

Posture of Human Beings at Work Place, Workstation Design, Role of Ergonomics

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Abstract:

Posture of human being is very important while working at workstation. Common postures in the office are standing, sitting, reaching, moving. (1) A good posture is that which does not impart stress on human being. As per the business and institutional furniture manufacturer Association(BIFMA) hand book(1), posture while sitting in front of computer (3) , posture for human being sitting in wheel chair i.e for physically challenged persons ,walkways for individuals with walkers are analysed in this paper. Anthropometry of some cases are analysed , similarly how must be the door handles and knobs are also analysed.

Key words:

Postures , BIFMA , Anthropometry , wheel chair.

Introduction & discussions:

Postures in the office: Some user prefer to stand at work place while performing the work. As shown in the figure following are the standing positions of human beings during precision work , light work ,heavy work. Desk height for standing operators can range from 0.711 meters to 1.09 meters. While selecting desk height it is important to remember that top line of the text on a computer monitor should be located at eye level as shown in figure 1.



Figure: 1 Different desk heights at work stations

Visualisation of desk and work surface:

Visualisation of desk and work surface are shown in the figure 2 and table 1 reflects anthropometry for that position.



Figure : 2 Visualisation of desk and Work surface

		Letter	Specifications	
			Measurement	BIFMA Guideline
Seated	Height for Thighs	A	Thigh clearance + Shoe allowance + Popliteal height	At least 0.68meters
	Depth for Knees	B	Buttock-knee length & Abdominal extension depth	No less than 0.432mtrs
	Width for Thighs	Not Shown	Hip breadth, sitting + Movement allowance + Clothing allowance	No less than 0.5mtrs
	Height at Foot Level	C	Lateral malleolus height + Shoe allowance	0.1meters

Work	Depth at Foot Level	D	Buttock-popliteal length + Foot length + Abdominal extension depth	No less than 0.6mtrs
	Height at Foot Level	C	Lateral malleolus height + Shoe allowance	0.1meters
Standing	Depth at Foot Level	Not Shown	None	0.16meters
	Width at Foot Level	Not Shown	Hip breadth, sitting + Movement allowance	0.5mtrs
Desks for Computer Surfaces	Sitting Height for Input Devices (Desk)	F	Popliteal height + Elbow rest height, sitting + Shoe allowance + Input device thickness	0.57-0.73 (adjustable) 0.73 (non-adjustable)
	Sitting Height for VDTs (Eye Height)	G	Eye height, sitting + Popliteal height + Shoe allowance	Complex interdependencies; allow top of screen at eye level; approximate height: 1.08-1.34mtrs
	Standing Height for Input Devices (Desk)	Not Shown	Elbow rest height, standing + Shoe allowance + Input device thickness	0.93-1.16mtrs
	Standing Height for VDTs (Eye Height)	Not Shown	Eye height, standing + Shoe allowance	Complex interdependencies; allow top of screen at eye level; approximate height: 1.45-1.78mtrs
Support	Viewing Depth	H	None	No less than 0.4mtrs from VDTs to eyes

Table 1BIFMA guide lines for desk and work surfaces, measurements can be visualized using figure 2(All dimensions are in meters)As shown in the figure 2 visualisation of desk and work surface A,B,C,D,E,F,G,H are indicated in the figure ,corresponding measurements are mentioned in table 1 for seated work , standing work ,support surfaces for computer desk.

Ergonomic design of wheel chair(For physically challenged person):

Designing for wheelchair use requires extra floor space. Following are some guidelines to consider when designing for wheelchair users.(4)

Clear floor space

0.76meters x 1022 meters

Doorway clearance

0.92meters (preferred)

T-shaped space

0.92 meters width in each corridor

1.53 meters (minimum) depth

Turning space for wheelchair

1.53 Meters diameter



Figure 3 Ergonomic wheel chair for user sitting at work space(Physically challenged person)

Measurement	Letter	Value
Desk Depth	A	5.0mtrs-6.35 mtrs
Lower Reach Height (minimum)	B	2.29meters
Desk Height	C	6.36mtrs-8.86mtrs
Shelf Height (maximum)	D	12.2metres

Table 2 Measurements of wheel chair(All dimensions are in meters)(4)

Above measurements from the diagram gives desk depth, lower reach height , desk height , shelf height

Walk way for person with crutches, canes & walker

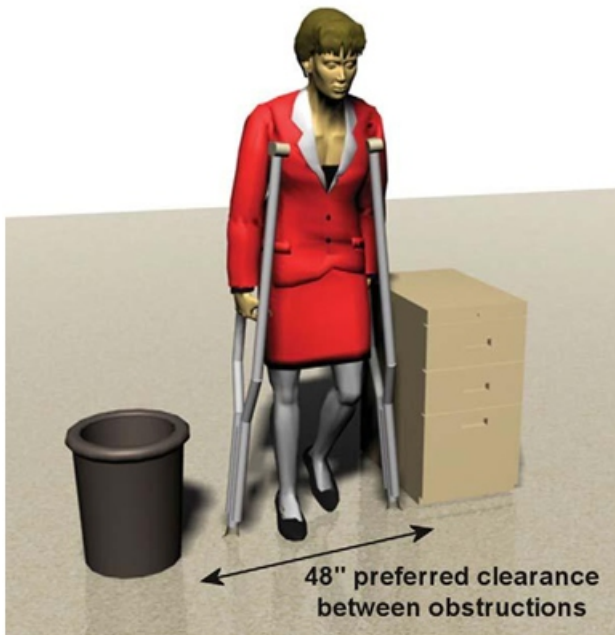


Figure 4: walk way clearance min 1.22 meters.

Conclusions:

From the above discussions we can arrive to conclusion that how the person must be positioned while standing , sitting, sitting in front of computer desk , clearance required for walkways for physically challenged persons, prevent from injuries due improper postures, it also help positioning of physically challenged person in wheel chair .This data will help out the persons to prevent from injuries due improper postures, it also helps in designing the work station according to requirement of persons.

References:

- 1.BIFMA guidelines hand book 2002.
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- 4.BIFMA guidelines for ultimate test and fit.