DESIGNING FOR LAB SERVICES

Why Early Planning of Electrical & Utility Cutouts Matters in Laboratory Furniture

A Planning Framework for Architects & Lab Planners

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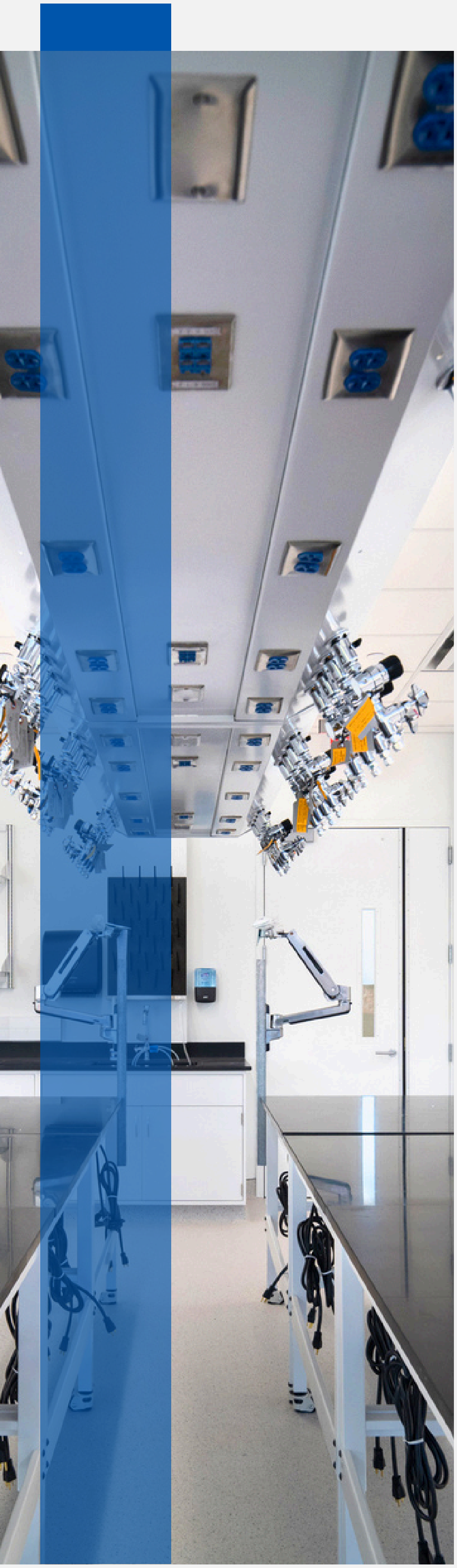
EXECUTIVE SUMMARY

Laboratory projects demand flexibility, reliability, and long-term performance. Yet electrical and utility service planning, particularly service cutouts within laboratory furniture, is frequently finalized after furniture layouts and specifications are already established. When service requirements are resolved late, project teams are often forced into field modifications, reduced accessibility, or permanent compromises that affect safety, maintenance, and future adaptability.

Major institutional laboratory design guidelines consistently emphasize early coordination of architectural, electrical, and utility systems, noting that laboratories must be designed for flexibility rather than fixed, single-use conditions.[1] Despite this, service cutout decisions are often treated as technical details instead of core planning elements.

This paper outlines why early service cutout planning matters, identifies common oversights, and provides a practical framework architects and lab planners can use to align service needs with furniture design, reducing downstream risk while preserving flexibility over the life of the laboratory.



1. THE HIDDEN IMPACT OF LATE SERVICE DECISIONS

Furniture layouts are typically developed early to support spatial planning, workflow, and equipment adjacencies. Electrical, data, and utility requirements, however, often evolve later as end-user input is refined or equipment selections change.

When service decisions lag behind furniture design, available options narrow quickly.

Teams may rely on:

- Field-cut modifications
- Surface-mounted raceways
- Exposed or inefficient cord routing
- Reduced access to outlets and services

While these approaches may resolve immediate needs, they often introduce long-term operational challenges that persist well beyond project turnover.

2. SERVICES ARE NOT STATIC - LABS EVOLVE

Laboratories are among the most change-intensive building types. Over time:

- Equipment footprints change
- Power density increases
- Research priorities shift
- Codes and safety expectations evolve

National laboratory design guidance recognizes that research environments change frequently and that systems should be planned to accommodate future reconfiguration rather than optimized solely for day-one conditions.[2]

Early service planning, therefore, is not about predicting every future requirement, it is about preserving the ability to respond when change inevitably occurs.

3. A FAMILIAR PATTERN: WHEN PLANNING HAPPENS TOO LATE

In many lab projects, additional power or data requirements are identified after furniture installation. With limited access to internal service pathways or cutout locations, teams resort to surface-mounted solutions or localized modifications to meet immediate needs.

While functional, these solutions can:

- Reduce accessibility for maintenance
- Compromise cleanability
- Limit future reconfiguration
- Increase lifecycle cost

Multiple university laboratory design standards caution that unresolved service requirements during early design frequently lead to post-installation modifications and operational compromises.[3]

4. WHY CUTOUTS MATTER MORE THAN THEY APPEAR

Service cutouts are not simply openings in panels. Their location, size, and method of integration directly influence:

- Structural integrity of the furniture system
- Safety and compliance, including electrical and laboratory standards
- Accessibility for users and maintenance staff
- Cleanability and contamination control
- Capacity for future modification

Once furniture is manufactured and installed, the ability to adapt service locations becomes constrained. Decisions made early can either preserve flexibility or permanently limit it.

5. WHEN SERVICE DECISIONS SHOULD BE MADE

Aligning service planning with design phases helps keep options open:

SCHEMATIC DESIGN (SD):
Establish anticipated power density, service zones, and growth assumptions.

DESIGN DEVELOPMENT (DD):
Confirm cutout strategy, service separation, and accessibility expectations.

CONSTRUCTION DOCUMENTS (CD):
Finalize quantities and locations with confidence that future needs have been considered.

Treating service cutouts as early design decisions, rather than late technical resolutions, reduces downstream risk.

6. EARLY SERVICE PLANNING CHECKLIST

Architects and lab planners can use the following questions to guide early coordination:

1. Are anticipated power and data needs likely to increase over time?
2. Has equipment turnover been considered?
3. Will outlets and services remain accessible after equipment is installed?
4. Is the separation of power, data, and low-voltage services required?
5. Can future service changes be accommodated without replacing furniture?
6. Is there capacity for additional cutouts without compromising structure?

These questions help shift the conversation from “what fits today” to “what performs over time.”

7. MANUFACTURING CAPABILITIES AND DESIGN ADAPTABILITY

The degree to which a furniture system can support thoughtful service planning is influenced by how it is manufactured.

Systems reliant on fixed, outsourced punch patterns often require service decisions to be locked in early. Changes later in the process may result in redesigns, added lead time, or acceptance of suboptimal solutions.

Industry standards for adaptable laboratory furniture recognize service integration as a core design consideration, reinforcing the importance of systems capable of accommodating varied and evolving service requirements.[3] Systems designed and manufactured with in-house cut and form capabilities inherently support this level of adaptability by allowing project-specific layouts and responsiveness when requirements change.

8. SHIFTING THE CONVERSATION EARLIER

Service cutouts are most effective when discussed as part of the overall design strategy, not as an afterthought.

WHEN ADDRESSED EARLY:

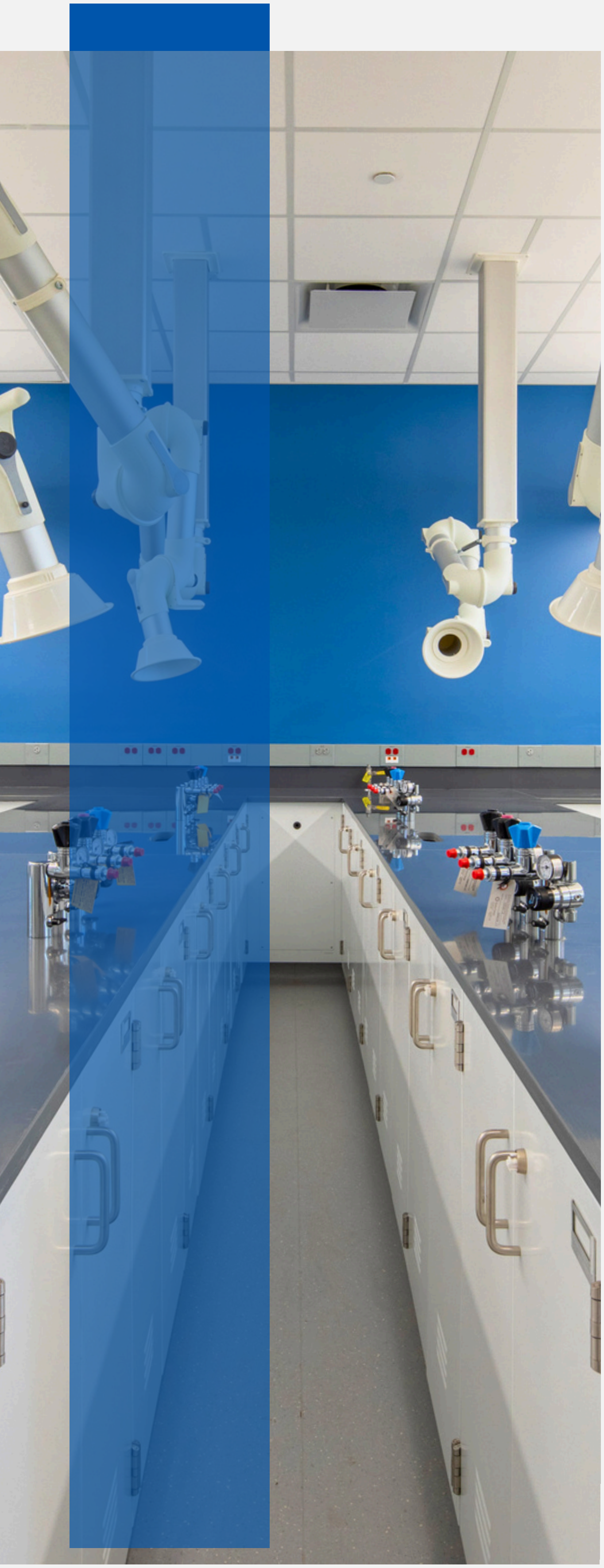
- End users are prompted to think critically about current and future needs
- Risks are identified while options remain open
- Furniture systems can be selected to support adaptability
- Projects experience fewer compromises and late-stage surprises

This shift benefits not only the construction phase, but also the full operational life of the laboratory.

CONCLUSION

The question is not whether laboratory service requirements will change, but whether the furniture system has been designed to accommodate that change.

Early, intentional planning of electrical and utility cutouts enables architects and lab planners to deliver laboratories that are safer, more adaptable, and better aligned with the realities of scientific work. By prioritizing planning frameworks over reactive solutions, project teams can ensure that laboratory environments perform not just at turnover, but throughout their entire lifecycle.



ABOUT THE AUTHOR

Lance Gray is a Product Manager at Kewaunee Scientific, where he specializes in laboratory furniture systems that support innovation, compliance, and long-term performance.

With a background in building products and a focus on fenestration and modular lab benches, Lance brings a practical, user-centric perspective to lab design.

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