PPE intelligence
translating process into facility
powered by PORR

Research & Laboratory

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ABSTRACT

PPE intelligence delivers an integrated, end-to-end approach to laboratory planning – translating user needs, processes, and capacity analyses into functional layouts, equipment and utility concepts, and IT/automation strategies. With iterative coordination and modular design, plans stay flexible as requirements evolve. Supported by PORR Group's execution strength, PPE intelligence manages tendering, supplier coordination, and construction through to commissioning. The result: efficient, adaptable, and future-proof laboratories delivered reliably from concept to operation

Fig. 1: Early stage visualization of laboratory environment

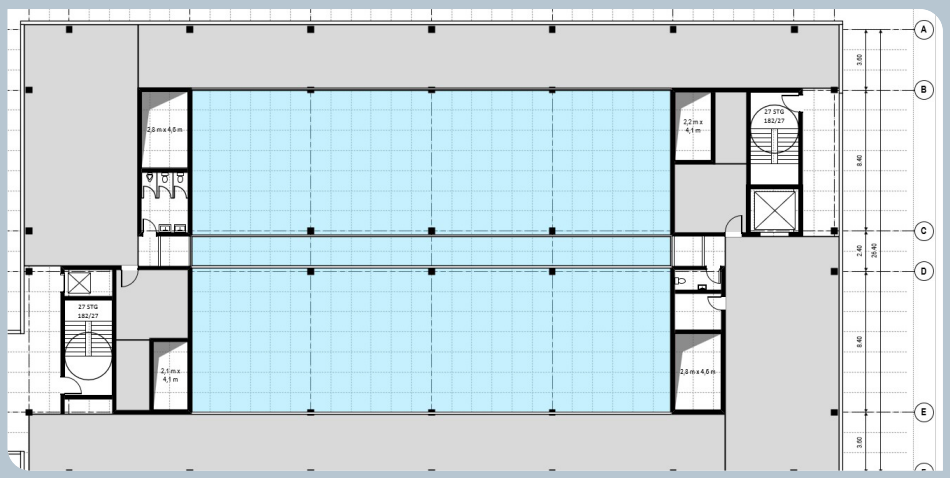

Fig. 2: Modular design example

Research, development, and scale-up – a chemical or pharmaceutical company's product pipeline originates in the laboratory. From the initial testing of drug candidates to the market authorization of finished products, various development stages are first completed in the lab before manufacturing for market supply starts. Focused research, rigorous development plans, and efficient implementation are prerequisites for successful product launches.

In pharmaceutical research and development, AI is already being used today to predict the likely effects and side effects of new drug candidates, as well as for the reliable, predictive analysis of data from toxicity studies, stability studies, and clinical trials of finished medicinal products. This is drastically shortening the development cycles of new drugs and has dramatic consequences for the entire industry.

Especially in research laboratories, where teams and fields of research are constantly changing, flexible working environments are essential. How can this flexibility be tailored and integrated into a laboratory design, and which level of flexibility is required? What is the optimal spatial layout, particularly for the technical systems such as ventilation and utilities?

PPE intelligence offers the right solution for your laboratory, whether it's a new build or a renovation. We understand your laboratory processes and support you and your project – from the initial idea to handover into routine operation.

LABORATORY PLANNING SERVICES AT PPE INTELLIGENCE

Basic Principle:
"Translating Process into Facility".
PPE intelligence translates user needs, laboratory processes, and capacity requirements into functional spatial, operational, and technical concepts.
All laboratory planners have laboratory experience and communicate professionally with users on an equal footing.

OUR AREAS OF EXPERTISE

- Biotech & Pharma
- Research & Laboratory
- Advanced Industries & Logistics

PPE intelligence is a multidisciplinary consulting and engineering firm combining Process Engineering with Facility Design & Delivery. At our core, we translate complex operational processes – whether highly regulated or not – into built environments. This conviction defines our identity and is captured in our guiding principle:
Translating Process into Facility.

Fig. 3: Our areas of expertise

WHAT'S IN IT FOR YOU
Set up your laboratory project right the first time! PPE intelligence delivers laboratory engineering, procurement and construction from early idea phase to operations throughout the entire life cycle of the facility.

PPE INTELLIGENCE LABORATORY PLANNING SERVICES

User Needs & Processes
- Identification of laboratory tasks (R&D, QC, biotech, scale-up, etc.)
- Recording & mapping of all relevant process flows, including logistics, hygiene, & documentation processes, as well as other relevant business processes
- Creation of process flow diagrams as a basis for areas, zones, containment, & layout

Capacity Analysis
- Assessment of whether the equipment & personnel are sufficient for processing the planned number of samples
- Calculation of utilization scenarios and, if necessary, simulations with shift models & simultaneity
- Derivation of necessary adjustments (more equipment, more workstations, more media, etc.

Space, Functional, & Layout Planning
- Zoning of GMP & non-GMP areas
- Definition of laboratory, ancillary, utility, & documentation areas
- Special attention to safety, hygiene, & data requirements in the GMP environment

IT & Automation Strategy
- Selection & integration of laboratory automation solutions (hardware & software)
- Ensuring data integrity, secure transmission, & system compatibility
- Clarifying interfaces between users, devices, software, & IT infrastructure

Equipment, Utility, & Furniture Planning
- Creation of equipment & utility requirement lists (centralized for integrated planning)
- Use of a dedicated database for equipment, utility, & furniture – this serves as a planning & life cycle database for both, planners & operators
- Inclusion of technical requirements (ventilation, gases, water, data, etc.)

Flexibility & Modularity Concepts
- Use of modular laboratory components ("Typicals")
- Rapid reconfiguration without lengthy downtimes
- Shorter construction times
- Future-proof, flexible space utilization
- Particularly important for R&D laboratories with changing teams & tasks

Tendering & Procurement
- Creation of tender packages for furniture, equipment, & technical trades
- Support with supplier selection, obtaining quotes, & technical negotiations
- Support with long-lead-item procurement
- Complete or partial outsourcing of the procurement process is possible

OUR DELIVERY OPTIONS

E
Engineering

AGILE EPCM(V)
Agile Engineering, Procurement, Construction Mgmt, Validation

EPC
Engineering, Procurement, Construction

IPD
Integrated Project Delivery

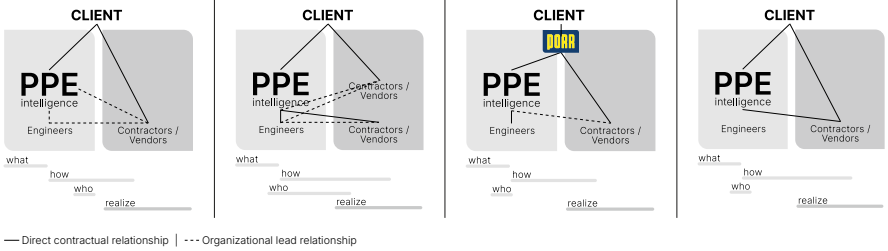

Fig. 4: Our delivery options

Site Coordination & Implementation
- Site management with interface coordination of all trades
- Ensuring that commissioning can begin without delay
- Management of the delivery, installation, & commissioning of equipment.
- Documentation, inventory, & site acceptance testing

Laboratory Relocation & Inventory Integration
- Inventory of existing equipment
- Planning & coordination of relocation & re-installation
- Support with tendering & selection of a freight forwarder

Commissioning & Qualification (optional)
- Support with FAT/SAT, qualification documentation, & risk analyses
- Support with commissioning, method transfer, & GMP topics

SPECIFIC STRENGTHS OF PPE INTELLIGENCE
- Integrated Planning
- Collaboration between laboratory planning, architecture, building physics, MEP (mechanical, electrical, & plumbing) & building services engineering
- Iterative planning through topic-based workshops & regular coordination meetings

STRONG IMPLEMENTATION FOUNDATION
Cooperation with PORR Group enables flexible implementation models:
- Early supplier integration
- General contractor models
- Hybrid models
- At the same time, independent enough to collaborate with other construction companies

Laboratory design is not solely based on functional or aesthetic considerations, but often also reflects the demands & hierarchies of the organization. Addressing these differences is an important task of laboratory planning.

RESULT
A laboratory planned & built by PPE intelligence is:

- Functional
- Efficient
- Adaptable & future-proof
- Well-documented
- GMP compliant (if required)
- Constructed & commissioned smoothly
- Tailored to user needs
- Prepared for the entire life cycle of the facility

If the laboratory's key performance indicators suddenly become poor, there are increasing numbers of out-of-spec (OOS) results, unexpected contaminations occur, employees are dissatisfied, or efficiency declines, it can be assumed that the processes in the laboratory are unclear or simply non-existent.
A good starting point to address such issues & to optimize both, premises & processes in your lab.

Fig. 5: Rendering of a laboratory workplace

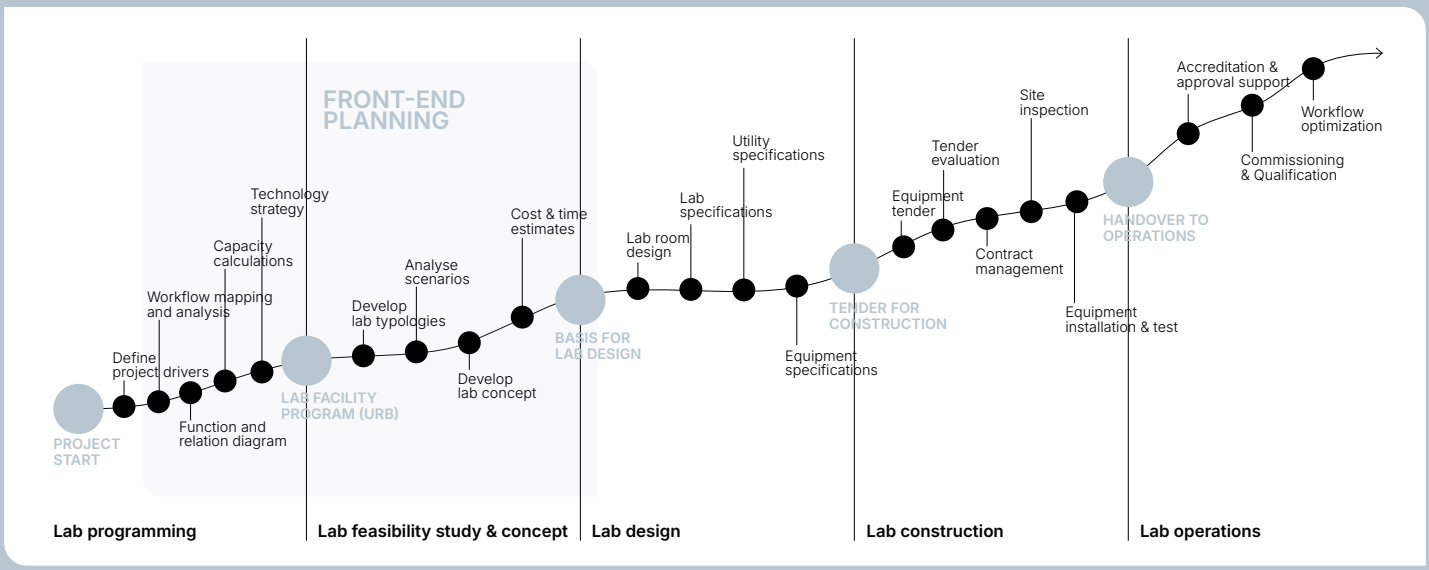

Fig. 6: Consecutive phases in a lab project

THE GMP QUALITY CONTROL LAB
What actually distinguishes a GMP laboratory from a non-GMP laboratory? The EU GMP Guide has been enforced since 2005, meaning that compliance must be demonstrated. Laboratories operating within the context of GMP-controlled production must meet specific requirements. Under GMP regulations, quality control is a separate entity and always separate from manufacturing; this also applies to personnel and management. In principle, quality control laboratories are considered non-product-contact, as are process control samples from production and samples from environmental monitoring.
This means that samples tested must never be administered to patients. A second important aspect of GMP laboratories covers the generation, processing, and transfer of data, especially raw data. A classic area of focus in laboratory audits, this is where findings or deviations are frequently discovered. Finally, another important distinguishing feature is the obligation to document and control laboratory processes according to a set of predefined, company-specific, and official guidelines.

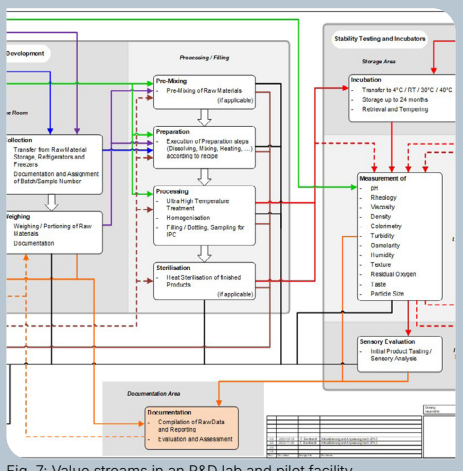

Fig. 7: Value streams in an R&D lab and pilot facility

Often, non-GMP activities are also required in GMP quality control laboratories, for example, for method development or research and development.
How must these areas be separated, and what restrictions apply to personnel, chemicals, reference standards, and equipment?
Can the operator use the same facilities for different purposes?
If you are facing these questions, please feel free to contact us.

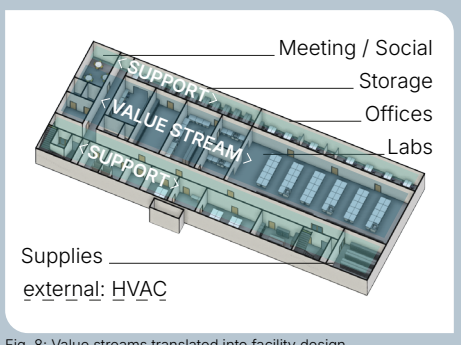

Fig. 8: Value streams translated into facility design

Fig. 9: Laboratory workplace with equipment installed

PROCUREMENT

At some point in every project, the question arises: what needs to be procured, and by whom? Does the builder even have the expertise and capacity to procure laboratory equipment? And what delivery times can currently be expected?
In our planning, the Object Breakdown Structure provides this information. Typical procurement units in a laboratory include furniture and equipment. Both can be bundled in different procurement packages or procured individually, depending on the procurement strategy. Here, we support the client with our experience and personal contacts with virtually all manufacturers on the market. Before selecting suppliers, the client receives a list of qualified manufacturers with their respective product ranges. We also create a list of long-term items—furniture and equipment with particularly long delivery times that must be ordered early. This allows for timely obtaining and evaluation of bids. Subsequently, we provide support in the technical tendering negotiations, culminating in the award recommendation.
Depending on the client's wishes and capacity, we can therefore partially or completely manage the entire procurement process, from initial planning to delivery and installation.

CONSTRUCTION MANAGEMENT

On the construction site, planning and execution converge. Poor planning is immediately exposed. How can the builder ensure that everything runs smoothly on the construction site, that no delays occur, and that the budget is not exceeded? For laboratory refurbishments or new builds, good specialist construction management on the site is essential, with continuous coordination of interfaces between all the trades involved, with suppliers, and with the overall construction management. This requires a thorough understanding of the fundamental processes of the work to be carried out by all disciplines. Furthermore, we always ensure that the subsequent phases of commissioning laboratory equipment, which are typically no longer part of the project, can begin without delay. Our services include scheduling the delivery, installation, and commissioning of equipment, as well as supporting its initial qualification. We also offer schedule tracking, documentation, inventory management, and site acceptance testing. This ensures a timely start to laboratory operations and guarantees consistent documentation throughout the laboratory's lifespan.

Fig. 10: Laboratory building during construction

LABORATORY PLANNING AND BUILDING

Before a laboratory project can enter the construction phase, all contractors and suppliers must be identified and contractually bound. Only then can construction begin. A completed planning phase is always a prerequisite.
At PPE intelligence, we can support various project management models, depending on the type and scope of the project and the builder's requirements. These range from the early involvement of suppliers as planning partners to a general contractor model. With PORR Group, a strong construction group, behind us, we can handle all possible scenarios in the realization of a construction project. At the same time, we are independent enough to collaborate with other construction companies as execution partners on a project. Especially with laboratory buildings, there is no turnkey standard solution.

PPE intelligence offers its expertise in pre-qualification and tendering at the interface between planners and contractors to achieve the most time- and cost-effective solution for the client. We would be happy to provide you with an overview of the complex interrelationships, your options, and our services in this area. In any case, we accompany the client and the users of the laboratory until the handover into ongoing operation.

PPE intelligence offers the right solution for your laboratory, whether it's a new build or a renovation.
We understand laboratory processes and support you and your project – from the initial concept to handover for routine operation.

NICE TO KNOW

PPE intelligence is an independent consulting and engineering company within the PORR Group. We focus on biotech & pharma, research & laboratory, as well as logistics & advanced factory planning. The PORR Group employs around 21,000 people, including more than 1,000 engineers.
Together, we combine **Engineering Agility** with **PORR Stability**.

Our monthly Tech Sheet