

# Engineering Excellence in Auckland

3 year plan for quality technical guidance  
and tools for Auckland Council

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# 3 Year Plan for Quality Technical Guidance and Tools for Auckland Council

## 1 Executive summary

### 1.1 Context

Engineering and Technical Services (ETS) is a specialist unit under the Chief Engineer. Our role is to manage technical/infrastructure risks to Auckland Council. The 'technical' context relates to the engineering, science and building elements associated with delivering or enabling infrastructure.

### 1.2 Purpose

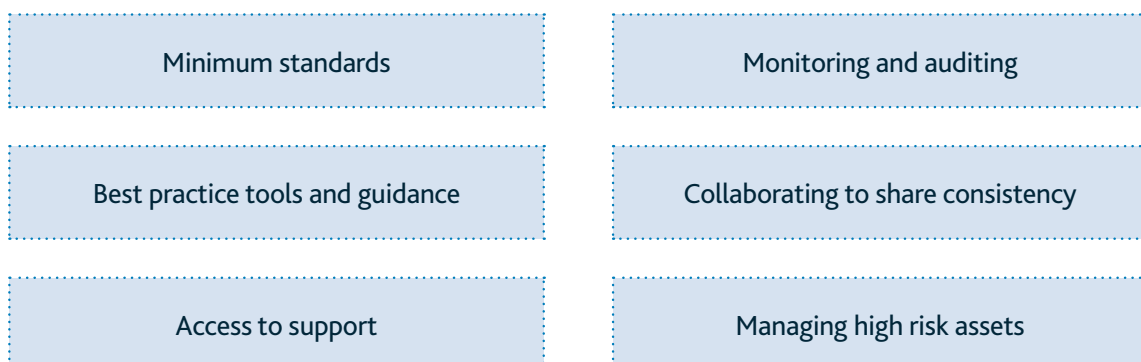
This strategic business planning document identifies initiatives we will undertake over the next three years to improve infrastructure outcomes and consistency. By delivering a technical framework, we will support the rest of the council in delivering the Auckland Plan, enable industry compliance with the Unitary Plan and meet council objectives in relation to infrastructure delivery. We will also standardise our industry approaches, reducing the cost of doing business and improving efficiency and competency of our staff and suppliers. We will provide tangible benefits with each deliverable.

### 1.3 Objectives

- Build a technical framework for Auckland Council.
- Link policy to delivery.
- Improve consistency, in technical standards and quality of technical advice.
- Reduce work and cost per project through standard approaches.
- Recognise and improve the technical skills of our staff.
- Inform risk management through technical considerations.
- Enable quality and resilient infrastructure development in Auckland.

### 1.4 Technical framework

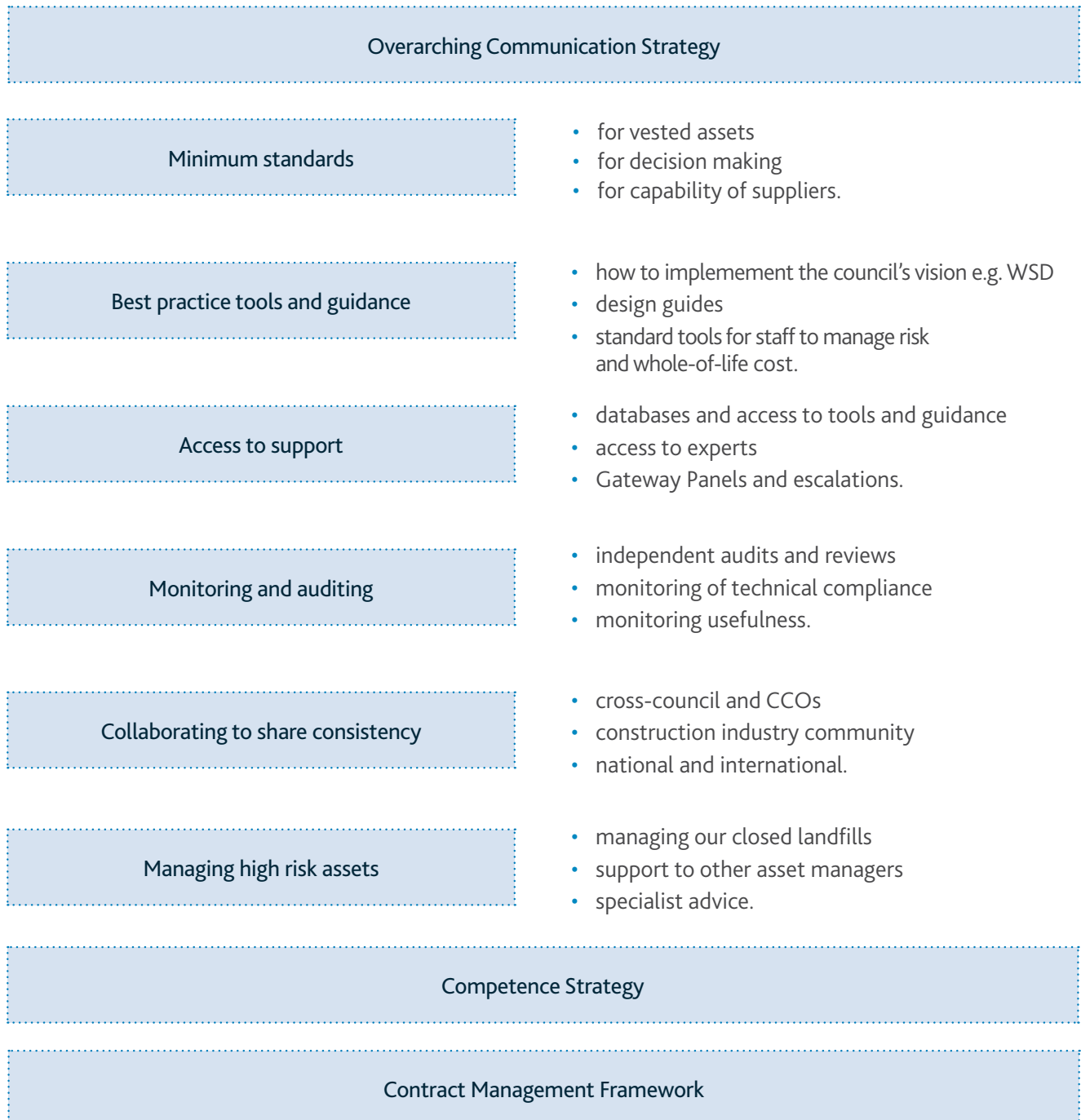
We will deliver quality technical guidance, tools and support through:



## 1.5 Stakeholders

Our stakeholders are the council and CCOs, utilities, horizontal and vertical infrastructure industries, developers, and the citizens and environment of Auckland.

## 1.6 From Framework to Implementation Plan



## 1.7 Success measures

We have defined success measures to document use of our guidance, and engagement of staff and industry in development of outcomes, and in knowledge sharing and dissemination.



## 2 Need for high quality technical advice

Auckland Council sets technical direction through the Unitary Plan, through lifelines and public risk management, consent conditions and by setting minimum standards for infrastructure. It also guides technical direction through the provision of design advice, best practice guidance, case studies and training or upskilling for staff and industry. High quality technical advice enables us to translate policy into on-the-ground deliverables, which allows us to achieve consistent infrastructure service levels for our communities.

Setting standards, such as minimum technical requirements for our own projects and developments, makes our consenting processes more efficient and ensures our assets have acceptable whole-of-life costs and performance. It also gives us a basis for monitoring performance and challenging ourselves and others if we don't get the performance we require. Setting standards gives us a base to define and improve capabilities, both of our staff and our suppliers. This in turn will reduce the costs associated with any unplanned outcomes on our projects.

Providing technical guidance is a way of defining the detail of how to achieve the council's objectives in relation to environmental outcomes, risk and hazard management and urban and rural development. It offers staff and developers road maps (which we support with tools and guides), which significantly increases the uptake of initiatives. Having defined approaches makes design and consenting more cost effective, for us and for industry. Having tools and guides also means we don't reinvent the wheel. At present, most design and construction contracts have bespoke technical requirements.

By standardising, we will save money on most, if not all, of the infrastructure contracts that the council produces. We will reduce uncertainty in the industry and make it easier to identify and deal with "true" variations on infrastructure contracts.

The existence of the ETS unit offers an opportunity to consolidate, standardise and improve the provision of technical advice across the council, allowing data, guidance and tools to be easily found and used. We are working collaboratively across the council family to collect and collate best-practice activities, approaches and documentation already in place, as well as developing tools and guidance where needed.



Seawall construction.

### 2.1 Current situation

Our aim is to improve technical consistency across the council, thereby reducing cost and ensuring ongoing good practice. Currently, infrastructure delivery departments have different approaches to:

- defining and articulating infrastructure objectives
- determining and communicating minimum standards for infrastructure they develop
- managing engineering / technical risk
- undertaking and using physical investigations as part of decision-making
- managing contracts on site
- writing contracts and defining technical scopes
- cost estimating.

In addition, since the amalgamation of the seven district councils and the regional council, development of good practice design guidance has been focused on one or two specific areas to meet the immediate technical demands of the new Unitary Plan. Now that the Unitary Plan is in the hearings phase, there is an opportunity to address wider guidance requirements to enable Consenting and Development Engineering to assess engineering proposals effectively under the new Plan.

With the inception of the Chief Engineer role and the ETS unit within Infrastructure & Environmental Services (I&ES), there is now a 'go-to' point for trouble-shooting of infrastructure or construction issues within the council. There is also a natural point for technical collaboration, knowledge sharing, information management and practice management within the wider expertise of I&ES and across operations.

The council focus on commercial outcomes has resulted in improving project controls, including the advent of the Gateway project governance process. This provides an opportunity to improve technical consistency within a more structured approach. Therefore, a tactical strategic plan is needed to optimise definitions of standards, provision of tools, guidance, dissemination and support to maximise effectiveness.

## 2.2 Objectives

Our objective is to make quality technical advice available to council staff and the wider council family, our supply chain and customers in order to assist the council in developing good infrastructure for Auckland in a cost-effective way.

The objective of this document is to articulate our three-year implementation plan, to ensure that improvements build pace across the council, and are embedded in how we do business.

## 2.3 Document layout and hierarchy of technical documentation

<b>Section 3</b>	<b>Addressing standards</b> <ul style="list-style-type: none"> <li>Codes of practice and new products and materials lists and catalogues are mandatory guidance for external providers delivering and vesting assets to the council.</li> <li>The Gateway process is mandatory for significant capital projects, and will become mandatory for other projects through 2016.</li> <li>Section 3 also includes our role in continuously improving competence standards in the council.</li> </ul>
<b>Section 4</b>	<b>Best practice documents and tools</b> <ul style="list-style-type: none"> <li>Guidance documents and design guides are not mandatory, but do capture best practice and would therefore be expected to be used in demonstrating compliance with environmental standards and council performance expectations.</li> <li>Internal guidance such as tools, guides, standards and advice are expected to be used by council staff where provided. Departures from the standard approaches should therefore be documented in departmental risk registers, as part of documented decision-making.</li> </ul>
<b>Section 5</b>	<b>How to access engineering and technical services advice</b> <ul style="list-style-type: none"> <li>This includes how we engage with others throughout scoping and delivery of advice.</li> </ul>
<b>Section 6</b>	<b>How we assess compliance across technical outcomes</b> <ul style="list-style-type: none"> <li>This includes the overall effectiveness of infrastructure project outcomes.</li> </ul>
<b>Section 7</b>	<b>Collaboration and who our stakeholders are</b> <ul style="list-style-type: none"> <li>Our aim is to improve consistency in outcomes across Auckland, and we rely on collaborative and open approaches to find best practical solutions.</li> </ul>
<b>Section 8</b>	<b>How we make advice available</b> <ul style="list-style-type: none"> <li>This includes how we disseminate our work and in particular, how we engage with industry and other stakeholders using collaborative vehicles such as communities of practice.</li> </ul>
<b>Section 9</b>	<b>How we will monitor the implementation and success of this technical excellence strategy for Auckland.</b>

### 3 Setting standards

Minimum standards are needed for the council and developers to ensure all council-owned infrastructure meets suitable minimum standards for lifespan, safe operation and maintenance and asset reliability. There are also technical capability requirements for some of the activities council undertakes. Part of the council's role is to develop and maintain optimum competencies of our staff and define where we require specific competency standards for external suppliers.

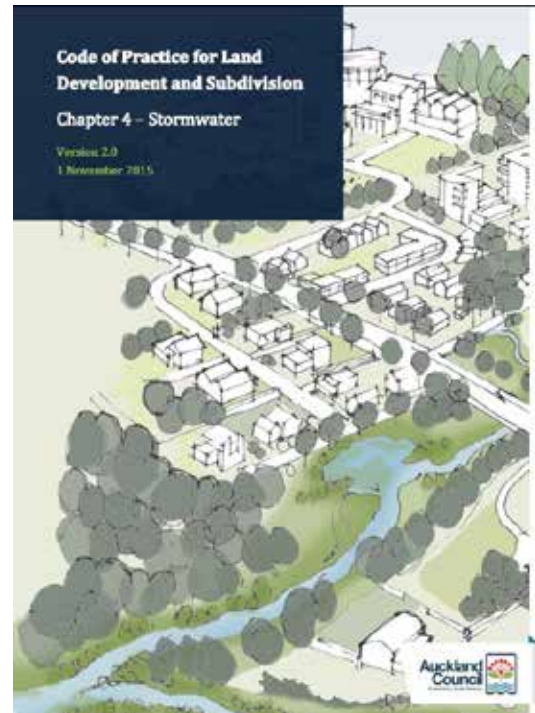
#### 3.1 Codes of practice

Codes of practice are developed to:

- set minimum technical standards for infrastructure, for both assets that council builds and assets which are vested to us in development
- help the council define and assess developer compliance with performance requirements and to streamline consenting for compliant projects.

These codes of practice are being developed in collaboration with the council family. The following programme has been established to deliver additions to the current chapters of the Auckland Code of Practice for Land Development and Subdivision, which will ensure vested assets perform and are cost effective to maintain.

These have been prioritised to manage some of the changes arising from the Unitary Plan, and to address some of the council's high risk activities.



Code of practice deliverables	Start date	Deliverable date
Green Infrastructure and Landscape Infrastructure	2016	2017
Dams and ponds	2017	2017
Landfill cap	2016	2016
Utilities	2016	2017
Geotechnical	2016	2017
Soakage	2017	2017
Coastal	2016	2017
Stormwater	Complete & ongoing	
Integration / implementation across Council	2017	2018
Gateway guide and manual	Complete & ongoing	



### 3.2 Standard products and materials

By establishing a preferred list of products and materials used in council infrastructure, we can influence whole-of-life cost and manage maintenance and operational requirements more effectively.

We have developed an approval process for any new infrastructure products or materials that enables us to work across council, Auckland Transport (AT) and Watercare, so that our suppliers will have a standard list to refer to. Once implemented, we will work with existing council catalogues and approved lists to develop a standard catalogue of approved products. Subsequently, we will update our operations and maintenance manuals and technical specifications to reflect our requirements. We are also formally documenting council's product acceptance methodology.

A key part of developing standard products and materials is through council and industry liaison with a focus on keeping things simple. We will continue to engage with industry to ensure we have positive effects on the market and on technical outcomes through special interest groups, discussed in Section 7.



Geo textile used in embankment stabilisation.

Products and materials deliverables	Start date	Deliverable date
New products approval process	Complete & ongoing	
Standard catalogue of products	2016	2018
Update O&M manuals and specifications	2017	2017
Recycled materials approval	2016	2017
Performance assessment guidance – stormwater treatment devices	2016	2017
Pre-approved foundation types	2016	2018

### 3.3 Quality standards through processes

Quality is managed throughout our project stages and technical inputs are vital to ensure our infrastructure is designed appropriately, built safely and offers us the expected lifespan and performance. A number of council documents, standards and approaches rely on technical direction to capture suitable information for delivery of high quality reports, designs and high quality assets. The tools to deliver this direction are listed in Section 4 – this section addresses the processes to achieve and monitor standards.

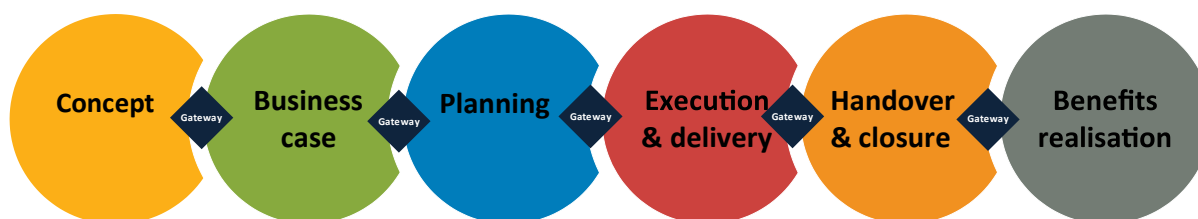
#### 3.3.1 Decision making processes

ETS has led the development of the Gateway process to define and capture project decision making at key stages, the intent of which is to drive better project governance and better risk management. This process will be further expanded alongside the development of specific project-phase documents suitable for infrastructure. ETS and departmental champions are leading a panel escalation process for complex decisions, utilising suitable advisors and developing a suitable format based on managing project risks and governance.

We are also developing and collating department-specific documents which capture project decisions – this is detailed in Section 4. Gateway is currently being disseminated throughout capital delivery projects and programmes and will move onto operational and other elements.

ETS is developing and embedding processes to capture technical challenges and drive towards construction cost savings and option innovation throughout the design process. This value challenge is incorporated into high value and high risks jobs, often via the Gateway process.

We will prepare decision-making tools, such as decision trees, to enable users to determine which course of action or technical guidance tool would be appropriate for their circumstances.



### 3.3.2 Quality review processes

A key part of successful project delivery is ensuring that there are appropriate quality reviews throughout a project's life cycle. The Gateway process has checks embedded which require evidence of quality control at each decision-making stage. More work is underway to develop suitable quality checks that protect council interests by balancing quality requirements, risk and cost to ensure interventions and audits are appropriate.

Work has started on defining quality requirements and critical audit points in construction contracts, both for council contracts and for developer infrastructure which will ultimately be vested to the council to manage. This is the highest priority, as it will reduce the number of defects in our new assets, hence saving operational and maintenance costs over the asset life.

Decision making deliverables	Start date	Deliverable date
Gateway process documentation	Complete & ongoing	
Gateway panel's process	Complete & ongoing	
Value challenge process	2016	2016
Technical quality assurance process	2016	2016
Gateway local board pilot	2016	2017
Decision trees	2016	2017
Project innovation process	2016	2017
Operational decision making documents	2016	2017
Safety-in-design	2016	2016
Community assets	2016	2017
Alignment of technical guidance publications	2016	2018
Integration / implementation across Council	2016	2018

### 3.4 Technical standards through documents

ETS develops standard documents and maintains their currency to enable consistency in infrastructure design and construction, reducing risk and cost and improving overall quality. These are detailed below.

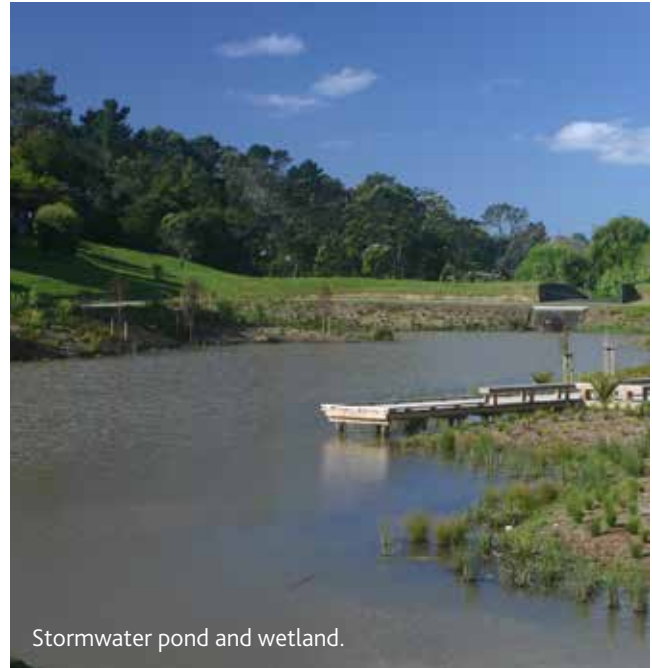
#### 3.4.1 Standard specifications

Specifications define how we want work to be done, generally design and construction, modelling, and site investigations. Each task will have its own specification, relating to methodology, risk management, quality requirements, checking etc. This forms part of a contract with suppliers.

ETS will collect, develop, improve/maintain for currency and store standard specifications to be used on council infrastructure projects. We will collect feedback from users, including staff and industry, on improvements and share best practice across the council family.

Development of a single set of specifications will save development costs on many projects across council. It will reduce timescales for producing tender documentation, and give council a more robust basis for improving the predictability of project costs. It will also set agreed standards for industry, which will reduce the number of variation claims on council projects and improve the quality of deliverables. We will focus on one type of infrastructure at a time, to enable early use.

The specifications will set quality acceptance criteria and performance requirements, including any needed for site specific sign-offs. This will improve the quality of the assets we have built, reduce problems at handover stage and will minimise O&M costs. The specifications will be available to industry for developers to use.



Stormwater pond and wetland.



Coastal Instability.



We will define specifications for survey and data gathering, to ensure that data is gathered consistently across council. This will enable compliance with national metadata standards, ensuring our asset management planning uses consistent data across the council. It will also, in time, enable and make provision for the use of Building Information Models.

Our first specification to be developed is a geotechnical investigation specification which will improve quality and consistence for ground investigations. It is being created as a joint project with other local and national bodies to achieve maximum usage across the country, which will streamline procurement of ground investigations by ensuring that we do not continue to pay others to develop unique contracts each time and will consequently, result in reduced costs. It will also include standard methods for measurement and standard schedules to reduce on-site variations. Other specifications to be developed include topographic surveys and condition surveys.

Having a single set of standards will provide a vehicle to implement council policy, for example waste management requirements will be embedded into council specifications, to help industry move towards council targets for Auckland reducing waste to landfill. Our technical specifications will be published on the web for easy access – they will be developed into an on-line database to make tender documents more cost effective to produce. As a technical asset, they will be updated regularly to incorporate new research, materials, technologies and regulatory changes.

### 3.4.2 Standard scopes

Scopes are generally how we define our more generic requirements, usually for consultancy, such as project management, quality checking and the like and also how we define and detail what we know of the project so far and what our objectives of the work are. As this occurs earlier than construction, less detail is known, so fewer specifications are suitable – however there is an opportunity to consolidate approaches.

ETS will compile from existing scopes, develop where necessary and hold standard scopes to ensure that the council receives good quality work from advisors and from field-data gathering. These will include a standard template for procurement of consultancy advice which includes quality checks, requirements, and standard requirements to accompany any data gathering. This will save the cost of developing scopes for each project. It will also save time and give more certainty to staff and industry about council requirements. We expect that the defined quality requirements will also improve technical project outcomes and improve the council's position in relation to proving liability when poor outcomes occur. We envisage that over time, a library of standard scopes will be developed across the council's infrastructure activities, which can be modified for specialist requirements as needed.

Standard scope deliverables	Start date	Deliverable date
Ground investigation specifications	2016	2016
Geotechnical reports	2016	2016
Contaminated land reports	2016	2017
Geotechnical baseline reports	2016	2017
Stormwater specification	2016	2016
Dams and floodbanks	2016	2017
Retaining wall specifications	2017	2017
Contaminated land specifications	2016	2016
Topographical survey specifications	2017	2017
Coastal specifications	2016	2017
Building specifications	2017	2017
Open spaces	2017	2018
Planting specifications	2017	2018
Graffiti and vandalism prevention	2017	2018
Consultancy contract scope outline	2016	2016
Construction contract preliminaries	2016	2016
Online specifications	2018	2018
Acceptance criteria	Ongoing	



### 3.5 Competence standards

The council defines required competencies to undertake some of the work we require. Part of the role of ETS is to work across the delivery units and other infrastructure-related departments to assist in defining competence levels for specific activities or deliverables.

For example, ETS has worked across the CAPEX delivery group to define capabilities required for the Engineer to the Contract role for the main infrastructure contract used by the council. This has resulted in a defined list of capabilities for low, medium and high risk projects, which embeds the concept of ongoing capability development. Defining required technical competencies will enable staff and managers to focus on increasing and maintaining council staff capabilities, whilst minimising risk to delivery. We will continue to work across delivery areas of council, to assist departments in defining and measuring competence standards for staff, including project and contract managers, engineers and others. We will also develop and provide training in key competence areas, which is detailed below.



Closed landfill specialist monitoring of well installation.

We will develop evaluation tools, to evaluate relevant competencies of our suppliers and other technical advisors, to enable us to take a risk-based approach to reviews and peer reviews. This is particularly relevant to health and safety, and to some design aspects for high risk projects.

#### 3.5.1 Professional qualifications

ETS has identified a number of professional qualifications which incorporate career and competence development structures for council's professional engineering, scientist and other infrastructure-related staff. We have established a development programme for the Institute of Professional Engineers New Zealand (IPENZ), NZ's premier engineering qualification. To support this, we have developed an engineering mentoring programme for experienced staff and new graduates, and a specialist graduate training programme across

I&ES and Development Engineering, which is embedded in council's overall graduate programme. We will develop similar programmes for modellers, scientists and other relevant specialists, and make them available across the council.

Increasing the professional qualifications of staff will not only improve competence levels across our staff and make us more attractive as an employer; it will also increase council staff credibility in hearings or other arenas where proof of technical competence or professional standing is required.

We are also working across the council to define SQEPs (Suitably Qualified and Experienced Professionals), and how the council can evaluate SQEPs - both internal staff and those advising on projects within the council's decision-making ambit.

Competence and professional qualification deliverables	Start date	Deliverable date
Engineer to Contract competencies	Complete	
Competence matrix	2016	2016
Contract Manager	2016	2016
IPENZ scheme	Complete & ongoing	
Engineering graduate programme	Complete & ongoing	
CIWEM scheme	2016	2016
EIANZ scheme	2016	2016
CIWM scheme	2016	2016
Technical communities	2016	2016
Technical mentors' training	Complete & ongoing	
Technical training	2016	2018
Gateway training	Complete & ongoing	
Technical competence minimum standards and qualifications	2016	2017
Intern programme	Ongoing	

## 4 Centre of technical excellence

We envisage that ETS will be the council's centre of technical excellence, and will provide coordination and direct input where appropriate into a variety of council corporate documents. However, our predominant role will be to:

- develop documents and tools
- support implementation of design guides
- enable delivery of council objectives
- respond to opportunities for improvement
- mitigate technical risk.

There is a strong business driver for this, in terms of reducing design and delivery costs, reducing consent processing costs, reducing risks of inadequate design or poor construction, and keeping people safe. This also requires proactive action – our approach to reactive support is covered in Section 5.

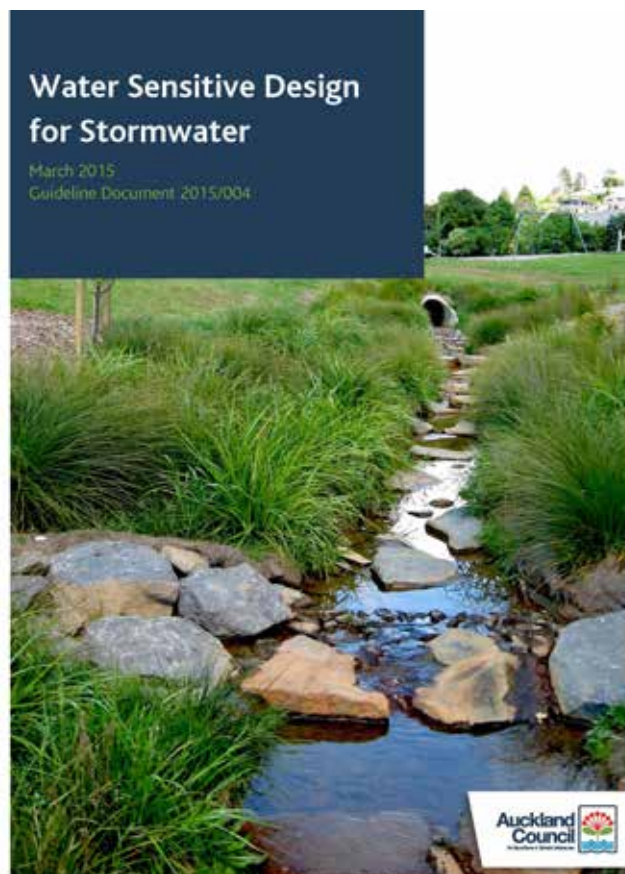
This section develops the detail of the technical areas we will focus on – for external industry this will be design guidance and associated development of knowledge. Within council, this will entail standardising our approach to a number of technical areas and collating and disseminating tools and data, working across the council family in collaboration. It will also involve developing and implementing approaches to managing our high risk assets.

### 4.1 Design guides

ETS will, where required, develop and hold infrastructure design guides for council staff and industry. The aim of developing guidance is to meet market-specific needs such as how to comply with aspects of the Auckland Unitary Plan, and to meet council-specific needs such as setting minimum design considerations for critical or problematic assets such as trash screens. ETS will also provide advice to the council on where international guidance proves suitable, such that development of local specific guidance is unlikely to achieve additional value outcomes above that of using existing guidelines.

At present, there is a focus on water sensitive design guidance to enable developers to comply with the Unitary Plan. As seen from the programme below, there are a number of areas where additional guidance is needed (to manage known risks or issues) and a suite of water sensitive design documentation is underway. The design guides will enable consenting and development engineering staff to process applications efficiently where the design has complied with guidance, and to identify non-compliance at early

stages. They will also give industry certainty of how to comply with the Unitary Plan. This will result in time savings across both the council and industry through reducing wasted work. It will also ensure the receiving environment of Auckland is protected adequately whilst enabling growth and development.



Another suite of guidance tools is being developed for Auckland soils, including soakage, infiltration and weak ground design requirements. A further work focus is design and use considerations for recycled materials – ETS will also be developing guidelines on how to include re-use and recycling considerations when designing and constructing infrastructure, following on from current research. We envisage that we will prepare documentation on some coastal design issues, including outfalls, and update and widen guidance on rainfall, inlets and outlets. Although our focus is on infrastructure, including open space infrastructure, in time, it is likely that guidance documentation will include some building matters, such as graffiti-proofing design.

The design guides developed by Auckland Council (and its predecessors) are in use across New Zealand and are recognised as best practice. It is important to recognise that nowhere in New Zealand, apart from Auckland and more recently Christchurch, has design guidance been developed for local conditions, which for us includes relatively high rainfall, very fine soil particles and volcanic geology.

ETS has undertaken a prioritisation process for guidance, resulting in the programme below for years one and two. This includes consolidating practice notes used by Consents into more formal guidance where required.

Design guidance deliverables	Start date	Deliverable date
Water sensitive design	Complete	
TP10 GD01	2016	2016
• Infiltration design	2016	2016
• Pervious paving	2016	2016
• Bioretention	2016	2016
• Rain tanks	2016	2016
• Ponds	2016	2016
• Wetlands	2016	2016
• Swales	2016	2016
• Green roof	2016	2016
• Plants and soils	2017	2018
• Inlet and outlet design	2016	2016
TP108 rainfall update	2017	2018
TP58 on-site wastewater design	2016	2017
TP90 sediment/erosion control guide	2016	2016
TP109 dam and floodbank guidance	2016	2017
Green infrastructure design	2016	2017
Construction on closed landfills	2016	2017
Use of recycled materials	2016	2017
Coastal management guidelines	2016	2017
Coastal outfall design	2016	2017
Trash screens	2016	2016
Safety-in-design guide	2016	2016
Infrastructure design / resilient design	2017	2017
Standard design and details	2017	2018



## 4.2 Research and development projects

Some of our design guides rely on global best practice, and some rely on Auckland specific world-leading research. Auckland Council has an ongoing partnership with Auckland University, which ETS co-leads with the Research, Investigation & Monitoring Unit (RIMU), our focus being on infrastructure-related research. At present, there are several research projects underway across stormwater, geology and waste. Our focus is on applied research which can be adapted into design or construction guidance to achieve better technical and environmental outcomes. Additionally, RIMU and ETS are working with the University engineering school to encourage innovation in infrastructure. Coastal management services is working with the University's science school, via the Coastal Community of Practice.

RIMU is the council's research specialist unit. ETS is working with RIMU to provide practical interpretation of some of the field research undertaken (coastal), and to make sure our technical guidance makes best use of our in-house knowledge and meets requirements for future monitoring.



Leachate iron oxide discharge from closed landfill.

Research deliverables	Start date	Deliverable date
Soil soakage characterisation	2016	2017
Pond maintenance	2016	2016
Rainfall runoff	2016	2017
Recycled aggregates	2016	2017
Coastal trends and responses	2016	2017
Sediment ponds effectiveness	Complete	
Contamination sources	2017	2017
Innovation grants	2016	2017
Acid sulphate soils	Complete	
Expansive soils	2016	2018
Long-term consolidation of peat soils	2016	2017
Liquefaction	2016	2016
Tunnelling induced settlement	2016	2017



### 4.3 Infrastructure contracts

ETS is a centre of technical advice for infrastructure contracts and is spearheading the development of a contract management framework across council. Workshops covering health and safety, contract documents, capability, data management and compliance will deliver tools and processes for council staff to standardise good practice across council. As an interface with legal and procurement, we will jointly develop training and guidance focused on infrastructure delivery. The team will advise on specific procurements and participate in high risk, high value tender panels. The team also offers an Engineer to the Contract capability, although with low staff numbers our role is generally to upskill other council staff through advice, guidance and mentoring.

#### 4.3.1 Professional services contracts

ETS, working with delivery departments, will develop a standard consultancy scope layout, which will incorporate quality requirements, project management requirements and how to deal with variations. This will work alongside Gateway processes and our standard specifications for investigations to improve investigation and design outcomes. This will reduce staff time and cost, and also reduce the risk of variations. It will also incorporate safety-in-design requirements, to ensure compliance with new Health and Safety regulations.

After industry feedback about levels of professional indemnity Insurance, ETS, Procurement and Legal have been developing a suitable approach for engineering consultancies. This involves assessment of the council's risk framework to determine risks and consequences relating specifically to technical advice, and development of a suitable risk-based approach to setting thresholds. This is being incorporated into Gateway documentation.

We will also develop and disseminate a CCCS Short Form Contract suitable for council use. This will save staff time costs, and encourage use of formal contracts rather than purchase orders for consultancy work, which will also help manage council risk.



#### 4.3.2 Construction contracts

We will work with Legal, Procurement and Delivery Departments to develop standardised General Conditions of Contract for infrastructure delivery contracts, which will follow on from the council-wide standard parts of the contract to identify general and preliminary contract requirements, and a standardised layout for technical specific items. This will reduce cost of contract preparation and increase industry certainty of council requirements. We will work across the council family, to seek consistency in approaches where possible.

In addition, we will develop Short Forms of Contract for the major contract types, to ensure the appropriate conditions are available for high risk, low value projects. This, in addition to associated guides for use, will reduce risks and costs associated with staff using inappropriate types of contract.

We will work with Procurement, Legal and Risk Departments and delivery specialists to develop an approach to bonds, comprising a risk matrix. This will reduce industry cost to work with the council, whilst managing the council's risk exposure appropriately, and ensure a level playing field in construction contracts. Over time, we will work with the same people to consider the business case of self-insurance for public liability of construction sites – an approach which is already adopted by Watercare.

We will work with operational departments to develop standardised methods of measurement and schedules of quantity for infrastructure delivery contracts. This work has been done in Australia and the UK, so can be developed into a cost-effective approach for New Zealand. We will also work with other parts of the council family such as AT and Watercare to seek a consistent approach across the industry. Having a standard way of defining and measuring (for valuation) each item of work on site will significantly reduce on-site variations, as well as the cost of contract preparation. It will make contract management and contract reposting easier, while significantly reducing uncertainty amongst our suppliers when pricing for work.

We will also develop specific guidance on valuing variations for council staff involved in infrastructure contracts.

#### 4.3.3 Risk

We will develop guides on assessing risk in infrastructure projects. This will be used to inform the Gateway process, and to inform project decision-making. Over time, the council intends that managers move to a more risk-based approach to managing delivery of infrastructure, which focusses on early identification and mitigation. We will advise on risk cost in contracts, which will improve early mitigation of high risks and enable budgeting for lower risks. We will also assist in advising on appropriate contingency budgets for infrastructure projects, again working alongside procurement.

Landfill remediation project.



#### 4.3.4 Contract management capability

We will develop a competence matrix for any staff involved in contract management, and develop and run, introductory training.

The team has already developed guidance documentation on experience requirements to undertake the Engineer to the Contract role. This will be supplemented with the development of specific competencies required for contract management, for consultancy (CCCS) and construction (NZS3910, NZS3916 and NEC) contracts. A Contract Management Community of Practice will be established to share good practice and provide mentoring for developing engineers and engineer representatives.

Training will be developed, with Legal and Procurement, to increase understanding of contract law, to upskill staff on specific contracts, and to interface with site supervision competencies.

#### 4.3.5 Contract evaluation

The team works with the Auckland Infrastructure and Procurement Group, to interface with industry around establishing, meeting and understanding client requirements. We will work with procurement and operational departments to develop standard weighted attributes for quality-focused work, to improve tender outcomes. This will help the industry reduce the cost of tendering on price-focused projects. We will work with procurement and delivery departments to improve past performance evaluation criteria when assessing infrastructure suppliers for new work, and embed them into contract documentation.

Contract form deliverables	Start date	Deliverable date
NZS3910 insurance requirements	Complete & ongoing	
CCCS insurance requirements	Complete & ongoing	
Contract for non-construction works	2016	2016
CCCS short form	2016	2016
Guidance on weighted attribute use	2016	2017
NZS3910 training	Complete & ongoing	
NZS3916 training	2016	2016
NZS3917 training	2016	2016
NZS3910 short form	2016	2016
Infrastructure risk framework	2016	2017
Valuing variations guidance	2016	2016
Standard methods of measurement	2016	2017
Contract management strategy		
• H&S in contracts	2016	2017
• Contract documents	2016	2017
• Capability	2016	2017
• Data management	2016	2017
• Compliance and audit	2016	2017

## 4.4 Earth sciences

Our specialists include geotechnical engineers, contaminated land experts, coastal scientists, geomorphologists and engineers.

### 4.4.1 Geotechnical

We will develop geotechnical and contaminated land site investigation guidance, which will comply with our Code of Practice requirements and our data gathering requirements. Unforeseen ground conditions are the most common cause of variations on site, and in most cases, more appropriate ground investigations could have identified the risks. This guidance document will assist with the scoping of our site investigations so that they properly achieve the requirements for design and construction of infrastructure.

We will develop guidance on dams, to supplement Ministry of Business, Innovation & Employment (MBIE) dam guidance, and to ensure that any new dams in Auckland are designed and built to manage our risks as a major urban centre. This will extend to dams that only hold water intermittently, such as flood banks, and to dams which are outside the Building Act requirements but which may still pose a failure risk. We will ensure that dam guidance includes operational and maintenance requirements so that our staff can maintain assets safely.

As we gain better data on soils, we will develop additional guidance documents on soakage and infiltration for Auckland.

We will revise existing guidance documents on sediment and erosion control during construction. Sediment accumulation has a major effect on receiving environments – improving how we manage construction sites will help achieve good environmental outcomes for Auckland. As well as developing guidance, training will be developed for industry. A community of practice will be established across industry.

Over time, as we gather better data and implement better testing of soils, we envisage ETS will take a role in managing cut-and-fill materials across council projects. This will lead to efficiencies in material reuse, and reduced costs of disposal and of importing material. A database of works will be developed to enable advance planning, across the council family.

#### 4.4.2 Contaminated land

We will work with other operational council family stakeholders in the contaminated land space within the council to develop a strategy across these teams to manage the council's contaminated land risks on council-owned land, and to meet our statutory functions and duties as set out in the Resource Management Act. The specialist team will also work to identify emerging contamination issues, and gain consensus across council to achieve a robust and consistent approach, providing certainty to ourselves and industry.

We will develop technical guidance documents and support tools on the contaminated land process and practice so that their use by our internal customers such as parks, stormwater, properties and the wider council family can embed contaminated land management throughout their project lifecycles. This will enable early identification of contaminated land issues risks early on in projects and allow timely responses in a considered, technically robust and cost-effective way, rather than addressing issues as they arise during construction or having unnecessary residual risk following project development, requiring ongoing resources.

We will assist, where required, in identifying and recording known or suspected latent liabilities associated with contaminated land on council-owned land and prioritising investigation, remediation and management with the overall aim of reducing the level of liability through a combination of remediation, consenting and improved consent management, acquisition and divestment. This will ensure council management of liability in a technically robust way. It will also enable us to identify sites which might be eligible for external

funding of remediation through the Ministry for the Environment (MfE) Contaminated Sites Remediation Fund and work with key stakeholders to secure this funding.



Contaminated site warning for remediation works.

We will develop guidance, as well as working with key parts of council to minimise contaminated land risk as part of the acquisition and disposal process.

We will include guidance on identification and testing for contaminated land in our geotechnical specification depending on the risk profile of the project. This will significantly reduce late discovery of contamination and help us develop cost-effective solutions early. We will also develop guidance on treatment of various contaminants, to enable cost-effective approaches.

We will work closely with the MBIE, MfE and other national bodies to ensure best outcomes for Auckland, and will ensure our guidance is valid across the council family. We will also include guidance in departmental documents, where relevant, to ensure risks are identified and costed from business case onwards. We will develop training for council staff, and have already established a contaminated land community of practice to ensure dissemination and collaboration across the council family.

We will develop construction guides on working on or near closed landfills, and develop design guides on landfill details such as capping. This will manage risks around others working on or near these high risk assets. We will also develop operational policy on how we manage our closed landfills, to ensure that we maximise the efficiency of other uses on the surface.

#### 4.4.3 Coastal management

Working with the Operations Division and the wider council family, we will develop an operational coastal management framework and tactics to manage future coastal risks in Auckland. We will identify key hotspot areas and issues, and will assist the council in asset prioritisation planning for coastal assets as part of developing asset management plans.



Our initial focus is likely to be on high erosion areas, or areas which suffer frequent storm damage. We will work across the council to assist the development of key messages to disseminate approaches, including practice notes for issues such as landowner approvals. Coastal Compartment Plans will be developed to implement strategic approaches. This has several advantages for the council; it enables low cost, specific and targeted planning and advice on effective solutions. As coastal behaviour is not well understood, the cost savings from providing this guidance are substantial and immediate.

We will develop guidance and templates and provide training for coastal condition surveys (structures and green infrastructure), to upskill staff in ongoing assessment. We will also provide audit and interpretation services to ensure robustness. This will enable effective use of staff time and ensure that suitable data is gathered and analysed appropriately, to effectively manage asset performance. Findings will feed into asset management planning and assist with renewal prioritisation.



Algies Bay seawall construction.

We will develop guidance on future management of coastal infrastructure, to ensure appropriate treatment of risk, and to assess consentability at early stages. This messaging will be promoted via facilitation of the Auckland Council Coastal Community of Practice facilitated by Coastal Management Services. This will set performance standards and enable more discussion and consideration of costs of responses to storm damage. We will also develop guidance on coastal outfalls and dissipation devices (on shore), working with asset owners to achieve best practice. This will seek to reduce beach erosion from outfalls and improve amenity, hence improving use, whilst reducing beach maintenance costs.



Orewa Beach sand redistribution.

We will continue to work with the Strategy Division to assist with the development of policy and plans ensuring the rules and regulations provide for operational requirements and practice. We will advise on development issues around eroding coastlines, current and future, and develop guidance on managing erosion and related issues exacerbated via sea level rise and climate change. We will also develop guidance on implementing coastal flood risk management in accordance with the Unitary Plan.



Earth sciences deliverables	Start date	Deliverable date
Coastal condition survey	2016	2016
Coastal asset data review project	2016	2016
Coastal compartment plans	2016	2018
Coastal operational management guide	2016	2016
Coastal inundation model guide	2016	2016
Coastal erosion rates	2016	2017
Contamination management guides	2016	2016
Council contaminated land database	2016	2016
Cut/fill management system	2016	2017
Environmental due diligence	2017	2018
Contaminated land function identification	2016	2017
Natural hazard information management	2016	2016
National hazard risk management action plan	2016	2016

#### 4.5 Project safety, quality and environmental management

Within ETS we have specialist capability around safety, quality and environmental management of site and field work.

We seek to support the council's Operations Division to ensure the business is given adequate support where the safety, quality and environmental risk is greatest due to the nature of the work (ie construction). Our resources support the work of the council's Corporate Health and Safety unit, yet focus specifically on mitigating construction and out-of-office hazards.

Our focus is on understanding risk. A strong characteristic of our planned programmes is an emphasis on sector or industry based programmes, through tailored support and more targeted interventions. Our safety, quality and environmental (SQE) strategies recognise the link between a good evidence base and the ability to prioritise and target activities and efforts collectively across the Operations Division.

We recognise that SQE project risks shouldn't be treated in isolation, rather embedded into Auckland Council's delivery model including the Gateway process. By doing so, we can enhance compliance



Rosedale closed landfill flare.

strategies at all stages of a project; from concept, business case, planning, execution and delivery, handover and closure, through to benefits realisation.

We work closely with our contract and risk specialists and our procurement team, ensuring contracts are fit for purpose, risks and mitigations referenced, competency standards listed, and delivery expectations defined.

We advise on all manner of high risk activities including construction, mining operations, working with the asbestos regulations, dams or closed landfills, working alongside the other technical specialists in ETS. We provide specialist training to manage health, safety, quality and environmental risks in contracts, placing accountability and responsibility onto site and project managers, based on clear guidance and competency-based training, working with the contracts and risk specialists.

We work with infrastructure delivery teams to develop strategic planning and tracking performance-based outcomes. Five key areas over the three year plan include:

- development of industry specific training for contract managers
- communicating SQE expectations through supplier inductions, guidance and partnering approaches
- providing due diligence through a consistent monitoring and tracking programme
- providing accurate safety and environmental reporting based on capital works delivery
- developing useful, performance-enhancing KPIs.

A community of practice will be established.

We will develop guides for staff to implement corporate policy in our out of office activities. Our initial focus is working safely out of office, applying driving policy to site work and use of four wheel drives and all-terrain vehicles. We will update and improve some standard templates to focus on specific types of site work and risk. We are developing guidance on how to consider safety-in-design, which will be embedded into the Gateway process to meet the requirements of 2015 safety legislation.

We will develop a health and safety induction for staff doing out of office work or site supervision. We will also develop a consultant and contractor induction programme, to ensure our suppliers understand and are working to council standards. By communicating council requirements clearly, we will reduce site risks and reinforce acceptable standards.

We have defined some site supervision safety competences and have developed a two-day training course for site staff, to ensure they understand site risks. We will also develop ongoing lunchtime safety training through a targeted programme.

This will include lessons learnt from audits or incidents. We have already developed site accident investigation training and will continue to roll this out in the training program.

We will work to add health and safety, quality and environmental considerations into other technical documents, particularly tender documents and construction contracts to include our requirements. We will also continue to develop guides as the industry changes, with the advent of new legislation or approaches to construction.

Manhole access in gaseous environment.



HSQE deliverables	Start date	Deliverable date
Out-of-office guide	Complete	
Safe driving policy	Complete	
Safety-in-design guidance	Ongoing	
Site contract management training	2016	2017
Contractor induction	2016	2016
Site supervision training	2016	2016
Safety competences matrix	Complete	
Contract management clauses	2016	2016
New regulations infrastructure guidance	2016	2016

## 4.6 Data

Access to data is a fundamental part of getting the right technical outcomes. Council holds a lot of data, in various forms. It is more cost-effective to enable access to this data, rather than repeat the data gathering. We have therefore included the provision of data as a tool to enable good outcomes.

In some cases, ETS will directly hold and manage databases of technical data. In other cases, such as the national geotechnical database, ETS will provide ongoing technical advice, including review of technical risk to the council, advice to council users and in some cases, data cleansing support.

ETS will initiate the development of metadata standards for council data, and work with developers to ensure that the data capture is appropriate.

### 4.6.1 Contaminated land database

Council has statutory responsibilities under Section 30 of the RMA around investigation of land for the purpose of identifying and monitoring contaminated land. Whilst a contaminated land database is important for the identification of contaminated land for the general public, it is also key for the council in terms of land-use planning and measuring the success of pollution prevention policies and rules. ETS will occasionally review the data held in this database to identify trends within this data and identify responses to these trends.



Newmarket Park closed landfill remediation.

### 4.6.2 Geotechnical database

As noted above, Watercare has developed a GIS-based geotechnical database for Auckland, and ETS has coordinated and facilitated collating and uploading of council data into the database. New data uploads will be included in the geotechnical specifications. This data is in the process of being transitioned to a MBIE national database. ETS will continue to provide data and technical support to MBIE once the transition is complete.

#### 4.6.3 Cost database

ETS will compile, hold and update capital cost databases for infrastructure projects, working in conjunction with asset providers. Having access to robust cost estimates will assist council in decision making at early project stages, including enabling informed decisions about prioritisation and project risk.

#### 4.6.4 Intranet

ETS will develop a technical portal on the intranet, enabling easy access by council staff to technical guidance, tools and data.

Data management deliverables	Start date	Deliverable date
Geotechnical database	complete	
Unit cost database	2016	2017
Intranet	2016	2016
Internet	2016	2016
Council contaminated land database	2016	2016
High risk asset database	2017	2018
Coastal reports database	2016	2016
Geotechnical reports database	2016	2018
Geotechnical database user guide	2016	2016
Lessons learnt	Ongoing	
Consolidating technical document publications	Ongoing	

## 5 Projects and advice

### 5.1 Types of advice

Types of advice range from specific troubleshooting on infrastructure design and construction projects, to development of guidance and operational policy to resolve issues, to technical governance to ensure a suitable level of technical oversight of high risk programmes. In all this, the ETS unit acts as facilitator, to ensure appropriate expertise is included, as well as a provider of specialist advice from ETS subject matter experts.

#### 5.1.1 Operational policy

Operational policy may be required in response to a risk, or to determine tactics to implement council strategy effectively. In this event, ETS will coordinate the development of the response and enable its technical validation and consistent adoption across the council family and other stakeholders.

#### 5.1.2 Technical guidance

Technical guidance is required to set standards. In general, guidance is developed either in response to a need arising from operational activity (asset delivery or consenting), to mitigate specific risks, or to drive improvements. ETS leads the scoping, prioritisation and delivery of a range of guidance documentation, where other council subject matter experts and user groups are involved, alongside industry, to develop and disseminate guidance and good practice.

#### 5.1.3 Project specific advice

Project advice is needed to solve or influence a specific problem – to bring in non-standard expertise, or to troubleshoot unexpected events. In this instance, advice is generally ad hoc and reactive, with an overview of risk triggers and confirmation of problem ensuring that issues which arise consistently lead to development of operational policy or technical guidance.

#### 5.1.4 Technical governance

Processes are needed to ensure that technical governance is underway on projects or programmes of work. This includes Gateway processes, to confirm conscious decision making at project stages, plus quality assurance and quality control processes and audit. ETS leads the development and embedding of such processes, working alongside corporate support. Technical governance includes the use of panel review processes for high risk decisions or projects.

### 5.2 Methodology to deliver

Utilising practices derived through consultation for the quality policy advice, a methodology has been established to identify the need for, implement and disseminate quality technical advice.

### 5.3 Panels and expert contracts

We believe there would be great value to the council in developing term contracts or panels for geotechnical investigations, contamination investigations and the like. Some departments have already set this up, or are in the process. We will advise on technical requirements, and be a centralised source for access to investigations. This year, we will investigate options, to build into our ongoing strategy.

We also propose setting a panel to give us, and others in the council, access to specialist advice for reviews and urgent responses. This would assist in identifying suitable skills and setting up a contract prior to there being an issue to address. This year, we will identify core requirements in a business case, with a view to procuring by end of financial year.



## 6 Audits, monitoring and compliance

### 6.1 Independent audit of health, safety, quality on site

ETS performs a specific function in I&ES to independently audit site compliance with health, safety and quality requirements of council. This is intended to assure the performance of contractors and supervisory staff on site, to highlight any issues with requirements or with competences of those performing, and to feed back into council to enable improvements or remediation. The independent audit role also undertakes investigations of breaches or incidents.

Work is currently underway with stormwater to update the site quality audit requirements, based on new standard specifications.

### 6.2 Independent audit of HSEQ for office-based infrastructure projects

A process has been established to undertake independent audit of office-based projects, i.e., those in pre-site implementation stages. Whilst we anticipate Gateway panels will audit outcomes, compliance with the process will be managed by the contract or project manager, and a risk-based audit of compliance will be undertaken on a sample of projects. This relies on the development of consultancy specifications, which is underway at present.

### 6.3 Other independent review

ETS undertakes reviews of technical outcomes, on request, to provide an independent view of appropriateness of technical advice, contract conditions, risk mitigation, cost variations and decisions made. These remain confidential where required, with lessons learnt integrated into our future advice.

We advise on technical aspects of due diligence work, such as contaminated land review of land the council intends to buy or sell, when requested.



Stormwater upgrade pipe laying.

### 6.4 Monitoring and compliance

ETS reports on safety and quality monitoring and compliance data for I&ES, based on project manager and site supervisor audits. Reporting is reviewed and analysed for trends. This analysis informs future direction and priorities in terms of developing guidance and setting operational policy.

## 7 Stakeholders and collaboration

For technical advice to be effective, a range of stakeholders have to be involved in developing and implementing such advice. We have few staff, so rely on collaboration and engagement to deliver an ambitious programme of technical improvements.

Within the council, the ETS Unit works with: Stormwater, Solid Waste, Parks, Sports and Recreation, Environmental Services, City Transformation, IS, Procurement, Community Development, Libraries, Property, Resource Consents, Building Control, Civil Defence, Strategy and Policy, RIMU, Auckland Design Manual, Sustainability, Legal, EPMO, Health and Safety, Unitary Plan, Licencing and Compliance. Within the council family, we also work with Watercare, Auckland Transport and Auckland Council Property Ltd (ACPL), and are developing engagement with Waterfront on technical matters. We undertake Local Board liaison as specialist support/technical interface.

Outside the council, we lead interfaces with the Contractors' Federation and Association of Consulting Engineers, who represent the contracting and consulting industries respectively. We have direct engagement with the majority of contractors and consultants in the Auckland marketplace. We lead interface with the Standards NZ, the NZ Transport Agency (NZTA), and we are also a key point of contact with infrastructure suppliers and manufacturers, either individually or through industry associations such as the Concrete Pipe Association, Cement and Concrete Association of NZ (CCANZ).

Although we do not lead the council relationships, ETS has interfaces with MfE, MBIE on technical issues such as contamination, climate change, construction procurement. We also have information-sharing relationships with a number of NZ local government agencies.

We lead relationships with appropriate professional bodies, such as IPENZ, to ensure that our training and competence development can lead to recognition through professional qualifications.

### 7.1 Stakeholder management plan

We will develop a stakeholder management plan, to identify our most influential relationships to ensure we achieve our objectives. This year, we will also specifically consider how to engage with some stakeholders that we do not interface with regularly, including iwi.

## 8 Dissemination

We recognise that technical advice needs to be used, and needs to be accessible. Dissemination needs to be through a variety of channels, depending on the scale of advice and the target audience. We envisage the following:

- external and internal web pages, with links to published documents and to key people
- published documents, tools and data in a range of scales of technical complexity
- communities of practice, holding knowledge of practice and capability across council and across industry
- targeted training, in house and for suppliers where relevant to council outcomes, such as consent compliance
- council-run seminars and conferences
- identification of council champions for key elements such as water sensitive design
- compilation of council technical papers and presentations
- newsletters and case studies
- industry special interest groups.

We will develop a training calendar and a communications plan this year. We expect all external training and conferences to be driven by industry demand, and are therefore either cost-neutral or revenue-attracting. Generally, working groups or interest groups will be project related. We have the ongoing wider groups and Communities of Practice planned or underway, with regular meetings being held. In most cases, the community is established and activities are ongoing.

Communities of practice	Start date	Deliverable date
Coastal	In place	Ongoing
AIPG	In place	Ongoing
AC/AT/WSL technical group	In place	Ongoing
Water sensitive design	In place	Ongoing
Contaminated land	In place	Ongoing
Cost engineering	In place	Ongoing
Dam group	In place	Ongoing
Geotechnical	In place	Ongoing
Gateway champions	In place	Ongoing
Contract management	In place	Ongoing

## 9 Measures of Success

Outcome	Measure	Reporting
Out of office guide		
Industry use	No. of downloads	
	No. of industry partners involved/ branded	
Council use	No. of units/departments involved in development of document	
	No. of staff trained	
	No. of lunch and learn held	
Ease of access	No. of clicks to document (for internal and external websites)	
Engagement	Community of Practice established for subject	
	Steering group approach used	
	Feedback process used by industry	
Measurable success of document	Document defines measurable outcome	
Research		
Choice of topic	Academic partner found for research topic	
	Client partners found for research topic	
Usefulness of research	Research outcomes used in guidance document, technical specifications etc	
Capability		
Engagement	No. of community of practice meetings held, objectives met	
	No. of lunch and learn held	
	No. of attending lunch and learn	
Training	No. of technical training attendees	
	No. of staff on professional qualification schemes	
Technical Advice		
Project success / quality	Improved efficiency	
	Cost-effective outcomes	
	Assets easy and safe to maintain	

All internal documents will have specific success measures developed.











