Survey and Land Registration Bureau

Survey Product Catalogue

2020-2021

slrb.gov.bh



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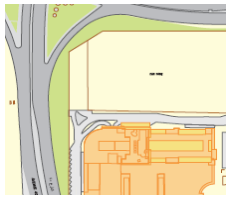
TOPO

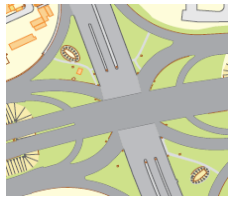
Topographic mapping is readily used across government and the private sector as the authoritative reference for national planning, infrastructure and urban development in the Kingdom.

SLRB maintains an extensive representation of natural and built environment features by surveying using photogrammetric and field survey techniques.

SLRB captures over 150 feature types managed within a set of 478 discrete Logical Map Boundaries (LMBs) that approximately follow Bahrain's administrative Block areas.

For further information about Topographic survey services please visit the SLRB Website









Logical Map Boundaries
LMB represents all topographic features of the natural and built environment within a single block area where 478 LMB's complete the whole Kingdom.



Buildings
SLRB maintains geospatial datasets of buildings consists all types of building structures.



Transportation
Covers the entire road network including bridges, highways, footpaths, Bus Stops and street furniture.



Cultural
Historical sites and structures such as forts, monuments and heritage architecture.



Physical Infrastructure
On ground physical infrastructure and utilities represented in LMB includes Substations, Pylons, Manholes, Inspection covers and Pipelines etc.



Natural Features
On ground natural structures represented in LMB includes vegetation, coastline and trees etc.

Products	Logical Map Boundaries (Total of 478 LMB)		
Accuracy	±20cm	**Coverage**	Whole of Bahrain
End user	Government Private sector	**Currency**	3 Years
Data source	GPS, Total station, Aerial Imagery	**Format**	Digital (CAD) Hardcopy
Detail level	Buildings: Footprints & Rooftops LOD1 – LOD1.5		

IMAGERY

SLRB provides an array of airborne captured imagery products of the Kingdom. Precise aerial imagery is the primary reference to update the national mapping and digital 1:1000 base map.

Imagery is captured approximately every 2 to 3 years and it is outsourced to private sector professional operators.

In support of the National Committee of Geospatial Information Governance (NCGIG) SLRB coordinates the Continuous Coordinated Imagery Programme (CCIP) for government entities that also incorporates LiDAR and elevation products.

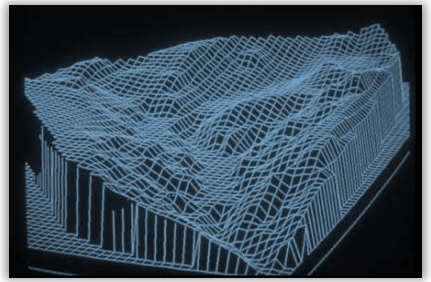
Imagery products of up to 10cm GSD are available over various years and urban areas. Products include true ortho-imagery, stereo overlap from 60-80% and oblique imagery in high rise regions. A range of derived elevation products are available including DTM, DSM and contours.

For further information about Topographic survey services please visit the SLRB Website

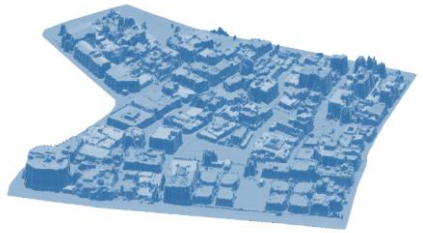




Topographic maps
Utilising imagery to produce topographic maps



DTM
Digital Terrain Models obtained from Airborne LiDAR & Imagery



DSM
Digital Surface models obtained from Imagery or LiDAR

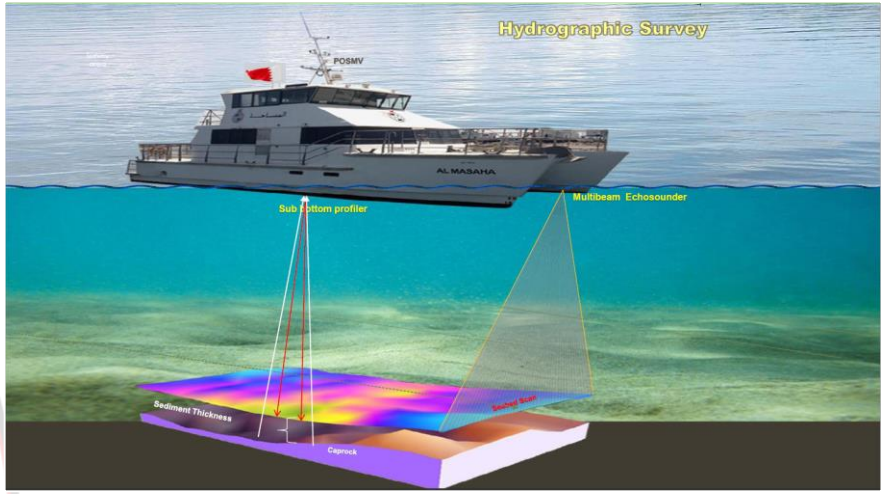
Product	Ground Sample Distance (GSD) & Coverage	Format
Ortho-imagery 2017	10 cm GSD 	Digital Mosaic (Various Formats)
Ortho-imagery Archive 2013-2010-2007-2002-1996-1966-1950's	10 cm GSD 	Digital Mosaic (Various Formats)
Oblique 2013 Limited Areas	10 cm GSD 	Digital
Historical Imagery	Various	Film/Scan
Flight Lines	Various	Digital/Scan



HYDRO

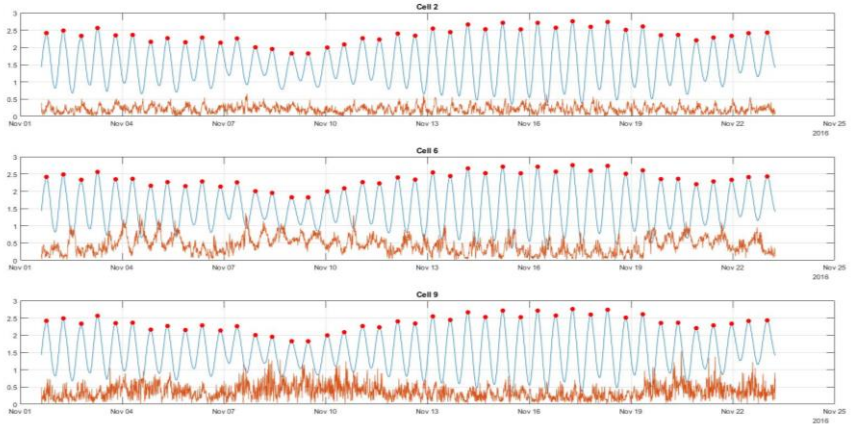
Hydrographic Survey Directorate (HSD) of SLRB produces nautical and marine charts necessary to ensure the safe navigation of ships and maritime vessels in Bahrain's territorial waters.

As a member of the International Hydrographic Organization (IHO) and maritime community, SLRB delivers electronic and hardcopy hydrographic charts to international standards. Supporting products include continuous tidal stream service data and tide tables, bathymetry data and a range of hydrographic survey services on request.

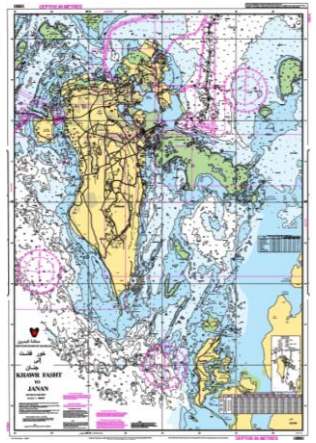


Hydrographic survey operations

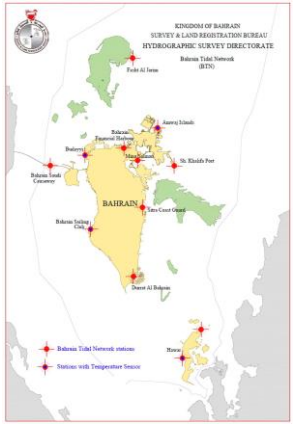
Product	Format
Navigation charts	Digital chart (ENC – S57 format) Hardcopy Digital (GeoPDF)
Tidal Stream	ASCII format
Tidal Stream Atlas	Hardcopy
Tide tables	Hardcopy Digital
Bathymetry	Point clouds & Depth Soundings
Current data	ASCII format



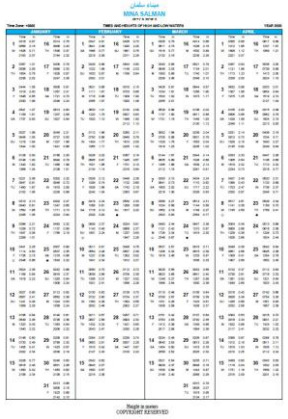
Current speed and direction



Navigation Charts



Bahrain Tidal Network (BTN)



Tide Tables

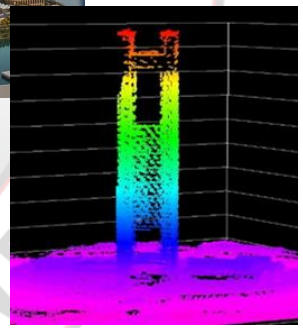
For further information about Hydrographic survey services please visit the SLRB Website

3D CITIES

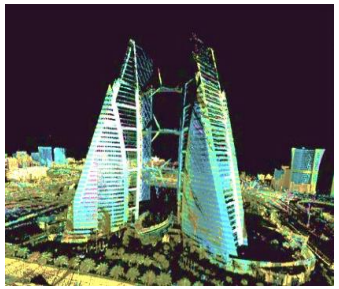
3D cities are digital models of urban areas that represent terrain surfaces, locations, buildings, vegetation, infrastructure and landscape elements in three-dimensional scale.

On request, SLRB adopts modern technology to successfully produce precise and high quality geospatial data of your project area derived from aerial imagery, LiDAR and terrestrial laser scanners.





3D digital model of the Four Seasons Hotel in Bahrain Bay derived from LiDAR.



Point Clouds
High accuracy data captured using sensors such as LiDAR laser scanners, UAV and mobile mapping vehicles



Imagery
Geo-referenced images, oblique and true ortho-imagery, stereo photogrammetric models



3D Precise Mapping
Three dimensional maps of topographic features with accuracy of up to 8cm



Accuracy	Up to 8 cm	**Coverage**	On Demand
Currency	On Demand	**Format**	Geo-referenced Imagery Point Clouds, DTM, DSM

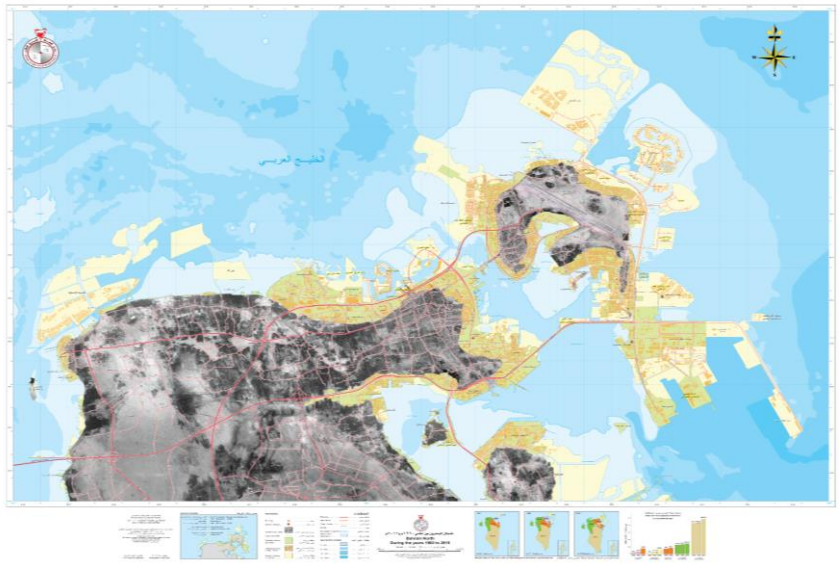


MAPPING

SLRB produces a full range of small scale national cartographic map products derived from the topographic digital 1:1000 base map.

SLRB also produces customized and thematic maps for government agencies and the private sector at various scales such as focused areas, land use types, education health services, reliefs & contours, cultural sites, environmental themes and tourism.

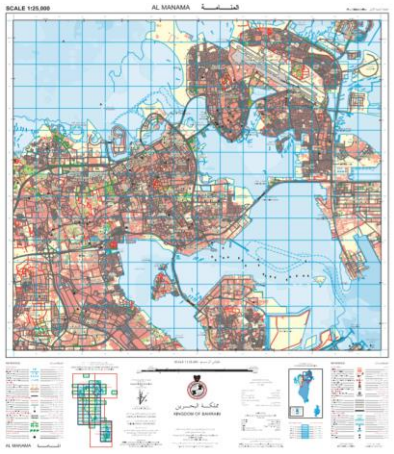
For further information about Topographic survey services please visit the SLRB Website



Land Development in Bahrain North 1960-2007



Pearl Fishing Banks & Other Shoal Areas in the vicinity of Bahrain



AL Manama
Scale 1:25,000

Product	Scales Available	Output
Topographic maps	1:1,000 Base Map 1:10,000 1:25,000 1:50,000 1:100,000 1:250,000 & More	Hardcopy Digital
Thematic	Various (on request)	Hardcopy Digital
Customized	Various (on request)	

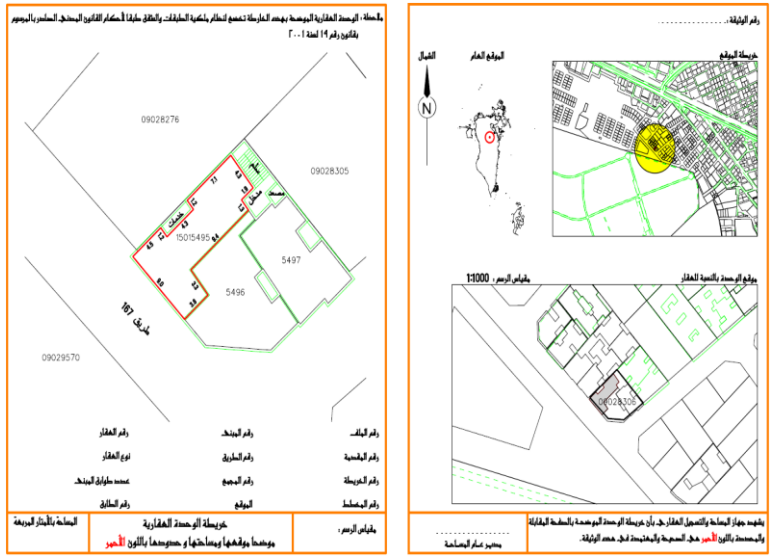
CADASTRAL

SLRB is responsible for land and property registration in the Kingdom of Bahrain and underpins the economy by securing land ownership and confidence in the property market consisting over 230,000 property parcels.

Cadastral Survey Directorate (CSD) is responsible for ensuring the authoritative measurement and delineation of property boundaries to maintain the integrity of the cadastre.

CSD provide survey services to government and set standards for the private sector surveying firms. CSD are responsible for preparing the Deed Plan that forms the spatial component of the Title Deed registered in the Land Registry.

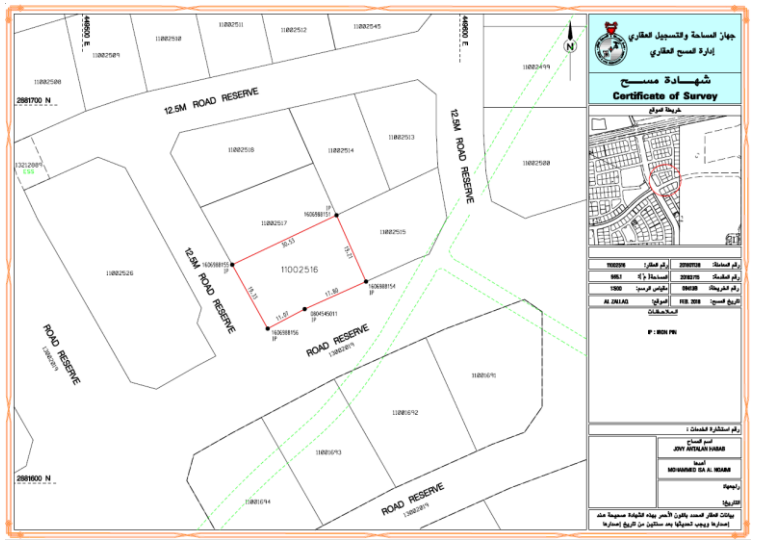
For further information about Cadastral survey services please visit the SLRB Website



Deed plan of a Strata Parcel



Imagery with Parcels Boundaries



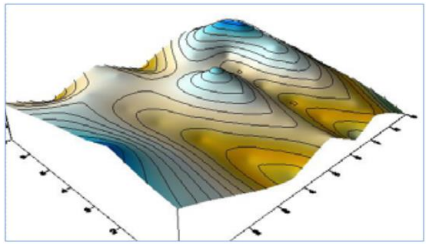
Certificate of Survey

Accuracy	±5 cm
Data source	GPS & Total station field survey
Data users	Government, Private Sector, Individuals

ELEVATION

Elevation describes the different heights of the land terrain surface. SLRB use of GPS and multiple modern technologies such as LiDAR and aerial imagery to generate various elevation products.

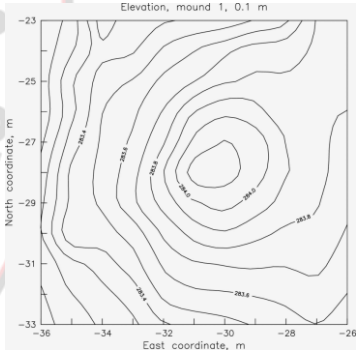
In particular Digital Surface Model (DSM), Digital Terrain Model (DTM) and digital contour lines are being produced at various intervals and different output formats.



DTM
Digital terrain model

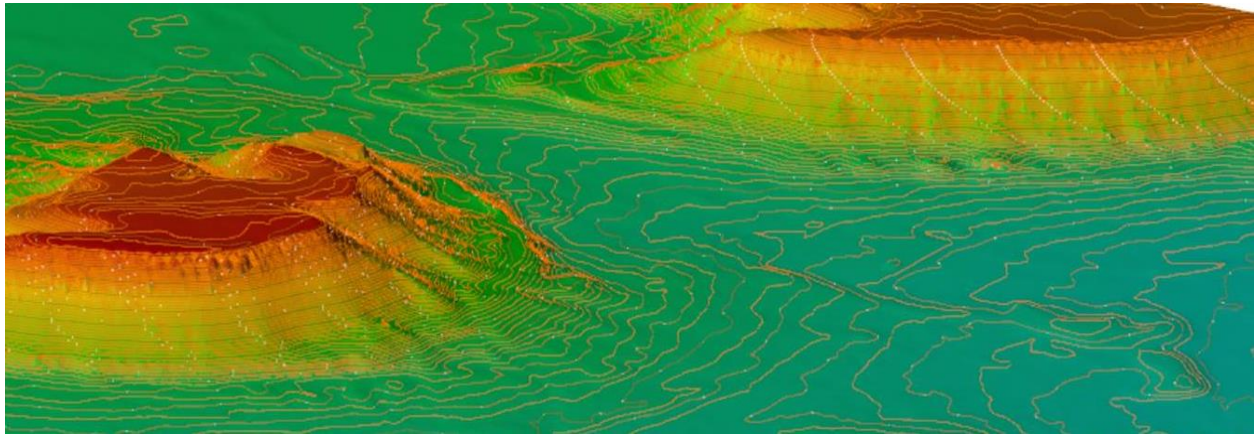


DSM
Digital surface model



Contours
Various height intervals

Product	Intervals	Format
DTM	1m 10m 25m 50m Various	Digital Point Cloud
DSM	On Demand	Digital Point Cloud
Contours	1m 2m 5m Various	Digital Hardcopy



For further information about Topographic survey services please visit the SLRB Website

GEODETIC

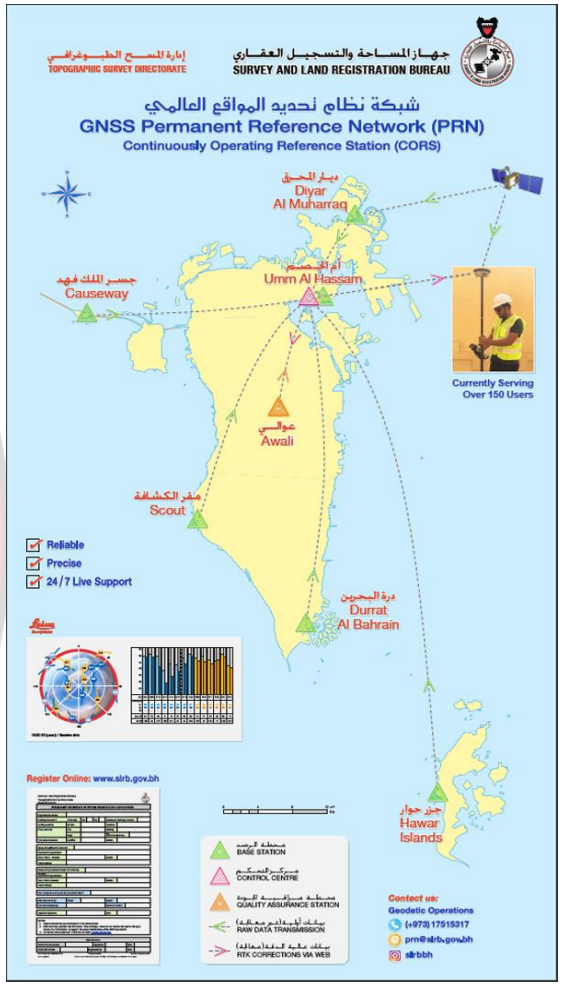
Permanent Reference Network (PRN) provides the geodetic basis for all surveying and engineering operations in Bahrain in that it is the Nation's official precise positioning service.

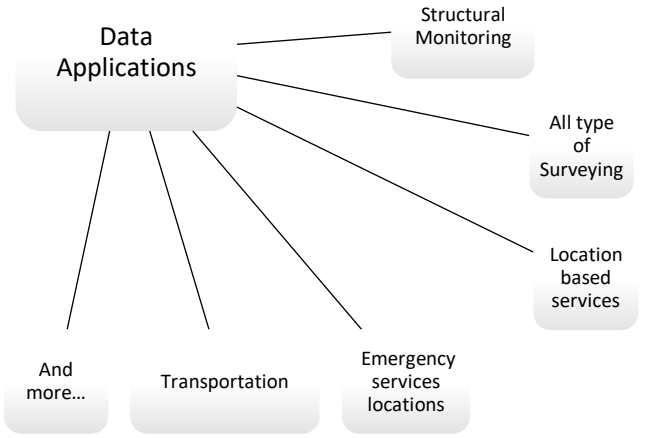
PRN comprises six (6) GNSS Reference Stations creating a network that covers all of the urban and development areas of the Kingdom. The six (6) reference stations are located at Diyar Al Muharraq, King Fahd Causeway, Scout Camp, Durrat Al Bahrain, Hawar Islands and Umm Al Hassam.

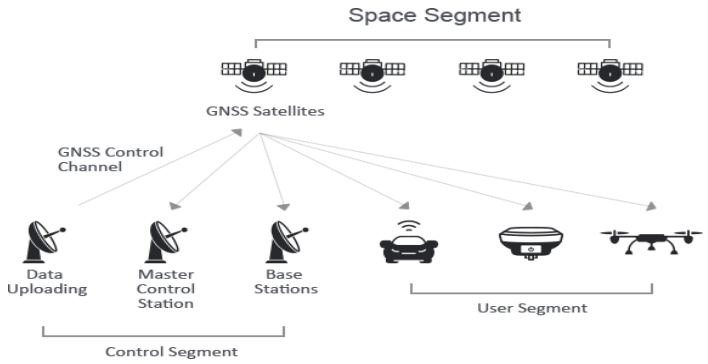
The PRN is available for private sector survey and engineering firms via a subscription to access the service.

Click here to download PRN registration form and email it to PRN@slrb.gov.bh

For further information about PRN Subscription and geodetic survey services please visit the SLRB Website.







Access	Upon Request
Data Output	RINEX Data – 24Hr data tracking and archive RTK Solution and Transformation parameters
Data Currency	Real-time
PRN Reference Stations	6 GNSS Stations
Quality Assurance	One correction station
Subscription Fees	Annual (fees currently waived *Aug 2020)

Know your reference system

GEODETIC

Not all data is created equally. It is important that users know the coordinate reference system, projection and datum of each dataset being used particularly when importing or combining geospatial data.

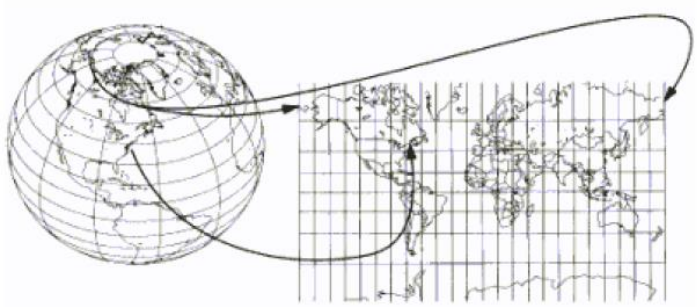
National System of Measurement in Bahrain is Metric System (SI). Meters are used for distance and square meters m2 or square kilometers Km2 for areas. Historically, Bahrain used the Imperial System (inches and feet) in 1969 and therefore, historical records up to that time may be represented in Imperial dimensions.

Reference Datum and Projection

The reference datum for all government mapping and cadastral surveys in Bahrain is the Ain Al-Abd (1970) Datum while the grid projection used in the Kingdom is the Universal Transverse Mercator (UTM) Zone 39.

Engineering design and construction sectors may use a Local Plane Coordinate System for their designs and construction lay-outs but will be required to submit the corresponding UTM 39, Ain Al-Abd Datum grid coordinates if their projects need government approval. Surveys to be approved by the Cadastral Survey Directorate, must use the Bahrain CSCS Model , a specialised map projection for the Cadastral Survey Directorate.

For surveys employing GNSS instruments, it is recommended that users must connect to the Bahrain Permanent Reference Network since the WGS84 (ITRF2005, to be precise) coordinates obtained can be easily transformed to Ain Al-Abd Datum and then projected to UTM Zone 39. Official transformation parameter sets are available to accomplish this task, however, users are advised to consult the "Guide for Using Projections and Datums in Bahrain" published by SLRB for proper usage of these parameters.



A reference datum is a mathematical model of the shape of the Earth and it can be a "local" or a global model. For example, the Ain Al-Abd Datum is a local reference datum while WGS84 and ITRF are global ones. A projection is basically the transformation of the spheroidal Earth (Latitude/Longitude /Ellipsoidal Height'') into a flat sheet called a map (Easting/Northing) (refer to the diagram).

Primary Geodetic Infrastructure in Bahrain is the Permanent Reference Network (PRN) consisting of 6 high quality GNSS receivers distributed throughout the country. It aims to benefit engineering, construction, others survey and mapping activities, and all major infrastructure projects within the Kingdom. The PRN offers a precise RTK positioning service that can be accessed by an annual subscription. Registration can be done by contacting the SLRB Topographic Survey Directorate.

The coordinate reference frame of the PRN is ITRF05, Epoch 2005.0. This means that users will receive position coordinates in WGS84 (ITRF2005, to be precise) as their fundamental (a-priori) observed values. If users require the position coordinates in a different datum then a set of transformation parameters must first be computed and applied to those a-priori coordinates to have them properly referred to the user's intended datum. In case the survey results need to be reported in Ain Al-Abd 1970 Datum, the user may use any of the official published transformation parameter sets.

ACCESS & PRICING

Data requests can be made online via http://www.slrb.gov.bh

Data users are required to agree to the permitted terms of use and conditions of the Memorandum of Understanding (MOU) or Digital Data License (DDL). Some materials may be restricted or not available.

For Government

Via Memorandum of Understanding (MOU)

For Business

Via Digital Data License (DDL)

For Individuals

Via Digital Data License (DDL)

Abstract Pricing List

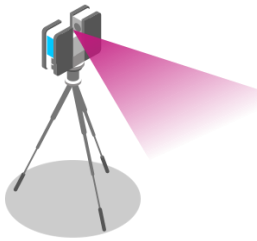
PRN Access	540 BHD (Annual) (currently waived *Aug 2020)	**Bahrain Map 1:250,000**	200 BHD (DGN) 50 BHD (PDF)
DTM	50 BHD (1m Intervals) 40 BHD (10m Intervals) 30 BHD (25m Intervals)	**Manama Map 1:25,000**	3 BHD (Hardcopy)
Survey Controls	75 BHD (20mm) 50 BHD (10cm)	**Qibla Establishment**	100 BHD Per Job
Orthophoto 1:5,000	50 BHD (10cm) 25 BHD (20cm) 10 BHD (50cm)	**As-Built Registration**	10 BHD Per Job
Survey Accuracy Audit	2 BHD Per Building 100 BHD Per Liner Km	**Coordinates Transformation**	5 BHD Per Point

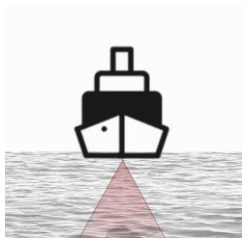
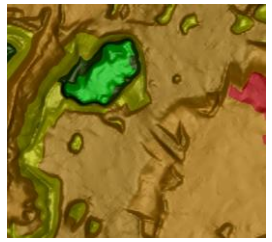
Full pricing is available at http://www.slrb.gov.bh

Need further information or require a quote for survey and mapping services. Please call Topographic Survey Directorate on (+973) 1751 5352







For further information about Survey products and services please visit the SLRB Website.

slrb.gov.bh

