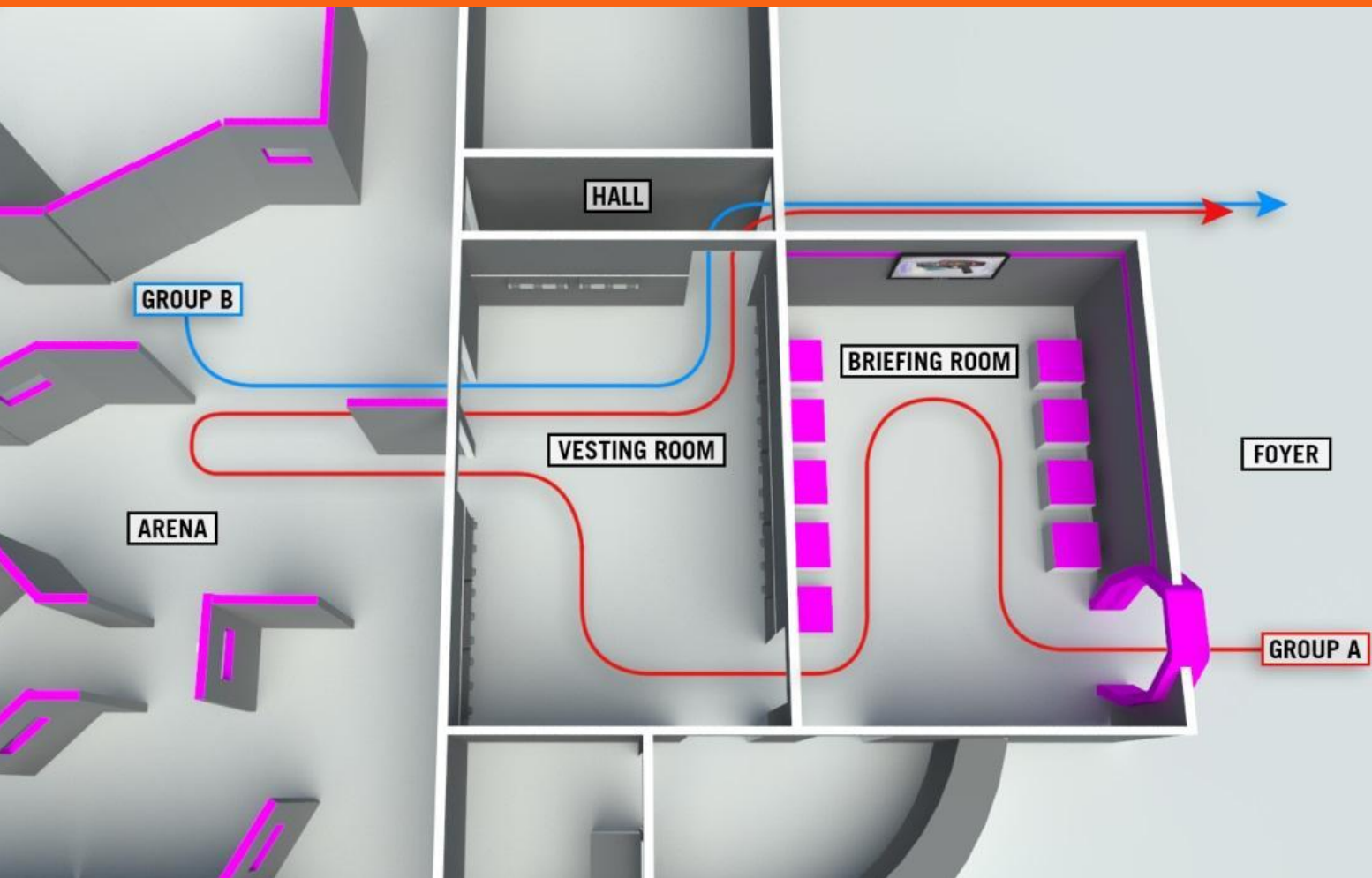




Building Your Laser Tag

Room layout considerations



Doug Willems

Summary

This White Paper summarizes the assistance that the Delta Strike team provide to prospective owners of new Laser Tag Centers all over the globe. Delta Strike consultants have supported hundreds of laser tag businesses through the planning and design stages of their Laser Tag Center. This White Paper shares the lessons that our team has learned along the way.

Section 1

We cover **the various rooms** that you may or may not include in your Laser Tag Center. Delta Strike suggests what **equipment needs** are to be considered for each room, and provides advice on **appropriate sizing**. Delta Strike also considers rooms that could allow you to diversify or add value such as birthday party rooms, catering for corporate/group events and arcades.

Section 2

The Delta Strike team considers the **layout of the Laser Tag Center**. The team provides feedback on a number of designs, making suggestions on how layout could be improved to make more revenue or to improve customer experience. This is a free service that Delta Strike provides to all their new clients as well as current clients looking at opening new centers. This section also goes into detail about **the importance of game flow**.

Section 3

Delta Strike examines the **design of the arena**. Admittedly, there are factors that you cannot influence, but there are others where your decisions can greatly impact the success of your center. Delta Strike talks you through flooring, ceiling, and everything in between.

If you decide that creating your arena independently is not for you, and you would prefer to use the services of a professional theming company, contact Delta Strike and we will refer you to a reputable and professional company who specializes in this field.

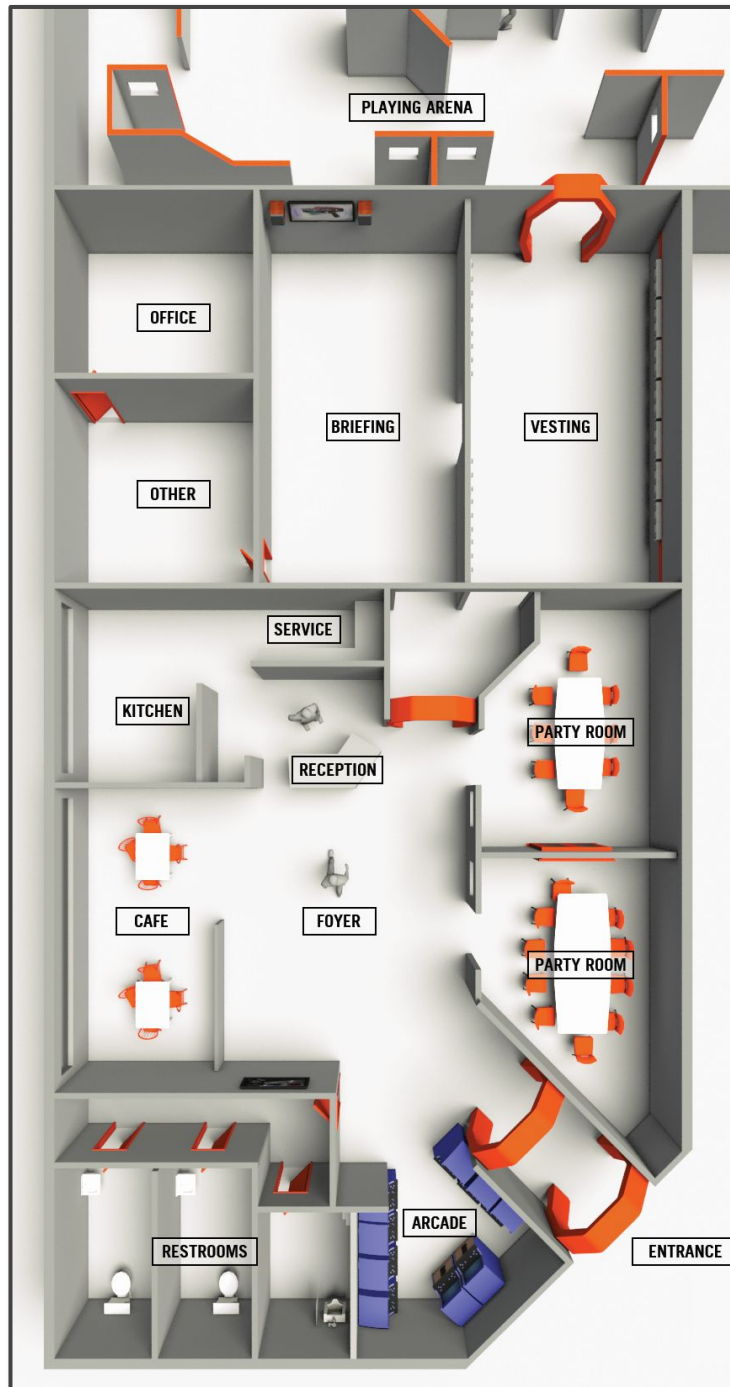
This White Paper aims to help perspective Laser Tag entrepreneurs avoid expensive design mistakes. Most of these mistakes can be avoided by working alongside industry experts. Our global network of Delta Strike consultants is available to assist anyone considering establishing a Laser Tag Center. Delta Strike's free Online Business Tools provide to other resources and White Papers that may be of interest.

Please visit our website www.deltastrike.com to contact your local consultant.

Section 1

What Rooms are Required?

This section details the different rooms that are required within a Laser Tag Center and considers what equipment should be included in each. We will also go into the size recommendations of each room and why.



Foyer

Location of the waiting area for customers will very likely be close to the entrance and will have the reception area attached to it.

1. Score screens on the wall (showing current game statistics)
2. Membership kiosks (PCs) so players can view their statistics and configure their next game
3. League statistics charts
4. A photo board of players and tournament winners
5. Notices of upcoming events
6. Televisions showing players currently in game (CCTV)



Reception Area

For stand-alone Laser Tag Centers, the reception will normally be next to/within the foyer area and next to the briefing room.

For an FEC (Family Entertainment Center), the main reception area may be located elsewhere in the center, away from the laser tag rooms. If this is the case, a smaller Laser Tag counter can be provided if desired.



Reception Area Equipment

1. Refrigerator, drinks, snack food, merchandise
2. Computer(s) for Point of Sale (POS), Bookings, and Game Control Software
3. Phones and debit/credit card machines
4. Cash Register
5. Local Area Network (LAN) switcher
6. Printer (printing score sheets)
7. Brochures and price list
8. Pricing Chart (on wall)
9. Member registration hardware (log in receptor)
10. Sound equipment for arena (if not in the service area)
11. Membership kiosks – see membership for more details.



Vesting Room (Also known as the Armory)

The Vesting room is where customers will put on and take off their phaser packs (vests/phasers). This room, in almost all cases, leads directly to the Arena. Think about theming for this area as this adds to the excitement before the game.

Scale

When determining the size of this room, take into consideration that the phaser pack racks are mounted against the walls. There are also likely to be 3 to 4 doors taking up wall space. Allocate 10-12 sqft (1 sqm) per phaser pack. Make sure that you future proof your vesting room and consider potential expansion. It is very common for businesses to start with a smaller number of phaser packs to meet their start-up budget and then increase as the business warrants it.

Equipment

- 1.The phaser pack mounting racks with equipment chargers
- 2.Lockers/cabinets for customers to store their personal items

Optionally, a small speaker system with a microphone so your staff do not have to shout when providing final instructions (it can get very noisy!)



Briefing Room

The Briefing Room is often located between the foyer and the vesting room. In this room, players are given instructions on how to use the equipment and play the game. A briefing room increases throughput efficiencies as it allows one group to be given instructions while another group is taking their equipment off.

Theming in this room is also very important as this is where the “experience” begins.



Size

Allocate 8 sqft or 0.75 sqm per phaser pack. As with the vesting room, ensure you have considered future expansion plans when you allocate space.

If there is a lack of space, the vesting room can be used to provide briefing instructions. However, this will restrict throughput. Alternatively, the foyer can also have a briefing area, although this will cause crowding and greater noise levels.

Equipment

1. DVD player and flat screen TV (or Video Projector) for video demonstration/instructions on how to play Laser Tag.
2. Long bench or tiered seating.



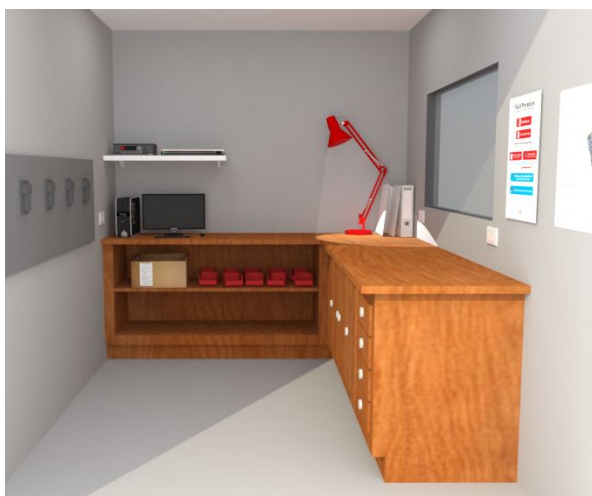
Service Area

This room is where spare parts are kept and phaser packs can be maintained or repaired. We recommend that the service room is next to the reception, with a one-way window fitted, as this allows staff to watch the reception area while they are repairing/maintaining equipment. This is especially helpful during quiet times when there are less staff rostered on.



Equipment

1. Shelving and cupboards with spare parts and tools
2. Chair and workbench
3. Lighting and sound controllers for the arena (alternatively, this can be in reception)
4. Network racks, telephone junction box etc.



Office

1. Desk, chair, computer and printer, shelving and filing cabinet
2. CCTV TV/recorder for security recordings which can also show the reception area so the manager can see if customers have arrived.
3. Game booking software may be installed on the manager's computer. This will allow the manager to take bookings away from the reception area when busy.

Restrooms

Work with your architect/local authority to determine the number of restrooms you will be required to have. Don't forget about wheelchair access or compliance with the ADA standards for Accessible Design (or any standards there might be in place in your country).

Birthday Party Rooms / Group Spaces

On average, 50-60% of laser tag customers visit for a birthday party. Many centres cater to this demographic by providing birthday party rooms. Although the rooms themselves generally don't make a massive profit, they are a great amenities to offer guests to ensure their special treatment to their group. This will set you apart.

1. **Large open plan birthday area-** This provides for a number of birthday parties at the same time. It has lower set-up costs and is more versatile. However, the public tend to use the same areas when waiting for a game. The charge to customers will be less because the areas are less exclusive.
2. **Multiple birthday party rooms-** Having multiple birthday party rooms is more achievable for multiple entertainment facilities. Party rooms should be 300-350 sq. ft. or 28-32 sq. m. Consider separating party rooms with movable partitions so you can combine the spaces and accommodate larger parties, school groups, and corporate events. Guests will pay more for a party in a dedicated party space..



Kitchen

FECs will most likely provide restaurant style meals, and the kitchen will be a fully equipped affair. In many cases, FECs will also provide bar facilities. For stand-alone Laser Tag Centers, food can be prepared in a kitchen on-site, or can be contracted in as required, or a combination of both.

The simplest food service is heating up pre-cooked foods such as pizzas, hot dogs, etc. and combining these with snack foods such as chips and sweets (candy). Soft drinks/soda can be supplied by purchasing in bulk or dispensed by a vending machine.

There are health and safety regulations associated with food preparation, so talk to your local authority and/or architect to determine the viability of a kitchen for your site. Also to be considered is fat removal (if using deep frying equipment) as well as ventilation to remove cooking smells.

Kitchen Equipment to Include

- | | |
|--|---|
| 1. Cooktop, oven/s, range hood | 5. Hand washing sink |
| 2. Freezer, refrigerator | 6. Deep fryer |
| 3. Stainless steel bench top with sink | 7. Cupboards for storage of food and utensils |
| 4. Commercial dishwasher | 8. Coved vinyl flooring |

Arcade Area and Other Entertainment Rooms

Arcade machines work well within Laser Tag Centers as they give customers something to do while they are waiting for their game and the business gains another income stream. There are other forms of entertainment which have also been successful in serving this purpose, such as mini climbing walls, internet cafes, mini golf, and mini bowling lanes etc.

Redemption games are typically arcade games of skill that reward the player proportionally to their score in the game. The reward most often comes in the form of tickets, with more tickets being awarded for higher scores. These tickets can then be redeemed (hence the name) at a central location for prizes.

You should allocate approx. 60 sqft or 5.65 sqm per game. Games will cost an average of 10,000USD each, however revenue share opportunities are common, allowing you to include machines without the initial investment.

Observation Areas

Some Laser Tag Centers provide an observation area for non-players to watch the game in progress. These areas are often created out of chance - by this I mean that the layout of the rooms within a particular building make such areas easy and in-expensive to include.

Observation areas are normally either:

1. On the same level, where a safety glass partition separates the arena from the foyer area or between the arena and the birthday party rooms. With this option, ensure it is in a dimly lit space. Otherwise customers will have to put their hand on the glass to see.
2. Above the arena where an observation deck (with railings) overlooks the game in action.

Another way for non-players to observe a game in action is to have CCTV cameras within the arena and display the video on monitors within in the foyer area.



Section 2

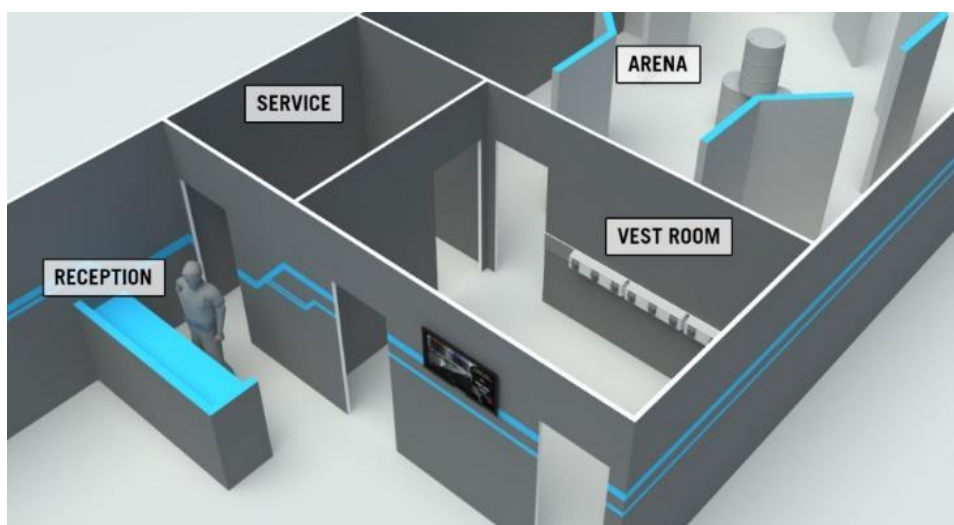
Design and Planning Process

This section looks at some sample Laser Tag designs and provides commentary on the pros and cons from the Delta Strike team. This is a free service that Delta Strike offers all new clients, providing arena designs specifically tailored for your building.

Note: prior to designing your Laser Tag Center, it is paramount that you have selected a building, and you have scaled and dimension plan view drawings to work from. You will notice that the sample designs included in this section vary considerably. This is because the design layout needs to be adapted to the characteristics of a particular building.

Example 1

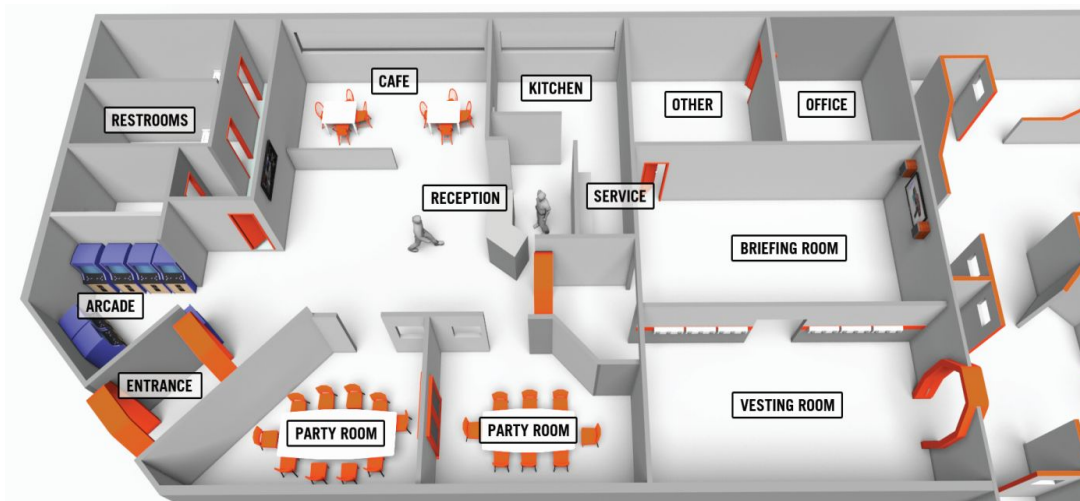
Small Laser Tag Area as Part of an FEC



Room	Area (Square Feet)	Area (Square Meters)
Arena	about 2,000	about 186
Reception	80	7.5
Rest Rooms	elsewhere	elsewhere
Vesting/Briefing Room	180	27
Foyer (Waiting includes Briefing Area)	400	37
Service Area	75	7
Office	elsewhere	elsewhere
Birthday Party Rooms	elsewhere	elsewhere
Other Entertainment Rooms	elsewhere	elsewhere
Kitchen	elsewhere	elsewhere

Example 2

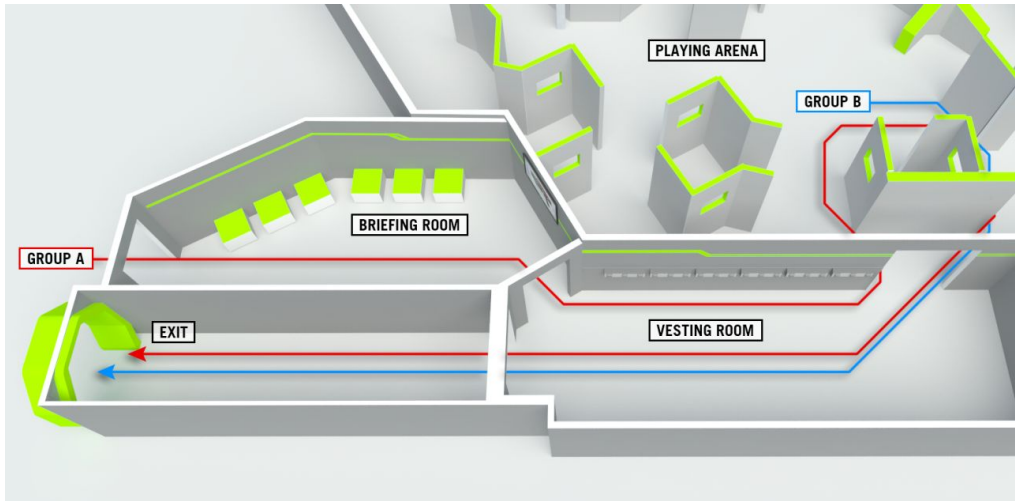
Large Stand Alone Laser Tag Setup



"The entrance provides opportunities for attracting walk-in customers, with glass doors and theming. The arena is a large space – we would warn that any larger than this and players would struggle to find one another, reducing game enjoyment. However, the arcade space could be larger – and this sized foyer could potentially get crowded during busy times. The briefing area is a good size to accommodate 30-40 players, as is the vesting room."

Room	Area (Square Feet)	Area (Square Meters)
Entrance	85	8
Arena	about 5-6,000	about 600
Arcade Area	110	10
Rest Rooms	300	28
Reception	80	7.5
Café	220	20
Briefing Area	320	30
Vesting Room	180	50
Foyer	350	32
Service/Staff room Area	150	14
Office	140	32
Birthday Party Room 1	192	18
Birthday Party Room 2	210	18
Kitchen	106	10
Other Entertainment Rooms	Not Used	Not Used

Example 3 FEC Setup



“The briefing area is a good size to accommodate about 30 players, as is the vesting room. The service area provides an opportunity to see customers if required with the installation of a good size one-way mirror.”

Room	Area (Square Feet)	Area (Square Meters)	Comments
Entrance	85	8	From other entertainment areas in the FEC
Arena	4-5,000	370-465	Size depending on space available
Reception	140	13	Access to Arena
Briefing Area	260	24	Good size to accommodate about 30 players
Vesting Room	300	36	Good size to accommodate about 30 players
Foyer	About 190	17	Through-way to other entertainment areas in the FEC
Service Area	110	10	Good size- add one-way mirror to see customers if required
Exit Hall			Also emergency route

Your Area and Space Allocation

The first sections of the white paper should have given you some inspiration for what rooms you would like to include in your Laser Tag Center and what size those rooms need to be. You may find that you would like to include more rooms than you actually have space for in your Center.

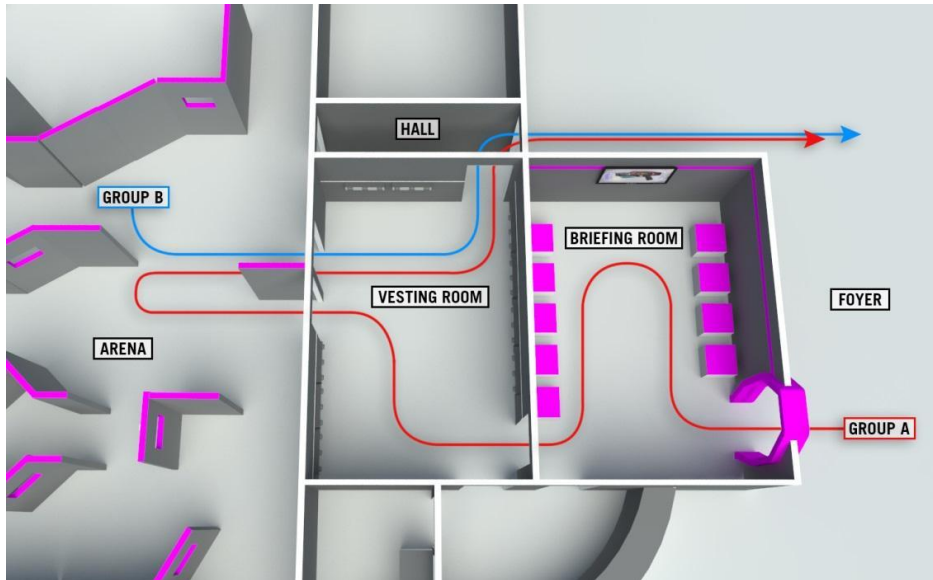
The table below shows how critical a room is to the success of a Laser Tag Center, in the opinion of the Delta Strike team. This may help you to prioritise the rooms that you wish to include in your Laser Tag Center.

Room	Essential	Good for Efficiency	Earn extra income
Foyer	✓		
Reception	✓		
Vesting Room	✓		
Arena	✓		
Rest Rooms	✓		
Maintenance Area	✓		
Service Area		✓	
Briefing Room		✓✓✓	
Office		✓	
Birthday Party Rooms			✓✓✓
Arcade area			✓✓
Other entertainment rooms			✓✓✓
Observation area			
Kitchen			✓✓

Game Flow

Large Stand Alone Laser Tag Setup

There is another very important factor to consider when designing your Laser Tag Center. Critical to a successful design is the game flow. Your Center should be designed to get customers in and out of the Arena as smoothly as possible, to reduce downtime. The picture below illustrates how the game flow is managed in this example Laser Tag Center.



The table below shows which room Group A and B are in, as they move through the Laser Tag Center. There is limited downtime between groups, with Group B taking off the equipment as Group A are being briefed, ready to put on their vests. We advise that you keep game flow uppermost in your mind when planning your Laser Center.

Game Flow - For Laser Tag utilizing a briefing room		
	Group A	Group B
1	In Foyer area - pay for game	Already playing in Arena
2	Move from Foyer Area to Briefing Room, view briefing video and/or listen to instructions from staff	Move from Arena to Vesting Room - take off equipment
3	Move from Briefing Room to Vesting Room: - put on their vests - get final instructions	Move from Vesting Room to Foyer Area, pick up score sheets
4	Move from Vesting Room to Arena: - play game	
5	Move from Arena to Vesting room: take vests off	
6	Move from Vesting Room to Foyer - pick up score sheets	

Section 3

Creating the Magic: Arena Design

Arena Layout

There are a number of factors that will influence the layout of your arena:

Shape of the Arena:

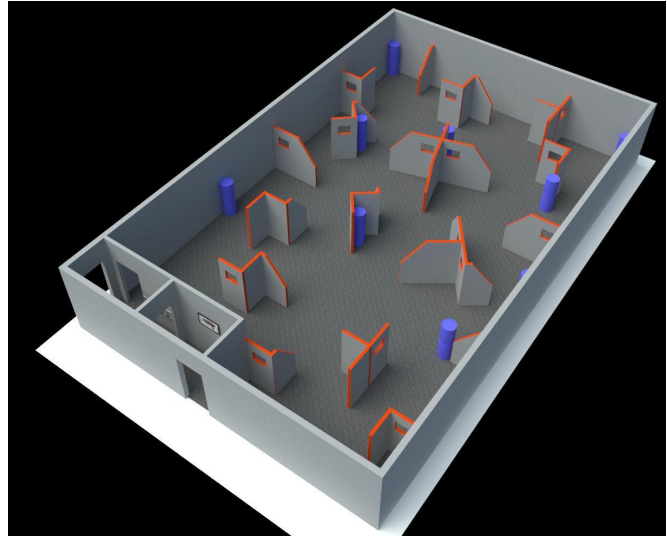
The arena shape can vary considerably from square, to rectangular, to “L” shaped. The main criterion is that it should not be too narrow; otherwise players are forced into bottlenecks.

Height of the Arena:

If you can remove a false ceiling – we recommend it – otherwise the rooms can feel too claustrophobic.

Single Level or Multi-level:

Arenas can be single or multi-level. Multiple levels are often thought of as superior in that they provide a third dimension to run around in, creating a more mysterious atmosphere. If you are short on space, multiple levels are also a great way of increasing the total arena size.



Size of the Arena

The size of the arena is very much dependent on the size of the building, which in turn, is very much dependent on the location of your business (central city locations will invariably be smaller than industrial areas because the real estate is more expensive).

The size of the arena will also influence how many players you have playing comfortably at any one time.

The following chart indicates the number of players that you can expect to be able to accommodate in a certain sized space:

Arena (Square Foot)	Arena (Square Meters)	No of phasers
7,000	650	34 to 45
6,000	558	29 to 40
5,000	465	24 to 34
4,000	371	20 to 26
3,000	278	15 to 20
2,000	185	1 to 14

Flooring

We are often asked, “What is the ideal flooring material for a laser tag arena?” There is no single, ideal product. However, the most common options are listed below with a brief description and the pros and cons for each.

Concrete

The most common arena floor is concrete. Robust, easy to clean and easy to paint, concrete is perhaps the most versatile of the options available. If you are renovating an existing structure to build your arena, there is a good chance it will already have a concrete floor, saving you time and money. The one process that a concrete floor **MUST** undergo is sealing, either with a lacquer concrete sealant (often a two pot mix) or floor paint. Unpainted floors will produce concrete dust, which is not only uncomfortable but also harmful to your customers. A flooring expert will be able to advise the best options to suit your situation.

Timber

Often used for mezzanine floors, but occasionally on ground floors as well, timber is strong and versatile. Care should be taken, however, to reduce open cavities below it. Timber floors tend to be the loudest, if not solidly constructed. Timber is also easy to clean.

Carpet

Although carpet is more expensive to install and maintain, it has a number of benefits over hard flooring. Firstly, it mutes sounds, providing a much quieter arena by reducing echoes and footsteps. Secondly, it is softer, helping reduce the injury rate of players. The main issue with carpet is cleaning. Carpet must be vacuumed, which takes more time than sweeping and, should any liquids, mud, food be taken into the arena and subsequently smeared into the floor, the cleaning requirements can be substantial. Consideration should also be made when planning to use haze machines as they create moisture. Most sites lay the carpet first and then install the arena partitions on top.

Rubber

Recycled rubber can provide a cheaper alternative to carpet (in some countries) with similar benefits. It is soft, mutes sound, and cushions falls. Rubber is also easier to clean, as the smooth surface can be swept like concrete. Rubber is more expensive than concrete and can get slippery when wet. Texturing the rubber surface can help with the latter issue, but may increase costs further.

Partitions and Boundary Walls

MDF (Medium Density Fiber Board)

MDF is the most commonly used material to clad boundary walls and partitions. We recommend 3/8 inch (1cm) minimum, with 1/2 inch (1.25cm) for those areas you expect may sustain high impact knocks. MDF will also provide a good mounting surface for arena components.

If your center already has drywall boundary walls, these will damage very quickly. You can clad MDF sheets against the Drywall itself, (normally in “portrait” orientation which will be around 8 ft. or 2.4 meters high). Anything above 8 feet should not require cladding.

Drywall/Plasterboard/Gibb

We strongly advise everyone to never use drywall to clad partitions. We have found that even the “high impact” drywall products will break. Kicking such a panel will usually result in a whole that causes problems.

Concrete/Cement Cladding

Sometimes Local Authorities require a fireproof cladding. In this case, there are many concrete cladding products available on the market. These do tend to be more expensive and heavy. Be sure to select a product that does not have a rough surface and can be painted, as rough concrete can damage clothes and equipment. When fireproof partitions are required, the partition’s internal framework should be made of metal.

Chip Board/Particleboard

Although this is often cheaper than MDF the resulting finish can be very rough – damaging players clothing and vests. Paint will chip off this material more easily than other products.

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Ceiling

As a general rule, everything above the level of the lighting grid should be painted matte black. This will allow other lighting from LEDs, Laser Tag packs, lasers, and black light painted images on the walls to stand out more vividly. Many operators prefer to paint the air-conditioning ducts, rafters and other internal building structures. Others will illuminate specific structures to provide an “industrial look.” Any such lighting should be low in intensity. Many roofs/ceilings have light “leakage” coming through rafters, tiles, and the roofing structure; these light gaps should be blocked.

Wires and cables are often laid above the arena partitions in ceiling ducts, along rafters, and cable ducts. From there they hang down to attach to the relevant electronic devices below. In most cases, black cables/wires are used, or the wires are painted black. This makes them less visible, and helps prevent vandalism within the arena.

Lighting

Emergency/Work Lights

Usually your Local Authority (or Fire Marshal) requires emergency lighting in the case of fire. A grid of “white” lighting, normally fluorescent or halogen should be installed. These are very handy for cleaning and working in the arena. Contact your electrician to determine suitable placement.

UV Lighting

An evenly distributed UV lighting grid, using standard UV fluorescent tubes, will ensure that any UV painted surfaces will light up sufficiently. This grid should be set as high as possible to allow the best light dispersion.

Haze Machines vs Smoke Machines

There are two main choices when adding fog effects to your arena. One of these is almost necessary to complete the best gameplay experience. Although they are very similar in description, they operate very differently.

Feature	Haze Machine	Smoke Machine
How do they affect the lights?	Enhances laser beam and illuminates	Light cannot penetrate clouds, hard to see through
Chemicals used	Invisible mist in the air, minimal residue	Leave oily residue, difficult to see through
Activation	Self-timer, manual trigger, or Delta Strike software programming	Manual trigger or timer

Haze machines operate under hot temperatures and the cheaper models will often break down very quickly. We have found the Martin range of haze machines to be very reliable.

If you have any questions on how to set up your laser tag business, you can call us direct - simply go to the **contacts** page on our website, www.deltastrike.com and call the sales representative closest to you.

We hope this paper has been helpful and informative. There are many other white papers that can be downloaded free of charge from **Downloads** section of our website.



All the Best,

Doug Willems

CEO

Delta Strike

A handwritten signature in black ink, appearing to read 'Doug Willems', written over a light grey background.