Chapter 1. Traditional Design Sequence

1. Traditional Design Sequence

The traditional sequence in design and construction

This 2017 guide update is organized according to a traditional sequence of design and construction. It is a simplified description of the approach commonly called “Design-Bid-Build.”

First you design your new planetarium; then send the construction documents, specifications and bill of quantities out for bids from general contractors; and then chose one from the bids; construct the building, and finally install and test your planetarium equipment. Then, it’s showtime!

There are many variations of this process, such as Design-Build or Construction-Manager. The goal of these approaches is to get the construction team involved earlier, which can be beneficial. However, at this point we want to keep it simple, so here we will describe just a traditional sequence, and we can always explore other project delivery approaches as appropriate.

One unique aspect of the planetarium universe is technology integration. With both opto-mechanical and digital systems, it is really important to at least engage the technology providers up front during design. You may, in fact, have decided what technology you want to purchase long before your building project is started, which can also be very beneficial.

Many technology providers offer a complete solution: projection systems, all other equipment, and the entire building, an approach sometimes called turn-key. As a planetarian, you get a guaranteed working planetarium. The key is to make sure that turn-key provides a good value for your investment.

If you are a start-up, or have to relocate, a huge complexity in this process can be just finding the right site. However, many planetariums may just need to add a new digital dome to complement their starball, or may just be upgrading their technology. Since the vast majority of planetariums already have a site, and we are trying to keep this guideline simple, we will assume that you have available land. Like the other possible variations mentioned above, we can always add site selection and acquisition analysis if that’s what you need.

Finally, again for simplicity, we have written this guideline from the perspective of a stand-alone planetarium organization. There are many planetariums like this, but there are also many that are part of an
observatory, a college or university or school, a science museum, or a research center. All of these other institutions may have their own process for design and construction, and they certainly have a wider group of stakeholders and decision makers. Here the key is that your new planetarium has to fit into the overall framework and buildings of these institutions.

As noted above, we will begin with the first step in the design sequence, the Design Brief, and then progress sequentially through each step:

- Design Sequence and Steps
- Design Brief
- Master Plan
- Concept Design
- Schematic Design (SD)
- Design Development (DD)
- Construction Documents (CD)

For all planetarians trying to navigate the cloud of hot gas in design and cryptic acronyms in construction, we hope this IPS 2017 Design+ Operations Guide will be a good starting point, checklist and reference for your journey. Bon voyage!

**What is the Design Brief?**

Many people think that the way planetariums are designed follows this pattern:

- You are awed by the initial plans.
- You are shocked by the budget.
- You go back to the drawing board.

This is NOT a good idea.

The objective of the Design Brief is to figure out what you want in your planetarium first, and then start the drawing process. This will save you time, money, and stress. And, as a bonus, you may actually get a planetarium without windows.

Your Design Brief will also test the feasibility of your proposed planetarium: what space is required for what you need, what quality level do you want, can you afford it, and when does it need to become operational?
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Actually, we do go back to the drawing board. Design is an iterative process, so the best projects consider many concepts, sketches, ideas, strategies, cool stuff, and so on. But with your Design Brief to provide a direction and a cross-check, your project has a higher chance of success. Most importantly, the process of creating your Design Brief will inspire your donors, your board, your staff, and your audience.

The Design Brief is also known around the world as the Design Program or Architectural Program. Since in the IPS galaxy “programming” describes the content you are presenting, we will continue to use the term Design Brief to avoid confusion.

**Design Brief Contents**

This section of the *Design+ Operations Guide* covers the Design Brief, the first task in the whole sequence of design and construction for a new stand-alone planetarium. The section has the following contents, organized sequentially by task:

- Design Brief process
- Vision + Goals
- Analysis + Concepts
- Feasibility Test
- Decision Summary

**Design Brief Process**

Although from the layperson’s viewpoint the Design Brief process may seem complicated, it is really straightforward.

The process begins by defining your vision and goals for your new planetarium. Next, your team needs to do some homework to analyze your situation and begin to develop design concepts. You may look at many ideas and consider best practices from around the world and other IPS members.

In all likelihood, as you analyze your priorities, you will find a favorite preferred concept. Then, the feasibility of your preferred concept should be tested to make sure everything is in balance: project scope, quality level, space quantity, budget, and schedule. Finally, your board, leadership or stakeholders will make a decision, hopefully, to approve your recommendation of your preferred concept.

Many parts of the Design Brief process can be completed by you, the planetarian, and your staff. Ultimately, in order to design and build a new planetarium, you will need to engage some professionals to help you with the whole process. Perhaps the most important person to engage at this point is someone to help you write a formal Design Brief. This could be an architect or engineer, a project manager, or a planetarium technology provider if you choose a turn-key solution.
Vision + Goals: Vision workshop

A great way to start your new planetarium project, inspire your team, and create consensus, is to bring everyone together for a vision workshop for perhaps two hours, or over a working lunch. Please be sure to include your board, leadership, and stakeholders so that they are part of the process from the beginning. If you have already engaged your architect or project manager, you can rely on them to facilitate this workshop.

All you need is the checklist found on the next page or at https://www.ips-planetarium.org/page/2017DesignGuide. Please send it to your participants in advance so they are well-prepared.

Print the checklist poster-size, and put it on the wall next to some blank flip-charts to record the discussion. After everyone has their lunch, then start down the Vision + Goals checklist. Tighten your reins, because you may in for a gallop.

The vision workshop will allow all stakeholders to express their aspirations and preferences in an open and transparent forum and start your planetarium project off with clear direction and momentum.
CHECKLIST: Design Brief: Vision + Goals

Customers

• What audience will your planetarium serve?
• Who is your direct competition: other nearby planetariums, cinemas, performance halls, home-theaters, personal VR, other?
• Who is your co-opetition (i.e. possible synergies or partners, not true “competitors”): observatories, science museums, schools?
• What types of planetarium shows will you offer, i.e. content, show duration, screening frequency?
• Will you have offerings for specific groups, such as kids, schools or adults?
• What will be the style of your planetarium shows: interactive-LIPS, no narrator, or a combination?
• Will you have other events besides planetarium shows, e.g. theater, music, classes, symposiums, community outreach, ability to rent for private use?
• What are your expected hours of operation: daily, weekly, monthly, seasonally?
• What is your expected annual visitor volume, at start-up, in the medium term, in the long term?

Planetarium (Inside Space)

• What is your maximum anticipated seating capacity in your dome?
• Will you have opto-mechanical, digital, or hybrid projection technology?
• Do you have a preferred hardware and software platform(s)?
• What other projection technologies will be required: e.g. Keynote/PowerPoint, dome-casting, video, TV, internet, live streaming, lasers, cove lighting, amazing shiny new things?
• What are the best practices in the planetarium universe?
• Who has the coolest stuff?

Building (Outside Space)

• What other complimentary spaces may be needed (beside the dome and support), e.g. for exhibits, seminars, conferences, research, science fairs, science competitions?
• Will you produce your own planetarium shows in-house?
• How many people are on your staff: full-time and part-time, today and in the long-term steady state?
• What image + brand should your building convey: Dr. Einstein, Dr. Who, or Dr. May?
Budget

• What quality level is needed in the building: Rolls Royce, Subaru, or Kia?
• What is the up-front capital budget for construction?
• What is the annual operating budget for on-going operations?
• What are your sources of funding; how much money has been secured already?

Schedule

• When would you like to start construction?
• How long a period should be reserved for planetarium equipment installation and testing, after construction?
• What is the target date to for your grand opening?
• Will you build the entire project all at once, or over multiple phases?