

A collaborative approach to managing risks

Barry Clarke

Immediate Past President ICE

Professor of Civil Engineering Geotechnics,
University of Leeds

Geotechnica



In partnership with
Pinnacle
Events



Platinum Sponsors



Gold Sponsors



Supported by
Brunel
UNIVERSITY
LONDON

Introduction

Ground is a hazard

Construction delays and failures due to the ground can add 5% to the outturn cost because the risk is not properly addressed

Addressing risk requires collaboration

Geotechnica



In partnership with
Pinnacle
Events



Platinum Sponsors
TESMEC
Middle East



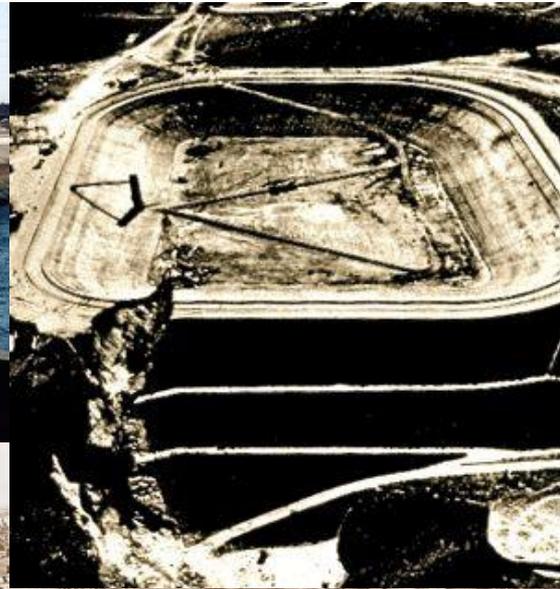
Gulf Laboratories Co. WLL

Gold Sponsors



Supported by
Brunel
UNIVERSITY
LONDON

Baldwin Hills Reservoir (1963)



Geotechnica



In partnership with
Pinnacle
Events



Gold Sponsors



Supported by
Brunel
UNIVERSITY
LONDON

Nicholls Highway Collapse (2004)



The original design misinterpreted the local geology and overestimated the soil shear strength in its analysis. (*Whittle, 2004*)

The use of an effective stress analysis of an undrained problem in the numerical analyses to model near normally consolidated soils is fundamentally incorrect, (*Hight et al, 2005*)

Geotechnica



In partnership with
Pinnacle
Events



Platinum Sponsors



Gold Sponsors



Supported by
Brunel
UNIVERSITY
LONDON

Reducing Ground Risk

Geotechnica



In partnership with
Pinnacle
Events



Platinum Sponsors



Gold Sponsors



Supported by



Eurocode 7

“knowledge of the ground conditions depends on the extent and quality of the geotechnical investigations. Such knowledge and the control of workmanship are usually more significant to fulfilling the fundamental requirements than is precision in the calculation models and partial factors”

Geotechnica



In partnership with
Pinnacle
Events



Platinum Sponsors



Gold Sponsors



Supported by
Brunel
UNIVERSITY
LONDON

Geotechnical reports - Factual

history

geology

groundwater

hazards

test results

GIR

Geotechnica



In partnership with
 Pinnacle
Events



Platinum Sponsors
TESMEC
Middle East



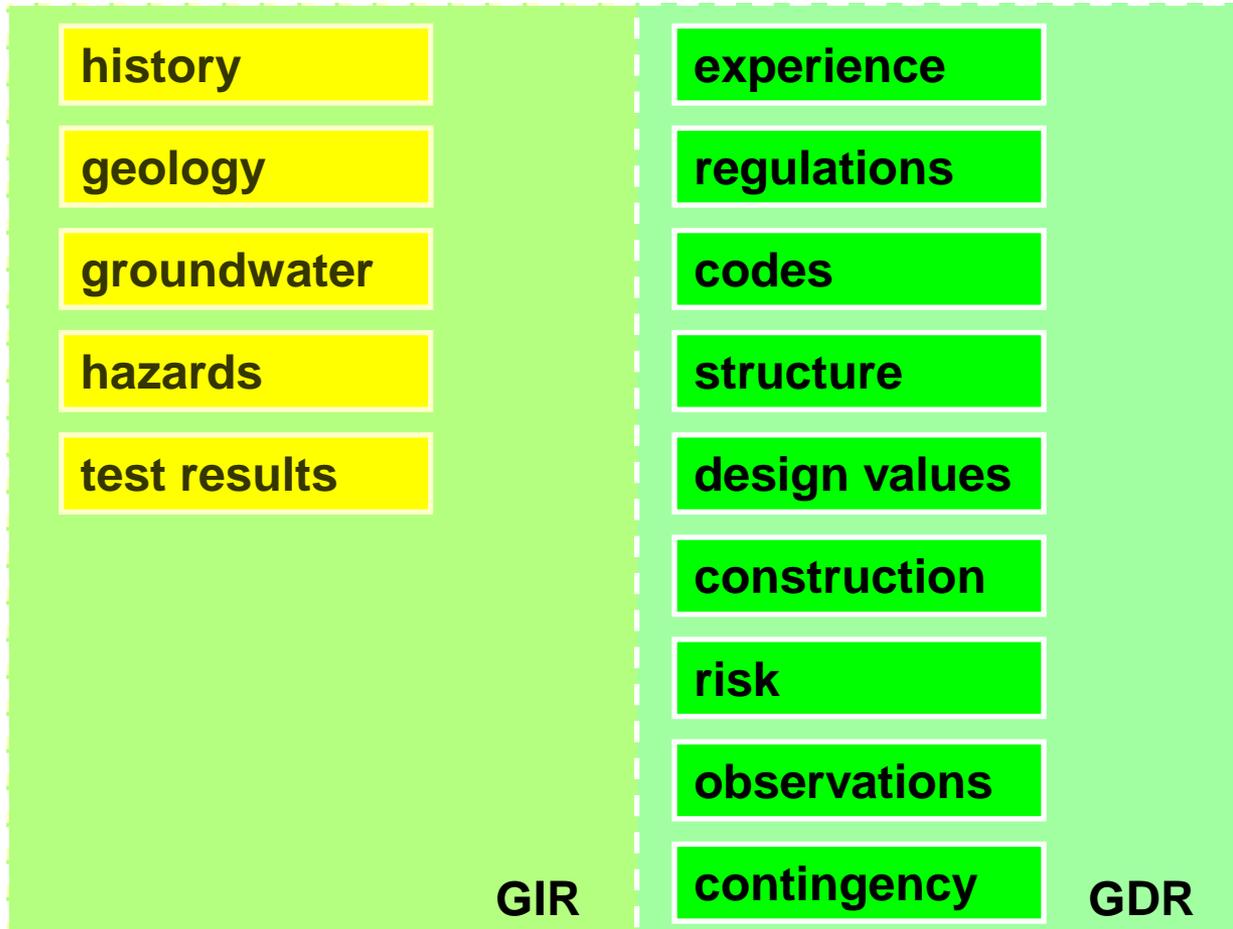
Gulf Laboratories Co. WLL

Gold Sponsors



Supported by
Brunel
UNIVERSITY
LONDON

Geotechnical reports - Interpretative



Geotechnica



In partnership with
Pinnacle
Events



Platinum Sponsors

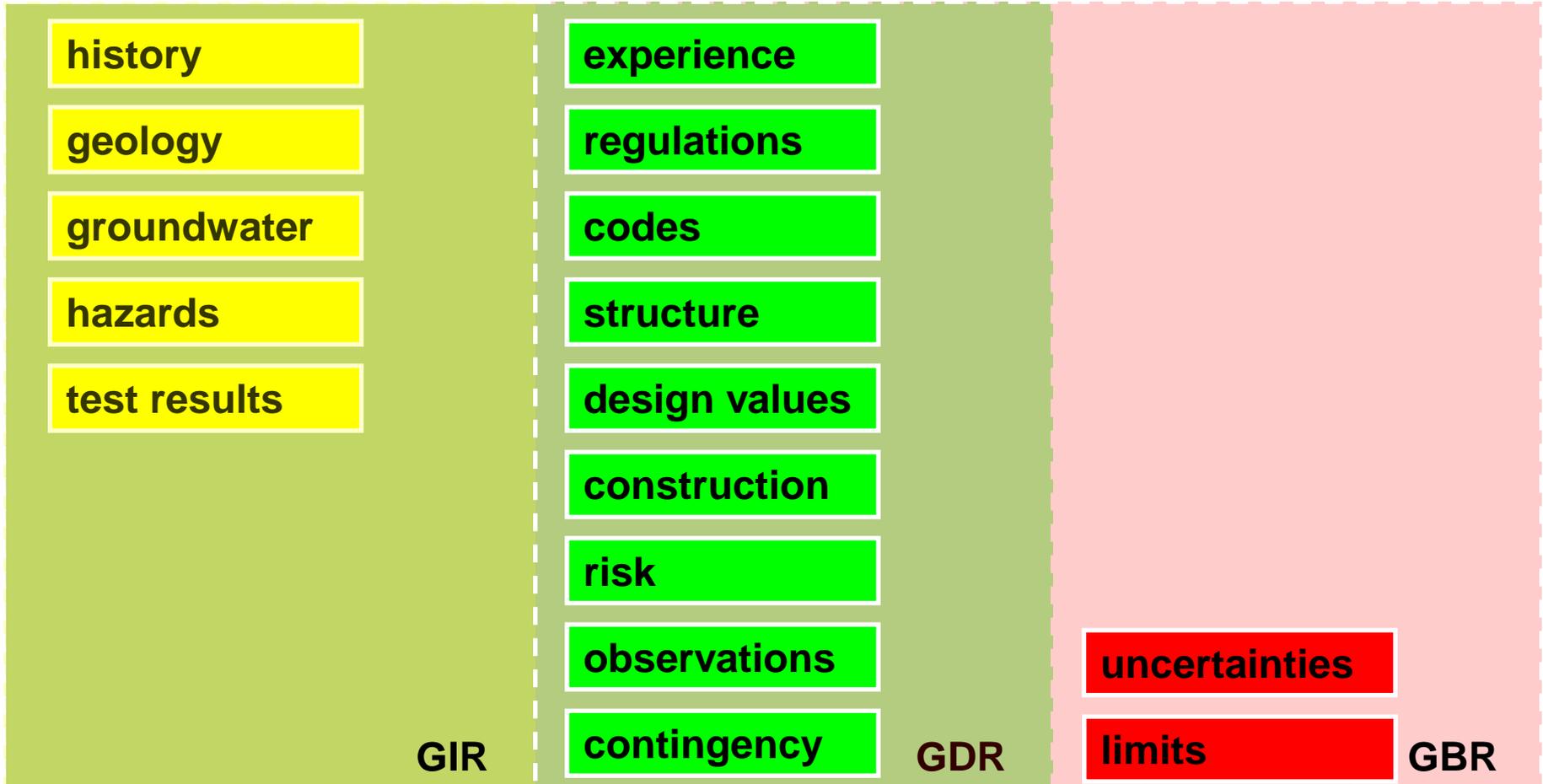


Gold Sponsors



Supported by
Brunel
UNIVERSITY
LONDON

Geotechnical reports - Baseline



Geotechnica



In partnership with
Pinnacle
Events



Platinum Sponsors



Gold Sponsors



Supported by
Brunel
UNIVERSITY
LONDON

Lessons learnt

- Use a competent workforce
- Create an appropriate procurement model
- Use a project team that is inclusive
- Provide leadership by sharing best practice

Geotechnica



In partnership with
Pinnacle
Events



Platinum Sponsors



Gold Sponsors



Supported by
Brunel
UNIVERSITY
LONDON

Competency and Risk

Geotechnica



In partnership with
Pinnacle
Events



Platinum Sponsors



Gold Sponsors



Supported by
Brunel
UNIVERSITY
LONDON

Competency

- Experience
- Licensing
- Registration

Geotechnica



In partnership with
Pinnacle
Events



Platinum Sponsors
TESMEC
Middle East



Gold Sponsors
Gulf Laboratories Co. WLL



Supported by
Brunel
UNIVERSITY
LONDON

Professionalism

- Knowledge and understanding
- Design and development of processes, systems, services and products
- Responsibility, management or leadership
- Communication and inter-personal skills
- Professional commitment

Geotechnica



In partnership with
Pinnacle
Events



Platinum Sponsors



Gold Sponsors



Supported by
Brunel
UNIVERSITY
LONDON

Ethical behaviour

- Act with due skill, care and diligence and with proper regard for professional standards.
- Prevent avoidable danger to health or safety.
- **Act in accordance with the principles of sustainability, and prevent avoidable adverse impact on the environment and society.**
- **Maintain and enhance their competence, undertake only professional tasks for which they are competent, and disclose relevant limitations of competence.**
 - Accept appropriate responsibility for work carried out under their supervision.
 - Treat all persons fairly and with respect.
 - Encourage others to advance their learning and competence.
 - Avoid where possible real or perceived conflict of interest, and advise affected parties when such conflicts arise.
 - Observe the proper duties of confidentiality owed to appropriate parties.
 - Reject bribery and all forms of corrupt behaviour, and make positive efforts to ensure others do likewise.
- **Assess and manage relevant risks and communicate these appropriately.**

Geotechnica



In partnership with
Pinnacle
Events



Platinum Sponsors
TESMEC
Middle East



Gulf Laboratories Co. WLL

Gold Sponsors



Supported by
Brunel
UNIVERSITY
LONDON

Guidance on sustainability

- Contribute to building a sustainable society, present and future
- Apply professional and responsible judgement and take a leadership role
- Do more than just comply with legislation and codes
- Use resources efficiently and effectively
- Seek multiple views to solve sustainability challenges
- **Manage risk to minimise adverse impact to people or the environment**

Geotechnica



In partnership with
Pinnacle
Events



Platinum Sponsors
TESMEC
Middle East



Gulf Laboratories Co. WLL

Gold Sponsors



Supported by
Brunel
UNIVERSITY
LONDON

Guidance on risk

- Professional and responsible judgement, taking a leadership role
- A systematic and holistic approach to risk identification, assessment and management
- Comply with legislation and codes, but be prepared to seek further improvements
- Good communication with the others involved
- Lasting systems for oversight and scrutiny
- Contribute to public awareness of risk

Geotechnica



In partnership with
Pinnacle
Events



Platinum Sponsors



Gold Sponsors



Supported by
Brunel
UNIVERSITY
LONDON

Procurement

Geotechnica



In partnership with
Pinnacle
Events



Platinum Sponsors



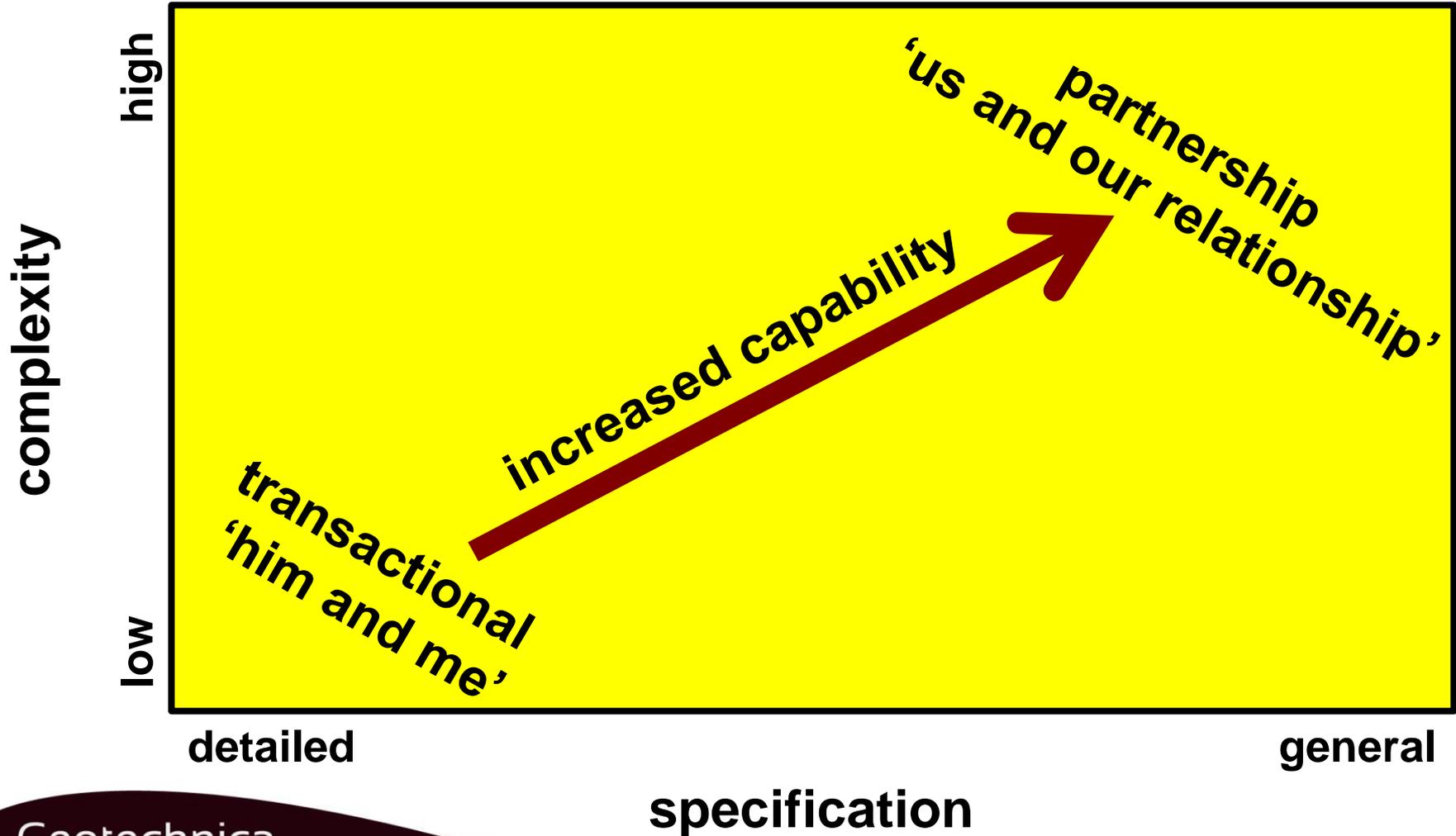
Gold Sponsors



Supported by



Procurement



Geotechnica



In partnership with
Pinnacle
Events



Supported by
Brunel
UNIVERSITY
LONDON

Infrastructure Procurement Route Map

Geotechnica



In partnership with
Pinnacle
Events



Platinum Sponsors
TESMEC
Middle East



Gulf Laboratories Co. WLL

Gold Sponsors



Supported by
Brunel
UNIVERSITY
LONDON

Key components

- Assessment tools to enable sponsors, clients and the supply chain to align behaviours and identify capability gaps.
- ‘complexity’ assessment tools for establishing the nature of the delivery environment.
- Adoption of the common characteristics and behaviours associated with successful infrastructure project and programme delivery:
- Industry leaders and experts in the infrastructure sector to identify, develop and disseminate best practice.

Geotechnica



In partnership with
Pinnacle
Events



Platinum Sponsors
TESMEC
Middle East



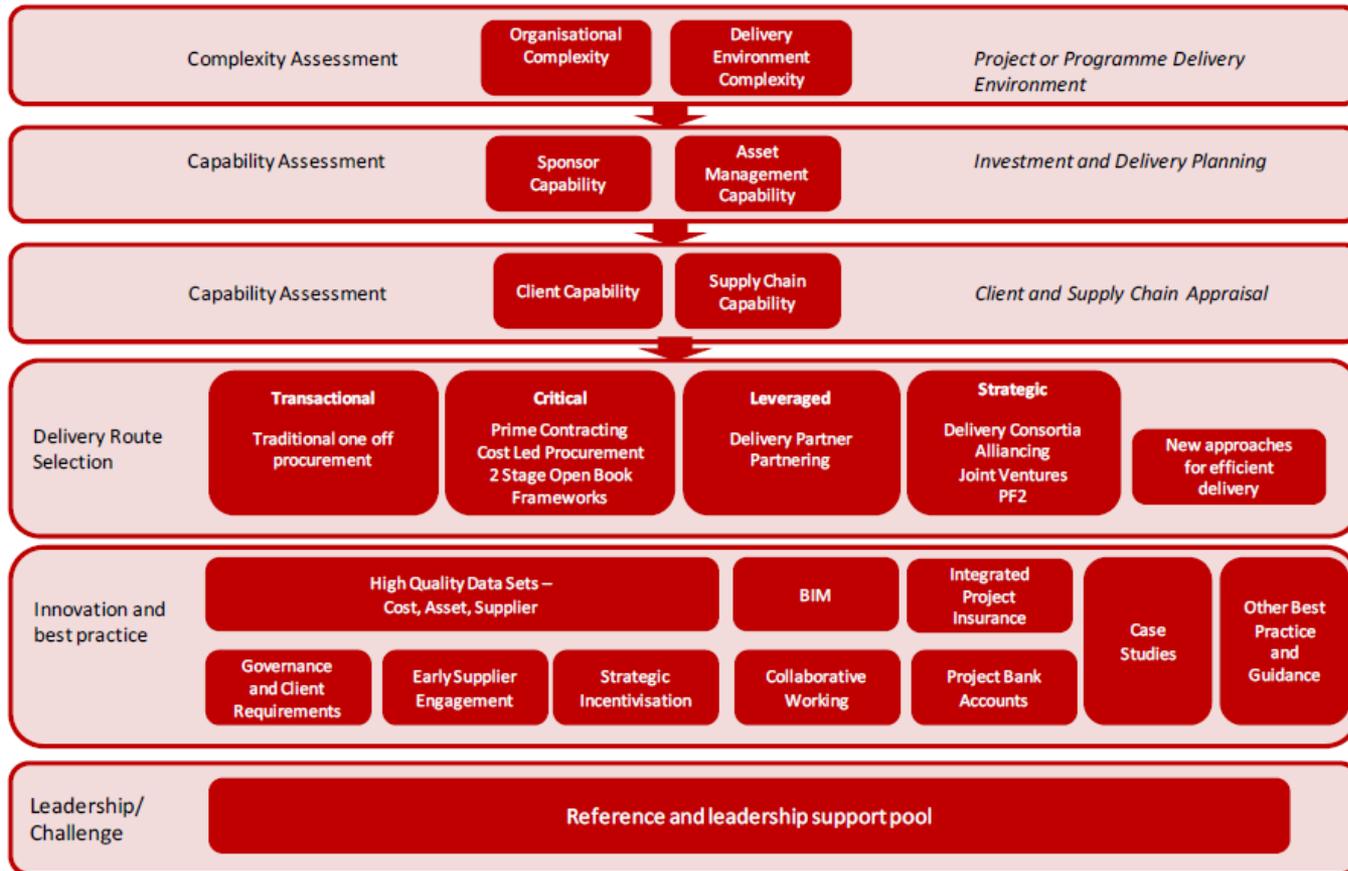
Gulf Laboratories Co. WLL

Gold Sponsors

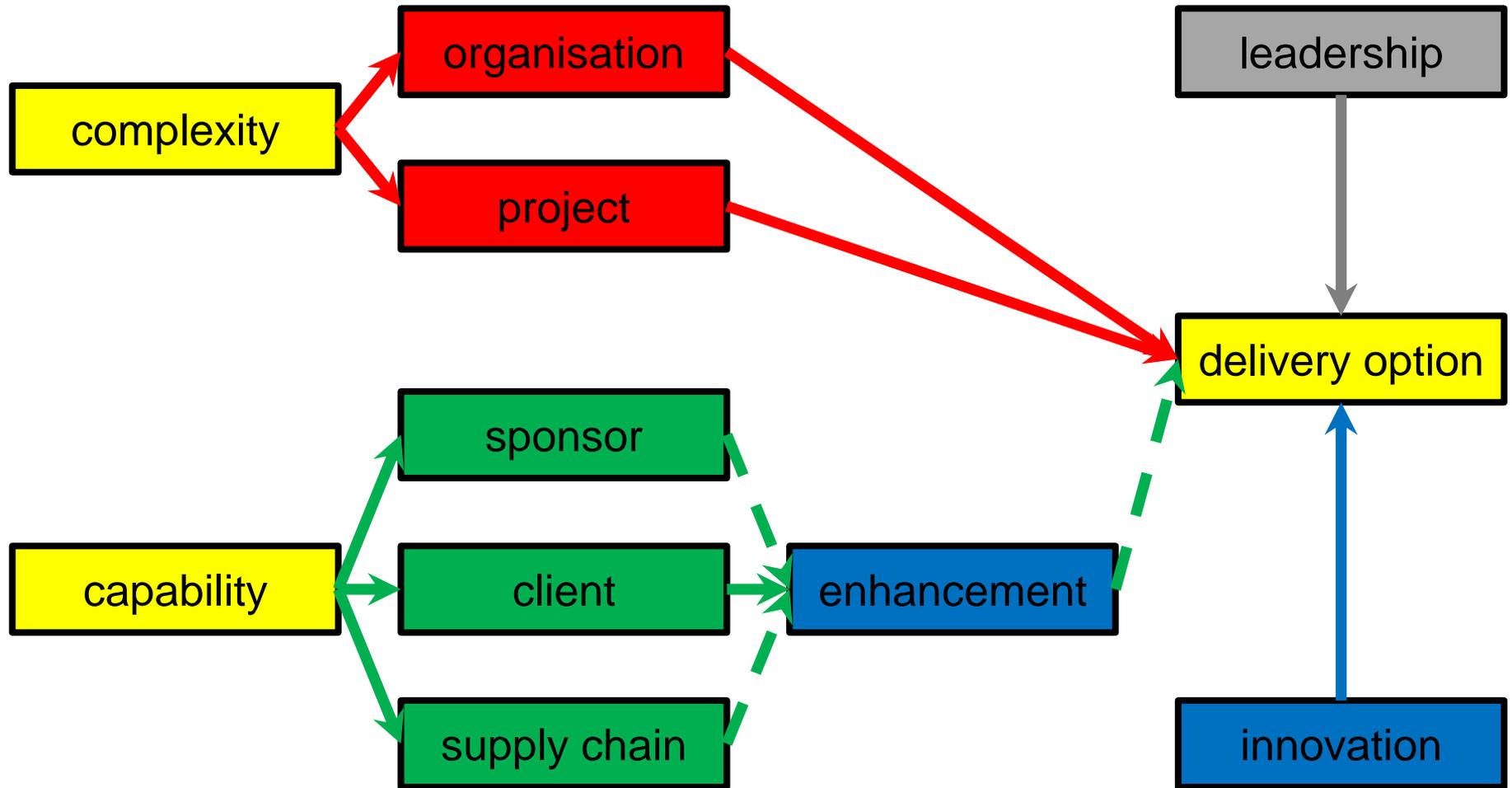


Supported by
Brunel
UNIVERSITY
LONDON

Overview



Overview



Complexity awareness

- Organisational complexity
 - People
 - Culture
 - Technology and assets
 - Goals, vision and values
 - Processes and procedures
 - Work organisation and practices

Geotechnica



In partnership with
Pinnacle
Events



Platinum Sponsors



Gold Sponsors



Supported by
Brunel
UNIVERSITY
LONDON

Complexity awareness

- Organisational complexity
- Delivery environment complexity
 - Strategic importance; Stability of context; Stakeholders; Financial impact
 - Requirements; Interfaces; Technology; Organisational capability
 - Execution complexity/extent of change; Ranges of disciplines and skills; Dependencies; Interdependences

Geotechnica



In partnership with
Pinnacle
Events



Platinum Sponsors

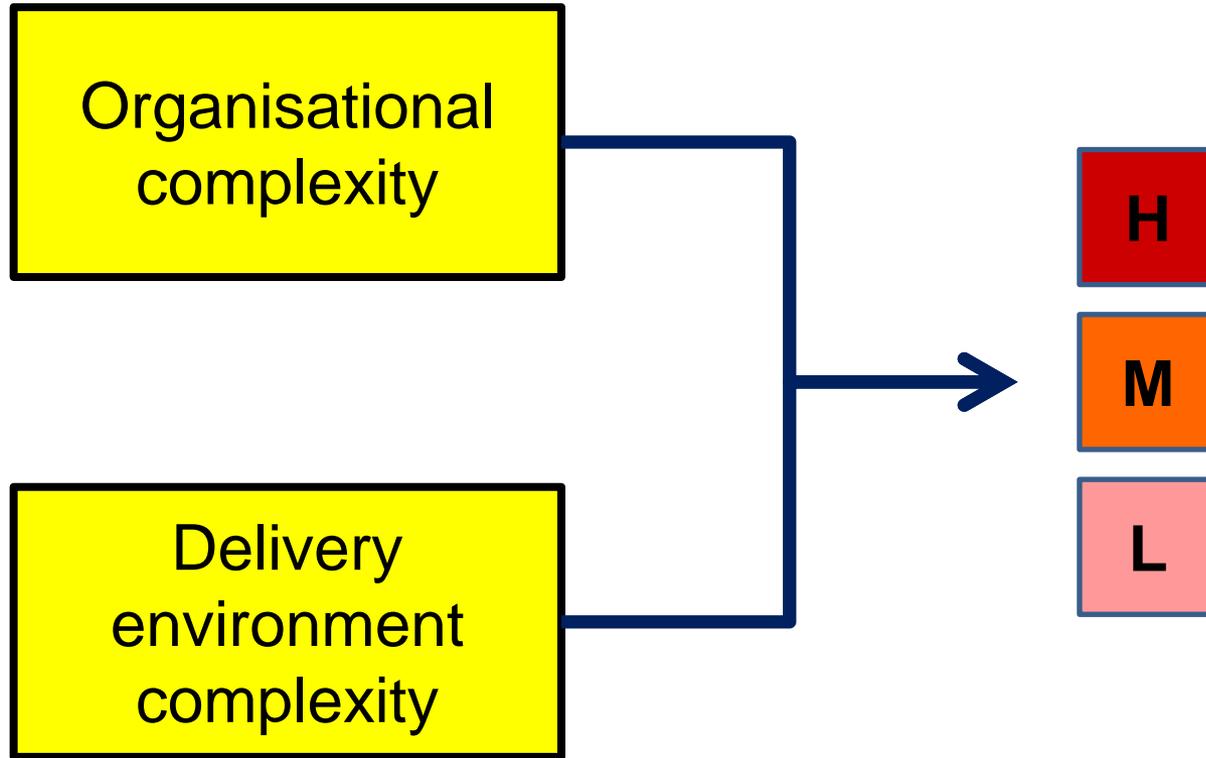


Gold Sponsors

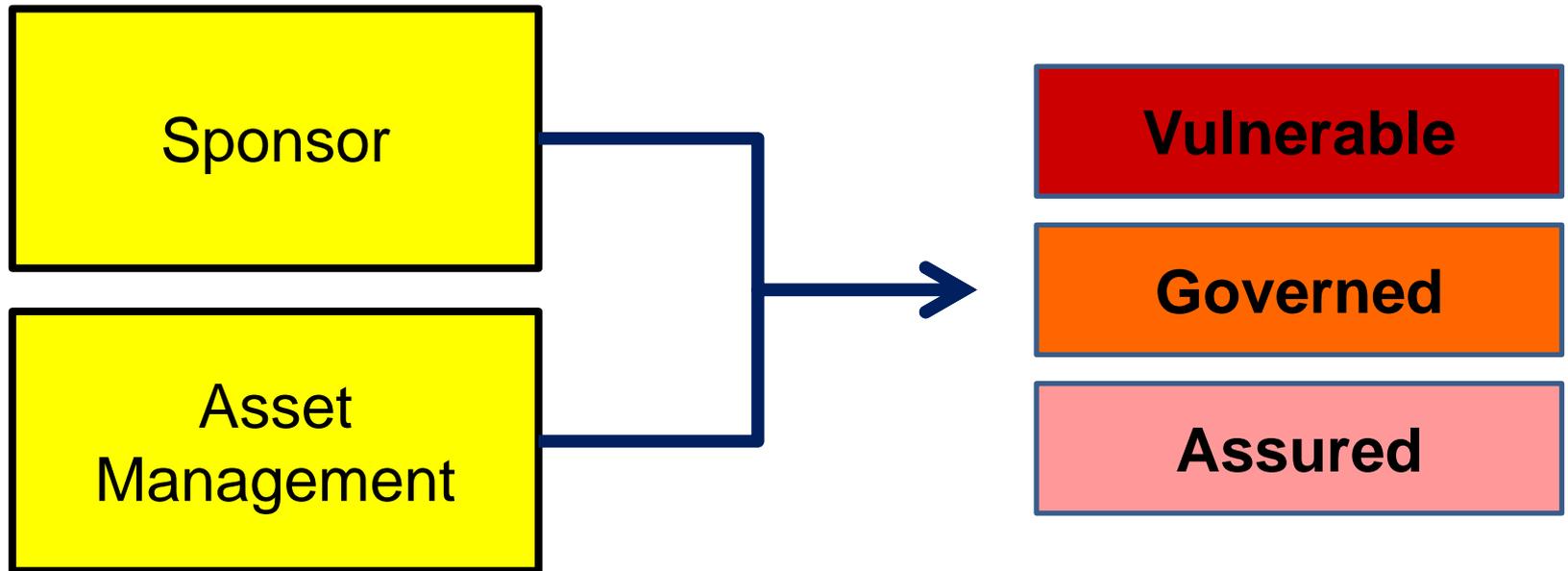


Supported by
Brunel
UNIVERSITY
LONDON

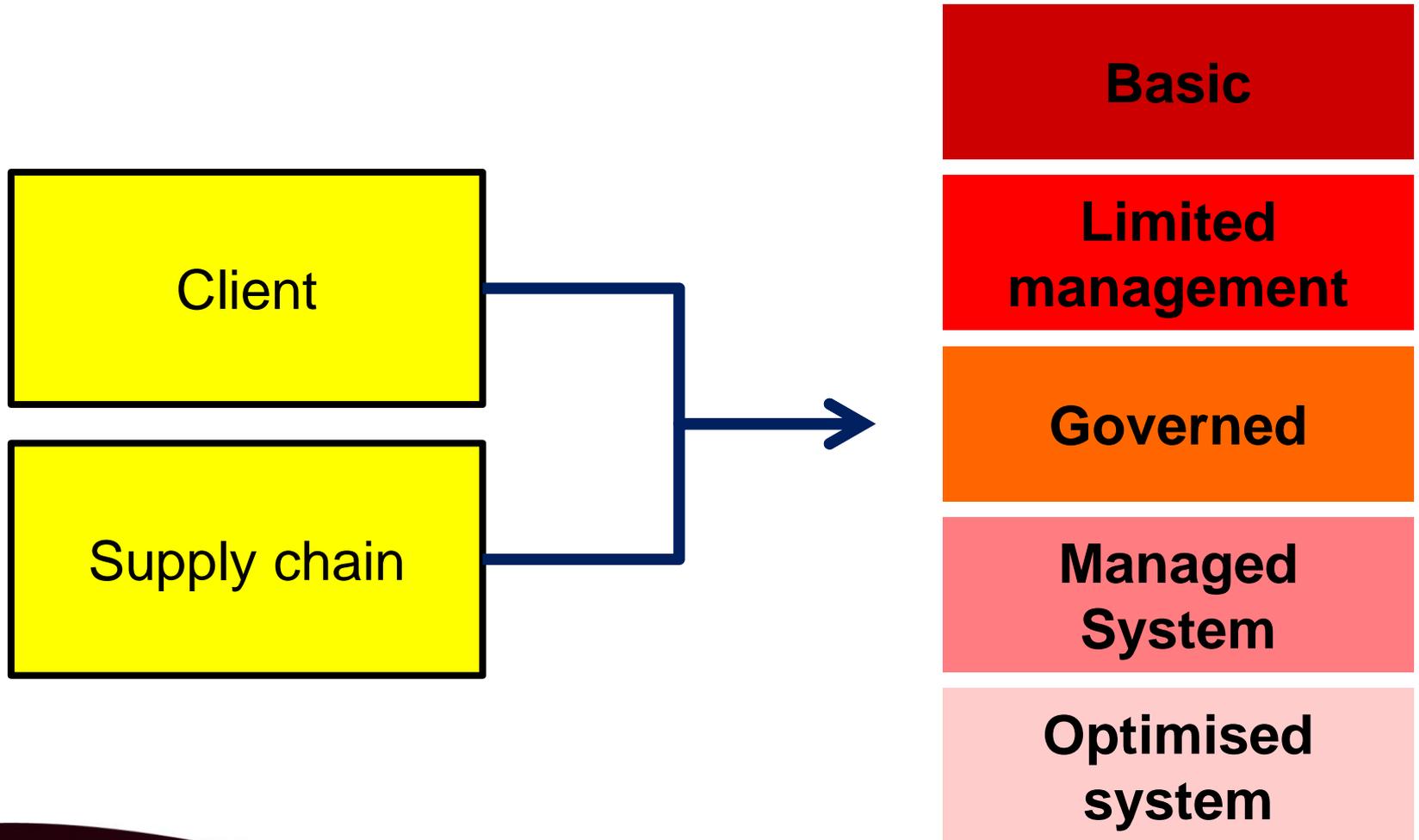
Complexity assessment



Capability assessment



Capability assessment



Geotechnica



In partnership with
Pinnacle
Events



Platinum Sponsors

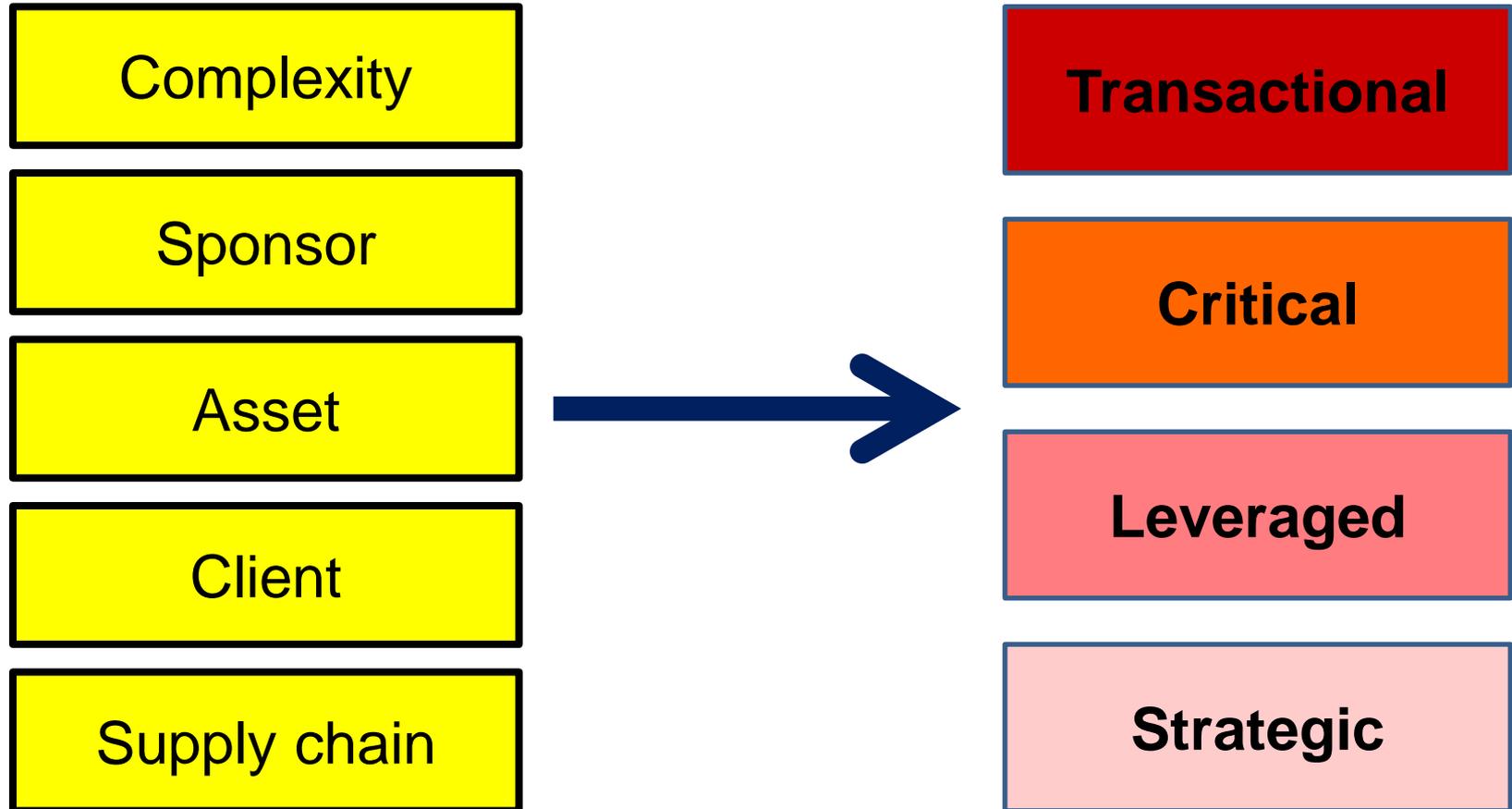


Gold Sponsors



Supported by
Brunel
UNIVERSITY
LONDON

Procurement strategy



Enhancement programme

- The complexity and capability must be aligned
- Enhancement programme to deal with misalignment
 - Up skill the client
 - Select a supply chain that can demonstrate the right level of capability
 - Identify best practice
 - Share knowledge
 - Introduce innovation.

Geotechnica



In partnership with
Pinnacle
Events



Platinum Sponsors



Gold Sponsors



Supported by
Brunel
UNIVERSITY
LONDON

Conclusion

Geotechnica



In partnership with
Pinnacle
Events



Platinum Sponsors



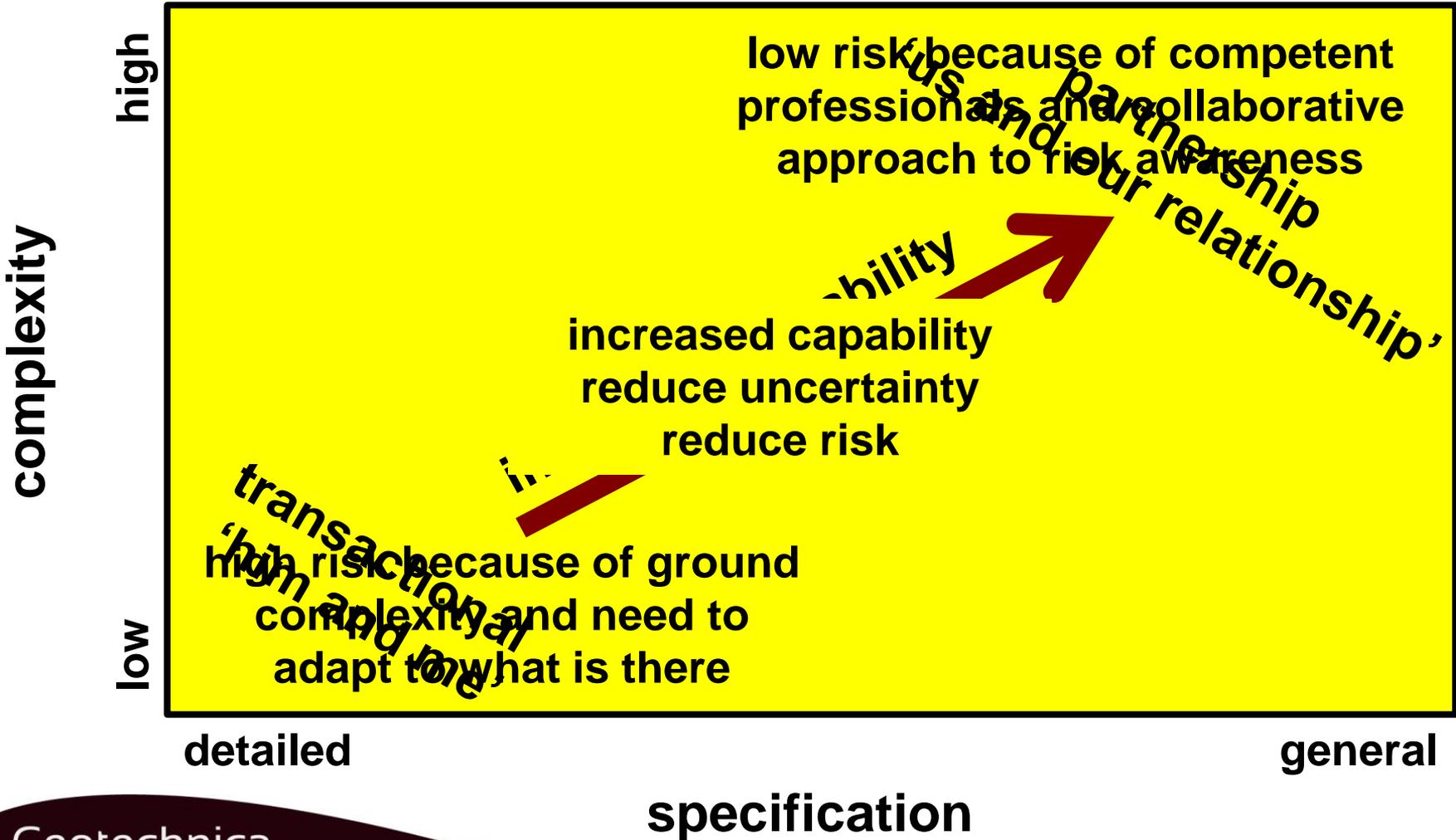
Gold Sponsors



Supported by



Procurement – ground engineering



Geotechnica



In partnership with
Pinnacle
Events



Supported by
Brunel
UNIVERSITY
LONDON