Planning and realization of production plants

Product-specific or multifunctional.
Horizontal circulation plants.
Vertical battery plants.

REFERENCE

We create success!
Features of the plant

Plant capacity:
320 m² double wall/shift or
750 m² lattice girder slab/shift

Hall:
Area 3.290 m², Clearance 8.35 m

Personnel:
10 employee/shift (wall)
8 employee/shift (slab)

Plant concept

- Double Wall 180 – 400 mm
- Double Wall and lattice girder slab with curved overlapping reinforcement
- 40 pallets L/W 12,5/3,3 m
- Tilting bybass station
- Shuttering robot, also for magnet box and magnets for inserts
- Automated straightening and cutting machine for round steel
- Possibility to produce core insulated double walls
- Direct concrete transport from a new mixing plant
- Divided hall
- Inside the hall a large stacking and interim storage area for precast elements
- Plant with high potential

Summary

For this third plant our customer demanded a high-duty plant including a shuttering robot to reduce personnel costs. Together with the plant a main pc was installed. Also a data connection/transfer between all 3 factories is realized.

Conclusion:
A flexible and high potential plant with a possibility to extend product range

Performance RT:

- Planning
- Support for design of shuttering robot

Magazin for insert magnets and magnet box

Shuttering robot

Working station lattice girder
Double Wall Plant
Power

Features of the plant

Plant capacity:
320 m² double wall/shift or
750 m² lattice girder slab/shift

Hall:
Area 2,550 m², Clearance 8,10 m

Personnel:
12 employee/shift (wall)
10 employee/shift (slab)

Plant concept

- Double Wall 180 – 400 mm
- Double wall production extendable into a multifunctional plant
- 40 pallets L/W 12,50 m/3,28 m
- A high quality standard of the end product
- A high automation level even without robot
- Possibility to produce core insulated double walls
- Direct concrete transfer from a new mixing plant
- Divided hall
- Possibility to load simultaneously up to 3 trailers in the hall
- A low cost and very adaptive plant

Summary

Our customer demanded to invest in a high performance plant equipped with machine technology that is easy to handle, but does not require any complex robot technology. In close co-operation with the customer an exact definition of the product, the future product completion as well as the performance was made. The optimization of the data, integration between the technical office, the production facilities, logistics, workstations and material handling lead to a manageable plant that is easy to use.

Conclusion:
An optimized plant with high potential. The technology is planned for producing lattice girder slabs as well with only minor adjustment and without productivity loss.

With few more steps the production of solid walls would be possible as well, including finishing the surface.

Performance RT:

- Planning

Rack feeder and curing chamber
Concreting
Features of the plant

Plant capacity:
160 m² double wall/shift

Hall:
Area 820 m², Clearance 6,38 m

Personnel:
5 employee/shift

Plant concept

- Double wall 180 – 400 mm
- 24 pallets L/W 8,0 m/3,0 m
- Low investment cost
- Lower level of automation
- Realization in an existing hall: L/W/H 54,0 m/11,2 m/6,4 m
- Hall extension for steel processing: L/W/H 24,0 m/9,0 m/5,5 m
- Total area: 820 m²
- The existing hall cranes can be used.
- All foundations, inserts, pits and services should be incorporated within 20 cm on top of the existing hall floor.

Summary

The owner of our reference project wanted to produce only double walls. A multifunctional plant was explicitly not desired.

The conception and realization of a circulation plant, designed exclusively for a single product, reduced the investment costs to a minimum, but also facilitates a highly efficient production.
Features of the plant

Plant capacity:
280 m² double wall/shift or
720 m² lattice girder slab/shift

Hall:
Area 4,000 m², Clearance 13,85 m

Personnel:
10 employee/shift (double wall)
8 employee/shift (slab)

Plant concept

• Double wall 180 – 500 mm
• Special elements up to 600 mm
• 32 pallets L/W 10,6/3,65 m extendable up to 18 Pallets
• Tilting bypass station
• 2 compacting stations
• Laser projection
• Automated straightening and cutting for round steel
• Possibility to produce core insulated double walls and special elements
• Direct concrete transport from the existing mixing plant integrated inside the hall
• Usage of SCC is also possible
• Divided hall
• At the lift-off area it is possible to place 8 in-loader pallets ready for usage

Summary

Our customer, a building company, demanded a plant with a high flexibility for products. Partly the produced elements are used for own need and for the market.

Conclusion:
A plant with highly production flexibility, 3 stations for special elements and possibilities to extend.

Performance RT:

• Planning
• Project management
Features of the plant

**Plant capacity:**
180 m² double wall/shift or 480 m² lattice girder slab/shift or 240 m² solid wall/shift

**Hall:**
Area 2.200 m², Clearance 11,0 m

**Personnel:**
6 – 10 employee/shift (dependent on the degree of difficulty of the final product)

Plant concept

- Double wall 180 – 400 mm, core-insulation double walls, solid wall 100 – 160 mm, lattice girder slab
- 38 pallets L/W 10,60 m/3,65 m
- Dimension of hall: L/W/H 82 m/27 m/11 m
- Platform +5,0 m: L/W 15 m/10 m
- Concrete transport from an existing mixing plant
- Hall with two cranes, each 10 to

Additional service:
- Support in the adaptation of the company organization
- Employee training
  - sales department
  - technical department
  - production
  - assembly team

Production planning

The used plant technique considers a partly low qualification of the production employees. A simple but robust machine technology is used. Without reducing the high quality of the end product the use of sensitive robot technology is not required.

The use of an innovative laser and shuttering technique assures a high level of accuracy and quality. Reymann Technik supports in planning and realization of concrete transport, product storage and transport logistic.

Hall planning

- Planning support and mentoring during the realization of the hall and all necessary construction work, including crane, building service, etc.
- Support in construction management

Performance RT:

General contractor
- Planning
- Construction services
- Delivery
- Assembly
- Commissioning
- Know-how transfer
- Project management
Technical office and CAD

- Development and optimization of a structural concept for double walls and lattice girder slab in an earthquake area according to Greek standards
- Optimization of standard solutions for a simplification of the technical adaption and building permission
- Training of the employees with the new production specific CAD software and mentoring during the planning for the first buildig project
- Support during restructuring of the technical office

Production

- Training of the employees before and during production start
- Production accompanying within the first weeks, with:
  - Safety-related instructions
  - Concrete technical adaptations
  - Optimization of machines and system control
  - Initiation of quality assurance
  - Daily enhance

Precast element assembly

- Organization of all necessary assembly utilities
- Assembly training of the employees, also regarding safety-related requirements
- Support of the construction management during the first assembly

Summary

The customer produces precast parts to supply the own company for the construction of houses ready to use.

The previous production could not accommodate demand in precast parts anymore. The customer decided to assign Reymann Technik as a general contractor. Reymann Technik’s additional service offered the customer:

- Independent planning
- Support in construction site management
- Support during the complete organization of the assembly, commissioning and the first weeks of production
- Quick enhancement of the output
- Technical assistance for the introduction of the new products lattice girder slabs and double wall in all division
Features of the plant

Plant capacity:
400 m² solid wall/shift

Hall:
Area 2.400 m², Clearance 7,59 m

Personnel:
14 employee/shift (wall)

Base for plant concept

- Existing hall
  Length x width 127 x 25 m
- Portal frame moveable inside the hall
- Existing pre-stressing line for hollow core slab production
- Available net area for the plant:
  Length x width 155 x 7 m!

Plant concept

- Solid wall 127 – 254 mm
- 24 pallets L/W 13,0/4,02 m
- Vertical circulation with a width of only 7 m!
  - Automated rack feeder
  - Curing chamber for 14 pallets
    + max. 5 pallets inside curing chamber tunnel
  - Lift off at ±0,00
  - Automated lifting station
  - Moulding at +1,15
  - Reinforcement at +1,15
  - Lowering station
  - Concreting, compating and smoothing at ±0,00
  - Pre curing tunnel at ±0,00 m
- With tilting bypass station
- With Laser projection
- Concrete transport via bucket conveyor

Conclusion:
The „smallest circulation“ plant for wall thickness up to 3,54 m! Target was to reduce employee cost by increasing production quality.

Performance RT:

General contractor
- Planning
- Construction service
- Delivery
- Assembly
- Commissioning
- Project management

Circulation on tunnel +1,15 m

Concrete transfer station

Concreting station
Solid Wall Plant

Features of the plant

Plant capacity:
700 m² solid wall/shift

Hall:
Area 5,600 m², Clearance 10,80 m

Personnel:
20 employee/shift (wall)

Plant concept

- Solid wall 100 – 350 mm
  element height up to 1,200 mm
- 40 pallets L/W 13,5/4,35 m
- Fixed shuttering side adjustable to different heights
- Magnet shuttering system flexible inside 25 mm-raster from 100 up to 350 mm
- Pre demoulding directly after smoothing, through this less shutterings are required
- Pallet lines for reinforcement
- Stations placed on the curing chamber
- Tilting bypass station
- Churing chamber tunnel for 5 pallets, to generate a puffer (pre-curing before smoothing)
- Smoothing line with 2 helicopter leveling device working area for 4 pallets
- Inside the hall stacking and interim storage for precast elements
- Option: double wall

Summary

As demanded by the customer production capacity should increase up to 40 elements per day.
Realized capacity:
- 36 pallets
- 42 walls
- 870 m² wall
- 146 m³ concrete
- 20 employees
- 10 hours
Requirement of the custumer a smoothed surface with high quality.

Conclusion:
Optimum production results with high quality and quantity are produced. The planed systems with curing tunnel, smoothing line, and demoulding after smoothing increases the efficiency considerably.

Performance RT:

- Planning
Features of the plant

**Plant capacity:**
500 m² solid wall/shift

**Hall:**
Area 5.000 m², Clearance 12 m, Platform 880 m²

**Personnel:**
Minimum 18 employees/shift (dependent on the degree of difficulty of the final product)

Plant concept

- Flexible circulation plant for highly complex solid walls or other solid walls/special parts
- Optimum production of sandwich walls is possible
- Production with SCC is possible without vibration station
- Shuttering handling devices for moulding and demoulding
- Moulding with laser projection
- Solid wall production 150 – 200 mm, Option: 100 – 300 mm
- 3 Smoothing stations with two remote controlled helicopter smoothing devices and power trowels for highly smooth surfaces
- 40 pallets L/W 13,50 m/4,35 m extendable up to 60 pallets
- Possibility to load up to 5 in-loader pallets at the same time inside the hall
- Flexible shuttering in height and length with reinforcement through the suttering
- Production main computer for the automatic control of product specific cycle for the pallets through the circulation plant

Special service

- Organization and accomplishment of construction works
- Complete supply and installation of inserts
- Supportive production management over several weeks after commissioning
- Support with the adjustement of a new date interface between the in-house CAD-software and the host

Performance RT:

General contractor
- Planning
- Construction service
- Delivery
- Assembly
- Commissioning
- Project management

Example for planning and optimised workstation for the demoulding and moulding
Concrete distributor with opposite working tandem levelling beams

Tilting and bypass station - option: second tilting station

Lift off station and pallet for inloader transport

Hanging rack feeder

Hanging rack feeder moving a pallet in the curing chamber

Tilting station with beams as mechanical stop and bypass station

Moulding station for shuttering with cleaning and oiling machine for pallets

Shuttering storage and worktable for the shuttering

Shuttering screwed onto the tilting side of the pallet

Shuttering handling crane - demoulding

Flexible shuttering system with connecting reinforcement

Detail: connecting reinforcement with wire loops

Shuttering handling crane - moulding

Detail: connecting reinforcement with bar system

Solid wall with connecting reinforcement

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Features of the plant

Plant capacity:
320 m² double wall/shift

Hall:
Area 3.200 m², Clearance 11 m

Personnel:
10 – 16 employee/shift

Plant concept

- Flexible production of several products at the same time
- Automatic shuttering robots for two shuttering systems
- Shuttering handling device
- Automated steel processing
  Option: reinforcement robot
- Quality control with laser projection
- Automated concrete distributor
  Option: second concrete distributor
- Two compacting units
- 4 independent pallet stations for special works and finishing
- Double wall 180 – 400 mm,
  Core insulated double wall,
  Solid wall 100 – 200 mm, lattice girder slab
- 40 pallets L/W 12,60 m/3,65 m

Performance RT:
- Planning
- Know-how transfer
- Project management
Example

The existing plant was built at the beginning of the 90’s. A huge part of the machines did not correspond to today’s technical standard. Repeating interruptions led to an interference of the production.

The goal of the cooperation with Reymann Technik was the modernization of the plant in order to guarantee a long-term competitiveness.

All upgrading actions took place during current production.

Planing steps

- Phase 1
  Analysis of actual condition at the plant considering safety and economic aspects, production and organizational aspects
- Phase 2
  Suggestion of rationalization with compilation of the corresponding investment costs
- Phase 3
  Planning, realization and commissioning

Activities

The most important modification and modernisation actions were:

- New and optimized rack feeder
- New circulation control system with process control and production retracement
- Main computer production
- Laser projection for moulding and quality control
- Automated coil wire rotary straightener and cutter and lattice girder processing
- Automated shuttering transport, cleaning and oiling
- Optimization of the production process
- Optimization of the shuttering system
- Enhancement of the production capacity
- Reducing production cost

Performance RT:

- Analysis
- Planning
- Project management

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Features of the plant

**Plant capacity:**
320 m² solid wall/shift
960 m²/day

**Hall:**
Area 4.750 m², Clearance 15.6 m

**Personnel:**
12 employee/shift

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**Plant concept**

- Solid wall 140 mm
- Wall height up to 3.400 mm
- 8 outer molds (stationary)
- 20 inner molds L/V 11,0/3,4 m moveable + concreting from both sides
- Adjustable wall height on height adjustable floor
- Moveable face-sided shuttering at the inner mold
- Magnet shuttering inside
- Transport of inner mold with a central travelling platform between work stations:
  - outer mold/concreting/curing
  - Puffer station/curing
  - Lift-off station
  - Moulding station
  - Reinforcement station
- Fill in concrete from above via concrete distributor

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**Summary**

Production of all sides smooth solid walls.
A wall which is smaller at the top is to realize.

Requirement: producing walls with less tolerance.
Concrete surface with a good quality and without any reworking.

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**Performance RT:**

- Planning
Features of the plant

Plant capacity:
120 m² sandwich wall in 2 x 8 hours

Hall:
Area 380 m², Clearance 7,59 m

Personnel:
4 employee/shift

Plant concept

- Wall thickness 60 - 420 mm
- Wall height up to 3,500 mm
- 1 pair of outer mold (moveable)
- 3 Inner mold L/W 9,0/3,5 m moveable + concreting from both sides
- moveable face-sided shuttering at the inner mold, useable for all wall thicknesses without adjustment works
- Adjustment of wall height via magnet shuttering from the top
- Magnet shuttering inside
- Heating system inside the inner and outer mold
- Transport of concrete via pump UPP and inlet UCI from the bottom
- Work station system for vertical preparation of reinforcement including sandwich insulation with all connections

Performance RT:
- Planning

RATEC:
- Delivery
- Assembly
- Commissioning

Concrete transport via pump

Work station system for insulation and reinforcement processing
We have lead of 2 generations in terms of experience and we can therefore design a higher level of success.

We are the oldest engineering consultancy to concentrate on the development and implementation of modern prefabricated concrete component plants, which means that Reymann Technik is capable of achieving much more than other planning offices or mechanical engineering companies.

Our customers profit from leading terms of experience, which guarantees a high security of investment. By being independent of machine manufacturers, we are able to perform, ruthless, process analysis and to implement a manufacturing concept which is tailored solely to the success of our customers. Taking our job seriously, loyal partnership and absolute cost-utility transparency form the basis of our company policy, as practised daily. Our customers know and have experienced, that Reymann Technik can be relied upon.

Our engineers will be happy to advise you without obligation.

Before you can enjoy success, you need dialogue. Reymann Technik offers you the opportunity of holding an initial dialogue on your premises, with no obligation. You will receive the stimulation needed for positive advance of your intentions. We do not conduct sales talk, but hold constructive discussions about the chances and risks of the prefabricated concrete component works of the future - which means your concrete works.

We want to stimulate you into having ideas which are to benefit to you. We would be happy to have the chance of making a vital contribution to your success too.