AI TOOLS FOR EVERYDAY TASKS

MAY 2025

engineering new zealand
te ao rangahau

Welcome to "AI Tools for everyday tasks," a guide for Engineering New Zealand members. This guide aims to streamline your processes, boost productivity and foster innovation in your engineering practices.

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Getting started with AI tools

AI tools can seem overwhelming at first, but with a few simple steps, you can begin integrating them into your everyday workflows to save time, improve accuracy and drive innovation. Here's a quick guide:

Identify your use cases

Start by identifying tasks in your daily work where AI can assist. Common examples for engineers include:

- Drafting technical emails and reports
- Summarising standards or long documents
- Reviewing a technical report
- Conducting background research for a project
- Creating images for presentations
- Transcribing and summarising meetings

Choose your tools

Based on your needs, pick the tools that best suit your workflow:

- For writing, summarising and reviewing: ChatGPT, Claude or Gemini
- For image generation: DALL-E 3, Midjourney or Microsoft Designer
- For research: GPT-4 with web access, Elicit.org or Semantic Scholar
- For meetings: Otter.ai or Zoom's AI assistant.

While many tools are free to explore, full functionality and data security often require paid subscriptions.

Start small with prompts

Use the templates provided in this document as a starting point. You don't need to be a prompt engineer, just be clear, specific and try adjusting your prompt to improve results.

Test and iterate

Try AI tools on non-critical tasks first. Observe where they add value and where they might need human review. Many tools learn from context, so more detail often gives better results.

Discuss tool use with your team

Align with your manager or team on when and how to use AI tools, especially when dealing with sensitive data or client communications. Paid versions may offer enterprise-grade features worth exploring.

Stay curious and keep learning

AI is evolving fast. Sign up for newsletters, join webinars, or follow tool changelogs to keep up to date with new capabilities that may benefit your engineering discipline.

Remember: AI should support, not replace, your engineering judgment. Use it to enhance your efficiency, not to automate critical decision-making without oversight.

Prompt templates

Use the following prompt templates to get you started.

Crafting emails

Prompt template

Write an email to [recipient's name and relationship to you] regarding [subject]. The purpose of this email is to [explain the purpose, eg request a meeting, provide an update, follow up on a previous conversation].

Include the following details:

- [Specific detail 1]
- [Specific detail 2]
- [Specific detail 3]

Tone: [formal/informal, concise/detailed].

Subject line: [suggested subject line].

Additional instruction: [eg attach a file, ask for confirmation]."

Summarising documents

Prompt template

Summarise the following document for [purpose, eg an executive summary, a team briefing].

Summary length: [eg one paragraph, three bullet points, 250 words].

Tone: [desired tone, eg concise, formal, friendly].

Document: [Insert link or text]

Focus on: [main findings, recommendations, critical data, etc.].

In depth research

Generative AI tools now support multi-step, comprehensive research – ideal for reports, presentations or technical projects.

Prompt template

I need in-depth research on [topic/question] for a [report/presentation/etc.], suitable for [audience type].

Please include:

1. Key facts and data
2. Historical background
3. Recent trends
4. Relevant case studies
5. Expert commentary
6. Reliable sources and citations

Output: [length or format, eg 1,000 words, 10 bullet points]

Tone: [eg professional, neutral]

Make sure the information is accurate and up-to-date as of [desired time frame]. Include visual aids if appropriate.

Tip: Use GPT-4 or Claude 3 with document upload functionality to analyse legislation, technical standards or journal articles. For academic-grade results, consider integrating with tools like **Elicit.org** or **Semantic Scholar.**

Examples of engineering discipline specific prompt questions

Geotechnical site investigation

Prompt: Conduct a deep research report on liquefaction risks and historical seismic activity in eastern Christchurch, including case studies from the 2010-2011 Canterbury earthquakes.

Sustainable building materials

Prompt: Provide a deep research summary comparing the carbon footprints and cost-effectiveness of using mass timber versus reinforced concrete in mid-rise buildings in New Zealand.

Stormwater management and climate change

Prompt: Generate a deep research report on recent advances in stormwater management practices used in Auckland to mitigate flood risks associated with climate change.

Renewable energy integration

Prompt: Perform deep research into successful case studies of integrating large-scale solar or wind farms into existing power grids in the South Island of New Zealand.

Transportation infrastructure resilience

Prompt: Compile a deep research document highlighting best practices and innovative technologies for enhancing resilience of transport infrastructure along State Highway 1 in earthquake-prone regions such as Kaikōura.

Safety pressure valve compliance and best practices

Prompt: Prepare a Deep Research report on current New Zealand safety regulations and best-practice guidelines for the installation, maintenance, and testing of safety pressure valves in industrial boilers and pressure vessels.

Technical report review

Generative AI tools can assist engineers in reviewing technical reports by checking clarity, structure, and completeness. While they don't replace peer review, they can offer useful insights and help catch issues before final review.

Prompt template

Please review the [following/uploaded] technical report text for clarity, grammar, and structure.

Provide suggestions for:

- Improving sentence flow and readability
- Clarifying technical terminology or ambiguous phrasing
- Identifying any missing components (e.g., methodology, results, conclusions)

Maintain a professional and constructive tone. Focus on improving the document for technical and non-technical readers alike.

Suggested workflow

Upload the draft report or copy a section of it into the AI tool. If the report contains proprietary or confidential information, ensure the AI tool used complies with your organisation's data security policies and does not retain or share input data beyond your session.

1. Use the prompt above to receive a critique or feedback.
2. Make edits based on the suggestions provided.
3. Optionally, re-submit the revised section for another round of review.
4. Follow up with a human reviewer or senior engineer for final checks.

This process helps reduce errors, improve professionalism, and streamline your report development cycle. It can also help junior engineers learn better writing techniques through example-based revision.

Creating an Excel spreadsheet

Generative AI tools can assist engineers in creating structured spreadsheets to manage data, perform calculations or track project progress. This is particularly useful for routine engineering tasks like quantity tracking, design comparisons or asset maintenance logs.

Prompt template

Create an Excel spreadsheet for [engineering task, eg tracking geotechnical borehole data, calculating beam loadings or scheduling maintenance for HVAC systems].

The spreadsheet should include:

- A clear title and date
- Column headers such as [e.g. Location, Sample depth (m), Soil type, SPT N-value]
- Basic formulas or calculations where relevant
- Example rows of realistic data

Output format: Table in .csv format

Make the layout user-friendly and easy to read.

Example use case

Engineering task: Foundation load summary

Prompt example: "Create an Excel spreadsheet to summarise axial and shear loads on pile foundations for a commercial building.

Include columns for: Pile ID, Location, Axial Load (kN), Shear Load (kN), Safety Factor and Load Ratio.

Use sample data for 5 piles and include a formula to calculate Load Ratio = Axial Load/Safety Factor.

Output as CSV format."

Resulting structure:

Pile ID	Location	Axial Load (kN)	Shear Load (kN)	Safety Factor	Load Ratio
P1	Grid A1	750	120	2.5	300.0
P2	Grid B2	600	100	2.0	300.0
P3	Grid C3	900	130	3.0	300.0
P4	Grid D4	800	140	2.0	400.0
P5	Grid E5	700	110	2.5	280.0

You can then copy this structure into Excel or use it directly in tools like ChatGPT with spreadsheet plug-ins to automate the creation.

Tips:

- Use AI for layout and data structure; validate all engineering logic before applying.
- Always cross-check formulas and units.
- Ensure your spreadsheet aligns with project standards or regulatory requirements.

Writing minutes

Using transcripts and generative AI

Prompt template

Create meeting minutes based on [following/uploaded transcript].

Include:

- Date, time, and attendees
- Agenda items
- Key discussion points
- Decisions made
- Action items assigned

Use a professional tone and bullet points.

Using a specialised application like OtterAI or similar tools

The app:

- Joins meetings as a virtual attendee
- Provides full transcription
- Offers playback with synced audio
- Generates summaries and action items
- Free version allows up to 30 mins per session

To consider

When using AI tools, always consider privacy and data security. Avoid sharing confidential client information, proprietary data, or sensitive project details in public AI platforms unless they have been approved for secure use within your organisation.

Disclaimer

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