Task 1 – Establish Project Setup and Technical Basis

This stage will establish the project goals and objectives across the project team, by defining the requirements of the project, the data and the TOT-CLIC functionality.

It is envisaged that this is the most crucial part of the project. Clear definition of these items is required to ensure that the project outcomes, and sufficient future-proofing of TOT-CLIC, can be achieved. Therefore, focussed review and coordination between Arup and CERN of these requirements at this early stage will be required. In summary this will comprise parallel tasks:

Task 1A – Datasets Review

- Existing data exists from the FCC-TOT project. Tasks comprise:
    - Collation of baseline of existing data
    - Review and identify current and required granularity of data
    - Identification of potential available required datasets
    - Assess compatibility of data types and granularity with the required level of detail of the CLIC project requirements

Task 1B – CLIC Requirements Review

- Review and identify requirements and any engineering calculations required relating to modelling of:
    - Physics requirements
    - Engineering requirements: geotechnical, tunnelling
    - Geodetic requirements: coordinate system, laser straight requirements
    - Functional requirements: adjusting alignment depth and shaft locations, movement of IR, and movement of surface buildings to be relative to IR.
    - Output requirements: charts, data export requirements

Task 1C – TOT-CLIC User Review

- Review and identify end users.
    - Define the roles of end users
    - Identify how these roles will use TOT-CLIC and what problem they are trying to address

Task 1D – TOT-CLIC Application Development

- Review and identify system requirements e.g. hosting, mapping licences; application security, user and data management, model visualisation.
- Establish any application constraints based on the system requirements.
- Assess compatibility with a revised CLIC-TOT programme-interface.

Requirements for all Task 1 activities shall aim to be in line with the data and functionality requirements in Section 4.2 and 4.3 of CERN's TOT-CLIC Specification. This shall include movement of shaft locations. Full compatibility of individual functionality will be dependent on level of data integrity and the requirement of achieving a robust functional performance for the end-user of the CLIC-TOT.

Deliverable:

Technical note / presentation slides clarifying current stage of the CLIC-TOT development basis, client requirements, the data reviewed.

Task 2 – Data and Functionality Prioritisation

A combined review and agreement on Task 1 outcomes is required to identify limitations and opportunities of data and the level of data integrity required to allow overall project aims to be achieved.

This task shall identify limitations/opportunities of data and what level of data integrity is required to allow overall project aims to be achieved. The task shall include:

- MoSCoW type review and agreement of data with CERN (Must, Should, Could, Won't Haves)
- Define level of detail of existing data and level of detail required, e.g.:
    - Geometry, e.g. fault lines
    - Geometry + attribute, e.g. Geothermal Drillings
    - Geometry + attribute + for analysis e.g. Geological Boundaries
- Agree how data matches requirements and extent to which functionality will be integrated and new data gained.

The overall aim is to prioritise and reach agreement on the level of detail of data and functionality that is possible to be included within the TOT-CLIC to deliver a minimum viable product

Deliverable:

Technical note / presentation slides identifying MoSCoW type matrix agreement and steps required for implementation of these requirements into TOT-CLIC.

Task 3 – Specifications and TOT-CLIC Wireframing (Concept Stage)

This stage will define and specify data requirements to external contractors. In parallel with this, wireframing of the TOT-CLIC user interface and architecting of the entire application shall commence.

Task 3A - Specifications

- Specify required data and data type in order to achieve appropriate extent and level of detail of data, as agreed upon in above stages. Specification of data type, level of detail, and format to external providers e.g. GADZ, SITG, BRGM.
    - This is a technical specification. Managing the interface, ensuring licences for data is CERN's responsibility.
    - Data will be requested in industry type formats and Level of details to be as compatible as reasonably possible for input directly into TOT-CLIC.
    - It is expected that new data will need to be integrated with existing FCC-TOT data, which lies outside of FCC-TOT boundaries, or where improved maturity of data is available.
    - A limited amount of time has been set aside for data processing and to ensure integration of datasets e.g. stitching of data boundaries, Processing of required data to ensure integrity of overlap.
- Upon receipt of the specified data by the contractor, Arup will verify the compliance of the data with the specification and identify to CERN if any further re-processing or work is needed by the contractor to ensure validity of the data.

Checking of the validity of any further iterations required of the contractor is included in the cost of this task.

- Deliverable: Data Specifications Document. As the details of the document relies on finalisation of Stage 2, aspects of this may need to be started in Stage 2 in order to minimise the gap in time between data specification, the contractor's data collation and processing, Arup's verification of the compliance of this data, and any re-iteration of the data back between Arup and the contractor.

Task 3B – TOT-CLIC Development (Concept Stage)

- At this stage a system architecture of the entire application will be defined. Wireframes of the TOT-CLIC functional layout and general user interface will be worked up and agreed with CERN along with the system architecture.
- Following this, the project team will have reached agreement on data and functionality and interface concept. Programming and coding development shall commence at this stage.

Deliverable:

Data specification documents
TOT-CLIC system architecture outline and wireframes

Task 4 – Data Integration and TOT-CLIC (beta) development

- TOT-CLIC application development
- Integration of the specified and verified data from Stage 3 into TOT-CLIC.
- Integration of functionality into TOT-CLIC
- Throughout this stage, frequent updating and dialogue with CERN will be required to ensure that any changes / updates from original requirements can be converged appropriately with CERN and that these are captured and agreed upon as required.

Deliverable:

TOT-CLIC (beta application) i.e. the dashboard application with functional requirements and usability integrated but with limitations on use. The intent is to provide an application at this stage which demonstrates progress and direction, from which comments from CERN can be taken on board and integrated as appropriate.

Task 5 – Finalised TOT-CLIC Development

The final CLIC-TOT application shall be delivered at this stage with full functionality.

Deliverable:

Final TOT-CLIC application for use by CERN's project team.
User guidance manual

Task 6 – Troubleshooting and Technical Support

Following handover of TOT-CLIC to CERN, there may be unforeseen functional and usability issues that arise during the course of normal use of TOT-CLIC, due to the bespoke nature of the platform development. It is not anticipated that this will be significant; nevertheless, we have set aside a task to provide troubleshooting and technical support to fix minor issues as they arise. This task relates to bug fixes to the delivered application code and does not include changes to functionality. The required time and budget required to resolve such issues through patching of the underlying code is hard to predict. For planning purposes, a two-week turnaround between identification of an issue, agreement of a resolution and update of TOT-CLIC is anticipated in standard cases. A nominal amount, equal to 3 days of technical programming support has been set aside to cover such eventualities. If this is not required, the fee for this task shall not be charged.