

Paro Valley Development Plan

DEVELOPMENT CONTROL REGULATION & GUIDELINES

Vol
III



DEPARTMENT OF HUMAN SETTLEMENT,
MINISTRY OF WORKS & HUMAN SETTLEMENT

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Foreword

Many of the cities now though the most beautiful are the result of solid, long lasting systems of prohibitions and guidance. Hence, the DCR are related to designated zones and precincts in the Valley. It will include specifications of uses allowed, percentages of plot coverage, setbacks from roads and from property lines, densities, allowed Floor Area Ratios and provision for on-site infrastructure and Building bye laws.

The Guidelines sets out a series of guiding principles and development checklists that are focused on preserving and enhancing the natural environment, while promoting development and land use that positively contributes to the character of the entire Paro Valley.

For ease of reference, this document has been separated into the following two sections:

Section A - DCR

- Administration
- Planning
 - Cultural Landscape
 - Built Environment
- Amenities and Services
 - Parking
 - Water
 - Waste Water
 - Waste Management
 - Storm Water

Section B – Guidelines

- General Provisions
- Environment

Each section contains a series of sub-sections that address planning and development matters specific to Paro Valley.

Each sub-section identifies a set of **Guiding Principles** that give both proponents and decision making authorities a clear understanding of the intent and expectation for development and land use in the Paro Valley.

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SECTION A. DEVELOPMENT CONTROL REGULATION (DCR)

I ADMINISTRATION

TITLE, EXTENT AND COMMENCEMENT

1. These Rules shall:
 - a. Be called the Paro Valley Development Control Regulation (PVDCR) 2016.
 - b. Extend to the declared Paro Valley Development area as well as the extended areas, as defined in these Rules.
 - c. Come into force from the day of notification by Ministry of Works & human Settlement.
2. This PVDCR will be read in conjunction with the provisions of BBR 2002 & Rural Construction Rules 2013 and the Traditional Architectural Guidelines of Bhutan.

INTERPRETATION

3. Unless the context otherwise requires, the terms and expressions not defined herein shall have the same meaning as indicated in the following legislations:
 - a. The Local Government Act 2009
 - b. The Land Act 2007
 - c. Urban Area and Property Regulations 2003
 - d. National Housing Policy 2002
 - e. Building Code of Bhutan 2003
 - f. Bhutan Building Rules 2002
4. If there is a conflict between the requirements of these Regulations and those of any other rules or byelaws, these Regulations shall prevail.

IMPLEMENTING AUTHORITY

5. Whereas the provisioning of services like water supply and waste management is a generic requirement that should be provided irrespective of administrative boundaries. In an urban setting, the responsibility for provisioning of services (operation and maintenance) rests with the respective Thromde. However, in case of Paro the plan is prepared for the entire valley which include both urban and rural area that are under different administration. Further, the rural areas, though under the same Dzongkhag administration, are again under different Gewog administration. Therefore, it is recommended that a central authority "**Paro Valley Development Authority**" be instituted under the Dzongkhag administration in order to implement the plan.

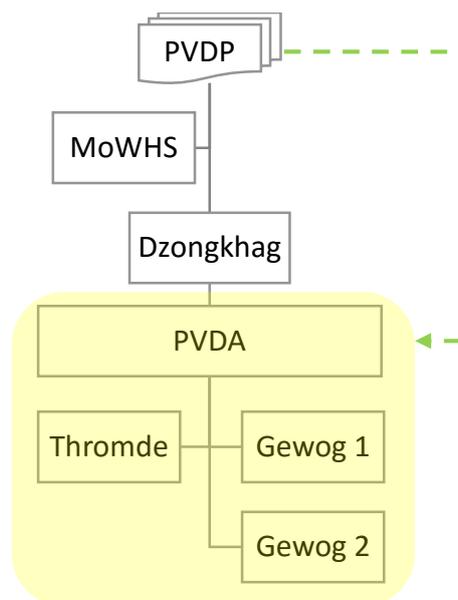


Figure I-1 Intuitional Arrangement

ROLES AND RESPONSIBILITIES OF PVDA

6. The following will be the roles and responsibilities of PVDA:
 - a. To liaise between the MoWHS, Dzongkhag, Thromde, Gewogs and other government departments for the implementation of plan.
 - b. To coordinate and provide for provisioning of services like water supply and waste management, etc...
 - c. To coordinate the provisioning of infrastructures like road and footpath.
 - d. To coordinate with the Department of Hydro-Met and liaise with farmers in order to suggest appropriate harvesting time according to weather forecast.
7. The control and monitoring within the Thromde boundary shall be as per Local Government Act 2009.
8. The control and monitoring outside the Thromde jurisdiction shall be in accordance with the Rural Construction Rules 2013 unless otherwise specified in this regulation.

DELEGATION OF POWER

9. The Dzongkhag Administration may delegate some of its powers, duties or functions vested in it under these Rules to the Gewog Administration in writing clearly stating the scope and limitations of the delegated powers, duties or functions. No power, duty or function that requires referral to or the concurrence of the Competent Authority shall be delegated.

DISCRETIONARY POWER

10. The Implementing Authority may exercise its discretion in conformity with the intent and spirit of these Regulations, in order to mitigate any demonstrable hardship or to sub serve public interest in the following ways:

- a. Decide on matters where it is alleged that there is an error in any order, requirement, decision and determination, interpretation made by it under delegation of powers, while applying these Regulations.
- b. Interpret these regulations in various contexts or in situations where more clarity is required under such circumstances the Implementing Authority's decision shall be final and binding.
- c. Decide upon the nature and the extent of concessions in respect of marginal distances, room heights, etc. that can be granted in cases of proven hardship for reasons which are to be recorded in writing. However, such relaxation shall not affect the health, safety and hygiene of the inhabitants of the building and the neighborhood and the structural stability of the building. Provided further that while granting such relaxation, as above, the authority may impose conditions as may be necessary. These may include a payment of deposit and its forfeiture for non-compliance, payment of a premium amount and other obligations, etc.
- d. No concessions in respect of the additional floors shall be given.
- e. Decide on the fine or compounding charges to be made applicable in cases of developments where non-adherence to these Regulations is detected.
- f. Modify the limit of a precinct where the boundary of a precinct divides a parcel of land or where a layout street or a Thram or a plot number actually on the ground varies from its location shown on the Local Area Plan.
- g. Authorize the erection of a building or the use of premises for a public services undertaking or a public utility purpose where such an authorization is reasonably necessary for the convenience and the welfare of the public, even if such erection or use is not permitted as per these Regulations.
- h. Determine and establish the location of precinct boundaries in cases of doubts or controversies.

REFERRAL OF SPECIFIC APPLICATIONS

11. The PVDA shall seek advice of the Competent Authority if:
 - a. The proposed use differs from uses already permitted in the area.
 - b. Group housing is proposed.
 - c. The basic infrastructure and service requirements, in terms of water supply, waste water, solid waste, parking areas, would be more than the requirements of a standard house in that particular area.

AUTHORITY FOR AMENDMENT AND INTERPRETATION

12. The authority for amendment and interpretation of these Rules shall vest with the Competent Authority as defined in these Rules and the Competent Authority's interpretation shall be final and binding.

CONSTRUCTION PERMITS

13. All constructions, including development of sites and change of land use, shall require prior written approval of the Paro Valley Development Authority under the Dzongkhag Administration, which shall be processed through the respective Gewog Administrations. However, no such permit may be necessary for temporary or semi-permanent farm related structures like cattle sheds and farm produce storage facilities limited to one floor.
14. No construction permit shall be necessary for the maintenance, improvement or alteration of a building which:
 - a. Affect only the interior of the building without altering the structural members of the building.
 - b. Do not affect the external appearance of the building.
 - c. Do not add built up area to the existing building.
15. No construction permit shall be necessary for carrying out the following works by/ in compliance with an order or direction made by an authority under a law for the time being in force:
 - a. required for the maintenance or improvement of highway, road or public street, being works carried out on land within the boundaries of such highway, road or public street including repairs, extensions, modifications to existing service installations, culverts, bridges, tunnels, drains, foot over bridges, subways, pavements, pedestrian railings along pavements, medians, etc,
 - b. for the purpose of constructing, laying, inspecting, repairing or renewing drains, sewers, mains, pipes, cable, telephone or other apparatus including breaking open of a street or other land for that purpose,
 - c. Falling in the purview of the operational constructions by Government departments/ bodies, such as water tanks – over head or underground, pumping stations, sub-stations, traffic signals, bus stop shelters, overhead electrical equipment for electrification, etc.
 - d. excavation (including) wells made in the ordinary course of agricultural operation; (for the construction of a road intended to give access to land solely for agricultural purposes),
 - e. For an occasional use of land such as exhibitions, fairs, etc., but shall obtain temporary permission from the Implementing Authority.
16. However, there shall be no such exemptions in the case of heritage buildings or structures in heritage precincts.

DOCUMENTS AND PARTICULARS TO BE FURNISHED WITH THE APPLICATION

17. All applications for construction shall be made along with the supporting documents including:
 - a. A copy of the Lagthram or the ownership certificate.
 - b. A copy of the Citizenship Identity Card of the Applicant who shall be the registered landowner.

- c. A copy of the site plan.
 - d. Three copies of proposed layout plan drawn to a scale of not less than 1:500 showing the details as listed in Annexure 1, wherever applicable (in the case where plot is more than ten hectares, scale shall not be less than 1:1000)
 - e. Clearances from relevant agencies where necessary.
18. Any action taken, or developments permitted, under the Regulations or Building Rules, existing prior to these Regulations coming into force, shall be deemed to be valid and continue to be so valid, unless otherwise specified.
19. In the case of development, for which the Commencement Certificate has been obtained prior to these Regulations coming into force, and where amendments to the sanctioned plan is proposed, these Regulations shall apply.
20. 'Construction Permit' granted in the past shall be revalidated in conformity to these Regulations.

**PLANS/DRAWINGS AND SPECIFICATIONS TO BE PREPARED BY REGISTERED ARCHITECT/ URBAN PLANNER/
URBAN DESIGNER**

21. The plans and particulars prescribed under clause No. 17-d above shall be prepared by a registered **Architect, Urban Planner and/ or Urban Designer**

SCRUTINY FEE

22. A person or body applying for permission for carrying out development shall with his/ its application pay to the Implementing Authority the scrutiny fees as mentioned in Annexure-3 or as decided by the Implementing Authority from time to time.

SERVICE AND AMENITY FEES

23. Permission for carrying out development shall be granted by the Implementing Authority only on payment of service and amenities fees as may be decided by the Implementing Authority from time to time. These fees and maintenance charges shall be revised on review by Implementing Authority from time to time.

VALIDITY OF APPROVALS

24. The validity of the approved building plan shall be for two years from the date of approval. The construction should start within two years from issue of building permission.

REVALIDATION / RENEWAL

25. Building permission granted under these regulations shall be deemed to have lapsed, if such development work has not commenced till two year from the date of sanction of development permit, provided that, the Implementing Authority may on application made to it before the expiry of above period extend the period by a further one year at a time for renewal of the building permission.

REJECTION OF APPLICATION

26. If the plans and information given as per these regulations do not give all the particulars necessary to deal satisfactorily with the building permission application, the application shall be rejected. The building permission shall be in the prescribed form and it should be issued by the Implementing Authority. Every order granting permission subject to conditions or refusing permission shall state the grounds for imposing such conditions or for such refusal.

CANCELLATION / REVOCATION OF APPROVAL

27. The building permission if secured by a person/body by a misrepresentation or by producing false documents is not valid and such development permission will be treated as cancelled/revoked.

LIABILITIES OF APPLICANT

28. Notwithstanding the construction permit granted under these Regulations, a person/body undertaking any development work shall continue to be wholly and solely liable for any injury or damage (direct or indirect) or loss whatsoever that may be caused to anyone in or around the area during such construction and no liability whatsoever in this regard shall be cast on the Implementing Authority.

RESPONSIBILITIES OF APPLICANT

29. Neither the grant of development permission nor the approval of the plans, drawings and specifications shall in any way absolve the applicant of the responsibility for carrying out the development in accordance with requirement of these regulations.

CHANGE OF OWNERSHIP

30. Building permission granted under these Regulations shall be deemed to be suspended/ cancelled/ revoked, in cases of change of ownership, unless the 'original' owner who applied for, and obtained the development approval submits a letter to the Implementing Authority about the change in ownership giving details of the transaction and the new owner submits an application duly attaching copies of all the official records of such a transaction and an undertaking that he accepts the transfer to himself, of all the responsibilities and liabilities of the previous owner that relate to the development on the site.

NO OBJECTION CLEARANCE (NOC) FROM REFERRAL AUTHORITIES FOR CERTAIN PROJECTS

31. The proposal submitted shall be in conformity with other Acts/ Regulations and shall, wherever applicable submit the NOC, from the respective authorities for conformity with:
 - a. The Bhutan Power Corporation's Electricity Grid Lines and the horizontal and vertical clear distances to be kept open to sky
 - b. The provisions of Environmental Assessment Act, 2000.

- c. The provisions of NEC Secretariat's, 'Regulations for the Environmental Clearance of Projects, 2001'.
- d. The conservation/ preservation of monuments and cultural heritage.
- e. The Department of Industry, Ministry of Economic Affairs, RGoB for the establishment of industries.
- f. The Department of Trade, Ministry of Economic Affairs, RGoB for the setting up and operation of fuel stations
- g. The Department of Geology and Mines, Ministry of Economic Affairs, RGoB for the setting up and operation of:
 - Quarrying and mining activities on less than 3 hectares
 - Mineral exploration for verifying mineral deposits
 - Emergency responses to natural disasters/ hazards.
- h. The Department of Forestry Services, Ministry of Agriculture and Forest, RGoB for:
 - Surface collection of sand and boulders,
 - All other activities governed by the Forest and Nature Conservation Act, 1995 and Rules, 2000, except sections that require NEC's clearance
- i. The Department of Agriculture, Ministry of Agriculture and Forest, for:
 - Farm roads,
 - Irrigation channels,
 - Activities related to agriculture research and development

DEMOLITION AND/ OR RECONSTRUCTION OF DANGEROUS/UNSAFE DILAPIDATED BUILDINGS

32. Wherever it is necessary to demolish a dilapidated/ unsafe structure in the interest of public safety, such demolition shall be carried out by the owner wherever so directed by the Implementing Authority. However if the same is to be reconstructed, it shall be done in conformity with these Regulations with due approval from the Implementing Authority.

TEMPORARY PERMISSION

33. Applications for temporary permissions need not be submitted through the registered professional. A scrutiny fee shall be paid as specified in the Annexure-3. These temporary permissions shall be permitted only in case of private premises - temporary sheds to be used for storing construction material/ as watchmen's cabin during construction phase.

DEVELOPMENT UNDERTAKEN ON BEHALF OF THE GOVERNMENT

34. The Office-in-Charge of a Government Department shall inform in writing to the Implementing Authority of the intention to carry out development for its purpose along with the plans of proposed development or construction.

- a. All the development undertaken on behalf of the Government shall strictly confirm to these regulations.
- b. Any Government proposal which is not in conformity with Punakha Urban Development Plan, and these regulations should have prior approval from the Competent Authority

PROCEDURE DURING DEVELOPMENT/CONSTRUCTION

35. No applicant shall carry out any further work without an inspection (Ref clause 47) and clearance by the Implementing Authority.
36. The progress certificate shall not be necessary in the following cases:
 - a. Alteration in Building not involving the structural part of the building.
 - b. Extension of existing residential building on the ground floor up to maximum 15sq.m in area provided it conforms to the setback rules and plot coverage.
37. On receipt of the progress report certifying that the work has been executed as per the approved plan, it shall be the duty of the Implementing Authority to inspect, verify and endorse the report.

TEMPORARY SERVICE CONNECTION

38. An applicant with a certified copy of construction permit may apply to the respective agencies for temporary connection of services like electricity, water and sewerage.

LOADING, UNLOADING AND STACKING OF MATERIALS AND EQUIPMENT

39. The use of a public street/ road or a public place for loading and unloading and stacking of materials of construction and construction equipment and excavated materials shall not be allowed, unless permitted by the Implementing Authority.
40. Material or equipment found on public street/ road or public land without prior approval is liable to be confiscated and the owner shall be liable for penal charges.

DOCUMENTS AT SITE

41. The person to whom construction permit is issued shall during construction, keep:
 - a. Posted in a conspicuous place, at the site for which permission has been issued a copy of the development permission and
 - b. A copy of the approved drawings and specification on the site for which the permit was issued.

SAFETY ON SITE

42. All construction sites must be organized in a manner that the safety of all persons (particularly laborers) on the site, at all times is assured. Every person on the construction site should be well equipped with helmet, boots, gloves, safety belts, first aid kit etc. On such sites safety barriers will be erected around all chutes, shafts, floor openings and slab edges, etc. All the workers at site should be insured

INSPECTIONS

Building constructions shall be subject to routine/ periodic inspections by the Implementing Authority or persons/ bodies authorized by the Implementing Authority. In the event of deviation(s) from the approved plan and drawings or any of the conditions noted in this section, the Implementing Authority shall have the full authority to stop construction. The Implementing Authority may, at any time during erection of a building or the execution of work or development, make an inspection thereof without giving prior notice of his intention to do so. Following shall be the recognized stages for progress verification and checking in the erection of a building or the execution of a work:

- a. Site layout shall be verified and approved by the authorized Engineer/ Building Inspector from the Implementing Authority,
 - b. Foundation; before casting of footings
 - c. Plinth; in case of basement before the casting of basement slab,
 - d. Each storey shall be inspected before any casting,
 - e. Before roofing
43. A person/ body who is empowered/ responsible under these Regulations shall give to the designated officer of the Implementing Authority at least four working days' notice in writing of the time at which the work will be ready for inspection.
44. This shall be called the progress certificate. This progress certificate shall be duly filled-in and kept with the owner/ architect and produced at the time of each inspection to be scrutinized and signed/ endorsed by the building inspector, before the commencement of the next stage of construction.
45. The applicant/ developer/ owner shall permit authorized officers of the Implementing Authority to enter the plot for which the development permission has been sought/ granted for carrying out development, at any time for the purpose of enforcing these regulations.
46. The applicant shall keep a board at site of development mentioning the plot no, sub plot no, etc name of owner, and name of architect/ engineer/ developer/ owner, building permit no.
47. The building shall also be inspected for fire safety norms as per the fire safety regulations.

DEVELOPMENT WITHOUT PRIOR WRITTEN APPROVAL

48. If the work requiring the written permission of the Implementing Authority under the provision of these Regulations or other rules, regulation or by-law is done by a person without obtaining written permission and not conforming to the provisions of these regulations it shall be deemed to be unauthorized. The Implementing Authority shall at any time, by written notice, order the same to be removed, pulled down or undone.

DEVIATION AND PENALTY

49. Deviations during construction from the approved building plan shall require prior approval from the Implementing Authority and would be approved only if it is in conformity to these regulations. In case the deviation is in conformity of these regulations, then a penalty may be levied as decided by the Implementing Authority. The following formula may be used for the purpose of calculating the penalty:

Amount= Excess area deviated x 0.2*(prevailing unit area cost of construction, based on current BSR)

50. Internal deviations which does not have structural implications and which are within the setback rules may be approved after resubmission of as-built drawings and upon payment of a lump sum penalty as may be fixed by the City Committee from time to time.
51. Any deviations which are not in conformity to these Regulations shall be demolished at the owner's own risks/ costs.
52. Essential services like water and power supply will be disconnected if the owner/developer fails to comply.

ILLEGAL OCCUPATION OF BUILDING

53. Notwithstanding the provision of other laws to the contrary, the Implementing Authority may, by written notice, order the whole building or part thereof to be vacated forthwith, or within the time specified in such notice:
- a. If such building or part thereof has been unlawfully occupied in contravention of these Regulations.
 - b. If a notice has been issued in respect of such building, or part thereof, requiring the alteration or reconstruction of works specified in such notice have not been commenced or completed.
 - c. if the building or part thereof is in a ruinous or dangerous condition, which are likely to fall and cause damage to persons occupying, restoring to or passing by such building/ structures or any other structure or place in the neighborhood thereof.
 - d. If the site is in danger of collapsing, due to land slide, or erosion, or flood, or if the site is in danger of stones, boulders, debris, earth falling on it from areas at a higher elevation
54. The reasons for requiring such building or portion thereof to be vacated shall be clearly specified in the notice.
55. The affixing of the written notice on the premises shall be deemed a sufficient intimation to the occupiers of the building or portion thereof.
56. On the issue of notice, a person occupying the building or portion thereof to which the notice relates shall vacate the building or portion as directed in the notice and no person shall so long as the notice is withdrawn, enter the building or portion thereof, except for the purpose of carrying out a work of reinstatement which be lawfully permitted to be carried out.

57. A person who acts in contravention of the above provisions or who obstructs the action taken under these regulations shall be removed from such building or part thereof by the police, which may also use such force as is reasonably necessary to affect entry in the said premises.
58. The cost of measures taken under this provision shall be recovered from the owners.

OCCUPANCY CERTIFICATE

59. The applicant shall obtain occupancy certificate from the Implementing Authority prior to occupancy or use of development so completed. The Authority issuing occupancy certificate shall ensure that:
 - a. Septic tank and soak-pit have been constructed as per standards and are located as per approved plan.
 - b. Domestic drains (to collect the rainwater) have been constructed as per standards and are connected and as directed by the Implementing Authority.
 - c. The completed portion of the building/dwelling unit applied for occupation is fit and safe for occupancy.
 - d. Construction debris around the building, and/or on the abutting road, and/or adjoining property is cleared by the applicant.
 - e. Parking space is properly paved and the layout of parking space is provided as per the approved plans.
 - f. Proper arrangements are made for regular maintenance of fire protection services as provided in Building Code of Bhutan 2003 and in these regulations.
 - g. In the case of buildings with three storeys or more, public gathering places, cinemas, auditoria, schools, colleges, government building and hospitals, a Certificate of Structural Stability shall be obtained from the site engineer.
60. Permanent connection to services like water, sewerage, electricity and telephone to the building shall be given by the respective agencies after issue of occupancy certificate only.

DEFINITIONS

61. These Regulations, unless the context otherwise requires, the terms and expressions defined as follows shall have the meaning indicated against each of them.
62. The terms and expressions not defined in these Regulations shall have the same meanings as in the Bhutan Municipal Act, 1999 and the rules framed there under or as mentioned in the Bhutan Building Rules, 2002 and the Building Code of Bhutan, 2003 as the case may be unless the context otherwise requires.

Additions and/or Alterations

Shall mean any change in an existing authorized building or approved plans of a building, or a change from one use to another use, or a structural change such as additions to the area or height, or the removal of part of a building, or a change to the structure, such as the construction or cutting into or removal of any wall or part of a wall, partition, column, beam, joist, or re-roofing, or reconstruction of any kind, alterations to a floor, including a mezzanine floor, or any support, or a change to, or closing of any required means of ingress, or egress, or a change to fixtures, or equipment, as provided in these regulations

Advertising Sign/Hoarding

Shall mean any surface or a structure with any character, letter or illustration, applied there to and displayed in any manner whatsoever out of doors for the purpose of advertising, giving information regarding, or to attract the people to any place, cause, person, public performance, article or merchandise, and which surface or structure is attached to, forms part of, or is connected with any building, or is fixed to a tree or to the ground, or to any pole, screen, hoarding or displayed in any space, or in or over any water body included in the limits of the notified area of the Implementing Authority.

Air-Conditioning

Shall mean the process of treating air to control simultaneously, or singly, its temperature, humidity, cleanliness and distribution to meet the requirement of an enclosed space.

Amenities

Shall mean roads, streets, open spaces, parks, recreational grounds, playgrounds, gardens, water supply, electric supply, street lighting, drainage, sewerage, public works and other utilities, communication network, etc. for the citizens' use and convenience.

Apartment/Flats

Shall mean residential buildings constructed in a detached or semidetached manner being designed as ground floor plus one or more upper floors and constructed as separate dwelling units with common staircase and other building services

Applicant

Shall mean the registered owner(s) of a property who applies in the prescribed form to construct/ alter/ extend a building.

Architect

Shall mean a person with degree or diploma in architecture from an Institute, College or University accredited by the respective country's accreditation board to impart professional degrees in architecture.

Attic

Shall mean the space within the confines of the roof structure, above the ceiling of the top floor which is constructed and adopted for storage purpose, lift machine room, water tanks etc.

Basement or Cellar

Shall mean the lowest storey of a building more than 75% below the lowest ground level. Permitted only for vehicular parking and other building services.

Building Line

Shall mean the plinth of the building running in line with the adjoining plinth of the building parallel to the road.

Building Services

Building Services shall mean HVAC plant, power generator, underground sumps, pumps, boilers, sub-station, lift pits and related services, chutes, storages, laundry and other services related to building maintenance

Betterment Charge

Means a charge levied by the Implementing Authority for ensuring off-site services and amenities to the area by the Implementing Authority.

Building

Meaning any structure for whatsoever purpose, and of whatsoever materials constructed and every part thereof, whether used as human habitation or not including foundations, plinths, walls, columns, floors, roofs, chimneys, plumbing and building services, fixed platforms, verandas, balconies, cornices or projections, part of a building or anything affixed thereto. However, structures of a temporary nature like tents, hutments, etc. erected for temporary purposes or for ceremonial occasions, with the permission of the Implementing Authority, shall not be considered to be "buildings".

- i. **"Assembly building"** shall mean a building or part thereof where groups of people congregate or gather for amusement, recreation, social, religious, patriotic, civil, travel and similar purposes. Assembly buildings shall include theatres for drama and cinema, city halls, town halls, auditoria, exhibition halls, museums, "marriage halls", "skating rinks", gymnasia, stadia, restaurants, eating or boarding houses, places of worship, dance halls, clubs, road, air, or other public transportation stations.
- ii. **"Business building"** shall mean any building or part thereof used for transaction or record thereof. Offices, banks and all professional establishments are classified as business buildings if their principal function is transaction of business and/or keeping of books and records thereof.
- iii. **"Detached building"** shall mean a building with walls and roofs independent of any other building and with open spaces on all sides.

- iv. **"Semi Detached Building"** shall mean a building detached on three sides with open spaces as specified in these Regulations. A superficial connection via a beam, wall, balcony, corridor, Sky Bridge, or any other trivial connection will not qualify a building to be defined as "semi-detached"
- v. **"Educational building"** shall mean a building exclusively used for a school or college, recognized by the appropriate Board or University, or any other Implementing Authority involving assembly for instruction, education or recreation incidental to educational use, and including a building for such other uses incidental thereto such as a library, laboratory, fine arts facility, or a research institution. It shall also include quarters for essential staff required to reside in the premises, and buildings used as hostels and boarding solely captive to an educational institution whether situated in its campus or not.
- vi. **"Hazardous building"** shall mean a building or part thereof used for:
 - a. Storage, handling, manufacture or processing of radio- active substances or of highly combustible or explosive materials or products which are liable to burn with extreme rapidity and/or producing poisonous fumes or explosive emanations.
 - b. Storage, handling, manufacture or processing which involves highly corrosive, toxic obnoxious alkalis, acids, or other liquids, gases or chemicals producing flame, fumes, and explosive mixtures or which result in division of matter into fine particles capable of spontaneous ignition.
 - c. Storage, handling, manufacture, experimentation, research, or processing which could cause any danger to the public health, hygiene or safety, as certified by the competent health and safety officials of the Royal Government of Bhutan
- vii. **"Industrial building"** shall mean a building or part thereof wherein products or materials are fabricated, assembled or processed, such as assembly plants, laboratories, power plants, refineries, gas plants, mills, dairies and factories.
- viii. **"Institutional or public building"** shall mean a building constructed by the Royal Government, Semi-Government organizations, public sector undertakings, registered Charitable Trusts for their public activities, such as administration, education, medical, recreational and cultural, hostel for working women or men, or for an auditorium or complex for cultural and allied activities, or for an hospice, care of orphans, abandoned women, children and infants, convalescents, destitute or aged persons and for penal or correctional detention with restricted liberty of the inmates ordinarily providing sleeping accommodation, hospitals, sanatoria, custodian and penal institutions such as jails, prisons, mental hospitals, houses of correction, detention and reformatories, clubs, golf course, sports stadium, buildings and facilities constructed by the Royal Government for the promotion of tourism, such as inns, resorts, lodges, etc..

- ix. **"Commercial/ Mercantile building"** shall mean a building or part thereof primarily used for commercial purposes such as shops, stores, departmental stores or markets, for display and sale of goods or merchandise, including office, storage and service facilities incidental thereto located in the same building. Mixed use buildings with commercial areas on the ground floor and residential above shall be construed as Commercial building for the purposes of this document.
- x. **"Office building (premises)"**, shall mean a building or premises or part thereof whose sole or principal use is for an office or for office purposes or clerical work. "Office purposes" includes the purpose of administration, clerical work, handling money, telephone, telegraph and computer operation; and "clerical work" including writing, book-keeping, sorting papers, typing, filing, duplicating, punching cards, tapes or machines, calculations, drawing, of matter for publication and editorial preparation of matter of publication.
- xi. **"Residential Building"** shall mean a building in which sleeping accommodation is provided for normal residential purposes, with or without cooking or dining facilities, and includes one or more family dwellings, lodging or boarding houses, hostels, dormitories, apartment houses, flats and private garages of such buildings.
- xii. **"Special Building"** shall mean
- a. a building solely used for the purpose of a drama or cinema theater, motion picture, drive-in-theatre, an assembly hall or auditorium, town hall, lecture hall, an exhibition hall, theatre, museum, a stadium, a "community hall, marriage hall;
 - b. a hazardous building;
 - c. a building of a wholesale establishment;
 - d. centrally air-conditioned building which is more than three floors,
 - e. a building of more than two floors constructed on stilts,
 - f. a building of more than four floors.
- xiii. **"Storage Building"** shall mean a building or part thereof used primarily for storage or shelter of goods, merchandise and includes a building used as a warehouse, cold storage, freight depot, transit shed, store house, public garage, hangar, truck terminal, grain elevator, barn and stable.
- xiv. **"Unsafe Building"** shall mean a building which,
- a. is structurally unsafe,
 - b. is unsanitary,
 - c. is not provided with adequate means of egress,
 - d. constitutes a fire hazard,
 - e. is dangerous to human life,

- f. In relation to its existing use constitutes a hazard to safety or health or public welfare by reasons of inadequate maintenance, dilapidation or abandonment.
- xv. **"Wholesale establishment"** shall mean an establishment wholly or partly engaged in wholesale trade and manufacture, wholesale outlets, including related storage facilities, warehouses and establishments engaged in truck transport, including truck transport booking, warehouses.

Building Land Parcel

Shall mean a land/plot or part of a land/plot or combination of more than one land/plot over which a building is to be constructed as approved by the Implementing Authority.

Building Plinth

Means the footprint of a structure or the ground cover occupied by a structure.

Built-Up Area

Shall mean the area covered by a building on all floors including cantilevered portions, if any, but except the areas excluded specifically under these Regulations.

Balcony

The platform projecting from the wall of a building with a balustrade or railing along its outer edge, often with access from a door or window.

Building Setback

Shall mean a distance between the plot boundary and building or distance between buildings.

Building Inspector

Shall mean a technical person authorized by the Implementing Authority to inspect buildings and their premises during construction / renovation / addition / alteration.

Carpet Area

(Otherwise called "Net Internal Floor Area") shall mean the covered area on all floors, excluding the area of the walls.

Competent Authority

Shall mean the Department of Human Settlement, Ministry of Works and Human Settlement.

Clustered Village

Means an existing village settlement with traditional houses constructed in close proximity to one another with distinct form and character.

Construction

Means any erection and/ or alteration of any building or structure.

Construction Permit

Means a valid permission, or authorization, in writing by the 'Implementing Authority' to carry out development, issued to a legally empowered developer, with due regard to the prevailing Act/ Regulations in force at the time of issue.

Chimney

Shall mean a construction by means of which a flue is formed for the purpose of carrying products of combustion to the open air and includes a chimneystack and the flue pipe.

Common Wall

Shall mean a structure joining two or more properties.

Combustible Material

Shall mean that material which when burnt adds heat to a fire when tested for combustibility in accordance with the IS: 3808-1966 Method of Test for Combustibility of Building Material, National Building Code, India.

Convenience Shop

Shall mean shops each with a carpet area not exceeding 20 sq.m and comprising those dealing with day-to-day requirements, as distinguished from wholesale trade or retail shopping. It includes:

- i. Food grain or ration shops
- ii. Doma shops/kiosks
- iii. Shops for collecting and distribution of clothes and other materials for cleaning and dyeing establishments
- iv. Tailor or darner shops
- v. Groceries, confectioneries, general provision shops
- vi. Hair dressing saloons and beauty parlors
- vii. Bicycle / scooter/ motorcycle hire shops
- viii. Motorcar hire shops
- ix. Vegetable and fruits shops
- x. Milk and milk products shops
- xi. Medical and dental practitioners' dispensaries or clinics, pathological or diagnostic clinics and pharmacies
- xii. Florists.
- xiii. Shops dealing in ladies ornaments such as bangles, cosmetics, etc.
- xiv. Shops selling bakery products
- xv. Newspaper, magazine stalls and circulating libraries
- xvi. Wood, coal and fuel shops
- xvii. Books and stationery shops or stores
- xviii. Cloth and garment shops
- xix. Plumbers, electricians, radio, television and video equipment repair shops and video libraries
- xx. Restaurants and eating houses
- xxi. Shoes and sports shops

xxii. Hardware shops

xxiii. Taxi stand office

With the approval of the Implementing Authority, this list may be added to, or altered, or amended from time to time.

Corridor

Shall mean a common passage or circulation space including a common entrance hall.

Courtyard

Shall mean a space permanently open to the sky within the site around a structure or surrounded either partially or completely by a structure.

Covered Area

Shall mean the area covered by a building on the ground floor.

Developer

Shall mean the person, who is legally empowered to construct or to execute work on a plot of land, building unit, building or structure, or where no person is empowered, the owner of the building unit, building or structure.

Development

Means the carrying out of building construction, engineering, mining, or other operations, in, over, or under land or water or the making of any material or structural change including demolition of building or reclamation of land or any change in use of the premises and includes redevelopment and layout and subdivision of any land.

- i. **Plotted Development:** Means the carrying out of development leading to the subdivision of land into plots.
- ii. **Flatted Development:** Means the carrying out of development on a site leading to the construction of flats.

Deviation

Shall mean carrying out or undertaking a building construction or land development activity in departure from the sanctioned/ approved plans, permissions or orders, irrespective of the degree of change.

Drain

Shall mean a system or a line of pipes, with their fittings and accessories such as manholes, inspection chambers, traps, gullies, floor traps, used for drainage of buildings or yards appurtenant to the buildings within the same catchments. A drain includes an open channel for conveying surface water or a system for the removal of any liquid.

Dwelling Unit

Means a shelter consisting of residential accommodations for one household.

Enclosed Staircase

Shall mean a staircase separated by walls and doors from the rest of the building.

Engineer

Shall mean a person with a degree or diploma in civil and /or structural engineering from any recognized Institute, College, or University of Engineering accredited by the respective country's accreditation board to impart professional degrees in engineering.

Existing Building

Shall mean a building or a structure existing before the commencement of these Regulations.

Existing Use

Shall mean use of a plot of land, a building, or a structure existing before the commencement of these Regulations.

Exit

Shall mean a passage, channel of means of egress from any building, storey or floor area to a street or other open space of safety; horizontal exit, outside exit and vertical exit having meanings at (i), (ii) and (iii) respectively as under:

- i. "HORIZONTAL EXIT": shall mean an exit which is a protected opening through or around at firewall or bridge connecting two or more buildings.
- ii. "OUTSIDE EXIT": shall mean an exit from a building to a public way, to an open area leading to a public way, or to an enclosed fire resistant passage leading to a public way.
- iii. "VERTICAL EXIT": shall mean an exit used for ascending or descending between two or more levels, including stairways, smoke-proof towers, ramps, escalators and fire escapes.

External Wall

Shall mean an outer wall of a building not being a party wall even though adjoining a wall of another building and also shall mean a wall abutting on an interior open space of any building.

Escape Route

Shall mean any well-ventilated corridor, staircase or other circulation space, or any combination of the same, by means of which a safe place in the open air at ground level can be reached.

Fire And/ Or Emergency Alarm System

Shall mean an arrangement of call points or detectors, or sensors, or sounders, and other equipment for the transmission and indication of alarm signals working automatically or manually in the event of fire.

Fire Proof Door

Shall mean a door or shutter fitted to a wall opening, and constructed and erected with the requirement to check the transmission of heat and fire for a specified period. Fireproof doors for various purposes must conform to the specifications and performance standards as laid out in the Bhutan Building Code of Bhutan 2003, (BTS-015-2003, Part 2 Section 6 Fire Protection).

Fire Pump

Shall mean a machine, driven by external power for transmitting energy to fluids by coupling the pump to a suitable engine or motor, which may have varying outputs/capacity but shall be capable of having a pressure of 3.2kg/cm² at the topmost level of a multi-storied building.

Fire Resistance

Shall mean the time during which a fire resistant material, i.e. material having a certain degree of fire resistance, fulfils its function of contributing to the fire safety of a building when subjected to prescribed conditions of heat and load or restraint. The fire resistance test of structures shall be done in accordance with IS: 3809-1966 Fire Resistance Test of Structure.

Fire Separation

Shall mean the distance in meters measured from any other building on the site or from another site, or from the opposite side of a street or other public space to the building.

Fire Service Inlet/ Hydrant

Shall mean a connection provided at the base of a building for pumping up water through-in-built fire-fighting arrangements by fire service pumps in accordance with the recommendation of the Chief Fire Officer.

Fire Tower

Shall mean an enclosed staircase, which can only be approached from the various floors through landings or lobbies separated from both the floor area and the staircase by fire resisting doors. The specifications and performance standards of the enclosing walls, materials and doors shall be as per those stated in I.S3809-1966 Fire Resistance Test of Structure.

Floor

Shall mean the lower surface in a storey on which one normally walks in a building, and does not include a mezzanine floor. The floor at ground level with a direct access to a street or open ground/ land shall be called the ground floor; the ground floor shall also be counted as a floor in defining the number of floors. (In the estimation of floors, the actual areas or extent of the floors shall have no consideration) The nomenclature of the other floors shall be as follows: the floor above the ground floor shall be termed as floor 1, with the next higher floor being termed as floor 2, and so on upwards.

Floor Area

Shall mean the total area of the floor including the area of walls.

Front

Front as applied to a plot; shall mean the portion facing the road and in case of plot abutting on more than one road the plot shall be deemed to front on all such roads / means of access.

Footing

Shall mean a foundation unit constructed in brickwork, stone masonry or concrete under the base of a wall or column for the purpose of distributing the load over a large area.

Foundation

Shall mean that part of the structure, which is in direct contact with and transmitting loads to the ground.

Garage/ Parking – Private

Shall mean a building or a portion thereof designed and used for the parking of vehicles.

Garage/ Parking – Public

Shall mean a building or portion thereof, designed other than as a private garage, operated for gain, designed and/or used for parking motor-driven or other vehicles.

Ground Level

Shall mean the lowest ground level within the plot.

Group Housing

Shall mean a housing scheme wherein two or more independent dwelling units or buildings are constructed in an undivided parcel of land.

Habitable Room

Shall mean a room occupied or designed for occupancy for human habitation and uses incidental thereto, including a kitchen if used as a living room, but excluding a bath-room, water closet compartment, laundry, serving and storing, pantry, corridor, cellar, attic, store-room and spaces not frequently used.

Hazardous Material

Shall mean: radioactive substances and material which is highly combustible or explosive and/or which may produce poisonous fumes, explosive emanations, or storage, handling, processing or manufacturing of which may involve highly corrosive, toxic, obnoxious alkalis or acids or other liquids; other liquids or chemicals producing flame, fumes, explosive, poisonous, irritant or corrosive gases or which may produce explosive mixtures of dust or fine particles capable of spontaneous ignition.

Biological substances causing viruses, infections or which could cause uncontrolled bacterial growth harmful to humans, livestock, or plant life.

Height of Building

Shall mean the vertical distance measured from the level of the lowest natural ground level, up to the top of the finished level of the top most floor slab in case of flat roofs and up to the midpoint of the height of the sloping roof. The height of the sloping roof shall be taken as an average height of the relevant floor. The number of floors specification includes the ground floor. In addition to the precinct regulations, the height of buildings shall be governed by the

“Guidelines on Traditional Architecture of Bhutan” and by the overall allowable building heights.

Height of a Room

Shall mean the vertical distance measured from the finished floor surface to the finished ceiling/slab surface. The height of a room with a pitched roof shall mean the average height between the finished floor surface and the bottom of the eaves and the bottom of the ridge.

Implementing Authority

Means a Dzongkhag Administration. It may also refer to Paro Valley development Authority and Gewog Administration to the extent that powers, duties or functions under these Rules are delegated to it in writing.

Land Development

Means any change to the use of land, subdivision of land or development of sites including excavations.

Layout

Shall mean laying out a parcel of land or lands into smaller plots for building on, with laying of roads / streets, including formation, levelling, blacktopping or paving of the roads and footpaths, etc. and laying of the services and amenities such as water supply, drainage, street lighting, open spaces, etc.

Lift

Shall mean a mechanically guided car, platform or transport for persons and materials between two or more levels in a vertical or substantially vertical direction.

Loft

An Intermediary floor between two floors on a residual space in a pitched roof, above normal floor level with a maximum height of 1.5m and which is constructed or adopted for storage purpose.

Mezzanine Floor

Shall mean an intermediate floor with height not more than 2.3m, between two main floors overhanging or overlooking a floor beneath and accessible only from the lower floor. The total floor area of the Mezzanine floor should not exceed 1/3rd of the lower area. The floor area of the mezzanine floor shall be considered for calculating the total built up area of the building.

Mixed-Use

Means use of a building primarily for residential purposes with parts of it used for commercial activities.

Municipal Boundary

Shall mean the boundary of Paro Thromde as defined by the Royal Government/Competent Authority.

Non-Combustible

Shall mean not liable to burn or add heat to a fire when tested for combustibility in accordance with the IS: 3808-1966 Method of Test for Combustibility of Building Materials.

Occupancy or Use

Shall mean the principal occupancy or use for which a building, or a part of it, is used or intended to be used, including contingent subsidiary occupancies; mixed occupancy building being those in which more than one occupancy are present in different portions of the building.

Occupancy Certificate

Shall mean an official document issued by the Implementing Authority certifying that the building is safe and fit for occupation.

Owner

Shall mean person in whose name the land or property is registered as per the Land Records with the N.M.C. and who receives rent for the use of the land or building or would be entitled to do so if it were let.

Parapet

Shall mean a low wall or railing built along the edge of roof or a floor.

Parking Space

Shall mean an area, enclosed or unenclosed, covered or uncovered, sufficient in size to park vehicles with space for movement. Parking spaces shall be served by a driveway connecting them with a street or alley and permitting ingress or egress of vehicles.

Partition

Shall mean an interior non-load bearing divider wall not more than one storey or part thereof in height.

Plinth

Shall mean a portion of a building between the surface of the surrounding ground level and the finished floor surface immediately above the ground.

Plinth Height

Shall mean the height of the finished floor of the lowest floor level above the natural ground level.

Plinth Area

Shall mean the built-up covered area measured at the floor level of the basement or of any storey, including the walls.

Plot

Shall mean a piece of land enclosed by definite boundaries fixed by the Implementing Authority.

Porch

Shall mean a covered surface supported on pillars or otherwise for the purpose of a pedestrian or vehicular approach to a building.

Precinct Plan

Shall mean a geographical area designated in the approved Urban Development Plan/ Structure Plan/ Local Area Plan for the purpose of regulating land uses within the approved municipal boundary.

Public Utility, Public Facility, Services Buildings

Shall include buildings or works developed or undertaken by the Govt./ Semi-Govt. or Public Undertaking only, such as sub-station, and receiving station of the Electricity Dept., Building for infrastructural facilities like bus service, water supply, drainage, sanitation, domestic garbage disposal, pumping station, electricity, purification plant, police building, post and telegraph and telecommunication, public urinals, milk supply, and public telephone booth, fire brigade station, ward and zonal offices of Implementing Authority, taxis, scooter and cycle stand and parking lot, garden, nursery, playground and open spaces, canal, communication network, first aid medical center, primary health center, dispensary, library, reading room and religious buildings/ places of public worship.

Property

Shall mean either a business or industrial premise; a single domestic dwelling, e.g. a house or an apartment; or a building with multiple domestic dwellings, businesses or industries or empty lot.

RCC

Means Reinforced Cement Construction

Registered Architect/ Engineer/ Structural Designer/ Urban Planner/ Designer/ Developer

Shall mean respectively a person registered by the Implementing Authority or any other recognized institutions/ organizations for the purpose of these Regulations as an Architect, Engineer, Structural Designer, Urban Designer, Urban Planner or Developer, under these Regulations or any other Rules prevailing for the area.

Recreation and Open Spaces

Shall mean an area primarily intended for active and passive recreational purposes.

Referral Authority

Shall mean an Authority created by the Royal Government of Bhutan to which certain aspects of a proposed development may be required to be referred to, and a "no objection certificate" obtained from, before the Implementing Authority scrutinizes/examines the proposal for giving approval.

Residential Building

Shall mean a building used for human habitation including garages and out houses.

Residential Use

Shall mean a use of any building unit for the purpose of human habitation and includes similar activities like hotels, lodges, inns, guesthouses, and hostels.

Right Of Way

(ROW) shall mean an area reserved for road carriageway, central verge, footpath, roadside drains, avenue plantations and utilities.

Road/ Street

Shall mean any public expressway, highway, boulevard, street, lane, pathway, alley, stairway, passageway, carriageway, footway, square place or bridge, whether a thoroughfare or not, over which the public have a right of passage or access or have passed and had access uninterruptedly for a specified period, whether existing or proposed in any scheme, and includes all bunds, channels, ditches, storm-water drains, culverts, sidewalks, traffic islands, road-side trees and, hedges retaining walls, fences, barriers and railings within the street lines.

Row Houses

Shall mean a row of houses with only front and rear open spaces.

Rural Area

Means any area or settlement outside the declared municipal boundary. It includes the semi- and peri-urban areas that lie immediately outside the municipal boundary.

Setback

Shall mean the distance between the plot boundary and the outer edge of the building or the distance between buildings within a plot, wherein built-up area shall not be permitted except specifically permitted projections under this regulation.

Street-Level or Grade

Shall mean the officially established elevation or grade of the center line of the street upon which a plot fronts, and if there is no officially established grade, the existing grade of the street at its midpoint.

Sanitary Inspector

Shall mean a technical person authorized by the Implementing Authority to inspect and regulate water supply, drainage and sanitation.

Service Road

Shall mean a road/ lane provided at the front, rear or side of a plot for service purposes and includes a road/ lane provided along a major road or expressway to cater to local traffic.

Shopping Centre or Commercial Centre

Shall mean group of shops, offices and/ or stalls designed to form market/office complex.

Site Development

Means the carrying out of engineering, mining, or other operations, in, over, or under land or water or the making of any material or structural change including demolition of building or reclamation of land or any change in use of the premises and includes redevelopment and layout and subdivision of any land.

Stair Cover

Shall mean a structure with a covering roof over a staircase and its landing built to enclose only the stairs for the purpose of providing protection from the weather, and not to be used for human habitation.

Storey

Shall mean the portion of a building included between the surface of any floor and the surface of the floor next above it, or if there be no floor above it, then the space between any floor and the ceiling next above it.

Sub-Division

Shall mean the division of a single plot or building unit into two or more legal parts.

Tenement

Shall mean an independent dwelling unit with a kitchen, or a cooking space.

Tenement Building / Ownership Flats

Shall mean a residential building constructed in a detached manner, or in a semi-detached manner, or as ownership flats in a building unit, each being designed and constructed for separate occupation with independent provision of bath and WC.

Travel Distance

Shall mean the distance from the remotest point of a building to a place of safety, be it a vertical exit or a horizontal exit or an outside exit, measured along the line of travel.

Urban Planner/Designer

Shall mean a person with degree or diploma in Urban Planning/ Designing from an Institute, College or University accredited by the respective country's accreditation board to impart professional degrees in Urban Planning/ Designing.

Unauthorized Building

Shall mean a building or structure which was constructed without sanction from the Implementing Authority empowered to control building pattern and form, at the time the concerned construction took place.

Ventilator

Shall mean an appliance or an aperture which is usually used for the purpose of ventilating a room or space.

Water Closet (Wc)

Shall mean a privy with an arrangement for flushing the pan with water, but does not include a bathroom. It shall not be smaller in floor area than one square meter.

Water Course

Shall mean a natural channel or an artificial channel formed by draining or diversion of a natural channel meant for carrying storm and wastewater.

Warehouse or Godown

Shall mean a public or private building, the whole or a substantial part of which is used or intended to be used for the storage of goods whether for storing or for sale or for any similar purpose.

Wholesale Trade

Shall mean a business or enterprise, which operates on the basis of buying, receiving, transiting or taking goods from the producers and selling, trading, distributing such goods and products to retailers, convenience shops, etc., but not to the end users. Any trade where ninety percent of the premises used is for the storage of bulk goods, cartons and crates of goods, disassembled goods or goods to be passed on to retail units or direct sales outlets shall be deemed to be a Wholesale Trade use/ activity.

Window

Shall mean an opening, other than a door, to the outside of a building, which provides all or part of the required ventilation.

Interpretation and Meaning of Expression

The use of present tense includes future tense, the masculine gender includes feminine gender and singular includes plural or vice versa.

II PLANNING

LAND USE PLANNING

One of the first studies in the analysis is the Existing Land Use Plan, which has been generated along with the Base Map. This has been analysed for its suitability in terms of the carrying capacity of infrastructure, in terms of the mismatches in usages, which emerge, and in terms of the impact of various uses on the road and transport system. Modifications has been made in the existing land use and a new land use system has been planned, taking into account the new areas of the valley. A system of Zoning has been established which has been linked to each precincts with a land use schedule, maximum density allowed, maximum Floor Area Ratio, building setbacks and percentages of ground coverage on plots.

Requirements for leaving spaces for parking, septic tanks and other essential on-plot has been stated. Requirements for setting various structures away from road/building frontages has been stated (such as water storage tanks, out-houses, sheds, carports, etc.). The Valley Development Plan preparation has studied the appropriateness and sustainability of the emerging trends for land use in the currently identified commercial as well as other zones.

The basic land uses in the plan are segregated into two major categories (Cultural Landscape and Built Environment zones), which has been further segregated precincts.

VISION AND OBJECTIVE

The underlying principle adopted in the Paro Valley Development Plan is that of Smart Growth, which primarily concentrates growth in compact walk able urban hubs to avoid sprawl. The vision, aims and objectives has been drawn imbued with these principles as follows:

Vision

"Preserve Paro Valley as an image of Bhutan's Cultural Landscape"

Objectives

- Conserve significant Cultural Landscape of the valley
- Provide infrastructure for solid waste management, water supply and sewage for the development of the focus areas.
- Promote sustainable tourism development with benefits for the local population.
- Promote Paro Valley by adopting principles of smart growth.

CULTURAL LANDSCAPE ZONE

Cultural landscapes serve as a legacy for everyone. Benefits from the preservation of cultural landscapes are enormous. Similar to the historic buildings, landscapes reveal aspects of a country's origins and development. Through their form, features, and the ways they are used, cultural landscapes reveal much about our evolving relationships with the natural world. They provide scenic, economic, ecological, social, recreational, and educational opportunities, which help individuals, communities and nations, understand themselves.

"The principal reason why we seek to preserve our heritage is to preserve our own identity, to give us a point of reference from which we can measure ourselves".

Landscape legacies are irreplaceable and they are alarmingly at risk. This happens because of neglect and inappropriate development. Too often the long-term environmental and cultural ramifications of short-term decisions are not understood and as a result we lose a unique portion of our cultural patrimony. The constant effort it takes to protect our nation's cultural landscapes is everyone's responsibility. Their ongoing preservation and interpretation can yield an improved quality of life and a sense of place and identity for future generations.

The protection of the Cultural Landscape is an essential part of the PVDP vision and strategy. Beyond the importance of maintaining and enhancing local ecosystems, the Cultural Landscape is one of the key elements that contribute to the rural character of the Paro Valley. In addition the Cultural Landscape, in particular the Paddy Fields and Historic sites, is integral to the future of agricultural production and unique identity in the Valley and must be managed mindfully.

The Development Plan recognizes the ecological, aesthetic and productive importance of the natural environment and sets out guiding principles and development checklists to be observed in relation to:

*Landscape protection
Groundwater protection
Watercourse protection
Landform protection; and
Tree protection*

Table A-1 Precincts schedule under Cultural Landscape Zone

Precinct	Characteristics	Objective	Special Conditions
Agriculture Precinct	Predominantly Chhuzhing located along the low lying plains of the valley	Preserve Cultivation of agricultural produce	As a matter of principle, buildings and infrastructure will be prohibited. Exceptions, only for agricultural purposes, include small-scale buildings and infrastructures as well as linking paths.
Religious Precinct	Places of religious, cultural and historical significance along with the immediate surroundings. Chortens, Mani Walls, Lhakhangs, prayer wheels, statues, monasteries and Heritage Village	Preserve and enhance in order to maintain the sanctity	Extensions and facilities directly related to the religious and heritage structures are allowed. Basic tourism related infrastructure should be provided (e.g. information kiosk and toilets). A buffer area around each religious and heritage site should be kept free of any construction. During the festival period, camping with basic facilities (water supply and toilets) is allowed nearby the religious and heritage sites. Good accessibility by public transport and the provision of related infrastructure are to be ensured. In suitable areas, a restricted number of parking areas can be provided.
Dzong Precinct	Rinpung Dzong and its immediate surrounding areas	Preserve and enhance	No construction will be allowed in this precinct except for restoration works and provision of amenities and services related to the Dzong precinct enhancement.
Heritage village Precinct	Historic or traditional mixed use settlements earmarked for conservation	Preserve and enhance	All the existing structures should be conserved. Renovation and restoration should be done with necessary care and attention after getting necessary clearances from the Department of Culture. Activities related to local handicraft and Home Stay will be permitted.
Royal Precinct		Preserve and enhance	Development will be under royal prerogative

Precinct	Characteristics	Objective	Special Conditions
Open-space Precinct	Recreation, playgrounds and parks	Preserve and enhance	<p>No construction will be allowed in this precinct except for infrastructure related to sports and recreational facility in the designated area.</p> <p>Open parkways, children’s playground, rock garden, water fountains, amphitheatres, gazebos, trellis, outdoor cafes, information kiosks, public toilets, and recreational landscape elements.</p> <p>Special attention to be given to public safety especially through provisioning of adequate lighting, elimination of blind spots, safe infrastructure design, and universal accessibility to public amenities like toilets and pathways.</p>
Water front Precinct	Buffer of 30 m for Pachhu and Dochhu. 15 m for major streams	Preserve and enhance identified water front development areas	<p>No development is allowed within 30 meters from the two rivers and 15 meters from the edge of the stream.</p> <p>This buffer has been incorporated into the open space system and will form part of the open recreational area.</p> <p>Footpaths can be proposed along this buffer to allow easy access for residents to move between the forest and the riverside.</p> <p>Open space amenities like parks, gardens, and active recreational sports facilities like soccer fields, outdoor basketball and tennis courts etc. can be permissible.</p> <p>Sporting facilities and sewage treatment plants may be constructed after getting necessary approvals.</p>
Environment Sensitive Precinct	Slope more than 50% and high hazard areas	Preserve	<p>These are the areas that are environmentally fragile in terms of slope and flood hazard and hence no construction will be allowed.</p> <p>Activities related to environmental enhancement and protection. Existing structures may be retained with prior approval, but new construction and extension of old structures will not be permitted.</p>

Precinct	Characteristics	Objective	Special Conditions
Forest Precinct	Existing Government reserved forest and community forest	Preserve	<p>The existing forest area and the forest boundary should be preserved.</p> <p>No buildings should be constructed in the forest precinct, with the exception for land identified for substitution in lieu of chhuzhing conversion. However, the land substitution will have to be allocate in clusters and not as an individual isolated areas.</p> <p>Footpaths, cycle tracks, walkways, and landscape elements for public parks will be permitted. Preservation of existing vegetation and use as passive outdoor recreation area</p>

Table A-2 Precinct Schedule showing Plot Coverage, Setbacks, and Allowable Floor for Precincts under Cultural Landscape Zone

NO	Precinct	Min Plot Size	Max. Plot Coverage	Max Height	Minimum Setback (m)			Compound Wall
		(Decimal)	(%)	(Floors)	Front	Side	Rear	Ht. In m
P1	Agriculture	-	-	-	-	-	-	-
P2	Forest	-	-	-	-	-	-	-
P3	Heritage	As Per Dept. Of Culture, MoHCA						
P4	Open-space	-	-	-	-	-	-	-
P5	Water front	-	-	-	-	-	-	-
P6	Environment Sensitive	-	-	-	-	-	-	-
P7	Dzong	As Per Dept. Of Culture, MoHCA						
P8	Heritage village	-	50%	3	2	2	2	1.5
P9	Royal	-	-	-	-	-	-	-

BUILT ENVIRONMENT ZONE

The design, scale and location of buildings within the landscape contribute to the visual and contextual character of a region or place. The eclectic mix of typical rural, traditional Bhutanese built form that characterises the Paro Valley, is starting to be influenced by a stronger market forces of building contemporary building which is not sympathetic on architectural design and the application of natural and traditional building materials.

The Development Plan requires the submission of a building application for any development within the Paro Valley Development Plan area. A building application is required so that the PVDA can assess proposals for development against the 'Objectives', 'Guiding principles'.

Table A-3 Precincts schedule under Built Environment Zone

Precinct	Characteristics	Objective	Special Conditions
Town Centre Precinct	Tshongdue area	High density mixed use and commercial development	The Town centre will have the highest density allowing buildings up to five floors with 60% ground coverage. Residential, incidental to and limited to 50% of the built up area can be permissible.
Neighbourhood Node Precinct	Provisioning of amenities and facilities accessible within comfortable distance at Shaba, Bondey, Lamgong and Luchi	Medium density mixed use and commercial development for amenities and services	LPG delivery centres and Fuel station can be permitted under the fulfilment of all relevant safety norms. Only two storey building shall be allowed for plots abutting the primary road / high way.
Rural Residential Precinct	Kamzhing, Khimsa and Orchards within 0 to 30 degree slope	Low density residential and mixed use development	This precinct will have building up to two floors with 40% ground coverage. Exemptions may be made for existing traditional buildings that are re-constructed in the same fashion as the existing one. Institutional use may be permitted on a minimum plot size of 1000 sq.m Resorts, Hotels with boarding and lodging facilities in a minimum of 2,500sq.m plot may be permitted.
Rural Residential Precinct LD (Low Density)	Kamzhing, Khimsa and Orchards within 31 to 50 degree slope	Very low density residential development	This precinct will have building up to one floors only with 20% ground coverage.
Traditional Village Precinct	Traditional mixed use settlements	Low density residential development	This precinct will have building up to three floors with 40% ground coverage if done using traditional materials and techniques, else only two storey will be permissible if constructed using contemporary methods like reinforced cement concrete. Ancillary structures like store and cattle sheds of up to one storey only will not be considered under the coverage. Activities related to local handicraft and Home Stay will be permitted.

Precinct	Characteristics	Objective	Special Conditions
Scattered Settlements Precinct	Traditional independent settlements	Very Low density residential development	<p>This precinct will have residential use only and building up to three floors with 20% ground coverage will be permissible.</p> <p>Ancillary structures like store and cattle sheds of up to one storey only will not be considered under the coverage.</p> <p>Activities related to local handicraft and Home Stay will be permitted.</p>
Institutional Precinct	Land earmarked for Schools, offices and other institutions	Medium Density development	<p>This precinct will have building up to three floors only with 30% ground coverage</p> <p>Residential and other activities incidental to the main institutional use, provided only 20 % of the site should be used for such activities.</p>
Industrial Precinct	Land earmarked for industrial and manufacturing units	Medium Density development for economic activity	<p>This precinct will have building up to two floors only with 50% ground coverage</p> <p>Residential dwelling only for industrial workers and other public utility service staff, working within the industrial premises (subject to N.O.C. from authorities such as the National Environment Commission (NEC)/ Dept. of Trade and Industry).</p>
Military Precinct	Land earmarked for Military use	Security	The building construction will have to be in line with the traditional architectural guidelines and the colour code for Paro.
Service Precinct	Bus terminal, Taxi stand, Truck parking, workshops, stores and warehouse.	Medium Density development for economic activity and services	This precinct will have building up to two floors with 50% ground coverage.
Tourism Intensive Precinct	Land earmarked for tourism related products and services	Low density development for tourism related infrastructure	This precinct will have building up to two floors with 25% ground coverage.
Airport Precinct	Existing Airport Area	As per Dept. of Civil Aviation	The building construction will have to be in line with the traditional architectural guidelines and the colour code for Paro.

Table A-4 DCR for Precincts under Built Environment Zone

NO	Precinct	Min Plot Size	Max. Plot Coverage	Max Height	Minimum Setback (m)			Compound Wall
		(Decimal)	(%)	(Floors)	Front	Side	Rear	Ht. In m
D1	Town Center Precinct	5.5	60%	5	1.5	2	3	0
D2	Neighborhood Node Precinct	13.0	40%*	3*	3 / 5	3	3	0
D5	Rural Residential Precinct	25.0	40%	2	3 / 5	2	2	1.5
D5	Rural Residential Precinct (LD)	25.0	20%	1	3 / 5	2	2	1.5
D3	Traditional village Precinct	13.0	40%	3	3 / 5	2	2	1.5
D4	Scattered settlements Precinct	25.0	20%	3	3 / 5	2	2	1.5
D6	Institutional Precinct	25.0	30%	3	3 / 5	3	3	1.5
D7	Industrial Precinct	25.0	50%	2	3 / 5	3	3	1.5
D8	Military Precinct	-	-	-	-	-	-	-
D9	Service Precinct	13.0	50%	2	3 / 5	3	3	1.5
D10	Tourism Intensive Precinct	50.0	25%	2	3 / 5	2	2	1.5
D11	Airport Precinct	As Per Dept. Of Civil Aviation						

**Note 1: Neighborhood Node Precinct – Only 2 storey building will be permissible on plots abutting the primary road/Highway with 60% ground coverage.*

Note 2: Plot Coverage - The maximum plot coverage shall be within the setback rules as prescribed in this regulation.

Note 3: All plots directly abutting the Primary Road shall have a minimum front setback of 5 meters.

Note 4: Projected Balconies - Cantilevered balconies (not enclosed) projecting up to 1.2 m in the setback area from the ground floor level external wall face shall be permitted. Projections beyond 1.2 m may be permitted provided they do not extend into the setback areas and they are structurally safe. Such projections/structures shall not be allowed in the front elevation of a building. In case of buildings, where the setback is less than 3 meters, cantilevered balconies shall not be allowed only at the rear.

Note 5: The above setback and coverage requirement shall not be applicable for single storey ancillary buildings (temporary or semi-permanent farm related structures like cattle sheds and farm produce storage facilities).

Note 6: For the detailed Precinct Schedule that addresses the local level issues please refer the Precinct Schedule framed under each LOCAL AREA PLAN.

PRECINCT USE TABLE

The Precinct Table identifies the use classes permitted in the various precinct identified in the Development Plan. The permissibility of any use class is determined by cross reference between the list of use classes on the left hand side of the Precinct Table and the list of Precincts at the top of the Precinct Table.

The symbols used in Precinct Table have the following meanings:

'P' means that the use is **permitted** by the Scheme providing the use complies with the relevant development standards and requirements of the Scheme.

'N' means that the use is not permitted unless the local government has exercised its discretion by granting planning approval.

'X' means a use that is **not permitted** by the Scheme.

Table A-5 Precinct Use Table

Use Classes	Cultural Landscape Zone										Built Environment											
	Agriculture Precinct	Forest Precinct	Heritage Precinct	Open-space Precinct	Water front Precinct	Environment Sensitive Precinct	Dzong Precinct	Heritage village Precinct	Royal Precinct	Town center Precinct	Neighborhood node Precinct	Rural Residential Precinct	Rural Residential Precinct (LD)	Traditional village Precinct	Scattered settlements Precinct	Institutional Precinct	Industrial Precinct	Military Precinct	Service Precinct	Tourism Intensive Precinct	Airport Precinct	
1 Aged or Dependent Persons Dwelling	X	X	X	X	X	X	-	X	-	N	P	N	N	X	X	X	X	-	X	X	-	
2 Agriculture	P	X	X	X	X	X	-	X	-	X	X	P	P	P	P	X	X	-	X	X	-	
3 Agroforestry	X	P	X	P	X	P	-	X	-	X	X	X	P	X	X	X	X	-	X	X	-	
4 Amusement Parlour	X	X	X	X	X	X	-	X	-	P	P	X	X	X	X	X	X	-	X	X	-	
5 Ancillary Accommodation	X	X	X	X	X	X	-	N	-	X	X	P	P	P	P	X	X	-	X	X	-	
6 Animal Establishment	X	X	X	X	X	X	-	X	-	X	X	P	P	P	P	X	X	-	X	X	-	
7 Animal Husbandry	X	X	X	X	X	X	-	X	-	X	X	X	N	P	P	X	X	-	X	X	-	
8 Bed and Breakfast	X	X	X	X	X	X	-	X	-	P	P	P	P	P	P	X	X	-	X	X	-	
9 Camping Area	X	X	X	P	X	P	-	X	-	X	X	X	N	X	X	X	X	-	X	X	-	
10 Car Park	X	X	X	P	P	X	-	X	-	P	P	X	X	X	X	P	P	-	P	X	-	
11 Child Care Premises	X	X	X	X	X	X	-	X	-	P	P	N	N	X	X	X	X	-	X	X	-	
12 Cinema/Theatre	X	X	X	X	X	X	-	X	-	P	P	X	X	X	X	X	X	-	X	X	-	

	Use Classes	Cultural Landscape Zone									Built Environment											
		Agriculture Precinct	Forest Precinct	Heritage Precinct	Open-space Precinct	Water front Precinct	Environment Sensitive Precinct	Dzong Precinct	Heritage village Precinct	Royal Precinct	Town center Precinct	Neighborhood node Precinct	Rural Residential Precinct	Rural Residential Precinct (LD)	Traditional village Precinct	Scattered settlements Precinct	Institutional Precinct	Industrial Precinct	Military Precinct	Service Precinct	Tourism Intensive Precinct	Airport Precinct
13	Civic Use	X	X	X	X	X	X	-	X	-	X	X	X	X	X	X	P	X	-	X	X	-
14	Club Premises	X	X	X	X	X	X	-	X	-	P	N	X	X	X	X	X	X	-	X	X	-
15	Community Purpose	X	X	X	P	X	X	-	X	-	X	X	P	N	X	X	P	X	-	P	X	-
16	Consulting Rooms	X	X	X	X	X	X	-	X	-	P	P	N	X	X	X	X	X	-	X	X	-
17	Convenience Store	X	X	X	X	X	X	-	X	-	P	P	N	X	N	X	X	X	-	X	X	-
18	Corrective Institution	X	X	X	X	X	X	-	X	-	X	X	N	X	X	X	P	X	-	X	X	-
19	Crematorium	X	N	X	X	X	N	-	X	-	X	X	X	X	X	X	X	X	-	X	X	-
20	Eco-tourist Facility	X	X	X	X	X	X	-	X	-	X	X	P	N	X	X	X	X	-	X	P	-
21	Educational Establishment	X	X	X	X	X	X	-	X	-	X	X	N	X	X	X	X	P	-	X	X	-
22	Equestrian Facility	X	X	X	X	X	X	-	X	-	X	X	P	P	P	P	X	X	-	X	X	-
23	Exhibition Centre	X	X	X	P	N	X	-	X	-	P	P	X	X	X	X	X	X	-	X	X	-
24	Family Day Care	X	X	X	X	X	X	-	X	-	P	P	P	N	X	X	X	X	-	X	X	-
25	Fast Food Outlet	X	X	X	X	X	X	-	X	-	P	P	X	X	X	X	X	X	-	X	X	-
26	Food and Beverage Production	X	X	X	X	X	X	-	X	-	P	P	N	X	X	X	X	X	-	X	X	-
27	Fuel Depot	X	X	X	X	X	X	-	X	-	P	P	X	X	X	X	X	X	-	P	X	-
28	Garden Centre	X	X	X	P	P	X	-	X	-	X	X	N	N	X	X	X	X	-	X	X	-
29	Grouped Dwelling	X	X	X	X	X	X	-	X	-	P	P	N	X	X	X	X	X	-	X	X	-
30	Holiday Home	X	X	X	X	X	X	-	X	-	P	N	N	N	N	N	X	X	-	X	P	-
31	Home Business	X	X	X	X	X	X	-	X	-	P	P	P	P	P	P	X	X	-	X	X	-
32	Home Occupation	X	X	X	X	X	X	-	P	-	P	P	P	P	P	P	X	X	-	X	P	-
33	Home Office	X	X	X	X	X	X	-	P	-	P	P	P	P	P	P	X	X	-	X	P	-
34	Hospital	X	X	X	X	X	X	-	X	-	X	X	X	X	X	X	X	X	-	P	X	-
35	Hotel	X	X	X	X	X	X	-	X	-	P	N	X	X	X	X	X	X	-	X	X	-
36	Industry - Cottage	X	X	X	X	X	X	-	P	-	P	P	P	N	P	P	X	X	-	P	P	-
37	Industry - General	X	X	X	X	X	X	-	X	-	X	X	X	X	X	X	X	N	-	X	X	-
38	Industry - Light	X	X	X	X	X	X	-	X	-	X	X	X	X	X	X	X	N	-	X	X	-

		Cultural Landscape Zone									Built Environment											
Use Classes		Agriculture Precinct	Forest Precinct	Heritage Precinct	Open-space Precinct	Water front Precinct	Environment Sensitive Precinct	Dzong Precinct	Heritage village Precinct	Royal Precinct	Town center Precinct	Neighborhood node Precinct	Rural Residential Precinct	Rural Residential Precinct (LD)	Traditional village Precinct	Scattered settlements Precinct	Institutional Precinct	Industrial Precinct	Military Precinct	Service Precinct	Tourism Intensive Precinct	Airport Precinct
39	Industry - Mining	X	X	X	X	X	X	-	X	-	X	X	X	X	X	X	X	X	-	X	X	-
40	Industry - Noxious	X	X	X	X	X	X	-	X	-	X	X	X	X	X	X	X	X	-	X	X	-
41	Industry - Rural	X	X	X	X	X	X	-	X	-	X	X	N	X	X	X	X	N	-	X	X	-
42	Industry - Service	X	X	X	X	X	X	-	X	-	P	P	N	N	X	X	X	X	-	X	N	-
43	Market	X	X	X	X	X	X	-	X	-	P	P	X	X	X	X	X	X	-	N	X	-
44	Medical Centre	X	X	X	X	X	X	-	X	-	P	P	X	X	X	X	X	X	-	X	X	-
45	Motel	X	X	X	X	X	X	-	X	-	P	P	X	X	X	X	X	X	-	X	X	-
46	Motor Vehicle Repair	X	X	X	X	X	X	-	X	-	P	P	X	X	X	X	X	X	-	X	X	-
47	Motor Vehicle Wash	X	X	X	X	X	X	-	X	-	P	P	N	X	X	X	X	X	-	X	X	-
48	Multiple Dwelling	X	X	X	X	X	X	-	X	-	P	P	N	X	X	X	X	X	-	X	X	-
49	Night Club	X	X	X	X	X	X	-	X	-	P	X	X	X	X	X	X	X	-	X	X	-
50	Office	X	X	X	X	X	X	-	X	-	P	P	N	X	X	X	P	X	-	X	X	-
51	Place of Worship	X	X	N	X	N	X	-	N	-	X	X	N	N	N	N	X	X	-	X	X	-
52	Radio and TV Installation Private	X	X	X	X	X	X	-	X	-	N	N	N	X	X	X	X	X	-	P	X	-
53	Recreation - Private	X	X	X	X	X	X	-	X	-	X	X	N	X	X	X	X	X	-	X	X	-
54	Recreation - Public	X	X	X	X	X	X	-	X	-	X	X	N	X	X	X	X	X	-	X	X	-
55	Residential Building	X	X	X	X	X	X	-	X	-	P	P	P	P	X	X	X	X	-	X	X	-
56	Restaurant	X	X	X	X	X	X	-	X	-	P	P	N	X	X	X	X	X	-	X	P	-
57	Service Station	X	X	X	X	X	X	-	X	-	N	N	N	X	X	X	X	X	-	P	X	-
58	Shop	X	X	X	X	X	X	-	X	-	P	P	N	X	X	X	X	X	-	X	X	-
59	Showroom	X	X	X	X	X	X	-	X	-	P	P	X	X	X	X	X	X	-	X	X	-
60	Single Bedroom Dwelling	X	X	X	X	X	X	-	X	-	P	P	P	P	P	P	X	X	-	X	P	-
61	Single House	X	X	X	X	X	X	-	X	-	P	P	P	P	P	P	X	X	-	X	X	-
62	Storage	X	X	X	X	X	X	-	X	-	X	X	N	X	X	X	X	X	-	X	X	-
63	Telecommunications Infrastructure	X	X	X	X	N	N	-	X	-	N	N	N	N	X	N	X	X	-	P	X	-
64	Tourist Resort	X	X	X	X	X	X	-	X	-	X	X	N	N	X	X	X	X	-	X	P	-
65	Trade Display	X	X	X	N	X	X	-	X	-	X	X	X	X	X	X	X	X	-	X	X	-

Use Classes		Cultural Landscape Zone									Built Environment											
		Agriculture Precinct	Forest Precinct	Heritage Precinct	Open-space Precinct	Water front Precinct	Environment Sensitive Precinct	Dzong Precinct	Heritage village Precinct	Royal Precinct	Town center Precinct	Neighborhood node Precinct	Rural Residential Precinct	Rural Residential Precinct (LD)	Traditional village Precinct	Scattered settlements Precinct	Institutional Precinct	Industrial Precinct	Military Precinct	Service Precinct	Tourism Intensive Precinct	Airport Precinct
66	Transport Depot	X	X	X	X	X	X	-	X	-	X	X	X	X	X	X	X	X	-	P	X	-
67	Veterinary Clinic	X	X	X	X	X	X	-	X	-	P	P	X	X	X	X	X	X	-	X	X	-
68	Warehouse	X	X	X	X	X	X	-	X	-	X	X	X	X	X	X	X	X	-	P	X	-

EXISTING NON-CONFORMING USES

63. A lawful use of land existing prior to the notification of the PVDP of which these Precinct Sanctions forms a part and which do not conform to the designated Precinct Sanctions, shall be permitted to continue, subject to the condition that no extension, modification of the buildings, nor extension, or intensification of the non-confirming use shall be permitted. The existing use (structures) will continue but once the structure is demolished no further development/ redevelopment shall be allowed.

SECTION B. GUIDELINES

The Development Guidelines shall be applicable to all the area within the Paro Valley including the area beyond the project area.

III PLANNING

LAND USE PLANNING

64. The predominant land use permitted shall be residential and mixed-use development. Proposal for any other use, irrespective of the ownership or the proponent, shall require special approval of the Dzongkhag Administration who may decide on its own or refer to the Competent Authority, depending on the nature of the proposal, unless otherwise specified in this regulation.
65. Hotels, resorts, offices, group housing, hostels, etc shall not be permitted within an existing clustered village. However, home-stay facilities with a limited number of beds may be permitted provided such facilities do not exert undue pressure on the resources or the sanctity of the local community.
66. No construction shall be permitted:
 - a. In an environmentally sensitive area or along and/or obstructing water courses or natural drainage.
 - b. Within 15 meters of the edge of a major stream and within 30 meters of the bank or edge of a river, measured from the highest water level recorded.
 - c. If it would have adverse impact on the scenic views, historic and cultural significances of the area or the overall ambience of the traditional settlement.
67. If the slope of the site or the plot proposed for construction is greater than 30%, only single storey construction may be permitted provided there is no excavation beyond 3.5 meters and appropriate mitigation measures are adopted.
68. Restrictions and special requirements shall be placed for constructions and site developments proposed next to or in the vicinity of sacred sites and structures like Lhakhangs and Choeten. Specific issues to be considered in assessing such proposals include:
 - a. Nature of existing and proposed land uses.
 - b. Plot and building layout, access and orientation.
 - c. Building scale, proportion and the architecture.
 - d. Materials and modes of construction.
 - e. Location of septic tanks, soak-away pits and drainage system.

MINIMUM PLOT AREA

69. The area of any plot designated or used for construction, transacted or marked for subdivision shall not be less than 13 decimal unless otherwise specified in this regulation.

BUILDING ORIENTATION

70. Layout of all new building constructions shall follow the orientation of the existing houses. In new street developments the houses shall face the primary access road or be as prescribed in the specific development guidelines.

PLOT COVERAGE

71. The maximum plot coverage permissible shall be 50% provided all constructions are within the minimum setback requirements. Exception to this rule may be granted for new constructions:
 - a. In a clustered village where the customary and/ or existing construction rules shall apply.
 - b. On the same building plinth as an existing structure that is being removed and re-built upon.
72. The plinth area of a house or building shall be limited to a maximum of 200 sq.m or 2150 sqft and any proposal with greater plinth area shall require concurrence of the Dzongkhag Administration and the Competent Authority.
73. In case of areas for which Local Area Plans are in place the maximum Plot Coverage will be governed by the respective Local Area Plans.

SETBACK REQUIREMENT

74. All constructions shall maintain a minimum setback of 3 metres on all sides including 5 metres on the side accommodating septic tank and soak-away pit, measured from the plot boundary. If there are two or more buildings on a plot, the minimum distance between any two buildings shall be at least 6 metres. However, exceptions under Rule 40, 43 & 44 shall apply to this Rule as well.
75. The Minimum side and rear setback for buildings up to two floors and for Plots which are irregular in shape, (i.e. other than square and rectangular plots) may be up to 2 meter. However, it will be within the permissible plot coverage rules.
76. Setback for Narrow plot shall be within the permissible plot coverage as follows:
 - a. This provision shall be applicable to plots with dimensions less than 12 mt.
 - b. The side setbacks may be up to 2meter.
77. All plots directly abutting the Primary Road, whatever may be the precinct, shall have a minimum front setback of 5 meters.
78. Traditional **rabsey** projections not extending beyond 1.5 metres from the face of the building wall, may be permitted within the setback areas.
79. All roof projections, including those over projected balconies and verandas, shall be within the registered plot boundary.
80. In case of areas for which Local Area Plans are in place the setback requirements will be governed by the respective Local Area Plans.

NUMBER OF FLOORS

81. The maximum number of floors permitted shall be two unless otherwise specified in this regulation. However, reconstruction of the existing 3-storeyed traditional houses shall be permitted provided the construction is on the same plinth and carried out with the traditional materials and in the traditional style.
82. Construction of traditional style roof features including ***shambarnang, jamthog*** and ***lungo*** may be permitted over the number of floors allowed in Rule 50.
83. The permissible number of floors will be measured from the road level. Additional one floor only shall be allowed in case of plots that are at more than 3 mt lower elevation than the road level.
84. The permissible building height shall be a maximum of 2 floors for plots less than the standard size.

RENOVATION AND/OR EXTENSION TO EXISTING STRUCTURES

85. All proposals for renovation of or extension to the existing structures, with the exception of those listed under Rule 14 (a), (b) and (c), shall require approval as for new constructions. The Implementing Authority shall ensure that the renovation or the extension works do not adversely affect structural safety, aesthetics and overall ambience of the existing structure or the settlements around it.

IV CONSTRUCTION

SITE EXCAVATIONS

86. Site excavations shall be avoided to the extent possible. On sloping sites environment sensitive construction technique, like split level constructions, are to be encouraged. Where excavation is unavoidable, no single stretch of drop or vertical cut shall exceed 3 metres.

BUILDING STANDARDS

87. All constructions shall meet the basic standards of health, hygiene and safety including earthquake resilience and fire and wind safety measures as prescribed in the Bhutan Building Rules and the Building Codes of Bhutan.

USE OF LOCAL MATERIALS

88. All construction, to the extent possible, shall use the local and locally produced construction materials.

CONSTRUCTION ALONG HIGHWAYS AND DZONGKHAG ROADS

89. All constructions along the national highways and other roads shall maintain the prescribed setback for the road right of ways and other requirements as per the Road Act and other relevant regulations and guidelines.
90. Exposed toilets, plumbing and waste disposal fixtures shall not be permitted on side of the building facing the main or the primary access road.

REINFORCED CEMENT CONCRETE CONSTRUCTIONS

91. Construction of Reinforced Cement Concrete shall be discouraged in the rural areas. If RCC constructions are proposed in the rural areas:
 - a. The building shall be designed by qualified architects and engineers in proof of which copies of registration and degree certificates shall be submitted with the building permit application form.
 - b. The proposals shall be reviewed for the fulfilment of the design requirements for RCC constructions by the Implementing Authority.
 - c. The external façade shall be compatible with the existing settlement patterns.
92. RCC or any other structure that do not blend with or that are not consistent with the existing village settlement pattern or houses in a clustered village shall not be permitted.

V ARCHITECTURE

PROMOTION OF TRADITIONAL ARCHITECTURE

93. The architectural features in a buildings shall be as per the Bhutanese Architectural Guidelines 2014, unless otherwise specified in this regulation. The generic building typology in Paro valley should incorporate the following features:

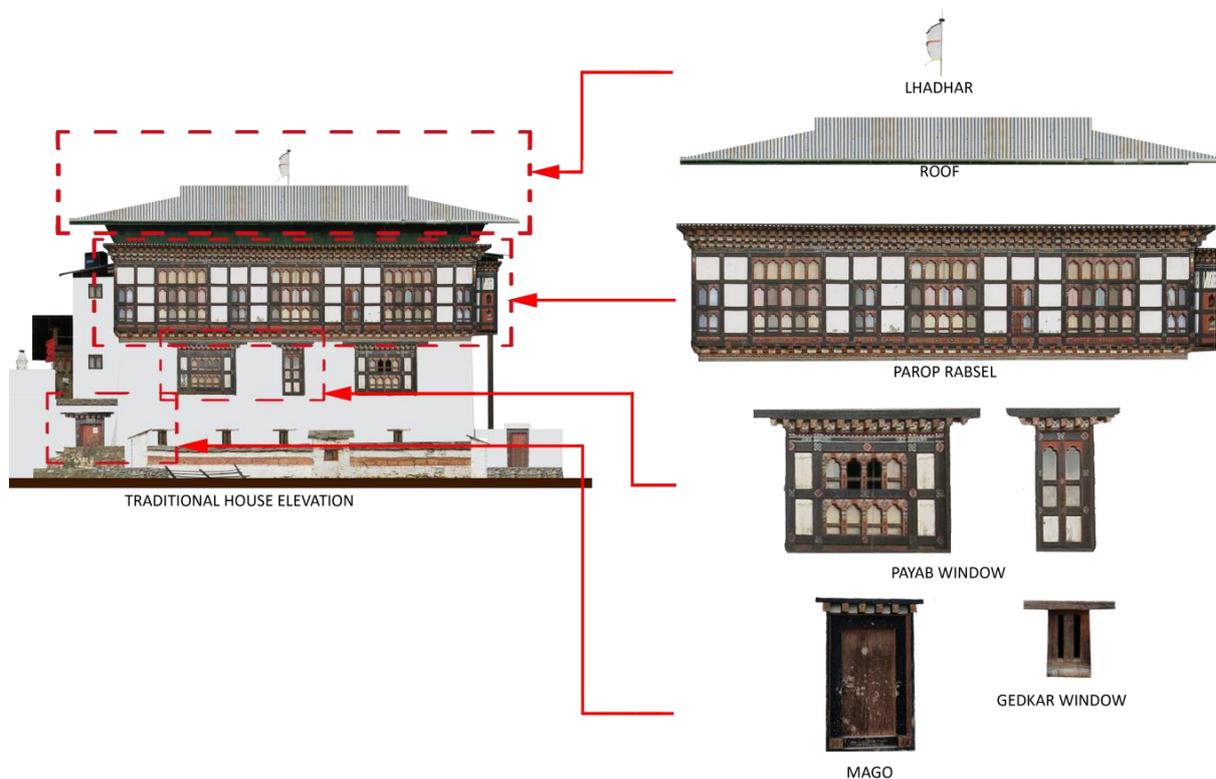


Figure V-1 Typical architectural features to be incorporated in a building

94. All constructions shall have pitched roofs with roof angles between a minimum of 12 degrees and a maximum of 15 degrees. No exposed water storage tanks shall be permitted above the roof.
95. All external doors, windows and building elements shall incorporate the traditional features as prescribed in the relevant regulations and guidelines.
96. The top most floors of constructions more than one storey high shall have traditional **rabsey** features (preferably Parop rabsey)
97. If Reinforced Cement Concrete (RCC) constructions are proposed in rural areas, the applicants shall not be eligible for subsidized timber available for rural house constructions. However, exception may be granted for minor RCC works in wet areas, for example RCC slabs in kitchen and toilet.

BASEMENT FLOOR

98. Basement floors shall be permitted only in Town Centre, Neighborhood and Intuitional Precinct. The floor below the road level would be considered as a basement up to a maximum of one level and shall be used for car parking and storage. It may be used for entertainment purpose in the town center provided it confirms to minimum light, ventilation and emergency egress requirement.
99. In precincts other than Town Centre, basement for parking may be permitted only if the plot is more than 750 square meter

COMPOUND WALL

100. Compound wall facing the road should be see through and not a blank/opaque wall on plots that are at or above the road level, unless it is a requirement due to high security reasons in some of the intuitional establishments.
101. Except with the special permission of the Authority the maximum height of the compound wall shall be 1.5 m above the adjacent ground level. Compound wall up to 2.4m height may be permitted if the top 0.9 m is of open type construction of a design to be approved by the Implementing Authority.
102. In case of a corner plot the height of the boundary walls shall be restricted to 0.75 m for a length of 10m on the front and side of the interactions and balance height of 0.75 m if required. It may be made up of open type construction (through railings) and design to be approved by the Implementing Authority.
103. The provisions of (67) and (68) are not applicable to boundary walls of Jails, industrial buildings, electric sub-stations transformer stations, institutional buildings like Sanatoria, hospitals, industrial buildings like workshops, factories and educational buildings like schools, colleges, including the hostels, and other uses of public utility undertakings and height up to 2.4 m or more, maybe permitted by the Authority.
104. Compound gate should open entirely inside the property and shall not open any access/pathway/road/street.

BALCONY

105. Balconies and verandas (not enclosed or roofed) projecting up to 1.2 m from the ground floor external wall face shall be permitted only on the building face not facing the primary road. In the case of buildings where the setback is less than 3 meter, cantilevered balconies shall not be allowed.

MINIMUM FLOOR SPACE OF ROOMS IN RESIDENTIAL BUILDINGS

106. The minimum floor spaces will be as follows:

	ROOM FUNCTION	MINIMUM FLOOR AREA	MINIMUM WIDTH	REMARKS
69.1	LIVING:			
(a)	Combined Living/ Dining	12 m ²	3000mm	
(b)	Only living.	9 m ²	3000mm	Primary room when separate dining is provided.
(c)	Dining/Family room	7.5 m ²	2500mm	Secondary room when living room is provided separately
69.2	BEDROOM:			
(a)	Primary bedroom	12 m ²	3000mm	When only one bedroom is provided.
(b)	Secondary bedroom	9 m ²	3000mm	When more than one bedroom is provided.
(c)	Additional /other bedroom	7.5 m ²	2500mm	Bedroom provided in addition to primary/secondary bedroom
69.3	KITCHEN:			
(a)	Kitchen cum store	6 m ²	2000mm	When no separate store is provided.
(b)	Kitchen	4.32 m ²	1800mm	Separate store has to be provided.
(c)	Store	1.44 m ²	1200mm	Store with a separate kitchen
69.4	BATHROOM:			
(a)	Toilet	2.16 m ²	1200mm	
(b)	Toilet with internal partition wall	3.36 m ²	1400mm	Min width of 900mm for water closet.
(c)	Bathroom	1.82 m ²	1300mm	
(d)	Separate WC	1.08 m ²	900mm	
69.5	BALCONY:	1.35 m ²	900mm	

CIRCULATION SPACE REQUIREMENTS

107. The minimum circulation spaces will be as follows:

		DIMENSIONS FOR:	
		RESIDENTIAL BUILDINGS	INSTITUTIONAL AND COMMERCIAL BUILDINGS
70.1	Clear width of private corridor or staircase (internal stair serving one residence only).	Min 900mm	N/A
70.2	Clear width of common corridor or staircase	Min 1100mm	Min 1500mm (unless calculated to be greater according to fire escape rules)
70.3	Height of staircase handrail above pitch line of staircase	Min 900mm	Min 900mm
70.4	Staircase riser	Max 190mm	Max 190mm
70.5	Staircase tread	Min 250mm	Min 280mm
70.6	Height of doors	Min 1800mm	Min 2000mm
70.7	Width of door to habitable room	Min 850mm	Min 900mm
70.8	Width of door to main entrance	Min 900mm	Min 1000mm
70.9	Width of other doors	Min 700mm	Min 850mm
70.10	Habitable room floor to ceiling height in high altitude	Min 2450mm	Min 2450mm
70.11	Habitable room floor to ceiling height in low altitude	Min 2750mm	Min 2750mm
70.12	Water closet, bathroom or store floor to ceiling height	Min 2100mm	Min 2300mm
70.13	Mezzanine floor to ceiling height	Min 2100mm	Min 2300mm

LIGHT AND VENTILATION REQUIREMENTS

108. A habitable room shall be provided with windows and other apertures having a total openable area not less than 1/6th of the floor area. The openings shall face directly onto an external space.

109. A kitchen shall be provided with ventilation through windows/ventilators having a minimum area equal to 1/6th of the floor area of the kitchen.

110. The water closet located against the external wall shall be provided with an opening or a glazed window not less than 0.2 sq. m for lighting and ventilation.

111. A storeroom shall have ventilation through windows and ventilators or other apertures. In case of window, the opening shall not be less than 1/10th of the floor area.

112. A basement shall have ventilation through windows, ventilators or other apertures, the area of which shall not be less than 1/10th of the floor area.

ARTIFICIAL LIGHTING AND MECHANICAL VENTILATION

113. Wherever the day lighting and natural ventilation is insufficient to meet the standard requirements of lighting and ventilation the same shall be ensured through artificial lighting and mechanical ventilation. (Refer to IS code of practice).

VENTILATION SHAFT

114. A ventilation shaft shall be provided for toilet, kitchen and store room that do not have adequate direct access to natural ventilation from an external open space. The size of such ventilation shaft shall be as follows:
- a. 1.5 square meter in area with a minimum width of 1.0m for building up to 2 floors.
 - b. 2.8 square meter in area with a minimum width of 1.2m for building of 3 and 4 floors: and
 - c. 4.0 square meter in area with a minimum width of 1.5m for building of 5 and 6 floors including basement floors.
 - d. All shafts shall be accessible from ground floor with minimum opening size of 900x2000mm height.

PLINTH HEIGHT

115. The plinth height shall not be less than 150 mm.

FIRE SAFETY

116. Every building meant for human occupancy shall be provided with exits sufficient to permit safe escape of occupants, in case of fire or other emergency.
117. Exits shall be free of obstructions and be clearly visible with the routes to the exits clearly marked and sign posted.
118. Doors with a fire resistance of at least ½ hour shall be provided along the escape routes to prevent spread of fire and smoke particularly at the entrances to stairs.
119. All escape exits shall provide continuous means of egress to the exterior of a building or to an exterior open space leading to a street. Exit routes shall be arranged so that they may be reached without passing through another occupied space.
120. Exits shall be so located that the travel distance to the exit on each floor shall not exceed the distances as follows :

Building type	Travel distance
Residential	22.5m
Institutional	22.5m
Commercial/Assembly	30m
Industrial	45m

121. The travel distance to an exit from the dead end of a corridor shall not exceed half the distance specified in the table above, except in institutional and commercial/assembly building types in which case it shall not exceed 6m.
122. Wherever more than one exit is required exits shall be placed as remote from each other as possible and shall be arranged to provide direct access in separate directions from any point in the area served.
123. All building having more than four floors and all institutional and commercial/assembly building types having an area of more than 500sq.m on each floor shall have a minimum of two fire escape staircases. The provision of additional

alternative staircases shall be subject to the requirements of travel distance being complied with.

124. Fire escape staircases must be of a protected type and at least one shall open directly into an exterior space or to an open place of safety. 'Protected' means that if there is a fire anywhere in the building, it should not be allowed to enter the staircase shaft. No internal windows can be provided looking into fire escape staircases.
125. Interior fire escape stairs must be constructed of a non-combustible material throughout and as completely enclosed self-contained units with an external wall constituting at least one of the sides.
126. Doors onto fire escape staircases must have a fire resistance of at least one hour, should open in the direction of escape and must not reduce the minimum width of the landing or staircase.
127. All buildings should be provided with at least one fire extinguisher on each floor.
128. All buildings must have a fire plan showing :
 - a. Location and number of fire extinguishers.
 - b. Means of escape – location of internal and external fire escape stairs, fire exits and direction of escape.
129. Fireplaces shall have a floor of concrete or similar fire proof material and shall be provided with a chimney. Chimneys shall extend 600mm or more above the highest point of the roof.

ELEVATORS

130. All buildings having more than four floors shall have elevator(s). Elevators cannot be used for fire escape purposes.

ACCESS FOR THE DISABLED

131. The ground floor of institutional buildings must be accessible to disabled people through at least one entrance.
132. Where ramps are necessary or desired for disabled access they shall not have a slope of greater than 1 in 12. A ramp shall have a handrail on at least one side and preferably two sides.
133. Ramps must have a non-slip surface and a level platform at the top, which are at least 1800x1800mm if a door swings out onto it. Platforms must extend at least 300mm beyond each side of a doorway. Each ramp must have at least 1800mm straight clearance at the bottom.
134. Ramps must have level platforms at 9.5m horizontal intervals and wherever they turn.
135. Where toilets are generally provided an appropriate number of facilities (in accordance with the use and capacity of the building) must be made accessible to and be usable by disabled people.

136. Disabled toilets for wheelchair access must be at least 1520x1520mm square, have a door of 1000mm wide opening inwards and have appropriately designed and mounted handrails to provide support. Disabled toilets should be designed to follow standard codes of good practice.

FLOORS

137. Ground floor shall be so constructed as to prevent dampness rising by capillary action into the floor.
138. Flooring of kitchen shall be of impervious and fire proof materials.
139. Toilet and bathroom shall have floor of impervious materials.
140. The internal walls of water closet shall be finished with an impervious material up to a minimum height of 90 cm from the floor.
141. The floor and walls of the basement floors shall be provided with damp proofing treatment.

STRUCTURAL CONTROL

143. Structural design shall comply with the codes and specifications but not limited to the following, adopted and / or issued by the Competent Authority from time to time.

144. Analysis of Structure (building)

- a. PWD structural design standards 1997
- b. IS 1893 - 1984: Criteria for earthquake resistant design of structures
- c. IS 456 – Code of practice for plain and reinforced concrete
- d. IS 875 –1987: Code of practice for Design loads (other than earthquake)
- e. NUDC/007/1985 – Timber Roof Trusses
- f. NUDC/002/1985 – Manual for Timber Engineering Design

145. Design of Structure (buildings)

- a. PWD structural design standards 1997
- b. IS 4326 – Earthquake resistant design & construction of building
- c. IS 456 – Code of practice for plain and reinforced concrete
- d. NUDC/007/1985 – Timber Roof Trusses
- e. NUDC/002/1985 – Manual for Timber Engineering Design
- f. IS 800 – Design of steel structures
- g. IS 806 – Design of Tubular Truss
- h. IS 1904-1978: Code of practice for structural safety of buildings (Shallow foundation)

146. Detailing of Structure (buildings)

- a. PWD structural design standards 1997
- b. IS 13920 –1993: Ductile detailing of concrete structures subjected to seismic forces
- c. IS 4326 – Earthquake resistant design & construction of building
- d. IS 456 – Code of practice for plain and reinforced concrete
- e. NUDC/007/1985 – Timber Roof Trusses
- f. NUDC/002/1985 – Manual for Timber Engineering Design
- g. IS 800 – Design of steel structures
- h. IS 806 – Design of Tubular Truss

ELECTRICAL INSTALLATIONS CONTROL

147. The electrical drawings shall be submitted while applying for the building permit along with other drawings. Permanent connection shall be given only after issue of occupancy certificate. All service connections shall be given only after an Implementing Authority approves the building plan. (Refer code of practice for design, installation, commission, etc.)

TELEPHONE

148. For buildings which require provision of telephone services, detail plans shall be submitted as per the guidelines (Annex 2).

149. Telephone wiring to any point shall be standard 0.5 mm gauge single pair copper wire in a 25 mm PVC/MS conduit which shall be located at least 500 mm from any electrical cable route.

150. A proper bridge shall be provided where electrical and telephone routes cross.

151. Telephone terminal points shall be at least 1500 mm above the floor level in an accessible area.

152. A maximum of five pairs of telephone wires shall be drawn through 25mm conduit.

VI AMENITIES AND SERVICES

PARKING STANDARDS

The parking standard is set forth to ensure that, during an assessment of development proposal, proper consideration is given to accommodation of vehicle attracted to the proposed development site.

The minimum requirement for car parking space will be determined according to the characteristics of the development project, the location of the project and the land use pattern of the project locality. A development proposal should not adversely affect road safety or significantly inconvenience the flow of traffic. Under a normal circumstance, vehicles from the developed area should not overflow parking area within their premises, onto the adjoining road and interrupt the flow of traffic.

153. For assessment of parking provision of a development proposal, the developers will be required to demonstrate the adequacy of parking space provision within the development area, along with space for maneuvering and other operational requirements.
154. In case of mixed use development, e.g. commercial ground floor and residential upper floors, the combined figures applicable to both uses will apply. However, in multi-purpose development, if the developers can adequately exhibit that separate uses operate at different times of the day greater flexibility will be applied.
155. The following are standard space requirements of some typical vehicles. These may be used as basic minimum reference values but different layouts such as parallel, angled and perpendicular parking have slightly different overall space requirements and detailed layout of parking spaces will be site specific.

Table B-1 Standard Parking Space Dimensions

Sl	Vehicle Type	Vehicle Dimension	Parking Space Dimension*
1	Car/SUV	1950 mm X 4980 mm	2400 mm X 5500 mm
2	Minibus	2000 mm X 7700 mm	3500 mm X 9000 mm
3	Trucks/Buses	2440 mm X 9290 mm	3500 mm X 12000 mm

***The dimension refers to standing space only and do not account access and maneuvering space**

156. Operational parking space for commercial and service vehicles will depend on the type attracted to a development and should provide for maneuvering space to enable vehicles to exit the site in forward gear.
157. Paro Valley Development Authority, on request or as necessary, may provide advice on the parking requirement for developments not covered by these standards taking into account the number and size of vehicles likely to use the proposed development at any one time and transportation policy.
158. Provision of parking space for motorcyclist is an important aspect. In absence of motorcycle parking space, a bike being parked in a car parking space consumes the

entire space while actual requirement for motorcycle parking is much less. In general, motorcyclist are vulnerable road users and in a tight enclosed space, the vulnerability increase. Thus, these requirements of motorcyclist should be considered while providing motorcycle parking spaces in a proposed development project.

159. The promotion of utility cycling as a travel mode is part of a policy for sustainable urban transport and an alternative to use of private cars. One step in this process is to improve the provision, safety, convenience and general environment for cycling. Good quality and secure cycle parking is an integral part of sustainable transport policy.

160. For the purpose of interpreting the attached standards, Gross Floor Area (GFA) shall be equivalent the carpet area.

Table B-2 Parking requirement for Non Residential Use

Use Class	Description	Non Operational Parking Space	Operation Parking Space	Cycle Parking Standard
NR1 - Shops	Grocery	1 car space per 20 m ² GFA	1 truck space per 750 m ² GFA	Minimum 1 space per unit
	Non Grocery	1 car space per 25 m ² GFA	1 truck space per 750 m ² GFA	Minimum 1 space per unit
NR2 - Offices	Customers Oriented- banks, airlines, etc	1 car space per 25 m ² GFA	1 car space per 2000 m ² GFA	Minimum 1 space per unit
	General Office	1 car space per 50 m ² GFA		Minimum 1 space per unit
NR3 Hospitality	Hotels	1 car space per every 2 rooms and 1 Bus space for every 6 rooms	1 truck space per hotel	
	Restaurant and Bar	1 car space per 15 m ² GFA		
NR4 Education	Day Car Facility	1 car space per 5 children 1 car space per 4 staffs	Adequate Turning Space for truck	
	Day Scholar School	1 car space per 10 students 1 car space per 3 teachers	Adequate Parking Facility for School Bus	1 unit per 20 students
	Boarding School	1 car space per 20 students	Adequate Parking Facility for School Bus	1 unit per 20 students

		1 car space per 3 teachers		
NR4 - Health	Hospital	1 car space per doctor, dentist or vet 1 car space per 3 other staff 4 car spaces per consulting or treatment room 1 car space per 3 beds at In-patient facility	Operational parking Space for Ambulance and service trucks must be provided and will depend on the needs of the hospital	1 unit per 10 staffs
NR5 - Industry and Ware House	Industry	1 car space per 80 m ² GFA	Minimum 1 truck space or 1 truck space per 750 m ² GFA	Minimum 2 per unit
	Warehouse	1 car space per 200 m ² GFA	1 truck space per 200 m ² GFA	Minimum 2 per unit
NR6 – Leisure and Assembly	Theatres, cinemas, concert halls, dance halls and similar	1 car space per 10 fixed seats		Minimum 10 per unit
NR6 – Sports Facility	Indoor / outdoor sport grounds	1 car space per 10 fixed seats 1 car space per 4 players		1 per 50 seats
NR7 – Open Space	Public Open Space	4 car parking space per hectare		
NR8 - Others	Any other public service	1 car parking space per 50 m ² of GFA		

Table B-3 Parking requirement for Residential Use

Use Class	Description	Parking Space
Detached House Apartment Building	Detached House	2 car spaces per unit
	1 bedroom	0.5 car space per unit
	2 bedroom	1 car space per unit
	3 bedrooms	1.5 car space per unit

PROVISION OF ACCESS

- 161. Any plot being earmarked, formed, planned, designated or transacted shall have an access connecting the proposed plot to a road, footpath or walkway clearly marked irrespective of the nature of transaction.
- 162. Where the provision of vehicular access to a plot is not feasible, the plot shall be connected by a pedestrian access.

INTERNAL ROAD LAYOUT FOR PLOT SUB DIVISION

- 163. In case of sub-division of plots, the right of way for the internal road within the layout shall be of minimum 4.75 meters. This width of internal road right of ways has been arrived upon considering road carriage width of 3.25 meters, footpath width of 1 meters and roadside drain of 0.5 meters. The minimum specified road widths shall be developed completely up to the plot boundaries by providing all the required infrastructure as stated above.

PROVISION FOR ROADS AND ACCESS IN EXTENDED AREAS

- 164. The primary road network is connecting the extreme ends of study area, Drugyel in the north and Isuna in the South. When connecting these two extreme ends of the valley, the extended areas are sufficiently accessed by the primary roads.
- 165. In the extended areas, when the need arise for upgrading the farm road to a full-fledged access roads, the road geometrics to be adopted will be as given in the cross-section below. The width of the carriage lane will be 3.25 meters and the road will also include a footpath of 1.5-meter width.

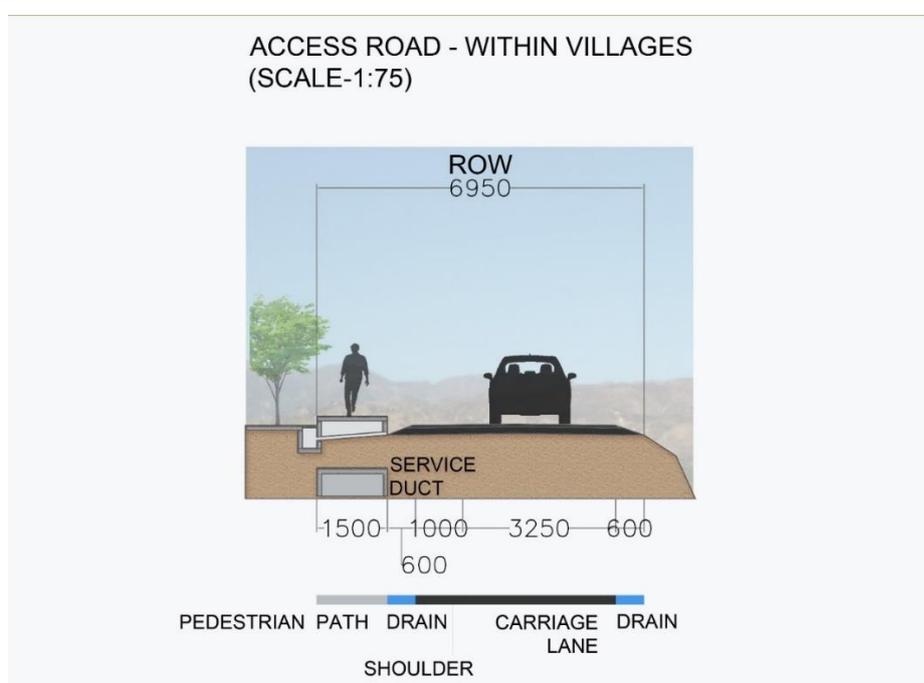


Figure VI-1 Typical Cross section of an Access Road

WATER

All settlements including the extended area should have provision for safe and adequate water for potable and non-potable applications. In addition, to ensure availability for future generations best practices and conservation measures should be practiced.

GENERAL

166. In line with the Rural Water Supply and Sanitation Policy, responsibility for planning and managing implementation of water supply facilities will be placed at the lowest appropriate level, which means the community or even the household in some cases.
167. Every household in the extended area should have access to a basic level of water service, defined as a safe traditional or private supply or shared tap stand which delivers at least 45 litres of water per capita per day within 100 meters horizontal distance and 25 metres vertical distance of a household¹.
168. Communities receiving improved water supplies must have willingness to contribute to the construction, management and operation and maintenance of improved water supply facilities to ensure sustainability.
169. Where technical and topographic factors and water availability permit, where there are specific requests from community members and the community management organisation agrees, higher than basic service levels such as individual tap stands or a service connection near the house for in-house connections can be provided at cost to the household. The maintenance cost of an individual tap stand shall be borne by the household.
170. Multiple uses of water should be considered in all drinking water supply projects. Wherever possible, these water supply projects should be incorporated into existing watershed management plans and should promote multiple uses of water as a means of conserving and using efficiently this scarce resource.
171. Every water supply scheme in the extended area should develop and implement water safety plan for improved water quality and sustainability of the schemes.
172. Proposals for hotels, resorts, offices, group housing, hostels, etc. shall identify their own water sources. Such proposal shall not tap water from an existing village water supply scheme/system. Proposals for the use of the surplus water, if any, shall be endorsed by the community.

SOURCE

173. A water source is considered suitable for human consumption if flow and water quality tests demonstrate acceptable yields and physical and bacteriological quality. For all sources it is required that there is no direct and visible source of pollution in the catchments area or upstream of the scheme's intake.

¹ Rural water supply and sanitation policy

174. Sources for drinking water will mainly be protected springs or a stream, but can include groundwater and rainwater (figures 1 and 2).
175. Water sources that are intermittent or seasonal can be very disruptive to community life and often pose health risks to the users. Priority should be given to sources that provide a reliable supply at all times and for the life of the project.
176. The cost of the water supply project should also be taken into account while selecting the source of water. Gravity supplies are more economical than pumping systems.



Figure VI-2 Rain Water Harvesting



Figure VI-3 Spring source

177. The source of water should have sufficient quantity of water to meet the maximum projected demand of the community. It should also be adequate to provide ample water for other competing users of the source including the 30% environmental flow.
178. In case of competing uses of water and where the water resources is not sufficient, the highest priority in allocation of water resources to be given for drinking and sanitation.
179. Final selection of a source will be contingent upon obtaining an agreement ensuring water use rights and extraction volumes.
180. Sources with ownership/use disputes and/or sources located in and used by other villages for irrigation or drinking, unless their prior expressed written consent is obtained.
181. Extreme efforts should be made to protect existing and potential sources from contamination to ensure a continued safe drinking water supply.
182. A maximum distance-to-source criterion of five kilometres will be applied to avoid lengthy pipelines, which are subject to damage and difficult to maintain by caretakers and manage by communities.
183. If there is no acceptable source within this distance, alternative sources or designs will be considered, including rainwater harvesting, groundwater and schemes with simple treatment to ensure that the least-cost technical option is selected, considering capital and lifetime O&M costs.
184. To ensure availability for future generations, the withdrawal of fresh water from an ecosystem should not exceed its natural replacement rate.
185. Water sources and systems shall be maintained such that appropriate quantities and quality of water are available consistently or on a regular basis

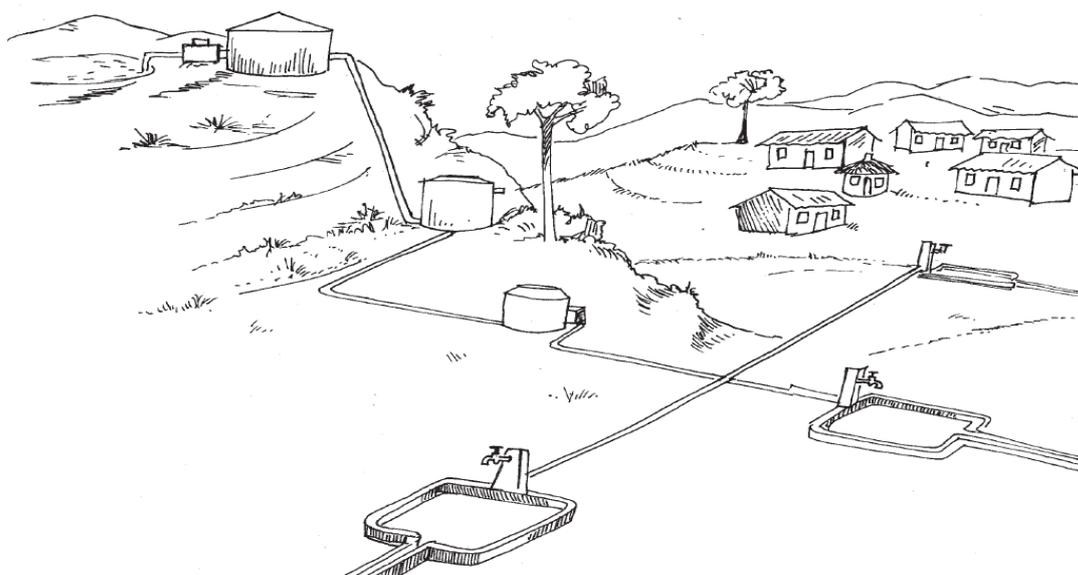


Figure VI-4 Gravity Flow Scheme

TREATMENT

- 186. The type(s) of treatment required will depend on the source of water and the quality of source water which shall be tested in accordance with the Bhutan Drinking Water Quality Standards 2016.
- 187. Treatment of groundwater is to be accomplished by simple measures that do not contaminate the natural environment.
- 188. The various treatment system that could be used for each type of contaminant is listed in table 1.
- 189. The type of treatment system will depend on kind of contaminant, extent of contamination, simplicity and durability, dependency on power, affordability and profile of water users.
- 190. Operational monitoring of the treatment system shall be carried out regularly in accordance with the Bhutan Drinking Water Quality Standards 2016.
- 191. The water quality of the treated water should comply with the Bhutan Drinking Water Quality Standards 2016 which is shown in table 2.

Table B-4 Water treatment method based on contaminants

Sl No.	Contaminant	Treatment
1	Turbidity	Settling/Sedimentation, Slow sand filter, Rapid sand filter, Pressure filter
2	Odour	Aeration, Boiling
3	Bacteriological	Filtration, boiling, disinfection

Table B-5 Drinking water quality standards (rural)

a) Physical parameters

Sl.No	Parameter	Unit	Target limits
1	Conductivity	μS/cm	1000
2	Odour	-	Un-objectionable
3	Appearance		Un-objectionable
4	pH	-	6.5 – 8.5
5	Taste	-	Un-objectionable
6	Turbidity	NTU	5

b) Bacteriological parameter

Sl.No	Parameter	Unit	Risk Assessment	
1	E.Coli	CFU/ml	0	Safe Water
			1 - 10	Low Health Risk
			11 - 50	Intermediate to High Health Risk
			>50	Grossly Polluted

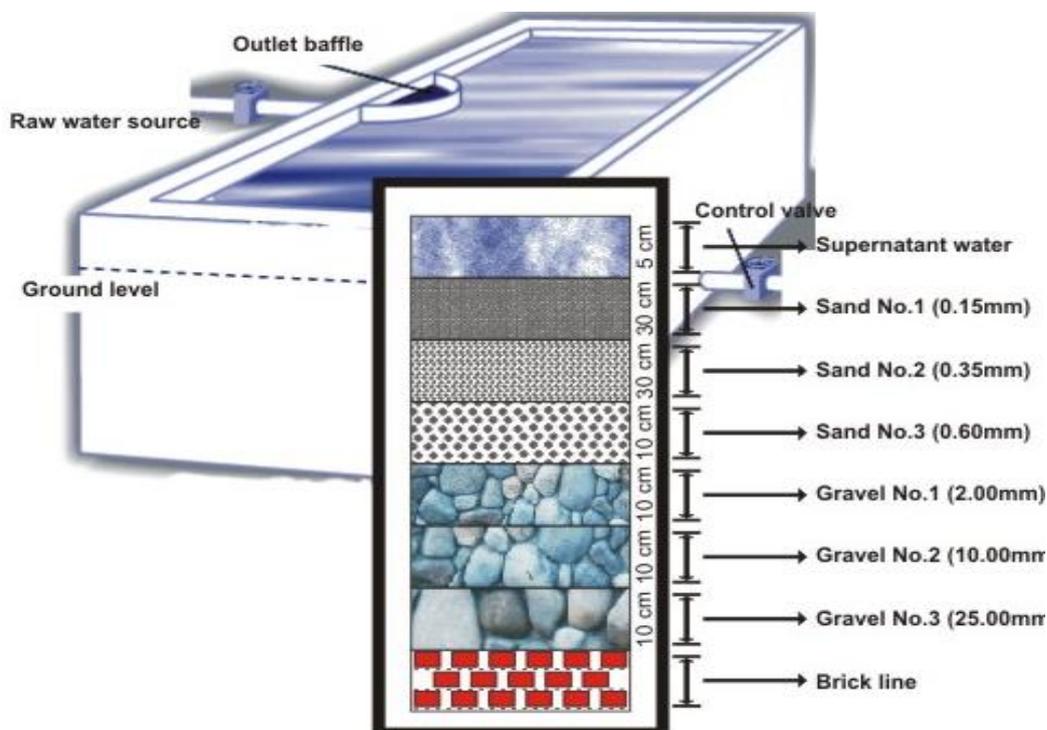


Figure VI-5 Slow Sand Filtration

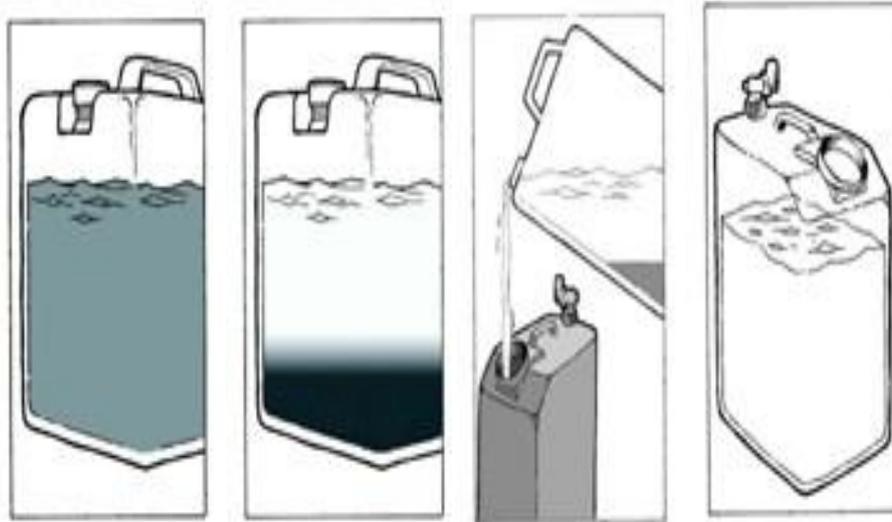


Figure VI-6 Settling

STORAGE

192. Water storage methods should not adversely affect the natural environment.
193. Water storage must be designed to ensure the special aspects of the aesthetics of the natural environment are not disturbed.
194. The storage tank shall be located in an elevated location, if feasible to ensure distribution through gravity.
195. The capacity of the storage tanks should be adequate to meet the peak demand.
196. The storage tank should be covered and protected to minimize contamination.
197. The storage tank material should be non-corrosive and cleaned periodically. Tank cleaning supervision and monitoring shall be carried out by the local health official as outlined in the Water Regulations 2014.
198. The water quality in the storage tanks shall be monitored in accordance with the Bhutan Drinking Water Quality Standards 2016.



Figure VI-7 Protected storage reservoirs

DISTRIBUTION

199. The pipelines are ideally to be buried to avoid accidental breakages and damages from frost.
200. No pipe should be intentionally laid in water, or on frozen foundations, or when the trench conditions are unsuitable.
201. No distribution methods should cause large scale destruction to the natural environment.
202. Water distribution methods should not disturb the natural quality of the site.
203. Depending on the topography, the distribution systems can be through gravity, pumping or combination of both.
204. The pipelines should be capable of a rate of flow sufficient to satisfy the combined maximum demand of all the services to be supplied.
205. The pipeline materials are generally polyvinyl chloride (PVC), high density polyethylene (HDPE) or galvanized iron (GI) pipes. The pipe material selection is dependent on the working pressure, cost, availability, etc.
206. All the pipelines used must be of brands approved by the Bhutan Standards Bureau.
207. The physical location of the various pipeline mechanical appurtenances such as air and scour valves should take into account issues such as ease of access, protection from vehicles and farming equipment, surface drainage, and ground water levels.
208. If the pipelines are aligned along the road, it shall be laid along one side of the road and necessary approvals shall be sought before laying of the pipelines.
209. Where pipelines are laid on private property, it shall be ensured that proper easements are obtained.



Figure VI-8 HDPE pipelines



Figure VI-9 Tap stands

CONSERVATION

210. Some Water Conservation Measures include:
 211. Using waterless toilets where feasible.
 212. Using water of lower quality such as grey water, rain water or runoff from ground surfaces for toilet flushing or irrigation of vegetative landscape or food crops. These

uses do not require the level of water quality as that needed for internal consumption, bathing, or washing.

- 213. Dual flush toilets use up to 67% less water than conventional toilets. Rain water can also be used for flushing toilets.
- 214. Commercial appliances used in kitchen and laundry areas should also be water-savings models.
- 215. Tap Aerators, which break water flow into fine droplets to maintain "wetting effectiveness" while using less water. An additional benefit is that they reduce splashing while washing hands and dishes.
- 216. Garden hose nozzles that shut off water when it is not being used, instead of letting a hose run.
- 217. Automatic taps is a water conservation tap that eliminates water waste at the tap.
- 218. Water can also be conserved by landscaping with native plants.
- 219. Agricultural practices which promotes water use efficiency and have positive impacts on the water quality should be encouraged.
- 220. The Wetland in the extended areas must be restored to improve the water quality and reduce flooding.

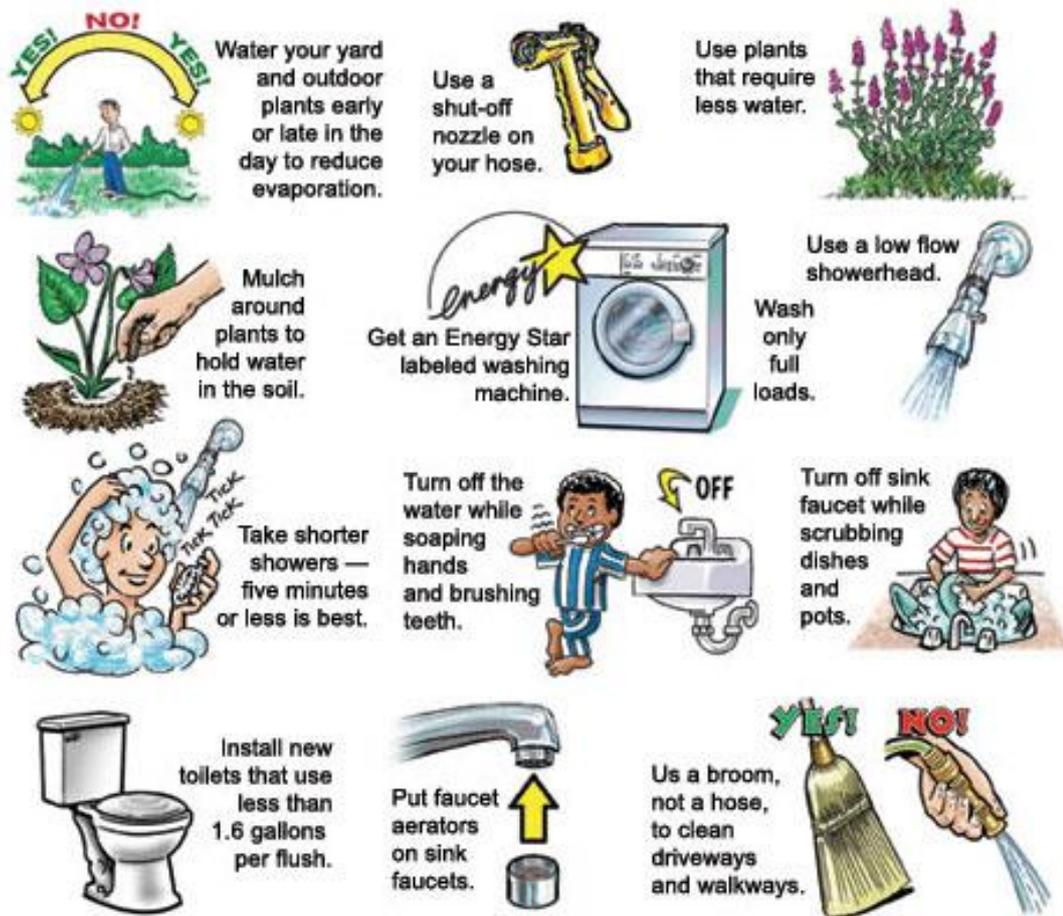


Figure VI-10 Water conservation measures

WASTEWATER

Every household in the community should have access to adequate and sustainable sanitation facility. All the wastewater generated from the settlements in the extended area should be discharged in an environmentally sound manner so as to bring about an improvement in the general quality of life of the people.

TOILETS

221. Every household should have access to improved sanitation facilities such as flush or pour flush, long drop toilets, ventilated improved pit latrine, pit latrine with slab and composting (ecosan) toilets as shown in figure III-10.

222. Appropriate sanitation technology should be selected that is low cost, convenient and can be easily and reliably operated and maintained by rural villages. The selection of most appropriate sanitation technology shall be referred from the *Handbook on Toilet Options for Rural Bhutan* which provides technical details along with graphic illustrations of the different types of toilet.

223. The construction process for the selected toilet option shall be in accordance with the *Training Manual for Toilet Construction*.

Table B-6 Comparison of different types of toilets/latrines

Type of latrine	Affordability	Reduces smell and insect breeding	Suitable for social customs and habits		Water requirement for flushing	Possibility of use of nutrients of excreta
			Water users	Non water users		
Improved traditional pit	Cheapest of all	No	Not appropriate as it gets filled quickly	Appropriate	No	No
Ventilated improved pit	More expensive than improved traditional pit	Yes	Not appropriate as it gets filled quickly	Appropriate	No	No
Pour flush	More expensive than Ecosan	Yes	Appropriate	Not Appropriate	Yes	No
EcoSan	More expensive than ventilated improved pit	No	Not Appropriate	Appropriate	No	Yes

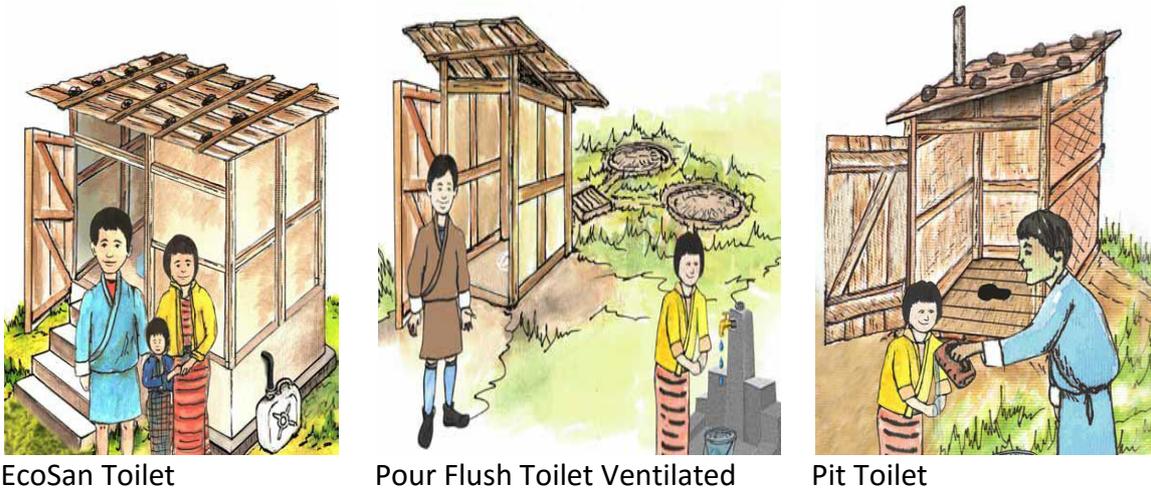


Figure VI-11 Improved sanitation facility



Figure VI-12 Construction step for Pour Flush Toilet

SEPTIC TANKS

- 224. Individual household septic tank shall be one of the alternative options for discharging wastewater in an environmentally sound manner.
- 225. Every flush toilet shall be connected to a septic tank and soak pit.
- 226. Septic tanks must be sited in locations where they are accessible for both maintenance and de-sludging.

227. Septic tanks should be located as far as possible away from buildings and should not be located in swampy areas or areas prone to flooding.

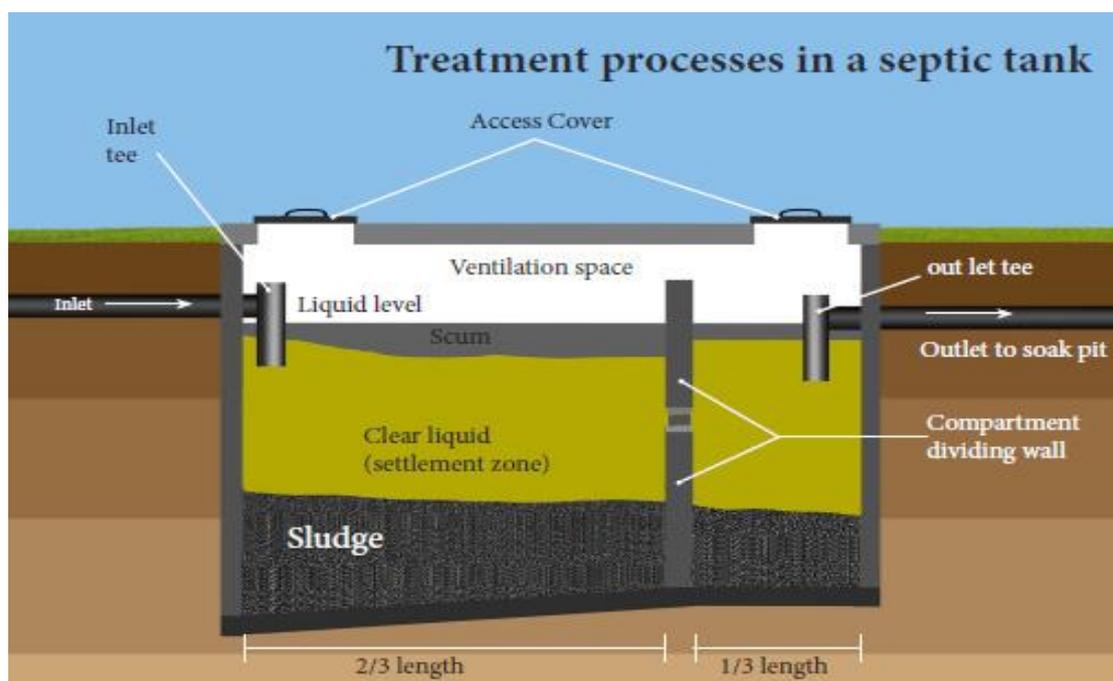


Figure VI-13 Septic Tank

228. On no account should roof drainage or surface water drainage be allowed to enter the septic tank system.

229. Septic tanks should be designed with adequate capacity to ensure proper settling of incoming sewage, proper digestion of the settled sewage and storage of digested sludge until it is removed.

230. Septic tanks shall be adequately sized depending on the number of users. The Septic Tank Manual shall be referred for guidance on sizing and construction of septic tanks.

231. Septic tanks should be provided with a free board of at least 30cm to prevent flooding.

232. Septic tanks should be provided with ventilation pipes and cowls at a suitable height to take out foul smells.

233. On commissioning a septic tank, the tank should be filled with water. As the tank fills with solids and effluent, this water is displaced to the soak away area.

234. It is recommended that a few bucketful of sludge from an established septic tank are added to a new tank in order to accelerate the start of biological action.

235. Effluent from the septic tank should not be discharged into an open drainage system since it poses health hazard, creates bad smells and encourages mosquito breeding.

Table B-7 Minimum Size for Users with Desludging Every 2 Years

No.of user	Length(m)	Width(m)	Height(m)
5	1.5	0.75	1.30
10	2.00	0.90	1.30
15	2.00	0.90	2.00
25	2.60	1.30	1.80
50	4.00	1.40	2.00
75	5.00	1.50	2.00
100	5.70	2.10	1.70

236. It is important that the sludge is removed as frequently as required to ensure that it does not occupy too great a proportion of the tank capacity.

237. Adequate care must be taken to design, construct, operate and maintain the septic system so that it can provide years of reliable service. The operation and maintenance of the septic tank shall be carried out as per the Septic Tank Manual.

238. Grey water may be passed into the septic tank provided the tank and the means for effluent disposal are designed to cope up with this extra liquid.

239. There shall not be any risk of flooding or water logging in the soak pit area since such occurrences will overload the system and create a surface health hazard.

SOAK PITS

Soak pits provide an economical method for disposal of effluent from septic tanks and compost latrines.

240. The effectiveness of effluent treatment in a soak pit depends on the porosity and percolation characteristics of the soil, level of the groundwater table, climatic conditions, presence or absence of vegetation, aeration of the soil and the concentration of suspended solids in the effluent. It is therefore essential to consider these factors before designing and constructing a soak pit.

241. Soak pits (Figure 13) shall be located near septic tanks but at least 5 metres away from any building or structure.

242. Soak pits must be of adequate size, and care must be taken to ensure that no flooding by surface runoff and subsequent saturation occurs.

243. Soak pits should be constructed in permeable soils only, and no single pit should deal with more than 5000 litres of effluent per day. A simple test for permeability can be made by digging a pit about 1 metre diameter and 2 metres deep. The pit should be filled with clean water. In suitable soil, all water should seep away within 24 hours².

² Environmental code of practice for Sanitation and Sewage Management, NEC

244. It is good practice to protect these areas by fencing to prevent entry by children and digging by scavengers, and to plant trees and shrubs around the perimeter.

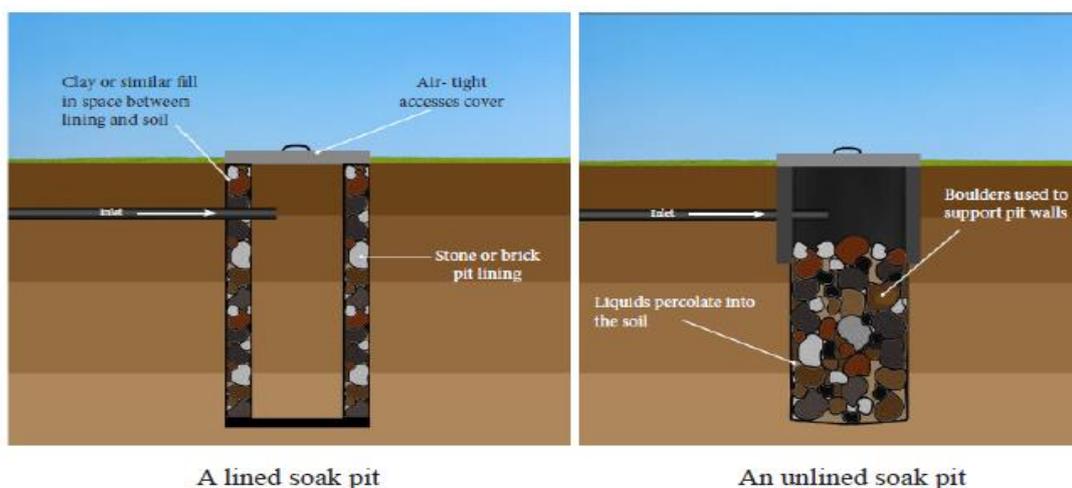


Figure VI-14 Soak pit

SLUDGE DISPOSAL

245. Emptying of sludge waste from pits and septic tanks and its subsequent disposal is an inherently risky operation in terms of the spread of diseases, and every care should be taken to ensure minimal health hazards to operators and the general public.

246. All sludge waste needs to be properly covered during collection and cartage to avoid flies coming into contact with excreta.

247. Where vacuum tanks are not available, special precautions need to be taken, e.g. the use of covered buckets and containers and covering the surface of excreta with sawdust, ash, soil or dry cow dung.

248. Frequency of sludge removal should be ensured every 3 to 5 years, subject to local conditions.

249. It is important to annually check on the depth of sludge waste in the septic tank. De-sludging of septic tanks should take place when the sludge depth has reached 2/3 of the liquid depth.

250. When de-sludging septic tanks, some sludge should be allowed to remain and the tank refilled with water in order to promote the essential microbial activity in the cleaned tank.

251. Sludge must be disposed of in a safe and proper manner at an approved and officially designated site. Preferably, it should be taken directly to the treatment plant; alternatively, where there is no treatment plant, it might be buried in the ground.

252. In the case of pit latrines, when the pit is nearly full, the pit can be topped up with soil and abandoned. Trees can be planted on top of the pit. Ideally, the floor slab and superstructure shall be designed and constructed in such a way that they can be moved to a new site.



Figure VI-15 Safe disposal of sludge

WASTE MANAGEMENT

All settlement in the extended area should have an environment that is acceptably uncontaminated by waste. Addressing waste issues will require different approaches appropriate to each community depending on the size of the population, accessibility by motor roads, access to waste services, and consumption patterns. All households in the extended area shall manage their waste in a manner that does not threaten public health or the environment.

SOLID WASTE

253. Solid waste in the extended areas shall be managed through the application of 3R principle (Reduce, Reuse and Recycle).
254. At household level, the best way to handle solid waste is to segregate it at source and recover what is possible. Eg. Segregation into organic wastes (wet waste) to be used for feeding animals or composting and dry waste such as paper, plastic, glass, metal to be reused or recycled.
255. The solid waste management system can be designed so that recovered dry waste is stored at the household level and then at the village for a fixed number of days, after which it is collected by a designated collector or scrap dealer for transporting to a market place in the vicinity. Developing such a system at village, Gewog and Dzongkhag level will be more economical and manageable.
256. All households should have access to a refuse container.
257. Waste (garbage, dry leaves, plastics, paper, etc) shall not be burnt to avoid air pollution. Open dumping should also be strictly prohibited.
258. Stray animals shall not be allowed to move around waste storage facilities.



Figure VI-16 Segregation of waste

Wet Waste	Dry Waste
<ul style="list-style-type: none"> - Kitchen waste (vegetables/fruit peel, food leftovers, egg shells, chicken/fish bones, rotten fruits/vegetables, teabags, etc.) - Garden waste (fallen leaves, twigs, flowers). Weeds, etc.) 	<ul style="list-style-type: none"> - Plastic (Plastic covers/bottles/wraps/cups. Milk/curd packets, etc.) - Paper (Newspapers/magazines, cardboards, tetra packs, paper cups/plates etc.) - Metals, Glass, Rubbers, Cosmetics, batteries, bulbs, etc,

Figure VI-17 Wet and dry waste

259. All composting within the extended area shall be conducted in a manner which prevents animals or the weather from scattering the composting materials and which does not create unreasonable odour or nuisance conditions.
260. All solid waste generated by the households and which is not otherwise composted or recycled shall be disposed off in containers or bins placed at established locations for collections, which will ultimately be disposed in the landfill.
261. All shops, hotels and other commercial establishments shall provide a clearly marked waste containers or bins for use by themselves and their customers.
262. Final disposal of solid waste is carried out in such a place and in such a way as to avoid creating health and environmental problems for the local population.
263. Efforts may be made to coordinate with the municipality for disposal of wastes from the extended area to the landfill and also development of a regional landfill site can be advocated for at higher levels of government.
264. Proposals for hotels, resorts, offices, group housing, hostels, etc shall identify appropriate system and sites for disposal of the solid wastes generated by the proposed land uses and constructions.
265. Cattle waste (both dung and urine) is an important resource and shall be used wherever applicable as a soil conditioner, for biogas generation, as a source of fuel or as a raw material for generating organic compost.
266. Improper storage of cattle waste leads to the creation of unhygienic conditions in communities and to environmental pollution. Households should be required to store the dung and urine in a well-protected, hygienic and environmentally safe manner.
267. Information Education and Communication campaigns are strategically important in leading to the ultimate goal of “waste free environments” and in promoting the application of 3R principle. IEC campaigns shall be implemented at the village and the gewog level by the Dzongkhag and other competent authorities.
268. The medical wastes generated from the BHUs in the extended area shall be managed as per the ‘guideline for infection control and health care waste management in health facilities’ developed by the Ministry of Health.

HOME COMPOSTING

- 269. The idea behind composting is simple and involves placing the right ingredients into the compost bin, keeping it moist, and giving it some air. When done properly, rich compost will be created to be used for garden beds that can add nutrients and hold moisture in the soil.
- 270. Compost shall be contained in a structure that is designed to limit odors as well as rodent and pest access.
- 271. Compost structures shall be made of impenetrable and durable material such as wood, plastic or fiberglass, and enclosed on the top and sides.
- 272. Wire structures, metal fencing or other open mesh materials shall not be used for composting.
- 273. Composting material shall be leaves, grass clippings, straw, non-woody and woody plant trimmings, sawdust, raw fruit and vegetables scraps, dry eggshells and tea bags.
- 274. Meat, bones, grease, eggs, dairy products, whole or partial animals, faeces, or inorganic materials such as rock, plastics or synthetic fibres cannot be used for composting.

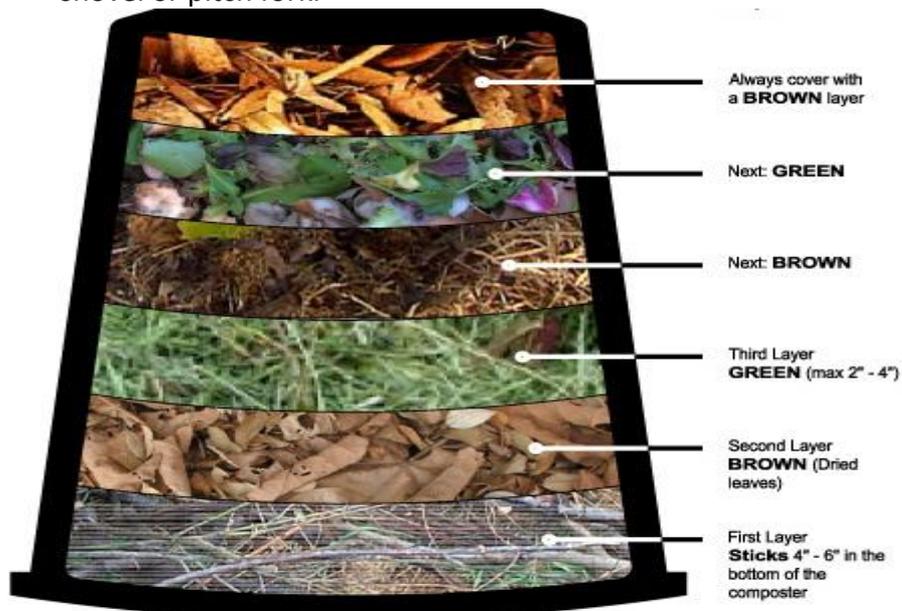
Table B-8 Compostable and Non Compostable Materials

Greens	Browns	Do not Compost
<ul style="list-style-type: none"> • Fruit and vegetables scraps • Teabags • Old flower and plant stems • Soft prunings • Weeds • Grass clippings • Chicken manure 	<ul style="list-style-type: none"> • Paper and paper bags • Egg trays • Newspaper • Cardboards • Autumn leaves • Hedge clippings • Sawdust • Crushed eggshells • Old straw and hay • Wood ash 	<ul style="list-style-type: none"> • Meat or fish • Cooked food • Plastic bags • Tin cans • Glass • Plastic bottles • Disposable nappies • Glossy magazines • Tetra packs

- 275. Compost shall be properly maintained at all times to minimize odors and to promote effective decomposition of the materials in a safe, secure and sanitary manner.
- 276. A properly maintained compost pile consists of three things:
 - a. The right ingredients – Keeping the ratio of ingredients consistent: two parts green to one part brown. Green materials include raw fruit and vegetables, grass clippings, weeds, cut up green houseplants, coffee and tea bags. Brown

materials include brown leaves, dead grass, straw, twigs, woodchips and sawdust.

- b. Moisture – Maintaining appropriate moisture levels. To test the pile, pick up a handful of the mixture - if water drips out, there is too much water. If the material falls to pieces, it is too dry. Ideal conditions exist when the mixture stays in a clump for a few seconds before breaking apart.
- c. Air circulation – Keeping the air circulating by regularly turning the pile with a shovel or pitch fork.



KEEP MOIST: As wet as a wrung out sponge.

AERATE: Air helps to speed up decomposition. Aeration should be done throughout the entire composting process.

KEEP COVERED: Use a compost lid, cardboard or canvas over top of your pile.

Figure VI-18 Home composting

CONSTRUCTION WASTE

Construction and demolition waste is generated whenever any construction/demolition activity takes place, such as, building roads, bridges, etc. It consists mostly of inert and non-biodegradable material such as debris, concrete, steel, plaster, metal, wood, plastics, packaging and paper products, fluorescent tubes, light fixtures, tiles, paints, etc. These wastes are often stacked along the road causing traffic congestion, drainage blockages and unpleasant sights. Therefore, construction waste also has to be managed properly.

277. The primary effort shall be to engage in construction waste prevention and reduce the amount of waste generated in the first place. Prevention is financially advantageous as it reduces the purchase of construction materials and obviates the need to remove wastes from site. Examples of waste prevention include ensuring ordering material on a need basis, ensuring correct sequencing of operations, ensuring proper storage, etc.
278. Material that is generated should be reused on site or salvaged for subsequent reuse to the greatest extent possible and disposal should only be considered as a last resort.
279. Construction and demolition waste can be used in the following manner:
- a. Reuse (on site) of bricks, stone slabs, timber, conduits, piping railings etc. to the extent possible and depending upon their condition.
 - b. Waste timber can be recycled as shuttering or hoarding or sent for reprocessing as medium density fibre board
 - c. Sale of material which cannot be used at the site due to design constraint or change in design.
 - d. Plastics, broken glass, scrap metal etc. can be used by recycling industries.
 - e. Rubble, brick bats, broken plaster/concrete pieces etc. can be used for building activity, such as, levelling, under coat of lanes where the traffic does not constitute of heavy moving loads.
 - f. Larger unusable pieces can be sent for filling up low-lying areas.
 - g. Fine material, such as sand, dust etc. can be used as cover material.
280. Construction wastes are best stored at source, i.e., at the point of generation. If they are scattered around or thrown on the road, they not only cause obstruction to traffic but also add to the workload of the local body.
281. For large developmental projects special provision should be made for storage and handling of waste material.
282. All construction/demolition waste should be stored within the site itself. A proper screen should be provided so that the waste does not get scattered and does not become an eyesore.
283. Attempts should be made to keep the waste segregated into different heaps as far as possible so that their further gradation and reuse is facilitated.

284. Material, which can be reused at the same site for the purpose of construction, site development, etc. should also be kept in separate heaps from those, which are to be disposed to landfill or sold for processing.



Figure VI-19 Recycling of construction waste



Figure VI-20 Storage of construction waste

a.

285. Burning of waste materials on site, such as plastics, chemicals or wood that is painted, chemically treated or contaminated with chemicals shall be prohibited.

286. The waste shall be transported without spillage on its way.

287. All construction waste or excavated soil shall be disposed only in areas designated by the local body.

STORM WATER

All settlements in the extended area should have an environment in which the health and other risks posed by water erosion and standing water, including storm water are minimised.

GENERAL

288. Storm water systems should be designed to mimic natural processes.
289. Storm water systems shall be designed to conform to natural drainage patterns and discharge to natural drainage paths within a drainage basin where practicable.
290. Special attention should be paid to the aesthetic aspects of the structures and landscaping works during construction to blend in with the environment.
291. The storm water system should contain and manage runoff flow rates at the site-level itself, reducing the impact of flooding on settlements.
292. Areas around dwellings should be kept free of standing wastewater, and storm water drains are kept clear.
293. Shelters, paths and water and sanitation facilities shall not be flooded or eroded by water.
294. Water point drainage shall be well planned, built and maintained including the drainage from tap stands, washing and bathing areas.
295. Surface or subsurface drainage caused by changes in grade or placement of impervious surfaces shall be collected and conveyed to an approved point of discharge to prevent flowing over adjacent public or private property.
296. Runoff must be discharged in a manner that will not cause adverse impacts on downstream properties or storm water systems.
297. Storm water runoff shall be directed to natural systems like landscaped planters, swales and rain gardens, etc. to reduce and filter storm water runoffs, if feasible.
298. The point of disposal for all storm water shall be any storm drain, existing open channel or detention or retention pond.
299. Discharges from the storm water drains should not pollute existing surface or groundwater sources or cause erosion.
300. Where ecologically important wetlands or rivers are recipients of storm water discharge, the quality and quantity of storm water discharges into such systems should be regulated to minimize downstream impacts.

STORM WATER SYSTEM

301. The storm water drainage system should be able to handle blockages and flows in excess of the design capacity to minimize the likelihood of nuisance flooding or damage to private properties.
302. The storm water networks should be laid in such a way to ensure that flows will not discharge onto private property during times when storm water flows are equal to or exceed the major system design capacity.

- 303.If the new drainage system is at the downstream end of an existing network, the possibility of future improvement of the upstream systems shall be taken into account.
- 304.The new system should be designed to accept the increased flow after improvement of the existing upstream network.
- 305.As far as possible, storm water drainage systems should be located on Government Land, which are non-building areas to ensure free and unrestricted access at all times for construction, repairs and maintenance.
- 306.The storm water drains should not be located in areas, routes, vegetation and landmarks that have a cultural and/or historical use or significance where possible.
- 307.The storm water system should achieve high velocities called self- cleansing velocity to avoid silting of sewers by settling down of the solids.

WATER SENSITIVE DESIGN

- 308.The storm water management should be based on the principles of water sensitive urban design to address storm water effects as close to source as possible.
- 309.Storm water management shall focus on water sensitive design approaches to reduce or eliminate storm water runoff generation through source control, and use of natural systems and processes to manage storm water quantity and quality effects.



Figure VI-21 Water sensitive design approaches to reduce runoffs (Infiltration trench & rain garden)

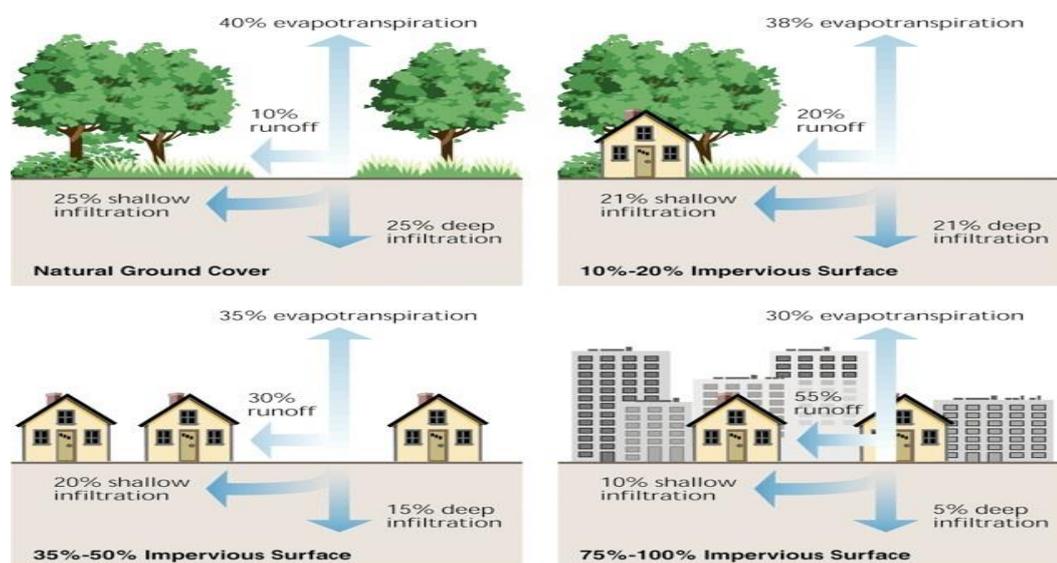


Figure VI-22 The impacts of imperviousness on the storm water runoff

- 310. The amount of impervious surfaces in the extended area shall be limited.
- 311. Where the site intercepts natural corridors, storm water management should seek to retain or recreate such corridors.
- 312. The existing wetlands in the areas must be retained and recreated.
- 313. Where possible, the use of permeable paving surfaces such as wood decks, bricks, and concrete lattice to allow water to soak into the ground should be encouraged.



Figure VI-23 Infiltration trenches along the roadside to promote infiltration of runoffs



Figure VI-24 Vernacular style pavement

- 314. Thick vegetation or “buffer strips” should be allowed alongside waterways to filter and slow runoff and soak up pollutants.
- 315. Vernacular style pavement (Dolep) which allows surface rain water to filter and percolate into the ground rather than concentrating rainwater into a runoff should be encouraged.
- 316. The storm water should be managed in a proper way to ensure a habitat for wildlife in watercourses for bio-diversity enhancement.
- 317. Structural storm water management solutions shall include engineered structures such as pipes, concrete channels, etc. while non-structural storm water management solutions shall include sustainable drainage systems such as ponds, vegetated swales, wetlands, etc.

Table B-9 Components of sustainable drainage systems

Pervious paving	Surfaces that allow inflow of rainwater into the underlying construction of soil.
Green roofs	Vegetated roofs that reduce the volume and rate of runoff and remove pollution.
Swales	Shallow vegetated channels that conduct and retain water and may also permit infiltration.
Detention Basins and Retention Basins	Areas that may be utilised for surface runoff storage as well as to provide water quality.
Infiltration devices	Sub-surface structures to promote the infiltration of surface water to ground. They can be trenches, basins or soak-away.
Pervious paving	Surface that allow inflow of rainwater into the underlying construction or soil.
Constructed wetlands	Constructed Wetlands are ponds with shallow areas and wetland vegetation to improve pollutant removal and enhance wild life habitat.
Rainwater harvesting	The rain is collected and conveyed into a storage tank and is used for outdoor non-potable water uses.

OPERATION AND MAINTENANCE

- 318. The storm water drains should be periodically maintained to function properly.
- 319. Adequate budget provision should be kept for operation and maintenance of the storm water system in the extended area.
- 320. No person shall fill or obstruct the open drainage or ditches by disposal of debris or solid wastes.
- 321. Vegetated storm water facilities, such as grassed swales and bio-filters, shall be inspected, mowed and replanted as required.
- 322. It shall be the duty of the owner to maintain, repair and restore all private storm water and drainage systems located on the owner's property to reduce flooding in their vicinity.



Figure VI-25 Importance of periodic maintenance

VII ENVIRONMENT

AIR POLLUTION

323. All households in the extended area shall be encouraged to replace traditional stoves and firewood with smokeless stoves/heaters and alternatives for firewood such as sawdust briquettes to reduce consumption of firewood and improve air quality.
324. Preventive measures for fire hazards shall be implemented where ever possible to avoid air pollution and fatal damage to property.
325. Appropriate regulation and standards shall be adopted for electrical installations to prevent short circuiting and fire hazards.
326. Indoor air quality shall be improved by encouraging use of low VOC materials (Paints & Adhesives) and zero or low emission finish materials for buildings.
327. Necessary permits shall be obtained from the concerned authorities prior to burning of any agricultural debris.
328. All vehicles plying within the extended area should comply with the vehicle emission standards.
329. Where construction work generates dust, all reasonable and practicable measures must be taken to minimize that dust. This can often be achieved by dampening the ground with a light spray of water.
330. Sites that remain exposed for long periods of time must have dust suppression methods applied. In addition, covering of loads shall be ensured when transporting material.



Figure VII-1 Good and bad building practices

NOISE POLLUTION

331. Noise prevention and mitigation measures should be applied where there is predicted or measured noise impacts from a project facility or operations. The preferred method for controlling noise from stationary sources is to implement noise control measures at source.
332. Barriers should be located as close to the source or to the receptor location to be effective.
333. The hours of operation for specific pieces of equipment or operations shall be limited, especially mobile sources operating through community areas.

- 334. Where ever feasible, the noise sources shall be re-located to less sensitive areas to take advantage of distance and shielding.
- 335. Advantage shall be taken of the natural topography to act as a noise buffer.
- 336. Where ever possible, traffic routing through community areas shall be reduced.
- 337. Flight routes, timing and altitude for aircraft (airplane and helicopter) flying over community areas shall be planned properly.

WATER POLLUTION

- 338. Effluent from the houses shall not be discharged in any water bodies without any prior treatment.
- 339. The solid waste in the extended areas should be managed properly to reduce its impacts on water quality.
- 340. Effluent (soap and dirty water) from workshops and vehicles wash facilities in the extended area shall be treated before it is released into the surrounding environment.
- 341. The workshops with vehicle wash facilities in the extended area shall follow the 'guidelines for vehicle wash facility' developed by NEC to reduce the impact on the environment.
- 342. Organic farming shall be encouraged in the extended areas to reduce pesticide runoff in the water bodies.
- 343. River permits should be obtained from concerned authority for any river running program (kayaking, rafting, etc.) in the extended areas.

RETAINING NATURAL VEGETATION

Existing vegetation on steep slopes is not only important to the ecological and aesthetic values of the site, but also plays an important role in the maintenance of slope stability, drainage and erosion prevention. The decision to retain or remove vegetation should therefore, be based on an intimate knowledge of the site.

- 344. Make strategic use of existing vegetation to retain the site's natural character.
- 345. Phase land clearing to minimize the area exposed to soil loss and erosion at all times. Phasing may be service related (roads and main service lines), or spatially related (i.e., clearing only one portion of the plot at a time, completing development and re-vegetation to control erosion before starting the next portion).
- 346. For areas of the site where vegetation must be removed but no construction will occur, leave soil intact (i.e., avoid compaction, excavation, filling, etc) to allow for more successful replanting in these areas.

RE-VEGETATION AND LANDSCAPING

- 347. Replace trees in a manner that helps to restore the natural character of the hillside site.

348. Specifically, plant trees to screen undesirable views and buffer incompatible uses.
349. Arrange trees in natural groupings or clusters rather than in lines or formal arrangements.
350. It is strongly recommended to use native plants for site restoration and landscaping as much as possible.
351. Where the use of native plants is not desirable due to given site or view constraints, select naturalized plants that is similar in appearance, growth habit, color and texture to native plants, and that will not act as a weed in the natural environment.
352. Plant shrubs and trees in masses and patterns characteristic of a natural setting and with the intent of encouraging biodiversity.
353. For restoration or creation of habitat areas (e.g. riparian areas, ravines, greenways, etc.) use plant species that have value as food or cover for wildlife.
354. For dry or south facing slopes, replant with drought and fire-resistant species.

PRESERVATION OF FLORA AND FAUNA

Wildlife and plants are inextricably linked and many insects for instance can only survive if a particular plant is present. Due to this strong link between plants, insects and other wildlife it is possible to predict which wildlife is likely to thrive if a given range of plant species is growing together. Following is recommended for preservation of vegetation and landscape on site: -

355. When developing the site, care should be taken to keep vegetation clearing at a minimum.
356. Compensatory forestation should be practiced wherever vegetation removal has been done.
357. Protection of existing vegetation (including trees, shrubs, grasses and other plants) where possible, by preventing disturbance or damage to specified areas during construction is recommended.
358. The extended areas should stop/slow deforestation and forest degradation by practicing sustainable management of forests to avoid emissions, conserve water resources, prevent flooding and preserve biodiversity.

Paro Valley Development Plan

Figure VII-2 Energy efficient rammed earth used for construction in rural area



ENERGY EFFICIENCY

All settlements shall follow an energy efficient pathway so as to minimise the depletion of the domestic energy resources.

359. All households in the extended area shall be encouraged to replace traditional stoves with efficient improved cooking stoves to reduce the consumption of firewood.
360. All households shall use sawdust briquette as an alternative fuel source for heating purpose.
361. All households shall be encouraged to use alternative renewable energy source such as solar energy for lighting, heating etc.
362. Green designs and sustainable technologies should be adopted during construction in the extended area to save energy.
363. The built environment in the extended area should be in harmony with our country's natural pristine environment.
364. The houses in the extended area should take advantage of natural site features, such as topography, sunlight, shade, and prevailing breezes, to promote energy conservation
365. The household in the extended area should be encouraged to use Energy-Efficient Lighting such as efficient lamps, ballasts, controls, and luminaries coordinated with daylight and color of interior space to provide the requisite level of light.
366. Any developmental activities in the extended areas should use green materials and resources to minimize the impacts on the environment and maximize the energy efficiency.
367. The energy meters should be used in the extended area to monitor energy consumption to ensure energy conservation.
368. Natural lighting should be used wherever possible but where artificial light is needed, LED or regular and compact fluorescent lighting should be used.
369. The passive solar building design should be used in the extended area, whereby, windows, walls, and floors are designed in a careful and sensitive manner with reference to the sun and landscape to collect, store, and distribute solar energy in the form of heat in the winter and reject solar heat in the summer to allow for heating and cooling.



Figure VII-3 Energy efficient lighting

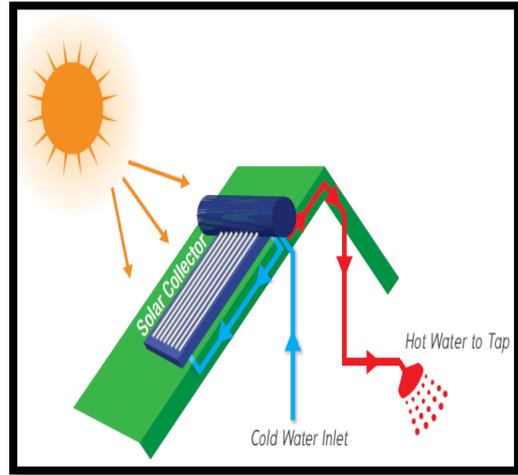


Figure VII-4 Solar water heater

- 370. Any development should support the transition to a low carbon future and encourage the reuse of existing resources, including conversion of existing buildings and encourage the use of renewable resources.
- 371. When replacing kitchen or bathroom fittings consider adding internal solid wall insulation or installing mechanical ventilation with heat recovery
- 372. When laying new flooring consider adding floor insulation
- 373. When re-roofing, renew insulation and consider the installation of solar photovoltaic or solar water heating technology.

SECTION C.ANNEXTURE

ANNEXURE 1 - LIST OF DETAILS TO BE SHOWN ON PROPOSED LAND DEVELOPMENT PLAN/ SUBDIVISION PLAN (WHEREVER APPLICABLE)

- i. The boundaries of the plot and plot level in relation to neighboring road level.
- ii. The highest and lowest levels of the plot and average slope with direction thereof.
- iii. The position of the plot in relation to neighboring streets and name of the streets
- iv. Width of the proposed streets and internal roads.
- v. Sub-division of the land or plot or building unit with dimension and area of each of the proposed sub-divisions and their use in conformity with these regulations.
- vi. Dimensions and areas of open space and common amenities plots provided for under these regulations.
- vii. All the existing buildings and other development standing on or under the site.
- viii. The position of buildings and of all other buildings and construction which the applicant intends to erect.
- ix. The means of access from the street to the buildings or the site and all other building and constructions which the applicant intends to subdivide.
- x. Yards and open spaces to be left around the subdivided buildings to secure free circulation of air, admission of light and access.
- xi. The width of street in front and of the street at the side or rear of the subdivided building.
- xii. The direction of north point relative to the plan of the site or the buildings.
- xiii. Any physical feature such as trees, wells, drains, pipelines, high-tension lines etc.
- xiv. Existing streets on all sides indicating clearly the regular line for streets if any prescribed under the Local Area Plan and passing through the building units
- xv. The location of the building in the plot with complete dimensions.
- xvi. A plan indicating parking spaces, with egress and ingress if required under these regulations
- xvii. The positions of the building units immediately adjoining the proposed development.
- xviii. The position of every water closet, privy, urinal, bathrooms, cess pool, well or cistern in connection with the building other than those shown in the detailed plan.
- xix. The lines of sewers on the site and/or building, the size, depth and inclination of every sewer and the means to be provided for the ventilation of the sewers.
- xx. The position and level of the outfall of the sewer.
- xxi. The position of sewer, where the sewerage is intended to be connected to sewer.

ANNEXURE 2 - LIST OF DETAILS TO BE SHOWN IN DRAWINGS/PLANS FOR OBTAINING BUILDING PERMIT

Drawings with complete design information and details, but not limited to the following, shall be submitted to the Implementing Authority for scrutiny and approval.

A. ARCHITECTURAL DRAWINGS

- a. Site plan shall be drawn to scale and shall include the position of the proposed building in the plot showing the dimensions of the plot boundaries, set back lines and showing the approach road, location of septic tanks, soak pit, roof drainage, and drainage plan. The site plan shall clearly show any proposed widening right of way, no build line where a 15m clearance is required major streams, minor streams, cliffs, ledges, etc. are required as indicate by the latest official site plan issued by GMA (for safety and environmental protection)
- b. Site plan shall include a schematic drawing showing information on adjacent plot like building line, permanent features, drainage, access road, septic tank and soak pit location.
- c. Layout plan of each floor, elevations of all sides of the building, sections through toilets and staircases, details of doors, windows, traditional cornices, railing/parapet, opening and other methods of ventilation, details of toilet and kitchen.
- d. Proposed parking layout as prescribed under this regulation
- e. A digital copy of the drawings for reference, if available.
- f. Drawings shall have proper title block indicating name and signature of owner, Architect, type and number of storey, location, date, revision number and date, scale, and north direction.
- g. The following minimum scales shall be followed:
 - Site Plan 1:500
 - Elevation/plan/section 1:100
 - Stair case/toilet/kitchen details 1:50
 - Door/windows/cornice details 1:25

B. STRUCTURAL DRAWINGS

- a. A copy of design calculation notes.
- b. Design codes used shall be listed on the drawing.
- c. Loads (assumed or actual) shall be listed on the drawing.
- d. Material properties shall be listed on the drawing.
- e. Assumed soil bearing capacity or soil investigation report shall be attached.
- f. Foundation plan, truss layout plan showing truss and purlin spacing, beam and slab layout plan for each floor showing clearly the staircase opening, shaft opening and any other openings and depressions.
- g. Concrete and reinforcement details for foundation, beams, slab, staircase, lintel, cornice, projections, zhu and rabsey, wall, etc.
- h. Truss elevations and connection details showing the holding down details.
- i. Details of separation gap indicating the location of such gap on the plan wherever required
- j. Details of splice locations and splice length for beams, columns, slab and staircase.
- k. For Load bearing walls, details of plinth band, lintel band, roof band including vertical bars at corners, opening jambs, wall junctions to be shown.
- l. Foundation details indicating depth of foundation and plinth level.
- m. Dimensions shall be clearly indicated for all structural members
 - Anchorage of beam bars in an external beam – column junction
 - Column ties and Beam stirrups details
 - Retaining details in case of foundation founded on different levels
- n. Drawings shall bear proper title block indicating name and signature of owner, Structural Engineer, type and number of storey, location, drawing title, date, and revision number.

C. ELECTRICAL CONNECTIONS

- a. Single line diagram of total electrical system showing incoming terminal point and distribution network.
- b. Electrical layout plan showing positions of light points, power points, any other outlets, switches and wiring diagram.
- c. Tapping off junctions, switchboards, and distribution circuits for power and lighting from SDB and phase distribution (in the case of multiphase installations) shall be indicated clearly on the wiring layout plan.
- d. Sub distribution boards showing circuits and respective loads and protection devices.
- e. Power distribution boards for large multi-storey buildings showing floor- wise distribution from main control board and incoming power line.
- f. For multi-storied / complex buildings, design calculations shall be submitted.
- g. Drawings shall bear proper title block indicating name and signature of owner, Electrical Engineer, type and number of storey, location, drawing title, date, and revision number.

ADDITIONS AND/ OR ALTERATIONS TO EXISTING INSTALLATIONS

The following information shall be submitted for additions and/or alterations to existing Installation:

- a. Polarity test results
- b. Insulation test results
- c. Earth continuity test results
- d. Earthing test results
- e. Capacity, condition and specification of existing spare circuits
- f. Rating, specification and condition of existing incoming mains control gear
- g. Composite (existing and proposed) layout plans for all floors

Note: For factories, relevant by laws shall be followed as per Bhutan factory, electricity rules or relevant international standards.

LEGEND SHALL SHOW

- a. Type and wattage of fixtures
- b. Type of SDBs
- c. Type of PCBs and connected load
- d. Type of MCBs
- e. Switches and Switchboards
- f. Junction boards
- g.

COMPOUND ELECTRIFICATION WORK

- a. Fixture and fitting specification
- b. Foundation details for support poles etc.
- c. Terminal box details.
- d. Size and type of cable proposed to be used.
- e. Single line diagram showing
 - Connections
 - Phase distribution
 - Circuitry

D. TELEPHONE CONNECTIONS

Submitted drawings shall indicate symbols and legend. All points, junctions, routes ducts, telephone terminal cabinet are to be clearly indicated.

Drawings shall bear proper title block indicating name and signature of owner, Concerned Engineer, type and number of storey, location, drawing title, date, and revision number.

E. DRAINAGE AND SANITATION

- a. Plan showing Kitchen, bathroom and WC outlets.
- b. Plan showing location of septic tank and soak-pit or sanitary pipe lay out to the nearest sewer line, including manholes, wherever it exists.
- c. Drainage layout plan connecting to the nearest storm water drain.
- d. Sewer design shall be in accordance with plumbing code of practice.
- e. Materials and sizes of pipeline.

F. WATER SUPPLY

- a. Layout plan of internal plumbing system of each floor with details of pipe sizes and material.
- b. Water meters shall be provided for each dwelling unit.
- c. Plumbing design shall be in accordance with plumbing code of practice.
- d. Materials and sizes of pipe line
- e. Drawings shall bear proper title block indicating name and signature of owner, Engineer, type and number of storey, location, drawing title, date, and revision number.

ANNEXURE 3 - SCRUTINY FEES AND SERVICE AND AMENITY FEE PAYABLE AT THE TIME OF APPLICATION FOR LAND DEVELOPMENT/BUILDING PERMIT

Sl. No.	Category	Service and Amenity Fees (Nu. Per Sq.m of Built-up Area)
01	Residential/ Institutional Building Use	Nu. 30/sq.m
02	Commercial/ Industrial Uses	Nu. 50/sq.m

Scrutiny Fee: The minimum scrutiny fee for land development / building permission shall be Nu. 3000.00 or Nu. 16.14/sq.m whichever is more. Fee for renewal of development / building permission shall be Nu. 500.00.

Sr. No.	Category	Fee
01	Issuance of Official Site Plan	As approved by Implementing Authority

ANNEXURE 5 - APPLICATION FOR BUILDING OCCUPANCY

To:

The Chairman /Thrompon,
Paro Valley Development Authority/Paro Thromde

Sir,

I hereby certify that the addition/ alteration/ construction of building on Plot/ Thram No. in Lam, intown has been completed on, according to the approved building plan/ drawings, vide permit No. dated.....

The work has been completed to our best satisfaction. Workmanship and all the materials (type and grade) have been used strictly in accordance with the approved documents/drawings and relevant standards, codes of practice and specifications. Provisions of the Bhutan Building Rules, conditions or orders issued there under have not been transgressed/ violated in the course of the work. The building is fit for use for which it has been added/ altered/ constructed. The necessary 'Occupancy Certificate' may be issued.

Signature of the Owner:

Name & Address:

Telephone No. (Residence):

Telephone No. (Office):

Fax No.:

E-mail address:

Dated:

ANNEXURE 6 - OCCUPANCY CERTIFICATE

To,

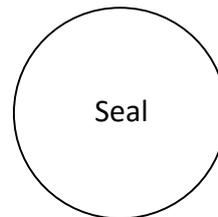
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.....
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Sir/Madam,

With reference to the application dated regarding the addition/ alteration/ construction of building on plot/Thram No. in Street/ Lam.....intown has been inspected on date and found that the building is fit / not fit for occupation.

Instruction / Remarks (if any):

Chairman / Thrompon
City/Municipal Corporation



SECTION D. REFERENCES

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- NECS, 2016, Bhutan Drinking Water Quality Standards
- International Institute for Energy Conservation, Thailand, 2015, Energy Efficiency guidelines for Commercial and Public Buildings in the Pacific
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- <http://www.sswm.info/content/stormwater-management>
- <http://www.stlouispark.org/backyard-composting/residential-compost-guidelines.html>

b.