

STATEMENT OF WORK

FOR

ngVLA ANTENNA STATION INFRASTRUCTURE

Design, Engineering, and Construction Services

Issued by:

**Associated Universities, Incorporated (AUI) /
National Radio Astronomy Observatory (NRAO)**

Contract Vehicle: Indefinite Delivery, Indefinite Quantity (IDIQ) contract with Task Orders

**DRAFT FOR
REQUEST FOR INFORMATION (RFI)**
FOR PLANNING PURPOSES ONLY — NO AWARD WILL RESULT

Issued: October 2026

1. Background

The Associated Universities Incorporated (AUI) and National Radio Astronomy Observatory (NRAO) are designing and constructing the Next Generation Very Large Array (ngVLA) — the most powerful radio telescope array in history. When complete, the ngVLA will consist of more than 250 antennas spanning more than 8,000 km across North America.

The ngVLA array is organized into three sub-arrays:

- Main Array: The majority of the 18-meter diameter antennas, distributed across New Mexico, Texas, and Arizona.
- Mid and Long Baseline Arrays distributed across hemisphere may include stations in Hawaii, Washington, California, Iowa, West Virginia, New Hampshire, and U.S. Virgin Islands.

The initial phase of this infrastructure effort will focus on approximately a dozen Remote Long Baseline stations that are widely dispersed for optimal astronomical use. As the project matures, additional Core, Spiral, Mid-Baseline, and remaining Long Baseline stations will be added, along with supporting facilities infrastructure.

This RFI addresses the Antenna Station Infrastructure work only. This scope prepares each site for the antenna station to be installed but does not include the 18-meter dish antenna itself. Antenna installation will be performed under a separate contract; the infrastructure contractor is responsible for coordination with the antenna installation contractor.

2. Purpose and Objectives

The purpose of this RFI is to identify qualified contractors capable of providing engineering design and construction services for ngVLA Antenna Station Infrastructure on task orders issued against an IDIQ contract.

The primary objectives of this effort are to design and build antenna station infrastructure components at locations selected by NRAO. Task orders may be issued for:

- Design Services Only (Preliminary or Final Design)
- Construction Services Only (utilizing Government-Furnished Designs)
- Integrated Design-Build Services

The infrastructure components required at each station location typically include the following elements, which may vary based on station type (Core vs. Remote), location, and site-specific conditions:

Foundation and Civil Works:

- 18-meter dish antenna station foundation (customized per location using the NRAO reference design; all geotechnical surveys and engineering are Contractor-furnished)
- Site grading, drainage, and earthwork
- Concrete pad(s) for electronics enclosures and ancillary equipment

Enclosures and Facilities:

- Electronics enclosures and data center shelters
- Operations and Maintenance (O&M) facilities (as applicable per station type)
- Ancillary infrastructure (weather monitoring station mounts, GNSS antenna mounts, etc.)

Access and Security:

- Access roads (construction-phase and permanent operational access)
- Security fencing and access control

Electrical Systems:

- Electrical service interconnection from utility provider or independent power source
- On-site electrical distribution
- Backup power generation (as required by station type)
- Grounding system (ground ring) designed for site-specific soil resistance conditions
- Lightning protection

Communications / Fiber:

- Fiber optic interconnections and distribution (ISP fiber or private fiber backbone, as applicable)
- Underground conduit infrastructure for fiber and electrical routing

Site Utilities:

- Underground utility conduits for all services
- Water and sewage (as required by station type and location)
- Stormwater management and environmental mitigation measures

3. Scope of Work

The Contractor shall provide all personnel, management, supervision, materials, equipment, and services necessary to perform the work described herein in support of the ngVLA Antenna Station Infrastructure project. Work shall be performed at NRAO-designated locations primarily across the United States (CONUS and OCONUS), as identified in individual Task Orders.

3.1 Task 1 – Preliminary Design Services

The Contractor shall conduct all necessary field surveys and investigations and gather site information required to develop a Preliminary Design (approximately 30% design completion) that meets project requirements and is suitable for obtaining necessary regulatory approvals.

Surveys and Investigations (Contractor-Furnished):

- a. Site property and boundary survey
- b. Topographic survey
- c. Geotechnical soil investigation and report (for civil engineering foundation design)
- d. Soil resistivity survey (for grounding and lightning protection design)
- e. Utility identification and location survey (above and below grade)
- f. Environmental site assessment (Phase I ESA; Phase II if warranted)
- g. Cultural/archaeological survey (as required by applicable regulations)
- h. Wetlands delineation and jurisdictional determination (as applicable)

Preliminary Design Deliverables:

- i. 30% Design drawings and specifications for all infrastructure elements
- j. Preliminary foundation design based on geotechnical findings and NRAO antenna reference design
- k. Preliminary electrical one-line diagram and site plan
- l. Preliminary fiber/communications routing plan
- m. Preliminary cost estimate
- n. Permit identification matrix (identifying all required local, state, federal permits)
- o. Preliminary project schedule

The Contractor shall coordinate with NRAO and key stakeholders and incorporate review comments as needed until NRAO grants approval to proceed to Final Design.

3.2 Task 2 – Final Design Services

The Contractor shall develop Final Construction Documents (100% design) adequate for construction bids or construction commencement. All applicable codes and standards shall be applied. A licensed Professional Engineer (PE) registered in the state of construction shall stamp all applicable drawings and specifications.

Final Design Deliverables:

- p. 100% Construction Drawings (Civil, Structural, Electrical, Grounding, Communications, Site)
- q. Project Specifications (CSI format)
- r. Stamped and signed structural calculations for antenna foundation and all structures
- s. Final cost estimate (AACE Class 2 or equivalent)
- t. Final project schedule
- u. Permit applications and supporting documentation for all required permits
- v. Construction Quality Control Plan outline

- w. Coordination interface document with the antenna installation contractor

3.3 Task 3 – Construction Services

The Contractor shall mobilize and construct all station infrastructure in accordance with NRAO-approved construction documents. Construction activities include, but are not limited to:

- Site preparation, clearing, grubbing, and grading
- Geotechnical verification testing during construction (as directed by the Geotechnical Engineer of Record)
- Antenna station foundation construction (including excavation, reinforcing steel, concrete placement, anchor bolt installation, and backfill)
- Installation of underground conduit systems for electrical, fiber, and grounding
- Ground ring installation and testing
- Electrical service interconnection and on-site distribution
- Backup power generator installation (as applicable)
- Electronics enclosure and shelter installation
- O&M facility construction (as applicable)
- Access road construction or improvement
- Security fencing installation
- Fiber/communications interconnection and termination
- Ancillary infrastructure installation (weather station mounts, GNSS mounts, etc.)
- Environmental mitigation implementation (erosion/sediment controls, stormwater BMPs, restoration)
- Coordination with the antenna installation contractor for interface alignment and dimensional verification
- Commissioning and testing of all installed systems
- Site cleanup, final grading, and restoration

3.4 Project Management Services

Throughout all tasks, the Contractor shall provide comprehensive project management including:

- Integrated Project Management Schedule with Earned Value reporting (Primavera P6 or equivalent)
- Cost estimating and cost control for all infrastructure scopes
- Design review coordination and documentation
- Subcontractor and vendor management
- Quality Control oversight for all design and construction activities
- Monthly progress reporting to NRAO
- Risk identification, tracking, and mitigation management

4. Deliverables and Reporting

The Contractor shall provide the deliverables listed in Table 1 in accordance with the specified formats and due dates. Specific due dates will be established in each individual Task Order.

Table 1 – Project Deliverables

Deliverable / Reporting Requirement	Format / Due Date
Site Survey Reports (property, topo, geotechnical, soil resistivity)	PDF + native files; Per Task 1 schedule
Environmental Assessments (Phase I/II ESA, wetlands, cultural)	PDF; Per Task 1 schedule
Preliminary Design Package (30% drawings, specs, cost estimate)	PDF + CAD/BIM; Per Task 1 schedule; NRAO review required
Permit Identification Matrix	PDF; With Preliminary Design Package
Final Construction Documents (100% drawings, specs, calculations)	PDF + CAD/BIM; Per Task 2 schedule; PE-stamped
Final Cost Estimate (AACE Class 2)	PDF + MS Excel; With Final Design Package
Permit Applications and Supporting Documentation	As required; Per permit agency deadlines
Construction Quality Control Plan (CQCP)	PDF; Prior to construction NTP
Health and Safety Plan (HSP)	PDF; Prior to construction NTP
Preliminary Integrated Master Schedule (IMS)	P6 + PDF; Within 15 calendar days of Task Order award
Initial Integrated Master Schedule (IMS)	P6 + PDF; Within 42 calendar days of Task Order award
Monthly Progress Report (including IMS update and cost report)	Monthly; PDF + P6 + MS Excel
Earned Value Management Report	Monthly; PDF + MS Excel
Daily Construction Reports	Daily during active construction; PDF; CMIS portal
Construction Progress Meeting Agenda	Weekly during construction; 3 days prior to meeting; PDF

Deliverable / Reporting Requirement	Format / Due Date
Construction Progress Meeting Minutes	Weekly during construction; within 2 days after meeting; PDF
Kick-Off Meeting	Within 7 calendar days of Task Order award
Design Review Meeting(s)	30%, 60%, 90%, 100% design milestones; as required
Construction Submittals (materials, shop drawings, etc.)	Per submittal register; PDF; Prior to material procurement
Geotechnical Verification Reports (during construction)	PDF; As required during construction
Antenna Foundation Interface Verification Report	PDF; Prior to antenna installation contractor handoff
Photo Documentation (pre-construction, during, post-construction)	JPEG (min. 5 MP); Maintain on CMIS portal
Environmental Compliance and Waste Disposal Documentation	PDF; As required; Prior to final payment
Pre-Final Punch-Out Inspection Report	PDF; Upon substantial completion
Final Inspection Report and Certificate of Completion	PDF; Upon final acceptance
As-Built / Record Drawings	PDF + CAD/BIM; Prior to final payment
O&M Manuals and Warranty Documentation	PDF; Prior to final payment
Critical Issue / Mishap Notification	Within 1 hour; Telephone + Email to NRAO CO/COR

5. Period and Place of Performance

The anticipated Period of Performance (POP) will be established at the individual Task Order level based on the specific scope, station type, and location. Initial Task Orders are anticipated to cover the first cohort of Remote Long Baseline station locations (approximately 12 sites).

Place of performance includes NRAO-designated field sites (CONUS and OCONUS) and remote/telework as authorized. Long Baseline sites may require OCONUS-specific regulatory compliance and logistics planning. NRAO will provide initial location assessments; all survey and geotechnical investigations are Contractor-furnished.

6. Government-Furnished and Contractor-Furnished Items

6.1 Government-Furnished Information (GFI)

NRAO/AUI will provide the following to the Contractor:

- Initial location coordinates and conceptual site assessments for each station
- 18-meter antenna foundation reference design (document TBD — to be issued with solicitation)
- Antenna interface document defining foundation-to-antenna interface requirements (document TBD)
- ngVLA project standards and design criteria documents
- Antenna installation contractor interface requirements and schedule (as available)
- NRAO project oversight and technical review

6.2 Contractor-Furnished Resources

The Contractor shall provide all other resources necessary to perform the work, including:

- All personnel, labor, management, supervision, and subcontractors
- All materials, equipment, tools, and consumables
- All surveys, geotechnical investigations, and engineering studies listed in Section 3
- All permitting, licensing, and regulatory compliance activities
- All transportation, mobilization, and logistics
- Professional Engineer(s) licensed in all applicable states/jurisdictions
- Project management software and collaboration tools (Primavera P6 or equivalent)

7. Applicable Standards and Constraints

The Contractor shall perform all work in accordance with applicable federal, state, and local laws, regulations, codes, and standards. Applicable standards include, but are not limited to:

7.1 Federal and Safety Standards

- OSHA 29 CFR 1926 – Construction Industry Safety Standards
- U.S. Army Corps of Engineers Safety and Health Requirements Manual, EM 385-1-1
- NFPA 70 – National Electrical Code (NEC)
- NFPA 780 – Standard for the Installation of Lightning Protection Systems
- IEEE 80 – Guide for Safety in AC Substation Grounding (as applicable to grounding design)
- ASCE 7 – Minimum Design Loads for Buildings and Other Structures
- ACI 318 – Building Code Requirements for Structural Concrete (for foundations)
- AISC Steel Construction Manual (for structural steel elements)

7.2 Environmental Regulations

- National Environmental Policy Act (NEPA) – coordination with NRAO on compliance
- Clean Water Act Section 404 (U.S. Army Corps of Engineers permits, as applicable)
- Endangered Species Act (ESA) Section 7 consultations (as applicable)
- National Historic Preservation Act (NHPA) Section 106 coordination (as applicable)
- State environmental regulations applicable to each station location
- EPA Stormwater Permit (NPDES General Construction Permit) where applicable

7.3 NRAO-Specific Standards

- NRAO ngVLA Technical Requirements Documents (to be provided with solicitation)
- NRAO 18-meter Antenna Foundation Reference Design (document TBD)
- NRAO Antenna Interface Document (document TBD)
- National Radio Quiet Zone (NRQZ) requirements for any stations near Green Bank, WV or Sugar Grove, WV
- NRAO construction quality standards and inspection requirements

7.4 Telecommunications and Electrical

- BICSI standards for fiber optic infrastructure installation
- IEEE/ANSI standards for electrical equipment and grounding
- Local utility provider interconnection requirements (applicable to each site)

8. Key Personnel Requirements

The following key personnel are anticipated to be required for task orders under this effort. Specific qualifications will be defined at the Task Order level:

- Project Manager: Minimum 10 years' experience in engineering/construction project management; experience with radio telescope, large-scale scientific infrastructure, or antenna/tower construction preferred.
- Lead Civil/Structural Engineer (PE): Licensed Professional Engineer; experience with specialty foundation design for precision structures; geotechnical evaluation experience required.
- Electrical Engineer (PE): Licensed Professional Engineer; experience with remote site power systems, grounding design, and fiber/communications infrastructure.
- Site Superintendent: Minimum 7 years' field construction experience; experience with remote or austere site construction required.
- Site Safety and Health Officer (SSHO): Current OSHA 30-hour Construction certification; EM 385-1-1 awareness training.
- Contractor Quality Control (CQC) Manager: Minimum 5 years' QC experience; CQC certification per USACE requirements.
- Scheduler: Minimum 5 years' scheduling experience including 2 years with Primavera P6.