

# Bridges to Schools: Training Day

08 July 2024

# Welcome to Bridges to Schools Training Day!

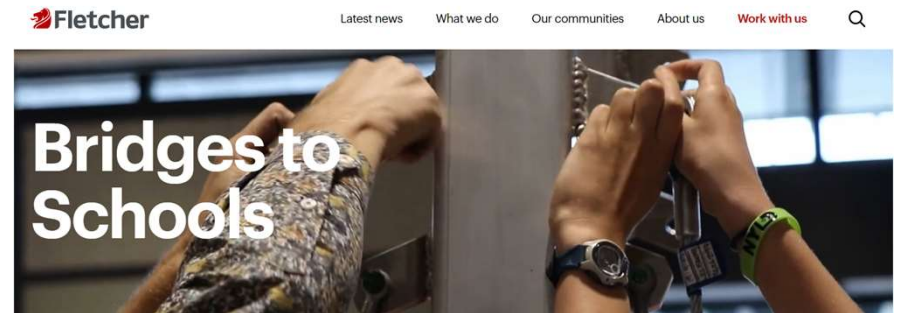
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- Who are we?
- Why are we doing this?
- Where did it come from?
  - ICE
  - AUT
  - Fletcher Building
    - Fletcher Construction, Brian Perry Civil & Higgins
    - Placemakers
    - Altus
    - Easysteel
- Launch day video <https://vimeo.com/720923204>



# Booking Requirements

- Details can be found online:
  - Website: [www.fletcherconstruction.co.nz/bts](http://www.fletcherconstruction.co.nz/bts)
  - Email: [australasia@ice.org.uk](mailto:australasia@ice.org.uk)
- Co-ordinate with School STEM Lead
  - Classes from Years 5-12
  - Assembly hall or gymnasium...
    - 17m x 5m x 4m
- Volunteers x 2
  - Load-out, setup & packdown.
  - Assisting each group
- Pick a date
  - Check availability
  - Email: [australasia@ice.org.uk](mailto:australasia@ice.org.uk)



Bridges to Schools was launched in New Zealand in 2021.

The programme sees a child-sized cable-stayed bridge broken down into sections and taken to schools across Aotearoa. Volunteers explain the bridge and some engineering basics to the kids, before helping them to put the bridge together, testing their engineering understanding as they go. It's a fun and engaging way to spark kids' interest in civil engineering and STEM careers.

Bridges to Schools is an Institution of Civil Engineers (ICE) international programme, brought

LEADERSHIP IN  
CONSTRUCTION



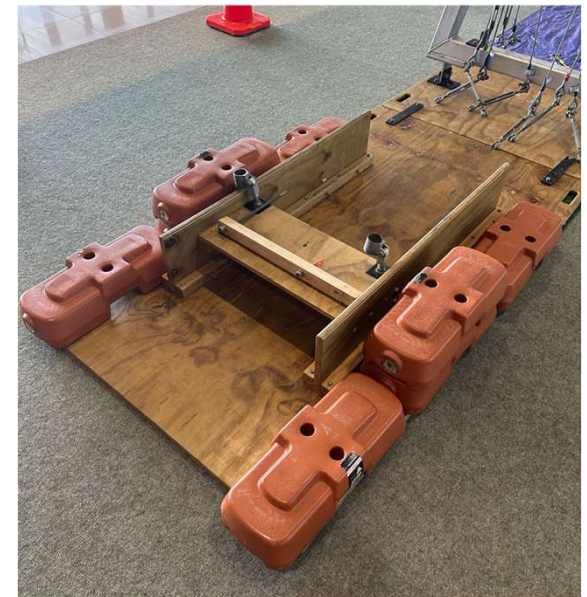
# Collection and Load out

- Pick up the bridge trailer
  - Penrose Campus Carpark and access
  - 1500kg Braked Towing capacity min.
  - High hitch point
- Load out
  - It's a workout! Get help.
    - Allow 90min.
  - Proximity to the room and access
    - Ideally no stairs
    - Consider trip hazards please
  - Lay the parts out neatly
    - Avoid double handling.
    - Where will the bridge be setup?
    - Where will the kids be seated?



# Pre-session setup

- The A-frames
  - Laydown the sheeting
  - Stand the A-frame up, secure bolt at the base.
  - Place onto sheeting at lines indicated.
  - Place kentledge frame & steel plates
    - CHECK: Critical dimension between front of steel plates = 7.91m.
  - Alignment between A-Frames
  - Place weights on kentledge frame
    - CHECK: Critical dimension between front of steel plates = 7.91m.
  - Hang the cables from the A-Frame
    - CHECK: All cables have bolts and nuts.
      - Spares in the toolbox.



# The Session Plan – Part 1

- Welcome and introductions
  - Ask the kids to sit on the floor in front of the parts.
  - Who are we? Why are we here?
- STEM talk (5min max for the younger kids!...)
  - Ask the kids leading questions and try to make it interactive....
    - What is STEM?
    - What kind of careers do people in STEM careers have?
    - What is Engineering?
      - *“Engineering is the application of science and mathematics to solve problems”*
      - Structural, Geotechnical, Mechanical, Electrical, Environmental, Water, Aeronautical, Aerospace!
    - Does anyone have any friends or family members that are Engineers? What do they do?
    - Talk about what a bridge is and describe different types of bridges
      - Auckland Harbour Bridge = Truss Bridge
      - Golden Gate = Suspension Bridge
      - Grafton Gully Bridge = Arch bridge
      - Millau Viaduct = Cable-stayed bridge (7 piers roughly the same height as our Sky tower!!)
      - *“A bridge connects people and communities”*

# The Session Plan – Part 2

- Introduce the different parts of the bridge
  - A-Frame “Piers” – Aluminium to make it light
  - Weights (25kg each) – To stop it from collapsing!
  - Cable stays, shackles & turnbuckles – “Twist them and they shorten!”
  - Deck panels – Colour coded
  - Billets
- PPE & Warm-up
  - Hardhats? Hi-Viz Vests? Gloves?
    - Working with timber (splinters = gloves)
    - Pinching of fingers when connecting together
  - Get the kids to stand and warm-up with basic dynamic stretches
- Split them into 2 groups for either end – set them free.
  - Groups of 6-10 to work at each end and meet in the middle





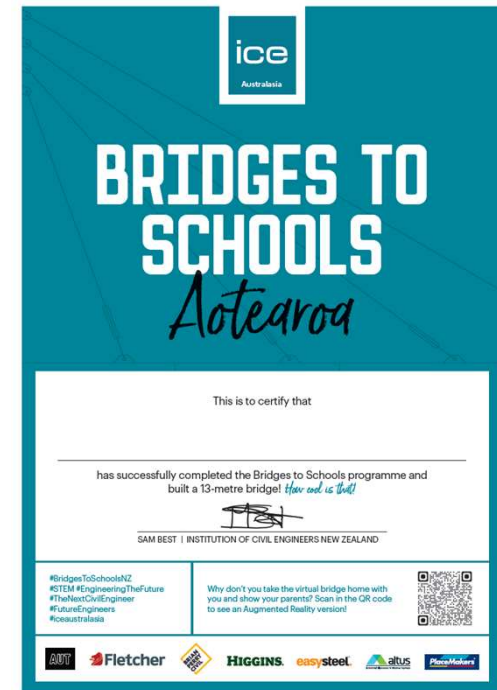
# The Session Plan – Part 3

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- Volunteers need to walk around and keep an eye on...
  - Securing the first deck panel
  - Use of the polystyrene block
  - Reminding them to keep their fingers clear!
  - The middle deck panel connection
  - Not to wind the turnbuckles until it is all connected
- Final checks & proof load (Adult!)
  - All cables should have tension.
  - Deck panels should float over the A-frame but between the sway stops.
  - Max loading on the bridge – 2 kids max.
- Paper-Scissors-Rock game
  - Teams walk from either side and play RSP. If they lose they step off the bridge, the winner progresses. Win 3 in a row, get a point for your team.

# The Session Plan – Part 4

- Once they have had some fun.. Break it back down for the next session
  - Lay it out neatly
  - Check all the turnbuckles have their bolts & nuts!
- Certificates
  - The Teacher can hand these out to the kids there or in the classroom
  - Includes an AR model of the bridge through QR code (Apple, Android?)



# End of the day

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- Packing the trailer
  - See the packing guide for details
    - Weight blocks at the front of trailer first.
- If left overnight, inside a locked room only please.
  - Spare parts to be put inside the trailer

# Other thoughts

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- Let the kids make mistakes
  - After they have made the mistake, point it out and let them fix it.
    - “What could you have done differently”
  - Try not to help them too much!... They will figure it out.
- Encourage the quieter kids
  - Leading questions (coaching...)
    - What is going to happen next?
    - What is going to happen if we overtighten the cables?
    - What would happen if we don't tighten the turnbuckles?