

Kingsford to Randwick 132,000 volt Cable Project

Frequently asked questions

AREA OF INTEREST	QUESTION	RESPONSE/KEY MESSAGES
Project need and route selection		
Project justification	Why is the project needed?	<p>Ausgrid's substation in St. Marks Road, Randwick is currently supplied by three 132kV Self Contained Fluid Filled (SCFF) underground cables: two from a substation in Waterloo, and one from Double Bay.</p> <p>The existing cables were installed in 1969. In recent years, they have experienced failures, fluid leaks and increased rates of corrective works. A condition assessment has recommended the cables from Waterloo be replaced by 2021. The cable from Double Bay will be retired by the mid-2020's.</p> <p>Ausgrid is planning to retire the substation in Waterloo in the early 2020's so it will no longer service the substation in Randwick. Pending project approval, the existing cables would be replaced with one new 132,000 volt underground cable and a set of spare ducts for a future second cable. These would be installed between the substation in Randwick and our substation in Anderson Street, Kingsford.</p> <p>The Project is part of a program to replace fluid filled cables across the Ausgrid network to minimise the risk of fluid leaks.</p>
Existing cables	Why can't we just fix the existing cables?	<p>Ausgrid is working with the Environmental Protection Agency (EPA) to progressively remove SCFF cables from Ausgrid's network.</p> <p>The fluid filled cables have high maintenance costs, higher failure rates, extended repair times and require special jointing. Failure of these cables can lead to leaks which have the potential to cause environmental damage.</p>
	Why can't you just replace the existing cables along the same route?	<p>The existing 132,000 volt cables are old, as is the equipment inside the substation at Waterloo. They need to be replaced before they become unreliable.</p> <p>Ausgrid plans to retire the substation in Waterloo in the early 2020's. The most cost effective solution is to install cables from the closest supply point to Randwick that has available 132kV connection points, which is the Kingsford substation.</p>
New cables	What is the preferred route for the new cables?	<p>Ausgrid is proposing to install the new 132,000 cables and spare conduits between its substation in St Marks Road in Randwick and the substation in Anderson Street in Kingsford.</p> <p>From St Marks Road, they would run south to Oswald Street, crossing under Alison Road. At Oswald Street, the cable and conduits would run east to Courland Street, south to Dolphin Street and west to St Luke Street. From there, they would run south to Dudley Street, crossing Coogee Bay Road.</p> <p>At Dudley Street, the route would head south to Howard Street and west to Canberra Street, then south to Bundock Street and west to Avoca Street and onto Sturt Street toward Anzac Parade. The cables would cross Anzac Parade into Hayward Street, Anderson Street and connect into the Kingsford substation.</p>

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<p>Route selection and options</p>	<p>How was the preferred route for the new cables chosen?</p>	<p>Ausgrid considered a number of different factors when planning the new cable route, including:</p> <ul style="list-style-type: none"> • Location of existing underground utilities like water and sewer pipes, gas mains, telecommunications cables, and other electricity cables. • Community impacts, like noise and out-of-hours construction work. • Traffic. We have tried to select streets that are not major thoroughfares to avoid disrupting motorists and minimising night work, which affects residents. • Environmental impacts, such as tree removal. • Cost effectiveness. We have tried to minimise costs so savings are passed on to our customers. • Technical requirements, including cable ratings and network security. • Locating the cables in an accessible place for routine and emergency maintenance. • Other infrastructure projects in the area, such as a light rail. • Location of large stakeholders with large areas of land within the project area. This includes the Prince of Wales Hospital, the University of NSW, schools, Randwick Racecourse, Randwick Barracks and shopping precincts.
	<p>Were other route options considered?</p>	<p>Yes. In addition to the preferred route, Ausgrid considered a number of other routes, including using Avoca Street, Frenchmans Road and Carrington Road.</p> <p>Avoca Street and Frenchmans Road are busy arterial roads that are state classified by Roads and Maritime Services (RMS). They have higher traffic volumes than surrounding local roads. On state classified roads, Ausgrid is required to install cables deeper than on council roads, to comply with RMS requirements. This results in a greater volume of materials to be handled and greater impacts on traffic.</p> <p>Access to classified roads is managed by the Transport Management Centre (TMC). They stipulate the working hours on these roads, as well as council roads within 100m of traffic lights.</p> <p>Ausgrid has been advised by the TMC that night work would be required on Avoca Street, Frenchmans Road and Carrington Road, as traffic volumes are lower at this time. Construction noise at night has a much higher impact on the community. Night work is also more expensive because of labour loading. Any increased costs would be passed onto customers.</p> <p>Furthermore, the Environmental Protection Agency (EPA) restricts Ausgrid's work at night to two nights per week. This means it would take up to three times longer to complete work on Avoca Street, Frenchmans Road or Carrington Road.</p> <p>Ausgrid considers routes along Avoca Street, Frenchmans Road and Carrington Road to be infeasible given the above mentioned issues.</p>
	<p>Ausgrid is already installing new cables in Kingsford and Randwick, as part of the separate Eastern Suburbs Cable Project.</p> <p>In some streets, existing spare conduits have been used. Why can't these also be used for the Kingsford to Randwick Cable Project?</p>	<p>The Eastern Suburbs Cable Project involves installing 11,000 volt connections between the substations at Kingsford and Randwick. The route section between the Kingsford Substation and High Street required a combination of installing new and use of existing conduits and cables. The route section between High Street and the substation in Randwick uses existing conduits and cables.</p> <p>The existing conduits being used on that project are a combination of earthenware, asbestos cement and PVC with diameters ranging from 50mm to 150mm. They are not engineered for 132,000 volt cables, but rather 11,000 low volt cables and street lighting. They differ in terms of:</p> <ul style="list-style-type: none"> • conduit internal diameter and depth • conduit encasement • the number of conduits in the conduit bank • spacing • conduit and pit locations • conduit turning circles (bending radius), not being compatible with 132,000 volt cable; and • dimensions and depths of pits • continuity <p>The conduit system that would be installed as part of the 132,000 volt project would be specifically designed for the new cables between the two substations.</p>

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Project timing	When would the project start and finish?	<p>The Eastern Suburbs Cable Project involves installing 11,000 volt connections between the substations at Kingsford and Randwick. The route section between the Kingsford Substation and High Street required a combination of installing new and use of existing conduits and cables. The route section between High Street and the substation in Randwick uses existing conduits and cables.</p> <p>The existing conduits being used on that project are a combination of earthenware, asbestos cement and PVC with diameters ranging from 50mm to 150mm. They are not engineered for 132,000 volt cables, but rather 11,000 low volt cables and street lighting. They differ in terms of:</p> <ul style="list-style-type: none"> • conduit internal diameter and depth • conduit encasement • the number of conduits in the conduit bank • spacing • conduit and pit locations • conduit turning circles (bending radius), not being compatible with 132,000 volt cable; and • dimensions and depths of pits • continuity <p>The conduit system that would be installed as part of the 132,000 volt project would be specifically designed for the new cables between the two substations.</p> <p>Pending approval, construction could start in late 2018 and continue for approximately 9-12 months. A detailed project and community engagement timeline is below:</p> <p>Early 2018: Initial meetings with key stakeholders to obtain feedback on preferred cable route.</p> <p>April 2018: Information sessions to introduce project to community and obtain initial feedback. Feedback used by Ausgrid as part of planning process.</p> <p>May- July 2018: Site investigations to assess ground conditions and pinpoint any existing services along preferred cable route. Ongoing liaison with the community.</p> <p>June - September 2018: Environmental assessment (REF) prepared and displayed for comment. Community feedback incorporated as a part of the project review.</p> <p>October - late 2018: Project considered for approval, based on REF. Pending approval, construction contractor engaged.</p> <p>Late 2018 - early 2020: Construction to install conduits and cables, and reinstatement of affected areas completed in stages. Retiring existing 132,000 volt cables.</p>
Construction - installing the new cables		
Overall process	How would the new cables be installed?	The new cable would be installed using a combination of open trenching and an underbore for Alison Road in Randwick. There will also be associated work at various locations along the route to build underground 'joint bays' and pits to pull through and join sections of cable.
	Will you put the cables in the road or footpath?	132,000 volt cables are generally installed in the roadway.

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Trenching	What does trenching involve?	<p>To install the new cables, we would dig a trench in roads approximately 1.3 metres wide and 1.3m deep, depending on the location of underground services, the trench may require to be wider or deeper. Conduits (plastic pipes) would then be laid into the trench to hold the new cables. There would be trenching crews working at multiple locations simultaneously.</p> <p>Once the conduits are installed, the trench is backfilled and the impacted area is resurfaced. The cables are installed into the conduits at a later date.</p>
	Do you put these cables in a trench with other services?	<p>Ausgrid does not generally put cables in trenches with other services other than fibre optic cables for our network, as there are technical requirements that require certain distance to be kept from other services.</p> <p>There are also safety considerations when working near cables that are in operation.</p>
	At what depth are new cables installed?	<p>On Council maintained roads, the minimum depth of cover for cables is 750mm. However, cables are often installed deeper to avoid existing underground utility services.</p> <p>On classified state roads, RMS dictates the depths at which utility services must be installed to ensure they do not impede the maintenance or, if necessary, the reconstruction of the road pavement. Ausgrid cables must be installed 1000mm deep on RMS roads.</p>
	<p>There is a lot of ageing existing underground infrastructure across the project area.</p> <p>What steps has Ausgrid taken to ensure this is not damaged during trenching?</p>	<p>Ausgrid is aware of the ageing underground infrastructure in the project area. During the initial planning stages, Ausgrid compiled information about existing underground infrastructure from Dial Before You Dig (DBYD) plans.</p> <p>Ground investigations were undertaken along the preferred cable route in May and June 2018 to physically confirm the depth and location of existing assets. The data collected has been used to confirm the viability of the preferred cable route.</p>
	Will this project take the current overhead powerlines and put them underground?	No. Overhead lines along the route are of a lower voltage and cannot be installed in the same trench as 132,000 Volt cables that are being replaced by this project.
Joint bays	What is a joint bay?	<p>At intervals along the route there would be extended works to excavate large underground pits known as 'joint bays'.</p> <p>Work on the joint bays would happen in distinct stages over a two to four month period. This amount of time is required to allow the pit to be excavated, the cables to be pulled through and specialist crews to undertake cable joining work inside the bay.</p> <p>First, precast concrete joint bays would be brought to site and placed into the large excavation by our contractors. The cables would then be brought to the joint bay locations on large cable drums and pulled through the joint bays into the conduits.</p> <p>Ausgrid and the contractor would make contact with all residents adjacent to the joint bays well in advance of work starting to discuss the construction process.</p>

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Horizontal Directional Drilling	What is Horizontal Directional Drilling?	Horizontal Directional Drilling (HDD) is a method of installing underground infrastructure including conduits and cables with minimal impact on the surrounding area. HDD is used when trenching or excavating is not practical due to environmental or social constraints.
	Would Ausgrid be doing any HDD work on this project?	Yes. Ausgrid would use HDD to install the new conduits under Alison Road at the intersection with St Marks Road. This would eliminate the need to excavate across Alison Road or under the retaining wall at the northern side of the road.
	What would the HDD work involve?	The HDD process would start with excavating entry and exit pits on St Marks Road on either side of Alison Road. A drilling machine would then be used to bore a path under Alison Road from the entry pit to the exit pit. Next, the conduits that would house the new electricity cables would be installed into the bore. The cables themselves would be pulled through the conduits at a later date. The project team would discuss the proposed location of the HDD site, including work compounds and the entry and exit pits with surrounding residents after Ausgrid contractors have prepared their construction plans.
Work at substations	Will there be any work at the substations in Waterloo, Randwick and Kingsford?	Yes. There will be work undertaken inside each substation to disconnect and remove old electrical equipment and connect new equipment. Most of this work would happen inside the substation sites so it is not expected to significantly impact the neighbouring properties.
Work hours	What would the work hours be?	Ausgrid's standard work hours are 7 am to 6 pm Monday to Friday, and 8 am to 1 pm on Saturdays.
Out of hours work	Would there be any work at night?	Yes. Some work would need to be done outside of normal work hours, including night work to minimise the impact on traffic, businesses and the general community during the day. Ausgrid would contact affected stakeholders in advance.
Timeframe	How long will work take outside my home?	Generally, trenching proceeds at a rate of 20-30 meters per day so this means that crews should pass your home in around two-three days. However, this rate depends on how much rock is in the ground as this takes longer to excavate.
Construction impacts	How would the work impact the community along the route?	Ausgrid is committed to minimising the impact of its activities on local communities and the environment. There would be some temporary changes to traffic and parking arrangements along the preferred cable route. Ausgrid would work closely with Councils and Roads and Maritime Services (RMS) to minimise our impact on the local road network. A detailed Traffic Management Plan will be prepared in consultation with Council, RMS and other key stakeholders. Ausgrid has prepared an environmental assessment to determine the potential impacts of the project. The assessment outlines the required measures to mitigate any impacts. All work would be completed in line with the environmental assessment, the Construction Environmental Management Plan and Ausgrid's environmental management policies.
	What will the work site look like?	A typical work site encompasses a number of vehicles including an excavator, a truck to remove the spoil and other trucks containing equipment and crews. On-site personnel including work crews and traffic control staff would also be present. Traffic conditions would also be changed temporarily. Click here (please supply link) to view an information graphic showing a typical work site and the different stages of cable laying.

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Driveway access	Will I be able to get my car out of the driveway while you are working in my street?	<p>Yes. Access to properties would be maintained throughout the project unless we have made prior arrangements with you. If crews are working directly in front of your property, they will work with you to help you exit as quickly and safely as possible.</p> <p>Generally, steel plates are placed over the trench to allow cars to drive over the trench – this can take around five to ten minutes to organise depending on the work being undertaken.</p> <p>Traffic controllers will be on site to ensure you can safely enter onto the road/street.</p>
Trees	Would there be any impact on trees?	<p>The potential impact of the project on trees along the preferred cable route is considered in the REF. Ausgrid does not plan to impact any trees during construction. Suitable mitigation measures would be put in place prior to and during work to ensure trees retain their structural integrity and public amenity. This would be achieved by either hand digging around trees roots, or boring under them.</p> <p>If any trees or roots need to be removed or cut, Ausgrid would work closely with Randwick City Council and would notify the community in advance.</p>
	Would the new cables be damaged by tree roots?	<p>Some trees, particularly figs, have wide-spreading and aggressive root systems that will seek out water. This can impact pipes, drainage and pavements. Ausgrid's new cables would be encased in a weak concrete mix at a depth of greater than 600mm, which is where most tree roots are found. As such, tree roots are not expected to impact the cables.</p>
Safety	Will the roads be safe for pedestrians/ cyclists during construction?	<p>Trenches are generally located within the centre of the road, however the cable alignment is largely determined by existing services in the roadway.</p> <p>During construction, control measures would be put in place to ensure the safety of pedestrians / cyclists. Steel plates are usually used to cover any open trenches between shifts and these areas would be sign posted.</p>
	What happens if asbestos is discovered during construction?	<p>A waste classification assessment has been completed for the preferred route and can be found in the REF. Generally speaking, if asbestos is found during construction work, Ausgrid employees and contractors are trained to remove and dispose of it safely.</p>
Decommissioning – retiring the existing cables		
Process	When would the existing 132,000 volt cables be decommissioned and what would that involve?	<p>The existing 132,000 volt cables between the substations in Waterloo and Randwick would be decommissioned once the new cables have been installed and commissioned.</p> <p>The decommissioning process would involve excavation work at three existing pits along the existing cable route to purge the fluid from inside them using water. Once the fluid has been purged, Ausgrid would seal the cables and leave them in the ground.</p>
Safety	Why are the existing cables left in the ground? Won't they impact the environment?	<p>The purging process leaves the cables in a condition where they no longer pose a significant long-term threat to either the environment or the community.</p> <p>From the early 20th century, fluid filled HV cables were the most modern cable available and were installed throughout the world. These types of cables allowed the 'undergrounding' of high voltage overhead power lines and tower lines – which has shaped the development of modern cities today.</p> <p>Over the last 20 years there has been the development and industry acceptance of XLPE 'plastic' type cables. This technology is used on all new cable projects.</p> <p>The UK has approximately 7800km of fluid filled cable, 2500km in London alone. Sydney and Newcastle networks, at their peak had approximately 480km fluid filled cables.</p> <p>The decommissioning methodology is "industry best practice" and purging the cables using water removes 99% of the free fluid from within the cable – this is superior to previous decommissioning methods which purged cables using nitrogen gas, which only removed between 40-60% of the free fluid. Assessments of the decommissioning methodology have found that purging the cables, sealing them and leaving them in-situ poses less of an environmental, social and economic risk compared to removing them.</p>

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Restoration		
Process	What areas does Ausgrid restore?	Ausgrid is obliged by legislation to make good areas disturbed by the installation of electrical infrastructure. All affected areas, including roads and grass verges, will be restored to as close to their previous condition as possible.
	What is the restoration process?	Restoration typically involves two stages: <ul style="list-style-type: none"> · Excavated sections of road will be progressively backfilled and temporarily resurfaced to allow normal use by traffic. · Once all cables have been installed and tested, permanent resurfacing will be done in consultation with the relevant authority.
Coordination with Council	How will Ausgrid work with Council to avoid digging up roads that they have, or plan to, resurface?	Ausgrid commenced discussions with Randwick City Council about the project and our preferred cable route in early 2018. These meetings will continue throughout all stages of the project to keep council updated on our plans and to coordinate works where possible to try to minimise having to excavate after any council road restoration.
Electric and Magnetic Fields (EMF)		
General	What are electric and magnetic fields?	When electrical equipment is in use, electric and magnetic fields (EMF) are produced. You will find EMF in and around most households and workplaces from sources such as appliances, building wiring, office equipment and the local electricity network (including overhead power lines or underground cables). When talking about EMF in relation to whether there are any health concerns, people are generally referring to magnetic fields.
	What are the relevant Australian guidelines in relation to magnetic fields?	The Australian Radiation Protection and Nuclear Safety Agency (ARPANSA) is the Australian Government authority responsible for setting the exposure limits for magnetic fields. In line with multiple other countries, ARPANSA has adopted the International Commission on Non-ionising Radiation Protection (ICNIRP), recommended public exposure limit of 2,000mG.
More information	How can I find out more about EMF in relation to the Kingsford to Randwick cable project specifically?	A specialist EMF assessment has been prepared for the project. This can be found in the REF.
Cost		
Overall project cost	How much will the project cost?	The budget allocated to complete this project as submitted to the Australian Energy Regulator is \$21.2 million.
	How does Ausgrid cost cable options?	Ausgrid has completed a range of 132,000 Volt cable projects in recent years. Using information from previous projects we are able to assess likely costs and risks of each project.
	Who pays for the project?	NSW electricity customers are funding the replacement of these cables through the network component of their electricity bills.
Construction costs	Does it cost more to install cables around corners, compared to straight stretches of road?	Yes. Corners where a cable bends (such as at intersections) tend to have other underground utilities that must be carefully excavated around. This slows down the productivity of the contractor, which increases the cost of these particular sections.
	Does the gradient of a road impact the cost of installing new cables?	No. The gradient or slope of a road does not impact the cost of the project
	What is the underbore on Alison Road expected to cost?	The horizontal directional drilling (HDD) technology that Ausgrid is proposing to use to cross Alison Road would cost approximately 60% more than traditional trenching. Actual costings will be obtained via a competitive market tender process, prior to project determination.

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Project assessment and approval		
Environmental assessment	Will the environmental impacts of the project be assessed?	Yes. An environmental assessment known as a Review of Environmental Factors or REF has been prepared by Ausgrid.
	What is the process for preparing the REF?	Ausgrid's Environment Team assesses the environmental impacts of the project. The team member assigned to the project engages with, and compiles reports from, a range of external specialty consultants. This information is used to determine the mitigation measures required to reduce the impact of the project on the environment and community. This process meets the requirements of the <i>Environmental Planning and Assessment Act 1979</i> .
	Can I comment on the REF?	Yes. The REF will be on public exhibition at several locations between 7 and 27 September 2018. Key stakeholders and the community will be invited to review the REF and make submissions. People living and/or working along and near the preferred cable route will receive a newsletter with further details on this process. Following the REF exhibition, Ausgrid will review all submissions and prepare a report.
	What happens after the public exhibition period ends?	Following the REF exhibition, Ausgrid will review all submissions and prepare a report. We will then determine the project for approval based on information contained in the REF, the specialist reports, the submissions report and other relevant documents.
Project approval	Who approves the project?	Under <i>Part 5 of the NSW Environmental Planning and Assessment Act 1979</i> , Ausgrid is the nominated determining authority for the installation of electrical infrastructure.
Community engagement		
Project development	How has Ausgrid engaged with the key stakeholders and community to date?	Ausgrid has sought to involve key stakeholders, such as Randwick City Council (Council) and the community early in this project so we can use local feedback as part of the planning process and to minimise impacts during construction. Ausgrid started engaging with stakeholders, such as Council in early 2018 to obtain feedback on the preferred cable route. Engagement with residents and businesses along and around the preferred cable route started in late March 2018 when the first project newsletter was distributed. A second newsletter was issued in early September 2018 to provide an update on the project and information on how to view and make a submission on the REF. Copies of the newsletters can be found on the project web page. On 5 and 10 April 2018, we held two information sessions, one at the Juniors Kingsford and the other at the Randwick Club, to seek local information and initial community feedback on the preferred cable route. At these sessions, members of the project team gave two short presentations - on project need and what to expect during construction of a typical underground 132,000 Volt cable project. The presentation can be viewed via the link on the project web page. The environmental assessment, or REF is on public exhibition for comment between Friday 7 and Thursday 27 September 2018, and a drop in session will be held on Tuesday 18 September at the Randwick Club. Ausgrid takes all comments and feedback on board and makes changes to the project plans where practical and efficient.
	Construction	How would Ausgrid engage with the community during construction?
	How much notice would residents receive before construction starts?	Ausgrid generally provides four clear business days' notice before any work begins in an area. This is in addition to the progressive information provided during project planning.