



Interpreting project brief & planning policy through design & construction

The designer's perspective

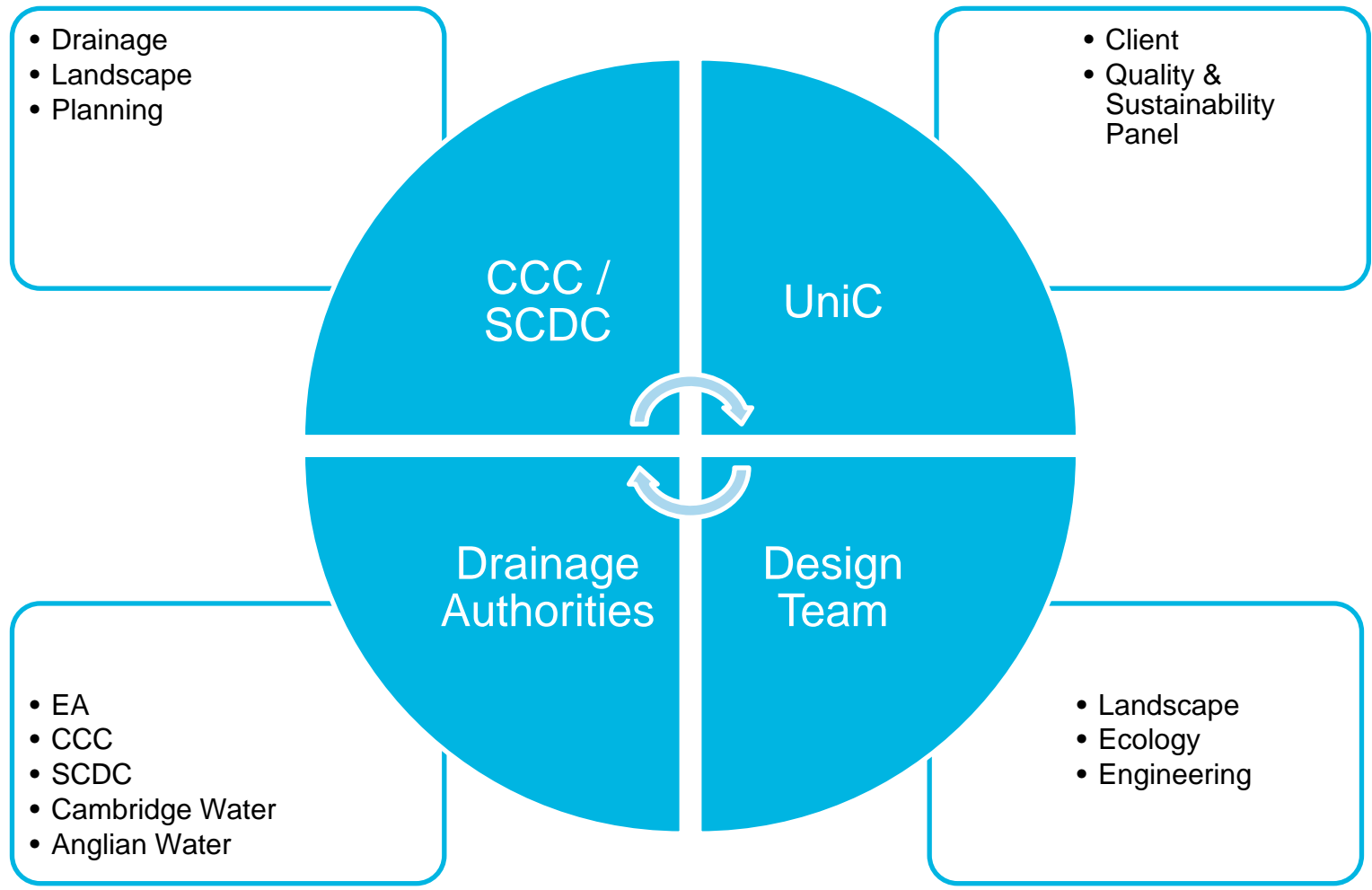


My role

- Involved in the project since 2010
- Project Manager for infrastructure design
 - Supported development of masterplan
 - Supported OPA , prepared sitewide strategies
 - Developed design for sitewide infrastructure for Phase 1
 - Developed design for on-plot infrastructure
- Multi-disciplinary co-ordination



Interfaces / consultees





Designers



Masterplanning

Sustainability

Landscape

Town Planning

Surface water
drainage

Highways

Earthworks

Utilities



Project Brief & Policy Background – landscape/drainage

– Project Brief

- create parkland and wildlife corridors linking the surrounding areas
- create a community facility with high quality green spaces
- create a landscape setting
- create opportunities for habitat restoration and enhancement

– Policy Background

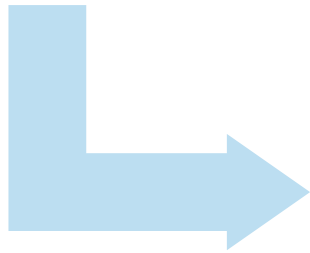
- NWC Area Action Plan
- Phase 2 Water Cycle Strategy
- Cambridge Surface Water Management Plan



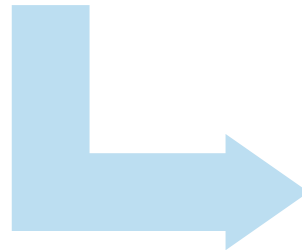
Surface Water Drainage Strategies



- Flood Risk Assessment
- Washpit Brook
- Sitewide drainage strategy



- Surface Water Drainage Strategy
- Potable Water Supply Strategy
- Attenuation requirements for each development parcel/Lot



- Lot specific proposals
- Link back to SWDS



OPA



Masterplan considerations

- Desire for high quality landscape
- Understand existing drainage regime and flooding mechanisms
- Include spatial allowance for conveyance and attenuation
- Orientate blocks to work with topography
- Develop masterplan and site levels to reduce flood risk and accommodate exceedance flows
- Incorporate cascading SuDS and Long Term Storage

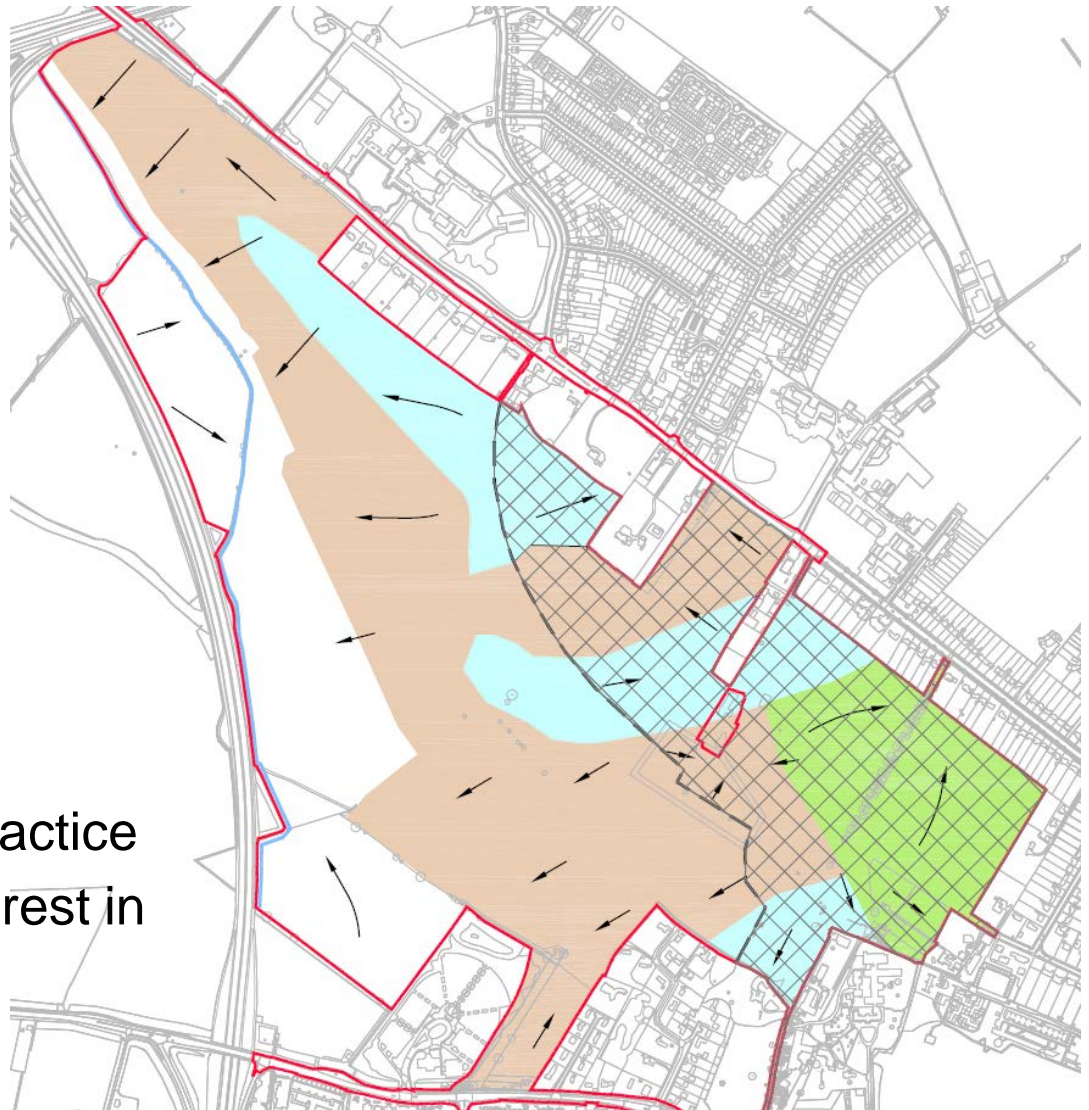
Constraints and opportunities

– Constraints

- Geology
- Levels
- Wet spot
- Washpit Brook
- Existing ecology

– Opportunities

- Use water as a resource
- Reduce flood risk
- University lead in best practice
- Client with long-term interest in project and wider area



Evolution of the masterplan



2005



2009



2008



2011

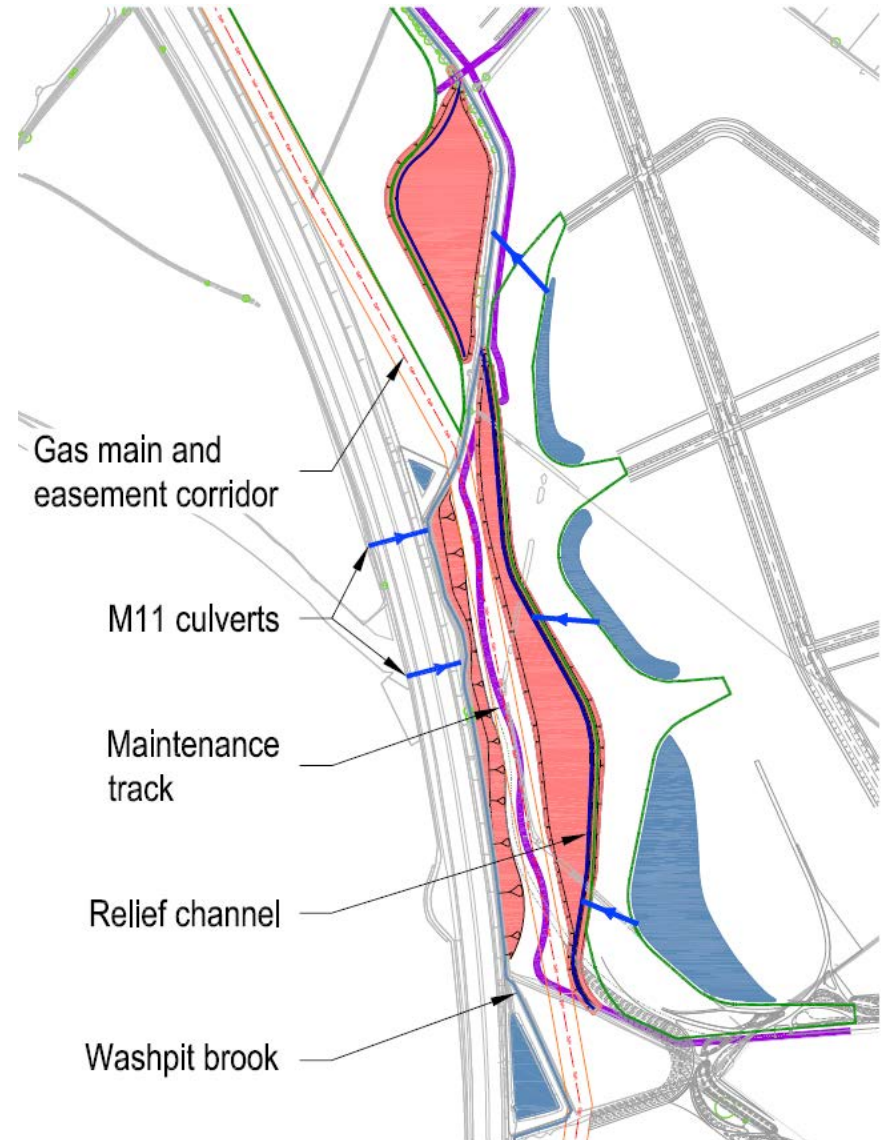
Development of Western Edge proposals

Constraints

- HP gas main
- Existing ecology
- Award watercourse
- Washpit Brook riparian zone
- M11 culverts

Designed to provide

- Amenity space
- Noise / visual screening
- Balanced earthworks
- Washpit Brook
- Surface water attenuation



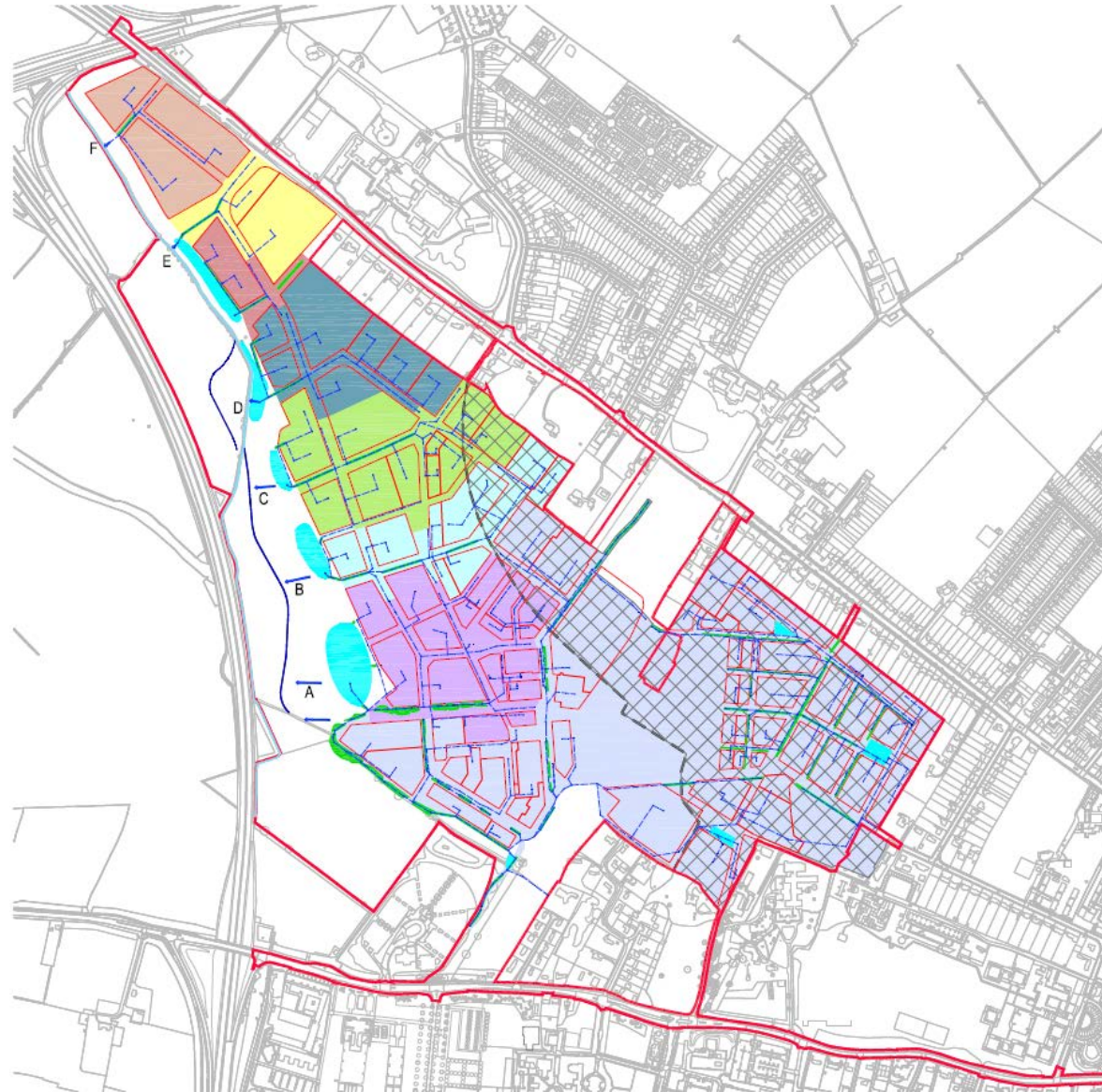
Illustrative masterplan



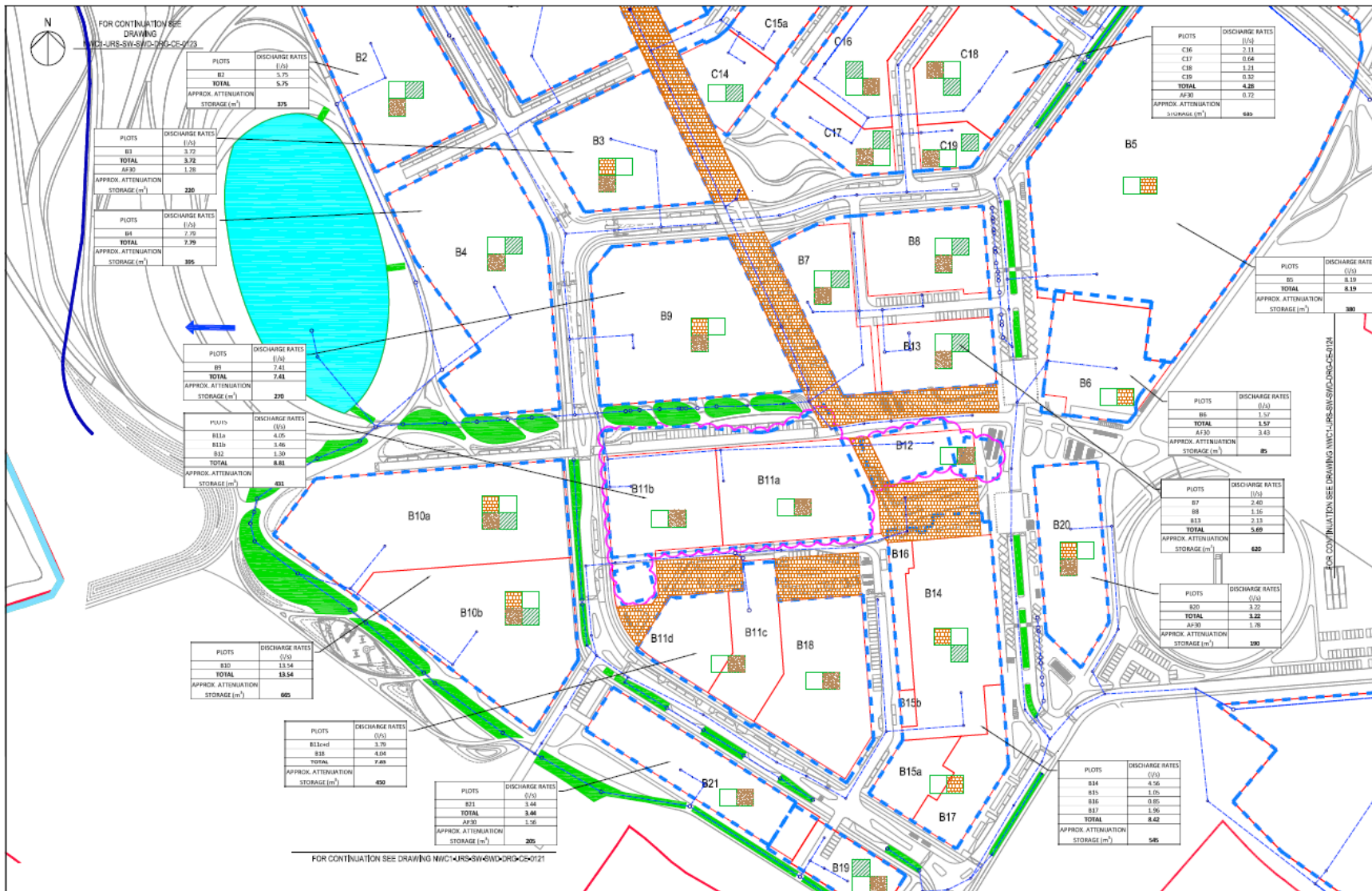


Sitewide Conditions

Surface Water Drainage Strategy



Surface Water Drainage Strategy



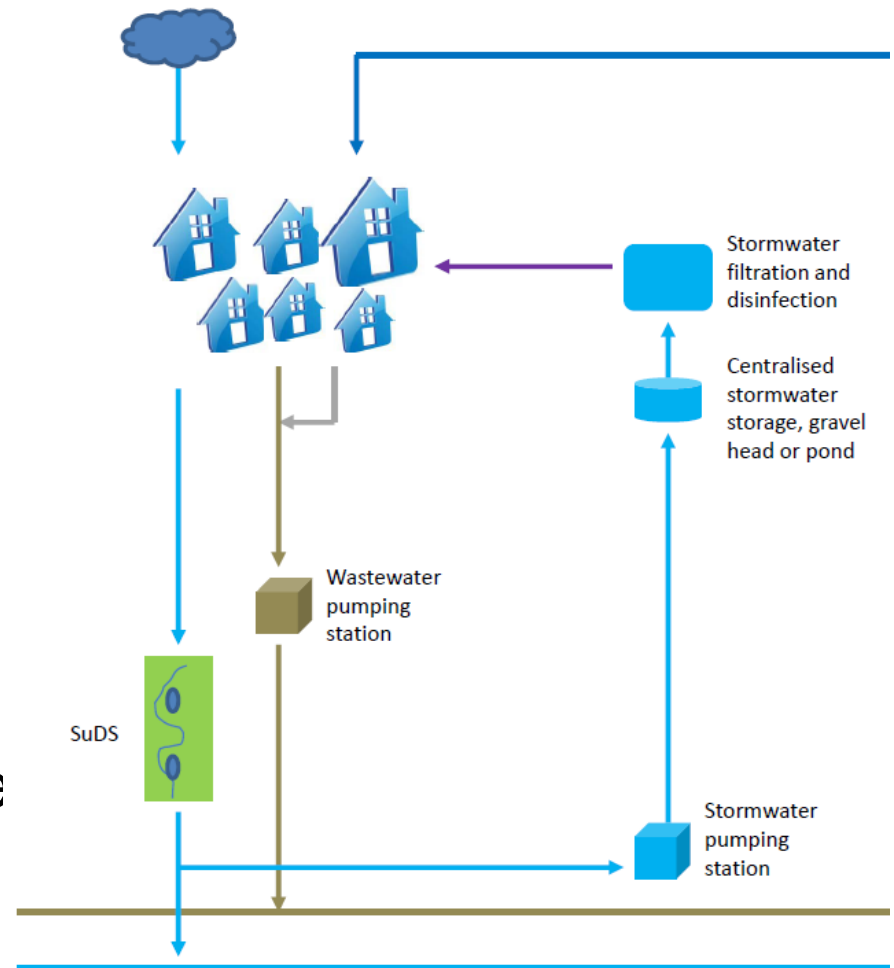


Water Supply Strategy

Feature	Water use estimation litres / person / day	Water Demand Type
WC	12.3	Non-potable
Taps (excluding kitchen taps)	7.2	Potable
Bath	15.5	Potable
Shower	23.9	Potable
Kitchen sink taps	11.8	Potable
Washing machine	14.3	Non-potable
Dishwasher	3.3	Potable
Garden	5.0	Non-potable
Total potable demand/person	61.7	
Total non-potable demand/person	31.6	
Total demand/person	93.3	

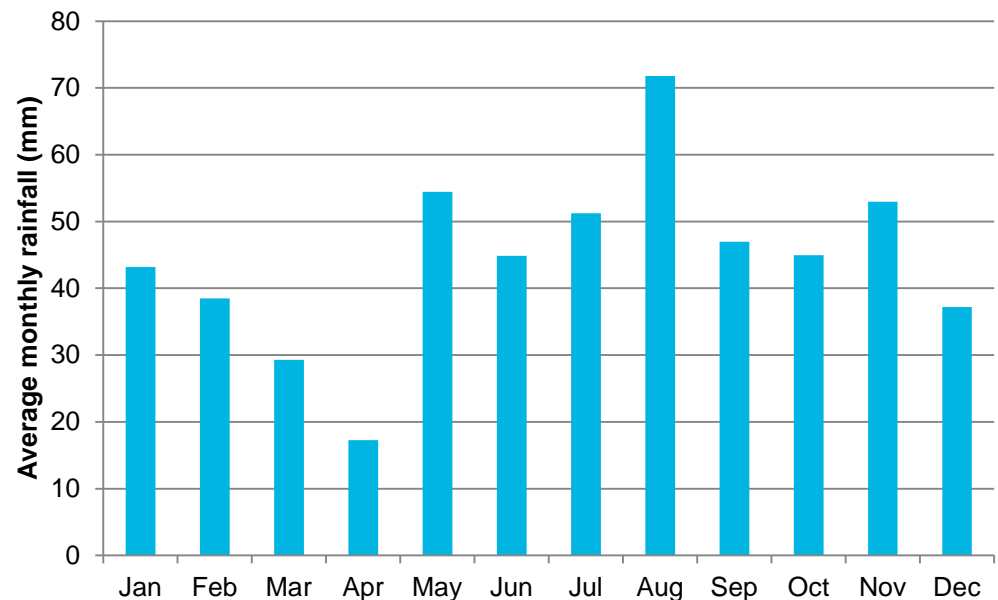
Review of water use

- Investigation of options to reduce water use
- Review of single, grouped or sitewide treatment facilities
- Decision to use surface water drainage network to common treatment facility
- Incorporation of non-potable water distribution network



Storage requirement

- Reviewed local rainfall data to determine supply
- Determined demand for non-potable water
- Determined storage required to maintain 30 day supply
- Lagoon size reviewed





RMA designs



Surface water design development

- Landscape designed to accommodate attenuation
- Promotion of Water Sensitive Urban Design
- Consideration of maintenance
- Levels designed to consider exceedance
- Coordination of landscape and underground features



Primary Street

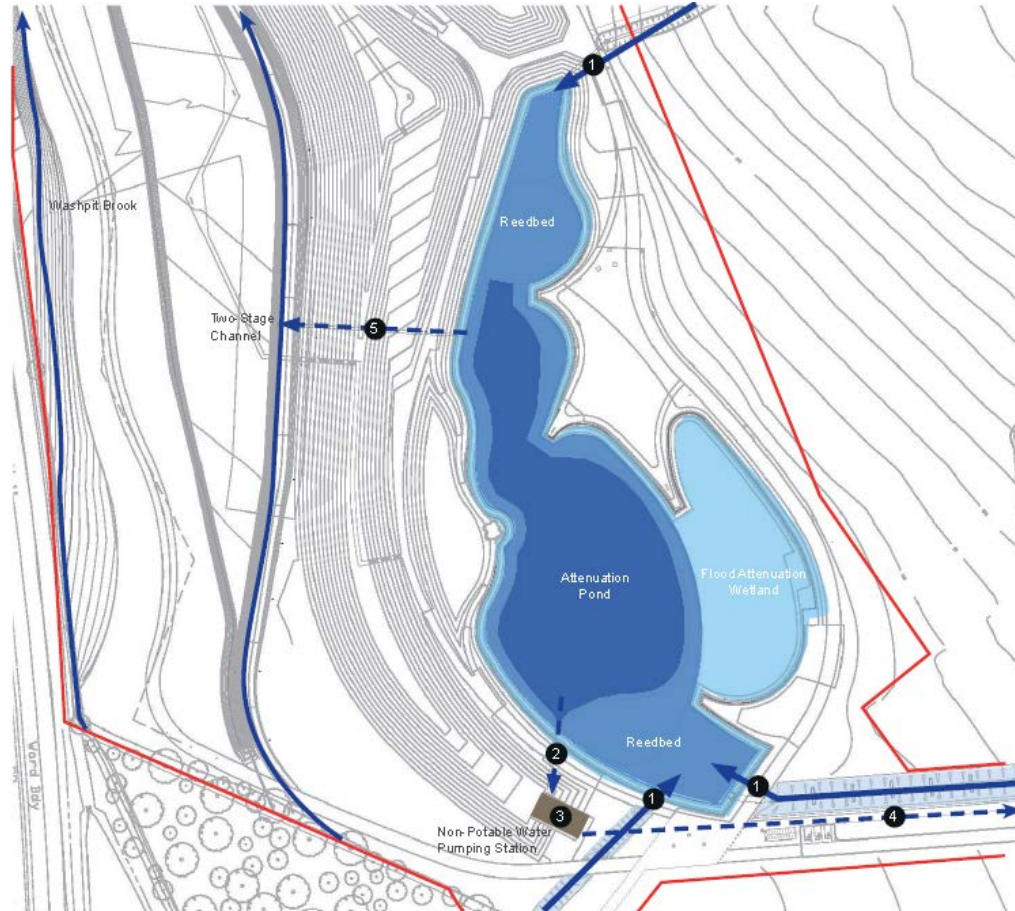




Green fingers



Western Edge Attenuation Lagoon

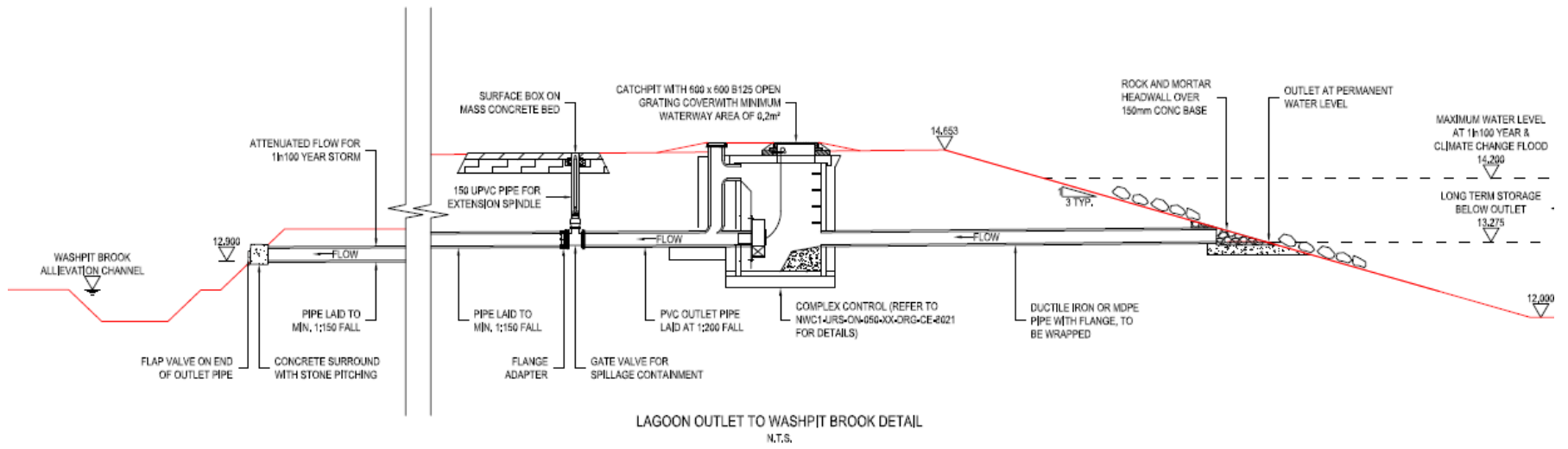


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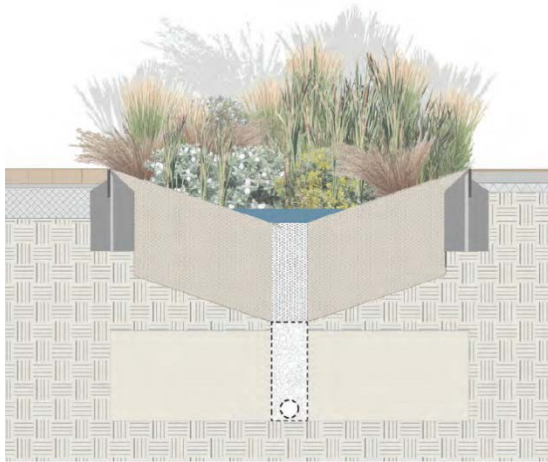
- Long term storage (level 12.00 - 13.000)
- Long term storage (level 13.00 - 13.275)
- Maximum water level 1 in 100 year & climate change flood (level 14.20)
- Green Corridor Swales

- 1 Culvert inlet from Green Corridor swales to Pond Reedbed
- 2 Culvert to Non-Potable Water Pumping Station
- 3 Non-Potable Water Pumping Station
- 4 Piped Non-Potable Water Supply to Development
- 5 Overflow culvert from Pond to 2-stage channel

Western Edge



Examples of SuDS





Detailed design

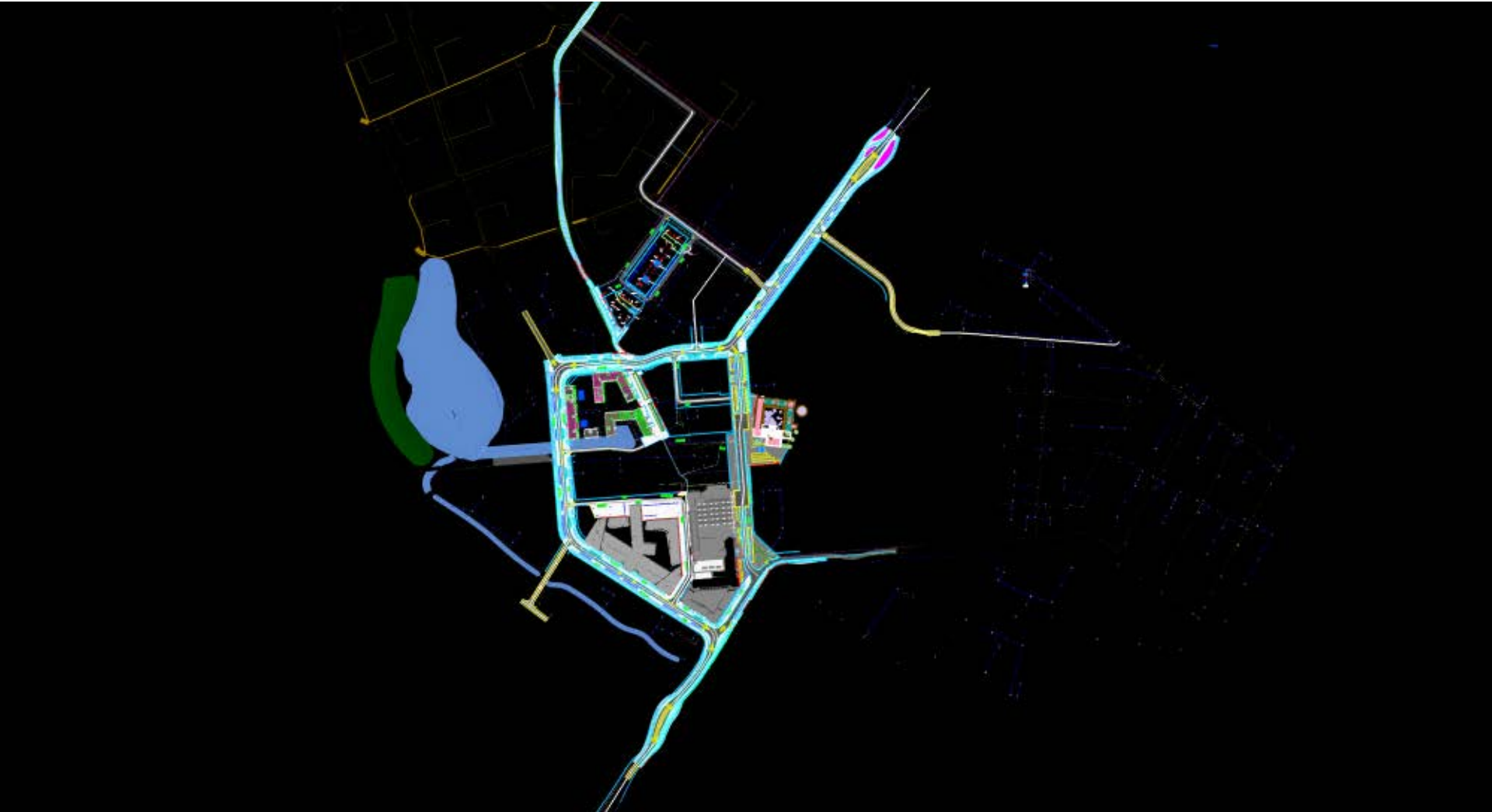


Sitewide infrastructure

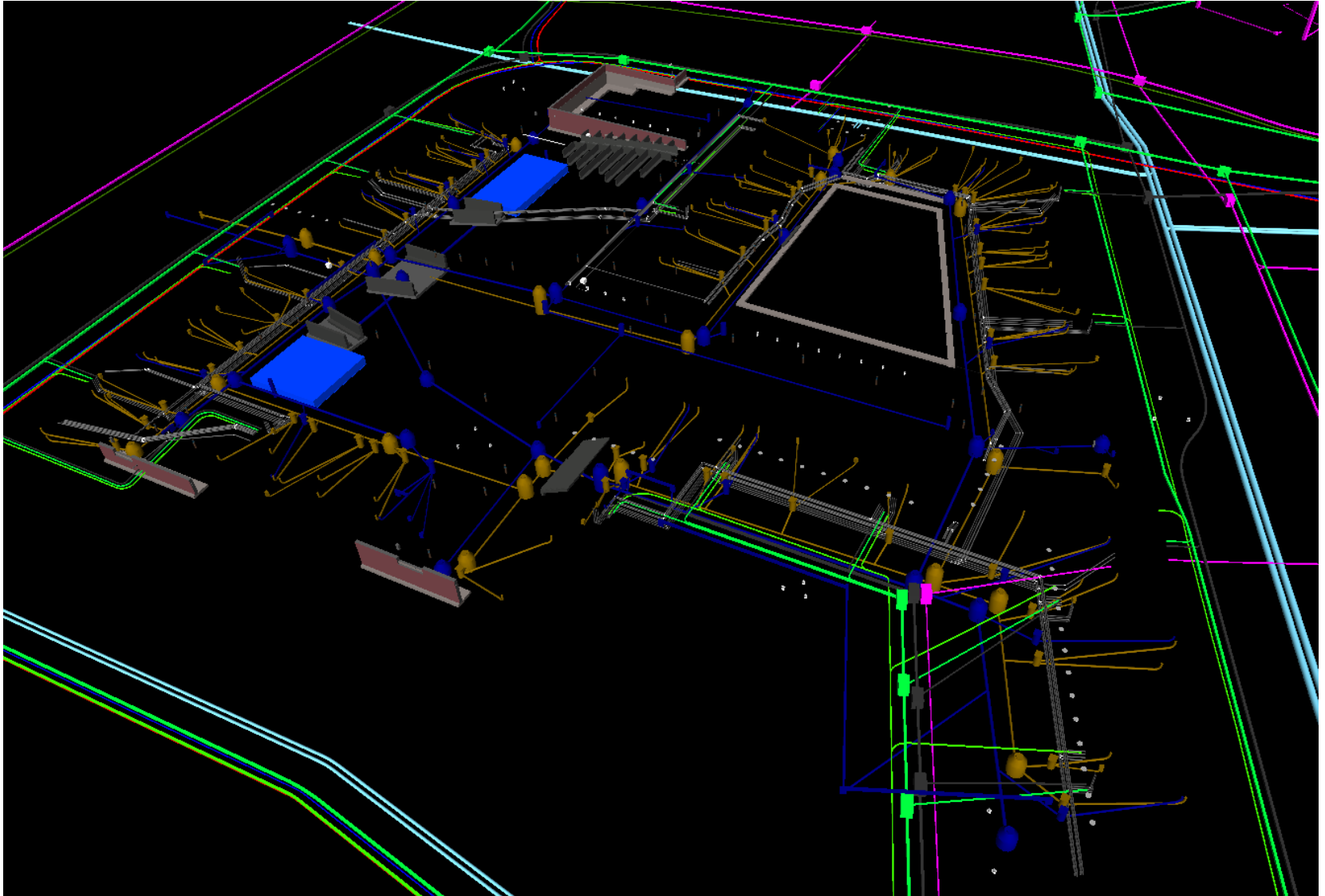
- Complex underground network
- Surface and foul water networks
- Potable and non-potable water
- District Heating and gas
- LV & HV electricity, traffic signal ducts
- BT, Virgin, Granta communications networks
- Underground bins and tree pits
- Civil 3D models, coordinated in Navisworks



Coordinated designs



Coordinated designs



Interpreting project brief & planning policy through design



Construction



Designer's role during construction

- Prepared CEMP & Pollution Control Strategy
- Prepared haul road design with pollution control lagoons
- Works let as Design & Build
 - Design assurance role
 - Review drawings to ensure design intent and compliance with RMA
 - Design coordination role

Progress to date





Conclusion



What have we learned from this project?

- One solution can have multiple benefits
- Sustainable and green solutions can be cheaper to build and maintain than heavily engineered solutions and bring aesthetic benefits
- Rainwater is a true resource that should be recycled wherever possible
- Proud to be involved in landmark project
- Sharing best practice with other clients in order to apply to other projects



The Vision Delivered



Thank you