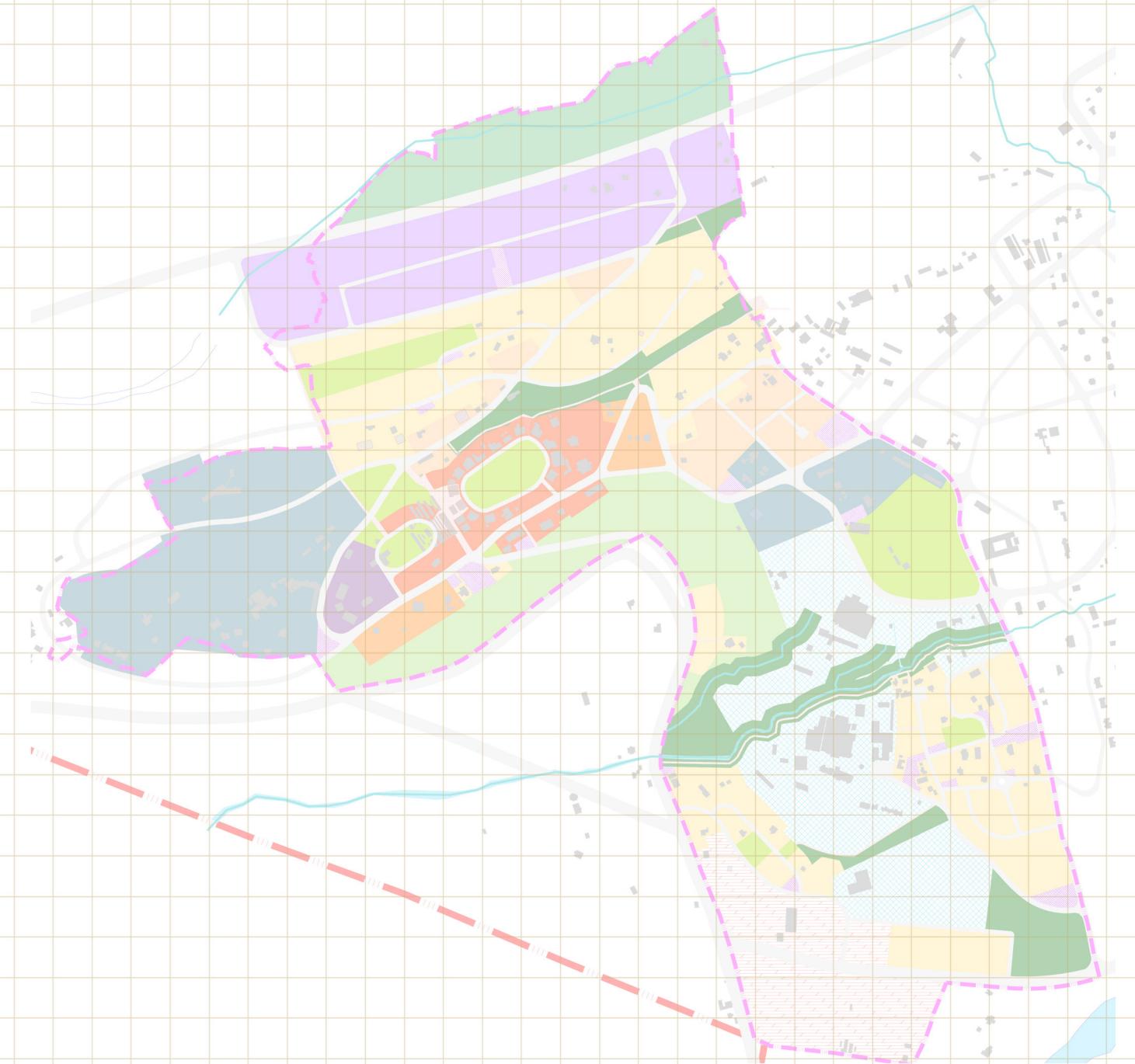


S A M T S E
STRUCTURE PLAN



LOCAL AREA PLAN Urban Core

Benninger Architectonics USA Incorporated

The Structure Plan for Samtse

Local Area Plan - Samtse Urban Core

Submitted on: 5th May, 2005

B E N N I N G E R A R C H I T E C T O N I C S U S A I N C O R P O R A T E D
A r c h i t e c t s a n d U r b a n P l a n n e r s

Regional Office : "Shraddha," Samata Society, Ashok Nagar, University Road, Pune-411007, India, Tel: 0091-20-2553 0252, Fax: 0091-20-2553 5661, E-mail: ccba@vsnl.net
Bhutan Office : Near Kuengacholling Guest House, Upper Motithang; P.O. Box 869, Thimphu, Bhutan, Tel: 00975-2-325 974, Fax: 00975-2-331 364, E-mail: bausa@druknet.bt

LOCAL AREA PLANNING

This Local Area Plan for the Samtse Urban Core is based on an analytical assessment of the existing situation, looking into aspects such as the present land use pattern, existing buildings, land holdings and infrastructure layouts. Analyses of topography, surface hydrology and other environmental factors have also shaped the plan. The primary aim of this Local Area Plan is to ensure balanced and planned development within the town, achieving the vision of the tomorrow's Samtse.

The proposals and design solutions presented in this localized, contextual plan have been developed from the larger context by translating the Structure Plan of Samtse town to the local level. This has been done while addressing issues at the Urban Village level. The new layout for this local area plan considers efficient vehicular and pedestrian access to public amenities, located within a comfortable walking distance from all the parts of the Urban Village. Rationalization of the existing plots has been proposed, which draws on the principles of land pooling. Land Pooling is a democratic and equitable process, through which an equal proportion of land is taken from each plot, in return for the provision of modern infrastructure services, amenities, regular plot layouts, walkways and roads. The proportion of land to be deducted is so determined that it is sufficient to provide all the required roads, community facilities and services. It generates land resources for the establishment of the services. As a principle, the plan avoids the destruction of any permanent private structures.

A major consideration of this local area plan is to house its proportion of the total town population, which will have to be accommodated in the town as a whole over the coming decades. Should the town population reach 14,000 over the Structure Plan horizon time, the local area will have to house nearly 1,125 dwelling units to accommodate its proportionate share of inhabitants! The planned population of this Local Area Plan is 5,632.

Implementation of any local area plan is a consultative and collaborative process. It involves educating the stakeholders about the benefits of local level planning and the need for land pooling and other collaborative efforts. The attempt in this plan is to avoid land acquisition, so that the developmental activities envisioned, are equally shared by all the land owners of the local area. There must be a dialogue with the landowners regarding the "before" and "after" status of their land parcels, explaining the net benefits of the planning process. The local authority will have to carry out a series of community consultations and one-to-one meetings, to make the implementation of this local area plan a truly democratic process, supported by the citizens for whom it is developed. People must realize that their property values will increase dramatically due to local area planning, off-setting their proportionate loss of land.

ACKNOWLEDGEMENT

His Excellency, Lyonpo Kinzang Dorji, Ministry of Works and Human Settlement, has been a guiding force, emphasizing the urgent requirement for an operational plan for Samtse. We thank him for his valuable guidance. He has taken a personal interest in reviewing all aspects of this plan and guiding the professional team. He is a continuous source of inspiration, guidance and constructive criticism.

We must place on record our indebtedness to Honorable Tshering Dorji, Secretary, Ministry of Works and Human Settlement, who was instrumental in the preparation of the Structure Plans for Gelephu, Damphu and Samtse. He has guided us in the preparation of this plan, taking an interest in all aspects of development.

We also thank Mr. Rinchen Dorji, Director, Department of Urban Development and Engineering Services, Ministry of Works and Human Settlement, for his support, guidance and insight at critical junctures during the planning process. Without his support this plan would not have emerged.

We thank the Chief Town Planner of Bhutan, Mr. Meghraj Adhikari, Department of Urban Development and Engineering Services, Ministry of Works and Human Settlement, who has taken time off of his busy schedule to guide us whenever needed. He has participated in field survey visits and meetings with local stake holders.

We would also like to specially thank Mr. Tashi Gyeltshen, Dasho Dzongda, Samtse Dzongkhag, for extending to us his considered ideas, valuable support and encouragement. He has proven to be a man of vision, constructive guidance and positive thinking.

Our team is indebted to Ms. Tashi Wangmo, Urban Designer, Mr. Thukten Choeda, Assistant Planner and Mr. Tashi Penjore, Architect, Department of Urban Development and Engineering Services, Ministry of Works and Human Settlement, for his valuable support and enthusiastic participation. We express our gratitude to Mr. Sangay Dorji, District Engineer, Mr. Sangay Tenzin, Municipal Engineer, all the staff of the Dzongkhag Engineering Cell and other departments, for their support during the data collection and planning process.

A team of Urban Designers and Planners, including Mr. Kamesh S., Chief Planner BAUSA, Mr. Harshad Rajadhyaksha, Urban Designer BAUSA, and Mr. Ashish Lahoti, Urban Designer BAUSA, has prepared this report. Mr. Akkisetty Ramprasad Naidu, Mr. Rahul Sathe, Mr. Balasaheb Alange, Mr. Jagadeesh Taluri, Mr. Navin Pradhan, Mr. Ranjit Wagh, Mr. Deepak Kaw, Mr. Sonam Geley and Mr. Ashok Labade have been a source of constant encouragement.

**Christopher Charles Benninger
BENNINGER ARCHITECTONICS USA INCORPORATED
Thimphu, BHUTAN, May, 2005**



TABLE OF CONTENTS

Acknowledgements	
Table of Contents	
Chapter 1 INTRODUCTION TO LOCAL AREA PLAN	(1 – 3)
1.1 Philosophy of Urban Development Envisioned in the Town	
1.2 What is a Local Area Plan?	
1.3 Aims and Objectives of a Local Area Plan	
1.4 Process involved in the Preparation of a Local Area Plan	
1.5 Public Participation in the Preparation of a Local Area Plan	
Chapter 2 EXISTING SCENARIO	(4 – 9)
2.1 Introduction	
2.2 Existing Land Use Pattern	
2.3 Existing Land Ownership Pattern	
2.4 Existing Amenities and Facilities	
2.4.1 Road and Circulation Network	
2.4.2 Open Space System	
2.4.3 Health, Education, Shopping and other Community Facilities	
2.4.4 Heritage and Religious Structures	
2.5 Existing Housing and Density Pattern	
2.6 Existing Utilities and Services	
2.6.1 Water Supply	
2.6.2 Sewerage System	
2.6.3 Storm Water Drainage	
2.6.4 Solid Waste Disposal	
2.7 Special Features	
Chapter 3 ANALYTICAL STUDIES AND PROPOSALS FOR ACTION	(10 – 19)
3.1 Land Suitability for Development in the Local Area	
3.2 Population Accommodation and Density Distribution within the Local Area	
3.3 Planning Standards	
3.4 Concept of the Plan	
3.5 Proposed Plot Re-Configuration	
3.6 Proposed Precinct Plan	
3.7 Proposed Density Distribution	
3.8 Proposed Amenities and Facilities	
3.8.1 Urban Hub	
3.8.2 Circulation System and Road Network	
3.8.3 Open Space System	
3.8.4 Proposed Heritage Precinct	
3.9 Proposed Utilities and Services Network	
3.9.1 Water Supply System	
3.9.2 Sewerage System	
3.9.3 Solid Waste Management System	
3.9.4 Street Lighting System	
3.9.5 Storm Water Drainage System	
3.9.6 Fire Fighting Facilities	
LIST OF DRAWINGS	
Dwg No. 2.1	Location of the Local Area Plan
Dwg No. 2.2	Base Plan
Dwg No. 2.3	Existing Cadastral Plan
Dwg No. 2.4	Existing Land Use Plan
Dwg No. 2.5	Existing Land Ownership Plan
Dwg No. 2.6	Existing Amenities Plan
Dwg No. 2.7	Existing Infrastructure Plan
Dwg No. 3.1	Proposed Plot-Reconfiguration Plan
Dwg No. 3.2	Proposed Precinct Plan
Dwg No. 3.3	Proposed Circulation Network
Dwg No. 3.4	Proposed Road Sections
Dwg No. 3.5	Proposed Open Space Network
Dwg No. 3.6	Proposed Amenities and Services Plan
LIST OF TABLES AND ANNEXURE	
Table No. 2.1	Existing Land Use Distribution
Table No. 2.2	Existing Land Ownership Pattern
Table No. 2.3	Existing Built-up area and Building Height
Table No. 2.4	List of Existing Amenities and Facilities available in the Local Area
Table No. 2.5	Existing Land Holding Pattern in the Local Area
Table No. 3.1	Details of Lands falling as a part of the Environment Conservation Zone
Table No. 3.2	List of Amenities and Facilities as per Planning Standards for 5,632 Residential Population and 14,000 town population
Table No. 3.3	Break-Up of Land Area in the Local Area Plan
Table No. 3.4	Areas under Different Precinct schedule and their related Population Accommodation
Table No. 3.5	List of Amenities and Facilities Proposed in the Urban Hub
Table No. 3.6	Details of the Proposed Street lighting System in the local area
Annexure - 1 PLOT-RECONFIGURATION TABLES	
Annexure - 2 PRECINCT SCHEDULE	



1.0 INTRODUCTION TO LOCAL AREA PLAN

1.1 PHILOSOPHY OF URBAN DEVELOPMENT ENVISIONED IN THE TOWN

The manner of accommodating future population, its density distribution and the strategies for future urban growth within the town, all become crucial, given the potential for extensive growth in Samtse as both Service Center and Dzongkhag Head-quarter. One of the major challenges is to control future *urban sprawl* in the urban region. Towards achieving a sustainable density distribution strategy for the town, which would accommodate the future population without disturbing the eco-fragileness and bio-diversity of the region, the Structure Plan strongly advocates a pattern of urban settlement, where development is concentrated at pockets called "Urban Villages." Extensive densification and development activities are envisioned in the identified Urban Villages to accommodate the future population and associated urban facilities. The existing town core must be restructured.

An Urban Village, as envisioned in the Structure Plan for Samtse will consist of three major components. They are the Village Square, (or the Neighborhood Node); the Village Core; and the Village Periphery. These three components vary from each other in terms of their density of population per hectare and their land-use distributions.

The Urban Village Core is essentially the high density residential sector of the Urban Village, characterized by walk-up apartments. These high-density residential sectors will be provided with basic amenities and services for self-sustenance in the form of a Village Square, located conceptually at the centre of the Urban Village. The Village Square, apart from accommodating basic amenities, will also be a high-density residential zone at specific locations. Thus, the Village Square and central area will form the main population concentration of an Urban Village. The Urban Village peripheries are essentially medium to low-density developments encircling the village core and are dominated by buildings like row-housing and individual bungalows. The Urban Hub is essentially a large Village Square, provided with additional facilities, which will cater to the needs of the entire town, and its larger service catchment area. Retail, hospitality and entertainment would characterize one hub, while another may be focused on wholesale markets.

The Village Square and the Village Core will accommodate a gross population density in a range of 200 to 250 persons per hectare, while the gross population density of the Village Periphery will be at a range of 100-150 people per hectare.

The Village Squares (and the Urban Hubs) apart from accommodating amenities and services, will also function as a magnet to initiate and sustain the process of urbanization and settlement development in respective Urban Villages. The strategy put forth in this discussion

is to establish Village Squares and an Urban Hub as precursors to initiate the development of surrounding urban settlements. While this may be debated, it is our proposition that major planned development follows, and depends on, the availability of amenities and services. This can be understood looking at the history of urban development in the global context. Establishing an Urban Hub, followed by Village Squares of the respective Urban Villages, together with the provision of infrastructure for urban development, would be the priority for any urban development, and would be the **urban growth strategy** at a conceptual level, advocated in the Structure Plan for Samtse.

Thus, Urban Villages become the basic unit of planning in the Structure Plan. Planning and development of every Urban Village in a rationalized and effective manner is the key for the success of the Structure Plan of Samtse. This assumes freezing of development in open lands, while development in new Urban Villages is facilitated and enhanced.

1.2 WHAT IS A LOCAL AREA PLAN?

A Local Area Plan is a planning tool, which focuses on a particular area at any given time, aiming toward translating broader objectives, organization and proposals of the Structure Plan to a localized and implementable level. The Local Area Plans prepared as a part of the Structure Plan for Samtse are seen as a tool to achieve a balance between the town level developmental needs, respecting the local needs. It is also seen as an effective means of translating of the Structure Plan proposals into a local level plan.

Each Local Area Plan proposed in the Structure Plan for Samtse focuses on an Urban Village identified in the structure plan. These are areas bound by major roads, using existing cadastral boundaries, natural landscape features like streams; major geographic "edges;" and forest lines. Within these defined areas, various development activities are proposed considering the future town- and local-level needs. These typically include a high-density zone of walk-up apartments to house the future population of the town, with a Village Square catering to the basic needs of the Urban Village as described earlier. This Village Square is usually located at the centre of the Urban Village and along, or in close proximity with, the arterial roads, so that the local area citizens can access these facilities easily from all the parts of the Urban Village and could easily be connected to the town core, Urban Hub and other nodes. The idea is to provide compact, walkable communities, surrounded by medium-density residential plots, which in turn are surrounded by low-density garden bungalows, usually with houses nestled into orchards, or privately developed green areas.



The roads are laid out in a hierarchy so that all plots are well served. Movement right-of-ways are also used for sidewalks, the water supply network, sewerage drains, storm water drainage, street lighting and solid waste collection. A system of green spaces is also proposed which will provide recreation options to the citizens of Urban Villages. Some higher level amenities and facilities like schools, community halls, or a library, are proposed in every Urban Village considering its respective population accommodation. As discussed earlier every Village Square will contain basic amenities like convenience shops, taxi stand, news and telephone kiosk, police station, a pavilion containing post boxes, a clinic, a crèche for working mothers, a toddler's park, small vegetable market, pub and ample parking areas. One of the arteries will have provision for future express bus link, linking the urban hub and other village squares.

1.3 AIMS AND OBJECTIVES OF A LOCAL AREA PLAN

The Local Area Plans for Samtse are prepared with the overall aim to facilitate the implementation of Structure Plan proposals at the local level.

The plan attempts to achieve the following broad objectives:

- To facilitate a pattern of development, which can accommodate the area's share of projected population;
- To facilitate the provision of necessary infrastructure required for efficient Urban Development in a planned and sustainable manner;
- To provide for the required amenities within comfortable walking distance from all the parts of the proposed Urban Villages;
- To rationalize the land subdivision within the local area in a manner, which allows for the efficient introduction of urban infrastructure and services;
- To build up a local area layout, which addresses and respects the existing natural features of the area;
- To provide a development option for the area, which exists in balance with nature, while respecting the unique traditional values of the place, guiding future urban growth in a manner sensitive to the ecology of the town and its surroundings;
- To plan future development of the town in a balanced and sustainable manner, effectively integrating urban components of the town into the whole of the town;
- To introduce building typologies appropriate for the envisioned future development of the town; and,
- To assure that all the plots of the local area are facilitated through a road network which provides access.

1.4 PROCESS INVOLVED IN THE PREPARATION OF A LOCAL AREA PLAN

The preparation of a local area plan involves analytical rationalization of the land parcels located in the local area. The method of land pooling has been adopted as a tool for the preparation of local area plans to make the planning process participatory and democratic.

Land Pooling

Land pooling is a method by which all the local citizens in an urban area, irrespective of their existing conditions, come together to share among themselves and to solve problems like insufficient services, no clearly laid out roads, plots with no access and properties with no potential for further development. In most existing situations no civic amenities like parks, solid waste collection bins, or basic health services are possible. Without a rational street network, fire engines and ambulances can never reach the sites. Without a street network no water supply system, storm water drainage, communication cables, or street lighting is possible.

In land pooling, at the start of the process, a hypothetical condition, in which all of the land is brought into one "Pool," is considered. A rational road layout, with all of the amenities and services required for the area, will be planned. These roads, amenities and services may, but not necessarily, take up to thirty percent of the land. To "create" this common land within the local area, the percentage of land needed for these common facilities is deducted from each plot. Now the original plots which were of odd shapes, are reconstituted into regular polygons and distributed rationally. These new plots, which are proportionately smaller than the original properties, are however marketable urban plots! Their value immediately increases! Over time, as the area is upgraded with services and roads, the value increases even more. On steep slopes where alignment of roads is impossible, because of physical slope constraints, the land is regularized in a manner that footpaths serve each plot, with common parking at entrance areas. These public walkways are wide enough to carry urban infrastructure also. In this model, about twenty percent of the land area is used for common facilities.

The Planning Process

In the planning process, each plot is measured through a total station survey, identifying all structures on it. It is correlated with the town's land records so that the owners know exactly where and how much land they own before the local area planning process. After the local area planning process every plot is located in an Urban Precinct (or functional area under the Structure Plan zoning) with respect to its size, which determines the allowable uses, plot coverage, set backs, building heights, etc. Structures cannot be constructed in sensitive environmental zones (like natural storm water drains, forest covers, on steep contours, etc.).

Thus, at the beginning of the planning process, each participant knows what their "starting condition is." Next a professional planning team studies the area within the concerned urban villages, locating natural features, adjusting Urban Precinct zones from the Structure Plan to



suit local conditions, noting water, electrical and other services and existing roads. The number and sizes of the existing plots are also studied.

Integration of the Local Area Plan with the Structure Plan

There is a link between the Structure Plan and the Local Area Plan of an Urban Village. The Structure Plan includes the non-negotiable elements and components of land utilization, which rule over all the local area plans. These non-negotiable elements and components include; the sanctity of forest cover, the natural landscape of the area, natural storm water drainage courses, flood protection measures and setbacks for zones with possible flood risks and other sensitive environmental protection measures. These must be conserved in the local area plans.

Next are the right-of-ways for primary and arterial roads, primary uses along these transportation corridors, and other major roads, which are “givens” in the local area plans. Each Urban Village requires a central service square and high-density housing around it to accommodate future population and their required facilities. This also adds population to share the costs of urban infrastructure amongst more users, bringing down the cost per household. All of this must be discussed openly with the population. They must be aware of all the parameters and concerns which are formative in plan making. Wherever they are affected, they must know why. There are costs, but there are also benefits. Both must be explained in detail. Dramatically higher land values of planned areas more than off-set the losses landowners experience in the thirty percent common land they loose.

Population and Economic Viability

Local Area Plans are for the future, and not only for today. There must be adequate density in each Urban Village so that the households can share the costs of services and facilities, making these facilities economical in any given condition. Without a Village Square and high-density housing, the Urban Village will not have enough population to share the costs, and per household costs will go beyond the users' ability to pay. This usually occurs in low-density, higher income group areas, where bungalows and cottages are spread over a large area, which becomes physically difficult and expensive to service. In such cases the rest of the town dwellers wind up subsidizing the costs of the low-density dwellers. To balance this inequity, fewer services are provided to low-density residents. They have to contribute more for roads, water supply, sewerage management, electric lines, telephone lines, etc.

Finally, the Structure Plan is for the coming generations. Each Urban Village will have to house its “fair share” of people as calculated from the population projection and should be correlated with the future population of the town in coming decades. From this viewpoint, also Village Squares and high-density houses will be needed in each local area.

1.5 PUBLIC PARTICIPATION IN THE PREPARATION OF A LOCAL AREA PLAN

Explaining the local area plan in a positive and constructive manner plays a crucial role in the success of the plan. Each landowner should be given a detailed explanation of the costs and benefits of the process. They must be made aware of the entire process involved in the preparation of the plan and should be made a part of the plan preparation exercise. Their consensus regarding the development possibilities should be respected and addressed if found rational. A public meeting should be conducted at the end of every plan preparation stage, showing the proposed green areas, Village Square, low-density and high-density residential areas, road network and other urban facilities. Through a series of such meetings, where suggestions and complaints are integrated, the plan evolves.

To further the interaction, a small committee of four or five representatives from the respective Urban Village is selected and these representatives maintain contact with the professional planners and discuss important issues.



2.0 EXISTING SCENARIO

2.1 INTRODUCTION

The Samtse Urban Core Local Area Plan covers an area of 103.29 hectares, with the oval market forming the center of the local area. The northern boundary of the local area is defined by Damdhum Chhu while the Samtse General Hospital forms the eastern edge. The Samtse Rabdey Dratshang occupies a significant location within the local area. On the southern side the local area boundary extends upto the proposed Dry port and Sukruti Chhu. The important institutions located within the local area include Samtse General Hospital, Food Corporation of Bhutan, Bank of Bhutan, Revenue and Customs Office, Veterinary Hospital, Bhutan Telecom, Road Safety and Transport Authority and Forest Department. Industries like Bhutan Fruit Products Limited, Samtse Distillery, Saw-mill and Card Box Factory form a part of this local area.

This local area, apart from serving the town residents, also serves the entire Dzongkhag and its catchment area. Samtse's significant location along the Bhutan-India border and the road connection from the Indian sub-continent, exerts enormous pressure on the existing urban core for trade and business. The existing institutional setup, which is concentrated in this local area, enjoys a large floating population within the local area.

The established significance of the local area is on account of various developmental activities that have already taken place. The location of various institutions, the varying edge conditions, the activity pattern in different locations, religious institutions and commercial establishments are the prime guiding factors of the local area.

Other guiding factors are in the form of steep slope areas, which are along the peninsular head. These would be strengthened in the form of protected green belts thus conserving the natural surface drainage pattern and providing pedestrian access through the local area as prescribed in the Samtse Structure Plan. The existing road layout and the overlaid services would be instrumental for planning the future infrastructure layout within the local area.

As described earlier the Samtse Urban Core Local Area Plan is perceived as a tool to translate the broader goals that are outlined in the Structure Plan of Samtse into a practical urban setting. On the one hand, it facilitates the implementation of specific objectives proposed in the Samtse Structure Plan. These objectives include the accommodation of increased population over the coming decades, the distribution of population density in a sustainable way, the realization of an efficient movement system, and the appropriate patterning of infrastructure services. On the other hand, the plan illustrates the implementation of precinct sanctions within local areas and at the individual plot level. The plan addresses local issues such as the provision of community amenities within a comfortable walking

distance and the restructuring of plots into a rational urban system provided with all the necessary urban facilities for its development.



Damdhum Chhu Bed forming the Northern edge of the Local Area. Tarred road on the left is towards Sibsu from Samtse Town

2.2 EXISTING LAND USE PATTERN

Presently the local area is dominated by commercial establishments and institutional lands with a moderately developed urban core. Most of the existing structures within the oval core are permanent in nature serving as either commercial spaces or residences. The lands located in Devithan towards Damdhum Chhu are however under agricultural usage. The Rabdey Dratshang and Doduel Chorten, located within the local area occupy a significant location. Apart from commercial buildings surrounding the oval open space, the Samphel Cinema Hall provides recreational facility at town level.

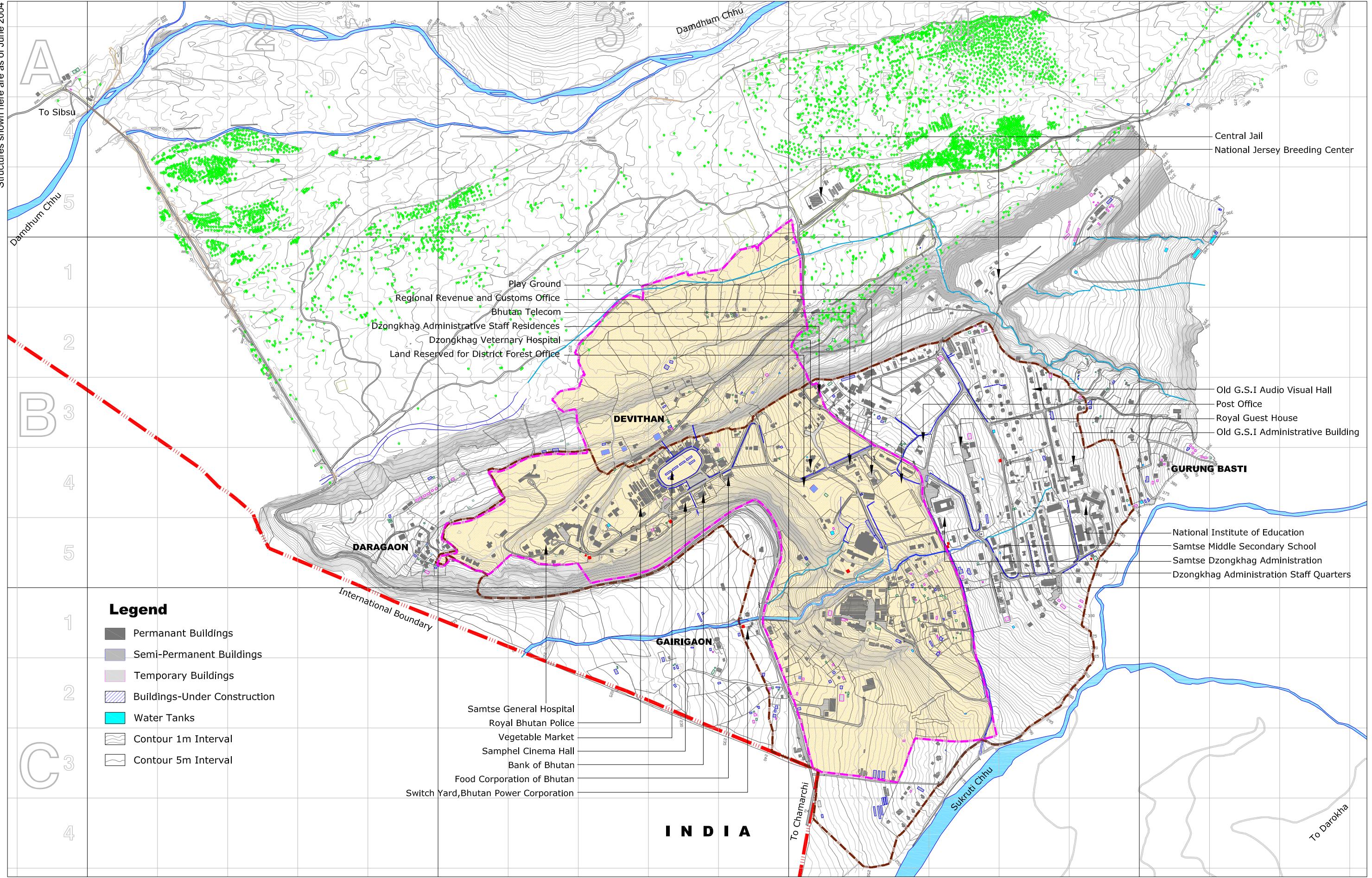
Commercial Landuse

Samtse Urban Core local area is the central hub of all the commercial establishments in the town. Shops serving all the day-to-day requirements are concentrated in the oval market. Apart from the permanent shops, the weekly market takes place in temporary sheds located in the center of the oval core. Traders from the hinterland depend heavily on the Samtse town core for their trading and business activities.



Vegetable Market and Parking Area in the main commercial core of Samtse

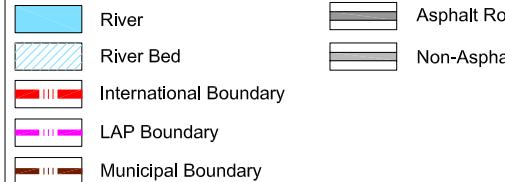




SOURCES

* Total Station Survey Drawings provided by Department of Urban Development and Engineering Services, MoWHS, RGOb

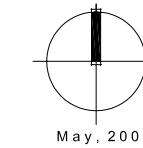
* Ground Verification, June 2004 by Benninger Architectonics USA Inc, DUD&ES and Samtse Municipal Corporation



LOCATION OF LOCAL AREA PLAN
Samtse Structure Plan - Urban Core Local Area Plan

Benninger Architectonics USA Inc.
with the Department of Urban Development and Engineering Services, MoWHS, RGob

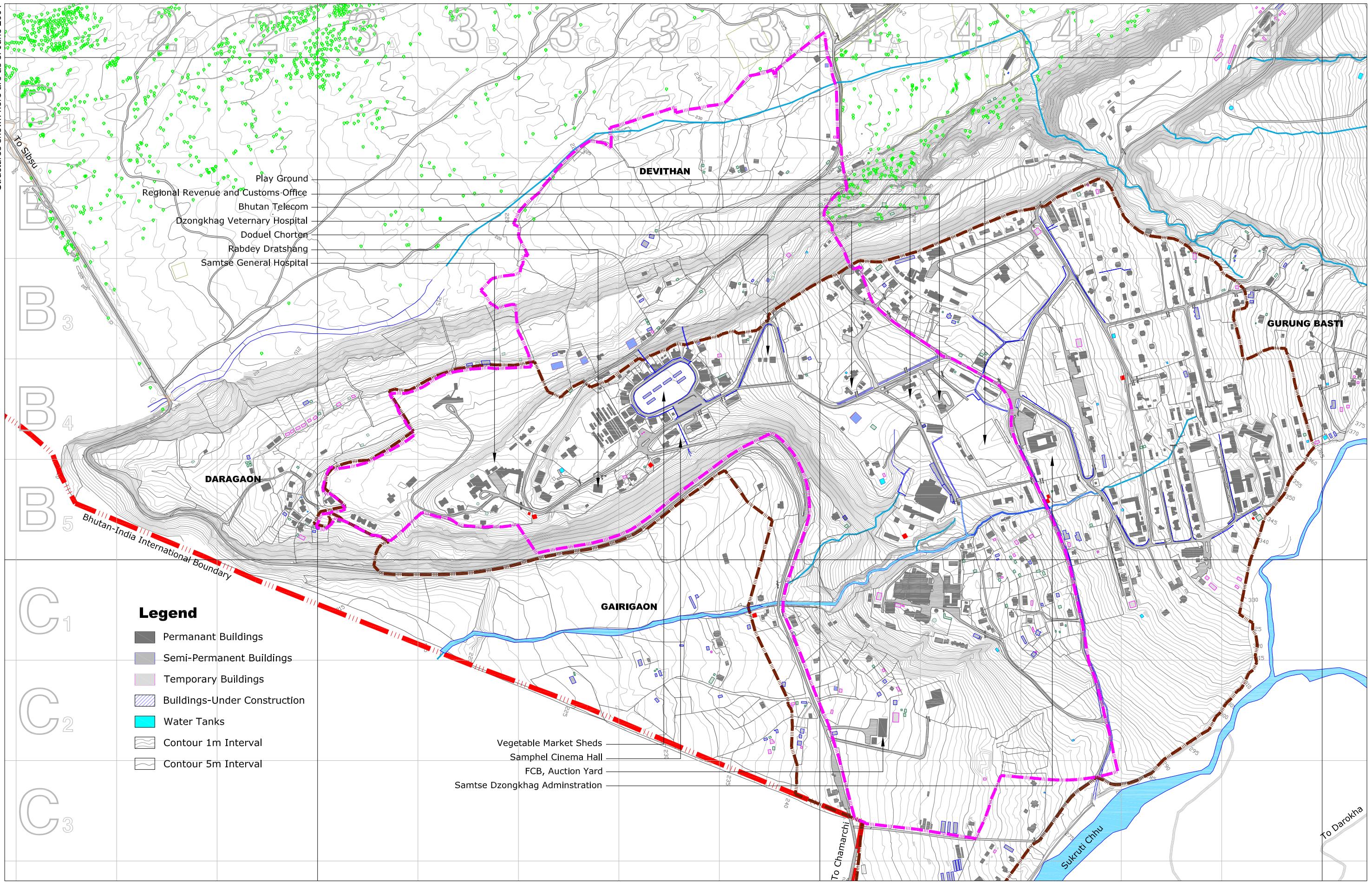
Scale: 1:10000



May, 2005

Drawing 2.1

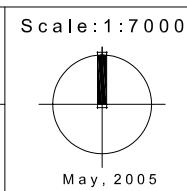
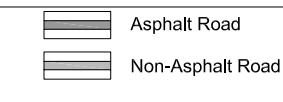
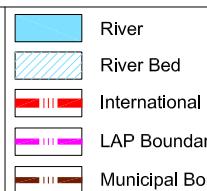
Page No. 4 A



Sources

* Total Station Survey Drawings provided by Department of Urban Development and Engineering Services, MoWHS, RGob

* Ground Verification, June 2004 by Benninger Architectonics USA Inc, DUD&ES and Samtse Municipal Corporation

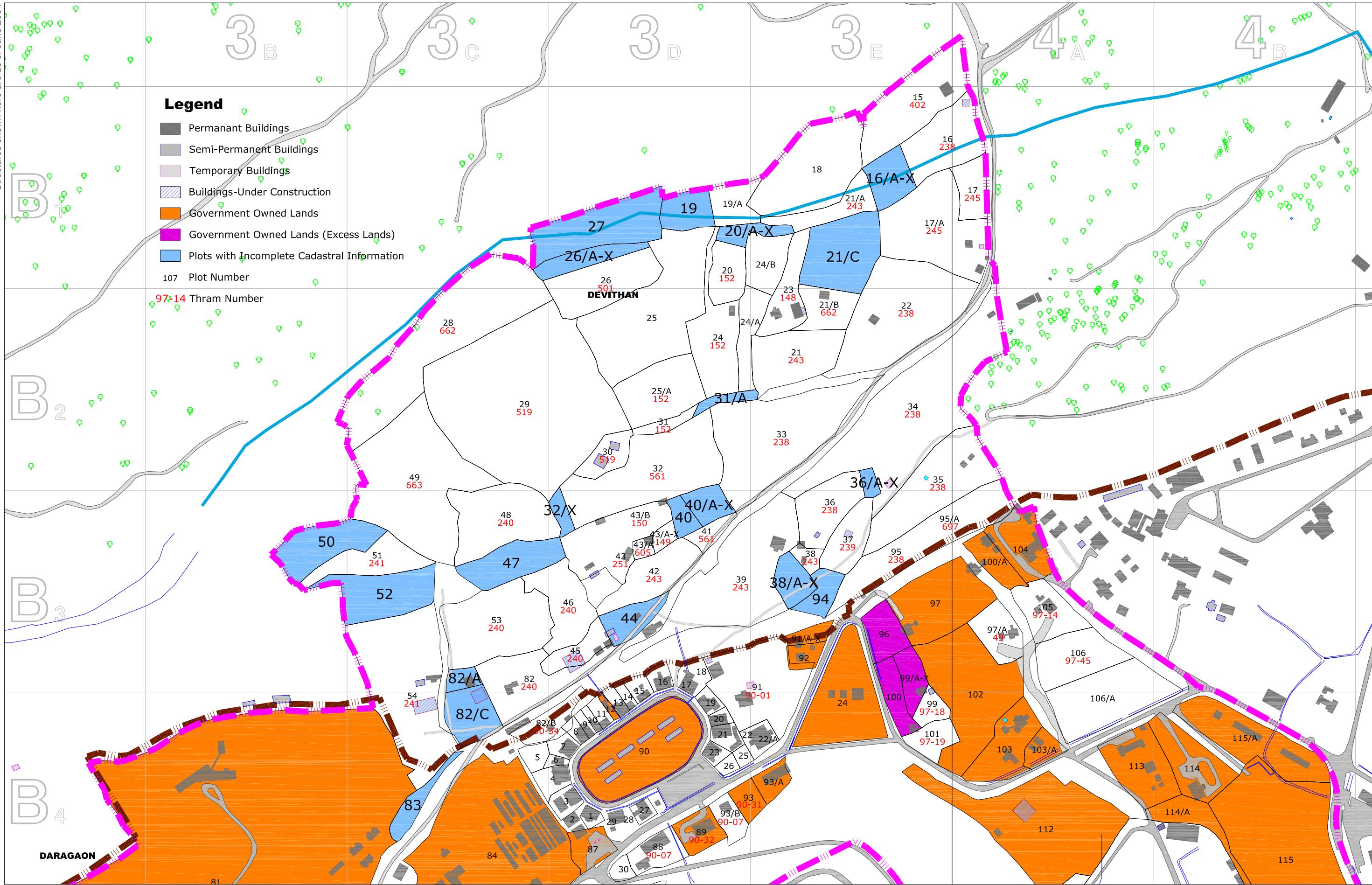


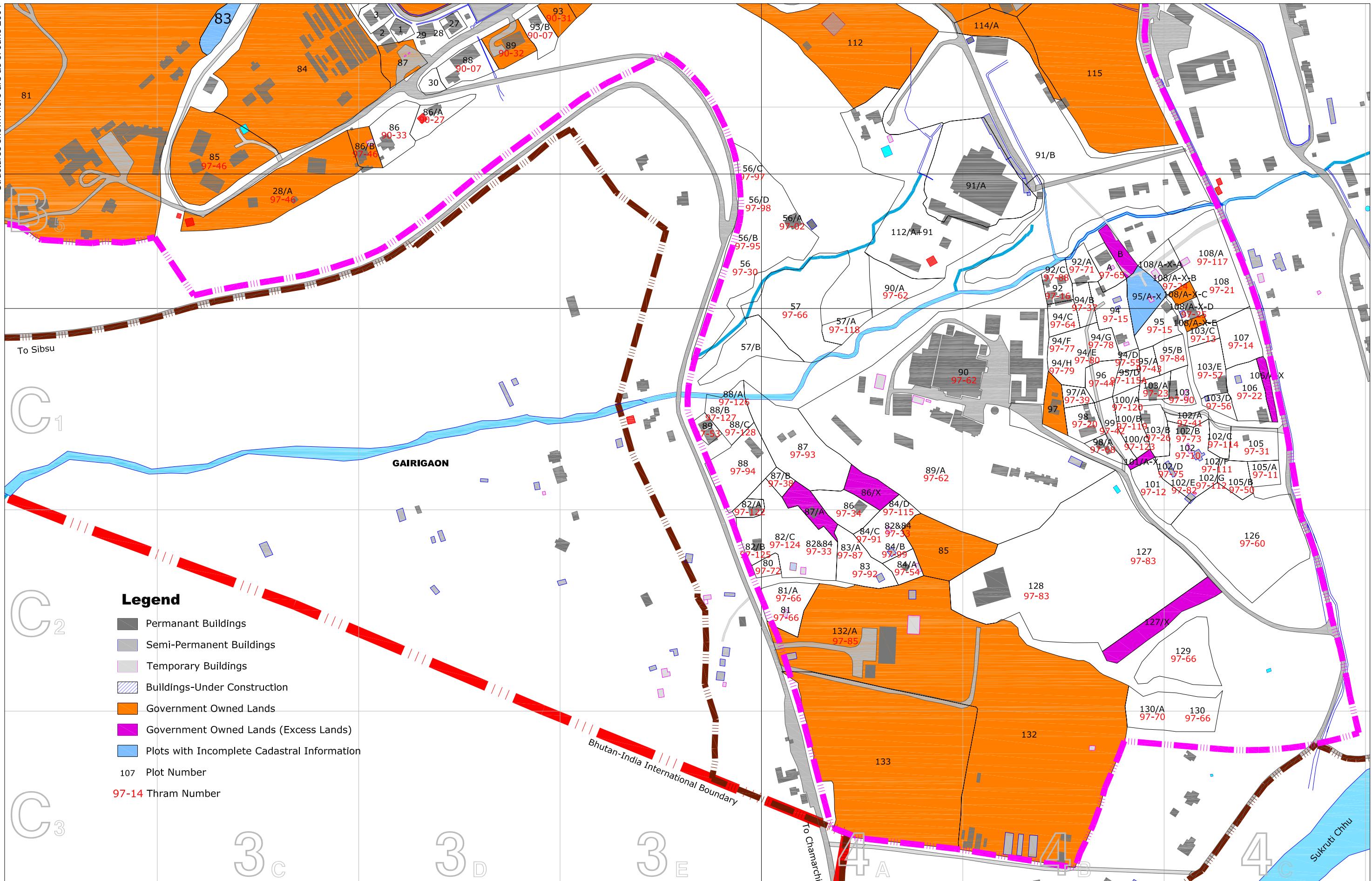
Drawing 2.2

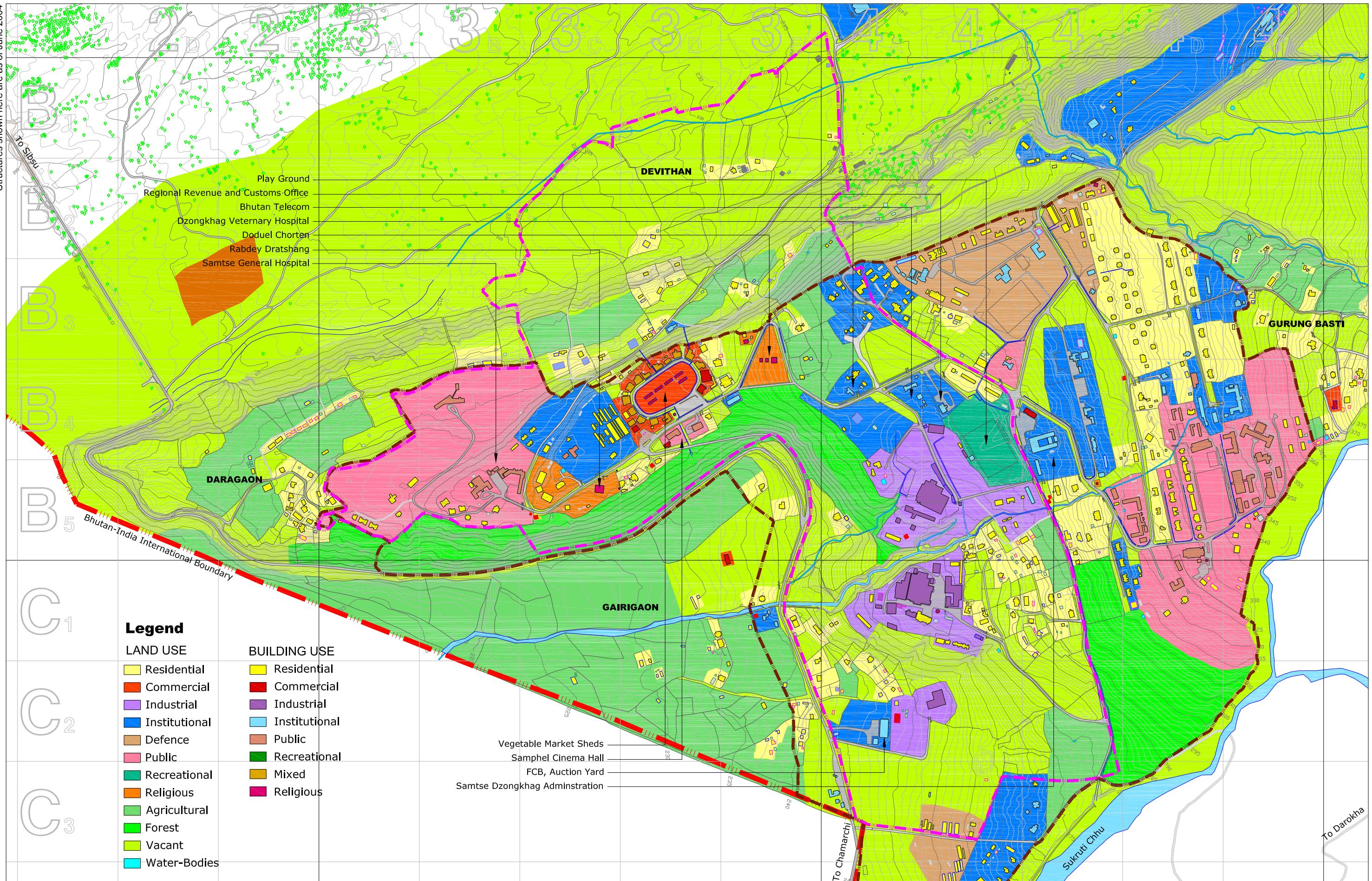
Page No. 4 B

Benninger Architectonics USA Inc.
with the Department of Urban Development and Engineering Services, MoWHS, RGob





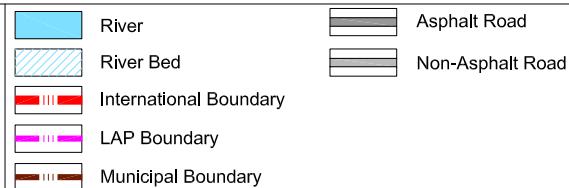




Sources

* Total Station Survey Drawings provided by Department of Urban Development and Engineering Services, MoWHS, RGob

* Ground Verification, June 2004 by Benninger Architectonics USA Inc, DUD&ES and Samtse Municipal Corporation



EXISTING LANDUSE PLAN
Samtse Structure Plan - Urban Core Local Area Plan

Benninger Architectonics USA Inc.
with the Department of Urban Development and Engineering Services, MoWHS, RGob
Municipal Corporation

Scale: 1:7000
May, 2005
KEY PLAN

Drawing 2.4
Page No. 4 F

Institutional and Public Landuse

The Urban Core local area is concentrated with institutional lands which constitute 17.62 % of the total local area. These public institutions include the Samtse General Hospital, Bhutan Telecom, Royal Bhutan Police establishment, Bank of Bhutan, Animal Husbandry Office, Department of Forest Office, Road Safety and Transport Authority, Food Corporation of Bhutan, Regional Revenue and Customs Office, and Bhutan Chamber of Commerce.

Residential Landuse

The residential landuse is 7.54 % of the total local area. The town core area is merely concentrated with buildings under residential use. Major residential chunk is located in the peripheral area which is to the east forming part of GSI Colony and Gurung Basti.

Religious Landuse

Samtse Rabdey Dratshang and Doduel Chorten are the religious centers of the local area. The prayer wheel pavilion located near parking area inside the oval core is widely used as a gathering place by the local residents. Near Doduel chorten there also exist a Shiva temple which is frequently visited by devotees.

Agriculture Landuse

The peripheral lands, mostly in Devithan area and some near Gairigaon are under agricultural use. They form 8.17 % of the total local area. These agricultural lands are currently under great pressure for transformation into urban landuses.



Land under Agricultural usage in Devithan area

Table 2.1: Existing Land Use Distribution

Land Use	Area (in Hectares)	Percentage to Total Area
Residential	7.79	7.54
Agriculture	8.44	8.17

Land Use	Area (in Hectares)	Percentage to Total Area
Commercial	1.91	1.84
Vacant	44.59	43.16
Institutional	8.07	7.81
Public	10.14	9.81
Roads	1.83	1.77
Recreational	1.93	1.86
Religious	1.93	1.86
Industrial	9.68	9.37
Forests	6.34	6.13
Defense/Security	0.64	0.61
Total	103.29	100 %

Source: Visual Ground Verification conducted by Benninger Architectonics USA Incorporated in association with the Department of Urban Development and Engineering Services, MoW&HS, RGoB and the Samtse Municipal Corporation during June 2004.

2.3 EXISTING LAND OWNERSHIP PATTERN

The land holding pattern of the Samtse Urban Core local area is primarily dominated by privately owned lands under residential, commercial and agricultural usage. There is a substantial amount of government lands within the local area, which is evident from the present institutional development within the local area.

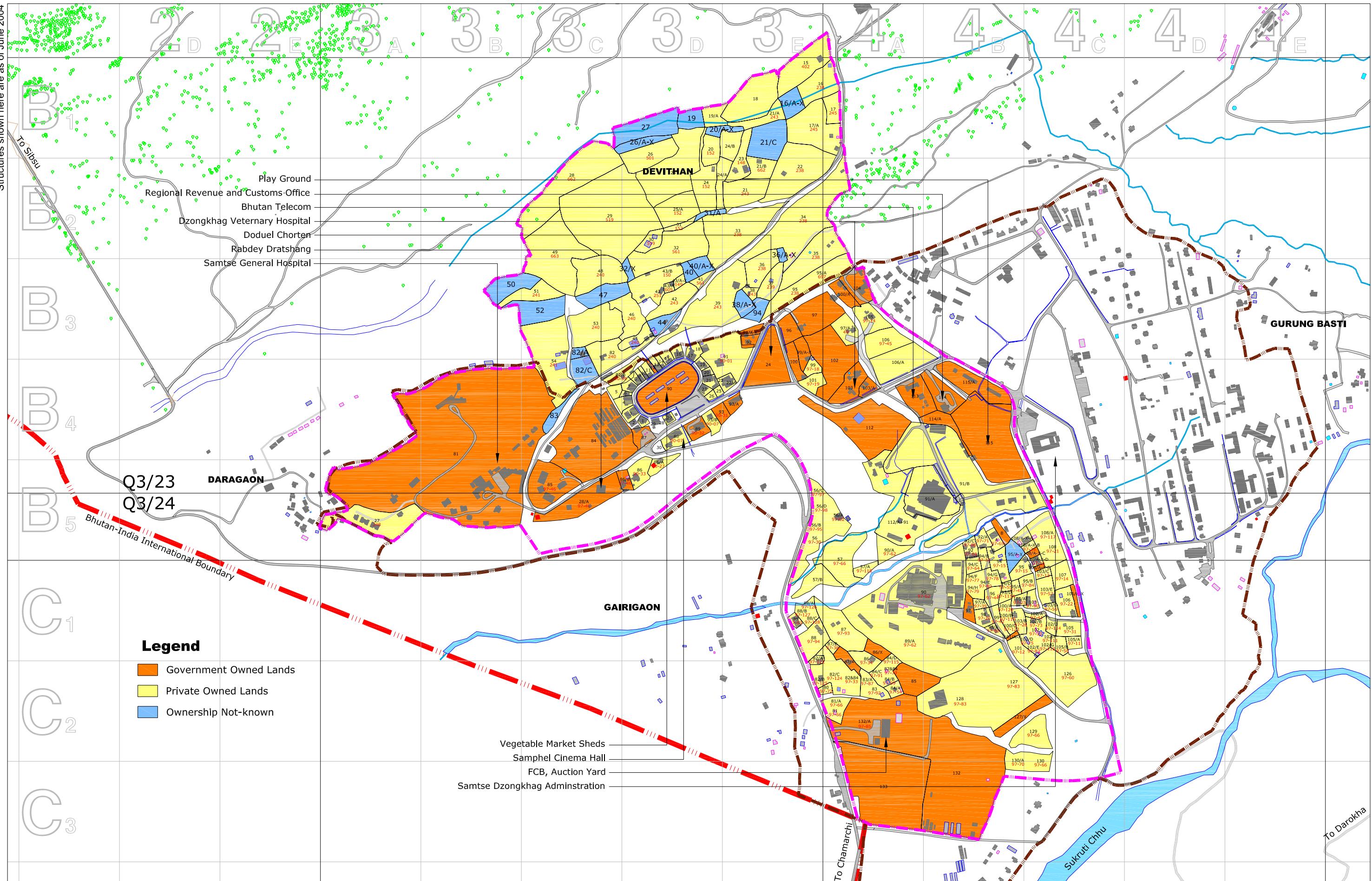
The following table describes the private and government ownership of land as a percent of the total land recorded in the cadastral map of the local area. In addition to the total of government and private lands in the table, there are areas under road right-of-ways, steep slopes, forest plantations, water bodies and natural streams, which belong to the government per se.

Table 2.2: Existing Land Ownership Pattern

Ownership	Area (in Hectare)	Percentage to Total Area
Private	49.78	48.2
Government	32.78	31.8
Other Government Lands (Steep Slope Areas)	15.08	14.6
No Information	4.02	3.9
Road Usage	1.63	1.5
Total	103.29	100 %

Source: Department of Land Records, Samtse Dzongkhag and Samtse Municipal Corporation.

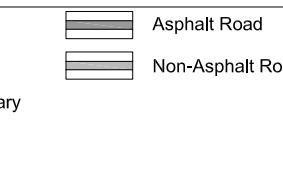
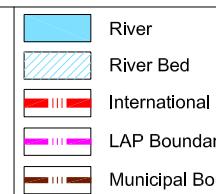




Sources

* Total Station Survey Drawings provided by Department of Urban Development and Engineering Services, MoWHS, RGob

* Ground Verification, June 2004 by Benninger Architectonics USA Inc.



EXISTING LAND OWNERSHIP PLAN
Samtse Structure Plan - Urban Core Local Area Plan

Benninger Architectonics USA Inc.
with the Department of Urban Development and Engineering Services, MoWHS, RGob
Municipal Corporation

Scale: 1:7000
May, 2005
KEY PLAN

Drawing 2.5
Page No. 5 A

2.4 EXISTING AMENITIES AND FACILITIES

As described earlier, the Samtse Urban Core local area is concentrated with amenities and facilities which fulfill most of the modern day requirements of the town. The Central Spine connecting the border check post and the rest of the town, which passes through the center of the local area, forms the major spine. Other tarred roads emerge from this spine within the area. Most of the institutions and public facilities within the local area are located adjacent to this Central Spine.

2.4.1 Road and Circulation Network

The Samtse Urban Core's road network is mainly bound by the central spine which connects the border check post to Gurung Basti area. Today, the road network in the local area functions effectively. The compactness of the town, with most of the present development concentrated in and around the town core, and more than half of the population of the town living in these areas, together with a low vehicle ownership rate and the mixed landuse of the town, considerably reduces the vehicular movement. However the challenge lies in efficiently connecting the Samtse town core with the extended areas of Gairigaon, Devithan and Daragaon.



Road connecting the Dzong and the Town Core forming an important traffic spine within the local area



Road leading towards the International Border Check Post

The road intersection near Bhutan Oil Distributor (BOD) forms a crucial junction in the town, with roads leading to Devithan, Chamarchi (India), and Dzong. Over the next fifteen years because of assumed growth in trade and commerce, higher personal incomes and coming up of Sibsu-Daipham Highway connecting the town; it is envisioned that there will be a major increase in the number of commercial and private vehicles within the local area. Unless accommodation for these vehicles is planned, traffic congestion and hazards will grow rapidly.

The presence of footpaths along the roads in the town core and along the periphery of vegetable market and Doduel Chorten, provide healthy clues for developing a well established footpath network in the future. However, the existing footpath network is inadequate and an efficient network connecting important destinations across slopes should be planned.

2.4.2 Open Space System

Samtse town, located on a peninsular hillock, lacks an organized and defined open space system. The open spaces in Samtse town are incidental, disjointed and rather loosely organized in the fabric. The most impressive open spaces within the local area are the football ground and the central open space in the oval market. The football ground also provides opportunity for outdoor sports like archery, dart throwing, etc. Its location on the junction of the crossroads coupled with Dzong in the background makes it the most special. The other ground associated with previous school building (currently occupied by Army) also allows various sporting activities including basket-ball.

The forest lands along the steep slopes located both to the north and west of the local area, forms an integral part of the existing open space system within the urban core local area. These densely vegetated patches need to be identified and efficiently compounded with the existing open space system.

The Structure Plan recommends an organized open space network within the town limits essentially connecting the urban village centers with the urban core and important open spaces and amenities.

The identified surface drainage patterns and the buffer zones along the natural streams provide an opportunity to efficiently integrate the pedestrian movement within the local area.

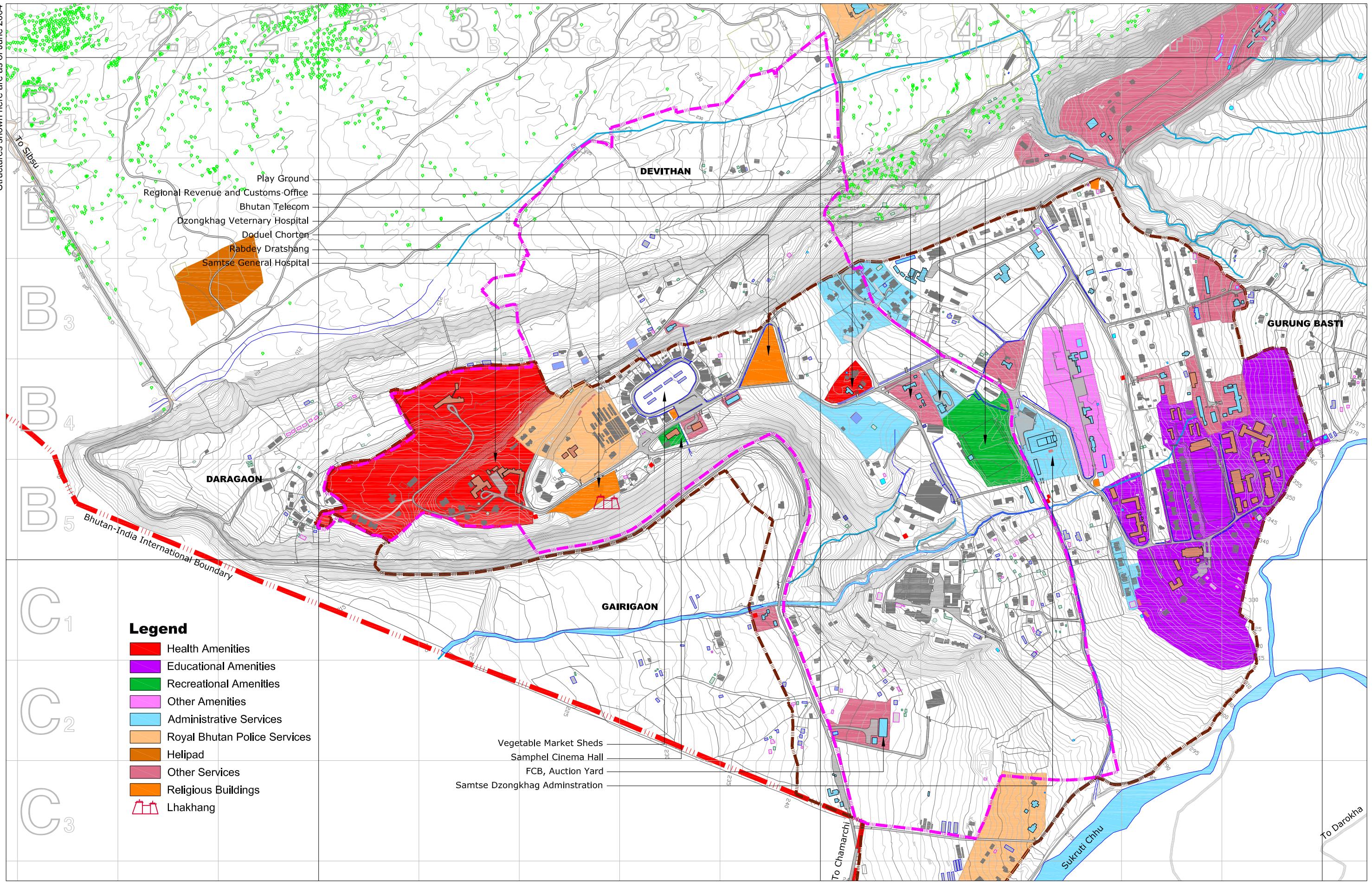
Apart from creating active recreational open spaces; there is a need to design an open space surrounding the Doduel Chorten and the Dratshang, which shall play a vital role in the creation of an open space system within the local area. The ambience created due to the presence of various religious iconographies would be advantageous towards creating an identity for these important urban spaces.

2.4.3 Health, Education, Shopping and Other Community Facilities

The basic and advanced health facilities for the local area residents are provided by the Samtse General Hospital located within the local area. This sixty-bed hospital has various facilities such as OPD, eye section, dental section, X-ray unit, maternal child health unit (MCH), operation facilities and testing laboratories.

As Samtse Urban Core is the hub for commercial establishments, shopping is one of the prime functions in the local area. The Urban Core serves the entire Dzongkhag population and its hinterland, apart from serving the town residents.

Other community facilities include recreational facilities like the Samphel Cinema and the football ground. Various financial and government offices located within the local area, makes this local area most special in Samtse town.



Sources

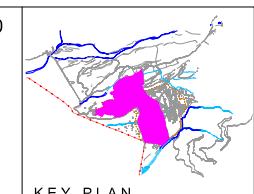
- Total Station Survey Drawings provided by Department of Urban Development and Engineering Services, MoWHS, RGob
- Ground Verification, June 2004 by Benninger Architectonics USA Inc, DUD&ES and Samtse Municipal Corporation

EXISTING AMENITIES PLAN

Samtse Structure Plan - Urban Core Local Area Plan

Benninger Architectonics USA Inc.
with the Department of Urban Development and Engineering Services, MoWHS, RGob
Municipal Corporation

Scale: 1:7000
May, 2005



Drawing 2.6
Page No. 6 A

2.4.4 Heritage and Religious Structures

The presence of religious structures and iconography, within the local area makes it more sacred and picturesque. The Samtse Rabdey needs to be more defined as a special place as it fails to stand out from the surroundings in its current location. The Prayer Wheel pavilion near oval market would deserve special attention as it is widely used by the local residents as an important meeting place. The Doduel Chorten is an important landmark of the local area which is frequently visited by the elderly during evening time.



Samtse Rabdey Dratshang



Doduel Chorten

2.5 EXISTING HOUSING AND DENSITY PATTERN

The existing population of the Samtse Urban Core local area is estimated to be 2,050 persons. This population estimation is based on the ground verification of dwelling units located within the local area and with reference to the population survey conducted by the Department of Urban Development and Engineering Services during January, 2002 for the purpose of the Urban Sector Programme Support.

The average gross population density in this local area is approximately 20 persons per hectare, which is higher than the density in the other local areas of the town. The commercial block within the local area enjoys much larger densities while in the peripheral areas the density decreases substantially. The residential structures located in the local area are mostly permanent in nature, varying from commercial usage to individual apartments. On an average most of the buildings within the local area are ground storey structures.

Most of the existing buildings in Samtse were constructed before the amendment of the Bhutan Building Control Regulations-2002. This has resulted in insufficient setbacks and margins, between the building structures, thus resulting in an unhygienic situation within the town core area.

The existing built-up area in Urban Core local area is **52,714.28** square meters, while the existing total ground coverage is **41,167.82** square meters.

Table 2.3: Existing Built-up area and Building Height

Building Heights	Built-up Area (in square meters)
Only Ground Floor	41167.82
Ground + 1 Floor	10625.51
Ground + 2 Floors	920.95
Total	52,714.28

Source: Visual Ground Verification conducted by Benninger Architectonics USA Incorporated in association with the Department of Urban Development and Engineering Services, MoW&HS, RGoB and the Samtse Municipal Corporation during June 2004.

2.6 EXISTING UTILITIES AND SERVICES

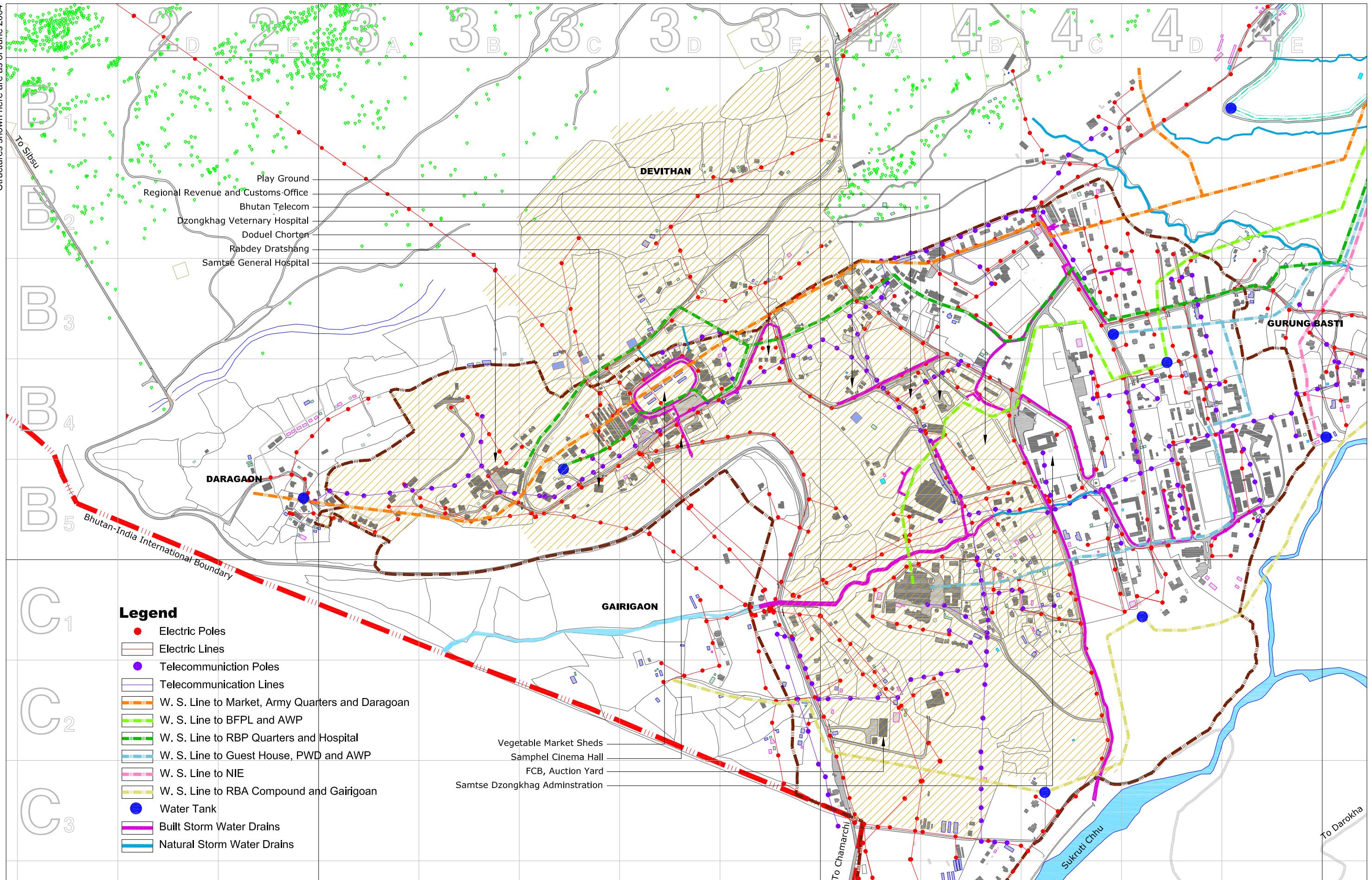
Samtse being the Dzongkhag Headquarters acts as the hub for various services like telecommunications, electricity, etc. within the Dzongkhag. Though the town enjoys the status of Dzongkhag Headquarters, in various aspects one cannot overlook the shortages the town faces in terms of availability of essential utilities and services. Potable water supply and basic sanitation are subjects that need immediate consideration. The projected development in the town and in the local area depend on how well these essential utilities and services are planned in the future.

2.6.1 Water Supply

There are three sources from where water is drawn for supply to the town. These include the Damdhum Chhu, Sukruti Chhu and Athraise Chhu. Water from these sources is partially treated in the water tanks above the NJBC campus. There is no water treatment plant in Samtse town. Water from these tanks is supplied to the town by gravity flow.

The water supply system of Samtse consists of 8 inch, 6 inch, 5 inch, 4 inch, 11/2 inch and 1 inch diameter galvanized iron (GI) pipes arranged in a hierarchical manner with respect to the water supply requirements. Two lines of 4 inch diameter HDPE pipes from Damdhum are laid recently.

The combined water yield of the sources is $2376 \text{ m}^3/\text{day}$. The water is supplied ranging from six to nine hours a day. On comparing the water availability and demand, it is observed that the present sources are adequate to meet the present demand. However, there are complaints of water shortage for days together. Considering the acute shortage of potable water in the town, as a part of the DANIDA supported town sanitation scheme, a water supply project is prioritized.



SOURCES

* Total Station Survey Drawings provided by Department of Urban Development and Engineering Services, MoWHS, RGOb

* Ground Verification, June 2004 by Benninger Architectonics USA Inc, DUD&ES and Samtse Municipal Corporation



EXISTING INFRASTRUCTURE PLAN
Samtse Structure Plan - Urban Core Local Area Plan

Benninger Architectonics USA Inc.
with the Department of Urban Development and Engineering Services, MoWHS, RGob
Municipal Corporation

Scale: 1:7000
May, 2005
KEY PLAN

Drawing 2.7
Page No. 7 A

2.6.2 Sewerage System

Samtse does not have an organized sewerage collection and disposal system. Individual buildings are served by septic tanks and by soak pits located within plots. Apartment buildings usually have a common septic tank.

According to the pre-feasibility study report, based on the present water consumption, the likely sewerage which could be generated is estimated about 708 cubic meters per day. In addition, an equal amount of industrial waste is likely to be generated. In the absence of any organized sewerage system in the town, septic tanks are the common method of sewerage disposal. The overflow of effluents from septic tanks is disposed of into surface drains. This causes a great threat to the hygienic conditions in the town. It is observed that the septic tanks and the soak pits are full and rarely cleaned. For public convenience the local governing body in the past had constructed one public toilet near football ground which is currently in a dilapidated state.

Out of the total population of Samtse, about 17% of the population depends on pit latrines and open defecation as their sole sanitary facility, while 83% of the population depends on in-house sanitation facilities.

There is a definite need to re-conceptualize the sewerage system in Samtse by construction of sewer lines and community septic tanks. DANIDA has already initiated a proposal which will help improving the sanitation facilities and public hygiene in the town.

2.6.3 Strom Water Drainage

The storm water drainage system of Samtse consists of natural surface drainage system, together with constructed open drains. This combined system carries storm water, sullage and septic tank overflow. Constructed in the past, the drains comprise of rectangular and trapezoidal lined main drains built along the natural drainage pattern with slopes in the range of one to four percent. The larger part of the town core is served by lateral, mainly open drains. Taking advantage of the terrain, runoff is carried to the fringe areas of the town and disposed off into the natural drains to the north and south of the town. This is an unhygienic solution promising health hazards in the future.

2.6.4 Solid Waste Disposal

According to the pre-feasibility Report, carried out by the RGoB, the estimated solid waste generated in the town is about 2.2 tons per day. There is no solid waste management system in Samtse. Even though some people dispose their waste in community bins, in absence of any system for emptying bins the solid waste is burnt in open.

All the commercial establishments in the town core have been provided with individual dustbins by the Municipal Corporation. The dustbins are carried by the sweepers and emptied in the nearby forest area.

The school and a few other institutes burn their waste in the open air. The domestic waste collected is about 1.4 tons, per day while the commercial establishment's wastes account to 0.7 tons. Spilling of solid waste from the open bins is one of the common problems faced and creates a serious threat to the hygienic condition in the town.

The existing system of waste disposal needs to be re-conceptualized by studying alternate disposal techniques and proper collection methods. A suitable land-fill site for disposal of solid waste should be identified and transport vehicles need to be procured. It should be ensured that waste is collected from each and every place to keep Samtse clean and healthy.



Dumping of solid waste behind the market area and on the slopes near Sibsu Road

Table 2.4: List of Existing Amenities and Facilities available in the Local Area

Amenities and Services	Physical Description	Location in the Local Area	Analytical Description
Circulation and Road Network	Tarred Roads	All over the Local Area	4.25 Kms
	Un-Tarred Roads	All over the Local Area	1.45 Kms.
Open Spaces	Football Ground	Near Dzong	1.93 Hectares
	Potential Recreational Space	Oval Core with Haat Sheds	0.75 Hectares
Community and Social Facilities	Samtse General Hospital	-	-
	Haat Sheds	-	6 nos.
	RSTA Office	-	-
	Bhutan Telecom	-	-
	Royal Bhutan Police	-	-
	Fair Price Shop	-	-
	Financial Institutions	-	-



Amenities and Services	Physical Description	Location in the Local Area	Analytical Description
Heritage and Religious Structures	Samtse Rabdey Dratshang	-	-
	Doduel Chorten	-	-
	Gyem Chamdrel Sum	Prayer Wheel near Parking Area	-
	Shiv Mandir	Opposite Doduel Chorten	
Water Supply Distribution System	Distribution through gravity flow	Water Storage tank located to the east of NJBC upper terrace	-
Solid Waste Disposal Bins	Concrete bins and individual bins with commercial establishments	-	-
	Open Disposal	-	-
Sewerage System	Septic Tanks	In all individual structures	-
Storm Water Drainage	Constructed Drains	In Town Core	-
	Un Constructed Drains	Along the peripheries	-

Source : Total Station Survey Drawing provided by DUDES and Visual Ground Verification conducted by Benninger Architectonics USA Incorporated in association with the Department of Urban Development and Engineering Services, MoW&HS, RGoB and Samtse Municipal Corporation during June 2004

5001-10,000	27	11.0
More than 10,000	20	8.2
Total	242	100

Source : Department of Land Records, Dzongkhag Administration, Samtse and Samtse Municipal Corporation.

2.7 SPECIAL FEATURES

As mentioned earlier, most of the lands within the local area are either under commercial or residential usage. This local area offers an excellent opportunity in terms of 'Conservative Surgery' and demonstrates an ideal Samtse Urban Core serving both the town as well as the entire dzongkhag. The presence of various institutions and amenities would be inspiring for the planners to design an ideal local area. The presence of open spaces like the football ground is essential as they shall serve the future Urban Core as respiring spaces. These spaces have to be conserved and enhanced as a part of the local area plan exercise.

Table 2.5: Existing Land Holding Pattern in the Local Area

Plot Area Range (in square meters)	Number of plots	Percent to Total Area
Less than 500	61	25.3
501-1000	46	19.0
1001-2000	44	18.3
2001-3000	20	8.2
3001-5000	24	10.0

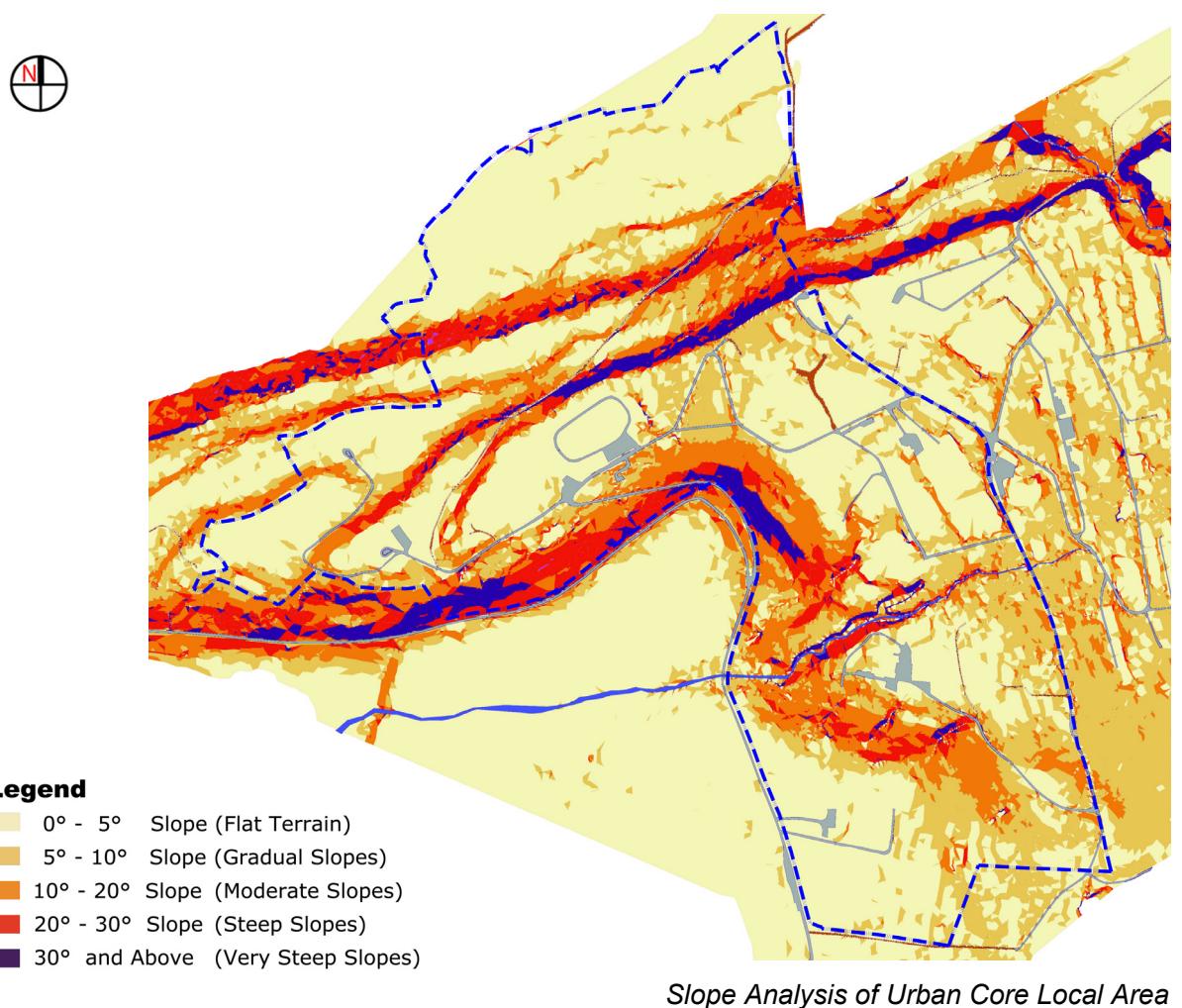


3.0 ANALYTICAL STUDIES AND PROPOSALS FOR ACTION

3.1 LAND SUITABILITY FOR DEVELOPMENT IN THE LOCAL AREA

The main objective of the land suitability analysis is to identify the developable land available within the local area. Though the Samtse Urban Core local area is one of the potential area in the town for urban development it is necessary that the future development should respect and conserve the natural environmental features of the place, like the land form, steep slope areas, forest vegetation, natural surface storm water channels, etc. No future developments should be allowed in such fragile areas. Thus, land suitability analysis becomes important for future development.

A fifteen meter wide protected green buffer zone is proposed on the either side of the identified major natural surface storm water channels to protect the surface drainage pattern, and its environment, from urban development. This proposed buffer zone will reserve a right-of-way for the natural storm water channels in the town's landscape and in the long run would form a public asset, which will enhance the land values and quality of life. This area would be a "no construction" zone. The proposed green buffer will form a part of the open space system proposed in the town and will be provided with foot paths along its edge.



Apart, from the natural storm water drain protection green buffer, steep slopes and forest vegetation areas shall be identified and would be reserved as a "no construction zone" which will form a part of the proposed open space system. These areas will serve as passive recreation places and serve as green lungs for future Samtse.

Samtse town is located on comparatively flatter lands on a peninsular hillock, and most of the local area is suitable for any kind of urban development.

Apart from identifying the environment conservation zones, analysis was carried out regarding slopes, elevation mapping, tracing natural drainage channels and climatic data which are essential to the land suitability analysis. This helps the entire planning process to derive a suitable planning layout respecting various needs.

Table 3.1: Details of Lands falling as a part of the Environment Conservation Zones

Land Under	Area (in hectares)	Percentage to Total Area of the Local Area
Proposed Environmental Conservation Zone (along the streams and natural surface storm water drains)	3.03	2.94
Environmental Conservation Zone (along very steep slope areas)	6.48	6.27
Flood Prone Zone (near Damdhum Chhu)	5.21	5.05
Forest Environments (near Sukruti Chhu)	13.03	12.60
Total	27.75	26.86

Source: Proposed Precinct Plan, Structure Plan for Samtse, BAUSA.inc.

3.2 POPULATION ACCOMMODATION AND DENSITY DISTRIBUTION WITHIN THE LOCAL AREA

The Structure Plan for Samtse estimates that the current population of Samtse town would increase to about 14,000 in the coming two decades. Strategies and phasing to accommodate this additional population within the municipal limits, is proposed as a part of the Structure Plan in the form of Urban Villages.

Development of Village Squares/Urban Hub surrounded by high- and medium-density population concentrations, in every Urban Village, is proposed as a vital tool to accommodate the additional population, to facilitate provision of infrastructure and other utility services. This will also fulfill the housing requirements for the people from various economic classes.



The Samtse Urban Core Local Area Plan, developed on these premises, attempts to accommodate its share of the projected population, the housing requirements, and the provision of infrastructure and utility services. Such a strategy will create economic viability over a range of urban services.

The Urban Village periphery (UV-3) with medium-density housing, and the proposal for developing the existing town core into an Urban Hub, will make the Samtse Urban Core a self-sufficient urban node, with a range of amenities and services at a walkable distance from all the future dwelling units.

As a part of the Samtse Structure Plan, areas were identified within the municipal limit, for various types of urban development with respect to the density distribution, for housing in-fill, and for the expansion of existing housing, across the entire Samtse town. Based on the proportion of the “net residential developable area” in each Urban Village, the total projected population for the town has been distributed. Considering the “net residential developable area” available in the Samtse Urban Core local area, to that of the entire town, a planned population of 5,632 needs to be accommodated.

The total net developable area for accommodating future population in the Samtse Municipal Corporation limits is 144.68 hectares, while the net developable area for accommodating future population in the Samtse Urban Core Local Area is 59.96 hectares (excluding environmental conservation areas, forest environments, flood prone areas, major institutions). Towards calculating the net residential developable area within the town, which will house the future population, residential development coefficients were assumed for various precincts with respect to their proportion of residential development to their net development. From the calculation the total net residential developable area within the Samtse Municipal Corporation limit is calculated to be 59.38 hectares. The net residential developable area in the Samtse Urban Core Local Area Plan is 23.89 hectares (excluding the primary road network, open spaces, institutional developments, conserved and protected areas). The percentage of net residential developable area in the Samtse Urban Core Local Area Plan to the total of the town is around 40.23%.

The estimated population of Samtse by the year 2025 is 14,000,¹ which is proposed to be accommodated in the total net residential developable land available within the Samtse Municipal Corporation limit!

Based on the proportion of total net residential developable area within the Samtse Urban Core local area, to the town’s total net residential developable area, the population accommodation share of the local area is 5,632 people!

¹ Estimated at 6.00% annual compound growth rate, derived from the population growth analysis, considering various growth scenarios for development, with a base population of 3,457 people for the year 2002, as per the Urban Sector Programme Support, pre-feasibility study conducted by the Department of Urban Development and Engineering Services during January, 2004.

Assuming an average household size of five persons, the number of dwelling units required to house the estimated population in the local area is around 1,126.

The existing population of the local area is largely concentrated in the existing town core and areas located near Army Welfare Project. The town core area allows flexibility for future development only through vertical expansion. The land parcels located to the north of the town core towards Devithan are very sparsely developed and allow great scope for future development. These areas with the provision of basic amenities and facilities within a walkable limit could be developed into medium- to low- density residential neighborhoods.

About half of the land located within the local area has already been developed with no concern for basic amenities and services. The main challenge of the plan is to provide these amenities and facilities to all the plots with minimal disturbance to the existing development. Considering the above mentioned objective the method of “Conservative Surgery” has been adopted as a basic planning philosophy in the local area planning process.

3.3 PLANNING STANDARDS

The study on planning standards is carried out as a part of the local area planning process, to identify the amount and number of facilities and amenities needed to be provided within the Urban Village for its self-sustenance. These are calculated by estimating the projected future population of the Urban Village and the number of people who will be visiting the Urban Village in a day. These “populations” which generate requirements for amenities are called “population thresholds”. One of the main factors which influence the use of these amenities and facilities is the travel distance. If people can walk to a basic service its use increases, and therefore the “population threshold” required for establishing the service would come down. Higher densities of population therefore not only augment more efficient utilization of infrastructure, but also more use, and more efficient use of social services.

The basic objective of suggesting various norms and standards for Local Area Plans is to provide a basis for taking decisions regarding correct distribution of various social amenities in the town’s spatial area. For the purpose of the Samtse Urban Core Local Area Plan, planning standards are extracted from two sources. The first document is the ‘Urban Development Plans Formulation and Implementation Guidelines, 1996’ (U.D.P.F.I. Guidelines) by the Institute of Town Planners, India. The second document is the ‘Planning Standards for Urban Settlements in Bhutan, 1999’ by the Urban Development and Housing Division, Ministry of Communications, RGOb.

The suggested norms and standards for various facilities and amenities within the local area are indicated in the form of the following table. The standards drawn below are considering a “conservative” threshold envisioned due to the Service Center catchment area.



Table 3.2: List of Amenities and Facilities as per the Planning Standards for 5,632 Residential Population and 14,000 town population

Amenities and Services	Physical Description	Location in the Local Area	Analytical Description
Open Spaces	Toddler Play Area / Group Open Space	At every residential neighborhoods	Minimum of 500 square meters per play area 0.5 hectare per 1000 residents
	Park/Play ground	Within the Urban Village	1 per 2,500-20,000, Min. 0.5 ha per 1000 person or not less than 10% of a developed area
	Major Public Park / Central Public Garden with play facilities	Within the Urban Village at walkable distance from all parts of Urban Village	One per 3000 population located at a site area of minimum 25 square meters
Community and Social Facilities	Recreational / Health Club	At a walking distance from the residential areas	One at Urban Village level serving the local needs
	Spiritual Centre	At a walking distance from the residential areas	
	Weekly Vegetable Market	At a walking distance from the residential areas	One at town level serving the local needs
	Postal Facility	At a walking distance from the residential areas	One at town level serving the local needs
	Transit Stop	At a walking distance from the residential areas	
	Taxi Stand	At a walking distance from the residential areas	One at Urban Village level
	Police and Fire protection facility	Within the residential neighborhood	One at Urban Village Level serving other local needs
	Fuel station	At a walking distance from the residential areas	One at Urban Village Level
	Community Hall	Within the residential neighborhood	One at Urban Village Level
	Other essential Community and Social Facilities catering to the daily needs of the residents like telephone booth, pub, internet café etc.	At a walking distance from the residential areas	
Shopping Facilities	Convenience Shopping	At a walking distance from the residential areas	At every residential neighborhood level
	Local Shopping	At walking distance from the residential areas	One at Urban Village Level
	Community Shopping Area	Within the Urban Hub	One at town level
Education Facility	Nursery cum Primary School	At a walking distance from the High-Density Residential Area	One at Urban Village Level

Amenities and Services	Physical Description	Location in the Local Area	Analytical Description
	Secondary School	Within the Urban Village	1 per 7500 with student population of 350-500 and a plot area of min 4000 square meters
Health Facility	Basic and Advanced Health Facilities	At a walking distance from the residential areas	
	Electric Transformer	Within the residential area	
	Bill Collection Centre	At a walking distance from the residential areas	

Source : U.D.P.F.I Guidelines, 1996 and Planning Standards for Urban Settlements in Bhutan, 1999

3.4 CONCEPT OF THE PLAN

The design aspects of the Samtse Urban Core Local Area Plan evolve from the Structure Plan proposals and the existing cadastral pattern of the Urban Village. The main objective of the local area plan, as mentioned in the earlier chapter, is to provide basic amenities and services for all the plots available within the local area, so that these plots can be used for future urban development. Apart from this, the local area also addresses various other issues, like future population accommodation, development of an Urban Hub, religious institutions, and creating an institutional core for the region, as Samtse will emerge as a Service Center serving South Western Bhutan.

As a part of the Environment Conservation Precinct (E-1) along the natural storm water channels, a series of community and neighborhood level open spaces are proposed, which also form a green pedestrian corridor allowing un-interrupted, safe pedestrian access to all parts of the local area. This will also provide spaces for accommodating religious icons within residential neighborhoods. The plan also proposes development of the existing town core into a pedestrian friendly environment by proposing parking lots for vehicles along its periphery and by proposing partial pedestrianization of selected streets like Oval Core.

A hub of community and social facilities is envisioned at the east of the local area towards football ground that will form the central focus of both the Urban Village and the town at large. The Urban Spine, connecting the town core and the Dzong from International Boundary Check post, passing through the Urban Village, is envisioned as a part of the local area plan. This central spine will connect various institutions, open spaces, the central community and social facility hub and, most importantly provide access to the residential blocks.

The following sections explain the basic considerations and concepts of the local area in brief.



3.5 PROPOSED PLOT RE-CONFIGURATION

A major focus of the Samtse Urban Core Local Area Plan is to reconfigure the existing developable land within the local area limit, in such a manner that each plot is provided with proper access, amenities and services, so that these areas could be used for urban development, and to accommodate the future population. By reconfiguring the layout of land, the plots shall be regular in size and shape allowing for efficient development. This is essential because the land has been subdivided, sold and developed in a haphazard manner, with no provision for the inclusion of modern infrastructure, which will assure hygiene, health, communications, electricity, drainage and access.

Most of the lands in the entire local area are privately owned (about 48%). Other developable areas are either government lands, or lands under institutional usage. Most of these government lands are already developed, like the Samtse General Hospital, Bank of Bhutan, Royal Bhutan Police, Food Corporation of Bhutan, Dzongkhag lands, Bhutan Telecom and they function as essential amenities and services for the town, fulfilling the basic needs of the town dwellers. Other land belonging to industrial units is developed upto its maximum potential.

At places where, the individual plot sizes are less than the minimum allowable plot sizes for urban development (i.e. less than 300 square meters of land area), the plots are consolidated with other plots of the same nature to achieve the minimum allowable plot sizes required or regularized by giving extra land.

The reconfiguration of plots within the local area involves designing a new layout for the entire area under consideration and the redistribution of the area's land into regular plot sizes, with access roads of a minimum width. This will also allow for the provision of adequate storm water drainage and the laying of underground infrastructure. This process is carried out in a consultative process, where the owners are kept informed about the process of restructuring and redistributing the plots. After equitably deducting common areas from every plot for new roads, existing road widening and extension, public open spaces and amenities, the new rationalized plots will be "reissued." In this process, the land, values are enhanced and the value of property goes up. Generally, the landowners end up with a property package of much higher value than when they began! The value of the land acquired for civic improvement at the time of acquisition is far less than the "value added" to the property at the time of redistribution. The amount of land deducted from parcels, is a percentage derived by calculating the total land required for new roads, existing road widening and extension, open spaces, common infrastructure and community amenities in the new layout, distributed equally over the entire land area.

Besides these objectives and modalities, the accommodation of the estimated future population, and its appropriate distribution through variable densities, has also governed the reconfiguration of land in the Urban Core Local Area Plan.

Table 3.3: Break-up of Land Area in the Local Area Plan

Break-up for the Total Land Area under Local Area Planning			
Description		Area (in hectare)	Percentage to the Total Area
Total Land Area of the Local Area Plan		103.29	100
Total Land Area Under Guided Land Development	Under existing Town Core	3.92	3.79
Area Not Considered for land Pooling Exercise	Lands falling as a part of Environment Conservation Zone (Refer Table No. 3.1)	27.75	26.8
	Plots under Endowment Precinct (E-8)	11.51	11.14
	Plots where Land Pooling not feasible	1.27	1.22
Net Land Area of the Local Area Plan considered for Land Pooling Exercise		58.84	56.96 %
Break-up for the Land Pooled area and Pooling Percentage			
Description		Area (in hectare)	Percentage to the net land area considered for land pooling
Total area of the Proposed Roads and Footpaths		9.59	16.29
Area of the Proposed Open Space System and Natural Environment Protection green buffer (including Play ground, Neighborhood Play Area, Public Gardens, Religious Open Spaces etc.)		31.38	-
Lands falling as a part of Environment Conservation Zone (Refer Table No. 3.1)		27.75	-
Net Area Of Proposed Open Space System		3.63	6.17
Total area of the Proposed Amenities and Facilities (including Service Plots, Community Facilities plots, etc.)		1.5	2.54
Total Area of the Proposed Facilities with in the local area		14.72	25 %

Based on the proposed layout and plot redistribution, 25 percent of the land will be deducted from each plot, while the remaining land shall be returned to the landowners. Where there is a permanent structure on a plot, that same plot, will be returned to the original owner after deducting the pooling percentage of land. The plot-wise reconfiguration and reallocation details are attached in the table at the end of this chapter.





Sources
* Total Station Survey Drawings provided by Department of Urban Development and Engineering Services, MoWHS, RGOb
* Ground Verification, June 2004 by Benninger Architectonics USA Inc, DUD&ES and Samtse Municipal Corporation



PROPOSED PLOT RE-CONFIGURATION PLAN

Samtse Structure Plan - Urban Core Local Area Plan

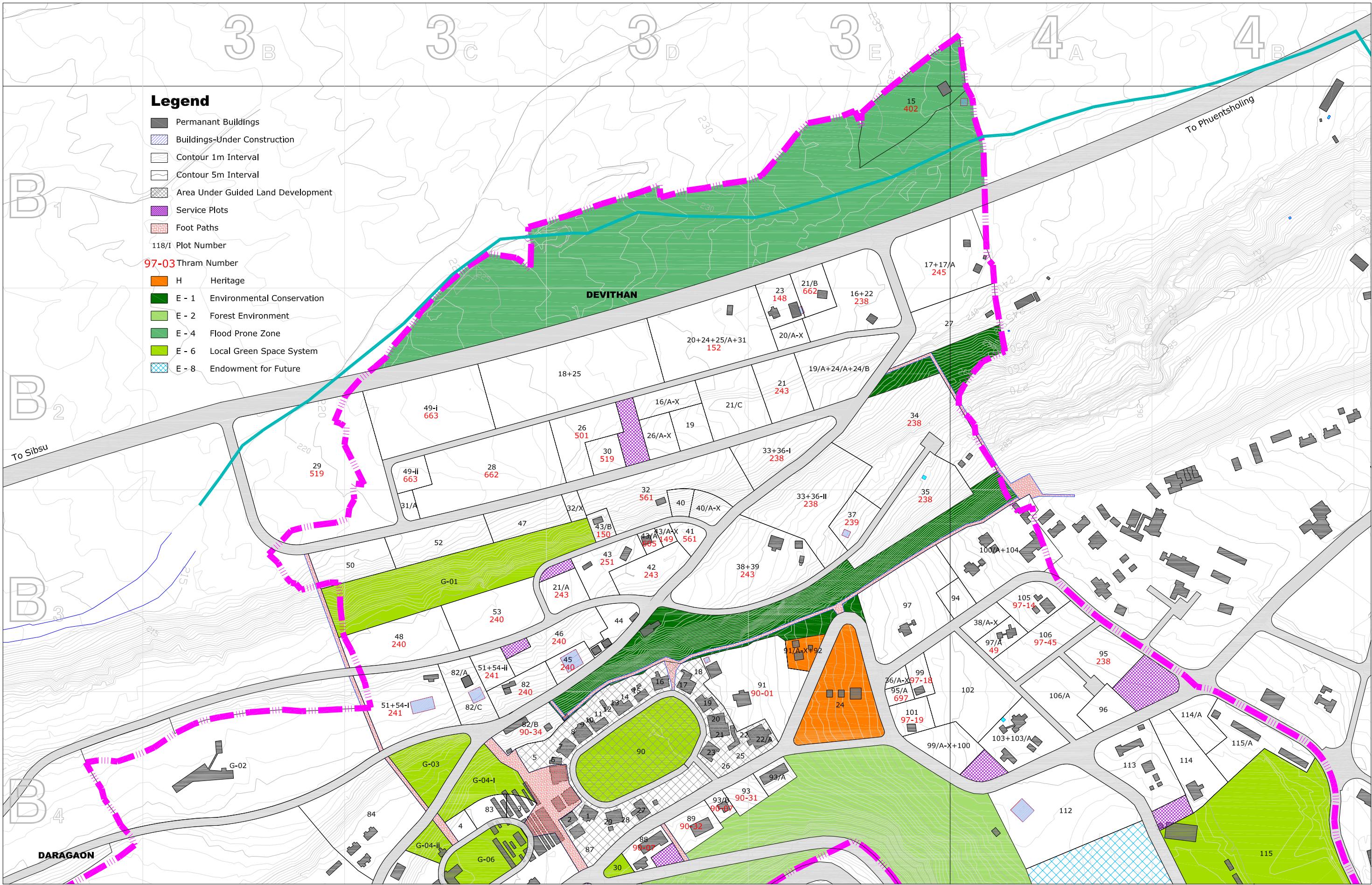
Benninger Architectonics USA Inc.
with the Department of Urban Development and Engineering Services, MoWHS, RGOb

Scale: 1:7000
May, 2005



Drawing 3.1

Page No. 13 A



Sources

- Total Station Survey Drawings provided by Department of Urban Development and Engineering Services, MoWHS, RGoB
- Ground Verification, June 2004 by Benninger Architectonics USA Inc, DUD&ES and Samtse Municipal Corporation

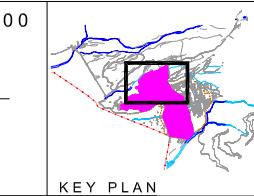
River
River Bed
International Boundary
LAP Boundary

Asphalt Road
Non-Asphalt Road

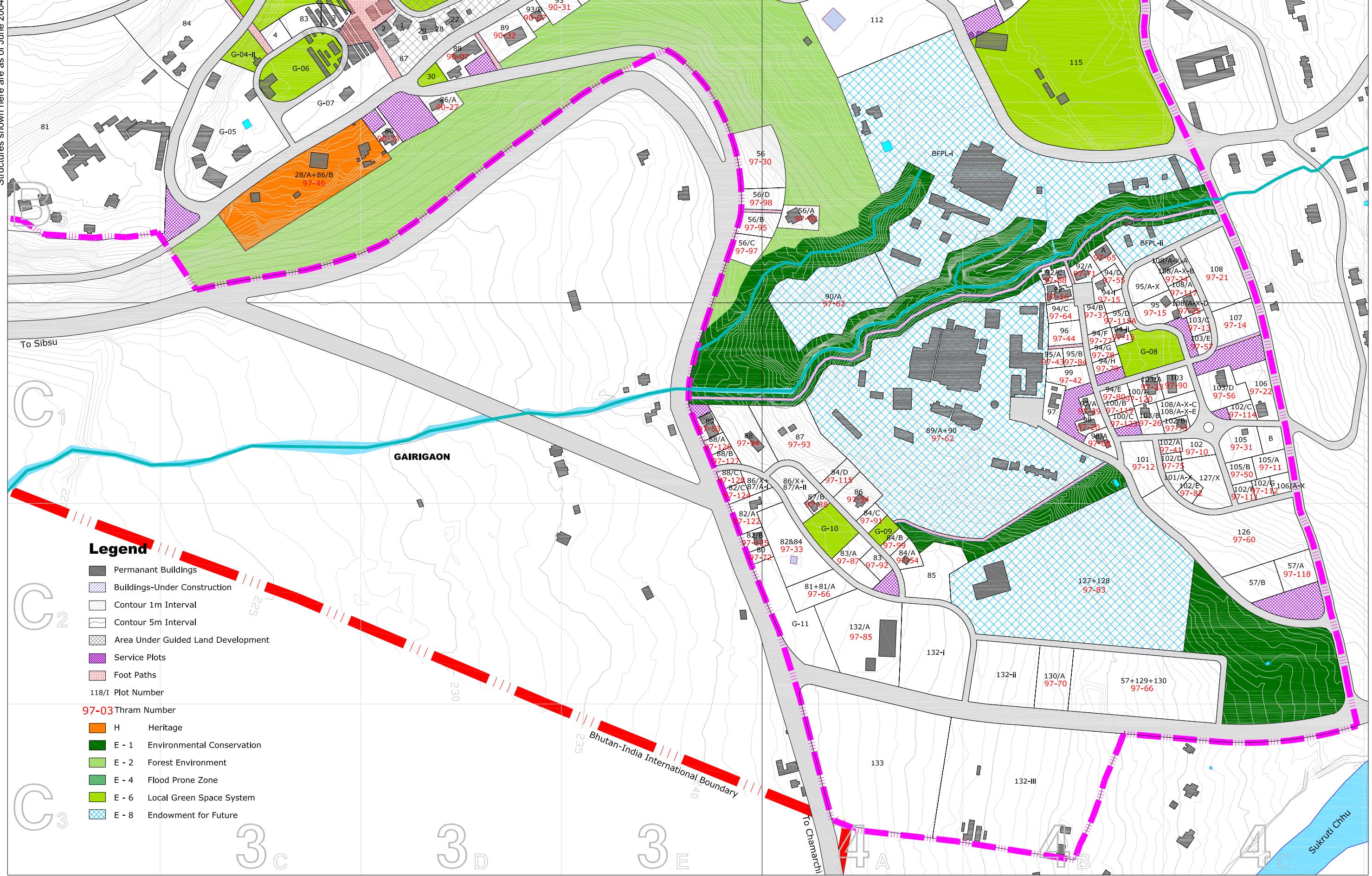
PROPOSED PLOT RE-CONFIGURATION PLAN
Samtse Structure Plan - Urban Core Local Area Plan

Benninger Architectonics USA Inc.
with the Department of Urban Development and Engineering Services, MoWHS, RGoB

Scale: 1:3500
May, 2005



Drawing 3.1A
Page No. 13 B



Sources

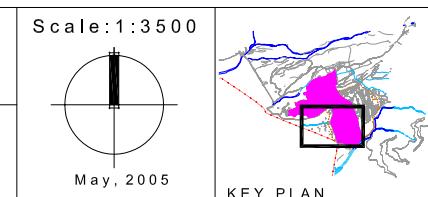
- Total Station Survey Drawings provided by Department of Urban Development and Engineering Services, MoWHS, RGOb
- Ground Verification, June 2004 by Benninger Architectonics USA Inc, DUD&ES and Samtse Municipal Corporation

River
River Bed
International Boundary
LAP Boundary

Asphalt Road
Non-Asphalt Road

PROPOSED PLOT RE-CONFIGURATION PLAN
Samtse Structure Plan - Urban Core Local Area Plan

Benninger Architectonics USA Inc.
with the Department of Urban Development and Engineering Services, MoWHS, RGOb



3.6 PROPOSED PRECINCT PLAN

Though, the precincts proposed in the Samtse Urban Core Local Area Plan are derived from the Structure Plan, the concept evolved for this local area and the issues related to this local area have necessitated some local level changes.

The predominant precinct schedule of the proposal is the residential areas divided across two precincts, namely, the Urban Village-Core (UV-2) and the Urban Village–Periphery (UV-3). According to the main permitted uses in these two precincts, allowed building heights and plot coverage regulations proposed in the Development Control Regulations, UV-2 is envisioned to be a high-density residential precinct, while UV-3 is a medium- to low-density residential precinct. Ground floor level commercial activities, local level retail shopping, service establishments, and small restaurants are permissible in these predominantly residential precincts, based on which a mix of residential and commercial development is envisioned to be developed in these areas. The development envisioned in UV-2 will provide housing for middle income and lower-middle income level groups. The UV-2 precinct within the local area is concentrated around the proposed Urban Hub (UC-1) precinct. The Urban Village Periphery (UV-3) Precinct is proposed surrounding the UV-2 precinct.

The existing town core and its immediate surroundings are classified as an Urban Hub (UC-1) Precinct. This proposal will facilitate the establishment of commercial and public dominated uses within the precinct, which will cater to the needs of the residents of the entire town as well as region. The Urban Hub Precinct will house higher level shopping facilities, regional level hospital, post office, town hall, financial and other service oriented institutions, higher level entertainment and recreational facilities, etc. As described earlier high-density residential development (UV-2) will surround these precincts.

Protection, as well as enhancement, of environment resources is a major theme and concern of the Structure Plan. Implementation of these concerns is ensured through various environmental and open spaces related precincts. The Environmental Conservation (E-1) precinct, proposed in the local area, provides protection by prohibiting development activities in these areas. Under the provisions of the Environmental Conservation Precinct (E-1), no development is allowed in the steep slope areas (slope more than 30 deg), within a fifteen meter wide strip on either side of the natural streams and within a fifteen meters wide strip along major natural storm water drain course.

No urban development of permanent nature will be allowed on the flood prone areas under Flood Prone area (E-4) precinct.

Open spaces, recreation grounds and parks are provided under the Local Green Space System (E-6) Precinct. A series of common open spaces, which can be developed as small plazas, squares or toddler's playing areas are provided within the residential areas, and along the proposed pedestrian links.

Other Environmental Precincts such as International Buffer Zone (E-7) and Endowment Precinct (E-8) are reserved to conserve and ensure efficient planning in future.

The Samtse Rabdey, the Doduel Chorten and its immediate surroundings within the local area, are proposed under the Heritage Precinct (H). This precinct will have provisions for protection, development and enhancement of religious and heritage sites. Approval for any modification to the structure, or development within the heritage precinct, has to be obtained from the Department of Culture, or any other competent authority. Apart from this, land reserved for accommodating religious features and icons will also form a part of this precinct.

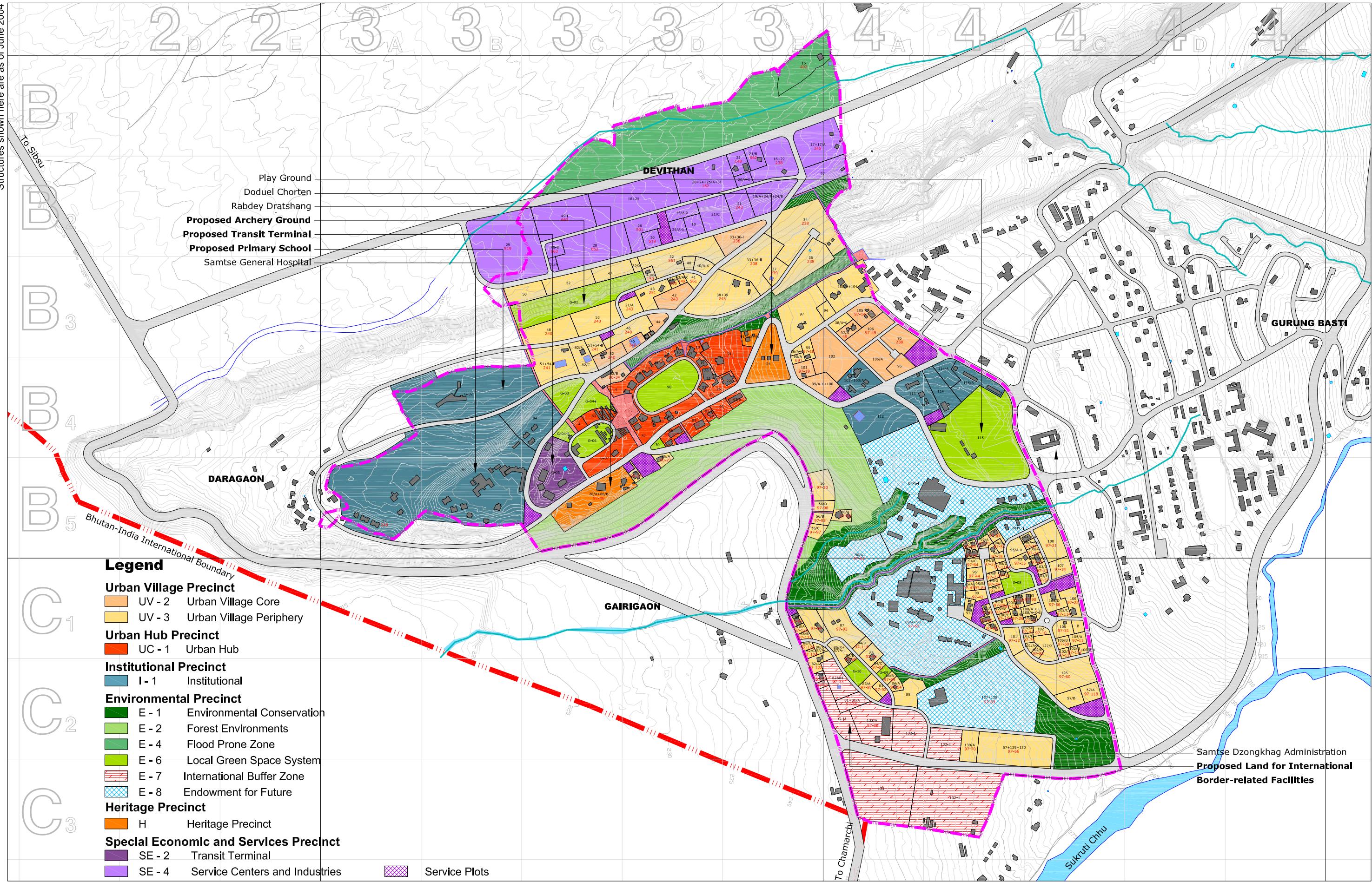
Other important precincts include Transit Terminal (SE-2) which reserves land for construction of a bus station and Service Centers and Industries Precinct (SE-4) for future small-scale industrial and service provider's development in the town.

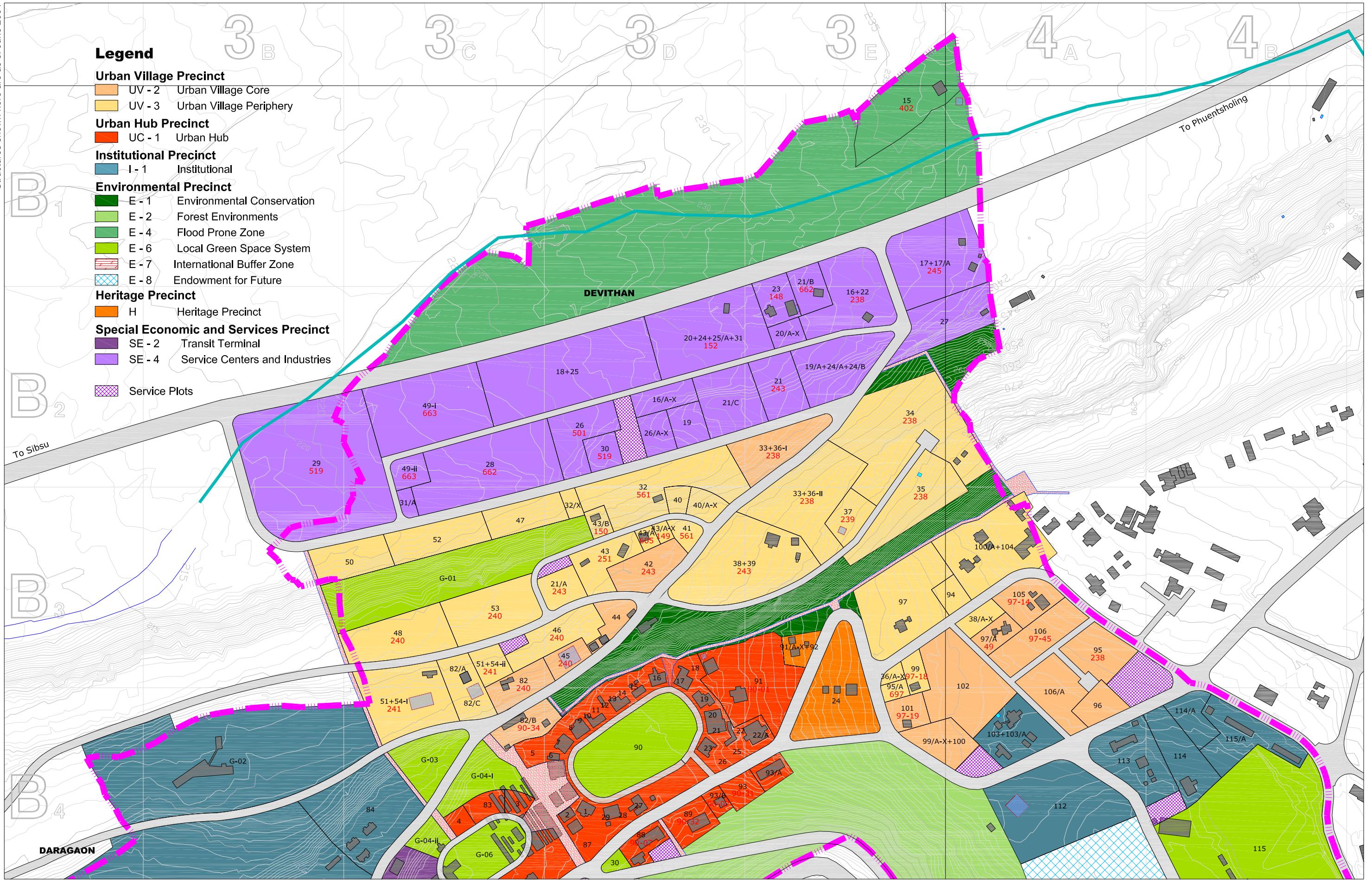
For details on the uses sanctioned, and the uses permissible on appeal, to competent authorities in these precincts, refer to the "Precinct Schedule" in the Annexure.

Table 3.4: Areas Under Different Precinct Schedule and Their related Population Accommodation

Precinct	Area (in hectares)	Percentage to Total LAP Area	Number of Dwelling Units	Population Accommo- dation
Urban Village Precinct				
Urban Village Core (high-density) (UV-2)	3.41	3.3	170	850
Urban Village Periphery (medium-to low-density) (UV-3)	17.77	17.2	530	2,650
Urban Hub				
Urban Core (high-density) (UC-1)	4.29	4.1	220	1,100
Institutional Precincts				
Local level Institutions (I-1)	12.59	12.1	130	650
Environmental Precinct				
Environmental Conservation Precinct (E-1)	6.86	6.6	-	-
Forest Environments (E-2)	6.60	6.3	-	-







Sources

- * Total Station Survey Drawings provided by Department of Urban Development and Engineering Services, MoWHS, RGoB
- * Ground Verification, June 2004 by Benninger Architectonics USA Inc., DUD&ES and Samtse Municipal Corporation

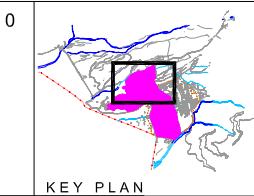
River	Asphalt Road
River Bed	Non-Asphalt Road
International Boundary	
LAP Boundary	

PROPOSED PRECINCT PLAN

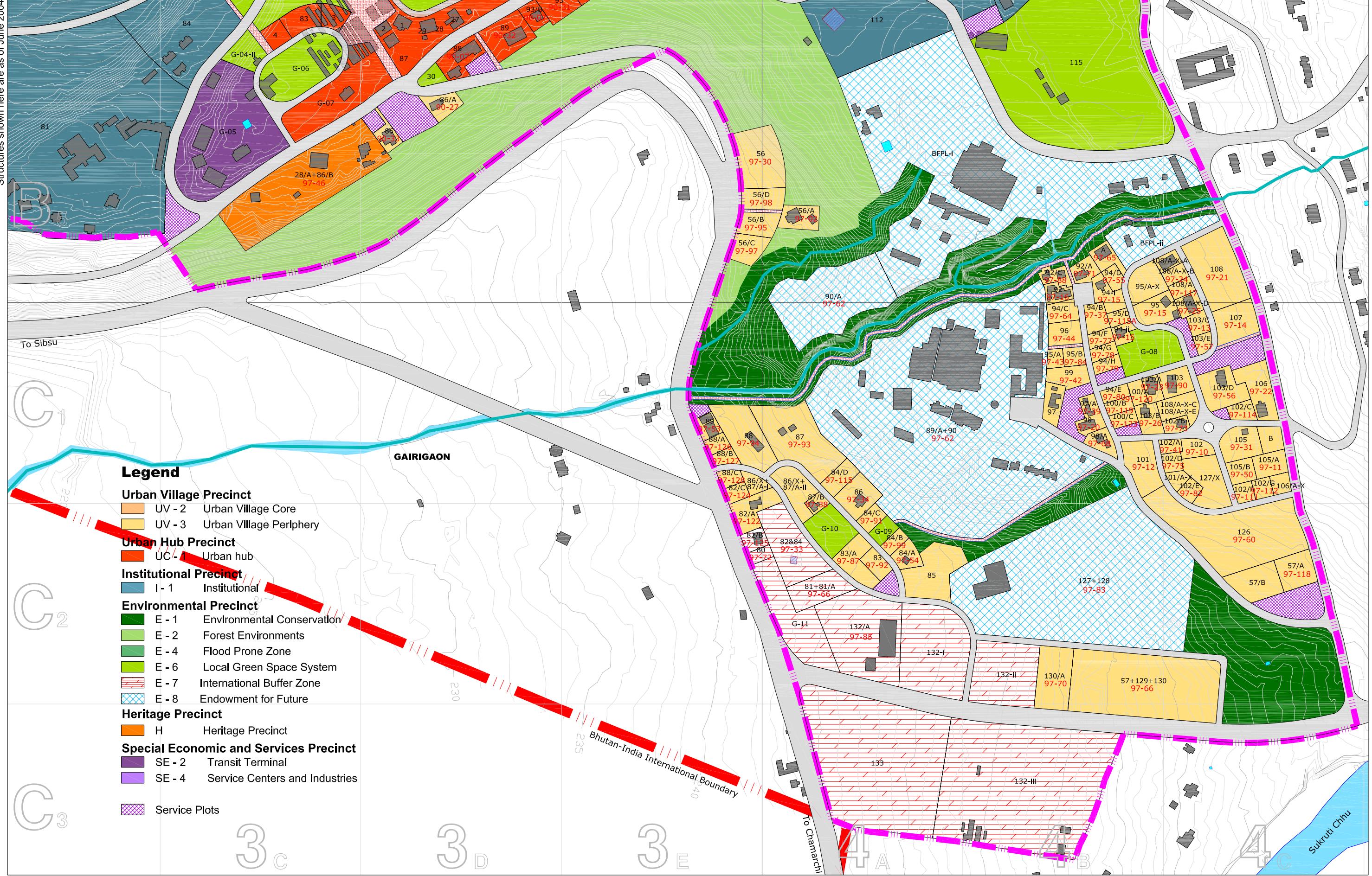
Samtse Structure Plan - Urban Core Local Area Plan

Benninger Architectonics USA Inc.
with the Department of Urban Development and Engineering Services, MoWHS, RGoB

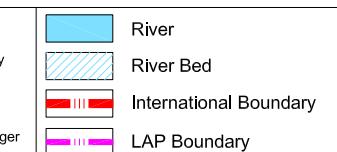
Scale: 1:3500
May, 2005



Drawing 3.2A
Page No. 14 B



Sources
* Total Station Survey Drawings provided by Department of Urban Development and Engineering Services, MoWHS, RGOb
* Ground Verification, June 2004 by Benninger Architectonics USA Inc, DUD&ES and Samtse Municipal Corporation
River



PROPOSED PRECINCT PLAN

Samtse Structure Plan - Urban Core Local Area Plan

Benninger Architectonics USA Inc.
with the Department of Urban Development and Engineering Services, MoWHS, RGOb

Scale: 1:3500
May, 2005
KEY PLAN

Drawing 3.2B
Page No. 14 C

Precinct	Area (in hectares)	Percentage to Total LAP Area	Number of Dwelling Units	Population Accommodation
Flood Prone Zone (E-4)	5.90	5.7	-	-
Local Green Space System (E-6)	5.17	5.0	-	-
International Buffer Zone (E-7)	6.10	5.9	-	-
Endowment for Future (E-8)	11.51	11.1	-	-
Heritage Precinct				
Heritage (H)	1.57	1.5	-	-
Special Economic and Services Precinct				
Transit Terminal (SE-2)	0.97	0.9	-	-
Service Centers and Industries (SE-4)	9.46	9.1	95	450
Service Plots	1.50	1.4	-	-
Total	93.70	90.7 %	1145	5,700

3.7 PROPOSED DENSITY DISTRIBUTION

Population density, being a function of the number of dwelling units per unit area, is regulated by plot sizes, building heights, and plot coverages prescribed in the proposed Development Control Regulations.

High-Density Development

A typical plot configuration (using plots with areas above 1000 square meters) could be developed with 50% percent ground coverage, and a maximum of four floors high, as prescribed in the proposed Development Control Regulations. Developed as apartments and other high-density residential typologies would result in an optimum net developable area density of 150-175 persons per hectare, and a maximum net developable area density of 425-450 persons per hectare. Such a configuration of plots is desirable around the concentration of community and social facilities of the local area, which will bring a larger proportion of population within a comfortable walking distance of the proposed services and amenities. Provision of the proposed Urban Village Core (UV-2) precinct around the basic facilities and amenities will facilitate such high-density development within the local area. Such high density development will also make the provision of amenities and services economical and self-sustainable.

Medium- to Low-Density Development

Another development scenario proposed in the local area uses a typical plot configuration with a minimum developable plot size of 300 square meters. Areas surrounding the UV-2 are proposed to be developed under this envisioned condition. Developed with a plot configuration ranging above 300 square meters, with 50%-60% percent ground coverage, a maximum of three floors high, as prescribed in the proposed Development Control Regulations, and as low-rise apartments, bungalows or row houses would result in a net developable area density of 125-175 persons per hectare.

Such medium-to low-density development will be suitable for the upper-middle-class population. Pedestrian connections linking these areas with the Urban Hub and open spaces would be provided. Provisions of the Urban Village-Periphery, (UV-3) will facilitate such medium-density development.

3.8 PROPOSED AMENITIES AND FACILITIES

The proposed amenities and facilities in the local area are a direct outcome of the planning standard studies described in an earlier section of the report. The proposal also considers the provision of facilities and amenities, which will help in establishing the local area as a vibrant node of future Samtse catering to the needs of the entire town and dzongkhag.

3.8.1 Urban Hub

Urban Hub as an important Town Level Facility

The basic idea of an Urban Hub is to create a commercial center with all the public facilities. The Urban Hub envisioned in the Samtse Urban Core will not only serve the population of the local area but also the population of the town and the Samtse dzongkhag. The commercial areas and public facilities will also help in creating the needed urbaneness in the Samtse town.

Urban Hub as an important element in the transit oriented development

The Urban Hub can act either as a destination, or a transit node, with facilities for 'modal split' within the entire framework of transport suggested for Samtse town in the Structure Plan. Thus, transport facilities in the future, like an inter-town bus terminus; local level public transport, and a large taxi stand, will connect the Urban Hub with the rest of the town. Public parking will be accommodated within the Hub. People in other parts of the town, can drive to the Hub acting as a workplace and as a center for commercial, recreational facilities. They can enjoy the pedestrian oriented environment proposed within the Urban Hub.



Components of the Urban Hub

The Urban Hub can be split into the following three components:

- 1) Commercial component.
- 2) Recreational component
- 3) Public Conveniences component.

Commercial Component

This will include the town level and local level commercial activities like shopping arcades, departmental stores, bookshops, net cafés, bars, restaurants and cafeterias. It would also house private and public office spaces required for the growing business community in the town with the envisioned Special Economic Development Zone in the region. Based upon the development control regulations, there will be separate guidelines to control the ground coverage and height of these commercial buildings. There should be urban design controls for the massing and facades of these buildings. Apart from this, every commercial building should have off-street parking in the front to accommodate the visitor's vehicle parking.

As a dzongkhag headquarter, Samtse will act as a wholesale center, serving retailers in the entire catchment area. This will require "go-downs" for storage. Small scale production activities, like printing presses and cereal milling, must be provided for.

Recreational Component

This will include town level recreational facilities like cinema theatre, auditorium, pool parlours, etc. These facilities can be under private ownership. The recreational component also includes town level sports facilities like the existing football ground, indoor sporting facilities, tennis and basketball courts, archery field, etc. A system of open spaces connecting all the sporting facilities is also proposed within the Urban Village as a part of the Environmental Conservation Precinct.

Public Conveniences Component

This includes the public facilities provided by the government like a hospital, post office, banks, fire station, fuel services, etc. Most of the public conveniences at present are provided and maintained by the government and are proposed to be up-graded considering the future needs. All these public buildings are distributed along the proposed Urban Spine, which will help in visually organizing the central spine by controlling the visual massing and facades of these public buildings through Urban Design guidelines.

The Samtse Urban Core Urban Hub provides for the following amenities:

Table 3.5: List of Amenities and Facilities Proposed in the Urban Hub

Amenity	Details
Commercial Plots (private ownership)	Department stores, clinics, crèches, private hospitals, general merchandise, hardware stores, variety of shops, restaurants, bars, discos, libraries, bowling alleys, net cafés, ATM centre etc.
Offices	Offices, professional suites, studios, agencies.
Transit Terminal	Bus parking, Ticketing facility, Waiting area for passengers, Refreshment facilities, Public toilets, parking facilities.
Hospital	Up-gradation of the existing Samtse General Hospital with additional facilities.
Taxi Stand	To accommodate about 30 taxis.
Police Station	Up-gradation of the existing Royal Bhutan Police campus and a temporary jail.
Post Office and Telecommunications Center.	Up-gradation of the existing post office and telecommunication centre with facilities like, post boxes, telephone booths, telephone billing center, internet facilities, parking facilities.
Cinema Hall	Up-gradation of the existing Samphel Cinema hall refreshment facilities, public toilets, etc.
Recreation	Facilities for pool tables, caroms, cards, bowling alley, wedding hall, clubs, etc. which could be developed as a part of the commercial plots.
Service and fuel station	Up-gradation of the existing BOD fuel station with additional storage facilities for petroleum products, basic service facilities, telephone and fire fighting facilities and automobile work shops, recyclable waste store room.
Parking	Parking lots at strategic locations, road side parking facilities and plot level parking.
Public and Government Institutions	Plots for the establishment of future government and public institutions.
Spiritual and Heritage	Up-gradation of the Samtse Rabdey and its surroundings, reservation of areas within the local area for the establishment of future heritage structures,
Plazas and Green Areas	Includes open spaces, plazas, green areas, part pedestrianization of Oval core with provision for plazas.



3.8.2 Circulation System and Road Network

The Primary objective of the proposed circulation system within the local area is:

- to provide access to all the plots located within the local area;
- to facilitate uninterrupted and safe vehicular movement negotiating the topographical character of the town;
- to prevent vehicular-pedestrian conflicts;
- to provide easy off-street pedestrian movement
- to provide emergency vehicle access to all the parts of the local area; and,
- To accommodate future public transport, as it emerges.

The proposed circulation system is composed of a series of roads arranged in a hierarchical order. The Urban Spines envisioned as a part of the Samtse Structure Plan connecting the Urban Bye-Passes and the Samtse Urban Core passing through the centre of the Urban Village will form the primary road network of the local area. The proposal of the urban spine is one of the sacred and non negotiable parts of the proposed circulation system within the local area. All other secondary and access roads will originate from this urban spine serving the internal areas of the local area. This road will reserve a right-of-way of minimum 12 meters with foot paths on the either side of the road. The edge of this road will accommodate all the town level functions. This road will also form a strong welcoming gesture for the people entering the town from the Indian sub-continent.

The next set of proposed vehicular circulation network will criss-cross each other forming a system of interlinked road networks, connecting the town peripheral road systems. These roads will typically reserve a right-of-way of 10 meters with footpath on one side of the road. A typically access roads, which provide access to the individual plots located within the local area, will reserve an 8 meter right-of-way with footpaths on either side of the road or a 6 meter right-of-way with a footpath on one side of the road.

Prioritizing the pedestrian movement system is one of the prime objectives of the plan. With the given topographical condition of the town, effective organization of off street footpaths will provide for shorter walking distances routes within the local area. Apart from the proposed off street and on street footpaths, a three meter wide pedestrian pathway is proposed along the sides of the streams and natural storm water drain course (under the Environmental Conservation Precinct) and along the open space system. All the proposed pathways will criss-cross each other at regular intervals, connecting the major destination points of the local area. These proposed footpaths would roughly follow the existing foot trails and un-tarred roads.

3.8.3 Open Space System

A system of open spaces is proposed within the Samtse Urban Core Local Area Plan in the form of Local Green Space System (E-6). The proposed Environment Conservation green buffer (E-1) along the natural storm water drains and steep slope areas and Forest

Environments (E-2) will all form a part of the proposed open space system in the local area. The community parks proposed at every residential neighborhood would be an active recreational space with sports facilities, while the green buffer along the natural drains would act as passive recreational space. The proposed footpath system would connect all the proposed open spaces together, thus facilitating the pedestrians to access the open spaces easily.

The existing football ground located to the east of the town core will form the central recreational open space of the local area as well as the entire town with provision for outdoors sporting facilities like football, basketball, volleyball, archery, etc. These will also provide spaces for social and community gatherings during important national celebrations. More land has been allotted just besides the pavilion in the football ground which shall be used for construction of sports related facilities and parking during important events.

Thus pedestrian and vehicular accessibility to this local area level sporting ground will be improved. The inbuilt advantage of this ground, being at the centre of the town, will increase the usability of this open space.

The open spaces mentioned above, apart from accommodating facilities for active recreational use, will also reserve spaces for accommodating traditional and religious features like prayer flags, chortens, and prayer wheels in the town's landscape.

3.8.4 Proposed Heritage Precinct

As mentioned earlier there are a few important religious and heritage structures and precincts, within the local area which give identity to the local area. Conservation and enhancement of these religious and heritage structures, and their surroundings, form an integral part of the local area plan proposals.

Enhancement of the Samtse Rabdey and its surroundings is one of the important heritage proposals. The proposal includes establishing an identity to the Lhakhang by proper flood lighting and by reserving open spaces for accommodating religious icons and symbols.

Enhancement of the Doduel Chorten, Prayer Wheel pavilion, and its surroundings is also proposed as a part of the local area plan.

Apart, from the conservation and enhancement of the existing religious structures, the local area plan reserves lands along the open space system and major roads that will be used for accommodating traditional and religious features like prayer flags, chortens, prayer wheels and mani walls in the town's landscape. Night lighting, and monumental lighting of the existing and proposed heritage structures, would be part of the proposal.





Sources

- Total Station Survey Drawings provided by Department of Urban Development and Engineering Services, MoWHS, RGOb
- Ground Verification, June 2004 by Benninger Architectonics USA Inc, DUD&ES and Samtse Municipal Corporation

River	Asphalt Road
River Bed	Non-Asphalt Road
International Boundary	LAP Boundary

PROPOSED ROAD NETWORK PLAN

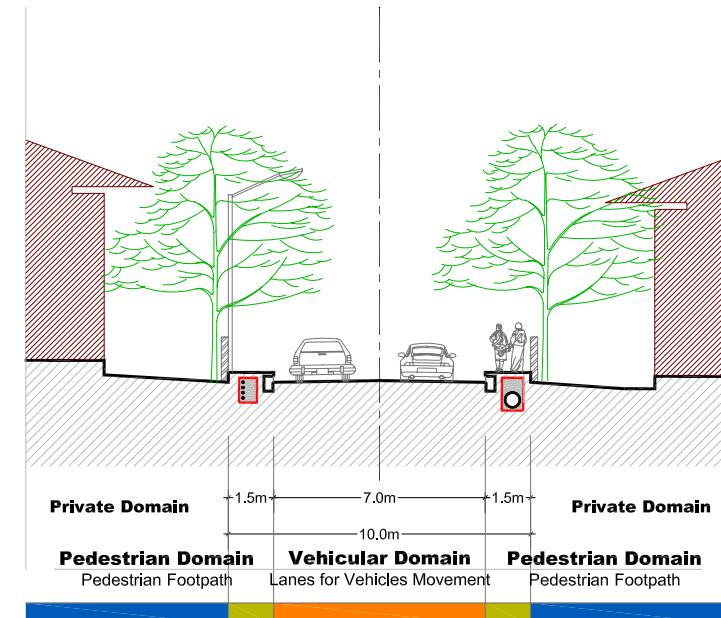
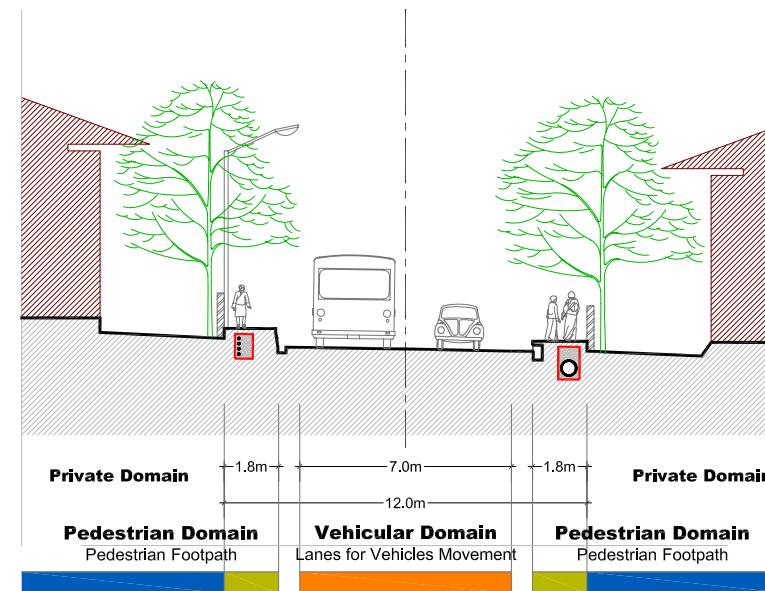
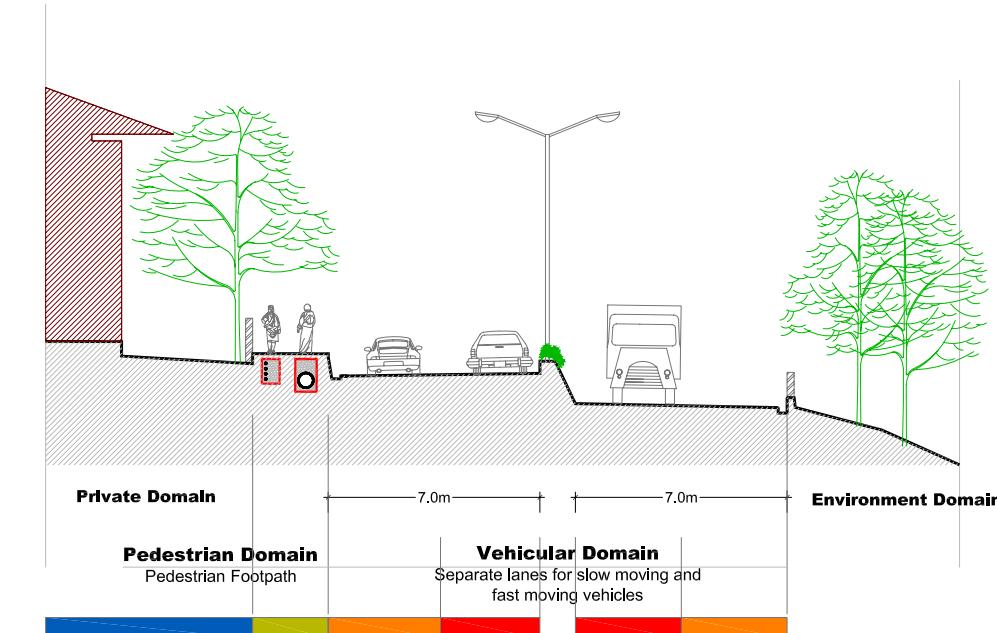
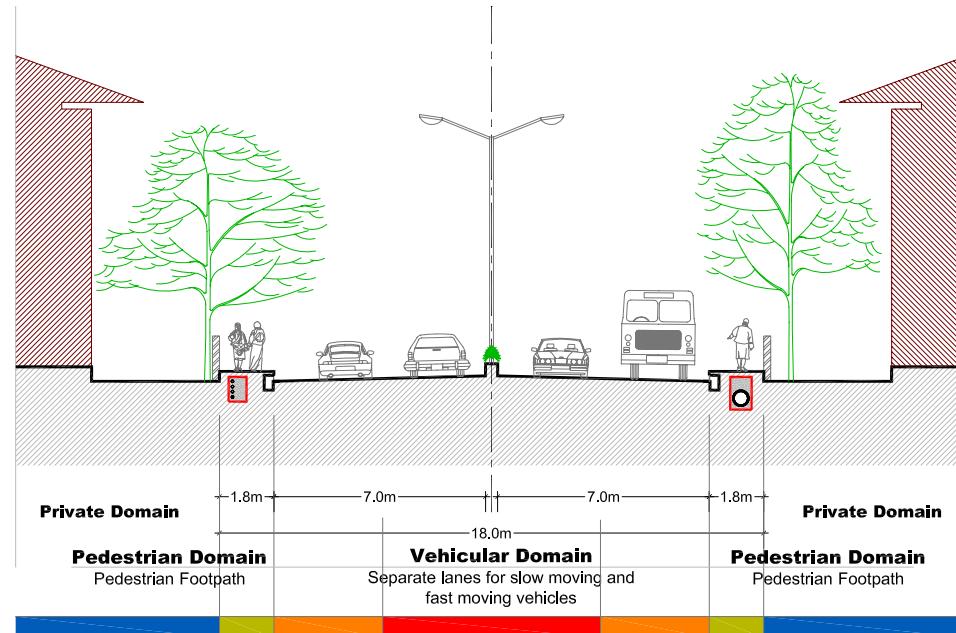
Samtse Structure Plan - Urban Core Local Area Plan

Benninger Architectonics USA Inc.
with the Department of Urban Development and Engineering Services, MoWHS, RGOb

Scale: 1:7000
May, 2005



Drawing 3.3
Page No. 17 A



Sources

* Urban Roads Standard - 2002, Standards & Quality Control Authority, Mnistry of Works and Human Settlement, RGOb.

Vector Scale Colour Code Description
Fast Moving Traffic Lane
Slow Moving Traffic Lane
Pedestrian and Bi-Cycle Lane
Private Domain

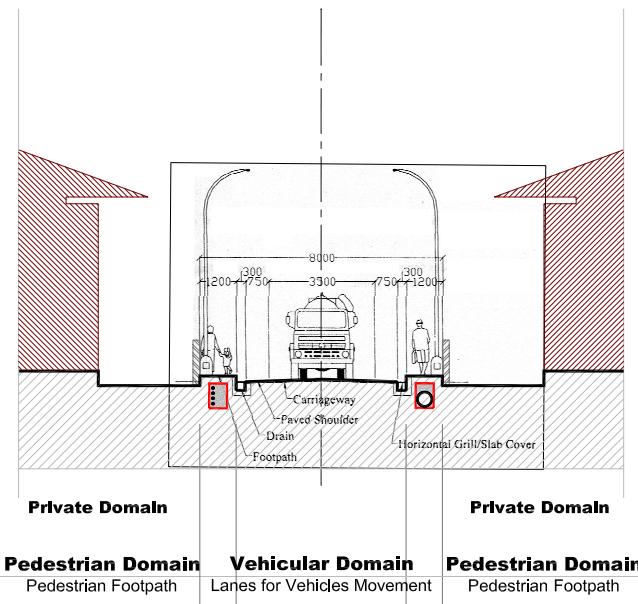
PROPOSED ROAD SECTIONS
Samtse Structure Plan - Urban Core Local Area Plan

Benninger Architectonics USA Inc.
with the Department of Urban Development and Engineering Services, MoWHS, RGOb

Scale: 1: 250
May, 2005

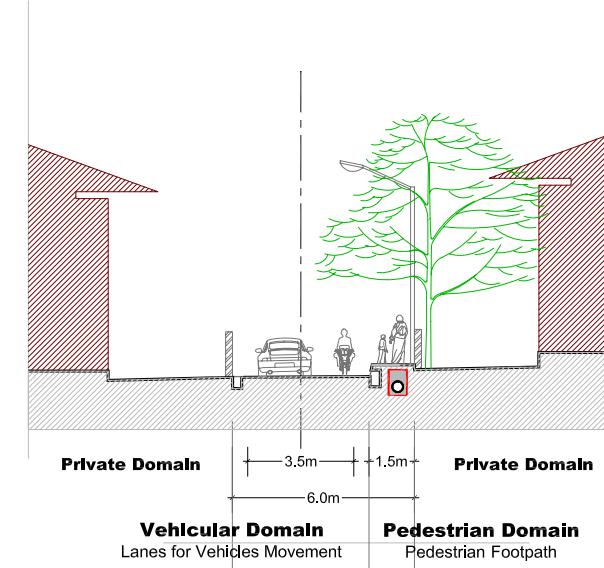
Drawing 3.4A

Page No. 17 B



Access Road (Alt # 1)

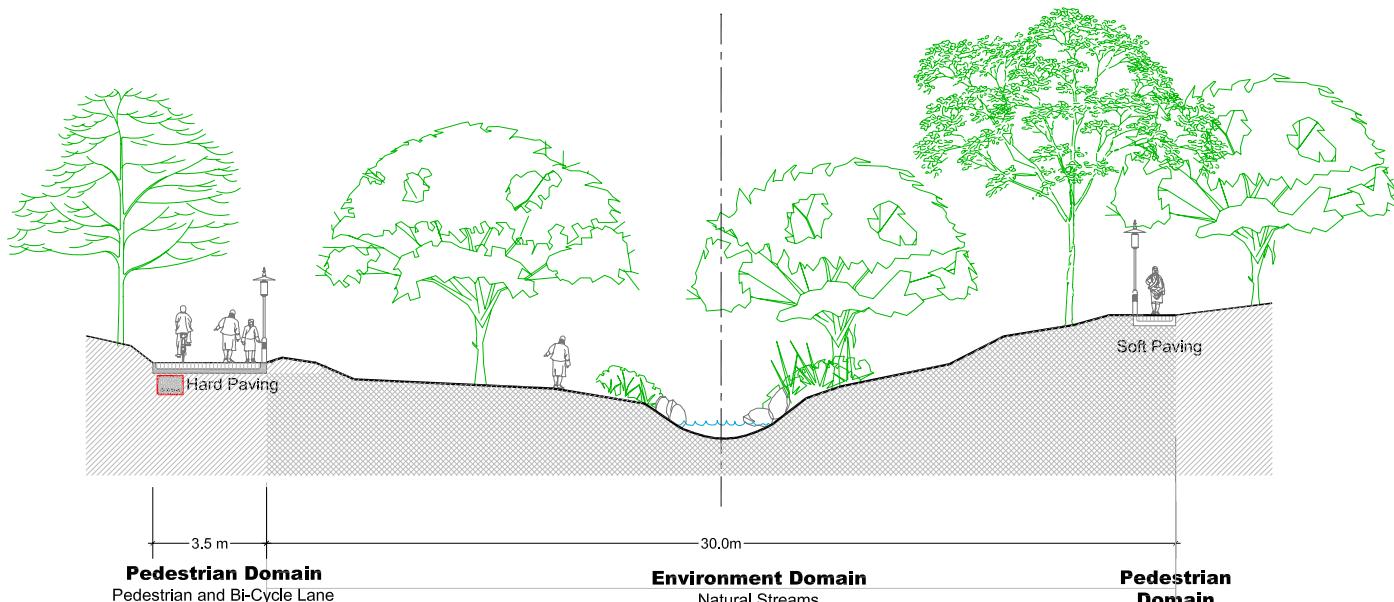
- 8 m ROW
- Single Lane Carriage way
- 1.2 m wide Pedestrian Footpath on Either Side



Access Road (Alt # 2)

(internal roads in the residential areas, connects with the secondary roads)

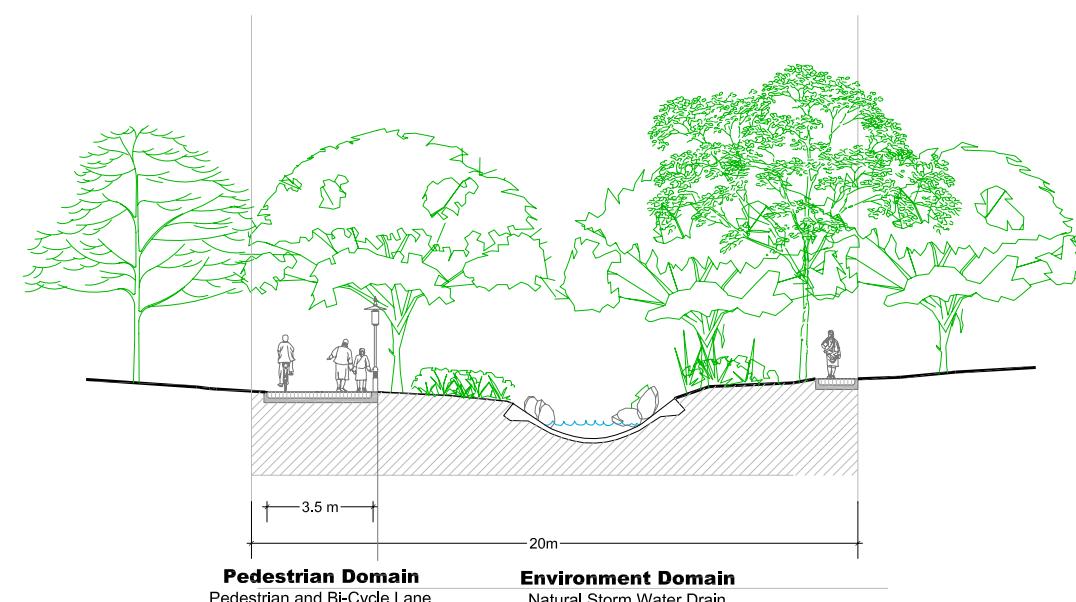
- 6 m ROW
- Single Lane Carriage way
- 1.5 m wide Pedestrian Footpath on one side
- 50 cm Paved or Earthen Shoulder on sides of the Carriage way
- Provision for Sewer Line



Off-Street Pedestrian Pathway

(pathways along the sides of natural streams)

- 30 m Environmental Protection ROW
- 3.5 m Pedestrian and Bi-Cycle lane as edge defining element
- Environment Domain along the stream course could be put into passive recreational uses



Off-Street Pedestrian Pathway

(pathways along the sides of natural storm water drains)

- 15 m ROW
- 3.5 m Pedestrian and Bi-Cycle lane on one side
- Environment Domain along the drain course could be put into active recreational use like neighborhood play areas at specific places after necessary study and without blocking the course of the natural storm water drain

Vector Scale Colour Code Description

- Fast Moving Traffic Lane
- Slow Moving Traffic Lane
- Pedestrian and Bi-Cycle Lane
- Private Domain
- Road Side Parking

PROPOSED ROAD SECTIONS

Samtse Structure Plan - Urban Core Local Area Plan

Benninger Architectonics USA Inc.
with the Department of Urban Development and Engineering Services, MoWHS, RGOb

Scale: 1: 250

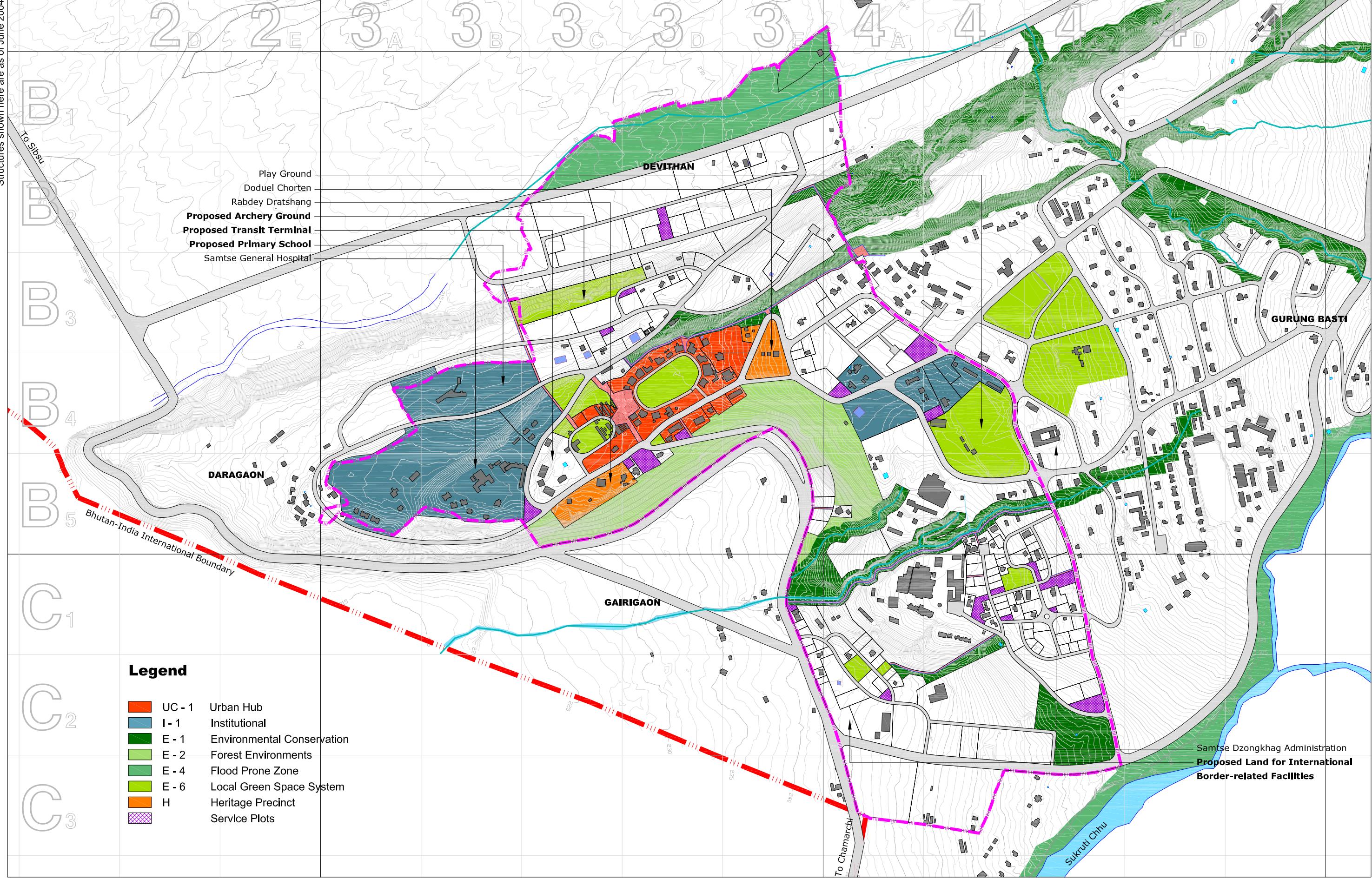
Drawing 3.4B

May, 2005

Page No. 17 C

Sources

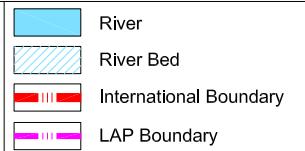
* Urban Roads Standard - 2002, Standards & Quality Control Authority, Ministry of Works and Human Settlement, RGOb.





Sources

- * Total Station Survey Drawings provided by Department of Urban Development and Engineering Services, MoWHS, RGOb
- * Ground Verification, June 2004 by Benninger Architecture USA Inc., DUD&ES and Samtse Municipal Corporation

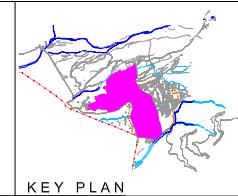


PROPOSED AMENITIES AND SERVICES PLAN

Samtse Structure Plan - Urban Core Local Area Plan

Benninger Architecture USA Inc.
with the Department of Urban Development and Engineering Services, MoWHS, RGOb

Scale: 1:7000
May, 2005



Drawing 3.6
Page No. 17 E

3.9 PROPOSED UTILITIES AND SERVICE NETWORKS

Planning for Utilities and Services is crucial for both the future development envisioned in the local area and to ensure better living conditions in the town. It must also be noted that the selection of appropriate utilities systems, and their design, should be done by qualified public health engineers. In this local area plan a conceptual network of these systems are envisioned so that the network rights-of-way can be reserved and preliminary estimates can be done. The actual designs and costs will be carried out by public health engineers engaged by DANIDA, who shall interact with the stake holders of Samtse.

3.9.1 Water Supply System

Water Supply demand for the residential population of the Gurung Basti local area is estimated to be 7,88,500 liters per day, considering an average of 140 liters per person per day, as per the planning standards. As mentioned earlier, provision of a new water supply network in Samtse town is under conceptualization, with DANIDA funding. The present source of water supply for the town will still function as the source for coming two decades. Though the detailing and designing of this new water-supply scheme, and its distribution system, has not yet been started under this programme, it is assumed that the water supply distribution system will be gravity based one. Construction of a water treatment plant for potable water supply in the town is necessary and needs to be carried out in a priority basis.

Presently, though there exists a rudimentary water supply network within the local area that draws water from the water reservoir located to the west of the National Jersey Breeding Center upper terrace, considering the future demands, and the areas the proposed water supply network should cater to, it is proposed that a separate intermediate water reservoir should be established for Urban Core area, which will cater to the water supply requirements of the local area. Since, the envisioned distribution system is proposed to be gravity based one; the water reservoir could be located to the east of the local area, taking advantage of the topographical condition of the town.

The storage capacity of the reservoir should be designed considering the distribution timing to various parts of the local area, and the respective population served. Potable water from the proposed treatment plant, will be transmitted to this water reservoir through appropriate mechanism, from where the water will be distributed to the local area through a gravity-flow system. The distribution network is proposed to be of Galvanized Iron / Ductile Iron pipes.

3.9.2 Sewerage System

Installation and development of a well established sewerage network within the Samtse town is another area which needs due consideration. With the envisioned population growth in the town over coming two decades makes this issue crucial. If proper sanitation facilities are not proposed and implemented in pace with the urban development, Samtse will fall as a victim of deteriorating living standard with high health risks. The existing topographical condition of the

town could be advantageously used for the establishment of a sewerage system within the town which will also serve the local area. The treatment plant shall be located along the Dumdum river bed which could be connected to the main trunk line conceptually proposed to be laid along the northern edge of the town adjoining the steep slope area, from where further connections to the internal parts of the future urban development could be established taking advantage of the slopes. The proposed road and pedestrian network within the local area will also facilitate such a distribution system.

The sewerage network within the local area will be accommodated on the special service ducts proposed underneath the footpaths. No sewer will run under the road carriageway, which hinders traffic flow during maintenance.

3.9.3 Solid Waste Management System

Efficient management of solid waste requires a proper collection and disposal system within the local area networked into the entire town system.

Samtse town, being a society of strong community relationships, provides great flexibility to propose the system of segregating the waste at the source itself. This will greatly help in minimizing the volume of solid waste disposed at the disposal site. It is proposed that public participation in solid waste management should be encouraged in the town by decentralizing the collection and disposal process. The solid waste can be segregated into recyclable and non-recyclable wastes, which could be re-cycled, or disposed of appropriately.

It is proposed that the High-density development (UV-2) envisioned surrounding the proposed Village Square (community and social facilities hub) be served by a door-to-door solid waste collection system. The medium- and low-density residential development areas, located within the local area, will be provided with community bins, at regular intervals and at strategic points, where each household will dispose its waste. Under the proposed system, the community will hire the services of the Municipal Corporation's trained workers (by paying service charges) to collect the waste from each household and the community garbage Bins. The workers will be trained to segregate the waste into recyclable and non-recyclable categories and will dump the non-recyclable wastes in the main garbage bins located along the primary roads at regular intervals. Disposal of this waste from these bins will be carried out by the Municipal Corporation on a regular basis, by trucking the waste to the identified land-fill sites.

Identification of an appropriate disposal system for the collected solid waste is another crucial factor which needs to be prioritized.



3.9.4 Street Lighting System

An adequate street lighting system is proposed along the road network in the local area. Since there is no organized street lighting system available in the local area, the entire system needs to be installed. Details of the proposed street lighting system are as follows:

Table 3.7: Details of the Proposed Street Lighting System in the Local Area

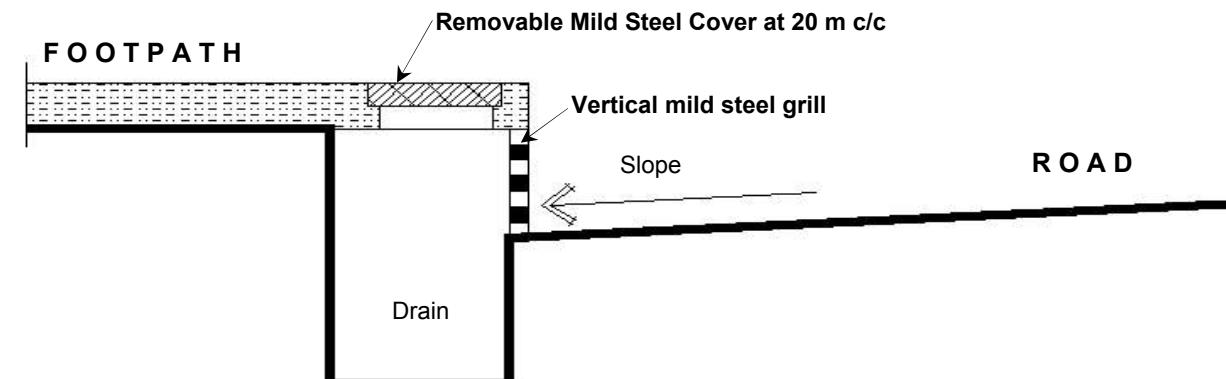
Road Hierarchy	Location	c/c Distance	Type
Urban Bye-Pass	Along the Median	30 meters	400W Mercury / Sodium Vapor or 35W Low Pressure Sodium Vapor
Urban Spine connecting Urban Village and the Urban Core	Along the Footpaths on either sides of the roads	30 meters	400W Mercury / Sodium Vapor or 35W Low Pressure Sodium Vapor
Collector Roads (Secondary Roads)	Along the Footpaths, on either side of the roads, in a staggered manner	30 meters	150W Mercury / Sodium Vapor
Access Streets inside the Residential Neighborhoods	Along the Footpaths, on one side of the roads	20 meters	75W sodium vapor / 125 W Mercury Vapor
Foot Paths	On either sides of the footpaths in a staggered manner	20 meters	150W Decorative Lamps / 75 W Sodium Vapor / 125W Mercury Vapor

3.9.5 Storm Water Drainage System

Samtse, with its topographical condition, needs an established storm water drainage network to avoid flooding and water clogging in low-lying areas. The issue gets further exaggerated given the high amount of rainfall the town receives during monsoons. The existing topographical conditions of the local area, creating a natural surface storm water drainage pattern within the town's landscape, should be protected to allow for a smooth out-flow of the storm water from the local area. For this reason environment protection buffers are proposed along the sides of these natural storm water drains, which will form the primary storm water drainage network.

The secondary storm-water drainage network will run underneath the on-street footpaths. A typical drain laid under the footpath, will have vertical grills, at appropriate intervals, as part of the level-difference between the footpath and the carriageway. This arrangement is suitable to prevent blocking of the drains due to garbage and other waste being accumulated on the horizontal grills.

These secondary drains will open out into the natural storm water drains which will connect to the rivers flowing adjoining the town at regular intervals. The points will be provided with storm water drain purification ponds, which will filter and purify the organic and suspended particles, carried by the surface run-off, before joining these water bodies. These ponds will also act as a recreational feature along the river and stream side green belt.



Typical Section: Storm Water Drainage

3.9.6 Fire Fighting Facilities

To satisfy and safeguard the fire fighting requirements of the local area, it is proposed that there should be a reservoir of approximately 50cum (50,000 Liters) capacity. This recommendation has been adopted from the recommendations of the Draft Planning Standards for Urban Settlements in Bhutan, by the Department of Urban Development and Housing, MoC, 1999.

It is proposed that this reservoir be established in the higher elevation point of the Urban Village to satisfy the fire safety requirements. It is proposed that from the storage reservoir a pressurized network of Water Supply be established to enable the setting up of on-street "Fire-Hydrants" within the Village Square, the high-density development areas surrounding the Village Square, and in institutional development areas, at an interval of 120 meters. It is proposed that medium- and low-density residential areas be served by fire engines. A fire engine halt is proposed to be located within the Urban Core, to cater to this need. It is also proposed that, a "village volunteer fire-fighting force", be created within the local area, which will carry out preventive inspections of each house annually, run community functional education classes on fire prevention, and fire fighting itself, recommend the types and placement locations of extinguishers and train selected youth in rapid action fire fighting.

Annexure - 1 PLOT - RECONFIGURATION TABLES



Table – 1 Plot Re-Configuration Table for Private Owned Plots

No	Owner's Name	Thram No.	Current Plot No.	Sheet No.	Registered Area as per Cadastral Data		25% Land Pooling Area (Sq.M.)	Ownership Area after Land Pooling (Sq.M.)	Final Allotted Area		Final Plot No.	Sub-Divided Plot Areas (Sq.M.)	Precinct Usage	Remarks
					Acres	Sq.M.			Acres	Sq.M.				
1	Usha Dukpa	97-02	56/A	Q3/24	0.3	1214.05	303.51	910.54	0.22	910.22	56/A		UV-3	
2	Omnath Gurung	97-10	102	Q3/24	0.18	728.43	182.11	546.32	0.14	547.13	102		UV-3	
3	Dil Bdr. Gurung	97-11	105/A	Q3/24	0.25	1011.71	252.93	758.78	0.19	757.34	105/A		UV-3	
4	Pema Tshering	97-12	101	Q3/24	0.5	2023.41	505.85	1517.56	0.37	1517.26	101		UV-3	
5	Ragu Raj Gurung	97-13	103/C	Q3/24	0.14	566.56	141.64	424.92	0.10	424.91	103/C		UV-3	
6	Tshering Dorji	97-14	105	Q3/23	0.68	2751.84	687.96	2063.88	0.51	2063.6	105		UV-2	
7	Tshering Dorji	97-14	107	Q3/24	0.48	1942.48	485.62	1456.86	0.36	1457.22	107		UV-3	
8	Kabi Raj Gurung	97-15	94	Q3/24	0.38	1537.79	384.45	1153.35	0.29	1153.59	94-i	774.01	UV-3	Plot Split into two individual plots due to presence of existing permanent structures in the original plot.
											94-ii	379.58	UV-3	
9	Kabi Raj Gurung	97-15	95	Q3/24	0.36	1456.86	364.21	1092.64	0.27	1094.86	95		UV-3	
10	Nar Bdr. Tamang	97-16	92	Q3/24	0.12	485.62	121.40	364.21	0.12	485.95	92		UV-3	Plot not considered for Land Pooling due to the presence of existing permanent structure within the plot. Additional land area should be compensated Monetarily.
11	Indra Maya Chhetri	97-18	99	Q3/23	0.2	809.37	202.34	607.02	0.20	809.88	99		UV-3	Plot not considered for Land Pooling due to the presence of existing permanent structure within the plot. Additional land area should be compensated Monetarily.
12	Tobgay	97-19	101	Q3/23	0.4	1618.73	404.68	1214.05	0.30	1214.91	101		UV-2	
13	Bijay Mucktan	97-20	98	Q3/24	0.12	485.62	121.40	364.21	0.19	768.75	98	UV-3	Considered as a single plot due to un-clear plot demarcation between the plots. Plot not considered for Land Pooling due to the presence of existing permanent structures within the plot. Additional land area should be compensated Monetarily.	
14	Indar Bir Mucktan	97-39	97/A	Q3/24	0.07	283.28	70.82	212.46			97/A			
15	Sonam Chokey	97-21	108	Q3/24	1.08	4370.57	1092.64	3277.93	0.81	3277.79	108		UV-3	
16	L.B. Gurung/Reeta Gurung	97-22	106	Q3/24	0.5	2023.41	505.85	1517.56	0.38	1518.85	106		UV-3	
17	Parsu Ram Gurung	97-23	103/A	Q3/24	0.14	566.56	141.64	424.92	0.10	424.64	103/A		UV-3	
18	Pushp Raj Gurung		108/A-X-A	Q3/24	0.12	485.62	121.40	364.21	0.09	363.03	108/A-X-A		UV-3	
19	Tandin Wangmo	97-24	108/A-X-B	Q3/24	0.12	485.62	121.40	364.21	0.09	364.16	108/A-X-B		UV-3	
20	Pa Raj Tamang	97-25	108/A-X-D	Q3/24	0.12	485.62	121.40	364.21	0.12	486.27	108/A-X-D		UV-3	Plot not considered for Land Pooling due to the presence of existing permanent structure within the plot. Additional land area should be compensated Monetarily.
21	Tshewang Pelmo	97-26	103/B	Q3/24	0.23	930.77	232.69	698.08	0.17	699.67	103/B		UV-3	
22	Wangmo	97-30	56	Q3/24	0.88	3561.21	890.30	2670.90	0.66	2670.36	56		UV-3	
23	D.K Gurung	97-31	105	Q3/24	0.4	1618.73	404.68	1214.05	0.30	1217.78	105		UV-3	
24	Pretiman Tamang	97-33	82 & 84	Q3/24	0.98	3965.89	991.47	2974.42	0.74	2974.53	82 & 84		E-7	
25	Harka Narayan Pradhan	97-34	86	Q3/24	0.4	1618.73	404.68	1214.05	0.30	1214.96	86		UV-3	
26	Ruthara Mane Mucktan	97-37	94/B	Q3/24	0.2	809.37	202.34	607.02	0.15	607.37	94/B		UV-3	



No	Owner's Name	Thram No.	Current Plot No.	Sheet No.	Registered Area as per Cadastral Data		25% Land Pooling Area (Sq.M.)	Ownership Area after Land Pooling (Sq.M.)	Final Allotted Area		Final Plot No.	Sub-Divided Plot Areas (Sq.M.)	Precinct Usage	Remarks
					Acres	Sq.M.			Acres	Sq.M.				
27	Sangay Kumar Tamang	97-38	87/B	Q3/24	0.1	404.68	101.17	303.51	0.08	303.69	87/B		UV-3	House was constructed over Plot No. 87/A which is an Excess Government Land and now has been regularised.
28	Tshering Wangdi	97-41	102/A	Q3/24	0.08	323.75	80.94	242.81	0.07	300.38	102/A		UV-3	Additional area allotted to achieve a plot area more than 300 Sq.Mts, which is the minimum plot size for urban development. Additional land area should be compensated Monetarily.
29	Mane Raj Rai	97-42	99	Q3/24	0.26	1052.17	263.04	789.13	0.20	789.83	99		UV-3	
30	Ugyen Wangmo	97-43	95/A	Q3/24	0.1	404.68	101.17	303.51	0.08	303.8	95/A		UV-3	
31	Menuka Chhetri	97-44	96	Q3/24	0.25	1011.71	252.93	758.78	0.19	758.92	96		UV-3	
32	Rathna Bdr. Gurung	97-45	106	Q3/23	1	4046.83	1011.71	3035.12	0.75	3035.59	106		UV-2	
33	Chokey Dukpa	97-50	105/B	Q3/24	0.2	809.37	202.34	607.02	0.15	607.89	105/B			
34	Lhaba Dorji	97-53	89	Q3/24	0.12	485.62	121.40	364.21	0.12	486.45	89		UV-3	Plot not considered for Land Pooling due to the presence of existing permanent structure within the plot. Additional land area should be compensated Monetarily.
35	Naiten Mo	97-54	84/A	Q3/24	0.2	809.37	202.34	607.02	0.15	608.58	84/A		UV-3	
36	Nenuka Dorjee	97-55	94/D	Q3/24	0.12	485.62	121.40	364.21	0.09	364.53	94/D		UV-3	
37	Nandu Giree	97-56	103/D	Q3/24	0.5	2023.41	505.85	1517.56	0.37	1517.48	103/D		UV-3	
38	Hera Devi Gurung	97-57	103/E	Q3/24	0.1	404.68	101.17	303.51	0.07	303.51	103/E		UV-3	
39	Sonam Udon	97-60	126	Q3/24	2.42	9793.32	2448.33	7344.99	1.82	7347.59	126		UV-3	
40	Army Welfare Project	97-62	90	Q3/24	9.46	38282.96			10.69	43260.31	89/A + 90		E-8	Plot not considered for Land Pooling due to the present nature of land-use. The consolidated plot is demarcated under E-8 (Endowment for Future Precinct)
41	Army Welfare Project	97-62	89/A	Q3/24	1.23	4977.59								
42	Army Welfare Project	97-62	90/A	Q3/24	1.67	6758.20			1.67	6759.27	90/A		E-8	Plot not considered for Land Pooling due to the present nature of land-use. The plot is demarcated under E-8 (Endowment for Future Precinct)
43	Army Welfare Project	97-83	127	Q3/24	3.65	14770.91			6.58	26629.9	127 + 128		E-8	Plot not considered for Land Pooling due to the present nature of land-use. The consolidated plot is demarcated under E-8 (Endowment for Future Precinct)
44	Army Welfare Project	97-83	128	Q3/24	2.93	11857.20								
45	Ganga Sharma	97-64	94/C	Q3/24	0.2	809.37	202.34	607.02	0.15	607.75	94/C		UV-3	
46	Aum Bhakum	97-65	A	Q3/24	0.2	809.37	202.34	607.02	0.15	607.21	A		UV-3	
47	Chandra Bdr. Thapa	97-66	57	Q3/24	2.07	8376.93	2094.23	6282.70	2.28	9224.77	57 + 129 + 130		UV-3	Combined Plot No. 57, 129 and 130 and allotted one plot.
48	Chandra Bdr. Thapa	97-66	130	Q3/24	0.13	526.09	131.52	394.57						
49	Chandra Bdr. Thapa	97-66	129	Q3/24	0.84	3399.33	849.83	2549.50						
50	Chandra Bdr. Thapa	97-66	81	Q3/24	0.36	1456.86	364.21	1092.64	0.38	1546.21	81 + 81/A		E-7	Combined Plot No. 81 and 81/A and allotted one plot.
51	Chandra Bdr. Thapa	97-66	81/A	Q3/24	0.15	607.02	151.76	455.27						
52	Binoy Moktan	97-68	98/A	Q3/24	0.19	768.90	192.22	576.67	0.14	575.62	98/A		UV-3	
53	Karchung Dorji	97-70	130/A	Q3/24	0.7	2832.78	708.19	2124.58	0.53	2124.73	130/A		UV-3	
54	Sangay Tashi	97-71	92/A	Q3/24	0.18	728.43	182.11	546.32	0.13	546.07	92/A		UV-3	



No	Owner's Name	Thram No.	Current Plot No.	Sheet No.	Registered Area as per Cadastral Data		25% Land Pooling Area (Sq.M.)	Ownership Area after Land Pooling (Sq.M.)	Final Allotted Area		Final Plot No.	Sub-Divided Plot Areas (Sq.M.)	Precinct Usage	Remarks
					Acres	Sq.M.			Acres	Sq.M.				
55	Sonam Choeki	97-72	80	Q3/24	0.1	404.68	101.17	303.51	0.08	303.83	80		E-7	
56	Ganesh Gurung	97-73	102/B	Q3/24	0.12	485.62	121.40	364.21	0.09	364.99	102/B		UV-3	
57	Ran Singh Tamang	97-75	102/D	Q3/24	0.12	485.62	121.40	364.21	0.09	364.08	102/D		UV-3	
58	Chandra Kr.Thapa	97-77	94/F	Q3/24	0.12	485.62	121.40	364.21	0.09	364.22	94/F		UV-3	
59	Budha Maya Pradhan	97-78	94/G	Q3/24	0.12	485.62	121.40	364.21	0.09	364.02	94/G		UV-3	
60	Suman Pradhan	97-79	94/H	Q3/24	0.12	485.62	121.40	364.21	0.09	364.94	94/H		UV-3	
61	Krishna Pradhan	97-80	94/E	Q3/24	0.12	485.62	121.40	364.21	0.09	366.83	94/E		UV-3	
62	Dorji Wangchuck	97-82	102/E	Q3/24	0.12	485.62	121.40	364.21	0.09	364.65	102/E		UV-3	
63	M.K.Rai	97-84	95/B	Q3/24	0.13	526.09	131.52	394.57	0.10	395.24	95/B		UV-3	
64	B.B.Chetri	97-87	83/A	Q3/24	0.4	1618.73	404.68	1214.05	0.30	1216.52	83/A		UV-3	
65	Thuli Maya Tamang	97-88	92/C	Q3/24	0.12	485.62	121.40	364.21	0.12	485.78	92/C		UV-3	Plot not considered for Land Pooling due to the presence of existing permanent structure within the plot. Additional land area should be compensated Monetarily.
66	G.L.Gurung	97-90	103	Q3/24	0.27	1092.64	273.16	819.48	0.20	820.16	103		UV-3	
67	Suman Tamang	97-91	84/C	Q3/24	0.15	607.02	151.76	455.27	0.11	455.26	84/C		UV-3	
68	Bhupen Kr. Chetri	97-92	83	Q3/24	0.18	728.43	182.11	546.32	0.14	546.88	83		UV-3	
69	Deo Kr.Tamang	97-93	87	Q3/24	1.29	5220.40	1305.10	3915.30	0.97	3918.49	87		UV-3	
70	Pa Tshering Lepcha	97-94	88	Q3/24	0.8	3237.46	809.37	2428.10	0.60	2428.67	88		UV-3	
71	Tshombu Dukpa	97-95	56/B	Q3/24	0.3	1214.05	303.51	910.54	0.23	910.92	56/B		UV-3	
72	Pemba Tshering	97-97	56/C	Q3/24	0.3	1214.05	303.51	910.54	0.23	911.76	56/C		UV-3	
73	Karma Tshering	97-98	56/D	Q3/24	0.3	1214.05	303.51	910.54	0.22	910.53	56/D		UV-3	
74	Singyela	97-99	84/B	Q3/24	0.12	485.62	121.40	364.21	0.09	364.66	84/B		UV-3	
75	Tshewang Rinzin	97-111	102/F	Q3/24	0.12	485.62	121.40	364.21	0.09	364.87	102/F		UV-3	
76	Norbu Cheozom	97-112	102/G	Q3/24	0.12	485.62	121.40	364.21	0.09	364.24	102/G		UV-3	
77	Jigmey	97-114	102/C	Q3/24	0.15	607.02	151.76	455.27	0.11	455.96	102/C		UV-3	
78	Jinlab Chhoden	97-115	84/D	Q3/24	0.23	930.77	232.69	698.08	0.17	698.11	84/D		UV-3	
79	Dung Dorji	97-115/A	95/D	Q3/24	0.1	404.68	101.17	303.51	0.08	303.83	95/D		UV-3	
80	Phuntsho Duba	97-117	108/A	Q3/24	0.12	485.62	121.40	364.21	0.09	366.72	108/A		UV-3	
81	D A Mothi	97-118	57/A	Q3/24	0.4	1618.73	404.68	1214.05	0.30	1214.18	57/A		UV-3	
82	Pema Chhoden	97-119	100/B	Q3/24	0.12	485.62	121.40	364.21	0.09	364.71	100/B		UV-3	
83	Sonam Lhaki	97-120	100/A	Q3/24	0.12	485.62	121.40	364.21	0.09	364.85	100/A		UV-3	
84	Bema Kumari Tamang	97-122	82/A	Q3/24	0.4	1618.73	404.68	1214.05	0.30	1215.44	82/A		UV-3	
85	Karma Lhamo	97-123	100/C	Q3/24	0.12	485.62	121.40	364.21	0.09	365.77	100/C		UV-3	



No	Owner's Name	Thram No.	Current Plot No.	Sheet No.	Registered Area as per Cadastral Data		25% Land Pooling Area (Sq.M.)	Ownership Area after Land Pooling (Sq.M.)	Final Allotted Area		Final Plot No.	Sub-Divided Plot Areas (Sq.M.)	Precinct Usage	Remarks	
					Acres	Sq.M.			Acres	Sq.M.					
86	Kumar Singh Rai	97-124	82/C	Q3/24	0.12	485.62	121.40	364.21	0.09	365.61	82/C		UV-3		
87	Chhoden	97-125	82/B	Q3/24	0.15	607.02	151.76	455.27	0.11	455.82	82/B		E-7		
88	Tshering Chhoden	97-126	88/A	Q3/24	0.12	485.62	121.40	364.21	0.09	364.41	88/A		UV-3		
89	Chhokey Yangzom	97-127	88/B	Q3/24	0.12	485.62	121.40	364.21	0.09	365.14	88/B		UV-3		
90	Yoeser Lhamo	97-128	88/C	Q3/24	0.12	485.62	121.40	364.21	0.09	364.16	88/C		UV-3		
91	Sonam Tshering	49	97/A	Q3/23	0.35	1416.39	354.10	1062.29	0.26	1062.81	97/A		UV-2	Old Thram Number. New Thram Numbar need to be verified.	
92	BFPL		106/A	Q3/23	1	4046.83	1011.71	3035.12	0.75	3035.48	106/A		UV-2		
93	BFPL		112/A	Q3/23	1.47	5948.83			9.51	38490.25	BFPL-i	35891.96	E-8	Plot not considered for Land Pooling due to the present nature of land-use. The consolidated plot is demarcated under E-8 (Endowment for Future Precinct)	
94	BFPL		91	Q3/24	1.55	6272.58					BFPL-ii	2598.29	E-8	Plot not considered for Land Pooling due to the present nature of land-use. The consolidated plot is demarcated under E-8 (Endowment for Future Precinct)	
95	BFPL		91/B	Q3/24	5.83	23592.99									
96	BFPL		91/A	Q3/24	3.63	14689.97									
97	Thawa Tenzin	Not Known	57/B	Q3/24	0.5	2023.41	505.85	1517.56	0.38	1517.92	57/B		UV-3		
DEVITHAN															
98	Dil Bahadur Darji	148	23	Q3/23	0.55	2225.75	556.44	1669.32	0.41	1669.75	23		SE-4		
99	Ram Das Pradhan	149	43/A-X	Q3/23	0.1	404.68	101.17	303.51	0.08	303.73	43/A-X		UV-3		
100	Shyem Doj Rai	150	43/B	Q3/23	0.20	809.37	202.34	607.02	0.15	607.49	43/B		UV-3		
101	Thinley Drukpa	152	25/A	Q3/23	1	4046.83	1011.71	3035.12	1.91	7710.42	20+24+25/A +31	SE-4	Combined Plot No. 20, 24, 25/A and 31 and allotted one plot.		
102	Thinley Drukpa	152	20	Q3/23	0.43	1740.13	435.03	1305.10							
103	Thinley Drukpa	152	24	Q3/23	0.94	3804.02	951.00	2853.01							
104	Thinley Drukpa	152	31	Q3/23	0.17	687.96	171.99	515.97							
105	Chandra Pradhan	238	33	Q3/23	2.62	10602.68	2650.67	7952.01	2.51	10137.79	33+36-i	3195.87	UV-2	Combined Plot No. 33 and 36 and allotted two plots.	
111	Chandra Pradhan	238	36	Q3/23	0.72	2913.71	728.43	2185.29			33+36-ii	6941.92	UV-3		
106	Chandra Pradhan	238	34	Q3/23	3.44	13921.08	3480.27	10440.81	2.58	10444.22	34		UV-3		
107	Chandra Pradhan	238	16	Q3/23	1.47	5948.83	1487.21	4461.62	1.32	5341.22	16 + 22	SE-4	Combined Plot No. 16 and 22 and allotted one plot.		
108	Chandra Pradhan	238	22	Q3/23	0.29	1173.58	293.39	880.18							
109	Chandra Pradhan	238	95	Q3/23	0.85	3439.80	859.95	2579.85	0.64	2579.95	95		UV-2	Plot has been relocated form its original location on account of steep slope.	
110	Chandra Pradhan	238	35	Q3/23	1.60	6474.92	1618.73	4856.19	1.20	4856.98	35		UV-3		
111	Purna Bdr. Pradhan	239	37	Q3/23	0.51	2063.88	515.97	1547.91	0.38	1547.59	37		UV-3		
112	Loknath Sharma	240	45	Q3/23	0.34	1375.92	343.98	1031.94	0.26	1033.48	45		UV-2		
113	Loknath Sharma	240	46	Q3/23	0.92	3723.08	930.77	2792.31	0.69	2792.11	46		UV-3		
114	Loknath Sharma	240	48	Q3/23	1.47	5948.83	1487.21	4461.62	1.10	4466.45	48		UV-3		



No	Owner's Name	Thram No.	Current Plot No.	Sheet No.	Registered Area as per Cadastral Data		25% Land Pooling Area (Sq.M.)	Ownership Area after Land Pooling (Sq.M.)	Final Allotted Area		Final Plot No.	Sub-Divided Plot Areas (Sq.M.)	Precinct Usage	Remarks
					Acres	Sq.M.			Acres	Sq.M.				
115	Loknath Sharma	240	53	Q3/23	1.45	5867.90	1466.97	4400.92	1.09	4404.94	53		UV-3	
116	Loknath Sharma	240	82	Q3/23	0.62	2509.03	627.26	1881.77	0.46	1881.23	82		UV-2	
117	Karma Pemo	241	51	Q3/23	0.12	485.62	121.40	364.21	1.67	6738.57	51+54-i	5606.79	UV-3	Combined Plot No. 51 and 54 and allotted two plots.
118	Karma Pemo	241	54	Q3/23	2.1	8498.33	2124.58	6373.75			51+54-ii	1131.78	UV-3	
119	Akal Man Pradhan	243	42	Q3/23	0.8	3237.46	809.37	2428.10	0.60	2428.46	42		UV-2	
120	Akal Man Pradhan	243	21	Q3/23	0.88	3561.21	890.30	2670.90	0.66	2670.4	21		SE-4	
123	Akal Man Pradhan	243	38	Q3/23	0.16	647.49	161.87	485.62	2.09	8439.32	38 + 39		UV-3	Combined Plot No. 38 and 39 and allotted one plot.
121	Akal Man Pradhan	243	39	Q3/23	2.62	10602.68	2650.67	7952.01						
122	Akal Man Pradhan	243	21/A	Q3/23	0.46	1861.54	465.38	1396.15	0.34	1395.72	21/A		UV-3	
123	Nandu Kumar Pradhan	245	17	Q3/23	0.40	1618.73	404.68	1214.05	1.69	6829.81	17 + 17/A		SE-4	Combined Plot No. 17 and 17/A and allotted one plot.
124	Nandu Kumar Pradhan	245	17/A	Q3/23	1.85	7486.63	1871.66	5614.97						
125	Maya Rai	251	43	Q3/23	0.78	3156.52	789.13	2367.39	0.58	2367.17	43		UV-3	
126	Thinley Budhar	402	15	Q3/23	1.47	5948.83	1487.21	4461.62						Plot not considered for Land Pooling nor Relocated since Permanent Structure exists.
127	Sonam Phuntsho	501	26	Q3/23	1	4046.83	1011.71	3035.12	0.75	3035.91	26		SE-4	
128	Norbu Tshering	519	29	Q3/23	5.9	23876.27	5969.07	17907.20	4.42	17907.1	29		SE-4	
129	Norbu Tshering	519	30	Q3/23	0.37	1497.33	374.33	1122.99	0.28	1122.76	30		SE-4	
130	Ram Bahadur Pradhan	561	32	Q3/23	2.21	8943.48	2235.87	6707.61	1.66	6707.85	32		UV-3	
131	Ram Bahadur Pradhan	561	41	Q3/23	0.24	971.24	242.81	728.43	0.18	728.64	41		UV-3	
132	Tshering Dorji	605	43/A	Q3/23	0.13	526.09	131.52	394.57	0.10	395.17	43/A		UV-3	
133	Kuenley	662	28	Q3/23	2.86	11573.92	2893.48	8680.44	2.15	8680.48	28		SE-4	
134	Kuenley	662	21/B	Q3/23	0.5	2023.41	505.85	1517.56	0.38	1517.75	21/B		SE-4	
135	Pema Zangmo	663	49	Q3/23	3	12140.48	3035.12	9105.36	2.25	9105.37	49-i	8045.74	SE-4	Plot Split into two individual plots due to large area.
											49-ii	1059.63	SE-4	
136	Sonam Dendup	697	95/A	Q3/23	0.15	607.02	151.76	455.27	0.11	455.95	95/A		UV-3	Plot has been relocated from its original location on account of steep slope.
137	Karmo		18	Q3/23	1.15	4653.85	1163.46	3490.39	2.83	11442.63	18 + 25		SE-4	Combined Plot No. 18 and 25 and allotted one plot.
138	Karmo		25	Q3/23	2.62	10602.68	2650.67	7952.01						



No	Owner's Name	Thram No.	Current Plot No.	Sheet No.	Registered Area as per Cadastral Data		25% Land Pooling Area (Sq.M.)	Ownership Area after Land Pooling (Sq.M.)	Final Allotted Area		Final Plot No.	Sub-Divided Plot Areas (Sq.M.)	Precinct Usage	Remarks
					Acres	Sq.M.			Acres	Sq.M.				
139	Karmo		24/A	Q3/23	0.5	2023.41	505.85	1517.56	1.12	4552.15	19/A + 24/A + 24/B	SE-4	Combined Plot No. 19/A, 24/A and 24/B and allotted one plot.	
140	Karmo		24/B	Q3/23	0.5	2023.41	505.85	1517.56						
141	Karmo		19/A	Q3/23	0.5	2023.41	505.85	1517.56						
	DARAGAON													
142	Man.Bdr. Chhetri	248	27	Q3/24	1.72	6960.54	1740.13	5220.40						Plot falls as a part of the hospital compound area as per the surey drawing provided by the DUDES, MoW&HS. Ownership of the plot and its location needs to be verified and clarified

Table – 2 Plot Re-Configuration Table for Government Owned Plots

No	Owner's Name	Thram No.	Current Plot No.	Sheet No.	Registered Area as per Cadastral Data		25% Land Pooling Area (Sq.M.)	Ownership Area after Land Pooling (Sq.M.)	Final Allotted Area		Final Plot No.	Sub-Divided Plot Areas (Sq.M.)	Precinct Usage	Remarks	
					Acres	Sq.M.			Acres	Sq.M.					
1	Department of Forest		112	Q3/23	3	12140.48	3035.12	9105.36	2.25	9106.24	112		I-1		
2	Bhutan Telecom		113	Q3/23	1.42	5746.49	1436.62	4309.87	1.07	4310.15	113		I-1		
3	Bhutan Telecom(Staff Quarters)		115/A	Q3/23	1.3	5260.87	1315.22	3945.65	0.97	3944.98	115/A		I-1		
4	Revenue and Customs		97	Q3/24	0.24	971.24	242.81	728.43	0.18	728.05	97		UV-3		
5	Revenue and Customs		114	Q3/23	0.8	3237.46	809.37	2428.10	0.80	3256.27	114		I-1	Plot not considered for Land Pooling due to the presence of existing permanent structure within the plot. Additional land area should be compensated Monetarily.	
6	S.P. and O.C. Samtse (RBP)		97	Q3/23	2.22	8983.95	2245.99	6737.96	1.67	6738.78	97		UV-3		
7	S.P. and O.C. Samtse (RBP)		84	Q3/23	4.9	19829.44			1.89	7653.96	84		I-1	The Original Plot Area needs to be allocated in Dzong Precinct. New Plot located as No. 84 in Bazaar area must be utilised for Local Level Police Station.	
8	Food Corporation of Bhutan		93/A	Q3/23	0.22	890.30			0.22	891.99	93/A		UC	Under Guided Land Development.	
9	Dzongkhag-Haat Shed		90	Q3/23	6.11	24726.10	6181.53	18544.58	1.88	7596.59	90		E-6	Plot No. 90 in Bazaar Area has already been subdivided and no more of the area 6.11 Acres. The plot is under Guided Land Development.	
10	Dzongkhag-BOD		87	Q3/23	0.31	1254.52	313.63	940.89							
11	Dzongkhag-Football Ground		115	Q3/23	3.94	15944.49	3986.12	11958.37	6.23	25208.52			E-6	Additional area allotted for construction of Sport's Related Facilities.	
12	Dzongkhag-Behind Animal Husbandary		102	Q3/23	2	8093.65	2023.41	6070.24	1.50	6070.48			UV-2		
13	Dzongkhag-Dzongda's Residence		100/A	Q3/23	1.54	6232.11	1558.03	4674.08			6741.56	100/A + 104	UV-3	Combined Plot No. 100/A and 104 and allotted one plot.	
14	Dzongkhag-Below Dzongda's Residence		104	Q3/24	0.68	2751.84	687.96	2063.88							
15	Dzongkhag-Near Football Ground		114/A	Q3/23	0.47	1902.01	475.50	1426.51	0.42	1690.86	114/A		I-1		
16	Dzongkhag-Animal Husbandary		103	Q3/24	0.75	3035.12	758.78	2276.34			3436.69	103 + 103/A	I-1	Combined Plot No. 103 and 103/A and allotted one plot.	
17	Dzongkhag-Animal Husbandary		103/A	Q3/23				248.83	746.50						
19	Dzongkhag-Shiva Mandir		92	Q3/23	0.17	687.96	171.99	515.97			961.4	91/A-X + 92	H	Combined Plot No. 91/A-X and 92 and allotted one plot.	
20	Dzongkhag-Shiva Mandir		91/A-X	Q3/23				167.59	502.76						
21	Dzonkhag		30	Q3/23				112.13	336.38	0.10	398.18	30	E-6		
22	Rabdey Dratshang	97-46	28/A	Q3/24	1.57	6353.52					2.17	8781.78	28/A + 86/B	H	Combined Plot No. 28/A and 86/B and allotted one plot.
23	Rabdey Dratshang	97-46	86/B	Q3/23	0.6	2428.10									
24	Rabdey Dratshang	97-46	85	Q3/23	1.81	7324.75								The Original Plot Area needs to be allocated in Dzong Precinct.	
25	Rabdey Dratshang (In Market)		12	Q3/23	0.07	283.28								Under Guided Land Development.	



No	Owner's Name	Thram No.	Current Plot No.	Sheet No.	Registered Area as per Cadastral Data		25% Land Pooling Area (Sq.M.)	Ownership Area after Land Pooling (Sq.M.)	Final Allotted Area		Final Plot No.	Sub-Divided Plot Areas (Sq.M.)	Precinct Usage	Remarks
					Acres	Sq.M.			Acres	Sq.M.				
26	Hospital		81	Q3/23	22.69	91822.46	22955.61	68866.84	17.02	68866.28	81		I-1	
27	Bank of Bhutan	90-32	89	Q3/23	0.4	1618.73			0.40	1618.38	89		UC	Under Guided Land Development.
28	Paro Dratshang	90-31	93	Q3/23	0.25	1011.71			0.25	1013.26	93		UC	Under Guided Land Development.
29	Agriculture Farm		133	Q3/24	5.4	21852.86	5463.21	16389.64	4.05	16388.39	133		E-7	
30	Agriculture Farm		132	Q3/24	9.75	39456.54	9864.14	29592.41	7.31	29592.32	132-i	5773.4	E-7	Plot Split into three individual plots due to large area.
31	Food Corporation of Bhutan	97-85	132/A	Q3/24	2	8093.65	2023.41	6070.24	1.50	6069.53	132/A		E-7	
32	Dzongkhag		85	Q3/24	0.8	3237.46	809.37	2428.10	0.60	2428.59	85		UV-3	
33	Dzongkhag		108/A-X-C	Q3/24	0.12	485.619	121.40	364.21	0.23	943.4	108/A-X-C + 108/A-X-E		UV-3	Combined Plot No. 108/A-X-C and 108/A-X-E and allotted one plot.
34	Dzongkhag		108/A-X-E	Q3/24	0.12	485.619	121.40	364.21						
35	Dzongkhag (Central Chorten)		24	Q3/24			1530.84	4592.51	1.48	5975.64	24		H	
	EXCESS LANDS													
1	Dzongkhag		96	Q3/23			462.13	1386.38	0.34	1386.8	96		UV-2	
2	Dzongkhag		99/A-X	Q3/23			337.41	1012.22	0.53	2164.72	99/A-X + 100	UV-2	Combined Plot No. 99/A-X and 100 and allotted one plot.	
3	Dzongkhag		100	Q3/23			384.12	1152.37						
4	Dzongkhag		87/A	Q3/24			284.94	854.81	0.42	1715.97	86/X+87/A-i	411.4	UV-3	Combined Plot No. 86/X and 87/A and allotted two plots.
5	Dzongkhag		86/X	Q3/24			294.27	882.82			86/X+87/A-il	1304.57	UV-3	
6	Dzongkhag		127/X	Q3/24			550.46	1651.39	0.41	1674.68	127/X		UV-3	
7	Dzongkhag		106/A-X	Q3/24			121.40	364.19	0.09	365.96	106/A-X		UV-3	
8	Dzongkhag		101/A-X	Q3/24			50.89	152.66	0.08	303.74	101/A-X		UV-3	Additional area allotted to achieve a plot area more than 300 Sq.Mts, which is the minimum plot size for urban development.
9	Dzongkhag		B	Q3/24			188.45	565.35	0.14	570.25	B		UV-3	



Table – 3 Plot Re-Configuration Table for Plots with Missing Information/Data

No	Owner's Name	Thram No.	Current Plot No.	Sheet No.	Survey of Bhutan Cadastral Sheet Polygon Area		25% Land Pooling Area (Sq.M.)	Ownership Area after Land Pooling (Sq.M.)	Final Allotted Area		Final Plot No.	Sub-Divided Plot Areas (Sq.M.)	Precinct Usage	Remarks
					Acres	Sq.M.			Acres	Sq.M.				
1	Unknown		16/A-X	Q3/23	0.50	2017.82	504.46	1513.37	0.37	1513.22	16/A-X		SE-4	
2	Unknown		19	Q3/23	0.45	1825.74	456.44	1369.31	0.34	1369.66	19		SE-4	
3	Unknown		20/A-X	Q3/23	0.25	1008.27	252.07	756.20	0.19	774.83	20/A-X		SE-4	
4	Unknown		21/C	Q3/23	1.23	4959.98	1240.00	3719.99	0.92	3719.71	21/C		SE-4	
5	Unknown		26/A-X	Q3/23	0.42	1695.03	423.76	1271.27	0.31	1270.43	26/A-X		SE-4	
6	Unknown		27	Q3/23	1.32	5340.84	1335.21	4005.63	0.99	4005.05	27		SE-4	
7	Unknown		31/A	Q3/23	0.14	581.21	145.30	435.91	0.11	436.22	31/A		SE-4	
8	Unknown		32/X	Q3/23	0.15	605.6	151.40	454.20	0.11	456.48	32/X		UV-3	
9	Unknown		36/A-X	Q3/23	0.10	413.43	103.36	310.07	0.08	322.71	36/A-X		UV-3	Plot has been relocated form its original location on account of steep slope.
10	Unknown		38/A-X	Q3/23	0.36	1473.17	368.29	1104.88	0.22	895.34	38/A-X		UV-3	Plot has been relocated form its original location on account of steep slope.
11	Unknown		40	Q3/23	0.20	797.54	199.39	598.16	0.15	598.84	40		UV-3	
12	Unknown		40/A-X	Q3/23	0.32	1290.06	322.52	967.55	0.24	967.64	40/A-X		UV-3	
13	Unknown		44	Q3/23	0.42	1698.07	424.52	1273.55	0.31	1272.88	44		UV-2	
14	Unknown		47	Q3/23	0.77	3125.56	781.39	2344.17	0.58	2344.04	47		UV-3	
15	Unknown		50	Q3/23	0.89	3588.92	897.23	2691.69	0.67	2691.57	50		UV-3	
16	Unknown		52	Q3/23	1.04	4191.05	1047.76	3143.29	0.78	3144.09	52		UV-3	
17	Unknown		82/A	Q3/23	0.16	645.54	161.39	484.16	0.58	2331.1	82/A	UV-3	Considered as a single plot due to un-clear plot demarcatation between the plots.	
18	Unknown		82/C	Q3/23	0.61	2463.17	615.79	1847.38			82/C			
19	Unknown		83	Q3/23	0.30	1202.3	300.58	901.73			83		UC	Relocated from its Original Location.
20	Unknown		94	Q3/23	0.31	1273.18	318.30	954.89	0.21	846.19	94		UV-3	
21	Unknown		95/A-X	Q3/24	0.38	1533.46	383.37	1150.10	0.28	1148.73	95/A-X		UV-3	



Table – 4 Plot Re-Configuration Table for Plots under Guided Land Development located within the Bazaar area

No	Owner's Name	Thram No.	Current Plot No.	Sheet No.	Registered Area as per Cadastral Data		Final Allotted Area		Final Plot No.	Sub-Divided Plot Areas (Sq.M.)	Precinct Usage	Remarks
					Acres	Sq.M.	Acres	Sq.M.				
BAZZAR AREA												
1	Sonam Jatsho	90-01	91	Q3/23	1.62	6555.86	1.62	6555.14	91		UC	Plot has been reconfigured in the same location. Plot falls as a part of Guided Land Development.
2	Dorji Wangdi	90-02	26	Q3/23	0.08	323.75						Under Guided Land Development.
3	Drungtsho P.M Pradhan	90-03	18 & 17	Q3/23	0.18	728.43						Under Guided Land Development.
4	Nandu Giri	90-04	25	Q3/23	0.08	323.75						Under Guided Land Development.
5	Kinga	90-05	22/A	Q3/23	0.105	424.92						Under Guided Land Development.
6	Omapati Sharma	90-06	22	Q3/23	0.105	424.92						Under Guided Land Development.
7	P.M Gallay	90-07	88	Q3/23	0.199	805.32	0.43	1735.97	88	1192.38	UC	Combined Areas of Plot No. 88 and 93/B and allotted two plots.
8	P.M Gallay	90-07	93/B	Q3/23	0.23	930.77			93/B	543.59	UC	
9	Dasho B.K Thapa	90-08	16	Q3/23	0.164	663.68						Under Guided Land Development.
10	Lingpoen Dophu Drukpa	90-09	15	Q3/23	0.1639	663.27						Under Guided Land Development.
11	C.K Gurrung	90-10	14	Q3/23	0.05	202.34						Under Guided Land Development.
12	Jachu/Dongay	90-11	11	Q3/23	0.06	242.81						Under Guided Land Development.
13	Dorji Tshering	90-12	10	Q3/23	0.03	121.40						Under Guided Land Development.
14	Tula Ram Adhikari	90-13	9	Q3/23	0.06	242.81						Under Guided Land Development.
15	Phagcha	90-14	8	Q3/23	0.08	323.75						Under Guided Land Development.
16	Sonam Jamtsho	90-15	19	Q3/23	0.0835	337.91						Under Guided Land Development.
17	Nima Tshering	90-16	20	Q3/23	0.0468	189.39						Under Guided Land Development.
18	Desang	90-17	21	Q3/23	0.1143	462.55						Under Guided Land Development.
19	Moni Raj	90-18	23	Q3/23	0.1044	422.49						Under Guided Land Development.
20	Jaga Beri	90-19	27	Q3/23	0.1915	774.97						Under Guided Land Development.
21	Nob Tshering	90-20	7	Q3/23	0.122	493.71						Under Guided Land Development.
22	Late Rinchen Drukpa	90-21	6	Q3/23	0.05	202.34						Under Guided Land Development.
23	Gujay Drukpa	90-22	4	Q3/23	0.1313	531.35	0.13	531.89	4		UC	Relocated from its Original Location.
24	Dezang Galog	90-23	5	Q3/23	0.109	441.10						Under Guided Land Development.
25	Choden Zangmo	90-25	2	Q3/23	0.0436	176.44						Under Guided Land Development.
26	Lingpoen Pema Tshering	90-26	3	Q3/23	0.146	590.84	0.15	590.59	3		UC	Relocated from its Original Location.
27	Rinchen Dawa(Rinchen Bida)	90-27	86/A	Q3/23	0.18	728.43	0.18	729.35	86/A		UV-3	Plot has been reconfigured in the same location. Plot falls as a part of Guided Land Development.
28	Passang Lhamo	90-28	28	Q3/23	0.0585	236.74						Under Guided Land Development.
29	Dasho Norbu Tshering	90-29	13	Q3/23	0.0885	358.14						Under Guided Land Development.



No	Owner's Name	Thram No.	Current Plot No.	Sheet No.	Registered Area as per Cadastral Data		Final Allotted Area		Final Plot No.	Sub-Divided Plot Areas (Sq.M.)	Precinct Usage	Remarks
					Acres	Sq.M.	Acres	Sq.M.				
30	Namgay Dema	90-33	86	Q3/23	0.13	526.09	0.13	526.21	86		UV-3	Plot has been reconfigured in the same location. Plot falls as a part of Guided Land Development.
31	Thinley Dukpa	90-34	82/B	Q3/23	0.43	1740.13	0.43	1741.99	82/B		UV-2	Plot has been reconfigured in the same location. Plot falls as a part of Guided Land Development.
32	Dorji Dendup	90-35	29	Q3/23	0.59	2387.63						Under Guided Land Development.

Table – 5 Plot Re-Configuration Table for Plots proposed for Community Facilities and Amenities

No	Sheet No.	Allotted Plot No.	Final Allotted Area		Precinct Usage	Remarks
			Acres	Sq.M.		
1	Q3/23	G-01	2.87	11609.23	E-6	To be utilised for both Active and Passive recreation
2	Q3/23	G-02	5.86	23722.55	I-1	To be utilised for construction of a Primary School
3	Q3/23	G-03	0.74	2996.46	E-6	To be utilised for both Active and Passive recreation
4	Q3/23	G-04-i	0.73	2943.22	E-6	To be utilised for Passive recreation
5	Q3/23	G-04-ii	0.25	995.88		
6	Q3/23	G-05	2.42	9777.42	SE-2	To be utilised for establishing a Transit Terminal
7	Q3/23	G-06	0.90	3660.6	E-6	To be utilised for Passive recreation
8	Q3/23	G-07	1.08	4380.76	UC	To be utilised for construction of socio-commercial facilities like Fair Price Shops, Neighborhood Clinic, ATM center, etc.
9	Q3/24	G-08	0.54	2172.26	E-6	To be utilised for both Active and Passive recreation
10	Q3/24	G-09	0.11	458.37	E-6	To be utilised for Passive recreation
11	Q3/24	G-10	0.39	1594.39	E-6	To be utilised for both Active and Passive recreation
12	Q3/24	G-11	0.91	3697.1	E-7	To be utilised for construction of International Border related facilities.



Annexure - 2 PRECINCT SCHEDULE

Note :

For better understanding and to facilitate the easy implementation of the proposed Precinct Schedule in the Samtse Structure Plan, an attempt has been made to compare the proposed system with the precinct schedule proposed in the Thimphu Structure Plan. However, it should be clearly understood that the attempt here is to compare these two systems just in terms of permitted uses and not to equate them in terms of development potentials and possibilities. The proposed Precinct Schedule should be read in comparison with the Development Control Regulations proposed for the respective towns, which will be primary determinant and will rule the entire development dynamics in the town.

1. **UV – 1** (Urban Village Square) would be read as **NN** (Neighborhood Node) as in Thimphu Structure Plan
2. **UV – 2** (Urban Village Core) would be read as **UV - 1** (Urban Village Core) as in Thimphu Structure Plan
3. **UV – 3** (Urban Village Periphery) would be read as **UV - 2** (Urban Village Periphery) as in Thimphu Structure Plan
4. **UV – 4** (Urban Village Enclave) would be read as **UV - 3** (Urban Village Enclave) as in Thimphu Structure Plan
5. **UC – 1** (Urban Core) would be read as **UC** (Urban Core) as in Thimphu Structure Plan
6. **UC – 2** (Urban Hub) would be read as **UH** (Urban Hub) as in Thimphu Structure Plan
7. **I – 1** (Local, National and International Institutions) would be read as **I** (Local, National and International Institutions) as in Thimphu Structure Plan
8. **E – 5** (National Importance Open Spaces) would be read as **G - 1** (National Importance Open Spaces) as in Thimphu Structure Plan
9. **E – 6** (Local Importance Open Spaces) would be read as **G - 2** (Local Importance Open Spaces) as in Thimphu Structure Plan
10. **E – 8** (Endowment Precincts) would be read as **EN** (Endowment Precincts) as in Thimphu Structure Plan
11. **SE – 1** (Urban Corridor Precincts) would be read as **CP** (Urban Corridor Precincts) as in Thimphu Structure Plan
12. **SE – 4** (Service Centers and Industries) would be read as **SSIC** (Service Centers and Industries) as in Thimphu Structure Plan



The ‘precinct’ plan gives more flexibility than the conventional ‘landuse’ plan, however it is to be understood that every precinct has a dominant activity and the other activities are supportive to it. So the supportive activities are governed by the main activity, and within a precinct only a limited number of supportive activities are allowed. Thus, if an activity though secondary in nature is not compatible to the main activity they should not be allowed. The proposed precincts have been marked and defined with a scientific temperament and rational logistics with due consideration to the Bhutanese lifestyle, however if need arises in future to change the precinct definition the local authority after consultation with Town Committee, and the DUDE&S, MOW&HS, can make the necessary modifications.

Table 5.1 : Precinct Schedule showing Uses Permissible in Designated Precincts

Sr. No.	Designated Urban Precinct	Uses Sanctioned	Uses Permissible On Appeal To Competent Authority / Special Conditions
1.0	URBAN VILLAGE PRECINCT This Precinct takes into cognizance the residential use and its immediate needs.		
1.1	UV – 1 Village Square	Convenience Shopping / Basic Amenities All uses permitted in UV - 2 Retail commercial use such as Retail Shops, Restaurants, Hostels, Maternity Homes, Clinics, Convenience Shopping, Professional Offices and Establishments (of less than 15 employees), ATMs, Crèche / Children's day care center, Kindergartens, Primary Schools, Dispensaries, Clinics, Health Centers, Pathological Laboratories, Maternity Homes, Nursing Homes, Local Hospitals, Public Facilities, Public Utilities, Public Transportation Stops, Parks, Gardens, Playgrounds, Apartments, Service Establishments (residential), Light Home Workshops etc., Local Libraries, , Club Houses, Community Halls , Petrol Pumps with or without Service Stations, Kiosks, Taxi Stands, Vegetable Vendors, Display Areas, Neighborhood Pub (one only), Outdoor Cafes.	Firewood and Timber Stock Yard, High School, Boarding and Lodging.
1.2	UV – 2 Urban Village Core	High Density, Residential Precinct All uses allowed in UV - 3 a) All types of residential dwellings including apartments and group housing, professional services, commercial only on ground floors, household economic activity, light home workshops, and cottage industries not involving use of, or installation of, any machinery driven by more than 10 KW power and which do not create noise, vibrations, fumes and dust provided that such home occupations and cottage industries and other non - residential uses shall not be permissible in the tenement dwellings or flats. Play fields, gardens, gymnasium, swimming pool, etc. b) Ubiquitous local level retail shops and services establishments, small restaurant, pre - primary and primary school, dispensary, clinic. c) Public facilities and utilities, club house, local community hall.	Min. Plot size – 1000 sq m All permissible non-residential uses in residential area may be permitted in a residential dwelling only on the ground floor or any other floor with separate means of access/staircase from within the building or outside the building, but not within the prescribed marginal space. Such development shall only be permitted beyond 150 Mts. from the boundary of the building unit of existing school, or heritage place.
1.3	UV – 3 Urban Village Periphery	Medium and Low Density Residential Precinct All uses allowed in UV - 4 Apartments and group housing with more than 10 units shall not be permitted.	L.P.G., Cylinder delivery center for the domestic consumption only if on a separate plot of at least 1000 sq m with no other use on the premises. All other conditions as listed in UV – 4.
1.4	UV – 4 Urban Village Enclave	LIG / EWS Housing, Unplanned Settlements and Bagos Precincts Residential, ubiquitous local level retail shops and services, household economic activity and cottage industries not involving use of, or installation of, any machinery driven by more than 1KW power and which do not create noise, vibrations, fumes and dust provided that such home occupations and cottage industries shall not be permissible in the tenement dwellings or flats, LIG / EWS welfare housing schemes, all LIG / EWS housing typologies, Site and Services Schemes, Bagos Improvement and redevelopment Schemes, construction of Community WC's and Bathing Places.	All permissible non-residential uses in residential area may be permitted in a residential dwelling only on ground floor or any other floor with separate means of access/staircase from within the building or outside the building, but not within the prescribed marginal space.



Sr. No.	Designated Urban Precinct	Uses Sanctioned	Uses Permissible On Appeal To Competent Authority / Special Conditions
2.0	URBAN HUB PRECINCT This Precinct takes into cognizance the commercial, institutional and recreational uses and their immediate needs at town level.		
2.1	UC – 1 Urban Hub	Entertainment and Shopping Centers All uses permitted in UV - 1 Cinema Hall, Multiplexes, Shopping Centers, Food Courts, Bowling Alleys, Pool and Billiard Halls, Lodging and Boarding Houses, Hotels, Tourism and Recreation based facilities. Commercial Center, Public Buildings, Auditorium, Petrol Pumps, Transport Terminal for passengers, Nursing Home, Hospitals, Office Buildings, Public Facilities, Public Utilities, Banks, Professional Offices, Parks, Gardens, Playgrounds, Schools, Colleges, Educational Buildings, Training Institutes Research Institutions, Hostels, Boarding Houses, Staff Quarters, Canteens, Sports Complex Gymnasium, Library, Assembly Buildings including Swimming Pool, Club, Stadium, Theatre, Open Space proposed for Party & Marriage Ceremony and Amusement and Recreation Activities, Art Galleries, Exhibition Halls, Discotheques, Bars (in association with eating establishments of forty seats and over).	Small printing press Residential incidental to and limited to 25 % of predominant institutional use on plot > 4000 sq m.
3.0	INSTITUTIONAL PRECINCT This Precinct takes into cognizance the institutional use and its immediate needs.		
3.1	I - 1 Institutional Precinct	Local, National and International Institutions Educational, Training, Cultural and Government Institutions, Public Libraries, Museums, Art galleries, Government Offices.	Residential and other activities incidental to the main institutional use, provided only 20 % of the site should be used for such activities.
3.2	I - 2 Dzong Precinct	Dzong Complex Activities related to and which enhance the image, use and iconography of the Dzong. Cultural and Government Institutions, Public Libraries, Museums, Art Galleries, Government Offices, Diplomatic Offices, Community Halls, Town Hall, Play fields, Gardens, Public Facilities.	All the buildings shall strictly comply with the Urban Design Controls and Traditional Bhutanese Architecture and should get approvals from the competent authorities.
4.0	ENVIRONMENTAL PRECINCT This Precinct takes into cognizance the environmental aspects related to a town at various levels and related concerns.		
4.1	E - 1 Environmental Conservation	Natural Reserve and sanctuary, the River Basin, Natural Storm Water Drainage Systems, Avifauna, Fauna Habitats, unique Flora and Bio - mass preserves. Activities related to environmental enhancement / protection and permitted / undertaken by or on behalf of the National Environment Commission.	To be cleared by the National Environment Commission (NEC) No access road or any service installations to private lots to be permitted through this zone.
4.2	E - 2 Forest Environments	All uses permitted in E - 1 Activities related to and permitted / undertaken by or on behalf of the Forest Department.	To be cleared by the Forest Department and the National Environment Commission (NEC) No access road or any service installations to private lots to be permitted through this zone.



Sr. No.	Designated Urban Precinct	Uses Sanctioned	Uses Permissible On Appeal To Competent Authority / Special Conditions
4.3	E - 3 Agricultural Environments	<p>Agriculture</p> <p>All uses permitted in E - 1 and E - 2</p> <p>Agriculture, Horticulture, poultry keeping (subject to the N.O.C./approval and conditions laid down by the Department of Agriculture), Dairy Development, fisheries, animal rearing and breeding, Open Storage of Drying Manure. Farm House located in land of not less than 4000 sq. Mts., Camp for recreation of any type Natural Reserves and Sanctuaries, Athletic Track, Archery Range, Zoo, Nursery, Botanical Garden, Wayside Shops, Restaurant.</p>	<p>Tourist information centers / kiosks, museum for the history of the site, region, public conveniences such as toilets, cultural center, parks, gardens. Traditional architectural guidelines to be applicable.</p> <p>More than one farmhouse shall be permitted provided the minimum plot area per farm house is 1000 sq.m.</p> <p>Building to be constructed at a distance of not less than 8 meters from the road, on which it abuts.</p> <p>For other activities for this precinct regulation, ground coverage shall not exceed 5% of the land area. In case of public and semi - public uses and buildings of charitable & religious purposes the competent authority may permit development activities to the extent of 10% of the land area.</p> <p>Education, Hospital for infectious and contagious disease, Mental hospital, Sanatorium. With a ground coverage not exceeding 15% of land area...</p> <p>Only basement, Ground floor, and first floor structure may be permitted, however, the structure for storage of inflammable material and explosive goods shall be single storied only.</p> <p>For poultry farm, maximum 25% ground coverage shall be permitted. No sub - division of land shall be allowed.</p>
4.4	E - 4 Flood Prone Zone	<p>Zones with risk of possible Flooding</p> <p>Development will be permitted in this zone only under the condition that necessary flood protection measures for the entire zone are implemented and certified by competent authorities.</p> <p>All uses permitted in E - 1, E - 2, E - 3, E - 5 and E - 6</p> <p>Tourist attractions and Facilities, Tourist information centers / kiosks, Horticulture, Orchards, Floriculture, Vegetable Gardens, Botanical Garden, Facilities for Plant Tissue - culture, Mushroom Culture, Green Houses, Herbal based Health Centre, Health Clubs, Cemetery and Burial Ground, Brick Kiln, public conveniences such as toilets, Resorts.</p>	<p>Museum for the history of the site, region, cultural center, parks, gardens. Traditional architectural guidelines to be applicable.</p> <p>More than one farmhouse shall be permitted provided the minimum plot area per farm house is 1000 sq.m.</p> <p>Building to be constructed at a distance of not less than 8 meters from the road, on which it abuts.</p> <p>For other activities for this precinct regulation, ground coverage shall not exceed 5% of the land area.</p> <p>Only basement, Ground floor, and first floor structure may be permitted, however, the structure for storage of inflammable material and explosive goods shall be single storied only.</p>
4.5	E - 5 National Importance Open Spaces	<p>Precincts of National Importance</p> <p>National Sports Complex, Aquarium, Race Track, Shooting Range, Zoo, Nursery, Stadium, Botanical Garden, Planetarium, Amusement Park, Swimming Pool, Exhibition and Fair grounds, Recreational use of water.</p>	<p>To be cleared by the National Environment Commission (NEC). Uses like Drive In Cinema, Restaurants, etc. shall be permitted by special permissions.</p>
4.6	E - 6 Local Green Space System	<p>Public Assets</p> <p>Parks, Gardens, Playgrounds, Recreation of any type, Club House, Small Stadium, Heritage related Structures.</p>	Cremation and burial grounds.



Sr. No.	Designated Urban Precinct	Uses Sanctioned	Uses Permissible On Appeal To Competent Authority / Special Conditions
4.7	E – 7 International Buffer Zone	International Boundary Non-Habitable Land along International Boundary of minimum 500 meters width. Customs and Immigration Check posts, Military Camps, Parking for Cargo Vehicles at Fixed locations. Agriculture with crops that do not block vision of patrols and allow easy accessibility.	No permanent structures for agriculture or other purpose. Maximum of open type shelters of temporary nature would be allowed with permission from Army and Customs and Immigration Department.
4.8	E – 8 Endowment for the Future	Precincts of land whose use determination is differed to future generations	
5.0	HERITAGE PRECINCT This Precinct takes into cognizance the historic, religious and spiritual uses and their immediate needs.		
5.1	H Heritage	Cultural and Religious Heritage Spiritual and religious artifacts and places, Chortens, Mani Walls, Lhakhangs, Prayer Wheels, Statues, Monasteries and activities related to enhancement / protection / conservation of the heritage structures and/or precincts and permitted / undertaken by or on behalf of the Department of Culture, Ministry of Home and Cultural Affairs, RgoB.	To be cleared by the Department of Culture, Ministry of Home and Cultural Affairs, RgoB.
6.0	SPECIAL ECONOMIC PRECINCT This Precinct takes into cognizance the various aspects related to the economy generation at regional and national level.		
6.1	SE – 1 Urban Corridor	Trunk Infrastructure All – over – and – under ground infrastructure required to operate the urban area. Mainly roads, bus shelters, official signage, egress and access roads, not private road driveways and private plots or sub – divisions.	Any road (public or private) entering this precinct must first be approved by the GMC elected Members and then sent to the DUDES, for final approval.
6.2	SE – 2 Multi-Mode Transit Hub	Zones characterized by Multi-Modal transit Terminus location Multi Mode Transit Terminus, Transit Stops, Visitor Centre, Parks, Gardens, Passengers Stay area, hospitality hub, tourist information centre, ATM, cafes, phone kiosks, convenience and souvenir shops, clean toilets and showers, luggage storage, petrol pump with minor repairs shop, transit hotel, rest areas, Taxi Parking, Visitors Parking, Security Post, Check Posts, Pedestrian cross-overs.	
6.3	SE – 3 Dry Port	Precincts characterized by warehousing and transportation of heavy cargo Ware houses, Transshipment yards, Cold Storage, Go downs, Transport terminals for Goods, Stock Yard, Storage Yards, Amenities for Workers, Check Posts, Security Posts, Packing Units.	Residential dwelling only for Dry Port workers and other public utility service staff, working within the Dry Port premises, Storage of inflammable goods, Dumping of solid industrial wastes (subject to N.O.C. from authorities such as the National Environment Commission (NEC) / Dept. of Trade and Industry).



Sr. No.	Designated Urban Precinct	Uses Sanctioned	Uses Permissible On Appeal To Competent Authority / Special Conditions
6.4	SE - 4 Service Centers and Industry	Service Centers, Industries and Workshops Wholesale markets and their ancillary uses, ice factory and cold storage, ware houses, Go downs, transport terminal for goods and passengers, restaurants, lodges, dormitory, oil depot, steel stock yard, timber stock yard, junk yard, saw mill, LPG Cylinder storage depot, storage of permissible goods. Service industries – to serve residential activities, commercial and industrial establishments, as also the daily needs of the people. Pasteurizing and milk processing, printing press, binding, packaging, sealing, paper box manufacturing, battery charging, bakeries and confectionaries, cleaning and pressing establishments for clothes, small cold storage units, etc. Light industry, Non-polluting industrial activity. Incidental residential activity. Banks, canteens, etc. Amenities for workers.	Residential dwelling only for industrial workers and other public utility service staff, working within the industrial premises, querying of gravel, sand, clay and stone. Storage of inflammable goods, Dumping of solid industrial wastes (subject to N.O.C. from authorities such as the National Environment Commission (NEC) / Dept. of Trade and Industry).
7.0	ROYAL PRECINCT		
7.1	R Royal Uses	Zones related to Royal uses	To be cleared by His Majesty.
8.0	DEFENCE PRECINCT		
8.1	D Defence	Zones related to National Security Defence related	To be cleared by His Majesty / the Army Headquarters.

Note:

- Public utility, public facility, services buildings shall include buildings or works developed or undertaken by the Government / Semi-Government or Public Undertaking only, such as sub - station, and receiving station of the Electricity Department, building for infrastructural facilities like bus service, water supply, drainage, sanitation, domestic garbage disposal, pumping station, electricity, purification plant, police building, post and telegraph and telecommunication, public urinals, milk supply, and public telephone booth, fire brigade station, ward and zonal offices of Competent Authority, taxies, scooter and cycle stand and parking lot, garden, nursery, playground and open spaces, canal, communication network, first aid medical center, primary health center, dispensary, library, reading room and religious buildings / places of public worship.
- Shops, commercial establishments and professional uses (up to fifteen employees) shall be permitted in any precinct by charging license for these value added uses, which are not detrimental to development in the surrounding zone, with specific conditions. This value added license shall be a one-time fee and shall be decided by the Competent Authority from time to time. The Competent Authority shall regularize existing shops and commercial establishments not approved earlier by charging additional fees, as per the above stated provision.
- The shortfall of parking and other requirements shall not be condoned, but the Competent Authority may consider the case if equivalent facility in any manner is offered by the owner /occupants of the premises. In no case, regularization of built-up area shall be considered by the Competent Authority.
- In the case of the 'Uses permissible on appeal to the Competent Authority it shall be mandatory to apply for and revalidate the permission after five years. The Competent Authority shall revalidate the permission only based on an Environmental Assessment Report submitted by the National Environment Commission (NEC) and accepted by Town Committee after inspection of the site and the activities on the site. If so deemed, the National Environment Commission (NEC) may require further revalidation after a period it deems necessary.
- Where uses are allowed in Environmental Precinct based on a "Special Appeal," it is incumbent on the Samtse Municipal Corporation to certify to the Town Committee Members after three years, and not later than five years, that the uses in fact conform to the application and the sanction, and conditions of successful Spatial Appeals for uses.



Table of Contents

1. Introduction.....	3
1.1 Background History.....	3
2. The Structure plan	4
2.1 The Concept.....	4
2.2 Vision	5
2.3 Strategy.....	5
3. Local Area Plan.....	6
3.1 Proposed site	6
4. Existing Scenario	7
4.1 Demographic Characteristics.....	7
4.2 Existing Land Patterns.....	8
4.2.1 Existing Land Ownership.....	8
4.2.2 Plot size classification	10
4.2.3 Existing Building Typology	11
4.2.4 Building Height.....	12
4.3 Existing Amenities and facilities	14
4.3.1 Road and Circulation.....	14
4.2.2 Open Space System.....	15
4.2.3. Institutional Establishments and Offices	16
4.2.4 Heritage and Religious Structure	17
4.2.5 Housing	17
4.3 Existing Utility and Services	18
4.3.1. Drinking Water Supply and Distribution.....	18
4.3.3 Drainage System	20
4.3.4 Sewerage System	20
4.3.5 Solid Waste Management.....	21
5. Analytical Study	22
5.1 Land for development.	22
5.2 Slope Analysis	22
5.3 Land Unsuitable for Development	24
5.4 Land for Development.....	25
5.5 SWOT Analysis	26
5.6 Mode of Land mobilization.....	27
6.1Concept of the Plan.....	30

6.2 AXIOMS FOR THE TRANSFORMATION OF SAMTSE	30
6.3 Proposed Precinct Plan.....	33
6.3.1. Urban Village Precincts	35
6.3.2. Urban village -1.....	35
6.3.3. Urban Village-2 & Urban Village-3.....	36
6.3.4 Transit Terminal.....	37
6.3.5 Institutional Precinct	38
6.3.6 Environmental Conservation Precinct	39
6.3.7 Open Space System	41
6.3.8 Foot path	41
6.3.9 Proposed international boundary precinct	42
6.4 Infrastructural proposal.....	44
6.4.1 Water Supply System.....	46
6.4.2 Circulation System and Road Networks	46
6.4.3 Water Supply System.....	50
6.4.5 Solid Waste Management System.....	51
6.4.6 Street Lighting.....	52
6.4.7 Storm Water Drainage System	52
6.4.8 Fire Fighting Facilities	53
7. Plot Reconfigurations	54
Area 1. Gurung Busti.....	54
Area 2. Litchi Bari Area	56
Area 3. Daragaon Busti	57
8. Implementation Plan	58
Phase 1	58
➤ Demarcation of the plots:	58
➤ Widening of existing road and construction of drains and service ducts	58
➤ Construction of access with drains and service ducts	58
Phase 2	58
➤ Distribution network for water supply.....	58
➤ Sewerage and STP	59

Phase 3	59
➤ Construction of Parking	59
➤ Construction of off- street footpath.....	59
➤ Development of open spaces	59

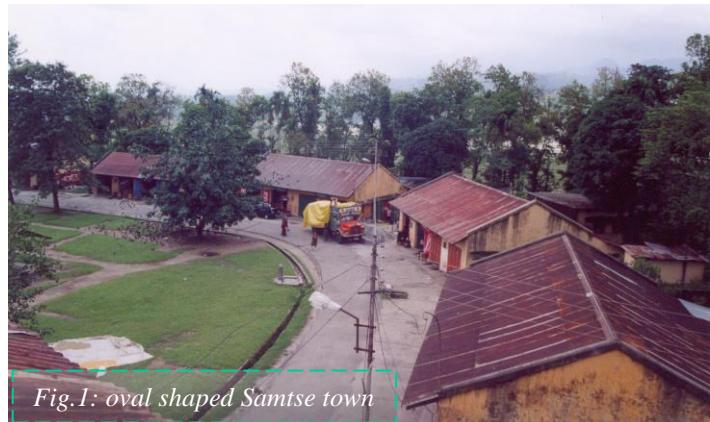
1. Introduction

1.1 Background History

Samtse was established as headquarter of five divisional offices (Phuentsholing, Kalikhola, Dorokha, Sibsoo, and Chengmari) upon the appointment of first District commissioner in 1950's It became the winter capital of 'Development Wing' in the 1960s. This was followed by the establishment of fruit processing units and distillery. Gradually, it became the Dzongkhag headquarter in 1970s with the establishment of an administrative unit.

The first town planning in Samtse was initiated by a Chinese company with the conceptualization of an oval-shaped market area in 1975.

Since then, there was hardly any development in the area until 2005 when the current structure plan for Samtse Thromde was initiated.



1.2 Location & Climate

Samtse Dzongkhag is located in South-west Bhutan bordering Chhukha Dzongkhag in the east, Haa Dzongkhag in the north and the Indian States of west Bengal in the south and Sikkim in the west. It serves as the economic and service center for the hinterland settlements within Samtse Dzongkhag and is an important transit hub for the neighboring Dzongkhag of Haa.

It ranges from an elevation of 200- 400 meters above mean sea level and covers an area of approximately 1309.1 square kilometers. It lies in the subtropical monsoon climatic zone with mean annual rainfall of 1500-4000 mm and mean monthly temperatures ranging from 15 degree Celsius in winter to 30 degree Celsius in summer. It is hot and humid during summer and dry and cool during winter.

2. The Structure plan

The '**Samtse Structure Plan**' lays out the basic themes upon which the strategy of Samtse's development is based. It proposes to create a new image for Samtse as a **Service Center** for the southern part of Bhutan, as well as for the western region. The establishment of Dry Port and even a Free Trade Zone is of utmost importance in Samtse with the industrial estate being envisaged in the area.

The plan proposes a system of **efficient circulation network**. The Samtse - Phuentsholing road which is a part of Sibsoo - Diapham National Highway will allow Samtse to become another '**Gateway**' to the Kingdom of Bhutan. It envisions an impressive entrance into the city of Samtse through a portal from India - One for passenger vehicles such as buses and automobiles; and another for cargo vehicles.

With the Samtse - Phuentsholing and Sibsoo - Diapham road, a major **urban corridor** will be Established. This urban corridor will serve as the backbone for a Special Economic Zone.

2.1 The Concept

The design aspects of the Samtse Local Area Plan II, evolve from the Structure Plan proposals and the existing cadastral pattern of the Urban Village. The main objective of the local area plan, is to provide basic amenities and services for all the plots available within the local area, so that these plots can be used for future urban development. Apart from this, the local area also addresses various other issues, like future population accommodation, religious institutions, and creating an institutional core for the region, as Samtse will emerge as a Service Center serving South Western Bhutan.

As a part of the Environment Conservation Precinct (E-1) along the natural storm water channels, a series of community and neighborhood level open spaces are proposed, which also form a green pedestrian corridor allowing un-interrupted, safe pedestrian access to all parts of the local area. This will also provide spaces for accommodating religious icons within residential neighborhoods.

The proposed central spine will connect various institutions, open spaces, the central community and social facility hub and, most importantly provide access to the residential blocks.

The structured Plan for the Samtse is to be implemented through two Local Area Plans (LAP-I & LAP-II). LAP-I, which consists of core town area, Devithan, Litchi Bari, Army Welfare Project (AWP) area and upper Gairigaon covering an area of 0.83 Sq. Km (204.7 acres) was prepared in 2005 and is being implemented. The approved structure plan occupies an area of 659 Acres / 2.67sq.km LAP-II consists of Daragaon, Gurung Busty, Lower Gairigaon, and Sukruti area covering an area of 4.05 Sq. Km (1001.33 acres)

2.2 Vision

“Samtse to be a city with a better built atmosphere, infrastructure and quality of life with economic sustenance and serve as a service center for the entire Dzongkhag”.

2.3 Strategy

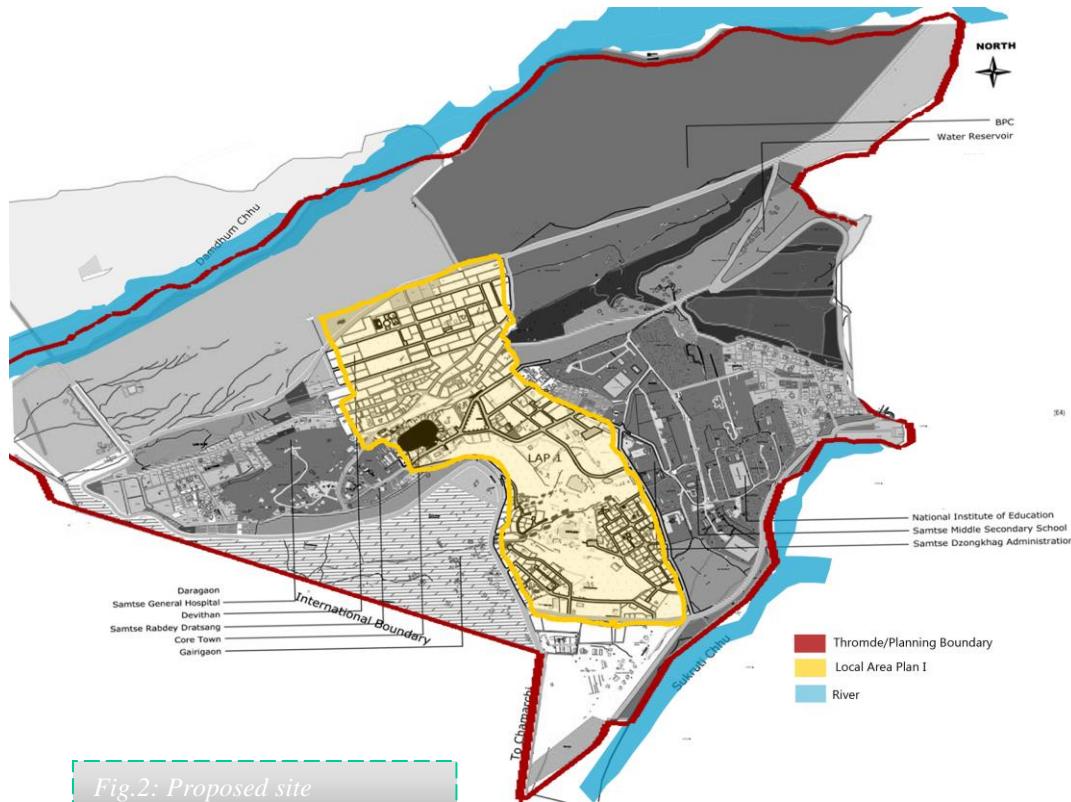
- The city should grow inclusively and the people should be a part of the process of development of the city.
- The city should develop a strong economic base for sustenance by growing in the manufacturing sector.
- Utilizing the proposed connectivity namely the Samtse-Phuentsholing Highway and opt for a transit oriented development.
- Make Samtse as an Educational Hub for the Southern Part of the country

3. Local Area Plan

3.1 Proposed site

The Local Area Plan II (LAP II) boundary for Samtse Extended area is physically defined by a Dum dum chhu at the north starting from industrial area to Sukruti chhu at the south, steep slopes with forest cover towards the east and India- Bhutan international boundary towards the west. It has a total area of 1001.33 acres.

Huge chunk of land under LAP II remains an institutional, meanwhile the 220 number of plots out of 287 are privately owned. The establishment of these institutional and service centers in Samtse will add to the vitality of the town. Further the up-coming Industrial Project will also bring socio-economic benefits both to Samtse area and the region. The area around the Dzongkhag Administration is predominantly institutional in nature with the Royal Guest House, Higher and lower Secondary Schools, Bhutan Telecom, Bhutan Post Office etc. surrounding the Dzong. Gurung Basti behind the Samtse College of education towards the east are predominant residential areas of Samtse. Gairigaon near the international boundary, Daragaon behind the hospital campus and Devithan near Damdhum Chhu bed are the original Basti (Village) areas surrounding Samtse town.



4. Existing Scenario

4.1 Demographic Characteristics

According to the ‘Bhutan Living Standard Survey Listing 2002’ by Central Statistical Organization, Thimphu, the population of Samtse Thromde is estimated to be 3,457. As a precursor to the preparation of the Structure Plan for Samtse, a pre-feasibility study was carried out jointly by MoWHS and the Samtse Municipality in February 2004. As per this report the population of Samtse for the year 2003 was estimated to be 3,500. A sample size of 6% of the total population covering about 37 households was interviewed for studying the current trends and demographical aspects. The analysis of the data collected by MoWHS is used as the base data for the entire planning process.

The average household size of Samtse is calculated to be 5.5 persons per household. The male to female ratio is 0.94 with female population constituting about 48.5%. About 48% of the population ranges in age group between 19 and 45. About 8% have their own housing, while 75% are tenants and 2% stay in government provided housing. About 23% of the population dwells in class I and II type of accommodation, 25% in class III and 14% in class IV type housing.

The existing factories like the Bhutan Fruit Products Limited and the Samtse Distillery have provided suitable accommodation to their permanent staff, while most of the “day workers” come daily from India. Taking the highest growth rate assuming that Samtse will grow into one of the highly potential urban center in the country. The population of the Thromde will reach to 13,605 in 2025 taking the compound growth rate of 6% per annum.

Year	Population projection with a compound rate of		
	5% (National Average Urban Growth Rate)	5.5% (Addition of 0.5% with the establishment of in-country connection road between Samtse- Phuentsholing)	6% (addition of 0.5% considering the envisioned economic and employment generation activities in the region)
2005	4,002	4,060	-
2010	5,108	5,306	5,677
2015	6,519	6,934	7,597
2020	8,319	9,063	10,167
2025	10,618	11,844	13,605

Table.1: Summary of population growth in Samtse

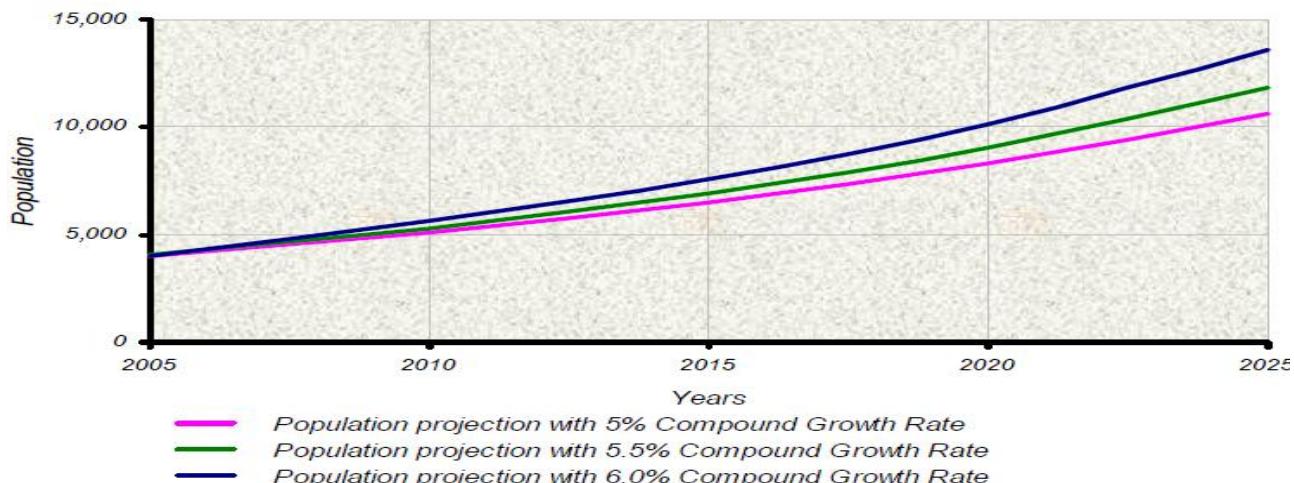


Fig. 3: Summary of population growth in Samtse

4.2 Existing Land Patterns

4.2.1 Existing Land Ownership

The map and table below illustrates the existing land use pattern. The total registered land is 1001.33 acres. Of these a total of 802.16 acres are owned by the institutions. However the private plots holds the second largest of the total Municipal land with total of 220 plot with 89 acres, 6% registered as State land but most of the land comprised of steep slopes or gullies, 4% registered as RBP and RBA , 1% registered as corporation and only 3.8 acres registered as Dratshang.

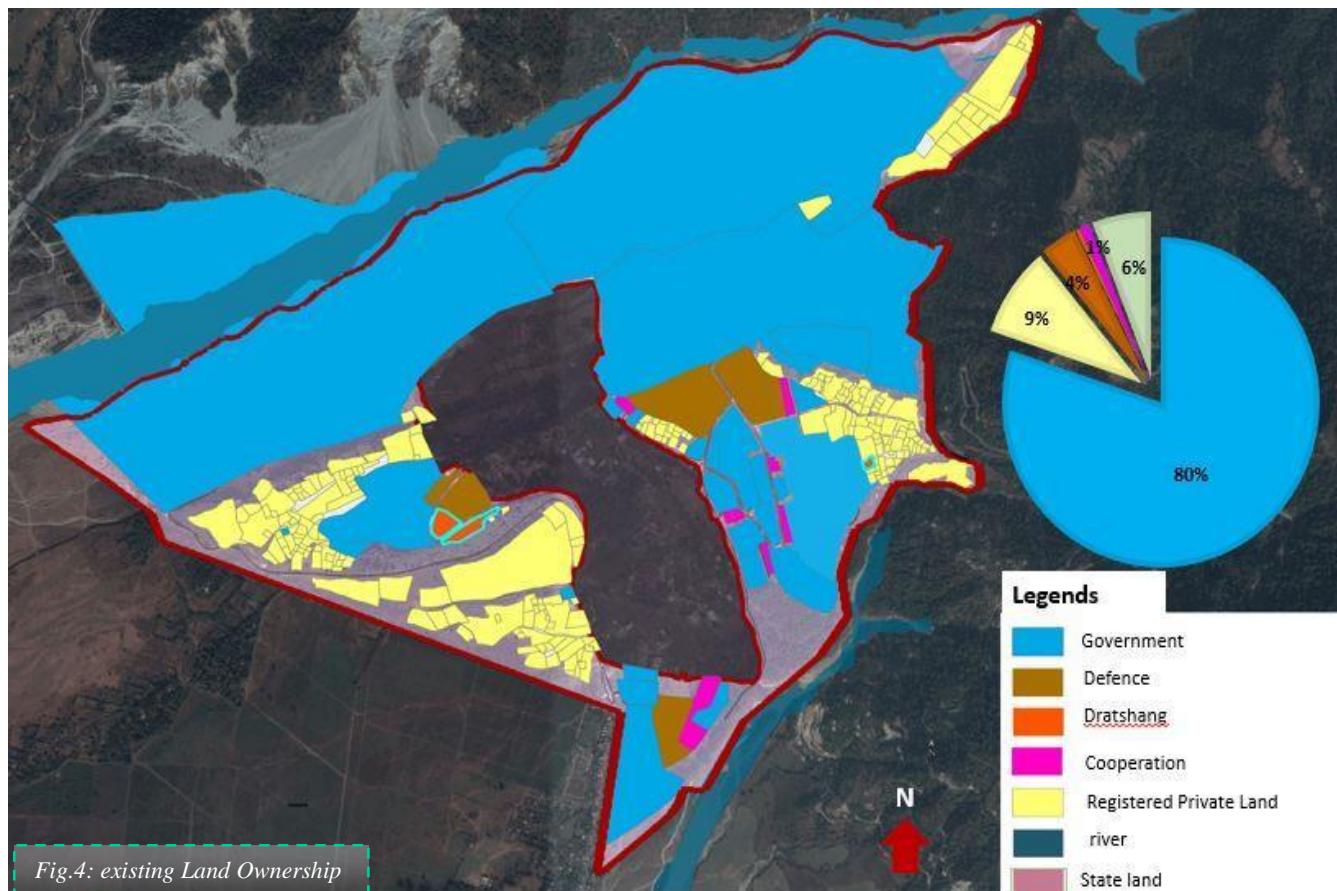
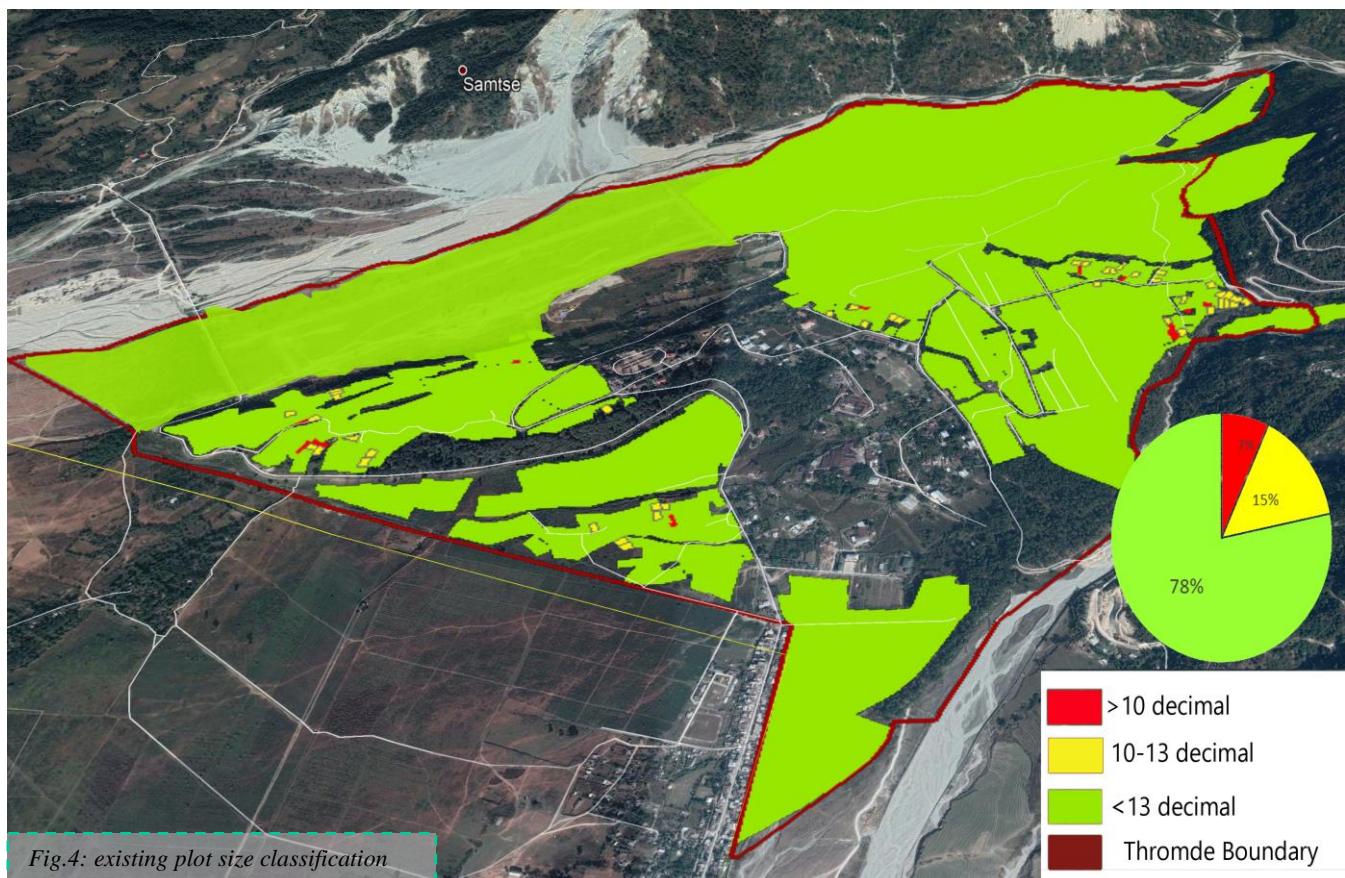


Table 2: Total no of plots and Area occupied by each land holding

4.2.2 Plot size classification

The plot sizes under Samtse local area plan II is broadly classified under two categories, plots measuring above and below 13 decimals. As per the local government act of Bhutan, 2009, section 273 (t) under powers and functions of Thromde administration, it states that “minimum plot size in potential growth areas of Thromde shall be 13 decimals (before land pooling) whereas in areas where local area plan exists, minimum plot sizes shall be as specified in the approved local area plans”. Considering this statement, a plot size classification was worked out as shown in the table 3.

There are 288 plots with an area of 942.33 acres excluding the state owned land in which 225 plots are more than 13 decimals and 43 plots between 10-13 decimal.



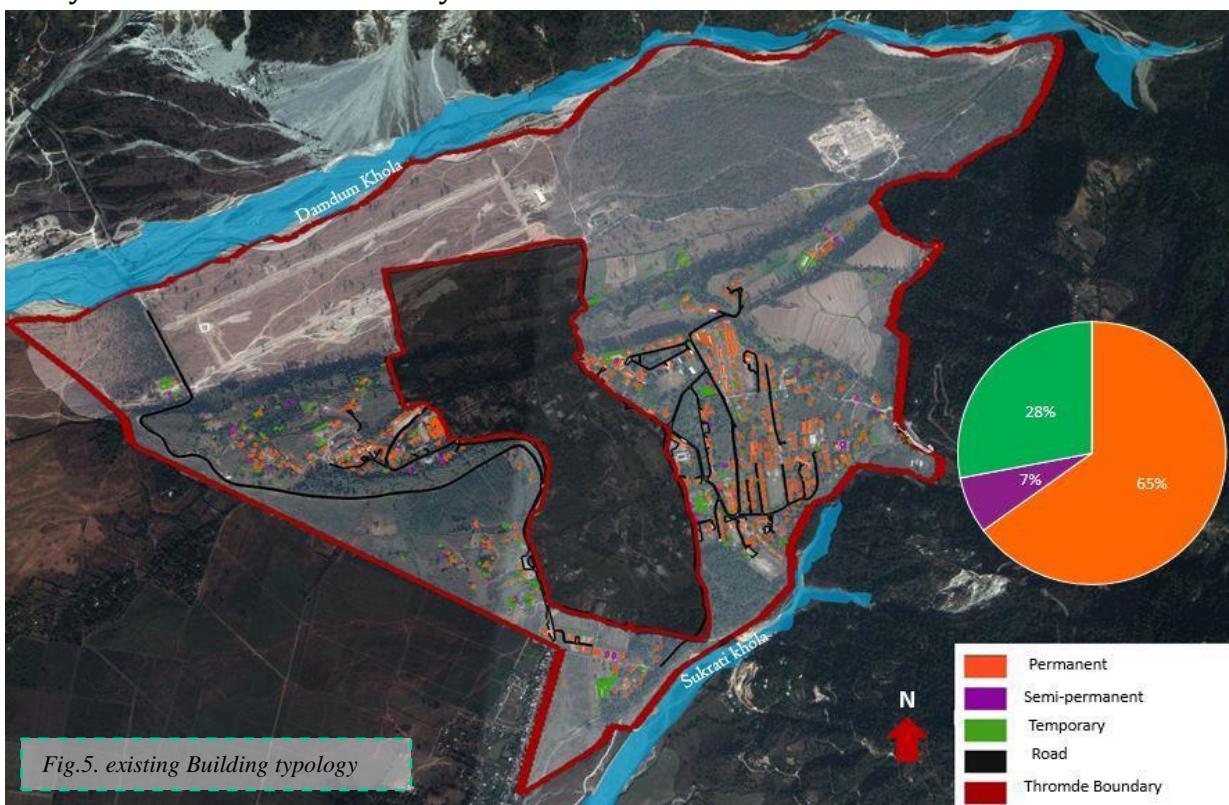
Plot	No of plot	Square meter	Acres
Less than 10	20	5718.126	1.41
between 10-13 decimal	43	20936.65	5.17
More than 13 decimal	225	3,785,146.	935.33
Total	288		942.33

Table.3: Existing plot size

4.2.3 Existing Building Typology

Building types are conceptualized in order to comprehend their scale, character, placement, function and aesthetics in the streetscape.

Most of the habitable structures under Samtse Local area plan II are permanent buildings which is shown in bright orange given in the map. Semi-permanent structures consist of about 7% while temporary structure comprises 28%. However, the temporary structures comprises of mostly animal sheds and ancillary structures like kitchen and toilets.



Typology	count
Permanent Structure	1260
Semi- Permanent Structure	135
Temporary Structure	385
Total	1780

Table 4. Total no. of building typology

4.2.4 Building Height

The Building Height Map represents the density of built-up areas in the Samtse LAP II. The obvious layers of built-up densities could be observed in institution area around Dzongkhag Administration and around the residential area at Gurung busti. As depicted in the chart, Almost 94% of the buildings in Samtse are ground storied while a few buildings are three storied high and there is only three storied building with attic at Gurung busti area. Institutional buildings, like the school and Bhutan telecom building are three stories high, but the sheer sparse nature of the built form fails to make an impression over the observer.

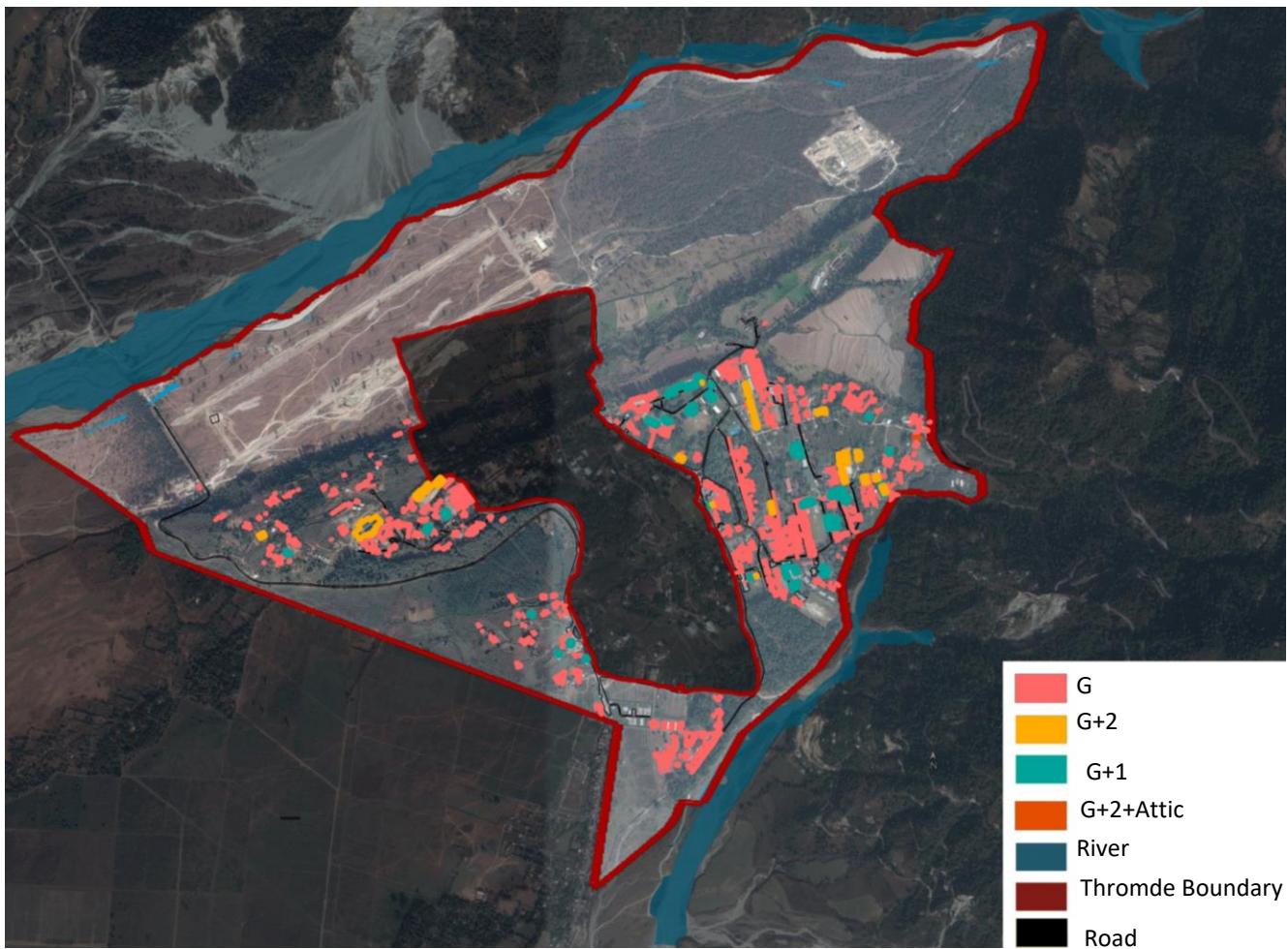


Fig 6: Number of floor in percentage

Types	Count
Ground floor	1008
G+1	36
G+2	25
G+2+Attic	1
Total	1070

Table 5: No. of different types of building

4.3 Existing Amenities and facilities

4.3.1 Road and Circulation

The road leading from zero-point to the Dzongkhag Administration forms the major spine of the town, with roads branching at intervals and also acts as primary road. Important institutions and public facilities like fuel station, Dratshang, Core Town, chorten, RRCO, Bhutan telecom, Dzong, SCOE, school, etc. are linked by this central spine.

Most of the roads within the LAP II are unpaved road. Highlighted in green are narrow and can be found in Gurung bust, Daragaon busti, Jersey breeding center and Sukruti area.

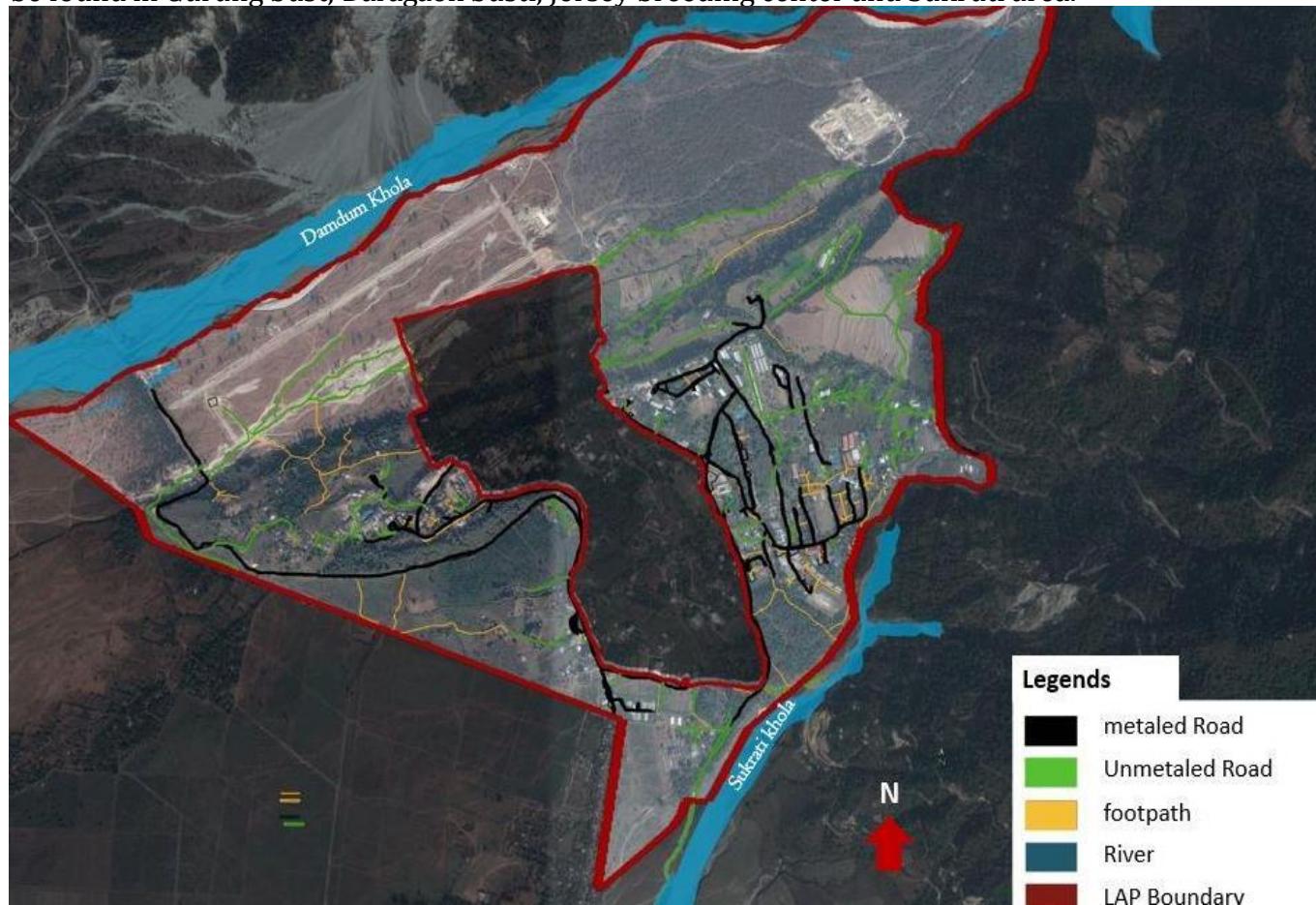


Fig.7: Existing Movement network



Fig 8: unmetalled road at Daragaon below hospital

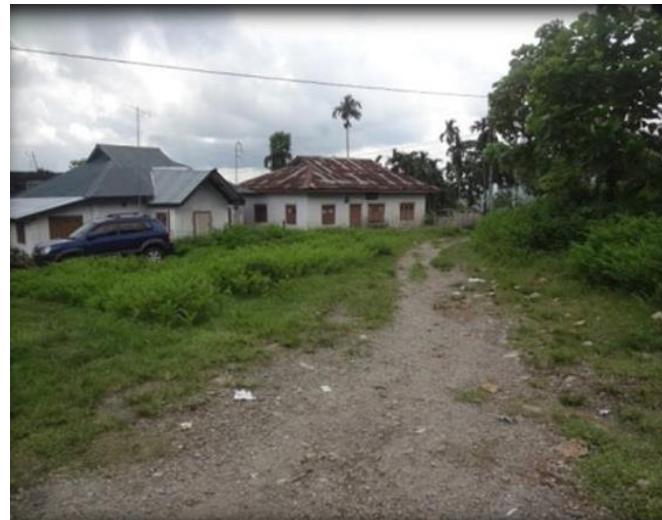


Fig.9: existing unmetalled road at Gurung busy area

4.2.2 Open Space System

Samtse Thromde, located on a peninsular hillock, lacks an organized and defined open space system. The open spaces in Samtse town are incidental, disjointed and rather loosely organized in the fabric. The most impressive open spaces within the local area are the football ground below the Dzongkhag Administration office. The football ground also provides opportunity for outdoor sports like archery, dart throwing, etc. Its location on the junction of the crossroads coupled with Dzong in the background makes it the most special.

The forest lands along the steep slopes located both to the north and west of the local area, forms an integral part of the existing open space system within the urban core local area.

These densely vegetated patches need to be identified and efficiently compounded with the existing open space system.



Fig 10: the only multi-purpose space in Samtse.

The Structure Plan recommends an organized open space network within the town limits essentially connecting the urban village centers with the urban core and important open spaces and amenities.

The identified surface drainage patterns and the buffer zones along the natural streams provide an opportunity to efficiently integrate the pedestrian movement within the local area. Apart from creating active recreational open spaces; there is a need to design an open space within the residential area, Health, Education, Shopping and Other Community Facilities. The Urban Core serves the entire Dzongkhag population and its hinterland, apart from serving the town residents.

4.2.3. Institutional Establishments and Offices

Owing to its strategic location, Samtse is found to be an ideal location for institutions and offices with regional interests. Though such interests are constrained by the limited space, a number of offices have already been established. Almost 80% of the total of 1001.33 acres land constitutes of institutional establishment. These institutions include Dzongkhag Hospital, Dratshang, Dzongkhag Administration, Royal Guest house, Samtse General Hospital, Royal Bhutan Army, Royal Bhutan Police, Bhutan Power Corporation, Lower and Higher Secondary School, Samtse College of Education, Industrial Area, Forest Office and Bhutan Post Office.

The presence of these national level and regional level institutions in Samtse can be seen as a great advantage for such a small town. These strengthen the economic base, ensuring an inflow of capital as well as add vitality to the area.



Fig 11 Samtse Dzongkhag Administration



Fig 12: Samtse District Court



Fig 13: Samtse General Hospital



Fig 14: Samtse College of Education

4.2.4 Heritage and Religious Structure

Religious and heritage assets provide the inhabitants with both passive, as well as spiritual, forms of recreation. They are special as they offer peace and a serene ambience.



Fig 15: Samtse Dratshang



Fig 16: jangchuk chorten near the school

There is a Monastery (Dratshang) with Lam Neten and monk body just located near the core town where the annual festival is held every year.

Sidok chorten constructed is located at the roundabout near the Dzongkhag administration which also acts as the diversion of traffic. There is also a small jangchuk chorten located near the school area where their parents wait for their children especially during the lunch and after school hours.

Nearby people, especially the elder people come to these places to circumambulate as their daily spiritual practice as well as for the physical health.

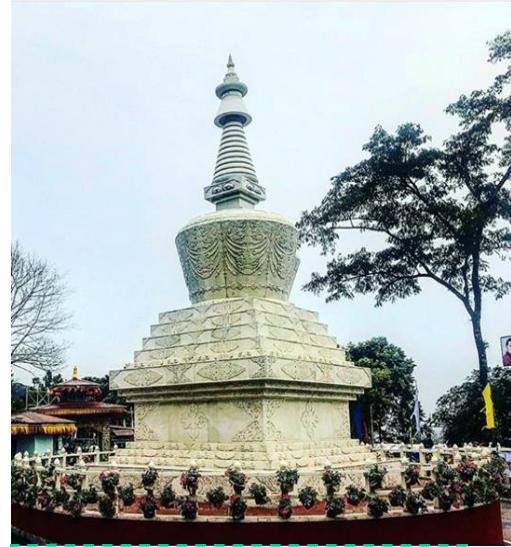


Fig 17. Sidok chorten near Dzong.

4.2.5 Housing

The existing area under LAP II mostly consists of one and two-storied houses and few of three storied permanent structure. While some houses are occupied and maintained well, many are in bad shape.

There are also a number of structures in the institutional areas used both for administrative and residential purposes. Almost all structures in the institutional areas are of single storied except for the few 3 storied NPPF housing.



Fig 18: three storied NPPF housing colony above the school



Fig 19: Three storied NPPF housing colony at Daragaon Area



Fig 01: single storied semi-permanent structure.



Fig 21: Double storied semi-permanent residential building at Daragaon



Fig 22: Double storied semi-permanent residential building at Daragaon



Fig 23: Temporary structure at Gurung Busti area

4.3 Existing Utility and Services

4.3.1. Drinking Water Supply and Distribution

There are three sources from where water is drawn for supply to the town. These include the Damdhum Chhu, Sukruti Chhu and Athraise Chhu. There is separate water storage of 250 cu.m for Gurung Basti area. Water from these sources is partially treated in the water tanks above the NJBC campus. There is no water treatment plant in Samtse town. Water from these tanks is transmitted to the town by gravity flow.

The combined water yield from these sources is 2376 m³/day. The water is supplied ranging from six to nine hours a day. On comparing the water availability and demand, it is observed that the present sources are adequate to meet the present demand. However, there are complaints of

water shortage for days together. Considering the acute shortage of potable water in the region, a water supply project is prioritized with future plans for the Augmentation of Damdhum Gravity Source and Rehabilitation of Damdhum Pumping Source.

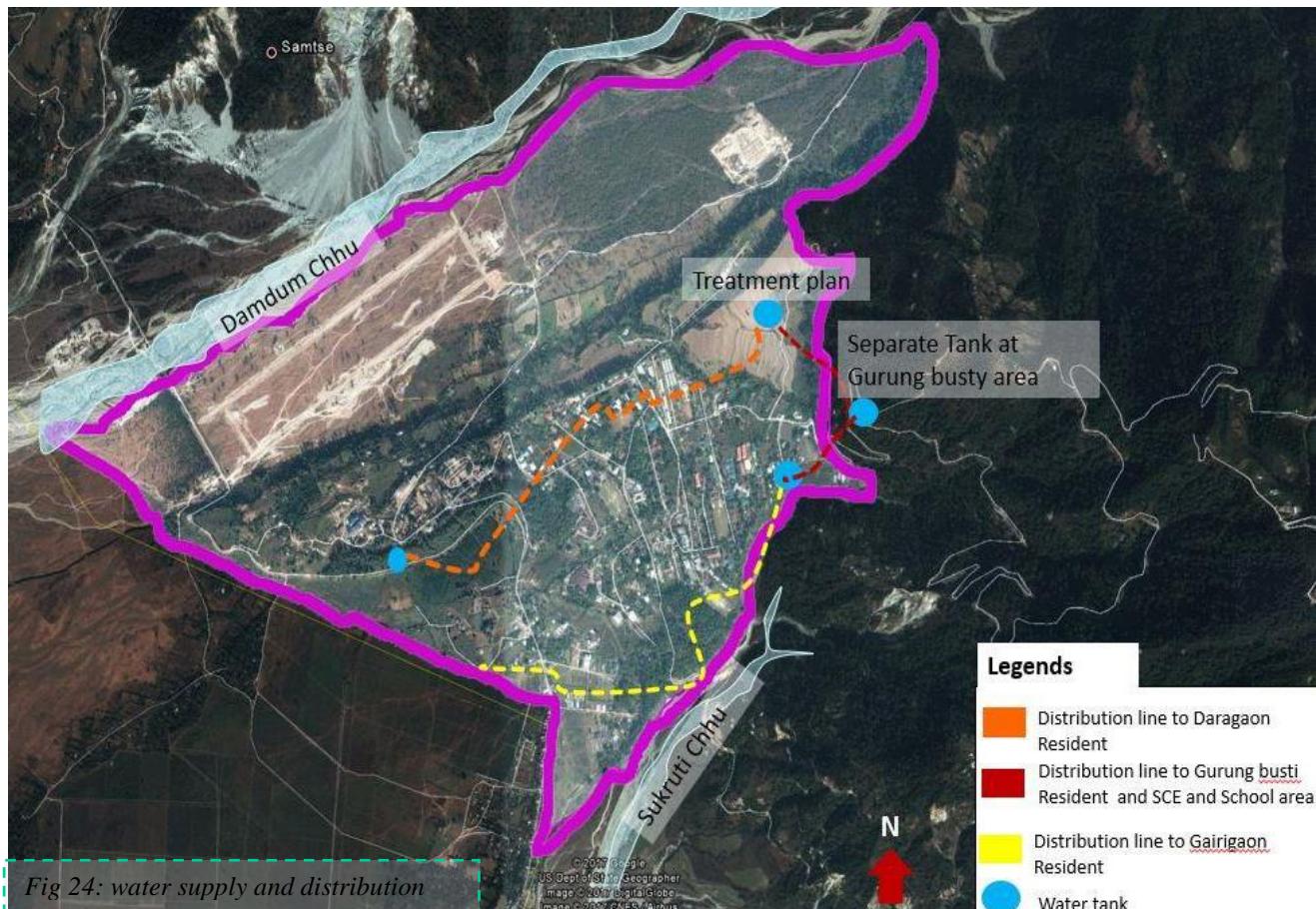


Fig 25: water from the source taken to treatment plant



Fig 26: Damdhum water source.

4.3.3 Drainage System

There is no proper storm water drainage system beyond the immediate vicinity of individual houses. Consequently, storm water often follow the nearest road or the natural depressions making its way down to the main rivers without any treatment. Besides, the runoff from the open drains and road poses threat of erosion to the settlements in the lower plains especially during heavy down pours.



Fig 27: natural surface drainage system along the road at Gurung busy area



Fig 28: constructed drainage system along the paved road

4.3.4 Sewerage System

Samtse does not have an organized sewerage collection and disposal system.

Individual buildings are served by septic tanks and by soak pits located within plots, but it was observed that only 60% of soak pit are functional.

The area within the LAP II is de-sludge by municipal and taken to FSTP plant at Majathang approximately 4.5 km from the town.



Fig 29: FSTP plant at Majathang.

4.3.5 Solid Waste Management

There is no solid waste management system in Samtse.

All the residential have been provided with individual dustbins by municipal.

According to the report, it was estimated that 1.4 tons of waste is generated per day.

The area within the LAP II is de-sludge by municipal and taken to landfill site at Majathang which is approximately 4.5 from the town.

Spilling of solid waste from the open bins is one of the common problem faced.



Fig 30: landfill site at Majathang, Samtse.

5. Analytical Study

5.1 Land for development.

Land suitability analysis is carried out to identify developable land available within the planning boundary. Topography, climate, availability of natural resources and existing settlements are the major determinants for the suitability assessment for any settlements. Land on steep slopes and cliffs, under forest cover, under river protection zones and environmentally fragile areas are identified and marked for protection. While such areas are not suitable for urban development, they can form part of the town's open space system that would ultimately help to improve the quality of urban life.

5.2 Slope Analysis

The slope analysis studies the surface of the land under different slope categories. This is useful to identify areas that are suitable for various developments or more importantly to help designate appropriate land uses.

In this analysis, land with slopes between 0 and 30% have been considered suitable for development while any land with slopes greater than 30% shall be considered only for restricted development, as is the practice in the country. Furthermore, area with slope gradient of 57 % and above are not permitted for development, owing to the steepness of the slope, making it prone to disasters.

Since Samtse town is located on comparatively flatter lands on a peninsular hillock, and most of the local area is suitable for any kind of urban development. The analysis found that 8% (55 acres) of the site has slopes greater than 57% which will mainly be maintained as protected areas where no development will be allowed. Another 8% (53.09acres) of the total planning area falls under steep slopes between 15-30%, wherein restricted development will be permitted. Of the remaining 570.6 acres, 457.7 acres are in the existing town area which has been identified as unsuitable for human settlement because of environmentally sensitive areas or within flood protection areas along the rivers and security of a nation cannot be comprised and hence the border town like Samtse is one of the top agenda in planning should be security and hence a buffer space is no exception.

Therefore the net area available for effective development including those under institutional ownership is 543.6 acres.

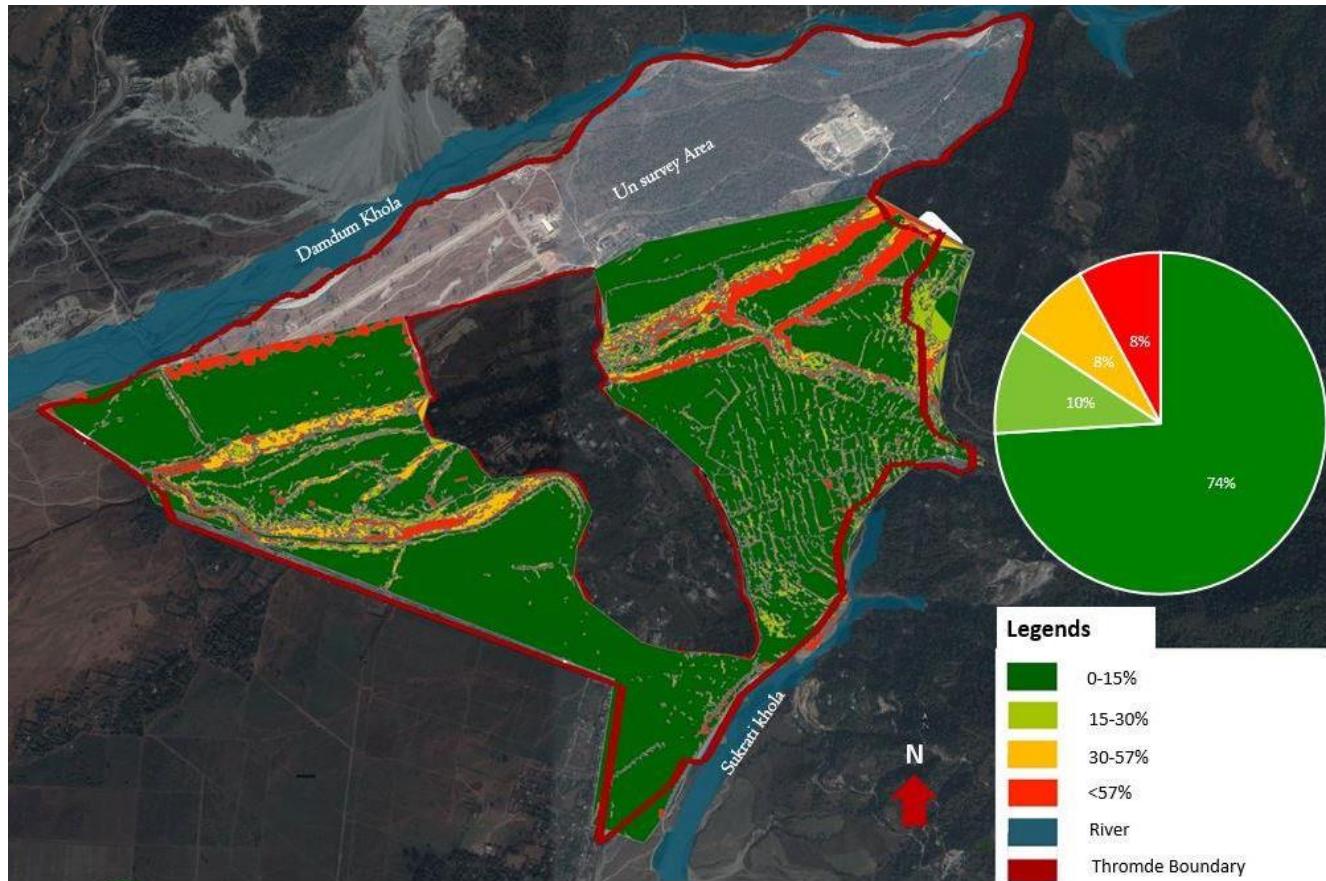


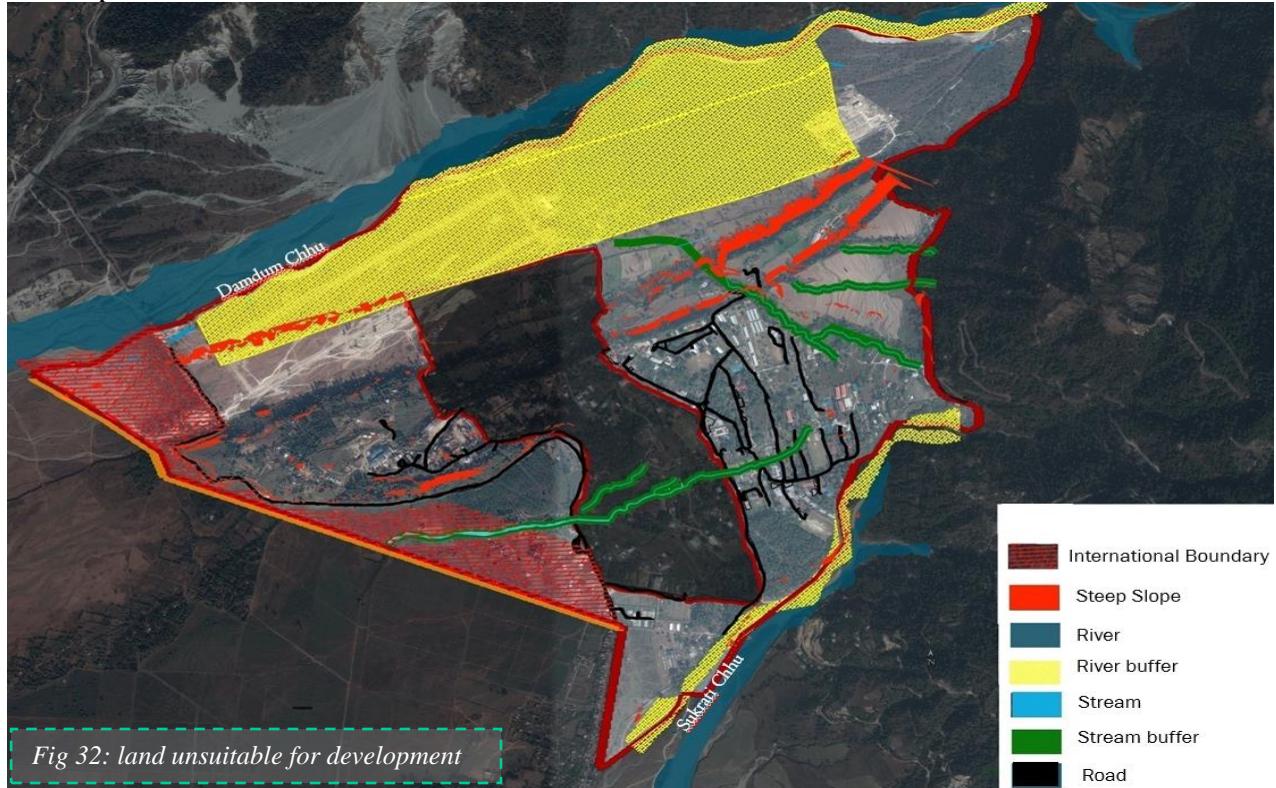
Fig 31: slope analysis

Slope Gradient	Areas in acres
0-15%	502.6
15-30%	68
30-57%	53.09
<57%	55

Table 6.slope analysis in terms of acres

5.3 Land Unsuitable for Development

The composite land suitability analysis map illustrates the different areas under slope and hazard zones, river, stream and international buffer. About 233.57 acres of the total LAP (1001.3 acres) area falls under different hazard or buffer zones and these area not feasible for development.



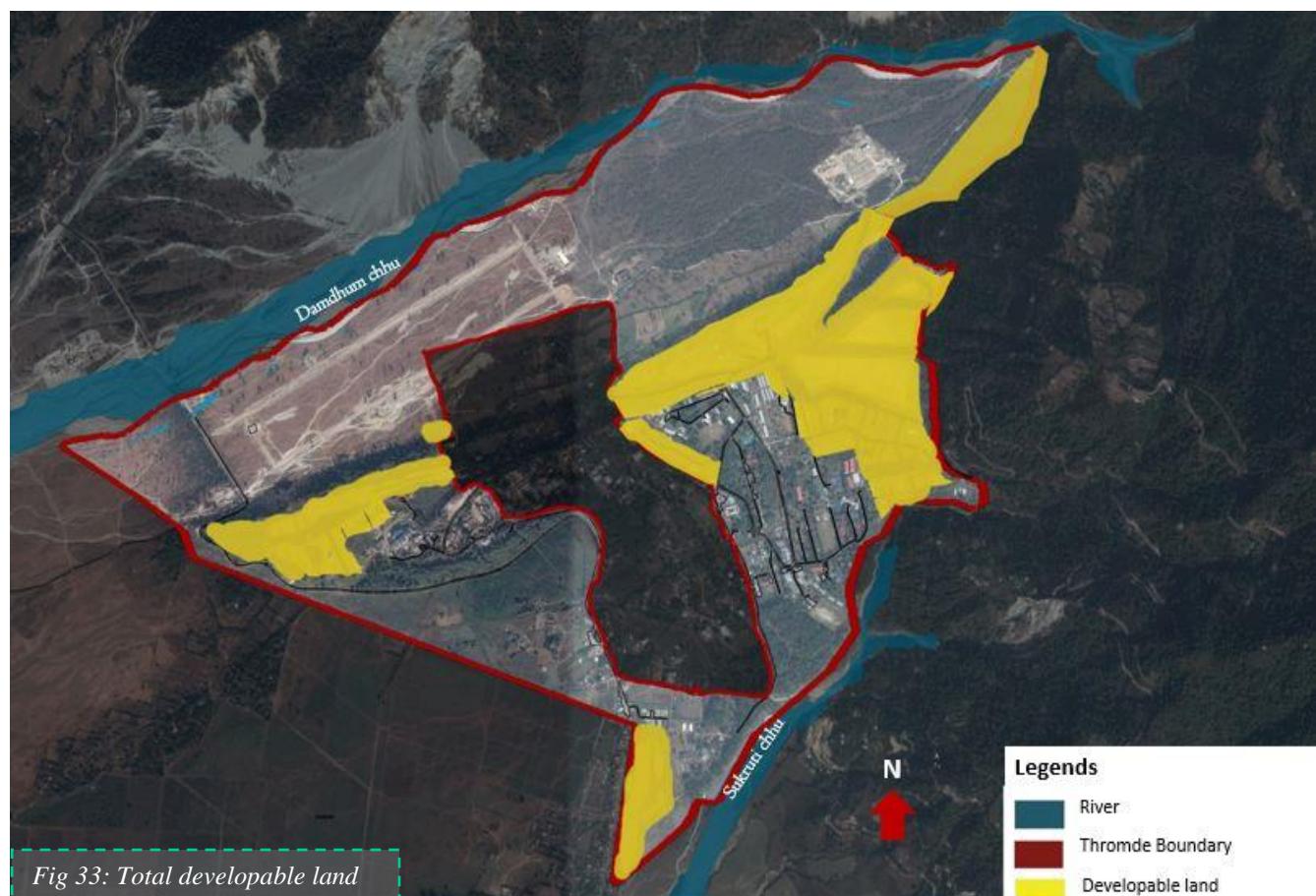
Land Use Types	Area in Sqm.	Area in	% of Total
Green Corridor/stream buffer	136201.98	33.65	4.38%
River buffer	267092.5	66	8.56%
International buffer	374,860.822	92.62	12.06%
Protected area	167135.2	41.3	5.37%
Total	945224.3	233.5	

Table 7: Area of land unsuitable for

5.4 Land for Development

The preceding analyses help to determine the areas that are suitable for development. These are the areas that are arrived at after identifying areas that fall either on steep slopes, environmentally sensitive areas or within flood protection areas along the rivers. Further, parcels of land have to be maintained as either green areas or open spaces for public safety and convenience reasons. As a result, the total developable area is 767.73 acres including developed area (both institutional and private area). However huge chunk of land is occupied by institutional area which is already developed or have their own future plans.

Thus the Total developable area is only **187.94** acres (224.8%). The proposed development would require judicious use of resources while maintaining the balance between the built-up and open areas.



5.5 SWOT Analysis

Table below indicates the various strengths, weaknesses, opportunities and threats that confront the proposed development for Samtse LAP II. Such an analysis helps to arrive at a clear course of direction for future development and to take the precautions necessary to negate the perceived Threats and shortfalls.

Strengths	Weaknesses
<ul style="list-style-type: none"> • Commercial center for whole Dzongkhag, Vicinity to Indian Border and head quarter of Samtse Dzongkhag. • Samtse – Phuentsholing, & Samtse – Haa via Dorokha highway connecting to major trading hub. • Generally flat or gradual terrain • Location of Dzongkhag Hospital and other institutions within the vicinity. • Pleasant climate (as compared to other southern Dzongkhag) 	<ul style="list-style-type: none"> • Limited land for future expansion • Fragile ecology in the surrounding area. • Presence of industries within the town. • Limited land availability around town area.
Opportunities	Threats
<ul style="list-style-type: none"> • Upcoming industrial estate nearby to boost the economy of the place. • Presence of institutional areas such as NIE, Schools, Hospital and Temple. • Winter migration place. • Proposed to be developed as the service center (according to 11th Five Year Plan) 	<ul style="list-style-type: none"> • The pollution imposed by the industries. • Floods due to heavy rainfall.

Table 8 .Strengths, Weakness, Opportunities and Threats for Samtse LAP II

5.6 Mode of Land mobilization

Given the limited land available for development, mobilization and assemblage of land for urban development has been a difficult task. On the other hand Bhutan is faced with a rapid rate of urbanization, a recognized global trend. Though the laws of the country provide for acquisition of land for public purposes including urban development, the Government since the last decade has been promoting the concept of Land Pooling.

Land pooling is a method by which all the local citizens in an urban area, irrespective of their existing conditions, come together to share among themselves and to solve problems like insufficient services, no clearly laid out roads, plots with no access and properties with no potential for further development. In this scheme all landowners in an area contribute a certain agreed percentage of their land holdings towards provision of infrastructure and common amenities. The Land Pooling Rules 2009, adopted to streamline the land pooling process, stipulates a number of conditions for employment of the scheme among which are the suitability and feasibility studies and the ceiling on land pooling contribution ratio. For an area to be suitable for Land Pooling scheme it has to be in an urban area and the proportion of developed plots should not exceed 25%. The feasibility study requires consideration of the proportion of the plots which are vacant, the number of land owners, the size of the plots, topography, the likely environmental impact of a scheme, the need for environmental screening and the rise in property values. Further, implementation of a land pooling scheme requires that the contribution ratio does not exceed 30%.

In land pooling, at the start of the process, a hypothetical condition, in which all of the land is brought into one “Pool,” is considered. A rational road layout, with all of the amenities and services required for the area, will be planned. These roads, amenities and services may, but not necessarily, take up to thirty percent of the land. To “create” this common land within the local area, the percentage of land needed for these common facilities is deducted from each plot. Now the original plots which were of odd shapes, are reconstituted into regular polygons and distributed rationally. These new plots, which are proportionately smaller than the original properties, are however marketable urban plots. The value of the plot immediately increases over time, as the area is upgraded with services and roads. On steep slopes where alignment of roads is impossible, because of physical slope constrains, the land is regularized in a manner that footpaths serve each plot, with common parking at entrance areas. These public walkways are wide enough to carry urban infrastructure also.

As for Samtse Local Area plan II, differential land pooling percentages are adopted based on the precinct designation, which is the basis for different number of floors and the uses. The table in the following page illustrates the details of the land pooling contribution as per the development proposals in this local area plan.

SI	Different land Holdings	Area(Sq.m)	Area(acre)
1.	Private land	363812.4	89.08
2.	Government Land	3246226	802.16
3.	Corporation Land	41925.43	10.36
4.	Defense Land	157341.8	38.88
5.	Dratshang Land	15458.99	3.82
6.	State Land	238764.5	59.03
	Total		1,001.33
Land Excluded from Land Pooling			
1.	Under Steep Slope	222577.1	55.00
2.	Stream Buffer	267092.5	66.00
3.	International Buffer	374819.8	92.62
4.	Industrial Area	760809	188.00
5.	Protected area	167135.2	41.30
6.	Existing Road	63657.05	15.73
7	Institutional Areas(defense, Dratshang, School, Hospital, College)	1423441	351.74
8.	Transit Terminal	12140.57	3.00
	Total	3291673	813.39

Table 9. Excluded from land pooling

SI	Total Suitable Registered land for LP	190.94 acres	
	Proposed Public facilities	Area (sq.m)	Area (Acres)
1.	Proposed Road	182108.5	45.00
2.	Kindergarten	2023.428	0.50
3.	Community Space / Children Play Area/footpath	2023.428	4.00
4.	Bicycle track	4046.856	1.00
5.	Parking	4046.856	1.00
6.	Service Plots & infrastructure	2023.428	0.50
	Total	210436.5	52.00
	Average Land pooling Percentage		28

Table 10. Proposed public facilities considered under land pooling

Proposed Precincts	Differential LP %
Urban Village 1	28.8
Urban Village-2	26.4
Urban Village-3	24.1
E-4	20.3
Transit terminal	30
Service-2	24.5

Table 11. Differential land pooling for Areas under different Precincts

6. Proposals for Action

6.1 Concept of the Plan

The layout and design of the Samtse Structure Plan is based on the concept **Principles of Intelligent Urbanism (PIU)**. PIU are a set of ten axioms, laying down a value-based framework within which participatory planning can take place. PIU emerged from several decades of urban planning practice. The Principles of Intelligent Urbanism are described briefly below.

6.2 AXIOMS FOR THE TRANSFORMATION OF SAMTSE

Principle One:

A Balance with Nature emphasizes the distinction between utilizing resources and exploiting them. It focuses on a threshold beyond which deforestation, soil erosion, aquifer depletion, silting, and flooding reinforce one another in urban development, destroying life support systems. The principle promotes environmental assessments to identify fragile zones, threatened natural systems and habitats that can be enhanced through conservation, density control, land use and open space planning. In Samtse, the occurrence of frequent landslides and mining operations in the surrounding hills have resulted in the siltation of major streams feeding the Damdhum Chhu and Sukruti Chhu basins as they enter the tarai. These deposits of silt have made the drainage system shallower and therefore wider. Due to this, the streams will choose new paths in heavy rainfall seasons.

Thus, watershed management is critical to the planning, growth and even survival of Samtse.



Fig 34. Landslides and Mining in the slopes of the Mountains near Samtse and its resultant silt deposition in the river basins

Principle Two:

A Balance with Tradition integrates plan interventions with existing cultural assets, respecting traditional practices and precedents of style. The present chorten, Dratshang and lhakhangs in the town will become the focal point in the plan. This principle sees Bhutanese culture as the last living tradition of the Great Himalayan civilization and explores a relevant vernacular style which responds to new functions and technologies.



Fig 35. Samtse Dzong

Principle Three:

Appropriate Technology promotes building materials, techniques, infrastructural systems and construction management consistent with people's capacities, geoclimatic conditions, local resources, and suitable capital investments. Accountability and transparency are enhanced by overlaying the physical spread of urban utilities and services upon electoral constituent areas, such that people's representatives are interlinked with technical systems performance.

Principle Four:

Conviviality sponsors social interaction through public domains, in a hierarchy of places, devised for personal solace, companionship, romance, domesticity, neighborliness, community and civic life.



Fig 37. Interaction through public domain

Principle Five:

Efficiency promotes a balance between the consumption of resources like energy, time and finance, With planned achievements in comfort, safety, security, access, tenure, and hygiene. It encourages optimum sharing of land, roads, facilities, services and infrastructural networks reducing per household costs, while increasing affordability and civic viability. While Samtse is compact near the market, it is on the whole a spread out and low density town, making the supply of services and utilities costly on a per household basis. Densification therefore becomes a goal of the plan.

Principle Six:

Human Scale encourages ground level, pedestrian oriented urban arrangements, based on anthropometric dimensions, as opposed to “machine-scales”. Walkable, mixed use urban villages are encouraged, over single-functional blocks, linked by motorways and surrounded by parking lots.

Principle Seven:

Opportunity Matrix enriches the town as a vehicle for personal, social, and economic development, through access to a range of organizations, services and facilities, providing a variety of opportunities for education, recreation, employment, business, mobility, shelter, health, safety and basic needs. Samtse shall be an Urban Service Center, clustering higher education facilities, hostels for students from the hinterlands, specialized health care facilities and social welfare activities. It will create economic infrastructure generating jobs, income and consumption.



Fig 38. Services and facilities providing variety of opportunities

Principle Eight:

Regional Integration, envisions the city as an organic part of a larger environmental, socio-economic and cultural-geographic system, essential for its sustainability. Samtse is a regional center and shall act as the Service Center for south-western Bhutan. The proposed dry port and the Special Economic Zone will make Samtse the economic generator for the area, as well as the districts to the north for which Samtse will act as a supply center. The Sibsoo to Samtse belt is a highly potential Special Economic Zone, covering a relatively large percentage of the low lying flat land in Bhutan.

Principle Nine:

Balanced Movement promotes integrated transport systems comprising walkways, cycle paths, bus lanes and automobile channels. The modal split nodes between these become the public domains around which cluster high density, urban hubs and pedestrian, mixed-use urban villages.

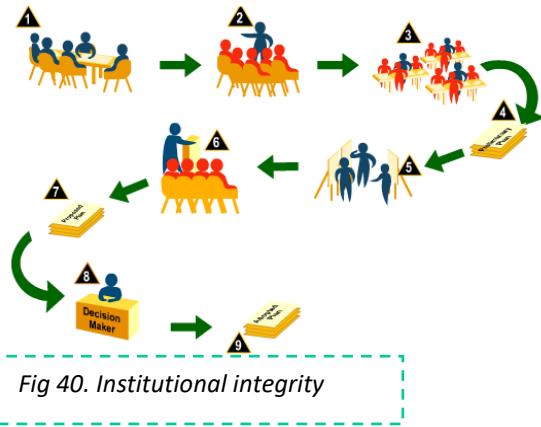


Fig 39. Integrated transport system

The Samtse-Sibsoo belt will grow in an ad-hoc manner unless the transport network is carefully conceptualized. Modes of transport such as air, bus, truck, taxi, automobile, cycle and pedestrian must all be integrated. The Siboo-Daipham National Highway within Bhutan linking the southern areas in the west and east must be part of the concept.

Principle Ten:

Institutional Integrity recognizes that good practices, inherent in considered principles can only be realized through accountable, transparent, competent and participatory local governance, founded on appropriate data bases, due entitlements, civic responsibilities and duties. PIU promotes a range of facilitative and promotes urban development management tools to achieve appropriate urban practices, systems and forms.



The Structure Plan and the integrated Local Area Plans will become part of the legal framework of the area. Adequate staff must be engaged to layout the plans, accept and clear development proposals and to insure the continuous maintenance and development of infrastructure.

6.3 Proposed Precinct Plan

Though, the precincts proposed in the Samtse Local Area Plan II are derived from the Structure Plan, which promotes mixed-use development recognizing Bhutanese way of life calling for different precincts to accommodate different phase of life. These precincts facilitate and promote various activities, and are sanctified as auspicious places for these necessary activities, which make up city life. The precincts assure that a religious function will not be disturbed by an industrial function and that residential "house holding" activities will not be disturbed by intensive retailing and wholesaling.

The Precinct Plan of Samtse gives a clear indication of the organization of the various land uses in the town. The entire area is divided into following precinct categories: Urban Village 1, Urban Village 2, Urban Village 3, Institutional, Heritage, Services, Environmental Conservation, Open Spaces, and Defense.

The precincts have been designated after a careful consideration of the analysis indicated above not limited to land, infrastructure, population, natural and built environment and also taking into account the scope for the future development. One of the main factors considered in determining the land uses for different areas and their development control regulations was the impact on the environment. Therefore, the sanctioned precincts aim to preserve the

environment and to promote a sustainable development. While the site is primarily vacant, there are few structures on some plots. Efforts have been made to retain these structures.

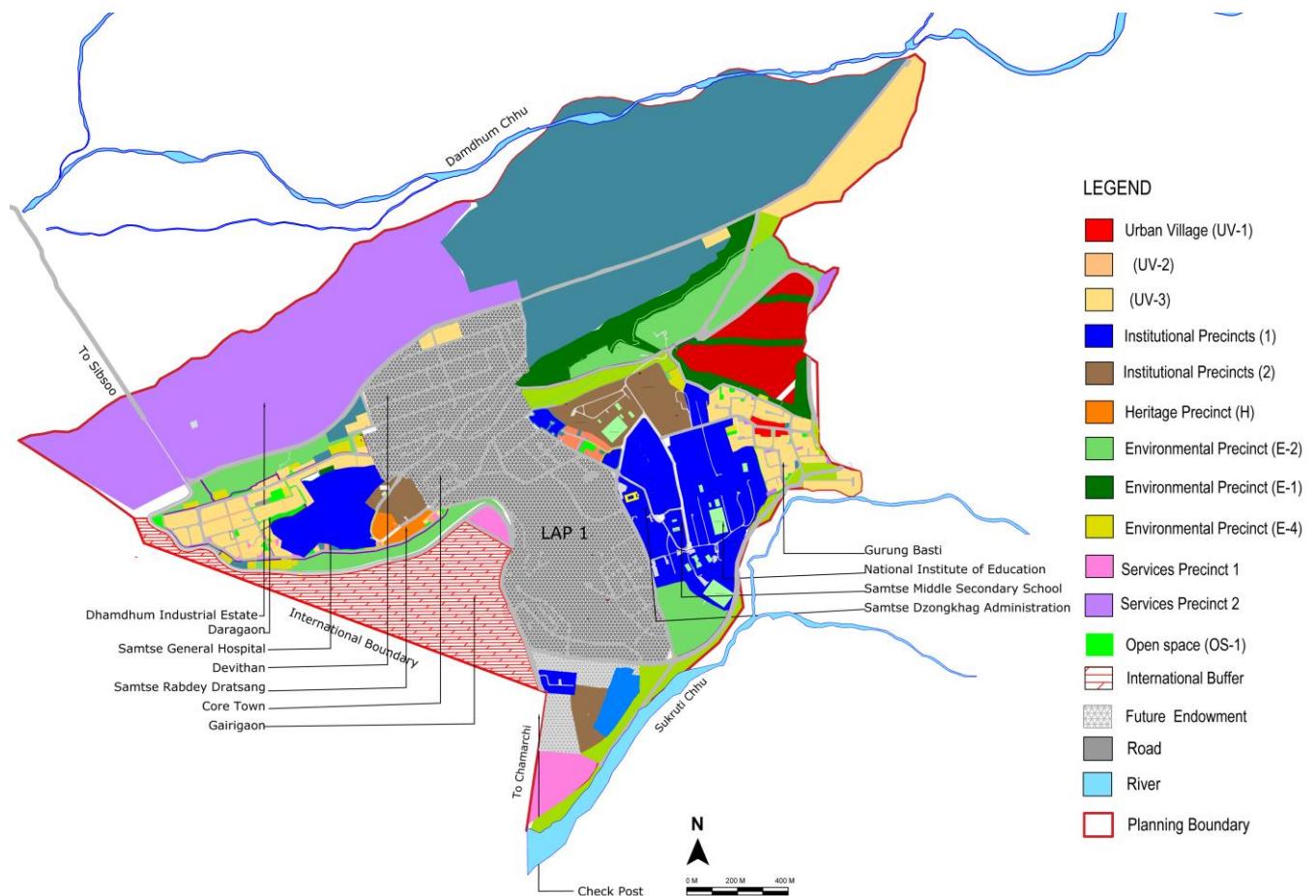


Fig 41. Proposed Precincts

6.3.1. Urban Village Precincts

The Urban Village Precincts are areas zoned for mixed use development- a place to live, work and play. There are three categories of residential areas, UV-1 for medium and UV-2 for low density developments and UV-3 for very low density developments.

Conceptually an Urban Village, as identified in the Samtse Structure Plan, will have amenities, basic services and convenience shopping at their centers, called Village Squares or more central and larger Urban Hubs. These are surrounded by medium to high density walk-up apartments forming the core of the settlement. These are then surrounded with a ring of medium density, and low density settlements towards the periphery. One of the major determinants in identifying the limit of an Urban Village, and the location of the Village Squares in the Urban Village, is the comfortable walking distance and the proximity of the existing settlements and facilities available within the given location.

6.3.2 Urban village -1

The Urban Village -1 (UV1),precinct is ideal for normal residential development allowing shops and other amenities at ground and first floor and is proposed immediate next to the new proposed road towards Gurung busty area.

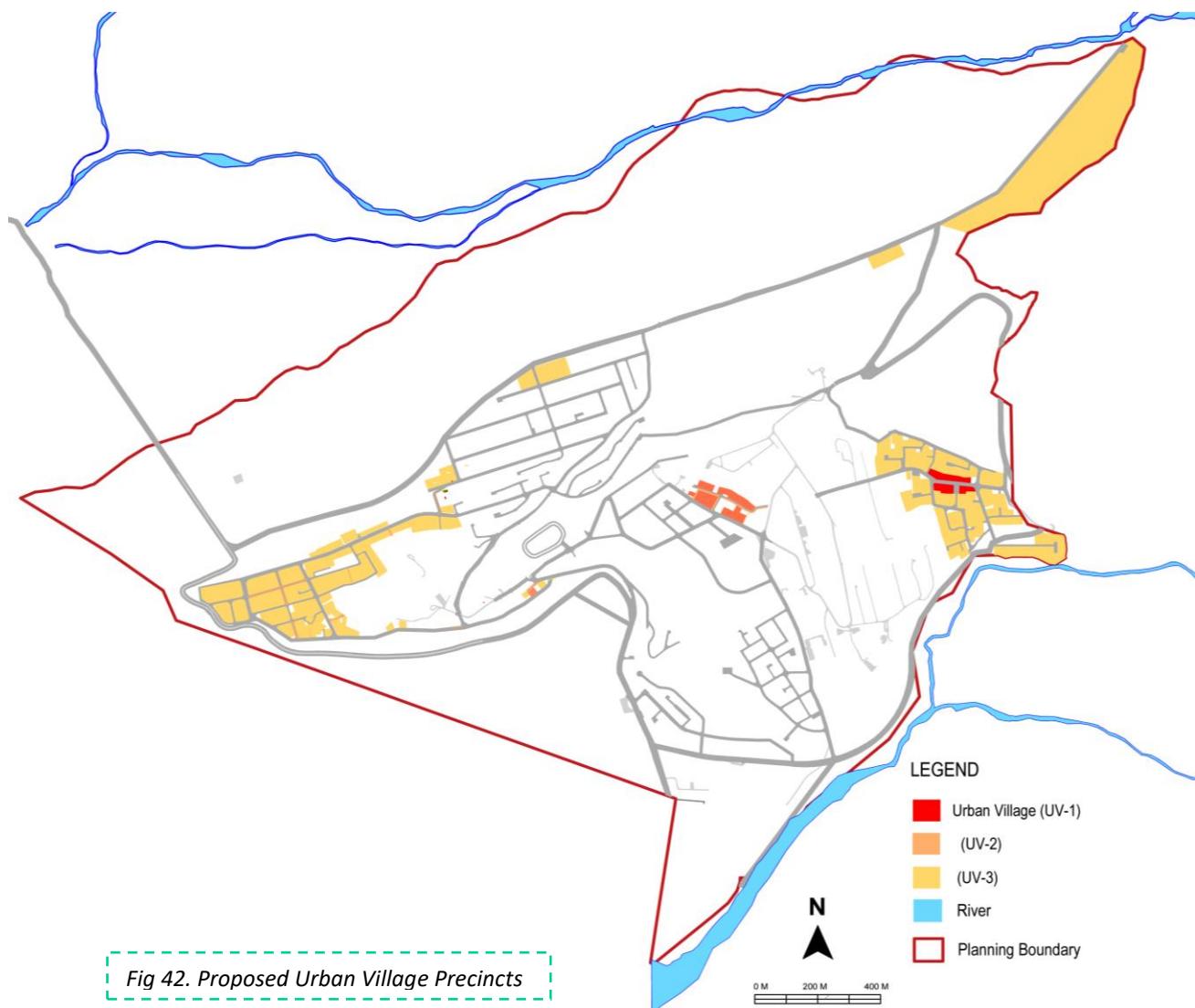
UV-1, which form the amenity core of the Urban Villages, essentially would have amenities and facilities for the self-sustainability of the Urban Village it belongs to. There will be convenience shops, a restaurant cum bar, cafes, barber shop, beauty salon, basic health unit, minor repair shop for autos, a taxi stand, news stand kiosk, neighborhood pub, bakery, cyber café, laundry and other amenities. UV-1 could also be a business centers with office space, cafes, laundries, taxi stands, book kiosks, post boxes, community halls, crèches, ATMs and other ancillary facilities. These Village Squares will be linked with the other urban village (UV-2 & UV-3) through well-established transit corridors and pedestrian movement system.

6.3.3 Urban Village-2 & Urban Village-3

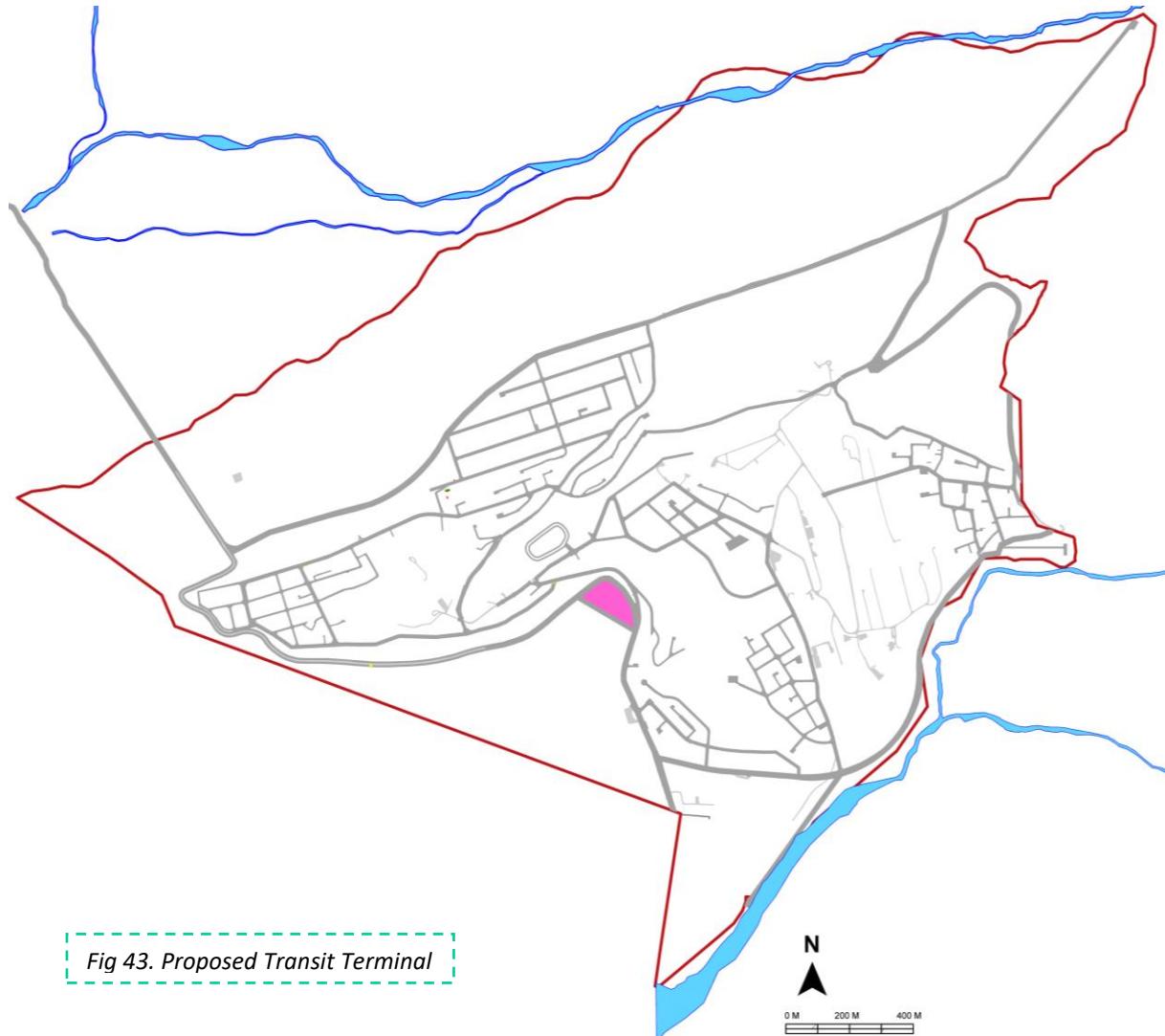
The predominant precinct schedule of the proposal is the residential areas divided across two precincts, namely, the Urban Village-2 (UV-2) and the Urban Village-3 (UV-3).

According to the main permitted uses in UV-2 precincts, allowed building heights and plot coverage regulations proposed in the Development Control Regulations, UV-2 is envisioned to be a high-density residential precinct allowing commercial activities, local level retail shopping, service establishment at ground floor level only.

UV-3 is a medium- to low-density residential precinct. Predominantly Residential development and few retail shop only at ground floor is envisioned to be developed in these areas. The development envisioned in UV-2 will provide housing for middle income and lower-middle income level groups.



6.3.4 Transit Terminal

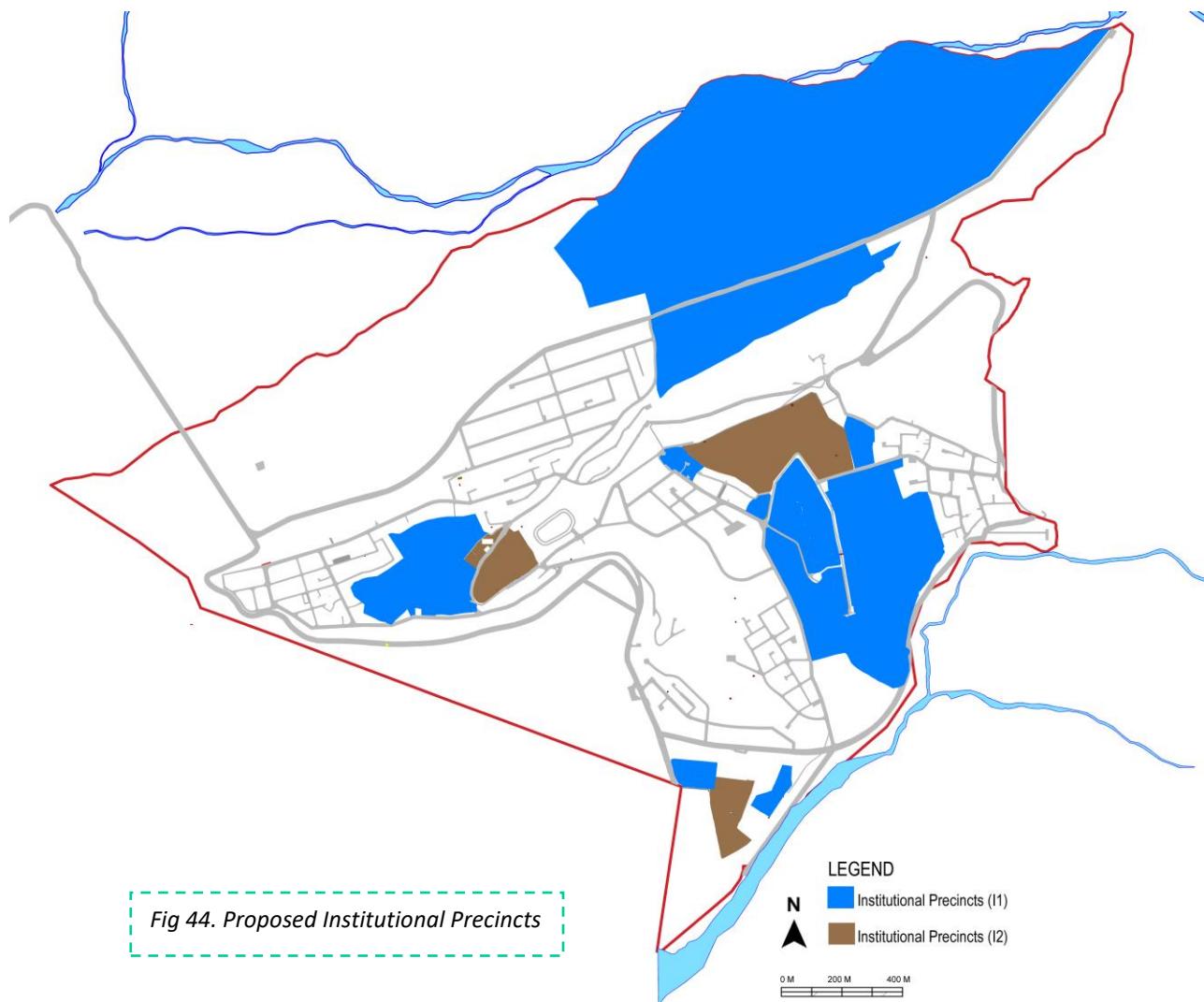


For any Public Transit System to become successful, one of the prime requirements is the creation of transit hubs, so that the citizens have proper facilities, as well as options to reach the destinations.

In Samtse, the public transit terminal is propose below the samtse-sibsoo highway which will occupy an area of 3 acres in total. To encourage the use of the inter-city public transportation system, the transit Terminal would house both intercity buses and buses commuting to and from other Dzongkhag. There will be facilities such as visitor's center, taxi lounge, cafes, phone kiosk, and convenience and souvenir shops including rest areas. It would also house Immigration Customs office and necessary security posts.

6.3.5 Institutional Precinct

The existing institutions namely; Royal Bhutan Police and Royal Bhutan Army is proposed as Institutional precinct (I2). All the existing institution; Lower Secondary School, higher Secondary, Dzongkhag Administration, Samtse College of Education, Samtse General Hospital, Forest Range Office areas have been retained in their originality and proposed as Institutional Precinct (I1) This is because they are not only already established in their respective areas but also provide important public services. However, the boundary of Samtse Hospital, Samtse College of education, Bhutan Post Office, Royal Bhutan Army, Industrials area and Jersey breeding Center areas has been slightly altered, without affecting its existing establishments. This overall reconfiguration will enhance the connectivity and land use for the entire area.



6.3.6 Environmental Conservation Precinct

A network of protected spaces is proposed within the Samtse LAP II. This has been done, despite the fact that Samtse has very limited area for development, to ensure the natural environment and terrain of the area are preserved. Areas under precincts include the river/flood protection corridor along the river; steep drops and cliff areas and rock outcrops. Low lying areas and gullies with history or indication of natural drainage systems have also been marked for storm water drainage along with buffer areas.

Adequate buffer spaces have also been maintained between the environmental conservation areas and those areas marked for development. Stringent regulations in terms of the type of development that would be permitted in such areas have also been drafted.

The proposed Natural Environment Protection and Enhancement Zones are classified into:

- Streams, Rivulets and Surface Storm Water Drain Protection Zones;
- Forest Cover Protection Zone;
- Steep Slopes Protection and Soil-Stabilization Zones in the mountains slopes of the Samtse town and its surroundings; and,
- Flood Protection Zone.

All the proposed Environment protection and Enhancement Zones will fall as a part of the respective Environmental Precincts proposed as a part of the precinct plan for the town.



Fig 45: Environmental Conservation Precincts

6.3.7 Open Space System

The proposed open space system should contain a great variety of facilities and atmospheres, suitable for all kinds of special interest group; challenging and autonomous places for the teens; serene rural and quiet for older people; or crowded and active areas for those who want stimulus and companionship.

Another important factor is the even distribution of these open spaces in the urban landscape. The recreational spaces distributed and located in close proximity to urban communities. The open spaces also include playground, sports fields and recreational areas and green corridors that provide linkages between different environmental precinct areas.

The open spaces mentioned above, apart from accommodating facilities for active recreational use, will also reserve spaces for accommodating traditional and religious features like prayer flags, shortens, and prayer wheels in the town's landscape.

6.3.8 Foot path

The Transportation Plan puts special emphasis on promoting pedestrian movement by making it safer and more convenient through several measures. Given the unique physical settings and scale of the town, walking makes it easier to commute between destinations. A town-wide system of pathways, providing shorter routes to important nodes, residential areas, open space systems and heritage sites has been identified.

A network of foot path is proposed in Samtse Local Area plan II. Comfortable sidewalks along the roads reinforce the pedestrian environment. The comfort and convenience of the pedestrian walkways, which encourage pedestrian movement, will reduce internal auto trips by creating destinations, which are attainable without a car. A minimum of a 1.8 meter wide on-street foot path is proposed along with the street lighting. Wider sidewalks are to be provided in the commercial areas, or around Village Squares, and at places where pedestrian activity is intense. However, the width of sidewalks is to be determined based on location, context and their role within the area.

The off-street Pathway network will complement the road and the open space network proposed in the town. This off-street pathway network often provides the shortest and easier connections between roads, residential sectors, and commercial nodes and other destinations located in the town. Off-street walkways will provide flexibility for pedestrian movement within the residential and commercial area attracting various leisure activities along them. These pathways will run parallel to the rivers, streams, natural storm water drains connecting the open space system and linking other major destinations. Along the streams and rivers, this pathway system will act as the boundary line for the eco-fragile zones identified in the structure plan.

6.3.9 Proposed international boundary precinct

The security of the nation cannot be compromised and hence one of the prime agenda in planning the border town is to reserve adequate spaces for security measures in the future. Samtse being the border town is no exception to this situation.

The structure plan designates area below the existing Samtse- Sibsoo highway as International Boundary precinct as the buffer to the main development area. In total there are 49 plots measuring 92.62 acres within this precinct.

Though restricted development is proposed within the Buffer Zone, renovation of the existing structures shall be allowed. Development related to security facilities, including immigration and customs could be allowed, under special approval from competent authorities and Royal Bhutan Army. Agriculture practice would be allowed in this proposed zone provided that the type of crops cultivated would not restrict the vision and the accessibility when needed. In the long run, the Government and local administration should take appropriate measures to resettle the Existing intensive development and institutions if any in the International Border Precinct to a safer place, outside and make the precinct free of any type of intensive urban development.

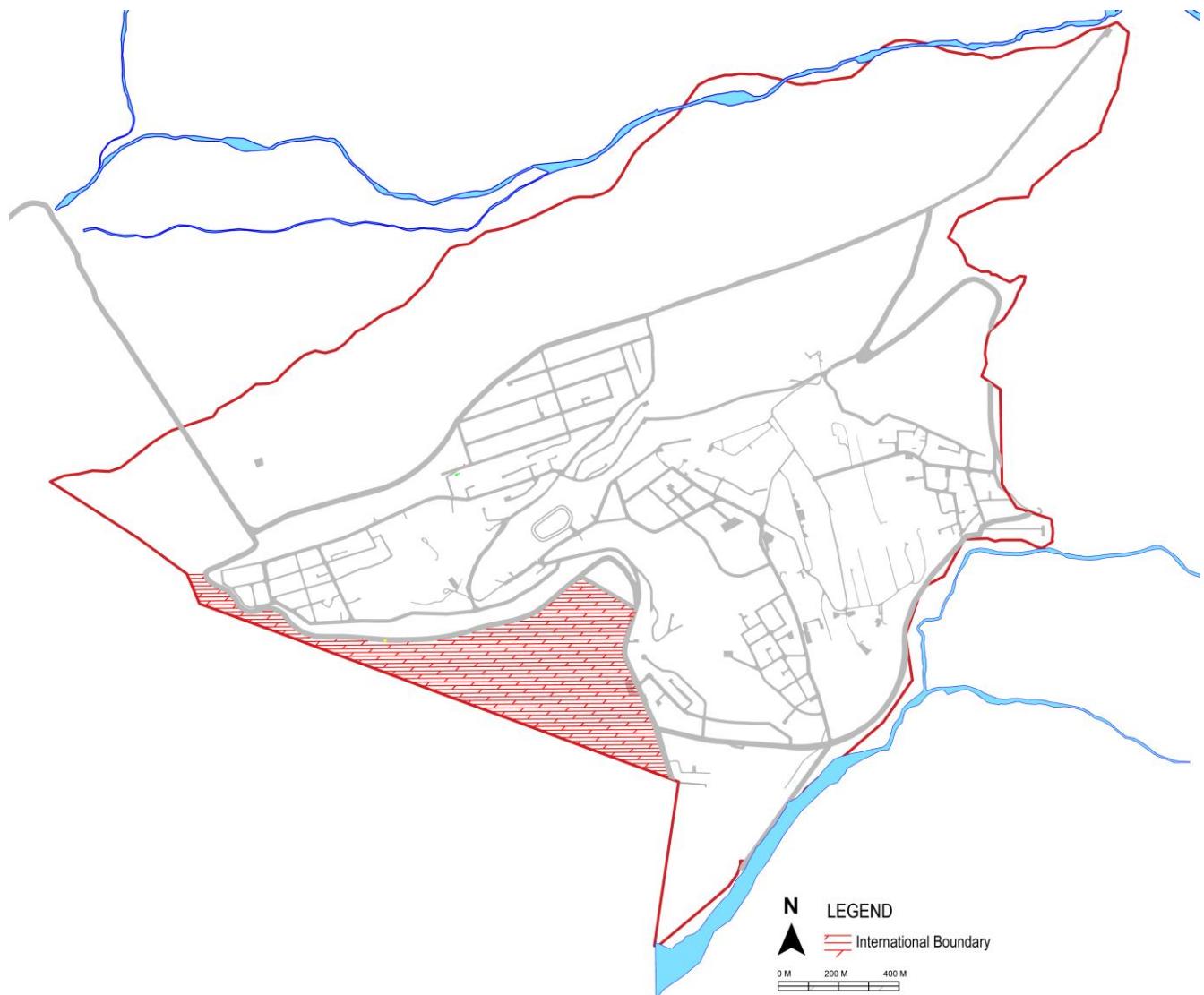


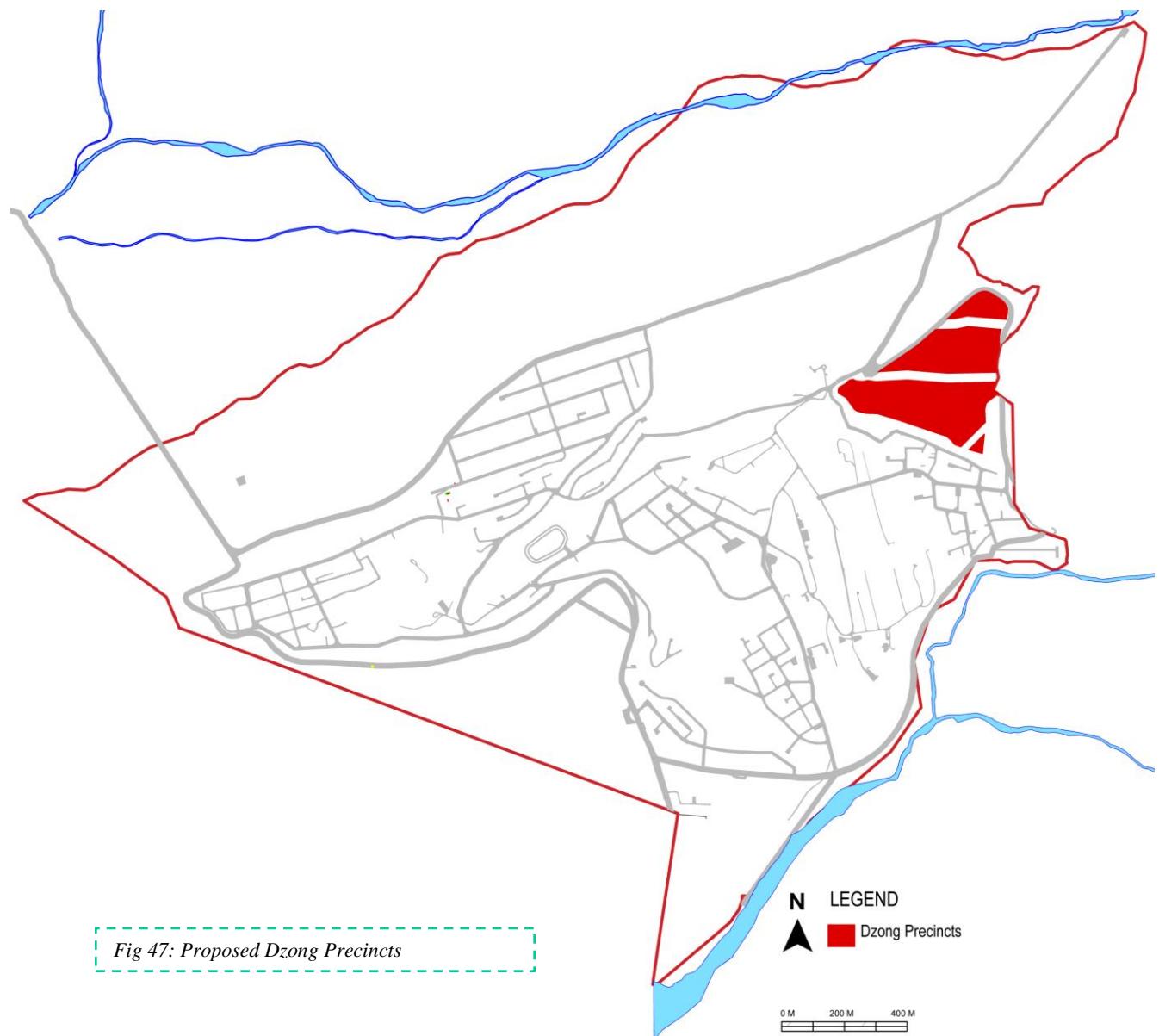
Fig 46: Proposed International Boundary

6.4 Dzong Precincts

After a careful analysis of the physiographical and the visual character of the town it is proposed in the structure plan that these institutions be located to the north-eastern part of the town in the upper grazing terrace of the present National Jersey Breeding Centre. The jersey breeding center does not comply with potential urban land uses and hence it would be necessary to relocate such non-urban activities outside the town limits.

The proposed location will give importance to these developments in the town's landscape by the dominant visual axis the place establishes and the higher altitude of the location with respect to the rest of the town.

The area will be reserved as a Dzong Precinct in the proposed Precinct Plan for Samtse. This precinct apart from accommodating activities related to the will also accommodate the proposed relocated Dratshang, the Monastic School and the new Royal Guest House. Thus the unique Bhutanese living tradition of strong interrelation between the Administration, Monastic Bodies and Royal uses can be achieved both at symbolic and at operation level. The proposed Dzong precinct will be a sacred place of the town, directly accessed from the proposed Urban Bye-Pass system and will form a majestic welcoming entrance for the people entering the town from Phuentsholing and the rest of the country. The panoramic view of the Damdhum Chhu bed and the surrounding landscape will visually enhance the Dzong Precinct.



6.5 Infrastructural proposal

Planning for Utilities and Services is crucial for both the future development envisioned in the Local area and to ensure better living conditions in the town. It must also be noted that the selection of appropriate utilities systems, and their design, should be done by qualified public health engineers. In this local area plan a conceptual network of these systems are envisioned so that the network rights-of-way can be reserved and preliminary estimates can be done.

6.5.1 Water Supply System

Water Supply demand for the residential population of the Gurung Basti local area is estimated to be 788,500 liters per day, considering an average of 140 liters per person per day, as per the planning standards. As mentioned earlier, The Department of Water and Sanitation division under MoWHS has proposed for a provision of a new water supply network in Samtse with future plans for the Augmentation of Damdhum Gravity Source and Rehabilitation of Damdhum Pumping Source. Further, with the Construction of additional service reservoirs at the distribution, especially at the location of shortage of water, the maintenance of Water treatment plant and operation and management of water supply will also be carried out.

The funding for the successful implementation for the above recommendations will be either explored from RGoB funding or the ADB Loan as Samtse is one of the ADB Project towns. The details of the works to be executed will be planned, designed and estimated for further implementation by the concern Agency.

6.5.2 Circulation System and Road Networks

The Primary objective of the proposed circulation system within the local area is:

- To provide access to all the plots located within the local area;
- To facilitate uninterrupted and safe vehicular movement negotiating the topographical character of the town;
- To prevent vehicular-pedestrian conflicts;
- To provide easy off-street pedestrian movement
- To provide emergency vehicle access to all the parts of the local area; and,
- To accommodate future public transport, as it emerges.

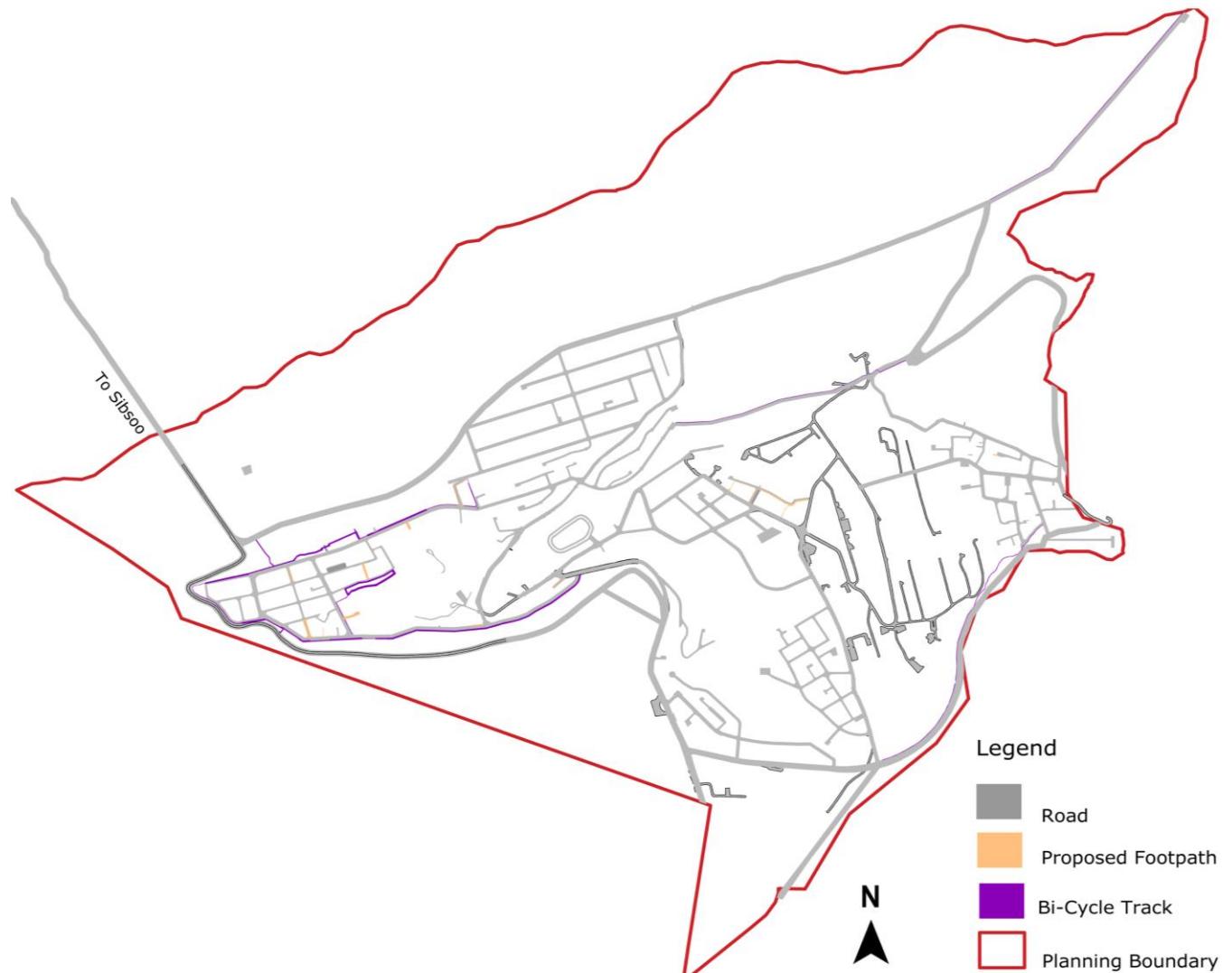


Fig 47. Proposed road, footpath and bi-cycle connectivity.

The proposed circulation system is composed of a series of roads arranged in a hierarchical four categories of roads - primary, secondary, tertiary roads and urban corridor, are proposed as follows:-

Sl.no	Road classification	Road width	Description
1	Primary road	18-15m	1.8 m+14m+1.8 m (14m carriageway)
2	Secondary Road	12 m	1.8m+10m+1.8m (10m carriageway)
3	Tertiary Road	10 m	1.8m+ 8.2 m (8.2m carriageway)
4	Access Road	4.5 m	1.2m+3.3m (3.3m carriageway)

Table 12. Road classification and its width

The primary road, with a Row of 15-18metres and footpaths on both sides, a central median in the Urban Core runs along the periphery of the Thromde boundary forming a loop. It starts from the existing zero point at the Gairigaon and runs through the proposed industrial area and finally connects with the highway to Dorokha. The other primary road starts from the upper Gairigaon near the BPC area and towards the boundary of Samtse College of Education near Sukruti and finally connects with the highway to Dorokha. The new proposed Samtse-Phuentsholing highway will also run along this primary road.

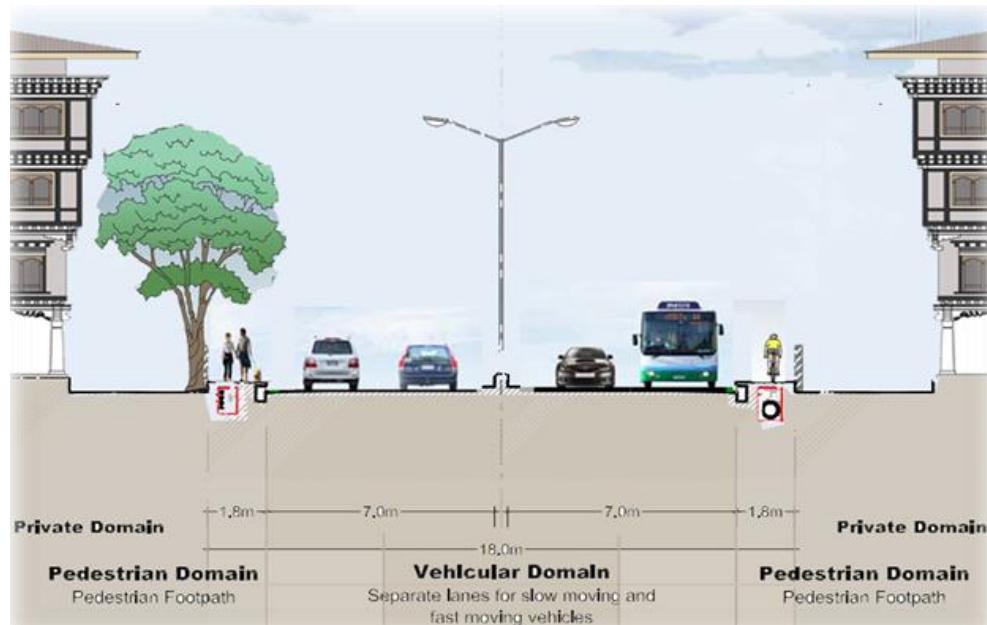


Fig 48: Cross section of primary road.

Secondary roads are the minor roads connecting tertiary roads to the primary roads. The secondary roads have a RoW of 12 meters typical Secondary Road would have a two lane carriageway and footpath, preferably on either side of the road. Wherever possible, wider pathways with provision for bicycle lanes would be provided.

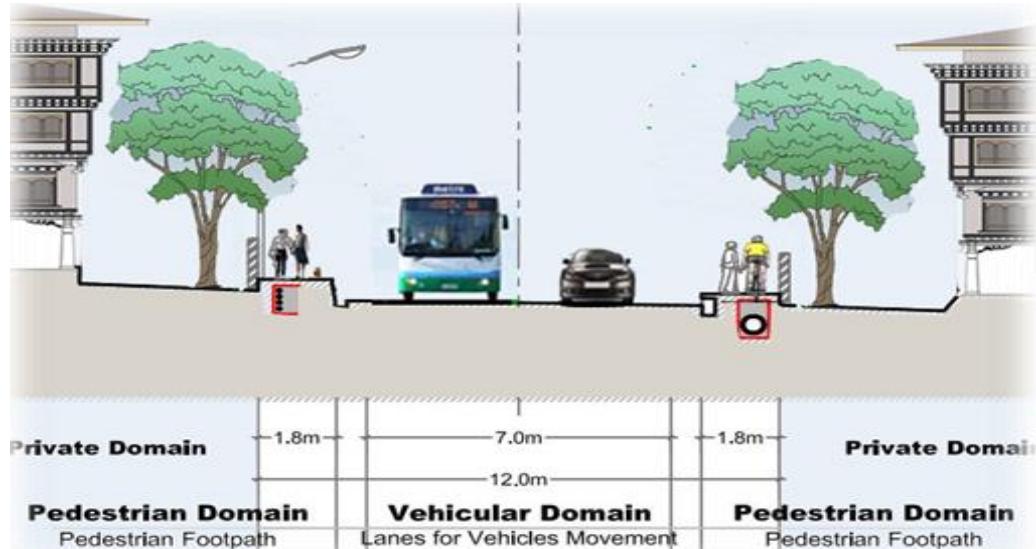


Fig 49: Cross section of secondary road.

Tertiary roads are the access roads for the plots which are not accessible via secondary roads. They also provide access to the open spaces such as the parks. The Tertiary Road have a RoW of 10 meters with footpath on one side only and other side identified as Bi-cycle pathways. Wherever possible, wider pathways with provision for bicycle lanes would be provided.

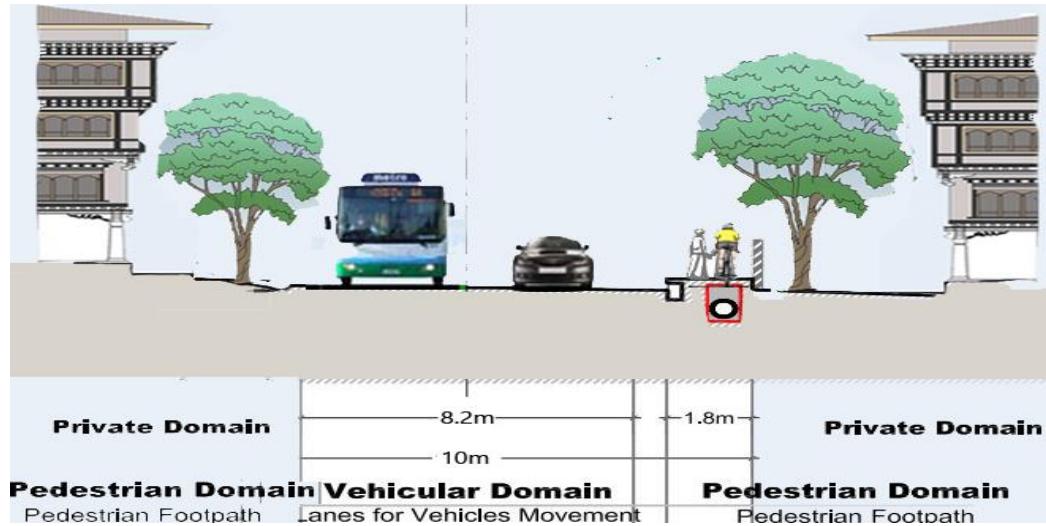


Fig 50: Cross section of primary road.

Access Roads are designed to serve low volumes of traffic through a pedestrian friendly environment with RoW of 4-6meters. Carriageways should only be wide enough to allow two vehicles to slowly pass each other. Emergency and service vehicles may use both travel lanes. Pedestrian movement and bicycles would be encouraged on the street itself, though provision for footpaths will also be provided for additional safety.

Besides the road side footpath, a system of off-street footpaths, pathways and bi-cycle track are also proposed. Further, footpaths have been proposed along trails that are currently used as pathways. While fulfilling the connectivity and circulation needs, the footpaths also serve as significant view points and leisure tracks.

A series of gazebos and seating arrangements are also proposed to be developed along these pathways.

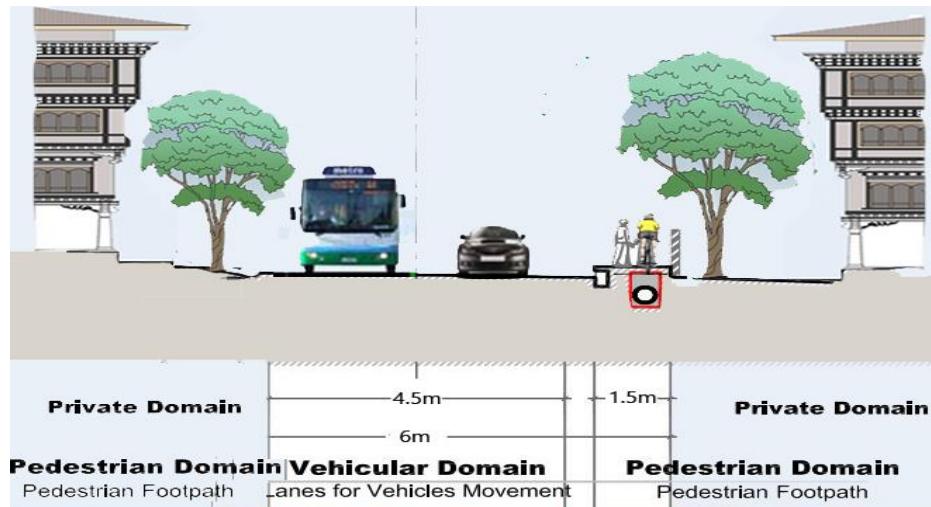


Fig 51: Cross section of access road.

6.4.3 Water Supply System

Installation and development of a well-established sewerage network within the Samtse LAP II is another area which needs due consideration. With the envisioned population growth in the town over coming two decades makes this issue crucial. If proper sanitation facilities are not proposed and implemented in pace with the urban development, Samtse will fall as a victim of deteriorating living standard with high health risks. The existing topographical condition of the town could be advantageously used for the establishment of a sewerage system within the town which will also serve the local area. The treatment plant which is located at Majathang, could be connected to the main trunk line conceptually proposed to be

laid along the northern edge of the town adjoining the steep slope area, from where further connections to the internal parts of the future urban development could be established taking advantage of the slopes.

The proposed road and pedestrian network within the local area will also facilitate such a distribution system. The sewerage network within the local area will be accommodated on the special service ducts proposed underneath the footpaths. No sewer will run under the road carriageway, which hinders traffic flow during maintenance.

6.4.5 Solid Waste Management System

Efficient management of solid waste requires a proper collection and disposal system within the local area networked into the entire town system. Samtse, being a society of strong community relationships, provides great flexibility to propose the system of segregating the waste at the source itself. This will greatly help in minimizing the volume of solid waste disposed at the disposal site. It is proposed that public participation in solid waste management should be encouraged in the town by decentralizing the collection and disposal process. The solid waste can be segregated into recyclable and non-recyclable wastes, which could be re-cycled, or disposed of appropriately.

It is proposed that the High-density development (UV-2) envisioned surrounding the proposed Village Square (community and social facilities hub) be served by a door-to-door solid waste collection system. The medium- and low-density residential development areas, located within the local area, will be provided with community bins, at regular intervals and at strategic points, where each household will dispose its waste. Under the proposed system, the community will hire the services of the Municipal Corporation's trained workers (by paying service charges) to collect the waste from each household and the community garbage Bins.

The workers will be trained to segregate the waste into recyclable and non-recyclable categories and will dump the non-recyclable wastes in the main garbage bins located along the primary roads at regular intervals. Disposal of this waste from these bins will be carried out by the Thromde as it is practiced now on a regular basis, by trucking the waste to the identified land-fill sites. Identification of an appropriate disposal system or the widening of the present land fill site for the collected solid waste is another crucial factor which needs to be prioritized.

6.4.6 Street Lighting

An adequate street lighting system is proposed along the road network in the local area. Since there is no organized street lighting system available in the local area, the entire system needs to be installed. Details of the proposed street lighting system are as follows:

Road Hierarchy	Location	c/c Distance	Type
Urban Bye-Pass	Along the Median	30 meters	400W Mercury / Sodium Vapor or 35W Low Pressure Sodium Vapor
Urban Spine connecting Urban Village and the Urban Core	Along the Footpaths on either sides of the roads	30 meters	400W Mercury / Sodium Vapor or 35W Low Pressure Sodium Vapor
Collector Roads (Secondary Roads)	Along the Footpaths, on either side of the roads, in a staggered manner	30 meters	150W Mercury / Sodium Vapor
Access Streets inside the Residential Neighborhoods	Along the Footpaths, on one side of the roads	20 meters	75W sodium vapor / 125 W Mercury Vapor
Foot Paths	On either sides of the footpaths in a staggered manner	20 meters	150W Decorative Lamps / 75 W Sodium Vapor / 125W Mercury Vapor

Table 12: Details of the Proposed Street Lighting System in the Local Area

6.4.7 Storm Water Drainage System

Samtse, with its topographical condition, needs an established storm water drainage network to avoid flooding and water clogging in low-lying areas. The issue gets further exaggerated given the high amount of rainfall the town receives during monsoons. The existing topographical conditions of the local area, creating a natural surface storm water drainage pattern within the town's landscape, should be protected to allow for a smooth out-flow of the storm water from the local area. For this reason environment protection buffers are proposed along the sides of these natural storm water drains, which will form the primary storm water drainage network.

The secondary storm-water drainage network will run underneath the on-street footpaths. A typical drain laid under the footpath, will have vertical grills, at appropriate intervals, as part of the level-difference between the footpath and the carriageway. This arrangement is suitable to prevent blocking of the drains due to garbage and other waste being accumulated on the horizontal grills. These secondary drains will open out into the natural storm water

drains which will connect to the rivers flowing adjoining the town at regular intervals. The points will be provided with storm water drain purification ponds, which will filter and purify the organic and suspended particles, carried by the surface run-off, before joining these water bodies. These ponds will also act as a recreational feature along the river and stream side green belt.

6.4.8 Fire Fighting Facilities

To satisfy and safeguard the firefighting requirements of the local area, it is proposed that there should be a reservoir of approximately 50cum (50,000 Liters) capacity. This recommendation has been adopted from the recommendations of the Draft Planning Standards for Urban Settlements in Bhutan, by the Department of Urban Development and Housing, MoC, 1999.

It is proposed that this reservoir be established in the higher elevation point of the Urban Village to satisfy the fire safety requirements. It is proposed that from the storage reservoir a pressurized network of Water Supply be established to enable the setting up of on-street “Fire-Hydrants” within, the high-density development areas surrounding the Urban Village, and in institutional development areas, at an interval of 120 meters. It is proposed that medium- and low-density residential areas be served by fire engines. A fire engine halt is proposed to be located within the Urban Core, to cater to this need. It is also proposed that, a “village volunteer fire-fighting force”, be created within the local area, which will carry out preventive inspections of each house annually, run community functional education classes on fire prevention, and firefighting itself, recommend the types and placement locations of extinguishers and train selected youth in rapid action firefighting.

7.Plot Reconfigurations

A major focus of the Samtse Local Area Plan II is to reconfigure the existing developable land within the local area limit, in such a manner that each plot is provided with proper access, amenities and services. By reconfiguring the layout of land, the plots shall be regular in size and shape allowing for efficient development. This is essential because the land has been subdivided, sold and developed in a haphazard manner, with no provision for the inclusion of modern infrastructure, which will assure hygiene, health, communications, electricity, drainage and access.

For Samtse Local Area Plan II, the method of differential land pooling has been adopted as a tool for the preparation of local area plan to make the planning process participatory and democratic. The plot reconfiguration has been considered to the 3rd decimal of its area (in square meter) since it is a requisite from the National Land Commission. An ideal depth of every plot varying in each precinct was considered. Also the individual plots were configured after keeping the provision for road, footpath and green area.

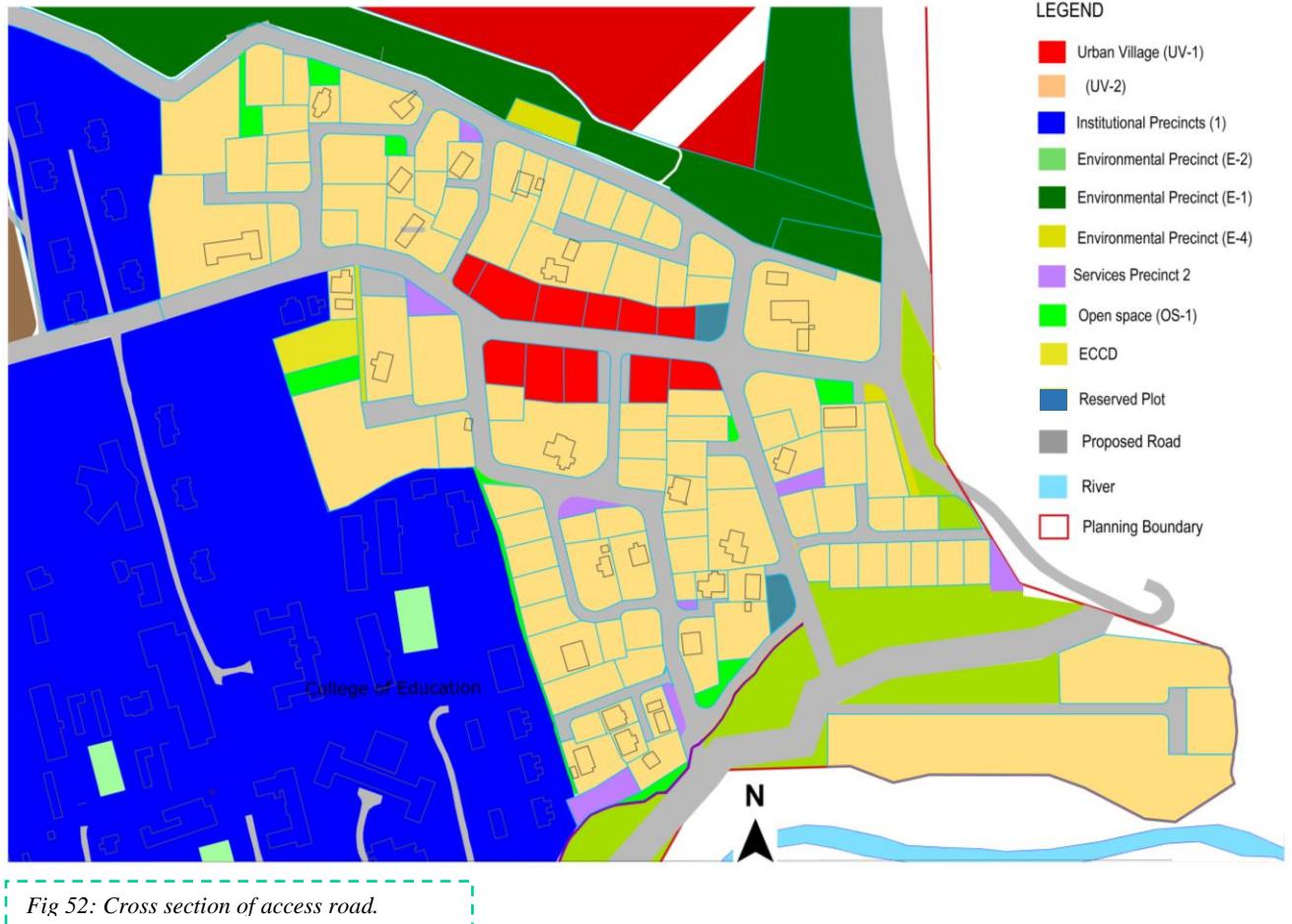
Area 1. Gurung Busti

Gurung Busti area is predominantly a UV-3 precincts, which means it predominantly a Residential area located below Samtse Dorokha Highway and above Samtse College of Education.

Since most of the plots were already developed with permanent and semi-permanent structure, the re-configuration of plots through the scheme of land pooling was carried out by retaining the permanent structures. The land pooling of 24.1% is applied for UV-3 precincts.

The UV-1 (mixed use medium density) precincts is also proposed in this area abutting the road that leads to Dorokha. E-1 precincts at the periphery, E-4 precincts at the steep area are proposed accordingly. Since Gurung busti is envisioned as the neighborhood node, other facilities such as ECCD, Open space for parks, children play area is also been proposed.

Service plots for small services plots for future service installation and reserve plot has also been proposed from the land pooling contribution so that such kind of plot can be sold to finance the project or to construct the facilities for the communities.



Area 2. Litchi Bari Area



The settlement between the Royal Bhutan Army at the north, Bhutan post office at the east and road leading to Dzongkhag Administration to the south is called as Litchi Bari area. This settlement is envisioned as medium density residential (UV-2) neighborhood encompassing all the basic amenities. Other public facilities such as Neighborhood Park, common parking is also provided within the settlement. Other public facilities include reserved plot and small services plots for future service installation.

Area 3. Daragaon Busti

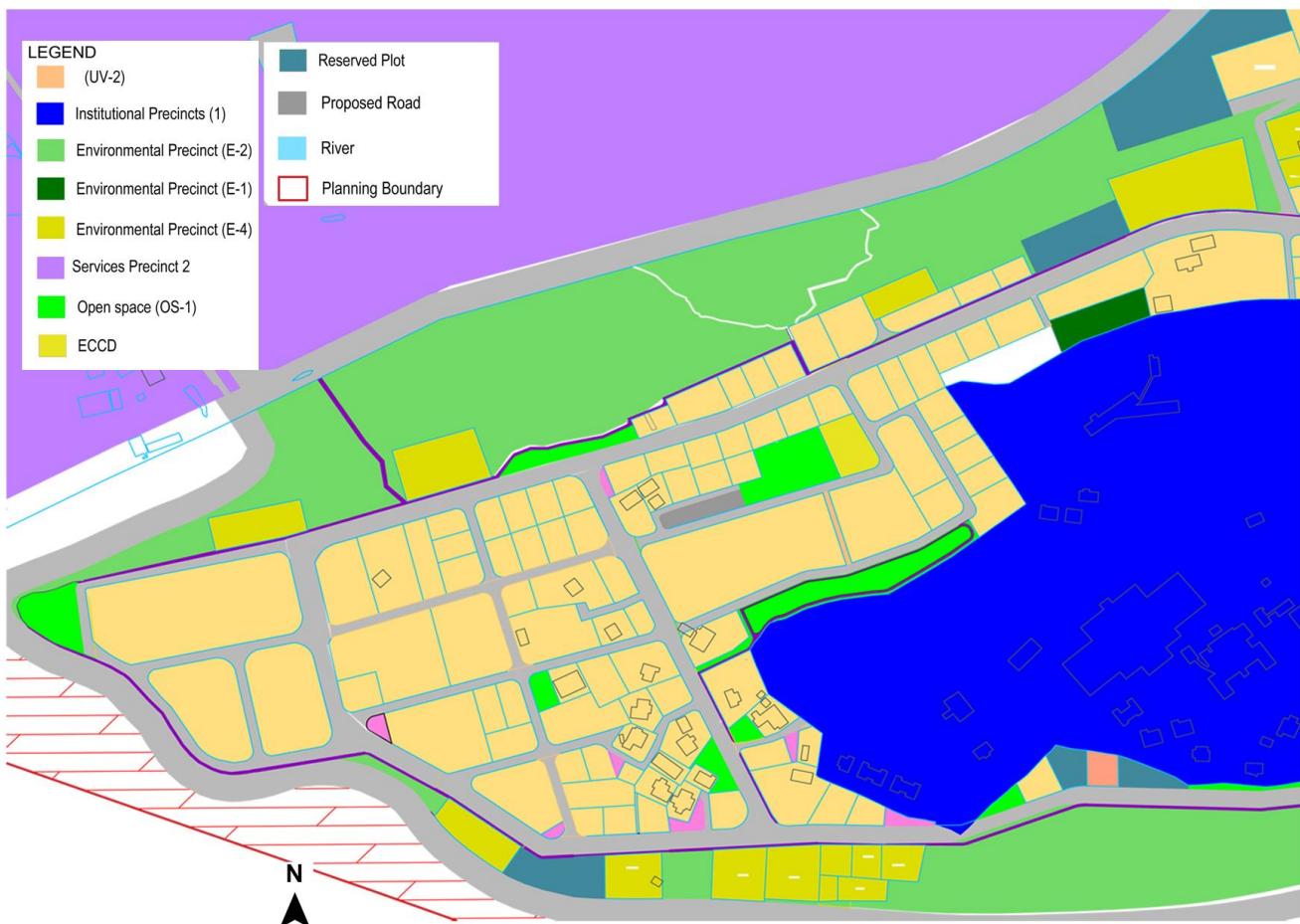


Fig 54: Cross section of access road.

Daragaon settlement is situated below the Samtse General Hospital. This area primarily comprises of UV-1 precincts. The area that falls within the steep area is proposed as E-4 and E-1 precincts accordingly. As an entry to this settlement, a secondary road has been proposed below the existing Samtse Dratshang to divert the traffic away from Samtse General Hospital. Pedestrian access and bi-cycle track has also been provided along the road. The open space is provided within this settlement to improve the quality of life for the residents' community. Other public facilities such as ECCD, service plot, reserved plot and common parking has also proposed.

8. Implementation Plan

As part of any Local Area Plan, the implementation plan is an important section, which serves as an overall strategy and guide the implementing body to complete all the development activity successfully. This chapter serves as the guide for prioritizing and allocating the resources accordingly. It would also help various Departments to plan and implement different projects with better coordination, efficiency and transparency. The implementation plan has been divided into three phases spanning over the planning period.

Phase 1

➤ Demarcation of the plots:

Once the plan is approved by the landowners and the approving authority, the plan validation would be carried out by the National Land Commission. Then the demarcation process would be coordinated by the Dzongkhag administration with the Surveyors, Land record officials and Planners.

➤ Widening of existing road and construction of drains and service ducts

With the aim of providing connectivity and access to all the plots in the plan area, the first priority is to widen the road to the proposed right of way. The road will be widened according to the designed cross section. The widening of the roads will also include the construction of the footpaths, drains and service ducts as indicated in the design cross section (concern Department to be consulted for the detail Design).

➤ Construction of access with drains and service ducts

Alongside the widening works, the construction of new access roads should also be done according to the design cross section. Footpaths and service ducts should be constructed with the access road as per the design section.

Phase 2

➤ Distribution network for water supply

With the construction of water treatment plant and reservoir, the provision of water supply distribution line should also be commenced. The areas within the planning area where the project has not covered has to be taken care in this phase.

➤ **Sewerage and STP**

A central sewerage treatment plant should also be implemented in this phase alongside with a sewer network.

Phase 3

➤ **Construction of Parking**

The construction of parking space for residents will be implemented in this phase of the plan.

➤ **Construction of off- street footpath**

In the final phases of the plan, the pedestrian infrastructure will be improved and built according to the plan. The footpaths will be the connecting the green areas together and improve the overall walkability of the town.

➤ **Development of open spaces**

Finally, the last phase will focus on the development of the open spaces and green areas that are located in the area. The green area will be developed as breathing space for the town. The open spaces are a vital part of the making the community space for people to interact. Open gyms and other facility will also make the town a better place to live in

Annexure