



Market Survey: MID Infrastructure Contract 1

1. Client and Market Survey:

The SKAO, formally known as the SKA Observatory, is a global collaboration of Member States whose mission is to build and operate cutting-edge radio telescopes to transform our understanding of the Universe, and deliver benefits to society through global collaboration and innovation. Headquartered in the UK, its two telescope arrays will be constructed in Australia and South Africa and be the two most advanced radio telescope networks on Earth. A later expansion is envisioned in both countries and other African partner countries.

Together with other state-of-the-art research facilities, the SKAO's telescopes will explore the unknown frontiers of science and deepen our understanding of key processes, including the formation and evolution of galaxies, fundamental physics in extreme environments and the origins of life. Through the development of innovative technologies and its contribution to addressing societal challenges, the SKAO will play its part to address the United Nations' Sustainable Development Goals and deliver significant benefits across its membership and beyond.

The SKAO invite expressions of interest for the contract described below.

To express an interest in this contract candidates must:

1. Create an account on the [SKAO Supplier Portal](#).
2. Complete the Registration process via the 'Tender notice overview' page for this contract on the SKAO Supplier Portal.

The submission of supporting information or documentation at this stage of the procurement process is not required.

At the next stage invitations to pre-qualify for the contract will be issued according to the indicative timeframe below.

A shortlist of pre-qualified contractors will then be invited to submit tenders.

2. Project:

The SKAO will have a uniquely distributed character: one observatory, operating two telescopes, on three continents for the global scientific community.

The two SKAO telescopes will be located in radio quiet zones in South Africa and Western Australia. They differ in design and are complementary by their very nature. Both are interferometers: arrays of antennas which when linked together act as one enormous telescope, bigger than would ever be possible in a traditional single-dish design.

In South Africa, the SKA-Mid telescope will initially comprise 197 dishes, 64 of which are already in place and form the MeerKAT precursor telescope, itself a world-class facility, which will be integrated into SKA-Mid. In Western Australia, an initial 131,072 low-frequency antennas will form the SKA-Low telescope, spread across 512 antenna stations.

The telescopes' design is scalable and upgradable, allowing future improvements to maintain their world-leading capabilities, and also to align with available funding. This includes state-of-the-art scientific and computing infrastructures, designed to progressively exploit the capabilities of the Observatory as computing technology continuously improves over coming decades.



3. Contract:

MID Infrastructure Contract 1: Infrastructure (Access Roads, Power & Fibre Reticulation Networks, Antenna Foundations, Temporary Accommodation, Water & Sanitation, Security and Weather, Visual & STI Monitoring Stations)

4. Contract Description:

The successful Contractor will be required to take responsibility for the design of the whole of the works. The tender package will include a reference design, which has been prepared by SKAO. Tenderers will be able either to adopt the reference design and provide such additional new design as necessary to complete it, or to prepare a fully new design. New design prepared by the Contractor will be subject to an acceptance procedure. The SKAO reference design will be deemed to have been accepted.

The Contractor's Scope is the design, manufacture, supply, delivery, installation, testing, commissioning and training associated with the following works:

- a) **Gravel roads and antenna platforms (Access):** There is a total of approximately 450km of roadworks required. Of the 450km, 95km will be new roads in the MID telescope spiral arms, 15km will be new roads in the core of the telescope and 340km in the spiral arms will be existing farm and

district roads which will be rehabilitated to improve access. The dish antenna platforms have a 26.5m radius and comprise of the same layer works as the basic farm (gravel) roads.

- b) Electrical reticulation (Power):** Electrical reticulation throughout the telescope array which is a 22 kV overhead and underground cable network supplying mini-substations or transformers, which in turn supplies groups of dish antennas at **400 V**.
- c) Optic fibre reticulation:** The main constituents of the fibre reticulation infrastructure are:
- An underground fibre network to be implemented in parallel to the existing Fibre Network to serve the new dish antennas.
 - Underground fibre links between the overhead fibre network on the three (3) spiral arms and the dishes and their associated 21 No. local off-Grid solar PV power plants.
 - An overhead fibre network along the full length of the 3 spiral arms including repeater facilities.
- d) Dish Foundations:** Structural reinforced concrete piled and/or pad dish foundations for 109 dishes.
- Two types of cast in-situ piled reinforced foundations are required:
 - 7m diameter pile cap on 8 No. 0.75m diameter vertical augered piles (93 No.)
 - 7m diameter pile cap on 8 No. 0.9m diameter 1H:4V raking augered piles (6 No.)
 - Where the competent medium hard rock is found at or shallower than 3m, a pad (spread) foundation is required:
 - 11m diameter cast in-situ reinforced concrete pad foundation (10 No.)
- e) Removal of temporary accommodation:** Reinstatement of the construction camp area (constructed by others) after other Contractors have removed their own site accommodation, fencing and associated services. Reinstatement includes:
- Removal and disposal of perimeter fencing and fence foundations
 - Removal and disposal of MID Water and Sanitation (as described in Appendix C)
 - Removal and disposal of construction activity debris
 - Re-grading of the ground and dedicated access roads to match the adjacent topography.
 - Removal of the RFI screened office and work-desks
- f) Water and sanitation:** Establishment of the continuous supply of water required for **construction** purposes. Existing boreholes yield test results indicate a total surplus of 59kl/day over the full project footprint when comparing the total sustainable yield and the estimated demand. There are boreholes with less than the required minimum yield (or zero yield) that can be supplemented by other boreholes or by trucking of water and storing it in water storage tanks.
- g) Security (fencing):** This work package comprises the following fencing:
- 2.5m high security perimeter fencing for 21 dishes on the 3 spiral arms. These will have 6m wide access gates with two 6m wide removable panels on either side of the gate. The fencing will be 100m x 100m in plan.

- Security Perimeter fencing at 4 repeater stations situated in the 3 spiral arms. These will each have a 3m wide access gate. The fencing will be 20m x 20m in plan.
- Security perimeter fencing at 3 Weather Monitoring Stations situated in the 3 spiral arms. The fencing will be 10m x 10m in plan.

h) Infrastructure associated with other monitoring systems: The supporting infrastructure (only) for Site monitoring products as follows:

- Three (3) new Weather monitoring stations - three phase power, fibre, foundations, earthing and masts.
- Power & Fibre for four (4) new Visual monitoring systems - three phase power, fibre, foundations, earthing and masts.
- Infrastructure for Tropospheric/STI Monitoring Station (TMS) - single phase power, fibre, foundations (quantity 3), earthing, masts (quantity 3) and fence.

The successful infrastructure Contractor (MID Infrastructure Contract 1), the successful Site Monitoring product Contractor (MID Infrastructure Contract 3), and the Project Manager will collectively manage the interfaces associated with the site monitoring products.

5. Tender Evaluation and Key Criteria:

- a)** The Contractor (or Lead Contractor if a Joint venture) should have a CIDB contractor grading designation of 9CE or 9EP or higher.
- b)** The Contractor should have competent in-house or subcontracted design engineers/consultants for the various disciplines covered in the scope.
- c)** The Contractor (including design engineers) should be able to demonstrate experience in infrastructure design and construction of similar size and scope.
- d)** The Contractor should be able to demonstrate experience in NEC (New Engineering Contract) contracts.
- e)** A "most economically advantageous tender evaluation method" will be adopted which will include both price and functionality/quality criteria.
- f)** The Contractor will be required to subcontract at least 30% of the value of this contract excluding major materials and equipment, to local contractors. The tenders that the Contractor prepares in terms of this requirement, must be offered first to South African citizens in and around the Carnarvon, Williston, Brandvlei and Van Wyksvlei Local Municipalities (in Karoo Hoogland and Kareeberg District Municipalities, respectively). Should no suitable contractors be shown to be available, offers may be extended to the area of the Northern Cape Province.

The SKAO is an inter-governmental treaty organisation, and conducts its procurement and tender processes in accordance with its own procurement policies.

6. Contract Form:

The Contract will be executed under the NEC4 Engineering and Construction Contract (ECC) contract - Option A.

7. Indicative Timeframe:

Subject to the SKAO Council approving the SKA Construction Proposal in June 2021 and the meeting of other requirements, the table below sets out the **indicative timeframe** for this Contract:

Market Survey close	30 July 2021
Pre-Qualification period	02 August 2021 - 20 August 2021
Invitation to Tender issued	27 August 2021
Closing date of Tenders	22 October 2021
Contract Award	22 February 2022
Completion (installation)	30 September 2024
12 month maintenance	30 September 2025