



San Mateo County Ergonomic Office Standards

2014 Edition

Table of Contents

I.	SCOPE AND PURPOSE	4
II.	FUNDAMENTAL ERGONOMIC PRINCIPLES	5
III.	WORKSTATION STANDARDS	5
A.	Workstation Height	5
B.	Work Surface	5
C.	Computer Surface.....	6
D.	Corner Computer Surface.....	6
E.	Leg Clearance	6
F.	Keyboard Cutouts	6
IV.	SIT-STAND COMPUTER WORKSTATIONS.....	7
V.	MILL WORK AND CASE GOOD FURNITURE (BUILT-INS)	7
VI.	RECEPTION STATIONS	7
VII.	KEYBOARD PLATFORMS	8
VIII.	TASK SEATING	8
A.	Specifications.....	8
B.	Armrests	9
C.	Construction and Design.....	9
D.	Specialized Seating	10
E.	Chair Fittings.....	10
IX.	COMPUTER COMPONENTS.....	11
A.	Monitors	11
B.	Monitor Arms, Dual Monitors	11
C.	CPU/Hard Drives	11
D.	Keyboards.....	11
E.	Mice	12
F.	Laptops.....	12
G.	Tablets and Touch Screen Devices	12
X.	ACCESSORIES.....	13
A.	Headsets.....	13
B.	Foot Rests	13
C.	Anti-Glare Screens and Privacy Filters	13
D.	Document Holders	14
E.	Speech Recognition Software.....	14

F.	RSIGuard Software.....	14
XI.	LIGHTING	15
XII.	CLEANING OF COMPUTER EQUIPMENT	15
XIII.	NOISE.....	16

COUNTY OF SAN MATEO
Ergonomic Office Standards

I. SCOPE AND PURPOSE

The following standards have been developed to assist in controlling risk factors known to contribute to musculoskeletal disorders (MSDs) in the office environment. They are to be used by departments while:

- Designing or redesigning office areas;
- Relocating employees whether temporarily or permanently;
- Purchasing furniture and equipment.

The goal of implementing these standards is to support the health and safety of the staff of San Mateo County and to create an environment where employees can work comfortably and efficiently. Additional resources available in the County to assist departments with ergonomic issues include:

1. Department Ergonomic Coordinators
2. Human Resources, Risk Management and Procurement Divisions
3. Ergonomics Policy for Computer Operations
4. Ergonomic Equipment Procurement Guide (in development)
5. Ergonomic Evaluation and Self-Assessment Forms

This standard applies to computer workstations used regularly in office workplaces by users with normal perceptual and cognitive capabilities for text, data, and simple graphics processing tasks. It is specifically intended for moderate to intensive computer users. (*Moderate computer users are defined as inputting 2-4 hours per day/shift and intensive users are defined as inputting 4+ hours a day/shift.*)

The specifications in this standard are not intended to apply to the diverse uses of computers beyond the office workplace. Although generalizations of some specifications contained in this standard to other applications may be reasonable and justifiable, such generalizations exceed the scope of this standard.

It is the intent of the Ergonomic Coordinators Council to review the following standards every 2 years.

II. FUNDAMENTAL ERGONOMIC PRINCIPLES

The specifications presented in this standard are intended to support workers in performing their necessary tasks at computer workstations. The specifications are in keeping with the following human factors and ergonomics objectives:

- Enhance workstation usability by improving ease of use and ease of learning;
- Support users of various physical sizes and expertise levels;
- Maintain user performance by allowing postural changes that minimize static loads;
- Promote user satisfaction by fostering product acceptance and product usage;
- Avoid awkward postures via the design and adjustability of work place furnishing and equipment;
- Avoid unsupported body parts, specifically but not exclusively, the torso, back, and arms.

III. WORKSTATION STANDARDS

A. Workstation Height

Workstations in the County will be a standard height of 29 inches and will be a continuous flat fixed surface. If a workstation needs to be adjustable and if it is a modular system workstation, the fixed support(s) will be changed to adjustable support(s).

B. Work Surface

Work surface tops should have no sharp edges and a minimum depth of 24 – 36 inches. The front edge of the work surface should be waterfall or rounded to minimize sharp edges. The work surface material shall have a matte finish to inhibit glare.

C. Computer Surface

1. If the computer surface is fixed-height without a keyboard platform, the depth should be a minimum of 30 inches. This would generally not be provided for moderate to intensive computer users.
2. If the surface is straight with a keyboard platform, the depth should be a minimum of 24 inches.
3. If the computer surface is straight with a cutout, it should include a long arm keyboard mechanism and have a minimum depth of 30 inches.

D. Corner Computer Surface

The size of corner work surface is dependent on the side surface, which shall have a minimum depth of 24 inches, and must accommodate a 28–30 inch wide keyboard platform.

E. Leg Clearance

1. Where there is only one task location, e.g. a computer station, the leg clearance should be no less than 29 inches wide.
2. Where a multiple task location exists, the leg clearance at the primary task point should be no less than 29 inches wide and the leg clearance at the secondary task points should be no less than 27 inches wide.
3. For both primary and secondary task points within a single workstation, the depth of the clearance should be no less than 23 inches at the floor level.

F. Keyboard Cutouts

Workstation cutouts should be a standard feature for moderate to intensive computer users, which allow frequently used items to be placed within the primary reach zone. A cutout shall be large enough to fit a 28 inch wide keyboard platform.

IV. SIT-STAND COMPUTER WORKSTATIONS

1. Adjustable height “Sit-Stand” computer workstations may be provided to support specific medical or physical needs.
2. Staff afforded a sit-stand workstation shall receive additional training and familiarization with the set-up and use of the sit-stand station.
3. The adjustment range of the work surface of sit-stand workstations shall meet the sitting and standing elbow height of the intended user.
4. An evaluation by an ergonomic consultant will be conducted to assess work space feasibility and determine a potential user’s compatibility in the use of a sit-stand workstation.

V. MILL WORK AND CASE GOOD FURNITURE (BUILT-INS)

1. Mill work and case good furniture may be appropriate for functional or appearance reasons, such as public walk up counters, high traffic work areas or where no alteration or accommodation of the work surface to individual workers is anticipated.
2. For a seated computer workstation, mill work should be considered only if available systems furniture cannot meet the workspace or necessary task requirements. Mill work computer workstations shall meet the general requirement of “Workstation Standards” in this document.
3. Counters should provide surface depth protection by minimizing long reaches and awkward postures for the workers interacting with people across the counter.

VI. RECEPTION STATIONS

For counters where the public stands, the counter surface should be 42 inches above the floor and 34 inches for ADA height counters. Reaches for workers, whether seated or standing, should be no greater than 24 inches in depth.

VII. KEYBOARD PLATFORMS

1. Keyboard platforms should be straight 28 – 30 inches wide standard platforms with no split pad. Gel or foam filled wrist rests are available to prevent contact pressure with the platform or surface. Where provided, wrist rests should be maintained and replaced when worn.
2. Keyboard arm mechanisms should have independent controls for adjustment of platform height and angle. The control should require minimal force to adjust and lock the platform position and shall be of a low-profile design to present minimal intrusion into leg clearance. The platform should have a vertical adjustment range of at least 4 inches and an angle of from 0° (flat) to 10° negative.
3. The keyboard platform (or tray) system is intended to reduce upper extremity strain and minimize forward posture. A keyboard system should be able to support the weight of the arms during use but is not be intended to support the body weight of the operator.

VIII. TASK SEATING

A. Specifications

1. SEAT HEIGHT

- a) A pneumatic cylinder with low hand force and easily operated controls should range a minimum of 5 inches within a range of 14.5 to 22 inches.
- b) Lower or taller cylinders will be available for individuals with seated heights below and above the standard height adjustment range.

2. SEAT DEPTH

- a) Seat cushion depth shall permit contact with the backrest in the lumbar region of the spine and be designed to avoid excessive pressure on the backside of the lower leg and knee and the underside of the thigh.
- b) Seat cushion depth of 19 inches and a relieved or “waterfall” leading edge generally will meet this requirement.

- c) Seat pans or backrests can be adjusted to meet these criteria. In these cases, the range of depth adjustment should be a minimum of 2 inches and the minimum depth adjustment should be 17 inches.

3. SEAT WIDTH

- a) Seat pans must be wide enough to accommodate the breadth at the thighs of the user when seated. For this reason chairs with differing seat pans are recommended. Minimum width of seat pans should be 18 inches.

4. SEAT BACK

- a) The seat back should provide support to the lumbar region of the spine. The lumbar support should adjust within the range of 6 to 14 inches above the seat pan.
- b) The seat back shall permit the user to recline a minimum of 10° up to 15° behind the vertical.

B. Armrests

1. Armrests are recommended for tasks that require prolonged or intensive keystroking/mouse work or where hands or arms are suspended over the keyboard. Armrests should be adjustable in height and width and may pivot inwardly or outwardly to provide support for the users' forearms.
2. Armrests should adjust to a height of 6 to 10 inches above the seat pan. If armrest height interferes with the height of the keyboard platform, lowered armrest brackets may be provided.
3. Armrest to armrest width should adjust from a minimum of roughly 14 and a maximum of 20 inches with 18 inches as a typical distance.
4. Armrests shall be comprised of a padded material and are to be maintained in good condition and replaced as needed.

C. Construction and Design

1. Chair has five points of support.
2. Chair casters appropriate for the floor surface, such as carpeted or tiled flooring.
3. Chair is rated for the weight and physical needs of the user.

4. Chair meets or exceeds the following design standards:
 - a) *American National Standards Institute and the Human Factors and Ergonomics Society: ANSI/HFES*
 - b) *American National Standards Institute and the Business and Institutional Furniture Manufacturer's Association: ANSI/BIFMA*
 - c) *California Bureau of Home Furnishings and Thermal Insulation, Technical Bulletin for Public Occupancies: CTB 133*
 - d) *Applicable specialized environmental requirements, such as health care and correctional facility standards*

D. Specialized Seating

1. For high counters and computer surfaces, seating should meet the same specifications as above and include a foot-ring for support. High counter or work surfaces should have space to accommodate a height adjustable footrest as the main support surface for the worker's feet.
2. For larger and smaller scale seating, the dimensions and weight capacity shall meet the requirements of the individual.

E. Chair Fittings

1. Task seating options are available for users based upon physical needs, performance requirements, and comfort level. Samples of typical workstation chairs will be available for fit-testing by users. Fittings can be arranged through the Procurement Division, x4001.

IX. COMPUTER COMPONENTS

A. Monitors

1. Monitor Position -should place the top of the screen no higher than the eye height of the operator. The distance between the screen of the monitor and the operator's eyes should be appropriate for the near vision of the operator, whether corrected by glasses or not, i.e., the operator should not have to lean forward or squint to clearly see the characters on the monitor screen.
2. Operators should be instructed and encouraged to adjust the brightness and contrast of their individual monitor to best suit their ability to clearly see the characters on the display.

B. Monitor Arms, Dual Monitors

1. Adjustable mounting arms for monitors may be provided depending on the task requirements or physical needs of the user. This will apply to dual monitor installations as well.
2. Where monitor arms are provided, they shall have a height adjustment range of a minimum of 7 inches. The highest adjustment position for top of the monitor screen should be approximately 52 inches above the floor. The depth adjustment of a monitor arm should be between 20 and 35 inches for workers with normal visual capabilities.

C. CPU/Hard Drives

1. The recommended position of CPU vertical towers would be on the desktop (space permitting) or underneath the desk surface and slightly to the side and far enough to the rear to avoid the users bumping the CPU's with their knees, while allowing easy access for the users to reach controls, disc drives, USB ports, etc., of the CPU.
2. Monitors are **not** recommended to be placed on top of CPU towers as this will likely position the monitor above the height for the user to maintain a neutral neck posture.

D. Keyboards

Alternative keyboards should allow for a variety of hardware choices to support specific tasks or physical needs of the employee. Styles available include fixed-angle, adjustable-angle, split and compact.

E. Mice

1. Alternative mice and input devices should allow for a variety of hardware choices to support specific tasks or physical needs of the employee. Alternate pointing devices include trackballs, touch pad, pen and tablet, and digitizing tablets.
2. Alternative mice should be adjustable, via software, for speed or accuracy of operation. The input device should be able to be used with relaxed or “neutral” joint postures and should not have sharp edges that could compress the soft tissue in the wrist or hand.

F. Laptops

Where a laptop computer is the primary computing device, (i.e., it is used for more than 20% of a worker’s tasks) an external monitor, keyboard and mouse shall be provided. RSiGuard shall be installed on each laptop that is a workers primary computing device.

G. Tablets and Touch Screen Devices

1. Where tablets or touch screen devices are a primary computing device at a workstation, the station shall have a mounting mechanism that will allow the device to:
 - Tilt up to 60° from the vertical
 - Rise 20” above the work surface
 - Lower in front of and below the work surface
 - Hover over a keyboard
 - Be height adjustable in the same vertical plane
 - Be stable in response to user touch forces, i.e. no “bounce.”

2. Where the nature of the work requires the use of a separate keyboard and pointing device, the keyboard shall be mounted/supported as specified in Section IX, Keyboard Systems.
3. Where tablets are a primary computing device away from a workstation, the tablet shall not weigh greater than 2 lbs., and the display screen should be no smaller than 8 inches, measured diagonally.
4. Users of mobile tablets and similar devices should be instructed regarding the risks of sustained holding times, awkward postures of the hands, wrists, head and neck, and visual fatigue potentially associated with their use.

X. ACCESSORIES

A. Headsets

Headsets are strongly recommended for employees who use the telephone as a normal part of their duties. Headsets are **required** for employees who work on the computer and telephone simultaneously.

B. Foot Rests

Footrests should not be necessary for proper foot support of the computer operator. Footrests may be provided on a case-by-case basis for the comfort of the operator in supporting alternate positions of the foot, ankle and lower leg. Where high counters or work surfaces exist, footrests may be necessary to provide proper foot support for the worker.

C. Anti-Glare Screens and Privacy Filters

1. Anti-glare screens may be used where glare from a monitor screen(s) cannot be reduced by adjusting the brightness and contrast settings, relocating task lights or the monitor's position. Changing diffusers on overhead light fixtures or alternate window coverings may also be appropriate.
2. Privacy filters may be used where task requirements suggest their desirability. Monitor brightness and contrast may have to be adjusted to optimize the worker's ability to clearly see the characters on the monitor if a privacy filter is used.

D. Document Holders

1. In-line Document Holders are most appropriate for frequently viewed documents and/or when it is important that the person keying be able to look forward, rather than having to frequently turn his/her neck.
2. The in-line document holder mounts between the monitor and the keyboard. If an employee must handle the source document frequently, an in-line document holder can be used so repetitive over reaching is reduced.
3. Slant Boards can be used in situations where reading and/or writing creates a strain on the neck or writing arm from prolonged forward flexion or bending. The examples have a padded edge for normal reading and writing tasks.

E. Speech Recognition Software

1. Speech recognition software, such as Dragon Naturally Speaking, may be provided basis to support specific medical or physical needs.
2. An evaluation by an ergonomic consultant will be conducted to assess work space feasibility and determine a potential user's compatibility with speech recognition software.
3. Staff afforded speech recognition software shall receive additional training and familiarization with the set-up and use of the software.

F. RSIGuard Software

1. RSIGuard is software designed to prompt computer users with a stretch-break when they are at risk for developing discomfort or injury from prolonged keyboard and mouse use.
2. RSIGuard is available to all County employees and is required for employees who have work-related computer injuries or use laptops as a primary computing device.
3. Department IT Divisions or Information Services (ISD) can install RSIGuard on desktop and laptop computers. The application is free of charge, with the exception of IT installation costs.

XI. LIGHTING

1. Illumination should be sufficient for the effective performance of the required task. Illumination range should be between 200 and 500 lux (18.6 to 46.5 foot-candle) on the work surface.
2. Where natural light is available, it should be utilized to its fullest to supplement any artificial light provided. Where natural lighting may increase the light levels beyond an acceptable level of comfort, blinds, shades or the like must be provided to allow employees to control the overall illumination in their work area.
3. Where computer work is the primary task but reading papers is also necessary, an additional task light may be needed if lighting levels in the work station do not provide for sufficient illumination. Where visual tasks require long duration or high intensity visual demands, lighting levels above normal office settings may be needed.

XII. CLEANING OF COMPUTER EQUIPMENT

1. Cleaning of computer equipment is the responsibility of the operator and is important for the proper function of the equipment. Cleaning requirements include:
 - a) *The mouse should be cleaned with a damp cloth monthly to remove built-up dirt and assure its easy movement.*
 - b) *Ball and rollers should also be cleaned monthly with rubbing alcohol to maintain the accurate function of the mouse.*
 - c) *Keyboards should be dusted frequently or vacuumed if possible. Liquid cleaners should not be used on keyboards, unless significant build-up exists on the keys. A small amount of rubbing alcohol on a swab or cloth can be used to remove build-up. The operator should take care not to spill ANY liquids on the keyboard.*
 - d) *Monitor Screens should be dusted regularly. Commercial monitor screen cleaners can be used if necessary. Regular glass cleaner shall NOT be used.*

XIII. NOISE

1. Background noise levels in any work setting should present minimal interference with normal speech and annoyance to cognitive processes.
2. If the background noise levels are higher than desired, noise may be reduced by using carpeted floors, ceiling acoustical tiles, draperies, and sound-absorbing/isolating partitions or other sound-absorbing materials.