Ferrybridge Multifuel 2 Project

SSE gained planning permission for the £330 million energy from waste facility in October 2015. FM2 is due to generate circa 90MW and will produce enough energy to power around 160,000 homes. The power plant is planned to be operational late 2018.

Careys Civil Engineering were awarded the RC and infrastructure package from main contractor Hitachi Zosen Inova in September 2016.

Presentation Agenda

- Technical Aspects
- Formwork
- Slipformed Structure
- Falsework
- Reinforcement
- Concrete
- Slipform Concrete
- Reference and Sample Panels
- Health & Safety
- Waste Bunker Time-lapse

Technical Aspects

Waste Bunker

- 85m x 45 m
- 330m of wall
- 28.900m high
- 185m3/ m
- 4500m3 total
- Geometric complexity
- 3D Modelling
- Temporary works
Ferrybridge Multifuel 2 Project

**Formwork**

**Designers**
- UK Slipform – Waste Bunker
- Peri – Lift Shaft
- Doka – Mass foundation edge shuttering
- RMD – Turbine Table edge shuttering

---

Ferrybridge Multifuel 2 Project

**Slipform**

- Slipform Build Commenced 5th December 2016
- Build - 6 weeks duration
- Slide to Level 2.500m - 1 day
- Install Hanging - 2 days
- Main Slide to level 25.100m – 11 days
- Adapt and Dismantle Rig – 15 days
- Slide to Level 28.900m – 2 days
- Slipform complete and removed from site on the 27th March 2017

**Challenges**
- Geometry: 3D model utilised
- Logistics
- Number of operatives
Ferrybridge Multifuel 2 Project

Falsework

Hopper Deck Truss Wall

- 24m high
- 65m long x 700 thick x 5.4m high
- 240kg reinforcement/m³
- RMD were awarded the contract to design soffit support systems
- 1200m² of falsework support

Ferrybridge Multifuel 2 Project

Reinforcement

- Total project tonnage: 5000 Tonne
- 800 Tonne installed within Slipform Works
- Supplier: BRC

Challenges

- Bar length and diameter breaching manual handling regulations.
- Congestion of reinforcement
Concrete

- Total cubage on site 40,000
- 9 Mix designs approved – C40/C60/Air Entrained/Fibre Concrete
- Site specification determines a set of 6 cubes be taken every 40m³ pours
- Strike cubes taking separately to allow stripping of False/Formwork
- Hydration monitored with Thermal Couplers
- Maximum pour size 850m³

Ferrybridge Multifuel 2 Project

Concrete - Waste Bunker (Slipform)

- Hanson awarded contract to provide on site batching plant to provide 4500m³ on 24 hour working cycle. (Max 45 m³/hr)
- Placement
  - Wall thickness 500mm-700mm
  - 4 mobile concrete pumps
  - 90 Concrete operatives per day
  - 1 layer of 100mm per hour
  - Average 350m³ per day
Mix Designs - Waste Bunker (Slipform)

- Concrete specified was C32/40
- 3 mix designs approved for variants in ambient temperature
- Approved mix designs tested for setting times.
- 460 kg Cement/Combination content in each design.
- DC Classification relaxed from DC4 to DC3Z allowing the GGBS content to drop below 70%
- GGBS content 42%-55% in acceptable mixes
- Concrete strength of 0.2 n/mm² required to allow slip form process.
- Sika P180/VS1000 Admixtures used to manipulate setting times.

Reference Panel

Finish
- Waste Bunker Walls agreed finish from Ferrybridge Multifuel 1 (Adjacent project)
- Slabs- Reference Panels cast on site agreed prior to construction

Trial mixes
- Setting time suitability for method of construction
Health & Safety

- CCE employed up to 5 full time HSE advisors at labour peak
- Pictorial Method Statement produced to assist Operative understanding
- Managers and Operatives competently trained and familiarised
- Daily co-ordination with all site contractors