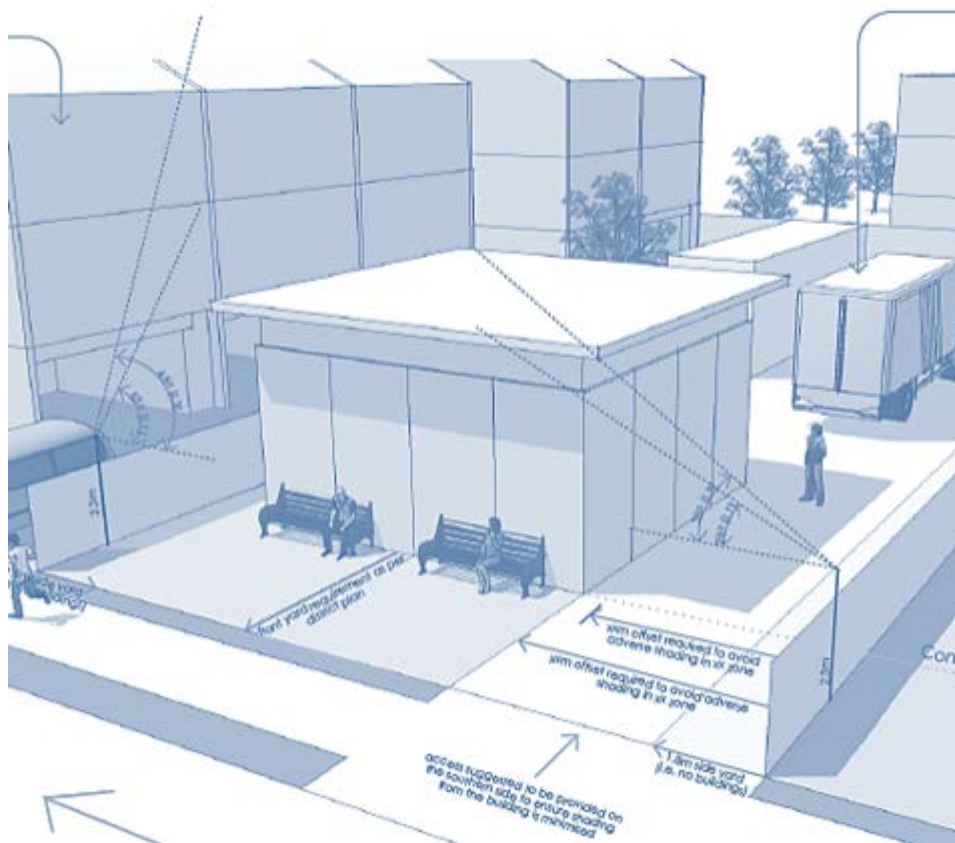


## Architectural design guidelines

### DP-12

Ver. 1

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0.1	First draft	J de Villiers	29/09/2017
0.2	Changes to references and examples	J de Villiers	15/10/2017
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## Abbreviations

AEE	Assessment of environmental effects
AUP	Auckland Unitary Plan
CPTED	Crime prevention through environmental design
RMA	Resource Management Act (1991)

## 1. Introduction

The architectural design guidelines are to provide effective consultation between Watercare, customers, Council stakeholders, Iwi, local boards and to meet Resource Management Act requirements.

### 1.1 Guideline scope

To outline the approach to architectural design and include relevant design disciplines to ensure a holistic, integrated design approach on above ground design elements for buildings or structures housing equipment and facilities above ground and more specifically pump stations and reservoirs.

## 2. Reference material

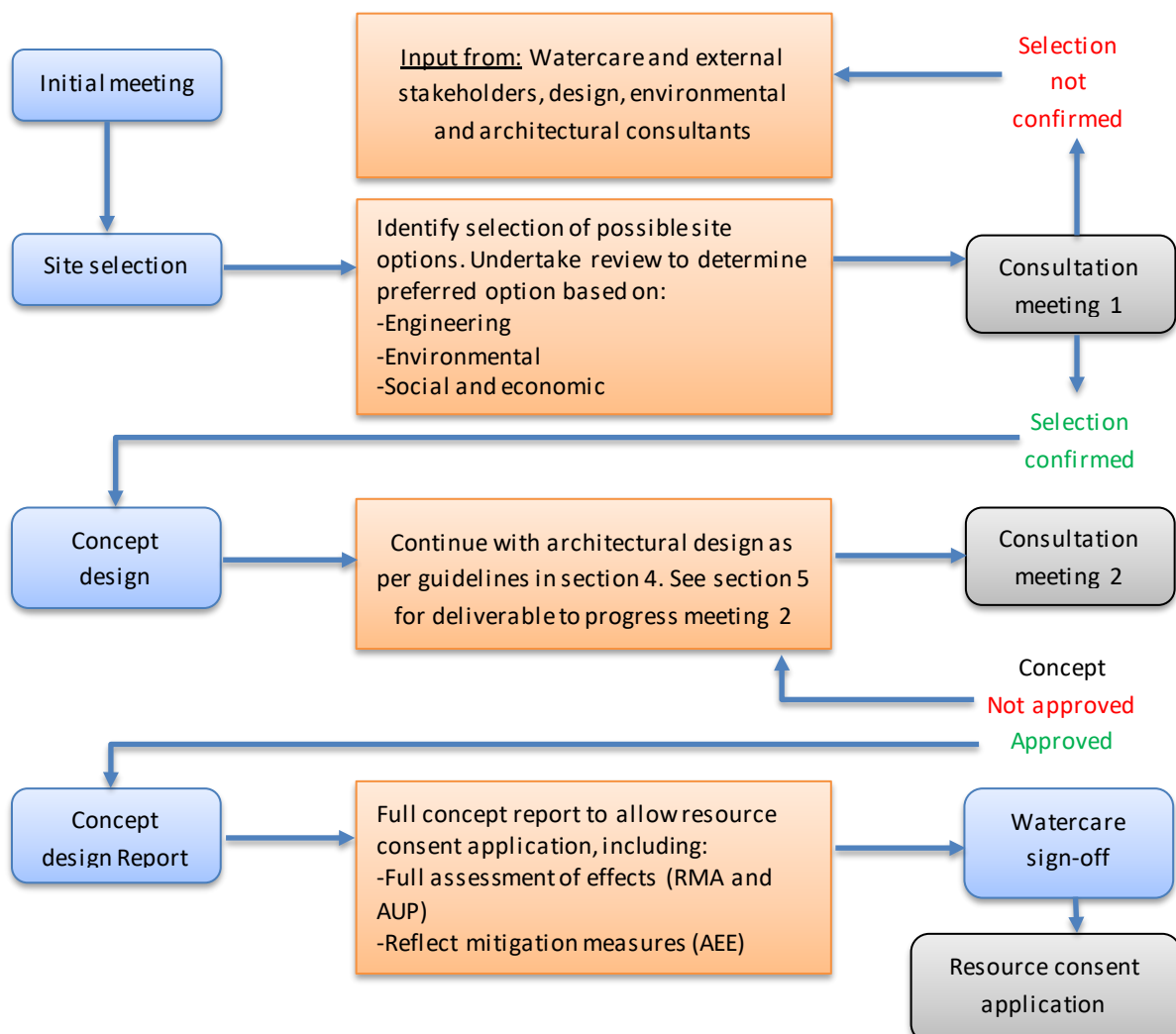
*SCIRT, 2012, Pump station design guide: A guide to the siting, architectural treatment and landscaping of pump stations and vacuum stations*

## 3. Design approach

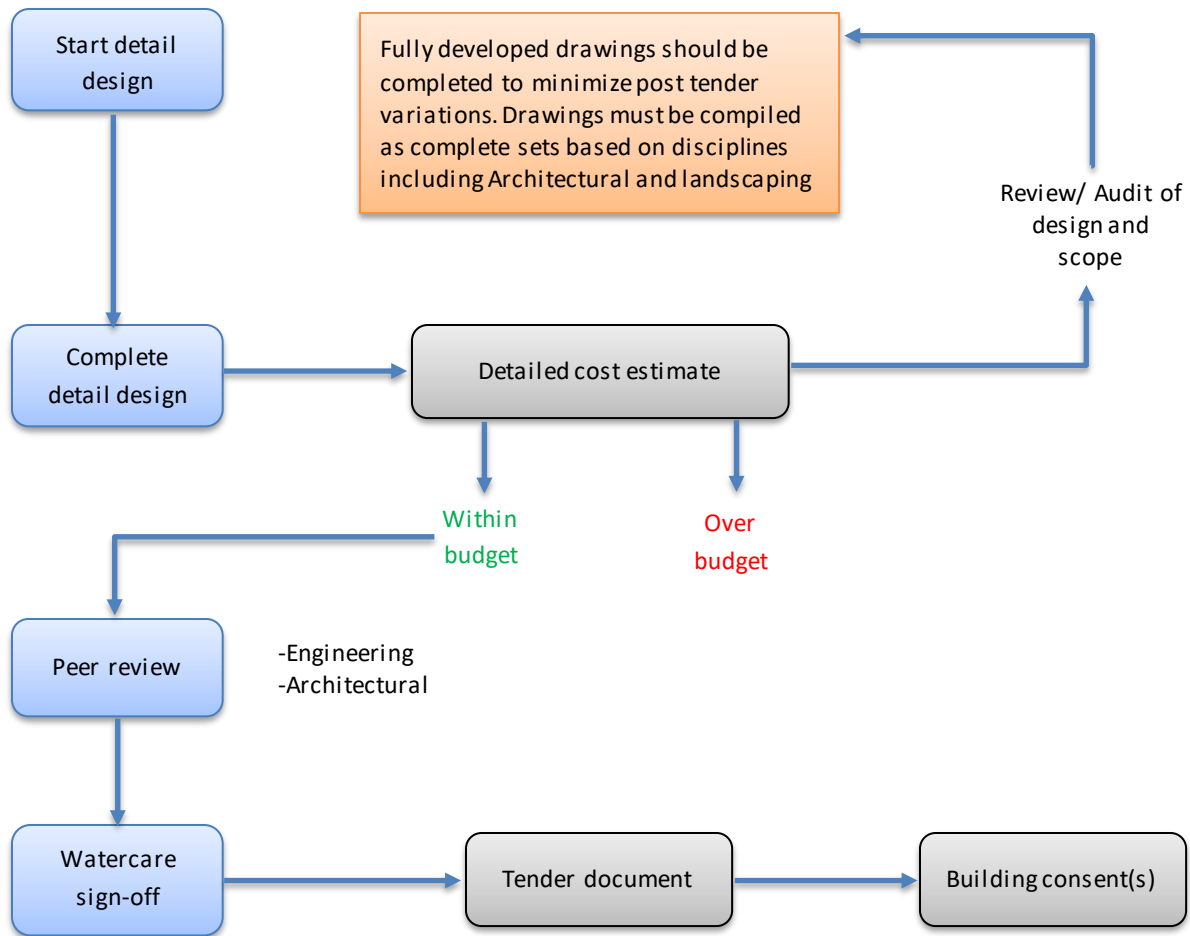
The design approach is to enable initial feedback from stakeholders and interested parties to be considered before detail design starts.

### 3.1 Design process

- i. Concept development: The concept stage includes site selection, site layout, architectural and landscaping concept development



- ii. **Detailed design:** Architectural and landscaping option selection and development of construction drawings, obtaining necessary consents, cost finalisation and tendering.



- iii. **Construction and maintenance:** Ensuring consent conditions are fulfilled and maintained with the use of management plans. For landscape development a 12 month establishment period is required.

#### 4. Guidelines

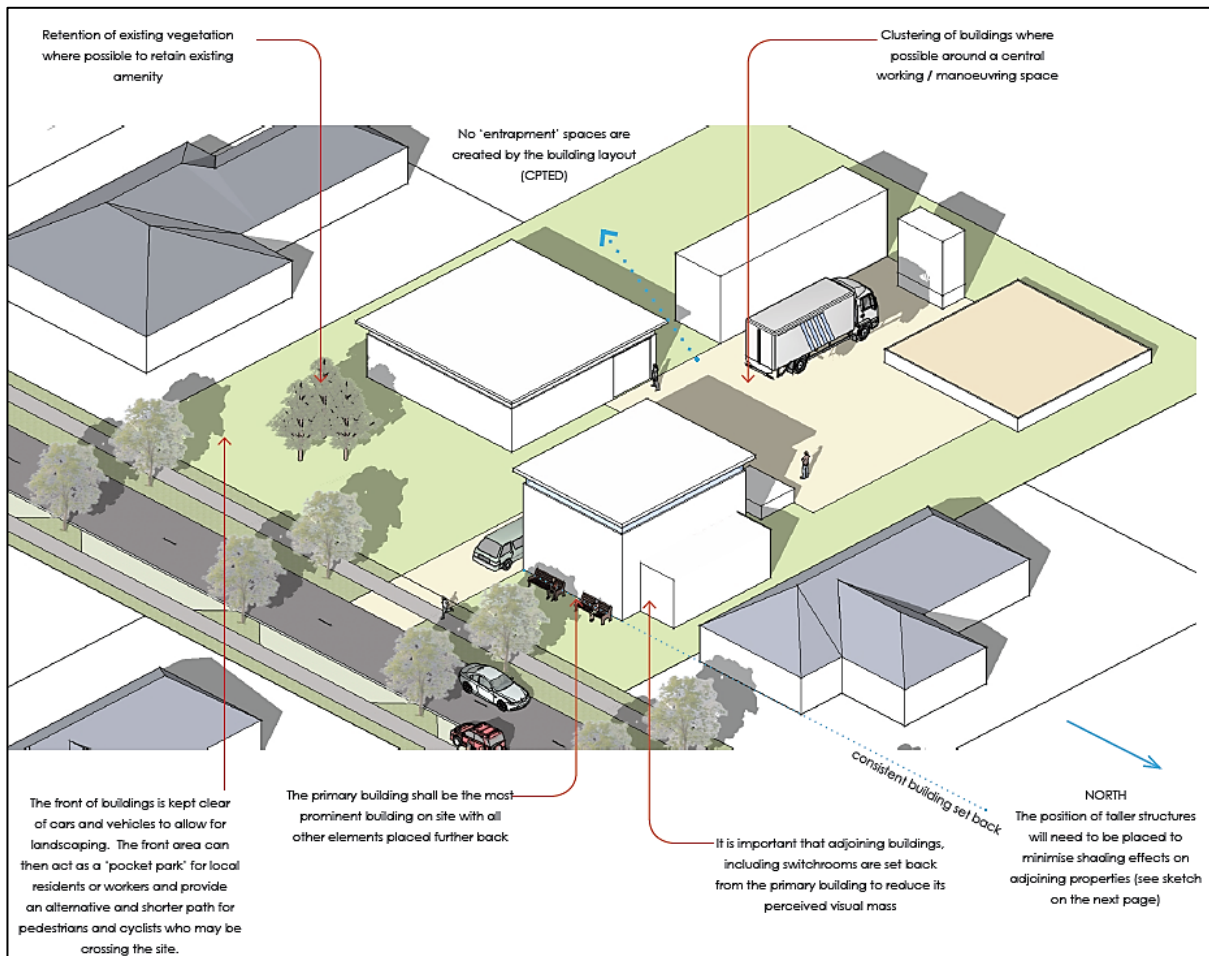
There are a number of ancillary equipment features that can be included in the above ground architectural design consideration such as:

- Electrical rooms and transformers
- Valve chambers
- Sheds
- Biofilters
- Tanks
- Hard stand areas

Size and composition can vary greatly between sites, however these guidelines apply to all sites. The importance levels, equipment hierarchy and environment may require compromise and variance, however all guidelines should be addressed through the design process to achieve the best outcome. Not all guidelines can be applied due to site specific constraints such as vegetation or existing surrounding infrastructure.

## 4.1 Site layout guidelines

**Sketch 1** showing generic design guidelines for facilities and associated structures as discussed in this section:



### a) Building hierarchy:

At the start of the design stage one building should be selected as the primary structure. This building takes prominence in the layout design.

### b) Building set backs:

The primary building should be set back from the road boundary to be consistent with the adjoining properties, or the distance listed as the minimum requirement by the Auckland Unitary Plan, whichever is the lesser.

On corner sites, the primary building should be prominently positioned to relate to the corner.

### c) Vegetation:

The amenity value of exiting vegetation and trees must be considered for retention and used to screen parts of the site. Involve a landscape designer, urban designer and Arborist for advice on the value of existing vegetation and removal or replacement.

### d) Crime prevention through environmental design (CPTED) principles:

Access: Safe movement and connections

Places with well-defined routes, spaces and entrances that provide for convenient and safe movement without compromising security.

Surveillance and sightlines: See and be seen

Places where all publicly accessible spaces are overlooked and where clear sightlines and good lighting provide maximum visibility.

Layout: Clear and logical orientation

Places that are laid out to discourage crime and enhance perceptions of safety. The space helps with orientation and way-finding.

Activity mix: Eyes on the street

Places where the level of human activity is appropriate to the location and creates a reduced risk of crime and a sense of safety at all times by promoting a compatible mix of uses and increased use of public spaces.

Sense of ownership: Showing a space is cared for

Places that promote a sense of ownership, respect, territorial responsibility and community

Quality environments: Well-designed, managed and maintained environment

Places that provide a quality environment are designed with management and maintenance in mind to discourage crime and promote community safety in the present and future.

Physical protection: Measures using active security

Places that include necessary well designed security features.

**e) Clustering of buildings:**

Cluster buildings as close as possible to provide a sense of unity between the different elements and reducing the amount of hard stand, impermeable surfacing required.

**f) Screening:**

A combination of screening elements can be adopted to assist with unifying the space.

**g) Future proofing:**

Take into account future growth in the facility requirement, including the installation of additional buildings and equipment.

**h) Access, manoeuvring and craneage:**

Vehicle parking and manoeuvring space should be located to the side or rear of the primary building to assist with screening and separate these private functions from public areas.

**i) Engineering requirements:**

Engineering requirements are overriding and must be at the forefront of the layout design to ensure sufficient spacing is provided for current and future facilities. The following components need to be considered:



- Process requirements
- Design life
- Importance level rating
- Access, operation and maintenance
- Environmental engineering such as noise, vibration and odour control
- Aesthetics appropriateness to the location

Often secondary cladding elements are required to overlay the engineered structure to maintain fit for purpose design.

## **j) Safety in Facility Design**

Watercare's Safety in Facility Design guide details the required operational outcomes and provides a summary of good design practice for Facility Design. These practices are intended to guide architects and design engineers on the requirements, layout and features and the relationship of elements within facilities.

The design guide is continuously updated and makes reference to template designs contained in the Engineering Standard Framework. The guide gives consideration to the following operational requirements:

### Accessibility

- Ensure and effective line of sight and safe vehicle movements to and from the site
- Eliminate confined equipment spaces
- Eliminate Ladders for access in dry spaces

### Workplace safety

- Minimise the number of rooms and maximise sightlines
- Mitigate noise breakout
- Contain and treat chemical odours and fumes

### Improved constructability and maintainability

- Vertical removability of heavy equipment
- Reliable and maintainable lighting

### Energy footprint approaches in an era of rapid technological change

- Power Management
- Illumination
- Ventilation

To account for daytime power outages, the illumination design shall include natural lighting with either elevated windows or translucent roofing panels. All translucent roofing sections shall include fall through protection (wire mesh or grill).

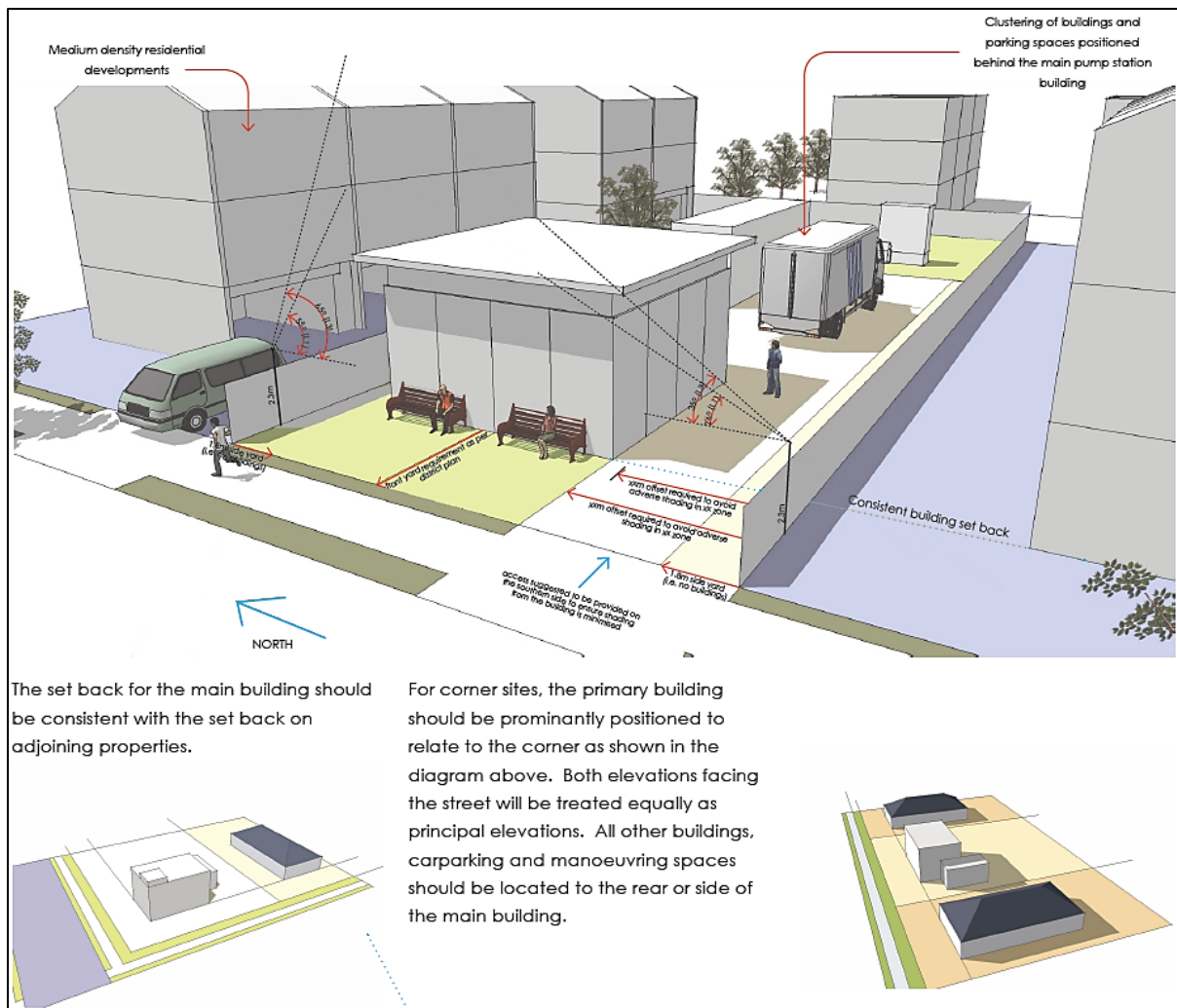
## **k) Recreation and public use:**

In some areas, such as park, recreational use is desirable and access should be made along with existing facility usage and the opportunity to improve use of such areas.

## **l) Shade recession planes:**

Under the Auckland Unitary Plan Shade recession planes are outlined for specific zones. The angle of the recession plane is dependent on the zone of the adjoining property (if different) and can have major influence on the design of taller structures.

**Sketch 2** showing set back and shade recession planes



## 5. Design deliverables

### 5.1 Concept development

To enable effective consultation with relevant stakeholders and to fulfil resource management act requirements, the following deliverables needs to be developed:

#### 5.1.1 Site plan

The site plan needs to show temporary works including:

- Location of the proposed works
- Temporary and permanent access requirements with surface treatments and associated drainage
- Construction areas and methodology
- Works within the vicinity of trees and other vegetation, accompanied by an arborist's report
- Locations of proposed test pits or other investigative works

#### 5.1.2 Building material, plant and fence palette

Development of a materials and planting palette that will be used in the design. Include suggested plant sizes and their spacing.

Identify the proposed fencing and gate styles and the materials it is to be manufactured from.

### 5.1.3 Rendered site plan

The rendered site plan should be produced at a scale of 1:200 and show building elevations for:

- Location of permanent structures, earthworks, retaining walls, fences and hard stand areas
- Permanent access requirements including surface treatment and associated drainage
- The position of protected trees and other existing vegetation that are to be retained
- Landscape planting areas
- Building material palette
- Planting palette

Example of a rendered concept plans:



### 5.1.4 Photo of illustration viewpoints

Provide colour photos showing the proposed site works, building sites, fencing areas, landscaping and earthworks. Examples of viewpoint photos:



**Photo example 1:** view from a pedestrian footpath towards a proposed pump station site. Consideration should be given to the surrounding properties' balcony levels when designing the eye-level of the viewer from their vantage point.



**Photo example 2:** view from the street towards a proposed pump station site, capturing the surrounding urban area fencing and view. The fencing area may obscure the eye-level view to the proposed site.

The locations of the viewpoints should be agreed with Watercare prior to development and should show sufficient information as part of the assessment of environmental effects (AEE) and for consultation purposes.

The illustrations should be developed to be shown for day 1 of operations as well as an established site at 5 years after placed in operation.

### 5.1.5 Concept design report

All the relevant information must be compiled into a single report to be used as a basis for resource consent applications as may be required including preliminary costing for the works.

The report must be sign-off by Watercare before proceeding with detailed design.

## 5.2 Detailed design

Following acceptance of the concept development report, detailed drawings and specifications are developed.

### 5.2.1 Site plan

The site plan must show:

- Location of the proposed works
- Temporary works
- Area of construction
- Works in vicinity of trees and vegetation
- Temporary and permanent access, surface treatment and associated drainage
- Location of proposed boreholes, test pits, or other investigations

### 5.2.2 Full construction drawings

- Layout showing set-out coordinates, grade, gradients and surface treatments
- Drainage plans and impermeable surfaces
- Elevation and plans showing sufficient detail for building consent

- Architectural drawings showing details that include surface finishes, fixings, door and window details and cladding/material compositions
- Landscape planting plans and specification showing plant species quantities, maturity/size that are required

### **5.2.3 Cost estimation**

Provide a full cost estimation undertaken by a suitably qualified quantity surveyor to ensure the project is still on budget.

If the cost estimation is found to be in excess of 10% of the budget a full audit must be undertaken to evaluate where savings are achievable or identify other measures that will reduce the cost to budget.

When the budget is found to be over the budget but still within 10 %, a value engineering process must be undertaken with Watercare to evaluate where savings can be achieved or if additional funding can be sourced.

### **5.2.4 Execution plan**

Include methodologies for temporary works, protection measures of existing and new trees and vegetation during construction as well as sequencing of works

### **5.2.5 Contract documentation**

Prepare contract documentation with Watercare specific terms and conditions.

### **5.2.6 Building consent documentation**

Prepare a full set of documents to comply with Auckland Council requirements.