

Noel Carroll



Principal Engineer

Hobart Tasmania



Contact

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Qualifications & professional affiliations

- MEngSc (Coastal Engineering & Management), University of NSW, 2006
- Bachelor of Engineering (Civil), Tasmanian College of Advanced Education, Hobart
- Member, Engineers Australia
- Chartered Professional Engineer
- National Professional Engineer's Register (Structural and Civil)
- Accredited Building Practitioner, Tasmania and Registered Professional Engineer, Queensland
- Past Deputy Chair, National Committee on Coastal & Ocean Engineering, Engineers Australia
- Past Member, Structural College Board, Engineers Australia
- Member, PIANC

Noel has over 40 years' experience in structural engineering design, inspection of works under construction, contract administration and quality management in structural, maritime & coastal, and mining engineering in Australia and Papua New Guinea.

Noel has been responsible for the structural design, documentation, and inspections during construction for a variety of works including coastal engineering, maritime engineering for near-shore structures, bridges, and public, commercial & private buildings. His design experience includes using reinforced concrete, prestressed concrete, structural steel, aluminium, timber and masonry materials.

Noel's mining expertise includes mine structures, underground excavations, deep excavations and heavy infrastructure including tunnel plugs & shafts.

Noel has extensive experience identifying, prioritising and achieving critical results.

Focus

Maritime and coastal

- Design of structures related to marine works, including jetties, piers, wharves and dolphins.
- Coastal zone management.
- Structural modelling, appraisals, and strengthening.
- Design of wave attenuation systems.
- Seawall remediation.
- Design of rock revetments.
- Coastal hazard assessments and peer review of coastal erosion assessments.
- Beach nourishment.

Mining

- Ventilation, accessway, and cable shaft design. Deep shaft access prefabricated ladder/landing modules lowered from above and supported from the cap structure.
- Shaft collar design.
- Appraisal of site structures.
- Access tunnel design.
- Stope closure barricades for backfilling with CAF.
- Main tunnel closure plug for 150m water head.
- Closure caps for the ventilation shafts and the main shaft, Beaconsfield Mine.

Structural

- Design, documentation, and inspection of work in progress for public, commercial, industrial and private building structures.
- Precast construction.
- Factory and warehousing.
- Gantries and fixed cranes.
- Equipment trusses.
- Ramps and bridges.
- Wharves.
- Scaffolding.
- Remediation.

Project experience

Maritime and coastal

King Island Scheelite (Group6 Metals)

- Comprehensive wave study.
- Design of a massive rock emplacement into the sea at Grassy Bay (KI) and including for design of the dynamically stable revetments.

Department of State Growth (Transport)

- Wave study of Pitt Water.
- Analysis of waves and design of revetments for a large scale enlargement of the old causeways between Hobart Airport and Sorell, Tasmania.
- Prepare a large Concept Design Report.

Coffs Harbour City Council

- Assess wave conditions and extreme water levels at Jetty Beach, Coffs Harbour.
- Prepare a concept design and the associated report re a proposed civic development there including a stepped concrete revetment, boardwalks, etc.

Clarence City Council

- Assess wave conditions and extreme water levels at Bellerive Beach, Tasmania.
- Prepare a concept design and the associated report re a proposed civic development there including a reinforced concrete seawall on piles, etc.

Woodside Energy Pty Ltd

- Feasibility study for selection of a preferred berth at Bell Bay, Tasmania, to cater for a 85,000 tonne displacement vessel re the export of ammonia.

Department of Parks & Environment

- Investigate the feasibility of sand scraping to stabilise dune erosion that is prevalent at Lewisham, Tasmania.
- pittsh.com.au

East Arm Resources

- Concept design of a \$25 million export wharf and berthing facilities at Bell Bay for a local quarrying enterprise.

Tasmanian Ports Corporation

- Design of a 400 tonne mooring dolphin for cruise ships at Berth 7 in the Port of Burnie.
- Strengthening of a 100 tonne mooring dolphin at the Port of Spring Bay including pile condition assessment, design and detailing the replacement of the dolphin cap with reinforced concrete.
- New fender systems at Macquarie Wharf No 1 for two tug boats in the Port of Hobart.
- Participate in the safety review team making recommendations for the location of life saving features in the Port of Hobart, e.g. life buoy stations, etc.
- Macquarie Wharves Nos 2 & 3 – Apron infill.
- Macquarie Point Terminal – Specification and contract administration for the reconstruction of approximately 10,000m² of heavy-duty pavement.
- Forklift-Mounted Spreader Lifting Beam – Design of new steel structure rated to 35t SWL.
- Victoria Dock Moveable Bridge – Structural modelling and appraisal.
- Franklin Wharf Ferry Pier – Structural appraisal and strengthening.
- Sullivans Cove Skirt Breakwater – Reattachment of all concrete panels after the failure of the original connecting bolts.
- Sullivans Cove Ferry Low Landing – Structural design of a new facility.
- Kings Pier Marina Entry – New wave screen design.
- Domain Slipways
 - structural appraisal and remediation of the cradle mooring arms for slipway 1
 - complete structural appraisal of all land-based slipway structures and all cradles for slipways 1, 2 & 3
 - slipping plans for numerous vessels including barges and catamarans.

Hobart Ports Corporation

- Kings Pier Marina
 - review of the wave study and conceptual structural design for the fixed stem
 - design for improved wave attenuation of the concrete skirt breakwater and new breakwater at the entry
 - design of remediation for strengthening the existing concrete skirt breakwater
 - floating pontoon berth and gangway.

- Kings Pier
 - Low Landing and Wharf Infill – New boardwalk and replace derelict wharf
 - Kings Pier Trafficable Stem – Wave attenuation system.
- Macquarie Wharves
 - assessment of permissible vehicle loads up to 78t GCM limit for wharves 1, 2 & 3
 - assessment of the corroded portion of deck next to the sea wall and assessment of the deck structure for the operation of a 40t SWL forklift truck with an approximate 100t axle load and a new Portainer crane for wharves 4 & 5
 - re-support a cracked prestressed concrete beam on a new H pile for wharf 5
 - assessed the structural capacity of the corroded wharf and designed fenders for a RoRo ship for wharf 6.
- Strahan – Seawall remediation, modifications to the existing slipway for slipping larger vessels, rebuilding the existing jetty and assessment of floating berth used by air charter operator, and design of the new cast-in-situ 66m concrete jetty for passenger ferries.
- Brooke Street Pier – New ferry infrastructure including a finger pier, and design of the repairs to a damaged timber pier.
- Elizabeth Street Pier – Review of a concrete corrosion study and review of proposed remediation, check of permissible truck loads.
- Constitution Dock – Investigation of proposals for a large floating walkway and yacht moorings.
- Spring Bay Wharf – Fender upgrading and design of an all-new structure for a 150t mooring dolphin, including design of the new concrete cap on steel tube piles.
- Spring Bay Shiploader on Wharf Head – Assessed proposed higher loads on the substructure and assessed required structural repairs to the corroded wharf.
- Stanley Fishermen's Dock Crayfish Facility – Structural assessment of the corroded wharf and the proposed remediation; reviewed the corrosion report and alternative renovation of the timber finger piers.
- Stanley Wharf – Assessment of breakwater wharf for unloading coal and bentonite, and 160 t equipment.
- Selfs Point Oil Wharf – Design of new water safety ladders.
- Port Huon Wharf - Check of wharf deck capacity for storage of aquaculture tanks and timber truck loads.
- Electrona Development – Investigation of feasibility for a wharf including structural options, selection of test pile sizes and overview of the available geotechnical information. Conceptual design.
- Domain Slip – Design of new tow beam structure for the slip cradle system and assessment of ship slipping capacity for two large vessels.

Marine Board of Hobart

- Macquarie Wharves
 - reconstruction of the steel RoRo ramp for 120t transporter and 60t axle forklift for wharf 6
 - tower-mounted bollard system for wharf 5 mooring.
- Stanley Container Wharf – Extension with a precast concrete deck on piles for 30kPa UDL/60t axle loading.
- Stanley Wharf – New breasting/berthing dolphin concrete on steel piles for the 'Bass Reefer'.
- Constitution Dock – Reconstruction of the rolling bascule bridge, including piles, steelwork, castings, and counterweight.
- St Helens and Selfs Point Oil Wharves – Participation with the design development.

King Island Ports Corporation

- Grassy Wharf – Assessment of the corroded deck for support of T44 trucks and 25t excavator, RoRo apron investigation, demolition of a three-leg derrick crane and design for dredging to suit deeper draft vessels.
- Grassy Harbour – Design for replacement of an offshore beacon.
- Naracoopa Jetty – Appraisal of load capacity due to the jetty's deteriorated condition and conceptual design for a new concrete jetty on steel tube piles.
- Breakwater Wharf – Engineering feasibility study for a proposed bulk cargo wharf.
- Currie Wharf – Load rating.

Department of Primary Industries, Parks, Water and Environment

- Naracoopa Jetty - Assessed and prepared budget costings for the demolition of the old jetty and construction of a new timber jetty, and prepared a record of the jetty as a heritage place.
- Pavilion Point Jetty – Examined options for the development of ferry infrastructure.
- Detention River, Hellyer – Participated in a peer review of the geomorphological study and reports regarding river bank sand erosion at Hellyer.

Forestry Tasmania

- Pine Cove, Macquarie Harbour – Wind and wave study to determine the feasibility of a jetty.

Clarence City Council

- 29 Thompson Way, Clifton Beach – Peer review of a geomorphological study and appraisal of dune erosion re a proposed house site.
- Roches Beach Erosion – Participation in a workshop forum and advice to Council on the proposed management of beach erosion.

- Bellerive Boardwalk – Design of piles, fendering, concrete superstructure and slipway wing walls at the opening bridge.
- Kangaroo Bay Small Vessel Pontoon Berth – Assessment of council's coastal inundation planning overlay.
- Montagu Bay Jetty – Advice about the structural concept and a structural check design.
- Undertaking and peer review of coastal erosion assessments for private dwellings.

Hobart City Council

- Cornelian Bay Park Seawall – Peer review of the previous geomorphological and coastal engineering reports. Design of a new seawall and management techniques to remediate the beach following long-term shore erosion.
- Battery Point Walkway and Cycleway – Concept design of the structure for a trafficable way over the water around Battery Point, including moveable bridges.

Tasman Council

- Cripps Creek Bridge – Appraisal of damage to the bridge spill-through abutment batter at the mouth of the estuary.

Break O'Day Council

- St Helens Foreshore – Appraisal of the wind setup calculations by others and advice about ameliorating the beach foreshore erosion.

Central Coast Council

- Leven River Boating Pontoon – New concrete landing with restraint piles supporting the existing gangway at the boat ramp.

Port Welshpool, Victoria

- New Recreational Boating Jetty – Advice about probable wave heights and a structural proof check of the design.

Public Marine Facilities

- Motor Yacht Club Of Tasmania – Superintendent on a design and construct contract for a new marina including a concrete panel skirt breakwater. Examination of proposals for rebuilding the damaged breakwater.
- Royal Yacht Club Of Tasmania – Initial engineering advice for the marina feasibility study.
- Royal Yacht Club of Tasmania – Engineering advice on the deteriorated piles and dinghy wharf.
- Franklin Community Marina – Piled timber jetties for the Franklin Progress Association.
- Surveyors Bay Coast Care Group – Design of a concrete launching ramp and jetty.
- Adventure Bay Jetty – Timber piling and deck, and new jetty for Kingborough Municipal Council.

- Spring Bay Marina Development, Triabunna – Site appraisal and advice about reclamation, dredging and blasting the estuary bed for yacht moorings/hotel.

Port Arthur Historic Site Management Authority

- Mason Cove – Design of a wide jetty, berthing/mooring dolphins, a hydraulically operated hinged gangway and a passenger shelter shed for the tourist ferry catamaran Marana.
- Point Puer – Design of very long jetty, dolphins and a hinged gangway supported on a large pontoon for the Marana.
- Isle of the Dead – Design of jetty dolphins and a hydraulically operated hinged gangway for the Marana together with project management of the planners, environmental scientists, and the visualisation study.
- Cruise Ship Tender Boat Infrastructure – Concept design development for this proposed infrastructure at Mason Cove.
- Seawall Storm Damage – Appraisal of the damage and concept design development for the proposed remediation and raised wall.
- Stewarts Bay Jetty – Structural appraisal and report about the existing facility.

Federal Hotels and Vantage Hotel Group

- Freycinet Lodge, Coles Bay – Enlargement and strengthening of the existing timber jetty.
- Federal Hotels and Resorts – Conceptual design of a new wharf for catamarans at Coles Bay.
- Wrest Point Casino Jetty – Design for remediation of the original jetty and new berthing piles.
- Federal Hotels Jetty, Port Arthur – Site appraisal and concept design of a new long jetty for motor launches.
- Bonnet Island, Macquarie Harbour – Site appraisal and concept design of the new tourist vessel infrastructure subject to swift currents.

Huon Aquaculture Company Ltd

- Net Loading Wharf, Port Huon Industrial Site – Design of a new concrete wharf for the net hoisting mobile cranes.
- Foreshore Development, Hideaway Bay – Advice about reclamation and design development for a new linear wharf.
- Barge Landing, Hideaway Bay – New landing for front-loading barges and triaxle truck trailers.
- Barge Landing, Strahan – New loading for front-loading barges and triaxle truck trailers.
- Old Wharf, Strahan – Structural appraisal of the existing wharf and verification of the existing pile adequacy.
- Shipwright's Point Development – Advice about reclamation, piling, sea walls and structural requirements for this proposal.

Miscellaneous maritime projects

- Tasmanian Scallops, Triabunna – Design of new wharf/jetty at Paddys Point for fish unloading to service a nearby factory development.
- Shellfish Culture, Little Swanport – Structural appraisal of the existing deteriorated jetty.
- Galpin's Boatyard and Marina, Prince Of Wales Bay – Prepared site layout plans and report about the condition of the existing infrastructure.
- Tasblue Mussels, Port Arthur – Designed a lifting frame and davit to be mounted on an existing wharf.

International Catamarans

- Pow Bay Fitout Wharf – New precast concrete on timber piles including a crane heavy lift area.
- Dry Dock – Precast and in-situ reinforced/prestressed concrete 4000mm maximum depth dock on a reclaimed site.
- Coverdales – Conceptual design for the elevated slipway cradle runways and dry dock gate restraints.

Nyrstar Hobart Smelter (formerly Zinifex/Pasminco Hobart Smelter)

- Assessed the condition and load capacity of the timber piling and deck structure for heavy vehicles on berths 1 & 3. Undertook a feasibility study and schematic design for a replacement wharf including new berthing/mooring dolphins for a 22,000 DWT vessel using post-tensioned ground anchors through the piling.
- Acid Pipeline Integrity – Assessed the existing timber piled framed jetty for adequacy due to berthing loads.
- Assessed wharf concrete-filled tube piles for adequacy due to sag of ship loader rails on Berths 1 & 2.

Private facilities

- Dr Murton's jetty, Battery Point – a long timber and steel structure for a private vessel.

Mine structures

- Fossey Mine, Tasmania
 - design of the portal plug for a 153m hydraulic head
 - design of a barricade for slope backfilling.
- Wapi Golpu Mine, Papua New Guinea
 - preliminary design for an 11m internal diameter, 1100m deep concrete-lined ventilation shaft;
 - preliminary design for a concrete-lined collar within a rock-filled embankment for the ventilation shaft;
 - concept design for a steel headframe over the ventilation shaft.
- Lady Loretta Mine, Queensland (Mancala) – Design of a new mine egress ladderway in an existing shaft approximately 138m deep.

- Savage River Mine, Tasmania – Design of temporary underpinning support for the crusher building and design of the replacement columns torn away by a 'runaway' Euclid truck.
- Mt Lyell Copper Mine, Tasmania – Appraisal of site structures, including the winder building and headframe for asset valuations.

Underground and deep excavations

- Kaugel Hydro Power Scheme, Papua New Guinea
 - design of the concrete-lined access tunnel to the underground power station, the tunnel bifurcate junction and portal structure. Design for a large spoil heap beside the access road;
 - design of the 370m deep concrete-lined ventilation and cable shaft including personnel accessways and the hexagonal shaft cap structure.
- North West Shelf Gas Project – Design of a bentonite slurry wall related to dewatering around the perimeter of a deep-tiered excavation for one of the shore
- Storage tanks.
- North Head Wastewater Treatment Plant, Sydney – Resident Engineer for works being undertaken by contractors and the MWWB day labour work crews; and overseeing the excavation of a tunnel through hard sandstone (drill and blast method), and construction of cut-and-cover reinforced gallery tunnels.

Special near-surface excavations

- Ok Tedi Gold Project, Papua New Guinea – Appointed as the safety engineer on-site in a remote location at the Ok Menga River overseeing the water jet sluicing of the river canyon walls with high-pressure hoses to expose rock for the dam abutments and overseeing the diamond drilling activities for geotechnical logging.
- International Catamarans, Tasmania – Concept design for a bund and underwater excavation together with the detailed design for a reinforced concrete dry dock.

Structural

Bridges

- Design of a 22m 'Super T' highway bridge over a railway on the Truck Vehicle Bypass Route, Burnie.
- Design of extra-high vehicle bridge barricades for trucks on a curved alignment.
- Reconstruction of the steel RoRo ramp for 120t transporter and 60t axle forklift at Macquarie wharf 6, Hobart. The strengthened ramp was reinstalled as a fixed bridge.
- Rolling bascule bridge reconstruction, including piles, rolling steelwork, castings and counterweight at Constitution Dock, Hobart.
- Alterations to Victoria Dock Bridge for improved operation. New traffic barrier gates. Structural modelling of the bridge to ascertain asymmetric deflection behaviour. Assistance with the design for procurement of a new centre bearing. Load rating calculations.

- University of Tasmania – New three-storey pharmacy building, two additions to the law faculty main entry, offices and the library, new floor on top of the geology faculty building, and structural alterations to the shop in the student union building.
- Hospital Alterations and Refurbishment – Numerous projects.

Office type buildings

- Rosny Plaza – Prestressed four-storey concrete offices, retail, and car park.
- Island State Credit Union – Refurbishment of a 'Chicago' style brick building.
- North Forest Products Research Facility, Ridgley – New building.
- Hertz, Hobart – Two-storey administration building.
- Taroona Wildlife Research Centre – New facility.
- Hampden Offices, Sandy Bay Road – Three-story development.
- TCCI Burnett Street – Two-storey building.
- 2 Elizabeth Street and 7 & 9 Franklin Wharf – Extensive structural alterations in conjunction with a high-class refurbishment.
- Anglesea Barracks Recruitment Centre – Two-storey building over an old tip site.
- HEC Depot, Devonport – Significant Hebel block building.

Church and related buildings

- Uniting Church North Hobart – Additions and alterations.
- Sacred Heart Church, New Town – New copper clad steel framed spire.
- St Michael's Collegiate Auditorium – Alterations to heritage building for mezzanine.
- Salvation Army Worship Centre, Elizabeth Street, Hobart – Large suspended slab on a difficult site.
- Church of Apostles Launceston – New stone-clad concrete tower and very large copper spire.
- Church of Christ Howrah – Alterations and additions.

Commercial projects

- Purity/Woolworths City Store Supermarket – Significant refurbishment and extensions.
- Northgate Shopping Centre – Vast extension, including precast wall panels and a prestressed floor slab.
- Wrest Point Casino Boardwalk Development – Major alterations.
- Novotel Launceston International Hotel – Significant eight-storey building.

- Centrepoint – Alterations for the granite facade additions.
- Huon Village – Major extension, refurbishment, and extensive civil works.
- Shoreline Shopping Centre – Significant alterations and additions.
- Chickenfeed Sandy Bay Store – New building.
- BWS Sorell – New bottle shop enclosing drive-through lanes.

Unit developments

- Common Ground 'A Place to Call Home' – \$10 million inner-city development.
- Oriana, 55 Sandy Bay Road – Multiple units including prestressed concrete podium above a car park. Capital cost: \$2 million.
- Beaumaris, 82 Sandy Bay Road – Multiple units, including steel-framed floors and precast concrete wall panels. Capital cost: \$2.5 million.
- Wapping Unit Development – Multiple units including prestressed concrete podium above a car park, piled foundation and site-cast tilt-up concrete walling, refurbishment of the existing old MTT building on the corner. Capital cost: \$3 million.
- Windsor Court Unit Development – 53 single and two storey units. Estimated capital costs: \$12.5 million.
- 4/6 Ellerslie Road – Three-storey unit development.
- Barossa Park, Glenorchy – 18 unit development.

Aged care developments

- Rubicon Grove, Port Sorell – 60-bed low-care facility. Capital cost: \$9.5 million.
- Barossa Park, Glenorchy – 130-bed low-care facility. Capital cost: \$24 million.
- Hawthorn Village', Blackmans Bay – New units and common facilities. Capital cost: \$2.5 million.
- Bishop Davies Court, Kingston – Reconstruction of the upper level for new bedrooms and common facilities. Capital cost: \$9.5 million.
- 141a Channel Highway – Stage 1 of a 36 self-care unit development. Capital cost: \$3 million.

Precast tilt-up construction

- Metal Fabrications Training Centre – State-of-the-art facility with a mix of precast and steel frame.
- New Norfolk HEC Depot – Extensive development, including offices, workshops and garaging.
- International Catamarans Plate Store – Factory and offices for initial training college.
- Metro Depot Development – Vast run of free-standing cantilever walling.

Peer reviewed technical papers prepared & presented by Noel

- Carroll, N. D. (2013) - 'Marina Breakwater Retrofitted Wave Attenuation, Kings Pier, Hobart', Australasian Coasts & Ports Conference, Sydney, 2013.
- Carroll, N. D. and von Savageri, C. (2017) - '400 tonne Mooring Dolphin at the Port of Burnie, Tasmania', Australasian Coasts & Ports Conference, Cairns, 2017.
- Carroll, N. D. (2019) - 'History about ports in Hobart and SE Tasmania', Australasian Coasts & Ports Conference, Hobart, 2019.

Participation with the development of technical guidelines

- Sydney Coastal Councils Group (2013) - 'Assessment and decision Frameworks for Seawall structures', Coastal Adaptation Decision Pathways Project (CAP), published on 21/4/2013, Sydney, NSW.