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FMOC

Sandia National Laboratories Collaborative IGPP Building Programming Plan

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Sandia National Laboratories

U.S. DEPARTMENT OF ENERGY

National Nuclear Security Administration

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1.0 Site Analysis

1.1 Site Location, Boundary, and Size

The site is located in Tech Area I, north of Building 894 and southeast of Building 810 on 9th St. A realignment of K Ave. from Gate 17 will connect to the existing avenue to the east. The site will have two building pads to include the site for Building 730 and a building pad for future development directly north of the IGPP site. The site area identified for the new IGPP is approximately 18,370 square feet as indicated.

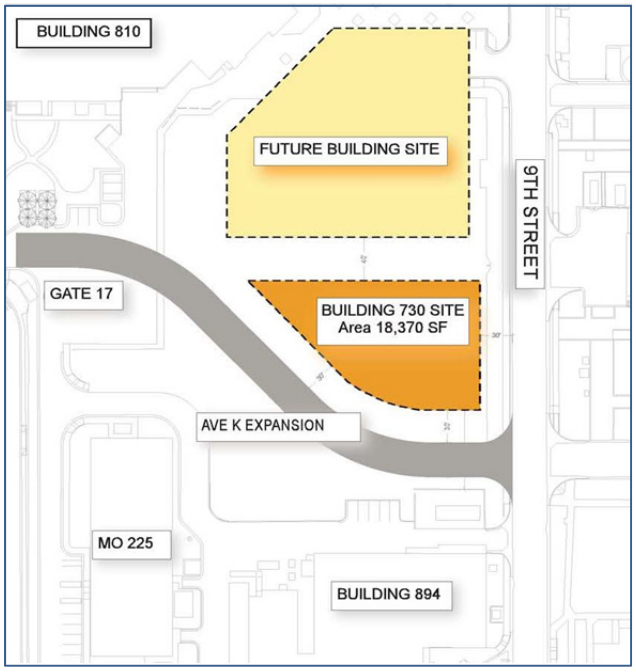


Figure 1.1 Site Photos

1.2 A Brief History of the Site

The site is the vacant land that was the original location of Building 893 and thirteen modular office (MO) buildings. The site was cleared in phases beginning in 2007, and site restoration was completed in November 2008. The restoration of the site included the removal or abatement and demolition of the thirteen MOs. Building 893 was a concrete building with occupants that were vacated as part of the MESA project, and then the building was decontaminated and demolished. As demolition occurred, the on-site utilities were isolated and capped. The site is clear and ready for redevelopment.

1.3 ADA Accessibility Issues

Sandia National Laboratories, Architectural Accessibility Review Board, produced *Accessibility Requirements at Sandia National Laboratories New Mexico*, which addresses specific needs for the labs. In addition, the guiding principles must be met in the ADA and ABA *Accessibility Guidelines for Buildings and Facilities* published in the Federal Register on July 23, 2004, and amended August 5, 2005.

Handicapped-accessible parking must be provided near the new building. Specific concerns will be a fully accessible route from the handicapped-accessible parking to the building. The site has a pronounced slope at the western end of the developable site and will be a consideration in the design of accessibility issues. The remaining site is relatively flat since this was a previous building location. A site survey, which is part of the Performance Specification, provides information concerning the site's slope.

The building itself must be fully accessible per the codes and documentation stated above.

1.4 Characteristics of the Site and the Surrounding Area

The site is located within Tech Area I Limited Area. The surrounding area is fully developed with a large plaza directly north of the site. The site has been cleared with minimal vegetation along the pedestrian route along 9th St.

1.5 Architectural Characteristics of the Area

The surrounding buildings range from single story to four story structures. The site is adjacent to the historic brick building district of SNL. The characteristics of the surrounding buildings include the following:

- Buildings 800, 801, and 802 are three-story brick buildings that house office functions.
- Building 836 is a two-story brick office and light laboratory building.
- Building 804 is a single story office and light laboratory building with brick façade.
- Buildings 810 and 891 are concrete and glass, four-story office and light laboratory buildings. Building 810 is adjacent to a large exterior plaza.
- Building 840 is the old machine shop, which is a combination of high bay and offices on the first floor and a mezzanine with offices. The building has a brick façade.
- Buildings 864, 865, and 868 are utilitarian buildings with a high level of interior equipment and constructed of painted concrete block.
- Building 894 is a brick structure with a high bay in a single story and two-story sections with offices above low-bay laboratories.
- MO325 and MO324 are located to the southwest.

1.6 Pedestrian and Vehicle Circulation

The current pedestrian and vehicular circulation includes the following elements:

- There are 10 spaces, one of which is handicapped accessible, directly north of the identified site near the plaza.
- A seven-slot parking area is located at the northwest corner of the site; but with the realignment of K Ave., this parking will be removed.
- There is a service access drive to Building 810 from Gate 17 directly to the northwest corner of the site. It must be preserved.
- The plaza north of the site links to the northwest quadrant, administration area, and to all quadrants to the south and southeast.

The new pedestrian and vehicle circulation will require the following:

- Pedestrian access from the plaza to the new site should consider the second building pad to the north of the proposed building site.
- Handicapped-accessible route must be provided from the parking area to the building.
- Parking for government vehicles and GEM® Carts must be a reasonable distance from the building with an improved path for pedestrians. The vehicle parking spaces must not necessarily be directly adjacent to the facility.

Parking requirements will be in compliance with the SNL Campus Design Guidelines (CDG) and at a minimum will include the following:

- Two ADA-compliant parking spaces.
- Four GEM cart or future electric fleet vehicle storage spaces with a minimum of two charging stations complete with cord reels. Spaces should be same width as standard parking stalls (9′).
- Government parking spaces based on the number of occupants per the CDG.

1.7 Seasonal Wind and Solar Patterns

Longitude and Latitude

City: Albuquerque **State:** New Mexico **Zip Code:** 87185
Latitude: 35.05 **Longitude:** 106.54 **Altitude:** 5,436 ft

The sun path and prevailing winds are shown Figures 1.2 and 1.3. The sun is lower on the horizon in winter than in the summer. The prevailing winds are from the north, northeast, and east during winter and from the south, southwest and west during summer.

Figure 1.2 Summer Sun Path and Prevailing Winds

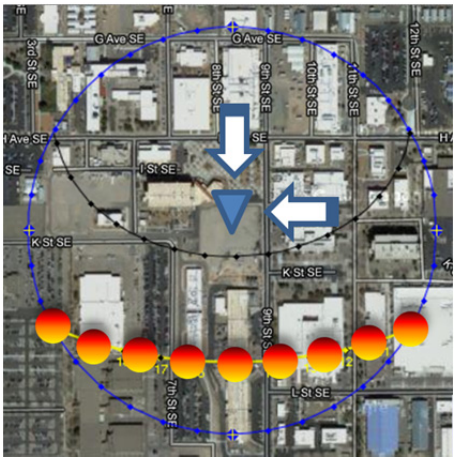


Figure 1.3 Winter Sun Path and Prevailing Winds

2.0 LEED Recommendations

Building 730 is required to attain Leadership in Energy and Environmental Design (LEED®) Gold certification under the LEED for New Construction & Major Renovations™ green building certification system (v2009). To ensure compliance with the Guiding Principles for Federal Leadership in High-Performance Sustainable Buildings in New Construction and Major Renovations, achieving the following LEED credits is mandatory:

- WEc-1.1, Water-Efficient Landscaping (Reduce by 50%, 2 pts)
- EAc-1, Optimize Energy Performance (30% Energy Reduction, 10 pts)
- MRc-2, Construction Waste Management (50% Diversion, 1 pt)
- MRc-4.1, Recycled Content (10%, 1 pt)
- EQc-3.1, Construction IAQ Management Plan – During Construction
- EQc-3.2, Construction IAQ Management Plan – Before Occupancy
- EQc-4.1, Low Emitting Materials – Adhesives and Sealants
- EQc-4.2, Low Emitting Materials – Paints and Coatings
- EQc-4.3, Low Emitting Materials – Flooring Systems
- EQc-4.4, Low Emitting Materials – Composite Wood and Agrifiber Products
- EQc-7.1, Thermal Comfort – Design
- EQc-8.1, Daylighting and Views – Daylighting

Additional recommendations and considerations for LEED credits are described below.

2.1 Category Assessment

2.1.1 Sustainable Sites

The location of the building site lends itself to meeting the majority of the credits under this category. The project team should provide a secure location for bikes and include changing room/shower facilities for bicyclists. The design should include charging stations for the GEM carts in preferred spots close to the building entrance. To address stormwater credits, determine the amount of stormwater produced from the building/site design (per LEED criteria) and provide a strategy to meet the requirements. Strategies might include water harvesting, containment and reuse for irrigation, bio swales, permeable paving, etc. The selected roofing material for the building should be highly reflective and meet the LEED requirements for at least 75% of the roof area. Site design should incorporate highly reflective materials that meet the LEED requirements for all hardscape. Ensure the designs of both interior and exterior lighting meet LEED requirements. Exterior lighting property trespass will not be an issue with achieving this credit, because the building sits on a larger campus.

2.1.2 Water Efficiency

A 20% reduction in water consumption as it relates to plumbing fixtures is a prerequisite of the LEED-NC rating system. This reduction can be met by adherence to existing SNL practices for low-flow plumbing fixtures and sensor requirements for faucets. Additional points should be targeted for water use reduction percentages above 20%. Water-efficient landscaping criteria can be met through landscape design which incorporates native species and high-efficiency landscape irrigation. Consider water harvesting and water reuse, and how it might be implemented in this building.

2.1.3 Energy and Atmosphere

A minimum 30% reduction (10 points minimum) in energy consumption for the Energy and Atmosphere Credit 1 is required for the project. Utilize ASHRAE standard 90.1-2007 for preliminary energy model calculations to determine building efficiency.

A number of potential energy efficiency measures/techniques should be considered, including the following:

- Executive Orders 13524 and 13423 require that solar domestic water heating be provided to meet at least 30% of the annual domestic hot water needs, if determined to be life-cycle cost effective. With New Mexico's solar flux, and the site's orientation, it is likely that such heating is cost effective.
- Building-integrated photovoltaics (BIPV)
- WattStopper® or equivalent digital lighting management control systems in offices, conference rooms, and common spaces. These systems control the lighting in spaces by automatically shutting off lights when spaces are vacant, and requiring manual "on" when personnel enter the spaces. These systems also send a signal to the building automation control system to control heating ventilation and air conditioning to the spaces based on occupancy/vacancy.
- Energy-saving fixtures and equipment, including ENERGY STAR™ and Federal Energy Management Program–designated Energy Efficient Products.

2.1.4 Materials and Resources

Points for construction waste management, recycled content, and regional material are achievable. Rapidly renewable materials and certified wood are also considered achievable points and will be based on the building's design.

2.1.5 Indoor Environmental Quality

Most of the credits in this category are achievable. Credit 5 will be dependent on the ability of the proposed mechanical system to utilize MERV 13 filters for credit compliance. Credit 6.2 is also dependent on the proposed mechanical systems' ability to provide for individual zoning. Meeting the requirement for the daylighting credit is dependent on floor plan design and implementation of creative strategies to provide natural light into the building. Some design considerations may include open office plan, low partitions, light-colored paint, light wells, skylights, and light shelves.

2.1.6 Innovation and Design Process

The consultant A/E team, in conjunction with SNL, has identified several innovation credits that have been both vetted by USGBC/GBCI and implemented on the SNL campus. The project team should identify additional potential innovation credits, as well as "exemplary performance" opportunities associated with targeted credits that can be achieved through design or construction. To achieve credit 2, the project team should have a LEED Accredited Professional (in good standing) with the designation (BD+C).

2.1.7 Regional Priority Credits

Regional credits opportunities are determined based on the project's zip code (87123).

A LEED-NC checklist has been developed using the LEED-NC v2009 rating system. The consultant A/E team has determined that at least 65 points are possible, meeting the requirements for LEED Gold certification. These items should be explored in more detail during design development.

LEED 2009 for New Construction and Major Renovations

Project Checklist

Sandia National Laboratories - Building 730

Sustainable Sites — Possible Points: 26

Y	?	N			
Y			Prereq 1	Construction Activity Pollution Prevention	
1			Credit 1	Site Selection	1
		5	Credit 2	Development Density and Community Connectivity	5
		1	Credit 3	Brownfield Redevelopment	1
6			Credit 4.1	Alternative Transportation—Public Transportation Access	6
1			Credit 4.2	Alternative Transportation—Bicycle Storage and Changing Rooms	1
3			Credit 4.3	Alternative Transportation—Low-Emitting and Fuel-Efficient Vehicles	3
2			Credit 4.4	Alternative Transportation—Parking Capacity	2
		1	Credit 5.1	Site Development—Protect or Restore Habitat	1
		1	Credit 5.2	Site Development—Maximize Open Space	1
1			Credit 6.1	Stormwater Design—Quantity Control	1
1			Credit 6.2	Stormwater Design—Quality Control	1
1			Credit 7.1	Heat Island Effect—Non-roof	1
1			Credit 7.2	Heat Island Effect—Roof	1
1			Credit 8	Light Pollution Reduction	1

Water Efficiency — Possible Points: 10

Y			Prereq 1	Water Use Reduction—20% Reduction	
2	2		Credit 1	Water Efficient Landscaping	2 to 4
		2	Credit 2	Innovative Wastewater Technologies	2
2	2		Credit 3	Water Use Reduction	2 to 4

Energy and Atmosphere — Possible Points: 35

Y			Prereq 1	Fundamental Commissioning of Building Energy Systems	
Y			Prereq 2	Minimum Energy Performance	
Y			Prereq 3	Fundamental Refrigerant Management	
10	9		Credit 1	Optimize Energy Performance	1 to 19
	7		Credit 2	On-Site Renewable Energy	1 to 7
2			Credit 3	Enhanced Commissioning	2
	2		Credit 4	Enhanced Refrigerant Management	2
3			Credit 5	Measurement and Verification	3
2			Credit 6	Green Power	2

Materials and Resources — Possible Points: 14

Y			Prereq 1	Storage and Collection of Recyclables	
		3	Credit 1.1	Building Reuse—Maintain Existing Walls, Floors, and Roof	1 to 3
		1	Credit 1.2	Building Reuse—Maintain 50% of Interior Non-Structural Elements	1
1	1		Credit 2	Construction Waste Management	1 to 2
		2	Credit 3	Materials Reuse	1 to 2

Materials and Resources, Continued

2			Credit 4	Recycled Content	1 to 2
1	1		Credit 5	Regional Materials	1 to 2
	1		Credit 6	Rapidly Renewable Materials	1
	1		Credit 7	Certified Wood	1

Indoor Environmental Quality — Possible Points: 15

Y			Prereq 1	Minimum Indoor Air Quality Performance	
Y			Prereq 2	Environmental Tobacco Smoke (ETS) Control	
1			Credit 1	Outdoor Air Delivery Monitoring	1
1			Credit 2	Increased Ventilation	1
1			Credit 3.1	Construction IAQ Management Plan—During Construction	1
1			Credit 3.2	Construction IAQ Management Plan—Before Occupancy	1
1			Credit 4.1	Low-Emitting Materials—Adhesives and Sealants	1
1			Credit 4.2	Low-Emitting Materials—Paints and Coatings	1
1			Credit 4.3	Low-Emitting Materials—Flooring Systems	1
1			Credit 4.4	Low-Emitting Materials—Composite Wood and Agrifiber Products	1
	1		Credit 5	Indoor Chemical and Pollutant Source Control	1
1			Credit 6.1	Controllability of Systems—Lighting	1
	1		Credit 6.2	Controllability of Systems—Thermal Comfort	1
1			Credit 7.1	Thermal Comfort—Design	1
1			Credit 7.2	Thermal Comfort—Verification	1
1			Credit 8.1	Daylight and Views—Daylight	1
	1		Credit 8.2	Daylight and Views—Views	1

Innovation and Design Process — Possible Points: 6

1			Credit 1.1	Innovation in Design: Sandia Green Cleaning Program	1
1			Credit 1.2	Innovation in Design: Exemplary Performance SSc4.3	1
1			Credit 1.3	Innovation in Design: Exemplary Performance EAc6	1
1			Credit 1.4	Innovation in Design: Low Mercury Lamp Spec/Policy	1
1			Credit 1.5	Innovation in Design: TBD	1
1			Credit 2	LEED Accredited Professional	1

Regional Priority Credits — Possible Points: 4

1			Credit 1.1	Regional Priority: SSc4.1	1
1			Credit 1.2	Regional Priority: SSc6.1	1
1			Credit 1.3	Regional Priority: SSc7.1	1
1			Credit 1.4	Regional Priority: SSc7.2	1

Total — Possible Points: 110

Certified 40 to 49 points Silver 50 to 59 points Gold 60 to 79 points Platinum 80 to 110

Figure 2.1 Draft LEED Checklist for New Construction

3.0 Programming/Conceptual Design

3.1 Overall Concepts and Components

Sandia National Laboratories is moving toward a workspace concept that utilizes open offices with limited use of hard walls to define space and focuses on the shared space rather than the individual's space. The main reasons SNL is moving toward this model are to

1. Have an agile work environment that can be easily and inexpensively reconfigured with changing program needs,
2. Take advantage of collaborative collocation opportunities afforded with the open office model, and
3. Reduce the footprint of SNL, increase worker density in the office environment, and save money on operational costs.

To provide a more flexible, light-filled, and collaborative work environment, SNL is moving toward an Innovative Workplace concept for office workspace. This concept encourages a balance of focused individual work space, collaborative teaming space, learning/education space, and socializing/sharing space while maximizing natural daylighting and views. This concept meets the daylighting credit of USGBC LEED guidelines and LEED Gold certification. (See the LEED Recommendations, Indoor Environmental Quality of this document, and the SNL Campus Design Guidelines Architectural section.)

The following key concepts are essential to the successful transition to the open office concept.

3.1.1 Space Use

The primary space use includes the staff, managers, and office administrative assistant (OAA) work spaces. Common use areas for the staff will include designated areas for safes, files and printers. Meeting and privacy areas will include focus rooms used for private conversations and one-on-one meetings; small meeting or project rooms that will accommodate up to six people; informal meeting areas which are integrated into the open workstations with seating up to six people; and social centers/break areas will be included on each floor to include a coffee bar and seating for four people. All of these spaces will be defined by modular furniture systems and freestanding furniture. Ceiling-high panels will be required to separate Need-to-Know areas (See Need-to-Know section of this document. Also, see the Performance Specifications for further instructions concerning the modular furniture.)

Hard-wall construction will only be used for building core requirements (restrooms, chases, vertical circulation, lobbies, mechanical and electrical rooms). Each floor will have designated formal meetings/training/light laboratory spaces. These spaces will be Closed Area–ready (formally called VTR), and the occupant will be able to make it a Closed Area after occupancy if needed. The social center/break room could be a combination of hard-wall construction, modular systems, and freestanding furniture to define the space. Hard-wall construction is required for plumbing connections.

Space use type summary:

- Staff workstations, 64 net square feet each
- Level 2 Managers, 96 net square feet each, locate adjacent to a small meeting room
- Managers, 96 net square feet each
- OAAs, 64 net square feet each
- Safes/files, 64 net square feet

- Common-use printers, 64 net square feet
- Focus rooms, 48 net square feet
- Informal meeting areas, 128 net square feet
- Small meeting/project rooms, 96 net square feet
- Meeting rooms, 192 net square feet (second and third floor)
- Formal meeting room, 384 net square feet (first floor)
- Social centers/break rooms, 96 net square feet, and
- Formal meeting/training rooms/Closed Area ready rooms/light laboratories, 1,050 net square feet that can be divided into two separate spaces for two meeting rooms, two light laboratories or remain at 1,050 nsf for training room or light laboratory

3.1.2 Space Descriptions

Kit-of-Parts

To increase flexibility, the open office concept will include a "kit of parts" for workstations, focus rooms, area dividers, common-use printers, informal meeting areas, and small meeting rooms. Building 730 will be based on a modular workstation of a standard 4-foot-wide panel. The panel will support the other workstation components. All kit-of-parts elements must consider ergonomics and ADA accessibility. The "kit-of-parts" module will allow for personalization and reconfiguration within the individual workstation as well as allow for plug-and-play to increase or decrease the office density. For example, an open collaboration area can easily be modified to accommodate more workstations and vice versa.

Ceiling-high panel spaces: All ceiling-high spaces should be located away from the perimeter glazing and near building core elements to preserve daylight and views for the open office. A good portion of the panels should be glazed with a frosted film strategically applied for visual privacy.

Open office spaces: All open office spaces should be configured so the higher panels and storage are located perpendicular to the exterior glazing and the lower panels are parallel to the exterior glazing. Every effort should be made to preserve daylight and views for all occupants of the building.

Office Areas

Level 2 Manager workstation will be a standard 96 square feet consisting of four-foot-wide panel units and a door consistent with the four-foot-wide panel module. Typically, a Level 2 Manager would have an office large enough to house a conference table and chairs. To provide ample space for a Level 2 Manager, but keeping with the modular manager office configuration, his or her office should be located adjacent to an enclosed meeting room with an adjoining door. The rooms will have ceiling-high architectural movable walls composed of a combination of opaque and glazed panels with film to maximize daylighting but maintain visual privacy. This space will be used for private conversations, and sound-attenuation techniques will be implemented. These movable walls must be compatible with the selected SNL standard furniture components for this building. Other concepts within this section and as designed by the A/E team will determine how these panels are used. Other components will include a standardized "Manager kit-of parts" composed of computer and desk workspace, overhead storage, file storage, small meeting table and chairs.

Manager workstations will be a standard 96 square feet consisting of four-foot-wide panel units and a door consistent with the four-foot-wide panel module. The rooms will have ceiling-high architectural movable walls composed of a combination of opaque and glazed panels with film to maximize daylighting but maintain visual privacy. This space will be used for private conversations, and sound attenuation techniques will be implemented. These movable walls must be compatible with the selected

SNL standard furniture components for this building. Other concepts within this section and as designed by the A/E team will determine how these panels are used. Other components will include a standardized "Manager kit-of parts" composed of computer and desk workspace, overhead storage, file storage, small meeting table and chairs.

Staff and OAA workstations will be a standard 64 square feet consisting of four-foot-wide panel units on three sides. The total panel height will be ~5 ½ feet with fabric panels on the storage spline (perpendicular to daylighting) and using a combination of 48" fabric panels and glass stackers on the remaining sides. These workstations are to be composed of modular systems furniture per SNL specifications and be built with the concept of potentially raising these panel heights to their maximum capability. Other concepts within this section and as designed by the A/E team will determine how these panels are used. Other components will include a standardized "Staff kit-of parts" composed of computer and desk workspace, overhead storage, file storage and chair/options.

Focus rooms will be a be a standard 48 square feet consisting of two- and four-foot-wide panel units and a door consistent with the four-foot-wide panel module. The rooms will have ceiling high Architectural movable walls composed of a combination of opaque and glazed panels with film to maximize day lighting, but maintain visual privacy. This space will be used for private conversations, and sound attenuation techniques will be implemented. These movable walls must be compatible with the selected SNL standard furniture components for this building. These rooms will be located in a common-use area. Other concepts should be considered in the design and location of these spaces including using these spaces as separation between Need-to-Know areas. Other components will include a standardized "Focus room kit-of parts" composed of desk workspace, overhead storage and chair.

Small meeting and project rooms will be a be a standard 96 square feet consisting of four-foot-wide panel units and a door consistent with the four-foot-wide panel module. The rooms will have ceiling-high architectural movable walls composed of a combination of opaque and glazed panels with film to maximize daylighting, but maintain visual privacy. This space will be used for private conversations, and sound attenuation techniques will be implemented. These movable walls must be compatible with the selected SNL standard furniture components for this building. These rooms will be located in a common use area. Other concepts should be considered in the design and location of these spaces.

Safes and files should have a designated location on each floor. This area could be defined by partitions at each end and located within office areas. One suggestion would be adjacent to the OAA workstations or along hard-wall construction areas. This area should be a designated area consistent from floor to floor. The purpose of this requirement is to ensure that over the years as the building is reconfigured, the safes and files are in a location designed for this dead load, meeting the structural requirements. Small safes that fit under the counter may be placed in workstations in lieu of typical file cabinets.

Common-use printers will be integrated into the open office areas. One area should have a full-sized copier; this area should be more isolated from the office areas to create better acoustical separation. One suggestion would be adjacent to the OAA workstations or along hard wall construction areas.

Informal meeting areas will be integrated into the open office plan and defined by the surrounding workstation panels.

Social centers/break rooms must be located in the common area adjacent to one hard wall for plumbing runs to a sink. Provide a minimum of 10 linear feet of upper and lower cabinets with a sink, area for coffee maker and refrigerator. A small seating area for four to eight people; modular partitions and/or freestanding furniture could be used to define the space.

The formal meeting room on the first floor will have seating up to 20 people in a standard 384 square feet consisting of four foot wide panel units and a door consistent with the four foot wide panel module. The room will have ceiling high Architectural movable walls comprised of a combination of opaque and glazed panels with film to maximize day lighting, but maintain visual privacy. This is a space that will be used for private conversations and sound attenuation techniques will be implemented. These movable

walls must be compatible with the selected SNL standard furniture components for this building. These rooms will be located in a common use area. Other concepts should be considered in the design and location of these spaces.

The meeting rooms on the second and third floors will have seating up to 10 people in a standard 192 square feet consisting of four foot wide panel units and a door consistent with the four foot wide panel module. The room will have ceiling high Architectural movable walls comprised of a combination of opaque and glazed panels with film to maximize day lighting, but maintain visual privacy. This space will be used for private conversations, and sound attenuation techniques will be implemented. These movable walls must be compatible with the selected SNL standard furniture components for this building. These rooms will be located in a common-use area. Other concepts should be considered in the design and location of these spaces.

On each floor there will be a 1,050 net square foot Formal Meeting/Training Room/Closed Area Ready Rooms/Light Laboratory area. The initial use on each floor will include

1. Computer training room to accommodate 15 computers plus one teaching station, printers, and plotters in 1,050 nsf.
2. Computer support- CNC machine for proto-typing, computer work benches, component storage, and server area in 1,050 nsf.
3. Closed area ready space with 3 workstations, computer server area, anthrocarts, and plotters in 1,050 nsf.

For future reconfiguration, all of these spaces must have the flexibility to serve as any of these functions:

- Formal conference room, training room, be a Closed Area, or light laboratory space. The 1,050 net square feet can be divided into two separate spaces for two meeting rooms, two light laboratories or remain at 1,050 nsf for training room or light laboratory. Must be very versatile to accommodate any of the stated space needs. This will be a hard walled shell that can be:
  - Subdivided for two formal meeting or rooms to seat up to 12 people; or
  - One larger formal meeting or computer training room to seat up to 24 people; or
  - Electrical laboratories of three 350 square foot modules 350 each; or
  - One larger electrical laboratory of 1,050 square feet.
  - The space should be designed to be Closed Area ready.
  - Accessed from office areas.

Building Support Spaces

Building support includes restrooms, IDRs, lobbies, janitor closets, mechanical and electrical rooms.

- Restrooms
  - Restroom requirements have been estimated in the list of spaces however, actual requirements are dependent on code compliance completed as part of the design process. Restroom facilities are provided as part of the core, building support spaces and is included on each floor.
- Mechanical Areas
- IDR/MDR
  - A main IDR will be provided on the first floor and will be part of the core of the building support.
- Janitor closets

  - Janitor closets will be provided on each floor and will be part of the core of the building support.
- Egress and circulation
  - Calculations for egress and circulation are included in the list of spaces within the areas calculated for usable area and gross area. The interior office circulation is included in the usable area calculations. The main circulation and egress is estimated in the gross area calculation.

Equipment and Special Requirements

- Each staff and manager workstation must accommodate both red and black data lines with appropriate space between both networks.
- Each workstation will have telephone, desktop computer, and two to four screens.
- Safes and file areas must be accommodated spatially and structurally.
- The common-use printer areas will have printers and paper storage, shredder, and recycle and trash bins.
- Connections and required separation for data networking must be provided for red data lines.
- Focus rooms will have an STE phone line and red and black computer connections.
- Informal meeting areas will have table and chairs.
- Small meeting and project rooms will have a phone, table and chairs, and white boards with black and red data connectivity. Connections for black and red must have the required separation.
- Social center/break rooms will have a sink, refrigerator, and coffee maker on a countertop.
- Meeting rooms (192 nsf) on the second and third floor and the formal meeting room (384 nsf) on the first floor will have infrastructure to support overhead projection and pull-down screens, white boards, red and black data and telecommunications connections, video conferencing for meeting and training rooms, and an STE phone line.
- Formal meeting/training rooms/Closed Area ready room/light laboratories must have the capability to add the following:
  - Infrastructure to support overhead projection and pull down screens, white boards, red and black data and telecommunications connections, video conferencing for meeting and training rooms, and an STE phone line.
  - Training rooms to include computer training and infrastructure for electrical and data drops.
  - Infrastructure to support overhead cable trays, grounding system, electrical for workbenches in perimeter conduits. The ability to have 220v 3-phase electrical. Red and black data and telecommunications.
  - Closed Area–ready infrastructure in conformance with NNSA Information Security NAP and Physical Protection NAP documents.
  - Separation of black and red data drops must be considered.
  - See Appendix B, *Chameleon System Facilities Infrastructure for AV Room*, for a sample of required infrastructure.

Mechanical, Electrical, Data Flexibility

The mechanical, electrical and data runs must be flexible for changing needs. It is conceivable that some areas that are created for focus rooms, informal meeting areas, small meeting and project rooms will be utilized as office workspaces during peak work load periods and converted back to the original purpose once the project is complete. The flexibility of the chosen systems must respond to these changing needs without compromising the function of the mechanical, electrical and data systems.

The design must consider the length of run limitations, design loads, and increased efficiency while maximizing functionality, and enhancing the physical work environment through ambient heating, cooling, air quality, and natural light.

The design of the ceiling grid, lighting, HVAC, fire protection, data runs, and electrical runs must consider the modularity of the furniture layouts keeping in mind that some of the panels will reach the height of the ceiling and may be reconfigured with lower panels in the future.

3.1.3 Security Considerations

SNL personnel are ever diligent in protecting our national security. An open concept presents some challenges that must be addressed through the thoughtful design and layout of the workstations and common areas. The following concepts have been identified as requirements. Additional creative alternatives are encouraged with the primary goal of protecting information used by the SNL personnel.

3.1.4 Need-to-Know Concepts

A predominant security concept for protecting information is subdividing departments into Need-to-Know groups. This requires that classified matter be controlled and limited to only those individuals with appropriate clearance and the need to know that information.

The IGPP office workstations must have the capability to isolate workstations in Need-to-Know "pods." This area must be flexible to expand and contract. Components of a Need-to-Know pod include the following:

- Open office "pods" with the flexibility to isolate workstations in increments of four to twelve workstations. These areas must have the capability to expand and contract through separation of each pod. Separation between pods should be accomplished through the use of a clear threshold into the pod area. The main circulation path should be defined by a run of panels that are low enough to allow daylight into the building, but high enough to deter passersby from having the ability to casually see the work being done. See the kit-of-parts section. These workstations must also have the ability to accommodate a ceiling-high panel system simply by adding panels to the existing configuration. Essentially, the pods should be able to be converted from open office to an enclosed pod area with a door.
- Visibility control of computer screens must be accomplished within the workstation layouts to prevent a sight line from the main corridors to the computer screens within the pod. Avoid sight lines from other workstations within the pod if possible. Screen guards may be required if visual isolation is not possible.
- The entire floor plate on each floor must have the ability to be converted into one large Closed Area. This will require a lobby for vertical circulation to enable controlled access capability (e.g., card reader).

3.1.5 Auditory Concepts

Ultimately, each worker is responsible for safe-guarding information. This is a particular challenge in an open-office situation. Consider the following issues:

- Office layout should be designed to avoid obvious noise intrusion possibilities. Individual work stations should be positioned relative to columns, walls, and each other to avoid uninterrupted sound paths between contiguous work stations. Occupant orientation is also important, because there is a significant difference between the sound level when a talker faces a listener versus the talker facing away from the listener.

- Isolate sensitive spaces such as managers' offices, conference rooms, focus rooms, and project rooms.
- Isolate noise-producing areas such as copier and printers and conference rooms.

Several spaces with ceiling-high partitions and the ability to close doors should be provided for phone conversations or meetings. Sound transmitted from these rooms must be attenuated. Measures for sound attenuation may include but, is not limited to the following concepts:

- Minimizing untreated hard surfaces
- Providing barriers, furniture, ceiling, and wall panels that have sound absorptive materials
- Providing an active sound-masking system

3.1.6 Building Organization and Zoning

The facility is anticipated to have three levels with the primary mechanical space on the ground floor for easy access. The office areas will be consistent from floor to floor with the elements described above.

Zoning and organization of each floor should be consistent. Core spaces will include

- Vertical circulation,
- Lobbies,
- Restrooms and janitorial closets, and
- Mechanical, electrical, and data distribution.

Office areas must meet the Need-to-Know requirements of four to twelve workstations with centrally located office support spaces. The office support spaces include

- Safes/files,
- Common-use printers,
- Focus rooms,
- Informal meeting areas,
- Small meeting/project rooms,
- Meeting rooms (192 nsf and 384 nsf),
- Social centers/break rooms, and
- Formal meeting/training rooms/Closed Area ready rooms/light laboratories.

3.2 Relationship Diagrams

The following relationship diagram is an illustration of how each floor may be organized. The diagram is zoned with the core spaces separated from the office functions with access control.

The office area is zoned for quiet and noise-producing areas. Noise may be produced from the formal meeting area when staff congregate there, but when meetings are in session, the area requires quiet. The social/break area is adjacent to this space for the convenience of a coffee bar.

Shared or common functions are centrally located or dispersed depending on the office layout. The key is to provide equal access to all users. However, printers can be noisy and this issue must be considered when locating this space.

The informal spaces are located within the staff workstation areas as a means of providing expansion for workstations if needed in the future.

The other key element shown is how the core spaces relate to the office functions. Figure 3.1 shows the core spaces centrally located. Other options may be considered in the organization of the building.

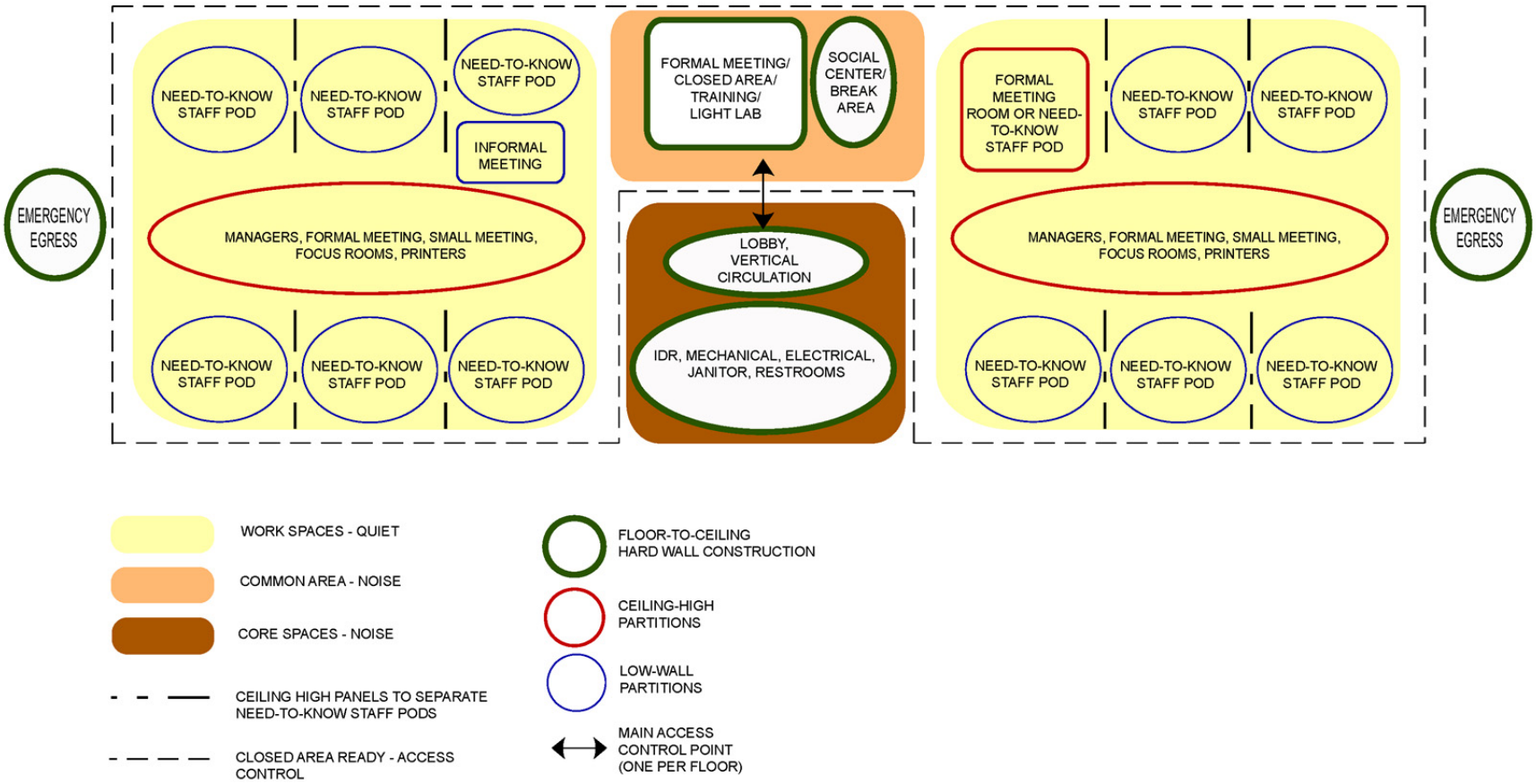


Figure 3.1 Illustration of Suggested Spatial Relationships

4.0 List of Spaces

For planning purposes, the planning assumes the following gross area parameters:

- Assume the building will be a minimum of 26,000 gross square feet and approximately 18,760 net square feet.
- Each floor will have lobby, mechanical, and electrical space needs. The first floor must accommodate a larger lobby, mechanical, and electrical rooms. All areas in the List of Spaces (Figures 4.1 and 4.2) are estimates and dependent on code and building system analysis of the proposed design to verify sizes.
- Space Allocation Ratios:
  - One Level 2 Manager office should be provided adjacent to one of the small meeting/project rooms
  - One Manager per 20 staff and OAA positions
  - One to two OAAs per 38 staff
  - One informal meeting room per 40 staff (Staff and Manager)
  - One focus room per 10 staff
  - One small meeting/project room per 60 staff (Staff and Manager)
  - One printer/safe/file area per 20 staff (Staff and Manager)
  - One formal meeting/training/closed area/light lab per floor
  - One formal meeting room on the first floor and one meeting room on each of the second and third floors
  - Building support per floor

First Floor

Modular Furniture Systems					Total Net Square Footage	**4,120**
	Description	Space Classification	Area/Unit	# Units	# Modules	Net Square Footage
Office Modules	**Level II Manager**	Open Office	120	1.0	1.0	120
	Level II Manager's OAA	Open Office	64	1.0	1.0	64
	Manager	Open Office	96	2.0	1.0	192
	OAA	Open Office	64	1.0	1.0	64
	Staff	Open Office	64	38.0	1.0	2,432
	Focus Rooms	Open Office	48	4.0	1.0	192
	Informal Meeting Areas	Open Office	128	1.0	1.0	128
	Formal Meeting	Open Office	128	3.0	1.0	384
	Small Meeting/Project Rooms	Open Office	96	2.0	1.0	192
	Social Center/Break Area	Open Office	96	1.0	1.0	96
	Common-use Printers	Open Office	64	2.0	1.0	128
	Common Safes/Files	Open Office	64	2.0	1.0	128
		Internal Circulation		25%		**1,030**
		Usable SF				**5,150**
Hard-wall Construction					Total Net Square Footage	**1,050**
	Description	Space Classification	Area/Unit	# Units	# Modules	Net Square Footage
	Formal Meeting/Training/Closed Area/Light Lab	Special Use-Hard Wall	350	3.0	1.0	1,050
		Internal Circulation		25%	Above	
		Usable SF				**1,050**
Building Support					Total Net Square Footage	**2,255**
	Description	Space Classification	Area/Unit	# Units	# Modules	Net Square Footage
Building Support	**Restrooms**	RRs	130	1.0	2.0	260
	Elevator Equipment Room	Building Support	45	1.0	1.0	45
	IDRs	Data Support	150	1.0	1.0	150
	Lobby / Seating	Building Support	400	1.0	1.0	400
	Janitor Closets	Building Support	150	1.0	1.0	150
	Mechanical Room	Building Support	1000	1.0	1.0	1,000
	Electrical Rooms	Building Support	250	1.0	1.0	250
	Vestibule is part of circulation	Internal Circulation		25%		**564**
		Usable SF				**2,818**
Total Gross Square Feet						**10,730**

Figure 4.1 First Floor List of Spaces

Second and Third Floor (Each Floor)

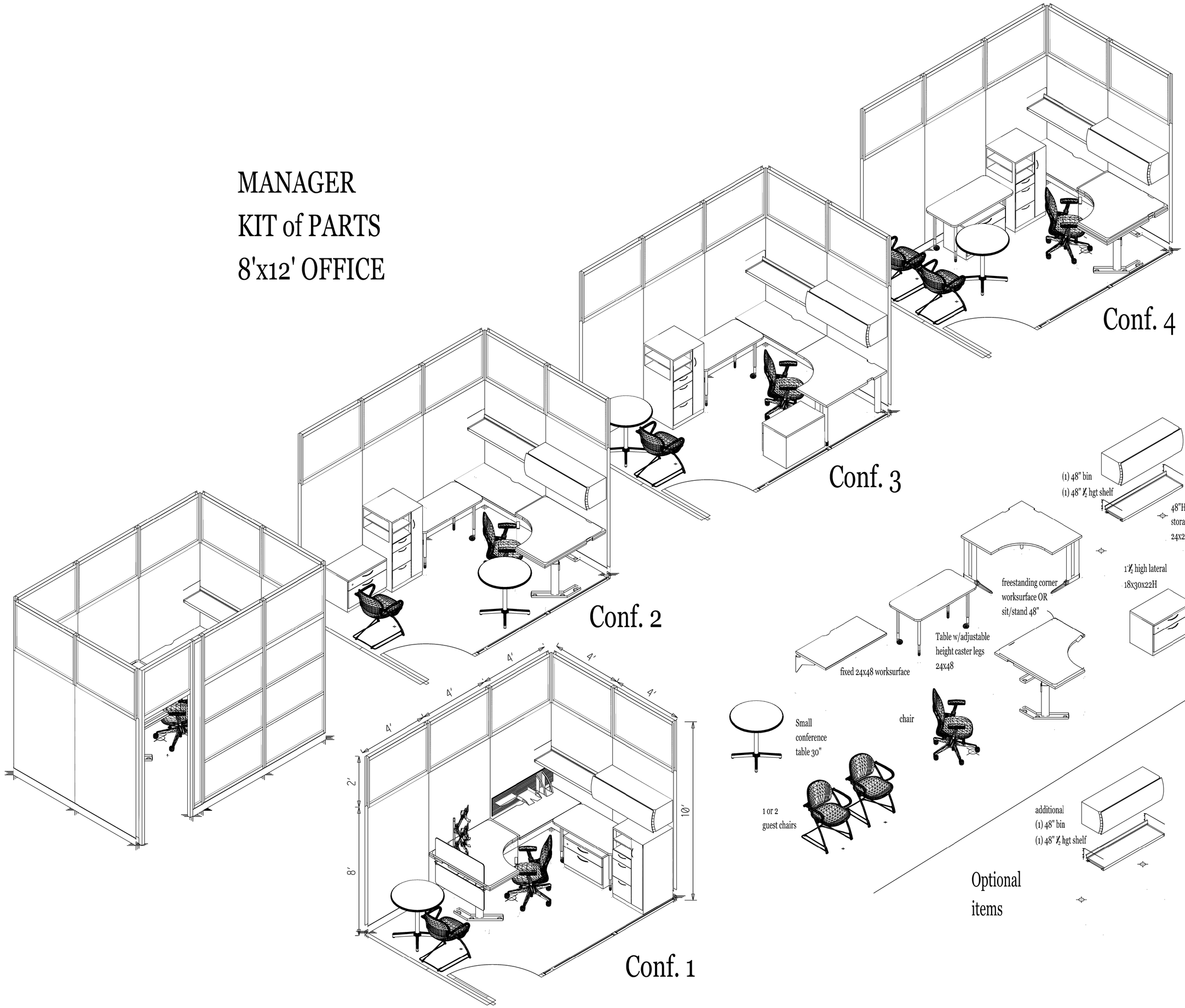
Modular Furniture Systems					Total Net Square Footage	**3,552**
	Description	Space Classification	Area/Unit	# Units	# Modules	Net Square
Office Modules	**Manager**	Open Office	96	2.0	1.0	192
	OAA	Open Office	64	1.0	1.0	64
	Staff	Open Office	64	38.0	1.0	2,432
	Focus Rooms	Open Office	48	4.0	1.0	192
	Informal Meeting Areas	Open Office	128	1.0	1.0	128
	Meeting Rooms	Open Office	192	1.0	1.0	192
	Social Center/Break Area	Open Office	96	1.0	1.0	96
	Common-use Printers	Open Office	64	2.0	1.0	128
	Common Safes/Files	Open Office	64	2.0	1.0	128
		Internal Circulation		25%		**888**
		Usable SF				**4,440**
Hard-wall Construction					Total Net Square Footage	**1,050**
	Description	Space Classification	Area/Unit	# Units	# Modules	Net Square Footage
	Formal Meeting/Training/Closed Area/Light Lab	Special Use-Hard Wall	350	3.0	1.0	1,050
		Internal Circulation		25%	Above	
		Usable SF				**1,050**
Building Support					Total Net Square Footage	**740**
	Description	Space Classification	Area/Unit	# Units	# Modules	Net Square Footage
Building Support	**Restrooms**	RRs	130	1.0	2.0	260
	Elevator Equipment Room	Building Support				
	Lobby	Building Support	150	1.0	1.0	150
	Janitor Closets	Building Support	50	1.0	1.0	50
	Mechanical Room	Building Support	200	1.0	1.0	200
	Electrical Rooms	Building Support	80	1.0	1.0	80
		Internal Circulation		25%		**185**
		Usable SF				**925**
Total Gross Square Feet						**7,635**

Net Square Footage	**18,109**
Usable Square Footage	**21,848**
Gross Square Footage	**26,000**
Occupancy	**125**

Figure 4.2 Second and Third Floor List of Spaces

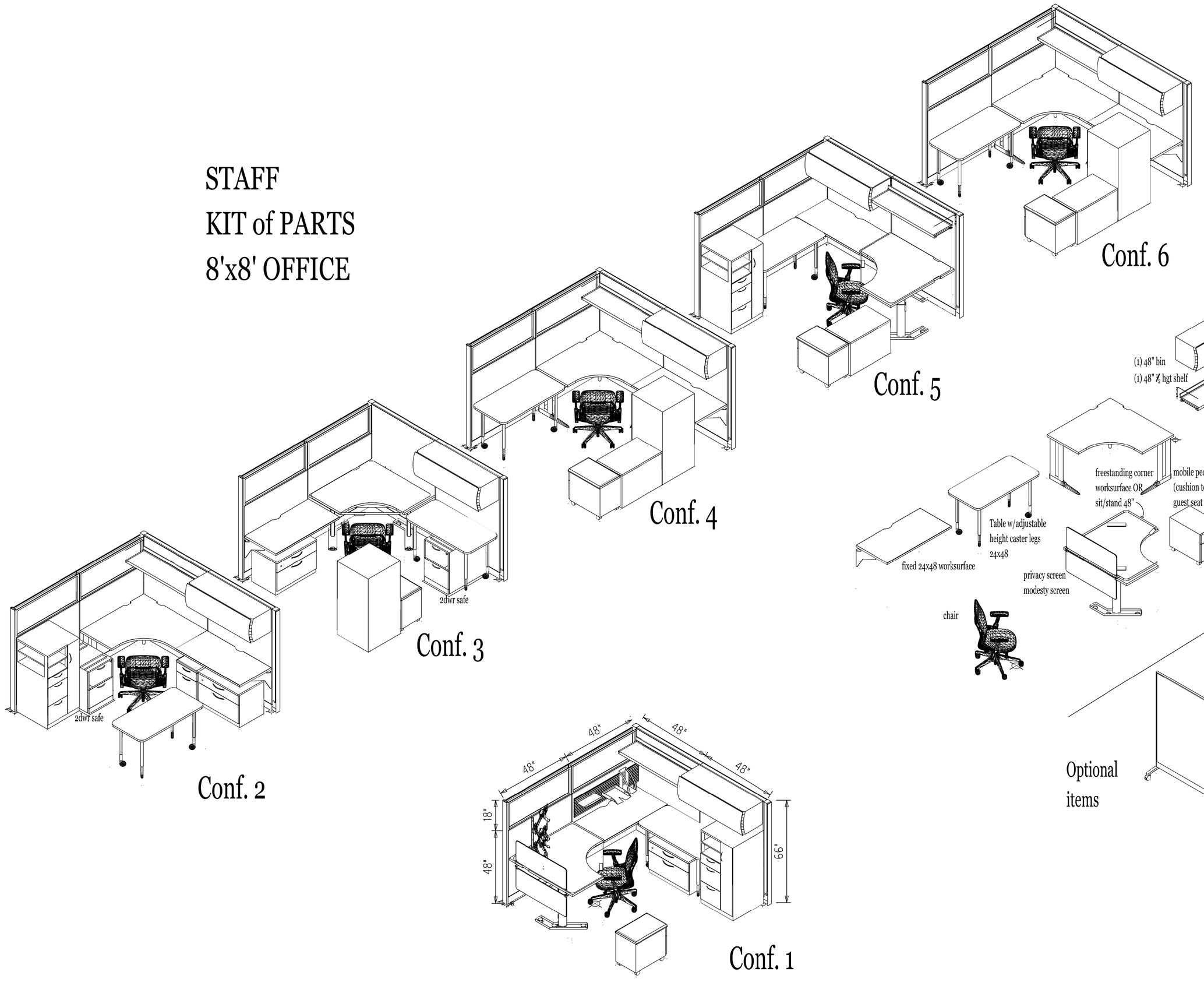
Attachment A: Kits of Parts and Furniture Plans

MANAGER
KIT of PARTS
8'x12' OFFICE



Optional
items

STAFF
KIT of PARTS
8'x8' OFFICE



Conf. 6

Conf. 5

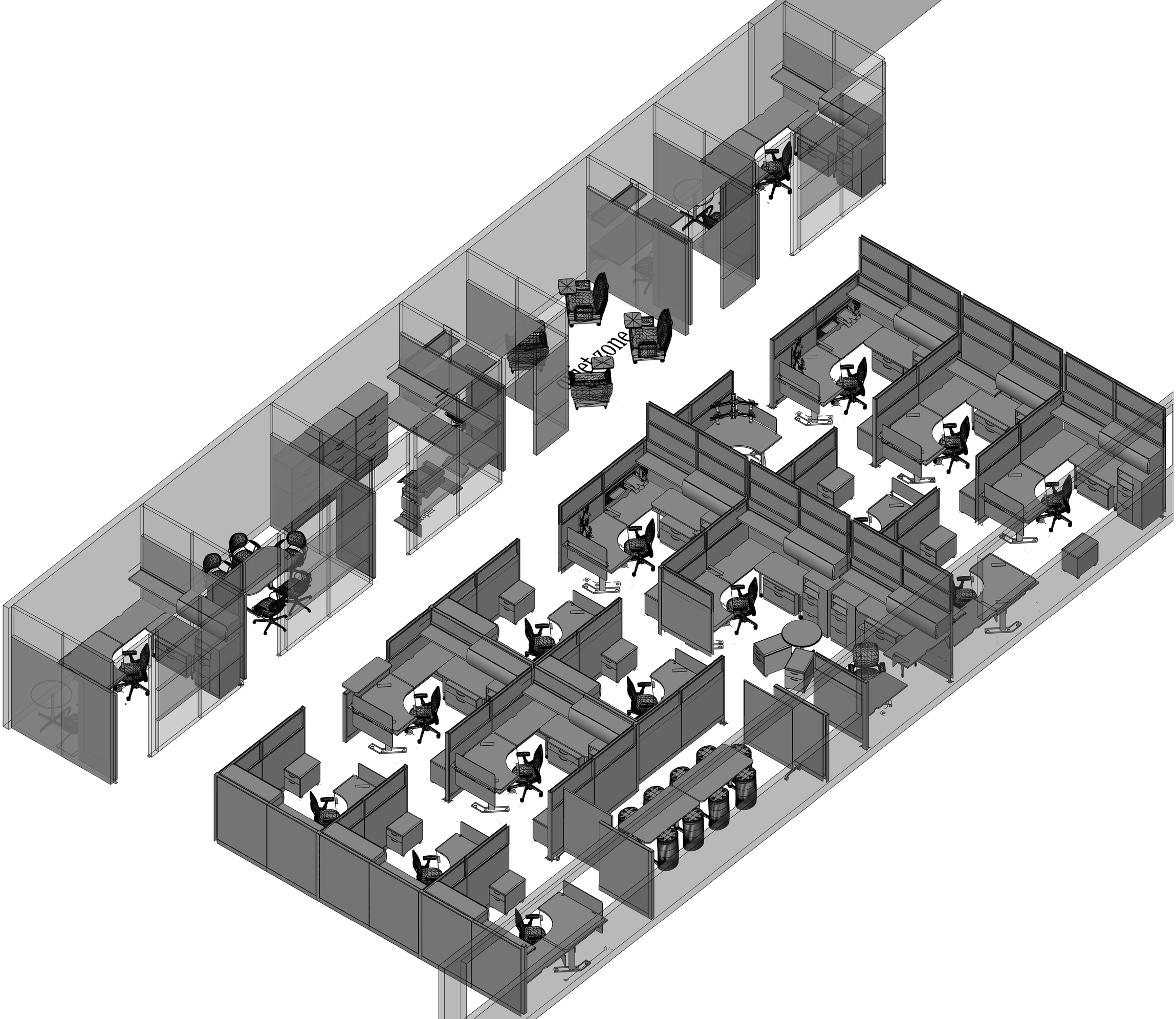
Conf. 4

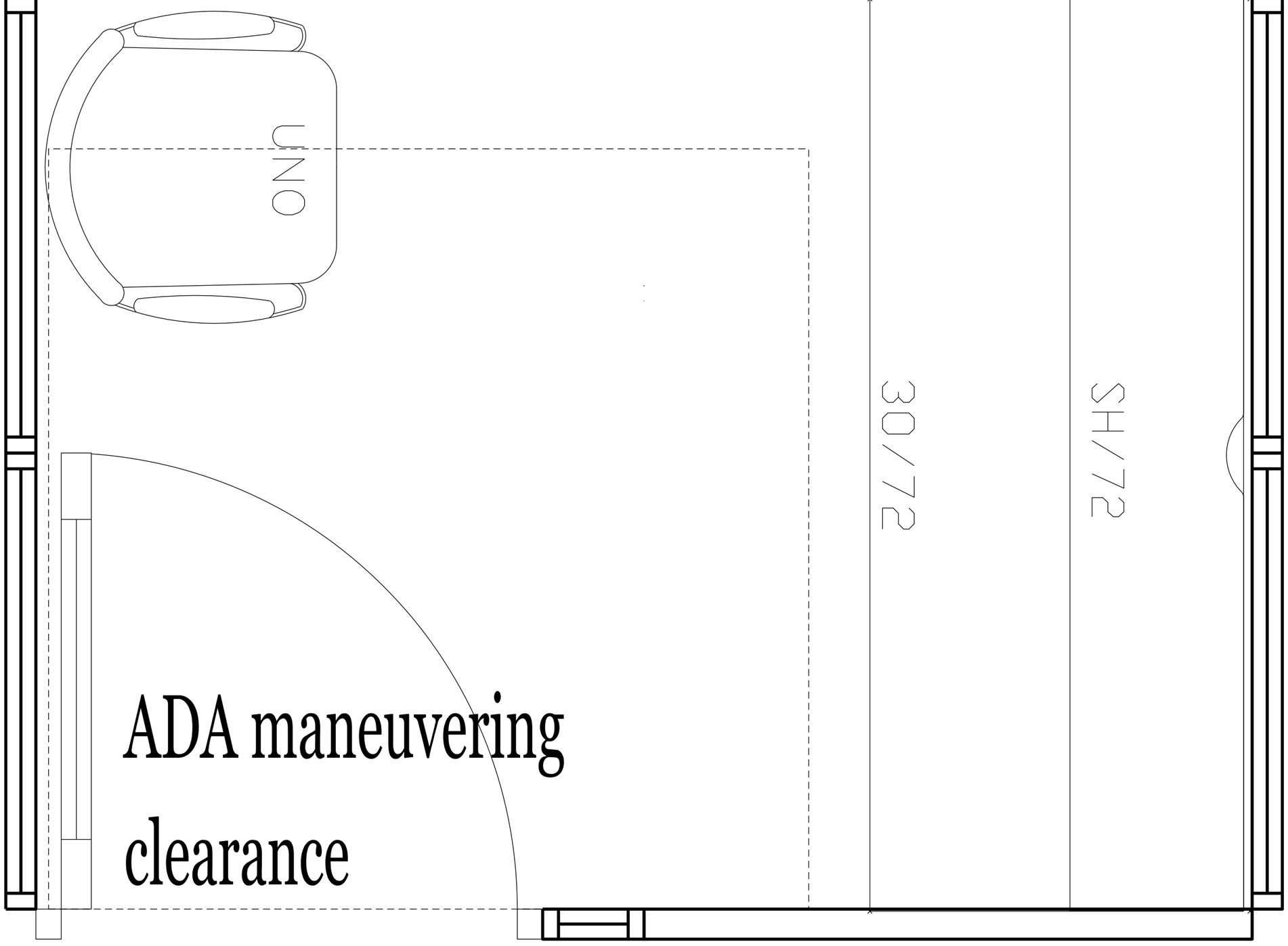
Conf. 3

Conf. 2

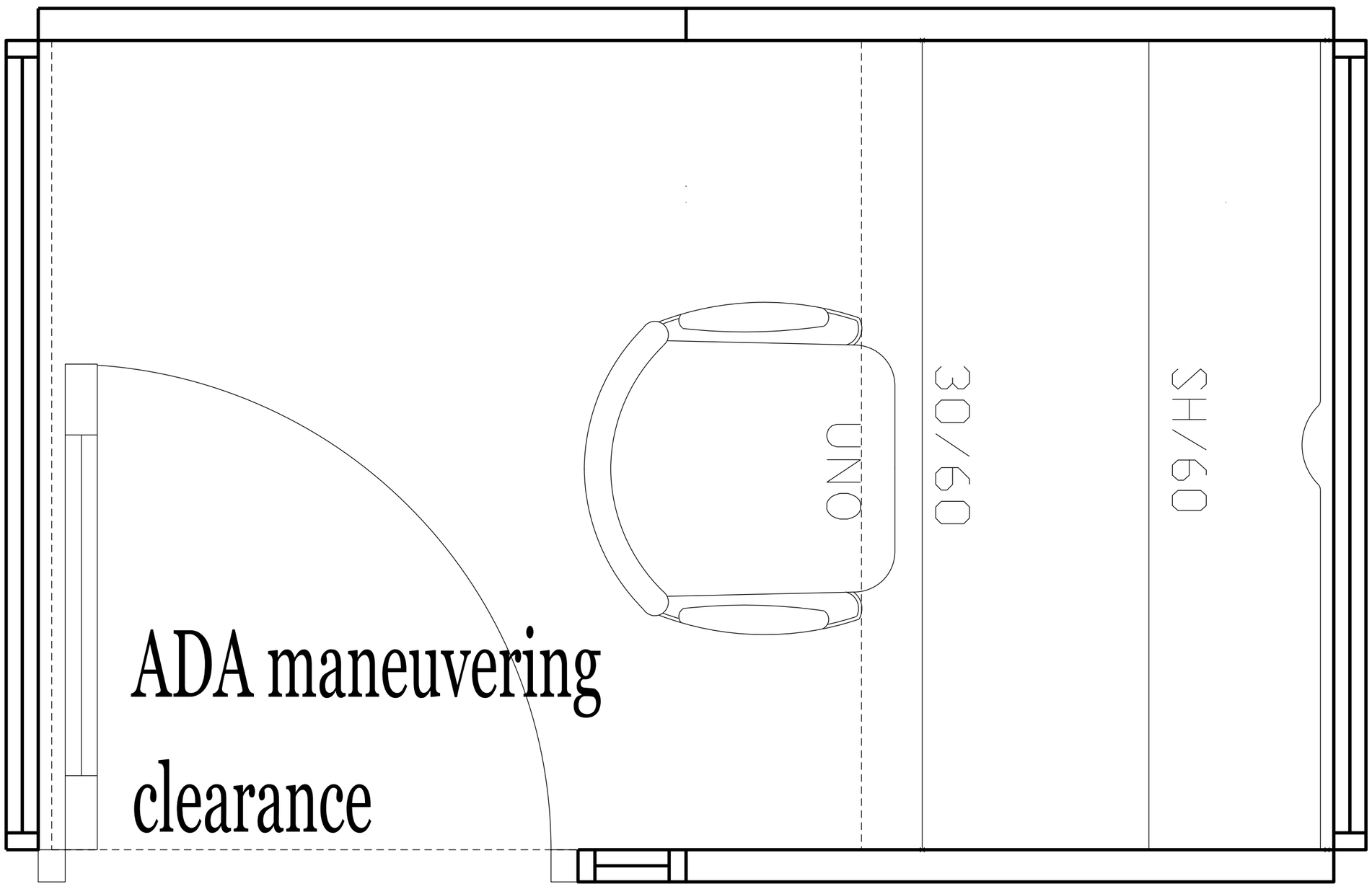
Conf. 1

Optional items

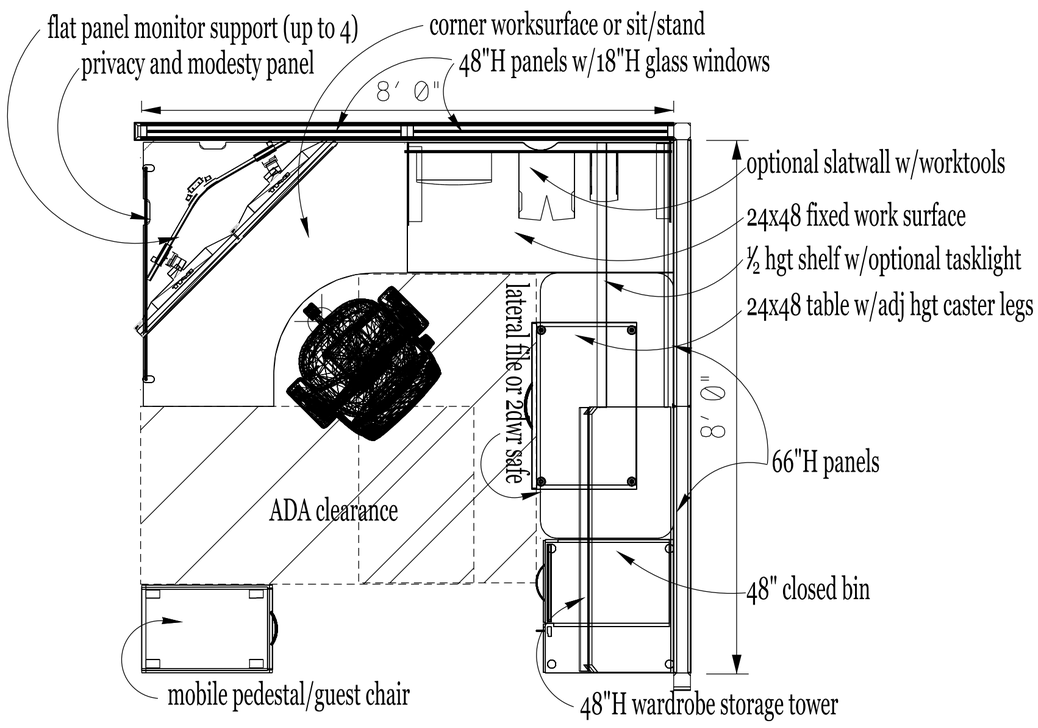

Quiet Zone

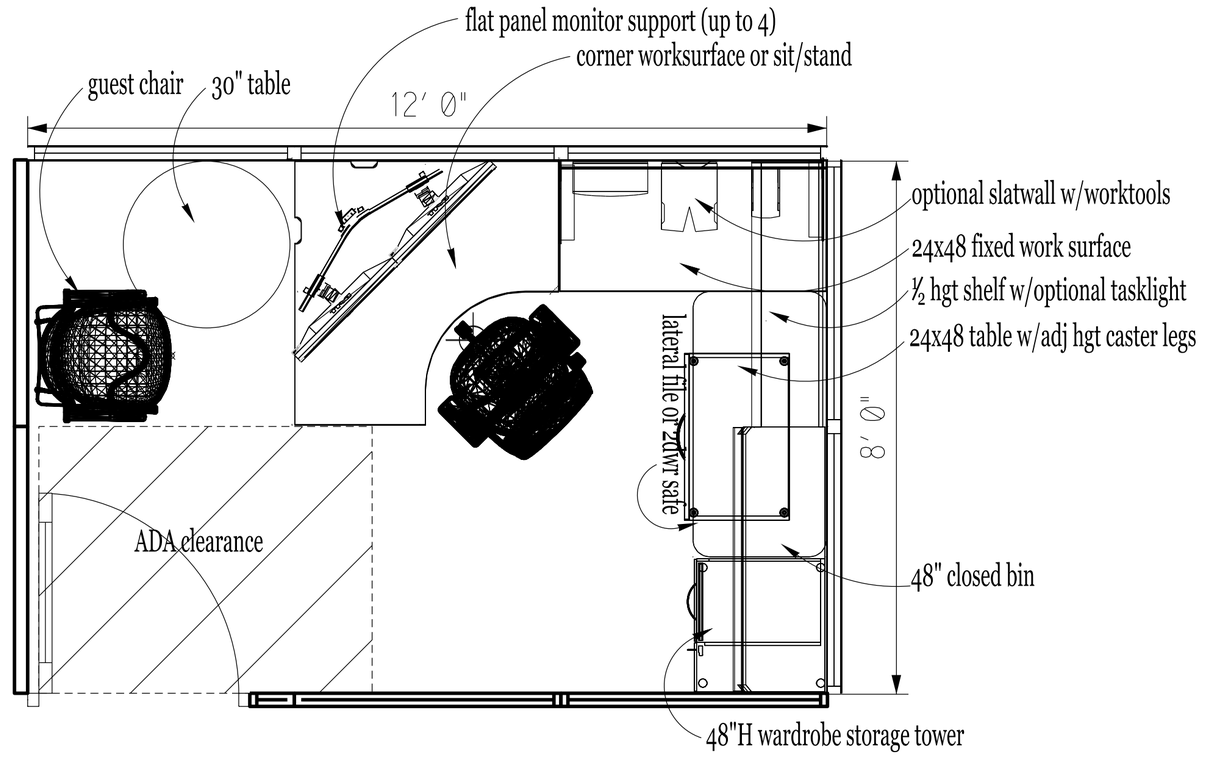


6'x8' focus room



5'x8' focus room


flat panel monitor support (up to 4)
privacy and modesty panel
corner worksurface or sit/stand
48"H panels w/18"H glass windows
8' 0"
optional slatwall w/worktools
24x48 fixed work surface
½ hgt shelf w/optional tasklight
24x48 table w/adj hgt caster legs
lateral file or 2dwr safe
8' 0"
66"H panels
ADA clearance
48" closed bin
mobile pedestal/guest chair
48"H wardrobe storage tower


flat panel monitor support (up to 4)
guest chair
30" table
corner worksurface or sit/stand
12' 0"
optional slatwall w/worktools
24x48 fixed work surface
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24x48 table w/adj hgt caster legs
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ADA clearance
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