SLIPFORM ENGINEERING

CASE STUDY

Wymington Digester Tanks and Gladstone Dock Silos

RC Base Slabs and Slipformed Walls Delivered at Scale

Slipform Engineering delivered two consecutive reinforced concrete silo programmes through engineering-led planning, logistics control and disciplined self-delivery.

Project	Delivery Snapshot
Wymington	5 silos; base slabs from 1 July to 23 July; walls slipformed from 4 August to 9 August; 3,500m3 concrete; 1200 tonnes reinforcement.
Gladstone Dock	4 silos; base slabs from 18 August to 19 September; walls slipformed from 28 August to 16 October; 12,000m3 concrete; 2,500 tonnes reinforcement.

Delivering major reinforced concrete structures through planning, logistics and self-delivery

Slipform Engineering delivered two consecutive high-intensity reinforced concrete silo projects by applying the same core principle on both schemes: engineering-led planning, logistics control and disciplined self-delivery.

At Wymington, for Wykes Engineering, the challenge was to construct five large reinforced concrete digester structures within a tightly constrained footprint using a single oversized slipform operation. At Gladstone Dock, Liverpool, the challenge evolved into delivering a major silo development within a live, constrained dockside environment, while maintaining programme continuity immediately after completing Wymington.

Taken together, the two projects demonstrate a clear capability: large concrete structures, high reinforcement densities and substantial concrete volumes can be planned, controlled and delivered safely at pace when sequencing, logistics and site interfaces are engineered properly from the outset.

Slipform Engineering's delivery model is built around direct ownership of the critical path. We engineer, plan and self-deliver complex slipform structures using our own specialist rig and directly employed workforce. Where appropriate, we also act as Principal Contractor, removing interface risk and giving the client a single point of accountability.

Engineering-led planning before construction begins

Projects of this nature are won or lost long before the first concrete arrives on site.

Continuous slipform operations leave no room for reactive management. Reinforcement sequencing, formwork arrangements, jack loading, concrete supply, pump positioning, labour rotation, crane usage, welfare provision, access routes, rebar storage, lighting, supervision and emergency planning all have to be determined in advance. Once the rig starts, the structure does not wait for decisions to be made.

- Detailed construction sequencing
- Reinforcement fixing studies and access planning
- Concrete logistics modelling
- Temporary works coordination
- Crane, pump and storage zone planning
- Workforce shift planning
- Interface elimination through self-delivery
- Early identification of physical constraints affecting rig operation

1. Wykes Engineering Digester Tanks, Wymington

Project Overview

- 4 no. 26.8m diameter silos
- 1 no. 12.8m diameter silo
- 21m high reinforced concrete walls
- Approximately 370 linear metres of 400mm thick wall construction
- 186 hydraulic jacks operating concurrently
- Complex reinforced concrete base slabs incorporating reversed central cones

The structures were arranged within a highly constrained footprint of approximately 58m x 58m, supported by carefully planned craneage, pedestrian access, reinforcement storage, welfare, plant movement and concrete placing arrangements.

The Challenge

The defining challenge at Wymington was not just structural scale. It was the requirement to execute that scale simultaneously within a confined site.

A conventional approach would likely have split the works into sequential phases, moving rig resources from one structure to the next. Slipform Engineering instead engineered a methodology to construct all five silo walls together in a single oversized slipform rig.

- All reinforcement sequencing had to be coordinated across five structures at once
- Concrete deliveries had to support uninterrupted multi-wall slipforming
- Site circulation had to function continuously despite the restricted footprint
- Craneage and pump positions had to be fixed around the rig geometry
- Labour numbers, welfare and supervision had to match the intensity of a 24-hour operation
- Rebar storage and handling areas had to be arranged so supply never became the bottleneck

The Solution

The Wymington base slabs were structurally demanding because they did not consist of simple flat circular slabs. They incorporated reversed central cones, requiring careful reinforcement sequencing, geometry control and concrete placement planning.

Slipform Engineering started the base slab works on 1 July and completed the base slab works on 23 July. That base slab phase created the platform for the following continuous wall operation and was a critical part of the overall programme.

Once the base structures were complete and ready, Slipform Engineering commenced the wall slipform phase at 7:00am on 4 August. The walls reached the full 21m height at 10:00pm on 9 August, meaning the wall operation was completed in approximately 5.5 days of continuous production.

- 3,500m3 of concrete
- 1200 tonnes of reinforcement
- 21m high walls
- Five structures slipformed simultaneously

Logistics and Planning

Confined footprint management

The silos were arranged tightly, with access, crane standing areas, pump locations, pedestrian segregation and material storage all having to coexist around the working rig. This demanded a carefully controlled site setup and strict discipline during both the base slab and continuous slipform periods.

Crane and pump reach planning

Concrete placement had to be engineered around the size of the rig, the wall geometry and the limitations of pumping and placing equipment at full height. This required detailed planning before the operation began, particularly because all five structures were being advanced simultaneously.

Labour density and welfare scaling

The workforce required for the slipform operation was significant, and welfare, shift rotation, supervision and access had to scale with the intensity of the programme.

Rebar handling and storage

Reinforcement supply was planned spatially as well as programmatically. Dedicated storage areas, access routes and lifting arrangements ensured reinforcement could be fixed continuously without interrupting progress on the base slabs or the wall pours.

Quality control under continuous operation

The project was monitored by Lloyd's Register throughout construction, with the completed works formally certified as compliant with its QA requirements.

Outcome

The Wymington project proved that Slipform Engineering could compress what would normally be a phased reinforced concrete programme into one tightly controlled continuous operation. The result was a major reduction in programme duration, removal of inter-phase downtime and earlier release of the structures for follow-on mechanical and process installation works.

2. From Wymington directly to Gladstone Dock

A key part of this case study is the continuity of delivery.

Slipform Engineering completed the Wymington works in August and then moved directly into the base slab and slipformed wall works at Gladstone Dock, Liverpool.

The same management philosophy, the same engineering-led planning approach and the same construction discipline that delivered the Wymington digester walls in 5.5 days was then applied again on a major dockside silo scheme over the following weeks.

Wymington was not a one-off. It was immediately followed by a second major concrete delivery phase at Liverpool, proving the model can be repeated across different sites, constraints and project conditions.

3. Gladstone Dock Silos, Bootle, Liverpool

Project Overview

At Gladstone Dock, Slipform Engineering was appointed as Principal Contractor for the design and build delivery of a major silo development for Novada Cement in Bootle, Liverpool.

The wider scheme comprises:

- 4 no. 20m diameter reinforced concrete silos
- Each slipformed to 41.83m height from base
- Piling, reinforced concrete base slabs and tower crane bases
- Roofs, ancillary slabs and associated structures
- Full internal fit-out
- Drainage, service routes and discharge infrastructure
- M&E installations, testing and commissioning
- Final surfacing and handover

Across the four silos, the principal reinforced concrete package for the base slabs and silo structures involved:

- 2,500 tonnes of reinforcement
- 12,000m3 of concrete
- 251 linear metres of walling
- Walls 800mm thick at lower level, reducing to 450mm above
- 8 no. 1000mm x 1000mm columns in the lower section of each silo, terminating during the slipforming sequence

The Challenge

If Wymington was about maximising simultaneous production inside a tight footprint, Gladstone Dock added a new layer of complexity: a constrained brownfield marine-side environment with multiple interfaces and a live industrial setting.

The project had to be coordinated around:

- Restricted access and circulation within a dockside site
- Existing infrastructure and buried services
- Marine-adjacent operational constraints
- Heavy lifting logistics and crane base planning
- Simultaneous management of piling, enabling works, RC works and follow-on packages
- Integration of permanent works with temporary construction operations
- Safe segregation of labour, plant, materials and ongoing industrial activity

This is where the value of acting as Principal Contractor becomes particularly clear.

By controlling design, temporary works, construction sequencing and subcontractor interfaces, Slipform Engineering could align the RC programme with the wider site logistics rather than treating concrete works as an isolated trade package.

The Solution

At Liverpool, the base slab programme began almost immediately after Wymington. Slipform Engineering poured the first silo base slab on 18 August and completed the last base slab on 19 September.

That means the company moved directly from completing the Wymington wall operation into a new phase of heavy reinforced concrete base slab delivery in Liverpool.

The wall programme then progressed in a tightly sequenced manner:

- Slipforming of Silo 1 walls started on 28 August
- Silo 1 walls were completed on Thursday 4 September
- No Sunday working
- Final Silo 4 walls were completed on Thursday 16 October

This demonstrates a sustained period of repeat slipform delivery across multiple silos over approximately 6 to 7 weeks, following directly on from the base slab phase.

That continuity is one of the most powerful aspects of the Liverpool project. It shows that the team did not merely achieve one successful slipform event. It repeatedly mobilised, sequenced and delivered major wall pours across four silos while maintaining progress on the surrounding scheme.

Structural Complexity and Planning

The Liverpool wall design introduced a different kind of technical challenge from Wymington.

Where Wymington centred on simultaneous five-silo operations at 400mm wall thickness, Gladstone Dock required:

- 800mm thick walls at lower level
- Reduction to 450mm thickness above
- Integrated 1m x 1m lower-level columns
- Rig adaptation at approximately 8.630m height
- Coordination of the point at which the columns terminated during the slipforming process

For a continuous slipform operation to remain stable and accurate through a wall-thickness change and column termination zone, the following had to be resolved in advance:

- Rig reconfiguration method
- Sequence of reinforcement changes
- Shutter and yoke modifications
- Temporary works checks
- Concrete placement consistency
- Dimensional control through the transition
- Workforce briefing and shift continuity
- Supervision and QA hold points

Tower Crane Strategy and Rig Turnaround

A further critical part of the Gladstone Dock delivery strategy was the early selection of the tower cranes. This was not simply a lifting plant decision; it was a programme, safety and construction methodology decision.

The roof steelwork package had been designed around major individual lifts, with the principal roof steel element for each silo weighing approximately 30 tonnes. The tower crane selection therefore had to ensure that each roof steel assembly could be lifted and installed into position in a single lift per silo, avoiding the

need for piece-by-piece assembly at height.

The preliminary crane plan identified two large tower cranes for the scheme: TC1 WOLFF 700 B and TC2 WOLFF 630 B, both with 45m jib lengths and 52.7m tower heights, with lifting capacities shown up to 30.4 tonnes at 25m radius and 29.1 tonnes at 25m radius respectively. These crane capacities were a critical enabler of the proposed lifting strategy.

This crane strategy was fundamental to making the roof installation both safe and efficient. By enabling each major roof steel section to be lifted into place in one operation, the works avoided unnecessary secondary handling, reduced time spent working at height and simplified the interface between the concrete and steelwork phases. In practical terms, the crane selection gave the project a cleaner and more controlled roof installation sequence.

The benefit of the larger tower cranes extended beyond the roof steelwork. The same lifting strategy also supported the dismantling and relocation of the slipform rig between silos. Once each silo wall pour was complete, the cranes had sufficient capacity to dismantle the rig at the top of the structure in 4 no. full three-deck rig section lifts, each weighting 17.5 tonnes. That significantly reduced the amount of piece-by-piece breakdown required at height and allowed the rig to be transferred and rebuilt much more efficiently on the next silo base.

This had a direct programme advantage. By engineering the crane selection around both the roof steel lifts and the rig relocation sequence, Slipform Engineering minimised the turnaround period between silos to just four days from the end of concrete on one silo to the start of concrete on the next. On a multi-silo scheme, that level of turnaround efficiency is highly significant. It reduced non-productive time between slipform campaigns, maintained momentum across the sequence of four silos and helped preserve overall programme certainty.

Outcome

Slipform Engineering demonstrated that large reinforced concrete silo structures can be delivered at scale through a controlled rolling programme. The Liverpool project highlights the company's ability to maintain programme momentum across consecutive major projects, deliver large quantities of concrete and reinforcement in a constrained environment, manage complex interfaces as Principal Contractor and execute repeat slipform operations with consistency and control.

4. The common thread: logistics and planning as the real enabler

A. The build is won in pre-construction

At both projects, performance depended on solving the construction sequence before site execution began. Reinforcement, pumping, crane usage, access, labour, welfare, storage and shift planning were treated as engineering exercises, not site-level assumptions.

B. Site logistics must be engineered around the concrete operation

At Wymington, access, crane placement, pump standing areas, rebar storage and pedestrian routes had to be organised around a simultaneous five-silo rig within a compact footprint. At Liverpool, the same

philosophy had to operate inside a far more complicated dockside environment with multiple interfaces and live-site constraints.

C. Self-delivery removes interface risk

Because Slipform Engineering delivered the critical reinforced concrete works with its own workforce and its own rig, the company retained direct control over programme, sequencing, safety and quality during the highest-risk phases.

D. High output is a result, not a starting point

The headline production figures are impressive, but they are the outcome of planning discipline: Wymington delivered circa 3,500m3 concrete and 1200 tonnes reinforcement, with base slabs from 1 July to 23 July and wall slipforming completed in 5.5 days. Liverpool delivered 12,000m3 concrete and 2,500 tonnes reinforcement across four silos over approximately 6 to 7 weeks.

5. Quantified delivery story

Metric	Wymington	Gladstone Dock
Base slab works started	1 July	18 August
Base slab works completed	23 July	19 September
Wall slipform commenced	7:00am on 4 August	28 August
Wall slipform completed	10:00pm on 9 August	16 October
Concrete volume	3,500m3	12,000m3
Reinforcement quantity	1200 tonnes	2,500 tonnes
Structures delivered	5 silos	4 silos
Geometry / height	21m high walls	20m diameter; 41.83m high
Wall build-up	400mm	800mm reducing to 450mm
Key delivery outcome	Five silo walls slipformed simultaneously in approximately 5.5 days	Four large silos delivered through a tightly sequenced base slab and slipform programme in a constrained dockside environment

Across the two consecutive schemes, Slipform Engineering demonstrated the ability to deliver major reinforced concrete structures at speed and scale: 15,500m3 of concrete and 3,700 tonnes of reinforcement in total across both projects.

6. Conclusion

Together, Wymington and Gladstone Dock provide a compelling demonstration of Slipform Engineering's capability in the delivery of major reinforced concrete structures.

- Deliver large volumes of concrete and reinforcement at pace
- Control complex base slab and slipform wall sequences
- Manage difficult site logistics and access constraints
- Adapt methodologies between very different project environments
- Provide single-point responsibility where required
- Convert engineering planning into reliable construction output

Slipform Engineering does not just design major concrete structures.

We plan them properly, control the interfaces and deliver them at scale.

Key Project Data

Wymington Digester Tanks

Item	Detail
Client	Wykes Engineering
Principal Contractor	Slipform Engineering Ltd
Location	Wymington
Project Type	Reinforced concrete digester tank construction comprising RC base slabs and slipformed walls
Number of Structures	4 no. 26.8m diameter silos and 1 no. 12.8m diameter silo
Structure Diameter	26.8m and 12.8m
Wall Height	21m
Wall Length	Approximately 370 linear metres
Wall Thickness	400mm
Base Slab Configuration	RC bases with reversed central cones
Base Slab Programme	1 July to 23 July
Wall Slipform Programme	4 August to 9 August
Concrete Volume	Approximately 3,500m3
Reinforcement Quantity	Approximately 1200 tonnes
Key Delivery Achievement	Five silos slipformed simultaneously in approximately 5.5 days within a constrained 58m x 58m site footprint

Gladstone Dock Silos

Item	Detail
Client	Novada Cement
Principal Contractor	Slipform Engineering Ltd
Location	Gladstone Dock, Bootle, Liverpool
Project Type	Reinforced concrete silo construction comprising RC base slabs and slipformed walls
Number of Structures	4 no. reinforced concrete silos
Structure Diameter	20m
Wall Height	41.83m from base
Wall Length	251 linear metres
Wall Thickness	800mm reducing to 450mm
Base Slab Configuration	Reinforced concrete silo base slabs for four 20m diameter silos
Base Slab Programme	18 August to 19 September
Wall Slipform Programme	28 August to 16 October
Concrete Volume	12,000m3
Reinforcement Quantity	2,500 tonnes
Key Delivery Achievement	Four large silos delivered in a constrained dockside environment through a tightly sequenced base slab and slipform wall programme immediately following completion of Wymington