Production Desk Guidelines

Why we need them, and how to build them

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Introduction and Acknowledgements

A number of prompts led me to write these guidelines; the issue of unsatisfactory production desks that do not meet basic health and safety standards is not new, but it has recently gained a more prominent profile as a result of articles written by Lighting Designers Johanna Town, Rob Halliday and Mark Jonathan, in industry media. This, together with my own experience of a number of bad examples led me to believe there is room for significant improvement. I wanted to try and tackle the issue, initially planning to build a new set of desks for the Guildhall School in London. Once I was fully into my project, I realised my research could go further, and decided to author this document as a tool for improving production desk health and safety on an industry wide level. My hope is that these guidelines will spread awareness, inform those who may not understand the consequences that flow from unsatisfactory desks and influence those in a position to implement change. They will hopefully enable theatres to improve the situation, build their own desks and seek a more permanent solution.

I would like to thank Nick Peel, my supervising tutor, for his support and guidance during my project, and the many contacts he provided. My pathway leader, Andy Taylor, for his belief in my project and motivating me to get it right.

Thank you to industry professionals: Paul Franklin of Charcoalblue for showing me a different side of the issue, Johanna Town, Chair of the Association of Lighting Designers, for providing the full backing of the ALD, and Lighting Designer Mark Jonathan for giving my project publicity and providing evidence that good solutions are possible.

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Section A: Production Desks Explained

i) What are they?

Production desks are removable desks constructed in a theatre auditorium to create a working space for members of the creative and production Teams. Frequently, they do not amount to 'desks' at all, but are make-shift workstations that meet few of the basic health and safety requirements.

The number of desks will vary depending on the scale of show and venue. Up to 6 desks are often required.

ii) Why are they needed?

During technical rehearsals, the creative team need to have a good perspective of the stage, matching the audience viewpoint. The director needs to be able to communicate easily with the performers, and also have quick access to the stage. Therefore, the team needs to be in the auditorium, not backstage or in a control room. They also need access to their scripts, plans, laptops, notepads and other equipment. This means they need a suitable working surface, a desk.

iii) Who uses them, and when are they used?

The list of personnel at the production desk varies from show to show, but could typically include:

- *Director*
- *Designer, Scenic and/or Costume*
- *Choreographer*
- *Lighting Designer*
- *Lighting Programmer*
- *Sound Designer*
- *Sound Programmer*
- *Video Designer*
- *Video Programmer*
- *Automation Programmer/Designer*
- *Deputy Stage Manager*

Despite commonly having a control room or operating position, programmers still need to be at the production desk. They need to be sat with their respective designer for quick and easy communication. They also need to be able to see/hear the space in order to better work with the Designer.

Production desks are required whenever technical work is happening on a show. This could be for multiple days/weeks for technical periods or just a few hours for a rehearsal or lighting session.

Section B: The Issue

i) Facts and figures

During the summer of 2019, Matt Dean undertook a survey entitled 'Proper Production Desks - Industry Survey'. 109 industry professionals responded and some stand out figures were compiled from the data which are set out below:

1. *More than 90% of users find production desks uncomfortable*
2. *80% of users are frequently injured by production desks*
3. *More than 90% of users find production desks aren't usually the right height*
4. *Almost 80% think production desks are difficult to access*
5. *Of the 80% who have been injured by production desks, almost 10% have had to seek professional attention and a further 60% have had to self-medicate*
6. *The average user experiences pain after only 5 and a half hours at the desk. The typical work day duration during technical rehearsals can be up to 11 hours*
   (Dean 2019)

ii) Common issues

Based on the 2019 survey, the following are the most commonly noted issues with production desks:

1. *Wrong desk height*
2. *Not being sat on a proper seat (a plank is often placed across the armrests)*
3. *The desk is just a sheet of ply, lacking stability*
4. *The desk is difficult to access*
5. *The desk isn't flat*
6. *The desk is too far away*
   (Dean 2019)

A common solution to the user height issue is the provision of a 'Butt Board'. This is a short plank, sometimes padded which is put across the armrests of the auditorium seating. This solution, whilst inexpensive, is not an acceptable solution. There is no back support, the plank will put unnecessary pressure on the back of the thighs, and it is unlikely the user will be able to adopt correct posture

Section C: Health and Safety

i) Relevant legislation and guidance

Document	Notes
The Workplace (Health, Safety and Welfare) Regulations 1992	*Section 11 is the useful part here; the wording can be used as indisputable reason for the need for proper seating at the Production Desk: 'A suitable seat shall be provided for each person at work…'* *Section 12 covers condition of floors and traffic routes, emphasising the need for accessible production desks*
Health and Safety (Display Screen Equipment) Regulations 1992	*These regulations provide the legal basis for the HSE guidance below. It doesn't require specific dimensions, but does require consultation of the health and safety of the users: 'for the purpose of assessing the health and safety risks to which those persons are exposed' REG 2*
HSG57: Seating at Work	*This guidance is extremely helpful, giving specific dimensions and recommendations. It is a useful design tool to correctly scale a desk for the average range of users. For example, the recommended seat height is '380-535mm' (Health and Safety Executive, 1997)*
Working with Display Screen Equipment	*This guidance is most relevant to desks for users with screens, such as the lighting programmer. As well as the physical properties of the workstation, it covers lighting and the display content, for example 'Make sure individual characters on the screen are sharp, in focus and don't flicker or move' (Health and Safety Executive, 2013)*
Display screen equipment workstation checklist	*This checklist is effective as a tool for evaluating a production desk and finding areas for improvement*
BS EN 527-1:2011 *Office furniture. Work tables and desks. Dimensions*	*This document is intended for use by workstation designers, the language being easy to interpret from a design perspective. It explains the source for the standards in the introduction: (The dimensions) 'are based on the requirements of anthropometric measurements, mechanical design, subjective preference…' (British Standards Institution, 2011)*
BS EN ISO 9241: 1999 *Ergonomic requirements for office work with visual display terminals*	*This standard is similar to the above, but also covers desks with screens/laptops*

ii) 'As far as reasonably practicable'

To demonstrate proper consideration for the production desk, the provider needs to show they have taken every reasonable and practicable step to ensure the health and safety of its users. In reference to work station analysis, the Health and Safety (Display Screen Equipment) Regulations 1992, state 'The employer shall reduce the risks identified in consequence of an assessment to the lowest extent reasonably practicable' REG 2

Unless the 'Ideal Solution' (See Section D, below) is possible, it's challenging to meet the above criteria in full. However, this isn't an excuse for providing a poor desk, as the provider needs to demonstrate every reasonable and practicable step has been taken toward meeting the criteria. In the event that (non-adjustable) auditorium seating is used, the requirement to introduce adjustability into the design of the desk is paramount. Section E provides ideas for meeting the criteria where the 'Ideal Solution' isn't possible.

Section D: What can be done?

i) Is the existing desk suitable?

The easiest way to find out if a desk needs improving is to ask the users. Also ask the staff who build/strike the desks. The following questions should all have positive answers:

- *Is the desk comfortable for all day working?*
- *Is the desk the right height (and is it right for all the potential users)?*
- *Can the user see the stage without straining?*
- *Is the desk easy and safe to construct (and to put away)?*
- *Can you get to the working position with ease?*

You should also inspect the desk and be able to answer yes to all these questions:

- *Is the user on an appropriate seat?*
- *Is the desk stable?*
- *Is the desk flat?*
- *Can the user be comfortable in the seat and simultaneously reach their work?*
- *Are there any trip hazards around the working area?*

If there are mostly negative answers to the above, its likely you'll need new desks, but if there is just one, it's worth trying to isolate that problem and solve it.

*To more thoroughly analyse a desk, the '*Display Screen Equipment Workstation Checklist' *can help to identify specific issues. It's also useful to compare the dimensions of the setup to those outlined in '*HSG57: Seating at Work'.

ii) The Ideal Solution

In terms of ergonomics and comfort, the Ideal Solution involves sitting the users on adjustable office chairs, at actual office-style desks. This means the user can easily find a comfortable position. The solution relies on being able to create an area of flat floor in the auditorium. This could require removable seating or a set of decking that is built over the seats. This method has been successfully implemented in a number of theatres.

In the Guildhall School's Silk Street Theatre, seats are folded away and a custom set of decking is assembled on the seating bank. This creates a large, flat area which allows users to sit at proper desks on proper chairs. The set up time is approximately 45 minutes to assemble the decking with 4 bodies. This is a reasonable amount of time as the desks are out for weeks at a time.

This may not be possible where there are restrictive schedules or lack of storage. For example, if the desks are going to be out for 3 weeks, it's worth spending an hour setting them up. However, this wouldn't be viable for a 3 hour lighting session. It's possible that different solutions are required for different activities. For example, a full solution would be required for a week of technical rehearsals, but for a short lighting session a stripped back solution may be more appropriate.

iii) Where should Production Desks come from?

There aren't any 'off the shelf' options for production desks currently. As they are so specific to a venue, it would be difficult to design one that could work everywhere. Sourcing options for a production desk are therefore limited to building in-house or having them custom fabricated.

New builds and refurbishments

When building or refurbishing a theatre, it's a really good opportunity to install suitable infrastructure to support the use of production desks. When considerations are made at an early stage, it becomes significantly easier to develop a good solution at a later date. As a minimum, architects, theatre designers and consultants should include areas of removable seating in their seating layouts, so that flat areas can be created easily within the auditorium seating, as well as including data/network and power outlets in those locations as part of the building wiring infrastructure. The provision of the production desks should be discussed between the client/end user and the Design team. If, as is usually the case, the production desks are procured directly by the client/end user, separate to the main construction contract, the Design Team should be asked to include suitable nearby storage locations within their scheme.

Section E: Designing Production Desks

i) Ergonomics and adjustability

The most important factor of a production desk is that it provides a safe and comfortable working environment for its users. The simplest way to achieve this is to use the dimensions outlined in HSG57: Seating at Work. *Unless the 'Ideal Solution' (Section D: ii) is possible, it's likely that the restricting factor will be the auditorium seating. Therefore, this should be taken into account when designing the desk. The following factors are key in achieving comfort and safety:*

- *When completing tasks at the desk, the user's forearms should be parallel with the ground*
- *There should be a minimum of 170mm clearance for the thighs (desk underside to seat)*
- *There should be a minimum of 450mm for the knees (desk edge to first obstruction)*
- *Desk surface should be 660-1000mm above the feet*
- *Feet should be flat on the floor, if this isn't possible, a footrest should be provided*

Where the seating is fixed, adjustability is often forgotten. However, to demonstrate that every reasonable step has been taken, adjustability needs to be created. Listed below are some methods for building adjustability into a fixed seat:

- *Seat height: A range of suitable cushions can be made available to for users to stack*
- *Seat tilt: A wedge cushion can be used to change the angle of the seat*
- *Lumbar support: A removable back support can be used to provide different levels of back support*
- *Chair position: A sliding desk top can be designed, to allow the user to get closer to or further from the desk*
- *Armrest height: padding could be used to increase the depth of the armrest.*

ii) Location and storage

Location can make all the difference in finding a comfortable and safe position for the users. If the desks are on a steep slope, for example on a Victorian theatre circle level, it's likely the user will have to strain to see the stage over the rear edge of the desk. If the desks were moved to a shallower part of the auditorium, such as the stalls, they would have an easier view of the stage. The equipment on the desk is also likely to obstruct the view, so this is an essential consideration in the process.

Factors to consider when choosing location:

- *The director will want to access the stage quickly*
- *The lighting designer needs to see the stage floor*
- *The lighting programmer will appreciate being able to see intelligent lighting fixture hanging positions*
- *Cabling - the production desk needs connection to power and technical infrastructure such as lighting and sound networks*
- *The creative team likes to be sat centrally in the auditorium*
- *The creative team need to be able to get up and move around the space easily*

Storage is a common issue relating to production desks, as they need to be stored, but remain easily accessible. The smaller the storage location, the more compact the desks need to be. Ideally, the storage for them will be near the chosen production desk location, to reduce set up time

iii) Materials

It's important to properly consider the materials used as they will affect:

- *Durability of the desk*
- *Ease of setting up/taking down*
- *Cost of the desk*
- *Difficulty of manufacture*

Good material choices include:

Frame and legs: Aluminium slotted profile
Available cut to length with a wide variety of connectors
Pros: Lightweight, quick to assemble, no material processing needed
Cons: Higher Cost

Frame: Timber
3x1 is commonly available in theatres
Pros: Very low cost, easy to replace
Cons: Less durable, requires construction skills and tools, taking more time

Frame: Stock metal
Aluminium or Steel
Pros: Low cost, durable, strong
Cons: High skill level and tools requires, difficult to repair, slow process

Legs: Aluminium tube and key clamps
Commonly available in theatres, wide variety of connectors available
Pros: Low cost, easy to assemble
Cons: Cumbersome, legs are liable to go missing

Bracing: Steel wire rope
Commonly available in theatres,
Pros: Easy to assemble, provides bracing that folds without disassembly
Cons: Specialist tools required, otherwise expensive

Top: Plastic roof sheeting
Available as Twin Wall or Triple Wall
Pros: Very lightweight, very inexpensive
Cons: Not durable, high glare surface

Top: Flightcase hardware
Coated plywood and metal components
Pros: High Durability, easy to design, inexpensive components, dark surface reduces glare
Cons: Requires material processing and some construction skill/time

iv) Extras

Once the desk is comfortable and safe, there are other features that can make the desk more useful. These all have their own advantages (pros) and disadvantages (cons)

Internal electrics

Power, data and communications cabling can be wired into the desk

Pros: Increases speed of setup, reduces clutter on the desk, keeps cables tidy

Cons: Increases weight of the desk, technology is prone to change so features may become obsolete

Conclusion: Unlike data and communications technology, power is unlikely to change. Having built in power distribution is very useful and relatively future proof

Monitor mounts

Monitor mounts can be built into the desk. Quick release mounts can be used

Pros: Increase speed of setup, increases visual comfort for the user

Cons: Increases weight of desk, can make the desk cumbersome

Conclusion: If the setup is short, it's a useful addition. Mounts should be removable to make the desk easier to store

Built in lighting

Lighting solutions such as dimming gooseneck LEDs can be built in

Pros: Quick to set up, keeps desk tidy

Cons: Goosenecks are delicate and expensive, increases weight of the desk. Not ideal for every user

Conclusion: Lighting is a very personal choice and should be adjustable. Building it in makes this difficult

Custom looms for cabling

Looms can be created as a tidy way of cabling the desks

Pros: All cables instantly available, saves time

Cons: Expensive, poses a trip hazard if not run safely

Conclusion: Looms remain flexible, meaning they can be upgraded/extended as necessary

v) Other considerations

There are a number of less substantial, yet still important, considerations to make.

- *Wi-Fi coverage: People working at the desk will need internet access, and do not want to walk to the foyer or offices to send an email*
- *Equipment access: All equipment on the desk should be within easy reach. Commonly used items such as comms packs need to be instantly accessible, so mounting them in a convenient location is useful*
- *User posture: If the user of the desk doesn't have a good working posture, they are more likely to become uncomfortable or injured. Good posture should be promoted*
- *Breaks and rests: Most desks would become uncomfortable during uninterrupted use. Users should have the opportunity to stand and walk around frequently, a few minutes of standing each hour can make a big difference. To enable this, the desk must be easy to access*
- *Lighting: This is a challenging issue, as recent research has found two damaging effects of blue light. Firstly, significant exposure to blue light can increase the rate of* macular degeneration *(vision loss, normally age related). Secondly, Blue light is a major influence on our* circadian rhythms *(primarily, sleep cycles). Long exposure to blue light, particularly at night can cause sleepless nights and daytime fatigue. Instead, a dimmable, adjustable colour temperature lamp can be provided, allowing the user to find a comfortable setting*

Section F: Case Study
Guildhall School's Milton Court Studio

i) Introduction and Previous Solution Analysis

In September/October 2019, I took on the task of improving the production desks in Milton Court Studio. My primary objective was to make them safe and comfortable. Secondarily, I wanted to make them as easy to use as possible. I spent 3 weeks researching and prototyping and completed the majority of the build in 2 weeks.

The image below shows the existing solution; a trestle table with custom made leg extenders.

To analyse the current solution, I made use of the Health and Safety Executives' 'Display screen equipment workstation checklist' *and* 'HSG57: Seating at Work' *On the workstation checklist, the existing solution failed on 12 out of 31 points. The major failures concerned the position of the user relative to the desk and equipment on it. The seat is also a significant issue, as it does not adjust to permit the user to find a comfortable position. As you can see in the images below, the user is either too far from the desk, or has no space for their legs.*

I compared the dimensions of the existing solution to the recommendations in 'HSG57: Seating at Work'. *The results are below, and as the table makes clear, significant improvement is needed.*

Dimension	Recommended (mm)	Actual (mm)	Suitable?
Armrest length	200 min	190	Too short
Seat height	380-535	400	Just in range
Armrest height	200-250	220	In range
Centre of lumbar support	170-300	100	Too low
Angle of seat	+or-5 degrees	-10	Too leant back
Backrest height	200-550	460	In range
Seat width	400min	410	Just in range
Seat depth	380-470	430	In range
Desk height	660-1000	670	Just in range
Desk thickness	40max	30	In range
Seat to bottom of desk	170min	270	In range
Seat to desktop	210-300	250	In range
Leg room	600min	300	Too little

ii) Solution Development

To design the desks appropriately, I firstly considered the restrictions of the theatre.

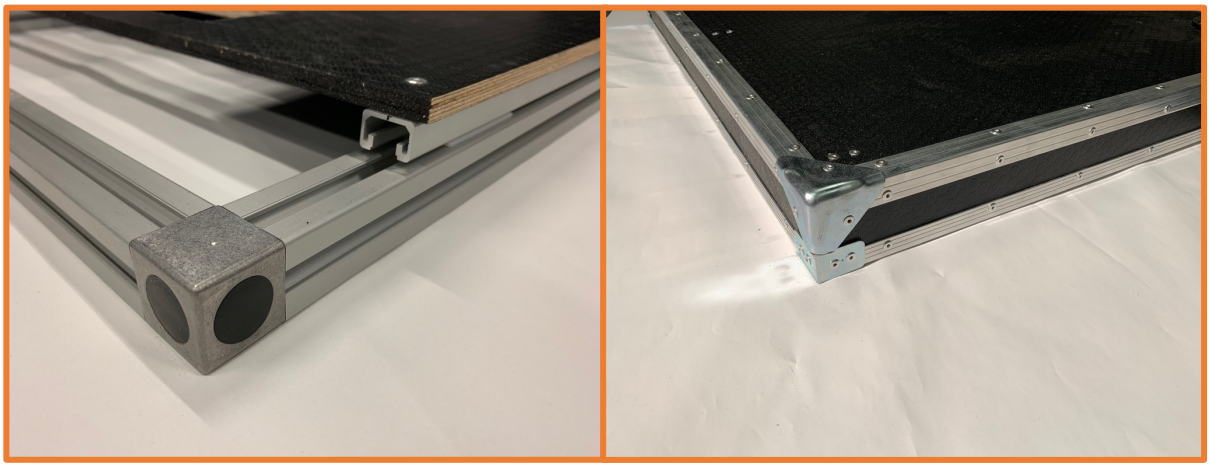
- *Very limited storage space*
- *Fixed seating*
- *Not possible to create a flat space*
- *Flexible seating arrangement*

These restrictions mean the 'Ideal Solution' (Section D ii) isn't possible, as there is no flat area, and not enough space to store a set of decking.

Based on these guidelines and restrictions, I wrote a design specification. A simplified version is below:

Category	Point	Justification
Form:	*They should be a dark colour, to reduce glare and light bounce*	*This will improve the environment in which the Lighting Designer is working*
	The desks should look professional and be visibly well constructed	*This will provide a good working environment*
	The desks should be large enough to accommodate equipment (see desk specific requirements below) but small enough for easy handling and positioning	*This will ensure a useful product and improve manual handling*
Function:	*Allow an unobstructed view of the stage*	*The reason production desks exist is to provide a better view of the stage, so the desks should achieve this*
	Provide a cable management solution	*Production Desks typically have lots of cabling, which can quickly become a hazard or cause faults, the desks should provide a solution to this*
	Provide suitable lighting	*Work at production desks takes place in the dark, the desks should provide a suitable solution that reduces eye strain*
User Requirements:	*The desks need to be lightweight*	*The desks will be lifted/set up on a seating block, so reducing effort required is key to avoid injury*
	The desks need to be quick to set up and take down	*Due to tight time constraints, the desks need to a quick task that could be completed at the last minute*
	The production desks should be easy to access	*Users shouldn't have to squeeze down the aisle and should be able to exit promptly in case of an emergency*
	The desks should be comfortable to work at and meet relevant guidance and legislation	*Users will potentially sit at the desk for ~10 hours per day. Every possible step must be taken to avoid injury from uncomfortable or unsupportive desks*
Performance Requirements:	*The desks need to be stable*	*Expensive equipment will be used on the desks, and there must be no risk of the desk collapsing. Users may also lean on the desks*
	The desks should last for at least 10 years, both in terms of durability and technology. The desk should be as futureproof as possible	*The production desks will be a custom solution and therefore incur significant costs, meaning the product should last. Technology moves so quickly in this industry that the desks risk becoming obsolete if they are not carefully thought through*
Material and Component Requirements:	*The materials used should be lightweight. Materials such as ply and aluminium have good strength to weight ratios*	*To reduce the overall weight of the desks*
	The materials must be impact resistant	*It is likely the desks will be dropped or treated roughly*

I prototyped the frame and sliding mechanism with aluminium slotted profile and found it to be a very sturdy yet light material. I experimented with flightcase components for the lid and concluded it was very affordable and durable. The images below show these two prototypes.



Based on this prototyping, I decided to use aluminium profile for the frames and legs. It is lightweight, durable and simple to assemble. Sections can be ordered cut to length, making the assembly process very quick, accurate and simple
For the desk top, flightcase hardware was a simple and lightweight solution. It is extremely durable, has a low glare surface and is quick to assemble.
To incorporate adjustability into the desk, I implemented two features. I used threaded feet, to give 70mm of height adjustability. I also made use of profile sliders to create a sliding top. This means the user has easy access to the desk and can then pull the desk forward with ease to create a proper working position. Other components included locking hinges, monitor mounts and flush mount power outlets.

Using the above specification, and taking into account the restrictions and prototyping, I designed a set of three desks for Milton Court Studio. Based on an internal survey, the users most in need of new desks were lighting designers and lighting, sound and video programmers. Based on size and amount of equipment, the lighting designer and lighting programmer each needed a desk and the sound and video programmers could share a desk.

iii) New Solution Analysis

Below are some images of the new solution:

Top Left-Bottom Right: The desks from the stage, the desks from aisle, the Lighting Programmer's desk, the Sound/Video desk, the Lighting Designer's desk, the lighting designers' desk in the forward position, the new seating equipment, the new improved user posture

To analyse the new solution, I completed the same 'Display screen equipment workstation checklist' by the *Health and Safety Executive. The desks (including newly bought lumbar and wedge cushions), passed all criteria of the assessment. Some of the checks, such as 'Does the chair have…castors or glides' concerned the chair, but these criteria were fulfilled by the desk.*

I also completed a dimension comparison using the recommendations in 'HSG57: Seating at Work'; the results are below. The table clearly demonstrates the success of the desk

Dimension	Recommended (mm)	Actual (mm)	Suitable?
Armrest length	200 min	240	In range
Seat height	380-535	470	In range
Armrest height	200-250	220	In range
Centre of lumbar support	170-300	250	In range
Angle of seat	+or-5 degrees	0 degrees	In range
Backrest height	200-550	460	In range
Seat width	400min	410	Just in range
Seat depth	380-470	430	In range
Desk height	660-1000	700-770	In range
Desk thickness – excluding lip	40max	20	In range
Seat to bottom of desk	170min	220	In range
Seat to desktop	210-300	300	In range
Leg room	600min	600	Just in range

Section G: Summary

i) Top Tips for Providers and Users

Tips for providers	Tips for users
Talk to the users *Production desk users are the best people to help you improve the equipment.*	***Adopt good posture*** *Posture Trainers are available online and can be used to steadily improve posture*
Prioritise production desks *Allocate enough time to set them up properly and give the users time to make themselves comfortable*	***Take your breaks*** *Make sure to take all your allocated breaks and use the opportunity to stretch and move*
Improve infrastructure *If the opportunity arises, make improvement to the building, as in Section D iii)*	***Speak up*** *If a provider doesn't know something is wrong, they can't improve it.*
Be informed *Make sure that staff and users are aware of the risks, so that they can take protect themselves*	***DIY*** *If you find a really comfortable cushion or back support, take it with you*

ii) Step-by-Step Improvement

This short guide outlines how to improve your desks from initial complaint to finished product

1) *Analyse your current solution*
   a) *Make use of Sections C and D to objectively analyse your current solution*
   b) *Talk to the users of the desk and find out what their major complaints are*
   c) *Investigate and see if seating is removable*
2) *Develop a solution*
   a) *Using the feedback from Step 1, list what needs to be improved*
   b) *Use the suggestions in Section E to decide what features/materials the desks need*
   c) *Decide the best location for the desks*
   d) *Identify a suitable storage location and note the space available*
3) *Design the solution*
   a) *Analyse the chosen location and take any key measurements including rise (height difference between rows), seat height, height of seat backs and aisle width*
   b) *Identify the equipment that will be used on the desk and measure the footprint of each.*
   c) *Using the taken dimensions and the recommendations in Section E, design the desks to fit the location and provide an ergonomic solution for the user (Starting with desk height is useful)*
4) *Build the solution*
   a) *If approval for spending is required, use Sections A, B and C to inform and convince the appropriate staff*
   b) *Dedicate some time to building the desks, as troubleshooting is likely*
5) *Testing and finalisation*
   a) *Analyse the solution as in Step 1) to ensure that improvement has been made*
   b) *Document the new desks and ensure that all users are aware of its features*

iii) Conclusion

In conclusion and as demonstrated in Section F, building a safe and comfortable set of production desks takes time and thought, but is practically achievable. By following these guidelines and referring to the relevant documents in Section C, a production desk solution can be a straightforward process. In short, a successful outcome can be achieved through cooperation and by everyone taking some responsibility within the process; users, by ensuring that issues are heard and that they are using equipment correctly, providers, by listening to the needs of the users and doing everything possible to develop and maintain a solution that meets the required standards and is fit for purpose. In addition, building managers need to understand the issue and create an environment in which providers are able to generate solutions. As the research and guidelines show it is not enough to say that production desks are temporary, and the rules don't therefore apply; there is clear evidence of the adverse health issues that stem from badly designed production desks so a robust and coherent approach from the industry is paramount. These guidelines form the basis for that approach by providing the necessary information to create good and lasting solutions; the responsibility now lies with the industry as a whole, to push for change.

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