KIER · Considerate Constructors Associate · ARUP · Austin·Smith:Lord · Coleg y Cymoedd · MOTT MACDONALD · Llywodraeth Cymru Welsh Government · exemplar

Coleg y Cymoedd

- Introduction
  - Gordon Brown - Director - CEW
- Introduction to the Project
  - Paul Davies - Executive Director of Resources - Coleg y Cymoedd
- Project & Site Constraints
  - Alun Owen - Project Manager - Mott Macdonald
- The Collaborative Engineered Solution
  - Tim Young - Lead Architect - ASL
- Overcoming the Challenge
  - Mark Poole - Project Manager - Kier Construction
- Closing Statements, Q&A
  - Gordon Brown - CEW
- Site Tour

exemplar.org.uk

Coleg y Cymoedd – New Aberdare Campus

Monday 6th March 2017

ADEILADU ARBENIGRWYDD YNG NGHYMRU

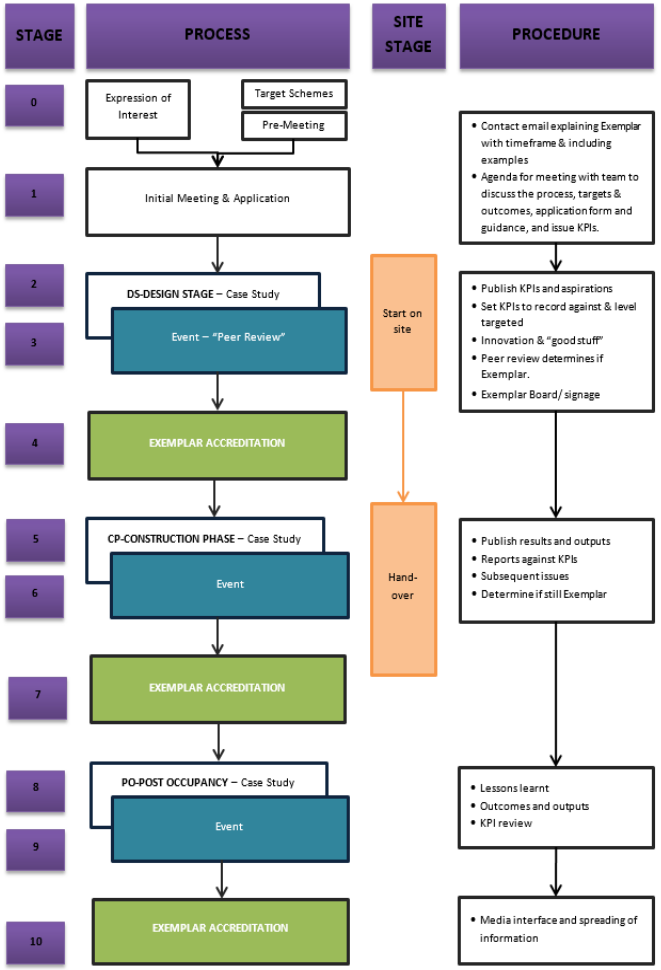
CONSTRUCTING EXCELLENCE IN WALES

Noddir gan Lywodraeth Cymru
Sponsored by Welsh Government

Wholly funded by Welsh Government to help to improve the performance of the construction industry across Wales, by sharing and learning from best practice

Exemplar Programme

- Case studies at 3 key stages
  - Design Stage – Intent
  - Construction Phase – Delivery
  - Post Occupation – Outcomes
- Peer Review
- Evidence based i.e. KPI's

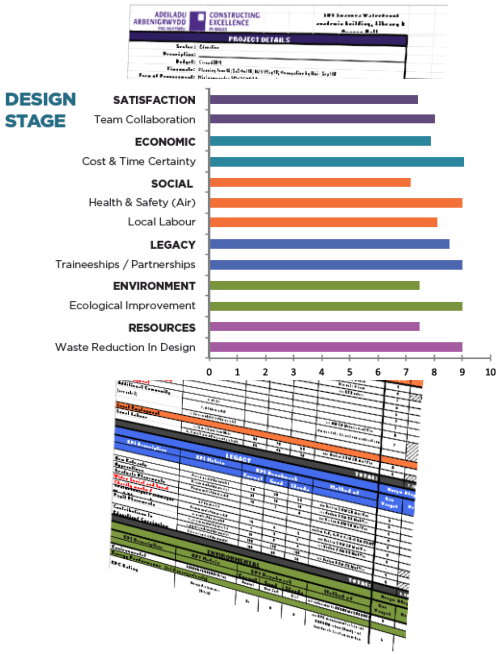


KIER · Considerate Constructors Associate · ARUP · Austin·Smith:Lord · Coleg y Cymoedd · Mott MacDonald · Llywodraeth Cymru Welsh Government · exemplar

exemplar.org.uk

Case Studies

KPIs



Events & Awards

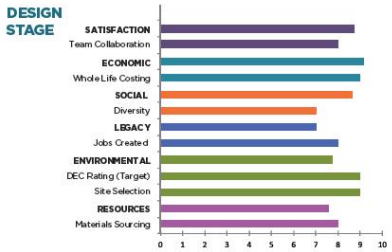
KIER · Considerate Constructors Associate · ARUP · Austin·Smith:Lord · Coleg y Cymoedd · Mott MacDonald · Llywodraeth Cymru Welsh Government · exemplar

Coleg y Cymoedd

- Peer Review of Coleg y Cymoedd
- Exemplar & Innovation in what ways?
- Yellow for collected at the end

DESIGN STAGE **CASE STUDY**

exemplar.org.uk



The new £20m Coleg y Cymoedd campus in Aberdare has been part-funded (50%) by the Welsh Government and is a priority scheme in the 21st Century Schools Programme. The new campus will open in September 2017 providing variety of practical workshops in carpentry, brickwork, plumbing, electrical, catering courses, hair and beauty spaces, and student facilities to replace those on the existing campus and offer new facilities.

The project also includes the refurbishment of the existing disused railway station building and car parking facilities for the college including local road upgrades. The project is set to achieve BREEAM Excellent, an accolade that demonstrates the combined team commitment to sustainability.

To ensure the scheme was feasible, a number of site related challenges needed to be overcome. These included dealing with contaminated land, and the nearby river leaving the proposed site on a flood plain. A collaborative engineered approach by Kier and the design team provided a workable solution, providing cost certainty, and delivered within the required timescale.

Procured under the SEWSCAP 2 Framework, Kier have been appointed under an initial pre-construction services appointment to develop the design and market test packages to achieve an agreed contract sum.

PROJECT DETAILS

Client:	Paul Davies, Coleg y Cymoedd
PM:	Alun Owen, Mott MacDonald
Contractor:	Mark Poole, Kier Construction
Designer:	Tim Young, Austin Smith Lord
Structures:	Marvin Owens, ARUP
M&E Design:	Lorne Stewart / ARUP
Value:	Circa £16m construction cost
Project size:	5,800m²
Contract:	NEC Option A (Priced Contract with Activity Schedule)
Duration:	64 weeks

KEY CONTACTS

Gordon Brown - CE Wales
gordon.brown@cewales.org.uk

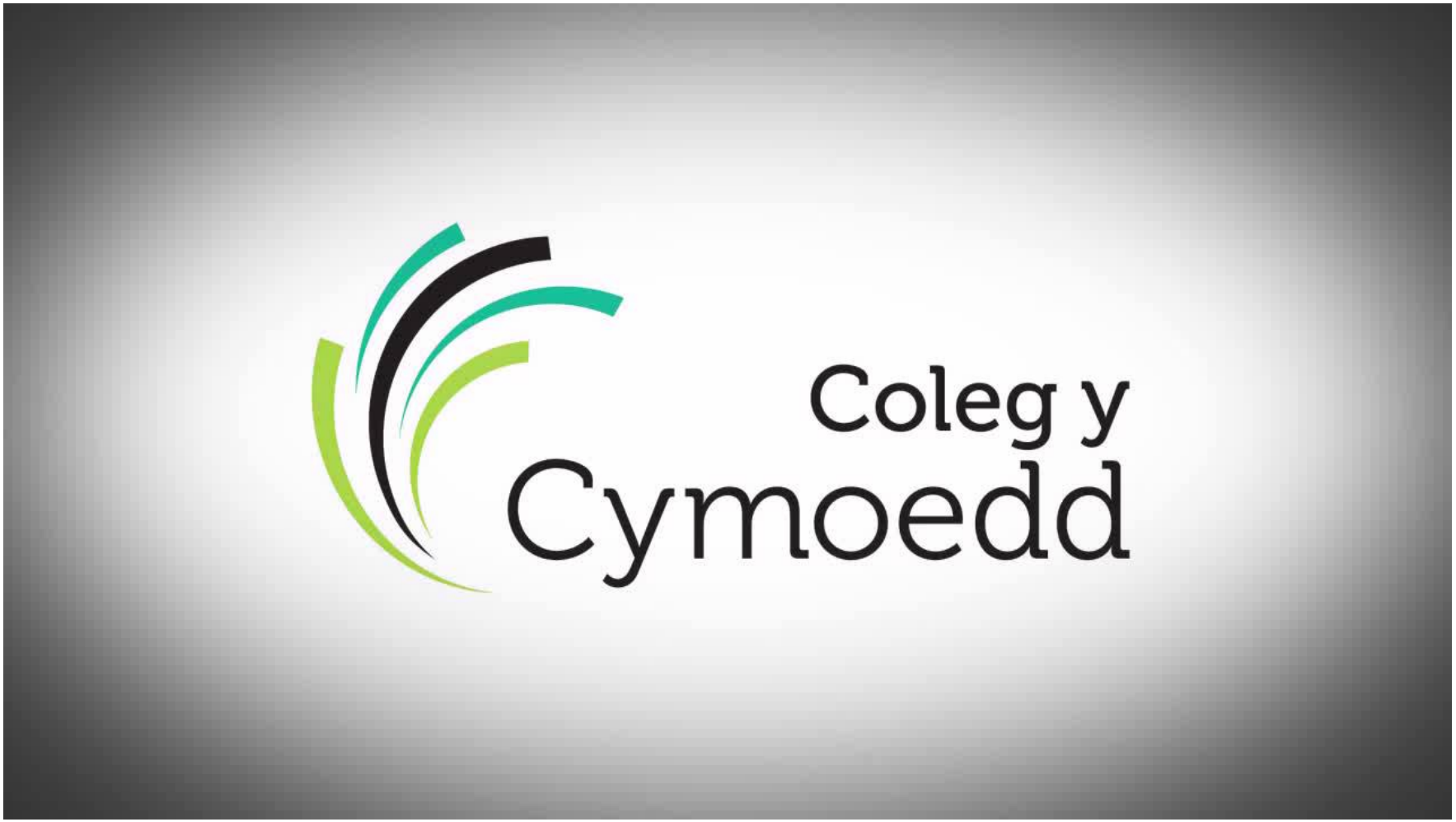
Paul Davies - Coleg y Cymoedd
paul.davies@cymoedd.ac.uk

KIER · CONSIDERATE CONSTRUCTORS ASSOCIATE · ARUP · Austin·Smith:Lord · Coleg y Cymoedd · MOTT MACDONALD · Llywodraeth Cymru Welsh Government · exemplar

Coleg y Cymoedd

- Introduction to the Project
  - Paul Davies - Executive Director of Resources - Coleg y Cymoedd

Coleg y Cymoedd



KIER · Considerate Constructors Associate · ARUP · Austin·Smith:Lord · Coleg y Cymoedd · Mott MacDonald · Llywodraeth Cymru Welsh Government · exemplar

Coleg y Cymoedd

- Project & Site Constraints
  - Alun Owen - Project Manager - Mott Macdonald

Procurement & Programme

- Project & Commercial Managers - Mott MacDonald Limited
- Principal Contractor - Kier Construction Limited
- Architectural Design – Austin Smith Lord
- Civil, Structural, MEP Design - Arup
- Form of Contract – NEC Option A (Activity Schedule)
- Enabling Works - 10 weeks
- Construction Period - 64 weeks
- Project Value - £22 million

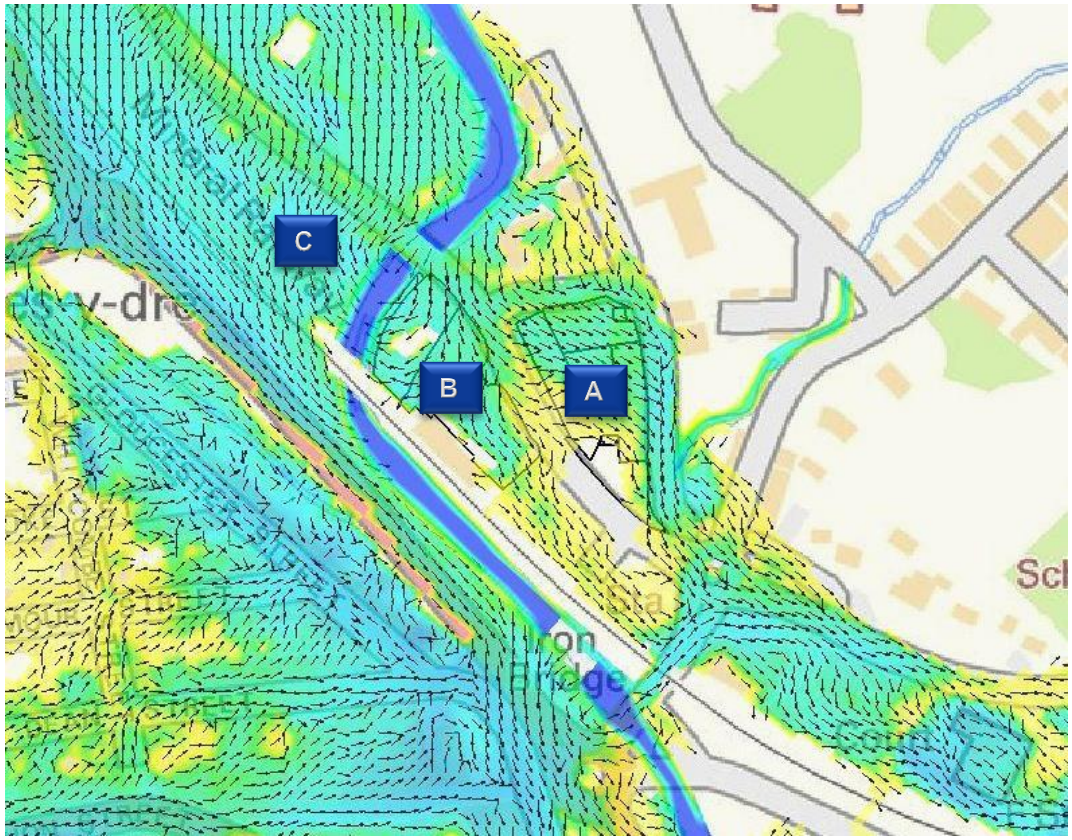
Site Analysis

- River Cynon
- Transport
- Frontages
- Orientation
- Access

KIER · Considerate Constructors Associate · ARUP · Austin·Smith:Lord · Coleg y Cymoedd · Mott MacDonald · Llywodraeth Cymru Welsh Government · exemplar

Site Constraints

- Flooding
- Contamination
- Site Services
- Ecology
- River (Sinc)
- Railway Line
- Culvert
- Highways
- Neighbouring Properties
- Station Building
- Risk & Cost Management

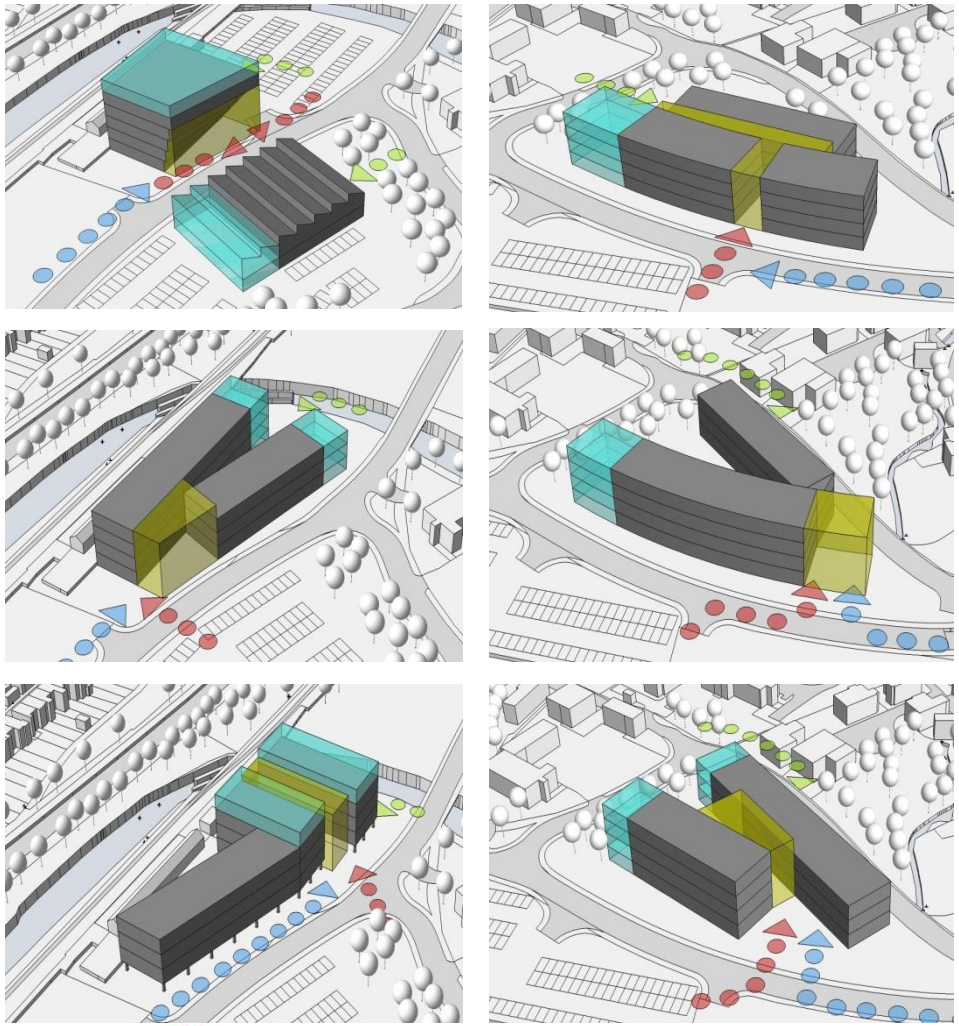


Coleg y Cymoedd

- The Collaborative Engineered Solution
  - Tim Young – Lead Architect – Austin Smith Lord

Feasibility Options

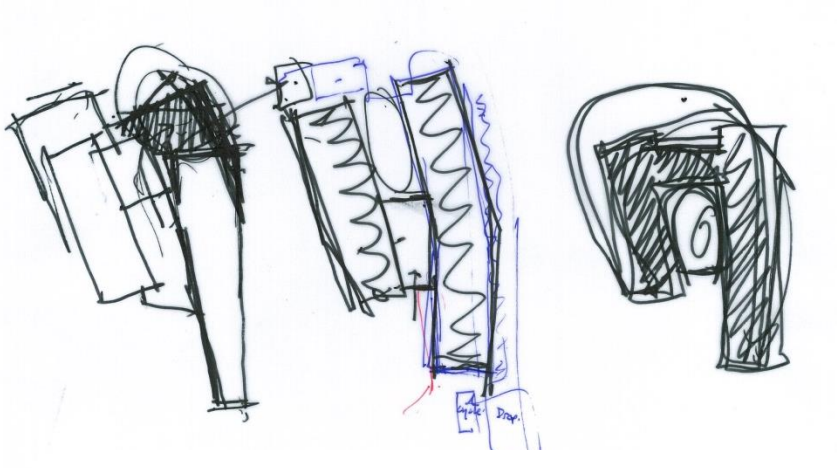
- Options considered for Sites A & B
- Site C added to provide extra car parking space
- Site A preferred



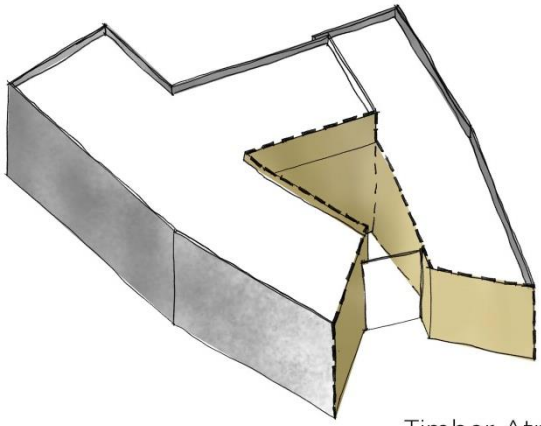
KIER CONSIDERATE CONSTRUCTORS ASSOCIATE ARUP Austin·Smith:Lord Coleg y Cymoedd MOTT MACDONALD Llywodraeth Cymru Welsh Government exemplar

Preferred Concept

- Massing – stepped 3 and 4 storey
- Form wrapped around an atrium to create a heart space
- Entrance facing new piazza and main approach to site
- Materials – timber and metal



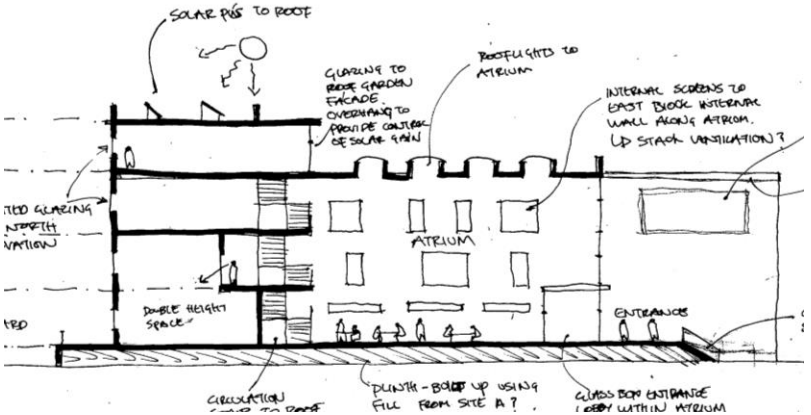
Metal Wrap



Timber Atrium cut away

Preferred Concept

- Site layout / arrangement
  - Entrance
  - Service yard
  - Car parking / drop off
- Building elevated on podium

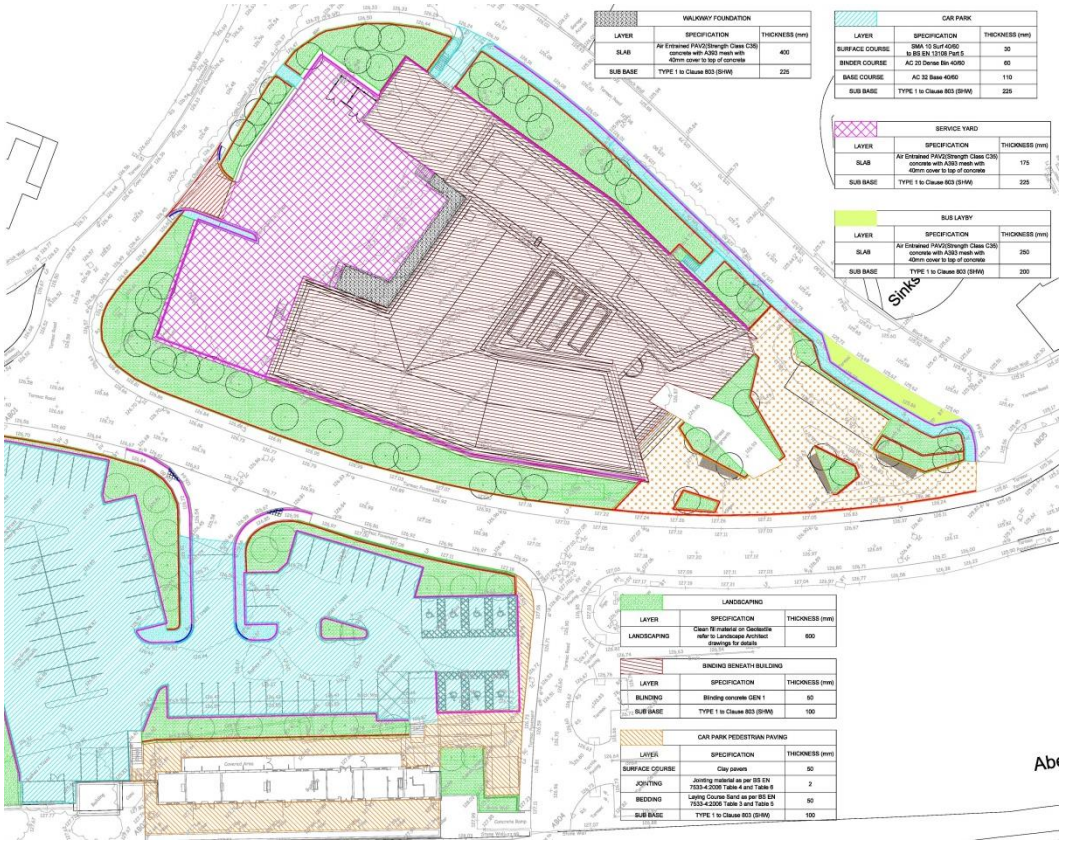


Constraints - Site Layout & Landscape

- Buffer zone
- Existing culvert
- Existing sewer
- Highways
- Railway line
- Noise
- Gas main

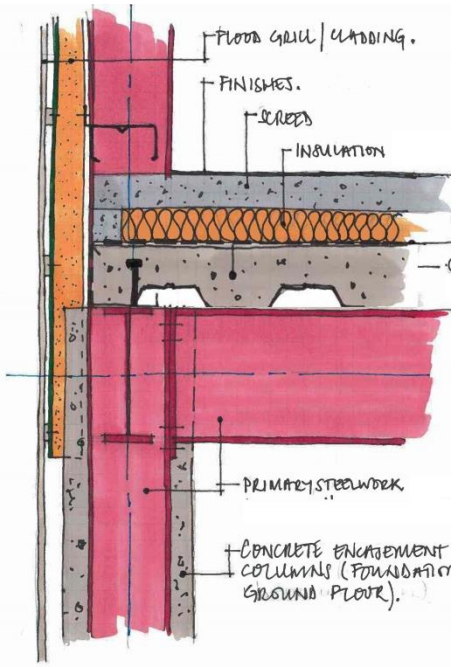
Constraints - Design Impacts

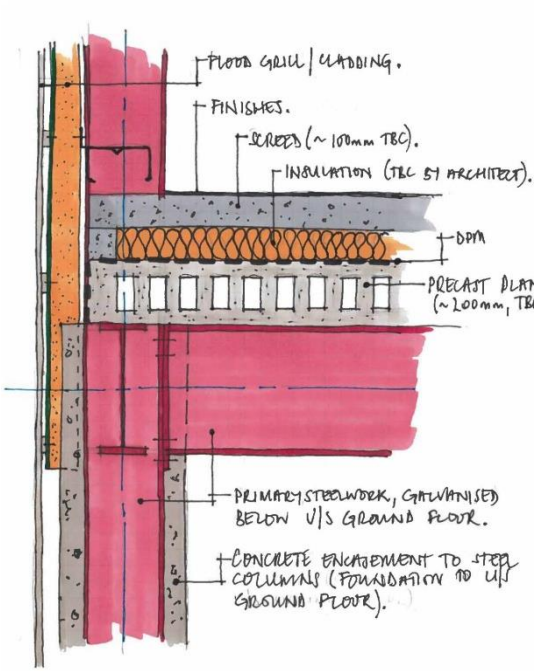
- Raised building to accommodate flood water flow, structure to have minimal impact on flood flows
- Ground levels typically needed to return to existing following construction, including below the building
- Under croft to be formed and to be open, secure and maintenance free
- Ground floor supporting structure to be maintenance free due to limited / no access
- Short construction programme



Design - Frame Options

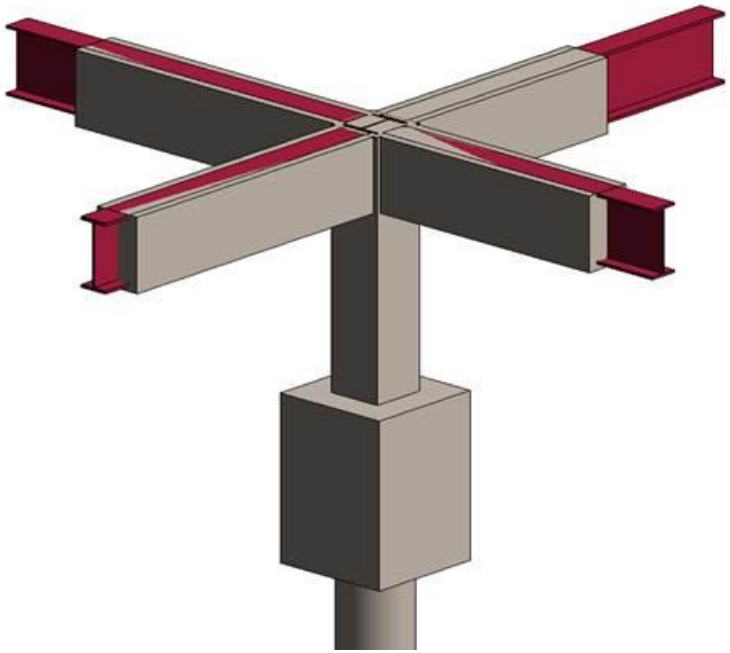
- Concrete – Ruled out pretty much straight away due to programming issues and formwork
- Steel / Concrete hybrid – not possible to form a concrete podium due to under croft levels
- Steel frame with composite beams and in-situ concrete decks
- Ground floor options
- Precast hollow-rib slab with structural screed
- Sacrificial re-entrant deck, assuming composite beam design





Design - Steel Protection to Ground Floor

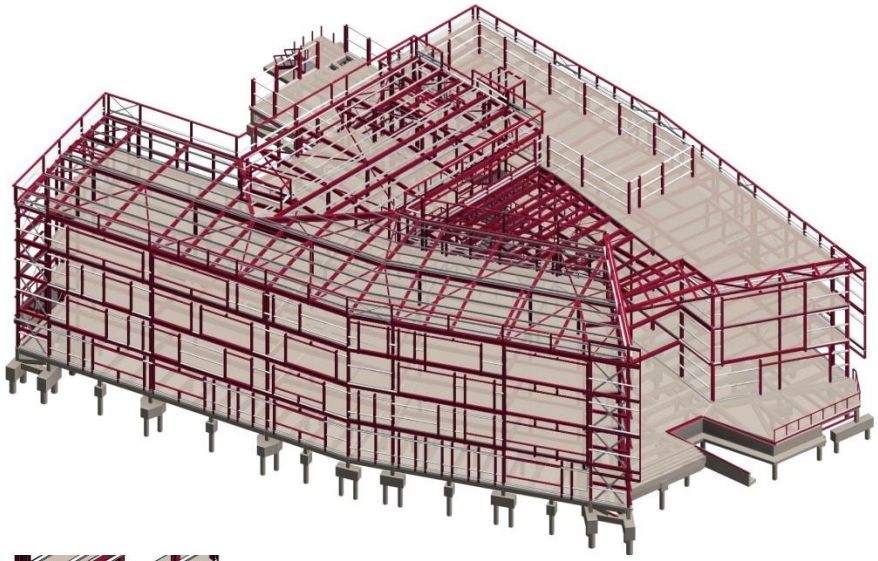
- Corrosion protection:
  - Standard shop applied corrosion protection
  - Galvanised corrosion protection to steelwork
  - Fully concrete encased steelwork

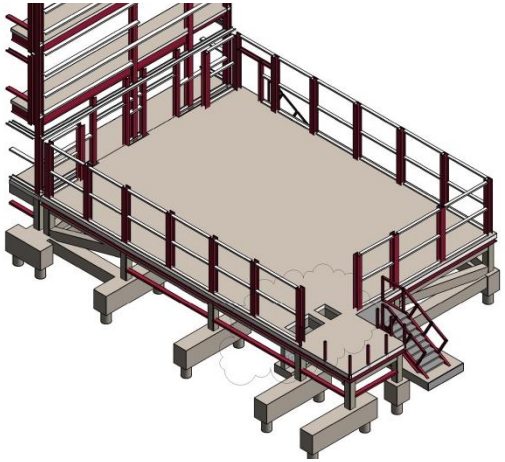


- Fire protection
  - Fire boarding
  - Intumescent paint
  - Fully concrete encased steelwork

Design - Structural Solution

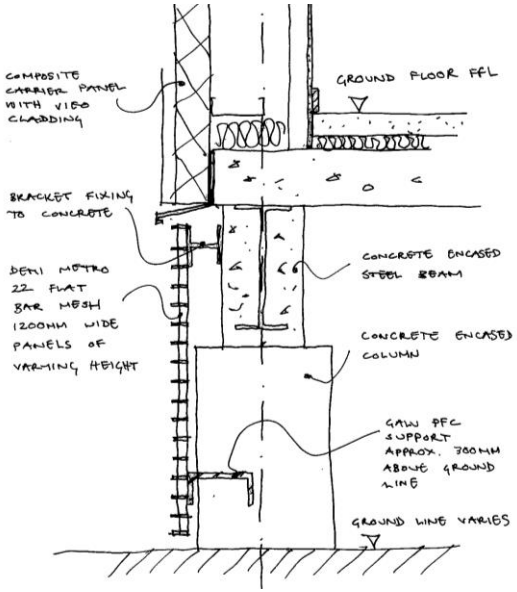
- Steel frame, braced around stair cores
- Precast stairs
- 150mm thick in-situ concrete slab on standard trapezoidal decking to upper levels, beams designed compositely
- 200mm thick insitu concrete slab on re-entrant decking at ground floor, beams designed as composite, slab designed as one-way spanning slab
- Fully concrete encased steelwork below ground level to provide corrosion and fire protection

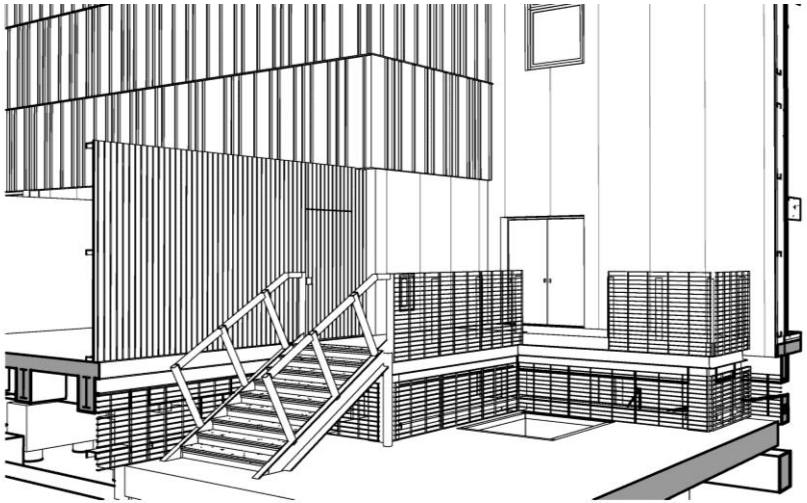




Design - Undercroft

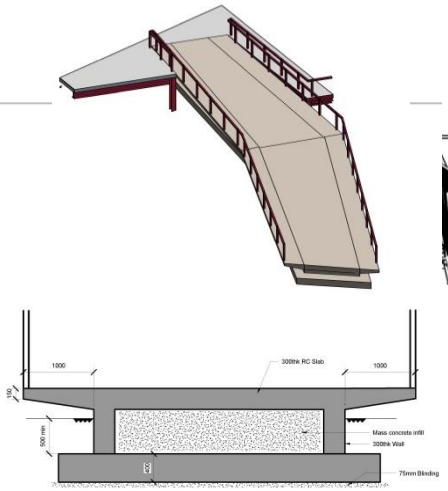
- Perimeter grating – security and protection
- Minimise maintenance requirements
- Unobstructed flow of water

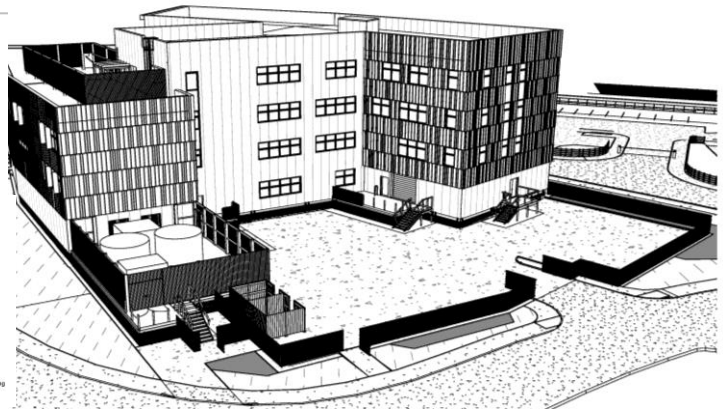


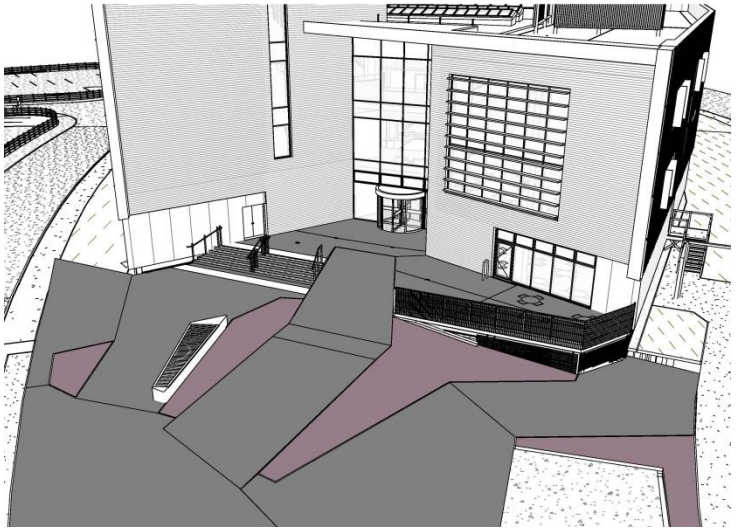


Design - Access

- Entrance ramp and steps
- Raised terrace
- Means of escape
- Delivery / service yard





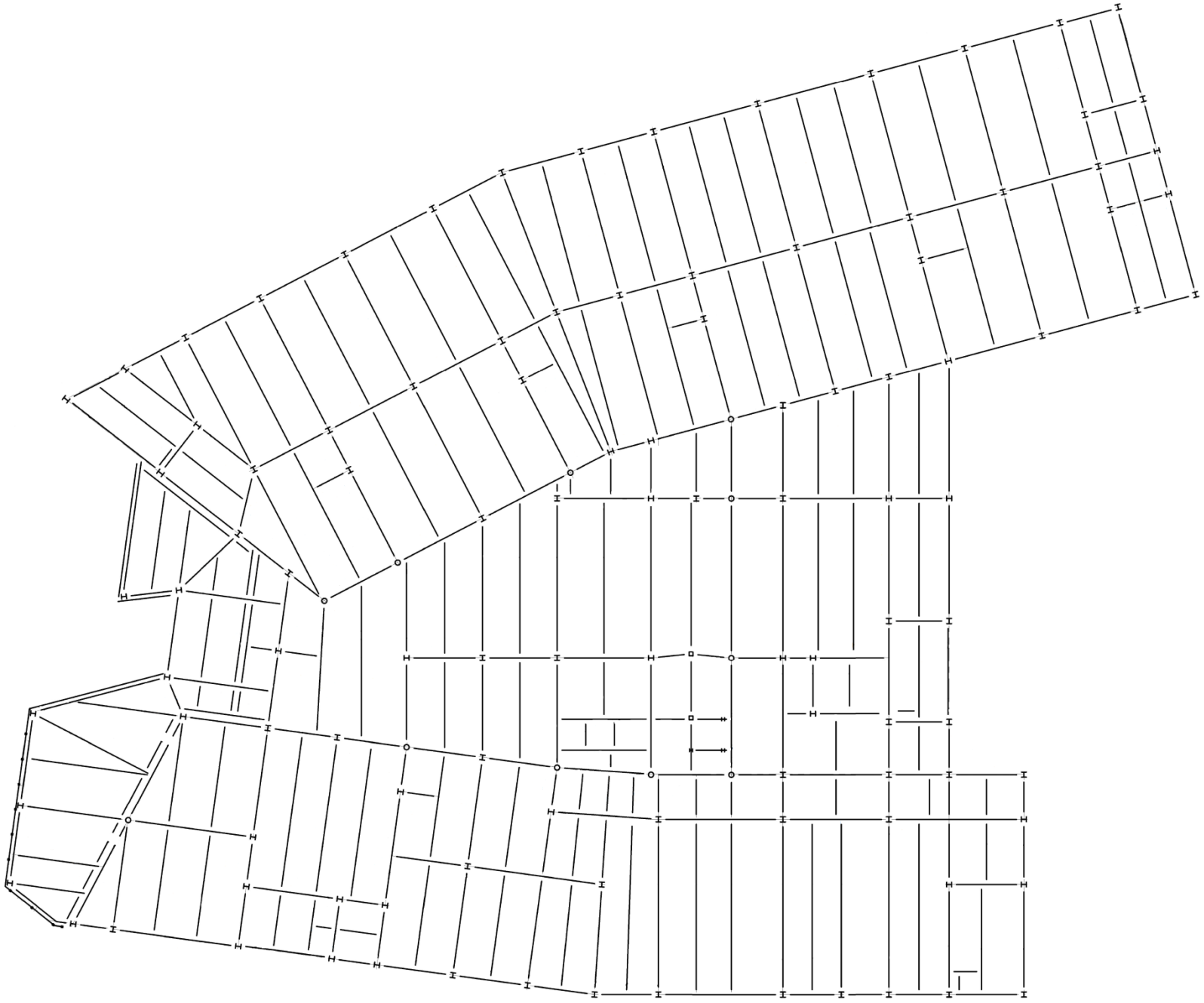


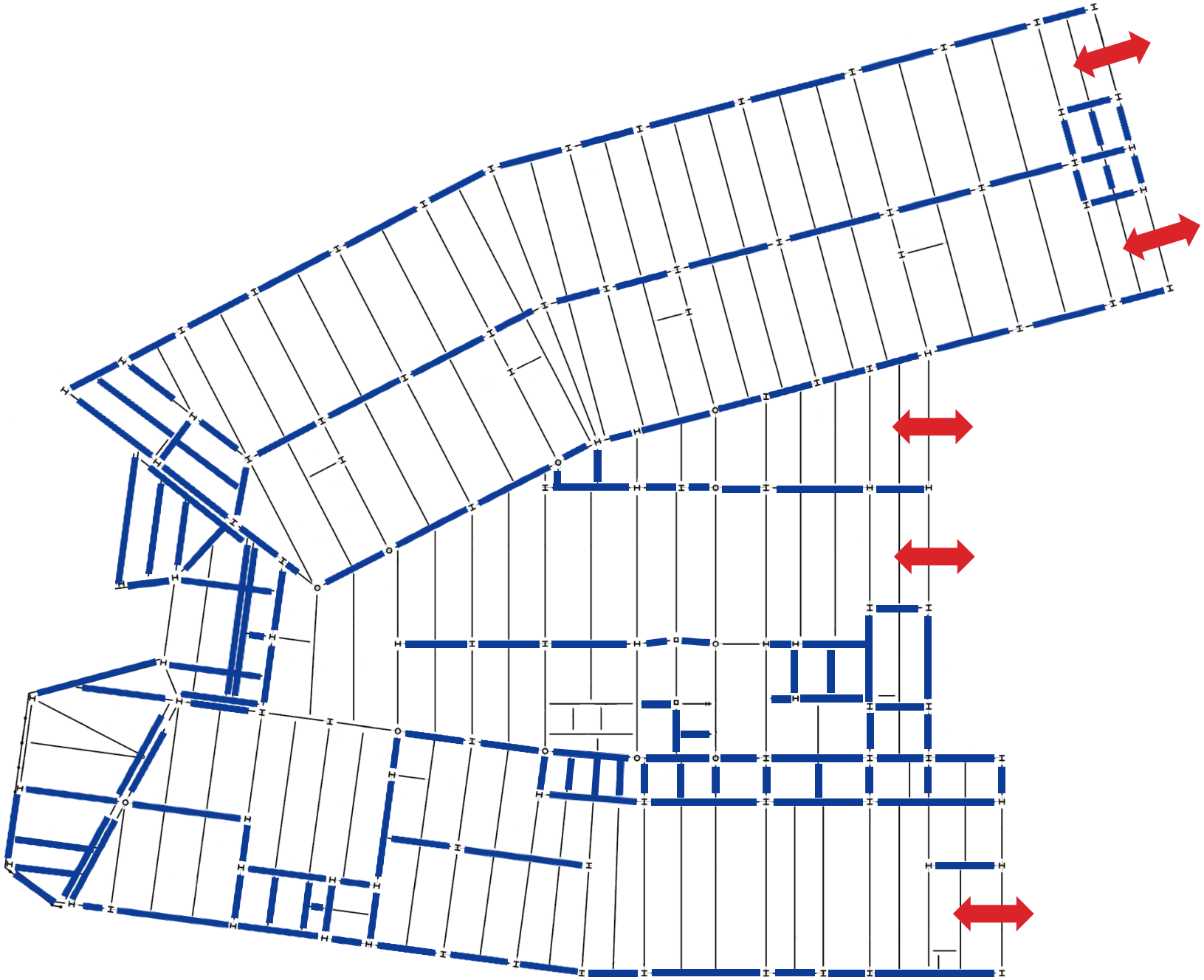
Coleg y Cymoedd

- Overcoming the Challenge
  - Mark Poole – Project Manager – Kier Construction

Overcoming the Challenge

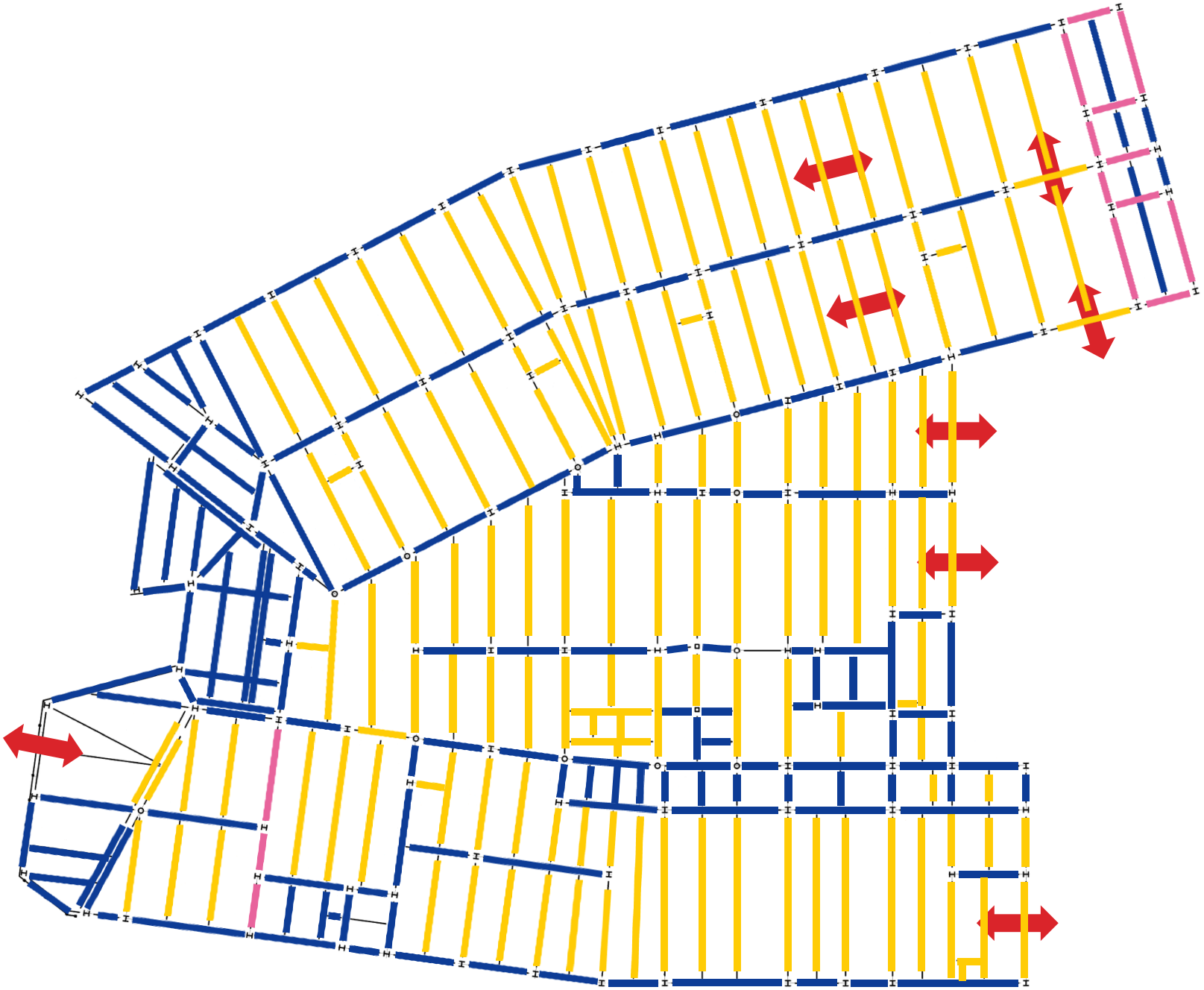
- Programme
- Access
- Construction Methodology
- Drainage Solution
- Incoming Services





Overcoming the Challenge

KIER CONSIDERATE CONSTRUCTORS ASSOCIATE ARUP Austin·Smith:Lord Coleg y Cymoedd MOTT MACDONALD Llywodraeth Cymru Welsh Government exemplar



Overcoming the Challenge

KIER CONSIDERATE CONSTRUCTORS ASSOCIATE ARUP Austin·Smith:Lord Coleg y Cymoedd MOTT MACDONALD Llywodraeth Cymru Welsh Government exemplar

Overcoming the Challenge

Overcoming the Challenge

KIER · Considerate Constructors Associate · ARUP · Austin·Smith:Lord · Coleg y Cymoedd · Mott MacDonald · Llywodraeth Cymru Welsh Government · eXemplar

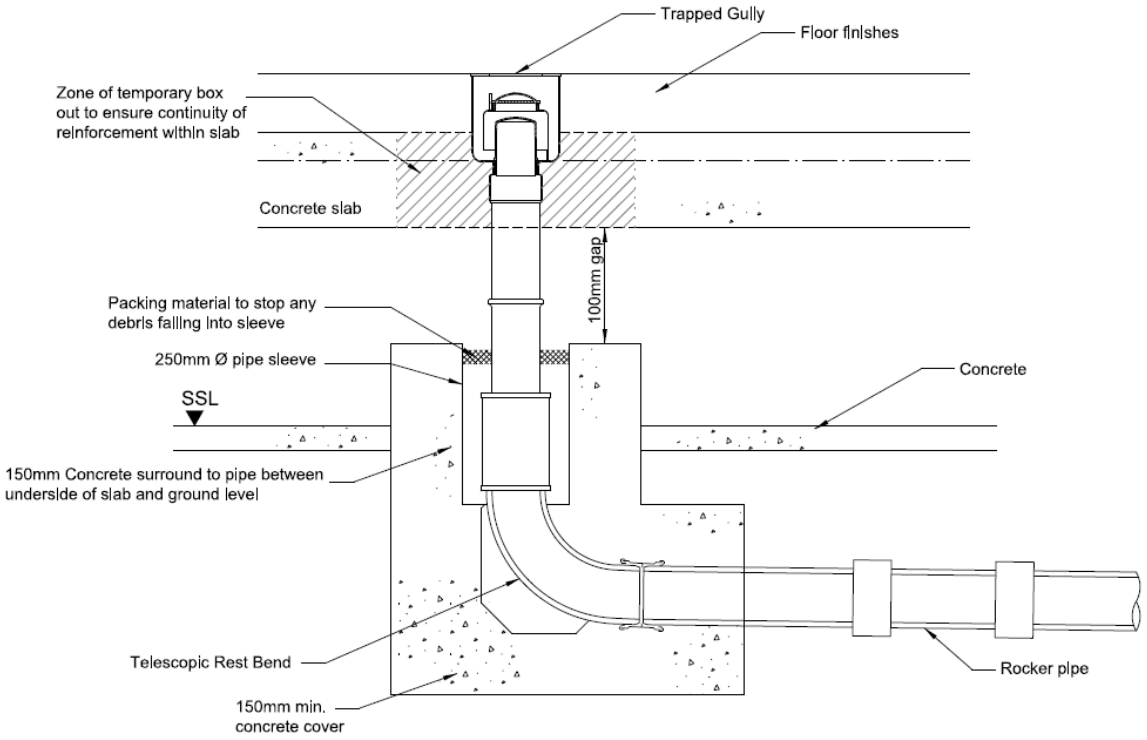
Overcoming the Challenge

KIER · Considerate Constructors Associate · ARUP · Austin·Smith:Lord · Coleg y Cymoedd · Mott MacDonald · Llywodraeth Cymru Welsh Government · exemplar

Overcoming the Challenge

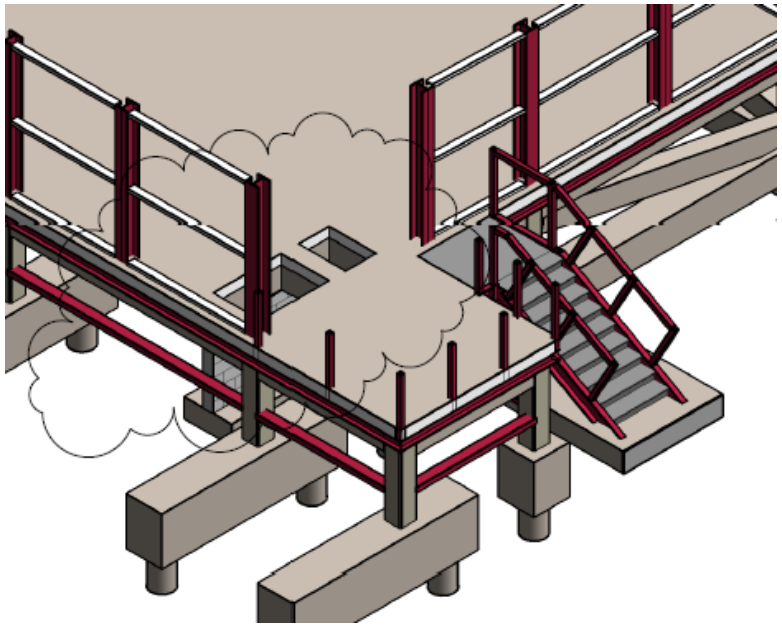
KIER · Considerate Constructors Associate · ARUP · Austin·Smith:Lord · Coleg y Cymoedd · Mott MacDonald · Llywodraeth Cymru Welsh Government · exemplar

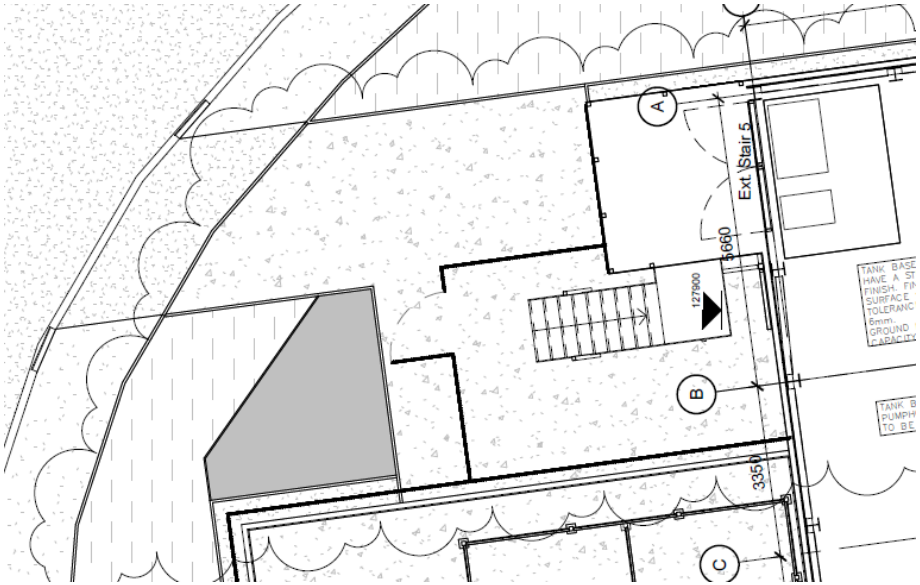
Overcoming the Challenge



To Below Ground Drainage
Connection Of Above Ground Gully

Overcoming the Challenge





Bird’s Eye View

Coleg y Cymoedd

- Q&A
  - Gordon Brown – Director – CEW

Site Tour

- No Planned Fire Drills
- Fire Assembly in Railway Station Car Park
- Full PPE including Gloves & Glasses
- No Smoking
- No Mobile Phones
- Stay within allocated groups
- Hold hand rails when using stairs
- Thank You