

The International manufacturing Corporation

Scenario:

You are employed as the network manager for a large commercial enterprise that employs approximately 2500 employees across a number of sites. All sites are currently connecting using an ISDN BRI line.

The main HQ sites is situated in Geneva and it has a separated data/server farm approximately 3.5km away in Plan-Les-Ouates, Switzerland, the server farm is outsourced to a third party company, but you need to provide the connectivity.

There is a UK distribution centre based in Birmingham as well as a regional sales office (this is 100m away from distribution centre, separated by a two lane road).

There is also a manufacturing site where there is an environmental test chamber situation 35m from the main building. This chamber is EMI shielded, and can be controlled in terms of extreme negative and positive temperatures and humidity levels. The manufacturing site is based in Annecy, France.

Within the LANS at each site they are currently cabled using cat3 UTP and based around hub technology. You need to look at various technologies and derive a solution including a business plan to increase the bandwidth, the efficiency and overall quality of communications of the network. In the business plan you will need to describe, in a format suitable for the CEO (Chief Executive Officer) that explains the technology, and provides comment on the RoI (Return on Investment).

The brief that you have been given is that the large majority of the users are desk based, there are also nomadic users, i.e. ones that need might need connectivity in meeting rooms, manufacturing areas etc. Finally you will need to provide internet access to corporate visitors. In terms of technology the company is also looking at potentially using VoIP as a solution to reducing international telephone call costs.

You are also required to produce a topology diagram showing the main LAN/WAN connections, you are not required to get a full quote for all of the network equipment but an approximate price for the hardware (assume PC's will not need replacing), software (for example do you need to update servers, or VPN clients etc.) and a cost for labour to implement the design. This can then be used to look at the RoI, for example will implementing VoIP save the company money over a 5 year period when you look at the implementation costs? If you were to look at the cost of a telephone call between Switzerland and France (approx values can be gained from the web). A telephony consultant has carried out an investigation within the company and an approximate figure of each employee makes 15 minutes of international calls each working day.

Your design should be simulated using Opnet and compared against a simulation that you have made of the original site.

You need to submit a report containing (limit 3500 words +/- 10%):

- A topology diagram for each site, showing the new network hardware appliances and choice of inter building and inter site connectivity
- A diagram show how you plan to connect the sites together
- A narrative justifying your approach, for example if 2 sites were 1.5km apart would it be better to connect using WiMax or pay for a leased line?
- A financial justification looking at the RoI for upgrading the system, also comment on whether the upgrade would increase productivity and efficiency.
- Proof using Opnet that the solution is workable.

The requirements for each site is shown in appendix 1.

The basic floor plan of the three sites is shown in appendix 2.

Appendix 1

Site 1: HQ - Geneva

Ground floor:

Room	Requirements	Misc
Reception	2 x PC Nomadic connectivity Internal/external telephony	
Meeting room 1	Nomadic connectivity Internal/external telephony 4 x PC	
Meeting room 2	Nomadic connectivity Internal/external telephony 4 x PC	
Product Demo Area	5 x PC Nomadic connectivity Internal/external telephony 5 spare network sockets Nomadic connectivity	

First floor:

Room	Requirements	Misc
Management team	4 x PC Nomadic connectivity Internal/external telephony	
Open Plan Office	Limited Nomadic connectivity Internal/external telephony 10 x PC	

Second floor:

Room	Requirements	Misc
MD	1 x PC Nomadic connectivity Internal/external telephony	
CEO	1 x PC Nomadic connectivity Internal/external telephony	
Open Plan Office	Limited Nomadic connectivity Internal/external telephony 10 x PC	

Site 1: HQ – Server/data farm at Plan-Les-Ouates

Ground floor:

Room	Requirements	Misc
Reception	2 x PC Nomadic connectivity Internal/external telephony	
Server Room	Internal/external telephony 10 x server class machines 8 x RAID array storage devices	

Site 2: Manufacturing - Annecy

Ground floor:

Room	Requirements	Misc
Reception	2 x PC Nomadic connectivity Internal/external telephony	
manufacturing Area	Nomadic connectivity Internal telephony 4 x PC	

First floor:

Room	Requirements	Misc
Management team	4 x PC Nomadic connectivity Internal/external telephony	
Open Plan Office	Limited Nomadic connectivity Internal/external telephony 10 x PC	

Second floor:

Room	Requirements	Misc
Management team	1 x PC Nomadic connectivity Internal/external telephony	
Storage Area	Nomadic connectivity Internal/external telephony 5 x PC	

Test Chamber:

Room	Requirements	Misc
Chamber 1 & 2	Nomadic connectivity Internal/external telephony	
Reception	1 x PC Nomadic connectivity Internal/external telephony	

Assembly/test area	10 x PC Nomadic Connectivity Internal/external connectivity	
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Site 3: Regional sales Birmingham

Ground floor:

Room	Requirements	Misc
Reception	2 x PC Nomadic connectivity Internal/external telephony	
Production Demonstartion Area	Nomadic connectivity Internal telephony 4 x PC	
Meeting room 1 & 2	1 x PC Internal/external telephony Nomadic connectivity	

First floor:

Room	Requirements	Misc
Management team	4 x PC Nomadic connectivity Internal/external telephony	
Open Plan Office	Limited Nomadic connectivity Internal/external telephony 10 x PC	

Site 3 cont.: Distribution – Birmingham

Ground floor:

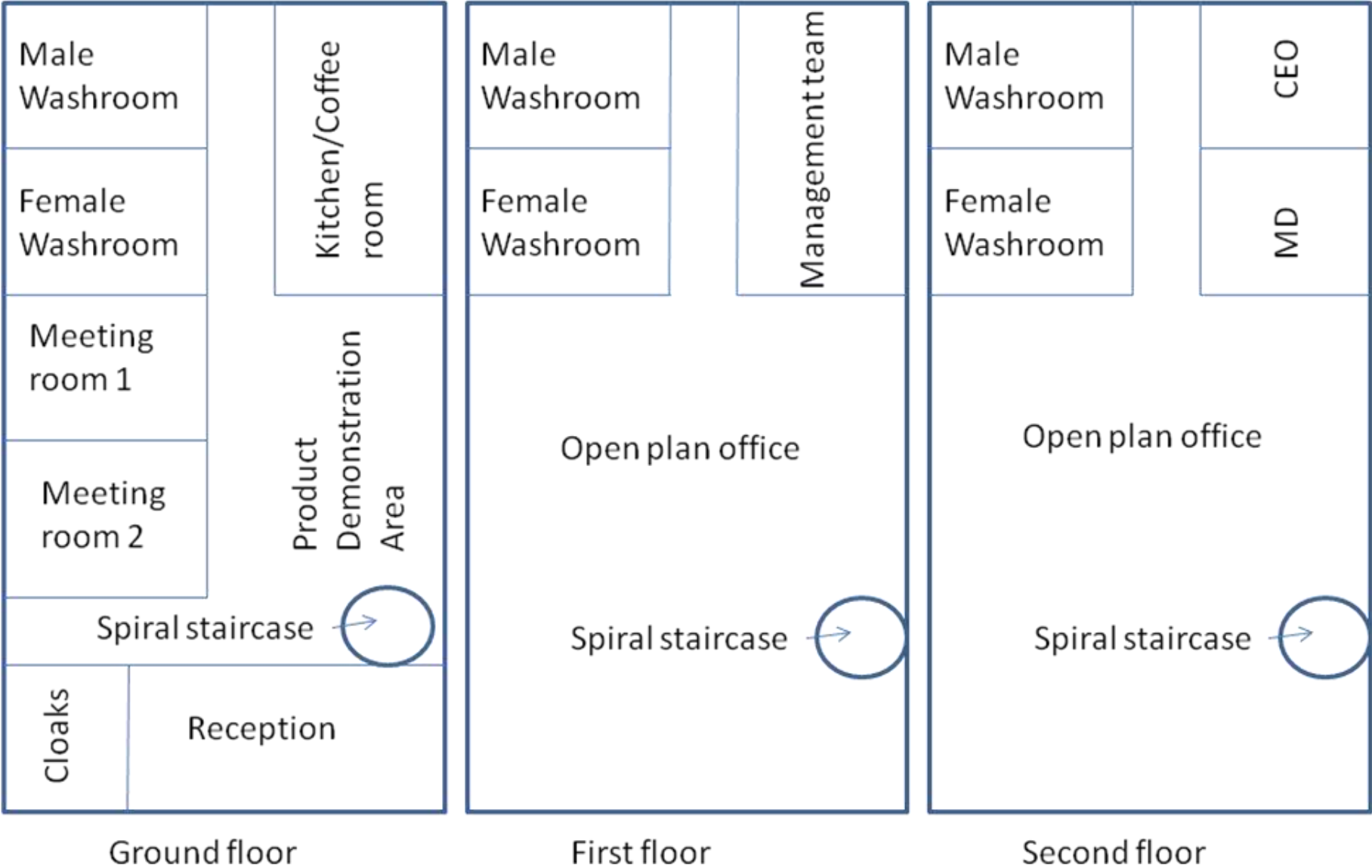
Room	Requirements	Misc
Reception	2 x PC Nomadic connectivity Internal/external telephony	
Storage/Distribution Area	Nomadic connectivity Internal/external telephony 5 x PC	

First floor:

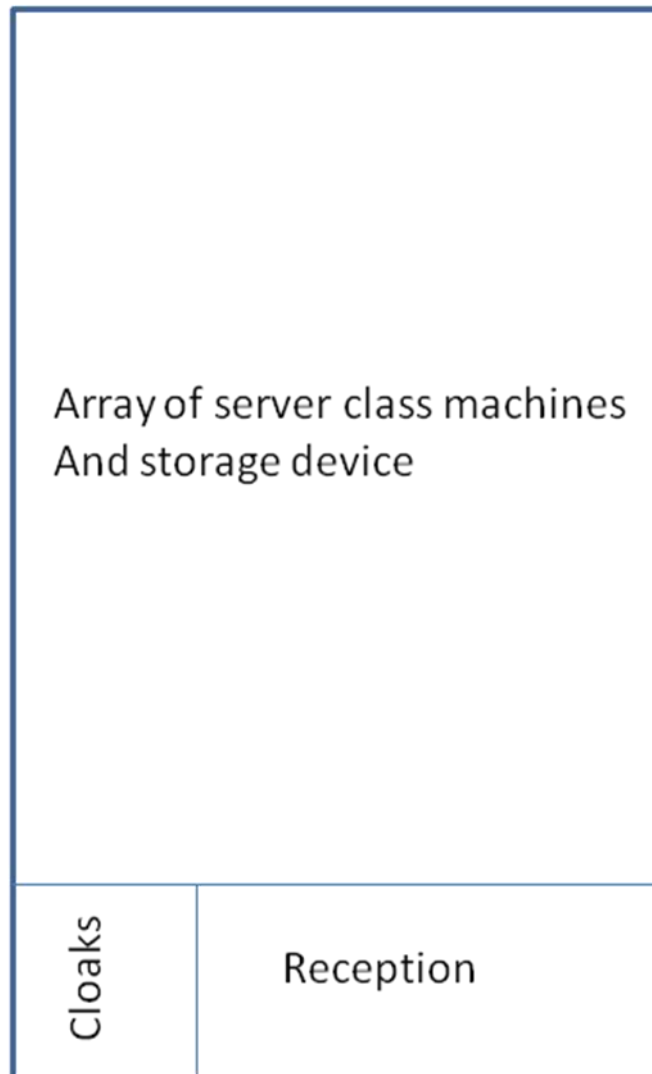
Room	Requirements	Misc
Management team	1 x PC Nomadic connectivity Internal/external telephony	
Storage Area	Nomadic connectivity Internal/external telephony 5 x PC	

Appendix 2.

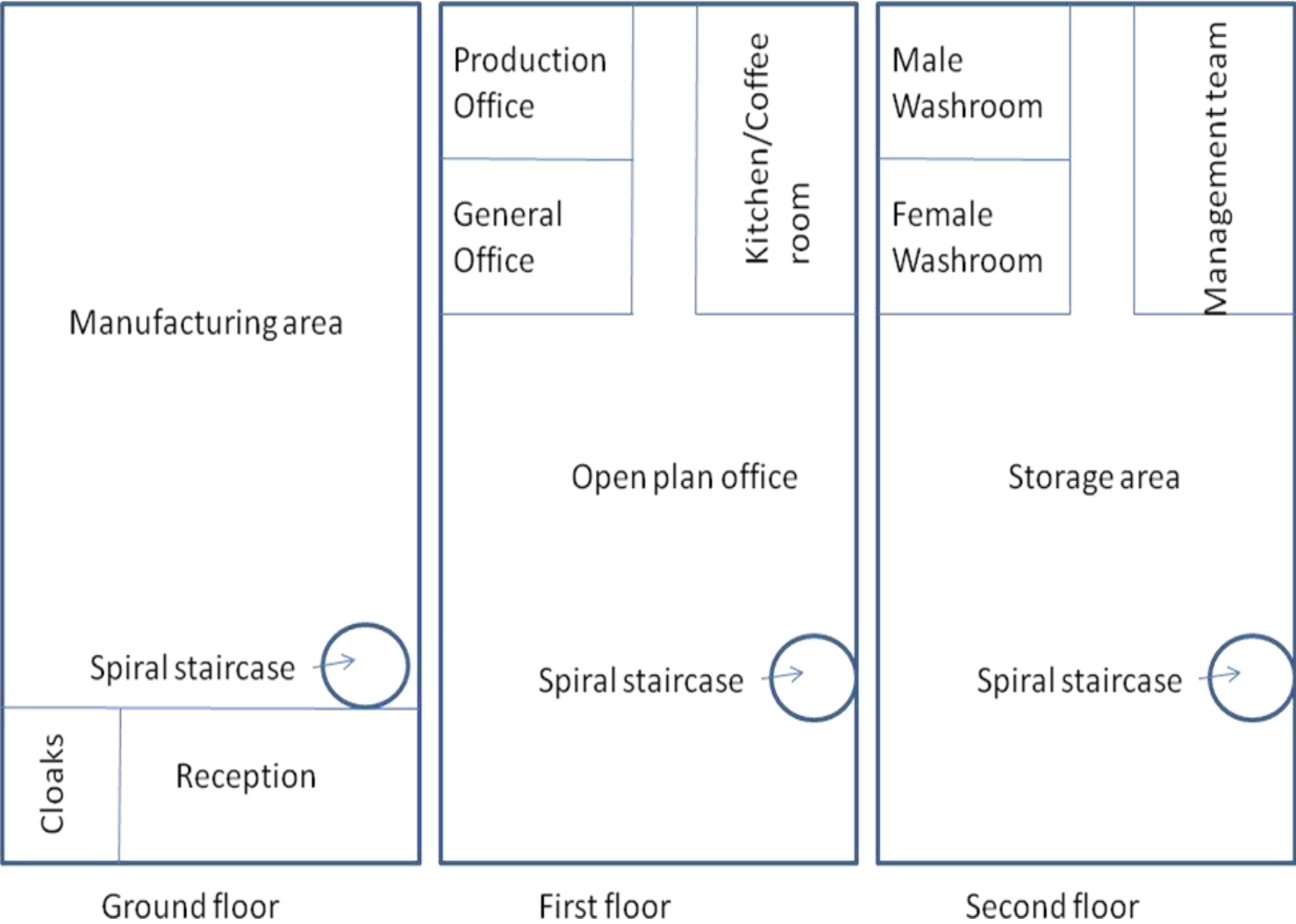
Site 1 – HQ (Geneva)



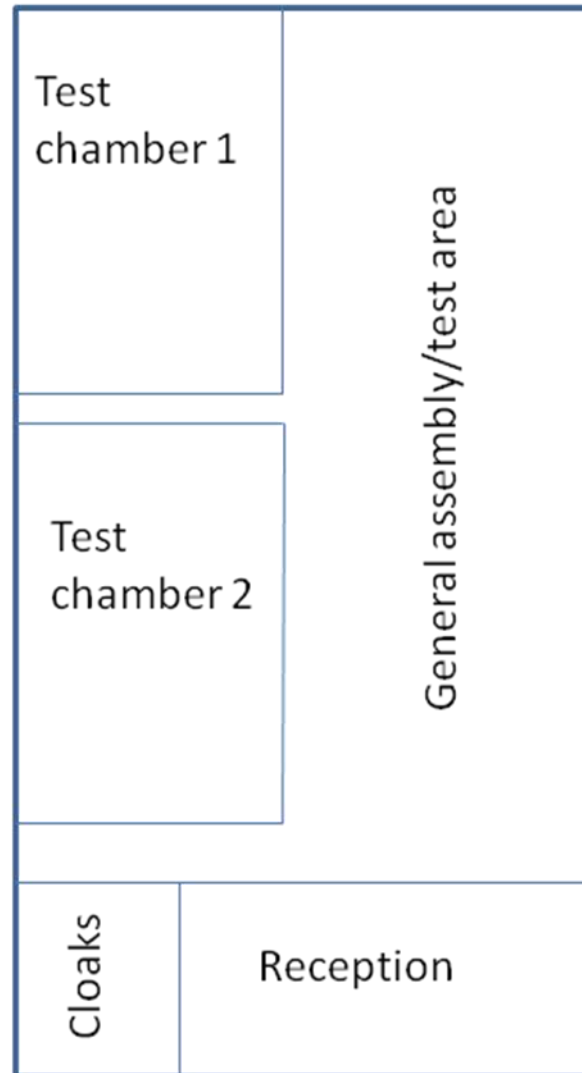
Site 1 cont. – Server/data farm



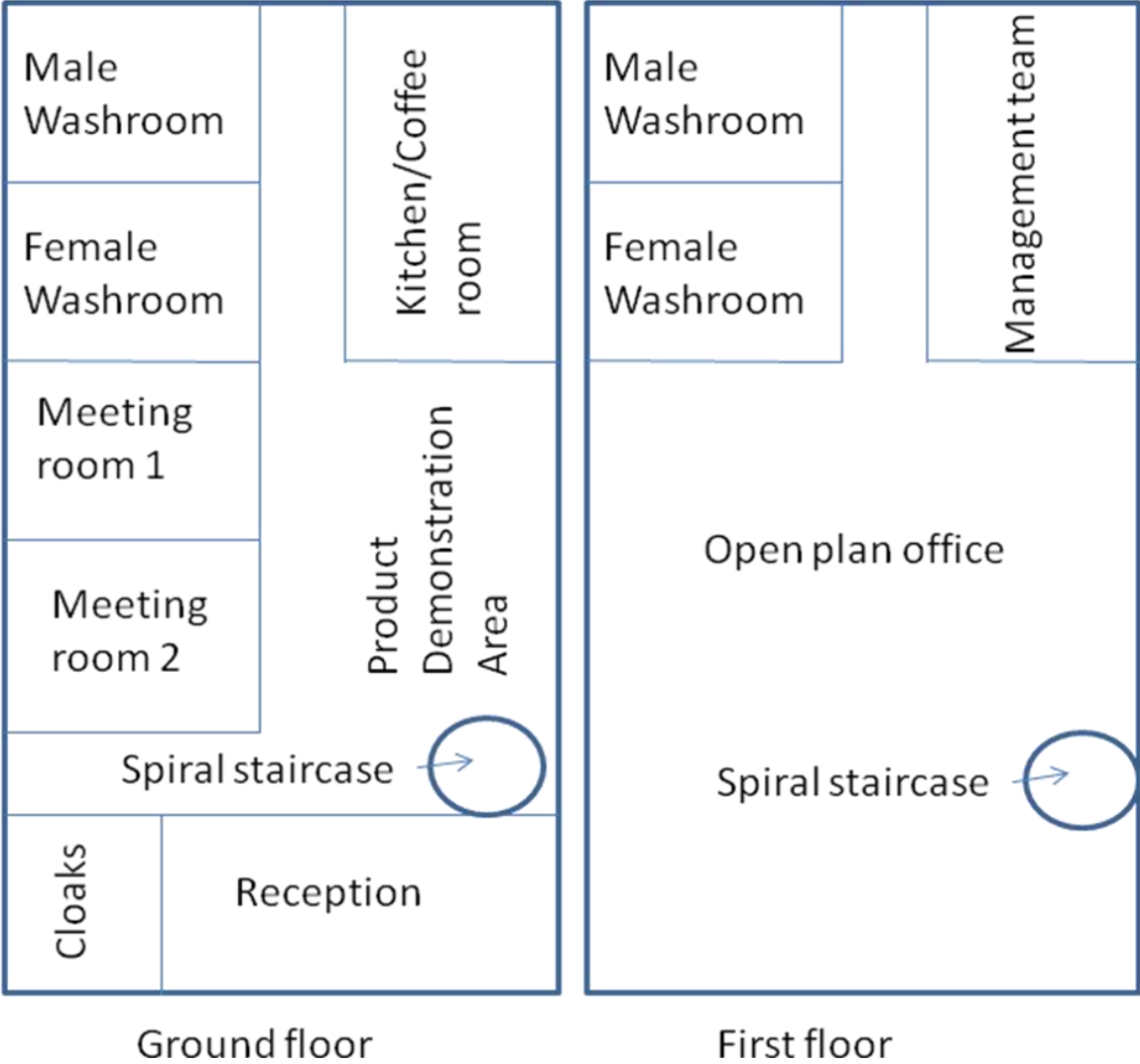
Site 2 - Manufacturing (Annex)



Site 2 cont. – Environment test chamber



Site 3 – regional Sales (Birmingham)



Site 3 cont. Distribution U.K (Birmingham)

