# JUMBO BLOCK®

# Digital Planning & Infrastructure Suite


The **JUMBO BLOCK® Digital Planning & Infrastructure Suite** combines planning, simulation and infrastructure monitoring in an integrated digital toolset.

The digital tools support planners, municipalities and infrastructure operators in various phases of a project – from the initial concept idea to the operation of a plant.

**They reduce planning uncertainty and create a reliable basis for decisions regarding technical, economic and infrastructural measures.**

The suite was designed to meet both the **physical requirements of modern infrastructure planning** and the **digital requirements for traceability, documentation and system security** .

The system architecture is thus aligned with current **European frameworks for critical infrastructures** , in particular:

- **KRITIS** – Protection of critical infrastructures
- **NIS-2 Directive** – Cybersecurity and Traceability of Digital Systems
- **CRA (Cyber Resilience Act)** – Security requirements for digital products and systems

The combination of planning tools and digital monitoring enables **traceable documentation of infrastructure measures** and thus supports modern requirements for **resilient and verifiable infrastructure** .

# JUMBO BLOCK® Plan

The **JUMBO BLOCK® Plan Tool** enables the geometric and structural pre-planning of modular JUMBO BLOCK® systems.

With just a few inputs, you can calculate, among other things:

- Number of modules required
- Retention volume of the system
- Required components (base plates, side plates, cover plates)
- Material requirements
- Plant layout

The tool serves as a basis for an **initial technical project assessment** .

# JUMBO BLOCK® Hydro

The **JUMBO BLOCK® Hydro Tool** supports the **hydrological pre-planning** of rain events and retention systems.

Based on:

- Rainfall intensities
- catchment areas
- Return times

can be calculated:

- required retention volume
- Number of JUMBO BLOCK® modules required
- potential plant capacities.

The Hydro Tool thus complements geometric planning with **hydrological dimensioning** .

# JUMBO BLOCK® Dashboard

The **JUMBO BLOCK® Dashboard** forms the digital layer of the infrastructure.

Connected **IoT sensors** can be used to monitor, for example:

- Water levels
- System states
- Operating data of the plant

The data can also be documented via **verifiable log systems and distributed ledger technology (IOTA) .**

This dashboard enables **transparent and traceable infrastructure monitoring** .

# One system – four tools

Together, the three digital tools provide comprehensive support for modern infrastructure projects.

| **phase** | **Tool** |
|---|---|
| Concept & Preliminary Planning | **JUMBO BLOCK® Plan** |
| Hydrological dimensioning | **JUMBO BLOCK® Hydro** |
| Economic considerations | **JUMBO BLOCK® Budget** |
| Operation & Monitoring | **JUMBO BLOCK® Dashboard** |

Together they form the **digital planning and operational level for JUMBO BLOCK® retention infrastructure** .

# System principle of the JUMBO BLOCK® system

The JUMBO BLOCK® system is a modular underground storage system for **rainwater retention under traffic areas** .

The system consists of standardized **JUMBO BLOCK® hollow modules** , which are installed below the surface and supplemented by **base plates, side plates and cover plates .**

The modules are installed **block by block on one level** and together form a large-volume underground storage reservoir.

The system can be used, for example, in:

- streets
- Parking areas
- places
- industrial areas

Depending on the system design, the stored rainwater can be:

- **temporarily retained (retention facility)**
- **controlled seepage (infiltration system)**
- **be derived with a time delay**

Thanks to its modular design, the size of a system can be **scaled virtually without limit** , as it depends solely on the **number of modules used** .

# User manual

# JUMBO BLOCK® Plan

# Purpose of the Plan Tool

The JUMBO BLOCK® Plan Tool is used for the geometric and structural pre-planning of modular JUMBO BLOCK® systems.

With just a few entries, planners, municipalities and engineering firms can:

- Determine the required number of JUMBO BLOCK® modules
- calculate the storage volume of the system
- Determine the required components (base plates, side plates, cover plates).
- perform a material assessment
- Visualize a system layout

**JUMBO BLOCK® Hydro tool is also** available for hydrological pre-planning .

## 1. Import / Export

The Plan Tool enables data exchange between the individual JUMBO BLOCK® applications.

### Features:

- **Import from Hydro.**
  Transfer of:
  - calculated retention volume
  - Rainfall parameters
  - Project data

- **Plan Import:**
  Import of a previously saved plan file for further editing.

- **Export for Budget:**
  Transfer of all relevant data to the **JUMBO BLOCK® Budget tool** , including:
  - Number of modules
  - Component quantities
  - Volumes
  - Joint lengths
  - Concrete classes

# 2. Project Information

The Project Information section contains basic project data:

- Project name
- Organization / Municipality / Office
- contact person
- Project location
- e-mail
- phone
- Remarks

This data appears in the results overview as well as in the print/PDF.

# 3. Planning mode

The tool offers two planning approaches:

### Planning via target volume

- Enter a desired retention volume
- automatic calculation of:
    - Number of modules
    - system area
    - Material requirements

☞ suitable for a given retention volume

### Planning based on plant dimensions

- Input of the length and width of the area
- automatic calculation of:
    - Number of modules
    - achievable volume
    - Material requirements

☞ suitable for limited space

### Standard basis

- Module dimensions: **2.5 × 2.5 × 2.5 m**
- Net storage volume: **13.9 m³ per module**

# 4. Manual customization / special layout

This area allows for targeted adjustments to the planning.

## Adjustable parameters:

**Module**

- automatic calculation
- manual adjustment

**floor slabs**

- Number automatic / manual
- Thickness selectable

**side panels**

- Number automatic / manual
- Width
- thickness
- Overhang correction

**Cover plates**

- Number automatic / manual
- Thickness selectable

**layout**

- Special geometries and instructions can be defined.

# 5. SABA sealing mode

The tool takes different sealing options into account:

### Standard sealing

- complete sealing of the system
- Water is retained

### Infiltration without adhesive

- no seal
- The water seeps away completely.

### Infiltration with bonding

- spot bonding
- Standard assumption:
    - 2 m of bonding per component connection

### Additional options:

- Sealing of cover plates: **yes / no**
- automatic calculation:
    - Joint lengths
    - Material requirements
    - **15% reserve**

# 6. Concrete classes

### JUMBO BLOCK® Module

- Concrete class: **C40/50 (fixed definition)**
- Vertical columns: **25 × 25 cm**

### Panel components

- selectable:
    - C40/50
    - C80/95

# 7. Automatic pre-planning

The tool automatically calculates:

- Number of modules
- system area
- Retention volume
- Material requirements

Additionally, an optimized standard layout is generated.

# 8. Plant layout

The layout visualizes the facility as a grid:

- Modules in longitudinal direction
- Modules in transverse direction
- Overall structure of the system

☞ Each block corresponds to one JUMBO BLOCK® module.

# 9. Results Overview

Summary of all relevant planning data:

- Number of modules
- Net storage volume
- Gross excavation volume
- Total weight
- Space requirement

### Component overview

The following will be calculated:

- JUMBO BLOCK® Module
- base plates
- side plates
- cover plates

including:

- Individual volume
- Total volume
- Individual weight
- Total weight

### Joint sealing

The following will be calculated:

- Joint lengths per component
- Total joint length
- Material requirements
- 15% safety reserve

## 10. Theoretical reference values

The tool provides additional technical reference values:

- Concrete classes
- Compressive strength fck [MPa]
- theoretical pressure forces

☞ These values are for guidance only
☞ Not a static analysis

## 11. Print / PDF / Inquiry

Features:

- Print planning
- PDF creation
- Transfer to project partners

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