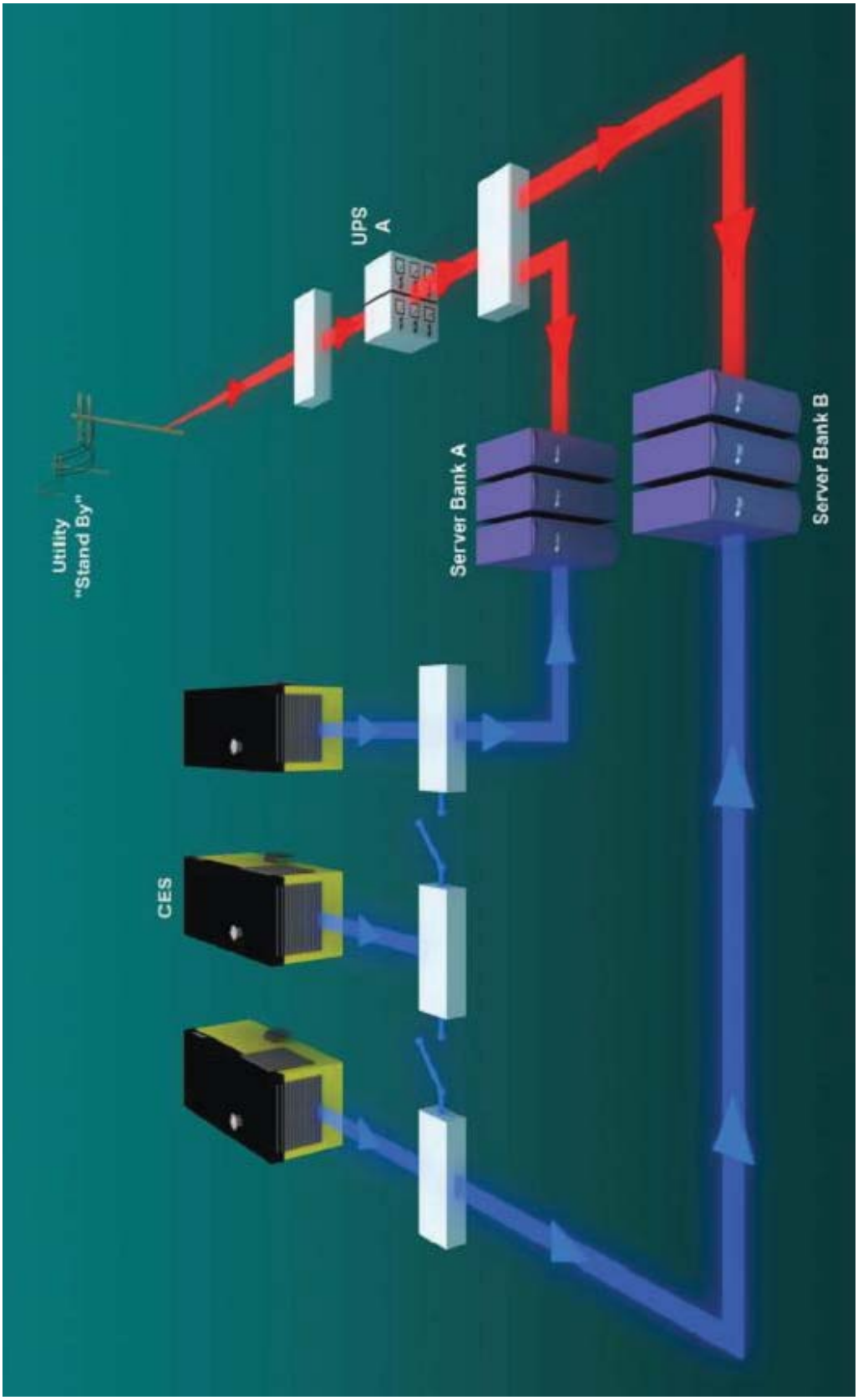
Enough generators would be provided to meet the initial load of the data center, plus a 25% initial growth allowance. The redundant generator would be used to power the office building. In the event of a generator failure, the redundant generator would power the data center and the office building would use utility power. Space and conduit would be provided for additional generators so that they would meet the projected final load of all data bays filled to 150 W/SF.

The proposed cogeneration option has the advantage of being higher in cycle efficiency than fossil-fuel utility power plants that are not able to use waste heat, more environmentally friendly and, given forecasted relative fuel and electricity utility rates over time, cost effective over the life cycle of the building.

By retaining the grid as back-up, the ability to leverage fuel-switching would be enabled in the future, helping to ensure the most cost effective operation. Overall first costs may also be reduced (e.g, reduction or elimination of the UPS). Waste heat from the cogeneration system will be used for heating and to operate absorption chillers. Excess heat may also be fed back into the capital campus steam system, creating another potential revenue source for DIS.

**Figure 3f**

## Cogeneration Configuration



**Cogeneration (Critical Energy System) Option Equipment List**

| First Install | Final Install (assume yr 7) |
|---|---|
| MECHANICAL EQUIPMENT | |
| 1- 500 Ton Centrifugal Chillers | 3 - 500 Ton Centrifugal Chillers |
| 4- 250 Ton HJIC Adsorption Chillers | 10- 250 Ton HJIC Adsorption Chillers |
| 2- 2300 KW Natural gas Fired engine generators with Heat recovery | 6- 2300 KW Natural gas Fired engine generators with Heat recovery |
| 1- 2000 kW Diesel Engine Generator | 2- 2000 kW Diesel Engine Generator |
| 3 - 1200 GPM, 100' Head Primary Chilled Water Pumps | 6 - 1200 GPM, 100' Head Primary Chilled Water Pumps |
| 2 - Two pump Variable Volume Pump Skid, 2- 1200 GPM pumps, 100' Head | 4 - Two pump Variable Volume Pump Skid, 2- 1200 GPM pumps, 100' Head |
| 3 - Condenser Pumps, 1500 GPM, 100' Head | 6 - Condenser Pumps, 1500 GPM, 100' Head |
| 3 - Cooling Towers, Stainless Steel | 6 - Cooling Towers, Stainless Steel |
| 30 - 30 Ton Computer Room Air Handling Units - Liebert Type, Chilled Water | 90 - 30 Ton Computer Room Air Handling Units - Liebert Type, Chilled Water |
| Loop Piping sized to 150 watts per SF, welded, steel, sch 40 for two data halls | Loop Piping sized to 150 watts per SF, welded, steel, sch 40 for four data halls |
| 3 - 16,000 underground fuels tanks with submersible pumps, double wall | 3 - 16,000 underground fuels tanks with submersible pumps, double wall |
| Two - Fuel pump skids each with two fuel oil pumps and controls. | Two - Fuel pump skids each with two fuel oil pumps and controls. |
| Fuel System leak Detection and inventory monitoring | Fuel System leak Detection and inventory monitoring |
| ELECTRICAL EQUIPMENT | |
| 1 - 12 MVA Oil filled transformers | 1 - 12 MVA Oil filled transformers |
| 1 - 3000 kW UPS Systems complete with fully rated static switch, and maintenance bypass section | 1 - 3000 kW UPS Systems complete with fully rated static switch, and maintenance bypass section |
| 4 - Flooded Cell battery Strings complete with stands and base containment | 4- Flooded Cell battery Strings complete with stands and base containment |
| One Battery Monitoring System | One Battery Monitoring System |

**Sustainable Design: Mechanical and Electrical**

Because of the large electrical loads and accompanying cooling requirements of the data center, it's overall energy usage will be more than an order of magnitude greater than the offices. For this reason, it is important for DIS as a state agency to identify proven energy management strategies to improve the environmental footprint of this project while reducing operating costs dramatically. One such strategy is cogeneration discussed above.

A number of other best practices have also been identified for data centers. Most recently, a comprehensive design guide provided by California utility PG&E and developed by Lawrence Berkeley National Laboratory included the following HVAC best practices strategies

- Use air-side economizers when outside air is cooler than data center hot exhaust (return) air. The climate in Olympia is ideal for this strategy, as the vast majority of hours have temperatures below 55F. Adequate access to outside air in the architectural design of the building would need to be considered. Re-directing of additional waste heat from the cogeneration system in winter to the campus loop would multiple the potential benefits of this strategy.
- Provide custom-designed large central air-handling systems rather than a larger number of smaller, traditional distributed-unit systems. Larger systems would include larger fans and motors which generally are of higher efficiency, and also take advantage of VAV operation by using variable frequency drives. By sizing ductwork for future full load conditions the initial fan energy consumption would be extremely low.
- Depending on the mechanical cooling strategy, free cooling via a water-side economizer may be advantageous to cool building chilled water during mild outdoor conditions.
- Use a wider set-point for temperature and humidity control.

## 3.8 Applicable Codes and Regulations

The proposed site is located on the Capitol Campus, within the City of Olympia, in Thurston County. The City of Olympia Building Official is the Authority Having Jurisdiction (AHJ) for most building related issues. The Olympia Fire Marshall is the AHJ for fire protection, alarm and life-safety issues. Electrical inspection is performed by the City of Olympia. The buildings will conform to the current edition of the International Building Code (IBC) and will be required to comply with the Washington State Nonresidential Energy Code. Refer to the appendix for zoning and building code analysis.

### 3.9 LEED and Sustainability

The Data Center and the Office Building will be over 5000 sq feet and are therefore required to conform to Chapter12, Laws of 2005 (ESSB 5509) and meet a LEED silver standard. In addition to this, the recent Governor's Executive Order 07-02: Washington Climate Change Challenge, identifies "constructing high performance green buildings" as one strategy to achieving reduced green-house gas emissions in the State of Washington. This project will be a prominent and major building on the Capitol Campus, and as such, could be an example of the State's leadership in the battle against global warming.

An eco-charette was performed with the user group during the pre-design phase and a summary of the goals identified is located in the appendix. The LEED scorecards that follow show that the Office Building can achieve a LEED Gold rating and the Data Center building a LEED Silver rating. Strategies that are proposed are:

- Energy efficient mechanical systems for the Data Center
- Using an energy efficient raised floor mechanical system for the office building
- Using energy efficient lighting and lighting controls
- Utilizing natural daylight in the office building
- Rainwater collection
- Efficient building envelope including sunshading on the south facade
- Green or energy star roofs
- Co-generation of power
- Water efficiency

# LEED-NC V 2.2 SCORECARD

## Office Building

| 44 | 14 | 11 | Total Project Score LEED V. 2.2 | Certified 26-32 Silver 33-38 Gold 39 -51 Platinum 52+ | Possible Points 69 |
|---|---|---|---|---|---|

### Sustainable Sites — Possible Points 14

| Y | ? | N | | | |
|---|---|---|---|---|---|
| y | | | Prereq 1 | **Erosion & Sedimentation Control** | 0 |
| y | | | Credit 1 | **Site Selection** | 1 |
| | ? | | Credit 2 | **Density Development & Community Connectivity** | 1 |
| | | n | Credit 3 | **Brownfield Redevelopment** | 1 |
| y | | | Credit 4.1 | **Alternative Transportation**, Public Transportation Access | 1 |
| y | | | Credit 4.2 | **Alternative Transportation**, Bicycle Storage & Changing Rooms | 1 |
| y | | | Credit 4.3 | **Alternative Transportation**, Alternative Fuel Vehicles | 1 |
| | ? | | Credit 4.4 | **Alternative Transportation**, Parking Capacity | 1 |
| | ? | | Credit 5.1 | **Reduced Site Disturbance**, Protect or Restore Open Space | 1 |
| | ? | | Credit 5.2 | **Reduced Site Disturbance**, Development Footprint | 1 |
| | ? | | Credit 6.1 | **Stormwater Management**, Rate and Quantity | 1 |
| y | | | Credit 6.2 | **Stormwater Management**, Treatment | 1 |
| y | | | Credit 7.1 | **Landscape & Exterior Design to Reduce Heat Islands**, Non-Roof | 1 |
| y | | | Credit 7.2 | **Landscape & Exterior Design to Reduce Heat Islands**, Roof | 1 |
| y | | | Credit 8 | **Light Pollution Reduction** | 1 |

### Water Efficiency — Possible Points 5

| Y | ? | N | | | |
|---|---|---|---|---|---|
| y | | | Credit 1.1 | **Water Efficient Landscaping**, Reduce by 50% | 1 |
| y | | | Credit 1.2 | **Water Efficient Landscaping**, No Potable Use or No Irrigation | 1 |
| | ? | | Credit 2 | **Innovative Wastewater Technologies** | 1 |
| y | | | Credit 3.1 | **Water Use Reduction**, 20% Reduction | 1 |
| y | | | Credit 3.2 | **Water Use Reduction**, 30% Reduction | 1 |

### Energy & Atmosphere — Possible Points 17

| Y | ? | N | | | |
|---|---|---|---|---|---|
| Y | | | Prereq 1 | **Fundamental Building Systems Commissioning** | 0 |
| Y | | | Prereq 2 | **Minimum Energy Performance** ASHRAE 90.1-2004 | 0 |
| Y | | | Prereq 3 | **CFC Reduction in HVAC&R Equipment** | 0 |
| y | | | Credit 1.1 | **Optimize Energy Performance**, 10.5% | 1 |
| y | | | Credit 1.2 | **Optimize Energy Performance**, 14% | 1 |
| y | | | Credit 1.3 | **Optimize Energy Performance**, 17.5& | 1 |
| y | | | Credit 1.4 | **Optimize Energy Performance**, 21% | 1 |
| | ? | | Credit 1.5 | **Optimize Energy Performance**, 24.5% | 1 |
| | ? | | Credit 1.6 | **Optimize Energy Performance**, 28% | 1 |
| | ? | | Credit 1.7 | **Optimize Energy Performance**, 31.5% | 1 |
| | | n | Credit 1.8 | **Optimize Energy Performance**, 35% | 1 |
| | | n | Credit 1.9 | **Optimize Energy Performance**, 38.5% | 1 |
| | | n | Credit 1.10 | **Optimize Energy Performance**, 42% | 1 |
| | ? | | Credit 2.1 | **Renewable Energy**, 5% | 1 |
| | | n | Credit 2.2 | **Renewable Energy**, 10% | 1 |
| | | n | Credit 2.3 | **Renewable Energy**, 20% | 1 |
| y | | | Credit 3 | **Additional Commissioning** | 1 |
| y | | | Credit 4 | **Enhanced Refrigerant Management** | 1 |
| y | | | Credit 5 | **Measurement & Verification** | 1 |
| | ? | | Credit 6 | **Green Power** | 1 |

### Materials & Resources — Possible Points 13

| Y | ? | N | | | |
|---|---|---|---|---|---|
| Y | | | Prereq 1 | **Storage & Collection of Recyclables** | 0 |
| | | n | Credit 1.1 | **Building Reuse**, Maintain 75% of Existing Shell | 1 |
| | | n | Credit 1.2 | **Building Reuse**, Maintain 100% of Existing Shell | 1 |
| | | n | Credit 1.3 | **Building Reuse**, Maintain 50% of Interior Non-Structural Elements | 1 |
| y | | | Credit 2.1 | **Construction Waste Management**, Divert 50% | 1 |
| y | | | Credit 2.2 | **Construction Waste Management**, Divert 75% | 1 |
| | | n | Credit 3.1 | **Resource Reuse**, Specify 5% | 1 |
| | | n | Credit 3.2 | **Resource Reuse**, Specify 10% | 1 |
| y | | | Credit 4.1 | **Recycled Content**, 10% (post-consumer + ½ pre-consumer | 1 |
| y | | | Credit 4.2 | **Recycled Content**, 20% (post-consumer + ½ pre-consumer | 1 |
| y | | | Credit 5.1 | **Local/Regional Materials**, 10% Extracted, Processed & Manufactured Re | 1 |
| | ? | | Credit 5.2 | **Local/Regional Materials**, 20% Extracted, Processed & Manufactured Re( | 1 |
| | ? | | Credit 6 | **Rapidly Renewable Materials** | 1 |
| y | | | Credit 7 | **Certified Wood** | 1 |

### Indoor Environmental Quality — Possible Points 15

| Y | ? | N | | | |
|---|---|---|---|---|---|
| Y | | | Prereq 1 | **Minimum IAQ Performance** ASHRAE 62.1-2004 | 0 |
| Y | | | Prereq 2 | **Environmental Tobacco Smoke** (ETS) **Control** | 0 |
| y | | | Credit 1 | **Carbon Dioxide** ($CO_2$) **Monitoring** | 1 |
| y | | | Credit 2 | **Increase Ventilation Effectiveness** | 1 |
| y | | | Credit 3.1 | **Construction IAQ Management Plan**, During Construction | 1 |
| y | | | Credit 3.2 | **Construction IAQ Management Plan**, Before Occupancy | 1 |
| y | | | Credit 4.1 | **Low-Emitting Materials**, Adhesives & Sealants | 1 |
| y | | | Credit 4.2 | **Low-Emitting Materials**, Paints | 1 |
| y | | | Credit 4.3 | **Low-Emitting Materials**, Carpet | 1 |
| y | | | Credit 4.4 | **Low-Emitting Materials**, Composite Wood | 1 |
| y | | | Credit 5 | **Indoor Chemical & Pollutant Source Control** | 1 |
| | ? | | Credit 6.1 | **Controllability of Systems**, Lighting | 1 |
| y | | | Credit 6.2 | **Controllability of Systems**, Thermal Comfort | 1 |
| y | | | Credit 7.1 | **Thermal Comfort**, Design ASHRAE 55-2004 | 1 |
| y | | | Credit 7.2 | **Thermal Comfort**, Verification / Occupancy | 1 |
| y | | | Credit 8.1 | **Daylight & Views**, Daylight 75% of Spaces | 1 |
| y | | | Credit 8.2 | **Daylight & Views**, Views for 90% of Spaces | 1 |

### Innovation & Design Process — Possible Points 5

| Y | ? | N | | | |
|---|---|---|---|---|---|
| y | | | Credit 1.1 | **Innovation in Design**: Green Housekeeping/Operations program | 1 |
| y | | | Credit 1.2 | **Innovation in Design**: Exemplary Performance - 40% Water Use Reductior | 1 |
| y | | | Credit 1.3 | **Innovation in Design**: Construction Waste Mgmt 95% | 1 |
| y | | | Credit 1.4 | **Innovation in Design**: Exemplary Performance Recycled Content 30% | 1 |
| Y | | | Credit 2 | **LEED Accredited Professional: Perkins+Will** | 1 |

# LEED-NC V 2.2 SCORECARD

## Data Center

| 39 | 14 | 16 | Total Project Score LEED V. 2.2 | Certified 26-32 Silver 33-38 Gold 39 -51 Platinum 52+ | Possible Points 69 |
|---|---|---|---|---|---|

### Sustainable Sites — Possible Points 14

| Y | ? | N | | | |
|---|---|---|---|---|---|
| y | | | Prereq 1 | **Erosion & Sedimentation Control** | 0 |
| y | | | Credit 1 | **Site Selection** | 1 |
| | ? | | Credit 2 | **Density Development & Community Connectivity** | 1 |
| | | n | Credit 3 | **Brownfield Redevelopment** | 1 |
| y | | | Credit 4.1 | **Alternative Transportation**, Public Transportation Access | 1 |
| y | | | Credit 4.2 | **Alternative Transportation**, Bicycle Storage & Changing Rooms | 1 |
| y | | | Credit 4.3 | **Alternative Transportation**, Alternative Fuel Vehicles | 1 |
| | ? | | Credit 4.4 | **Alternative Transportation**, Parking Capacity | 1 |
| | ? | | Credit 5.1 | **Reduced Site Disturbance**, Protect or Restore Open Space | 1 |
| | ? | | Credit 5.2 | **Reduced Site Disturbance**, Development Footprint | 1 |
| | ? | | Credit 6.1 | **Stormwater Management**, Rate and Quantity | 1 |
| y | | | Credit 6.2 | **Stormwater Management**, Treatment | 1 |
| y | | | Credit 7.1 | **Landscape & Exterior Design to Reduce Heat Islands**, Non-Roof | 1 |
| y | | | Credit 7.2 | **Landscape & Exterior Design to Reduce Heat Islands**, Roof | 1 |
| y | | | Credit 8 | **Light Pollution Reduction** | 1 |

### Water Efficiency — Possible Points 5

| Y | ? | N | | | |
|---|---|---|---|---|---|
| y | | | Credit 1.1 | **Water Efficient Landscaping**, Reduce by 50% | 1 |
| y | | | Credit 1.2 | **Water Efficient Landscaping**, No Potable Use or No Irrigation | 1 |
| | ? | | Credit 2 | **Innovative Wastewater Technologies** | 1 |
| y | | | Credit 3.1 | **Water Use Reduction**, 20% Reduction | 1 |
| y | | | Credit 3.2 | **Water Use Reduction**, 30% Reduction | 1 |

### Energy & Atmosphere — Possible Points 17

| Y | ? | N | | | |
|---|---|---|---|---|---|
| Y | | | Prereq 1 | **Fundamental Building Systems Commissioning** | 0 |
| Y | | | Prereq 2 | **Minimum Energy Performance** ASHRAE 90.1-2004 | 0 |
| Y | | | Prereq 3 | **CFC Reduction in HVAC&R Equipment** | 0 |
| y | | | Credit 1.1 | **Optimize Energy Performance**, 10.5% | 1 |
| | ? | | Credit 1.2 | **Optimize Energy Performance**, 14% | 1 |
| | | n | Credit 1.3 | **Optimize Energy Performance**, 17.5& | 1 |
| | | n | Credit 1.4 | **Optimize Energy Performance**, 21% | 1 |
| | | n | Credit 1.5 | **Optimize Energy Performance**, 24.5% | 1 |
| | | n | Credit 1.6 | **Optimize Energy Performance**, 28% | 1 |
| | | n | Credit 1.7 | **Optimize Energy Performance**, 31.5% | 1 |
| | | n | Credit 1.8 | **Optimize Energy Performance**, 35% | 1 |
| | | n | Credit 1.9 | **Optimize Energy Performance**, 38.5% | 1 |
| | | n | Credit 1.10 | **Optimize Energy Performance**, 42% | 1 |
| | ? | | Credit 2.1 | **Renewable Energy**, 5% | 1 |
| | | n | Credit 2.2 | **Renewable Energy**, 10% | 1 |
| | | n | Credit 2.3 | **Renewable Energy**, 20% | 1 |
| y | | | Credit 3 | **Additional Commissioning** | 1 |
| y | | | Credit 4 | **Enhanced Refrigerant Management** | 1 |
| y | | | Credit 5 | **Measurement & Verification** | 1 |
| | ? | | Credit 6 | **Green Power** | 1 |

### Materials & Resources — Possible Points 13

| Y | ? | N | | | |
|---|---|---|---|---|---|
| Y | | | Prereq 1 | **Storage & Collection of Recyclables** | 0 |
| | | n | Credit 1.1 | **Building Reuse**, Maintain 75% of Existing Shell | 1 |
| | | n | Credit 1.2 | **Building Reuse**, Maintain 100% of Existing Shell | 1 |
| | | n | Credit 1.3 | **Building Reuse**, Maintain 50% of Interior Non-Structural Elements | 1 |
| y | | | Credit 2.1 | **Construction Waste Management**, Divert 50% | 1 |
| y | | | Credit 2.2 | **Construction Waste Management**, Divert 75% | 1 |
| | | n | Credit 3.1 | **Resource Reuse**, Specify 5% | 1 |
| | | n | Credit 3.2 | **Resource Reuse**, Specify 10% | 1 |
| y | | | Credit 4.1 | **Recycled Content**, 10% (post-consumer + ½ pre-consumer | 1 |
| y | | | Credit 4.2 | **Recycled Content**, 20% (post-consumer + ½ pre-consumer | 1 |
| y | | | Credit 5.1 | **Local/Regional Materials**, 10% Extracted, Processed & Manufactured Reg | 1 |
| | ? | | Credit 5.2 | **Local/Regional Materials**, 20% Extracted, Processed & Manufactured Regi | 1 |
| | ? | | Credit 6 | **Rapidly Renewable Materials** | 1 |
| y | | | Credit 7 | **Certified Wood** | 1 |

### Indoor Environmental Quality — Possible Points 15

| Y | ? | N | | | |
|---|---|---|---|---|---|
| Y | | | Prereq 1 | **Minimum IAQ Performance** ASHRAE 62.1-2004 | 0 |
| Y | | | Prereq 2 | **Environmental Tobacco Smoke** (ETS) **Control** | 0 |
| y | | | Credit 1 | **Carbon Dioxide** ($CO_2$) **Monitoring** | 1 |
| y | | | Credit 2 | **Increase Ventilation Effectiveness** | 1 |
| y | | | Credit 3.1 | **Construction IAQ Management Plan**, During Construction | 1 |
| y | | | Credit 3.2 | **Construction IAQ Management Plan**, Before Occupancy | 1 |
| y | | | Credit 4.1 | **Low-Emitting Materials**, Adhesives & Sealants | 1 |
| y | | | Credit 4.2 | **Low-Emitting Materials**, Paints | 1 |
| y | | | Credit 4.3 | **Low-Emitting Materials**, Carpet | 1 |
| y | | | Credit 4.4 | **Low-Emitting Materials**, Composite Wood | 1 |
| y | | | Credit 5 | **Indoor Chemical & Pollutant Source Control** | 1 |
| | ? | | Credit 6.1 | **Controllability of Systems**, Lighting | 1 |
| y | | | Credit 6.2 | **Controllability of Systems**, Thermal Comfort | 1 |
| y | | | Credit 7.1 | **Thermal Comfort**, Design ASHRAE 55-2004 | 1 |
| y | | | Credit 7.2 | **Thermal Comfort**, Verification / Occupancy | 1 |
| | ? | | Credit 8.1 | **Daylight & Views**, Daylight 75% of Spaces | 1 |
| | ? | | Credit 8.2 | **Daylight & Views**, Views for 90% of Spaces | 1 |

### Innovation & Design Process — Possible Points 5

| Y | ? | N | | | |
|---|---|---|---|---|---|
| y | | | Credit 1.1 | **Innovation in Design**: Green Housekeeping/Operations program | 1 |
| y | | | Credit 1.2 | **Innovation in Design**: Exemplary Performance - 40% Water Use Reduction | 1 |
| y | | | Credit 1.3 | **Innovation in Design**: Construction Waste Mgmt 95% | 1 |
| y | | | Credit 1.4 | **Innovation in Design**: Exemplary Performance Recycled Content 30% | 1 |
| Y | | | Credit 2 | **LEED Accredited Professional: Perkins+Will** | 1 |

## 4.0 Site Analysis

| | | |
|---|---|---|
| 4.1 | Analysis of Potential Sites | 79 |
| 4.2 | Acquisition Process | 85 |
| 4.3 | Preferred Site Analysis | 85 |

## 4.1 Analysis of Potential Sites

**The Renovation Alternative**
Currently DIS operations are in Office Building 2 on the capitol campus and 9 other sites in Olympia, Tumwater and Lacey (for a total of 10 sites). The design team has toured the existing facilities and evaluated the feasibility of upgrading the current facilities to meet the immediate and long term needs of DIS. We have established criteria for comparing a new construction option with renovating the current Data Center facility in OB2 and remaining in the 9 smaller facilities in the local vicinity. The value of renovating existing facilities vs. developing a new building site is assessed according to these criteria and is summarized on the chart below (Renovation vs. New Build Criteria). Per this chart, a higher number yields a better score.

| **Renovation vs New Build** | Priority | **Renovate Exist.** | | **New Building** | |
|---|---|---|---|---|---|
| Criteria | Factor | Raw | Weighted | Raw | Weighted |
| Proximity to Major Customers | 3 | 10 | 30 | 8 | 24 |
| Development Costs | 3 | 0 | 0 | 0 | 0 |
| Utility Infrastructure Capacity | | | | | |
| Power Supply and Redundancy | 3 | 3 | 9 | 10 | 30 |
| Fiber | 3 | 10 | 30 | 10 | 30 |
| Security Issues | 2 | 3 | 6 | 10 | 20 |
| Sustainable Opportunities | 2 | 3 | 6 | 10 | 20 |
| Seismic Upgrades | 1 | 3 | 3 | 10 | 10 |
| Building Efficiency | 1 | 3 | 3 | 10 | 10 |
| 24/7 Emergency Access | 1 | 2 | 2 | 10 | 10 |
| Site Risks/Constructability | 1 | 2 | 2 | 10 | 10 |
| Expansion beyond Initial Project | 1 | 2 | 2 | 10 | 10 |
| **TOTAL SCORE** | | **41** | **61** | **98** | **120** |
| | | | | | |

**Analysis Criteria**

In order to evaluate the potential sites for a new facility, a series of weighted criteria were developed by Perkins+Will and DIS. Each potential site was then graded per these criteria through a series of site visits, site documentation review, and discussions with various agencies or utilities as required. No new site survey work or subsurface investigations were performed for this evaluation. The selection criteria used for this evaluation are defined below:

**Development Cost:** Relative development cost and risks that may be attributed to , but not limited to, utility relocation, new utilites or infrastructure required, environmental mitigation, or steep slopes on site. This is a high priority factor (3).
**Utility Infrastructure Capacity:** This criteria assesses the availability of reliable redundant power and fiber availability. This is a high priority factor (3).
**Proximity to Major Customers:** Proximity to major customers served by DIS, distance defined as from the Capitol Campus. This is a high priority factor (3).
**Security:** Sites may have risk or benefits due to the natural landscape or adjacent uses. This is a medium priority factor (2).
**Sustainable Opportunities - Site Reuse:** Sites that are already in use or developed are preferred over undisturbed sites. This is a medium priority factor (2).
**Sustainable Opportunities – Transportation:** Accessibility to public transportation and amenities will reduce automobile use. This is a medium priority factor (2).
**Zoning Constraints/Buildable Area:** Size, location and height restrictions may affect the flexibility of specific sites. This is a low priority factor (1).
**Impact on Existing Context:** Assess development on natural landscape features or incompatible adjacent uses. This is a low priority factor (1).
**24/7 Emergency Access:** Risk is associated with disasters that may render the sites unreachable or unserviceable. This is a low priority factor (1).
**Expansion Potential:** Site size and restrictions will affect the limit of future expansion. This is a low priority factor (1).

**Evaluation of New Facility Sites**

Initially, four sites were identified as possible locations for a new facility. However, one of them, Capitol Campus Master Plan Opportunity Site #8 (east of the DOT Building) was eliminated from this study due to the extremely restrictive site size. The three remaining sites evaluated were all of suitable size and configuration to accommodate the long term needs of the DIS as defined by this report. All of the potential sites are state owned properties and are identified in the *Master Plan for the Capitol of the State of Washington, June 2006* as opportunity sites listed below:

Opportunity Site #9: Wheeler (Capitol Visitors) Parking Lot
Lacey Satellite Campus, Site L1 - West of Ecology Building
Tumwater Satellite Campus, Site T2 - West of Goodrich Building

In the following pages, a map of the sites, the scoring of the sites, and a brief summary of each site, its physical characteristics and the salient criteria grading are provided.

Existing Locations
Proposed sites

Overall campus map showing existing and potential future sites.

| SITE SELECTION | Priority | Wheeler Site | | Lacey Site | | Tumwater Site | |
|---|---|---|---|---|---|---|---|
| CRITERIA | Factor | Raw | Weighted | Raw | Weighted | Raw | Weighted |
| Development Cost | 3 | 5 | 15 | 6 | 18 | 7 | 21 |
| Utility Infrastructure Capacity | | | | | | | |
| Power Supply and Redundancy | 3 | 10 | 30 | 6 | 18 | 6 | 18 |
| Fiber | 3 | 10 | 30 | 7 | 21 | 8 | 24 |
| Proximity to Major Customers | 3 | 10 | 30 | 4 | 12 | 3 | 9 |
| Security | 2 | 10 | 20 | 10 | 20 | 10 | 20 |
| Sustainable Opportunities | | | | | | | |
| Site Reuse | 2 | 10 | 20 | 0 | 0 | 10 | 20 |
| Public Transportation / Walking | 2 | 10 | 20 | 5 | 10 | 2 | 4 |
| Zoning Constraints / Buildable Area | 1 | 7 | 7 | 6 | 6 | 9 | 9 |
| Impact on Existing Context | 1 | 8 | 8 | 4 | 4 | 10 | 10 |
| 24/7 Emergency Access | 1 | 10 | 10 | 5 | 5 | 5 | 5 |
| Expansion Beyond Initial Project | 1 | 5 | 5 | 6 | 6 | 6 | 6 |
| | | | | | | | |
| | | | | | | | |
| **TOTAL SCORE** | | **85** | **195** | **59** | **120** | **76** | **146** |

**Opportunity Site #9: Wheeler (Capitol Visitors) Parking Lot**

Adjacent to the Campus at the intersection of 14th Ave SE and Jefferson Street, this site is conveniently located near other campus facilities. As the largest of the capitol campus opportunity sites, it is the only capitol campus location identified in the 2006 Master Plan that will accommodate the DIS requirements. The Master Plan has identified this site as a prime location for state office facilities and/or parking. Currently the site functions as a parking lot for park and ride bus service and visitors to the capitol. There is currently a small daycare facility on site as well as 5 small existing residential structures that have been converted to state office functions. Development of the site will need to consider impacts to the adjacent neighborhood.

**Lacey Satellite Campus, Site L1 - West of Ecology Building**

This development site, located in Lacey, is part of the 67 acre campus that includes the Department of Ecology facility. The property is approximately 4.9 miles from the capitol campus. It is a mostly wooded, fairly flat site that has never been developed. The property is adjacent to the St. Martin's University property and is required to follow the *Design Guidelines for St. Martin's Park, January 1, 1991* as well as deed 'Covenants, Conditions, and Restrictions'. The guidelines identify height and design constraints which reinforce a desire to maintain the natural qualities of the site. The development is required to allow a street connection from Desmond Drive adjacent to the site westward to connect to 3rd Ave. This new street connection would form the southerly boundary of the site and will likely affect the development costs of this property. There appear to be two small wetlands in the woods that will require the project to either avoid them, severely limiting the development area, or require mitigation on another portion of the state property.

While the site is larger than the Wheeler site, the sizeable "footprint" area of the DIS program is too great to fit in with the design guidelines for the site. The previous planning for an office building on this site was for a significantly smaller footprint. The DIS program is expected to eliminate most of the forested area of this site creating a significant ecological change that will need to be effectively mitigated.

**Tumwater Satellite Campus, Site T2 - West of Goodrich Building**

The site identified in Tumwater an approximately 8-10 acres of mostly level development area. It is adjacent to the recently constructed Goodrich Building, which currently houses the Department of Corrections and part of the Department of Transportation. The site is bounded on the South by Tumwater Blvd. and on the north by the Labor and Industries Facility. To the east of the identified site is the Goodrich Building and Linderson Way beyond. The west portion of the site is an undisturbed wooded buffer to the adjacent I-5 access ramp. The un-wooded portions of the site are entirely occupied by a surface parking lot that serves the Goodrich Building.

There are several factors that affect the location of DIS on this site. An evaluation of this site in the *Headquarters and Data Center Pre-design Study, Dec 12, 1991* identified risks from the adjacent fuel storage tank farm that is located just across Linderson Way. There is also a 6" Olympic Pipeline Company gas pipeline in Center Street just west of the property. These adjacent uses pose a security risk that must be considered in the selection of this site.

The site has an extremely high water table that will require mitigation. Currently the site parking structures are designed and built with runoff retention below them: a similar solution will need to be built into the strategy for this site.

All existing parking that is displaced with the development of new buildings will need to be replaced on the site. It is assumed that the DIS parking needs of about 400 cars and the displaced parking (approximately 80% of total spaces currently on site) will need to be housed in a new above ground parking structure. This is a site development constraint that will affect the cost of the project.

### 4.2 Acquisition Process

The preferred site, the Wheeler Avenue site, is on the east capitol campus and is currently state owned and therefore aquisition is not required.

### 4.3 Preferred Site Analysis

The Opportunity Site #9: Wheeler (Capitol Visitors) Parking Lot is the preferred location for the development and consolidation of the DIS programs. This study has investigated the feasibility and cost of development of this site in detail. The advantages of the preferred site include:

Proximity to primary clients on the capitol campus
Good access to the transportation corridor for access to distant clients
Meeting the Capitol Campus Master Plan goals for the site
Excellent utility services and redundancy
Nearby public transportation access
Optimum site security potential
Site development costs are comparable to other locations
Buildable area which accommodates the program

Existing parking lot

Existing structures on site

Existing electrical substation

**Site Location and Condition**

The site identified as the preferred site option is bounded by 14th Ave. SE on the North, Jefferson Street SE on the West and 16th Ave. SE on the South. The east edge of the site is a embankment that is bordered by the railway. Southeast of the site there is a existing electrical substation that is not included in the site area. Refer to the Appendix for the Substation Memo regarding this substation, its condition, planned upgrades and the subsequent effects on the Data Center facility. The current uses include a large open parking lot that is used for visitor parking for the Capitol and for local bus service. The 144 parking spaces will need to be accommodated within this project or be relocated off-site. There are 5 small structures on the site, none of which have any significant historic value. The JLARC building at the southwest corner of the site is a 2 story brick building that is recommended to be replaced elsewhere on campus. There is a small single story daycare center on the northwest corner of the site which may need to be relocated, pending final location of new facilities. The remaining 3 buildings are single story domestic structures converted to state office use, they are recommended for demolition. It is assumed that parking associated with the existing uses on the site will be relocated.

**Relationships to Capitol Campus**

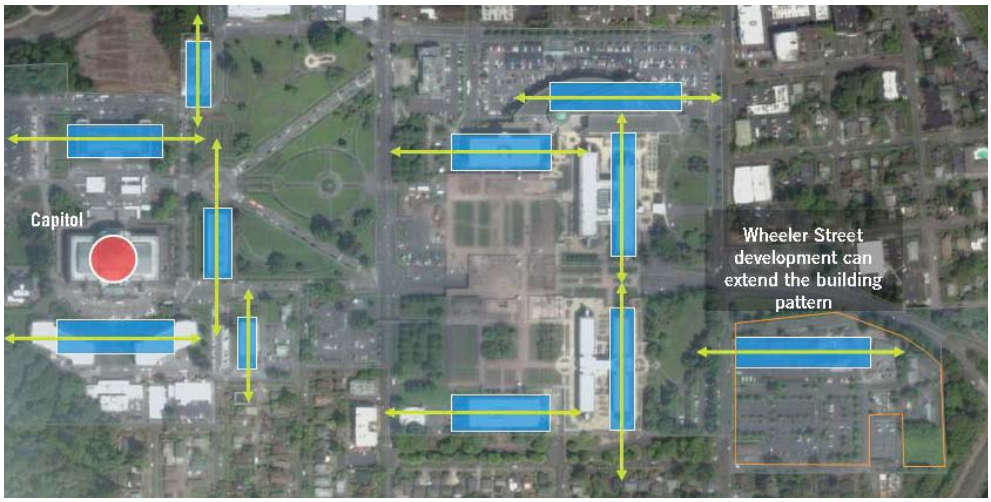
The site has a unique relation to the overall Capitol Campus. The most prominent entrance or gateway to the Capitol is the approach from I-5 to the capitol along 14th Ave, adjacent to the site. The development of this property with significant buildings has an opportunity to enhance and frame this gateway and the experience of entering Olympia in a beneficial way. Careful siting of buildings that enhance this sense of arrival while maintaining the presence of a mature landscaped setting will be key to the success of this site development.

Campus Major Open Spaces

The Capitol Campus is defined significantly by the major green spaces and the landscape setting. The expansive greens are enhanced by smaller more intimate defined spaces such as the gathering space that is formed around the Sundial, or the Sunken Garden. This pattern is accentuated by significant monuments and

Small Open Spaces and Monuments

art that give focus and meaning. To integrate the Wheeler site development into campus these patterns will ideally be continued through the utilization of intimate open spaces and integration of art and significant landscape features.




Campus Building Patterns

Building patterns on the Capitol Campus have been developed over time and provide a unique campus quality and connection to the landscaped setting. These patterns, as diagrammed, describe a set of perpendicular relationships between adjacent building components. This pattern, when applied consistently, allows buildings to form and enjoy open spaces, light and views. On The Wheeler site efforts should be made to extend this pattern to the major building components.

**Pedestrian Connections**

There are currently very few pedestrian connections eastward between the East campus and the Wheeler site. At the south edge 16th Ave and Maple Park are the primary connections. 14th Ave. has no pedestrian accommodation due to the grade

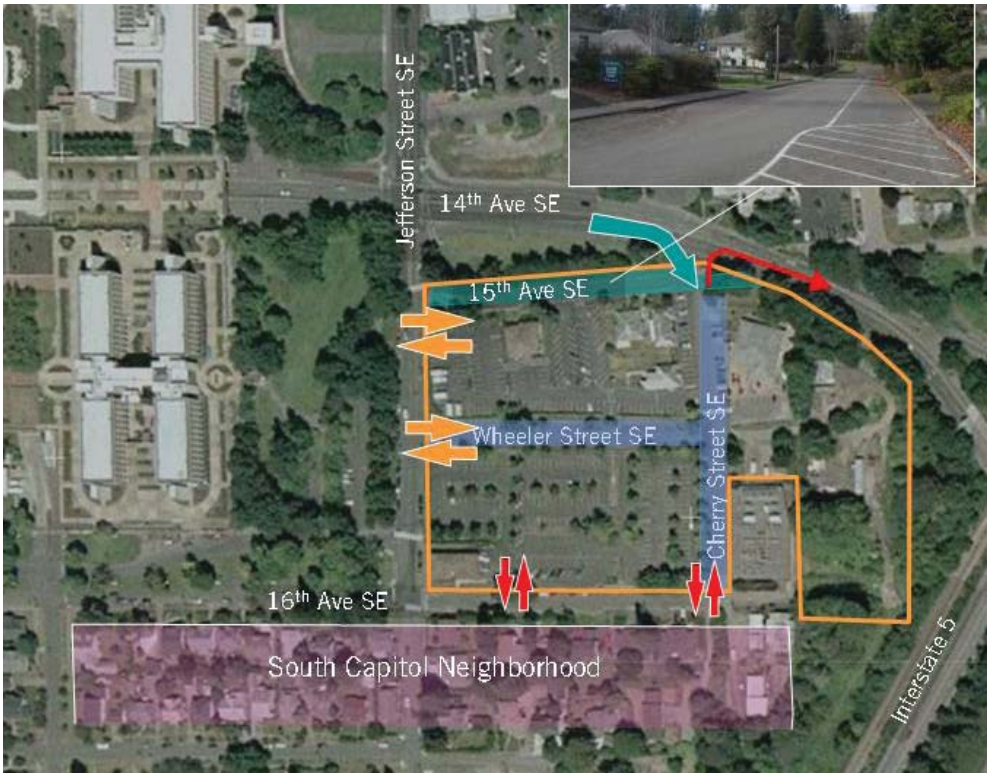
Connection to Plaza Level at OB2

Pedestrian Connections

separation of the roadway. At the middle of OB2 and the DOT Building there are exterior connections to the upper level of the East plaza. Unfortunately these are underdeveloped and at the OB2 location do not include provisions for accessibility. Pedestrian connections from the Wheeler site to campus should be enhanced to improve the integration of this new campus developed area.

**Existing Streets**

Three streets are currently located within the site boundary: 15th Ave. NE, Cherry Street and Wheeler Street. Each existing street is not continued into adjacent blocks and can be considered for elimination or reconfiguration. 15th Street is currently a one way street running west primarily serving both the bus loop that runs through the site and autos using the parking lots. Due to its restricted turns on to 14th Ave. it is probable that 15th will serve only a minor function in the site redevelopment. If 15th Ave. is eliminated the small triangular green strip just to the




Jefferson Street: preferred access street

16TH Ave. SE: Available for access but should be minimized to reduce impact on neighborhood

14th Ave SE: For a Eastbound right turn only into the site

Existing Cherry Street is right turn only onto 14th

Existing 15th one way west

Streets and Access

north (not included in the site) could be enhanced as a valuable landscape buffer and a pedestrian friendly open space extended to the north face of new building development. The north portion of Cherry is available for reconfiguration to meet the needs of the new program on the site. Based on a review of the campus utility drawings it is assumed that access to the electrical substation and underground feeds will need to be maintained in a easement in the south portion of Cherry Street. Wheeler street is primarily a local access for the parking lot and bus stops, and should be removed or reconfigured as needed to serve the site.

**Access and Parking**
The site is bounded by streets on three sides. Jefferson Street SE is the primary roadway connecting this site to the rest of Olympia and I-5. It is the best choice for access into the site, especially for high volume use such as parking facilities and bus-stops. It benefits from the traffic management at the signalized intersection at 14th Ave. Due to the adjacent residential neighborhood 16th Avenue NE is undesirable as a major site access point. 14th Ave SE is a high traffic feeder to I-5 and has only restricted turning movements allowed to and from it. Access to Wheeler Street site from 14th will likely be limited to an eastbound right turn only, suitable for service access (entrance only).

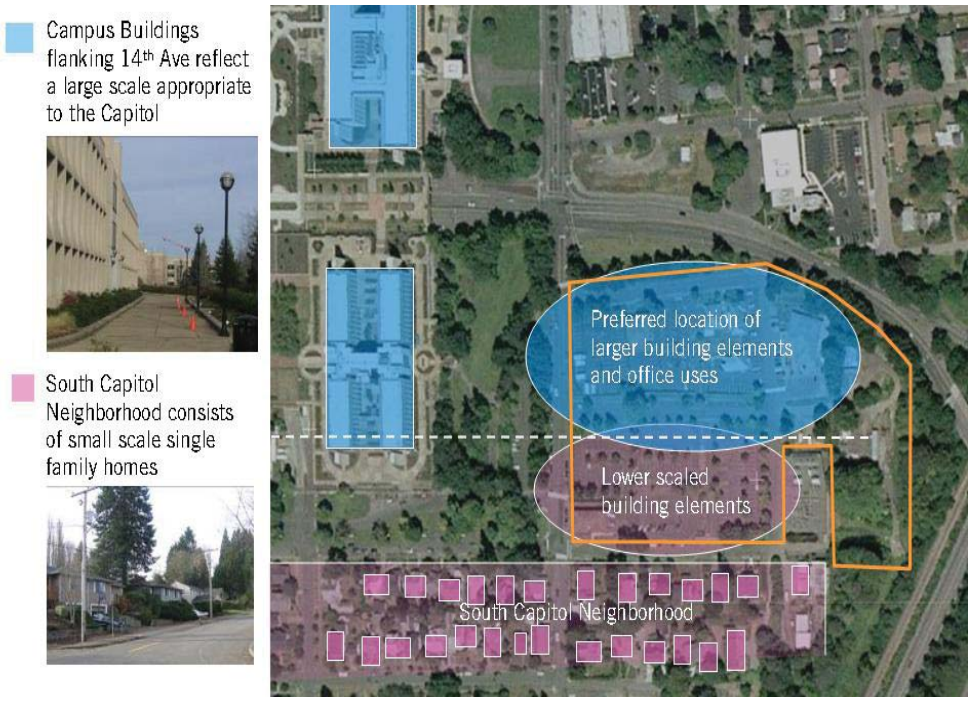
**Green Space and Natural Amenities**

The existing vegetation within the site includes rows of ornamental deciduous trees, native and non-native groundcovers and low shrubs throughout the existing surface parking area. The tree canopy on the east end of the site, around the power station, is dominated by early-successional deciduous trees on an inaccessible steep slope towards Interstate 5. Adjacent to the north side of 15th Avenue SE sits a triangular piece of land covered with turf. The turf is bordered to the south by a row of mature evergreen trees which provide enclosure to the end of the site. An evergreen tree, deciduous tree and groundcover palette dominate the west side of the site along Jefferson Street SE. The understory in this area is a mix of native and non-native evergreen shrubs. This block, together with another heavily vegetated block to the north, create continuous tree canopy and accentuate a sense of gateway into the main capitol campus. Linear Maple Park, which sits on the southwest end of the site between Maple Park Avenue SE and 16th Avenue SE, is dominated by mature maple trees. There is a great potential to pull this arrangement of dominant trees into the site.

**Relationship to Neighborhood / Site Setbacks and Buffers**

The existence of the South Capitol Neighborhood adjacent to the site to the south suggests that the the project should respect this smaller scale and place the smaller, lower scale components in this area and put the larger scale elements on the north or east portions of the site.

The City of Olympia requirements for site setbacks and yards for residential neighborhoods do not apply to Capitol Campus properties, however, responsible site development should provide a generous allowance for its landscaped setting, being consistent with the goals of the Campus Master Plan. On this site green buffers and setbacks should be considered to allow generous planting along the street edges. Respect for existing green buffers along 14th Ave. and at the east end of the site should be maintained. As mentioned above, southwest of the site is a developed green called Maple Park: the extension of this green buffer along the south edge of the site is encouraged as a visual amenity for the adjacent residences and as a transition buffer for campus.




Surrounding Building Heights

**Site Topography**

Generally, the site slopes down from the southwest corner to the east and northeast and has a change in elevation from 116' at the highest point to 70' at the lowest. Of the 8 total site acres, 0.2 acres have slopes of 20% or greater. These areas are concentrated on the eastern portion of the site which contains a steep hillside sloping down east towards Interstate 5. These step-slopes (10 to 40%) begin east of the existing child care center and power station, which sit on a flat zone. The western edge of the site, along Jefferson Street SE (from southwest corner to northwest corner), has an average slope of 6.4%, and the southern edge along 16th Ave. SE (from southwest corner to southeast corner) has an average slope of 4%.

Approximate Site Contours

**Site Climate**

The climate in the city of Olympia is fairly typical of the Pacific Northwest region, with temperatures ranging from 31 degrees Fahrenheit as an average low to 77 degrees as an average high. Annual average precipitation is 51 inches each year. Monthly precipitation ranges from 1.0 inch as an average low to 8.2 inches as an average high. The average annual snow fall is 3 inches. The prevailing winds are south/southwest in the summer and south in the winter. The average annual number of cloudy days is 230. The average number of rainy days is 147.

**Site Soils**

Refer to the Geotechnical Report included in the appendix of this report.

**Regulatory Requirements**

The site is located on the Capitol Campus and is under jurisdiction of the City of Olympia. The project will require a State Environmental Policy Act (SEPA) Checklist. Other regulatory requirements have been addressed in other places of this report.

**Construction Impact on Surroundings**

The largest impact to the surrounding area will be to the neighborhood directly to the south of the site. Meetings with the neighborhood will be scheduled and any impacts will be addressed through the Land Use Permitting process. Typical mitigation methods during construction include noise control and dust control. A construction traffic / logistics plan will be implemented.

All the buildings currently on the site are scheduled to be demolished to allow the proposed building to be built with the exception of the day care center located on the northeast corner. DIS is planning on contacting the day care center to explore options to either relocate their facility or find ways to integrate them into the proposed facility.

**History of Contamination on Site**

At this point, no history of contamination on site is known. An environmental analysis should be performed to identify potential risks.

**Wetlands Impact**

There are no known wetlands on this site.

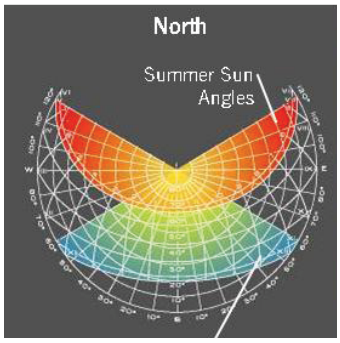
**Archaeological Analysis**

There are five structures on the Wheeler Avenue site (preferred site) that will need to be removed to accommodate the project. Four structures have been cleared for removal by the Department of Archaeology & Historic Preservation (DAHP). Refer to the appendix for the DAHP report. The fifth structure, 506 16th Avenue SE, Olympia, requires further investigation prior to a determination being made by DAHP. GA has contracted with a firm to conduct the necessary investigation to provide the information DAHP requires.

**LEED & Sustainability**

Reducing polluted storm-water from flowing into the Puget Sound is a key recommendation from the Puget Sound Partnership, which was founded by Governor Chris Gregoire. All water subject to roadway pollution will be treated on site through a variety of measures such as bioswales and treatment vaults.

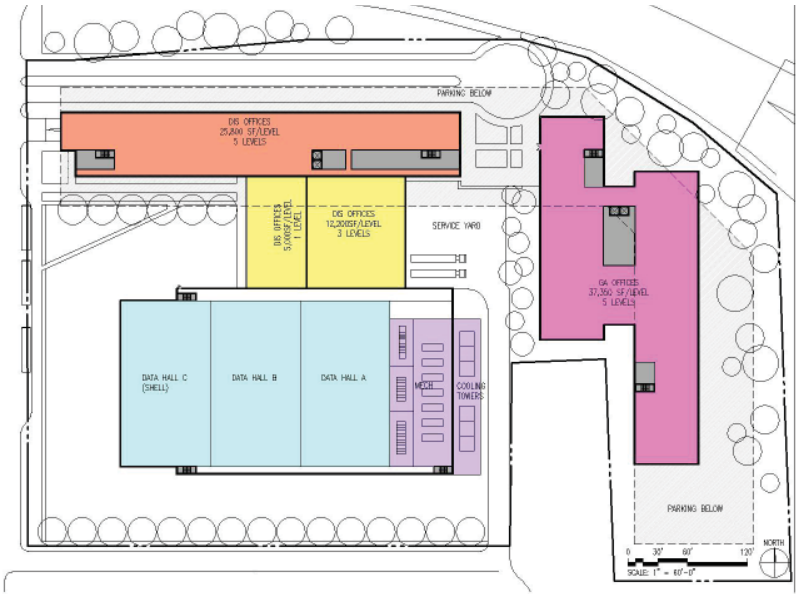
Additionally, a goal will be to reduce the non-polluted stormwater run-off by storing it in a “rainwater cistern”. This water can be reused for irrigation and used in the building for non-potable uses such as flushing of toilets. The use of “green” or “vegetated” roofs will be incorporated as much as possible to also reduce stormwater run-off. Another method to reduce run-off is to allow the water to infiltrate back into the soil. However, a preliminary soils report has indicated that the soils will not support much infiltration.




Solar orientation and orientation to prevailing winds also impact the layout of the buildings on a site. Orienting the office building with the major facades facing North/South maximizes the excellent daylight that occurs on the north side and allows full sun-shading on the South side with simple horizontal projections. In addition, utilizing natural ventilation when appropriate can help reduce energy loads on the building. Since the prevailing winds are from the south and south west, orienting the building in the north south axis will also aid the ability for wind to move through the building.

**Accommodation of Future Buildings on Site**

Included as part of this study, Perkins+Will, DIS, and the GA explored the possibility to locate an additional 175,000 square foot office building on the site. It was determined that this office building could be accommodated on site with the design of the preferred alternative presented in this report. This additional building would be 5 stories tall and would be placed on the eastern half of the site with a "daylight" basement parking garage below it. The garage could be connected to the underground parking garage of the preferred alternative. This conceptual scheme is shown below. It was not the scope of this predesign report to develop this scheme further or to provide a cost estimate for it. Further study of this expansion option is recommended.




## 4.4 Site Utilities Narrative

**Drainage**

The existing site runoff can be characterized as sheet flow generally from south to north with the highest point on the site being the southwest corner, and the lowest point being the northwest corner. There is a total relief of approximately 19 feet south to north at the west property line, and approximately 9 feet west to east at the south property line. There is a total relief of approximately 4 feet south to north at the east property line, and approximately 6 feet east to west along the north property line. The majority of the site drainage is collected in catch basins throughout the site. These catch basins then discharge to the City of Olympia storm drain mains in both Wheeler Avenue SE and 15th Avenue SE. Both of these mains ultimately discharge to the existing 18 inch main in Jefferson Street SE.
The proposed drainage system will collect new roof drains, foundation drains, and runoff from the new buildings and regraded and/or disturbed areas in new catch basins, area drains and pipes, and convey stormwater to the existing storm drain system In Jefferson Street SE.

The campus falls within the jurisdiction of the City of Olympia for code enforcement. Stormwater treatment and disposal for the site will be in accordance with the minimum requirements of the City of Olympia Stormwater Manual dated January 2005. Development sites are to demonstrate compliance with these requirements through the preparation of Stormwater Site Plans (SSP). Two major components of these plans are a Construction Stormwater Pollution Prevention Plan (SWPPP) and a Permanent Stormwater Control Plan (PSCP). The Construction SWPPP shall identify how the project intends to control pollution generated during the construction phase only, primarily erosion and sediment. The PSCP shall identify how the project intends to provide permanent BMPs for the control of pollution from stormwater runoff after construction has been completed. Sites must submit these plans for review by the City if they add or replace 2,000 square feet or more of impervious surface, or disturb 7,000 square feet or more of land.
Water quality treatment is required for all pollutant generating impervious surfaces (PGIS) including driveways, parking areas and the service dock area. As runoff from the site ultimately discharges to Indian / Moxlie Creeks, a riparian corridor, enhanced treatment is required. Enhanced treatment requires a two-step treatment drain, which in most cases for sites such as this would consist of a wet vault/pond for basic treatment and a compost filter system for enhanced treatment.

In a phone conversation with Mr. Craig Tosomeen, Stormwater Drainage Manual Advisor for the City of Olympia Public Works Department, the proposed site is located in an area of the City that allows for an exception to the criteria of Minimum Requirement #7, Flow Control. Using the Western Washington Hydrology Model, predevelopment is to be modeled as Forest unless, "The drainage area of the immediate stream and all subsequent downstream basins has had at least 40 percent total impervious area for the last 20 years. In this case, the predeveloped condition to be matched shall be the existing land cover condition." Mr. Tosomeen stated that the city would not take exception to the Owner petitioning that the basin downstream of the site has been developed for the last 20 years as the downstream basin is the downtown core which has been developed for well over 20 years.

By this interpretation, the pre-developed site conditions can be modeled as the current conditions and stormwater can be released to the existing City storm drain conveyance system without flow control as long as flow rates are shown to not deteriorate the drainage network (e.g. scouring of a natural channel). The site currently is mostly a parking lot with approximately 90 percent impervious surfaces while the proposed site is approximately 65 percent impervious. Therefore detention is not required for the proposed site.

As the stormwater outfall(s) for this project does not change the natural flow or bed of any fresh water of the state, it appears that a Hydraulic Project Approval (HPA) from the Washington State Department of Fish and Wildlife (WDFW) will not be required.

During construction, as the project will disturb five acres or more, the Owner must apply for the Department of Ecology's construction stormwater permit known as the National Pollutant Discharge Elimination System (NPDES) permit.

**Water Distribution**

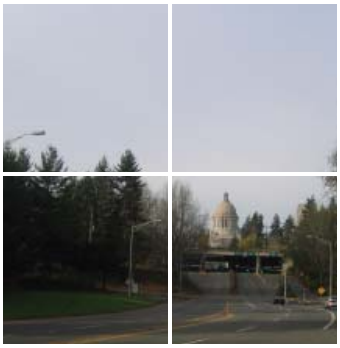
A new domestic water and fire service distribution system will be provided to the new building. Services will be extended from the nearest adjacent water main and piped to the buildings following the shortest possible alignment. Generally, new service lines are expected to be fifty (50) feet or less in length.

The City of Olympia is the water purveyor for the project. The nearest water line is an existing 10-inch main in Jefferson Street SE. It is not known whether the new building will exceed the existing domestic water supply or fire flow capacity of this existing water main; therefore, flow testing of the system is recommended. A double detector check valve assembly (DDCVA) will be located either inside the building or outside in an underground vault. A fire department connection (FDC) and post indicator valve (PIV) outside the building will also be required. It is proposed to use a wall mounted FDC at the face of the new building. It appears that at least one new fire hydrant will be required for the project. An irrigation connection and meter will also be installed.

The existing water main running east-west through the site in Wheeler Avenue SE will have to be removed as it conflicts with the proposed building footprint.

**Sanitary Sewer System**

A sanitary sewer service will be provided to the building. The service will extend to the nearest adjacent sewer main to the building following the shortest possible



# 5.0 Project Budget Analysis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### 5.1 Assumptions

The pricing for the construction cost is based on the following general conditions of construction:

A start date of January 2009
A construction period of 22 months
The general contract will be Design/Bid/Build
There will not be small business set aside requirements
The contractor will be required to pay prevailing wages
The general contractor will have full access to the site during normal business hours
There are no phasing requirements

The assumptions for the budget analysis include the following:
LEED Silver Rating

### 5.2 Construction Cost Summary

The detailed construction cost estimate can be found in the appendix. The preferred alternate described in this report has a total construction cost summarized by the following:

| | Area (gsf) | Cost/sf | Cost |
|---|---|---|---|
| **Office Building** | 119,317 | 306.63 | 36,587,000 |
| **Data Center** | 177,904 | 481.93 | 85,738,000 |
| **Parking Garage** | 159,533 | 112.88 | 18,007,000 |
| **Site** | | | 10,284,000 |
| **Total** | | | **150,615,00** |

## 5.3 Form C4 Predesign Capital Project Request Report Summary

**PREDESIGN CAPITAL PROJECT REQUEST REPORT SUMMARY** (Rev. 6/01)

| AGENCY NAME | | | | | AGENCY CODE |
|---|---|---|---|---|---|
| Department of Information Services | | | | | 155 |
| PROJECT TITLE | | | | TYPE | PROJECT NUMBER |
| DIS Data Center and Office Building | | | | 3 | |
| PLAN PRIORITY | OFM PRIORITY | PREVIOUSLY | COUNTY | CITY | LEGISLATIVE DIST. |
| 001 | 1 | Yes | Thurston | Olympia | 22 |

| WAS PROJECT INCLUDED IN PRIOR 10 YEARS? S?PLAN? (9) | Yes | IF YES, WHEN? | 1994 | PREV. PROJECT # | 1994-3-001 |
|---|---|---|---|---|---|

PROJECT DESCRIPTION
a. Problem/Justification/Why is this project needed?

**Project Mgmt by GA?** Yes

DIS is faced with two major business problems that the new facility will mitigate. The data center in Office Building 2 (OB2) is a major risk factor for DIS and the state. Second, the dispersed location of DIS office facilities, ten facilities in Thurston County, results in inefficiencies and productivity problems.
The data center houses the computing services that process millions of business transactions each day for citizens and state agencies in the areas of social services, employment, corrections, licensing, business regulation, finance and retirement systems, health care, and natural resources.
The existing data center was first constructed in 1975. The useful life for a data center facility, according to the Gartner Group is approximately ten years. The current data center is 31 years old and suffers from age related problems. The data center was designed for a main frame computer environment that is being superseded by a rack and server environment. Current electrical and cooling systems are difficult, and costly to adapt to this new environment. The 1975 facility layout does not accommodate the new hosted and ala carte (designed for agency staff access to manage their server farms) services needed by our clients. The age related limitations of this facility complicate coordination (load balancing) with a business continuity facility in Eastern Washington.
DIS currently has 440 FTE staff housed in ten separate buildings in Olympia, West Olympia, Lacey, and Tumwater. DIS leases a total of 215,000 square feet all from private land lords except 80,000 square feet for the current data center in OB2. Not only is the agency spread in ten locations, agency divisions are in as many as four locations.

b. Proposed Solution/Benefit to public service, strategic goals?

**Complies w/GMA?** Yes

The project is the construction of a new state owned data center and office building. The facility is proposed to be approximately 282,000 gross square feet overall with the data center portion about 166,000 square feet. The building is to be constructed on the East capitol campus on a site identified by the 2006 Capitol Campus Master Plan as a future development opportunity (Site 9 -- Wheeler Avenue Parking Lot). The building will be constructed in such a fashion to blend with existing structures on the campus and with materials and systems to provide an expected life of 50 to 100 years. The facility will be constructed to blend with and enhance the existing neighborhood.

c. Predesign Issues

Four major issues have been identified that need further analysis after the predesign is complete and during project design; (1) planning for an additional building on Wheeler site, (2) parking and traffic flow, (3) data center power cogeneration, and (4) project LEED rating and LEED strategies.

RELATED COSTS Operating budget costs/savings required for this project including staff and cost of maintenance: 0.0 FTE; / $ per fiscal year 1,594,550

PROJECT STATISTICS

| PROJECT LIFE | Net Project Size (sq. ft.) | | | Gross Project Size (sq. ft.) | | | | Cost Per Gross Square Foot | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 50+ | New | 233,000 | Remodel | | New | 282,000 | Remode | | New | Remodel |

| Building Type: | | PROJECT SCHEDULE (20) | | ADJUSTED CAPITAL COST | |
|---|---|---|---|---|---|
| Project Phases | BASE COST 2007 | START | COMPLETE | % | COST |
| ACQUISITION COSTS | 0 | | | | |
| DESIGN CONSULTANT SERVICES | 9,502,490 | 06/2007 | 12/2008 | 5.2 | 10,180,000 |
| CONSTRUCTION CONTRACT COSTS: | | | | | |
| MACC | | | | | |
| 10 % Contingency | | | | | |
| 8.4 % TAX | | | | | |
| CONSTRUCTION SUBTOTAL | 163,540,045 | 01/2008 | 11/2010 | 10. | 179,649,000 |
| EQUIPMENT (include tax) | 2,926,800 | | | 10. | 3,221,000 |
| ARTWORK | 437,680 | | | | 438,000 |
| OTHER COSTS | | | | | |
| CONTRACT ADMINISTRATION | 3,495,000 | | | | 3,495,000 |
| | | | | | |
| TOTAL COST | **179,902,015** | | | **9.5** | **196,983,000** |

| | |
|---|---|
| ANALYSIS DATE: | 04-10-2007 |
| PREPARED BY: | Jim Martin |
| PHONE NUMBER: | 360.902.3485 |

ABBREVIATIONS
Assignable Sq Feet (ASF)
Full-Time Equivalent Student (FTE)
Weekly Student Hours (WSH) = student hours per week in room
Room Utilization Rate (RUR) = hours per week room is scheduled for use
Number of Stations (N) = desks or lab stations
Station Occupancy Ratio (SOR) = percent of stations used during scheduled use

| A. ROOM TYPES | ASF | N | FTE | WSH | RUR | SOR |
|---|---|---|---|---|---|---|
| Classroom | | | | | | |
| Dry Lab | | | | | | |
| Wet Lab | | | | | | |
| Computer Lab | | | | | | |
| Faculty Office | | n\a | n\a | n\a | | n\a |
| Student Assembly | | n\a | n\a | n\a | | n\a |
| Non-Assignable Rooms | | n\a | n\a | n\a | n\a | n\a |

| B. OPERATING AND MAINTENANCE COSTS | $/YEAR |
|---|---|
| Utilities | 567,850 |
| Custodial | 361,250 |
| Maintenance | 426,400 |
| Security | |
| Landscaping and Ground Maintenance | |
| Liability and Hazard Insurance | 51,750 |
| Tenant Improvements | |
| Capital Maintenance | 106,800 |
| Management Fees | 80,500 |
| Total O&M Cost | 1,594,550 |

OPERATING IMPACT

| | Est. Total | 2007-09 | 2009-11 | 2011-13 | 2013-15 | 2015-17 | 2017-19 |
|---|---|---|---|---|---|---|---|
| Annual Average FTEs (#) | | | | | | | |
| General Fund-State | $ | | | | | | |
| Total Funds | $ | | | | | | |

PROJECT FUNDING

| FUND CODE(S) | ESTIMATED TOTAL COST | TOTAL EXPENDITURES | | 2007-09 FISCAL PERIOD | |
|---|---|---|---|---|---|
| | | Prior Biennium | Current Biennium | Reappropriation | New Appropriation |
| COP-1 | Alternate Financing – No Appropriation | $ | $ | $ | $ |
| | | FUTURE FISCAL PERIODS | | | |
| | | 20009-11 | 2011-13 | 2013-15 | 2015-17 |
| | | $ | $ | $ | $ |

## 5.4 Form C100 Agency/Institution Project Cost Estimate

| STATE OF WASHINGTON<br>AGENCY/INSTITUTION PROJECT COST SUMMARY | | |
|---|---|---|
| **Agency** | Department of Information Services | |
| **Project Name** | Data Center and Office Building | |
| **Project Number** | 2008-030-001 | |

| Contact Information | |
|---|---|
| Analysis Date | 4/9/2007 |
| Analysis By | TSG |
| Contact Phone Number | 3609023485 |

| Statistics | Primary | Secondary | Total |
|---|---|---|---|
| Gross Square Feet | 174,815 | 115,155 | 289,970 |
| Net Square Feet | 156,176 | 95,962 | 252,138 |
| Efficiency | 89% | 83% | 87% |
| Escalated MACC Cost per Sq.Ft. | 549 | 474 | 519 |
| Building Type | Other Schedule A Projects | Office Buildings | |
| Is project a remodel? | No | No | |
| A/E Fee Class | A | B | |
| A/E Fee Percentage | 6.00% | 5.80% | |

| Schedule | Start Date | End Date |
|---|---|---|
| Predesign (mm-yyyy) | Dec-2006 | Apr-2007 |
| Design (mm-yyyy) | Jun-2007 | Dec-2008 |
| Construction (mm-yyyy) | Jan-2009 | Nov-2010 |
| Construction Duration (months) | 22 | |

| Cost Summary | |
|---|---|
| **Project Phase** | **Escalated Cost** |
| **Project Total** | $196,975,000 |
| **Consultant Services** | $10,182,000 |
| Pre-Schematic Design Services | $0 |
| A/E Basic Design Services | $5,855,000 |
| A/E Extra Services/Reimbursables | $195,000 |
| Other Services | $3,632,000 |
| Design Services Contingency | $500,000 |
| **Construction** | $179,649,000 |
| MACC - Primary | $96,022,000 |
| MACC - Secondary | $54,594,000 |
| GC/CM Risk Contingency | $0 |
| GC/CM or Design Build | $0 |
| Contingencies | $15,090,000 |
| Sales Tax | $13,943,000 |
| **Other** | $7,144,000 |
| Acquisition | $0 |
| Equipment | $2,969,000 |
| Equipment Tax | $249,000 |
| Artwork | $431,000 |
| Agency Project Administration | $3,495,000 |
| Other | $0 |

| Other Details | |
|---|---|
| Number of C100s Included in Summary | 1 |
| Alternative Public Works Project | No |
| State Construction Inflation Rate | 3.00% |
| Base Month | Mar-2006 |
| Project Administration by | Agency and GA |
| Project Admin Impact to GA that is NOT included in Project Total | $5,378,640 |

C100 PredesignRev.xls (Project Summary) Date Printed: 4/18/2007 PAGE 1 OF 1

STATE OF WASHINGTON

## AGENCY/INSTITUTION PROJECT COST ESTIMATE

FORM
**C-100**
Version 2.6.1
July 1, 2005

| | | | |
|---|---|---|---|
| **AGENCY:** | Department of Information Services | **Analysis Date:** | 4/9/2007 |
| **PROJECT NAME:** | Data Center and Office Building | **Analysis By:** | TSG |
| **PROJECT NUMBER:** | 2008-030-001 | **Contact Phone #:** | 3609023485 |
| **LOCATION:** | Olympia Campus | | |

| STATISTICS: | Primary | Secondary |
|---|---|---|
| Gross Square Feet | 174,815 | 115,155 |
| Net Square Feet | 156,176 | 95,962 |
| Efficiency | 89% | 83% |
| Estimated Cost per S.F. | 549 | 474 |
| Building Type: | Other Schedule A Projects | Office Buildings |
| Is project a remodel? | No | No |
| A/E Fee Class | A | B |
| A/E Fee Percentage: | 6.00% | 5.80% |

| | |
|---|---|
| Contingency Rate: | 5.00% |
| Management Reserve: | 5.00% |
| Tax Rate: | 8.40% |
| Art Requirement Applies: | Yes |
| Project Admin by GA: | Yes |
| Higher Ed. Institution: | No |
| Alternative Public Works Project: | No |

| Project Schedule | Start Date | End Date |
|---|---|---|
| 1. Predesign (mm-yyyy): | Dec-2006 | Apr-2007 |
| 2. Design (mm-yyyy): | Jun-2007 | Dec-2008 |
| 3. Construction (mm-yyyy): | Jan-2009 | Nov-2010 |
| 5. Construction Duration (in Months): | 22 | |
| State Construction Inflation Rate: | 3.00% | |
| Base Month: | Mar-2006 | |

| Project Cost Summary | |
|---|---|
| Primary MACC (escalated): | $96,022,000 |
| Secondary MACC (escalated): | $54,594,000 |
| Current Project Total: | $177,110,667 |
| Escalated Project Total: | $196,975,000 |

| | |
|---|---|
| Includes Formula Overrides: | No |

| | ITEM | | BASE MONTH AMOUNT | FORMULA OVERRIDE | STANDARD FORMULA | ESCALATION FACTOR | ESCALATED COST |
|---|---|---|---|---|---|---|---|
| **A.** | **ACQUISITION COSTS** | | | | | | |
| 1 | Purchase/Lease Cost | | | | | | |
| 2 | Appraisal and Closing Costs | | | | | | |
| 3 | Right-of-Way Costs | | | | | | |
| 4 | Offsite Mitigation | | | | | | |
| 5 | | | | | | | |
| INSERT | <--Double-Click Here to Insert a Row | | | | | | |
| **Total: Acquisition Costs** | | | **$0** | | | 1.0000 | **$0** |
| **B.** | **CONSULTANT SERVICES** | | | | | | |
| **1** | **Pre-Schematic Design Services** | | | | | | |
| a. | Programming/Site Analysis | | | | | | |
| b. | Environmental Analysis | | | | | | |
| c. | Predesign Study | | | | | | |
| d. | | | | | | | |
| INSERT | <--Double-Click Here to Insert a Row | | | | | | |
| | **SubTotal: Pre-Schematic Design Services** | | **$0** | | | 1.0382 | **$0** |
| **2** | **Construction Documents** | | | | | | |
| a. | A/E Basic Design Services - Up to Bidding (69%) | | $3,562,841 | | $3,562,841 | | |
| b. | A/E Basic Design Services - Secondary (69%) | | $1,952,774 | | $1,952,774 | | |
| | **SubTotal: Construction Documents** | | **$5,515,615** | | | 1.0616 | **$5,855,000** |
| **3** | **Extra Services** | | | | | | |
| a. | Civil Design (Above Basic Services) | | | | | | |
| b. | Geotechnical Investigation | | $20,000 | | | | |
| c. | Commissioning | | | | | | |
| d. | Site Survey | | | | | | |
| e. | Testing | | | | | | |
| f. | Energy Conservation Report | | | | | | |
| g. | Voice/Data Consultant | | | | | | |
| h. | VE Participation & Implementation | | $30,000 | | | | |
| i. | Constructability Review Participation | | $94,000 | | | | |
| j. | Environmental Mitigation Services (EIS) | | | | | | |
| k. | Landscape Consultant | | | | | | |
| l. | ELCCA -- Energy Lifecycle Cost Analysis | | $40,000 | | | | |
| INSERT | <--Double-Click Here to Insert a Row | | | | | | |
| | **SubTotal: Extra Services** | | **$184,000** | | | 1.0616 | **$195,000** |
| **4** | **Other Services** | | | | | | |
| a. | Bid/Construction/Closeout - 31% of basic services | | $1,600,697 | | $1,600,697 | | |
| b. | Bid/Construction/Closeout - Secondary | | $877,333 | | $877,333 | | |
| c. | HVAC Balancing | | $150,000 | | | | |
| d. | Commissioning and Training | | $250,000 | | | | |
| e. | Site Representative | | $120,000 | | | | |
| f. | Misc. Services | | $250,000 | | | | |
| INSERT | <--Double-Click Here to Insert a Row | | | | | | |
| | **SubTotal: Other Services** | | **$3,248,030** | | | 1.1182 | **$3,632,000** |
| **5** | **Design Services Contingency** | 5.00% | $447,382 | | $447,382 | | |
| a. | | | | | | | |
| INSERT | <--Double-Click Here to Insert a Row | | | | | | |
| | **SubTotal: Design Services Contingency** | | **$447,382** | | | 1.1182 | **$500,000** |

| | ITEM | | BASE MONTH AMOUNT | FORMULA OVERRIDE | STANDARD FORMULA | ESCALATION FACTOR | ESCALATED COST |
|---|---|---|---|---|---|---|---|
| **Total: Consultant Services** | | | **$9,395,027** | | | | **$10,182,000** |
| **C.** | **CONSTRUCTION CONTRACTS** | | | | | | |
| **1** | **Site Work** | | | | | | |
| | a. G10 - Site Preparation | | $760,000 | | | | |
| | b. G20 - Site Improvements | | $2,822,000 | | | | |
| | c. G30 - Site Mechanical Utilities | | | | | | |
| | d. G40 - Site Electrical Utilities | | $3,418,000 | | | | |
| | e. G60 - Other Site Construction | | $1,137,000 | | | | |
| | f. Additional Escallation (7.7%) | | $662,000 | | | | |
| | g. Design Contingency | | $651,000 | | | | |
| INSERT | <--Double-Click Here to Insert a Row | | | | | | |
| | **SubTotal: Site Work** | | **$9,450,000** | | | 1.0882 | **$10,284,000** |
| **2** | **Related Project Costs** | | | | | | |
| | a. Off site improvements | | | | | | |
| | b. City Utilities Relocation | | | | | | |
| | c. Parking Mitigation | | | | | | |
| | d. Stormwater Retention/Detention | | | | | | |
| | e. Wetland Mitigation | | | | | | |
| | f. | | | | | | |
| INSERT | <--Double-Click Here to Insert a Row | | | | | | |
| | **SubTotal: Related Project Costs** | | **$0** | | | 1.0882 | **$0** |
| **3A** | **Facility Construction - Primary** | | | | | | |
| | a. A10 - Foundations | | | | | | |
| | b. A20 - Basement Construction | | | | | | |
| | c. B10 - Superstructure | | | | | | |
| | d. B20 - Exterior Closure | | | | | | |
| | e. B30 - Roofing | | | | | | |
| | f. C10 - Interior Construction | | | | | | |
| | g. C20 - Stairs | | | | | | |
| | h. C30 - Interior Finishes | | | | | | |
| | i. D10 - Conveying | | | | | | |
| | j. D20 - Plumbing Systems | | | | | | |
| | k. D30 - HVAC Systems | | | | | | |
| | l. D40 - Fire Protection Systems | | | | | | |
| | m. D50 - Electrical Systems | | | | | | |
| | n.. F10 - Special Construction | | | | | | |
| | o.. F20 - Selective Demolition | | | | | | |
| | p. General Conditions | | | | | | |
| | q. Data Center MACC | | $63,710,000 | | | | |
| | r. Design Contingency | | $9,556,000 | | | | |
| | s. Additional Escallation (7.7%) | | $3,409,000 | | | | |
| INSERT | <--Double-Click Here to Insert a Row | | | | | | |
| | **SubTotal: Facility Construction - Primary** | | **$76,675,000** | | | 1.1182 | **$85,738,000** |
| | **Maximum Allowable Construction Cost (MACC) - Primary** | | **$86,125,000** | | | | **$96,022,000** |
| **3B** | **Facility Construction -Secondary (By Building System)** | | | | | | |
| | a. A10 - Foundations | | | | | | |
| | b. A20 - Basement Construction | | | | | | |
| | c. B10 - Superstructure | | | | | | |
| | d. B20 - Exterior Closure | | | | | | |
| | e. B30 - Roofing | | | | | | |
| | f. C10 - Interior Construction | | | | | | |
| | g. C20 - Stairs | | | | | | |
| | h. C30 - Interior Finishes | | | | | | |
| | i. D10 - Conveying | | | | | | |
| | j. D20 - Plumbing Systems | | | | | | |
| | k. D30 - HVAC Systems | | | | | | |
| | l. D40 - Fire Protection Systems | | | | | | |
| | m. D50 - Electrical Systems | | | | | | |
| | n.. F10 - Special Construction | | | | | | |
| | o.. F20 - Selective Demolition | | | | | | |
| | p. General Conditions | | | | | | |
| | q. MACC Estimate -- Office | | $27,915,000 | | | | |
| | r. MACC Estimate -- Parking Structure (400 space) | | $14,248,000 | | | | |
| | s. Design Contingency | | $4,490,000 | | | | |
| | t. Additional Escallation (7.7%) | | $2,170,000 | | | | |
| INSERT | <--Double-Click Here to Insert a Row | | | | | | |
| | **SubTotal: Facility Construction -Secondary (By Building System)** | | **$48,823,000** | | | 1.1182 | **$54,594,000** |
| | **Maximum Allowable Construction Cost (MACC) - Secondary** | | **$48,823,000** | | | | **$54,594,000** |
| **4** | **GC/CM Risk Contingency - NOT APPLICABLE** | | | | | | |
| **5** | **GC/CM or Design Build Costs - NOT APPLICABLE** | | | | | | |
| **6** | **Construction Contingencies** | | | | | | |
| | a. Management Reserve | 5.00% | $6,747,400 | | $6,747,400 | | |
| | b. Allowance for Change Orders | 5.00% | $6,747,400 | | $6,747,400 | | |
| | c. | | | | | | |
| INSERT | <--Double-Click Here to Insert a Row | | | | | | |
| | **SubTotal: Construction Contingencies** | | **$13,494,800** | | | 1.1182 | **$15,090,000** |
| **7** | **Sales Tax** | 8.40% | $12,469,195 | | $12,469,195 | | |
| | a. | | | | | | |
| INSERT | <--Double-Click Here to Insert a Row | | | | | | |
| | **SubTotal: Sales Tax** | | **$12,469,195** | | | 1.1182 | **$13,943,000** |

| | ITEM | | BASE MONTH AMOUNT | FORMULA OVERRIDE | STANDARD FORMULA | ESCALATION FACTOR | ESCALATED COST |
|---|---|---|---|---|---|---|---|
| **Total: Construction Contracts** | | | **$160,911,995** | | | | **$179,649,000** |
| **D.** | **EQUIPMENT** | | | | | | |
| 1 | E10 - Equipment | | | | | | |
| 2 | E20 - Furnishings | | $2,655,000 | | | | |
| 3 | F10 - Special Construction | | | | | | |
| 4 | | | | | | | |
| INSERT | <--Double-Click Here to Insert a Row | | | | | | |
| | **SubTotal: Equipment** | | **$2,655,000** | | | 1.1182 | **$2,969,000** |
| **99** | **Sales Tax** | 8.40% | $223,020 | | $223,020 | | |
| 100 | | | | | | | |
| INSERT | <--Double-Click Here to Insert a Row | | | | | | |
| | **SubTotal: Sales Tax** | | **$223,020** | | | 1.1182 | **$249,000** |
| **Total: Equipment** | | | **$2,878,020** | | | | **$3,218,000** |
| **E.** | **ARTWORK** | | | | | | |
| 1 | Project Artwork | | $430,625 | | $430,625 | | |
| 2 | Higher Education Artwork | | N/A | | N/A | | |
| 3 | | | | | | | |
| INSERT | <--Double-Click Here to Insert a Row | | | | | | |
| **Total: Artwork** | | | **$430,625** | | | 1.0000 | **$431,000** |
| **F.** | **OTHER COSTS** | | | | | | |
| 1 | Mitigation Costs | | | | | | |
| 2 | Hazardous Material Remediation\Removal | | | | | | |
| 3 | | | | | | | |
| INSERT | <--Double-Click Here to Insert a Row | | | | | | |
| **Total: Other Costs** | | | **$0** | | | 1.0882 | **$0** |
| **G.** | **PROJECT MANAGEMENT** | | | | | | |
| 1 | Agency Project Management | | $0 | | $0 | | |
| 2 | Project Management | | $3,495,000 | | | | |
| INSERT | <--Double-Click Here to Insert a Row | | | | | | |
| **Total: Project Management** | | | **$3,495,000** | | | 1.0000 | **$3,495,000** |
| **G R A N D  T O T A L** | | | **$177,110,667** | | | | **$196,975,000** |

**NOTES**

## 5.5 Form C3 Benefit and Life Cycle Cost Analysis Summary

STATE OF WASHINGTON
BENEFIT AND LIFE CYCLE COST ANALYSIS SUMMARY

FORM C-3 (Rev 6-01)

| | | | |
|---|---|---|---|
| Agency | Department of Information Services | | LCC |
| Project | New DIS Data Center & Office Building | Analysis Date | 4/12/2007 |
| Location | Wheeler Site, Olympia, WA | Analysis By | Craig Donald & Jim Martin |
| Economic Life (in Years) 50 | Discount Rate 4.60% | File Name | Form C-3 Annualized DIS Projec |

| Description | Build New - COP Financed | | Build New - 63-20 Financed | | Build New - GO Bonds | | Continue Lease | | Alternate No. 5 | | Alternate No. 6 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Estimated Cost | Present Worth | Estimated Cost | Present Worth | Estimated Cost | Present Worth | Estimated Cost | Present Worth | Estimated Cost | Present Worth | Estimated Cost | Present Worth |
| 1. Initial Costs | | | | | | | | | | | | |
| A. | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 |
| B Amortized Cost | $335,543,963 | $204,460,564 | $352,564,927 | $214,832,129 | $327,736,917 | $199,703,414 | $0 | $0 | $0 | $0 | $0 | $0 |
| C. Moving Expense | $2,623,065 | $2,623,065 | $2,623,065 | $2,623,065 | $2,623,065 | $2,623,065 | | | | | | |
| D. | | | | | | | | | | | | |
| E. | | | | | | | | | | | | |
| F. | | | | | | | | | | | | |
| G. | | | | | | | | | | | | |
| *Total Initial Cost (PW)* | $338,167,028 | $207,083,629 | $355,187,992 | $217,455,194 | $330,359,982 | $202,326,479 | $0 | $0 | $0 | $0 | $0 | $0 |
| *Total Initial Cost Difference vs.Lowest Cost Alternative* | | | | | | | | | | | | |
| 2. Replacement/Salvage Cost & Residual Value | | | | | | | | | | | | |
| *(See appropriate Resid-Repl Sheet)* Year | | | | | | | | | | | | |
| A. | | | | | | | | | | | | |
| B | | | | | | | | | | | | |
| C. | | | | | | | | | | | | |
| D. | | | | | | | | | | | | |
| E. | | | | | | | | | | | | |
| F. | | | | | | | | | | | | |
| G. | | | | | | | | | | | | |
| H. | | | | | | | | | | | | |
| *Total Replacement Cost/(Savings) (PW)* | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 |
| 3. Annual Costs (Savings) | | | | | | | | | | | | |
| A. Operating Cost | $486,429,954 | $115,816,045 | $486,429,954 | $115,816,045 | $486,429,954 | $115,816,045 | $419,786,100 | $94,661,027 | $0 | $0 | $0 | $0 |
| B | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 |
| C. Lease Payments (Starting rate $14.60, a | | | | | | | $456,684,086 | $132,108,846 | | | | |
| D. | | | | | | | | | | | | |
| E. | | | | | | | | | | | | |
| F. | | | | | | | | | | | | |
| G. | | | | | | | | | | | | |
| H. | | | | | | | | | | | | |
| *Total Annual Cost* | $486,429,954 | $115,816,045 | $486,429,954 | $115,816,045 | $486,429,954 | $115,816,045 | $876,470,185 | $226,769,873 | $0 | $0 | $0 | $0 |
| Grand Total Costs (Savings) | $824,596,982 | $322,899,674 | $841,617,947 | $333,271,239 | $816,789,937 | $318,142,524 | $876,470,185 | $226,769,873 | $0 | $0 | $0 | $0 |
| Life Cycle PW Savings (Loss) vs. Lowest Cost Option | | | | | | | | | | | | |
| Savings (Loss) % vs. Lowest Cost Option | | | | | | | | | | | | |

### 5.6 Budget in Relation to the Scope of Work

The budget for the DIS Data Center and Office Building can be summarized by breaking the budget into major components; data center, office building, parking garage and site work.

Project components as a percentage of total maximum allowable construction cost (MACC) are displayed below.

| | |
|---|---|
| Data Center | 56% |
| Office Building | 25% |
| Parking Garage | 12% |
| Site Work | 7% |

Detailed project budget information can be found in section 5.4 Form C100.

### 5.7 Effective Utilization of Space

DIS is located in a total of ten facilities: all facilities are in Thurston County. Nine facilities are privately owned and leased by DIS. All nine facilities will be vacated when DIS moves to its new facility. Several of the vacated facilities are located close to the east capitol campus and would be favorably considered by other tenants because of the location and facility condition. Some of the activities displaced by the project may want to consider the vacated facilities.

The DIS data center is located in OB2 on the east capitol campus. DIS will vacate OB2 when the new data center is complete. GA will be able to reassign the DIS space in OB2. This space may be attractive to the current major tenant of OB2.

### 5.8 Funding Sources

The DIS Data Center and Office Building project is proposed for alternative financing. This financing would take the form of certificate of participation (COP) financing or 63-20 financing. This financing will be paid for over time with agency revenues for the sale of DIS services including data center services.

## 6.0 Master Plan and Policy Coordination

### 6.1 Capitol Masterplan 2006

The approach to the preferred alternate (Wheeler Site) is consistent with the 2006 Capitol Campus Masterplan. Important goals for this project include: enhancing the sense of gateway to the campus, complimenting the existing architecture of the campus, and respecting the local neighborhood. Refer to Section 4 for a more detailed discussion.

### 6.2 2007-2009 Strategic Plan, May 2006

The Washington State DIS strategic plan outlines the goals and objectives of the department and has been followed in the development of programming assumptions.

### 6.3 Governor's Executive order 07-02, Washington's Climate Change Challenge

This order identifies "constructing high performance green buildings" as one strategy to achieving reduced green-house gas emissions in the State of Washington. This project will be a prominent and major building on the Capitol Campus, and as such, can be an example of the State's leadership in the battle against global warming. The design of this facility integrates sustainable principles into every component and are discussed throughout this report.

### 6.4 Chapter 12, Laws of 2005 (ESSB 5509)

The project will achieve at a minimum a silver rating from the USGBC.

# 7.0 Facility Operations and Maintenance Requirements

7.1 Assumptions 112

7.2 Operating Costs in Table Form 112

### 7.1 Assumptions

Facility operations and maintenance services on the capitol campus are generally provided by the Department of General Administration, Facilities Division. It is assumed that The Department of General Administration (GA) will provide facility operations and maintenance services for the Department of Information Services (DIS) data center and office building.

### 7.2 Operating Costs in Table Form

The DIS Data Center and Office Building will significantly impact the DIS operating budget with both cost increases and cost avoidance.

**Table 1**

Table 1 depicts the analysis of several sets of utilities, operations and maintenance costs from various sources. These costs are for office facilities only. Data sources include;

DIS - experience with its leased facilities
GA - Edna Goodrich Building in Tumwater
GA – experience on the current capitol campus
GA – BOMA data for the Seattle area for government facilities
GA – BOMA data for the Seattle area for private facilities
Department of Ecology – Proposed new NW Regional Office
GA – Proposed for the Executive Office Plaza / Heritage Center

The cost estimates proposed by DIS reflect the unique nature of the office building proposed. Energy savings will be a principal goal of the office building and use of waste heat from the data center will be a principal component of that savings.

**Table 2**

Table 2 takes the DIS proposed utilities and maintenance costs and inflates those costs at a rate of 2.9 percent per year. The table shows five biennia of data.

**Table 3**

Table 3 depicts the unique operation costs of a data center facility. Of special note is the energy cost assumption of $10.15 per square foot for this facility. This rate reflects the unique nature of the equipment maintained in the data center.

**Efficiencies and Cost Avoidance**

Co-location and consolidation of facilities will result in efficiencies and operational savings. DIS is currently located in 10 facilities in the Thurston County area. This situation results in duplication of equipment, facilities and services. Being housed in multiple facilities results in the inefficient use of space and staff time. Being in multiple locations is confusing for customers of DIS services.

Co-location will result in the shared use of expensive facilities including; auditorium and large conference rooms, food service areas, reception functions, and others.

Substantial savings will accrue to DIS customers through the shared use and added capacity of the data center facility. The ability of the state to avoid or reduce the need for data center facilities in other state buildings will enable our customers to save significantly on construction costs.

The DIS Data Center and Office Building is being designed to score as a LEED Silver facility or better. Sustainable improvements to the facility will result in substantial lifecycle savings.

| Operation and Maintenance Cost Analysis | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Office Facilities | | | | | | | | | | | | |
| 2007 $ | | | | | | | | | | | | |
| **Utilities & Maintenance** | **DIS Exper.** | **Goodrich Building (1)** | **Existing Campus (1)** | **BOMA Seattle Govn't (1)** | **BOMA Seattle Private (1)** | **Ecology NW Region Office** | | **Average Adjusted** | **GA New Office Building (1)** | **Diff** | | **DIS Proposed** |
| | | | | | | | | | | | | |
| Utilities | 1.15 | 1.14 | 2.13 | 2.02 | 1.44 | 0.00 | | 1.31 | 1.50 | 0.19 | | 1.15 |
| Custodial | 1.21 | 1.23 | 2.28 | 1.52 | 1.21 | 1.87 | | 1.55 | 1.40 | (0.15) | | 1.25 |
| Maintenance | 1.32 | 1.60 | 2.41 | 1.80 | 1.73 | 0.14 | | 1.50 | 1.60 | 0.10 | | 1.60 |
| Security (2) | 0.00 | 0.51 | 0.80 | 1.74 | 0.11 | 0.20 | | 0.67 | 0.60 | (0.07) | | 0.00 |
| Insurance | 0.23 | 0.45 | 0.05 | 0.00 | 0.33 | 0.00 | | 0.27 | 0.55 | 0.29 | | 0.45 |
| Capital Replacement Reserve | 0.00 | 0.60 | 2.00 | 0.00 | 0.00 | 0.00 | | 1.30 | 2.00 | 0.70 | | 0.60 |
| Mgt. Fee | 0.46 | 1.68 | 0.40 | 0.94 | 1.24 | 0.83 | | 0.93 | 0.70 | (0.23) | | 0.70 |
| Total | 4.37 | 7.21 | 10.07 | 8.02 | 6.06 | 3.04 | | 7.53 | 8.35 | 0.82 | | 5.75 |
| | | | | | | | | | | | | |
| New Office sf | 115,000 | | | | | | | | | | | |
| | | | | | | | | | | | | |
| ***Notes:*** | | | | | | | | | | | | |
| (1) Source Department of General Administration publications. (BOMA - Building Owners and Managers Association) | | | | | | | | | | | | |
| (2) DIS currently has security expense in its budget and will maintain a similar level of effort. | | | | | | | | | | | | |

**Table 1**

| Maintenance and Operation Cost Over Time | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Office Facilities | | | | | | | | | | | |
| | | **2007-09** | | **2009-11** | | **2011-13** | | **2013-15** | | **2015-17** | |
| | **2007** | **2008** | **2009** | **2010** | **2011** | **2012** | **2013** | **2014** | **2015** | **2016** | **2017** |
| Utilities | 1.15 | 1.18 | 1.22 | 1.25 | 1.29 | 1.33 | 1.37 | 1.40 | 1.45 | 1.49 | 1.53 |
| Custodial | 1.25 | 1.29 | 1.32 | 1.36 | 1.40 | 1.44 | 1.48 | 1.53 | 1.57 | 1.62 | 1.66 |
| Maintenance | 1.60 | 1.65 | 1.69 | 1.74 | 1.79 | 1.85 | 1.90 | 1.95 | 2.01 | 2.07 | 2.13 |
| Security (2) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Insurance | 0.45 | 0.46 | 0.48 | 0.49 | 0.50 | 0.52 | 0.53 | 0.55 | 0.57 | 0.58 | 0.60 |
| Capital Replacement Reserve | 0.60 | 0.62 | 0.64 | 0.65 | 0.67 | 0.69 | 0.71 | 0.73 | 0.75 | 0.78 | 0.80 |
| Mgt. Fee | 0.70 | 0.72 | 0.74 | 0.76 | 0.78 | 0.81 | 0.83 | 0.86 | 0.88 | 0.91 | 0.93 |
| Total | 5.75 | 5.92 | 6.09 | 6.26 | 6.45 | 6.63 | 6.83 | 7.02 | 7.23 | 7.44 | 7.65 |
| | | | | | | | | | | | |
| Notes: | | | | | | | | | | | |
| An average 2.9 percent annual inflation rate is used for all cost areas. | | | | | | | | | | | |

**Table 2**

| Maintenance and Operating Cost | | | | |
|---|---|---|---|---|
| Data Center | | | | |
| 2007 $ | | | | |
| ***Utilities & Maintenance*** | ***Cost per Square Foot*** | ***Square Feet Applicable*** | ***Total Cost*** | ***Notes*** |
| | | | | |
| Utilities - Data Halls | 10.15 | 30,000 | 304,500 | Cost based on built out raised floor square footage. |
| Utilities - General | 1.15 | 114,000 | 131,100 | Cost for office / production sreas |
| Custodial | 1.25 | 174,000 | 217,500 | Custodial service in data center facility. |
| Maintenance - Data Halls | 2.00 | 30,000 | 60,000 | Cost applied to built out data hall and back office square footage. |
| Maintenance - General | 1.60 | 114,000 | 182,400 | Cost for office / production sreas |
| Security | 0.00 | | | Security is part of the DIS budget and will continue at current level of effort |
| Insurance | 0.00 | | | Insurance is part of the DIS budget and will continue at current level of effort |
| Capital Replacement Reserve | 0.60 | 63,000 | 37,800 | Cost based on roof area of data halls and connecting building. |
| Mgt. Fee | 0.00 | | | DIS currently manages the data center facility and will continue that practice. |
| Total | | | 933,300 | |
| | | | | |
| New Data Center SF | 174,000 | | | |
| Raised Floor - Built Out | 30,000 | | | |
| Raised Floor - Shell | 30,000 | | | |
| Data Hall Roof Area | 45,000 | | | |

**Table 3**

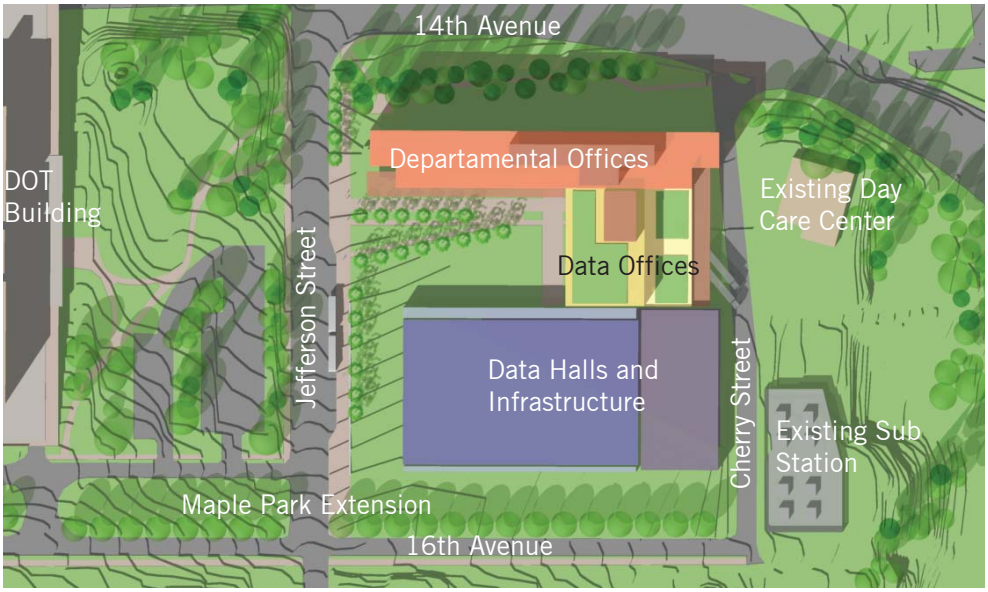
# 8.0 Project Drawings/Diagrams

8.1 Conceptual Massing 116

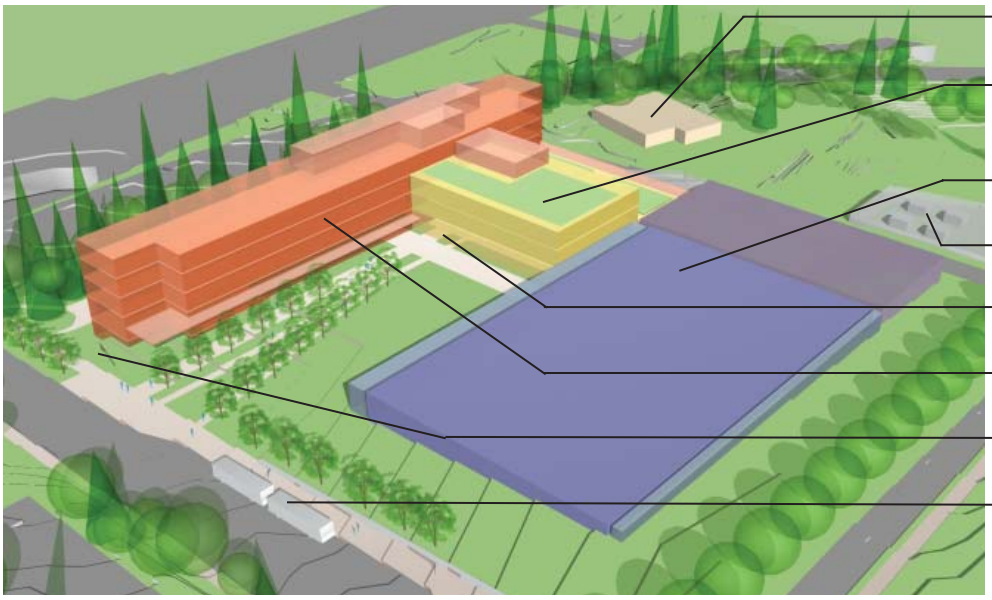
8.2 Landscape Concept 117

8.3 Building Plans 118

## 8.1 Conceptual Massing




**Site Plan**




**View from the Southwest**

## 8.2 Landscape Concept

**1. Jefferson Street**
formal front edge - civic and campus scale

**2. Street Trees**
on Jefferson Street existing native deciduous/evergreen trees

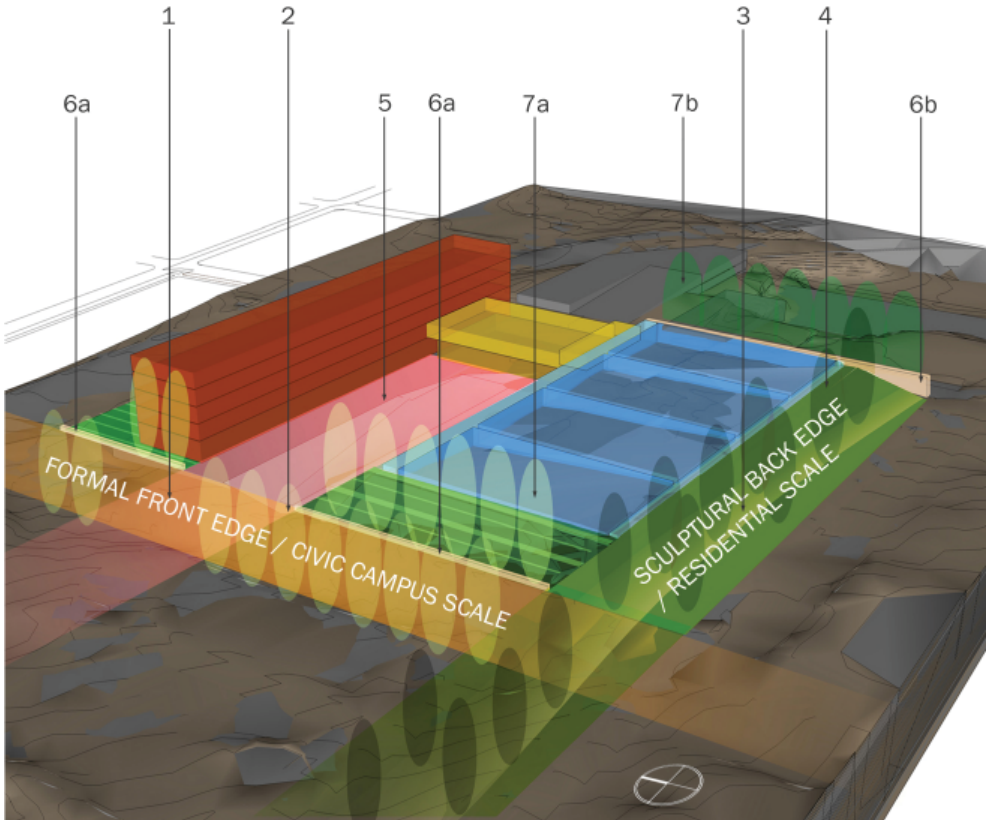
**3. 16th Ave SE Sculpted Edge**
sculpted/vegetated landform as security barrier - residential scale

**4. Maple Park Extension**
extension of trees from Maple Park holds the back edge of the site

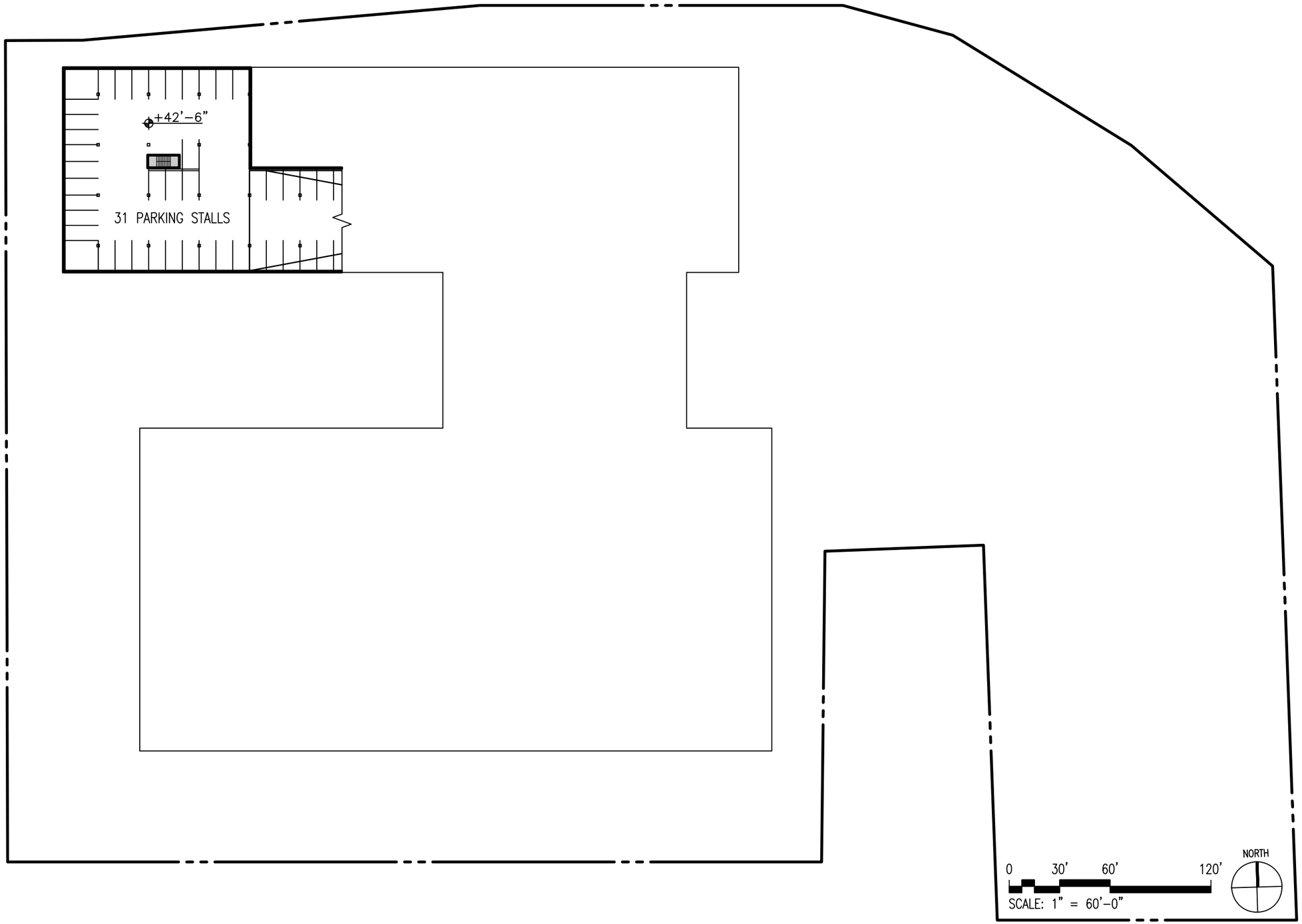
**5. Entry Plaza**
public entry plaza tying with the exiting Capitol Campus geometry

**6. Civic/Urban Edge**
a. civic/urban formal front edge as security barrier (i.e. seating walls/terraces/bollards etc.)
b. formal expression for the termination of sculpted landform holds the eastern back edge of the site

**7. Proposed Vegetation**
a. mirrored street trees to formalize urban presence of Jefferson street and accentuate sense of gateway into the site
b. trees to complete the anchoring effect for the southeast corner of the site



## 8.3 Floor Plans and Sections

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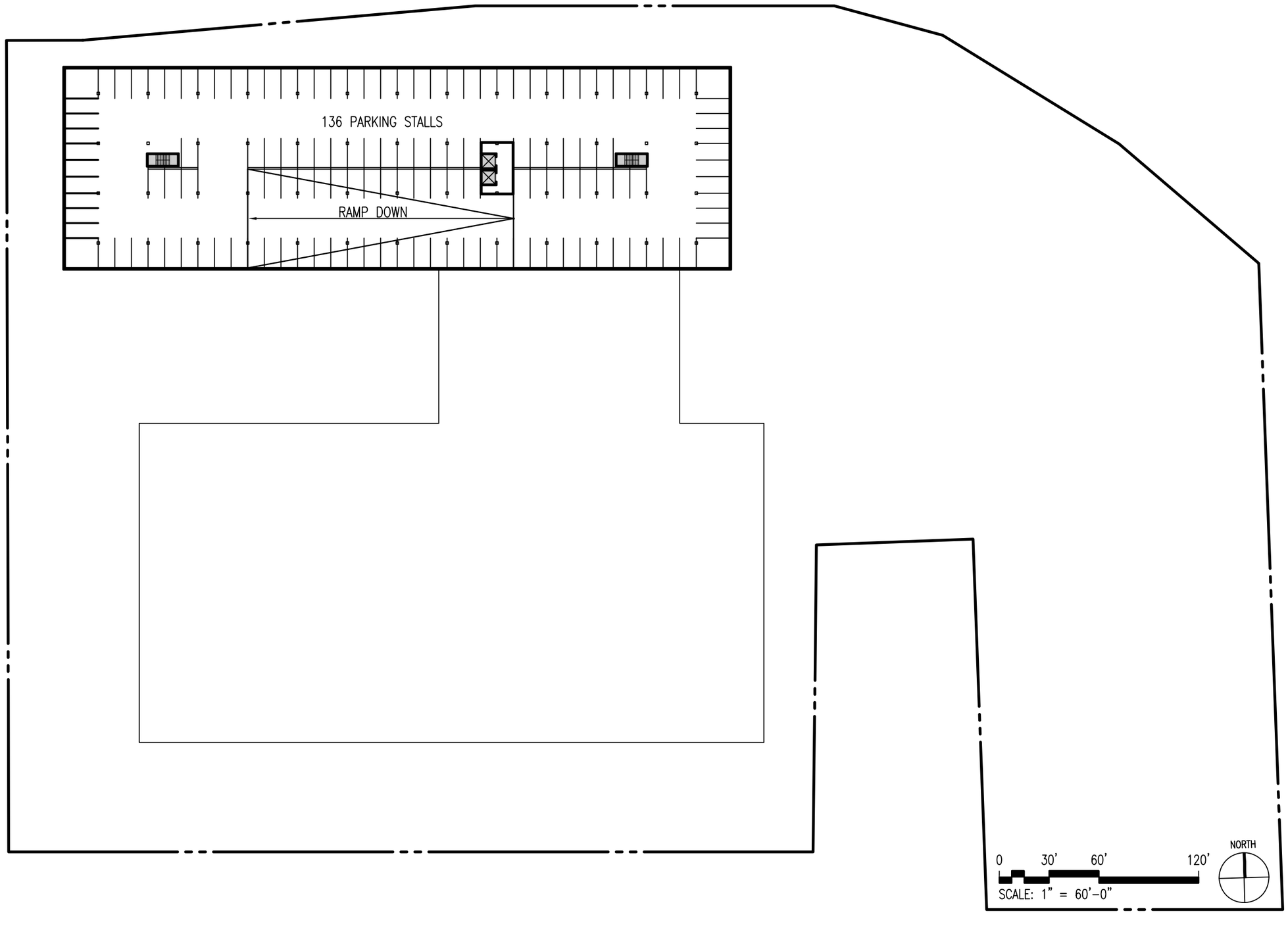
# PARKING LEVEL 4

DIS Data Center
& Office Predesign

Washington State
DIS
Capitol Campus
Olympia, WA

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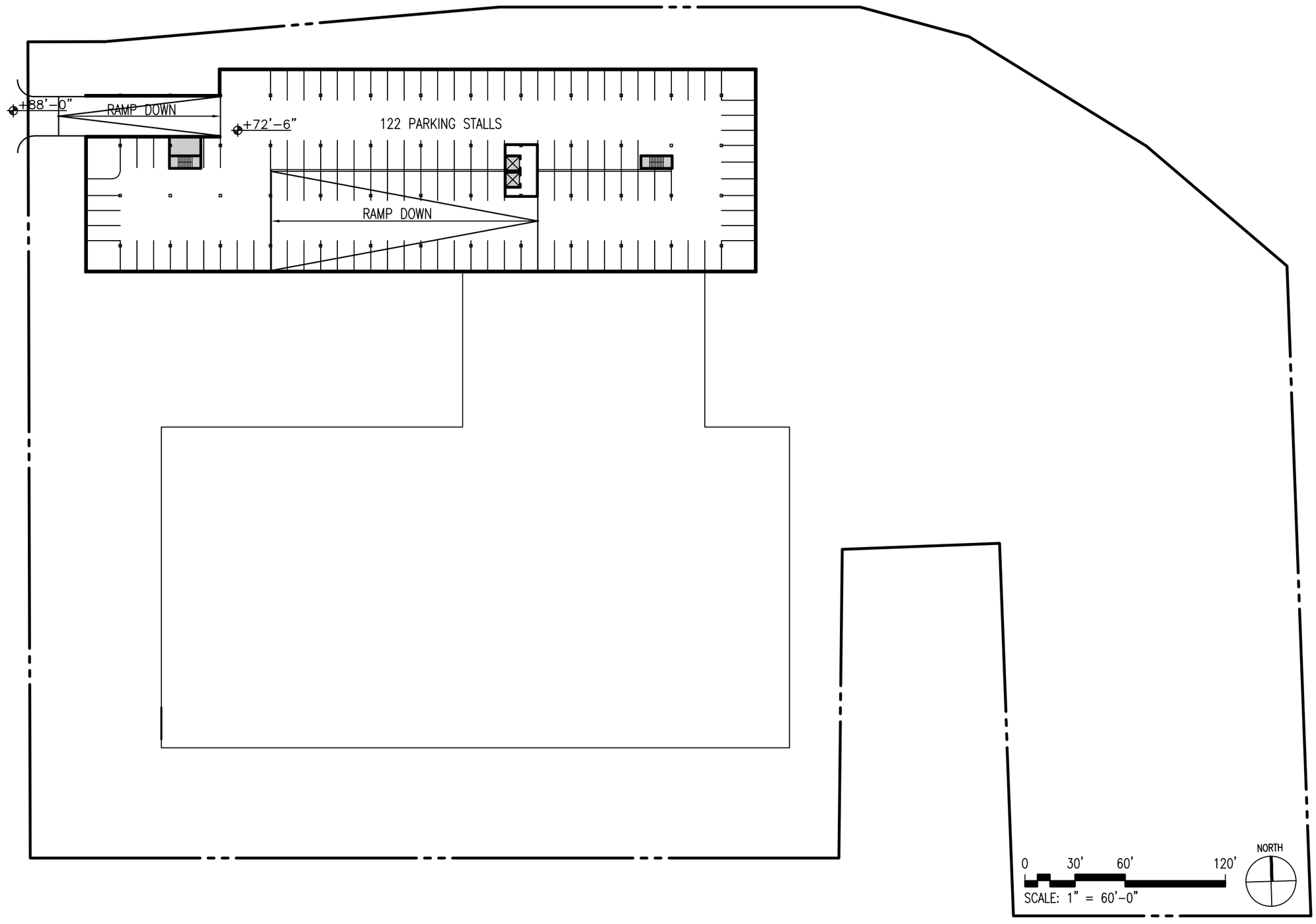
# PARKING LEVEL 2 & 3

**DIS Data Center & Office Predesign**

**Washington State DIS**
**Capitol Campus**
**Olympia, WA**

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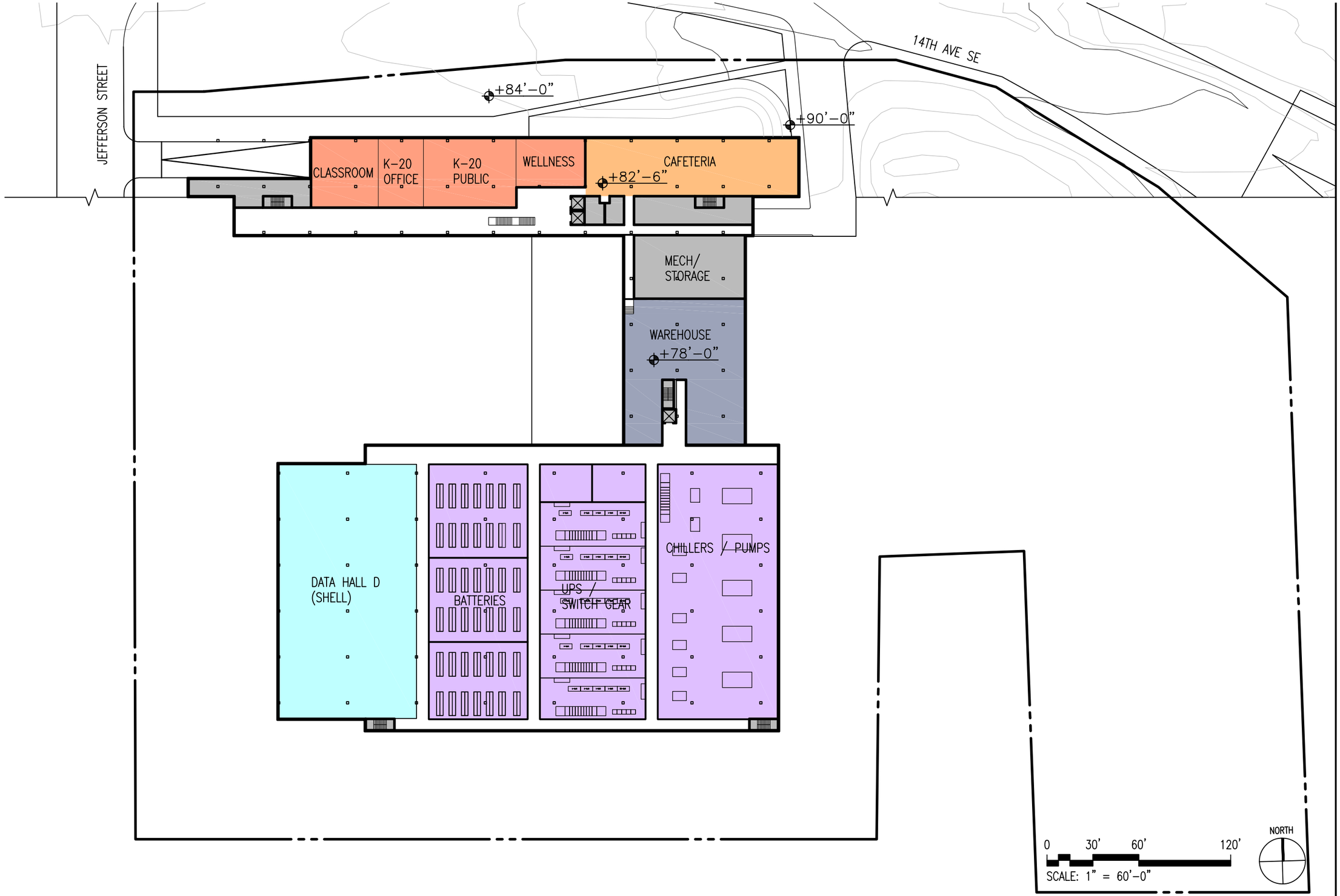
# PARKING LEVEL 1

**DIS Data Center & Office Predesign**

**Washington State DIS**
**Capitol Campus**
**Olympia, WA**

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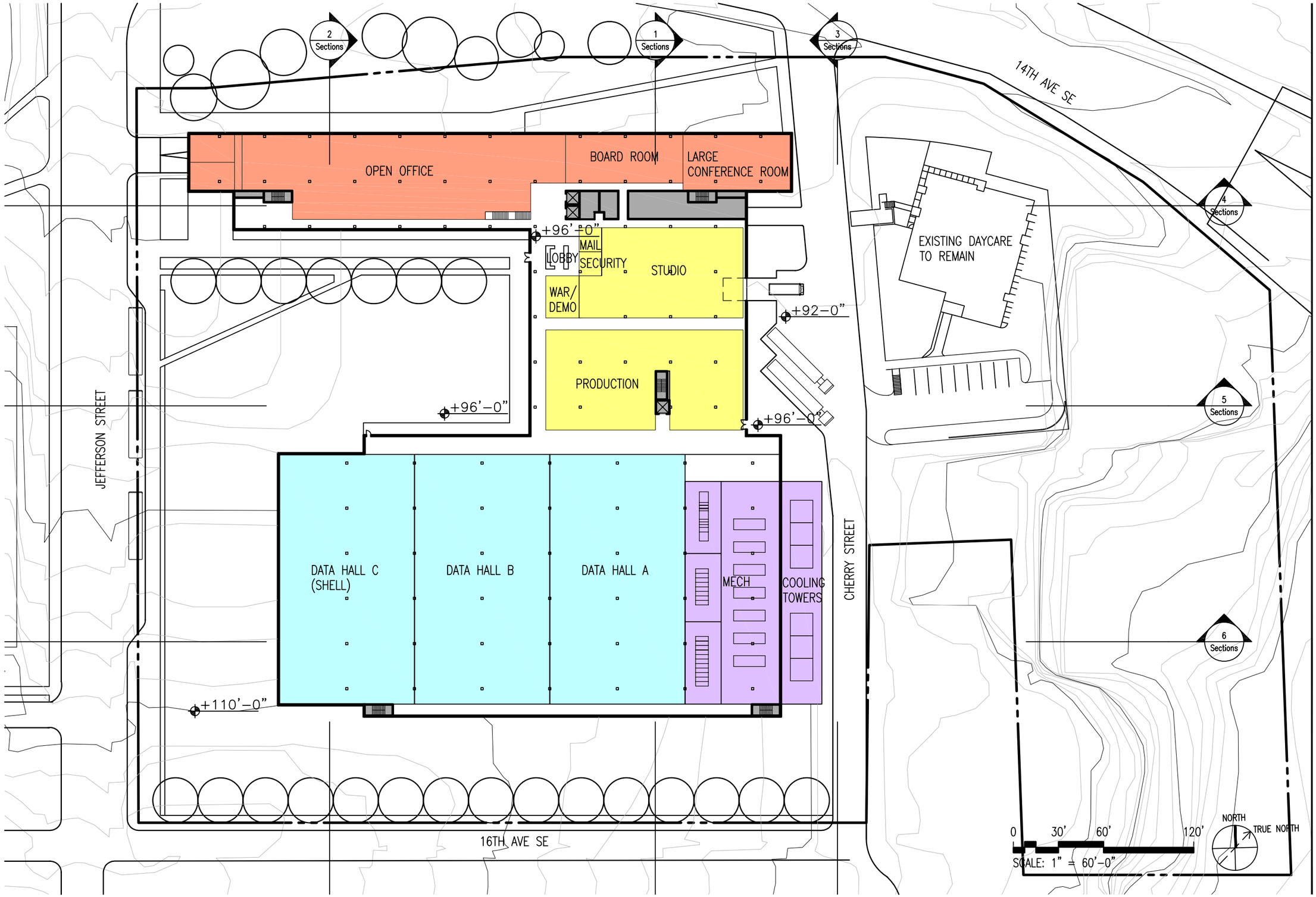
# BASEMENT LEVEL PLAN

DIS Data Center & Office Predesign

Washington State DIS
Capitol Campus
Olympia, WA

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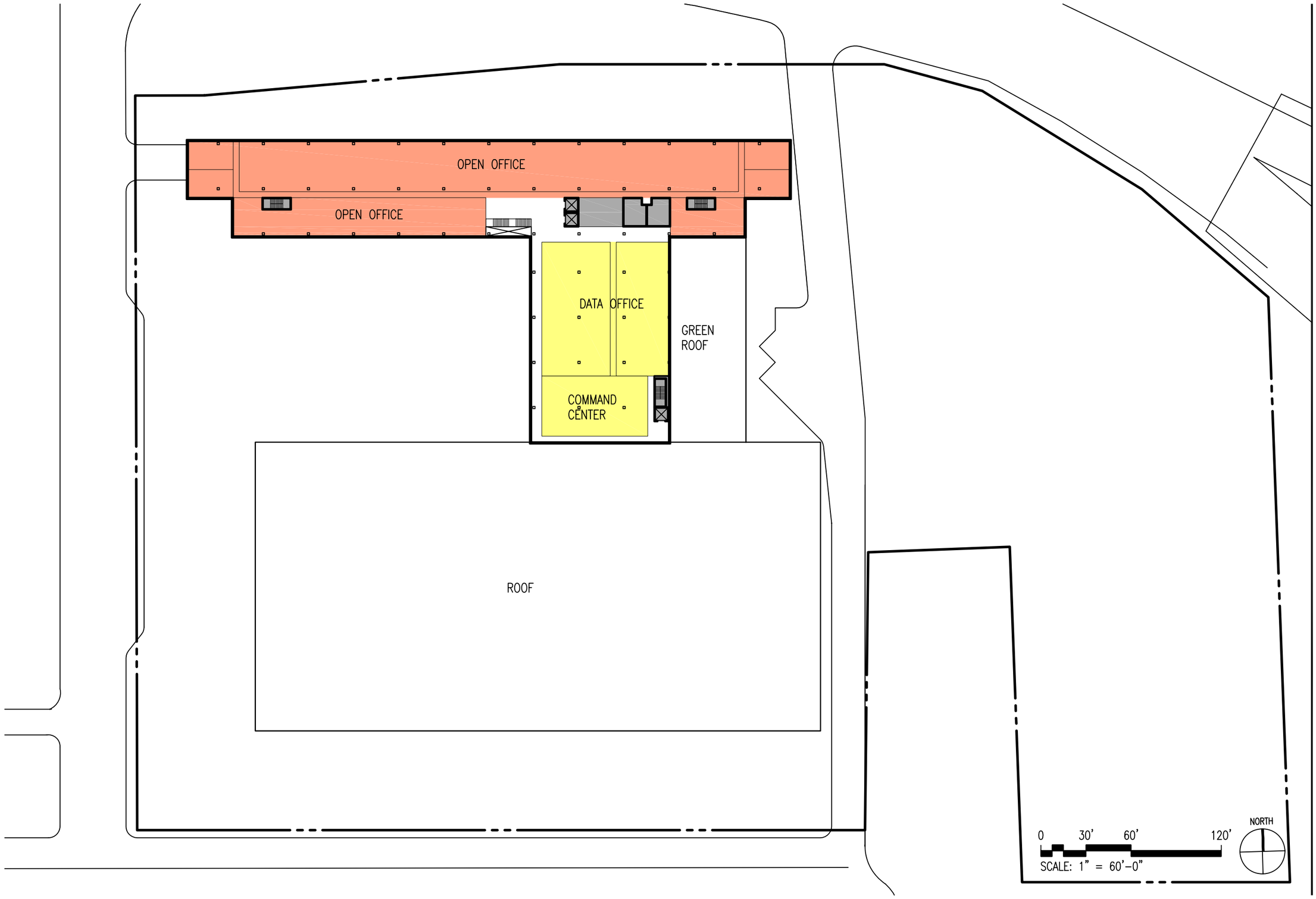
# LEVEL ONE PLAN

**DIS Data Center & Office Predesign**

**Washington State DIS**
**Capitol Campus**
**Olympia, WA**

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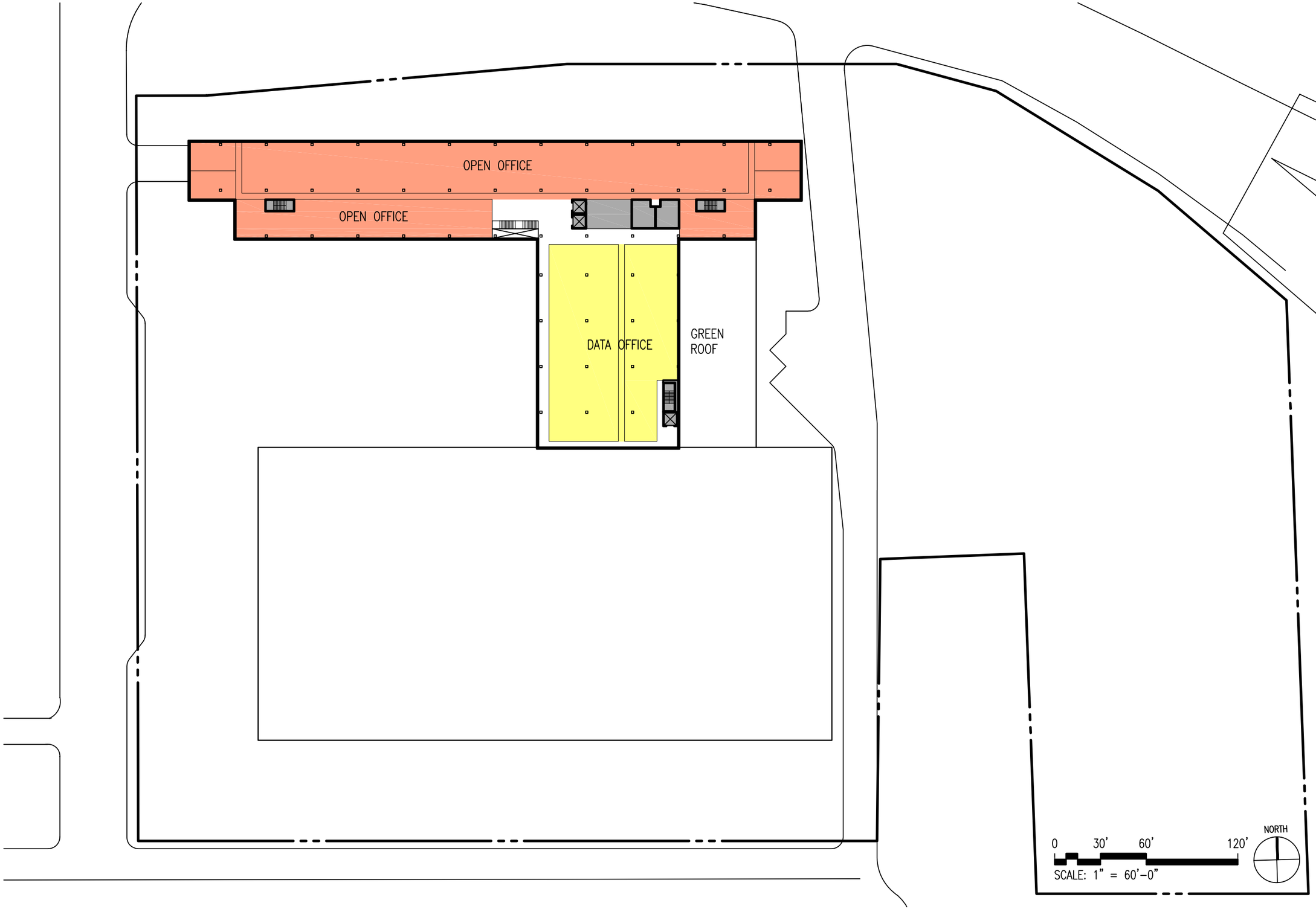
# LEVEL TWO PLAN

**DIS Data Center & Office Predesign**

**Washington State DIS**

**Capitol Campus Olympia, WA**

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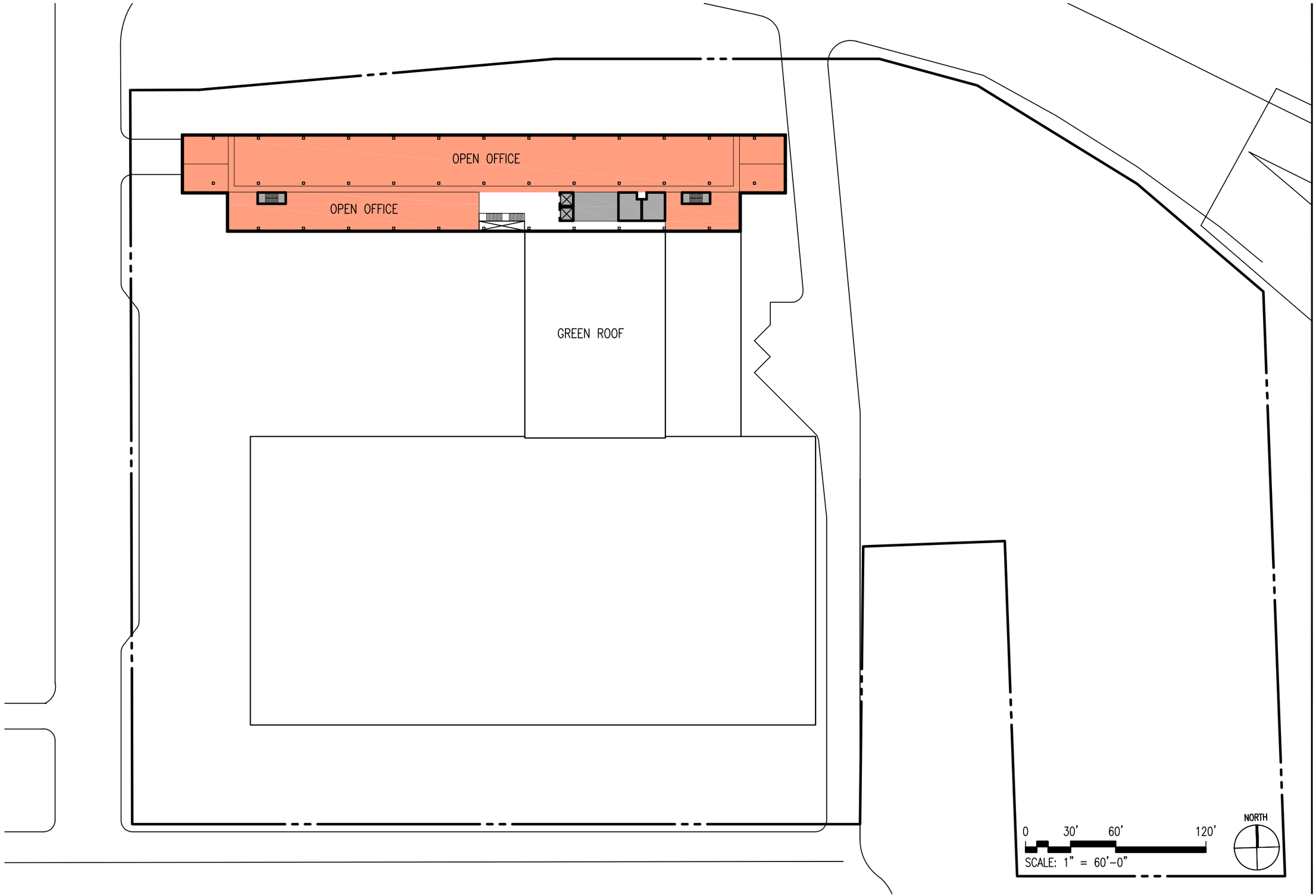
# LEVEL THREE PLAN

**DIS Data Center & Office Predesign**

**Washington State DIS**
**Capitol Campus**
**Olympia, WA**

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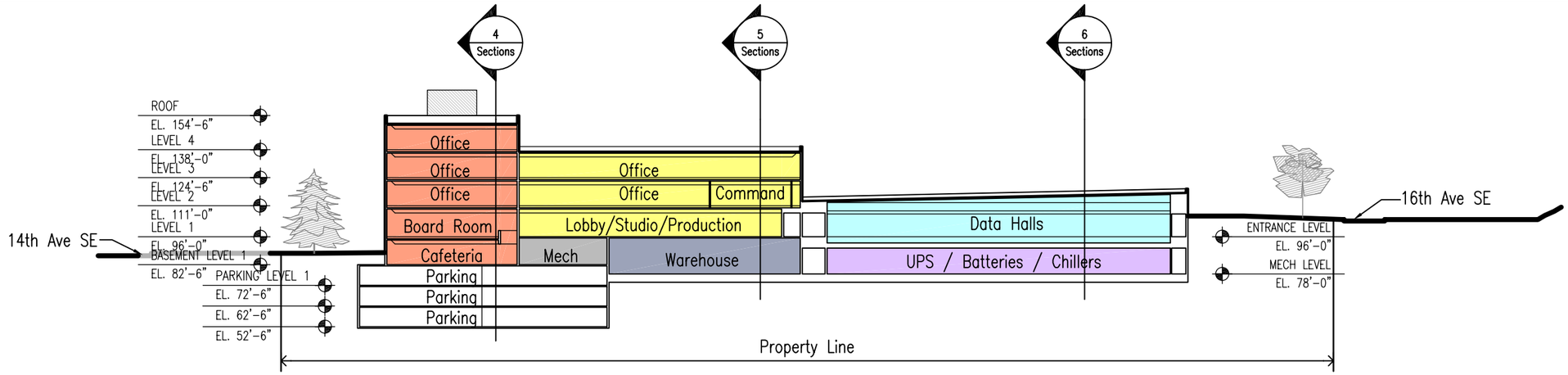
# LEVEL FOUR PLAN

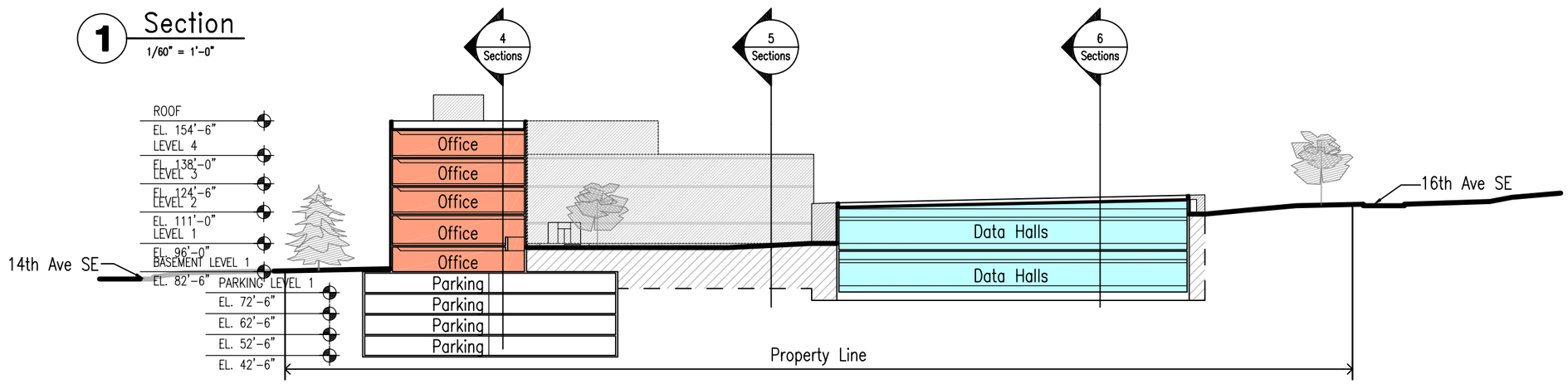
**DIS Data Center & Office Predesign**

**Washington State DIS**

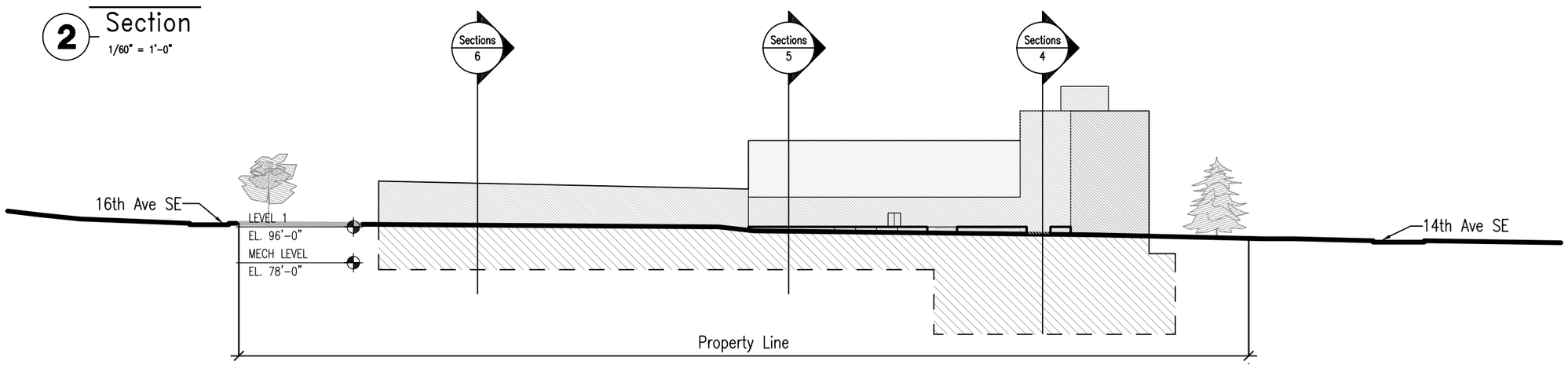
**Capitol Campus Olympia, WA**




1 Section
1/60" = 1'-0"




2 Section
1/60" = 1'-0"




3 Cherry Street Section
1/60" = 1'-0"

0 30' 60' 120'
SCALE: 1" = 60'-0"

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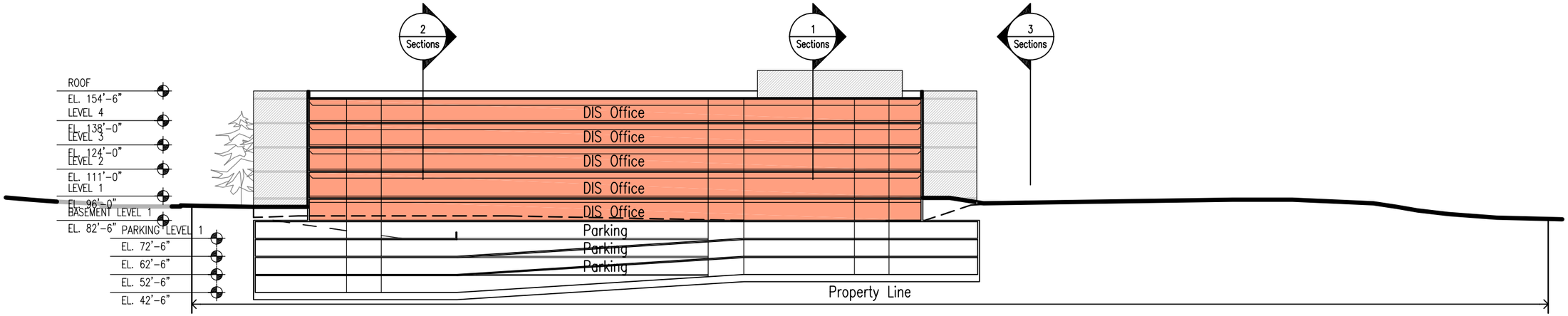
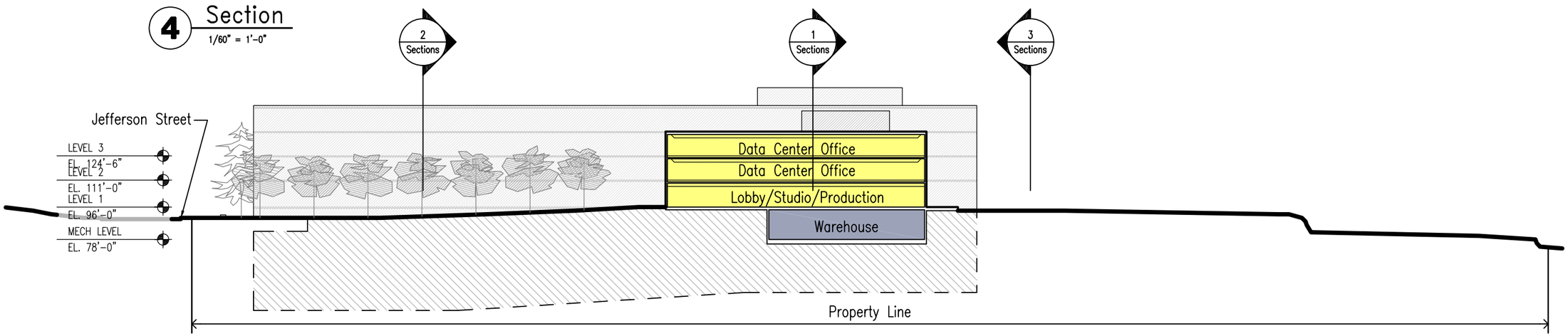
# BUILDING SECTIONS

DIS Data Center & Office Predesign

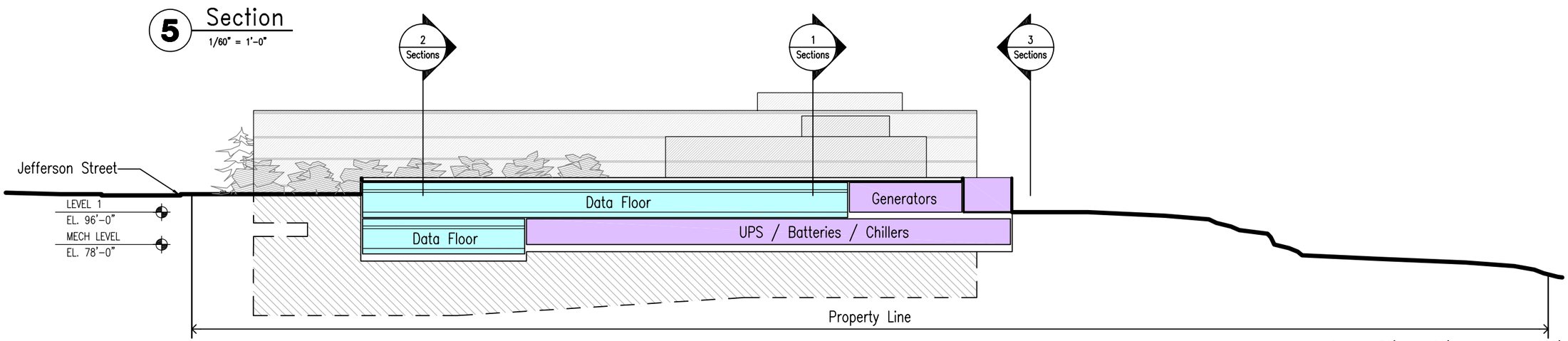
Washington State DIS
Capitol Campus
Olympia, WA




4 Section
1/60" = 1'-0"




5 Section
1/60" = 1'-0"




6 Section
1/60" = 1'-0"

0 30' 60' 120'
SCALE: 1" = 60'-0"

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# BUILDING SECTIONS

DIS Data Center
& Office Predesign

Washington State
DIS
Capitol Campus
Olympia, WA

# 9.0 Appendix


| | | |
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APPENDIX A

# Predesign Checklist

## PREDESIGN CHECKLIST NEW!

The predesign checklist should be completed by the agency and submitted to the Office of Financial Management with the predesign.

Is the following in the predesign? If not, it should be noted "not applicable"

- ☐ Executive Summary

- ☐ Project Analysis
  - Discussion of operational needs
  - Discussion of alternatives
  - Discussion of selected alternative
  - Identification of issues
  - Prior planning and history
  - Stakeholders
  - Implementation approach
  - Project management
  - Schedule

- ☐ Program Analysis
  - Assumptions
  - Functions and FTEs
  - Spatial relationships between the facility and site
  - Interrelationships and adjacencies of functions
  - Major equipment
  - Special systems such as environmental, information technology, etc.
  - Future needs and flexibility
  - Sustainability and energy utilization
  - Applicable codes and regulations

- ☐ Site Analysis
  - Potential sites
  - Building footprint
  - Site considerations such as physical, regulatory, and access issues
  - Acquisition process

- ☐ Project Budget Analysis
  - Assumptions
  - Detailed estimates

- Funding sources
- Form C-4, Predesign Capital Project Request Report Summary
- Form C100, Agency/Institution Project Cost Estimate
- Form C-3, Benefit and Life Cycle Cost Analysis Summary
- Sign off by agency

☐ Master Plan and Policy Coordination
- Impacts to existing plans
- Adherence to significant state policies

☐ Facility Operations and Maintenance Requirements
- Assumptions
- Operating costs in table form
- Staffing plan (capital and operating)

☐ Project Drawings/Diagrams
- Site plans
- Building plans
- Building volumes
- Elevations

☐ Appendix
- Predesign checklist
- Project budget unit cost detail
- Sustainable design charette summary
- Additional information as needed

Washington State Department of Information Services

BASELINE CONCEPTUAL
COST MODEL REV 8B

for

Washington State Department of Information Services
DC+OB+PG
Olympia, WA

DAVIS LANGDON
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March 23, 2007

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March 23, 2007

Kay Kornovich
Perkins + Will
1221Second Avenue
Suite 200
Seattle, Washington 98101

Re: Washington State Department of Information Services
Subject: DC+OB+PG
Location: Olympia, WA

Dear Kay:

In accordance with your instructions, we enclose our Conceptual Cost Model for the project referenced above.

We would be pleased to discuss this report with you further at your convenience.

Sincerely,
Jon Bayles for

David Hudd

*Davis Langdon 0278-7508*

Enclosures

*BASIS OF COST MODEL REV 8B*

| Cost Model Rev 8B Prepared From | Received |
|---|---|
| Drawings | 01/15/07 |

02022007-Plans & Sections
- Plan-P1.dwg
- Alternate Plan-B1.pdf
- Alternate Plan-L1.pdf
- Plan-L2.dwg
- Plan-L3-L4.dwg
- Sections.dwg

Narratives:
- AUDIO VISUAL DIS AV Program-InProg2.pdf
- CIVIL WSDIS Predesign Civil Narrative.doc
- DATA CENTER 8506076-00 WA State DC Narrative.pdf
- DIS Electrical Narrative rev1.doc
- GEOTECH Tech Memo #01 - Foundations.pdf
- HVAC PLBG Stantec Predesign narrative.doc
- LANDSCAPE WSDIS Landscape Concept Text.doc
- LEED NC 2 2 Office Score Card 02 06 07.pdf
- LEED NC 2 2 Score Card DATA CENTER 02 06 07.pdf
- STRUCTURAL - FOUNDATION Narrative.pdf
- TELECOM WA DIS Technology Basis of Design.doc
- STRUCTURAL WADIS-Predesign_Quantities.pdf

Discussions with the Project Architect and Engineers

*BASIS OF COST MODEL REV 8B*

Conditions of Construction

The pricing is based on the following general conditions of construction

A start date of January 2009

A construction period of 22 months

The general contract will be Design/Bid/Build

There will not be small business set aside requirements

The contractor will be required to pay prevailing wages

There are no phasing requirements

The general contractor will have full access to the site during normal business hours

*BIDDING PROCESS - MARKET CONDITIONS*

This document is based on the measurement and pricing of quantities wherever information is provided and/or reasonable assumptions for other work not covered in the drawings or specifications, as stated within this document. Unit rates have been obtained from historical records and/or discussion with contractors. The unit rates reflect current bid costs in the area. All unit rates relevant to subcontractor work include the subcontractors overhead and profit unless otherwise stated. The mark-ups cover the costs of field overhead, home office overhead and profit and range from 15% to 25% of the cost for a particular item of work.

Pricing reflects probable construction costs obtainable in the project locality on the date of this statement of probable costs. This estimate is a determination of fair market value for the construction of this project. It is not a prediction of low bid. Pricing assumes competitive bidding for every portion of the construction work for all subcontractors and general contractors, with a minimum of 4 bidders for all items of subcontracted work and 6-7 general contractor bids. Experience indicates that a fewer number of bidders may result in higher bids, conversely an increased number of bidders may result in more competitive bids.

Since Davis Langdon has no control over the cost of labor, material, equipment, or over the contractor's method of determining prices, or over the competitive bidding or market conditions at the time of bid, the statement of probable construction cost is based on industry practice, professional experience and qualifications, and represents Davis Langdon's best judgment as professional construction consultant familiar with the construction industry. However, Davis Langdon cannot and does not guarantee that the proposals, bids, or the construction cost will not vary from opinions of probable cost prepared by them.

*EXCLUSIONS*

Owner supplied and installed furniture, fixtures and equipment

Loose furniture and equipment except as specifically identified

Security equipment and devices

Audio visual equipment

Hazardous material handling, disposal and abatement

Compression of schedule, premium or shift work, and restrictions on the contractor's working hours

Design, testing, inspection or construction management fees

Architectural and design fees

Scope change and post contract contingencies

Assessments, taxes, finance, legal and development charges

Environmental impact mitigation

Builder's risk, project wrap-up and other owner provided insurance program

Land and easement acquisition

Escalation beyond Escalation to Midpoint (December 2009)

Washington State Department of Information Services
DC+OB+PG
Olympia, WA

*BASELINE Conceptual Cost Model REV 8b*
*March 23, 2007*
*0278-7508.110*

*OVERALL SUMMARY*

| | Gross Floor Area | $ / SF | $x1,000 |
|---|---|---|---|
| Parking Garage | 159,533 SF | 112.88 | 18,007 |
| Office Building | 119,317 SF | 306.63 | 36,587 |
| Data Center (3 over 1) | 177,904 SF | 481.93 | 85,738 |
| *TOTAL Building Construction* | 456,757 SF | 307.23 | 140,332 |
| Sitework | | | 10,284 |
| *TOTAL Building & Sitework Construction* | *January 2009* | | *150,615* |

*Alternates*

| | |
|---|---|
| Alternate 1: Rough order of magnitude for Cogen option in lieu of Baseline | (924) |
| Alternate 4: Rough order of magnitude for 1 level below grade and two levels above grade parking structure in lieu of Baseline | 376 |
| Alternate 7: Phased construction of Parking/Office building | 643 |

*Please refer to the Inclusions and Exclusions sections of this report*

WASHINGTON STATE DEPARTMENT OF INFORMATION SERVICES DC+OB+PG OLYMPIA, WA
BASELINE CONCEPTUAL COST MODEL REV 8B MARCH 23, 2007

DAVIS LANGDON

| | PARKING GARAGE COMPONENT SUMMARY | | OFFICE BUILDING COMPONENT SUMMARY | | DATA CENTER (3 OVER 1) COMPONENT SUMMARY | | CUP COMPONENT SUMMARY | | AGGREGATE BUILDING SUMMARY | | SITEWORK COMPONENT SUMMARY | | AGGREGATE BUILDING & SITEWORK SUMMARY | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 159,533 GSF | | 119,317 GSF | | 177,904 GSF | | 0 GSF | | 456,754 GSF | | 285,776 GSF | | 456,754 GSF | |
| | x $1,000 | $/GSF | x $1,000 | $/GSF | x $1,000 | $/GSF | x $1,000 | $/GSF | x $1,000 | $/GSF | x $1,000 | $/GSF | x $1,000 | $/GSF |
| Foundations | $3,741 | 23.45 | $0 | 0.00 | $4,190 | 23.55 | $0 | #DIV/0! | $7,931 | 17.36 | $0 | 0.00 | $7,931 | 17.36 |
| Vertical Structure | $1,863 | 11.68 | $1,112 | 9.32 | $2,815 | 15.82 | $0 | #DIV/0! | $5,791 | 12.68 | $0 | 0.00 | $5,791 | 12.68 |
| Floor & Roof Structures | $3,373 | 21.14 | $3,347 | 28.05 | $4,963 | 27.90 | $0 | #DIV/0! | $11,683 | 25.58 | $0 | 0.00 | $11,683 | 25.58 |
| Exterior Cladding | $41 | 0.26 | $5,752 | 48.21 | $1,707 | 9.60 | $0 | #DIV/0! | $7,501 | 16.42 | $0 | 0.00 | $7,501 | 16.42 |
| Roofing, Waterproofing & Skylights | $489 | 3.07 | $374 | 3.13 | $2,694 | 15.14 | $0 | #DIV/0! | $3,557 | 7.79 | $0 | 0.00 | $3,557 | 7.79 |
| Interior Partitions, Doors & Glazing | $306 | 1.92 | $1,804 | 15.12 | $2,076 | 11.67 | $0 | #DIV/0! | $4,185 | 9.16 | $0 | 0.00 | $4,185 | 9.16 |
| Floor, Wall & Ceiling Finishes | $355 | 2.22 | $1,865 | 15.63 | $2,286 | 12.85 | $0 | #DIV/0! | $4,506 | 9.87 | $0 | 0.00 | $4,506 | 9.87 |
| Function Equipment & Specialties | $96 | 0.60 | $1,042 | 8.73 | $533 | 3.00 | $0 | #DIV/0! | $1,671 | 3.66 | $0 | 0.00 | $1,671 | 3.66 |
| Stairs & Vertical Transportation | $277 | 1.73 | $708 | 5.93 | $305 | 1.71 | $0 | #DIV/0! | $1,289 | 2.82 | $0 | 0.00 | $1,289 | 2.82 |
| Plumbing Systems | $135 | 0.84 | $885 | 7.42 | $1,761 | 9.90 | $0 | #DIV/0! | $2,780 | 6.09 | $0 | 0.00 | $2,780 | 6.09 |
| Heating, Ventilating & Air Conditioning | $441 | 2.76 | $3,142 | 26.34 | $9,612 | 54.03 | $0 | #DIV/0! | $13,195 | 28.89 | $0 | 0.00 | $13,195 | 28.89 |
| Electric Lighting, Power & Communications | $502 | 3.15 | $3,521 | 29.51 | $20,789 | 116.86 | $0 | #DIV/0! | $24,812 | 54.32 | $0 | 0.00 | $24,812 | 54.32 |
| Fire Protection Systems | $638 | 4.00 | $459 | 3.85 | $1,070 | 6.01 | $0 | #DIV/0! | $2,167 | 4.74 | $0 | 0.00 | $2,167 | 4.74 |
| Site Preparation & Demolition | $0 | 0.00 | $0 | 0.00 | $0 | 0.00 | $0 | #DIV/0! | $0 | 0.00 | $760 | 2.66 | $760 | 1.66 |
| Site Paving, Structures & Landscaping | $0 | 0.00 | $0 | 0.00 | $0 | 0.00 | $0 | #DIV/0! | $0 | 0.00 | $2,822 | 9.88 | $2,822 | 6.18 |
| Utilities on Site | $0 | 0.00 | $0 | 0.00 | $0 | 0.00 | $0 | #DIV/0! | $0 | 0.00 | $3,418 | 11.96 | $3,418 | 7.48 |
| General conditions including hoisting | $1,379 | 8.64 | $2,701 | 22.64 | $6,165 | 34.65 | $0 | #DIV/0! | $10,245 | 22.43 | $787 | 2.75 | $11,032 | 24.15 |
| Contractor's Overhead & Profit or Fee | $614 | 3.85 | $1,202 | 10.07 | $2,743 | 15.42 | $0 | #DIV/0! | $4,559 | 9.98 | $350 | 1.22 | $4,909 | 10.75 |
| Contingency for Development of Design | $1,140 | 7.15 | $3,350 | 28.08 | $9,556 | 53.71 | $0 | #DIV/0! | $14,046 | 30.75 | $651 | 2.28 | $14,697 | 32.18 |
| Escalation to Midpoint (December 2009) | $2,619 | 16.42 | $5,322 | 44.60 | $12,472 | 70.11 | $0 | #DIV/0! | $20,413 | 44.69 | $1,496 | 5.23 | $21,909 | 47.97 |
| | $18,007 | 112.88 | $36,587 | 306.63 | $85,738 | 481.93 | $0 | #DIV/0! | $140,332 | 307.24 | $10,284 | 35.99 | $150,615 | 329.75 |

File: 0278-7508.160 rpt WA DIS 03-23-07b.xls

Washington State Department of Information Services DC+OB+PG
Parking Garage
Olympia, WA

*BASELINE Conceptual Cost Model REV 8b*
*March 23, 2007*
*0278-7508.110*

*PARKING GARAGE AREAS & CONTROL QUANTITIES*

Areas

| | SF | SF | SF |
|---|---|---|---|
| Enclosed Areas | | | |
| Gfa Lower Parking Level | 13,664 | | |
| Gfa Typical Parking Level 2-3 Horizontal | 79,331 | | |
| Gfa Typical Parking Level 2-3 Ramp | 18,758 | | |
| Gfa Parking Level 1 Horizontal | 36,425 | | |
| Gfa Parking Level 1 Ramp | 9,379 | | |
| Gfa Parking Level 1 Ramp | 1,976 | | |
| SUBTOTAL, Enclosed Area | | 159,533 | |
| Covered area | | | |
| SUBTOTAL, Covered Area @ ½ Value | | | |
| TOTAL GROSS FLOOR AREA | | | 159,533 |

Control Quantities

| | | | | Ratio to Gross Area |
|---|---|---|---|---|
| Functional Units | | 400 | Car Parks | 2.507 |
| Number of stories (x1,000) | | 4 | EA | 0.025 |
| Gross Area | | 159,533 | SF | 1.000 |
| Enclosed Area | | 159,533 | SF | 1.000 |
| Covered Area | | 0 | SF | 0.000 |
| Footprint Area | | 49,044 | SF | 0.307 |
| Volume | | 1,595,328 | CF | 10.000 |
| Basement Volume | | 1,595,328 | CF | 10.000 |
| Gross Wall Area | | 205,029 | SF | 1.285 |
| Retaining Wall Area | | 205,029 | SF | 1.285 |
| Finished Wall Area | | 0 | SF | 0.000 |
| Windows or Glazing Area | 0.00% | 0 | SF | 0.000 |
| Roof Area - Flat | | 24,671 | SF | 0.155 |
| Roof Area - Sloping | | 0 | SF | 0.000 |
| Roof Area - Total | | 24,671 | SF | 0.155 |
| Roof Glazing Area | | 0 | SF | 0.000 |
| Interior Partition Length | | 1,043 | LF | 0.007 |
| Finished Area | | 159,533 | SF | 1.000 |
| Elevators (x10,000) | | 2 | EA | 0.125 |
| Plumbing Fixtures (x1,000) | | 0 | EA | 0.000 |

Washington State Department of Information Services DC+OB+PG — *BASELINE Conceptual Cost Model REV 8b*
Parking Garage — *March 23, 2007*
Olympia, WA — *0278-7508.110*

*PARKING GARAGE COMPONENT SUMMARY*

Gross Area: 159,533 SF

| | | $/SF | $x1,000 |
|---|---|---|---|
| 1. Foundations | | 23.45 | 3,741 |
| 2. Vertical Structure | | 11.68 | 1,863 |
| 3. Floor & Roof Structures | | 21.14 | 3,373 |
| 4. Exterior Cladding | | 0.26 | 41 |
| 5. Roofing, Waterproofing & Skylights | | 3.07 | 489 |
| *Shell (1-5)* | | 59.60 | 9,507 |
| 6. Interior Partitions, Doors & Glazing | | 1.92 | 306 |
| 7. Floor, Wall & Ceiling Finishes | | 2.22 | 355 |
| *Interiors (6-7)* | | 4.14 | 660 |
| 8. Function Equipment & Specialties | | 0.60 | 96 |
| 9. Stairs & Vertical Transportation | | 1.73 | 277 |
| *Equipment & Vertical Transportation (8-9)* | | 2.33 | 372 |
| 10. Plumbing Systems | | 0.84 | 135 |
| 11. Heating, Ventilating & Air Conditioning | | 2.76 | 441 |
| 12. Electric Lighting, Power & Communications | | 3.15 | 502 |
| 13. Fire Protection Systems | | 4.00 | 638 |
| *Mechanical & Electrical (10-13)* | | 10.75 | 1,715 |
| *Total Building Construction (1-13)* | | 76.82 | 12,255 |
| 14. Site Preparation & Demolition | | 0.00 | 0 |
| 15. Site Paving, Structures & Landscaping | | 0.00 | 0 |
| 16. Utilities on Site | | 0.00 | 0 |
| *Total Site Construction (14-16)* | | 0.00 | 0 |
| *TOTAL BUILDING & SITE (1-16)* | | 76.82 | 12,255 |
| General conditions including hoisting | 11.25% | 8.64 | 1,379 |
| Contractor's Overhead & Profit or Fee | 4.50% | 3.85 | 614 |
| *PLANNED CONSTRUCTION COST* | *March 2007* | 89.31 | 14,248 |
| Contingency for Development of Design | 8.00% | 7.15 | 1,140 |
| Escalation to Midpoint (December 2009) | 17.02% | 16.42 | 2,619 |
| *RECOMMENDED BUDGET* | *January 2009* | 112.88 | 18,007 |

Washington State Department of Information Services DC+OB+PG — *BASELINE Conceptual Cost Model REV 8b*
Parking Garage — *March 23, 2007*
Olympia, WA — *0278-7508.110*

| *Item Description* | *Quantity* | *Unit* | *Rate* | *Total* |
|---|---|---|---|---|
| 1. Foundations | | | | |
| Excavation | | | | |
| Excavate basement and remove | 64,847 | CY | 14.50 | 940,282 |
| Shoring sides of excavation | | | | |
| Vertical earth banks, H piles/wood lagging | 35,495 | SF | 49.50 | 1,757,003 |
| Piling | | | | |
| Drilled reinforced concrete caissons | | | | EXCLUDED |
| Reinforced concrete including excavation | | | | |
| Column bases | | | | |
| Machine excavate footings | 2,581 | CY | 14.75 | 38,070 |
| Fine grade bottom of footings | 7,263 | SF | 0.30 | 2,179 |
| Formwork to footing sides, built-up | 8,424 | SF | 11.91 | 100,347 |
| Reinforcing steel in footings, mild allow 100pcy | 110,040 | LB | 0.75 | 82,530 |
| Concrete, 5000psi | 1,048 | CY | 154.00 | 161,392 |
| Float top of footing | 7,263 | SF | 0.30 | 2,179 |
| Backfill footing w/structural fill | 1,533 | CY | 23.75 | 36,409 |
| Remove surplus excavation | 3,355 | CY | 12.00 | 40,260 |
| Retaining wall footings, assume 5'W x 2'H | | | | |
| Machine excavate footings | 1,007 | CY | 14.75 | 14,853 |
| Fine grade bottom of footings | 5,240 | SF | 0.30 | 1,572 |
| Formwork to footing sides, built-up | 4,212 | SF | 11.90 | 50,123 |
| Waterstops | 1,048 | LF | 3.00 | 3,144 |
| Reinforcing steel in footings, mild allow 100pcy | 44,835 | LB | 0.75 | 33,626 |
| Concrete, 5000psi | 427 | CY | 154.00 | 65,758 |
| Float top of footing | 5,240 | SF | 0.30 | 1,572 |
| Backfill footing w/structural fill | 580 | CY | 23.75 | 13,775 |
| Remove surplus excavation | 1,309 | CY | 12.02 | 15,731 |
| Mat foundations, allow (2) ea 34'x34'x8' | | | | |
| Machine excavate footings | 1,281 | CY | 14.75 | 18,895 |
| Fine grade bottom of footings | 2,312 | SF | 0.30 | 694 |
| Formwork to footing sides, built-up | 2,176 | SF | 11.91 | 25,921 |
| Reinforcing steel in footings, mild allow 150pcy | 118,755 | LB | 0.75 | 89,066 |
| Concrete, 5000psi | 754 | CY | 154.00 | 116,116 |
| Float top of footing | 2,312 | SF | 0.30 | 694 |
| Backfill footing w/structural fill | 527 | CY | 23.75 | 12,516 |

Washington State Department of Information Services DC+OB+PG — *BASELINE Conceptual Cost Model REV 8b*
Parking Garage — *March 23, 2007*
Olympia, WA — *0278-7508.110*

| *Item Description* | *Quantity* | *Unit* | *Rate* | *Total* |
|---|---|---|---|---|
| Remove surplus excavation | 1,665 | CY | 12.02 | 20,009 |
| Elevator pits | 2 | EA | 9,500.00 | 19,000 |
| Sump pits | 2 | EA | 1,400.00 | 2,800 |
| Subsurface drainage | | | | |
| Perimeter foundation drain | 1,048 | LF | 19.50 | 20,436 |
| Underslab drain tile | | LF | | EXCLUDED |
| Permanent dewatering system | | LS | | EXCLUDED |
| Temporary job dewatering | 12 | MO | 4,500.00 | 54,000 |
| | | | | 3,740,949 |

## 2. Vertical Structure

| | | | | |
|---|---|---|---|---|
| Columns and pilasters | | | | |
| Reinforced concrete gravity columns, assume 24"x32" | | | | |
| Formwork to columns, built-up | 16,863 | SF | 5.40 | 91,060 |
| Reinforcing steel in columns, allow 550pcy | 226,875 | LB | 0.75 | 170,156 |
| Concrete, 5000psi | 375 | CY | 288.85 | 108,319 |
| Finish | 16,863 | SF | 0.65 | 10,961 |
| Retaining walls | | | | |
| Reinforced concrete retaining walls, assume 18" | | | | |
| Formwork to walls, built-up | 71,110 | SF | 9.25 | 657,768 |
| Reinforcing steel in retaining walls, allow 180pcy | 410,058 | LB | 0.75 | 307,544 |
| Concrete, 5000psi | 2,071 | CY | 227.50 | 471,153 |
| Finish | 71,110 | SF | 0.65 | 46,222 |
| | | | | 1,863,181 |

## 3. Floor and Roof Structure

| | | | | |
|---|---|---|---|---|
| Floor at lowest level | | | | |
| Slab on grade, 6" | | | | |
| Fine grade | 49,044 | SF | 0.30 | 14,713 |
| Gravel base, 6" | 908 | CY | 28.00 | 25,424 |
| Vapor barrier | 49,044 | SF | 0.15 | 7,357 |
| Sand cushion, 2" | 303 | CY | 28.00 | 8,484 |

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| *Item Description* | *Quantity* | *Unit* | *Rate* | *Total* |
|---|---|---|---|---|
| Construction jt/edge form | 4,904 | LF | 3.80 | 18,635 |
| Set screeds | 49,044 | SF | 0.15 | 7,357 |
| Reinforcing steel, allow 70pcy | 73,427 | LB | 0.75 | 55,070 |
| Concrete, 4000psi | 999 | CY | 145.00 | 144,855 |
| Control jt | 1,471 | LF | 3.00 | 4,413 |
| Finish | 49,044 | SF | 0.50 | 24,522 |
| Suspended floors | | | | |
| Reinforced concrete beam & slab, 6" | | | | |
| Formwork to soffit of slab | 110,489 | SF | 7.35 | 812,094 |
| Formwork to beam sides | 36,830 | SF | 13.54 | 498,597 |
| Reinforcing steel in slab, allow 5.5psf | 698,843 | LB | 0.75 | 524,132 |
| Concrete, 5000psi | 3,581 | CY | 154.00 | 551,474 |
| Finish | 110,489 | SF | 0.50 | 55,245 |
| Flat roofs | | | | |
| Reinforced concrete beam & slab, 6" | | | | |
| Formwork to soffit of slab | 24,671 | SF | 7.35 | 181,332 |
| Formwork to beam sides | 8,224 | SF | 13.54 | 111,335 |
| Reinforcing steel in slab, allow 5.5psf | 156,044 | LB | 0.75 | 117,033 |
| Concrete, 5000psi | 800 | CY | 154.00 | 123,200 |
| Finish | 24,671 | SF | 0.50 | 12,336 |
| Miscellaneous | | | | |
| Misc metals, .2psf | 31,907 | LB | 1.85 | 59,028 |
| Concrete curbs/housekeeping pads | 159,533 | SF | 0.10 | 15,953 |
| | | | | 3,372,588 |

## 4. Exterior Cladding

| | | | | |
|---|---|---|---|---|
| Interior finish to exterior walls | | | | |
| Paint interior concrete or block | 35,555 | SF | 0.80 | 28,444 |
| Exterior doors, frames and hardware | | | | |
| Overhead sectional door, 24' x 10' motorized | 1 | EA | 13,000.00 | 13,000 |
| | | | | 41,444 |

## 5. Roofing, Waterproofing & Skylights

| | |
|---|---|
| Waterproofing slabs | EXCLUDED |
| Waterproofing walls below grade | |

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| *Item Description* | *Quantity* | *Unit* | *Rate* | *Total* |
|---|---|---|---|---|
| Bentonite panels and waterproofing | 35,555 | SF | 5.50 | 195,553 |
| Insulation | | | | |
| Rigid insulation under roofing | 24,671 | SF | 6.00 | 148,026 |
| Roofing | | | | |
| Membrane roofing | 24,671 | SF | 5.50 | 135,691 |
| Rough carpentry | 1 | LS | 10,000.00 | 10,000 |
| | | | | 489,269 |

## 6. Interior Partitions, Doors & Glazing

| | | | | |
|---|---|---|---|---|
| Concrete, block or brick walls | | | | |
| Reinforced concrete block, 8" | 15,016 | SF | 15.75 | 236,502 |
| Partition framing and cores | | | | |
| Shaftwall system including CH stud, 1" core board, gyp surfacing and paint | 1,837 | SF | 9.00 | 16,533 |
| Partition surfacing | | | | |
| Paint interior concrete or block | 30,032 | SF | 0.80 | 24,026 |
| Balustrades and rails | | | | |
| Cable guardrail | 180 | LF | 50.00 | 9,000 |
| Interior doors, frames and hardware | | | | |
| Hollow steel doors and frames, per leaf | 13 | EA | 1,500.00 | 19,500 |
| | | | | 305,561 |

## 7. Floor, Wall & Ceiling Finishes

| | | | | |
|---|---|---|---|---|
| Floors | | | | |
| Concrete sealer to parking areas | 158,333 | SF | 1.00 | 158,333 |
| VCT to elevator lobbies | 1,200 | SF | 3.10 | 3,720 |
| Bases or skirtings, etc. | | | | |
| Resilient base to elevator lobbies | 351 | LF | 2.00 | 702 |
| Ceilings | | | | |
| Insulation to underside of occupied space | 24,373 | SF | 2.00 | 48,746 |
| Paint interior concrete soffits | 158,333 | SF | 0.88 | 139,333 |

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| *Item Description* | *Quantity* | *Unit* | *Rate* | *Total* |
|---|---|---|---|---|
| ACT to elevator lobbies | 1,200 | SF | 3.40 | 4,080 |
| | | | | 354,914 |
| **8. Function Equipment & Specialties** | | | | |
| Protective guards, barriers and bumpers | 159,533 | SF | 0.15 | 23,930 |
| Allow | 159,533 | | | |
| Chalkboards, insignia and graphics | | | | |
| Entrance sign | 1 | LS | 6,000.00 | 6,000 |
| Code signage | 159,533 | SF | 0.08 | 12,763 |
| Wayfinding | 159,533 | SF | 0.10 | 15,953 |
| Pavement markings and signage | 159,533 | SF | 0.10 | 15,953 |
| Amenities and convenience items | | | | |
| Fire extinguishers and cabinets | 18 | EA | 350.00 | 6,300 |
| Bike lockers and storage | 1 | LS | 15,000.00 | 15,000 |
| Special use equipment | | | | |
| Parking control booth | | | | EXCLUDED |
| | | | | 95,899 |
| **9. Stairs & Vertical Transportation** | | | | |
| Staircase flights - floor to floor | | | | |
| Pre-engineered steel stairs | 7 | EA | 15,500.00 | 108,500 |
| Elevators | | | | |
| Passenger, traction 350fpm, per stop | 6 | EA | 28,000.00 | 168,000 |
| | | | | 276,500 |
| **10. Plumbing Systems** | | | | |
| Sanitary waste, vent and service piping | | | | |
| Hose bibbs/wall hydrants | 11 | EA | 1,000.00 | 11,000 |
| Surface water drainage | | | | |
| Floor drains | 50 | EA | 950.00 | 47,500 |
| Clean outs | 10 | EA | 300.00 | 3,000 |
| Drain and vent piping; uninsulated | 2,000 | LF | 34.00 | 68,000 |

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| *Item Description* | *Quantity* | *Unit* | *Rate* | *Total* |
|---|---|---|---|---|
| Oil separator | 1 | EA | 5,000.00 | 5,000 |
| | | | | 134,500 |

11. Heating, Ventilation & Air Conditioning

| | | | | |
|---|---|---|---|---|
| Air distribution and return | | | | |
| Galvanized steel ductwork | 39,900 | LB | 5.75 | 229,425 |
| Diffusers and return air grilles | | | | |
| Ceiling/wall diffusers and return air grilles | 160 | EA | 120.00 | 19,200 |
| Independent exhaust ventilation | | | | |
| Miscellaneous fans | 240,000 | CFM | 0.80 | 192,000 |
| | | | | 440,625 |

12. Electrical Lighting, Power & Communication

| | | | | |
|---|---|---|---|---|
| Main service and distribution etc. | | | | |
| Secondary switchgear, switchboards,MCC's and feeders | 650 | KVA | 100.00 | 65,000 |
| Emergency or uninterrupted power | | | | |
| Secondary switchboards, ATS, transformers and feeders | 150 | KVA | 150.00 | 22,500 |
| Machine and equipment power | | | | |
| Connections and switches | 159,533 | SF | 0.25 | 39,883 |
| User convenience power | | | | |
| Receptacles including panelboards, conduit and wire | 32 | EA | 450.00 | 14,400 |
| Lighting | | | | |
| Fixtures including panelboards, conduit, wire and switching | | | | |
| Interior fixtures | 355 | EA | 450.00 | 159,750 |
| Exterior entrance lighting - allow | 1 | LS | 10,000.00 | 10,000 |
| Emergency lighting - allow | 1 | LS | 10,000.00 | 10,000 |
| Lighting and power specialties | | | | |
| Lighting and power specialties, including grounding, lighting controls etc. | 1 | LS | 15,000.00 | 15,000 |
| Alarm and security systems | | | | |

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| *Item Description* | *Quantity* | *Unit* | *Rate* | *Total* |
|---|---|---|---|---|
| Fire alarm devices including conduit, wire and head end equipment | 44 | EA | 850.00 | 37,400 |
| Security system allowance - duress buttons & CCTV | 32 | EA | 4,000.00 | 128,000 |
| | | | | 501,933 |

13. Fire Protection Systems

| | | | | |
|---|---|---|---|---|
| Fire sprinkler systems | | | | |
| Dry sprinkler and standpipe system | 159,533 | SF | 4.00 | 638,132 |
| | | | | 638,132 |

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*OFFICE BUILDING AREAS & CONTROL QUANTITIES*

Areas

| | SF | SF | SF |
|---|---|---|---|
| Enclosed Areas | | | |
| Gfa Office Building Lower Level | 22,334 | | |
| Gfa Office Building First Flr | 24,373 | | |
| Gfa Office Building Second Floor | 23,156 | | |
| Gfa Office Building Level 3 & 4 | 46,490 | | |
| Penthouse | 1,944 | | |
| SUBTOTAL, Enclosed Area | | 118,297 | |
| Covered area | 2,039 | | |
| Lower Level Soffit | | | |
| SUBTOTAL, Covered Area @ ½ Value | | 1,020 | |
| TOTAL GROSS FLOOR AREA | | | 119,317 |

Control Quantities

| | | | | Ratio to Gross Area |
|---|---|---|---|---|
| Number of stories (x1,000) | | 6 | EA | 0.050 |
| Gross Area | | 119,317 | SF | 1.000 |
| Enclosed Area | | 118,297 | SF | 0.991 |
| Covered Area | | 2,039 | SF | 0.017 |
| Footprint Area | | 24,373 | SF | 0.204 |
| Volume | | 1,637,456 | CF | 13.724 |
| Basement Volume | | 22,334 | CF | 0.187 |
| Gross Wall Area | | 67,730 | SF | 0.568 |
| Retaining Wall Area | | 0 | SF | 0.000 |
| Finished Wall Area | | 67,730 | SF | 0.568 |
| Windows or Glazing Area | 67.97% | 46,037 | SF | 0.386 |
| Roof Area - Flat | | 24,373 | SF | 0.204 |
| Roof Area - Sloping | | 0 | SF | 0.000 |
| Roof Area - Total | | 24,373 | SF | 0.204 |
| Roof Glazing Area | | 0 | SF | 0.000 |
| Interior Partition Length | | 9,973 | LF | 0.084 |
| Finished Area | | 118,297 | SF | 0.991 |
| Elevators (x10,000) | | 2 | EA | 0.168 |
| Plumbing Fixtures (x1,000) | | 120 | EA | 1.006 |
| Electrical Load | | 2,428 | KW | 20.349 |

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Olympia, WA

*BASELINE Conceptual Cost Model REV 8b*
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*OFFICE BUILDING COMPONENT SUMMARY*

Gross Area: 119,317 SF

| | | $/SF | $x1,000 |
|---|---|---|---|
| 1. Foundations | | 0.00 | 0 |
| 2. Vertical Structure | | 9.32 | 1,112 |
| 3. Floor & Roof Structures | | 28.05 | 3,347 |
| 4. Exterior Cladding | | 48.21 | 5,752 |
| 5. Roofing, Waterproofing & Skylights | | 3.13 | 374 |
| *Shell (1-5)* | | 88.72 | 10,585 |
| 6. Interior Partitions, Doors & Glazing | | 15.12 | 1,804 |
| 7. Floor, Wall & Ceiling Finishes | | 15.63 | 1,865 |
| *Interiors (6-7)* | | 30.75 | 3,669 |
| 8. Function Equipment & Specialties | | 8.73 | 1,042 |
| 9. Stairs & Vertical Transportation | | 5.93 | 708 |
| *Equipment & Vertical Transportation (8-9)* | | 14.66 | 1,750 |
| 10. Plumbing Systems | | 7.42 | 885 |
| 11. Heating, Ventilating & Air Conditioning | | 26.34 | 3,142 |
| 12. Electric Lighting, Power & Communications | | 29.51 | 3,521 |
| 13. Fire Protection Systems | | 3.85 | 459 |
| *Mechanical & Electrical (10-13)* | | 67.12 | 8,008 |
| *Total Building Construction (1-13)* | | 201.24 | 24,012 |
| 14. Site Preparation & Demolition | | 0.00 | 0 |
| 15. Site Paving, Structures & Landscaping | | 0.00 | 0 |
| 16. Utilities on Site | | 0.00 | 0 |
| *Total Site Construction (14-16)* | | 0.00 | 0 |
| *TOTAL BUILDING & SITE (1-16)* | | 201.24 | 24,012 |
| General conditions including hoisting | 11.25% | 22.64 | 2,701 |
| Contractor's Overhead & Profit or Fee | 4.50% | 10.07 | 1,202 |
| *PLANNED CONSTRUCTION COST* | *March 2007* | 233.95 | 27,915 |
| Contingency for Development of Design | 12.00% | 28.08 | 3,350 |
| Escalation to Midpoint (December 2009) | 17.02% | 44.60 | 5,322 |
| *RECOMMENDED BUDGET* | *January 2009* | 306.63 | 36,587 |

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| *Item Description* | *Quantity* | *Unit* | *Rate* | *Total* |
|---|---|---|---|---|
| 1. Foundations | | | | |
| Included in Parking | | | | |
| | | | | 0 |
| 2. Vertical Structure | | | | |
| Columns and pilasters | | | | |
| Reinforced concrete gravity columns, assume 24"x32" | | | | |
| Formwork to columns, built-up | 25,016 | SF | 5.40 | 135,086 |
| Reinforcing steel in columns, allow 550pcy | 336,380 | LB | 0.75 | 252,285 |
| Concrete, 5000psi | 556 | CY | 288.85 | 160,601 |
| Finish | 25,016 | SF | 0.65 | 16,260 |
| Shear bracing | | | | |
| Reinforced concrete shear walls, assume 15" | | | | |
| Formwork to walls, built-up | 25,705 | SF | 9.25 | 237,771 |
| Reinforcing steel in shear walls, allow 300pcy | 203,940 | LB | 0.75 | 152,955 |
| Concrete, 5000psi | 618 | CY | 227.50 | 140,595 |
| Finish | 25,705 | SF | 0.65 | 16,708 |
| | | | | 1,112,262 |
| 3. Floor and Roof Structure | | | | |
| Suspended floors | | | | |
| Reinforced concrete beam & slab, 6" | | | | |
| Formwork to soffit of slab | 119,317 | SF | 7.35 | 876,980 |
| Formwork to beam sides | 39,773 | SF | 13.54 | 538,438 |
| Reinforcing steel in slab, allow 5.5psf | 754,680 | LB | 0.75 | 566,010 |
| Concrete, 5000psi | 3,867 | CY | 154.00 | 595,518 |
| Finish | 119,317 | SF | 0.50 | 59,659 |
| Flat roofs | | | | |
| Reinforced concrete beam & slab, 6" | | | | |
| Formwork to soffit of slab | 24,373 | SF | 7.35 | 179,142 |
| Formwork to beam sides | 8,124 | SF | 13.54 | 109,981 |
| Reinforcing steel in slab, allow 5.5psf | 147,834 | LB | 0.75 | 110,876 |
| Concrete, 5000psi | 790 | CY | 154.00 | 121,660 |

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| *Item Description* | *Quantity* | *Unit* | *Rate* | *Total* |
|---|---|---|---|---|
| Finish | 24,373 | SF | 0.50 | 12,187 |
| Miscellaneous | | | | |
| Misc metals | 119,317 | SF | 1.38 | 164,657 |
| Concrete curbs/housekeeping pads | 119,317 | SF | 0.10 | 11,932 |
| | | | | 3,347,039 |

4. Exterior Cladding

| | | | | |
|---|---|---|---|---|
| Wall framing, furring and insulation | | | | |
| Sheet metal stud framing an furring | 21,693 | SF | 6.50 | 141,005 |
| Batt insulation in walls | 21,693 | SF | 1.00 | 21,693 |
| Prefabricated cladding panels | | | | |
| Prefinished metal siding including back-up framing, etc. | 3,255 | SF | 28.00 | 91,140 |
| Architectural precast concrete panels, 30% | 18,438 | SF | 55.00 | 1,014,090 |
| Interior finish to exterior walls | | | | |
| Gypsum board walls, taped and textured | 21,693 | SF | 1.93 | 41,867 |
| Paint gypsum board or plaster | 21,693 | SF | 0.54 | 11,714 |
| Windows, glazing and louvers | | | | |
| Prefinished metal glazed curtainwall, 70% | 43,022 | SF | 80.00 | 3,441,760 |
| Exterior doors, frames and hardware | | | | |
| Aluminum glazed entrances and frames, per leaf | 10 | EA | 3,000.00 | 30,000 |
| Hollow steel doors, per leaf | 9 | EA | 1,500.00 | 13,500 |
| Fascias, bands, screens and trim, etc. | | | | |
| Allow for seismic joint | 669 | LF | 100.00 | 66,900 |
| Allow for horizontal sunshade, South elev only | 1,356 | LF | 175.00 | 237,300 |
| Allow for interior light shelf | 1,356 | LF | 175.00 | 237,300 |
| Soffits | | | | |
| Composite metal panel | 2,039 | SF | 65.00 | 132,535 |
| Balustrades, parapets and screens | | | | |
| Parapet - extend curtainwall | 3,015 | SF | 80.00 | 241,200 |
| Finish backside of parapet | 3,015 | SF | 10.00 | 30,150 |
| | | | | 5,752,154 |

5. Roofing, Waterproofing & Skylights

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| *Item Description* | *Quantity* | *Unit* | *Rate* | *Total* |
|---|---|---|---|---|
| Insulation | | | | |
| Rigid insulation under roofing | 24,373 | SF | 6.00 | 146,238 |
| Roofing | | | | |
| Single-ply TPO membrane | 24,373 | SF | 6.50 | 158,425 |
| Roof or deck traffic surfaces | | | | |
| Walkpads | 1,219 | SF | 5.70 | 6,948 |
| Roofing upstands and sheetmetal | | | | |
| Coping | 1,005 | LF | 15.00 | 15,075 |
| Allow for roof carpentry and general sheetmetal | 24,373 | SF | 1.00 | 24,373 |
| Caulking and sealants | | | | |
| Allow | 64,715 | SF | 0.35 | 22,650 |
| | | | | 373,709 |

## 6. Interior Partitions, Doors & Glazing

| | | | | |
|---|---|---|---|---|
| Partition framing and cores | | | | |
| Metal stud framing | 129,592 | SF | 2.40 | 311,021 |
| Partition surfacing | | | | |
| Gypsum board walls, taped and textured | 259,184 | SF | 1.93 | 501,067 |
| Paint gypsum board or plaster | 259,184 | SF | 0.54 | 140,841 |
| Sound insulation | | | | |
| Batt insulation in walls | 129,592 | SF | 0.85 | 110,153 |
| Balustrades and rails | | | | |
| Glass and metal balustrades | 216 | LF | 385.00 | 83,160 |
| Window walls and borrowed lights | | | | |
| Allow for window wall/transoms and sidelights | 9,071 | SF | 44.00 | 399,124 |
| Interior doors, frames and hardware | | | | |
| Wood doors, per leaf | 246 | EA | 1,050.00 | 258,300 |
| | | | | 1,803,666 |

## 7. Floor, Wall & Ceiling Finishes

| | | | | |
|---|---|---|---|---|
| Floors | | | | |
| Concrete sealer | 119,317 | SF | 1.00 | 119,317 |
| Raised access floor, 12" | 116,353 | SF | 7.75 | 901,736 |
| Bases | | | | |
| Allow | 119,317 | SF | 0.50 | 59,659 |

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| *Item Description* | *Quantity* | *Unit* | *Rate* | *Total* |
|---|---|---|---|---|
| Walls | | | | |
| Allow | 119,317 | SF | 1.50 | 178,976 |
| Columns | | | | |
| Allow | 25,016 | SF | 4.00 | 100,064 |
| Ceilings | | | | |
| Allow | 119,317 | SF | 4.24 | 505,307 |
| | | | | 1,865,058 |

8. Function Equipment & Specialties

| | | | | |
|---|---|---|---|---|
| Protective guards, barriers and bumpers | | | | |
| Allow for corner guards, wall protection, dock bumpers | 119,317 | SF | 0.12 | 14,318 |
| Prefabricated compartments and accessories | | | | |
| Allow for toilet partitions and urinal screens | 119,317 | SF | 0.55 | 65,624 |
| Allow for toilet accessories | 119,317 | SF | 0.35 | 41,761 |
| Shelving and millwork | | | | |
| Allow for shelving, mail slots, etc. | 119,317 | SF | 0.15 | 17,898 |
| Cabinets and counter tops | | | | |
| Allow for modular casework | 119,317 | SF | 2.00 | 238,634 |
| Chalkboards, insignia, graphics, etc. | | | | |
| Code signage | 119,317 | SF | 0.10 | 11,932 |
| Wayfinding/Room ID/Graphics | 119,317 | SF | 0.90 | 107,385 |
| Tackboards/markerboards | 119,317 | SF | 0.15 | 17,898 |
| Light and vision control | | | | |
| Roller shades | 43,022 | SF | 8.00 | 344,176 |
| Projections screens | 119,317 | SF | 0.12 | 14,318 |
| Conveying & powered mechanical equipment | | | | |
| Allow for window washing davits | 34 | EA | 500.00 | 17,000 |
| Amenities and convenience items | | | | |
| Allow for lockers/benches | 119,317 | SF | 0.06 | 7,159 |
| Allow for fire extinguishers | 40 | EA | 350.00 | 14,000 |
| Special use equipment of all types | | | | |
| Kitchen and food service equipment, Break Area | 1,000 | SF | 115.00 | 115,000 |
| Allow for residential kitchen appliances | 10 | SF | 1,500.00 | 15,000 |
| | | | | 1,042,103 |

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| *Item Description* | *Quantity* | *Unit* | *Rate* | *Total* |
|---|---|---|---|---|
| 9. Stairs & Vertical Transportation | | | | |
| Staircase flights - floor to floor | | | | |
| Pre-engineered steel stairs, per flight | 9 | EA | 15,500.00 | 139,500 |
| Communicating stair including terrazzo treads/risers and glass balustrades | 4 | EA | 65,000.00 | 260,000 |
| Elevators | | | | |
| Passenger, traction 350fpm, per stop | 11 | EA | 28,000.00 | 308,000 |
| | | | | 707,500 |
| 10. Plumbing Systems | | | | |
| Sanitary fixtures and connection piping | | | | |
| Plumbing fixtures | 120 | EA | 1,250.00 | 150,000 |
| Sanitary waste, vent and service piping | | | | |
| Floor drains and sinks | 24 | EA | 1,000.00 | 24,000 |
| Hose bibbs/wall hydrants | 1 | LS | 10,000.00 | 10,000 |
| Rough in to plumbing fixtures | 120 | EA | 2,150.00 | 258,000 |
| Rough-in to catering | 1 | LS | 35,000.00 | 35,000 |
| Premium for gray water system | 1 | LS | 200,000.00 | 200,000 |
| Water treatment, storage and circulation | | | | |
| Gas fired domestic water heaters and pumps | 1 | LS | 12,000.00 | 12,000 |
| Expansion tanks and air separators | 1 | LS | 2,000.00 | 2,000 |
| Sewage ejector | 1 | EA | 7,500.00 | 7,500 |
| Surface water drainage | | | | |
| Roof and overflow drains | 62 | EA | 350.00 | 21,700 |
| Drain pipework; insulated | 3,667 | LF | 40.00 | 146,680 |
| Gas and fuel oil distribution | | | | |
| Gas to water heaters and catering | 1 | LS | 18,000.00 | 18,000 |
| | | | | 884,880 |
| 11. Heating, Ventilation & Air Conditioning | | | | |
| Piping, fittings, valves and insulation | | | | |
| HHW piping, valves and insulation to AHU, and VAV boxes | 119,317 | SF | 4.00 | 477,268 |

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| *Item Description* | *Quantity* | *Unit* | *Rate* | *Total* |
|---|---|---|---|---|
| CHW piping, valves and insulation to AHU's | 119,317 | SF | 1.25 | 149,146 |
| Air handling equipment | | | | |
| Central air handling units | 119,317 | CFM | 4.00 | 477,268 |
| Variable frequency drives | 191 | HP | 225.00 | 42,975 |
| VAV boxes with reheat | 120 | EA | 950.00 | 114,000 |
| Independent coolers/split systems | 1 | LS | 15,000.00 | 15,000 |
| Sound attenuation | 119,317 | CFM | 0.35 | 41,761 |
| Air distribution and return | | | | |
| Galvanized steel ductwork | 119,317 | LB | 5.75 | 686,073 |
| Flexible duct | 3,005 | LF | 12.00 | 36,060 |
| Duct volume dampers | 600 | EA | 65.00 | 39,000 |
| Catering exhaust | 1 | LS | 200,000.00 | 200,000 |
| Duct fire dampers | 41 | EA | 1,200.00 | 49,200 |
| Duct insulation | 71,580 | SF | 2.60 | 186,108 |
| Diffusers and return air grilles | | | | |
| Ceiling/wall diffusers and return air grilles | 600 | EA | 120.00 | 72,000 |
| Controls, instrumentation and balancing | | | | |
| DDC control system; Siemens | 119,317 | SF | 3.75 | 447,439 |
| Testing and commissioning | 1,000 | HR | 90.00 | 90,000 |
| Independent exhaust ventilation | | | | |
| Miscellaneous fans | 23,863 | CFM | 0.80 | 19,090 |
| | | | | 3,142,388 |

## 12. Electrical Lighting, Power & Communication

| | | | | |
|---|---|---|---|---|
| Main service and distribution etc. | | | | |
| Switchgear, transformers, switchboards,MCC's and feeders - serving office and garage | 3,035 | KVA | 250.00 | 758,750 |
| Emergency or uninterrupted power | | | | |
| Secondary switchboards, ATS, transformers and feeders | 430 | KVA | 150.00 | 64,500 |
| Machine and equipment power | | | | |
| Connections and switches | 119,317 | SF | 1.35 | 161,078 |
| User convenience power | | | | |
| Receptacles including panelboards, conduit and wire | 1,705 | EA | 285.00 | 485,925 |
| Lighting | | | | |

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| *Item Description* | *Quantity* | *Unit* | *Rate* | *Total* |
|---|---|---|---|---|
| Fixtures including panelboards, conduit, wire and switching | 1,990 | EA | 485.00 | 965,150 |
| Lighting and power specialties | | | | |
| Grounding system | 1 | LS | 11,500.00 | 11,500 |
| Lighting controls | 119,317 | SF | 1.00 | 119,317 |
| Telephone and communications systems | | | | |
| MDF/IDF rough-in | 1 | LS | 40,000.00 | 40,000 |
| Cable trays | 2,386 | LF | 40.00 | 95,440 |
| Telephone/data outlets including conduit and cable | 600 | EA | 700.00 | 420,000 |
| Wireless access points | 33 | EA | 750.00 | 24,750 |
| CATV outlets including conduit, wire and head end equipment - allow | 40 | EA | 500.00 | 20,000 |
| AV conduit system | 1 | LS | 75,000.00 | 75,000 |
| Alarm and security systems | | | | |
| Fire alarm control panel and annunciator | 1 | LS | 50,000.00 | 50,000 |
| Fire alarm devices including conduit and wire | 300 | EA | 600.00 | 180,000 |
| Security system rough in | 1 | LS | 15,000.00 | 15,000 |
| Security system equipment and cabling - allowance | 1 | LS | 35,000.00 | 35,000 |
| | | | | 3,521,410 |

## 13. Fire Protection Systems

| | | | | |
|---|---|---|---|---|
| Fire sprinkler systems | | | | |
| Automatic wet sprinkler system | 119,317 | SF | 3.85 | 459,370 |
| | | | | 459,370 |

Washington State Department of Information Services DC+OB+PG
Data Center (3 over 1)
Olympia, WA

*BASELINE Conceptual Cost Model REV 8b*
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*DATA CENTER (3 OVER 1) AREAS & CONTROL QUANTITIES*

Areas

| | SF | SF | SF |
|---|---|---|---|
| Enclosed Areas | | | |
| GFA Data center Lower level STORAGE/WAREHOUSE | 10,900 | | |
| GFA Data Center Lower level UPS/BATTERIES/CHILLERS | 45,000 | | |
| GFA Data Center Lower level DATA HALL Shell | 15,300 | | |
| GFA Data center First flr STUDIO/PRODUCTION | 18,000 | | |
| GFA Data center First flr DATA HALL (50% shell) | 61,750 | | |
| GFA Data center Second floor DATA OFFICE/COMMAND CENTER | 23,867 | | |
| Penthouse | 3,087 | | |
| SUBTOTAL, Enclosed Area | | 177,904 | |
| Covered area | | | |
| SUBTOTAL, Covered Area @ ½ Value | | | |
| TOTAL GROSS FLOOR AREA | | | 177,904 |

Control Quantities

| | | | | Ratio to Gross Area |
|---|---|---|---|---|
| Functional Units - RAISED FLOOR | | 30,000 | SF | 0.169 |
| Number of stories (x1,000) | | 4 | EA | 0.022 |
| Gross Area | | 177,904 | SF | 1.000 |
| Enclosed Area | | 177,904 | SF | 1.000 |
| Covered Area | | 0 | SF | 0.000 |
| Footprint Area | | 79,750 | SF | 0.448 |
| Volume | | 3,280,335 | CF | 18.439 |
| Basement Volume | | 1,772,700 | CF | 9.964 |
| Gross Wall Area | | 23,909 | SF | 0.134 |
| Retaining Wall Area | | 5,461 | SF | 0.031 |
| Finished Wall Area | | 18,448 | SF | 0.104 |
| Windows or Glazing Area | 47.45% | 11,344 | SF | 0.064 |
| Roof Area - Flat | | 79,750 | SF | 0.448 |
| Roof Area - Sloping | | 0 | SF | 0.000 |
| Roof Area - Total | | 79,750 | SF | 0.448 |

| | |
|---|---|
| Washington State Department of Information Services DC+OB+PG | *BASELINE Conceptual Cost Model REV 8b* |
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*DATA CENTER (3 OVER 1) AREAS & CONTROL QUANTITIES*

| | | | |
|---|---|---|---|
| Roof Glazing Area | 0 | SF | 0.000 |
| Interior Partition Length | 7,653 | LF | 0.043 |
| Finished Area | 147,904 | SF | 0.831 |
| Elevators (x10,000) | 1 | EA | 0.056 |
| Plumbing Fixtures (x1,000) | 90 | EA | 0.506 |
| Electrical Load | 21,600 | KW | 121.414 |

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Data Center (3 over 1)
Olympia, WA

*BASELINE Conceptual Cost Model REV 8b*
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*DATA CENTER (3 OVER 1) COMPONENT SUMMARY*

Gross Area: 177,904 SF

| | | $/SF | $x1,000 |
|---|---|---|---|
| 1. Foundations | | 23.55 | 4,190 |
| 2. Vertical Structure | | 15.82 | 2,815 |
| 3. Floor & Roof Structures | | 27.90 | 4,963 |
| 4. Exterior Cladding | | 9.60 | 1,707 |
| 5. Roofing, Waterproofing & Skylights | | 15.14 | 2,694 |
| *Shell (1-5)* | | 92.01 | 16,370 |
| 6. Interior Partitions, Doors & Glazing | | 11.67 | 2,076 |
| 7. Floor, Wall & Ceiling Finishes | | 12.85 | 2,286 |
| *Interiors (6-7)* | | 24.52 | 4,363 |
| 8. Function Equipment & Specialties | | 3.00 | 533 |
| 9. Stairs & Vertical Transportation | | 1.71 | 305 |
| *Equipment & Vertical Transportation (8-9)* | | 4.71 | 838 |
| 10. Plumbing Systems | | 9.90 | 1,761 |
| 11. Heating, Ventilating & Air Conditioning | | 54.03 | 9,612 |
| 12. Electric Lighting, Power & Communications | | 116.86 | 20,789 |
| 13. Fire Protection Systems | | 6.01 | 1,070 |
| *Mechanical & Electrical (10-13)* | | 186.79 | 33,231 |
| *Total Building Construction (1-13)* | | 308.04 | 54,802 |
| 14. Site Preparation & Demolition | | 0.00 | 0 |
| 15. Site Paving, Structures & Landscaping | | 0.00 | 0 |
| 16. Utilities on Site | | 0.00 | 0 |
| *Total Site Construction (14-16)* | | 0.00 | 0 |
| *TOTAL BUILDING & SITE (1-16)* | | 308.04 | 54,802 |
| General conditions including hoisting | 11.25% | 34.65 | 6,165 |
| Contractor's Overhead & Profit or Fee | 4.50% | 15.42 | 2,743 |
| *PLANNED CONSTRUCTION COST* | *March 2007* | 358.11 | 63,710 |
| Contingency for Development of Design | 15.00% | 53.71 | 9,556 |
| Escalation to Midpoint (December 2009) | 17.02% | 70.11 | 12,472 |
| *RECOMMENDED BUDGET* | *January 2009* | 481.93 | 85,738 |

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Data Center (3 over 1) — *March 23, 2007*
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| *Item Description* | *Quantity* | *Unit* | *Rate* | *Total* |
|---|---|---|---|---|
| 1. Foundations | | | | |
| Excavation | | | | |
| Excavate basement and remove | 104,865 | CY | 14.50 | 1,520,543 |
| Shoring sides of excavation | | | | |
| Vertical earth banks, H piles/wood lagging | 6,160 | SF | 49.50 | 304,920 |
| Piling | | | | |
| Drilled reinforced concrete caissons, 18" x 65' | | | | |
| Auger, earth | 20,933 | LF | 20.00 | 418,660 |
| Auger, rock 8' | 840 | LF | 26.00 | 21,840 |
| Haul spoils | 2,036 | CY | 10.00 | 20,360 |
| Casing | 20,933 | LF | 20.00 | 418,660 |
| Reinforcing steel in piles, mild allow 200pcy | 361,680 | LB | 0.75 | 271,260 |
| Concrete, 5000psi | 1,644 | CY | 154.00 | 253,176 |
| Reinforced concrete including excavation | | | | |
| Pile caps | | | | |
| Machine excavate footings | 3,712 | CY | 14.75 | 54,752 |
| Fine grade bottom of footings | 6,564 | SF | 0.30 | 1,969 |
| Formwork to footing sides, built-up | 11,909 | SF | 11.91 | 141,860 |
| Reinforcing steel in footings, mild allow 125pcy | 157,894 | LB | 0.75 | 118,421 |
| Concrete, 5000psi | 1,203 | CY | 154.00 | 185,262 |
| Float top of footing | 6,564 | SF | 0.30 | 1,969 |
| Backfill footing w/structural fill | 2,509 | CY | 23.75 | 59,589 |
| Remove surplus excavation | 4,826 | CY | 12.00 | 57,912 |
| Retaining wall footings, assume 5'W x 2'H | | | | |
| Machine excavate footings | 1,305 | CY | 14.75 | 19,249 |
| Fine grade bottom of footings | 6,800 | SF | 0.30 | 2,040 |
| Formwork to footing sides, built-up | 5,460 | SF | 11.90 | 64,974 |
| Waterstops | 1,360 | LF | 3.00 | 4,080 |
| Reinforcing steel in footings, mild allow 100pcy | 58,170 | LB | 0.75 | 43,628 |
| Concrete, 5000psi | 554 | CY | 154.00 | 85,316 |
| Float top of footing | 6,800 | SF | 0.30 | 2,040 |
| Backfill footing w/structural fill | 751 | CY | 23.75 | 17,836 |
| Remove surplus excavation | 1,697 | CY | 12.02 | 20,394 |
| Elevator pits | 1 | EA | 9,500.00 | 9,500 |
| Sump pits | 1 | EA | 1,400.00 | 1,400 |
| Subsurface drainage | | | | |

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| *Item Description* | *Quantity* | *Unit* | *Rate* | *Total* |
|---|---|---|---|---|
| Perimeter foundation drain | 1,360 | LF | 19.50 | 26,520 |
| Temporary job dewatering | 12 | MO | 3,500.00 | 42,000 |
| | | | | 4,190,128 |

## 2. Vertical Structure

| | | | | |
|---|---|---|---|---|
| Columns and pilasters | | | | |
| Reinforced concrete gravity columns, assume 24"x32" & 24"x24" | | | | |
| Formwork to columns, built-up | 26,831 | SF | 5.40 | 144,887 |
| Reinforcing steel in columns, allow 550pcy | 335,775 | LB | 0.75 | 251,831 |
| Concrete, 5000psi | 555 | CY | 288.85 | 160,312 |
| Finish | 26,831 | SF | 0.65 | 17,440 |
| Retaining walls | | | | |
| Reinforced concrete retaining walls, assume 21" | | | | |
| Formwork to walls, built-up | 10,922 | SF | 9.25 | 101,029 |
| Reinforcing steel in retaining walls, allow 180pcy | 678,546 | LB | 0.75 | 508,910 |
| Concrete, 5000psi | 3,427 | CY | 227.50 | 779,643 |
| Finish | 100,922 | SF | 0.65 | 65,599 |
| Shear bracing | | | | |
| Reinforced concrete shear walls, assume 15" & 18" | | | | |
| Formwork to walls, built-up | 35,157 | SF | 9.25 | 325,202 |
| Reinforcing steel in shear walls, allow 300pcy | 303,930 | LB | 0.75 | 227,948 |
| Concrete, 5000psi | 921 | CY | 227.50 | 209,528 |
| Finish | 35,157 | SF | 0.65 | 22,852 |
| | | | | 2,815,180 |

## 3. Floor and Roof Structure

| | | | | |
|---|---|---|---|---|
| Floor at lowest level | | | | |
| Slab on grade, 8" | | | | |
| Fine grade | 79,750 | SF | 0.30 | 23,925 |

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| *Item Description* | *Quantity* | *Unit* | *Rate* | *Total* |
|---|---|---|---|---|
| Gravel base, 6" | 1,477 | CY | 28.00 | 41,356 |
| Vapor barrier | 79,750 | SF | 0.15 | 11,963 |
| Sand cushion, 2" | 492 | CY | 28.00 | 13,776 |
| Construction jt/edge form | 7,975 | LF | 3.80 | 30,305 |
| Set screeds | 79,750 | SF | 0.15 | 11,963 |
| Reinforcing steel, allow 100pcy | 227,430 | LB | 0.75 | 170,573 |
| Concrete, 4000psi | 2,166 | CY | 145.00 | 314,070 |
| Control jt | 2,393 | LF | 3.00 | 7,179 |
| Finish | 79,750 | SF | 0.50 | 39,875 |
| Suspended floors | | | | |
| Precast double tees and beams | | | | |
| Allow for double tees, beams and joint filler | 53,200 | SF | 16.00 | 851,200 |
| Topping slab, 4" | 690 | CY | 154.00 | 106,260 |
| Finish | 532,000 | SF | 0.50 | 266,000 |
| Reinforced concrete beam & slab, 6" | 44,954 | SF | 22.10 | 993,335 |
| Flat roofs | | | | |
| Allow for double tees, beams and joint filler, topping slab and finish | 61,750 | SF | 23.00 | 1,420,088 |
| Reinforced concrete beam & slab, 6" | 18,000 | SF | 22.10 | 397,741 |
| Miscellaneous | | | | |
| Misc metals | 177,904 | SF | 1.38 | 245,508 |
| Concrete curbs/housekeeping pads | 177,904 | SF | 0.10 | 17,790 |
| | | | | 4,962,905 |

## 4. Exterior Cladding

| | | | | |
|---|---|---|---|---|
| Wall framing, furring and insulation | | | | |
| Sheet metal stud framing an furring | 19,917 | SF | 2.40 | 47,801 |
| Batt insulation in walls | 19,917 | SF | 1.00 | 19,917 |
| Prefabricated cladding panels | | | | |
| Prefinished metal siding including back-up framing, etc. | 3,696 | SF | 28.00 | 103,488 |
| Architectural precast concrete panels | 4,221 | SF | 55.00 | 232,155 |
| Interior finish to exterior walls | | | | |
| Gypsum board walls, taped and textured | 19,917 | SF | 1.93 | 38,440 |
| Paint gypsum board or plaster | 19,917 | SF | 0.54 | 10,755 |
| Windows, glazing and louvers | | | | |

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| *Item Description* | *Quantity* | *Unit* | *Rate* | *Total* |
|---|---|---|---|---|
| Prefinished metal glazed curtainwall | 9,849 | SF | 80.00 | 787,920 |
| Exterior doors, frames and hardware | | | | |
| Aluminum glazed entrances and frames, per leaf | 18 | EA | 3,000.00 | 54,000 |
| Hollow steel doors, per leaf | 16 | EA | 1,500.00 | 24,000 |
| Fascias, bands, screens and trim, etc. | | | | |
| Allow for horizontal sunshade, South elev only | 188 | LF | 175.00 | 32,900 |
| Allow for interior light shelf | 188 | LF | 175.00 | 32,900 |
| Balustrades, parapets and screens | | | | |
| Parapet - extend curtainwall | 1,495 | SF | 80.00 | 119,600 |
| Parapet - extend concrete wall | 3,408 | SF | 45.33 | 154,480 |
| Finish backside of parapet | 4,903 | SF | 10.00 | 49,030 |
| | | | | 1,707,386 |

## 5. Roofing, Waterproofing & Skylights

| | | | | |
|---|---|---|---|---|
| Waterproofing walls below grade | | | | |
| Bentonite panels and waterproofing | 50,461 | SF | 5.50 | 277,536 |
| Roofing | | | | |
| Allow for green roof including roofing, sheetmetal, pavers/plantings, etc | 79,750 | SF | 30.00 | 2,392,500 |
| Caulking and sealants | | | | |
| Allow | 68,909 | SF | 0.35 | 24,118 |
| | | | | 2,694,154 |

## 6. Interior Partitions, Doors & Glazing

| | | | | |
|---|---|---|---|---|
| Partition framing and cores | | | | |
| Metal stud framing | 154,395 | SF | 2.40 | 370,548 |
| Partition surfacing | | | | |
| Gypsum board walls, taped and textured | 308,790 | SF | 1.93 | 596,968 |
| Paint gypsum board or plaster | 308,790 | SF | 0.54 | 167,796 |
| Sound insulation | | | | |
| Batt insulation in walls | 154,395 | SF | 0.85 | 131,236 |
| Balustrades and rails | | | | |

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| *Item Description* | *Quantity* | *Unit* | *Rate* | *Total* |
|---|---|---|---|---|
| Allow | 1 | LS | 25,000.00 | 25,000 |
| Window walls and borrowed lights | | | | |
| Allow for window wall/transoms and sidelights | 10,808 | SF | 44.00 | 475,552 |
| Interior doors, frames and hardware | | | | |
| Wood doors, per leaf | 206 | EA | 1,500.00 | 309,000 |
| | | | | 2,076,101 |

## 7. Floor, Wall & Ceiling Finishes

| | | | | |
|---|---|---|---|---|
| Floors | | | | |
| Concrete sealer | 166,904 | SF | 1.00 | 166,904 |
| Raised access floor, 12" | 23,867 | SF | 7.75 | 184,969 |
| Raised access floor, 36" | 30,000 | SF | 21.00 | 630,000 |
| Allow for CRC coating | 11,000 | SF | 8.00 | 88,000 |
| Bases | | | | |
| Allow | 177,904 | SF | 0.50 | 88,952 |
| Walls | | | | |
| Allow | 177,904 | SF | 1.50 | 266,856 |
| Columns | | | | |
| Allow | 26,831 | SF | 4.00 | 107,324 |
| Ceilings | | | | |
| Allow | 177,904 | SF | 4.24 | 753,423 |
| | | | | 2,286,429 |

## 8. Function Equipment & Specialties

| | | | | |
|---|---|---|---|---|
| Protective guards, barriers and bumpers | | | | |
| Allow for corner guards, wall protection, dock bumpers | 177,904 | SF | 0.10 | 17,790 |
| Prefabricated compartments and accessories | | | | |
| Allow for toilet partitions and urinal screens | 177,904 | SF | 0.18 | 32,023 |
| Allow for toilet accessories | 177,904 | SF | 0.12 | 21,348 |
| Shelving and millwork | 177,904 | | | |
| Allow for shelving, mail slots, etc. | 177,904 | SF | 0.04 | 6,671 |
| Cabinets and counter tops | | | | |

Washington State Department of Information Services DC+OB+PG — *BASELINE Conceptual Cost Model REV 8b*
Data Center (3 over 1) — *March 23, 2007*
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| *Item Description* | *Quantity* | *Unit* | *Rate* | *Total* |
|---|---|---|---|---|
| Allow for modular casework | 177,904 | SF | 1.50 | 266,856 |
| Chalkboards, insignia, graphics, etc. | | | | |
| Code signage | 177,904 | SF | 0.10 | 17,790 |
| Wayfinding/Room ID/Graphics | 177,904 | SF | 0.23 | 40,028 |
| Tackboards/markerboards | 177,904 | SF | 0.04 | 6,671 |
| Light and vision control | | | | |
| Roller shades | 9,849 | SF | 8.00 | 78,792 |
| Projections screens | 177,904 | SF | 0.03 | 5,337 |
| Conveying & powered mechanical equipment | | | | |
| Allow for window washing davits | 17 | EA | 500.00 | 8,500 |
| Amenities and convenience items | | | | |
| Allow for lockers/benches | 177,904 | SF | 0.06 | 10,674 |
| Allow for fire extinguishers | 59 | EA | 350.00 | 20,650 |
| | | | | 533,133 |

## 9. Stairs & Vertical Transportation

| | | | | |
|---|---|---|---|---|
| Staircase flights - floor to floor | | | | |
| Pre-engineered steel stairs, per flight | 10 | EA | 15,500.00 | 155,000 |
| Elevators | | | | |
| Freight, hydraulic 150fpm, 4 stop | 1 | EA | 150,000.00 | 150,000 |
| | | | | 305,000 |

## 10. Plumbing Systems

| | | | | |
|---|---|---|---|---|
| Sanitary fixtures and connection piping | | | | |
| Plumbing fixtures | 90 | EA | 1,250.00 | 112,500 |
| Sanitary waste, vent and service piping | | | | |
| Floor drains and sinks | 18 | EA | 1,000.00 | 18,000 |
| Hose bibbs/wall hydrants | 1 | LS | 8,000.00 | 8,000 |
| Rough in to plumbing fixtures | 90 | EA | 2,150.00 | 193,500 |
| Premium for gray water system | 1 | LS | 100,000.00 | 100,000 |
| Water treatment, storage and circulation | | | | |
| Gas fired domestic water heaters and pumps | 1 | LS | 9,600.00 | 9,600 |

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| *Item Description* | *Quantity* | *Unit* | *Rate* | *Total* |
|---|---|---|---|---|
| Expansion tanks and air separators | 1 | LS | 2,000.00 | 2,000 |
| Sewage ejector | 1 | EA | 7,500.00 | 7,500 |
| Surface water drainage | | | | |
| Roof and overflow drains | 232 | EA | 350.00 | 81,200 |
| Drain pipework; insulated | 8,770 | LF | 40.00 | 350,800 |
| Gas and fuel oil distribution | | | | |
| Gas to water heaters | 1 | LS | 10,000.00 | 10,000 |
| Allowance for additional seismic bracing | 177,904 | SF | 0.60 | 106,742 |
| CUP | | | | |
| Gas and fuel oil distribution | | | | |
| Piping to boilers | 1 | LS | 25,000.00 | 25,000 |
| Bulk oil storage and ancillaries | 48,000 | GAL | 10.00 | 480,000 |
| Fuel oil pump skids; duplicate pumps | 2 | EA | 100,000.00 | 200,000 |
| Fuel oil leak detection system | 1 | LS | 50,000.00 | 50,000 |
| Allowance for additional seismic bracing | 9,750 | SF | 0.60 | 5,850 |
| | | | | 1,760,692 |

## 11. Heating, Ventilation & Air Conditioning

| | | | | |
|---|---|---|---|---|
| CUP | | | | |
| Heat generation and chilling | | | | |
| Gas fired heating boilers, flues and ancillaries | 11,700 | MBTU | 20.00 | 234,000 |
| Water cooled chillers | 1,500 | TN | 500.00 | 750,000 |
| Cooling towers; stainless steel | 1,500 | TN | 200.00 | 300,000 |
| Water treatment | 1 | LS | 50,000.00 | 50,000 |
| Thermal storage and circulation pumps | | | | |
| Expansion tanks and air separators | 2 | EA | 8,000.00 | 16,000 |
| HHW pumps | 4 | EA | 5,000.00 | 20,000 |
| Chilled water primary pumps; 1200gpm | 3 | EA | 35,000.00 | 105,000 |
| Chilled water secondary pumps; 1200 gpm; two pump skid, variable volume | 2 | EA | 70,000.00 | 140,000 |
| Condenser water pumps; 1500 gpm | 3 | EA | 40,000.00 | 120,000 |
| Variable speed drives | 130 | HP | 250.00 | 32,500 |
| Vibration isolation to pumps | 12 | EA | 1,500.00 | 18,000 |
| Piping, fittings, valves and insulation | | | | |

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| *Item Description* | *Quantity* | *Unit* | *Rate* | *Total* |
|---|---|---|---|---|
| Heating and chilled water piping, valves and insulation | 9,750 | SF | 40.00 | 390,000 |
| Condenser water piping incl valves | 9,750 | SF | 20.00 | 195,000 |
| Controls, instrumentation and balancing | | | | |
| DDC control system | 1 | LS | 150,000.00 | 150,000 |
| Testing and commissioning | 600 | HR | 90.00 | 54,000 |
| Allowance for additional seismic bracing | 1 | LS | 100,000.00 | 100,000 |
| DATA CENTER | | | | |
| Piping, fittings, valves and insulation | | | | |
| HHW piping, valves and insulation | 117,904 | SF | 3.50 | 412,664 |
| CHW piping, valves and insulation | 147,904 | SF | 4.40 | 650,778 |
| Air handling equipment | | | | |
| Central air handling units | 162,946 | CFM | 3.00 | 488,838 |
| Computer room air conditioning units (CRAC); 30 TN capacity | 30 | EA | 75,000.00 | 2,250,000 |
| VAV units with reheat | 118 | EA | 950.00 | 112,100 |
| Sound attenuation | 162,946 | CFM | 0.35 | 57,031 |
| Air distribution and return | | | | |
| Galvanized steel ductwork | 190,407 | LB | 5.75 | 1,094,840 |
| Flexible ducting | 4,890 | LF | 12.00 | 58,680 |
| Duct volume dampers | 978 | EA | 65.00 | 63,570 |
| Duct fire dampers | 85 | EA | 1,200.00 | 102,000 |
| Duct insulation | 11,424 | SF | 2.60 | 29,702 |
| Diffusers and return air grilles | | | | |
| Ceiling/wall diffusers and return air grilles | 978 | EA | 120.00 | 117,360 |
| Controls, instrumentation and balancing | | | | |
| DDC control system | 177,904 | SF | 6.30 | 1,120,795 |
| Testing and commissioning | 2,000 | HR | 90.00 | 180,000 |
| Independent exhaust ventilation | | | | |
| Miscellaneous fans | 35,581 | CFM | 0.80 | 28,465 |
| Allowance for additional seismic bracing | 131,104 | SF | 1.30 | 170,435 |
| | | | | 9,611,759 |

12. Electrical Lighting, Power & Communication

CUP

Main service and distribution etc.

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Data Center (3 over 1) — *March 23, 2007*
Olympia, WA — *0278-7508.110*

| *Item Description* | *Quantity* | *Unit* | *Rate* | *Total* |
|---|---|---|---|---|
| Main switchboard, double ended, 12.47kV, 1200A | 1 | LS | 850,000.00 | 850,000 |
| Feeder conduit and wire, 12.47kV, main switchboard to substation transformers - allowance | 500 | LF | 300.00 | 150,000 |
| Substation transformers, 12.47kV/480V - initial install | 10 | EA | 120,000.00 | 1,200,000 |
| Substation transformers, 12.47kV/480V - final install - excluded | | | | |
| Switchboards, Mechanical plant | 1 | EA | 90,000.00 | 90,000 |
| Feeder conduit and wire, 480V, substation transformers to mechanical switchboard - allowance | 200 | LF | 250.00 | 50,000 |
| Emergency or uninterrupted power | | | | |
| Generators, diesel, 12.47kV - initial install | 6,600 | KVA | 250.00 | 1,650,000 |
| Generators, diesel, 12.47kV - final install - excluded | | | | |
| Generator paralleling switchgear, 12.47kV | 1 | LS | 500,000.00 | 500,000 |
| Generator controls | 1 | LS | 150,000.00 | 150,000 |
| Feeder conduit and wire, 12.47kV, generators to main switchboard - allowance | 1 | LS | 45,000.00 | 45,000 |
| Machine and equipment power | | | | |
| Connections and switches | 1 | LS | 300,000.00 | 300,000 |
| DATA CENTER | | | | |
| Main service and distribution etc. | | | | |
| Switchboards, 480V - initial install | 18,000 | AMP | 45.00 | 810,000 |
| Switchboards, 480V - final install - excluded | | | | |
| Static transfer switches, 480V, 400A | 32 | EA | 8,500.00 | 272,000 |
| Power distribution units, 400A, 300kVA, 480V - initial install | 32 | EA | 30,000.00 | 960,000 |
| Power distribution units, 400A, 300kVA, 480V - final install - excluded | | | | |
| Remote power panels - initial install | 128 | EA | 8,500.00 | 1,088,000 |
| Remote power panels - final install - excluded | | | | |
| Feeder conduit and wire, 480V, substation transformers to switchboards - allow | 1,800 | LF | 700.00 | 1,260,000 |
| Feeder bus duct, 480/277V, 2000A, between switchboards - allowance | 300 | LF | 950.00 | 285,000 |
| Feeder bus duct, 480/277V, 4000A, between switchboards - allowance | 150 | LF | 1,250.00 | 187,500 |
| Feeder conduit and wire, 480V, switchboards to PDU's - allow | 2,400 | LF | 78.00 | 187,200 |

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*BASELINE Conceptual Cost Model REV 8b*
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| *Item Description* | *Quantity* | *Unit* | *Rate* | *Total* |
|---|---|---|---|---|
| Feeder conduit and wire, 480V, PDU's to RPP's - allow | 6,400 | LF | 43.00 | 275,200 |
| DC power distribution system - allowance | 1 | LS | 85,000.00 | 85,000 |
| Secondary switchgear, switchboards,MCC's and feeders - office/support space | 2,355 | KVA | 150.00 | 353,250 |
| Emergency or uninterrupted power | | | | |
| UPS systems - initial install | 6,000 | KW | 650.00 | 3,900,000 |
| UPS systems - final install - excluded | | | | |
| Static bypass switches | 3 | EA | 30,000.00 | 90,000 |
| Switchboards, 480V - initial install | 12,000 | AMP | 45.00 | 540,000 |
| Switchboards, 480V - final install - excluded | | | | |
| Load banks - initial install | 3 | EA | 15,000.00 | 45,000 |
| Load banks - final install - excluded | | | | |
| Feeder bus duct, 480/277V, 4000A, between switchboards and UPS - allowance | 300 | LF | 1,250.00 | 375,000 |
| Feeder bus duct, 480/277V, 2000A, between switchboards and Load banks - allowance | 150 | LF | 950.00 | 142,500 |
| Emergency power off system | 1 | LS | 75,000.00 | 75,000 |
| Secondary switchboards, ATS, transformers and feeders - office/support space | 430 | KVA | 150.00 | 64,500 |
| Machine and equipment power | | | | |
| Mechanical equipment connections and switches | 177,904 | SF | 1.50 | 266,856 |
| Miscellaneous connections including security, BAS, | 1 | LS | 150,000.00 | 150,000 |
| User convenience power | | | | |
| Receptacles including panelboards, conduit and wire - data halls - initial install | 148 | EA | 285.00 | 42,180 |
| Receptacles including panelboards, conduit and wire - office/support space | 1,814 | EA | 285.00 | 516,990 |
| Lighting | | | | |
| Fixtures including panelboards, conduit, wire and switching | 2,725 | EA | 485.00 | 1,321,625 |
| Lighting and power specialties | | | | |
| Grounding system | 1 | LS | 125,000.00 | 125,000 |
| Lighting controls | 177,904 | SF | 0.65 | 115,638 |
| Lightning protection | 177,904 | SF | 0.85 | 151,218 |
| Cable trays - power systems - data halls - initial install | 1 | LS | 100,000.00 | 100,000 |
| Telephone and communications systems | | | | |

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| *Item Description* | *Quantity* | *Unit* | *Rate* | *Total* |
|---|---|---|---|---|
| MDF/IDF rough-in | 1 | LS | 50,000.00 | 50,000 |
| Cable trays - data halls - initial install | 1 | LS | 100,000.00 | 100,000 |
| Cable trays - office/support space | 2,365 | LF | 40.00 | 94,600 |
| Telephone/data passive systems, including conduit, cable, cabinets, terminations, panels and racks - data halls - initial install - excluded | | | | |
| Telephone/data outlets including conduit and cable - office/support space | 594 | EA | 700.00 | 415,800 |
| Wireless access points | 34 | EA | 750.00 | 25,500 |
| CATV outlets including conduit, wire and head end equipment - allow | 45 | EA | 500.00 | 22,500 |
| AV conduit system | 1 | LS | 100,000.00 | 100,000 |
| Alarm and security systems | | | | EXCLUDED |
| Fire alarm control panel and annunciator | 1 | LS | 75,000.00 | 75,000 |
| Fire alarm devices including conduit and wire | 510 | EA | 600.00 | 306,000 |
| VESDA detection system - data halls - initial install | 30,000 | SF | 6.00 | 180,000 |
| Security system rough in | 1 | LS | 50,000.00 | 50,000 |
| Security system equipment and cabling - allowance | 1 | LS | 250,000.00 | 250,000 |
| Building management controls | | | | |
| Power monitoring system | 1 | LS | 350,000.00 | 350,000 |
| | | | | 20,789,057 |

## 13. Fire Protection Systems

| | | | | |
|---|---|---|---|---|
| Fire sprinkler systems | | | | |
| Automatic dry sprinkler system | 117,904 | SF | 4.62 | 544,716 |
| Clean agent system to data halls | 30,000 | SF | 10.00 | 300,000 |
| Clean agent system to data halls shell | 30,000 | SF | 4.00 | 120,000 |
| Allowance for additional seismic bracing | 131,104 | SF | 0.80 | 104,883 |
| | | | | 1,069,600 |

Washington State Department of Information Services DC+OB+PG
Sitework
Olympia, WA

*BASELINE Conceptual Cost Model REV 8b*
*March 23, 2007*
*0278-7508.110*

*SITEWORK AREAS & CONTROL QUANTITIES*

Areas

| | SF | SF | SF |
|---|---|---|---|
| Sitework Area | 285,776 | | |
| TOTAL GROSS SITE AREA | | | 285,776 |

Control Quantities

| | | | Ratio to Gross Area |
|---|---|---|---|
| Gross site area | 285,776 | SF | 1.000 |
| Building demolition area | 14,800 | SF | 0.052 |
| Site demolition/clearing area | 285,776 | SF | 1.000 |
| Earthwork, Site cut/fill | 63,506 | CY | 0.222 |
| Building footprints (new) area | 128,794 | SF | 0.451 |
| Vehicular paving area | 26,070 | SF | 0.091 |
| Pedestrian paving area | 27,830 | SF | 0.097 |
| Landscape area (excluding green roofs) | 103,082 | SF | 0.361 |

Washington State Department of Information Services DC+OB+PG — *BASELINE Conceptual Cost Model REV 8b*
Sitework — *March 23, 2007*
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*SITEWORK COMPONENT SUMMARY*

Gross Area: 285,776 SF

| | | $/SF | $x1,000 |
|---|---|---|---|
| 14. Site Preparation & Demolition | | 2.66 | 760 |
| 15. Site Paving, Structures & Landscaping | | 9.88 | 2,822 |
| 16. Utilities on Site | | 11.96 | 3,418 |
| *TOTAL BUILDING & SITE (1-16)* | | 24.49 | 7,000 |
| General conditions including hoisting | 11.25% | 2.75 | 787 |
| Contractor's Overhead & Profit or Fee | 4.50% | 1.22 | 350 |
| *PLANNED CONSTRUCTION COST* | *March 2007* | 28.47 | 8,137 |
| Contingency for Development of Design | 8.00% | 2.28 | 651 |
| Escalation to Midpoint (December 2009) | 17.02% | 5.23 | 1,496 |
| *RECOMMENDED BUDGET* | *January 2009* | 35.99 | 10,284 |

Washington State Department of Information Services DC+OB+PG
Sitework
Olympia, WA

*BASELINE Conceptual Cost Model REV 8b*
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| *Item Description* | *Quantity* | *Unit* | *Rate* | *Total* |
|---|---|---|---|---|
| **14. Site Preparation & Building Demolition** | | | | |
| HazMat abatement | | SF | 8.50 | EXCLUDED |
| Demolition of buildings and structures | 14,800 | SF | 7.25 | 107,332 |
| Site protective construction | | | | |
| Erosion control | 285,776 | SF | 0.15 | 42,866 |
| Site clearing and grading | | | | |
| Fell and remove trees | 60 | EA | 100.00 | 6,000 |
| Protect existing | 1 | LS | 25,000.00 | 25,000 |
| General site clearance | 285,776 | SF | 0.50 | 142,888 |
| Site utility demo/cap/relocate | 1 | LS | 250,000.00 | 250,000 |
| Rough grade | 285,776 | SF | 0.65 | 185,754 |
| | | | | 759,841 |
| **15. Site Paving, Structures & Landscaping** | | | | |
| Vehicular paving and curbs | | | | |
| AC paving | 18,370 | SF | 2.85 | 52,355 |
| Allow for curb/gutter | 1,500 | LF | 18.00 | 27,000 |
| Concrete paving | 7,700 | SF | 6.00 | 46,200 |
| Pedestrian paving | | | | |
| Concrete paving, scored/colored | 27,830 | SF | 7.00 | 194,810 |
| Structures and water features | | | | |
| Service tunnel, 45'L x 13'W x 8'H | 45 | LF | 1,500.00 | 67,500 |
| Allow for site piers | 1 | LS | 100,000.00 | 100,000 |
| Allow for smoking shelter | 2 | EA | 15,000.00 | 30,000 |
| Allow for trash enclosure | 1 | EA | 30,000.00 | 30,000 |
| Landscape planting and maintenance | | | | |
| Construct filled mounds with borrowed material | 22,080 | CY | 4.00 | 88,320 |
| Landscape planting | 103,082 | SF | | |
| Topsoil fertilizer and grading | 19.04% | | 1,453,456.00 | 276,788 |
| Sod | 0.51% | | 1,453,456.00 | 7,360 |

Washington State Department of Information Services DC+OB+PG — *BASELINE Conceptual Cost Model REV 8b*
Sitework — *March 23, 2007*
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| *Item Description* | *Quantity* | *Unit* | *Rate* | *Total* |
|---|---|---|---|---|
| Trees | 18.11% | | 1,453,456.00 | 263,202 |
| Shrubs/Ground covers/Plantings/Mulch | 62.34% | | 1,453,456.00 | 906,106 |
| Irrigation | | | | |
| Allow, Rainbird Maxicom | 103,082 | SF | 1.40 | 144,315 |
| Fencing and miscellaneous accessories | | | | |
| Allow for site walls | 1 | LS | 100,000.00 | 100,000 |
| Allow for property fence, aluminum security fence | 1,542 | LF | 75.00 | 115,650 |
| Allow for site furnishings | 1 | LS | 25,000.00 | 25,000 |
| Allow for flag poles | 3 | EA | 2,500.00 | 7,500 |
| Allow for monument signs | 4 | EA | 10,000.00 | 40,000 |
| Allow for site signage | 1 | LS | 50,000.00 | 50,000 |
| Site lighting and power | | | | |
| Site lighting - allowance | 1 | LS | 250,000.00 | 250,000 |
| | | | | 2,822,105 |

## 16. Utilities on Site

| | | | | |
|---|---|---|---|---|
| Water mains - domestic and fire | | | | |
| Underground piping | 100 | LF | 150.00 | 15,000 |
| Connections to existing | 2 | EA | 2,500.00 | 5,000 |
| Valves and specialties | 1 | LS | 25,000.00 | 25,000 |
| Gas and fuel oil storage and piping | | | | |
| Underground piping | 50 | LF | 150.00 | 7,500 |
| Connections to existing | 2 | EA | 3,000.00 | 6,000 |
| Valves and specialties | 1 | LS | 25,000.00 | 25,000 |
| Underground sewer piping | | | | |
| Underground piping | 1,000 | LF | 100.00 | 100,000 |
| Connections to existing | 1 | EA | 3,000.00 | 3,000 |
| Manholes | 4 | EA | 3,500.00 | 14,000 |
| Storm water system | | | | |
| Underground piping | 150 | LF | 125.00 | 18,750 |
| Connections to existing | 1 | EA | 2,500.00 | 2,500 |

Washington State Department of Information Services DC+OB+PG
Sitework
Olympia, WA

*BASELINE Conceptual Cost Model REV 8b*
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| *Item Description* | *Quantity* | *Unit* | *Rate* | *Total* |
|---|---|---|---|---|
| Manholes | 2 | EA | 3,000.00 | 6,000 |
| Area drains | 5 | EA | 1,000.00 | 5,000 |
| Rainwater cistern allowance | 250,000 | CF | 5.00 | 1,250,000 |
| Electrical main service | | | | |
| Underground feeders | 200 | LF | 500.00 | 100,000 |
| Manholes | 2 | EA | 10,000.00 | 20,000 |
| Connections to existing | 1 | LS | 5,000.00 | 5,000 |
| Telephone and signal systems connection | | | | |
| Underground ductbank and cabling | 200 | LF | 350.00 | 70,000 |
| Manholes | 2 | EA | 10,000.00 | 20,000 |
| Connections to existing | 1 | LS | 10,000.00 | 10,000 |
| Electrical main service | | | | |
| Modifications and connections at PSE substation | | | | EXCLUDED |
| PSE utility primary cabling, 43.8kV - allowance | 1,000 | LF | 700.00 | 700,000 |
| Concrete encased conduit for primary cabling - allowance | 1 | LS | 100,000.00 | 100,000 |
| PSE utility transformers, 43.8kV to 12.47kV, oil filled, 12MV | 2 | EA | 150,000.00 | 300,000 |
| Secondary conduit and wire, 12.47kV - allowance | 200 | LF | 1,500.00 | 300,000 |
| Incoming electrical service for office building - | 1 | LS | 250,000.00 | 250,000 |
| Telephone and signal systems connection | | | | |
| Telecom/signals ductbank - allowance | 1 | LS | 60,000.00 | 60,000 |
| | | | | 3,417,750 |

Washington State Department of Information Services DC+OB+PG — *BASELINE Conceptual Cost Model REV 8b*
Alternates — *March 23, 2007*
Olympia, WA — *0278-7508.110*

| | *Quantity* | *Unit* | *Rate* | *Total* |
|---|---|---|---|---|
| Alternate 1: Rough order of magnitude for Cogen option in lieu of Baseline | | | | |
| Data Center | | | | |
| Excavate and remove basement | (4,252) | CY | 14.50 | (61,654) |
| Precast double tees and beams | (6,337) | SF | 16.00 | (101,392) |
| Topping slab, 4" | (82) | CY | 154.00 | (12,628) |
| Finish | (6,337) | SF | 0.50 | (3,169) |
| Misc metals | (6,337) | SF | 1.38 | (8,745) |
| Concrete curbs/housekeeping pads | (6,337) | SF | 0.10 | (634) |
| Metal stud framing | (150) | SF | 2.40 | (360) |
| Gypsum board walls, taped and textured | (300) | SF | 1.93 | (580) |
| Paint gypsum board or plaster | (300) | SF | 0.54 | (163) |
| Allow for window wall/transoms and sidelights | (10) | SF | 44.00 | (440) |
| Concrete sealer | (6,337) | SF | 1.00 | (6,337) |
| Bases | (6,337) | SF | 0.50 | (3,169) |
| Walls | (6,337) | SF | 1.50 | (9,506) |
| Ceilings | (6,337) | SF | 4.24 | (26,837) |
| Allow for corner guards, wall protection, dock bumpers | (6,337) | SF | 0.10 | (634) |
| Allow for toilet partitions and urinal screens | (6,337) | SF | 0.18 | (1,141) |
| Allow for toilet accessories | (6,337) | SF | 0.12 | (760) |
| Allow for shelving, mail slots, etc. | (6,337) | SF | 0.04 | (238) |
| Allow for modular casework | (6,337) | SF | 1.50 | (9,506) |
| Code signage | (6,337) | SF | 0.10 | (634) |
| Wayfinding/Room ID/Graphics | (6,337) | SF | 0.23 | (1,426) |
| Tackboards/markerboards | (6,337) | SF | 0.04 | (238) |
| Projections screens | (6,337) | SF | 0.03 | (190) |
| Allow for lockers/benches | (6,337) | SF | 0.06 | (380) |
| Allow for fire extinguishers | (2) | EA | 350.00 | (700) |
| HHW piping, valves and insulation | (6,377) | SF | 3.50 | (22,320) |
| CHW piping, valves and insulation | (6,377) | SF | 4.40 | (28,059) |
| Central air handling units | (7,015) | CFM | 3.00 | (21,045) |
| VAV units with reheat | (7) | EA | 950.00 | (6,650) |
| Sound attenuation | (7,015) | CFM | 0.35 | (2,455) |
| Galvanized steel ductwork | (6,377) | LB | 5.75 | (36,668) |
| Flexible ducting | (160) | LF | 12.00 | (1,920) |
| Duct volume dampers | (32) | EA | 65.00 | (2,080) |
| Duct fire dampers | (2) | EA | 1,200.00 | (2,400) |
| Duct insulation | (3,826) | SF | 2.60 | (9,948) |

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*BASELINE Conceptual Cost Model REV 8b*
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| | *Quantity* | *Unit* | *Rate* | *Total* |
|---|---|---|---|---|
| Ceiling/wall diffusers and return air grilles | (32) | EA | 120.00 | (3,840) |
| DDC control system | (6,377) | SF | 3.75 | (23,914) |
| Miscellaneous fans | (1,276) | CFM | 0.80 | (1,021) |
| Allowance for additional seismic bracing | (6,377) | SF | 1.30 | (8,290) |
| Secondary switchgear, switchboards,MCC's and feeders - office/support space | (130) | KVA | 150.00 | (19,500) |
| UPS systems - initial install | (3,000) | KW | 650.00 | (1,950,000) |
| Static bypass switches | (2) | EA | 30,000.00 | (60,000) |
| Switchboards, 480V - initial install | (6,000) | AMP | 45.00 | (270,000) |
| Switchboards, 480V - final install - excluded | | | | |
| Load banks - initial install | (2) | EA | 10,000.00 | (20,000) |
| Feeder bus duct, 480/277V, 4000A, between switchboards and UPS - allowance | (150) | LF | 1,250.00 | (187,500) |
| Feeder bus duct, 480/277V, 2000A, between switchboards and Load banks - allowance | (150) | LF | 950.00 | (142,500) |
| Secondary switchboards, ATS, transformers and feeders - office/support space | (20) | KVA | 150.00 | (3,000) |
| Mechanical equipment connections and switches | (6,377) | SF | 1.50 | (9,566) |
| Receptacles including panelboards, conduit and wire - office/support space | (98) | EA | 285.00 | (27,930) |
| Fixtures including panelboards, conduit, wire and switching | (116) | EA | 485.00 | (56,260) |
| Lighting controls | (6,377) | SF | 0.65 | (4,145) |
| Lightning protection | (6,377) | SF | 0.85 | (5,420) |
| Cable trays - office/support space | (125) | LF | 40.00 | (5,000) |
| Fire alarm devices including conduit and wire | (18) | EA | 600.00 | (10,800) |
| CUP | | | | |
| Gas fired heating boilers, flues and ancillaries | (338) | MBTU | 20.00 | (6,760) |
| Centrifugal chillers | (1,000) | TN | 500.00 | (500,000) |
| Absorption chillers | 1,000 | TN | 1,000.00 | 1,000,000 |
| Generators, diesel, 12.47kV - initial install | (4,400) | KVA | 250.00 | (1,100,000) |
| Generators, gas fired, 12.47kV - with heat recovery | 4,600 | KW | 850.00 | 3,910,000 |
| Sitework | | | | |
| PSE utility primary cabling, 43.8kV - allowance | (500) | LF | 700.00 | (350,000) |
| Concrete encased conduit for primary cabling - allowance | (1) | LS | 50,000.00 | (50,000) |

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| | *Quantity* | *Unit* | *Rate* | *Total* |
|---|---|---|---|---|
| PSE utility transformers, 43.8kV to 12.47kV, oil filled, 12MV | (1) | EA | 150,000.00 | (150,000) |
| Secondary conduit and wire, 12.47kV - allowance | (100) | LF | 1,500.00 | (150,000) |
| Markups | 56.45 | % | (590,447.43) | (333,324) |
| | | | | (923,771) |

Alternate 4: Rough order of magnitude for 1 level below grade and two levels above grade parking structure in lieu of Baseline

| | | | | |
|---|---|---|---|---|
| Baseline parking garage | (159,533) | SF | 76.82 | (12,255,325) |
| Revised parking garage | | | | |
| Excavation | | | | |
| Excavate basement and remove | 28,522 | CY | 14.50 | 413,569 |
| Shoring sides of excavation | | | | |
| Vertical earth banks, H piles/wood lagging | | SF | 49.50 | |
| Piling | | | | |
| Drilled reinforced concrete caissons, 18" x 65' | | | | |
| Auger, earth | 33,110 | LF | 20.00 | 662,200 |
| Auger, rock 8' | 4,647 | LF | 26.00 | 120,822 |
| Haul spoils | 3,211 | CY | 10.00 | 32,110 |
| Casing | 33,110 | LF | 20.00 | 662,200 |
| Reinforcing steel in piles, mild allow 200pcy | 570,460 | LB | 0.75 | 427,845 |
| Concrete, 5000psi | 2,593 | CY | 154.00 | 399,322 |
| Reinforced concrete including excavation | | | | |
| Pile caps | | | | |
| Machine excavate footings | 7,862 | CY | 14.75 | 115,965 |
| Fine grade bottom of footings | 9,488 | SF | 0.30 | 2,846 |
| Formwork to footing sides, built-up | 18,907 | SF | 11.91 | 225,220 |
| Reinforcing steel in footings, mild allow 125pcy | 228,244 | LB | 0.75 | 171,183 |
| Concrete, 5000psi | 1,739 | CY | 154.00 | 267,806 |
| Float top of footing | 9,488 | SF | 0.30 | 2,846 |
| Backfill footing w/structural fill | 6,123 | CY | 23.75 | 145,421 |
| Remove surplus excavation | 10,221 | CY | 12.00 | 122,652 |
| Retaining wall footings, assume 5'W x 2'H | | | | |

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Olympia, WA

*BASELINE Conceptual Cost Model REV 8b*
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| | *Quantity* | *Unit* | *Rate* | *Total* |
|---|---|---|---|---|
| Machine excavate footings | 1,007 | CY | 14.75 | 14,853 |
| Fine grade bottom of footings | 5,240 | SF | 0.30 | 1,572 |
| Formwork to footing sides, built-up | 4,212 | SF | 11.90 | 50,123 |
| Waterstops | 1,048 | LF | 3.00 | 3,144 |
| Reinforcing steel in footings, mild allow 100pcy | 44,835 | LB | 0.75 | 33,626 |
| Concrete, 5000psi | 427 | CY | 154.00 | 65,758 |
| Float top of footing | 5,240 | SF | 0.30 | 1,572 |
| Backfill footing w/structural fill | 580 | CY | 23.75 | 13,775 |
| Remove surplus excavation | 1,309 | CY | 12.02 | 15,731 |
| Elevator pits | 4 | EA | 9,500.00 | 38,000 |
| Sump pits | 4 | EA | 1,400.00 | 5,600 |
| Subsurface drainage | | | | |
| Perimeter foundation drain | 1,048 | LF | 19.50 | 20,436 |
| Underslab drain tile | | LF | | |
| Permanent dewatering system | | LS | | |
| Temporary job dewatering | 6 | MO | 4,500.00 | 27,000 |
| Columns and pilasters | | | | |
| Reinforced concrete gravity columns, assume 24"x32" | | | | |
| Formwork to columns, built-up | 34,340 | SF | 5.40 | 185,436 |
| Reinforcing steel in columns, allow 550pcy | 461,615 | LB | 0.75 | 346,211 |
| Concrete, 5000psi | 763 | CY | 288.85 | 220,393 |
| Finish | 34,340 | SF | 0.65 | 22,321 |
| Retaining walls | | | | |
| Reinforced concrete retaining walls, assume 18" | | | | |
| Formwork to walls, built-up | 24,138 | SF | 9.25 | 223,277 |
| Reinforcing steel in retaining walls, allow 180pcy | 139,194 | LB | 0.75 | 104,396 |
| Concrete, 5000psi | 703 | CY | 227.50 | 159,933 |
| Finish | 24,138 | SF | 0.65 | 15,690 |
| Shear bracing | | | | |
| Reinforced concrete shear walls, assume 15" | | | | |
| Formwork to walls, built-up | 25,705 | SF | 9.25 | 237,771 |
| Reinforcing steel in shear walls, allow 300pcy | 135,960 | LB | 0.75 | 101,970 |
| Concrete, 5000psi | 412 | CY | 227.50 | 93,730 |
| Finish | 25,705 | SF | 0.65 | 16,708 |

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| | *Quantity* | *Unit* | *Rate* | *Total* |
|---|---|---|---|---|
| Floor at lowest level | | | | |
| Slab on grade, 6" | | | | |
| Fine grade | 103,657 | SF | 0.30 | 31,097 |
| Gravel base, 6" | 1,920 | CY | 28.00 | 53,760 |
| Vapor barrier | 103,657 | SF | 0.15 | 15,549 |
| Sand cushion, 2" | 640 | CY | 28.00 | 17,920 |
| Construction jt/edge form | 10,366 | LF | 3.80 | 39,391 |
| Set screeds | 103,657 | SF | 0.15 | 15,549 |
| Reinforcing steel, allow 70pcy | 155,232 | LB | 0.75 | 116,424 |
| Concrete, 4000psi | 2,112 | CY | 145.00 | 306,240 |
| Control jt | 3,110 | LF | 3.00 | 9,330 |
| Finish | 103,657 | SF | 0.50 | 51,829 |
| Suspended floors | | | | |
| Reinforced concrete beam & slab, 6" | | | | |
| Formwork to soffit of slab | 55,876 | SF | 7.35 | 410,689 |
| Formwork to beam sides | 18,626 | SF | 13.54 | 252,155 |
| Reinforcing steel in slab, allow 5.5psf | 353,416 | LB | 0.75 | 265,062 |
| Concrete, 5000psi | 1,811 | CY | 154.00 | 278,894 |
| Finish | 55,876 | SF | 0.50 | 27,938 |
| Flat roofs | | | | |
| Reinforced concrete beam & slab, 6" | | | | |
| Formwork to soffit of slab | 23,407 | SF | 7.35 | 172,041 |
| Formwork to beam sides | 26,428 | SF | 13.54 | 357,777 |
| Reinforcing steel in slab, allow 5.5psf | 148,049 | LB | 0.75 | 111,037 |
| Concrete, 5000psi | 2,569 | CY | 154.00 | 395,626 |
| Finish | 23,407 | SF | 0.50 | 11,704 |
| Miscellaneous | | | | |
| Misc metals, .2psf | 31,907 | LB | 1.85 | 59,028 |
| Concrete curbs/housekeeping pads | 159,533 | SF | 0.10 | 15,953 |
| Prefabricated cladding panels | | | | |
| Allow for screening | 23,733 | SF | 30.00 | 711,990 |
| Interior finish to exterior walls | | | | |
| Paint interior concrete or block | 12,069 | SF | 0.80 | 9,655 |
| Exterior doors, frames and hardware | | | | |
| Overhead sectional door, 24' x 10' motorized | 2 | EA | 13,000.00 | 26,000 |
| Waterproofing slabs | | | | |

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| | *Quantity* | *Unit* | *Rate* | *Total* |
|---|---|---|---|---|
| Allow for traffic coating | 55,876 | SF | 3.50 | 195,566 |
| Waterproofing walls below grade | | | | |
| Bentonite panels and waterproofing | 12,069 | SF | 5.50 | 66,380 |
| Insulation | | | | |
| Rigid insulation under roofing | 23,407 | SF | 6.00 | 140,442 |
| Roofing | | | | |
| Membrane roofing | 23,407 | SF | 5.50 | 128,739 |
| Rough carpentry | 1 | LS | 20,000.00 | 20,000 |
| | | | | |
| Concrete, block or brick walls | | | | |
| Reinforced concrete block, 8" | 14,466 | SF | 15.75 | 227,840 |
| Partition framing and cores | | | | |
| Shaftwall system including CH stud, 1" core board, gyp surfacing and paint | 1,837 | SF | 9.00 | 16,533 |
| Partition surfacing | | | | |
| Paint interior concrete or block | 28,932 | SF | 0.80 | 23,146 |
| Baslustrades and rails | | | | |
| Cable guardrail | 180 | LF | 50.00 | 9,000 |
| Interior doors, frames and hardware | | | | |
| Hollow steel doors and frames, per leaf | 13 | EA | 1,500.00 | 19,500 |
| | | | | |
| Floors | | | | |
| Concrete sealer to parking areas | 102,457 | SF | 1.00 | 102,457 |
| VCT to elevator lobbies | 1,200 | SF | 3.10 | 3,720 |
| Bases or skirtings, etc. | | | | |
| Resilient base to elevator lobbies | 351 | LF | 2.00 | 702 |
| Ceilings | | | | |
| Insulation to underside of occupied space | 24,373 | SF | 2.00 | 48,746 |
| Paint interior concrete soffits | 158,333 | SF | 0.88 | 139,333 |
| ACT to elevator lobbies | 1,200 | SF | 3.40 | 4,080 |
| | | | | |
| Protective guards, barriers and bumpers | 159,533 | SF | 0.15 | 23,930 |
| Allow | 159,533 | | | |
| Chalkboards, insignia and graphics | | | | |
| Entrance sign | 1 | LS | 6,000.00 | 6,000 |
| Code signage | 159,533 | SF | 0.08 | 12,763 |
| Wayfinding | 159,533 | SF | 0.10 | 15,953 |
| Pavement markings and signage | 159,533 | SF | 0.10 | 15,953 |
| Amenities and convenience items | | | | |

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| | *Quantity* | *Unit* | *Rate* | *Total* |
|---|---|---|---|---|
| Fire extinguishers and cabinets | 18 | EA | 350.00 | 6,300 |
| Bike lockers and storage | 1 | LS | 15,000.00 | 15,000 |
| Sanitary waste, vent and service piping | | | | |
| Hose bibbs/wall hydrants | 11 | EA | 1,000.00 | 11,000 |
| Surface water drainage | | | | |
| Floor drains | 50 | EA | 950.00 | 47,500 |
| Clean outs | 10 | EA | 300.00 | 3,000 |
| Drain and vent piping; uninsulated | 2,000 | LF | 34.00 | 68,000 |
| Oil separator | 1 | EA | 5,000.00 | 5,000 |
| Air distribution and return | | | | |
| Galvanized steel ductwork | 39,900 | LB | 5.75 | 229,425 |
| Diffusers and return air grilles | | | | |
| Ceiling/wall diffusers and return air grilles | 160 | EA | 120.00 | 19,200 |
| Independent exhaust ventilation | | | | |
| Miscellaneous fans | 240,000 | CFM | 0.80 | 192,000 |
| Main service and distribution etc. | | | | |
| Secondary switchgear, switchboards,MCC's and feeders | 650 | KVA | 100.00 | 65,000 |
| Emergency or uninterrupted power | | | | |
| Secondary switchboards, ATS, transformers and feeders | 150 | KVA | 150.00 | 22,500 |
| Machine and equipment power | | | | |
| Connections and switches | 159,533 | SF | 0.25 | 39,883 |
| User convenience power | | | | |
| Receptacles including panelboards, conduit and wire | 32 | EA | 450.00 | 14,400 |
| Lighting | | | | |
| Fixtures including panelboards, conduit, wire and switching | | | | |
| Interior fixtures | 355 | EA | 450.00 | 159,750 |
| Exterior entrance lighting - allow | 1 | LS | 10,000.00 | 10,000 |
| Emergency lighting - allow | 1 | LS | 10,000.00 | 10,000 |
| Lighting and power specialties | | | | |
| Lighting and power specialties, including grounding, lighting controls etc. | 1 | LS | 15,000.00 | 15,000 |
| Alarm and security systems | | | | |

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| | *Quantity* | *Unit* | *Rate* | *Total* |
|---|---|---|---|---|
| Fire alarm devices including conduit, wire and head end equipment | 44 | EA | 850.00 | 37,400 |
| Security system allowance - duress buttons & CCTV | 32 | EA | 4,000.00 | 128,000 |
| Fire sprinkler systems | | | | |
| Dry sprinkler and standpipe system | 159,533 | SF | 4.00 | 638,132 |
| Markups | 46.93 | % | 255,614.63 | 119,959 |
| | | | | 375,573 |

Alternate 7: Phased construction of Parking/Office building

| | | | | |
|---|---|---|---|---|
| Data center | | | | |
| Exterior cladding allowance | 7,855 | SF | 74.62 | 586,125 |
| Vertical transportation allowance | | | | |
| Allow for exit stairs | 7 | FLT | 15,500.00 | 108,500 |
| Allow for passenger elevator, hydraulic 4-stop | 2 | EA | 65,000.00 | 130,000 |
| Site improvements | | | | |
| Surface parking allow for AC paving and curb | 40,000 | SF | 4.32 | 172,792 |
| Landscape/irr/ped paving | 24,373 | SF | 14.36 | 349,996 |
| Markups | 56.45% | | 1,347,412.42 | 760,628 |
| Allow for revised schedule | | | | |
| Start date | 07/01/08 | | | |
| Finish date | 12/01/09 | | | |
| Duration | 17 | MO | | |
| Revised escalation | -3.39% | | 87,845,561.80 | (2,977,965) |
| Office building | | | | |
| Foundations | | | | |
| Allow for underpinning | 4,350 | SF | 100.00 | 435,000 |
| Exterior cladding | | | | |
| Interface existing | 7,855 | SF | 20.00 | 157,100 |
| Markups | 52.37% | | 592,100.00 | 310,087 |
| Allow for revised schedule | | | | |
| Start date | 07/01/09 | | | |
| Finish date | 12/01/10 | | | |

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| | *Quantity* | *Unit* | *Rate* | *Total* |
|---|---|---|---|---|
| Duration | 17 | MO | | |
| Revised escalation | 1.10% | | 55,496,220.91 | 610,458 |
| | | | | 642,721 |

**Building Code Review**
**Washington State Department of Information Services**
**Office Building and Data Center**
**Perkins+Will**
**April 10, 2007**

Code Summary:

- The building is being considered one building of Type IIA construction.
- Relative to exiting and fire alarms the buildings are considered as one single building.
- The building is not high-rise construction.
- The data center and office building will be considered one single building for the purpose of determining area limitations, continuity of fire walls and the limitation on the number of stories.
- An "average" floor will require a minimum of 7 toilets or urinals and 8 lavatories split evenly between men and women.

Applicable Codes:

- Olympic Municipal Code (OMC) Title 16
- International Building Code 2003 Edition (with Washington State amendments),
    - Appendix D, & Fire Districts
    - Appendix E, Sections 101 through 106
    - Appendix G, Flood resistant construction
    - Appendix H, Signs
    - Appendix J, Grading
- ICC/ANSI A117.1 (ICC A117.1-03)
- 2003 International Mechanical Code (IMC)
- 2003 International Fuel Gas Code (IFGC)
- The National Fuel Gas Code (NFPA 54)
- The Liquified Petroleum Gas Code (NFPA 58)
- 2003 Uniform Plumbing Code (UPC) and the following appendices:
    - Appendix A, Pipe sizing
    - Appendix B, Notes on combination waste/venting
    - Appendix I, Installation Standards
    - Appendix H, Grease Interceptors
- 2003 Washington State Energy Code (WSEC)
- 2003 Washington State Ventilation & Indoor Air Quality Code (VIAQ)
- 2002 National Electrical Code (NEC)

Note: some of these codes are superceded by Washington State amendments.

This list does not include Ordinance provisions to regulate Grading and Clearing (OMC 16.48), Floodplain Development (OMC 16.04.030.20), Tree protection ordinances, etc.

Demolition of existing buildings or structures will be performed via separate permit(s). Permits shall be obtained from Olympia Region Clean Air Agency (ORCAA). A total of 5 existing buildings are to be demolished.

International Building Code (IBC) Structural Design Criteria:
Roof Snow Load: 25 PSF
Snow load may not be reduced for roof slope pursuant to IBC 1608.4
Basic Wind Speed: 85 MPH
Exposure: C in some locations near shoreline or on hills, B Elsewhere
Seismic Design Category: D1
A geotechnical investigation is required for commercial projects pursuant to IBC Section 1802.

**International Building Code Review:**

Chapter 1: for Administrative Requirements
Construction documents for buildings shall be submitted pursuant to Section 106.

Chapter 3: Use and Occupancy Classification

Occupancy Groups:

- Group B (Business) is the main occupancy group; see incidental and accessory uses below.
- Group A-3 (Assembly spaces of 50-300 persons) includes the large common conference room. Lobby/reception area, wellness room, board room, classroom, training room and learning center.
- Group A-2 (Assembly uses intended for food consumption) includes the cafeteria/lunchroom.
- Group E (Education) includes the K-20 web conference room.
- Group S-2 (Low Hazard Storage) includes the enclosed parking garage, loading dock and miscellaneous storage areas.
- Group S-1 (Medium Hazard Storage) includes the paper storage area.

Incidental Use Areas (Table 302.1.1)

- Storage Rooms greater than 100 sf require 1-hour separation or fire extinguishing system.
- Note that with fire extinguishing system smoke separation is still required (302.1.1)

Accessory use areas (section 302.2)

- Accessory use areas not in Table 302.1.1 and not classified as Group H are not required to be separated if the accessory use area is less than 10% of the area of the floor on which it is located and does not exceed Table 503 values for such use group.
- Accessory assembly areas less than 750 sf are not considered separate occupancies.

Occupancy Separations (see section 302.3 and Table 302.3.2)

- In general there is a 2-hour occupancy separation between type B and type A-3 occupancies with reduction to one hour permitted when sprinklers are provided. See note B in Table 302.3.2 which addresses occupancy separations not being required for storage areas within Group B.
- There is a 2-hour occupancy separation between type B and type A-2 occupancies with reduction to one hour permitted when sprinklers are provided.
- There is a 2-hour occupancy separation between type E and B occupancies with reduction to one hour permitted when sprinklers are provided.
- There is a 3-hour separation between the parking garage (S-2) and the building above (type B).

- Mixed Occupancy (302.3): If classified as a mixed occupancy building, the uses must be either Separated or Non-Separated and the allowable floor areas would be calculated accordingly:

  Non-Separated Uses (section 302.3.1): Required construction type shall be determined by applying height and area limitations for each use group to the entire building and the most restrictive type so determined shall apply to the entire building.

  Separated Uses (section 302.3.2): In each story, the building area shall be such that the sum of the ratios of floor areas of each use divided by the allowable area for each floor shall be less than one.

**Summary:**

- Primary Occupancy is Group B with some accessory A-3, A-2, S-2, S-1 and E use groups.
- The garage will be Group S-2 and it is considered a separate and distinct building for the purpose of determining area limitations, continuity of firewalls and the limitation on the number of stories. See section 508.2 (Group S-2 enclosed parking garage with Group A, B, M or R above).
- Based on construction Type IIA (see chapter 6 summary below), we anticipate that the building will be classified as Mixed Occupancy with Separated Uses because the A-3 and A-2 spaces fill more than 10% of the area of some levels and thus cannot be called accessory use to group B. Any other occupancy groups classified as accessory or incidental use areas to the main occupancy group do not need to be considered different occupancy and only need to be separated with a fire barrier if required as defined in incidental use areas.

Chapter 4: Special Requirements Based on Use and Occupancy

See Section 403: High-Rise Buildings

Section 403.1 Applicability. The provision of this section shall apply to buildings having occupied floors located more than 75 feet above the lowest level of fire department vehicle access. The height of the office building is 72'.

See Section 404: Atriums.

See Section 406: Motor-Vehicle-Related Occupancies

Section 406.4 Enclosed parking garages

Chapter 5: General Building Heights and Areas

Building areas shall include exterior areas below projections of roofs or floors above (section 502.1)

- Allowable Height and Building Area (see Table 503)
- Assuming Construction Type I-B (refer to Chapters 3 and 6)

  Maximum area: no single story shall exceed allowable area/floor

  Unlimited sf/floor for Group A (x3 stories per 506.4)

Maximum # of stories:

5 stories for Group B

5 stories for Group A-3 and A-2

Maximum height: measured to average height of highest roof surface
75 feet above "grade plane" for type IIA construction
Grade Plane: Plane representing the average of finished ground level adjoining the building at exterior walls. With the building set into a hillside, the approximate average grade plane can be averaged from the southwest corner to the northeast corner of the building as those are the highest and lowest points of grade.

- Height and Area Modifications (Section 504 and Section 506):
  May increase maximum height by 20' and 1 additional story if protected with an approved automatic sprinkler system in accordance with 903.3.1.1.
  May increase maximum areas per calculations as part of the general area modifications (Section 506.1) if protected with sprinkler system. This includes additions due to a frontage increase (Section 506.2).

Summary:
For construction Type IIA:
Maximum Allowable Building area (Group B):
37,500 sf/floor
Maximum Allowable Building area (Group A-3):
37,500 sf/floor

Maximum Number of Stories: 5 + 1 story sprinkler modification = 6 stories max.
Max building Height: 75 feet + 20 feet sprinkler modification = 95 feet.
The frontage area increase factor is 44%.
The sprinkler area increase factor is 200%.
For construction Type IIA, the area increase due to frontage and sprinkler system compliant with 903.3.1.1 yield an overall allowable area of 135,329 sf.
The building is within maximum allowable area, maximum number of stories and maximum allowable height for construction type IIA.

Chapter 6: Types of Construction

Anticipated construction type: Type IIA

Type II construction is a type of construction in which all building elements listed in Table 601 are of non-combustible materials.

Fire resistance-rating requirements of building elements, Type I-B (see Table 601):

| | |
|---|---|
| Structural Frame: | 1 hour |
| Bearing Walls (interior and exterior): | 1 hour |
| Nonbearing exterior walls (per table 602): | 0 hours (w/min. fire separation distance of 10') |
| Nonbearing interior walls: | 0 hours |
| Floor Construction | 1 hours |
| Roof Construction | 1 hour |

Chapter 7: Fire Resistance-Rated Construction

This chapter describes materials and assemblies to be used when required to be built of fire-resistive rated construction by the code. Some fire-rated construction to note:

| | |
|---|---|
| Stairway Enclosures | 2 hr. when greater than 4 stories (see 1010.1) |
| Area Separation | 2 hr. |
| Shaft Enclosures (section 707) | 1 hr. if less than 4 stories, 2 hr. if greater than 4 stories |
| Protected Elevator Lobby | Not required if building is sprinkler protected (707.14.1) |
| Corridors | See Section 10.16 (not required if sprinklered) |
| Occupancy Separation | See Chapter 3 summary above |
| Building Elements | See Chapter 6 summary above |

Table 705.4 – Firewall fire-resistance ratings:

Groups B, A or E and S-2 require 2 hour rating for firewalls. Each portion of a building separated by one or more firewalls that comply with the provisions of this section shall be considered a separate building.

Groups B, A or E and S-1 require 3 hour rating for firewalls. Each portion of a building separated by one or more firewalls that comply with the provisions of this section shall be considered a separate building.

Table 715.3 – Fire door and fire shutter protective ratings:

Firewalls and fire barriers with 3-hour rating require 3-hour rated doors
Firewalls and fire barriers with 2-hour rating require 1.5-hour rated doors
Shaft exit enclosures and exit passageways with a 1-hour rating require 1-hour rated doors
Other fire barriers with 1-hour rating require 20 min rated doors
Exterior walls requiring a 2-hour rating require 1.5 hour rated doors

715.3.7 Fire doors shall be self-closing in accordance with this section

715.3.7.3 Requirements for automatic closing by actuation of smoke detector apply to the cross-corridor doors at exit stairs.

Chapter 8: Interior Finishes

Wall and Ceiling Finishes: see Section 803.1 for Class A, B and C requirements for flame spread and smoke development.

Flame Spread of finish materials per Table 803.5 for sprinklered buildings by occupancy group:

| | Group A-3 and A-2 | Group B or E | Group S-1 and S-2 |
|---|---|---|---|
| Stairways: | Class B | Class B | Class C |
| Exitways: | Class B | Class C | Class C |
| Rooms: | Class C | Class C | Class C |

Interior floor finishes per Section 804.

Chapter 9: Fire Protection Systems

Complying automatic sprinkler systems are defined in this chapter, and sprinklers are used as reason for a number of height and area modifications and other exceptions throughout the code.

Sprinklers are not required for occupancy group B (See Section 903.2)
Sprinklers are only required for occupancy group A-3 (See Section 903.2.1.3) if the A-3 fire area exceeds 12,000 sf or has an occupied load of 300 or is located on a floor other than level of exit discharge. This requires the building's A-3 occupancy spaces to be sprinklered.

Sprinklers are only required for occupancy group A-2 (See Section 903.2.1.2) if the A-2 fire area exceeds 5,000 sf or has an occupant load of 300 or is located on a floor other than level of exit discharge. This requires the building's A-2 occupancy spaces to be sprinklered

Sprinklers are required in occupancy group S-2 (See Section 903.2.9)

It is our intention to equip the building with automatic sprinkler systems complying with 903.1.2 throughout.

Chapter 10: Means of Egress

Maximum height of egress path: 7' – 0" throughout, 6' – 8" minimum at stairs

Occupant Load determination (Section 1004): the largest load number calculated by both designed occupant use as well as occupant load calculated per values given by table 1004.1.2.

Occupant Load Factors (Table 1004.1.2)

| | |
|---|---|
| Assembly without fixed seats: | |
| Concentrated (chairs only not fixed): | 7 net |
| Standing Space: | 5 net |
| Unconcentrated (tables and chairs): | 15 net |
| Office & Business areas: | 100 gross |
| Kitchens, commercial: | 200 gross |
| Parking Garage: | 200 gross |
| Storage Rooms: | 300 gross |
| Mechanical Rooms: | 300 gross |
| Library Reading Room: | 50 net |
| Library Stack Area: | 100 gross |

Do not sum up the floors. Each floor is independent of the other. (1004.4)

Egress with per person served (Table 1005.1)

| | |
|---|---|
| Stairways | 0.2" per person w/sprinkler system, not less than 48" (1007.3) |
| Other egress components | 0.15" per person w/sprinkler system, not less than 44" at corridors |

Door encroachment: no more than 7" when fully open (1005.2)

Accessible Means of Egress (1007.1): provide accessible route to an area of refuge, horizontal exit or public way (See Section 1002). Accessible spaces shall have a minimum of one accessible means of egress or two accessible means from a space required to have more than one exit. See also 1007.3 – an enclosed stair can be considered part of accessible means of egress and per 1007.3 exception #3, a 48" required clear width and a defined area of refuge at enlarged landings is not required if building is fully sprinklered.

Buildings with four or more stories (1007.2.1): One accessible means of egress shall be via a complying elevator when a floor is four or more stories above or below an exit discharge.

Areas of Refuge (1007.6): Sized to accommodate one wheelchair space of 30" x 48" for each 200 occupants. When located within enlarged stair enclosure landings, the area of refuge shall not reduce the required exit width. A two-way communication device is required at the area of refuge (1007.6.3). Area of refuge is required as noted in 1007.3 above.

Assisted Rescue – External Holdings Section 1007.2, exceptions 1 or 2:

- At exits and elevators serving a required accessible space but not providing an approved accessible means of egress, signage shall be installed indicating the location of accessible means of egress, per 1007.7.
- Exterior area for assisted rescue must be open to the outside air and meet the requirements of Section 1007.6.1. Separation walls shall comply with the requirements of Section 704 for exterior walls. Where walls or openings are between the area for assisted rescue and the interior of the building, the building exterior walls within 10 feet horizontally of a non-rated wall or unprotected opening shall be constructed as required for a mimimum 1-hour fire-resistance rating with 3/4 –hour opening protectives. This construction shall extend vertically from the ground to a point 10 feet above the floor level of the area for assisted rescue or to the roof line, whichever is lower.
    - The exterior area for assisted rescue shall be at least 50 percent open, and the open area above the guards shall be so distributed as to minimize the accumulation of smoke or toxic gases, per Section 1007.8.1.
    - Exterior exit stairways that are part of the means of egress for the exterior area for assisted rescue shall provide a clear width of 48 inches between handrails, per 1007.8.2.
    - Exterior areas for assisted rescue shall have identification as required for area of refuge that complies with Section 1007.6.5.

Floor Elevation at either side of a doorway is shown, per 1008.1.4.

Roof Stair: One stairway up to the roof is required in buildings 4 or more stories in height (1009.12). Roof stairway access is required through a penthouse (walls, floor and roof) complying with section 1509.2 (1009.12.1).

Outdoor Conditions: Stairways and walking surfaces comply per 1009.5.
Ramps and walkways surfaces comply per 1010.7.

Guards are provided per Section 1010.6, 1012, 1012.5, 1012.4.

Egress through intervening spaces (1013.2): Only permitted when intervening space is accessory to the area served.

Common path of egress travel (1013.3): Maximum 75' travel before two means of egress are available.

Exit Access Doorways Required (Table 1014.1): Greater than 50 occupants requires two exit access doorways.

Exit Access and Travel Distance (Table 1015.1): With a sprinkler system, the maximum travel distance is 250 feet for A, E and S-1 occupancies, 300 feet for B occupancy, and 400 feet for S-2 occupancy.

Corridors in group B, group A, group E and group S occupancies shall be 1-hour rated without a sprinkler system or non-rated with a sprinkler system (Table 1016.1).

Maximum dead end corridors: 20 feet. 50 feet with a sprinkler system in group B occupancy.

Maximum Number of Exits (1018):

Room or spaces with occupant load of 1-500 require access to 2 exits (Table 1018.1)
Room or spaces with occupant load of 501-1,000 require access to 3 exits (Table 1018.1).
Room or spaces with occupant load of >1,000 require access to 4 exits (Table 1018.1).

Occupied Roof shall have access to exits as required for stories (1018.1).

Vertical Exit Enclosures (1019):

2-hour rated when connecting more than 4 stories
1-hour rated when connecting fewer than 4 stories

Exterior walls of vertical exit enclosures shall be rated per 704 for exterior walls. Where non-rated or unprotected openings enclose the stair and are exposed to other parts of the building by less than 180 degrees, the building exterior walls within 10 feet shall be rated to mimimum 1-hour to a point 10 feet above the top-most landing or the roof line, whichever is lower.

Outdoor Useable Areas (see Section 1004.8)

Egress Illumination – Exit Discharge (see Section 1006)

Exterior exit ramps and stairways shall comply with Section 1022.

Exit discharge shall comply with Section 1023.

Chapter 11: Accessibility

In addition to 2003 IBC and any Washington State amendments, it is also anticipated that the design team will discuss accessibility goals with the State that meet universal design standards that they may be more stringent than required by any codes or regulations.

Accessible routes of travel shall be indicated on the plans. Accessible routes of travel from the building's accessible entrances and accessible exits to the public right-of-way shall also be shown on the plans.
Accessible entrances and exits shall be indicated on the plans.
Accessible routes connecting all buildings on site shall be indicated on the plans.

The following shall be indicated on the plans: Accessible cross walks, curb cuts, curb ramps, standard curbs, dropped curbs, ramps, surfacing materials, paint strip layouts, and relative finish surface elevation of parking stalls and curb ramps, etc. on the plans. Walk off (level), step up or step down curbs shall also be indicated on plans, as well as slip-resistant surfaces for all accessible routes of travel and accessible parking areas.

The accessible route of travel shall be illuminated. Type, location and intensity of all illumination shall be provided.

Accessible parking shall be provided, pursuant to Chapter 11. Standard accessible and accessible van stall(s) shall be provided as specified by Code. Number of required stalls complies with Table 1106.1.

Section 1104, Accessible Route: Accessible means of egress, Section 1007.

- Site arrival points (Section 1104.1): Accessible routes within the site shall be provided from public transportation stops, accessible parking and accessible passenger loading zones, and public streets or sidewalks to the accessible building entrance served.

- Exception: An accessible route shall not be required between site arrival points and the building or facility entrance if the only means of access between them is a vehicular way not providing for pedestrian access.
- Within a site (Section 1104.2): At least one accessible route shall connect accessible buildings, accessible facilities, accessible elements and accessible spaces that are on the same site.
- Connected spaces (Section 1104.3): When a building, or portion of a building, is required to be accessible, and accessible route shall be provided to each portion of the building, to accessible building entrances connecting accessible pedestrian walkways and the public way. Where only one accessible route is provided, the accessible route shall not pass through kitchens, storage rooms, restrooms, closets or similar spaces.
- The required number of exits from any story, basement or individual space shall be maintained until arrival at grade or public way, per Section 1018.
- Multilevel buildings and facilities (Section 1104.4): At least one accessible route shall connect each accessible level, including mezzanines, in multilevel buildings and facilities.
  Exceptions: In group A and S occupancies, levels that do not contain accessible elements or other spaces required by Section 1107 or 1108 are not required to be served by an accessible route from an accessible level.

- Location (Section 1104.5): Accessible routes shall coincide with or be located in the same area as a general circulation path. Where the circulation path is interior, the accessible route shall also be interior.

- Security Barriers (Section 1104.6): Security barriers including, but not limited to, security bollards and security bollards and security checkpoints shall not obstruct a required accessible route or accessible means of egress.
  Exception: Where security barriers incorporate elements that cannot comply with these requirements, such as certain metal detectors, fluoroscopes or other similar devices, the accessible route shall be permitted to be provided adjacent to security screening devices. The accessible route shall permit persons with disabilities passing around security barriers to maintain visual contact with their personal items to the same extent provided others passing through the security barrier.

<u>Accessible Entrances (Section 1105):</u>

- Public Entrances (1105.1): In addition to accessible entrances required by Section 1105.1 through 1105.1.6, at least 50 percent of all public entrances shall be accessible.
  Washington State Amendment (WSA 1105.1): Exterior exit within 6" of grade
  Exception: An accessible entrance is not required to areas not required to be accessible.
- Parking garage entrances (1105.1.1): Where provided, direct access for pedestrians from parking structures to buildings or facility entrances shall be accessible.
- Entrances from tunnels or elevated walkways (1105.1.2): Where direct access is provided for pedestrians from a pedestrian tunnel or elevated walkway to a building or facility, at least one entrance to the building or facility from each tunnel or walkway shall be accessible.
- Restricted entrances (1105.1.3): Where restricted entrances are provided to a building or facility, at least one restricted entrance to the building or facility shall be accessible.
- Service entrances (1105.1.5): If a service entrance is the only entrance to a building or a tenant space in a facility, that entrance shall be accessible.

Parking and Passenger Loading Facilities (Section 1106):

- Required where parking is provided, per Section 1106.1. Accessible parking spaces shall be provided in compliance with Table 1106.1, except as required by Sections 1006.2 through 1106.4. The number of accessible parking spaces shall be determined based on the total number of parking spaces provided for the facility.

  Exception: This section does not apply to parking spaces used exclusively for buses, trucks, other delivery vehicles, law enforcement vehicles, or vehicular impound and motor pools where lots accessed by the public are provided with an accessible passenger loading zone.

| Total Parking Spaces Provided | Required Minimum Number of Accessible Spaces |
|---|---|
| 1 to 25 | 1 |
| 25 to 50 | 2 |
| 51 to 75 | 3 |
| 76 to 100 | 4 |
| 101 to 150 | 5 |
| 151 to 200 | 6 |
| 201 to 300 | 7 |
| 301 to 400 | 8 |
| 401 to 500 | 9 |
| 501 to 1,000 | 2% of total |
| More than 1,000 | 20, plus one for each 100 over 1,000 |

- Van Spaces (1106.5): For every six or fraction of six accessible parking spaces, at least one shall be a van-accessible parking space.
- Location (1106.6): Accessible parking spaces shall be located on the shortest accessible route of travel from adjacent parking to an accessible building entrance. Accessible parking spaces shall be dispersed among the various types of parking facilities provided. In parking facilities that do not serve a particular building, accessible parking spaces shall be located on the shortest route to an accessible pedestrian entrance to the parking facility. Where buildings have multiple accessible entrances with adjacent parking, accessible parking spaces shall be dispersed and located near the accessible entrances.
  - Washington State Amendment
  - Exception: In multilevel parking structures, van-accessible parking spaces are permitted on one level.

- Passenger loading zones (1106.7.1): Continuous loading zones. Where passenger e provided, one passenger loading zone in every continuous 100 linear feet maximum of loading zone space shall be accessible.

Accessible signage shall be provided, per IBC Section 1110 and ICC/ANSI A117.1.

Chapter 12: Interior Environment

Applicable ventilation, temperature, lighting and sound transmission provisions

Yards and courts shall comply with section 1206.

Chapter 13: Energy Efficiency

Refer also to mechanical and electrical systems narratives.
Applicable codes & guidelines to be reviewed with authorities having jurisdiction:

- International Energy Conservation Code
- Washington State Energy Code
- Energy Life Cycle Cost Analysis (ELCCA)
- Leadership in Energy and Environmental Design (LEED) per RCW 39.35 D

Washington State Energy Code Minimum Building Envelope Requirements (Table 13-1)

| Item | Minimum Thermal Performance |
|---|---|
| Roofs | R-21 or U=0.050 |
| Opaque Walls | R-19 or U=0.14 |
| Opaque Doors | U=0.60 |
| Floors over unconditioned space | R-19 or U=0.056 |
| Slab on Grade | R-10 or F=.54 |
| Glazing (30% to 45% of wall area) | Max U=0.60 and Max SHCG=.4 |

Chapter 14: Exterior Walls
Applicable definitions: Stone (natural), concrete

Chapter 15: Roof Assemblies and Rooftop Structures
The enclosed mechanical area is considered a penthouse (Section 1509.2)

Chapter 16, 17 and 18: Structural requirements and standards. Refer to structural narrative in predesign document.

A complete geotechnical report will be provided pursuant to Chapter 18 (Soils and Foundations) This building will be compliant with Section 1805.2.3 for footings on or adjacent to slopes and Section 1805.3.1 for building clearance from ascending slopes on the plans.

Chapter 19, 20, 21, 22, 23, 24, 25 and 26: Building materials requirements and standards.

Chapter 27: Electrical requirements and standards. Refer to electrical narrative.

Chapter 28: Mechanical requirements and standards. Refer to mechanical narrative.

Chapter 29: Plumbing systems. Refer also to plumbing systems narrative in predesign document.

**Minimum Number of Required Plumbing Facilities** (Table 2902.1)

Table 2902.1 has been amended by the State of Washington.
"Average" floor +/- 23,700 sf
Assume 90 men: requires 7 toilets (or 3 urinals + 2 toilets)
4 lavatories

Assume 90 women: requires 7 toilets
4 lavatories

Chapter 30: Elevators and Conveying Systems

Hoist way Enclosure protection: see 3002.1
Elevator Car to accommodate stretcher required in buildings of 4 stories or more (3002.4)
Emergency Operations per section 3003
Hoist way venting required per section 3004
Elevator Machine Rooms per section 3006

Chapter 31: Special Construction

Temporary Structures (3102)
Pedestrian walkways and tunnels (3104)
Awnings and canopies (3105)
Signs (3107)
Radio and television towers (3108)

Chapter 32: Encroachments into the Public Right of Way

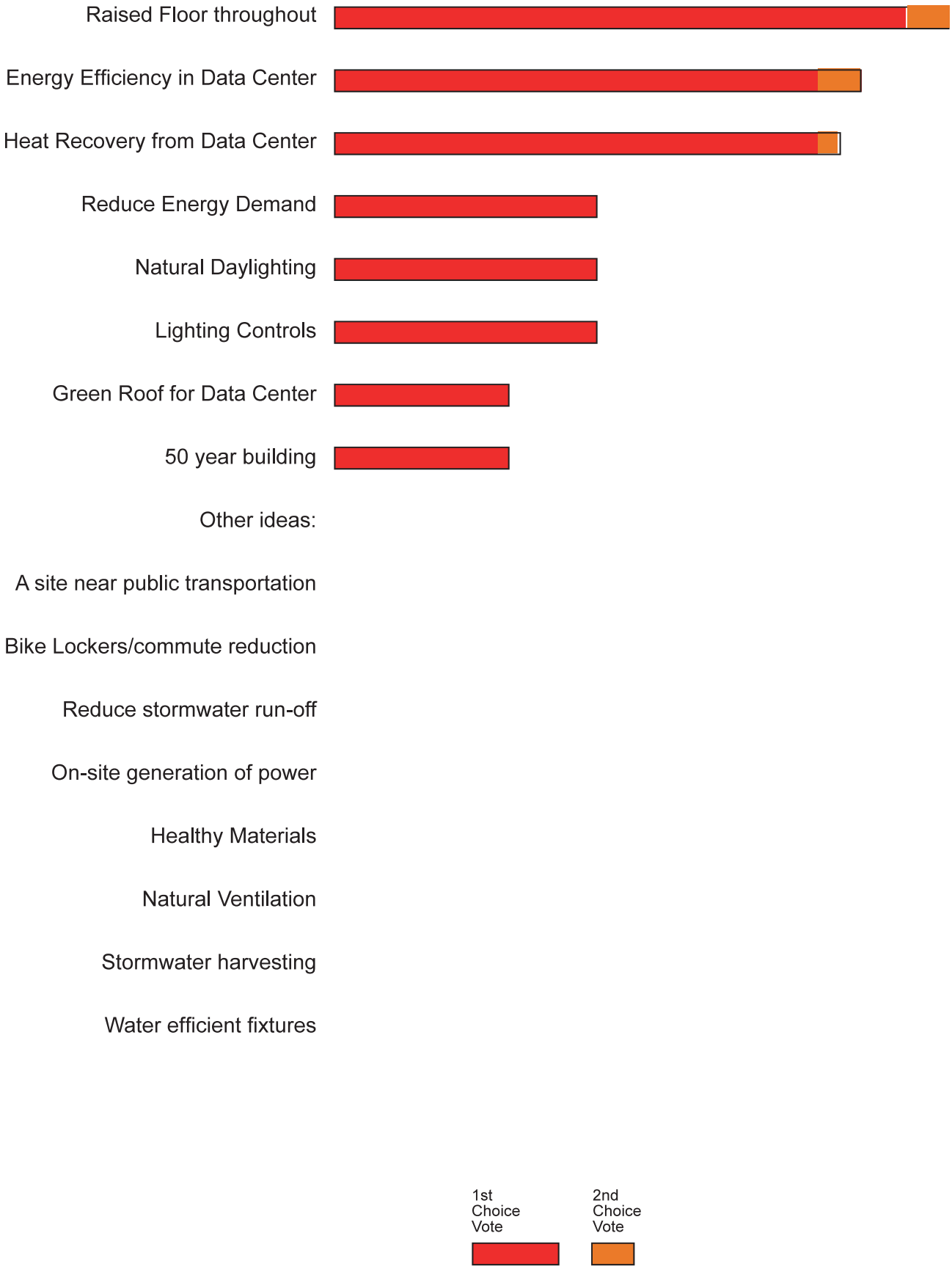
Drainage (3201.4): Drainage water collected from a roof, awning, canopy or marquee, and condensate from mechanical equipment shall not flow over a public walking surface.
Steps (3202.1): Steps shall not project more than 12 inches and shall be guarded by approval devices not less than 3 feet high, or shall be located between columns or pilasters.

Chapter 33: Safeguards During Construction

Project will comply with Construction Safeguards, Section 3302.
Demolition (Section 3303)
Site Work
Sanitary: Sanitary facilities shall be provided during construction, remodeling or demolition activites per UPC and Washington State requirements.
Protection of Pedestrians (3306)
Protection or adjoining property (3307)
Temporary use of streets, alleys and public property, per Section 3308 and local ordinance of State or federal law, if applicable.
Fire extinguishers shall be provided per Section 3309.
Exits shall comply with Section 3310.
Standpipes for buildings of 4 or more stories shall comply with Section 3311.
An automatic sprinkler system shall be provided throughout, in compliance with Section 3312.

## 9.2 Eco Charette

### Eco Charette Priorities Graph



# Notes From Eco Charette Brainstorming Session

## Indoor Air

| 1st Choice | 2nd Choice | |
|---|---|---|
| | | Minimize onsite noise to allow for operable windows |
| | | Site Sensitivity - noise, pollution sources |
| | | Materials management - Glues, Carpets, Paints |
| * | | Day lighting and Reflective Lighting |
| | | Maximize Daylight in offices |
| | | Natural ventilation for offices |
| | | CO2 Monitoring |
| *** | ** | Raised Floor Throughout |
| | | Dirt/Dust removal area prior to entry |

## Energy

| 1st Choice | 2nd Choice | |
|---|---|---|
| * | | Reduce Energy Demand |
| | | Optimize HVAC efficiency in data center |
| ** | ** | Energy Efficiency of Data Center |
| **** | * | Heat Recovery from data center |
| | | Use ground source heating/cooling |
| | | Use variable air volume in data center |
| | | Use water cooled chillers |
| | | On-site generation of CHP, eliminate infrastructure |
| | | Purchase requirements for Data Center include use of energy efficient equipment |
| | | Photovoltaic |
| | | Occupancy and CO2 sensor controls |
| | | Reduce outside air in Data center |
| | | Virtualization server consolidation |
| | | Adiabatic Humidification |
| | | Energy Modeling and benchmarking |
| * | | Light zoning and timers |
| | | Feed Data Center heat into Capitol Campus heat loop |
| | | Loosen Data Center temperature and humidification requirements |
| | | Earth duct for pre-heat or pre-cool air |

## Materials

| 1st Choice | 2nd Choice | |
|---|---|---|
| | | Provide Flexible (reusable) Space for Offices |
| | | Paperless |
| | | Gortex on building skin |
| | | Use native materials for interior finishes |
| * | | 50 year building |
| | | Construction waste recycle |
| | | Cogeneration reduces batteries by 50% |
| | | Locate close to linear - electric, water gas |

| 1st Choice | 2nd Choice | Site |
|---|---|---|
| | | Pick a site near public transportation, minimize SOV |
| | | Encourage Commute Trip Reduction (Transit, bike racks, lockers . . .) |
| | | Electric Car Plugs |
| | | Bike lockers |
| | | Building design should enhance access to public transit |
| * | | Green Roof for Data Center |
| | | Rain Gardens to Reduce Storm water |
| | | Rain runoff |
| | | Integrated Natural Treatment Systems |
| | | Drought tolerant and low maintenance landscaping |
| | | Minimize impervious surface |
| | | Retain/Enhance native trees and vegetation |
| | | Site Design that celebrates the seasons |
| | | Covered area between buildings and parking |
| | | Building orientation to leverage/mitigate solar |

| 1st Choice | 2nd Choice | Water |
|---|---|---|
| | | Storm water harvesting and Reuse |
| | | Reduce water use with Lowflow Fixtures |
| | | Waterless urinals |
| | | Eco-Power Faucet |

## 9.3 Room Data Sheets

### Washington State Department of Information Services

**Program:** Data Center
**Room Name:** Data Hall
**Occupancy:** 0
**Date:** 02/28/07
**Manager:**
**Net Area:** 15,000 sf +/- (per data hall)
**Ceiling Height:** 12' - 0"

**Room Activity:** Electronic Data Processing

**Adjacency Requirements:** Command Center, Battery Rooms

**Room Finishes**
**Ceiling:** Suspended Clg, UL Class A
**Wall:** Paint
**Base:** Rubber
**Floor:** Raised access floor panel
**Doors:**
**Door Size: 6**' - 0" x 6' - 8" (Paired)
**Door Type:** Automatic or hold open

**Vision Panel:** No
**Special Security Req:** RX - electrical lock for high security area
**Special Doors:** Extra heavy duty seamless construction w/in
**Noise Criteria:**
**Notes/Issues:**

Daily Occupance Use:
- [ ] 8 Hours (8:00 - 5:00)
- [ ] 14 Hours (8:00-10:00)
- [x] 24 Hours

Services:
- [ ] Cylinder Gas
- [ ] Hot Water
- [ ] Cold Water
- [ ] Process Cooling Water
- [ ] Floor Drain
- [ ] Floor Sink
- [ ] Emergency Shower
- [ ] Eyewash
- [ ] Other…

Chemical Use/Storage:
- [ ] Solvents
- [ ] Acids
- [ ] Toxics
- [ ] Gases
- [ ] Hazardous Storage
- [ ] Other…

Lighting Requirements:
- [ ] Natural
- [x] Ambient Light Level
- [ ] Light Level - Work Plane
- [ ] Special Lighting Requirements
- [ ] Darkenable
- [ ] Dimmable
- [x] No Windows

Electrical Power Supply:
- [ ] Special Outlet
- [x] 110v, 20a, 1 phase
- [x] 208v, 30a, 1 phase
- [x] 208v, 30a, 3 phase
- [x] 240v
- [x] 480v
- [x] Isolated Ground Outlet
- [x] Standby Power
- [ ] Explosion Proof Outlet

Communications
- [x] Telephone Outlet
- [x] Computer Outlet
- [x] Intercom

Environmental Conditions
- [x] Air Changes
- [x] Humidity Control
- [x] Air Recycle - Yes
- [ ] Air Recycle - No
- [ ] Operable Windows
- [x] Air Conditioned

Air Pressure:
- [ ] Positive
- [x] Negative
- [ ] Uncontrolled

Air Filtration:
- [x] Supply
- [ ] Exhaust

Equipment:
- [x] Vibration Sensitive
- [ ] Light Sensitive
- [x] Heat Producing
- [x] Noise Producing
- [ ] Lasers
- [ ] Alarm
- [ ] Other…

Security/Access
- [ ] Public Access
- [x] Controlled Access
- [x] Card Reader
- [x] Cameras
- [ ] Other

## Washington State Department of Information Services

**Program:** Data Center
**Room Name:** Tape Area
**Occupancy:** 0
**Date:** 02/28/07
**Manager:** Valerie Robinson
**Net Area:** 1,470 sf
**Ceiling Height:** 10' - 0"

**Room Activity:** Tape Cleaning, Storage & Library
**Adjacency Requirements:** Data Halls

**Room Finishes**
**Ceiling:** Exposed
**Wall:** Paint
**Base:** Rubber
**Floor:** Raised Floor
**Doors:**
**Door Size:**
**Door Type:**

**Vision Panel:**
**Special Security Req:** Yes
**Special Doors:**
**Noise Criteria:**
**Notes/Issues:**

---

Daily Occupance Use:
- ☐ 8 Hours (8:00 - 5:00)
- ☐ 14 Hours (8:00-10:00)
- ☑ 24 Hours

Services:
- ☐ Cylinder Gas
- ☐ Hot Water
- ☐ Cold Water
- ☐ Process Cooling Water
- ☐ Floor Drain
- ☐ Floor Sink
- ☐ Emergency Shower
- ☐ Eyewash
- ☐ Other…

Chemical Use/Storage:
- ☐ Solvents
- ☐ Acids
- ☐ Toxics
- ☐ Gases
- ☐ Hazardous Storage
- ☐ Other…

Lighting Requirements:
- ☐ Natural
- ☐ Ambient Light Level
- ☑ Light Level - Work Plane
- ☐ Special Lighting Requirements
- ☐ Darkenable
- ☐ Dimmable
- ☑ No Windows

Electrical Power Supply:
- ☐ Special Outlet
- ☑ 110v, 20a, 1 phase
- ☐ 208v, 30a, 1 phase
- ☐ 208v, 30a, 3 phase
- ☐ 240v
- ☐ 480v
- ☐ Isolated Ground Outlet
- ☐ Standby Power
- ☐ Explosion Proof Outlet

Communications
- ☑ Telephone Outlet
- ☑ Computer Outlet
- ☐ Intercom

Environmental Conditions
- ☐ Air Changes
- ☑ Humidity Control
- ☐ Air Recycle - Yes
- ☐ Air Recycle - No
- ☐ Operable Windows
- ☑ Air Conditioned

Air Pressure:
- ☐ Positive
- ☐ Negative
- ☐ Uncontrolled

Air Filtration:
- ☐ Supply
- ☐ Exhaust

Equipment:
- ☐ Vibration Sensitive
- ☐ Light Sensitive
- ☐ Heat Producing
- ☐ Noise Producing
- ☐ Lasers
- ☐ Alarm
- ☐ Other…

Security/Access
- ☐ Public Access
- ☑ Controlled Access
- ☑ Card Reader
- ☐ Cameras
- ☐ Other

## Washington State Department of Information Services

**Program:**

**Room Name:** Production | **Occupancy:** 37 | **Date:** 02/28/07

**Manager:** | **Net Area:** 8,297 sf

**Ceiling Height:** 10' - 0"

**Room Activity:** Printing, Paper Storage, Warrant Vault

**Adjacency Requirements:** Data Halls

**Room Finishes**

**Ceiling:** Exposed

**Wall:** Paint

**Base:** Rubber

**Floor:** Concrete

**Doors:** Roll-Up Door

**Door Size:**

**Door Type:**

**Vision Panel:**

**Special Security Req:** Yes

**Special Doors:**

**Noise Criteria:**

**Notes/Issues:**

---

Daily Occupance Use:
- ☐ 8 Hours (8:00 - 5:00)
- ☐ 14 Hours (8:00-10:00)
- ☑ 24 Hours

Services:
- ☐ Cylinder Gas
- ☐ Hot Water
- ☐ Cold Water
- ☐ Process Cooling Water
- ☐ Floor Drain
- ☐ Floor Sink
- ☐ Emergency Shower
- ☐ Eyewash
- ☐ Other…

Chemical Use/Storage:
- ☐ Solvents
- ☐ Acids
- ☐ Toxics
- ☐ Gases
- ☐ Hazardous Storage
- ☐ Other…

Lighting Requirements:
- ☐ Natural
- ☐ Ambient Light Level
- ☑ Light Level - Work Plane
- ☐ Special Lighting Requirements
- ☐ Darkenable
- ☐ Dimmable
- ☑ No Windows

Electrical Power Supply:
- ☐ Special Outlet
- ☑ 110v, 20a, 1 phase
- ☐ 208v, 30a, 1 phase
- ☐ 208v, 30a, 3 phase
- ☐ 240v
- ☐ 480v
- ☐ Isolated Ground Outlet
- ☑ Standby Power
- ☐ Explosion Proof Outlet

Communications
- ☑ Telephone Outlet
- ☑ Computer Outlet
- ☐ Intercom

Environmental Conditions
- ☐ Air Changes
- ☑ Humidity Control
- ☐ Air Recycle - Yes
- ☐ Air Recycle - No
- ☐ Operable Windows
- ☑ Air Conditioned

Air Pressure:
- ☐ Positive
- ☐ Negative
- ☐ Uncontrolled

Air Filtration:
- ☐ Supply
- ☐ Exhaust

Equipment:
- ☐ Vibration Sensitive
- ☐ Light Sensitive
- ☐ Heat Producing
- ☐ Noise Producing
- ☐ Lasers
- ☐ Alarm
- ☐ Other…

Security/Access
- ☐ Public Access
- ☑ Controlled Access
- ☑ Card Reader
- ☐ Cameras
- ☐ Other

## Washington State Department of Information Services

**Program:** Computer Services Division
**Room Name:** Warehouse
**Occupancy:** 0 FTE
**Date:** 02/28/07
**Manager:** Carlyle Ludwig
**Net Area:** 6,500 sf
**Ceiling Height:** 12' - 0"

**Room Activity:** Loading, Unloading, Storage
**Adjacency Requirements:** Data Center, Loading Dock

**Room Finishes**
**Ceiling:** exposed
**Wall:** Paint
**Base:**
**Floor:** Concrete
**Doors:** Garage/roll-up
**Door Size:**
**Door Type:**

**Vision Panel:**
**Special Security Req:** Yes
**Special Doors:**
**Noise Criteria:**
**Notes/Issues:**

---

Daily Occupance Use:
- [x] 8 Hours (8:00 - 5:00)
- [ ] 14 Hours (8:00-10:00)
- [ ] 24 Hours

Services:
- [ ] Cylinder Gas
- [x] Hot Water
- [x] Cold Water
- [ ] Process Cooling Water
- [x] Floor Drain
- [ ] Floor Sink
- [ ] Emergency Shower
- [ ] Eyewash
- [ ] Other…

Chemical Use/Storage:
- [ ] Solvents
- [ ] Acids
- [ ] Toxics
- [ ] Gases
- [ ] Hazardous Storage
- [ ] Other…

Lighting Requirements:
- [ ] Natural
- [ ] Ambient Light Level
- [x] Light Level - Work Plane
- [ ] Special Lighting Requirements
- [ ] Darkenable
- [ ] Dimmable
- [ ] No Windows

Electrical Power Supply:
- [ ] Special Outlet
- [x] 110v, 20a, 1 phase
- [x] 208v, 30a, 1 phase
- [ ] 208v, 30a, 3 phase
- [x] 240v
- [ ] 480v
- [ ] Isolated Ground Outlet
- [x] Standby Power
- [ ] Explosion Proof Outlet

Communications
- [x] Telephone Outlet
- [x] Computer Outlet
- [ ] Intercom

Environmental Conditions
- [ ] Air Changes
- [ ] Humidity Control
- [ ] Air Recycle - Yes
- [ ] Air Recycle - No
- [ ] Operable Windows
- [ ] Air Conditioned
- [x] Heat

Air Pressure:
- [ ] Positive
- [ ] Negative
- [ ] Uncontrolled

Air Filtration:
- [ ] Supply
- [ ] Exhaust

Equipment:
- [ ] Vibration Sensitive
- [ ] Light Sensitive
- [ ] Heat Producing
- [ ] Noise Producing
- [ ] Lasers
- [x] Alarm
- [ ] Other…

Security/Access
- [ ] Public Access
- [x] Controlled Access
- [x] Card Reader
- [ ] Cameras
- [ ] Other

## Washington State Department of Information Services

**Program:** Computer Services Division
**Room Name:** Leasing/Brokering Warehouse
**Occupancy:**
**Date:** 02/28/07
**Manager:** Scott Smith
**Net Area:**
**Ceiling Height:** 9' - 0"
**Room Activity:** Loading, shipping, computer set-up
**Adjacency Requirements:** TAS

**Room Finishes**
**Ceiling:** Exposed
**Wall:** Concrete - durable
**Base:**
**Floor:** Tile/linoleum
**Doors:**
**Door Size:**
**Door Type:**

**Vision Panel:**
**Special Security Req:** customer bell, card reader
**Special Doors:** roll up? Double doors
**Noise Criteria:**
**Notes/Issues:**

---

Daily Occupance Use:
- [ ] 8 Hours (8:00 - 5:00)
- [x] 14 Hours (8:00-10:00)
- [ ] 24 Hours

Services:
- [ ] Cylinder Gas
- [x] Hot Water
- [x] Cold Water
- [x] Process Cooling Water
- [ ] Floor Drain
- [ ] Floor Sink
- [x] Emergency Shower
- [ ] Eyewash
- [ ] Other…

Chemical Use/Storage:
- [ ] Solvents
- [ ] Acids
- [ ] Toxics
- [ ] Gases
- [ ] Hazardous Storage
- [ ] Other…

Lighting Requirements:
- [x] Natural
- [ ] Ambient Light Level
- [ ] Light Level - Work Plane
- [ ] Special Lighting Requirements
- [ ] Darkenable
- [ ] Dimmable
- [ ] No Windows

Electrical Power Supply:
- [ ] Special Outlet
- [x] 110v, 20a, 1 phase
- [ ] 208v, 30a, 1 phase
- [ ] 208v, 30a, 3 phase
- [ ] 240v
- [ ] 480v
- [x] Isolated Ground Outlet
- [x] Standby Power
- [ ] Explosion Proof Outlet

Communications
- [x] Telephone Outlet
- [x] Computer Outlet
- [ ] Intercom

Environmental Conditions
- [ ] Air Changes
- [ ] Humidity Control
- [ ] Air Recycle - Yes
- [ ] Air Recycle - No
- [ ] Operable Windows
- [x] Air Conditioned

Air Pressure:
- [ ] Positive
- [ ] Negative
- [ ] Uncontrolled

Air Filtration:
- [ ] Supply
- [ ] Exhaust

Equipment:
- [ ] Vibration Sensitive
- [ ] Light Sensitive
- [ ] Heat Producing
- [ ] Noise Producing
- [ ] Lasers
- [x] Alarm
- [ ] Other…

Security/Access
- [x] Public Access
- [x] Controlled Access
- [x] Card Reader
- [x] Cameras
- [ ] Other

## Washington State Department of Information Services

**Program: Interactive** Technologies
**Room Name:** TV Studio
**Manager:** Renee Klosterman

**Occupancy:** 9
**Date:** 02/28/07
**Net Area:** 5,347 sf
**Ceiling Height:** 9' - 0" (14' - 0" in studio)

**Room Activity:** Editing, Studio, Production
**Adjacency Requirements:** lobby

**Room Finishes**
**Ceiling:** Exposed, Acoustic
**Wall:** Paint, Acoustic
**Base:** Rubber
**Floor:** Carpet
**Doors:** Garage, Sound-proof
**Door Size:**
**Door Type:**

**Vision Panel:** control room
**Special Security Req:** Yes
**Special Doors:**
**Noise Criteria:**
**Notes/Issues:** TV studio & edit suites - special requirements

---

Daily Occupance Use:
- [ ] 8 Hours (8:00 - 5:00)
- [ ] 14 Hours (8:00-10:00)
- [x] 24 Hours

Services:
- [ ] Cylinder Gas
- [ ] Hot Water
- [ ] Cold Water
- [ ] Process Cooling Water
- [ ] Floor Drain
- [ ] Floor Sink
- [ ] Emergency Shower
- [ ] Eyewash
- [ ] Other…

Chemical Use/Storage:
- [ ] Solvents
- [ ] Acids
- [ ] Toxics
- [ ] Gases
- [ ] Hazardous Storage
- [ ] Other…

Lighting Requirements:
- [ ] Natural
- [ ] Ambient Light Level
- [x] Light Level - Work Plane
- [x] Special Lighting Requirements
- [x] Darkenable
- [x] Dimmable
- [x] No Windows

Electrical Power Supply:
- [x] Special Outlet
- [x] 110v, 20a, 1 phase
- [x] 208v, 30a, 1 phase
- [x] 208v, 30a, 3 phase
- [ ] 240v
- [ ] 480v
- [ ] Isolated Ground Outlet
- [x] Standby Power
- [ ] Explosion Proof Outlet

Communications
- [x] Telephone Outlet
- [x] Computer Outlet
- [ ] Intercom

Environmental Conditions
- [ ] Air Changes
- [ ] Humidity Control
- [ ] Air Recycle - Yes
- [ ] Air Recycle - No
- [ ] Operable Windows
- [x] Air Conditioned

Air Pressure:
- [ ] Positive
- [ ] Negative
- [ ] Uncontrolled

Air Filtration:
- [ ] Supply
- [ ] Exhaust

Equipment:
- [ ] Vibration Sensitive
- [ ] Light Sensitive
- [ ] Heat Producing
- [ ] Noise Producing
- [ ] Lasers
- [ ] Alarm
- [x] Other… cameras, audio, vis

Security/Access
- [x] Public Access
- [x] Controlled Access
- [x] Card Reader
- [ ] Cameras
- [ ] Other

## Washington State Department of Information Services

**Program:** Data Center
**Room Name:** Command Center
**Manager:** Jim Albert

**Occupancy:** 13
**Net Area:** 2,860 sf
**Ceiling Height:** 9' - 0"

**Date:** 02/28/07

**Room Activity:** monitoring, meeting
**Adjacency Requirements:** Data Center

**Room Finishes**
**Ceiling:** Acoustic
**Wall:** Paint
**Base:** Rubber
**Floor:** Carpet
**Doors:**
**Door Size:**
**Door Type:**

**Vision Panel:** No
**Special Security Req:** Yes
**Special Doors:**
**Noise Criteria:**
**Notes/Issues:**

---

Daily Occupance Use:
- ☐ 8 Hours (8:00 - 5:00)
- ☐ 14 Hours (8:00-10:00)
- ☑ 24 Hours

Services:
- ☐ Cylinder Gas
- ☐ Hot Water
- ☐ Cold Water
- ☐ Process Cooling Water
- ☐ Floor Drain
- ☐ Floor Sink
- ☐ Emergency Shower
- ☐ Eyewash
- ☐ Other…

Chemical Use/Storage:
- ☐ Solvents
- ☐ Acids
- ☐ Toxics
- ☐ Gases
- ☐ Hazardous Storage
- ☐ Other…

Lighting Requirements:
- ☐ Natural
- ☐ Ambient Light Level
- ☑ Light Level - Work Plane
- ☑ Special Lighting Requirements
- ☐ Darkenable
- ☐ Dimmable
- ☑ No Windows

Electrical Power Supply:
- ☐ Special Outlet
- ☑ 110v, 20a, 1 phase
- ☐ 208v, 30a, 1 phase
- ☐ 208v, 30a, 3 phase
- ☐ 240v
- ☐ 480v
- ☐ Isolated Ground Outlet
- ☐ Standby Power
- ☐ Explosion Proof Outlet

Communications
- ☑ Telephone Outlet
- ☑ Computer Outlet
- ☐ Intercom

Environmental Conditions
- ☐ Air Changes
- ☐ Humidity Control
- ☐ Air Recycle - Yes
- ☐ Air Recycle - No
- ☐ Operable Windows
- ☐ Air Conditioned

Air Pressure:
- ☐ Positive
- ☐ Negative
- ☐ Uncontrolled

Air Filtration:
- ☐ Supply
- ☐ Exhaust

Equipment:
- ☐ Vibration Sensitive
- ☐ Light Sensitive
- ☐ Heat Producing
- ☐ Noise Producing
- ☐ Lasers
- ☐ Alarm
- ☐ Other…

Security/Access
- ☐ Public Access
- ☑ Controlled Access
- ☑ Card Reader
- ☐ Cameras
- ☐ Other

## Washington State Department of Information Services

**Program:** Computer Services Division
**Room Name:** Security Office
**Manager:** Carlyle Ludwig

**Occupancy:** 3
**Net Area:** 408 sf
**Ceiling Height:** 9' - 0"

**Date:** 02/28/07

**Room Activity:** Office
**Adjacency Requirements:** TAS

**Room Finishes**
**Ceiling:** Acoustic
**Wall:** Paint
**Base:** Rubber
**Floor:** Carpet
**Doors:**
**Door Size:**
**Door Type:**

**Vision Panel:**
**Special Security Req:**
**Special Doors:**
**Noise Criteria:**
**Notes/Issues:**

---

Daily Occupance Use:
- ☐ 8 Hours (8:00 - 5:00)
- ☐ 14 Hours (8:00-10:00)
- ☑ 24 Hours

Services:
- ☐ Cylinder Gas
- ☐ Hot Water
- ☐ Cold Water
- ☐ Process Cooling Water
- ☐ Floor Drain
- ☐ Floor Sink
- ☐ Emergency Shower
- ☐ Eyewash
- ☐ Other…

Chemical Use/Storage:
- ☐ Solvents
- ☐ Acids
- ☐ Toxics
- ☐ Gases
- ☐ Hazardous Storage
- ☐ Other…

Lighting Requirements:
- ☐ Natural
- ☐ Ambient Light Level
- ☑ Light Level - Work Plane
- ☐ Special Lighting Requirements
- ☐ Darkenable
- ☐ Dimmable
- ☐ No Windows

Electrical Power Supply:
- ☐ Special Outlet
- ☑ 110v, 20a, 1 phase
- ☑ 208v, 30a, 1 phase
- ☐ 208v, 30a, 3 phase
- ☐ 240v
- ☐ 480v
- ☐ Isolated Ground Outlet
- ☐ Standby Power
- ☐ Explosion Proof Outlet

Communications
- ☑ Telephone Outlet
- ☑ Computer Outlet
- ☐ Intercom

Environmental Conditions
- ☐ Air Changes
- ☐ Humidity Control
- ☐ Air Recycle - Yes
- ☐ Air Recycle - No
- ☐ Operable Windows
- ☑ Air Conditioned

Air Pressure:
- ☐ Positive
- ☐ Negative
- ☐ Uncontrolled

Air Filtration:
- ☐ Supply
- ☐ Exhaust

Equipment:
- ☐ Vibration Sensitive
- ☐ Light Sensitive
- ☐ Heat Producing
- ☐ Noise Producing
- ☐ Lasers
- ☐ Alarm
- ☐ Other…

Security/Access
- ☑ Public Access
- ☑ Controlled Access
- ☑ Card Reader
- ☑ Cameras
- ☐ Other

## Washington State Department of Information Services

**Program:** Director's Office
**Room Name:** Lobby/Reception
**Occupancy:** 2
**Date:** 02/28/07
**Manager:** Kelly Bradley
**Net Area:** 2000
**Ceiling Height:** 10' - 0"

**Room Activity:** Lobby, Reception, Waiting
**Adjacency Requirements:** Director's Office, Mail Room

**Room Finishes**
**Ceiling:** Acoustic
**Wall:** Paint/Wood Panel
**Base:** Wood
**Floor:** Terazzo
**Doors:** Entry Doors
**Door Size:**
**Door Type:**

**Vision Panel:**
**Special Security Req:** Panic Button
**Special Doors:** ADA
**Noise Criteria:**
**Notes/Issues:**

---

Daily Occupance Use:
- [x] 8 Hours (8:00 - 5:00)
- [ ] 14 Hours (8:00-10:00)
- [ ] 24 Hours

Services:
- [ ] Cylinder Gas
- [ ] Hot Water
- [ ] Cold Water
- [ ] Process Cooling Water
- [ ] Floor Drain
- [ ] Floor Sink
- [ ] Emergency Shower
- [ ] Eyewash
- [ ] Other…

Chemical Use/Storage:
- [ ] Solvents
- [ ] Acids
- [ ] Toxics
- [ ] Gases
- [ ] Hazardous Storage
- [ ] Other…

Lighting Requirements:
- [x] Natural
- [ ] Ambient Light Level
- [x] Light Level - Work Plane
- [ ] Special Lighting Requirements
- [ ] Darkenable
- [ ] Dimmable
- [ ] No Windows

Electrical Power Supply:
- [ ] Special Outlet
- [x] 110v, 20a, 1 phase
- [ ] 208v, 30a, 1 phase
- [ ] 208v, 30a, 3 phase
- [ ] 240v
- [ ] 480v
- [ ] Isolated Ground Outlet
- [ ] Standby Power
- [ ] Explosion Proof Outlet

Communications
- [x] Telephone Outlet
- [x] Computer Outlet
- [x] Intercom

Environmental Conditions
- [ ] Air Changes
- [ ] Humidity Control
- [ ] Air Recycle - Yes
- [ ] Air Recycle - No
- [ ] Operable Windows
- [ ] Air Conditioned

Air Pressure:
- [ ] Positive
- [x] Negative
- [ ] Uncontrolled

Air Filtration:
- [ ] Supply
- [ ] Exhaust

Equipment:
- [ ] Vibration Sensitive
- [ ] Light Sensitive
- [ ] Heat Producing
- [ ] Noise Producing
- [ ] Lasers
- [ ] Alarm
- [ ] Other…

Security/Access
- [x] Public Access
- [ ] Controlled Access
- [x] Card Reader
- [x] Cameras
- [ ] Other

## Washington State Department of Information Services

**Program:** Director's Office
**Room Name:** Wellness Room
**Manager:** Kelly Bradley

**Occupancy:** 20
**Net Area:** 800 sf
**Ceiling Height:** 9' - 0"

**Date:** 02/28/07

**Room Activity:** Exercise, rest
**Adjacency Requirements:** Restroom

**Room Finishes**
**Ceiling:** Exposed
**Wall:** Paint
**Base:** Rubber
**Floor:** Linoleum/Cork
**Doors:**
**Door Size:** 3' - 0" x 6' - 8"
**Door Type:**

**Vision Panel:** No
**Special Security Req:**
**Special Doors:**
**Noise Criteria:**
**Notes/Issues:**

---

Daily Occupance Use:
- [x] 8 Hours (8:00 - 5:00)
- [ ] 14 Hours (8:00-10:00)
- [ ] 24 Hours

Services:
- [ ] Cylinder Gas
- [ ] Hot Water
- [ ] Cold Water
- [ ] Process Cooling Water
- [ ] Floor Drain
- [ ] Floor Sink
- [ ] Emergency Shower
- [ ] Eyewash
- [ ] Other… Drinking Fountain

Chemical Use/Storage:
- [ ] Solvents
- [ ] Acids
- [ ] Toxics
- [ ] Gases
- [ ] Hazardous Storage
- [ ] Other…

Lighting Requirements:
- [x] Natural
- [ ] Ambient Light Level
- [ ] Light Level - Work Plane
- [ ] Special Lighting Requirements
- [x] Darkenable
- [x] Dimmable
- [ ] No Windows

Electrical Power Supply:
- [ ] Special Outlet
- [x] 110v, 20a, 1 phase
- [ ] 208v, 30a, 1 phase
- [ ] 208v, 30a, 3 phase
- [ ] 240v
- [ ] 480v
- [ ] Isolated Ground Outlet
- [ ] Standby Power
- [ ] Explosion Proof Outlet

Communications
- [x] Telephone Outlet
- [x] Computer Outlet
- [ ] Intercom

Environmental Conditions
- [x] Air Changes
- [ ] Humidity Control
- [ ] Air Recycle - Yes
- [ ] Air Recycle - No
- [ ] Operable Windows
- [ ] Air Conditioned

Air Pressure:
- [ ] Positive
- [ ] Negative
- [ ] Uncontrolled

Air Filtration:
- [ ] Supply
- [ ] Exhaust

Equipment:
- [ ] Vibration Sensitive
- [ ] Light Sensitive
- [ ] Heat Producing
- [ ] Noise Producing
- [ ] Lasers
- [ ] Alarm
- [x] Other… TV

Security/Access
- [ ] Public Access
- [x] Controlled Access
- [x] Card Reader
- [ ] Cameras
- [ ] Other

## Washington State Department of Information Services

**Program:** MOSTD
**Room Name:** Board Room
**Manager:** Tracy Guerin

**Occupancy:** Varies
**Net Area:** 2,000 sf
**Ceiling Height:** 9' - 0"

**Date:** 02/28/07

**Room Activity: Meeting**
**Adjacency Requirements:** Lobby

**Room Finishes**
**Ceiling:** Acoustic
**Wall:** Paint
**Base:** Rubber
**Floor:** Carpet
**Doors:**
**Door Size:**
**Door Type:**

**Vision Panel:**
**Special Security Req:**
**Special Doors:**
**Noise Criteria:**
**Notes/Issues:** divisible

---

Daily Occupance Use:
- [ ] 8 Hours (8:00 - 5:00)
- [x] 14 Hours (8:00-10:00)
- [ ] 24 Hours

Services:
- [ ] Cylinder Gas
- [x] Hot Water
- [x] Cold Water
- [ ] Process Cooling Water
- [ ] Floor Drain
- [ ] Floor Sink
- [ ] Emergency Shower
- [ ] Eyewash
- [ ] Other…

Chemical Use/Storage:
- [ ] Solvents
- [ ] Acids
- [ ] Toxics
- [ ] Gases
- [ ] Hazardous Storage
- [ ] Other…

Lighting Requirements:
- [ ] Natural
- [ ] Ambient Light Level
- [ ] Light Level - Work Plane
- [x] Special Lighting Requirements
- [x] Darkenable
- [ ] Dimmable
- [ ] No Windows

Electrical Power Supply:
- [ ] Special Outlet
- [x] 110v, 20a, 1 phase
- [ ] 208v, 30a, 1 phase
- [ ] 208v, 30a, 3 phase
- [ ] 240v
- [ ] 480v
- [ ] Isolated Ground Outlet
- [ ] Standby Power
- [ ] Explosion Proof Outlet

Communications
- [x] Telephone Outlet
- [x] Computer Outlet
- [ ] Intercom

Environmental Conditions
- [ ] Air Changes
- [ ] Humidity Control
- [ ] Air Recycle - Yes
- [ ] Air Recycle - No
- [ ] Operable Windows
- [x] Air Conditioned

Storage Room
- [x] Chairs, easels, supplies

Kitchenette
- [x] Sink
- [x] Refrigerator

Air Pressure:
- [ ] Positive
- [ ] Negative
- [ ] Uncontrolled

Air Filtration:
- [ ] Supply
- [ ] Exhaust

Equipment:
- [ ] Vibration Sensitive
- [ ] Light Sensitive
- [ ] Heat Producing
- [ ] Noise Producing
- [ ] Lasers
- [ ] Alarm
- [x] Projection screen
- [x] Microphone
- [x] Tele-conference
- [x] Video conference
- [x] Other

Security/Access
- [x] Public Access - 8am-5pm
- [ ] Controlled Access
- [x] Card Reader
- [ ] Cameras
- [ ] Other

## Washington State Department of Information Services

**Program:** MOSTD
**Room Name:** Classroom
**Manager:** Tracy Guerin

**Occupancy:** Varies
**Net Area:** 1,300 sf
**Ceiling Height:** 9' - 0"

**Date:** 02/28/07

**Room Activity:**
**Adjacency Requirements:**

**Room Finishes**
**Ceiling:** Acoustic
**Wall:** Paint/Wood Panel
**Base:** Rubber
**Floor:** Carpet
**Doors:**
**Door Size:**
**Door Type:**

**Vision Panel:**
**Special Security Req:**
**Special Doors:**
**Noise Criteria:**
**Notes/Issues:**

---

Daily Occupance Use:
- [x] 8 Hours (8:00 - 5:00)
- [ ] 14 Hours (8:00-10:00)
- [ ] 24 Hours

Services:
- [ ] Cylinder Gas
- [x] Hot Water
- [x] Cold Water
- [ ] Process Cooling Water
- [ ] Floor Drain
- [ ] Floor Sink
- [ ] Emergency Shower
- [ ] Eyewash
- [ ] Other…

Chemical Use/Storage:
- [ ] Solvents
- [ ] Acids
- [ ] Toxics
- [ ] Gases
- [ ] Hazardous Storage
- [ ] Other…

Lighting Requirements:
- [ ] Natural
- [ ] Ambient Light Level
- [x] Light Level - Work Plane
- [x] Special Lighting Requirements
- [x] Darkenable
- [ ] Dimmable
- [ ] No Windows

Electrical Power Supply:
- [ ] Special Outlet
- [x] 110v, 20a, 1 phase
- [ ] 208v, 30a, 1 phase
- [ ] 208v, 30a, 3 phase
- [ ] 240v
- [ ] 480v
- [ ] Isolated Ground Outlet
- [ ] Standby Power
- [ ] Explosion Proof Outlet

Communications
- [x] Telephone Outlet
- [x] Computer Outlet
- [ ] Intercom

Environmental Conditions
- [ ] Air Changes
- [ ] Humidity Control
- [ ] Air Recycle - Yes
- [ ] Air Recycle - No
- [ ] Operable Windows
- [ ] Air Conditioned

Storage Room
- [x]

Kitchenette
- [x] Sink
- [x] Refrigerator
- [x] Counterspace

Air Pressure:
- [ ] Positive
- [ ] Negative
- [ ] Uncontrolled

Air Filtration:
- [ ] Supply
- [ ] Exhaust

Equipment:
- [ ] Vibration Sensitive
- [ ] Light Sensitive
- [ ] Heat Producing
- [ ] Noise Producing
- [ ] Lasers
- [ ] Alarm
- [ ] Other…

Security/Access
- [ ] Public Access
- [ ] Controlled Access
- [ ] Card Reader
- [ ] Cameras
- [ ] Other

Equipment:
- [x] Projection Screen
- [x] Teleconference
- [x] Video Conference
- [x] Other

## Washington State Department of Information Services

**Program:** Computer Services Division
**Room Name:** Library
**Manager:** Christine Dolan

**Occupancy:** Varies
**Net Area:** 400 sf
**Ceiling Height:** 9' - 0"

**Date:** 02/28/07

**Room Activity:** Book storage, study
**Adjacency Requirements:**

**Room Finishes**
**Ceiling:** Acoustic
**Wall:** Paint
**Base:** Rubber
**Floor:** Carpet
**Doors:**
**Door Size:**
**Door Type:**

**Vision Panel:** Yes
**Special Security Req:**
**Special Doors:**
**Noise Criteria:**
**Notes/Issues:**

---

Daily Occupance Use:
- [ ] 8 Hours (8:00 - 5:00)
- [ ] 14 Hours (8:00-10:00)
- [x] 24 Hours

Services:
- [ ] Cylinder Gas
- [ ] Hot Water
- [ ] Cold Water
- [ ] Process Cooling Water
- [ ] Floor Drain
- [ ] Floor Sink
- [ ] Emergency Shower
- [ ] Eyewash
- [ ] Other…

Chemical Use/Storage:
- [ ] Solvents
- [ ] Acids
- [ ] Toxics
- [ ] Gases
- [ ] Hazardous Storage
- [ ] Other…

Lighting Requirements:
- [ ] Natural
- [ ] Ambient Light Level
- [x] Light Level - Work Plane
- [ ] Special Lighting Requirements
- [ ] Darkenable
- [ ] Dimmable
- [x] No Windows

Electrical Power Supply:
- [ ] Special Outlet
- [x] 110v, 20a, 1 phase
- [x] 208v, 30a, 1 phase
- [ ] 208v, 30a, 3 phase
- [ ] 240v
- [ ] 480v
- [ ] Isolated Ground Outlet
- [ ] Standby Power
- [ ] Explosion Proof Outlet

Communications
- [x] Telephone Outlet
- [x] Computer Outlet
- [ ] Intercom

Environmental Conditions
- [ ] Air Changes
- [ ] Humidity Control
- [ ] Air Recycle - Yes
- [ ] Air Recycle - No
- [ ] Operable Windows
- [x] Air Conditioned

Air Pressure:
- [ ] Positive
- [ ] Negative
- [ ] Uncontrolled

Air Filtration:
- [ ] Supply
- [ ] Exhaust

Equipment:
- [ ] Vibration Sensitive
- [ ] Light Sensitive
- [ ] Heat Producing
- [ ] Noise Producing
- [ ] Lasers
- [ ] Alarm
- [ ] Other…

Security/Access
- [ ] Public Access
- [x] Controlled Access
- [ ] Card Reader
- [ ] Cameras
- [ ] Other

## Washington State Department of Information Services

**Program:** Director's Office
**Room Name:** Mail Room
**Manager:** Kelly Bradley

**Occupancy:** 0
**Net Area:** 500 sf
**Ceiling Height:** 9' - 0"

**Date:** 02/28/07

**Room Activity:** mail sorting, distribution
**Adjacency Requirements:** Lobby/Reception

**Room Finishes**
**Ceiling:** Acoustic
**Wall:** Paint
**Base:** Rubber
**Floor:** Carpet
**Doors:**
**Door Size:** 3' - 0" x 6' - 8"
**Door Type:**

**Vision Panel:** Yes
**Special Security Req:** Yes
**Special Doors:**
**Noise Criteria:**
**Notes/Issues:** mail cabinets/boxes

---

Daily Occupance Use:
- [x] 8 Hours (8:00 - 5:00)
- [ ] 14 Hours (8:00-10:00)
- [ ] 24 Hours

Services:
- [ ] Cylinder Gas
- [ ] Hot Water
- [ ] Cold Water
- [ ] Process Cooling Water
- [ ] Floor Drain
- [ ] Floor Sink
- [ ] Emergency Shower
- [ ] Eyewash
- [ ] Other…

Chemical Use/Storage:
- [ ] Solvents
- [ ] Acids
- [ ] Toxics
- [ ] Gases
- [ ] Hazardous Storage
- [ ] Other…

Lighting Requirements:
- [ ] Natural
- [ ] Ambient Light Level
- [x] Light Level - Work Plane
- [ ] Special Lighting Requirements
- [ ] Darkenable (can be "lights out", not accessed frequently
- [ ] Dimmable
- [ ] No Windows

Electrical Power Supply:
- [ ] Special Outlet
- [x] 110v, 20a, 1 phase
- [x] 208v, 30a, 1 phase
- [ ] 208v, 30a, 3 phase
- [x] 240v
- [ ] 480v
- [ ] Isolated Ground Outlet
- [x] Standby Power
- [ ] Explosion Proof Outlet

Communications
- [x] Telephone Outlet
- [x] Computer Outlet
- [ ] Intercom

Environmental Conditions
- [ ] Air Changes
- [ ] Humidity Control
- [ ] Air Recycle - Yes
- [ ] Air Recycle - No
- [ ] Operable Windows
- [ ] Air Conditioned

Air Pressure:
- [ ] Positive
- [ ] Negative
- [ ] Uncontrolled

Air Filtration:
- [ ] Supply
- [ ] Exhaust

Equipment:
- [ ] Vibration Sensitive
- [ ] Light Sensitive
- [ ] Heat Producing
- [x] Noise Producing
- [ ] Lasers
- [ ] Alarm
- [ ] Other…

Security/Access
- [ ] Public Access
- [x] Controlled Access
- [x] Card Reader
- [ ] Cameras
- [ ] Other

## Washington State Department of Information Services

**Program:** Computer Services Division
**Room Name:** Test Server Closet
**Manager:** Karen Peterson

**Occupancy:** 0
**Net Area:**
**Ceiling Height:** 9' - 0"

**Date:** 02/28/07

**Room Activity:** Software Testing
**Adjacency Requirements:** CSD

**Room Finishes**
**Ceiling:** Exposed
**Wall:** Paint
**Base:** Rubber
**Floor:** Carpet
**Doors:** Fold-out/Double
**Door Size:**
**Door Type:**

**Vision Panel:**
**Special Security Req:**
**Special Doors:**
**Noise Criteria:**
**Notes/Issues:**

---

Daily Occupance Use:
- ☐ 8 Hours (8:00 - 5:00)
- ☐ 14 Hours (8:00-10:00)
- ☑ 24 Hours

Services:
- ☐ Cylinder Gas
- ☐ Hot Water
- ☐ Cold Water
- ☐ Process Cooling Water
- ☐ Floor Drain
- ☐ Floor Sink
- ☐ Emergency Shower
- ☐ Eyewash
- ☐ Other…

Chemical Use/Storage:
- ☐ Solvents
- ☐ Acids
- ☐ Toxics
- ☐ Gases
- ☐ Hazardous Storage
- ☐ Other…

Lighting Requirements:
- ☐ Natural
- ☐ Ambient Light Level
- ☑ Light Level - Work Plane
- ☐ Special Lighting Requirements
- ☐ Darkenable
- ☐ Dimmable
- ☑ No Windows

Electrical Power Supply:
- ☐ Special Outlet
- ☑ 110v, 20a, 1 phase
- ☑ 208v, 30a, 1 phase
- ☐ 208v, 30a, 3 phase
- ☐ 240v
- ☐ 480v
- ☐ Isolated Ground Outlet
- ☐ Standby Power
- ☐ Explosion Proof Outlet

Communications
- ☑ Telephone Outlet
- ☑ Computer Outlet
- ☐ Intercom

Environmental Conditions
- ☐ Air Changes
- ☐ Humidity Control
- ☐ Air Recycle - Yes
- ☐ Air Recycle - No
- ☐ Operable Windows
- ☑ Air Conditioned

Air Pressure:
- ☐ Positive
- ☐ Negative
- ☐ Uncontrolled

Air Filtration:
- ☐ Supply
- ☐ Exhaust

Equipment:
- ☑ Vibration Sensitive
- ☐ Light Sensitive
- ☐ Heat Producing
- ☑ Noise Producing
- ☐ Lasers
- ☐ Alarm
- ☐ Other…

Security/Access
- ☐ Public Access
- ☑ Controlled Access
- ☑ Card Reader
- ☐ Cameras
- ☐ Other

## Washington State Department of Information Services

**Program:** All
**Room Name:** Conference Room
**Manager:** Kelly Bradley

**Occupancy:** Varies
**Date:** 02/28/07
**Net Area:** 240 (sm), 450 (med), 700 (lg)
**Ceiling Height:** 9' - 0"

**Room Activity:** Meeting
**Adjacency Requirements:**

**Room Finishes**
**Ceiling:** Acoustic
**Wall:** Paint
**Base:** Rubber
**Floor:** Carpet
**Doors:**
**Door Size:** 3' - 0" x 8' - 6"
**Door Type:**

**Vision Panel:** Yes
**Special Security Req:**
**Special Doors:**
**Noise Criteria:**
**Notes/Issues:**

---

Daily Occupance Use:
- [ ] 8 Hours (8:00 - 5:00)
- [x] 14 Hours (8:00-10:00)
- [ ] 24 Hours

Services:
- [ ] Cylinder Gas
- [ ] Hot Water
- [ ] Cold Water
- [ ] Process Cooling Water
- [ ] Floor Drain
- [ ] Floor Sink
- [ ] Emergency Shower
- [ ] Eyewash
- [ ] Other…

Chemical Use/Storage:
- [ ] Solvents
- [ ] Acids
- [ ] Toxics
- [ ] Gases
- [ ] Hazardous Storage
- [ ] Other…

Lighting Requirements:
- [x] Natural
- [ ] Ambient Light Level
- [ ] Light Level - Work Plane
- [x] Special Lighting Requirements
- [x] Darkenable
- [ ] Dimmable
- [ ] No Windows

Electrical Power Supply:
- [ ] Special Outlet
- [x] 110v, 20a, 1 phase
- [ ] 208v, 30a, 1 phase
- [ ] 208v, 30a, 3 phase
- [ ] 240v
- [ ] 480v
- [ ] Isolated Ground Outlet
- [ ] Standby Power
- [ ] Explosion Proof Outlet

Communications
- [x] Telephone Outlet
- [x] Computer Outlet
- [ ] Intercom

Environmental Conditions
- [ ] Air Changes
- [ ] Humidity Control
- [ ] Air Recycle - Yes
- [ ] Air Recycle - No
- [ ] Operable Windows
- [ ] Air Conditioned

Equipment
- [x] Projector
- [x] Video Conference
- [x] Other
- [x] Internet Access
- [x] Drop-down screen
- [x] Cable access
- [x] White Board

Air Pressure:
- [ ] Positive
- [ ] Negative
- [ ] Uncontrolled

Air Filtration:
- [ ] Supply
- [ ] Exhaust

Equipment:
- [ ] Vibration Sensitive
- [ ] Light Sensitive
- [ ] Heat Producing
- [ ] Noise Producing
- [ ] Lasers
- [ ] Alarm
- [ ] Other…

Security/Access
- [ ] Public Access
- [x] Controlled Access
- [ ] Card Reader
- [ ] Cameras
- [ ] Other

## Washington State Department of Information Services

**Program:** Director's Office
**Room Name:** Break/Lunch Room
**Manager:** Kelly Bradley

**Occupancy:** 200
**Net Area:** 3,500 sf
**Ceiling Height:** 9' - 0"

**Date:** 02/28/07

**Room Activity:** Eating
**Adjacency Requirements:** Restrooms

**Room Finishes**
**Ceiling:** Exposed
**Wall:** Paint
**Base:** Rubber
**Floor:** Cork/Linoleum
**Doors:** Paired
**Door Size:**
**Door Type:**

**Vision Panel:** Yes
**Special Security Req:**
**Special Doors:**
**Noise Criteria:**
**Notes/Issues:** wireless internet?

---

Daily Occupance Use:
- [ ] 8 Hours (8:00 - 5:00)
- [ ] 14 Hours (8:00-10:00)
- [x] 24 Hours

Services:
- [ ] Cylinder Gas
- [x] Hot Water
- [x] Cold Water
- [ ] Process Cooling Water
- [ ] Floor Drain
- [ ] Floor Sink
- [ ] Emergency Shower
- [ ] Eyewash
- [ ] Other…

Chemical Use/Storage:
- [ ] Solvents
- [ ] Acids
- [ ] Toxics
- [ ] Gases
- [ ] Hazardous Storage
- [ ] Other…

Lighting Requirements:
- [x] Natural
- [ ] Ambient Light Level
- [ ] Light Level - Work Plane
- [ ] Special Lighting Requirements
- [ ] Darkenable
- [ ] Dimmable
- [ ] No Windows

Electrical Power Supply:
- [ ] Special Outlet
- [x] 110v, 20a, 1 phase
- [x] 208v, 30a, 1 phase
- [ ] 208v, 30a, 3 phase
- [x] 240v
- [ ] 480v
- [ ] Isolated Ground Outlet
- [ ] Standby Power
- [ ] Explosion Proof Outlet

Communications
- [x] Telephone Outlet
- [ ] Computer Outlet
- [ ] Intercom

Environmental Conditions
- [ ] Air Changes
- [ ] Humidity Control
- [ ] Air Recycle - Yes
- [ ] Air Recycle - No
- [ ] Operable Windows
- [ ] Air Conditioned

Kitchen
- [x] Sink
- [x] Microwave (2)
- [x] Stove
- [x] Vending
- [x] Other: Refrigerator, Dishwasher

Air Pressure:
- [ ] Positive
- [ ] Negative
- [ ] Uncontrolled

Air Filtration:
- [ ] Supply
- [ ] Exhaust

Equipment:
- [ ] Vibration Sensitive
- [ ] Light Sensitive
- [ ] Heat Producing
- [ ] Noise Producing
- [ ] Lasers
- [ ] Alarm
- [ ] Other…

Security/Access
- [ ] Public Access
- [x] Controlled Access
- [ ] Card Reader
- [ ] Cameras
- [ ] Other

## Washington State Department of Information Services

**Program:** Management Services Division
**Room Name:** Payroll Office
**Occupancy:** 2
**Date:** 02/28/07
**Manager:** Chuck Smith
**Net Area:** 200
**Ceiling Height:** 9' - 0"

**Room Activity:** Office, records storage
**Adjacency Requirements:** Human Resourncs, Finance Records

**Room Finishes**
**Ceiling:** Acoustic
**Wall:** Paint
**Base:** Rubber
**Floor:** Carpet
**Doors:**
**Door Size:**
**Door Type:**

**Vision Panel:**
**Special Security Req:** Yes
**Special Doors:**
**Noise Criteria:**
**Notes/Issues:** ability to lock because of payroll records

---

Daily Occupance Use:
- [x] 8 Hours (8:00 - 5:00)
- [ ] 14 Hours (8:00-10:00)
- [ ] 24 Hours

Services:
- [ ] Cylinder Gas
- [ ] Hot Water
- [ ] Cold Water
- [ ] Process Cooling Water
- [ ] Floor Drain
- [ ] Floor Sink
- [ ] Emergency Shower
- [ ] Eyewash
- [ ] Other…

Chemical Use/Storage:
- [ ] Solvents
- [ ] Acids
- [ ] Toxics
- [ ] Gases
- [ ] Hazardous Storage
- [ ] Other…

Lighting Requirements:
- [x] Natural
- [ ] Ambient Light Level
- [x] Light Level - Work Plane
- [ ] Special Lighting Requirements
- [ ] Darkenable
- [ ] Dimmable
- [ ] No Windows

Electrical Power Supply:
- [ ] Special Outlet
- [x] 110v, 20a, 1 phase
- [ ] 208v, 30a, 1 phase
- [ ] 208v, 30a, 3 phase
- [ ] 240v
- [ ] 480v
- [ ] Isolated Ground Outlet
- [ ] Standby Power
- [ ] Explosion Proof Outlet

Communications
- [x] Telephone Outlet
- [x] Computer Outlet
- [ ] Intercom

Environmental Conditions
- [ ] Air Changes
- [ ] Humidity Control
- [ ] Air Recycle - Yes
- [ ] Air Recycle - No
- [ ] Operable Windows
- [x] Air Conditioned

Air Pressure:
- [ ] Positive
- [ ] Negative
- [ ] Uncontrolled

Air Filtration:
- [ ] Supply
- [ ] Exhaust

Equipment:
- [ ] Vibration Sensitive
- [ ] Light Sensitive
- [ ] Heat Producing
- [ ] Noise Producing
- [ ] Lasers
- [ ] Alarm
- [ ] Other…

Security/Access
- [ ] Public Access
- [x] Controlled Access
- [x] Card Reader
- [ ] Cameras
- [ ] Other

## Washington State Department of Information Services

**Program:** Management Services Division

**Room Name:** Finance Records
**Occupancy:** Varies
**Date:** 02/28/07

**Manager:** Chuck Smith
**Net Area:** 150 sf
**Ceiling Height:** 9' - 0"

**Room Activity:** Record Storage

**Adjacency Requirements:** Human Resournces, Payroll Office

**Room Finishes**
**Ceiling:** Acoustic
**Wall:** Paint
**Base:** Rubber
**Floor:** Carpet
**Doors:**
**Door Size:**
**Door Type:**

**Vision Panel:**
**Special Security Req:**
**Special Doors:**
**Noise Criteria:**
**Notes/Issues:** file cabinets, Copy machine, printer (shared - 2), scanner, fax, microfiche reader, printer, shredding container

---

Daily Occupance Use:
- [x] 10 Hours (7:00 - 6:00)
- [ ] 14 Hours (8:00-10:00)
- [ ] 24 Hours

Services:
- [ ] Cylinder Gas
- [ ] Hot Water
- [ ] Cold Water
- [ ] Process Cooling Water
- [ ] Floor Drain
- [ ] Floor Sink
- [ ] Emergency Shower
- [ ] Eyewash
- [ ] Other…

Chemical Use/Storage:
- [ ] Solvents
- [ ] Acids
- [ ] Toxics
- [ ] Gases
- [ ] Hazardous Storage
- [ ] Other…

Lighting Requirements:
- [ ] Natural
- [x] Ambient Light Level
- [ ] Light Level - Work Plane
- [ ] Special Lighting Requirements
- [ ] Darkenable
- [ ] Dimmable
- [x] No Windows

Electrical Power Supply:
- [ ] Special Outlet
- [x] 110v, 20a, 1 phase
- [ ] 208v, 30a, 1 phase
- [ ] 208v, 30a, 3 phase
- [ ] 240v
- [ ] 480v
- [ ] Isolated Ground Outlet
- [ ] Standby Power
- [ ] Explosion Proof Outlet

Communications
- [x] Telephone Outlet
- [ ] Computer Outlet
- [ ] Intercom

Environmental Conditions
- [ ] Air Changes
- [ ] Humidity Control
- [ ] Air Recycle - Yes
- [ ] Air Recycle - No
- [ ] Operable Windows
- [ ] Air Conditioned

Air Pressure:
- [ ] Positive
- [ ] Negative
- [ ] Uncontrolled

Air Filtration:
- [ ] Supply
- [ ] Exhaust

Equipment:
- [ ] Vibration Sensitive
- [ ] Light Sensitive
- [ ] Heat Producing
- [ ] Noise Producing
- [ ] Lasers
- [ ] Alarm
- [ ] Other…

Security/Access
- [ ] Public Access
- [x] Controlled Access
- [ ] Card Reader
- [ ] Cameras
- [ ] Other

# PRELIMINARY GEOTECHNICAL REPORT
# Washington DIS Siting Study
# Wheeler Avenue Site
# Olympia, Washington

PROJECT NO. 06-217
March 2007

Prepared for:

Perkins+Will &
Washington State DIS

PanGEO INCORPORATED

*Geotechnical & Earthquake Engineering Consultants*

PanGEO INCORPORATED
Geotechnical & Earthquake Engineering Consultants

March 9, 2007
File No. 06-217

Mr. Dan Nelson
**Perkins + Will**
1221 2nd Avenue #200
Seattle, WA 98101

**Re: Preliminary Geotechnical Report**
**Washington DIS Siting Study**
**Wheeler Avenue Site**
**Olympia, Washington**

Dear Mr. Nelson,

Enclosed is our preliminary geotechnical report for the conceptual design of the foundations for the Washington State Department of Information Services (DIS) data center at the Wheeler Avenue site in Olympia, which is located east of the Capitol Campus Complex. The DIS complex will include a low to mid-rise office building, an office building/command center with a productions studio, and a building for the data center equipment. Various components of the data center may be constructed below grade including a 3 to 4 level underground parking garage and the equipment and support area for the data center equipment.

Based on our site explorations, the Wheeler Avenue site is underlain by surficial fill overlying native deposits of sand, silty clay and clayey silt. Soils within about 25 feet of the ground surface are suitable for the support of light structures that are settlement tolerant. However, heavy or settlement intolerant structures would need to be supported on piles, such as 100 kip capacity, 18" diameter augercast piles extending to an elevation of at least 50 feet, or the near surface soils (upper 25 feet) will need to be improved to support conventional spread footing foundations. Parking garages and buildings extending about 25 feet below grade may be supported on conventional spread footings or mat foundations designed for an allowable load of 8 ksf. Basement walls should include composite drainage systems, such as Miradrain to capture groundwater seepage, and bentonite panels, such as Miraclay.

In general, the subsurface conditions at the Wheeler Avenue site are conducive for the proposed development. However, the relatively weaker soils within about 25 feet of the ground surface and the presence of zones of groundwater seepage will require additional expenditures for pile foundations or ground improvement and somewhat more elaborate waterproofing measures will be required for the basement walls.

The recommendations contained in the attached report are intended only for preliminary design. Additional site explorations and engineering studies will be required to provide final design recommendations for the complex. Please call if there are any questions on this report.

Sincerely,

W. Paul Grant, P.E.
Principal

Enclosure: Preliminary Geotechnical Report

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# PRELIMINARY GEOTECHNICAL REPORT
# WASHINGTON DIS SITING STUDY
# WHEELER AVENUE SITE
# OLYMPIA, WASHINGTON

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## 1.0 INTRODUCTION

PanGEO, Inc. (PanGEO) completed a geotechnical engineering study to provide preliminary foundation design parameters for the new for the new Washington State Department of Information Services (DIS) Data Center Complex at the Wheeler Avenue Site in Olympia, just east of the Capitol Campus Complex. In accordance with our proposals dated October 25, 2006 and January 15, 2007, our study included evaluating the subsurface conditions at the site with three new site explorations and providing preliminary recommendations for foundations to support the various at grade and below grade buildings. The following summarizes our findings and conclusions.

## 2.0 SITE AND PROJECT DESCRIPTION

The Wheeler Avenue site, which is being considered for the new DIS facility, is a rectangular parcel that is bounded by 15$^{th}$ and 16$^{th}$ Avenues SE on the north and south, respectively, Jefferson Street on the West and by the I-5 right-of-way on the east, as approximately shown on Figure 1. The property extends about 750 feet in the east-west direction and about 500 feet in the north-south direction. The majority of the site is used for parking by State employees. Also, there are several one to two story structures located along the northern property line.

The ground surface at the site generally slopes to the northeast and there is a steep cut slope leading down to Interstate 5 along the east property line. In general, there is about a 30 foot differential in elevation between the topographic high at the southwest corner of the site (approximate elevation 118') and the surface elevation of about 86 feet along the 15$^{th}$ Avenue SE.

The new DIS Data Center will include a low to mid-rise office building, an office building/command center with a productions studio, and the building for the data center equipment. Various components of the data center complex may be constructed below grade including a 3 to 4 level underground parking garage and the equipment and support area for the data center equipment. Building loads have not been determined, but column loads for some of the larger buildings may be on the order of 500 kips.

## 3.0 SUBSURFACE CONDITIONS

Subsurface conditions at the Wheeler Avenue site were evaluated from the results of one boring and two cone penetrometer probes that were advanced at the site during the week of January 22, 2007. Figure 1 shows the locations of the field explorations. Boring B-1 was drilled to a depth of 51.5 feet below the existing ground surface at the northwest corner of the site. Soil samples were retrieved from the boring at 2.5 foot intervals to a depth of 20 feet and at 5 foot depth intervals thereafter. All samples were retrieved in conjunction with the Standard Penetration Test (SPT). All samples retrieved from the boring were classified in the field by our engineering geologist based on the methodology outlined in Figure 2.

In addition to the boring, we advanced two cone penetrometer test (CPT) probes, each to a depth of 100 feet, at the locations shown of Figure 1. The CPTs provide a more rapid means of evaluating the subsurface conditions. Logs of the subsurface explorations are presented in Figures 3, 4 and 5.

In general, the explorations indicate that the site is underlain by 2 to as much as 9 feet of fill, consisting of soft to medium stiff silty clay with some scattered debris. The fill may locally overlie about 5 feet of outwash deposits consisting of medium dense sand and gravel. The outwash deposits overlie lacustrine deposits consisting of medium stiff to stiff silty clay to clayey silt. These lacustrine deposits are typically very stiff to hard below a depth of about 25 feet. The lacustrine deposits, which extended to depths of at least 100 feet below the ground surface, may also contain outwash deposits of dense sand.

Perched ground water may exist within discrete sand seams within the lacustrine deposits. That is, ground water seepage may be expected within about 15 feet of the ground surface and also within some of the more extensive sand layers at depth.

## 4.0 CONCLUSIONS AND RECOMMENDATIONS

### 4.1 FOUNDATION TYPES

The near surface soils at the site can generally support lightly loaded single story structures on conventional spread footing foundations designed for a relatively low allowable bearing pressure of 3 ksf. However, the very stiff to hard lacustrine soils encountered in the explorations below a depth of about 25 feet can support conventional spread footing and mat foundations designed for a higher allowable bearing pressure of 8 ksf. The above allowable bearing pressures may be increased by 33% for seismic loading. In general, lightly loaded surface foundations or the more heavily loaded foundations bearing below a depth of 25 feet may experience settlements on the order of 1 inch for foundations designed in accordance with the above recommendations.

Structures with basement floor levels located above the bearing stratum (i.e. within about 20 feet of the existing ground surface) may be supported on augercast piling that extend

through the weaker surficial soils and develop bearing within the underlying competent bearing stratum. The augercast piles should have a minimum diameter of 18 inches and the pile tips should extend at least 15 feet into the very stiff to hard soils (i.e. minimum tip elevations of about 50 feet. Piles extending to this tip elevation should provide an allowable load capacity of 100 kips in compression and 70 kips in tension. With an additional 15 feet of embedment, the piles should support an allowable load of 200 kips in compression and 170 kips in tension.

In lieu of piles, the weaker near surface soils may be improved to a depth of about 25 feet using GeoPiers which will then allow the use of conventional spread footings but at an allowable bearing capacity of about 5 ksf.

### 4.2 Seismic Design Parameters

The seismic design of the facility will be accomplished using the 2003 and later editions of the International Building Code (IBC), which specifies use of a design earthquake having a 2% probability of occurrence in 50 years (return interval of 2,475 years). The following parameters, which are consistent with the 2002 USGS seismic hazard maps, are recommended for the seismic design of the complex:

| Site Class | Spectral Acceleration at 0.2 sec. (g) | Spectral Acceleration at 1.0 sec. (g) | Site Coefficients | | Design Spectral Response Parameters | | Control Periods (sec.) | | Design PGA ($S_{DS}/2.5$) |
|---|---|---|---|---|---|---|---|---|---|
| | $S_S$ | $S_1$ | $F_a$ | $F_v$ | $S_{DS}$ | $S_{D1}$ | $T_O$ | $T_S$ | |
| D | 1.16 | 0.43 | 1.04 | 1.57 | 0.80 | 0.45 | 0.11 | 0.56 | 0.32 |

The potential for earthquake-induced soil liquefaction is considered to be very low because the site is generally underlain by cohesive soils that are not susceptible to liquefaction and the sands underlying the site at depth have a sufficient density to preclude the development of liquefaction. Therefore, special design considerations associated with soil liquefaction are not necessary for this project.

### 4.3 Lateral Restraint

Lateral forces from wind or seismic loading may be resisted by the combination of passive earth pressures acting against the embedded portions of the foundations and by friction acting on the base of the foundations (pile caps excluded). Passive resistance values may be determined using an equivalent fluid weight of 400 pounds per cubic foot (pcf). This value includes a factor safety of at least 2 assuming that the properly compacted structural fill will be placed adjacent to the sides of the footings. A

coefficient friction of 0.5 may be used to determine the frictional resistance at the base of the footings. This coefficient includes a factor safety of approximate 1.5.

### 4.4 Lateral Earth Pressures

Below grade walls of the buildings and parking structures should be designed for a lateral earth pressure equivalent to a fluid weight of 35 pcf. This recommendation assumes a level ground surface behind the face of the wall. Seismic (ultimate) loads acting on below grade walls may be determined using a uniform earth pressure of 6H (psf) where H is the height of soil (ft.) behind the wall.

### 4.5 Drainage and Waterproofing

We recommend that all basement walls be constructed using full face coverage of a geo-composite drain board, such as MiraDrain, to intercept groundwater seepage at the face of the basement walls. Groundwater intercepted by this perimeter system should be tight lined to a storm sewer system for offsite disposal. Additionally, we recommend that the basement walls be protected with bentonite panel, such as MiraClay, to provide an additional level of water protection.

### 4.6 Floor Slabs

In our opinion, conventional slab on grade construction may be used for the site structures.

### 4.7 Stormwater Infiltration

The boring and cone penetrometer probes suggest that poor draining cohesive soils, such as silty clays, are the predominant materials that underlie the site. Considering these conditions, we recommend that any infiltration scheme be based on a conservative infiltration rate of less than about 0.1 inches per hour. Any designs assuming groundwater infiltration should be confirmed with additional site explorations and site testing.

## 5.0 CONSTRUCTION CONSIDERATIONS

### 5.1 Cut Slopes

Where unconstrained by site geometry, open cuts with side slopes of 1(H):1(V) may be used for site excavations. Permanent cut and fill slopes in landscaping areas should be restricted to slopes no steeper than 2(H):1(V).

### 5.2 Material Reuse

The on-site soils have an excessive silt content will be difficult to handle and compact during wet weather as well as in their natural state. While the on-site soils can be used for landscape area, they should not be used for structural fill beneath footings or floor slabs. Any excavated site soil planned for later reuse should be stockpiled and protected with plastic sheeting to prevent softening from rainfall.

### 5.3 Excavation Shoring systems

Excavation shoring systems consisting of cantilever and tieback soldier pile walls and possibly soil nail walls may be used in conjunction with some of the deeper site excavations. The soldier piles will likely encounter seepage and soft ground that may require the use of casing in the upper 10 to 15 feet. Additional casing may be required depending on the depth of the excavation and zones of groundwater seepage.

While the site soils are generally cohesive and will exhibit good stand-up for soil nail support systems, zones of seepage, particularly in the upper 15 feet where fill and soft soils may also be encountered, may create locally difficult construction conditions for soil nail walls such that the cost of soil nailing may be higher than typical projects in that more coordination would be needed between the excavation contractor and the shotcrete applicator and that larger quantities of shotcrete may be required in areas of running ground which is aggravated from groundwater seepage.

Tiebacks and soil nails within about 25 feet of the ground surface may develop relatively low capacities because of the weaker nature of the soils in this zone. These conditions may require longer anchors or nails or installations with steeper inclinations to place the bond zone of the anchors in the more competent soil underlying the site at a depth of about 25 feet.

### 5.3 Dewatering and drainage

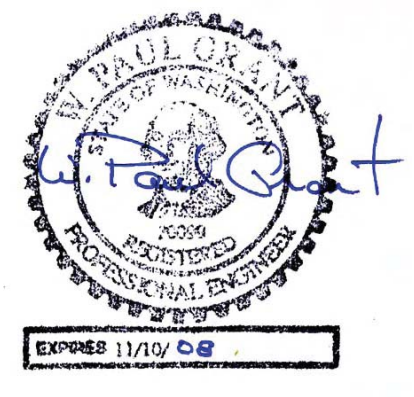
The site excavations will likely encounter localized zones of groundwater seepage. Overall seepage rates are estimated to be less than 1 gpm per 10 linear feet of excavation. We anticipate that the site excavations can be readily dewatered using conventional sumps.

## 6.0 ADDITIONAL STUDIES

The recommendations presented in this report are preliminary and additional subsurface explorations and engineering studies will be required to develop final design recommendations for the project.

## 7.0 LIMITATIONS

We have prepared this preliminary report for use by the consultant team to evaluate the suitability of the Wheeler Avenue site for the potential construction of the DIS Data Center. Recommendations contained in this report are based on a site reconnaissance, a limited subsurface exploration program, review of pertinent subsurface information, and our understanding of the project. The scope of our work specifically excluded the assessment of environmental characteristics, particularly those involving hazardous substances. The study was performed using a mutually agreed-upon scope of work. Additional studies will be required to develop final design recommendations.




W. Paul Grant, P.E.
Principal Geotechnical Engineer

# REFERENCES

International Building Code (IBC), 2003, International Code Council

**Approximate Scale**
**1"=200'**
**0 200**

**Legend:**
- **B-1 PanGEO Boring**
- **CPT-1 Cone Penetrometer Test**

| | | | |
|---|---|---|---|
| PanGEO INCORPORATED | **Washington DIS Siting Study Wheeler Avenue Site Olympia, Washington** | **SITE & EXPLORATION PLAN** | |
| | | Project No. 06-217 | Figure No. 1 |

06-217BoringPlan.ppt 03/08/2007(10:12 AM) SHE

## RELATIVE DENSITY / CONSISTENCY

| SAND / GRAVEL | | | SILT / CLAY | | |
|---|---|---|---|---|---|
| Density | SPT N-values | Approx. Relative Density (%) | Consistency | SPT N-values | Approx. Undrained Shear Strength (psf) |
| Very Loose | <4 | <15 | Very Soft | <2 | <250 |
| Loose | 4 to 10 | 15 - 35 | Soft | 2 to 4 | 250 - 500 |
| Med. Dense | 10 to 30 | 35 - 65 | Med. Stiff | 4 to 8 | 500 - 1000 |
| Dense | 30 to 50 | 65 - 85 | Stiff | 8 to 15 | 1000 - 2000 |
| Very Dense | >50 | 85 - 100 | Very Stiff | 15 to 30 | 2000 - 4000 |
| | | | Hard | >30 | >4000 |

## UNIFIED SOIL CLASSIFICATION SYSTEM

| MAJOR DIVISIONS | | GROUP DESCRIPTIONS | |
|---|---|---|---|
| Gravel<br>50% or more of the coarse fraction retained on the #4 sieve. Use dual symbols (eg. GP-GM) for 5% to 12% fines. | GRAVEL (<5% fines) | GW | Well-graded GRAVEL |
| | | GP | Poorly-graded GRAVEL |
| | GRAVEL (>12% fines) | GM | Silty GRAVEL |
| | | GC | Clayey GRAVEL |
| Sand<br>50% or more of the coarse fraction passing the #4 sieve. Use dual symbols (eg. SP-SM) for 5% to 12% fines. | SAND (<5% fines) | SW | Well-graded SAND |
| | | SP | Poorly-graded SAND |
| | SAND (>12% fines) | SM | Silty SAND |
| | | SC | Clayey SAND |
| Silt and Clay<br>50%or more passing #200 sieve | Liquid Limit < 50 | ML | SILT |
| | | CL | Lean CLAY |
| | | OL | Organic SILT or CLAY |
| | Liquid Limit > 50 | MH | Elastic SILT |
| | | CH | Fat CLAY |
| | | OH | Organic SILT or CLAY |
| Highly Organic Soils | | PT | PEAT |

**Notes:** 1. Soil exploration logs contain material descriptions based on visual observation and field tests using a system modified from the Uniform Soil Classification System (USCS). Where necessary laboratory tests have been conducted (as noted in the "Other Tests" column), unit descriptions may include a classification. Please refer to the discussions in the report text for a more complete description of the subsurface conditions.

2. The graphic symbols given above are not inclusive of all symbols that may appear on the borehole logs. Other symbols may be used where field observations indicated mixed soil constituents or dual constituent materials.

## DESCRIPTIONS OF SOIL STRUCTURES

| | | | |
|---|---|---|---|
| Layered: | Units of material distinguished by color and/or composition from material units above and below | Fissured: | Breaks along defined planes |
| Laminated: | Layers of soil typically 0.05 to 1mm thick, max. 1 cm | Slickensided: | Fracture planes that are polished or glossy |
| Lens: | Layer of soil that pinches out laterally | Blocky: | Angular soil lumps that resist breakdown |
| Interlayered: | Alternating layers of differing soil material | Disrupted: | Soil that is broken and mixed |
| Pocket: | Erratic, discontinuous deposit of limited extent | Scattered: | Less than one per foot |
| Homogeneous: | Soil with uniform color and composition throughout | Numerous: | More than one per foot |
| | | BCN: | Angle between bedding plane and a plane normal to core axis |

## COMPONENT DEFINITIONS

| COMPONENT | SIZE / SIEVE RANGE | COMPONENT | SIZE / SIEVE RANGE |
|---|---|---|---|
| Boulder: | > 12 inches | Sand | |
| Cobbles: | 3 to 12 inches | Coarse Sand: | #4 to #10 sieve (4.5 to 2.0 mm) |
| Gravel | | Medium Sand: | #10 to #40 sieve (2.0 to 0.42 mm) |
| Coarse Gravel: | 3 to 3/4 inches | Fine Sand: | #40 to #200 sieve (0.42 to 0.074 mm) |
| Fine Gravel: | 3/4 inches to #4 sieve | Silt | 0.074 to 0.002 mm |
| | | Clay | <0.002 mm |

## TEST SYMBOLS

for In Situ and Laboratory Tests listed in "Other Tests" column.

| | |
|---|---|
| CBR | California Bearing Ratio |
| Comp | Compaction Tests |
| Con | Consolidation |
| DD | Dry Density |
| DS | Direct Shear |
| %F | Fines Content |
| GS | Grain Size |
| Perm | Permeability |
| PP | Pocket Penetrometer |
| R | R-value |
| SG | Specific Gravity |
| TV | Torvane |
| TXC | Triaxial Compression |
| UCC | Unconfined Compression |

## SYMBOLS

Sample/In Situ test types and intervals

- 2-inch OD Split Spoon, SPT (140-lb. hammer, 30" drop)
- 3.25-inch OD Spilt Spoon (300-lb hammer, 30" drop)
- Non-standard penetration test (see boring log for details)
- Thin wall (Shelby) tube
- Grab
- Rock core
- Vane Shear

## MONITORING WELL

- Groundwater Level at time of drilling (ATD)
- Static Groundwater Level
- Cement / Concrete Seal
- Bentonite grout / seal
- Silica sand backfill
- Slotted tip
- Slough
- Bottom of Boring

## MOISTURE CONTENT

| | |
|---|---|
| Dry | Dusty, dry to the touch |
| Moist | Damp but no visible water |
| Wet | Visible free water |

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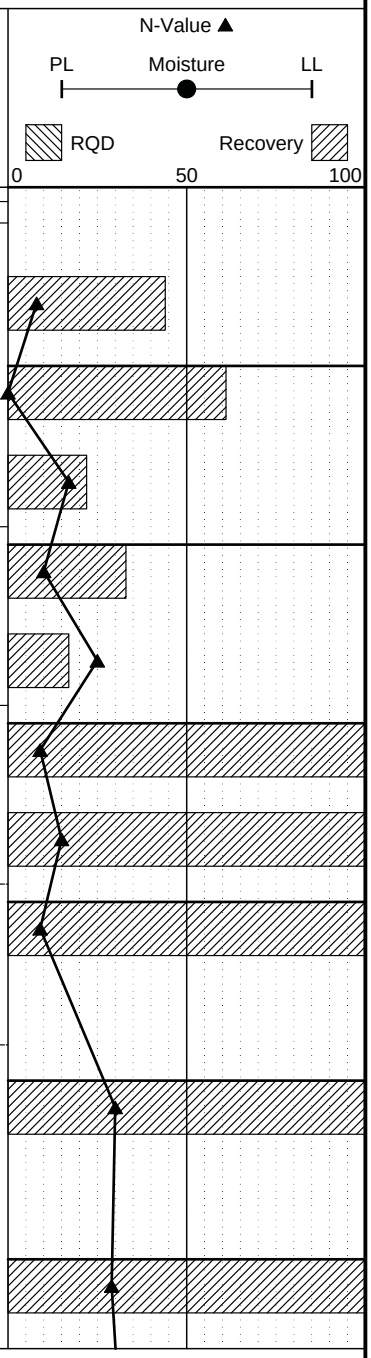
Phone: 206.262.0370

**Terms and Symbols for Boring and Test Pit Logs**

**Figure 2**

| | | | |
|---|---|---|---|
| Project: | Washington State DIS Center Siting Study | Surface Elevation: | |
| Job Number: | 06-217 | Top of Casing Elev.: | N/A |
| Location: | Wheeler Avenue SE and Cherry Street SE, Olympia, WA | Drilling Method: | Hollow Stem Auger |
| Coordinates: | Northing: , Easting: | Sampling Method: | SPT |

| Depth, (ft) | Sample No. | Sample Type | Blows / 6 in. | Other Tests | Symbol | MATERIAL DESCRIPTION |
|---|---|---|---|---|---|---|
| 0 | | | | | | Two 2.5" layers of Asphalt. |
| | | | | | | Brown gravel and sand. (Base Course). |
| | S-1 | | 7 3 5 | | | Medium stiff to very soft, brown gray, silty CLAY: moist to wet, medium plastic, slow dilatancy, fine broken and mixed texture, trace brick debris at top. (Fill). |
| 5 | S-2 | | 0 0 0 | | | Becoming very soft, wet, light brown, low to medium plastic (CL) silty clay, scattered gavel and sandy seams, broken texture with occasional gray, angular clay clasts and debris. |
| | S-3 | | 5 8 9 | | | Stiff silt and clay with sand, scattered charcoal debris and possible brick fragments. |
| 10 | S-4 | | 3 4 6 | | | Medium dense, brown SAND to GRAVEL with Sand: wet (saturated), fine to coarse grained, well graded, slightly weathered with minor matrix material. (Alluvium / Outwash). |
| | S-5 | | 8 17 8 | | | Grading to gravel with sand , rounded, blocky to tabular. |
| 15 | S-6 | | 2 4 5 | | | Medium stiff to stiff, brown gray, silty CLAY to clayey SILT: wet (saturated), medium plastic (top), no dilatancy, occasional orange weathered mottles. (Lacustrine Beds). |
| | S-7 | | 5 6 9 | | | Becoming clayey silt, non-plastic with rapid dilatancy, occasional sand bed, sub-horizontal, gas bubbles. |
| 20 | S-8 | | 2 4 5 | | | Medium stiff, brown gray SILT with sand: wet, fine grained, non-plastic to low platic, rapid dilatancy, laminated with laminae of silty clay, subhorizontal beds, rare dark grains, gas bubbles. (Lacustrine). |
| 25 | S-9 | | 5 9 21 | | | Medium stiff, brown gray, clayey SILT: moist to wet, non-plastic to low plastic, slow dilatancy, some fine to medium sand in seams, massive to laminated, occasional rusty mottles. (Lacustrine). |
| 30 | S-10 | | 3 10 19 | | | Silt with clay and fine sand, interbedded with 4 inch beds, subhorizontal layering. |




| | |
|---|---|
| Completion Depth: | 51.5ft |
| Date Borehole Started: | 1/23/07 |
| Date Borehole Completed: | 1/23/07 |
| Logged By: | SHE |
| Drilling Company: | Holocene Drilling |

Remarks: Standard Penetration Test (SPT) sampler driven with a 140 lb. safety hammer. Hammer operated with an autotrip hammer mechanism. **Note**: hammer calibrated to 40% efficiency.

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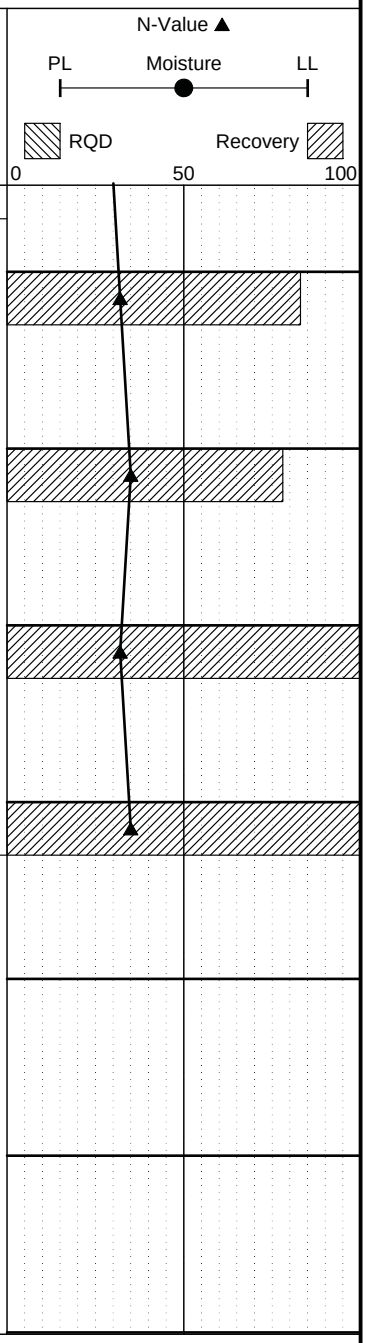
**LOG OF TEST BORING B-1**

**Figure 3**

| | | | |
|---|---|---|---|
| Project: | Washington State DIS Center Siting Study | Surface Elevation: | |
| Job Number: | 06-217 | Top of Casing Elev.: | N/A |
| Location: | Wheeler Avenue SE and Cherry Street SE, Olympia, WA | Drilling Method: | Hollow Stem Auger |
| Coordinates: | Northing: , Easting: | Sampling Method: | SPT |

| Depth, (ft) | Sample No. | Sample Type | Blows / 6 in. | Other Tests | Symbol | MATERIAL DESCRIPTION |
|---|---|---|---|---|---|---|
| | | | | | | Dense, brown, SAND: moist to wet, fine grained, poorly graded, clean, homogeneous, indistinctly laminated to massive. (Outwash?). |
| 35 | S-11 | | 11 13 19 | | | |
| 40 | S-12 | | 8 15 20 | | | Becoming fine to medium sand with fine to coarse interbeds, laminated. |
| 45 | S-13 | | 10 14 18 | | | Becoming wet. |
| 50 | S-14 | | 8 16 19 | | | Grading ti fine sand with silt, with 4 inch clayey silt bed in tip, sharp contact, bedding dip 0° to 30°. |
| | | | | | | Bottom of Boring. |
| 55 | | | | | | |
| 60 | | | | | | |
| 65 | | | | | | |




| | |
|---|---|
| Completion Depth: | 51.5ft |
| Date Borehole Started: | 1/23/07 |
| Date Borehole Completed: | 1/23/07 |
| Logged By: | SHE |
| Drilling Company: | Holocene Drilling |

Remarks: Standard Penetration Test (SPT) sampler driven with a 140 lb. safety hammer. Hammer operated with an autotrip hammer mechanism. **Note**: hammer calibrated to 40% efficiency.

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Phone: 206.262.0370

## LOG OF TEST BORING B-1

**Figure 3**

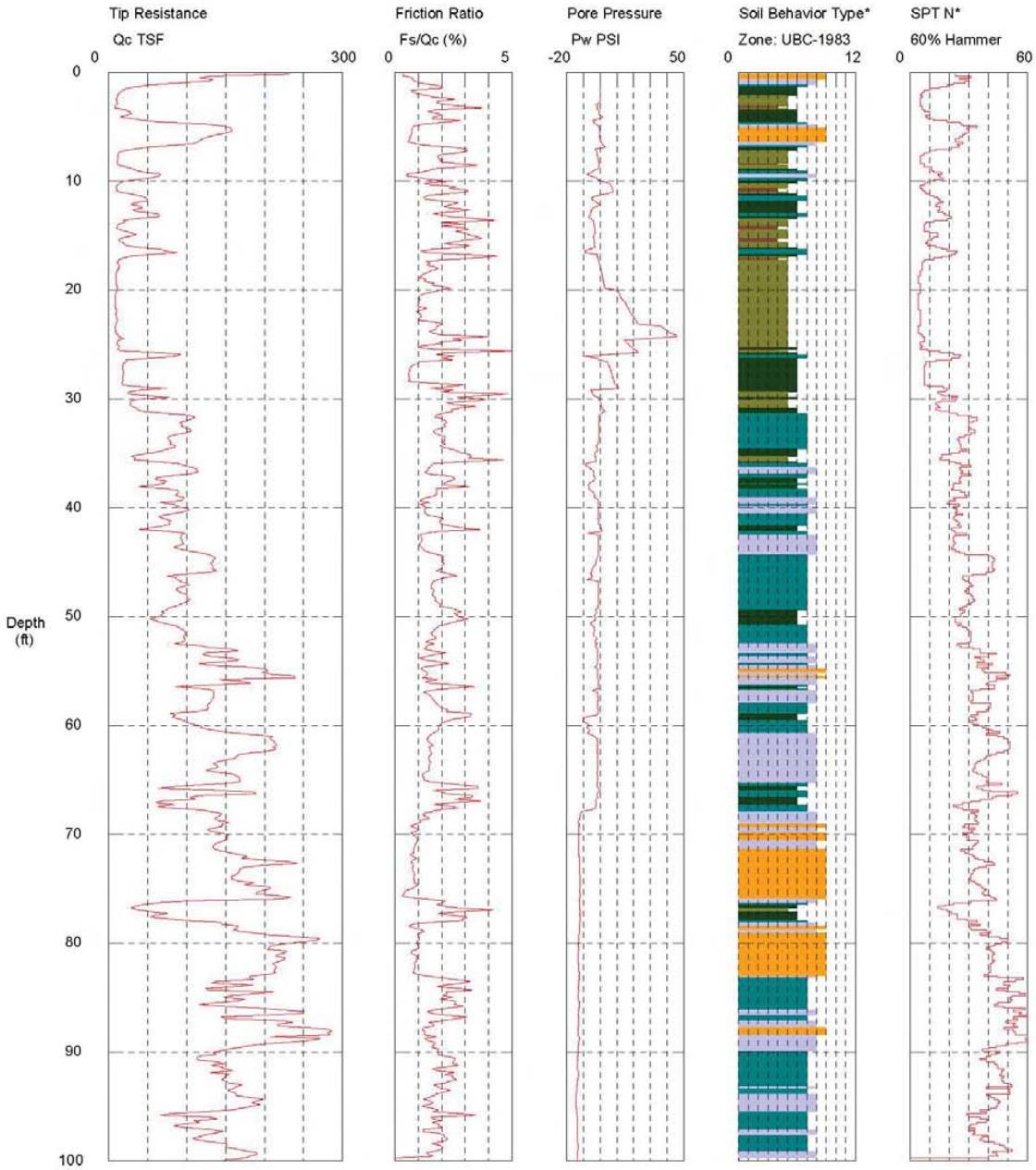
LOG OF BOREHOLE 06-217_DIS-LOGS.GPJ PANGEO.GDT 2/5/07

# PanGeo Inc.

Operator: Brown
Sounding: CPT-01
Cone Used: DSG0708

CPT Date/Time: 1/25/2007 12:01:53 PM
Location: WA DIS Data Center
Job Number: 06-217

Ground Surface Elevation ~ 115 feet




Maximum Depth = 99.90 feet

Depth Increment = 0.164 feet

1 sensitive fine grained
2 organic material
3 clay
In parking lot

4 silty clay to clay
5 clayey silt to silty clay
6 sandy silt to clayey silt

7 silty sand to sandy silt
8 sand to silty sand
9 sand

10 gravelly sand to sand
11 very stiff fine grained (*)
12 sand to clayey sand (*)

*Soil behavior type and SPT based on data from UBC-1983

Northwest Cone Exploration

06-217_CPT-1.ppt 2/5/2007(10:12 AM) SHE

PanGEO INCORPORATED

**Washington DIS Siting Study Wheeler Avenue Site Olympia, Washington**

**CPT-1 LOG**

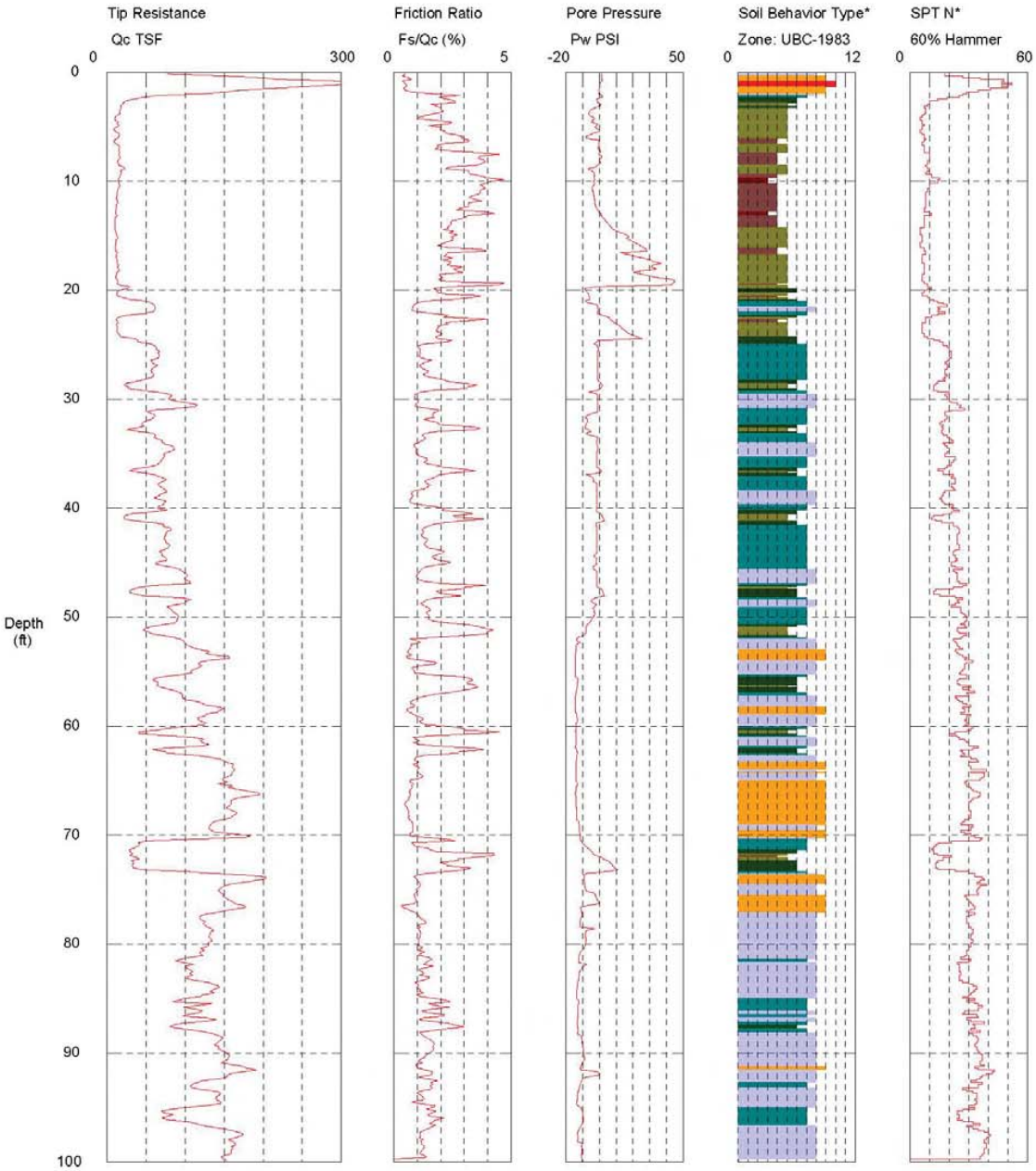
| Project No. | Figure No. |
|---|---|
| 06-217 | 4 |

# PanGeo Inc.

Operator: Brown
Sounding: CPT-02
Cone Used: DSG0708

CPT Date/Time: 1/25/2007 10:51:47 AM
Location: WA DIS Data Center
Job Number: 06-217

Ground Surface Elevation ~ 96 feet




Maximum Depth = 99.90 feet

Depth Increment = 0.164 feet

1 sensitive fine grained
2 organic material
3 clay
4 silty clay to clay
5 clayey silt to silty clay
6 sandy silt to clayey silt
7 silty sand to sandy silt
8 sand to silty sand
9 sand
10 gravelly sand to sand
11 very stiff fine grained (*)
12 sand to clayey sand (*)

*Soil behavior type and SPT based on data from UBC-1983

Northwest Cone Exploration

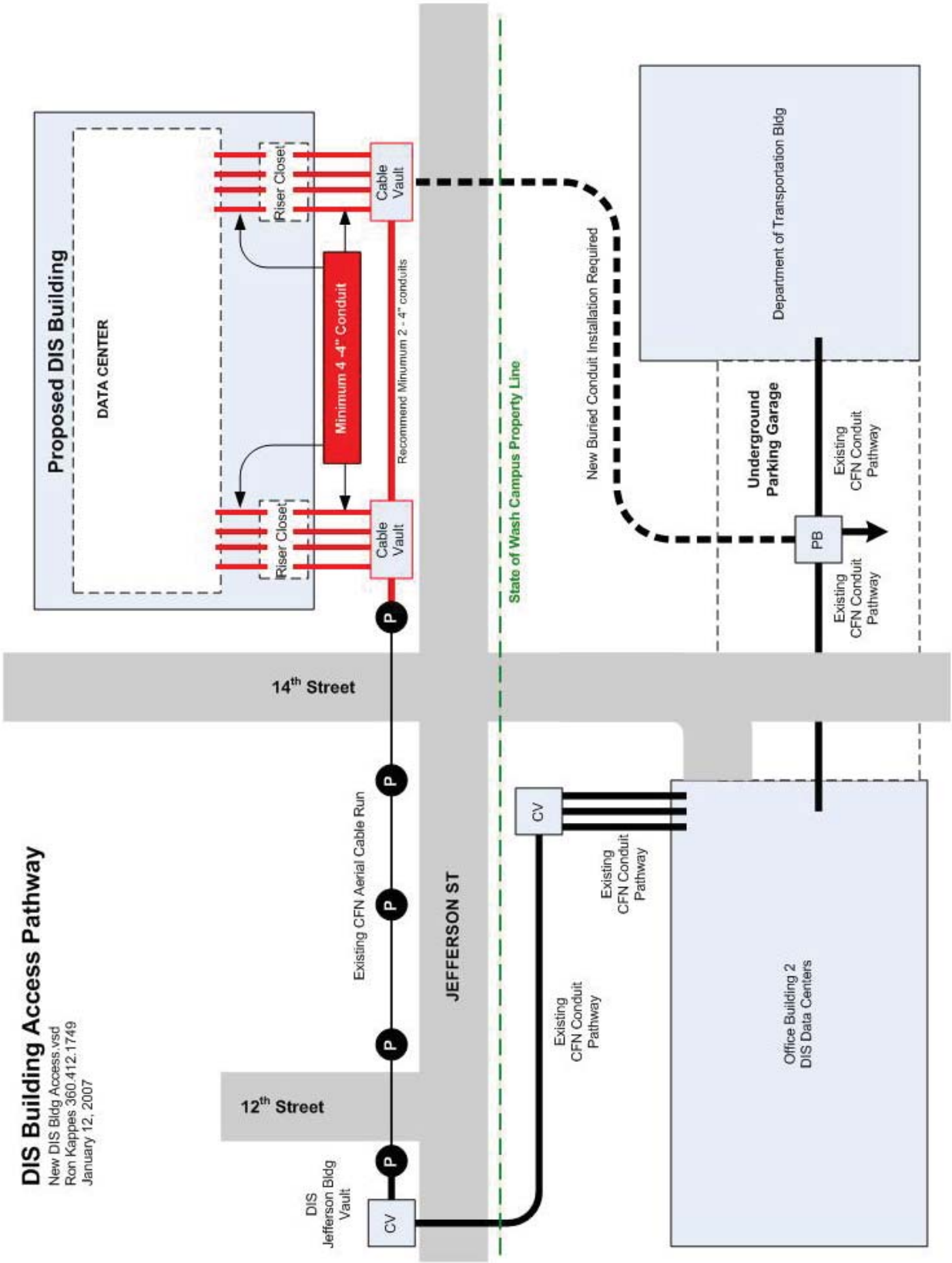
PanGEO INCORPORATED

**Washington DIS Siting Study Wheeler Avenue Site Olympia, Washington**

**CPT-2 LOG**

| Project No. | Figure No. |
|---|---|
| 06-217 | 5 |

06-217_CPT-2.ppt 2/5/2007(10:12 AM) SHE


DIS Building Access Pathway
New DIS Bldg Access.vsd
Ron Kappes 360.412.1749
January 12, 2007
Proposed DIS Building
DATA CENTER
Riser Closet
Riser Closet
Minimum 4 -4" Conduit
Cable Vault
Cable Vault
Recommend Minumum 2 - 4" conduits
P
P
P
P
P
Existing CFN Aerial Cable Run
DIS Jefferson Bldg Vault
CV
12th Street
14th Street
JEFFERSON ST
State of Wash Campus Property Line
New Buried Conduit Installation Required
Department of Transportation Bldg
Underground Parking Garage
PB
Existing CFN Conduit Pathway
Existing CFN Conduit Pathway
CV
Existing CFN Conduit Pathway
Existing CFN Conduit Pathway
Office Building 2
DIS Data Centers

STATE OF WASHINGTON

# DEPARTMENT OF ARCHAEOLOGY & HISTORIC PRESERVATION

*1063 S. Capitol Way, Suite 106 • Olympia, Washington 98501*
*Mailing address: PO Box 48343 • Olympia, Washington 98504-8343*
*(360) 586-3065 • Fax Number (360) 586-3067 • Website: www.dahp.wa.gov*

August 22, 2006

Mr. James D Albert
Deputy Director of Operations
Department of Information Services
PO Box 42445
Olympia, WA 98504-2445

Re: Determination of Eligibility

Dear Mr. Albert:

Recently, the Department of Archaeology and Historic Preservation (DAHP) was contacted concerning several Capital Construction 07-09 Biennium Projects. We have reviewed the requested projects on behalf of the State Historic Preservation Officer (SHPO) under the guidelines of the Governor's Executive Order 05-05 (GEO 05-05). My review is based upon documentation contained in your communication.

| Log # | Project | Response: |
|---|---|---|
| *082206-17-WSGA* | *Department of Information Services office structure 515 15th Avenue SE, Olympia* | |
| *082206-18-WSGA* | *Department of Information Services office structure 531 15th Avenue SE, Olympia* | |
| *082206-19-WSGA* | *Department of Information Services office structure 1505 S Cherry St., Olympia* | |
| *082206-20-WSGA* | *Department of Information Services office structure 1515 S Cherry St., Olympia* | |

Research indicates that the referenced properties are not currently listed in the Washington Heritage Register or National Register of Historic Places. The referenced properties are NOT ELIGIBLE for the National Register of Historic Places under criterion C. As a result of this finding, further contact with DAHP is not necessary.

However the following property will require further investigation prior to a determination being made.

*082206-21-WSGA* *Department of Information Services office structure 506 16th Avenue SE, Olympia*

Please provide DAHP with an electronic version of our Historic Property Inventory form for this structure filled out by a qualified cultural resource specialist. A listing of qualified professionals can be located on our website at www.dahp.wa.gov. In future correspondence, please refer to the corresponding log number.

Mr. Albert
August 22, 2006
Page 2

If additional information on the project becomes available, or if any archaeological resources are uncovered during construction, please halt work in the area of discovery and contact the appropriate Native American Tribes and DAHP for further consultation. If Federal funds or permits are required to complete these tasks, then the projects shall be reviewed under Section 106 of the National Historic Preservation Act.

Thank you for the opportunity to review and comment. If you have any questions, please contact me.

Sincerely,

Russell Holter
Project Compliance Reviewer
Russell.Holter@dahp.wa.gov

PERKINS + WILL

## Memo

| | |
|---|---|
| To: | DIS / GA |
| From: | Dan Nelson and Tim Janof (Sparling) |
| Date: | February 14, 2007 |
| Subject: | Electrical Substation on the Wheeler Site |

Phone conversation with Casey Cochrane (360-786-5987), the PSE service rep for Thurston County. We discussed the reliability of the substation. Here is what he said:

- There was a substation outage last year because a car crashed into a pole that carried their transmission lines. I asked if the two transmission line feeds to this substation can come in different routes so that this wouldn't happen again, but he referred me to the distribution engineer and will contact him.
- There was an outage this year, along with 2/3 of the entire state, during the recent wind storms.
- The substation will be expanded within their existing footprint. They are just adding another transformer in an empty spot within their existing fence line.
- The substation is their highest priority due to its high profile use.

There was a concern from the client about harmonics or EMF causing issues if we run the medium voltage power lines to the facility:

1. PSE requires that the system be designed to meet IEEE 519 standards for harmonic content, which is 5% maximum harmonic voltage distortion. This level of distortion is not known to affect equipment within facilities. Note that, even though the data center and office building are fed at 12.47kV (or similar voltage), there are still step-down transformers that will filter out much of the noise one may see on the utility's own medium voltage system. Harmonic distortion is not a concern on the utility side. In fact, the data center's own system will produce much more harmonic content internally than anything seen on the utility side.

2. Electromagnetic fields (EMF) -- The EMF concerns are actually reduced because we are serving the buildings at a higher voltage. Higher voltage means less current, and EMF is proportional to current. Also, we expect that the EMF will be greatly reduced since the new medium voltage lines will be run underground inside conduits. When wire is closer together, the net field is much less than if the lines were run overhead in widely spaced power lines. Also, the earth/dirt provides some additional shielding.

C:\Documents and Settings\goodelle\Local Settings\Temporary Internet Files\OLK15C\Substation Memo 2-14-07.doc

Design Opportunity Recommendations:
Department of Information Services Data Center & Office Building Predesign
January 5, 2007

## Introduction:

The purpose of the following Design Opportunity Recommendation (DOR) is to provide guidance to the design consultants and project staff, as well as provide a point of reference for future design review of project development by the Capitol Campus Design Advisory Committee (CCDAC). The DOR identifies relevant campus design considerations regarding context, programming, historic features, building design and landscaping that should be addressed, and major opportunities that exist for design of the project. The DOR also discusses special requirements and expectations. The goal of the DOR is to encourage design excellence in campus development to ensure intelligent functioning and to produce the highest overall design quality. CCDAC considers the Department of Information Services Data Center & Office Building to be an extremely important and significant addition to the Capital Campus.

The following criteria include categories of Context, Program and Concept Development. The DOR recommends the concurrent development of the context analysis and preliminary programming work. The resulting study with prioritized issues, objectives, criteria and program requirements will be used as the basis for concept development and evaluation.

One of the major purposes of this pre-design effort is to evaluate site options, those on the Olympia campus as well as those in Lacy and Tumwater. While it is too early to prejudge any individual site, some of the comments herein specifically address the Wheeler Avenue parking lot (Opportunity Site #9 in the 2006 Master Plan). Other more general comments should apply to all sites examined. If Opportunity Site #9 becomes the recommended option, the CCDAC endorses the preparation of a sub-campus plan for the entire site, indicating its build-out capacity for other potential campus activities including other buildings, parking structures, transportation facilities, etc. When the site for the project has been selected, an amended DOR describing specific recommendations for the site will be developed and approved by the CCDAC.

As with the development of any significant campus area and its associated buildings, there is the impulse to expand the scope of the study beyond the primary objectives of the study. This DOR acknowledges that the scope of the study does not include a campus wide transportation or parking evaluation to assess the project's parking program component. These are major encompassing studies on their own and if it is felt they are needed, they should be undertaken separately. However, evaluation of existing data and development of new information may be critical to ensure that parking and transportation issues are properly addressed. Specifically, if the chosen site is an existing parking lot, how will those existing parking spaces be replaced or accommodated along with requirements for the proposed activity, and how will transit access be provided.

## Context:

The study shall consider and evaluate the context of the project within the campus and surrounding community. It will consider how the proposed facilities will contribute to its context

and how the context will shape the facility. The context evaluation shall take the form of an urban design study, including the consideration of the following:

1. Assess the physical, environmental and functional campus and city fabric to allow development of site and building design criteria and parameters. These include but are not limited to campus organizing tools such as view corridors, axes, edges, buffers, open space, transitional zones and topography; City structure including zoning, pedestrian and vehicular circulation; aesthetic objectives that include design character, form and style of campus and surrounding City, and current and proposed City development plans. See the 2006 master plan for guidance and 1991 master plan for additional information. This effort shall result in the identification of design criteria, development parameters and prioritized design objectives and opportunities. This shall be used as a tool for shaping and evaluating concept development.
2. Address the following issues identified by the CCDAC in developing the context study. Each shall be considered and used in the development of concept and design work:
    a. Respect the architectural style, scale and spatial structure of the East and Southeast Campus and capture their spirit.
    b. Provide transition in scale, massing, character and function to the city and surrounding community. Include the evaluation of the form and function of 14th Avenue as a main entrance to the Capitol Campus as well as the wooded landscape buffer to the north. Consider the site edges which play a significant role in establishing the campus entry and respect that all sides of the site are public and the site does not have a “back”.
    c. Enhance the campus edges and transition zones as well as the established hierarchy of campus space and function.
    d. Develop a building complex which reflects its role within the context of the campus and in relationship to the Legislative Building as the primary campus “monument”.
    e. Evaluate the various approach sequences to the project site / buildings from the campus and city for all transportation modes.
    f. Evaluate the role and function of city streets for access and urban design continuity prior to considering the potential of any street vacation or relocation.
    g. Evaluate the relationship of the project to adjoining campus spaces and buildings to develop recommendations and criteria for potential massing or setbacks.
3. Evaluate site capability given the contextual issues identified above and the potential need to expand the project site in response to the program needs. Should the project site need to be expanded, identify relocation options for displaced functions prior to considering the expansion of the program on site in such a manner which may undermine the site’s existing or potential campus functions.
4. Evaluate the issues and opportunities associated with the project functioning as a model of sustainiablity, meeting or exceeding a LEEDs Silver rating
5. Identify issues and existing features which are sacrosanct and not to be impacted by the project. Identify opportunities and constraints associated with these elements. Examples include the existing campus buffer.

Program:

The following are program issues and observations that in conjunction with the context study will shape subsequent concept development:

2

1. Reflect in the building program a spatial hierarchy of public reception activities to private office functions to secure equipment areas. This hierarchy shall be addressed in both exterior and interior spaces.
2. Use this hierarchy of spaces for the site in preparing development concepts in conjunction with the analysis of campus context and evaluation of site capacity.
3. Evaluate and program for the role of public spaces and their sequence in fostering the function of government and community life. An example is the way the sundial area adjacent to the Legislative Building functions as an area supporting informal gatherings, meetings and decision making activities. Identify spaces and facilities which support this function.
4. Evaluate the sites capacity to support parking. Concurrently obtain data regarding potential available parking capacity elsewhere on campus. .
5. Evaluate the impact of the transportation needs of the program on the site, adjoining campus and transportation systems.
6. Identify security issues which might dictate design parameters.

Concepts:

1. All concepts shall result in an appropriately scaled sequence of buildings relating to existing campus open space and adjoining buildings.
2. Incorporate the existing hierarchy of campus organizing elements in the concept to assure an integrated and legible project which is a vital component of a coherent Capitol Campus assembly of buildings and open space.
3. Prepare concepts that develop sequenced exterior spaces which support the larger campus but establish a hierarchy of open spaces specific to this site.
4. Concepts shall reflect a hierarchy of public to private to secure functions. This hierarchy shall be addressed in both exterior and interior spaces and shall be consistent with existing campus patterns.
5. Create a hierarchy of “public face” or entry requirements for major program components. For example the Data Center and the Office Building will each require a different degree of public face.
6. Balance the need for special security and protection requirements with design scale and appearance issues, especially at the ground level where windows and doors may be discouraged.
7. Enhance a sense of entry to the main Capitol Campus.
8. Evaluate the opportunity for framing or establishing views, vistas and axis.
9. Design solutions should reflect the architectural thinking of our time and should not merely mimic existing campus historic styles.

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*Pre-design Report Prepared by:*
**Washington State Department of Information Services**

**Perkins+Will Seattle**
Dan Nelson, Project Manager
(206) 381 6018