AS BUILT GUIDELINES FOR POWERSYSTEM, WASTE MANAGEMENT, WATER AND SEWERAGE FOR RESORTS

CONTENTS

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CHAPTER IV. CONTENTS OF AS-BUILT DRAWINGS REPORT FOR SEWERAGE SYSTEMS

Section 1. Design Layout

Section 2. Detailed Drawings for Specific Components

CHAPTER V. CONTENTS OF AS-BUILT REPORT FOR WATER SUPPLY SYSTEMS FOR RESORTS

Section 1. Description of the Island

Section 2. Drinking Water Usage

Section 3. Design of Water Supply System

Section 4. Renewable Energy Integration (PV System Integration)

Section 5. Design Criteria's & Calculations

Section 6. Estimated Energy Demand for the System

Section 7. Provision of Standby Electricity

Section 8. Estimated Operational Cost

Section 9. Spares & Maintenance Tools

Section 10. Conclusion

Section 11. Annexes

Section 12. Appendix

CHAPTER VI. CONTENTS OF AS-BUILT DRAWINGS REPORT FOR WATER SUPPLY SYSTEMS

Section 1. Design Layout

Section 2. Detailed Drawings for Specific Components

Contents of as-built design for Power System for existing facilities

Part1: Declaration

[Sender Address]

[Date]

The Chief Executive,
Utility Regulatory Authority,
Kaasinjee Magu,
Male', 20044,
Republic of Maldives,

Dear Sir,

DECLARATION

I **[Name]** with Licensed Number **[License-Number]** declare that all information provided with this document **(Title of Document)** is true and shall produce proof of such information if I am called upon to do so. I am aware that the Utility Regulatory Authority (URA) reserves the right to reject this application, if URA finds that the information provided is inaccurate or incomplete. Furthermore, if such information is found to be misleading and/or falsified, the URA reserves the right to impose penalties or take legal action, in accordance with the relevant laws, regulations, guidelines and procedures. Such penalties may range from suspension of permits/license, fines, and in severe cases criminal prosecution.

Sincerely,

[Signature]
[Name]
[License-Number]
[Contact-Number]

Part 2 - Guideline for As-built Drawings of Power System

1. **Powerhouse**
   a. Powerhouse layout – Showing immediate surrounding that should include the following.
      i. Proper labelling on scaled map.
      ii. Map to span up to the nearest habited buildings.
      iii. Show distances from neighboring buildings.
      iv. All key structures of powerhouse
   b. Powerhouse floor plan
      i. Major Dimensions
         1. Distance between Generator sets
         2. Distance from Generator sets to nearest wall in all directions.
   c. Powerhouse Sectional View
      i. Elevation
      ii. End view
      iii. Major dimensions
         1. Height of Generator
         2. Height of Powerhouse
         3. Height of Chimney/Exhaust
         4. Height of Other major equipment
         5. Height of doors and relevant infrastructure
   d. Fuel System layout
      i. Single Line Drawing of Fuel System (including main tank and day tank piping)
      ii. Fuel System layout on a scale diagram
      iii. Drawings of Fuel Storage showing necessary protection measures such as bund wall
   e. Table of fuel storage with the following
      i. Tank Number
      ii. Tank Type (Day/Bulk)
      iii. Tank Material
      iv. Tank Size
      v. Type of fuel

2. **Generating & Transmission Equipment**
   a. Table of numbered Diesel-powered Generating equipment along with their 100% and 80% rating in kW, kVA, A
   b. Datasheets of Diesel-powered Generating equipment. If Datasheet includes multiple models, the model number should be highlighted.
   c. Renewable Energy
      i. Nominal Rating of Generating Source(s)
      ii. Inverter Sizing & Technical Datasheet

iii. Battery Sizes & Technical Datasheet
iv. BMS & EMS Technical Datasheet

d. Table of numbered Transmission equipment along with their rating 100% and 80% rating in kW, kVA, A
e. Datasheet of Transmission equipment. If Datasheet includes multiple models, the model number should be highlighted.
f. Table of numbered Protection Devices used in Voltages 1000V or above.
g. Datasheet of Protection Devices.

3. Generator Control Panel & Distribution Panels

a. Single Line Drawing of Main Switchboard (MSB) showing the following.
   i. Generators and downstream protection devices and controllers
   ii. Busbar configuration, dimensions, materials, and rating.
   iii. Labelled Feeders and downstream protection devices
   iv. CT/VT Ratios where applicable

4. Distribution Network

a. Layout of LV Distribution Network, Distribution Boxes and Service Cables on a scaled map
b. Layout of MV Distribution Network, Substations and Service Cables on a scaled map
c. Single Line Drawing of the LV Distribution Network with feeder pillars and distribution boxes, showing cable length, size, voltage drop, and percentage voltage drop.
d. Single Line Drawing of the MV Distribution Network with feeder pillars and substations, showing cable length, size, voltage drop, and percentage voltage drop.
e. Measured voltage drop of all end point of each feeder
f. Single Line Drawing of panels showing the following (For power distribution panels with MCCB ≥ 63A)
   i. Outgoing feeder ratings and protection devices
   ii. Busbar configuration and rating
   iii. CT/VT Ratios where applicable
   iv. Proper referencing to incoming feeder in MSB
   v. List of outgoing distribution boxes and sub-distribution boxes with their references

5. Cable

a. Table of Cables consisting of the following information
   i. Fields Required
      1. From – To
      2. Model
      3. Size
      4. Length
      5. Conductor Material
   ii. Should cover the following aspects of the power system
      1. Generator to MSB

2. MSB/Feeders to Outgoing Panels/Distribution Boxes
3. Subsequent Panels/Distribution Boxes
4. Cables used in Buildings (Exempt from 5.a.i.1 & 5.a.i.4)

b. Conformity Certificate of Cables if not already approved by URA

6. Load

a. Peak load of all outgoing feeders

7. Fire Fighting System and Lightning Protection

a. Certification or documentation of approval of firefighting system from the relevant government approved agency
b. Lightning Protection coverage
c. Lightning protection device(s) and their specification

Note:

- Documents submitted under 1, 2, 3, 4, 5, 6, 7.b and 7.c of the *Part 2 - Guideline for As-built Drawings of Power System* should be checked and verified by a URA Licensed Power Engineer who is issued with the relevant categories.
- Parts not relevant should be marked as such.
- All documents submitted (hard copy) should be bound together; documents larger than A4 size should be folder to A4 size
- Soft copy in DWG/DXF format of Parts 1.a, 1.b, 1.c, 3.a, 4.a, 4.b, 4.c, 4.d, 4.f & 7.b should be submitted via a CD-R or attached with the online submission.
- Soft copy in XLS format of Parts 4.e & 6.a should be submitted via a CD-R or attached with the online submission.
- Information on all documents should be legible.
- Minimum 2 sets of the original documents (hard copies) should be submitted.
- Proper referencing needs to be given where necessary.
- Additional information relevant to the Power System Design, apart from what is required in this document needs to be provided upon request by URA.

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AS-BUILT DESIGN REPORT GUIDELINE OF WASTE MANAGEMENT SYSTEM AT EXISTING RESORTS

(REQUIRED CONTENTS)

1. Basic Information

a. Island/resort description b. Demographic aspects

c. Generation of MSW (Municipal Solid Waste) in the resort (estimates of generated waste/types of waste)

2. Existing Waste Management System

a. Waste Collection System

i. Waste Categorization

ii. General description of how waste is collected within the resort. b. Waste Storage

i. Capacity for dry waste storage

ii. Capacity for wet waste storage

iii. Mechanism for Hazardous and special waste storage

iv. Waste Storage location (as-built drawings as indicated under point 4 of this document)

c. Machinery/Equipment used mechanical processing of waste (shredder, baler, compactor, glass crusher)

i. Equipment list

ii. Machinery/Equipment specification and relevant documents (catalogue, brochures etc)

iii. Management of processed waste (from the machineries)

d. Waste treatment facilities (details stated in point 3 of this document should be included for each treatment activity)

e. Waste Transfer

   i. Type/types of waste transferred.

   ii. Route of transfer (internally from facility to designated jetty – marked in map)

   iii. Method of transport (resort vessel, third party, type of vessel)

   iv. Final disposal facility details

Contents of as-built report for Water supply system for Resorts

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Contents of as-built drawings report for Water supply system

1. **DESIGN LAYOUT**
    1. Water Supply Network Layout
    2. Water Supply Network Zone Layout
    3. Network pressure layout
    4. Rainwater Collection Network Layout
    5. E&M Drawings.
2. **DETAILED DRAWINGS FOR SPECIFIC COMPONENTS**
    1. Meter connection details
    2. Valve chamber details
    3. Water meter layout
    4. P&DI diagram of the RO plant.
    5. E&M Drawings for control panel
    6. Trenching layout
    7. Intake details
    8. Brine tank details
    9. Rainwater lift well details
    10. Pump shed details
    11. Pump shed structural details
    12. Treated water tank details
    13. Rainwater holding tank details
    14. Rainwater transfer pump hut layout
    15. Ballast block details
    16. Diffuser details
    17. Brine sea outfall details
    18. Rainwater first flush details
    19. Rainwater Internal network layout
    20. Washout valve chamber detail
    21. Soak pit details
    22. Administrative (RO) building facility layout
    23. Boundary wall layout

Contents of as-built report for Sewerage system for Resorts

8. **Sewerage Treatment Plant (STP) Design Details**
   - 8.1. Design Flow Bases
   - 8.2. Influent Water Quality
   - 8.3. Treatment Scheme
   - 8.4. Treated Effluent Water Quality
   - 8.5. Process description
   - 8.6. Bar Screen
   - 8.7. Oil Skimmer
   - 8.8. Grit Chamber
   - 8.9. Equalization Tank
   - 8.10. Aeration Tank (MBBR)
   - 8.11. Settling Tank (Tube Settler)
   - 8.12. Sludge management
   - 8.13. Process flow diagram
   - 8.14. Control systems
   - 8.15. Equalization Tank & Raw Sewage Transfer Pump
   - 8.16. Aeration Tank, Settling Tank and Clear Water Tank
   - 8.17. Ocean Outfall System
   - 8.18. Design calculations
   - 8.19. Equipment list
   - 8.20. Valve schedule
   - 8.21. Pipe & fittings
   - 8.22. Electrical & instrumentation

9. **Conclusion**

10. **Annexes**
    - 10.1. Sewer Network Flow Calculations and Pipe Velocity Calculations (ANNEX-01)
    - 10.2. Sewer Pump sizing and Head Loss Calculations (ANNEX-02)
    - 10.3. Anchor Block Sizing Calculations (ANNEX-03)
    - 10.4. Spares and Maintenance Tools list (ANNEX-04)

11. **Appendix**
    - 11.1. Civil Structural Stamped drawings, PNID/ SLD stamped Drawings
    - 11.2. O&M Manual
    - 11.3. Laboratory Equipment List
    - 11.4. Catalogues and brochures

Contents of as-built drawings report for Sewerage system

1. DESIGN LAYOUT

1. Sewerage Network Layout
2. Sewerage Network Catchment Areas
3. Sewerage Network Zone Layout
4. Pump station room / Lift station room Layout
5. STP room layout
6. E&M Drawings.

2. DETAILED DRAWINGS FOR SPECIFIC COMPONENTS

1. Pump station layout
2. STP location
3. Pump station / Lift station details
4. Discharge pump station details
5. Gate valves details
6. Boundary wall details
7. Vent stack details
8. Odor control system details
9. Control panel board details
10. Pump station Sampling well details
11. Trench & bedding details
12. Maintenance shaft (mh) details
13. Manhole details
14. Catchpit details
15. House connection details (toilet to catchpit)
16. Thrust block details
17. Ballast block details
18. Diffuser details
19. Sea outfall details
20. E&M drawings for each control panel of pump station
21. P&DI drawings of STP
22. E&M drawings of STP
23. Hydraulic profile drawings of STP
24. Profile diagrams - pump station 01, pump station 02