General Practitioners March 2024 Newsletter

Welcome to the first newsletter for 2024. It looks like the residential construction industry is getting back into the swing of things with more homes being built again.

In this quarter's newsletter we have some handy tips for our engineers to consider with calculations, we have a great article showing a job well done, when a design acted the way it was intended during a natural disaster. There is a quick quiz on retaining wall detailing as well as a good lessons learnt.

The EGP committee met last month to discuss our plans for the year. Part of this year's goal is to get a better understanding of our growing membership. We have included a short survey that we please ask our members to complete (it is about 5 questions). This will help us to get a better gauge on our members and what topics to target for our webinars and newsletters.

Don't forget to share your photos of any interesting jobs you have done for others to view on Slack, or submissions can be emailed to general.practitioners@engineeringnz.org. Also, **I would like to encourage you all to submit your lessons learned for inclusion in our upcoming newsletters.** This is anonymous and a great tool to help other engineers to not repeat the same mistakes. We are also asking for you to submit photos that you think best describe Engineering General Practice, so that we can showcase exactly what we as EGPs do.

Tamlyn Adams, Editor

In this issue:

Message from the Chair

Welcome to our first newsletter for year, with 2024 well underway we have been busy working on setting up the events and webinars for the year, so this newsletter should be a quick read.

There is a lot going on in the Engineering space and our committee met at Engineering New Zealand in Wellington last month to discuss our plans for the upcoming year and set plans in place for the what's and how's of adding value to our members. It was great to hear insights that the legal team deal with, in their role with Engineering New Zealand Te Ao Rangahau, as well as having some good passionate discussions about what it means to be an EGP.

We have strengthened our ties with some of the other technical groups (NZGS, NZTDS etc.), in keeping with our Vision and Purpose, in order to provide more connectivity for our members to these groups and support those working in smaller practices who do not have the capacity to belong to a number of technical societies.

As part of the work that we are doing behind the scenes and working on the new relationships that we are building, we have a webinar series running this year on Tips and Tricks for our EGP members, starting this month. These are shaping up to be a good mix of non-technical and technical. as always if there any topics that you would like to hear more about, please get in touch with us via our General Practitioners email address as below.

Thanks again to all the support from Engineering New Zealand Te Ao Rangahau, who are working on updating our website and coordinating behind the scenes to keep our Slack channel running.

We have set aside the 11 of April for the next member event, so if you would like to know what is happening in your region and haven't heard anything, please also get in touch.

That all from me, so until next time…

Kelly Pilkington

Chair

general.practitioners@engineeringnz.org

The EGP One Question Survey

This issue, we are asking Engineering General Practitioners:

The construction sector has been experiencing some difficult times lately. As an engineer you may have missed out on work recently due to a more competitive bid. Which of the following best describes your attitude towards pricing work in a downturn?

- If you 'buy work' or undercut your competitors to keep staff busy you are ultimately just harming the profession and de-valuing what we as engineers do. Smaller fees also result in poorer engineering design.
- Competitive bidding on work is just a means to improve efficiency in the industry and remove the dead wood. There needs to be an incentive to do things better, cheaper and faster otherwise we as engineers don't develop.

CLICK TO TAKE THE SURVEY

In the last issue we asked:

Trying to get a better gauge on our readers, it would be interesting to see what size companies you work in.

ANSWER CHOICES	RESPONSES
I'm a sole practitioner	39.53%
I work in a small firm of 12 engineers or less	41.86%
I am employed in a larger firm.	18.6%

It looks like majority of our members work in small firms. It is great to see a good percentage in the larger firms as well though. I myself work in a larger firm, but get so much value from the EGP resources.

Learning Opportunities

The biggest opportunities to learn from are not when things go right, but when they go wrong. The best way to learn from your mistakes is to recognise what went wrong and how you (and others) can avoid making the same mistake again.

Click on the links below to read some anonymous Learning Opportunities submitted by two different contributors:

1. Steel post retaining walls and inadequate drainage.

Do you have a learning opportunity that would be of interest to your fellow EGP members, please submit your examples for others to learn from? Download the Learning Opportunities form here and send it to egp.sig.anonymous@gmail.com

EGP Slack Channel Update

Nick Calvert

The EGPSIG Slack channel provides a useful forum for technical discussion. The committee recommends that all our members are active on the slack channel. Follow this link to sign up and

install the EGP Slack Channel. If you have any issues or questions regarding the Slack channel, feel free to email your questions to tech.groups@engineeringnz.org.

The Slack channel has been very busy since the last update. Our number of active members has increased with some new names popping up in posts and responses.

As posted on the Slack Channel, due to very high charges from Slack, we have had to reduce the number of channels to one. We would encourage everyone to post all content into the one general slack channel.

The following is a short summary of the topics covered since last update:

- Considering alternatives to NZS3604 type subfloor systems with low ground clearance and high water table
- Terraced retaining wall design approaches
- Foundation options for sites with high water tables and weak soils
- Ethical issue with the earthquake strength of existing houses – are they Earthquake Prone?
- Construction approaches for timber pile walls near to the boundary
- Maxraft design philosophies
- Driven timber piles in close proximity to underground services
- Coatings for steel enclosed in external wall linings in residential buildings
- Discussions about floor slabs on expansive soils
- Conversations on filling in PS4 documents
- Foundation design for reciprocating machinery
- Discussion about what happens to buildings after 50 years
- Insurers requesting percentage NBS for residential buildings
- Debate on the use of BRANZ SR337
- Timber pole retaining wall design approaches including pole strength and availability
- Minimum reinforcing for SED designed NZS3604 type pile foundations
- Design of waffle slabs for 3 storey dwellings

Missed any topics of interest to you? Have a look back on the Slack Channel to see what was discussed.

If you have any interesting photos from your EGP jobs, share them on the EGP-Photos Channel on Slack. Great to see what we are working on out there.

We ask all members to continue to be active on the Slack channel because the more activity, the more beneficial the content is for everyone. If you missed out on any of these, go have a look at the discussions and feel free to add your input.

Top Tips for Clear Concise Calcs

Bruce Tricker

I'm a structural engineer and a CPEng Practice Area Assessor for Engineering New Zealand. In over thirty years of practice I've seen a wide range of work by other engineers. Despite not being an

expert in any particular branch of structural engineering, on a good set of calculations I find that it's possible to follow the thought process on something I've never personally designed before, know exactly what the designer is doing and potentially identify some overlooked elements or errors.

On other work I find myself spending more time trying to put the jigsaw together than working out whether the picture makes sense, even on the sorts of projects I am quite familiar with. And this is before being able to assess individual design elements.

There is no such thing as a right or wrong way to prepare calculations. In fact, if you were only designing something for your own purposes it could literally be scrawled on the back of an envelope (to use an overworked metaphor).

The problem is that today our work is likely to be reviewed by someone else, whether that is an internal checker, the Council, a peer reviewer or a professional body. There is also a possibility that in the future when you renew your CPEng application the regulating body may audit samples of your work rather than look at your hand-picked Greatest Hits – think about that!

The tips here come from the perspective of a structural engineer but they relate equally to other disciplines or mixed disciplines.

The Basics

Some engineers may consider including the following as unnecessary, particularly on small projects. These are, however, not just for your benefit, but for the poor sod trying to make sense of your work.

- A table of contents – so that the reader can see how you have laid things out.
- Numbered pages – so that a query regarding a particular section can be referred to. (This can be easily automated with software like Bluebeam.)
- A Design Features Report (DFR) – if a bespoke report is too much work you can use the free ACE/ENZ system which also automates your producer statements and other certificates.
- State your assumptions and references (e.g. Geotechnical report)

Arrange Your Calculations in a Logical Order

Here is one possible way to order a calculation set on a structural project:

1. Actions (dead, live, wind, snow, earthquake)
2. Lateral stability system (this can dictate other elements)
3. Individual structural elements
4. Non-structural elements
5. Foundations and retaining walls
6. Ancillary elements (not part of the building)

There is no right or wrong way to lay out your calculations but if it makes logical sense to you then that's a good start. If you just scooped up the contents of the job file then that is probably not a good start.

Clearly State What Element You Are Designing

Numbering your design elements is a great idea (e.g. 'Beam B5'), particularly if you have more than a few to design but it is easy to get the numbering mixed up. I like to use a descriptive name that distinguishes the element from other similar ones.

Context is also very important. The single most important consideration when designing a beam is the span. For a retaining wall, it's the height. So why not give yourself (and the checker) a head start by stating the key information up front.

Here are a couple of design element titles that clearly identify the element, and provide context:

Beam B 16 over southern workshop L = 16.0m

Retaining wall RW 3 behind Pump Station H = 2.5 to 3.5m

By the way, there is a drafting standard AS/NZS 1100.501:2002 which gives codes for structural elements if you want to align with this. For example **2 PF 3** would be portal frame 3 on Level 2.

As part of our office practice we also paste a snapshot of the design element from the drawings onto the calculation page. This makes cross-referencing with the drawings super easy. Alternatively, you could draw up a simple sketch (see below).

Provide a Firm Conclusion to Your Designs

State your conclusion so that a checker can see what you have selected (underlined here for good measure). Examples:

USE 4/40,000L tanks

USE 6/M20 Grade 8.8/S bolts

A (Good) Picture is Worth a Thousand Words

A simple sketch in your calculations can aid you in the design process but will also help the checker understand what you are trying to do. It needs to be simple enough to draw quickly but still be immediately recognisable. Some tips:

- Draw to scale, even in your calculations. This is particularly important when designing things like connections so that you can verify that everything fits.
- For beams and frames, draw the deflected shape. (Practice makes perfect here.) This helps you and the checker for many reasons, including understanding what the restraints are supposed to be doing and whether you have a realistic mechanism.
- Learn the standard symbols and hatches for different materials – this can turn a bunch of lines into a solid object that jumps off the page and is immediately recognisable.

By including the basics, arranging your calculations in a logical order, showing your load paths, clearly stating what you are designing and what your conclusions are you are well on the way to creating clear, concise calculations. This will minimise rework, reduce review time and avoid errors – and who doesn't want that!

EGPs Doing What They Do Best

It is great to see your projects being constructed, but even better to see them withstand disaster events.

Pete Van Grinsven, former EGP Chair sent us a great image of a retaining wall he designed, intended to provide protection for the ground above the nearby house. The wall was built a year before the slip occurred. Instability issues were raised due to cracking and subsidence in the lawn area at the head of the slope, with the house only 4m from the wall.

It is a deeply anchored and tied back wall with two sets of anchor piles under the driveway. When the July 28 event came along the slip below the wall occurred. In excess of 20000m^3 went down the hill. There was no effect above the wall, it did what it was designed to do - job done!

This is a great example of collaboration between an EGP (who controlled the project), a geotech engineer (KGA), a contractor (Polesmith), and the owners. Council would not permit the work to proceed under emergency designation. They had to get a BC and an RC (wall proximity to the boundary) before proceeding. At least a waiver was issued, so they did not have to wait for a council inspector for the piles. These were drilled in batches and poured the same day with both Geotech and structural monitoring occurring.

EGP Professional Diversity Survey

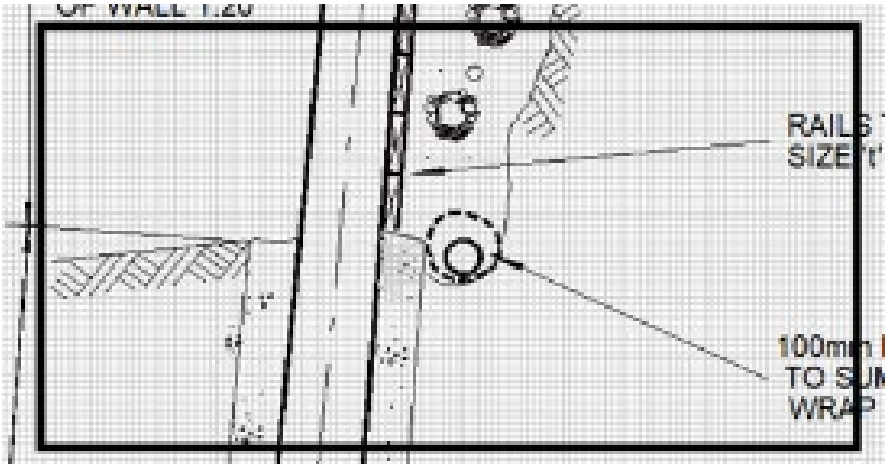
We would like to know a bit more about our members and what fields you work in, to be able to provide the most relevant information to you in our newsletters and Webinars. We ask that you please allow for 2 minutes to partake in our short survey:

CLICK TO TAKE THE SURVEY

Which One is Better?

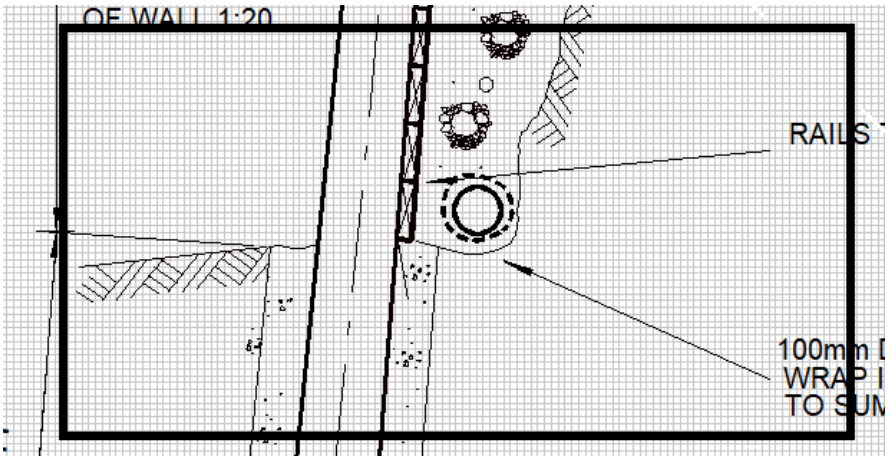
Here is a common detail that is often poorly constructed. Which is best, A or B?

Option A



Or

Option B



Find the answer at the end of the newsletter.

Upcoming EGP Webinars

The EGP has recently been rolling out a few great webinars for our members with a few other exciting ones lined up. Below are some webinars that may be of interest to our members coming up soon, otherwise please refer to the Engineering New Zealand link below for a full list of upcoming webinars:

Date	**Webinar/Event**
21/03/2024	Embedded Retaining Walls – Online Course
10/04/2024	Fundamentals of Pile Design in Liquefiable and expansive soils – Online Course
17/04/2024	**Top 5 Geotechnical RFIs and How to Avoid Them - Webinar**

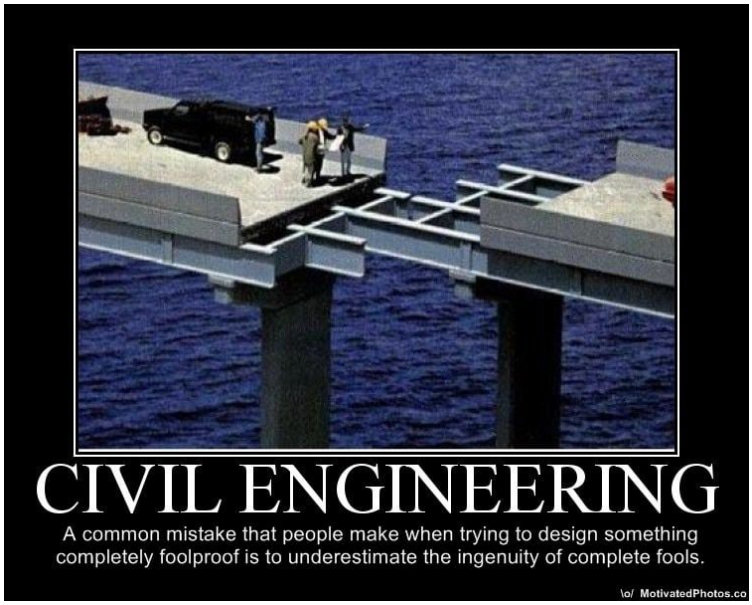
The EGP is embarking on a series of Webinars over the next 12 months that focus on general topics: Tips and Tricks for GP Engineers. I hope you managed to see our Webinar on "**On Site Wastewater treatment and Disposal**" on the 13 March. If not this will be put up on our website in a few weeks' time.

As a voluntary committee, we want to bring you quality content to support your work as a General Practitioner and we hope you'll join us for our next webinar. If you have ideas for future webinar topics, please get in touch, we would love to hear from you.

If you missed any of the previous EGP webinars, you can watch it through the link below:

Watch Here

For a Laugh



Which One is Better – Answer

Although not often seen, option A is the better installation as the draincoil is positioned below the lower ground level, preventing water short circuiting across the lower level. It also reduces water sitting at the base of the poles which could lead to the poles rotting. This detail is particularly relevant for steel retaining walls to avoid rusting from ponding water.