

وزارة شؤون البلديات والزراعة

قرار رقم (٧٢) لسنة ٢٠٢٦

بشأن اعتماد المعايير والمواصفات

لتقديم خرائط البناء القائم (As Built) "خرائط الحدود الخارجية" في نظام بنايات

وزير شؤون البلديات والزراعة:

بعد الاطلاع على قانون تنظيم المباني الصادر بالمرسوم بقانون رقم (١٣) لسنة ١٩٧٧، وتعديلاته، وعلى
الأخص المادة (١٩) منه،
وعلى قانون البلديات الصادر بالمرسوم بقانون رقم (٣٥) لسنة ٢٠٠١، وتعديلاته، ولائحته التنفيذية
الصادرة بالقرار رقم (١٦) لسنة ٢٠٠٢، وتعديلاتها،
وعلى الاشتراطات التنظيمية للتعمير بمختلف المناطق في مملكة البحرين الصادرة بالقرار رقم (٩٣) لسنة
٢٠٢٣،

وبناءً على عرض وكيل الوزارة لشؤون البلديات،

فُتِر الآتي:

المادة الأولى

يُعمد لتقديم خرائط البناء القائم (As Built) "خرائط الحدود الخارجية" في نظام بنايات
(www.benayat.bh)، المعايير والمواصفات المرافقة لهذا القرار.

المادة الثانية

على وكيل الوزارة لشؤون البلديات والمعنيين - كُلٌّ فيما يخصه - تنفيذ أحكام هذا القرار، ويُعمل به من
تاريخ نشره في الجريدة الرسمية.

وزير شؤون البلديات والزراعة

المهندس وائل بن ناصر المبارك

صدر بتاريخ: ٨ محرم ١٤٤٨هـ

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**STANDARDS AND SPECIFICATIONS FOR
SUBMITTING AS-BUILT DRAWINGS
"OUTER BOUNDARY MAPS"**

STANDARDS AND SPECIFICATIONS FOR SUBMITTING
AS-BUILT DRAWINGS
"OUTER BOUNDARY MAPS"

Revision History

Version	Date	Amendment(s)	Author
1.0	December 2025	First Release of this Document	As-Built Team (TSD-SLRB)

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Special thanks are extended to the Ministry of Municipalities Affairs and Agriculture, the Information & eGovernment Authority and Private Engineering Offices for their valuable feedback, which greatly contributed to defining these requirements.

Note: Users of this document must ensure that they refer to the **latest version**. This document is independent and distinct from the *Data Capture Standards and Specifications for As-Built Field Survey* and should be applied specifically for Outer Boundary Map (OBM) submissions.

Introduction

This document provides the official standards and specifications for submitting "Outer Boundary Maps" (OBM) to the Survey & Land Registration Bureau (SLRB). OBMs are used to update the official topographic base map maintained by the SLRB.

The data update process will be carried out through a systematic review and inclusion of provided OBM data on an individual project basis. All work shall be performed by licensed Engineering Offices in accordance with the standards, specifications, and guidelines defined in this document to ensure consistency, accuracy, and data integrity.

The data provider is fully responsible for the accuracy and completeness of all submitted OBM data. The main objective of this document is to ensure that all mapped features and structures are represented accurately, in their true location, and with the appropriate identifying codes.

The purpose of this document is to define the guidelines and technical standards for preparing and submitting OBMs. It ensures that all submitted data meets the SLRB's data submission requirements, including the format, geometry, attributes, positional accuracy, and file structure.

It also provides clear instructions for interpreting and drafting topographic features, so that submitted OBMs are consistent.

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1. "Outer Boundary Maps" (OBM) Drawing Standards and Specifications

This section establishes the standards for the preparation of Outer Boundary Maps (OBMs) intended for updating the Bahrain National Geospatial Database. It defines the required specifications to ensure accuracy, consistency, and uniformity in all drawings, file formats, and georeferencing practices.

Note: OBM's should be provided at both "Building Permit stage" and "Construction Follow-up stage" according to the final As-Built conditions.

1.1. Drawing "Outer Boundary Maps"

A. Outer Building Line "Building Roof" (Closed Polygon)

- Provide the "Outer building line" showing the maximum horizontal coverage of the building at **any floor level**, representing the full horizontal extent. (as shown in Fig. 1 – Red Line).
- The drawing must correspond to the actual As-Built at the final completion stage.
- Ensure all "Outer building line" are represented as a planar closed polygon with no self-intersections, gaps, or overlaps.

B. Building Footprint (Closed Polygon)

- Provide the "Building Footprint" showing the maximum horizontal coverage of the building at **Ground level** within the cadastral plot boundary (as shown in Fig. 1 – Red dashed Line).
- The drawing must correspond to the actual As-Built at the final completion stage.
- Ensure all "Building Footprint" are represented as a planar closed polygon with no self-intersections, gaps, or overlaps.

C. Property Entrance (Line)

- Provide the "Property Entrance", clearly Showing its location at **ground level** within the cadastral plot boundary (as shown in Fig. 1 – Orange Line).
- Ensure each "Property Entrance" is represented as a line, with no self-intersections, gaps, or overlaps.

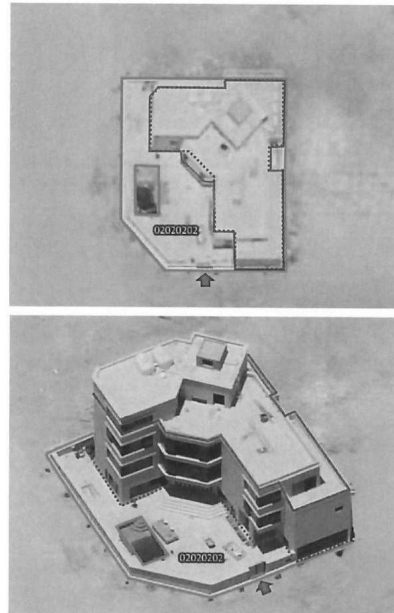


Figure 1: Example of "Outer Boundary Maps"

Outer Building Line "Building Roof"	Building Footprint
Property Entrance	Boundary Wall
Cadastral Plot Boundary	Swimming Pool
Encroachment Building	02020202 Parcel Number

D. Boundary Wall (Line String)

- Provide all "Boundary Walls" showing the external limits of the property at **ground level** within the cadastral plot boundary. (as shown in Fig. 1 – Yellow Line).
- The drawing must correspond to the actual As-Built at the final completion stage.
- External "Boundary Walls" must snap precisely to building corners and cadastral boundaries, with no undershoots or overshoots.
- Ensure all "Boundary Walls" are represented using either Line or Line String geometry, based on the wall layout, with no self-intersections, gaps, or overlaps between segments.

E. Cadastral Plot Boundary (Closed Polygon)

- Provide the official "Cadastral Plot Boundary" as received from the government system. (as shown in Fig. 1 – Green Line).
- Ensure the "Cadastral Plot Boundary" represented as a planar closed Polygon, with no self-intersections, gaps, or overlaps.

F. Swimming Pool (Closed Polygon)

- Provide all "Swimming Pool" showing the maximum horizontal coverage of the swimming pool at **any floor level** within the cadastral plot boundary (as shown in Fig. 1 – Blue Line).
- The drawing must correspond to the actual As-Built at the completion stage.
- Ensure each "Swimming Pool" represented as a planar closed Polygon, with no self-intersections, gaps, or overlaps.

G. Encroachment Building (Closed Polygon)

- Provide "Encroachment Building" showing any portion of a building that extends inside the subject parcel boundary at **any floor level**. (see Appendix – Glossary)
- The drawing must correspond to the actual As-Built at the completion stage.
- Ensure each "Encroachment Building" represented as a planar closed Polygon, with no self-intersections, gaps, or overlaps.

H. Parcel Number (Text)

- Provide "Parcel Number" as a text within the cadastral plot boundary, matching the **official number** issued by Survey and Land Registration Bureau (SLRB) (as shown in Fig. 1 – White Text).
- The "parcel number" should be placed at the center of the plot and remain fully visible without overlapping other features or annotations.

1.2. CAD layers and Geometry Requirements

The table below Defines the feature name, CAD feature name, geometry type, and symbology.

Sr.	Feature Name	CAD Feature Name	CAD Geometry Type	Default Symbology (ByLevel): Color Line Style Line Weight
A	Outer Building Line	Building_Unclassified_Unsurveyed_As_Built_Eng	Closed Shape /Polygon	CO=44 (RGB 255,228,181) LC=0 CONTINUOUS 0.00 mm
B	Building Footprint	Building_Footprint_As_Built_Eng	Closed Shape /Polygon	CO=150 (RGB 120,82,0) LC=5 Long Dash Gap 0.00 mm
C	Property Entrance	Delimiter_Gate_As_Built_Eng	Line String /Polyline	CO=0 (RGB 255,255,255) LC=0 CONTINUOUS 0.00 mm
D	Boundary Wall	Delimiter_Wall_As_Built_Eng	Line String /Polyline	CO=6 (RGB 255,127,0) LC=0 CONTINUOUS 0.00 mm
E	Cadastral Plot Boundary	Cadastral_Boundary_As_Built_Eng	Closed Shape /Polygon	CO=3 (RGB 255,0,0) LC=0 CONTINUOUS 0.00 mm
F	Swimming Pool	Hydrography_Recreational_Pool_As_Built_Eng	Closed Shape /Polygon	CO=1 (RGB 0,0,255) LC=0 CONTINUOUS 0.00 mm
G	Encroachment Building	Building_Encroachment_Unclassified_Unsurveyed_As_Built_Eng	Closed Shape /Polygon	CO=7 (RGB 0,255,255) LC=5 Long Dash Gap 0.00 mm
H	Parcel Number	Text_Parcel_Number_As_Built_Eng	Text	CO=3 (RGB 255,0,0) LC=0 CONTINUOUS 0.00 mm

1.3. Formats and Georeferencing Specifications

This section defines the required digital file formats, measurement units & setting and spatial reference standards to ensure consistency and positional accuracy of submitted OBM drawings with the Bahrain National Grid system.

1.3.1 Accepted File Formats and Projection

Requirement	Specification
Accepted Formats	DGN, DWG, DXF, ESRI Shapefile.
Drawing Unit	Metric units — 1 drawing unit must equal 1 meter
Georeferencing	Drawings must be georeferenced to their actual location within the parcel boundary.
Projection	Bahrain National Grid (Ain Al Abd / UTM Zone 39N), EPSG:20439

- Standard seed file (SLRB_OBM_Seed.dgn) will be provided by SLRB to ensure consistency across all submissions (do not use default seed files).

1.3.2 Units & Setting Requirements

The following working unit settings must be applied to avoid scaling and alignment issues:

Setting	Value
Master Unit	Meters (M)
Sub-Unit	Millimeters (mm)
Resolution (UOR)	10,000 UOR per meter
Solids Accuracy	4.29497E-06 m

1.3.3 DGN format Submission Requirements

Requirement	Specification
Geographic Coordinate System (GCS)	Ain Al Abd 1970 / UTM Zone 39N (EPSG:20439). Must be assigned in the model properties.
Global Origin / Working Area	As defined in the SLRB seed file (no changes permitted).
Working Units Rule	Do not change Working Units after geometry exists. If conversion is needed, scale the geometry, do not relabel the units.
Direct DGN Option (Recommended)	Engineering Offices may submit DGN V8 directly.
AutoCAD Export Method	AutoCAD users must export via DGNEXPORT → V8 and browse to SLRB_OBM_Seed.dgn to ensure correct units/UOR/GCS.

1.3.4 DWG/DXF format Submission Requirements

Requirement	Specification
Supported Versions	AutoCAD 2018 (AC1032)–2025
Drawing Units	1 drawing unit = 1 meter
INSUNITS Setting	Set INSUNITS = 6 (Meters)
Coordinate Reference	Coordinates in meters, consistent with Ain el Abd 1970 / UTM Zone 39N (EPSG:20439)
Exporting to DGN (if applicable)	Use DGNEXPORT → V8 and select SLRB_OBM_Seed.dgn to preserve units, UOR, and projection consistency

1.3.5 Shapefiles format Submission Requirements

Requirement	Specification
Format	ESRI Shapefile (.shp, .shx, .dbf, .prj)
Coordinate Reference System (CRS)	Ain el Abd 1970 / UTM Zone 39N (EPSG:20439)
Units	Meters (UNIT["Meter", 1.0]) defined in the .prj file
Geometry Validity	Include only clean, valid geometries, with no gaps, overlaps, or self-intersections
Coordinates	XY in meters (consistent with Bahrain National Grid)

1.4. Site Measurement Guidelines and Data Quality

This section outlines the essential practices and industry leading methodologies (Best Practices) for site measurement, referencing, and quality assurance, ensuring all project layouts accurately reflect both the design and the actual site conditions.

1.4.1 Field Verification Requirement

All measurements and dimensions referenced in the final-stage drawings must be verified against actual site conditions during construction follow-up (NOC). No measurement shall be considered valid unless it has been confirmed through an on-site inspection conducted by the Supervising engineering office.

1.4.2 Practical Field Guidance and Data Integrity

The engineering office personnel (including the site engineer or technical staff) who conduct measurements are expected to follow the following principles:

- **Accurate Representation:** All drawings should accurately represent the actual site conditions at the time of measurement. This includes existing permanent features such as buildings, boundary walls, property entrances, swimming pools, encroachment buildings, and the official cadastral plot boundaries.
- **Foundational Reference Points:** All positional layouts and measurements on-site should be based on known, verified, and fixed reference points (Solid Points). Such as:
 1. **Cadastral Plot Markers:** The legally established boundary monuments, pins, or corner stone's defining the property's limits.
 2. **Survey Control Points:** Highly accurate, established points (often labeled Ground Control Points or Benchmarks) whose coordinates (horizontal and/or vertical) are known and tied to an official geodetic system.
 3. **Permanent Physical Features:** Existing, stable elements such as the corner or wall of a durable structure, provided its exact and verified coordinates or locations are accurately documented and introduced into the project's coordinate system.

1.4.3 Measurement Equipment and Data Quality

To ensure the highest levels of positional accuracy and data quality, measurements for validation and setting out shall be conducted using the appropriate method such as:

- Tape or Measuring Wheel: For short distances or simple, non-critical measurements.
- Laser Distance Meters (Disto or similar): For quick, approximate measurements and dimensional checks.
- Total Station: Essential for high-accuracy horizontal and vertical measurements, especially for larger or complex sites and for setting out critical project features.
- GNSS / GPS Surveying: Utilized for high-accuracy horizontal and vertical measurements, especially for larger or complex sites and for setting out critical project features.

1.4.4 Measurement Data Quality

All measured data in the drawings must be consistent with the dimensions /coordinates documented in the Attribute provided. Maintaining high data quality requires continuous verification of all measurements against the project's "Foundational Reference Points" and the design specifications

2. Attribute Requirements

This section identifies the attributes to be provided where applicable.

Attribute	Unit / Format	Available in Benayat System (Building Permits / Construction Follow up / Both)
Parcel Number	(e.g., 01010101)	Yes, Both
Building Permit Number	(e.g., NC/00/0000)	Yes, Both
Construction Follow Up (Request Number)	(e.g., CF/000/0000)	Yes, Construction Follow up
Construction Follow Up (Stage)	(e.g., Foundation, Final Inspection, etc.)	Yes, Construction Follow up
Construction Follow Up (Stage Start Date)	(e.g., Month 00, 0000)	Yes, Construction Follow up
Construction Follow Up (Stage End Date)	(e.g., Month 00, 0000)	Yes, Construction Follow up
Supervisor Engineering Office	(e.g., Office Name)	Yes, Both
Application Type	(e.g., New Construction, etc.)	Yes, Building Permits
Block	(e.g., 000)	Yes, Both
Roads	(e.g., 000)	Yes, Both
Area	(e.g., Busaiteen, Hidd, etc.)	Yes, Both
Governorate	(e.g., Muharraq, Capital, etc.)	Yes, Both
Zone Code	(e.g., A, B, etc.)	Yes, Both
Zone Description	(e.g., Investment Buildings -D, Row Housing -A, etc.)	Yes, Both
Usage Nature	(e.g., Villa, Hotel, etc.)	Yes, Both
Property Usage	(e.g., Residential, Commercial, etc.)	Yes, Both
Parcel Area	(e.g., in square meters)	Yes, Both
Building Area	(e.g., in square meters)	Yes, Both
Net Built-Up Area	(e.g., in square meters)	Yes, Both
Built-Up Area %	(e.g., in percentage)	Yes, Both
Floors	(e.g., 1, 2, 3, ...)	Yes, Both
No. of Buildings	(e.g., 1, 2, 3, ...)	Yes, Both
Building Height AGL (m)	(e.g., in meters)	Yes, Building Permits
Building Height ASL (m)	(e.g., in meters)	Yes, Building Permits
Has Mezzanine	(e.g., YES or NO)	Yes, Both
Has Basement	(e.g., YES or NO)	Yes, Both
Front Elevation Area	(e.g., in meters)	Yes, Both
Left Elevation Area	(e.g., in meters)	Yes, Both
Right Elevation Area	(e.g., in meters)	Yes, Both
Rear Elevation Area	(e.g., in meters)	Yes, Both
Ownership Type	(e.g., Self-owned, etc.)	Yes, Both
Project ID	(e.g., ADO-xxx, etc...)	Yes, Both
Car Park Count	(e.g., 1, 2, 3, ...)	Yes, Both

3. Submission Requirements and deliverables:

All submissions shall be made through the "Benayat System", where all requirements are listed and must be fulfilled at the time of request.

Appendix – Glossary

Boundary Walls	The external walls enclosing the parcel. Must connect precisely to building corners and the cadastral boundary, with no undershoots or overshoots.
CAD ByLevel / ByLayer	Symbology (color, line type/style, and line weight) shall be controlled at the level/layer. Element-level overrides are not permitted in OBM submissions.
Cadastral Plot Boundary	The official SLRB parcel boundary geometry for a registered parcel. Must be a planar closed polygon, with no gaps or overlaps.
DGN	MicroStation design file (V8) format used for OBMs, storing models, levels, working units, UOR, GCS, and symbology. OBM settings shall originate from the SLRB seed file.
DGN Seed file	A preconfigured MicroStation file (e.g., SLRB_OBM_Seed.dgn) defining units, UOR, GCS, global origin, and level standards for new designs.
DGNEXPORT	AutoCAD command used to export DWG → DGN (V8). During export, select the SLRB seed file (e.g., SLRB_OBM_Seed.dgn) to ensure correct units, UOR, GCS, and global origin.
DWG	AutoCAD drawing file. For OBM submissions, set INSUNITS = 6 (Meters), to maintain correct scale and coordinate values
DWG Insertion Units (INSUNITS)	AutoCAD system variable that defines one drawing unit. Must be set to 6 (Meters) for correct scaling on inserts and exports.
DXF	AutoCAD exchange format (ASCII/Binary) for interoperability. Use when a neutral CAD format is required. Retain meters and EPSG:20439.
Encroachment Building	Any portion of a building that crosses the parcel boundary onto adjacent private or public land.
GCS (Geographic Coordinate System)	The coordinate system assigned to the model. For OBMs: Ain el Abd 1970 / UTM Zone 39N (EPSG:20439).
Georeference / Georeferencing	Anchoring the drawing to the national grid so that coordinates match real-world locations. For OBM: assign <i>Ain el Abd 1970 / UTM Zone 39N (EPSG:20439)</i> and tie to at least two SLRB control points (three recommended). Apply <i>Translate + Rotate</i> only (no scale/shear). Files must include projection and unit metadata: • DGN: Model GCS set. • DWG: INSUNITS = 6 (Meters). • SHP: .prj includes EPSG:20439 with UNIT["Meter",1.0].
Global Origin / Working Area (MicroStation)	The model's internal origin and valid design window defined by the seed file. Do not modify. This ensures alignment with SLRB topographic DGNs and avoids precision shifts.
Line String / Shape (DGN)	Basic DGN geometry primitives - Line String (open chain) and Shape (closed polygon). DWG equivalents are Polyline (open/closed).
Outer Building Line	The maximum horizontal extent of a building at any floor level

Outer Boundary Map (OBM)	A drawing capturing the outer building line, boundary walls, property entrances, cadastral plot boundary, swimming pools, and encroachment buildings, representing the final As-Built condition. The outer boundaries reflect the actual built layout of the ground floor and final constructed design.
Property Entrance ".SHP (ESRI Shapefile)"	The vehicular or pedestrian gate located on the parcel boundary and used for site access. Vector GIS format delivered as a set of files: .shp (geometry), .shx (index), .dbf (attributes), .prj (projection). For OBM, .prj must define "Ain el Abd 1970 / UTM Zone 39N (EPSG:20439)" with units in meters.
Total Station	Survey instrument measuring angles and distances with high precision. Used for tying the OBM to SLRB control points and establishing traverses or closures.
UOR (Units of Resolution)	MicroStation storage precision — at 10,000 UOR per meter, the solids accuracy is approximately 0.000004 m (4 µm).
Solid Accuracy	The smallest unit of precision in a DGN file, equal to about 0.000004 m (4 microns), it shows how precise the file can store positions and dimensions.
Working Units (DGN)	Master Unit = Meters, Sub Unit = Millimeters, Resolution (UOR) = 10,000 per meter. Do not change units after geometry exists.