



Australian Government

BUILDING OUR FUTURE

ARTC



Inland Rail:

Once-in-a-generation
project connecting regional
Australia to global markets

**InlandRail**

**INLAND RAIL QUARRY MATERIALS
JUNE 2017**

AUSTRALIAN RAIL TRACK CORPORATION

- The Australian Rail Track Corporation (ARTC) is an Australian Government owned Corporation that manages and maintains approximately 8,500km of rail network.
- ARTC is delivering this multi-billion dollar infrastructure project in partnership with the private sector.
- ARTC are well qualified for the job and have successfully delivered more than \$5 billion in capital upgrades to the national rail freight network to date.



INLAND RAIL PROPOSED ROUTE



INLAND RAIL

- A new **1,700km freight rail line from Melbourne to Brisbane** via regional VIC, NSW and QLD
- A **road-competitive rail service** based on transit time, reliability and pricing that is equal to or better than road.
- Completes the spine of the rail network, providing a service that will see freight delivered between **Melbourne to Brisbane in less than 24 hours**
- **Utilises approximately 1,200km of the existing rail corridors and requires 500km of new corridor** where we need to build new track – minimising the impacts to landholders, the environment and communities
- Inland Rail will **reduce costs, create jobs, take trucks off our roads** and enable businesses and producers to be more competitive.



BUILDING WHAT INDUSTRY WANTS



Reliability



Price



Transit time



Freight available
when the market wants

» Inland Rail - Key technical characteristics that underpin the service offering

Train Length	1800m with future proofing for ultimate 3600m train length
Axle Load / Max Speed	21 tonnes @ 115km/h, 25 tonnes @ 80km/h, with future proofing for 30 tonnes @ 80km/h
Double Stacking	7.1m clearances for double stack operation
Interoperability	<p>Full interoperability with the interstate mainline standard gauge network</p> <p>Dual-gauging in Queensland to provide for connectivity to the Queensland narrow gauge regional network</p> <p>Connections to the NSW Country Regional Network to provide for standard gauge connections to the ports of Melbourne, Port Kembla, Sydney, Newcastle, Brisbane, Adelaide and Perth.</p>

FEDERAL BUDGET ANNOUNCEMENT



The Federal Government announced an additional \$8.4 billion funding commitment to deliver Inland Rail, via an equity investment in ARTC.



Consistent with the Government's announcement as part of last year's Federal Budget that ARTC would deliver Inland Rail in partnership with the private sector, the Government has also confirmed that the 126km section from Toowoomba to Kagaru in Queensland will be delivered through a Public Private Partnership.



This is a significant commitment that will benefit Australians living in our cities and in our regions.





FEDERAL BUDGET ANNOUNCEMENT



ARTC have been working hard to get Inland Rail shovel-ready with the \$894 million commitment the Government had made in previous Budgets, so we welcome this commitment to get on and build it in partnership with the private sector.



But more than this there are broader economic benefits which are backed and recognised by Infrastructure Australia – it's why they placed it on their **National Priority List**.



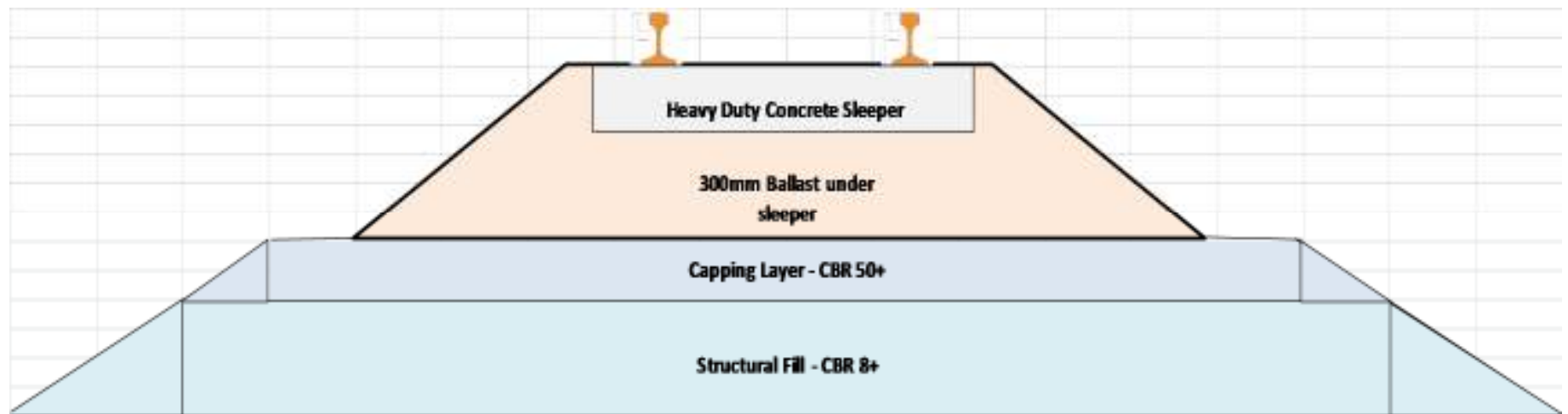
PROPOSED SCOPE

CATEGORY	PROJECT	DESCRIPTION	LENGTH (APPROX)
Upgrade works	Narrabri to North Star (NSW)	Upgrading to interstate mainline standards	293km
	Parkes to Narromine (NSW)		
Enhancement works	Kagaru to Acacia Ridge (QLD)	Providing double-stack capability and passing loops	709km
	Albury to Illabo (NSW)		
	Stockinbingal to Parkes (NSW)		
	Tottenham to Albury (VIC)		
Missing Link projects	Helidon to Calvert (QLD)	New greenfield plus upgrade to dual gauge (includes Toowoomba and Little Liverpool Range tunnels)	708km
	Calvert to Kagaru (QLD)		
	Border to Gowrie (QLD)	New greenfield plus upgrade to dual gauge	
	Gowrie to Helidon (QLD)		
	Narromine to Narrabri (NSW)	New greenfield standard gauge	
	North Star to Border (NSW)		
	Illabo to Stockinbingal (NSW)		
TOTAL			1710km

INLAND RAIL QUARRY MATERIALS

INLAND RAIL TYPICAL TRACK STRUCTURE

Below is a typical cross section indicating the track structure including the ballast, capping & structural fill materials required for the Inland Rail Projects.



The thickness of the ballast is up to 300mm below sleeper whilst the thickness of the capping and structural fill may vary depending on the final designs, which take into account the naturally occurring materials that will be encountered throughout each project.

The major quarry products required for the construction of the Inland Rail projects include:

- Rail Ballast
- Capping material
- Drainage blanket
- Rock protection (Armour rock)

Other material requirements may include the following, depending on construction methodology and project location:

- Concrete aggregates
- Gabion rock
- Structural fill
- Select fill – RSS wall backfill.
- Bedding Sand

The below table provides a summary of the approximate quantities of ballast and capping material required for each IR project, the actual requirements will be refined through the next design phase. The average material requirements on greenfield & brownfield projects is approx. 7000t/km.

Project	Length of Project	Ballast	Capping
Tottenham to Albury	304	90000	33000
Albury to Illabo	185	40000	22500
Illabo to Stockinbingal	37	155000	125000
Stockinbingal to Parkes	173	18000	8000
Parkes to Narromine	107	465000	180000
Narromine to Narrabri	307	1200000	1000000
Narrabri to North Star	186	800000	300000
North Star to Border	30	225000	180000
Border to Gowrie	226	840000	680000
Gowrie to Calvert	73	370000	300000
Calvert to Kagaru	54	245000	200000
Kagaru to Acacia Ridge & Bromelton	52	42000	34000
	Total m3	2,806,250	1,361,111
	Total tonnes	4,490,000	3,062,500

Ballast Material Properties - ARTC Specification ETA-04-01

- Bulk Density > 1200kg/m³
- Particle Density > 2500kg/m³
- Misshapen particles (9.5mm) < 30%
- Flakiness Index (6.7mm) < 30%
- Aggregate crushing value < 25%
- Wet Attrition Value < 6%
- Los Angeles < 25%
- Weak particles < 5%

Material Grading

Sieve Size	% Passing
63.0	100
53	85-100
37.5	20-65
26.5	0-20
19	0-5
13.2	0-2
4.75	0-1
0.075	0-1

Note – Updates to the specification may be made during the next design phase.

Capping Material Properties – ARTC IR specification ETC-08-03

- Soaked CBR >50%
- Liquid Limit < 30
- Plastic Limit < 20
- Plasticity Index 6-12 (WPI 140-360)
- Wet/Dry strength > 85kN & < 35% variation
- Linear Shrinkage < 3%
- Maximum Dry Density > 2.0t/m³
- Point load > 1.0MPa
- Flakiness Index < 40
- Particle Shape <30% passing 2:1 caliper ratio
- Artificial Weathering (RMS T103) & Repeated Compaction (RMS T102)

Material Grading

Sieve Size	% Passing
53	100
37.5	100
26.5	100
19	80-100
9.5	55-100
2.36	30-70
0.0425	12-40
0.075	5-25

Note – Updates to the specification may be made during the next design phase.

Construction contracts for the Inland Rail projects are expected to be awarded from 2018 to 2020 based on a staged programme with the Parkes to Narromine and Narrabri to North Star projects progressing first.

ARTC's current procurement strategy is summarised below:

- Release tenders for the civil & track construction contracts for each of the 13 projects. The release of these tenders will be done through open tenders via Tenderlink.
- Award contracts for the civil and track construction works. These contracts will include the supply, delivery and placement of all materials, including quarried materials

