

Fourth Primary Education Development Program (PEDP4)

INFRASTRUCTURE PLAN AND PLANNING GUIDELINES

Directorate of Primary Education
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LIST OF ABBREVIATIONS

ADB	:	Asian Development Bank
AIRP	:	Arsenic Iron Removal Plant
AUEO	:	Asst. Upazila Education Officer
BNBC	:	Bangladesh National Building Code
BWDB	:	Bangladesh Water Development Board
CI	:	Corrugated Iron
DLIs	:	Disbursement Linked Indicators
DoE	:	Dept. of Environment
DPs	:	Development Partners
DPE	:	Directorate of Primary Education
DPEO	:	District Primary Education Officer
DPHE	:	Department of Public Health Engineering
DPP	:	Development Program Proposal
DTW	:	Deep Tubewell
ECNEC	:	Executive Committee for National Economic Council
EiE	:	Education in Emergencies
ESMF	:	Environmental and Social Safeguard Framework
GIEAP	:	Gender and Inclusive Education Action Plan
GOB	:	Government of Bangladesh
GPS	:	Government Primary School
HT	:	Head Teacher
GI	:	Galvanized Iron
IA	:	Implementing Agency
ICT	:	Information and Communication Technology
LGED	:	Local Government Engineering Department
MHM	:	Menstrual Hygiene Management
MoPME	:	Ministry of Primary and Mass Education
NAPE	:	National Academy of Primary Education
NBI	:	Need Based Infrastructure
NNPS	:	Newly Nationalized Primary School
PEDP4	:	Fourth Primary Education Development Program
PEPMIS	:	Primary Education Properties Management Information System
PP	:	Pre-Primary
PPE	:	Pre-Primary Education
PVC	:	Polyvinyl Chloride
RCC	:	Reinforced Cement Concrete
SCR	:	Student Classroom Ratio
SDGs	:	Sustainable Development Goals
SMC	:	School Management Committee
STW	:	Shallow Tube Well
UEO	:	Upazila Education Officer
UPEC	:	Upazila Primary Education Committee
UV	:	Ultra Violet
WASA	:	Water Supply and Sewerage Authority
WASH	:	Water and Sanitary Hygiene

EXECUTIVE SUMMARY

PEDP4 has been launched officially on July 01, 2018 by DPE. One of the three major components of the program is 'Equitable Access and Participation'. The objective of this component is to provide all communities with learning environments that support participation of all children, ensure continuity of education, and enable quality. Under this component, there are 5 sub-components which are related to the civil works such as i) Need-based Infrastructure Development, ii) Need-based Furniture, iii) Maintenance and Repair, iv) Water, Sanitation and Hygiene, and v) Education in Emergencies (EiE). As per DPP of PEDP4, the total cost of civil works is more than 60% of the total program cost in which more than 90% works are related to the school infrastructure. It is obvious that the success of the program greatly depends on the appropriate planning and effective implementation of the civil works related to the primary schools.

The primary schools are distributed to the village level throughout the country. The infrastructure development planning is necessary for every school to support the effective and sustainable development. As every school is unique in relation to its students, teachers, support structures and the availability of resources, the strategies for preparing and producing a 'School Infrastructure Development Plan' will vary from school to school. So, an infrastructure planning guideline is essential for uniform planning of the primary schools throughout the country.

The '**Infrastructure Plan and Planning Guidelines**' has been prepared for achieving the year-0 DLI of Need-based Infrastructure Development (DLI5). As per DLI protocol, Infrastructure indicates need-based infrastructure (NBI) of primary schools. So, NBI plan and planning of primary schools have been covered in the guidelines. However, these guidelines consist of three parts, Part-A, Part-B & Part-C. There are 9 Sections in Part-A which contains infrastructure plan and planning guidelines. Part-A will be needed for the school authority and local officers of DPE, LGED and DPHE while planning of NBI. Guideline for need assessment and site planning are in Part-B with having 8 Sections which will be needed for LGED and DPHE while assessing the needs of various NBIs. And Part-C contains prioritization criteria for various NBIs, having 3 Sections which would need to be incorporated in the livelist software for ranking the schools requiring various NBIs.

The main objective of these guidelines is to help all government primary schools under MoPME to have good physical infrastructure and healthy learning environment. The background and purpose of the planning guidelines are discussed in Section 1 and 2 respectively.

The primary schools need infrastructure and facilities for its smooth functioning. It is necessary to have these infrastructure and facilities adequately available for maintaining a good school environment. Some standards are required for assessing the needs of these components. To ensure equitable development and for reducing disparities, some policies and criteria are also required for NBI planning. Considering the importance in

planning, both the standards for NBI in the primary schools, and the policies & criteria for NBIs planning are provided in Section 3 and 4 respectively.

Infrastructure planning for primary schools is not an easy task. For appropriate planning, one should have general ideas about the current practices of infrastructure development, suitability of the options available in different situations and surroundings, construction/manufacturing processes of different options available, requirements and availability of materials, manpower, equipment and technologies in construction as well as maintenance for each of the options. Moreover, safety & security, aesthetical beauty, economy and sustainability should also be considered during planning. Some options, practices, arrangements, technical aspects and suitability for building construction, water supply and furniture are briefly discussed in Section 5.

The plan and design (architectural & structural) of school infrastructure need to be prepared following the rules/instructions of latest revised national building code (BNBC-2015). However, some guidelines will be helpful for DPE and its partner implementing agencies in planning and design of NBI uniformly throughout the country. Some of the guidelines for preparing plan & design of various NBIs are emphasized in Section 7.

The standards, policies & criteria for NBI and the guidelines for its planning will help the planning and design of different infrastructures in the primary schools. The architectural and engineering plans and designs are most essential for the implementation of NBI development works but would not be enough. The assessment of the needs of various school infrastructure and facilities, selection of the schools, preparation of master plan, managing the existing infrastructure and facilities, and social & environmental issues also need to be considered for proper planning. For effective and sustainable infrastructure development in the primary schools, the issues to be considered while planning in PEPD4 are briefed in Section 6 & 8.

For effective planning and equitable development of the primary schools, the schools that require additional infrastructure need to be identified by assessing the needs of different school infrastructure and facilities properly. A guideline is very essential for uniform needs assessment of different infrastructures in the primary schools throughout the country. The needs assessment guideline approved by MoPME in PEDP3 has been updated as per standards, policies and criteria for NBI planning in PEDP4. For maximizing the impact and reaching the most deserving children with the resource constraints and other considerations, some prioritization criteria are needed to identify schools requiring different infrastructure development most. As the need assessment guideline will be needed for the implementing agencies (LGED & DPHE) during field verification and in assessing the needs of various NBIs, the updated needs assessment guideline is provided in Part-B. Similarly, the prioritization criteria will need to be incorporated in the livelist software (PEPMIS) for ranking the schools requiring various NBIs, which are elaborately discussed further in Part-C.

Hope, these guidelines will set out a framework within which infrastructure development plans will achieve highest standards, consistency, uniformity and sustainability. And thus, will help all government primary schools under MoPME to have good physical infrastructure and healthy learning environment.

PART-A

INFRASTRUCTURE PLAN AND PLANNING GUIDELINES FOR PRIMARY SCHOOL

1. Background

Government of Bangladesh, with the joint support from nine Development Partners(DPs) has been implementing the Fourth Primary Education Development Program (PEDP4) under the sector wide approach. The overall objective of PEDP4 is to provide quality primary education for all children of the country from pre-primary up to grade 5 through an inclusive and equitable education system. The executing agency is the Ministry of Primary and Mass Education (MoPME) and the main implementing agency is the Directorate of Primary Education (DPE).

The GOB and the DPs have worked jointly to design a PEDP4 five-year program to provide quality education to all children of Bangladesh from pre-primary to grade 5 through an efficient, inclusive and equitable education system. The PEDP4 Program Document has been approved by the MoPME in March 2018. The Development Program Proposal (DPP) of the PEDP4 has also been approved by the ECNEC in May 2018. The Program will be implemented over the course of five years from July 2018 to June 2023.

One of the three major components of the program is 'Equitable Access and Participation'. The objective of this component is to provide all communities with learning environments that support participation of all children, ensure continuity of education, and enable quality. There are 7 sub-components, each of which has been designed to achieve an intermediate outcome as follows:

1. Need-based Infrastructure: The physical environment for teaching and learning, teacher education and professional development, and education system administration are improved to meet needs and national standards.
2. Need-based Furniture: All schools are furnished according to the need-based list.
3. Maintenance: School and other education infrastructure are properly maintained.
4. Water and Sanitary Hygiene: Schools, teachers and students have the facilities and capacities to drink potable water and practice sanitary hygiene.
5. Out-of-School Children: Out-of-school children are identified and enrolled in schools/learning centers to complete the primary education cycle.
6. Special Education Needs and Disability: Children with special education needs and disability receive primary education at mainstream primary schools.
7. Education in Emergencies: Institutional capacity and coordination mechanisms are strengthened to ensure continuity of education and disaster risk reduction.
8. Communication and Social Mobilization: Key stakeholders are empowered and informed to promote, support and advance the provision of quality primary education to all age-appropriate children, with special focus on poor, marginalized and/or hard-to-reach/disadvantaged communities.

Under this Component Two of Equitable Access and Participation, following are 5 sub-components which are related to the civil works:

Sub-component 2.1: Need-based Infrastructure Development

Sub-component 2.2: Need-based Furniture

- Sub-component 2.3: Maintenance and Repairs
- Sub-component 2.4: Water, Sanitation and Hygiene
- Sub-component 2.7: Education in Emergencies

In PEDP4, the civil works are related to 4 types of educational institutions/office buildings/training academy such as a) Primary schools, b) DPE field offices/training centers, c) DPE HQs., Leadership center and Warehouse, and d)NAPE. All the civil works will be implemented under the leadership of DPE. Both the LGED and DPHE, as partner implementing agencies, will assist DPE in implementing all these civil works. For better management and coordination, the civil works under the above sub-components can be grouped as i) Physical Infrastructure Development, ii) Furniture Supply (Need based), iii) Maintenance, and iv) Education in Emergencies.

As per DPP of PEDP4, the total cost of civil works is more than 60% of the total program cost and in which more than 90% works are related to school infrastructure development. The civil works related to the primary schools can be summarized as follows:

1. Physical Infrastructure Development
 - a) NBI Development Works
 - b) Construction of WASH Blocks
 - c) Installation of Water Sources
2. Furniture Supply (Need-based)
 - a) Furniture Supply for primary schools
3. Maintenance
 - a) Maintenance of existing buildings
 - b) Maintenance of WASH Blocks
4. Education in Emergencies
 - a) Rehabilitation Program for primary schools

“Needs-based Infrastructure Development” is one of the major sub-components under the “Equitable Access and Participation” component. The objective of this component is to improve the quality of physical learning and working environments through the construction of classrooms and other infrastructure, and the provision of associated furniture. A total of **50,500** classrooms, teachers’ room, and head teacher rooms will be constructed with a view to ensuring that all schools have enough rooms to operate on a staggered double shift basis; with the provision for gradual increase in single-shifts. Also Playing Accessories and Boundary Wall & Gate will be provided in **10,000** and **5,000** primary schools respectively. Under the sub-component “Water, Sanitation and Hygiene” about **58,000** WASH Blocks will be constructed to ensure that all schools have at least one gender-segregated and disability accessible WASH Block, **15,000** safe Water Sources will be installed to ensure a safe drinking water point for each school. Necessary furniture will be supplied to improve the quality of the physical learning environment under the sub-component “Need based Furniture”. Funds will be allocated for routine maintenance of **42,000** schools and repair of **23,000** schools every year. Routine maintenance and repair works will also be done for **28,500** and **10,000** WASH Blocks respectively with a view to keep the schools clean and in a functional

state under the sub-component “Maintenance and Repairs”. Moreover, disaster resilience and disaster preparedness of the primary education sector will be enhanced and ensured; and school safety will also be promoted enabling continuity of education during and after emergencies under the sub-component “Education in Emergencies”.

As per DPP, more than 60% cost of the program has been allocated for civil works in which more than 90% cost is associated with the infrastructure development of primary schools. It can be said the success of the program will greatly depend on the appropriate planning & design, and successful implementation of the school infrastructure development. So, the infrastructure plan and planning guidelines are very important in this regard.

PEDP4 envisions to adopting several fiduciary measures through a set of agreed disbursement link indicators (DLIs). Out of 9 DLIs, Need-based Infrastructure Development is DLI5 under Component two “Equitable Access and Participation”. “Infrastructure Plan and Planning Guideline updated and approved’ has been set as target for year-0 in the Protocol of DLI5. As per DLI Protocol mentioned in the DPP of the program, infrastructure refers to the need-based infrastructure which includes additional classrooms, WASH Blocks, water source/TW for drinking, furniture supply (need-based) and other facilities of the primary schools. For the achievement of year-0 DLI, DPE should update its Guidelines for Infrastructure Planning and prioritizing infrastructure needs (i.e., NBI Assessment and Prioritization Criteria). The updated guidelines are to be approved by MoPME and published in the DPE website.

The previously approved guideline “Guideline for Need Assessment and Planning of Infrastructure” was prepared for need-based infrastructure of primary schools such as school buildings/classrooms, toilets/WASH Blocks as part of NBI DLI activities of PEDP3. These guidelines have also been prepared regarding the need-based infrastructure of primary schools.

2. Purpose and Status of the Planning Guidelines

The primary schools are distributed to the village level throughout the country and located in urban and rural areas, plain land and special zones as well. The present infrastructure and facilities, numbers of students and teachers, socio-economic growth, geographical context, and needs of infrastructure development etc. vary greatly from school to school. The infrastructure development planning is necessary for every school to support the effective and sustainable development. The development plan will provide the strategic framework and policy context for all local planning decisions. As every school is unique in relation to its students, its teachers, its support structures and the availability of resources, the strategies for preparing and producing a “School Infrastructure Development Plan” will vary from school to school. Some planning guidelines are essential for uniform planning of the primary schools throughout the country. The aims of these guidelines are:

- To improve the quality and consistency of physical infrastructure development plans, and thereby decisions on planning applications,
- To strengthen the strategic content of the development plans, and
- To encourage consensus-building in the preparation, implementation and review of development plans.

These guidelines will set out a framework within which development plans will achieve high standards, consistency, uniformity and sustainability. However, it is intended that the guidelines for developing a school Infrastructure Plan will serve as a resource for the schools. These guidelines will assist the head teacher, teachers, SMC, AUEO and UEO in a primary school to produce a School Plan in consultation with and support from the local implementing agencies (i.e. LGED and DPHE) and provide information with which they can decide the:

- Most appropriate type of construction for their school buildings and sanitation facilities
- Selecting and preparing building sites, and
- The most appropriate designs for the school infrastructure and other facilities.

The main objective of these guidelines is to help all government primary schools under MoPME to have good physical infrastructures and healthy learning environment.

3. Standards for Need-Based Infrastructure in the Primary Schools

Generally, a primary school should have a piece of land of its own. The primary schools need some infrastructure and facilities for its smooth functioning. The infrastructure and facilities required for the primary schools are classrooms for Pre-Primary Education (PPE) and primary grades I-V, teachers' room, head teacher room, multipurpose room, furniture, WASH Blocks, water sources, playing items and boundary wall etc. It is very essential to have these infrastructure and facilities adequately available for maintaining a good school environment.

Both the students and teachers are the main stakeholders of the primary schools. The quantities/numbers of the infrastructure and facilities required in the primary schools will be different based on the numbers of students and teachers available. Some standards are needed for assessing the needs of these components. The standards for need-based infrastructure in the primary schools are as follows:

Schools:

- i) One school for habitations having catchment of at least 2,000 populations. The distance between two schools must be not less than two km subject to some flexibility under GoB guideline.

Classrooms:

- i) There will be not less than 4 (four) usable classrooms of which 1 (one) room for PPE and 3 (three) classrooms for primary grades.
- ii) Further classrooms will be provided for the primary grades to prevent overcrowding. The student classroom ratio (SCR) should be 40:1; however, up to 56 students may be accommodated in the classroom.

PP Classroom:

- i) One designated PP classroom.
- ii) The SCR should be 30:1, if necessary for increased number of students' double shift will be introduced.

Teachers and Teachers' room:

- i) Each school must have a minimum 5 (five) teachers, of which 1 (one) PPE teacher, 3 (three) teachers for Grades 1-5, and 1 (one) Head Teacher (HT).
- ii) At least 1 (one) room for teachers. The room will be same size as the classroom and will normally accommodate up to 12 (twelve) teachers.
- iii) Given the number of students exceeds 600, HT room will be considered separately.

Multipurpose room:

- i) One multipurpose room to accommodate library, storage and ICT facilities.

Furniture:

For Classrooms Grades 1-5:

- i) 2-seater and 3-seater low bench and high bench for the students. The furniture provided will be child-friendly and suitable for favourable academic environment.
- ii) One set chair and table in each classroom (for the class teacher).
- iii) One Writing board in each classroom (Black/Green).
- iv) One Book corner in each classroom.
- v) One Flipchart stand
- vi) One interactive white board for multipurpose room, where possible.

For Teachers' room:

- i) Rectangular shaped teachers' table with chair at both sides.
- ii) 1(one) table and 1 chair for the HT along with 2 chairs in front side.
- iii) A long wall cabinet with locker provisions for teachers.

For Head Teacher's room:

- i) 1(one) table and 1 chair along with 2 chairs in front side.
- ii) 1(one) steel almirah, 1 file cabinet and 1 bookshelf.

WASH Blocks:

- i) One toilet for every 50 girls.
- ii) One toilet for every 75 boys.
- iii) One urinal for every 50 boys.

Water Source:

- i) At least one source of safe, potable water – tap water supply or tube well with provision of additional motors.

Playing Items:

- i) Indoor/Outdoor playing items for all schools.

Boundary Wall:

- i) Boundary wall/green fencing and gate for every school.

4. Policies and Criteria for NBI Planning in Primary Schools

To ensure equitable infrastructure development and for reducing disparities, some policies and criteria for NBI Planning will be necessary. Given resource constraints and other considerations, following policies and criteria should be applied to identify schools requiring infrastructures and to clarify how the standards are to be met.

Land Possession:

- i) For need-based Infrastructure planning, the schools shall possess minimum land area (08 decimals in Metropolitan areas, 12 decimals in Pourashava areas, and 30 decimals in other areas) being registered in the name of the schools¹.
- ii) If any school runs in the rented buildings or buildings on temporarily hired lands, those will not be considered for planning in PEDP4.
- iii) If the schools need additional land for extension and be possible to manage locally by the SMC, local elites or communities, can also be considered for planning in PEDP4.
- iv) If the schools require additional land to be purchased for extending school facilities (due to river erosion or national development works) will not be considered in PEDP4 but in other projects under MoPME.

Additional Classrooms/School:

- i) The minimum population in the catchment area will be 2,000 and the distance from the nearest school will be not less than 2 Km. However, this criterion may be relaxed for the schools in special zones such as haor/beel/char/flood or river erosion prone/Coastal/Hilly areas.
- ii) If a school does not meet the standard pertaining to the number of classrooms, only its existing usable classrooms will be considered.
- iii) For calculating classroom requirements, it will be assumed that the school can operate on a double shift basis, as follows:
Shift-1 (Morning) : PPE + Class-I + Class-II + Class-V
Shift-2 (Day) : PPE (as per school/community decision, see below)+ Class-III + Class-IV + Class-V (Contd.)
- iv) In the case of vertical extension, the size of the classroom will be consistent with the classroom size of the existing building. In other cases, the room size will be 19.5 feet by 26.5 feet. However, school infrastructure in the special zones such as hill, haor, coastal, char areas will be carried out considering their geographical specificities under an approved guideline.
- v) The minimum finished floor-to-ceiling height will be not less than 3meters (9 feet 10 inches), as per BNBC 2006.

- vi) The minimum visual angle from the side of the room to the middle of the wall upon which the writing board is affixed shall be 30 degrees.

1 *Bangladesh Gazette, Adl. No., Date: August 2011, SRO No. 263-Law/2011, Rule No. 20*

PP Classroom:

- i) The PP room is to be used for PP students only.
- iii) It will be the same size as the classroom for primary grades. But there should be a provision for sound proof movable partitions between rooms to facilitate the management of special events.
- ii) 1(one) designated PP classroom for every school, accommodating at most 30 students.
- iii) In the case of overcrowding, double shift will be introduced, as per school/community decision.

Teachers' and Head Teachers' room:

- i) Generally, the teachers' room will be of same size as the classroom and will be used by 12 (twelve) teachers. For more than 12 teachers, the room size will be bigger than normal or additional room can be provided for them, as suitable.
- ii) For determining the number of teachers' rooms required in a school, it will be assumed that the already existing teachers' rooms may accommodate up to 40% more teachers, or 17 teachers maximum. For more than 17 teachers' in a school, one additional room could be provided.
- iii) In the event of more than 17 teachers in a school, the new teachers' room size will be bigger than normal.
- iv) Given the number of students exceeds 600; HT room will be constructed separately.

Multipurpose room:

- i) For the schools with number of students relatively high (say 500), one multipurpose room will be provided to accommodate library, storage and ICT facilities.
- ii) The size of the multipurpose room will be same size as the classroom for primary grade or bigger (if necessary) as per decision of the respective schools.

Furniture for Classrooms:

- i) In a single-shift school, one set of high and low bench may be used for Grades 1-3 while another set may be used for Grades 4-5. In a double-shift school, one set may be used for Grades 1-4 while another set may be used for Grade-5.
- ii) Furniture will be made of non-hazardous materials and child-friendly. It will be of manageable weight and locally repairable.

- iii) Furniture design and classroom lay-out will consider that the minimum distance from the first row of benches to the writing board will be 2 meters; and that, where feasible, the main natural light should come from the left side of the seated student.
- iv) The writing board should be green or black.
- v) The book corner will have at least one set of shelves for books and another set for teaching-learning materials.

Furniture for HT's room:

- i) Steel Almirah and file cabinet should be provided in HT's room with provisions for keeping valuable goods of the students and teachers such as Tablet, Laptop and or multi-media Projector etc.

Play Items:

- i) This will include such items as Sleeper, Swing, Sea-saw, hanging rings, balancing and ladder Jig-jag.
- ii) They will be provided if the necessary space is available.
- iii) Playing items will be child-friendly, safe and of suitable size. The existing specifications will be updated.

WASH Block:

- i) Toilet facilities will be provided in the form of WASH Blocks in general having 3 toilets, 1 hand wash and 1-footwash basin and running water supply. Out of the three, one will be designated for the disables. The male WASH Block will also have at least 2 squattingurinals.
- ii) The standards will be met by providing sex-segregated facilities. That is, schools receiving sanitation facilities will have at least two separate Blocks, one for female (girls and female teachers) and one for male (boys and male teachers).
- iii) Where feasible, the male and female Blocks will be positionally separate. If this is not feasible, the respective entrances will face in opposite directions.
- iv) Entrances will be designed to enable accessibility (including for children with physical disabilities), while at the same time ensuring privacy and security.
- v) The height of the toilet will be not less than 2.15 meters, located in a compartment with dimensions 1.0 by 1.2 meters (minimum area 1.2 sqm).
- vi) In cases where the Block or sanitation facilities is attached or built into the school, they should be located separately e.g. on alternate floors.
- vii) Must be accessible by persons with physical disabilities.

Water Source:

- i) Each school must have an adequate access to safe drinking water.
- ii) Safe water will be provided to all schools, using an option suitable to the local hydro-geological formation. The option selected will be a reliable water point that produces enough water for all the year round.

- iii) At least one source of safe, potable water - tap water supply or tube well with budgetary provisions for additional motors. There will be a provision for one tube-well (water source/water point) for 100 students.
- iv) Alternative provision for supply of safe drinking water will be in place in schools, where required. Rainwater harvesting can be explored where necessary.
- v) All drinking water points provided to the schools will be tested for microbiological and chemical contamination to ensure they meet the national quality standards, before handing over to the schools.
- vi) Water quality of existing water points will also be tested by DPHE on an annual basis in all schools.

Boundary Wall:

- i) Boundary wall will be provided to schools, where necessary, being proximate to or having issues with:
 - a) Highway road;
 - b) Railway line or junction or Level Crossing;
 - c) Water body;
 - d) Upazila connecting road;
 - e) Market place;
 - f) Land encroachment or dispute;
 - g) Land erosion.
- ii) Boundary wall can be made of brick, reinforced cement concrete (RCC) or other local materials.
- iii) Green fencing can be used in rural areas provided it is constructed such that it can fulfill the functions of a boundary wall.
- iv) In cases where land erosion threatens the school building or surrounding premises, the boundary wall will be constructed so as also to fulfill the function of a retaining wall.

Access to Electricity:

- i) All schools must have access to electricity for normal building services of electric fittings like light, fan etc., and powersource for running water supply and ICT equipment. The source of electricity will depend on the accessibility.
- ii) The schools which are located at a close distance to the power grid (0 to 2 km) should be connected to it.
- iii) The schools which are further away than 2 km from the power grid and have no possibility of power grid extension over the near future(with in next 5 years) should use alternative energy sources (e.g. solar panel, biogas plant or low-cost generator etc.)
- iv) The schools which are already connected to the power grid may also use alternative energy sources as a supplement.

Access, Equity and Safeguards:

- i) Access to quality education environment must be equal and equitable to all children. There should be no discrimination on poverty, age, geographical location, linguistic, cultural and social marginalization and disabilities.
- ii) The location of the school should be child-friendly, gender-friendly, safe and easily accessible for all, particularly for the child, girls, special children and women/mothers (who bring children to the schools).
- iv) All school buildings and campuses shall be approachable by a public or private road or street or an approved means of access.
- v) A school must have a child-friendly, barrier free environment which promotes inclusive access and equal rights for every child.
- vi) Child-friendly internal and external elements will be incorporated in all the new construction and repair works.
- vii) All children must have equal opportunity to education irrespective of their individual characteristics or differences across the country. Gender and IE should be mainstreamed in all activities (plan, design and implementation of NBI development works) irrespective of gender, ethnicity, disadvantaged groups, class, race and disability.
- viii) Both social and environmental safeguard issues should be complied with the safeguard policies of the country and DPs as well.
- viii) Provision of safe, clean and hygienic environment should be ensured for all students.
- ix) All schools will be fitted with disabled friendly provisions.
- x) The concept of Green School through construction of new infrastructure should be promoted.
- xi) Safety and security should be of utmost concern of school campus design.

5. Planning of School Infrastructure and Facilities

The development of school infrastructure and facilities are essential in every school for providing good school environment and achieving school effectiveness. The school complex should appear to be a unified development, not a haphazard collection of buildings, toilets/WASH Blocks, playgrounds, and parking lots etc. The school infrastructure planning is significant for the achievement of school effectiveness and a significant support for school improvement. It enables the school authority to control the direction and pace of its own development in a professional way. As every primary school is unique, the strategies employed for preparing a School Infrastructure Plan will vary from school to school. With the limited resources, different options for infrastructure and facilities need to be explored in planning of school infrastructure for effective and sustainable development in primary education.

Infrastructure Planning for Primary Schools is not an easy task. For appropriate planning, one should have general ideas about the current practices of infrastructure development, suitability of the options available in different situations and surroundings, construction/manufacturing processes of different options available, requirements and availability of materials, manpower, equipment and technologies for both construction and maintenance as well. Moreover, safety & security, aesthetical beauty, economy and sustainability of the proposed infrastructure/facilities should also be considered during planning. However, some options, practices, arrangement, technical aspects and suitability for building construction, water supply and furniture are briefly discussed below:

5.1 Construction Types

A school should be adapted to the specific conditions of the local community and the geographical characteristics of the site. Below is given some construction types which could be selected for the construction of school/additional classrooms and WASH Blocks depending on the situations of the respective schools and its surroundings.

- i) Reinforce Concrete Frame Structure
- ii) Masonry Structure
- iii) Semi-Pucca Structure
- iv) Fully Tin-shed or Mixture of Traditional materials.

5.1.1 Reinforced Concrete Frame Structure

Structural concrete reinforced with no less than the minimum amount of reinforcement specified in the code is termed as reinforced concrete (RC). RC frames consist of beams, columns and their connections which are constructed first. RC frames resist both gravity and lateral loads. Floor/roof slab and beams transmit the vertical and lateral loads to the columns. Footing beneath each column either individual or combined can be provided as foundation to transmit the loads from the structure to the ground. RCC framed structure is basically an assembly of slabs, beams, columns and foundation inter-connected to each other as a unit. Monolithic construction is possible with RCC framed structures and they can resist vibrations, earthquakes and shocks more effectively than load bearing/masonry building. In plain land areas and where the numbers of students are high, but the lands are scarce, this RCC frame with 3-6 storied foundation may be constructed in those schools.

5.1.2 Masonry Structure

Brick, hollow brick and hollow concrete block are the common masonry units used for walls and buildings. They generally provide great compressive strength and are best suited to structures with light transverse loading. In Masonry building, masonry walls are the main load bearing elements and transmit the gravity load from the slab(s) above down to the foundation. Reinforced Masonry or concrete with still reinforcement offers much greater tensile and lateral strength to structures. Brick foundation or strip footing beneath the wall can be provided as foundation which transmits the loads from the structure to the ground. Masonry building is suitable for low- to medium-rise building construction. In the schools where the numbers of students are less and even no possibility of increasing in future, this masonry structure with 2-storied foundation may be constructed there.

5.1.3 Semi-Pucca Structure

A semi-pucca structure is one of which either the roof or the walls but not both is made of pucca materials like burnt bricks, stone, cement, concrete or timber. The structure is one storied and of which the walls are made of either brick masonry or RCC frames with partition wall, floors are cemented, and the roof is with Corrugated Iron (CI) sheets over wooden or still truss. It is a semi-permanent structure. Semi-pucca Tin-shed is suitable for the schools in remote areas or in special zones.

5.1.4 Fully Tin-shed or Mixture of Traditional Materials

The sides of this structure are made of CI sheets with wooden or steel posts and the roof is with CI sheets over wooden or still truss. If necessary, its floor can be made on a raised platform and the sides with locally available traditional materials. It is a kind of temporary structure and easily shift-able. It can be constructed very quickly with much less cost. Tin-shed is suitable for special zones like char/haor/hilly or river erosion prone areas. In case of emergencies, this type of tin-shed can be constructed very easily and quickly.

5.2 Furniture in Primary Schools

Furniture is an important aspect because students spend most of their time seated in the classroom. The furniture should be able to move and easy to arrange to allow students to sit in places that are best suited for their learning styles. In the primary schools, different types of furniture and seating arrangements are needed for the classrooms of pre-primary to primary grades, teachers' rooms and multipurpose rooms as well. Local timber, plywood, steel, fiber plastic and masonry etc. or its combination can be used for different types of furniture in the primary schools depending on the availability of materials and carpenters, workshops, furniture suppliers or manufacturers.

5.2.1 Pre-Primary Class Seats and Corners

The teaching of the elementary curriculum is best taught if children are seated on floor mats and around table or shelves for up to eight children. It is a good idea to incorporate shelves around the perimeter of classroom walls for keeping teaching learning materials. For the PP class, children can sit on mats and working shelves or tables could be organized alongside the walls as corners with the writing board and teacher's table area cleared. Children can also sit on small chairs/tools around large and low height tables and 6-8 chairs/tools may be kept around each table.

5.2.2 Primary Grade Seats and Desks

The seat combined with the desktop is preferred for primary schools. For the primary grades, both 2-seater and 3-seater low bench and high bench may be provided in the classroom. The size of the low bench and high bench will vary from grade to grade. Even in each grade, the age and growths of the children are not same. Consequently, there is no size that fits all. The bench design should allow children to place feet flat on the floor and elbows comfortably on the bench top. In an ideal primary school two or three bench sizes may be needed to cater for all. The different sized benches can be painted in different colours for easy identification. A provision of shelf below the high bench top will help the students for keeping books and other learning materials. For ease of movement, the low bench and high bench should not be too heavy, or it could be separate.

5.2.3 Seating /Furniture Arrangement in the Classroom

The layout of furniture in the classroom is very important. The physical setup of chairs, tables, or high and low benches, and presentation in a classroom can significantly influence teaching and learning. Seating arrangements can impact how the teacher communicates with the students and how the students interact with one another. When the classroom setup is in harmony with the teaching style, the students, and the space and furniture available, the benefits can be endless. Factors that influence classroom configurations are classroom size and shape, distractions, student age and size, and teaching style & objectives etc. The classroom configuration or seating arrangements which are most common are as follows:

- i) Traditional Rows or Columns,
- ii) Roundtable/Circle,
- iii) Horseshoe/Semicircle or U-shape,
- iv) Pods/Clusters (Nested Tables in Groups)

However, traditional set up is more common in the classrooms due to its flexibility. The traditional setup typically consists of rows of fixed seating. Classroom desks or benches are arranged in rows or columns, with a teacher's desk or table at the front. Students face the teacher with their backs to one another. The straight-row arrangement is suitable to make the best use of available natural light from the windows. The rows configuration (also known as the columns configuration) is the most common classroom seating arrangement. This type of setup complements teacher-based instruction and presentations. Students are more focused on coursework and independent assignments. As the teachers can't get around behind the students to look at their work, it is difficult to monitor. Though this seating arrangement can be used for any class size, large classes may often see uneven levels of interaction as the students in the front row will participate more while those in the back may lose focus.

Having some cons, this seating arrangement is historically common in the primary schools of Bangladesh for accommodating a lot of students in a small space. However, to work in this layout, there should be some spaces at the front of the class and the walkway between the rows.

5.2.4 Other Furniture

In each classroom, one set of chair and table is needed for the teacher. All classrooms should have a writing board/chalk board. The writing board can be made of wood or plywood either hanging on the wall or be placed on wooden/metal frame/stand/cart. It can also be of masonry board, built in with the classroom and fixed at the wall. The colour of the board could preferably be green as green colour relaxes the eyes and prevent fatigue. Furthermore, the human eye is highly sensitive to the green colour. The green colour is associated with relaxation and calmness, which can help students be more focused. As for many teachers, the writing board is a major focus in their teaching which should be user friendly. It needs to be ensured that the students can clearly see it without too much strain or difficulty. For more mobility and flexibility, instead of wall-mounted chalkboard, a rolling whiteboard or writing board on cart or stand with wheels may be considered that can be easily moved around the classroom. It is also a good idea to incorporate book corner in each classroom having shelves with shutters for keeping books and other teaching-learning materials. This book corner can also be made of steel/wood/plywood or masonry built-in with the classrooms at the corner of the walls.

Like the students, teachers also spend most of their times in the schools. They also need some furniture while staying in the teachers' room/office room. Teachers can have either individual table with chair or large room table with chair surrounding it. Some book self, file cabinet and almirah will also be required for keeping learning materials

and other relevant materials as well. But the Head Teacher needs separate table and chairs for better management and coordination.

In the multipurpose room, furniture like bookshelf, rack, whiteboard, computer desk and chair etc. will be needed to accommodate library, storage and ICT facilities.

5.3 Water Supply Options

In the primary schools, different Water Supply Options are available, but the suitable options should be selected considering the type and capacity of water sources, quality of the water from different sources, and the treatment of the water required for any sources which are discussed below:

5.3.1 Water Sources

Water sources are generally classified according to their relative location on the surface of the earth. The sources of water in Bangladesh are surface water, groundwater and rainwater. The availability of surface water and rainwater is not consistent due to seasonal variation. Groundwater is the main source of water supply in Bangladesh. Groundwater is often cheaper, more convenient and less vulnerable to pollution than surface water. Therefore, it is commonly used for public water supplies. However, schools can get their water supply from several sources:

- i) Piped water supply;
- ii) Wells, springs and ponds;
- iii) Tubewells/boreholes; and
- iv) Rainwater.

Piped water supply systems are usually owned and maintained by the local governments, such as cities or other public entities. If the school is in or near a city or pourashava that has piped water, it can be connected to the public water supply. Underground reservoir tank and overhead water tank will be required for water storage.

A well is a hole which has been dug, bored, driven or drilled beneath the ground for extracting ground water. Wells can vary greatly in depth, water volume and water quality. Well water may be drawn by pumping from a source below the surface of the earth. Alternatively, it could be drawn up using containers, such as buckets that are raised mechanically or by hand. Ring well is used for extracting potable water in rural areas. Ring wells are generally not very deep because these cannot readily be sunk far enough below the water table. The Ring well may be up to 15 meters (50 feet) deep, with diameter usually ranging from 1 meter to 1.5 meters. A well with a hand pump can be installed if the groundwater is within 8 meters of the ground surface.

When the ground water is too deep for a well, a borehole can be used. Borehole is a small diameter well bored or drilled in the earth specially to obtain water. Tubewell or borehole is used to describe water well. It is a device installed into a well to abstract ground water from an aquifer. A well is first drilled into the ground and then a pipe

assembly is lowered which consists of an intake section and a discharge section. The intake section consists of a slotted part, the well screen, and a blind pipe. The discharge section consists of housing pipe, pump, and discharge mouth or sprout.

Different types of Tubewells are used in Bangladesh for groundwater abstraction. The most popular one is known as Hand Tubewell (HTW) and number 6 pumps are used for abstracting groundwater for drinking and domestic use. A second type of hand tubewell is known as TARA Pump operated by a piston pump and used for drawing water from deep Groundwater Table areas. These hand pumps are designed for lifting water from bore wells with static water level not exceeding 15 meters. They are more cost-effective than other pumps for medium lifts (up to 15 meters) and are safer from bacteriological contamination and corrosion problems. These wells have normally 3.81 to 6.35 cm in diameters. Shallow Tubewells (STW), have 5.08-10.16cm diameter and abstract water with the help of centrifugal pump. Deep Tubewells are of large diameter (15.24-20.32 cm) and pump water by a submersible turbine pump. The material used for HTW, TARA and STW are mostly PVC although GI pipes are used in some cases. DTWs are constructed mainly of stainless steel or fiberglass screens and GI pipe as blind pipe and housing pipe. Water supply DTWs are generally more than 150m in depth. DTWs are used for municipal water supply in urban areas of Bangladesh.

Rainwater would be an immediate resource to augment the existing water supply system by “catching water whenever it falls”. Rainwater can be utilized as an important source of water supply in areas where rain is well distributed throughout the year and where surface water and groundwater are scarce. The rainwater can be collected from roofs of buildings, houses, and other catchments from which it can be channeled to a storage tank.

A reliable water supply of clean drinkable water is a major problem for many schools in Bangladesh. Often piped water supply is unreliable and is not available for parts of the day or even for many weeks. Where public water supply is not available, the individual potable water source should be used. Sometimes, water from wells, boreholes or streams becomes contaminated or dries up. The availability of rainwater is also limited by the rainfall intensity, and distribution over the year.

Groundwater is the main source of water supply in urban and rural areas of Bangladesh. Groundwater is available in adequate quantity but the availability of groundwater for drinking purpose has become a problem for the following reasons:

- i) Arsenic in ground water;
- ii) Excessive dissolved iron;
- iii) Salinity in the shallow aquifers in the coastal areas;
- iv) Lowering of groundwater level; and
- v) Rock/stony layers in hilly areas.

Groundwater depletion is primarily caused by the sustained groundwater pumping. This result in reduced or no yield of water during dry period from the existing well in major cities such Dhaka, Rajshahi and Barind tract areas. Groundwater depletion will force us to pump water from deeper within the ground. In Bangladesh, ground water depletion,

seawater intrusion and arsenic contamination of groundwater, microbial contamination of surface water and seasonally variable rainfall make reliable access to acceptable quality drinking water a challenge. Consequently, it is important that all schools should have a backup water supply.

However, the location of the school will determine the best type of water source. The type of water source that would be suitable for the school is to be selected with the help of local DPHE Engineer.

5.3.2 Water Quality

“Water Quality” is a measure of how good the water is, in terms of supporting beneficial uses or meeting its environmental values. Potable water is water suitable for drinking and cooking purposes. Potability considers both the safety of water in terms of health, and its acceptability to the consumers – usually in terms of taste, odor, color, and other sensible qualities.

Water Quality can be defined in terms of the chemical, physical, and microbiological content of water. In accordance with the Bangladesh National Standards for Drinking Water, all these three chemical, physical and microbiological aspects need to be considered. Water from developed wells shall meet the potable water quality standard requirements specified by the Department of Environment (DoE), Bangladesh.

Before deciding on the source(s) of surface or groundwater, it is important to conduct water quality tests through representative samples. These tests ideally should be performed on site and through samples taken to the laboratory for definitive analysis. Samples from the potential surface and groundwater sources should be collected and analyzed for several quality parameters. During sampling, some parameters may be observed and tested on site with the use of portable equipment; while others must be analyzed formally by an accredited testing laboratory.

5.3.3 Water Treatment

If the water contains contaminants and undesirable components, the quality of water needs to be improved to make it acceptable for drinking. Water treatment removes contaminants and undesirable components or reduces their concentration so that the water becomes potable or fit for drinking. Water treatment is also required to remove or destroy pathogenic microorganisms.

Water treatment is the process of removing undesirable chemicals, materials, and biological contaminants from raw water. The purpose of water treatment is to ensure that the quality of the water to be supplied to the consumers is within acceptable standards. Depending on the treatment method, the concentration of the undesirable particulates or contaminants may be reduced or eliminated. These contaminants include suspended particles, dissolved elements and minerals, bacteria, and algae that degrade the raw water quality. Water treatment ideally should be avoided. It is best to select sources with good water quality at the outset to reduce facility and operation cost.

Following two terms related to water treatment are very significant.

Water Purification – “The act of cleaning by getting rid of impurities.” It refers to the process of removing specified contaminants from a water source. Water Filtration, Distillation, Desalination, Reverse Osmosis etc.

Water Disinfection – “Killing or removal of microorganisms outside the body by direct exposure to chemical or physical agents or processes.” It refers to a purification process that kills or removes biological contaminants (cysts, bacteria, viruses, protozoans, etc.) from a water source. Water that has been disinfected (by UV radiation, boiling, chlorination, micro-filtration, ozone, etc.) may still be polluted with other contaminants.

As mentioned earlier, access to quality drinking water is now a challenge due to several reasons. Both surface water and groundwater need treatment. Some common treatment methods usually followed in community water supply in Bangladesh are discussed below:

Arsenic Iron Removal Plant(AIRP): Excessive iron and or arsenic may be present in the groundwater of different parts of the country. Arsenic Iron removal plants (AIRPs) are a relatively inexpensive way of removing arsenic from groundwater to access to safe drinking water.

Desalination: Both the extent and concentration of salinity are increasing in the ground water near coastal areas. Saline water can be treated to yield fresh water by desalination method. Two main processes are used, reverse osmosis or distillation. Both methods require more energy than water treatment of local surface waters and are usually used in coastal areas only or where groundwater has high salinity.

Groundwater Depletion: Groundwater depletion is primarily caused by the sustained groundwater pumping and inadequate recharge due to rapid urbanization. This results in reduced or no yield of water during dry period from the existing well in major cities and Barind tract areas. Groundwater depletion will force us to pump water from deeper within the ground.

6. Master Plan for School Infrastructure and Facilities

6.1 Master Plan

A master plan is a comprehensive document intended to guide development for the next 15-20 years. Master plan acts as a reference document to inform and guide future decision makers in their review and implementation of future phases. It provides a road map from the existing physical portfolio of facilities to a consensus future vision of an educational environment that is fully aligned with the mission of the school. A master plan is essential for a school to have a clear and well-founded base for future direction.

6.2 Developing a Master Plan

A master plan is a document which includes drawings, schedules, explanatory diagrams and other materials, clearly defining the development of the campus and the logic behind it. It identifies existing land use and buildings and proposes future use together with a phased growth plan. By developing a master plan, the complexity surrounding facilities can be made coherent and assures that decisions are sound and limited resources are wisely allocated. And the schools can avoid making hasty decisions and costly mistakes; for example, a new building in the wrong place.

The development of a master plan does not imply a commitment or intention to progress the project or stages in a plan. Rather it provides the way in which a preferred development would proceed when funding becomes available. A well-executed master plan should remain viable for at least a decade but should allow for regular updates as the school and its curricula evolve. However, a comprehensive master plan should include the following:

- Guiding principles of the school
- Acknowledgement of the stakeholders and participants of all sexes
- Present and future educational programs

- A context of community including historical or cultural values
- Background history
- Constraints and opportunities
- Summary of assessments for the existing asset portfolio including a comparison of program requirements to existing buildings and site conditions
- Analysis of renovation/addition/replacement/adaptive re-use alternatives
- Overview of scopes and budgets and cost efficiencies with proposed solutions, alternatives, priorities and schedules
- Conceptual plans and diagrams
- Capacity and utilization
- Recommendations.

6.3 Preparation of Master Plan for School Infrastructure and Facilities

Primary schools are located both in plain land areas and special zones such as char, haor, tea Garden, slum, boarder, island, hill or coastal areas etc. In these special zones, both the students and physical infrastructural facilities existing or projected/required in future are different or even significantly less from the plain areas. Various natural hazards such as flood, cyclone, tornado, earthquake, landslide, riverbank erosion, water logging, salinity intrusion, groundwater depletion and groundwater contamination etc. frequently prevalent in Bangladesh. The distribution and impact of these events are diverse and not all, but one or two events are predominant in a particular area. Different areas or zones are vulnerable to different hazards.

For every school, a master plan is required for upgrading the physical infrastructure to meet current and future demands, for making the complexity surrounding facilities consistent and optimum utilization of limited resources. But the master plan would not be similar for every school considering its existing facilities, locations and future needs. While preparing school master plan for infrastructure development, the following approach can be taken in to consideration:

- i) Considering government vision, national policies and sustainable development goals, socio-economic culture and future growth for 15-20 years, a set of standards and requirements of infrastructure and other facilities are to be ascertained for the primary schools.
- ii) Based on these standards and requirements, some typical guidelines for Master plans need to be prepared for both urban and rural areas and for different special zones. Both the implementing agencies (LGED and DPHE) can help DPE with the typical master plans for different areas of the country.
- iii) For a school, considering its existing land, infrastructure & facilities, growth in the catchment area and future needs, surrounding environment and vulnerability etc., actual master plan to be prepared jointly by all the stakeholders following the typical master plan of that area as guideline.
- iv) The master plan thus prepared under the guidance of a committee should be approved by another committee and preserved in the school and other local offices (DPE, LGED and DPHE) as well.

- v) Later, all development works in the school would be implemented gradually following the approved master plan.
- vi) The approved master plan could also be reviewed and updated time to time as and when necessary, particularly at the beginning of an education sector development program.

6.4 Master Plan Preparation Committee

There should be a committee for infrastructure development in every school. The committee will be known as school infrastructure development committee and responsible for the development and implementation of the master plan. The committee will consist of following members:

Sl.No.	Designation	Position
1	Upazila/Thana Education Officer	Convener
2	Upazila Engineer/Assistant Engineer, LGED	Member
3	Assistant Engineer, DPHE	Member
4	Local representative(s) from Civil Society/Guardians/Educationist (at least one woman)	Member
5	SMC Chair (of concerned school)	Member
6	AUEO of respective cluster	Member
7	Head Teacher(of concerned school)	Member Secretary

N.B. The committee may co-opt any potential member from the local leaders/elites/social workers, if necessary.

Three elements-the Vision, the Educational Plan and the Business Plan – will be drawn upon by the School Infrastructure Development Committee to lead the master planning process. Based on the typical master plan for different areas/zones, Education Policy (2010), Environmental Policies and SDGs of the government, the committee will develop a draft master plan for the school. The LGED Upazila Office can provide necessary technical support in preparing the draft master plan for the schools. If possible, the committee/SMC can also engage a draftsman/Auto CAD expert for drafting the master plan.

6.5 Master Plan Review

The approved Master plans are not static and should be reviewed every few years – certainly before another phase of construction is commenced. The review should verify whether any of the original goals and objectives has changed, and whether the logic behind the proposed development is still present. Educational outcomes and pedagogical approaches may have changes with time. Similarly, planning laws and regulations or standards, policies and criteria for school infrastructures may also be changed. Later, changes in any or all these factors may initiate review of the school's master plans.

6.6 Master Plan Review and Approval Committee:

In each upazila/thana, there is an Upazila/Thana Primary Education Committee responsible for managing and monitoring of all the education related activities within the upazila/thana. This Education Committee is a 16-member committee headed by Upazila Parishad Chairman. Honourable MP of the area is the adviser, Upazila Nirbahee Officer (UNO) is the Executive Vice Chairman, and UEO is the member Secretary of the committee. The formation of the Upazila Primary Education Committee is shown in the **Annex-I**. At the Upazila Chairman office, the committee will review the draft master plan of the schools based on typical master plan of the area/zone, demographic growth, socio-economic and cultural context of the area etc.

7. Guidelines for Planning and Design of Need-Based Infrastructure

The “Bangladesh National Building Code (BNBC)” provides guidelines for regulating building construction activities across the country. The plan and design (architectural and structural) of school infrastructures shall be prepared following the rules/instructions of latest revised national building code, BNBC-2015. However, some guidelines will be helpful for DPE Planning and Development division and field officers, Head Teachers and SMCs, and its partner implementing agencies (LGED and DPHE) for planning and design of NBI uniformly throughout the country. Some of the guidelines for preparing plan & design of NBIs are given below:

7.1 Planning of School Infrastructure and Facilities

- i) A school must be adapted to the specific conditions of the local community and the geographic characteristics of the site; it must be concerned with the local economy and projections of demographic growth.
- ii) The total open area in a school should be kept around 50% (minimum) of the school area (BNBC 2006). The open area could be used as playground, playing items, walkway, temporary shed, gardening and tree plantations etc.
- iii) Generally, for good school environment, open space with one school building would be preferable to accommodate the classrooms, teachers’ room and other facilities than 2 or 3 buildings in one school.
- iv) The location of the school building should be child and gender friendly, safe and easily accessible for all, particularly for the child, girls, specialized children and women/mothers (who bring their children to the schools).
- v) For existing pucca or semi-pucca school buildings, repair and renovation/refurbishment should be given priority than replacement.
- vi) For the construction of additional classrooms, the possibility of vertical extension shall be given preference. If vertical extension is not possible, only then horizontal expansion will be considered.

- vii) For more than one building side by side in the same school, a minimum separation of 2 meters between the buildings shall be maintained if the heights of both the adjacent buildings are not more than two storeys. If the height of either of the adjacent buildings in the same plot is more than two storeys, mandatory open space between the buildings as per BNBC shall be maintained.
- viii) The orientation of the building should be North-South (preferably south facing) i.e., windows be at N-S facing for admitting essential daylight and ventilation through windows. The orientation could be varied up to maximum 30° if necessary.
- ix) The school complex should appear to be a unified development, not a haphazard collection of buildings, toilets/WASH Blocks, play fields, and parking lots etc. Care should be taken so that the aesthetical beauty and architectural views of the existing and or proposed buildings are not hampered in any way.
- x) The minimum set back (the distance which a building is set back from street or road) rules of the respective Urban Development Authorities/City Corporations/Pourashavas should be maintained in the planning of school buildings and WASH Blocks.
- v) The school buildings shall have enough clear distance from the Overhead Electric Lines/National Grid Lines.
- xi) Generally, a minimum of 2-storeyed foundation shall be considered for school buildings in normal areas. Three or more storeyed foundation can be provided if it is justified considering high number of students, future demand, scarcity of land or any other limitations.
- xii) In river erosion prone areas, instead of permanent structure shift-able semi-pucca/katcha tin-shed structure (as suitable for makeshift school) shall be considered as temporary arrangement. The advice of BWDB may be seek and considered in this regard.
- xiii) The WASH Blocks should be located carefully to ensure privacy, safety and convenience. The WASH Blocks and hand washing facilities should be adjacent to the school building and if there is no space, as close as possible to classrooms and playing areas, to ensure that they can be used conveniently and safely. It can be located at one side or corner of the school area for ease of future maintenance. However, provision of separate WASH Blocks for female teachers & girls, and male teachers and boys, should be maintained.
- xiv) No WASH Block or its disposal system should be constructed either in front of the school or near the gate or adjoining the abutting property/street or canal causing barrier or aesthetical nuisance.
- xv) Similarly, water source or TW should not be set beside toilet, WASH Block, road, dump or garbage areas.
- xvi) In Urban/City Corporation areas where piped water supply and public sewerage system are available, sanitation facilities can be considered attached with the school building.

- xvii) For school buildings with 3 to 6 storied foundations, WASH facilities shall be considered attached in each floor.
- xviii) In case of flood /cyclone prone areas where ground floor is kept open, attached toilets/WASH Blocks should also be considered instead or in addition to separate WASH Block(s).
- xix) Multistoried WASH Blocks shall be considered in line with the school buildings. WASH Blocks for boys and girls could be provided either at each floor or alternate floors, or at one side or both sides of the adjacent school building depending on the needs and suitability. However, foundation for the WASH Blocks should be same as that of the school building attached.
- xx) For one or two storeyed school buildings, individual/separate WASH Blocks can be provided if enoughspace is not available for attached WASH Blocks.
- xxi) In the schools where both additional classrooms and WASH Block are needed, space for attached WASH Block should also be considered while planning for additional classrooms.
- xxii) Ramp or any other facilities should be considered in such a way that it does not hamper the construction of attached WASH Block in future.
- xxiii) There should be hearty coordination between LGED & DPHE for proper planning, design and construction of WASH Blocks
- xxiv) Finishing schedule for civil, sanitary and electrical works (Doors, Window and grill, exterior and interior painting, brick cladding, tiles, sanitary & electric fittings and fixtures etc.) of school building and WASH Block should be of similar standards.
- xxv) All the buildings should have provision for electrification, sanitation and plumbing works etc. Estimate should be inclusive of electrical and sanitary/plumbing works.
- xxvi) Cost of construction will also include furniture, fixtures, fittings, circulation area (verandah, stair and ramp) etc.
- xxvii) Provisions for renewable energy utilization may be explored in the school buildingsin areas where no electric grid line is available,specially in char/coastal/hilly areas.
- xxviii) Rainwater harvesting can be considered as an alternative option for water supply in the schools in areas where water crisis is ever increasing and there is enough rainfall.
- xxix) In addition to the WASH Blocks, each school should have group hand wash facilities to promote the culture of hand washing practices and it should be located to the WASH Blocks as close as possible.
- xxx) Enough water points and water-use facilities (w. r. to the number of students) should be available at the right places for all needs (drinking water, washing and cleaning etc.) in the school.
- xxxi) Play, recreation and high-volume activity are hallmarks of the schoolyard. Designing a school site should combine multiple sensitivities to the needs of children in their learning environment.
- xxxii) Provisions for playgrounds, playing accessories, main gate entryways and community gathering spaces,vehicular access for drop-off and pick-up, and

- ease of peak time circulation (in urban areas) etc. should be considered if necessary space is available.
- xxxiii) Outdoor play and recreation areas should be located so that the noise does not interfere with the study in classrooms. All recreation areas must be separated from pedestrian and automobile traffic. If a playground is adjacent to the street or water reservoir, barrier should be placed between the two.
 - xxxiv) Proper landscaping should also be considered in the development of school complex. The relationship between the building and the space surrounding it could be developed using appropriate landscape elements such as plantings, ground surfacing materials depending on the intended use of the area, and fences, walls, steps, and permanent outdoor benches.
 - xxxv) Trees and shrubs shall be planted judiciously to meet the requirements of shade and sunshine, to control noise and dust, to provide privacy and to improve visual quality, without jeopardizing natural ventilation and lighting of a building.
 - xxxvi) Species of trees shall be so chosen and planted that their roots do not endanger the building foundation and their branches do not interfere with the building superstructure.
 - xxxvii) Along with the name of the school, upazila and district could be written visibly on the main gate of the school.

7.2 Design of Additional Rooms/Reconstruction of Schools

- i) The building is to be structurally stable, weatherproof according to the local environmental conditions, climate responsive, easily exited in case of emergency and well-integrated with the environmental and cultural context.
- ii) The design of school buildings should be adapted to different geographical areas of the country like char, haor or beel areas, flood or river erosion prone areas, coastal area, and hilly area etc.
- iii) Use of local construction materials and low-cost technologies should be given preference. Cost effective and environment-friendly alternative building materials should be introduced. For example, instead of traditional burnt bricks, green bricks or cement concrete blocks can be used for wall; similarly, GI sheet can be replaced with the thermal coated industrial roof sheet or steel roofing sheet for roof etc.
- iv) The construction of school/additional class rooms should be cost effective, achievable through local contractors with locally available materials and its maintenance achievable locally.
- v) School building must incorporate safety features for resistance against hazards (such as railing, grill, parapet, concealed wiring, rational spacing and good finishing of various exposed items or components, earthing, and lightning protection etc.)
- vi) Classroom doors should be located at sides and rear of the classroom rather than at the front. Every classroom to have two (2) doors opening outside in a verandah for easy exit. All doors shall be a minimum of three (3) feet wide and 2-inches thick.
- vii) The school buildings to be designed for earthquake, cyclonic wind resistance applicable as per BNBC.

- viii) All fire protection norms as per BNBC must be followed in the design and construction of school buildings. Only one means of exit/staircase can be provided for the buildings of maximum 2 storeys (foundation) and maximum occupant load 200. All other large school buildings should have minimum two staircases opening into a large covered or open space.
- ix) The design of foundation of the school building should be based on soil investigation report of the site.
- x) The formation level of the plot/site shall not be lower than the adjacent road level. For flood prone and uneven or undulated areas the formation level shall be decided considering the general characteristics of the terrain and future development plans.
- xi) The plinth or ground floor level of the building to be kept at least 15 cm above the known highest flood level, minimum 45 cm above the formation level or adjacent front road. In flood prone area the plinth level shall not be located below the design flood level.
- xii) The length of the room should not exceed its width by more than 50% i.e., aspect ratio of classroom should not exceed 3:2. However, the size of different types of rooms (classrooms, teachers' room/HT room and multi-purpose room etc.) to be provided in accordance with the standards and policies for primary schools, the type of extensions, availability of space and teaching pedagogy etc.
- xiii) The location of the multi-purpose room should be girl friendly i.e., neither isolated nor situated behind.
- xiv) It is important the school be flexible and capable of future expansion. The design of the school should allow for future changes and addition of further accommodation.
- xv) There shall be no columns in any room. Columns placed within the room's interior space severely hamper room arrangement and student viewing of the teacher and visual aid. Every seat must have an unobstructed view of the teaching wall. No columns or other visual obstructions are allowed in primary school classrooms.
- xvi) All classrooms should have writingboard/chalkboard or whiteboard across the front of the room. The presentation area and information displays should generally be located on the narrow wall of the room. The front wall of the room behind the teacher area should have no protrusions (structural or otherwise) into the room so that writing board, white board, projection screen or information displays can be installed across the entire wall of the presenter area.
- xvii) The school building/facilities must be energy efficient and should be designed so that energy consumption is minimized. An even distribution of natural light and natural ventilation across the room should be taken in to account. It is better if the main light comes from the left side so that there are no shadows thrown on the work being done.
- xviii) Adequate cross-ventilation will be a factor for natural comfort and wellbeing throughout the year. Every room should have ample number of windows doors, and ventilators in the ceilings for enough lighting and ventilation.

- xix) Classrooms should enough good fresh-air circulation to avoid heat and excessive humidity. A minimum of 20% of the classroom floor area should be window area to ensure daylight and ventilation. Windows should be at the side of the room, and not at the front or back.
- xx) Classrooms require lighting that can produce enough brightness for reading and writing and for illumination on writing board/chalkboard and teaching areas. All lighting controls/switches should be conveniently located at the front and side of the room near entrance doors.
- xxi) Classrooms shall be designed to provide adequate acoustical separation from all other interior and exterior noise source. Minimum acoustical requirements: Walls, ceilings and floors etc. with Sound Transmission Coefficient (STC) of 50, an overall noise level in empty rooms under Noise Control (NC) 35, and Reverberation Time (RT) 60 of 0.4 second or less.
- xxii) All new school buildings and new extensions should be designed to provide equal access for all. All areas at ground floor level should be accessible to all building users. Classrooms should be accessible for all children; ramps, wide doorways and other interventions should be provided for less mobile children. All new school buildings (horizontal extension) shall have a covered entrance (i.e., porch).
- xxiii) The design of new additional classrooms shall consider the flow of students both in and out of the building and within the building as well as the need for the teachers to move around in the front of the room.
- xxiv) Every school building or additional classrooms should be designed with enough circulation areas such as verandah, corridor, staircase and chillakotha/attic etc. A verandah is to be provided along one side of the building.
- xxv) The minimum width of stair case and corridor/passage shall not be less than 2 meters. The rise and tread of the stair should be 5 inches and 11 inches respectively so that the stair should not be too steep. Stair nosing (steel or brass) can be considered to protect the stair edges from rapid damaging. A white line to be drawn in the middle of the stair with 'up & down' arrow sign.
- xxvi) Ramp (maximum slope 1:12 or 10 degrees) shall be provided along with the school in such a way to ease access for the specialized children.
- xxvii) Verandah grill can be provided in all the floors (as per local needs) for safety and security reasons. Gate should also be provided in such a way so that all sorts of unwanted entry inside the school building can be prevented after the school is over, during holidays or long vacation.
- xxviii) The roof of a school building shall be constructed in such a manner that the rain water is drained freely away from the building without causing dampness of the roof or the walls of the building or of an adjacent building.
- xxix) In the roof slab, there should be a provision of heat reflecting/trapping to prevent excessive heat during hot summer days. In semi-pucca or tin-shed building, provision of false ceiling should be kept for heat trapping.
- xxx) Rainwater harvesting may be included in large school buildings particularly in the high rainfall areas and where safe water source is scarce.

- xxxi) Minimum distances from Overhead Electric Lines/National Grid Lines as per BNBC must be maintained during construction or extension of the buildings.
- xxxii) Provision for Electricity connection and electrical fittings like light, fan shall be provided to the schools.
- xxxiii) Where there is no playground in the school, new school building could be designed keeping the ground floor or its part open as suitable.
- xxxiv) There shall be an approved finish schedule for civil, electrical and plumbing works/items and the same finishing schedule will be followed for all the constructions in the primary schools.
- xxxv) The building construction information such as 'Year of Construction', 'Foundation Provisions' and 'Design Life' etc. should be inscribed permanently on the building.

7.3 Design of Pre-Primary Classroom

- i) The classroom that would be designated for PPE should be located on the floor of exit discharge.
- ii) The PP classroom shall be of equal size of the other classrooms but there should be at least three corners for keeping educative learning and entertainment materials such as imagination corner, block corner, and book & drawing corner etc.
- iii) The corner facilities for keeping various learning and playing materials could be provided with boxes having shelves & shutters (18 inches width and 3-seater bench length) made of wood/plywood or fiber plastic.
- iv) Thick vinyl floor mat/carpet/tiles can be provided on the floor on which children can sit and move around easily.
- v) In addition to floor mat, child friendly low height round table (need-based) with some chairs/tools around could be provided for facilitating group work and to be used in the winter, if needed.
- vi) For the PP classroom, provision for a drawing/chalkboard shall be kept at one side of the wall with full length and below window level where children can draw at ease whatever they like.
- vii) The PP classroom should have proper ventilation like the additional classrooms.
- viii) There should be a provision for sound proof movable partitions between rooms to facilitate the management of special events.
- ix) The PP room should be designed and built to minimize physical hazards. Some extra safety measures shall be considered for the PP classroom such as all electric fittings and appliances should be out of reach to the children, catch hook of the window to be avoided etc.

7.4 Design of WASH Blocks

- i) WASH facilities should be simple in design, comfortable & hygienic to use and easy to clean.

- ii) Each WASH Block will consist of at least 3 toilets, 1 hand wash and 1 foot-wash basin. Out of the three, 1- toilet will be designated for the disabled and the male WASH Block will also have at least 2 squatting urinals.
- iii) For effective operation and maintenance, WASH Block should be provided with running water supply from a separate source of water and overhead PVC water tank. In areas where there is no electricity, alternative power sources (solar panel and generator) could be used for ensuring running water supply.
- iv) WASH facilities for boys and girls should be in two physically separate blocks with a conventional sign of man or woman on its front, spaced sufficiently apart, if not possible, at least separated by solid walls but with opposite entrances.
- v) The compartments of the WASH Block should not to be visible from outside, especially for girls. Entrances should be positioned so that one cannot easily see the Block compartment entrance to provide maximum privacy in entering and leaving the WASH Blocks.
- vi) The orientation of WASH facilities –specially the direction that the WASH Block/toilet entrance faces, must also consider the perceived security and safety of the girls. The orientation of the squatting plates (pan, commode & urinal etc.) should also consider cultural and religious norms.
- vii)** The height (floor to ceiling) of toilet/WASH Block shall not be less than 2.15 meters, and the minimum area of each toilet shall be 1.2 square meter (size: 1m x1.2m).
- viii) Menstrual Hygiene Management (MHM) facilities should be incorporated in the WASH Block for female teachers & girls. For incorporating MHM facilities, each toilet in the WASH Block should be larger than that of male teachers & boys.
- ix) The detailed design of the WASH facilities provided must also be child friendly. Steps (in case of individual WASH Block(s)) must be easy to climb. Door handles must be easy to reach. The toilet interior cannot be too dark. Squatting plates must be designed to accommodate a child's feet rather than those of an adult. Provision should also be there for adequate natural lighting and ventilation.
- x) All WASH Blocks should have impervious floor and wall up to five feet (min) above the finished floor.
- xi) The doors of the Toilets/WASH Blocks should be of durable materials and water proof.
- xii) Towel rail and hook/hanger for keeping school bag and or clothes to be provided inside the WASH Block and or toilets.
- xiii) If WASH Blocks are not connected to the school building, ramp shall be provided at the entrance of the WASH Block(s) to facilitate easy access for all the children with physical disabilities and its design like slope, width and or hand rails etc. should be provided as per BNBC.
- xiv) In each WASH Block, one room/toilet shall be designed for the children with special needs as per BNBC. This room should be equipped with appropriate toilet seat and hand rail for easy use by the students with disabilities.

- xv) The view and elevation of the WASH Block should be alike or matching with the adjacent school building either existing or proposed.
- xvi) In multistoried WASH Blocks, following options can be incorporated depending on the needs and suitability:
 - Option-1: WASH Blocks for Boys and Girls are with separate entrance in each floor.
 - Option-2: WASH Blocks for Boys and Girls are in alternate floors.
 - Option-3: WASH Blocks for Boys and Girls are at both sides of the school building in each floor.
- xvii) The foundation provision of the WASH Block (if attached) should be the same as that of the school building and its design shall be based on soil investigation report of the site.
- xviii) The roof of a WASH Block shall be constructed in such a manner that the rain water is drained freely away from the building without causing dampness of the roof or the walls of the building or of an adjacent building.
- xix) The design of WASH Blocks should be adapted to different geographical areas like char, island, haor, beel areas, flood or river erosion prone areas, coastal areas and hilly areas. There should be some typical design of WASH Blocks (isolated - separate & combined) for different special zones.
- xx) In case of flood /cyclone prone areas where ground floor (of the school building) is kept open, built-in/attached toilets/WASH Blocks should also be considered instead or in addition to separate WASH Block(s).
- xxi) The finishing schedule of the WASH Blocks (finishing items of civil works like interior and exterior painting, grill, tiles, electrical and plumbing fittings and fixtures etc.) should be of similar standards to that of the school/additional classrooms.
- xxii) For disposal system, septic tank, soak well or soak pit will be provided with the WASH Blocks. The location, design and construction of disposal system shall conform to the requirements of BNBC.
- xxiii) The disposal system should be designed based on location with respect to the wells or other sources of water, soil permeability, ground water elevation, area available and maximum occupancy etc. Septic tank(s) shall not discharge into open water course.
- xxiv) Where there is land constraint, septic tanks to be constructed under the WASH Blocks structure.
- xxv) In haor/low land areas, soak away will not be constructed due to high water table. Septic tank to be constructed above ground level to avoid ground and surface water contamination.
- xxvi) The minimum distance of various components of the disposal system (septic tank, leach pit, soak well or soak pit etc.) from the well or stream shall be (10-15meters) in accordance with the BNBC.
- xxvii) Quick and safe disposal of wastewater should be ensured in the design of WASH Blocks. Connection to the public sewer system would be the most appropriate wastewater disposal option. In other situations, soakaway pits or infiltration trenches should be used. All wastewater drainage system should be covered, to avoid the risks of disease-vector breeding and contamination.

7.5 Design of Water Sources

- i) Deep or shallow Tube well, Tube well with TARA or submersible pump, Rainwater harvesting, Pond Sand Filter (PSF), Ring Well (RW), and connection to the Piped water supply system i.e., WASA/City Corporation/Pourashava water supply system etc. may be considered as water supply options.
- ii) If piped water supply system with enough pressure is available, the water main may be connected directly to the water distribution system for continuous water supply.
- iii) For inadequate pressure in the piped water supply system, the building premises shall have an underground reservoir tank to store water. Then the water from the underground tank can be boosted up by a centrifugal pump to the roof tank.
- iv) In the absence of piped water supply system, the individual potable water source shall be used for water supply. The individual water source may also be used as back up support if piped water supply is available.
- v) The capacity of the individual water source shall be enough to supply water of 45 Liters per Capita per Day (BNBC 2006).
- vi) The location of the individual water sources/tube wells should be selected in such a way that it does not hamper the aesthetical beauty and environment of the school.
- vii) For existing wells that have desired capacity and water quality should be given priority in selection. If the capacity of a well is not enough, it should be checked to see if it can be developed to increase the yield. If water quality is not good enough, a decision must be made whether to go for a new well or to provide some treatment facilities.
- viii) For new wells, the following steps are to be called for:
 1. Determine the best possible well sites
 2. Prepare preliminary well design
 3. Select the method of construction
 4. Construct the well following standard procedure
 5. Test for safe yield and water quality.
- ix) Multiple water points can be provided in primary schools where number of students is higher (say 300) and some innovative design will be encouraged for that.
- x) Drinking-water points should be enough, clearly identified and safe. There shall be at least one drinking water fountain/point/facilities (filter/pitcher on a stand with glass) in each floor.
- xi) Provision for rainwater harvesting should be kept in the schools of areas where safe water source is scarce.

- xii) Water from the piped water supply or individual water source shall meet the potable water quality standard requirements specified by the Department of Environment, Bangladesh.
- xiii) Any water source or TW should not be located beside toilet/septic tank, road, dump or garbage disposal areas. However, the minimum distance of water source and pump suction line from potential sources of contamination shall be in accordance with BNBC
- xiv) Tube wells should be provided with standard size platform with drain and suitable locking arrangement.
- xv) The waste water from the tube well should not cause any harm to the environment of the school premises rather be drained out of the school through pucca/masonry drain.
- xvi) In flood prone areas, suitable measures (raised platform or provision for raising tube well head etc.) can be considered with tube wells to avoid contamination during high flood.

7.6 Classroom Furniture Layout

Student desk (high & low benches), teacher's desk (chair & table), writing board/chalkboard, whiteboard, flipchart stand, book corner etc. are some common furniture in the class rooms of primary grades. As the students spent most of the time in the classrooms, the layout of classroom furniture is very important. The teaching-learning output mostly depends on the readability and comfortability in the classrooms, teachers' interaction and monitoring etc. Classroom should have either 2-seater or 3-seater benches or in combination. A set of chair and table is required for teacher. A writing board or chalkboard shall be provided in each classroom which should be located at the front of the room on the active teaching wall. The board can be made of wood or plywood either hanging on the wall or be placed on the wooden/metal frame/stand. It can also be masonry, built-in with the classroom and fixed at the wall. The colour of the board should preferably be green as green colour relaxes the eyes and prevent fatigue. Also, whiteboard and flip chart stand are necessary for effective presentation & display and book corner for keeping books & other teaching-learning materials. However, the following rules/standards should be followed for furniture layout in the classrooms:

- i) Maximum vertical viewing angle at the first row shall be less than 35° to the top of the board (Fig-7.1)
- ii) Minimum horizontal viewing angle at the first row shall be greater than 30° (from the side of the first row to the rear end of the writing board/chalkboard) (Fig-7.2)
- iii) The distance from the first row of benches to the writing board should be at least 2 meters (Fig-7.3)
- iv) In the classrooms, the teacher's table/desk will require 10 square feet (5'x2') which is to be positioned at least 3 feet (1 meter) from the teaching wall. (Fig-7.3)
- v) Student high benches will be at least 18 inches deep.

- vi) The writing board (12 feet width) to be provided at the front or back wall so that the main natural light should come from the left side of the seated students. A continuous tray of full length of the board can be provided for chinks and dusters.
- vii) The height of the writing board/chalkboard shall be not less than the distance from the center of the board to the furthest student/back row divided by 5.3 (Fig-7.2)
- viii) The board could be 4 feet in height and in no case the bottom of the board is lower than 3 feet above the floor (Fig-7.2).

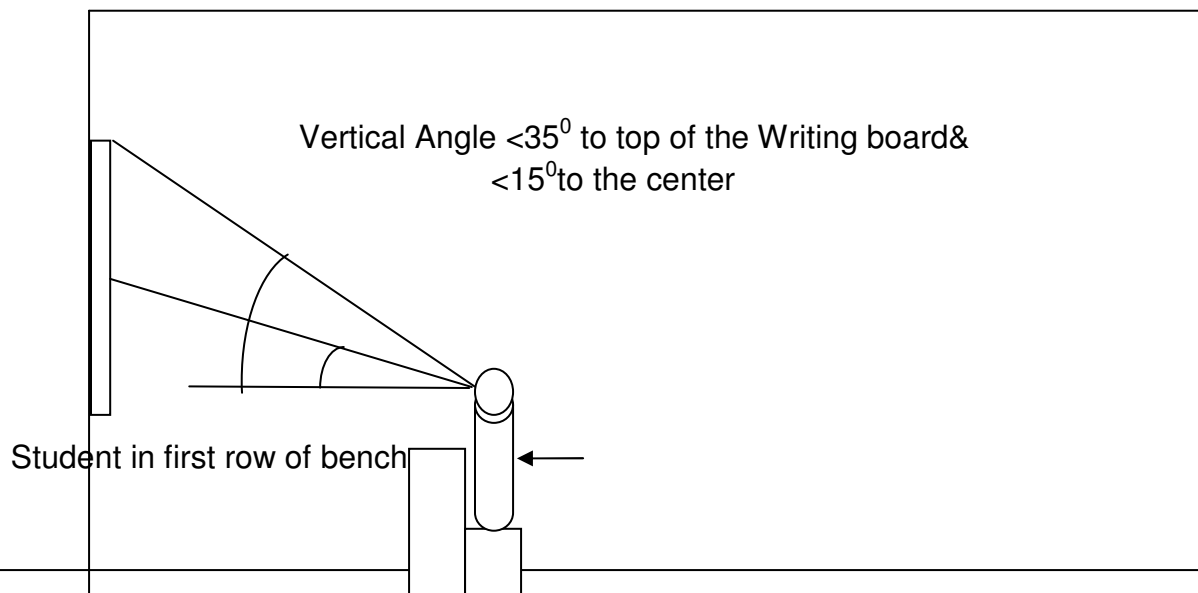


Fig-7.1: Vertical viewing angle at the first row

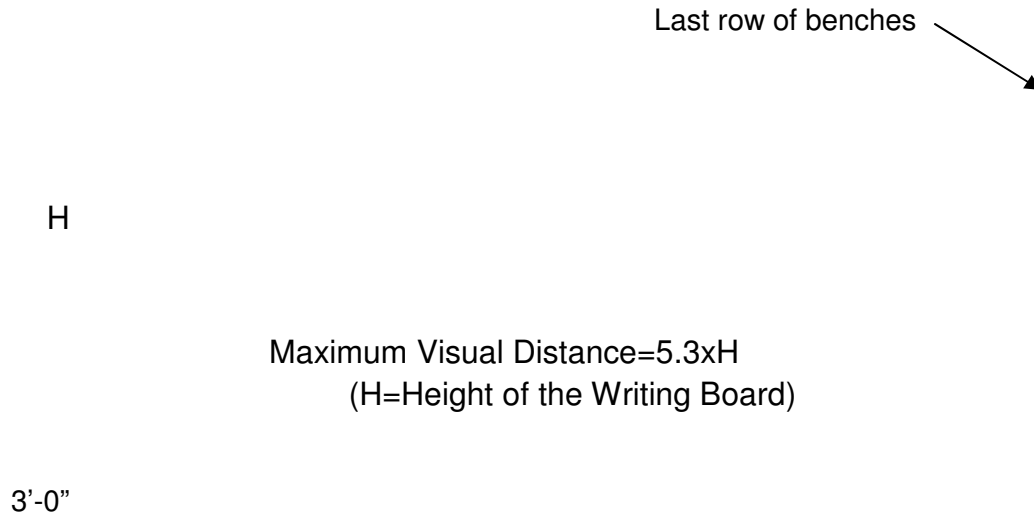


Fig-7.2: Height of Writing board and maximum Visual distance

In a classroom with traditional setup, students can sit on benches laid in 3 columns either 2-seater bench in the middle and 3-seater bench at both sides or vice versa in each row. For maximum 56 students, 7 or 8 rows of benches will be required in each classroom. The two typical layouts of furniture in the classrooms is given below:

Layout-1:

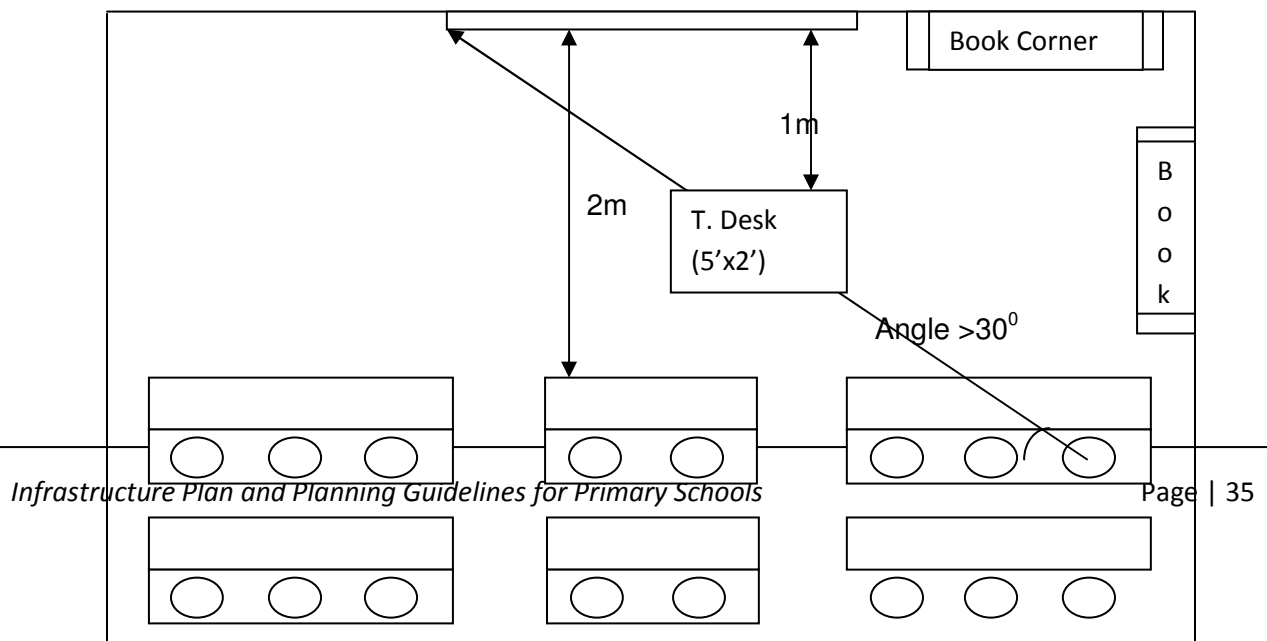


Fig-7.3: Classroom Furniture Layout with 2-seater bench at the middle of each row

Layout-2:

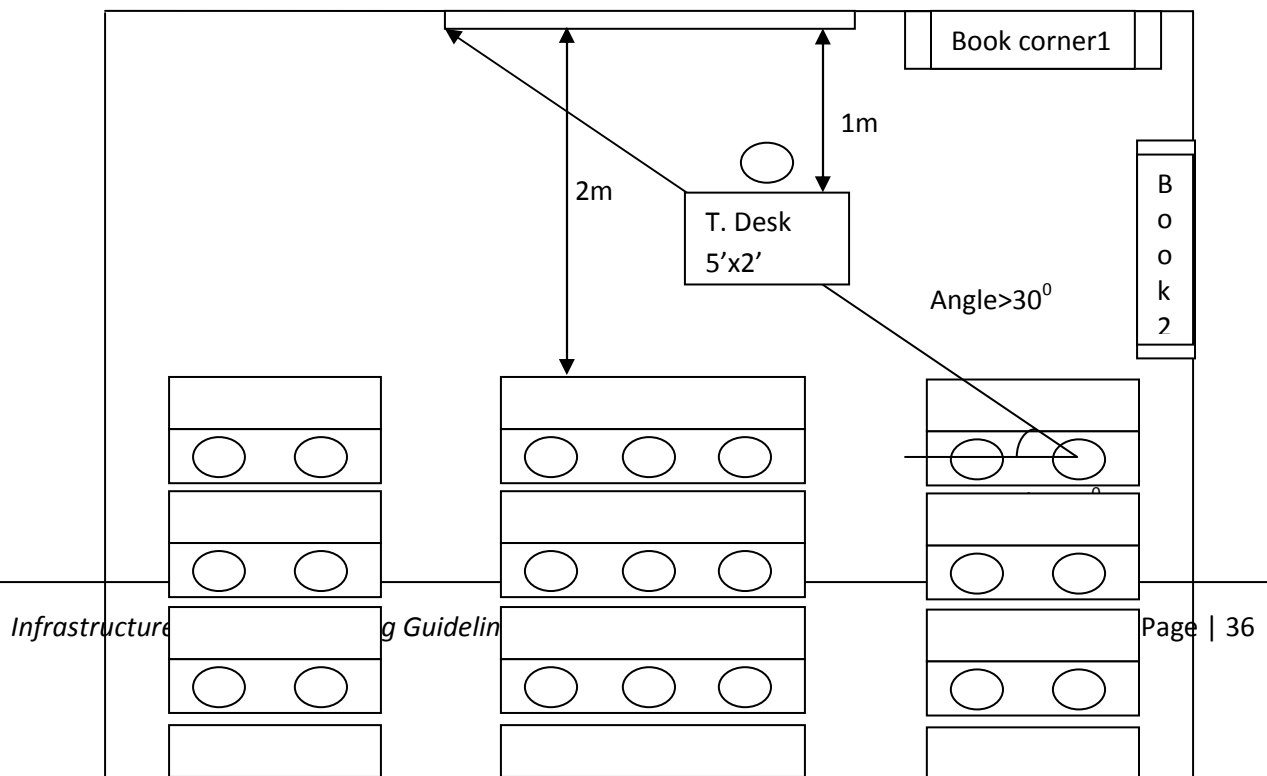


Fig-7.4: Classroom Furniture Layout with 3-seater bench at the middle of each row

7.7 Final Drawings and Finish Schedule

Finally, all the planning and design of school infrastructure and facilities mentioned above should be incorporated in the drawings and finish schedules. Several categories/types of drawings along with the finish schedule need to be provided for representing the complete final drawings which should include the following:

A. Site Plan:

- i) Entire site, property lines;
- ii) North arrow reference;
- iii) Complete topography, existing and finished;
- iv) Streets or highways with names or numbers and sidewalks adjacent to property;
- v) Proposed drives, walks, and parking areas on-site including access for the physically disabled;
- vi) Location of all existing buildings on the sites and on adjacent property;
- vii) Location of proposed buildings, and possible future additions, with dimensions to establish location;

- viii) Water, electricity and underground gas service lines (if any);
- ix) Sewage disposal system;
- x) Storm drainage;
- xi) Landscaping;
- xii) Field, playground improvements;
- xiii) Wetland or ponds or ditches etc.;
- xiv) Distances from roads/highway/railway line or junction/river or canals etc. and
- xv) High Flood Level (HFL) in the flood prone areas.

B. Architectural Plan with detailing:

- i) Layout plan
- ii) All floor plans to scale of 1/8 inches or larger, fully dimensioned;
- iii) Roof plan showing equipment, roof access and drainage;
- iv) Elevations of all finished floors;
- v) Vertical dimensions and datum reference for all floor levels;
- vi) Typical classroom wall features;
- vii) Openings, windows, doors, and door frames;
- viii) Plan markings to local sections and details;
- ix) Wall sections for all floors;
- x) Doors and Windows types, sizes and hardware sets;
- xi) Flashing, skylight, overhangs, sun-sheds, parapets; porch;
- xii) Stair details including riser, treads, handrails,
- xiii) Window grill, verandah grill, ventilator grill;
- xiv) Ground floor steps, ramp, planter box, collapsible gate; and
- xv) Boundary wall and gate.

C. Structural Design with detailing:

- i) Foundation design;
- ii) Superstructure design showing all structural members (beam, column, slab, roof slab, chillakotha slab) with section detailing, and bar schedules;
- iii) Design of stair, staircase, stair rails, chillakotha door, collapsible gate;
- iv) Detailed column beam joints and other construction joints;
- v) Design of parapet, cornices, sunshade, and porch;
- vi) Design of verandah railing, verandah grill, ventilator grill;
- vii) Design of doors and windows frames and shutter, window grills;
- viii) Design of underground reservoir design (if necessary);
- ix) Design of ground floor steps, ramp, planter box;
- x) Design of boundary wall (front and sides) and gate.

D. Sanitary and Plumbing Design:

- i) Design of water supply, waste water and sewage disposal facilities;
- ii) Location of all fixtures and mounting heights;
- iii) Design of sanitary disposal system like septic tank, soak away, leach pit and inspection pits etc.

- iv) Design of shallow and deep drains;
- vi) Tube well platform with drain; and
- vii) Rainwater harvesting system.

E. Electrical Design:

- i) External & Internal Electrification system,
- ii) Location and details of main and secondary distribution boards, switches, panels, fuses, and circuit breakers;
- iii) Electric fittings and fixtures (light, fan, switches, sockets, power sources etc.) with locations, types, wattage, lumen and mounting heights;
- iv) Earthing and lightning arrester;
- v) Fire protection system; and
- vi) Solar panel system.

F. Furniture Design and Layout:

- i) Location, size and height of classroom furniture such as writing board/chalkboard, and different corners for PP class;
- ii) Location, size and height of classroom furniture such as writing board/chalkboard, high and low benches and book corner for the students of primary grades;
- iii) Location & design of chair, table, almirah and file cabinet for the teachers' room and head teacher's room and
- iv) Design of furniture for multi-purpose room.

G. Finish Schedules:

The interior and exterior finishing items of the school building, WASH Block and other facilities (civil, electrical and plumbing works/items) should be described in brief as interior and exterior finish schedules of the primary schools. These finish schedules will make the project go much smoother because finishing items will be known beforehand and help building the school infrastructure more aesthetically acceptable and uniform throughout the country. Some typical finish schedules are as follows:

- i) Exterior finish schedule of building works;
- ii) Interior finish schedule of building works;
- iii) Plumbing fittings and fixtures;
- iv) Exterior Electrical fittings and fixtures; and
- v) Interior Electrical fittings and fixtures in/c fire protection system.

8. Effective and Sustainable School Infrastructure Planning in PEDP4

The standards, policies & criteria for NBI and the guidelines for its planning will help the planning of different infrastructures in the primary schools. The architectural and engineering plans and designs are most essential for the implementation of NBI development works but not enough. The assessment of the needs of various school infrastructure and facilities, selection of the schools, master plan, managing the existing infrastructure and facilities, and social & environmental issues should also be considered for proper planning. For effective and sustainable infrastructure development in the primary schools, the following issues need to be considered while planning in PEDP4:

1. Preparation of Master Plan for School Infrastructure & Facilities
2. Planning for Disaster Resilient School Infrastructure
3. Update Guideline for Need Assessment and Planning of NBI
4. Update Prioritization Criteria of various NBIs for PEDP4
5. Special Priority of NBI for the Schools in Special Zones
6. Update and Up-gradation of Livelist Software (PEPMIS)
7. Education in Emergencies (EiE)

8. Maintenance of Existing School Infrastructure & Facilities.
9. Ensure Universal Access and Safeguards
10. Heritage Preservation.

8.1 Preparation of Master Plan for School Infrastructure and Facilities

Already discussed in Section 6.

8.2 Planning for Disaster Resilient School Infrastructure

A disaster is a sudden, calamitous event that seriously disrupts the functioning of a community or society and causes human, material, and economic or environmental losses that exceed the ability of the affected community or society to cope using its own resources. Disaster can be natural and manmade.

A hazard is any source of potential damage, harm or adverse health effects on something or someone. Floods, cyclone, landslide, and earthquake etc. are some of the natural hazards frequently happened in Bangladesh.

Resilience can be defined as the ability of a system, community or society exposed to hazards to resist, absorb, adjust to and recover from the effects of a hazard in a timely and efficient manner. This would include structures and functions (United Nations, 2009). Conceptually, resilience entails three interrelated dimensions: lower probabilities of failure; less-severe negative consequences when failures do occur; and faster recovery from failures (Bruneau et al., 2003). The emphasis on consequences and recovery suggests that improving the resilience of infrastructure systems is not only a technical problem, but it also has societal dimensions. Designing resilient infrastructure systems will require collaborative efforts by engineers and social scientists.

Resilient infrastructure plays a critical role in supporting communities to withstand, respond to and recover from natural disasters. The increasing number and intensity of extreme weather events is likely to threaten certain school infrastructure necessitate the increased focus on resilience and improving the maintenance of existing infrastructure.

Sustainability is the consideration of infrastructure resilience in a long-term environmental context. Disaster resilience is an inherent characteristic of sustainability. Designing and building infrastructure that can withstand disasters will reduce their negative environmental impact.

Making infrastructure disaster resilient encompasses both structural and non-structural measures. Structural ones include flood control systems, protective embankments, rehabilitation and retrofitting of buildings. Non-structural measures refer to risk-sensitive planning, hazard mapping and eco-system-based management.

School infrastructure is often built according to standard design templates. This can be adjusted to reflect site-specific considerations, including the local hazard environment, to increase their resilience to disasters. In every year, education disruption happened

due to washing away of many school buildings in the river erosion prone areas. DPE could take advice of BWDB for the schools alongside or adjacent to the major rivers having proximity to the river bank erosion. Shift-able structure is more suitable than pucca buildings in those areas susceptible to river bank erosion. In the flood-prone areas, school buildings can be constructed above high flood level or ground floor can be raised allowing flood water to pass below it. Elevated tube-wells and flood-proof WASH Blocks/Toilets can be provided to ensure year-round safe water and hygienic sanitation. In addition to providing lightning arrester on top of each building, some palm trees can be planted near the school buildings and or alongside the road or open field for lightning protection of school buildings and its users.

The increasing frequency of natural disasters with large human and economic loss calls for recognizing disaster risks and concerted action to strengthen resilience. This needs to be implemented within an integrated disaster risk management framework that combines climate change adaptation, disaster risk reduction, disaster preparedness, post-disaster relief, early recovery, reconstruction.

Disaster cannot be stopped. But the impact of disasters can be minimized by making the infrastructure disaster resilient. During the disasters, school infrastructure and facilities itself must be in safe first to keep safe the users and other assets within. School facilities can be made safer through enforcement of BNBC in its planning, design and construction, and provisions of the minimum protective equipment/materials to all schools. Selection of construction sites and school designs should take in to account potential climate and disaster impacts. Climate-smart and innovative interventions should be introduced to enhance energy efficiency, water and food security and safety. Routine maintenance and non-structural mitigation measures should be promoted for increased safety of children and protection of the investment in primary schools.

However, a guideline is necessary for making school infrastructure disaster resilient which should be followed in planning, design and construction of school infrastructure.

8.3 Update Guideline for Need Assessment and Planning of NBI

For equitable development of the primary schools and reducing disparities, the schools that require additional infrastructure development need to be identified by assessing the needs of different school infrastructure and facilities properly. A guideline is essential for uniform needs assessment of different infrastructures in the primary schools throughout the country. It may be mentioned here that the “Guideline for Need Assessment and Planning for Infrastructure (School Buildings/Classrooms and Toilets/WASH Blocks)” was approved by MoPME in PEDP3. The previously approved guideline was prepared for NBI of primary schools as part of part of NBI DLI activities in PEDP3. The guideline has been updated as per approved standards, policies and criteria for NBI planning in PEDP4 and attached in **Part-B**.

8.4 Update Prioritization Criteria for various NBIs in PEDP4

Following are the names of comprehensive lists of schools having needs of various NBIs that would need to be prioritized/ranked for selection as per approved target in PEDP4.

- a) Additional Classrooms/Reconstruction of Schools
- b) WASH Block(s)
- c) Water Sources
- d) Furniture Supply (Need-based)
- e) Maintenance of Schools
- f) Boundary Wall
- g) Play Items/Accessories

To maximize the impact and reach the most deserving children within the funding constraint, time frame, and existing institutional capacity etc. the comprehensive lists of schools identified for various NBIs and facilities would be prioritized based on the requirements. When two or more schools would possess same need, those schools are to be ranked as per prioritization criteria in the order. The revised criteria and order for prioritizing/ranking the comprehensive lists of schools of various NBIs are briefed below and elaborated in **PART-C**.

(a) Additional Classrooms/Reconstruction of Schools: The following criteria and order can be applied for prioritizing the schools that require additional classrooms/reconstruction of schools in PEDP4.

- 1) Ratio of additional rooms (classroom & teachers' room) vs existing rooms.
- 2) Replace katcha school
- 3) Number of existing rooms
- 4) Number of additional rooms (classroom & teacher's room)
- 5) Number of additional teachers
- 6) Number of students

(b) WASH Block(s): The following criteria and order can be applied for prioritizing the schools that require additional WASH Block(s) in PEDP4.

- 1) Number of additional toilet(s) for girls
- 2) Number of girls' enrolment
- 3) Number of additional toilet(s) for boys
- 4) Number of Boys enrolment
- 5) Number of existing toilet(s) for girls
- 6) Number of existing toilet(s) for boys

(c) Water Sources: The following criteria and order can be applied for prioritizing the schools that require Water Source/Tube well for drinking water supply in PEDP4.

- 1) Number of students
- 2) Girls' enrolment

- 3) Affected Water sources by Arsenic/high salinity, lowering of Water Table or other conditions making the existing water source unusable
- 4) Water source repairable
- 5) Type of water source proposed

(d) Furniture Supply (Need based): The following criteria and order can be applied for prioritizing the schools that require furniture (need based) in PEDP4.

- 1) Ratio of additional furniture vs. existing furniture
- 2) Number of additional furniture
- 3) Number of usable classrooms
- 4) Number of furniture repairable
- 5) Number of students
- 6) Number of Teachers' post

(e) Maintenance of Schools: The following criteria and order can be applied for prioritizing the schools that require Maintenance in PEDP4.

- 1) Major repair
- 2) Minor repair
- 3) Year of last maintenance done
- 4) Year of construction
- 5) Number of students

(f) Boundary Wall: The following criteria and order can be applied for prioritizing the schools that require Boundary Wall in PEDP4.

- 1) Along the Highway road/Railway line or Junction or Level crossing
- 2) Along the water body
- 3) Along the market place
- 4) Land encroachment
- 5) Land disputes
- 6) Location (urban)
- 7) Distance from the Highway/Railway line or Junction or Level crossing
- 8) Distance from the water body/market place
- 9) Number of students.

(g) Play Items/Accessories: The following criteria and order can be applied for prioritizing the schools that require Play Items/Accessories in PEDP4.

- 1) Availability of space
- 2) Number of students
- 3) Play ground
- 4) Number of shifts in the schools

8.5 Special Priority of NBI for the Schools in Special Zones

PEDP4 will be implemented in the whole country including geographically challenged areas like hilly terrain, waterlogged haor and coastal areas. More than 25% of the primary schools (GPS, NNPS & RNGPS) are in the special zones like char, island, haor, hilly, coast, slum, and tribal areas etc. In general, the situations in these zones are difficult, with issues of access and disadvantage being prevalent. Both the students and existing facilities are limited or less in the special zones and the needs of these schools are different than those of plain land areas. To ensure equitable development in primary education throughout the country, the schools in the special zones need to be prioritized separately with the same prioritization criteria mentioned above. That is, there will be two separate lists for each type of NBI, one for plain land areas and the other for the special zones. Each list will be ranked using the prioritization criteria mentioned above and elaborated in **Part-C**. In the final prioritized NBI lists, the proportion of schools between plain land areas and special zones will be approximately three-to-one (3:1).

8.6 Update and Up-gradation of Livelist Software (PEPMIS)

In PEDP4, the most deserving primary schools for various NBIs development will be selected through the software named Primary Education Property Management Information System (PEPMIS). To reduce disparity and reach the most deserving children, the NBI lists will be generated through PEPMIS for identifying those schools which require different types of additional infrastructure development.

The basic information of the schools and their present physical conditions would be entered and validated at different levels. The standards and policies of NBI planning, the need assessment criteria of various infrastructure and facilities, and the prioritization criteria for ranking the schools for different needs etc. are the major design parameters in the PEPMIS. The PEPMIS software which was designed and updated for PEDP3 infrastructure planning should be updated further before applying for PEDP4. For efficient and effective planning, equitable and sustainable development, three new modules on school furniture, EiE, and maintenance of NBI should also be incorporated in the PEPMIS along with its regular maintenance. Moreover, PEPMIS should be compatible with the other software available in DPE for data cross checking and avoiding repetition in data collections.

8.7 Education in Emergencies (EiE)

As Bangladesh is a disaster-prone country, various disasters both natural and manmade like flood, cyclone, tornado, nor'easter, river erosion, fire hazard, shifting of schools for national development activities etc. are frequently happened and affected normal education even for a longer period. In many primary schools, immediate interventions of infrastructure development works will be necessary for continuing

education during these emergencies. To ensure continuity of education and disaster risk reduction during and after these emergencies –

- i) A guideline is necessary for selection of those schools which require emergency interventions, its planning and implementation on an emergency basis.
- ii) Following the guideline, web-based software needs to be developed/updated for quick selection and immediate interventions of the affected schools.
- iii) Response to Emergency Education should be consistent with national Emergency Preparedness and Response Plans.
- iv) A culture of safety and enabling continuity of education for all children should be promoted.
- v) Provisions for immediate interventions in the disaster-affected schools and selection of school designs considering potential climate and disaster impacts.
- vi) Provisions for minimum set of protective equipment/materials (fire extinguishers and fire boards, first aid boxes, etc.) in the schools especially vulnerable to disasters
- vii) Provisions for temporary/make shift structures (low cost, using locally available materials) as transitional school in the affected areas during emergency period and or interventions.
- viii) Provisions for typical make-shift school design in/c WASH Blocks which could be replicated in possible cases of disaster affected schools.
- ix) Provisions for implementing certain climate-smart interventions (i.e., solar panel, appropriate insulating system) to enhance energy efficiency, and water and food security (i.e., rainwater harvesting and school gardens).
- x) During disaster, though some schools might not be severely damaged or destroyed rather be affected partially or indirectly by various disasters. Regular operations would be hampered in those schools just after the disaster events. Provisions for special or post disaster maintenance works would be necessary for those schools to normalize the services for normal education.

8.8 Maintenance of Existing School Infrastructure & Facilities

Over the years, use and the environment cause infrastructure to deteriorate. External parts of a building are weathered quickly when exposed to the natural environment. Without proper maintenance, they will deteriorate easily. Due to lack of maintenance, the life of the buildings is greatly reduced, and buildings are becoming inhabitable. Apart from decay and degradation of the building itself, inadequate maintenance can reduce performance, affect health and threaten the safety of occupants and those in the vicinity.

The infrastructure and other facilities in the primary schools are often inadequately maintained and frequently show evidences of lack of maintenance and repair. Proper and timely maintenance and rehabilitation of buildings and other facilities are essential to prevent their deterioration, keep them safe and tidy, provide a pleasant and comfortable environment and uphold their value. In this context, a 'Maintenance

Guideline' is needed for effective and sustainable maintenance of school infrastructure and facilities. Following issues need to be incorporated and clarified in the guideline:

- i) The category of maintenance of NBI in the primary schools,
- ii) Nature of work in each category of maintenance,
- iii) Responsibility of carrying out maintenance and repair works,
- iv) Eligibility, identification and selection of schools for NBI maintenance,
- v) Justification of major repair works,
- vi) Maintenance plan,
- vii) Budget & fund allocation
- viii) Management and monitoring of maintenance works, and
- ix) Software for efficient management and monitoring of NBI maintenance.

8.9 Ensure Equitable Access and Safeguards

Access to quality education environment should be universal with a focus on the poorest and the disadvantaged. Much emphasis should be given on the selection of schools, planning and design of school infrastructure and facilities so that no social and regional disparity could happen in primary education irrespective of gender, ethnicity, disadvantaged groups, class, race and disability.

All NBI development in the primary schools should be gender sensitive to achieve gender equality. The Gender and IE Action Plan (GIEAP) should be integrated in the planning, design and implementation of school infrastructure to reduce inequalities between boys and girls and all other disadvantaged grouped children from PP to Grade-V. All school buildings and campuses shall be approachable by a public or private road or an approved means of access.

More than 25% of the primary schools (GPS, NNPS and RNGPS) are in the special zones like char, island, haor, hilly, coast, and Tribal areas etc. In general, the situations in these zones are difficult, with issues of access and disadvantage being prevalent. The population and needs of physical facilities of the schools in these areas are different, even much less than those of plain land areas. To ensure equitable development in primary education throughout the country, the schools in the special zones should be considered with priority.

Any development works may have some social and environmental consequences, but it should be complied with the agreed Environmental and Social Safeguard Framework (ESMF). All the safeguard issues need to be streamlined by incorporating the various safeguard requirements in the implementation process like Implementing Agencies (IAs) Construction Manual, Implementation Guideline, and the Particular Conditions of Contract (PCC) of the Bidding Documents for ensuring its smooth compliance. Moreover, to ease ensuring smooth compliance of safeguard issues, it should also be considered even at the very beginning of infrastructures planning. Every school that needs any infrastructure development should be preliminary screened with the Rapid Environmental Assessment Checklist and Involuntary Resettlement Impact Categorization Checklist (see **Annexure**).

8.10 Heritage Preservation

Heritage preservation is an essential part of any city that values itself. There are some ancient and historic buildings or properties in the primary schools which may have heritage value. A building may have little value as a property but have much heritage value because a momentous event transpired there. Heritage buildings/properties are cultural assets and have physical links to our past. Historically significant buildings contribute to our city's cultural and economic well-being. They fulfill important demands for cultural experiences and leisure and create benefits for tourism.

Heritage and sustainable development are intimately linked. The heritage school buildings must be retained, and any future development must be sensitive to the setting and cartilage of these buildings. The future development must acknowledge the setting and place of heritage buildings. The significant/large trees at the site also need to be sensitively designed into the future development. If any conflicts arise there between the heritage preservation and development, it should be assessed and managed to achieve an optimum balance.

9. Conclusion

Everybody likes to see his school as a dream school. These guidelines will help every school in uniform planning and development of infrastructure and facilities. The application of these guidelines will ensure all the primary schools to have a good learning environment for all the students (girls, boys and special children) irrespective of the resources available, its geographic locations or the type of community the school serves. All concerned with the NBI planning and development should be committed to follow these guidelines for appropriate and sustainable infrastructure development in the primary education sector. Good education infrastructure will help raise education standards throughout Bangladesh.

PART-B

GUIDELINES FOR INFRASTRUCTURE NEEDS ASSESSMENT AND SITE PLANNING

(School Buildings/Class Rooms and Toilets/WASH Blocks)

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1. Introduction

PEDP4 has the provision of providing infrastructure in the primary schools with a hope to improve the quality of education by reducing overcrowding and by creating good school environment. Infrastructure should not be randomly built rather based on actual requirement. This is a challenging task which requires a reliable and updated database supported by subsequent field verification. A set of need assessment criteria have been developed and agreed upon to accomplish the task. The net infrastructure needs assessment requires arithmetic summation of the future needs and existing usable infrastructure. The future needs of the infrastructure to be assessed based on approved standards & policies of NBI planning, and the usable infrastructure to be assessed further from the arithmetic summation of the total existing infrastructure and infrastructure with bad conditions.

However, during the need assessment, it is necessary to assess the structural condition of existing infrastructure to check their usability. Declaring an existing infrastructure unusable might change the result of the whole need assessment exercise. It is utmost important to have a common understanding on the criteria of assessing the physical condition of the existing infrastructure. There are standard procedures for assessing condition of infrastructure which often is a combination of visual inspection and test of materials. Considering the large number of infrastructures in PEDP4, test of materials in every case might not be a feasible choice except exceptional cases and the assessment should be mostly done based on visual inspection. This makes the exercise subjective in nature and creates opportunities for confusion. Even with the same degree of knowledge and experience, different people may assess differently due to the very subjective nature of the procedure. It is extremely important that people involved in the need assessment exercise follow a common guideline so that the assessments do not vary widely despite the subjectivity of the process. It is also very important that the need assessment exercise is integrated with the overall layout planning of various existing and planned infrastructure so that land, which is precious and scarce, can be optimally utilized keeping in mind the future demand and use.

The previously approved guideline “Guideline for Need Assessment and Planning of Infrastructure” mainly covered future infrastructure needs assessment in primary schools, condition assessment of existing school infrastructure, and infrastructure planning & preparation of site plan. Out of these, infrastructure needs assessment has been updated as per standards & policies of NBI planning of PEDP4 and some minor editing have been done in the condition assessment of existing infrastructure. Infrastructure planning and preparation of site plan mainly highlighted site planning which has also been updated. Consequently, the updated guideline has been renamed as “Guidelines for Infrastructure Needs Assessment and Site Planning”.

2. Purpose of this Guideline

This guideline has been prepared to facilitate structural assessment of various infrastructures such as class rooms, school buildings up to two story and water and sanitation facilities as a part of need assessment activities for additional infrastructure in a school.

This guideline would also help in preparing the site plan showing the entire infrastructure so that the use of land can be optimized, and cost of additional infrastructure can be reduced. It is to be noted that assessing structural condition usually requires high level of technical knowledge and experience which is often supported by various field and laboratory tests. Considering the practical constraints, this guideline has been prepared to assess condition of an infrastructure solely based on visual inspection. In case of any confusion about the condition of an infrastructure, the case should be referred to an Expert Team who should carry out a detail evaluation of the infrastructure along with relevant tests if necessary to find out the actual condition.

3. The Process Flow

The whole exercise of assessment of physical condition and need assessment is shown in Fig-1

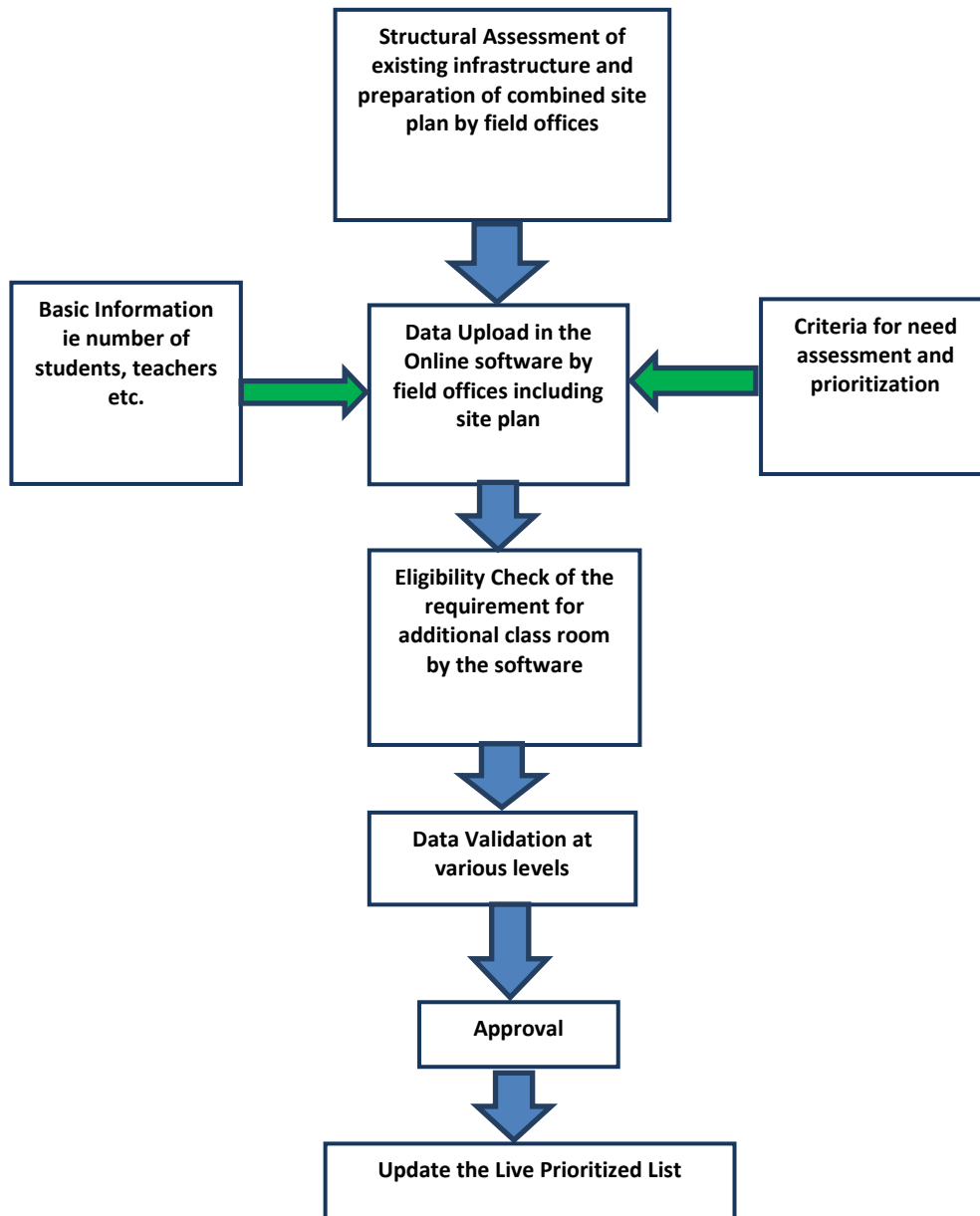


Fig- 1: Process flow of need assessment, layout planning and data upload

4. Types of Infrastructure Covered

School buildings and toilets across the country were constructed at various times in many ways and hence the type of structure varies depending on the location and age of construction. Structurally these can be broadly categorized as follows:

1. Brick masonry building with load bearing wall and RCC roof
2. RCC Frame structure with RCC slab, beam and column.
3. Semi Pucca building with tin shed roof
4. Toilets/WASH Blocks
5. Katcha schools where wall and roof are made of tin and the floor is made of either concrete or clay/mud.



Fig- 2 : Brick Masonry building



Fig- 3 : Semi Pucca building



Fig- 4 : RCC Frame Structure



Fig- 5 : Toilets

As the katcha schools would not be considered as usable, this guideline has been prepared to assess the condition of infrastructure of the first four categories and **building up to two storeys**.

5. Procedures to be Followed

Structural assessment is an examination of existing infrastructure to assess the extent of distress occurred due to various reasons to find out its structural stability. It also helps to prioritize the distressed elements according to seriousness for repairs and to select and plan the effective remedy.

A building/room consists of several various structural and non-structural components. Structural components include beams, columns, roof slab, load bearing wall, foundation etc. while nonstructural components include plaster, door, window, painting, railing, grill work, floor finishes etc. While toilets and WASH Blocks are structurally like school buildings, they have some additional features such as septic tank/leach pit, squatting pan etc.

Steps of Condition Assessment:

A set of activities are required to assess Structural condition of an infrastructure as shown in Fig- 6.

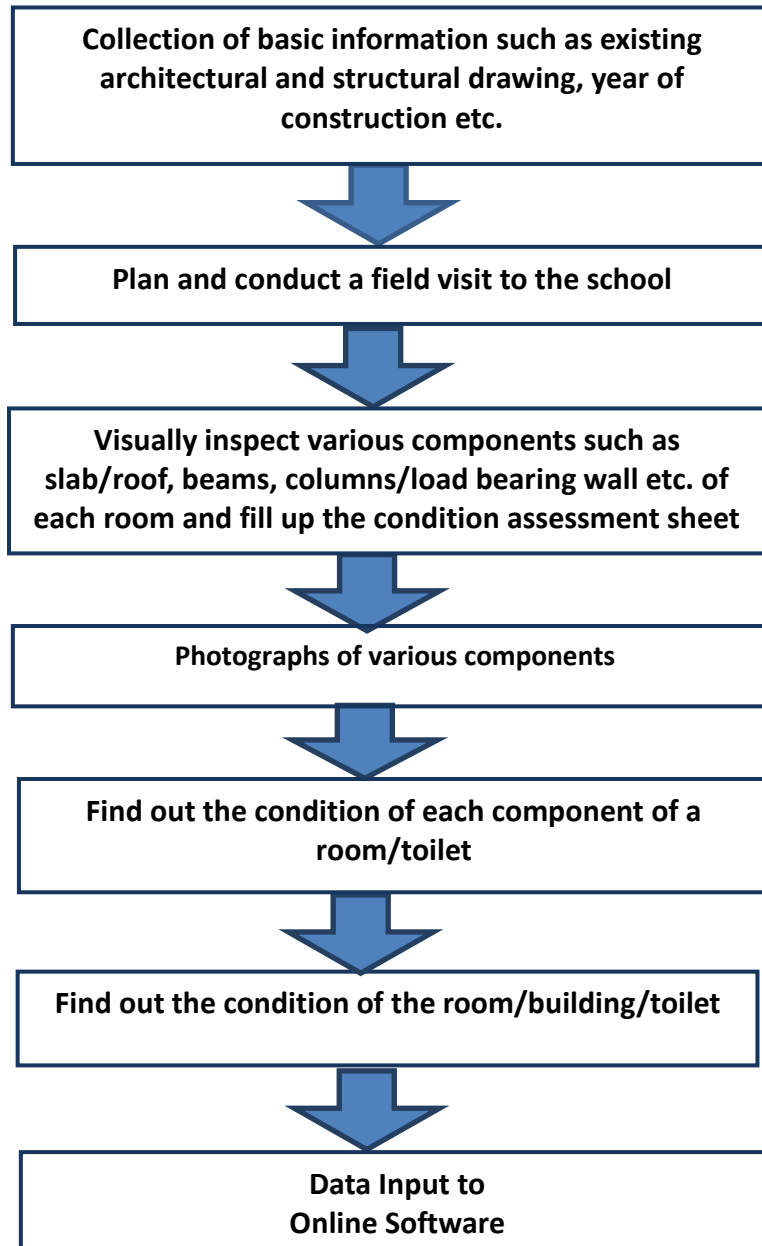


Fig-6: Steps of condition assessment

Basic Information Gathering:

Before undertaking a Condition Assessment of a building/structure, some essential information is required and be obtained from the clients/owners. Efforts should be made to obtain as much information as possible about the existing structure. Information required from the owner/client should be listed out even though many construction details and other related information may not be available with the owners/clients. One important piece of information is its date of construction. This is important for several reasons. Perhaps the most important reason is that the age of the building could indicate its form of construction and suggest material those were likely to have been used in its structure and fabric. In addition, defects are usually related to forms of construction commonly adopted at certain times. The agency which constructed the building might also be helpful during the assessment. A typical format for collection of this information is given in **Annex-A**.

Visual Inspection:

1. Visual examination of a structure is an effective qualitative method of evaluation of structural soundness and identifying the typical distress symptoms together with the associated problems.
2. This provides valuable information regarding its workmanship, structural serviceability and material deterioration mechanism.
3. It is meant to give a quick scan of the structure to assess its state of general health.
4. Simple tools and Instruments like camera, magnifying glass, binoculars, gauge for crack width measurement, chisel and hammer are usually needed. Occasionally, a light platform/scaffold tower can be used for access to advantage.
5. It is convenient to inspect the outside of a building first and then examine the inside. However, a preliminary walk round the building should be made first. This will give a general idea of the condition, age and layout of the building.
6. In general, visual inspection comprises of three stages: exterior overview, interior inspection and review of exterior and surrounding site. The external appraisal focuses on the main elements of the building and records any significant defects. Usually this is done using a top-down approach-inspecting the roof, then the walls of the upper floors down to the ground level. The internal inspection is done on room by room basis. It should record any defects in the slab, beams, columns or walls. Any problems relating to the use and condition of the building as well as to what extent any defects found externally are affecting it internally should be recorded. In the absence of the original drawings, a sketch of the building would be required.

Photographic Record:

It is always necessary to carry a camera during such inspection and take necessary photographs of the distressed structure and its members.

Fig- 7 shows the linkage of various activities to be performed which would ultimately help in preparing the prioritized live list of Needs Based Infrastructure.

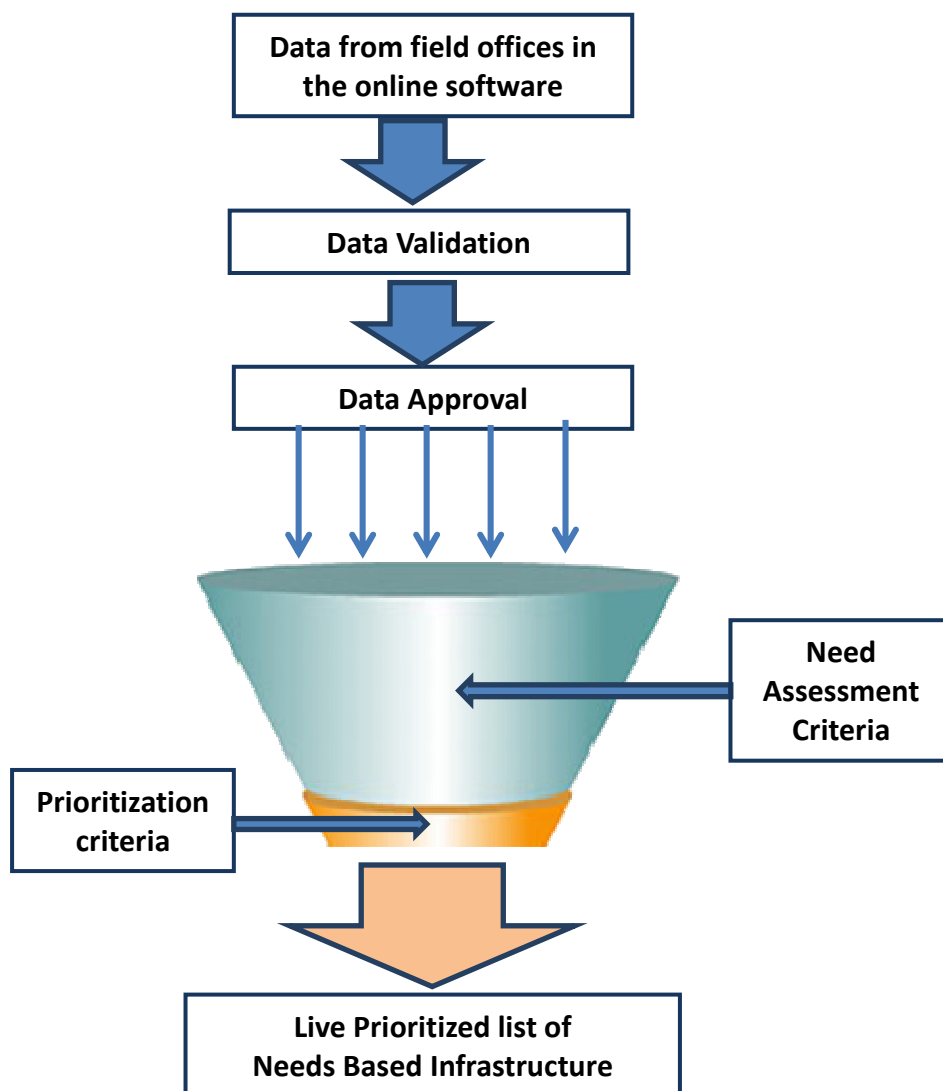


Fig-7: Process flow for preparation of the Live List of NBI

6. Classification of Condition

Various perspectives of damage and classification of infrastructure

Visible damage to infrastructure can be divided into three categories such as:

Architectural Damage: This type of damage affects the appearance of the infrastructure and is usually related to minor cracks in the walls, floors and finishes. Cracks in walls greater than 1mm (0.04 inch) wide are typical threshold values that would be noticed by the school authority/stakeholders.

Functional Damage (or Serviceability) Damage: This type of damage affects the use of the infrastructure. Examples include jammed doors and windows, extensively cracked and falling plaster, and the tilting of walls and floors. Ground movements may cause cracking that leads to premature deterioration of materials or leaking roofs and facades.

Structural Damage: This type of damage affects the stability of the buildings. Examples include cracking or distortions to support members such as beams, columns or load bearing walls. This category would also include complete collapse of the building.

As the structural safety is a major concern for a structure, the condition of these elements is important to decide on whether a structure is usable, or it should be replaced. Along with this, sometime the cost of the repair can also be important in taking decision. It might be the case that although the structural safety is not hampered, the cost of repair/rehabilitation is so high that a replacement might be more economic. An estimated cost up to 60% of the new construction might be feasible for repair and rehabilitation of existing building. It might be good to go for replacement beyond that. In deciding whether a retrofitting work would be undertaken would also depend on the availability of appropriate technical man power along with skilled labor to accomplish a work.

The following can be another perspective of the damage assessment and categorization of an infrastructure i.e., school building/class room or toilet. Such as:

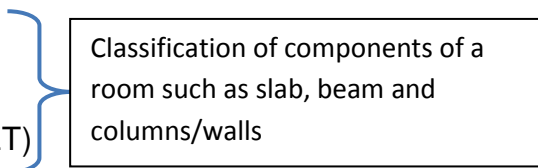
- A. The structure has not shown any signs of distress and it satisfies all the safety and serviceability requirements according to relevant Codes of practice, hence no action is needed towards retrofitting.
- B. The structure is seen to be deficient (or distressed) but it can be repaired and strengthened to satisfy the codal safety requirements or performance criteria set by the user.
- C. The structure is badly damaged, and a new infrastructure should be built.

Classification of infrastructure adopted in this guideline

Classification for RCC frame structure and brick masonry building

Classification of structural components of a Room

In line with the above, the following classification of the major structural components of a room such as slab, beams and columns/load bearing walls would be considered during assessment of class rooms/school building and toilets/WASH Blocks in PEDP-3. Such as:

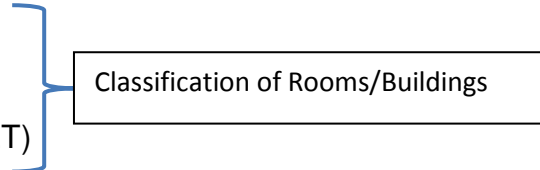
1. Good (G)
 2. Repairable (R)
 3. Un-Usable (UU)
 4. Referred to Expert Team (RET)
- 
- Classification of components of a room such as slab, beam and columns/walls

A **Good** condition means the component does not need any kind of repair except routine maintenance. A **Repairable** condition means that the component would require maintenance (minor or major) and can be used. An **Unusable** condition means that the component is not suitable for use and beyond the technical and/or economic feasibility of repair.

As the team is not conducting any kind of field or laboratory tests, in many cases, it might be difficult to take any decision without detail technical evaluation. In such cases, the team would refer the case to an **Expert Team (ET)**. Once such referral to Expert Team is made, the assessment result would be deferred unless opinion of the Expert Team is received. A detail description and characteristics of the above categories have been given in **Annex-G**.

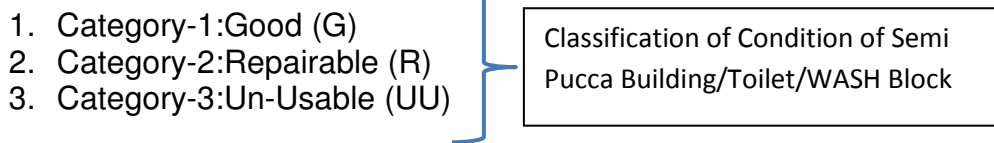
Classification of a Room/Building

Based on the condition of the selected components, in a similar manner, decision about condition of a room/ building would be determined as follows:

1. Category-1:Good (G)
 2. Category-2:Repairable (R)
 3. Category-3:Un-Usable (UU)
 4. Category-4: Referred to Expert Team (RET)
- 
- Classification of Rooms/Buildings

Classification for Semi Pucca Building/Toilet or WASH Blocks

Unlike RCC frame structure or brick masonry building, in case of condition assessment of Semi-Pucca Building or toilet/WASH Blocks, a component would be classified as either **Good, Repairable or Unusable** and no referral is deemed necessary to the Expert Team considering the simple structural design of these infrastructures. In such cases, cost of repair would play an important role in the decision making as described later in this document.



It is to be noted here that this guideline is not intended to prepare an estimate of maintenance work but to assess its condition to facilitate the infrastructural need assessment exercise only.

7. Assessment of Condition

The process of assessing the structural condition of an existing infrastructure includes assembling and systematically analyzing relevant information and data to determine the structural adequacy. This often calls for collection of design and drawing and other necessary pertinent information, visual inspection and necessary field and laboratory tests of various construction materials. While the diagnosis of damage or deterioration in some cases is reasonably straight forward, it may not be so in many cases. Particularly difficult are cases in which the cause and effect phenomenon cannot be readily explained or when prognosis in terms of long-term performance of restored structure is to be made. This will require thorough technical inspection and an understanding of the behavior of the structural components.

Due to potential cost of a comprehensive structural assessment of an existing infrastructure, especially when a large inventory is to be dealt, a multilevel approach is generally recommended. The basic process entails a preliminary assessment followed by a detailed assessment, if required. This approach has been followed in this guideline.

Assessment of RCC Frame Structure

In case of RCC frame structure, the condition of a room would be determined first based on the condition of three components such as Slab, Beams and Columns. The distress in an RCC building can be observed in the form of cracks, spalling and scaling of concrete. Cracking is the most common indication of distress in a concrete structure. It may affect appearance only or indicate significant structural distress or lack of durability. Cracks may represent the total extent of the damage, or they may point to problems of greater magnitude.

When dealing with cracks, it is often necessary to enlarge the crack to gain access to the steelwork before a correct diagnosis can be obtained.

During the need assessment process, the team would assess condition of each room by examining the condition of each component as mentioned in the format shown in **Annex-C**. After assessment of condition of individual component of a room, the overall condition of the room would be determined as per the following guideline.

Room Condition Type	Slab	Beam	Column
Cat-1: Good	Good	All the beams are in good condition	All the columns are in good condition
Cat-2: Repairable	Good/ Repairable	Most of the beams are good except a few (up to 25%) which need repair	Most of the columns are good except a few (up to 25%) which need repair
Cat-3: Unusable*	Repairable	Most of the beams are found unusable	Any of the columns is found unusable(it does not include verandah Column. If a verandah column is found unusable as per the criteria described in Annex-G, opinion of the Expert Team should be taken before final decision.)
Cat-4 Referred to Expert Team	Good/ Repairable	Most of the beams need repair	Most of the columns need repair
	Unusable	Most of the beams are good	Most of the columns are good

* In case of declaring an infrastructure “Unusable”, the assessment team would take an opinion of the Expert Team before final decision.

In addition to the above, if long and large cracks are found on any of the walls, the case should be referred to the Expert Team as this might be an indication of settlement of foundation or any other movement of the structural component of the building which demand more detail investigation.

If assessment of any component of a room is referred to Expert Team, condition of the room and the building would be considered out of the scope of the team and decision of the Expert Team in such cases would be conclusive. Once such referral is made, an Expert Team headed by the Executive Engineer, LGED would conduct a detail evaluation of the building to assess its condition. During such assessment, the Expert Team would also estimate the cost of repair or rehabilitation. Such an estimate can form the basis for an initial decision regarding the economic feasibility of the rehabilitation work. If result of such initial evaluation indicates that structural strengthening is economically feasible, a more detailed analysis may be required. If the cost of

rehabilitation is determined to be prohibitive, alternate uses of the building may be established or a plan made for phasing out of its use.

The following summarizes the responsibility of the Expert Team:

- i. Inspect the infrastructure as soon as possible
- ii. Perform detail evaluation of the condition of the infrastructure
- iii. Conduct any test necessary to complete the assessment
- iv. Look into the economic and technical feasibility of the repair/refurbishment work.
- v. Send their recommendations to the assessment team within 2-3 weeks of the referral.

It is to be noted here that if any building is found to be declared unusable, an approval for such condemnation from the respective Committee formed by MoPME for condemnation of Building would be required.

Assessment of Brick Masonry Building

Similar approach like RCC structure would be followed in case of Brick Masonry Building with load bearing walls as shown in **Annex-D**. In this case, the columns would be replaced by load bearing walls. However, a wall would be identified either as Good or Repairable or Referred to Expert Team but not as Unusable by the assessment team as shown in Annex-D and described in Annex-H.

Assessment of Semi Pucca Building

In case of semi pucca building, the condition of wall of each room and condition of Truss and Roof Sheet of the whole building would be assessed as shown in **Annex-E**. The components would be assessed as **Good, Repairable or Unusable**. Once the format is filled up by the team and if it is found that most of the components are in good condition, the building would be considered as **Good** for the purpose the need assessment exercise. However, if it is found that substantial repair of various components would be required, then a tentative estimate of the repair cost considering all the components of the building of each room would be calculated. If it is found that the cost of repair is less than 60% of demolition and reconstruction of the same semi pucca building, the building would be considered as **Repairable** and if the cost exceeds 60%, it would be termed as **Unusable**. In such case, a similar semi-pucca building would be constructed in the school.

Assessment of Toilets/WASH Blocks

Similar approach like Semi Pucca buildings would be followed in case of assessing the condition of toilets and WASH Blocks. The team would assess the condition of the

toilets as mentioned in the format shown in Annex-F. Once the format is filled up by the team and if it is found that most of the components are in Good condition, it would be counted as **Usable**. However, if it is found that substantial repair of various elements would be required, then a tentative estimate of the repair cost would be prepared. If it is found that the cost of repair is less than 60% of demolition and reconstruction of the toilet, it would be considered as **Repairable**. If the cost exceeds 60%, it would be termed as **Unusable**.

Additional Points in Assessment of Condition of a Building

In addition to structural assessment, occupational considerations, environmental considerations and legal issues should also be taken into consideration in determining the condition of a school building. Such as:

1. If the plinth level of an existing RCC frame structure or load bearing brick masonry building is below the highest flood level or if the plinth level of the building goes under water during rainy season for adjacent land condition which cannot be solved/managed, then the building would be declared unusable.
2. Any room/building declared unusable by any technical committee formed by the government would also be considered un-usable.
3. The verandah and the staircase would be assessed using the relevant formats to find out the condition and to determine the usability. However, the condition of these components would not be the cause of declaring a building unusable by the committee. In case of any confusion or if the condition appears to be very poor, the case should be referred to the Expert Team for assessing the overall condition of the building.
4. In disaster prone area like hill, coast or flood prone area and area under Seismic Zone-III as per Bangladesh National Building Code (BNBC), some environmental factors like high salinity, earthquake or landslide etc. could be considered in the assessment and the conditions of the components need to be observed more cautiously/stringently.
5. If a school building is found susceptible/vulnerable to river erosion soon, it should be relocated irrespective of its structural condition.

8. Guidelines for Infrastructure and Site Planning

Planning for new infrastructure in a school as well as how to place various infrastructure to optimally utilize the available land maintaining good school environment is very important. The first step of such planning is to determine the need of new infrastructure considering the number of students in each class room as shown in Annex-H.

To accomplish this task, some basic information such as student and teachers' number would be required along with the condition of existing infrastructure. The guidelines for assessing condition of existing infrastructure have already been explained in the previous sections. Once the need of additional room and or WASH Block is determined, several questions would come up such as whether a vertical or horizontal extension would be considered. In case of horizontal expansion, many other relevant issues such as orientation of the building, foundation design etc. need to be addressed. As more than one agency are involved in the construction, for a better co-ordination and for ensuring good school environment, a combined site plan also needs to be prepared. The following guidelines would be helpful to carry out the task properly.

Planning of Infrastructure

For effective use of existing land and infrastructure and to maintain a good school environment and to harmonize the construction work of various agencies working in the same school campus, the following guidelines should be followed while proposing new infrastructure in a school.

1. Each school should have at least 3 classrooms for Grade I to V in double shift and one class room would be considered for 56 students.
2. Each school must have a designated PP classroom considering specific sitting arrangements' and it would be considered for 30 students.
3. At least one teachers' room should be considered for a school. The teachers' room should be of same size as the class room which will be used by 12 teachers. For more than 17 teachers' in a school, one additional room or a new teachers' room bigger than normal could be provided. For more than 600 students in a school, one separate HT room should be considered.
4. The need for additional room in the school would be calculated by summing up the requirement for class rooms and teacher's room considering double shift.
5. The need for additional room would be determined using the need assessment criteria as shown in **Annex-H**. Please note that the need assessment would be done considering two shifts for the school even if the school is approved and being operated as single shift.

6. In case of construction of additional room, the possibility of vertical extension of existing building should be given preference. In such cases, the capacity of existing foundation must be carefully assessed for such extension.
7. If vertical extension is not possible, only then horizontal extension would be considered. Every possible effort should be made to effectively plan and utilize the available space for such horizontal expansion keeping in mind the future extension possibilities. For example, if a single room is to construct at present, a plan should be made considering the total available area and future possibility of extension (i.e., three or four rooms) so that even a single room would be constructed now, the school would have the flexibility to construct more class rooms as an extension of this single room.
8. In case of horizontal extension, usually a two storied foundation would be considered unless a higher foundation is justified considering high number of students and scarcity of land. South facing is preferable and cross ventilation needs to be ensured.
9. More than 50% of the school area should be kept as open space for playground, playing items, walkway, temporary shed, gardening and tree plantations etc.
10. In case of land scarcity specially in the urban areas, the ground floor should be kept open which would be used by the students as playground.
11. When only one story of a multistory building would be constructed, the roof of the building can be made of high-quality tin and truss made of MS angle although the design of the foundation would consider RCC Slab. While a vertical extension would be necessary, the tin roof would be dismantled and shifted to the top story and an RCC slab would be constructed in that place. This can be piloted in the saline prone areas to see the effectiveness.
12. Instead of fixed partition wall, such wall of a couple of adjacent rooms (2 or 3) can be made foldable with appropriate materials so that if necessary, the partition can be folded to make a larger space (i.e., space of twice or thrice the size of a single room) which can be used for various purposes such as guardian's meeting, cultural program etc.). Such initiative can be piloted first in selected schools to see the effectiveness.
13. WASH Block/Toilets should be located as close as possible to the main school building so that they can be accessed during rain. If necessary, shaded gangway can be constructed to help the children and teachers use the toilet during rainy season.
14. The male and female WASH Block should be in separate place. If not possible, they should have entry in opposite face of the WASH Blocks.
15. For schools in urban areas/City Corporation areas or having three or more storied foundation, priority should be given for built-in/attached sanitation facilities in each floor of the school (multi-storied WASH Blocks).
16. In case of flood prone areas where the ground floor is kept open, attached toilets instead/in addition to separate WASH Block outside the school building should be considered so that those can be accessible during flood time.
17. There must be provision for adequate space for Septic Tank/Leach pit, Master pit and Soak well adjacent to the Toilets/Wash Blocks but with a safe distance (10m) from drinking Water Sources.
18. The septic tank and soak well/leach pit top should be above the highest flood level.
19. Waste water from the septic tank should be properly drained out.

20. Sewerage and waste water line should be connected to the Public Sewerage System (if available). There should be a provision for surface drain for draining out surface runoff to the roadside drain or nearby pond/reservoir.
21. Rainwater harvesting, Pond Sand Filter (PSF) and connection to WASA/Pourashava water supply system etc. may be considered as alternate water supply options if necessary.
22. If space is available, a separate play zone to install the playing accessories should be ear marked.
23. Inter connectivity among different school buildings and among the WASH Blocks should be considered to smoothen the operation of the school, to maintain good school environment and to maximize the use and effectiveness of various components of the school. Such connectivity can be made by tin shed walkway or by any other means.
24. If a semi pucca school building can be repaired or refurbished, such activity should be undertaken on priority basis.
25. In case of erosion prone area, no permanent structure should be built and shift-able semi pucca or katcha structure (makeshift school) should be constructed.
26. If the school is located close to national or regional high way or close to any other busy road having high volume of motorized traffic, railway line or junction, large water body or having proximity of land dispute or land encroachment etc., boundary wall should be considered on priority basis in such school to ensure safety of the children.

Preparation of Site Plan

After determining the need of additional infrastructure in the school, a site plan of the school needs to be prepared jointly by local officers of the LGED and DPHE, and the School authority (UEO/AUEO, SMC) where the existing buildings and proposed additional rooms/buildings/WASH Block(s)/ Water Source etc. to be shown. This preliminary site plan would be necessary for identifying the schools (through livelist software) which required different NBI development. However, the following guidelines should be followed in preparing such joint site plan.

- i) The plan should be prepared in scale on A4 or Legal-size paper so that it can be scanned easily.
- ii) Each side of the site/school area with measurement and North-South direction should be shown
- iii) Existing infrastructure and facilities should be drawn in firm line with brief name, type of structure, outside measurements and number of storey etc.
- iv) Proposed infrastructure and facilities should be drawn in dotted line
- v) Distance from the adjacent main road or access road, river/canal/water reservoir if available should be mentioned.
- vi) Location of adjacent Public sewerage/drainage system if available should be shown
- vii) Level of the land w.r.to adjacent road top should be shown
- viii) Flood level for flood prone area should be mentioned.

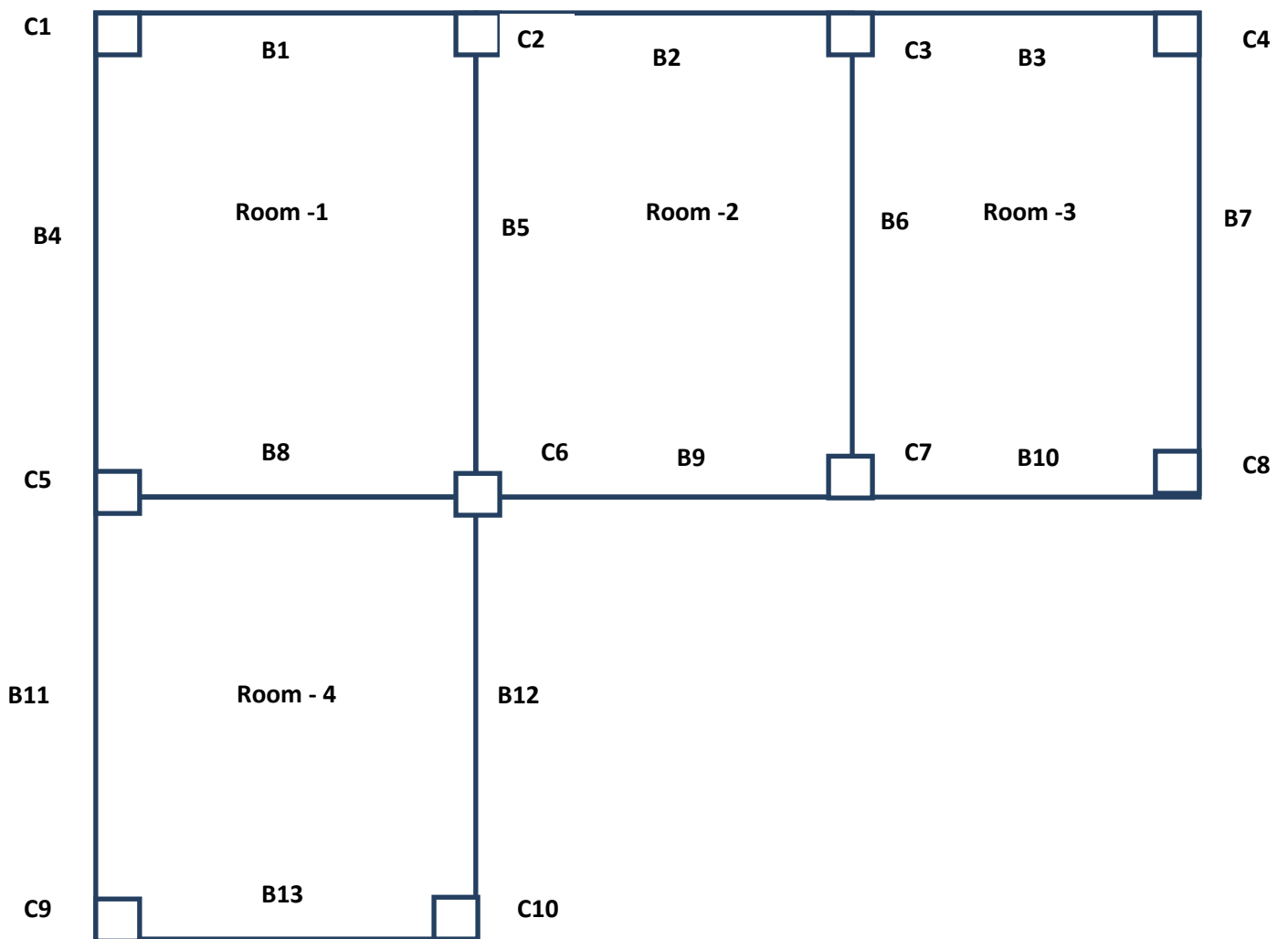
A sample lay out plan is shown in **Annex-I**.

ANNEXES

Annex-A: Information about the Infrastructure

- a) Type of the Infrastructure:
- b) Location:
 - i. Name of the District:
 - ii. Name of the Upazila:
 - iii. Name of the School:
 - iv. EMIS Code of the School:
- c) Year of construction:
- d) Name of the agency which constructed the school/Toilet/WASH Block:
- e) Is the location of the school being susceptible to cyclone and tidal surges?
- f) Is there any history of earthquake/landslide in the area?
- g) When the last earthquake took place and how was the severity as per the perception of the local people:
- h) Whether salinity and corrosion are a common problem of the area:
- i) Does the location is prone to river erosion:
- j) Does the school have architectural and structural design of the infrastructure?
- k) Is there any record of major repair of the infrastructure? If yes, the year and type of last major repair:
- l) Does the school have public heritage/historic building?

Annex B: Schematic Diagram of the School Building with Location and Numbering of various Components



Ground Floor Plan

Annex C: Format for Condition Assessment for RCC Frame Structure (Contd..)

Notes:

L: Length

W: Width

D: Depth

G: Good

R: Repairable

RET: Referred to Expert Team

Additional Points to be noted:

Recommendations of the Evaluation Team:

Annex D: Format for Condition Assessment for Brick Masonry Building (Contd...)

Room No: 2

Location of Room: GF/1st Floor

BEAMS	L (ft)	W (inch)	D (inch)	Condition of the component				WALLS	H (ft)	Thickn ess (inch)	Condition of the component			SLAB	Size			Condition of the component			
				G	R	UU	RET				G	R	RET		L (ft)	W (ft)	D (inch)	G	R	UU	RET
B1								W1													
B2								W2													
B3								W3													
B4								W4													
B5																					
B6																					
B7																					
B8																					

Room No: 3

Location of Room: GF/1st Floor

BEAMS	L (ft)	W (inch)	D (inch)	Condition of the component				WALLS	H (ft)	Thickn ess (inch)	Condition of the component			SLAB	Size			Condition of the component			
				G	R	UU	RET				G	R	RET		L (ft)	W (ft)	D (inch)	G	R	UU	RET
B1								W1													
B2								W2													
B3								W3													
B4								W4													
B5																					
B6																					
B7																					
B8																					

Annex D: Format for Condition Assessment for Brick Masonry Building (Contd...)

Room No: 4

Location of Room: GF/1st Floor

BEAMS	L (ft)	W (inch)	D (inch)	Condition of the component				WALLS	H (ft)	Thickn ess (inch)	Condition of the component			SLAB	Size			Condition of the component			
				G	R	UU	RET				G	R	RET		L (ft)	W (ft)	D (inch)	G	R	UU	RET
B1								W1													
B2								W2													
B3								W3													
B4								W4													
B5																					
B6																					
B7																					
B8																					

Verandah

Location: GF/1st Floor

BEAMS	L (ft)	W (inch)	D (inch)	Condition of the component				COLUMNS	H (ft)	Size (inch)	Condition of the component				SLAB	Size			Condition of the component			
				G	R	UU	RET				G	R	UU	RET		L (ft)	W (ft)	D (inch)	G	R	UU	RET
B1								C1														
B2								C2														
B3								C3														
B4								C4														
B5								C5														
B6								C6														
								C7														
								C8														

Annex D: Format for Condition Assessment for Brick Masonry Building (Contd...)

Notes:

L: Length

W: Width

D: Depth

G: Good

R: Repairable

RET: Referred to Expert Team

Additional Points to be noted:

Recommendations of the Evaluation Team:

Annex E: Format for Condition Assessment for Semi Pucca Building

Semi Pucca Building No:
Year of Construction of the Building:

Format for Walls

WALLS	Room-1		Room-2		Room-3		Room-4		Remarks
	Condition of the component		Condition of the component		Condition of the component		Condition of the component		
	G	R	G	R	G	R	G	R	
W1									
W2									
W3									
W4									

Format for Roof Sheet

Type of the component	Type of material	Condition of the component		Approximate percentage of damaged sheet	Description of damage
		G	R		
Roof Sheet					

Annex E: Format for Condition Assessment for Semi Pucca Building (Contd..)

Format for Roof Truss

Type of the component	Type of material	Condition of the component		Total number Truss	Total Number of damaged Truss
		Good	Repairable		
Roof Truss					

Additional Points to be noted:

Recommendations of the Evaluation Team:

Annex F: Format for Condition Assessment for Toilets/WASH Blocks

Name of District:
 Upazila:
 Name of the school:
 School Type:
 School Code:

Condition Assessment of Superstructure:

Identification	Length (ft)	Width (ft)	Height (ft)	Type of Roof	Condition		Description of damage
					Good	Repairable	
Toilet-1/WASH Block-1							
Toilet-2/WASH Block-2							
Toilet-3/WASH Block-3							

Condition Assessment of Waste Disposal System:

Type of the component	Length (ft)	Width/Dia (ft)	Approximate Height (ft)	Condition		Remarks
				Good	Repairable	
Septic Tank/Leach Pit						
Pit/Soak Well						

Annex F: Format for Condition Assessment for Toilets/WASH Blocks (Contd..)

Overall condition of the Toilet/WASH Blocks:

Toilet/WASH Block-1: Usable/Repairable/Unusable

Toilet/WASH Block-2: Usable/Repairable/Unusable

Recommendations of the Evaluation Team:

Annex-G: Guidelines for Condition Assessment

Columns

Columns are one of the most important load bearing structural members of a building which transfers load from beams to ground through foundation. RCC columns receive load from beam and transfer it to foundation. Columns are designed to carry axial load and bending moments. Reinforcement bars increase the load carrying capacity of column as well as take tension if there is excessive bending moment. Stirrups keep entire core concrete intact and increase shear strength of column. It is important to have enough cover concrete to avoid decay of reinforcement. One of the distresses in RCC column is spalling of outer layer of concrete and exposed reinforcement. Exposed reinforcement is affected by atmosphere at a faster rate. Reinforcement is also affected by atmosphere if there is vertical or cross crack in column. These kinds of cracks are induced because of excessive load on the column. Column buckling is another type of distress, which shows excessive load on column. Beam-column junction is a crucial part for observation. Soundness of this portion indicates good load transfer mechanism of frame structure.

RCC column supports a large area and hence is of primary importance. Any damage or collapse of column may trigger the collapse of entire building, depending upon its location and condition of adjacent columns. In a frame structure, virtually entire structure acts as a single unit. During the design phase, care is taken to provide adequate redundancy in the structure. So, the load is already distributed to other columns when a column is weak as compared to others. But in an old and dilapidated structure, all the columns have same age and almost equally weak or strong. So, collapse of any one column may trigger progressive collapse of the building. For this reason, it is very important to check all columns carefully. It is to be noted here that if any column is repaired, record of such repair should properly be maintained, and these should be carefully studied if any decision for vertical extension of such building is considered.

Assessment of Condition of Columns:

Category of the condition	Characteristics	Remarks
Good	<ul style="list-style-type: none"> • No visible crack or spalling of concrete. • No history of major crack repair • Only final finishes disfigured. 	
Repairable	<ul style="list-style-type: none"> • Minor cracks and/or spalling of concrete limited to a short length i.e., 25% of the clear length of the column with or without rebar exposed. • The clear cover of the concrete is scaled off at various places with little exposure of rebar. • Minor corrosion of rebar • No buckling of columns or reinforcing bar. 	Extent of any of the characteristics or in combination could be up to 25% of the clear length.
Un-Usable	<ul style="list-style-type: none"> • Major crack and/or severe spalling of concrete along a significant length of the column and severe corrosion of reinforcing bar with significant reduction of cross-sectional area (more than 15% of the original cross-sectional area) and/or buckling of reinforcement bar. 	
Referred to Expert Team (RET)	<ul style="list-style-type: none"> • Minor/Major crack or spalling of concrete along a significant length (more than 25% of the clear length) of the column. • Reinforcing bar fully or partly exposed with sign of moderate corrosion • Loss of concrete temperment/strength. 	Extent of any of the characteristics or in combination could be more than 25% area

Example of Condition of Columns

1. Example of Repairable Columns



2. Example of Un-Usable Columns



3. Example of Columns to be referred to Expert Team



Beams

Beam carries load from slab and transfer it to vertical load carrying member, wall or column. Beams are designed for transferring shear and bending moment. RCC beams show distress because of various reasons. Poor concrete quality is one of the primary reasons of failure/dilapidation of such beams. Reinforcement bars deteriorate at a faster rate if adequate thickness of cover concrete is not available for protection. Bottom portion of beam at midspan is in tension and hence vertical tension cracks are common there, rising from bottom to top. On the other hand, ends of beam have tension at top and vertical cracks originate at top and progress to bottom. Shear cracks are generated because of heavy load on floors. These cracks are generally found near support and inclined at approximately 45 degrees. It is to be noted here that if any beam is repaired, record of such repair should properly be maintained, and these should be carefully studied if any decision for vertical extension of such building is considered.

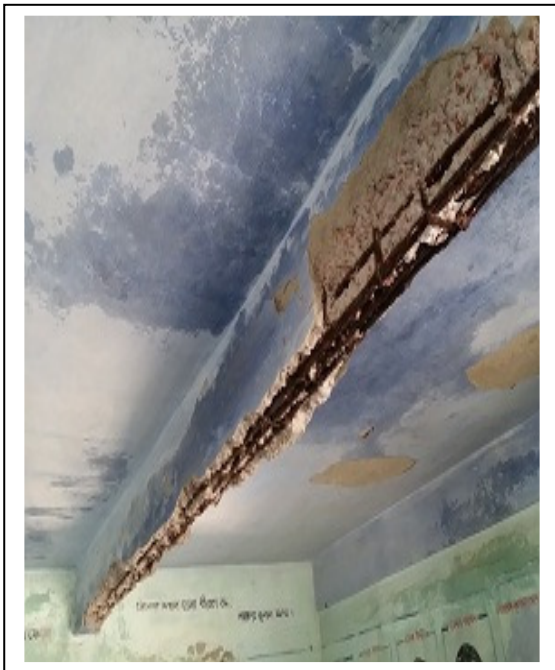
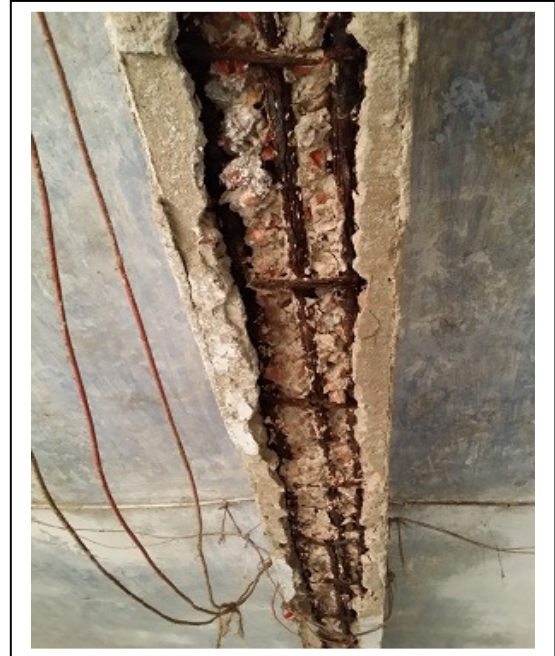
Category of the condition	Characteristics	Remarks
Good	<ul style="list-style-type: none"> • No visible crack except hairline or shrinkage cracks. • No spalling of concrete. • No previous history of repair • Only final finishes disfigured. • No deflection observed. 	
Repairable	<ul style="list-style-type: none"> • Small cracks and/or spalling of concrete along a short span of length (limited to 25% of clear span) of the beam with or without exposure of rebar. • Minor corrosion of reinforcing bars. • Slight deflection or sagging of beam (<1inch) 	Extent of any of the characteristics or in combination could be up to 25% of the clear span
Un-Usable	<ul style="list-style-type: none"> • Large cracks and/or spalling of concrete along a significant length of the beam with or without exposure of rebar • Severe corrosion of reinforcing bar. • Large deflection or sagging of beam. • Loss of concrete temperament/strength • Large cracks perpendicular to main reinforcement near mid span. • Large diagonal cracks near the support or mid span 	
Referred to Expert Team	<ul style="list-style-type: none"> • Large cracks and/or spalling of concrete along a significant length of the beam with or without exposure of rebar • Moderate corrosion of reinforcing bar. • Moderate deflection or sagging of beam (>1 inch). • Loss of concrete temperament/strength • Small to moderate cracks perpendicular to main reinforcement near mid span or small to moderate diagonal crack near support or near mid span. 	

Example of Condition of Beam

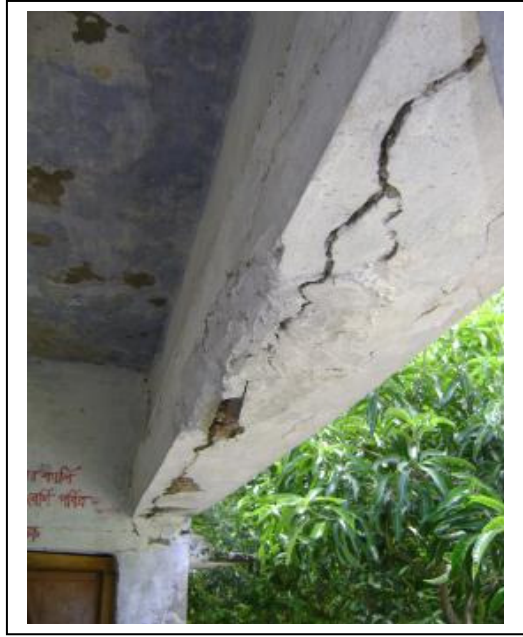
1. Example of Repairable Beams



2. Example of Un-Usable Beams



3. Example of Beams to be referred to Expert Team



RCC Slab

RCC slabs are designed to carry certain amount of shear and moment load. Bottom reinforcement is designed to carry tension. Enough thickness of cover concrete is required to avoid rusting of reinforcement.

Cracks in the slab might be an indication of excessive amount of load on the floor or corrosion of the reinforcing bars. Sloping of floor indicates unequal settlement of supporting walls or columns, deterioration of supporting beam or disintegration of joists at ends. Distress in the slab can be noted by observing tilted or cracked floor tiles, visible sagging of supporting joists etc. Exposed reinforcement is a common observation in deteriorated concrete slab, which indicates water seepage in slab and reduced capacity of slab. In RCC slab, reinforcement may be exposed because of falling of concrete cover at lower face of the slab.

Distressed floors are a point of concern for the safety of the occupant. Falling pieces from slabs, sudden failure of supporting joists, etc., pose danger of injury or death for occupants. Failure of entire slab panel may trigger progressive collapse if the slabs at lower floors are also deteriorated.

Category of the condition	Characteristics	Remarks
Good	<ul style="list-style-type: none">• No/minor visible crack• No spalling of concrete.• No sign of water soaking• No record of water seepage• No previous history of repair• Only final finishes disfigured.• No deflection or sagging of the slab.	
Repairable	<ul style="list-style-type: none">• Small cracks and/or spalling of plaster and/or clear cover of concrete in small area (up to 25% of the slab area) with or without exposure of reinforcing bar and cross-sectional area is not reduced significantly (reduction is not more than 15% of the original area).• History of small repair in the past Slight deflection or sagging of the slab	
Un-Usable	<ul style="list-style-type: none">• Spalling of plaster and/or clear cover of concrete covering a large area (more than 60% of	

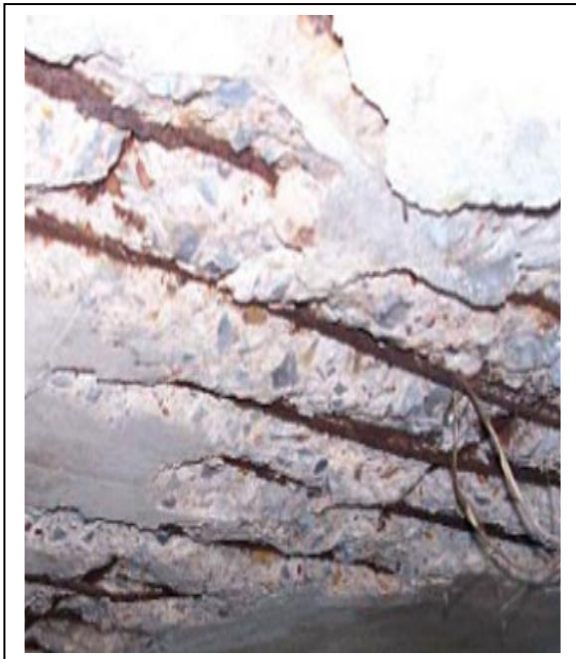
Category of the condition	Characteristics	Remarks
	<p>the slab area) with exposure of reinforcing bar and cross-sectional area of bars is reduced significantly (reduction is more than 15% of the original area).</p>	
<p>Referred to Expert Team</p>	<ul style="list-style-type: none"> • Large cracks and/or spalling of plaster and/or clear cover of concrete covering a moderate area (up to 40% of the slab area) with or without exposure of reinforcing bar and cross-sectional area is reduced/not reduced significantly (reduction is not more than 15% of the original area). • History of small repair in the past • Abnormal vibration of slab while walking on it. • Significant deflection or sagging of the slab 	

Example of Condition of Slab

1. Example of Repairable Slabs



2. Example of Un-Usable Slabs



3. Example of Slabs to be referred to Expert Team



Load Bearing Wall

Load bearing walls are main component of Brick Masonry building. Walls carry the entire load from beam/joists and transfer it to foundation. Walls are designed to carry vertical load. Walls can be made of brick. Strength of wall depends on strength of brick as well as binding mortar. Distressing or collapse of a wall panel may cause collapse of entire building. Severely distressed wall cannot retain slab weight effectively and hence poses the danger of slab collapse. If a wall is in very dilapidated condition, its load is transferred to adjacent walls, which may cause their early decay.

Walls are damaged because of various reasons. Differential settlement at foundation level is one cause of damage of wall. Wall cracks are of two types: vertical and cross or diagonal. Vertical cracks are caused by differential settlement, excessive vertical load or movement of perpendicular walls in different direction. Diagonal or cross cracks develop due to lateral forces such as earthquake loads. Other kind of wall damage includes bulging of wall, tilting of wall and wall settlement. Wall bulging is the phenomenon where wall thickness increases at certain locations due to high loading. Material of wall starts losing bond and being pushed in outward direction due to load. Tilting of wall is the result of lateral force or tilting of foundation itself. Foundation settlement causes unequal settlement of building, which causes tilting of beam, joists and eventually of slab and wall.

Category of the condition	Characteristics	Remarks
Good	<ul style="list-style-type: none"> • No visible crack except hair line cracks/shrinkage cracks. • No settlement of the wall • No sign of dampness and water soaking • No sign of efflorescence • No sign of bulging or tilting • No previous history of crack repair 	
Repairable	<ul style="list-style-type: none"> • Small to medium cracks(diagonal, vertical, horizontal or step type crack). • Plaster of the wall partly/fully damaged. • Dampness of the wall or sign of water soaking. • Sing of efflorescence 	
Referred to Expert Team	<ul style="list-style-type: none"> • Large cracks(diagonal, vertical, horizontal or step type crack). • Significant tilting of wall (>4 inches) • Bulging of wall in wide area • Large settlement of the wall. 	

Example of Condition of Load Bearing Wall

1. Example of repairable Load Bearing Wall



2. Example of Load Bearing Wall to be referred to Expert Team



Roof Truss

Category of the condition	Characteristics	Remarks
Good	<ul style="list-style-type: none">No/ Minor damage to steel/wood of the truss	
Repairable	<ul style="list-style-type: none">Substantial damage to steel/wood of roof truss.	

Roof Sheet

Category of the condition	Characteristics	Remarks
Good	<ul style="list-style-type: none">No/Minor damage to roof sheet	
Repairable	<ul style="list-style-type: none">Substantial damage to roof sheet	

Wall of Semi Pucca building

Category of the condition	Characteristics	Remarks
Good	<ul style="list-style-type: none">No/Minor cracks (static/live), no visual settlement, no major damage to plaster.	
Repairable	<ul style="list-style-type: none">Large cracks (static/live), deep settlement, substantial damage to plaster	

Toilet Superstructure

Category of the condition	Characteristics	Remarks
Good	<ul style="list-style-type: none"> • No/minor damage of plaster • No visual crack • No settlement of floor/wall • No/minor damage to door/window 	
Repairable	<ul style="list-style-type: none"> • Substantial damage to plaster • Large cracks • Settlement of wall/floor • Substantial damage to window/door 	

Waste Disposal System

Category of the condition	Characteristics	Remarks
Good	<ul style="list-style-type: none"> • No damage to squatting pan/commode and water seal • No damage to connecting pipes • The septic and soak well/leach pit are functional and require no/minor repair or rehabilitation. 	
Repairable	<ul style="list-style-type: none"> • Substantial damage to squatting pan/commode and water seal • Substantial damage to connecting pipes • The septic tank and soak well/leach pit require major repair or rehabilitation to make it functional. 	

Annex- H: Need Assessment Criteria

NEED ASSESSMENT CRITERIA

Need for Additional Rooms (Classrooms, Teachers' room and HT room):

The following criteria should be followed in determining the need of additional room in a school:

1. One school for habitations having catchments of 2,000 and no school within 2 sq. km.
2. Classroom/student ratio 1:40 for Grade I-V and 1:30 for PP. With flexibility of overcrowding up to 40% i.e., maximum 56 students would be accommodated in a class room for primary grade.
3. Minimum 4 classrooms and one teachers' room in a school.
4. The teachers' room will be same size as the classroom and will be used by 12 teachers. For determining the number of teachers' room required in a school, it will be assumed that the teachers' room may accommodate up to 40% more teachers, or 17 teachers maximum. In the event of more than 17 teachers, the teachers' room size will be bigger than normal or one additional room could be provided.
5. One separate HT room for the schools having more than 600 students.
6. Need would be calculated considering double shift even if the school is approved and running as single shift. This would be solely for need assessment in PEDP 4.
7. The following shift configuration would be considered.
 - a. Shift-1: Pre-primary + Class-I + Class-II + Class-V
 - b. Shift-2: Pre-primary (as per school/community decision) + Class-III + Class-IV + Class-V (contd.)

Steps to find out the need for additional rooms can be summarized as follows:

1. Determine the total class room required for Shift-1 and Shift-2 considering 56 students in each classroom for Grade I-V and 30 students in PP.
2. Then the larger of the requirement of shift-1 and shift-2 would be considered as the class room requirement for the school.
3. Calculate the number of teacher's room required for the school considering one room for 12 teachers in a school and other criterion (if necessary).
4. Consider one separate HT room for more than 600 students in a school.
5. Calculate the total room requirement of the school by summing the requirement for class room and teacher's/HT room and by comparing the requirement of minimum class rooms.
6. Find out the number of Good/Usable rooms available in the school.
7. Compare the requirement with available room and find out the additional room required for the school.
8. However, if it is found that total number of students in any school is abnormally small with a similar trend in the last few years, number/size of room can be

determined smaller than that is required as per above criteria which would seem rational by the authority.

The following is an example of need assessment as mentioned above:

Let us assume that the following are class wise student number of a school.

Student Number						
PP	Class I	Class II	Class III	Class IV	Class V	Total
55	70	80	55	50	45	355

Following is the result of the condition survey of existing class rooms:

Number and condition of existing rooms			
Total	Good	Repairable	Unusable
9	3	2	4

Following Table shows the need assessment calculations:

	Number of Student/Teacher	Number of rooms required	Total Room required	Total Room required for the school	Total number of existing rooms	Number of Unusable rooms	Need for Additional Room(s)
Class Room							
SHIFT-1							
PP	30	1	6	6	9	4	2
Class-V	45	1					
Class-I	70	2					
Class-II	80	2					
SHIFT-2							
PP	25	1	4	7	9	4	2
Class-V	45	1					
Class-III	55	1					
Class-IV	50	1					
Teachers' Room							
Total Sanctioned Post	6	1	1	1			$9 - 4 = 5$ $7 - 5 = 2$

Need for Additional Toilets

The following criteria should be followed in determining the need of the additional WASH Block/toilet in a school:

1. Teachers' toilets: at least one; provide two if the number of teachers is more than 30
2. One toilet for 50 girls
3. One toilet for 75 boys
4. One urinal for 50 boys
5. Number of teachers' toilet: common with boys' and girls' toilets
6. One WASH Block would be constructed comprising of three toilets of which one would be designed for the students with disabilities and with the provision of hand washing facilities. There will be provision of urinals in the male WASH Block.
7. Boys' and girls' toilets to be given separately and proportionately

Considering the resource constraints, the following criteria would be applied:

if requirements of toilet/WC >10 then consider 3 toilets

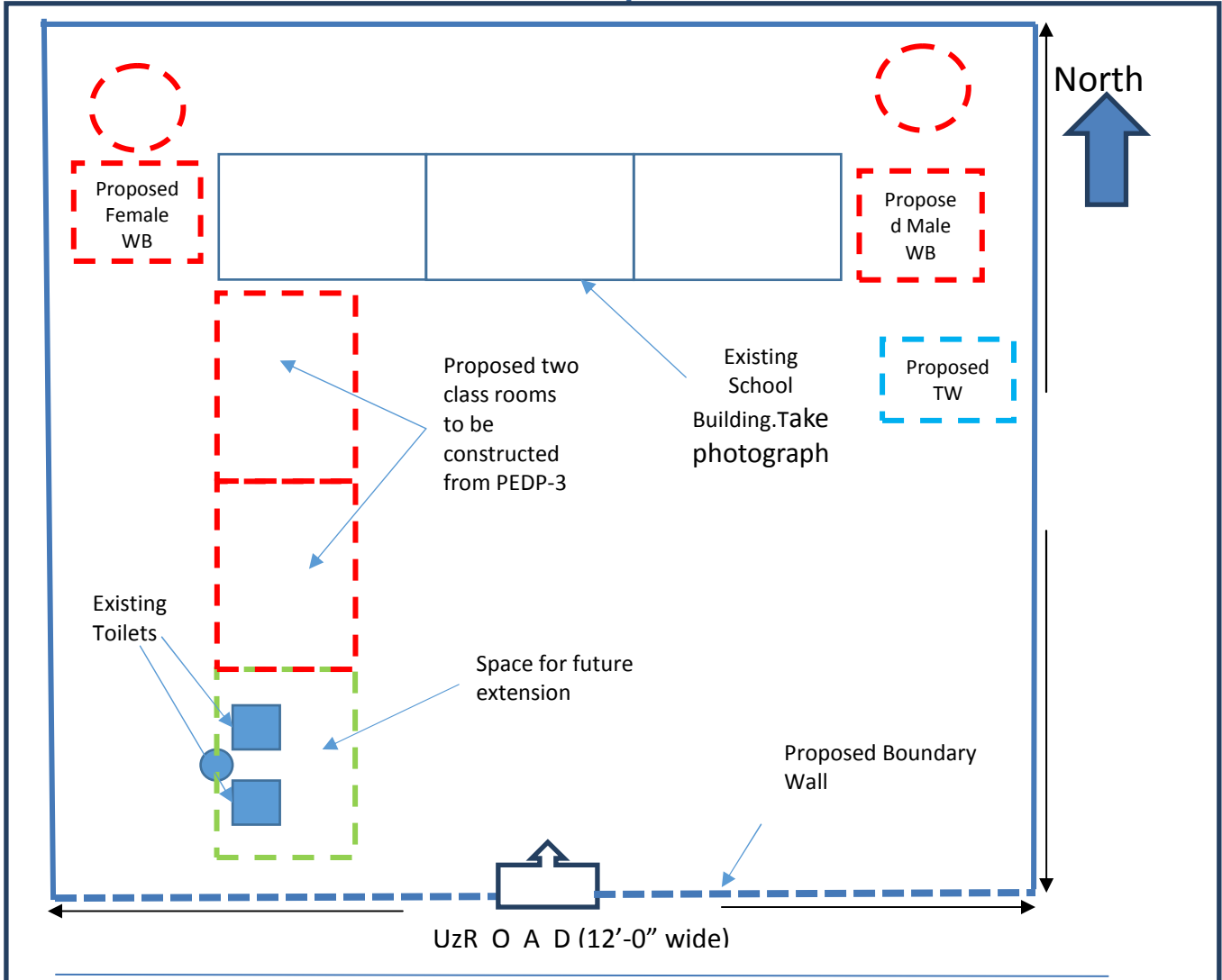
if requirements of toilet/WC >5 and < 10 then consider 2 toilets

if requirements of toilet/WC >1 and <5 then consider 1 toilet

Need for Additional water points

1. At least one source of drinking water.

Annex-I: Sample Site Plan



LEGEND

- Existing infrastructure
- Proposed infrastructure

SCALE:

Name of the School:	Site Plan for
EMIS Code:	
	District _____ Upazila: _____ <small>and male and female WASH Block</small>
Name and signature of the officials:	
1. _____ 2. _____ 3. _____	4. _____

PART-C

PRIORITIZATION CRITERIA FOR NEED-BASED INFRASTRUCTURE

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1. Prioritization Criteria for Various NBIs of Primary Schools in PEDP4

Following are the names of comprehensive lists of schools having needs of various NBIs that would need to be prioritized/ranked for selection as per approved target in PEDP4.

- a) Additional Classrooms/Reconstruction of Schools
- b) WASH Block(s)
- c) Water Sources
- d) Furniture Supply (Need-based)
- e) Maintenance of Schools
- f) Boundary Wall
- (g) Play Items/Accessories

To maximize the impact and reach the most deserving children within the funding constraint, time frame, and existing institutional capacity etc. the comprehensive lists of schools identified for various NBIs and facilities (such as additional classroom/reconstruction of schools, additional WASH Blocks, Water Sources for drinking, Furniture Supply, Boundary Walls, and Play Items etc.) would be prioritized based on the requirements. When two or more schools would possess same needs, those schools are to be ranked comparing prioritization criteria in the order. After first prioritization, if there are two or more schools with same needs, then these in turn would be ranked according to a second criterion; if then two or more schools would possess the same need according to the second criterion, they would then be ranked according to a third criterion; and so on.

In PEDP3, some prioritization criteria had been used for prioritizing the comprehensive lists of schools for various NBIs such as additional classrooms/Reconstruction, toilets, water sources for drinking and maintenance of schools. The prioritization criteria for ranking the schools for furniture supply (need-based), boundary walls, and playing accessories have also been recommended. However, the revised criteria and order for prioritizing/ranking the comprehensive lists of schools in PEDP4 are elaborated below:

1.1 Additional Classrooms/Reconstruction of Schools

The following criteria and order can be applied for prioritizing the schools that require additional classrooms/reconstruction of schools in PEDP4.

- 1) Ratio of additional rooms (classroom & teachers' room) vs existing rooms
- 2) Replace katcha school
- 3) Number of existing rooms
- 4) Number of additional rooms (classroom & teacher's room)
- 5) Number of additional teachers
- 6) Number of students

Schools requiring one or more rooms will be ranked, first, by the ratio of the number of additional rooms required to the number of existing rooms (with the highest ratio coming

at the top of the list). If then within the ranking there are schools with the same highest ratio, these schools with the same ratio will be ranked according to whether it is a katcha school that requires replacing; those requiring replacement will be placed at the top of the list. If then there is more than one school (whether katcha or not), they will be ranked according to the number of existing rooms; with the schools having fewer existing rooms being ranked first. The ranking continues in these manners using the following criteria: number of additional rooms (with the larger number being ranked first); and the number of additional teachers required (with the smaller number being ranked first); and the number of students enrolled (with the greater number being ranked first).

Once the ranking for the schools with the same, highest ratio has been completed, then those schools that have the second highest ratio would be ranked in the same manner; and so on. Thus, a prioritized list of school would be developed for additional rooms/schools.

1.2 WASH Block(s)

The following criteria and order can be applied for prioritizing the schools that require additional WASH Block(s) in PEDP4.

- 1) Number of additional toilet(s) for girls
- 2) Number of girls' enrolment
- 3) Number of additional toilet(s) for boys
- 4) Number of boys' enrolment
- 5) Number of existing toilet(s) for girls
- 6) Number of existing toilet(s) for boys

For the prioritization of schools for WASH Block(s)/toilets, the ranking would first be generated according to the number of additional toilets for girls required, with those schools with the greatest need coming first. If at the top of the list there are two or more schools that each have the same number of needed additional girls' toilets, these schools would be ranked according to "Girls' enrolment", the schools which have more girls' enrolment would get priority and be ranked top. If then there are schools that have an equal number of girls' enrolled, then these schools would be ranked according to the number of additional toilets for boys (with the greater the additional need getting higher ranking); number of boys enrolled (with the larger number getting higher ranking); the number of existing toilet(s) for girls (with the smaller number getting higher ranking); and the number of existing toilet(s) for boys (with the smaller number getting higher ranking). Once the first set of schools with the largest number of additional toilet(s) for the girls has been ranked in this manner, then those schools with the second largest number of additional toilet(s) for girls would be ranked in the same manner. Thus, a prioritized list of schools would be developed for additional Toilets.

1.3 Water Sources

The following criteria and order can be applied for prioritizing the schools that require Water Source/Tube well for drinking water supply in PEDP4.

- 1) Number of students
- 2) Girls' enrolment
- 3) Affected Water sources by Arsenic/high salinity, lowering of Water Table or other conditions making the existing water source unusable
- 4) Water source repairable
- 5) Type of water source proposed

For the prioritization of schools to install Water Sources/Tube wells, highest number of students among the schools will be counted and compared first. Among those schools having same number of students, the next prioritization criteria would be "Girls enrolment". The schools having more girl students would get priority and be ranked higher. If two or more schools remain in the same group of needs, then next prioritization criteria would be "Affected Water Sources by Arsenic, High Salinity or Lowering of Water Table etc." If the existing water sources of the schools are affected by Arsenic or high salinity or lowering of Water Table etc. then it might need to be replaced and would get priority. If multiple schools still need to be ranked because of it fulfilling same criteria, those schools will be compared with "Water Source Repairable". If the schools have no Water Source Repairable, those schools would get priority and be ranked top. Then the schools with next Water Source Options the type of water sources proposed will be the next criteria of ranking the schools and the priority of water options would be as Public Water Supply, DTW, STW, Tara and other options etc. If two or more schools have same proposed water options, then those schools will be rank following the other criteria gradually. Thus, a prioritized list of schools would be developed for Water Sources.

1.4 Furniture Supply (Need based)

In the primary schools, need-based furniture refers to furniture for existing classrooms as well as teachers' room, Head Teacher's room or Office room. Classroom furniture is high bench & low bench for the students and chair & table for the class teachers'. Teachers' room furniture is mainly chair & table for the Teachers' and Head Teachers', almirah, book shelf and file cabinet etc. As the high bench is required most for the students in the schools both in use and quantity, this could be considered as the basic criteria for grouping the schools which required need-based furniture for the sake of quick assessment and planning. Then these schools would be ranked following the prioritization criteria in the order as mentioned below.

- 1) Ratio of additional furniture vs. existing furniture
- 2) Number of additional furniture
- 3) Number of usable classrooms
- 4) Number of furniture repairable
- 5) Number of students

6) Number of Teachers' post

Among the schools requiring need-based furniture (in/c high bench) will be ranked, first, by the ratio of the number of additional furniture vs. existing furniture (with the highest ratio coming at the top of the list). If then within the ranking there are schools with same highest ratio, these schools would be further prioritized comparing the other criteria listed above: "Number of additional furniture" (high bench), "Number of usable classrooms", "Number of furniture repairable", "Number of students", and "Number of Teachers' post" in that order. That is, the schools requiring additional furniture (including high bench) would be ranked according to the ratio of the number of additional high bench required to the existing number of high benches; with the schools having the highest ratio getting priority in the ranking. If there are two or more schools with the highest ratio, they will be ranked according to the second criterion viz. the number of additional furniture they require (high bench only); with the school having the highest requirement getting priority and being ranked top. Then, if two or more schools have the same number of items of needed furniture (high bench only), these schools would be ranked according to the number of "Usable classrooms" they have; with schools having more usable classroom(s) getting priority and being ranked top. Should there be further ranking required, then a similar process would be used with the schools having less "Furniture repairable" (high bench only) or more "Students enrolment" or more "Teachers Post" getting priority and being ranked at the top.

If there are some schools which required need-based furniture but no high bench, then those schools would be further ranked considering chair for Teachers (or any item which required second most) and again the same prioritization process shall be followed. Thus, a prioritized list of schools would be developed for need based furniture.

1.5 Maintenance of Schools

The following criteria and order can be applied for prioritizing the schools that require Maintenance in PEDP4.

- 1) Major repair
- 2) Minor repair
- 3) Year of last maintenance done
- 4) Year of construction
- 5) Number of students

This category refers to schools that require either major or minor repair (rehabilitation), rather than new construction; and that have not received any funds for major or minor repair in the previous two years. (It does not refer to schools requiring regular/routine maintenance). These schools would be ranked as follows: all schools requiring major repair would come first, after which the schools requiring minor repair would be listed. The schools in each group would be ranked following the prioritization criteria 3), 4), and 5) in that order. Thus, those schools that have the oldest year of previous maintenance would be ranked first. If then there are two or more schools that have the same year of previous maintenance, the older buildings would get priority and be ranked top. If then

there are two or more schools that have the same year of construction, the schools would be further compared with “Number of students” for ranking; the schools having larger students’ number would get priority and be ranked top. Thus, a prioritized list of schools would be developed for periodic maintenance.

1.6 Boundary Wall

The following criteria and order can be applied for prioritizing the schools that require Boundary Wall in PEDP4.

- 1) Along the Highway road/Railway line or Junction or Level crossing
- 2) Along the Water body
- 3) Along the Market place
- 4) Land encroachment
- 5) Land disputes
- 6) Location (urban)
- 7) Distance from the Highway/Railway line or Junction or Level crossing
- 8) Distance from the Water body/Market place
- 9) Number of students

For the prioritization of schools for Boundary wall, the schools which require Boundary wall would be ranked following the prioritization criteria 1) to 9) in that order. That is, those schools would be ranked at the top which are located along the highway road/railway line or junction or level crossing. If necessary, these schools (which are along the highway road or railway line or junction or level crossing) would be ranked further following the other prioritization criteria in the order they are given, in the same manner as explained in the previous paragraphs. The schools which are located along the water body or market place would get priority. Likewise, the schools which already have land encroachment problem or highly vulnerable to the land encroachment or other land dispute issues would get priority. If necessary, the schools would be further ranked considering its location. Then the schools which are in urban areas finally be given priority in providing Boundary wall. If some schools are still to be ranked, those schools would be compared with the distance from the highway or railway or water body or market place. The schools which are located closer to the highway or water body would get priority in getting Boundary wall. If there are two or more schools in this group, those schools would be further compared with the “Number of students” for ranking; the schools having larger students’ number would get priority and be ranked top. Once all the schools meeting the first criterion (i.e. being along the highway road etc.) have been ranked, then the schools being along the water body would be ranked in a similar manner. Thus, a prioritized list of schools would be developed for Boundary wall.

1.7 Play Items/Accessories

The following criteria and order can be applied for prioritizing the schools that require Play Items/Accessories in PEDP4.

- 1) Availability of space
- 2) Number of students
- 3) Play ground
- 4) Number of shifts in the schools

Schools that do not have available space will be removed from the list and will not be considered. Then the remaining schools would be ranked following the “Number of Students”. The schools which have more students would get priority and be ranked top. If necessary, the schools with the same number of enrolled students would be further ranked considering the “Playground”. The schools having suitable space for Playing Items, but no Playground would get priority in getting Playing Items and be ranked top. If there are still two or more schools in the same group, those schools would be further ranked comparing the “Number of shifts in the schools”. The schools having single shift would get priority. Thus, a prioritized list of schools would be developed for Playing Items.

2. Special Priority of NBI for the Schools in Special Zones

PEDP4 will be implemented in the whole country including geographically challenged areas like hilly terrain, waterlogged haor and coastal areas etc. More than 25% of the total primary schools (GPS, NNPS & RNGPS) are located in the special zones such aschar, island, haor, hilly, coast, slum, and tribal areas. In general, the situations in these zones are difficult, with issues of access and disadvantage being prevalent. Both the students and existing facilities are limited or even much less in the special zones and the needs of these schools are different than those of plain land areas. To ensure equitable development in primary education throughout the country, the schools in the special zones need to be prioritized separately for different NBIs with the same prioritization criteria mentioned above. That is, there will be two separate lists for each type of NBI, one for plain land areas and the other for the special zones. Each list will be ranked using the prioritization criteria elaborated above. In the prioritized NBI lists, the proportion of schools between plain land areas and special zones will be approximately three-to-one (3:1).

3. Conclusion

Using the prioritization criteria mentioned above; the comprehensive lists of schools for various NBIs can be prioritized/ ranked for reaching the most deserving children within the funding constraints. For equitable development in primary education throughout the country, the schools in plain land and special zones should be prioritized separately and later combined in proportions three-to-one (3:1) for the final prioritized lists for various NBIs. In PEDP4, the prioritized lists for various NBIs would be generated through livelist software (PEPMIS) but the updated prioritization criteria must be incorporated first in the software to make it live.

ANNEXURES

Annex -I: FORMATION OF UPAZILA PRIMARY EDUCATION COMMITTEE

(As per MoPME Circular No. 38.008.035.00.00.007.2012.119, Dated: 12 March 2014)

Sl. No.	Designation	Position
1	Hon'ble MP of the area	Advisor
2	Upazila Parishad Chairman	Chairman
3	Upazila Nirbahee Officer (UNO)	Nirbahee Vice Chairman
4-5	2-Upazila Parishad Vice Chairman (Serial to be fixed based on seniority)	Vice-Chairman
6	Upazila Health and Family Planning Officer	Member
7	Upazila Engineer	Member
8	Mayor of Pourahsava (If there is any Pourashave within the Upazila, it's Mayor will be a member as Ex-Officio)	Member
9	1-Union Parishad Chairman (Nominated by the Hon'ble MP)	Member
10	1-Head Teacher (Male/Female) of Secondary/Higher Secondary School within the Upazila (Nominated by DPEO)	Member
11	Upazila Inhabitant 1-Eminent Educator (Woman) (Nominated by the Hon'ble MP)	Member
12	Upazila Inhabitant 1-Eminent Educator (Man) (Nominated by the Hon'ble MP)	Member
13	1-SMC Chairman of GPS (Nominate by DC in consultation with DPEO)	Member
14	1-Head Teacher(Male/Female) of GPS (Nominate by DC in consultation with DPEO)	Member
15	Instructor of Upazila Resource Center (URC)	Member
16	Upazila Education Officer	Member Secretary

**Annex-II: ENVIRONMENTAL SCREENING CHECKLIST FOR
EXTENSION/RECONSTRUCTION OF SCHOOL BUILDINGS**

**SECTION-II.1: SUB-PROJECT IDENTIFICATION FOR CONSTRUCTION OF ADL.
CLASSROOMS**

Name of the Work/School/Office: _____

Name of the District: _____

Name of the Upazila, Union & Village: _____

EMIS Code of the School: _____

SECTION-II.2: PROPOSED ACTIVITIES AS PER PRELIMINARY SCHEME DESIGN

Title of Activities	Description of Proposed Activities (Length, width, area, volume,	Remarks
Land development	Filling a lowland by Sandfilling (30ft X 20 ft X 10 ft)	
Construction of main school building (extension)		
Construction of boundary wall		
Construction of internal Roads		
Construction of water supply and sanitary latrine (toilet)/WASH Block		

**SECTION-II.3: ENVIRONMENTAL SCREENING FOR
EXTENSION/RECONSTRUCTION OF SCHOOL & OFFICE
BUILDINGS**

Project Name: Fourth Primary Education Development Program (PEDP4)

Date of Screening: _____

Category of component based on environmental regulations of the Government of Bangladesh:

Name of School: _____

District: _____

Upazila: _____

Union: _____

Village: _____

Type of Subproject: _____

Major Activities of the Subproject:

SCREENING QUESTIONS	Yes	No	Impact Scale (Low-1 &)	If "Yes", please provide REMARKS
A. Subproject Siting Is the subproject area adjacent to or within any of the following environmentally sensitive areas?				
Protected Area				
Wetland				
Unstable slope, landslide, erosion area				
Disaster prone area (e.g. flood, cyclone, Storm surge)				
B. Potential Environmental Impacts Will the subproject cause.....?				
Loss of agricultural/forestland?				
Negative effects on rare, (vulnerable), threatened, or endangered species of flora and/or fauna or their habitat?				
Negative effects on designated wetlands?				
Negative effects on locally important or valued ecosystems or vegetation?				
Destruction of trees and vegetation?				Mainly due to horizontal extension of school.
Insufficient drainage leading to water logging?				

SCREENING QUESTIONS	Yes	No	Impact Scale (Low-1 &)	If "Yes", please provide REMARKS
Negative effects on surface water quality, quantities or flow?				
Block any road/access/approach?				
Will there be any long-term impacts on local hydrology?				
Is adequate water supply to school available?				
Increased noise due to day-to-day construction activities?				
C. Other Potential Impacts Will the subproject cause.....?				
Degradation or disturbance of historical or culturally important sites (mosque, graveyards, monuments etc.)?				
Health risks to labors involved in activities?				
D. Potential Positive Environmental Impacts				
Improved sanitation and personal hygiene				
Enhanced quality of school environment				
E. Environmental assessment category as per GOB				
What is the environment assessment category (DDR or IEE) as per ECA 97 and ECR97 of GOB and ADB's SPS?				As per DOE (ECA & ECR 97), Category- Orange A& ADB, Category-C.
Will project enhance quality of education?				
Score Total				

Notes: Exact screening results will be site specific of subproject. ADB = Asian Development Bank, DDR = Due Diligence Report, ECA = Environmental Conservation Act, ECR = Environmental Conservation Rules, GOB = Government of Bangladesh, IEE = Initial Environmental Examination, SPS = Safeguard Policy Statement;
Source: ADB.

Type of Environmental Assessment to be undertaken:

Signed by LGED Assistant Engineer/DPHE Assistant Engineer: _____

Name: _____

Date: _____

Reviewed and signed by LGED Upazila Engineer/ DPHE Sub-Divisional Engineer:

Name: _____

Date: _____

**Annex-III: ENVIRONMENTAL SCREENING CHECKLIST FOR WATER
SUPPLY/SANITATION/ WASH BLOCKS FACILITIES**

**SECTION-III.1: SUB-PROJECT IDENTIFICATION(FORWATER ANDSANITATION/WASH
BLOCKSFACILITIES)**

Nameof theWork/School: _____

Nameof theDistrict: _____

Nameof theUpazila: _____

EMIS Code of theSchool: _____

SECTION- III.2: PROPOSED ACTIVITIES AS PER PRELIMINARY SCHEME DESIGN

Title ofActivities	Description ofProposedActivities(Length,width,area, volume, height etc.)	Remarks
Land development	Fillinga lowland bySandfilling (30ft X20ft X 10ft)	
Constructionof WASHBlock		
Installation of DTW		

**SECTION-III.3:ENVIRONMENTAL SCREENING OF WATER
SUPPLY/SANITATION/WASH BLOCKS FACILITIES**

Project Name: Fourth Primary Education Development Program (PEDP4)

Date of Screening: _____

Category of component based on environmental regulations of the GOB: _____

Name of School/Office: _____

District: _____ Upazila: _____

Union: _____ Village: _____

Type of Subproject: _____

Major Activities under the Subproject:

SCREENING QUESTIONS	Yes	No	Impact Scale (Low-1 and High-6)	If "Yes", please provide REMARKS
A. Subproject Siting Is the subproject area adjacent to or within any of the following environmentally sensitive areas?				
Protected Area				
Wetland				
Unstable slope, landslide, erosion area				In hill tracks areas
Disaster-prone area (e.g. flood, cyclone, Storm surge)				
B. Potential Environmental Impacts Will the subproject cause.....?				
Loss of agricultural/forestland?				
Negative effects on rare (vulnerable), threatened, endangered species of flora and/or fauna or their habitat?				
Negative effects on designated wetlands?				
Negative effects on locally important or valued ecosystems or vegetation?				
Destruction of trees and vegetation?				
Insufficient drainage leading to water logging?				

SCREENING QUESTIONS	Yes	No	Impact Scale (Low-1 and High-6)	If "Yes", please provide REMARKS
Negative effects on surface water quality, quantities or flow?				
Block any road/access/approach?				
Will there be any long-term impact on local hydrology?				
Is adequate water supply to school available?				
Increased noise due to day-to-day construction activities?				
C. Other Potential Impacts Will this subproject cause.....?				
Degradation or disturbance of historical or culturally important sites (mosque, graveyards, monuments etc.)?				
Health risks to labors involved in activities?				
D. Potential Positive Environmental Impacts				
Improved sanitation and personal hygiene				
Enhanced quality of school environment				
E. Environmental assessment Category as per GOB				
What is the environmental assessment category (DDR or IEE) as per ECA 97?				As per DOE (ECA & ECR 97), Category- Orange A & ADB, Category-C
Will project enhance quality of Education?				
Score Total				

ADB =Asian Development Bank, DDR = Due Diligence Report, ECA = Environmental Conservation Act, ECR = Environmental Conservation Rules, GOB=Government of Bangladesh, IEE=initial environmental examination, SPS= Safeguard Policy Statement;
Source:ADB.

Type of Environmental Assessment to be undertaken:

Signed by LGED Asst. Engineer/ DPHE Asst. Engineer:

Name: _____
Date: _____

Reviewed and signed by LGED Upazila Engineer/ DPHE Sub-Divisional Engineer: _____

Name: _____
Date: _____

Annex- IV: INVOLUNTARY RESETTLEMENT IMPACT CATEGORIZATION CHECKLIST

Project Name: Fourth Primary Education Development Program (PEDP4)

Date of Screening: _____

Name of School: _____

District: _____

Upazila: _____

Union: _____

Village: _____

Type of Subproject: _____

Major Activities under the Subproject:

Involuntary Resettlement Category			
[] New [] Re-categorization — Previous Category []			
<input type="checkbox"/> Category A	<input type="checkbox"/> Category B	<input type="checkbox"/> Category C	<input type="checkbox"/> Category FI

Probable Involuntary Resettlement Effects	Yes	No	Not Known	Remarks
Involuntary Acquisition of Land				
1. Will there be land acquisition?				
2. Is the site for land acquisition known?				
3. Is the ownership status and current usage of land to be acquired known?				
4. Will easement be utilized within an existing Right of Way (ROW)?				
5. Will there be loss of shelter and residential land due to land acquisition?				
6. Will there be loss of agricultural and other productive assets due to land acquisition?				
7. Will there be losses of crops, trees, and fixed assets due to land acquisition?				
8. Will there be loss of businesses or enterprises due to land acquisition?				
9. Will there be loss of income sources and means of livelihoods due to land acquisition?				

Probable Involuntary Resettlement Effects	Yes	No	Not Known	Remarks
Involuntary restrictions on land use or on access to legally designated parks and protected areas				
10. Will people lose access to natural resources, communal facilities and services?				
11. If land use is changed, will it have an adverse impact on social and economic activities?				
12. Will access to land and resources owned communally or by the state be restricted?				
Information on Displaced Persons:				
Any estimate of the likely number of persons that will be displaced by the Project? []No[]Yes				
If yes, approximately how many?				
Are any of them poor, female-heads of households, or vulnerable to poverty risks? []No[]Yes				
Are any displaced persons from tribes, minor races, ethnic sects and communities? ¹[]No []Yes				

Comments of the Team:

Signed by LGED Assistant Engineer, DPHE Assistant Engineer, and School Authority:

Name: _____

Date: _____

¹ Groups or population identified as Indigenous Peoples within the context of ADB's Safeguard Policy Statement will be referred to in this document as **tribes, minor races, ethnic sects and communities** (following the request of the Government of Bangladesh)

DECISION ON CATEGORIZATION

- 200 or more people will be severely affected (displaced from housing or losing 10% or more of their productive/income-generating assets. Should be categorized as an A project/subproject. A full resettlement plan is required.
- 20 families or less than 200 people will be affected. Should be categorized as a B project/subproject but requires a full resettlement plan.
- Less than 20 families will be affected. Should be categorized as a B project/subproject. Requires an abbreviated resettlement plan.
- No person is adversely affected. Should be categorized as a C project/subproject.