PA/02825/25: TO DEMOLISH AN EXISTING CONSTRUCTION YARD AND BUILT STRUCTURES, PROPOSED OVERSITE EXCAVATION TO ACCOMMODATE THE CONSTRUCTION OF A COMMERCIAL CAR PARK, SUPERMARKET, A MIXED USE OUTLET VILLAGE (CONSISTING OF CLASS 2A MEDICAL, CLASS 3C SPORT CENTRE, CLASS 4A OFFICES, CLASS 4B RETAIL, CLASS 4C COFFEE SHOPS, CLASS 4D RESTAURANTS, BANK) AND THREE-STARS HOTEL HAVING 120 ROOMS. SITE AT ELBROS CONCRETE LTD, TRIQ L-INDUSTRIJA C/W, TRIQ IL-MADONNA TAD-DAWL, KIRKOP

ENVIRONMENTAL IMPACT ASSESSMENT REPORT

VOLUME 2: TECHNICAL APPENDICES

Version 1: August 2026

Report Reference:

Adi Associates Environmental Consultants Ltd, 2026. Proposed Commercial Complex, Triq l-Industrija, Kirkop (PA/02825/25). Environmental Impact Assessment Report – Volume 2: Technical Appendices. San Gwann, August 2026.

THIS IS A DIGITAL COPY OF THE REPORT.

RESPECT THE ENVIRONMENT – KEEP IT DIGITAL

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PA 02825/25

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Technical Appendix I

TERMS OF REFERENCE AND METHOD STATEMENTS

Supporting Documents for

Environmental Impact Assessment Report

TERMS OF REFERENCE

FOR THE PREPARATION OF AN

ENVIRONMENTAL IMPACT ASSESSMENT

PA/02825/25 (EA/00013/25)

To demolish an existing construction yard and built structures, proposed oversite excavation to accommodate the construction of a commercial car park, supermarket, a mixed use outlet village (consisting of class 2A medical, class 3C sport centre, class 4A offices, class 4B retail, class 4C coffee shops, class 4D restaurants, bank) and three-stars Hotel having 120 rooms.

Site at Elbros Concrete Ltd., Triq l-Industrija c/w, Triq il-Madonna Tad-Dawl, Kirkop

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24/11/2025

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Note 1: The Environment and Resources Authority (ERA) reserves the right to modify these Terms of Reference according to any relevant environmental and planning considerations that may emerge at any relevant stage of the EIA or the permit application process, as well as in the event of any changes or updates to the proposed development. ERA also reserves the right to request additional or amended studies should the findings of the EIA be insufficient to adequately inform the decision-making process or if the EIA identifies matters which should be subject to further investigation.

Note 2: Unless otherwise agreed with ERA, all requirements set out in these Terms of Reference are to be complied with. If there are any aspects that the consultants deem irrelevant to this study, or if at any stage the consultants discover any environmentally-relevant aspect (not included in these TORs) that needs to be studied, the consultants shall inform ERA immediately, justifying their reasoning.

Note 3: Difficulties, including technical difficulties and lack of information, encountered by the consultants in compiling the required information shall be made clear in the EIA. All references to published works and sources of information shall be duly acknowledged in a manner that enables tracing of the information source and verification. No material may be incorporated by reference unless it is reasonably available for inspection by potentially interested persons within the consultation period and thereafter, and for record-keeping and unhindered perusal by ERA. Any material which is based on unavailable proprietary data shall not be incorporated by reference.

Note 4: Any requirement for confidentiality of any section or detail of the EIA must be strongly justified and a formal request in this regard must be submitted to ERA. Should ERA grant confidentiality, alternative material that is still adequate for proper assessment, public consultation and decision-making must be provided.

Note 5: Agreement on method statements, and ancillary liaison with ERA, is not mandatory but is recommended. Nevertheless, ERA reserves the right to disagree with the methodology proposed, including proposed areas of influence, and with the EIA submissions in general, and to factor such disagreement in its critique of the EIA.

Note 6: During review of the EIA, ERA will submit comments for the consultants' consideration, as relevant. Following the consultants' response to ERA satisfaction, a revised version of the EIA, addressing the comments, will normally be required. This may take the form of a complete resubmission or of an Addendum detailing the revisions to the previous submissions, as deemed most expedient by ERA, taking into account continuity and traceability of the information, and overall user-friendliness vis-à-vis subsequent review, presentation, public consultation, record-keeping and decision-making. A complete resubmission will generally be required if changes are numerous or complex, whereas an Addendum may be preferred if changes are more limited.

Note 7: The consultants are not exonerated from obtaining any formal authorisation from ERA, and from other relevant entities, vis-à-vis any activity ancillary to the EIA (*e.g.* collection, sampling, capture, or waiver of access restrictions) wherever such authorisation is legally required.

Note 8: These Terms of Reference, and all ancillary correspondence, are issued without prejudice to ERA's position on the project. Accordingly, their issuing (even when customised to address specific project details) should not be construed as evidence in favour or against the project or any component thereof, unless the contrary is clearly stated.

Note 9: Wherever relevant, references to land also include the sea, and ancillary terms such as land-take, ground cover, landscape, vehicles, access roads, etc. should be interpreted accordingly.

Note 10: Wherever any baseline studies required by these Terms of Reference is covered by already-existing data, such data should be used in preference to unnecessary duplication of baseline studies, unless the consultants or ERA or both are of the opinion that the existing data is unavailable, incorrect, outdated, unreliable, insufficient, or otherwise inadequate for the purpose of the EIA.

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An Environmental Impact Assessment (EIA) Report is to be prepared as required by the Schedule I, Category II, Sections 7.1.2.1 and 9.0.2.3 of the Environmental Impact Assessment Regulations (S.L. 549.46).
The required components of the EIA are:

i. A **Coordinated Assessment Report**, in conformity with the following Sections of these Terms of Reference. This report should assess the project in its totality;
*[**Note:** The coordinated assessment should seek to analyse and integrate the main considerations emerging from the technical reports, rather than just reproducing excerpts from the reports.]*

ii. A separate **Appendix (or Appendices)** containing all technical studies and original survey reports as prepared by the individual specialist consultants for specific topics;
*[**Note:** Experts contributing to the EIA should be specifically asked to consider impact interactions and cross-cutting issues, and to communicate information between each other accordingly].*

iii. A separate **Non-Technical Summary** of the EIA, in both the Maltese and English languages. This should have enough details for the public to understand the project and the related environmental considerations, and should be written in reader-friendly language (*e.g.* avoiding unnecessary technical jargon);

iv. A **declaration of conformity** with regards to conflict of interest, in accordance with sub-regulations 17(3) of the EIA Regulations (refer to Appendix 1 to these Terms of Reference); and

v. An addendum detailing the **feedback received from stakeholders, from the public, and from ERA** during the relevant consultation stages of the EIA, and how they were addressed.

Wherever relevant and appropriate, all components of the EIA should include tables and figures (*e.g.* maps, plans, photographs, photomontages, charts, graphs, diagrams, cross-sections) and quantifications**.**

The complete EIA Report (including all the above components) should be submitted as a printable digital copy (in .pdf format, with copying fully enabled throughout) and as a printed copy. Likewise, in case further revisions are to be made to the EIA Report, both a printable digital copy (in .pdf format, with copying enabled throughout) and a printed copy of the revised EIA Report, or an Addendum, is to be submitted to ERA.

Any other assessments, including Appropriate Assessment [as required by the Flora, Fauna and Natural Habitats Regulations (S.L. 549.44)] are to be submitted separately from the EIA. Cross-referencing between the EIA and any such assessment should be clear and reasonably limited, such that both of the following considerations are duly satisfied:

1. Alerting the reader to the fact that the aspect in question is also being addressed in another parallel assessment; and
2. Enabling the reader to easily follow both the EIA and the other assessments as stand-alone documents.

Any other technical studies/ reports which are of direct environmental relevance to the project or are cross-referred to in the EIA report, should be submitted together with the EIA, and made available to the public. Should these documents not be made available upon submission of the EIA report, ERA reserves the right to re-open the public consultation for an additional 30-days, over and above the timeframe stipulated in Regulation 19(1), as deemed fit.

More detailed specifications are identified in the following pages.

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1.0 DESCRIPTION OF THE PROPOSED DEVELOPMENT AND ITS CONTEXT

The description of the proposal is to include the aspects outlined below, and should take into account the entire proposal and any ancillary facilities and infrastructure connected with, or arising due to, the project.

1.1 Justification for the Proposal

1.1.1 Objectives

The purpose and objectives of the development and whether these are related to current legal obligations, policies or plans.

1.1.2 Demand

The current and expected requirement or demand for the proposed land uses, also explaining how the proposal will address the requirement/demand.

1.2 Description of the Physical Characteristics of the Whole Project and the Land Use Requirements during the Construction, Operational and Decommissioning Phases

The following aspects should be addressed for all phases of the project, clearly distinguishing between aspects relating to construction phase, operational phase, decommissioning phase, or more than one phase. References to the construction phase and decommissioning phase also include ancillary site preparation, clearing, excavation, demolition/dismantling, and site reinstatement works, as relevant.

1.2.1 General characteristics

Description of the proposed development including size, area, height, volume, configuration/layout, general design, location and proposed elevations of buildings/structures/installations, hard and soft landscaping, access arrangements, boundary demarcation arrangements, land use requirements, and land take of ancillary facilities (including infrastructure, storage, servicing, security etc.). The description is to be consistent with the details submitted in the relevant permit applications, throughout both the EIA process and the development permission application process.

1.2.2 Construction, Operational and production processes

The relevant construction, operational and production processes and their main characteristics, including:

- The nature and quantity of materials used or generated;
- The source, type, quantity, composition and concentration of residues and emissions including water, air, soil pollution, noise (including impulsive underwater noise), vibration, light, heat, radiation etc. resulting from the proposed project; the parameters to be reported should be in line with relevant EU policy; and
- The expected annual and total emissions, including Greenhouse Gases (GHG), and the contribution to total national GHG emission on an annual basis.

1.2.3 Project management

An indicative framework outlining the key parameters and site management arrangements during construction, operation and decommissioning phases, including:

- Works methodology, including any mineral processing plants such as batching plants within the construction site;
- Expected duration of all phases, as well as season, frequency and duration of interventions;
- Depths and volumes of excavation, and type of material to be excavated; and
- Types and quantities of raw materials and primary resources to be consumed, including water, energy, stone and other resources, and measures to reduce such consumption.

1.2.4 Access, transportation and related infrastructure

1. A forecast of the type, quantity and size of vehicles (and/or vessels) envisaged during each phase and their respective frequency of use, as well as an identification of the routes that vehicles will use to/from and within the site. The required arrangements should also be compared with the relevant existing situation (in

terms of structural considerations, stability and state of roads, road width and gradient, turning circles and junctions, type of surfacing, and other physical or environmental constraints, etc). Interventions that would need to be carried out to accommodate the required vehicles (*e.g.* new or altered access roads), and sites/buildings/structures/features likely to be affected as a result, should be identified accordingly.

2. Facilities for the storage, parking, on-site servicing, loading/unloading of equipment, vehicles and other machinery.

1.2.5 Water, sewerage, runoff management, energy, telecommunications, and ancillary infrastructure

1. Estimates of water management specifications of the development and the identification of the sources of water to be used, including the following:
   - The features and processes of the proposed development and its ancillary facilities which consume water, including estimates of water consumption and runoff/effluent generation during operation;
   - The sources of water (*e.g.* second-class water, public potable water mains, on-site production) envisaged to meet the projected demand;
   - The water-saving measures, where applicable, that are envisaged (*e.g.* use of low-flow fittings, reuse of harvested storm water runoff and rainwater, treatment and reuse of grey water/sewage), and details as to how such water will be used/managed; and
   - The facilities and structures to be installed in connection with the above (*e.g.* water production, purification, collection, storage, distribution and saving) including estimates of the sizing of pipelines, reservoirs and equipment.

2. Estimates of the energy-related specifications, including:
   - The features and processes of the proposed development and its ancillary facilities which consume energy, including estimates of consumption during operation. The analysis should consider, as relevant, the connected load (in MW or MVA), the overall power factor, the annual MWh split in terms of end-use (lighting, climate cooling/heating/ventilation, plant etc.) which reflects the expected use of the facilities;
   - The energy sources envisaged to meet the projected demand;
   - The facilities and structures to be installed in connection with the above (*e.g.* energy production, storage, distribution and saving) including estimates of the sizing of cables, buildings and equipment; and
   - The expected energy performance of the proposal, including building orientation, natural ventilation, construction materials, integration of low/zero-carbon technologies to meet energy needs; avoidance of features which increase energy consumption; and energy efficiency measures in the finishing and operation of the development.

3. Infrastructural services and utilities related to water and power supplies, sewerage, telecommunications and runoff management, and ancillary works (*e.g.* trenches, tunnels, culverts, switching/transformer stations, pump houses, inspection chambers).

4. The extent to which the project can realistically be self-sufficient with regard to its energy and water needs, through appropriate measures such as the efficient use of energy and water, collection of rain and storm water for reuse, reuse of treated wastewater/sewage, technologies that reduce energy consumption, and the integration of alternative energy sources. Alternatives in terms of design, fabric and orientation of the buildings should also be explored and assessed.

1.2.6 Waste management

1. A sufficiently detailed indication of the waste management implications likely to arise from the project, including wastes generated by ancillary facilities and wastes which may arise from accidental spillages and leakages and from repair works. Wastes should be subdivided according to the relevant project phases.

2. The following information is to be provided for each waste stream, as relevant to each phase:
   - Identification of processes or activities that would result in waste generation;
   - European Waste Catalogue Codes for each waste stream, as per relevant legislation;
   - The projected quantities and rate of generation for each type of waste;
   - Information on waste handling and storage, on site as well as off site;
   - The method of transportation and frequency; and
   - The method of characterizing the chemical composition of dredged waste; where applicable.

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This information should be presented in table format as follows, and should also include cross-references to the relevant regulations, particularly The Waste Regulations (S.L. 549.63):

Phase	Type of waste	EWC Code	H-Code	Activity (*e.g.* sanding, scraping, power washing etc.)	Estimated quantities	Final permitted disposal location

3. The envisaged waste management arrangements using the Best Practicable Environmental Options (BPEO) available, and the envisaged efforts to minimise waste generation and to divert waste to reuse or recycling rather than disposal.
4. Layout plans (to scale) clearly showing all relevant waste management infrastructure and related facilities (*e.g.* bunded areas for storage of waste fuels, wheel-wash facilities, etc.), clearly distinguishing between temporary and permanent structures for each phase.

1.2.7 Longer-term developments

Additional future developments, land uses and other commitments that are ancillary or consequent to the project or are likely to arise in relation to the same project or its expansion, as well as longer-term needs of the proposal, including: ancillary infrastructure not accounted for in the previous sections; any consequent interventions/arrangements required to accommodate the development; any foreseeable extensions or updates to the proposal; any displacement of existing uses; and decommissioning.

2.0 ASSESSMENT OF ALTERNATIVES

An outline of the main alternatives studied and an indication of the main reasons for this choice, taking into account the relevant environmental effects and their prevention (or optimisation) at source. The following alternatives need to be duly considered, as relevant to the development itself (or to one or more phases thereof) and its requirements and constraints:

2.1 Alternative sites

2.2 Alternative technologies

2.3 Alternative layouts (including building heights, where relevant)

2.4 Downscaling of the project, or elimination of project components

2.5 Zero option (do-nothing scenario) - *i.e.* an assessment of the way the site would develop in the absence of the proposed project.
*[**Note:** The zero option should be considered in sufficient detail as a plausible scenario in the EIA, wherever relevant, and not discarded upfront without proper discussion of its implications.]*

2.6 Hybrids/combinations of the above

The findings of the assessment of alternatives should be summarised in a table format for ease of comparison.

3.0 A DESCRIPTION OF THE SITE AND ITS SURROUNDINGS (*I.E.* ENVIRONMENTAL BASELINE)

The existing environmental features, characteristics and conditions, in and around the proposed development site as well as in all locations likely to be affected by the development or by ancillary interventions and operations, are to be identified and described in sufficient detail, with particular attention to the aspects elaborated further in the next sections.

The consultants should also identify (and justify) wherever relevant:
1. The geographic area (*e.g.* viewshed or other area of influence) that needs to be covered by each study;

2. The relevant sensitive receptors vis-à-vis the environmental parameter under consideration (*e.g.* residential communities, other users, natural ecosystems, specific populations of particular species, or individual physical features);
3. The location of the reference points or stations (*e.g.* viewpoints, monitoring stations, or sampling points (including depth of multiple sampling points at a single sampling point in the case of water media and sediment, where applicable) to be used in the study; and
4. Other methodological parameters of relevance, also noting that the assessment will normally require both desk-top studies and on-site investigations (including visual observations and sampling, as relevant).

Note: *It is recommended that these details are discussed in advance with the ERA prior to commencement of the relevant parts of the studies, in order to pre-empt (as much as possible) later-stage issues.*

Wherever relevant to the environmental aspects under discussion, reference to legislation, policies, plans (including programmes and strategies) standards and targets, should also be made, such that the compatibility (or otherwise) of the proposal therewith is also factored into the assessment required by ***Section 4*** below. The discussion should cover the following aspects, in the appropriate level of detail:

- Supra-national (*e.g.* European Union; United Nations; or other international or regional) legislation, directives, policies, conventions, protocols, treaties, charters, plans and obligations;
- National legislation, policies and plans (*e.g.* Structure Plan; National Environment Policy); and
- Sub-national legislation, policies and plans (*e.g.* local plans, site-specific regulations, action plans, management plans, and protective designations such as scheduling or Natura 2000).

Note: *In addition to already in-force legislation, policies and plans, the discussion should also cover any foreseeable future updates (or new legislation, policies and plans) likely to be fulfilled, affected or compromised by the proposed project. Furthermore, it should be noted that some cross-cutting legal/policy instruments (e.g. Water Framework Directive and Marine Strategy Framework Directive) may need to be factored into more than one aspect of the discussion.*

3.1 Land Cover and Uses

A description of the land cover and land uses within the area of influence of the project, including roads, footpaths and public access routes. Details including nature, magnitude, proximity to site, etc. should be included.

3.2 Landscape Character and Visual Amenity

3.2.1 Landscape Character

The study should describe the landscape-related area of influence and landscape setting of the proposed site, identifying the component character areas and local landscape tracts, and the landscape elements, characteristics and degree of sensitivity thereof, so as to enable the prediction and assessment of:

- The changes to the landscape attributable (in full or in part) to the proposed development;
- The implications of such changes on the quality and perception of the landscape and its elements, in each of the identified landscape character areas and local landscape tracts; and
- The effects of such changes on relevant receptors (the receptors should also be duly identified and their degree of sensitivity should also be indicated and justified).

Reference should also be made to the '*Draft Landscape Assessment Study, 2004,*' and to the *Guidelines for Landscape and Visual Impact Assessment* (*The Landscape Institute* & *IEMA*), as relevant.

3.2.2 Visual Amenity

The following need to be identified and submitted for prior ERA approval:

- The Zone of Theoretical Visibility (ZTV; also known as Zone of Visual Influence) of the site and the development under consideration; and
- Assessment viewpoints representative of short-, medium- and long-distance views towards the site. A baseline photograph taken from each proposed viewpoint is also required. The submission should cover all the important views of the site, whilst avoiding the inclusion of superfluous or inappropriate viewpoints (*e.g.* positions from which the site is not visible, or where the view is obstructed or dominated by physical obstacles in the foreground).

Thereafter, for each approved viewpoint, the projected situation and appearance of the site (*i.e.* as it would look with the proposed development in place) should be compared to the current baseline situation (*i.e.* without the proposed development). The following should be predicted and assessed accordingly:

- The expected changes to visual amenity as a result of the proposed development;
- The effects of such changes on the quality of the visual amenity of the site; and
- The effects of such changes on relevant receptors. (The receptors should also be duly identified and their degree of sensitivity should also be indicated and justified).

Note: *The baseline photographs and the photomontages should, unless otherwise directed by ERA, satisfy the following:*

(a) The location of each viewpoint should be shown on a map that also depicts the viewshed for the proposed site as described above. The visual angle of the photograph should also be indicated and should not be greater than 50°. Stitched photos that illustrate the field of vision towards the site from each viewpoint are acceptable as long as they are additional to the 50-degree photograph.

(b) The photographs and photomontages submitted should:
- *Be at least A3 in size. Strips which are A3 in width but not in length are not appropriate except as supplementary illustrative material;*
- *Include the date and time at which the photo was taken;*
- *Be of good quality, with faithful reproduction approximating as much as reasonably possible what would normally be visible to the naked eye. The photos should be taken in good weather, and should be taken at least 2 hours after sunrise and 2 hours before sunset. Colours should not be digitally or otherwise manipulated. As a guideline, the image should have a printing density of 200 dots per inch or better. In some instances, digital images having a resolution of 1024 x 728 or better may be required for multimedia presentation purposes;*
- *Be taken in such a manner that near-field objects do not overpower or dominate features near the image plane passing through the project area;*
- *Be taken from a height above ground level that is representative of the eye level of the viewer, and such height should be duly documented; and*
- *Ensure that all additional/replacement structures and features depicted in the photomontages have a scale which proportionately tallies with the existing nearby features.*

(c) Wherever relevant, the photomontage(s) should cover the following scenarios:
- *The development without the proposed landscaping scheme, representing the worst-case scenario;*
- *The development complete with the proposed landscaping scheme as it is expected to look when the trees reach maturity, also providing an indicative timeframe as to when such maturity is expected to be attained; and*
- *(where relevant in relation to impact of nocturnal lighting) the development and its ancillary lighting as it would appear during night-time.*

3.3 Geology, Geomorphology and Hydrogeology

A comprehensive investigation of:

1. The geology and geomorphology of the site and its surroundings, including:
   (i) existing geology, stratigraphy, structure, lithology, physiography and geomorphology features;
   (ii) palaeontological features;
   (iii) hydrogeological features; and
   (iv) soil types;

   Each feature shall be listed in a table, together with a short description and if any of the features are absent, this shall be stated. A scaled map, clearly depicting the feature occurrence within the area of influence, shall also be provided.

2. The geo-technical properties and considerations relevant to the site and its area of influence, including:
   (i) land stability;
   (ii) mechanical, erosional and structural properties of the terrain and land mass;
   (iii) any relevant fissures, faults, hollows, or weak points;
   (iv) the vulnerability of the site to natural forces such as wave action, erosive elements, landslides and mass movements; and
   (v) any other considerations affecting the implications and risks posed by the proposed development or by any of its ancillary interventions such as site clearance, earth-moving, and excavations.

   Each of the above shall be listed in a table along with a short description and if any of the features are absent, this shall be stated. A scaled map, clearly depicting the feature occurrence within the area of influence, shall also be provided.

3. The quality of the material that will be excavated (including soil, rock/mineral resource, and any existing fill material) and its potential for reuse.

4. Sampling and testing should comply with the relevant standards (unless otherwise agreed, BS standards or other recognised equivalents should be used), and should extend to a sufficient depth below the deepest level of the proposed development (taking into consideration all proposed excavations and underground structures). Wherever the study involves the drilling of core samples, the number, depth and location thereof should also be submitted for ERA approval prior to carrying out of any *in situ* tests.

3.4 Water bodies (including ground water bodies as relevant)

The study should identify the hydrological, hydromorphological and physicochemical characteristics of the water bodies and water resources in the area under investigation, including (as relevant):

1. The hydrology of the site and its surroundings, including all relevant features and dynamics, such as: aquifers; springs; surface waters; etc, including a description of any potential linkages between different water bodies (i.e. groundwater linkages to surface waters), also cross-referring to hydrogeological factors (see ***Section 3.3*** above) as relevant;
2. The type, size and physical characteristics of any aquifers and surface water bodies within the area of influence of the site, including: the nature of the water body (*e.g.* aquifer, flowing surface water, etc.); whether the water body is ephemeral or permanent; and other characteristics such as depth; as well as physical and chemical characteristics;
3. Natural and anthropogenic dynamics including groundwater recharge patterns; pumping and abstraction patterns; on-site and off-site drainage patterns; pipe/culvert connectivity between water bodies, run-off patterns; and flood risks; and
4. The study should provide a sufficiently detailed baseline to enable assessment of the effects of the proposal on the quality of the water body (underground) and the extent of area affected by hydrographical changes, the nature of the changes (whether temporary or permanent). Such assessment should be undertaken in line with indicators used/established by relevant EU policy.

3.5 Architectural, Archaeological, Historical & Cultural Heritage and related Material Assets

Refer to Appendix 2.

3.6 Air Quality

This study should clearly establish the current background levels of pollution (including dust, chemical emissions such as VOCs, and odours) and should include a clear comparison to the relevant reference and limit values as specified in the relevant legislation as well as in any other relevant guidance documents. Details on prevailing wind and climate conditions should also be included, amongst other relevant parameters.

The methodology to be used should be submitted for ERA's evaluation prior to commencement of the studies. The Air Quality Study shall be conducted in accordance with the attached terms of reference: https://era.org.mt/topic/air-quality-related-matters-and-planning-applications/

3.7 Exterior Lighting

This study should provide sufficiently detailed information the envisaged lighting required during both constructon and operational phases. The study should indicate how any lighting shall be fully contained within the site and avoid light spilling in the surrounding environment.

A lighting plan is to be submitted. This shall include:

- Overall lighting scheme including mitigation measures;
- Detailed lighting scheme for the different proposed areas, including a clear indication of the quantities, positioning, orientation of proposed luminaires and times of operation;
- Cumulation with other existing sources including traffic and with other predicted sources such as new developments;
- Technical specifications of proposed luminaries such as luminous flux per type of lamp, polar diagrams, correlated colour temperature; and
- Modelling of the envisaged illumination levels.

Note 1: *In the case of light pollution, the study needs to consider, among others, glare (e.g. the blinding light which is a danger to motorists/pedestrians and to fauna), light trespass (light straying into an area where it is not desired or required) and sky glow ('wasted' light directed upwards), together with any other relevant variables which are relevant to the determination of impact on the surrounding receptors.*

3.8 Infrastructure and Utilities

The assessment should investigate the currently available infrastructural services (including water supply, energy supply, sewerage, telecommunications infrastructure, access roads, parking, *etc.*), including details about their carrying capacity, physical condition and other relevant practical considerations. It should also compare this information to the infrastructural demands of the project as identified in ***Section 1*** above, so as to clearly indicate:

1. whether the current utilities are adequate to meet the demand arising from the proposed development;
2. whether any significant loading, congestion or damaging of the infrastructural or transport network is envisaged; and
3. whether any new or upgraded services/arrangements will be rendered necessary, both in the short-term and in the longer-term. If any requirement for new infrastructure (or upgrading, alteration or extension of the existing infrastructure) is envisaged, the relevant details including associated works and their environmental implications should also be indicated.

The assessment should also identify any existing or projected infrastructural services located within the area of influence of the development (even if not related to the demands of the development) that might be affected by the development or which may need to be displaced or diverted as a consequence of the development or its ancillary operations and interventions.

3.9 Public Access

The assessment should identify the current public access arrangements (particularly the accessibility of the countryside, coast, and public open spaces), including existing footpaths and other public access routes, and should clearly indicate whether these would be affected and how.

Wherever any new or altered arrangements are proposed, these should be clearly identified and their environmental implications should also be indicated.

3.10 Other relevant environmental aspects and features

Other relevant environmental features or considerations not identified in the preceding sections should also be identified and described, as relevant.

4.0 ASSESSMENT OF ENVIRONMENTAL IMPACTS AND ENVIRONMENTAL RISKS

All likely significant effects and risks posed by the proposed project on the environment during all relevant phases (including construction/excavation/demolition, operation and decommissioning) should be assessed in detail, taking into account the information emerging from Sections 1, 2 and 3 above. Apart from considering the project on its own merits (*i.e.* if taken in isolation), the assessment should also take into account the wider surrounding context and should consider the limitations and effects that the surrounding environmental constraints, features and dynamics may exert on the proposed development, thereby identifying any incompatibilities, conflicts, interferences or other relevant implications that may arise if the project is implemented.

In this regard, the assessment should address the following aspects, as applicable for any category of effects or for the overall evaluation of environmental impact, addressing the worst-case scenario wherever relevant:

1. An exhaustive identification and description of the envisaged impacts;
2. The magnitude, severity and significance of the impacts;
3. The geographical extent/range and physical distribution of the impacts, in relation to: site coverage; the features located in the site surroundings; whether the impacts are short-, medium- or long-range; and any transboundary impacts (*i.e.* impacts affecting other countries);
4. The timing and duration of the impacts (whether the impact is temporary or permanent; short-, medium- or long-term; and reasonable quantification of timeframes);
5. Whether the impacts are reversible or irreversible (including the degree of reversibility in practice and a clear identification of any conditions, assumptions and pre-requisites for reversibility);

6. A comprehensive coverage of direct, indirect, secondary and cumulative impacts, including:
    - interactions (*e.g.* summative, synergistic, antagonistic, and vicious-cycle effects) between impacts;
    - interactions or interference with natural or anthropogenic processes and dynamics;
    - cumulation of the project and its effects with other past, present or reasonably foreseeable developments, activities and land uses and with other relevant baseline situations; and
    - wider impacts and environmental implications arising from consequent demands, implications and commitments associated with the project (including: displacement of existing uses; new or increased pressures on the environment in the surroundings of the project, including pressures which may be exacerbated by the proposal but of which effects may go beyond the area of influence; and impacts of any additional interventions likely to be triggered or necessitated by situations created, induced or exacerbated by the project);
7. Whether the impacts are adverse, neutral or beneficial;
8. The sensitivity and resilience of resources, environmental features and receptors vis-à-vis the impacts;
9. Implications and conflicts vis-à-vis environmentally-relevant plans, policies and regulations;
10. The probability of the impacts occurring; and
11. The techniques, methods, calculations and assumptions used in the analyses and predictions, and the confidence level/limits and uncertainties vis-à-vis impact prediction.

The impacts that need to be addressed are detailed further in the sub-sections below.

4.1 Effects on the environmental aspects identified in Section 3

The assessment should thoroughly identify and evaluate the impacts and implications of the project on all the relevant environmental aspects identified in Section 3 above, also taking into account the various considerations outlined in the respective sections.

With regards to Section 3.4, the ecological status of the area in question is to be evaluated, taking into consideration the definition of status by relevant EU Policy, and assessing the extent to which the project will cause deterioration in status or compromise the achievement of good status in line with Article 4(7) of the EU Water Framework Directive.

4.2 Impacts related to Climate Change and Climate Change Adaptation

The assessment should address the following aspects, as relevant:

1. The contribution of the project to greenhouse gas (GHG) emissions and climate change, including:
    (i) The direct, indirect and off-site GHG emissions and related impacts during all relevant phases of the project, including those arising as a result of the electrical power demand of the project;
    (ii) Any massive GHG emissions that may occur as a consequence of accidents or malfunctions;
    (iii) The impacts of the proposal on carbon sinks (*e.g.* wooded/afforested areas, agricultural soils, landfills, wetlands, and marine environments);
    (iv) The components of the project that are expected to contribute to renewable energy generation on site or to a reduction in GHG emissions through substitution of current generation facilities, including a quantification and critique of their reliability and actual net contribution to climate change mitigation as well as an identification of the impacts of such components on other aspects of the environment (*e.g.* landscape, land take, avifauna); and
    (v) The implications of the project and its operations and ancillary demands on National GHG emission targets.

2. The implications of climate change on the proposal, including:
    (i) The aspects/elements of the project that are likely to be affected by changes or variability in climate-related parameters (*e.g.* temperature, humidity, weather patterns, sea level, etc.);
    (ii) The potential impacts that such changes may have on the proposal, including any possible impacts resulting from changes to multiple parameters; and
    (iii) The adaptability of the project and its components and operations vis-à-vis the relevant climate change parameters and trends.

4.3 Environmental risk

The assessment should also address, in sufficient detail, any relevant environmental risk (including major-accident scenarios such as contamination, emissions, explosions, blast, flooding, major spillages, etc.) likely to result in environmental damage or deterioration. The range of accident scenarios considered should exhaustively cover, as relevant:

1. one-time risks (*e.g.* during construction or decommissioning works);
2. recurrent risks during project operation; and
3. risks associated with extreme events (*e.g.* effect of earthquakes or natural disasters on the project).

The assessment should include, as relevant: a quantification of the risk magnitude and probability; and risk analysis vis-à-vis any hazardous materials stored, handled, or generated on site or transported to/from the site.

Note: *Should the proposal fall within the scope of the Seveso/COMAH regulations, a stand-alone Risk Assessment may be required, to the satisfaction of the relevant Competent Authority. In such instances, separate Terms of Reference are issued for the Risk Assessment.*

4.4 Effects on Human Populations resulting from impacts on the environment

This assessment should also identify any impacts of the development on the surrounding and visiting population (*e.g.* effects on public health), that may result from impacts on the environment. In the case of health-related effects, reference should be made to published epidemiological and other studies, as relevant, and the views of the Environmental Health Directorate should be sought.

4.5 Other Environmental Effects

Any other environmental effects deemed relevant to the project but not fitting within any of the above sections should also be identified and assessed.

5.0 REQUIRED MEASURES, IDENTIFICATION OF RESIDUAL IMPACTS, AND MONITORING PROGRAMME

5.1 Mitigation Measures

A clear identification and explanation of the measures envisaged to prevent, eliminate, reduce or offset (as relevant) the identified significant adverse effects of the project during all relevant phases including construction, operation and decommissioning [see ***Section 1.2.3*** above].

As a general rule, mitigation measures for construction-phase impacts should be packaged as a holistic Construction Management Plan (CMP). Whilst the detailed workings of the CMP may need to be devised at a later stage (*e.g.* after the final design of the project has been approved and/or after a contractor has been appointed), the key parameters that the CMP must adhere to for proper mitigation need to be identified in the EIA. Broadly similar considerations also apply vis-à-vis operational-phase impacts [which may need to be mitigated through an operational permit] and decommissioning-phase impacts [see ***Section 5.4*** below], where relevant.

Mitigation measures for accident/risk scenarios should be packaged as a holistic plan that includes the integration of failsafe systems into the project design as well as well-defined contingency measures.

The recommended measures should be feasible, realistically implementable to the required standards and in a timely manner, effective and reliable, and reasonably exhaustive. They should not be dependent on factors that are beyond the developer's and ERA's control or which would be difficult to monitor, implement or enforce. The actual scope for, and feasibility of, effective prevention or mitigation should also be clearly indicated, also identifying all potentially important pre-requisites, conditionalities and side-effects.

5.2 Residual Impacts

Any residual impacts [*i.e.* impacts that cannot be effectively mitigated, or can only be partly mitigated, or which are expected to remain or recur again following exhaustive implementation of mitigation measures] should also be clearly identified.

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5.3 Additional Measures

Compensatory measures (*i.e.* measures intended to offset, in whole or in part, the residual impacts) should also be identified, as reasonably relevant. Such measures should be not considered as an acceptable substitute to impact avoidance or mitigation.

If the assessment also identifies beneficial impacts on the environment, measures to maximise the environmental benefit should also be identified.

In both instances, the same practical considerations as indicated vis-à-vis mitigation measures should also apply.

5.4 Decommissioning Plan

A decommissioning plan (DP) should also be proposed to address the following circumstances, as relevant:

1. Removal of any temporary or defined-lifetime development (or of any structures, infrastructure or land use required temporarily in connection with it) upon the expiry of their permitted duration; and
2. Removal of the development (or of any secondary developments, infrastructure or land use ancillary to it) in the event of redundancy, cessation of operations, serious default from critical mitigation measures, or other overriding situations that may emerge in future.

The DP should also include, as relevant, a phasing-out plan, proposals for site remediation or decontamination, and methodological guidance on site reinstatement or appropriate after-use.

5.5 Monitoring Programme

A realistic and enforceable programme for effective monitoring of those works envisaged to have an adverse or uncertain impact. The monitoring programme should include:

1. Details regarding type and frequency of monitoring and reporting, including spot checks;
2. The parameters that will be monitored, their units of measurement, the monitoring indicators to be used; and standard analytical methods in line with relevant EU policy;
3. An effective indication of the required action to address any exceedances, risks, mitigation failures or non-compliances for each monitoring parameter;
4. An evaluation of forecasts, predictions and measures identified in the EIA; and
5. An indication of the nature and extent of any additional investigations (including EIAs or ad hoc detailed investigations, if relevant) that may be required in the event of any contingencies, unanticipated impacts, or impacts of larger magnitude or extent than predicted.

The programme should address all relevant stages, as follows:

(a) Where relevant, monitoring of preliminary on-site investigations that may entail significant disturbance or damage to site features (*e.g.* archaeological excavations, geological sampling, or any works that require prior site clearance or any significant destructive sampling);.
*[**Note:** Official written consent from the competent authorities (e.g. Superintendence of Cultural Heritage) may also be required for such interventions.]*

(b) Monitoring of the construction phase, including the situation before initiation of works (including site clearance), during appropriate stages of progress, and after completion of works;

(c) Monitoring of the operational phase, except where otherwise directed by ERA (*e.g.* where monitoring would be more appropriately integrated into an operating permit); and

(d) Where relevant, monitoring of the decommissioning phase, including the situation before initiation of works, during appropriate stages of progress, and after completion of works.

5.6 Identification of required authorisations

The assessment should also identify all environmentally-relevant permits, licences, clearances and authorisations (other than the development permit to which this EIA is ancillary) which must be obtained by the applicant in order to effectively implement the project if development permission is granted. Any uncertainty, as to whether any of these pre-requisites is applicable to the project, should be clearly stated.

Note on Sections 5.1 to 5.6 above:
The expected effects, the proposed measures, the residual impacts, the proposed monitoring etc. should also be summarised in a user-friendly itemised table that enables the reader to easily relate the various aspects to each other. An indicative specimen table is attached in ***Appendix 3***.

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APPENDIX 1 REQUIRED DECLARATION

Signed Declaration: Conflict of interest

Signed declaration in accordance with sub-regulation 17(3):
This declaration is to be submitted with each environmental survey report forming part of the EIA.

Attn: Director of Environment and Resources (ERA).

I, _____, hereby declare that, I have no personal or financial interest in the proposed development. Moreover, I declare that I am not in any way associated with any individual, company, association or grouping that has any direct or indirect, personal, professional or financial interest in the proposed development.

_____ _____

Date Signature

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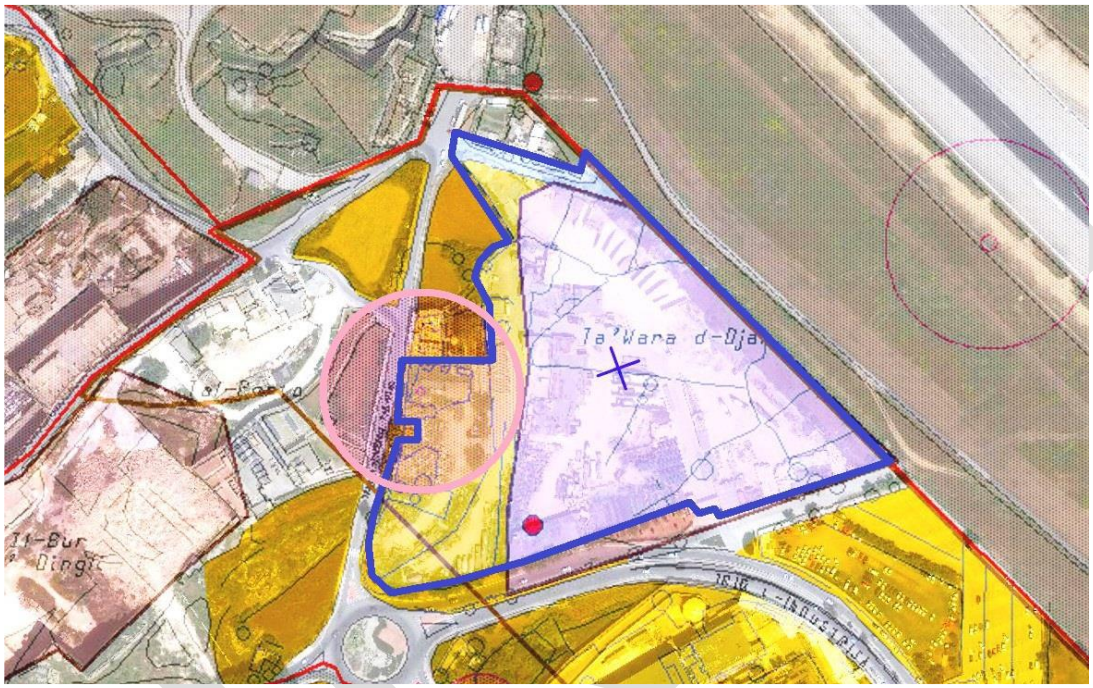
APPENDIX 2: TERMS OF REFERENCE FOR A CULTURAL HERITAGE ASSESSMENT

1.0 Preamble

The proposal involves a large-scale development within an area that is characterised by its archaeological sensitivity and partly overlapping with an archaeological constraint as designated in the South Malta Local Plan. Other cultural heritage features are located in the vicinity and surroundings of the site in question.

The EIA is to explore potential impacts that may occur within the project's site footprint and beyond, including direct impacts on the known archaeology in the area.



The site in question marked in blue, in relation to the archaeological constraint in the South Malta Local Plan marked in pink.

2.0 Scope and Definitions of the EIA

For the purposes of this document, cultural heritage is defined by **Article 2** of the **Cultural Heritage Act 2002 (as amended) (CAP 445)** This includes movable or immovable objects of artistic, architectural, historical, archaeological, ethnographic, palaeontological, and geological importance.

The **Cultural Heritage Act (Art. 2**) specifically includes the landscape within the definition of cultural heritage.
The study area shall include:
The development site and its immediate surroundings, with particular attention to the already mentioned archaeologically sensitive areas.

In the context of this application, cultural heritage considerations may include known and potential archaeological features of importance within the site footprint and in the surrounding area.

The above cultural heritage definitions and considerations are not to be considered as exhaustive. The EIA must consider all other forms of cultural heritage, both known and unknown.

The Environmental Impact assessment will:
Identify and determine whether the proposed development is likely to cause any adverse effects on the already mentioned recorded and potential archaeological features.

3.0 Methodology

In quantifying the cultural heritage assets within the study area, and assessing the impacts of the proposed development, the EIA will undertake:

A study of the possible negative effects of the proposed interventions on archaeological features in the area.

Proposals for mitigation measures, including Archaeological investigations and Archaeological monitoring of works

4.0 Authorisation by the Superintendence of Cultural Heritage

As per **Cultural Heritage Act 2002 (as amended) (CAP 445),** any form of investigation or prospection required for the identification of cultural heritage (including excavation, field walking, topographic surveys and remote sensing) may only be undertaken by the Superintendence of Cultural Heritage or with its written approval

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PROTECTIVE INVENTORY OF THE MALTESE CULTURAL HERITAGE HERITAGE DATA CAPTURE SHEET		Ref. No.

Location	Category	Type	Site Location (Address)
Eastings	Northings	Feature	Period - Year

S.S. No. 1	S.S. No. 2	Description
S.S. No. 3	S.S. No. 4	
Date		
Negative No.	Film No.	
Present Utilization		

Existing Legal Protection	GN. Number	GN. Date

Comments

Buffer Zone	A	B	C	D	E	Others
Eastings						
Northings						

Site Map

Scale 1 : 2500

Archaeological Characteristics – Sketch/Scaled drawings:	
Condition:	Degree of Protection (Structure Plan policies UCO7 or ARC 2):
State of Security:	Proposed Utilization:
Basic Bibliography:	

Compiled by:	Revised by:
Checked by:	Checked by:
Date:	Date:

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APPENDIX 3: SPECIMEN IMPACT TABLE

Impact type and source			**Impact receptor**		**Effect & scale**							**Probability of impact occurring** (Inevitable, Likely, Unlikely, Remote, Uncertain)	**Overall impact significance**	**Proposed mitigation measures**	**Residual impact significance**	**Other requirements** (monitoring, authorisations, etc)
Impact type	**Specific intervention leading to impact**	**Project phase** (construction/ operation/ decommissioning)	**Receptor type**	**Sensitivity toward impact**	**Direct/ Indirect/ Cumulative**	**Beneficial/ Adverse**	**Severity**	**Physical / geographic extent of impact**	**Short-/medium- / long-term**	**Temporary** (indicate duration)**/ Permanent**	**Reversible** (indicate ease of reversibility) **/ Irreversible**					

[Insert definition of relevant criteria used to describe the impacts]

REDEVELOPMENT OF THE COMINO HOTEL AND BUNGALOWS

GEO-ENVIRONMENT METHOD STATEMENT

INTRODUCTION

1. This Method Statement outlines the methodology for the geo-environment baseline study of the Environmental Impact Assessment (EIA) Report for PA/02825/25: *To demolish an existing construction yard and built structures, proposed oversite excavation to accommodate the construction of a commercial car park, supermarket, a mixed use outlet village (consisting of class 2A medical, class 3C sport centre, class 4A offices, class 4B retail, class 4C coffee shops, class 4D restaurants, bank) and three-stars Hotel having 120 rooms. Site at Elbros Concrete Ltd., Triq l-Industrija c/w, Triq il-Madonna Tad-Dawl, Kirkop*. The development is hereinafter referred to as 'the Scheme'.

TERMS OF REFERENCE

2. The Terms of Reference provided by the Environment & Resources Authority (ERA) are:

3.0 A DESCRIPTION OF THE SITE AND ITS SURROUNDINGS (I.E. ENVIRONMENTAL BASELINE)

The existing environmental features, characteristics and conditions, in and around the proposed development site as well as in all locations likely to be affected by the development or by ancillary interventions and operations, are to be identified and described in sufficient detail, with particular attention to the aspects elaborated further in the next sections.

The consultants should also identify (and justify) wherever relevant:

1. The geographic area (e.g. viewshed or other area of influence) that needs to be covered by each study;
2. The relevant sensitive receptors vis-à-vis the environmental parameter under consideration (e.g. residential communities, other users, natural ecosystems, specific populations of particular species, or individual physical features);
3. The location of the reference points or stations (e.g. viewpoints, monitoring stations, or sampling points (including depth of multiple sampling points at a single sampling point in the case of water media and sediment, where applicable) to be used in the study; and
4. Other methodological parameters of relevance, also noting that the assessment will normally require both desk-top studies and on-site investigations (including visual observations and sampling, as relevant).

Note: It is recommended that these details are discussed in advance with the ERA prior to commencement of the relevant parts of the studies, in order to pre-empt (as much as possible) later-stage issues.

Wherever relevant to the environmental aspects under discussion, reference to legislation, policies, plans (including programmes and strategies) standards and targets, should also be made, such that the compatibility (or otherwise) of the proposal therewith is also factored into the assessment required by Section 4 below. The discussion should cover the following aspects, in the appropriate level of detail:

- Supra-national (e.g. European Union; United Nations; or other international or regional) legislation, directives, policies, conventions, protocols, treaties, charters, plans and obligations;
- National legislation, policies and plans (e.g. Structure Plan; National Environment Policy); and
- Sub-national legislation, policies and plans (e.g. local plans, site-specific regulations, action plans, management plans, and protective designations such as scheduling or Natura 2000).

Note: In addition to already in-force legislation, policies and plans, the discussion should also cover any foreseeable future updates (or new legislation, policies and plans) likely to be fulfilled, affected or compromised by the proposed project. Furthermore, it should be noted that some cross-cutting legal/policy instruments (e.g. Water Framework Directive and Marine Strategy Framework Directive) may need to be factored into more than one aspect of the discussion.

3.3 Geology, Geomorphology, Hydrogeology, and Soils

A comprehensive investigation of:

1. The geology and geomorphology of the site and its surroundings, including:

   (i) existing geology, stratigraphy, structure, lithology, physiography and geomorphology features;

   (ii) palaeontological features;

   (iii) hydrogeological features; and

   (iv) soil types;

Each feature shall be listed in a table, together with a short description and if any of the features are absent, this shall be stated. A scaled map, clearly depicting the feature occurrence within the area of influence, shall also be provided.

2. The geo-technical properties and considerations relevant to the site and its area of influence, including:

(i) land stability;

(ii) mechanical, erosional and structural properties of the terrain and land mass;

(iii) any relevant fissures, faults, hollows, or weak points;

(iv) the vulnerability of the site to natural forces such as wave action, erosive elements, landslides and mass movements; and

(v) any other considerations affecting the implications and risks posed by the proposed development or by any of its ancillary interventions such as site clearance, earth-moving, and excavations.

Each of the above shall be listed in a table along with a short description and if any of the features are absent, this shall be stated. A scaled map, clearly depicting the feature occurrence within the area of influence, shall also be provided.

3. The quality of the material that will be excavated (including soil, rock/mineral resource, and any existing fill material) and its potential for reuse.

4. Sampling and testing should comply with the relevant standards (unless otherwise agreed, BS standards or other recognised equivalents should be used), and should extend to a sufficient depth below the deepest level of the proposed development (taking into consideration all proposed excavations and underground structures). Wherever the study involves the drilling of core samples, the number, depth and location thereof should also be submitted for ERA approval prior to carrying out of any *in situ* tests.

3.4 Water Bodies (including terrestrial, underground, and marine water bodies, as relevant)

The study should identify the hydrological, hydromorphological and physicochemical characteristics of the water bodies, water resources and aquatic environments in the area under investigation, including (as relevant):

1. The hydrology of the site and its surroundings, including all relevant features and dynamics, such as: aquifers; springs; surface waters; etc, including a description of any potential linkages between different water bodies (i.e. groundwater linkages to surface waters), also cross-referring to hydrogeological factors (see Section 3.3 above) as relevant;

2. The type, size and physical characteristics of any aquifers and surface water bodies within the area of influence of the site, including: the nature of the water body (e.g. aquifer, flowing surface water, etc.); whether the water body is ephemeral or permanent; and other characteristics such as depth; as well as physical and chemical characteristics;

3. Natural and anthropogenic dynamics including groundwater recharge patterns; pumping and abstraction patterns; on-site and off-site drainage patterns; pipe/culvert connectivity between water bodies, run-off patterns; and flood risks; and

4. The study should provide a sufficiently detailed baseline to enable assessment of the effects of the proposal on the quality of the water body (underground) and the extent of area affected by hydrographical changes, the nature of the changes (whether temporary or permanent). Such assessment should be undertaken in line with indicators used/established by relevant EU policy.

4.0 ASSESSMENT OF ENVIRONMENTAL IMPACTS AND ENVIRONMENTAL RISKS

All likely significant effects and risks posed by the proposed project on the environment during all relevant phases (including construction/excavation/demolition, operation and decommissioning) should be assessed in detail, taking into account the information emerging from Sections 1, 2 and 3 above. Apart from considering the project on its own merits (i.e. if taken in isolation), the assessment should also take into account the wider surrounding context and should consider the limitations and effects that the surrounding environmental constraints, features and dynamics may exert on the proposed development, thereby identifying any incompatibilities, conflicts, interferences or other relevant implications that may arise if the project is implemented.

In this regard, the assessment should address the following aspects, as applicable for any category of effects or for the overall evaluation of environmental impact, addressing the worst-case scenario wherever relevant:

1. An exhaustive identification and description of the envisaged impacts;

2. The magnitude, severity and significance of the impacts;

3. The geographical extent/range and physical distribution of the impacts, in relation to: site coverage; the features located in the site surroundings; whether the impacts are short-, medium- or long-range; and any transboundary impacts (i.e. impacts affecting other countries);

4. The timing and duration of the impacts (whether the impact is temporary or permanent; short-, medium- or long-term; and reasonable quantification of timeframes);

5. Whether the impacts are reversible or irreversible (including the degree of reversibility in practice and a clear identification of any conditions, assumptions and pre-requisites for reversibility);

6. A comprehensive coverage of direct, indirect, secondary and cumulative impacts, including:

- interactions (e.g. summative, synergistic, antagonistic, and vicious-cycle effects) between impacts;
- interactions or interference with natural or anthropogenic processes and dynamics;
- cumulation of the project and its effects with other past, present or reasonably foreseeable developments, activities and land uses and with other relevant baseline situations; and
- wider impacts and environmental implications arising from consequent demands, implications and commitments associated with the project (including: displacement of existing uses; new or increased pressures on the environment in the surroundings of the project, including pressures which may be exacerbated by the proposal but of which effects may go beyond the area of influence; and impacts of any additional interventions likely to be triggered or necessitated by situations created, induced or exacerbated by the project);

7. Whether the impacts are adverse, neutral or beneficial;

8. The sensitivity and resilience of resources, environmental features and receptors vis-à-vis the impacts;

9. Implications and conflicts vis-à-vis environmentally relevant plans, policies and regulations;

10. The probability of the impacts occurring; and

11. The techniques, methods, calculations and assumptions used in the analyses and predictions, and the confidence level/limits and uncertainties vis-à-vis impact prediction.

The impacts that need to be addressed are detailed further in the sub-sections below.

4.1 Effects on the environmental aspects identified in Section 3

The assessment should thoroughly identify and evaluate the impacts and implications of the project on all the relevant environmental aspects identified in Section 3 above, also taking into account the various considerations outlined in the respective sections.

With regard to Section 3.4, the ecological status of the area in question is to be evaluated, taking into consideration the definition of status by relevant EU Policy, and assessing the extent to which the project will cause deterioration in status or compromise the achievement of good status in line with Article 4(7) of the EU Water Framework Directive.

5.0 REQUIRED MEASURES, IDENTIFICATION OF RESIDUAL IMPACTS, AND MONITORING PROGRAMME

5.1 Mitigation Measures

A clear identification and explanation of the measures envisaged to prevent, eliminate, reduce or offset (as relevant) the identified significant adverse effects of the project during all relevant phases including construction, operation and decommissioning [see ***Section 1.2.3*** above].

As a general rule, mitigation measures for construction-phase impacts should be packaged as a holistic Construction Management Plan (CMP). Whilst the detailed workings of the CMP may need to be devised at a later stage (e.g. after the final design of the project has been approved and/or after a contractor has been appointed), the key parameters that the CMP must adhere to for proper mitigation need to be identified in the EIA. Broadly similar considerations also apply vis-à-vis operational-phase impacts [which may need to be mitigated through an operational permit] and decommissioning-phase impacts [see ***Section 5.4*** below], where relevant.

Mitigation measures for accident/risk scenarios should be packaged as a holistic plan that includes the integration of failsafe systems into the project design as well as well-defined contingency measures.

The recommended measures should be feasible, realistically implementable to the required standards and in a timely manner, effective and reliable, and reasonably exhaustive. They should not be dependent on factors that are beyond the developer's and ERA's control or which would be difficult to monitor, implement or enforce. The actual scope for, and feasibility of, effective prevention or mitigation should also be clearly indicated, also identifying all potentially important pre-requisites, conditionalities and side-effects.

5.2 Residual Impacts

Any residual impacts [i.e. impacts that cannot be effectively mitigated, or can only be partly mitigated, or which are expected to remain or recur again following exhaustive implementation of mitigation measures] should also be clearly identified.

5.3 Additional Measures

Compensatory measures (i.e. measures intended to offset, in whole or in part, the residual impacts) should also be identified, as reasonably relevant. Such measures should be not considered as an acceptable substitute to impact avoidance or mitigation.

If the assessment also identifies beneficial impacts on the environment, measures to maximise the environmental benefit should also be identified.

In both instances, the same practical considerations as indicated vis-à-vis mitigation measures should also apply.

5.5 Monitoring Programme

A realistic and enforceable programme for effective monitoring of those works envisaged to have an adverse or uncertain impact. The monitoring programme should include:

1. Details regarding type and frequency of monitoring and reporting, including spot checks;
2. The parameters that will be monitored, and the monitoring indicators to be used;
3. An effective indication of the required action to address any exceedances, risks, mitigation failures or non-compliances for each monitoring parameter;
4. An evaluation of forecasts, predictions and measures identified in the EPS; and
5. An indication of the nature and extent of any additional investigations (including EIAs or ad hoc detailed investigations, if relevant) that may be required in the event of any contingencies, unanticipated impacts, or impacts of larger magnitude or extent than predicted.

The programme should address all relevant stages, as follows:

(a) Where relevant, monitoring of preliminary on-site investigations that may entail significant disturbance or damage to site features (e.g. geological sampling or any works that require prior site clearance);

(b) Monitoring of the construction phase, including the situation before initiation of works (including site clearance), during appropriate stages of progress, and after completion of works;

(c) Monitoring of the operational phase, except where otherwise directed by ERA (e.g. where monitoring would be more appropriately integrated into an operating permit); and

(d) Where relevant, monitoring of the decommissioning phase, including the situation before initiation of works, during appropriate stages of progress, and after completion of works.

Note on Sections 5.1 to 5.6 above:

The expected effects, the proposed measures, the residual impacts, the proposed monitoring etc. should also be summarised in a user-friendly itemised table that enables the reader to easily relate the various aspects to each other. An indicative specimen table is attached in ***Appendix 3***.

AREA OF INFLUENCE

3. Having regard to the nature of the Scheme, and the extent of the excavation works and the main catchment area of the flows that are likely to traverse the site, the Area of Influence (A of I) for the geology and hydrology is shown in **Figure 1.**

ASSESSMENT METHODOLOGY

Literature Search

4. A literature search in relation to previous geo-environment survey work relevant to the A of I will be undertaken. This, together with the Consultant's own knowledge of the area, will provide a context for the baseline surveys. It is noted that geo-technical investigations have already been carried out on the Scheme site, which involved the drilling of a significant number of boreholes across the site. The results of these investigations will inform the baseline study.

Methodology

5. The study will establish the existing geology, geomorphology, hydrogeological and hydrological baseline. This will involve:

- Identification and description of the geology, geomorphology and hydrogeology of the site and the A of I;
- Identification, mapping and description of any structural features (such as faults) that may be present, outcrop formations, members, or bed sub-divisions, including their palaeontologic content;
- Identification and description of aquifers, water courses, drainage patterns; surface run-off; and springs and wells (if any); and
- Identification of features that are protected by legislation, or which warrant such protection, and their appropriate level of protection, as necessary.

6. The following will be produced as part of the geo-environment baseline survey:

- Geological map;
- Hydrology map; and
- Report of the quality of the stone material to be excavated and its potential reuse as described hereunder.

Figure 1: Area of Influence for Geology / Hydrology Study

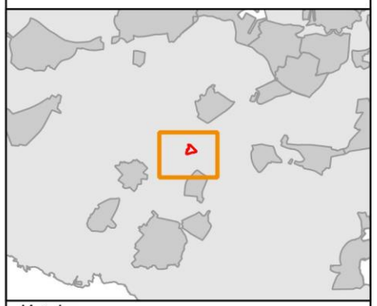
Geo-Environment Method Statement

Legend

Site boundary

Hydrology baseline

Proposed Mixed Use Outlet Kirkop



Map by:

Client: Qormi Construction Ltd
Ref: QCL007
Date: 1 / 2026

Copyright: Planning Authority. Basemap is for indicative purposes only, and shall not be used for direct interpretation.

P:\Mapping\Adi\EIA\QCL007 - Kirkop Outlet Village

7. A Geotechnical Investigation[1] has already been carried out. The quality of the material to be excavated was assessed by visual examination of the rock exposed at the site, using past geological experience acquired in studies and by examination of the rock core samples. Samples were taken from the locations shown in **Figure 2**.

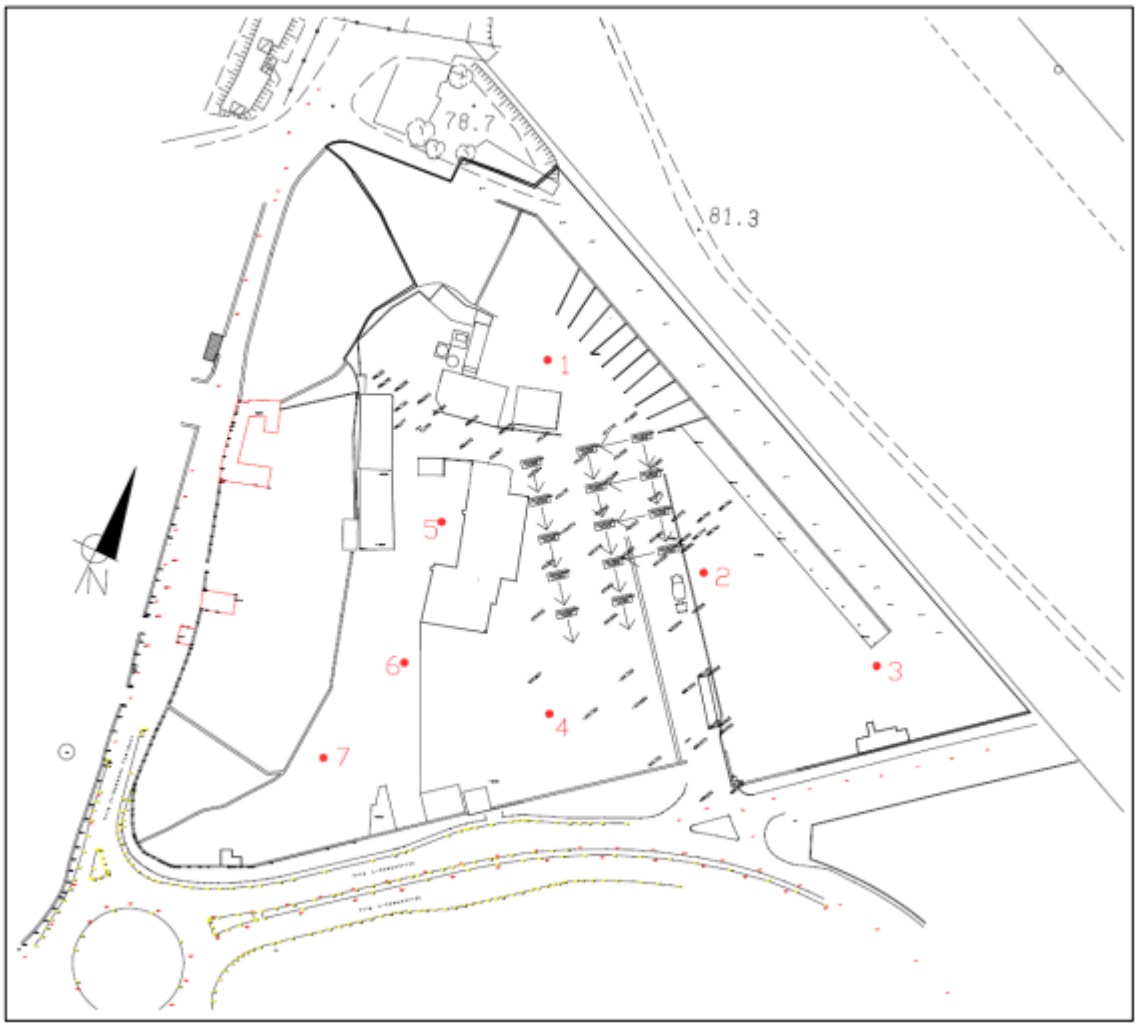
8. The site investigation was conducted in full accordance with BS 5930:2015 "Code of practice for geological site investigations", BS EN 1997:2004 "Geotechnical Design – Part 1: General Rules" and BS EN 1997-2:2007 "Geotechnical Design - Part 2: Ground Investigation and Testing". Uniaxial compressive strength tests on rock samples were performed according to the International Society for Rock Mechanics (ISRM) suggested methods and Annex W of EN 1997-2:2007.

Standards and Guidance

9. The conservation importance of geological, geomorphological and hydrogeological features will be determined by reference to the *South Malta Local Plan,* the *Minerals Subject Plan* and the *Earth Conservation Strategy* (The British Nature Conservancy Council, 1991).

[1] Terracore, 2024. Proposed Geotechnical Investigations at Elbros Plant, Kirkop. Ground Investigations Report

Figure 2: Location of rock core samples



IDENTIFICATION OF IMPACTS

10. In terms of geology, geomorphology, hydrogeology, and soils, the geo-environmental impacts of the Scheme are likely to arise from the construction and operation of the Scheme. The impact of changes resulting from the Scheme on geology and geomorphology will make reference to the nature of the beds and the degree of protection afforded to them through policy and / or legislation. The impact of changes resulting from the Scheme on water bodies will identify whether the A of I is in the groundwater safeguard zone, and the presence of any registered groundwater boreholes in the A of I.

IMPACT SIGNIFICANCE

11. The significance of the impact(s) will include:

- Description of impact;

- Policy importance of impact (Local, National, International);
- Extent of effect;
- Duration of impact (temporary / permanent);
- Adverse or beneficial impact;
- Reversible / irreversible impact;
- Sensitivity of geo-environmental resources to the identified impacts;
- Probability of the impact occurring (certain, likely, uncertain, unlikely, remote); and
- Scope for mitigation / enhancement (very good, good, none).

12. Based on the above, a summary of the significance of the impact will be judged in terms of whether the impact is considered to be:

- **Not significant**:
    - Little or no change to the geological, geomorphological and hydrogeological regime.
- **Minor significance**:
    - Changes to the geological / geomorphological regime, involving the removal of overburden; changes to the hydrological regime, but no impact on the aquifer or galleries, or with potential for substantial changes to be offset by mitigation.
- **Major significance**:
    - Changes to the geological / geomorphological regime involving the extraction of mineral resources; changes to the hydrological regime that impact on the aquifer, with little opportunity for changes to be offset by mitigation.

IMPACT MITIGATION AND MONITORING

13. The scope for mitigation will be identified, and the need for monitoring of geological, geomorphological, hydrogeological and hydrological aspects within the A of I will be addressed in the EIA Report.

MIXED USE OUTLET VILLAGE, KIRKOP

AIR QUALITY METHOD STATEMENT

INTRODUCTION

1. This method statement outlines the methodology for the Air Quality Study as part of the Environmental Impact Assessment (EIA) for PA/02825/25: *To demolish an existing construction yard and built structures, proposed oversite excavation to accommodate the construction of a commercial car park, supermarket, a mixed use outlet village (consisting of class 2A medical, class 3C sport centre, class 4A offices, class 4B retail, class 4C coffee shops, class 4D restaurants, bank) and three-stars Hotel having 120 rooms. Site at Elbros Concrete Ltd., Triq l-Industrija c/w, Triq il-Madonna Tad-Dawl, Kirkop*. The development is hereinafter referred to as 'the Scheme'.

Terms of Reference

2. The Terms of Reference (ToR) issued by the Environment & Resources Authority (ERA) for air quality assessment are included in **Appendix 1**.

ASSESSMENT METHODOLOGY

Scope of Assessment

3. The air quality assessment will focus on the potential impacts on air quality from vehicular traffic arising from the operation of the mixed use development subject of PA/02825/25. According to the AADT estimate letter to ERA[1], the current site (the *Elbros* facility) generates an AADT of 246 trips, resulting in a net increase in primary trips from the Scheme of 4,526 trips.

Traffic Data

4. The predicted change in air quality as a result of the Scheme will be based on predicted network (without the Scheme) and operational traffic growth (with the Scheme) as estimated in the TIA that is being prepared for the Scheme.

5. The years considered will be the base year of operation, and the base year of operation plus five years. Both years' (base year, and base year + five years) traffic data will be used, since even if traffic flows are predicted to be greater after five years of operation, traffic levels in the base year may have a higher impact on air quality given that emissions from vehicles are reducing with time.

6. **Figure 1** shows the location of the Scheme and the Area of Study. The Area of

[1] Adi Associates, June 2025. AADT for Proposed Commercial Complex at Triq l-Industrija, Triq Il-Madonna tad-Dawl, Ħal Kirkop.

Study has been selected taking into account the distribution of traffic from the Scheme and includes a number of sensitive receptors located on the roads where the increase in AADT due to the Scheme is the highest. A threshold of around 500 AADT is typically applied when designating the Area of Study, since an assessment of previous studies (presented in **Appendix 2**) suggests that below this AADT, the impact on air quality is negligible.

Baseline Air Quality

7. Knowledge of the current baseline is principally required to calibrate the air dispersion model (as requested by ERA); dispersion modelling is used to predict future air quality at the Scheme and at the nearest sensitive receptors, both without and with the Scheme.

8. A site visit was carried out on 2nd February 2026, to identify a suitable monitoring location. The most appropriate location for the baseline monitoring survey was identified on Triq L-Avjazzjoni as shown in **Figure 2**. This point lies on the route that most vehicles will take leaving the Scheme site and was selected due to the prevailing north-westerly wind direction and traffic patterns. Positioning the sampler at this location maximizes exposure to emissions in line with natural airflow patterns, capturing representative baseline data for the study. The equipment will be placed at a distance of not more than 5 m from the edge of Triq L-Avjazzjoni (as shown in **Figure 2**), which is a trafficked road that will likely experience the highest increases in AADT from the Scheme. Consideration was also given to other factors including the following:

- provision of electricity supply;
- site accessibility and safety / security;
- distance from the edge of a road junction and traffic lights; and
- monitoring location not screened from the road by trees or trucks.

Figure 1: Location of Site and Area of Study

Figure 2: Baseline monitoring location

Copyright: Planning Authority. Basemap is for indicative purposes only, and shall not be used for direct interpretation.

9. The PM_{10} sampler will be placed on Triq L-Avjazzjoni, on the pavement whereas the NO_2 diffusion tube will be attached to a pole. The PM_{10} sampling head and the passive diffusive tube will be placed at a height of between 1.5 and 4 metres above the ground.

PM_{10}

10. Measurement of PM_{10} will be carried out in accordance with the reference method EN 12341:2023. Sampling will be carried out using a low-volume sampler equipped with a size selective inlet and drawing in ambient air with a constant flow rate of 2.3 m^3/h. The sampler is a reference sampler for PM_{10} according to EN 12341:2023. Calibration certificate of the equipment is included in **Appendix 3**.

11. Samples will be collected on pre-weighed quartz filters supplied by a laboratory accredited to EN ISO IEC 17025 and EN 12341:2023. After sampling, the filters will be conditioned and weighed at the same accredited laboratory.

12. 24-hour samples will be collected over six weeks (42 days).

NO_2

13. Passam NO_2 passive diffusion monitoring tubes will be used. The equivalence of Passam tubes to the standard chemiluminescence test according to EN 14211:2012 was demonstrated in a study conducted in North Rhine Westphalia, with the findings published in the peer-reviewed paper by Pfeffer *et al.*, (2010)[2]. The tubes will be supplied by Passam ag, which is a laboratory accredited to ISO/IEC 17025:2017, and later returned for analysis. The analysis is specifically accredited.

14. Two 3-week samples will be collected over six weeks.

15. Data from ERA's diffusion tube network in the Area of Study will also be included for reference.

Modelling

16. Modelling will be used to assess the impact from vehicular traffic during the operational phase of the Scheme.

Dispersion Model

17. BREEZE Roads will be used to model emissions of NO_2 and PM_{10} traffic emissions under baseline conditions and the operational phase. The reference years during operation will be the base year and base year plus five years.

18. Urban background values are required since BREEZE Roads only predicts impacts on

[2] Pfeffer *et al.* (2010). Calibration of diffusive samplers for nitrogen dioxide using the reference method – Evaluation of measurement uncertainty. *Gefahrstoffe- Reinhaltung der Luft*, 11-12, 500-506.

air quality occurring due to the emissions from traffic included in the model. These traffic emissions then need to be added to background air quality levels to predict the overall level of emissions.

19. It is proposed to obtain background values from ERA; the method used to obtain the background values is at ERA's discretion, following an assessment of the baseline monitoring data.

20. The background will be assumed to remain constant throughout the years modelled.

Emission Factors

21. Emission factors are required to predict emission from current and future vehicle fleet compositions. It will be assumed that vehicle emissions rates are similar to those in the UK and hence the same emissions factors will be used. These factors are based on a toolkit published by Defra[3] that mirrors the past and present vehicle fleet in the UK. The factors will, however, be adjusted to the Maltese scenario in line with the age distribution of Maltese fleet and taking into consideration the percentage HGVs and average vehicle speed applicable to the specific road under assessment.[4]

22. The UK average vehicle age is 8 years, compared to Malta's 15 years (as per NSO data[5]). This implies that currently, the Maltese emission factors are 7 years behind those of the UK. Therefore, the emission factors of the current fleet are equivalent to the UK emission factors for 2017.

23. The UK emission factors for PM_{10} are for tailpipe emissions, brake, tyre, and abrasion, they do not include allowance for resuspension. This assessment assumes a PM_{10} resuspension emission rate equivalent to 50 mg/veh-km and also assumes that resuspension is linearly related to the number of vehicles. It is considered that both the emission rate and the linear relationship with the number of vehicles are conservative assumptions.

Meteorological Data

24. Meteorological data for the most recent year available will be obtained from the Malta International Airport.

Sensitive Receptors

25. As mentioned, the Area of Study has been selected taking note of the sensitive

[3] The toolkit makes use of emission factors published by the UK Department for Transport (derived from actual vehicle emissions) together with information on fleet composition on different road types. The toolkit is developed by the Highways Agency, AEA, Bureau Veritas and Air Quality Consultants, together with contributions from CERC.

[4] Any possible remaining differences with regard to the Maltese fleet (in comparison to the Defra toolkit) are taken account of in the calibration factor used to bring the predictions in line with the measured data.

[5] NSO (2022), *Transport Statistics 2021*, Transport-publication2022.pdf, Table 3.2.18.

receptors located along the route where the increase in AADT due to the Scheme site is the highest.

26. Air quality will therefore be modelled at the principal air sensitive receptors along the affected road links. Receptors have been selected taking into account the applicability of air quality objectives, as per UK guidance[6]. The receptors are shown in **Table 1** and **Figure 1**. It is noted that although each sensitive receptor is marked as a point on the road, the result of the modelling would be representative of the entire stretch of the road where traffic is constant. Additionally, in selecting the individual points, the distance from the edge of the road was considered, and preference was given to the point located closer to the road centre. Therefore, the receptor points selected are representative of the entire stretch of the road where traffic is constant, and the worst-case in terms of distance from the road has been included.

Table 1: Air sensitive receptors

Point ref. (Figure 1)	Receptor type
SR 1	Bus stop
SR 2	Bus stop
SR 3	Playground
SR 4	Bus stop/Pedestrian bridge
SR 5	Residences
SR 6	Public garden
SR 7	Chapel
SR 8	Football pitch
SR 9	Residences
SR 10	Residences

[6] Defra (2018) *Local Air Quality Management Technical Guidance LAQM.TG16* https://laqm.defra.gov.uk/documents/LAQM-TG16-February-18-v1.pdf (Box 1.1).

Model Output

27. The output of the model, including the urban background, will be presented in tabular format. The expected concentrations at the sensitive receptors without the Scheme and with the Scheme will be specified.

28. The modelled data, added to the urban background, will be compared to the measured data. If necessary, a calibration factor will be applied to the above scenarios to ensure that the predictions match the measured data. Any unexplained discrepancies between the modelled concentration and the baseline concentration will be addressed by a multiplicative adjustment factor as the case may be.

29. Contour plots will also be presented for the NO_2 and PM_{10} annual average predictions, for both the base year and the base year plus 5 year scenarios, with and without the Scheme.

30. To predict the likelihood of the site not being in compliance with the daily exceedances of PM_{10} for both scenarios, if the annual PM_{10} average levels are ≥29 $\mu g/m^3$, this equation provided by ERA will be used:

$$PCT = (1.46 \times CAA) + 0.03$$

where:

- PCT = 90.4th percentile of the daily PM_{10} averages (an indicator of the number of exceedances of the PM_{10} daily limit value); and
- CAA = Annual PM_{10} average (in both the baseline and with Scheme scenarios).

31. For NO_2 it will be assumed that the annual mean is always exceeded before the allowed number of hourly exceedances is reached. Therefore, if the annual mean is not exceeded, it will be assumed that the allowed number of hourly exceedances will not be exceeded either.

Consideration of Cumulative Impacts

32. The ToR require that all planned developments (i.e., those with a permit but not yet operational) in the area of the Scheme site be considered in the air quality study.

33. The traffic generated by any approved major developments affecting the roads in the Area of Study will be included in the baseline scenario.

Impact Significance Criteria

34. The significance criteria in

Table 1 and **Table 2** will be used to assess the significance of impacts arising from traffic

generated by the Scheme on air quality[7].

Table 1: Criteria of significance: NO_2/PM_{10} annual levels

Baseline annual levels of NO_2/PM_{10}	Change in annual NO_2/PM_{10} levels due to Scheme			
	≤0.4 µg/m³	≥0.8 to <2 µg/m³	≥2.4 to <4.0 µg/m³	>4.0 µg/m³
≥44 µg/m³	Moderate	Substantial	Substantial	Substantial
41.2 to 43.6 µg/m³	Moderate	Moderate	Substantial	Substantial
38.0 to 40.8 µg/m³	Slight	Moderate	Moderate	Substantial
30.4 to 37.6 µg/m³	Negligible	Slight	Moderate	Moderate
≤30 µg/m³	Negligible	Negligible	Slight	Moderate

Table 2: Criteria of significance: PM_{10} daily limit exceedances

Baseline PCT[8]	Change in PCT due to Scheme			
	0.5 µg/m³	1.0 to 2.5 µg/m³	3.0 to 5.0 µg/m³	>5.0 µg/m³
≥55 µg/m³	Moderate	Substantial	Substantial	Substantial
51.5 to 54.5 µg/m³	Moderate	Moderate	Substantial	Substantial
47.5 to 51.0 µg/m³	Slight	Moderate	Moderate	Substantial
38.0 to 47.0 µg/m³	Negligible	Slight	Moderate	Moderate
≤37.5 µg/m³	Negligible	Negligible	Slight	Moderate

IMPACT MITIGATION AND MONITORING

35. If adverse impacts are identified, the air quality assessment will outline measures that can be put in place to prevent, minimise and, where possible, offset any significant adverse effects resulting from the Scheme. An outline monitoring programme will also be prepared, should this be required.

36. Should ERA require any modifications or alternatives to the project as a result of adverse impacts, these will be prepared separately.

[7] In additional to these criteria, ERA also provided the recently updated Significance Criteria Tool V1.2 which will be used to verify the significance of impacts (Email dated 28th July 2023 by Nolle Michael).
[8] 90.4th percentile of the daily PM_{10} averages.

Appendix 1: Air Quality Terms of Reference

TERMS OF REFERENCE[1]

FOR THE PREPARATION OF AN

AIR QUALITY STUDY

June 2019 version

TERMS OF REFERENCE FOR AIR QUALITY

Legal background:

Regulation 29 of S.L. 549.59, grants ERA the power to issue guidance notes on the conduction of Air Quality Studies which are required by any Regulations issued under the Environment Protection Act including the EIA Regulations (S.L. 549.46).

Part II of Schedule 7 to S.L. 549.59 sets the following (legally binding limit values): an annual limit value of 40µg/m^3 for PM_{10}, a daily limit value for PM_{10} of 50µg/m^3 which can not be exceeded on more than 35 calendar days (90.4% of the daily readings in a calendar year should be < 50 µg/m^3), an annual limit value 40µg/m^3 for NO_2 and an hourly limit value of 200µg/m^3, which can not be exceeded more than 18 times per calendar year.

Regulations 19 and 20 of S.L. 549.59 give ERA the responsibility to ensure that the above mentioned limits are complied with across Malta and Gozo.

0. **Applicability**

These terms of reference are applicable to all development applications irrespective of whether or not it qualifies for an Environmental Impact Assessment, as long as the expected increase in traffic flows due to the operation of the project is ≥ 1000 passenger cars AADT or ≥ 200 HDV AADT.

The Air Quality study shall be conducted as follows:

a) *The relevant details of the proposed development:* This should include an overview of the expected traffic changes when the project is FULLY operational. The report should also include a brief introduction to the sensitivity of the area to increases in traffic flows and changes in air pollution levels keeping in mind the NO_2 levels registered by the passive diffusion tubes (include in ERA's network) sited closest to the site.

b) *Description of the relevant immission standards with reference to S.L. 549.59.*

c) *The assessment methods*: This section shall include any relevant details on the methods used in order to monitor the base line levels of NO_2 and PM_{10}, including any proof of equivalence to the reference method(s) as applicable (see 2.i and 2.n below). The section

shall also include a part outlining the core details of the model (including version number) being used in order to predict the impact of the development. The consultants shall also include details on all the input data used and its source, including features of the traffic flows used, speeds, apportionment by vehicle type etc.

d) *Site selection*: This section shall include the considerations made by the consultants in the selection of the monitoring site. The consultants shall also show how the selected site matches the site selection criteria in Annex I and the additional criteria Section 2 paragraph k). Prior to the commencement of the monitoring campaign the consultants shall together with the method statement include a map with the GIS location of the sampling point. The map shall include any measurements showing that the selected site complies with points v), vi), vii) and ix) of Annex I.; the identification of any sensitive receptor in an area determined according to the guidelines in point f), below, as well as any available traffic counts for any thoroughfare within this area. The monitoring campaign cannot start unless the site has been approved by ERA. The rationale behind the selection of the sampling site shall be clearly outlined explaining how the site meets all the site selection criteria especially the criterion in Section 2, paragraph k).

e) *Model verification*: Model verification involves a comparison between the predicted and the measured values for both PM_{10} and NO_2. Any errors between modeled and measured values should be adequately corrected. In addition consultants are expected to include estimates of the uncertainties in the traffic flows, vehicle emission factors and background concentrations. Any modeled concentrations should include a cumulative sensitivity analysis for these uncertainties (the effect of each uncertainty should be clearly outlined). The limitations of the model should be clearly stated e.g. the software's inability to model dispersion of air pollutants if the air flow is affected by trees or the inability to model pollutant concentrations in street canyons.

f) *Identification of sensitive receptors*: For the projects in Annex II to this document and within the scope of S.L. 549.46, the consultants will be required through the use of software modeling traffic flows, to delineate the extent of the area affected by increased traffic flows due to the project. Baseline studies may be required for more than one location. Any sensitive receptor within this area shall be clearly identified through the use of a GIS package. For any other project the consultants may do away with the delineation and identify the sensitive receptors within a 3km radius around the site. Sensitive receptors include schools, retirement homes, residential units, hospitals, etc.

g) *Description of the baseline conditions*: This section should include details on location of the points at which the air quality monitoring was carried out, the reason for which this particular site was used, the sampling period, data capture, the scale up factors provided by ERA and if possible a break-up of the base line levels of the pollutant by the source.

h) *Assessment of impact*: Results of the modeling for the "with development" scenario should be clearly set out in tables and also through the use of contour maps (which shall include the sensitive receptors identified in e) above), this should be compared to the "without development" scenario with respect to both the table and the contour map. The comparison between both scenarios shall also be applied to each of the sensitive receptors identified in e) above.

i) *Determination of the significance of the impact*: The table in section 4 (and the tool made available through the ERA website) shall be used for each of the sensitive receptors identified in e) as well as for the modeled concentrations at the site where the monitoring was carried out.

j) *Cumulative impacts*: If in the area there are other planned developments, which have already been granted development consent then the contribution of these developments should also be considered at a point in the future when these are fully operational.

k) *Mitigation measures*: If the effect of the project is substantially adverse or worse, then the report shall include any mitigation measures, which have been identified and, which will reduce the impact of the project to at least slightly adverse. Non-quantifiable measures will not be expected.

l) *Summary of the report*: The report should be written in clear, concise, grammatically correct English. If the English of the report is unacceptable, the report shall be sent to the consultants for correction and ERA will not take any responsibility for any delays in the process.

2. **Base Line Studies**

a) The baseline levels of PM_{10} and NO_2 shall be established through *in-situ* monitoring;

b) Baseline levels of PM_{10} shall be determined using the reference method (EN 12341:2014) for the determination of PM_{10};

c) The consultants should use the reference method for the sampling and measurement of PM_{10};

d) The design criteria for the samplers shall be as per Annex B to the said standard and shall be as per Section IV of Annex IX: EN 12341: 2014;

Inlet Design	Flow rate		Filters
See Section 5.1.2 and Annex A of EN 12341:2014	To a nominal value of 2.3 $m^3.hr^{-1}$ see Section 5.1.5 of EN 12341:2014	The instantaneous value of the flow rate shall be kept within 5% of the nominal value. The volumetric flow rate averaged over the sampling period shall be within 2% of the nominal value, see Section 5.1.5	Circular: such that the diameter of the exposed area through which the sampled air passes is between 34mm and 44mm.

Table 1 design criteria for the samplers.

e) The resolution of the balance used for the weighing of filters sampled using an LVS shall be at least 10 µg, Section 5.2.2 of EN 12341:2014;

f) The filters should be conditioned for at least 48 hours (Section 6.2 of EN12341:2014) at 50% relative humidity (+ or - 5%) with an uncertainty of ≤ 2% RH and at 20 ºC (+ or - 1 ºC) with an uncertainty of ≤ 0.2 ºC, according Table 2, Section 5.2 of EN12341:2014.

g) The filters should be weighed at least twice for concordance (the difference between successive readings shall ≤ 40µg, Section 6.2 of EN12341:2014) with a time lag of at least 12 hours between the two weightings;

h) Flow rates are at ambient volumes not at normalised volumes. The weighing shall take place in the same climate controlled room at the same environmental conditions as in f);

i) Consultants can use alternative sampling and measurement methods if they demonstrate to ERA's satisfaction, equivalence to the above mentioned method under the Maltese air pollution climate. Equivalence shall be determined using the European Commission's method for the determination of equivalence; any other method shall be deemed unacceptable. ERA will accept certificates of equivalence issued by third parties, which have been based on the method herein;

j) Compliance with non-European standards does not satisfy the requirements above;

k) Regarding the siting of the sampler/diffusion tube, the consultant shall submit a method statement indicating the location of the sampler/diffusion tube. The sampling point(s) should not be within the site to be developed or exactly adjacent to it, but should be sited at a location representative of the thoroughfare on which the highest traffic impacts (due to the project) are expected. In addition the consultant is obliged to use all the criteria in Annex I to determine the sampling location. In addition the ERA may at its discretion ask the consultant to change the location of the sampler;

l) The sampling time shall be no less than 6 weeks and extendible by a further 3 weeks depending on the considerations made by the consultants and using the respective penalties in s), below;

m) The consultants shall discard readings influenced by Saharan dust intrusions. These episodes are characterized by a marked spatial consistency, demonstrated by concomitant peaks in the levels of PM_{10} (and $PM_{2,5}$) across the Maltese Islands (see Figure 1 below). The consultants shall use this in conjunction with following two tools to confirm the occurrence of these episodes a) MACC ensemble and b) HYSPLIT back trajectory model.

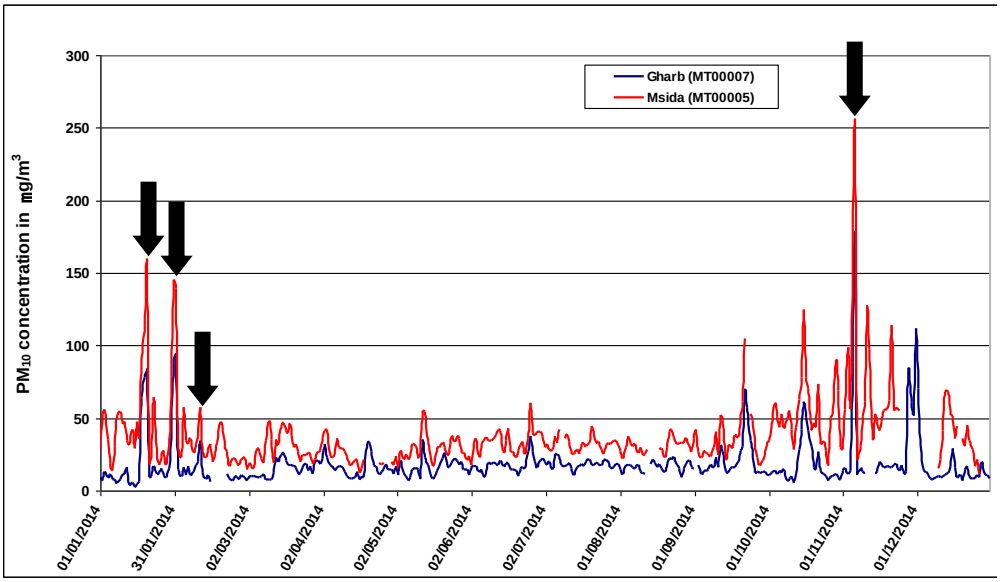


Figure 1: Comparison of the PM_{10} levels in Għarb (blue) to the PM_{10} levels in Msida (red) measured in 2014. The black arrows show some of the Saharan events throughout 2014.

n) The PM_{10} dataset shall in no case consist of <42 or <63 (depending on whether the baseline monitoring period has been set for 6 or 9 weeks) daily readings, excluding any discarded readings.

Baseline levels of NO_2.

o) Baseline levels of NO_2 shall be determined using EN 14211:2005. The consultant may use passive diffusive tubes if it is shown that the latter are equivalent to the reference method.

p) If the consultant opts for passive diffusion tubes, he shall forward at least 1 article in a peer reviewed journal e.g. Pfeffer *et al.* (2010) – *Gefahrsoffe-Reinhalt der Luft. 11-12,* 500-506, which shows that the equivalence of these tubes has been demonstrated for field trials (not exposure chambers) in at least 1 EU Member State. Equivalence should preferably, also have been demonstrated in Malta. The field trial shall include the comparison of at least 40 individual measurements taken throughout a whole calendar year. Equivalence shall be determined using a modification of European Commission's method for the determination of equivalence for PM_{10}; any other method shall be deemed unacceptable

q) The sampling point for NO_2 shall be the same as for PM_{10}.

Annualisation of the 6 (or 9) week averaged values for PM_{10} and NO_2.

r) The factor in l) and p) above shall be based on the use of the following equation (adapted from LAQM TG(16), April 2016 version:

$$CAA = \frac{p_{y+1}^{x\ weeks}}{p_{y}^{x\ weeks}} \times P_{y}^{52\ weeks}$$

Where:
CAA is the corrected annual average;

$p_{y+1}^{x\ weeks}$ is the concentration of NO_2 or PM_{10} measured by the consultants throughout the 6 (9) week (baseline) monitoring period;

$p_{y}^{x\ weeks}$ is the concentration of NO_2 or PM_{10} measured throughout the same 6 (9) week monitoring period of the preceding year at a comparable ERA fixed station; and

$P_{y}^{52\ weeks}$ is the annual average of NO_2 or PM_{10} measured at the comparable ERA fixed station.

Traffic Counts.

a) The consultant shall also take traffic counts at the main junctions near the monitoring site. The number and location of the counters are to be approved by ERA, (unless longer term traffic counts are already available).

b) The traffic count shall take into consideration the vehicle type and the legislation class.

c) The consultant shall use an appropriate model in order to scale the traffic counts obtained during the 6 (or 9) week period to AADT.

3. **Modeling**

a) Once the baseline levels have been obtained the consultant shall determine the impact of the project on air quality through dispersion modeling.

b) The following models are deemed acceptable by ERA:
IMMIS^{em}
BREEZE Roads.
ADMS-Urban

c) The model used should use the logic outlined by e) below,

d) The consultant shall use exclusively the emission factors in the latest version of the Handbook of emission factors for road transport emissions (HBEFA v 3.3). The average age of the Maltese vehicle fleet shall be taken as 13 years.

e) The use of other emission factors is not acceptable.

f) The consultant shall estimate the ambient background levels for both NO_2 and PM_{10}. The approach in Figure 2 below shall be deemed acceptable for both pollutants.

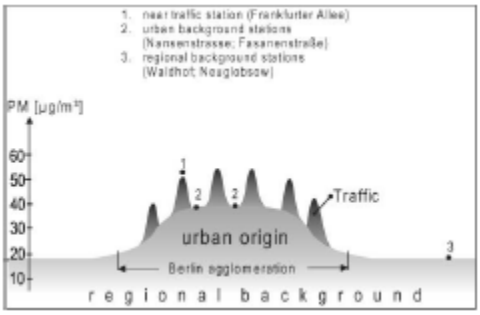


Figure 2: Horizontal profile for PM_{10} concentration, Lenschow *et al.* (2001) – *Atmospheric Environment 35,* 29-33.

g) The rural background can be captured through the use of the EMEP or LOTOS-EUROS model at a resolution of 50km × 50km (The GAINS model might have to be used for emissions data for the EU), the urban background can be captured through the use of a model such as CHIMERE at a resolution of 7km × 7km.

h) The predictions of the model shall be assessed by comparing the modeled data to the monitoring data provided by the baseline studies. The modeled data must not deviate by more than ±20%.

i) Other methods can be used in order to determine the background levels of NO_2 and PM_{10}, including statistical methods aimed at deriving "horizontal profiles" similar to the ones in Figure 1 (see e.g. Gómez-Losada et al., 2016 – *Atmospheric Environment 127*, 255-261) and based on a full year's dataset, interpolation of data from the nearest ERA diffusion tubes, etc.

j) The consultant should clearly explain the rationale behind the determination of the background levels.

k) The consultant shall use the model to project the annual PM_{10} and NO_2 levels into the future, when the project is fully operational taking into account the cumulative impact of projects in the area, which have been granted development consent.

l) The consultant shall model two distinct scenarios: A) without the project and B) with the project.

m) Results shall be displayed as a colour-coded contour map with the modelled annual concentrations of NO_2 and PM_{10} as well as the calculated 90.4^{th} percentiles for the daily PM_{10} levels (calculated using the equation in q) within a 3km radius and especially at the sensitive receptors in point 1e. The position of the sensitive receptors shall be clearly labeled.

n) For the annual averages of NO_2 and PM_{10} as well as for the 90.4^{th} percentile of the PM_{10} levels, the contour maps shall show the situation with the scheme and without the scheme.

o) Contour plots for the 90.4^{th} percentile of the PM10 levels shall include the error in the prediction of this value, which shall be calculated using the equation in q).

p) For the three criteria above the consultants shall also draw colour-coded contour maps expressing the difference in the annual levels/90.4th percentile, between the two scenarios (with and without the scheme) in terms of the significance criteria in 4 b) and 4 c).

q) The minimum acceptable resolution for the model is 50m × 50m and the consultants shall model concentrations at all 50m × 50m grid cells within the area of influence.

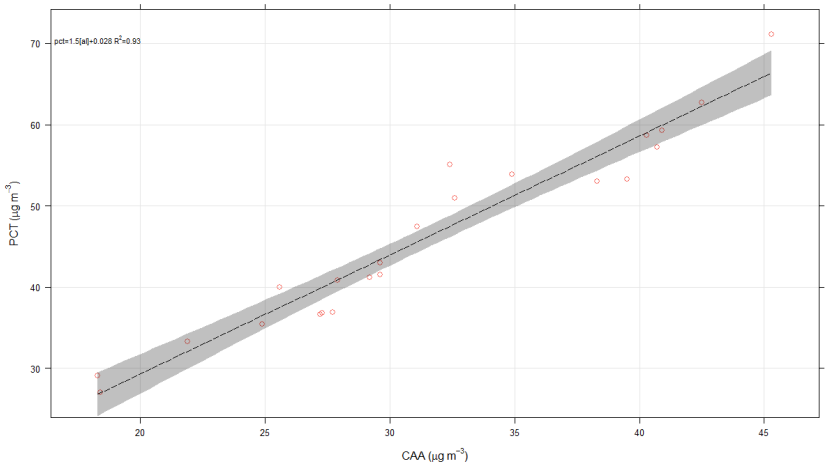


Figure 3: Plot of CAA vs PCT
see e.g. Querol *et al.* (2004) – *Journal of Aerosol Science 35.9*, 1151 – 1172

r) The consultant shall calculate the baseline of the 90.4th percentile of the daily PM_{10} using the following equation:

$$PCT = (1.46 \times CAA) + 0.03$$

Error in PCT or ΔPCT should be calculated using the following equation:

$$\Delta PCT = 3.09 \times \left[1.04 + \frac{(CAA-31.57)^2}{1278.17}\right]^{0.5}$$

The equation for both PCT and ΔPCT shall be updated on a yearly basis by ERA.

The final value of the PCT shall be quoted as PCT (±ΔPCT) µg/m^3.

Where CAA (in µg/m^3) is the average of the 6 (or 9) week monitoring period and corrected to an annual average using a factor, which shall be determined by ERA, PCT is the 90.4th percentile of the daily PM_{10} averages in µg/m^3. The equation above will be modified on a yearly basis by ERA.

s) If PCT > 50 µg/m^3 (error included) then it is likely that the site is not in compliance with the 90.4th percentile criterion.

t) The consultant shall also use the modeled annual levels for PM_{10} (AA) to calculate the PCT due to the project (and the error in the PCT) using the same equation as in n) but substituting AA for CAA.

u) For scaled up annual averages (CAA) <30µg/m^3 (errors included) the consultants will not be obliged to analyse for compliance with the 90.4th percentile criterion.

v) For NO_2 the consultant shall assume that the annual mean is always exceeded before the allowed number of hourly exceedances.

w) Any assumptions must be clearly stated by the consultant.

4. **Significance Criteria**

a) The following criteria of significance (adapted from IAQM's Planning for Air Quality Guidance, January 2017 version) shall be used by the consultant to determine the significance of the impact at all sensitive receptors and at any point within the 3km radius at which the impact of the project on traffic increases is the highest.

b) A significance criteria tool shall be made available on the ERA website, for guidance and interpretative purposes.

c) For annual levels of NO_2/PM_{10} in $\mu g/m^3$.

		Change in the annual NO_2/PM_{10} (dAA) levels due to scheme ($\mu g/m^3$).			
		dAA ≤ 0.4 $\mu g/m^3$	0.8 $\mu g/m^3$ ≤ dAA ≤ 2.0 $\mu g/m^3$	2.4 $\mu g/m^3$ ≤ dAA ≤ 4.0 $\mu g/m^3$	dAA > 4.0 $\mu g/m^3$
CAA for NO_2/PM_{10} ($\mu g/m^3$)	CAA ≥ 44$\mu g/m^3$	MODERATE	SUBSTANTIAL	SUBSTANTIAL	SUBSTANTIAL
	43.6 $\mu g/m^3$ ≤ CAA ≤ 41.2 $\mu g/m^3$	MODERATE	MODERATE	SUBSTANTIAL	SUBSTANTIAL
	40.8 $\mu g/m^3$ ≤ CAA ≤ 38.0 $\mu g/m^3$	SLIGHT	MODERATE	MODERATE	SUBSTANTIAL
	37.6 $\mu g/m^3$ ≤ CAA ≤ 30.4 $\mu g/m^3$	NEGLIGIBLE	SLIGHT	MODERATE	MODERATE
	CAA ≤ 30 $\mu g/m^3$	NEGLIGIBLE	NEGLIGIBLE	SLIGHT	MODERATE

d) For compliance with the 90.4th percentile criterion for PM_{10}.

		Change in the PCT (dPCT) due to scheme ($\mu g/m^3$).			
		dPCT ≤ 0.5$\mu g/m^3$	1.0 $\mu g/m^3$ ≤ dPCT ≤ 2.5 $\mu g/m^3$	3.0 $\mu g/m^3$ ≤ dPCT ≤ 5.0 $\mu g/m^3$	dPCT > 5.0 $\mu g/m^3$
PCT ($\mu g/m^3$)	PCT ≥ 55$\mu g/m^3$	MODERATE	SUBSTANTIAL	SUBSTANTIAL	SUBSTANTIAL
	54.5 $\mu g/m^3$ ≤ PCT ≤ 51.5 $\mu g/m^3$	MODERATE	MODERATE	SUBSTANTIAL	SUBSTANTIAL
	51.0 $\mu g/m^3$ ≤ PCT ≤ 47.5 $\mu g/m^3$	SLIGHT	MODERATE	MODERATE	SUBSTANTIAL
	47.0 $\mu g/m^3$ ≤ PCT ≤ 38.0 $\mu g/m^3$	NEGLIGIBLE	SLIGHT	MODERATE	MODERATE
	PCT ≤ 37.5 $\mu g/m^3$	NEGLIGIBLE	NEGLIGIBLE	SLIGHT	MODERATE

e) Whenever the impact of the project is determined to be "negligible" no further action will be required from the developer.

f) If the impact of the project is classified as "substantially adverse" then ERA will not recommend approval unless the project is modified in such a way (including scaling down) that the significance of the impact is measurably lessened to at least "slightly adverse". In this case a green travel plan will not be considered as sufficient.

g) If the impact of the project is "moderate adverse" then the developer will be asked to modify the project. The modifications can include a green travel plan which has to include specific, measurable[2] and achievable objectives together with their respective implementation time-frames. The developer will be asked to finance at least in part, the implementation of the green travel plan. The implementation of the plan will have to be audited and eventually updated by the developer on a periodic basis. If the green travel plan does not lower the significance of the impact then the developer will we asked to take additional measures, which may include scaling-down the project.

h) If the impact of the project is slightly adverse then the developer will be asked to consider alternatives, which will lessen the impact of the project.

[2] The term measurable in this context means that the green travel plan shall quantify the reduction in the pollutant levels (in $\mu g/m^3$), over the scenario leading to the classification of the impact as "moderately adverse".

Concluding Remarks

a) The air quality study shall consider the **CUMULATIVE** impact of all development taking place and/or which is planned for the site in question irrespective of the number of separate Planning Applications involved.

b) If the applicant-decides to develop a part of the site at some point in the future, then a full air quality study will be requested and this will have to consider the cumulative impact from the whole site, in line with the ERA Guidelines on the issue. This requirement will apply irrespective of the incremental increase in traffic flow as a result of the latter development.

ANNEX I
Site selection Criteria mention in Section 1 d) and in Section k).

i. PM_{10} samplers shall sited at least 500m from:
    a) dust piles;
    b) construction/demolition/excavation sites & quarries;
    c) dirt tracks;
    d) un-asphalted surfaces;
    e) surfaces which are visibly covered with dust; and
    f) any other surface or activity likely to lead to the entrainment of dust
    .

ii. There shall be absolutely no bends in between the PM_{10} sampling head/sampling inlet for NO_2 and the analyser.

iii. The height of the PM_{10} sampling head/sampling inlet for the NO_2 analyser/NO_2 passive diffusive tube shall be ≥1.5m and ≤ 4m above the ground.

iv. For active samplers, the exhaust outlet shall be positioned in such a way that recirculation of the exhaust air to the sampling inlet is avoided.

v. The samplers shall be placed at a point, which is representative of a street segment ≥ 100 m.

vi. The distance of the PM_{10} sampling head/sampling inlet for the NO_2 analyser/NO_2 passive diffusive tubes from the edge of any road junction shall be ≥ 25m.

vii. The PM_{10} sampling head/sampling inlets for the NO_2 analyser/NO_2 passive diffusive tube shall be placed at ≤ 10m from the kerbside.

viii. The flow around the PM_{10} sampling head/sampling inlets for the NO_2 analyser/NO_2 passive diffusive tube shall be unrestricted, without any obstructions in the vicinity of the sampler i.e. free in an arc of at least 270°.

ix. The PM_{10} sampling head/sampling inlets for the NO_2 analyser/NO_2 passive diffusive tube shall in no case be at < 0.5 from the nearest building.

Note: The selection of the site is solely the consultants' responsibility. ERA will not waive the requirement for in situ monitoring due to erroneous readings resulting from poorly chosen monitoring sites. The 6 (or 9) week monitoring period will apply regardless of any time constraint the consultants might have. ERA will therefore not assume responsibility for any delays caused by this issue.

ANNEX II
(Projects identified in section 1f).

Projects falling within the scope of the following categories in Schedule I of LN 412 of 2017 are covered by the article above:

All Section 1 (*General land use*) projects depending on the type of project.

The following projects within Section 2 (*Transport Infrastructure Projects*):

Section 2.1 (*Roads*) - Category I
2.1.1.1;
2.1.1.2.

Section 2.1 (*Roads)* - Category II
2.1.2.1.

All projects in Section 2.2 (*Airports*) irrespective of the Category;

The following projects within Section 6 (*Development on the coast or at sea – including ports*):

Section 6.1 (*Ports, Marinas and Waterways*)
6.1.1.1;
6.1.1.2.

All the projects in Section 7 (*Urban Development and Recreational Projects*), with the exclusion of:

Section 7.1 (*Urban Development Projects*)
7.1.2.2;
7.1.2.3 unless it is accompanied by a Section 2, Section 6 or a Section 7 project ,which is not covered by this exclusion.

Section 7.2 (*Recreational or Sporting Establishments*)
7.2.1.1;
7.2.2.3;
7.2.2.4.

The following projects within Section 12 (Industrial Development)

Section 12.7 (*Industrial Estates*)
12.7.2.1.

Section 13.0 (*Changes or Extensions to approved projects, and reactivation of projects*) on a case by case basis.

Appendix 2: Defining the Area of Study

Objective

A desk study has been carried out to assess the relationship between the increase in AADT and the increase in emissions at the receptors in previous studies.

The objective was to define the increase in AADT at which the impact at receptors is always negligible, with a view to guiding the establishment of the Area of Study. In accordance with ERA guidance, changes of <0.5% of the limit value (i.e. 0.2 $\mu g/m^3$ for NO_2 and PM_{10} annual levels, and <0.3 $\mu g/m^3$ for PM_{10} PCT) are considered negligible.

Method

Several projects carried out by Adi Associates Environmental Consultants Ltd were evaluated; the projects are listed in **Table A1** overleaf.

The method used was as follows:

- The average increase in pollutant concentrations (NO_2 / PM_{10} annual average / PM_{10} daily average) was calculated at all receptors considered in the study. The data considered was for a 15-year vehicle age, and both the base year and base year + 5 years predictions were considered;
- The average increase in AADT (for both the base year, and the base year + 5 years) was also calculated at all receptors;
- The ratio of: average increase in pollutant to average increase in AADT was calculated; and
- Using this ratio, the maximum AADT increase that would cause the pollutant concentration at the receptor to reach the 'negligible' threshold was calculated.

Results

The results are summarised in **Table A1**. This Table shows that NO_2 is the pollutant most sensitive to AADT increases, where an increase of 636 vehicles on average causes a 0.2 $\mu g/m^3$ increase in NO_2 annual average concentration at the sensitive receptors.

Recommendation

Based on this assessment, an AADT of 500 is suggested as a guideline lower threshold when defining the Area of Study; this should be sufficient to identify the worst-case impact in most studies.

It is recommended that the actual Area of Study should, however, be reviewed on a case-by-case basis depending on the context of the specific study (e.g. taking into consideration the existing baseline).

Table A1: AADT at which a negligible increase was observed

PA reference	Project	Base year	Base year + 5 years	AADT at which:		
				NO_2 increase (annual average) is 0.2 µg/m³	PM_{10} increase (annual average) is 0.2 µg/m³	PM_{10} increase (daily average) is 0.3 µg/m³
PA 01892/19	Mercury Towers Phase 2 EIA update	2023	2028	602	1,446	1,531
PA 01191/05	Sliema Townsquare EIA update 2018	2022	2027	852	4,007	4,117
PA 09524/18	Naxxar mixed-use development	2020	2025	742	4,872	5,005
PA 06044/17	Verdala Hotel EIA	2021	2026	494	4,595	4,720
PA 01029/18	Shoreline Smart City EPS	2023	2028	491	3,325	3,416
Average AADT at which there is a negligible increase:				**636**	**3,649**	**3,758**

Appendix 3:

Calibration certificate of LVS

CALIBRATION PROCEDURE

Issued by Joseph Cachia & Son Ltd
Date issued: Tuesday 3rd March 2026

103, Archbishop Street
Valletta
VLT1446
Tel: 2552 9000
www.jcs.com.mt

Customer :	Ensure		
Site :	JCS Workshop		
Equipment calibrated:	Low volume sampler		
Manufacturer:	Comde-Derenda GmbH	Model:	LVS3.1
Serial No:	00850	Software Version:	2.39.001.0001
		Hardware Version:	5.3
Date of calibration:	03rd March 2026		
Re-Calibrate by:	03rd March 2027	Calibration frequency:	12 months

Certified Flow Meter

MesaLabs TetraCal-Ultra– Air flow calibrator

Serial No:	**140657**
Flow Calibration No:	**140657-09122024**
Temperature Reference Primary standard:	**EUTECHNICS S/N: 358921 NIST**
Pressure Reference Primary standard:	**Vaisala PTB330(50-1100) S/N: H0850001**
	Cal. Cert. Date 09 DEC 2024

Calibration Procedure

PREPARATIONS FOR THE CALIBRATION PROCESS

A reference volume-meter (dry gas meter or lab-rotameter) must be connected to the air intake at the device using a hose connection.

Temperature and Pressure Sensors Calibration:

Service Menu

The **Service** menu is used primarily to check the sensors and for adjustment and maintenance work carried out by service technicians. This menu will not usually be used in normal operations. You access the **Service** menu from the main screen by selecting Setup → Service.

Shown in the **Service** menu are all measured values reported by the unit's sensors together with the corresponding correction parameters. Here it is also possible to check the pump's motor under manual control of the pump.

Calibrating the individual sensors (temperature, air pressure and relative humidity) requires the *PST* software and an external PC. *Please contact the Comde-Derenda GmbH for further information in this regard.*

CALIBRATION PROCEDURE

Flow Calibration:

In order to access the **Administrator** settings it is necessary first to select Administrator in the **Setup** menu and then to enter the administrator password, digit by digit, and to confirm the entry by selecting OK and pressing on the jog dial. Then you can make the settings described below in the administrator menu. The password set at the factory is "0000".

The Device Adjustment menu enables authorized service technicians to make changes to specific system settings. This menu is protected by a special password.

Prior to starting the calibration procedure, allow the system to warm up by selecting a sampling duration of 15 min in the TIME mode menu. Then proceed as follows:

1. Remove the sampling inlet, the filter holder and the air intake tube by proceeding in the reverse order of the assembling process (see 4.2).

2. Connect the reference flow meter to the air intake opening using the respective hose.

3. *In the main menu, select Setup and confirm by pressing the jog dial.*

4. In the setup menu, select Kalib. Daten and confirm.

5. In the administrator menu, enter code "0000", select OK and confirm.
You will then see the **calibration menu**, in which the currently valid data for 6 calibration points with different flow rates (depending on model) are shown. To accurately calibrate the flow sensor, it will be necessary to check and adjust the settings for all 6 calibration points as described below.

6. Select manually and confirm (Fig. 29).

7. Check the values shown for air temperature (**TLuft**) and atmospheric pressure (**Pa**) at the lower right part of the screen. If these differ from the values indicated by the calibrated reference instrument by more than 2 K resp. 4 mbar, then the temperature and/or pressure sensors will first have to be calibrated or adjusted.

8. Select the first line, KF-Blende 1:, and confirm.

9. Observe the indicator on the external flow meter and adjust the pump motor speed, if necessary, by turning the jog dial until the reading on the flow meter matches the reading under **[V] soll**.

10. When the correct value has been reached, press the jog dial for approx. 2-3 seconds to confirm the motor speed setting (the message "**saved**" will flash at the bottom of the screen).

11. Repeat steps 8 through 10 for all 5 remaining calibration points.

12. After having adjusted the motor speed settings for all 6 volume flow rates, select Ready and confirm to save the settings.

13. Select and confirm back twice to return to the main menu

CALIBRATION PROCEDURE

After finishing the calibration procedure, it is necessary to execute a test run in order to check the settings. To do so, start a sampling cycle in the TIME operating mode and check to see whether the value indicated by the external flow meter corresponds to the flow rates set. If there are discrepancies between the values, then the calibration procedure will have to be repeated.

Set Flow Rate (m^3/h)	Expected Flow Rates (Qa lpm)
1.0	16.666
1.5	25.000
2.0	33.333
2.3	38.333
3.0	50.000

Calibration settings

Set Flow Rate (m^3/h)	Expected Flow Rates (Qa lpm)	Display Reading of Flow calibrator (Qa lpm)	Deviance from set point %	Less than 5% deviation
1.0	16.666	16.67	0.060006	TRUE
1.5	25.000	24.98	0.080032	TRUE
2.0	33.333	33.39	0.179856	TRUE
2.3	38.333	38.25	0.208932	TRUE
3.0	50.000	49.99	0.020002	TRUE

CALIBRATION PROCEDURE

Calibration carried out by:

Name Steve Mallia Signature

This calibration report applies only to the item calibrated
This report may not be reproduced without the permission of Joseph Cachia & Son Ltd

MIXED USE OUTLET VILLAGE, KIRKOP

CULTURAL HERITAGE METHOD STATEMENT

INTRODUCTION

1. This method statement outlines the methodology for the cultural heritage input to the Environmental Impact Assessment (EIA) Report for PA/02825/25: *To demolish an existing construction yard and built structures, proposed oversite excavation to accommodate the construction of a commercial car park, supermarket, a mixed use outlet village (consisting of class 2A medical, class 3C sport centre, class 4A offices, class 4B retail, class 4C coffee shops, class 4D restaurants, bank) and three-stars Hotel having 120 rooms. Site at Elbros Concrete Ltd., Triq l-Industrija c/w, Triq il-Madonna Tad-Dawl, Kirkop*. The development is hereinafter referred to as 'the Scheme'.

TERMS OF REFERENCE

2. The Terms of Reference provided by the Environment & Resources Authority (ERA) are:

3.0 A DESCRIPTION OF THE SITE AND ITS SURROUNDINGS (I.E. ENVIRONMENTAL BASELINE)

The existing environmental features, characteristics and conditions, in and around the proposed development site as well as in all locations likely to be affected by the development or by ancillary interventions and operations, are to be identified and described in sufficient detail, with particular attention to the aspects elaborated further in the next sections.

The consultants should also identify (and justify) wherever relevant:

1. The geographic area (e.g. viewshed or other area of influence) that needs to be covered by each study;
2. The relevant sensitive receptors vis-à-vis the environmental parameter under consideration (e.g. residential communities, other users, natural ecosystems, specific populations of particular species, or individual physical features);
3. The location of the reference points or stations (e.g. viewpoints, monitoring stations, or sampling points (including depth of multiple sampling points at a single sampling point in the case of water media and sediment, where applicable) to be used in the study; and
4. Other methodological parameters of relevance, also noting that the assessment will normally require both desk-top studies and on-site investigations (including visual observations and sampling, as relevant).

Note: It is recommended that these details are discussed in advance with the ERA prior to commencement of the relevant parts of the studies, in order to pre-empt (as much as possible) later-stage issues.

Wherever relevant to the environmental aspects under discussion, reference to legislation, policies, plans (including programmes and strategies) standards and targets, should also be made, such that the compatibility (or otherwise) of the proposal therewith is also factored into the assessment required by Section 4 below. The discussion should cover the following aspects, in the appropriate level of detail:

- Supra-national (e.g. European Union; United Nations; or other international or regional) legislation, directives, policies, conventions, protocols, treaties, charters, plans and obligations;
- National legislation, policies and plans (e.g. Structure Plan; National Environment Policy); and
- Sub-national legislation, policies and plans (e.g. local plans, site-specific regulations, action plans, management plans, and protective designations such as scheduling or Natura 2000).

Note: In addition to already in-force legislation, policies and plans, the discussion should also cover any foreseeable future updates (or new legislation, policies and plans) likely to be fulfilled, affected or compromised by the proposed project. Furthermore, it should be noted that some cross-cutting legal/policy instruments (e.g. Water Framework Directive and Marine Strategy Framework Directive) may need to be factored into more than one aspect of the discussion.

3.5 Architectural, Archaeological, Historical & Cultural Heritage and related Material Assets

Refer to Appendix 2.

4.0 ASSESSMENT OF ENVIRONMENTAL IMPACTS AND ENVIRONMENTAL RISKS

All likely significant effects and risks posed by the proposed project on the environment during all relevant phases (including construction/excavation/demolition, operation and decommissioning) should be assessed in detail, taking into account the information emerging from Sections 1, 2 and 3 above. Apart from considering the project on its own merits (i.e. if taken in isolation), the assessment should also take into account the wider surrounding context and should consider the limitations and effects that the surrounding environmental constraints, features and dynamics may exert on the proposed development, thereby identifying any incompatibilities, conflicts, interferences or other relevant implications that may arise if the project is implemented.

In this regard, the assessment should address the following aspects, as applicable for any category of effects or for the overall evaluation of environmental impact, addressing the worst-case scenario wherever relevant:

1. An exhaustive identification and description of the envisaged impacts;

2. The magnitude, severity and significance of the impacts;

3. The geographical extent/range and physical distribution of the impacts, in relation to: site coverage; the features located in the site surroundings; whether the impacts are short-, medium- or long-range; and any transboundary impacts (i.e. impacts affecting other countries);

4. The timing and duration of the impacts (whether the impact is temporary or permanent; short-, medium- or long-term; and reasonable quantification of timeframes);

5. Whether the impacts are reversible or irreversible (including the degree of reversibility in practice and a clear identification of any conditions, assumptions and pre-requisites for reversibility);

6. A comprehensive coverage of direct, indirect, secondary and cumulative impacts, including:

    - interactions (e.g. summative, synergistic, antagonistic, and vicious-cycle effects) between impacts;
    - interactions or interference with natural or anthropogenic processes and dynamics;
    - cumulation of the project and its effects with other past, present or reasonably foreseeable

developments, activities and land uses and with other relevant baseline situations; and

- wider impacts and environmental implications arising from consequent demands, implications and commitments associated with the project (including: displacement of existing uses; new or increased pressures on the environment in the surroundings of the project, including pressures which may be exacerbated by the proposal but of which effects may go beyond the area of influence; and impacts of any additional interventions likely to be triggered or necessitated by situations created, induced or exacerbated by the project);

7. Whether the impacts are adverse, neutral or beneficial;

8. The sensitivity and resilience of resources, environmental features and receptors vis-à-vis the impacts;

9. Implications and conflicts vis-à-vis environmentally relevant plans, policies and regulations;

10. The probability of the impacts occurring; and

11. The techniques, methods, calculations and assumptions used in the analyses and predictions, and the confidence level/limits and uncertainties vis-à-vis impact prediction.

The impacts that need to be addressed are detailed further in the sub-sections below.

4.1 Effects on the environmental aspects identified in Section 3

The assessment should thoroughly identify and evaluate the impacts and implications of the project on all the relevant environmental aspects identified in Section 3 above, also taking into account the various considerations outlined in the respective sections.

With regard to Section 3.4, the ecological status of the area in question is to be evaluated, taking into consideration the definition of status by relevant EU Policy, and assessing the extent to which the project will cause deterioration in status or compromise the achievement of good status in line with Article 4(7) of the EU Water Framework Directive.

5.0 REQUIRED MEASURES, IDENTIFICATION OF RESIDUAL IMPACTS, AND MONITORING PROGRAMME

5.1 Mitigation Measures

A clear identification and explanation of the measures envisaged to prevent, eliminate, reduce or offset (as relevant) the identified significant adverse effects of the project during all relevant phases including construction, operation and decommissioning [see ***Section 1.2.3*** above].

As a general rule, mitigation measures for construction-phase impacts should be packaged as a holistic Construction Management Plan (CMP). Whilst the detailed workings of the CMP may need to be devised at a later stage (e.g. after the final design of the project has been approved and/or after a contractor has been appointed), the key parameters that the CMP must adhere to for proper mitigation need to be identified in the EIA. Broadly similar considerations also apply vis-à-vis operational-phase impacts [which may need to be mitigated through an operational permit] and decommissioning-phase impacts [see ***Section 5.4*** below], where relevant.

Mitigation measures for accident/risk scenarios should be packaged as a holistic plan that includes the integration of failsafe systems into the project design as well as well-defined contingency measures.

The recommended measures should be feasible, realistically implementable to the required standards

and in a timely manner, effective and reliable, and reasonably exhaustive. They should not be dependent on factors that are beyond the developer's and ERA's control or which would be difficult to monitor, implement or enforce. The actual scope for, and feasibility of, effective prevention or mitigation should also be clearly indicated, also identifying all potentially important pre-requisites, conditionalities and side-effects.

5.2 Residual Impacts

Any residual impacts [i.e. impacts that cannot be effectively mitigated, or can only be partly mitigated, or which are expected to remain or recur again following exhaustive implementation of mitigation measures] should also be clearly identified.

5.3 Additional Measures

Compensatory measures (i.e. measures intended to offset, in whole or in part, the residual impacts) should also be identified, as reasonably relevant. Such measures should be not considered as an acceptable substitute to impact avoidance or mitigation.

If the assessment also identifies beneficial impacts on the environment, measures to maximise the environmental benefit should also be identified.

In both instances, the same practical considerations as indicated vis-à-vis mitigation measures should also apply.

5.5 Monitoring Programme

A realistic and enforceable programme for effective monitoring of those works envisaged to have an adverse or uncertain impact. The monitoring programme should include:

1. Details regarding type and frequency of monitoring and reporting, including spot checks;
2. The parameters that will be monitored, and the monitoring indicators to be used;
3. An effective indication of the required action to address any exceedances, risks, mitigation failures or non-compliances for each monitoring parameter;
4. An evaluation of forecasts, predictions and measures identified in the EPS; and
5. An indication of the nature and extent of any additional investigations (including EIAs or ad hoc detailed investigations, if relevant) that may be required in the event of any contingencies, unanticipated impacts, or impacts of larger magnitude or extent than predicted.

The programme should address all relevant stages, as follows:

(a) Where relevant, monitoring of preliminary on-site investigations that may entail significant disturbance or damage to site features (e.g. geological sampling or any works that require prior site clearance);

(b) Monitoring of the construction phase, including the situation before initiation of works (including site clearance), during appropriate stages of progress, and after completion of works;

(c) Monitoring of the operational phase, except where otherwise directed by ERA (e.g. where monitoring would be more appropriately integrated into an operating permit); and

(d) Where relevant, monitoring of the decommissioning phase, including the situation before initiation of works, during appropriate stages of progress, and after completion of works.

Note on Sections 5.1 to 5.6 above:

The expected effects, the proposed measures, the residual impacts, the proposed monitoring etc.

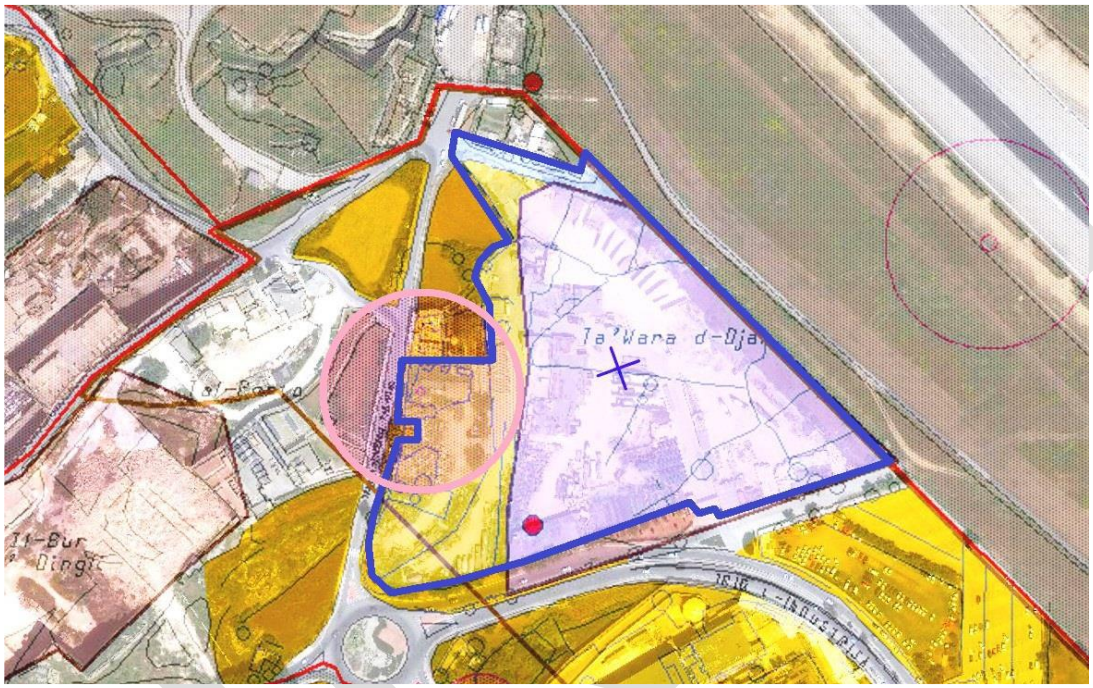
should also be summarised in a user-friendly itemised table that enables the reader to easily relate the various aspects to each other. An indicative specimen table is attached in ***Appendix 3***.

APPENDIX 2: TERMS OF REFERENCE FOR A CULTURAL HERITAGE ASSESSMENT

1.0 Preamble

The proposal involves a large-scale development within an area that is characterised by its archaeological sensitivity and partly overlapping with an archaeological constraint as designated in the South Malta Local Plan. Other cultural heritage features are located in the vicinity and surroundings of the site in question.

The EIA is to explore potential impacts that may occur within the project's site footprint and beyond, including direct impacts on the known archaeology in the area.



The site in question marked in blue, in relation to the archaeological constraint in the South Malta Local Plan marked in pink.

2.0 Scope and Definitions of the EIA

For the purposes of this document, cultural heritage is defined by **Article 2** of the **Cultural Heritage Act 2002 (as amended) (CAP 445)** This includes movable or immovable objects of artistic, architectural, historical, archaeological, ethnographic, palaeontological, and geological importance.

The **Cultural Heritage Act (Art. 2**) specifically includes the landscape within the definition of cultural heritage.
The study area shall include:
The development site and its immediate surroundings, with particular attention to the already mentioned archaeologically sensitive areas.

In the context of this application, cultural heritage considerations may include known and potential archaeological features of importance within the site footprint and in the surrounding area.

The above cultural heritage definitions and considerations are not to be considered as exhaustive. The EIA must consider all other forms of cultural heritage, both known and unknown.

The Environmental Impact assessment will:
Identify and determine whether the proposed development is likely to cause any adverse effects on the already mentioned recorded and potential archaeological features.

3.0 Methodology

In quantifying the cultural heritage assets within the study area, and assessing the impacts of the proposed development, the EIA will undertake:

A study of the possible negative effects of the proposed interventions on archaeological features in the area.

Proposals for mitigation measures, including Archaeological investigations and Archaeological monitoring of works

4.0 Authorisation by the Superintendence of Cultural Heritage

As per **Cultural Heritage Act 2002 (as amended) (CAP 445),** any form of investigation or prospection required for the identification of cultural heritage (including excavation, field walking, topographic surveys and remote sensing) may only be undertaken by the Superintendence of Cultural Heritage or with its written approval

FINAL

PROTECTIVE INVENTORY OF THE MALTESE CULTURAL HERITAGE HERITAGE DATA CAPTURE SHEET		Ref. No.

Location	Category	Type	Site Location (Address)
Eastings	Northings	Feature	Period - Year

S.S. No. 1	S.S. No. 2	Description
S.S. No. 3	S.S. No. 4	
Date		
Negative No.	Film No.	
Present Utilization		

Existing Legal Protection	GN. Number	GN. Date

Comments

Buffer Zone	A	B	C	D	E	Others
Eastings						
Northings						

Site Map

Scale 1 : 2500

Archaeological Characteristics – Sketch/Scaled drawings:	
Condition:	Degree of Protection (Structure Plan policies UCO7 or ARC 2):
State of Security:	Proposed Utilization:
Basic Bibliography:	

Compiled by:	Revised by:
Checked by:	Checked by:
Date:	Date:

FINAL

APPENDIX 3: SPECIMEN IMPACT TABLE

Impact type and source			**Impact receptor**		**Effect & scale**							**Probability of impact occurring** (Inevitable, Likely, Unlikely, Remote, Uncertain)	**Overall impact significance**	**Proposed mitigation measures**	**Residual impact significance**	**Other requirements** (monitoring, authorisations, etc)
Impact type	**Specific intervention leading to impact**	**Project phase** (construction/ operation/ decommissioning)	**Receptor type**	**Sensitivity toward impact**	**Direct/ Indirect/ Cumulative**	**Beneficial/ Adverse**	**Severity**	**Physical / geographic extent of impact**	**Short-/medium- / long-term**	**Temporary** (indicate duration)**/ Permanent**	**Reversible** (indicate ease of reversibility) **/ Irreversible**					

[Insert definition of relevant criteria used to describe the impacts]

AREA OF INFLUENCE

3. **Figure 1** illustrates the Area of Influence (A of I) for the cultural heritage study.

ASSESSMENT METHODOLOGY

Methodology

4. The cultural heritage study will comprise:

- A baseline survey of the cultural heritage assets (artistic, architectural, historical, archaeological, ethnographic assets) and an evaluation of their importance;
- An assessment of the impact of the construction and operation of the Scheme on the cultural heritage assets and an evaluation of the significance of these effects;
- Input to the design and operational plan for the Scheme to minimise potential adverse impacts on the cultural heritage assets; and
- A description of mitigation measures designed to minimise adverse impacts on cultural heritage.

Literature Search

5. A literature search in relation to previous survey work relevant to the A of I will be undertaken; this will include a review of existing literature, old manuscripts, and reports of earlier discoveries, a study of toponomy, and other material, as relevant. This information, together with the Consultants' knowledge of the area, will provide a context for the baseline surveys.

Mapping

6. A physical survey will be undertaken, to identify, inspect, record, and map all existing visible man-made features within the A of I. No excavation or activities other than those described herein will be undertaken. The results of the survey will be provided in the form of data cards, as prescribed by the ToR. Each feature will be individually identified with a consecutive numbered reference.

Evaluation

7. Based on literature searches, on the Consultants' previous knowledge of the survey area, and on the findings of the physical survey, the conservation importance of each of the identified features will be established by reference to appropriate legislation, standards, and guidance. These will include the *Structure Plan for the Maltese Islands* 1992[1], the relevant environmental and planning legislation, and the *Cultural Heritage*

[1] The *Structure Plan for the Maltese Islands 1992* has been superseded by the *Strategic Plan for the Environment and Development 2015* (SPED); however, the SPED does not outline policy guidance for cultural heritage in the level

Act 2002.

IDENTIFICATION OF POTENTIAL IMPACTS

8. The sensitive cultural heritage receptors will be identified as part of the baseline survey. An assessment of the potential impact will be made in accordance with the ToR.

9. The potential impacts of the Scheme during construction include loss of features through land take up, damage to features, and alteration or degradation of the quality of the setting of the features. The features may be further degraded during the operation of the Scheme.

PREDICTION OF IMPACTS

10. Each of the identified potential impacts will be examined. The survey information will be entered into a Geographical Information System (GIS); this system will enable the mapping of features / areas of cultural heritage importance that could be lost or affected during the construction and operation of the Scheme.

IMPACT SIGNIFICANCE

11. The significance of the impact(s) will include:

- Description of impact;
- Policy importance of impact (Local, National, International);
- Extent of effect;
- Duration of impact (temporary / permanent);
- Adverse or beneficial impact;
- Reversible / irreversible impact;
- Sensitivity of the cultural heritage receptor to the identified impacts;
- Probability of impact occurring (certain, likely, uncertain, unlikely, remote); and
- Scope for mitigation / enhancement (very good, good, none).

12. The significance of impacts on cultural heritage is dependent upon the importance assigned to each of the cultural heritage features, either through legislation or by the

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of detail that it was outlined in the SPED. In the absence of specific policy guidance, and specifically in respect of the classification of cultural heritage features, reference was made to the Structure Plan.

Consultants, and to the degree of disturbance or damage likely to arise from the construction and / or operation of the Scheme.

13. A summary of the significance of the impact will be judged in terms of whether the impact is considered to be **not significant**, of **minor significance**, or of **major significance**. The assessment criteria applicable in relation to determining the significance levels are described in **Table 1**.

Table 1: Impact Significance Criteria

Potential damage or destruction to features / Class or grade of cultural heritage feature	**Cultural significance**			
	Major Class / Grade A / 1	**Medium Class / Grade B / 2**	**Minor Class / Grade C / 3**	**None / not graded**
No material change to the cultural heritage feature	Not significant	Not significant	Not significant	Not significant
Small scale changes to the cultural heritage feature (i.e. alterations), which are unlikely to affect the integrity of the feature	Major	Minor	Minor	Not significant
Loss of, or disturbance to, the cultural heritage feature which is likely to affect the integrity of the feature	Major	Major	Minor	Not significant

IMPACT MITIGATION AND MONITORING

14. The scope for mitigation will be identified, and the need for monitoring of cultural heritage features will be addressed in the EIA Report.

Figure 1: Area of Influence for Cultural Heritage Study

Cultural Heritage Method Statement

Legend

Site boundary

Proposed area of influence

Proposed Mixed Use Outlet Kirkop

Map by:

Adi ASSOCIATES

Client: Qormi Construction Ltd
Ref: QCL007
Date: 1 / 2026

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P:\Mapping\Adi\EIA\QCL007 - Kirkop Outlet Village

MIXED USE OUTLET VILLAGE, KIRKOP

LANDSCAPE AND VISUAL AMENITY METHOD STATEMENT

INTRODUCTION

1. This method statement outlines the methodology for the visual amenity and landscape impact assessment as part of the Environmental Impact Assessment (EIA) for PA/02825/25: *To demolish an existing construction yard and built structures, proposed oversite excavation to accommodate the construction of a commercial car park, supermarket, a mixed use outlet village (consisting of class 2A medical, class 3C sport centre, class 4A offices, class 4B retail, class 4C coffee shops, class 4D restaurants, bank) and three-stars Hotel having 120 rooms. Site at Elbros Concrete Ltd., Triq l-Industrija c/w, Triq il-Madonna Tad-Dawl, Kirkop*. The development is hereinafter referred to as 'the Scheme'.

TERMS OF REFERENCE

2. The Terms of Reference provided by the Environment & Resources Authority (ERA) are:

3.0 A DESCRIPTION OF THE SITE AND ITS SURROUNDINGS (I.E. ENVIRONMENTAL BASELINE)

The existing environmental features, characteristics and conditions, in and around the proposed development site as well as in all locations likely to be affected by the development or by ancillary interventions and operations, are to be identified and described in sufficient detail, with particular attention to the aspects elaborated further in the next sections.

The consultants should also identify (and justify) wherever relevant:

1. The geographic area (e.g. viewshed or other area of influence) that needs to be covered by each study;
2. The relevant sensitive receptors vis-à-vis the environmental parameter under consideration (e.g. residential communities, other users, natural ecosystems, specific populations of particular species, or individual physical features);
3. The location of the reference points or stations (e.g. viewpoints, monitoring stations, or sampling points (including depth of multiple sampling points at a single sampling point in the case of water media and sediment, where applicable) to be used in the study; and
4. Other methodological parameters of relevance, also noting that the assessment will normally require both desk-top studies and on-site investigations (including visual observations and sampling, as relevant).

Note: It is recommended that these details are discussed in advance with the ERA prior to commencement of the relevant parts of the studies, in order to pre-empt (as much as possible) later-stage issues.

Wherever relevant to the environmental aspects under discussion, reference to legislation, policies, plans (including programmes and strategies) standards and targets, should also be made, such that the compatibility (or otherwise) of the proposal therewith is also factored into the assessment required

by Section 4 below. The discussion should cover the following aspects, in the appropriate level of detail:

- Supra-national (e.g. European Union; United Nations; or other international or regional) legislation, directives, policies, conventions, protocols, treaties, charters, plans and obligations;
- National legislation, policies and plans (e.g. Structure Plan; National Environment Policy); and
- Sub-national legislation, policies and plans (e.g. local plans, site-specific regulations, action plans, management plans, and protective designations such as scheduling or Natura 2000).

Note: In addition to already in-force legislation, policies and plans, the discussion should also cover any foreseeable future updates (or new legislation, policies and plans) likely to be fulfilled, affected or compromised by the proposed project. Furthermore, it should be noted that some cross-cutting legal/policy instruments (e.g. Water Framework Directive and Marine Strategy Framework Directive) may need to be factored into more than one aspect of the discussion.

3.2 Landscape Character and Visual Amenity

3.2.1 Landscape Character

The study should describe the landscape-related area of influence and landscape setting of the proposed site, identifying the component character areas and local landscape tracts, and the landscape elements, characteristics and degree of sensitivity thereof, so as to enable the prediction and assessment of:

- The changes to the landscape attributable (in full or in part) to the proposed development;
- The implications of such changes on the quality and perception of the landscape and its elements, in each of the identified landscape character areas and local landscape tracts; and
- The effects of such changes on relevant receptors (the receptors should also be duly identified and their degree of sensitivity should also be indicated and justified).

Reference should also be made to the '*Draft Landscape Assessment Study, 2004*,' and to the *Guidelines for Landscape and Visual Impact Assessment (The Landscape Institute & IEMA*), as relevant.

3.2.2 Visual Amenity

The following need to be identified and submitted for prior ERA approval:

- The Zone of Theoretical Visibility (ZTV; also known as Zone of Visual Influence) of the site and the development under consideration; and
- Assessment viewpoints representative of short-, medium- and long-distance views towards the site. A baseline photograph taken from each proposed viewpoint is also required. The submission should cover all the important views of the site, whilst avoiding the inclusion of superfluous or inappropriate viewpoints (e.g. positions from which the site is not visible, or where the view is obstructed or dominated by physical obstacles in the foreground).

Thereafter, for each approved viewpoint, the projected situation and appearance of the site (i.e. as it would look with the proposed development in place) should be compared to the current baseline situation (i.e. without the proposed development). The following should be predicted and assessed accordingly:

- The expected changes to visual amenity as a result of the proposed development;
- The effects of such changes on the quality of the visual amenity of the site; and
- The effects of such changes on relevant receptors. (The receptors should also be duly identified and their degree of sensitivity should also be indicated and justified).

Note: The baseline photographs and the photomontages should, unless otherwise directed by ERA, satisfy the following:

(a) The location of each viewpoint should be shown on a map that also depicts the viewshed for the proposed site as described above. The visual angle of the photograph should also be indicated and should not be greater than 50°. Stitched photos that illustrate the field of vision towards the site from each viewpoint are acceptable as long as they are additional to the 50-degree photograph.

(b) The photographs and photomontages submitted should:

- *Be at least A3 in size. Strips which are A3 in width but not in length are not appropriate except as supplementary illustrative material;*
- *Include the date and time at which the photo was taken;*
- *Be of good quality, with faithful reproduction approximating as much as reasonably possible what would normally be visible to the naked eye. The photos should be taken in good weather, and should be taken at least 2 hours after sunrise and 2 hours before sunset. Colours should not be digitally or otherwise manipulated. As a guideline, the image should have a printing density of 200 dots per inch or better. In some instances, digital images having a resolution of 1024 x 728 or better may be required for multimedia presentation purposes;*
- *Be taken in such a manner that near-field objects do not overpower or dominate features near the image plane passing through the project area;*
- *Be taken from a height above ground level that is representative of the eye level of the viewer, and such height should be duly documented; and*
- *Ensure that all additional/replacement structures and features depicted in the photomontages have a scale which proportionately tallies with the existing nearby features.*

(c) Wherever relevant, the photomontage(s) should cover the following scenarios:

- *The development without the proposed landscaping scheme, representing the worst-case scenario;*
- *The development complete with the proposed landscaping scheme as it is expected to look when the trees reach maturity, also providing an indicative timeframe as to when such maturity is expected to be attained; and*
- *(where relevant in relation to impact of nocturnal lighting) the development and its ancillary lighting as it would appear during night-time.*

4.0 ASSESSMENT OF ENVIRONMENTAL IMPACTS AND ENVIRONMENTAL RISKS

All likely significant effects and risks posed by the proposed project on the environment during all relevant phases (including construction/excavation/demolition, operation and decommissioning) should be assessed in detail, taking into account the information emerging from Sections 1, 2 and 3 above. Apart from considering the project on its own merits (i.e. if taken in isolation), the assessment should also take into account the wider surrounding context and should consider the limitations and effects that the surrounding environmental constraints, features and dynamics may exert on the

proposed development, thereby identifying any incompatibilities, conflicts, interferences or other relevant implications that may arise if the project is implemented.

In this regard, the assessment should address the following aspects, as applicable for any category of effects or for the overall evaluation of environmental impact, addressing the worst-case scenario wherever relevant:

1. An exhaustive identification and description of the envisaged impacts;

2. The magnitude, severity and significance of the impacts;

3. The geographical extent/range and physical distribution of the impacts, in relation to: site coverage; the features located in the site surroundings; whether the impacts are short-, medium- or long-range; and any transboundary impacts (i.e. impacts affecting other countries);

4. The timing and duration of the impacts (whether the impact is temporary or permanent; short-, medium- or long-term; and reasonable quantification of timeframes);

5. Whether the impacts are reversible or irreversible (including the degree of reversibility in practice and a clear identification of any conditions, assumptions and pre-requisites for reversibility);

6. A comprehensive coverage of direct, indirect, secondary and cumulative impacts, including:

    - interactions (e.g. summative, synergistic, antagonistic, and vicious-cycle effects) between impacts;
    - interactions or interference with natural or anthropogenic processes and dynamics;
    - cumulation of the project and its effects with other past, present or reasonably foreseeable developments, activities and land uses and with other relevant baseline situations; and
    - wider impacts and environmental implications arising from consequent demands, implications and commitments associated with the project (including: displacement of existing uses; new or increased pressures on the environment in the surroundings of the project, including pressures which may be exacerbated by the proposal but of which effects may go beyond the area of influence; and impacts of any additional interventions likely to be triggered or necessitated by situations created, induced or exacerbated by the project);

7. Whether the impacts are adverse, neutral or beneficial;

8. The sensitivity and resilience of resources, environmental features and receptors vis-à-vis the impacts;

9. Implications and conflicts vis-à-vis environmentally relevant plans, policies and regulations;

10. The probability of the impacts occurring; and

11. The techniques, methods, calculations and assumptions used in the analyses and predictions, and the confidence level/limits and uncertainties vis-à-vis impact prediction.

The impacts that need to be addressed are detailed further in the sub-sections below.

4.1 Effects on the environmental aspects identified in Section 3

The assessment should thoroughly identify and evaluate the impacts and implications of the project on all the relevant environmental aspects identified in Section 3 above, also taking into account the

various considerations outlined in the respective sections.

With regard to Section 3.4, the ecological status of the area in question is to be evaluated, taking into consideration the definition of status by relevant EU Policy, and assessing the extent to which the project will cause deterioration in status or compromise the achievement of good status in line with Article 4(7) of the EU Water Framework Directive.

5.0 REQUIRED MEASURES, IDENTIFICATION OF RESIDUAL IMPACTS, AND MONITORING PROGRAMME

5.1 Mitigation Measures

A clear identification and explanation of the measures envisaged to prevent, eliminate, reduce or offset (as relevant) the identified significant adverse effects of the project during all relevant phases including construction, operation and decommissioning [see ***Section 1.2.3*** above].

As a general rule, mitigation measures for construction-phase impacts should be packaged as a holistic Construction Management Plan (CMP). Whilst the detailed workings of the CMP may need to be devised at a later stage (e.g. after the final design of the project has been approved and/or after a contractor has been appointed), the key parameters that the CMP must adhere to for proper mitigation need to be identified in the EIA. Broadly similar considerations also apply vis-à-vis operational-phase impacts [which may need to be mitigated through an operational permit] and decommissioning-phase impacts [see ***Section 5.4*** below], where relevant.

Mitigation measures for accident/risk scenarios should be packaged as a holistic plan that includes the integration of failsafe systems into the project design as well as well-defined contingency measures.

The recommended measures should be feasible, realistically implementable to the required standards and in a timely manner, effective and reliable, and reasonably exhaustive. They should not be dependent on factors that are beyond the developer's and ERA's control or which would be difficult to monitor, implement or enforce. The actual scope for, and feasibility of, effective prevention or mitigation should also be clearly indicated, also identifying all potentially important pre-requisites, conditionalities and side-effects.

5.2 Residual Impacts

Any residual impacts [i.e. impacts that cannot be effectively mitigated, or can only be partly mitigated, or which are expected to remain or recur again following exhaustive implementation of mitigation measures] should also be clearly identified.

5.3 Additional Measures

Compensatory measures (i.e. measures intended to offset, in whole or in part, the residual impacts) should also be identified, as reasonably relevant. Such measures should be not considered as an acceptable substitute to impact avoidance or mitigation.

If the assessment also identifies beneficial impacts on the environment, measures to maximise the environmental benefit should also be identified.

In both instances, the same practical considerations as indicated vis-à-vis mitigation measures should also apply.

LANDSCAPE AND VISUAL IMPACT ASSESSMENT

3. Assessment of landscape and visual amenity is a complex task, involving examination of a wide range of factors that contribute to the qualities and attributes of the existing landscape and that may contribute to the attributes of the Scheme. This involves consideration of the evolution of the landscape and the factors that have led to its current condition from the underlying geology through to anthropogenic activities.

4. Landscape and visual impacts are distinct, albeit strongly related. Landscape impacts result from the interaction between the proposed development and the existing landscape resource, experienced through changes to any element or combination of landscape elements. Visual impacts relate to the effect that the Scheme would have on the amenity of sensitive receptors, relating to the actual or perceived visible changes to the character and quality of the landscape.

5. The landscape and visual amenity study will comprise the following:

- Baseline survey and characterisation of the landscape and visual amenity at and around the Scheme site using desktop and field survey techniques;
- Evaluation of the landscape character of the Scheme site and its setting;
- Establishment of the key factors that have led to the formation of the current landscape;
- Establishment of the Zone of Theoretical Visibility (ZTV) for the Scheme and identification of key viewpoints and receptors;
- Input of potentially beneficial design measures to the Scheme;
- Prediction of the impacts of the Scheme on the visual amenity of the Area of Influence;
- Assessment of the significance of the impacts on the landscape and visual amenity of the Area of Influence; and
- Description of mitigation measures designed into the Scheme to minimise adverse impacts and enhance any beneficial impacts on the landscape and visual amenity of the Scheme.

ASSESSMENT METHODOLOGY

Standards and Guidance

6. The landscape and visual assessment will be carried out in line with the national and international best practice methodologies as appropriate, notably:

- *Preparation of Environmental Statements for Planning Projects that require Environmental Assessment, A Good Practice Guide produced by the Department of the Environment (now DETR) (1995)*;

- *Guidelines for Landscape and Visual Impact Assessment (2013)* – Institute of Environmental Management & Assessment and the Landscape Institute (UK);
- MEPA's draft Landscape Assessment Study; and
- *Best Practice Guide – Visual Simulations* (2015) – MEPA.

Area of Influence

7. The Area of Influence has been defined using a combination of desk and field-based techniques. Most notably, the ZTV of the Scheme is identified (see **Figure 2**). This encompasses the roads and public places from where the Scheme site is visible. The ZTV, viewpoints and baseline photographs are illustrated in the figures below.

Baseline Data

8. The visual amenity baseline will be formulated by reference to a series of viewpoints within the ZTV that are to be agreed with ERA through this Method Statement (see **Figure 2**).

9. The landscape baseline will be established through reference to mapped land use information including cultural heritage features, trees, etc., an analysis of aerial photographs, and a review of the *Strategic Plan for the Environment and Development* (SPED), the *Gozo and Comino Local Plan*, and the *draft Landscape Assessment for the Maltese Islands*, to identify policy background and any potentially important landscape areas within or adjacent to the Scheme.

Landscape Assessment

Description and Character of the Site

10. This comprises the description of the landform and land cover of the Scheme site and its surroundings and confirmation of the location of landscape features. The landscape character of the Scheme site is identified. The information will be recorded through the use of checklists, map annotations, and photographic records. **Figure 1** presents the landscape character map developed for the Scheme site and the surrounding area.

Characterisation of the Local Area

11. The characterisation of the local area will provide inputs into the design of the Scheme so that it might fit in with the local landscape and built character.

Evaluation

12. The importance of the landscape will be assessed in relation to appropriate legislation, standards, and guidelines, and in particular to any designations that apply to the Scheme site and / or to the surrounding area.

Visual Assessment

13. The mapped material will be used to identify potentially significant views and viewpoints for analysis during the field survey. A three-dimensional computer-based

viewshed analysis was established for the Scheme. The extent of the viewshed (ZTV) has been verified in the field and key viewpoints identified. These include:

- Short distance views;
- Medium distance views from publicly accessible locations; and
- Long distance views from high points or tourist/visitor attractions.

14. The proposed viewpoints are considered to be representative and therefore will assist in the proper evaluation of the visual impact of the proposed development.

15. All photographs will be taken from the proposed viewpoints with a calibrated full-frame digital SLR camera having a fixed lens mounted on a tripod. The camera specifications are as follows:

- Camera Type: Canon EOS 5Ds
- Megapixels: 50.6
- Sensor: Full Frame
- Sensor Size: 36.0mm x 24.0mm
- Lens Type: Prime Lens
- Pixel Dimensions: 8688 x 5792
- Aspect Ratio: 3:2

16. The location of the viewpoints will be recorded and their position surveyed accordingly.

17. A computer-generated 3D model of the proposed building will be constructed from the architect's drawings to level of detail 3 (LOD 3); the 3D model together with surveying data, cameras and lights are subsequently positioned with respect to the coordinate system used by the Planning Authority.

18. The position and properties of the cameras in the 3D model space are checked to ensure that they match the position and properties of the camera used to take the photographs.

19. Camera-matching will be carried out in a professional 3D modelling programme.

20. Computer generated renders will be produced from the selected viewpoints and then superimposed on the respective photographs to produce the verified photomontages.

21. Whenever possible, Single Frame Images shall be presented at an effective focal length of 75 mm. Alternatively, if this is not possible, focal lengths of 50 mm or 28 mm (in this order) will be prepared. The following is a list of the Single Frame

Images which will be presented:

- Single frame image; Existing view; 75 mm or 50 mm or 28 mm; and
- Single frame image; Proposed development added; 75 mm or 50 mm or 28 mm.

22. The viewpoint locations are illustrated in **Figure 2** and listed in **Table 1** below. The existing views from these locations will be photographed and ground-truthed once ERA has agreed in principle to the chosen views with an aim to avoid re-visiting the field should ERA require any changes. These views will form the basis for the preparation of photomontages that will be used to assess the impact of the Scheme.

Table 1: Viewpoints

Viewpoint	Location	Coordinates
VP1	Triq Ramlija, Kirkop	453242.2900, 3967236.6960
VP2	Triq Il-Belt Valletta, Mqabba	453203.8920, 3967233.3590
VP3	Triq L-Industrija, Kirkop	453396.7510, 3967300.0860
VP4	Triq Il-Belt Valletta, L-Imqabba	453180.2690,3967259.5960
VP5	Triq Il-Madonna Tad-Dawl, Kirkop	453257.5600,3967555.0190
VP6	Triq Il-Madonna Tad-Dawl, Kirkop (closer to roundabout) – Park Area	453226.7590,3967360.6570
VP7	Gnien Il-Gibjun, Zurrieq	451868.2040,3964476.7060
VP8	Vjal Ix-Xarolla, Zurrieq / Hal Safi	453055.5980,3965526.2180

IDENTIFICATION OF POTENTIAL IMPACTS

23. Receptors sensitive to the change in the visual amenity will be identified.

24. Potential changes in the landscape will be identified for each of the landscape character areas.

Prediction of Potential Impacts

25. The visual impacts of the development will be predicted by creating photomontages for each of the identified viewpoints. This will include overlaying a computer-generated perspective of the project over photographs of the existing situation and assessing how the visual amenity will change.

26. Changes to the landscape will be assessed using the photomontages and the information available in the baseline studies: geo-environment, cultural heritage, and land cover.

IMPACT SIGNIFICANCE

27. This section will include the following information for each potential impact:

- Description of impact;
- Policy importance of the impact (Local, National, International);
- Extent of effect on landscape / visual amenity;
- Duration of impact (temporary/permanent);
- Adverse or beneficial impact;
- Reversible/irreversible impact;
- Sensitivity of receptor;
- Probability of impact occurring (certain, likely, uncertain, unlikely, remote);
- Scope for mitigation/enhancement (very good, good, none); and
- Residual impacts.

28. The significance of visual impacts will be assessed in relation to:

- The number and sensitivity of receptors affected;
- The duration of the changes;
- The changes to the view from the identified viewpoints as shown by the photomontages; and
- Scope for further mitigation / enhancement measures.

29. Based on the above criteria, an assessment of: (i) the significance of impacts on the landscape and (ii) the visual impact at each of the viewpoints will be made in terms of whether it is considered:

- **Not significant** – little or no perceptible changes to the view or landscape;
- Of **minor significance** – noticeable changes to the view or landscape with potential for substantial changes to be offset by mitigation; and
- Of **moderate significance** - discernible changes to the view or landscape that are out of character with the landscape. Where the extent of the negative impact on the landscape character is medium in scale and landscape sensitive receptor is of medium sensitivity to change and/or of medium intrinsic value;
- Of **major significance** – substantial changes to the view or landscape with little opportunity for changes to be offset by mitigation.

IMPACT MITIGATION & MONITORING

30. It is envisaged that the majority of the mitigation measures will be incorporated in the design of the Scheme so that it fits as closely as possible with the landscape and built

character of the area. Landscape proposals will take account of the provisions in the *'Guidelines on Trees, Shrubs and Plants for Planting and Landscaping in the Maltese Islands'* published by the Malta Environment and Planning Authority (now the Planning Authority).

Adi Associates Environmental Consultants Ltd
January 2026

Figure 1: Landscape Character Areas

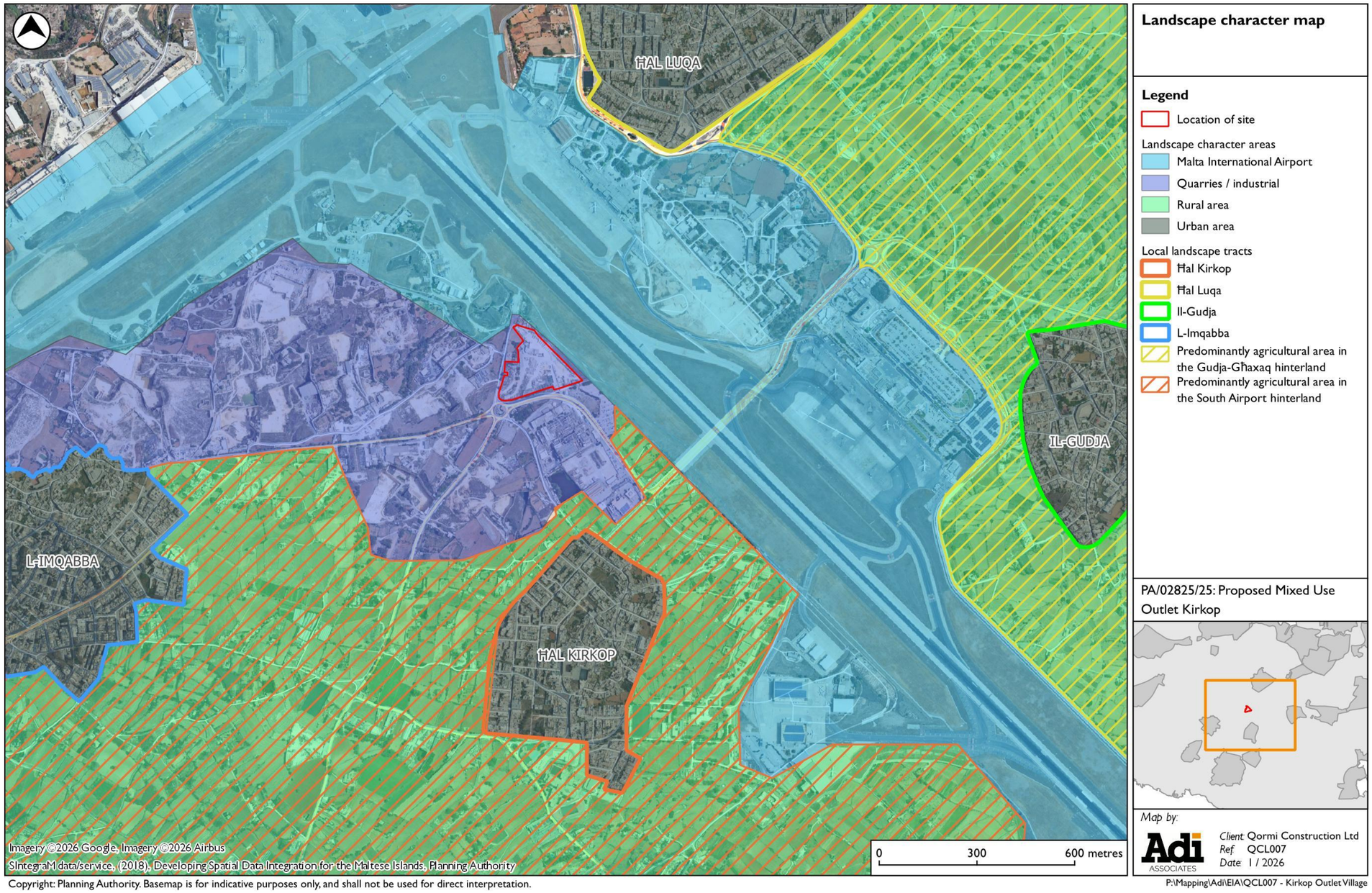

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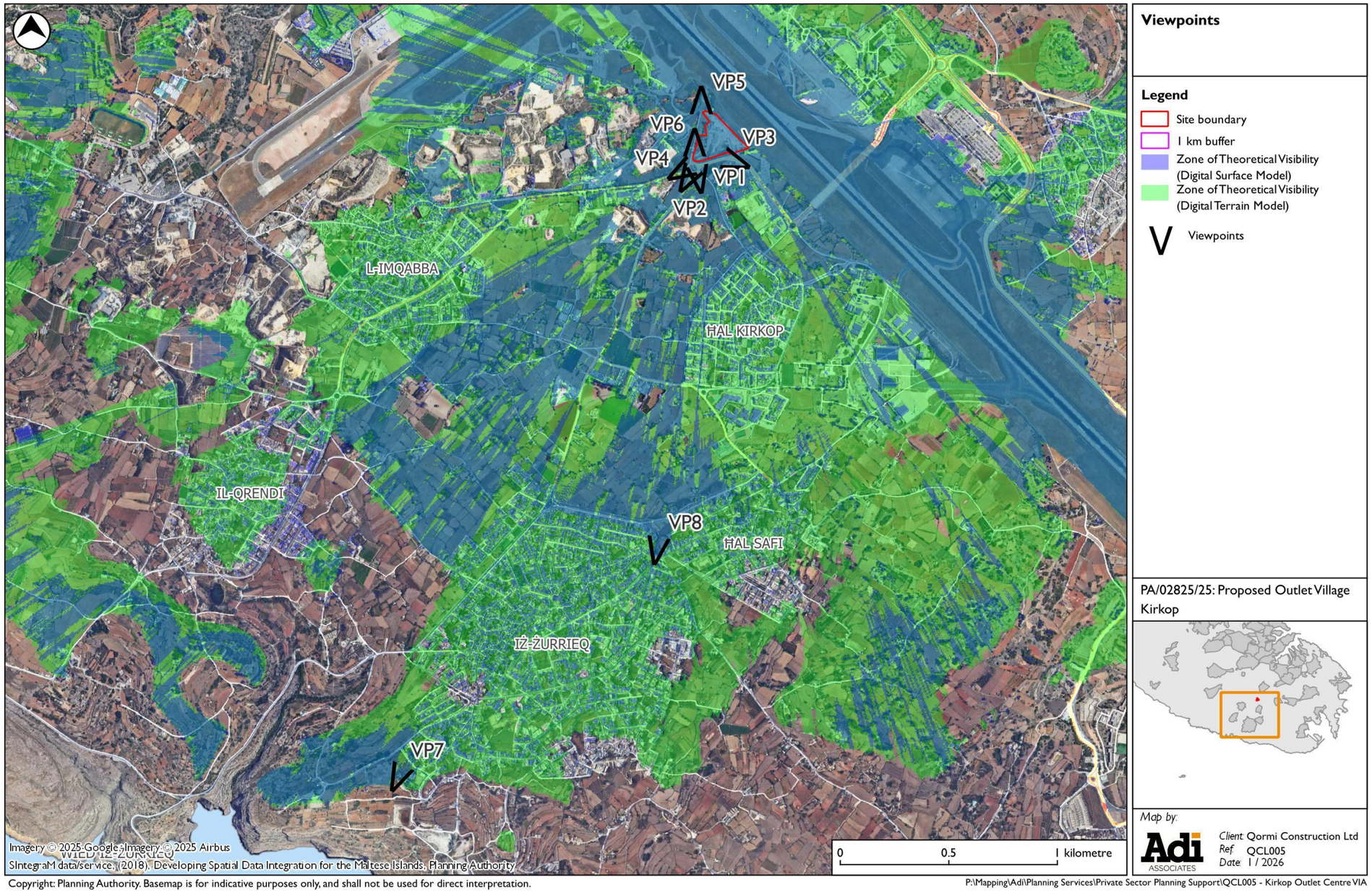
Figure 2: Viewpoints



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VP1: Triq Ramlija, Kirkop

VP2: Triq Il-Belt Valletta, Mqabba

VP 3: Triq L-Industrija, Kirkop

VP4: Triq Il-Belt Valletta, L-Imqabba

VP5: Triq Il-Madonna Tad-Dawl, Kirkop

VP6: Triq Il-Madonna Tad-Dawl, Kirkop (closer to roundabout) – Park Area

VP7: Gnien Il-Gibjun, Zurrieq

VP8: Vjal Ix-Xarolla, Zurrieq / Hal Safi

PA 02825/25

Proposed Commercial Complex, Triq l-Industrija, Kirkop

Technical Appendix 2

GEO-ENVIRONMENT BASELINE REPORT & GEO-TECHNICAL SURVEY

Prepared by Dr Adrian Mifsud and Terracore Ltd

Supporting Documents for

Environmental Impact Assessment Report

Signed Declaration: Identification of Consultants and Contributors

Attn: Director of Environment and Resources (ERA)

I, Adrian Mifsud, who carried out the study (or part thereof) on geo-environment for the EIA for the proposed Commercial Complex at Triq l-Industrija, Kirkop (PA 02825/25) hereby declare that I take responsibility for the study and any statement and conclusion contained therein.

24th June 2026

Date

Signature

Demolition and Construction of Commercial Complex with Hotel and Car Park

Triq il-Madonna Tad-Dawl, Kirkop

PA/02825/25

Job no.: J801 Rep. no.1

Baseline study for geology, geomorphology and hydrology

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May 2026

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1 Terms of reference and introduction

The undersigned has been commissioned by ADI Associates, on behalf of Elbros Concrete Ltd., to undertake a geological, geomorphological, hydrogeological and water environment baseline assessment for the proposed development consisting of:

> *"The demolition of an existing construction yard and built structures and the proposed oversite excavation to accommodate the construction of a commercial car park, supermarket, a mixed-use outlet village (comprising Class 2A medical, Class 3C sport centre, Class 4A offices, Class 4B retail, Class 4C coffee shops, Class 4D restaurants and bank), and a three-star hotel having 120 rooms."*

The site is located at the site of the current Elbros Concrete Ltd., Triq l-Industrija corner with Triq il-Madonna tad-Dawl, Kirkop (Figure 1-1).

Figure 1-1 Site location outlined in yellow and the corresponding area of influence outlined in red. The site is centred approximately at latitude 35.849532°N and longitude 14.482920°E. ***(Source: Google Earth)***

This baseline technical report forms part of the Environmental Impact Assessment (EIA) being prepared in accordance with the Terms of Reference issued by the Environment and Resources Authority (ERA) for Planning Application PA/02825/25 (EA/00013/25). For the purpose of this report, the development will hereafter be referred to as the proposed mixed-use commercial and hotel development at Kirkop.

This document therefore establishes the methodology, scope and standards to be adopted for the baseline investigations and subsequent assessment of potential impacts associated with the proposed development.

This baseline report addresses the scope of the Environmental Impact Assessment Report, the terms of reference of which have been set by the Environment and Resources Authority, Malta. The scope of this report is listed as follows:

1. Identification of the geology, geomorphology and hydrology of the site and its surroundings, including existing lithological, stratigraphical, paleontological, hydrogeological and physiographic features and soil types;
2. The geotechnical properties and considerations relevant to the site and its area of influence, including: land stability; mechanical, erosional and structural properties of the terrain and land mass; any relevant fissures, faults, hollows, or weak points;
3. The quality of the material that will be excavated (including soil, rock/mineral resource, and any existing fill material) and its potential for reuse.

The study area includes the development footprint and its immediate surroundings, together with the wider hydrogeological and hydrological catchment where relevant. The extent of the area of influence (Figure 1-1) is defined on the basis of geological continuity and structural features; groundwater flow regimes and aquifer extent; and surface water drainage patterns and potential pathways for impact arising from excavation and construction activities. Sensitive receptors, including groundwater bodies, nearby abstractions and any surface water features, are identified and noted for consideration in subsequent stages of the EIA.

This site appraisal has been carried out in accordance with BS 5930:1999 “Code of practice for site investigations”. Likewise, in-situ and laboratory testing complies with BS 1377:1990, “Methods of Tests for Soils for Civil Engineering Purposes” and the relevant ISRM suggested methods unless stated otherwise in the text.

2 Site location and zoning designation

In terms of planning and land-use considerations, the site currently accommodates an established construction/industrial yard and forms part of a wider area characterised predominantly by industrial, commercial and storage-related activities. The surrounding area includes a mix of industrial premises, warehousing and ancillary infrastructure, together with pockets of agricultural land and open areas beyond the immediate developed footprint.

Figure 2-1 and Figure 2-2 show that the site under consideration is located within the industrial area of Kirkop in the southern part of mainland Malta, centred approximately at latitude 35.849532°N and longitude 14.482920°E. The site covers an area of approximately 34,000m².

To the north, south and west, the site is bordered primarily by industrial and commercial premises, together with access roads serving the wider industrial estate (Figure 2-1). Towards the south and east, the surrounding context transitions into a more open setting characterised by agricultural land and scattered rural features beyond the defined industrial footprint (Figure 2-2). The wider area is also influenced by strategic transport infrastructure, including the nearby arterial road network and Malta International Airport located further to the north and east (airport runway visible in the east in Figure 1-1).

The site itself comprises a fully developed footprint that includes hardstanding surfaces, storage yards and built structures associated with its current use as a construction and concrete batching facility. The land is therefore already committed to developed use and does not constitute undeveloped agricultural land.

As shown in the Kirkop Local Plan Environmental Constraints Map (Figure 2-3), the site lies within an area identified as having archaeological sensitivity (SMCO 04) (green dashed circle in Figure 2-3). Planning Authority MapServer data further indicate that the site falls within an area of groundwater safeguard containment and is located within the 100–300m groundwater protection buffer zone (SMCO 08, full red circle in Figure 2-3). These environmental and planning constraints will be taken into consideration in the geological, hydrogeological and environmental assessments forming part of this study.

Figure 2-1 View 1; south eastern view from the site displaying industrial and commercial premises (image from Google maps street view 2026.02.05).

Figure 2-2 View 2; southern and south western view from the site displaying industrial and commercial premises (image from Google maps street view 2026.02.05).

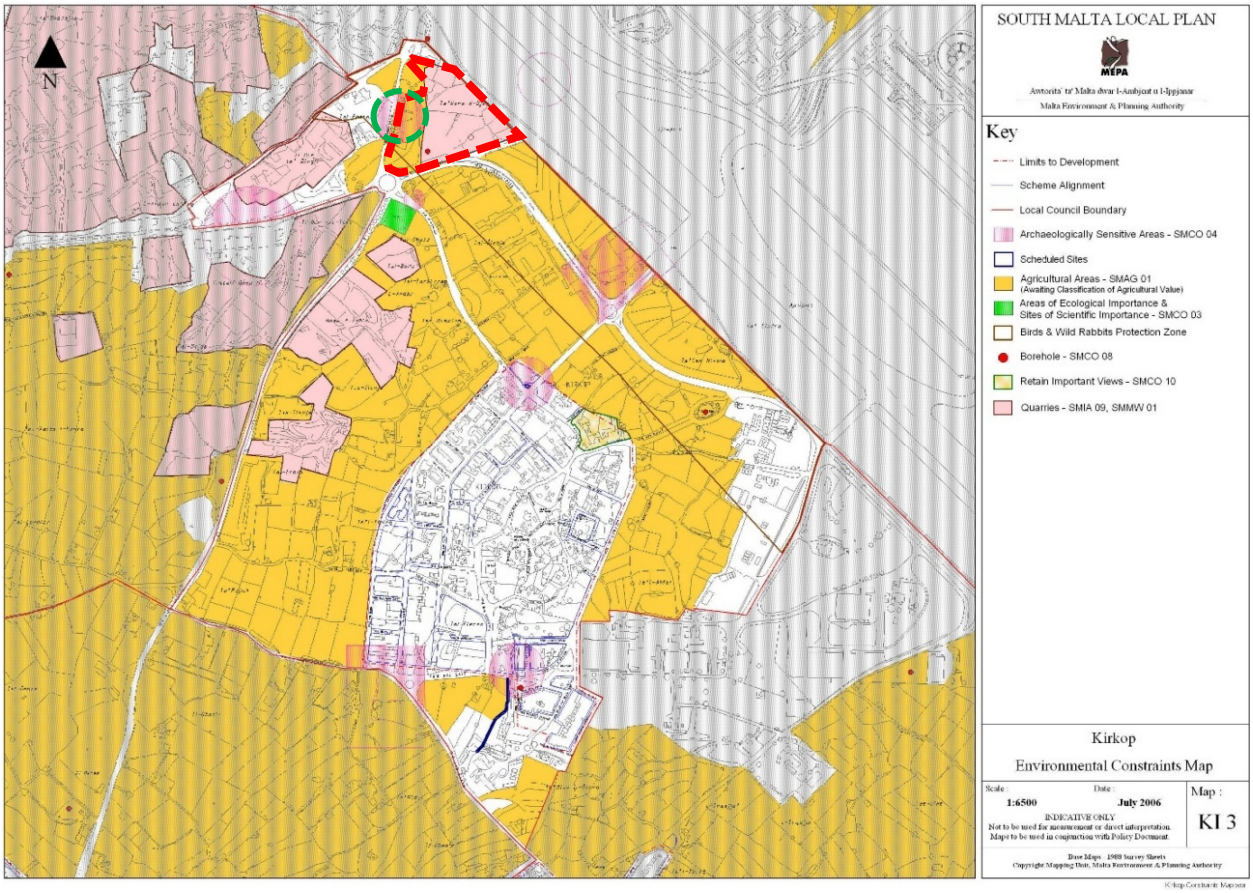


Figure 2-3 South Malta Local Plan – Kirkop Environmental Constraints Map (Source Planning Authority). Site location outlined in red, green circle outlines area archaeologically sensitive area (SMCO 04).

3 The project

The proposed development, subject of Planning Application PA/02825/25, consists of the comprehensive redevelopment of the existing construction yard and associated built structures. The site is to be cleared and redeveloped into a mixed-use commercial and hospitality complex.

The redevelopment will comprise a mixed-use commercial and hospitality scheme incorporating a range of land uses. The proposed development includes the construction of a commercial car park, intended to serve the overall development and associated uses, a supermarket and a mixed-use outlet village, comprising a range of commercial and service-oriented establishments. These include Class 2A – medical and health-related facilities, Class 3C – sports and fitness centre, Class 4A – office spaces, Class 4B – retail outlets, Class 4C – coffee shops and similar establishments, Class 4D – restaurants and food and beverage outlets a banking facility and a three-star hotel providing approximately 120 guest rooms, together with ancillary hotel facilities and services.

The proposal therefore represents a substantial change in land use from its current construction and industrial function to a predominantly commercial and service-oriented development.

The development will also include all required ancillary infrastructure and services necessary for its construction and operation. These are expected to include internal access roads, servicing areas, pedestrian circulation routes, utilities infrastructure, drainage and runoff management systems, energy and water supply connections, waste management facilities, landscaping and boundary treatments.

Following demolition, the project will include oversite excavation works to accommodate the construction of multiple buildings, ancillary infrastructure and basement or sub-surface levels where required.

Existing site levels shown on the project drawings are consistent with the levels derived from the CloudIsle LiDAR dataset (available from the University of Malta Cloudisle Project (http://www.um.edu.mt /projects/cloudisle/).

Excavation is required across the whole site, as indicated on the project plans prepared for the proposed development (Figure 3-1 and Figure 3-2). The plans are available and show both the extent of excavation and the proposed formation levels. The depths of excavation are displayed along a number of sections through the site, allowing the proposed excavation profile to be assessed against existing ground levels.

The proposed excavation formation level is indicated at approximately +64.7m above mean sea level. On the basis of the existing site levels, this corresponds to an average excavation depth of approximately 13.2m below current ground level, although local excavation depths will vary depending on the existing surface profile and the proposed formation levels shown on the project sections.

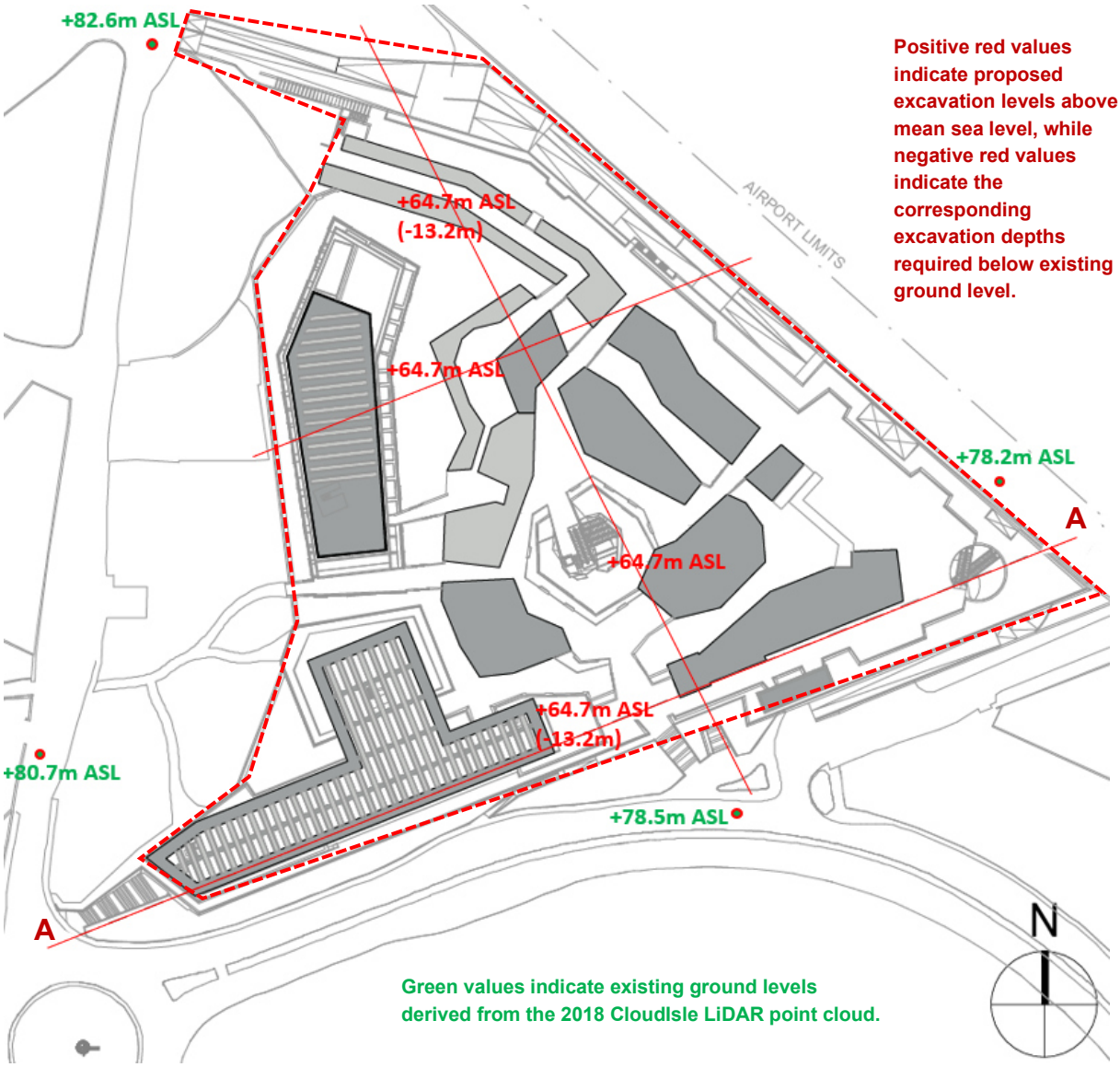


Figure 3-1 – Masterplan as provided by the project architects showing the proposed excavation extent and level annotations.

The excavation will therefore involve substantial removal of material across the development footprint.

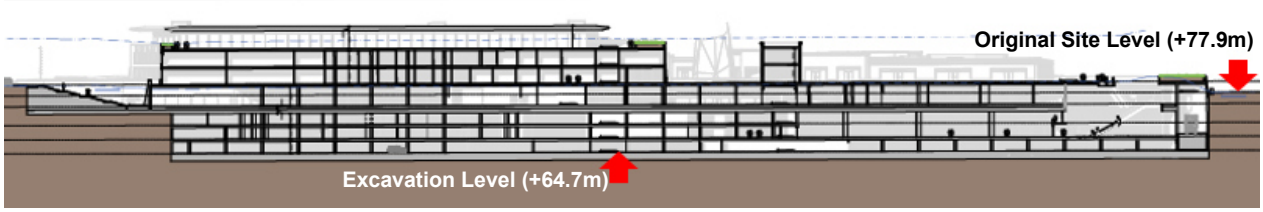


Figure 3-2 – Section AA through the proposed development, as provided by the project architects, showing the existing site profile and the proposed excavation formation levels expressed in metres above mean sea level.

The proposed structures are expected to comprise a reinforced concrete frame supported by conventional pad foundations beneath the columns of the building. Considering the anticipated building form, number of floors, column spans and the known geology of the area, no major issues are expected at this stage in terms of foundation bearing capacity, subject to detailed structural and geotechnical design.

4 Geological and Geomorphological Setting

The following sub-sections present a baseline overview of the geological, structural geological, geomorphological, hydrological and soil conditions relevant to the proposed development. Each thematic sub-section first outlines the general geological and environmental context of the Maltese Islands in order to establish a regional framework and subsequently provides a detailed description of the site-specific conditions and characteristics within the study area and its immediate surroundings. This approach ensures that site specific conditions are assessed within their broader national geological and environmental setting.

4.1 Geology

The Maltese Islands are composed entirely of sedimentary rocks of marine origin, forming part of the Pelagian Platform located between the African and European continental plates in the central Mediterranean. The archipelago, consisting primarily of Malta, Gozo and Comino, represents an emergent section of a gently tilted carbonate platform that was uplifted above sea level during the late Miocene and Pliocene epochs.

The stratigraphy of the Maltese Islands comprises a sequence of five principal Oligo-Miocene sedimentary rock formations. The strata of relevance to this project are the following (from oldest to youngest,)

1. **Lower Coralline Limestone Formation**

   This is the oldest exposed formation and consists predominantly of pale grey to buff limestone rich in coralline algae, that at the surface is generally hard and compact, often due to weathering and calcification processes. However, at depth it can sometimes be much less stiff and compact, sometimes resembling a compacted sand of very low interparticle cementation.

   Along the western and southern shorelines of the Maltese Islands, it is sufficiently cohesive to sustain vertical faces in excess of 100m, thus forming steep coastal cliffs. Due to its relatively high mechanical strength it generally forms a competent foundation stratum where it is proven.

2. **Globigerina Limestone Formation**

   Overlying the Lower Coralline Limestone, and separated from it by a phosphatised hardground, the Globigerina Limestone formation consists mainly of fine-grained, yellowish to pale grey biogenic limestone that are composed largely of planktonic foraminifera. It is subdivided into Lower, Middle and Upper members separated by further phosphatic hardgrounds, the former of these being of relevance to this project. This formation is widely distributed across Malta and forms gently undulating terrain and many of the island's low hills and plains. It is relatively soft and workable, making it historically significant as a building stone.

According to the Geological Map of Malta (1993), the bedrock underlying the site corresponds to the Globigerina Limestone formation (Figure 4-1), specifically the Lower member (LGL). The LGL can be described as a fine to medium-grained biomicritic limestone mainly composed of Globigerina foraminifera fossil shells, and which is typically massively bedded. Two main types are identified, locally known as 'franka' and 'soll'. The 'franka' layer is a fine grained, cream coloured wackestone of economic value as it is quarried for masonry blocks. The 'soll' bed is generally rust mottled and bioturbated, sometimes exhibiting a grey to olive colour in the Grand-Harbour region and its immediate environs.

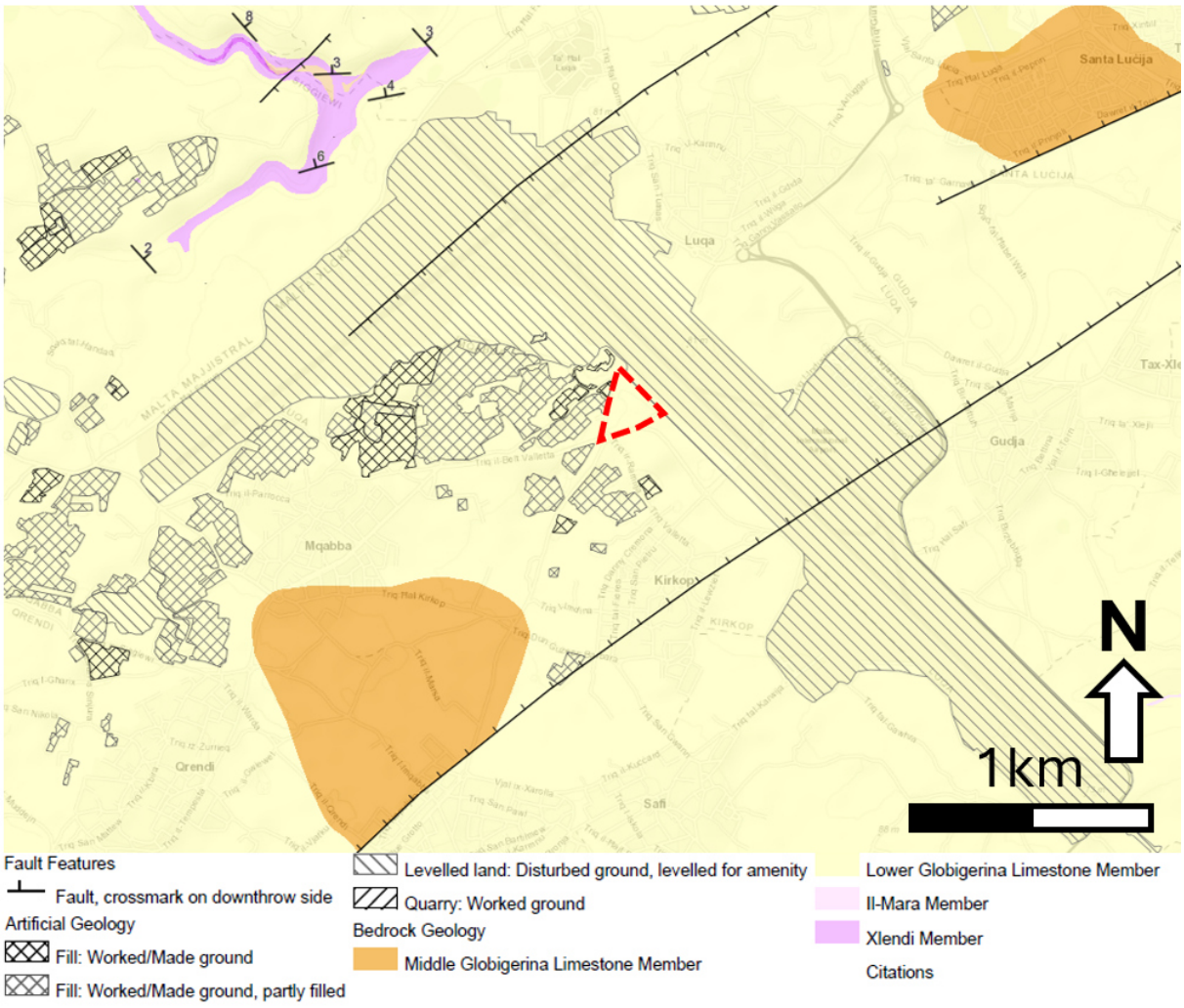


Figure 4-1 – Extract from the geological map of the Maltese Islands (2022). Site location is indicated in a red dashed polygon.

Surface weathering of the Lower Member is often developed by the formation of sub-horizontal joints or fissures that are sometimes gradually filled with terrarossa soils over the millennia. This weathered layer is rarely of uniform thickness, and the soil-filled beds (generally containing Terrarossa soils) can be found anywhere within the uppermost part of the sequence.

The Lower Globigerina member is present in most areas of the Maltese Islands, although in much thicker sections in the vicinity of Valletta and the Grand Harbour, where a maximum thickness of around 100m is reached. The thickness of this member at the site is not known, however the underlying Mara member of the Lower Coralline Limestone formation is mapped in outcrop at some 1.7 kilometres northwest of the site, exposed along the valley slopes of Wied Qirda.

Based on the approximate elevation at which the Lower Coralline Limestone Formation is known to outcrop in the wider area (circa 60 m above mean sea level) and the approximate elevation of the site, where the Lower Globigerina Limestone Member (LGL Mmb) occurs at around 80 m above mean sea level, the local

thickness of the LGL Mmb may be approximated at ~20 m. This indicative thickness is greater than the anticipated maximum excavation depth for the project (approximately 13.2m), suggesting that excavation works are likely to remain within the Lower Globigerina Limestone. This interpretation is supported by the site-specific ground investigation (see Section 5 below - *TERRACORE, TERR24/QOR001/J8017*), which provides evidence that coring proceeded solely within the Lower Globigerina Limestone across all boreholes drilled, and did not encounter the Lower Coralline Limestone before the maximum borehole depth of 14–17 m below ground level was reached.

4.2 Structural Geology

The geological structure of the Maltese Islands is characterised by gentle tilting and faulting. The islands dip generally towards the east and north-east, resulting in higher topography along the western and southwestern regions and lower-lying terrain towards the north-east.

Several major fault systems influence the structural configuration of the islands. The most prominent is the Great Fault, which traverses Malta in a south-west to north-east direction and has resulted in differential uplift and subsidence across the island. Numerous secondary faults, joints and fissures occur throughout the rock sequence and play an important role in groundwater movement, slope stability and excavation behaviour.

The site is located approximately mid-way between two sub-parallel inferred faults oriented southwest–northeast; one extends from the coast of Żurrieq to Għaxaq (circa 5.10 km in length), whilst the other extends from Il-Wileġ to the northern part of the Malta International Airport (circa 7.85 km in length) (Figure 4-1). Given the reported distance of the site from the nearest inferred fault traces (approximately 0.75–1.0 km), the site is not expected to lie within a typical fault core or immediate damage zone where intensely fractured rock, gouge, or shear zones would ordinarily be most prevalent. This is consistent with the ground investigation findings, which indicate predominantly fair-to-excellent quality Lower Globigerina Limestone core recovery and do not describe fault gouge, intensely sheared intervals, or markedly degraded core quality that would be indicative of a fault zone intersecting the boreholes (*TERRACORE Ref. TERR24/QOR001/J8017*).

4.3 Geomorphology

The present-day landscape of the Maltese Islands is the result of long-term interaction between geological structure, lithology, marine processes and subaerial erosion. Key geomorphological features include:

- **Coastal cliffs and platforms**, particularly along western Malta and Gozo, formed through marine erosion of resistant limestone formations;
- **Karstic landscapes**, including solution features such as fissures, cavities and sinkholes developed within limestone formations through dissolution processes;
- **Terraced slopes**, commonly associated with Blue Clay outcrops underlying more resistant limestone formations;
- **Dry valleys (widien)** formed primarily during wetter climatic phases in the Quaternary and now functioning mainly as surface runoff channels during intense rainfall events;
- **Plateaus and gently undulating plains** developed on Globigerina Limestone and Upper Coralline Limestone formations.

Surface processes such as weathering, mass movement and coastal erosion continue to modify the landscape. In particular, slope instability associated with clay-rich formations and coastal erosion along exposed cliff lines represent ongoing geomorphological processes. This is not the case for this particular site.

In geomorphological terms, surface drainage in southern Malta is commonly organised into short catchments that feed dry valleys (widien), which function as preferential runoff pathways during storms and convey flows towards the coast. Ħal Kirkop is situated in the southern-central part of Malta, within a landscape that is generally characterised by gently undulating to low-relief terrain developed predominantly in the Globigerina Limestone succession. This part of Malta forms part of a broad limestone plateau and rural–industrial fringe where natural landforms have been locally modified by long-standing anthropogenic activity (including quarrying/industrial uses and associated infrastructure), resulting in extensive areas of re-profiled ground and hardstanding.

The wider Kirkop–airport area therefore sits within a setting where minor local lows, road corridors, and engineered drains can influence runoff routing toward downstream valley systems and coastal discharge points, a consideration reflected in Malta's catchment management and flood hazard mapping frameworks.

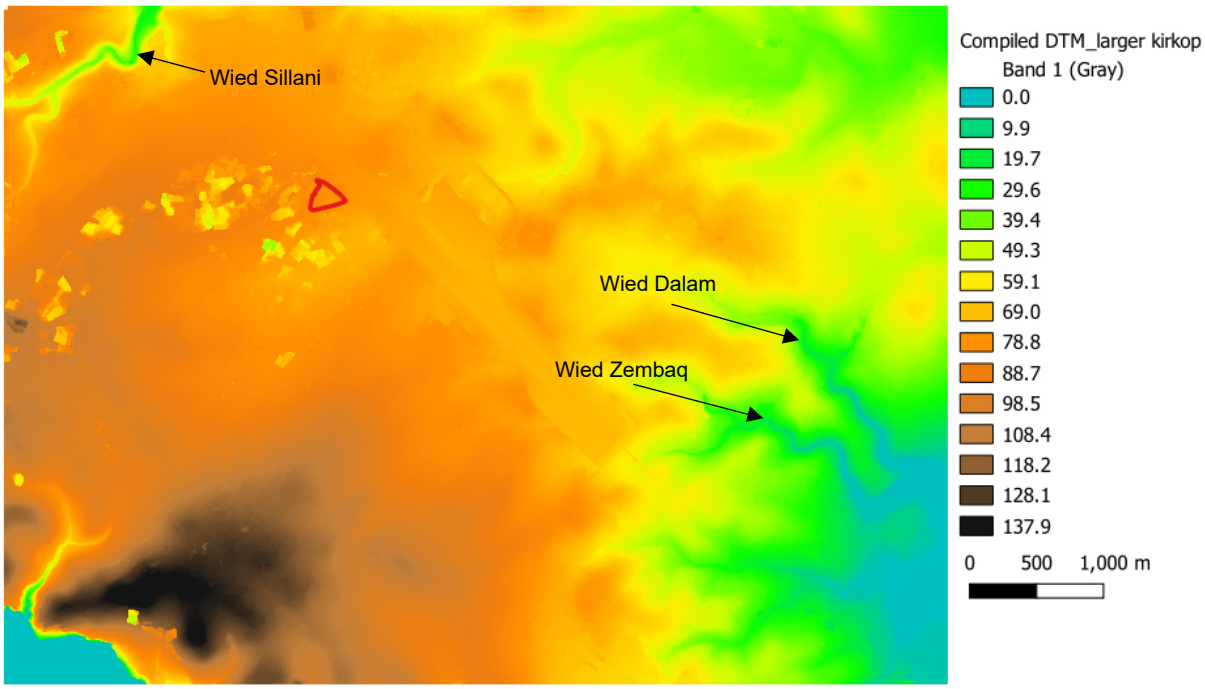


Figure 4-2 Topography of the south-eastern region of the Maltese Islands, site location indicated in red polygon. DTM source: Cloudisle Project, University of Malta, Territorial LiDAR Data for the Maltese Islands.

At the project location (centred approximately at 35.8498458°N, 14.4833054°E), the site lies immediately adjacent to major strategic infrastructure associated with the airport/industrial estate area, and the local topography is very gently sloping, with surface drainage expected to occur mainly as episodic runoff during intense rainfall events, consistent with the typically ephemeral nature of Maltese watercourses.

4.4 Hydrology

The geological formations of the Maltese Islands give rise to a characteristic hydrogeological regime dominated by limestone aquifers. The principal aquifers occur within the Upper and Lower Coralline Limestone formations and the Globigerina Limestone. These aquifers typically form perched and mean sea-level groundwater bodies, influenced by the islands' structural configuration and limited recharge from rainfall. The Blue Clay Formation acts as an aquiclude, locally impeding vertical groundwater movement and giving rise to perched water tables and springs along formation boundaries.

The site is located within the southern Malta plateau in an area characterised by short, ephemeral drainage systems typical of the Maltese Islands. No natural watercourses traverse the site, and surface runoff is expected to occur primarily as overland flow during intense rainfall events.

The nearest mapped valley system is Wied is-Sillani, located approximately 1.6 km to the northwest of the site. A more substantial valley system associated with Wied Dalam / Wied Żembaq lies approximately 3 km to the southeast. These valleys form part of separate local catchment systems draining towards the western and south-eastern coastal areas respectively (Figure 4-2 and Figure 4-3).

Based on available topographic data and the generally level nature of the site, the development area does not lie within the main channel corridor of any of these valley systems (Figure 4-3). The site is therefore not situated within the core drainage axis of a major watercourse, and any overflow or flood risk from established valley systems is considered unlikely. Surface water management for the proposed development will therefore primarily relate to on-site runoff control and controlled discharge rather than interaction with an existing natural watercourse.

The site does not lie within the main thalweg of a defined valley system but instead occupies a gently sloping interfluve area. Surface runoff generated within the site is therefore expected to flow predominantly westwards to southwestwards, following local topographic gradients before joining minor drainage pathways that contribute to the broader valley systems located further downstream.

The contributing catchment draining across the site is relatively limited in extent and is confined to the immediate upslope agricultural and semi-developed land parcels to the east and northeast. Based on preliminary GIS-based delineation from the DEM, the upstream contributing area is modest in scale when compared to the major valley catchments (e.g., Wied is-Sillani to the northwest and Wied Dalam/Wied iż-Żembaq to the southeast).

The site is located along the upper peripheral portion of a small local surface water catchment, as illustrated in Figure 4-3. The topographic model indicates that ground levels decrease gradually from the eastern and northeastern portions of the study area towards the west and southwest, where runoff is ultimately conveyed towards the wider drainage system associated with the Kirkop–airport corridor.

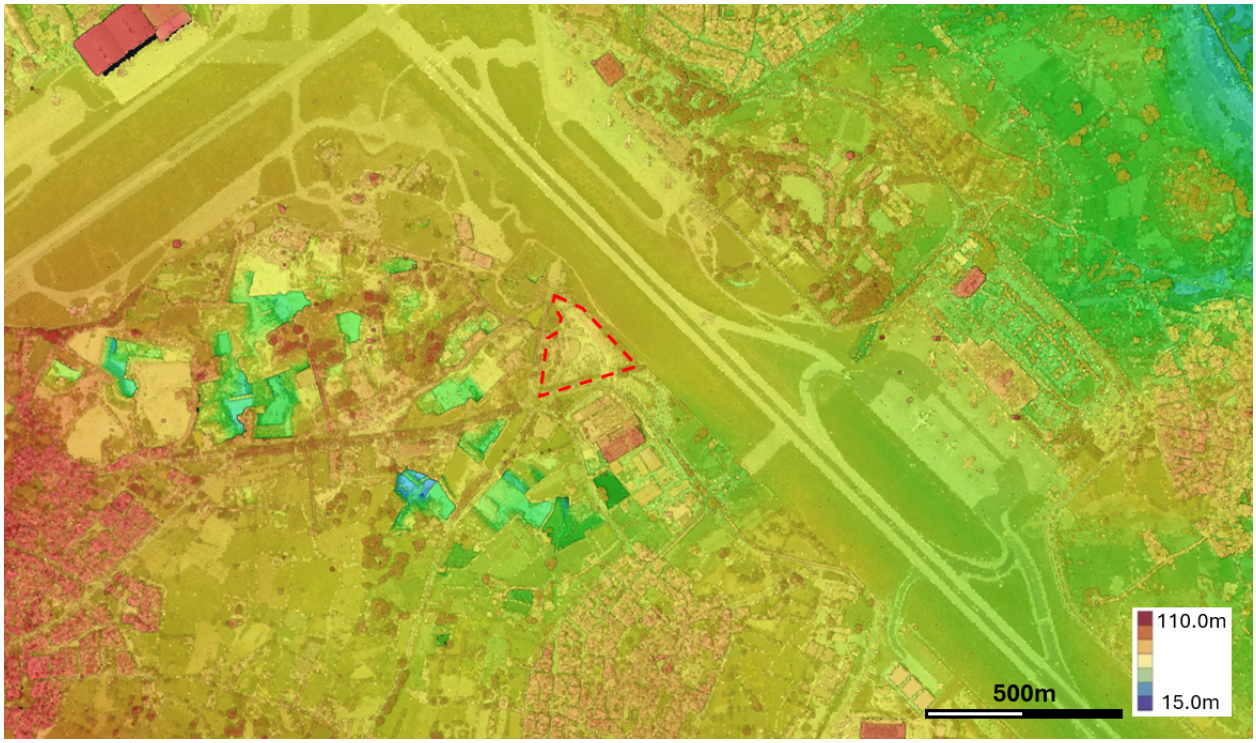


Figure 4-3 Water Catchment area indicated in green on topographical map. Source: Territorial LiDAR Data for the Maltese Islands, Cloudisle Project, University of Malta.

Given the predominantly hardstanding and developed nature of the site, and the proposed increase in impermeable surfaces associated with the development, surface runoff volumes and peak flow rates are expected to increase locally unless appropriate stormwater attenuation and controlled discharge measures

are implemented. Surface water management will therefore need to incorporate on-site retention and gradual release mechanisms to avoid increased downstream runoff concentration.

Figure 4-4 shows a disused quarry located approximately 230m south of the southern boundary of the project site. This quarry is partly filled with water. Based on the CloudIsle LiDAR data, the water surface lies at approximately **+64.4m** above mean sea level (Figure 4-5).

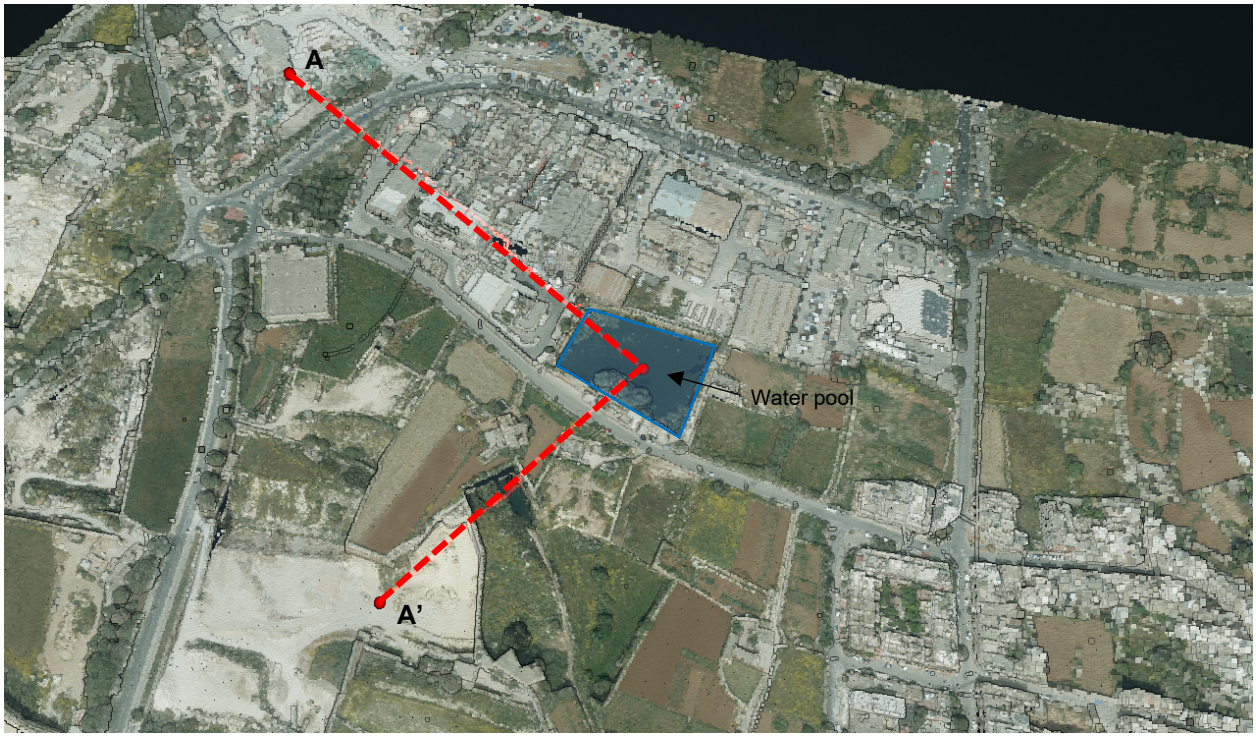


Figure 4-4 Disused quarry located approximately 230m south of the southern boundary of the project site. This quarry is partly filled with water.

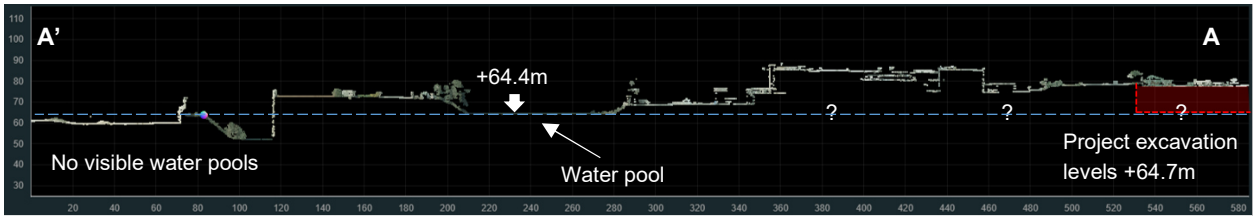


Figure 4-5 Cross-section based on CloudIsle LiDAR data (2018), showing the assessed transect across the water-filled disused quarry, adjacent lower-elevation quarries without standing water, and the proposed excavation formation level.

The presence of water in this disused quarry should not automatically be interpreted as representing a continuous regional groundwater table at this elevation. This is because other quarries located approximately 60m to the west appear to have quarry floors that are lower than the observed water level, with recorded floor levels of approximately +52.1m and +59.9m above mean sea level, yet these quarries do not appear to contain standing water (Figure 4-5). Some of these quarries also show signs of active or recent rock extraction.

If a laterally continuous groundwater body existed at approximately +64.4m above mean sea level, the deeper nearby quarries would normally be expected to intercept the same water body and contain standing water, unless they were being actively dewatered. The absence of ponding in the deeper quarries therefore suggests that the water body in the disused quarry is more likely to be a localised perched or ponded water feature, rather than a continuous groundwater level.

Several mechanisms may explain this condition. The disused quarry may collect direct rainfall and local surface runoff from its surrounding catchment, with the quarry void acting as a sump. The quarry floor may also be locally less permeable, either because of the natural characteristics of the exposed bed or because it has become partially sealed by quarry fines, weathered Globigerina Limestone, silt, clayey material or accumulated sediment. Such sealing would reduce infiltration and allow water to persist within the quarry void. In contrast, the neighbouring deeper quarries may be better drained through open joints, fissures, quarry faces or more permeable rock zones, allowing rainfall and seepage water to percolate downwards rather than accumulate at the surface. Active quarrying may also remove fine sealing material or involve incidental drainage or pumping, further reducing the likelihood of persistent ponding.

The proposed excavation formation level for the project is indicated at approximately +64.7m above mean sea level, which is only around 0.3m above the observed water surface level in the disused quarry (Figure 4-5). Although the available evidence suggests that the quarry water is probably localised and not representative of a continuous groundwater table, the close similarity between these levels is relevant from a construction and hydrogeological risk perspective.

In particular, if the ponding in the quarry is associated with a local low-permeability horizon, and if a comparable horizon is present beneath the project site at or near the proposed excavation level, then excavation could encounter perched water, damp zones or local seepage. This would be most likely following prolonged or intense rainfall, when perched water levels may rise temporarily. The issue would not necessarily be the interception of a regional aquifer, but rather the exposure of a locally perched water-bearing condition within the Lower Globigerina Limestone.

The available laboratory results do not provide direct evidence of such a low-permeability horizon, since permeability testing was not carried out. The results do, however, indicate a porous limestone fabric, with variable moisture content and degree of saturation. These data confirm that the rock mass can retain water to varying degrees, but they do not establish whether water movement is controlled by matrix permeability, discontinuities, sealed bedding surfaces or localised fine-grained horizons. The possible presence of local low-permeability material at excavation level (and hence ponding at excavation level) should therefore be treated as a construction risk to be verified, rather than as a confirmed condition.

The absence of ponding in deeper nearby quarries reduces the likelihood of a continuous groundwater level at +64.4m above mean sea level, but it does not entirely exclude local perched water conditions within the excavation footprint. Given that the proposed excavation is extensive and will reach a formation level close to the observed quarry water level, it would be prudent to allow for construction-phase water management measures. These may include inspection for seepage during excavation, provision for temporary sump pumping, maintaining drainage paths within the excavation, and verifying groundwater or perched water conditions through standpipe monitoring, targeted trial observations or permeability assessment before or during excavation. Particular attention should be given after wet periods, when perched water levels and quarry water levels may be temporarily elevated.

4.5 Water extraction boreholes in the immediate vicinity

The immediate environs of the site contain a number of boreholes that are used for groundwater extraction. These are detailed in the maps below, provided by the Environment and Resources Authority (ERA)

There are several water extraction boreholes within the area of influence around the site. The nearest private borehole appears to be within the western boundary of the site, with several other boreholes immediately downstream.

These boreholes are likely to extend to the lower fresh water table immediately above sea level. The rocks in this area, according to the geological map and later confirmed, in part, by the findings of the investigation for this project, are generally of sufficiently high secondary permeability to preclude the formation of perched water tables in this area. The presence of the Lower Coralline limestone suggests that permeability is likely

to increase with depth, in this area. The top layer of Globigerina limestone is generally of lower permeability, and would therefore reduce seepage to the deeper layers, unless the rock mass is very intensely fissured.

There are no water galleries in the immediate vicinity of the site.

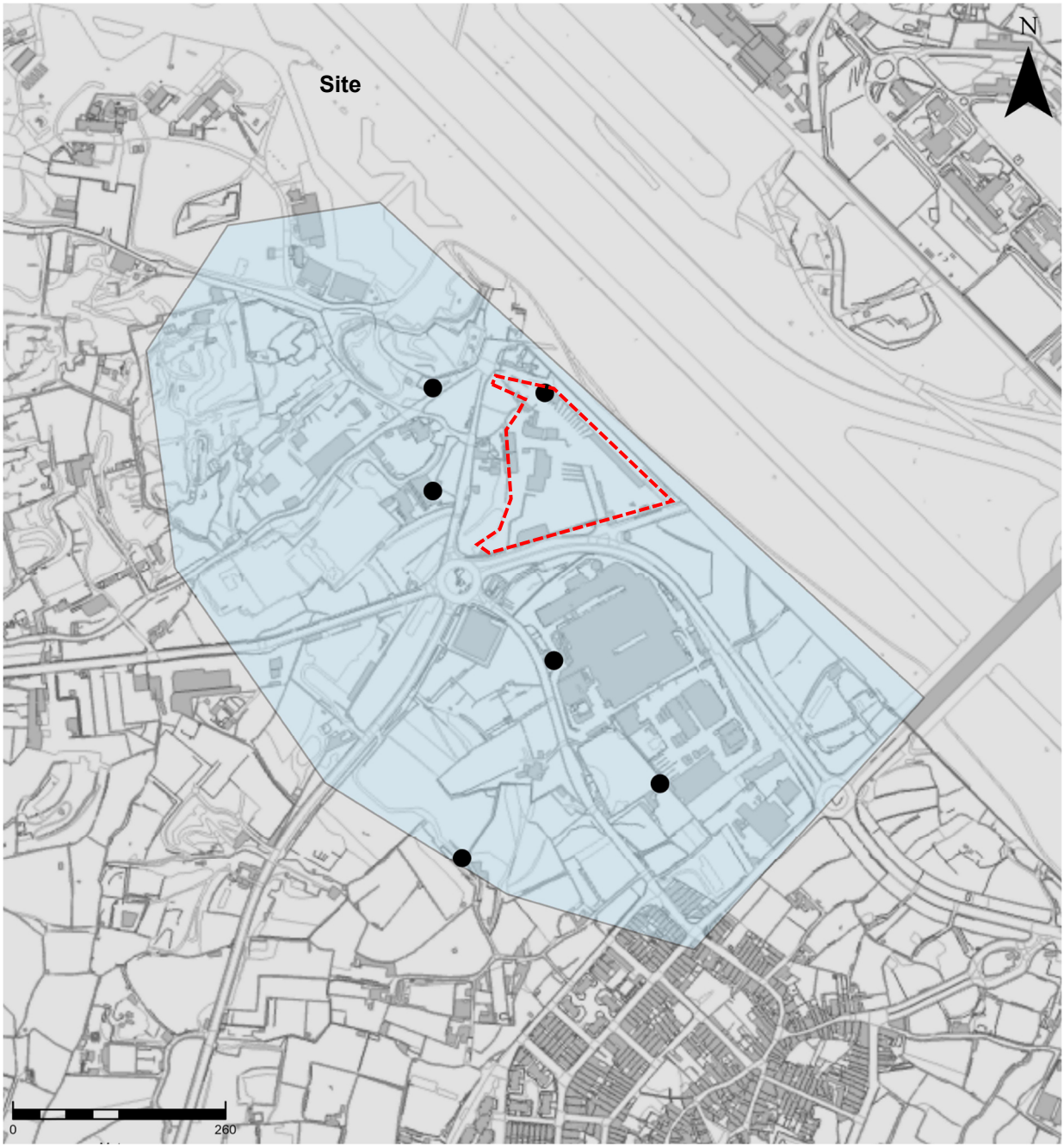


Figure 4-6 – Borehole data supplied by the Environment and Resources Authority.

4.6 Soil

Soil development in the Maltese Islands is closely linked to the underlying geology, topography, climate and land-use history. The islands are characterised by relatively shallow, calcareous soils that have developed primarily through the weathering of the underlying limestone and clay formations, together with the accumulation of transported material in valleys and low-lying areas.

Given the semi-arid Mediterranean climate, limited vegetation cover and long history of agricultural activity, soil profiles across the islands are generally thin and discontinuous, with significant spatial variability over

short distances. Soil formation is influenced by both natural geomorphological processes and anthropogenic modification, including terracing, cultivation and land reclamation.

Several main soil types are recognised across the Maltese Islands, typically classified according to colour, composition and parent material. Of relevance to this project are the following soil formations:

a. Terra Rossa Soils

Terra Rossa soils are among the most characteristic soils of the Maltese Islands and are typically associated with limestone terrains, particularly over Upper and Lower Coralline Limestone formations. These soils are generally reddish-brown in colour due to the presence of iron oxides and form through the dissolution of carbonate bedrock and the accumulation of insoluble residues.

Terra Rossa soils are typically clay-rich, moderately deep where preserved and relatively well-drained. They are often found in karst depressions, fissures and gently sloping plateau surfaces. Due to their relatively good structure and fertility compared to other local soils, they have historically been favoured for agricultural use. According to the drift map by Lang (1960), the area of the proposed project is indicated to be covered by the Terra Rossa soils, but the degree of disturbance brought about by man in this area makes this highly doubtful, and if any of these soils remain, they are likely to be limited to isolated patches.

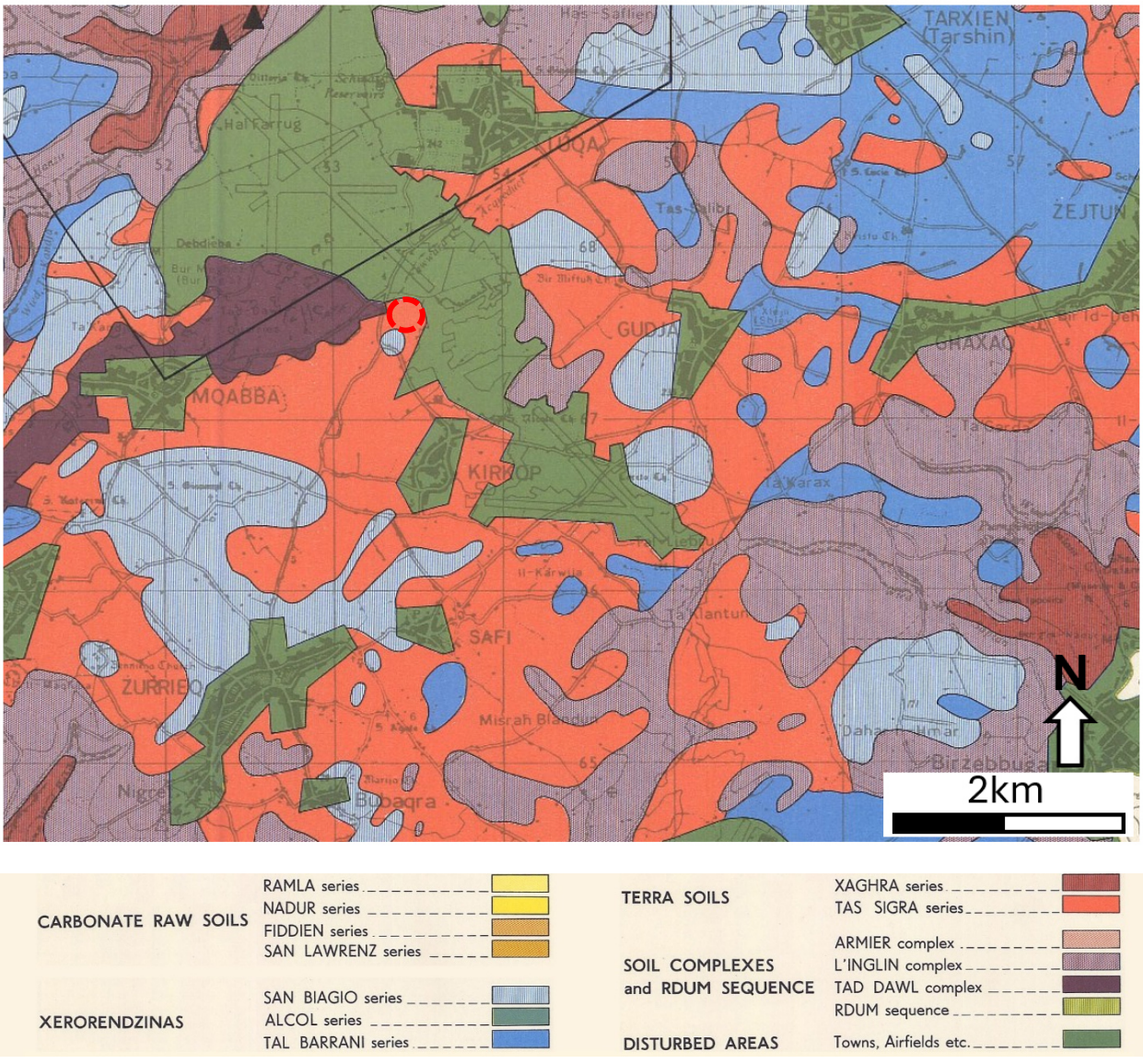


Figure 4-7 Extract from the Soil Map of Malta and Gozo (Source: Lang D.M. 1960). Site location is indicated in red dashed circle.

An extract from Lang's soil map for the Maltese Islands (1960) reproduced below indicates that the soils found within the zone are mainly from the Terra Soil – Tas-Siġra series (Figure 4-7). The tas-Siġra series is classified as an earthy terra fusca according to the Kubiena (1953) classification. The top soil is generally loose to slightly compact and usually of a dark matt brown colour. In profile it exhibits a humus deficient, thin grey-brown A horizon overlying a thicker reddish brown ferruginous B horizon which overlies bedrock (Lang, 1961).

b. Xerorendzina Soils

The same applies to Xerorendzina soils, which are indicated to exist just to the south of the site. These are thin, immature soils developed over Globigerina Limestone and other calcareous parent materials. These soils are generally pale brown to grey in colour, with a high calcium carbonate content and limited profile development. They are commonly shallow, stony and prone to erosion, particularly on sloping terrain. Due to their limited depth and low organic matter content, xerorendzina soils have relatively low water-holding capacity and fertility. They are often associated with abandoned or marginal agricultural land and semi-natural garigue landscapes.

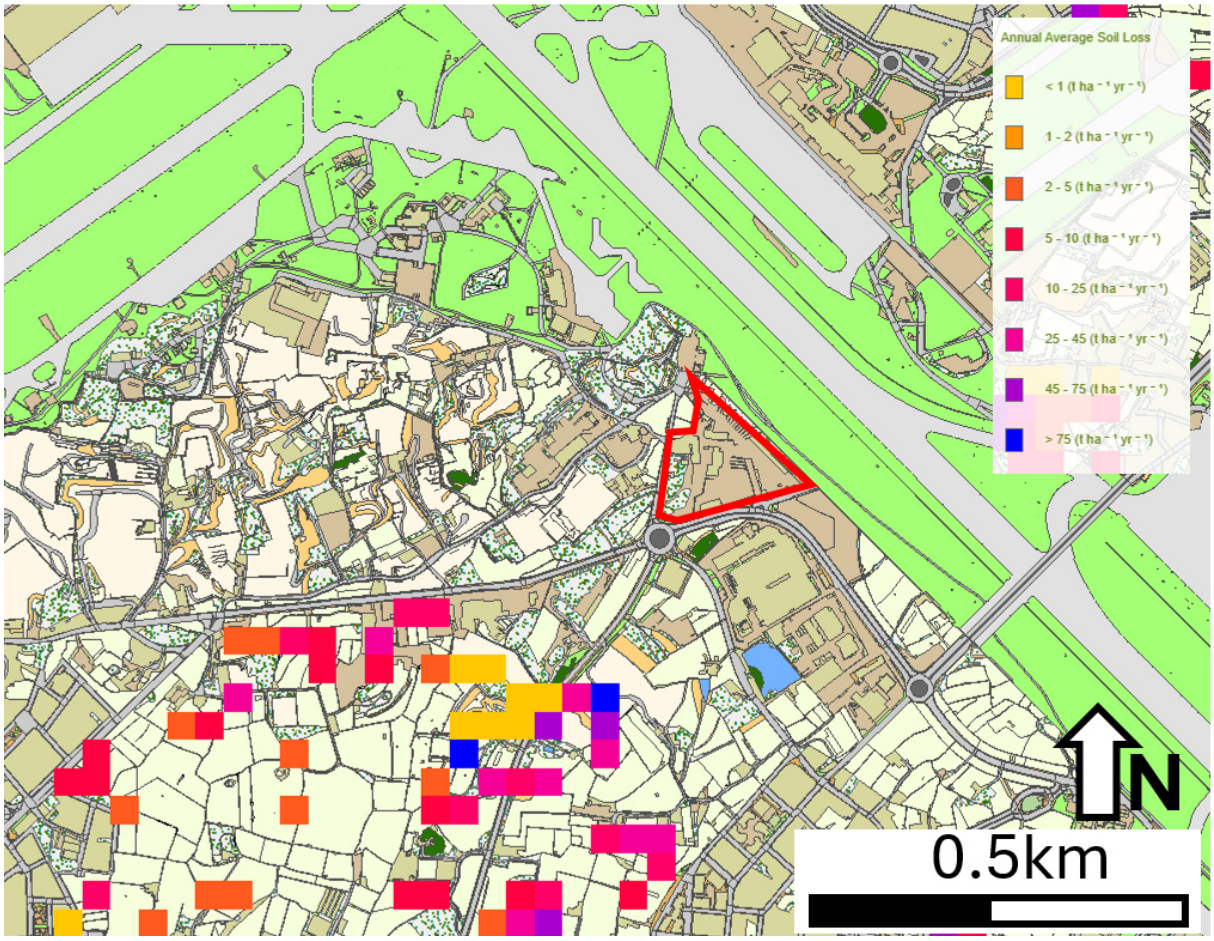


Figure 4-8 – A soil erosion model (rUSLE) indicating site does not seem to be subject to soil erosion. This is confirmed by on site assessments. Map taken from the ERA Geoportal and paper available through https://www.xjenza.org/JOURNAL/OLD/3-1-2015/09.pdf.

Soil erosion is recognised as an important land degradation process in the Maltese Islands, largely driven by shallow soils, sloping terrain and episodic high-intensity rainfall events. A national-scale assessment undertaken by Sultana (2015) for the Malta Environment and Planning Authority identified soil erosion by water as a significant constraint on soil sustainability in Malta, particularly where soils are exposed and runoff is concentrated (Figure 4-8). Within this modelling framework, the study area falls within a zone

mapped as having negligible soil loss by water erosion (i.e., effectively no predicted erosion under the model assumptions), reflecting the local terrain and land-cover characteristics used in the assessment.

During the site inspection, no measurable or visible evidence of active soil erosion (such as rilling, gullying, sediment deposition or exposed subsoil profiles) was observed within the project footprint. This is consistent with the largely level topography of the site and its current predominantly developed/hardstanding condition, which limits the presence of exposed natural soil surfaces. Notwithstanding this, temporary soil erosion risk may increase during construction phases where excavation and stockpiling expose bare soils; therefore, appropriate sediment and runoff management measures should be implemented as part of standard construction environmental management practice.

5 Site Work

More detailed information about the intact rock characteristics of the site can be obtained from the reports of the ground investigation by Terracore, carried out in April 2024 (Ref. TERR24/QOR001/J8017)

During this investigation, seven vertical boreholes (BH1 to BH7) with core recovery were drilled to depths ranging between 14 m and 17 m below ground level. The borehole locations were selected in coordination with the project design team so as to provide representative coverage across the proposed development footprint and to investigate ground conditions to depths exceeding the anticipated maximum excavation level. The borehole locations are indicated in Figure 5-1 and the Ground Investigation Report (Ref. TERR24/QOR001/J8017).

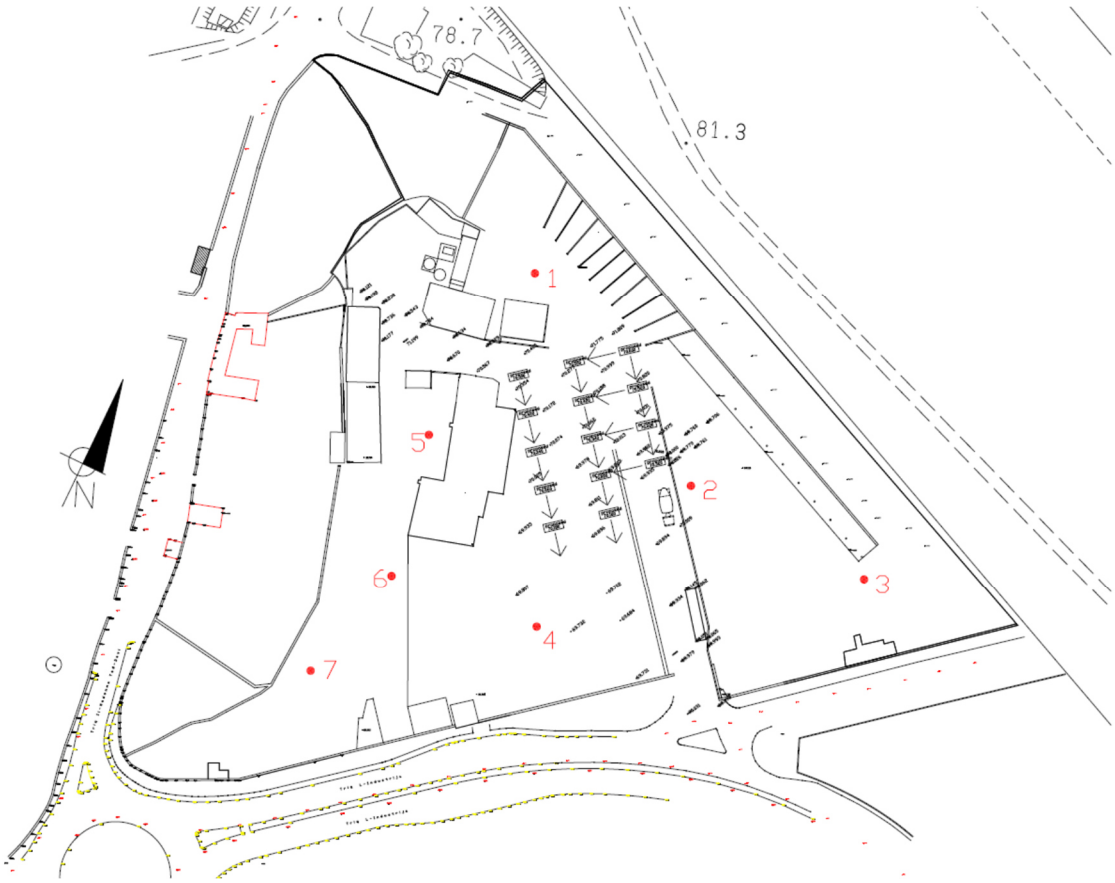


Figure 5-1 - Plan Showing Borehole Locations at Elbros Plant, Kirkop (from Terracore report TERRACORE Ground Investigations Report, Ref. TERR24/QOR001/J8017).

Borehole elevations and depths are presented in the geotechnical report relative to ground level at the time of drilling. For the purposes of this EIA, elevations may be expressed in metres above mean sea level (m amsl) where required, based on available topographic data for the site area.

The 3-D Territorial LiDar Maps for Malta (source: http://www.um.edu.mt/projects/cloudisle) indicate that the site is approximately at 81 metres above sea level at the locations of borehole 5.

5.1 Intact rock

The material recovered from the boreholes indicates that the site is underlain entirely by the Lower Globigerina Limestone Formation to the maximum explored depth (14–17 m bgl). The limestone is typically described as light-yellow to cream in colour, locally mottled or stained, and composed predominantly of wackestones. The intact rock strength is generally described as weak to moderately weak when assessed in the field using a geological hammer, although laboratory testing would provide more precise strength parameters.

The Lower Coralline Limestone Formation was not encountered in any of the boreholes. Based on regional geological relationships and the depth of investigation, it is inferred that this formation occurs at a greater depth beneath the site than that explored during the current investigation.

Laboratory tests were carried out at Terracore Ltd., to assess the strength and pore structure characteristics of bedrock underlying the site. This was achieved by carrying out unconfined compressive strength measurements in accordance with the recommended methods of the International Society for Rock Mechanics (ISRM). The bulk density was measured for each test specimen, immediately before crushing the specimen in the compression machine. The moisture content was also determined.

The particle density of the rock specimens was assumed at 2.7Mg/m^3 based on tests carried out on similar materials by the author. This value depends on the mineralogical characteristics of the limestone (its purity as calcium carbonate) and generally varies between 2.60 and 2.74Mg/m^3. Assuming this value, the porosity, void ratio, degree of saturation and saturated densities can all be determined, in addition to the unconfined compression strength, the bulk density and the moisture content, which are measured directly from the test specimens.

Table 5-1 – Summary of test data

	Gs (assumed)	Bulk unit wt	Dry unit wt	Voids ratio	Porosity	Degree of saturation	Saturated unit wt	Unconfined comp. strength	Moisture Content
	Mg/m^3	kN/m^3	kN/m^3			%	kN/m^3	MPa	%
Minimum	2.70	18.50	16.23	0.48	0.33	57.43	20.02	6.90	13.20
Maximum	2.70	20.52	17.84	0.63	0.39	97.09	21.04	16.30	19.60
Average	***2.70***	***19.73***	***17.01***	***0.56***	***0.36***	***77.86***	***20.52***	***12.12***	***15.99***

Bulk density, dry density, moisture content and unconfined compressive strength values are taken directly from the laboratory testing programme reported in TERRACORE Ground Investigations Report (Ref. TERR24/QOR001/J8017).

Void ratio, porosity, degree of saturation and saturated unit weight have been calculated by the undersigned using the reported mean laboratory values and assuming a particle density (G_s) of 2.70 Mg/m³, representative of calcarenitic Lower Globigerina Limestone. These derived parameters are intended to provide indicative geotechnical context and do not replace site-specific engineering design calculations.

The graphs in Figure 5-2 summarise the results from the laboratory testing programme reported in TERRACORE Ground Investigations Report (Ref. TERR24/QOR001/J8017). The tested specimens are all from core samples from within the Lower Globigerina Limestone.

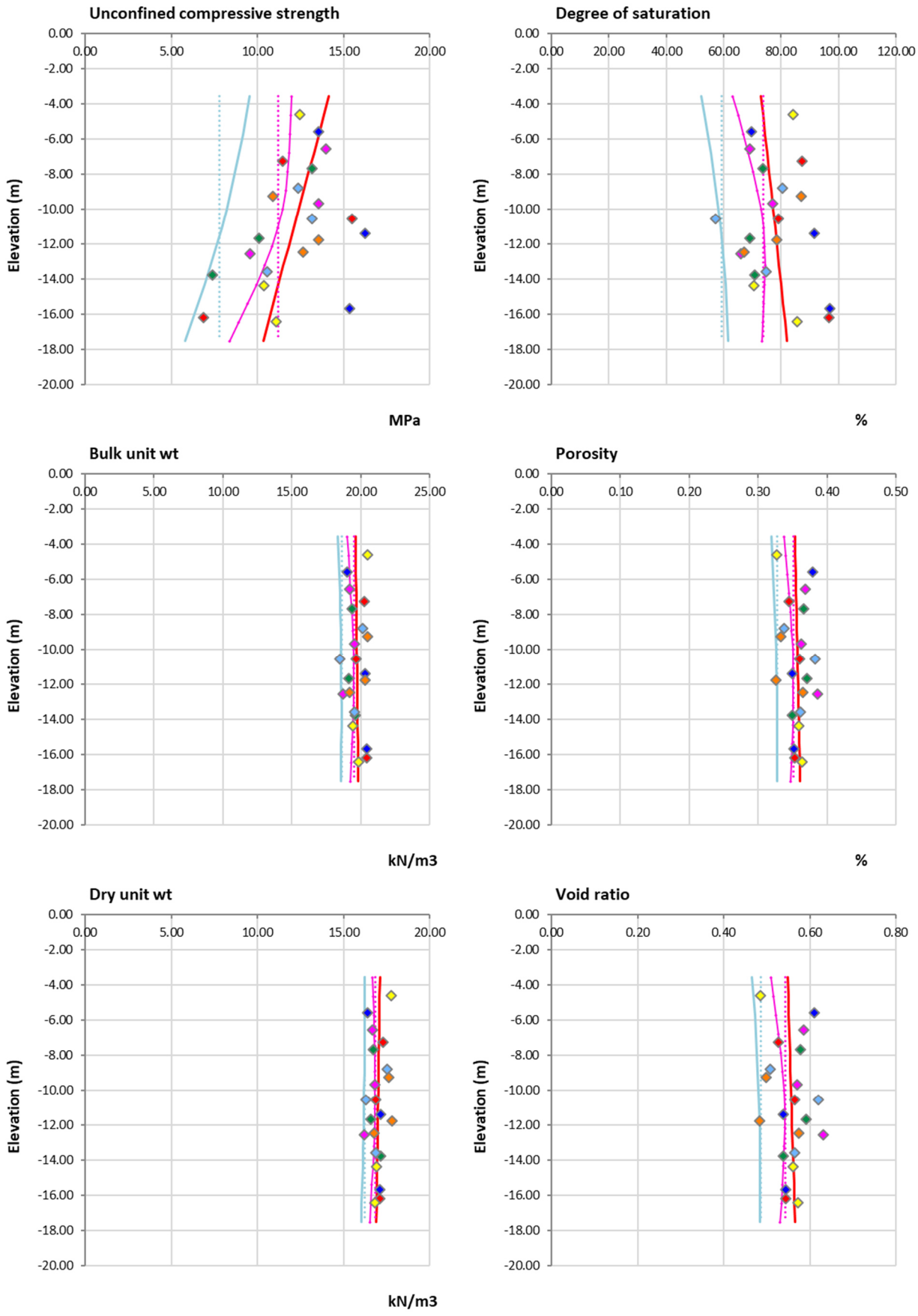


Figure 5-2 – Interpretation of intact rock test carried out by Terracore Ltd on rock specimens prepared from retrieved borehole core.

The bulk unit weight ranges from approximately 18.5kN/m³ to 20.5kN/m³, with an average of approximately 19.7kN/m³. The results are generally consistent with depth, with some scatter between individual specimens. The average dry unit weight is approximately 17.0kN/m³, ranging from about 16.2kN/m³ to 17.8kN/m³.

Void ratio and porosity show moderate variation with depth. The void ratio ranges from approximately 0.48 to 0.63, with an average of about 0.56, while porosity ranges from approximately 0.33 to 0.39, with an average of about 0.36. Some specimens therefore have void ratios greater than 0.60, which indicates a relatively open pore structure. This is relevant because higher void ratio and porosity may be associated with lower dry unit weight, greater moisture sensitivity and a greater dependence of strength on the degree of interparticle cementation. However, the results do not indicate a strong or consistent increase in void ratio or porosity with depth, although some deeper specimens show slightly lower dry unit weight and higher moisture content.

The unconfined compressive strength results range from 6.9MPa to 16.3MPa, with an average of approximately 12.1MPa. These values are considered consistent with the expected behaviour of weak Lower Globigerina Limestone and do not appear anomalous for this lithology. The lower strength values occur mainly in some of the deeper specimens, and the deeper tested levels therefore show greater variability in strength. However, the relationship between strength, dry unit weight, void ratio and porosity is not sufficiently strong to rely on any single parameter as a direct predictor of strength. The results should therefore be interpreted as indicating a variable but generally competent Lower Globigerina Limestone rock mass, subject to confirmation of the degree of fracturing and discontinuity conditions recorded in the borehole logs.

The measured degree of saturation ranges from approximately 57% to 97%, with an average of approximately 78%, indicating that the specimens were not consistently fully saturated at the time of testing. Several specimens have degrees of saturation below approximately 75%. This is relevant because partially saturated porous limestones may exhibit enhanced apparent strength when compared with equivalent specimens tested in a saturated condition. Consequently, some of the measured UCS values may be higher than would be expected if the same specimens were tested in a fully saturated state.

In the present dataset, however, no clear or consistent relationship is evident between degree of saturation and unconfined compressive strength. The statement that less saturated specimens may be stronger is therefore valid as a general geotechnical consideration, but it is not strongly demonstrated by the available results. The derived geotechnical parameters should therefore be considered in conjunction with the moisture condition of the specimens and the limitations of laboratory testing on selected intact core samples.

The scatter in UCS values for specimens with broadly similar unit weight, void ratio and saturation also suggests that intact strength is likely to be influenced by factors not directly measured in the laboratory tests. In porous bioclastic limestones such as the Lower Globigerina Limestone, strength can be strongly affected by the degree of cementation, grain bonding, fossil content, micro-fabric and micro-cracking. The available laboratory data do not allow cementation to be quantified directly, but the variability in strength indicates that differences in cementation and rock fabric are likely to contribute to the observed behaviour. This should be borne in mind during excavation and foundation assessment, particularly if weaker, poorly cemented or more weathered horizons are encountered.

It is to be noted that the strength of the ground in resisting the project loads will not be dependent only on the results of these laboratory tests. The engineering behaviour of a rock mass depends on the strength of the intact rock (presented in the results of the laboratory tests) and on the degree of fracturing or discontinuity, which is indicated on the borehole logs and which is described in the following section. Both of these should be considered when assessing the interaction between the proposed structures and the ground.

5.2 Rock mass

The borehole logs in the Terracore report show the Total Core Recovery (TCR), the Solid Core Recovery (SCR) and the Rock Quality Designation (RQD) values for each section of retrived core. These are normally taken over enitre runs of the drilling process. One run is defined as the amount of core retreived between two successive assembly/dismantling operations of the entire drill string. This process is required every time that the double core sampler at the bottom end of the drill string is filled with rock core. The TCR is a measure of the proportion of core recovered of both solid and non intact quality to the total length drilled in each run. It may occur that the rock may be friable to an extent that the drilling sampler would not be capable of retrieving it from the ground.

The SCR is the ratio of solid core (defined as core having one complete diameter) recovered to total length drilled while the RQD is the ratio of the sum of cylindrical core pieces that are longer than 100mm, to the total length drilled. For the purposes of the RQD, only natural discontinuities are taken into consideration and thus the drilling induced cracks are ignored.

Figure 5-3 – SCR values for boreholes 1 to 7 (from Terracore report TERRACORE Ground Investigations Report, Ref. TERR24/QOR001/J8017)

The recorded RQD values are reproduced Figure 5-3. These indicate that the recovered rock mass generally falls within the **fair to excellent quality range**, with many intervals classified as good to excellent. Higher degrees of fracturing were typically observed within the uppermost metres of rock, consistent with

weathering effects commonly encountered in the Globigerina Limestone. At greater depth, the rock mass is generally more intact and massive in character.

Figure 5-4 – RQD values for boreholes 1 to 7 (from Terracore report TERRACORE Ground Investigations Report, Ref. TERR24/QOR001/J8017)

No significant loss of drilling fluid circulation was reported during drilling operations, and no major cavities or karstified zones were encountered within the explored depth range. This suggests that discontinuities intersected by the boreholes are generally tight and not significantly open or solution-widened. While minor discontinuities were observed within the core, these do not appear to form continuous or highly permeable pathways. The absence of marked core degradation, fault gouge or intensely sheared intervals further indicates that the boreholes did not intersect any major structural discontinuities or fault cores within the investigated depth range.

Overall, the ground investigation indicates that the site is underlain by a relatively competent limestone rock mass of generally good quality, with limited fracturing and no evidence of significant karstification or major structural disturbance within the investigated depth range. These findings provide an appropriate geological and geotechnical baseline for the assessment of excavation behaviour, foundation design considerations and potential hydrogeological interactions associated with the proposed development.

6 Vulnerability of the site to natural forces

The site is characterised by very low relief and is effectively level to gently sloping, with no abrupt changes in ground elevation within the development footprint. The nearest notable geomorphological feature is the shallow incision associated with the Wied Sillani and Wied Dalam valley systems, located to the north and south of the site (Figure 4-2). Given the generally flat nature of the site and the absence of steep slopes, the vulnerability of the site to slope-related geomorphological processes such as landslip, rotational failure or mass-wasting is considered negligible.

No permanent watercourses traverse the site, and surface drainage is expected to occur primarily as episodic sheet runoff during intense rainfall events, consistent with the ephemeral nature of Maltese hydrology. As such, there are no significant natural fluvial processes within the site that would be expected to generate material erosive forces. Any erosion risk is therefore more likely to be associated with construction-phase soil exposure and runoff management, rather than with inherent site geomorphology.

With respect to subsurface geomorphological processes, carbonate lithologies in Malta can be susceptible to dissolution and karstification, potentially resulting in the formation of fissure enlargement, small voids, or solution features over geological timescales. However, the site-specific ground investigation (Ref. TERR24/QOR001/J8017) recorded consistent coring within the Lower Globigerina Limestone to depths of 14–17 m, with generally fair to excellent rock quality and no recorded evidence of significant cavities, solution voids, or karstified zones within the investigated depth range.

While localised dissolution features cannot be entirely excluded in limestone terrains, it is noted that the Lower Globigerina Limestone typically develops **smaller-scale dissolution features** compared to the Coralline Limestone formations, where larger cavities and caves are more commonly encountered. Any isolated minor voids or fissure enlargements, if encountered during excavation, can be appropriately managed through standard engineering measures (e.g., local treatment, bridging, or redesign of minor foundation elements). Where concentrated point loading is envisaged, targeted probing or additional verification during excavation may be undertaken to confirm local rock mass integrity prior to final foundation construction.

7 Vulnerability of the site to development processes

Based on the ground investigation data and the geological interpretation for the site, the excavation is expected to remain predominantly within the Lower Globigerina Limestone, which was encountered in all boreholes to the maximum investigated depths. The excavation works should therefore be assessed in relation to the quality, discontinuity pattern and engineering behaviour of this limestone unit, together with any local weaker, fractured or weathered zones that may be encountered during the works.

Detailed discontinuity characteristics are not fully known at this stage and should therefore be verified either through further investigation before excavation starts or by systematic geological inspection as excavation proceeds. This should include assessment of jointing, bedding, fissuring, weathered zones and any localised cavities or weak horizons exposed during the works.

The history of quarrying in the wider area suggests that extensive open fissuring or major cavities are not widespread within the exposed rock mass, as such features would likely have been encountered during quarrying operations. However, this observation should not be taken as definitive evidence of their absence beneath the project site. The possibility of localised discontinuities, minor cavities or weaker zones should therefore remain part of the excavation and foundation risk assessment.

Within the expected rock formation, karstic activity is considered more likely to occur as small-scale solution features or phreatic tubes rather than large, cavernous voids. This reduces, but does not entirely remove, the potential risk of localised punching or loss of support beneath foundation elements. It is therefore recommended that targeted probing, geophysical investigation or other suitable verification methods are

carried out prior to foundation construction in order to identify the presence or absence of any karstic cavities, open fissures or locally weakened zones.

8 Possibility for reuse of excavated material

The ground conditions at the site indicate two principal material types that may arise during excavation, namely a limited thickness of surficial overburden/topsoil and the underlying Lower Globigerina Limestone. These materials present opportunities for reuse, provided that appropriate segregation, handling and suitability considerations are applied.

Any topsoil and shallow overburden encountered should be stripped and stockpiled separately from other excavated materials in order to preserve its organic content and soil structure. Where practicable, this material should be retained for reuse within the project for landscaping and reinstatement works. Where on-site reuse is not feasible, the material may be relocated to an approved receiving site for agricultural or land restoration purposes, subject to the relevant permitting and management controls.

The bulk of excavation arisings are expected to comprise Lower Globigerina Limestone, as confirmed by the ground investigation, which identified this lithology consistently within all boreholes.

While this limestone can be excavated and reused as general fill, the proximity of the site to active quarries suggests that the proposed excavation might provide an opportunity for quarrying natural stone blocks of sizes typically used in the construction industry. The high RQD values reported in the borehole core also suggest that this kind of activity may be possible

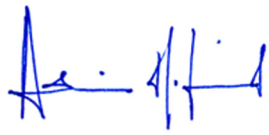
If the excavated Globigerina Limestone is used as a general fill, especially where stringent engineered fill specifications are required, very careful consideration should be given to the possibility of an elevated fines content, as this is likely to result in a fill of low permeability, which would result in undrained behaviour, making compaction very difficult. This problem is generally avoidable if careful sieving procedures are adopted to separate fines from the main body of material that is used for fill.

Where reuse as engineered fill, sub-base or pavement construction is proposed, suitability should be confirmed through an appropriate materials testing and grading assessment, and alternative imported aggregate material may be required to meet engineering performance criteria.

9 Disclaimer

Any opinions expressed in this report are based on the ground conditions revealed by the site works, together with an assessment of the site and of laboratory test results. Whilst opinions may be expressed relating to sub-soil conditions in parts of the site not investigated, for example between exploratory positions, these are only for guidance and no liability can be accepted for their accuracy.

The recommendations in this report are for guidance only and the user remains responsible to make all the necessary geotechnical design checks according to MSA EN 1997-1 Eurocode 7 – Geotechnical Design. General Rules, for every particular foundation situation, and to make the necessary site observations to verify the assumptions described in this report.



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18th May 2026

TERRACORE

Proposed Geotechnical Investigations at Elbros Plant, Kirkop.

Site Investigations at Elbros Plant, Kirkop.

Ground Investigations Report

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DOCUMENT CONTROL

PROJECT NAME : *Proposed Geotechnical Investigations at Elbros Plant, Kirkop.*

DOCUMENT TITLE : *Ground Investigations Report*

DOCUMENT No. : *TERR24/QOR001/J8017*

DOCUMENT ISSUE

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FOREWARD

Recommendations presented in this report are based on the findings from the locations where the boreholes were drilled and for which the laboratory test results were carried out. Therefore, the Report may not represent all conditions that the Client/Architect/Engineer may encounter later on during the course of site works (including excavation, clearing of site etc.) on the said project. Whilst opinions may be expressed relating to sub-soil conditions in parts of the site not investigated, for example away from the location of the boreholes drilled, these are only for guidance and no liability can be accepted for their accuracy.

It is imperative that the following report is read in its entirety. The geological and geotechnical findings provided in this document should not be relied upon for any specific application without thorough and competent examination and verification of its accuracy, suitability and applicability by qualified professionals.

The rocks and soils encountered and the samples retained represent a limited amount of the material present in the subsurface at the site. Although the investigation recovered representative samples of the geological materials present, some material present on the site may not have been examined. Should significantly different rocks or soils be determined during site works, then further investigation may prove necessary.

Unless otherwise stated in this report, drilling us undertaken using rotatory techniques. This method is regarded as being one of the most reliable.

Boring and sampling procedures are undertaken in accordance with:

- BS 5930:1999 – Code of practice for ground investigations.
- EN 1997:2:2007- Geotechnical Design Part 2: Ground Investigation and testing.

1. INTRODUCTION

TERRACORE Ltd. was commissioned by Qormi Constructions Ltd. to undertake a preliminary site investigation at Elbros Plant, Kirkop. (**Figure 1**).

Figure 1: Ariel Photo indicating site location at Elbros Plant, Kirkop. (*Source: Google Earth)*

2. SCOPE OF WORK – DESIGN METHODOLOGY

The aim of the investigation is to identify the existing terrain conditions, top of bedrock and the presence of clay beds, caverns and voids as well as the quality of clay-soil beneath.

For the fulfilment of the Evaluation and subsequent Interpretation Scope, the design methodology was dictated by the following successive stages:

- *Desk study and evaluation* of the available geological, geotechnical and hydrogeological information. Moreover, problematic or instable locations are taken also into account. These included among others, the formations involved in the project area, the indicated major or minor hazards such as faults, disturbance zones, major or minor instabilities, the orientation of the main structural features of the formations in relation to the project layout, the prevailing groundwater regime etc.
- *Observation on site of the main elements of the geotechnical investigations.* At this stage, the site was visited by experienced engineering geologists of the design team and the main elements of the geology were recorded and verified, in conjunction of the examination of the borehole cores.
- *Detailed evaluation of the existing information* through the conclusions obtained in the course of on-site verification. The particular design stage included the evaluation of the statistical processing of the laboratory test results and the arrangement of the geotechnical units.
- *Combination of the collected, verified and evaluated information* and development of the pertinent general geological and geotechnical model for the project area.

Sampling and testing should comply with the relevant standards (unless otherwise agreed, BS standards or other recognised equivalents should be used), and should extend to a sufficient depth below the deepest level of the proposed development (taking into consideration all proposed excavations and underground structures). Wherever the study involves the drilling of core samples, the number, depth and location thereof should also be submitted for EPD approval prior to carrying out of any in situ tests.

3. STANDARDS & GUIDANCE

The site investigation was conducted in full accordance with *BS 5930:2015 "Code of practice for geological site investigations"*, *BS EN 1997:2004 "Geotechnical Design – Part 1: General Rules"* and *BS EN 1997-2:2007 "Geotechnical Design - Part 2: Ground Investigation and Testing"*.

Uniaxial compressive strength tests on rock samples were performed according to the *International Society for Rock Mechanics (ISRM) suggested methods and Annex W of EN 1997-2:2007.*

4. AVAILABLE DATA

For the implementation of the present final report, the following documents were taken into consideration:

[1] Google Earth Images.

[2] Plan Showing Borehole Locations at Elbros Plant, Kirkop. (Source: Planning Authority)

5. SITE LOCATION & PROJECT DESCRIPTION

5.1 Site Location

The investigated site is located at Elbros Plant, Kirkop and is indicated in **Figure 1**. Along with this the Site Plan Showing Borehole locations has been provided in **Figure 2 below**.

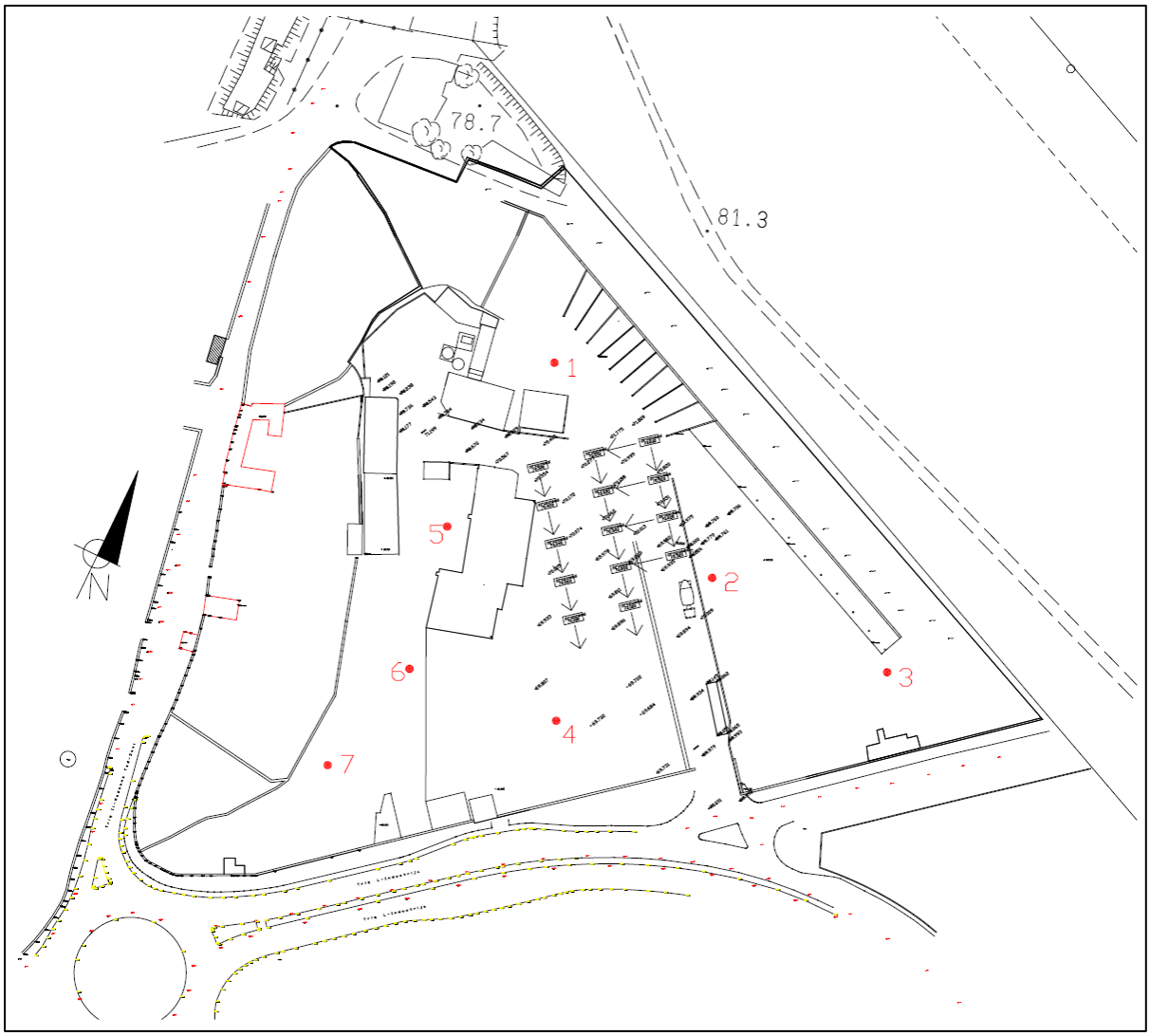

Figure 2: Plan Showing Borehole Locations at Elbros Plant, Kirkop. *(Source: Planning Authority)*

5.2 Project Description

The investigated site location has been provided in Figure 1. Its South boundary is marked by Triq L-Industrija, West boundary by Triq Il-Madonna Tad-Dawl, North boundary by an access road whereas its East boundary is bordering with the Malta International Airport on the . **(See Figure 1**)

6. GEOLOGY OF THE AREA

6.1 Geological Setting of Malta

The Maltese strata comprise hard, massive sometimes reefal, tectonically competent coralline limestones, ductile fine grained biomicrites and plastic marls and clays of a tectonically incompetent behaviour. The litho and Chrono stratigraphical rock succession and the paleo-environment of the Maltese Islands have been studied in detail by Murray (1890), Felix (1973), Pedley (1978), Pedley *et al.* (1978), Di Geronimo *et al.* (1981). According to these authors they consist of the following formations (from youngest to oldest):

1. **Upper Coralline Limestone Formation:** up to 162m thick, represented by shallow water facies ranging from subtidal through intertidal and supratidal environments.
2. **Greensand Formation:** up to 12m glauconitic limestones.
3. **Blue clay Formation:** up to 65m slightly consolidated marls which have been deposited in an open marine environment at sea-depth between 200 and 40 m.
4. **Globigerina Limestone Formation:** a 23 - 207m thick sequence of fine-grained biomicrites with intercalated layers of phosphorite nodules. These series have been deposited at water depth between 40 and 150m in a shallow shelf area.
5. **Lower Coralline Limestone Formation:** exposed above sea level up to 140m, represented by a shallow water facies formed at sea-depth of less than 50 m.

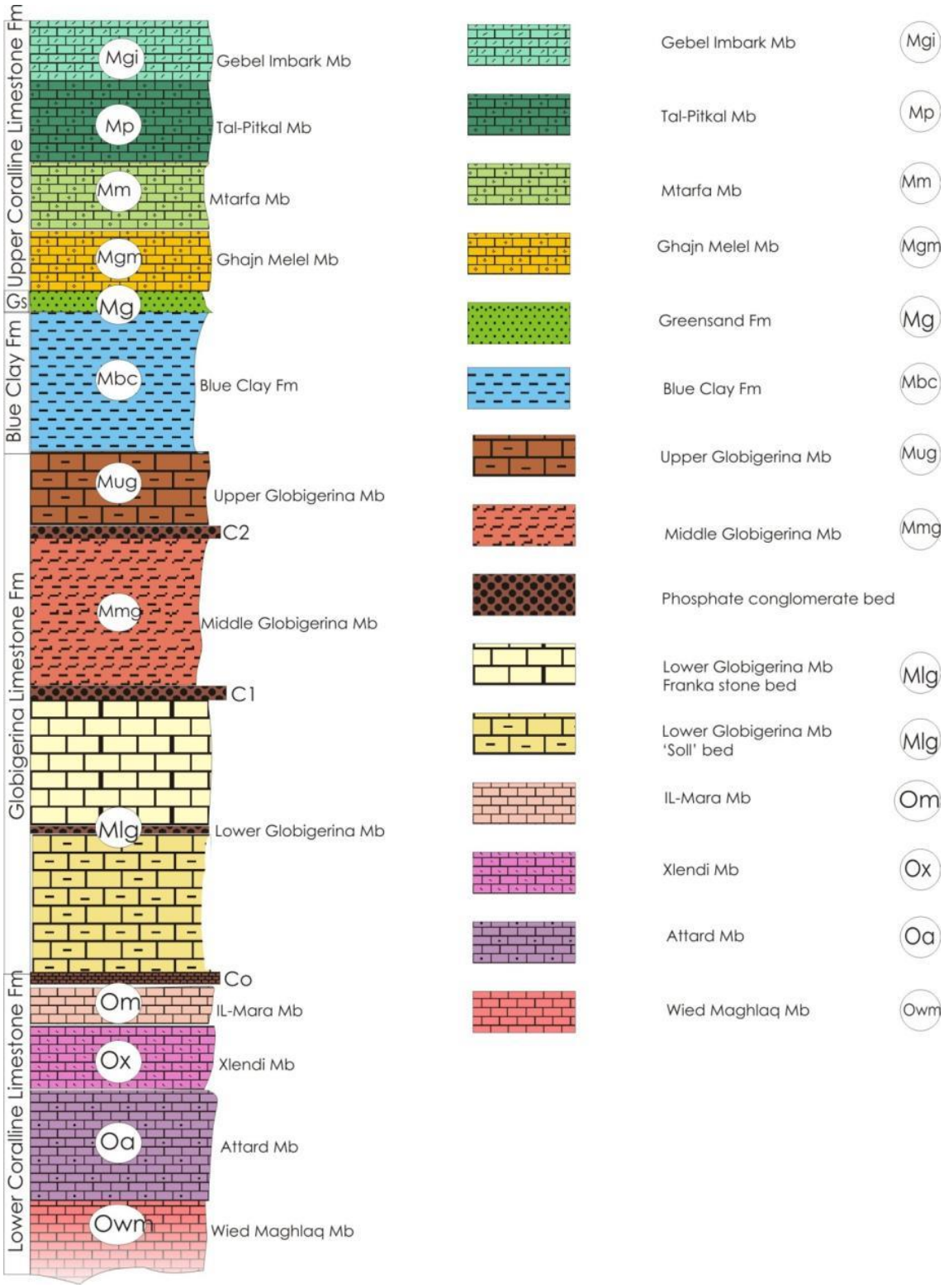

Figure 3: Litho-stratigraphy of the Maltese Islands.

6.2 Geological Conditions along the project area

The extract from the published geological Map of the Maltese islands (1993) shown in **Figure 4** below indicates that the site (marked in red) is located on the Lower Globigerina Limestone Formation.

The Lower Globigerina Limestone consists of a massive, yellow, pale yellow to pale grey colored medium to fine, soft foraminiferal calcarenite with moderate to intense thalassinoidean burrow systems.

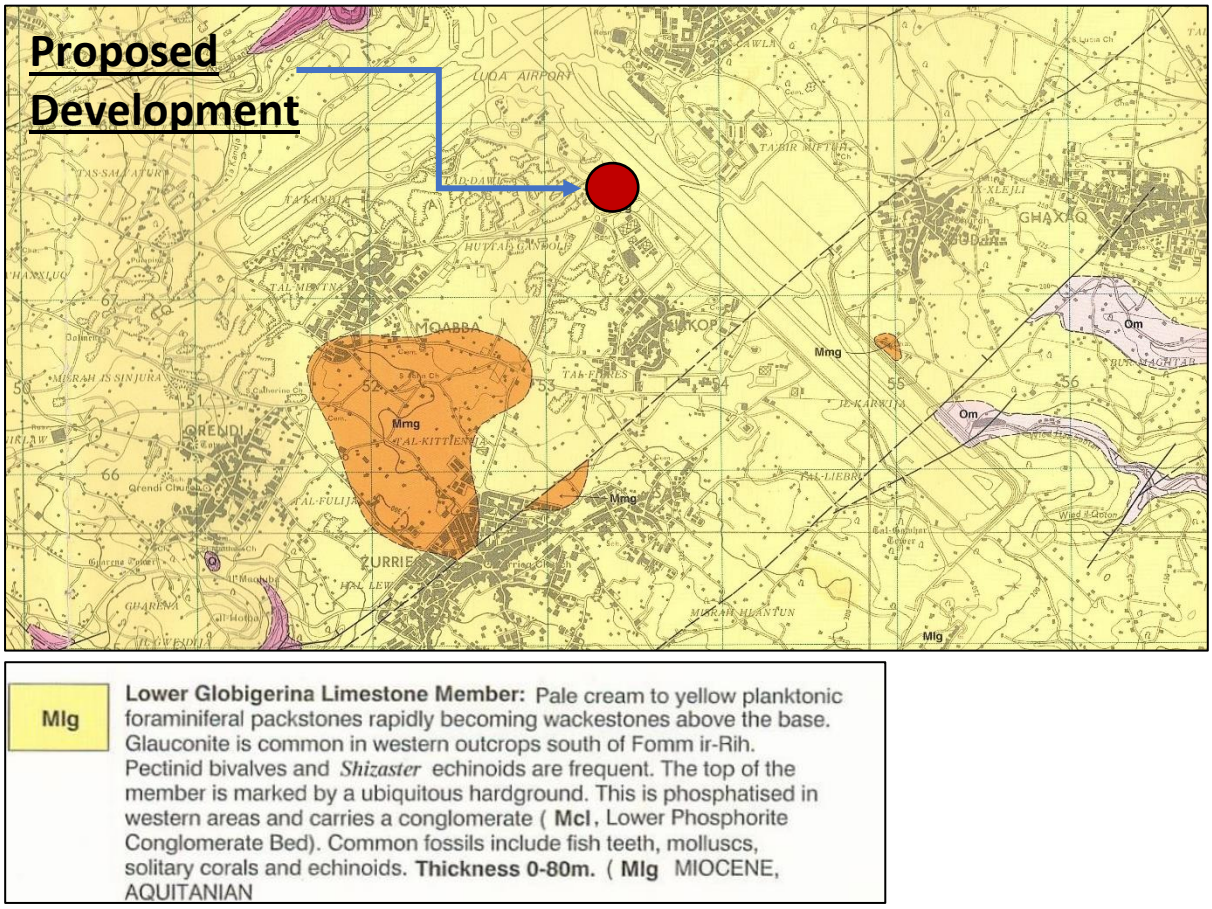

Figure 4: Geological map extract showing the geology of the area and the geological description of the rock formation (Source: Geological Map of the Maltese Islands, 1993)

7. GEOTECHNICAL INVESTIGATIONS & PREDICTIONS

7.1 Site Works - In situ investigations

Fieldwork was undertaken from the 16th till 18th of April 2024, and comprised the drilling and testing of seven (7) boreholes, denoted as BH-1 to BH-7. The approximate position of these boreholes has been indicated in the Plan shown in **Figure 2**.

The borehole drilling records are shown in **Appendix 2** and summarized in **Table 1** below.

	Date drilled	*Top of bedrock (m)*	*Coring run (m)*	*Total depth (m)*
BH-1	17/04/2024	0.70	0.70 – 17.00	17.00
BH-2	16/04/2024	0.00	0.00 – 17.00	17.00
BH-3	16/04/2024	1.00	1.00 – 17.00	17.00
BH-4	17/04/2024	0.40	0.40 – 17.00	17.00
BH-5	17/04/2024	0.25	0.25 – 17.00	17.00
BH-6	18/04/2024	0.50	0.50 – 14.00	14.00
BH-7	18/04/2024	0.50	0.50 – 14.00	14.00

Table 1: Borehole drilling records.

7.2 Classification

The main geological stratum encountered during the investigation is:

- Light-yellow to Cream, Fine to Coarse, Weak, Lower Globigerina Limestone of “Fair” to “Excellent” quality.

Photographs of the rock core recovered are shown in **Appendix 3**. The borehole logs are located in **Appendix 5**.

7.3 Groundwater conditions

No data for the measured water level after drilling has been reported in the boreholes.

7.4 Rock Quality

Table 2 below shows the values of the quality of the rock cores recovered namely the Total Core Recovery (TCR), the Solid Core Recovery (SCR), the Rock Quality Designation (RQD) and the Fracture Index. These parameters are described in **Figure 6** as per BS5930:2015.

BH No.	Run No.	Depth *(m)*	TCR *(%)*	SCR *(%)*	RQD *(%)*	Rock Quality	Fracture Index *(fractures/m)*
BH-1	1	0.70-1.00	100	100	82	Good	0/0.3m
		1.00-2.00		100	100	Excellent	0/m
		2.00-3.00		100	100	Excellent	0/m
	2	3.00-4.00	100	100	100	Excellent	1/m
		4.00-5.00		100	100	Excellent	1/m
		5.00-6.00		100	100	Excellent	0/m
	3	6.00-7.00	100	100	100	Excellent	0/m
		7.00-8.00		100	100	Excellent	0/m
		8.00-9.00		100	100	Excellent	1/m
	4	9.00-10.00	100	100	94	Excellent	1/m
		10.00-11.00		100	100	Excellent	0/m
		11.00-12.00		100	100	Excellent	0/m
	5	12.00-13.00	100	97	88	Good	2/m
		13.00-14.00		100	100	Excellent	1/m
		14.00-15.00		100	100	Excellent	0/m
	6	15.00-16.00	100	100	100	Excellent	0/m
		16.00-17.00		100	100	Excellent	0/m
BH-2	1	0.00-1.00	100	100	95	Excellent	0/m
		1.00-2.00		100	100	Excellent	0/m
		2.00-3.00		100	100	Excellent	0/m
	2	3.00-4.00	100	100	87	Good	1/m
		4.00-5.00		100	91	Excellent	2/m
		5.00-6.00		100	90	Excellent	0/m
	3	6.00-7.00	100	97	76	Good	0/m
		7.00-8.00		100	100	Excellent	0/m
		8.00-9.00		100	100	Excellent	0/m
	4	9.00-10.00	100	100	88	Good	1/m
		10.00-11.00		100	100	Excellent	0/m
		11.00-12.00		100	100	Excellent	0/m
	5	12.00-13.00	100	100	90	Excellent	2/m
		13.00-14.00		100	100	Excellent	0/m
		14.00-15.00		100	100	Excellent	0/m
	6	15.00-16.00	100	100	93	Excellent	0/m
		16.00-17.00		100	100	Excellent	0/m
BH-3	1	1.00-2.00	100	94	68	Fair	5/m
		2.00-3.00		100	100	Excellent	0/m
	2	3.00-4.00	100	96	93	Excellent	0/m
		4.00-5.00		100	100	Excellent	1/m

BH No.	Run No.	Depth *(m)*	TCR *(%)*	SCR *(%)*	RQD *(%)*	Rock Quality	Fracture Index *(fractures/m)*
		5.00-6.00		100	100	Excellent	0/m
	3	6.00-7.00	100	100	100	Excellent	1/m
		7.00-8.00		100	100	Excellent	0/m
		8.00-9.00		100	100	Excellent	0/m
	4	9.00-10.00	100	100	100	Excellent	0/m
		10.00-11.00		100	100	Excellent	0/m
		11.00-12.00		100	100	Excellent	0/m
	5	12.00-13.00	100	100	91	Excellent	0/m
		13.00-14.00		100	83	Good	1/m
		14.00-15.00		100	100	Excellent	0/m
	6	15.00-16.00	100	100	100	Excellent	0/m
		16.00-17.00		100	100	Excellent	1/m
BH-4	1	0.40-1.00	100	93	88	Good	0/0.6m
		1.00-2.00		100	100	Excellent	0/m
		2.00-3.00		100	100	Excellent	0/m
	2	3.00-4.00	100	100	100	Excellent	0/m
		4.00-5.00		100	94	Excellent	1/m
		5.00-6.00		100	100	Excellent	1/m
	3	6.00-7.00	100	100	96	Excellent	0/m
		7.00-8.00		100	100	Excellent	0/m
		8.00-9.00		100	100	Excellent	0/m
	4	9.00-10.00	100	100	100	Excellent	1/m
		10.00-11.00		100	100	Excellent	0/m
		11.00-12.00		100	96	Excellent	1/m
	5	12.00-13.00	100	100	93	Excellent	0/m
		13.00-14.00		100	100	Excellent	0/m
		14.00-15.00		100	100	Excellent	1/m
	6	15.00-16.00	100	100	100	Excellent	1/m
		16.00-17.00		100	100	Excellent	0/m
BH-5	1	0.25-1.00	100	91	83	Good	2/0.75m
		1.00-2.00		95	81	Good	1/m (continued sub-vertical joint from above)
		2.00-3.00		92	89	Good	1/m
	2	3.00-4.00	100	100	100	Excellent	1/m
		4.00-5.00		98	90	Excellent	0/m
		5.00-6.00		98	87	Good	0/m
	3	6.00-7.00	100	100	88	Good	1/m
		7.00-8.00		100	100	Excellent	0/m
		8.00-9.00		100	100	Excellent	0/m

BH No.	Run No.	Depth *(m)*	TCR *(%)*	SCR *(%)*	RQD *(%)*	Rock Quality	Fracture Index *(fractures/m)*
	4	9.00-10.00	100	100	96	Excellent	1/m
		10.00-11.00		100	100	Excellent	0/m
		11.00-12.00		100	100	Excellent	0/m
	5	12.00-13.00	100	100	100	Excellent	1/m
		13.00-14.00		100	100	Excellent	0/m
		14.00-15.00		100	100	Excellent	0/m
	6	15.00-16.00	100	100	100	Excellent	2/m
		16.00-17.00		100	100	Excellent	0/m
BH-6	1	0.50-1.00	100	92	55	Fair	2/0.5m
		1.00-2.00		100	77	Good	3/m
		2.00-3.00		100	100	Excellent	0/m
	2	3.00-4.00	100	100	100	Excellent	0/m
		4.00-5.00		98	94	Excellent	1/m
		5.00-6.00		100	100	Excellent	1/m
	3	6.00-7.00	100	100	93	Excellent	0/m
		7.00-8.00		100	100	Excellent	0/m
		8.00-9.00		100	100	Excellent	0/m
	4	9.00-10.00	100	100	100	Excellent	0/m
		10.00-11.00		100	91	Excellent	1/m
		11.00-12.00		100	100	Excellent	0/m
	5	12.00-13.00	100	100	100	Excellent	1/m
		13.00-14.00		100	100	Excellent	0/m
BH-7	1	0.50-1.00	100	90	67	Fair	1/0.5m
		1.00-2.00		100	91	Excellent	2/m
		2.00-3.00		100	100	Excellent	0/m
	2	3.00-4.00	100	100	100	Excellent	1/m
		4.00-5.00		100	100	Excellent	0/m
		5.00-6.00		100	100	Excellent	0/m
	3	6.00-7.00	100	100	100	Excellent	0/m
		7.00-8.00		100	100	Excellent	0/m
		8.00-9.00		100	100	Excellent	0/m
	4	9.00-10.00	100	100	100	Excellent	0/m
		10.00-11.00		100	86	Good	1/m
		11.00-12.00		100	93	Excellent	0/m
	5	12.00-13.00	100	100	100	Excellent	0/m
		13.00-14.00		100	100	Excellent	0/m

Table 2: Quality of rock core: TCR, SCR, RQD and Fracture Index.

Figure 5: SCR per length for Boreholes (BH-1 to BH-7).

Terms for classification of discontinuity state (see Figure 10)

TCR (%)	Length of core recovered (solid and non-intact) expressed as a ratio of the length of core run.
SCR (%)	Length of solid core recovered expressed as a ratio of the length of core run. Solid core has a full diameter, uninterrupted by natural discontinuities, but not necessarily a full circumference and is commonly measured along the core axis or other scan line.
RQD (%)	Length of solid core each pieces longer than 100 mm expressed as a ratio of the length of core run.
Fracture index	Count of the number or spacing of fractures over an arbitrary length of core of similar intensity of fracturing recorded as minimum/mode/maximum. Commonly reported as Fracture Spacing (If, mm) or as Fracture Index (FI, number of fractures per metre). Where core is non-intact in the ground, the abbreviation NI may be used.

NOTE The total core recovery (TCR) records the proportion of core recovered and is read with the description, solid core recovery (SCR) and rock quality designation (RQD). The TCR of itself gives little information on the character of the core or the rock from which it was recovered. This measurement is required to ensure that all depth related records such as boundaries, markers and samples are correct.

Figure 6: Terms for classification of discontinuity state (Table 31 of BS5930:2015).

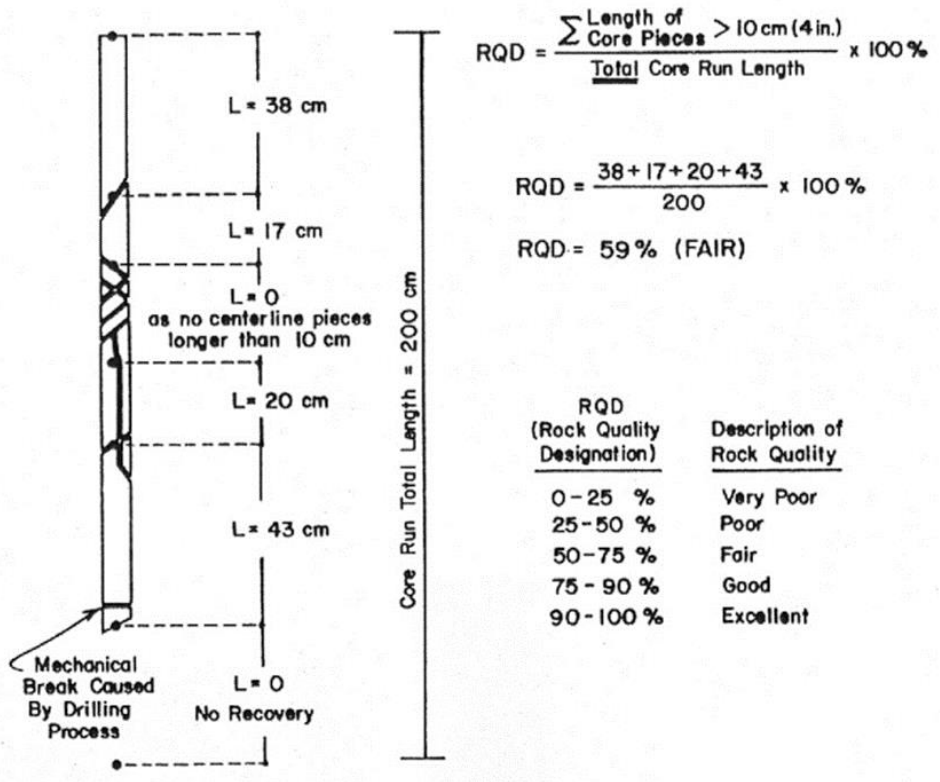

Figure 7: RQD Classification Index (Deere and Deere, 1988).

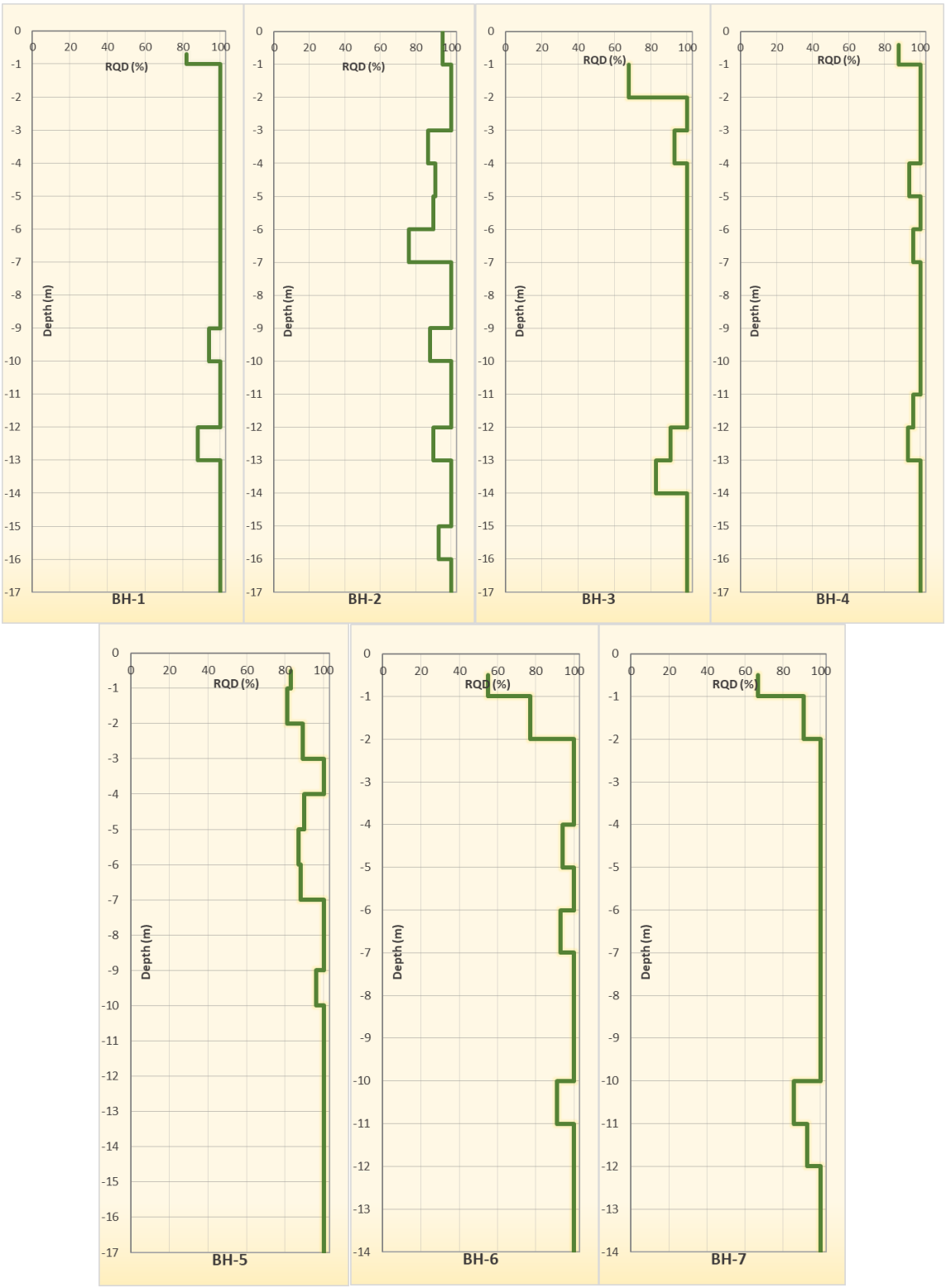

Figure 8: RQD per depth for Boreholes (BH-1 to BH-7).

7.5 Laboratory Results & Interpretation

Twenty-one (21) specimens of Lower Globigerina Limestone were selected from various depths along the recovered rock core from the seven (7) boreholes BH-1 to BH-7 for Unconfined Compressive Strength (UCS) testing. The rock specimens were tested according to the ISRM suggested method. The laboratory results are summarised in **Table 3** below, and the test certificates are located in **Appendix 3**.

BH No.	Run No.	Specimen No.	Depth *(m)*	Bulk Density *(kg/m³)*	Dry Density *(kg/m³)*	Water Content *(%)*	UCS *(MPa)*	Average UCS *(MPa)*
BH-1	3	1	7.30	2068	1714	17.1	11.5	**11.3**
	4	2	10.60	2011	1677	16.6	15.5	
	6	3	16.20	2089	1680	19.6	6.9	
BH-2	3	4	7.70	1981	1669	15.8	13.2	**10.2**
	4	5	11.70	1954	1657	15.2	10.1	
	5	6	13.80	2003	1718	14.2	7.4	
BH-3	2	7	4.65	2092	1774	15.2	12.5	**11.3**
	5	8	14.40	1982	1691	14.7	10.4	
	6	9	16.45	2029	1659	18.2	11.1	
BH-4	3	10	6.60	1958	1664	15.0	14.0	**12.4**
	4	11	9.70	1999	1674	16.3	13.6	
	5	12	12.60	1911	1615	15.5	9.6	
BH-5	2	13	5.60	1941	1634	15.8	13.6	**15.1**
	4	14	11.40	2075	1696	18.3	16.3	
	6	15	15.70	2090	1680	19.6	15.4	
BH-6	3	16	8.80	2060	1748	15.2	12.4	**12.1**
	4	17	10.60	1886	1636	13.2	13.2	
	5	18	13.60	1995	1681	15.7	10.6	
BH-7	4	19	9.30	2091	1754	16.1	10.9	**12.4**
	4	20	11.80	2076	1784	14.1	13.6	
	5	21	12.50	1959	1678	14.3	12.7	

Table 3: Unconfined compressive strength (UCS) of the limestone specimens.

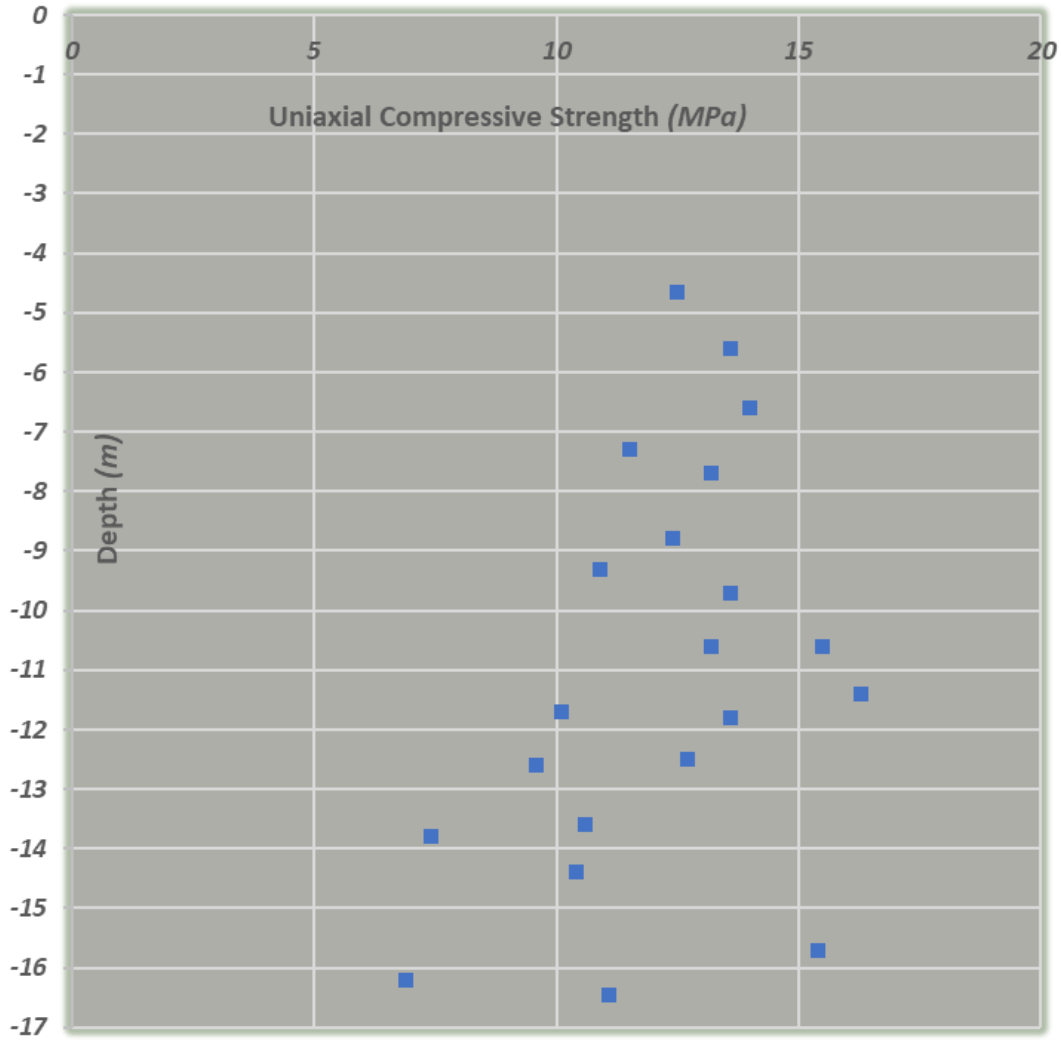

Figure 9: Scatter diagrams of unconfined compression test results per depth for BH-1 to BH-7.

The UCS of the tested Lower Globigerina Limestone ranged from 6.9 MPa to 16.3MPa.

To note that the values of the UCS refer to the strength of intact rock, and it is not the strength of the rock mass. The UCS values exclude any weaker or fractured rock that could not be tested. Based on the description of the rock strength given in BS EN ISO 14689-1:2003 and BS5930:2015 (**Figure 10**), the strength of the tested specimens of the recovered Lower Globigerina Limestone are classified as being ***"Weak".***

Terms for description of rock strength

Term for use in field or based on measurement	Definition for field use	Definition on basis of Unconfined Compressive Strength measurements MPa
Extremely weak	Can be indented by thumbnail. Gravel sized lumps crush between finger and thumb.	0.6 – 1.0
Very weak	Crumbles under firm blows with point of geological hammer. Can be peeled by a pocket knife.	1 – 5
Weak	Can be peeled by a pocket knife with difficulty. Shallow indentations made by firm blow with the point of geological hammer.	5 – 25
Medium strong	Cannot be scraped with pocket knife. Can be fractured with a single firm blow of geological hammer.	25 – 50
Strong	Requires more than one blow of geological hammer to fracture.	50 – 100
Very strong	Requires many blows of geological hammer to fracture.	100 – 250
Extremely strong	Can only be chipped with geological hammer.	>250

NOTE Based on BS EN ISO 14689-1:2003 4.2.7, Table 5.

Figure 10: Terms for description of rock strength (Table 25 of BS5930:2015).

7.5.1. Physical properties

The following table presents the range of values and the statistical processing of the physical properties of Limestone.

Physical Properties	*Value Range*		*Number of Values*	*Mean Values*	*Standard Deviation*
	from	to			
Bulk Density [Mg/m^3]	1886	2092	17	2011.905	63.661
Dry Density [Mg/m^3]	1615	1784	17	1689.667	44.967
Water Content [%]	13.2	19.6	17	15.985	1.736

Table 4: Physical properties of Limestone.

7.5.2. Mechanical properties

The following table presents the range of values and the statistical processing of the mechanical properties of Limestone.

Mechanical Properties		*Value Range*		*Value Range*	*Mean Values*	*Standard Deviation*
		from	from			
UCS	**Unconfined Compression Strength [MPa]**	6.9	16.3	17	12.119	2.457

Table 5: Mechanical properties of Limestone.

7.6 Presumed Allowable Bearing Pressure

No foundation details of the proposed development have been provided. Therefore, having no information on the loads, levels, shapes and sizes of the foundations, an estimate of the presumed allowable bearing pressure for foundations placed directly on the encountered rock is provided, based on the rock quality and UCS values of BH-1 to BH-7.

Lowest UCS of the tested limestone:	6.9 MPa
Mean UCS of the tested limestone:	12.11 MPa
Presumed Allowable Bearing Pressure at 7.00m:	2.41 MPa on sound rock
Presumed Allowable Bearing Pressure at 14.00m:	2.18 MPa on sound rock

8. CONCLUSIONS

1. The site investigation carried out at Elbros Plant, Kirkop; comprised the drilling of seven (7) boreholes.

2. The recovered rock core consists of "Fair" to "Excellent" quality Lower Globigerina Limestone.

3. No voids have been reported by the drillers.

4. Twenty-one (21) specimens from the recovered Lower Globigerina Limestone samples were tested for unconfined compressive strength (UCS). The UCS of the tested Lower Globigerina Limestone ranged from 6.9MPa to 16.3MPa. The mean UCS of the rock is 12.11MPa.

5. Having no details of the proposed foundation (the loads, levels, shapes and sizes of the foundations), a presumed allowable bearing pressure for foundations placed directly on sound Lower Globigerina Limestone has been provided in Section 7.6.

6. This recommended allowable bearing pressure does not apply to foundations located on fractured rock, or at the upper edge of a vertical excavation face and any of these foundations would have to be considered on a case-by-case basis.

7. No data for the measured water level after drilling has been recorded in the boreholes.

8. Excavation works will be performed by conventional excavation means, with special caution.

9. Carry out construction in generally dry conditions.

10. Many rock types like clay, clayey limestone and marls, will deteriorate when exposed to the atmosphere – a phenomenon commonly known as weathering. Hence a soil/rock which appears to have desirable structural properties when freshly exposed may be unacceptable after having been allowed to weather there for a few months. In most cases, very simple remedial measures like covering with soil or fill will prevent or at least

effectively inhibit weathering.

11. During the excavation works it is essential that geological-geotechnical mapping of the behaviour and the characteristics of the slopes must be recorded, in order to interpret the prevailing conditions and the design assumptions, as well as, identification of any cases that will require the implementation of support measures.

12. The Designer must be informed accordingly and in the due time if any mismatches or divergences from the predictions made about the prevailing ground conditions described in the Geotechnical Investigation & Predictions, as presented in the relevant paragraph of present report (sequence and characteristics of the formations, orientation of the structural features, water occurrences etc.), will be observed or identified during construction.

9. DISCLAIMER

9.1 Notes on Excavation Monitoring

9.1.1 Excavation in rock

If any excavation is undertaken it is recommended to monitor the walls of the excavation, preferably by an experienced geologist due to presence of potentially unstable rock wedges or slabs created due to daylighting of particular joints as the excavation proceeds (see figure below). This is required for health and safety reasons and to safeguard 3rd party property on the margins of the site.

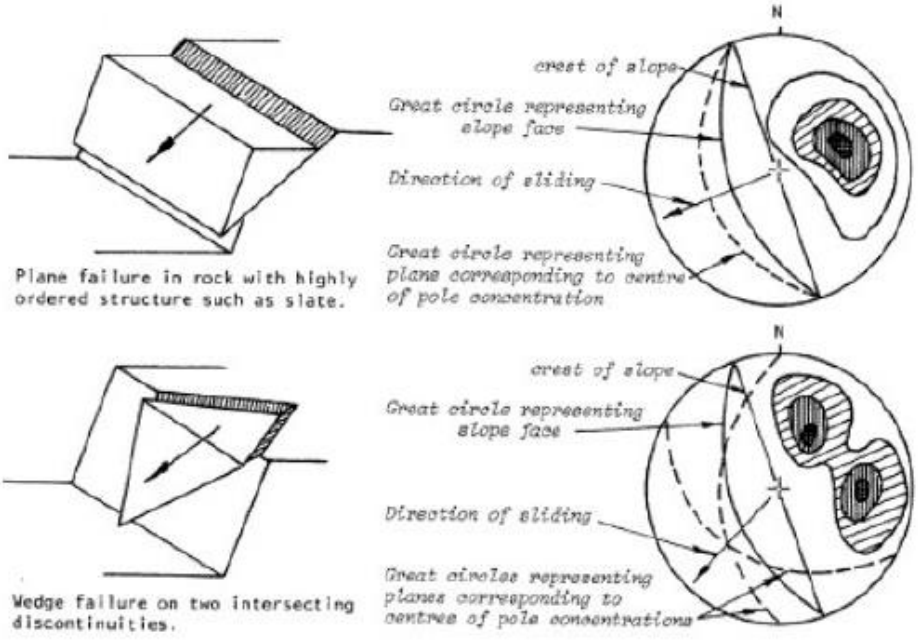

Figure 11: Potential rock wedge and rock prism modes of failure

9.1.2 Shallow horizontal discontinuities

The presence of shallow horizontal discontinuities like bedding planes may cause block detachment during excavation and consequent damage to 3rd party foundations or 3rd party property (see figure below). This may be due to the vibrations caused by the excavator or else due to settlement as the block is detached by the excavator (Hammer or saw) from the rest of the stratum.

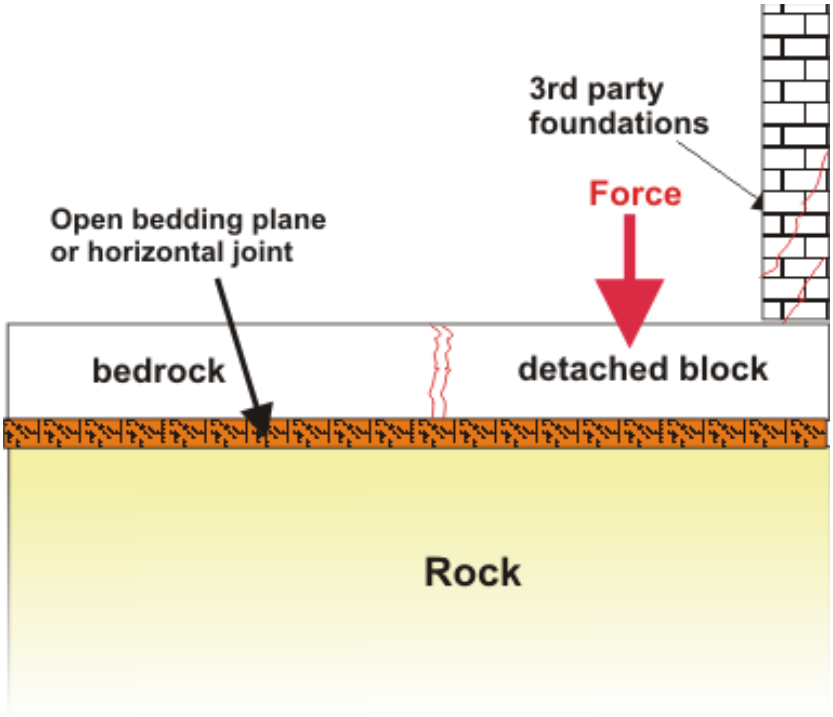

Figure 12: Rock block detachment caused by Shallow horizontal or low angle discontinuities

9.1.3 Marls and Marly Limestone

Even in the absence of any discontinuities, the geotechnical qualities of Marl and Marly Limestone deteriorate on exposure due to weathering processes, unless adequately protected.

Exposure of foundations resting on such rocks will lead to eventual collapse.

APPENDIX 1 – TECTONICS & SEISMICITY

1.a. Structural Geology – Tectonics

Structural evolution of the Maltese Islands:

1. Lower Miocene: Synsedimentary NE-SW (50-70°) trending extension fractures developed.
2. Upper Tortonian: Synsedimentary normal faults, trending 150^0, reflect the first tectonic impulse in the formation of the Pantelleria Rift (W of Malta) which interrupts in a NW-SE direction the shelf bridge that connects northern Africa with southern Sicily.
3. Post Tortonian-Lower Messinian and pre-Quaternary: NE-SW to ENE-WSW (60-80°) trending horsts and grabens which traverse the islands were formed. At the same time the Pantelleria Rift evolved with its climax in the Pliocene. The contemporaneousness of both events might be due to a mantle updoming which hit pre-existent crossing weakness zones in the overlying crust.
4. Quaternary-recent: Normal faulting orientated 120° and associated with the Pantelleria Rift. Continuous rifting leads to ongoing shoulder unwarping, with Maltese Islands tilting towards NE.

Some of the NE-SW trending normal faults are neotectonally remodelled in to strike slip faults. The kinematic analysis of the fracture pattern on E-Gozo results in a general model for a shear process within an interstratification of competent and incompetent rocks. Normal faulting the Maltese Islands have also been affected by horizontal movements. This is indicated at many sites by the formation of second order tension-and-shear fractures.

An excellent base for detailed studies on Maltese rock succession and tectonics is presented in the Geological Map of the Maltese Islands, Sheet 1 (1:25.000) published by the Oil Exploration Directorate, Office of the Prime Minister (1993).

This major tectonic feature has no influence on the site or the project other than raising the Middle Globigerina Limestone formation - the mean sea level aquifer.

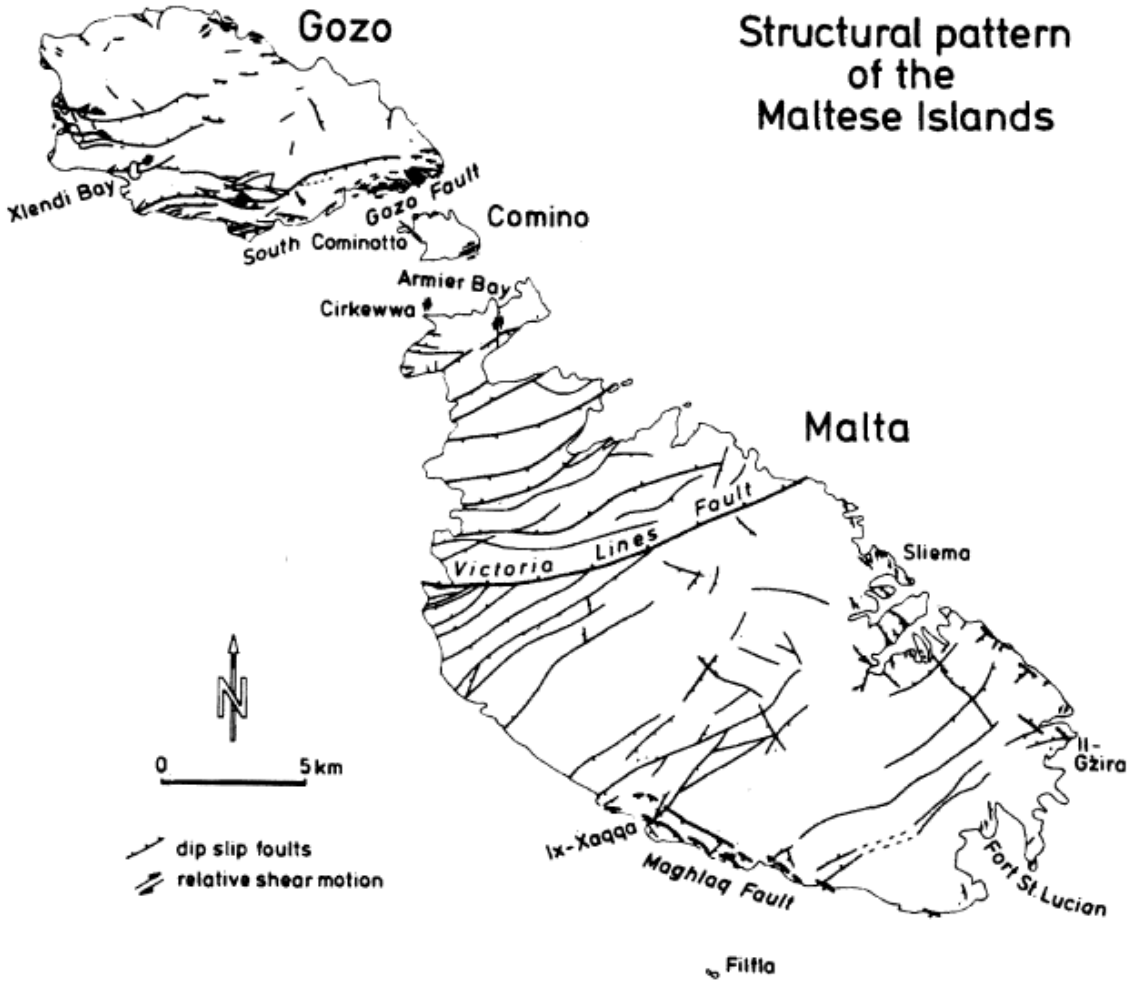

Figure I: Structural pattern of the Maltese Islands (modified after BP Geological Map 1957, House et al. 1961, Pedley & Waugh 1976 and lilies 1982).

1.b. Seismicity

The Maltese archipelago consists of three main islands – Malta, Gozo and Comino, with a total land area of 316 km^2. The main Euro-African plate collision margin passes about 200 km to the north in Sicily and along the Hellenic Arc to the east, while the seismically active Hyblean-Malta Escarpment is situated about 100 km to the east. No loss of life has ever been documented as a direct result of earthquake activity, and the last occurrence of serious damage to buildings was almost a century ago.

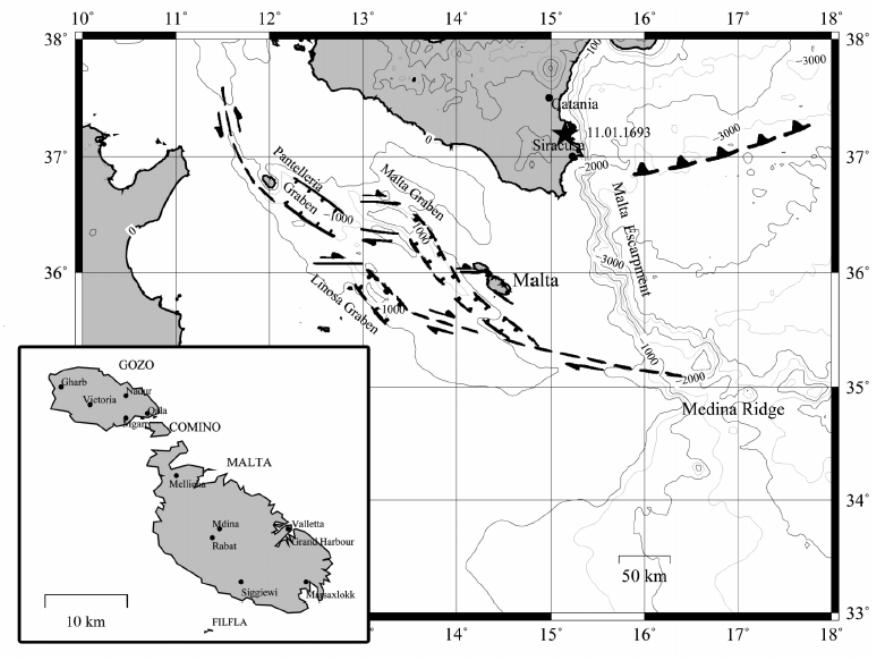

Figure II: Bathymetry of the Sicily Channel and main tectonic features of the Sicily Channel Rift Zone-bounding normal faults and strike-slip lineaments (modified after Reuther and Eisbacher, 1985 and Reuther, 1990). Also shown are the Calabrian Arc subduction zone and epicentre of the 11/01/1693 earthquake (Boschi *et al.,* 2000). Inset shows the Maltese islands.

The islands themselves are made up of an Oligocene-Miocene shallow water sedimentary sequence of carbonates and clays. The layer sequence is intensely faulted and disrupted, mainly through an older NE-SW trending fault set, while a more recent steeply-dipping normal fault trending NW-SE along the southern coast of Malta is the most prominent onshore expression of the similarly trending normal faults bounding the grabens of the SCRZ (Illies, 1981; Reuther and Eisbacher, 1985).

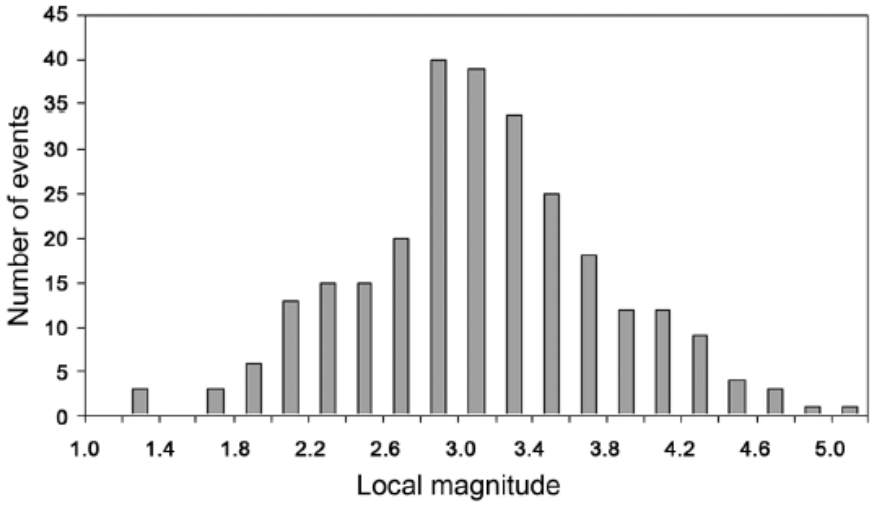

Figure III: Distribution of local magnitudes as measured at station WDD (Malta) for events within a 100km radius, for the period 1995-present. The magnitudes peak at around 3.0.

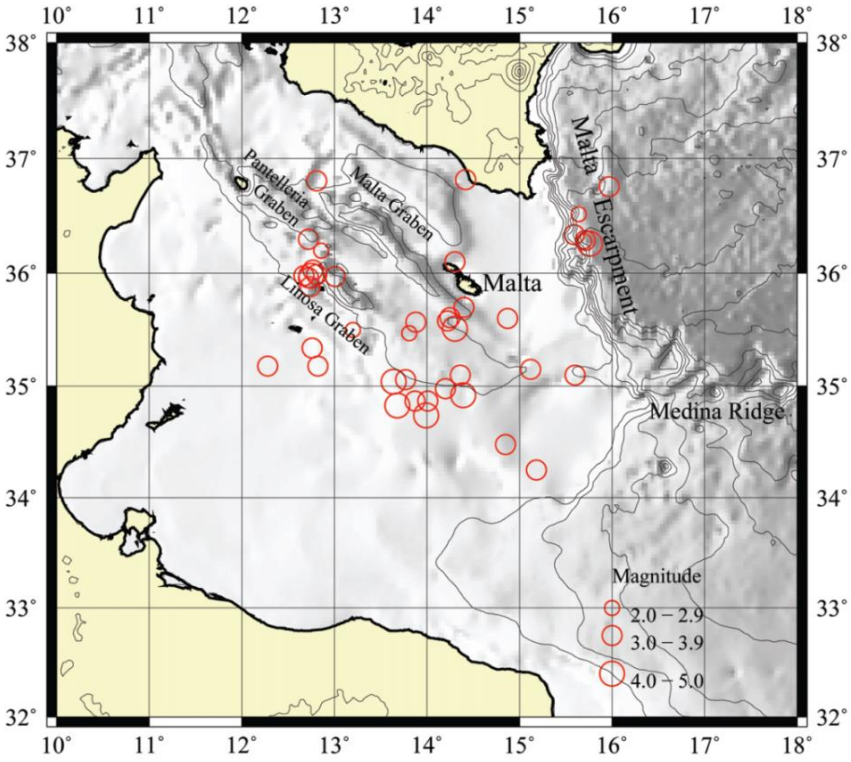

Figure IV: Seismicity which has been more reliably located in recent years, either by including individual event phase data from the Tunisian seismic network (Said, 1997; Zammit, 2003), or by considering events located by INGV that include WDD in their routine location procedure.

In a deterministic sense, the seismic source area that poses the greatest hazard to the Maltese islands is probably the northern end of the Malta escarpment, which appears to have the potential of generating the largest earthquakes in the region. This is the most probable source region of the 11 January 1693 event that has caused the maximum intensity on the Maltese islands since 1500.

Year	Month	Day	Hour	Lat	Long	Region	I_{max} on Maltese islands	I_o	M	Parameter reference
1542	12	10	15:15	37.20	14.90	E. Sicily	VII	XI	M_w 6.6	Gruppo di Lavoro CPTI (2004)
1562	3	8	Morning			Sicily Channel?	V?			
1636	9	1				Sicily Channel(?)	V?			
1693	1	11	13:30	37.18	15.02	E. Sicily	VII-VIII	XI	M_w 7.4	Boschi *et al.* (2000)
1743	2	20	16:30	39.87	18.78	Ionian Sea	VII	IX	M_w 6.9	Gruppo di Lavoro CPTI (2004)
1789	1	19	Morning			Sicily Channel(?)	V?			
1793	2	26	Morning			Sicily Channel?	V?			
1848	1	11	12:00	37.20	15.20	E. Sicily	V	VIII-IX	M_w 5.5	Gruppo di Lavoro CPTI (2004)
1856	10	12	00:45	35.60	26.00	Crete	VII		M_w 7.7	Papazachos *et al.* (2000)
1861	2	8	23:45			Sicily Channel(?)	V?			
1886	8	15	02:45			Sicily Channel(?)	V			
1886	8	27	22:00	37.00	27.20	Aegean Sea	VI-VII	XI	M_w 7.3	Papazachos *et al.* (2000)
1911	9	30	09:25	36.4?	13.5?	Sicily Channel	VII			
1923	9	18	07:30	35.5?	14.5?	Sicily Channel	VI			ISC (2001)
1926	6	26	19:46	36.50	27.50	Aegean Sea	V		M_w 7.6	Papazachos *et al.* (2000)
1972	3	21	23:06	35.80	15.00	Sicily Channel	V		M_b 4.5	ISC (2001)

Table a: Subset of felt earthquake catalogue, showing only events that produced EMS-98 *I*=V and over on the Maltese islands.

The catalogue contains close to 100 events which have produced effects of intensity ≥ II in the Maltese islands since 1530. However, this includes events which form part of earthquake sequences or swarms, sometimes lasting several weeks that appear to be characteristic of Sicily Channel seismicity. For example, a sequence of more than 6 shocks was felt in March 1710 (*Archivio Segreto Vaticano*, vol. 61), while 16 shocks were felt during August 1886 alone (*Malta,* 16, 17, 18, 21/08/1886). A subset of the catalogue containing events with site intensity V and over is presented in Table I. The islands have experienced intensity VII-VIII damage once in this period, and intensity VII at least on four occasions.

Although the catalogue only goes back some 500 years, and damaging earthquakes are few, it is still possible to make some considerations about seismic hazard.

A seismic hazard study commissioned before the construction of a new power station on Malta gives an expected PGA of 0.12 *g* for a 475-year return period (Mouchel and Partners, 1990). Camilleri (2003) estimates a return period of 1800 years for *I*=VII in the Maltese islands, and 333 years for *I*=VI. The ESC-SESAME Unified Hazard Model for the European-Mediterranean Region (Giardini *et al*., 2003) classifies Malta in the top end of the *"Low Hazard"* region, with a 475-year return period corresponding to Peak Ground Acceleration (PGA) values of 0.04-0.08 *g*.

The return period for intensity V is 18 years, for intensity VI 40 years, for intensity VII 92 years, and for intensity VIII it turns out to be 1000 years. The latter is based on a single observation of intensity VII-VIII for the 1693 earthquake.

It is clear that a certain level of hazard is also presented by the lower magnitude Sicily Channel seismicity. At least two events in this region since 1900 have produced damage of intensity ≥VI. Perhaps more important is the hazard posed by long-period ground motion arising from large subduction zone earthquakes in the Hellenic Arc, capable of producing intensities up to VII even from distances greater than 1000 km. This effect is probably due also to a different kind of attenuation regime for propagation through the Ionian Basin. In any case, it is evident that this phenomenon must be seriously considered in any risk assessment, especially in the case of high-rise buildings.

Since 1530, the maximum intensity experienced has been VII-VIII, and intensity VII has been experienced at least 4 times. The major seismic hazard to the islands arises from the northern segment of the Malta Escarpment, but active fault zones of the Sicily Channel Rift Zone as well as large Hellenic Arc earthquakes, also pose a potential hazard that cannot be neglected.

Using the available seismic history for the Maltese islands, together with deterministic effects of the most influential seismic sources, it is reasonable to arrive at intensity VII-VIII as the one with a 475-year return period. Although no accelerometric data are available, it is also possible, though tentative, to postulate that expected peak ground accelerations for this return period fall within the 0.04-0.1 *g* band, therefore belonging to the category of ground motions which necessitate seismic design procedures as detailed in EC8 seismic rules.

APPENDIX 2 – DRILLING LOGS

TERRACORE

Terracore Ltd, New Street in Kappar Street, Industrial Estate, Mosta
T: (+356) 2158 3241 F: (+356) 2141 8645 M: (+356) 9947 1618
E: info@terracoremalta.com W: www.terracoremalta.com

Client:	Qormi Constructions Ltd.	**Drill Type:**	CMV	**B/H No:**	1
Location:	Elbros Plant	**Drilling Fluid:**	Water	**Job No:**	J8017
Area:	Kirkop	**Drill:**	MK600M	**Date:**	17/04/2024

From	To	DESCRIPTION	Core Run Length	Core Run Recovery	Circulation	Core Recovery %
0.00	0.70	Started open hole to find bedrock. **Bedrock found at 0.70m.**	0.70			
0.70	3.00	Started coring run no.1.	2.30	2.30	F	100%
3.00	6.00	Started coring run no.2.	3.00	3.00	F	100%
6.00	9.00	Started coring run no.3.	3.00	3.00	F	100%
9.00	12.00	Started coring run no.4.	3.00	3.00	F	100%
12.00	15.00	Started coring run no.5.	3.00	3.00	F	100%
15.00	17.00	Started coring run no.6.	2.00	2.00	F	100%

Driller	Prem	**REMARKS**
		Circulation: F = Full,P = Partial Loss, L = Total Loss.
		Drill Direction: Vertical; Site Type: Cleared
Assistant Driller	Destiny and Sohga	Test = SPT, Vane, Soil Sampling.

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Client:	Qormi Constructions Ltd.	**Drill Type:**	CMV	**B/H No:**	2
Location:	Elbros Plant	**Drilling Fluid:**	Water	**Job No:**	J8017
Area:	Kirkop	**Drill:**	MK600M	**Date:**	16/04/2024

From	To	DESCRIPTION	Core Run Length	Core Run Recovery	Circulation	Core Recovery %
0.00	3.00	Started coring run no.1.	3.00	3.00	L	100%
3.00	6.00	Started coring run no.2.	3.00	3.00	L	100%
6.00	9.00	Started coring run no.3.	3.00	3.00	L	100%
9.00	12.00	Started coring run no.4.	3.00	3.00	L	100%
12.00	15.00	Started coring run no.5.	3.00	3.00	L	100%
15.00	17.00	Started coring run no.6.	2.00	2.00	L	100%

Driller	Prem	**REMARKS**
		Circulation: F = Full,P = Partial Loss, L = Total Loss.
		Drill Direction: Vertical; Site Type: Cleared
Assistant Driller	Destiny and Sohga	Test = SPT, Vane, Soil Sampling.

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Client:	Qormi Constructions Ltd.	**Drill Type:**	CMV	**B/H No:**	3
Location:	Elbros Plant	**Drilling Fluid:**	Water	**Job No:**	J8017
Area:	Kirkop	**Drill:**	MK600M	**Date:**	16/04/2024

From	To	DESCRIPTION	Core Run Length	Core Run Recovery	Circulation	Core Recovery %
0.00	1.00	Started open hole to find bedrock. **Bedrock found at 1.00m.**	1.00			
1.00	3.00	Started coring run no.1.	2.00	2.00	F	100%
3.00	6.00	Started coring run no.2.	3.00	3.00	F	100%
6.00	9.00	Started coring run no.3.	3.00	3.00	F	100%
9.00	12.00	Started coring run no.4.	3.00	3.00	F	100%
12.00	15.00	Started coring run no.5.	3.00	3.00	L	100%
15.00	17.00	Started coring run no.6.	2.00	2.00	L	100%

Driller Prem

Assistant Driller Destiny and Sohga

REMARKS
Circulation: F = Full,P = Partial Loss, L = Total Loss.
Drill Direction: Vertical; Site Type: Cleared
Test = SPT, Vane, Soil Sampling.

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Client:	Qormi Constructions Ltd.	**Drill Type:**	CMV	**B/H No:**	4
Location:	Elbros Plant	**Drilling Fluid:**	Water	**Job No:**	J8017
Area:	Kirkop	**Drill:**	MK600M	**Date:**	17/04/2024

From	To	DESCRIPTION	Core Run Length	Core Run Recovery	Circulation	Core Recovery %
0.00	0.40	Started open hole to find bedrock. **Bedrock found at 0.40m.**	0.40			
0.40	3.00	Started coring run no.1.	2.60	2.60	F	100%
3.00	6.00	Started coring run no.2.	3.00	3.00	F	100%
6.00	9.00	Started coring run no.3.	3.00	3.00	F	100%
9.00	12.00	Started coring run no.4.	3.00	3.00	F	100%
12.00	15.00	Started coring run no.5.	3.00	3.00	F	100%
15.00	17.00	Started coring run no.6.	2.00	2.00	F	100%

Driller Prem

Assistant Driller Destiny and Sohga

REMARKS
Circulation: F = Full,P = Partial Loss, L = Total Loss.
Drill Direction: Vertical; Site Type: Cleared
Test = SPT, Vane, Soil Sampling.

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Client:	Qormi Constructions Ltd.	**Drill Type:**	CMV	**B/H No:**	5
Location:	Elbros Plant	**Drilling Fluid:**	Water	**Job No:**	J8017
Area:	Kirkop	**Drill:**	MK600M	**Date:**	18/04/2024

From	To	DESCRIPTION	Core Run Length	Core Run Recovery	Circulation	Core Recovery %
0.00	0.25	Started open hole to find bedrock. **Bedrock found at 0.25m.**	0.25			
0.25	3.00	Started coring run no.1.	2.75	2.75	F	100%
3.00	6.00	Started coring run no.2.	3.00	3.00	F	100%
6.00	9.00	Started coring run no.3.	3.00	3.00	F	100%
9.00	12.00	Started coring run no.4.	3.00	3.00	F	100%
12.00	15.00	Started coring run no.5.	3.00	3.00	F	100%
15.00	17.00	Started coring run no.6.	2.00	2.00	F	100%

Driller	Prem	**REMARKS**
		Circulation: F = Full,P = Partial Loss, L = Total Loss.
		Drill Direction: Vertical; Site Type: Cleared
Assistant Driller	Destiny and Sohga	Test = SPT, Vane, Soil Sampling.

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Client:	Qormi Constructions Ltd.	**Drill Type:**	CMV	**B/H No:**	6
Location:	Elbros Plant	**Drilling Fluid:**	Water	**Job No:**	J8017
Area:	Kirkop	**Drill:**	MK600M	**Date:**	18/04/2024

From	To	DESCRIPTION	Core Run Length	Core Run Recovery	Circulation	Core Recovery %
0.00	0.50	Started open hole to find bedrock. **Bedrock found at 0.50m.**	0.50			
0.50	3.00	Started coring run no.1.	2.50	2.50	L	100%
3.00	6.00	Started coring run no.2.	3.00	3.00	L	100%
6.00	9.00	Started coring run no.3.	3.00	3.00	L	100%
9.00	12.00	Started coring run no.4.	3.00	3.00	L	100%
12.00	14.00	Started coring run no.5.	2.00	2.00	L	100%

Driller	Prem	**REMARKS**
		Circulation: F = Full,P = Partial Loss, L = Total Loss.
		Drill Direction: Vertical; Site Type: Cleared
Assistant Driller	Destiny and Sohga	Test = SPT, Vane, Soil Sampling.

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Client:	Qormi Constructions Ltd.	**Drill Type:**	CMV	**B/H No:**	7
Location:	Elbros Plant	**Drilling Fluid:**	Water	**Job No:**	J8017
Area:	Kirkop	**Drill:**	MK600M	**Date:**	17/04/2024

From	To	DESCRIPTION	Core Run Length	Core Run Recovery	Circulation	Core Recovery %
0.00	0.50	Started open hole to find bedrock. **Bedrock found at 0.50m.**	0.50			
0.50	3.00	Started coring run no.1.	2.50	2.50	F	100%
3.00	6.00	Started coring run no.2.	3.00	3.00	L	100%
6.00	9.00	Started coring run no.3.	3.00	3.00	L	100%
9.00	12.00	Started coring run no.4.	3.00	3.00	L	100%
12.00	14.00	Started coring run no.5.	3.00	3.00	L	100%

Driller	Prem	**REMARKS**
		Circulation: F = Full,P = Partial Loss, L = Total Loss.
		Drill Direction: Vertical; Site Type: Cleared
Assistant Driller	Destiny and Sohga	Test = SPT, Vane, Soil Sampling.

APPENDIX 3 – SAMPLE PHOTOS

Plate 1: Drill Cores for the depth 0.70m to 6.00m in BH-1.

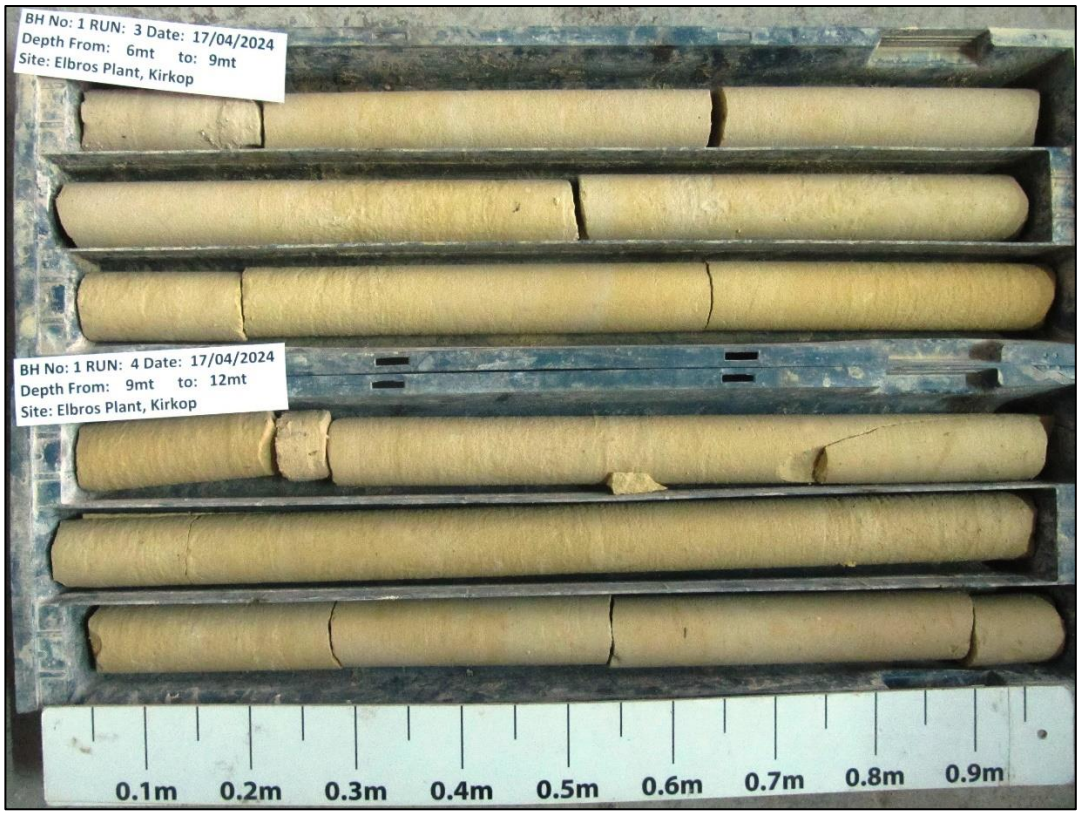

Plate 2: Drill Cores for the depth 6.00m to 12.00m in BH-1.

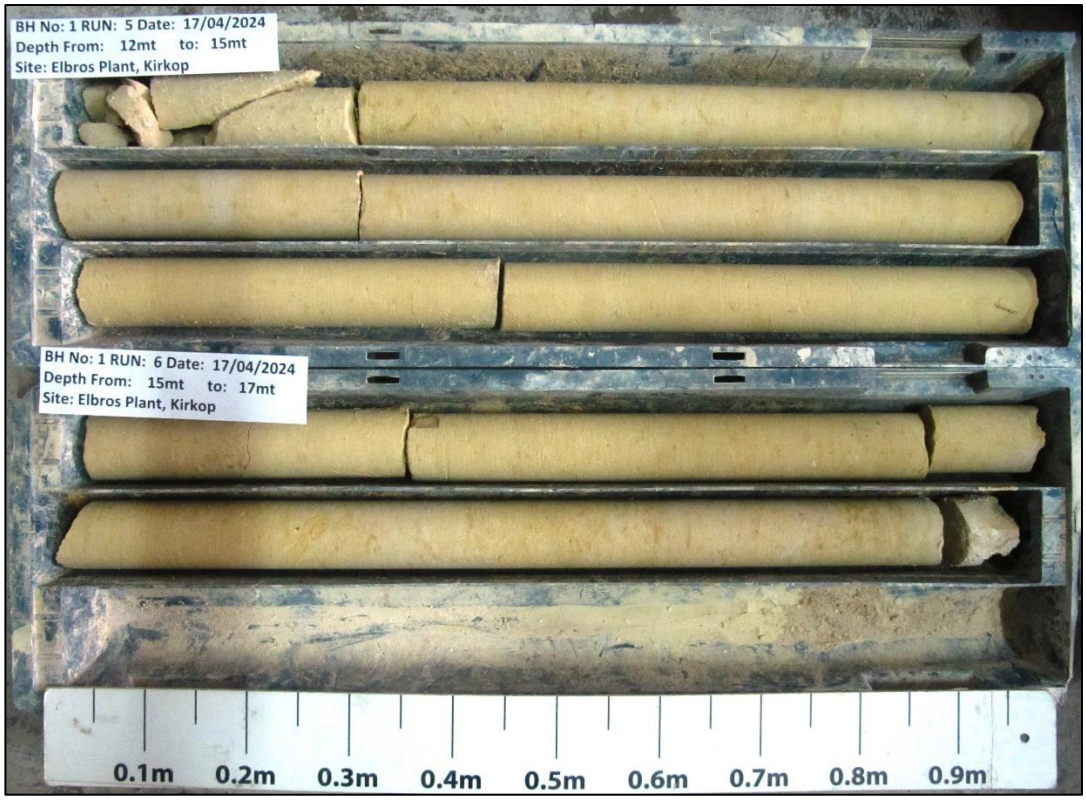

Plate 3: Drill Cores for the depth 12.00m to 17.00m in BH-1.

Plate 4: Drill Cores for the depth 0.00m to 6.00m in BH-2.

Plate 5: Drill Cores for the depth 6.00m to 12.00m in BH-2.

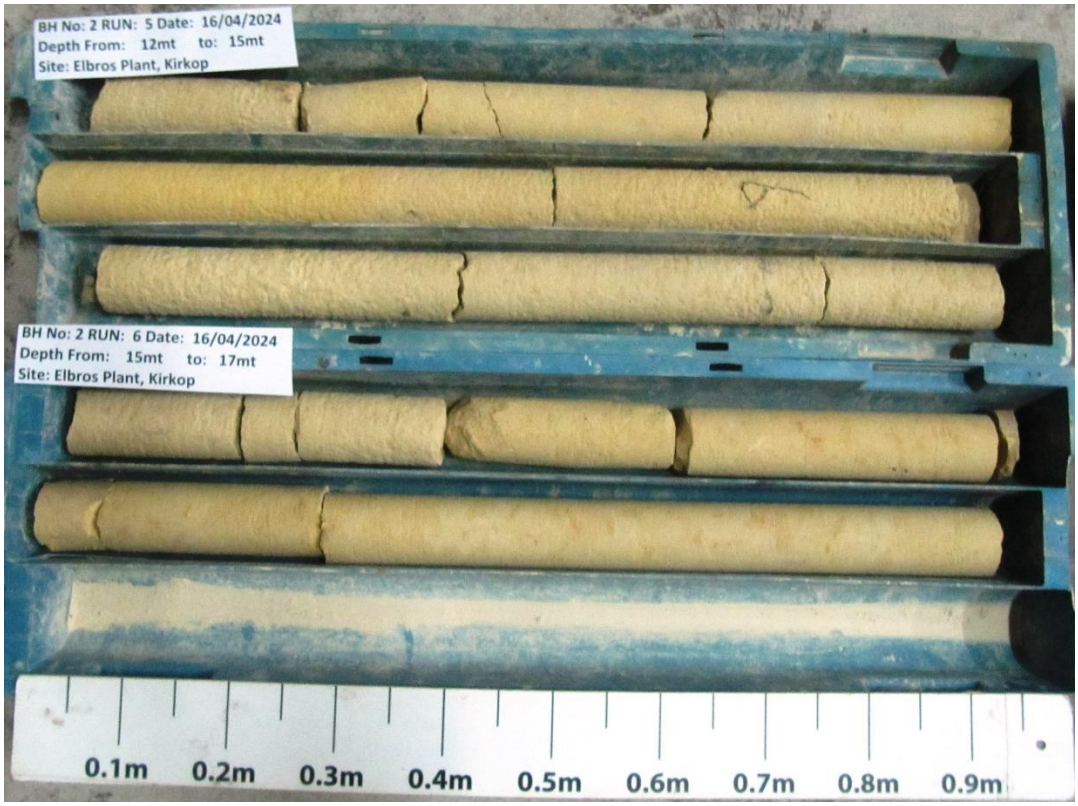

Plate 6: Drill Cores for the depth 12.00m to 17.00m in BH-2.

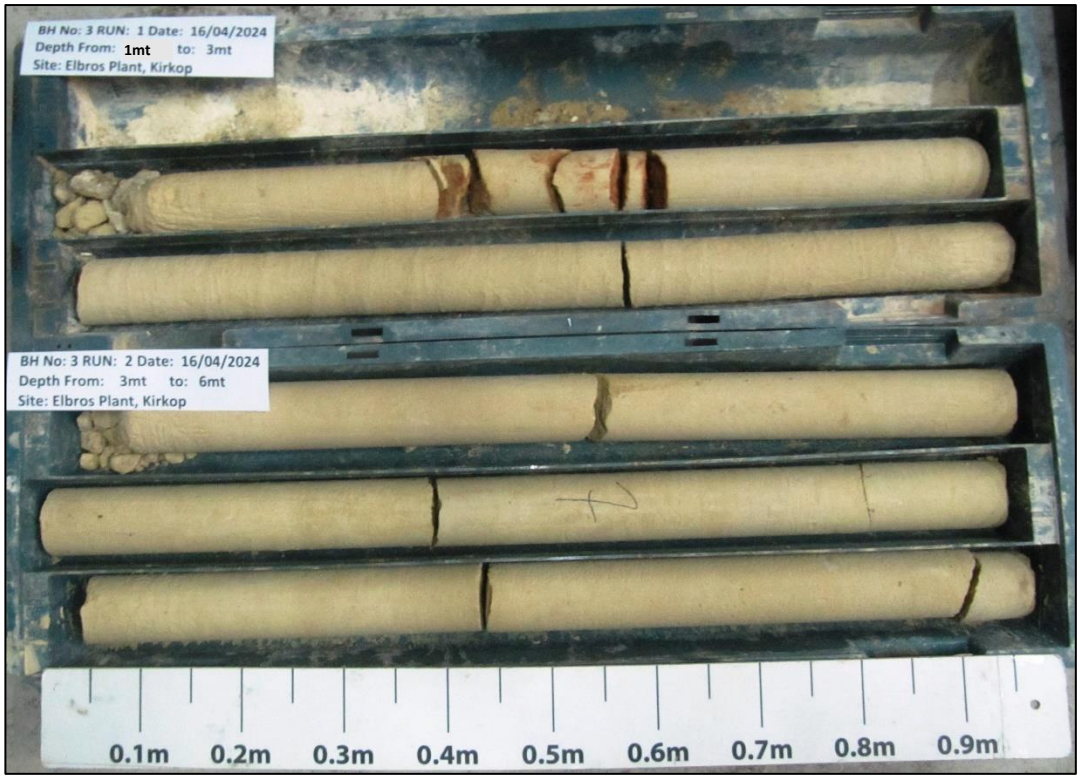

Plate 7: Drill Cores for the depth 1.00m to 6.00m in BH-3.

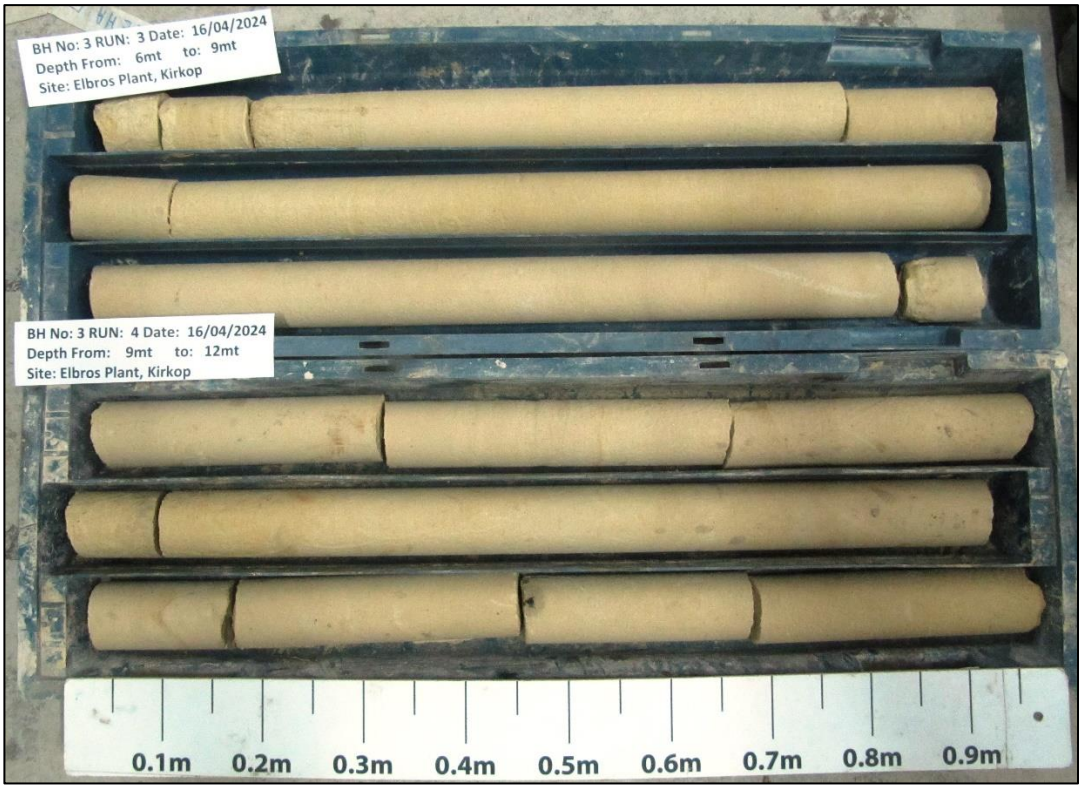

Plate 8: Drill Cores for the depth 6.00m to 12.00m in BH-3.

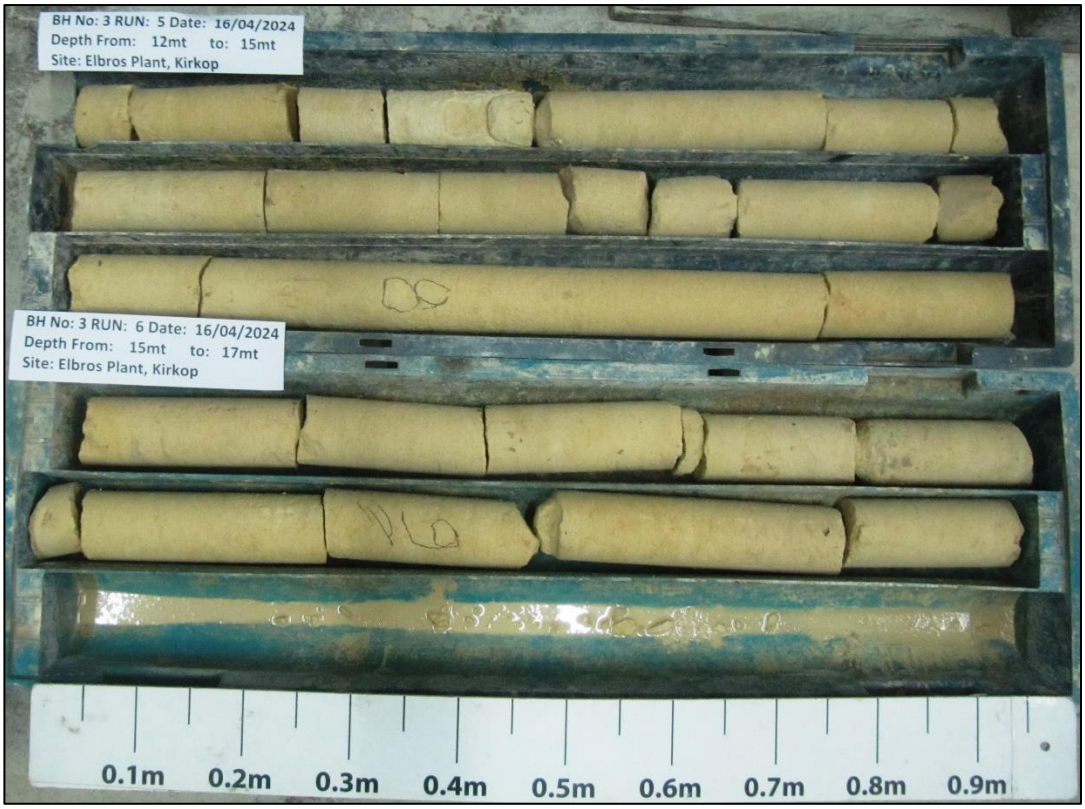

Plate 9: Drill Cores for the depth 12.00m to 17.00m in BH-3.

Plate 10: Drill Cores for the depth 0.40m to 6.00m in BH-4.

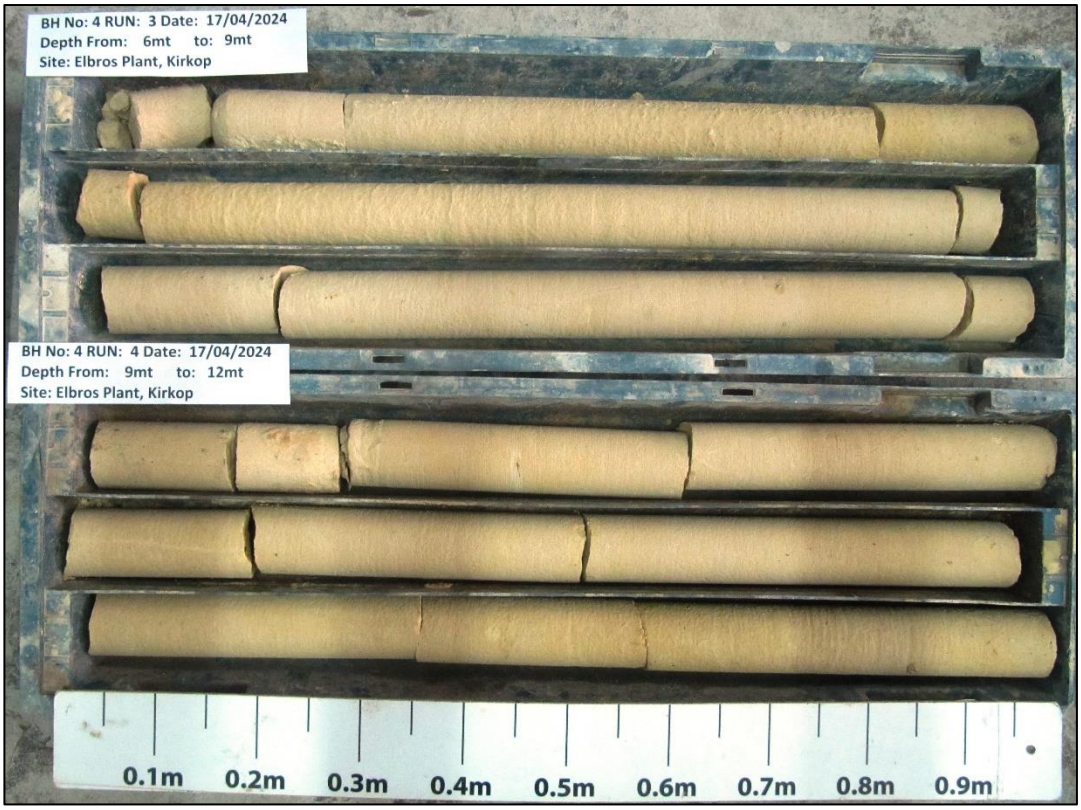

Plate 11: Drill Cores for the depth 6.00m to 12.00m in BH-4.

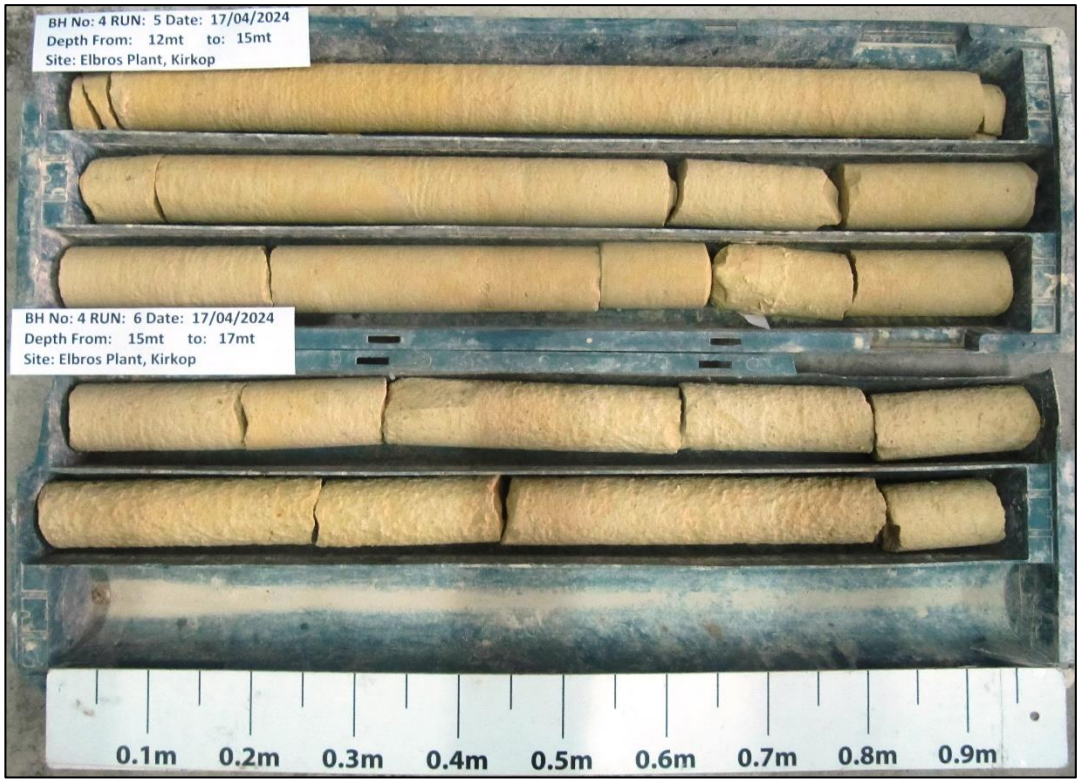

Plate 12: Drill Cores for the depth 12.00m to 17.00m in BH-4.

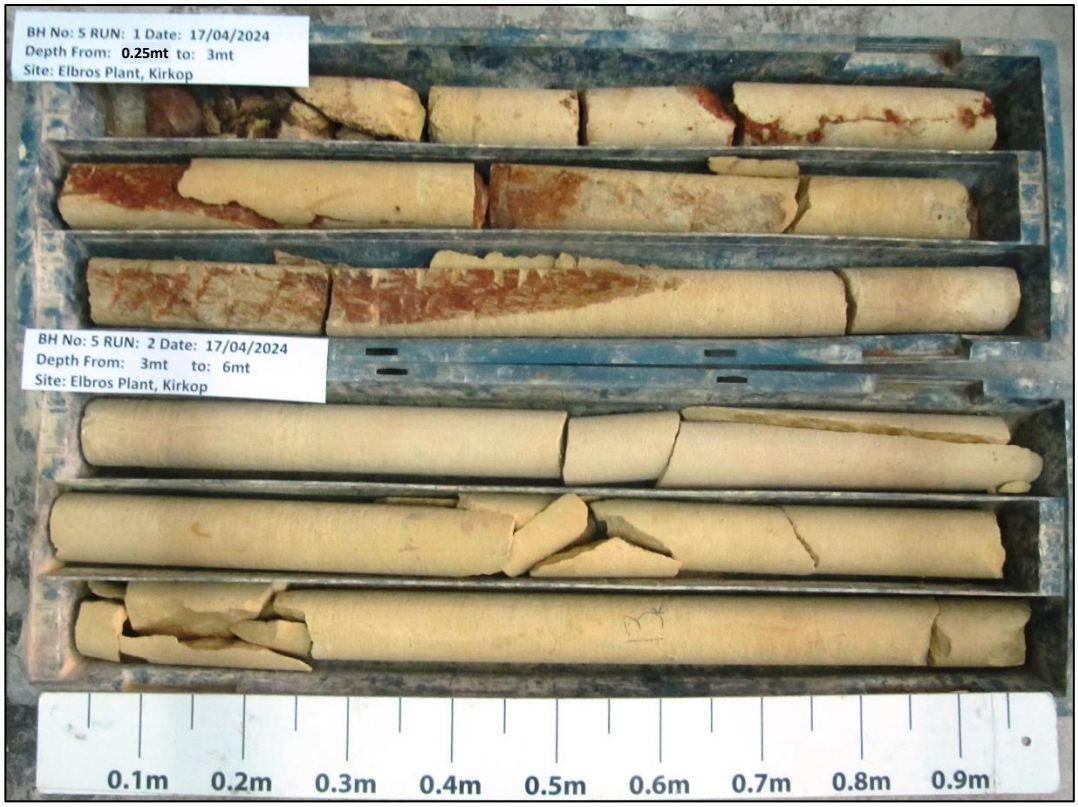

Plate 13: Drill Cores for the depth 0.25m to 6.00m in BH-5.

Plate 14: Drill Cores for the depth 6.00m to 12.00m in BH-5.

Plate 15: Drill Cores for the depth 12.00m to 17.00m in BH-5.

Plate 16: Drill Cores for the depth 0.50m to 6.00m in BH-6.

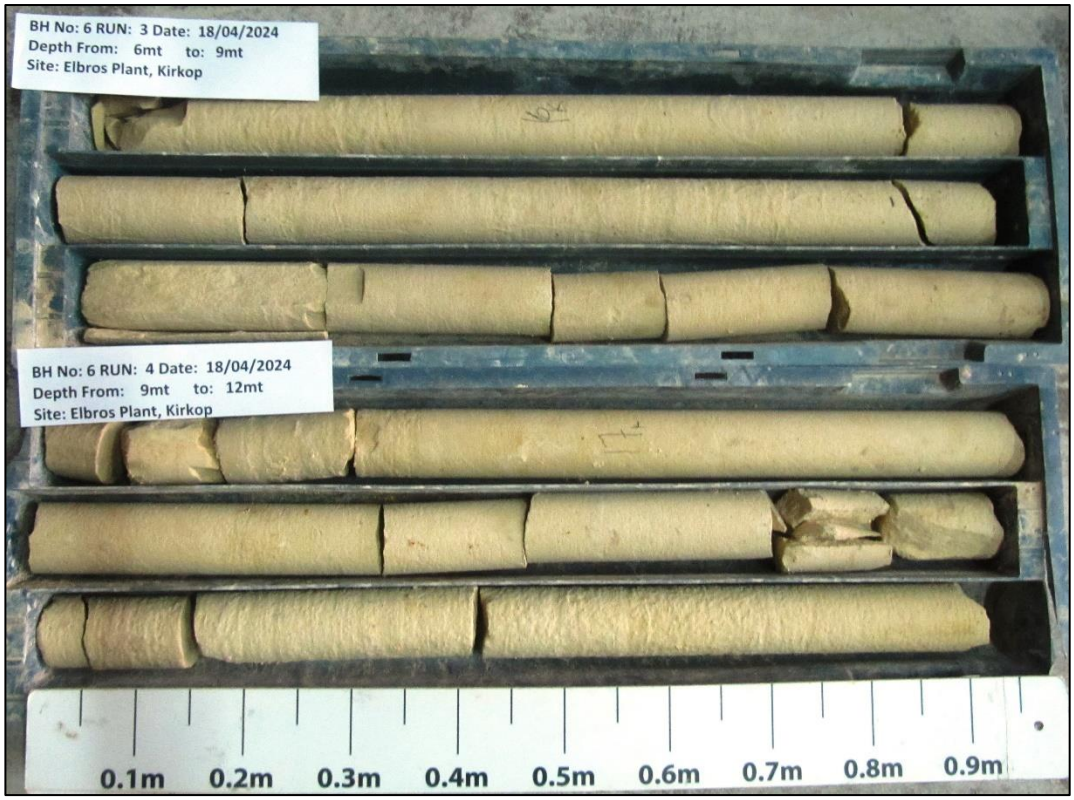

Plate 17: Drill Cores for the depth 6.00m to 12.00m in BH-6.

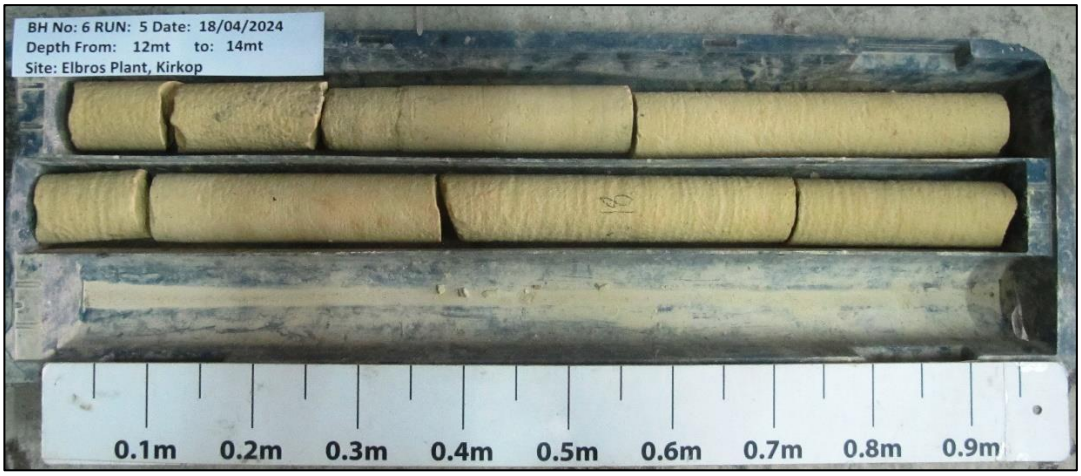

Plate 18: Drill Cores for the depth 12.00m to 14.00m in BH-6.

Plate 19: Drill Cores for the depth 0.50m to 6.00m in BH-7.

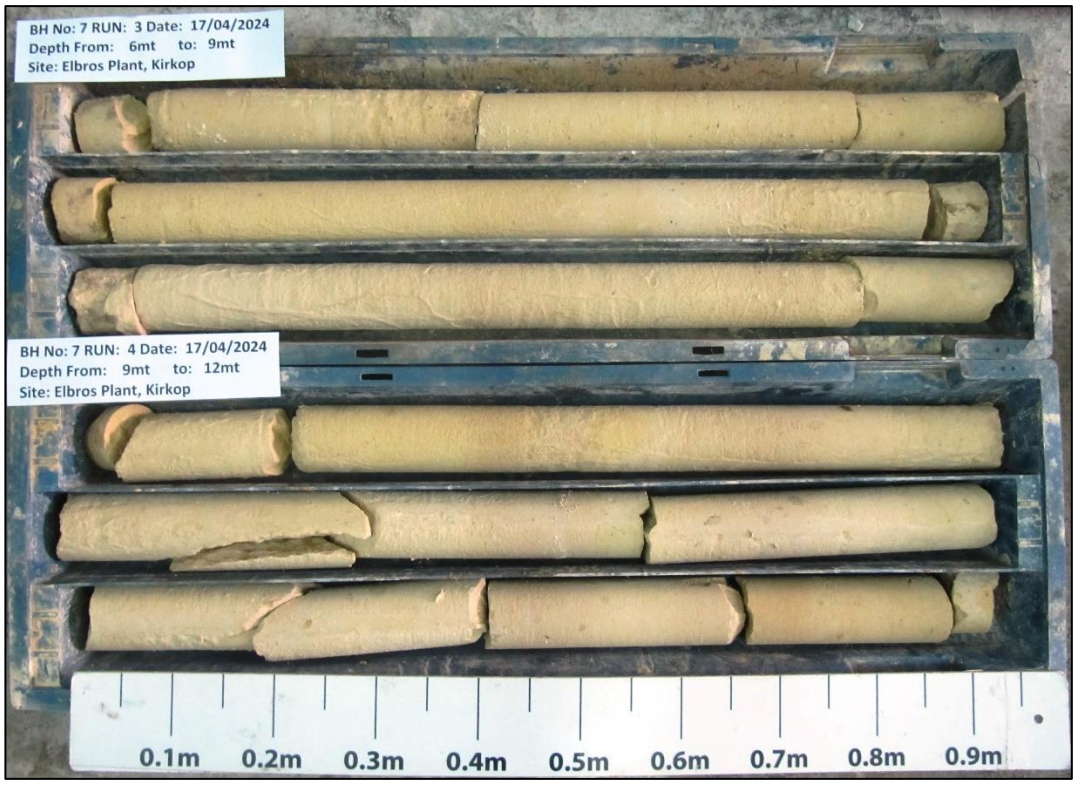

Plate 20: Drill Cores for the depth 6.00m to 12.00m in BH-7.

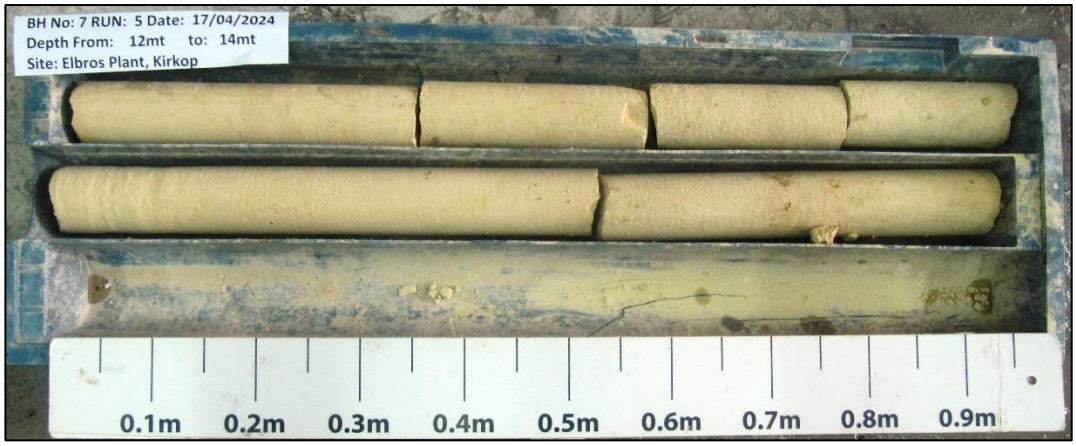

Plate 21: Drill Cores for the depth 12.00m to 14.00m in BH-7.

APPENDIX 4 – LABORATORY REPORTS

TERRACORE

LAB/ROCK/ISRM/Rev6/OCT13

Laboratory Test Certificate

Determination of Uniaxial Compressive Strength of Rock materials according to ISRM Suggested Method + Annex W

Client Name:	Qormi Construction Ltd	Date of sampling:	17/04/2024	Certificate no:	TCR001
Client address:	Tumas Group Corporate Office Level 3 Portomaso Business Tower Portomaso	Date of test:	26/04/2024	Date of certificate:	27/04/2024
		Type of corebarrel:	Standard	Job no:	J8017
Commissioned by:	Qormi Construction Ltd	Location/Town:	Kirkop	Test reference no:	Rock-001
Attn:	Qormi Construction Ltd	Project:	Elbros Plant	Tested by:	A.L
Client Tel No:	21375123			Drill type:	CMV

Details of prepared specimens		***BoreHole Number:***		***BH1***	
Specimen No:		RC 1	RC 2	RC 3	RC
Orientation of bedding planes with respect to the test specimen:		Perpendicular	Perpendicular	Perpendicular	
Storage condition of specimens:		Core box	Core box	Core box	
Depth:		7.3	10.6	16.2	
Run No:		3	4	6	
Sample Lithology:		Limestone	Limestone	Limestone	
Flatness 0.02% from diameter		Yes	Yes	Yes	
Specimen perpendicular to 0.1° to the axis		Yes	Yes	Yes	
Specimen sides smooth and straight to 0.3mm over full length of specimen:		Yes	Yes	Yes	
Initial diameter:(Average)	mm	70.5	70.3	70.8	
Initial length:(Average)	mm	159.4	178.7	165.9	
Initial area:	mm^2	3902.3	3878.3	3937.4	
Initial volume:	mL	621.9	692.9	653.1	
Length/diameter ratio:	L/D	2.26	2.55	2.34	
Condition as tested:		As received	As received	As received	
Mass of specimen:	g	1285.9	1393.0	1364.6	
Water content (to 0.1%):	%	17.1	16.6	19.6	
Bulk Density:	kg/m^3	2068	2011	2089	
Dry Density:	kg/m^3	1714	1677	1680	
Test details					
Machine type/ref:		EQ001 No:6 (Range 0 - 250kN)	EQ001 No:6 (Range 0 - 250kN)	EQ001 No:6 (Range 0 - 250kN)	
Rate of loading	N/min	10000	10000	10000	
Stress rate:	MPa/s	0.043	0.043	0.042	
Maximum failure load:	kN	44.9	60.3	27.3	
Test duration:	sec	371	383	*109	
Uniaxial compressive strength:	MPa	**11.5**	**15.5**	**6.9**	
Average UCS:				11.3	
Mode of failure:		Multiple shear	Multiple shear	Multiple shear	

Comments/Deviations from suggested method: *Out of crushing time range.

Measurement of Uncertainty: Nil.

Prepared by:
Janica Attard
Quality Manager

Approved by:
Craig Bonello
Laboratory Manager

TEST CERTIFICATE

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Registration No.: C32227
Directors: Alfred Xerri

Filename: J8017_Kirkop_Rock_Report_TCR001.xls

TERRACORE

LAB/ROCK/ISRM/Rev6/OCT13

Laboratory Test Certificate

Determination of Uniaxial Compressive Strength of Rock materials according to ISRM Suggested Method + Annex W

Client Name:	Qormi Construction Ltd	Date of sampling:	16/04/2024	Certificate no:	TCR002
Client address:	Tumas Group Corporate Office Level 3 Portomaso Business Tower Portomaso	Date of test:	26/04/2024	Date of certificate:	27/04/2024
		Type of corebarrel:	Standard	Job no:	J8017
Commissioned by:	Qormi Construction Ltd	Location/Town:	Kirkop	Test reference no:	Rock-002
Attn:	Qormi Construction Ltd	Project:	Elbros Plant	Tested by:	A.L
Client Tel No:	21375123			Drill type:	CMV

Details of prepared specimens		***BoreHole Number:***		***BH2***	
Specimen No:		RC 4	RC 5	RC 6	RC
Orientation of bedding planes with respect to the test specimen:		Perpendicular	Perpendicular	Perpendicular	
Storage condition of specimens:		Core box	Core box	Core box	
Depth:		7.7	11.7	13.8	
Run No:		3	4	5	
Sample Lithology:		Limestone	Limestone	Limestone	
Flatness 0.02% from diameter		Yes	Yes	Yes	
Specimen perpendicular to 0.1° to the axis		Yes	Yes	Yes	
Specimen sides smooth and straight to 0.3mm over full length of specimen:		Yes	Yes	Yes	
Initial diameter:(Average)	mm	70.7	70.9	70.7	
Initial length:(Average)	mm	184.6	173.2	178.6	
Initial area:	mm^2	3926.3	3944.8	3928.2	
Initial volume:	mL	724.7	683.1	701.5	
Length/diameter ratio:	L/D	2.61	2.44	2.53	
Condition as tested:		As received	As received	As received	
Mass of specimen:	g	1435.5	1334.9	1404.8	
Water content (to 0.1%):	%	15.8	15.2	14.2	
Bulk Density:	kg/m^3	1981	1954	2003	
Dry Density:	kg/m^3	1669	1657	1718	
Test details					
Machine type/ref:		EQ001 No:6 (Range 0 - 250kN)	EQ001 No:6 (Range 0 - 250kN)	EQ001 No:6 (Range 0 - 250kN)	
Rate of loading	N/min	10000	10000	10000	
Stress rate:	MPa/s	0.042	0.042	0.042	
Maximum failure load:	kN	51.7	40.0	29.1	
Test duration:	sec	365	355	*79	
Uniaxial compressive strength:	MPa	**13.2**	**10.1**	**7.4**	
Average UCS:				10.2	
Mode of failure:		Multiple shear	Multiple shear	Multiple shear	

Comments/Deviations from suggested method: *Out of crushing time range.

Measurement of Uncertainty: Nil.

Prepared by:
Janica Attard
Quality Manager

Approved by:
Craig Bonello
Laboratory Manager

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Filename: J8017_Kirkop_Rock_Report_TCR002.xls

TERRACORE

LAB/ROCK/ISRM/Rev6/OCT13

Laboratory Test Certificate

Determination of Uniaxial Compressive Strength of Rock materials according to ISRM Suggested Method + Annex W

Client Name:	Qormi Construction Ltd	Date of sampling:	16/04/2024	Certificate no:	TCR003
Client address:	Tumas Group Corporate Office Level 3 Portomaso Business Tower Portomaso	Date of test:	26/04/2024	Date of certificate:	27/04/2024
		Type of corebarrel:	Standard	Job no:	J8017
Commissioned by:	Qormi Construction Ltd	Location/Town:	Kirkop	Test reference no:	Rock-003
Attn:	Qormi Construction Ltd	Project:	Elbros Plant	Tested by:	A.L
Client Tel No:	21375123			Drill type:	CMV

Details of prepared specimens		***BoreHole Number:***	***BH3***		
Specimen No:		RC 7	RC 8	RC 9	RC
Orientation of bedding planes with respect to the test specimen:		Perpendicular	Perpendicular	Perpendicular	
Storage condition of specimens:		Core box	Core box	Core box	
Depth:		4.65	14.4	16.45	
Run No:		2	5	6	
Sample Lithology:		Limestone	Limestone	Limestone	
Flatness 0.02% from diameter		Yes	Yes	Yes	
Specimen perpendicular to 0.1° to the axis		Yes	Yes	Yes	
Specimen sides smooth and straight to 0.3mm over full length of specimen:		Yes	Yes	Yes	
Initial diameter:(Average)	mm	71.2	70.9	69.9	
Initial length:(Average)	mm	191.8	169.7	162.4	
Initial area:	mm^2	3978.3	3944.8	3834.3	
Initial volume:	mL	762.9	669.5	622.6	
Length/diameter ratio:	L/D	2.69	2.40	2.33	
Condition as tested:		As received	As received	As received	
Mass of specimen:	g	1596.0	1327.3	1263.4	
Water content (to 0.1%):	%	15.2	14.7	18.2	
Bulk Density:	kg/m^3	2092	1982	2029	
Dry Density:	kg/m^3	1774	1691	1659	
Test details					
Machine type/ref:		EQ001 No:6 (Range 0 - 250kN)	EQ001 No:6 (Range 0 - 250kN)	EQ001 No:6 (Range 0 - 250kN)	
Rate of loading	N/min	10000	10000	10000	
Stress rate:	MPa/s	0.042	0.042	0.043	
Maximum failure load:	kN	49.7	41.1	42.5	
Test duration:	sec	361	345	358	
Uniaxial compressive strength:	MPa	**12.5**	**10.4**	**11.1**	
Average UCS:				11.3	
Mode of failure:		Multiple shear	Multiple shear	Multiple shear	
Comments/Deviations from suggested method:				Nil.	
Measurement of Uncertainty:				Nil.	

Prepared by:

Janica Attard
Quality Manager

Approved by:

Craig Bonello
Laboratory Manager

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Laboratory Test Certificate

Determination of Uniaxial Compressive Strength of Rock materials according to ISRM Suggested Method + Annex W

Client Name:	Qormi Construction Ltd	Date of sampling:	17/04/2024	Certificate no:	TCR004
Client address:	Tumas Group Corporate Office Level 3 Portomaso Business Tower Portomaso	Date of test:	26/04/2024	Date of certificate:	27/04/2024
		Type of corebarrel:	Standard	Job no:	J8017
Commissioned by:	Qormi Construction Ltd	Location/Town:	Kirkop	Test reference no:	Rock-004
Attn:	Qormi Construction Ltd	Project:	Elbros Plant	Tested by:	A.L
Client Tel No:	21375123			Drill type:	CMV

Details of prepared specimens		***BoreHole Number:***			***BH4***	
Specimen No:		RC 10	RC 11	RC 12	RC	
Orientation of bedding planes with respect to the test specimen:		Perpendicular	Perpendicular	Perpendicular		
Storage condition of specimens:		Core box	Core box	Core box		
Depth:		6.6	9.7	12.6		
Run No:		3	4	5		
Sample Lithology:		Limestone	Limestone	Limestone		
Flatness 0.02% from diameter		Yes	Yes	Yes		
Specimen perpendicular to 0.1° to the axis		Yes	Yes	Yes		
Specimen sides smooth and straight to 0.3mm over full length of specimen:		Yes	Yes	Yes		
Initial diameter:(Average)	mm	70.4	70.5	70.9		
Initial length:(Average)	mm	180.4	166.9	173.3		
Initial area:	mm^2	3889.4	3899.3	3944.8		
Initial volume:	mL	701.5	650.7	683.4		
Length/diameter ratio:	L/D	2.56	2.36	2.45		
Condition as tested:		As received	As received	As received		
Mass of specimen:	g	1373.5	1301.0	1306.1		
Water content (to 0.1%):	%	15.0	16.3	15.5		
Bulk Density:	kg/m^3	1958	1999	1911		
Dry Density:	kg/m^3	1664	1674	1615		
Test details						
Machine type/ref:		EQ001 No:6 (Range 0 - 250kN)	EQ001 No:6 (Range 0 - 250kN)	EQ001 No:6 (Range 0 - 250kN)		
Rate of loading	N/min	10000	10000	10000		
Stress rate:	MPa/s	0.043	0.043	0.042		
Maximum failure load:	kN	54.4	53.1	38.1		
Test duration:	sec	361	365	351		
Uniaxial compressive strength:	MPa	**14.0**	**13.6**	**9.6**		
Average UCS:				12.4		
Mode of failure:		Multiple shear	Multiple shear	Multiple shear		

Comments/Deviations from suggested method: Nil.

Measurement of Uncertainty: Nil.

Prepared by:
Janica Attard
Quality Manager

Approved by:
Craig Bonello
Laboratory Manager

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Laboratory Test Certificate

Determination of Uniaxial Compressive Strength of Rock materials according to ISRM Suggested Method + Annex W

Client Name:	Qormi Construction Ltd	Date of sampling:	18/04/2024	Certificate no:	TCR005
Client address:	Tumas Group Corporate Office Level 3 Portomaso Business Tower Portomaso	Date of test:	26/04/2024	Date of certificate:	27/04/2024
		Type of corebarrel:	Standard	Job no:	J8017
Commissioned by:	Qormi Construction Ltd	Location/Town:	Kirkop	Test reference no:	Rock-005
Attn:	Qormi Construction Ltd	Project:	Elbros Plant	Tested by:	A.L
Client Tel No:	21375123			Drill type:	CMV

Details of prepared specimens		***BoreHole Number:***		***BH5***	
Specimen No:		RC 13	RC 14	RC 15	RC
Orientation of bedding planes with respect to the test specimen:		Perpendicular	Perpendicular	Perpendicular	
Storage condition of specimens:		Core box	Core box	Core box	
Depth:		5.6	11.4	15.7	
Run No:		2	4	6	
Sample Lithology:		Limestone	Limestone	Limestone	
Flatness 0.02% from diameter		Yes	Yes	Yes	
Specimen perpendicular to 0.1° to the axis		Yes	Yes	Yes	
Specimen sides smooth and straight to 0.3mm over full length of specimen:		Yes	Yes	Yes	
Initial diameter:(Average)	mm	70.8	70.6	70.4	
Initial length:(Average)	mm	166.1	165.5	173.2	
Initial area:	mm^2	3941.1	3911.5	3893.1	
Initial volume:	mL	654.6	647.2	674.1	
Length/diameter ratio:	L/D	2.35	2.35	2.46	
Condition as tested:		As received	As received	As received	
Mass of specimen:	g	1271.0	1342.8	1408.5	
Water content (to 0.1%):	%	15.8	18.3	19.6	
Bulk Density:	kg/m^3	1941	2075	2090	
Dry Density:	kg/m^3	1634	1696	1680	
Test details					
Machine type/ref:		EQ001 No:6 (Range 0 - 250kN)	EQ001 No:6 (Range 0 - 250kN)	EQ001 No:6 (Range 0 - 250kN)	
Rate of loading	N/min	10000	10000	10000	
Stress rate:	MPa/s	0.042	0.043	0.043	
Maximum failure load:	kN	53.7	63.7	59.9	
Test duration:	sec	356	398	374	
Uniaxial compressive strength:	MPa	**13.6**	**16.3**	**15.4**	
Average UCS:				15.1	
Mode of failure:		Multiple shear	Multiple shear	Multiple shear	

Comments/Deviations from suggested method: **Nil.**

Measurement of Uncertainty: **Nil.**

Prepared by:
Janica Attard
Quality Manager

Approved by:
Craig Bonello
Laboratory Manager

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LAB/ROCK/ISRM/Rev6/OCT13

Laboratory Test Certificate

Determination of Uniaxial Compressive Strength of Rock materials according to ISRM Suggested Method + Annex W

Client Name:	Qormi Construction Ltd	Date of sampling:	18/04/2024	Certificate no:	TCR006
Client address:	Tumas Group Corporate Office Level 3 Portomaso Business Tower Portomaso	Date of test:	26/04/2024	Date of certificate:	27/04/2024
		Type of corebarrel:	Standard	Job no:	J8017
Commissioned by:	Qormi Construction Ltd	Location/Town:	Kirkop	Test reference no:	Rock-006
Attn:	Qormi Construction Ltd	Project:	Elbros Plant	Tested by:	A.L
Client Tel No:	21375123			Drill type:	CMV

Details of prepared specimens		***BoreHole Number:***		***BH6***	
Specimen No:		RC 16	RC 17	RC 18	RC
Orientation of bedding planes with respect to the test specimen:		Perpendicular	Perpendicular	Perpendicular	
Storage condition of specimens:		Core box	Core box	Core box	
Depth:		8.8	10.6	13.6	
Run No:		3	4	5	
Sample Lithology:		Limestone	Limestone	Limestone	
Flatness 0.02% from diameter		Yes	Yes	Yes	
Specimen perpendicular to 0.1° to the axis		Yes	Yes	Yes	
Specimen sides smooth and straight to 0.3mm over full length of specimen:		Yes	Yes	Yes	
Initial diameter:(Average)	mm	71.1	71.1	70.3	
Initial length:(Average)	mm	164.3	173.8	177.3	
Initial area:	mm^2	3969.0	3970.9	3885.7	
Initial volume:	mL	652.0	690.2	688.8	
Length/diameter ratio:	L/D	2.31	2.44	2.52	
Condition as tested:		As received	As received	As received	
Mass of specimen:	g	1342.9	1301.5	1374.4	
Water content (to 0.1%):	%	15.2	13.2	15.7	
Bulk Density:	kg/m^3	2060	1886	1995	
Dry Density:	kg/m^3	1748	1636	1681	
Test details					
Machine type/ref:		EQ001 No:6 (Range 0 - 250kN)	EQ001 No:6 (Range 0 - 250kN)	EQ001 No:6 (Range 0 - 250kN)	
Rate of loading	N/min	10000	10000	10000	
Stress rate:	MPa/s	0.042	0.042	0.043	
Maximum failure load:	kN	49.2	52.4	41.1	
Test duration:	sec	349	349	341	
Uniaxial compressive strength:	MPa	**12.4**	**13.2**	**10.6**	
Average UCS:			12.1		
Mode of failure:		Multiple shear	Multiple shear	Multiple shear	

Comments/Deviations from suggested method: **Nil.**

Measurement of Uncertainty: **Nil.**

Prepared by:
Janica Attard
Quality Manager

Approved by:
Craig Bonello
Laboratory Manager

TEST CERTIFICATE

The results in this certificate only relate to the item tested or sampled indicated above

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Registration No.: C32227
Directors: Alfred Xerri

Filename: J8017_Kirkop_Rock_Report_TCR006.xls

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LAB/ROCK/ISRM/Rev6/OCT13

Laboratory Test Certificate

Determination of Uniaxial Compressive Strength of Rock materials according to ISRM Suggested Method + Annex W

Client Name:	Qormi Construction Ltd	Date of sampling:	17/04/2024	Certificate no:	TCR007
Client address:	Tumas Group Corporate Office Level 3 Portomaso Business Tower Portomaso	Date of test:	26/04/2024	Date of certificate:	27/04/2024
		Type of corebarrel:	Standard	Job no:	J8017
Commissioned by:	Qormi Construction Ltd	Location/Town:	Kirkop	Test reference no:	Rock-007
Attn:	Qormi Construction Ltd	Project:	Elbros Plant	Tested by:	A.L
Client Tel No:	21375123			Drill type:	CMV

Details of prepared specimens		***BoreHole Number:***	***BH7***		
Specimen No:		RC 19	RC 20	RC 21	RC
Orientation of bedding planes with respect to the test specimen:		Perpendicular	Perpendicular	Perpendicular	
Storage condition of specimens:		Core box	Core box	Core box	
Depth:		9.3	11.8	12.5	
Run No:		4	4	5	
Sample Lithology:		Limestone	Limestone	Limestone	
Flatness 0.02% from diameter		Yes	Yes	Yes	
Specimen perpendicular to 0.1° to the axis		Yes	Yes	Yes	
Specimen sides smooth and straight to 0.3mm over full length of specimen:		Yes	Yes	Yes	
Initial diameter:(Average)	mm	70.6	71.1	71.2	
Initial length:(Average)	mm	170.6	167.6	173.1	
Initial area:	mm^2	3911.5	3974.6	3980.2	
Initial volume:	mL	667.2	666.0	689.1	
Length/diameter ratio:	L/D	2.42	2.36	2.43	
Condition as tested:		As received	As received	As received	
Mass of specimen:	g	1394.8	1382.8	1349.7	
Water content (to 0.1%):	%	16.1	14.1	14.3	
Bulk Density:	kg/m^3	2091	2076	1959	
Dry Density:	kg/m^3	1754	1784	1678	
Test details					
Machine type/ref:		EQ001 No:6 (Range 0 - 250kN)	EQ001 No:6 (Range 0 - 250kN)	EQ001 No:6 (Range 0 - 250kN)	
Rate of loading	N/min	10000	10000	10000	
Stress rate:	MPa/s	0.043	0.042	0.042	
Maximum failure load:	kN	42.7	54.0	50.7	
Test duration:	sec	349	351	355	
Uniaxial compressive strength:	MPa	**10.9**	**13.6**	**12.7**	
Average UCS:				12.4	
Mode of failure:		Multiple shear	Multiple shear	Multiple shear	

Comments/Deviations from suggested method: **Nil.**

Measurement of Uncertainty: **Nil.**

Prepared by:
Janica Attard
Quality Manager

Approved by:
Craig Bonello
Laboratory Manager

TEST CERTIFICATE

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Filename: J8017_Kirkop_Rock_Report_TCR007.xls

APPENDIX 5 – BOREHOLE LOGS

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CLIENT:	Qormi Constructions Ltd.	**LOCATION** KIRKOP Elbros Plant	**BOREHOLE** BH-1
PROJECT:	Proposed Geotechnical Investigations at a Site at Elbros Plant, Kirkop.	**JOB Nr.** J8017	**Coordinates** E / N / H

Drill Rig:	CMV/MK600M	**Starting Date:**	17/04/2024	**Ground Water Level**	-
Driller:	Prem	**Ending Date:**	17/04/2024	**Inclination**	Vertical
Drilling Fluid:	Water	**Logged by:**	Gunjan Gandhi, Geotechnical Eng.		

Depth	Daily Advance	Bit (mm)	Casing	Piezometer Installation	Water Level	Water Losses	SPT Blows/15cm	Variation of N_{SPT} Versus Depth (0 10 20 30 40)	Description	Lithology
-1	17/04/2024	Open Hole				Full Returns			**OVERBURDEN**	
-2		MK600M							**- 0.70 m**	
-3									**Lower Globigerina LIMESTONE**	
-4									Light-yellow to Cream, Fine to Coarse, Weak, Limestone of Good to Excellent quality.	
-5										
-6										
-7									Sample No.1 / -7.30 m	
-8										
-9										
-10										

Depth	Run	TCR (%)	SCR (%)	RQD (%)	ISRM Rock Strength	Discontinuities: Type	Distance	Inclination	Infilling	Surface	Weathering
-1	Open Hole										
-2	1	100	100	82	R2 - Weak Rock	Joints and Mechanical cracks	1/m	Oblique	No Infilling	JRC = 2-4	
-3			100	100							
-4	2	100	100	100			1/m	Oblique	No Infilling	JRC = 2-4	
-5			100	100							
-6	3	100	100	100							
-7			100	100							
-8			100	100			1/m	Horizontal	No Infilling	JRC = 2-4	
-9	4	100	100	94			1/m	Horizontal	No Infilling	JRC = 2-4	
-10											

Depth	Physical Properties: Moisture Content W (%)	Specific Gravity G_s kg/m³	Dry Unit Weight γ kg/m³	Void Ratio e	Degree of Saturation S (%)	UCS: Strength q_c Mpa	Strain ε (%)	Point Load Test: $I_{s(50)}$ (Mpa)	$I_{s(50)}$ (Mpa)	Triaxal Compression: Type of Test	Stresses: Effective Φ' (°)	Effective c' (kPa)	Total Φ (°)	Total c (kPa)
-7	17.1	2068	1714			11.5								

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CLIENT:	Qormi Constructions Ltd.	**LOCATION** KIRKOP Elbros Plant	**BOREHOLE** BH-1
PROJECT:	Proposed Geotechnical Investigations at a Site at Elbros Plant, Kirkop.	**JOB Nr.** J8017	**Coordinates** E / N / H

Drill Rig:	CMV/MK600M	**Starting Date:**	17/04/2024	**Ground Water Level** -	
Driller:	Prem	**Ending Date:**	17/04/2024	**Inclination** Vertical	
Drilling Fluid:	Water	**Logged by:**	Gunjan Gandhi Geotechnical Eng.		

Depth	Daily Advance	Bit (mm)	Casing	Piezometer Installation	Water Level	Water Losses	SPT Blows/15cm	Variation of N_{SPT} Versus Depth (0 10 20 30 40)	Description	Lithology	Depth	Run	TCR (%)	SCR (%)	RQD (%)	ISRM Rock Strength	Discontinuities: Type	Distance	Inclination	Infilling	Surface	Weathering	Physical Properties: Moisture Content W (%)	Specific Gravity G_s kg/m³	Dry Unit Weight γ kg/m³	Void Ratio e	Degree of Saturation S (%)	UCS: Strength q_c Mpa	UCS: Strain ε (%)	Point Load Test: $I_{s(50)}$ (Mpa)	Point Load Test: $I_{s(50)}$ (Mpa)	Triaxal Compression: Type of Test	Stresses: Effective Φ' (°)	Effective c' (kPa)	Total Φ (°)	Total c (kPa)
									Lower Globigerina LIMESTONE																												
									Sample No.2 / -10.60 m																														
-11									Light-yellow to Cream, Fine to Coarse, Weak, Limestone of Good to Excellent quality.		-11	4	100	100	100								16.6	2011	1677			15.5									
														100	100																							
-12											-12																											
-13											-13			97	88			2/m	Oblique	No Infilling	JRC = 2-4																	
																			Horizontal																		
-14	17/04/2024	MK600M				Full Returns					-14	5	100	100	100	R2 - Weak Rock	Joints and Mechanical cracks	1/m	Horizontal	No Infilling	JRC = 2-4																	
														100	100																							
-15											-15																											
-16											-16			100	100																							
									Sample No.3 / -16.20 m			6	100										19.6	2089	1680			6.9									
-17									**End of Borehole -17.00m**		-17			100	100																							
-18											-18																											
-19											-19																											
-20											-20																											

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CLIENT:	Qormi Constructions Ltd.	**LOCATION** KIRKOP Elbros Plant	**BOREHOLE** BH-2
PROJECT:	Proposed Geotechnical Investigations at a Site at Elbros Plant, Kirkop.	**JOB Nr.** J8017	**Coordinates** E / N / H

Drill Rig:	CMV/MK600M	**Starting Date:**	16/04/2024	**Ground Water Level** -	
Driller:	Prem	**Ending Date:**	16/04/2024	**Inclination** Vertical	
Drilling Fluid:	Water	**Logged by:**	Gunjan Gandhi Geotechnical Eng.		

Depth	Daily Advance	Bit (mm)	Casing	Piezometer Installation	Water Level	Water Losses	SPT Blows/15cm	Variation of N_{SPT} Versus Depth (0 10 20 30 40)	Description	Lithology	Depth	Run	TCR (%)	SCR (%)	RQD (%)	ISRM Rock Strength
-1	16/04/2024	MK600M				Lost Returns			**Lower Globigerina LIMESTONE** Light-yellow to Cream, Fine to Coarse, Weak, Limestone of Good to Excellent quality.		-1			100	95	
-2											-2	1	100	100	100	
-3											-3			100	100	
-4											-4			100	87	
-5											-5	2	100	100	91	R2 - Weak Rock
-6											-6			100	90	
-7											-7			97	76	
									Sample No.4 / -7.70 m			3	100	100	100	
-8											-8			100	100	
-9											-9					
-10											-10	4	100	100	88	

Joints and Mechanical cracks

Type	Distance	Inclination	Infilling	Surface
	1/m	Oblique	Few Oxides	JRC = 2-4
	2/m	Oblique	Few Oxides	JRC = 2-4
		Horizontal		
	1/m	Oblique	No Infilling	JRC = 2-4

Weathering

Physical Properties

Moisture Content W (%)	Specific Gravity G_s kg/m³	Dry Unit Weight γ kg/m³	Void Ratio e	Degree of Saturation S (%)
15.8	1981	1669		

UCS

Strength q_c Mpa	Strain ε (%)
13.2	

Point Load Test

$I_{s(50)}$ (Mpa)	$I_{s(50)}$ (Mpa)

Triaxal Compression

Type of Test	Stresses: Effective Φ' (°)	Effective c' (kPa)	Total Φ (°)	Total c (kPa)

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PROJECT:	Proposed Geotechnical Investigations at a Site at Elbros Plant, Kirkop.	**JOB Nr.** J8017	**Coordinates** E / N / H

Drill Rig:	CMV/MK600M	**Starting Date:**	16/04/2024	**Ground Water Level** -	
Driller:	Prem	**Ending Date:**	16/04/2024	**Inclination** Vertical	
Drilling Fluid:	Water	**Logged by:**	Gunjan Gandhi Geotechnical Eng.		

Depth	Daily Advance	Bit (mm)	Casing	Piezometer Installation	Water Level	Water Losses	SPT Blows/15cm	Variation of N_{SPT} Versus Depth (0 10 20 30 40)	Description	Lithology	Depth	Run	TCR (%)	SCR (%)	RQD (%)	ISRM Rock Strength	Discontinuities: Type	Distance	Inclination	Infilling	Surface	Weathering	Physical Properties: Moisture Content W (%)	Specific Gravity G_s kg/m³	Dry Unit Weight γ kg/m³	Void Ratio e	Degree of Saturation S (%)	UCS: Strength q_c Mpa	Strain ε (%)	Point Load Test: $I_{s(50)}$ (Mpa)	$I_{s(50)}$ (Mpa)	Triaxal Compression: Type of Test	Stresses: Effective Φ' (°)	Effective c' (kPa)	Total Φ (°)	Total c (kPa)
-11	16/04/2024	MK600M				Lost Returns			**Lower Globigerina LIMESTONE** Light-yellow to Cream, Fine to Coarse, Weak, Limestone of Excellent quality.		-11	4	100	100	100	R2 - Weak Rock	Joints and Mechanical cracks																			
-12									Sample No.5 / -11.70 m		-12			100	100								15.2	1954	1657			10.1								
-13											-13	5	100	100	90			2/m	Oblique	No Infilling	JRC = 2-4																
-14									Sample No.6 / -13.80 m		-14			100	100			1/m	Oblique	No Infilling	JRC = 2-4		14.2	2003	1718			7.4								
-15											-15																									
-16											-16	6	100	100	93																					
-17									**End of Borehole -17.00m**		-17			100	100																					
-18											-18																									
-19											-19																									
-20											-20																									

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CLIENT:	Qormi Constructions Ltd.	**LOCATION** KIRKOP Elbros Plant	**BOREHOLE** BH-3
PROJECT:	Proposed Geotechnical Investigations at a Site at Elbros Plant, Kirkop.	**JOB Nr.** J8017	**Coordinates** E / N / H

Drill Rig:	CMV/MK600M	**Starting Date:**	16/04/2024	**Ground Water Level**	-
Driller:	Prem	**Ending Date:**	16/04/2024	**Inclination**	Vertical
Drilling Fluid:	Water	**Logged by:**	Gunjan Gandhi, Geotechnical Eng.		

Depth	Daily Advance	Bit (mm)	Casing	Piezometer Installation	Water Level	Water Losses	SPT Blows/15cm	Variation of N_{SPT} Versus Depth (0 10 20 30 40)	Description	Lithology	Depth	Run	TCR (%)	SCR (%)	RQD (%)	ISRM Rock Strength	Discontinuities: Type	Distance	Inclination	Infilling	Surface	Weathering	Physical Properties: Moisture Content W (%)	Specific Gravity G_s kg/m³	Dry Unit Weight γ kg/m³	Void Ratio e	Degree of Saturation S (%)	UCS: Strength q_c Mpa	Strain ε (%)	Point Load Test: $I_{s(50)}$ (Mpa)	$I_{s(50)}$ (Mpa)	Triaxal Compression: Type of Test	Stresses: Effective Φ' (°)	Effective c' (kPa)	Total Φ (°)	Total c (kPa)
-1		Open Hole							**OVERBURDEN** - 1.00 m		-1	Open Hole																								
-2									**Lower Globigerina LIMESTONE** Light-yellow to Cream, Fine to Coarse, Weak, Limestone of Fair to Excellent quality.		-2	1		94	68		5/m	Horizontal	Oxides	JRC = 4-6																
-3											-3			100	100																				
-4											-4			96	93																				
-5	16/04/2024	MK600M				Full Returns			Sample No.7 / -4.65 m		-5	2	100	100	100	R2 - Weak Rock	Joints and Mechanical cracks						15.2	2092	1774			12.5								
-6											-6			100	100																				
-7											-7	3	100	100	100		1/m	Oblique	No infilling	JRC = 2-4															
-8											-8			100	100																				
-9											-9			100	100																				
-10											-10	4	100	100	100																				

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CLIENT:	Qormi Constructions Ltd.	**LOCATION** KIRKOP Elbros Plant	**BOREHOLE** BH-3
PROJECT:	Proposed Geotechnical Investigations at a Site at Elbros Plant, Kirkop.	**JOB Nr.** J8017	**Coordinates** E / N / H

Drill Rig:	CMV/MK600M	**Starting Date:**	16/04/2024	**Ground Water Level** -	
Driller:	Prem	**Ending Date:**	16/04/2024	**Inclination** Vertical	
Drilling Fluid:	Water	**Logged by:**	Gunjan Gandhi Geotechnical Eng.		

Depth	Daily Advance	Bit (mm)	Casing	Piezometer Installation	Water Level	Water Losses	SPT Blows/15cm	Variation of N_{SPT} Versus Depth (0 10 20 30 40)	Description	Lithology	Depth	Run	TCR (%)	SCR (%)	RQD (%)	ISRM Rock Strength	Discontinuities: Type	Distance	Inclination	Infilling	Surface	Weathering	Physical Properties: Moisture Content W (%)	Specific Gravity G_s kg/m³	Dry Unit Weight γ kg/m³	Void Ratio e	Degree of Saturation S (%)	UCS: Strength q_c Mpa	Strain ε (%)	Point Load Test: $I_{s(50)}$ (Mpa)	$I_{s(50)}$ (Mpa)	Triaxal Compression: Type of Test	Stresses: Effective Φ' (°)	Effective c' (kPa)	Total Φ (°)	Total c (kPa)
-11	16/04/2024	MK600M				Full Returns			**Lower Globigerina LIMESTONE** Light-yellow to Cream, Fine to Coarse, Weak, Limestone of Good to Excellent quality.		-11	4	100	100	100	R2 - Weak Rock	Joints and Mechanical cracks																			
-12											-12			100	100																					
-13						Lost Returns					-13	5	100	100	91			1/m	Horizontal	No Infilling	JRC = 2-4															
-14									Sample No.8 / -14.40 m		-14			100	83																					
-15											-15			100	100								14.7	1982	1691			10.4								
-16											-16	6	100	100	100																					
-17									Sample No.9 / -16.45 m		-17			100	100			1/m	Oblique	No Infilling	JRC = 2-4		18.2	2029	1659			11.1								
									End of Borehole -17.00m																												
-18											-18																									
-19											-19																									
-20											-20																									

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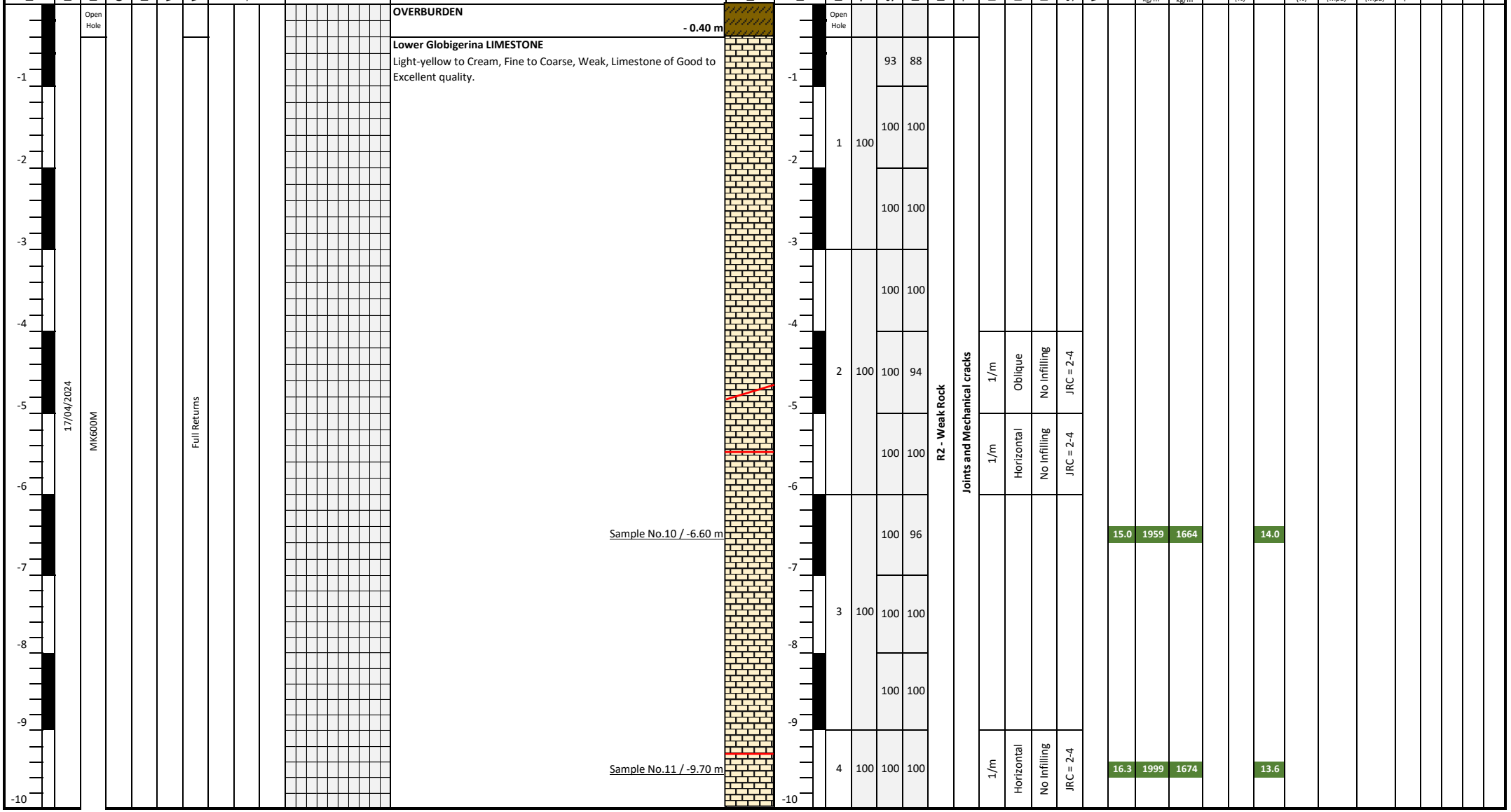
CLIENT:	Qormi Constructions Ltd.	**LOCATION** KIRKOP Elbros Plant	**BOREHOLE** BH-4
PROJECT:	Proposed Geotechnical Investigations at a Site at Elbros Plant, Kirkop.	**JOB Nr.** J8017	**Coordinates** E / N / H

Drill Rig:	CMV/MK600M	**Starting Date:**	17/04/2024	**Ground Water Level** -	
Driller:	Prem	**Ending Date:**	17/04/2024	**Inclination** Vertical	
Drilling Fluid:	Water	**Logged by:**	Gunjan Gandhi Geotechnical Eng.		



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PROJECT:	Proposed Geotechnical Investigations at a Site at Elbros Plant, Kirkop.	**JOB Nr.** J8017	**Coordinates** E / N / H

Drill Rig:	CMV/MK600M	**Starting Date:**	17/04/2024	**Ground Water Level**	-
Driller:	Prem	**Ending Date:**	17/04/2024	**Inclination**	Vertical
Drilling Fluid:	Water	**Logged by:**	Gunjan Gandhi, Geotechnical Eng.		

Depth	Daily Advance	Bit (mm)	Casing	Piezometer Installation	Water Level	Water Losses	SPT Blows/15cm	Variation of N_{SPT} Versus Depth (0 10 20 30 40)	Description	Lithology	Depth	Run	TCR (%)	SCR (%)	RQD (%)	ISRM Rock Strength	Discontinuities: Type	Distance	Inclination	Infilling	Surface	Weathering	Physical Properties: Moisture Content W (%)	Specific Gravity G_s kg/m³	Dry Unit Weight γ kg/m³	Void Ratio e	Degree of Saturation S (%)	UCS: Strength q_c Mpa	Strain ε (%)	Point Load Test: $I_{s(50)}$ (Mpa)	$I_{s(50)}$ (Mpa)	Triaxal Compression: Type of Test	Stresses: Effective Φ' (°)	Effective c' (kPa)	Total Φ (°)	Total c (kPa)
-11	17/04/2024	MK600M				Full Returns			**Lower Globigerina LIMESTONE** Light-yellow to Cream, Fine to Coarse, Weak, Limestone of Excellent quality.		-11	4	100	100	100	R2 - Weak Rock	Joints and Mechanical cracks	1/m	Oblique	No Infilling	JRC = 2-4																	
-12											-12			100	96																					
-13									Sample No.12 / -12.60 m		-13	5	100	100	93								15.5	1911	1615			9.6								
-14											-14			100	100			1/m	Horizontal	No Infilling	JRC = 2-4															
-15											-15																									
-16											-16	6	100	100	100			1/m	Oblique	No Infilling	JRC = 2-4															
-17									**End of Borehole -17.00m**		-17			100	100																					
-18											-18																									
-19											-19																									
-20											-20																									

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CLIENT:	Qormi Constructions Ltd.	**LOCATION** KIRKOP Elbros Plant	**BOREHOLE** BH-5
PROJECT:	Proposed Geotechnical Investigations at a Site at Elbros Plant, Kirkop.	**JOB Nr.** J8017	**Coordinates** E / N / H

Drill Rig:	CMV/MK600M	**Starting Date:**	18/04/2024	**Ground Water Level** -	
Driller:	Prem	**Ending Date:**	18/04/2024	**Inclination** Vertical	
Drilling Fluid:	Water	**Logged by:**	Gunjan Gandhi Geotechnical Eng.		

Depth	Daily Advance	Bit (mm)	Casing	Piezometer Installation	Water Level	Water Losses	SPT Blows/15cm	Variation of N_{SPT} Versus Depth (0 10 20 30 40)	Description	Lithology
-1	18/04/2024	Open Hole				Full Returns			**OVERBURDEN** - 0.25 m **Lower Globigerina LIMESTONE** Light-yellow to Cream, Fine to Coarse, Weak, Limestone of Good to Excellent quality.	
-2		MK600M								
-3										
-4										
-5									Sample No.13 / -5.60 m	
-6										
-7										
-8										
-9										
-10										

Depth	Run	TCR (%)	SCR (%)	RQD (%)	ISRM Rock Strength	Discontinuities: Type	Distance	Inclination	Infilling	Surface	Weathering
-1	1	100	91	83	R2 - Weak Rock	Joints and Mechanical cracks	2/0.75m	Oblique	Oxides	JRC = 4-6	
-2			95	81			1/m	Sub-vertical	Oxides	JRC = 4-6	
-3			92	89			1/m	Sub-vertical	Oxides	JRC = 4-7	
-4	2	100	100	100			1/m	Sub-vertical	No infilling	JRC = 4-8	
-5			98	90							
-6			98	87							
-7	3	100	100	88			1/m	Vertical	No infilling	JRC = 4-6	
-8			100	100							
-9			100	100							
-10	4	100	100	96			1/m	Horizontal	No infilling	JRC = 2-4	

Physical Properties					UCS		Point Load Test		Triaxal Compression				
Moisture Content W (%)	Specific Gravity G_s kg/m³	Dry Unit Weight γ kg/m³	Void Ratio e	Degree of Saturation S (%)	Strength q_c Mpa	Strain ε (%)	$I_{s(50)}$ (Mpa)	$I_{s(50)}$ (Mpa)	Type of Test	Stresses: Effective Φ' (°)	Effective c' (kPa)	Total Φ (°)	Total c (kPa)
15.8	1941	1634			13.6								

TERRACORE
INDEPENDENT CREDIBLE RELIABLE
Terracore Ltd.
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Industrial Estate
Mosta MST4001/MALTA
Tel: (+356) 2158 3243
Fax: (+356) 2141 8647
Mobile: (+356) 9947 1620
(+356) 9944 9131

CLIENT:	Qormi Constructions Ltd.	**LOCATION** KIRKOP Elbros Plant	**BOREHOLE** BH-5
PROJECT:	Proposed Geotechnical Investigations at a Site at Elbros Plant, Kirkop.	**JOB Nr.** J8017	**Coordinates** E / N / H

Drill Rig:	CMV/MK600M	**Starting Date:**	18/04/2024	**Ground Water Level** -	
Driller:	Prem	**Ending Date:**	18/04/2024	**Inclination** Vertical	
Drilling Fluid:	Water	**Logged by:**	Gunjan Gandhi Geotechnical Eng.		

Depth	Daily Advance	Bit (mm)	Casing	Piezometer Installation	Water Level	Water Losses	SPT Blows/15cm	Variation of N_{SPT} Versus Depth 0 10 20 30 40	Description	Lithology	Depth	Run	TCR (%)	SCR (%)	RQD (%)	ISRM Rock Strength	Discontinuities: Type	Distance	Inclination	Infilling	Surface	Weathering	Physical Properties: Moisture Content W (%)	Specific Gravity G_s kg/m³	Dry Unit Weight γ kg/m³	Void Ratio e	Degree of Saturation S (%)	UCS: Strength q_c Mpa	Strain ε (%)	Point Load Test: $I_{s(50)}$ (Mpa)	$I_{s(50)}$ (Mpa)	Triaxal Compression: Type of Test	Stresses: Effective Φ' (°)	Effective c' (kPa)	Total Φ (°)	Total c (kPa)
-11	18/04/2024	MK600M				Full Returns			**Lower Globigerina LIMESTONE** Light-yellow to Cream, Fine to Coarse, Weak, Limestone of Excellent quality.		-11	4	100	100	100	R2 - Weak Rock	Joints and Mechanical cracks																			
									Sample No.14 / -11.40 m					100	100								18.3	2075	1696			16.3								
-12											-12							1/m	Oblique	No Infilling	JRC = 2-4																
-13											-13	5	100	100	100																					
-14											-14				100	100																				
-15											-15																									
-16									Sample No.15 / -15.70 m		-16	6	100	100	100			2/m	Horizontal	No Infilling	JRC = 2-4		19.6	2090	1680			15.4								
-17									**End of Borehole -17.00m**		-17				100																							
-18											-18																									
-19											-19																									
-20											-20																									

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CLIENT:	Qormi Constructions Ltd.	**LOCATION** KIRKOP Elbros Plant	**BOREHOLE** BH-6
PROJECT:	Proposed Geotechnical Investigations at a Site at Elbros Plant, Kirkop.	**JOB Nr.** J8017	**Coordinates** E / N / H

Drill Rig:	CMV/MK600M	**Starting Date:**	18/04/2024	**Ground Water Level**	-
Driller:	Prem	**Ending Date:**	18/04/2024	**Inclination**	Vertical
Drilling Fluid:	Water	**Logged by:**	Gunjan Gandhi, Geotechnical Eng.		

Description

OVERBURDEN
- 0.50 m

Lower Globigerina LIMESTONE
Light-yellow to Cream, Fine to Coarse, Weak, Limestone of Fair to Excellent quality.

Sample No.16 / -8.80 m

Depth	Daily Advance	Bit (mm)	Casing	Piezometer Installation	Water Level	Water Losses	SPT Blows/15cm	Variation of N_{SPT} Versus Depth (0 10 20 30 40)	Lithology	Run	TCR (%)	SCR (%)	RQD (%)	ISRM Rock Strength	Discontinuities: Type	Distance	Inclination	Infilling	Surface	Weathering
-1	18/04/2024	Open Hole								Open Hole										
-2		MK600M				Lost Returns				1	100	92	55	R2 - Weak Rock	Joints and Mechanical cracks	2/0.5m	Horizontal	Few Oxides	JRC = 2-4	
-3												100	77			3/m	Horizontal	Few Oxides	JRC = 2-4	
-4												100	100							
-5										2	100	100	100							
-6												98	94			1/m	Oblique	Few Oxides	JRC = 2-4	
-7												100	100			1/m	Oblique	Few Oxides	JRC = 2-4	
-8										3	100	100	93							
-9												100	100							
-10												100	100							
										4	100	100	100							

Physical Properties					UCS		Point Load Test		Triaxal Compression				
Moisture Content	Specific Gravity	Dry Unit Weight	Void Ratio	Degree of Saturation	Strength	Strain			Type of Test	Stresses: Effective		Total	
W (%)	G_s kg/m³	γ kg/m³	e	S (%)	q_c Mpa	ε (%)	$I_{s(50)}$ (Mpa)	$I_{s(50)}$ (Mpa)		Φ' (°)	c' (kPa)	Φ (°)	c (kPa)
15.2	2060	1748			12.4								

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CLIENT:	Qormi Constructions Ltd.	**LOCATION** KIRKOP Elbros Plant	**BOREHOLE** BH-6
PROJECT:	Proposed Geotechnical Investigations at a Site at Elbros Plant, Kirkop.	**JOB Nr.** J8017	**Coordinates** E / N / H

Drill Rig:	CMV/MK600M	**Starting Date:**	18/04/2024	**Ground Water Level** -	
Driller:	Prem	**Ending Date:**	18/04/2024	**Inclination** Vertical	
Drilling Fluid:	Water	**Logged by:**	Gunjan Gandhi Geotechnical Eng.		

Depth	Daily Advance	Bit (mm)	Casing	Piezometer Installation	Water Level	Water Losses	SPT Blows/15cm	Variation of N_{SPT} Versus Depth (0 10 20 30 40)	Description	Lithology	Depth	Run	TCR (%)	SCR (%)	RQD (%)	ISRM Rock Strength	Discontinuities: Type	Distance	Inclination	Infilling	Surface	Weathering	Physical Properties: Moisture Content W (%)	Specific Gravity G_s kg/m³	Dry Unit Weight γ kg/m³	Void Ratio e	Degree of Saturation S (%)	UCS: Strength q_c Mpa	Strain ε (%)	Point Load Test: $I_{s(50)}$ (Mpa)	$I_{s(50)}$ (Mpa)	Triaxal Compression: Type of Test	Stresses: Effective Φ' (°)	Effective c' (kPa)	Total Φ (°)	Total c (kPa)
-11	18/04/2024	MK600M				Lost Returns			**Lower Globigerina LIMESTONE**		-11	4	100	100	91	R2 - Weak Rock	Joints and Mechanical cracks	1/m	Vertical	No Infilling	JRC = 2-4		13.2	1886	1636			13.2								
-12									Sample No.17 / -10.60 m Light-yellow to Cream, Fine to Coarse, Weak, Limestone of Excellent quality.		-12			100	100																						
-13											-13	5	100	100	100			1/m	Oblique	No Infilling	JRC = 2-4															
-14									Sample No.18 / -13.60 m **End of Borehole -14.00m**		-14			100	100								15.7	1995	1681			10.6								
-15											-15																									
-16											-16																									
-17											-17																									
-18											-18																									
-19											-19																									
-20											-20																									

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CLIENT:	Qormi Constructions Ltd.	**LOCATION** KIRKOP Elbros Plant	**BOREHOLE** BH-7
PROJECT:	Proposed Geotechnical Investigations at a Site at Elbros Plant, Kirkop.	**JOB Nr.** J8017	**Coordinates** E / N / H

Drill Rig:	CMV/MK600M	**Starting Date:**	17/04/2024	**Ground Water Level**	-
Driller:	Prem	**Ending Date:**	17/04/2024	**Inclination**	Vertical
Drilling Fluid:	Water	**Logged by:**	Gunjan Gandhi, Geotechnical Eng.		

Depth	Daily Advance	Bit (mm)	Casing	Piezometer Installation	Water Level	Water Losses	SPT Blows/15cm	Variation of N_{SPT} Versus Depth (0 10 20 30 40)	Description	Lithology	Depth	Run	TCR (%)	SCR (%)	RQD (%)	ISRM Rock Strength	Discontinuities: Type	Distance	Inclination	Infilling	Surface	Weathering
-1	17/04/2024	Open Hole				Full Returns			**OVERBURDEN** - 0.50 m **Lower Globigerina LIMESTONE** Light-yellow to Cream, Fine to Coarse, Weak, Limestone of Fair to Excellent quality.		-1			90	67			1/0.5m	Oblique	Few Oxides	JRC = 2-4	
-2		MK600M									-2	1	100	100	91			2/m	Oblique	Oxides	JRC = 2-4	
-3											-3			100	100							
-4											-4	2	100	100	100	R2 - Weak Rock	Joints and Mechanical cracks	1/m	Oblique	Few Oxides	JRC = 2-4	
-5											-5			100	100							
-6						Lost Returns					-6			100	100							
-7											-7	3	100	100	100							
-8											-8			100	100							
-9									Sample No.19 / -9.30 m		-9	4	100	100	100							
-10											-10											

Physical Properties					UCS		Point Load Test		Triaxal Compression				
Moisture Content	Specific Gravity	Dry Unit Weight	Void Ratio	Degree of Saturation	Strength	Strain			Type of Test	Stresses: Effective		Total	
W (%)	G_s kg/m³	γ kg/m³	e	S (%)	q_c Mpa	ε (%)	$I_{s(50)}$ (Mpa)	$I_{s(50)}$ (Mpa)		Φ' (°)	c' (kPa)	Φ (°)	c (kPa)
16.1	2091	1754			10.9								

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CLIENT:	Qormi Constructions Ltd.	**LOCATION** KIRKOP Elbros Plant	**BOREHOLE** BH-7
PROJECT:	Proposed Geotechnical Investigations at a Site at Elbros Plant, Kirkop.	**JOB Nr.** J8017	**Coordinates** E / N / H

Drill Rig:	CMV/MK600M	**Starting Date:**	17/04/2024	**Ground Water Level** -	
Driller:	Prem	**Ending Date:**	17/04/2024	**Inclination** Vertical	
Drilling Fluid:	Water	**Logged by:**	Gunjan Gandhi Geotechnical Eng.		

Depth	Daily Advance	Bit (mm)	Casing	Piezometer Installation	Water Level	Water Losses	SPT Blows/15cm	Variation of N_{SPT} Versus Depth (0 10 20 30 40)	Description	Lithology	Depth	Run	TCR (%)	SCR (%)	RQD (%)	ISRM Rock Strength	Discontinuities: Type	Distance	Inclination	Infilling	Surface	Weathering	Physical Properties: Moisture Content W (%)	Specific Gravity G_s kg/m³	Dry Unit Weight γ kg/m³	Void Ratio e	Degree of Saturation S (%)	UCS: Strength q_c Mpa	Strain ε (%)	Point Load Test: $I_{s(50)}$ (Mpa)	$I_{s(50)}$ (Mpa)	Triaxal Compression: Type of Test	Stresses: Effective Φ' (°)	Effective c' (kPa)	Total Φ (°)	Total c (kPa)
-11	17/04/2024	MK600M				Lost Returns			**Lower Globigerina LIMESTONE** Light-yellow to Cream, Fine to Coarse, Weak, Limestone of Good to Excellent quality.		-11	4	100	100	86	R2 - Weak Rock	Joints and Mechanical cracks	1/m	Sub-vertical	No Infilling	JRC = 2-4																
-12									Sample No.20 / -11.80 m		-12			100	93								14.1	2076	1784			13.6								
-13									Sample No.21 / -13.55 m		-13	5	100	100	100								14.3	1959	1678			12.7								
-14									**End of Borehole -14.00m**		-14			100	100																					
-15											-15																									
-16											-16																									
-17											-17																									
-18											-18																									
-19											-19																									
-20											-20																									

PA 02825/25

Proposed Commercial Complex, Triq l-Industrija, Kirkop

Technical Appendix 3

AIR QUALITY BASELINE MEASUREMENTS & AIR DISPERSION MODEL

Prepared by David Harvey

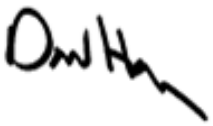
Supporting Documents for

Environmental Impact Assessment Report

Signed Declaration: Identification of Consultants and Contributors

Attn: Director of Environment and Resources (ERA)

I, David Harvey, who carried out the study (or part thereof) on air quality for the EIA for the proposed Commercial Complex at Triq l-Industrija, Kirkop (PA 02825/25) hereby declare that I take responsibility for the study and any statement and conclusion contained therein.



24th June 2026

Date

Signature

NO_2 Baseline Monitoring Results

1. The results of the NO_2 monitoring study are as follows:

Tube label	Start date	Start time	End date	End time	Exposure mins	NO_2 concentration ($\mu g/m^3$)
MAB-3	25/03/2026	11:00	15/04/2026	11:00	30240.0	23.9
MAB-10	15/04/2026	11:00	12/05/2026	14:30	39090.0	38.5
Weighted average concentration						**32.1**

2. The original laboratory reports are presented overleaf.

Test Report Air Pollution Measurement

passam ag

air quality monitoring

NO2 Nitrogen dioxide measurement by means of passive sampler

customer information		passive samplers		analysis		test report	
customer:	Adi Associates	date received:	18.05.2026	method:	SP01 photometer, Salzmann	created on:	21.05.2026
customer ID:	MAB	type:	tube (Palms)	analyte:	NO2−	created by:	K. Bodei
contact person:	David Micallef	pollutant:	NO2	date:	21.05.2026	checked on:	22.05.2026
project:	QCL007	limit of detection:	0.5 ug/m3 (14 days)	place:	passam ag	checked by:	N. Spichtig
reference:	25/03/26 - 12/05/26	sampling rate:	0.734 [ml/min]			file name:	MAB012601
		protective filter:	yes			pages:	1

note: applies to the sample as received; results below the detection limit are indicated with "<" and the associated value; this method is accredited to ISO/IEC 17025 measurement uncertainty <25%; sampling rate related to 20 °C; further information at www.passam.ch

measuring site	passive sampler		measuring period					measurement			result		Comment on the analysis
			start		end		exp. time	blank	sample		m analyte/ sampler	C NO2	
	label	lot no.	date	time	date	time	[h]	[ABS]	dilution	value [ABS]	[ug]	[ug/m3]	
LUQA	MAB-3	45678	25/03/2026	11:00	15/04/2026	11:00	504.0	0.003	1	0.242	0.53	23.9	
LUQA	MAB-10	45678	15/04/2026	11:00	12/05/2026	14:30	651.5	0.003	1:2	0.250	1.10	38.5	

PM_{10} Baseline Monitoring Results

Part A: PM_{10} monitoring results

Filter ID	Start date	Start time	End date	End time	Volume sampled (m^3)	PM_{10} concentration ($\mu g/m^3$)[1]	Notes
1951	25/03/2026	11:05:00	26/03/2026	11:00:00	55.006	29	
1952	26/03/2026	11:05:00	27/03/2026	11:00:00	55.007	27	
1953	27/03/2026	11:05:00	28/03/2026	11:00:00	55.007	20	
1954	28/03/2026	11:05:00	29/03/2026	11:00:00	55.006	28	
1955	29/03/2026	11:05:00	30/03/2026	11:00:00	55.007	48	
1956	30/03/2026	11:05:00	31/03/2026	11:00:00	55.007	34	
1957	31/03/2026	11:05:00	01/04/2026	11:00:00	55.007	14	
1958	01/04/2026	11:05:00	02/04/2026	11:00:00	55.007	13	
1959	02/04/2026	11:05:00	03/04/2026	11:00:00	55.008	16	
1960	03/04/2026	11:05:00	04/04/2026	11:00:00	55.007	22	
1961	04/04/2026	11:05:00	05/04/2026	11:00:00	55.007	31	
1962	05/04/2026	11:05:00	06/04/2026	11:00:00	55.006	39	
1963	06/04/2026	11:05:00	07/04/2026	11:00:00	55.006	24	
1964	07/04/2026	11:05:00	08/04/2026	11:00:00	55.007	18	
1965	08/04/2026	11:05:00	09/04/2026	11:00:00	55.006	26	
1966	09/04/2026	11:05:00	10/04/2026	10:16:00	53.331	39	
1968	10/04/2026	10:38:00	11/04/2026	10:33:00	55.007	26	
1969	11/04/2026	10:38:00	12/04/2026	10:33:00	55.007	39	
1970	12/04/2026	10:38:00	13/04/2026	10:33:00	55.007	180	Saharan Dust
1971	13/04/2026	10:38:00	14/04/2026	10:33:00	55.008	278	Saharan Dust
1972	14/04/2026	10:38:00	15/04/2026	10:33:00	55.007	92	Saharan Dust
1973	15/04/2026	10:38:00	16/04/2026	10:33:00	55.006	34	
1974	16/04/2026	10:38:00	17/04/2026	10:33:00	55.007	51	Daily exceedance
1975	17/04/2026	10:38:00	18/04/2026	10:33:00	55.006	52	Daily exceedance
1976	18/04/2026	10:38:00	19/04/2026	10:33:00	55.007	50	
1977	19/04/2026	10:38:00	20/04/2026	10:33:00	55.005	48	
1978	20/04/2026	10:38:00	21/04/2026	10:33:00	55.092	43	
1979	21/04/2026	10:38:00	22/04/2026	10:33:00	55.007	53	
1980	22/04/2026	10:38:00	23/04/2026	10:33:00	55.007	44	
1981	23/04/2026	11:43:00	24/04/2026	11:38:00	55.006	42	
1983	24/04/2026	11:43:00	25/04/2026	11:38:00	55.006	32	
1984	25/04/2026	11:43:00	26/04/2026	11:38:00	55.007	16	
1985	26/04/2026	11:43:00	27/04/2026	11:38:00	55.046	27	
1986	27/04/2026	11:43:00	28/04/2026	11:38:00	55.008	39	
1987	28/04/2026	11:43:00	29/04/2026	11:38:00	55.006	39	
1988	29/04/2026	11:43:00	30/04/2026	11:38:00	55.009	49	
1989	30/04/2026	11:43:00	01/05/2026	11:38:00	55.006	36	
1990	01/05/2026	11:43:00	02/05/2026	11:38:00	55.006	32	
1991	02/05/2026	11:43:00	03/05/2026	11:38:00	55.008	33	
1992	03/05/2026	11:43:00	04/05/2026	11:38:00	55.007	26	
1993	04/05/2026	11:43:00	05/05/2026	11:38:00	55.007	32	
1994	05/05/2026	11:43:00	06/05/2026	11:38:00	55.006	24	
1995	06/05/2026	12:06:00	07/05/2026	12:01:00	55.021	53	Saharan Dust
1996	07/05/2026	12:06:00	08/05/2026	12:01:00	55.003	102	Saharan Dust
1998	08/05/2026	12:06:00	09/05/2026	12:01:00	55.008	80	Saharan Dust
1999	09/05/2026	12:06:00	10/05/2026	12:01:00	55.006	60	Saharan Dust
2000	10/05/2026	12:06:00	11/05/2026	12:01:00	55.052	37	
23655	12/05/2026	12:47:00	13/05/2026	12:42:00	55.007	32	
23656	13/05/2026	12:47:00	14/05/2026	12:42:00	55.007	38	
23657	14/05/2026	12:47:00	15/05/2026	12:42:00	55.007	30	
23658	15/05/2026	12:47:00	16/05/2026	12:42:00	55.008	61	Saharan Dust
23659	16/05/2026	12:47:00	17/05/2026	12:42:00	55.006	31	
23660	17/05/2026	12:47:00	18/05/2026	12:42:00	55.007	43	

23676	18/05/2026	12:47:00	19/05/2026	10:40:00	50.333	29	
Average (46 days excluding Saharan dust)						**33.2 ± 11 μg/m^3**	

[1] Exceedances of the daily limit value of 50 μg/m^3 are in red. Saharan episodes are noted in brown

Part B: PM_{10} lab reports

Report n° EV-26-018381-154773

To:
ADI ASSOCIATES ENVIRONMENTAL CONSULTANTS LTD
KAPPARA BUSINESS CENTRE
11 TRIQ BIRKIRKARA
SGN4197 SAN GWANN - MALTA ()

Identification:	Filter n.1951 - Project: QCL007
Matrix:	Filter
Sampling Company:	Customer
Sample receiving date:	17/04/2026
Initial analysis date:	22/04/2026
Final analysis date:	22/04/2026
Report date:	28/04/2026

Test	U.M.	Result	U.M.	Sampling volume	U.M.	Calculated result	IM
[PV] Metodo di Prova UNI EN 12341:2023 - escluso/except par 5.1.1: apparecchiatura certificata							
Suspended particulate matter PM10	µg	1600	m³	55,006	µg/m³	29,1	± 5,4

The underlined information is provided by the customer, the laboratory declines responsibility for it.
* = the tests so marked are not accredited by Accredia
[BR] = analysis performed at the Brindisi Laboratory. LabAnalysis Environmental Science s.r.l., Cittadella della Ricerca, ed.6, S.S.7 per Mesagne, Brindisi.
[CA] = analysis performed at the Cagliari Laboratory. LabAnalysis Environmental Science s.r.l., Località Is Coras, Cagliari.
[CH] = analysis performed at the San Giovanni Teatino Laboratory. LabAnalysis Environmental Science s.r.l., Via Bolzano, 6/P, Chieti.
[FR] = analysis performed at the Ceccano Laboratory. LabAnalysis Environmental Science s.r.l., Via Monte Lepini 180, Frosinone.
[GE] = analysis performed at the Genova Laboratory. LabAnalysis Environmental Science s.r.l., Via Isocorte 16, Genova.
[PV] = analysis performed at the Casanova Lonati Laboratory. LabAnalysis Environmental Science s.r.l., Via Europa 5, Pavia.
[PZ] = analysis performed at the Grumento Nova Laboratory. LabAnalysis Environmental Science s.r.l., Via T. Morlino, 23, Potenza.
[RM] = analysis performed at the Rome Laboratory. LabAnalysis Environmental Science s.r.l., Via Camerata Picena, 385, Roma.
[VI] = analysis performed at the Nove Laboratory. LabAnalysis Environmental Science s.r.l., Via dell'Olmo, 2/1, Vicenza.
Sampling under the responsibility of the requesting company
U.M. = Unit of Measurement
Sampling volume = Sampling volume provided by the Customer
Calculated result = The result was recalculated in concentration, based on the sampling volume provided by the Customer
IM: The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor k=2, providing a level of confidence of approximately 95 % if result is greater than LOQ
The expanded uncertainty including sampling is reported only for information, even if the sampling was not performed directly by LabAnalysis.
The expanded uncertainty is associated only if result is greater than LOQ
"<x" = < MDL corrected for scaling factor (weighing and dilution)
MDL = method detection limit: the minimum concentration that can be measured and reported with 99% confidence that the analyte concentration is greater than zero
In the case of methods which envisage pre-concentration and purification phases, where not expressly indicated, the recovery is to be understood as included within the specific acceptability limits established by the test method or by current legislation. Unless expressly indicated, the recovery has not been used in the calculations.

Il Responsabile del laboratorio
Ordine dei Chimici della Provincia di Pavia n 423 A
Dott. Stefano Maggi

End of Certificate of Analysis.
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Sede Legale Via Bolzano, 6/P - 66020 San Giovanni Teatino (CH) | **Tel.** +39 085 9217 700 | info@labanalysis.it | www.labanalysis.it
LabAnalysis Environmental Science s.r.l., società soggetta a direzione e coordinamento da parte di LabAnalysis Group s.r.l.
Cap. Soc. €100.000,00 int. vers. - Registro Imprese di Chieti - C.F./P.IVA IT01532600697 - R.E.A. CCIAA di Chieti n.94054

Report n° EV-26-018381-154774

To:
ADI ASSOCIATES ENVIRONMENTAL CONSULTANTS LTD
KAPPARA BUSINESS CENTRE
11 TRIQ BIRKIRKARA
SGN4197 SAN GWANN - MALTA ()

Identification:	Filter n.1952 - Project: QCL007
Matrix:	Filter
Sampling Company:	Customer
Sample receiving date:	17/04/2026
Initial analysis date:	22/04/2026
Final analysis date:	22/04/2026
Report date:	28/04/2026

Test	U.M.	Result	U.M.	Sampling volume	U.M.	Calculated result	IM
[PV] Metodo di Prova UNI EN 12341:2023 - escluso/except par 5.1.1: apparecchiatura certificata							
Suspended particulate matter PM10	µg	1500	m³	55,007	µg/m³	27,3	± 5,4

The underlined information is provided by the customer, the laboratory declines responsibility for it.
* = the tests so marked are not accredited by Accredia
[BR] = analysis performed at the Brindisi Laboratory. LabAnalysis Environmental Science s.r.l., Cittadella della Ricerca, ed.6, S.S.7 per Mesagne, Brindisi.
[CA] = analysis performed at the Cagliari Laboratory. LabAnalysis Environmental Science s.r.l., Località Is Coras, Cagliari.
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[PZ] = analysis performed at the Grumento Nova Laboratory. LabAnalysis Environmental Science s.r.l., Via T. Morlino, 23, Potenza.
[RM] = analysis performed at the Rome Laboratory. LabAnalysis Environmental Science s.r.l., Via Camerata Picena, 385, Roma.
[VI] = analysis performed at the Nove Laboratory. LabAnalysis Environmental Science s.r.l., Via dell'Olmo, 2/1, Vicenza.
Sampling under the responsibility of the requesting company
U.M. = Unit of Measurement
Sampling volume = Sampling volume provided by the Customer
Calculated result = The result was recalculated in concentration, based on the sampling volume provided by the Customer
IM: The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor k=2, providing a level of confidence of approximately 95 % if result is greater than LOQ
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The expanded uncertainty is associated only if result is greater than LOQ
"<x" = < MDL corrected for scaling factor (weighing and dilution)
MDL = method detection limit: the minimum concentration that can be measured and reported with 99% confidence that the analyte concentration is greater than zero
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Il Responsabile del laboratorio
Ordine dei Chimici della Provincia di Pavia n 423 A
Dott. Stefano Maggi

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Report n° EV-26-018381-154775

To:
ADI ASSOCIATES ENVIRONMENTAL CONSULTANTS LTD
KAPPARA BUSINESS CENTRE
11 TRIQ BIRKIRKARA
SGN4197 SAN GWANN - MALTA ()

Identification:	Filter n.1953 - Project: QCL007
Matrix:	Filter
Sampling Company:	Customer
Sample receiving date:	17/04/2026
Initial analysis date:	22/04/2026
Final analysis date:	22/04/2026
Report date:	28/04/2026

Test	U.M.	Result	U.M.	Sampling volume	U.M.	Calculated result	IM
[PV] Metodo di Prova UNI EN 12341:2023 - escluso/except par 5.1.1: apparecchiatura certificata							
Suspended particulate matter PM10	µg	1090	m³	55,007	µg/m³	19,8	± 5,4

The underlined information is provided by the customer, the laboratory declines responsibility for it.
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[BR] = analysis performed at the Brindisi Laboratory. LabAnalysis Environmental Science s.r.l., Cittadella della Ricerca, ed.6, S.S.7 per Mesagne, Brindisi.
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Sampling under the responsibility of the requesting company
U.M. = Unit of Measurement
Sampling volume = Sampling volume provided by the Customer
Calculated result = The result was recalculated in concentration, based on the sampling volume provided by the Customer
IM: The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor k=2, providing a level of confidence of approximately 95 % if result is greater than LOQ
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The expanded uncertainty is associated only if result is greater than LOQ
"<x" = < MDL corrected for scaling factor (weighing and dilution)
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Il Responsabile del laboratorio
Ordine dei Chimici della Provincia di Pavia n 423 A
Dott. Stefano Maggi

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Report n° EV-26-018381-154776

To:
ADI ASSOCIATES ENVIRONMENTAL CONSULTANTS LTD
KAPPARA BUSINESS CENTRE
11 TRIQ BIRKIRKARA
SGN4197 SAN GWANN - MALTA ()

Identification:	Filter n.1954 - Project: QCL007
Matrix:	Filter
Sampling Company:	Customer
Sample receiving date:	17/04/2026
Initial analysis date:	22/04/2026
Final analysis date:	22/04/2026
Report date:	28/04/2026

Test	U.M.	Result	U.M.	Sampling volume	U.M.	Calculated result	IM
[PV] Metodo di Prova UNI EN 12341:2023 - escluso/except par 5.1.1: apparecchiatura certificata							
Suspended particulate matter PM10	µg	1520	m³	55,006	µg/m³	27,6	± 5,4

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[VI] = analysis performed at the Nove Laboratory. LabAnalysis Environmental Science s.r.l., Via dell'Olmo, 2/1, Vicenza.
Sampling under the responsibility of the requesting company
U.M. = Unit of Measurement
Sampling volume = Sampling volume provided by the Customer
Calculated result = The result was recalculated in concentration, based on the sampling volume provided by the Customer
IM: The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor k=2, providing a level of confidence of approximately 95 % if result is greater than LOQ
The expanded uncertainty including sampling is reported only for information, even if the sampling was not performed directly by LabAnalysis.
The expanded uncertainty is associated only if result is greater than LOQ
"<x" = < MDL corrected for scaling factor (weighing and dilution)
MDL = method detection limit: the minimum concentration that can be measured and reported with 99% confidence that the analyte concentration is greater than zero
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Il Responsabile del laboratorio
Ordine dei Chimici della Provincia di Pavia n 423 A
Dott. Stefano Maggi

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Report n° EV-26-018381-154777

To:
ADI ASSOCIATES ENVIRONMENTAL CONSULTANTS LTD
KAPPARA BUSINESS CENTRE
11 TRIQ BIRKIRKARA
SGN4197 SAN GWANN - MALTA ()

Identification:	Filter n.1955 - Project: QCL007
Matrix:	Filter
Sampling Company:	Customer
Sample receiving date:	17/04/2026
Initial analysis date:	22/04/2026
Final analysis date:	22/04/2026
Report date:	28/04/2026

Test	U.M.	Result	U.M.	Sampling volume	U.M.	Calculated result	IM
[PV] Metodo di Prova UNI EN 12341:2023 - escluso/except par 5.1.1: apparecchiatura certificata							
Suspended particulate matter PM10	µg	2620	m³	55,007	µg/m³	47,6	± 5,4

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[VI] = analysis performed at the Nove Laboratory. LabAnalysis Environmental Science s.r.l., Via dell'Olmo, 2/1, Vicenza.
Sampling under the responsibility of the requesting company
U.M. = Unit of Measurement
Sampling volume = Sampling volume provided by the Customer
Calculated result = The result was recalculated in concentration, based on the sampling volume provided by the Customer
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The expanded uncertainty is associated only if result is greater than LOQ
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MDL = method detection limit: the minimum concentration that can be measured and reported with 99% confidence that the analyte concentration is greater than zero
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Il Responsabile del laboratorio
Ordine dei Chimici della Provincia di Pavia n 423 A
Dott. Stefano Maggi

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Cap. Soc. €100.000,00 int. vers. - Registro Imprese di Chieti - C.F./P.IVA IT01532600697 - R.E.A. CCIAA di Chieti n.94054

Report n° EV-26-018381-154778

To:
ADI ASSOCIATES ENVIRONMENTAL CONSULTANTS LTD
KAPPARA BUSINESS CENTRE
11 TRIQ BIRKIRKARA
SGN4197 SAN GWANN - MALTA ()

Identification:	Filter n.1956 - Project: QCL007
Matrix:	Filter
Sampling Company:	Customer
Sample receiving date:	17/04/2026
Initial analysis date:	22/04/2026
Final analysis date:	22/04/2026
Report date:	28/04/2026

Test	U.M.	Result	U.M.	Sampling volume	U.M.	Calculated result	IM
[PV] Metodo di Prova UNI EN 12341:2023 - escluso/except par 5.1.1: apparecchiatura certificata							
Suspended particulate matter PM10	µg	1880	m³	55,007	µg/m³	34,2	± 5,4

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U.M. = Unit of Measurement
Sampling volume = Sampling volume provided by the Customer
Calculated result = The result was recalculated in concentration, based on the sampling volume provided by the Customer
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Il Responsabile del laboratorio
Ordine dei Chimici della Provincia di Pavia n 423 A
Dott. Stefano Maggi

End of Certificate of Analysis.
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LabAnalysis Environmental Science s.r.l., società soggetta a direzione e coordinamento da parte di LabAnalysis Group s.r.l.
Cap. Soc. €100.000,00 int. vers. - Registro Imprese di Chieti - C.F./P.IVA IT01532600697 - R.E.A. CCIAA di Chieti n.94054

Report n° EV-26-018381-154779

To:
ADI ASSOCIATES ENVIRONMENTAL CONSULTANTS LTD
KAPPARA BUSINESS CENTRE
11 TRIQ BIRKIRKARA
SGN4197 SAN GWANN - MALTA ()

Identification:	Filter n.1957 - Project: QCL007
Matrix:	Filter
Sampling Company:	Customer
Sample receiving date:	17/04/2026
Initial analysis date:	22/04/2026
Final analysis date:	22/04/2026
Report date:	28/04/2026

Test	U.M.	Result	U.M.	Sampling volume	U.M.	Calculated result	IM
[PV] Metodo di Prova UNI EN 12341:2023 - escluso/except par 5.1.1: apparecchiatura certificata							
Suspended particulate matter PM10	µg	778	m³	55,007	µg/m³	14,1	± 5,4

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Sampling under the responsibility of the requesting company
U.M. = Unit of Measurement
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Calculated result = The result was recalculated in concentration, based on the sampling volume provided by the Customer
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Il Responsabile del laboratorio
Ordine dei Chimici della Provincia di Pavia n 423 A
Dott. Stefano Maggi

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LabAnalysis Environmental Science s.r.l., società soggetta a direzione e coordinamento da parte di LabAnalysis Group s.r.l.
Cap. Soc. €100.000,00 int. vers. - Registro Imprese di Chieti - C.F./P.IVA IT01532600697 - R.E.A. CCIAA di Chieti n.94054

Report n° EV-26-018381-154780

To:
ADI ASSOCIATES ENVIRONMENTAL CONSULTANTS LTD
KAPPARA BUSINESS CENTRE
11 TRIQ BIRKIRKARA
SGN4197 SAN GWANN - MALTA ()

Identification:	Filter n.1958 - Project: QCL007
Matrix:	Filter
Sampling Company:	Customer
Sample receiving date:	17/04/2026
Initial analysis date:	22/04/2026
Final analysis date:	22/04/2026
Report date:	28/04/2026

Test	U.M.	Result	U.M.	Sampling volume	U.M.	Calculated result	IM
[PV] Metodo di Prova UNI EN 12341:2023 - escluso/except par 5.1.1: apparecchiatura certificata							
Suspended particulate matter PM10	µg	702	m³	55,007	µg/m³	12,8	± 5,4

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[VI] = analysis performed at the Nove Laboratory. LabAnalysis Environmental Science s.r.l., Via dell'Olmo, 2/1, Vicenza.
Sampling under the responsibility of the requesting company
U.M. = Unit of Measurement
Sampling volume = Sampling volume provided by the Customer
Calculated result = The result was recalculated in concentration, based on the sampling volume provided by the Customer
IM: The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor k=2, providing a level of confidence of approximately 95 % if result is greater than LOQ
The expanded uncertainty including sampling is reported only for information, even if the sampling was not performed directly by LabAnalysis.
The expanded uncertainty is associated only if result is greater than LOQ
"<x" = < MDL corrected for scaling factor (weighing and dilution)
MDL = method detection limit: the minimum concentration that can be measured and reported with 99% confidence that the analyte concentration is greater than zero
In the case of methods which envisage pre-concentration and purification phases, where not expressly indicated, the recovery is to be understood as included within the specific acceptability limits established by the test method or by current legislation. Unless expressly indicated, the recovery has not been used in the calculations.

Il Responsabile del laboratorio
Ordine dei Chimici della Provincia di Pavia n 423 A
Dott. Stefano Maggi

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LabAnalysis Environmental Science s.r.l., società soggetta a direzione e coordinamento da parte di LabAnalysis Group s.r.l.
Cap. Soc. €100.000,00 int. vers. - Registro Imprese di Chieti - C.F./P.IVA IT01532600697 - R.E.A. CCIAA di Chieti n.94054

Report n° EV-26-018381-154781

To:
ADI ASSOCIATES ENVIRONMENTAL CONSULTANTS LTD
KAPPARA BUSINESS CENTRE
11 TRIQ BIRKIRKARA
SGN4197 SAN GWANN - MALTA ()

Identification:	Filter n.1959 - Project: QCL007
Matrix:	Filter
Sampling Company:	Customer
Sample receiving date:	17/04/2026
Initial analysis date:	22/04/2026
Final analysis date:	22/04/2026
Report date:	28/04/2026

Test	U.M.	Result	U.M.	Sampling volume	U.M.	Calculated result	IM
[PV] Metodo di Prova UNI EN 12341:2023 - escluso/except par 5.1.1: apparecchiatura certificata							
Suspended particulate matter PM10	µg	874	m³	55,008	µg/m³	15,9	± 5,4

The underlined information is provided by the customer, the laboratory declines responsibility for it.
* = the tests so marked are not accredited by Accredia
[BR] = analysis performed at the Brindisi Laboratory. LabAnalysis Environmental Science s.r.l., Cittadella della Ricerca, ed.6, S.S.7 per Mesagne, Brindisi.
[CA] = analysis performed at the Cagliari Laboratory. LabAnalysis Environmental Science s.r.l., Località Is Coras, Cagliari.
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[GE] = analysis performed at the Genova Laboratory. LabAnalysis Environmental Science s.r.l., Via Isocorte 16, Genova.
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[PZ] = analysis performed at the Grumento Nova Laboratory. LabAnalysis Environmental Science s.r.l., Via T. Morlino, 23, Potenza.
[RM] = analysis performed at the Rome Laboratory. LabAnalysis Environmental Science s.r.l., Via Camerata Picena, 385, Roma.
[VI] = analysis performed at the Nove Laboratory. LabAnalysis Environmental Science s.r.l., Via dell'Olmo, 2/1, Vicenza.
Sampling under the responsibility of the requesting company
U.M. = Unit of Measurement
Sampling volume = Sampling volume provided by the Customer
Calculated result = The result was recalculated in concentration, based on the sampling volume provided by the Customer
IM: The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor k=2, providing a level of confidence of approximately 95 % if result is greater than LOQ
The expanded uncertainty including sampling is reported only for information, even if the sampling was not performed directly by LabAnalysis.
The expanded uncertainty is associated only if result is greater than LOQ
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MDL = method detection limit: the minimum concentration that can be measured and reported with 99% confidence that the analyte concentration is greater than zero
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Il Responsabile del laboratorio
Ordine dei Chimici della Provincia di Pavia n 423 A
Dott. Stefano Maggi

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Report n° EV-26-018381-154782

To:
ADI ASSOCIATES ENVIRONMENTAL CONSULTANTS LTD
KAPPARA BUSINESS CENTRE
11 TRIQ BIRKIRKARA
SGN4197 SAN GWANN - MALTA ()

Identification:	Filter n.1960 - Project: QCL007
Matrix:	Filter
Sampling Company:	Customer
Sample receiving date:	17/04/2026
Initial analysis date:	22/04/2026
Final analysis date:	22/04/2026
Report date:	28/04/2026

Test	U.M.	Result	U.M.	Sampling volume	U.M.	Calculated result	IM
[PV] Metodo di Prova UNI EN 12341:2023 - escluso/except par 5.1.1: apparecchiatura certificata							
Suspended particulate matter PM10	µg	1190	m³	55,007	µg/m³	21,6	± 5,4

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* = the tests so marked are not accredited by Accredia
[BR] = analysis performed at the Brindisi Laboratory. LabAnalysis Environmental Science s.r.l., Cittadella della Ricerca, ed.6, S.S.7 per Mesagne, Brindisi.
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Sampling under the responsibility of the requesting company
U.M. = Unit of Measurement
Sampling volume = Sampling volume provided by the Customer
Calculated result = The result was recalculated in concentration, based on the sampling volume provided by the Customer
IM: The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor k=2, providing a level of confidence of approximately 95 % if result is greater than LOQ
The expanded uncertainty including sampling is reported only for information, even if the sampling was not performed directly by LabAnalysis.
The expanded uncertainty is associated only if result is greater than LOQ
"<x" = < MDL corrected for scaling factor (weighing and dilution)
MDL = method detection limit: the minimum concentration that can be measured and reported with 99% confidence that the analyte concentration is greater than zero
In the case of methods which envisage pre-concentration and purification phases, where not expressly indicated, the recovery is to be understood as included within the specific acceptability limits established by the test method or by current legislation. Unless expressly indicated, the recovery has not been used in the calculations.

Il Responsabile del laboratorio
Ordine dei Chimici della Provincia di Pavia n 423 A
Dott. Stefano Maggi

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Report n° EV-26-018381-154783

To:
ADI ASSOCIATES ENVIRONMENTAL CONSULTANTS LTD
KAPPARA BUSINESS CENTRE
11 TRIQ BIRKIRKARA
SGN4197 SAN GWANN - MALTA ()

Identification:	Filter n.1961 - Project: QCL007
Matrix:	Filter
Sampling Company:	Customer
Sample receiving date:	17/04/2026
Initial analysis date:	22/04/2026
Final analysis date:	22/04/2026
Report date:	28/04/2026

Test	U.M.	Result	U.M.	Sampling volume	U.M.	Calculated result	IM
[PV] Metodo di Prova UNI EN 12341:2023 - escluso/except par 5.1.1: apparecchiatura certificata							
Suspended particulate matter PM10	µg	1680	m³	55,007	µg/m³	30,5	± 5,4

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[VI] = analysis performed at the Nove Laboratory. LabAnalysis Environmental Science s.r.l., Via dell'Olmo, 2/1, Vicenza.
Sampling under the responsibility of the requesting company
U.M. = Unit of Measurement
Sampling volume = Sampling volume provided by the Customer
Calculated result = The result was recalculated in concentration, based on the sampling volume provided by the Customer
IM: The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor k=2, providing a level of confidence of approximately 95 % if result is greater than LOQ
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The expanded uncertainty is associated only if result is greater than LOQ
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In the case of methods which envisage pre-concentration and purification phases, where not expressly indicated, the recovery is to be understood as included within the specific acceptability limits established by the test method or by current legislation. Unless expressly indicated, the recovery has not been used in the calculations.

Il Responsabile del laboratorio
Ordine dei Chimici della Provincia di Pavia n 423 A
Dott. Stefano Maggi

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Report n° EV-26-018381-155855

To:
ADI ASSOCIATES ENVIRONMENTAL CONSULTANTS LTD
KAPPARA BUSINESS CENTRE
11 TRIQ BIRKIRKARA
SGN4197 SAN GWANN - MALTA ()

Identification:	Filter n.1962 - Project: QCL007
Matrix:	Filter
Sampling Company:	Customer
Sample receiving date:	17/04/2026
Initial analysis date:	22/04/2026
Final analysis date:	22/04/2026
Report date:	28/04/2026

Test	U.M.	Result	U.M.	Sampling volume	U.M.	Calculated result	IM
[PV] Metodo di Prova UNI EN 12341:2023 - escluso/except par 5.1.1: apparecchiatura certificata							
Suspended particulate matter PM10	µg	2120	m³	55,006	µg/m³	38,5	± 5,4

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[GE] = analysis performed at the Genova Laboratory. LabAnalysis Environmental Science s.r.l., Via Isocorte 16, Genova.
[PV] = analysis performed at the Casanova Lonati Laboratory. LabAnalysis Environmental Science s.r.l., Via Europa 5, Pavia.
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[RM] = analysis performed at the Rome Laboratory. LabAnalysis Environmental Science s.r.l., Via Camerata Picena, 385, Roma.
[VI] = analysis performed at the Nove Laboratory. LabAnalysis Environmental Science s.r.l., Via dell'Olmo, 2/1, Vicenza.
Sampling under the responsibility of the requesting company
U.M. = Unit of Measurement
Sampling volume = Sampling volume provided by the Customer
Calculated result = The result was recalculated in concentration, based on the sampling volume provided by the Customer
IM: The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor k=2, providing a level of confidence of approximately 95 % if result is greater than LOQ
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The expanded uncertainty is associated only if result is greater than LOQ
"<x" = < MDL corrected for scaling factor (weighing and dilution)
MDL = method detection limit: the minimum concentration that can be measured and reported with 99% confidence that the analyte concentration is greater than zero
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Il Responsabile del laboratorio
Ordine dei Chimici della Provincia di Pavia n 423 A
Dott. Stefano Maggi

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Report n° EV-26-018381-155856

To:
ADI ASSOCIATES ENVIRONMENTAL CONSULTANTS LTD
KAPPARA BUSINESS CENTRE
11 TRIQ BIRKIRKARA
SGN4197 SAN GWANN - MALTA ()

Identification:	Filter n.1963 - Project: QCL007
Matrix:	Filter
Sampling Company:	Customer
Sample receiving date:	17/04/2026
Initial analysis date:	22/04/2026
Final analysis date:	22/04/2026
Report date:	28/04/2026

Test	U.M.	Result	U.M.	Sampling volume	U.M.	Calculated result	IM
[PV] Metodo di Prova UNI EN 12341:2023 - escluso/except par 5.1.1: apparecchiatura certificata							
Suspended particulate matter PM10	µg	1330	m³	55,006	µg/m³	24,2	± 5,4

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[VI] = analysis performed at the Nove Laboratory. LabAnalysis Environmental Science s.r.l., Via dell'Olmo, 2/1, Vicenza.
Sampling under the responsibility of the requesting company
U.M. = Unit of Measurement
Sampling volume = Sampling volume provided by the Customer
Calculated result = The result was recalculated in concentration, based on the sampling volume provided by the Customer
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Il Responsabile del laboratorio
Ordine dei Chimici della Provincia di Pavia n 423 A
Dott. Stefano Maggi

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Report n° EV-26-018381-154784

To:
ADI ASSOCIATES ENVIRONMENTAL CONSULTANTS LTD
KAPPARA BUSINESS CENTRE
11 TRIQ BIRKIRKARA
SGN4197 SAN GWANN - MALTA ()

Identification:	Filter n.1964 - Project: QCL007
Matrix:	Filter
Sampling Company:	Customer
Sample receiving date:	17/04/2026
Initial analysis date:	22/04/2026
Final analysis date:	22/04/2026
Report date:	28/04/2026

Test	U.M.	Result	U.M.	Sampling volume	U.M.	Calculated result	IM
[PV] Metodo di Prova UNI EN 12341:2023 - escluso/except par 5.1.1: apparecchiatura certificata							
Suspended particulate matter PM10	µg	962	m³	55,007	µg/m³	17,5	± 5,4

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Sampling under the responsibility of the requesting company
U.M. = Unit of Measurement
Sampling volume = Sampling volume provided by the Customer
Calculated result = The result was recalculated in concentration, based on the sampling volume provided by the Customer
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Il Responsabile del laboratorio
Ordine dei Chimici della Provincia di Pavia n 423 A
Dott. Stefano Maggi

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Report n° EV-26-018381-154785

To:
ADI ASSOCIATES ENVIRONMENTAL CONSULTANTS LTD
KAPPARA BUSINESS CENTRE
11 TRIQ BIRKIRKARA
SGN4197 SAN GWANN - MALTA ()

Identification:	Filter n.1965 - Project: QCL007
Matrix:	Filter
Sampling Company:	Customer
Sample receiving date:	17/04/2026
Initial analysis date:	22/04/2026
Final analysis date:	22/04/2026
Report date:	28/04/2026

Test	U.M.	Result	U.M.	Sampling volume	U.M.	Calculated result	IM
[PV] Metodo di Prova UNI EN 12341:2023 - escluso/except par 5.1.1: apparecchiatura certificata							
Suspended particulate matter PM10	µg	1450	m³	55,006	µg/m³	26,4	± 5,4

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[VI] = analysis performed at the Nove Laboratory. LabAnalysis Environmental Science s.r.l., Via dell'Olmo, 2/1, Vicenza.
Sampling under the responsibility of the requesting company
U.M. = Unit of Measurement
Sampling volume = Sampling volume provided by the Customer
Calculated result = The result was recalculated in concentration, based on the sampling volume provided by the Customer
IM: The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor k=2, providing a level of confidence of approximately 95 % if result is greater than LOQ
The expanded uncertainty including sampling is reported only for information, even if the sampling was not performed directly by LabAnalysis.
The expanded uncertainty is associated only if result is greater than LOQ
"<x" = < MDL corrected for scaling factor (weighing and dilution)
MDL = method detection limit: the minimum concentration that can be measured and reported with 99% confidence that the analyte concentration is greater than zero
In the case of methods which envisage pre-concentration and purification phases, where not expressly indicated, the recovery is to be understood as included within the specific acceptability limits established by the test method or by current legislation. Unless expressly indicated, the recovery has not been used in the calculations.

Il Responsabile del laboratorio
Ordine dei Chimici della Provincia di Pavia n 423 A
Dott. Stefano Maggi

End of Certificate of Analysis.
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Report n° EV-26-018381-154786

To:
ADI ASSOCIATES ENVIRONMENTAL CONSULTANTS LTD
KAPPARA BUSINESS CENTRE
11 TRIQ BIRKIRKARA
SGN4197 SAN GWANN - MALTA ()

Identification:	Filter n.1966 - Project: QCL007
Matrix:	Filter
Sampling Company:	Customer
Sample receiving date:	17/04/2026
Initial analysis date:	22/04/2026
Final analysis date:	22/04/2026
Report date:	28/04/2026

Test	U.M.	Result	U.M.	Sampling volume	U.M.	Calculated result	IM
[PV] Metodo di Prova UNI EN 12341:2023 - escluso/except par 5.1.1: apparecchiatura certificata							
Suspended particulate matter PM10	µg	2100	m³	53,331	µg/m³	39,4	± 5,4

The underlined information is provided by the customer, the laboratory declines responsibility for it.
* = the tests so marked are not accredited by Accredia
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Sampling under the responsibility of the requesting company
U.M. = Unit of Measurement
Sampling volume = Sampling volume provided by the Customer
Calculated result = The result was recalculated in concentration, based on the sampling volume provided by the Customer
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The expanded uncertainty is associated only if result is greater than LOQ
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Il Responsabile del laboratorio
Ordine dei Chimici della Provincia di Pavia n 423 A
Dott. Stefano Maggi

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Report n° EV-26-020984-178243

To:
ADI ASSOCIATES ENVIRONMENTAL CONSULTANTS LTD
KAPPARA BUSINESS CENTRE
11 TRIQ BIRKIRKARA
SGN4197 SAN GWANN - MALTA ()

Identification:	Filter n. 1968 - Project: QCL007
Matrix:	Filter
Sampling Company:	Customer
Sample receiving date:	30/04/2026
Initial analysis date:	12/05/2026
Final analysis date:	12/05/2026
Report date:	13/05/2026

Test	U.M.	Result	U.M.	Sampling volume	U.M.	Calculated result	IM
[PV] Metodo di Prova UNI EN 12341:2023 - escluso/except par 5.1.1: apparecchiatura certificata							
Suspended particulate matter PM10	µg	1450	m³	55,007	µg/m³	26,4	± 5,4

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Sampling under the responsibility of the requesting company
U.M. = Unit of Measurement
Sampling volume = Sampling volume provided by the Customer
Calculated result = The result was recalculated in concentration, based on the sampling volume provided by the Customer
IM: The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor k=2, providing a level of confidence of approximately 95 % if result is greater than LOQ
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The expanded uncertainty is associated only if result is greater than LOQ
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Il Responsabile del laboratorio
Ordine dei Chimici della Provincia di Pavia n 423 A
Dott. Stefano Maggi

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ENVIRONMENTAL SCIENCE

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Qualità UNI EN ISO 9001:2015
Sicurezza UNI ISO 45001:2018
Ambiente UNI EN ISO 14001:2015

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Report n° EV-26-020984-178244

To:
ADI ASSOCIATES ENVIRONMENTAL CONSULTANTS LTD
KAPPARA BUSINESS CENTRE
11 TRIQ BIRKIRKARA
SGN4197 SAN GWANN - MALTA ()

Identification:	Filter n. 1969 - Project: QCL007
Matrix:	Filter
Sampling Company:	Customer
Sample receiving date:	30/04/2026
Initial analysis date:	12/05/2026
Final analysis date:	12/05/2026
Report date:	13/05/2026

Test	U.M.	Result	U.M.	Sampling volume	U.M.	Calculated result	IM
[PV] Metodo di Prova UNI EN 12341:2023 - escluso/except par 5.1.1: apparecchiatura certificata							
Suspended particulate matter PM10	µg	2120	m³	55,007	µg/m³	38,5	± 5,4

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Sampling under the responsibility of the requesting company
U.M. = Unit of Measurement
Sampling volume = Sampling volume provided by the Customer
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Il Responsabile del laboratorio
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Report n° EV-26-020984-178245

To:
ADI ASSOCIATES ENVIRONMENTAL CONSULTANTS LTD
KAPPARA BUSINESS CENTRE
11 TRIQ BIRKIRKARA
SGN4197 SAN GWANN - MALTA ()

Identification:	Filter n. 1970 - Project: QCL007
Matrix:	Filter
Sampling Company:	Customer
Sample receiving date:	30/04/2026
Initial analysis date:	12/05/2026
Final analysis date:	12/05/2026
Report date:	13/05/2026

Test	U.M.	Result	U.M.	Sampling volume	U.M.	Calculated result	IM
[PV] Metodo di Prova UNI EN 12341:2023 - escluso/except par 5.1.1: apparecchiatura certificata							
Suspended particulate matter PM10	µg	9880	m³	55,007	µg/m³	180	± 45

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Sampling under the responsibility of the requesting company
U.M. = Unit of Measurement
Sampling volume = Sampling volume provided by the Customer
Calculated result = The result was recalculated in concentration, based on the sampling volume provided by the Customer
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MDL = method detection limit: the minimum concentration that can be measured and reported with 99% confidence that the analyte concentration is greater than zero
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Il Responsabile del laboratorio
Ordine dei Chimici della Provincia di Pavia n 423 A
Dott. Stefano Maggi

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Report n° EV-26-020984-178246

To:
ADI ASSOCIATES ENVIRONMENTAL CONSULTANTS LTD
KAPPARA BUSINESS CENTRE
11 TRIQ BIRKIRKARA
SGN4197 SAN GWANN - MALTA ()

Identification:	Filter n. 1971 - Project: QCL007
Matrix:	Filter
Sampling Company:	Customer
Sample receiving date:	30/04/2026
Initial analysis date:	12/05/2026
Final analysis date:	12/05/2026
Report date:	13/05/2026

Test	U.M.	Result	U.M.	Sampling volume	U.M.	Calculated result	IM
[PV] Metodo di Prova UNI EN 12341:2023 - escluso/except par 5.1.1: apparecchiatura certificata							
Suspended particulate matter PM10	µg	15300	m³	55,008	µg/m³	278	± 70

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U.M. = Unit of Measurement
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Il Responsabile del laboratorio
Ordine dei Chimici della Provincia di Pavia n 423 A
Dott. Stefano Maggi

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Cap. Soc. €100.000,00 int. vers. - Registro Imprese di Chieti - C.F./P.IVA IT01532600697 - R.E.A. CCIAA di Chieti n.94054

Report n° EV-26-020984-178247

To:
ADI ASSOCIATES ENVIRONMENTAL CONSULTANTS LTD
KAPPARA BUSINESS CENTRE
11 TRIQ BIRKIRKARA
SGN4197 SAN GWANN - MALTA ()

Identification:	Filter n. 1972 - Project: QCL007
Matrix:	Filter
Sampling Company:	Customer
Sample receiving date:	30/04/2026
Initial analysis date:	12/05/2026
Final analysis date:	12/05/2026
Report date:	13/05/2026

Test	U.M.	Result	U.M.	Sampling volume	U.M.	Calculated result	IM
[PV] Metodo di Prova UNI EN 12341:2023 - escluso/except par 5.1.1: apparecchiatura certificata							
Suspended particulate matter PM10	µg	5060	m³	55,007	µg/m³	92	± 23

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U.M. = Unit of Measurement
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Il Responsabile del laboratorio
Ordine dei Chimici della Provincia di Pavia n 423 A
Dott. Stefano Maggi

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Report n° EV-26-020984-178248

To:
ADI ASSOCIATES ENVIRONMENTAL CONSULTANTS LTD
KAPPARA BUSINESS CENTRE
11 TRIQ BIRKIRKARA
SGN4197 SAN GWANN - MALTA ()

Identification:	Filter n. 1973 - Project: QCL007
Matrix:	Filter
Sampling Company:	Customer
Sample receiving date:	30/04/2026
Initial analysis date:	12/05/2026
Final analysis date:	12/05/2026
Report date:	13/05/2026

Test	U.M.	Result	U.M.	Sampling volume	U.M.	Calculated result	IM
[PV] Metodo di Prova UNI EN 12341:2023 - escluso/except par 5.1.1: apparecchiatura certificata							
Suspended particulate matter PM10	µg	1850	m³	55,006	µg/m³	33,6	± 5,4

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[VI] = analysis performed at the Nove Laboratory. LabAnalysis Environmental Science s.r.l., Via dell'Olmo, 2/1, Vicenza.
Sampling under the responsibility of the requesting company
U.M. = Unit of Measurement
Sampling volume = Sampling volume provided by the Customer
Calculated result = The result was recalculated in concentration, based on the sampling volume provided by the Customer
IM: The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor k=2, providing a level of confidence of approximately 95 % if result is greater than LOQ
The expanded uncertainty including sampling is reported only for information, even if the sampling was not performed directly by LabAnalysis.
The expanded uncertainty is associated only if result is greater than LOQ
"<x" = < MDL corrected for scaling factor (weighing and dilution)
MDL = method detection limit: the minimum concentration that can be measured and reported with 99% confidence that the analyte concentration is greater than zero
In the case of methods which envisage pre-concentration and purification phases, where not expressly indicated, the recovery is to be understood as included within the specific acceptability limits established by the test method or by current legislation. Unless expressly indicated, the recovery has not been used in the calculations.

Il Responsabile del laboratorio
Ordine dei Chimici della Provincia di Pavia n 423 A
Dott. Stefano Maggi

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LabAnalysis Environmental Science s.r.l., società soggetta a direzione e coordinamento da parte di LabAnalysis Group s.r.l.
Cap. Soc. €100.000,00 int. vers. - Registro Imprese di Chieti - C.F./P.IVA IT01532600697 - R.E.A. CCIAA di Chieti n.94054

Report n° EV-26-020984-178249

To:
ADI ASSOCIATES ENVIRONMENTAL CONSULTANTS LTD
KAPPARA BUSINESS CENTRE
11 TRIQ BIRKIRKARA
SGN4197 SAN GWANN - MALTA ()

Identification:	Filter n. 1974 - Project: QCL007
Matrix:	Filter
Sampling Company:	Customer
Sample receiving date:	30/04/2026
Initial analysis date:	12/05/2026
Final analysis date:	12/05/2026
Report date:	13/05/2026

Test	U.M.	Result	U.M.	Sampling volume	U.M.	Calculated result	IM
[PV] Metodo di Prova UNI EN 12341:2023 - escluso/except par 5.1.1: apparecchiatura certificata							
Suspended particulate matter PM10	µg	2810	m³	55,007	µg/m³	51,1	± 5,4

The underlined information is provided by the customer, the laboratory declines responsibility for it.
* = the tests so marked are not accredited by Accredia
[BR] = analysis performed at the Brindisi Laboratory. LabAnalysis Environmental Science s.r.l., Cittadella della Ricerca, ed.6, S.S.7 per Mesagne, Brindisi.
[CA] = analysis performed at the Cagliari Laboratory. LabAnalysis Environmental Science s.r.l., Località Is Coras, Cagliari.
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Sampling under the responsibility of the requesting company
U.M. = Unit of Measurement
Sampling volume = Sampling volume provided by the Customer
Calculated result = The result was recalculated in concentration, based on the sampling volume provided by the Customer
IM: The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor k=2, providing a level of confidence of approximately 95 % if result is greater than LOQ
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The expanded uncertainty is associated only if result is greater than LOQ
"<x" = < MDL corrected for scaling factor (weighing and dilution)
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Il Responsabile del laboratorio
Ordine dei Chimici della Provincia di Pavia n 423 A
Dott. Stefano Maggi

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Report n° EV-26-020984-178250

To:
ADI ASSOCIATES ENVIRONMENTAL CONSULTANTS LTD
KAPPARA BUSINESS CENTRE
11 TRIQ BIRKIRKARA
SGN4197 SAN GWANN - MALTA ()

Identification:	Filter n. 1975 - Project: QCL007
Matrix:	Filter
Sampling Company:	Customer
Sample receiving date:	30/04/2026
Initial analysis date:	12/05/2026
Final analysis date:	12/05/2026
Report date:	13/05/2026

Test	U.M.	Result	U.M.	Sampling volume	U.M.	Calculated result	IM
[PV] Metodo di Prova UNI EN 12341:2023 - escluso/except par 5.1.1: apparecchiatura certificata							
Suspended particulate matter PM10	µg	2850	m³	55,006	µg/m³	51,8	± 5,4

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Sampling under the responsibility of the requesting company
U.M. = Unit of Measurement
Sampling volume = Sampling volume provided by the Customer
Calculated result = The result was recalculated in concentration, based on the sampling volume provided by the Customer
IM: The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor k=2, providing a level of confidence of approximately 95 % if result is greater than LOQ
The expanded uncertainty including sampling is reported only for information, even if the sampling was not performed directly by LabAnalysis.
The expanded uncertainty is associated only if result is greater than LOQ
"<x" = < MDL corrected for scaling factor (weighing and dilution)
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Il Responsabile del laboratorio
Ordine dei Chimici della Provincia di Pavia n 423 A
Dott. Stefano Maggi

End of Certificate of Analysis.
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Report n° EV-26-020984-178251

To:
ADI ASSOCIATES ENVIRONMENTAL CONSULTANTS LTD
KAPPARA BUSINESS CENTRE
11 TRIQ BIRKIRKARA
SGN4197 SAN GWANN - MALTA ()

Identification:	Filter n. 1976 - Project: QCL007
Matrix:	Filter
Sampling Company:	Customer
Sample receiving date:	30/04/2026
Initial analysis date:	12/05/2026
Final analysis date:	12/05/2026
Report date:	13/05/2026

Test	U.M.	Result	U.M.	Sampling volume	U.M.	Calculated result	IM
[PV] Metodo di Prova UNI EN 12341:2023 - escluso/except par 5.1.1: apparecchiatura certificata							
Suspended particulate matter PM10	µg	2730	m³	55,007	µg/m³	49,6	± 5,4

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Sampling under the responsibility of the requesting company
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Sampling volume = Sampling volume provided by the Customer
Calculated result = The result was recalculated in concentration, based on the sampling volume provided by the Customer
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Il Responsabile del laboratorio
Ordine dei Chimici della Provincia di Pavia n 423 A
Dott. Stefano Maggi

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Report n° EV-26-020984-178252

To:
ADI ASSOCIATES ENVIRONMENTAL CONSULTANTS LTD
KAPPARA BUSINESS CENTRE
11 TRIQ BIRKIRKARA
SGN4197 SAN GWANN - MALTA ()

Identification:	Filter n. 1977 - Project: QCL007
Matrix:	Filter
Sampling Company:	Customer
Sample receiving date:	30/04/2026
Initial analysis date:	12/05/2026
Final analysis date:	12/05/2026
Report date:	13/05/2026

Test	U.M.	Result	U.M.	Sampling volume	U.M.	Calculated result	IM
[PV] Metodo di Prova UNI EN 12341:2023 - escluso/except par 5.1.1: apparecchiatura certificata							
Suspended particulate matter PM10	µg	2620	m³	55,005	µg/m³	47,6	± 5,4

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Il Responsabile del laboratorio
Ordine dei Chimici della Provincia di Pavia n 423 A
Dott. Stefano Maggi

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Report n° EV-26-020984-178253

To:
ADI ASSOCIATES ENVIRONMENTAL CONSULTANTS LTD
KAPPARA BUSINESS CENTRE
11 TRIQ BIRKIRKARA
SGN4197 SAN GWANN - MALTA ()

Identification:	Filter n. 1978 - Project: QCL007
Matrix:	Filter
Sampling Company:	Customer
Sample receiving date:	30/04/2026
Initial analysis date:	12/05/2026
Final analysis date:	12/05/2026
Report date:	13/05/2026

Test	U.M.	Result	U.M.	Sampling volume	U.M.	Calculated result	IM
[PV] Metodo di Prova UNI EN 12341:2023 - escluso/except par 5.1.1: apparecchiatura certificata							
Suspended particulate matter PM10	µg	2360	m³	55,092	µg/m³	42,8	± 5,4

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[FR] = analysis performed at the Ceccano Laboratory. LabAnalysis Environmental Science s.r.l., Via Monte Lepini 180, Frosinone.
[GE] = analysis performed at the Genova Laboratory. LabAnalysis Environmental Science s.r.l., Via Isocorte 16, Genova.
[PV] = analysis performed at the Casanova Lonati Laboratory. LabAnalysis Environmental Science s.r.l., Via Europa 5, Pavia.
[PZ] = analysis performed at the Grumento Nova Laboratory. LabAnalysis Environmental Science s.r.l., Via T. Morlino, 23, Potenza.
[RM] = analysis performed at the Rome Laboratory. LabAnalysis Environmental Science s.r.l., Via Camerata Picena, 385, Roma.
[VI] = analysis performed at the Nove Laboratory. LabAnalysis Environmental Science s.r.l., Via dell'Olmo, 2/1, Vicenza.
Sampling under the responsibility of the requesting company
U.M. = Unit of Measurement
Sampling volume = Sampling volume provided by the Customer
Calculated result = The result was recalculated in concentration, based on the sampling volume provided by the Customer
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Il Responsabile del laboratorio
Ordine dei Chimici della Provincia di Pavia n 423 A
Dott. Stefano Maggi

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Report n° EV-26-020984-178254

To:
ADI ASSOCIATES ENVIRONMENTAL CONSULTANTS LTD
KAPPARA BUSINESS CENTRE
11 TRIQ BIRKIRKARA
SGN4197 SAN GWANN - MALTA ()

Identification:	Filter n. 1979 - Project: QCL007
Matrix:	Filter
Sampling Company:	Customer
Sample receiving date:	30/04/2026
Initial analysis date:	12/05/2026
Final analysis date:	12/05/2026
Report date:	13/05/2026

Test	U.M.	Result	U.M.	Sampling volume	U.M.	Calculated result	IM
[PV] Metodo di Prova UNI EN 12341:2023 - escluso/except par 5.1.1: apparecchiatura certificata							
Suspended particulate matter PM10	µg	2900	m³	55,007	µg/m³	52,7	± 5,4

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[GE] = analysis performed at the Genova Laboratory. LabAnalysis Environmental Science s.r.l., Via Isocorte 16, Genova.
[PV] = analysis performed at the Casanova Lonati Laboratory. LabAnalysis Environmental Science s.r.l., Via Europa 5, Pavia.
[PZ] = analysis performed at the Grumento Nova Laboratory. LabAnalysis Environmental Science s.r.l., Via T. Morlino, 23, Potenza.
[RM] = analysis performed at the Rome Laboratory. LabAnalysis Environmental Science s.r.l., Via Camerata Picena, 385, Roma.
[VI] = analysis performed at the Nove Laboratory. LabAnalysis Environmental Science s.r.l., Via dell'Olmo, 2/1, Vicenza.
Sampling under the responsibility of the requesting company
U.M. = Unit of Measurement
Sampling volume = Sampling volume provided by the Customer
Calculated result = The result was recalculated in concentration, based on the sampling volume provided by the Customer
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Il Responsabile del laboratorio
Ordine dei Chimici della Provincia di Pavia n 423 A
Dott. Stefano Maggi

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Report n° EV-26-020984-178255

To:
ADI ASSOCIATES ENVIRONMENTAL CONSULTANTS LTD
KAPPARA BUSINESS CENTRE
11 TRIQ BIRKIRKARA
SGN4197 SAN GWANN - MALTA ()

Identification:	Filter n. 1980 - Project: QCL007
Matrix:	Filter
Sampling Company:	Customer
Sample receiving date:	30/04/2026
Initial analysis date:	12/05/2026
Final analysis date:	12/05/2026
Report date:	13/05/2026

Test	U.M.	Result	U.M.	Sampling volume	U.M.	Calculated result	IM
[PV] Metodo di Prova UNI EN 12341:2023 - escluso/except par 5.1.1: apparecchiatura certificata							
Suspended particulate matter PM10	µg	2430	m³	55,007	µg/m³	44,2	± 5,4

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[FR] = analysis performed at the Ceccano Laboratory. LabAnalysis Environmental Science s.r.l., Via Monte Lepini 180, Frosinone.
[GE] = analysis performed at the Genova Laboratory. LabAnalysis Environmental Science s.r.l., Via Isocorte 16, Genova.
[PV] = analysis performed at the Casanova Lonati Laboratory. LabAnalysis Environmental Science s.r.l., Via Europa 5, Pavia.
[PZ] = analysis performed at the Grumento Nova Laboratory. LabAnalysis Environmental Science s.r.l., Via T. Morlino, 23, Potenza.
[RM] = analysis performed at the Rome Laboratory. LabAnalysis Environmental Science s.r.l., Via Camerata Picena, 385, Roma.
[VI] = analysis performed at the Nove Laboratory. LabAnalysis Environmental Science s.r.l., Via dell'Olmo, 2/1, Vicenza.
Sampling under the responsibility of the requesting company
U.M. = Unit of Measurement
Sampling volume = Sampling volume provided by the Customer
Calculated result = The result was recalculated in concentration, based on the sampling volume provided by the Customer
IM: The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor k=2, providing a level of confidence of approximately 95 % if result is greater than LOQ
The expanded uncertainty including sampling is reported only for information, even if the sampling was not performed directly by LabAnalysis.
The expanded uncertainty is associated only if result is greater than LOQ
"<x" = < MDL corrected for scaling factor (weighing and dilution)
MDL = method detection limit: the minimum concentration that can be measured and reported with 99% confidence that the analyte concentration is greater than zero
In the case of methods which envisage pre-concentration and purification phases, where not expressly indicated, the recovery is to be understood as included within the specific acceptability limits established by the test method or by current legislation. Unless expressly indicated, the recovery has not been used in the calculations.

Il Responsabile del laboratorio
Ordine dei Chimici della Provincia di Pavia n 423 A
Dott. Stefano Maggi

End of Certificate of Analysis.
This Certificate of Analysis concerns only the samples analysed as received.
This Certificate of Analysis cannot be partially reproduced without the written authorization of the Head of LabAnalysis Environmental Science srl.

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Sede Legale Via Bolzano, 6/P - 66020 San Giovanni Teatino (CH) | **Tel.** +39 085 9217 700 | info@labanalysis.it | www.labanalysis.it
LabAnalysis Environmental Science s.r.l., società soggetta a direzione e coordinamento da parte di LabAnalysis Group s.r.l.
Cap. Soc. €100.000,00 int. vers. - Registro Imprese di Chieti - C.F./P.IVA IT01532600697 - R.E.A. CCIAA di Chieti n.94054

Report n° EV-26-025216-212950

To:
ADI ASSOCIATES ENVIRONMENTAL CONSULTANTS LTD
KAPPARA BUSINESS CENTRE
11 TRIQ BIRKIRKARA
SGN4197 SAN GWANN - MALTA ()

Identification:	Filter n. 1981 - Project: QCL007
Matrix:	Filter
Sampling Company:	Customer
Sample receiving date:	22/05/2026
Initial analysis date:	04/06/2026
Final analysis date:	04/06/2026
Report date:	08/06/2026

Test	U.M.	Result	U.M.	Sampling volume	U.M.	Calculated result	IM
[PV] Metodo di Prova UNI EN 12341:2023 - escluso/except par 5.1.1: apparecchiatura certificata							
Suspended particulate matter PM10	µg	2330	m³	55,006	µg/m³	42,4	± 5,4

The underlined information is provided by the customer, the laboratory declines responsibility for it.
* = the tests so marked are not accredited by Accredia
[BR] = analysis performed at the Brindisi Laboratory. LabAnalysis Environmental Science s.r.l., Cittadella della Ricerca, ed.6, S.S.7 per Mesagne, Brindisi.
[CA] = analysis performed at the Cagliari Laboratory. LabAnalysis Environmental Science s.r.l., Località Is Coras, Cagliari.
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[FR] = analysis performed at the Ceccano Laboratory. LabAnalysis Environmental Science s.r.l., Via Monte Lepini 180, Frosinone.
[GE] = analysis performed at the Genova Laboratory. LabAnalysis Environmental Science s.r.l., Via Isocorte 16, Genova.
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[VI] = analysis performed at the Nove Laboratory. LabAnalysis Environmental Science s.r.l., Via dell'Olmo, 2/1, Vicenza.
Sampling under the responsibility of the requesting company
U.M. = Unit of Measurement
Sampling volume = Sampling volume provided by the Customer
Calculated result = The result was recalculated in concentration, based on the sampling volume provided by the Customer
IM: The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor k=2, providing a level of confidence of approximately 95 % if result is greater than LOQ
The expanded uncertainty including sampling is reported only for information, even if the sampling was not performed directly by LabAnalysis.
The expanded uncertainty is associated only if result is greater than LOQ
"<x" = < MDL corrected for scaling factor (weighing and dilution)
MDL = method detection limit: the minimum concentration that can be measured and reported with 99% confidence that the analyte concentration is greater than zero
In the case of methods which envisage pre-concentration and purification phases, where not expressly indicated, the recovery is to be understood as included within the specific acceptability limits established by the test method or by current legislation. Unless expressly indicated, the recovery has not been used in the calculations.

End of Certificate of Analysis.
This Certificate of Analysis concerns only the samples analysed as received.
This Certificate of Analysis cannot be partially reproduced without the written authorization of the Head of LabAnalysis Environmental Science srl.

Report n° EV-26-025216-212951

To:
ADI ASSOCIATES ENVIRONMENTAL CONSULTANTS LTD
KAPPARA BUSINESS CENTRE
11 TRIQ BIRKIRKARA
SGN4197 SAN GWANN - MALTA ()

Identification:	Filter n. 1983 - Project: QCL007
Matrix:	Filter
Sampling Company:	Customer
Sample receiving date:	22/05/2026
Initial analysis date:	04/06/2026
Final analysis date:	04/06/2026
Report date:	08/06/2026

Test	U.M.	Result	U.M.	Sampling volume	U.M.	Calculated result	IM
[PV] Metodo di Prova UNI EN 12341:2023 - escluso/except par 5.1.1: apparecchiatura certificata							
Suspended particulate matter PM10	µg	1750	m³	55,006	µg/m³	31,8	± 5,4

The underlined information is provided by the customer, the laboratory declines responsibility for it.

* = the tests so marked are not accredited by Accredia

[BR] = analysis performed at the Brindisi Laboratory. LabAnalysis Environmental Science s.r.l., Cittadella della Ricerca, ed.6, S.S.7 per Mesagne, Brindisi.

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[CH] = analysis performed at the San Giovanni Teatino Laboratory. LabAnalysis Environmental Science s.r.l., Via Bolzano, 6/P, Chieti.

[FR] = analysis performed at the Ceccano Laboratory. LabAnalysis Environmental Science s.r.l., Via Monte Lepini 180, Frosinone.

[GE] = analysis performed at the Genova Laboratory. LabAnalysis Environmental Science s.r.l., Via Isocorte 16, Genova.

[PV] = analysis performed at the Casanova Lonati Laboratory. LabAnalysis Environmental Science s.r.l., Via Europa 5, Pavia.

[PZ] = analysis performed at the Grumento Nova Laboratory. LabAnalysis Environmental Science s.r.l., Via T. Morlino, 23, Potenza.

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[VI] = analysis performed at the Nove Laboratory. LabAnalysis Environmental Science s.r.l., Via dell'Olmo, 2/1, Vicenza.

Sampling under the responsibility of the requesting company

U.M. = Unit of Measurement

Sampling volume = Sampling volume provided by the Customer

Calculated result = The result was recalculated in concentration, based on the sampling volume provided by the Customer

IM: The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor k=2, providing a level of confidence of approximately 95 % if result is greater than LOQ

The expanded uncertainty including sampling is reported only for information, even if the sampling was not performed directly by LabAnalysis.

The expanded uncertainty is associated only if result is greater than LOQ

"<x" = < MDL corrected for scaling factor (weighing and dilution)

MDL = method detection limit: the minimum concentration that can be measured and reported with 99% confidence that the analyte concentration is greater than zero

In the case of methods which envisage pre-concentration and purification phases, where not expressly indicated, the recovery is to be understood as included within the specific acceptability limits established by the test method or by current legislation. Unless expressly indicated, the recovery has not been used in the calculations.

End of Certificate of Analysis.

This Certificate of Analysis concerns only the samples analysed as received.

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Report n° EV-26-025216-212952

To:
ADI ASSOCIATES ENVIRONMENTAL CONSULTANTS LTD
KAPPARA BUSINESS CENTRE
11 TRIQ BIRKIRKARA
SGN4197 SAN GWANN - MALTA ()

Identification:	Filter n. 1984 - Project: QCL007
Matrix:	Filter
Sampling Company:	Customer
Sample receiving date:	22/05/2026
Initial analysis date:	04/06/2026
Final analysis date:	04/06/2026
Report date:	08/06/2026

Test	U.M.	Result	U.M.	Sampling volume	U.M.	Calculated result	IM
[PV] Metodo di Prova UNI EN 12341:2023 - escluso/except par 5.1.1: apparecchiatura certificata							
Suspended particulate matter PM10	µg	872	m³	55,007	µg/m³	15,9	± 5,4

The underlined information is provided by the customer, the laboratory declines responsibility for it.

* = the tests so marked are not accredited by Accredia

[BR] = analysis performed at the Brindisi Laboratory. LabAnalysis Environmental Science s.r.l., Cittadella della Ricerca, ed.6, S.S.7 per Mesagne, Brindisi.

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Sampling under the responsibility of the requesting company

U.M. = Unit of Measurement

Sampling volume = Sampling volume provided by the Customer

Calculated result = The result was recalculated in concentration, based on the sampling volume provided by the Customer

IM: The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor k=2, providing a level of confidence of approximately 95 % if result is greater than LOQ

The expanded uncertainty including sampling is reported only for information, even if the sampling was not performed directly by LabAnalysis.

The expanded uncertainty is associated only if result is greater than LOQ

"<x" = < MDL corrected for scaling factor (weighing and dilution)

MDL = method detection limit: the minimum concentration that can be measured and reported with 99% confidence that the analyte concentration is greater than zero

In the case of methods which envisage pre-concentration and purification phases, where not expressly indicated, the recovery is to be understood as included within the specific acceptability limits established by the test method or by current legislation. Unless expressly indicated, the recovery has not been used in the calculations.

End of Certificate of Analysis.

This Certificate of Analysis concerns only the samples analysed as received.

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Report n° EV-26-025216-212953

To:
ADI ASSOCIATES ENVIRONMENTAL CONSULTANTS LTD
KAPPARA BUSINESS CENTRE
11 TRIQ BIRKIRKARA
SGN4197 SAN GWANN - MALTA ()

Identification:	Filter n. 1985 - Project: QCL007
Matrix:	Filter
Sampling Company:	Customer
Sample receiving date:	22/05/2026
Initial analysis date:	04/06/2026
Final analysis date:	04/06/2026
Report date:	08/06/2026

Test	U.M.	Result	U.M.	Sampling volume	U.M.	Calculated result	IM
[PV] Metodo di Prova UNI EN 12341:2023 - escluso/except par 5.1.1: apparecchiatura certificata							
Suspended particulate matter PM10	µg	1510	m³	55,046	µg/m³	27,4	± 5,4

The underlined information is provided by the customer, the laboratory declines responsibility for it.
* = the tests so marked are not accredited by Accredia
[BR] = analysis performed at the Brindisi Laboratory. LabAnalysis Environmental Science s.r.l., Cittadella della Ricerca, ed.6, S.S.7 per Mesagne, Brindisi.
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[VI] = analysis performed at the Nove Laboratory. LabAnalysis Environmental Science s.r.l., Via dell'Olmo, 2/1, Vicenza.
Sampling under the responsibility of the requesting company
U.M. = Unit of Measurement
Sampling volume = Sampling volume provided by the Customer
Calculated result = The result was recalculated in concentration, based on the sampling volume provided by the Customer
IM: The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor k=2, providing a level of confidence of approximately 95 % if result is greater than LOQ
The expanded uncertainty including sampling is reported only for information, even if the sampling was not performed directly by LabAnalysis.
The expanded uncertainty is associated only if result is greater than LOQ
"<x" = < MDL corrected for scaling factor (weighing and dilution)
MDL = method detection limit: the minimum concentration that can be measured and reported with 99% confidence that the analyte concentration is greater than zero
In the case of methods which envisage pre-concentration and purification phases, where not expressly indicated, the recovery is to be understood as included within the specific acceptability limits established by the test method or by current legislation. Unless expressly indicated, the recovery has not been used in the calculations.

End of Certificate of Analysis.
This Certificate of Analysis concerns only the samples analysed as received.
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Report n° EV-26-025216-212954

To:
ADI ASSOCIATES ENVIRONMENTAL CONSULTANTS LTD
KAPPARA BUSINESS CENTRE
11 TRIQ BIRKIRKARA
SGN4197 SAN GWANN - MALTA ()

Identification:	Filter n. 1986 - Project: QCL007
Matrix:	Filter
Sampling Company:	Customer
Sample receiving date:	22/05/2026
Initial analysis date:	04/06/2026
Final analysis date:	04/06/2026
Report date:	08/06/2026

Test	U.M.	Result	U.M.	Sampling volume	U.M.	Calculated result	IM
[PV] Metodo di Prova UNI EN 12341:2023 - escluso/except par 5.1.1: apparecchiatura certificata							
Suspended particulate matter PM10	µg	2130	m³	55,008	µg/m³	38,7	± 5,4

The underlined information is provided by the customer, the laboratory declines responsibility for it.
* = the tests so marked are not accredited by Accredia
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[VI] = analysis performed at the Nove Laboratory. LabAnalysis Environmental Science s.r.l., Via dell'Olmo, 2/1, Vicenza.
Sampling under the responsibility of the requesting company
U.M. = Unit of Measurement
Sampling volume = Sampling volume provided by the Customer
Calculated result = The result was recalculated in concentration, based on the sampling volume provided by the Customer
IM: The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor k=2, providing a level of confidence of approximately 95 % if result is greater than LOQ
The expanded uncertainty including sampling is reported only for information, even if the sampling was not performed directly by LabAnalysis.
The expanded uncertainty is associated only if result is greater than LOQ
"<x" = < MDL corrected for scaling factor (weighing and dilution)
MDL = method detection limit: the minimum concentration that can be measured and reported with 99% confidence that the analyte concentration is greater than zero
In the case of methods which envisage pre-concentration and purification phases, where not expressly indicated, the recovery is to be understood as included within the specific acceptability limits established by the test method or by current legislation. Unless expressly indicated, the recovery has not been used in the calculations.

End of Certificate of Analysis.
This Certificate of Analysis concerns only the samples analysed as received.
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Report n° EV-26-025216-212955

To:
ADI ASSOCIATES ENVIRONMENTAL CONSULTANTS LTD
KAPPARA BUSINESS CENTRE
11 TRIQ BIRKIRKARA
SGN4197 SAN GWANN - MALTA ()

Identification:	Filter n. 1987 - Project: QCL007
Matrix:	Filter
Sampling Company:	Customer
Sample receiving date:	22/05/2026
Initial analysis date:	04/06/2026
Final analysis date:	04/06/2026
Report date:	08/06/2026

Test	U.M.	Result	U.M.	Sampling volume	U.M.	Calculated result	IM
[PV] Metodo di Prova UNI EN 12341:2023 - escluso/except par 5.1.1: apparecchiatura certificata							
Suspended particulate matter PM10	µg	2140	m³	55,006	µg/m³	38,9	± 5,4

The underlined information is provided by the customer, the laboratory declines responsibility for it.
* = the tests so marked are not accredited by Accredia
[BR] = analysis performed at the Brindisi Laboratory. LabAnalysis Environmental Science s.r.l., Cittadella della Ricerca, ed.6, S.S.7 per Mesagne, Brindisi.
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[PV] = analysis performed at the Casanova Lonati Laboratory. LabAnalysis Environmental Science s.r.l., Via Europa 5, Pavia.
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[VI] = analysis performed at the Nove Laboratory. LabAnalysis Environmental Science s.r.l., Via dell'Olmo, 2/1, Vicenza.
Sampling under the responsibility of the requesting company
U.M. = Unit of Measurement
Sampling volume = Sampling volume provided by the Customer
Calculated result = The result was recalculated in concentration, based on the sampling volume provided by the Customer
IM: The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor k=2, providing a level of confidence of approximately 95 % if result is greater than LOQ
The expanded uncertainty including sampling is reported only for information, even if the sampling was not performed directly by LabAnalysis.
The expanded uncertainty is associated only if result is greater than LOQ
"<x" = < MDL corrected for scaling factor (weighing and dilution)
MDL = method detection limit: the minimum concentration that can be measured and reported with 99% confidence that the analyte concentration is greater than zero
In the case of methods which envisage pre-concentration and purification phases, where not expressly indicated, the recovery is to be understood as included within the specific acceptability limits established by the test method or by current legislation. Unless expressly indicated, the recovery has not been used in the calculations.

End of Certificate of Analysis.
This Certificate of Analysis concerns only the samples analysed as received.
This Certificate of Analysis cannot be partially reproduced without the written authorization of the Head of LabAnalysis Environmental Science srl.

Report n° EV-26-025216-212956

To:
ADI ASSOCIATES ENVIRONMENTAL CONSULTANTS LTD
KAPPARA BUSINESS CENTRE
11 TRIQ BIRKIRKARA
SGN4197 SAN GWANN - MALTA ()

Identification:	Filter n. 1988 - Project: QCL007
Matrix:	Filter
Sampling Company:	Customer
Sample receiving date:	22/05/2026
Initial analysis date:	04/06/2026
Final analysis date:	04/06/2026
Report date:	08/06/2026

Test	U.M.	Result	U.M.	Sampling volume	U.M.	Calculated result	IM
[PV] Metodo di Prova UNI EN 12341:2023 - escluso/except par 5.1.1: apparecchiatura certificata							
Suspended particulate matter PM10	µg	2670	m³	55,009	µg/m³	48,5	± 5,4

The underlined information is provided by the customer, the laboratory declines responsibility for it.

* = the tests so marked are not accredited by Accredia

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[VI] = analysis performed at the Nove Laboratory. LabAnalysis Environmental Science s.r.l., Via dell'Olmo, 2/1, Vicenza.

Sampling under the responsibility of the requesting company

U.M. = Unit of Measurement

Sampling volume = Sampling volume provided by the Customer

Calculated result = The result was recalculated in concentration, based on the sampling volume provided by the Customer

IM: The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor k=2, providing a level of confidence of approximately 95 % if result is greater than LOQ

The expanded uncertainty including sampling is reported only for information, even if the sampling was not performed directly by LabAnalysis.

The expanded uncertainty is associated only if result is greater than LOQ

"<x" = < MDL corrected for scaling factor (weighing and dilution)

MDL = method detection limit: the minimum concentration that can be measured and reported with 99% confidence that the analyte concentration is greater than zero

In the case of methods which envisage pre-concentration and purification phases, where not expressly indicated, the recovery is to be understood as included within the specific acceptability limits established by the test method or by current legislation. Unless expressly indicated, the recovery has not been used in the calculations.

End of Certificate of Analysis.

This Certificate of Analysis concerns only the samples analysed as received.

This Certificate of Analysis cannot be partially reproduced without the written authorization of the Head of LabAnalysis Environmental Science srl.

Report n° EV-26-025216-212957

To:
ADI ASSOCIATES ENVIRONMENTAL CONSULTANTS LTD
KAPPARA BUSINESS CENTRE
11 TRIQ BIRKIRKARA
SGN4197 SAN GWANN - MALTA ()

Identification:	Filter n. 1989 - Project: QCL007
Matrix:	Filter
Sampling Company:	Customer
Sample receiving date:	22/05/2026
Initial analysis date:	04/06/2026
Final analysis date:	04/06/2026
Report date:	08/06/2026

Test	U.M.	Result	U.M.	Sampling volume	U.M.	Calculated result	IM
[PV] Metodo di Prova UNI EN 12341:2023 - escluso/except par 5.1.1: apparecchiatura certificata							
Suspended particulate matter PM10	µg	1960	m³	55,006	µg/m³	35,6	± 5,4

The underlined information is provided by the customer, the laboratory declines responsibility for it.

* = the tests so marked are not accredited by Accredia

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[VI] = analysis performed at the Nove Laboratory. LabAnalysis Environmental Science s.r.l., Via dell'Olmo, 2/1, Vicenza.

Sampling under the responsibility of the requesting company

U.M. = Unit of Measurement

Sampling volume = Sampling volume provided by the Customer

Calculated result = The result was recalculated in concentration, based on the sampling volume provided by the Customer

IM: The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor k=2, providing a level of confidence of approximately 95 % if result is greater than LOQ

The expanded uncertainty including sampling is reported only for information, even if the sampling was not performed directly by LabAnalysis.

The expanded uncertainty is associated only if result is greater than LOQ

"<x" = < MDL corrected for scaling factor (weighing and dilution)

MDL = method detection limit: the minimum concentration that can be measured and reported with 99% confidence that the analyte concentration is greater than zero

In the case of methods which envisage pre-concentration and purification phases, where not expressly indicated, the recovery is to be understood as included within the specific acceptability limits established by the test method or by current legislation. Unless expressly indicated, the recovery has not been used in the calculations.

End of Certificate of Analysis.

This Certificate of Analysis concerns only the samples analysed as received.

This Certificate of Analysis cannot be partially reproduced without the written authorization of the Head of LabAnalysis Environmental Science srl.

Report n° EV-26-025216-212958

To:
ADI ASSOCIATES ENVIRONMENTAL CONSULTANTS LTD
KAPPARA BUSINESS CENTRE
11 TRIQ BIRKIRKARA
SGN4197 SAN GWANN - MALTA ()

Identification:	Filter n. 1990 - Project: QCL007
Matrix:	Filter
Sampling Company:	Customer
Sample receiving date:	22/05/2026
Initial analysis date:	04/06/2026
Final analysis date:	04/06/2026
Report date:	08/06/2026

Test	U.M.	Result	U.M.	Sampling volume	U.M.	Calculated result	IM
[PV] Metodo di Prova UNI EN 12341:2023 - escluso/except par 5.1.1: apparecchiatura certificata							
Suspended particulate matter PM10	µg	1770	m³	55,006	µg/m³	32,2	± 5,4

The underlined information is provided by the customer, the laboratory declines responsibility for it.
* = the tests so marked are not accredited by Accredia
[BR] = analysis performed at the Brindisi Laboratory. LabAnalysis Environmental Science s.r.l., Cittadella della Ricerca, ed.6, S.S.7 per Mesagne, Brindisi.
[CA] = analysis performed at the Cagliari Laboratory. LabAnalysis Environmental Science s.r.l., Località Is Coras, Cagliari.
[CH] = analysis performed at the San Giovanni Teatino Laboratory. LabAnalysis Environmental Science s.r.l., Via Bolzano, 6/P, Chieti.
[FR] = analysis performed at the Ceccano Laboratory. LabAnalysis Environmental Science s.r.l., Via Monte Lepini 180, Frosinone.
[GE] = analysis performed at the Genova Laboratory. LabAnalysis Environmental Science s.r.l., Via Isocorte 16, Genova.
[PV] = analysis performed at the Casanova Lonati Laboratory. LabAnalysis Environmental Science s.r.l., Via Europa 5, Pavia.
[PZ] = analysis performed at the Grumento Nova Laboratory. LabAnalysis Environmental Science s.r.l., Via T. Morlino, 23, Potenza.
[RM] = analysis performed at the Rome Laboratory. LabAnalysis Environmental Science s.r.l., Via Camerata Picena, 385, Roma.
[VI] = analysis performed at the Nove Laboratory. LabAnalysis Environmental Science s.r.l., Via dell'Olmo, 2/1, Vicenza.
Sampling under the responsibility of the requesting company
U.M. = Unit of Measurement
Sampling volume = Sampling volume provided by the Customer
Calculated result = The result was recalculated in concentration, based on the sampling volume provided by the Customer
IM: The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor k=2, providing a level of confidence of approximately 95 % if result is greater than LOQ
The expanded uncertainty including sampling is reported only for information, even if the sampling was not performed directly by LabAnalysis.
The expanded uncertainty is associated only if result is greater than LOQ
"<x" = < MDL corrected for scaling factor (weighing and dilution)
MDL = method detection limit: the minimum concentration that can be measured and reported with 99% confidence that the analyte concentration is greater than zero
In the case of methods which envisage pre-concentration and purification phases, where not expressly indicated, the recovery is to be understood as included within the specific acceptability limits established by the test method or by current legislation. Unless expressly indicated, the recovery has not been used in the calculations.

End of Certificate of Analysis.
This Certificate of Analysis concerns only the samples analysed as received.
This Certificate of Analysis cannot be partially reproduced without the written authorization of the Head of LabAnalysis Environmental Science srl.

Report n° EV-26-025216-212959

To:
ADI ASSOCIATES ENVIRONMENTAL CONSULTANTS LTD
KAPPARA BUSINESS CENTRE
11 TRIQ BIRKIRKARA
SGN4197 SAN GWANN - MALTA ()

Identification:	Filter n. 1991 - Project: QCL007
Matrix:	Filter
Sampling Company:	Customer
Sample receiving date:	22/05/2026
Initial analysis date:	04/06/2026
Final analysis date:	04/06/2026
Report date:	08/06/2026

Test	U.M.	Result	U.M.	Sampling volume	U.M.	Calculated result	IM
[PV] Metodo di Prova UNI EN 12341:2023 - escluso/except par 5.1.1: apparecchiatura certificata							
Suspended particulate matter PM10	µg	1800	m³	55,008	µg/m³	32,7	± 5,4

The underlined information is provided by the customer, the laboratory declines responsibility for it.

* = the tests so marked are not accredited by Accredia

[BR] = analysis performed at the Brindisi Laboratory. LabAnalysis Environmental Science s.r.l., Cittadella della Ricerca, ed.6, S.S.7 per Mesagne, Brindisi.

[CA] = analysis performed at the Cagliari Laboratory. LabAnalysis Environmental Science s.r.l., Località Is Coras, Cagliari.

[CH] = analysis performed at the San Giovanni Teatino Laboratory. LabAnalysis Environmental Science s.r.l., Via Bolzano, 6/P, Chieti.

[FR] = analysis performed at the Ceccano Laboratory. LabAnalysis Environmental Science s.r.l., Via Monte Lepini 180, Frosinone.

[GE] = analysis performed at the Genova Laboratory. LabAnalysis Environmental Science s.r.l., Via Isocorte 16, Genova.

[PV] = analysis performed at the Casanova Lonati Laboratory. LabAnalysis Environmental Science s.r.l., Via Europa 5, Pavia.

[PZ] = analysis performed at the Grumento Nova Laboratory. LabAnalysis Environmental Science s.r.l., Via T. Morlino, 23, Potenza.

[RM] = analysis performed at the Rome Laboratory. LabAnalysis Environmental Science s.r.l., Via Camerata Picena, 385, Roma.

[VI] = analysis performed at the Nove Laboratory. LabAnalysis Environmental Science s.r.l., Via dell'Olmo, 2/1, Vicenza.

Sampling under the responsibility of the requesting company

U.M. = Unit of Measurement

Sampling volume = Sampling volume provided by the Customer

Calculated result = The result was recalculated in concentration, based on the sampling volume provided by the Customer

IM: The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor k=2, providing a level of confidence of approximately 95 % if result is greater than LOQ

The expanded uncertainty including sampling is reported only for information, even if the sampling was not performed directly by LabAnalysis.

The expanded uncertainty is associated only if result is greater than LOQ

"<x" = < MDL corrected for scaling factor (weighing and dilution)

MDL = method detection limit: the minimum concentration that can be measured and reported with 99% confidence that the analyte concentration is greater than zero

In the case of methods which envisage pre-concentration and purification phases, where not expressly indicated, the recovery is to be understood as included within the specific acceptability limits established by the test method or by current legislation. Unless expressly indicated, the recovery has not been used in the calculations.

End of Certificate of Analysis.

This Certificate of Analysis concerns only the samples analysed as received.

This Certificate of Analysis cannot be partially reproduced without the written authorization of the Head of LabAnalysis Environmental Science srl.

Report n° EV-26-025216-212960

To:
ADI ASSOCIATES ENVIRONMENTAL CONSULTANTS LTD
KAPPARA BUSINESS CENTRE
11 TRIQ BIRKIRKARA
SGN4197 SAN GWANN - MALTA ()

Identification:	Filter n. 1992 - Project: QCL007
Matrix:	Filter
Sampling Company:	Customer
Sample receiving date:	22/05/2026
Initial analysis date:	04/06/2026
Final analysis date:	04/06/2026
Report date:	08/06/2026

Test	U.M.	Result	U.M.	Sampling volume	U.M.	Calculated result	IM
[PV] Metodo di Prova UNI EN 12341:2023 - escluso/except par 5.1.1: apparecchiatura certificata							
Suspended particulate matter PM10	µg	1450	m³	55,007	µg/m³	26,4	± 5,4

The underlined information is provided by the customer, the laboratory declines responsibility for it.

* = the tests so marked are not accredited by Accredia

[BR] = analysis performed at the Brindisi Laboratory. LabAnalysis Environmental Science s.r.l., Cittadella della Ricerca, ed.6, S.S.7 per Mesagne, Brindisi.

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[CH] = analysis performed at the San Giovanni Teatino Laboratory. LabAnalysis Environmental Science s.r.l., Via Bolzano, 6/P, Chieti.

[FR] = analysis performed at the Ceccano Laboratory. LabAnalysis Environmental Science s.r.l., Via Monte Lepini 180, Frosinone.

[GE] = analysis performed at the Genova Laboratory. LabAnalysis Environmental Science s.r.l., Via Isocorte 16, Genova.

[PV] = analysis performed at the Casanova Lonati Laboratory. LabAnalysis Environmental Science s.r.l., Via Europa 5, Pavia.

[PZ] = analysis performed at the Grumento Nova Laboratory. LabAnalysis Environmental Science s.r.l., Via T. Morlino, 23, Potenza.

[RM] = analysis performed at the Rome Laboratory. LabAnalysis Environmental Science s.r.l., Via Camerata Picena, 385, Roma.

[VI] = analysis performed at the Nove Laboratory. LabAnalysis Environmental Science s.r.l., Via dell'Olmo, 2/1, Vicenza.

Sampling under the responsibility of the requesting company

U.M. = Unit of Measurement

Sampling volume = Sampling volume provided by the Customer

Calculated result = The result was recalculated in concentration, based on the sampling volume provided by the Customer

IM: The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor k=2, providing a level of confidence of approximately 95 % if result is greater than LOQ

The expanded uncertainty including sampling is reported only for information, even if the sampling was not performed directly by LabAnalysis.

The expanded uncertainty is associated only if result is greater than LOQ

"<x" = < MDL corrected for scaling factor (weighing and dilution)

MDL = method detection limit: the minimum concentration that can be measured and reported with 99% confidence that the analyte concentration is greater than zero

In the case of methods which envisage pre-concentration and purification phases, where not expressly indicated, the recovery is to be understood as included within the specific acceptability limits established by the test method or by current legislation. Unless expressly indicated, the recovery has not been used in the calculations.

End of Certificate of Analysis.

This Certificate of Analysis concerns only the samples analysed as received.

This Certificate of Analysis cannot be partially reproduced without the written authorization of the Head of LabAnalysis Environmental Science srl.

Report n° EV-26-025216-212961

To:
ADI ASSOCIATES ENVIRONMENTAL CONSULTANTS LTD
KAPPARA BUSINESS CENTRE
11 TRIQ BIRKIRKARA
SGN4197 SAN GWANN - MALTA ()

Identification:	Filter n. 1993 - Project: QCL007
Matrix:	Filter
Sampling Company:	Customer
Sample receiving date:	22/05/2026
Initial analysis date:	04/06/2026
Final analysis date:	04/06/2026
Report date:	08/06/2026

Test	U.M.	Result	U.M.	Sampling volume	U.M.	Calculated result	IM
[PV] Metodo di Prova UNI EN 12341:2023 - escluso/except par 5.1.1: apparecchiatura certificata							
Suspended particulate matter PM10	µg	1760	m³	55,007	µg/m³	32,0	± 5,4

The underlined information is provided by the customer, the laboratory declines responsibility for it.
* = the tests so marked are not accredited by Accredia
[BR] = analysis performed at the Brindisi Laboratory. LabAnalysis Environmental Science s.r.l., Cittadella della Ricerca, ed.6, S.S.7 per Mesagne, Brindisi.
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[FR] = analysis performed at the Ceccano Laboratory. LabAnalysis Environmental Science s.r.l., Via Monte Lepini 180, Frosinone.
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[VI] = analysis performed at the Nove Laboratory. LabAnalysis Environmental Science s.r.l., Via dell'Olmo, 2/1, Vicenza.
Sampling under the responsibility of the requesting company
U.M. = Unit of Measurement
Sampling volume = Sampling volume provided by the Customer
Calculated result = The result was recalculated in concentration, based on the sampling volume provided by the Customer
IM: The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor k=2, providing a level of confidence of approximately 95 % if result is greater than LOQ
The expanded uncertainty including sampling is reported only for information, even if the sampling was not performed directly by LabAnalysis.
The expanded uncertainty is associated only if result is greater than LOQ
"<x" = < MDL corrected for scaling factor (weighing and dilution)
MDL = method detection limit: the minimum concentration that can be measured and reported with 99% confidence that the analyte concentration is greater than zero
In the case of methods which envisage pre-concentration and purification phases, where not expressly indicated, the recovery is to be understood as included within the specific acceptability limits established by the test method or by current legislation. Unless expressly indicated, the recovery has not been used in the calculations.

End of Certificate of Analysis.
This Certificate of Analysis concerns only the samples analysed as received.
This Certificate of Analysis cannot be partially reproduced without the written authorization of the Head of LabAnalysis Environmental Science srl.

Report n° EV-26-025216-212962

To:
ADI ASSOCIATES ENVIRONMENTAL CONSULTANTS LTD
KAPPARA BUSINESS CENTRE
11 TRIQ BIRKIRKARA
SGN4197 SAN GWANN - MALTA ()

Identification:	Filter n. 1994 - Project: QCL007
Matrix:	Filter
Sampling Company:	Customer
Sample receiving date:	22/05/2026
Initial analysis date:	04/06/2026
Final analysis date:	04/06/2026
Report date:	08/06/2026

Test	U.M.	Result	U.M.	Sampling volume	U.M.	Calculated result	IM
[PV] Metodo di Prova UNI EN 12341:2023 - escluso/except par 5.1.1: apparecchiatura certificata							
Suspended particulate matter PM10	µg	1330	m³	55,006	µg/m³	24,2	± 5,4

The underlined information is provided by the customer, the laboratory declines responsibility for it.

* = the tests so marked are not accredited by Accredia

[BR] = analysis performed at the Brindisi Laboratory. LabAnalysis Environmental Science s.r.l., Cittadella della Ricerca, ed.6, S.S.7 per Mesagne, Brindisi.

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[CH] = analysis performed at the San Giovanni Teatino Laboratory. LabAnalysis Environmental Science s.r.l., Via Bolzano, 6/P, Chieti.

[FR] = analysis performed at the Ceccano Laboratory. LabAnalysis Environmental Science s.r.l., Via Monte Lepini 180, Frosinone.

[GE] = analysis performed at the Genova Laboratory. LabAnalysis Environmental Science s.r.l., Via Isocorte 16, Genova.

[PV] = analysis performed at the Casanova Lonati Laboratory. LabAnalysis Environmental Science s.r.l., Via Europa 5, Pavia.

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[RM] = analysis performed at the Rome Laboratory. LabAnalysis Environmental Science s.r.l., Via Camerata Picena, 385, Roma.

[VI] = analysis performed at the Nove Laboratory. LabAnalysis Environmental Science s.r.l., Via dell'Olmo, 2/1, Vicenza.

Sampling under the responsibility of the requesting company

U.M. = Unit of Measurement

Sampling volume = Sampling volume provided by the Customer

Calculated result = The result was recalculated in concentration, based on the sampling volume provided by the Customer

IM: The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor k=2, providing a level of confidence of approximately 95 % if result is greater than LOQ

The expanded uncertainty including sampling is reported only for information, even if the sampling was not performed directly by LabAnalysis.

The expanded uncertainty is associated only if result is greater than LOQ

"<x" = < MDL corrected for scaling factor (weighing and dilution)

MDL = method detection limit: the minimum concentration that can be measured and reported with 99% confidence that the analyte concentration is greater than zero

In the case of methods which envisage pre-concentration and purification phases, where not expressly indicated, the recovery is to be understood as included within the specific acceptability limits established by the test method or by current legislation. Unless expressly indicated, the recovery has not been used in the calculations.

End of Certificate of Analysis.

This Certificate of Analysis concerns only the samples analysed as received.

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Report n° EV-26-025216-212963

To:
ADI ASSOCIATES ENVIRONMENTAL CONSULTANTS LTD
KAPPARA BUSINESS CENTRE
11 TRIQ BIRKIRKARA
SGN4197 SAN GWANN - MALTA ()

Identification:	Filter n. 1995 - Project: QCL007
Matrix:	Filter
Sampling Company:	Customer
Sample receiving date:	22/05/2026
Initial analysis date:	04/06/2026
Final analysis date:	04/06/2026
Report date:	08/06/2026

Test	U.M.	Result	U.M.	Sampling volume	U.M.	Calculated result	IM
[PV] Metodo di Prova UNI EN 12341:2023 - escluso/except par 5.1.1: apparecchiatura certificata							
Suspended particulate matter PM10	µg	2920	m³	55,021	µg/m³	53,1	± 5,4

The underlined information is provided by the customer, the laboratory declines responsibility for it.

* = the tests so marked are not accredited by Accredia

[BR] = analysis performed at the Brindisi Laboratory. LabAnalysis Environmental Science s.r.l., Cittadella della Ricerca, ed.6, S.S.7 per Mesagne, Brindisi.

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[CH] = analysis performed at the San Giovanni Teatino Laboratory. LabAnalysis Environmental Science s.r.l., Via Bolzano, 6/P, Chieti.

[FR] = analysis performed at the Ceccano Laboratory. LabAnalysis Environmental Science s.r.l., Via Monte Lepini 180, Frosinone.

[GE] = analysis performed at the Genova Laboratory. LabAnalysis Environmental Science s.r.l., Via Isocorte 16, Genova.

[PV] = analysis performed at the Casanova Lonati Laboratory. LabAnalysis Environmental Science s.r.l., Via Europa 5, Pavia.

[PZ] = analysis performed at the Grumento Nova Laboratory. LabAnalysis Environmental Science s.r.l., Via T. Morlino, 23, Potenza.

[RM] = analysis performed at the Rome Laboratory. LabAnalysis Environmental Science s.r.l., Via Camerata Picena, 385, Roma.

[VI] = analysis performed at the Nove Laboratory. LabAnalysis Environmental Science s.r.l., Via dell'Olmo, 2/1, Vicenza.

Sampling under the responsibility of the requesting company

U.M. = Unit of Measurement

Sampling volume = Sampling volume provided by the Customer

Calculated result = The result was recalculated in concentration, based on the sampling volume provided by the Customer

IM: The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor k=2, providing a level of confidence of approximately 95 % if result is greater than LOQ

The expanded uncertainty including sampling is reported only for information, even if the sampling was not performed directly by LabAnalysis.

The expanded uncertainty is associated only if result is greater than LOQ

"<x" = < MDL corrected for scaling factor (weighing and dilution)

MDL = method detection limit: the minimum concentration that can be measured and reported with 99% confidence that the analyte concentration is greater than zero

In the case of methods which envisage pre-concentration and purification phases, where not expressly indicated, the recovery is to be understood as included within the specific acceptability limits established by the test method or by current legislation. Unless expressly indicated, the recovery has not been used in the calculations.

End of Certificate of Analysis.

This Certificate of Analysis concerns only the samples analysed as received.

This Certificate of Analysis cannot be partially reproduced without the written authorization of the Head of LabAnalysis Environmental Science srl.

Report n° EV-26-025216-212964

To:
ADI ASSOCIATES ENVIRONMENTAL CONSULTANTS LTD
KAPPARA BUSINESS CENTRE
11 TRIQ BIRKIRKARA
SGN4197 SAN GWANN - MALTA ()

Identification:	Filter n. 1996 - Project: QCL007
Matrix:	Filter
Sampling Company:	Customer
Sample receiving date:	22/05/2026
Initial analysis date:	04/06/2026
Final analysis date:	04/06/2026
Report date:	08/06/2026

Test	U.M.	Result	U.M.	Sampling volume	U.M.	Calculated result	IM
[PV] Metodo di Prova UNI EN 12341:2023 - escluso/except par 5.1.1: apparecchiatura certificata							
Suspended particulate matter PM10	µg	5610	m³	55,003	µg/m³	102	± 26

The underlined information is provided by the customer, the laboratory declines responsibility for it.
* = the tests so marked are not accredited by Accredia
[BR] = analysis performed at the Brindisi Laboratory. LabAnalysis Environmental Science s.r.l., Cittadella della Ricerca, ed.6, S.S.7 per Mesagne, Brindisi.
[CA] = analysis performed at the Cagliari Laboratory. LabAnalysis Environmental Science s.r.l., Località Is Coras, Cagliari.
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[FR] = analysis performed at the Ceccano Laboratory. LabAnalysis Environmental Science s.r.l., Via Monte Lepini 180, Frosinone.
[GE] = analysis performed at the Genova Laboratory. LabAnalysis Environmental Science s.r.l., Via Isocorte 16, Genova.
[PV] = analysis performed at the Casanova Lonati Laboratory. LabAnalysis Environmental Science s.r.l., Via Europa 5, Pavia.
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[RM] = analysis performed at the Rome Laboratory. LabAnalysis Environmental Science s.r.l., Via Camerata Picena, 385, Roma.
[VI] = analysis performed at the Nove Laboratory. LabAnalysis Environmental Science s.r.l., Via dell'Olmo, 2/1, Vicenza.
Sampling under the responsibility of the requesting company
U.M. = Unit of Measurement
Sampling volume = Sampling volume provided by the Customer
Calculated result = The result was recalculated in concentration, based on the sampling volume provided by the Customer
IM: The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor k=2, providing a level of confidence of approximately 95 % if result is greater than LOQ
The expanded uncertainty including sampling is reported only for information, even if the sampling was not performed directly by LabAnalysis.
The expanded uncertainty is associated only if result is greater than LOQ
"<x" = < MDL corrected for scaling factor (weighing and dilution)
MDL = method detection limit: the minimum concentration that can be measured and reported with 99% confidence that the analyte concentration is greater than zero
In the case of methods which envisage pre-concentration and purification phases, where not expressly indicated, the recovery is to be understood as included within the specific acceptability limits established by the test method or by current legislation. Unless expressly indicated, the recovery has not been used in the calculations.

End of Certificate of Analysis.
This Certificate of Analysis concerns only the samples analysed as received.
This Certificate of Analysis cannot be partially reproduced without the written authorization of the Head of LabAnalysis Environmental Science srl.

Report n° EV-26-025216-212966

To:
ADI ASSOCIATES ENVIRONMENTAL CONSULTANTS LTD
KAPPARA BUSINESS CENTRE
11 TRIQ BIRKIRKARA
SGN4197 SAN GWANN - MALTA ()

Identification:	Filter n. 1998 - Project: QCL007
Matrix:	Filter
Sampling Company:	Customer
Sample receiving date:	22/05/2026
Initial analysis date:	04/06/2026
Final analysis date:	04/06/2026
Report date:	08/06/2026

Test	U.M.	Result	U.M.	Sampling volume	U.M.	Calculated result	IM
[PV] Metodo di Prova UNI EN 12341:2023 - escluso/except par 5.1.1: apparecchiatura certificata							
Suspended particulate matter PM10	µg	4380	m³	55,008	µg/m³	80	± 20

The underlined information is provided by the customer, the laboratory declines responsibility for it.

* = the tests so marked are not accredited by Accredia

[BR] = analysis performed at the Brindisi Laboratory. LabAnalysis Environmental Science s.r.l., Cittadella della Ricerca, ed.6, S.S.7 per Mesagne, Brindisi.

[CA] = analysis performed at the Cagliari Laboratory. LabAnalysis Environmental Science s.r.l., Località Is Coras, Cagliari.

[CH] = analysis performed at the San Giovanni Teatino Laboratory. LabAnalysis Environmental Science s.r.l., Via Bolzano, 6/P, Chieti.

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[VI] = analysis performed at the Nove Laboratory. LabAnalysis Environmental Science s.r.l., Via dell'Olmo, 2/1, Vicenza.

Sampling under the responsibility of the requesting company

U.M. = Unit of Measurement

Sampling volume = Sampling volume provided by the Customer

Calculated result = The result was recalculated in concentration, based on the sampling volume provided by the Customer

IM: The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor k=2, providing a level of confidence of approximately 95 % if result is greater than LOQ

The expanded uncertainty including sampling is reported only for information, even if the sampling was not performed directly by LabAnalysis.

The expanded uncertainty is associated only if result is greater than LOQ

"<x" = < MDL corrected for scaling factor (weighing and dilution)

MDL = method detection limit: the minimum concentration that can be measured and reported with 99% confidence that the analyte concentration is greater than zero

In the case of methods which envisage pre-concentration and purification phases, where not expressly indicated, the recovery is to be understood as included within the specific acceptability limits established by the test method or by current legislation. Unless expressly indicated, the recovery has not been used in the calculations.

End of Certificate of Analysis.

This Certificate of Analysis concerns only the samples analysed as received.

This Certificate of Analysis cannot be partially reproduced without the written authorization of the Head of LabAnalysis Environmental Science srl.

Report n° EV-26-025216-212967

To:
ADI ASSOCIATES ENVIRONMENTAL CONSULTANTS LTD
KAPPARA BUSINESS CENTRE
11 TRIQ BIRKIRKARA
SGN4197 SAN GWANN - MALTA ()

Identification:	Filter n. 1999 - Project: QCL007
Matrix:	Filter
Sampling Company:	Customer
Sample receiving date:	22/05/2026
Initial analysis date:	04/06/2026
Final analysis date:	04/06/2026
Report date:	08/06/2026

Test	U.M.	Result	U.M.	Sampling volume	U.M.	Calculated result	IM
[PV] Metodo di Prova UNI EN 12341:2023 - escluso/except par 5.1.1: apparecchiatura certificata							
Suspended particulate matter PM10	µg	3280	m³	55,006	µg/m³	60	± 15

The underlined information is provided by the customer, the laboratory declines responsibility for it.
* = the tests so marked are not accredited by Accredia
[BR] = analysis performed at the Brindisi Laboratory. LabAnalysis Environmental Science s.r.l., Cittadella della Ricerca, ed.6, S.S.7 per Mesagne, Brindisi.
[CA] = analysis performed at the Cagliari Laboratory. LabAnalysis Environmental Science s.r.l., Località Is Coras, Cagliari.
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[RM] = analysis performed at the Rome Laboratory. LabAnalysis Environmental Science s.r.l., Via Camerata Picena, 385, Roma.
[VI] = analysis performed at the Nove Laboratory. LabAnalysis Environmental Science s.r.l., Via dell'Olmo, 2/1, Vicenza.
Sampling under the responsibility of the requesting company
U.M. = Unit of Measurement
Sampling volume = Sampling volume provided by the Customer
Calculated result = The result was recalculated in concentration, based on the sampling volume provided by the Customer
IM: The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor k=2, providing a level of confidence of approximately 95 % if result is greater than LOQ
The expanded uncertainty including sampling is reported only for information, even if the sampling was not performed directly by LabAnalysis.
The expanded uncertainty is associated only if result is greater than LOQ
"<x" = < MDL corrected for scaling factor (weighing and dilution)
MDL = method detection limit: the minimum concentration that can be measured and reported with 99% confidence that the analyte concentration is greater than zero
In the case of methods which envisage pre-concentration and purification phases, where not expressly indicated, the recovery is to be understood as included within the specific acceptability limits established by the test method or by current legislation. Unless expressly indicated, the recovery has not been used in the calculations.

End of Certificate of Analysis.
This Certificate of Analysis concerns only the samples analysed as received.
This Certificate of Analysis cannot be partially reproduced without the written authorization of the Head of LabAnalysis Environmental Science srl.

Report n° EV-26-025216-212968

To:
ADI ASSOCIATES ENVIRONMENTAL CONSULTANTS LTD
KAPPARA BUSINESS CENTRE
11 TRIQ BIRKIRKARA
SGN4197 SAN GWANN - MALTA ()

Identification:	Filter n. 2000 - Project: QCL007
Matrix:	Filter
Sampling Company:	Customer
Sample receiving date:	22/05/2026
Initial analysis date:	04/06/2026
Final analysis date:	04/06/2026
Report date:	08/06/2026

Test	U.M.	Result	U.M.	Sampling volume	U.M.	Calculated result	IM
[PV] Metodo di Prova UNI EN 12341:2023 - escluso/except par 5.1.1: apparecchiatura certificata							
Suspended particulate matter PM10	µg	2020	m³	55,052	µg/m³	36,7	± 5,4

The underlined information is provided by the customer, the laboratory declines responsibility for it.

* = the tests so marked are not accredited by Accredia

[BR] = analysis performed at the Brindisi Laboratory. LabAnalysis Environmental Science s.r.l., Cittadella della Ricerca, ed.6, S.S.7 per Mesagne, Brindisi.

[CA] = analysis performed at the Cagliari Laboratory. LabAnalysis Environmental Science s.r.l., Località Is Coras, Cagliari.

[CH] = analysis performed at the San Giovanni Teatino Laboratory. LabAnalysis Environmental Science s.r.l., Via Bolzano, 6/P, Chieti.

[FR] = analysis performed at the Ceccano Laboratory. LabAnalysis Environmental Science s.r.l., Via Monte Lepini 180, Frosinone.

[GE] = analysis performed at the Genova Laboratory. LabAnalysis Environmental Science s.r.l., Via Isocorte 16, Genova.

[PV] = analysis performed at the Casanova Lonati Laboratory. LabAnalysis Environmental Science s.r.l., Via Europa 5, Pavia.

[PZ] = analysis performed at the Grumento Nova Laboratory. LabAnalysis Environmental Science s.r.l., Via T. Morlino, 23, Potenza.

[RM] = analysis performed at the Rome Laboratory. LabAnalysis Environmental Science s.r.l., Via Camerata Picena, 385, Roma.

[VI] = analysis performed at the Nove Laboratory. LabAnalysis Environmental Science s.r.l., Via dell'Olmo, 2/1, Vicenza.

Sampling under the responsibility of the requesting company

U.M. = Unit of Measurement

Sampling volume = Sampling volume provided by the Customer

Calculated result = The result was recalculated in concentration, based on the sampling volume provided by the Customer

IM: The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor k=2, providing a level of confidence of approximately 95 % if result is greater than LOQ

The expanded uncertainty including sampling is reported only for information, even if the sampling was not performed directly by LabAnalysis.

The expanded uncertainty is associated only if result is greater than LOQ

"<x" = < MDL corrected for scaling factor (weighing and dilution)

MDL = method detection limit: the minimum concentration that can be measured and reported with 99% confidence that the analyte concentration is greater than zero

In the case of methods which envisage pre-concentration and purification phases, where not expressly indicated, the recovery is to be understood as included within the specific acceptability limits established by the test method or by current legislation. Unless expressly indicated, the recovery has not been used in the calculations.

End of Certificate of Analysis.

This Certificate of Analysis concerns only the samples analysed as received.

This Certificate of Analysis cannot be partially reproduced without the written authorization of the Head of LabAnalysis Environmental Science srl.

Report n° EV-26-025216-212969

To:
ADI ASSOCIATES ENVIRONMENTAL CONSULTANTS LTD
KAPPARA BUSINESS CENTRE
11 TRIQ BIRKIRKARA
SGN4197 SAN GWANN - MALTA ()

Identification:	Filter n. 23655 - Project: QCL007
Matrix:	Filter
Sampling Company:	Customer
Sample receiving date:	22/05/2026
Initial analysis date:	04/06/2026
Final analysis date:	04/06/2026
Report date:	08/06/2026

Test	U.M.	Result	U.M.	Sampling volume	U.M.	Calculated result	IM
[PV] Metodo di Prova UNI EN 12341:2023 - escluso/except par 5.1.1: apparecchiatura certificata							
Suspended particulate matter PM10	µg	1750	m³	55,007	µg/m³	31,8	± 5,4

The underlined information is provided by the customer, the laboratory declines responsibility for it.

* = the tests so marked are not accredited by Accredia

[BR] = analysis performed at the Brindisi Laboratory. LabAnalysis Environmental Science s.r.l., Cittadella della Ricerca, ed.6, S.S.7 per Mesagne, Brindisi.

[CA] = analysis performed at the Cagliari Laboratory. LabAnalysis Environmental Science s.r.l., Località Is Coras, Cagliari.

[CH] = analysis performed at the San Giovanni Teatino Laboratory. LabAnalysis Environmental Science s.r.l., Via Bolzano, 6/P, Chieti.

[FR] = analysis performed at the Ceccano Laboratory. LabAnalysis Environmental Science s.r.l., Via Monte Lepini 180, Frosinone.

[GE] = analysis performed at the Genova Laboratory. LabAnalysis Environmental Science s.r.l., Via Isocorte 16, Genova.

[PV] = analysis performed at the Casanova Lonati Laboratory. LabAnalysis Environmental Science s.r.l., Via Europa 5, Pavia.

[PZ] = analysis performed at the Grumento Nova Laboratory. LabAnalysis Environmental Science s.r.l., Via T. Morlino, 23, Potenza.

[RM] = analysis performed at the Rome Laboratory. LabAnalysis Environmental Science s.r.l., Via Camerata Picena, 385, Roma.

[VI] = analysis performed at the Nove Laboratory. LabAnalysis Environmental Science s.r.l., Via dell'Olmo, 2/1, Vicenza.

Sampling under the responsibility of the requesting company

U.M. = Unit of Measurement

Sampling volume = Sampling volume provided by the Customer

Calculated result = The result was recalculated in concentration, based on the sampling volume provided by the Customer

IM: The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor k=2, providing a level of confidence of approximately 95 % if result is greater than LOQ

The expanded uncertainty including sampling is reported only for information, even if the sampling was not performed directly by LabAnalysis.

The expanded uncertainty is associated only if result is greater than LOQ

"<x" = < MDL corrected for scaling factor (weighing and dilution)

MDL = method detection limit: the minimum concentration that can be measured and reported with 99% confidence that the analyte concentration is greater than zero

In the case of methods which envisage pre-concentration and purification phases, where not expressly indicated, the recovery is to be understood as included within the specific acceptability limits established by the test method or by current legislation. Unless expressly indicated, the recovery has not been used in the calculations.

End of Certificate of Analysis.

This Certificate of Analysis concerns only the samples analysed as received.

This Certificate of Analysis cannot be partially reproduced without the written authorization of the Head of LabAnalysis Environmental Science srl.

Report n° EV-26-025216-212970

To:
ADI ASSOCIATES ENVIRONMENTAL CONSULTANTS LTD
KAPPARA BUSINESS CENTRE
11 TRIQ BIRKIRKARA
SGN4197 SAN GWANN - MALTA ()

Identification:	Filter n. 23656 - Project: QCL007
Matrix:	Filter
Sampling Company:	Customer
Sample receiving date:	22/05/2026
Initial analysis date:	04/06/2026
Final analysis date:	04/06/2026
Report date:	08/06/2026

Test	U.M.	Result	U.M.	Sampling volume	U.M.	Calculated result	IM
[PV] Metodo di Prova UNI EN 12341:2023 - escluso/except par 5.1.1: apparecchiatura certificata							
Suspended particulate matter PM10	µg	2070	m³	55,007	µg/m³	37,6	± 5,4

The underlined information is provided by the customer, the laboratory declines responsibility for it.

* = the tests so marked are not accredited by Accredia

[BR] = analysis performed at the Brindisi Laboratory. LabAnalysis Environmental Science s.r.l., Cittadella della Ricerca, ed.6, S.S.7 per Mesagne, Brindisi.

[CA] = analysis performed at the Cagliari Laboratory. LabAnalysis Environmental Science s.r.l., Località Is Coras, Cagliari.

[CH] = analysis performed at the San Giovanni Teatino Laboratory. LabAnalysis Environmental Science s.r.l., Via Bolzano, 6/P, Chieti.

[FR] = analysis performed at the Ceccano Laboratory. LabAnalysis Environmental Science s.r.l., Via Monte Lepini 180, Frosinone.

[GE] = analysis performed at the Genova Laboratory. LabAnalysis Environmental Science s.r.l., Via Isocorte 16, Genova.

[PV] = analysis performed at the Casanova Lonati Laboratory. LabAnalysis Environmental Science s.r.l., Via Europa 5, Pavia.

[PZ] = analysis performed at the Grumento Nova Laboratory. LabAnalysis Environmental Science s.r.l., Via T. Morlino, 23, Potenza.

[RM] = analysis performed at the Rome Laboratory. LabAnalysis Environmental Science s.r.l., Via Camerata Picena, 385, Roma.

[VI] = analysis performed at the Nove Laboratory. LabAnalysis Environmental Science s.r.l., Via dell'Olmo, 2/1, Vicenza.

Sampling under the responsibility of the requesting company

U.M. = Unit of Measurement

Sampling volume = Sampling volume provided by the Customer

Calculated result = The result was recalculated in concentration, based on the sampling volume provided by the Customer

IM: The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor k=2, providing a level of confidence of approximately 95 % if result is greater than LOQ

The expanded uncertainty including sampling is reported only for information, even if the sampling was not performed directly by LabAnalysis.

The expanded uncertainty is associated only if result is greater than LOQ

"<x" = < MDL corrected for scaling factor (weighing and dilution)

MDL = method detection limit: the minimum concentration that can be measured and reported with 99% confidence that the analyte concentration is greater than zero

In the case of methods which envisage pre-concentration and purification phases, where not expressly indicated, the recovery is to be understood as included within the specific acceptability limits established by the test method or by current legislation. Unless expressly indicated, the recovery has not been used in the calculations.

End of Certificate of Analysis.

This Certificate of Analysis concerns only the samples analysed as received.

This Certificate of Analysis cannot be partially reproduced without the written authorization of the Head of LabAnalysis Environmental Science srl.

Report n° EV-26-025216-212971

To:
ADI ASSOCIATES ENVIRONMENTAL CONSULTANTS LTD
KAPPARA BUSINESS CENTRE
11 TRIQ BIRKIRKARA
SGN4197 SAN GWANN - MALTA ()

Identification:	Filter n. 23657 - Project: QCL007
Matrix:	Filter
Sampling Company:	Customer
Sample receiving date:	22/05/2026
Initial analysis date:	04/06/2026
Final analysis date:	04/06/2026
Report date:	08/06/2026

Test	U.M.	Result	U.M.	Sampling volume	U.M.	Calculated result	IM
[PV] Metodo di Prova UNI EN 12341:2023 - escluso/except par 5.1.1: apparecchiatura certificata							
Suspended particulate matter PM10	µg	1640	m³	55,007	µg/m³	29,8	± 5,4

The underlined information is provided by the customer, the laboratory declines responsibility for it.

* = the tests so marked are not accredited by Accredia

[BR] = analysis performed at the Brindisi Laboratory. LabAnalysis Environmental Science s.r.l., Cittadella della Ricerca, ed.6, S.S.7 per Mesagne, Brindisi.

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[CH] = analysis performed at the San Giovanni Teatino Laboratory. LabAnalysis Environmental Science s.r.l., Via Bolzano, 6/P, Chieti.

[FR] = analysis performed at the Ceccano Laboratory. LabAnalysis Environmental Science s.r.l., Via Monte Lepini 180, Frosinone.

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[PZ] = analysis performed at the Grumento Nova Laboratory. LabAnalysis Environmental Science s.r.l., Via T. Morlino, 23, Potenza.

[RM] = analysis performed at the Rome Laboratory. LabAnalysis Environmental Science s.r.l., Via Camerata Picena, 385, Roma.

[VI] = analysis performed at the Nove Laboratory. LabAnalysis Environmental Science s.r.l., Via dell'Olmo, 2/1, Vicenza.

Sampling under the responsibility of the requesting company

U.M. = Unit of Measurement

Sampling volume = Sampling volume provided by the Customer

Calculated result = The result was recalculated in concentration, based on the sampling volume provided by the Customer

IM: The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor k=2, providing a level of confidence of approximately 95 % if result is greater than LOQ

The expanded uncertainty including sampling is reported only for information, even if the sampling was not performed directly by LabAnalysis.

The expanded uncertainty is associated only if result is greater than LOQ

"<x" = < MDL corrected for scaling factor (weighing and dilution)

MDL = method detection limit: the minimum concentration that can be measured and reported with 99% confidence that the analyte concentration is greater than zero

In the case of methods which envisage pre-concentration and purification phases, where not expressly indicated, the recovery is to be understood as included within the specific acceptability limits established by the test method or by current legislation. Unless expressly indicated, the recovery has not been used in the calculations.

End of Certificate of Analysis.

This Certificate of Analysis concerns only the samples analysed as received.

This Certificate of Analysis cannot be partially reproduced without the written authorization of the Head of LabAnalysis Environmental Science srl.

Report n° EV-26-025216-212972

To:
ADI ASSOCIATES ENVIRONMENTAL CONSULTANTS LTD
KAPPARA BUSINESS CENTRE
11 TRIQ BIRKIRKARA
SGN4197 SAN GWANN - MALTA ()

Identification:	Filter n. 23658 - Project: QCL007
Matrix:	Filter
Sampling Company:	Customer
Sample receiving date:	22/05/2026
Initial analysis date:	04/06/2026
Final analysis date:	04/06/2026
Report date:	08/06/2026

Test	U.M.	Result	U.M.	Sampling volume	U.M.	Calculated result	IM
[PV] Metodo di Prova UNI EN 12341:2023 - escluso/except par 5.1.1: apparecchiatura certificata							
Suspended particulate matter PM10	µg	3350	m³	55,008	µg/m³	61	± 15

The underlined information is provided by the customer, the laboratory declines responsibility for it.
* = the tests so marked are not accredited by Accredia
[BR] = analysis performed at the Brindisi Laboratory. LabAnalysis Environmental Science s.r.l., Cittadella della Ricerca, ed.6, S.S.7 per Mesagne, Brindisi.
[CA] = analysis performed at the Cagliari Laboratory. LabAnalysis Environmental Science s.r.l., Località Is Coras, Cagliari.
[CH] = analysis performed at the San Giovanni Teatino Laboratory. LabAnalysis Environmental Science s.r.l., Via Bolzano, 6/P, Chieti.
[FR] = analysis performed at the Ceccano Laboratory. LabAnalysis Environmental Science s.r.l., Via Monte Lepini 180, Frosinone.
[GE] = analysis performed at the Genova Laboratory. LabAnalysis Environmental Science s.r.l., Via Isocorte 16, Genova.
[PV] = analysis performed at the Casanova Lonati Laboratory. LabAnalysis Environmental Science s.r.l., Via Europa 5, Pavia.
[PZ] = analysis performed at the Grumento Nova Laboratory. LabAnalysis Environmental Science s.r.l., Via T. Morlino, 23, Potenza.
[RM] = analysis performed at the Rome Laboratory. LabAnalysis Environmental Science s.r.l., Via Camerata Picena, 385, Roma.
[VI] = analysis performed at the Nove Laboratory. LabAnalysis Environmental Science s.r.l., Via dell'Olmo, 2/1, Vicenza.
Sampling under the responsibility of the requesting company
U.M. = Unit of Measurement
Sampling volume = Sampling volume provided by the Customer
Calculated result = The result was recalculated in concentration, based on the sampling volume provided by the Customer
IM: The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor k=2, providing a level of confidence of approximately 95 % if result is greater than LOQ
The expanded uncertainty including sampling is reported only for information, even if the sampling was not performed directly by LabAnalysis.
The expanded uncertainty is associated only if result is greater than LOQ
"<x" = < MDL corrected for scaling factor (weighing and dilution)
MDL = method detection limit: the minimum concentration that can be measured and reported with 99% confidence that the analyte concentration is greater than zero
In the case of methods which envisage pre-concentration and purification phases, where not expressly indicated, the recovery is to be understood as included within the specific acceptability limits established by the test method or by current legislation. Unless expressly indicated, the recovery has not been used in the calculations.

End of Certificate of Analysis.
This Certificate of Analysis concerns only the samples analysed as received.
This Certificate of Analysis cannot be partially reproduced without the written authorization of the Head of LabAnalysis Environmental Science srl.

Report n° EV-26-025216-212973

To:
ADI ASSOCIATES ENVIRONMENTAL CONSULTANTS LTD
KAPPARA BUSINESS CENTRE
11 TRIQ BIRKIRKARA
SGN4197 SAN GWANN - MALTA ()

Identification:	Filter n. 23659 - Project: QCL007
Matrix:	Filter
Sampling Company:	Customer
Sample receiving date:	22/05/2026
Initial analysis date:	04/06/2026
Final analysis date:	04/06/2026
Report date:	08/06/2026

Test	U.M.	Result	U.M.	Sampling volume	U.M.	Calculated result	IM
[PV] Metodo di Prova UNI EN 12341:2023 - escluso/except par 5.1.1: apparecchiatura certificata							
Suspended particulate matter PM10	µg	1720	m³	55,006	µg/m³	31,3	± 5,4

The underlined information is provided by the customer, the laboratory declines responsibility for it.

* = the tests so marked are not accredited by Accredia

[BR] = analysis performed at the Brindisi Laboratory. LabAnalysis Environmental Science s.r.l., Cittadella della Ricerca, ed.6, S.S.7 per Mesagne, Brindisi.

[CA] = analysis performed at the Cagliari Laboratory. LabAnalysis Environmental Science s.r.l., Località Is Coras, Cagliari.

[CH] = analysis performed at the San Giovanni Teatino Laboratory. LabAnalysis Environmental Science s.r.l., Via Bolzano, 6/P, Chieti.

[FR] = analysis performed at the Ceccano Laboratory. LabAnalysis Environmental Science s.r.l., Via Monte Lepini 180, Frosinone.

[GE] = analysis performed at the Genova Laboratory. LabAnalysis Environmental Science s.r.l., Via Isocorte 16, Genova.

[PV] = analysis performed at the Casanova Lonati Laboratory. LabAnalysis Environmental Science s.r.l., Via Europa 5, Pavia.

[PZ] = analysis performed at the Grumento Nova Laboratory. LabAnalysis Environmental Science s.r.l., Via T. Morlino, 23, Potenza.

[RM] = analysis performed at the Rome Laboratory. LabAnalysis Environmental Science s.r.l., Via Camerata Picena, 385, Roma.

[VI] = analysis performed at the Nove Laboratory. LabAnalysis Environmental Science s.r.l., Via dell'Olmo, 2/1, Vicenza.

Sampling under the responsibility of the requesting company

U.M. = Unit of Measurement

Sampling volume = Sampling volume provided by the Customer

Calculated result = The result was recalculated in concentration, based on the sampling volume provided by the Customer

IM: The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor k=2, providing a level of confidence of approximately 95 % if result is greater than LOQ

The expanded uncertainty including sampling is reported only for information, even if the sampling was not performed directly by LabAnalysis.

The expanded uncertainty is associated only if result is greater than LOQ

"<x" = < MDL corrected for scaling factor (weighing and dilution)

MDL = method detection limit: the minimum concentration that can be measured and reported with 99% confidence that the analyte concentration is greater than zero

In the case of methods which envisage pre-concentration and purification phases, where not expressly indicated, the recovery is to be understood as included within the specific acceptability limits established by the test method or by current legislation. Unless expressly indicated, the recovery has not been used in the calculations.

End of Certificate of Analysis.

This Certificate of Analysis concerns only the samples analysed as received.

This Certificate of Analysis cannot be partially reproduced without the written authorization of the Head of LabAnalysis Environmental Science srl.

Report n° EV-26-025216-212974

To:
ADI ASSOCIATES ENVIRONMENTAL CONSULTANTS LTD
KAPPARA BUSINESS CENTRE
11 TRIQ BIRKIRKARA
SGN4197 SAN GWANN - MALTA ()

Identification:	Filter n. 23660 - Project: QCL007
Matrix:	Filter
Sampling Company:	Customer
Sample receiving date:	22/05/2026
Initial analysis date:	04/06/2026
Final analysis date:	04/06/2026
Report date:	08/06/2026

Test	U.M.	Result	U.M.	Sampling volume	U.M.	Calculated result	IM
[PV] Metodo di Prova UNI EN 12341:2023 - escluso/except par 5.1.1: apparecchiatura certificata							
Suspended particulate matter PM10	µg	2350	m³	55,007	µg/m³	42,7	± 5,4

The underlined information is provided by the customer, the laboratory declines responsibility for it.

* = the tests so marked are not accredited by Accredia

[BR] = analysis performed at the Brindisi Laboratory. LabAnalysis Environmental Science s.r.l., Cittadella della Ricerca, ed.6, S.S.7 per Mesagne, Brindisi.

[CA] = analysis performed at the Cagliari Laboratory. LabAnalysis Environmental Science s.r.l., Località Is Coras, Cagliari.

[CH] = analysis performed at the San Giovanni Teatino Laboratory. LabAnalysis Environmental Science s.r.l., Via Bolzano, 6/P, Chieti.

[FR] = analysis performed at the Ceccano Laboratory. LabAnalysis Environmental Science s.r.l., Via Monte Lepini 180, Frosinone.

[GE] = analysis performed at the Genova Laboratory. LabAnalysis Environmental Science s.r.l., Via Isocorte 16, Genova.

[PV] = analysis performed at the Casanova Lonati Laboratory. LabAnalysis Environmental Science s.r.l., Via Europa 5, Pavia.

[PZ] = analysis performed at the Grumento Nova Laboratory. LabAnalysis Environmental Science s.r.l., Via T. Morlino, 23, Potenza.

[RM] = analysis performed at the Rome Laboratory. LabAnalysis Environmental Science s.r.l., Via Camerata Picena, 385, Roma.

[VI] = analysis performed at the Nove Laboratory. LabAnalysis Environmental Science s.r.l., Via dell'Olmo, 2/1, Vicenza.

Sampling under the responsibility of the requesting company

U.M. = Unit of Measurement

Sampling volume = Sampling volume provided by the Customer

Calculated result = The result was recalculated in concentration, based on the sampling volume provided by the Customer

IM: The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor k=2, providing a level of confidence of approximately 95 % if result is greater than LOQ

The expanded uncertainty including sampling is reported only for information, even if the sampling was not performed directly by LabAnalysis.

The expanded uncertainty is associated only if result is greater than LOQ

"<x" = < MDL corrected for scaling factor (weighing and dilution)

MDL = method detection limit: the minimum concentration that can be measured and reported with 99% confidence that the analyte concentration is greater than zero

In the case of methods which envisage pre-concentration and purification phases, where not expressly indicated, the recovery is to be understood as included within the specific acceptability limits established by the test method or by current legislation. Unless expressly indicated, the recovery has not been used in the calculations.

End of Certificate of Analysis.

This Certificate of Analysis concerns only the samples analysed as received.

This Certificate of Analysis cannot be partially reproduced without the written authorization of the Head of LabAnalysis Environmental Science srl.

Report n° EV-26-025216-212975

To:
ADI ASSOCIATES ENVIRONMENTAL CONSULTANTS LTD
KAPPARA BUSINESS CENTRE
11 TRIQ BIRKIRKARA
SGN4197 SAN GWANN - MALTA ()

Identification:	Filter n. 23676 - Project: QCL007
Matrix:	Filter
Sampling Company:	Customer
Sample receiving date:	22/05/2026
Initial analysis date:	04/06/2026
Final analysis date:	04/06/2026
Report date:	08/06/2026

Test	U.M.	Result	U.M.	Sampling volume	U.M.	Calculated result	IM
[PV] Metodo di Prova UNI EN 12341:2023 - escluso/except par 5.1.1: apparecchiatura certificata							
Suspended particulate matter PM10	µg	1480	m³	50,333	µg/m³	29,4	± 5,4

The underlined information is provided by the customer, the laboratory declines responsibility for it.

* = the tests so marked are not accredited by Accredia

[BR] = analysis performed at the Brindisi Laboratory. LabAnalysis Environmental Science s.r.l., Cittadella della Ricerca, ed.6, S.S.7 per Mesagne, Brindisi.

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[PV] = analysis performed at the Casanova Lonati Laboratory. LabAnalysis Environmental Science s.r.l., Via Europa 5, Pavia.

[PZ] = analysis performed at the Grumento Nova Laboratory. LabAnalysis Environmental Science s.r.l., Via T. Morlino, 23, Potenza.

[RM] = analysis performed at the Rome Laboratory. LabAnalysis Environmental Science s.r.l., Via Camerata Picena, 385, Roma.

[VI] = analysis performed at the Nove Laboratory. LabAnalysis Environmental Science s.r.l., Via dell'Olmo, 2/1, Vicenza.

Sampling under the responsibility of the requesting company

U.M. = Unit of Measurement

Sampling volume = Sampling volume provided by the Customer

Calculated result = The result was recalculated in concentration, based on the sampling volume provided by the Customer

IM: The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor k=2, providing a level of confidence of approximately 95 % if result is greater than LOQ

The expanded uncertainty including sampling is reported only for information, even if the sampling was not performed directly by LabAnalysis.

The expanded uncertainty is associated only if result is greater than LOQ

"<x" = < MDL corrected for scaling factor (weighing and dilution)

MDL = method detection limit: the minimum concentration that can be measured and reported with 99% confidence that the analyte concentration is greater than zero

In the case of methods which envisage pre-concentration and purification phases, where not expressly indicated, the recovery is to be understood as included within the specific acceptability limits established by the test method or by current legislation. Unless expressly indicated, the recovery has not been used in the calculations.

End of Certificate of Analysis.

This Certificate of Analysis concerns only the samples analysed as received.

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BREEZE ROADs Modelling
QCL002
ADM Ltd Project P610
June 2026

	Factors
Calibration Factor for NOx	6.0
Calibration Factor for PM10	3.8

UK average vehicle age	8	years
Maltese average vehicle age	15	years

Link No:	Ref.	Road	% Heavy vehicles	Average Speed (km/h)	AADT 2025	2033 Baseline	2033 Scheme	2038 Baseline	2038 Scheme
1	SR1	Triq Valletta, Mqabba	7.1%	60	11,496	12,869	13,393	13,304	14,028
2	SR2	Triq Ir-Ramlija, Hal Kirkop	11.4%	45	1,329	1,439	2,184	1,513	2,258
3	SR3	Triq L-Ewwel Titjira, Hal Luqa	6.5%	55	47,468	52,178	56,157	54,800	58,779
4	SR4	Vjal L-Avjazzjoni, Hal Luqa	6.9%	58	79,876	99,441	101,501	103,853	105,913
5	SR5	Triq Il-Kunsill Tal-Ewropa, Hal Luqa	6.9%	61	71,889	84,866	86,025	88,837	89,996
6	SR6	Triq Hal Luqa, Santa Lucija	6.3%	62	9,712	10,946	11,757	11,482	12,293
7	SR7	Bir Miftuh Chapel, Gudja	7.7%	43	26,224	31,407	33,147	32,856	34,596
8	SR8	Gudja FC football pitch, Gudja	7.7%	38	29,000	34,413	35,754	36,015	37,356
9	SR9	Triq Hal Ghaxaq, Gudja	6.5%	37	20,450	24,637	25,577	25,767	26,707
10	KKP1	Triq Valletta, Hal Kirkop	7.2%	31	3,212	3,561	3,710	3,738	3,887
11	LQA4	Triq San Tumas, Hal Luqa	7.0%	54	24,842	32,581	33,085	33,953	34,457
12	GDI1	Dawret Il-Gudja, Gudja	7.7%	52	26,224	31,407	32,947	32,856	34,396
13	GXQ1	Dawret Hal Ghaxaq, Hal Ghaxaq	6.5%	41	19,715	23,656	24,282	24,745	25,371

PM10: Resuspension (mg/veh-km)	0.059

For Model Calibration

	No	Description	2025 Veh/hr Base	HGV (%)	KPH	Emission (g/Veh-km) NOx	PM10	Total PM10
		Emissions year	2018					
		from: EFT2024_v12.1.xlsb						
1	SR1	Triq Valletta, Mqabba	479	7.1%	60	0.283	0.040	0.090
2	SR2	Triq Ir-Ramlija, Hal Kirkop	55	11.4%	45	0.399	0.044	0.094
3	SR3	Triq L-Ewwel Titjira, Hal Luqa	1,978	6.5%	55	0.290	0.039	0.089
4	SR4	Vjal L-Avjazzjoni, Hal Luqa	3,328	6.9%	58	0.286	0.040	0.090
5	SR5	Triq Il-Kunsill Tal-Ewropa, Hal Luqa	2,995	6.9%	61	0.280	0.040	0.090
6	SR6	Triq Hal Luqa, Santa Lucija	405	6.3%	62	0.271	0.039	0.089
7	SR7	Bir Miftuh Chapel, Gudja	1,093	7.7%	43	0.358	0.041	0.091
8	SR8	Gudja FC football pitch, Gudja	1,208	7.7%	38	0.389	0.041	0.091
9	SR9	Triq Hal Ghaxaq, Gudja	852	6.5%	37	0.377	0.040	0.090
10	KKP1	Triq Valletta, Hal Kirkop	134	7.2%	31	0.442	0.041	0.091
11	LQA4	Triq San Tumas, Hal Luqa	1,035	7.0%	54	0.300	0.040	0.090
12	GDI1	Dawret Il-Gudja, Gudja	1,093	7.7%	52	0.312	0.041	0.091
13	GXQ1	Dawret Hal Ghaxaq, Hal Ghaxaq	821	6.5%	41	0.349	0.040	0.090
		Emissions year	2026					
		from: EFT2026_v14.1.xlsb						
1	SR1	Triq Valletta, Mqabba	528	7.1	60	0.186	0.032	0.082
2	SR2	Triq Ir-Ramlija, Hal Kirkop	60	11.4	45	0.233	0.041	0.091
3	SR3	Triq L-Ewwel Titjira, Hal Luqa	2,174	6.5	55	0.189	0.033	0.083
4	SR4	Vjal L-Avjazzjoni, Hal Luqa	4,143	6.9	58	0.187	0.032	0.082
5	SR5	Triq Il-Kunsill Tal-Ewropa, Hal Luqa	3,536	6.9	61	0.184	0.031	0.081
6	SR6	Triq Hal Luqa, Santa Lucija	456	6.3	62	0.181	0.030	0.080
7	SR7	Bir Miftuh Chapel, Gudja	1,309	7.7	43	0.217	0.038	0.088
8	SR8	Gudja FC football pitch, Gudja	1,434	7.7	38	0.230	0.039	0.089
9	SR9	Triq Hal Ghaxaq, Gudja	1,027	6.5	37	0.226	0.038	0.088
10	KKP1	Triq Valletta, Hal Kirkop	148	7.2	31	0.253	0.039	0.089
11	LQA4	Triq San Tumas, Hal Luqa	1,358	7.0	54	0.193	0.034	0.084
12	GDI1	Dawret Il-Gudja, Gudja	1,309	7.7	52	0.198	0.035	0.085
13	GXQ1	Dawret Hal Ghaxaq, Hal Ghaxaq	986	6.5	41	0.214	0.037	0.087
		Emissions year	2031					
		from: EFT2026_v14.1.xlsb						
1	SR1	Triq Valletta, Mqabba	554	7.1	60	0.086	0.029	0.079
2	SR2	Triq Ir-Ramlija, Hal Kirkop	63	11.4	45	0.107	0.038	0.088
3	SR3	Triq L-Ewwel Titjira, Hal Luqa	2,283	6.5	55	0.087	0.030	0.080
4	SR4	Vjal L-Avjazzjoni, Hal Luqa	4,327	6.9	58	0.087	0.030	0.080
5	SR5	Triq Il-Kunsill Tal-Ewropa, Hal Luqa	3,702	6.9	61	0.085	0.029	0.079
6	SR6	Triq Hal Luqa, Santa Lucija	478	6.3	62	0.084	0.028	0.078
7	SR7	Bir Miftuh Chapel, Gudja	1,369	7.7	43	0.099	0.035	0.085
8	SR8	Gudja FC football pitch, Gudja	1,501	7.7	38	0.104	0.036	0.086
9	SR9	Triq Hal Ghaxaq, Gudja	1,074	6.5	37	0.102	0.034	0.084
10	KKP1	Triq Valletta, Hal Kirkop	156	7.2	31	0.114	0.035	0.085
11	LQA4	Triq San Tumas, Hal Luqa	1,415	7.0	54	0.089	0.031	0.081
12	GDI1	Dawret Il-Gudja, Gudja	1,369	7.7	52	0.091	0.032	0.082
13	GXQ1	Dawret Hal Ghaxaq, Hal Ghaxaq	1,031	6.5	41	0.097	0.034	0.084

Calibrations and Predictions (µg/m3)

o:\nadirive\projects\P2610 Kirkop Outlet Village QCL007 \Roads_1

All predicted and measured value are ug/m3

	NO2	PM10	NOx	
Background	17.6	25.7	28.0	
Roadside Monitoring	34.7	38.5	82.0	
Measured-Background	17.1	12.8	54.0	contribution from road at monitoring location

NOx/NO2	NOx	NO2	Factors
Background	28.0	17.6	1.5258	0.7341
Roadside	82.0	34.7	3.3931	0.5278

Model Calibration (Method: ERA Multiplication)

Year	2025

	From Model		After Calibration		Total		
Receptor	NOx	PM10	NOx	PM10	NOx	PM10	NO2
R14: NO2 Monitor	8.99	-	53.9	-	81.9	-	34.7
R15: PM10 Monitor	-	3.35	-	12.7	-	38.4	
					Measured	38.5	34.7
					%age	100%	100%

Calibration: Multiplication Factors	
NOx Calibration Factor	6.0
PM10 Factor	3.8

"Sense Check" on Model Calibration

Year: 2025 Receptor No		NOx Road	NOx Total	NO2 Predicted	NO2 Measured
10	KKP1	0.87	33.2	21.6	19.0
11	LQA4	6.06	64.3	30.6	50.7
12	GDI1	5.82	62.9	30.2	27.4
13	GXQ1	4.51	55.0	28.1	42.2
14	Analyser	8.99	81.9	34.7	34.7

Location	Measured	Predicted	Difference (%)	
NOx Analyser	34.7	34.7	0%	
KKP1	19.0	21.6	13%	
LQA4	50.7	30.6	-40%	Unclear why the model and measured differ by more than 20%
GDI1	27.4	30.2	10%	
GXQ1	42.2	28.1	-33%	Unclear why the model and measured differ by more than 20%

Predictions for Assessment of Impacts on Air Quality

NOx (from Roads)

Run No			3	4	5	6
Assessment Year			2033		2038	
Receptor No.	Ref		Baseline	Scheme	Baseline	Scheme
1	SR1		2.00	2.11	0.97	1.02
2	SR2		0.59	0.73	0.28	0.35
3	SR3		5.12	5.44	2.48	2.62
4	SR4		8.11	8.29	3.94	4.02
5	SR5		7.49	7.60	3.63	3.68
6	SR6		1.36	1.44	0.66	0.70
7	SR7		3.31	3.41	1.60	1.65
8	SR8		2.03	2.11	0.96	1.00
9	SR9		3.31	3.44	1.56	1.62
10	KKP1		0.58	0.62	0.28	0.29
11	LQA4		5.09	5.18	2.44	2.48
12	GDI1		4.43	4.64	2.12	2.22
13	GXQ1		3.32	3.41	1.57	1.61
14	NOx		7.27	7.43	3.53	3.61
15	PM10		8.64	8.82	4.19	4.28

PM10 (from Road)

Run No			9	10	11	12
Assessment Year			2033		2038	
Receptor No.	Ref		Baseline	Scheme	Baseline	Scheme
1	SR1		0.88	0.93	0.89	0.94
2	SR2		0.25	0.30	0.25	0.30
3	SR3		2.25	2.39	2.28	2.41
4	SR4		3.55	3.63	3.63	3.70
5	SR5		3.29	3.34	3.36	3.41
6	SR6		0.60	0.64	0.61	0.65
7	SR7		1.44	1.48	1.46	1.51
8	SR8		0.81	0.84	0.82	0.85
9	SR9		1.31	1.36	1.30	1.35
10	KKP1		0.22	0.24	0.23	0.24
11	LQA4		2.21	2.25	2.22	2.26
12	GDI1		1.90	1.98	1.91	2.00
13	GXQ1		1.35	1.39	1.36	1.40
14	NOx		3.19	3.26	3.25	3.32
15	PM10		3.78	3.87	3.86	3.94

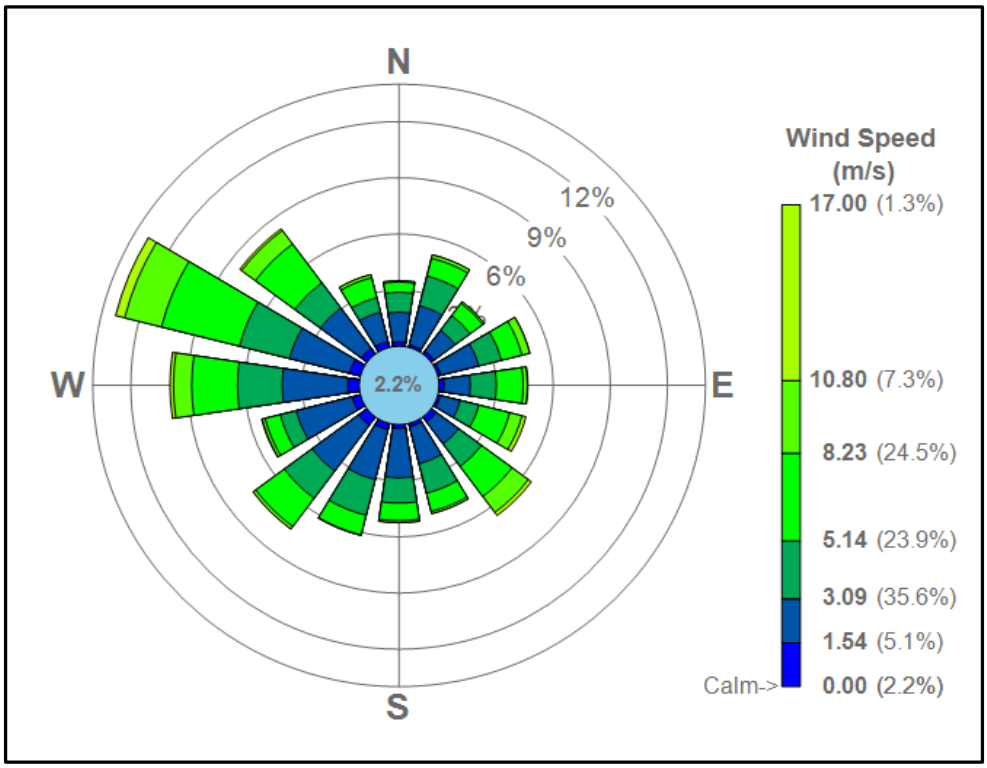
Annual Average NO2 (µg/m3)

Assessment Year			2033		2038	
Receptor	Ref		Baseline	Scheme	Baseline	Scheme
1	SR1		23.8	24.0	21.8	21.9
2	SR2		21.0	21.3	20.3	20.5
3	SR3		29.1	29.6	24.7	24.9
4	SR4		33.5	33.8	27.2	27.3
5	SR5		32.6	32.8	26.7	26.8
6	SR6		22.5	22.7	21.1	21.2
7	SR7		26.1	26.3	23.0	23.1
8	SR8		23.8	24.0	21.7	21.8
9	SR9		26.1	26.4	22.9	23.1
10	KKP1		21.0	21.0	20.3	20.3
11	LQA4		29.1	29.2	24.6	24.7
12	GDI1		28.0	28.3	24.0	24.2
13	GXQ1		26.2	26.3	23.0	23.0
14	NOx		32.3	32.6	26.5	26.6
15	PM10		34.2	34.5	27.6	27.8

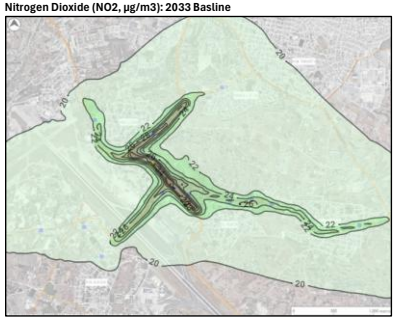
Annual Average PM10 (µg/m3)

Assessment Year			2033		2038	
Receptor	Ref		Baseline	Scheme	Baseline	Scheme
1	SR1		29.1	29.2	29.1	29.3
2	SR2		26.6	26.8	26.6	26.9
3	SR3		34.2	34.8	34.4	34.9
4	SR4		39.2	39.5	39.5	39.8
5	SR5		38.2	38.4	38.5	38.6
6	SR6		28.0	28.1	28.0	28.2
7	SR7		31.2	31.3	31.3	31.4
8	SR8		28.8	28.9	28.8	28.9
9	SR9		30.7	30.9	30.7	30.8
10	KKP1		26.8	26.9	26.8	26.8
11	LQA4		34.1	34.2	34.1	34.3
12	GDI1		32.9	33.2	33.0	33.3
13	GXQ1		30.8	31.0	30.9	31.0
14	NOx		37.8	38.1	38.1	38.3
15	PM10		40.1	40.4	40.4	40.7

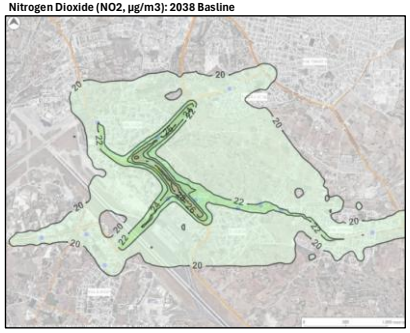
2025: Windrose for Luqa



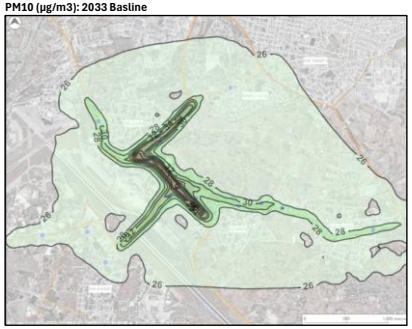
Nitrogen Dioxide (NO2, µg/m3): 2033 Basline



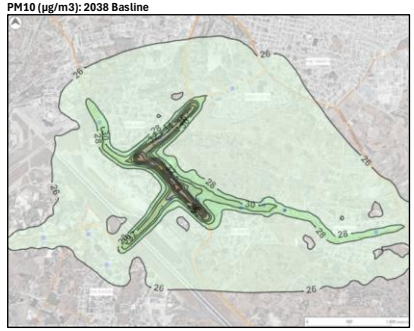
Nitrogen Dioxide (NO2, µg/m3): 2038 Basline



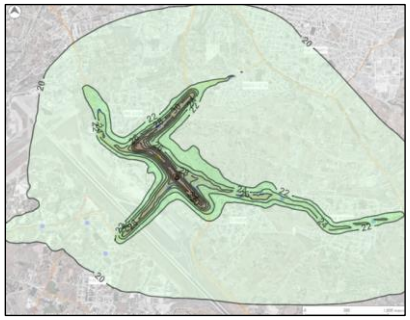
PM10 (µg/m3): 2033 Basline



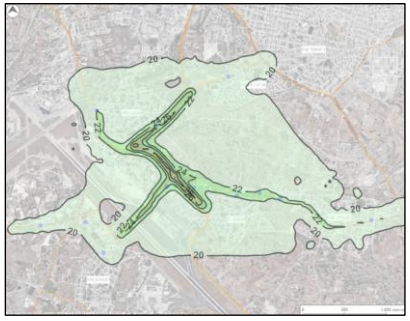
PM10 (µg/m3): 2038 Basline



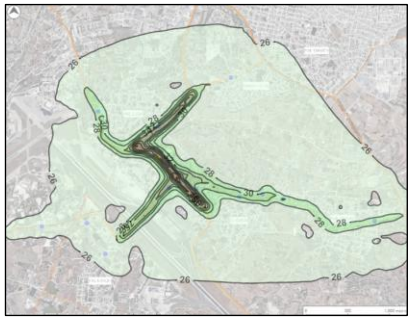
Nitrogen Dioxide (NO2, µg/m3): 2033 Scheme



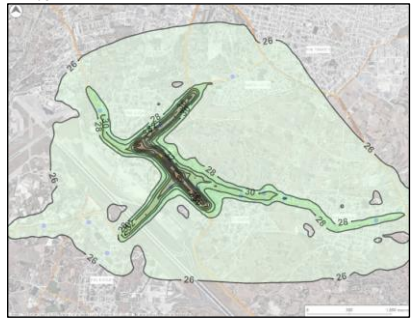
Nitrogen Dioxide (NO2, µg/m3): 2038 Scheme



PM10 µg/m3: 2033 Scheme



PM10 µg/m3: 2038 Scheme



PA 02825/25

Proposed Commercial Complex, Triq l-Industrija, Kirkop

Technical Appendix 4

CULTURAL HERITAGE BASELINE REPORT

Prepared by Kurt Balzan, Daniel Borg, Marlene Borg, Ernest Vella, and Joseph Calleja

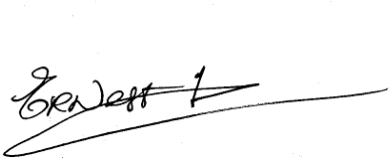
Supporting Documents for

Environmental Impact Assessment Report

Signed Declaration: Identification of Consultants and Contributors

Attn: Director of Environment and Resources (ERA)

We, Kurt Balzan, Daniel Borg, Marlene Borg, Ernest Vella, and Joseph Calleja who undertook and prepared the report of the cultural heritage baseline survey for the EIA Report of the Commercial Complex at Triq l-Industrija, Kirkop (PA 02825/25) hereby declare that such survey was solely carried out by us and we take responsibility for any statement or conclusion contained in the report.

24th June 2026	Kurt Balzan	
Date	Name	Signature
24th June 2026	Daniel Borg	
Date	Name	Signature
24th June 2026	Marlene Borg	
Date	Name	Signature
24th June 2026	Ernest Vella	
Date	Name	Signature
24th June 2026	Joseph Calleja	
Date	Name	Signature

Report for the Cultural Heritage Study for the Environmental Impact Assessment for Demolition of an existing construction yard and built structures, proposed oversite excavation to accommodate the construction of a commercial car park, supermarket, a mixed use outlet village (consisting of class 2A medical, class 3C sport centre, class 4A offices, class 4B retail, class 4C coffee shops, class 4D restaurants, bank) and three-stars Hotel having 120 rooms.

Site at Elbros Concrete Ltd., Triq l-Industrija c/w, Triq il-Madonna Tad-Dawl, Ħal Kirkop

(PA/02825/25)

Kurt Balzan O'Dea, Daniel Borg, Marlene Borg, Joseph Calleja, Ernest Vella

March 2026

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1. INTRODUCTION

1.1 Terms of Reference

In compliance with Maltese legislation and within the framework of planning policies, the Environment and Resources Authority (ERA) requires that an Environmental Impact Assessment (EIA) is carried out with respect of the proposed construction of a commercial car park, outlet village and three-star hotels at Elbros Concrete Ltd, Triq l-Industrija c/w Triq il-Madonna tad-Dawl, Ħal Kirkop.

Archaeology Services Co-operative Ltd (ASC) has been commissioned to carry out the baseline studies relative to the terrestrial cultural heritage by Adi Associates Environmental Consultants Ltd. This report is based on the Terms of Reference issued by ERA in November 2025.

1.2 Location and Brief Description of the Site

This proposed development lies on the northern part of Ħal Kirkop adjacent to the Malta International Airport. The site of proposed development (**Figure 1**) is currently a construction yard, parts of which were originally a quarry.

Area of Proposed Development

Area of Influence

Figure 1: Area covered by the Cultural Heritage Study

2. REPORT COMPILATION METHOD

2.1 Methodology of Study

This report is the cultural heritage baseline study to be used in an Environmental Impact Assessment. This study is required to provide information regarding provisions for environmental protection including, among others, the protection of archaeological and cultural (both vernacular and rural, including rubble walls, huts, wells, irrigation channels, ancient quarrying sites and farmhouses) features.

This report is based on findings from what is technically referred to as Ground Reconnaissance. This method of investigation primarily involves actual fieldwork, and incorporates the consultation of documentary sources and place-name evidence (Renfrew & Bahn 1991: 63). The fieldwork carried out consisted of a site-surface survey, or field-walking, in order to locate and record the whereabouts of sites and features. No aerial reconnaissance or sub-surface surveys, including excavations, were carried out.

This report is the result of a site-surface survey supplemented by desktop research. This work was carried out in January 2026 by qualified archaeologists from ASC Ltd. The report compilation method was developed after an initial site visit to examine the general landscape of the area.

The survey was undertaken by:

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2.2 Desk-Top Research

The general works of Abela (1647) and Wettinger (2000) were consulted, as well as Evans (1971), Trump (1997), Sagona (2002), and Vella (200). Other publications have also been consulted and are listed in the bibliography.

The Annual Reports on the Workings of the Museums Department (MARs), published from 1904 onwards, were also examined. Specific works regarding the different settlements which are affected by the proposed development were also consulted in order to further our understanding of the area under consideration as well as its sites and features.

2.3 Site Survey

The site survey covered the area of the proposed development and its surrounding areas as shown in **Figure 1**. The survey was limited to surface investigation, leaving out any possible cultural heritage buried beneath the ground. We therefore cannot exclude the possibility that archaeological remains do exist beneath the surface of the site surveyed.

The site survey consisted in walking in the area, looking for visible cultural features such as:

- architectural structures and the remains of structures;
- evidence of rock-cutting and rock-cut chambers;
- patterns and building techniques of rubble walls and dry-stone walls;
- piles of stones or dispersed large stones;
- caves or cavities in the rock-faces;
- rock-cut features, quarry marks, and cart-ruts;
- surface scatters of artefacts such as pottery sherds;
- important public and private buildings with particular architectural features.

2.4 Recording Systems

Any feature considered to be of cultural interest was recorded on the sheets described above including all the information required as detailed in **Appendix 1**.

2.5 Statutory Protection

The importance of the conservation of the identified sites and features has been identified with reference to relevant legislation standards, guidance and practices. These include the Strategic Plan for Environment and Development of 2015 (SPED) replacing the Structure Plan for the Maltese Islands, the Development Planning Act (2016) and the Cultural Heritage Act.

2.5.1 Cultural Heritage Act

This Act provides overall protection to "all movable or immovable objects of artistic, architectural, historical, archaeological, ethnographic, palaeontological and geological importance and includes information or data relative to cultural heritage pertaining to Malta or to any other country" (section 2). In section 3 it also specifies that "For the purposes of this Act, an object shall not be deemed to form part of the cultural heritage unless it has existed in Malta, including the territorial waters thereof, or in any other country, for fifty years, or unless it is an object of cultural, artistic, historical, ethnographic, scientific or industrial value, even if contemporary, that is worth preserving".

"No person shall make any interventions on such cultural property or classes thereof without first having obtained a permit therefore from the Superintendent" (Section 44.3). Applications are determined subject to the results of prior investigation: "Before determining an application under subarticle (3) hereof the Superintendent may require such information including the results of such tests, examinations or inspection by such persons accredited under this Act for the purpose as may be required by the Superintendent" (Section 44.4).

The restrictions on archaeological excavations is stated in Section 43(1) whereby "Archaeological or palaeontological excavations or explorations on land as well as in the

territorial waters or in the contiguous zone of Malta can only be made by the Superintendent, or with written permission of the Superintendent". Chance discoveries of archaeological remains are also regulated by Section 43(2), "Any person who, even accidentally, discovers any object, site or building to which this Act applies in accordance with article 3, shall immediately inform the Superintendent, keep the object found in situ, and shall not for a period of six working days after informing the Superintendent proceed with any work on the site where the object of cultural property is discovered". The details about rights and obligations by all parties in the eventuality of an archaeological discovery are described in Sections 43(3), 43(4), 43(5), 43(6), 43(7).

2.5.2 Strategic Plan for Environment and Development (SPED)

SPED, published in 2015, has replaced the Structure Plan for the Maltese Islands published in 1992. However, in the interim period "the provisions of policy UC07 of the 1992 Structure Plan shall remain in force as a guide to development proposals on scheduled buildings". **Table 1** reproduces the descriptions of the ratings in Policy UCO7, that, together with the ratings for Areas and Sites of Archaeological Importance (**Section 2.5.6**), have been used as proposed protection ratings for the cultural features recorded during the site survey described in **Section 3.3** below.

Protection Rating	Description in Policy UCO 7 of the Structure Plan for the Maltese Islands (1992)
Grade 1	"These are buildings of outstanding historical or architectural interest that demand to be preserved in their entirety. Demolition or alterations which impair the setting or change the external or internal appearance, including anything contained within the curtilage of the building, will not be allowed. Any interventions allowed must be directed to their scientific restoration and rehabilitation. Internal structural alterations will only be allowed in exceptional circumstances where this is paramount for reasons of keeping the building in active use." (Structure Plan for the Maltese Islands 1992: 77)
Grade 2	" These are buildings of some architectural or historical interest or which contribute to the visual image of an Urban Conservation Area. Permission to demolish such buildings will not normally be given. Alterations to the interior will be allowed if proposed to be carried out sensitively and causing the least detriment to the character and architectural homogeneity of the building." (Structure Plan for the Maltese Islands 1992: 77)
Grade 3	" These are buildings which have no historical importance and are only of minor architectural interest. Demolition may be permitted provided the replacement building is in harmony with its surroundings." (Structure Plan for the Maltese Islands 1992: 77)

Table 1: Summary of Protection Rating as described in Policy UCO7 of the Structure Plan for the Maltese Islands.

2.5.3 Government Notice 160 of 1997 (amended LN169, 2004)

Rubble Walls and Rural Structures (Conservation and Maintenance) Regulations as amended by LN 169 of 2004 protects all rubble walls and non-habitable rural structures in view of their historical and architectural importance, their exceptional beauty, their affording a habitat for flora and fauna, and their vital importance in the conservation of the soil and water. Walls may be sensitively repaired without the Planning Authority's prior authorisation. Certain areas may also be declared to be Rubble Wall Conservation areas in which no alterations to the location

or construction of rubble walls and the traditional methods of their repair and maintenance will be permitted without the written approval of the PA. In such Conservation areas, the Minister for the Environment may order the owner or occupier to repair and re-erect all the rubble walls within the area, and to continue to maintain them. The dismantling of the wall requires a permit from the PA.

2.5.4 The European Landscape Convention (Florence Convention)

The Florence Convention signed by all members of the Council of Europe, and therefore by Malta as well, clearly defines landscape and is aware that "sustainable development based on a balanced and harmonious relationship between social needs, economic activity and the environment" must be achieved (European Landscape Convention 2000: 1). It also maintains that "the landscape is an important part of the quality of life of people everywhere" and that it is a "key element of individual and social well-being and that its protection, management and planning entails rights and responsibilities for everyone" (European Landscape Convention 2000: 1).

According to this Convention, landscape "means an area, as perceived by people, whose character is the results of the action and interaction of natural and/or human factors" and covers "natural, rural, urban and peri-urban areas" (European Landscape Convention 2000: 2).

2.5.5 The Burra Charter (The Australia ICOMOS charter for the conservation of places of cultural significance)

The Burra Charter provides guidance for the conservation and management of places of cultural significance. It states that "Places of cultural significance enrich people's lives, often providing a deep and inspirational sense of connection to community and landscape, to the past and to lived experiences… They are irreplaceable and precious". Such places must therefore be conserved for present and future generations.

The Charter promotes a vigilant approach to change: "do as much as necessary to care for the place and to make it useable, but otherwise change it as little as possible so that its cultural significance is retained". Places of cultural significance are made up of fabric, that is all physical materials constituting them like building interiors, excavated material, fixtures and components. Such fabric should be disturbed as little as possible, even for study and documentation purposes.

2.5.6 Areas and Sites of Archaeological Importance

The North West Local Plan (MEPA 2006: 124-128) designates degrees of protection to areas and sites of archaeological importance. A summary of these protection ratings is provided in **Table 2**. These ratings have been used as criteria for proposing protection ratings for the cultural features recorded during the site survey described in **Chapter 3.3** below.

Policy NCWO4 also provides for any case in which there is "over-riding case of preservation", where development will be permitted after alternative layouts endeavouring to protect the site are provided by the developer (MEPA 2006: 126). Buffer zones, which are included in the protection strategy for Class A and Class B cultural assets are defined by the same policy as means to "to protect the setting of the monument so that its appearance can be appreciated from a distance; … to protect other possible remains within the immediate area; … to define an area around the feature in which enhancement shall take place, particularly where more recent development has created an adverse impact on the setting of the feature." (MEPA 2006: 126).

Policy NCWO5 concerns cultural assets that are discovered during development. In this case works are to stop and the SCH informed immediately and an Emergency Conservation Order is issued (MEPA 200a: 127). When there is a possibility of remains being uncovered or after the accidental discovery of such remains, the PA in consultation with SCH might ask the developer to carry out archaeological investigations under the direction of SCH. The developer may then be asked to alter the development to safeguard the archaeological remains (MEPA 2006: 127).

Protection Rating	Description	NWLP Policy
Class A	"No development will be permitted which would adversely affect the monument or site or its setting. A minimum buffer zone of at least 100m around the periphery of the site will be established in which no such development will be allowed." (MEPA 2006a: 125) In this case preservation measures will have precedence over accessibility and landscape screening should be provided for any structures within the 100m buffer zone to enhance the setting of the particular cultural asset (MEPA 2006a: 126).	NWCO 4
Class B	"No development will be permitted which would adversely affect the monument or site or its natural setting. A buffer zone of at least 50 m will be identified, its size dependent on the level of protection appropriate to the specific site or area, in which no such development will be allowed." (NWLP: 2006a: 125) As in a Class A asset, preservation will take precedence over accessibility (MEPA 2006a: 126).	NWCO 4
Class C	This level of protection is given to "assets of archaeological importance that should be preserved if possible, but may be covered up after adequate investigation, documentation and cataloguing" (MEPA 2006a: 126). "No development will be permitted within the site or area of archaeological importance until the applicant has submitted a written scheme of investigation, which has been approved by the Superintendence of Cultural Heritage. Adequate opportunities must be provided for the recording and, where necessary, the excavation of such sites. Before a permit is issued, agreement must be reached to cover provision for detailed ground and structural surveys, excavation in advance of development, the conservation of remains in-situ, and on the carrying out of a monitoring report as the development proceeds. Provision for subsequent access and presentation of the area or site shall be made." (MEPA 2006a: 125)	NWCO 4
Class D	This level of protection is given to a site belonging to a type known from numerous other examples, which should be protected if possible, after being recorded and catalogued before covering or destroying (MEPA 2006a:126). "No development will be permitted within the site or area of archaeological importance until the applicant has submitted a written scheme of investigation, which has been approved by the Superintendence of Cultural Heritage. Adequate opportunities must be provided for the recording and, where necessary, the excavation of such sites. Before a permit is issued, agreement must be reached to cover provision for detailed ground and structural surveys, excavation in advance of development, the conservation of remains in-situ and on the carrying out of a monitoring report as the development proceeds. Where possible provision for subsequent presentation of the area or site shall be made." (NWLP 2016a: 125-126)	NWCO 4
Class E	"Where applications for development permission are submitted on a site or area in which the Superintendence of Cultural Heritage or MEPA may have some	NWCO 4

archaeological interest, the applicant will be required to undertake an investigation including excavation if necessary. If following investigation, the Superintendence of Cultural Heritage considers the site to be of archaeological value, MEPA will normally refuse development permission if the proposed development would lead to the destruction of the site, or require the development to be modified so that the archaeological value of the site is protected" (NWLP: 2006a: 126). The archaeological interest mentioned above may results from the fact that the site may be known to "have existed as referred to in written documents, prints, maps, paintings, photographs or according to oral tradition, but no longer visible" (MEPA 2006a: 127).

Table 2: Summary of Protection Rating as described in the NWLP.

2.5.7 Scheduling

No features have been scheduled in the area of proposed development or immediate vicinity.

2.6 Difficulties

The area of development itself, being a construction yard, has not preserved most of the original cultural features. The general area is also mainly used for industrial purposes, or quarrying which has greatly affected the landscape. Some vernacular structures were not accessible, thus a detailed survey of the features was not always possible.

3. CULTURAL LANDSCAPE ASSESSMENT

Archaeological research is increasingly concerned with historical landscapes. The whole of our landscape, rural and urban, is a vast historical document. Such approaches aim at the preservation of historically important landscapes, especially when relating to arrangements of archaeological remains within the landscape. The historical landscape considers not only the important sites, but also the flora, fauna, topography, geology and scenery, as well as spiritual matters such as aesthetics, artistic and literary associations, folklore and tradition (Darvill et al. 1993: 571).

3.1 Toponomy

A number of placenames have been identified from the survey sheet or other literature in the proposed area of development and its immediate surroundings (refer to **Figure 2**). Toponomy, can be a very useful tool to reconstruct past landscapes as they give a hint of past land uses, tenure names, type of vegetation, and also topographical features that exist or existed in the area. Below is a list of these placenames related to the area of proposed development. All of these placenames appear in the 1912 Survey Sheet.

Ħal-Kirkop	first mentioned in the 1419 militia list (Wettinger 1969) it refers to a common Greek name Procopius (Wettinger 2000: 343).
Tad-Dawl	this placename is not listed in Wettinger 2000. However it is clearly linked to the shrine of the Madonna of the Light (Madonna tad-Dawl) erected in 1741 at the crossroads of the roads leading to Mqabba, Luqa, Ħal Kirkop and Zurrieq (IMD2026/012). The devotion to the 'Madre Santissima della Luce' had only started two decades earlier in 1722 in the city of Palermo (Lia 2013).
Ta' Wara d-Djar	Wettinger (2000: 561) places this toponym at Hal Arrig mentioned in a notarial deed of 1513. The author translates the placename as 'behind the house' which in this case is in the plural form, and describes the use of houses as exceptionally large dwellings (Wettiner 2000: 561).
Tal-Ġiebja	referring to a cistern, this place name was found by Wettinger (2000: 147) in a number of localities, including in a notarial deed dating to 1529 for a property in Zurrieq.
Tal-Għażż	no reference is found in Wettinger (2000). According to *ġabra* (https://mlrs.research.um.edu.mt/resources/gabra/) the noun spelt with a 'z' refers to mole skins; while the noun with a 'ż' refers to laziness or lethargy. The meaning behind the placename is not clear, especially when one also includes the verb 'għażż' which means 'cherish or value'.
Cuttalf Gandolf	Cuttalf is most probably the transcription of the word 'ħuttaf' which is mentioned in a 1435 document referring to chantry land in Ħal Kirkop (Wettinger 2000: 331) and is

	either linked to the swallow, or to a personal name of Arabic origin. Gandolf, on the other hand, is not linked to this area, but is found in another placename in Malta, which is linked by Wettinger (2000: 168) to a personal name or surname.
Tal-Ponta	The place name tal-Ponta is nor found directly in Wettinger (2000), though he does translate the place name 'Tal-Punta' in another locality as the headland (Wettinger 2000: 425).
Il-Bur ta' Dingli	Il-Bur is a common place name in the Maltese Islands, and is used to describe a meadow (Wettinger 2000: 74). Usually, this place name is followed by another noun, so that these meadows are distinguished. This placename is not mentioned in Wettinger (2000). However the name 'Dingli' is linked to a Maltese surname, which Wettinger (2000: 274) links to the Nubian town of Dongola.

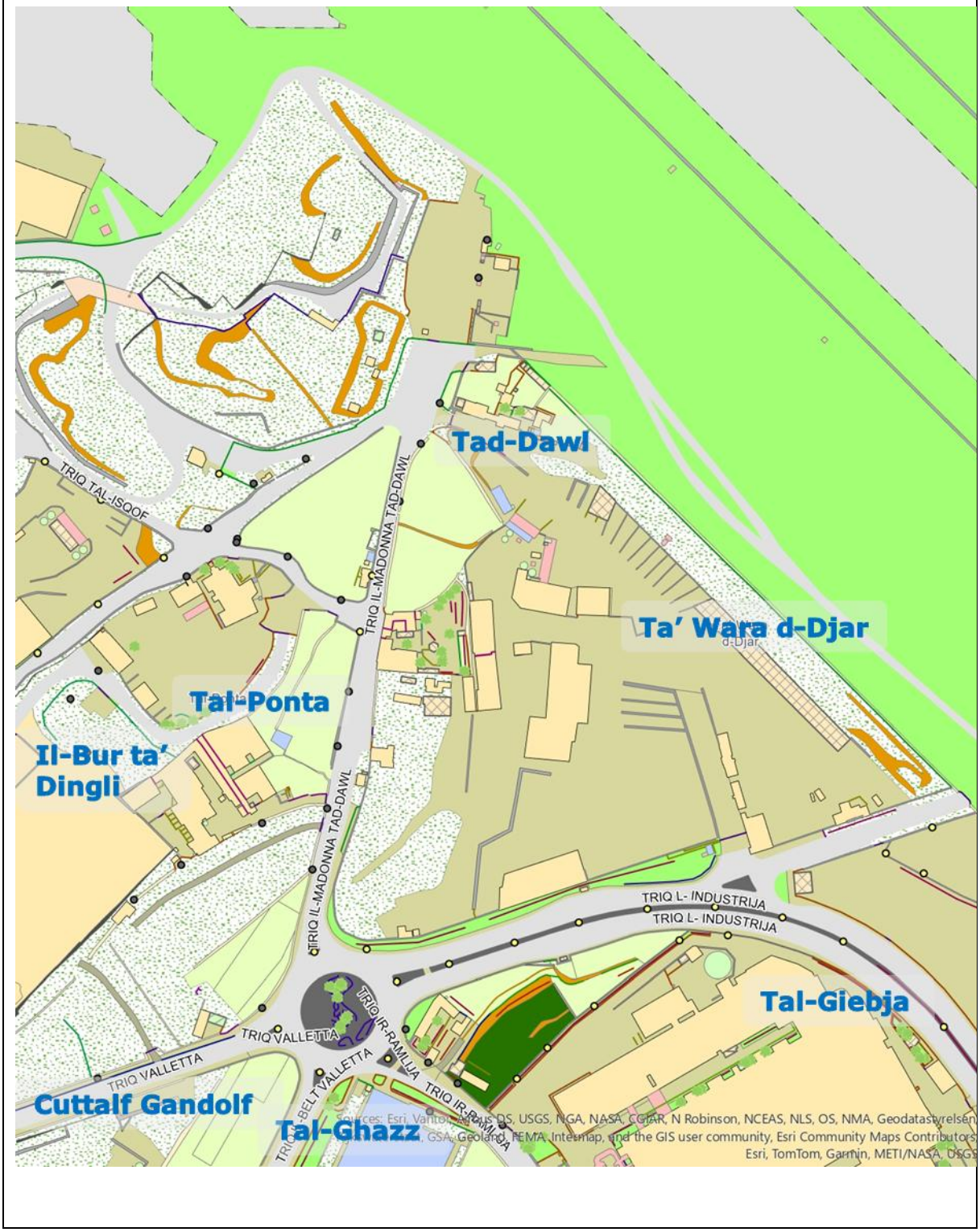

Figure 2: Location of Place Names covered by this study

3.2 Historical Importance of the Area

A cursory look at the SCH GIS interface, reveals that the area of proposed development is surrounded by a number of cultural features, some of which are quite unique and particular reflecting the gradual and largely spontaneous development of the settlement of Ħal Kirkop, mostly originating from a small number of houses and hamlets established along the crossroads connecting several neighbouring and larger villages. These routes linked Mqabba to the northwest, Luqa to the north, Gudja to the northeast, and Qrendi and Żurrieq to the southwest (**Figure 3**). The convergence of these roads at the centre of Ħal Kirkop suggests that the village developed as a nodal point within the local rural network, facilitating communication, movement, and interaction between the surrounding settlements. The surrounding landscape, however, was not only defined by its position within this network of routes but also by the presence of extensive deposits of high-quality globigerina limestone, a resource that would later underpin significant quarrying activity in the area (Bonanno & Vella 2000:1).

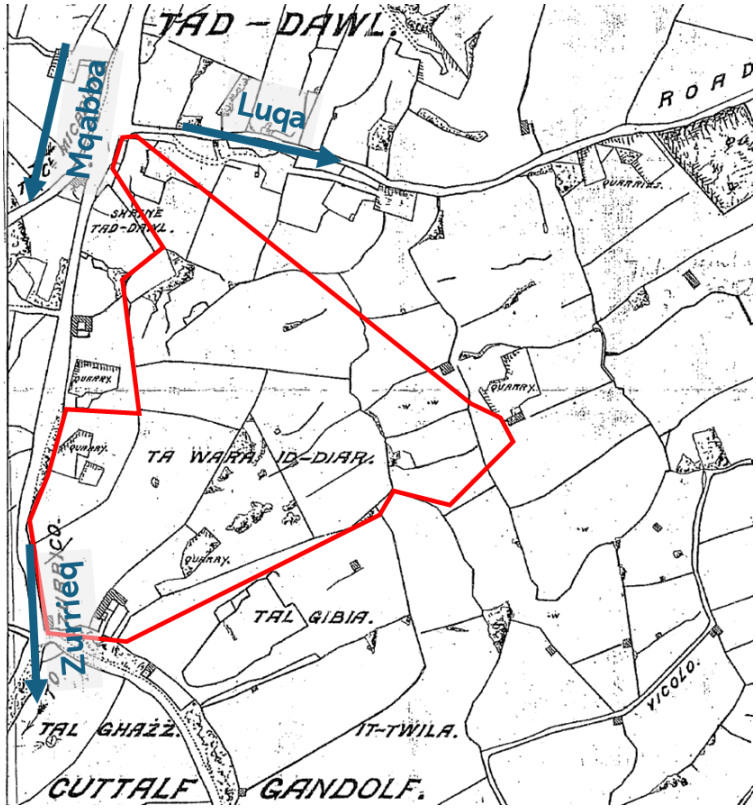

Figure 3: Location of the proposed site of development in relation to the crossroad leading to the neighbouring settlements of Ħal Kirkop (1912 SS)

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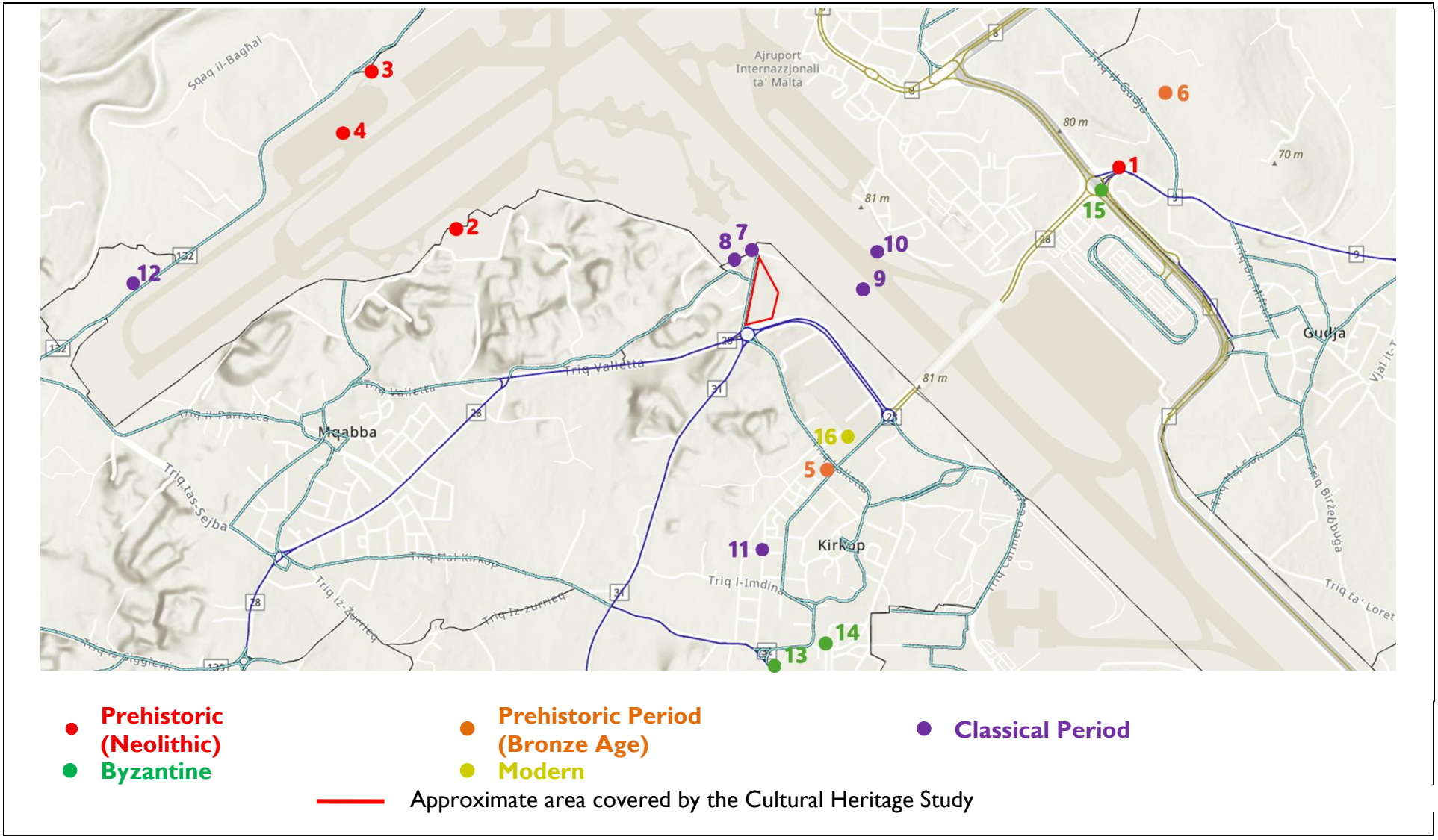


Figure 4: Documented Historical and Cultural Features affecting the area of the proposed development

Ref. to Fig. 4	Description	Site	Period
1.	Megaliths	Ħal Resqun	Prehistoric (Neolithic)
2.	Burials	Burmegħeż	Prehistoric (Neolithic)
3.	Megaliths	Id-Debdieba 1914	Prehistoric (Neolithic)
4.	Burial, silos, megaliths, cart ruts	Id-Debdieba 2019	Prehistoric (Neolithic)
5.	Megalith	Ħal Kirkop	Prehistoric (Bronze Age)
6.	Archaeological Deposits	Tal-Mejtin	Prehistoric (Bronze Age
7.	Agricultural Villa	Tad-Dawl	Classical
8.	Rock-tombs	Tad-Dawl	Classical
9.	Rock-tomb	Ir-Ramlija	Classical
10.	Rock-tombs	Malta International Airport	Classical
11.	Rock-tombs	Tal-Imdiek	Classical
12.	Tower	Tal-Wilga	Classical
13.	Rock-tombs	Sqaq tal-Harruba	Classical (Early Christian)
14.	Rock-tombs	Safi RAF Station	Classical (Early Christian)
15.	Rock-tombs	Hal Resqun	Classical (Early Christian)
16.	St Nicholas Chapel and Cemetery	Kirkop	Early Modern

Table 3: List of Cultural Features in the area of study

3.2.1 The Prehistoric Period

3.2.1.1. The Neolithic Period

The area surrounding Ħal Kirkop forms part of a wider archaeological landscape that preserves evidence of human activity dating back to prehistory. Less than one kilometre from the village are the megalithic remains located along Dawret il-Gudja Road, in the vicinity of the church of Santa Marija at Bir Miftuħ (**Plate 1; 1** in **Figure 4**). In this area, only a few metres from the church, the remains of another possible megalithic structure composed of three large megaliths have been recorded near a cistern.

Closer to the area of proposed development lies the site of Burmeghez (**2** in **Figure 4**). First discovered in 1911, with further discoveries made until 1935, the area yielded the burial of 39 individuals, associated with Temple Period Ceramics (Mercieca-Spiteri et.al. 2025: 80). Another prehistoric site, first discovered in 1914, then further investigated in 2019 is Id-Debdieba (**3** and **4** in **Figure 4**). The site was initially dated as a Prehistoric site, based on only a week-long investigation carried out by Thomas Ashby and Temi Zammit (Mercieca-Spiteri et.al. 2025: 81). The development-led archaeological investigation of 2019 determined the presence of a collapsed megalithic structure and postholes cart-ruts, and silo-pits (Mercieca-Spiteri et.al.2025: 82-83). One of the silo-pits contained the burial of an adolescent, accompanied by animal bones and pottery sherds darting to the Temple Period (Mercieca-Spiteri et.al. 2025: 85-86). Other silo-pits also yielded Temple Period pottery sherds

(Mercieca-Spiteri et.al. 2025: 89). This site poses questions as to the initial uses of the pits, possibly for dyeing or waste disposal, which were later used for burial (Mercieca-Spiteri et.al. 2025: 92).

The prehistoric landscape of the area is therefore rich and varied, especially when one keeps in mind that Ħal Kirkop lies between three major Late Neolithic megalithic complexes dating to around 3800 BC, namely Tarxien, Ħaġar Qim, and Mnajdra (Bonanno & Vella 2000:1).

Plate 1: The Ħal Resqun megaliths (source: Daniel Cilia from https://cdn-attachments.timesofmalta.com/local_02_temp-1505451648-59bb5e80-620x348.jpg**)**

3.2.1.2 The Bronze Age

Evidence from later prehistoric periods is also present within the immediate landscape of the proposed area of development. At the edge of the village of Ħal Kirkop stands a Bronze Age menhir dated to around 2000 BC (**5 in Figure 3; Plate 2**). This consists of a large solitary upright megalith not directly associated with any surviving structural remains. The stone is described as a roughly cut soft building stone of a quality similar to that found in the surrounding area. It rests on solid rock at road level and, for a height of 0.915 m, forms part of the boundary wall of an adjoining field (MAR 1913–14:4).

Originally, it must have measured approximately 0.915 m in width, 3.20 m in height, and 0.455 m in thickness. In its present state, one of the sides has been cut away so that the monolith tapers towards the upper end, reducing the upper surface to a square measuring only 9 cm. On this surface there is a small pedestal 0.455 m high on which a stone cross, now broken, once stood. This cross served for a time to mark the boundary of the parish, and the monolith is locally known as *Is-Salib* ("the cross") (MAR 1913–14:4).

Plate 2: The Ħal Kirkop menhir

At about 300 m to the NE of the Ħal Resqun megaliths is the site of Tal-Mejtin (**6** in **Figure 4**). This site consists of a number of pits dating to the Early Bronze Age as shown from the retrieved pottery vessels (**Plate 3**). Excavated in 1959 and 1960 (Evans 1971: 24) and later in 2008 (SCH 2008: 17), these pits were first used in the Bronze Age, and some of them were then reutilised in the Classical Period (Evans 1971:24).

Plate 3: Pottery from the Excavations of Tal-Mejtin

(http://fototeka.heritagemalta.org/img/2953/12504.tif.thumb.jpg)

3.2.2 Classical Period

The word 'Classical' is an umbrella term for the period that includes Phoenician, Punic, Roman and Early Christian remains in the context of Maltese archaeology. Cultural features from this period, are sometimes utilised from one phase to the next and therefore it is more cautious to classify them under this term. There is a consensus among scholars of this period who mostly agree that the Islands' culture essentially remained Punic, until at least the first century BC (Cardona 2021a: 232). Basically, pottery manufacturing techniques, coinage, religious practices and language remained Punic until this period (Cardona 2021a: 232).

Archaeological finds related to this period can be classified in three main categories: domestic or industrial, e.g., villas; ritual sites, that is temple sites and sanctuaries; and funerary, mostly in the form of rock-cut tombs.

3.2.2.1 Domestic and Industrial

Most of the Roman estates or villas "replaced or continued earlier agricultural enterprises that pre-existed the Roman presence, namely those of Punic or Carthaginian hegemony over the islands" (Bonanno 2018: 255). The spread of such villas in the Maltese Islands, a number of which are found in the southern part of Malta as shown in **Figure 5**, shows a well-organised exploitation of the natural resources at the time. While these villas were not richly adorned like the Roman house of Rabat on the outskirts of modern day Mdina, "the owners of these villas could well have been high-status Romans or Italians or businessmen (*negotiatores*) with enough capital to buy a piece of land, planting it with vines or olive trees and building a sturdy house equipped with the heating facilities for domestic bathing and with the required apparatus for olive oil (and possibly wine) pressing" (Bonanno 2018: 258).

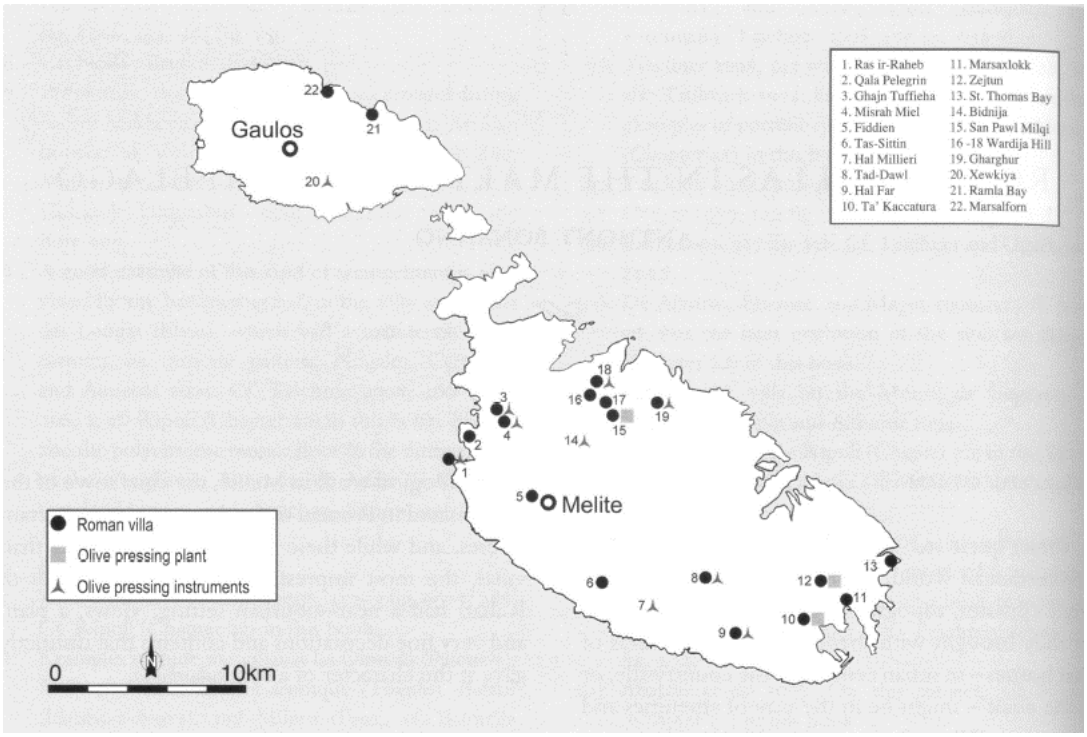


Figure 5: Distribution of the main Roman Villas in the Maltese Islands (source: Bonanno 2018: Map 11, Pg 256)

In close proximity to the area of proposed development, the remains of a villa were recorded and excavated in 1898 by A.A. Caruana (Bonanno 2018: 262-263). The remains were

uncovered in a field known as Nadur, formerly called *Fejdes-iz-Żgħir*, situated between the villages of Ħal Luqa and Mqabba, about five miles south of Valletta (Bonanno & Vella 2000:8; Caruana 1898, 1–3). The site (**7** in **Figure 4**; **Figure 6**) belonged to an agricultural villa and yielded a well-preserved *trapetum* (olive-pipper), which was taken to the Roman Villa in the 1950s by Sir Temi Zammit (Cardona 2021a: 237).

Excavations revealed part of the basement of a large rural structure constructed with carefully dressed stone blocks laid in regular courses, suggesting a farmstead or agricultural installation rather than a monumental building (Caruana 1898, 1–3).

Among the principal features uncovered were two large water reservoirs, stone crushing mills, troughs, channels, and a large storage vat, indicating installations connected with olive processing and oil production. Other spaces may have served as storage areas or animal pens, suggesting that the structure formed part of a wider agricultural complex within the Tad-Dawl landscape (Caruana 1898, 1–3).

Overall, the discovery provides important evidence for intensive agricultural activity in the Tad-Dawl area, highlighting the presence of a significant rural installation within this part of the Maltese countryside (Caruana 1898, 1–3).

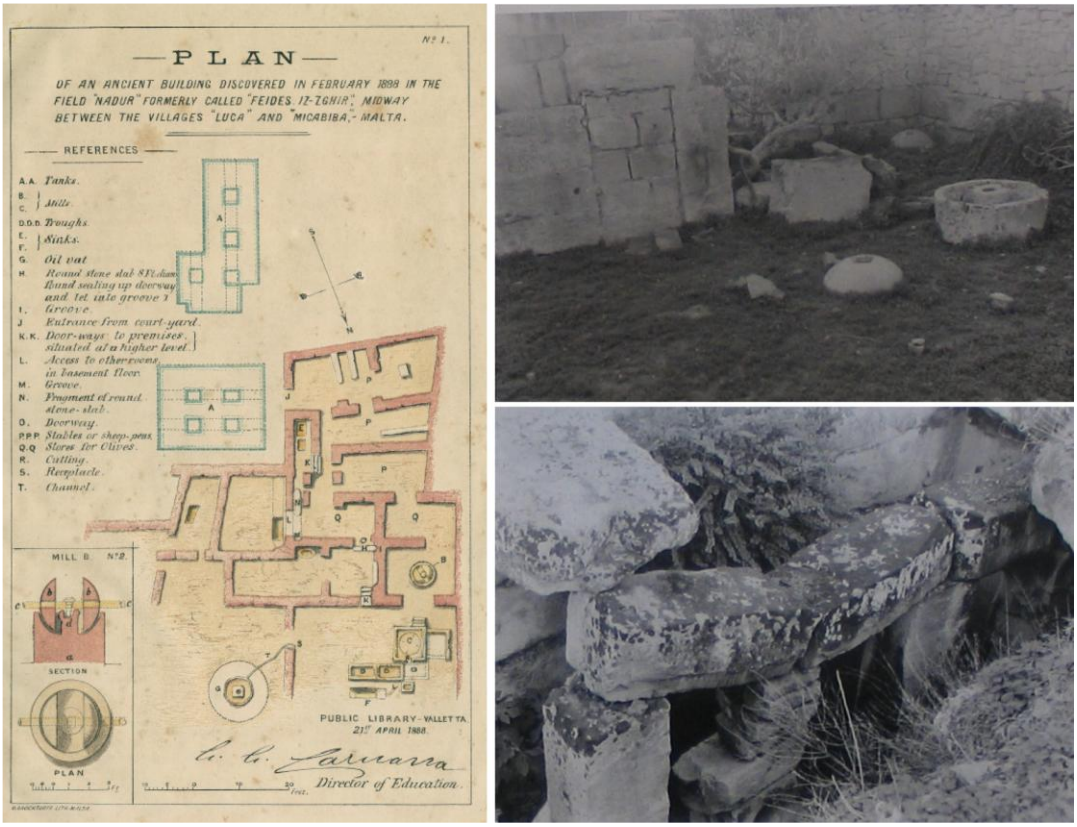


Figure 6: Caruana's plan and remains (reproduced from Cardona 2021)

Just about one kilometre from Ħal Kirkop, along Żurrieq Street in Ħal Safi (**Plate 4**), there are the remains of a wall that probably date to the Roman period. The remains consist of a straight wall measuring more than 20 m in length, of which only two courses survive. The blocks measure approximately 1.08 × 0.45 × 0.45 m, dimensions typical of Punic and Roman

ashlar masonry (Bonanno & Vella 2000:8). Excavations carried out nearby on Żurrieq Road, Safi also revealed part of a Roman building, including the floor and foundations of a room together with a T-shaped arrangement of rough foundation blocks. The remains were found at depths between 0.44 m and 1.28 m, although the site had been disturbed and very little pottery was recovered. (MAR 1967: 7)

Plate 4: Roman Wall at Safi

These remains further illustrate the extent of Roman presence in this area, which was likely centred on agricultural activity, particularly farming and olive oil production (Bonanno & Vella 2000:8).

3.2.2.2. Funerary

The main finds related to the Classical Period in the Maltese Islands are Punico-Roman tombs and Hypogea. The Punic period ranges from the 2nd half of the 8th century BC up to the end of the 1st century AD. Although in 218 BC the Maltese archipelago fell under Roman rule, "the indigenous late Punic culture survived here for at least another two and a half centuries" (Said-Zammit 1993: 157). Therefore, such tombs range from Phoenician to Early Christian. They were cut in the rock so as to bury the remains of the local inhabitants, together with pottery and other items. Most of these tombs were looted before their discovery in recent times. Such tombs occur both in groups as well as in isolation (Said-Zammit 1993: 157). There are 4 main tomb types – shaft and chamber, shaft tomb, chamber tombs, grave-pit (Said-Zammit 1993: 159). The shaft and chamber tomb was the most common with "the burial chamber, which was usually of a rectangular or an oval form, was preceded by an open shaft. This was generally rectangular in form and had an average length of 1.7 m, an average width of 0.8 m and an average height of 1.5 m" (Said-Zammit 1993: 158). Shaft tombs or chamber tombs were the least common (Said-Zammit 1993: 158). Where internment occurred in a grave-pit in the rock or soil, this was usually intended for cremation burials (Said-Zammit 1993: 159). Burial sites were "generally cut in gentle slopes and where outcrops of Upper Coralline or Globigerina Limestone prevailed" (Said-Zammit 1993: 160).

While almost half of the Punic tombs have been found around Rabat and Mdina, denoting the presence of the main settlement(s) there, clusters in other areas would have been associated with other settlements, possibly smaller ones like for example rural hamlets (Said-Zammit 1997: 4). Apart from the use of the funerary contents to date the burials, important data related to population changes and trade in the period can be inferred from the finds within the tombs.

Figure 7 reproduced from Said-Zammit (1993) shows that the presence of country villas, and tombs in the SE of Malta is relatively dense. The area of proposed development lies in the middle of this activity combining agricultural and burial practices, does denoting intense human activity in the Classical Period.

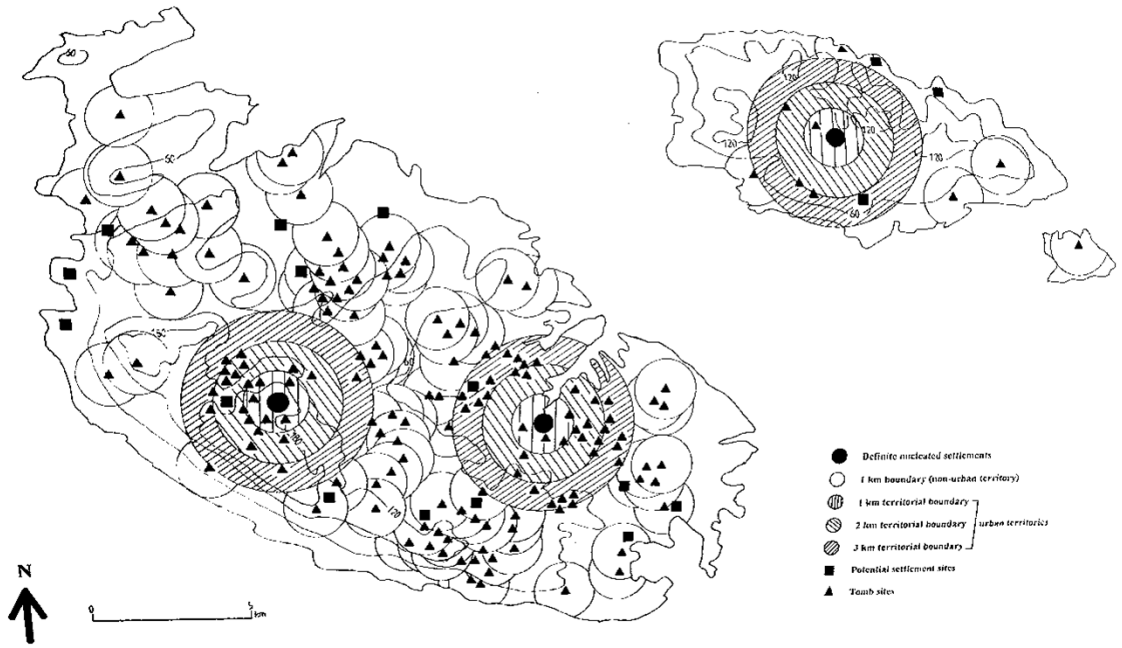


Figure 7: Distribution of Punic tombs and settlements from Said-Zammit (1997: fig. 27)

The closest tomb to the area of development was the one found at Tad-Dawl, south of the road leading to Mqabba, near a small chapel dating to the time of Grand Master Pinto, referring to **IMD2026/012** (**8** in **Figure 4**). The site overlooks a quarry known as *il-Għalka tal-Miss* within the area called *Ta' Guttaf Gandolf*. Much of the surrounding cemetery had already been destroyed by quarrying activity. The excavated remains consisted of a forecourt leading to two funerary chambers: one rectangular chamber with rounded corners and a longer, irregular chamber connected to a second damaged space. A niche cut into the forecourt—likely intended to hold cinerary urns—was found empty. Although no major artefacts were recovered, pottery fragments of typical Punic type, together with glass and bronze objects, allowed the tomb complex to be dated to approximately the 2nd–3rd century BC (MAR 1910–1911: 9).

In 1928 at Ta' Brillu or Ir-Ramlija (**9** in **Figure 4**) a tomb was surveyed in August 1928 with the assistance of E. B. Vella, and consisted of a rectangular shaft measuring approximately 1.2 m deep and 1.5 m wide, with four steps cut along the eastern side providing access to a concave burial chamber (MAR 1928–1929: 4–5). The chamber, entered through a narrow opening of about 0.6 m, widened internally and contained a trench cut along its axis as well as a small lamp niche in the wall. Fragmentary bones of a young individual and several sherds of

late Punic funerary pottery were recovered from the debris filling the chamber (MAR 1928–1929: 4–5).

During works carried out at the Malta International Airport in 2022-2023 (**10** in **Figure 4; Plate 5**), four shaft and chamber tombs were discovered (SCH 2023: 19-20). These tombs, three of which followed the typical and shaft and chamber plan, were looted and devoid of artefacts.

Plate 5: Shaft and chamber tombs discovered at MIA in 2022-2023 (SCH 2023)

A farther rock-cut tomb was discovered on 19 April 1943 in a field known as *Tal-Imdiek*, to the west of Ħal Kirkop (MAR 1946-47:6). Located 800m to the south of the proposed area of development in the corner of today's Triq tal-Frieres with Triq Karlu Darmanin (**11** in **Figure 4**), this tomb (KRK1943) had already been opened and thoroughly disturbed, with the cavity filled with stones and red earth. Cut into the globigerina limestone, it comprised a shaft oriented along a north-east–south-west axis, measuring approximately 2.7 m in length, 1.2 m in width, and 2.1 m in depth, with six steps descending along the south-western side. A rectangular entrance measuring 1.07 m in height and 0.74 m in width led into a burial chamber measuring roughly 2.1 m by 1.5 m, with a height of 1.35 m. The chamber contained a central trench cut into the floor and a small lamp niche in the north-western wall. Only a few

fragments of human bone and small sherds from funerary pottery were recovered (MAR 1946-47:6).

Such discoveries point out to a thriving and socially organised community in the area of study.

3.2.3.3 'Roman Tower'

A particular feature mainly characteristic of the SE of Malta are the Roman towers, found at Ta' Gawhar, Tat-Torrijiet, Tal-Bakkari, Ta' Wilga and Tas-Santi (**Figure 8**). Ta' Wilga located to the ENE of the site of the proposed development (**12** in **Figure 4**), was excavated in 1910 (**Figure 9**) and inside its chamber Punic pottery was discovered, as well as a rock-cut shaft tomb in its close proximity (Degaetano 2002: 7). The topography of the area and its proximity to the Tad-Dawl villa, following a similar typology in the case of other towers, suggests that this structure was used as a fortification to guard the groves and fields of the area (Degaeatano: 44; 76).

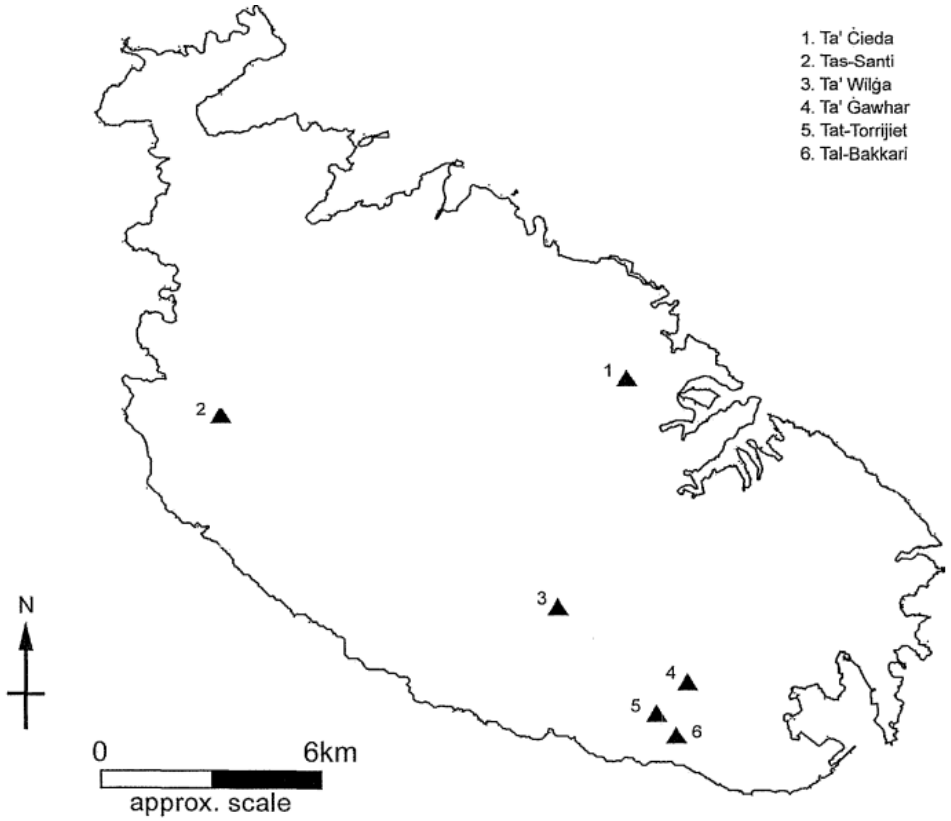


Figure 8: Location of Roman Towers reproduced from Dagaetano

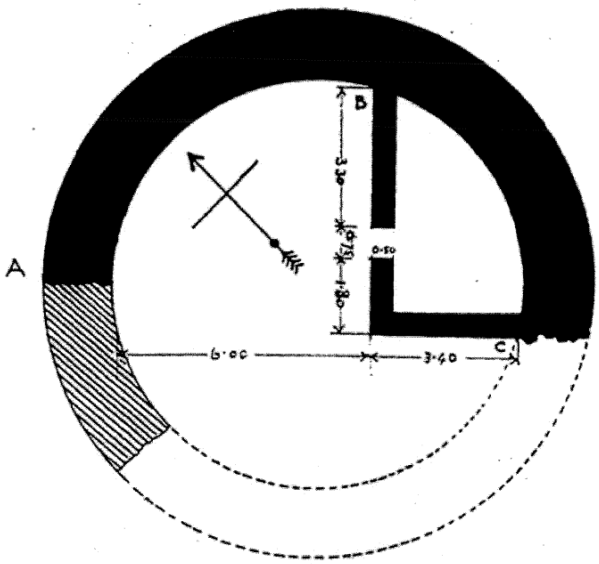


Figure 9: Plans of the Remains of Ta' Wilga (Ashby 1911)

Plate 6: Remains of Ta' Wilga Tower

3.2.3.4 Byzantine Period

The tradition of rock-cut tombs continued well into the Roman Era and the Christianisation of the Maltese islands. In fact, Early Christian burial sites in Malta were "were grafted to a deeply rooted indigenous tradition of rock-tombs and they were often given a Maltese interpretation and moulded to local requirements" (Buhagiar 1984: 3).

The first catacombs in the Ħal Kirkop area date to approximately the 4th–5th centuries AD, a period associated with the and early Byzantine phases in Malta. Several catacombs are known in and around the village, although some have since been lost. These burial complexes provide valuable evidence for the presence of small Christian communities living within a predominantly rural landscape (Bonanno & Vella 2000:9).

On 25 March 1943, a catacomb was discovered in a field at Sqaq tal-Ħarruba, Ħal Kirkop, during military levelling works. This has been located by Cassar (2016) as in the vicinity of today's St Benedict College in today's Triq San Gwann (approximately **13** in **Figure 4**) (Cassar 2016: 128-129). The complex had already been disturbed in antiquity and was found filled with rubble. Access was through a rock-cut shaft with seven steps, measuring approximately 2.44 m in length, 1.04 m in width, and 2.44 m in depth, originally sealed by a large stone slab (MAR 1946–47: v). A rectangular entrance led to a straight gallery with two window-type burial chambers, which continued into a second passage containing five additional chambers, giving a total of seven burial chambers. Each chamber was raised above the floor and provided with a rock-cut headrest, reflecting typical Late Roman catacomb burial practices (MAR 1946–47: v–vi; Buhagiar 1986: 254–255).

Another catacomb was discovered in 1962 (KRK 1962) during works near the RAF Station Safi preserved in situ in Triq taz-Zebbiegh (**14** in **Figure 4**). The complex consisted of a small entrance chamber with steps leading to two burial chambers, each intended for two individuals. The tomb had been disturbed earlier when a nearby Second World War air-raid shelter broke into part of the chamber. Nevertheless, human bones and fragments of Late Roman lamps, some bearing the Chi-Rho monogram, were recovered, confirming the Christian character of the burial and suggesting a date in the 4th–5th century AD (MAR 1962: 6, fig. 6).

Another important catacomb in the vicinity, at Ħal Resqun (**15** in **Figure 4**), is notable for its engraved reliefs executed in a naïve style. These carvings appear to represent Biblical scenes, including a human figure with open hands surrounded by animals and fish, possibly alluding to the Creation narrative, as well as two large birds—likely pelicans feeding their young, a common early Christian symbol of sacrifice and charity (Bonanno & Vella 2000:10).

Together, these catacombs illustrate the presence of small rural Christian communities occupying the landscape around Ħal Kirkop during Late Antiquity.

3.2.3 Medieval Period

For the years following the end of the Byzantine presence in Malta in 870 AD there is sparse documentation and "the majority of the tenth century Muslim sources concerning Malta are silent on the period between 870 and 1048. One of the handful of known sources dating to this period [Al-Himyarī's account translated by Brincat 1995] hints at Malta being an uninhabited island containing large flocks of sheep, wild donkeys and an abundance of honey" (Dalli 2006: 27). While it is unlikely that Malta was totally depopulated during this period (Luttrell 2002: 100, Molinari and Cutajar 1999: 9-16, Cutajar 2004: 58, Dalli 2006: 57-60), a drastic decline in population number is not improbable (Brincat 1995: 21).

While documentation for Medieval Malta is relatively scarce when compared to other historical periods and other European states, there is a further scarcity in the documentation of "rural settlement during the Byzantine and Arab periods" (Cutajar 2004: 60). Moreover, the comparative lack of archaeological finds related to this period from the countryside as

related to finds in Mdina and Cittadella might suggest "that the Maltese rural landscape was up to the eleventh century relatively unencumbered with human settlement" (Cutajar 2004: 60).

The area of study, however, has a relatively large amount of evidence pointing to intense settlements. The 1419 Militia List discovered by Prof. Godfrey Wettinger (1969) is one of the most important documents about Malta in the Middle Ages since it "gives us by far the best evidence so far discovered of the general distribution of the population of Malta so early in the fifteenth century. In that respect there is nothing superior or even equal to it until the later years of the sixteenth century, when the long series of population estimates starts" (Wettinger 1969: 82). The militia list refers to the adult male population between the ages of sixteen and sixty-five who did not live at Birgu or in Gozo (Wettinger 1969: 83). These men acted as guards of the coastal areas and the list mentions them in person according to the village they hail from (Fiorini 1994: 10). Of these, 30 from *Gudia* (Gudja), 27 from *Luca/Farrug* (Ħal Luqa and Hal Farrug), 21 from *Micabibe* (Mqabba), 18 from Safi, 61 from *Zuricu* (Zurrieq) and 16 from *Precopu* (Ħal Kirkop).

Although not located within Ħal Kirkop itself, on the western side, about 1 km away, stands the church of Ħal Millieri, built around the mid-15th century. This church was one of four that once served the medieval village of Ħal Millieri, a settlement that has since disappeared and which was situated between Mqabba and Żurrieq (Bonanno & Vella 2000:10). Excavations carried out at the same church in 1977 revealed the remains of an earlier structure beneath it, dating to around the mid-13th century (Bonanno & Vella 2000:10). One may therefore wonder whether this church served communities living in the surrounding area, possibly including those inhabiting the landscape around Ħal Kirkop, or whether other churches once existed in the vicinity that have since been lost as is suggested by Mercieca-Spiteri (2025: 299), describing the landscape in this area as "rich in small hamlets centered around chapels".

3.2.4 The Order of St John

The first printed map in which the Maltese Islands are featured separately, rather than in the same page as Italy or North Africa, for instance, dates to 1536 (Soler & Ganado 2013: 16). In this map by Quintinus (**Figure 10**), a number of small villages and two religious buildings to the SE of Malta are marked. Most probably these are the churches of Bir Miftuħ and St Catherine. There is no reference to Hal Kirkop or the nearby villages in this map.

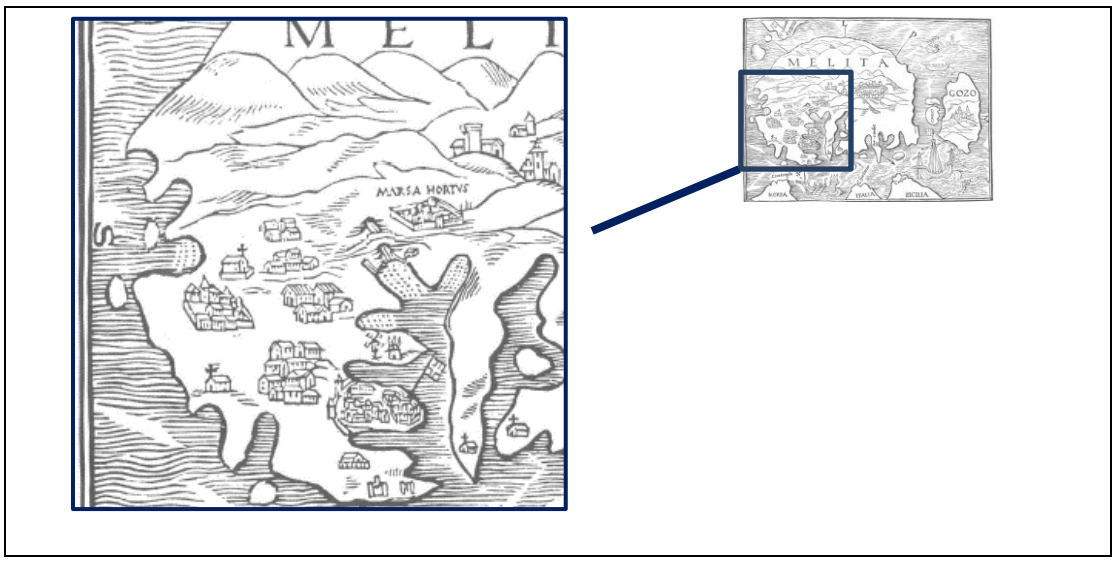


Figure 10: Chapels of Bir Miftuħ and St Catherine in the 1536 Map of the Maltese Islands by Johannes Quintinus

The father of Italian cartography, Giacome Castaldi, signed a map of the Maltese Islands in 1551 (Ganado & Schirò 2016: 69). In this map the area is only marked by very sparse settlement, which are not named. (**Figure 11**).

Figure 11: Detail from the 1551 Castaldi map, showing unnamed settlements in the western part of Malta

Another map dated to 1551 by Antonio Lafreri (**Figure 12**) is more detailed with *Alhaxac* (Hal Ghaxaq), *B'lmestu* (Bir Miftuh), *Crendi* (Qrendi), *Godia* (Gudja), *Luca* (Ħal Luqa), *Mekabebe* (Mqabba), *Meleri* (Hal Millieri), *Saphi* (Safi) and *Zuric* (Zurrieq) being mentioned (Ganado & Schirò 2016: 90). Ħal Kirkop had too small of a population, and was not even a parish at this time to be mentioned.

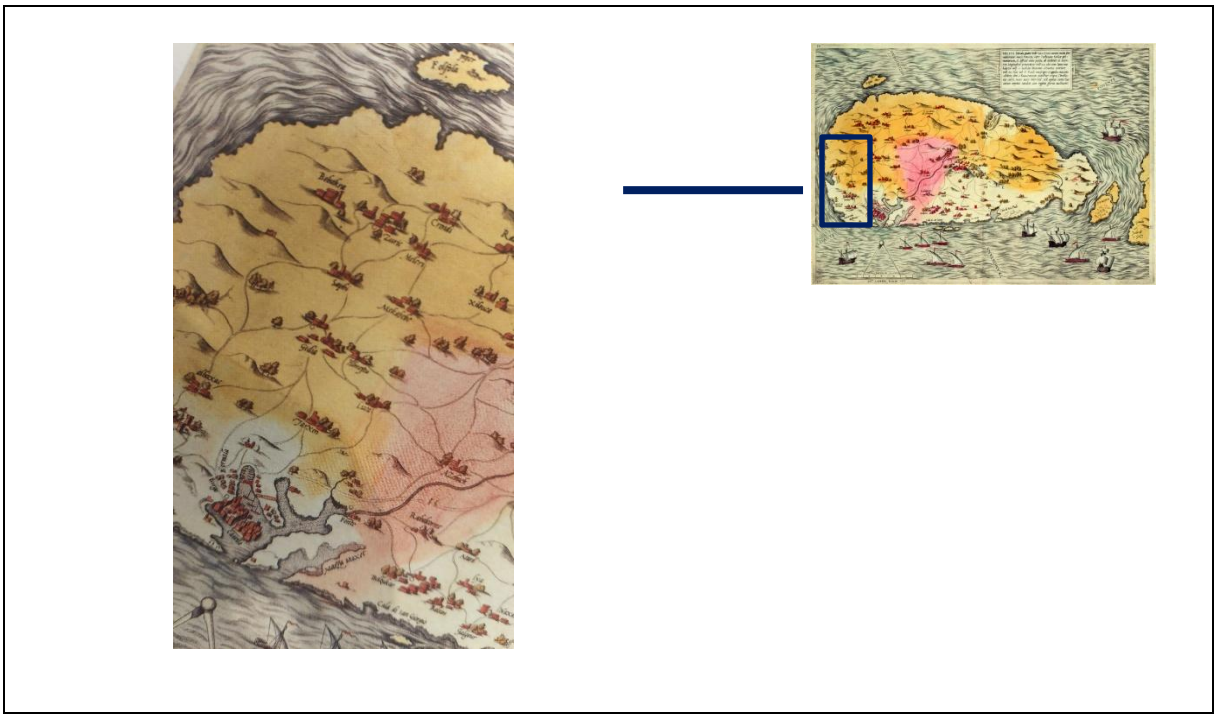


Figure 12: Detail from the 1551 Antonio Lafreri map, showing *Alashac, S Catharina* and *Bisbout*

The map in Perez D'Aleccio's cycle of frescoes of the Great Siege at the Grandmaster's Palace in Valletta, shows further detail, possibly because, with the advent of the Order of St John came certain economic and social stability which led to an increase in population. The frescoes executed in the 1570s and 1580s to depict the Order's victory over the Ottoman's siege of Malta in 1565, shows details of a number of villages in the SE of Malta including C.Corcop (Hal Kirkop) (**Figure 13**), but also a number of individuals carrying on with their daily activities. These included a hunter and his child chasing hares *at Santa Maria di Loreto* (near Gudja), and a farmer behind an ox tilling the land between *Casal Asciac* (Ħal Għaxaq) and *Casal Gioan* (Ħal-Ġwann, Żejtun), together with a number of figures walking along the road network.

There is no doubt that this part of Malta was agricultural in nature. This is also attested by place names of the localities, which even near the area of proposed development refer to irrigation, like tal-Giebja and Il-Bur. Most of the land near Hal Resqun belonged to the Curia (Wettinger 1981: 4) as is attested by the place name Tal-Isqof to the north of the proposed area of development, now mostly covered by the airport and terminal.

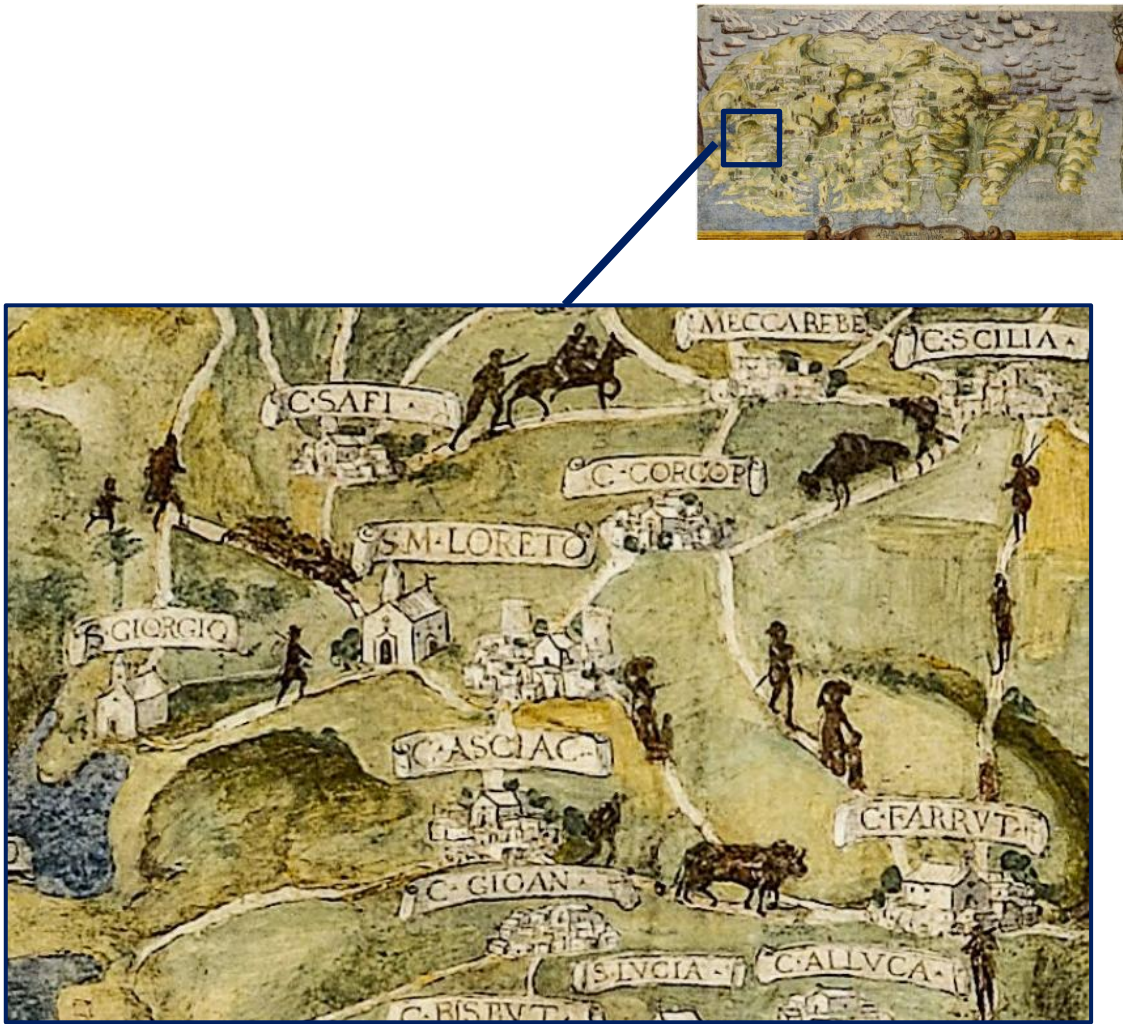


Figure 13: Settlements in the SE of Malta from the map by Perez D'Aleccio

The 1575 report of Mgr. Pietro Dusina, who was in Malta as Apostolic Visitor "forms a milestone in Maltese History on account of its far-reaching effects on the social and religious life of the Maltese people" (Cassar-Pullicino 1951: 398). Based on Dusina's records there were 50 households in Hal Kirkop (Fiorini 2000: 37). During his visit he noted the church of the Assumption, the church of St Leonard, the church of the Annunciation, and that of St Nicholas (Fiorini 2000: 37-38), whose remains recorded in the SMLP seem to be no longer extant but which are closest to the area of proposed development (**16** in **Figure 4**).

Ħal Kirkop obtained the status of a parish in 1592, upon the death of the rector of Bir Miftuh. The parish now included Ħal Kirkop, Safi and Mqabba, operating from the church of St James in Ħal Kirkop (Fiorini 2000: 42).

3.2.4.1 The Shrine dedicated to the Madonna tad-Dawl

The place name of the area originated from the location of a shrine dedicated to the Madonna tad-Dawl. Located on the crossroads of the road network linking Ħal Luqa, Mqabba, Zurrieq and Ħal Kirkop, the shrine was built during the reign of Grandmaster Pinto in 1741 (Bonnici 2019: 147). It consisted of a portico with three arches and contained a painting of the Madonna in middle arch, with statues of St Andrew and St Peter on each side (**Plates 7** and **8**). The

portico adorned by Pinto's coat of arms was a landmark in the area, and was also used by the Dejma to store their equipment (Bonnici 2019: 147). As shown in Plate 8, there was great devotion towards the statue, mostly maintained by families from Ħal Luqa (Bonnici 2019: 147). which was still intact until 1937, when a petition to the Maltese diocese was made for its restoration. However, the shrine was not meant to be restored, since it was dismantled during the Second World War due to vehicle manoeuvres in the area.

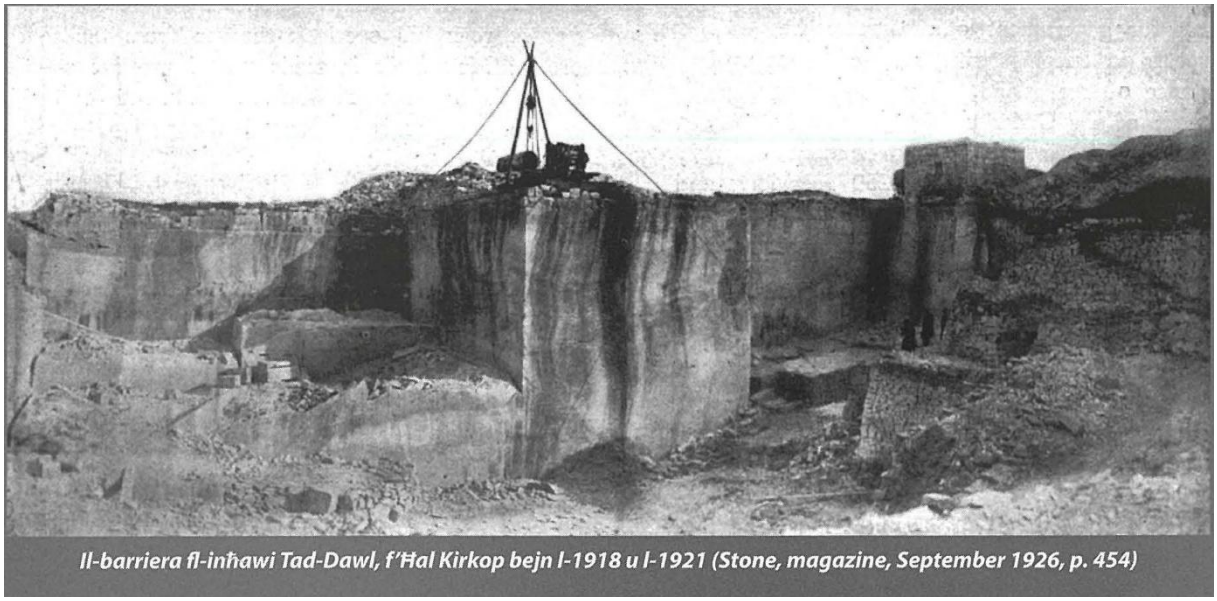
Plate 7: The shrine of the Madonna tad-Dawl source: https://www.facebook.com/zurriequlmadwar/photos/il-kappella-ftit-%C5%BCmien-qabel-twaqqg%C4%A7etthe-shrine-before-it-was-demolished/247798900471964/?set=a.155411510458444

Plate 8: The shrine of the Madonna tad-Dawl at the cross roads https://www.facebook.com/photo?fbid=10160797906341091&set=gm.2695242940642837&idorvanity=556886211145198)

3.2.5 The Modern Period

3.2.5.1 Quarrying Practices

The area known as Ta' Wara id-Djar contains a number of quarries (**Plate 9**). Ħal Kirkop, like the surrounding villages of Safi, Qrendi, Żurrieq, Siġġiewi, and Dingli, is characterised by a landscape dotted with quarries, attesting to the intensive quarrying activity historically associated with this region (Balm 1996: 83). In this southern part of Malta, vertical-sided quarries are a common feature of the landscape.



Il-barriera fl-inħawi Tad-Dawl, f'Ħal Kirkop bejn l-1918 u l-1921 (Stone, magazine, September 1926, p. 454)

Plate 9: Quarries at tad Dawl Ħal Kirkop (Carbone 2016: pg 141)

During the period of the Order of St John, quarrying was already an established activity, and possibly even before as attested on several occasions in the Maltese archaeological record. Blouet (1963: 261) notes that the most widely employed building material was *franka*, extracted from the Middle Globigerina Limestone formation. Much of this stone was quarried principally in the areas around Ħal Luqa and Naxxar. Limestone has long been used as a building material in Malta due to its favourable physical properties, particularly its relative softness when freshly quarried, which allows it to be easily cut and worked before hardening upon exposure (Blouet 1963: 261).

Ħal Kirkop retains a strong heritage associated with quarrying, which for many years provided the livelihood for numerous villagers. Some of these quarries date back to the period of the Order of St John, while during the twentieth century the *franka* extracted from Ħal Kirkop was highly sought after for building construction. During this period several families from the locality owned and operated quarries, employing workers from the surrounding area (Carbone 2016: 150–151).

Joseph Carbone's ethnographic research (Carbone 2016) records the testimonies of several former quarry workers from Ħal Kirkop, providing valuable insights into quarrying practices and labour conditions during the twentieth century. Frenċ Grech (born 1934), recalled that he began working at a young age as a *trinkatur* (trench cutter), the quarry worker responsible for cutting the trench around a stone block prior to its extraction. He worked in the quarry

owned by Nardu Chircop, known locally as Ta' Pupull, while his brother Nardu was also employed in the same occupation. Grech remembered a number of quarries operating in the area, including Ta' Ċacca, Tal-Pisutt (in Żurrieq), Ta' Żeppi Farrugia, Tal-Masturdaxxa, Ta' Nardu Chircop ta' Pupull, and those belonging to the Farrugia brothers—Salvu, Mikiel, and Indri ta' Ħurxinu. Other quarries mentioned included Ta' Żaren Attard, Taż-Żlieq, and Ta' Furti, most of which were located in the areas of Tar-Ramlija, Ramlija Road, Ix-Xagħra Road, and Valletta Road.

According to Grech, a quarry known as l-Għalqa ż-Żgħira (literally "the small field") was situated in an area now known as Misraħ Żerniq, and the stone extracted from this quarry was reportedly used in the construction of the parish church of St Leonard in Ħal Kirkop (Carbone 2016:151).

Other testimonies collected by Carbone further illustrate the demanding nature of quarry labour. Leonard Vella, who also worked as a *trinkatur* in a quarry belonging to Mikiel, known locally as ic-Ċeviku, recalled the difficult working conditions experienced by quarry workers. Labourers typically worked from dawn until nightfall for a wage of approximately £M1.20, and when work was interrupted by bad weather they were not paid (Carbone 2016:151). Similarly, Ninu Farrugia recalled beginning work in the quarries at the age of sixteen. According to Farrugia, labourers worked from early morning until late evening for a weekly wage of approximately £M1, and received no payment if they were ill or if rainfall prevented work from taking place (Carbone 2016:151–152)

Farrugia also described the daily routine of quarry workers. Labourers would begin work before sunrise, lighting a lantern to make their way to the quarry. They would then start striking the rock with pickaxes in order to prepare the trench (*trinka*) that defined the size of the block to be extracted (**Plate 10**). This trench, cut entirely by hand, had to reach a depth of approximately 1.06 m and a width of around 0.15 m, corresponding roughly to the dimensions of the stone block being quarried (Carbone 2016:152).

Plate 9: Government quarry at Ħal Kirkop 1948. A Government-owned quarry before the introduction of stone-cutting machinery (A British Information Services' photo donated by Dr George Azzopardi to the National Archives)

During the Second World War, stone workers from the quarries of Ħal Kirkop put their specialised skills to practical use by assisting in the excavation of approximately thirty rock-cut shelters around the village. These workers—primarily stone-cutters, masons, and

quarrymen—dedicated long hours to the construction of these protective spaces, applying their expertise in limestone extraction and cutting. The shelters were intended to provide protection for the local population during aerial bombardments. Of particular importance were those shelters located close to the RAF Luqa Aerodrome, as their proximity to this strategic military installation made them especially valuable and frequently used during air raids. (Micallef 1981)

3.2.5.2 The Airport

The current landscape of the area has been greatly altered by the Malta International Airport, its two runways and ancillary facilities. It was built to supplement the bases at Kalafrana, Hal Far and Ta' Qali that were not suitable for use in bad weather. Construction started in 1935, and mostly consisted of levelling the whole area, which was dotted with quarries and purchased from the Church at a price of £2,495 (Malta Independent 2014). It was the only tarmacked airfield during WW2 (Galea 1983: 323) and was also used for civilian use. Due to its presence, the surrounding settlement suffered from continuous enemy air bombings, but RAF Luqa was given 'The Invincible Airfield' badge at the end of the war (Galea 1983: 324). It remained an RAF station until 1979, from which Squadrons 13 and 203 worked (Galea 1983: 325).

In the meantime, a civil air terminal was opened in 1947 on the Ħal Luqa side and was replaced in 1992 by the current one at Gudja (Caruana 2008).

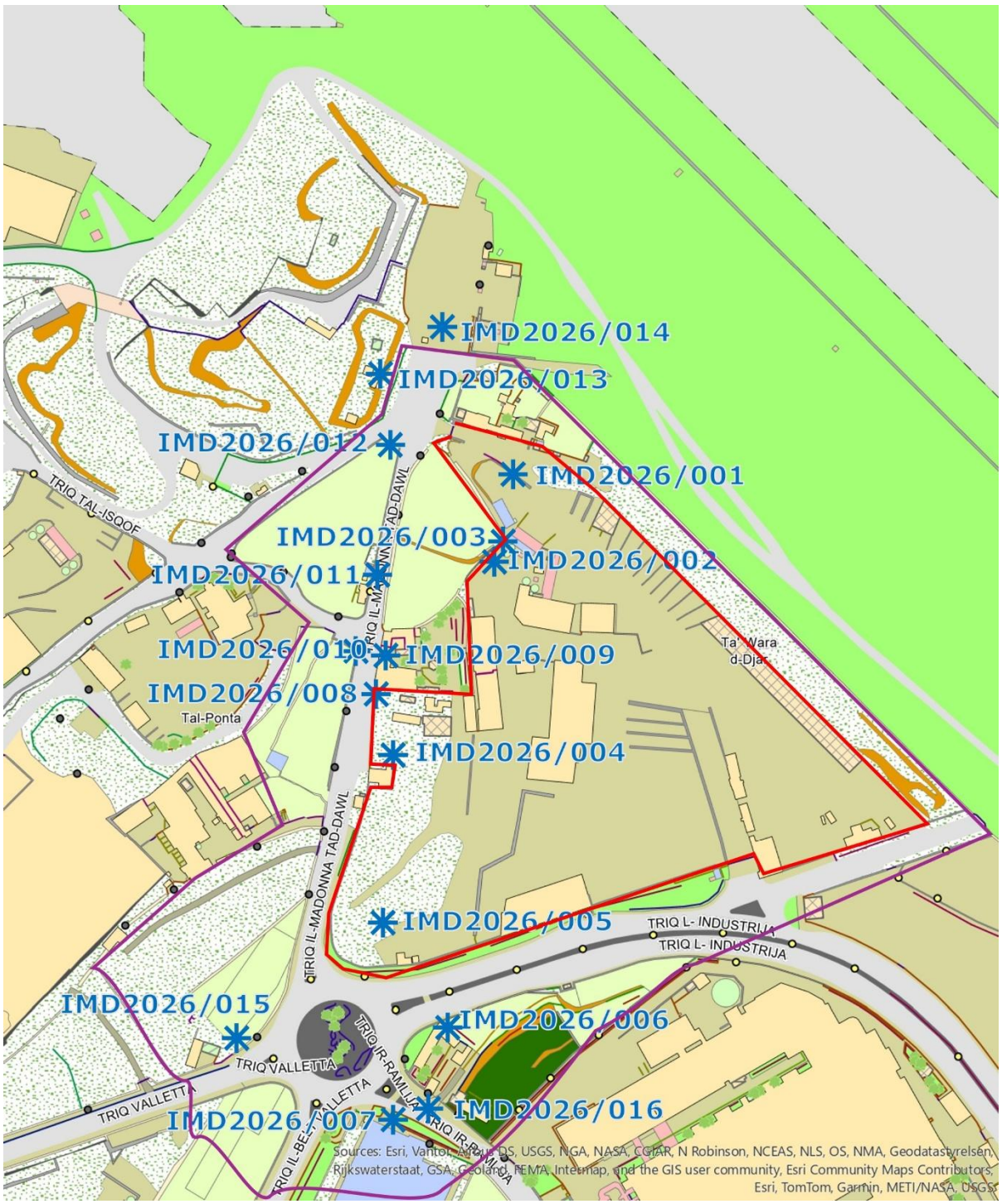
3.3 Description of the Cultural Heritage in the Area

The extant cultural features in the area of study surrounding the area of proposed development reflect the historical background that affected the wider area, discussed above. The 16 features recorded during this site survey in the area of the proposed development and its area of influence reflect this evolution of the landscape. (**Table 4**; **Figure 14**)

Area of proposed development

Area of influence

Figure 14: Cultural features in the area of study



Site Code	Location	Category	Site Description (Address)	Actual Protection	Proposed Protection
IMD2026/001	Ta' Wara d-Djar, Ħal Kirkop	Boundary	Rubble Wall	GN169/2004 for rubble wall	GN169/2004 for rubble wall
IMD2026/002	Ta' Wara d-Djar, Ħal Kirkop	Rock-cut	Rock-cut recess	None	Grade 2
IMD2026/003	Ta' Wara d-Djar, Ħal Kirkop	Rock-cut and Industrial	Quarry remains	None	Grade 3
IMD2026/004	Triq il-Madonna tad-Dawl, Ħal Kirkop	Vernacular	Farmhouse	None	Grade 2
IMD2026/005	Triq il-Madonna tad-Dawl, Ħal Kirkop	Boundary	Rubble Wall	GN169/2004 for rubble wall	GN169/2004 for rubble wall
IMD2026/006	Triq l-Industrija, Ħal Kirkop	Vernacular	Rural Complex	None	Grade 2
IMD2026/007	Triq Ir-Ramlija, Ħal Kirkop	Industrial	Reservoir and Pumping Station	None	Grade 2
IMD2026/008	Triq il-Madonna tad-Dawl, Ħal Kirkop	Boundary	Boundary Marker	None	Grade 2
IMD2026/009	Triq il-Madonna tad-Dawl, Ħal Kirkop	Vernacular	Farmhouse	None	Grade 2
IMD2026/010	Triq il-Madonna tad-Dawl, Ħal Kirkop	Rock-cut and Industrial	Quarry	None	Grade 3
IMD2026/011	Triq il-Madonna tad-Dawl, Ħal Kirkop	Vernacular, Rock-cut and Industria	Rural Complex built within a quarry	None	Grade 2
IMD2026/012	Triq il-Madonna tad-Dawl, Ħal Kirkop	Religious	Location of the Shrine of the Madonna tad-Dawl	None	Class E
IMD2026/013	Luqa Airport, Triq il-Madonna tad-Dawl, Ħal Kirkop	Fortifications	Fortification installations	None	Grade 2
IMD2026/014	Luqa Airport Gudja l/o Triq il-Madonna tad-Dawl, Ħal Kirkop	Industrial	Crash gate to old fuelling station	None	Grade 3
IMD2026/015	Triq Valletta, Ħal Kirkop	Vernacular	Farmhouse	None	Grade 3

IMD2026/016	Triq ir-Ramlija, Ħal Kirkop	Vernacular	Wellhead	None	Grade 3

Table 4: List of recorded cultural features and their proposed protection

3.3.1 The Area of Proposed Development

Most of the area of proposed development is apparently disturbed. However, given the surrounding features, history of archaeological discoveries in the area, and the presence of a potential remnant of a tomb (**IMD2026/002**), a description of the area of proposed development is also being compiled. For ease of reference, the area has been divided into ten zones as shown in **Figure 15**. A description of each zone based on observations carried out during the site survey on 31.1.2026 will follow below.

Figure 15: Delineation of zone used in the description of the area of proposed development

3.3.1.1 Zone 1

Zone 1 contains several small rooms constructed from globigerina limestone and concrete blocks along its western perimeter (**Plate 10a**). Two containers serving a similar storage function are also present (**Plate 10b**). Along the southern perimeter, the remains of two demolished rooms were identified (**Plate 10c**), adjacent to a substantial stack of scaffolding components.

In the southwestern corner, the dismantled cistern of a former concrete batching plant was observed resting horizontally, accompanied by several concrete beams, plastic water cisterns, and wrapped boxes of unidentified contents (**Plate 10d**). Along the northeastern perimeter, roofed sheds house various construction machinery and equipment, with additional materials stored on the shed roofs (**Plate 10e**).

Several construction vehicles, including trucks and lifting machinery, were parked within this area. A significant accumulation of construction waste was noted in the northeastern sector

(**Plate 10f**). The remaining ground surface is flat and muddy. Further archaeological exploration is recommended.

(a)

(b)

(c)

(d)

(e)

(f)

Plate 10: Zone 1 of the Area of Proposed Development

3.3.1.2 Zone 2

Zone 2 serves as the entrance to the yard and provides access to all other areas (**Plate 11a**). A guard room is located on the southwestern side of the roadway (**Plate 11b**). The western boundary wall is constructed of large globigerina limestone blocks (**Plate 11c**), while on the eastern side, the small rooms belonging to Zone 1 align the perimeter. A truck weighing scale is positioned at the southeastern end of the road. The roadway is surfaced with cement.

(a)

(b)

(c)

Plate 11: Zone 2 of the Area of Proposed Development

3.3.1.3 Zone 3

The northeastern perimeter of Zone 3 contains roofless garages built from concrete, used for storing piles of gravel of varying grades for truck loading (**Plate 12a**). At the northwestern tip is a truck-washing facility consisting of a recessed pit into which trucks reverse beneath an overhead beam fitted with water pipes. (**Plate 12b**)

A rubble wall extends from the northwestern to the southeastern perimeter. In the southwestern corner, a modern room constructed from globigerina limestone was noted (**Plate 12c**). The ground surface is covered with gravel. Further archaeological investigation is recommended.

(a)

(b)

(c)

Plate 12: Zone 3 of the Area of Proposed Development

3.3.1.4 Zone 4

An operational concrete batching plant occupies the northeastern portion of Zone 4 (**Plate 13a**). In the northwestern section one finds rock-cut recess **IMD2026/002** surrounded by bedrock that shows clear evidence of quarrying tool marks.

Various buildings constructed from globigerina limestone are located along the eastern and southern perimeters, as well as immediately southeast of the batching plant (**Pate 13b, Plate 13c, Plate 13d**). These serve different functions, including offices, lubricant storage, and a vehicle body-repair workshop.

(a)

(b)

(c)

(d)

Plate 13: Zone 4 of the Area of Proposed Development

3.3.1.5 Zone 5

From the southwestern to the southeastern parts of Zone 5, several dismantled tower cranes are stored. Along the eastern perimeter, two additional enclosures contain gravel of different grades. The western sector features a roofed complex used for truck storage (**Plate 14**). The floor surface is gravel-covered. Archaeological investigation is recommended.

Plate 14: Zone 5 of the Area of Proposed Development

3.3.1.6 Zone 6

The western perimeter of Zone 6 contains additional office buildings constructed of globigerina limestone (**Plate 15a**). The eastern perimeter forms the rear section of the roofed truck complex located in Zone 5, providing access points between the areas (**Plate 15b**). The ground surface is concrete. Further archaeological assessment is advisable.

(a)

(b)

Plate 15: Zone 6 of the Area of Proposed Development

3.3.1.7 Zone 7

The two-storey building **IMD2026/007** stands in the southwestern corner of Area 7. The remaining space is occupied by several piles of limestone waste material, including stone blocks, large limestone blocks, wooden beams, scaffolding components, stone slabs, drainage pipes, containers, fibre and plastic cisterns, ropes, and discarded tyres.

(a)

(b)

(c)

(d)

Plate 16: Zone 7 of the Area of Proposed Development

3.3.1.8 Zone 8

The northwestern and southwestern sections of Zone 8 contain additional construction-related materials, including timber beams, containers, and industrial machinery (**Plate 17a-b**). The central zone, stretching along a northeast–southwest axis, houses several discarded Bedford trucks and construction equipment of industrial cultural value (**Plate 17 c-d**). A rubble wall stands at the southwestern tip.

Construction waste and discarded engines were also noted. Along the southern perimeter are two small globigerina-limestone rooms, a damaged vehicle, a generator, and several boats (**Plate 17e**). The ground surface is gravel. Further archaeological investigation is recommended.

(a)

(b)

(c)

(d)

(e)

Plate 17: Zone 8 of the Area of Proposed Development

3.3.1.9 Zone 9

Zone 9 consists of a service road leading to a gate of the Malta International Airport. The road has several trees along its perimeter and is surfaced with tarmac. This area also merits archaeological investigation.

Plate 18: Zone 9 of the Area of Proposed Development

3.3.1.10 Zone 10

Zone 10 comprises *Triq il-Madonna tad-Dawl*, a road situated along the southwestern perimeter of the complex and running parallel to its western boundary. The western side of the road is lined with rubble walls and adjacent agricultural fields, while the eastern side is bordered by the outer boundary wall of the Elbros complex.

Plate 19: Zone 10 of the Area of Proposed Development

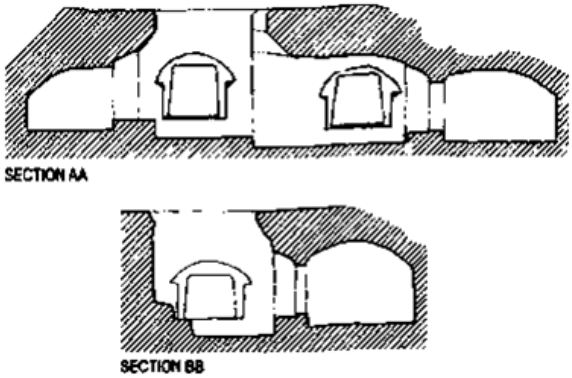
3.3.2 Rock-cutting

As discussed above this area was, and is currently still is, dotted with Globigerina Limestone quarries. The ones recorded in this study are no longer used.

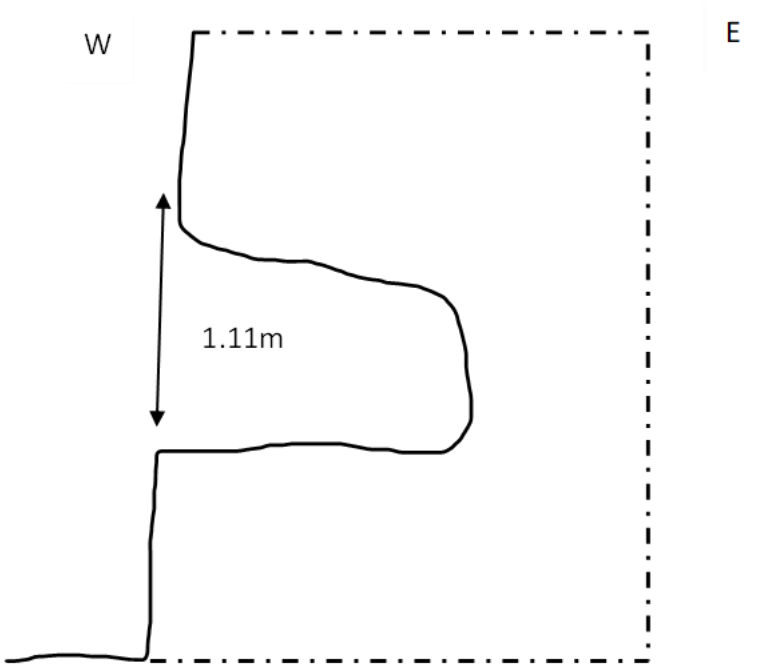
3.3.2.1 Rock-cut recess

Found within the area of proposed development in what clearly is a quarry, **IMD2026/002** is most probably the remains of a rock-cut burial chamber recorded in the area (**Plate 20**). It could well possibly belong to the tombs recorded in 1911, or another tomb, which had escaped complete obliteration by said quarrying. This suggestion is being put forward due to its resemblance in plan and section to the most common shaft and chamber tombs, as is shown in **Figure 16**.

Plate 20: IMD2026/002



Sections of Tad-Dawwar Catacomb (source Bonanno 2006: fig. 10)



Sketch Section of IMD2026/002

Figure 16: Comparison of the section of a typical rock-cut tomb and what seem to be the remains of a tomb at IMD2026/002.

Furthermore, the measurements also resemble the tombs excavated in 1943 (KRK 1943) as shown in **Table 5**.

	KRK 1943		**IMD2026/002**
Entrance height	1.07m		1.11m
Entrance width	0.74m		0.70m
Chamber plan	2.1mX 1.5m		1.9m X circa 2m

Table 5: Comparison of the dimensions of the tombs discovered in 1943 and rock-cut recess IMD2026/002

As such this feature, deserves to be preserved and protected as a Grade 2 feature as one of the last extant rock-tombs in the area of Tad-Dawl.

3.3.2.2 Quarrying

Quarrying on an industrial scale carried out in this part of the Maltese Islands, is also reflected in the area of study. Quarries **IMD2026/003** and **IMD2026/010** are remnants of such practices. In the former, one can witness the tool marks in what remain of the quarry walls (**Plate 21**), while the latter, has been mostly covered in soil and reclaimed for agricultural purposes (**Plate 22**). The same can be said of **IMD2026/011** where a rudimentary rural complex had been built to be used in conjunction with the field now reclaiming the quarry (**Plate 23**). All three features deserve to be recorded and merit a Grade 3 level of protection.

Plate 21: Quarry **IMD20126/003** and detail showing tool marks on the remaining quarry wall

Plate 22: reclaimed quarry for agriculture – IMD2026/010

Plate 23: reclaimed quarry for agriculture, where a small farmhouse was also built – IMD2026/011

3.3.3 Vernacular Features

The concept of vernacular architecture was first brought up by Rudofsky (1964 as quoted by Bianco 2016: 126) who gave the generic label of vernacular to the "anonymous, spontaneous, indigenous, rural, as the case may be". Oliver (1997 as quoted by Bianco 2016: 126) further expanded on this in the *Encyclopaedia of Vernacular Architecture of the World* where he defined the vernacular as "…dwellings and other buildings of the people. Related to their environmental contexts and available resources, they are customarily owner- or community-built, utilizing traditional technologies. All forms of vernacular architecture are built to meet specific needs, accommodating the values, economies and ways of living of the cultures that produce them". The area of proposed development and its area of influence falls precisely in this definition. Field rooms evolved into larger structures; quarried areas were transformed into tilled fields; and wells were dug, while the community established public paths for access, bounded the tracks with rubble walls and maintained them for posterity..

3.3.3.1 Farmhouses

Field rooms and farmhouse complexes are very common in Maltese rural areas, which is also the case in the area of study, whose landscape was until recent times an intermingling of quarrying and agriculture.

The farmhouses is the area of study are quite large when compared to typical farmhouses and field rooms. The larger ones might have possibly been owned by the quarry owner or foreman. All four farmhouses (**IMD2026/004, IMD2026/006, IMD2026/009** and **IMD2026/015**) show a typical layout with minimal apertures, exterior staircases when there is an upper floor, an open terrace (**Plate 24; 25, 26**), and an animal pen (**Plate 27**). While they do contain modern accretions these farmhouses are a rare feature in the area, and as such all merit a Grade 2 level or protection.

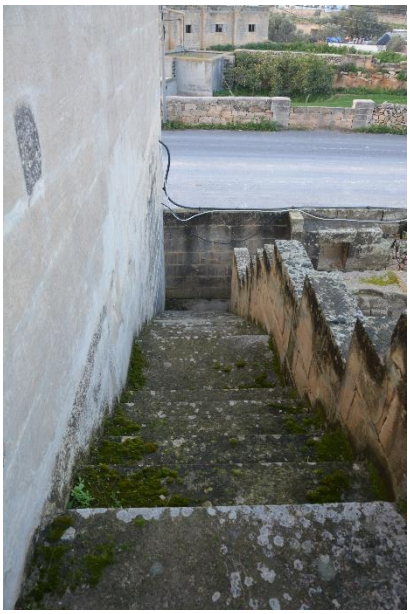


Plate 24: external staircase, open terrace and austere look, typical of a Maltese farmhouse – IMD2026/004

Plate 25: Austere façade, typical of Maltese farmhouses in IMD2026/009

Plate 26: External staircase in IMD2026/015

Plate 27: Animal pen in farmhouse IMD2026/006

3.3.3.2 Rubble Walls

Rubble walls are an essential part of the Maltese landscape. They do not only function as boundary walls between land holdings, but are also the habitat of a number of organisms, and are essential soil and water retainers. They are found in other areas in the Mediterranean region, but they are "the commonest dry stone expression of the Maltese archipelago, with the corbelled stone hut and the farmhouse, they are the most distinctive landmarks of its landscape" (Jaccarini 1998: 20, 22). The two recorded rubble walls in the area (**IMD2026/001** and **IMD2026/005; Plate 28**) are in a bad state of preservation and contain several modern accretions. They are already protected by GN169/2004 and their current state of repair calls for them to be almost completely rebuilt using the traditional techniques.

Plate 28: Rubble walls IMD2026/001 and IMD2026/005

3.3.3.3 Wells

An intensely cultivated agricultural landscape is obviously dependent on water supply. This is suggested both by the place name of Il-Giebja, as well as the wellhead **IMD2026/016** (**Plate 29**). Although it is not clear whether its location is original, one notes that other well head have been noted in the wider area outside the area of influence. Based on **Figure 17** reproduced from Gatt 2005, the well head lies on a platform. Usually the well head - *ħerża* - would stand on two slabs - *kaptelli.* It seems that the slabs are still there. Also, the opening is closed by a metal trap door indicating that safety is an issue and therefore a well is most probably present.

Given the good state of preservation, the wellhead requires a Grade 2 Level of Protection.

Plate 29: Well IMD2026/016

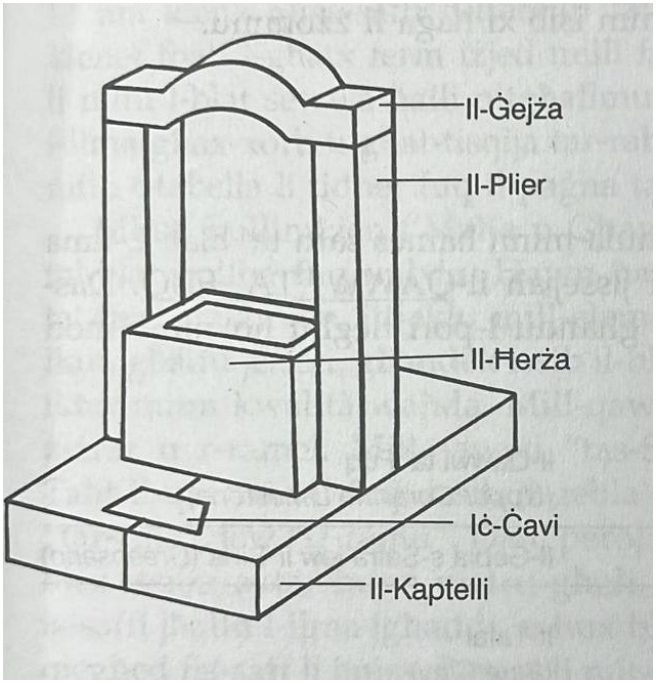


Figure 17: Parts of a Maltese wellhead (reproduced from Gatt 2005)

3.3.4 Industrial Features

The industrialisation of the area in the past century, has also led to a number of cultural features related to the airport as well as water-extraction and storage.

3.3.4.1 Airport-Related Features

The presence of the airport has greatly affected the landscape of the area. This occurred not only by the destruction of a number of rock-cut tombs and levelling of quarries, as discussed above, but also through the creation of other features related to the functioning of the airport in both wartime and peaceful times.

IMD2026/013 is made up of a number of structures related to air defence. There seems to be limited information about these features, possibly because they are relatively modern and are within the airport boundary wall. Nonetheless these cultural features deserve preservation, and therefore at least a Grade 2 Level of Protection. Linked to the airport are the remains of the old fuelling facilities accessed through a crash gate in airport boundary. **IMD2026/014** is a witness to the history of the operation of the airport, and as such deserve to be recorded and merit a Grade 3 Level of Protection.

Plate 30: IMD2026/013

Plate 31: Old fuelling facilities IMD2026/014

The modern boundary marker **IMD2026/008** (**Plate 32**) marking Government Property in the area, might have been used to limit public access to the area around the airport. These markers are not very common, and follow the pattern of the Colonial period markers. As such this particular marker, deserves to be recorded and merits a Grade 2 Level of Protection.

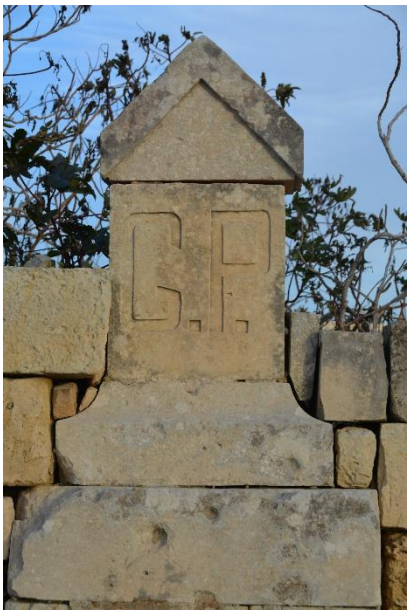


Plate 32: Boundary Marker IMD2026/008

3.3.4.2 Reservoir

The Ħal Kirkop covered reservoir was built in the 1960 in reinforced concrete (Mallia 2002). The reservoir was built over a 20th century quarry which was not existent in 1912. The reservoir has a capacity of 22,000,000 litres (Mallia 2002). It follows the same architectural style of other reservoirs of the time, which were an engineering feat to collect and store rainwater, developing on the preceding traditions of digging boreholes and wells wherever possible. As such this modern cultural feature deserves a Grade 2 Level of Protection.

Plate 33: Reservoir IMD2026/007

3.3.5 Religious Features

IMD2026/012 (**Plate 34**) marks the location of the shrine. It is hereby being suggested that this location is scheduled as Class E after an archaeological investigation is carried out to ensure that its foundations or other architectural elements are still in situ or in the vicinity. It is said that the stone blocks have been preserved, but their location is unknown (Bonnici 2019: 148). The painting of the Madonna, is now located in the Luqa Parish Museum (Bonnici 2019: 148).

Plate 34: Location of the Shrine of the Madonna tad-Dawl – IMD2026/012

3.4 The Cultural Landscape

All archaeological and historical sites and features form part of the landscape that surrounds them, and any survey of the cultural heritage has to study a site's context as well as the site itself. According to the Florence Convention (**Section 2.5.4**), landscape "means an area, as perceived by people, whose character is the results of the action and interaction of natural and/or human factors" and covers "natural, rural, urban and peri-urban areas" (European Landscape Convention 2000: 2). No cultural feature is isolated from the fields and geographical features which surround it, and on which it depends, to varying degrees. Every site is a piece of local history, embedded in its immediate cultural landscape and relating to the area around it (Barker 1993: 254). The phrase "cultural landscape" does not mean a special type of landscape, but rather a way of seeing landscapes, that emphasizes the interaction between human beings and nature over time. The main value of the cultural heritage in the area lies in the information it can yield regarding past settlement patterns, as well as the indications regarding land-use patterns.

Crawford (1953: 51-52) explains that landscapes can be compared to a palimpsest, that is "a document which has been written on and erased over and over again". Roberts (1987: 83), for example, compared visible landscapes with icebergs where "only a small proportion of their real substance lies above the surface". One therefore must keep in mind that "everything in landscape is older than we think" (Hoskins 1988: 12).

The area of study reflects the gradual transformation from a rural, agricultural setting into a more industrialised environment, transition to large-scale globigerina quarries and the airport and its facilities. Originally, the area was characterized by open fields, prehistoric and Classical settlements whose presence is attested by rock-cut silos and tombs, old pathways, and boundary walls. Gradually agriculture took over with fields separated by rubble walls, farmhouses, used by farmers who in the 18th and 19th century venerated the Madonna tad-Dawl in her shrine at the crossroad. Over time, the infrastructural changes brought about first by the soft stone quarries and later by the airport, resulted in a mixed landscape merging an ancient landscape with a modern one. While the ancient cultural landscape has been partially lost, evidence of it is still retained, as attested by the recent excavations at Id-Debdieba, an archaeological site, which was thought was completely lost. It is not known whether the villa and tombs of Tad-Dawl, have been completely obliterated or whether some remains are still extant beneath modern development. What is certain is that a number of cultural features in the area are a witness of a continuity of the cultural landscape from the past into the present, witnessing the evolution of the culture and lifestyle of the small rural community of Ħal Kirkop.

4. IMPACTS AND MITIGATION

The impacts of the proposed development can be divided into those affecting the area of development, its immediate surroundings and the general landscape.

While the area itself, at first glance seems to be highly disturbed, the cultural heritage survey above has indicated the presence of a farmhouse, as well as what is possibly the remains of parts of a tomb at Tad-Dawl. It is therefore suggested that before any works takes place, the site is cleared, previously identified modern accretions removed, and the site cleared of any loose soil or rubble to expose the bedrock surface. This will identify if there are any further remains of tombs like **IMD2026/002** or agricultural trenches that have been found in Ħal Safi and Ħal Luqa in recent years. Any clearing works and subsequent clearance of bedrock should be carried out should be monitored by archaeologists. Given that **IMD206/002** might be the only existing remains of the tombs of Tad-Dawl, it should be preserved and integrated into the development.

The site of proposed development also houses farmhouse **IMD2026/004**, which although has modern elements, follows the typical plan of a Maltese farmhouse. Therefore, it should be preserved due its plan and its links to the quarrying industry apparent in the first-floor rooms. Rubble wall **IMD20206/001** are the remains of a rubble wall, while the quarry remains **IMD2026/003** is a well-preserved palimpsest of a Globigerina Limestone quarry, preserving tool marks on its walls. This wall is an important part of the history of the quarrying industry of the islands and especially this area. The rubble wall could be restored, and the quarry wall could be preserved and if possible integrated into the development.

As a general comment, it should be noted that archaeological features may become visible during the clearance works, not only in areas where soil deposits are present, but also following the demolition of buildings. In such cases, additional evidence—such as quarrying activity or burial remains—may come to light, particularly during the cleaning of exposed bedrock. One should also keep in mind, the Burra Charter (Section 2.5.5) which promotes a vigilant approach to change: "do as much as necessary to care for the place and to make it useable, but otherwise change it as little as possible so that its cultural significance is retained".

The proposed development will rehabilitate the site itself, but will affect the cultural landscape of the area which is mostly vernacular in nature, represented by surrounding features like farmhouses, rubble walls and re-used quarries. Soft landscaping including indigenous shrubs and rural features such as rubble walls could be used to soften the transition between the development and the surrounding rural environment.

It is also being suggested that further research should be carried out regarding the whereabouts of the stones that made up the dismantled Tad-Dawl Shrine. This was located outside the area of development, but its reconstruction within the development would mitigate the negative impacts of such a development in the area.

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The Burra Charter, Australia ICOMOS, 1999.

The Cultural Heritage Act, 2002.

The Development Planning Act, 2016

The European Landscape Convention, Council of Europe, 2000

The Northwest Malta Local Plan, MEPA, 2006

The Strategic Plan for Environment and Development (SPED), 2015

The Structure Plan of the Maltese Islands (Revised). 1997.

Sheet 132, 1914 Survey Sheet, Office of Public Works Malta

Appendix I:
Catalogue of Cultural Features

Data Capture Sheet

Ref no
IMD2026/001

Location
Boundary Wall at Ta' Wara d-Djar, Ħal Kirkop

Category
Boundary

Site Description (Address)
Rubble wall

Eastings
5329

Northings
6750

Period
Unknown

SS1

SS2

SS3

SS4

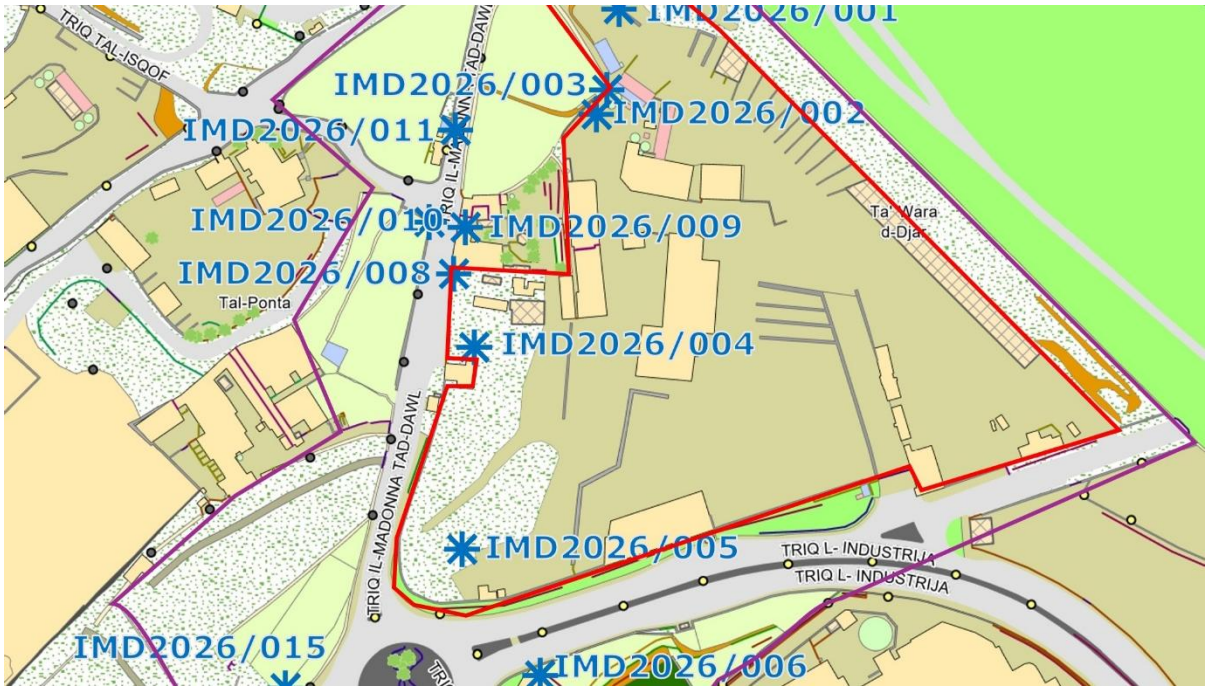
Date of survey sheet:
2026

Description
A wall running on a SSE-NNW direction dividing the quarry from the adjacent field. This part of the quarry has an open water reservoir to collect water from the washing of trucks and concrete mixers. The rubble wall is about 13 courses high. Parts of it are built on the globigerina bedrock but is not. completely visible along the course of the wall due to overgrowth. The wall follows the contour of the quarry towards the SW. This part of the boundary wall which is beneath a large carob tree is not in good condition as the northern part. It includes a number of dressed stones including xorok.

Present Utilisation
Boundary Wall

Comments

Site



Condition
Northern wall is in a good state; the southern part is not in good condition.

Degree of Protection
GN169/2004

Proposed Protection
GN169/2004

Basic Bibliography
Ellul, E., 2005,*Il-Ħitan tas-Sejjieħ*, Sta. Venera: Klabb KotbaMaltin

Compiled by
KBO, DB, MB, JC, EV

Date of Survey
31.i.2026

Photo file name IMD2026_001 (1)

Photo file name IMD2026_001 (3)

Photo file name IMD2026_001 (4)

Data Capture Sheet

Ref no
IMD2026/002

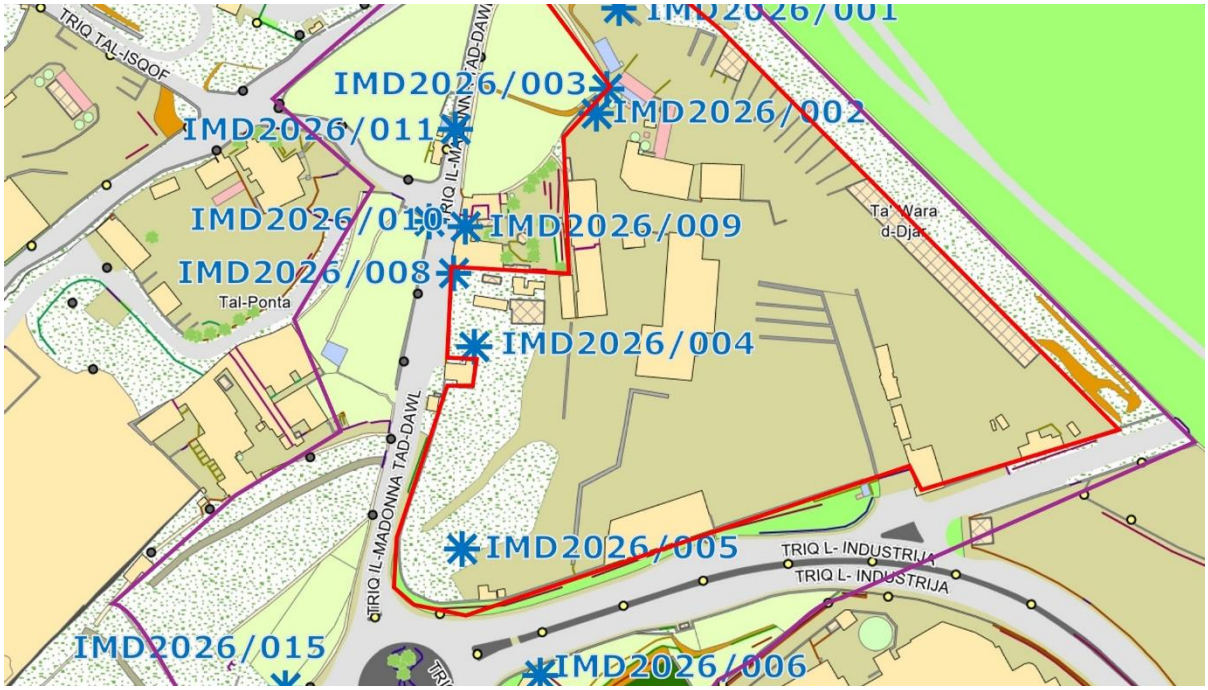
Location	**Category**	**Site Description (Address)**
Rock-cut Recess at Ta' Wara d-Djar, Ħal Kirkop	Rock-cut	Rock-cut recess
Eastings	**Northings**	**Period**
5330	6747	Unknown
SS1	**SS2**	**Description**
SS3	**SS4**	A small rock-cut recess hewn with pickaxes in the face of the quarried rock, beneath the southern wall IMD2026/01. The recess has a rounded rectangular plan, 1.9m wide. The entrance is 70cm wide and 1.11m high dipping northwards.
Date of survey sheet:	2026	

The entrance displays the rock-cut groove for the door jamb. This indicates that for some time the rock-cut chamber was closed with a door. Oral traditions state that the quarry men used this chamber to keep their drinking water, stored in tanks cool. The rock-cut chamber is situated 2 metres beneath the field, and on looking over on a reservoir part of the batching plant.
Originally this could have formed part of the necropolis of Tad-Dawl, recorded in 1911 (MAR 1911-1912).

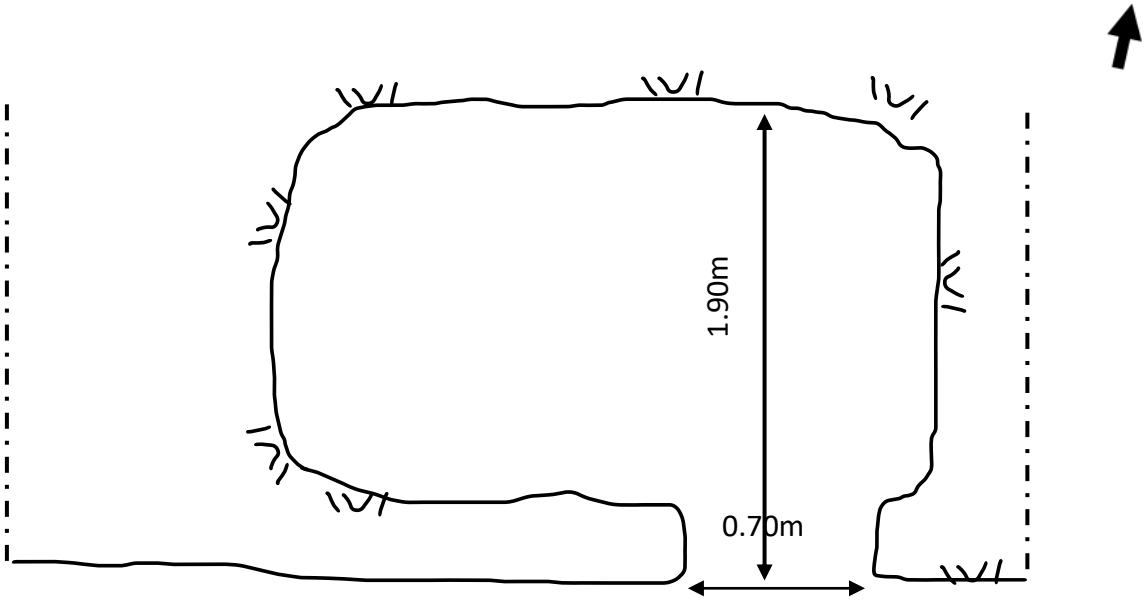
Present Utilisation
Storage

Comments
Due to the mouth of the cistern and the machinery located in front of the structure, it was not possible to enter and take the measurements of the length and height of IMD2026/02. However, the length did not exceed 2 metres.

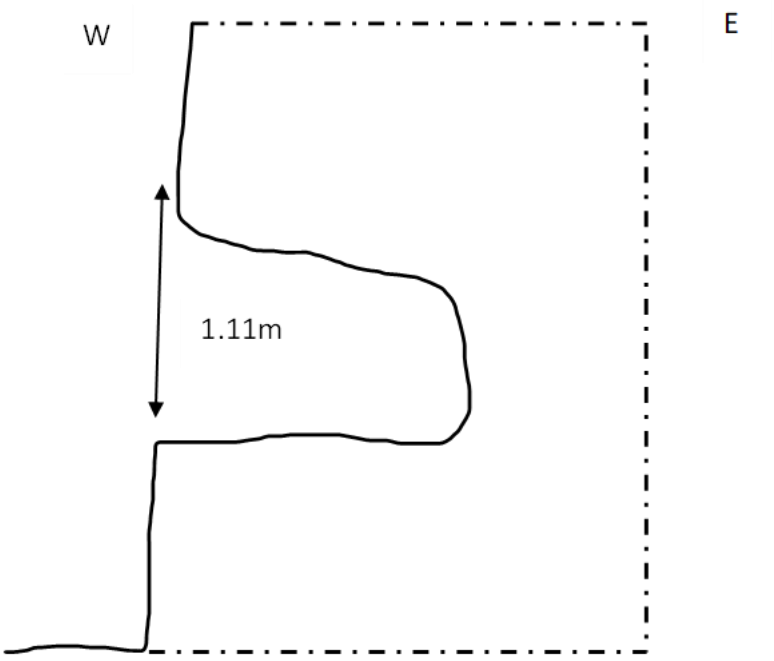
Site



Characteristics



Sketch plan



Sketch section

Condition
Good

Degree of Protection
None

Proposed Protection
Grade 2

Basic Bibliography
Museum Annual Report 1911-1912

Compiled by
KBO, DB, MB, JC, EV

Date of Survey
31.i.2026

Photo file name IMD2026_002(1)

Photo file name IMD2026_002(2)

Photo file name IMD2026_002(4)

Photo file name IMD2026_002(18)

Photo file name IMD2026_002(17)

Data Capture Sheet

Ref no
IMD2026/003

Location
Quarry remains at Ta' Wara d-Djar, Ħal Kirkop

Category
Rock-cut and Industrial

Site Description (Address)
Quarry remains

Eastings
5330

Northings
6748

Period
Pre-dating 1912

SS1

SS2

SS3

SS4

Date of survey sheet:
2026

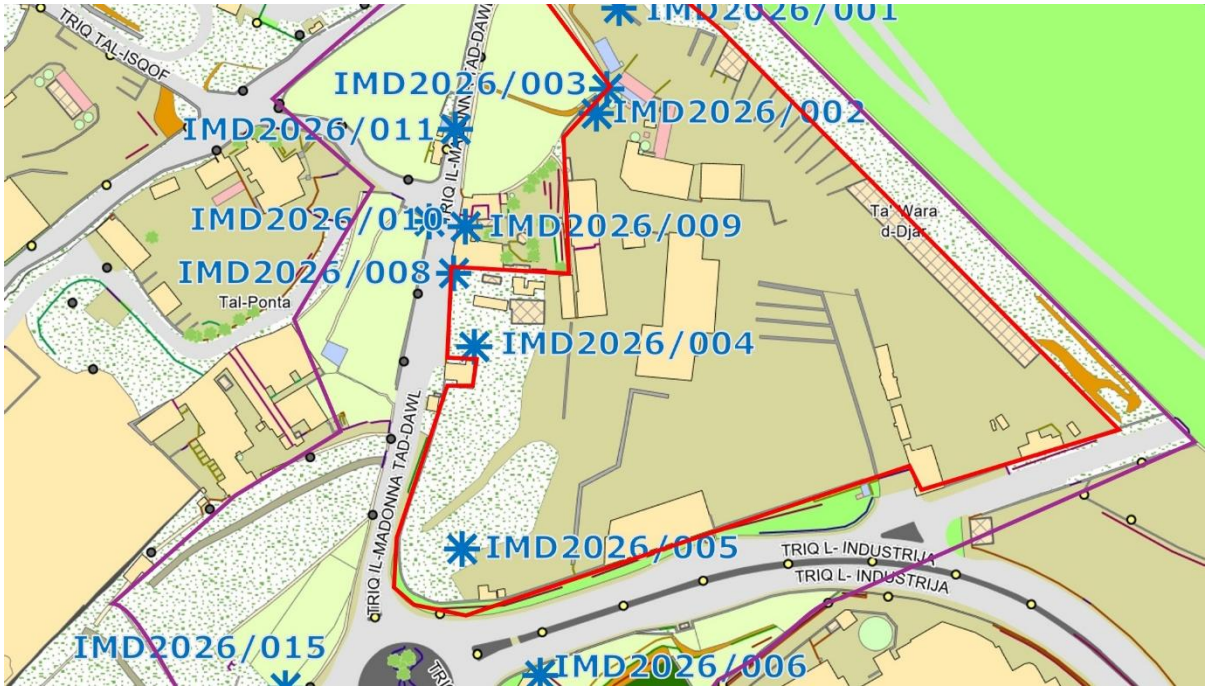
Description
About 10m to the west of IMD2026/002 in the same quarry face are several drilled holes. These follow the contour of a block, creating a palimpsest of the quarried rock. The holes have a diameter of 10cm to 4cm. These run on a west-east axis. Beneath these holes there are the traces of quarrying by mechanical rotary blade saws.

The quarry appears in the 1912 SS, therefore it predates 1912.

Present Utilisation
None

Comments
While in good condition, exposure to the elements will lead to the loss of the tool marks.

Site



Condition
Good

Degree of Protection
None

Proposed Protection
Grade 3

Basic Bibliography
Balm, R. (1996). Big holes in a small place: the stone quarrying dilemma in the Maltese Islands. *Geography: Journal of the Geographical Association*, 81(1), 82-91.

Carbone, J. (2016). Il-ġebla mill-barriera sa fuq il-lant tax-xogħol. *Festa San Leonardu, [Kirkop] 2016*, 140-155.

Compiled by
KBO, DB, MB, JC, EV

Date of Survey
31.i.2026

Photo file name IMD2026_003 (1)

Photo file name IMD2026_003 (7)

Photo file name IMD2026_003 (4)

ASC Archaeology Services Co-operative Ltd

Data Capture Sheet

Ref no IMD2026/004

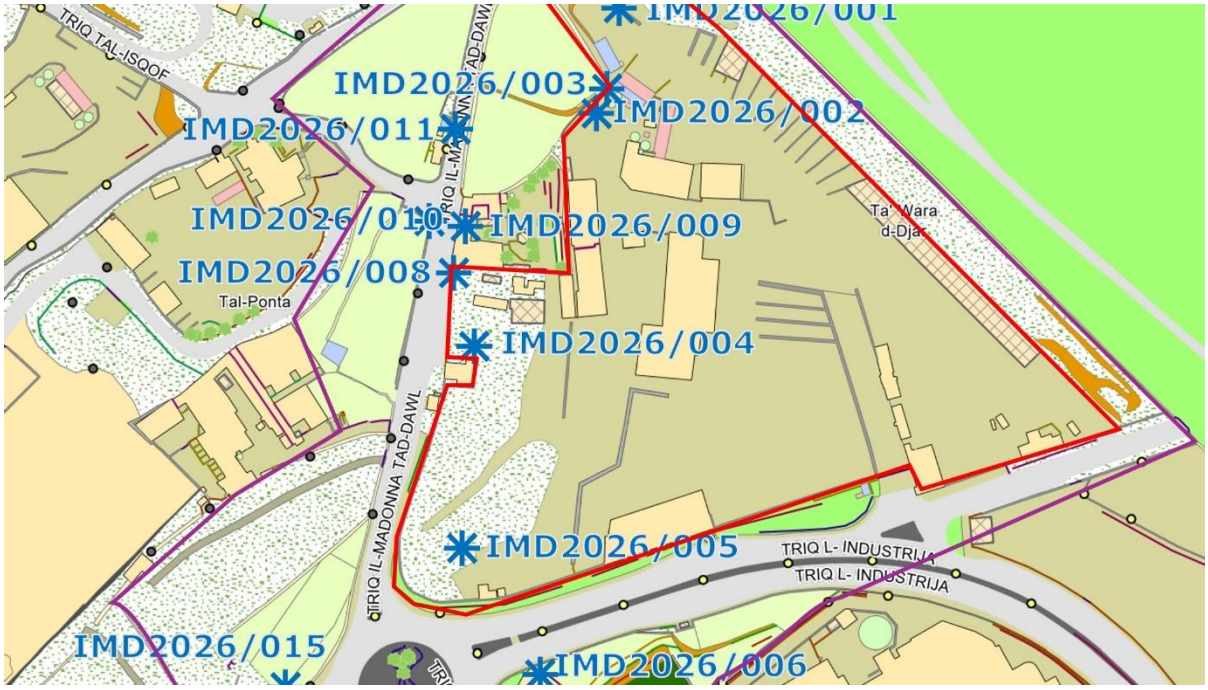
Location	**Category**	**Site Description (Address)**
Farmhouse at Triq il-Madonna tad-Dawl, Ħal Kirkop	Vernacular	Farmhouse
Eastings	**Northings**	**Period**
5325	6739	20th century
SS1	**SS2**	**Description**
SS3	**SS4**	A two-storey farmhouse, with the western side looking onto Triq il-Madonna tad-Dawl. On the northern side a flight of steps opens onto a setaħ. This leads to a room with the entrance looking towards the north. Inside there are no vernacular features except for the floor tiles. Both eastern and western walls are pierced by a window, whilst the
Date of survey sheet:	2026	

Latter has a doorway that leads into another room.
The ceiling does not bear any traces of beams and xorok, thus it is indicative that the roof was built in concrete. The opennig beneath the open stairs shows a concrete base, imlying that the staircase was built out of this maerial.
The upper rooms were full of different fireplaces, and a memorial plaque. This indicates that probably in the past, these rooms served as a display for stone objects.
At the ground floor level are two other rooms, built of dressed globigerina limestone slabs. The one looking east was not accessible and the room overlooking the west, adjacent to the road, now serves as a garage. The garage door is rectangular, opening onto the Triq Madonna tad-Dawl. The eastern room is built on a concrete foundation.
The flat surface and the patina of the dressed stone together with the use of concrete, indicate that the building dates to the post war period. The farmhouse is indicated on the survey sheet of 1968. Nonetheless the complex is built in the traditional Maltese farmhouse tradition, with the open staircase, setaħ and the upper room known as the għorfa, and should be retained.
In the area to the north of IMD2026/004 are several large blocks of worked stone, such as cornices, probably display items that were used as a showcase of craftsmanship.

Present Utilisation
garage and storage

Comments

Site



Condition
Fair

Degree of Protection
None

Proposed Protection
Grade 2

Basic Bibliography
Jaccarini, C.J., 1998, *Ir-Razzett – The Maltese Farmhouse*, P.E.G. Ltd, Malta

Compiled by
KBO, DB, MB, JC, EV

Date of Survey
31.i.2026

Photo file name IMD2026_004(31)

Photo file name IMD2026_004(9)

Photo file name IMD2026_004(1)

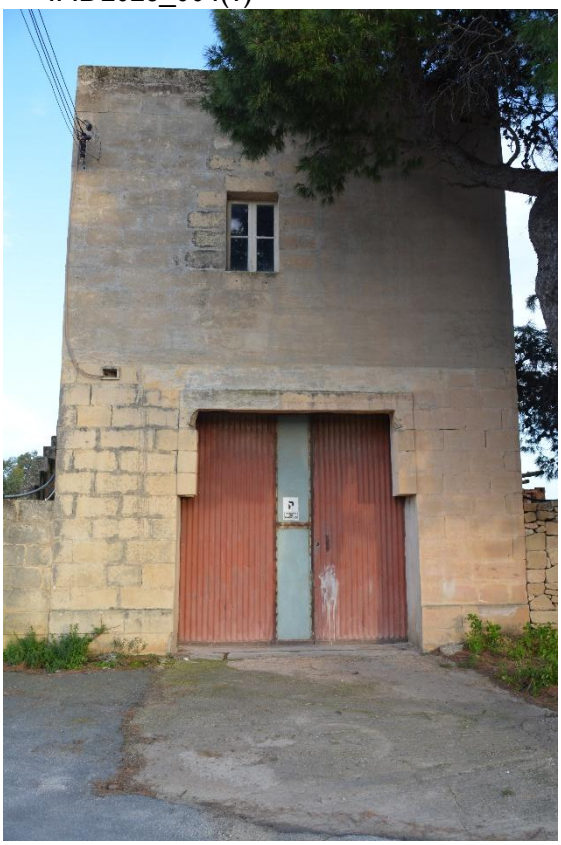


Photo file name IMD2026_004(4)

Photo file name IMD2026_004(13)

Photo file name IMD2026_004(12)

Photo file name IMD2026_004(24)

Photo file name IMD2026_004(15)

Photo file name IMD2026_004(22)

Photo file name IMD2026_004(21)

Photo file name IMD2026_004(19)

Photo file name IMD2026_004(29)

Data Capture Sheet

Ref no
IMD2026/005

Location
Rubble Wall at Triq il-Madonna tad-Dawl, Ħal Kirkop

Category
Boundary

Site Description (Address)
Rubble wall

Eastings
5324

Northings
6732

Period
Pre-dates 1912

SS1

SS2

SS3

SS4

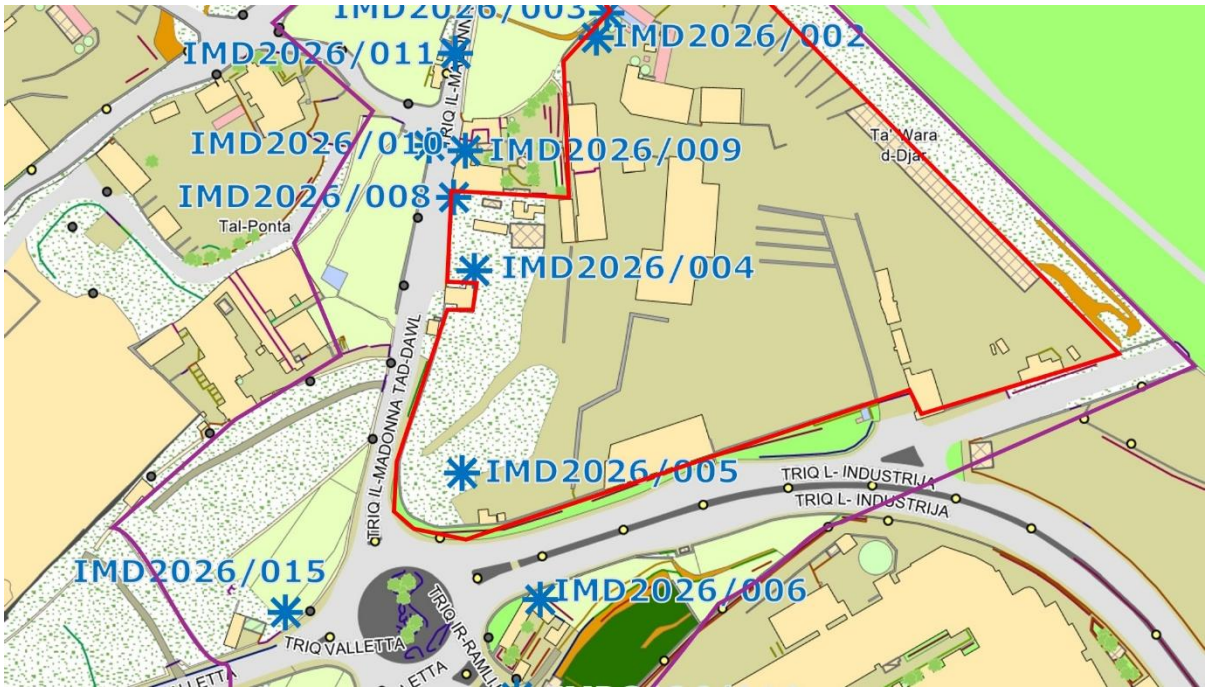
Description
The rubble wall runs on an east-west axis. It is six courses high, measuring 1.10m. It is built on globigerina bedrock. The rubble wall appears in the 1912 SS.

Date of survey sheet: 2026

Present Utilisation
Boundary Wall

Comments

Site



Characteristics

Overlay of 1912 SS and recent aerial photo
(https://www.arcgis.com/apps/instant/basic/index.html?appid=8d71e8d7484c433b9cf7430133dba256)

Condition
Varying from good to fair

Degree of Protection
GN169/2004

Proposed Protection
GN169/2004

Basic Bibliography
Ellul, E., 2005, *Il-Ħitan tas-Sejjieħ*, Sta. Venera: Klabb KotbaMaltin

Compiled by
KBO, DB, MB, JC, EV

Date of Survey
31.i.2026

Photo file name IMD2026_005(3)

Data Capture Sheet

Ref no
IMD2026/006

Location
Rural Complex at Triq l-Industrija, Ħal Kirkop

Category
Vernacular

Site Description (Address)
Rural complex

Eastings
5327

Northings
6728

Period
Pre-1912

SS1

SS2

SS3

SS4

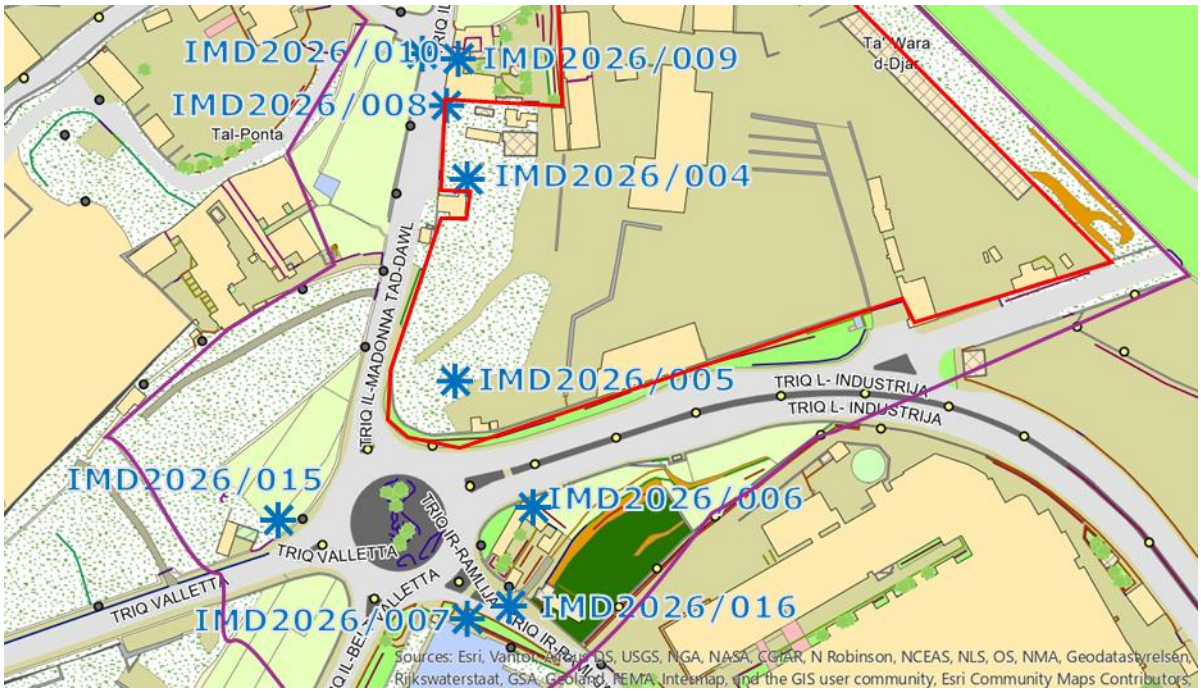
Date of survey sheet:
2026

Description
A rural complex consisting of a field room with a large animal pen (mandra). The entrance on the western side of the complex is through a garage.
Parts of this complex is visible in the 1912 SS. The part on Triq ir-Ramlija was a later extension.

Present Utilisation
Garage

Comments
Inaccessable and opuntia trees obstruct is visibility from the road

Site



Characteristics

Overlay of 1912 SS and recent aerial photo
(https://www.arcgis.com/apps/instant/basic/index.html?appid=8d71e8d7484c433b9cf7430133dba256)

Condition
Unknown

Degree of Protection
None

Proposed Protection
Grade 2

Basic Bibliography
Jaccarini, C.J., 1998, *Ir-Razzett – The Maltese Farmhouse*, P.E.G. Ltd, Malta

Compiled by
KBO, DB, MB, JC, EV

Date of Survey
31.i.2026

Photo file name IMD2026_006(12)

Photo file name IMD2026_006(10)

Photo file name IMD2026_006(9)

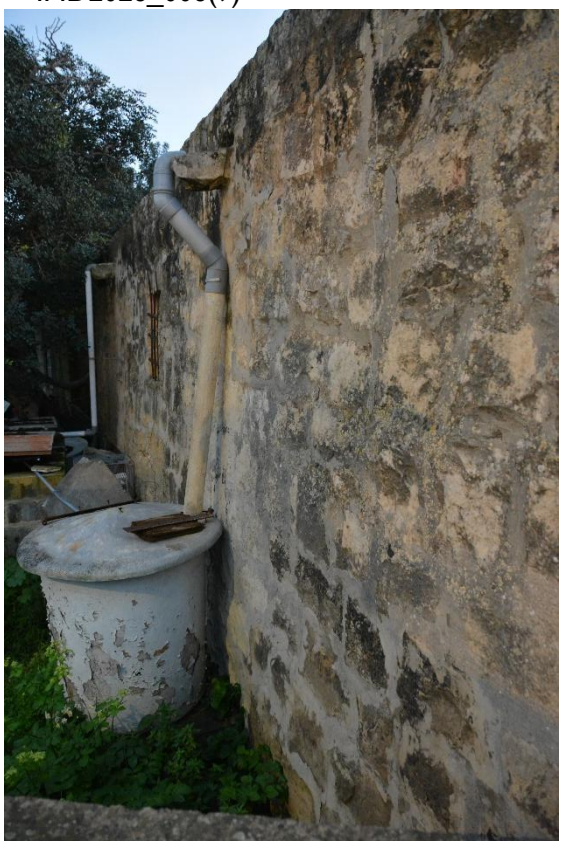
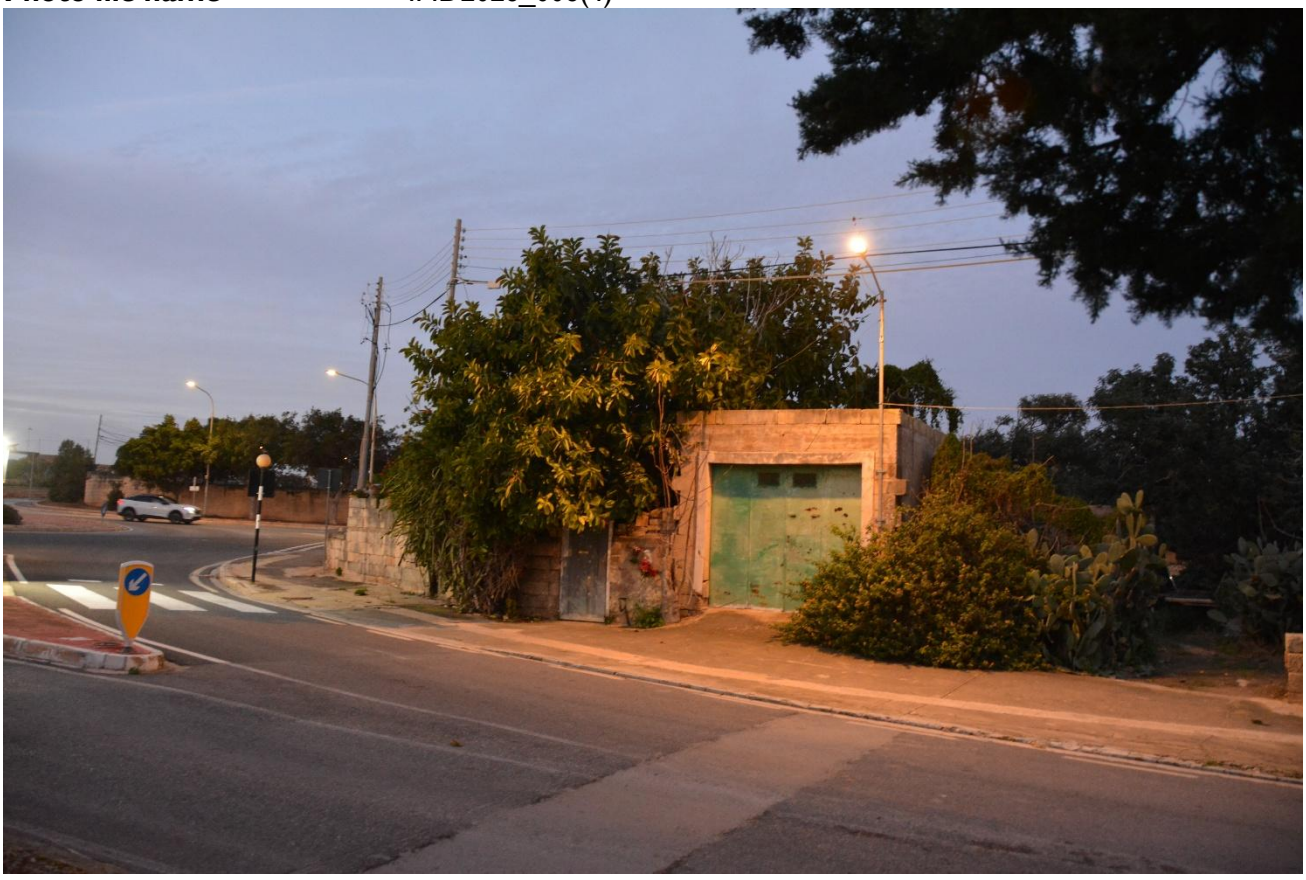


Photo file name IMD2026_006(4)



Data Capture Sheet

Ref no
IMD2026/007

Location
Reservoir at Triq Ir-Ramlija, Ħal Kirkop

Category
Industrial

Site Description (Address)
Reservoir

Eastings
5325

Northings
6723

Period
1960

SS1

SS2

Description
The Ħal Kirkop covered reservoir built in the 1960 in reinforced concrete. The reservoir was built over a 20th century quarry which was not existent in 1912. The reservoir has a capacity of 22,000,000 litres.

SS3

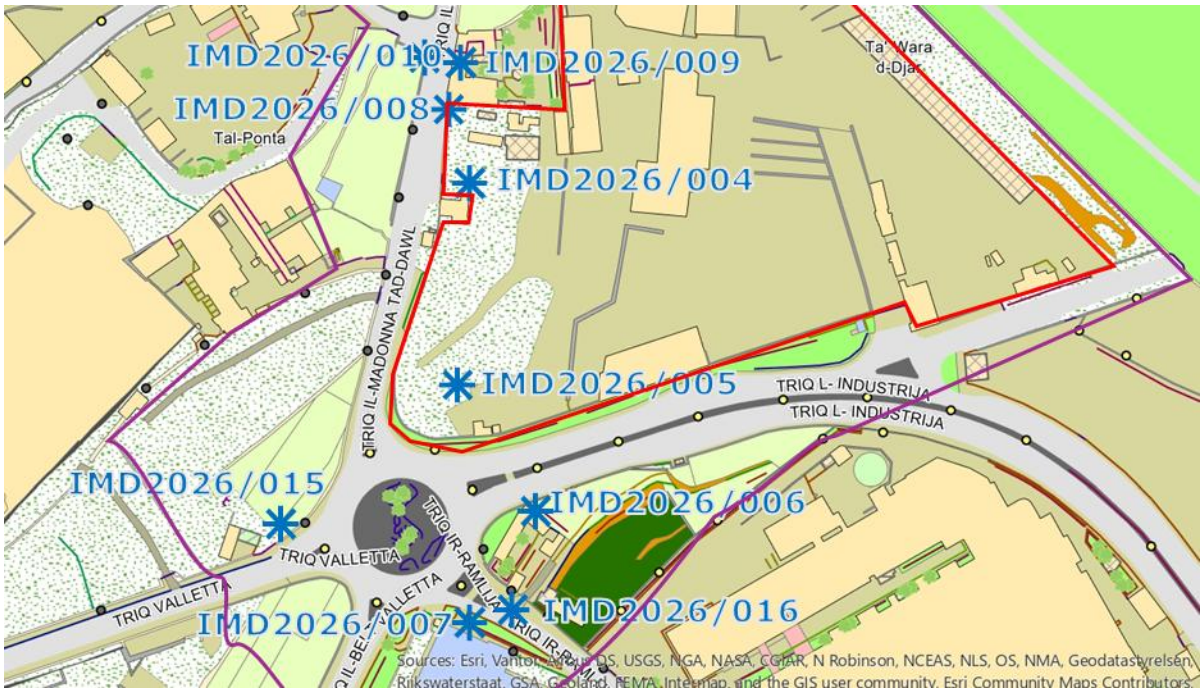
SS4

Date of survey sheet: 2026

Present Utilisation
Reservoir

Comments

Site



Condition
Very good

Degree of Protection
None

Proposed Protection
Grade 2

Basic Bibliography
Mallia, S., 2022, *The History of Water Conservation on the Maltese Islands*, Printit, Malta.

Compiled by
KBO, DB, MB, JC, EV

Date of Survey
31.i.2026

Photo file name IMD2026_007(1)

Photo file name IMD2026_007(8)

Photo file name IMD2026_007(10)

Photo file name Interior (from Mallia 2022: 371)

Data Capture Sheet

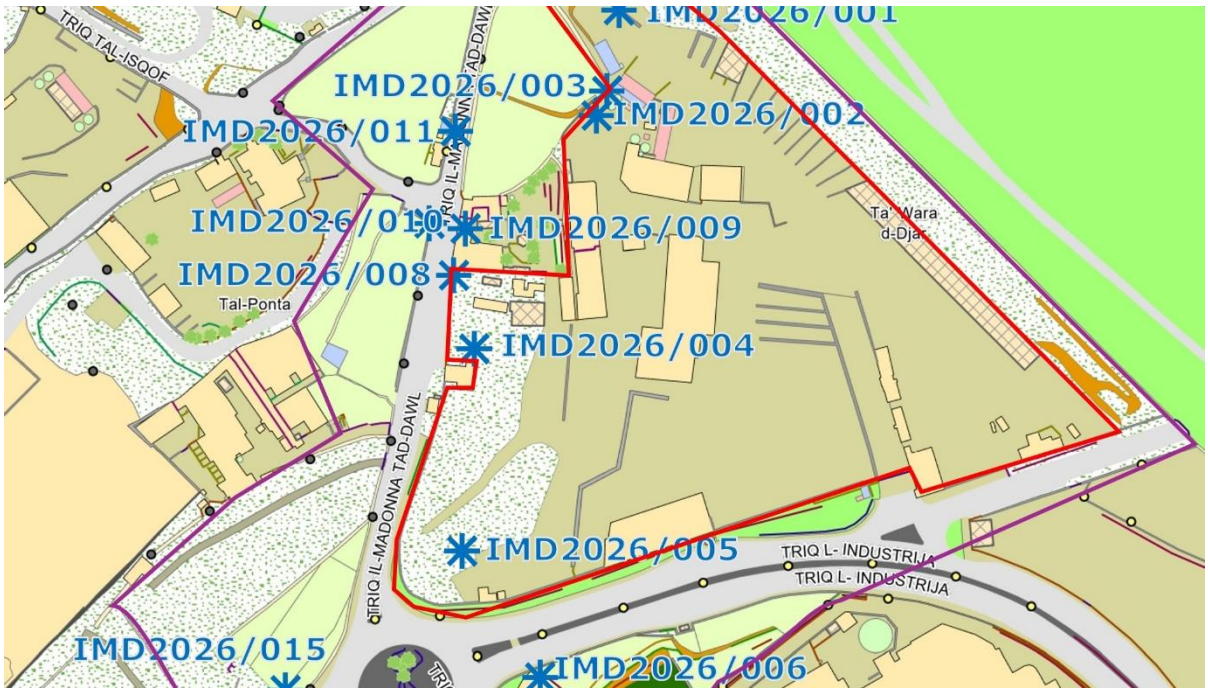
Ref no
IMD2026/008

Location	**Category**	**Site Description (Address)**
Boundary Marker at Triq il-Madonna tad-Dawl, Ħal Kirkop	Boundary	Boundary Marker
Eastings	**Northings**	**Period**
5324	6742	20th century
SS1	**SS2**	**Description**
SS3	**SS4**	A boundary marker consisting of dressed globigerina block, resting on a pedestal 6 courses high. The marker is capped with a corniced triangular tip. Etched in the face of the marker are the large initials G.P. probably referring to Government Property related to the proximity of the area to the airport. In fact in the 1968 SS, the area opposite this marker is marked as 'Government Property'.
Date of survey sheet:	2026	

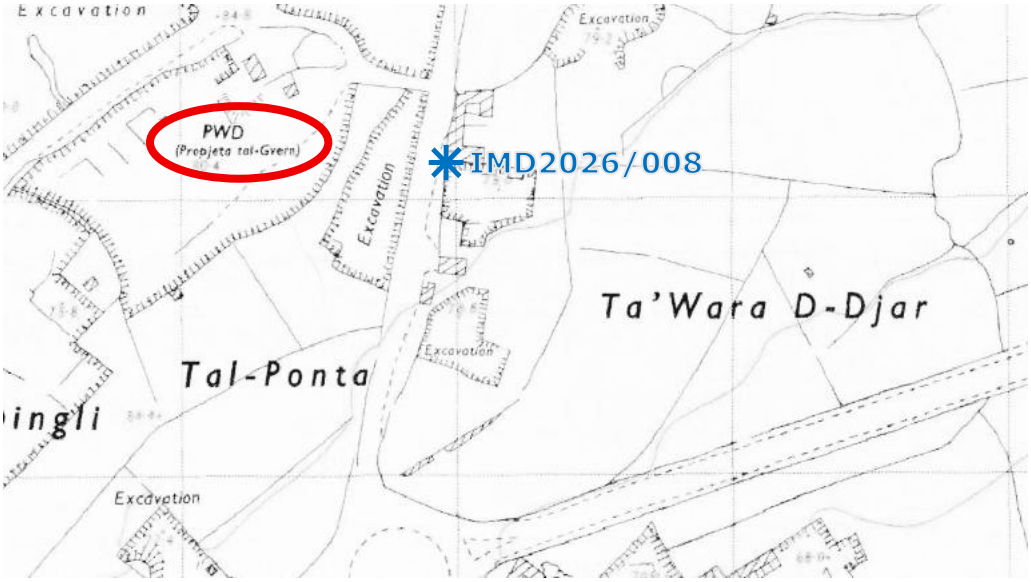
Present Utilisation
None

Comments

Site



Characteristics



Location of IMD2026_008 related to Government Property marked in the 1968SS

Condition
Good

Degree of Protection
None

Proposed Protection
Grade 2

Basic Bibliography

Compiled by
KBO, DB, MB, JC, EV

Date of Survey
31.i.2026

Photo file name IMD2026_008(1)

Photo file name IMD2026_008(2)

Data Capture Sheet

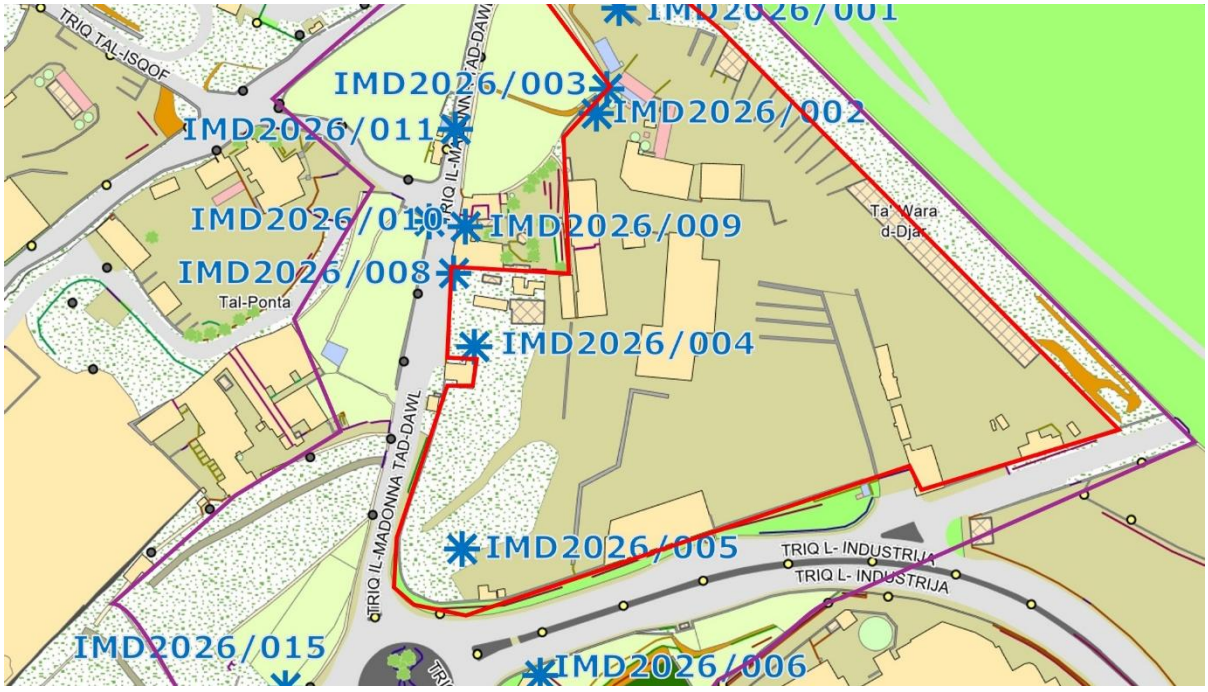
Ref no
IMD2026/009

Location	**Category**	**Site Description (Address)**
Farmhouse at Triq il-Madonna tad-Dawl, Ħal Kirkop	Vernacular	Farmhouse
Eastings	**Northings**	**Period**
5324	6744	Pre-1912
SS1	**SS2**	**Description**
SS3	**SS4**	Situated on the eastern side of Triq il-Madonna tad-Dawl, and to the northern side of the site, is a one storey farmhouse. Except for the door and a garage door, there are no other apertures. A simple cross standing on a base consisting of a three-stepped platform is carved in high relief a few metres to north of the door. Beneath this carved cross, there seems to be a blocked entrance, which is about 3 courses high. The boundary wall on the side of this farmhouse contain numerous dressed globigerina stones. It is possible that these were recycled from the Tad-Dawl shrine when it was dismantled. One of the stones north of IMD2026/009 has a graffito consisting of of the words T.D.
Date of survey sheet:	31.i.2026	

Present Utilisation
Garage

Comments
The Ordnance sheet of the 1920s marks this farmhouse. However, more rooms were added post 1920s. The farmhouse was inaccessable.

Site



Characteristics

Condition
Good

Degree of Protection
None

Proposed Protection
Grade 2

Basic Bibliography
Jaccarini, C.J., 1998, *Ir-Razzett – The Maltese Farmhouse*, P.E.G. Ltd, Malta

Compiled by
KBO, DB, MB, JC, EV

Date of Survey
31.i.2026

Photo file name IMD2026_009(3)

Photo file name IMD2026_009(8)

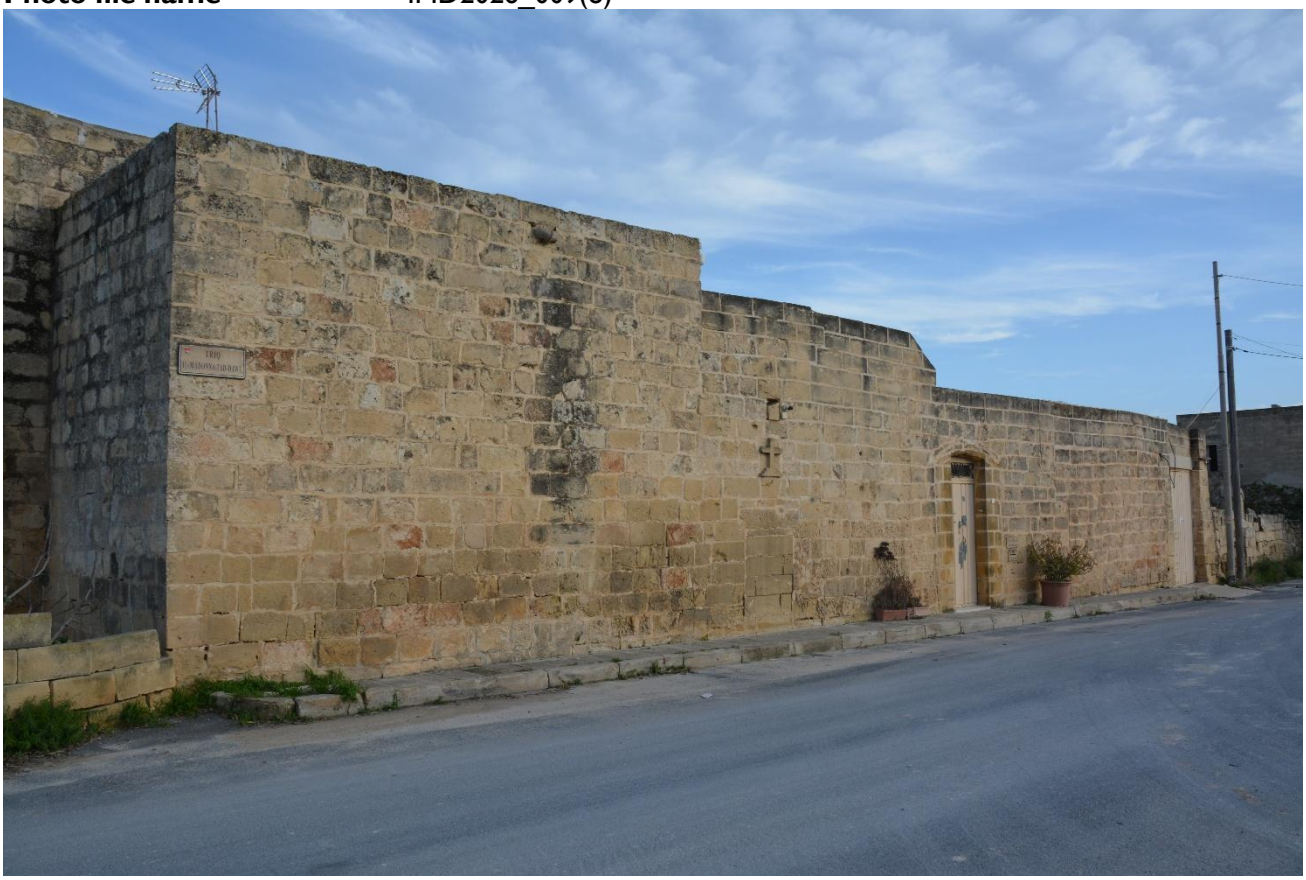


Photo file name IMD2026_009(2)

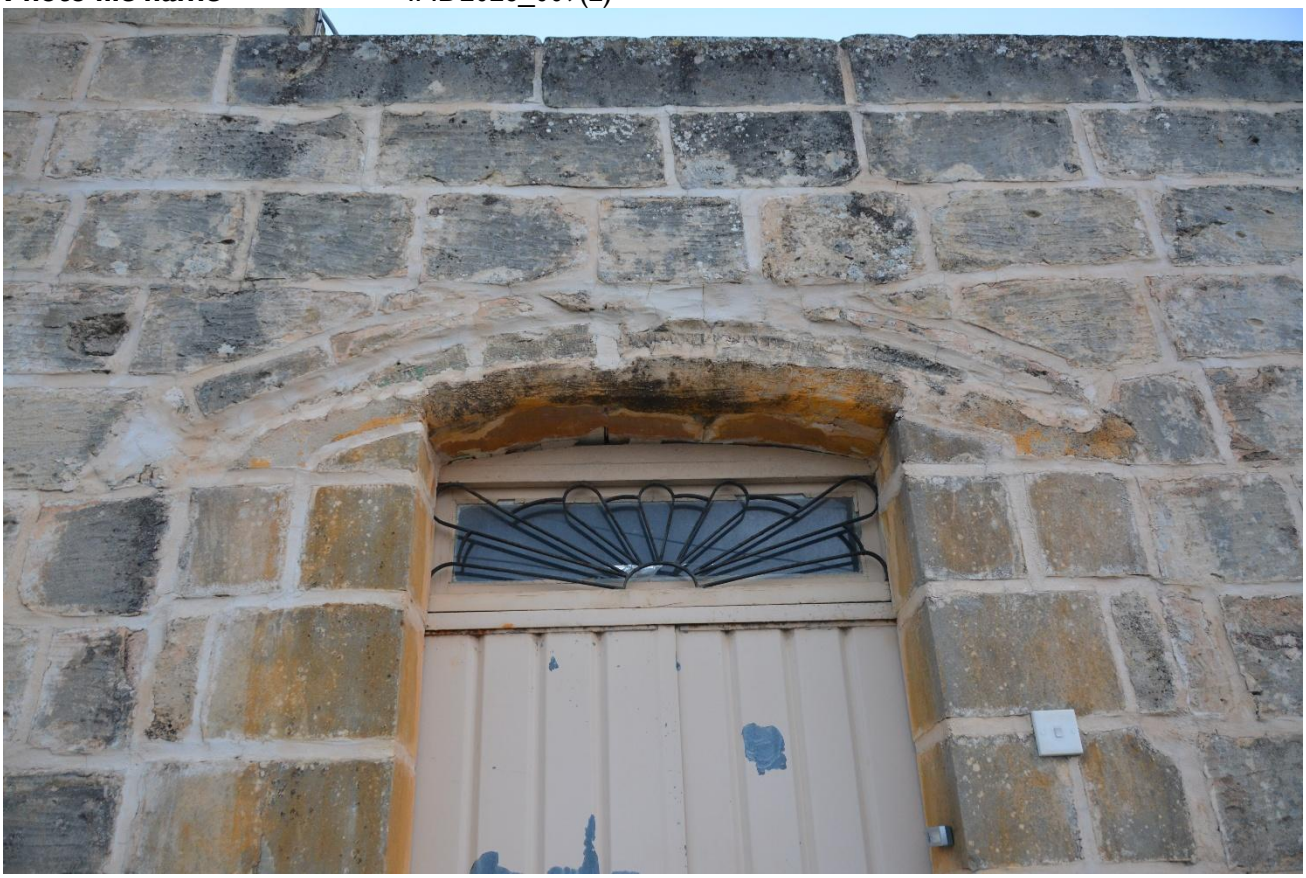


Photo file name IMD2026_009(6)

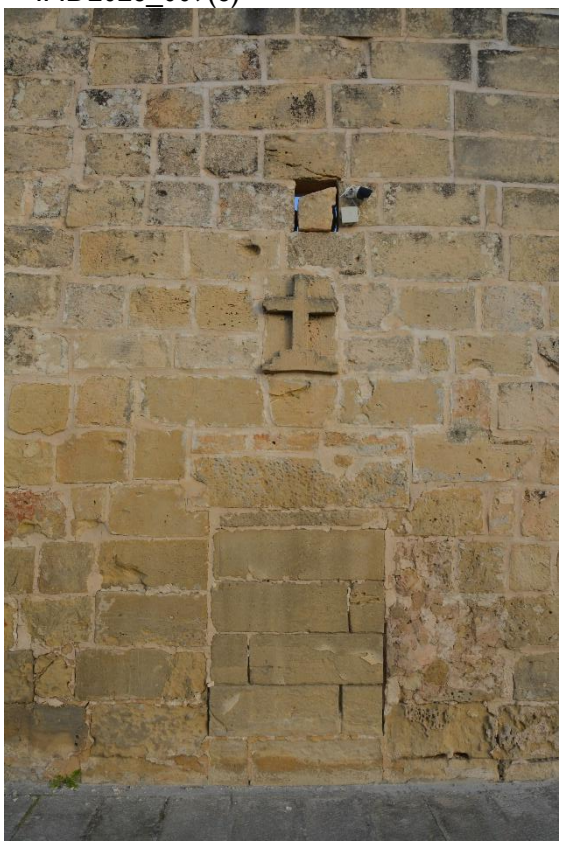


Photo file name IMD2026_009(5)

Photo file name IMD2026_009(11)

Photo file name IMD2026_009(10)

Photo file name IMD2026_009(15)

Photo file name IMD2026_009(TD)

Data Capture Sheet

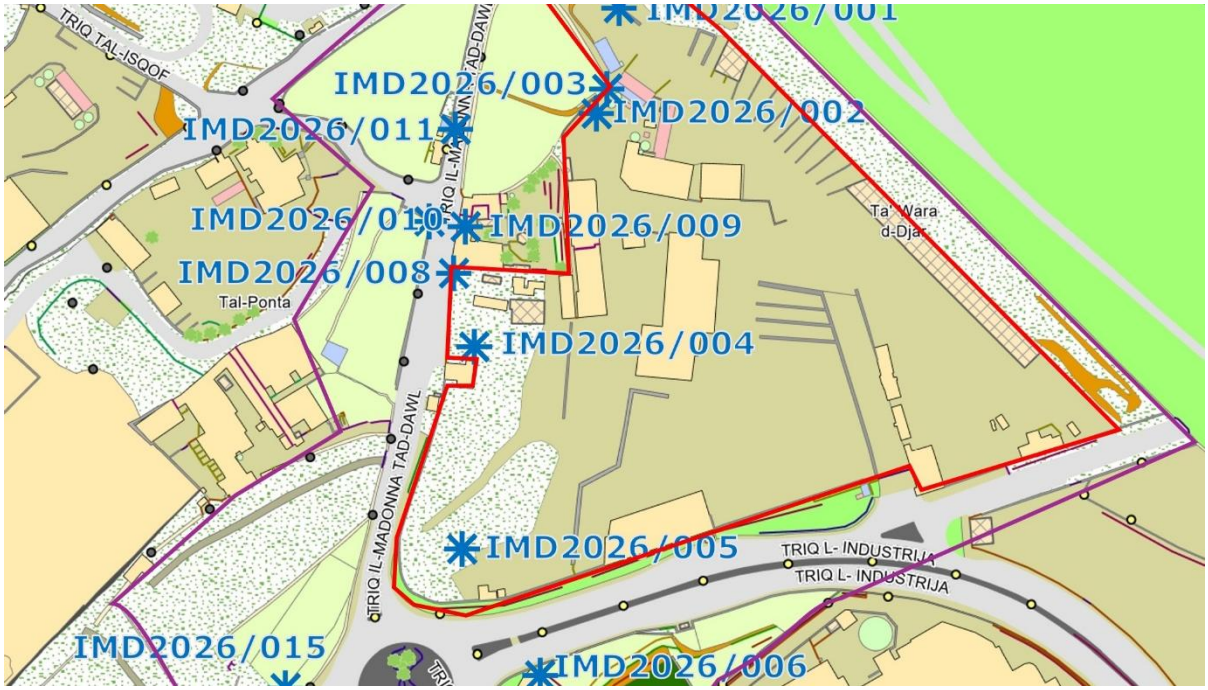
Ref no
IMD2026/010

Location	**Category**	**Site Description (Address)**
Quarry at Triq il-Madonna tad-Dawl, Ħal Kirkop	Rock-cut and Industrial	Quarry
Eastings	**Northings**	**Period**
5323	6743	20th century
SS1	**SS2**	**Description**
SS3	**SS4**	On the western side of Triq il-Madonna tad-Dawl, opposite IMD2026/009 is a quarry which was filled and turned into a field. This quarry is marked as' Excavation' on the 1968 Survey sheet but is not visible in the 1912SS. The boundary wall running in a N-S direction, consists mainly of dressed globigerina stones, and the rest of undressed stones. In the northern part of the field there are other rubble walls, some having dressed stone accretions.
Date of survey sheet:	2026	

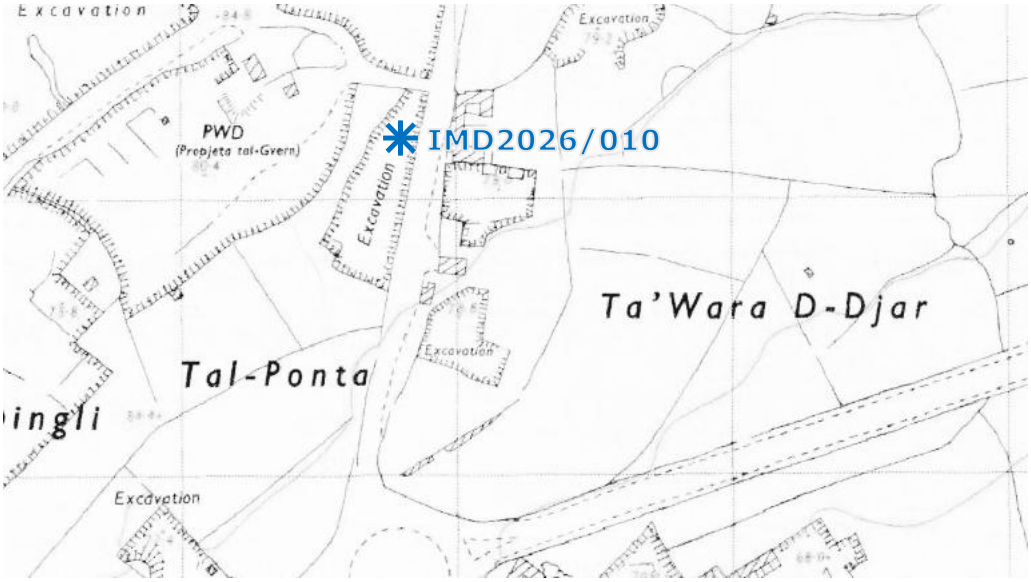
Present Utilisation
Field

Comments

Site



Characteristics



Location of IMD2026_008 related to Government Property marked in the 1968SS

Condition
Good

Degree of Protection
None

Proposed Protection
Grade 3

Basic Bibliography
Balm, R. (1996). Big holes in a small place: the stone quarrying dilemma in the Maltese Islands. *Geography: Journal of the Geographical Association*, 81(1), 82-91.
Carbone, J. (2016). Il-ġebla mill-barriera sa fuq il-lant tax-xogħol. *Festa San Leonardu, [Kirkop] 2016*, 140-155.

Compiled by
KBO, DB, MB, JC, EV

Date of Survey
31.i.2026

Photo file name IMD2026_010(1)

Photo file name IMD2026_010(3)

Data Capture Sheet

Ref no
IMD2026/011

Location
Rural complex built within a quarry at Triq il-Madonna tad-Dawl, Ħal Kirkop

Category
Vernacular, Rock-cut and Industrial

Site Description (Address)
Rural complex built within a quarry

Eastings
5324

Northings
6747

Period
Quarry pre-dates 1912

SS1

SS2

SS3

SS4

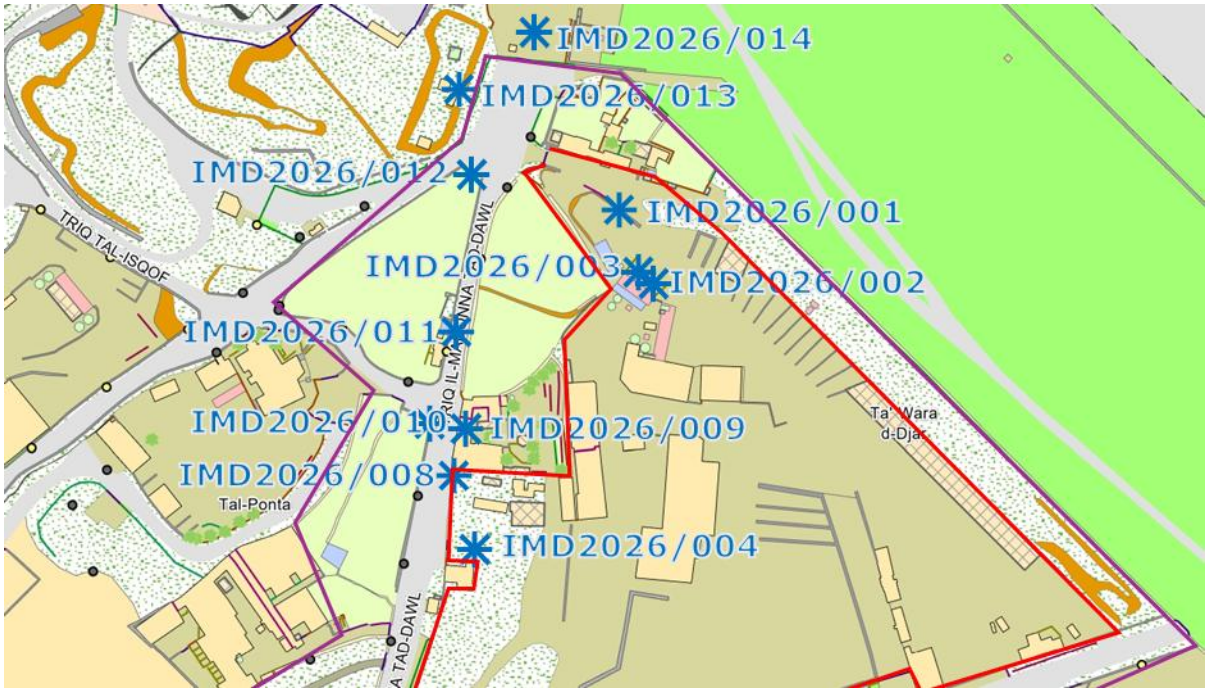
Date of survey sheet: 2026

Description
A rural complex consisting of a quarry turned into a field similar to IMD2026/010, and two rooms on the eastern side of the quarry, beneath Triq Madonna tad-Dawl. The complex consists of two rooms built in dressed globigerina stones. The roof of the northern is supported by wooden beams as observed in the section. The complex is also equipped with a water reservoir that collects water from the roof of the rooms.
The quarry pre-dates 1912, and the rural complex does not appear in the 1958 SS either.

Present Utilisation
None

Comments
Interior is inaccessable

Site



Characteristics

Overlay of 1912 SS and recent aerial photo
(https://www.arcgis.com/apps/instant/basic/index.html?appid=8d71e8d7484c433b9cf7430133dba256)

Condition
Bad

Degree of Protection
None

Proposed Protection
Grade 3

Basic Bibliography

Balm, R. (1996). Big holes in a small place: the stone quarrying dilemma in the Maltese Islands. Geography: Journal of the Geographical Association, 81(1), 82-91.

Carbone, J. (2016). Il-ġebla mill-barriera sa fuq il-lant tax-xogħol. Festa San Leonardu, [Kirkop] 2016, 140-155.

Jaccarini, C.J., 1998, *Ir-Razzett – The Maltese Farmhouse*, P.E.G. Ltd, Malta

Compiled by
KBO, DB, MB, JC, EV

Date of Survey
31.i.2026

Photo file name IMD2026_011(13)

Photo file name IMD2026_011(18)

Photo file name IMD2026_011(16)

Photo file name IMD2026_011(19)

Photo file name IMD2026_011(7)

Photo file name IMD2026_011(8)

Data Capture Sheet

Ref no
IMD2026/012

Location	**Category**	**Site Description (Address)**
Foundations of the Shrine of The Madonna tad-Dawl, Triq il-Madonna tad-Dawl, Ħal Kirkop	Religious	Location of the Shrine dedicated to the Madonna tad-Dawl

Eastings	**Northings**	**Period**
5325	6752	1741

SS1	**SS2**	**Description**
SS3	**SS4**	
Date of survey sheet:	2026	

The location of the 18th century shrine dedicated to the Madonna tad-Dawl, built by Grandmaster Pinto. This was a landmark since Dejma training was carried out in front of it and the portico was used as a storage and resting place. The three arches of the portico contained the painting of the Madonna in the central arch, flanked by the statues of Saint Andrew and St Peter on each side. The niche was still standing in 1937, when a petition was put forward with the Maltese diocese to restore it. However, it was dismantled during World War II. Today the area is overgrown with opuntia, an almond and an olive tree that are growing from the quarry beneath the road. The shallow boundary wall of dressed globigerina stones could have been the remnants of the structure.

Present Utilisation
None

Comments
The foundations of the niche should be excavated and documented. An information panel should be installed. A replica of the niche can be incorporated as part of the shopping complex. This will recuperate part of the local architectural heritage, raise the awarenss of the public.

Site

Characteristics

(https://www.facebook.com/zurriequlmadwar/photos/il-kappella-ftit-%C5%BCmien-qabel-twaqqg%C4%A7etthe-shrine-before-it-was-demolished/247798900471964/?set=a.155411510458444)

(https://www.facebook.com/photo?fbid=1016079790634109 1&set=gm.2695242940642837&idorvanity=556886211145198)

Condition
Destroyed

Degree of Protection
None

Proposed Protection
Class E

Basic Bibliography

Bonniċi, C. (2019). "In-niċċa tal-Madonna tad-Dawl fil-limiti ta' Ħal Kirkop" ... in-niċċa li ntesiet. Festa San Ġuzepp, Kirkop, 2019, 145-149.

Lia, C. (2013). Il-bidu tal-kult lejn il-Madonna tad-Dawl. *Festa titulari Sant'Andrija, Luqa, 2013*, 155, 157, 158, 159, 160.

Compiled by
KBO, DB, MB, JC, EV

Date of Survey
31.i.2026

Photo file name IMD2026_012(1)

Data Capture Sheet

Ref no
IMD2026/013

Location
Fortifications at Luqa Airport, Triq il-Madonna tad-Dawl, Ħal Kirkop

Category
Fortifications

Site Description (Address)
Fortification installations related to Luqa Airport

Eastings
5325

Northings
6755

Period
20th century

SS1

SS2

SS3

SS4

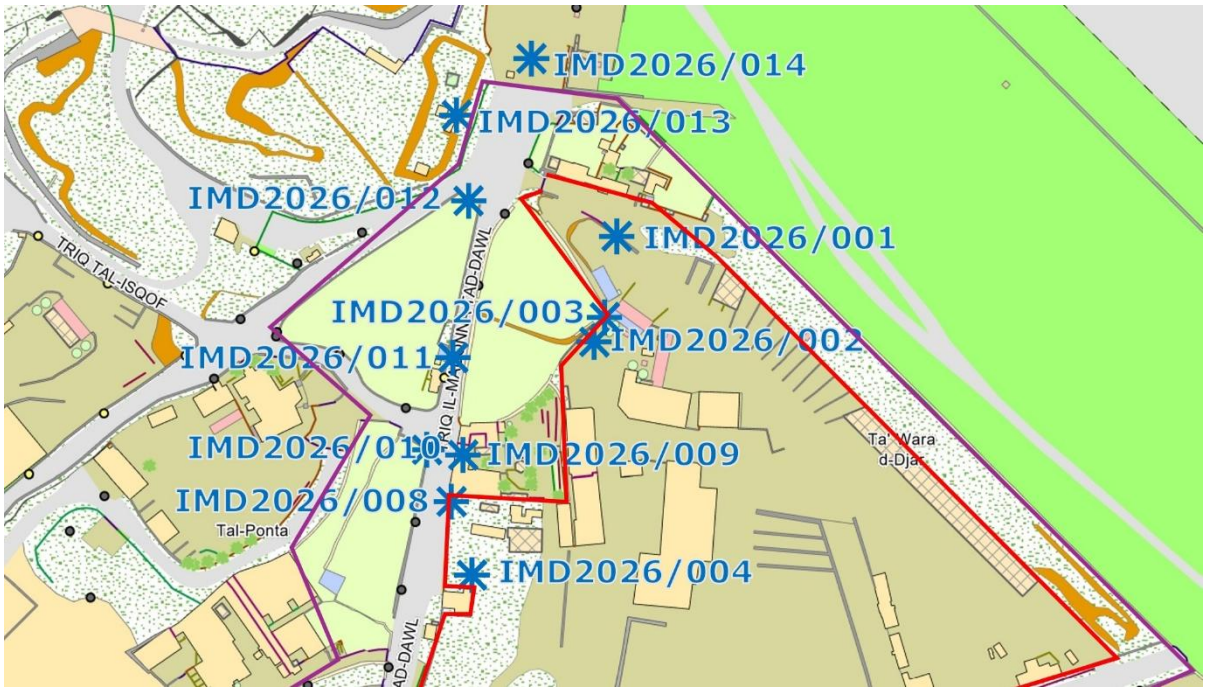
Date of survey sheet:
2026

Description
Structures related to Luqa Airport within the current boundaries of the airpot, consisting of a platform constructed from globigerina blocks and debris, on which stand 3 buildings: a pill box, rooms, and a searchlight room. Building 1- Pill box: The pill box is situated in the north-western part of the platform overlooking the air-port's entrance. This has a turret on top. At ground floor each façade has two embrasures and another in each corner. Building 2 - Room: built in concrete and is situated a few metres away SSE from the pill box. Function is unknown. Building 3 - Searchlight Room: a concrete flight of stairs leading to a small rectangular room with windows in southern and northern wall. The windows are quite large having louvers. The roof is covered with a wide flat concrete block framed by metal. Building 4 - Room: Cutting the base of the eastern face of the rubble platform is a rectangular room, built of globigerina and not concrete. In this room there is an engine.

Present Utilisation
Unknown

Comments
Inaccessable, but from the exterior the structures seem to be in good condition

Site



Condition
Good

Degree of Protection
None

Proposed Protection
Grade 2

Basic Bibliography

Compiled by
KBO, DB, MB, JC, EV

Date of Survey
31.i.2026

Photo file name IMD2026_013(20)

Photo file name IMD2026_013(24)

Photo file name IMD2026_013(15)

Photo file name IMD2026_013(8)

Photo file name IMD2026_013(10)

Photo file name IMD2026_013(11)

Photo file name IMD2026_013(1)

Data Capture Sheet

Ref no
IMD2026/014

Location
Fuelling station at Luqa Airport Gudja l/o Triq il-Madonna tad-Dawl, Ħal Kirkop

Category
Industrial

Site Description (Address)
Crash gate to old airport fuelling station

Eastings
5327

Northings
6757

Period
20th century

SS1

SS2

SS3

SS4

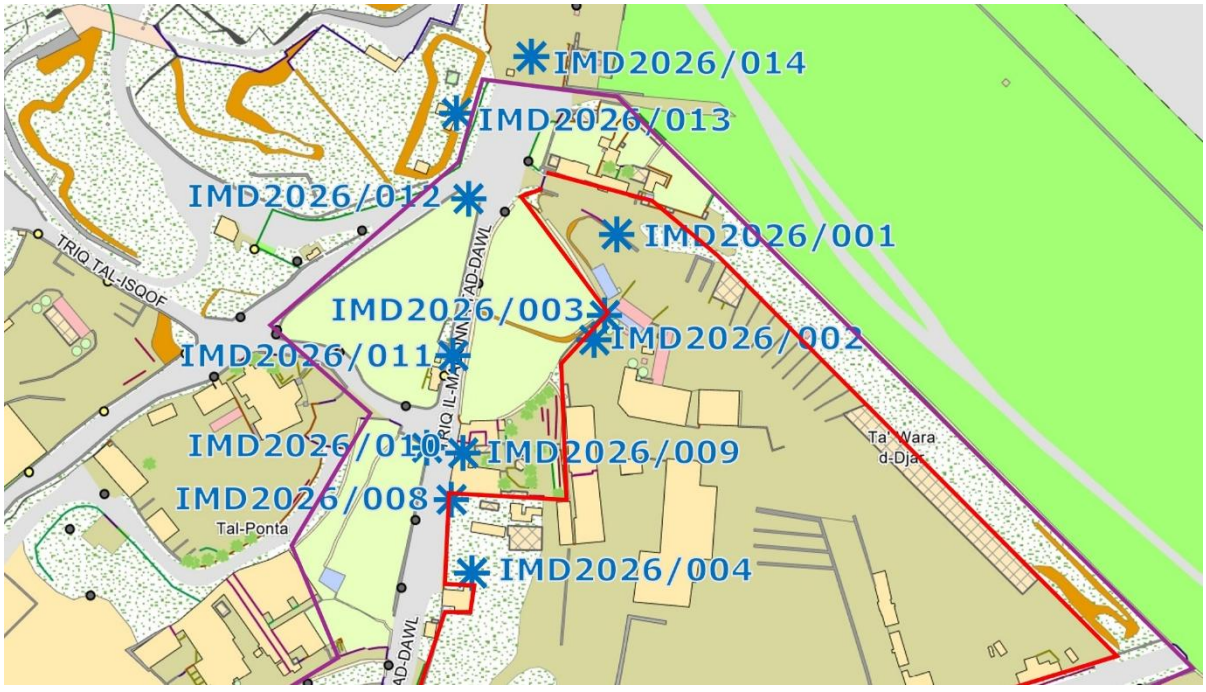
Date of survey sheet:
2026

Description
Enclosed by a fence and barbed wire is a gate and a wide tarmaced opening leading to a service road of the airport where the fuelling station was situated. On the north-western side is a guardroom built of globigerina and roofed with concrete. The guardroom has number 291.

Present Utilisation
None

Comments
Inaccessable

Site



Condition
Good

Degree of Protection
None

Proposed Protection
Grade 3

Basic Bibliography

Compiled by
KBO, DB, MB, JC, EV

Date of Survey
31.i.2026

Photo file name DWL2026/014(1)

Photo file name DWL2026/014(2)

Photo file name DWL2026/014(3)

Unkno

Data Capture Sheet

Ref no
IMD2026/015

Location
Farmhouse at Triq Valletta, Ħal Kirkop

Category
Vernacular

Site Description (Address)
Farmhouse

Eastings
5317

Northings
6726

Period
Pre-1912

SS1

SS2

SS3

SS4

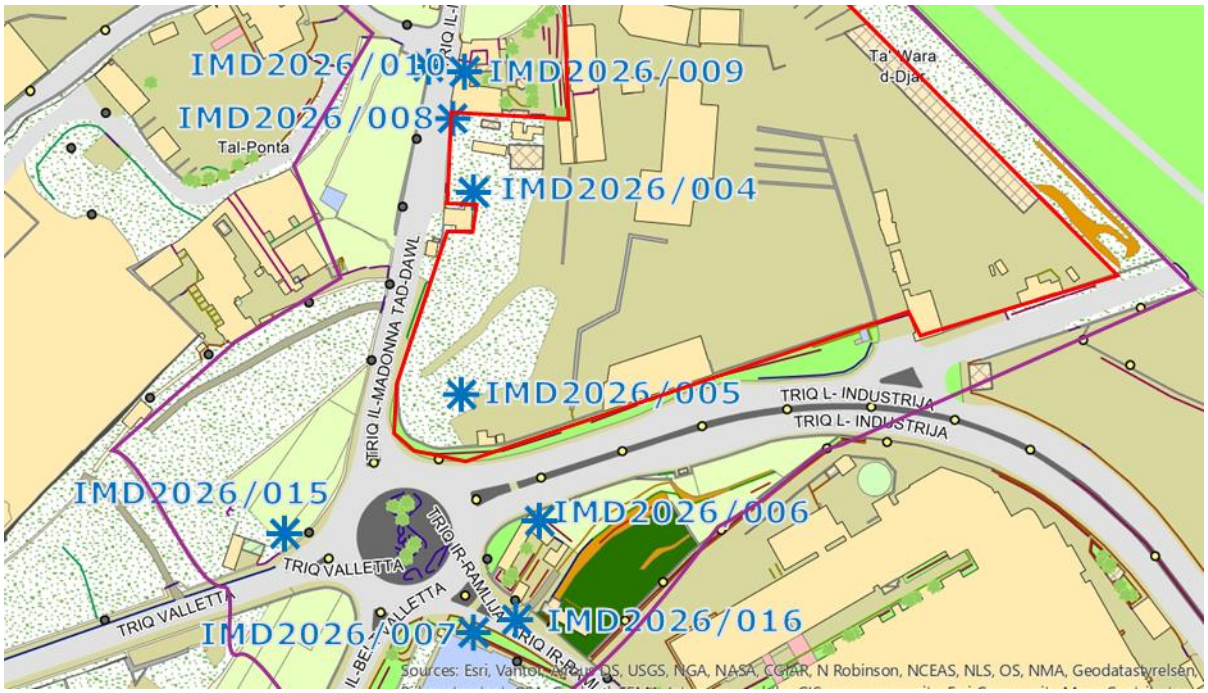
Date of survey sheet: 2026

Description
A small farmhouse situated at Triq l-Imqabba corner with Triq il-Madonna tad-Dawl. It consists of a mandra, maqjel and on top of the maqjel, the għorfa. The latter could be reached from an open stone staircase on the outside that led on to the maqjel. Abutting the western side are more rooms. The entrances to the complex and of the għorfa looks on the south, whilst the għorfa's window is on the north-east

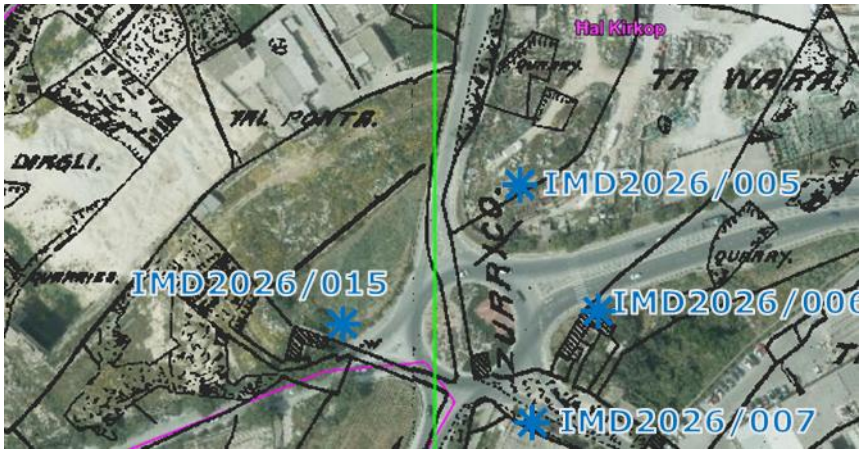
Present Utilisation
None

Comments
Inaccessable

Site



Characteristics



Overlay of 1912 SS and recent aerial photo
(https://www.arcgis.com/apps/instant/basic/index.html?appid=8d71e8d7484c433b9cf7430133dba256)

Condition
Collapsed roof

Degree of Protection
None

Proposed Protection
Grade 3

Basic Bibliography
Jaccarini, C.J., 1998, *Ir-Razzett – The Maltese Farmhouse*, P.E.G. Ltd, Malta

Compiled by
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Date of Survey
31.i.2026

Photo file name IMD2026_015(10)

Photo file name IMD2026_015(12)

Photo file name IMD2026_015(2)

Photo file name IMD2026_015(3)

Data Capture Sheet

Ref no
IMD2026/016

Location
Wellhead at Triq ir-Ramlija, Ħal Kirkop

Category
Vernacular

Site Description (Address)
Wellhead

Eastings
5327

Northings
6723

Period
unknown

SS1

SS2

SS3

SS4

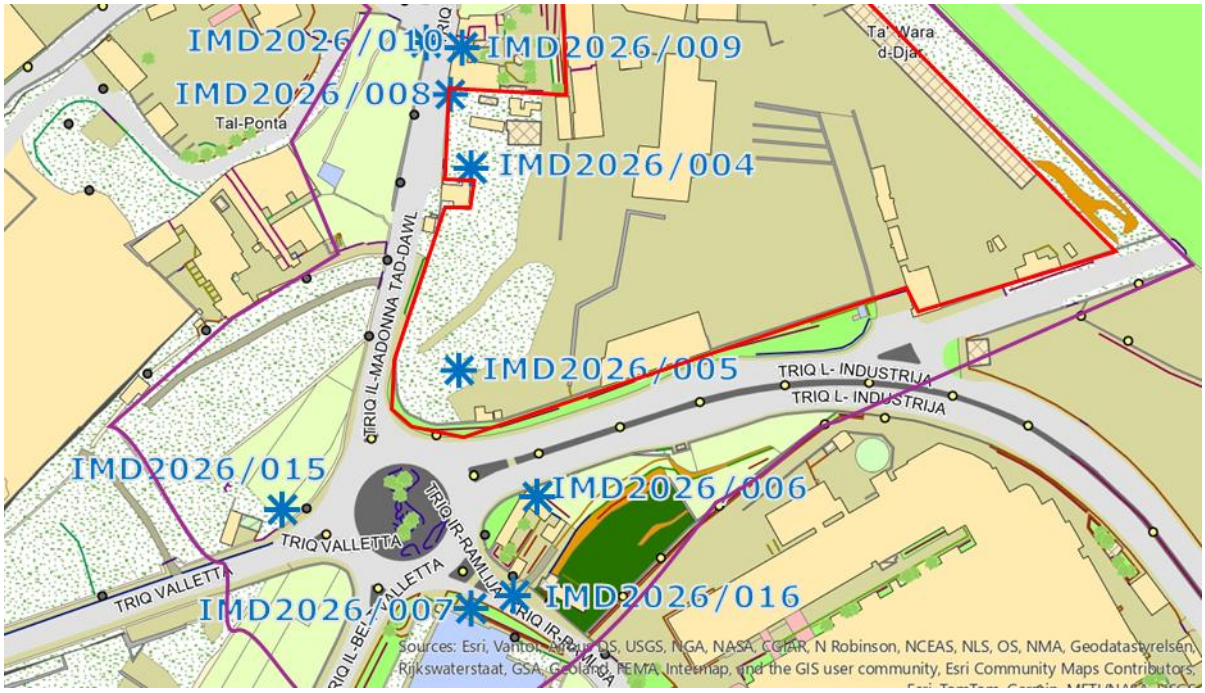
Date of survey sheet: 2026

Description
Wellhead on the modern pavement behind farmhouse IMD2026/006. The wellhead, *ħerża* does not have the pilasters, *plieri,* and the horizontal beam il-*ġejża* to which the pulley was fixed. Usually the *ġejża* consisted of a large horizontal slab. This indicates that either the wellhead is incomplete or that the farmer hauled the bucket of water without the aid of a pulley.

Present Utilisation
None

Comments
Since the pavement below it is modern, and since the well is not marked in the 1912 survey sheet, it is not clear whether the wellhead is in its original location or not.

Site



Condition
Good

Degree of Protection
None

Proposed Protection
Grade 3

Basic Bibliography
Jaccarini, C.J., 1998, *Ir-Razzett – The Maltese Farmhouse*, P.E.G. Ltd, Malta

Compiled by
KBO, DB, MB, JC, EV

Date of Survey
31.i.2026

Photo file name IMD2026_016 (1)