Government of the People's Republic of Bangladesh
Ministry of Local Government, Rural Development and Cooperatives
Local Government Division
Local Government Engineering Department

Guidelines for
Small Scale Water Resources Development Project

G7 Construction of Subproject Structure

November 2017

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EXHIBITS

Document Architecture of the New Sets of Guidelines for SSWRD Project

[Small Scale Water Resources Development (SSWRD) means, from physical points of view, implementing appropriate water management subprojects of small sizes, not exceeding 1000 hectare benefit area by the current definition, to resolve existing water management constraints to agriculture that in turn enhance rural employment leading to reduction of rural poverty. Implementation of SSWR subprojects involve long process from proposal of a subproject from Local Government Institutions (Union Parishad and Upazila Parishad) to its final selection, study of feasibility from different considerations (social, environmental, technical, economical), preparing detailed design and costing, constructing required physical works to standard quality and finally its operation and maintenance by its beneficiaries. The process has multiple facets too. It needs to be comprehensively beneficiaries' and other stakeholders' participatory, acceptable to people of widely varying social and socio-economic conditions, friendly to the surrounding environment, etc. Thus, Guidelines for SSWR Development is, of necessity, complex.

The long and complex process has been divided into major distinguishable steps and separate Guidelines for works and activities involved in those major steps have been developed. Environmental study applies to the subproject as whole and is of different nature. So, Guidelines for Environmental Assessment is made a separate document. Following this principle, the Ten (10) Guidelines with Alpha-numeric ID Numbers and Names as below constitute the Documentation of Guidelines for SSWR Development.

This list will appear in all the individual Guideline Documents with highlight of the current Document name for the user to refer when necessary]

The List of New Sets of Guidelines for SSWRD Project

G1	Policy and Development Process
G2	Identification of Subprojects
G3	Participatory Rural Appraisal of Subprojects
G4	Feasibility Study of Subprojects
G5	Environmental Assessment of Subprojects
G6	Detailed Design of Subproject Structures
G7	Construction of Subproject Structures
G8	Operation and Maintenance
G9	Monitoring and Evaluation
G10	Integrated Rural Development Plan between SSWR and Rural Road/Market

Farm, Land and Subproject Categories

FARM CATEGORIES

Land Holding		Farm Category
(ac)	(ha)	
<0.51	< 0.21	Landless
0.51 – 1.00	0.21 - 0.40	Marginal Farmer
1.01 – 2.49	0.41 – 1.00	Small Farmer
2.50 – 7.49	1.01 – 3.03	Medium Farmer
>7.50	>3.03	Large Farmer

LAND CATEGORIES

Depth of Average Monsoon Flooding		Land Category
(m)	(ft)	
<0.3	<1.0	Highland
0.3-0.9	1.0-3.0	Medium Highland
0.9-1.8	3.0-5.9	Medium Lowland
>1.8	>5.9	Lowland

AMENDMENT AND UPGRADATION RECORDS

This document "Guidelines for SSWR Development: G8Procurement of Works for Construction of Subprojects" has been issued following amendments and up-gradations as outlined below:

Revision	Description	Date
	Procurement of works for construction of SSWRD subprojects had been done following Government procedures as applicable to LGED for earlier projects – the ADB-assisted SSWRDSP-1 (1995-2002) and SSWRDSP-2 (2002-2010).	Prior to 2008
A	Government promulgated Public Procurement Act in 2006 and the Rules under the Act was framed in 2008 which is known as the Public Procurement Rules, 2008 (PPR 2008). All Government procurements are done following this procurement rules and, to streamline and standardize the procurements, the Central Procurement Technical Unit (CPTU) of the Implementation, Monitoring and Evaluation Division (IMED) of the Planning Ministry issued formats of Standard Tender Documents for Procurement of Works which are used by user Departments/Agencies for their procurements – works, services and supplies Procurements for JICA-assisted SSWRDP-1 (2009-2015) and ADB-assisted SSWRDP-3 (2010-2017) were done using these Standard Tender Documents.	Since 2008
B	This "Guidelines for SSWR Development: G7Procurement of Works for Subprojects", necessarily following PPR-2008 (amended time to time) and the Standard Tender Documents, is the *seventh* Document of a series of Guidelines for SSWR Development finalized and approved by a Working Group of LGED Professionals with proven experience in SSWR development with assistance from Specialist WRD Consultants under a JICA-LGED Technical Co-operation Project.	August 2017

I. Construction Works in SSWRD Subprojects

1. Construction works that are usually involved in SSWRD subprojects include earthworks in construction of embankments and excavation of khals, construction of hydraulic structures and construction of simple rural buildings for WMCA office-cum-community use. In some subprojects (CAD subprojects), construction of irrigation canals and/or buried pipe irrigation systems with associated water distribution structures are needed. Construction of rural roads, bridges/culverts and market development works may also be involved in some subprojects.

2. Construction/rehabilitation of embankments and excavation/re-excavation of khals are *exclusive earthworks*. Earthworks are also involved in construction of hydraulic structures, bridges and culverts, roads and buildings in excavation of foundations, backfilling to completed structures, etc. However, these earthworks are part of construction of the respective structures.

II. Procurement Method

3. Individual works involved in SSWRD subprojects are small in volume and so all works of a subproject is usually packaged for a single contract titled "Construction of Hydraulic Structures and Related Works" of a subproject to be procured through national contract under open tendering method following the provisions of the Public Procurement Rules, 2008 (PPR 2008) as amended time to time.

4. However, construction of exclusive earthworks – earthworks in constructing embankments and khals has the following considerations:

- **Small earthworks** – small in volume that can be done in time with locally available labourers and also small in dimensions of embankments and khals to be constructed, will be done by local landless labourers forming into Labour Contracting Societies (LCS). Works for LCS are kept small for reasons of quality management and timely completion of the work; and
- **Large earthworks** – large in volume that cannot be completed in time by available local labourers and also large in dimensions of the embankments and khals to be constructed, will be done under the package contract. Larger dimensions (high embankments, deep and wide khals) make maintaining quality of works difficult while working with LCS.

5. Considering real field difficulties in organizing and management of LCS including interest of labourers for other kind of works, the above considerations for earthwork construction has been included in the subproject development process which is detailed in ***Document G1: Overall Development Process of SSWR Subprojects in Figure III-3 Stage-3: Construction and First Year O&M of Subprojects and discussions of the activity Steps 20 and 21 in Section III D*.**

6. The division of earthwork between LCS and package contract will be decided by the PMO/Project Consultants when preparing detail deign and drawings of the subproject works. The BOQ of the two parts of earthwork will be issued separately.

III. LCS Management Guidelines (2004) for Earthworks by LCS

7. The use of Labour Contracting Societies (LCS) was introduced in LGED in the mid-1980s to create opportunities for local labourers to work in development projects directly without intermediaries so that their income would increase. LCS was initially used for earthworks but later was extended to other simple but labour-intensive construction and maintenance works. Initially, ad-hoc project based guidelines were used for management of LCS works. Later, in 2004, LGED adopted a comprehensive *LCS Management Guidelines* to apply to all LCS works in the organization. The **LCS Management Guidelines (2004)** is in two parts – one part (Chapter 2) for activities of *Rural Infrastructure Development and Maintenance* and the other part (Chapter 3) for activities of *Water Resources Infrastructure Construction and Maintenance*.

8. The document has been published in Bangla for field use; however, an English version (not formally published) is available in hard copy for reference (soft copy of the English version cannot be traced).

9. All small earthworks of SSWRD subprojects planned to be implemented by LCS will be organized and managed under the provisions of the **LCS Management Guidelines (2004), Chapter 3**.LGED's District and Upazila offices are equipped with necessary trainings and experience to implement LCS works. PMO/Project Consultants will provide necessary design-drawings, BOQ, approval of the work and the fund to the Executive Engineers when they will implement the works.

IV. Tender Documents for Procurement of Work Packages

10. To streamline and standardize Government procurements, the Central Procurement Technical Unit (CPTU) of IME Division of the Ministry of Planning has issued templates of Standard Tender Documents for procurement of works and services which can be downloaded from CPTU website by user agencies. The user agencies then, based on the template of CPTU, prepare their own project specific standard ready-to-use tender document templates.

11. LGED's SSWRD Projects have prepared two such Standard Tender Document templates – one for tender values up to BDTk 30 million and the other for tender values above BDTk 30 million (as per amendment done in 2016), both for open tendering method. The two ***Standard Tender Document Templates*** are given in ***Exhibits G7-A.1 and G7-A.2.***

12. The Standard Tender Documents, both of them, have Nine (9) Sections as below:

Section 1	Instruction to Tenderers (ITT)	Usually no change is required. However, if any project needs changes, those must be compatible with the provisions of the PPR 2008.If necessary, CPTU may be discussed.
Section 2	Tender Data Sheet (TDS)	Contains all Data pertinent to the Tender organized with reference to ITT
Section 3	General Conditions of Contract(GCC)	No change is usually required.
Section 4	Particular Conditions of Contract (PCC)	Contains conditions of the eventual Contract for the concerned work package referring to the GCC

Section 5	Tender and Contract Forms	Standard Forms are given to be returned by the Tenderers
Section 6	General Specifications	General Technical Specifications of works involved in the tender package. [***Subprojects may have differing works and so Tender Packages may contain Technical Specifications of only the works involved in the package].***
Section 7	Particular Specifications	Special / particular specifications of works required but has not been covered in the General Specification Section shall be given in this Section. ***[Special / particular specifications are usually not involved in SSWRD Projects]***
Section 8	Drawings	Approved Drawings of Package works
Section 9	Bill of Quantities	Engineer's estimates of items and quantities of works are provided for the Tenderer to offer quoted prices.

13. Detail technical specifications of works including material testing, quality control, measurement and payment, etc are included in **Section-6**. As works involved in a subproject are formed into a package for tendering and as subprojects may have different works, **Section-6** of a Tender Document will contain technical specifications of only the works involved in the package. This will avoid making the Tender Document uselessly large in volume. For the purpose, Technical Specifications of different works – Earthworks, Structures, Buried Irrigation Pipe Systems, Buildings, Bridges & Culverts, Roads, etc are provided in separate **Parts** in **Section-6** so that while preparing Tender Document of a specific subproject, only the required Parts may be used.

14. Tender Documents are usually prepared by contracted firms for Feasibility Study and Detail Design of subprojects. The firms will prepare the Tender Documents of subproject using the Standard Tender Document templates as given in the ***Exhibits*** as applicable by filling required data/information in *Sections 2 and 4*, compiling Technical Specifications of appropriate works in *Section 6*, adding a full set of approved *Drawings of Package Works in Section 8* and an approved *BOQ of the works in Section 9. T*he PMO/Project Consultants will check all these, approve and issue to the concerned Executive Engineer to invite open Tender following appropriate rules in force.

IV. Inspection Checklist for Constructed Structure

14. The structure to be constructed by the subproject such as hydraulic structure and buried pipe irrigation system should be properly inspected not only during construction but also at the completion by using checklists which are shown in the Table-1 and Table-2.

Table-1: Inspection Checklist of Hydraulic Structure

I. Quality Control during Construction

Work Item	Contents of Inspection	Observation
1. Foundation Work	(a) Sand filling is done as per design.	
	(b) Cutoff wall including sheet piling is done as design.	
	(c) Lean concrete is done as per design?	
2. Material Testing	(a) Cement Brand and Test Report wise Setting Time & Compressive Strength.	Brand: _____ , _____ Setting Time : _____ ; Compressive Strength: _____
	(b) Whether the gradation test of used stone/brick chips has been done? Mention the stone/brick chips size and LAA Value.	Gradation: _____ ; LAA Value : _____ ;
	(c) Whether the diameter of used MS Bar has been confirmed as per approved design? Mention the Grade, Allowable Yield Strength Value of MS Bar as per test report.	Dia of MS Bar: _____ Grade : _____ Allowable Yield Strength: ___
3. RCC Work	(a) Specimen Concrete Cylinder/Cube of RCC Work for Lab Test has proper strength.	Concrete Cylinder/Cube Strength:_____
	(b) W/C Ratio and Slump follow rightly for RCC work?	W/C Ratio: _____ ; Slump:_____
4. Others		

II. Finished Work at the Completion

Work Item	Contents of Inspection	Observation
1. Gate Bracing Structure	(a) Sill level is as per design?	
	(b) Piers are constructed as per design?	
	(c) Top slab is as per design?	
2. Stilling Basin	(a) Length of stilling basin is as per design?	
	(b) Glacis is as per design?	
	(c) Chute blocks are as per design?	
	(d) Baffle blocks are as per design?	
	(e) End sill is as per design?	
3. Apron and Wall	(a) Apron is as per design?	
	(b) Wing wall is as per design?	
	(c) Return wall is as per design?	
4. Protective Work	Protective works are as per design?	
5. Earth	Back filling has been done as per design?	

Backfilling		
6. Gate Operation	(a) Slide gate ・Sliding action to open/close is smooth. ・No Seepage of water when water is retained.	:
	(b) Flap gate ・Flapping action to open/close is smooth.	
7. Others		

Sign & Date:

Name :

Position : Sub-Assistant Engineer
Upazila/ District :

Sign & Date:

Name :

Position : Upazila Assistant Engineer
Upazila/ District :

Sign & Date:

Name :

Position : Upazila Engineer
Upazila/ District :

Inspection Comments by Assistant Engineer/ Sr. Assistant Engineer/Upazila Engineer on completion work before bill payment:

Sign & Date:
Name :
Position :

Upazila/District :

Inspection Comments by Executive Engineer on completion works before bill payment:

Sign & Date:

Name :

Position : Executive Engineer,
LGED; District:

Table-2: Inspection Checklist of CAD System

I. Quality Control during Construction

Work Item	Contents of Inspection	Observation
1. Pump House	(a) Floor level is as per design.	
	(b) Material of wall and concrete floor is appropriate.	
2. Header Tank	(a) Proper materials are used.	
	(b) RCC work is properly done	
3. Buried Pipe	(a) Trench excavation is properly done.	
	(b) Sand/Granular bedding is properly done with designed bed level.	
	(c) Pipe alignment is properly done.	
	(d) Sand backfilling is properly done.	
	(e) Pipe joint is properly done.	
	(f) Sand backfill and Earthen backfill are properly done.	
4. Outlets for Irrigation (Risers)	(a) Masonry outlet boxes are properly constructed.	
	(b) Alfalfa valves are properly installed.	
5. Standpipes	Standpipes are properly constructed.	
6. Washouts	Washouts are properly constructed.	
7. Others		

II. Finished Work at the Completion

Work Item	Contents of Inspection	Observation
1. Pump House	(a) Floor and wall are as per design.	
	(b) Pump function as per design.	
2. Header Tank	Header tank is as per design.	
3. Buried Pipe (Leakage Check)	The leakage check by "Water Filling Test": Check whether the amount of decreasing water in header tank is 100 litter per 24hour per 1cm diameter of pipe when the water filled with water in the system by closing all the outlets.	
4. Outlets for Irrigation (Risers)	Alfalfa valve open-close system properly works.	
	Flow of water through outlet is as per design.	
5. Standpipe Outlets	Standpipe outlets are as per design.	
6. Standpipes (Air Vents)	Standpipes (air vents) are as per design.	

7. Escapes (Standpipe Overflows)	Escapes (standpipe overflows) are as per design.	
8. Washouts	Washouts are as per design.	
9. Others		

Sign & Date:

Name :

Position : Sub-Assistant Engineer
Upazila/ District :

Sign & Date:

Name :

Position : Upazila Assistant Engineer
Upazila/ District :

Sign & Date:

Name :

Position : Upazila Engineer
Upazila/ District :

Inspection Comments by Assistant Engineer/ Sr. Assistant Engineer/Upazila Engineer on completion work before bill payment:

Sign & Date:
Name :
Position :

Upazila/District :

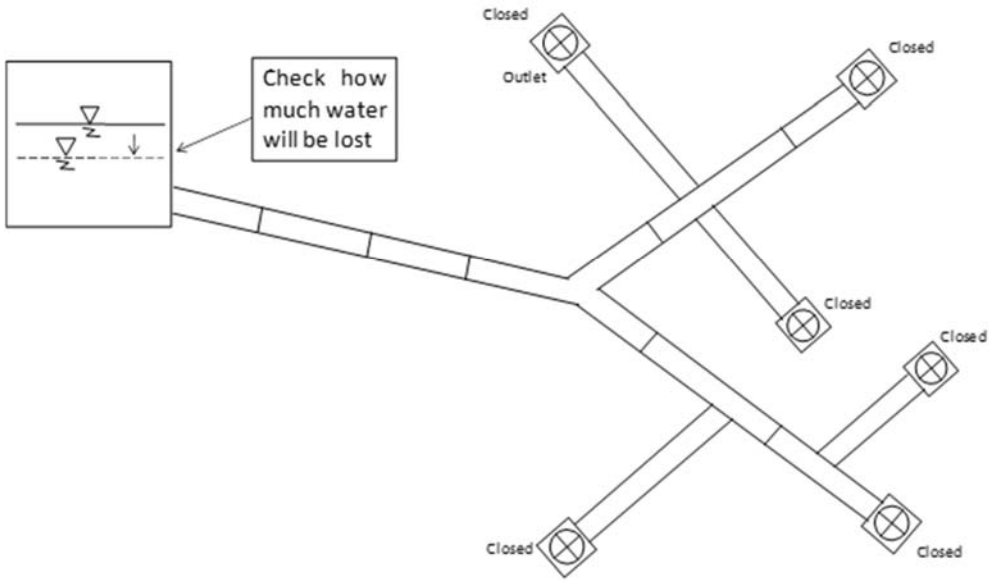
Inspection Comments by Executive Engineer on completion works before bill payment:

Sign & Date:

Name :

Position : Executive Engineer,
LGED; District:

Image of Leakage Check by "Water Filling Test"



EXHIBITS

Exhibit G7-A.1: **Standard Tender Document Template**
(For tender value up to BDTk 30 million)

Exhibit G7-A.2: **Standard Tender Document Template**
(For tender value above BDTk 30 million)