

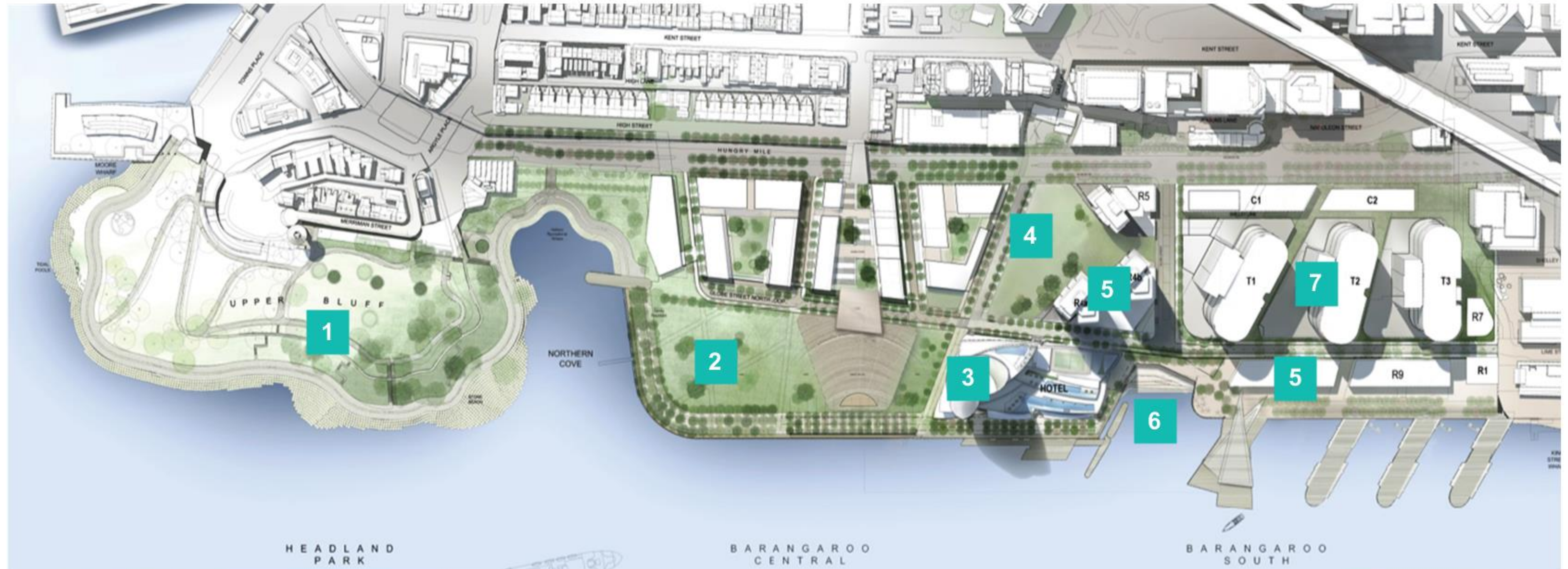
BARANGAROO SOUTH DISTRICT COOLING PLANT

Web seminar: Developing District Energy in New Zealand and Australia - Part II

May 2015



BARANGAROO PRECINCT PLAN



**BARANGAROO
POINT**



**CENTRAL
BARANGAROO**



**CROWN SYDNEY
RESORT HOTEL**



**HICKSON
PARK**



**RESIDENTIAL
HIGH/LOW RISE**



**WATERMANS
COVE**



**INTERNATIONAL
TOWERS SYDNEY**

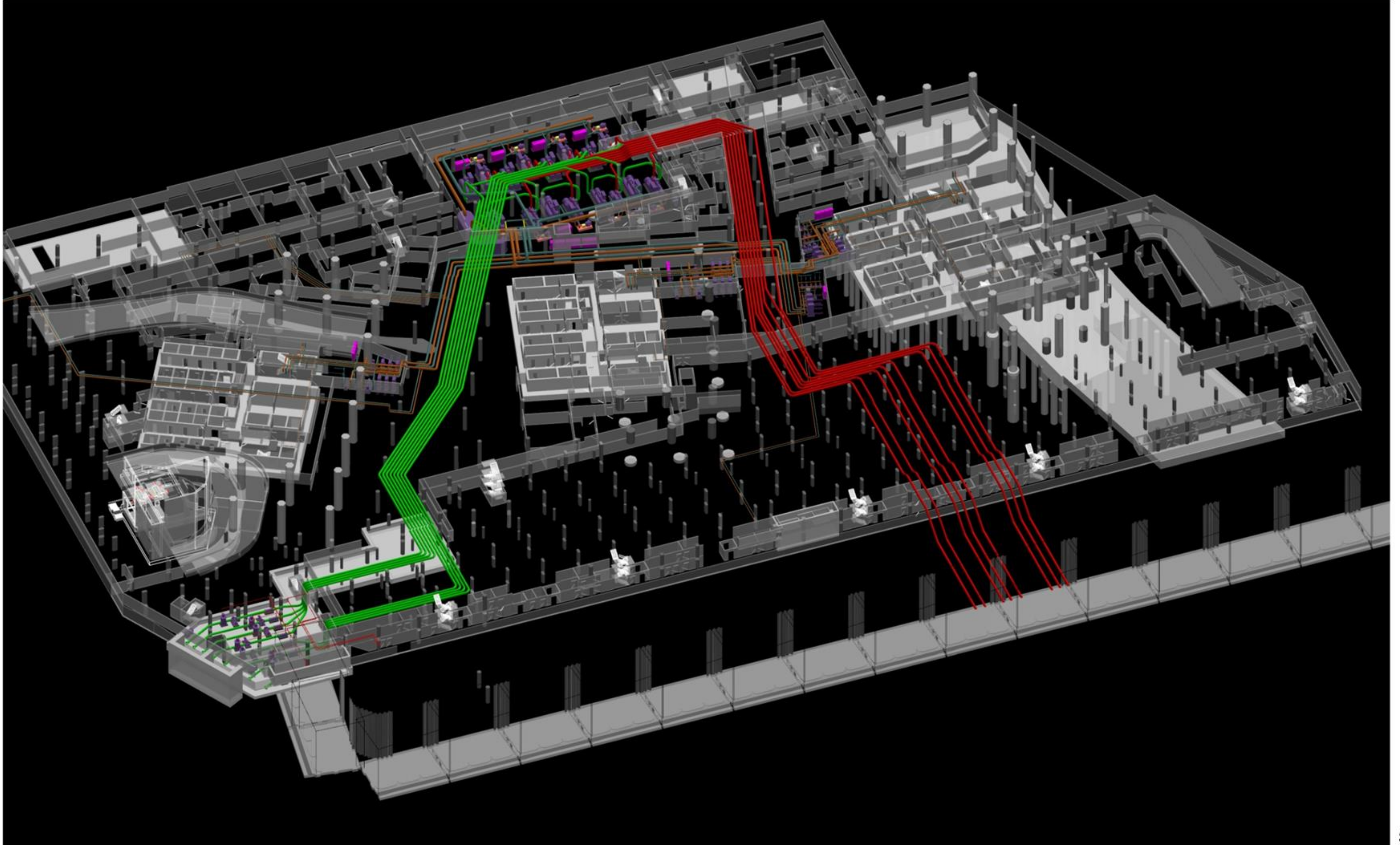
IT'S HAPPENING

Barangaroo |  Lend Lease



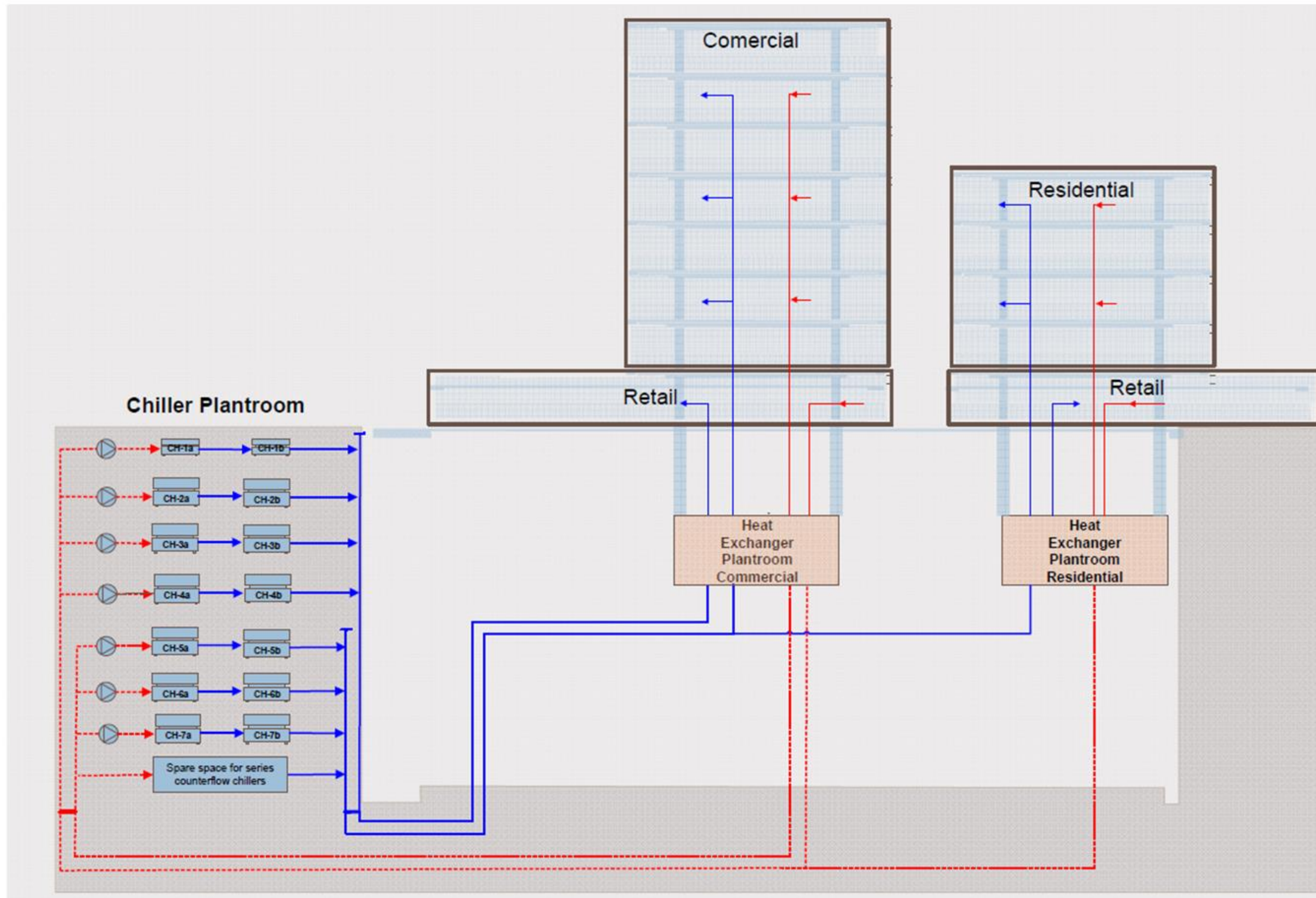
- Barangaroo South is committed to being water positive and carbon neutral.
- The District Cooling Plant (DCP) is a major contributor to achieving project sustainability commitments, which have driven design outcomes. Decision to commercialise the DCP made well into project.
- The DCP will provide the entire cooling capacity for the whole of Barangaroo South. Approx 540,000m² GFA
- District cooling in Australia is not common.
- Harbour Heat Rejection will be used in the place of typical cooling towers to reduce potable water demand.

DISTRICT COOLING PLANT

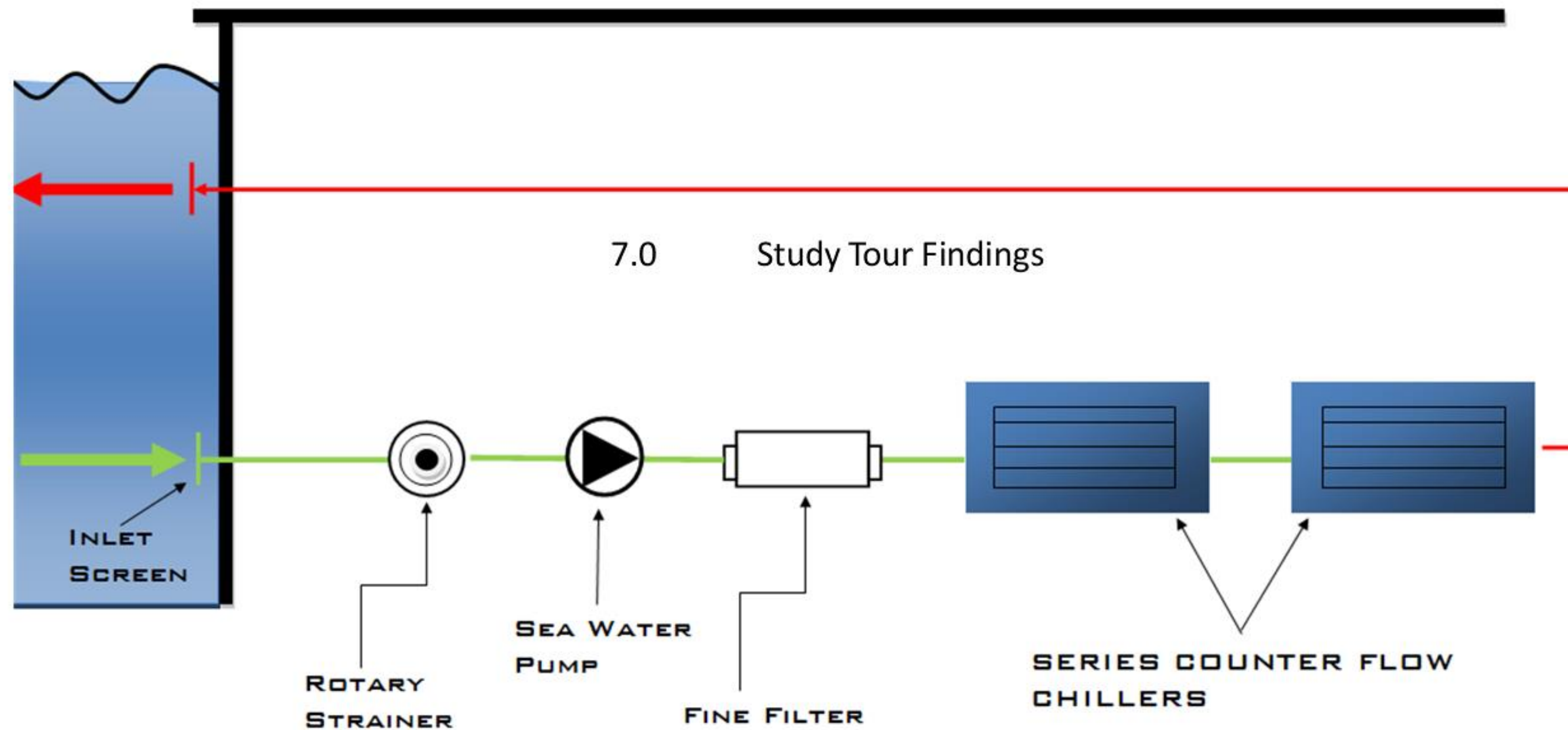


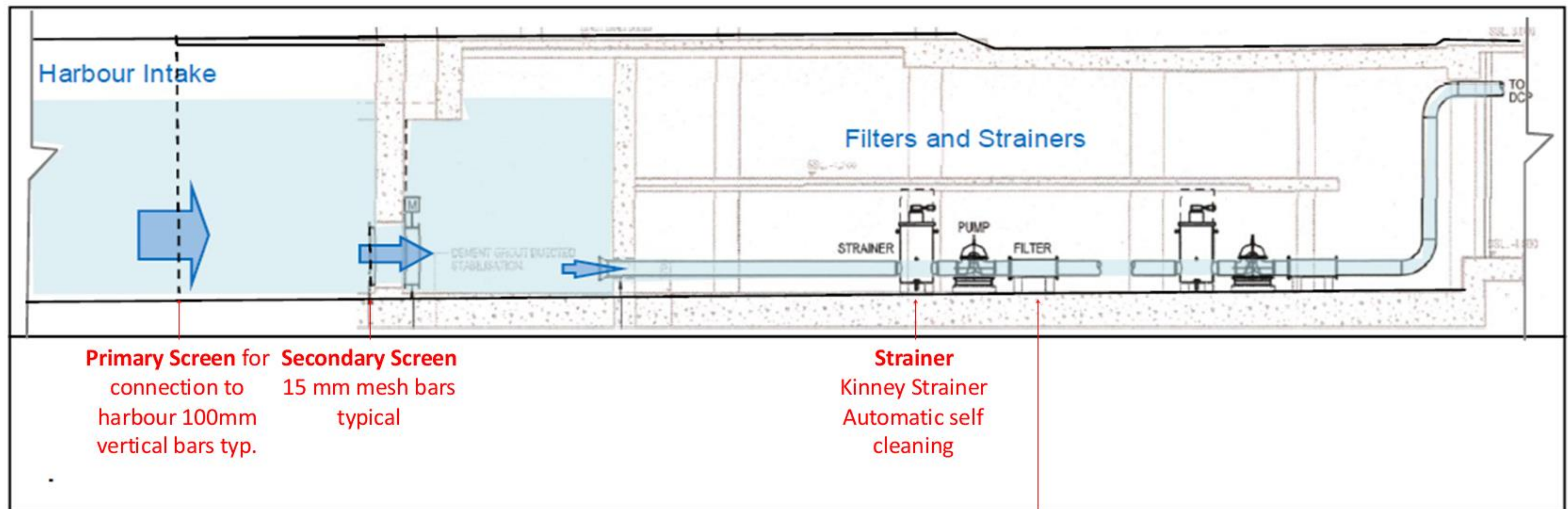
- a) Centralised plant that provides cooling to the whole of Barangaroo South
District Cooling Plant - Ultimate Plant Capacity of 72MW
- b) Uses the harbour for the rejection of heat in place of cooling towers which use high volumes of water
Harbour Heat Rejection (HHR)
- c) Seawater flow directly through the chillers without an intermediate heat exchanger for superior efficiency
Direct Sea Water Cooled Chillers
- d) Two chillers are arranged in series and the seawater flows in the opposite direction to the chilled water, again for superior efficiency and performance
Series Counter Flow Chillers
- e) Two stage automatic self cleaning filtration to reduce fouling and enhance performance
Kinney Screen and Jet Filter
- f) **SCADA** PLC based Control system
- g) **Materials** used are suitable for marine applications, e.g. Super Duplex SS, Titanium, HDPE, GRP.

District Cooling Plant - Key Elements



- a) **District Cooling Plant's** - are common overseas and are widely accepted as a cost effective form of providing chilled water to a district or large service area.
- b) **Harbour Heat Rejection (HHR)** – utilising the open sea, harbour or tidal rivers is common however the quality of the water body in many cases was observed to be relatively low to that which exists in Sydney Harbour. Filtration methods therefore differ.
- c) **Direct Sea Water Cooled Chillers** – Are in use overseas and CuNi or Ti tube material is used to offset saltwater corrosion and fouling potential. Barangaroo will use Titanium.
- d) **Series Counter Flow Chillers** – Are used overseas and are demonstrating high coefficients of performance (CoPs) compared to parallel arranged chillers.
- e) **Kinney Screen and Jet Filter** – Kinney screens and jet filters were observed in successful operation overseas but not together. Filtering methods used overseas differ from what will be used at Barangaroo due to the difference in intake design, water quality and regional engineering practice.





Legend

Harbour intake and screen
Penstock valve and screen
Pipe intake



Filter
Jet Filter
Self Cleaning Filter

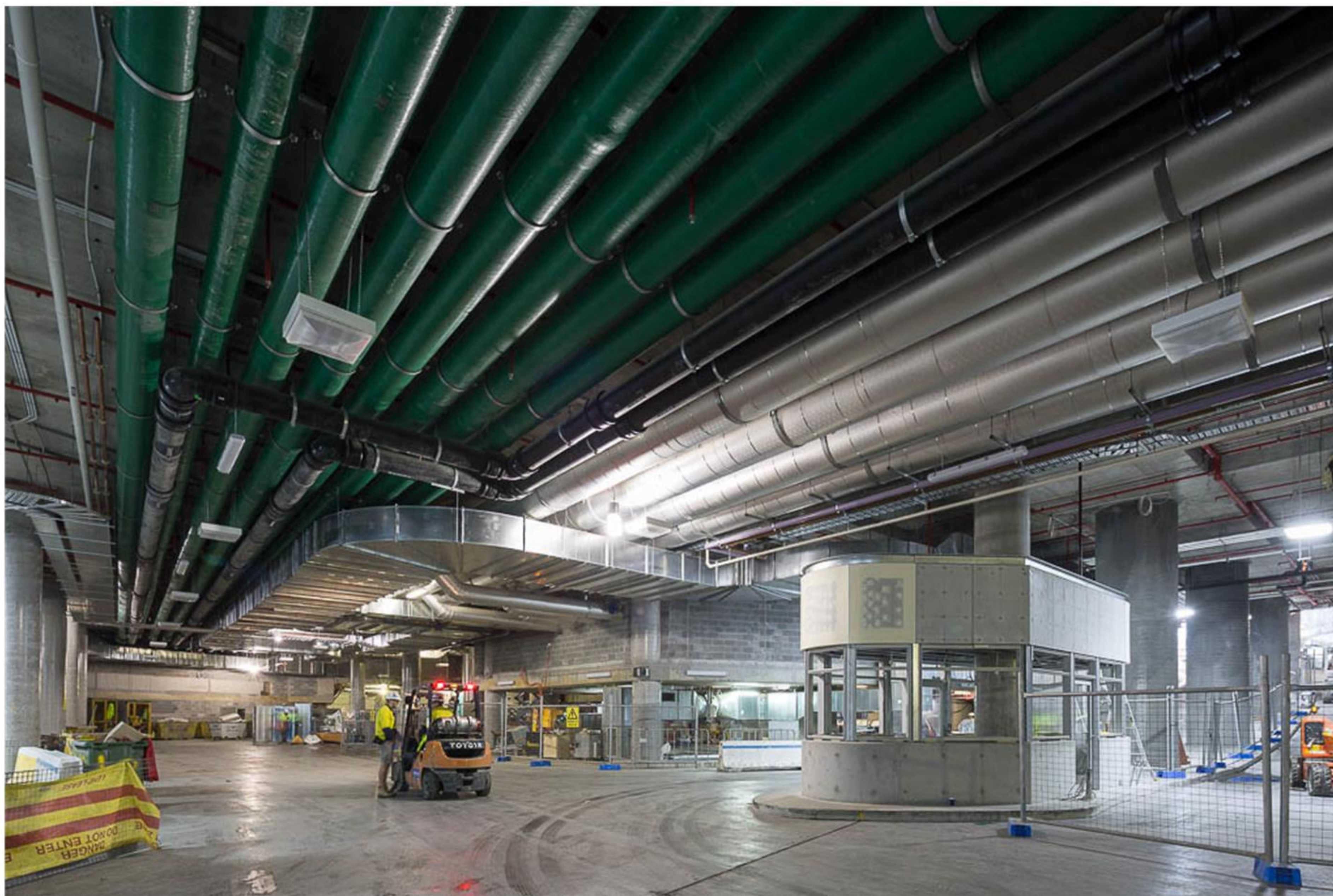
- International Peer Review – FVB Energy
- HAZOP reviews(Veolia/Hastie)
- Controls Peer Review – DC Pro Engineering
- Internal Design Review
- Sydney Harbour Site Visits
- DCP ROADS review
- International study Tour
 - DCPs in Europe, Asia and Middle East

DCP Construction Update

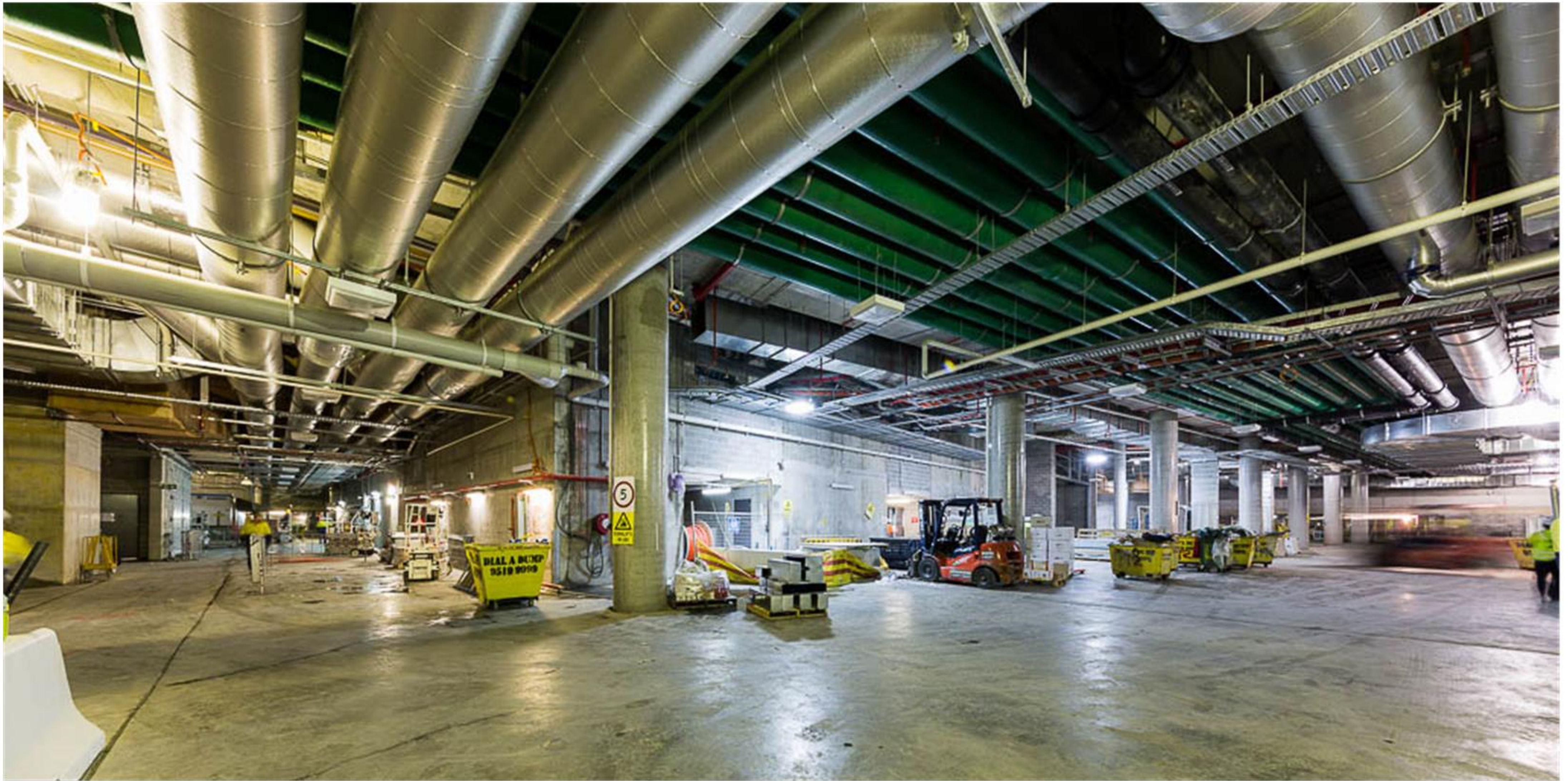


DCP Construction Update





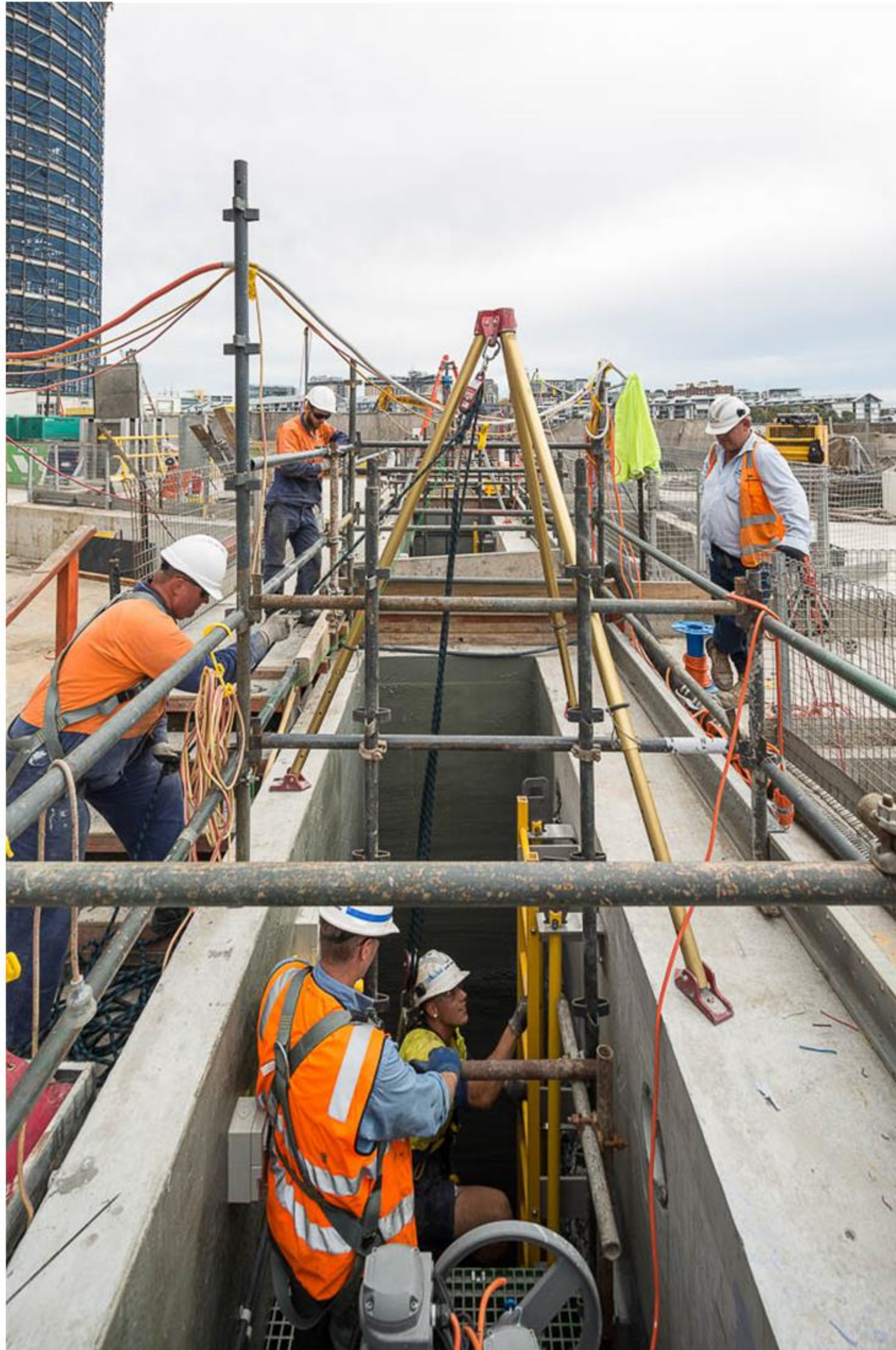
DCP Construction Update



DCP Construction Update



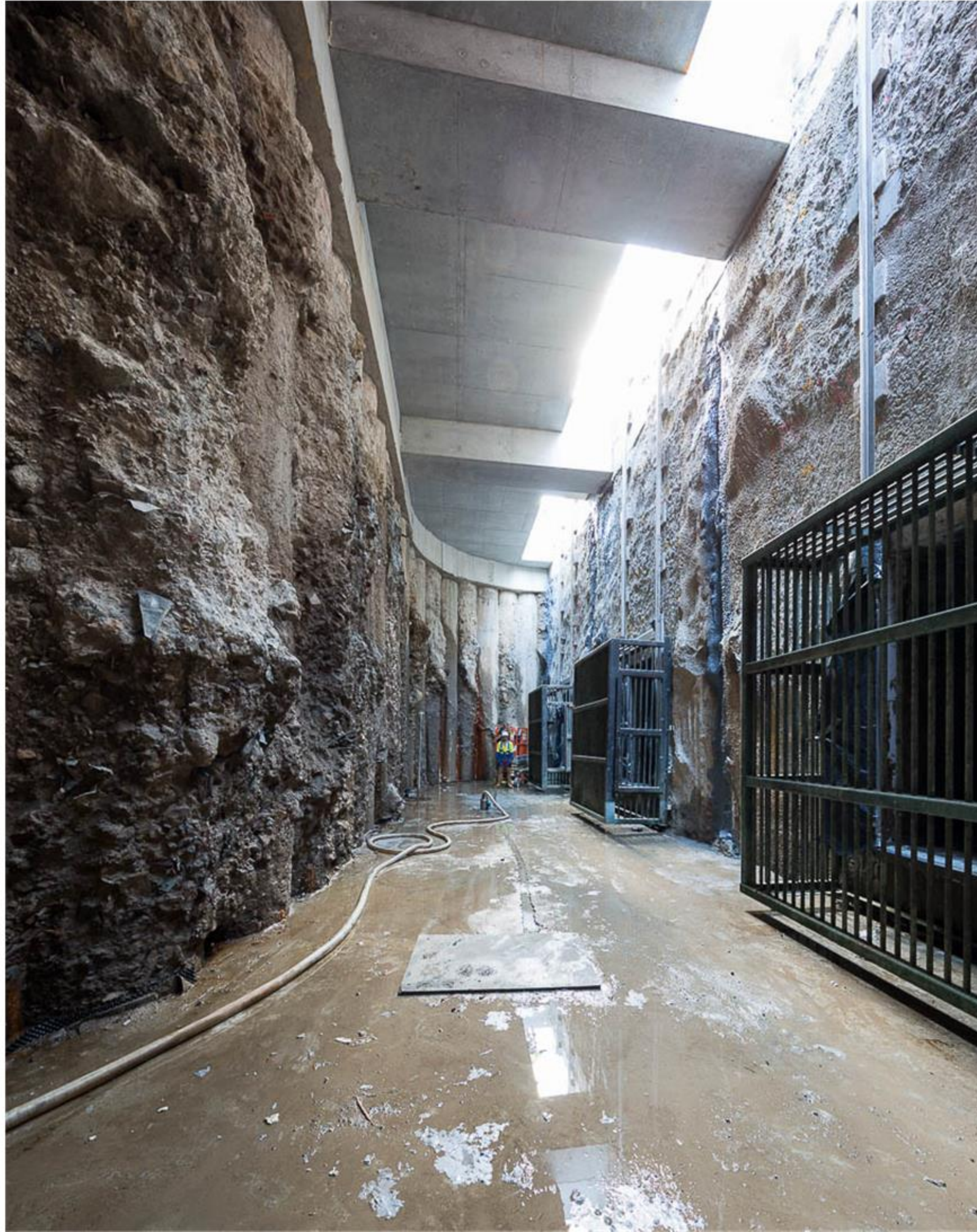
DCP Construction Update



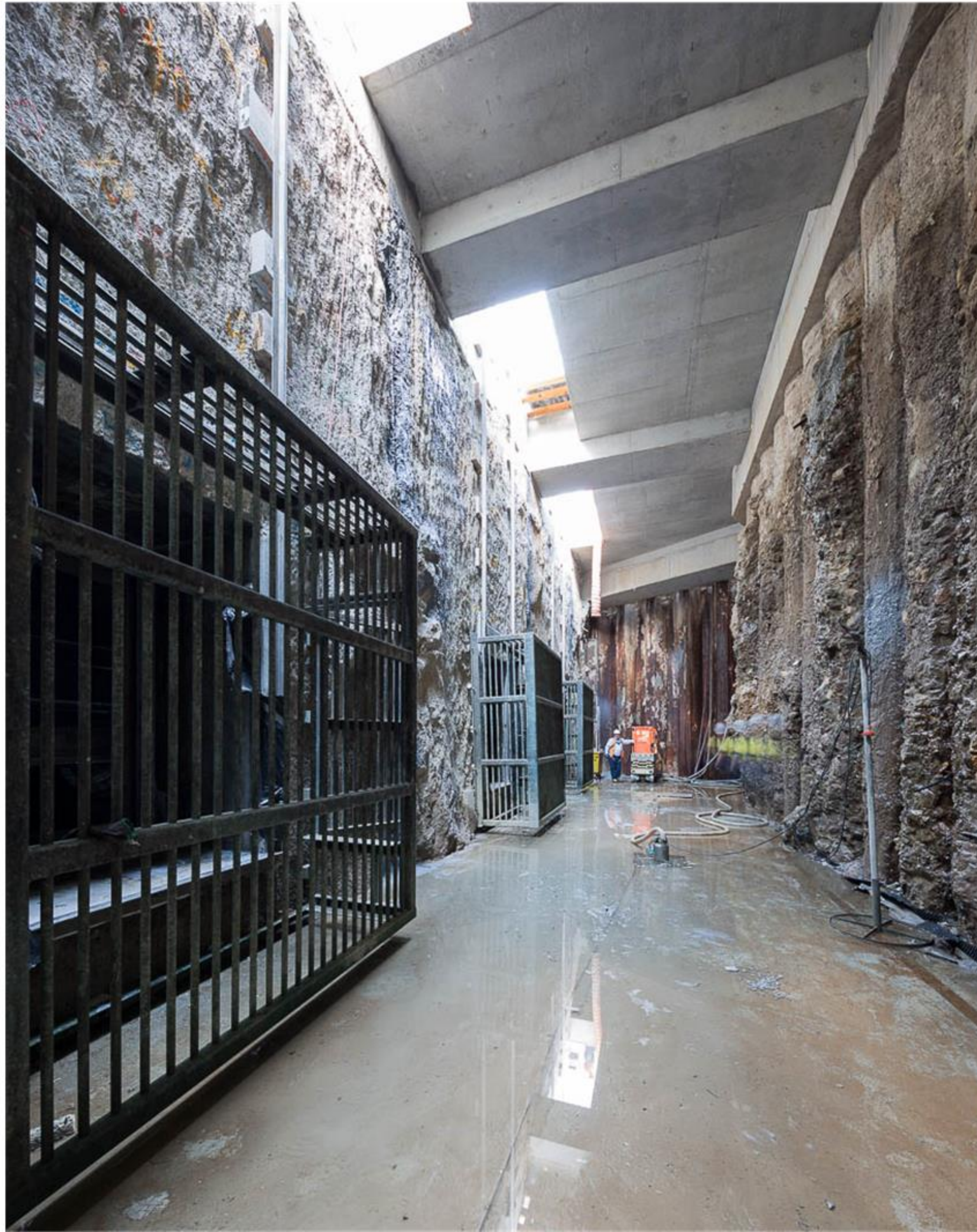
DCP Construction Update



DCP Construction Update



DCP Construction Update



DCP Construction Update

