

CHAPTER SIX SHELTER AND URBAN MANAGEMENT STRATEGIES

- **Shelter Strategy**
- **Urban Development Management System**



6.0 SHELTER AND URBAN MANAGEMENT STRATEGIES

Future strategies for development are important since they lay down various mechanisms and systems which will help in making the aims, objectives and 'proposals for action' stated in the Damphu Structure Plan a reality. These are established rules and regulations which form the non-negotiable components of a Structure Plan, formulated to guide the town managers and local authorities during the implementation of the Structure Plan. These strategies will be elaborated in detail as a part of the Structure Plan in the later stage of the plan preparation process. At this point it should be made clear that a Structure Plan, once cleared, is not negotiable, flexible or easily adaptable. It sets out a rigid "structure" that can be altered only at the highest level. Smaller area plans using Guided Development, or Local Area Plans, based on land pooling, are more flexible, adaptable and indeed more participatory. Yet they have to work within the framework of the Structure Plan.

6.1 SHELTER STRATEGY

His Highness has defined the goal of Bhutan as Gross National Happiness. Nothing brings happiness to the people like owning their own home. A major element of the Damphu Structure Plan is to bring housing within the reach of common people, moving this from the realm of dreams to reality.

The 'Housing Shortage' in Damphu is on account of delayed construction activities, in the absence of any proper Structure Plan for the town and denial of permission from authorities on account of shortage of infrastructural facilities like water supply and electricity. However this stagnant town is very soon going to get transformed into an active regional with high possibilities of increased population in the town, because of its status as Dzongkhag administration centre, location and the envisioned activities in the region. This housing shortage will grow even more in the coming decades. Hence it is the prime responsibility of the planners to formulate a shelter strategy for the people of Damphu.

The proposed Shelter Strategy could be understood in two main parts:

1. Designing and physical planning aspects of the town.
2. Finance, management and administration

6.1.1 Designing and Physical Planning Aspects

As discussed in chapter three 'Demography and Planning Standards', population projections and carrying capacity of a place are two inseparable aspects, that have a deep impact on the density pattern and hence the shelter strategy. The main physical determinants of the Shelter Strategy, which would determine the carrying capacity and the population density pattern in Damphu, would be:

- Land slope,
- Eco-fragile area,
- View and sightlines, and;
- Land cover.

The land slope directly relates to the physical capacity of the land in terms of accessibility to land, the ease of construction, stability of the structure, laying of infrastructure and related costing. The higher the slope, the lower is the associated population density. Hence in Damphu town the Village Square areas have been identified on comparatively flatter land to take up higher density whereas the higher slopes are designated as lands with low density. The eco-fragile nature of Damphu town and its immediate surroundings give a clear indication to curb the spread of urban development and consolidate it in minimum and least eco-fragile areas, rather than allowing urban sprawl. Since Damphu is rich in scenic beauty, as well as envisioned as a possible tourist destination, it becomes very important to restrict the spread of man made features especially like buildings in both a horizontal, as well as a vertical manner. The act of restricting building heights would help in minimizing hindrance of scenic views, or the sight lines which exist in Damphu, and are the very genesis of the tourism potential. Finally, the nature and pattern of land use and hence the activity associated with a place has an impact in the amount of population it attracts. Damphu has been planned for non-intensive and eco-friendly land use and activity patterns, which would help maintain the existing sanctity of the place as well as respect the carrying capacity of the place.

Taking into consideration the above factors and their implications the Structure Plan advocates 'low-rise, high-density' development as a development strategy. 'Low-rise, high-density' means the maximum height allowed in Damphu Town and its peripheral zone would be ground plus two floors, but to accommodate higher density of population the allowable ground coverage of buildings would be relatively high, and the building setbacks would be less. The details of the same are elaborately discussed in the later part of the chapter.

6.1.2 Finance, Management and Administration

In today's world the term 'Housing Problem' is often understood as a numbers game. The available dwelling units are compared with the number of households and a deficit is calculated to determine the "housing shortage." It has been considered as the government's responsibility to fill this gap, which always seems to be widening.

The solution to this "housing shortage" lies as much in the financial mechanisms we evolve and in the institutional modalities, as it does in the physical plans we prepare. It is important



that we facilitate the private sector to become active in the provision of housing, in addition to the public sector agencies involved now. The idea is to get small and medium sized builders into the shelter provision business, which would also provide employment in the construction industry. There is a crucial need to enhance the building skills and crafts in this sector, which can be one of the largest employers of vocationally trained Bhutanese youth. Other long-term loan schemes can be evolved for the buyers of housing units.

For achieving the above said goal two strategies seem to be required. First, the problem needs to be re-conceptualized from that of a “housing shortage” to one of “facilitating a shelter process.” Next, the problem has to be seen as promoting private sector initiatives. Thus, we are moving from the government producing amounts of minimum standard housing units, to facilitating and promoting an array of private actors to get on with the process of creating shelter in various manifestations.

The strategy proposed views the housing processes from different perspectives. These could be stated as:

1. Access to land,
2. Access to housing finance,
3. Access to materials and technology,
4. Access to construction; and,
5. Access to design, planning and management.

The main actors in such a scenario are the landowners, the contractors, the potential buyers, the materials suppliers, the skilled labour, the promoters, the designers and the financial institutions. If a housing strategy is to facilitate all of these actors, the barriers each face in meeting its peak performance need to be isolated and actions taken to break those barriers.

In addition to generating more shelter and more options for shelter, another goal of the Shelter Strategy is to increase the utilization of Bhutanese resources to achieve objectives. This involves evolution of more sophisticated financial mechanisms; training Bhutanese youth into skilled blue collar workers, promoting small electrical, plumbing and other specialized contractors and facilitating medium and large contractors.

6.1.3 Opportunity for Access to Shelter

The Shelter Strategy for Damphu envisions a variety of needs on the part of end users. These needs would relate to the users locational preferences, on the level of development of shelter (size, amenities and finishes) required and on the extent to which the users envision shelter to be a function of their social status. There will be those who will walk to work, or who will depend on a public transport system. Others will drive and location may not be so severe a criteria. Some may plan to remain single, or be childless parents, or to have large families or to

live in an extended household with several generations. For some households, the dwelling unit may act as a basic functional devise, providing shelter and security, while for others it may be a major source of social status. People’s willingness to pay for shelter may not be a direct function of their earning power, as they may prioritize other investments like the education of their children. In the actual design of the range of locations, sizes and potential development of dwelling units in plotted areas and in medium to high-density residential schemes the government must aim for a wide diversity of housing packages. The Local Area Plans will provide the mechanism within which the goal could be achieved.

Landowners require a Local Area Plan under which they can market their land. They need to know the layout and subdivision rules which will determine the density, land use and nearby amenities which will all together set a value and define potential buyers. Individual owners may not have the management skills to develop their land, so a strategy must facilitate “promoters!” Promoters can bring together all of the other actors and manage a physical product within the boundaries of an investment package. Promoters also need to know the prices, the rules and prospects governing each site. A good plan removes the element of the unknown, tying down all of the facts about each parcel of land.

One of the most facilitative processes the government could initiate would be “packaging projects” such that a team of professionals could “bid” a turnkey price to construct and sell entire neighborhoods. For example, the government may provide the bidders with a site plan, a detailed building programme, comprehensive specifications, the public facilities required, including housing units, site development, access roads, and walkways and landscaping.

The National Housing Development Corporation (NHDC) could initiate this process by inviting teams including an Architect, Landscape Designer, land owners, Contractor and a financial Promoter, to submit a comprehensive proposal to build, say two hundred houses, and all of the infrastructure and amenities. These bids would be proposals for everything from the design, layout and selling prices of the houses, shops and offices within the project.

The Government could further facilitate this process by assisting in the access to land for Group Housing, private sector projects. The proposed local area plans must designate plots for lower middle class group units, in the layouts. Row Houses must be introduced as a housing typology for higher density locations.

For such a scheme to work the government needs rolling capital for accumulating lands and its overheads. It would recuperate these from the promoter whose responsibility would be to pay all of the actors concerned, maintain a schedule and to sell the units in the open market. For this the promoter would need short-term capital investment of a substantial level. Thus, financial planning and the role of financial institutions like the Royal Insurance Corporation of Bhutan, the Bank of Bhutan, Bhutan National Bank and the Royal Pension Fund is very crucial



in increasing the housing stock of any particular place. Consortiums of actors noted above need short term capital loans to “get projects off the ground.”

Facilitative Finance

Finance is another facilitative and promotive element of the housing strategy. Until now, housing finance has been for the end users to buy their homes over some period of amortization and rate of interest. This concept of finance needs to be broadened.

At the national level Bhutan will have to evolve housing policy measures, which create urban and housing financial institutions. In doing so the scale of modest operations and limited human resources available must be formative parameters. On the other hand organizations that are repositories of surplus capital, such as banks, the pension fund and the Insurance Corporation must not act in the shelter sector in an ad hoc and independent manner, skewing the sector toward the internal needs of those organizations. The Shelter Strategy for Dampfu cannot await the emergence of this mechanism. At the same time two forms of development finance are urgently needed and the Bank of Bhutan may be entrusted to initiate these. The resources for these may come from a requirement that the insurance and pension institutions invest a fixed percentage of their reserves annually into the Bank of Bhutan’s shelter fund. The interest rate paid to these investors would be half a percent less than reaped from current market wholesale investments. The finances required are for seed capital for developers /promoters and long-term mortgage finance for homeowners.

Seed Capital

Entrepreneurs and developers will have to be facilitated during the early project gestation period. Finance must be extended to promoters for medium periods at medium rates of interest to buy property and to construct houses. From the time the land is bought, until the time the dwelling units are sold to end users, they will need seed capital to finance the actual construction of the units, to buy materials and better mechanized equipments and to pay the laborers during the construction process.

Financial planning and facilitation through Seed Capital is an essential element of the Shelter Strategy for Dampfu. It makes good sense that such an activity be initiated within the organization of an existing financial institution, than within the structure of a new and inexperienced development finance institution, specialized in the housing sector. Such Seed Capital loans should cover a medium quantity of construction. Performance with the first Seed Capital loan should be the criteria for advancement into further support. A gestation period of three to five years would be the credit period, with amortization running not more than four to seven years. Interest rates for Seed Capital should be considerably higher than the rates charged to homeowners for long term finance of individually owned dwelling units.

Long Term Mortgage Finance

The system needs to consider other channels also. A household may opt to build its house. In this case it needs long-term finance to buy the land and to develop it. To develop a vibrant housing market in Dampfu, as well as the country as a whole, a system of long-term mortgage finance is essential.

There are a limited number of perspective homeowners who can afford to make a one-time payment for their homes. The vast majority of potential buyers will be able to muster a maximum of twenty to thirty percent of the total dwelling unit cost as their initial equity share in the project. The Bank of Bhutan may initiate a savings scheme for future home owners; where in youngsters begin to make monthly deposits toward the time when they have accumulated the needed equity to embark on a full fledged housing loan. What is needed is to initiate a culture of savings and borrowing amongst the populace. In mortgage finance the dwelling unit itself becomes the asset held by the bank as surety against potential defaults. It is also essential in this kind of a system that the judicial system favors the banking system when the issue of repossession of property arises, due to defaults in loan payments by borrowers. A housing mortgage finance system cannot function where the potential of eviction and repossession does not exist. It is clear that a mix of buyers will emerge. Some will be in a position to make an outright purchase, extending payments to the developer in accordance with stages of construction. Others will require smaller portions of the total equity in the form of loans. But the majority of homebuyers will require around seventy-five percent of the equity in the form of a loan, and an amortization horizon of between fifteen to twenty years. Monthly payments will have to be profiled against the buyers estimated ability to pay over the amortization period. That ability would rise over time. Therefore a “telescoped” repayment schedule may make more sense in Bhutan than a simple system of equated monthly installments, which equalize the capital and interest over a long period of time, into a static monthly loan repayment, called an EMI in the banking industry. While these modalities must be worked out, there is no doubt that a mortgage finance system must be created urgently, using a rolling fund concept to initiate more and more loan opportunities with a given base of capital and annual investment from other pension and insurance institutions.

The government may promote such an effort by providing land owners with layouts for small plots and giving them support in planning site and services schemes on their land. Potential house owners may then buy these and build their own houses. By adjusting the building controls such that small houses do not need any permission, access to shelter becomes that much simpler.

This strategy proposes that the government gets out of the housing design, construction, sales and management of estates and facilitates and promotes other actors to do these things. This would allow the government to “go to scale,” through a facilitative and promotive strategy.



The advantage of this approach is that it off-loads the actual management of house building to the private sector; it facilitates the realization of the Structure Plan in terms of creating high density, compact, mixed-use communities near Neighborhood Nodes and Village Squares. Social facilities and amenities can be built into these packages, by the government including their budget allocations for amenities in the budget for the package. With such limited responsibilities the government could then hone in its capabilities on “project packaging,” coordination and facilitation. Concentrating on the Village Squares and high density precincts proposed in the Structure Plan, the government could initiate at least one such project the first year, and one in every subsequent two years. As the concerned department would be recuperating its overheads from the bidders, this activity would be self-financing. This also becomes a kind of land pooling scheme, as the government readjusts the land and hands it over to the promoters to develop and market it. The landowners are compensated at market rates, but only as the project is sold to consumers, with a “sunset clause” to protect them from inordinate delays in payment. The same scheme could be used for urban infill projects and Urban Core development projects, where saleable space makes up a sizable component of the works.

This strategy proposes that the government become a facilitator and promoter of shelter development rather than a provider of housing units.

Low Income Group Housing

This is an important part of any shelter strategy especially for any developing nation. Though Damphu currently may not need this, in the near future, when the town starts flourishing, the issue of shelter for the lower income groups may become a very vital element to avoid any kind of unhygienic or unsafe settlements. Almost all flourishing towns attract, support and are also supported by a large number of poor and unprivileged population, which we must bring out into the open, and address as a public policy and planning issue. They are predominantly workers whose ability to pay for accommodation is low and live in illegal and unhygienic Bagos. These will grow at a much faster rate than the better off segments of the society as the town grows. Subsidized housing will not solve the problem. One manner to address this issue is to formalize the occupations of these people making it mandatory to register domestic and construction workers, to pay reasonable and minimum wages, and to see that these people have adequate housing. What seems most reasonable is that the Development Briefs for medium and high-density housing complexes in the Local Area Plans include small housing units, whose market values and selling prices are within the reach of a broader band of users. The creation of neighborhoods with economic diversity, yet cultural homogeneity, would aid bringing new urban immigrants into the mainstream of national life. It obviates the creation of low income ghettos.

This segment of population could be provided with basic amenities such as path paving, street lighting, potable water through common taps, common sanitary and bathing places, and

washing areas. To cover these costs the local authority would place user charges on the inhabitants. Here again a fund would be needed to start the process. The user charges would have maintenance and capital formation components.

From an urban design point of view, this is the sector that the public sector should be focusing its limited skills on, while the private sector should be facilitating in the middle and upper income groups.

In every Local Area Plan of the town a small high-density village of low-income units could be constructed for domestic servants who will work in the area. Another strategy would be to require each detached bungalow to provide a “servant’s quarter” within their own compound. But these may not necessarily be inhabited by the household’s own servants in the long run. They may be rented out to young bachelor- workers who are recent migrants. Another strategy would be to layout Site and Services schemes of not more than fifty houses each where basic services (storm drains, paved foot paths, street lights, water, sewerage, solid waste collection and electricity) and the inhabitants would buy these little plots and construct their own modest shelters. Plots could be as small as fifty square meters each and party walls would be allowed. It may also be possible to provide the plinths and party walls in some schemes. There could also be provision of loans at very low interest rate or building materials under self help housing schemes.

Reception Accommodation

Cities and towns are growing rapidly in Bhutan. Educated youth with Tenth- and Twelfth-Standard “pass” are flocking to towns in search of employment, which they are finding in the service sector, in retailing, in the hospitality sector and in blue collar jobs. On the whole these are single, young male bachelors who team up with relatives or village friends and rent shanty rooms in illegal shacks. The shelter strategy sees a viable investment market in the construction of working women’s and working men’s Hospices in Damphu, as entry point housing. These would be walk-up structures having “triple seated” rooms with a small cooking niche, common toilets and baths and drying balconies. There may be a common mess and T.V. lounge on the ground floor.

Another issue of concern is the need for measures towards improving the skills of the Bhutanese workers in the construction industry. The development of such a force is suppressed by the existence of an underpaid supply of foreign laborers. This must stop! By exploiting Indian labour, which is cheap, the nation is destroying its own labour market. With a per capita income about three times India’s, in the immediate future, Bhutanese working conditions will have to be protected, if there is to be any kind of working force at all. Otherwise Bhutan will be closing the door to its own youth from the potential job market, while creating an underclass of migrant workers. An expanded skill development and construction management training programme is needed. There must be a guaranteed minimum wage to attract



Bhutanese youth into the construction industry, and to build up the national capability. The construction industry has the potential to be the country's largest employer! Any public policy and related programme must include components on regulation of foreign labour, training Bhutanese labour to take over these occupations, upgrading the skills and working conditions of these occupations to bring the dignity that these vocations deserve and to provide a range of housing options to these people. This is a policy area that cannot wait! In Damphu a "Building Center" should be created which imparts practical training to youngsters in carpentry, masonry, concrete work, plastering and interior finishes. The center will provide workshop based training mixed with on site training. This pattern of training is already well evolved in Bhutan.

6.1.4 Locations for Housing in Urban Villages

The Structure Plan of Damphu taking into consideration the terrain and ecological environment will fulfill the future housing demand of the town through mainly designating Medium and High-density Housing Neighborhoods in each self-contained Urban Village identified in the town and extreme sparse development in other fragile areas, further amplified by the preparation of Local Area Plans.

The Urban Villages, which form the basic planning unit of the Damphu Structure Plan, will be dominated by residential areas with varied density patterns to optimize the provision of essential urban services in response to the environmental conditions. Conceptually, these units will have amenities, basic services and a convenience shopping core in their center, called Village Squares, surrounded by medium- to high- density walk-up apartments, then with a ring of sparse density housing units towards the periphery. The Village Square surrounded by housing neighborhoods, will be basically a convenience center containing social amenities like health unit, police stand, taxi stand, post boxes, convenience shopping, vegetable shop, general store, pub, kindergarten, crèche, garden and public transit stop and will play a instrumental role in attracting and serving the population. The facilitation of the private sector by the government to create these housing stocks in the designated neighborhoods, will be a fillip to the entrepreneurs of the town and will generate employment in the construction industry. It is proposed to use students of the National Technical Training Authority, through a local "Building Centre" in the process, in order to create more skilled labour in the nation.

Local Area Plans will be used as the tool towards making the identified Urban Villages as a functional entity of the Damphu Structure Plan. This, together with land pooling techniques, will be used to create motorable access to all house plots, to organize plots into rational shapes, to provide services and amenities to these plots and to create more habitable plots! Thus, access to land for shelter is a key method, made operational in the Structure Plan.

In addition to the medium and high-density housing schemes, which will be identified in the Local Area Plan for the development of compact residential neighborhoods, promoted and

facilitated by the government, large plots, of about 500 square meters will also be created as a part of the Urban Village Core precinct (UV - 2) to accommodate private parties who wish to construct ground plus two storied apartment buildings. In the precinct called the Urban Village Periphery (UV - 3) a variety of plot sizes will be created to accommodate cottages, bungalows or smaller apartment blocks. Such structures will accommodate one or two households each, plus attached servant's quarters.

First, after the preparation of the Local Area Plans, roads will be demarcated on the sites, indicating all plots. Even before the roads are paved, or before any utilities are laid, the owners shall be entitled to begin their construction. Housing construction and the creation of utilities and services will go hand-in-hand! Only when a tax base is created in an area through the private initiative of plot owners, can support systems come into place. Thus, carving out of the rough roads, giving rudimentary access to the plots is the first priority. The next priority is to provide potable drinking water, first in raw form and later in a processed form. Electricity, telecommunications and rudimentary storm drainage will immediately follow. Finally, sewerage systems will be laid, roads will be surfaced, footpaths built, streetlights placed, solid waste collection bins positioned and other amenities will emerge.

Guided Development

The Development Control Regulations, as applicable to various Precincts, will guide this "infill" process. Guided development will generate densification in areas where it is efficient to extend social infrastructure and amenities. This will make existing infrastructure more efficient.

6.1.5 Role of National Housing Development Corporation in the Creation of Housing Stock

It is essential that the private sector be catalyzed in Damphu to create housing stock. The National Housing Development Corporation (NHDC) should take a lead role in such an effort. Instead of being a provider of housing, the NHDC can become a Facilitator of the Housing Process.

In each Local Area Plan an area would be designated for the compact residential neighborhood as noted above. The NHDC can identify and prioritize projects according to the market demand, with respect to location, need etc. Housing process in the identified locations would then be facilitated by "banking" all the private land parcels of the designated area in the form of a common account. As opposed to Land Acquisition, where the owners are losers, their land will be held in escrow for them, and they will de facto become participants in the free market production of housing. Should they decline such participation, acquisition procedure shall begin. Should they join they will have "equity" in the project with the value set as the market value, and they will also accordingly get a proportionate share of the profit.



The NHDC would prepare a Project Brief for each Neighborhood. This would include the gross and net residential densities to be achieved; the amount of open space to be created; the service and utility levels to be provided and the types, numbers and areas of the apartments, row houses and duplexes to be created. The Project Brief will also include the envisioned Specifications and a reference to the Development Control Rules and the Bhutan Building Rules, which must be followed. The Brief will include an investment plan stating all costs and projected profits.

The Promotion of Construction Professionals

In the next phase the NHDC will invite architects to compete in the preparation of designs for the over-all layout; buildings; apartment plans; internal roads parking and footpaths; landscaping; and utilities layouts. Architects from nearby countries may also participate, on the understanding that they will have to enter into collaborations with Bhutanese firms, should their designs be selected. Architects must follow the Specifications in the Brief, but may propose improved specifications, if they desire. A Technical Committee will select the best design and commission the architect as the designer and the Project Manager.

The Promotion of Promoters

The NHDC will make the selected design public. It will invite prospective developers who will act as the legal Promoters of the scheme, to bid for the role as Promoter. In the bids the contenders will have to agree to work under the supervision and the control of the selected Architect; they will have to state the percentage chargeable as their overheads, as the profits, and agree that they will charge future owners on a basis of a factor of the land cost, construction costs, fees, overheads and taxes. Their risk lies in the time they take to produce the dwelling units and on the market demand for the units. They may propose, in their bid, variations in the designs, unit areas and finishes, based on their understanding of the market. They may auction units to establish market prices, if they desire. The fees they will assign for the architect, and for the overhead fee they will pay to the NHDC for their promotion and audit role in the project, will be standardized and a “given” in the package. The amount of money to be paid to the landowners will be a “given” in the package. The base amount to be charged per square meter of built-up saleable area to the buyers will be bid by the competitors.

A Technical Committee composed of the Architect, and representatives of the NHDC will analyze and select the legal Promoter of the project. The promoter takes on the financial responsibility and liability of the project, until it is handed over to the end users. He negotiates with financial institutions, maintains accounts, operates bank accounts, and pays the overheads and architect’s fees to the NHDC. The NHDC pays the architect who also acts as the NHDC’s project manager.

Transfer of Project Ownership to the Promoters

At this stage the facilitative role of the NHDC becomes one of over-all Supervisor and Auditor, on behalf of the future clients. The selected architect and promoter now act as Project Managers, carrying out the preparation of construction documents, tendering documents and standard contracts between the Contractors and Promoters. The NHDC will certify the final selected contractor, but the architect and the Promoter will jointly select a contractor based on criteria given by the NHDC. If all the contractors bid over the estimate based on the Bhutan Schedule of Rates, the lowest bidder must be awarded the work. Wherein contractors bid under the Bhutan Schedule of Rates, the architect and promoter will not be bound to select the lowest bidder, but may use criteria like tract record, compatibility as a team member and other discretionary parameters, which they believe will result in the best final product for the end users.

Transfer of Housing Stock into the Market

After the completion of the project, the promoter, under the direct guidance of NHDC could either sell the housing stock at the market price and distribute the profit among the private land owners according to their respective share or could distribute the housing stock itself to the private land owners, retaining the share, of the promoter as initially agreed. In both the cases the involvement of the NHDC, towards making the housing stock available in the market, is very crucial considering the larger implications of such a nature of project in the housing stock of Dampfu. The promoter, and the private land owners, could pay overheads to the NHDC towards the maintenance of the project for a specified period time. Alternatively, each buyer will be required to pay a maintenance fee which goes into a general fund for property management.

6.1.6 Vacant Land Tax

There is an apparent, though not necessarily fundamental conflict between the regime of planning and the regime of property, especially when a new plan is overlaid upon an existing land ownership system. The structure plan sets down a new rationale. It promotes equal access to shelter and to land for shelter. It alters the value of land upward at the same time. Due to its inherent restrictions, it also limits development options. It disrupts the immediate plans of landowners at least until they understand and readjust to the new terms of the new plan.

In most societies land is held in the hands of a few longer-term residents of the city. Newcomers to the city and persons with more modest means may find entry into the housing market blocked by artificially high values of land. Unfortunately, in most of the situations the regime of property dominates the land system and most of the time access to land for shelter has virtually been blocked. The Structure Plan attempts to reverse that trend and opens more



opportunities. It suggests that methods towards equitably distributing land must emerge in Daphu. The Local Area Plans and the access to dwelling units created under the medium- and high-density residential projects go a long way to guaranteeing each household access to shelter. Guided development through the mechanism of the Development Control Rules adds another dimension to the system's operation. But in the end there must be some mechanism which limits the quantity of land held ineffectively and merely for investment.

There are limited options to control land accumulation. One of them is an effective land ceiling. But the legislation and implementation are cumbersome, means of concealing property ownership are many, and the entire process takes land effectively out of the market, driving up the remaining prices of lands that fall outside of the ceiling still higher. Land banking involves extensive data maintenance, sophisticated financial management and complicated accounting, which will not appear as transparent to the concerned public. It may only work where there are existing and highly developed financial institutions.

One possible mechanism is a Vacant Lands Tax. The concept would be to treat vacant land as an unused wealth of the nation and to use a system of taxation to catalyze it into the market. There would have to be a Register of Land Values maintained wherein the value of land in each area of the town is documented based on the actual registered transactions in the area. To assure that the values stated at the time of transaction are correct the Royal Government has a first option to buy lands where the registration is declared for a value less than twenty-five per cent of the Registered Value in that area of the town. Using the Register of Land Values, each area of the town would have a different ratable value, based upon which the town's land tax would be charged to users and also upon which the Vacant Land Tax would be charged. Generally, land values and the services and infrastructure provided by the local authority are high at some locations and low at some locations. So the Ratable Values also reflect the levels of services provided. Where there are vacant lands a Vacant Land tax of say five to ten per cent of the land value should be charged annually. The tax would tend to move land into the market, and curb the hoarding of land for investment purposes. Another characteristic of the Vacant Land Tax is that it also acts as a Wealth Tax, bringing more equity into the society.

When a property is purchased, there should be a Vacant Land Tax Holiday for three years, allowing time for the owner to initiate construction. There must also be a Land Transfer Tax, of about five to ten percent of the registered property value.

Acquisition of excess lands is a last resort. But the process is slow and the low rates create a good deal of animosity against the government. But acquisition must always be with the Royal Government as a last means to equalize the land holdings.



6.2 URBAN DEVELOPMENT MANAGEMENT SYSTEM

Urban areas are living organisms and a structure plan could be appropriately described as a skeleton, on which the parts of the town can be hung, much as a human body. In a vibrant settlement, there will be a myriad of new developmental projects continuously under execution by various sectors. There are many other social services and amenities which will come up in the town over the next decade. There will be an elaborate shelter system to accommodate the future population of the town. Though, each of these urban developments has its own rationale, regarding its networking and phasing, integrating with each other to form an organized system has manifold advantages including easing of the implementation process. It is important that these networks are planned as a system of main corridors, limbs and fingers in terms of hierarchical organization. In this given context management and planned development of these systems becomes crucial for the proper functioning of urban areas. The success and effective functioning of the urban development lies as much in the physical plans we prepare as it does in the effectiveness of the Development Management Systems we evolve for the town.

Such a management system should guide the development not just confined within the town boundaries, but also in its immediate surroundings. For the effectiveness of such a mechanism, the proposed Development Management System for Damphu could be elaborated and would have its influence in three varied tiers pertaining to various scales ranging from the regional to plot level. The ease and success of implementation specifically depends on the effectiveness in breaking down the scales at various levels supported by competitive administrative set-ups.

6.2.1 The Damphu Urban Peripheral Control Zone

The first tier of Development Management System proposed essentially governs the area around the Damphu town and its region. The Dzongkhag administration is responsible to see any development within this zone is in accordance with the plan.

The present Damphu town lies in its own small setting on top of a ridge with few opportunities to expand. Given the present economic development opportunities of the region, in the near future, unless the physical development is rationally distributed within the region, the carrying capacity of the present town would get exhausted and the entire surrounding landscape will become a victim of uncontrolled urban sprawl in both agricultural flatter lands as well as highly eco-fragile areas. We should not wait for this to happen. There must be a well detailed and elaborate development management mechanism to guide the development in the entire region. This will include an Urban Peripheral Control Zone, which controls the development in the immediate surrounding of the town and which guides the future planning and economic development activities of the region.

As an influence of the development in the town area, there is a great deal of slow, but nevertheless continual development in the periphery of the town. Hence, municipal boundaries are major issues in planning. Generally the bye-laws for construction within the municipal area are very strict and move through difficult procedures, while just across this magic line clearing plans is rather easy. Land taxes within the boundaries, of course, are comparatively higher than agricultural revenues in rural areas. The latter lands may be only a few meters from the former.

This causes “leap frogging of development” over the municipal boundaries. “Leap frogging” explains the habit of development to jump across the boundary where there are low taxes and few building restrictions. Land is undeveloped across the boundary and therefore cheaper. This causes inefficient urban sprawl. When the fringe areas are absorbed into the municipality service networks, they are then over extended, to accommodate low density, spread out and even inaccessible plots.

“Leap frogging” outside the municipal boundaries results in “patchy development” and in case of Damphu could cause a fatal environmental disaster by haphazard development in steep slopes and water shed regions. Apart from this a situation is created where suddenly a cluster of structures have developed, surrounded by hectares of empty lands. These small patchy clusters must provide their own storm drainage, water supply and sewerage management. Yet, there will be a pressure on the town governing authorities to provide electricity, telephone and road connections to these patchy developments.

The “leap frogging” would also lead to “strip development” along the Thimphu-Sarpang Highway, as these uncontrolled, cheap parcels have both access and potential commercial use facing the roads. This causes congestion along the highway as well as fatal accidents from vehicles pulling on and off the roads.

These fringe or peri-urban areas eventually come under the jurisdiction of the local authority, and eventually these areas need to be provided with infrastructure facilities and services as similar to the urban areas. The existing “strip” and “patchy development” becomes a hindrance during this process, which results in mismatches between the demand and the provision.

The structure plan proposes a peripheral control zone of approximately half kilometer radius around the proposed Damphu Municipal limit. This needs to be further reinforced in the structure plan both in terms of legal and implementation aspects. Thus, an extended area around Damphu’s proposed municipal boundary has to be declared as within an Urban Peripheral Control Zone. This zone will employ one of the ‘Environmental Precinct’ systems of regulation.



Satellite Urban Villages

The hilly terrain, availability of limited opportunities towards future expansion of the town limits, limitations in types of activities that can be undertaken in the town and its immediate surroundings give rise to the possibility of conceiving various satellite Urban Villages around Damphu, forming a larger region. This will accommodate spill-over activities of the town. The town of Changchey is located in a valley, which is about eleven kilometers from the main Thimphu-Sarpang highway and fifteen kilometers from Damphu Town. It has comparatively flatter land than Damphu, with easy availability of water and electricity and established accessibility provided by an existing tarred road. This is an ideal condition for the settlement to be developed as a satellite Urban Village to Damphu in the future. While Damphu could house major institutions including administrative, educational, financial, etc, Changchey could house agro-based, low scale industrial activities like food processing, etc. thus brightening the economical prospect of the region along with tourism. Changchey right from this stage has to be seen as part of the urban region since people working in the region would begin to settle in such settlements. In other words these settlements would begin to grow in an unplanned manner long before planning catches up with them. They may be considered as nascent Urban Villages and developed along the same pattern as other Urban Villages within the main Damphu town. Providing a proper bus link between these two places would be an important part of the development plan strategy. Other infrastructure could follow. This would take population pressure and hence excessive development pressure off of the Damphu town core over the long term.

6.2.2 Development Control Regulations for Damphu Town

At present all the developments in Damphu follow the Bhutan Building Rules, which are a set of basic guidelines applicable across the entire nation in a variety of settlements. On the other hand, the Bhutan Municipal Act enables local authorities to prepare plans for their respective urban settlements and adopt relevant development control regulations to direct development within their jurisdictions. Thus, the set of Development Control Regulations focused towards guiding development within the Damphu Municipal Limit forms the second tier of Development Management System.

The relevance of Development Control Regulations for any settlement in a given context follows a system of established guidelines and relationships with the Bhutan Building Rules. These could be summarized as below.

The Bhutan Building Rules, in general are applicable to urban areas across the country, in the absence of any structure plan for the urban areas in question. The operation of the Bhutan Building Rules is thus imperative, in urban areas where no structure plan exists.

Wherever a structure plan is sanctioned, the provisions of the accompanying Development Control Regulations, which are an intrinsic part of the concerned structure plan, will be applicable in that urban area. The provisions in the Bhutan Building Rules itself enable this.

Wherever a local area plan has been notified, its specific regulations, if any, shall be applicable within that local area alone. Generally, local area plans conform to the Development Control Regulations of the urban jurisdiction in which they fall.

Thus, in the absence of local area plans, the provisions of the structure plan for that urban settlement shall prevail. In the absence of a structure plan for any given urban settlement, the Bhutan Building Rules shall prevail.

This tiered set of Regulations reflects the fundamental policy of the Royal Government of Bhutan to decentralize governance, administration and development, enabling and facilitating strong responses to local conditions and aspirations.

The Development Control Regulations for Damphu apart from proposing new regulations considering the local conditions will also supplement the Bhutan Building Rules by adopting the guidelines and providing some additional directives needed in a larger urban context. These same provisions may be extended to the other settlements as plans are prepared and conditions warrant.

The Development Control Regulations will be an imperative set of rules which all the new and proposed developments in Damphu should follow. It shall be elaborated in detail as a separate document in the later part of the structure plan preparation process. Regulations regarding procedure for obtaining building permission, precinct schedule and plot sub-division are presented briefly in the following sub-chapter.

6.2.2.1 Procedure for Obtaining Development Permission

No person shall change the use of a land or carry out development without the written permission of the Implementing Authority.

Provided that no such development permission shall be necessary for the following:

1. Carrying out works for the maintenance, improvement or alteration of a building, being works which affect only the interior of the building without altering the structural members of the building or which do not materially affect the external appearance thereof – such as providing or closing of a window or a door or ventilator not opening towards other's property, providing intercommunication door, white washing / painting, retiling, plastering and patch work, re-flooring and replacement of flooring. Provided further that no built up area shall be added to the existing work without seeking the Implementing Authority's



permission. Provided however that no such exemption shall be available in the case of heritage buildings / structures in heritage precincts.

2. 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,
 - e) For the construction of a road intended to give access to land solely for agricultural purposes; and,
 - f) For an occasional use of land such as exhibitions, fairs, etc., but shall obtain temporary permission from the Implementing Authority.

6.2.2.2 Procedure to Obtain Permission for Land Development/ Subdivision

A person or body intending to carry out layout development as defined in these Regulations in or over a land and/or subdivide land or a building within the limits of the Damphu Municipal Corporation shall obtain prior permission for the same from the Implementing Authority by applying on the prescribed form and furnishing all information in forms, formats and plans prescribed under these regulations and as may be amended from time to time by the Implementing Authority.

The application shall be signed by the legal owner of the plot or authorized signatory. The applicant shall submit signed plans and drawings along with the application and pay the requisite scrutiny fees, development charges, betterment charges, and other charges and dues if any to be leviable under the Regulations.

A. Documents and Particulars to be furnished with the Application

The following particulars and documents shall be submitted along with the application.

1. Copy of the Land Ownership Certificate issued by the DMC.
2. Copy of the Site Plan certified / issued by the DMC.
3. Copy of Precinct Certificate substantiating "Use Conformity".

4. Three copies of proposed layout plan drawn to a scale of not less than 1:500 showing all the details of the development. In the case where plot is more than ten hectares, scale shall not be less than 1:1000. All the drawings shall be prepared in metric system only.
5. Certificate of undertaking in the prescribed Form by the registered Architect/Developer.
6. The applicant shall also submit a copy of N.O.C. / clearance from relevant Authority wherever applicable.
7. Plans / Drawings and Specifications prepared by a Registered Architect.
8. The applicant shall pay the requisite scrutiny fees, development charges, betterment charges, and other charges and dues if any to be leviable under the Regulations.
9. The proposals submitted for certain projects shall be in conformity with other Acts / Regulations and wherever applicable the Applicant / Registered professional must submit the 'No Objection Certificate' (NOC) from the respective authorities for conformity.

B. Approvals

The approval of a layout proposed to be developed, or subdivided will be given in two stages:

- Preliminary approval; and,
- Final approval.

The preliminary approval is only to enable the commencement of work on the site and to facilitate other preliminary activities related to subdivision and transfer of land. The preliminary approval shall be given only after inspection and verification of the demarcation of all the roads, individual lots, and other provisions required as per the relevant standards and proposed in the layout plan submitted by the applicant.

The final approval for the layout and / or subdivision shall be given only on the completion of all the requisite development on the site and after inspection and verification of the performance of the services and other common facilities / amenities provided as per the relevant standards and after handing over of the roads, common open spaces, area for public amenities and for public utilities to the Implementing Authority.

C. Validity of Approval

The validity of the approved layout development and/or sub-division plan shall be for one year from the date of approval. The development should start within 365 Gregorian calendar days from issue of development permit.

D. Revalidation / Renewal

Development permission granted under these Regulations shall be deemed to have lapsed, if such development work has not commenced till the expiry, of 365 Gregorian calendar days from the date of development permission, provided that, the Implementing Authority may on application made to it before the expiry of above period extend such period by a further period of 365 Gregorian calendar days at a time, on the payment of revalidation/renewal charges as decided by the implementing authority.



E. Rejection of Application

If the plans and information given do not contain all the particulars necessary to deal satisfactorily with the development permission application, the application shall be rejected.

F. Cancellation / Revocation of Approval

The development 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 canceled/revoked.

6.2.2.3 Procedure to Obtain Permission for Construction Activities

A Person, firm, body or developer intending to erect a building, or carry out additions and alterations, or carry out civil construction activity, in or over land owned by him or it, within the limits of the Dampfu Municipal Corporation (DMC) or the Urban Peripheral Control Zone (UPCZ), shall obtain prior permission for the same from the Implementing Authority by applying on the prescribed form and furnishing all information in the forms and format prescribed and as may be amended from time to time by the Implementing Authority.

All the applications for the above specified works, except applications for temporary permissions for public telephone booths, milk booths, and newspaper stalls of maximum dimensions two meters by two and a half meters, which shall be permitted only in specific locations, and shall be furnished through authorized registered professionals including Architects, Engineers, Structural Engineers, and Developers as under the regulations.

A. Documents and Particulars to be furnished with the application

1. The applicant shall sign all forms, plans, sections or written particulars or cause them to be signed by him and his duly authorized registered Architect, Engineer, Developer etc. as the case may be. Such person or authorized registered Architect, Engineer, developer shall furnish documentary evidence of his authority. If such notice or other document is signed by such authorized registered Architect, Engineer, Developer it shall state the name and address of the person on whose behalf it has been furnished.
2. The forms, plans, sections and descriptions to be furnished under these Regulations shall all be signed by each of the following persons:
 - a) A person making application for development permission.
 - b) A person who has prepared the plans and sections with descriptions, and must be a registered Architect.
 - c) A person who is responsible for the structural design and supervision of the construction i.e. a registered structural designer or civil engineer.
 - d) A developer.
3. A person who is engaged either to prepare plan or to prepare a structural design and structural report or to supervise the building shall give an undertaking (accepting full

responsibility for all of the above and liability in case of direct or indirect damage or loss) in the prescribed form.

4. A person / body who under the provisions of the relevant sections of these regulations is required to furnish to the Implementing Authority, plans or other documents, shall furnish three copies of such plans and other documents. One copy of each plan and document shall be returned, on approval, to the applicant duly signed by the Implementing Authority or authorized officer.
5. It shall be incumbent on the person/body whose plans have been approved, to submit amended plans, if any, for deviation leading to increase in built-up area, building height or change in plans, he proposes to make during the course of construction of his building work, and the procedure laid down for plans or other documents hereto before, shall be applicable to all such amended plans.
6. Approval of drawings and acceptance of statements, documents, structural report, structural drawings, progress certificate, or building completion certificates shall not discharge the Owner, Engineer, Architect, Structural Designer, Developer, from their responsibilities, imposed under these Regulations and other local laws.
7. A certificate of structural capability of the building in terms of ultimate number of floors it is designed for, and the soundness of the structural design for the seismic actions from the licensed structural designer in regard to the proposed building shall be submitted in the format prescribed under these Regulations. He shall also submit the detailed design and plans for office record.
8. Three copies of the site plan of the area proposed to be developed shall be submitted to a scale not less than 1:500, as the case may be, showing all the details of the proposed development. All the drawings shall be prepared in metric system only.
9. Three copies of the detailed drawings showing the plans, sections and elevations of the proposed building work to a scale of 1:100 showing all the details of the proposed development shall be submitted.
10. The plans / building drawings and particulars prescribed under these Regulations shall be prepared by a registered Architect.
11. All building applications shall enclose an "ultimate structural capability of the structure" statement from the architect or structural engineer, in terms of the total number of floors.
12. The applicant shall pay the requisite scrutiny fees, development charges, betterment charges, and other charges and dues if any to be leviable under the Regulations.
13. The application shall be signed only by the legal owner of the plot or authorized signatory. A building permit shall be issued only to the legal owner of the land or plot.

B. Scrutiny, Services and Amenity Fees

Permission for carrying out development shall be granted by the Implementing Authority only on payment of Scrutiny fees for processing the submitted application, service and amenities fees for execution of works as decided by the implementing authority. These fees and maintenance charges shall be revised on review by Implementing Authority from time to time.



C. Security Deposit

To ensure compliance with these regulations and the directions given in the sanctioned plan and other conditions, a security deposit shall be charged at the rates prescribed by the Implementing Authority from time to time for the due observance and performance of the conditions of the Development Permission. The amount shall be deposited on intimation before issue of "Development Permission".

1. The amount of security deposit shall be paid only in the form of a demand draft payable in Dampfu
2. Government, semi-Government, local authorities are exempted from this provision.
3. The security deposit shall be refunded without interest within one year after grant of the occupancy certificate, on written request from the applicant.
4. The security deposit shall be forfeited either in whole, or in part, at the absolute discretion of the Implementing Authority for breach of any of the provisions of these regulations and conditions of the "Development Permission". Such forfeiture shall be without prejudice to any other right of the Implementing Authority.

D. Grant of Development Permission

Grant of Development Permission shall mean acceptance by the Implementing Authority of the following requirements:

1. Permissible built-up area.
2. Height of a building and its various storey.
3. Permissible open spaces enforced under regulations, common area, marginal spaces, other open spaces, set backs, etc.
4. Permissible use of land and built spaces.
5. Arrangements of stairs, lifts, corridors and parking.
6. Minimum requirements of buildings with more than three floors, including certificate of soundness of structural design, N.O.C. from Fire Officer/Fire Safety Consultant as appointed by the Appropriate Authority.
7. Minimum requirement of sanitary facility and other common facility.
8. Adequate structural design, including all seismic precautions.
9. Required light and ventilation.

It shall not mean acceptance of correctness, confirmation, approval or endorsement of and shall not bind or render the Authority liable in any way in regard to:

1. Easement rights.
2. Variation in area from recorded areas of a plot or a building.
3. Structural reports and structural drawings.
4. Soundness of material specifications used in construction of the building.

E. Validity of Approvals

The validity of the approved building plan shall be for one Gregorian calendar year from the date of approval. The construction should start within one Gregorian calendar year from issue of building permission.

F. Revalidation / Renewal

Building permission granted under these regulations shall be deemed to have lapsed, if such development work has not commenced till the expiry of one Gregorian calendar year from the date of development permission, provided that, the Implementing Authority may on application made to it before the expiry of above period (one Gregorian calendar year) extend such period by a further period of one Gregorian calendar year at a time by charging a renewal fee as decided by the implementing authority.

G. Liabilities and Responsibility of the Applicant

Notwithstanding the development permission 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. 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.

H. Rejection of Application

If the plans and information given as per these Regulations do not give all the particulars necessary to deal satisfactorily with the development permission application, the application shall be rejected.

On receipt of the application for Development Permission, the Implementing Authority after making such inquiry as it thinks fit may communicate its decisions granting or refusing permission to the applicant as per the provisions of the Act. The permission may be granted with or without conditions or subject to general or special orders issued by the Royal Government in this behalf.

The Development permission shall be in the prescribed form and it should be issued by an officer authorized by the Implementing Authority in this behalf. Every order granting permission subject to conditions or refusing permission shall state the grounds for imposing such conditions or for such refusal.

I. Cancellation / Revocation of Approval

The development 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 canceled/revoked.



J. Change of Ownership

Development 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.

K. General Requirements of Site

Land shall not be used as a site for the construction of a building.

1. If the Implementing Authority considers that the site is in-sanitary, or that it is dangerous to construct a building on it, or no water supply is likely to be available within a reasonable period of time;
2. If the site is not drained properly or is incapable of being well drained;
3. If the building is proposed on an area filled up with carcasses, excreta, filthy and offensive matter, till the production of a certificate from the Implementing Authority to the effect that it is fit to be built upon from the health and sanitary point of view;
4. If the use of the said site is for a purpose which, in the Implementing Authority's opinion may be a source of danger to the health and safety of the inhabitants of the Urban Village;
5. If the Implementing Authority is not satisfied that the owner of the building has taken the required measures to safeguard the construction from getting damp or flooded ;
6. For assembly use, for cinemas, theatres, places of public worship, residential hotels, lodging and boarding houses, unless the site has been previously approved by the Implementing Authority and other relevant Authorities;
7. Unless it derives access from an authorized street/means of access described in these Regulations;
8. If the proposed development is likely to involve damage to or have deleterious impact on or is against urban aesthetic of environment or ecology and/or on historical / architectural/aesthetical buildings and precincts or is not in the public interest;
9. If the site is in a flood prone area, within 20 m. right-of-way for the natural storm water drains or an environmental conservation precinct, as laid in these Regulations, or the Forest Act, or an executive directive of the RGoB;
10. Within the "no build zone" prescribed in the structure plan document or a Heritage site, or an ecologically fragile zone; or,
11. For other reasons, to be communicated by the Implementing Authority in writing.

L. Demolition and/or Reconstruction of Dangerous / Unsafe / Dilapidated Buildings

Wherever it is necessary to demolish a dilapidated / unsafe structure in the interest of public safety, such demolition shall be carried out by the applicant 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.

M. Temporary Permission

Applications for temporary permissions need not be submitted through the registered professional. A scrutiny fee shall be paid as decided by the Implementing Authority. These temporary permissions shall be permitted only for:

1. In the case of private premises - temporary sheds to be used for storing construction material / as watchmen's cabin during construction phase,
2. On public premises – public call booths, milk supply booths, newspaper kiosks.
3. On public roads, highways - temporary sheds to be used for storing construction material / as watchmen's cabin / workmen's shelter during construction/ repairs/ maintenance of public roads.

N. N.O.C. From Referral Authorities for Special Projects

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;

1. The Department of Power's Electricity Grid Lines and the horizontal and vertical clear distances to be kept open to sky.
2. The provisions of Environmental Assessment Act, 2000.
3. The provisions of NEC Secretariat's, 'Regulations for the Environmental Clearance of Projects, 2001'.
4. The conservation/ preservation of monuments and cultural heritage.
5. The Department of Industry, Ministry of Trade and Industry, RGoB for the establishment of industries.
6. The Department of Trade, Ministry of Trade and Industry, RGoB for the setting up and operation of fuel stations.
7. The Department of Geology and Mines, Ministry of Trade and Industry, RGoB for the setting up and operation of:
 - Quarrying and mining activities on less than 3 hectares (only in the Urban Peripheral Control Zone).
 - Mineral exploration for verifying mineral deposits(only in the Urban Peripheral Control Zone).
 - Emergency responses to natural disasters/ hazards.
 - Clearance for the seismic design criteria's of the development.
8. The Department of Forestry Services, Ministry of Agriculture, 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.
9. The Department of Research and Development Services, Ministry of Agriculture, for:
 - Farm roads;
 - Irrigation channels;
 - Activities related to agriculture research and development.



10. Wherever there is an underground cable, conduit, pipe, drain, or similar channel for the purposes of a public utility, service, amenity, security, etc., belonging to a public agency, a NOC from that agency must be obtained.

Development Permission granted by Implementing Authority on the basis of a document/NOC received is not final and conclusive. It shall be considered in true sense and meaning of concerned issuing Authority. This Authority has no legal responsibility for such development permission.

6.2.2.4 Development Undertaken On Behalf Of The Government

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.

1. An official letter of Government Department addressed to the Authority or as the case may be to the authorized officer giving full particulars of the development work or an operational construction.
2. Building plan confirming to the provisions of Development Control Regulations for the proposed development work to a scale of not less than 1:100.
3. Plans confirming to the provisions of Dampfu Structure Plan showing complete details of the operational construction, such as detailed alignment, layouts, locations and such other matters with measurements.
4. Statement indicating the use of land confirming to the Precinct Sanctions, proposed to be made by the Government Department, for carrying out the development work.
5. The proposals of the Dampfu Structure Plan affecting the land, if any.
6. A Site Plan (three copies) of the area proposed to be developed to a scale of not less than 1:500.
7. Detailed plan (three copies) showing the plans, sections and elevations of the proposed development work to a scale of 1:100.
8. In case of layout of land or plot:
 - a) A site plan (three copies) drawn to a scale of 1:500 showing the surrounding land and existing access to the land included in the layout.
 - a) A layout plan (three copies) drawn to a scale of not less than 1:500 showing subdivisions of the land or plot with dimensions and area of each of the proposed subdivisions and their use.

6.2.2.5 Procedure to Obtaining Building Permission

A person / firm / body or developer shall not erect a building or carry out additions and alterations or carry out civil construction activity without obtaining a **building permit** from the Implementing Authority. A building permit shall be issued only to the legal owner of the land /plot.

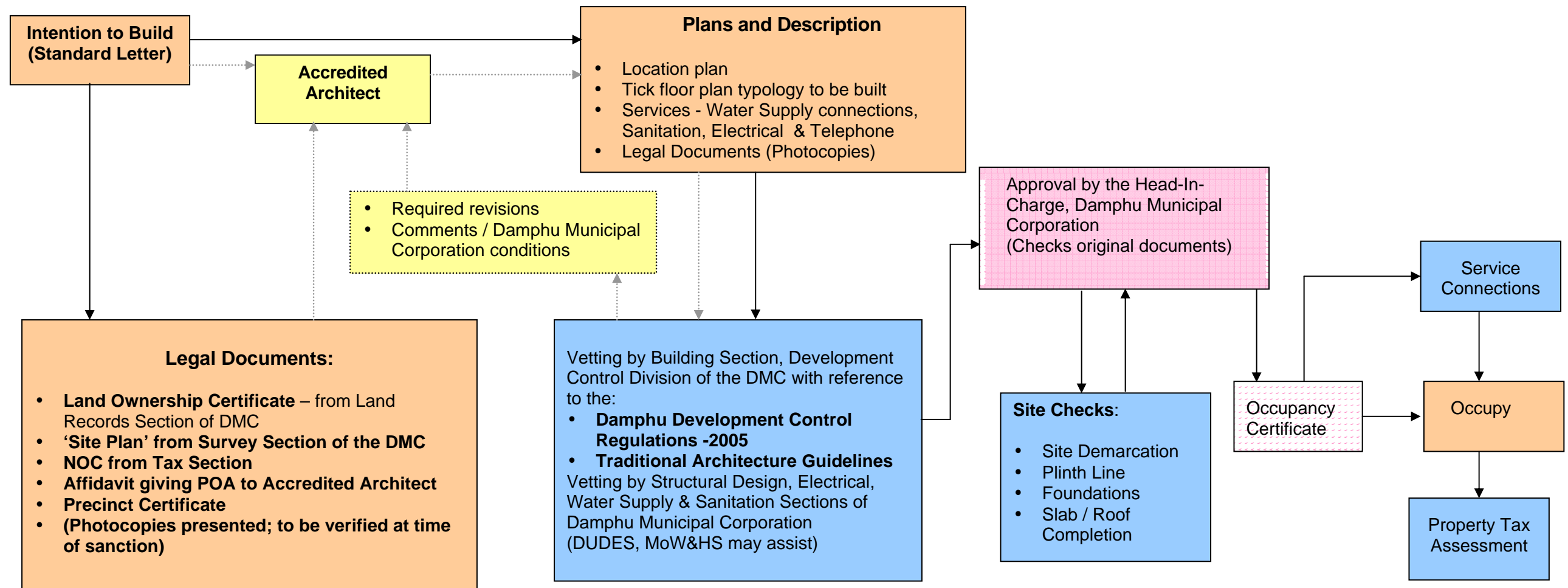
The procedures for obtaining building permission and also those procedures that are to be followed during construction are different for the two classes of buildings or construction:

1. Residential structures not exceeding two dwelling units and / or not more than two floors (Ground plus one floor) in sites up to 1000 square meters.
2. More than two residential units / building on more than 1000 square meters of land and / more than two floors / buildings for non-residential uses.

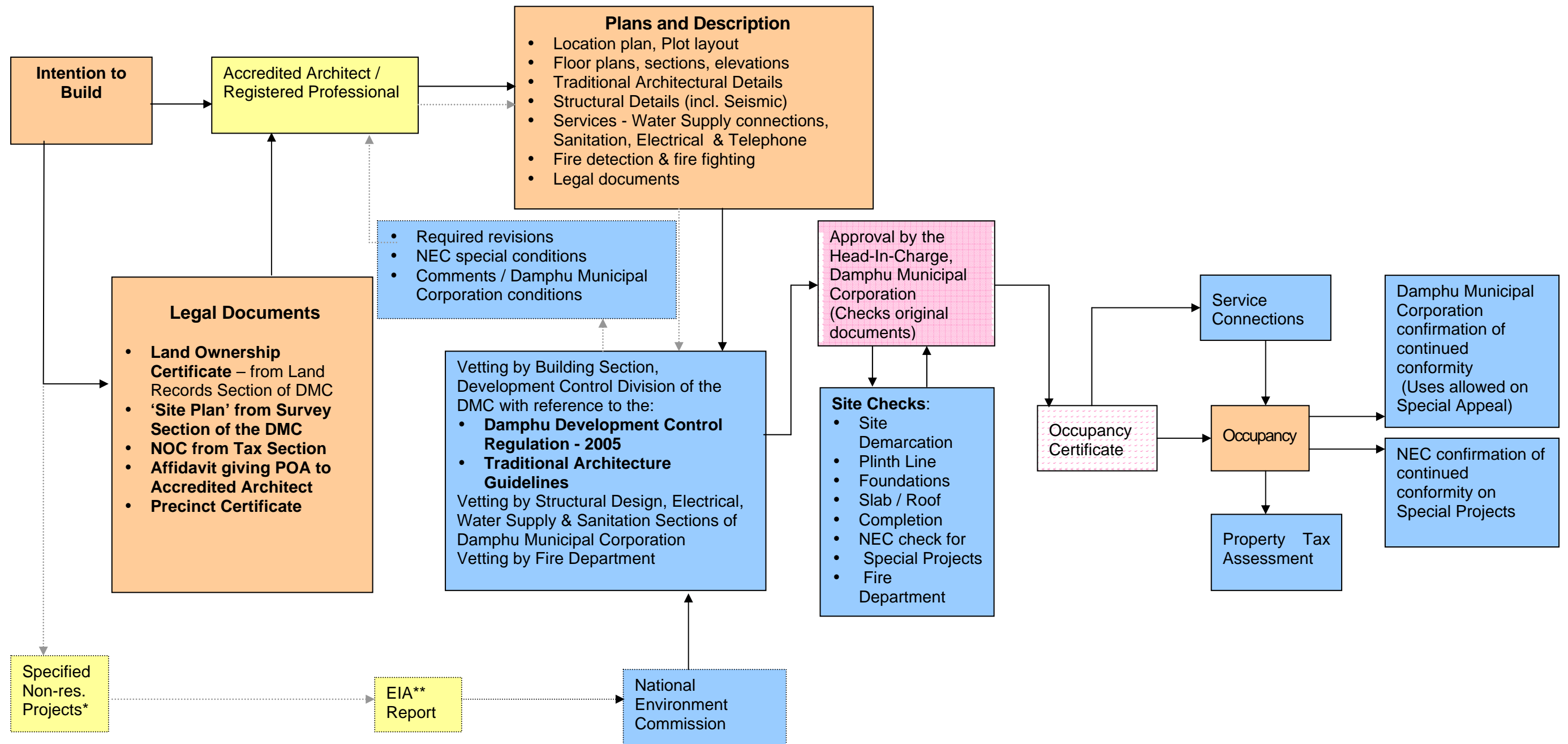
The procedures for the different classes of buildings / constructions are described in the following charts :



Procedure for obtaining building permissions and also the procedure that is to be followed during construction of Residential structures not exceeding two dwelling units and / or not more than two floors (Ground plus one floor) in plots up to 1000 square meters.



Procedure for obtaining building permission and also the procedures that are to be followed during construction of three or more residential units, or any building on a plot of more than 1000 square meters of land/ or more than two floors (Ground plus two and more) or buildings for non-residential uses.



* See Precinct conditions for limited cases

** Environmental Impact Assessment Report



6.2.2.6 Procedure during Development or Construction Activities

1. No person in-charge at any stage shall, except with previous written permission of the Implementing Authority, carry out further work after the issue of any requisition of these Development Control Regulations in respect of any previous stage in the development or construction unless the requisition has been duly complied with and the fact reported to the Implementing Authority.
2. 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 15 sq.m floor area.

A. Commencement Certificate

No person in charge at any stage shall, except with previous written permission of the designated officer of the Implementing Authority, or his authorized representatives, start work before the period of notice mentioned as above expires. On receipt of the progress certificate from the owner/applicant/supervisor, it shall be the duty of the Implementing Authority to check for deviation from the approved plan which may require resubmission or amended plan for approval of the Implementing Authority.

B. Temporary Service Connections

An applicant with a certified copy of building permit may apply to the respective agencies for temporary connection of services like electricity, water and sewerage. The use of a public street / road or a public place for loading and unloading and stacking of materials of construction and construction equipment shall not be allowed. Material or equipment found on public street/road or public land is liable to be confiscated and the owner shall be liable for penal charges.

C. Documents at Site

The person to whom development permission is issued shall during construction, keep;

1. Posted in a conspicuous place, on the site for which permission has been issued a copy of the development permission, and
2. A copy of the approved drawings and specification on the site for which the permit was issued.

D. 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, including quality control, 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 there of without giving prior notice of his intention to do so.

1. **Plinth Completion Certificate:** After the completion of work of each building up to the plinth level, the owner/his representative shall give notice in the prescribed form, to the Implementing Authority. The Implementing Authority shall carry out the inspection and give him permission in the form of Plinth Completion Certificate, for carrying out further construction work as per the sanctioned plan.
2. **Inspection at various stages:** 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) Plinth; (in case of basement before the casting of basement slab)
 - c) First storey;
 - d) Middle storey in case of building with more than three floors; and,
 - e) Last storey.
3. 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. 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.
4. 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.
5. The applicant shall keep, during carrying out of development, a copy of the approved plans and other documents on the premises where the development is permitted to be carried out.
6. The applicant shall keep a board at site of development mentioning the survey No, city survey No, Block No, Final Plot No., Sub plot No., etc. name of owner and name of Architect/ Engineer/Developer /Owner, Building Permit No.
7. **Inspection by Fire Department:** For special buildings/buildings with more than three floors, the work shall also be subject to inspection by the Chief Fire Officer. The Implementing Authority shall issue the occupancy certificate only after clearance by the said Chief Fire Officer/Implementing Authority.

E. Deviation during Construction Time

Alteration in the approved building plan shall require prior approval from the Implementing Authority. Notwithstanding anything stated in the above regulations it shall be incumbent on the person whose plans have been approved to submit revised plans for deviations he proposes to make during the course of construction of his building work and the procedure laid down for plans or other documents here to before shall apply to all such revised plans.



F. Occupancy Certificate

The applicant shall obtain occupancy certificate from the Implementing Authority prior to occupancy or use of development so completed.

The application for Occupancy Certificate shall include:

1. In case of any change from the approved plans, (which is permissible within these regulations), a completion report in the prescribed form along with three copies of the 'as built' drawings endorsed by the Registered Architect/Engineer. It shall also be incumbent on every person who is engaged under these Development Control Regulations to supervise the erection or re-erection of the building, to endorse this completion report. One copy of the 'as built' drawings shall be stamped and returned to the applicant after inspection and approval by the Implementing Authority.
2. A copy of the progress certificate containing all the comments and endorsements of the building inspector at every stage of inspection.

In case of occupying the building or part thereof without obtaining occupancy certificate, the Security Deposit shall be forfeited.

On receipt of the application, the building and its premises shall be inspected by the Implementing Authority to verify that the work has been completed as per the approved building drawings, or if there is a change, permissible within the Regulations, approve and endorse the 'as built' drawings submitted along with the completion report. The inspection team shall consist of authorized Architect and Engineer from the Implementing Authority. Based on this inspection report the Occupancy Certificate shall be issued.

The Implementing Authority issuing occupancy certificate before doing so shall consult concerned designated Fire Authority to inspect the building and issue a certificate that necessary requirements for the fire protection (wherever applicable) under these regulations have been fulfilled and if not, the applicant shall be asked to carry out necessary additions, alterations or rectifications to the satisfaction of the Implementing Authority before issuing occupancy certificate.

G. Issue of Occupancy Certificate

The Authority issuing occupancy certificate shall ensure that

1. Proper hygienic and sanitation facilities have been provided as per standards and are located as per approved plan.
2. Domestic drains (to collect the rainwater) have been constructed as per standards and as per the design directions approved time to time.
3. The completed portion of the building/dwelling unit applied for occupation is fit and safe for occupancy.
4. Construction debris around the building, and/or on the abutting road, and/or adjoining property is cleared by the applicant.

5. The applicant has permanently displayed the full postal address (house number, street name and zone) outside the main entrance to the building and where appropriate, each dwelling unit, with unit number.
6. The trees as per the design, are planted on site or ensure this by taking suitable deposits as decided from time to time for specific period by the Implementing Authority.
7. Parking space is properly paved and the layout of parking space is provided as per the approved plans. Signboards indicating the entrance, exit and location of parking spaces for different types of vehicles shall be permanently erected and maintained at a prominent place of a building unit.
8. Certificate of lift Inspector has been procured and submitted by the owner, regarding satisfactory erection of Lift.
9. Proper arrangements are made for regular maintenance of lift is provided.
10. The completion report endorsed by the Implementing Authority and certificate of fire department has been procured and submitted by the owner.
11. Proper arrangements are made for regular maintenance of fire protection services.
12. There shall be a ground water percolating well at the lowest corner of the site in a building land parcel having area more than 1500 sq. m.
13. In the case of buildings with three storey or more, public gathering places, cinemas, auditoria, schools, colleges, government building and hospitals, a Certificate of Structural Stability shall be obtained from the structural designer.

The occupancy certificate shall not be issued unless the required information is furnished by the owner and the Structural Designer/Architect concerned, in the schedule as prescribed by the Implementing Authority from time to time. 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.

H. Change of Building or Premises Uses

The applicant shall apply in writing to the Implementing Authority for conversion of approved building or premises uses to other uses or activity. Permission for change of use shall be given only if the building use conforms to precinct use schedule, structural safety of the building and other relevant clauses of these regulations.

I. Confirmation Inspections by Special Authorities and Damphu Municipal Corporation Regarding Special Projects Sanctioned / Appeals

Developments sanctioned through special conditions/appeals as listed in the Precinct Sanctions shall be liable for inspections by the NEC or the Implementing Authority for revalidation of the development permission.

J. Safety on Site

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. Special care must be taken that no person is



electrocuted, that no one falls, or that no one is burnt, or that no material falls on a person. A site wherein construction goes above 10 meters in height (or three floors) is deemed to be a “Hard Hat”/helmet site and every person on that site shall wear a hard hat/helmet at all time. On such sites safety barriers will be erected around all chutes, shafts, floor openings and slab edges, etc.

K. Child Labour

It is incumbent that the architect sees that no under age workers, or children, are present on the construction site, either as employees, guests, or as dependents of legal employees. A construction activity of a built-up area of 5000 sq.m or more shall provide a crèche or day care centre for the laborer’s children, where one, or more, women are employed on site.

L. Protection of adjoining Public Properties

No construction activity in any site shall damage any of the public properties located adjoining the site, or use these properties for their personal benefits like storing of construction materials during the construction time.

6.2.2.7 Development Without Prior Approvals

If a work requiring the written permission of the Implementing Authority under the provision of these Regulations or other rule, regulation or by-law is done by a person without obtaining written permission, 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. If the person carrying out such work is not the owner at the time of giving such notice, he shall be liable for carrying out the order of the Implementing Authority. If such erection or execution is not stopped forthwith, the Implementing Authority shall remove the person who is directing or carrying on the erection or execution from the premises by the police and shall take necessary steps to prevent the re-entry of such person on the premises without permission.

If the requisitions contained in the order are not carried out by the person or owner within the given period, the Implementing Authority shall remove or alter such work and the expenses thereof shall be paid by the person or owner as the case may be.

The Implementing Authority shall take suitable action against the registered architect/engineer, developer and others as specified in the Regulations involved in such development activities.

In cases where development has already started/commenced on site for which development permission in writing is not obtained from the Implementing Authority, but where this development on site is in accordance with the provisions of these Regulations, the development permission for such work on site without the prior permission may be granted by the Implementing Authority on the merits of each individual case. For such development

works, an additional amount shall be charged on the entire land area or total built up area as per the following rates, over and above the regular charges / fees.

Table 6.1 : Regulation Fees with respect to Developments without prior Approval

Sr. No	Nature of the unauthorized Development	Rate of regularization fee per sq.m for the portion of land in which development is made (or) commenced
1	Application for development (building) permission is not made.	20 times of the regular fees / charges
2	Application has been made but development (building construction) has been commenced prior to grant of permission	10 times of the regular fees / charges
3	All additional uses including layout and sub-division of land for which development approval has not been obtained	2 times of the regular fees / charges

6.2.2.8 Precinct Schedule with Applicable Regulations

The Damphu Structure Plan is structured into several precincts as earlier mentioned in Chapter 5.0 (Sub-Chapter 5.3). These precinct categories are formulated so that the city can harmoniously function as a growing organism. The type of development in each precinct shall be regulated as per the “Table of the Precinct Schedule,” showing Uses Permissible in the Designated Precincts’ (Sub-Chapter 5.3).

The following table regulates the Precinct Schedule showing Maximum Allowable Plot Coverage, Setbacks, number of designated Floors and Parking requirements in each Precinct.

The purposes of these regulations are very clear;

1. They are to assure that all habitable enclosed spaces obtain adequate ventilation and sun light.
2. They are to assure emergency access to all corners of all buildings in the advent of fires or earthquakes.
3. They are to assure access to under ground service networks (water and sewerage pipes); cables (electrical and communications).
4. They are to assure that septic tanks and their soak pit areas are open directly to sky and have adequate areas to function.
5. They are to assure visual privacy between one occupied unit and another.
6. They are to assure that there is adequate space on-site to park the vehicles owned by the building occupants and their visitors.



7. They are to bring visual order and harmony to the concerned towns.
8. They are to discourage plot fragmentation below optimal sizes and encourage amalgamation of land into plot sizes which can accommodate parking, leave adequate set-backs, and be safe and hygienic.

The less densely urban areas are built-up, the more costly the provision of basic urban infrastructure construction and maintenance becomes, on the other hand where density becomes inordinately high; it is not possible to park vehicles, for traffic to move smoothly, or to remove sewerage and solid waste. Thus, Urban Development Controls are in the interest of public safety, hygiene, convenience, cost effectiveness, viable urban management and easy vehicular and pedestrian movement.

Before proceeding with the actual table some terminologies are needed to be defined for the understanding of the reader.

Plot Area

Shall mean the 'Actual Area' of a piece of land registered as with the Land Records Office of the Implementing Authority.

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

Floor Area

Shall mean the built-up area including the area of walls.

Basement or Cellar

Shall mean the lowest storey of a building having minimum half of the clear floor height of the basement or cellar below the lowest ground level, but at least one meter of clearance (on average) above the ground level.

Plot Coverage

Means percentage of Area of Plot covered by structures, building plinths, walls, etc. either permanent or semi-permanent in nature of the total plot area.

Setbacks

Means the distance between the plot boundary and the building outer edge, or the distance between buildings within a plot.

Building Height

Shall mean the vertical distance measured from the level of the lowest natural ground level (side facing legal road), which provides principal access to the development, 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. However the maximum height of the attic shall be limited according to the regulations specified.

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.

Parking Space

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

Precinct Plan

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

Building features that shall be excluded from the calculation of built up area are:

- 1) Areas covered by porches, canopies, weather shields, etc.
- 2) Parking spaces.
- 3) Basements if not used for habitable purposes.

Site Plan

Means the up-to-date legal plan of the plot showing all boundaries, their dimensions, the total plot area, angles in degrees of corners, abutting legal roads and required set-backs issued by the competent authority.

Demarcation

Means the marking out of the Site Plan at the actual location, on the ground, by the competent authority in the presence of the owner and adjacent plot owners, if any.

Urban Peripheral Control Zone

Shall mean a defined peripheral area immediately outside the municipal boundary as fixed by the Competent Authority and restricted for development activities.

For a detailed list of terminologies and their respective definitions used in the proposed Development Control Regulations refer to Appendix-C at the end of this report.



The type of development in each precinct shall be regulated as per the following table.

Table 6.2 : Precinct Schedule Showing Plot Coverage, Setbacks, and Maximum Number of Allowable Floors.

Sr. NO.	DESIGNATED PRECINCTS	PLOT AREA (SQ.M.)	MAX. PLOT COVER-AGE (%)	MINIMUM SETBACK	MAXIMUM HEIGHT (Number of Floors)
1.0 URBAN VILLAGE PRECINCT					
1.1	UV - 1 Village Square	300 - 400	45	<ul style="list-style-type: none"> 5m in Front or on the side accommodating the Septic Tank 3m on all other sides 	2
		401 -1000	45		3
		1000 - 3000	50		3
		More than 3000	55		3
1.2	UV – 2 Urban Village Core	401 -1000	45	<ul style="list-style-type: none"> 5m in Front and the side accommodating the Septic Tank 3m on all other sides 	3
		1001 - 3000	50		3
		Above 3000	55		3
1.3	UV – 3a Urban Village Periphery	300 - 1000	45	<ul style="list-style-type: none"> 5m in Front or on the side accommodating the Septic Tank 3m on all other sides 	2
		1001 - 3000	50		2
		Above 3000	55		2
	UV – 3b Urban Village Fragile Periphery	300 - 1000	25		2
		1001 - 3000	30		2
		Above 3000	35		2
1.4	UV - 4 Urban Village Enclave	100 - 300	45	-	2
		300 - 400	50	-	2
2.0 TOWN CORE AND URBAN HUB PRECINCT					
2.1	UC-1 Urban Core	401 -1000	45	<ul style="list-style-type: none"> 5m in Front or on the side accommodating the Septic Tank 3m on all other sides 	3
		1001 - 3000	50		3
		Above 3000	55		3
3.0 INSTITUTIONAL PRECINCT					
3.1	I-1 Institutional	Less than1000	25	<ul style="list-style-type: none"> 5m in Front and the side accommodating the Septic Tank 3m on all other sides 	3
		More than1000	30		3
3.2	I-3 Institutions in Fragile areas	Above 4000	10	<ul style="list-style-type: none"> 5m on all sides 	3

Sr. NO.	DESIGNATED PRECINCTS	PLOT AREA (SQ.M.)	MAX. PLOT COVER-AGE (%)	MINIMUM SETBACK	MAXIMUM HEIGHT (Number of Floors)
4.0 ENVIRONMENTAL PRECINCT					
4.1	E - 1 Environmental Conservation	-	-	-	-
4.2	E - 2 Forest Environments	-	-	-	-
4.3	E - 3 High Slope & Orchards	4000	5	<ul style="list-style-type: none"> 5m on all sides 	2
4.4	E - 4 Agricultural Environments	4000	5	<ul style="list-style-type: none"> 5m on all sides 	2
4.5	E - 5 National Importance Open Spaces	-	20	<ul style="list-style-type: none"> 5m on all sides 	3
4.6	E - 6 Local Green Space System	-	20	<ul style="list-style-type: none"> 5m on all sides 	2
4.8	E - 8 Endowment for the future	-	As per precinct schedule	As per new assigned precinct schedule	3
5.0 HERITAGE PRECINCT					
5.1	H Heritage Precincts	-		Standards to be framed after Discussion with the NCCA & Department of Culture, RGoB	3
7.0 ROYAL PRECINCT					
7.1	R Royal Uses	-	30	-	3

NOTE :

- Plot Coverage :** The maximum permissible plot coverage shall be within the set back rules. In the case of residential buildings, and balconies (not enclosed or roofed) projecting up to 1.2 m from the ground floor external wall face shall be permitted. Such



projections/structures shall not cover the septic tanks. In the case of commercial buildings cantilevered projections shall be allowed only at the rear side.

2. **Building Height** : The permissible number of floors is inclusive of the ground floor and will be determined from the ground floor level. 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.
3. In any case, no development shall be allowed in the form of a single leveled block, which involves cutting the natural terrain of the plot by more than **1.5 meters** (one and half meters) height, resulting in forming the ground level of the proposed development at any given point.
4. Cantilevers in the form of Portico (or) Porch shall be allowed within the minimum setbacks, with a condition that the dimension of such cantilever projection should be less than half the dimension of the setback, with no habitable use above them. These projections should strictly comply with the traditional architectural guidelines prescribed by the competent authorities.
5. Ramps leading to the basement parking shall be allowed within the minimum setback leaving a clear margin of 1.5 m from the plot line. No roof cover shall be allowed for the ramp if located within the minimum setback area.
6. **Existing Non-Conforming Uses** : A lawful use of land existing prior to the notification of the Damphu Structure Plan 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. A change proposed in the existing building shall be permitted only if it is intended for changing the use to one that is permitted as per the schedule of permitted uses in the concerned Precinct. In principle the Implementing Authority will not allow extensions, modifications of Non-confirming Uses. Non-conforming uses that are incompatible to the surrounding uses or activity shall be allowed to continue operations for a maximum of five calendar years from the date these Precinct Sanctions become operational. A maximum of one, three-year extension, based on hardship can be made by the Implementing Authority. After that period no Non-Conforming use that is incompatible to the surrounding uses or activity shall be allowed.
7. **Parking Requirements** : Plot level parking, fulfilling the entire parking requirements of the proposed development in the plot, is mandatory for all the plots located within the Damphu Municipal Limit. Vehicular parking spaces for various developments should fulfill the standards prescribed as per the Planning Standards for Urban Settlements in Bhutan, Department of Urban Development and Housing, Ministry of Communication, 1999.

6.2.2.9 Regulations for future Local Area Layouts and Individual Plot Sub-Divisions

A Person, firm, agency, body or developer intending to carry out local area layout development in or over a land or subdivide land or a building within the limits of the Damphu Municipal Corporation (DMC) or the Urban Peripheral Control Zone (UPCZ) shall obtain prior permission for the same from the Implementing Authority by applying on the prescribed form and furnishing all information in the forms and format prescribed and as may be amended from time to time by the Implementing Authority. The application procedure shall comply with the planning standards as prescribed by the competent authority.

Subdivision of a land into smaller parcels for developing a layout or for construction of buildings shall not be permitted unless it derives access from an authorized and developed street/means of access. This implies that land locked/trapped sites shall not be sub-divided.

A. Internal Road Layout

Minimum Width of Road

The width of internal road right of ways in any layout cannot be less than 6m of width. However the width of the road could be decided with respect to the total land area the road serves as per the following table.

Table 6.3 : Width of Roads to be provided in Layouts

Sr. No	Precinct Type	Road / Access length in meters.	Width of road right of way (m) for total area served (sq.m.)		
			Up to 10000 sq.m	10000 to 25000 sq.m	More than 25000 sq.m
1	Urban Village Core and Periphery and other residential precincts	Up to 300	6.0	6.0	8.0
		301 to 600	8.0	8.0	10.0-12.0
		above 600	10.0	12.0	15.0
2	Urban Core, Urban Hubs, Industrial and any use other than residential.	Up to 300	8.0	8.0	10.0
		301 to 600	10.0	12.0	15.0
		above 600	15.0	18.0	24.0

NOTE:

1. Road / access provisions as described in the above table shall be over and above the marginal/setback open space to be left as per the requirements given in these Regulations
2. The length of an internal road shall be measured from its origin/the point of its junction with the wider road and its end/the junction with a narrower road.
3. In the case of a plot, surrounded on all sides by other plots, that is land-locked / trapped plot which has no access to a street or road, the Implementing Authority may enforce



access through adjoining plots or plot which shall, as far as possible, be nearest to the street or roads from the land-locked plots, at the cost of owner of the land-locked plot and such other conditions as may be prescribed by the Implementing Authority.

4. In cases of areas where no Local Area Plan is prepared, the existing means of access or easement road/access, an imaginary plot boundary shall be considered at minimum six meters from the centre of the road and from this imaginary plot boundary the margin/setback and other regulations shall be enforced till the local area plan is prepared. The Implementing Authority may enforce further set back considering the proposed development in the surroundings area in necessary.
5. The decision of the Implementing Authority shall be final in computing the length of the road for the purpose of determining the width.
6. In the case of termination of an internal road or roads, a 12 m diameter turning circle, or 12 m x 6 m turning 'T' (12 m. measured along the transverse branches on the street line) shall be enforced. Cul-de-sac roads shall not be allowed beyond a length of 150 m.
7. The level, gradients, position of the services such as water supply lines, street lighting, storm water drains, sewer lines, manholes, trees, etc. shall be fixed as approved by the Implementing Authority.
8. The shape of the plots, the junction of the roads, curves at the corners shall be designed as directed by the Implementing Authority.

Curvature/ Rounding off or Splay at Road Junctions:

Curvature / rounding off or splay at road junctions shall be provided as prescribed below :

1. 4.5 m radius or splay if the width of the road is up to 8 m.
2. 6 m radius if the width of the road is more than 8 m. and up to 12 m.
3. 9 m if the width of the road is more than 12 m. and up to 18 m.
4. 10 m radius if the width of the road exceeds 18 m.
5. At the junction of the roads, the width of the wider road shall be taken into consideration in determining the radius of curvature.
6. The building edge shall be set at least 3 m. from the intersecting curve / splay.

B. General Land Utilization Guidelines for Future Plot Sub-Division

In the subdivision of land for the purpose of plotted development, or for group housing in the form of flatted development, the following land utilization indices shall be achieved.

Table 6.4 : Land Utilization Indices for subdivision of land for the purpose of Plotted Development, or for Group Housing in the form of Flatted Development

Sr. No.	Land Utilization	For layouts of above one hectare area (% of Total Land)	For layouts of less than one hectare area (% of Total Land)
1	Residential *	60 to 65	65 to 70
2	Roads and footpaths	up to 27	20 to 25

3	Open space #	10	10
4	Public amenities (day care, school, health center, etc.)	2 to 4	-
5	Public Utilities (over head tank, septic tank garbage collection arrangement, electric substation, water supply reservoir / pumping station, etc	1	-

* Within this, plots for commercial use (permissible on ground floor only) shall be limited to 5 percent of the total layout area. Such plots where commercial use is limited to the ground floor shall be allowed only along main roads within the layout and the building shall have a minimum setback of three meters.

The area under open spaces should be planned in such a way that at least half of such an area is provided at a central location.

NOTE:

The areas under roads/streets/ footpaths and areas reserved for public amenities and utilities have to be transferred to the Implementing Authority before final approval can be obtained.

C. Plot Consolidation

In the case of a site or plot with existing buildings, its sub-division or consolidation shall not be approved unless it fulfils all the requirements under the following regulations.

Approach Road

Consolidation of plots shall be allowed only if the plots abut approach roads as follows:

1. The minimum width of the roads within the layout is as follows:
 - a) Development of individual residential typologies : 6.0 meters.
 - b) Development of Flats or other non-residential development: 8.0 - 10.0 meters.
2. The minimum specified road widths shall be developed completely up to the plot boundaries by providing all the required infrastructure networks: sidewalks, street lighting, trees, etc.

Footpaths

1. Where there is no motorable road access to individual plots, but only footpaths, the following shall apply for plot consolidation,

Table 6.5 : Maximum Number of Plots to be served with respect to width and length of foot path

Width of footpath (Meters)	Maximum Length (Meters)	Maximum No. of plots to be served
1.5	20	5
2.0	32	8



3.0	52	12
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2. The maximum length of paved pathway measured from the motorable road up to the farthest plot shall not exceed 50 meters.

D. Minimum Plot Sizes

Unless otherwise stated specifically, the minimum building plot/ unit shall be as follows:

Table 6.6 : Minimum Plot Sizes for Different Precincts

Sr. No.	Category of Use / Occupancy	Minimum Plot Size (Square Meters)
1	Row housing type of residential development, in precincts other than UV-1, UV-2, UC-1, UC-2 and E-3 Precincts	300
2	Residential in UC-1, UV-1 Precincts	400
3	Farm Houses, Bungalows in E-3 and E-4 Precincts	4000
4	Plots in UV-2 precincts and Residential structures with more than 6 dwelling units in UV-1, UV-3, UC-1, UC-2 and other Precincts, where residential use is permissible (except in Low Income Group Schemes)	1000
5	Educational Buildings	4000
6	Community / Multi-purpose hall	1500
7	Petrol pump	1200
8	Service establishment / Workshop	400
9	General Industry	1000

Minimum Plot Sizes allowed along abutting roads of different widths for securing land development / subdivision / building permission shall be as follows:

Table 6.7 : Minimum Plot Sizes for plots with respect to the width of the road

Width of Abutting Road (Meters)	Min. Plot Size Allowed (Square Meters)
Less than 12m	300
12m -15m	600
More than or equal to 18m	1000

E. Common Plot

Provision for common Plot within the local area layout proposed for the development of tenements, flats, group housing, is mandatory and should follow the guidelines of the implementing authority.

F. Tree Plantation

Tree plantation, with indigenous species of the Damphu region, at the rate of one tree per every 100 sq.m. of plot area, shall have to be undertaken and maintained in all developments within the Municipal limit. These trees shall preferably be planted at a spacing of between four to eight meters along the roads and streets, and along the edge of the common open spaces.

G. On-Site Physical Infrastructure

In all private layouts larger than two hectares, or containing forty or more plots, an area of at least one percent of the site shall be provided for garbage collection arrangement, electric sub-station, water supply storage reservoir / pumping station, etc.. This space shall be provided such that it is located on a major internal road of the layout and as per the directions of the DMC and other departments involved in providing services to the development.

H. Collection and Discharge of Storm Water

Every site development shall provide channels at the lower elevation/ level of the site which collects rainwater runoff over the site and discharges this runoff into public storm water drains or the rain water harvesting mechanism installed in the plot. The lower plot shall provide an easement or allow / provide a right of way or channel for the discharge of storm water run off from natural sources or adjacent plots of higher elevation into the public storm water drains. Installation of rain water harvesting system should be made compulsory at every plot level in the long run.

6.2.2.10 Parking Requirements

Vehicular parking facility should be provided by the developer within the boundaries of the site for all public, commercial, industrial and residential development according to the following schedule.

Table 6.8 : Parking Requirements

Description	Number of Vehicle Parking Spaces Required	
1) Residential Buildings (Single Family detached houses and Apartments)	Class – I	100% Car Parking *
	Class – II	75% Car Parking * 25% Two-Wheeler Parking *



	Class – III 50% Car Parking * 50% Two-Wheeler Parking * Class – IV 25% Car Parking * 75% Two-Wheeler Parking * * % of total Residential Units equivalent to one parking space
2) Shops (up to 40 Sq.Mts or 400 Sq.Ft of Clear Retail Floor Space)	1 Car Parking Space for Every 5 Shops
3) Shops (Over 50 Sq.Mts or 550 Sq.Ft of Clear Retail Floor Space)	1 Car Parking Space for Every 40 Sq.Mts of Clear Retail Floor Space
4) Department Store or Shopping Centers (over 450Sq.Mts or 5,000 Sq.Ft of Clear Retail Floor Space)	1 Car Parking Space for Every 25 Sq.Mts of Clear Retail Floor Space
5) Offices	1 Car Parking Space for Every 30 Sq.Mts of Net-Usable Office Floor area with a Minimum of 5 per office.
6) Public Halls, Community Centers, Non-Residential Clubs, Restaurants and Cafes	1 Car Parking Space for Every 30 Sq.Mts of Net-Usable Floor area
7) Theatres and Cinemas	1 Car Parking Space for Every 15 fixed seats of Public Accommodation
8) Hotels and Guest Houses	1 Car Parking Space for Every Room or 30 Sq.Mts of Net-Usable Floor area
9) Hospital	1 Car Parking Space for Every 10 Beds
10) Industry and Workshops	1 Car Parking Space for Every 80 Sq.Mts of Net-Usable Floor area
11) Warehouses	1 Car Parking Space for Every 100 Sq.Mts of Net-Usable Floor area
12) Vehicles Service and Repair Workshops	5 Car Parking Space for Every Service or Repair Bay

6.2.3 Local Area Plan

The third tier of the proposed Development Management System pertains to the specifics of a given area towards translating the Development Control Regulations proposed in the structure plan at town level to plot level. For implementation and working reasons, these are called as Local Area Plans. At any situation, it is the structure plan which rules over the local area plan of an Urban Village and the link between them extends at various levels. All the non-negotiable elements and components like roads, various environmental protection areas, population accommodation needs, noted in the structure plan must be conserved in the local area plans. On the other hand, it is the basic necessity of the local area plan to rationalize the proposals of the structure plan.

These local areas will form basic units of planning and could be perceived as a tool to translate the broader goals that are outlined in Damphu Structure Plan in to a practical setting. On one hand it will facilitate the implementation of the specific objectives of the structure plan and on the other the plan will illustrate the implementation of precincts sanctions within the local area and at individual plot level. It will also address local issues like provision of amenities at comfortable walking distance and restructuring of land parcels into a rational urban system.

The local areas generally, but not necessarily, will cover an Urban Village identified in the structure plan. Normally these are areas bounded by major roads, rivers, surface drains or other natural boundaries. At places where there is no established natural boundary they follow the existing cadastral boundaries. With in these defined areas, the urban systems are laid out completely respecting the guidelines provided by the Development Control Regulations in a workable and implementable manner. The distribution of various precincts proposed in the Damphu Structure Plan will also be rationalized in the Local Area Plans.

At places, where the Local Area Plan covers the entire Urban Village, a high-density housing zone with a village square in centre will be identified. These local areas will be developed as a self-sustainable unit in terms of infrastructure, services and amenities needs. The Village Square with the basic amenities for Urban Village will be generally located along a public transport movement corridor, so that the Village Square becomes the central focus of the Local Area Plan. The idea is to provide compact, walkable communities, surrounded by medium-density residential plots, which in turn is surrounded by low-density development. All the plots falling in a local area plan will be rationalized. Roads and other infrastructure services including water supply networks, sewerage networks, storm water drains, street lighting and solid waste management will be laid out in a hierarchical manner so that all the plots in the local area are well served.

In Damphu, one such Local Area Plan has been prepared for the town as a part of the Damphu Structure Plan.



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APPENDICES

- **Appendix - A - Selected Investment Plan**
- **Appendix - B - Definitions And Detailed Requirements For Obtaining Development Permissions**



Appendix - A - SELECTED INVESTMENT PLAN

A.1 INTRODUCTION

The Investment Plan for Damphu is prepared as a part of the Damphu Structure Plan, with the prime objective of the long-term wellbeing of the people of Damphu and their environment, through an innovative approach and the provision of cost-effective services.

To ensure sustainable communities and bring about lasting improvements to quality of life of individuals, families and neighborhoods, we need integrated policies, investment and action across a range of economic, social, physical and environmental issues.

This coordinated approach aims to deliver

- Access to economic opportunities (e.g. through new businesses and improved transport) along with the skills and support (e.g. training, child care and other support services) to take advantage of these opportunities;
- Improvements to the local environment, open spaces and facilities;
- Good quality and responsive public services (e.g. education, health and neighborhood services such as street cleaning, roads and lighting, and safety);
- Safer communities; and,
- Genuine community engagement in shaping the place they live.

This leads to an approach of making a balanced infrastructure investment program.

The Program will

- Invest in environmental, transportation and social infrastructure; and ,
- Maximize economic efficiency through innovative investment mechanisms like revolving and securitization funds and grants (where necessary).

The main goal is to achieve improved quality of life, increased environmental and health protection, reduced levels of homelessness and improved community well-being.

The main sectors of investment would be:

1. Environmental Infrastructure:

- a. Solid-waste management systems, including programs for reducing, reusing and recycling, waste diversion such as composting, upgrades of existing landfill sites;
- b. Water and wastewater systems, including water and wastewater treatment plants, distribution and collection systems (covering potable water, sanitary and other effluents and storm waters), and water conservation; and,
- c. Protection of ecologically sensitive lands and natural heritage.

2. Transportation Infrastructure:

- a. Repair and upgrade of roads and bridges;
- b. Construct new roads as proposed in the transportation plan; and,
- c. Mass public transport system.

3. Social Infrastructure:

- a. New affordable housing;
- b. Improved health services;
- c. Recreational facilities for children and youth; and,
- d. Revitalization, including housing intensification; and heritage preservation.

The investment will benefit in the form of

- Improved productivity and competitiveness;
- Local job creation and training;
- Community economic development;
- Increased community safety; and,
- Reduced levels of homelessness and the related costs of emergency shelters, health and social services.

A.2 EXECUTIVE SUMMARY

The preparation of the Damphu Structure Plan is the primary task of the Department of Urban Development and Engineering Services (DUDES) under the Ministry of Works and Human Settlement (MoW&HS), Royal Government of Bhutan (RGoB). This Investment Plan Report presents and discusses projects which are proposed as a part of the Damphu Structure Plan.

Proposals for action have been proposed along with the projects on-going and future planned [as mentioned in Damphu Structure Plan – 3.9]. Looking at the demographic studies it reveals that population will reach a figure of 8,700 by the year 2025 [Reference: Chapter -4, Demographic Studies and Planning Standards, Damphu Structure Plan].

The Investment Plan proposal can act as a reference to plan carefully, to take care of the infrastructure needs of this growing population. This Plan deals in detail with infrastructure projects. It aims to help various departments to work together more efficiently and to execute the projects in a coordinated way and to provide greater transparency for the community on the infrastructure strategies and projects. Along with this process the implementing authority should also stress on the issues of maintenance and of implication for the provision of new infrastructure; on the possibilities for multi-year budgeting for infrastructure projects, and on new technologies and their implications for infrastructure.



While proposing the proposals for action three major criteria are used to assess the merits of an infrastructure project.

They should:

- Meet a clear social need;
- Be consistent with existing government policies and requirements; and
- Produce more benefits than costs.

The community’s need for an infrastructure project may emerge from a number of factors. The report takes in to consideration population factor: population growth, population movements and the characteristics of new population distribution. The community’s need for infrastructure may also stem from the demands of economic change over and above that required simply to sustain a growing population.

The Damphu Structure Plan is prepared considering four key policy points within which strategies, plans, initiatives and individual infrastructure projects would fit.

These are:

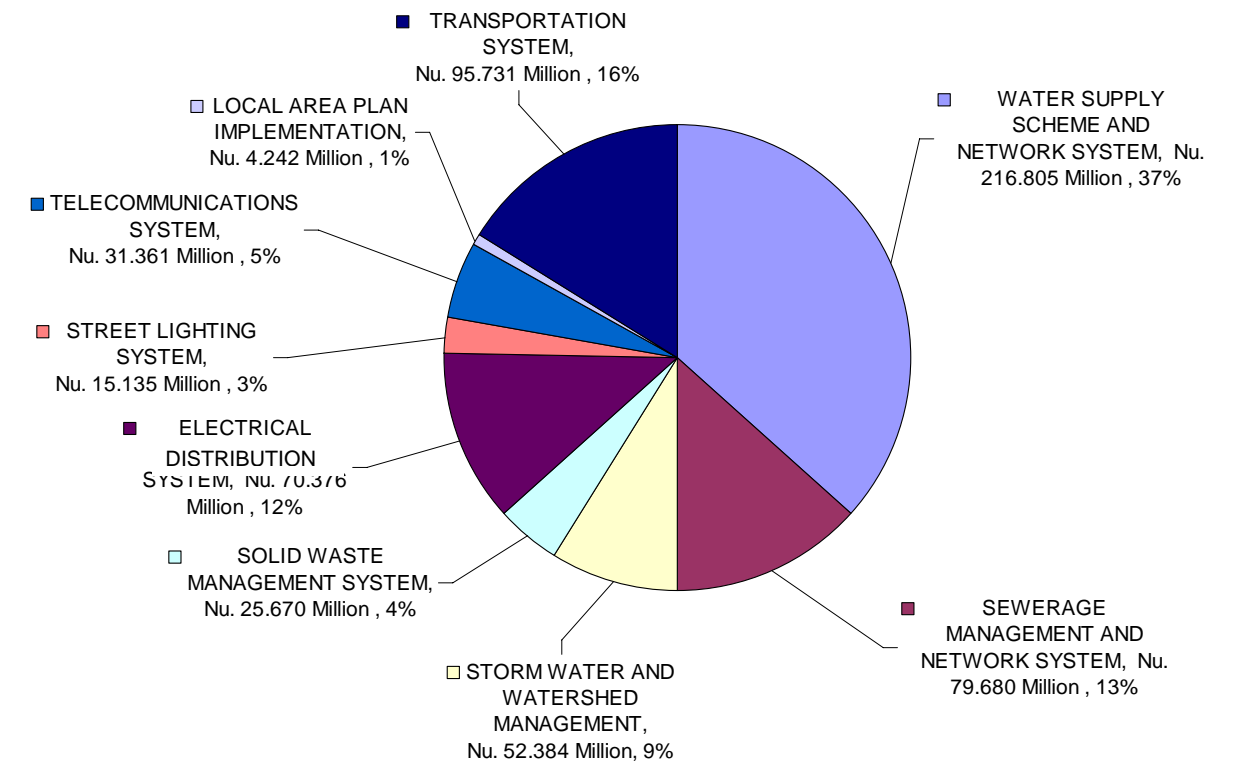
- Integrating **environment protection** into all activities;
- Encouraging **economic development** and **employment growth**;
- Achieving greater **social justice** for all members of the community and creating livable towns; and,
- Delivering more **financially responsible** programs that reduce public debt and unfunded liabilities.

Some of the most important initiatives aimed at helping, meet these commitments are:

- Reducing pollution from storm water and sewage;
- Integrating land use and transport planning;
- Investing in information technology infrastructure;
- Improving access to affordable housing; and
- Enhancing recreational and cultural infrastructure.

The Investment Plan specifies the proposed projects and recommendations that will deliver these initiatives.

As per the analysis of the proposed project mentioned in the ‘Proposals for Action’, the Investment for the Damphu Town (with the proposed extended municipal boundary limits) will be about Nu. 591.38 Million (or, USD 13.59 Million) up to the year 2025, for the projects various SECTORS.



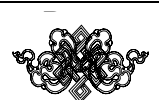
Investment Plan for Damphu: At a Glance – Sector wise Distribution [Period: 2005 – 2025]

A.3 PROPOSED PROJECTS : COST ESTIMATED (SECTOR WISE)

Damphu Structure Plan proposes various projects under the following SECTOR heads. The cost estimates are carried out for the same projects.

A.3.1 Utilities and Infrastructure

- Water Supply Scheme and Network System
- Sewerage Management and Network System
- Storm Water Management and Watershed Development
- Soil Waste Management System
- Electrical Distribution System
- Street Lighting System
- Telecommunication System
- Local Area Plan Implementation
- Transportation System



A.3.1.1 Water Supply System

The main objective of the proposed Water Supply System is to

- To ensure an efficient and regular supply of potable treated water for the entire area under the present and proposed extended municipal boundary.
- To ensure adequate tapping of the available water sources and after treatment, to utilize them as a part of the town water supply network.
- To enable a decentralized network of sources and supply networks to reduce and distribute the anticipated load on the central network, in the future, on to other subsidiary ones.
- To establish a cost efficient network, which would maximize the use of the gravity flow mechanism, thus efficiently utilizing the local terrain characteristics, reducing the need for expensive pumping facilities to the bare minimum.

Considering this framework, the following system of supply is proposed:

Flow Diagram of the proposed water supply network system

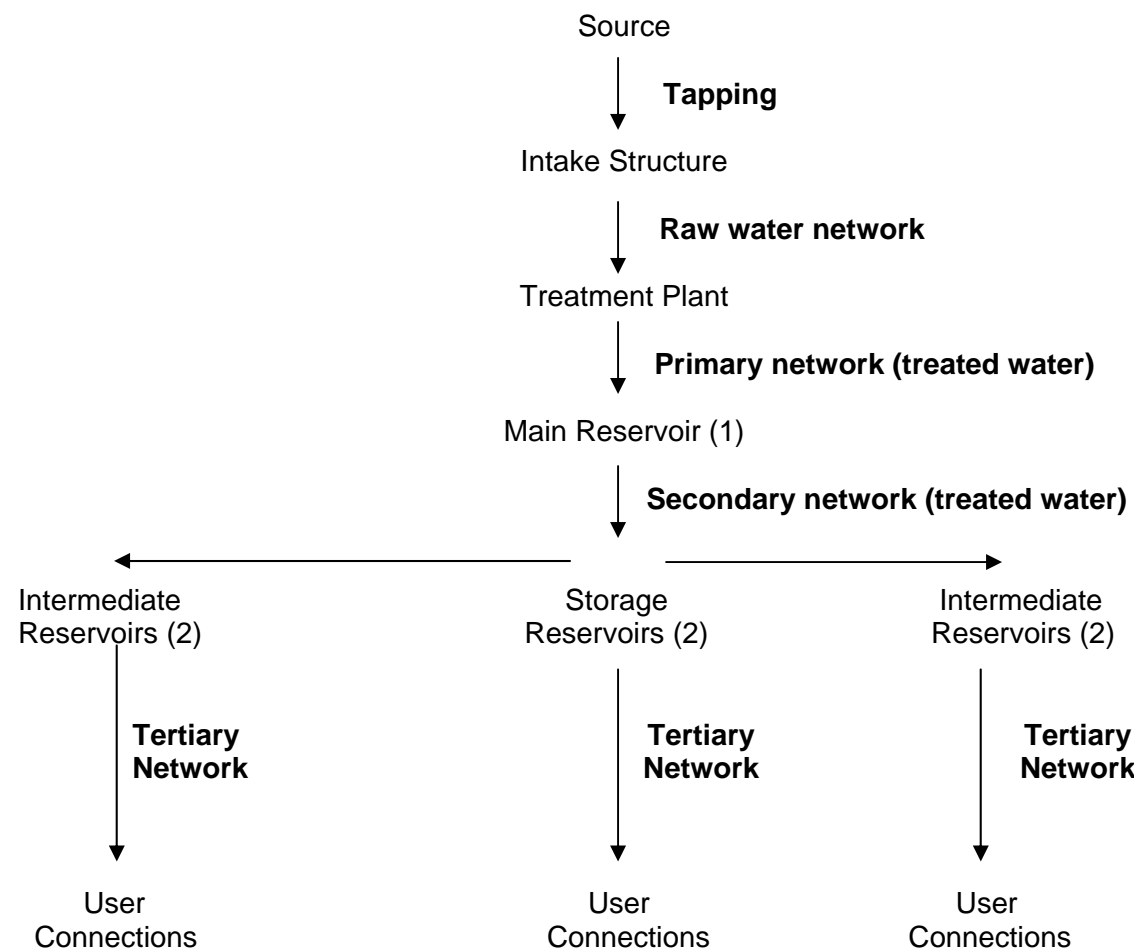


Table A.1 : Summary of Cost Estimates of the Proposed Projects for Water Supply System and its network

Sector	Estimated Cost (Nu.) (in million)	Estimated Cost (US \$) (in million)	Phase One 2005-2010 (in million)	Phase Two 2011-2015 (in million)	Phase Three 2016-2020 (in million)	Phase Four 2021-2025 (in million)
Water Supply Scheme and Network System	216.805	4.984	94.277	39.530	51.876	31.121

Note: For detailed calculation please refer to Table A.10 at the end of this Appendix

The costing for the Water Supply System is arrived at considering the proposed system of flow from source to the intermediate reservoirs and then to the distribution expected within the proposed municipal limits. **Pricing** of the water supply consumption should be as per the metered consumption for each unit and would vary according to the precinct it is located in. A detailed **pricing mechanism** could be evolved for different grades of development and income groups as per the density of the development. Looking at the proposed systems, there would be a phase-wise expansion of the current manpower capacities engaged in the management and maintenance of the urban water supply network, to cover and manage the other recommended treatment plants and other facilities in the outlying areas.

Conclusion

The estimated cost for the entire water supply network system for Damphu (with the extended municipal limits) is **Nu. 216.80 million**. This is a huge expenditure, but it is a necessity looking at the overall progress of the town. The entire scheme of implementation of the water supply system should be worked-out taking into consideration the amount to be invested and amount to be recovered from the consumers. At the same time the manpower and maintenance tasks have to be considered, as the system would have different control points. The implementing authority must establish this mechanism.

A.3.1.2 Sewerage Management System

The main objective of the proposed Sewerage Management System is to

- To ensure an efficient sewerage and waste water disposal system with respect to maintaining high standards of health and hygiene in Damphu.
- To lay the network of the sewerage network mainly along the natural drains and off the road networks. This will have a major advantage of not blocking the vehicular traffic during sewer repairing operations, which is a chronic problem on several main roads today.



- To enable a decentralized the sewer network and to reduce and distribute the anticipated load on the central network.
- To establish a cost efficient network, by installing sewage treatment plant.

For the purpose of facilitating an efficient sewerage System, the network lines which come from the territories to come at a point where pathways are proposed and then the lines follow the pathway running along the rivulets to the treatment plants. This pathway alignment will enable to locate the lines for maintenance and would also provide an access to the manholes.

Table A.2 : Summary Of Cost Estimates of the Proposed Project for Sewerage Management System

Sector	Estimated Cost (Nu.) (in million)	Estimated Cost (US \$) (in million)	Phase One 2005-2010 (in million)	Phase Two 2011-2015 (in million)	Phase Three 2016-2020 (in million)	Phase Four 2021-2025 (in million)
Sewerage Management and Network System	79.680	1.832	28.596	15.940	22.114	13.029

Note: For detailed calculation please refer to Table A.11 at the end of this Appendix

The costing for the Sewerage Management System is arrived at considering the various projects mentioned and the mechanism proposed for the same in the structure plan.

Conclusion

The estimated cost for the entire sewerage network system for Damphu (with the extended Town limits) is **Nu. 79.68 million**. It is a large expenditure over the years but it is a necessity looking the overall progress of the town. The entire scheme of implementation of the sewerage network system should be worked-out taking into consideration the amount to be invested, and the amount to be recovered from the consumers. At the same time enough manpower and maintenance tasks have to be considered as the system would have different control points. An appropriate mechanism for implementation must be established by the implementing authority.

A.3.1.3 Storm Water Drainage and Water Shed Management

The main objective of the proposed Storm Water Drainage System is to:

- To ensure an efficient storm water disposal system with respect to maintaining high standards of health and hygiene in Damphu.

- To lay the network of the storm water drainage mainly along the off the road networks.
- To establish a cost efficient network, by constructing storm water drainage channels wherever possible with loads according to areas of collection, thereby reducing on the exposed networks and the possibility of causing serious hygienic problems.

Table A.3 : Summary of Costs Estimates of the Proposed Project for Storm Water Drainage System

Sector	Estimated Cost (Nu.) (in million)	Estimated Cost (US \$) (in million)	Phase One 2005-2010 (in million)	Phase Two 2011-2015 (in million)	Phase Three 2016-2020 (in million)	Phase Four 2021-2025 (in million)
Storm Water drainage and Water Shed management	52.384	1.204	19.803	13.494	9.119	9.969

Note: For detailed calculation please refer to Table A.12 at the end of this Appendix

The costing for the Storm Water Drainage System is arrived considering the various projects mentioned in the Utilities and Infrastructure report.

Conclusion

The estimated amount for the entire storm water drainage system for Damphu (with the extended municipal limits) is **Nu. 52.38 million**. It is a large expenditure over the years but it is a necessity looking to the overall progress of the town.

A.3.1.4 Solid Waste Collection and Disposal Systems

The proposed Solid Waste Collection and Disposal System aim at

- Managing the Solid waste at source level by segregating the wastes into recyclable and reusable wastes, organic wastes and other rubbish.

The main objective of the proposed Solid Waste Collection and Disposal System is to

- To manage and minimize the volume of solid waste carried to the landfill site.
- To alter the methodology of solid waste collection and disposal system.
- To manage the solid waste at the source level.
- To extend the services of the solid waste collection network to all the proposed precincts.
- To decentralized the solid waste management system to other institutions and organizations. Large institutions should have their own facilities.
- To promote awareness among the public in managing the solid wastes.



Table A.4 : Summary Of Cost Estimates of the Proposed Solid Waste Collection And Disposal System

Sector	Estimated Cost (Nu.) (in million)	Estimated Cost (US \$) (in million)	Phase One 2005-2010 (in million)	Phase Two 2011-2015 (in million)	Phase Three 2016-2020 (in million)	Phase Four 2021-2025 (in million)
Solid Waste Management System	25.670	0.590	6.632	6.311	6.364	6.364

Note: For detailed calculation please refer to Table A.13 at the end of this Appendix

Conclusion

The estimated amount for the entire solid waste management system for Damphu (with the extended municipal limits) is **Nu. 25.67 million**. It is a large expenditure over the years but it is a necessity looking to the overall progress of the town. All the projects mentioned aims to minimize and manage the volume of the solid waste collected at the landfill site. Introduction of strict monitoring system, introduction of public participation and privatization of the solid waste management, will minimize the responsibilities and ease the management process for the Damphu Municipal Corporation. These systems will also induce awareness among the public.

A.3.1.5 Electrical [Power] Distribution System

The main objective of the proposed Electrical Power Distribution System is to:

- To provide sufficient electricity requirements to maximum consumption areas.
- To establish a proper mechanism by establishing maintenance centers at key locations.
- To convert the overhead lines network to underground network wherever necessary.

Table A.5 : Summary of Cost Estimates of the Proposed Electrical [Power] Distribution System

Sector	Estimated Cost (Nu.) (in million)	Estimated Cost (US \$) (in million)	Phase One 2005-2010 (in million)	Phase Two 2011-2015 (in million)	Phase Three 2016-2020 (in million)	Phase Four 2021-2025 (in million)
Electrical Distribution System	70.376	1.618	43.680	6.592	15.608	4.497

Note: For detailed calculation please refer to Table A.14 at the end of this Appendix

Pricing of the electrical distribution system should be worked-out as per the number of connections [by strict monitoring] and the investment to be done for the systems.

Conclusion

The estimated amount for the entire electrical distribution system for Damphu (with the extended Town limits) is **Nu. 70.38 million**. It is a large expenditure over the years, but it is a necessity looking at the overall progress of the town. The entire scheme of implementation of the electrical distribution system should be worked-out taking into consideration the amount to be invested and amount to be recovered from the consumers. Separate facilities to be established by the implementing authority.

A.3.1.6 Street Lighting

The main objective of the proposed Street Lighting System is to:

- To add a character to the streets of different types by providing various types of illumination characteristics.
- To add greater visibility to the vehicular traffic thus reducing the number of accidents.

Table A.6 : Summary of Cost Estimates of the Proposed Project for Street Lighting System

Sector	Estimated Cost (Nu.) (in million)	Estimated Cost (US \$) (in million)	Phase One 2005-2010 (in million)	Phase Two 2011-2015 (in million)	Phase Three 2016-2020 (in million)	Phase Four 2021-2025 (in million)
Street Lighting	15.135	0.348	3.990	5.354	2.645	3.146

Note: For detailed calculation please refer to Table A.15 at the end of this Appendix

The costing for the Street Lighting System is arrived considering the various transportation projects proposed.

Conclusions

The estimated amount for the entire street lighting system for the Damphu Town (with the extended Town limits) is **Nu. 15.13 million**. It is a large expenditure over the years but it is a necessity looking the overall traffic condition of the town. The entire scheme of



implementation of the street lighting system should be worked-out taking into consideration the immediate requirements.

A.3.1.7 Telecommunication System

The main objective of the proposed Telecommunication System is to:

- To upgrade the network system in areas of high demand.
- To increase the capacity of the existing and newly built stations in a phased manner considering the population and the number of connections.

Table A.7 : Summary of Cost Estimates of the Proposed Telecommunication System

Sector	Estimated Cost (Nu.) (in million)	Estimated Cost (US \$) (in million)	Phase One 2005-2010 (in million)	Phase Two 2011-2015 (in million)	Phase Three 2016-2020 (in million)	Phase Four 2021-2025 (in million)
Telecommunication system	31.361	0.721	11.455	5.852	10.573	3.480

Note: For detailed calculation please refer to Table A.16 at the end of this Appendix

The costing for the Telecommunication System is arrived considering the various proposed tasks. Accordingly, the entire planning network would have to be done from each of the proposed Urban Village roads after executing a detailed survey.

Conclusion

The estimated amount for the entire telecommunication system for Damphu (with the extended Town limits) is **Nu. 31.36 million**. It is a large expenditure over the years but it is a necessity looking the overall demand of the town and its extended limits. The entire scheme of implementation of the telecommunication system should be worked-out taking into consideration a detailed survey of the immediate requirements and also the future demand.

A.3.1.8 Transportation System

The main objective of the proposed transportation system is to:

- To strengthen the inter-town linkages.
- To reduce the emission levels in the town by promoting the Public Transit System and by discouraging the use of private vehicles.
- To encourage a pedestrian oriented transportation system by enhancing safety and convenience

- To complement the proposed land use pattern with appropriate transportation and pedestrian linkages.
- To create opportunities for the citizens of Damphu to meet new people and make new friends, which they meet sitting next to them in public transport.

Table A.8 : Summary of Cost Estimates of the Proposed Project for Transportation System

Sector	Estimated Cost (Nu.) (in million)	Estimated Cost (US \$) (in million)	Phase One 2005-2010 (in million)	Phase Two 2011-2015 (in million)	Phase Three 2016-2020 (in million)	Phase Four 2021-2025 (in million)
Transportation System	95.731	2.201	31.906	37.912	12.890	13.023

Note: For detailed calculation please refer to Table A.18 at the end of this Appendix

The costing for the Transportation System is arrived taking into consideration the town's present situation. A detailed survey has to be executed on the proposed roads and further make a study on its implication on the surrounding areas of the roads.

Conclusion

The estimated amount for the entire transportation system for the Damphu Town (with the extended Town limits) is **Nu. 95.73 million**. It is a large expenditure over the years but it is a necessity looking the overall traffic movements of the Town, its extended limits and the safety of the public. The entire scheme of implementation of the transportation system should be worked-out taking into consideration a detailed survey of the immediate requirements and also of the future demand

A.4 PROJECT IMPLEMENTATION AND PROJECT MANAGEMENT

A.4.1 Implementation

The Structure Plan is implemented through a variety of means including Local Area Plans prepared for various zones. The implementation may be done through the following methods

- Urban Strategy and Action Programme
- Economic Strategies
- Guidelines for Developer's Contributions
- City Conservation/ Forest Protection Strategy



- Recreation Strategies
- Tourism Strategies
- Urban Fringe Countryside Management Plan
- Local Transport Plans

Supplementary planning guidance does have to be prepared in order to assist in implementing the strategy. The particular supplementary planning guidance should contain broad guidelines about the requirements for developer contributions towards the services and facilities needed to support new development.

It is proposed that implementation of the Damphu Structure Plan, Damphu Municipal Corporation would be the Implementing Authority. Observing at the present structure of the Damphu Municipal Corporation, there is an immediate requirement to strengthen or rather recruit technical professionals in the engineering and management fields.

Also, the Damphu Municipal Corporation along with the Department of Urban Development and Engineering Services (DUDES) should explore the commissioning of the external or international consultants for design and project management of the jobs. Corporation representatives can be a part of the team so as to get trained and also as a means of direct exposure to the work.

The records from the Construction Development Board confirm that contractors under various categories are capable for executing projects of different scales, thus strengthening the capacities of the building construction contracting industry.

A provision in the projects implementation process is that the work should not be necessarily awarded to the lowest cost bidder. Should be ensured this provision will take care of the quality of the job. But, again this may not suffice, and, a very strict monitoring by a team of technical professionals has to be lined-up for close supervision and monitoring.

With the execution of the projects there has to be a back-up of a very strong maintenance team. This team will ensure regular monitoring and maintenance of the jobs being executed to keep them intact and functioning.

A.4.2 Resources

The Implementing Authorities have a good idea of the resources that are likely to be available to implement the Structure Plan's proposals. This includes taking account of the city's economic policies, the financial policies of implementing agencies and the likely availability for the use of land, labour and other material resources. As the Structure Plan sets out policies and proposals for land use in broad terms and over the long term, such an

assessment can only be made in general terms and will inevitably be subject to some uncertainty.

The Structure Plan provides the strategic precinct planning framework for the decision making by a wide range of public and private sector bodies and agencies whose contribution will be necessary to implement the Plan. In preparing the Plan consultation took place with concerned bodies regarding amongst other matters the use of resources. The Implementing Authority will need to work with these other bodies and agencies to secure the necessary resources to implement the Plan. Making effective use of resources will necessitate genuine partnership working both between the Implementing Authority and various bodies and organizations operating at the strategic and more local levels and with local communities.

Public investment includes funds made available from Local Authorities and those secured from the Government via bidding arrangements as for the Local Transport Plans and from other organizations. The restrictions on public expenditure means that much will depend on securing private finance to implement the development requirements proposed in the Plan. The above mentioned guidelines dealing with requirements for developer's contributions towards the services and facilities required to support new development will be particularly relevant in this respect.

A.4.3 Monitoring

Monitoring plays an important part in the Structure Plan implementation process. In order to assess the effectiveness and progress of the Plan, policies should be regularly monitored by the Implementing Authority.

There are two main elements of the monitoring process:

- Scrutiny of emerging Local Area Plans in terms of their conformity with Structure Plan policies.
- Identification of appropriate indicators and the continuous monitoring of social, economic and environmental data to assess the effectiveness of the Structure Plan.

The second element will be undertaken by the use of a selected number of key indicators and targets that will measure specific policies or groups of policies. It will provide a consistent basis to judge whether the Plan is achieving its objectives, and to identify where policies need to be strengthened, maintained, changed or removed as part of future reviews.

The following factors have been taken into account in identifying the key indicators

- The ability of the Structure Plan to influence the indicator;
- The overall objectives of the Plan set out in Strategy Policy;
- The policies themselves;
- The availability of source data; and,



- Their compatibility with other national, regional and local indicators.

The indicators will monitor progress towards meeting the targets set by the Plan. The measurement of such indicators will provide an initial indication of the effectiveness of the policies. However, further analysis will be required to be undertaken to give a more informed

consideration. The analysis of indicators and implementation of the policies through Local Area Plans will provide an opportunity to identify areas requiring further investigation and, where appropriate, the need for new policy responses in a future review of the Structure Plan.

Table A.9 : Executive Summary of the Investment Plan Proposals

Cost Estimate Summary : Sector Wise (with phasing)

Sr. No.	Sector	Estimated Cost (Nu.) (in million)	Estimated Cost (US \$) (in million)	Phase One 2005 - 2010 (in million)	Phase Two 2011 - 2015 (in million)	Phase Three 2016 - 2020 (in million)	Phase Four 2021 - 2025 (in million)
1.0	Water Supply and NetworkSystem	216.805	4.984	94.277	39.530	51.876	31.121
2.0	Sewerage Management and Network System	79.680	1.832	28.596	15.940	22.114	13.029
3.0	Storm Water Drainage and Water Shed Management	52.384	1.204	19.803	13.494	9.119	9.969
4.0	Solid Waste Management System	25.670	0.590	6.632	6.311	6.364	6.364
5.0	Electrical Distribution System	70.376	1.618	43.680	6.592	15.608	4.497
6.0	Street Lighting System	15.135	0.348	3.990	5.354	2.645	3.146
7.0	Telecommunication System	31.361	0.721	11.455	5.852	10.573	3.480
8.0	Local Area Plan Implementation	4.242	0.098	1.148	1.562	0.761	0.771
9.0	Transportation System	95.731	2.201	31.906	37.912	12.890	13.023
Total		591.384	13.596	241.487	132.547	131.950	85.400

Note

[a] The cost estimates have been derived from : Project mention in 'Proposals for Action' in the Damphu Structure Plan, and the quantification of items of works have been calculated from the proposed layouts etc.

[b] The cost estimated mentioned above are excluding 'inflation' component. During the process of finalizing and approval of a particular proposal necessary inflation index rate to be implied and then the final cost to be arrived at.

[c] 1 US Dollar = Nu. 43.50



Table A.10 : Cost Estimate for the Proposed Water Supply Scheme and Network System

Sr. No.	Item Description (in brief)	Quantity	Unit	Estimated Rate (Nu.)	Estimated Cost (Nu.)	Estimated Cost (Nu.) (in million)	Estimated Cost (US \$) (in million)	Phase One 2005 - 2010 (in million)	Phase Two 2011 - 2015 (in million)	Phase Three 2016 - 2020 (in million)	Phase Four 2021 - 2025 (in million)
1.0	Source										
1.1	Intake Structure and Sand Trap	3	Nos.	235,000	705,000	0.705	0.016	0.235	0.235		0.235
1.2	Monitoring and Maintenance Facility	3	LS	125,000	375,000	0.375	0.009	0.125	0.125		0.125
	Total [1.0]				1,080,000	1.080	0.025	0.360	0.360	0.000	0.360
2.0	Main Plant										
2.1	New Treatment Plant - 1	1	Nos.	4,800,000	4,800,000	4.800	0.110	4.800			
2.2	New Treatment Plant - 2	1	Nos.	6,500,000	6,500,000	6.500	0.149			6.500	
2.3	Up-gradation of existing Plant	1	Nos.	2,500,000	2,500,000	2.500	0.057		2.500		
	Total [2.0]				13,800,000	13.800	0.317	4.800	2.500	6.500	0.000
3.0	Reservoirs										
3.1	Main	1	Nos.	4,500,000	4,500,000	4.500	0.103	4.500			
3.2	Storage	2	Nos.	2,800,000	5,600,000	5.600	0.129	2.800		2.800	
3.3	Distribution	4	Nos.	1,800,000	7,200,000	7.200	0.166	1.800	1.800		3.600
	Total [3.0]				17,300,000	17.300	0.398	9.100	1.800	2.800	3.600
4.0	Distribution Network Pipelines										
4.1	Raw water line from Source to treatment plant	17,356	Rmt.	2,900	50,332,400	50.332	1.157	32.932			17.400
4.2	Treatment Plant to Main Reservoir	2,321	Rmt.	3,750	8,703,750	8.704	0.200	5.657			3.046
4.3	Main Reservoir to Storage Reservoir	2,750	Rmt.	4,250	11,687,500	11.688	0.269	5.844			5.844
4.4	Storage Reservoir to Distribution Reservoir	4,515	Rmt.	3,750	16,931,250	16.931	0.389	4.233	4.233		8.466
4.5	Up-gradation of existing pipelines	1,850	Rmt.	3,250	6,012,500	6.013	0.138	3.006	3.006		
4.6	Fire Hydrant System (pressurized)	4,250	Rmt.	4,250	18,062,500	18.063	0.415	6.322	7.225	1.806	2.709
4.7	Distribution Network Pipelines	6,588	Rmt.	3,250	21,411,000	21.411	0.492	7.494	8.564	2.141	3.212
	Total [4.0]				133,140,900	133.141	3.061	65.488	23.028	30.237	14.387
5.0	Total [1.0+2.0+3.0+4.0]				165,320,900	165.321	3.800	79.748	27.688	39.537	18.347
6.0	Miscellaneous										
6.1	Water Meter installation	1,800	Nos.	4,500	8,100,000	8.100	0.186	2.025	1.215	2.430	2.430
6.2	Maintenance Facility	3	LS	350,000	1,050,000	1.050	0.024	0.350	0.350	0.350	
6.3	Material Stock - Pipes	1	LS	19,971,135	19,971,135	19.971	0.459	4.993	2.996	5.991	5.991
6.4	Material Stock - Valves etc.	1	LS	6,657,045	6,657,045	6.657	0.153	1.664	0.999	1.997	1.997
	Total [6.0]				35,778,180	35.778	0.822	9.032	5.559	10.768	10.418



Sr. No.	Item Description (in brief)	Quantity	Unit	Estimated Rate (Nu.)	Estimated Cost (Nu.)	Estimated Cost (Nu.) (in million)	Estimated Cost (US \$) (in million)	Phase One 2005 - 2010 (in million)	Phase Two 2011 - 2015 (in million)	Phase Three 2016 - 2020 (in million)	Phase Four 2021 - 2025 (in million)
7.0	Other related cost										
7.1	System Design Cost [4.5 %] of (5.0)		%		7,439,441	7.439	0.171	2.604	2.976	0.744	1.116
7.2	Supervision and Administrative Cost [5 %] of (5.0)		%		8,266,045	8.266	0.190	2.893	3.306	0.827	1.240
	Total [7.0]				15,705,486	15.705	0.361	5.497	6.282	1.571	2.356
	Total [5.0 + 6.0 + 7.0]				216,804,566	216.805	4.984	94.277	39.530	51.876	31.121

Notes

[a] The item rate cost mentioned are inclusive of cost of material and labour including concrete channel and safety covers.

[b] The system proposed of treatment plants, reservoirs and water supply network is tentative based on the structure plan proposals and should be systemized by executing a proper survey for the source, for positioning of the reservoirs and further distribution network of pipelines with respect to it's diameter, type of type and it's laying.

[c] After the detailed survey the entire system should be designed by a Expert in Water Supply System.

[d] The System Design Cost are notional consultancy fees for the system design and the Supervision and Administrative Cost is assumed at five percent of the total cost of investment.

[e] In [6.0] Miscellaneous, a tentative provision of materials stock is proposed so as to be prepared for any emergencies in the system.



Table A.11 : Cost Estimate for the Proposed Sewerage Scheme and Network System

Sr. No.	Item Description (in brief)	Quantity	Unit	Estimated Rate (Nu.)	Estimated Cost (Nu.)	Estimated Cost (Nu.) (in million)	Estimated Cost (US \$) (in million)	Phase One 2005 - 2010 (in million)	Phase Two 2011 - 2015 (in million)	Phase Three 2016 - 2020 (in million)	Phase Four 2021 - 2025 (in million)
1.0	Collection										
1.1	Group collection structure	16	Nos.	675,000	10,800,000	10.800	0.248	2.700	2.700	2.700	2.700
	Total [1.0]				10,800,000	10.800	0.248	2.700	2.700	2.700	2.700
2.0	Treatment Plant										
2.1	New Treatment Plant - 1	1	Nos.	4,500,000	4,500,000	4.500	0.103	4.500			
2.2	New Treatment Plant - 2	1	Nos.	8,500,000	8,500,000	8.500	0.195			8.500	
	Total [2.0]				13,000,000	13.000	0.299	4.500	0.000	8.500	0.000
3.0	Sewerage Network Pipelines										
3.1	Laying of new sewerage pipeline	12,365	Rmt.	2,265	28,006,725	28.007	0.644	12.603	5.601	5.601	4.201
	Total [3.0]				28,006,725	28.007	0.644	12.603	5.601	5.601	4.201
4.0	Total [1.0+2.0+3.0]				51,806,725	51.807	1.191	19.803	8.301	16.801	6.901
5.0	Miscellaneous										
5.1	Mechanized Pressure Cleaners	8	Nos.	1,850,000	14,800,000	14.800	0.340	3.700	3.700	3.700	3.700
5.2	Maintenance Facility	3	LS	850,000	2,550,000	2.550	0.059	0.850	0.850		0.850
5.3	Material Stock - Pipes	1	LS	4,201,009	4,201,009	4.201	0.097	1.890	0.840	0.840	0.630
5.4	Material Stock - Ancillary etc.	1	LS	1,400,336	1,400,336	1.400	0.032	0.630	0.280	0.280	0.210
	Total [5.0]				22,951,345	22.951	0.528	7.071	5.670	4.820	5.390
6.0	Other related cost										
6.1	System Design Cost [4.5 %] of (4.0)		%		2,331,303	2.331	0.054	0.816	0.933	0.233	0.350
6.2	Supervision and Administrative Cost [5 %] of (4.0)		%		2,590,336	2.590	0.060	0.907	1.036	0.259	0.389
	Total [6.0]				4,921,639	4.922	0.113	1.723	1.969	0.492	0.738
	Total [4.0 + 5.0 + 6.0]				79,679,709	79.680	1.832	28.596	15.940	22.114	13.029

Notes

[a] The item rate cost mentioned are inclusive of cost of material and labour.

[b] The system proposed of treatment plants and sewerage pipeline network is tentative based on the structure plan proposals and should be systemized by executing a proper survey with respect to group collection points, network of sewerage pipelines with respect to it's diameter, type of type and it's laying.

[c] Item Rate for item no. (3.1) includes pipeline cost, manholes and inspection chambers.

[d] After the detailed survey the entire system should be designed by a Expert in Sewerage System.

[e] The System Design Cost are notional consultancy fees for the system design and the Supervision and Administrative Cost is assumed at five percent of the total cost of investment.

[f] In [5.0] Miscellaneous, a tentative provision of materials stock is proposed so as to be prepared for any emergencies in the system.



Table A.12 : Cost Estimate for the Storm Water Drainage System

Sr. No.	Item Description (in brief)	Quantity	Unit	Estimated Rate (Nu.)	Estimated Cost (Nu.)	Estimated Cost (Nu.) (in million)	Estimated Cost (US \$) (in million)	Phase One 2005 - 2010 (in million)	Phase Two 2011 - 2015 (in million)	Phase Three 2016 - 2020 (in million)	Phase Four 2021 - 2025 (in million)
1.0	Collection Structures										
1.1	Collection Structures	8	Nos.	675,000	5,400,000	5.400	0.124	1.350	1.350	1.350	1.350
	Total [1.0]				5,400,000	5.400	0.124	1.350	1.350	1.350	1.350
2.0	Support Systems										
2.1	Conservation of Mountain Slopes	0.8	sq.kms.	5,500,000	4,125,000	4.125	0.095	2.063	2.063		
2.2	Watershed Regions	1.25	sq.kms.	4,250,000	5,312,500	5.313	0.122	2.656	2.656		
	Total [2.0]				9,437,500	9.438	0.217	4.719	4.719	0.000	0.000
3.0	Storm Water Drain Network										
3.1	Open Storm Water Drains	8,125	Rmt.	1,475	11,984,375	11.984	0.276	2.996	2.996	2.996	2.996
3.2	Storm Water Drain Channels	4,250	Rmt.	4,580	19,465,000	19.465	0.447	8.759	2.920	3.893	3.893
	Total [3.0]				31,449,375	31.449	0.723	11.755	5.916	6.889	6.889
4.0	Total [1.0+2.0+3.0]				46,286,875	46.287	1.064	17.824	11.985	8.239	8.239
5.0	Miscellaneous										
5.1	Mechanized Pressure Cleaners	2	Nos.	850,000	1,700,000	1.700	0.039		0.850		0.850
	Total [5.0]				1,700,000	1.700	0.039	0.000	0.850	0.000	0.850
6.0	Other related cost										
6.1	System Design Cost [4.5 %] of (4.0)		%		2,082,909	2.083	0.048	0.937	0.312	0.417	0.417
6.2	Supervision and Administrative Cost [5 %] of (4.0)		%		2,314,344	2.314	0.053	1.041	0.347	0.463	0.463
	Total [6.0]				4,397,253	4.397	0.101	1.979	0.660	0.879	0.879
	Total [4.0 + 5.0 + 6.0]				52,384,128	52.384	1.204	19.803	13.494	9.119	9.969

Notes

[a] The item rate cost mentioned are inclusive of cost of material and labour.

[b] The Support System (2.0) are proposed and needs a very critical approach on the design of the system. An expert should be employed to explore the Support System proposed.

[c] Item Rate for item no. (3.0) includes cost of excavation, concrete trenches and covers.

[c] After the detailed survey the entire storm water system should be designed by a Expert to work as a back-up system during emergencies.

[d] The System Design Cost are notional consultancy fees for the system design and the Supervision and Administrative Cost is assumed at five percent of the total cost of investment.



Table A.13 : Cost Estimate for the Proposed Solid Waste Management System

Sr. No.	Item Description (in brief)	Quantity	Unit	Estimated Rate (Nu.)	Estimated Cost (Nu.)	Estimated Cost (Nu.) (in million)	Estimated Cost (US \$) (in million)	Phase One 2005 - 2010 (in million)	Phase Two 2011 - 2015 (in million)	Phase Three 2016 - 2020 (in million)	Phase Four 2021 - 2025 (in million)
1.0	Collection Structures										
1.1	Land Fill Site	1	LS	3,000,000	3,000,000	3.000	0.069	0.750	0.750	0.750	0.750
1.2	Large Pick-up Bins	28	Nos.	275,000	7,700,000	7.700	0.177	1.925	1.925	1.925	1.925
1.3	Refuse Collector	4	Nos.	2,675,000	10,700,000	10.700	0.246	2.675	2.675	2.675	2.675
	Total [1.0]				21,400,000	21.400	0.492	5.350	5.350	5.350	5.350
2.0	Total [1.0]				21,400,000	21.400	0.492	5.350	5.350	5.350	5.350
3.0	Miscellaneous										
3.1	Maintenance of Refuse Collectors		LS	3,200,000	3,200,000	3.200	0.074	0.800	0.800	0.800	0.800
	Total [3.0]				3,200,000	3.200	0.074	0.800	0.800	0.800	0.800
4.0	Other related cost										
4.1	Supervision and Administrative Cost [5 %] of (2.0)		%		1,070,000	1.070	0.025	0.482	0.161	0.214	0.214
	Total [4.0]				1,070,000	1.070	0.025	0.482	0.161	0.214	0.214
	Total [2.0 + 3.0 + 4.0]				25,670,000	25.670	0.590	6.632	6.311	6.364	6.364

Table A.14 : Cost Estimate for Electrical Distribution System

Sr. No.	Item Description (in brief)	Quantity	Unit	Estimated Rate (Nu.)	Estimated Cost (Nu.)	Estimated Cost (Nu.) (in million)	Estimated Cost (US \$) (in million)	Phase One 2005 - 2010 (in million)	Phase Two 2011 - 2015 (in million)	Phase Three 2016 - 2020 (in million)	Phase Four 2021 - 2025 (in million)
1.0	Transformers										
1.1	Transformer	3	Nos.	2,275,000	6,825,000	6.825	0.157	2.275		2.275	2.275
	Total [1.0]				6,825,000	6.825	0.157	2.275		2.275	2.275
2.0	Electricity Distribution Lines										
2.1	Underground Lines	4,125	RMT	4,500	18,562,500	18.563	0.427	13.922		4.641	
2.2	Overhead Lines	12,570	RMT	1,975	24,825,750	24.826	0.571	18.619		6.206	
	Total [2.0]				43,388,250	43.388	0.997	32.541		10.847	0.000
3.0	Total [1.0+2.0]				50,213,250	50.213	1.154	34.816		13.122	2.275
4.0	Miscellaneous										
4.1	Maintenance Yard Facility	2	LS	2,675,000	5,350,000	5.350	0.123	2.675	2.675		
4.2	Material Stock - Wires	1	LS	7,531,988	7,531,988	7.532	0.173	3.389	1.506	1.506	1.130
4.3	Material Stock - Ancillary etc.	1	LS	2,510,663	2,510,663	2.511	0.058	1.130	0.502	0.502	0.377
	Total [4.0]				15,392,650	15.393	0.354	7.194	4.684	2.009	1.506



Sr. No.	Item Description (in brief)	Quantity	Unit	Estimated Rate (Nu.)	Estimated Cost (Nu.)	Estimated Cost (Nu.) (in million)	Estimated Cost (US \$) (in million)	Phase One 2005 - 2010 (in million)	Phase Two 2011 - 2015 (in million)	Phase Three 2016 - 2020 (in million)	Phase Four 2021 - 2025 (in million)
5.0	Other related cost										
5.1	System Design Cost [4.5 %] of (3.0)		%		2,259,596	2.260	0.052	0.791	0.904	0.226	0.339
5.2	Supervision and Administrative Cost [5 %] of (3.0)		%		2,510,663	2.511	0.058	0.879	1.004	0.251	0.377
	Total [5.0]				4,770,259	4.770	0.110	1.670	1.908	0.477	0.716
Total [3.0 + 4.0 + 5.0]					70,376,159	70.376	1.618	43.680	6.592	15.608	4.497

Notes

[a] The item rate cost mentioned are inclusive of cost of material and labour.

[b] Item Rate for item no. (1.1) includes cost of the transformer, transformer room etc.

[c] After the detailed survey the entire system should be designed by a Expert in Electrical Distribution.

[d] The System Design Cost are notional consultancy fees for the system design and the Supervision and Administrative Cost is assumed at five percent of the total cost of investment.

[e] In [5.0] Miscellaneous, a tentative provision of materials stock is proposed so as to be prepared for any emergencies in the system.

Table A.15 : Cost Estimate for Proposed Street Lighting System

Sr. No.	Item Description (in brief)	Quantity	Unit	Estimated Rate (Nu.)	Estimated Cost (Nu.)	Estimated Cost (Nu.) (in million)	Estimated Cost (US \$) (in million)	Phase One 2005 - 2010 (in million)	Phase Two 2011 - 2015 (in million)	Phase Three 2016 - 2020 (in million)	Phase Four 2021 - 2025 (in million)
1.0	Street Lighting										
1.1	On proposed new Roads.	7,302	RMT	850	6,206,700	6.207	0.143	1.552	2.483	0.931	1.241
1.2	On existing roads	10,139	RMT	375	3,802,125	3.802	0.087	0.951	1.521	0.570	0.760
1.3	Hight Masts (in selected areas)	2	Nos.	1,875,000	3,750,000	3.750	0.086	0.938	0.938	0.938	0.938
	Total [1.0]				13,758,825	13.759	0.316	3.440	4.941	2.439	2.939
2.0	Total [1.0]										
					13,758,825	13.759	0.316	3.440	4.941	2.439	2.939
3.0	Miscellaneous										
3.1	Material Stock - Wires	1	LS	687,941	687,941	0.688	0.016	0.310	0.138	0.138	0.103
	Total [3.0]				687,941	0.688	0.016	0.310	0.138	0.138	0.103
4.0	Other related cost										
4.1	Supervision and Administrative Cost [5 %] of (4.0)		%		687,941	0.688	0.016	0.241	0.275	0.069	0.103
	Total [4.0]				687,941	0.688	0.016	0.241	0.275	0.069	0.103
Total [2.0 + 3.0 + 4.0]					15,134,708	15.135	0.348	3.990	5.354	2.645	3.146

Notes

[a] The item rate cost mentioned are inclusive of cost of material & labour. [b] In [3.0], a tentative provision of materials stock is proposed so as to be prepared for any emergencies in the system.



Table A.16 : Cost Estimate for Tele-Communication System

Sr. No.	Item Description (in brief)	Quantity	Unit	Estimated Rate (Nu.)	Estimated Cost (Nu.)	Estimated Cost (Nu.) (in million)	Estimated Cost (US \$) (in million)	Phase One 2005 - 2010 (in million)	Phase Two 2011 - 2015 (in million)	Phase Three 2016 - 2020 (in million)	Phase Four 2021 - 2025 (in million)	
1.0	Telecommunication System											
1.1	Up-gradation of present Exchange	1	LS	13,500,000	13,500,000	13.500	0.310	6.075		7.425		
1.2	Underground network	6,850	RMT	1,350	9,247,500	9.248	0.213	2.312	3.699	1.387	1.850	
1.3	Overhead network	4,515	RMT	750	3,386,250	3.386	0.078	0.847	0.847	0.847	0.847	
	Total [1.0]				26,133,750	26.134	0.601	9.233	4.546	9.659	2.696	
2.0	Total [1.0]											
					26,133,750	26.134	0.601	9.233	4.546	9.659	2.696	
3.0	Miscellaneous											
3.1	Material Stock - Wires	1	LS	3,920,063	3,920,063	3.920	0.090	1.764	0.784	0.784	0.588	
	Total [3.0]				3,920,063	3.920	0.090	1.764	0.784	0.784	0.588	
4.0	Other related cost											
4.1	Supervision and Administrative Cost [5 %] of (2.0)		%		1,306,688	1.307	0.030	0.457	0.523	0.131	0.196	
	Total [4.0]				1,306,688	1.307	0.030	0.457	0.523	0.131	0.196	
	Total [2.0 + 3.0 + 4.0]					31,360,500	31.361	0.721	11.455	5.852	10.573	3.480

Notes

[a] The item rate cost mentioned are inclusive of cost of material and labour.

[b] In [3.0] Miscellaneous, a tentative provision of materials stock is proposed so as to be prepared for any emergencies in the system.

Table A.17 : Cost Estimate for Local Area Plan Implementation

Sr. No.	Item Description (in brief)	Quantity	Unit	Estimated Rate (Nu.)	Estimated Cost (Nu.)	Estimated Cost (Nu.) (in million)	Estimated Cost (US \$) (in million)	Phase One 2005 - 2010 (in million)	Phase Two 2011 - 2015 (in million)	Phase Three 2016 - 2020 (in million)	Phase Four 2021 - 2025 (in million)	
1.0	Local Area Plan Implementation											
1.1	Extended Boundary Limits	449	Acre	750	336,551	0.337	0.008	0.151		0.185		
1.2	Demarcation	871,507	SQ.M.	4.25	3,703,905	3.704	0.085	0.926	1.482	0.556	0.741	
	Total [1.0]				4,040,455	4.040	0.093	1.077	1.482	0.741	0.741	
2.0	Total [1.0]											
					4,040,455	4.040	0.093	1.077	1.482	0.741	0.741	
3.0	Other related cost											
3.1	Supervision and Administrative Cost [5 %] of (2.0)		%		202,023	0.202	0.005	0.071	0.081	0.020	0.030	
	Total [3.0]				202,023	0.202	0.005	0.071	0.081	0.020	0.030	
	Total [2.0 + 3.0]					4,242,478	4.242	0.098	1.148	1.562	0.761	0.771

Notes

[a] The extended boundary limits of the Damphu Municipal Corporation needs to be established permanently.

[b] Local Area Plan needs to be demarcated as per the final approved plan with permanent bench markings.



Table A.18 : Cost Estimate for the Proposed Transportation System

Sr. No.	Item Description (in brief)	Quantity	Unit	Estimated Rate (Nu.)	Estimated Cost (Nu.)	Estimated Cost (Nu.) (in million)	Estimated Cost (US \$) (in million)	Phase One 2005 - 2010 (in million)	Phase Two 2011 - 2015 (in million)	Phase Three 2016 - 2020 (in million)	Phase Four 2021 - 2025 (in million)
1.0	Roads										
1.1	Up-grade Existing Roads										
1.1.1	Urban Corridor / Urban Bypass	2,820	RMT	4,125	11,632,500	11.633	0.267	4.071	5.235	1.163	1.163
1.1.2	Urban Spine	2,855	RMT	3,850	10,991,750	10.992	0.253	3.847	4.946	1.099	1.099
1.1.3	Secondary Roads in Urban Hub	4,465	RMT	2,015	8,996,975	8.997	0.207	3.149	4.049	0.900	0.900
	Total [1.1]				31,621,225	31.621	0.727	11.067	14.230	3.162	3.162
1.2	New Roads										
1.2.1	Urban Corridor / Urban Bypass	1,948	RMT	5,850	11,395,800	11.396	0.262	3.989	5.128	1.140	1.140
1.2.2	Secondary Roads in Urban Hub	5,354	RMT	2,850	15,258,900	15.259	0.351	5.341	6.867	1.526	1.526
	Total [1.2]				26,654,700	26.655	0.613	9.329	11.995	2.665	2.665
1.3	Develop and improve Road Junctions	12	Nos.	800,000	9,600,000	9.600	0.221	2.400	2.400	2.400	2.400
1.4	Construct pedestrain footpaths	6,750	RMT	1,450	9,787,500	9.788	0.225	3.426	4.404	0.979	0.979
1.5	Parking Lots	8	Nos.	450,000	3,600,000	3.600	0.083	0.900	0.900	0.900	0.900
1.6	Bus Stops	6	Nos.	85,000	510,000	0.510	0.012	0.255		0.255	
	Total [1.0]				81,773,425	81.773	1.880	27.377	33.929	10.361	10.106
2.0	Total [1.0]				81,773,425	81.773	1.880	27.377	33.929	10.361	10.106
3.0	Miscellaneous										
3.1	Road Cleaning Equipments	2	Nos.	875,000	1,750,000	1.750	0.040	0.438	0.263	0.525	0.525
3.2	Maintenance Facility	1	Nos.	350,000	350,000	0.350	0.008	0.350			
3.3	Material Stock	1	LS	4,088,671	4,088,671	4.089	0.094	1.022	0.613	1.227	1.227
	Total [3.0]				6,188,671	6.189	0.142	1.810	0.876	1.752	1.752
4.0	Other related cost										
4.1	System Design Cost [4.5 %] of (2.0)		%		3,679,804	3.680	0.085	1.288	1.472	0.368	0.552
4.2	Supervision and Administrative Cost [5 %] of (2.0)		%		4,088,671	4.089	0.094	1.431	1.635	0.409	0.613
	Total [4.0]				7,768,475	7.768	0.179	2.719	3.107	0.777	1.165
	Total [2.0 + 3.0 + 4.0]				95,730,572	95.731	2.201	31.906	37.912	12.890	13.023

Notes

[a] The item rate cost mentioned are inclusive of cost of material and labour including concrete channel and safety covers.

[b] After the detailed survey the road alignment and the cross-section to be finalized with a Road Designer\Expert.

[c] The Road Design Cost are notional consultancy fees for the system design and the Supervision and Administrative Cost is assumed at five percent of the total cost of investment.

[d] In [3.0] Miscellaneous, a tentative provision of materials stock is proposed so as to be prepared for any emergencies.



Appendix - B - DEFINITIONS AND DETAILED REQUIREMENTS FOR OBTAINING DEVELOPMENT PERMISSIONS

B.1 DEFINITIONS

The following sub-chapter puts forth the definitions of various terminologies uses in the proposed Development Control Regulation in a comprehensive manner. Thus it should be understood that, in the proposed Development Control Regulations, unless the context otherwise requires, the terms and expressions defined as follows shall have the meaning indicated against each of them.

The terms and expressions not defined in these nomenclature shall have the same meanings as in the Bhutan Municipal Act, 1999 and the rules framed there under or as mentioned in National Building Code (NBC) of India, as the case may be unless the context otherwise requires.

B.1.1 Act

Shall mean the Bhutan Municipal Act, 1999

B.1.2 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 re-construction 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.

B.1.3 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.

B.1.4 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.

B.1.5 Amenities

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

B.1.6 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.

B.1.7 Applicant

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

B.1.8 Architect

Shall mean a person with degree or diploma in architecture from an Institute, College or University accredited to impart teaching and to issue degree and/ or diploma, which is recognized by the Royal Civil Service Commission.

B.1.9 Basement or Cellar

Shall mean the lowest storey of a building having minimum half of the clear floor height of the basement or cellar below the lowest ground level. Where a plot has access from two different roads, the level of the lower road shall be accepted to be called a basement, if it is to be used exclusively for parking and utilities. On plots larger than 2500 Sq.Mts, where a star hotel or a multi-plex is to be constructed a basement may cover the entire plot, leaving a 1.8 meters margin on all sides.

B.1.10 Betterment Charge

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

B.1.11 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".

(a) "**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 theaters 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.

(b) "**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.

(c) "**Detached building**" shall mean a building with walls and roofs independent of any other building and with open spaces on all sides.

(d) "**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, skybridge, or any other trivial connection will not qualify a building to be defined as "semi-detached"

(e) "**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.

(f) "**Hazardous building**" shall mean a building or part thereof used for, -

- i. 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.
- ii. 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.
- iii. 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.

(g) "**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.

(h) "**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, and includes dharamshalas, 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..

(j) "**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.

(k) "**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.

(l) "**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.

(m) "**Special Building**" shall mean

- i. a building solely used for the purpose of a drama or cinema theater, motion picture, drive-in-theater, an assembly hall or auditorium, town hall, lecture hall, an exhibition hall, theater, museum, a stadium, a "community hall, marriage hall;
- ii. a hazardous building;
- iii. a building of a wholesale establishment;
- iv. centrally air-conditioned building which is more than three floors,
- v. a building of more than two floors constructed on stilts,
- vi. a building of more than four floors.

(n) "**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.

(o) "**Unsafe Building**" shall mean a building which,

- i. is structurally unsafe,
- ii. is unsanitary,



- iii. is not provided with adequate means of egress,
- iv. constitutes a fire hazard,
- v. is dangerous to human life,
- vi. in relation to its existing use constitutes a hazard to safety or health or public welfare by reasons of inadequate maintenance, dilapidation or abandonment.

(p) "**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.

B.1.12 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.

B.1.13 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.

B.1.14 Building Inspector

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

B.1.15 Carpet Area

(Otherwise called "Net Internal Floor Area") shall mean the covered area of the usable rooms at any floor, excluding the area of the walls.

B.1.16 Implementing Authority

Shall mean any person or persons or Authority or Authorities authorized by the Competent Authority/Damphu Municipal Corporation/ D.U.D.E.S, as the case may be, to perform such functions as may be specified in these Regulations. Different persons or authorities may be authorized to perform different functions.

B.1.17 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.

B.1.18 Commercial Zone

Shall mean an area primarily intended for commercial and allied purposes.

B.1.19 Common Wall

Shall mean a structure joining two or more properties.

B.1.20 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.

B.1.21 Convenience Shopping

Shall mean shops each with a carpet area not exceeding 25 sq.m (except otherwise indicated) 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, each with carpet area not exceeding 50 sq.m
- ii. Doma shops/kiosks
- iii. Tobacconists
- iv. Shops for collecting and distribution of clothes and other materials for cleaning and dyeing establishments
- v. Tailor or darning shops
- vi. Groceries, confectioneries, general provision shops, each with a carpet area not exceeding 50 sq.m
- vii. Hair dressing saloons and beauty parlors
- viii. Bicycle / scooter/ motorcycle hire and repair shops
- ix. Motorcar hires and repair shops not exceeding 50 sq.m.
- x. Vegetable and fruits shops
- xi. Milk and milk products shops
- xii. Medical and dental practitioners' dispensaries or clinics, pathological or diagnostic clinics and pharmacies, each with a carpet area not exceeding 50 sq.m
- xiii. Florists.
- xiv. Shops dealing in ladies ornaments such as bangles, cosmetics, etc.
- xv. Shops selling bakery products
- xvi. Newspaper, magazine stalls and circulating libraries
- xvii. Wood, coal and fuel shops, each with a carpet area not exceeding 30 sq.m
- xviii. Books and stationery shops or stores
- xix. Cloth and garment shops with areas less than 50 sq.m.
- xx. Plumbers, electricians, radio, television and video equipment repair shops and video libraries
- xxi. Restaurants and eating houses each with a carpet area not exceeding 50 sq.m
- xxii. Shoes and sports shops each with a carpet area not exceeding 75 sq.m.
- xxiii. Hardware shops not exceeding 50 sq.m.
- xxiv. Taxi stand office not exceeding 10 sq.m.



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

B.1.22 Corridor

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

B.1.23 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.

B.1.24 Common Plot / Land

Shall mean a common open to sky space exclusive of setbacks, margins, parking spaces and approaches, at the ground level of the building unit. The owner shall have to give an undertaking that the common plot shall be for the common use of all the residents or occupants of the building unit, free of cost.

On sanction of the development permission, the common plot shall deem to have been vested in the society/association of the residents/occupants. In case such society or association is to be formed, the possession/custody of common plot shall remain with Implementing Authority until such society/association is formed. The common plot shall not be sold to any other person and it shall not be put to any other use except for the common use of the residents/occupants.

B.1.25 Covered Area

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

B.1.26 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.

B.1.27 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 sub-division of any land.

Plotted Development : Means the carrying out of development leading to the subdivision of land into plots

Flatted Development : Means the carrying out of development on a site leading to the construction of flats

B.1.28 Development Charge

Means a charge levied by the Implementing Authority as per the provisions of the Bhutan Municipal Act, 1999 clause 95.

B.1.29 Development Permission

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.

B.1.30 Development Right

Means the right to carry out development of a building or land.

B.1.31 Deviation

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

B.1.32 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 catchment. A drain includes an open channel for conveying surface water or a system for the removal of any liquid.

B.1.33 Dwelling Unit

Shall mean a shelter consisting of residential accommodation for one household. Provided that the minimum accommodation in a dwelling unit shall be one habitable room of minimum carpet area of 9 sq.m. with a minimum side dimension of 2.5 m and a WC. It may not have more than one kitchen or cooking space.

B.1.34 Enclosed Staircase

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

B.1.35 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 recognized by the Royal Civil Service Commission.

B.1.36 Existing Building



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

B.1.37 Existing Use

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

B.1.38 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.

B.1.39 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.

B.1.40 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.

B.1.41 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.

B.1.42 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 concerned Indian Standards of the National Building Code, India.

B.1.43 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.

B.1.44 Fire Resistance

Shall mean the time during which a fire resistant material, i.e. material having a certain degree of fire resistance, fulfills 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.

B.1.45 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.

B.1.46 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.

B.1.47 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.S.

B.1.48 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.

B.1.49 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.

B.1.50 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.

B.1.51 Foundation

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

B.1.52 Garage – Private

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

B.1.53 Garage – Public

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

B.1.54 Ground Level

Shall mean the level of the crown of the existing nearest constructed road from where the principal vehicular access is taken or existing ground level within the plot, whichever is higher.

B.1.55 Group Housing

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

B.1.56 Hardship

Shall relate to the hardship arising due to the internal operation of the rules and not to the economic, social or personal condition of the applicant.

B.1.57 Home Occupation

Shall mean customary home occupation other than the conduct of an eating or a drinking place offering services to the general public, customarily carried out by a member of the family residing on the premises without employing hired labour, and for which there is no display to indicate from the exterior of the building that it is being utilized in whole or in part for any purpose other than a residential or dwelling use and in connection with which no article or service is sold or exhibited for sale except that which is produced therein, which shall be non-hazardous and not affecting the hygiene or safety of the inhabitants of the building and the neighborhood, and provided that no mechanical equipment is used except that as is customarily used for purely domestic or household purposes and /or employing licensable goods. If motive power is used, the total electricity load should not exceed 0.75 KW. "Home Occupation" may also include such similar occupations as may be specified by the Implementing Authority and subject to such terms and conditions as may be prescribed.

Under no case should an economic activity, deemed as a "Home Occupation" if it generates nuisance by way of sound, water, or air pollution.

B.1.58 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.

B.1.59 Hazardous Material

Shall mean: radio active 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.

B.1.60 Height of Building

Shall mean the vertical distance measured from the level of the lowest natural ground level, which provides principal access to the development, 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. However the maximum height of the attic shall be limited to that given in the Critical Dimensions (see Concerned Section).

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.

B.1.61 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.

B.1.62 Industrial Zone

Shall mean an area primarily intended for industries use or buildings and allied activities.



B.1.63 Institutional Zone

Shall mean an area primarily intended for institutional purposes.

B.1.64 Layout

Shall mean laying out a parcel of land or lands into smaller plots for building on, with laying of roads / streets, including formation, leveling, metalling or 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.

B.1.65 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.

B.1.66 LIGHT HOME WORKSHOP

Means a workshop wherein the work done or the machinery installed is such as could be done or installed in any residential area without detriment to the neighbourhood by means of noise, vibration, smell, fumes, smoke, soot, ash, dust or grit etc.

It will be subject to the following restrictions:

- i. Power used will be electrical.
- ii. Maximum power used will be 1.5 KW.
- iii. Maximum floor space occupied will be 20 sq.m.
- iv. It will be worked by the members of the family.
- v. Any part of the machinery including pulley, belt shafts etc. shall be attached to the walls or other parts of the building except the floor at which the same machinery is supported.

Such home workshop may be gold smithy, milk or curd churning, pills making, stitching embroidery, tailoring, vulcanizing, sewing machine, folding machine, milk-separation.

B.1.67 Light Industry

Means an industry in which the processes are carried out without detriment to the neighboring residential areas by reason of noise, vibration, smell, fumes, smoke, soot, ash, dust or grit. It will be subject to the following restrictions:

- i. Power used will be electrical
- ii. Maximum power used will be 10 KW, which may be enhanced up to 25 KW by the Implementing Authority in special cases of genuine expansion of existing factory, which may have reached the maximum limit of power.
- iii. Maximum floor space occupied shall not exceed 500 Sq.m.
- iv. It will be housed in a building suitable for the purpose. However, it shall not include the following industries:

Manufacturing or refining of ammonia, bleaching powder, chlorine, asphalt, brick, terracotta, gypsum, lime, plaster of Paris, coke, creosote, glucose, starch, dye, explosive or fire works or storage thereof in excess of 50 Kg. fertilizers, gas (fuel or illuminating) in excess of three hundred cubic meters, gelatin or glue from fish or animal refuse, or offal,

hydrochloric acid, nitric acid, sulphuric or sulphurous acid, lead black, linoleum or oil cloth, matches, pyrexilin or rubber or treatment thereof involving offensive odour, tar, turpentine or blast furnace, coal or junk yard, distillation of bores, coal weed or tar or manufacture of any of their distilled products, drop forages, fat grease lard of fallow manufactures, refining or rendering lout or grist mill, hot rolling mill, incineration, reduction, or dumping of dead animals, garbage or refuse except when accumulated and consumed on the same premises without the emission of odour, production or refining or storage above ground of petroleum or other inflammable liquids (except heating fuels), slaughtering of animals, tanning or curing or storage of raw hides and skins, tyre recapping.

B.1.68 Loft / Attic

Shall mean the space within the confines of the roof structure, above the ceiling of the top floor or an intermediate floor between two floors with a maximum height of 1.2 m measured between the bottom of the ceiling and the top of the loft and which is constructed and adopted for storage purpose. The loft if provided in a room shall not cover more than 20% of the floor area of the room.

B.1.69 Margin / Setback

Shall mean space fully open to sky provided at the ground level from the edge of the building wherein built-up area shall not be permitted except specifically permitted projections under this regulation.

B.1.70 Mezzanine Floor

Shall mean an intermediate floor with height not more than 2.3 m., between two main floors overhanging or overlooking a floor beneath and accessible only from the lower floor.

B.1.71 Municipal Boundary

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

B.1.72 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.

B.1.73 Obnoxious and Hazardous Industry

Means industry, which will create nuisance to the surrounding development in the form of smell, smoke, gas, dust, noise pollution, air pollution, water pollution and other unhygienic conditions.



B.1.74 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.

B.1.75 Occupancy Certificate

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

B.1.76 Open Space

Shall mean an area forming an integral part of the plot, left permanently open to sky.

B.1.77 Owner

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

B.1.78 Parapet

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

B.1.79 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.

B.1.80 Partition

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

B.1.81 Permanent Open Air Space

Shall mean air space permanently open if its freedom from encroachment is protected by any law or contract ensuring that the ground below it is either a street or is permanently and irrevocably appropriated as an open space.

B.1.82 Permission

Shall mean a valid permission or authorization in writing by the Implementing Authority to carry out development or a work regulated by the Regulations.

B.1.83 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.

B.1.84 Plinth Height

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

B.1.85 Plinth Area

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

B.1.86 Plot

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

B.1.87 Porch

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

B.1.88 Precinct Plan

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

B.1.89 Precinct-Use

Shall mean any activity/use, assigned to an area of land.

B.1.90 Public Purpose

The expression "Public Purpose" includes-

- i. The provision of village sites, or the extension, planned development or improvement of existing village sites;
- ii. The provision of land for town or rural planning;
- iii. The provision of land for planned development of land from public funds in pursuance of any scheme or policy of Royal Government and subsequent disposal thereof in whole or in part by lease, assignment or outright sale with the object of securing further development as planned;
- iv. The provision of land for a corporation owned or controlled by the Royal Government;
- v. The provision of land for residential purposes to the poor or landless or to persons residing in areas affected by natural calamities, or to persons displaced or affected by reason of the implementation of any scheme undertaken by the Royal Government, any local Authority or a corporation owned or controlled by the Royal Government;



- vi. The provision of land for carrying out any educational, housing, health or slum /bagos improvement and/or clearance scheme sponsored by the Royal Government or by any Authority established by the Royal Government for carrying out any such scheme or with the prior approval of the Royal Government,
- vii. The provision of land for any other scheme of development sponsored by the Royal Government or with the prior approval of the Royal Government, by a local Authority;
- viii. The provision of any premises or building for locating a public office, but does not include acquisition of land for Companies.

B.1.91 Registered Architect / Engineer / Structural Designer, Developer

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

B.1.92 Recreation and Open Spaces

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

B.1.93 Referral Authority

Shall mean an Authority created by the RGoB 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.

B.1.94 Residential Zone

Shall mean an area primarily intended for residential purposes.

B.1.95 Residential Building

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

B.1.96 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.

B.1.97 Right Of Way

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

B.1.98 Road/Street

Shall mean any 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.

B.1.99 Road/Street-Level or Grade

Shall mean the officially established elevation or grade of the centre 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 mid-point.

B.1.100 Road/Street Line

Shall mean the line defining the side limits of a road/street.

B.1.101 Road Width or Width of Road/Street

Shall mean the whole extent of space within the boundaries of a road / the clear average width of the existing ‘right of way’, including the carriageway and footpaths, etc.. However, in cases where a regular line of street is prescribed by the Implementing Authority, such width shall be considered for the purpose of computing building height. When applied to a new road/street, as laid down in the city survey or development plan or prescribed road lines by any act or law and measured at right angles to the course or intended course of direction of such road.

B.1.102 Row Houses

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

B.1.103 Sub-Division

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

B.1.104 Sanitary Inspector

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

B.1.105 Set Back

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

B.1.106 Service Establishment

Is wherein the work done or the machinery installed in such as would render service to the local residents and would satisfy their day-to-day residential needs and which does not create nuisance to the surrounding development in terms of noise, dust, water and air pollution. It will be subject to the following restrictions:

- i. Power used will be electrical.



- ii. Maximum power used to be 10 KW for residential zone and not more than 25 KW in commercial zone.
- iii. Maximum floor space occupied will be 50 sq.m.
- iv. It shall be detached and housed in a shop or a building specially designed for the purpose. Such establishment may be a fuel filling and/or service station, flour mill, bakery, laundry, air compressor unit, electrical motor, optical repair and watch repair shop, repair of musical instrument, carpentry, book-binding, printing press, paper-cutting, water cooling, and juice extracting unit, black-smithy, vulcanising, motor winding, cutting and nut cutting unit etc.

B.1.107 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.

B.1.108 Shopping Centre or Commercial Centre

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

B.1.109 Stair Cover

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

B.1.110 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.

B.1.111 Tenement

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

B.1.112 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.

B.1.113 Travel Distance

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

B.1.114 Transferable Development Right

Shall mean a development right to transfer the potential development on a site, designated for public purposes in a structure plan or local area plan. It is expressed in terms of total permissible built space, calculated on the basis of the 'Base FAR' allowable on that site / plot, and utilizable by the owner or transferred to someone else, from the present location to specified areas as per the structure plan or local area plan. It is allowable in lieu of compensation for the acquisition of the site / plot, free from all encumbrances, by the Implementing Authority.

B.1.115 Urban Control Zone

Shall mean a defined peripheral area immediately outside the municipal boundary as fixed by the Competent Authority and restricted for development activities.

B.1.116 Village Square

Village Square shall include activities such as community shopping centre, market, office building, cinema, small hospital, playground, swimming pool, town hall, open air theatre, civic and cultural facilities, library, higher secondary school, parking plots, public utility and service buildings such as post office, fire station, police station, religious building and building of public uses.

B.1.117 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.

B.1.118 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.

B.1.119 Warehouse Or Godown

Shall mean a 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. It is neither a domestic nor a public building, nor merely a shop if so used, not a store attached to and used for the proper functioning of a shop.

B.1.120 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, dissembled goods or goods to be passed on to retail units or direct sales outlets shall be deemed to be a Wholesale Trade use /activity.



B.1.121 Window

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

- 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.
- xiv. Existing streets on all sides indicating clearly the regular line for streets if any prescribed under the Structure 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, 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.
- xxii. Tree plantation as prescribed under the regulation.

B.2 LIST OF DETAILS TO BE SHOWN ON PROPOSED LAND DEVELOPMENT PLAN/ SUBDIVISION PLAN

- i. The boundaries of the plot and plot level in relation to neighbouring 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.

B.3 LIST OF DETAILS TO BE SHOWN IN DRAWINGS / PLANS FOR OBTAINING BUILDING PERMISSION**Drawing guidelines**

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

Architectural drawings

- i. 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 30 m. or a 15 m. clearance is required from rivers, major streams, minor streams, cliffs, ledges, etc. are required (for safety and environmental protection)
- ii. 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.



- iii. 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.
- iv. Drawings shall have proper title block indicating name of owner, type and number of storey, location, date, revision number and date, scale, and north direction.
- v. 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

Structural drawings

- i. A copy of design calculation notes.
- ii. Design codes used shall be listed on the drawing.
- iii. Loads (assumed or actual) shall be listed on the drawing.
- iv. Material properties shall be listed on the drawing.
- v. Assumed soil bearing capacity or soil investigation report shall be attached.
- vi. 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.
- vii. Concrete and reinforcement details for foundation, beams, slab, staircase, lintel, cornice, projections, zhu and rabsey, wall, etc.
- viii. Truss elevations and connection details showing the holding down details.
- ix. Details of separation gap indicating the location of such gap on the plan wherever required
- x. Details of splice locations and splice length for beams, columns, slab and staircase.
- xi. For Load bearing walls, details of plinth band, lintel band, roof band including vertical bars at corners, opening jambs, wall junctions to be shown.
- xii. Foundation details indicating depth of foundation and plinth level.
- xiii. 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
- xiv. Drawings shall bear proper title block indicating name of owner, type and number of storey, location, drawing title, date, revision number.
- xv. Structural design with reference to the seismic criteria's as per the norms of the high risk Zone-V, world seismic action map.

Electrical Drawings

- i. Single line diagram of total electrical system showing incoming terminal point and distribution network.

- ii. Electrical layout plan showing positions of light points, power points, any other outlets, switches and wiring diagram.
- iii. 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.
- iv. Sub distribution boards showing circuits and respective loads and protection devices.
- v. Power distribution boards for large multi-storey buildings showing floor- wise distribution from main control board and incoming power line.
- vi. For multi-storied / complex buildings, design calculations shall be submitted.

Additions and/or alterations to existing installations

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

- i. Polarity test results
- ii. Insulation test results
- iii. Earth continuity test results
- iv. Earthing test results
- v. Capacity, condition and specification of existing spare circuits
- vi. Rating, specification and condition of existing incoming mains control gear
- vii. 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.

The proposed Legend shall show the following

- Type and wattage of fixtures
- Type of SDBs
- Type of PCBs and connected load
- Type of MCBs
- Switches and Switchboards
- Junction boards

Compound Electrification work

- i. Fixture and fitting specification
- ii. Foundation details for support poles etc.
- iii. Terminal box details.
- iv. Size and type of cable proposed to be used.
- v. Single line diagram showing
 - Connections
 - Phase distribution
 - Circuitry



Telephone connections

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

Drainage and Sanitation Drawing

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

Water Supply

- i. Layout plan of internal plumbing system of each floor with details of pipe sizes and material.
- ii. Water meters shall be provided for each dwelling unit.
- iii. Plumbing design shall be in accordance with plumbing code of practice.
- iv. Materials and sizes of pipe line

B.4 REGISTRATION OF ARCHITECT, ENGINEER, STRUCTURAL DESIGNER, DEVELOPER**Application for Registration**

The Implementing Authority shall register Architect, Engineer, Structural Designer, Developer, Application for registration as Architect, Engineer, Structural Designer, Developer, in a prescribed form. Registration shall be valid for the period of five years or part thereof and shall be renewable or part thereof.

Revocation of Registration

A registration shall be liable to be revoked temporarily or permanently by the Implementing Authority if the registered person is found guilty of negligence or default in discharge of his responsibilities and duties or of any breach of any of these Regulations.

Provided that he shall be given a show cause notice and afforded reasonable opportunity of being heard by the Implementing Authority for the purpose of these Regulations.

Duties and Responsibilities**General Duties and Responsibilities Applicable To All**

- i. They shall study and be conversant with the provisions of the Bhutan Municipal Act, 1999, the rules made there under, the Damphu Development Control Regulations - 2005, and the other instructions circulated by the Implementing Authority and the provisions in force from time to time along with the instructions printed/mentioned on prescribed application forms and permission letter.
- ii. They shall inform the Implementing Authority of their employment/assignment / resignation for any work within 7 days of the date of such employment / assignment / resignation.
- iii. They shall prepare and submit all plans either new or revised when necessary, required documents and other details they are required to do so in a neat, clean and legible manner and on a durable paper properly arranged and folded in accordance with the provisions prevailing time to time.
- iv. They shall submit plans, documents and details without any scratches or corrections. Only small corrections will be permitted with proper initials. They shall correctly represent all the site conditions including grown up trees.
- v. They shall personally comply with all requisitions/ queries received from the Implementing Authority in connection with the work under their charge, promptly expeditiously and fully at one-time. Where they do not agree with requisitions/ queries, they shall state objections in writing; otherwise for non-compliance of any requisition/query within stipulated time, the plans and applications shall be filed forthwith, and shall not be re-opened.
- vi. They shall immediately intimate to the owners the corrections and other changes they make on the plans, documents and details as per requisitions/queries from the Implementing Authority.
- vii. They shall clearly indicate on every plan, document and submission, the details of their designation such as registered Architect, registered Engineer, registered Structural Designer, etc. with registration number, date, full name and their address below the signature for identification.
- viii. They or their authorized agent or employee, shall not accept the employment for preparation and submission of plans-documents and supervision of any work if the same is intended or proposed to be or being executed or already executed in contravention of these Regulations and any orders made there under and any Regulations or rules for the time being in force.



- ix. The registered person shall apply for undertaking the responsibility for the particular work in the forms prescribed by the Implementing Authority.
- x. The registered person shall provide the information and undertaking for the work undertaken by him in the forms prescribed by the Implementing Authority from time to time.

A. ARCHITECT

Qualification and Experience

A person holding a Bachelors Degree in Architecture/Diploma in Architecture (Equivalent to Bachelors of Architecture) with 2 years experience.

Scope Work and Competence

- i. Preparation and planning of all types of layouts and submission drawings and to submit certificate of supervision and completion for all types of buildings.
- ii. Supervision and execution of construction work as per specifications and drawings prepared by authorized registered structural designer and engineer.

Duties and Responsibilities

- i. He/she shall be responsible for making adequate arrangements to ensure not only that the work is executed as per the approved plans but also in confirmation with the stipulations of the National Building Code standards for safe and sound construction and non-hazardous, functioning of the services incorporated in the building and for making adequate provisions for services and equipment for protection from fire hazards as per the stipulations of the National Building Code, India, in the buildings and shall obtain N.O.C. from the Chief Fire Officer or concerned designated Authority/consultant before applying for occupation certificate.
- ii. He or she shall, on behalf of the owner, apply for the progress certificates, completion certificates and the occupation certificate and obtain the same as required under the regulations.
- iii. If the services of the registered architect are terminated, he shall immediately inform the Implementing Authority about his termination and the stage of work at which his services have been terminated. The registered architect appointed as replacement of the preceding architect shall inform about his appointment on the job, and inform the Implementing Authority of any deviation that might have occurred on the site with reference to the approved drawings and the stage at which he is taking over the charge. After Implementing Authority has inspected the site for his report, the newly appointed architect shall allow the work to proceed under his direction.
- iv. The registered architect appointed on the work shall inform the Implementing Authority immediately on discontinuation of the services of the registered/structural designer,

construction contractor, clerk of works, site supervisor, plumber or electrician and shall not allow the work to continue till the vacancy is filled by appointment of another person and the certificate of appointment of such person is submitted in the office of the Implementing Authority.

- v. He or she shall instruct the relevant agency that adequate provisions are made for ensuring the safety of workers and others during excavation, construction and erection.

Registration

- i. The registration fee if any shall be payable as prescribed by the Implementing Authority from time to time.
- ii. The Implementing Authority may black-list an architect in case of serious defaults or repeated defaults and shall inform The Royal Institute of Bhutanese Architects to take suitable action against such person under the provisions of The Royal Civil Service Commission. The registration shall be liable to be revoked temporarily or permanently by the Implementing Authority in such cases of negligence or default.

B. ENGINEER

Qualification and Experience

A degree in Civil Engineering or any equivalent qualification, recognized by The Royal Civil Service Commission. In addition to the qualifications stated above, the applicant should have at least five years experience in professional work if he is a holder of a Diploma in Civil Engineering/or equivalent.

Scope of Work and Competence

- i. Preparation and planning of all types of layouts and submission drawings and to submit certificate of supervision and completion for all types of buildings.
- ii. Supervision and excavation of construction work as per specifications and drawings prepared by authorized registered structural designer.
- iii. He/she can prepare and submit structural details and calculations for buildings of load bearing structures.

Duties and Responsibilities

As per the duties and responsibilities as specified for architect, with reference to engineer in place of Architect.

Registration

- i. The registration fees if any shall be payable as prescribed by the Implementing Authority from time to time.
- ii. If he/she is found negligent in his/her duties and responsibilities. The Implementing Authority may black-list an Engineer in case of serious defaults or repeated defaults and



shall inform The Royal Institute of Bhutanese Engineers, to take suitable action against such person. The registration shall be liable to be revoked temporarily or permanently by the Implementing Authority in such cases of negligence or default.

C. STRUCTURAL DESIGNER

Qualification and Experience

A Degree in Civil Engineering or any equivalent recognized by The Royal Civil Service Commission. In addition to above qualification, the applicant should have at least five years experience in structural design, two years of which must be in a responsible capacity in form of structural designer.

OR

A Master's degree in structural engineering from a recognized institute and at least two years experience in structural design work.

OR

A Doctor's degree in structural design from a recognized institute and at least one year experience in structural design work.

Scope of Work and Competence

To prepare and submit structural details for -

- i. All types of Buildings.
- ii. Special structures.

Duties and Responsibilities

- i. To prepare a report of the structural design
- ii. To prepare detailed structural design and to prescribe the method and technique of its execution strictly on the basis of the National Building Code, India, or relevant international standards.
- iii. To prepare detailed structural drawings and specifications for execution indicating thereon, design live loads, safe soil bearing capacity, specifications of material, assumptions made in design, special precautions to be taken by contractor to suit the design assumptions etc. whatever applicable.
- iv. To supply two copies of structural drawings to the site supervisor.
- v. To inspect the works at all-important stages and certify that the work being executed is up to the satisfaction of the Architect/Engineer.
- vi. To certify the structural safety and overall structural soundness of the building to the Architect/Engineer.
- vii. To advise the Owner/Architect/Engineer for arranging for tests and their reports for soil, building material etc. for his evaluation and design consideration.
- viii. He shall prepare the revised calculations and drawings in case of any revision with reference to the earlier submission of drawing and design in a particular case.

- ix. To submit the certificate of structural safety and over all structural soundness of building to Implementing Authority.

Registration

As specified for architect, with reference to structural designer place of Architect.

D. DEVELOPER

Qualification and Experience

The person/firm acting as Developer shall be of proven merits and experience.

Duties and Responsibilities

- i. Any person acting, in the capacity of the owner shall be the bonafide owner or authorized agent of the owner for developmental work proposed. He shall satisfy the Implementing Authority that he is the actual owner of the property of the authorized agent of the actual owner to undertake total responsibility as the owner, employer and manager of the property and its development and of all the assets and liabilities of the property and the project.
- ii. He shall appoint a registered Architect/Engineer to plan, design, prepare drawings and specifications and to direct the execution of the work in accordance with the requirements of these regulations. .
- iii. The appointment of the registered Architect/ Engineer shall mean that he has authorized the Architect/Engineer to do all things necessary and to take all adequate measures for preparing the design, drawings and specifications for the project and to appoint on his behalf appropriate persons to act as registered, clerk of works site supervisor, required for the proper execution of the project and to retain on behalf of the owner any other specialist or expert required on the work of the project.
- iv. He/Architect/Engineer shall give written information to the Implementing Authority about the commencement of the execution work. He shall see that the registered Architect/ Engineer fulfills all requirements of Implementing Authority.
- v. He shall not cause or allow any deviations from the approved drawings in the course of the execution of the project against the instruction the instruction of Architect /Engineer /Site Supervisor/Clerk of Works/Structural Designer and shall bear all responsibility for any irregularity committed in the use and function of the building or its parts for which the approval has been obtained.
- vi. He shall inform the Implementing Authority immediately if the services of the Architect/ Engineer appointed on the project are terminated or has ceased to function due to any reason and shall not allow any work to proceed till another Architect/Engineer is appointed on the project.



- vii. When no registered construction contractor or site supervisor is required to be appointed and not appointed he shall be responsible for their duties and responsibilities under the Regulations. .
- viii. He shall not commence the use of building or shall not give the possession to occupy the building to any one before as pertaining the occupancy certificate from the Implementing Authority.
- ix. He shall provide adequate safety measures for structural stability and protection against fire hazards likely from installation of services like electrical installation, plumbing, drainage, sanitation, water supply etc. wherever required under the regulations.
- x. He shall exhibit the names of registered persons only, on site and no additional names will be exhibited/displayed.
- xi. He shall explain the construction design and its intended use as per approved plan only, to the prospective purchaser of the premises under construction.

B.5 SUMMARY OF CRITICAL DIMENSIONS

Maximum Carpet Area (sq.m.) of shops in Convenience Shopping Centers

General	-20 Sq.mts
Food grain or ration shops	-50 Sq.mts
Groceries, confectioneries, general provision shops	-50 Sq.mts
Medical and dental practitioners' dispensaries or Clinics, pathological or diagnostic clinics and pharmacies	-50 Sq.mts
Wood, coal and fuel shops	-30 Sq.mts
Cloth and garment shops	-50 Sq.mts
Restaurants and eating houses	-50 Sq.mts
Shoes and sports shops	-75 Sq.mts
Taxi stand office	-10 Sq.mts

Dwelling Unit

At least one room of minimum carpet area of 20 sq.m., with a minimum side dimension of 2.5m and a WC.

Habitable Room

Minimum height - 2.7 m measured from finished floor to finished ceiling.
 Minimum width - 2.5 m.

Light Home Workshop

Maximum floor space - 20 sq.m.

Light Industry

Maximum floor space - 500 sq.m.

Loft / Attic

Maximum height - 1.2 m.
 Maximum area - 30% of the floor area of the room.

Mezzanine Floor

Maximum height - 2.5 m.

Service Establishment

Maximum floor space - 50 sq.m.

Water Closet (WC)

Minimum floor area of one square metre.

Temporary kiosks

Maximum dimensions for "temporary" public telephone booths, milk booths, and newspaper stalls - 2 m. X 2.5 m.

No Development Zones

All areas within 20 m along the identified natural storm water drain course

Crèche

Any construction site with minimum plot area - 2000 sq.m

Safety on Site

Any site wherein construction goes above 10 meters in height is deemed to be a "Hard Hat" site and every person on that site shall wear a hard hat at all time.



NOTES



