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
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Interfaces / consultees

- Drainage
- Landscape
- Planning
- Client
- Quality & Sustainability Panel

CCC / SCDC

UniC

Drainage Authorities

Design Team

- EA
- CCC
- SCDC
- Cambridge Water
- Anglian Water

- Landscape
- Ecology
- Engineering
Designers

Masterplanning
Sustainability
Landscape
Town Planning
Surface water drainage
Highways
Earthworks
Utilities

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– 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

OPA
- Flood Risk Assessment
- Washpit Brook
- Sitewide drainage strategy

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

RMA
- 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

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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
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# Water Supply Strategy

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

![Average monthly rainfall (mm) chart from January to December]
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
Green fingers

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Western Edge Attenuation Lagoon
Western Edge

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Examples of SuDS

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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
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

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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

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Thank you