Bases Conversion and Development Authority

BIDDING DOCUMENTS

DESIGN AND BUILD
of the National Academy of Sports (NAS) Phase 1 at New Clark City

January 2021

Part II. **Technical References**

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DESIGN AND BUILD OF THE NATIONAL ACADEMY OF SPORTS - PHASE 1 AT NEW CLARK CITY

Section 1. PROJECT BACKGROUND AND DESCRIPTION

A. BACKGROUND

1. The Bases Conversion and Development Authority (BCDA) is implementing the New Clark City Project (NCC), a flagship project of the Government of the Republic of the Philippines. This 9,450-hectare metropolis is a planned city landscape north of Metro Manila that will host businesses, domestic and international trade, schools and hospitals, research and development entities, regional tourism centers, national government offices, and international headquarters.

2. On 09 June 2020, the Republic Act No. 11470 or the National Academy of Sports Act ("NAS Act") was created to establish the National Academy of Sports System (NAS System) for secondary education program integrated with a special curriculum on sports to be offered to natural-born Filipino citizens on a full scholarship basis. The NAS System shall be attached to the Department of Education (DepEd), in close coordination with the Philippine Sports Commission (PSC).

3. The NAS Act mandates the BCDA with critical undertakings towards the establishment of the NAS System by requiring the provision the project site, undertake the construction and ensure that funding for the construction works is secured:

   (Section 5) Construction and Site of the NAS Main Campus

   "Provide the land for the site by way of usufruct in perpetuity", and "be in charge of the construction of classrooms, dormitories, and other sports facilities, and related amenities as may be determined by the Board of Trustees at the New Clark City campus".

   (Section 21) Appropriations.

   "BCDA shall likewise immediately include in its procurement plan the construction of classrooms, dormitories, and other sports facilities and related amenities for the NAS main campus whose funding shall also be included in the General Appropriations Act."

4. The construction program for the infrastructure development of the NAS System is divided by phases to manage the works required. This project covers the Phase 1 construction works, which is prioritized to provide the facilities that should be present to accommodate the first batch of students under the junior high school level. Phase 2

development, which is targeted to commence in 2023, will include the provision of expansion works as well as the provision of dormitory, kitchen hall, and more sporting facilities to provide a full-service facility for the campus as both the administrative and the academic population reaches their optimal level.

B. PROJECT DESCRIPTION

The "Project" that is subject of these Terms of Reference is composed of the design and construction of (1) the Administration and Academic Building, (2) the Multi-purpose gym, (3) the site development works, and (4) the fit out works including required finishes and installations.

Table 1. Project Components and Description

DESCRIPTION	
Site Development	Site Development within (GFA) of 25, 000 sqm (including building footpri
Building 1	Academic Building and Administration Building with a minimum GFA of 5,492 sqm
Building 2	Multi-purpose Gym with a minimum GFA of 5,620 sqm

The Design and Build DBC (DBC) shall undertake and complete the design and construction works within two hundred ten (210) days from the issuance of the Notice to Proceed (NTP) in accordance with the Minimum Performance Standards and Parameters (MPSP). The objective for the construction is to allow the start of the school year with facilities that can cater to the basic needs of students, athletes and the faculty members.

BCDA intends to apply the sum of Five Hundred Sixty-Eight Million and Four Hundred Thousand Pesos (PHP 568,400,000.00) inclusive of applicable taxes and fees being the Approved Budget of the Contract (ABC) to payments under the design and build contract.

C. SITE DEVELOPMENT AREA

The National Academy of Sports, which covers an aggregate land area of 43,866.05 square meters, is located in the National Government Administrative Center at New Clark City, Capas, Tarlac and lies within the southeastern portion of the newly constructed Athletics Stadium and eastern of Athletes Village.

Specifically, the works under the Phase 1 scope will be located within a portion of the total allocated land for the NAS System within a 25,000 sqm, which shall include the building footprint of the Phase 1 facilities as provided in Section VII. Technical References of this Bidding Documents.

The site development area proposes indicative shape and placement of the two building developments. The DBC is expected to come up and innovate the proposed floor-wise patterned with the DPWH Standard Specifications for Government Offices along with the requirements as specified in Section VII. MPSP.

Fig. 1. Location Map of the National Academy of Sports

D. PRELIMINARY INVESTIGATION

1. **Land Grading Design.** The final grading scheme for NCC must follow the existing contour, as much as possible, to minimize the total earthquake volume. The backfill materials must be taken within the project site and hauling distance must be the shortest possible between the cut and fill areas. The cut and fill layout plan must consider the overall Land Grading Plan indicated in the Updated Master Plan of the New Clark City.

2. **Utilities.** There is an existing underground utility corridor ready for expansion to the Project Site within the NCC NGAC Phase 1A area, consisting of power lines with Shin Clark Power Corporation as the official power distributor within NCC, water and sanitary lines with Prime Water New Clark City Corporation as official water distributor. For ICT, Philippine Long Distance Telephone Company (PLDT)/Smart Communications, Globe Telecom, Inc. (Globe) and Converge for ICT have existing embedded lines. Drainage facilities, road infrastructures and trees are also noted.

   The plans and drawings for the site development and utilities will consider the provisions in Section VII. Technical References of this Bidding Documents.

3. **Soil.** Based on the interdisciplinary study between PJIC, Nippon Koei and AECOM, New Clark City (NCC) is encompassing two stratigraphic groups: (1) Statigraphic Group 5 (Zambales Range) – the rugged mountainous portion of the area, primarily composed of an ophiolite complex, sedimentary carapace, and intrusive and extrusive volcanics and; (2) Statigraphic Group 1 (Ilocos-Central Luzon Basin) – the flat to undulating area, overlain by a sedimentary sequence of sandstones, shales, and shallow water carbonates and tuffaceous deposits of Upper Miocene to Pliocene age.

4. **Earthquake Hazard.** Among the four general types of ground conditions described by the Earthquake Engineering Committee, 1988, the ground surface in NCC can be categorized under Medium Soil, thickness of diluvial deposit above bedrock is greater than 10m, or thickness of alluvial deposit above bedrock is less than 10m, or thickness of alluvial deposit is less than 25m and thickness of soft deposit is less than 5m. Medium soil attenuates ground acceleration by 13%.

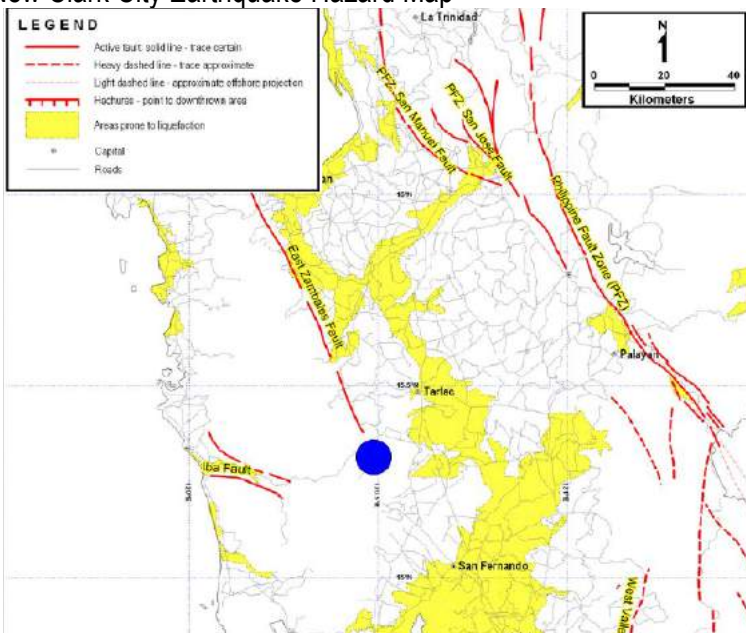
   Based on the estimated attenuation and amplification values computed using the Fukishima and Tanaka (1990) formula and the fault model parameters, a M 7.4 earthquake originating from the East Zambales Fault, 4 km away from NCC, may generate average peak ground acceleration of 0.552 g or 5.41 m/s^2, with medium soil attenuation of 0.48 g or 0.471 m/s^2 in the central portion of NCC. Corresponding to rating of VIII (Very Destructive) in the PHIVOLCS Earthquake Intensity Scale.

   The Project Area, although located 20-40 km hazard zone due to Volcanic Activity, has low susceptibility to earthquake-triggered landslide during an earthquake with a peak ground acceleration of 0.3 g, and intensity of IX (Modified Mercalli Intensity Scale) or VII (PHIVOLCS Earthquake Intensity Scale).

5. **Liquefaction.** Even after the 1991 eruption filled the entirety of NCC with thick reworked deposits from Mt. Pinatubo, liquefaction was not recorded. As indicated in the PHIVOLCS susceptibility map, areas that are prone to this geohazard occur further to the east at lower elevations and flatter topography, where rivers radiating from the eastern side of the Pinatubo Volcanic Complex and Zambales Range merge and drain southward into Manila Bay, as shown in the Liquefaction Susceptibility of Central Luzon.

6. **Other Hazards.** Based on the Mines and Geosciences Bureau's Landslide and Flood Susceptibility Map of New Clark City, the central area of the NCC Master Plan has high susceptibility to flooding. However, the location of the Project Area is shown to have a low susceptibility to flooding.

Fig. 2. New Clark City Earthquake Hazard Map



Map Source: PHIVOLCS

E. CONTRACTUAL FRAMEWORK

The Project shall be procured and implemented under a Design and Build Scheme pursuant to the provisions of RA 9184 and its Revised Implementing Rules and Regulations (RIRR), specifically Annexes "E" and "G" of the said RIRR - Guidelines for the Implementation of Contracts for Design and Build Infrastructure Projects.

Under this scheme, the procuring entity awards a single contract for the detailed architectural/engineering design and construction to a single firm, partnership, corporation, joint venture or consortium.

SECTION 2. SCOPE OF THE CONTRACT - GENERAL REQUIREMENTS

The "Scope of Works" to be carried out includes the following:

1. Design, construction and fit out works for:

    a. Academic and Administration Buildings;
    b. Multi-purpose gym; and
    c. Site Development work

    The design should contain the minimum number of personnel and occupants and must be in accordance with the functional space requirement intended for each space.

    Each minimum area to be provided and be constructed with fit-out is listed in the table of "Functional Space Requirements" in Section VII.A, MPSP. A tentative staff allocation has been indicated for each required space; however, the DBC is encouraged to innovate and propose their own floor-wise layout.

    As applicable, relevant standards and minimum measurements shall apply for each functional space requirement including the following:

    - NCC Design Standards and Guidelines
    - DPWH Standard Specifications for Government Offices - allocation of functional space while ensuring the corresponding number of personnel and occupants indicated below are accommodated
    - Modified Standard DPWH-DepEd School Buildings (as updated from time to time)
    - National Building Code of the Philippines and its Revised Implementing Rules and Regulations
    - IRR RA 9266 or Architecture Law and its Latest and Amended IRR
    - Batas Pambansa 344 – Accessibility Law and its Latest and Amended IRR
    - RA 9514 New Fire Code of the Philippines and its Revised IRR
    - Other laws that apply to the Project

    The preparation of plans for the site development area should follow requirements based on the review and confirmation of information on the preliminary survey mapping (topographic survey), and the NCC Master Development Plan as per Section VI. Technical References.

The following fit-out requirements shall be excluded from this Project and will be subjected to a separate procurement activity to be conducted by BCDA, which shall be installed upon completion of the construction works by the DBC:

a. Sports Equipment
b. Classroom Tables and Chairs
c. Office Equipment
d. ICT Equipment (Computers, Servers, Licenses & Software)
e. Office Furniture and Fixtures
f. Audio Visual Equipment
g. Kitchen Equipment and Dining Hall Furniture
h. Fitness Testing and Monitoring Equipment
i. Physical Therapy and Rehabilitation Equipment
j. Connectivity Requirements

2. Conduct of site investigations, surveys, soil testing and other similar activities which are required for finalizing the detailed building design shall be completed by the DBC during the preparatory construction works such that the final design addresses the findings from these activities.

    a. The Geotechnical Investigation should comply with Section 303 of the National Structural Code of the Philippines 2015 (NSCP-2015). The DBC should secure the services of a Geotechnical Engineer to evaluate the Geotechnical Investigation Report. The Geotechnical Engineer should recommend the foundation system and other information needed for the design of the substructure. Part of the assessment of the Geotechnical Engineer should include the seismic parameters in compliance to Section 208.4.3 to 208.4.4.4 of the NSCP-2015

3. Securing of permits required for the conduct of works (Building Permit, Electrical Permit, Sanitary Permit, Mechanical Permit, Zoning Permit, Fire Safety Permit, among others). The Environmental Compliance Certificate is already secured by the BCDA for the construction with the copy provided in Section VII. Technical References.

4. **Architectural and Engineering Designs.** The DBC shall design and complete all plans, drawings, specifications, BOQ and cost estimation, construction management, progress reports and claims for payments and completion reports.

5. Site Clearing and Earthworks.

6. **Site Civil Works.** The DBC shall design and develop the site civil works with internal roads, walkways, landscaping and paving ensuring efficient circulation, safe and unhampered pedestrian and vehicular flow and outdoor aesthetics. The site development works shall be carried out within the 25,000 sqm including the building footprint of the two buildings.

7. Structural Works.

8. **Architectural Interior Design Works.** All masonry, finishing, acoustics, lighting, moisture protection / thermal, glazing, wood / plastics, fenestrations [doors and windows], with pertinent plans and designs prepared by a duly - registered and Licensed Architect.

9. **Internal Fit out.** The following are examples, without limitation, or areas of internal fit-out that are considered within the scope of works:

    a. All floor, wall or ceiling finishes
    b. Above screed floor finishes to electrical rooms
    c. All partition walls
    d. Doors, louvers and the like, to all parts of the works and the relevant site development area

10. **Underground Utilities**. The DBC shall design and construct the underground utilities corridor (power, water, wastewater and ICT) and be integrated in the site development area following the Performance Specifications and Parameters and the relevant guidelines and updated requirements. The DBC is responsible for connecting to the tapping points provided by the utility providers on the project site premises, consistent with the master development plan.

11. **Electrical Works**. All electrical systems, including back-up power generator sets and transformers with pertinent plans and designs prepared by a duly registered and licensed professional Electrical Engineer ("PEE") as part of the construction cost. The system shall include all aspects of the works in Phase 1.

12. Electrical Auxiliaries Works.

13. **Air-conditioning Facilities** - The DBC shall provide brand new and latest models of air-conditioning units wherever required as per the design. The DBC shall propose the most energy efficient air conditioning system which could be a combination of DX-split type units, window type AC units and variable refrigerant flow (VRF) system.

14. **Mechanical Works.** Fire protection, automatic fire suppression system, and fire alarm prepared by a duly registered and licensed Professional Mechanical Engineer ("PME").

15. Engineered Mechanical Building Utilities and Ventilation Systems

16. Access-way via the main road, If applicable, the DBC shall include the design and construction 2-lane access road leading to the main entrance of the Project Site. The access way shall be connected to the existing road (located at the east side of the project site).

17. Electronics and Communication (including communication equipment, ducting and cabling systems, e.g., fiber optics). Design and installation of electronic systems that includes, vertical and horizontal LAN cabling, CCTV-ready prepared by a duly registered and licensed professional Electronics and Communications Engineer ("ECE").

18. The DBC shall design and provide security measures (landscaping elements) as components which shall be part of the construction cost.

19. **Utilities System.** The DBC shall design, install, test and commission various utilities connections for Phase 1 only as follows:

    a. The power and distribution system to accommodate the requirements of the construction works and the common areas within the site development area. This shall include the supply and installation of power transformer, substation, high-voltage and low voltage switchgear, distribution/sub-main cables, final sub-circuits, cable support systems and containments, lighting protection system, grounding (earthing) system, luminaires and lighting control system (at Common Areas only), power backup through generator, Telecommunications System;

    b. Water distribution piping, installation of water piping to sanitary ware and fittings, installation of waste piping to sanitary ware, above ground and underground drainage piping system shall be included in the scope;

    c. Sanitary and plumbing works;

    d. The sewer system accommodating the requirements of the entire phase 1 development will be part of the design and build works; and

    e. Water tanks, supply systems, water sewage, sanitary and disposal systems with the pertinent plans and designs prepared by a duly registered and licensed professional Sanitary Engineer ("SE").

20. PWD facilities. Facilities for persons with disabilities such as ramps and stair lift for movement to and from the raised platforms, tactile tiles/paving, separate toilets/ washrooms, among others, shall be provided as per applicable regulations, and shall be provided and located within each facility constructed.

21. Wayfinding and room signage systems.

22. Warranty. The DBC shall be liable for the design, any consequent structural defects and/or failure of the completed project within the warranty period specified in Section 62.2 of the IRR of RA 9184.

23. The DBC shall hold the responsibility of ensuring that all construction works are carried out by subcontractors, specialty contractors and other concerned parties in a thorough manner.

24. Temporary Facilities and Facilities for the Project Management Team including the operational and maintenance requirements; and

25. All other works, reports, documents, components and requirements that may be needed to the completion of the Project and acceptable to BCDA.

Section 3. SCOPE OF SERVICES

A. The DBC shall undertake the design and construction of the Project based on Section VI. MPSP and shall conform to the latest provisions of the National Building Code of the Philippines,

National Structural Code of the Philippines, Philippine Electrical Code, Philippine Mechanical Engineering Code, Plumbing Code, Fire Code of the Philippines, Accessibility Law and other laws and regulations covering environmental concerns and local ordinances and regulations.

B. **DBC's Responsibility.** The data and information as part of the competitive documents are for reference only. BCDA does not guarantee that these data are fully correct and up to date to the project at hand. The DBC is responsible for the accuracy and applicability of all data that it will use in its design and build proposal and services as stated in Section 7, Annex "G" of IRR RA 9184.

C. Conduct of Architectural and Engineering Surveys and Investigation

1. Annex "G" of the RIRR of RA No. 9184 specifies that the DBC shall conduct the surveys to confirm assumptions in the submitted technical bid, and present to BCDA the results and findings which would impact the detailed architectural and engineering designs of the Project. The DBC shall include the findings and recommendations and effects based on the site survey, topographic survey, geotechnical report and all other pertinent data related to the conditions of the project site on the technical components of its bid proposal, and which will be reflected in the Detailed Architecture and Engineering Design.

2. The DBC shall coordinate with the concerned utility providers for the removal/relocation of all existing utilities that will be affected by the Project. The DBC shall also be responsible in coordinating with the utility providers for the tapping points of the necessary utilities for the Project.

D. Preparation of the Detailed Architectural and Engineering Designs (DAED) for the Project Components

1. The DBC shall prepare and submit to BCDA the draft DAED covering the general requirement of the Project. The preparation of the DAED, including all aspects of the work shall be in accordance with Section VII. MPSP and Section VII. Technical References of this Bidding Document, particularly, the following site-specific Guidelines:

    - NCC Master Development Plan
    - NCC Design Guidelines
    - NGAC Urban Design and Standards
    - Updated Master Development Plan of the NCC (March 2020)

2. Pursuant to Section VII. MPSP, the design and the overall look and feel shall be adopted in all the spaces in the buildings.

    Design should be authentic and have sense of place and be iconic without competing with the existing surrounding structures. It should be permeable to take advantage of our tropical environment, with abundant use of natural light and cross ventilation. Form should be dynamic to convey the movement, energy and team spirit of our athletic scholars.

3. The DAED shall include the preparation of the following Detailed Design Drawings and Reports including any revisions and refinements as approved and required by the procuring entity:

    a. Detailed Engineering Survey and Investigation Results, Plans/Drawings and Reports;
    b. Detailed Site Development Plan;
    c. Detailed Architectural Plans (exterior and interior);
    d. Detailed Structural Plans;
    e. Detailed Electrical Plans;
    f. Detailed Electronics Plans;
    g. Detailed Mechanical Plans;
    h. Detailed Drainage, Sanitary, Plumbing and Plant Irrigation Plans;
    i. Detailed Fire Protection Plans;
    j. Detailed Utilities and Auxiliary Plans
    k. Detailed Landscape Plans including planting details;
    l. Detailed Plans for the removal/relocation of existing utilities and or structures;
    m. Design Analysis which includes basis of designs and design calculations;
    n. Detailed Technical Specifications which shall include descriptions of work items, material requirements, construction requirements and methods, methods of measurements, and basis of payments. Quality control program, sampling, testing and inspection requirements, material requirements and delivery schedules, shall be included in the specifications on applicable work items;
    o. Detailed Bill of Quantities, Cost Estimates including Detailed Unit Price Analyses;
    p. Cover Sheet, Project Location and Vicinity Map, Drawing Index, Summary of Quantities, General Notes, Legends, Symbols, Definitions and Abbreviations; and
    q. Safety Program and Methodology
    r. Construction Schedules, PERT-CPM, Equipment and Manpower Utilization Schedule
    s. Other necessary plans/drawings, details, documents and reports that may be required by BCDA.

E. Preparation of the Revised Detailed Architectural and Engineering Designs for Approval of the BCDA, as applicable

1. Any proposed revision on the DAED shall be discussed by the DBC with BCDA. The DBC shall prepare and submit the Revised DAED for each work following the determinations and agreement with the BCDA. The DBC shall submit a report on the revised DAED for the issuance of Notice of No Objection from the BCDA following the Minutes of Discussion.

2. After BCDA and DBC have agreed on the Revised DAED, the DBC shall prepare and submit the final DAED to BCDA for approval.

3. Changes in Design and Construction Requirements. Section 13.5 provides - “As a rule, changes in design and construction requirement shall be limited only to those that have not been anticipated in the contract documents prior to contract signing and approval.

F. Construction Phase

1. The contract implementation for the Project shall comply with Annex "E" of IRR of RA 9184 with appropriate modifications to incorporate the following supplemental provisions of Annex "G" - Guidelines for the Implementation of Contracts for Design and Build Infrastructure Projects:

    a. No works shall commence unless the DBC has submitted the prescribed detailed design and other documentary requirements and the procuring entity has given written approval. Work execution shall be in accordance with reviewed and approved documents following BCDA review and recommendations of the CMS.

2. The DBC shall be responsible for obtaining all necessary information as to risks, contingencies and other circumstances which may affect the works and shall prepare and submit all necessary documents specified by the concerned Building Officials to meet all regulatory approvals and permits as specified in the contract documents.

3. The DBC shall submit a detailed program of works within fourteen (14) calendar days after the issuance of the Notice to Proceed for approval by procuring entity that shall include, among others:

    a. The order in which it intends to carry out the work including anticipated timing for each stage of design/detailed engineering and construction;
    b. Periods for review of specific outputs and any other submissions and approvals;
    c. Sequence of timing for inspection and tests;
    d. General description of the design and construction methods to be adopted;
    e. Number and names of personnel to be assigned for each stage of the work;
    f. List of equipment required on site for each stage of the work; and
    g. Description of the quality control system to be utilized for the project.

4. Any errors, omissions, inconsistencies, inadequacies or failure submitted by the DBC that do not comply with the requirements shall be rectified, resubmitted and reviewed at the DBC's cost. If the DBC wishes to modify and design or document which has been previously submitted, reviewed and approved, the DBC shall notify the procuring entity within a reasonable period of time and shall shoulder the cost of such changes.

5. As a rule, changes in design and construction requirements shall be limited only to those that have not been anticipated in the contract documents prior to contract signing and approval. The following guidelines shall govern approval for change or variation orders:

    a. Change Orders resulting from design errors, omissions or non-conformance with the performance specifications and parameters and the contract documents by the DBC shall be implemented by the DBC at no additional cost to the BCDA.

    b. Provided that the DBC suffers delay and/or incurs costs due to changes or errors in the procuring entity's performance specifications and parameters, the DBC shall be entitled to either one of the following:

        - An extension of time for any such delays under section 10 of Annex "E" of IRR (RA 9184); or

- Payment for such costs as specified in the contract documents, provided that the cumulative amount of the variation order does not exceed ten percent (10%) of the original project cost.

6. The DBC shall be entitled to advance payment subject to the provisions of Section 4 of Annex "E", IRR of RA 9184.

7. The DBC shall provide all necessary equipment, personnel, instruments, documents and others to carry out specified tests.

8. This design and build projects shall have a minimum Defects Liability Period of one (1) year after contract completion or as provided for in the contract documents. This is without prejudice to the liabilities imposed upon the engineer/architect who drew up the plans and specification for building sanctioned under Section 1723 of the New Civil Code of the Philippines.

9. The DBC shall be held liable for design and structural defects and/or failure of the completed project within the applicable warranty period as specified in Section 62.2.3.2 of the IRR (RA 9184).

G. The DBC shall prepare and submit a Detailed Construction Management Plan (DCMP) as part of the DAED to BCDA for review and approval. The DCMP shall be based on the preliminary construction plan submitted in the Technical Proposal of the bidding, as updated and detailed to fit the elements of the DAED. The DCMP must identify the procedures, processes and management systems that the DBC will apply to ensure the implementation of the construction works in accordance with the Contract Agreement.

   Health, safety, and security programs shall be in accordance with Department Order No. 13, series of 1990, of the Department of Labor and Employment (DOLE). At the minimum, the Inter-Agency Task Force on Emerging Infectious Diseases, and any authorized government body public health protocols, guidelines and issuances against COVID-19 shall be incorporated in the DCMP and shall be implemented.

H. Safety Measures During Construction

1. The DBC shall submit to the Procuring Entity, for approval, a Detailed Safety Management Plan for the construction based on the preliminary Construction Methodology submitted as part of the Technical Proposal in its bid.

2. The DBC shall ensure the safety of its workers and personnel and accidents should be minimized in the Construction Site and its immediate surrounding area.

I. Completion of Construction

1. The BCDA shall issue a Certificate of Completion and Preliminary Acceptance of Construction, once it has been determined and certified that the following requirements are fully met:

a. All Tests for Construction complies with the pertinent provisions of the Blue Book and other test requirements for Construction.

b. All parts of the Project have been completed in accordance with the approved DAED including the rectification of all defects and punch list items.

c. The DBC's Project Completion Report has been submitted and certified by the BCDA as complying with the requirements.

2. The DBC shall submit the as-built drawings and other supporting documents such as, but not limited to, manuals, certificates, and warranties of all installed items to the BCDA not later than two (2) months after the date of issuance of the Certificate of Completion and Preliminary Acceptance;

3. Obtain Occupancy Permit; and

4. Provide all other necessary documents that BCDA shall require.

Section 4. APPROVED BUDGET FOR THE CONTRACT

1. The Approved Budget for the Contract (ABC) for this Design and Build Project is Pesos: **Five Hundred Sixty-Eight Million Four Hundred Thousand and 00/100 (PhP 568,400,000.00), inclusive of all taxes and fees**. This is the ceiling for the eligible, acceptable bids for all Works. The Bidder shall submit only one total cost for all Works.

2. Bids received in excess of the ABC shall be automatically rejected.

3. MANNER OF PAYMENT

    a. Advance Payment - The maximum amount of the advance payment shall be fifteen percent (15%) of the total contract price.

    b. Progress Payment

    Progress Payments shall be made through modified scheme upon completion of the following milestones:

    - 10% Completion of Site Development
    - 30% Completion of Academic and Administration Building.
    - 35% Completion of Multi-purpose Gym
    - 10% Completion of Rectification Works for Punch List items and issuance of Certificate of Completion by the CMS.

Section 5. CONTRACT DURATION AND IMPLEMENTATION

1. Contract Duration. Considering that this is a flagship, priority and fast track infrastructure project that needs to be completed on a tight schedule, the design and build services under the contract

must be completed in Two Hundred Ten (210) Calendar Days, reckoned from the date indicated in the Notice to Proceed.

2. Implementation Schedule. The DBC is required to follow and complete the Project within the indicative time frame as follows:

Fig. 3. NAS Phase 1 Implementation Schedule

Activity	Month						
	1	2	3	4	5	6	7
Design Phase							
Construction Phase							

Section 6. OBLIGATIONS OF BCDA

In general, BCDA shall:

1. Provide available data to the DBC. BCDA informs that the data and information in the Bidding Documents are for reference and does not guarantee that these are fully correct, up to date, and applicable to the project at hand. The DBC is responsible for the accuracy and applicability of all data, including the above, that it would use in its design and build proposal and services, as provided in the Annex "G" specifies that the data below are for reference only. BCDA shall make available for reference all existing documents pertaining to the Project. Whenever practicable, the BCDA shall provide assistance to the DBC in securing data from concerned government agencies/offices;

2. Arrange with the agencies concerned with the Project for the free and unimpeded access by the DBC's Personnel to all lands and properties in respect of which access is required for the performance of the services;

3. Approve the DBC's design without diminishing its full sole responsibility for the quality and integrity thereof as DBC;

4. Monitor the implementation of the projects in coordination, and review and evaluate the documents submitted by the DBC as required herein;

5. Provide funds required for the engagement of the services of the DBC in the amount of Pesos: Five Hundred Sixty Eight Million Four Hundred Thousand and 00/100 (PhP 568,400,000.00), inclusive of all applicable taxes and fees, is made available through the issuance of Certificate of Funds Availability (CFA) for that purpose;

6. Pay the DBC, upon request, based on the manner of payment consistent with the provision under Section 4 of this TOR.

7. Designate an on-site Representative to the Project; and

8. Perform other responsibilities as may be specified in the Contract Agreement.

Section 7. OBLIGATIONS OF THE DBC

The DBC shall:

2. Certify that it has inspected and examined the proposed project site, its surroundings and existing infrastructure and facilities related to the execution of the work and has obtained all the pieces of information that are considered necessary for the proper execution of the work covered in this Bidding Documents;

3. Ensure that all works at the stages of design, construction, restoration of affected areas, and testing and commissioning shall be carried out efficiently and effectively;

4. Provide the BCDA with complete reports, such as technical analysis, maps and details regarding the existing conditions and proposed improvements within the site;

5. Be accountable for accidents that might occur during the execution of the project and install warning signs and barriers in accordance with Department of Labor and Employment (DOLE) guidelines and construction safety procedures in the Negotiated Procurement Documents for the safety of the general public and the avoidance of any accidents;

6. Be professionally liable for the design and shall submit all its basic designs, plans, and as part of its Technical Proposal using Section X Bid Forms and Qualification Information. The DBC shall be liable for design and structural defects and/or failure of completed projects within the period specified in the IRR / RA No. 9184;

7. Implement designs, plans, and drawings in accordance with Section VI Minimum Performance Standards and Specifications [MPSP] approved by BCDA; and submit basic architectural plans as required in its Approach and Methodology, Section X, Bid Forms and Qualification Information.

8. Implement Flood Mitigating Measures as proposed in the Geo-hazard Certifications issued by the DENR.

9. Provide the following documents during contract implementation:

    a. Detailed Engineering Survey, Detailed Geotechnical Investigation and other necessary field survey and investigation results and reports (6 Sets in A-4 size quality paper)

    b. Approved Detailed Architectural and Engineering Design Plans and Drawings (1 set Original in A-1 size Mylar Sheet and 5 other copies in Blueprint)

    c. Approved Technical Specifications, Detailed Cost Estimates and Unit Price Analyses (6 Sets in A-4 size quality paper)

d. Design Analysis with detailed calculations/computations (6 Sets in A-4 size quality paper)

e. Monthly Progress Report and/or Supporting Documents for Progress Payments (Plans/Drawings in 3 sets of A3 size quality paper and all Reports in 3 sets of A-4 size quality paper)

f. Approved As-Built Plans (1 Original in A-1 size Mylar Sheet and 5 other copies in Blueprint)

g. Project Final Report (6 Sets in A-4 size quality paper)

h. Other necessary plans/drawings and reports that may be required by BCDA.

i. Electronic Files of all deliverables (to be stored in 1 Terabyte External Hard Drive)

9. Perform other responsibilities as may be specified in the contract agreement.

Section 8. ELIGIBILITY REQUIREMENTS

The eligibility requirements for the Design and Build Scheme shall comply with the applicable provisions of Section 23-24 of IRR of RA 9184.

A modified set of requirements integrating eligibility documents and criteria for infrastructure projects and consulting services shall be adopted in accordance with Annex "G" – Guidelines for the Procurement and Implementation of Contracts for Design and Build Infrastructure Projects of IRR of RA 9184.

A. Class "A" Documents (Legal, Technical and Financial Documents) and Class "B" Documents

The prospective bidder shall submit all the required Class "A" Documents and Class "B" Documents for Infrastructure Projects, as enumerated in Section II, Instruction to Bidders, and in general, the following documents:

a. Relevant statements of all on-going, completed, awarded but not yet started design or design and build related contracts, curriculum vitae of key staff, partners or principal officers; and

b. Bidder's valid PCAB "AAA" License and PCAB Large B Size Range, as well as valid licenses issued by the Professional Regulatory Commission (PRC) for design and engineering professionals;

c. Preliminary Architectural and Conceptual Design; and

d. Minimum Manning Requirement:

1. Detailed Design Phase

a. Team Leader/Project Design Manager (Licensed Civil Engineer or Architect with at least 10 years' work experience)

b. Structural Engineer (Licensed Civil Engineer with at least 5 years' work experience)

c. Geodetic Engineer (Licensed Geodetic Engineer with at least 5 years' work experience)

d. Geotechnical Engineer (Licensed Civil Engineer with at least 5 years' work experience)

e. Electrical Engineer (Licensed Professional Electrical Engineer with at least 5 years' work experience)

f. Mechanical Engineer (Licensed Professional Mechanical Engineer with at least 5 years' work experience)

g. Drainage/Sanitary/Plumbing Engineer (Licensed Civil/Sanitary Engineer with at least 5 years' work experience)

h. Materials Engineer (DPWH Accredited Materials Engineer II with at least 5 years' work experience)

i. Quantity / Cost / Specifications Engineer (Licensed Civil Engineer with at least 5 years' work experience)

j. Landscape Architect (Licensed Landscape Architect with at least 5 years' work experience)

2. Construction Phase

a. Project Manager (Licensed Civil Engineer or Architect with at least 10 years' work experience)

b. Deputy Project Manager (Licensed Civil Engineer with at least 5 years' work experience)

c. Structural Engineer (Licensed Civil Engineer with at least 5 years' work experience)

d. Geodetic Engineer (Licensed Geodetic Engineer with at least 5 years' work experience)

e. Electrical Engineer (Licensed Professional Electrical Engineer with at least 5 years' work experience)

f. Mechanical Engineer (Licensed Professional Mechanical Engineer with at least 5 years' work experience)

g. Drainage/Sanitary/Plumbing Engineer (Licensed Civil/Sanitary Engineer with at least 5 years' work experience)

h. Materials Engineer (DPWH Accredited Materials Engineer II with at least 5 years' work experience)

i. Quantity/Cost/Specifications Engineer (Licensed Civil Engineer with at least 5 years' work experience)

j. Safety Officer (DOLE Accredited Safety Officer with at least 5 years' work experience)

k. Landscape Architect (Licensed Landscape Architect with at least 5 years' work experience)

Section 9. ELIGIBILITY CRITERIA

A. The Construction Experience Requirement may be fulfilled by the bidder, their Affiliate, subcontractor, its Joint Venture Partner, or a Consortium Member. The entity nominated must be able to fulfill the Design and Construction Experience Requirement in the design, construction and development of eligible projects similar to the National Academy of Sports Project.

a. The bidder should have at least one similar project, both in design and construction, with a contract amount of not less than 50% of the ABC or a combination of one (1) completed similar construction project with a total project cost of at least 50% of the ABC and one (1) completed similar design project with a total project cost of at least 50% of the ABC.

For this purpose, similar projects shall refer to completed sports facilities, such as multi-sport gym, stadium, arena, or indoor sports facility.

b. The bidder, its Affiliate, its subcontractor, its Joint Venture Partner, or its Consortium Member must have local or international experience in successfully completing the design and construction of the following projects similar to the Project with the following minimum costs:

Table 2. Design and Construction Experience Requirements

CATEGORY OF COMPLETED SIMILAR PROJECTS	REQUIRED MINIMUM TOTAL PROJECT COST
Design and Build Project 1 Completed Design and Build Project	PhP 284 M
Combination of 1 Completed Design Project 1 Completed Construction Project	PhP 284 M PhP 284 M

Section 10. SUBMISSION AND RECEIPT OF BIDS

A. In the submission of bids, the first envelope (Technical Proposal) shall contain all the required documents for infrastructure projects under Section 25.2(b) of the IRR of RA 9184 and the following additional documents:

    a. Preliminary Site Development Plan for the entire 4.3-hectare area (NAS Block) to consider future expansion areas of the facilities within the entire NAS Block, in reference to Section VII.F Technical References (NAS Site Development Plan);

    b. Architectural Plans for the Phase 1 Facilities, in accordance with the degree of details specified in the Section VI. Terms of Reference and Section VII. Technical References, such as, but not limited to:

        1. Floor Plans
        2. Elevations
        3. Sections
        4. CAD 3D Rendered Perspective (Architectural Character)

    c. Design and construction methods;

    d. List of design and construction personnel, to be assigned to the Project, with their complete qualification and experience data; and

    e. Value engineering analysis of design and construction method.

B. The second envelope (Financial Proposal) shall contain all the required documents for infrastructure projects under Section 25.3 of the IRR of RA 9184 and the following additional documents:

    a. Lump sum bid prices, which shall include the detailed engineering cost, in the prescribed Bid Form;

    b. Detailed estimates including a summary sheet indicating the unit prices of construction materials, labor rates and equipment rentals used in coming up with the bid; and

    c. Cash flow by the quarter and payment schedule.

Section 11. BID EVALUATION

For the detailed evaluation of the design and build proposal, a two-step procedure shall be adopted by the Special Bids and Awards Committee for the National Academy of Sports:

A. First-Step Procedure:

    a. The first step of the evaluation shall involve the review of the preliminary conceptual designs and track record submitted by the DBC as indicated in the Bid Documents using

a non-discretionary "pass/fail'' criterion that involve compliance with the following requirements:

- Adherence of preliminary design plans to the required performance specifications and parameters and degree of details;

- Concept of approach and methodology for detailed engineering, design and construction with emphasis on the clarity, feasibility, innovativeness and comprehensiveness of the plan approach, and the quality of interpretation of project problems, risk, and suggested solutions;

- Quality of personnel to be assigned to the project which covers suitability of key staff to perform the duties of the particular assignments and general qualifications and competence including education and training of the key staff;

Table 3. Criteria for Conceptual Design:

	PASSED	FAILED	REMARKS
1. Architectural / Conceptual Design Consideration - In accordance with the degree of details specified in the MPSP of this TOR.			
a. Drawing Requirements (AutoCAD)			
● 3D Rendered Perspective (Architectural Character)			
b. Site Development Plan			
c. Conceptual Design			
● Floor Plans			
● Front, Rear Left and Right Side Elevations			
● Sections			

B. Second-Step Procedure:

a. Only those bids that passed the above criteria shall be subjected to the second step of evaluation.

b. The BAC shall open the financial proposal of each "passed" bidder and shall evaluate it using non-discretionary criteria including arithmetical corrections for computational errors as stated in the Bid Documents, and thus determine the correct total calculated bid prices. The BAC shall automatically disqualify any total calculated bid price which exceeds the ABC. The total calculated bid prices (not exceeding the ABC) shall be ranked, in ascending order, from lowest to highest. The bid with the lowest total calculated bid price shall be identified as the Lowest Calculated Bid (LCB).

Section II.

Minimum Performance Standards and Specifications

MINIMUM PERFORMANCE STANDARDS AND PARAMETERS (MPSP)

DESIGN AND BUILD OF THE NATIONAL ACADEMY OF SPORTS PHASE 1 AT NEW CLARK CITY

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MINIMUM PERFORMANCE STANDARDS AND PARAMETERS (MPSP)

DESIGN AND BUILD OF THE NATIONAL ACADEMY OF SPORTS (NAS) - PHASE 1 AT NEW CLARK CITY

Section 1. PURPOSE AND SCOPE OF THE PROJECT

The purpose of the Minimum Performance Standards and Parameters ("MPSP"), among others, is to:

1.1. Establish the minimum compliances that the Design and Build Contractor ("DBC") must comply with under the Contract Agreement with BCDA for the Design and Build of the National Sports Academy Phase 1 (hereinafter referred to as "the Project"), using the Implementing Rules and Regulations, Republic Act No. 9184 ("IRR/R.A. No. 9184"), especially Annex "G" Guidelines for the Procurement and implementation of Contracts for Design and Build Infrastructure Projects.

1.2. Ensure compliance of the DBC in adopting Architectural, Engineering and other Technical Guidelines and define performance standards for the Detailed Architectural and Engineering Design ("DAED") of the Project; and

1.3. Provide a quantifiable and verifiable basis for physical progress a basis for Claims for Payments of the DBC in accordance with the standards accounting and auditing rules and regulations of the Procuring Entity ("BCDA").

1.4. The scope of work of the Project essentially covers the Design and Build of the Infrastructure components of the National Academy of Sports ("NAS") - Phase 1 based on the Terms of Reference.

Section 2. MINIMUM REQUIREMENTS: DESIGN STANDARDS AND SPECIFICATIONS

The DBC shall consider as reference the conceptual design made by BCDA for the National Academy of Sports, and shall observe the following design standards:

A. Architectural Design Character.

1. **Codes and Standards.** The specifications for the buildings and other structures shall adhere to the following codes and standards:

   Codes:
   - National Building Code of the Philippines and its Revised Implementing Rules and Regulations
   - Batas Pambansa 344 – Accessibility Law
   - Fire Code of the Philippines and Its Revised Implementing Rules and Regulations

- IRR RA 9266 or Architectural and its Latest and Amended IRR
- Other Laws that apply to the Project

Standards:

- The design of the academic building shall also conform, as far as practicable, to the Department of Education Order No. 64, s. 2017, Establishing the Minimum Performance Standards and Specifications for DepEd School Buildings.
- Office spaces, which will be part of the academic building, as specified in the general requirements in the Terms of Reference must also conform with the Joint Circular 1 issued last 20 October 2016 by the Department of Budget and Management and the Department of Public Works and Highways, hereto attached as Annex "2".

Site Specific Guidelines:

- New Clark City Comprehensive Master Development Plan ("NCC CMDP")
- NCC Design Standards and Guidelines ("NCC DSG")
- NGAC Master Development Plan ("NGAC MDP")

2. The Site Development Plan for NAS encourages variance in the architectural design of buildings within a zone to evoke an identity that shall be consistent with the NGAC MDP and the NCC DSG. The Academic & Administration Building, and the Multi-purpose gym shall be designed by adopting the principles of a green infrastructure design as in the NCC DSG for individual buildings and should be designed as such to establish a relationship with the design and character of the buildings within the Sports Complex, but without excessive repetition of similar building features.

   The design of canopies, cornices, moldings, walls, columns, glazing and other architectural components must contribute to the overall character of the building. The use of Modern Philippine-inspired architecture is encouraged to showcase the local culture. Façades shall be able to create visual and architectural interest. Architectural elements to incorporate should include a variety of the following: bays and recesses, balconies and terraces, inset windows that allow for the expression of wall thickness, patterns of shade and shadow at facades, changes of material and color use of architectural details such as horizontal and vertical banding, cornices, door and window surrounds, and use of high-quality materials. Cornice lines and canopies should be coordinated across adjacent buildings.

3. Future-Ready Flexibility as a Campus within the "City of the Future". The design should also take into consideration that NAS will serve the growing needs of the next generation of sports scholars. Expansions are managed with modularity and scalability principles. It should be ready for future horizontal and/or vertical augmentation without compromising its structural integrity and iconic design presence as a whole.

4. The Green Building design principle. It is emphasized that the building design should also utilize eco-friendly materials that will integrate renewable energy strategies and efficient use of natural resources. Where possible, provide and integrate each development with ecosystem services, improve health and livability, provide space for local food production, as well as to mitigate heat.

Building design should adopt building forms that 'look out' onto the river parks such as deck terraces to enhance visual connection to green open spaces and shall not obstruct by providing walls that can block public access and views of parks.
The DBC shall not be required to secure any certification issued for Green Building Infrastructure however, the DBC must provide cost-effective solutions and a green building feature, which shall be discussed with the BCDA during the detailed engineering design, investigation and assessment and adopted only with the BCDA's approval.

5. Functionality and Space Optimization for athletic training and development as well as applied Sports Science. All room requirements listed herewith should be provided for and should be in accordance with the National Building Code of the Philippines. Space Planning should satisfy specific functions and allow efficient circulation in terms of physical movement and proximities, natural and artificial air flow.

6. Safe and Stimulating Holistic Learning Environment. Conducive to enrichment of education and experiences, the design should take full advantage of site givens, including our tropical environment. Interiors and exteriors shall maximize natural light and breeze, and lush landscape. The design should maximize natural light by planning open office areas in the outer perimeter of the building envelope and locating enclosed offices adjacent to the building core. Lighting fixtures wherever required shall have LED lights/lamps. Follow green building provisions for lighting.

   Colors should be incorporated in the over-all design to stimulate or soothe, depending on the space function. Design should be universal and provide accessibility for para-athletes and differently abled persons.

7. Adherence to World's Best Practices. The design of the facilities must be in compliance with the competition standards of global sports associations and world-class facilities guidelines of international learning institutions. The facilities must also be able to adapt and provide access to integrated technologies and reliable internet connectivity throughout the NAS Complex to support more sophisticated curricula and hone athletic abilities of the students.

B. Urban Design Requirements. The NAS Site Development Plan covers a wide array of development criteria and standards as reflected in Annex 'B'- Lot Information Plan.

1. **Landscaping.** Landscaping can be utilized to support resiliency efforts, through green infrastructure and stormwater retention. Naturally occurring wetlands, groves, and other existing natural resources and terrains should be maintained to the fullest extent possible. Specifications and limitations on impervious surfaces, stormwater retention, and percent green areas for parcels are indicated below as stated in the NCC DSG:

   a. Features and landscape materials shall complement the urban character and architecture of the particular neighborhood. Materials used must be safe, durable, easily maintained and aesthetically pleasing.

   b. Storm water drains shall be covered and flushed with the paving level. Natural drainage systems are strongly encouraged.

2. **Open Space.** Unless otherwise specified, each parcel in NGAC shall provide a minimum 30% of lot coverage as green space and/or public plaza. If hardscaped areas are added within the

green space, they must be constructed of permeable paving materials. All public green and open spaces shall be developed according to the NCC DSG and the design must be compatible with adjacent developments, architecture and urban character of the district.

3. **Circulation and Courtyards within Parcels.** Pavement, roadside railing and landscape materials shall complement the urban character of the district. Paving materials used must be safe, non-slip, durable and easily maintained, and aesthetically pleasing.

4. **"Street-Wall" and street-facing uses.** A street wall is created when individual building frontages are built up to the sidewalk/lot lines in order to define edges and activate urban open space. The building line of any structure must comply with the setback requirements as indicated requirements in the Building Code of Philippines. Build-to-Line requirements are detailed in the NCC DSG.

5. **Security Requirements.** Perimeter fences and gates should be avoided to the greatest extent possible. Any physical security measures must be incorporated seamlessly into the overall design of the landscape and buildings so as not to draw attention to the measures or detract from the urban context. Fences and walls along the plot frontage, public parks and streets must have a minimum porosity of 50%. Landscape elements such as hedges are encouraged in place of fences or walls. The design, height and materials of such measures are subject to review and approval of the BCDA.

6. **Emergency Access.** Emergency exit doors when open must not project beyond the property line. The design of the exit is subject to building, fire and other relevant codes and guidelines. Exit areas shall be designed with flared or beveled corners, angle inset or with similar details in order to avoid an enclosed and box-like appearance. The doors shall be designed and decorated so as to blend with the overall design and character of the building. Service access points for garbage trucks, etc., must be located away from the emergency exit areas.

C. Mobility Design Requirements

1. **Centralized Parking System.** The NAS Block, through NGAC, will be serviced by an external transportation system that is a mix of public and private transport, and an internal network of public transit, bicycle, and pedestrian circulation. Parking in the area should be concentrated into several centralized parking structures that can service multiple buildings. Surface parking lots shall only be allowed in a temporary capacity; and must be composed of permeable paving materials.

2. **Parking Entrances** should be below grade or screened from view and accessed via secondary streets. It is important to ensure entrances are located and oriented to minimize disruption of the public realm and street.

3. **Drop Offs and Local Access Roads** should be located within the interior of parcels, so as not to disrupt the street wall. They should be located near tower entrances; and adjacent buildings should share the same drop off area wherever possible. Where internal drop-offs are not possible, street side drop-offs (and their associated curb cuts) should not negatively impact the pedestrian zone of sidewalks or interrupt the street wall.

4. **Pedestrian Circulation.** All streets must prioritize pedestrian circulation, safety, and comfort. Narrow streets and small development blocks where possible will encourage pedestrian

activity. Pedestrian walkways forming part of the public pedestrian circulation network must be integrated into the internal circulation system of the individual developments into which it links.

5. **Pedestrian Amenities.** In the planning and layout of buildings within the NAS Block, primary consideration should be given to the pedestrian. The use of colonnades, arcades, canopies, and covered walks should be used for all support service facilities and are generally encouraged across all land-uses to improve the pedestrian right-of-way.

    a. Canopies may encroach within the street right of way by a maximum of 3 meters. They should have a consistent size and height established within each given block.

    b. **Shade Trees.** Street design should allow for the introduction of street trees wherever possible to add additional shading and visual improvement

    c. **Street Furniture.** All pedestrian sidewalk, paths, and plazas should be populated regularly with seating elements to support comfortable usage.

    d. **Accessibility.** Primary pedestrian circulation paths and entryways shall be designed to accommodate wheelchair access.

6. **Bike Lanes.** Bicycles are an integral part of mobility for residents and visitors and should be encouraged as an alternate mode of transport. The design of all local access streets must include a bike path, and all major streets must include a dedicated bike lane protected with a median and illuminated paths during nighttime.

7. **Bike Parking.** Parking for bicycles should be provided near the facility structures with a bike parking rack that can accommodate a minimum of 50 bikes.

D. Building Minimum Design Requirements

1. **Academic and Administration Building.** Will consist of at least three (3)-storey Academic Building with roof deck and Administration Building with roof deck and at least have a total GFA of 5,492 square meters.

    The floor plan for each of the identified spaces shall follow the functional space requirements stipulated in the Terms of Reference. The DBC shall conform to the BP 344 or the Accessibility Law requirements standard for Persons with Disabilities (PWD).

    Circulation space must be consistent with fire safety regulations and ensure efficient and unobstructed movement inside the building.

    a. Office Area

    The office area for the administration space shall be allocated such that executive offices are provided separate rooms adjacent to their staff officers. The space and configuration of the rest of the offices and workstations shall be provided in the design to be proposed by the DBC taking into account the space requirements indicated in Section 2.A.1 of the Terms of Reference.

Glass partitions shall be used in enclosed offices to increase natural light and to supervise staff if required.

b. Workstations and Cubicles

Cubicles are intended for middle managers and shall be provided with a space distinct from workstations occupied by staff. Shall have a minimum requirement of modular partitions and power and network floor mounted outlets.

Workstations layout which can be configured in various ways to accommodate the varying requirements of different functions or teams that shall be incorporated in the open office areas. Workstation designs which can be easily reconfigured without any significant disruption shall be proposed to allow maximum reuse and efficiency. The workstations shall have power and network floor mounted outlets.

Huddle area and meeting rooms shall be introduced in desired spaces to introduce flexibility in space usage.

c. Meeting rooms and Conference Rooms

The conference rooms shall have power and network outlets. There shall be ample storage for audio visual equipment, etc.

Meeting rooms should be flexible in space usage which means that such should be provided approximate to each other and can be converted and combined to form a larger meeting room by incorporating movable partitions, furniture and equipment.

d. Server Room shall be within the space for the administration floor. The features of this room are as follows:

i. Be tight sealed from dust and water flows, no penetration through ceiling or water sources above with no false ceiling and plumbing

ii. A separate rail shall be provided for power and network cabling

iii. Electronic door lock.

iv. Proper design and distribution of electrical and data outlets with separate power for AC units

v. Clear window panels

vi. Equip with fire suppression system/fire detection and alarm system

e. Comfort Rooms

i. Each floor of the academic building must have comfort rooms designed such that sufficient number of toilets for men and women are provided. Each toilet area must have the following but not limited to urinals and modesty boards (for male toilets),

toilet bowl with bidet, countertop lavatory with faucet, mop sink, hand dryer, tissue holder, concealed washroom combination (paper towel, dispenser and waste bin), facial mirror, soap dispenser and, toilet and shower partitions in numbers compliant with regulations. A separate comfort room shall be provided for (1) persons with disabilities (PWD), and (2) gender-neutral comfort room per floor

ii. The design shall consider the location of the other toilet areas in the building to consider efficient plumbing installation works.

f. Storage Rooms. The room shall be accessed only by a limited number of staff and can therefore be located accordingly in the design of the building.

g. Main Lobby: Hall of Champions

Shall be the front area for school area and administration area and shall accommodate a double floor high cut-out serving as an atrium and is more like a town square which encourages interaction & promotes student-athletes' sense of inclusion to the athletic community.

h. Service areas - Electrical/ Electronics / Mechanical/ LAN, etc.

i. The design shall accommodate areas required for various service components of the buildings such as, but not limited to, electrical, electronics, mechanical, maintenance, LAN, etc. These areas shall be designed based on specific inputs from the sub-consultants designing them such as electrical consultant, air conditioning consultant, etc.

ii. The design of electricity, plumbing and fire protection shall follow the provisions of the National Building Code, National Electrical Code, Philippine Electronics Code, and National Fire Protection Code (the version of the Building Code applicable will be the latest available on the day of award of the contract) and other Relevant Rules and Procedures.

iii. There shall be an electrical and auxiliary room at the ground floor where the necessary electrical panel boards, electrical components such as transformers, etc and auxiliary components for data, connectivity, etc, are located. Each floor shall have its own electrical and auxiliary room.

2. **Minimum Specifications and Functional Space Requirements**

a. **Site Development Works**

The functional spaces required in the site development area and outdoor spaces are described as follows:

Table 1. Functional Space Requirements for Site Development Works

	SPACES	FUNCTIONAL SPACE REQUIREMENTS NO OF PERSONNEL/OCCUPANTS
1	Loading/Drop Off Area	For various types of vehicles (i.e., Cars, SUV, Team Bus)
2	Parking Spaces	a. Dedicated Parking Spaces (sheltered or with trees) b. Open Parking Spaces (non-sheltered but with trees) c. Motorcycle and Bicycle Parking Space
4	Outdoor Sport Areas	a. Multi-Sports (7-a-side Soccer with a FOP of 55x36.5 meters (Carabao Grass Flooring and the Pitch Orientation should be North-South) and Field events b. Designated Area for Obstacle Course and Parkour
5	Internal Road, Bike Paths/Walk-Jog Lanes	a. See Fig.1 of number 5 - Page 22 b. Bike Paths/Walk-Jog Lanes (Sandwash Finish Texture with Franciscan Red Color)
6	Flag Ceremony/General Assembly Area/Emergency Assembly Areas (Grass)	Good for at least 1,200 pax
9	Utilities	a. Genset Room with a minimum area of 36sqm Minimum Capacities and Requirements: 1. Power Output Rating: 400kW/500kVA, 400V, 60Hz 2. Output Connections: Three Phase, 3 Wire+Neutral+Ground 3. Nameplates: For each major system component to identify manufacturer's name and address, and model and serial number of component Engine: 1. Fuel: Fuel oil, Grade DF-2 2. Rated Engine Speed: 1800rpm Mounting Frame: Maintain alignment of mounted components without depending on concrete foundation; and have lifting attachments b. Transformer Room with a minimum of 60 sqm c. Emergency Supplies and Equipment Room with a minimum area of 50sqm. d. Covered Motor Pool Area/Ambulance Area with a minimum capacity of 2 Team

		Bus, 2 Team Coasters, 3 Vans and 1 Ambulance e. Sewage Treatment Plant with a minimum of 4,500 cubic meters/day, with a minimum depth of 6meters (subject to change based on STP requirement) f. Underground Rainwater tank with minimum capacity of 100 cubic meters g. Underground Fire Tank with minimum capacity of 230 cubic meters h. Cistern Tank: 1. Underground Potable Water Tank with a minimum of 3,400 cubic meters/day 2. Underground Non Potable Water Tank with a minimum of 2,300 cubic meters/day *Depth of pump room is 5 meters for the rainwater, fire, potable and non potable tank.
10	Landscape	a. Trees shall be endemic b. Carabao Grass c. With shrubs
11	Perimeter Lights/Street lights	Lights to be provided within catwalks, perimeter, parking area

b. **NAS Administration Building**

The functional space requirements for Administration Building are described as follows:

Table 2. Functional Space Requirements for NAS Administration Building

SPACES		FUNCTIONAL SPACE REQUIREMENTS NO OF PERSONNEL/OCCUPANTS
BUILDING 1: ADMINISTRATION BUILDING		
Executive Offices		
1	NAS Executive Director's Office	a. Office of the Executive Director b. Mini Conference Room (Good for 4-6pax) c. Cubicle for Executive Assistant d. Workstations for Executive Director's staff (Good for 2 staff) e. Private Toilet and Bath with closet f. Private Pantry Area/Nook
2	NAS Deputy Executive Director for Admin and Curriculum Office	a. Office of the Deputy Executive Director for Admin and Curriculum b. Office Space for DED's Admin & Curriculum Staff (Good for 2 staff) c. Private Toilet

		d. Office of the Chief of Sports Sciences e. Office of the Chief of Athletes' Services f. Office for the Chief of Research & Evaluation
3	NAS Deputy Executive Director for Sports Office	a. Office of the Deputy Executive Director for Sports b. Office Space for DED's Sport Staff (Good for 2 staff) c. Private Toilet d. Office for the Chief of Sport Sciences e. Office for the Chief of Athletes' Services f. Office for the Chief of Research & Evaluation
4	Office of the Internal Auditor / Accreditation Room	a. Office of the Internal Auditor / Accreditation Room b. Workstations for the Internal Auditor's staff (Good for 4 staff)
5	NAS Executive Board Room	a. NAS Executive Board Room (Good for 20 pax)
6	Legal Department	a. Office of the Legal Dept. Director/ED's Chief of Staff (to be adjacent to Executive Director's Office, with exterior access/balcony) b. Private Toilet c. Office space for Attorney IV and Attorney III d. Workstation for Legal Dept staff (open space for the staff and with a small receiving area to receive documents unless all receiving will be centralized. Time and date stamps in legal documents are very important). e. Records/Filing room
NAS System Administration Offices		
7	National Registrar	a. Office of the National Registrar/Board Secretariat b. Student Records Section (with secure, fire-resistant room/storage for confidential records) c. Office Staff Area (Good for 2 staff) d. Reception Area e. Collaborative Space/Huddle Area (Good for 4-8 pax)
8	Human Resource Department	a. Office of the Human Resource Director b. Office of the Asst. Director for HR c. Cubicles for 3 Officers (1-Officer each for Organizational Development & Recruitment, Compensation & Benefits, and Employee Relations & Discipline) d. Office Space for HR Staff (Good for 6 staff (2 per section Officer) e. Reception Area (Good up to 5 pax) f. Testing Room (Good for 6-15pax / mini classroom type/ doubles as holding area) g. Records/Filing Room h. Storage
9	Finance Department	a. Office of the Finance Director b. Workstations for Finance administrative staff (Good for 4 staff)

		c. Office space of Supervising Financial Management Specialist d. Office of the Accounting Section Chief e. Office Space for the Accounting Section Staff (Good for 8 staff) f. Office of the Budget Section Chief g. Office Space for the Budget Section Staff (Good for 3 staff) h. Office of the Treasury Section Chief i. Office Space for the Treasury Section Staff (Good for 3 staff) j. Records/Filing/Storage Room for EACH Section (4) (One room with partitions for the 4 sections) k. Collaborative Space/Huddle Area (Good for 4-6 staff)
10	Campus Finance And Procurement Office	a. Office of the Procurement Director i. Workstation for 2 staff b. Office of the Procurement Manager c. Workstation for 5 staff d. Storage room
11	Planning and Development Department	a. Office of the Planning and Development Director b. Office Space for Planning Section Chief ● Workstations for the Planning staff (Good for 2 staff) ● Workstations for the Development Department (Good for 2 staff) c. Office Space for Development Section Chief and Staff (Good for 2 staff) d. Storage Room e. CAD Printing Area and Collaborative Space/Huddle Area
12	External Linkages/Affairs and Partnerships Department	a. Office of the External Linkages/Affairs and Partnerships Director b. Office Space for the EA&P Director's staff (Good for 2 staff) c. Cubicle for Media & Publications Head ● Workstations for Media & Publications staff (Good for 2 staff) d. Cubicle for Grants & Scholarships Head ● Workstations for Grants & Scholarships staff (Good for 2 staff) e. Cubicle for External Linkages & Affairs Head ● Workstations for External Linkages & Affairs staff (Good for 2 staff) f. Collaborative Space/Huddle Area (Good for 4-6 staff)

13	Information and Communication Technology Department	a. Office of the Information and Communication Technology Director b. Office Space for the ICT Director's Staff (Good for 2 staff) c. Cubicle for the Information Technology Officer ● Workstations for the I.T. Officer staff (Good for 2 staff) d. Cubicle for the Information Systems Analyst ● Workstations for the I.S. Analyst's staff (Good for 2 staff) e. Server Room and Data Center
14	Server Room and Data Center	a. Host server for the Admin & Academic Building
15	Administrative Services Department	a. Office of the Administrative Services Division Chief b. Office Space for the Admin Svcs. Staff (Good for 2 staff)
16	Security Monitoring and Surveillance Department	a. Office of the Security Section Chief b. Office Space for the Security Svcs. Staff (Good for 2 staff)
17	Admin Common Pantry and Dining Area	Good for 50 pax and shall serve as break out space to use during breaks from working or studying.
18	Comfort rooms with Showers	a. To be provided for each floor of the building (in case of several floors) b. PWD friendly; compliant with BP 344 (Male, Female, PWD, all-gender or gender neutral)
19	Main Administration Reception Area	Good for 30 pax
20	Meeting Rooms	a. Small Meeting Rooms (2 Rooms, Good for 4-8 pax). b. Medium Meeting Rooms (2 Rooms, Good for 6-10 pax; sound proof; good internet access and electric outlets). c. Large Meeting Rooms (1 Rooms, Good for 10-15 pax; sound proof; flexible design which allows smaller meeting space).

c. **NAS Academic Building**

The functional space requirements for the Academic Building can be described as follows:

Table 3. Functional Space Requirements for the NAS Academic Building

SPACES		FUNCTIONAL SPACE REQUIREMENTS NO OF PERSONNEL/OCCUPANTS
ACADEMIC BUILDING		
1	Campus Director's Office	a. Office of the Campus Director b. Workstation for CD Assistant c. Private Toilet and Bath d. Conference Room (Good for 10-12 pax)
2	Assistant Campus Director's Office	a. Office of the Asst. Campus Director b. Workstation for Asst. CD Staff c. Curriculum Coordinators' Cubicles (2)
3	Faculty Rooms (Junior High School)	a. Faculty Room with Workstations for Gr. 7-8 Faculty (Good for 16 Teachers) Gr. 7-8 Reception area with workstation for 1-staff b. Faculty Room with Workstations for Gr. 9 Faculty (Good for 16 Teachers) Gr. 9 Reception area with workstation for 1-staff c. Faculty Room with Workstations for Gr. 10 Faculty (Good for 16 Teachers) Gr. 10 Reception area with workstation for 1-staff d. Faculty Room (Good for 18-20pax) e. Faculty Comfort Rooms with Shower (male, female, PWD)
4	Faculty Lounge	a. Pantry and Dining Area (Good for 20-25 pax) b. Rest/Reading Room
5	Campus Registrar's Office	a. Office of the Campus/Assistant Registrar ● Workstations of the Campus/Assistant Registrar's staff (Good for 2 staff) ● Cubicle for the Secretariat ● ID Capturing Area/Printing/Photocopying Area b. Cubicle for the Admissions Section Head (Testing, Recruitment, Processing) ● Workstations for Admissions staff (Good for 2 staff) c. Cubicle for the Records Section Head (Records) ● Records Room ● Workstation for Records Section 1 staff d. Testing Room (Good for 3-4pax)
6	Administrative Staff Pantry Dining and Lounge	Good for 10-12 pax
7	Classrooms	20 rooms with at least 63 sqm or (7m x 9m each) (4 rooms with acoustic divider)

8	Library/Media Center (Good for 100 pax)	a. Library Technical Services Area (Acquisition, Cataloging, Circulation, etc.) b. Photocopying/Digitization Section c. Multimedia Resource Section/Film Viewing Areas (Good for 6 pax) d. Faculty Resource and Study Section (Good for 8-10 pax) e. Office of the Chief Librarian f. Counter/Workstation for Library Staff (Good for 2-3 pax) g. Creative Hub/Leisure Reading Section (Good for 12 pax) h. Archives
9	Science Laboratories	a. Physics/Sports Lab (double the size of a regular classroom) b. Biology/Chemistry Lab (double the size of a regular classroom) c. Labs Manager's Office d. Labs Assistants' Workstations (Good for 6 pax (1-per laboratory) e. Equipment disbursement and storage f. I.T. Lab (Good for 30 students) (size of a regular classroom) g. Audio-Visual Editing Room (Good for 6 pax)
10	Guidance Counselling Area	a. Reception Area b. Office of the Chief Guidance Counselor c. Counselling Rooms (2) (Good for 4pax) d. Consultation cubicles (2) (Good for 4pax) e. Records/Filing Room and Storage f. Workstations for Guidance and Counselling Staff
11	Health Services (Clinic)	a. Receiving Area and Triage (Good for 4-6 pax) b. Medical Services Area c. Dental Services Area d. Nurse's Station e. Doctor's/Dentist's Cubicles f. Sickbay/Bedspace Area/Treatment Area (Good for 4-6 pax) g. Medical Supply Storage Areas including cold storage/ice maker h. Isolation room
12	Food Management Service and Cafeteria/Nutrition Center	a. Cafeteria for Junior High School (Good for 150 pax) b. Kitchen and Food Preparation c. Dishwashing area and dry storage d. Cold storage area/Freezers e. Drop off/Delivery/Receiving area for food ingredients, etc. f. Office of the FMS Section Head/Nutritionist g. Workstation for Cafeteria Section Head's Assistant/Other Health Assistants (Good for 2 pax) h. Kitchen staff rest area and lockers (Good for 8-10 pax) i. Comfort Rooms and Drinking Water nook j. Faculty and Staff Dining Area (Good for 16-20pax)

13	Chief Administrative Office	a. Office of the Chief Admin Officer b. Workstations of the Chief Admin Officer staff (Good for 2 pax)
14	Lecture/Performance Halls / Audio-Visual Room	Good for 200 pax (1 Large room with divider to make 3 rooms)
15	General Services Office (Janitorial)	Good for 15-20pax
16	Transportation Office	Good for 6 pax
17	Safety and security office/Risk Mitigation	a. Security Monitoring and Command Station (with space for I.T. Surveillance Monitoring Equipment) b. Security team rest area and locker room (Good for 24 pax)(Male and Female) c. Security equipment storage room d. Office of the Head of Security, Safety, and Risk Mitigation e. Workstations for Security, Safety, & Risk Mitigation Staff (Good for 4 pax)
18	Physical Plant Office	a. Buildings Section/Infrastructure Maintenance Staff (Good for 5 pax) b. Grounds Section/Landscape Maintenance Staff (Good for 5 pax) c. Physical Plant Facility Head
19	Prayer Room	a. Good for 12 pax
20	Utilities (Generator Room, Mechanical-Electrical Room)	
21	Storage Rooms (Per Floor)	Storage rooms will be provided for each floor and shall be within an area at least 9 sqm
22	Comfort Rooms (Per Floor)	Student Comfort Rooms (male, female, gender neutral and PWD)
23	Nooks - Student Locker Areas, Kiosks, Huddle Spots, Charge Stations	
24	Main Lobby: "Hall of Champions"	a. Area to be provided should be within at least 80 sqm area b. Will serve as an atrium and is more like a town square which encourages interaction & promotes Student-Athletes' sense of inclusion to the athletic community.
25	Courtyard with Linear Garden	

d. **Multi-Purpose Gym.** The Multi-Purpose Gym should accommodate field of play (FOP), the flooring requirement according to the specified standard for the following sports:

Table 4. Functional Space Requirements for the NAS Multi-Purpose Gym

SPACES		FUNCTIONAL SPACE REQUIREMENTS NO OF PERSONNEL/OCCUPANTS
BUILDING 2: MULTI-PURPOSE GYM		
1	**Main Court (shared)** Basketball Court convertible to Volleyball court	Field of Play (FOP) of shared space with each field of play to be designed in accordance with the following: ● Basketball To be designed in accordance with the International Basketball Federation (FIBA) standards with 1st Grade MFMA Maple wood flooring. 19 x 32 meters Field of Play (FOP) first grade MFMA maple wood floor (FIBA standard); 300 retractable seats for spectators; 5 years warranty ● Volleyball: In accordance with the Fédération Internationale de Volleyball (FIVB) standards. 15 x 28 meters Field of Play (FOP) 9MM thick PVC flooring with protective treatment FIVB- preferred with 12 years warranty The DBC shall provide 300 retractable seats for spectators and shall decide on the best position of the retractable seats for best viewing for each game: ● 270 Seats without backrest ● 30 VIP Front Seats with backrest
2	**Gymnastics and Multi Sport** (Badminton, Sepak Takraw, Futsal and Handball)	The space shall have a design to apply the following: ● appropriate/highest Fédération Internationale de Gymnastique (FIG) standards; ● Badminton World Federation (BWF) standards; ● appropriate/highest International Sepak Takraw Federation (ISTAF) standards; ● Federation Internationale de Football Association (FIFA) (Futsal) standards; The 25 x 45 meters FOP should have at least 9MM thick PVC flooring with protective treatment FIG/BWF/ISTAF/FIFA standard with 12 years warranty

		The DBC shall provide 300 retractable seats for spectators and shall decide on the best position of the retractable seats for best viewing for each game: ● 270 Seats without backrest ● 30 VIP Front Seats with backrest
3	Martial Arts Rooms	Shared space of at least 568 sqm in total, providing each sport with distinct area (or room) to include: a. Taekwondo Training Room - World Taekwondo Federation standards with 30MM thick (EVA) foam interlocking mats 1x1 meter to world taekwondo standard b. Karate-do Training Room - 30mm thick (EVA) foam interlocking mats 1x1 meter to world karate federation WKF standard c. Judo Training Room - International Judo Federation standards with tatami mats to world judo federation standard
4	Table Tennis Training Area (4 Tables)	The space shall consider provision for 4 tables with a 5 x 10 meters FOP and play surfaces and requirements based on International Table Tennis Federation (ITTF) standards.
5	Sport Offices	The design shall be consistent with the workstation designs for: a. Office of the Section Head for Training and Development i. Workstations for Training & Development staff (Good for 2 staff) b. Office of the Section Head for Sports Events i. Workstations for Sports Events staff (Good for 2 staff) c. Sport Coaches' and Asst. Coaches Offices (1 Office per sport with an area good for 3-4 persons per office for 8 sports) d. Coaches Common Room and Pantry e. Team Meeting Room (Good for 20-24pax) (1 Big Room good for 20 – 24 persons with Divider to allow conversion to 2 smaller rooms)
6	Male Shower and Dressing Rooms/ Locker Rooms per Court Area or Training Area	a. Separate male shower rooms should be provided for each training area and should be a space that considers the number of students for each court/sport:

		1. Basketball & Volleyball (Good for 24-30pax) 2. Gymnastics and Multi Sports (Good for 20-24pax) 3. Martial Arts (Good for 30-34pax) 4. Table Tennis and Weightlifting (Good for 20-24pax) b. Sufficient number of shower cubicles should be provided and shall have adequate partitions c. Each shower / dressing rooms must have a lavatory with faucet in numbers compliant with regulations and at least one hand dryer d. The space should consider an arrangement to separate or limit wet floor from dry floor e. A separate shower / dressing room must be allocated for PWD (good for 1 person) and a gender-neutral design (good for 1 person) for each of the two (2) courts or training area
7	Female Shower and Dressing Rooms/ Locker Rooms per Court Area or Training Area	a. Separate female shower rooms should be provided for each training area and should be a space that considers the number of students for each court/sport. 1. Basketball & Volleyball (Good for 24-30pax) 2. Gymnastics and Multi Sports (Good for 20-24pax) 3. Martial Arts (Good for 30-34pax) 4. Table Tennis and Weightlifting (Good for 20-24pax) b. Sufficient number of shower cubicles should be provided and shall have adequate partitions c. Each shower / dressing rooms must have a lavatory with faucet in numbers compliant with regulations and at least one hand dryer d. The space should consider an arrangement to separate or limit wet floor from dry floor e. A separate shower / dressing room must be allocated for PWD (good for 1 person) and a gender-neutral design (good for 1 person) for each of the two (2) courts or training area
8	Comfort Rooms (Male, Female, Persons with	a. Sufficient number of toilets for men and women should be provided compliant with local regulations. Each toilet area

	Disability, and Gender-neutral rooms)	must have toilet bowls with bidet and lavatory with faucet in numbers compliant with regulations. For male toilet rooms, toilets must have urinals with modesty boards: 1. Basketball & Volleyball (Good for 6-10pax) 2. Gymnastics and Multi Sports (Good for 6-10pax) 3. Martial Arts (Good for 6-10pax) 4. Table Tennis and Weightlifting (Good for 6-10pax) b. Each designated comfort rooms must have at least one hand dryer c. A separate comfort room shall be provided for person with disability (PWD) and a gender-neutral design per floor in accordance with local regulations. d. The design shall consider the location of the other toilet areas in the building (frontline service areas, offices of the Division Chiefs, Project Director and ANS) while locating the toilets in each floor to ensure that plumbing installation works can be done efficiently.
9	Sport Supplies and Equipment Room	Provide dedicated space to be used for each sport for the storage of supplies and equipment with a minimum number of 6 rooms and a minimum area of 9 sqm per room.
10	Physical Therapy and Injury Management Room	a. Reception Area b. Satellite Clinic and First Aid station c. Physical Therapy/Injury Treatment Rooms or Curtained cubicles (Good for 8 pax) d. Rehabilitation/Functional Recovery area (with area for functional rehab equipment, open area for warmups/ exercises/ stretches with cushioned flooring) e. Physical Therapists' room with lounge/pantry area (Good for 8-12 pax) f. Doctor's Offices (2) g. Comfort Room (Male/Female/PWD/Gender-Neutral)
11	Weightlifting and Strength and Conditioning Room	● Shall be within an area at least 325 sqm ● Must provide an area for strength equipment (weights, Olympic sets, machines, cable/cord systems), warm up/ exercise/ stretching areas
12	Storage rooms	A separate room that will be shared by various sports and should be within an area that can accommodate storage use of the following: a. Basketball at least 32 sqm

		b. Gymnastics and Multi-sport (Badminton/Sepak/Futsal/Handball) at least 24sqm c. Martial Arts at least 18sqm d. Table Tennis at least 10 sqm e. Weightlifting and strength and conditioning equipment at least 15 sqm The storage room is intended for large materials and sporting tools. The door and ceiling should consider movability of the tools stored inside, for sharing by all sports identified The DBC shall decide on the location, to consider mobility, and accessibility to limited people
13	Physical Therapy and Injury Management room	a. An area intended for students or spectators that need medical attendance and shall be located within the common area or public areas of the gym for ease of access b. Shall provide adequate partition to let more public spaces be separated from the treatment areas
14	Weightlifting and Strength and conditioning room	The floor shall be a padded floor with high density rubber

3. Site investigations, surveys, soil testing and other similar activities which are required for finalizing the detailed building design shall be completed by the DBC during the preparatory construction works such that the final design addresses the findings from these activities.

    a. **Land Grading Plan**. All such plans shall consider the topography and geology of the area with reference to the Updated Master Plan of the NCC provided in Annex "C" (Part 4.2.2 Design Criteria, p 4-17):

        "The following are the design criteria for the land grading plan:

            a. Elevation of each lot for industrial, administrative/institutional, and commercial zones were set higher than the road elevation to avoid inundation.

            b. The road alignment and profile were set considering the topographical condition and water discharge direction.

            c. Minimum gradient of 0.50% and maximum gradient of 6% for roads were basically adopted"

4. The DBC shall design and develop the Site Development Area with internal roads (if applicable), walkways, bikelane, landscaping and paving ensuring efficient circulation, safe

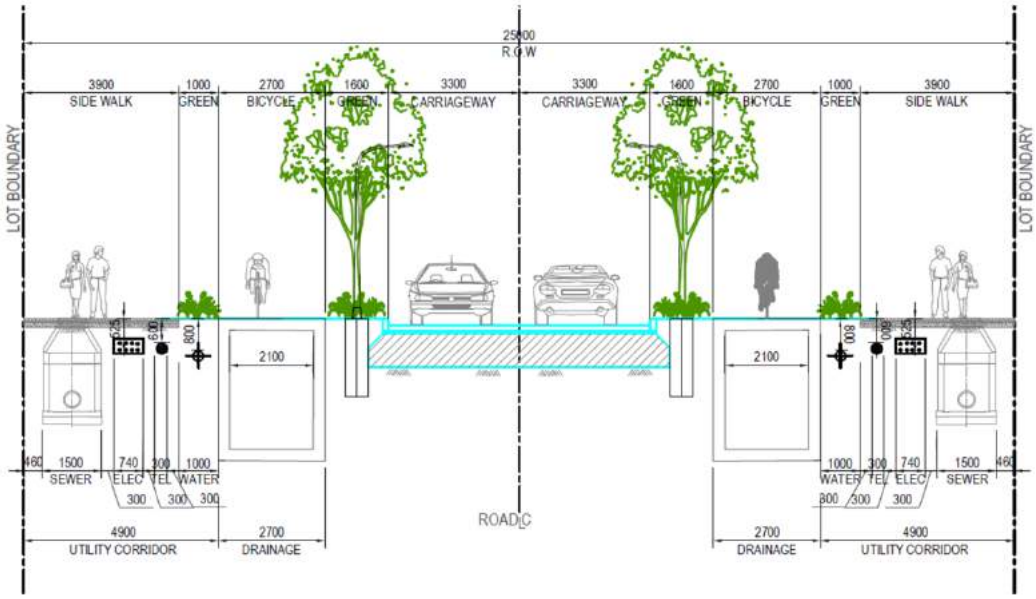
and unhampered pedestrian and vehicular flow and outdoor aesthetics. Premix paving consisting of road lines, channels drainage and curbs designed along with trees and flowering plants which shall be planted around the building, shall be ensured.

The design should consider adapting the natural placements of the existing old trees to ensure that the development will capitalize on the preserved natural environment. In case cutting of trees is unavoidable within the site development area, the cost of undertaking such and the securing of necessary permits shall be borne by the DBC.

5. The site development works shall be carried out within the 25,000 sqm including the building footprint of the two buildings.

   The design concept for the internal roads within the Property, if applicable, must include bike lanes, sidewalk, underground utility corridor, street lights and linear park, with reference to the Updated Master Plan of the NCC provided in Annex "C" (Part 4.4.10 Typical Cross section, p 4-47).

   Fig.1. Road Lay-out for Collector Roads at NCC, 25 meters



6. **Hanging Equipment**

   Height of trusses shall be 12.50 meters minimum from the finish floor line of the field of play. Height of lights, and other equipment must conform to the design requirements.

7. **Walls**

   a. Dry walls shall not be embedded with wet utilities.

   b. Layout and work on wall and floor tiles must be aligned, plumb, leveled, and squared.

   c. Painted Plastered CMU wall or drywall

d. Lahar Finish (Trowel finish in random pattern) similar to Athletics Stadium and Aquatics Center in New Clark City.

e. Tile color and design shall be approved first by BCDA before installation.

8. **Floors**

a. Floors at the openings of toilets for persons with disability shall be sloping and must be indicated in the plans and sections.

b. Layout and work on wall and floor tiles must be aligned, plumb, leveled, and squared.

c. Nonskid floor tiles shall be used on wet area like Comfort Rooms and Changing / Locker Rooms.

d. Tile color, size and design shall be approved first by BCDA before installation.

e. Straight to finish with sealer shall be used on a large scale of the buildings.

f. Ceiling Works: Acoustic Ceiling with metal frames to meeting rooms and exposed soffit slab in skim coat finish to other areas

g. Should conform to the BP 344 or the Accessibility Law requirements standard for PWD.

9. **Doors and Windows**

a. Major rooms that require security shall have sturdy doors i.e., metal doors on EE rooms

b. Major rooms that require natural light shall have glass doors or partitions i.e., Conference room/meeting room

c. Minor rooms that do not require security shall at least have wood flush doors with laminate; Storage rooms shall have painted wood flush doors

d. Fire escape doors should be provided with panic hardware and door closers and shall conform to the requirements of the Fire Code of the Philippines.

e. Number of doors for each classroom shall follow the DepEd requirements for Academic Buildings

f. Windows shall be laminated 6 mm thick tempered glass modern jalousie windows and tempered glass windows and shall conform to the DepEd requirements for School Buildings

g. Door finish and color shall be approved first by BCDA before application

h. Windowsills shall be slightly sloped outwards to prevent damage to windows and paint due to water slippage

i. All doors of a high-occupancy room shall be double action swing doors and as required by the Fire Code of the Philippines.

j. Should conform to the BP 344 or the Accessibility Law requirements standard for PWD.

10. **Corridors**

a. Corridors and exit doors shall conform to the requirements of the Fire Code of the Philippines.

b. Should conform to the BP 344 or the Accessibility Law requirements standard for PWD. The halls, stairs, and doors and facility components of the buildings must be wide and designed in compliance with the Accessibility Law and applied universal design components.

11. **Fixtures and Accessories**

a. Three-way electrical light switches shall be provided at both ends of a long corridor

b. Electrical light switches shall be located by the knob side of the door

c. Electrical switches and outlets shall be installed plumb and level

12. **Painting**

a. Painted ceiling shall be in exposed ceiling with skim coat.

b. Lahar finish for ordinary rooms, e.g., offices, unless specified to a higher type of paint.

c. Painted exterior walls shall be lahar finish unless otherwise specified.

d. Paint color and shade shall be approved first by BCDA before application.

13. **Minimum Proposed Schedule of Finishes**

All internal finishing and covering shall be free from tears, scoring or any other damage that is unsightly and/or could cause health and safety hazards. Flooring shall facilitate adequate drainage when necessary.

Table 5. Schedule of Finishes per Functional Area

AREA	TYPE OF FINISH
Floor	
Entrance lobby	Straight to finish with sealer
Executive Offices	Straight to finish with sealer
Administrative Offices	Straight to finish with sealer
Academic Building	Straight to finish with sealer
Sports Field of Play (FOP)	Accordance with the specification standard of each

	Sport Federation
Conference/Meeting Rooms	Straight to finish with sealer
Server rooms	Special type flooring for cable requirement
Pantry	Straight to finish with sealer
Utility rooms (Electro-mechanical)	Straight to finish with sealer
Comfort Rooms and Shower Rooms/Locker Rooms and other Wet Areas	Non-skid floor tiles

Wall Finishes	
Entrance lobby	Lahar finish / Lahar finish or Plaster painted Finish
Executive Offices	Lahar finish / Painted finish
Administrative Offices	modular office cubicles with manufacturer's finish, color is subject for approval first before the procurement office equipment are excluded
Academic Building	Lahar finish
Sports Field of Play (FOP)	Plastered/Painted finish/ Lahar finish
Meeting Rooms	Glass/Plastered/ Lahar finish
Toilets and Janitorial Services	Glazed Ceramic wall tiles
Pantry	Lahar finish
Utility rooms (Electro-mechanical)	Plain Cement Finish

Partition Type	
Entrance lobby	CMU wall/Glass partition (where applicable)
Dry Wall Partition (Offices)	Fiber cement board on metal studs
Wet Wall (Toilets and other similar function areas	CMU wall
Administrative/ Staff offices	Glass Partition for the entrance to offices to the ED, and 2 DEDs
Ceiling Finishes	
Academic Building	Suspended acoustic ceiling panels to meeting rooms and exposed soffit slab in skim coat finish to other areas
Executive offices, administrative officers, server rooms, toilets and janitorial services, pantry	Suspended fiber cement panels for all areas except utility rooms, fire exit stairs. Moisture resistant gypsum for wet areas
Sports Field of Play (FOP)	Painted steel frame finish with at least 12.5 meters height
Utility rooms	Plain cement Finish

14. **Staircases**

a. Stairs shall be constructed where appropriate following the standard specifications

b. Staircases and fire exits shall be designed in compliance with the Fire Code and other applicable regulations.

c. Must conform to the requirements under the BP 344 or the Accessibility Law and provide ramps and stair lift for the access of the PWD.

15. **Summary of Materials**

a. Materials to be used shall be fire-resistant, non-toxic, moisture-resistant and termite-resistant, e.g., fiber cement board, light-gauge steel frame.

b. Wet areas, e.g., toilets, and kitchen shall use non- skid/non-slip vitrified ceramic floor tiles.

c. Ramps and stairs shall use non-skid/non-slip floor tiles, materials as specified.

d. Cement board of 3.5mm with metal furring frames; full threaded support with shadow line and hangers.

e. 8mm diameter metal rod hangers with adjustable clips, and not galvanized iron wires, shall be used to support and suspend the aluminum T-runners and light gauge metal furring

f. All materials, color and design of walls, exterior finishes and roofing shall be approved first by BCDA or CMS before installation.

E. Structural Requirements

1. **Codes and Standards.** The specifications for the buildings and other structures shall adhere to the following codes and standards:

Codes:

- National Structural Code of the Philippines, NSCP 2017 7th Edition
- National Building Code of the Philippines
- Accessibility Law

Standards:

- American Institute of Steel Construction (AISC)
- American Concrete Institute (ACI)
- American Society for Testing Materials (ASTM)
- American Welding Society (AWS)
- American Society of Civil Engineers (ASCE)

2. **Structural Design Criteria:**

The site shall be soil investigated to determine the actual soil bearing capacity. In summary, the site suitability, conformity with structural code, shape and form subject to structural evaluation and monitoring shall be in effect.

a. Building Works

- Levels. Bottom slab of the lowest levels shall be no lower than +0.00m if no basement level is provided or -4.50m if a basement level is required. Peripheral earth retaining walls, elevator shafts and stairwells are to be made of reinforced concrete and shall, where necessary, take account of reasonably expected ground water penetration risk.

- A steel frame structure or reinforced concrete structure should be used for the Academic and Administration Buildings, and the Multi-purpose Gym.

- The Structures should be classified as Occupancy Category I: Essential Facilities with a Seismic Importance Factor, I = 1.50.

- The Structures should be designed from wind loading considering basic wind speed corresponding to Figure 207A.5-1C Basic Wind Speeds for Occupancy Category I Buildings and other Structures.

F. Civil Works Design Parameters

1. **Codes and Standards.** The Civil Works Design Requirements and specifications for all buildings and structures shall comply with the following codes and standards:

Codes:

- NSCP 2015: National Structural Code of the Philippines
- ACI 318-2005: American Concrete Institute
- PD1067- The Water Code of the Philippines
- National Plumbing Code of the Philippines
- PD856 - The Code on Sanitation of the Philippines
- RA9514 - Fire Code of the Philippines

Standards:

- American Society for Testing and Materials (ASTM)
- American Association of State Highway and Transportation Official (AASHTO) Policy on Geometric Design of Highways and Streets 2011
- Design Guidelines Criteria and Standards of the Department of Public Works and Highway
- DPWH Design Guidelines, Criteria and Standards, 2015, Volume 4
- DPWH Road Sign and Pavement Markings Manual, May 2012
- DPWH Road Safety Design Manual, May 2012

- AASHTO Roadside Design Guide
- Philippine Atmospheric, Geophysical and Astronomical Services Administration (PAGASA) for Rainfall Intensity Duration Frequency Data
- National Mapping and Resources Information Authority (NAMRIA)
- Department of Natural Resources and Environment
- Ordinances of Concerned City or Municipality

G. Sanitary / Building Plumbing Design Parameters

1. **Codes and Standards.** The Plumbing Design Requirements and specifications for all buildings and structures shall comply with the following codes and standards:

   Codes:
   - National Building Code of the Philippines
   - Fire Code of the Philippines
   - National Plumbing Code of the Philippines (NPCP)
   - Revised Plumbing Code of the Philippines
   - International Plumbing Code
   - PD 856 Code of Sanitation of the Philippines

   Standards:
   - National Water Resources Board (NWRB)
   - National Plumbers Association of the Philippines (NAMPAP)
   - Philippine Society of Sanitary Engineers, Inc. (PSSE)

2. **Building Facilities Sanitary / Plumbing System**

   a. **Waterline System.** Provide a complete water system sufficient for one (1) day storage. A potable and non-potable supply shall be provided for the development. Non potable water shall be used for flushing and irrigation. Complete with pipes and fittings and necessary accessories. The toilet areas, cleaners sink, and pantry sink at the minimum. Hot water supply will be provided for the cafeteria, kitchen, toilets and shower rooms.

   b. **Sanitary, Waste and Vent System.** All toilet areas, pantry, cleaners sink, etc. shall discharge to the centralized Sewage Treatment Plant. The treated effluent from the STP shall be re-used and supplied to the non-potable water tank. A centralized grease interceptor shall be provided for the cafeteria. Kitchen sinks shall have individual grease traps.

   c. **Storm and Drainage System.** A complete storm water drainage system will be provided for all roofs, setbacks, and area drains. The storm drainage system must be sized in consideration of the rainfall intensities, slope, and roof areas of the school buildings. Lifting stations will be provided if the development's pipe is lower than the utility tapping point. Storm water will be collected thru a central rainwater condensate tank (in accordance with PGBC requirement) this will be filtered and will be used for tertiary supply for the non-potable tank.

3. **Summary of Materials**

a. Cold Waterline pipes; for buildings, Polypropylene Pn16/Pn20 Fusion Weld Pipes including Trims and Fittings (BPS Certified)

b. Cold Waterline pipes

i. For main water riser inside building:
- ASTM A53
- ASTM A167
- ASTM A240
- ASTM A666

ii. For horizontal suspended piping and connection to each fixture inside building,
- ASTM F2389
- DIN 8074/ 8075
- DIN 1988 (Polypropylene Random Copolymer type 3 pipe)

c. All pipes, fittings, puddle flanges and ladder rungs installed inside the domestic water tank, rainwater tank, and fire tank shall be stainless steel.

i. For hot water supply, pipes shall be provided with insulation.

ii. Sanitary, waste and vent pipes

- For above ground soil and waste piping:
  - ASTM 888
  - CISPI 301
  - ASTM D 2665
  - ASTM D–2729
  - ASTM F891

- For buried soil and waste piping inside building:
  - ASTM A74, Service and Extra Heavy class

- For above ground vent piping inside building:
  - ASTM D 2665
  - ASTM D–2729
  - ASTM F891

- For underground soil, vent and waste piping inside building:
  - ASTM A74, Service and Extra Heavy class

iii. Storm and Drainage pipes

- For above ground storm drainage piping inside the building:
  - ASTM A53
  - ASTM 167
  - ASTM 240
  - ASTM 666

- For buried storm drainage piping inside the building:
  - ASTM A74, Service and Extra Heavy class

d. Plumbing Fixtures including Trims, Fittings and accessories: (BPS Certified)

e. Water Closet: Tank Button-Type flush

f. Lavatory: (Pedestal/Counter Type) /semi-pedestal with faucet.

g. Urinal: Wall hung Flush valve/lever/push button.

H. Electrical Design Parameters

1. **Codes and Standards.** The Electrical Design Requirements and specifications for all buildings and structures shall comply with the following codes and standards:

   Codes:
   i. Philippine Electrical Code
   j. National Electrical Code of the Philippines
   k. New Fire Code of the Philippines
   l. National Building Code and its New IRR
   m. Illuminating Engineering Society (IES) of North America

   Standards:
   - Underwriters Laboratory (UL)
   - National Fire Protection Association
   - International Electro-Mechanical Commission (IEC), including the Heavy-Duty Overhead Fans ("Big Ass Fan") for the design of environment air circulation of the Multi-Purpose Gym
   - Illumination Engineering Society (IES)
   - National Electrical Manufacturers Association (NEMA)

2. Site Works. Based on the proposed project plan, complete Electrical Layout shall be provided with the following:

   a. Lighting Layout
   b. Power Layout, Grounding and Lightning Protection Layout
   c. Single Line Diagram and Load Schedule
   d. Miscellaneous Details
   e. Main Electrical Room Layout
   f. Electrical Site Development Plan

3. Building Facilities Electrical System

   a. Medium Voltage Switchgear

      i. The medium voltage metal-clad switchgear shall be Indoor NEMA-2 and not less than US gauge 12.

ii. Each switchgear assembly shall have a minimum 25% spare capacity. Electronic surge protection shall be provided on the incoming supply line.

iii. Circuit Breakers should be Three-pole, single throw, electrically operated, draw-out mounting units using three

b. Transformer

i. Transformer shall be Oil-filled Transformer

ii. Transformer capacity shall be sufficient to serve the Electrical Load Demand of the proposed building.

iii. The primary side of the Transformer shall be compatible with the incoming electrical utility supply. While the secondary side of the transformer shall be 400V/230V, 3Φ, 4-Wire + Ground, 60Hz.

c. Main Distribution Panelboard

i. Nominal System Voltage shall be 400V/230V, 3Φ, 4-Wire + Ground, 60Hz.
ii. The Main Distribution Panelboard shall be connected via Automatic Transfer Switch to both the Transformer (Normal Power) and the Stand-by Generator Set (Emergency Power).

iii. The Main Distribution Panelboard shall utilize Air Circuit Breaker for 1000A and above Circuit Branches and Moulded Case Circuit Breaker for 800A and below.

d. Stand-by Generator Set

i. The proposed facility shall have 100% standby power and shall use stand-by rated diesel generator sets. The system should transfer automatically from stand-by mode.

ii. The stand-by generator sets shall be provided with fuel day tanks and bulk storage.

e. Lighting System

i. Lighting Luminaires shall be LED.

ii. Lighting Design shall generally follow the illumination level recommendations by the Illuminating Engineering Society (IES).

iii. Lighting Design shall follow the Philippine Green Building Code, specifically the recommended Lighting Power Densities indicated in the code. Occupancy Sensor and Daylight Sensor for selected areas shall be used to control lighting based on the density per area and exposure to natural lighting respectively.

iv. Emergency illumination shall be provided for a minimum of 90 minutes in the event of failure of normal lighting.

f. Wiring Devices

i. Switches shall be of 15A, 250V or 300V except as otherwise noted and approved. Terminals shall be screw-type or quick-connected type.

ii. Wiring devices must be of modern type and approved for both location and purpose. General use receptacle shall be 15A, 250V grounding type unless otherwise indicated on the drawings.

iii. Use of Ground Fault Circuit Interrupter receptacle outlet shall be based on the Philippine Electrical Code.

g. Panel boards and Circuit Breakers

i. The Panel board enclosure shall be NEMA 250, Type 1 for Indoor type and NEMA 250, Type 3R for Outdoor type.

ii. Circuit Breakers shall be moulded-case circuit breakers (MCCB). Provide MCCB of frame, trip rating and interrupting capacity as shown on the drawings. The circuit breakers shall be quick break and shall have common trip on all multiple breakers with internal trip mechanism.

iii. The phase, neutral and ground buses shall be of hard-drawn copper with 98 percent conductivity. The equipment ground bus shall be adequate for feeder and branch circuit equipment grounding conductors and shall be bonded to box.

h. Electrical Conduits, Boxes and Fittings

i. All conduits, boxes and fittings shall be standard rigid steel, zinc coated or galvanized

- Rigid Steel Conduits (RSC)
- Rigid Metal Conduits (RMC)
- Intermediate Metal Conduits (IMC)
- Electrical Metallic Tubing (EMT)
- Unplasticized Polyvinyl Chloride (uPVC) if required shall be schedule 40

i. Conductors

ii. Wires shall be properly designed in accordance with Article 3.10 and the grounding system shall conform to Article 2.50 of the PEC.

iii. The conductors used in the wiring system shall be of soft-annealed copper having a conductivity of not less than 98% of that of pure copper.

iv. Low Voltage Conductors shall be generally THHN-THWN unless otherwise specified.

v. All conduits of convenience outlets and wire ways for lighting branch circuit home runs shall be wired with a minimum of 3.5 mm square in size.

vi. Fire rated cable shall be rated for 3hours low acid, low corrosive gas emission and low or zero halogen (low smoke emission and non-toxic)

vii. Medium Voltage Conductor shall be copper, compact round stranding and uses crosslinked polyethylene as insulation (XLPE)

I. Electronics Design Parameters

1. **Codes and Standards.** The Electronics Supply System of all buildings and structures shall comply with the following codes and standards:

   Codes:
   - Philippine Electronics Code
   - International Life Safety Code (NFPA 101)
   - New Fire Code of the Philippines
   - National Electrical Code (NFPA 70)
   - National Building Code and its New IRR
   - Other laws that apply to the Project

   Standards:
   - Institute of Electrical and Electronics Engineers (IEEE)
   - Other standards that apply to the Project

2. Supply and installation of local area network (LAN) wiring and structured cabling and other accessories shall be suited for fiber optic connection based on the minimum requirements of this Project. All the facilities for the Project, such as the Multi-purpose building, Academic and Administration Buildings shall have ready- provision for voice and data system.

3. All wirings and accessories must be properly sized suited for the operation of this Project. The following Auxiliary Services shall be provided for this Project are: (1) Fire Detection and Alarm System, (2) Public Address System, (3) Security Management System (which includes a Card Access & door contacts), (4) Closed Circuit Television System (CCTV), (5) Structured Cabling System (SCS) and (6) Community Antenna System (CATV) including all wiring and wiring devices and other accessories necessary for its function and operation.

4. International standards may be used as reference where local standards do not provide adequate information for the Project's cabling system. These include the following, but not limited to:

   a. ISO 11801 – Specification of Structured Cabling for use within commercial premises.
   b. ANSI/TIA/EIA–606–A – Administration Standard for the Telecommunications Infrastructure of Commercial Buildings.

c. ANSI/TIA/EIA–568–B.2–1 – Commercial Building Telecommunications Cabling Standard.
d. ANSI/TIA-568-C.3 - Optical Fiber Cabling Components Standard.
e. ANSI/TIA-1179 – Healthcare Facility Telecommunications Cabling Standard.
f. ANSI-J-STD-607-A - Commercial Building Grounding (Earthing) and Bonding Requirements for Telecommunications.

5. Service Entrance (Roughing – ins)

    a. The main communication supply to the building shall be taken from the Telco and CATV utility company available in the area. The incoming supply shall be in underground concrete encasement.

    b. Unless specified/applicable, service entrance conduit shall be made of standard rigid steel, zinc coated, or galvanized. Intermediate Metallic Conduit (IMC) may be used. Underground runs shall be encased in concrete envelope or reinforced concrete envelope when crossing a roadway. Ends of conduits shall be provided with a sealing compound.

6. Fire Detection and Alarm System (FDAS)

    a. Every room and office shall be provided with smoke detector based on NFPA 72, Detector coverage.

    b. Every exit door and stairs shall be provided with Manual Pull Station and Fire alarm with speaker-strobe lights.

    c. Main Fire Alarm Control Panel (MFACP) for the building admin shall be located inside the Security room at Ground Floor Level.

    d. Type of system provided shall be fully addressable system.

7. Public Address System (PAS)

    a. Every room, facilities and other rooms shall be provided with ceiling mounted speakers based on NFPA 72, Evacuation System

    b. Every exit door and stairs shall be provided with wall-mounted speakers

    c. Main headend for PAS shall be located inside the Security room at Ground Floor Level.

    d. PAS shall be used only for evacuation system interfaced to FDAS.

8. Security Monitoring System

    a. Access control system– Shall provide the necessary devices including wiring, accessories and equipment.

b. Access Card – shall be provided on specific areas such as Security rooms, Admin room, IT room and other laboratory rooms.

c. Door contacts – shall be provided in all fire exit doors.

d. SMS Workstation/Monitor – Shall provide at least 32-inch television provision to be located at the Security Room at the ground floor

9. Closed Circuit Television System

a. CCTV system– Shall provide the necessary devices including wiring, accessories and equipment.

b. CCTV Main Server – Shall be provided inside the Server & Data Center room at the Academic Bldg.

c. Camera – Shall be provided and strategically located at all public areas such as entrance, exit, hallways, corridors, elevator, driveways, lobby, loading/unloading area.

d. CCTV Workstation/Monitor – Shall provide at least 32-inch television provision to be located at the Security Room at the ground floor

10. Community Antenna Televisions System

a. The provision of cabled digital television services network shall be undertaken by a cable service provider duly accredited by the National Telecommunications Commission (NTC), and shall be in accordance with the technical standards and existing regulations

b. Rooms to be provided with CATV shall be based on the minimum requirements indicated in the Terms of Reference.

11. Structured Cabling System (SCS)

a. The supply and set up of all materials shall provide support data and voice points for full cabling infrastructure. BCDA reserves the right to revise the number of data and voice points required during the actual implementation The DBS is required to propose a solution to implement cabling system with the Structure Cabling System which includes the following sub – systems:

- Work Area
- Horizontal
- Backbone
- Telecommunication Room / Equipment Room / Entrance Facilities Racking

b. The Structured Cabling System shall comply to the ANSI/EIA/TIA-568-B.2-1 Class E performance requirements, including 'Component Compliance' and 'Channel Compliance'. Independent channel test reports must be produced for the system that is

to be installed for both the channel and verification that the individual components are compliant.

c. The complete Structured Cabling System shall be suitable to support Analog and Digital Voice Applications, Data, Local Area Networks (LAN), Wide Area Networks (WAN), Video, and Low Voltage devices on common cabling platform. Fiber optic cable (FOC) shall be provided on Multi-sport, Academic and Administration buildings for main infrastructure going to Server and Data center room from Telco Service entrance utilities and a Cat 6 UTP shall be provided on every horizontal distribution for each building.

J. Mechanical Works Design Parameters

1. **Codes and Standards.** The Mechanical and Fire protection Design Requirements and specifications for all buildings and structures shall comply with the following codes and standards:

   Codes:
   - Philippine Society of Ventilating, Air Conditioning, and Refrigerating Engineers
   - American Society of Ventilating, Refrigerating and Air-Conditioning Engineers
   - New Fire Code of the Philippines
   - National Fire Protection Association
   - Philippine Mechanical Engineering Code

   Standards:
   - Philippine National Standards (PNS)
   - Underwriters Laboratory (UL) and Factory Mutual (FM)
   - International Electro technical Commission (IEC) 1988
   - National Fire Protection Association (NFPA)
   - American Society of Heating, Refrigeration and Air Conditioning Engineers (ASHRAE).

K. Ventilation and Air Conditioning System.

1. The Ventilation and Air Conditioning System shall be composed of complete plans and drawings of the following:

   a. General Notes, Legends and Symbols including Schematic Diagram of the Air Conditioning and Ventilation System.

   b. Floor layout of the Air Conditioning and Ventilation System indicating the unit designation and location of the air conditioners and fans.

   c. Duct layout indicating duct sizes, route and location of the dampers, diffusers, and return air register.

   d. Refrigerant piping layout and condensate drain routing.

   e. Equipment Schedule and Miscellaneous Details of Air Conditioners and Ventilating System.

f. Combination of DX-Split type, window type and VRF AC units shall be used whichever is applicable.

g. Ceiling cassette exhaust fans shall be provided in all executive toilets while in-line fan with ducted exhaust branches in all public toilets.

h. All offices, meeting/conference room, lecture hall, laboratories, media center and selected indoor sports facilities shall be provided with air-conditioning units using VRF system, DX-split type and Window type whichever is applicable.

i. Critical rooms with 24/7 operation such as data center, security/CCTV room, TELCO rooms, etc. shall have stand-by AC units.

j. Natural ventilation shall be primarily supplied by the operable windows and vents. Artificial ventilation inside each classroom shall be supplied by two (2) units of oscillating ceiling fans.

k. Janitorial closets and other spaces with hazardous chemicals shall have dedicated exhaust air duct and discharged directly to outside.

l. Mechanical ventilation shall be provided in selected indoor sports facilities.

m. Mechanical ventilation is required to all electrical and pump rooms to maintain acceptable room temperature.

n. Outdoor air for ventilation shall be provided in accordance with ASHRAE 62.1-2010 ventilation for acceptable indoor air quality. Consider fresh air pre-cooler to partially treat outdoor air before supplying to occupiable spaces.

o. Refrigerant to be used should be R–134a or as recommended by the local green building ordinance.

p. Cooling load requirements for regularly occupied spaces in the building shall be in accordance with ASHRAE 55–2016: Thermal Environmental Conditions for Human Occupancy.

q. Consider all life safety provisions such as stairwell & lift shaft pressurization as required by code.

r. Cooling load calculations shall be provided using e20 Hourly Analysis Program or equivalent.

2. Genset Fuel System

Main fuel storage tank shall be sized at 24 hours storage capacity suitable for buried installation using fabricated steel tank complete with fill line and vent pipe including cathodic protection while day tank at 8 hours storage capacity constructed in steel. Fuel leak detection system shall be provided.

L. Utility Services and Distribution.

The entirety of New Clark City will be serviced with water supply, sewage, electricity, ICT, drainage, and solid waste management systems. For Phase 1, the various utility service companies (power, water, wastewater treatment, solid waste disposal, ICT) will be responsible for distributing utilities to each parcel and building at the designated tapping points.

The DBC shall design and construct the underground utilities corridor and be integrated in the site development area following the Terms of Reference and MPSP (this document) and the relevant guidelines and updated requirements for New Clark City. The DBC is responsible in connecting to the tapping points provided by the utility providers on the project site premises, consistent with the NCC CMDP.

M. Stormwater Management

a. Each building parcel should be designed and developed such to retain or absorb 80% of rainfall on-site. This can be accomplished through a combination of green infrastructure (bioswales), absorptive surfaces (permeable paving and water-retaining landscapes), and retainage basins or tanks.

b. Best management practices will be provided on all parcels for treatment and management of excess stormwater prior to leaving parcels. The DBC will be responsible for collection of district-wide stormwater discharge from the Phase 1A area to discharge points along the nearest natural waterway.

N. Sustainability Requirements. As far as practicable, the design of the facilities should endeavor to follow general principles for Green Building, such as:

a. Design “Smart buildings” that strive for optimum energy management and storage systems

b. District cooling system to minimize use of refrigerants

c. Maximized use of natural light and ventilation

d. Use of shading devices and plant strips to minimize solar heat gain

e. Rainwater harvesting system for irrigation and industrial use

f. Use of solar panels to supplement electric supply in the daytime

g. Utilize energy saving lightning fixtures to reduce electric consumption

h. Specify water efficient fixtures and fittings to reduce water consumption

i. Use of buffer zones to block solar heat entering the office and other high-traffic spaces

j. Maximize green areas to soften the grounds surface and reduce heat absorption

k. Optimize the use of locally sourced materials that are low maintenance and environmentally friendly.

O. Disaster Resiliency

The design of the facilities with the NAS Phase 1 needs to have a level of resilience to ensure the on-going operations of the NAS, particularly in post-disaster situations. Key aspects of this include:

a. Base isolation, ground improvements and seismic engineering design commensurate with a building capable to withstand magnitude 8.0 earthquakes;

b. A 500 mm raised building platform for flood resilience and constructed away from the required easement areas from the river in accordance with the NCC MDP and NCC DSG;

c. On-site generator and UPS facilities for security of power supply following a disaster; and

d. Disaster-resilience requirements specified in the NCC CMDP and NCC DSG.

P. GAD (Gender and Development) Requirement

All infrastructure projects involve the construction of facilities, including schools, hospitals, dams, irrigation structures, and transportation systems shall adhere to the GAD Guidelines of the DOTR Department Order No. 2012-09.

In the design and construction of this Project, the DBC must take into consideration a number of gender issues, including the following:

a. Different groups of users may have divergent requirements based on the seasonality and location of their activities. Projects that are designed without considering the variations may have a great impact on women's workload and access to resources.

b. Women are rarely considered for employment in construction sites, although there are areas in which women have traditionally been involved in groundbreaking tasks. Most projects do not view women as potential workers. Where women workers need to move close to the worksite, they require secure and safe areas in construction camps.

c. Gender gaps are often found in women's and men's participation in users' groups that are organized to operate and maintain facilities (health centers, domestic water systems, and irrigation systems)

Section 3. CONSTRUCTION STANDARDS

A. Construction of the Project shall be implemented according to the DAED prepared by the DBC, as reviewed and approved by the CMS.

B. The Construction of the Project shall also comply with the MPSP for the Construction herein prescribed. The MPSP for Construction includes conformance to the provisions of the New Clark City Design Standards and Guidelines, and building under the DPWH Blue Book, Volume III.

C. For materials and technologies not covered by the Blue Book and Philippine Design Standards and Codes, or if the DBC intends to use any new material/ technology, the structural properties of the non-conventional materials to be used should be certified by accredited DPWH BRS laboratories and these properties should be used as inputs to structural analysis and designs to prove compliance to the MPSP subject to the approval of BCDA.

The Blue Book prescribes, among other things, the material requirements and construction requirements for different items of work, including the tests to be conducted during Construction by the DBC. The Blue Book incorporates provisions of the ASTM and ACI, among others, pertaining to construction. Attention shall be given to the relevant items of work in the following Parts of the Blue Book:

1. Part A – Facilities for the Engineer

a. Construction of Field Office Building for the Engineer

The DBC shall construct and maintain until final completion of the project a Field Office Building for the Engineer and his staff having a floor area of not less than 180 sqm. The office shall be fully air-conditioned, fully painted, made of concrete plaster finished walls and partitions, G.I. roofing, glass windows and hard wooden doors, plyboard ceilings, tiled floors, tiled toilet and bath with complete sanitary fixture and sewage connections to a septic tank and with complete electrical installation. All windows and door openings of the building shall be wire screened for insect protection.

b. Provision of Living Quarters for the Engineer (Rental Basis)

The DBC shall provide, operate and maintain Living Quarters for the Engineer and his staff on rental basis for at least seven (7) personnel and all utilities therein in good condition throughout the whole period, including all necessary electricity and lighting, water, drainage, sanitary facilities, internet and telephone services.

c. Provision of Furniture/Fixtures, Equipment and Appliances for the Field Office for the Engineer

The office shall be supplied with complete office supplies, furniture, fixture, appliances, equipment, internet service, electricity and lighting, potable water, drainage and sanitary facilities, consumables and other items. These shall be brand new when initially furnished

d. Provision of Furniture/Fixtures, Equipment and Appliances for the Living Quarters for the Engineer

The DBC shall furnish as soon as the Engineer starts his mobilization on site, sufficient furniture, fixtures, equipment, appliances, internet service and

necessary supplies for use in the Living Quarters, with the Engineer's prior approval. All furniture, fixtures, appliances and equipment, consumables and other items shall be brand new when initially furnished.

e. Operation and Maintenance of Field Office for the Engineer

The DBC is required to maintain and protect the Engineer's field office, living quarters and all utilities therein in good condition throughout the whole period for which the facility is required and to repair and/or replace broken items that become defective in any way.

f. Operation and Maintenance of Living Quarters for the Engineer

The DBC is required to maintain and protect the Engineer's field office, living quarters and all utilities therein in good condition throughout the whole period for which the facility is required and to repair and/or replace broken items that become defective in any way.

g. Provision of 4x4 Pick-Up Type Double Cab Service Vehicle for the Engineer (Bare Rental Basis)

- Within fifteen (15) days after the Commencement Date, the DBC shall provide and deliver to the Site, the following brand-new vehicles on rental basis for the exclusive use of the Engineer and his staff:

- 5 units 4WD Pick-Up Type, Double Crew Cab, Service Vehicle, 2000cc or higher, Diesel Engine with factory installed air-conditioner

- The DBC shall submit catalogues in the English language of the proposed rented vehicles to the Engineer for his approval within seven (7) days after the Commencement Date, and the final consent for the delivery of the rented vehicles on site shall be to the satisfaction of the Engineer.

h. Operation and Maintenance of 4x4 Pick-up Type Double Cab Service Vehicle for the Engineer

The DBC shall be solely responsible for all activities and costs related to the operation and maintenance of the vehicles including fuel, oil, drivers' wages including overtime payment, scheduled preventive maintenance services (PMS), its registration, provision of passes, access stickers and the like, and for providing fully comprehensive insurance until and including the date of issue of the Certificate of Completion.

i. Provision of Field Office Staff for the Assistance to the Engineer

The DBC shall provide 1 Secretary, 1 Clerk/Encoder (IT Expert), 1 Utilityman, and 1 Security Guard who shall be under the direction of the Engineer for the entire project duration.

j. Provision of Progress Photographs

The DBC shall provide a photographic record of the construction activities. Such photographs shall be taken before, during and after construction on the same angle of reference of sufficient number and as directed by the Engineer

k. Provision of Communication Facility for the Engineer

Within fifteen (15) days from the commencement of the Works, the DBC shall provide and maintain 7 cellular phones with at least 8GB RAM for the exclusive use of the Engineer and his staff.

l. Operation and Maintenance of Communication Facility for the Engineer

The 7 cellular phones with at least 8GB RAM shall be of good quality, brand new, ready for use, complete with accessories including provision for pre-paid cards worth one thousand pesos (P1,000) per unit. In order to have continuous operation and efficient maintenance of the equipment, the DBC shall also provide servicing and minor repairs, if needed.

2. Part B – Other General Requirements

- Refer to the DPWH Standard Specification.

2. Part C – Earthworks

- Refer to the DPWH Standard Specification.

3. Part D – Subbase and Base Course

- Refer to the DPWH Standard Specification

4. Part E – Surface Course

- Refer to the DPWH Standard Specification

5. Part F – Structural

- Refer to the DPWH Standard Specification
- Refer to the Structural Works Design Parameters

6. Part G – Mechanical

- Refer to the DPWH Standard Specification
- Refer to the Mechanical Works Design Parameters

7. Part H – Electrical

- Refer to the DPWH Standard Specification
- Refer to the Electrical Works Design Parameters and Shin Clark Power Design Standards and Specifications

8. Part I – Sanitary/Plumbing Works

    - Refer to the DPWH Standard Specification.
    - Refer to the Sanitary/Plumbing Works Design Parameters and Prime water Design Standards and Specifications

9. Part J – Miscellaneous

    - Refer to the DPWH Standard Specification.

10. Part K – Water and Sewer System

    - Refer to the DPWH Standard Specification and Prime Water Standard Specifications.

    - The Winning Bidder/DBC shall provide pipelines and materials to cater the Facilities of the project. It shall also provide the necessary tapping points for future developments. These systems shall be connected to the nearest Prime Water system.

11. Part L – Street Lights and Path walk Lights

    - Refer to the DPWH Standard Specification, Philippine Electrical Code and Shin Clark Power Design Standards and Specifications

12. Part M – Power Distribution Line;

    - Refer to the DPWH Standard Specification and Shin Clark Power Design Standards and Specifications.

13. Part N – Communication Line;

    - Refer to the DPWH Standard Specification and Philippine Electrical Code.

14. Part O – Softscape and Landscape;

    - Refer to the DPWH Standard Specification.

15. Part P – Demolition / removal of existing Utilities

    - Refer to the DPWH Standard Specification (if applicable).

16. Include additional Item/s when necessary

Section 4. CONSTRUCTION SAFETY AND HEALTH PROGRAM

Pursuant to the provisions of the Revised Implementing Rules and Regulations of RA 9184 and in accordance with the provisions of Section 5 of Department Order No. 13, series of 1998, of the Department of Labor and Employment (DOLE), the DBC shall submit to BCDA and DOLE the

Construction Safety and Health Program stating among others, and the IATF, DPWH protocols against COVID-19 as updated from time to time:

A. Construction Safety and Health Committee: The DBC to create the composition of the Construction Safety and Health Committee.

B. Specific Safety Policies: The DBC is responsible to undertake, observe and maintain in its construction site, including the frequency of and persons responsible for conducting toolbox, safety orientations and gang meetings.

C. Penalties and Sanctions: In violation of the approved Construction Safety and Health Program, DBC will be penalized pursuant to the laws under DOLE-Bureau of Working Conditions.

D. Information and Training: The DBC to submit the frequency, content and persons responsible for orienting, instructing, and training all workers at the site with regard to the Construction Safety and Health Program under which they operate.

E. Waste Disposal: The DBC is responsible for disposing waste arising from the construction and temporary facilities, and to be disposed to the accredited Sanitary Landfill.

F. Safety Provisions: PPE, Safety Personnel and Facilities, Workers' Welfare Facilities and Construction Safety Signage.

G. Safety on Construction Heavy Equipment: It must be ensured that appropriate certification is obtained, and conditions are met or complied with as stated in Section 10 of the Guidelines Governing Occupational Safety and Health in the Construction Industry, DOLE, D.O. No. 13, series of 1998.

H. The Construction Safety and Health Program shall be executed and verified by the DBC's Project Manager and shall be submitted to the Bureau of Working Conditions of the DOLE which may approve, disapprove or modify the same according to the existing laws, rules and regulations and other issuances of the DOLE.

I. The Construction Safety and Health Program shall be approved by the DOLE or the Department of Health and shall be implemented for the said contract.

Section 5. ENVIRONMENTAL MONITORING & MANAGEMENT PROCESS DURING CONSTRUCTION

Guidelines must be prepared for environmental monitoring and management such that the conditions on all environmental aspects to be taken care of by the DBC are carried out, that is to avoid, minimize, and mitigate any adverse environmental impacts during the construction stage. Main items for the environmental and management process are shown below.

Table 7. Environmental Monitoring

TYPE OF CONCEIVABLE IMPACT	ENVIRONMENTAL ITEMS TO BE MONITORED AND MANAGED
Increase of dust pollution	Air quality
Emission from construction machinery	Air quality
Noise and vibration from construction machinery	Noise and vibration level
Disposal of construction waste	Disposal method of the waste
Disposal of hazardous waste	Disposal and treatment method of the waste
Discharge of wastewater	Discharge method and water quality of the wastewater
Increase of land erosion	Land erosion
Damage on existing road by heavy equipment mobility and material transportation	Physical condition on road
Interference of traffic	Traffic management
Increase of population inflow with workforce mobilization	Public health and safety
Work accident	Safety

Section 6. TEST REQUIREMENTS

1. The DBC shall undertake tests during Construction in accordance with the schedule of minimum testing requirements for items of work and materials covered by the Blue Book.

2. If any new Construction materials proposed by the DBC are not covered by the Blue Book, these materials shall first pass the evaluation and accreditation system of the DPWH BRS, certified by the CMS, and approved by the BCDA, before the new materials are used in the Project.

3. If the Bidding Proponent is able to submit as part of its Technical Proposal a certification from the institutions listed in Schedule 2 of the Instructions to Bidders (ITB) (Schedule 1 of the Design-Build Arrangement) in lieu of a DPWH BRS certification, there is no need to submit a DPWH BRS certification as a Post-Award Requirement.

4. The DBC is required to provide certified on-site testing for concrete mixes at every Project Component site i.e., slump test, particularly for site-mixed or hand-mixed concrete. Other duly certified off-site tests such as rebar strength may be on a province-wide basis.

Section 7. COMPLETION OF CONSTRUCTION

The DBC shall fully comply with the following requirements for the completion of Construction:

1. All Tests for Construction comply with the pertinent provisions of the Blue Book and other test requirements of the MPSP for Construction.

2. All parts of the Project Component have been completed in accordance with the DAED, as certified by the CMS, and with the MPSP for Construction, including the rectification of all defects.

3. The completed Project Component can be safely and reliably placed into normal use and occupancy by the school authorities and students.

4. The DBC must deliver all the Project Components to the BCDA no later than the Construction Completion Deadline (CCD). As evidence of delivery, the DBC shall send the BCDA a Construction Completion Notice (CCN) for the Project Component when the DBC has finished Construction on such Project Component. For Project Components for which the DBC has sent the BCDA a CCN by the CCD, the CMS and a representative from the BCDA shall jointly conduct and finish the Punchlist Inspection (PI) of the Project Component and monitor recording of the results within fifteen (15) days from the receipt of the CCN. For Project Components which are not Excluded Project Components as defined in the BT Agreement, and for which the DBC sends the BCDA a CCN after the CCD, the IC and a representative from the BCDA shall jointly conduct and finish the PI of the Project Component and monitor recording of the results, within twenty-five (25) days from the receipt of the CCN.

5. The CMS shall notify the DBC and the BCDA at least three (3) days before the conduct of the PI of the Project Component. The DBC shall have the right to be present during the conduct of the PI; provided that the PI shall continue even if the DBC fails to be present on the date of the PI, as set by the CMS in the notice provided.

6. If the CMS and the representative from the BCDA determine after the PI that no items need to be rectified, the BCDA shall accept the Project Component and issue the Certificate of Completion (CoC) no later than the last day of the month following the month when the Project Component successfully passed the PI. If the CMS and the representative from the DepEd determine after the PI that there are items that need to be rectified, the CMS shall generate and send to the DBC, on the day following the end of the PI, a punch list of the items that need to be rectified in the Project Component before the Project Component will be acceptable to the BCDA.

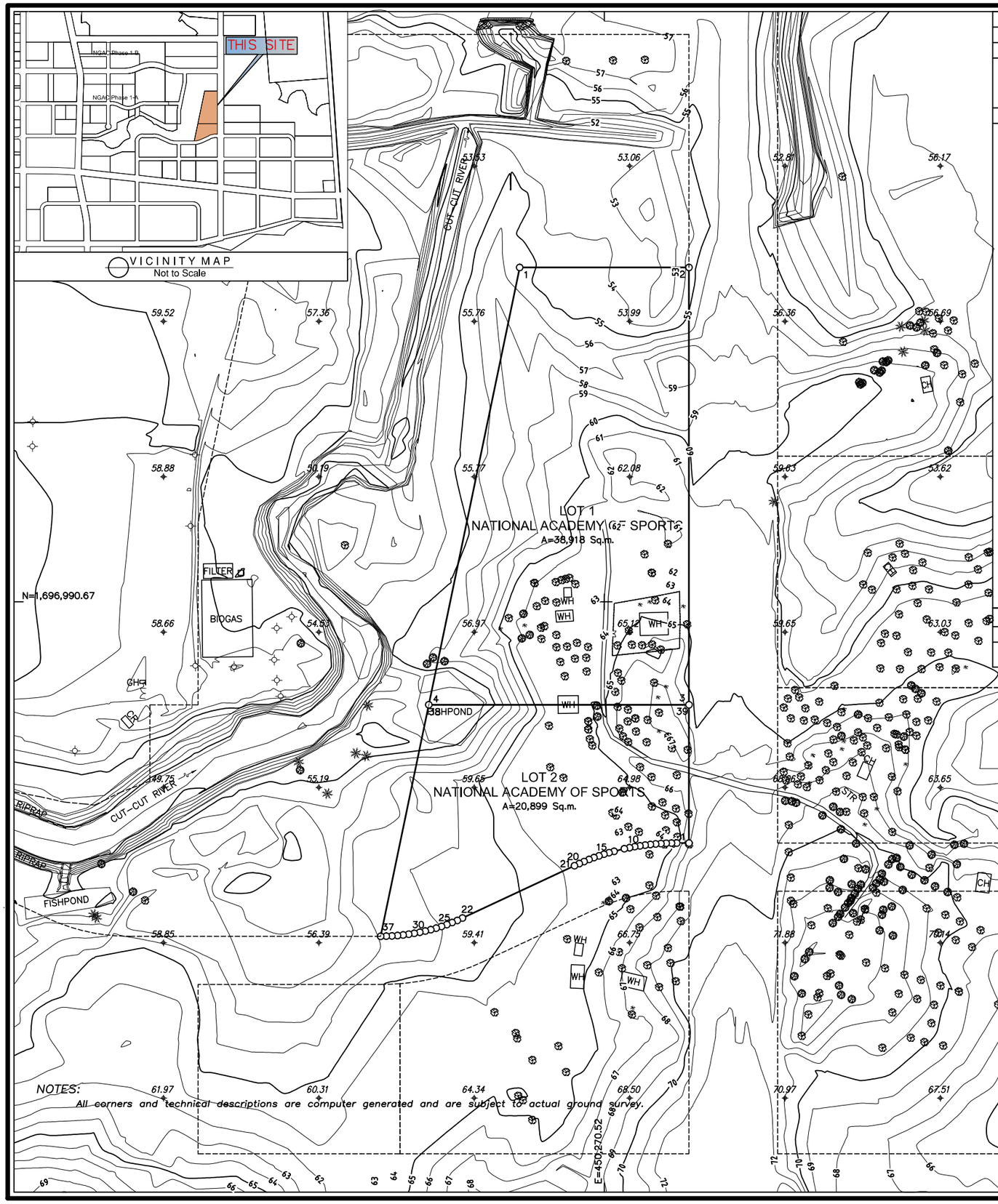
7. Upon completion of its rectification works the DBC shall notify the CMS and the BCDA by sending a Rectification Completion Notice (RCN) in writing, stating that a Rectification Inspection (RI) may be conducted. The CMS and a representative from the BCDA shall jointly conduct and finish the RI of the Project Component within fifteen (15) days from receipt of the RCN. If the CMS and the BCDA have determined that all the items stated in the punchlist have been rectified, the BCDA shall accept the Project Component and issue the CoC for such Project Component no later than the last day of the month following the month when the Project Component successfully passed the RI. If there are still defects discovered after the first RI, the process shall be repeated until all the items in the punchlist have been rectified by the DBC as determined by the CMS and the representative from the BCDA; provided, that rectification must be completed, and RCN must be sent to the BCDA, no later than the Final Rectification Deadline (FRD). The FRD with respect to a Project Component is the date which is sixty (60) days from the relevant Construction Completion Deadline (CCD).

8. The DBC must submit (1) the As-Built Drawings, (2) an Asset Register to include a description of all assets constructed, and (3) the Construction Completion Report for each Project Component under the Contract Package, to the BCDA not later than two (2) months after the issuance of the Certificate of Completion for the Project Component.

Section III.

Preliminary Survey and Maps

LMB Form No. GSD.C-1



TECHNICAL DESCRIPTIONS			
LINES		BEARINGS	DISTANCES
LOT 1, A=38,918 Sq.m.			
1	2	DUE EAST	109.00 m.
2	3	DUE SOUTH	281.50 m.
3	4	DUE WEST	167.50 m.
4	1	N 11°44' E	287.52 m.
LOT 2, A=20,899 Sq.m.			
1	2	DUE WEST	7.88 m.
2	3	S 89°22' W	3.40 m.
3	4	S 88°07' W	3.40 m.
4	5	S 86°52' W	3.40 m.
5	6	S 85°37' W	3.40 m.
6	7	S 84°22' W	3.40 m.
7	8	S 83°07' W	3.40 m.
8	9	S 81°52' W	3.40 m.
9	10	S 80°36' W	3.40 m.
10	11	S 79°21' W	3.40 m.
11	12	S 78°06' W	3.40 m.
12	13	S 76°13' W	6.80 m.
13	14	S 74°21' W	3.40 m.
14	15	S 73°06' W	3.40 m.
15	16	S 71°51' W	3.40 m.
16	17	S 70°35' W	3.40 m.
17	18	S 69°20' W	3.40 m.
18	19	S 68°05' W	3.40 m.
19	20	S 66°50' W	3.40 m.
20	21	S 65°35' W	3.40 m.
21	22	S 64°57' W	79.58 m.
22	23	S 65°47' W	3.63 m.
23	24	S 67°27' W	3.63 m.
24	25	S 69°08' W	3.63 m.
25	26	S 70°48' W	3.63 m.
26	27	S 72°28' W	3.63 m.
27	28	S 74°08' W	3.63 m.
28	29	S 75°48' W	3.63 m.
29	30	S 77°28' W	3.63 m.
30	31	S 79°08' W	3.63 m.
31	32	S 80°48' W	3.63 m.
32	33	S 82°28' W	3.63 m.
33	34	S 84°08' W	3.63 m.
34	35	S 85°49' W	3.63 m.
35	36	S 87°29' W	3.63 m.
36	37	S 89°09' W	3.63 m.
37	38	N 11°44' E	152.20 m.
38	39	DUE EAST	167.50 m.
39	1	DUE SOUTH	89.00 m.

TIE LINES from TRC-45 to corner "1"		
LOTS	BEARINGS	DISTANCES
LOT 1	S 52°31' E	3215.55 m.
LOT 2	S 48°49' E	3534.87 m.

N

S

SURVEY PLAN

OF PROPOSED
NATIONAL ACADEMY OF SPORTS
AS SURVEYED FOR
Republic of the Philippines
Bases Conversion and Development Authority
SITUATED IN THE

RURBAN CODE :
BARANGAY OF : ARANGUREN
MUN./CITY OF : CAPAS
PROVINCE OF : TARLAC
ISLAND OF : LUZON
CONTAINING AN AREA OF 59,817 SQ. M.

ZONE NO.
PPCS-PTM/PRS 92
BEARING : TRUE
SCALE 1: 2000

0 10 20 30 50 100 200

CERTIFICATION

We hereby certify that this is a correct proposed plan of National Academy of Sports with containing area of Fifty Nine Thousand Eight Hundred Seventeen Square Meters (59,817 Sq.m.) parcel of land being a portion of Lot 1-A, Nr-03-000021-D Amd.

I further certify that the technical descriptions of the boundary lines appearing on this plan are computer generated and subject to actual joint survey.

JAN. 13, 2021
Date Prepared

REGIE M. CEPE
CARTOGRAPHER / CAD
LAND AND ASSETS DEVELOPMENT DEPARTMENT
BASES CONVERSION AND DEVELOPMENT AUTHORITY

Checked by:

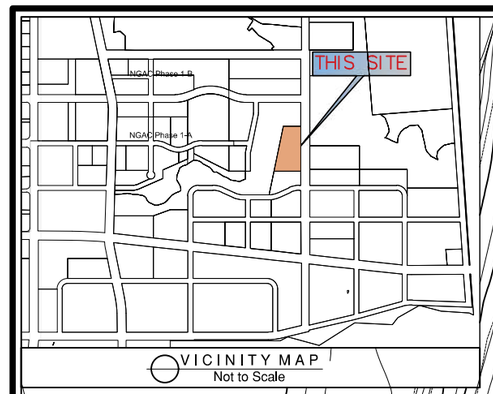
SHERA MARIE E. SERAD
GEODETIC ENGINEER
LAND AND ASSETS DEVELOPMENT DEPARTMENT
BASES CONVERSION AND DEVELOPMENT AUTHORITY

Noted by:

VICTOR JOY D. LAGRIA
GEODETIC ENGINEER/LMO IV
LAND AND ASSETS DEVELOPMENT DEPARTMENT
BASES CONVERSION AND DEVELOPMENT AUTHORITY

STSP# 2021-R-0003

LMB Form No. GSD.C-1



VICINITY MAP
Not to Scale

TECHNICAL DESCRIPTIONS		
LINES	BEARINGS	DISTANCES
LOT 1, A=38,918 Sq.m.		
1 2	DUE EAST	109.00 m.
2 3	DUE SOUTH	281.50 m.
3 4	DUE WEST	167.50 m.
4 1	N 11°44' E	287.52 m.
TIE LINES from TRC-45 to corner "1"		
LOTS	BEARINGS	DISTANCES
LOT 1	S 52°31' E	3215.55 m.

LOT 1
NATIONAL ACADEMY OF SPORTS
A=38,918 Sq.m.

LOT 2

FISHPOND

WH

N=1,697,065.18

E=466,241.27

N

S

SURVEY PLAN

OF PROPOSED NATIONAL ACADEMY OF SPORTS
(LOT 1)

AS SURVEYED FOR

Republic of the Philippines
Bases Conversion and Development Authority

SITUATED IN THE

RURBAN CODE :
BARANGAY OF : ARANGUREN
MUN./CITY OF : CAPAS
PROVINCE OF : TARLAC
ISLAND OF : LUZON
CONTAINING AN AREA OF 38,918 SQ. M.

ZONE NO.
PPCS-PTM/PRS 92
BEARING : TRUE
SCALE 1: 1000

0 10 20 30 40 50 100

CERTIFICATION

We hereby certify that this is a correct proposed plan of National Academy of Sports with containing area of Thirty Eight Thousand Nine Hundred Eighteen Square Meters (38,918 Sq.m.) parcel of land being a portion of Lot 1-A, Nr-03-000021-D Amd.

I further certify that the technical descriptions of the boundary lines appearing on this plan are computer generated and subject to actual joint survey.

JAN. 13, 2021
Date Prepared

REGIE M. CEPE
CARTOGRAPHER / CAD
LAND AND ASSETS DEVELOPMENT DEPARTMENT
BASES CONVERSION AND DEVELOPMENT AUTHORITY

Checked by:
SHERA MARIE E. SERAD
GEODETIC ENGINEER
LAND AND ASSETS DEVELOPMENT DEPARTMENT
BASES CONVERSION AND DEVELOPMENT AUTHORITY

Noted by:
VICTOR JOY D. LAGRIA
GEODETIC ENGINEER/LMO IV
LAND AND ASSETS DEVELOPMENT DEPARTMENT
BASES CONVERSION AND DEVELOPMENT AUTHORITY

STSP# 2021-R-0003

Department of Budget and Management
Department of Public Works and Highways

Joint Circular No. 1
October 20, **2016**

TO : ALL HEADS OF DEPARTMENTS, AGENCIES, BUREAUS, OFFICES, COMMISSIONS, STATE UNIVERSITIES AND COLLEGES, OTHER INSTRUMENTALITIES OF THE NATIONAL GOVERNMENT AND ALL OTHERS CONCERNED

SUBJECT : GUIDELINES ON THE REHABILITATION OR CONSTRUCTION OF GOVERNMENT BUILDINGS/OFFICE SPACE AND THE ACQUISITION OR OUTRIGHT PURCHASE OF LOT AND BUILDING

1.0 Purpose

Consistent with the government's thrust to utilize public resources in the most effective, efficient, economical and ethical way, the rehabilitation, construction and acquisition of government buildings to be used as permanent offices by National Government Agencies (NGAs), Government-Owned and/or -Controlled Corporations (GOCCs) and Government Financial Institutions (GFIs) shall be rationalized to ensure that spaces therein are distributed or allocated in the most economical, functional and practical manner to attain the occupants' maximum work efficiency.

Specifically, this Department of Budget and Management (DBM)–Department of Public Works and Highways (DPWH) Joint Circular is being issued to:

1.1 Provide guidelines on the following activities:

- 1.1.1 Acquisition/outright purchase of lot;
- 1.1.2 Acquisition/outright purchase of building;
- 1.1.3 Acquisition/outright purchase of lot and building;
- 1.1.4 Rehabilitation of an existing government building;
- 1.1.5 Construction of a new building;

1.2 Establish the standard allocation of space within office buildings; and

1.3 Prescribe the various schemes to be adopted in financing the aforementioned activities.

2.0 Definition of Terms

2.1 ***Build-and-Transfer (BT)***[1] – A contractual arrangement whereby the project proponent undertakes the financing and construction of a given infrastructure or development facility and, after its completion, turns it over to the government entity concerned, the latter of which shall pay the proponent on an agreed schedule its total investments expended on the project, plus a reasonable rate of return thereon. This arrangement may be employed in the construction of any infrastructure or development project, including critical facilities which, for security or strategic reasons, must be operated directly by the Government.

2.2 ***Build-Lease-and-Transfer (BLT)***[1] – A contractual arrangement whereby a project proponent is authorized to finance and construct an infrastructure or development facility and upon its completion turns it over to the government agency or local government unit concerned on a lease arrangement for a fixed period after which ownership of the facility is automatically transferred to the government agency or local government unit concerned.

2.3 ***Build-Operate-and-Transfer (BOT)***[1] – A contractual arrangement whereby the project proponent undertakes the construction, including financing, of a given infrastructure facility, and the operation and maintenance thereof. The project proponent operates the facility over a fixed term during which it is allowed to charge facility users appropriate tolls, fees, rentals, and charges not exceeding those proposed in its bid, or as negotiated and incorporated in the contract, to enable the project proponent to recover its investment and operating and maintenance expenses in the project. The project proponent transfers the facility to the government entity concerned at the end of the fixed term which shall not exceed fifty (50) years.

2.4 ***Multi-Year Obligational Authority (MYOA)*** – A document issued by the DBM either for locally-funded projects or foreign-assisted projects implemented by agencies in order to authorize the latter to enter into multi-year contracts for the full project cost, which contain an annual breakdown of the full project cost, and requires agencies to include in their budget proposal for the ensuing years the amount programmed for said year(s).

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[1] Definition culled from ***Republic Act (RA) No. 7718*** *(An Act Amending Certain Sections of RA No. 6957 Entitled, "An Act Authorizing the Financing, Construction, Operation and Maintenance of Infrastructure Projects by the Private Sector, and for Other Purposes)* dated May 4, 1998

3.0 General Policy Guidelines

3.1 To rationalize the allocation of funds for the rehabilitation, construction or acquisition of government offices, the NGAs, GOCCs and GFIs concerned which fall under the following circumstances shall be prioritized in the provision of funds for the purpose:

3.1.1 Those which are renting office space or building;
3.1.2 Those which own office space or building having structural defect;
3.1.3 Those forced to vacate their current office location;
3.1.4 Those which do not have adequate space to accommodate their existing personnel, while either renting or owning the building;
3.1.5 Those providing frontline services; or
3.1.6 Those which experience or encounter other situations or factors which necessitate the rehabilitation of the existing office space/building, the construction of a new one, or the acquisition of office space/building.

3.2 Agencies which intend to pursue the rehabilitation, construction, acquisition, or outright purchase of office building/space shall have the following options:

3.2.1 ***Agencies with existing lot and building:***

- Rehabilitation of its existing building only; or
- Complete demolition of the existing building and construction of a new building in its stead, provided said option is highly recommended by the DPWH considering factors such as degree of structural defect, building standards, and higher cost of rehabilitation, among others.

3.2.2 ***Agencies which already have a lot but without a building:***

- Construction of a new building.

3.2.3 ***Agencies without lot or building:***

- Acquisition of a lot with existing building;
- Acquisition of a lot without a building and the construction therein of a building; or
- Acquisition of office space in an existing building that is owned by another government agency or a private entity.

3.3 The rehabilitation or construction of government buildings/office space and the acquisition or outright purchase of lot, building, or lot and building/office space could be financed either through the following modes:

3.3.1 ***Public-Private Partnership or Private Financing***[2], either through a BT, BLT, or BOT arrangement; or

[2] Per RA 7718

3.3.2 ***Provision of funding support from the national government*** wherein the approved amount would be included by the DBM in the National Expenditure Program (NEP).

3.4 In summary, the following financing schemes shall govern the rehabilitation, construction, acquisition, or outright purchase of office building/space depending on the existence of the lot and building and the extent of the activity that would be undertaken by the Agency:

Particulars	Options	Possible Financing Schemes
a) Agencies with existing lot and building	a.1) Rehabilitation of the existing office building or space	❖ NEP funding
	a.2) Demolition of the old building and construction of a new building on the same lot, as applicable	❖ BT ❖ BLT ❖ BOT ❖ NEP funding
b) Agencies with lot but without building	b.1) Construction of a new building	❖ BT ❖ BLT ❖ BOT ❖ NEP funding
c) Agencies without lot or building	c.1) Acquisition of lot with existing building	❖ NEP funding
	c.2) Acquisition of lot and construction of new building	❖ BT ❖ BLT ❖ BOT ❖ NEP funding
	c.3) Acquisition of office space	❖ NEP funding

4.0 Specific Procedures in Undertaking the Activity

4.1 The NGAs and GOCCs/GFIs concerned shall first submit the proposed design of the agency's office building/space and the corresponding cost estimate to the DPWH's ***Office of the Undersecretary for Technical Services*** for review and recommendation.

This is necessary to ensure that the proposal would be in accordance with the ***revised space allocation standards*** for the rehabilitation, construction and acquisition of office building/space, attached as an **Annex** hereto, as well as the ***National Building Code of the Philippines***[3] and its referral codes, the ***Accessibility Law***[4], and other related rules and standards.

The appropriate space allocation in the building of an agency shall also be based on its number of authorized positions, nature of services provided (e.g., frontline or research and development), as well as the magnitude of clientele, if applicable.

Agencies which deliver frontline services (e.g., issuance of passport and birth certificate) are likewise required to include in their proposed design a covered path or walkway for the transacting public within the office premises, if feasible.

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[3] Presidential Decree No. 1096 dated February 19, 1977

[4] Batas Pambansa Blg. 344 dated February 25, 1983

In the case of ***intermediate-level agencies*** which are ***lower than a Department but higher than a Bureau***, the facilities that could be allowed would depend on the level of the Head and the principal subdivisions therein.

4.2 After the DPWH has ensured the consistency of the proposed design with pertinent standards and guidelines and has given its endorsement or recommendation on the matter, the NGAs and GOCCs/GFIs concerned may already request from the DBM the funding for the specific activity to be pursued (e.g., rehabilitation of an existing building, construction of a new building, acquisition of lot with building, and acquisition of a lot and construction of building).

In the case of the NGAs, they may also request the DBM for the issuance of a ***MYOA*** for the purpose, as necessary.

For GOCCs/GFIs concerned, they are required to submit to the DBM a Board Resolution or any similar document certifying that the financing of the project concerned has been included in its current budget proposal and will form part of the succeeding years' budget, as necessary.

In addition, funds for the same should also be included in the annual Corporate Operating Budget of the GOCC/GFI.

4.3 Consistent with ***DBM Circular Letter No. 2015-7***[5] dated June 3, 2015, the evaluation of agency proposals on the matter would be handled by either of the following:

Responsible Entity	Proposed Funding Level
❖ ***National Economic and Development Authority Board*** and/or any of its ***interagency committees***, as applicable	For projects costing ***₱1 billion and above***; either locally funded or foreign assisted, including PPP projects
❖ Development Budget Coordination Committee's ***Sub-Committee on Program/Project Appraisal***	For projects costing ***₱300 million to less than ₱1 billion***
❖ ***DBM***	For projects costing ***less than ₱300 million***

To facilitate the evaluation of the prioritization on the provision of funds, the agency request should indicate the justifications for undertaking the activity concerned and the supporting documents for the purpose, such as the following:

- ❖ ***Cost-benefit analysis*** to validate the best option that would be pursued;
- ❖ ***Proposed financing scheme*** provided under Section 3.5 of this Joint Circular; and

[5] Updated Guidelines for Issuance of Multi-Year Obligational Authority (MYOA)

- ***Other documentary requirements*** as provided under pertinent provisions of the annual General Appropriations Act in relation to the implementation of infrastructure projects and the annual Budget Call with respect to the proposed allotments for Buildings and Other Structures Outlay, DBM Circular Letter No. 2015-7 on the issuance of the MYOA, as well as other pertinent guidelines for Capital Outlays.

  These documentary requirements shall also include, but are not limited to, the ***geo-hazard certification*** issued by the ***Department of Environment and Natural Resources***.

4.4 In addition, the following shall be taken into consideration by the agencies concerned in the preparation of the aforementioned cost-benefit analysis indicated under Section 4.3:

- The parametric construction cost of an office building is about ***₱ 30,000-35,000 per square meter***.

  However, exception is being made if the construction area/site is reclaimed or has "soft soil" (e.g., *Bay City* within the Cities of Manila, Pasay and Parañaque and other areas of similar soil condition) and those areas near fault lines wherein the parametric construction cost is pegged higher at around ***₱ 40,000-50,000 per square meter***.

  Said ballpark figures are already inclusive of the overhead, contingencies and miscellaneous expenses, as well as the contractor's profit and value added tax.

- The standard cost of the preliminary and detailed engineering design (or building design) is equivalent to ***three to six percent (3-6%)*** of the projected total cost of the office building.

4.5 The endorsed cost estimate of the DPWH shall be taken into consideration by the DBM in the amount to be approved for the purpose and to be indicated in the MYOA, as applicable, and subsequently in the annual requirement of the activity to be included in the proposed NEP, subject to existing DBM rules and regulations, and Congressional approval.

5.0 Responsibility Clause

It shall be the responsibility of the Department Secretary or the Head of the Agency, GOCC or GFI to strictly enforce the provisions of this Joint Circular.

6.0 Repealing Clause

Pertinent portions of the DBM and DPWH issuances that are inconsistent with this Joint Circular are hereby repealed, amended or modified accordingly.

7.0 Saving Clause

Cases not covered by the provisions of this Joint Circular shall be submitted to the DBM and the DPWH for resolution.

8.0 Effectivity

This Joint Circular shall take effect immediately.

BENJAMIN E. DIOKNO
Secretary
Department of Budget and Management

Department of Budget and Management
DSEC-2016-000354

MARK A. VILLAR
Secretary
Department of Public Works and Highways

Department of Public Works and Highways
Office of the Secretary
WIN6Q42250

ANNEX

SPACE ALLOCATION STANDARDS
Gross Floor Area

PARTICULARS	MAXIMUM SPACE REQUIREMENTS (in sq. m.)
A. OFFICE OF THE SECRETARY OR ITS EQUIVALENT SG-31 POSITION	
▪ ***Secretary***	72.00
▪ ***Staff***	4.00-6.00/pax[1]
▪ ***Conference Room***	60.00
▪ ***Reception Room***	30.00
▪ ***Toilet/Bathroom***	6.00
▪ ***Pantry***	10.00
▪ ***Storage Area***[2]	10.00
B. OFFICE OF THE UNDERSECRETARY OR ITS EQUIVALENT SG-30 POSITION	
▪ ***Undersecretary***	63.00
▪ ***Staff***	4.00-6.00/pax[1]
▪ ***Conference Room***	40.00
▪ ***Reception Room***	20.00
▪ ***Toilet/Bathroom***	6.00
▪ ***Pantry***	10.00
▪ ***Storage Area***[2]	10.00
C. OFFICE OF THE ASSISTANT SECRETARY OR ITS EQUIVALENT SG-29 POSITION	
▪ ***Assistant Secretary***	56.00
▪ ***Staff***	4.00-6.00/pax[1]
▪ ***Conference Room***	30.00
▪ ***Reception Room***	20.00
▪ ***Toilet/Bathroom***	6.00
▪ ***Pantry***	10.00
▪ ***Storage Area***[2]	10.00
D. OFFICE OF THE DIRECTOR OR ITS EQUIVALENT SG-28 POSITION	
▪ ***Director IV***	36.00
▪ ***Staff***	4.00-6.00/pax[1]
▪ ***Reception Room***	10.00
▪ ***Toilet/Bathroom***	4.00
▪ ***Storage Area***[2]	6.00
E. OFFICE OF THE ASSISTANT DIRECTOR OR ITS EQUIVALENT SG-27 POSITION	
▪ ***Director III***	24.00
▪ ***Staff***	4.00-6.00/pax[1]
▪ ***Reception Room***[3]	10.00
▪ ***Toilet/Bathroom***	4.00
▪ ***Storage Area***[2,3]	6.00
F. DIVISION-LEVEL UNIT	
▪ ***Division Chief***	12.00
▪ ***Staff***	4.00-6.00/pax[1]

[1] Includes circulatory area
[2] For storage of supplies, equipment, records/files and other materials
[3] To be provided only for SG-27 Officials who are the authorized head of either the agency or the office within the agency

SPACE ALLOCATION STANDARDS
Gross Floor Area

PARTICULARS	MAXIMUM SPACE REQUIREMENTS (in sq. m.)
G. BUREAU/SERVICE/OFFICE/AGENCY-LEVEL FACILITIES	
▪ ***Conference Room***	30.00
▪ ***Storage Area***[4]	15.00
▪ ***Pantry***	10.00
H. MAIN LOBBY	0.25/pax; minimum for lobby as waiting/standing room is 0.28
I. TRAINING ROOM	2.40/pax including aisles and service area such as storage, production room and toilet for the staff
J. QUARTERS	
▪ ***Single Bed Room***	4.00
▪ ***Twin-Sharing Bed Room***	8.00
▪ ***Toilet/Bathroom***	4.00
▪ ***Pantry***	10.00
▪ ***Lobby/Lounge***	0.25/pax
K. TOILET FACILITIES[5]	1.50 per one water closet (WC) enclosure
▪ ***For Agencies providing frontline services (for public use)***	➢ 1 WC/1-100 for female ➢ 1 WC/1-200 for male ➢ 1 urinal/1-100 for male ➢ 1 lavatory/2 WC
▪ ***For Agencies with no clientele (for employees' use)***	➢ 1 WC/1-15, 2 WC/16-35, 3 WC/36-55 for male and female ➢ 1 lavatory/40 for male and female; or 1 lavatory/2 WC

[4] For storage of supplies, equipment, records/files and other materials
[5] Based on the Revised National Plumbing Code of the Philippines (Republic Act No. 1378)

Republic of the Philippines
Department of Environment and Natural Resources
ENVIRONMENTAL MANAGEMENT BUREAU
Regional Office III, Turquoise St., RAMAR Village, San Agustin,
City of San Fernando, Pampanga
Telephone No.(045) 455-3316 Fax No.(045) 455-3080
region3@emb.gov.ph
Visit us at http://www.r3.emb.gov.ph/

June 24, 2019

ECC-OL-R03-2019-0304

Ms. Aileen Anunciacion R. Zosa
Vice-President
BASES CONVERSION AND DEVLOPMENT AUTHORITY
Crescent Park West, Bonifacio Global City,
Taguig City

Subject: **ENVIRONMENTAL COMPLIANCE CERTIFICATE**

Dear Ms. Zosa,

This refers to the Environmental Compliance Certificate (ECC) application for the **proposed New Clark City Land Development Project** to be located in the Municipalities of Bamban and Capas, Tarlac.

After satisfying the requirements of the said application, this Bureau has decided to grant an ECC for the above-mentioned project.

With the issuance of this ECC, you are expected to implement the measures presented in the submitted Environmental Impacts Statement (EIS), intended to protect and mitigate the project's adverse impacts on community health, welfare and the environment. Environmental considerations shall be incorporated in all phases and aspects of the project.

This Certificate does not create any right nor be used as an authorization to implement the project. You may proceed with the implementation only after securing all the necessary and relevant permits from other pertinent Government Agencies. This Office shall be monitoring the project periodically to ensure strict compliance with the stipulations cited in the attached ECC.

Please be guided accordingly.

Very truly yours,

LORMELYN E. CLAUDIO, CESO IV
Regional Director

Republic of the Philippines
Department of Environment and Natural Resources
ENVIRONMENTAL MANAGEMENT BUREAU
Regional Office III, Turquoise St., RAMAR Village, San Agustin,
City of San Fernando, Pampanga
Telephone No.(045) 455-3316 Fax No.(045) 455-3080
region3@emb.gov.ph
Visit us at http://www.r3.emb.gov.ph/

ENVIRONMENTAL COMPLIANCE CERTIFICATE

(Issued under Presidential Decree 1586)

ECC-OL-R03-2019-0304

THIS IS TO CERTIFY THAT THE PROPONENT,**BASES CONVERSION AND DEVELOPMENT AUTHORITY**, represented by its Vice-President, **Ms. Aileen Anunciacion R. Zosa**, is granted this Environmental Compliance Certificate (ECC), for the **proposed New Clark City Land Development Project**to be located in the Municipalities of Bamban and Capas, Tarlac, by the Department of Environment and Natural Resources (DENR), through the Environmental Management Bureau (EMB).

THIS IS SUBJECTto the conditions and restrictions set in this ECC and in the attached document labelled as Annexes A and B.

This Certificate is issued with the following details:

PROJECT DESCRIPTION

The ECC covers the proposed Land Development Project (Group 3.6.5) covering a total land area of 9,450.00 hectares the boundary of which is defined under TCT Nos. 043-2016000076, 043-2016000068, 043-2016000069 and 043-2016000070 with the following components:

- *Administrative Building (Business Center and NCC Operations Center)*
- *Security Offices*
- *Open Spaces (Green Areas, Central Park, Linear parks, Recreational Ares and River parks)*
- *Utilities (Power Distribution System, Water, Sewer, Gas, ICT)*
- *BCDA Residential Housing Projects*
- *Road Network Development*
- *Transportation Hub*
- *Public Transportation Terminals*
- *Government Institutional Facilities*
- *Government Warehouse Facilities*
- *Emergency Operations Response Facilities*
- *Perimeter Fencing*
- *Gated Entrance*
-

Project Geographical Coordinates/ Location:

North Latitude -15°18' 31.88"
East Longitude - 120°30' 40.52"

This Certificate is issued in compliance with the requirements of Presidential Decree No. 1586, and in accordance to DENR Administrative Order (D.A.O.) No. 2003-30. Non-compliance with any of the provisions of this Certificate shall be a sufficient cause for the cancellation of this Certificate and/or imposition of a fine in an amount not to exceed Fifty Thousand Pesos (P50, 000.00) for every violation thereof without prejudice to imposition of fines and penalties under other environmental laws. The EMB, however, is not precluded from reevaluating, adding, removing and correcting any deficiencies or errors that may be found after issuance of this Certificate.

Issued at EMB-R03, Regional Office III, Turquoise St., RAMAR Village, San Agustin, City of San Fernando, Pampanga this June 24, 2019.

Recommending Approval:

ENGR. DENNIS O. CELESTIAL
Chief, Clearance & Permitting Division

Approved by:

LORMELYN E. CLAUDIO, CESO IV
Regional Director

SWORN ACCOUNTABILITY STATEMENT

I, Ms. Aileen Anunciacion R. Zosa, Vice-President, representing BASES CONVERSION AND DEVELOPMENT AUTHORITY with office address located in Crescent Park West, Bonifacio Global City, Taguig City, takes full responsibility in complying with all conditions in this Environmental Compliance Certificate (ECC).

_____
Ms. Aileen Anunciacion R. Zosa
Signature

TIN No. _____

Subscribed and sworn before me this _____, the above-named affiant taking oath presenting _____, issued on _____ _____ at _____.

Notary Public

Doc. No. _____
Page No. _____
Book No._____
Series of _____

Annex A

I. CONDITIONS

ENVIRONMENTAL MANAGEMENT

All commitments, mitigating measures and monitoring requirements, contained in the submitted Environmental Impact Statement (EIS) for the **proposed New Clark City Land DevelopmentProject**, particularly in the Environmental Management Plan/ Environmental Monitoring Plan, including any modifications and/or additional information as approved by the EMB, shall be instituted to minimize any adverse impact of the project to the environment throughout its implementation, which shall include among others to wit:

1. All mitigating measures in the submitted Environmental Impact Statement (EIS) shall be implemented;

2. Establish an Environmental Unit (EU) prior to project development or within thirty (30) days from issuance of this Certificate that shall competently handle the environment-related aspects of the project including conduct of seminars for its contractors/subcontractors. The EU shall ensure timely and adequate environmental monitoring as specified in the Environmental Management Plan/ Environmental Monitoring Plan.The EU shall have the following responsibilities:

    a. Monitor actual project impacts vis-à-vis the predicted impacts and management measures in the EIS;
    b. Recommend revisions to the EMP/EMoP, whenever necessary subject to the approval of EMB Region 3;
    c. Ensure that data gathered during monitoring activities are properly documented, assessed, evaluated and reported to EMB Region 3 in accordance with the standard formats; and,
    d. Ensure that monitoring and submissions of reports to EMB Region 3 are carried out as required;

3. The proponent shall set-up an Environmental Monitoring Team (EMT) composed of representatives from the stakeholders within thirty (30) days from issuance of this Certificate. Likewise, an Environmental Monitoring Fund (EMF) to cover all costs attendant to the operation of the EMT shall be established. Furthermore, an Environmental Guarantee Fund (EGF) to cover compensation to any environmental damages shall be established;

4. An Engineering Geological and Geohazard Assessment Report (EGGAR) that is based on the Geological Site Scoping Report (GSSR) from the Mines and Geosciences Bureau (MGB) Region 3 shall be undertaken particularly on flooding, soil erosion, earthquake, etc. prior to project development. All findings and recommendations stated in the EGGAR and GSSR shall be incorporated in the structural design and shall form part of the ECC conditions and shall be strictly implemented during project development and operation;

5. A Workable Traffic Management Program to include specific re-routing plan and traffic schemes (i.e., posting of road signages/warnings, appropriate

coordination with concerned government agencies) shall be implemented during construction and operations of the project;

6. Adequate slope protection measures shall be provided on steep sloping road cuts and in areas identified with potential risks to erosion to prevent landslides and soil erosion. Silt traps shall be constructed to prevent siltation of waterbodies;

7. Construction spoils and debris and hazardous wastes (used oil, paint wastes, busted bulbs, used lead acid batteries, scrap materials, etc.) generated during construction and development phase shall be properly managed and disposed pursuant to Ecological Solid Waste Management Act of 2000 (Republic Act 9003) and Toxic Substances and Hazardous and Nuclear Wastes Control Act of 1990 (Republic Act 6969). Likewise, the proponent shall enjoin its contractors, sub-contractors and locators to implement waste minimization, segregation, re-use and other ecological waste management practices;

8. Portalets/temporary sanitation facilities shall be provided during the construction phase. Septage shall be treated and disposed pursuant to the Implementing Rules and Regulation (IRR) of the Clean Water Act of 2004 (Republic Act 9275);

9. The proponent shall allocate an area for open space requirements pursuant to existing rules and regulations governing land development, which require the said area to be non-buildable and allocated for evacuation staging area and greenbelt area as part of climate change contingency measures;

10. Dust Control Plan to include regular watering of exposed areas during construction phase and maintenance of heavy equipment and vehicles shall be carried out;

11. Buffer zones with fences designed to attenuate excessive generation of traffic noise shall be established along the residential areas. The same shall be planted with trees/shrubs that absorb air pollutants;

12. Comply with Republic Act 9003 (Ecological Solid Waste Management Act of 2000) and Republic Act 6969 (Toxic Substances and Hazardous and Nuclear Wastes Control Act of 1990) by implementing the following:

    a. Designate temporary storage area/Materials Recovery Facility for recyclables, electronic wastes, BFLs, batteries and other special waste;
    b. Provide backyard composting area;
    c. Execute a Contract/Memorandum of Agreement (MOA) with the hauler and with Contract/MOA with accredited Sanitary Landfill (SLF) for disposal of residual waste; and
    d. Secure a Certificate of Disposal/Treatment issued by accredited Sanitary Landfill (SLF) and Treatment, Storage and Disposal (TSD) Facility operators;

13. The proponent shall construct and operate a Centralized Septage Treatment Plant (STP) with appropriate impermeable high density linings to prevent groundwater contamination and to treat domestic wastewater pursuant to DENR Memorandum Order dated February 10, 2004 otherwise, multi-chambered septic tank with appropriate impermeable high density linings shall be properly constructed and septage shall be hauled/transported and treated by a third party Licensed hauler and treater regularly pursuant to pertinent rules and regulations;

14. The proponent shall construct and operate a Centralized Wastewater Treatment Facility (WTF) with appropriate impermeable high-density linings or concrete materials to prevent groundwater contamination and to treat industrial wastewater and the effluent shall conform with the DENR Effluent Standards;

15. The proponent shall optimize the use of surface and rainwater through the development of rainwater harvesting system for domestic and other uses;

A. GENERAL CONDITIONS

16. The proponent shall conduct water sampling at the outfall area prior to site development in coordination with the Environmental Monitoring Team (EMT) for all applicable parameters under DENR Administrative Order (DAO) 2016-08. Thereafter, quarterly water sampling tests for receiving body of water/wastewater (influent/effluent) for parameters as per DENR Administrative Order (DAO) 2016-08 shall be undertaken;

17. Semi-annual ambient air sampling tests for Total Suspended Particulates (TSP), NO_x, SO_2, PM_{10} and other applicable parameters on air quality and noise sampling at potentially affected communities shall be undertaken, the results of which shall be part of the Quarterly Self-Monitoring Report;

18. The proponent shall formulate and implement Information Education Campaign (IEC) Programs incorporating recommended environmental management practices through but shall not be limited to various advertising media (i.e., posters, billboards, etc.);

19. Copy of Environmental Compliance Certificate (ECC) shall be posted in a conspicuous area in the administrative building;

20. The proponent shall allow inspection or monitoring that will be conducted by this Office anytime in coordination with concerned groups;

21. Should there be any complaint from the community related to traffic, environmental pollution, odor nuisance, dust emission, noise and sanitation problem brought about by the project's operation, the proponent shall be held responsible to address such problem;

22. An Abandonment Plan shall be submitted to this Office ninety (90) days prior to the project's abandonment. The plan shall include remediation, clean-up and rehabilitation measures of contaminated areas and proposed alternative project of activity suitable in the area;

23. Planting of native trees shall be undertaken either within the project site and/or in other areas as part of the proponent's social and environmental program. A Tree/Vegetation Plan prepared in coordination with the DENR-Provincial Environment and Natural Resources Office (PENRO) shall be submitted to this Office within sixty (60) days from the date of approval of this ECC which includes quantities and plant species, area/location and planting strategy and management programs, etc.;

24. The proponent shall comply with the requirements of other environmental laws, i.e. Republic Act (RA) 8749 or "The Clean Air Act of 1999", RA 6969 or "Toxic Substances and Hazardous and Nuclear Wastes Control Act of 1990", RA 9003 or "Ecological Solid Waste Management Act of 2000" and RA 9275 or "Clean Water Act of 2004", among which are:

- Secure Permit to Operate Air Pollution Source and Control Installations (APSCI) and Discharge Permit Water Pollution Source and Control Facilities (WSPCF)
- Designate Pollution Control Officer (PCO)
- Submit quarterly Self-Monitoring Report (SMR)
- Submit semi-annual Compliance Monitoring Report (CMR)
- Register as Hazardous Waste Generator

II. RESTRICTIONS

25. Any expansion or modification of the approved project components shall be subjected to new Environmental Impact Assessment (EIA) requirements and individual locators shall secure individual Environmental Compliance Certificate (ECC) from this Office prior to project development;

26. There shall be no diversion of natural waterways. Easements provided under the Water Code of the Philippines shall be observed;

27. No cutting of trees shall be undertaken without first securing Permit to Cut from DENR Region 3. Any cutting of trees implemented without the Permit to Cut will render this Certificate cancelled or revoked. In case there are trees to be affected by the project, tree balling (if applicable) shall be undertaken. Likewise, Inventory of trees to be cut shall be submitted to the DENR-Provincial Environment and Natural Resources Office (PENRO) and this Office thirty (30) days prior to actual start of site development;

28. A Water Resources Management Program to include establishment of rainwater harvesting system and forty-five (45) hectares retention pond (excluding natural waterways) and reforestation of upstream areas shall be submitted to this Office within sixty (60) days from receipt of this Certificate. Forest areas shall be enhanced in coordination with the PENRO/ CENRO; and

29. In case of transfer of ownership of this project, these same conditions and restrictions shall apply and the transferee shall be required to notify this Office within fifteen (15) days as regards to the transfer of ownership.

Non-compliance with any of the provisions of this certificate shall be a sufficient cause for the cancellation or suspension of this certificate and/or imposition of a fine in an amount not to exceed Fifty Thousand Pesos (50,000.00) for every violation thereof.

Annex B

PROJECT ASSESSMENT PLANNING TOOL

This is for assistance of the Proponent and government agencies concerned in the management of the project and for better coordination in mitigation on the impact of the project on its surrounding areas and to the environment.

By way of recommendation, the following have been taken noticed by the undersigned and are forwarding these recommendations to the parties and authorities concerned for proper appreciation and action.

RECOMMENDATIONS TO CONCERNED GOVERNMENT AGENCY/LGUs		**CONCERNED GOVERNMENT AGENCIES/ENTITIES**
1. Provide adequate drainage canal, concrete culverts, and other flood control measures to adequately receive and channel the run-off of silt-laden rain water to the nearby receiving body of water		Proponent/CDC
2. Protect legal easement along creek/river i.e. establishment of linear park along easement, construction of boundary wall to prevent encroachment of the required legal easement of adjacent creek/river and regular clean-up and desilting of adjacent creek/river to prevent clogging.		Proponent/DPWH/CDC/LGU
3. Provide segregation, collection, recycling, and disposal mechanism for solid waste.		Proponent/LGU
4. Comply with the regulation/occupational health and safety standards prior acquisition of a Permit to Operate		Proponent/DOLE
5. Secure Certificate of Non-Overlap		Proponent/NCIP
6. Secure tree cutting permit		FMB-DENR
7. Implement the Resettlement Action Plan		Proponent/NHA/LGU
ENVIRONMENTAL PLANNING RECOMMENDATIONS FOR THE PROPONENT The following are recommendations for the Proponent for the protection of the project area and the affected environment. It is strongly recommended that the same be strictly complied by the Proponents.		
1. Close monitoring of the project should be undertaken by the proponent to maintain a high level of safety and efficiency and immediately address any environmental hazard that may take place. 2. The proponent should lead in the installation of green features such as rainwater harvesting system, solar panels and environment-friendly and climate change adaptive architectural designs of buildings and structures.		

For dissemination and proper action of the parties concerned.

ENGR. DENNIS O. CELESTIAL
Chief, Clearance & Permitting Division

LORMELYN E. CLAUDIO, CESO IV
Regional Director

4.2 Task 4.1 Land Grading Plan

4.2.1 Design Concept

Preliminary ground leveling design was closely associated with topography, geology, and drainage. Since the development area is hilly and undulating land, there is not much serious issues on the drainage system. Based on the land grading and land use plans, layout for each of the infrastructure, which consists of electricity, water supply, sewerage, drainage and telecommunication, were designed following the road design.

4.2.2 Design Criteria

The land grading plan was prepared in accordance with the following design criteria:

(1) Elevation of each lot for industrial, administrative/institutional, and commercial zones were set higher than the road elevation to avoid inundation.

(2) Road alignment and profile were set considering the topographical condition and water discharge direction.

(3) Minimum gradient of 0.50% and maximum gradient of 6% for roads were basically adopted.

4.2.3 Land Grading Plan

The Land Grading Plan in Figure 4.21 was prepared using the Civil 3D software, which is an up-to-date computer technology. The Zone of Land Grading Plan is shown in Figure 4.2.2.

Key issue in the land grading design is to minimize the earthwork volume by carefully balancing the cutting and filling of areas of the Project. To attain the cut and fill balance, it is necessary to effectively utilize the earthwork volume by filling the low areas with those obtained by cutting the hilly areas. Moreover, the final grading scheme for NCC should follow the existing contour, as much as possible, to minimize the total earthwork volume. The backfill materials must be taken within the project site and hauling distance must be the shortest possible distance between cut and fill areas.

In carrying out the earthwork volume computations, the Consultant utilized applicable methods such as the Prismoidal Method. The cut & fill volume for the development area (except open space, green zones and low residential in hilly area, which will be developed based on the original ground line) was estimated at about 37,000,000m3 (refer to Table 4.2.1). Part of the developable areas that were excluded are the NGAC and Filinvest areas.

At the detailed design stage, introduction of infrastructure system/equipment that will help protect the natural environment and promote disaster resiliency of NCC are recommended, such as, but not limited to the following:

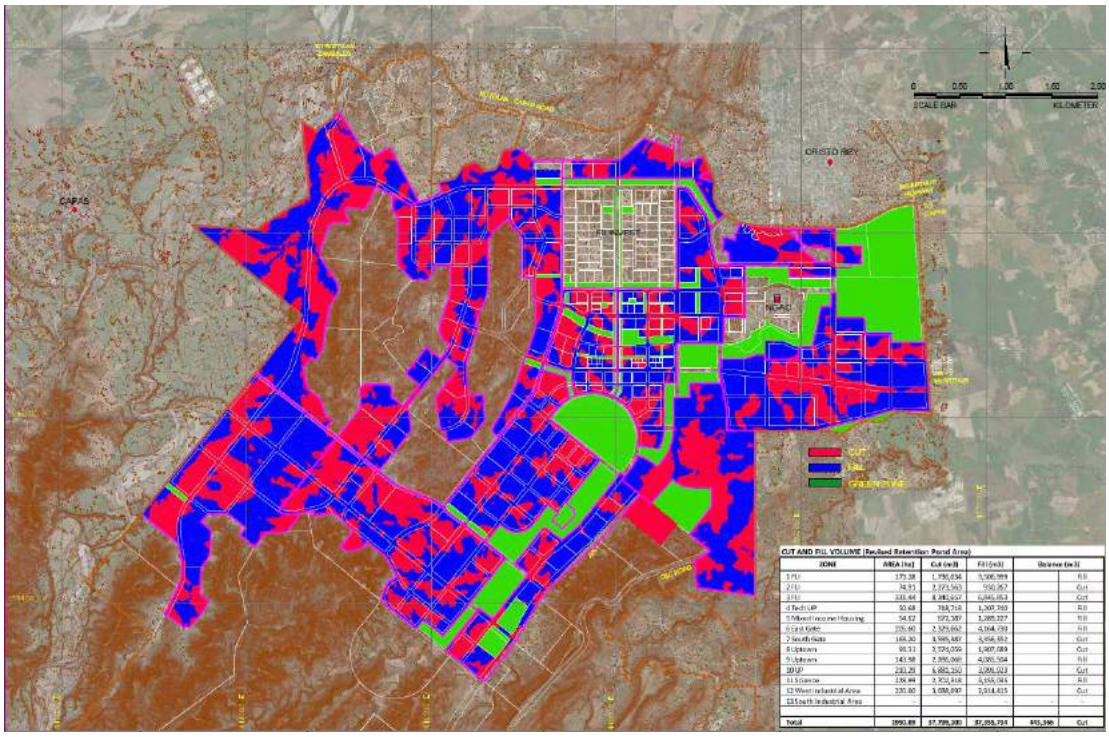
- Steel Silt Dam,
- Hybrid Sabo Dams for Sediment Capture,
- Rope Net for Rock fall Prevention with Minimal Impact on Nature,
- Curtain Net for Rock fall Protection with High-Energy Absorption,
- Slope Protection System conserving Greenery with Minimal Impact on Natural Slope,
- Catchment Well and Telescopic Drainage Pipe for Landslide Prevention

It is also recommended to introduce infrastructure monitoring system for embankment and slope failures, landslides and rock fall with the combined use of sensor technology and ICT.

Table 4.2.1 Cut & Fill Volume

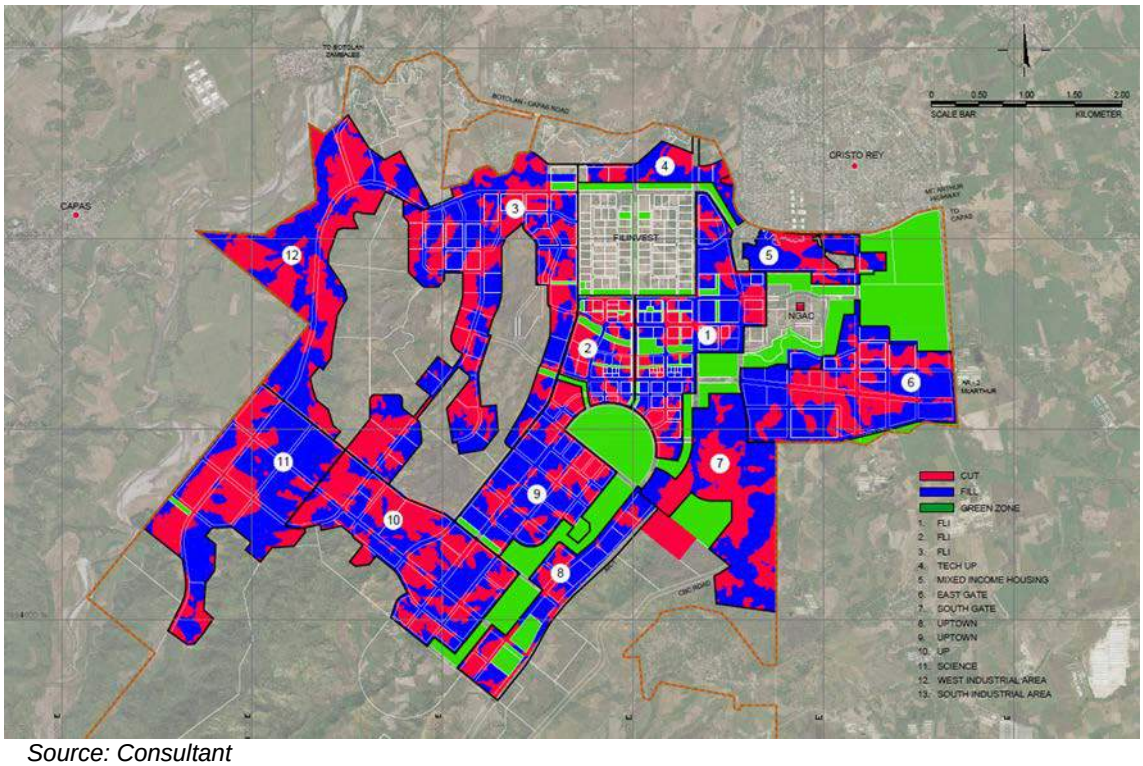
CUT AND FILL VOLUME (Revised Retention Pond Area)					
ZONE	**AREA (ha)**	**Cut (m3)**	**Fill (m3)**	**Balance (m3)**	
1 FLI	173.28	1,736,634	3,506,999	1,770,365	Fill
2 FLI	74.91	2,273,563	930,267	1,343,296	Cut
3 FLI	331.44	8,340,657	6,845,853	1,494,804	Cut
4 Tech UP	50.68	718,718	1,207,740	489,022	Fill
5 Mixed Income Housing	54.62	672,187	1,289,227	617,040	Fill
6 East Gate	205.60	2,329,662	4,164,730	1,835,069	Fill
7 South Gate	163.20	3,595,387	3,356,352	239,036	Cut
8 Uptown	93.31	2,574,059	1,907,689	666,370	Cut
9 Uptown	143.98	2,286,068	4,085,504	1,799,435	Fill
10 UP	210.29	6,881,150	3,991,923	2,889,227	Cut
11 Science	228.99	2,702,318	3,155,035	452,717	Fill
12 West Industrial Area	220.60	3,688,697	2,914,415	774,282	Cut
13 South Industrial Area	-	-	-	-	-
Total	**1950.89**	**37,799,100**	**37,355,734**	**443,366**	**Cut**

Source: Consultant



Source: Consultant

Figure 4.2.1 Cut and Fill Layout Plan (LG-PL-02)



Source: Consultant

Figure 4.2.2 Zonal Land Grading Plan (LG-PL-03)

4.3 Traffic Volume Forecast and Transportation System Plan

4.3.1 Condition and Assumption of Traffic Volume Forecast

The traffic volume was forecasted based on the updated land use map for New Clark City (NCC) using the following formula:

Forecasted $Trips_i = TR_i$ x Total Floor $Area_i$

Where:

- Forecasted $Trips_i$: Number of trips for land use i
- TR_i (trip generation/m^2) : Number of trips per unit floor area per land use i
- Total Floor $Area_i$ (m^2): Total allocated floor area for land use i

The trip rates were based on either (i) secondary data, if available, or (ii) computed values based on the existing locators within Clark Special Economic Zone[1]. The area per land use is sourced from the updated master plan.

Given that the New Clark City is envisioned to be a sustainable, "stand-alone" type of development, it is assumed that a substantial percentage of the trips will be purely internal. For purposes of planning, it is assumed that sixty percent (60%) of the trips will be purely within the development.

Based on the approved land use plan, there will be two (2) main types of travel demand. These are (i) commuter traffic and (ii) cargo traffic. Commuter traffic refers to all types of trips except cargo trips.

1 In order to compute for the trip rates, key informant interviews were conducted to gather data on traffic generation.

Section IV.

NGAC Master Development Plan

DETAILED MASTER PLAN

NEW CLARK CITY NATIONAL GOVERNMENT ADMINISTRATIVE CENTER

TASK A4 MASTER PLAN DEVELOPMENT REPORT

JANUARY 2021

05

TRANSPORTATION

A people-centric transport system that is well-connected, affordable, convenient and seamless plays a crucial role in ensuring that NGAC is livable, inclusive and attractive.

This chapter will outline the development of the transport master plan of NGAC. It will elaborate different modes of transport, including the road network, different public transport modes, regional transportation linkages, parking, and non-motorized transport.

The goal is to establish NGAC as a district with numerous transport options, that are efficient, comprehensive and convenient, with amenities and destinations that are easily and universally accessible.

5.1 ROAD NETWORK

5.1.1 ROAD LAYOUT

Vision and Principles

The principles that inform the concept for transport strategy are:

1. Permeable Road Transport for Passenger Navigation Promotion and development of an efficient and sustainable road transport.
2. Public Transport for Daily Commuter Access to different modes of transportation, including alternative modes and non-motorized transport.
3. Green Non-Motorized Transport (NMT) for Pedestrian Access

Figure 5.1 Transport Principles

Icon Sources: inipagistudio from Flaticon, Good Ware from Flaticon
Image Source: Designed by pch.vector / Freepik

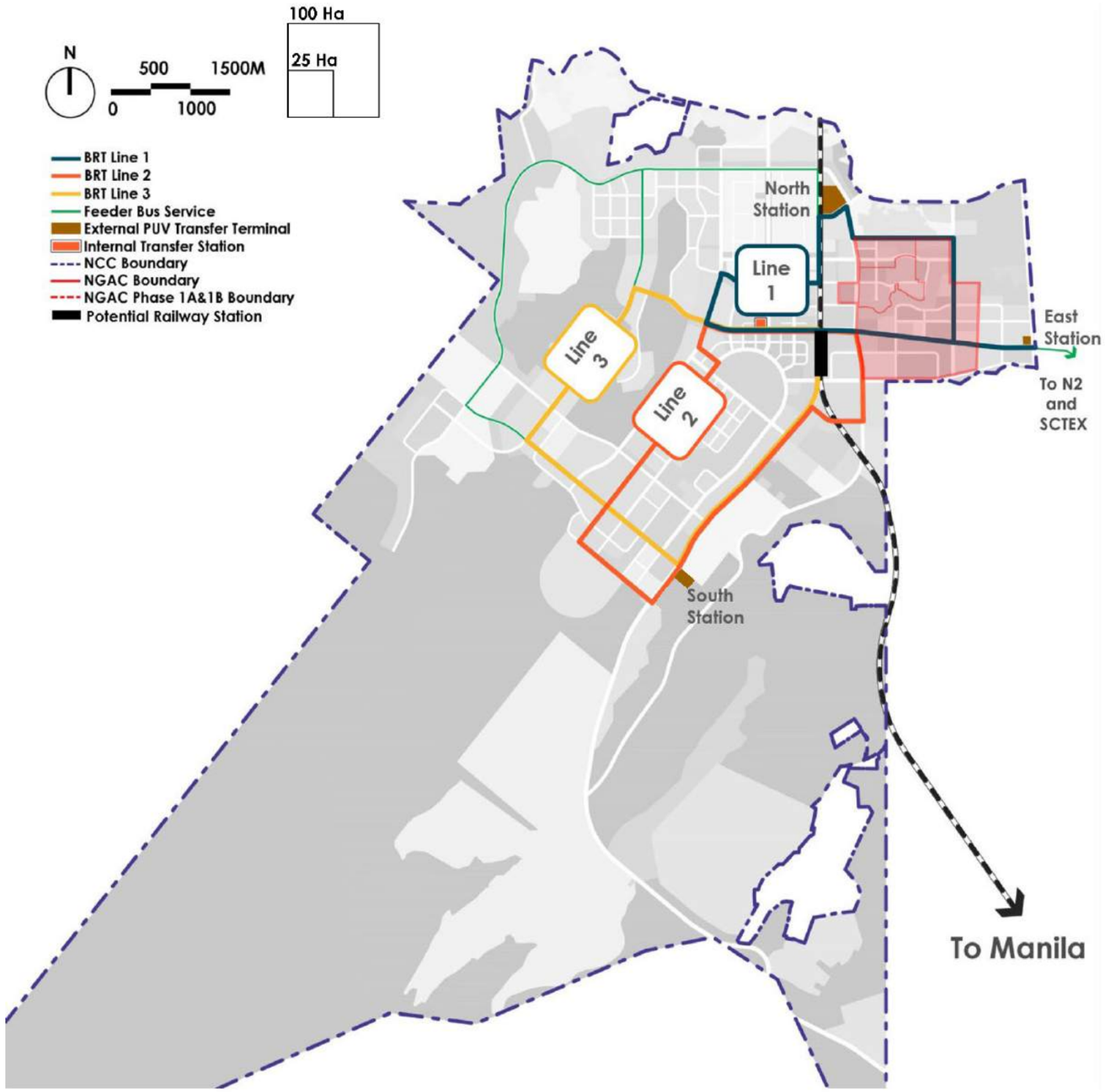


Figure 5.2 Transportation System to NCC and External Areas

Source: SJ based on the Overall NCC Transport Plan (as of June 2020))

5.2 REGIONAL CONNECTIVITY

5.2.1 CONNECTIVITY WITHIN NCC AND EXTERNAL DESTINATIONS

Within NCC: Proposed Internal Public Transport System

- Bus Rapid Transit (BRT) System: Lines 1, 2, and 3 (Routes) servicing several districts throughout NCC
- Feeder Bus Service

External Destinations: To Metro Manila, Subic, and other parts of northern Luzon

- NLEX to Metro Manila
- North-South Commuter Railway (NSCR) Connection
- SCTEX to Subic
- TPLEX to northern Luzon

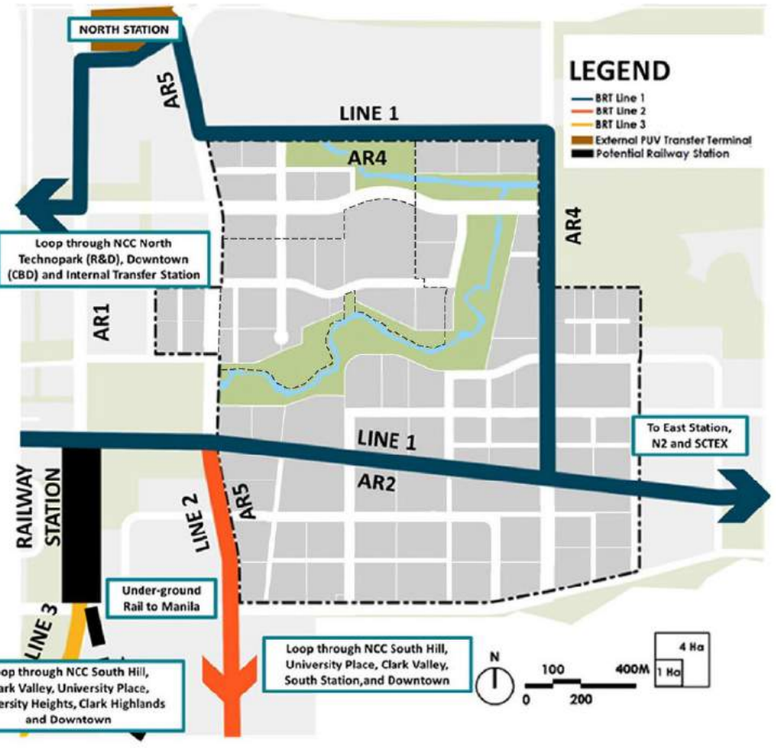


Figure 5.3 Transportation System within NGAC

Source: SJ based on the Overall NCC Transport Plan (as of June 2020))

5.2.2 TRANSFER TERMINALS WITHIN NCC TO EXTERNAL DESTINATIONS

Terminal Type, Location, and Land Area Allocation:

Proposed Bus Transfer Terminals

- North Terminal at the NCC entry from the Capas-Botolan Road = 8.73 Hectares
- South Terminal within Clark Special Economic Zone = 3.49 Hectares
- East Terminal towards the entry of NCC from the MacArthur Highway = 2.88 Hectares

Proposed Railway Terminal

- Clark Commuter Railway Station

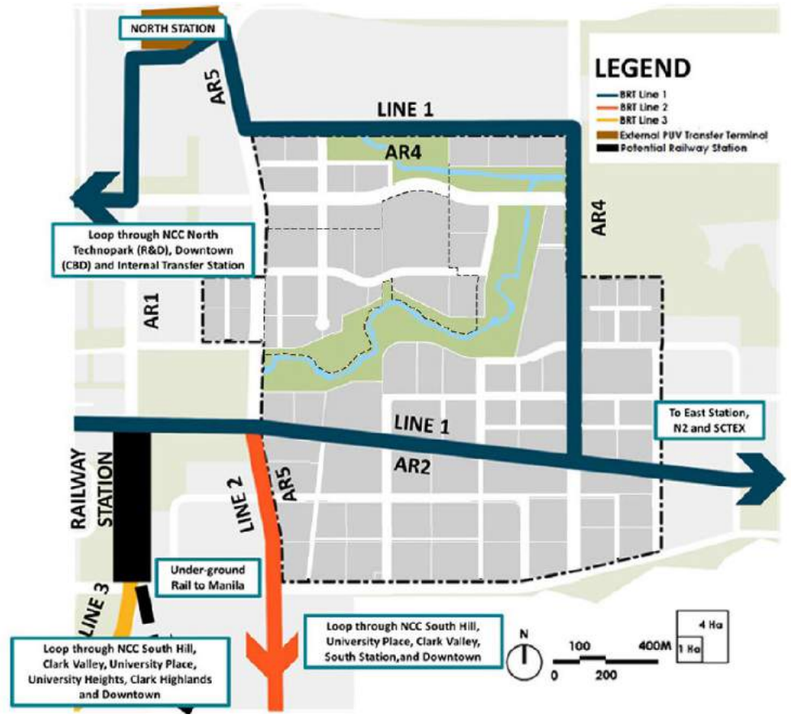


Figure 5.4 Transportation System within NGAC

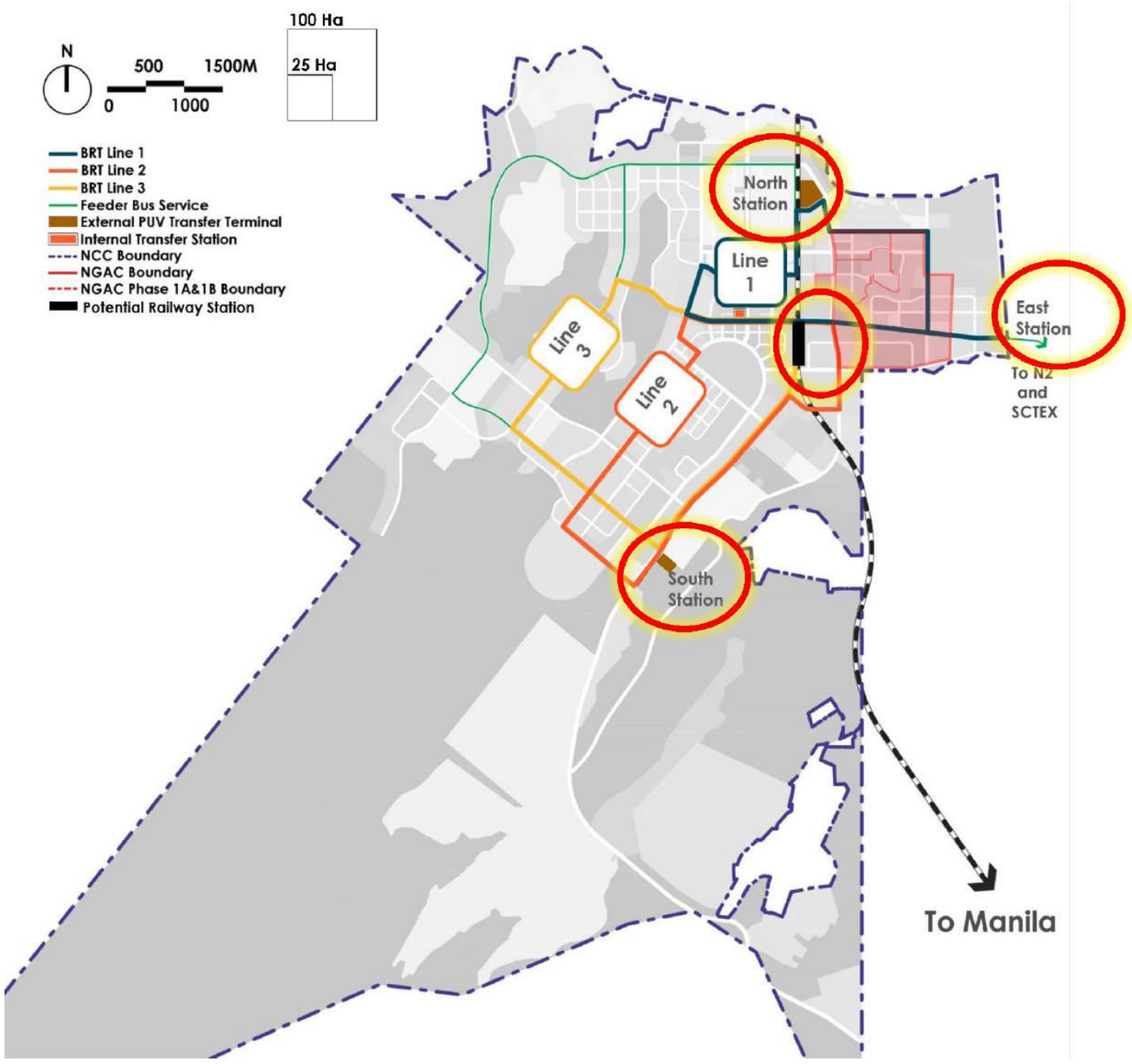


Figure 5.5 Transportation System within NGAC

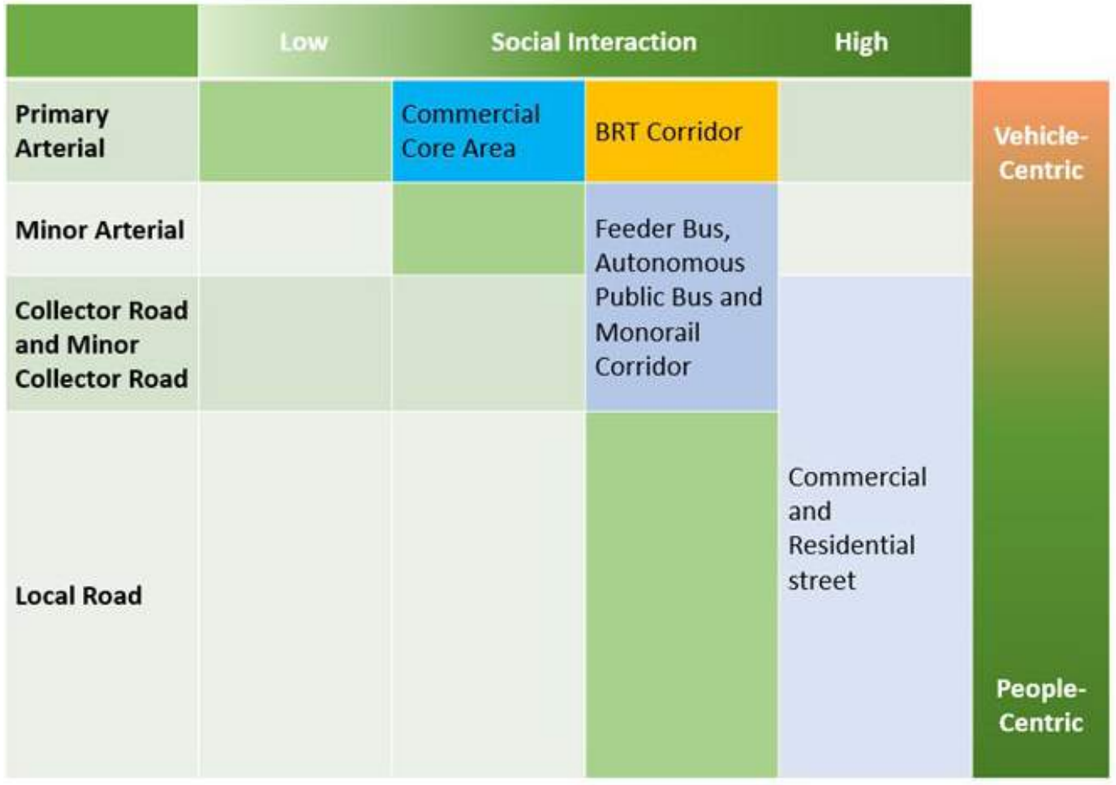


Figure 5.6 Road Hierarchy Matrix

5.3 ROAD NETWORK

5.3.1 ROAD HIERARCHY STRATEGIES

Road Hierarchy Matrix

To support the NGAC Detailed Master Plan, there is need to provide a standardized and well-planned road hierarchy to ensure that the roads are designed for their intended use with priority given to people's safety and social needs, depending on the urban context.

A proposed road hierarchy matrix was developed based on road classes and social interaction. This is in accordance with local road design practices, which have been shaped by the commitment to create a roadway environment that addresses safety, capacity, economic, and environmental concerns.

There are Four (4) proposed classification of roads within NGAC district:

- Primary Arterial Road (57m)
- Minor Arterial Road (48m)
- Collector Road (31m) Minor Collector Road (22m)
- Local Road (15m)

Roadway Environment and Social Interaction

The two major considerations in classifying highway and street networks functionally are access and mobility.

The (urban principal / primary) arterial system carries most of the trips entering and leaving the urban area, as well as most of the through movements bypassing the central city.

The (urban) minor arterial street system places more emphasis on land access than the higher system does and offers lower traffic mobility.

(Urban) Collector street system penetrate residential neighborhoods, distributing trips from the arterials through the area to their ultimate destinations.

Local roads and streets have relatively short trip lengths and because property access is their main function, there is little need for mobility or high operating speeds.

Source: AASHTO, A Policy on Geometric Design of Highways and Streets

Road Hierarchy

The hierarchy of the functional systems consists of principal arterials (for main movement), minor arterials (distributors), collectors, and local roads and streets. These classifications differ for urban and rural areas. Since NGAC district will be a future urban area, the following descriptions below satisfy the said category:

Principal / Primary Arterial Road (57m)

Principal / Primary arterial road system serves the major centers of activity of urbanized areas, the highest traffic volume corridors, and the longest trip desires. This system carries a high proportion of the total urban area travel even though it constitutes a relatively small percentage of the total roadway network. The system should be integrated both internally and between major rural connections.

Minor Arterial Road (48m)

The minor arterial road system interconnects with and augments the urban principal arterial system. It accommodates trips of moderate length at a somewhat lower level of travel mobility than principal arterials do. This system distributes travel to geographic areas smaller than those identified with the higher system.

Collector Road (31m) and Minor Collector Road (22m)

The collector road system provides both land access service and traffic circulation within residential neighborhoods and commercial and industrial areas.

Local Road (15m)

The urban local road system is comprised of the network that does not belong to the higher systems. It primarily permits direct access to abutting lands and connections to the higher order systems.

Slip Road

A Slip road is a service road running parallel to a higher-speed, limited-access road. A slip road or service road is often used to provide access to private driveways, shops, houses, industries or farms for road safety, where parallel high-speed roads are provided as part of a major highway.

Internal Access Road (10m)

Internal access road means a private road providing vehicular access within the property boundary of a parcel being proposed for development. This is only for the locator's reference upon implementation.

The Internal Access Roads are only indicative as shown on the map.

Source: AASHTO, A Policy on Geometric Design of Highways and Streets

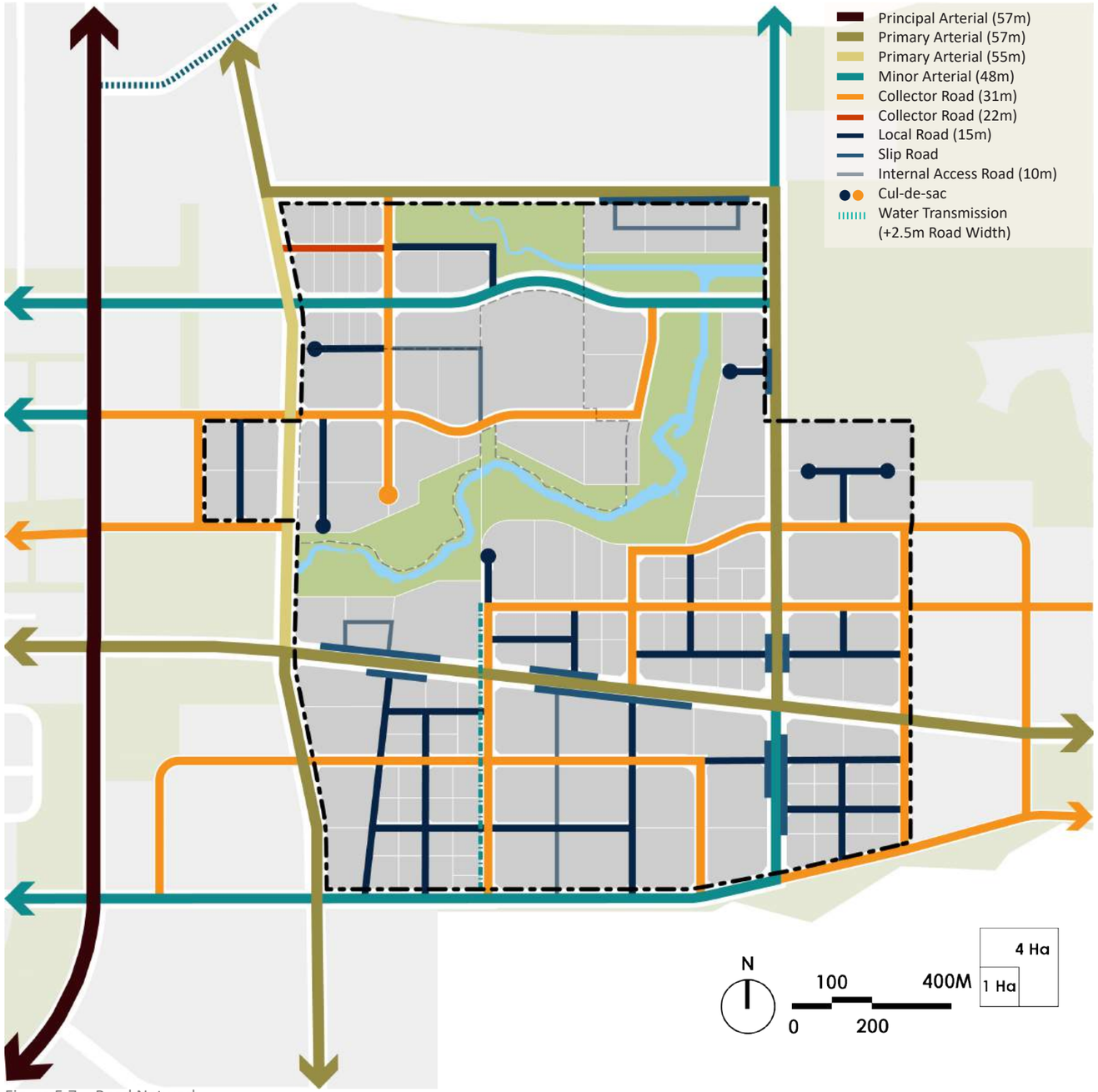


Figure 5.7 Road Network

Source: SJ based on the Overall NCC Transport Plan (as of June 2020))

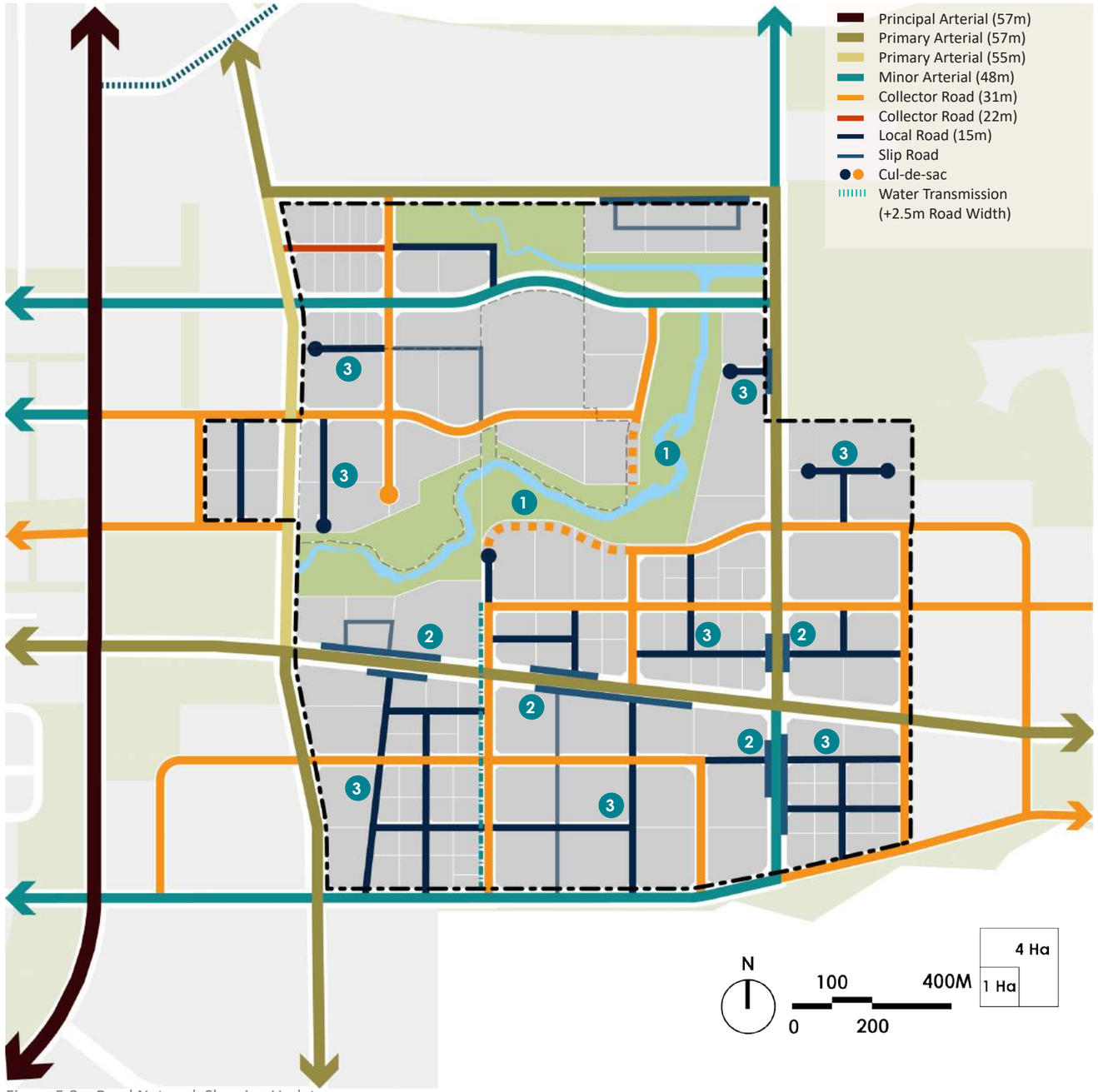


Figure 5.8 Road Network Showing Updates

Local Road Strategy

- Currently, the road network includes an Arterial and Collector system based on the proposed overall NCC transport plan.
- To supplement the overall network, local roads shall be introduced for plots where existing access can only be tapped from the arterial roads.
- Doing this will minimize intersections along arterial roads (Local Roads should only intersect with Collector Roads, where possible) to ensure smoother traffic flows.
- Roads along green spaces and parks shall also be avoided or minimized as much as possible.

Updates based on Overall NCC Transport Plan(as of June 2020)

The following are the proposed updates from overall NCC transport plan:

- Removal of Collector Roads to maximize the development frontage along riverside.
- Adoption of Slip Road and Right-in-right-out on Arterial roads to avoid traffic interference and ensure access for plots along primary arterial roads.
- Addition of Local Road and Internal Access Road within large land parcels for improved access to smaller plots.

It is noted that the local roads are proposals that will be reflected in the Development Control for each locator to follow.

Also, the Internal Access roads are recommended for improved access into the plots and are shown as an indicative alignment only. The master developer will only be in charge of the road network from the collector roads and above level.

1. Proposed removed Collector Road
2. Proposed Slip Roads and Right-in-right-out
3. Proposed Local Road

5.3.2 ADDITIONAL SLIP ROAD SEGMENTS ALONG PRIMARY ARTERIALS

Locations and Detail Plans

Slip roads provision along Arterial roads will improve the safety, as well as increase accessibility to the plots along the Arterial roads.

For Typical Slip Road and RIRO Design, see Figure 5.13.

To reduce the traffic interference on the Primary Arterial (AR4 and AR2), slip roads shall be provided as side access to connect with “internal access” roads.

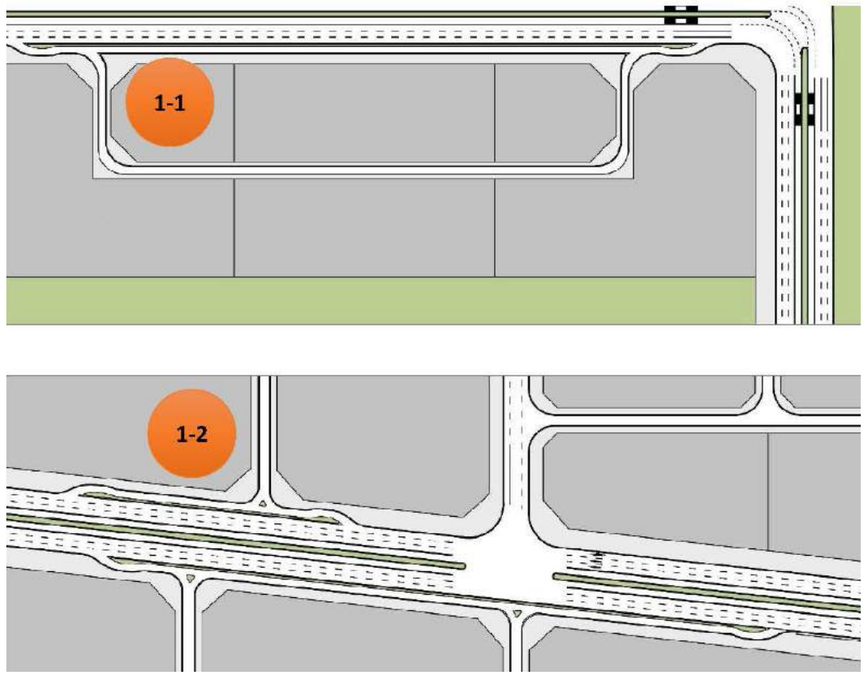


Figure 5.9 Blow-up View of Proposed Slip Roads at ‘Points 1-1 and 1-2’

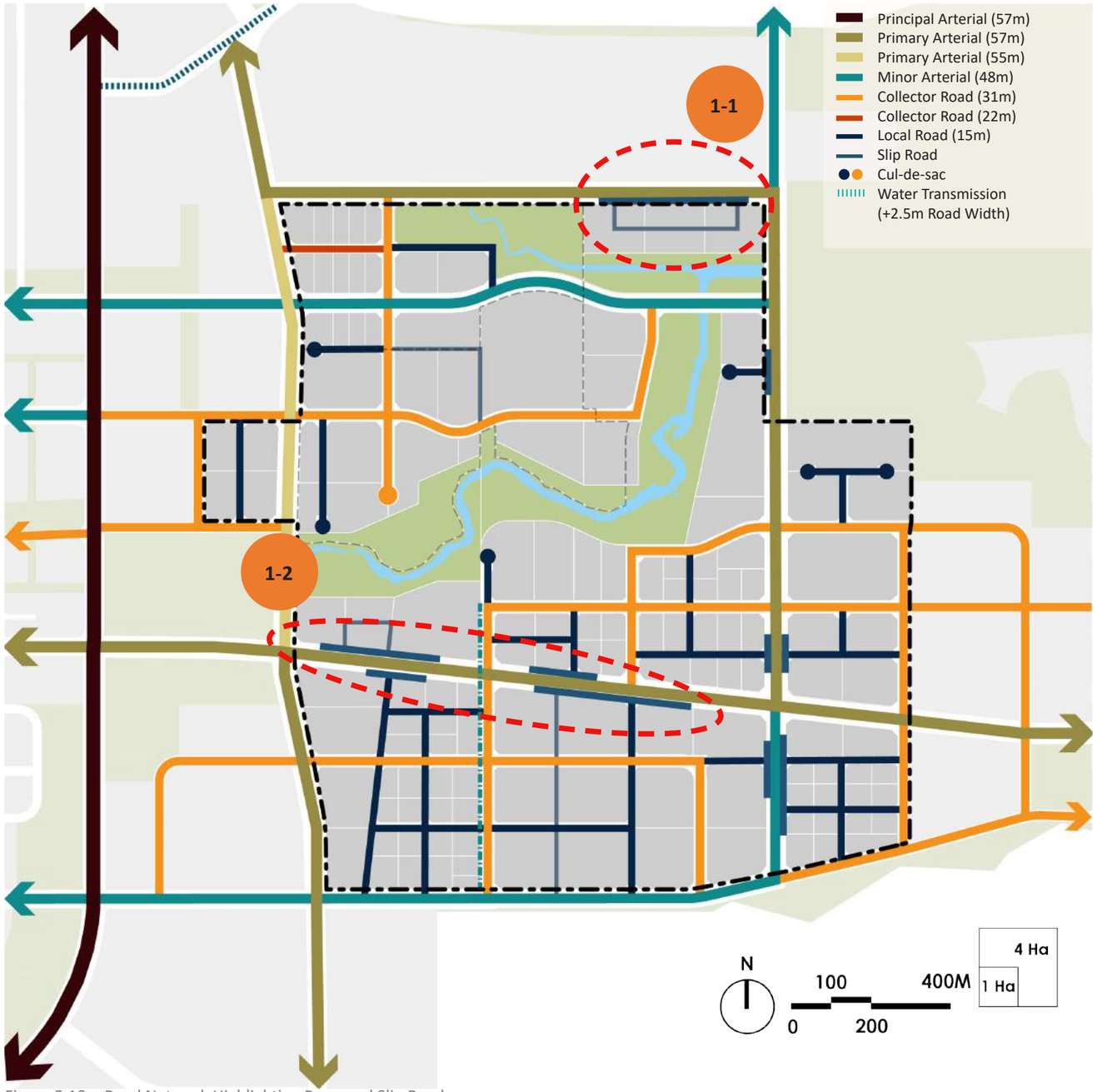


Figure 5.10 Road Network Highlighting Proposed Slip Roads

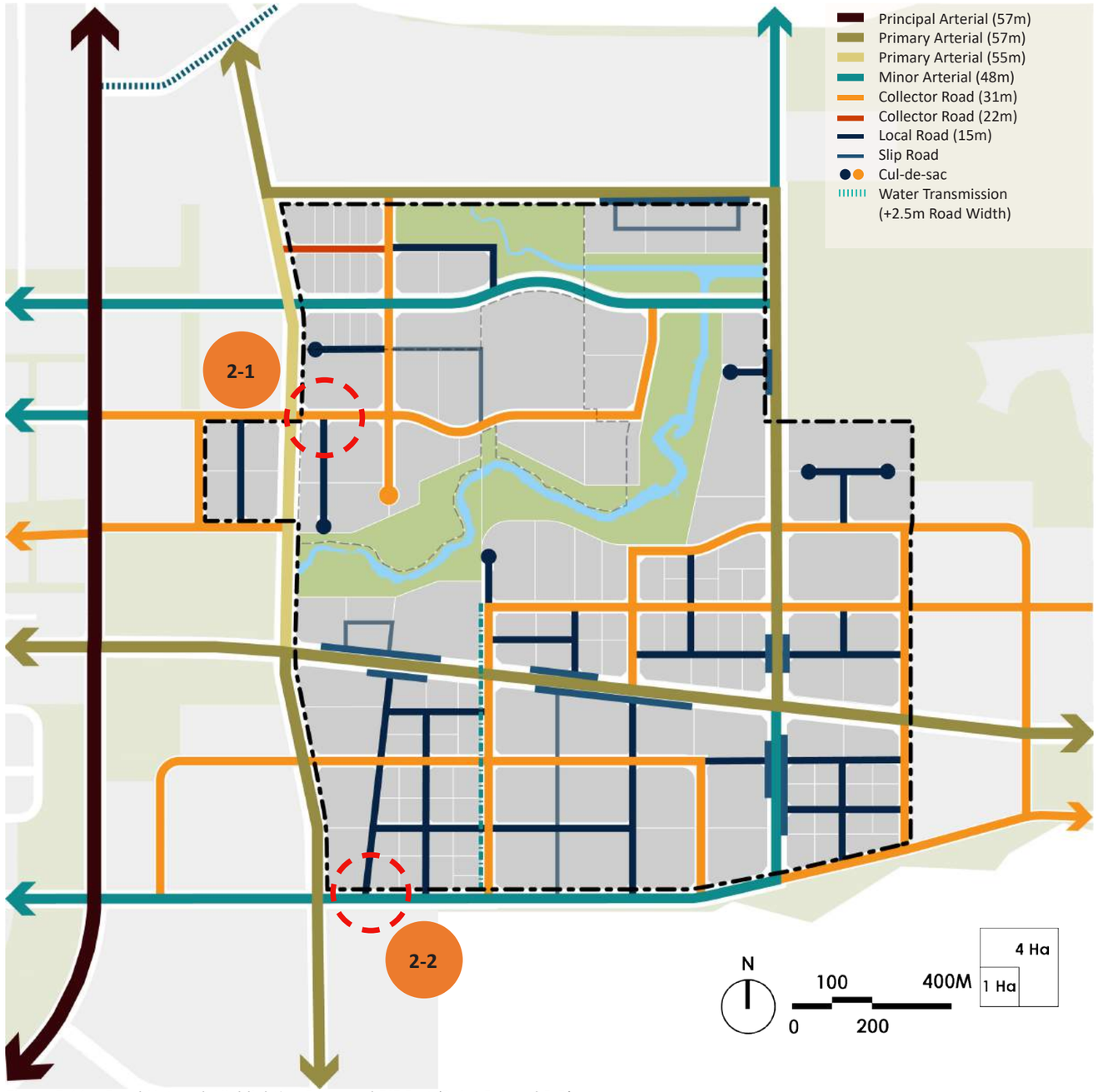


Figure 5.11 Road Network Highlighting Proposed RIRO at 'Point 2-1 and 2-2'

5.3.3 RIGHT-IN-RIGHT-OUT (RIRO)

Locations and Detail Plans

Right-In Right-Out or RIRO is a type of three-way road intersection that only permits right turns.

- The turn are required to be at least 50 m away from the intersections to the Primary Arterials.
- If the junction is too close to the local road, a provision of RIRO must include features to slow down vehicles.

For Typical Slip Road and RIRO Design, see Figure 5.13.

Source: AASHTO, A Policy on Geometric Design of Highways and Streets

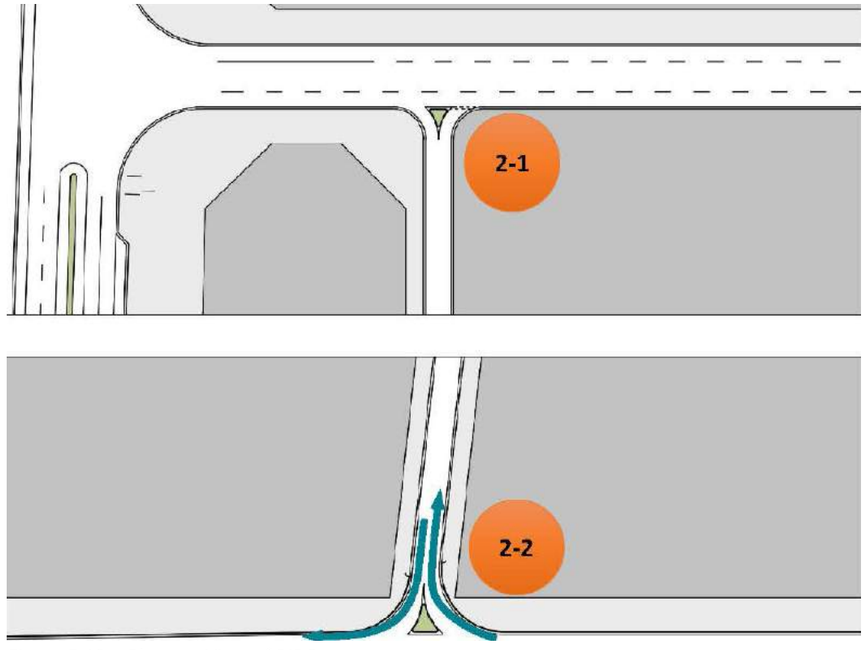


Figure 5.12 Blow-up View of RIRO

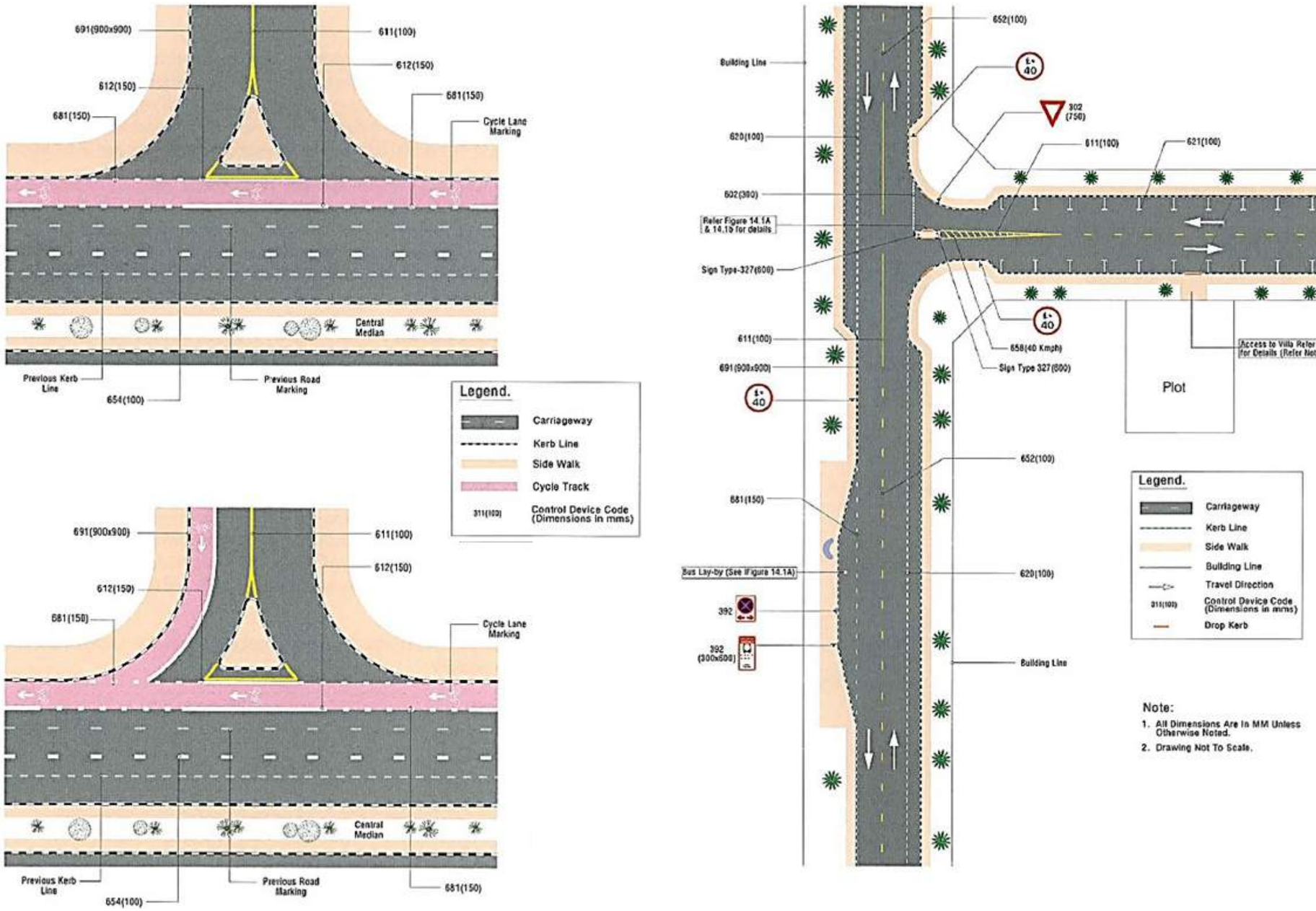


Figure 5.13 Typical Slip Road and RIRO Design *Source: Dubai Pedestrian and Cyclist Design Manual, January 2006, Chapter 14*

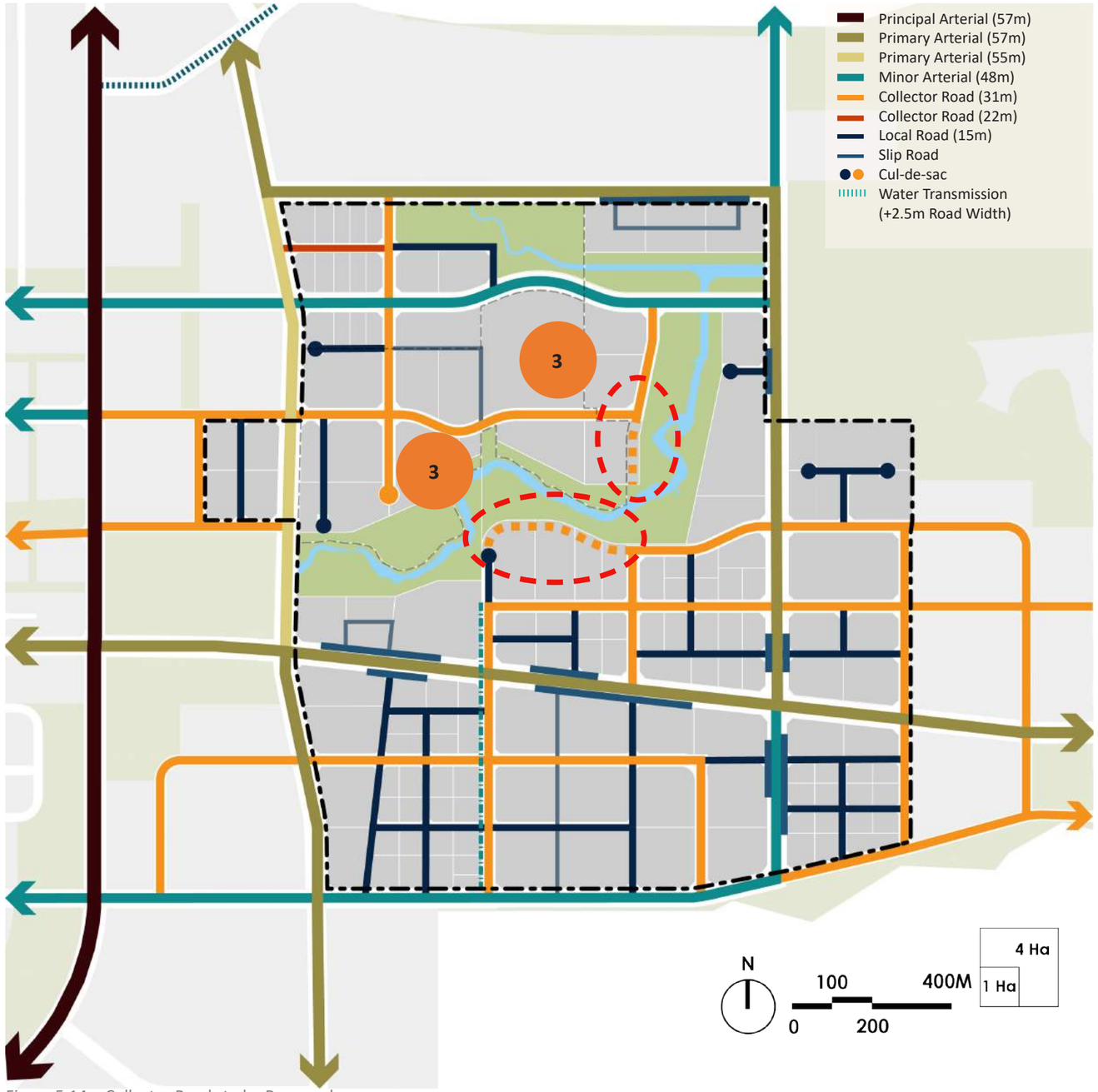


Figure 5.14 Collector Roads to be Removed

5.3.4 REMOVAL OF THE PLANNED COLLECTOR ROADS

Locations and Detail Plan

Figure 5.14 illustrates the plan proposals to reduce the amount of roads fronting the river corridor. Upon confirmation with Primewater (NCC's water provider) on Nov 6, 2020, this proposal will not impact the water service for the affected parcels as shown on Figure 5.15.

Also, the removal of collector roads have minimal impact on the traffic flow based on the calculated Average Daily Traffic (ADT).

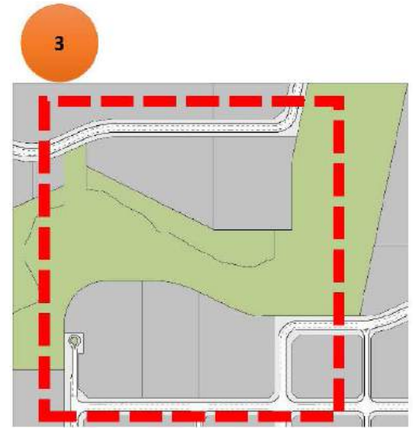


Figure 5.15 Blow-up View of Collector Roads to be removed at 'Points 3'

5.3.5 INTRODUCING "T-INTERSECTION" TO CONNECT LOCAL ROADS

Location and Detail Plan

T-intersection or three-leg intersection has the normal pavement width of both highways maintained except for the paved corner radii or where widening is needed to accommodate the selected design vehicle.

With the additional local road proposed to connect at the turning radius of a collector road. As shown on Figure 5.16, the detail plan resolves the intersection and improve the flow of traffic.

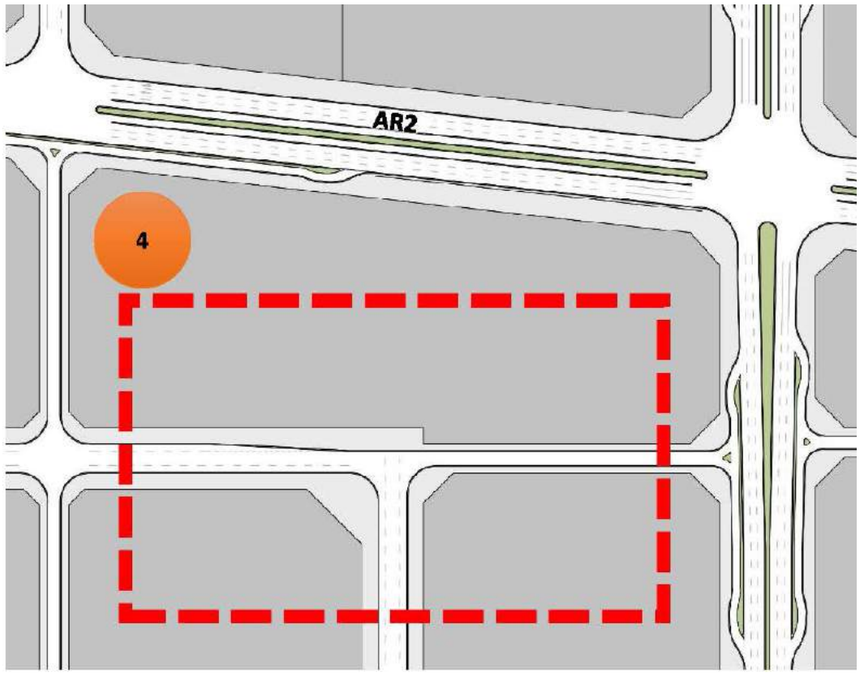


Figure 5.16 Blow-up View of Proposed T-Intersection at 'Point 4'

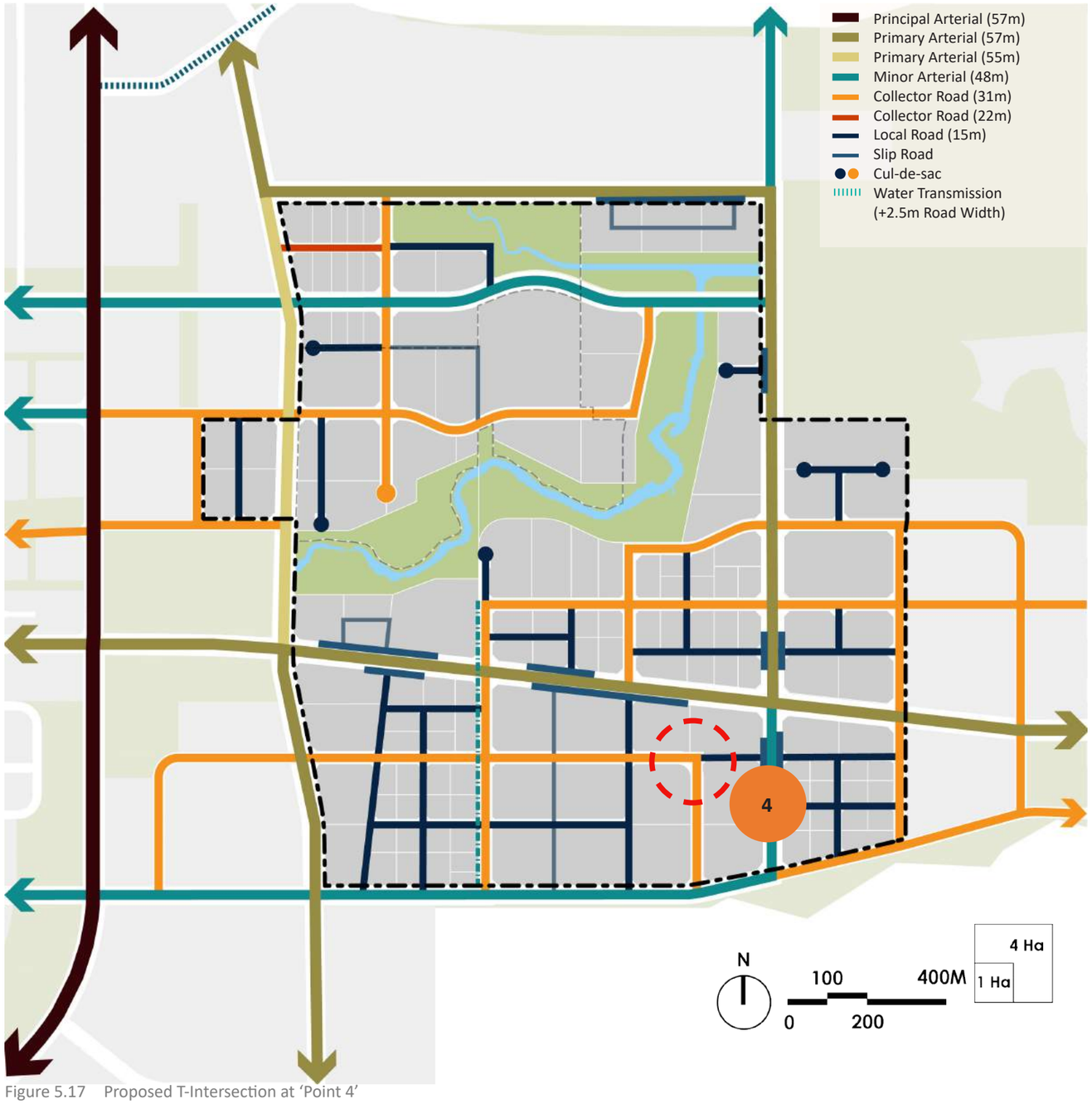


Figure 5.17 Proposed T-Intersection at 'Point 4'

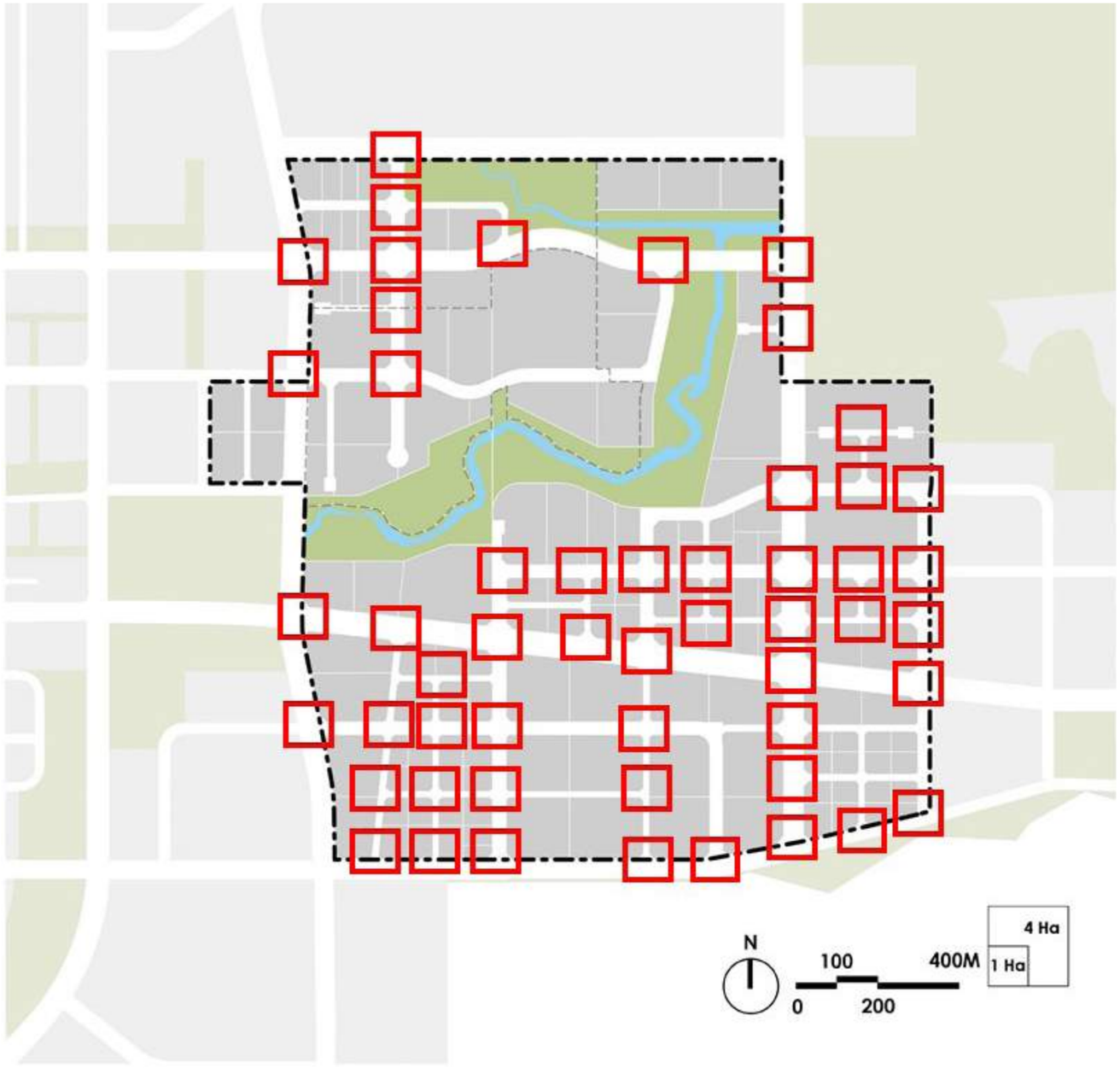


Figure 5.18 Road Junctions

5.3.6 ROAD JUNCTIONS

At-Grade Intersection Locations and Detail Plan

At-grade intersections are crossings or junctions of two or more roads / highways at a common level.

Source: DPWH Design Guidelines, Criteria & Standards (DGCS) Volume 4

At-grade intersections occur on roadway sections with moderate to steep grades. It is desirable to reduce the grade through the intersections.

Source: AASHTO, A Policy on Geometric Design of Highways and Streets

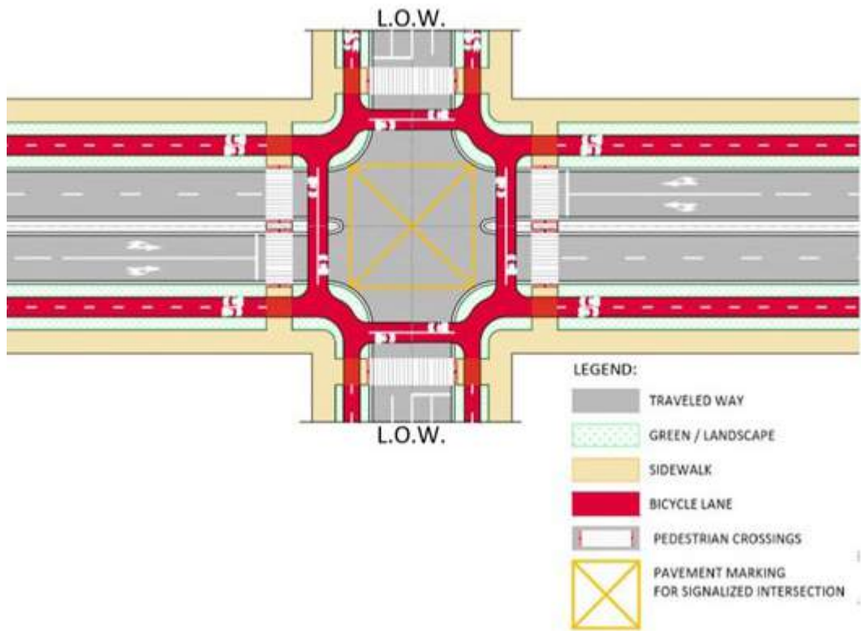
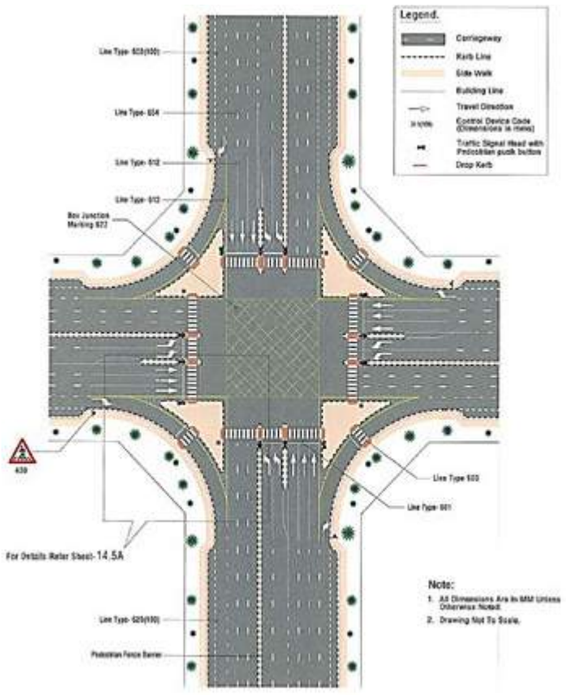
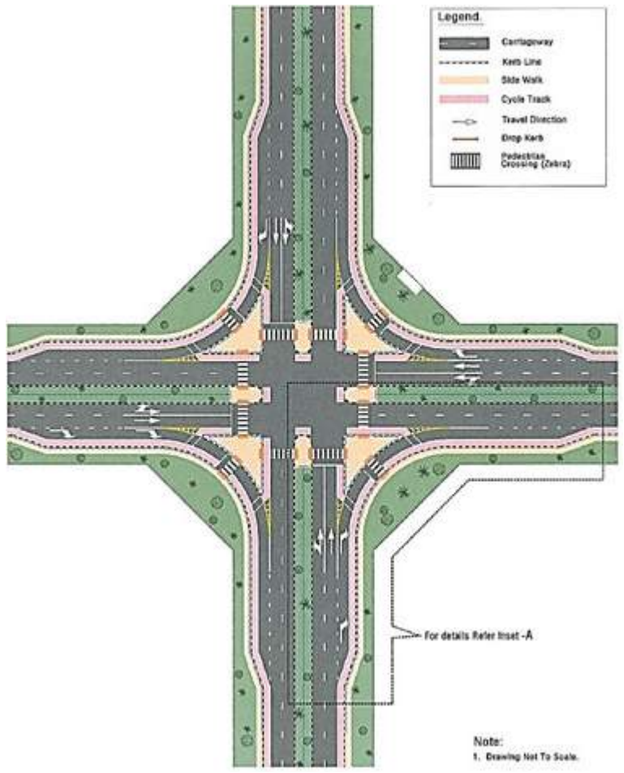
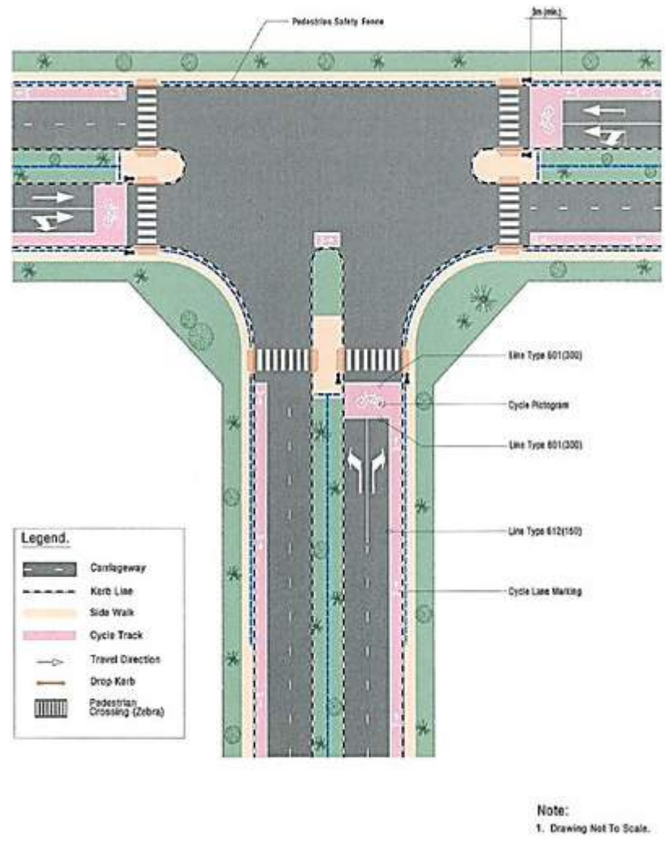
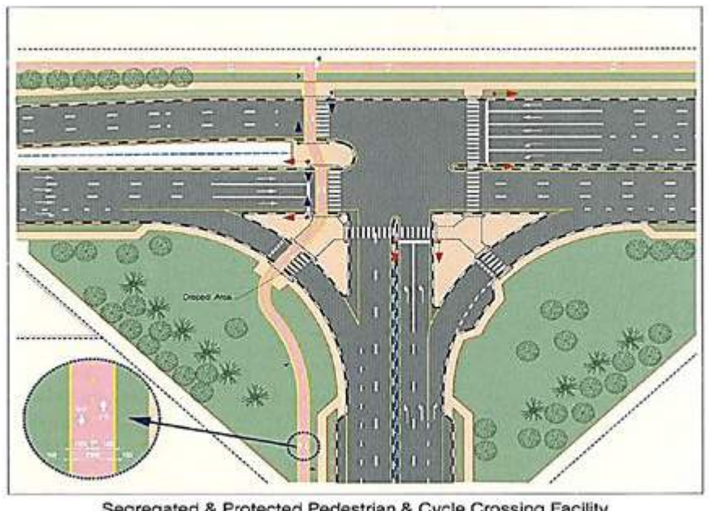


Figure 5.19 Sample Blow-up of Intersection

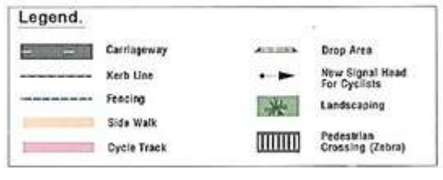








Segregated & Protected Pedestrian & Cycle Crossing Facility
At A Signalized Junction (Off Road Cycle Lane)

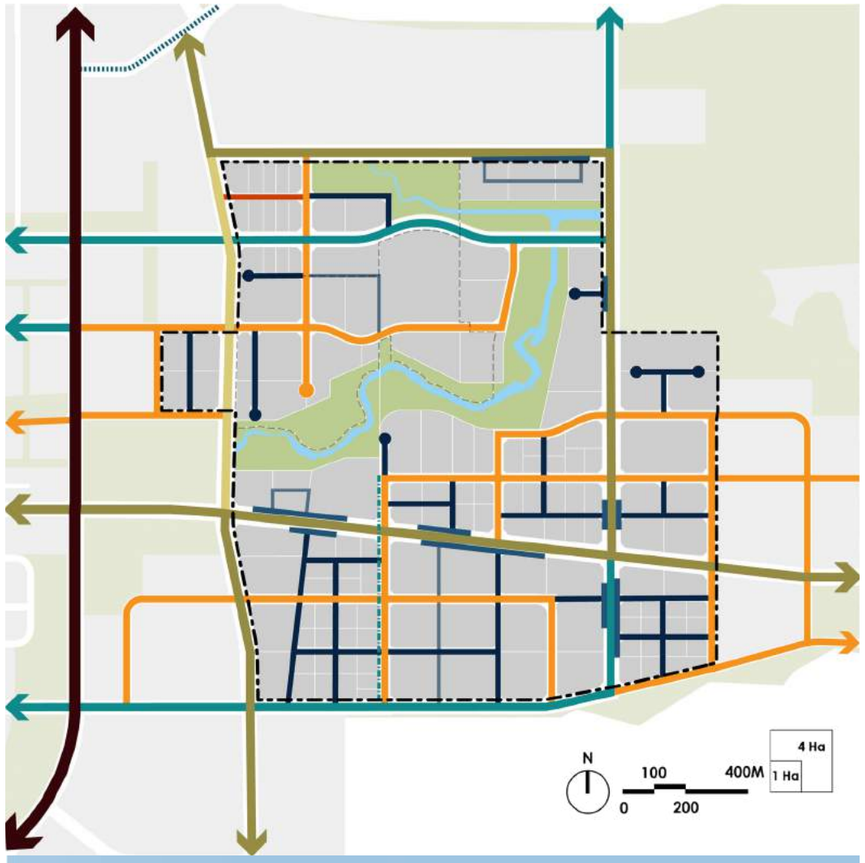


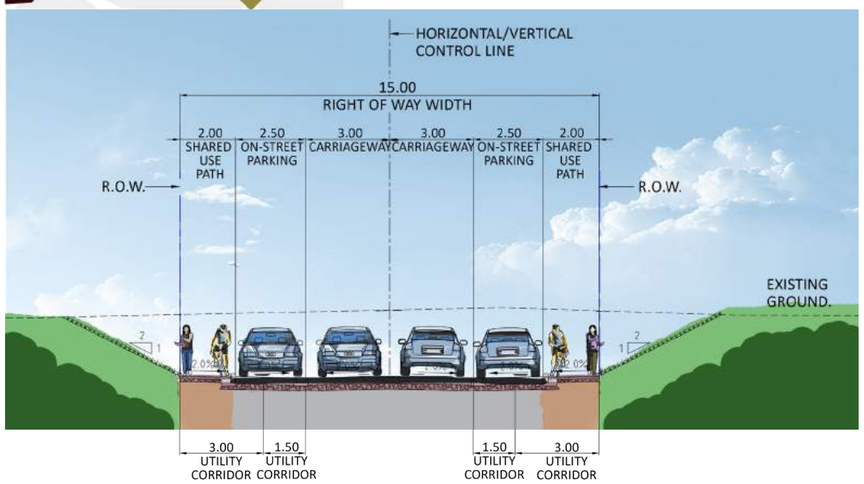
Note:
1. Drawing Not To Scale.

Figure 5.20 Typical Intersection Design

Source: Dubai Pedestrian and Cyclist Design Manual, January 2006, Chapter 14

Figure 5.21 Road Network





NOTE: Typical Road Cross Sections are based on the Overall NCC transport plan proposed Road Cross Sections (as of June 2020).

Figure 5.22 Proposed Typical Cross Sections for Local Roads

5.3.7 ROAD SECTIONS

Cross Section

A vertical section of the ground and roadway at right angles to the centerline of the roadway, including all elements of a highway or street from right-of-way line to right-of-way line.

- Roadway
  This is the portion of a highway, including shoulders, for vehicular use. A divided highway has two or more roadways.

- Traveled Way
  The portion of the roadway for the movement of vehicles, exclusive of shoulders and bicycle lanes.

- Curb
  It incorporates some raised or vertical element and serves as drainage control, roadway edge delineation, right-of-way reduction, aesthetics, delineation of pedestrian walkways, reduction of maintenance operations, and assistance in orderly roadside development.

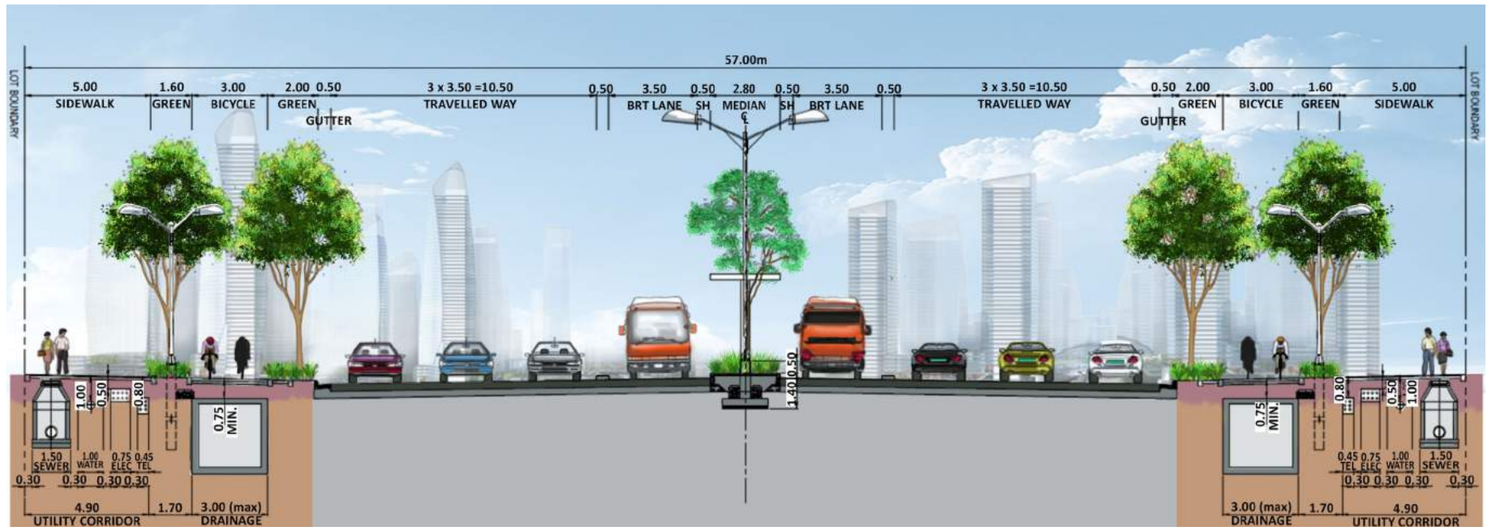
- Sidewalk
  It is a path along the side of a road commonly used by pedestrians.

- Bicycle Lane
  Bicycle usage can be expected on most urban arterials and should be considered in arterial street design. Features provided for bicycles may include wider outside lanes (with or without shared lane markings), bike lanes, and shared use side paths.

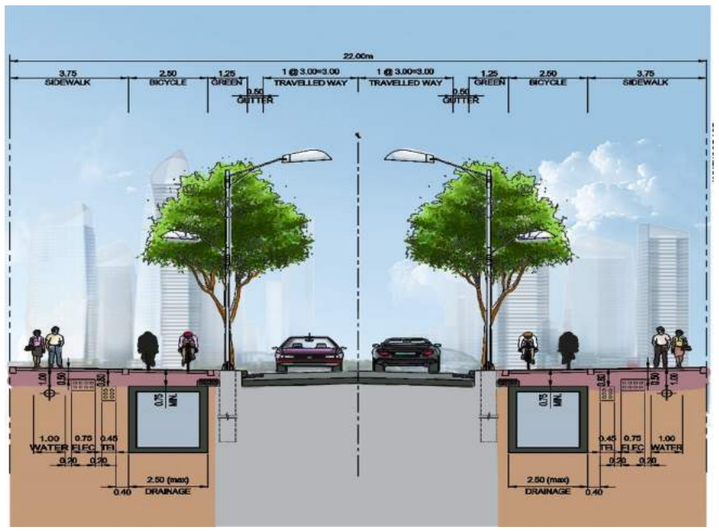
- Island
  It is a defined area between traffic lanes used for control of vehicle movements. Islands also provide an area for pedestrian refuge and traffic control devices.

- Right-of-Way
  The width of right-of-way for the complete development of an arterial street is influenced by both vehicular and non-motorized traffic demands, topography, land use, cost, intersection design, and the extent of ultimate expansion.

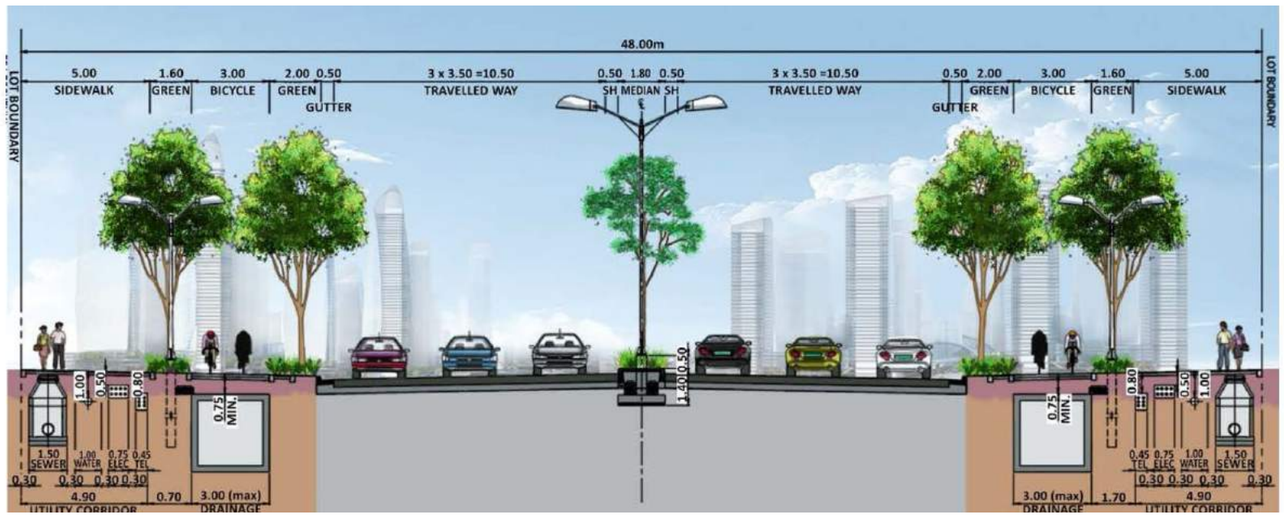
Source: AASHTO, A Policy on Geometric Design of Highways and Streets



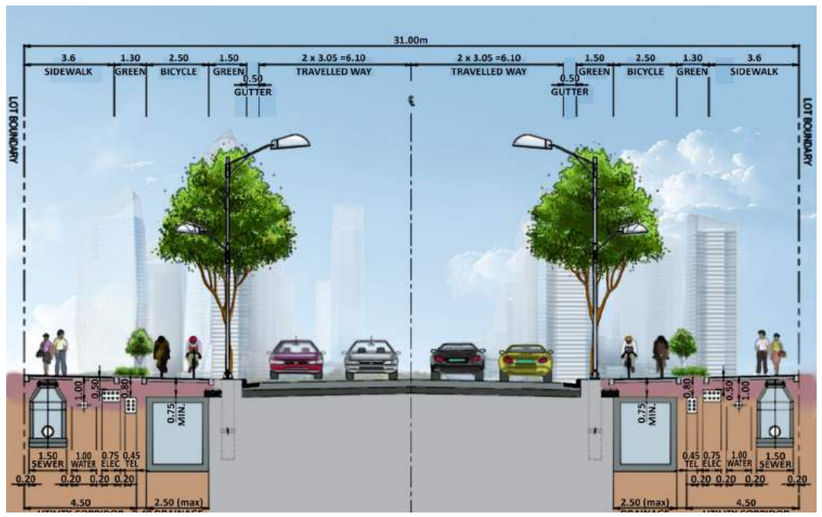
PRIMARY ARTERIAL ROAD (57M)



MINOR COLLECTOR ROAD (22M)



MINOR ARTERIAL ROAD (48M)



COLLECTOR ROAD (31M)

Figure 5.23 Typical Cross Sections for Arterial and Collector Roads *Source: The Overall NCC transport plan (as of June 2020).*

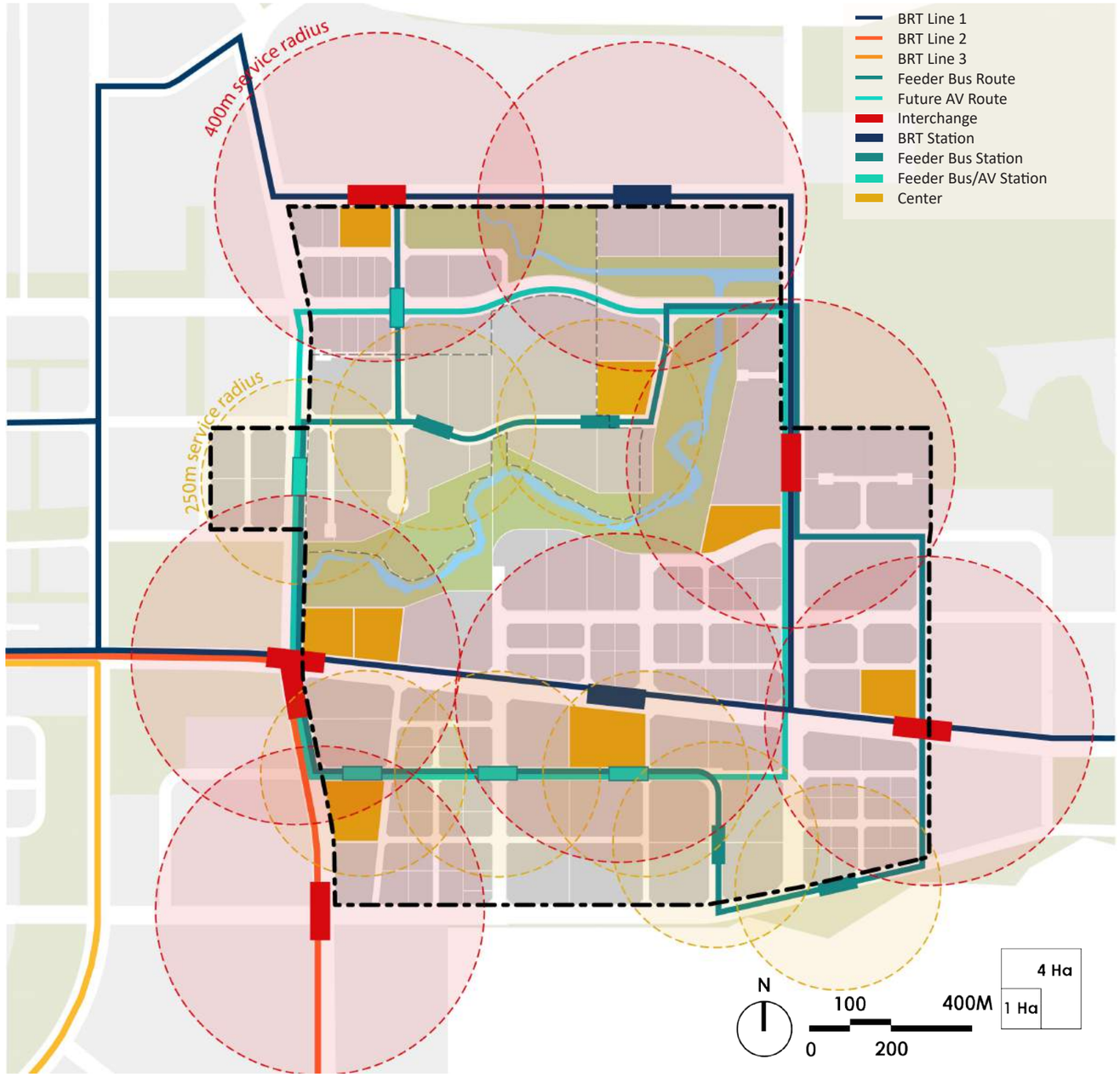


Figure 5.24 Public Transport Service Radius

5.4 PUBLIC TRANSPORT

5.4.1 NGAC'S NETWORK / SYSTEM

Rational of a Public Transport System

The needs of public transit should be considered in the development of an urban highway improvement program.

Design and operational features of the highway that are affected by these considerations include:

1. Locations of bus stops (spacing and location with respect to intersections and pedestrian crosswalks);
2. Design of bus stops and turnouts;
3. Reservation of bus lanes; and
4. Special traffic control measures.

BRT Network

- BRT Network based on Overall NCC Transport Plan (as of June 2020).
- BRT stations are proposed at a 400m (or 5min walk) service radius, along key pedestrian corridors and at identified centers, where possible.

Automated Vehicle (AV) Network

- In the short term, an AV system may be proposed to supplement the center of NGAC which are not within the service radius of the BRT.

Feeder Bus/ Guided Bus Network

- Before the construction of the Guided Bus System, a complementary feeder bus system may be introduced.
- Feeder bus and guided bus stations are proposed at a 250m (or 3min walk) service radius, along key pedestrian corridors and at identified centers.

5.4.2 BUS SPECIFICATIONS

The project will be utilizing the Bus Rapid Transit (BRT) system as a mode of transportation around the site. Feeder buses will also supplement the BRT system and provide easy access to the main route. The proposed BRT line will greatly impact the quality of life in the area. The system provides an eco-friendly alternative to using private cars without sacrificing safety and travel time. With that, fewer cars will be on the road which will effectively lower the emission of greenhouse gases and reduce road fatalities, crashes and injuries.

To minimize the ecological footprint of the BRT system, it is recommended to use cleaner vehicle technologies and standards to power the buses. By also limiting the use of private cars, people are encouraged to walk to their destinations from the station which will affect general public health. Faster travel time also equates to time savings and can be beneficial for the businesses surrounding the area.

Transit Bus

Transit buses are used for servicing short to medium distance trips. They usually belong to a publicly scheduled bus service network. A transit bus is commonly equipped with simple benches and have no additional space for luggage.

Features:

- Seating capacity: 29 (+1)
- Standing room: 76
- Multiple doors
- Stop request button
- Low floor technology
- Passenger information system

Coach Bus

Coach buses are typically designed for longer distance travel.

Features:

- Seating capacity: 44 to 49 (+1)
- Reclining seats
- Tables
- Luggage racks
- Toilets
- Entertainment
- Curtains

Articulated Bus

An articulated bus is an extended bus that is linked in two or more sections with the use of pivoting joints. This bus type is used for mass rapid transit systems. They can be designed as single-deck or double-decker bodies.

Features:

- Seating capacity: 48 (+1)
- Standing room: 98

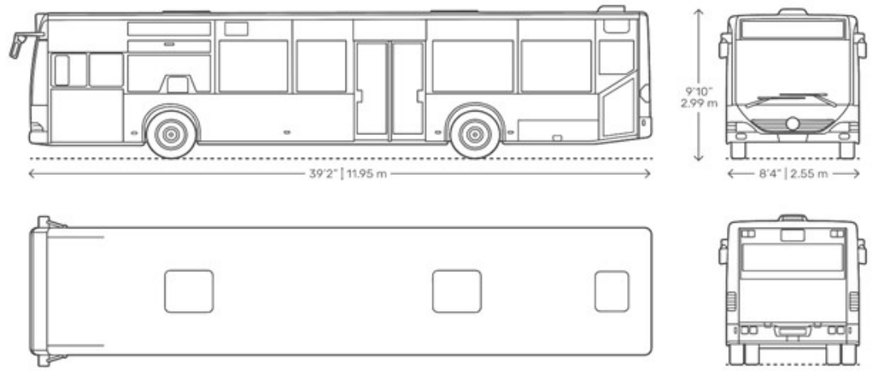


Figure 5.25 Transit Bus

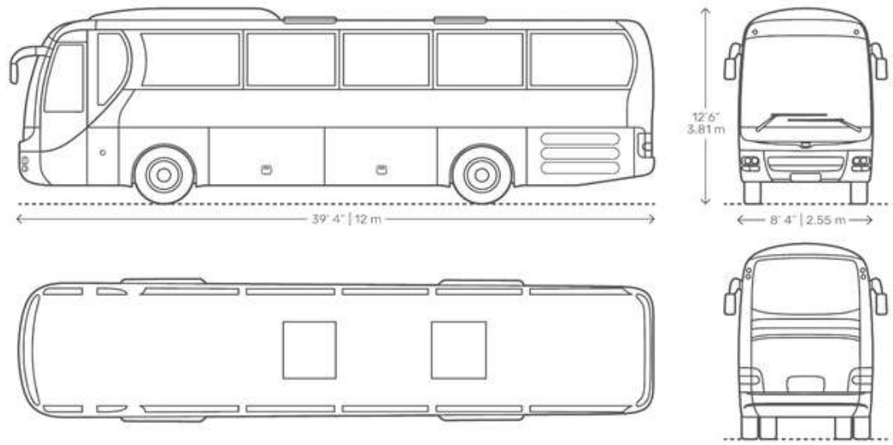


Figure 5.26 Coach Bus

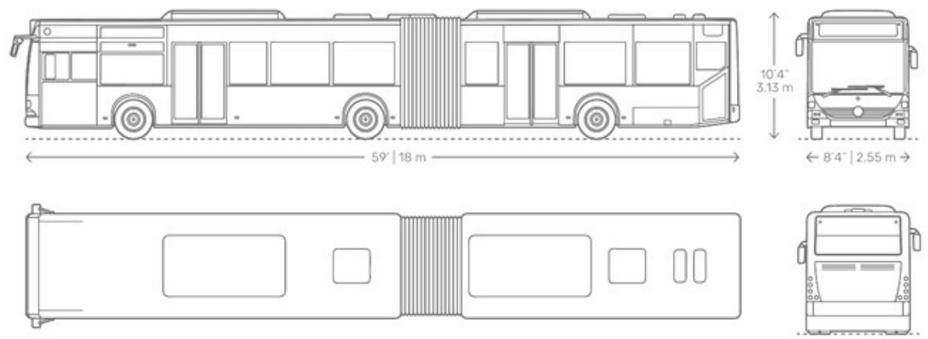


Figure 5.27 Articulated Bus *(Source: www.dimensions.com)*

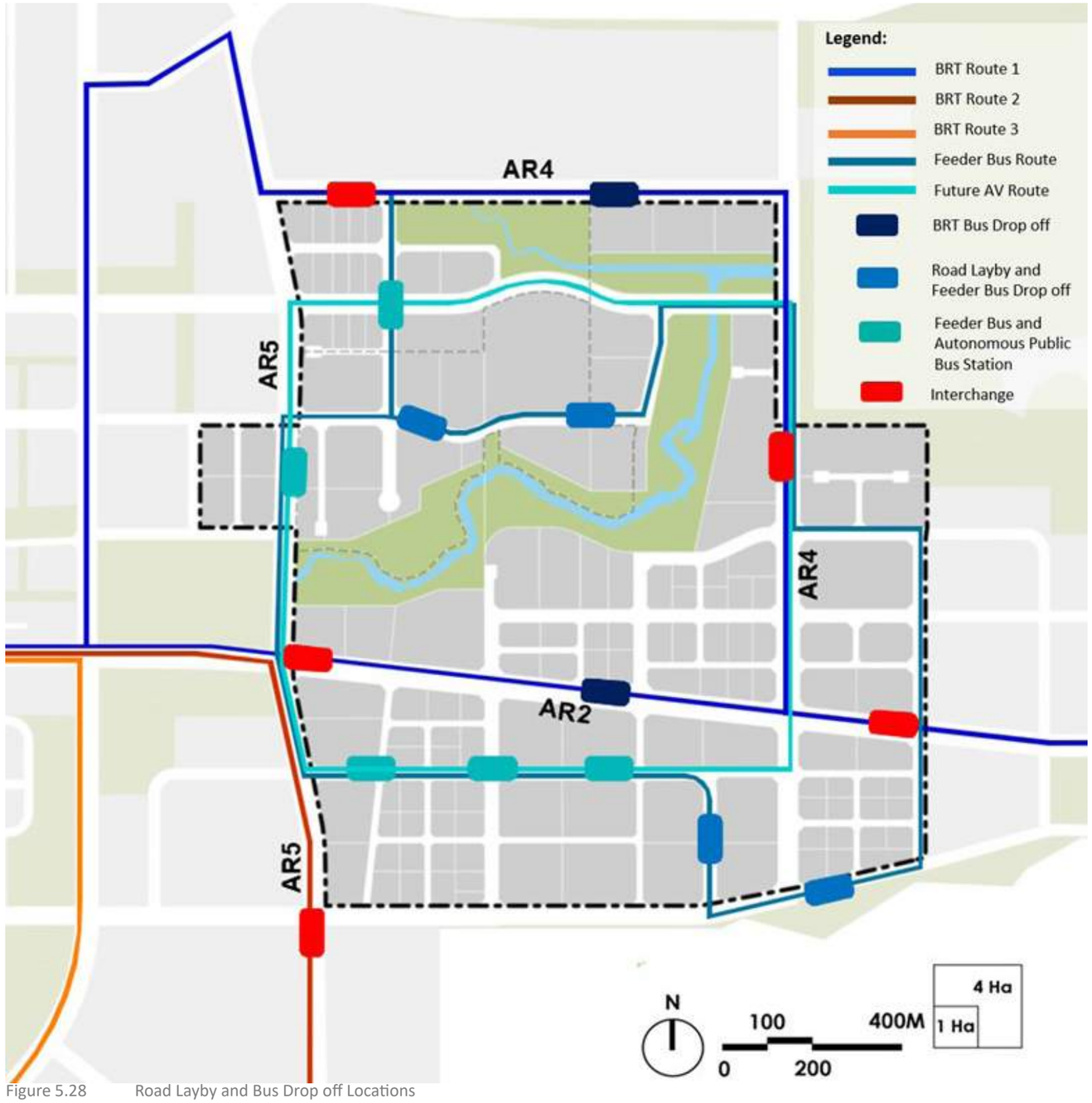


Figure 5.28 Road Layby and Bus Drop off Locations

5.4.3 ROAD LAYBYS AND BUS DROP OFFS

Locations and Reference Images

BRT Bus Drop Offs/ Interchanges, Feeder Bus/ Autonomous Public Bus Stations and Road Laybys locations are based on the Overall NCC Transport Plan (as of June 2020).

Figure 5.29 BRT Bus Drop off Sample

Figure 5.30 Roadside Layby and Feeder Bus Drop off Sample

Source: (1) WRI Brasil Cidades Sustentáveis; (2) Hanergy Thinfilm Power Group

5.4.4 BUS STOP DESIGN

The design of bus stops is a crucial element in providing quality bus services. Several factors need to be carefully considered in ensuring the bus stop's accessibility and overall functionality.

Bus Location and Spacing

The ideal spacing for bus stops is approximately 400m. Closer spacing can be provided to meet passenger needs. . Consideration should be given to improving spacing, and reviewing locations, particularly where interchange is an issue. Bus stops must be carefully planned as it affects the journey time.

Factors to consider:

- Close to main junctions without affecting road safety or junction operation
- Visibility of driver and prospective passengers to each other
- Adequate footway width
- Away from sites likely to be constructed
- Close proximity to pedestrian crossings
- Tail to tail on opposite sides of the road
- Sufficient space for a bus shelter
- Minimal walking distance between interchange stops

Curb Height

Standard curb height is 125mm to maintain a 12 percent or 7-degree gradient for deployed ramps. A curb height of 140mm is preferred for lower ramp gradients.

Bus Turnouts

Turnout Length: a minimum of 60 m and a maximum of 185 m based on a bus length of 15 m.
Minimum Width: 3.6 m
Minimum Width of Pedestrian Sidewalk or Platform: 2.0m

Specific location of turnouts shall take into consideration the following:

- Proximity to where pedestrians are concentrated
- Being 'downstream' of any road intersections
- A minimum spacing of 500 m in urban areas and 1000 m in rural areas
- An offset stagger of at least 30 m for turnouts on opposite sides of the road.

Figure 5.31 A bus stop in London
Source: publictechnology.net

Bus Boarders

Bus boarders are usually built out from existing curb lines and provide a platform for boarding. A full width boarder should project far enough into the carriageway for the bus to avoid maneuvering past parked vehicles. For cars this should be at least 2m and a minimum of 2.6m where goods vehicles/vans are stopping.

- Full width boarder
- Alternative full width boarder layouts
- Multiple Bus Full Width Boarders
- Half width boarder
- Angled boarder

Bus Stop Layouts

The ideal spacing for bus stops is approximately 400m. Closer spacing can be provided to meet passenger needs. Bus stops must be carefully planned as it affects the journey time.

Bus Maneuvers

A clear exit distance of 9m is the minimum length required for buses to leave the stop and rejoin the general traffic lane without the vehicle rear overhanging the curb. The absolute minimum of 7m can be used in constrained sections.

NOTE: Information to be confirmed with the Transport Planner.

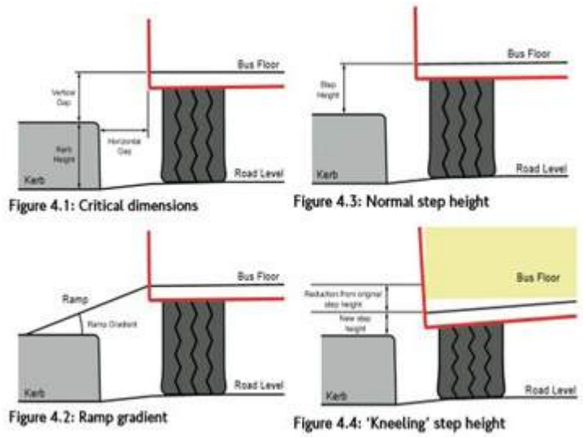


Figure 5.32 Relationship between bus and curb

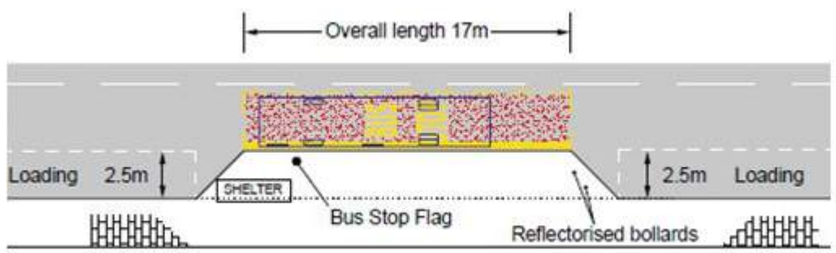


Figure 5.33 Bus stop with full width boarder

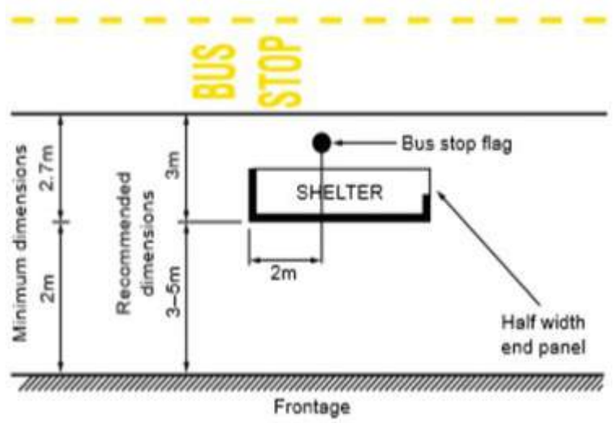


Figure 5.34 Passenger waiting area critical dimensions
Source: Accessible Bus Stop Guidance (Transport for London)

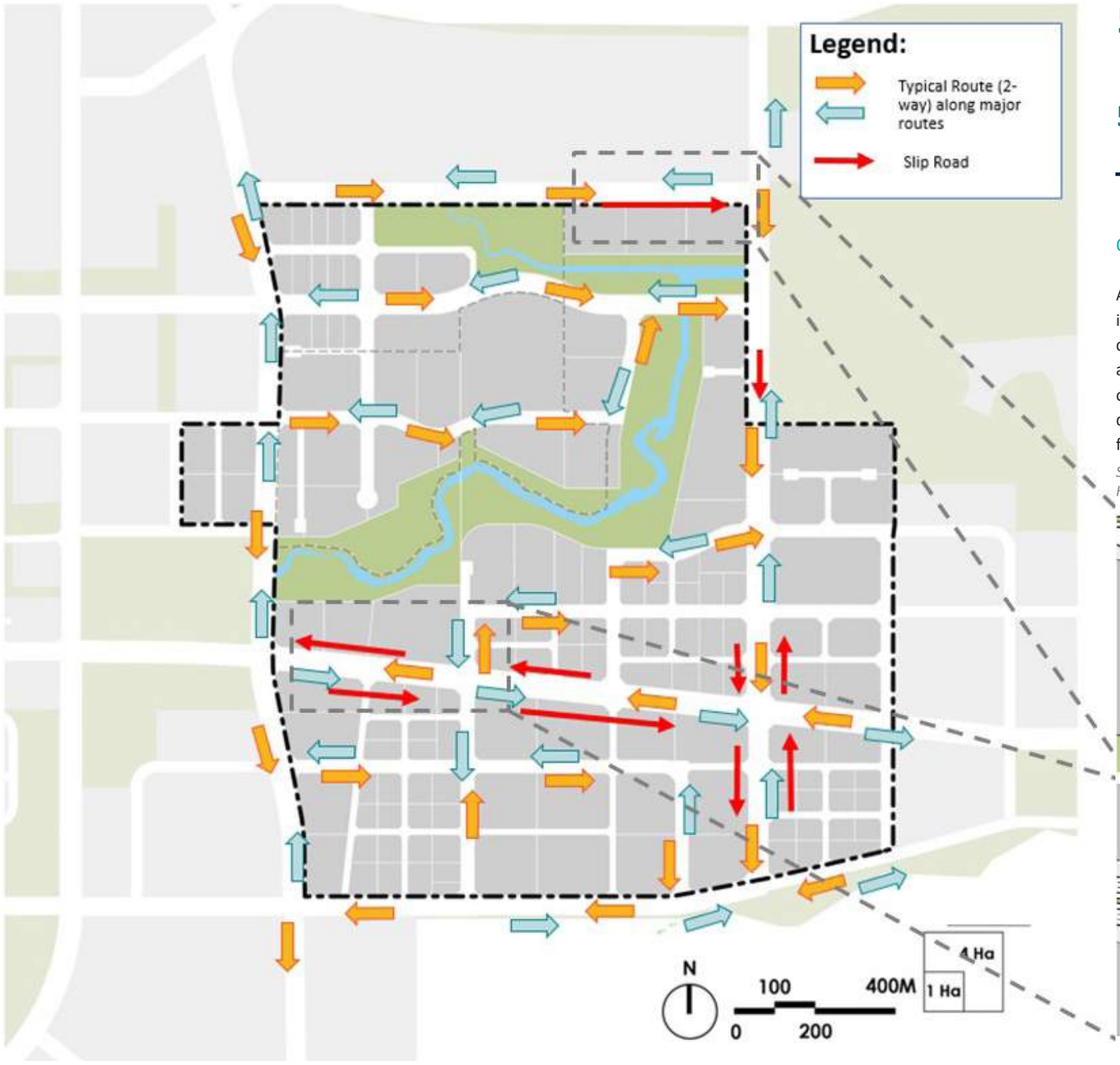


Figure 5.35 Vehicular Movement

5.5 VEHICULAR CIRCULATION

5.5.1 MOVEMENT & FLOW

Overall and Detail Plans

A clear hierarchy of vehicular movement is provided within the NGAC district. The conflict between serving through movement and providing access to a dispersed pattern of trip origins and destinations leads to the differences and gradations in the various functional types.

Source: AASHTO, A Policy on Geometric Design of Highways and Streets

- Major routes are typically Two-Way.
- Regulated limitation of access is needed on arterials to enhance their primary function of mobility, whilst Slip roads are proposed to facilitate access to nearby plots.
- Primary function of local roads and streets are to provide access.

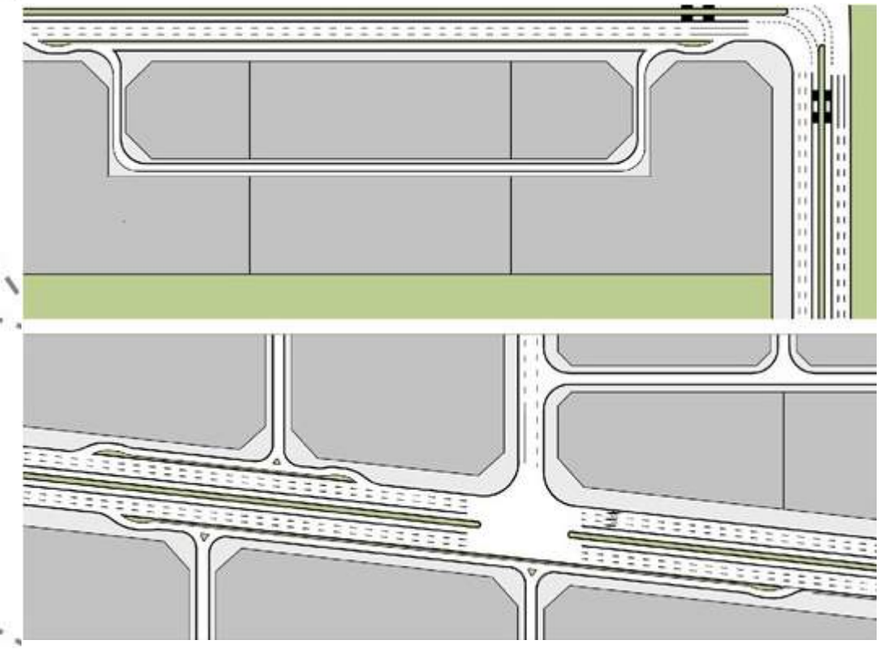


Figure 5.36 Blow-up View of Proposed Slip Roads

5.6 ACCESS TO PARCELS

5.6.1 VEHICULAR ACCESS

Access Control

The following access controls are proposed:

- The access to a property from an arterial road shall be prohibited to maintain smooth traffic flow.
- Access to individual developments are by collector roads or local roads only, with priority access from roads of lower hierarchy.
- It is proposed to include Right-In Right-Out (RIRO) for access from collector road. RIRO is an unsignalized access physically blocked by a median to prohibit left turns.

Vehicular Access Clearance

- The following minimum clearance for vehicular access from the edge of plot are proposed:

Distance from the turning radius is to refer to Table 5.1. For NGAC design, 25m curve radius will be employed.

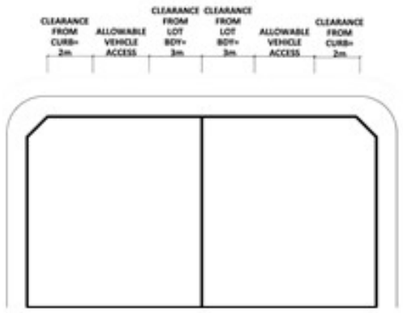


Figure 5.37 Minimum Vehicular Access Clearance from Curb and Lot

Table 5.1 Minimum Vehicular Access Clearance Distance from Edge of Plot

		If Vehicular Access on these road, the clearance should be			
		Primary Arterial	Minor Arterial	Collector Road	Local Road
Intersected with	Primary Arterial	×	50m	50m	25m
	Minor Arterial		25m	25m	25m
	Collector Road		25m	25m	25m
	Local Road		25m	25m	25m

Source: National Building Code of the Philippines

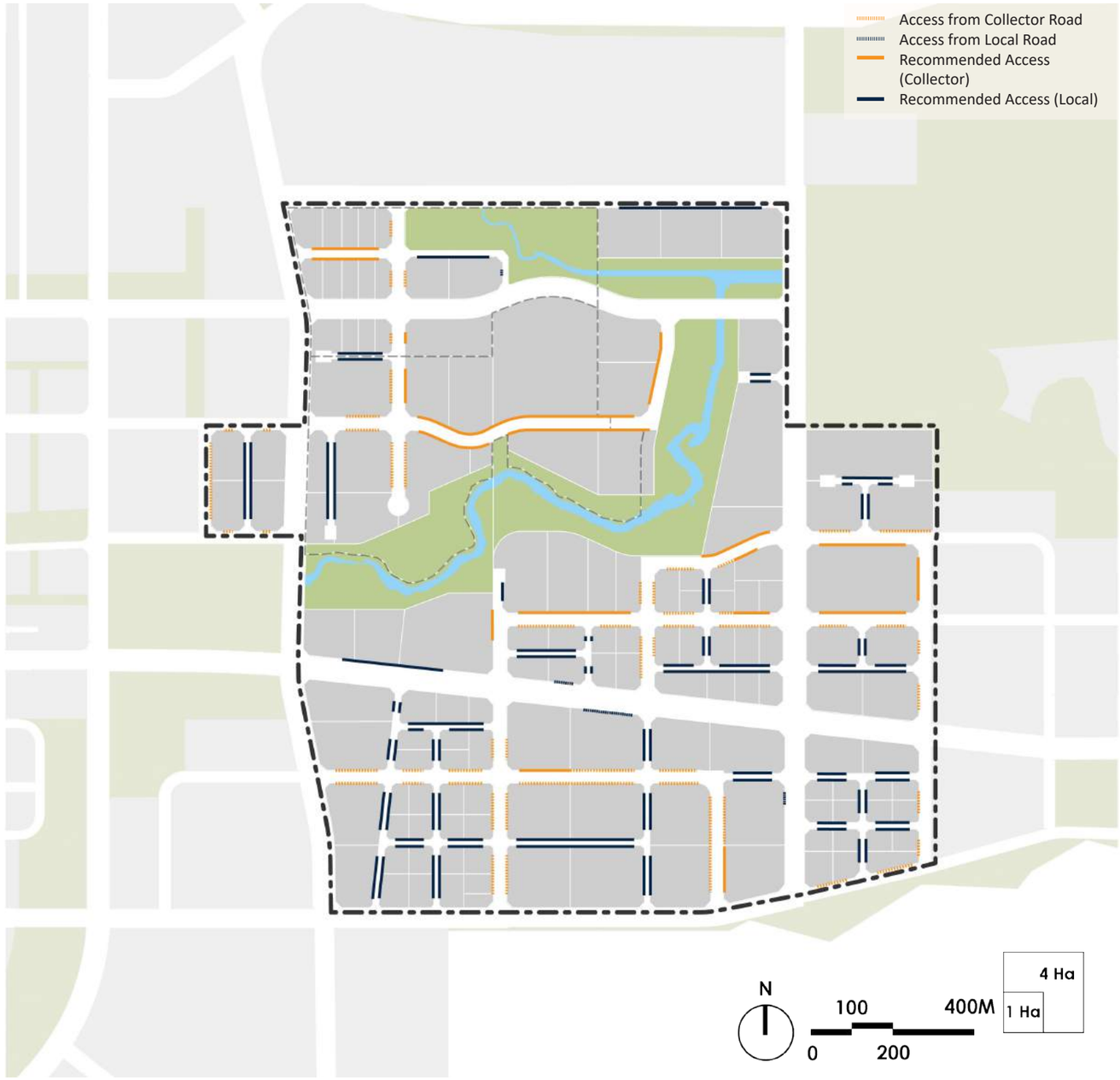


Figure 5.38 Vehicular Access Layout

Figure 5.39 Road/ Wayfinding Signage Locations

5.6.2 VEHICULAR ACCESS AND A CLEAR WAYFINDING AND ARRIVAL SEQUENCE

Access and Wayfinding

A standardized road traffic system is essential to ensure that drivers acquire the information necessary to enable them to comply with road regulations and to navigate their way around the road system in a safe and efficient manner.

Road Signage

Road Signs, includes Regulatory Signs, Warning Signs, Wayfinding Signs or Information Signs and Traffic Instruction Signs; and Pavement Markings are installed and applied at regular intervals along key pedestrian zones, at entrances / exits of transit stations and at all thoroughfares and intersections.

- Compliant with DPWH Standards..

Source: DPWH Highway Safety Design Standards Part 2

Figure 5.40 Example of Signage
Source: DPWH Highway Safety Design Standards Part 2

5.7 PARKING

5.7.1 LOCATION OF PARKING NODES

Car Parks: Centralized District Parking

- Located within 250m (3 min) from BRT Stations to encourage park-and-ride Combined parking requirements of multiple developments
- Proposed in the perimeter and away from key pedestrian corridors and green corridors, where possible
- Multi-modal, shared with Electric Vehicles (EVs), Automated Vehicle (AVs) and bikes
- Under the current code, only commercially available parking facilities located 200.0 meters from the building and permitted on-street parking may be the only ones counted as OFF-SITE/OFF-BUILDING parking compliance.

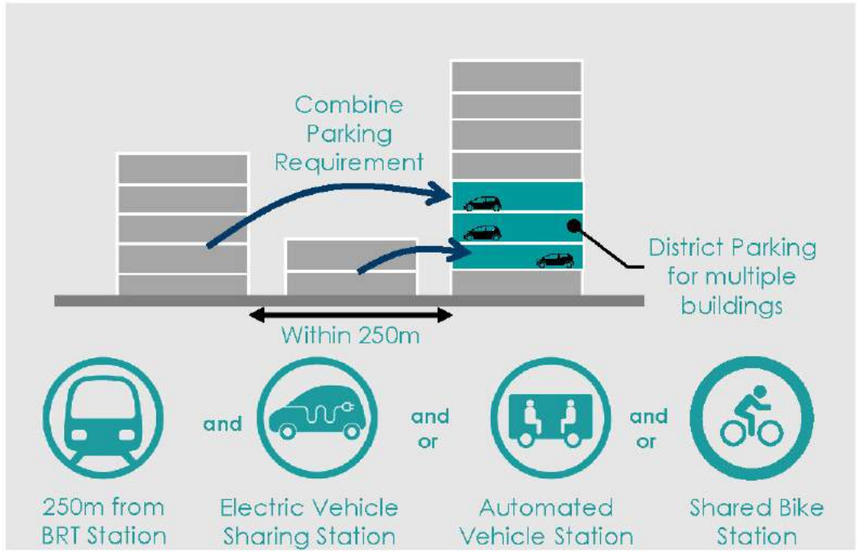


Figure 5.41 Example of District Parking

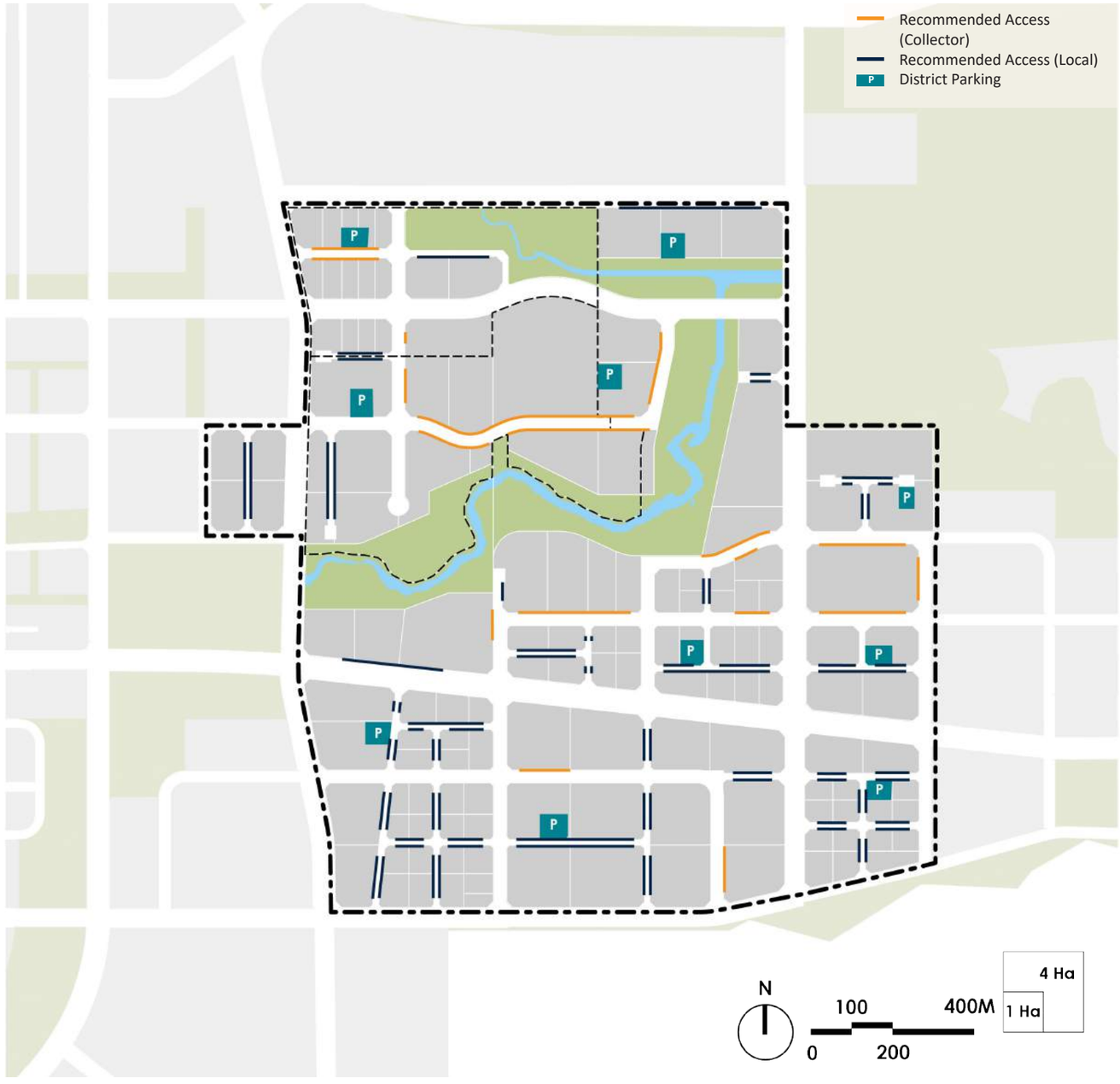


Figure 5.42 Location of Parking Nodes

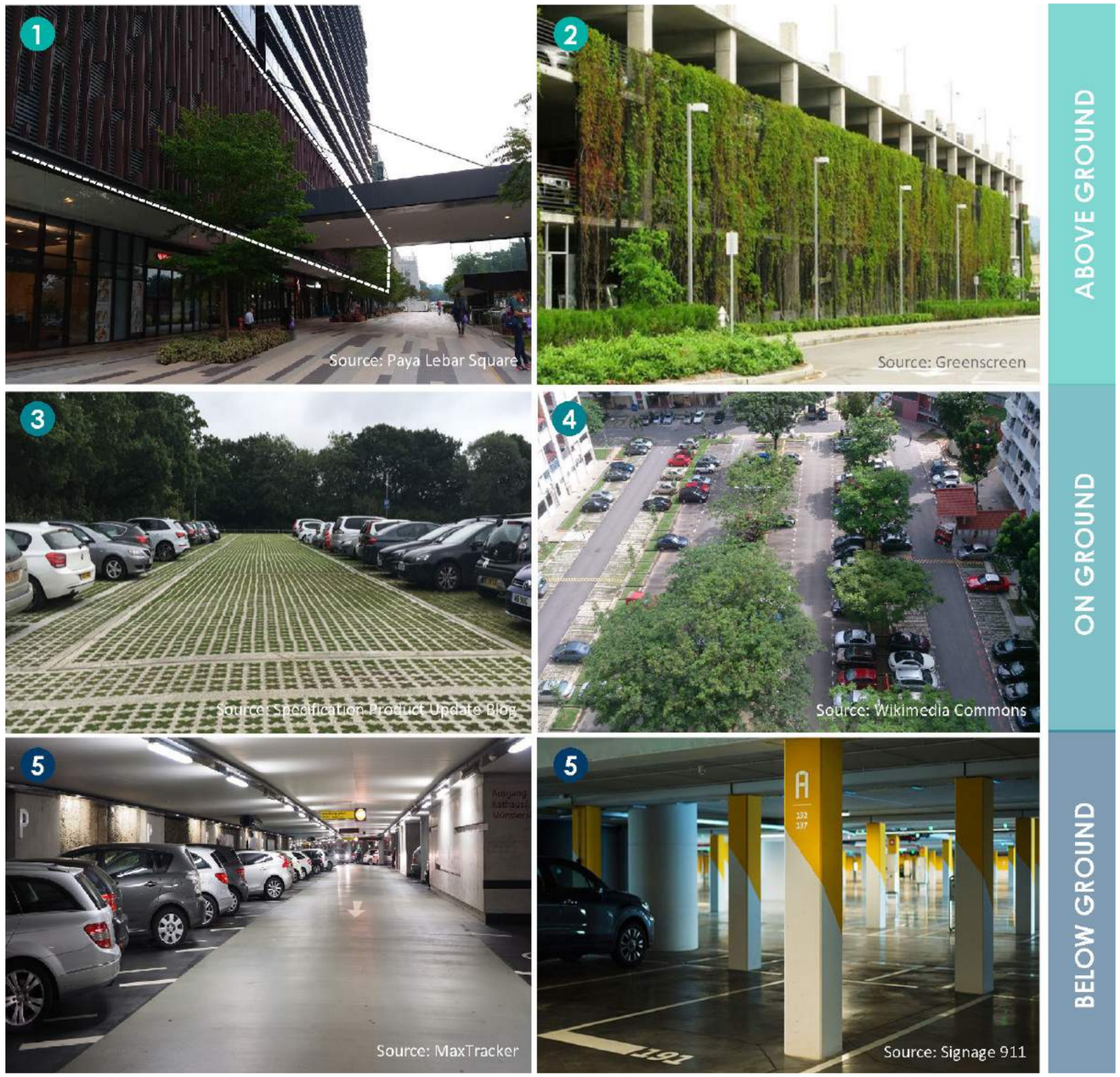


Figure 5.43 Sample Parking Type Locations

5.7.2 TYPE OF PARKING AREA

Parking Type Locations

Above Ground:

1. Parking above ground floor of developments
2. Multi-storey Carparks

On Ground:

3. Park-and-Ride Facilities

Park-and-ride facilities should be located adjacent to the street or highway and be visible enough to attract use by commuters. Other considerations that affect parking lot location are impacts on surrounding land uses, available capacity of the highway connecting roads to the system, terrain

- Surface Carpark shielded from the street by greenery
- Surface Carpark shielded from the street by developments

4. On-Street Parking

A road network should be designed and developed to provide for the safe and efficient movement of vehicles operating system. Although the movement of vehicles is the primary function of a roadway network, segments of the network may, as a result of land use, also provide on-street parking. Provisions of parking lanes parallel to the curb is needed to accommodate adjacent development.

Underground:

5. Basement Carparks

Source: AASHTO, A Policy on Geometric Design of Highways and Streets

5.7.3 ALLOCATION OF PARKING NODES TO ACCOMMODATE DEMAND

Table 5.2 Required Parking based on Land Use

PARAMETER / GUIDELINE	2013 IRR OF BP 344 ACCESSIBILITY LAW & 2005 NATIONAL BUILDING CODE
Accessible Parking Slot Provision	• Accessible parking dimensions and provisions
Required Parking based on Land Use	
R3 Rowhouse (Single Family and Multi family dwelling units)	• Minimum of one (1) pooled off-street cum on-site parking slot per 4 or 6 lots, with conditions based on NBC Table VII.4, 1.1 Division A-1 • 1 per lot (Lots with >120 sqm)
R5 Residential Condominium	• 1 per 4, 6, or 8 Units, with conditions based on NBC Table VII.4, 1.2 Division A-2 • 1 per unit (Units with >100 sqm GFA)
Hotel	• 1 car parking per 3 or 7 rooms, with conditions based on NBC Table VII.4, 2.1 Division B-1 • 2 tourist bus parking • Minimum loading slots based on NBC Table VII.4, 2.1 Division B-1
Residential Hotel	• 1 car slot per 5 units • 1 bus parking slot per 60 rooms/units • (conditions based on NBC Table VII.4, 2.1 Division B-1)
General Institutional (GI) - Educational	• 1 car slot per 5 classrooms • 1 off-RROW (or off-street) passenger loading space for 2 queued jeepney / shuttle slots • 1 school bus slot per 100 students
Health Facilities	• Public hospital (with conditions based on NBC Table VII.4, 4.2 Division D-2): • 1 car parking slot per 25 beds • 1 passenger loading space for 2 queued jeepney / shuttle slots • 1 loading slot for articulated truck/vehicle • 1 loading slot for standard truck per 5,000 sqm of GFA
	• Private hospital (with conditions based on NBC Table VII.4, 4.2 Division D-2): • 1 car parking slot per 12 beds • 1 passenger loading space for 2 queued jeepney / shuttle slots • 1 loading slot for articulated truck/vehicle • 1 loading slot for standard truck per 5,000 sqm of GFA

PARAMETER / GUIDELINE	NATIONAL BUILDING CODE (2005)
Required Parking based on Land Use	
Utilities, Transportation and Services (UTS): Terminals, multi-modals and inter-modals	• 1 car slot per 500 sqm of GFA • 1 passenger loading space for 2 queued jeepney / shuttle slots or 2 queued bus slots (as applicable) (with conditions based on NBC Table VII.4, 5.1 Division E-1)
Utilities, Transportation and Services (UTS): Transit stations	• 1 passenger loading space for 4 queued jeepney / shuttle slots or 3 queued bus slots (as applicable) (with conditions based on NBC Table VII.4, 5.1 Division E-1)
C-1 Commercial (Neighborhood shopping center/ supermarket)	• 1 car slot per 100 sqm of shopping floor area (with conditions based on NBC Table VII.4, 5.2 Division E-2)
C-2 Public Market	• 1 customer jeepney/shuttle parking slot per 150 sqm. market floor area • 1 vendor jeepney/shuttle parking slot per 300 sqm. market floor area • 1 off-RROW terminal for 2 jeepneys and 6 tricycle for 1000 sqm. market floor area
C-2 Restaurant, fast food centers, bars and beer houses	• 1 car slot per 30 sqm of customer area
C-2 Nightclubs, super clubs and theatre restaurants	• 1 car slot per 20 sqm of customer area
C-3 Aircraft hangars, open parking carports and garages, etc.	• 1 car slot per 1000 sq. m of GFA 1 bus slot per 100 worker 1 off-RROW passenger loading space for 2 queued jeepney/shuttle slots
Units located in office, commercial or mixed-use condominium buildings (R-MU)	• 1 per 1 or 2 Units, with conditions based on NBC Table VII.4, 1.2 Division E-2 • 1 per 70 sqm (Units with >70 sqm GFA) , with conditions based on NBC Table VII.4, 1.2 Division E-2
Public recreational assembly buildings (e.g., theaters / cinemas, auditoria, etc.) (CUL)	• 1 car slot • 1 jeepney/ shuttle slot per every 50 sqm of spectator area • 1 bus parking per 200 spectators (with conditions based on NBC Table VII.4, 8.1 Division H-1)

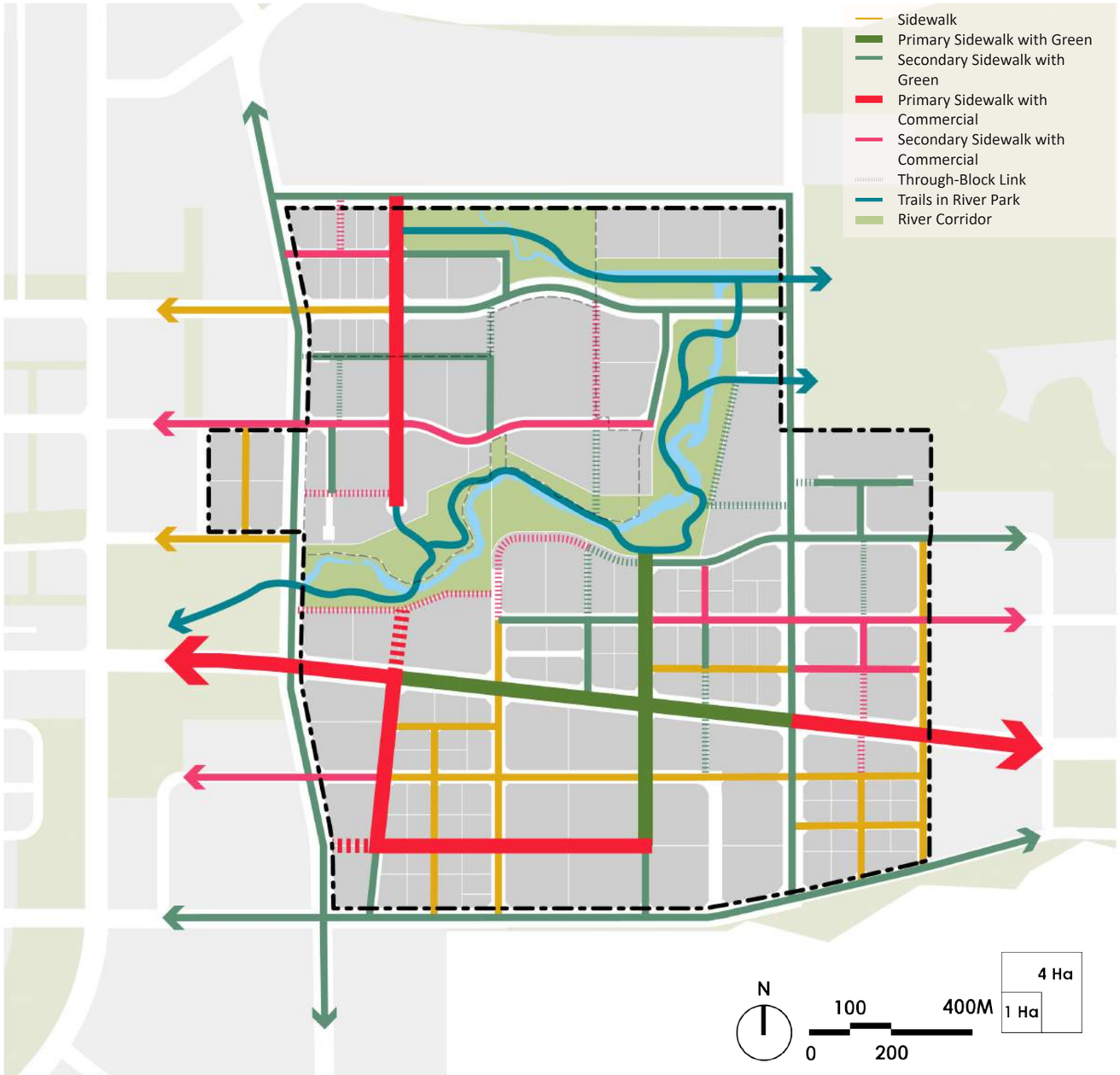


Figure 5.44 Pedestrian Network

5.8 NON-MOTORIZED TRANSPORT

5.8.1 PEDESTRIAN NETWORK

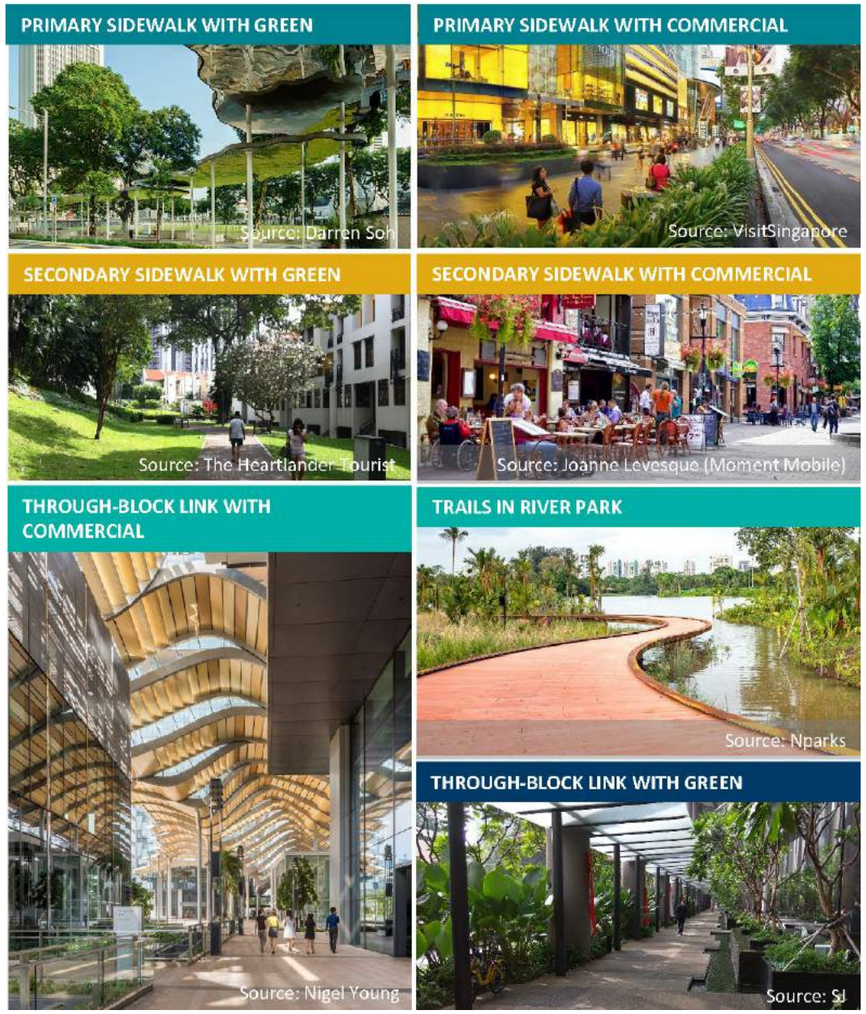


Figure 5.45 Sample Pedestrian Networks

5.8.2 CYCLING NETWORK

Non-motorized Transportation (NMT) Categories

Citywide Bicycle Lanes:

- 3.0m Width lanes along Arterial Roads and 2.5m Width lanes along Collector Roads.
- Cycling routes are integrated with Through-Block Link pedestrian network to increase the accessibility of each plot.

Bike Trails:

- Proposed recreational bike trails along the River Corridor.

Bicycle Sharing Station (Center):

- Bicycle Sharing Station also provide bicycle rack for bike parking.
- Proposed near open spaces or transport nodes to ensure seamless urban mobility.

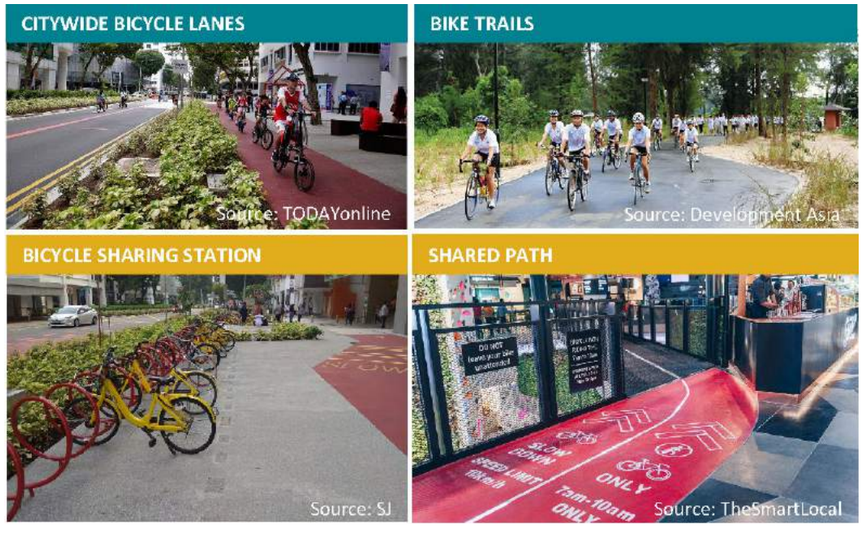


Figure 5.46 Sample Bicycle Sharing Station, Lanes and Trails

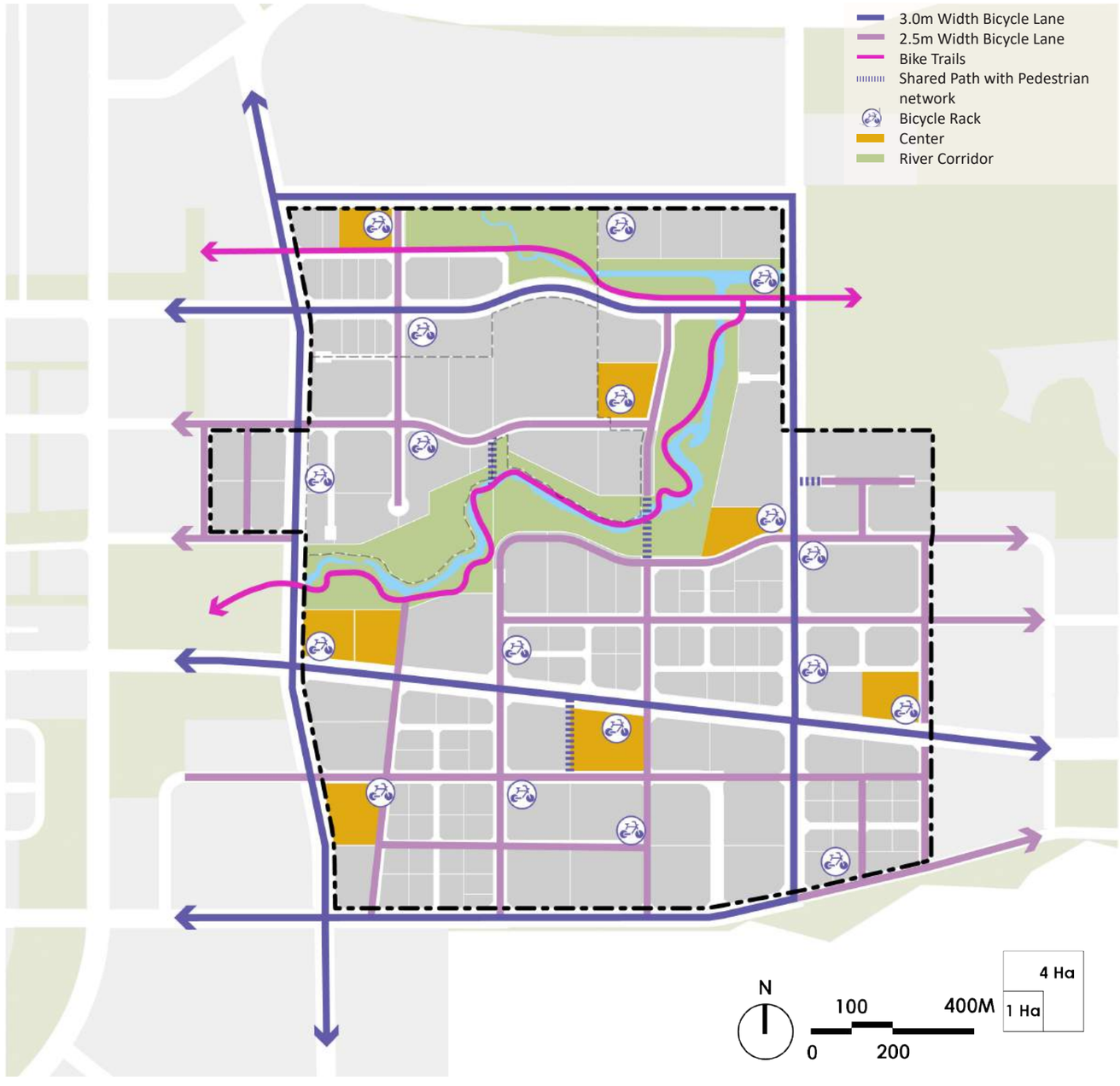


Figure 5.47 NMT Network

Figure 5.48 Example of Bicycle Parking

Sources: (1) San Francisco Bicycle Coalition (Flickr); (2) Sara Maroto Hebrero (Behance)

5.8.3 BICYCLE FACILITIES

Bicycle Facilities

Places to park, facilities to secure a cycle, lockers for personal possessions, and shower facilities.

- All developments shall comply with the minimum bicycle parking space requirements and provision of the End-of-Trip facilities can also qualify for GFA exemption are in the Table 5.3. This is to encourage locators to provide End-of-Trip facilities to better meet the needs of cyclists. Locators can submit their proposals for the Declarant's evaluation.

- Bicycle parking spaces provided will be exempted from GFA computation. The GFA exemption will also apply to surplus provision of bicycle parking spaces above minimum requirements if assessed by the Declarant to be reasonable, depending on the context of the development.

Bicycle Parking

- Bicycle parking is encouraged at the entrances of larger developments, at parks and public facilities, and transit stations and stop.

- Bicycle parking and racks may be integrated with other public furniture elements.

- Where possible, bicycle parking shall be sheltered and secure, such as through the provision of bicycle shelters and bicycle lockers.

- The provision of wayfinding signages to major destinations, transits stops and stations, and other guide maps catered to cyclist is recommended at bicycle parking areas.

Table 5.3 Bicycle Facilities and GFA Exemption

PROPOSED USE	MINIMUM BICYCLE PARKING SPACE REQUIREMENT	END-OF-TRIP FACILITIES THAT WILL BE EXEMPTED FROM GFA COMPUTATION
Residential		
Single-Family Housing Multi-Family Housing Condotel Ancillary Residential Facility Dormitory Workers' Accommodation	1 bicycle parking space for every 4 dwelling units	No GFA exemption for bicycle supporting facilities as shower/changing rooms are to be provided for within the home, or as part of the clubhouse facilities
Commercial		
Small Retail Shops Commercial Retail & Services, Financial Institutions/Bank Shopping Center/Mall, Hyper-mart Office Service Apartment Private Recreational Club, Holiday Chalet, Private Sports Club, Private Health Club Exhibition or Convention Hall	1 bicycle parking space for every 200m2 of floor area, for floor area up to 15,000 m^2, and 1 bicycle parking space for every subsequent 600m^2 of floor area, for floor area in excess of 15,000m^2	GFA exemption for bicycle supporting facilities, subject to: • 1 shower stall per 10 bicycle parking spaces (about 1.35sqm per shower stall) • Provision and size of lockers and PMD lockers to be subjected to evaluation • 1 toilet per cluster of facilities • Facilities should be located near the bicycle parking spaces for the convenience of cyclists
Home Office	1 bicycle parking space for every 4 dwelling units	No GFA exemption for bicycle supporting facilities as shower/changing rooms are to be provided for within the home, or as part of the clubhouse facilities
Industrial		
R&D Facility Automotive Repair Workshop Motor Vehicle Showroom Warehouse Non-Pollutive Industrial Use Industrial Uses Not Specified Above	1 bicycle parking space for every 150m^2 of floor area, for floor area up to 15,000m^2, and 1 bicycle parking space for every subsequent 1,000m^2 of floor area, for floor area in excess of 15,000m^2	GFA exemption for bicycle supporting facilities, subject to: • 1 shower stall per 10 bicycle parking spaces (about 1.35sqm per shower stall) • Provision and size of lockers and PMD lockers to be subjected to evaluation • 1 toilet per cluster of facilities • Facilities should be located near the bicycle parking spaces for the convenience of cyclists
Public Facilities		
Community Center Post Office Public Library Museum, Art Gallery, Concert Hall & Opera House, Cultural Center Government Facility Place of Worship	1 bicycle parking space for every 150m^2 of floor area, for floor area up to 15,000m^2 and 1 bicycle parking space for every subsequent 500m^2 of floor area, for floor area in excess of 15,000m^2	GFA exemption for bicycle supporting facilities, subject to: • 1 shower stall per 10 bicycle parking spaces (about 1.35sqm per shower stall) • Provision and size of lockers and PMD lockers to be subjected to evaluation • 1 toilet per cluster of facilities • Facilities should be located near the bicycle parking spaces for the convenience of cyclists
Sports and Recreation		
Place of Recreation, Sports or Culture, Multi-Purpose Arena Sport Complex, Stadium Sports Club, Gym	1 bicycle parking space for every 150m^2 of floor area, for floor area up to 15,000m^2 and 1 bicycle parking space for every subsequent 500m^2 of floor area, for floor area in excess of 15,000m^2	No GFA exemption for bicycle supporting facilities as shower/changing rooms/lockers should be provided as part of the development.

PROPOSED USE	MINIMUM BICYCLE PARKING SPACE REQUIREMENT	END-OF-TRIP FACILITIES THAT WILL BE EXEMPTED FROM GFA COMPUTATION
Educational Facilities		
Kindergarten, Day Care Center Primary, Secondary and High Schools (K-12)	1 bicycle parking per 5 pupils	No GFA exemption for bicycle supporting facilities as shower/ changing rooms/ lockers should be provided as part of the development
Polytechnic, University, Vocational School	2 bicycle parking per 200 students	
Food and Entertainment Facilities		
Night Club, Disco House & Dance Hall, KTV, Music Bar, Cocktail Lounge Hotel Place of Public Entertainment, Amusement Hall & Parlor, Entertainment Arcade, Cinema & Theater Restaurant Fast Food, Takeaway Food	1 bicycle parking space for every 100m² of floor area	GFA exemption for bicycle supporting facilities, subject to: • 1 shower stall per 10 bicycle parking spaces (about 1.35sqm per shower stall) • Provision and size of lockers and PMD lockers to be subjected to evaluation • 1 toilet per cluster of facilities • Facilities should be located near the bicycle parking spaces for the convenience of cyclists
Healthcare Facilities		
Hospital, Health Institution	1 bicycle parking per 15 beds	GFA exemption for bicycle supporting facilities, subject to: • 1 shower stall per 10 bicycle parking spaces (about 1.35sqm per shower stall) • Provision and size of lockers and PMD lockers to be subjected to evaluation • 1 toilet per cluster of facilities • Facilities should be located near the bicycle parking spaces for the convenience of cyclists
Sanitaria, Nursery or Convalescent Homes	1 bicycle parking per 7 beds	
Clinic/Polyclinic, Dental Clinic	1 bicycle parking space for every 150m² of floor area	
Infrastructure		
Public Transport Station (BRT/LRT Station and Line) Public Transport Hub (Rail Station, Terminal, Bus Interchange)	1 bicycle parking space for every 150m² of floor area, for floor area up to 15,000m² and 1 bicycle parking space for every subsequent 500m² of floor area, for floor area in excess of 15,000m²	GFA exemption for bicycle supporting facilities, subject to: • 1 shower stall per 10 bicycle parking spaces (about 1.35sqm per shower stall) • Provision and size of lockers and PMD lockers to be subjected to evaluation • 1 toilet per cluster of facilities • Facilities should be located near the bicycle parking spaces for the convenience of cyclists

Table 5.4 Car and Bicycle Parking Allocation

Zone	Plot ID	Plot Area	GFA	Car Parking Factor	Required Car Parking	Bicycle Factor	Required Bike Parking
R3 High Density Residential Zone							
Zone D	D-01-01	22,870	68,610	333.0	206	143	480
Zone D	D-01-02	22,035	66,104	333.0	199	143	462
Zone D	D-02-01	38,718	116,154	333.0	349	143	812
Zone D	D-02-02	18,001	54,004	333.0	162	143	378
Zone D	D-02-03	20,604	61,812	333.0	186	143	432
R-MU Mixed Use Residential Zone							
Zone A	A-03-01	12,737	50,948	173.0	294	229	222
Zone A	A-03-02	15,937	63,748	173.0	368	229	278
Zone B	B-01-02	18,803	75,210	173.0	435	229	328
Zone B	B-01-03	18,494	73,977	173.0	428	229	323
Zone B	B-01-04	18,382	73,526	173.0	425	229	321
Zone B	B-02-02	17,388	69,550	173.0	402	229	304
Zone B	B-02-03	17,767	71,066	173.0	411	229	310
Zone D	D-01-08	25,563	102,254	173.0	591	229	447
Zone D	D-01-09	19,450	77,799	173.0	450	229	340
Zone E	E-02-10	15,051	60,203	173.0	348	229	263
Zone G	G-01-01	14,239	56,955	173.0	329	229	249
Zone G	G-01-02	14,239	56,955	173.0	329	229	249
Zone G	G-02-01	12,946	51,782	173.0	299	229	226
Zone G	G-02-02	10,430	41,720	173.0	241	229	182
C2 City Level Commercial Zone							
Zone C	C-02-02	8,404	25,211	75.0	336	274	92
Zone C	C-02-05	23,037	69,110	75.0	921	418	165
Zone C	C-02-10	15,131	30,263	75.0	404	301	101
Zone D	D-01-07	15,829	47,488	75.0	633	368	129
Zone E	E-01-01	19,817	59,450	75.0	793	399	149
Zone E	E-01-02	21,504	64,513	75.0	860	410	157
Zone E	E-02-01	19,749	59,246	75.0	790	398	149
Zone G	G-01-03	14,940	44,820	75.0	598	359	125
Zone G	G-01-04	17,010	51,029	75.0	680	378	135
C3 Central Business Zone							
Zone C	C-02-09	14,566	58,262	102.0	571	396	147
GI-E General Institutional-Education Zone							
Zone C	C-02-11	39,820	39,820	642.0	62	25	1593
Zone D	D-01-06	43,866	43,866	642.0	68	25	1755
Zone D	D-04-01	46,192	46,192	642.0	72	25	1848

Zone	Plot ID	Plot Area	GFA	Car Parking Factor	Required Car Parking	Bicycle Factor	Required Bike Parking
GI-C General Institutional Civic Zone							
Zone A	A-01-01	7,122	14,244	287.0	50	150	95
Zone A	A-01-02	4,849	9,698	287.0	34	150	65
Zone A	A-01-03	4,052	8,104	287.0	28	150	54
Zone A	A-01-04	4,052	8,104	287.0	28	150	54
Zone A	A-01-05	4,131	8,261	287.0	29	150	55
Zone A	A-02-01	4,503	9,005	287.0	31	150	60
Zone A	A-02-02	4,823	9,645	287.0	34	150	64
Zone A	A-02-03	4,030	8,060	287.0	28	150	54
Zone A	A-02-04	4,030	8,060	287.0	28	150	54
Zone A	A-02-05	4,107	8,214	287.0	29	150	55
Zone A	A-04-01	6,682	13,364	287.0	47	150	89
Zone A	A-04-02	3,659	7,318	287.0	25	150	49
Zone A	A-04-03	3,659	7,318	287.0	25	150	49
Zone A	A-04-04	3,821	7,642	287.0	27	150	51
Zone A	A-04-05	29,577	59,154	287.0	206	314	188
Zone A	A-05-01	19,978	39,955	287.0	139	267	150
Zone A	A-05-02	16,878	33,757	287.0	118	245	138
Zone C	C-01-01	11,248	22,496	287.0	78	196	115
Zone C	C-01-02	11,247	22,493	287.0	78	196	115
Zone C	C-01-03	11,467	22,933	287.0	80	198	116
Zone C	C-01-04	11,035	22,071	287.0	77	193	114
Zone C	C-02-01	9,646	19,292	287.0	67	178	108
Zone D	D-01-10	11,190	22,379	287.0	78	195	115
Zone D	D-01-11	8,879	17,758	287.0	62	168	106
Zone D	D-03-01	6,667	13,334	287.0	46	150	89
Zone D	D-03-02	3,646	7,292	287.0	25	150	49
Zone D	D-03-03	4,211	8,421	287.0	29	150	56
Zone D	D-03-04	8,765	17,529	287.0	61	167	105
Zone D	D-03-05	3,713	7,425	287.0	26	150	50
Zone D	D-03-06	3,713	7,425	287.0	26	150	50
Zone D	D-03-07	4,800	9,600	287.0	33	150	64
Zone D	D-03-08	4,568	9,135	287.0	32	150	61
Zone E	E-01-03	9,037	18,073	287.0	63	170	106
Zone E	E-01-04	6,231	12,462	287.0	43	150	83
Zone E	E-01-05	4,081	8,162	287.0	28	150	54
Zone E	E-01-06	6,387	12,774	287.0	45	150	85
Zone E	E-01-07	4,600	9,200	287.0	32	150	61
Zone E	E-01-08	6,380	12,760	287.0	44	150	85
Zone E	E-01-09	5,846	11,693	287.0	41	150	78
Zone E	E-01-10	4,000	8,000	287.0	28	150	53

Zone	Plot ID	Plot Area	GFA	Car Parking Factor	Required Car Parking	Bicycle Factor	Required Bike Parking
			GI-C General Institutional Civic Zone				
Zone E	E-02-02	4,650	9,300	287.0	32	150	62
Zone E	E-02-03	5,253	10,506	287.0	37	150	70
Zone E	E-02-04	5,253	10,506	287.0	37	150	70
Zone E	E-02-05	5,583	11,165	287.0	39	150	74
Zone E	E-02-06	5,105	10,210	287.0	36	150	68
Zone E	E-02-07	5,062	10,125	287.0	35	150	67
Zone E	E-02-08	5,062	10,125	287.0	35	150	67
Zone E	E-02-09	5,411	10,822	287.0	38	150	72
Zone E	E-02-11	5,317	10,634	287.0	37	150	71
Zone E	E-02-12	4,725	9,450	287.0	33	150	63
Zone E	E-02-13	4,725	9,450	287.0	33	150	63
Zone E	E-02-14	5,050	10,101	287.0	35	150	67
Zone E	E-02-15	6,979	13,958	287.0	49	150	93
Zone E	E-02-16	5,590	11,181	287.0	39	150	75
Zone E	E-02-17	5,590	11,181	287.0	39	150	75
Zone E	E-02-18	3,522	7,044	287.0	25	150	47
Zone E	E-02-19	2,340	4,681	287.0	16	150	31
Zone F	F-01-01	6,819	13,638	287.0	48	150	91
Zone F	F-01-02	6,581	13,162	287.0	46	150	88
Zone F	F-01-03	4,556	9,113	287.0	32	150	61
Zone F	F-01-04	4,187	8,374	287.0	29	150	56
Zone F	F-01-05	6,341	12,683	287.0	44	150	85
Zone F	F-01-06	7,254	14,508	287.0	51	150	97
Zone F	F-01-07	5,628	11,255	287.0	39	150	75
Zone F	F-01-08	5,541	11,081	287.0	39	150	74
Zone F	F-02-01	6,468	12,936	287.0	45	150	86
Zone F	F-02-02	7,020	14,040	287.0	49	150	94
Zone F	F-02-03	7,020	14,040	287.0	49	150	94
Zone F	F-02-04	6,240	12,480	287.0	43	150	83
Zone F	F-02-05	5,972	11,943	287.0	42	150	80
Zone F	F-02-06	8,710	17,420	287.0	61	166	105
Zone F	F-02-07	5,314	10,629	287.0	37	150	71
Zone F	F-02-08	5,144	10,287	287.0	36	150	69
Zone F	F-02-09	5,282	10,564	287.0	37	150	70
Zone F	F-03-01	25,109	50,217	287.0	175	295	170
Zone F	F-03-02	27,172	54,344	287.0	189	304	179
Zone F	F-03-03	19,132	38,264	287.0	133	261	147
Zone F	F-03-04	20,943	41,886	287.0	146	272	154
Zone F	F-03-05	26,862	53,723	287.0	187	303	177
Zone F	F-03-06	18,952	37,904	287.0	132	260	146
Zone F	F-04-01	23,723	47,446	287.0	165	288	165
Zone F	F-04-02	28,892	57,784	287.0	201	311	186
Zone F	F-04-03	23,500	46,999	287.0	164	287	164
Zone F	F-04-04	23,642	47,285	287.0	165	287	165
Zone F	F-04-05	28,892	57,784	287.0	201	311	186
Zone F	F-04-06	23,623	47,247	287.0	165	287	165
Zone G	G-02-03	4,598	9,197	287.0	32	150	61
Zone G	G-02-04	4,763	9,526	287.0	33	150	64
Zone G	G-02-05	4,763	9,526	287.0	33	150	64
Zone G	G-02-06	4,303	8,605	287.0	30	150	57
Zone G	G-02-07	3,850	7,699	287.0	27	150	51
Zone G	G-02-08	3,988	7,975	287.0	28	150	53
Zone G	G-02-09	3,988	7,975	287.0	28	150	53
Zone G	G-02-10	3,602	7,204	287.0	25	150	48
Zone G	G-02-11	4,900	9,799	287.0	34	150	65
Zone G	G-02-12	5,075	10,150	287.0	35	150	68
Zone G	G-02-13	5,075	10,150	287.0	35	150	68
Zone G	G-02-14	4,585	9,169	287.0	32	150	61
Zone G	G-02-15	5,852	11,704	287.0	41	150	78
Zone G	G-02-16	4,968	9,937	287.0	35	150	66
Zone G	G-02-17	6,063	12,126	287.0	42	150	81
			PRE-P Passive Recreational Zone				
Zone B	B-01-01	65,543	0	-	0		70*
Zone B	B-01-05	44,334	0	-	0		70*
Zone C	C-02-07	41,099	0	-	0		*
Zone C	C-02-08	58,040	0	-	0		*
Zone D	D-01-03	14,992	0	-	0		*
Zone D	D-01-04	137,809	0	-	0		*
			PRE/CUL-A Active Recreational Zone				
Zone C	C-02-06	3,183	1,591	796.0	2	22	72
Zone D	D-01-05	16,237	8,119	796.0	10	94	86
			PRE/CUL-B Active Recreational Zone for SEA Games				
Zone A	A-05-03	20,008	40,017	500.0	80	267	150
Zone B	B-02-01	73,580	147,159	500.0	294	404	364
Zone C	C-02-03	21,833	43,665	500.0	87	278	157
Zone C	C-02-04	16,715	33,430	500.0	67	244	137

NOTE: Calculation of the required bicycle parking is based on the assumption that 100% of the GFA of each zone will comprise of its principle use. Based on the actual building uses proposed during implementation, the number of required bicycle parking may differ from what is proposed in Table 5.4.

5.8.4 PERSONAL MOBILITY DEVICE (PMD) MOVEMENT

Personal Mobility Devices (PMD)

Personal Mobility Devices (PMDs) are small wheeled devices that provide personal mobility and substitute for automobile travel. Included are the Electrical Personal Assistive Mobility Devices (EPAMDs), a self-balancing two non-tandem wheeled device designed to transport only one person with an electric propulsion system. Other than bicycles, PMD Types are:

Human-powered:

- Hand-powered wheelchairs
- Push scooters
- Unicycles

Motorized

- Electric powered bikes
- Motorized wheelchairs
- Electric / Gasoline powered scooters
- 'Segway' scooters

Source: : Victoria Transport Policy Institute

Regulations and restrictions of PMD use to be verified with the DPWH.

Figure 5.49 PMD Lanes across BGC, Makati
Source: : Electric Kick Scooter Philippines (EKSPH)

Figure 5.50 PMD Lanes

07

UTILITIES AND INFRASTRUCTURE

Good planning for utilities and infrastructure is crucial to support the sustainable urban development of NGAC. This is done by ensuring that infrastructures respond to future challenges while meeting the demands and needs of users in NGAC.

This chapter will address the infrastructure planning of NGAC. It will outline the key strategies for different aspects of utilities and infrastructure, including drainage, wastewater, water supply, power supply and solid waste to support the proposed master plan and developments in NGAC. The purpose is to implement an integrated infrastructure system that can ensure NGAC remains resilient in the face of climate change, disasters and future population demands.

9.1 DRAINAGE

9.1.1 OVERALL DRAINAGE PLAN

Existing Condition

There are existing and partially completed primary arterial, minor arterial, and collector roads in the project site as identified in Figure 9.1.

Existing roadside drains would need to be investigated and As Built drawings studied to verify the adequacy of the proposed drainage for phases 1A to 3 to tap into.

There are several roads that have no drainage systems at the time of the site visit conducted September 30, 2020.

Providing sufficient drainage system will be part of the undertaking based on the future development. Integration of the existing with the new drainage system will be further evaluated or studied during the detailed design phase.

Existing river is located at the middle of the project. Outfalls of the drainage networks will be discharging to the existing river.

Overall Drainage Plan

The drainage plan is based on the phasing of the project development as well as the phasing of the construction of the roads. There are several roads which will be constructed ahead of the project phasing plan. The drainage layout will follow the road phasing plan. The drainage networks have been designed to work independently with consideration to the phasing. Existing drainage systems of the Arterial Roads will be studied. However it is preferable to outfall to the river located in the middle of the project site.

River development will also need to be considered to increase the conveyance capacity. This may include modifying the river sections to be more efficient by widening, providing slope protection for erodible banks, desilting and dredging.

The removal of two (2) collector roads in Phase 3 plot will have minimal impact on the drainage network; a reduction for road side drains only. The increment of population (11%) will directly impact the drainage design considering land use, the runoff coefficient will vary from 0.7 to 1.0. Since the drainage networks will be designed independently according to phasing. Changes in drainage sizing will be localized and generally will not impact the overall drainage system.

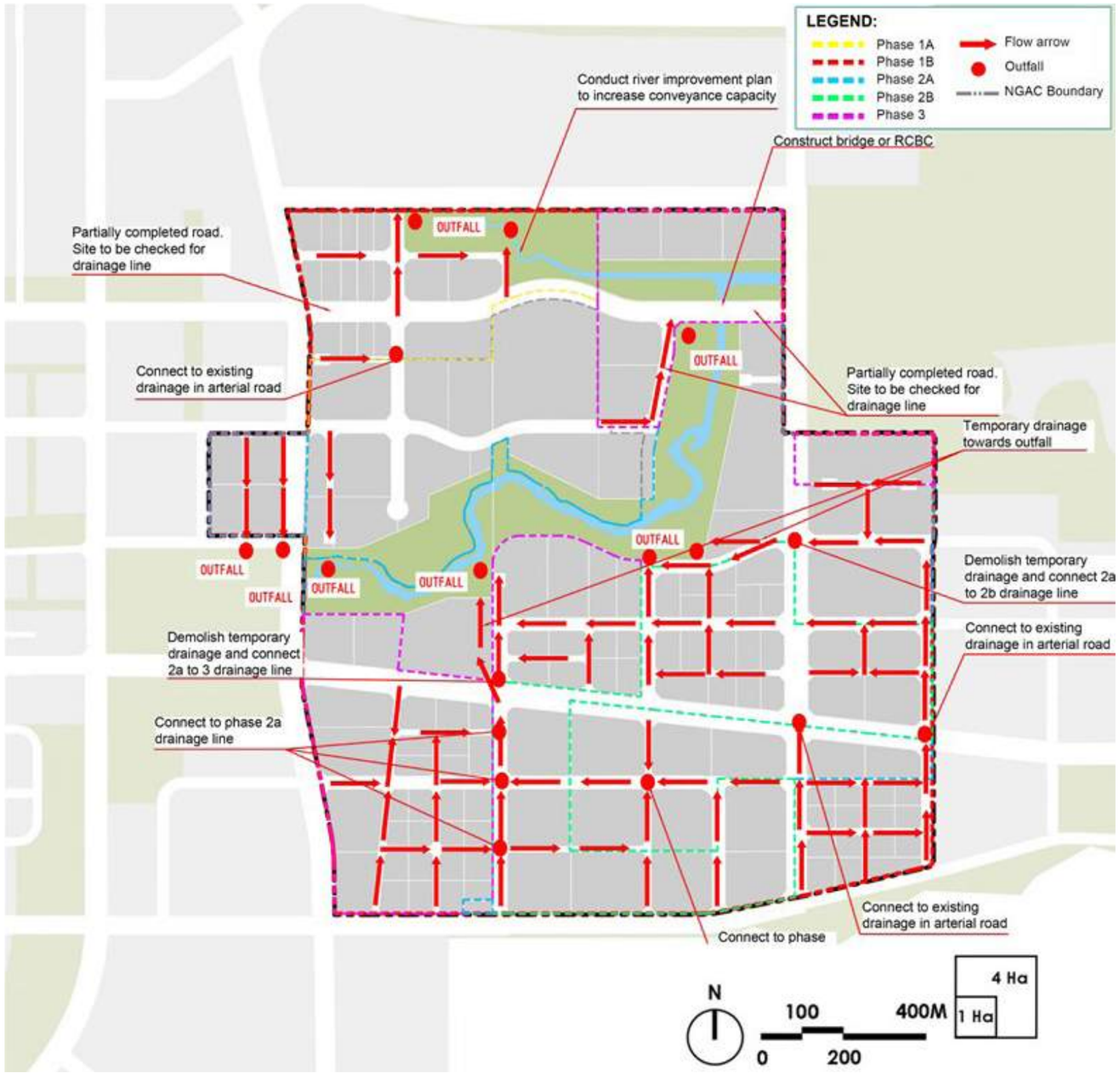


Figure 9.1 Overall Drainage Plan

9.1.2 VARIANCE FROM THE MASTER PLAN

The proposed drainage layout varies from the proposed master plan. The concerns that were considered were

1. The Phasing of the NGAC.
2. Project Boundary Extent of NGAC.

The Arterial Roads are already partially constructed. Some of the roads already have existing drainage lines.

There is uncertainty whether the size of the drainage along the AR's are sufficient to carry the drainage of the plots, or whether the inverts of the new drainage will be able to connect to AR's.

On the Southbound side, it shows that AR is outside the NGAC Project Boundary. This is not yet constructed. However, there are concerns on the construction schedule and the tie-in connections.

On the West side, there are locations where the drainage layout will have to connect with adjacent drainage network outside of NGAC's project boundary. This issue is dependent on the construction schedule of that drainage line and whether it is built large enough to account for upstream source of water run-off.

There may be flooding in the area where the connection should have been installed.

9.1.3 OUTFALL LOCATION NEAR STP

These are existing roads already. The existing drainage layout will need to be checked and evaluated for its appropriate outfall location.

Recommendations shall be provided if the outfall locations are inadequate and will cause localized flooding.

Figure 9.2 Typical Outfall. End of Culvert barrel flush with the headwall

Source: Hydraulic Design of Highway Culverts, 2012, U.S. Federal Highway Administration

9.2 WATER SUPPLY

9.2.1 OVERALL WATER SUPPLY PLAN

Design Concept

The concept of the design is to provide 24/7 supply of potable water to all locators within NGAC. The facilities may include reservoirs, pumping equipment and appurtenances installed at strategic locations to ensure continuity of supply while maintaining the minimum pressure at the delivery points.

Preliminary Design will follow the parameters as indicated in the MPSS and for those not present in the MPSS will follow the parameters will follow the LWUA design standard which is being adopted by most of the water district in the country. The design concept of the system is taking into consideration the following:

1. Parallel pipelines (both sides of the road) are proposed to be installed along the road network.

2. Distribution networks shall be designed to withstand the maximum standard pressure and a minimum pressure within the service area.

3. Pipelines are to be installed below ground meeting the minimum standard cover above crown to final grade. The minimum cover along road crossings will be observed.

4. Maximum flow velocities should not exceed standard.

5. Regulating water storage shall be provided to suit operational requirement and flow by gravity to the distribution system.

6. Valving schemes shall be considered in the design for hydraulic or system isolation to enable area partial shutdown during maintenance.

7. Pressure reducing valves are to be applied in the system to avoid excessive pressure exceeding the allowable maximum pressure within the system.

The removal of two (2) collector roads in Phase 2A plot will entail that the utility provider (Primewater) will have to provide the water services from the distribution pipelines nearest to the property

Reference:
Overall NCC Infrastructure Plan (as of June 2020)

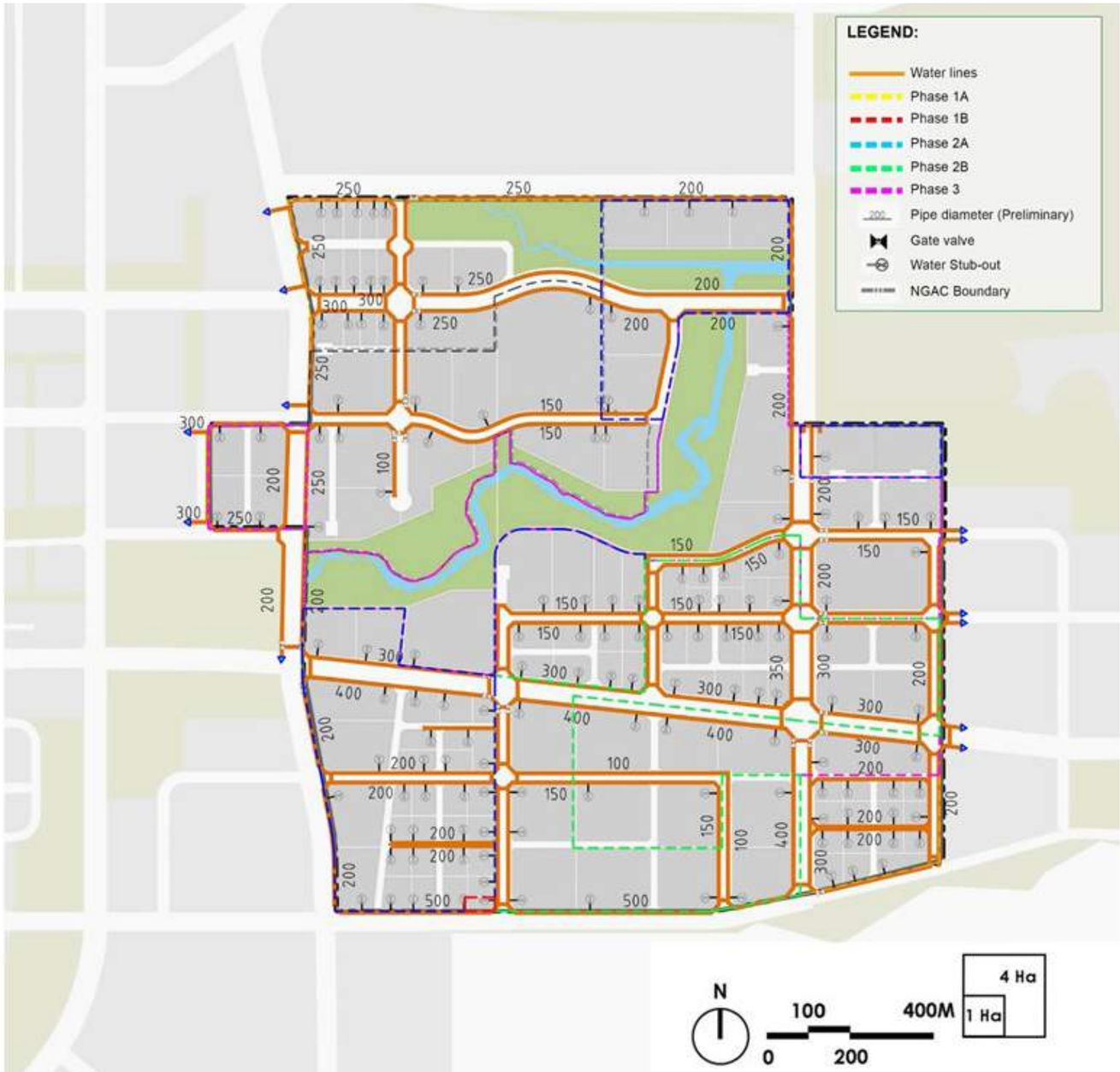


Figure 9.3 Overall Water Supply Plan
Based on the Overall NCC Infrastructure Plan (as of June 2020))

Table 9.1 Water Demand Estimates Comparison

SJ Land Use							
Land Use		Area (sqm)	Area (ha)	FAR	GFA (sqm)	Demand/ Area	Water Demand (m3/day)
	R2 Medium Density Residential Zone	0.00	0.00	1.5	0.00		
	R3 High Density Residential Zone	122,227.92	12.22	3.0	366,683.76	372	4547
	R-MU Mixed Use Residential Zone	231,423.77	23.14	4.0	925,695.09	411	9507
	C1 Neighborhood Level Commercial Zone	0.00	0.00	2.0	0.00	181	0
	C2 City Level Commercial Zone	155,420.69	15.54	3.0	466,262.06	164	2547
	C3 Central Business Zone	14,565.58	1.46	4.0	58,262.32	311	453
	GI-G General Institutional Civic Zone	841,415.10	84.14	2.0	1,682,830.20	57	4771
	GI-E General Institutional Education Zone	129,877.97	12.99	1.0	129,877.97	35	450
	PRE-P Passive Recreational Zone	361,817.61	36.18	-	-	-	-
	PRE/CUL-A Active Recreational Zone	19,419.77	1.94	0.5	9,709.89	5	11
	PRE/CUL-B Active Recreational Zone for SEA Games	132,136.02	13.21	2.0	264,272.04	100	1321
	Road (ROW)	426,237.66	42.62	-	-		
Total		2,434,542.09	243.45		3,903,593.32		23,607.02
NK Land Use							
Land Use		Area (sqm)	Area (ha)	FAR	GFA (sqm)	Demand/ Area	Water Demand (m3/day)
	R2 Medium Density Residential Zone	85,254.69	8.53	1.5	127,882.04	124	1053
	R3 High Density Residential Zone	117,657.51	11.77	3.0	352,972.53	372	4377
	R-MU Mixed Use Residential Zone	260,038.03	26.00	4.0	1,040,152.12	411	10682
	C1 Neighborhood Level Commercial Zone	52,228.55	5.22	2.0	104,457.10	181	945
	C2 City Level Commercial Zone	146,377.75	14.64	3.0	439,133.25	164	2399
	C3 Central Business Zone			4.0			
	GI-G General Institutional Civic Zone	677,118.92	67.71	2.0	1,354,237.84	57	3839
	GI-E General Institutional Education Zone	159,295.39	15.93	1.0	159,295.39	35	552
	PRE-1 Passive Recreational Zone	377,250.34	37.73	-	-	-	-
	PRE/CUL-A Active Recreational Zone	3,182.55	0.32	0.2	636.51	5	2
	PRE/CUL-B Active Recreational Zone for SEA Games	115,533.29	11.55	2.0	231,066.58	100	1155
	Road (ROW)	440,605.07	44.06	-	-		
Total		2,434,542.09	243.45		3,681,951.32		25,005.35

Source: SJ, Overall NCC infrastructure plan (as of June 2020)

9.2.2 WATER DEMAND

Comparison of Estimated Demand with Overall NCC Infrastructure Plan (as of June 2020)

Water demand projection from the Overall NCC Infrastructure Plan increased by 10% due to the change in land use/zoning classification within the 243 ha development. The per capita consumptions used in the Overall NCC Infrastructure Plan were adopted in the calculations of the new water demand projections.

The increase is due to changes in zoning/ classification within the total area.

System hydraulics shall be based on the finalized zoning plan and source confirmation for the supply of 27.391 MLD.

All other assumptions in terms of water quality, supply pressure and availability in the Overall NCC Infrastructure Plan are retained.

Effect of Possible Increase in Population

The proposed changes in land use that may result in an estimated 11% increase in population was reviewed in terms of water demand.

It was found that the increase in water demand by 2,366 m3/day (0.7%) to the total water demand for the whole of NCC (341,515 m3/day) due to land use change is insignificant and can be easily handled by Primewater.

9.3 SEWERAGE AND WASTEWATER TREATMENT

9.3.1 OVERALL SEWERAGE PLAN

Effluent Standards

The wastewater treatment plants shall employ a process to ensure that the effluent quality shall meet the standards set by the Department of Environment and Natural Resources particularly DENR DAO 2016-08 Effluent Standards. All technical specifications for the network and appurtenances specified in the original master plan shall be adopted.

Wastewater Demand

The water demand study will be used to determine the wastewater generated at the NGAC, and the Wastewater Treatment Plant will be sized accordingly in modular fashion as it follows the phase of development. The existing STP and sewerage network shall be integrated in the entire plan for wastewater services for the whole of NGAC.

The increase in population due to the changes in the land use and zoning plan naturally increased the water demand and wastewater generated by the entire development. Review of the pipe sizes of sewer network and treatment plant capacity shall be done to consider the said increase.

Figure 9.4 Aerial View of Existing STP

Source: NGAC Construction Supervision Team

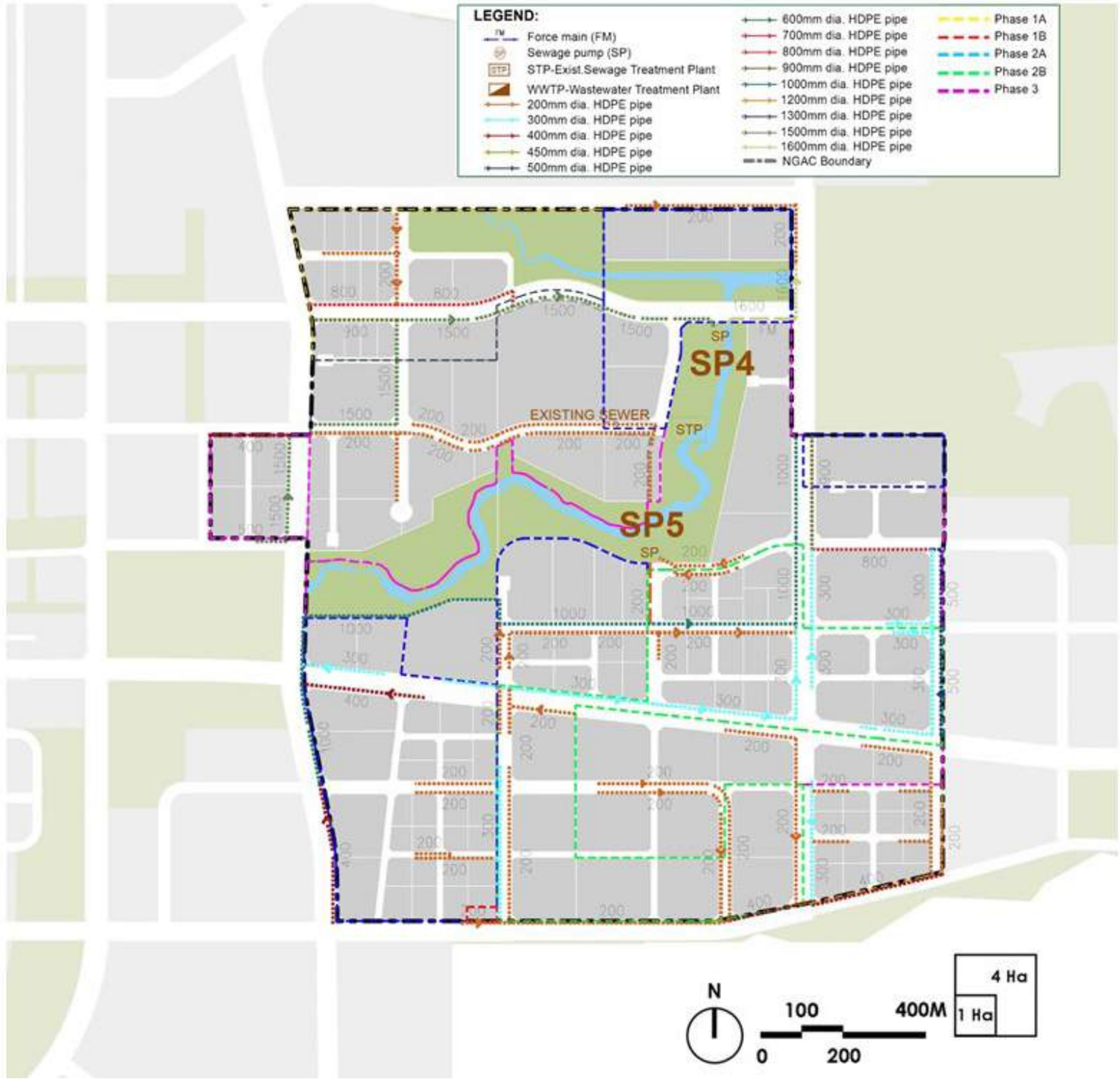


Figure 9.5 Overall Sewerage Plan

Based on the Overall NCC Infrastructure Plan (as of June 2020))

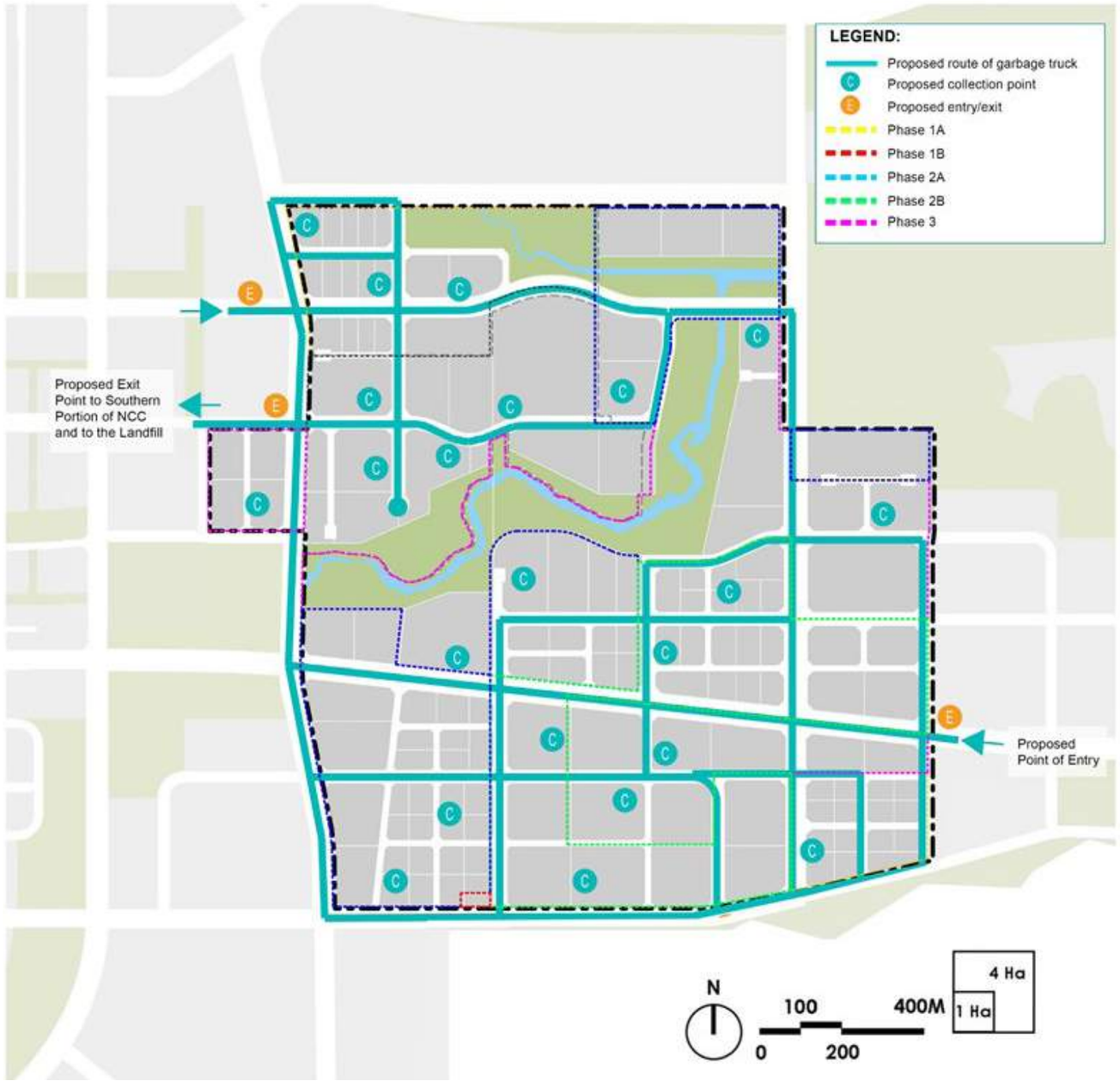


Figure 9.6 Overall Garbage Route and Collection Points

9.4 SOLID WASTE

9.4.1 OVERALL SOLID WASTE PLAN

Garbage Truck Route

The garbage truck route will avoid the use of main roads and along river when possible.

It is proposed to enter through AR2 from the East, and then exit to the West to the NCC area.

Garbage truck will then traverse the southern portion of NCC to reach the Metro Clark Landfill Site.

Figure 9.7 Location of the Landfill Site

Source: Overall NCC Infrastructure Plan (as of June 2020)

9.4.2 SOLID WASTE MANAGEMENT

Solid Waste Management at NGAC

Large volume of solid wastes are generated each day in any development such as the NGAC. Solid wastes are generally categorized into non-biodegradable, biodegradable and hazardous. Effective solid waste management system will be developed to ensure that solid wastes particularly hazardous wastes are handled, treated or disposed of in accordance with the government regulations.

The solid waste management at the NGAC shall comply with the requirements of RA 9003- Ecological Solid Waste Management Act which governs the management of solid waste in the country and being implemented by the Solid Waste Management Division of the Environmental Management Bureau of DENR One of the pertinent instruction in RA9003 is that segregation should be at source under the general types of waste such as:

- Biodegradable
- Recyclable
- Residual
- Special Waste

On-Site Waste Segregation

Locators shall be required to provide separate color-coded bins to contain solid wastes prior to pick-up for delivery to Materials Recovery Facility (MRF) and/or to the end of pipeline in proper coordination with the concerned LGU. Waste reduction and recovery program will be institutionalized to reduce the volume of solid wastes that will reach the end of pipeline.

Toxic wastes, if any, shall be handled, treated and disposed of properly in accordance with the provisions of RA 6969 – Toxic Substance and Hazardous and Nuclear Waste Control Act of 1990

Figure 9.8 R.A.9003 Ecological Solid Waste Management Act of 2000

Figure 9.9 Existing Garbage Bins along the Riverpark

Figure 9.10 R.A.6969 Toxic Substances and Hazardous and Nuclear Wastes Control Act of 1990

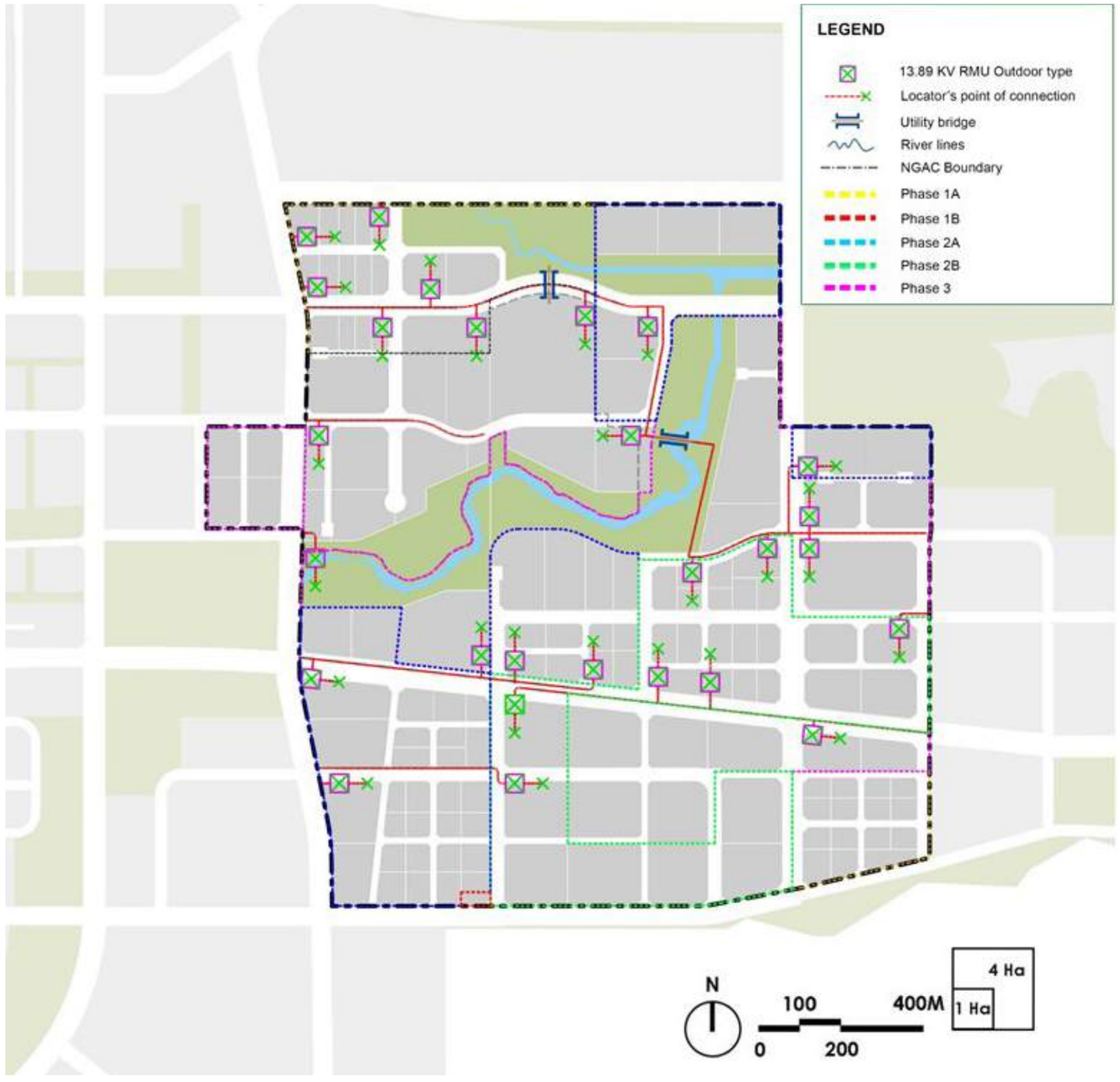


Figure 9.11 Overall Power Supply Plan

Based on the Overall NCC Infrastructure Plan (as of June 2020))

9.5 POWER SUPPLY

9.5.1 OVERALL POWER SUPPLY PLAN

Underground Distribution System

The layout of the power supply will still adopt the suggested layout from Overall NCC Infrastructure Plan. Consistent with the Minimum Performance Standards and Specification (MPSS) set out for the distribution utility in its Joint Venture Agreement (JVA) with BCDA, the distribution lines will be a 13.8kV, 3-phase underground in PVC concrete-encased conduits with corresponding Ring Main Units (RMU) switchgears.

The underground distribution lines are configured in an open-loop system using 500 MCM Cu cable for the main lines and 3/0 AWG Cu cable for the subsidiary lines. RMUs with smart automation capability will be used to provide flexibility for the underground distribution lines.

The 13.8kV underground distribution circuits will be equipped with line sensors for smart outage detection, remote-controlled line switches, and faulted circuit indicators all of which can be remotely operated to automatically locate, isolate line troubles and swiftly restore services by automatically transferring them to unaffected sections of the electric distribution system.

The development of the power utilities will follow the Phasing Plan for NGAC development and consistent with the service standards requirement for the distribution utility.

It should be noted that the annual Distribution Development Plan (DDP) or Implementation Plan of the distribution utility for the NCC will be subject to the review process as set out in the JVA.

Reference:
Overall NCC Infrastructure Plan (as of June 2020)

9.5.2 POWER DEMAND

Demand Estimates

Based on the updated land use plan and unit demand assumptions from the Overall NCC Infrastructure Plan, project demand in the area is slightly increased from 549.78 MW to 50.62 MW level.

This demand requirement can be supplied by the present substation of Meralco located outside the NGAC zone. The existing substation has a current capacity of 33MVA which more than caters for the current demand in area. Additional transformer capacity within the substation can be easily installed as soon as it is required consistent with the service standards for the distribution utility as stipulated in its Joint Venture Agreement (JVA) with BCDA.

The Overall NCC Infrastructure Plan for the whole of New Clark City requires for the overall development of six (6) substations strategically put up in the area in stages. Each substation will have a capacity of 3x33MVA which can be further upgraded for additional capacity, if required.

When the additional substation in the NCC becomes available, that will address the security requirement for at least "n-1" contingency for NGAC.

Reference:
Overall NCC Infrastructure Plan (as of June 2020)

Table 9.2 Power Demand Estimates Comparison

Demand Estimates Based on Updated Land Use as of 6 Jan 2021					
Land Use	Area (sqm)	Area (ha)	Percentage	W/m2	Demand, kW
R2 Medium Density Residential Zone	0.00	0.00	0.00%	7.20	0.00
R3 High Density Residential Zone	122,227.92	12.22	5.02%	7.20	880.04
R-MU Mixed Use Residential Zone	231,423.77	23.14	9.51%	19.90	4,605.33
C1 Neighborhood Level Commercial Zone	0.00	0.00	0.00%	92.00	0.00
C2 City Level Commercial Zone	155,420.69	15.54	6.38%	92.00	14,298.70
C3 Central Business Zone	14,565.58	1.46	0.60%	92.00	1,340.03
GI-G Government and Institutional Zone	841,415.10	84.14	34.56%	19.30	16,239.31
GI-E Education Zone	129,877.97	12.99	5.33%	19.30	2,506.64
PRE-P Passive Recreational Zone	361,817.61	36.18	14.86%	19.30	6,983.08
PRE/CUL-A Active Recreational Zone	19,419.77	1.94	0.80%	19.30	374.80
PRE/CUL-B Active Recreational Zone for SEA Games	132,136.02	13.21	5.43%	19.30	2,550.23
Road (ROW)	426,237.66	42.62	17.51%	0.00	0.00
Total	2,434,542.09	243.45	100.00%		49,778.17
NK Land Use					
Land Use	Area (sqm)	Area (ha)	Percentage	W/m2	kW
R2 Medium Density Residential Zone	85,254.69	8.53	3.50%	7.20	613.83
R3 High Density Residential Zone	117,657.51	11.77	4.83%	7.20	847.13
R-MU Mixed Use Residential Zone	260,038.03	26.00	10.68%	19.90	5,174.76
C1 Neighborhood Level Commercial Zone	52,228.55	5.22	2.15%	92.00	4,805.03
C2 City Level Commercial Zone	146,377.75	14.64	6.01%	92.00	13,466.75
GI-G Government and Institutional Zone	677,118.92	67.71	27.81%	19.30	13,068.40
GI-E Education Zone	159,295.39	15.93	6.54%	19.30	3,074.40
PRE-1 Passive Recreational Zone	377,250.34	37.73	15.50%	19.30	7,280.93
PRE-2A Active Recreational Zone	3,182.55	0.32	0.13%	19.30	61.42
PRE-2B Active Recreational Zone (SEA Game)	115,533.29	11.55	4.75%	19.30	2,229.79
Road (ROW)	440,605.07	44.06	18.10%	0.00	0.00
Total	2,434,542.09	243.45	100.00%		50,622.45

Source: SJ, Overall NCC infrastructure plan (as of June 2020)

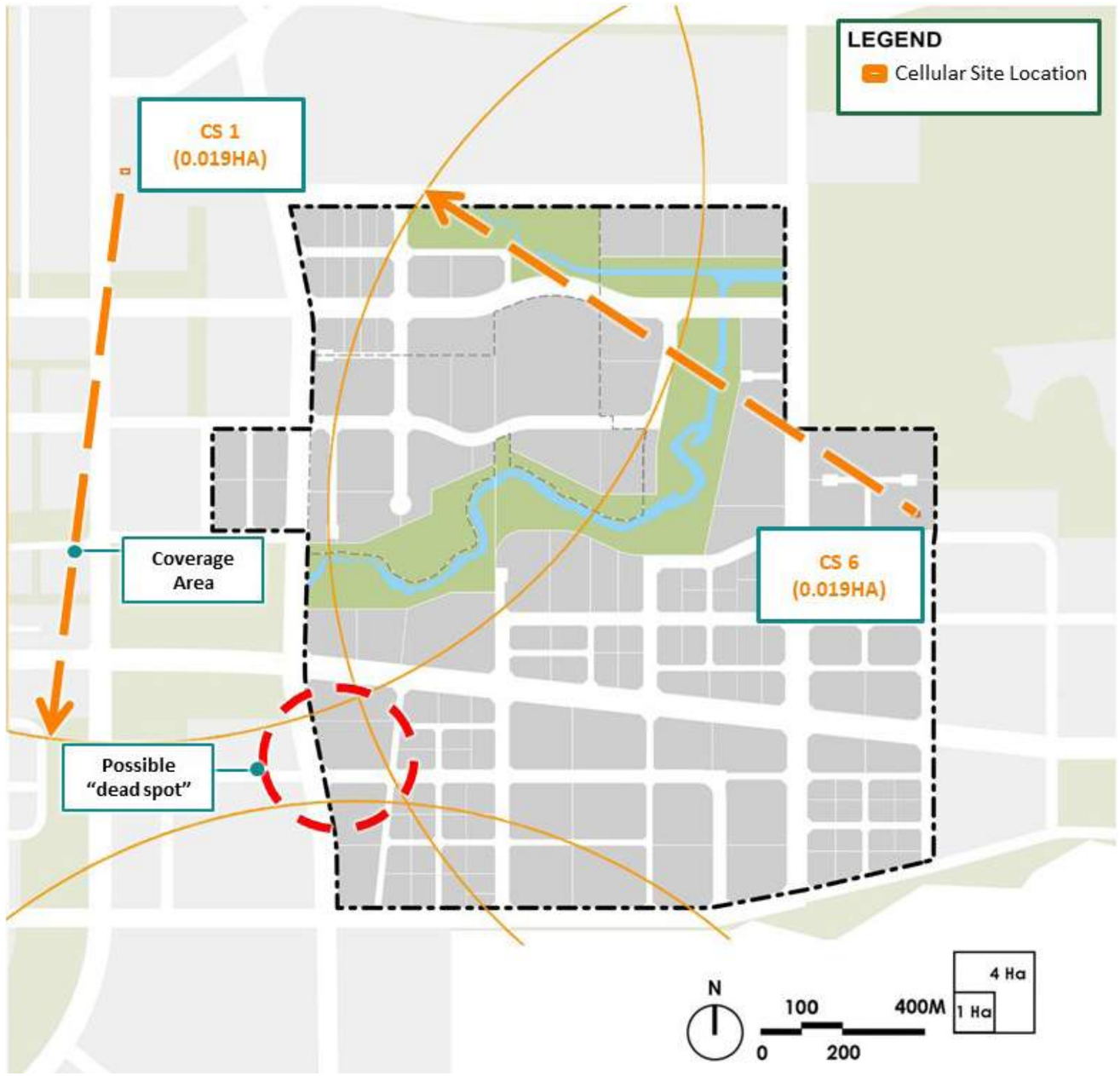


Figure 9.12 Cellular Site locations and Coverage Based on NK Volume II, June 2020

Source: SJ, Overall NCC infrastructure plan (as of June 2020)

9.6 INFORMATION AND COMMUNICATIONS TECHNOLOGY

9.6.1 IT TECHNOLOGY INFRASTRUCTURE

Mobile (Cellular) Technology Infrastructure

The original cellular design from the Overall NCC Infrastructure Plan is applicable for 3G and 4G.

The proposed/indicative cellular site locations was reflected in the revised master plan (Figure 9.12). It was found that a small area in the NGAC site is not covered by the cellular coverage. This may become a possible "dead spot" and may require a cell signal booster within the development in the future.

It is proposed to eventually have the 5G broadband technology in order to be compatible with Clark.

The Telecom Company will provide the necessary and detailed solution to ensure very good telecommunication signal and minimize dead spots in the area. Solutions like installing distribution antenna systems (DAS) to work with repeater system or wireless amplifier of the Telecom Company.

The telecommunication services in the area will be required to be compliant with the latest 5G technology or equivalent latest or state-of-the-art ICT infrastructure.

The MPSS for the Distribution Utility already requires it to have some smart grid elements consistent with the smart city vision of the NCC. Specifically, the electric distribution system will have some Home Area Network (HAN) capabilities to cater for the Internet of Things (IOT) functionalities in the future. The IOT functionalities will be considered in the overall and detailed planning of the electricity and ICT provider in the NGAC.

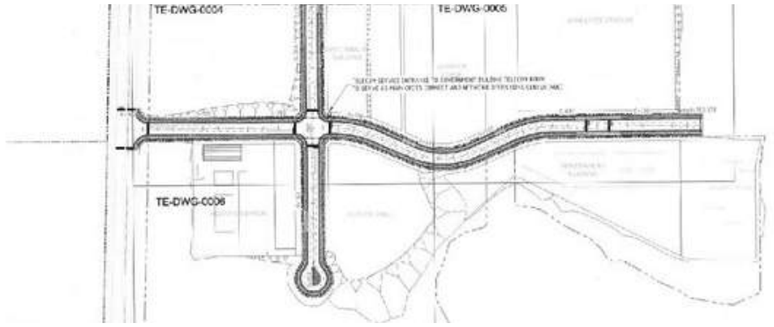


Figure 9.13 Phase 1A As-Built Underground Telecom Lines Layout

Source: NGAC Construction Supervision Team

9.6.2 UNDERGROUND FIBER OPTIC INFRASTRUCTURE

Phase 1A has an existing underground fiber optic cabling system. Based on the design, this system will cover the telecom requirements for the following:

- Voice and data
- CCTV
- CATV
- Interconnection for ICT services

The current design aims flexibility to scale up the bandwidth based on future requirements. There is also consideration on redundant pathways and free wi-fi for the whole area.

Reference:
NGAC Phase 1A Underground Fiber Optic Infrastructure Design Report (August 2018)

All electronics and telecommunications design shall comply with all the national codes and standards including but not limited to the following:

- Philippine Electronics Code Book 1 Telecommunications Facilities Distribution System
- Philippine Electronics Code Under Fire Detection and Alarm System
- ANSI/TIA-568-C-1 Commercial Building Telecommunications Cabling Standard
- ANSI/TIA-568-C-3 Optical Fiber Cabling Component Standards
- ANSI/TIA-607-CGenericTelecommunications Bonding and Grounding (Earthing) for Customer Premises
- EIA/TIA recommendation
- Existing laws and ordinances of the local enforcing authorities.

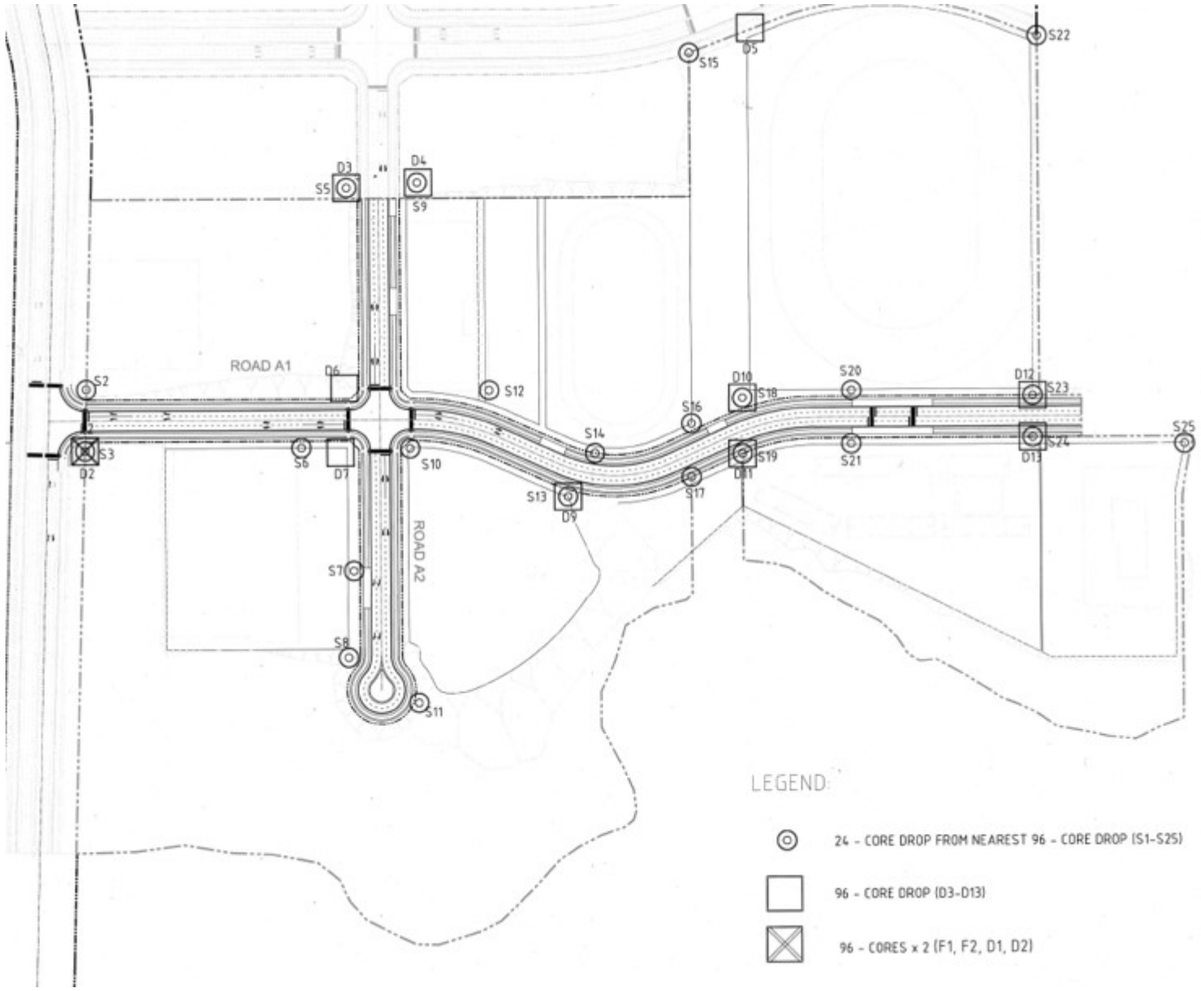


Figure 9.14 Phase 1A As-Built Underground Electronic Layout
Source: NGAC Construction Supervision Team

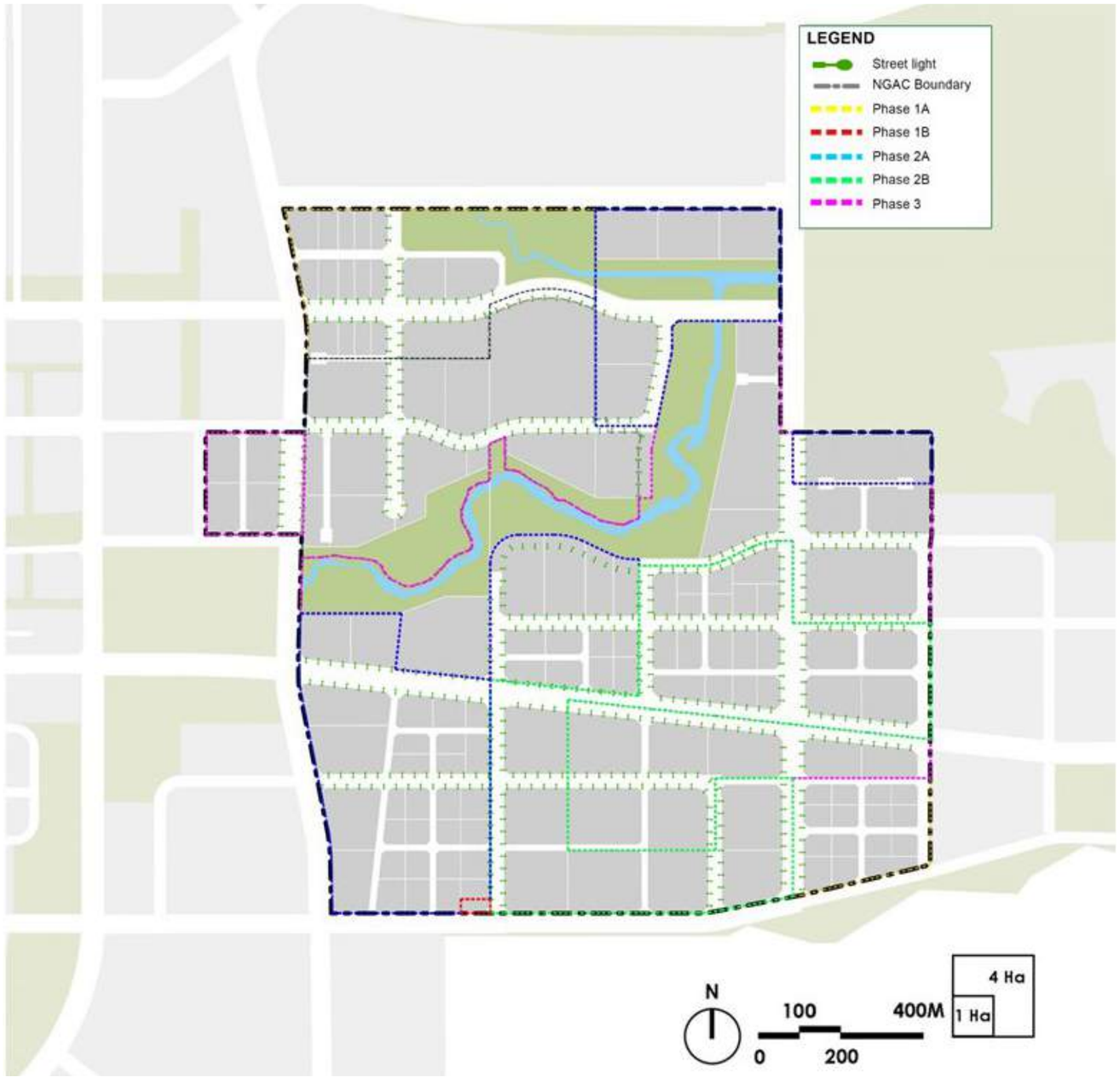


Figure 9.16 Overall Lighting Plan

9.7 LIGHTING

9.7.1 OVERALL LIGHTING PLAN

Solar Street Lights

NGAC is currently using Solar-powered LED street lights for Phase 1A. 100% of its energy is solar-powered.

Road lighting installation shall be effectively earthed to the ground using coper conductors.

Earth fault loop impedance test for each road light and LCPs shall be submitted to the NGAC Lighting Division

Reference:
NGAC Phase 1A Street Lighting System Design Report (January 2019)

Figure 9.15 Actual Street lights in Phase 1A

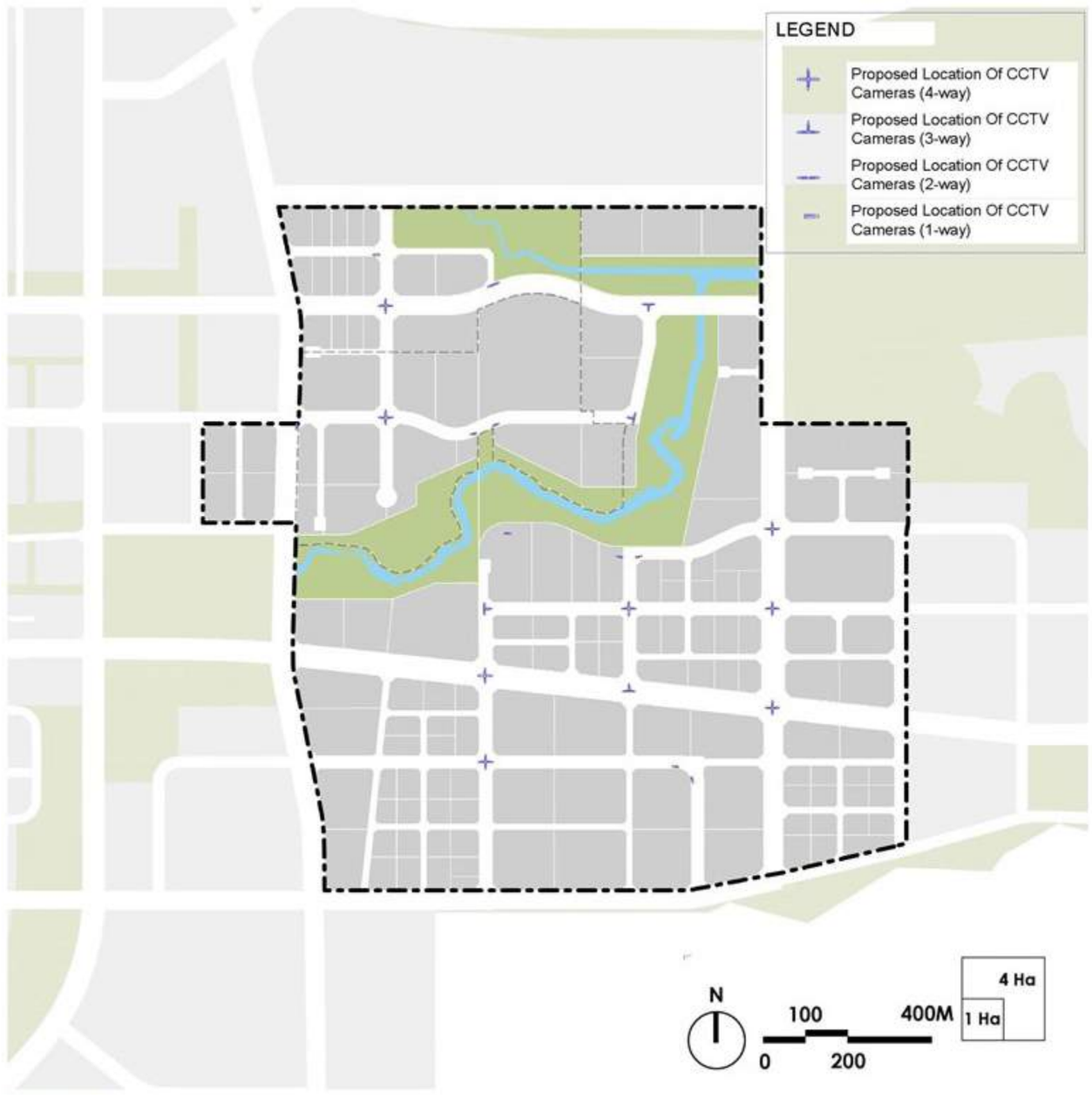


Figure 9.17 Overall Security Plan

9.8 SECURITY

9.8.1 OVERALL SECURITY PLAN

Overall Security and Monitoring

The current ICT fiber optic-based system can be integrated to a city-wide CCTV surveillance system. This surveillance system is for security and traffic monitoring, with cameras (IP based) located at strategic areas.

It is proposed that a Central Command Center will monitor and keep the events captured in the CCTV cameras.

It is also proposed to use solar-powered CCTV cameras for smart security systems, normally installed at street intersections and at other strategic locations.

Central Command Center and FDAS Monitoring

Central Command Center is meant to service NGAC only. After NCC gets close to being built-up, a central command can be relocated to service the entire city. Scope: CCTV systems, traffic control system, emergency response, coordination with utility company (i.e, Meralco, Primewater).

The current design concept for FDAS monitoring is that every building will have its own FDAS monitoring, which will be connected to the Central Command Center. This Central Command will be in charge of monitoring and fire response.

It is proposed that the Central Command Center will be near the Fire Station.

Figure 9.18 Solar Powered CCTV

Source: https://www.pngfind.com/mpng/iixTomm_flood-early-warning-system-cctv-camera-with-solar/

11

INTEGRATED SUSTAINABILITY STRATEGIES

During the master plan development process, it is important to adopt strategies to ensure than urban development will be carried out sustainably. This includes balancing nature conservation and urban development, adopting appropriate responses to climate change and developing disaster resilience.

This chapter seeks to provide solutions to direct NGAC towards green and sustainable growth. This will include protecting and enhancing the natural assets of NGAC, and adopting an integrated approach to infrastructure management to ensure that NGAC may remain resilient in the face of climate change and disasters.

11.1 OVERVIEW

11.1.1 OVERALL SUSTAINABLE FRAMEWORK

Alignment with NGAC Vision

The overall sustainable framework is linked to NGAC's Vision to have an "Active, Distinct, and Innovative Civic Hub and Cultural Heart." The three goals that stemmed from this vision became the take-off point to form the nine main themes for sustainable strategies.

The primary themes emphasized the need for a development that is efficient and follows best practice, but shall address the human element. While technology is a prime motivator and guide for locators, social and environmental strategies will offer a chance for the development to endure over time.

Figure 11.1 NGAC Vision Framework

Sustainable Strategies: Main Themes

Under the goal Effective Governance, the following three themes are established:

- Parallel/ Complementary Systems
- Critical Infrastructure, and
- Technology Infrastructure for Smart City Ecosystem.

Under the goal A Green District, the following three themes are established:

- Sustainable Urban Mobility and Transport Modes,
- Eco-friendly Development Solutions, and
- Smart and Energy Efficient Structures.

Lastly, under the goal People-Centric District, the following three themes are established:

- Livability,
- Connectivity, and
- Walkability.

The respective key issues, direction, challenges and recommendations are detailed in the following pages.

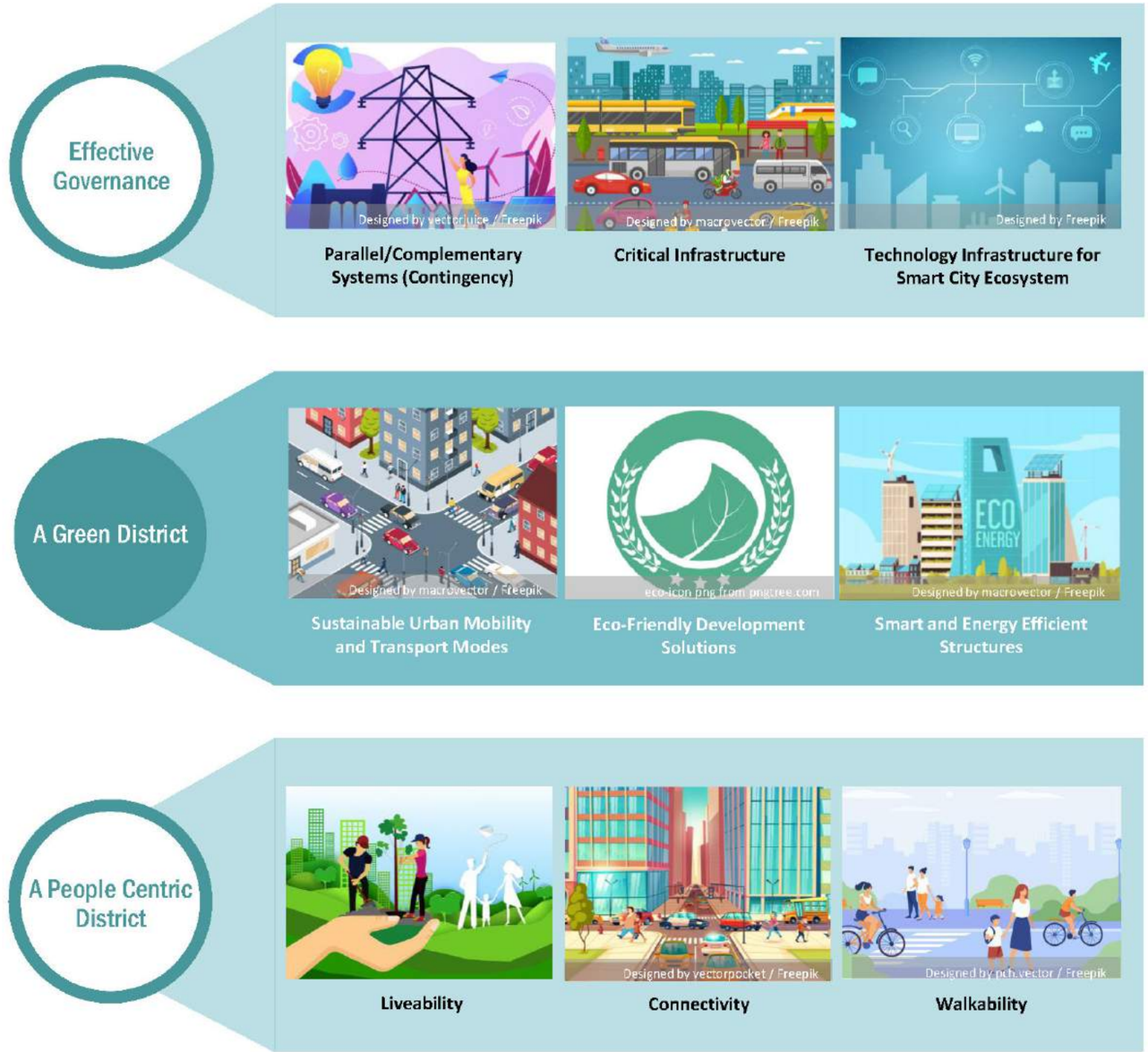


Figure 11.2 Overall Sustainable Framework based on NGAC Vision and Goals

Effective Governance

Parallel/Complementary Systems (Contingency)

Critical Infrastructure

Technology Infrastructure for Smart City Ecosystem

Key Issues	Direction	Challenges	Recommendations
• Current development may have limited access to supply and distribution systems in order to deal with possible capacity shortages and even disasters	• Ensuring that investments consider redundancy / contingency for efficient processes	• Cost for investment	• Partnerships in terms of financing • With fully instituted and operationalized checks & balances • Ensure DU's compliance with N-1 contingency and Smart Grid requirement in the Joint Venture Agreement (JVA)
• Current area has limited constructed infrastructure to ensure continuity of operations and connectivity even during a disaster	• Investment in and classification of the critical infrastructure within the area such as hospitals, transport network, security, and utilities	• Cost for investment • Possible overcrowding of RROW for roads due to development and can no longer be used in emergency situations • Security and maintenance	• Partnerships in terms of financing • Adaptable to the highest number of future situations • Insurance for recovery in case of disasters • Dedicated emergency vehicular access points and/ or paths • Central Command Center for overall security
• Current development may have limited technology infrastructure to build the smart city ecosystem	• Invest in information technology infrastructure base, and ensuring that the capacity can be expanded / increased in the future	• Cost for investment particularly considering that a technology's life cycle may be too short (i.e., obsolete) • Different applications/ programs might not be compatible	• Development done by phase but ensure compatibility of systems • Partnerships with service providers that have vertical integration in the supply chain to minimize risk of incompatibility

Figure 11.3 Effective Governance Strategies Framework

A Green District

	Key Issues	Direction	Challenges	Recommendations
 Sustainable Urban Mobility and Transport Modes	• Reduction of CO2 emissions • Discourage dependence on private vehicles	• Encouragement of Non-motorized Transport (NMT) • Promotion and Development of efficient and safe mass transportation • Investment in e-vehicles	• Preference for private vehicles due to convenience • Current development has limited public transportation lines that can connect it to other areas • High investment Cost requirement	• Strategic locations of transit stops to ensure that services and goods are accessible by NMT, e.g., walking, biking, etc. • Partnerships with private transport organizations for dedicated public transport modes • Partnerships in terms of financing
 Eco-Friendly Development Solutions	• Maintaining the ecological balance and nature as much as possible in the area • Development of environmentally-friendly infrastructure that can cater to the public's needs	• Ensuring that the natural resources are used efficiently	• Increase in development and population can put pressure in the natural resources	• Creation of protected zones within the districts, i.e., "no-build" or "public amenities" zones • Adoption of greywater recycling, rainwater harvesting, and zero waste • Encourage permeable paving, e.g., in street-level parking
 Smart and Energy Efficient Structures	• Construction of energy-efficient buildings and structures • Discourage dependence on traditional energy sources	• Encouragement of green building certification • Use of building integrated energy efficient technologies • Compliance with DOE Guidelines on Energy Conserving Design of Buildings • Investment in renewable energy and energy-efficient technologies	• May discourage locators due to higher cost of making buildings compliant with green building certifications • High investment cost requirement	• Delivered at optimal cost to consumers/ users • Encourage Energy Service Company (ESCO) business models through incentive mechanism • Partnerships in terms of financing and energy sources

Figure 11.4 Green District Strategies Framework

A People Centric District

Liveability

Connectivity

Walkability

Key Issues	Direction	Challenges	Recommendations
• Emphasis on safety of the public, whether residents or transient • Inclusiveness and quality of living environment for all range of income groups • Ensure social equality and attention towards the elderly, children and women	• Investment in security and emergency response systems	• High cost of initial investments, particularly in the CCTV and Central Management/ Monitoring System	• Partnerships with companies that provide security and emergency response systems • Objectives to be satisfied in full compliance with development controls (DCs)
• Access to different modes of transport, including alternative modes and non-motorized transport	• Provision of multiple options of transportation that are available throughout the area and during the day and night	• High cost of iniitial investment and potential of increasing the GHG emissions especially when the development is still in its early stages	• Objectives to be satisfied without sacrificing individual rights, security & privacy • Partnerships with companies that provide and operate alternative modes of transport (e.g., with apps) and in e-vehicles • Establishment of “compact” developments (5-10 minute walk to amenities and services)
• Accessibility to goods and services, open spaces, and places of interest / culture even through walking	• Prioritize pedestrian-friendly streets and intuitive wayfinding of access points	• Increased demand for saleable land may result in reduction of pedestrian and cycling paths / lanes	• Prescribe road right of way (RROW) that includes space for shared lanes / bicycle and pedestrian lanes and roads, and traffic calming strategies • Objectives to be satisfied for all users i.e. ambulatory, runnersing, PWD/ seniors/ children, bicycles, and others

Figure 11.5 People Centric District Strategies Framework

11.2 SPECIFIC STRATEGIES

11.2.1 EFFECTIVE GOVERNANCE

Sustainable Strategies under Respective Themes

Under Effective Governance, policies and programs, there are three themes focusing on:

- Parallel/ Complementary Systems (Contingency),
- Critical Infrastructure, and
- Technology Infrastructure for Smart City Ecosystem

For businesses and especially government offices to provide seamless services, it is important to foster connectivity, provide reliable power supply, and reinforce resilience.

For this to be possible, the infrastructure must be fully developed to ensure connectivity within and outside of NGAC. Furthermore, the IT infrastructure/ backbone must be established, as well as, the utilities such as power.

Safety and security must also be prioritized, it is important to have a central command center to monitor the area, especially with government areas requiring high level of security.

Policies

Policies focusing on the following shall be proposed:

- Emergency funding allotment
- Full application set / kit of the NGAC development controls (DCs)
- Designation and protection of Emergency Vehicle Access corridors/ areas

Programs

Programs focusing on the following shall be proposed:

- Investment in IT Infrastructure
- Asset management
- Alternative routes and / or modes
- Continuing training in the full appreciation with the correct application/ use and compliance monitoring agent on the NGAC development standards and guidelines (DSG)
- Development of Central Command Center with related systems and infrastructure

Emergency Funding Allotment

IT Infrastructure Investment

Asset Management

Alternative routes and/or modes

Emergency Vehicle Access Designation and Protection

Central Command Center

Figure 11.6 Sample Specific Sustainable Strategies under Effective Governance

Sources: https://www.clipartkey.com/view/ToowRT_fund-png-clipart-emergency-fund/
Web Vectors by Vecteezy https://www.vecteezy.com/free-vector/web
https://iconscout.com/icon/emergency-vehicle-1901819
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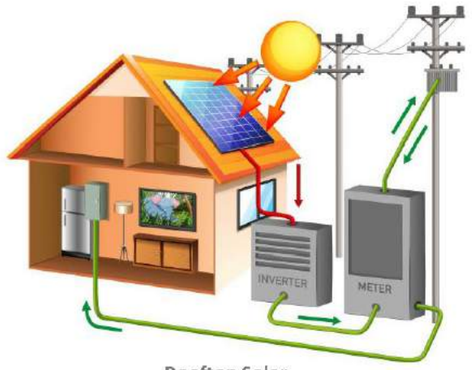
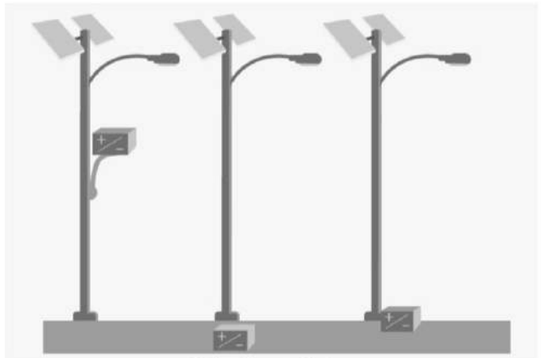
Integrated Energy Management



Rooftop Solar



Solar Street Lights

Power Wall

Energy Efficient Technologies

Incentive System for Compliances

Figure 11.7 Sample Specific Power-related Strategies under Green District

Sources: House vector created by brgfx - www.freepik.com
https://www.pngitem.com/middle/iooxxxh_basic-components-of-solar-led-street-light-hd/Tesla.com
https://www.seekpng.com/ima/u2t4r5u2t4q8e6o0/VectorStock.com/23503757

11.2.2 GREEN DISTRICT

Sustainable Strategies under Respective Themes

Under Green District, policies and programs, there are three themes focusing on:

- Sustainable Urban Mobility and Transport Modes,
- Eco-Friendly Development Solutions, and
- Smart and Energy Efficient Structures

Specific power-related strategies are enumerated in the succeeding sections.

Policies for Power

Policies focusing on the following shall be proposed:

- Designated establishments (with minimum annual energy consumptions of 500,000 kWh) to comply with integrated energy management system policy requirements
- In compliance with RA 11285 (Energy Efficiency and Conservation Act of 2019) and DOE Energy Conservation Design for Buildings and Utilities Guidelines
- Encourage use of building integrated renewable energy and energy efficient technologies
- Incentive system for compliances

Programs for Power

Programs focusing on the following shall be proposed:

- Develop and design measures that promote energy efficiency, conservation, and sufficiency
- May include installation of renewable energy technologies and energy efficient technologies
- Examples: rooftop solar, solar street lights, power wall, energy efficient lights, appliances, and equipment

Strategies under Water Conservation, Reuse and Recycling

In order for NGAC to become a green district, specific strategies are done for water in terms of the following:

- Conservation,
- Reuse, and
- Recycling.

With these, it is important to achieve a balanced development with nature conservation in NGAC.

Therefore, these strategies shall be proposed to maximize the utilization of one of the most important resources: water. Through treatment and recycling, the objective is to minimize wasteful consumption of water resources by the public.

Policies and programs shall be proposed to ensure water conservation.

Policies for Water

Policies focusing on the following shall be proposed:

- Develop long-term water source
- Institute water conservation measures and efficient use of potable water
- Require dual waste-water piping within buildings to separate greywater from black water
- Require pre-treatment to meet influent water quality standards for non-residential water users
- Collection and storage of storm water for non-potable use

Programs for Water

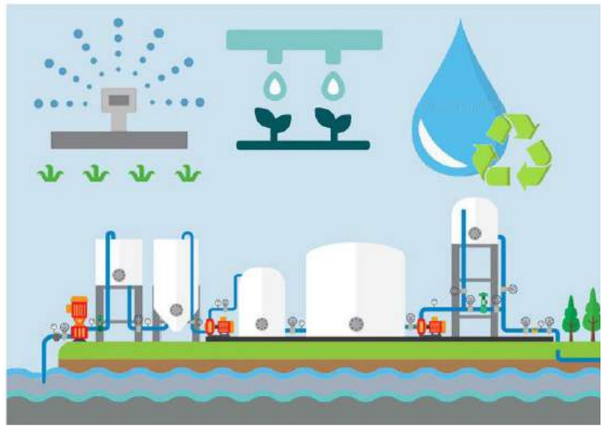
Programs focusing on the following shall be proposed:

- Prepare a feasibility study for use of surface water within and outside the development area for source of potable water
- Develop and design dual piping sewerage network for separate treatment of grey water and black water
- Re-use and recycling of treated grey water and storm water for irrigation and other non-potable use

Long-term water Source

Efficient use of Potable Water

Separate piping & treatment of wastewater



Reuse & recycling of greywater and storm water for irrigation and other non-potable use

Figure 11.8 Sample Specific Water-related Strategies under Green District

Sources: Wastewater treatment plant: macrovector - freepik_com

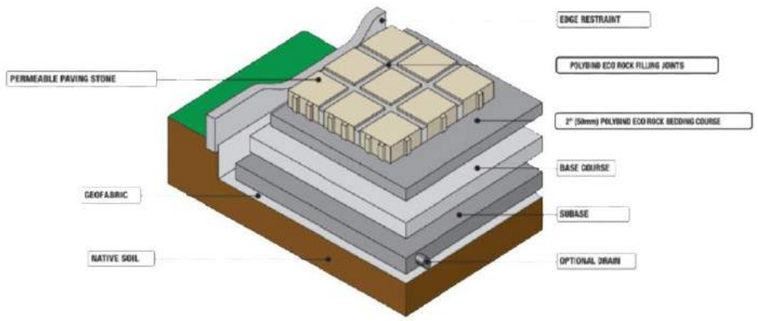
Service Radius Distances from Transit Stops

Protected zones for Nature and NMTs

CO2 Emission Limits

E-vehicles Adoption Program

Incentives for Public Transportation Companies and Users



Adoption of Environment-friendly Materials

Figure 11.9 Sample Specific Transport-related Strategies under Green District

Sources: https://pngtree.com/freepng/bus-stop-passenger-rest-direction-sign-destination-sign_3863987.html; https://pngtree.com/freepng/vector-shop-icon_3762863.htmlcompany-building png from pngtree.com; Car vector created by freepik - www.freepik.com; istockphoto-1205901011-612x612; bicycle png from pngtree.com; https://freeicons.io/conference-icons/ticket-icon-5556; https://pnghut.com/png/ywRcngr91U/bus-tram-car-public-transport-rectangle-transparent-png; https://www.cleanpng.com/png-rock-pavement-permeability-joint-permeable-paving-2611289

Strategies under Transport

Transportation greatly contributes to the success of a development, while also being a major contributor of pollution and CO2 emissions. The following strategies are enumerated to be in line with the vision of being a green district.

Policies for Transport

Policies focusing on the following shall be proposed:

- Setting of the boundaries of protected zones and safe refuge for both nature and the pedestrians and NMTs.
- Setting of the CO2 emissions standards / limits for the district
- Incentives for public transportation companies and users
- Facilitate the movement of high-priority traffic flows.
- Facilitate the desired scheme of traffic control.

Programs for Transport

Programs focusing on the following shall be proposed:

- Creation and implementation of an e-vehicles adoption program for the public (and private) transportation
- Provision of transit stops for mass transportation, e.g., buses, with a set distance from services
- Adoption of environment-friendly materials and methods, e.g., permeable pavement systems, grassed swales, green roofs, bio-retention systems, infiltration systems, and porous pavements
- Implementation of Intelligent Transportation Systems and Technologies.
- Accommodating high-priority movements at intersections addresses both driver's expectations and intersection capacity. The 3 legs signalised junction shows an intersection where double left and right turn lanes are used to facilitate high-volume turning movements.
- Lane arrangements, location of channelization islands, and medians should be established to facilitate pedestrian access and the placement of signs, signals, and markings.
- Accommodate decelerating, slow, or stopped vehicles outside higher speed through traffic lanes.

11.2.3 PEOPLE CENTRIC DISTRICT

Sustainable Strategies under Respective Themes

Under People Centric District, policies and programs, there are three themes focusing on:

- Liveability,
- Connectivity, and
- Walkability

Any area that is devoid of people will most likely feel “soulless” or like a “ghost town”. For NGAC to be a vibrant district, it is important to activate various locations to encourage people to participate in different types of activities.

Also, it is important for people to feel that the NGAC area is easily accessible, especially by walking, non-motorized transport, and even the availability of affordable public transport.

Policies

Policies focusing on the following shall be proposed:

- EDesignation of higher development densities at certain areas, while considering the impact in traffic volume and required services and infrastructure
- Required percentage of dedicated shared and/ or pedestrian lanes
- Setting of maximum Emergency / Security response time based on travel time and distance
- Full application set / kit of the NGAC development controls (DCs)

Programs

Programs focusing on the following shall be proposed:

- Parallel transport lines at major transit stops
- Continuing training in the full appreciation and correct application/use and compliance monitoring agent on the NGAC development standards and guidelines (DSG)
- Implementation of Traffic Calming Strategies, e.g., speed tables, controlled and uncontrolled pedestrian crossings
- Installation of CCTV monitoring for security / safety
- Ensuring well-lighted streets

Traffic Calming Strategies

Dedicated Shared / Pedestrian Lane

Installation of CCTV monitoring

Ensuring well-lighted Streets

Figure 11.10 Sample Specific Sustainable Strategies under People Centric District

Sources: People vector created by pch.vector - www.freepik.com
Designed by macrovector / Freepik
Technology vector created by freepik
Background photo created by fanjianhua - www.freepik.com

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NGAC DETAILED MASTERPLAN

Task B2: BLOCK/ LOT INFORMATION PLANS

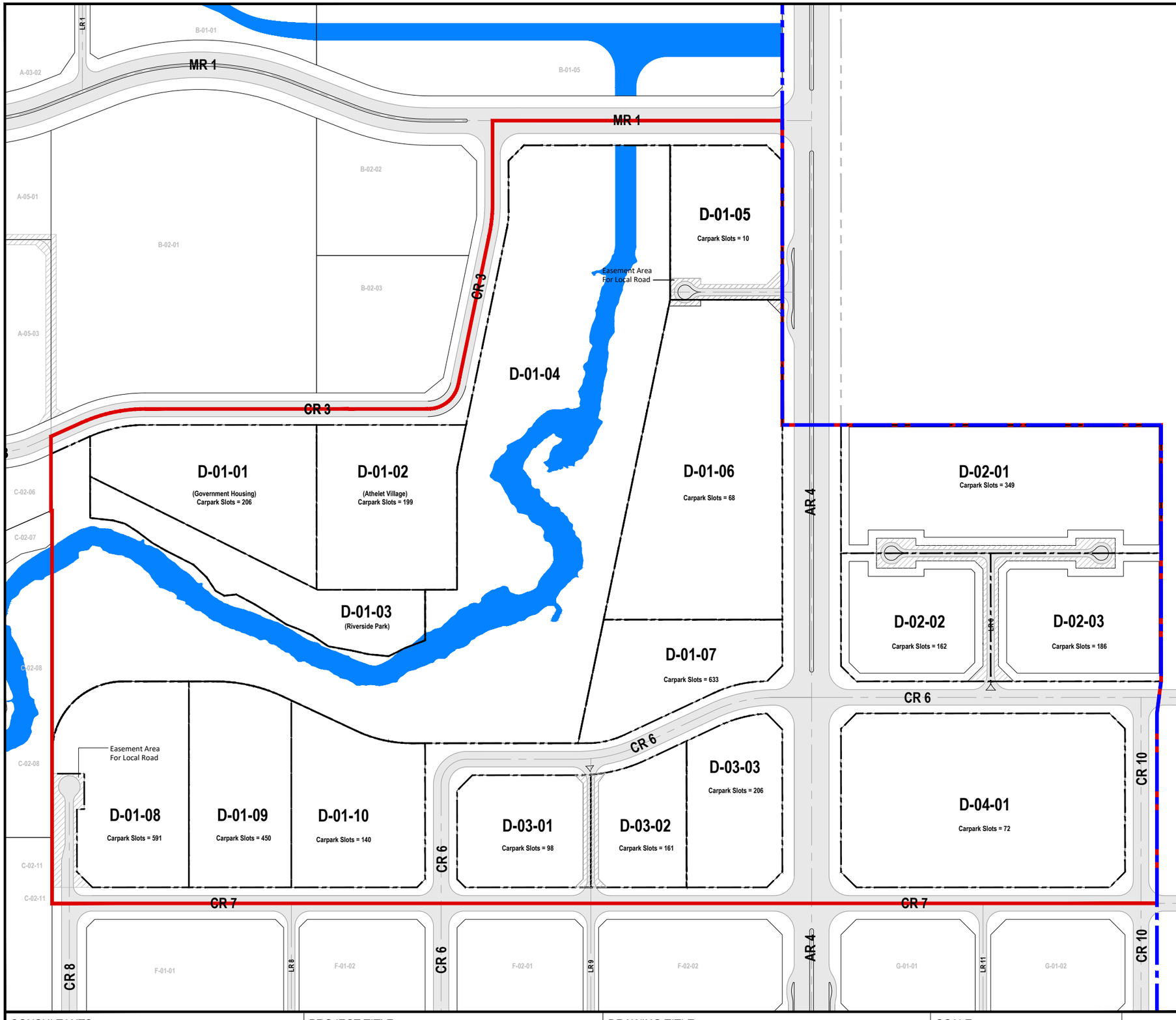
ZONE D: RIVER BEND ZONE

December 2020

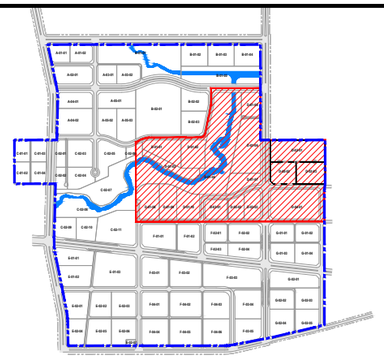
01

BLOCK/ LOT INFORMATION PLANS AT ZONE LEVEL

ZONE D: RIVER BEND ZONE



Key Plan:



Land Use	No. of plots	Plot Names
R3 High Density Residential Zone	5	D-01-01, D-01-02, D-02-01, D-02-02, D-02-03
R-MU Mixed Use Residential Zone	2	D-01-08, D-01-09
C1 Neighbourhood Level Commercial Zone	2	D-03-02, D-03-03
C2 City Level Commercial Zone	1	D-01-07
GI-E General Institutional Education Zone	2	D-01-06, D-04-01
GI-G General Institutional Civic Zone	2	D-01-10, D-03-01
PRE-P Passive Recreational Zone	2	D-01-03, D-01-04
PRE/CUL-A Active Recreational Zone	1	D-01-05
Total	17	

Note:
1. Lot areas shown are subject to verification and change by a Geodetic Engineer.
2. All easement areas indicated on the plan should be accessible by the public.
3. Open space easement areas may include Landscape easement, Plaza easement or Roadway easement.

Carpark Slots Plan at Zone D

Legend:

- Edge of Curb
- Roadway
- Local Road Easement
- Zone D Boundary
- Property Line
- NGAC Boundary
- Waterbody

CONSULTANTS: PJIC SJ SURBANA JURONG

PROJECT TITLE: NGAC DETAILED MASTERPLAN

DRAWING TITLE: Block / Lot Information Plan at Zone D

SCALE: 0 10 50 100

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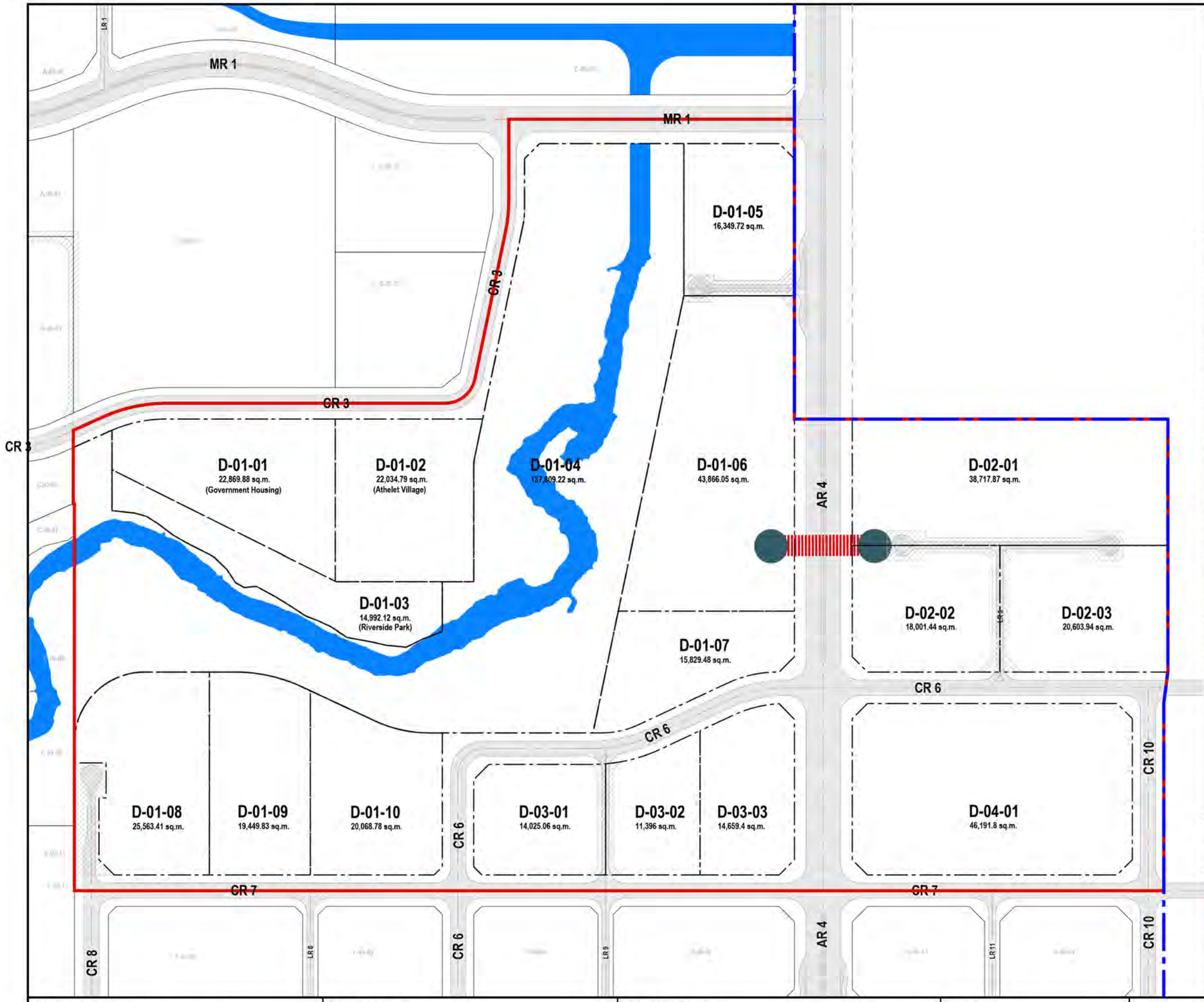


Key Plan:

Land Use	No. of plots	Plot Names
R3 High Density Residential Zone	5	D-01-01, D-01-02, D-02-01, D-02-02, D-02-03
R-MU Mixed Use Residential Zone	2	D-01-08, D-01-09
C1 Neighbourhood Level Commercial Zone	2	D-03-02, D-03-03
C2 City Level Commercial Zone	1	D-01-07
GI-E General Institutional Education Zone	2	D-01-06, D-04-01
GI-G General Institutional Civic Zone	2	D-01-10, D-03-01
PRE-P Passive Recreational Zone (Open Space)	2	D-01-03, D-01-04
PRE/CUL-A Active Recreational Zone	1	D-01-05
Total	17	

Note:
1. Lot areas shown are subject to verification and change by a Geodetic Engineer.
2. All other information not indicated in the information plans but deemed necessary by the interested party/ies shall refer to Design Standard and Guidelines of NGAC and the National Building Code of the Philippines for additional development controls.

EPL and UPL Plan at Zone D

Legend:

- Zone D Boundary
- NGAC Boundary
- Property Line
- RROW Line
- Edge of Curb
- Roadway
- Local Road Easement
- Waterbody
- Vertical Interchange
- Vertical Interchange

CONSULTANTS:

PJIC SJ SURBANA JURONG

PROJECT TITLE:

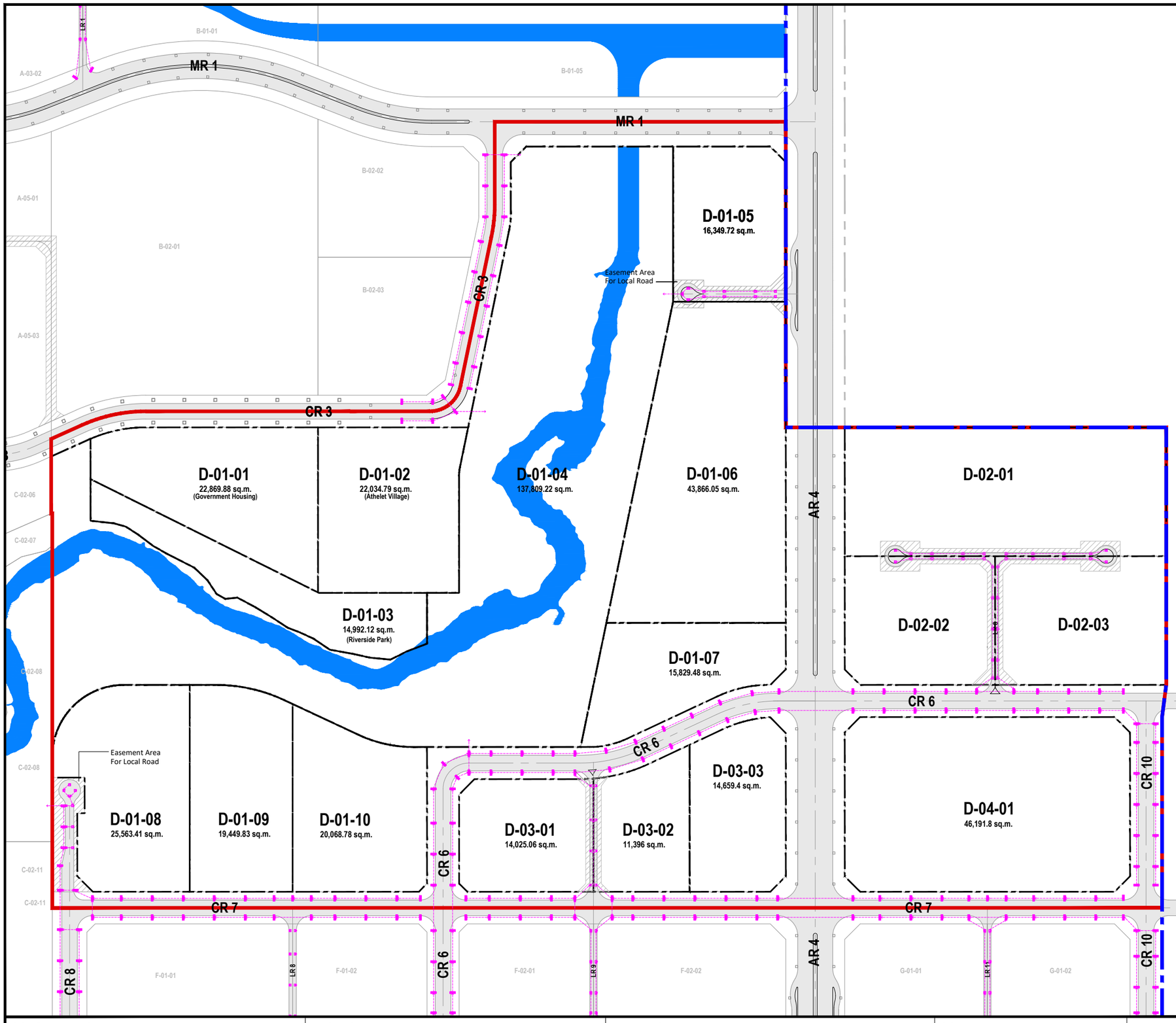
NGAC DETAILED MASTERPLAN

DRAWING TITLE:

Block / Lot Information Plan at Zone D

SCALE:

N



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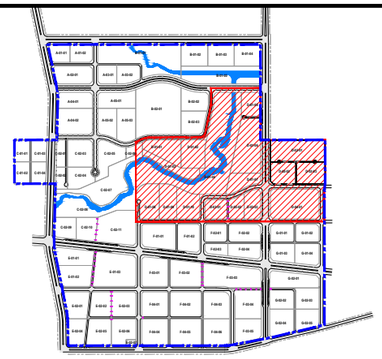

Land Use	No. of plots	Plot Names
R3 High Density Residential Zone	5	D-01-01, D-01-02, D-02-01, D-02-02, D-02-03
R-MU Mixed Use Residential Zone	2	D-01-08, D-01-09
C1 Neighbourhood Level Commercial Zone	2	D-03-02, D-03-03
C2 City Level Commercial Zone	1	D-01-07
GI-E General Institutional Education Zone	2	D-01-06, D-04-01
GI-G General Institutional Civic Zone	2	D-01-10, D-03-01
PRE-P Passive Recreational Zone	2	D-01-03, D-01-04
PRE/CUL-A Active Recreational Zone	1	D-01-05
Total	17	

Note:
1. All drainage manholes / catchbasins are indicative and is subject for approval.
2. Drainage lines along the Arterial Roads are for verification. These are existing or are under construction.
3. All other information not indicated in the information plans but deemed necessary by the interested party/ies shall refer to Design Standard and Guidelines of NGAC and the National Building Code of the Philippines for additional development controls.

Drainage Plan at Zone D

Legend:

- Roadway
- Local Road Easement
- Zone D Boundary
- Property Line
- NGAC Boundary
- Catchbasin/ Manhole
- Drainage
- Waterbody

CONSULTANTS:

PJIC SJ SURBANA JURONG

PROJECT TITLE:

NGAC DETAILED MASTERPLAN

DRAWING TITLE:

Block / Lot Information Plan at Zone D

SCALE:

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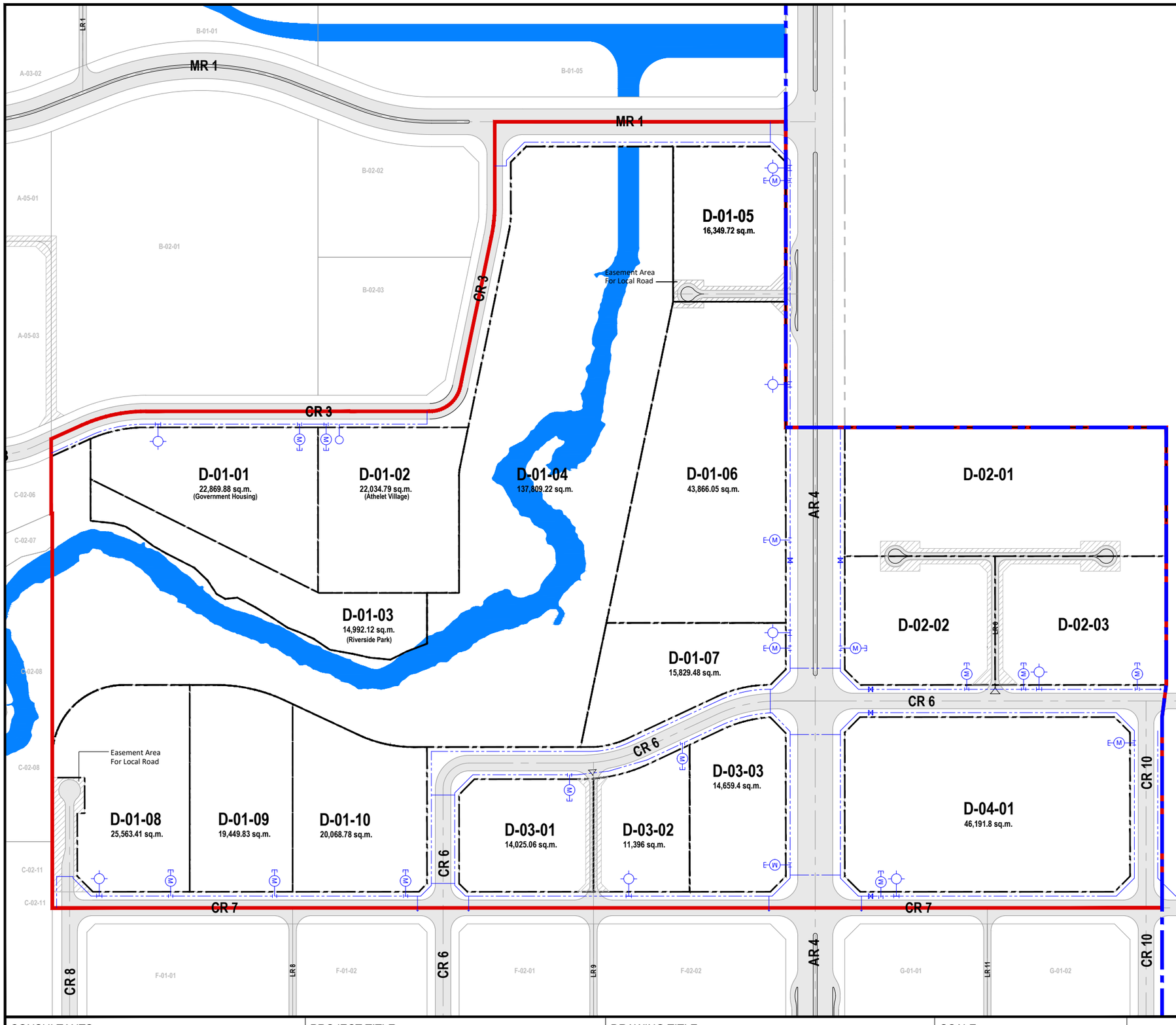

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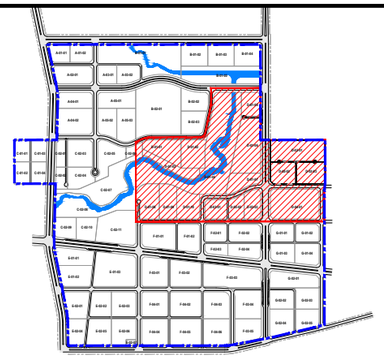

Land Use	No. of plots	Plot Names
R3 High Density Residential Zone	5	D-01-01, D-01-02, D-02-01, D-02-02, D-02-03
R-MU Mixed Use Residential Zone	2	D-01-08, D-01-09
C1 Neighbourhood Level Commercial Zone	2	D-03-02, D-03-03
C2 City Level Commercial Zone	1	D-01-07
GI-E General Institutional Education Zone	2	D-01-06, D-04-01
GI-G General Institutional Civic Zone	2	D-01-10, D-03-01
PRE-P Passive Recreational Zone	2	D-01-03, D-01-04
PRE/CUL-A Active Recreational Zone	1	D-01-05
Total	17	

Note:
1. All other information not indicated in the information plans but deemed necessary by the interested party/ies shall refer to Design Standard and Guidelines of NGAC and the National Building Code of the Philippines for additional development controls.

Water Supply Plan at Zone D

Legend:

- Roadway
- Local Road Easement
- Zone D Boundary
- Property Line
- NGAC Boundary
- Waterbody
- Water
- Gate Valve
- Service Connection
- Fire Hydrant
- Blow Off Valve

CONSULTANTS:

PJIC SJ SURBANA JURONG

PROJECT TITLE:

NGAC DETAILED MASTERPLAN

DRAWING TITLE:

Block / Lot Information Plan at Zone D

SCALE:

0 10 50 100

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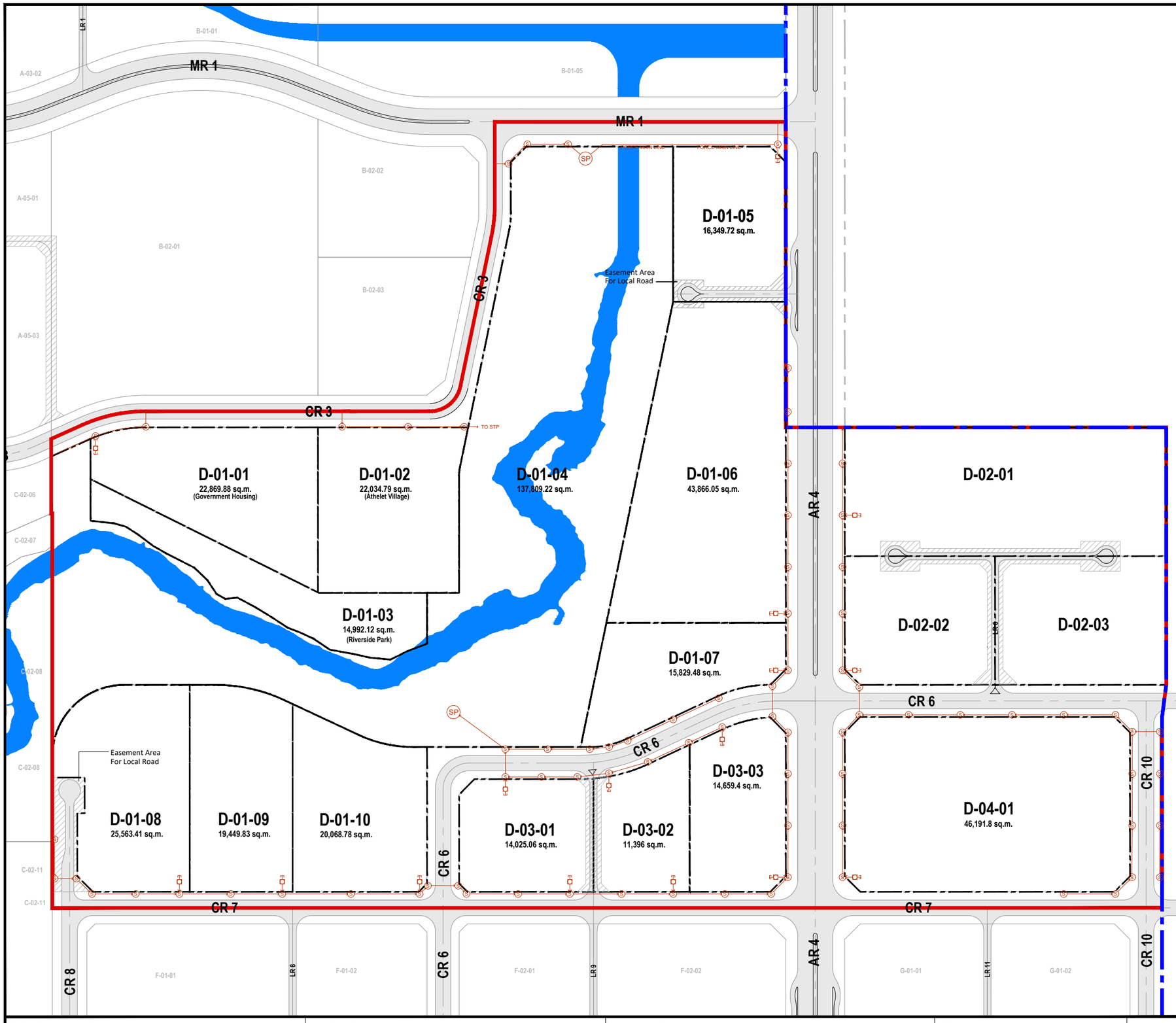

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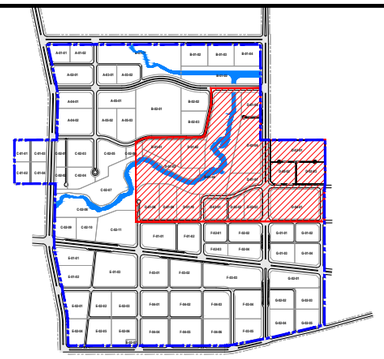

Land Use	No. of plots	Plot Names
R3 High Density Residential Zone	5	D-01-01, D-01-02, D-02-01, D-02-02, D-02-03
R-MU Mixed Use Residential Zone	2	D-01-08, D-01-09
C1 Neighbourhood Level Commercial Zone	2	D-03-02, D-03-03
C2 City Level Commercial Zone	1	D-01-07
GI-E General Institutional Education Zone	2	D-01-06, D-04-01
GI-G General Institutional Civic Zone	2	D-01-10, D-03-01
PRE-P Passive Recreational Zone	2	D-01-03, D-01-04
PRE/CUL-A Active Recreational Zone	1	D-01-05
Total	17	

Note:
1. All other information not indicated in the information plans but deemed necessary by the interested party/ies shall refer to Design Standard and Guidelines of NGAC and the National Building Code of the Philippines for additional development controls.

Sewer Plan at Zone D

Legend:

- Roadway
- Local Road Easement
- Zone D Boundary
- Property Line
- NGAC Boundary
- Waterbody
- Sewer
- Sewer Manhole
- Service Connection

CONSULTANTS: PJIC, SURBANA JURONG

PROJECT TITLE: NGAC DETAILED MASTERPLAN

DRAWING TITLE: Block / Lot Information Plan at Zone D

SCALE: 0 10 50 100

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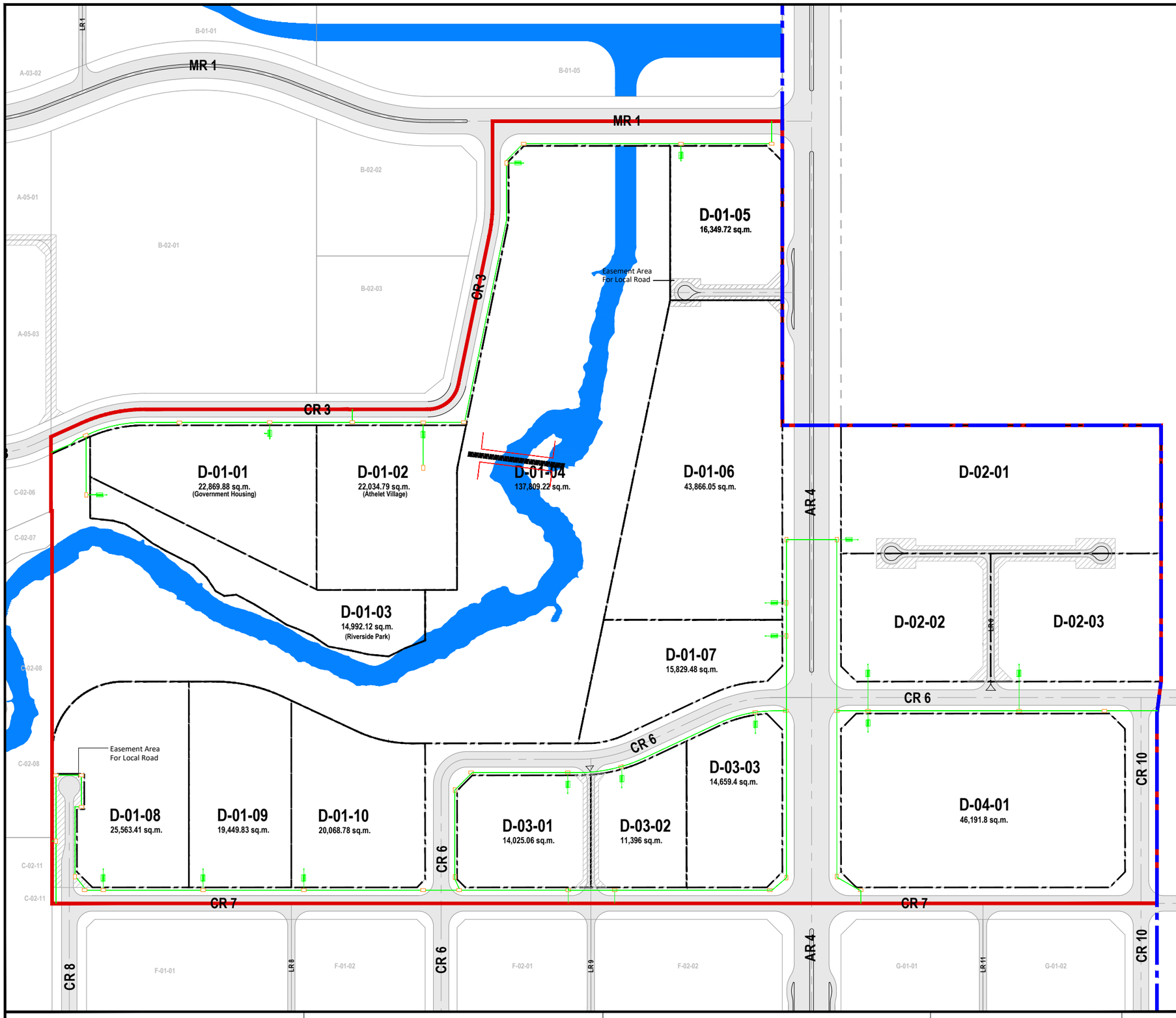
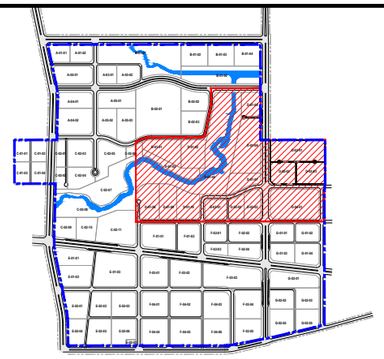


Key Plan:



Land Use	No. of plots	Plot Names
R3 High Density Residential Zone	5	D-01-01, D-01-02, D-02-01, D-02-02, D-02-03
R-MU Mixed Use Residential Zone	2	D-01-08, D-01-09
C1 Neighbourhood Level Commercial Zone	2	D-03-02, D-03-03
C2 City Level Commercial Zone	1	D-01-07
GI-E General Institutional Education Zone	2	D-01-06, D-04-01
GI-G General Institutional Civic Zone	2	D-01-10, D-03-01
PRE-P Passive Recreational Zone	2	D-01-03, D-01-04
PRE/CUL-A Active Recreational Zone	1	D-01-05
Total	17	

Note:
1. Pad mounted switchgear and electrical manhole are purely indicative and shall be subject to final approved detailed design.
2. All other information not indicated in the information plans but deemed necessary by the interested party/ies shall refer to Design Standard and Guidelines of NGAC and the National Building Code of the Philippines for additional development controls.

Power Plan at Zone D

Legend:

- Roadway
- Local Road Easement
- Zone D Boundary
- Property Line
- NGAC Boundary
- Manhole
- Padmounted Switchgear
- Power
- Waterbody

CONSULTANTS:

PJIC SJ SURBANA JURONG

PROJECT TITLE:

NGAC DETAILED MASTERPLAN

DRAWING TITLE:

Block / Lot Information Plan at Zone D

SCALE:

0 10 50 100

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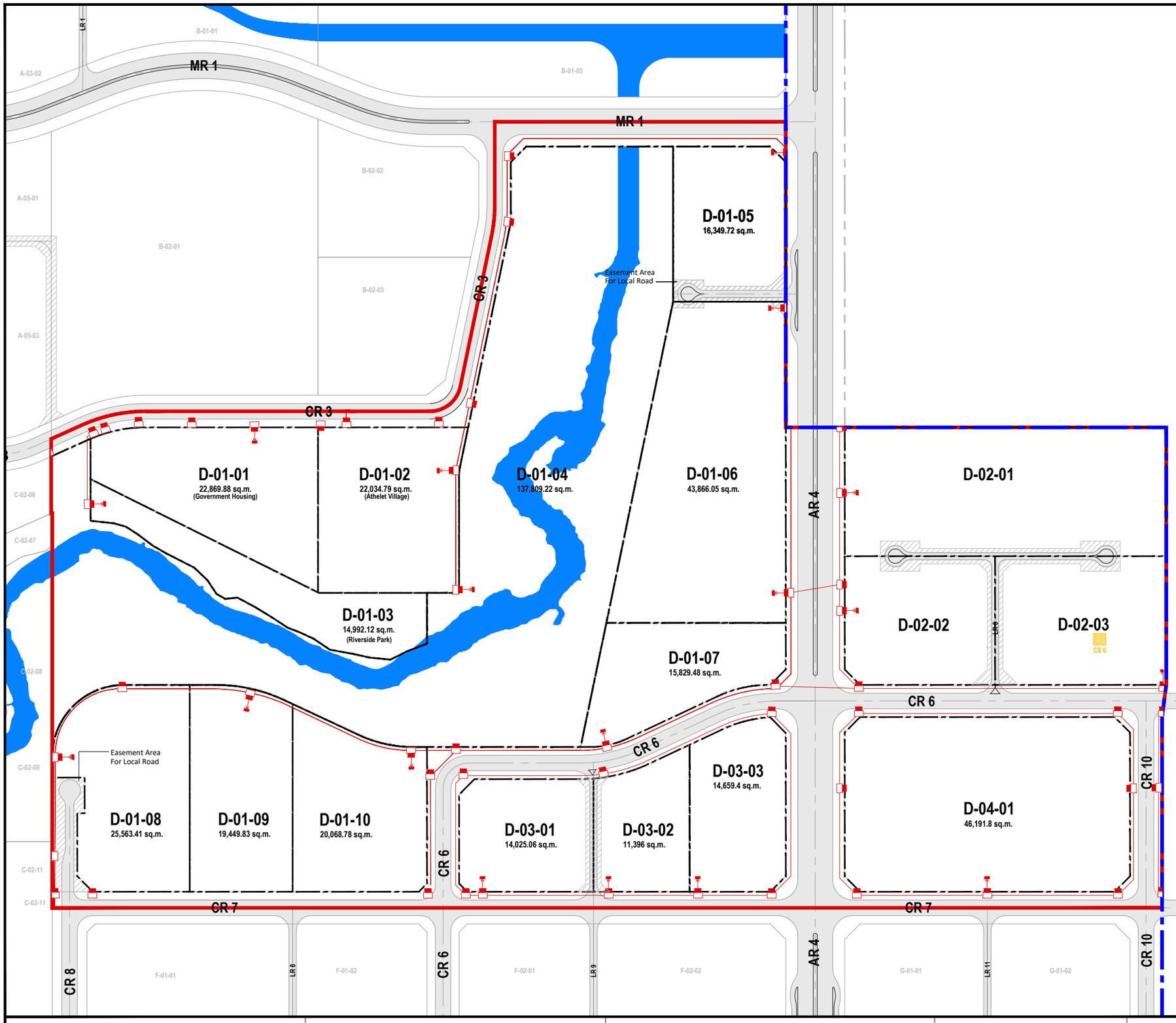
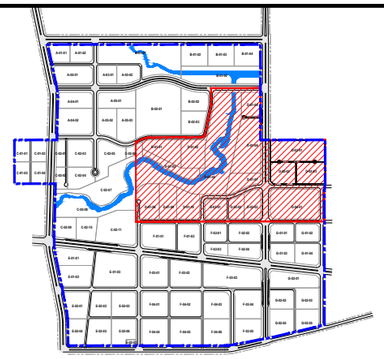


Key Plan:



Land Use	No. of plots	Plot Names
R3 High Density Residential Zone	5	D-01-01, D-01-02, D-02-01, D-02-02, D-02-03
R-MU Mixed Use Residential Zone	2	D-01-08, D-01-09
C1 Neighbourhood Level Commercial Zone	2	D-03-02, D-03-03
C2 City Level Commercial Zone	1	D-01-07
GI-E General Institutional Education Zone	2	D-01-06, D-04-01
GI-G General Institutional Civic Zone	2	D-01-10, D-03-01
PRE-P Passive Recreational Zone	2	D-01-03, D-01-04
PRE/CUL-A Active Recreational Zone	1	D-01-05
Total	17	

Note:
1. All cellular site locations/CATV/TTC are purely indicative and shall be subject to final approval by the Telecommunications Company / CATV provider.
2. All other information not indicated in the information plans but deemed necessary by the interested party/ies shall refer to Design Standard and Guidelines of NGAC and the National Building Code of the Philippines for additional development controls.

Telecom Plan at Zone D

Legend:

- Roadway
- Local Road Easement
- Zone D Boundary
- Property Line
- NGAC Boundary
- Comm Ln&Conc. Manhole
- Comm. Conduit Stubout
- Tel. Terminal Cabinet
- Tower
- Waterbody

CONSULTANTS: PJIC, SURBANA JURONG

PROJECT TITLE: NGAC DETAILED MASTERPLAN

DRAWING TITLE: Block / Lot Information Plan at Zone D

SCALE: 0 10 50 100

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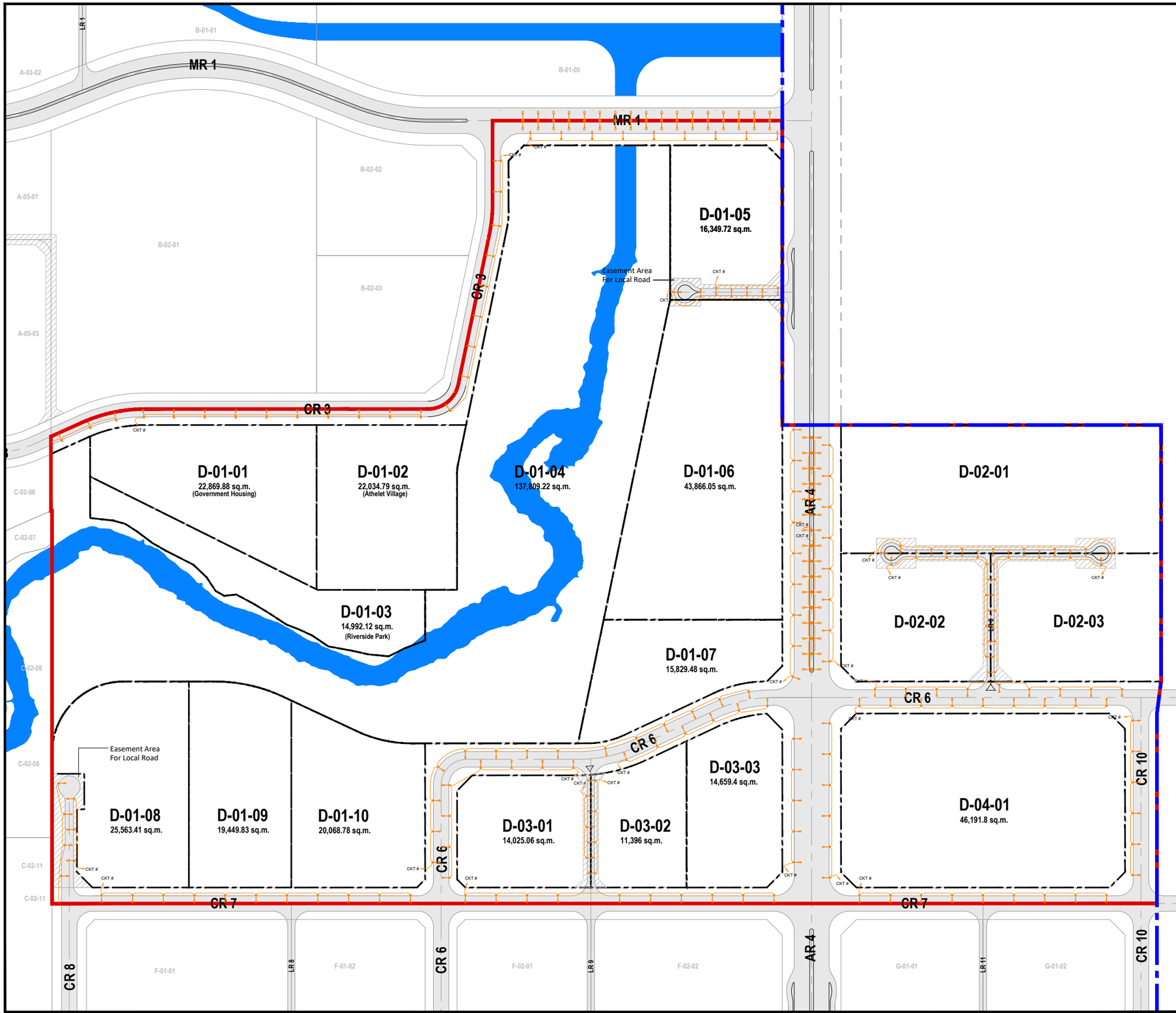

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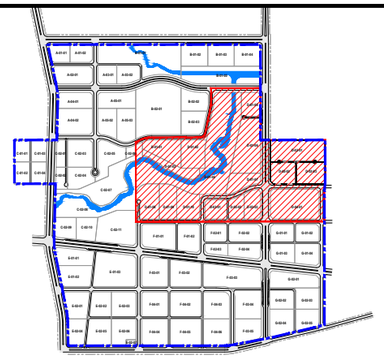


Land Use	No. of plots	Plot Names
R3 High Density Residential Zone	5	D-01-01, D-01-02, D-02-01, D-02-02, D-02-03
R-MU Mixed Use Residential Zone	2	D-01-08, D-01-09
C1 Neighbourhood Level Commercial Zone	2	D-03-02, D-03-03
C2 City Level Commercial Zone	1	D-01-07
GI-E General Institutional Education Zone	2	D-01-06, D-04-01
GI-G General Institutional Civic Zone	2	D-01-10, D-03-01
PRE-P Passive Recreational Zone	2	D-01-03, D-01-04
PRE/CUL-A Active Recreational Zone	1	D-01-05
Total	17	

Note:
1. All streetlight locations are purely indicative and shall be subject to final approve detail design .
2. All other information not indicated in the information plans but deemed necessary by the interested party/ies shall refer to Design Standard and Guidelines of NGAC and the National Building Code of the Philippines for additional development controls.

Street Lighting Plan at Zone D

Legend:

- Roadway
- Local Road Easement
- Zone D Boundary
- Property Line
- NGAC Boundary
- Single Roadway Lamp Post
- Double Arm Roadway Lamp Post
- Lighting
- Waterbody

CONSULTANTS:

PJIC SJ SURBANA JURONG

PROJECT TITLE:

NGAC DETAILED MASTERPLAN

DRAWING TITLE:

Block / Lot Information Plan at Zone D

SCALE:

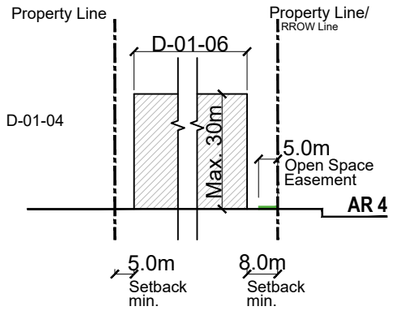
0 10 50 100

N

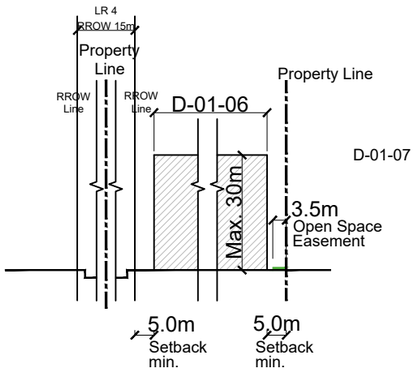
02

BLOCK/ LOT INFORMATION PLANS

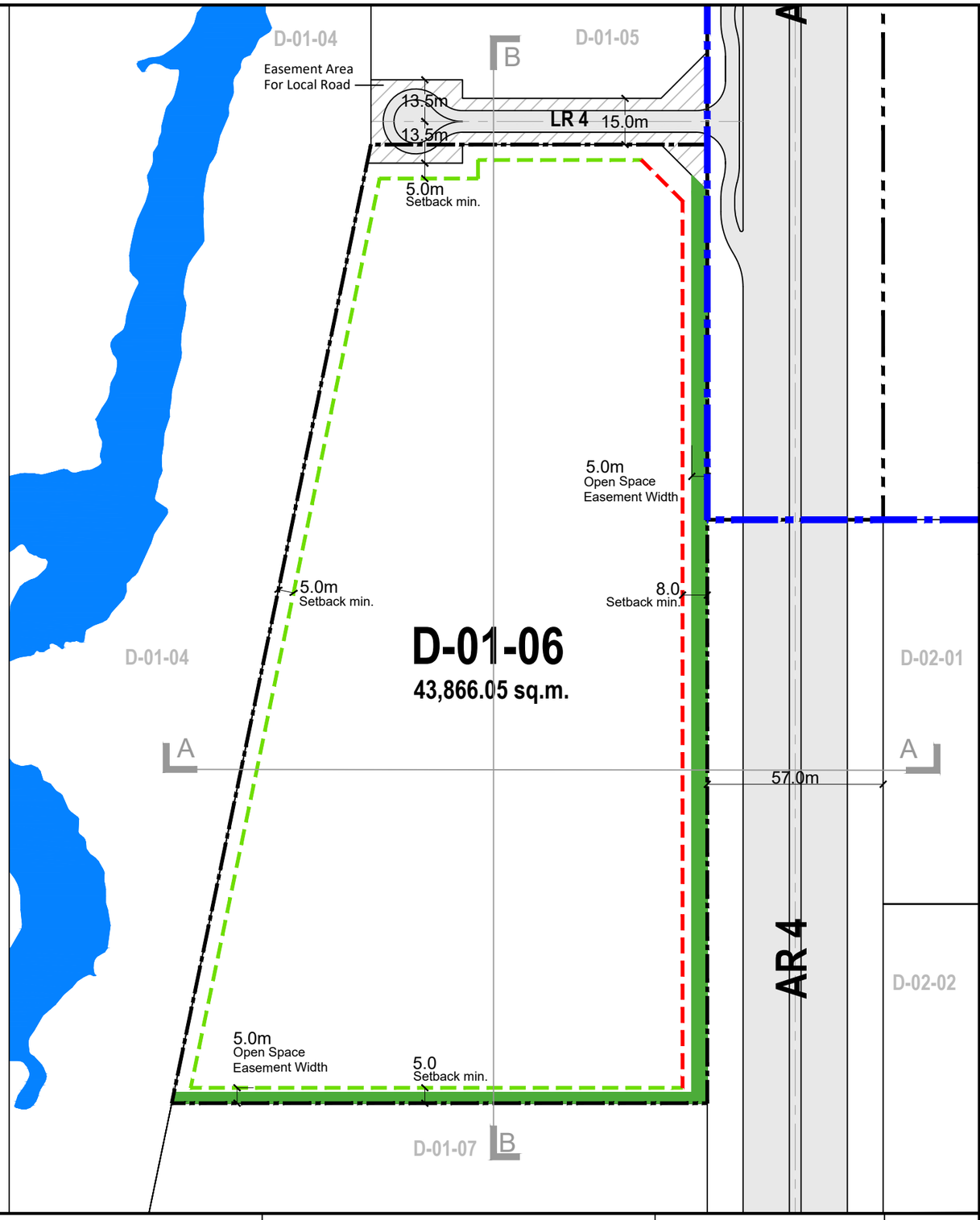
ZONE D: RIVER BEND ZONE



Section A-A



Section B-B



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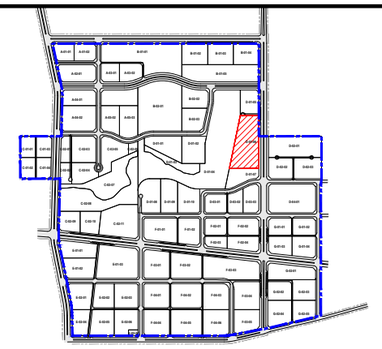

Lot ID	D-01-06
Land Use Zoning	GI-E General Institutional Education Zone
Lot Area (sqm)	43,866.05
Max. PSO (%)	50%
Max. BHL (m)	30
Max. FAR	1.0
Max. GFA (sqm)	43,866
Max.TGFA (sqm)	54,833
Min.Open Space Coverage[1] (%)	30+10%=40%
Min. Landscape Replacement Area (%)	50%
Carpark Lots	68
Building Setback	Frontage: 8m Rear: 5m Side: 5m
Min. Build to Line (%)	-
Open Space (Trees/ Plants)	Big trees spaced at 8-12m Medium trees spaced at 4-6m Small trees spaced at 3-4m

Note:
1. Min. open space coverage includes both Softscape and Hardscape areas, but excludes roads and driveways.
2. Lot areas shown are subject to verification and change by a Geodetic Engineer.
3. Parameters listed above, except for setbacks and plantings, are prescribed based on the proposed Detailed Master Plan as of Nov 2020.
4. Parking lots numbers are based on the maximum GFA of each plot.
5. All easement areas indicated on the plan should be accessible by the public.
6. Open space easement areas may include Landscape easement, Plaza easement or Roadway easement.
7. Trees and shrubs design according to district theme. Tree canopy should have appropriate clearance in between buildings.
8. Building forms on sections are only indicative.
9. In the case that the resultant building footprint generated by the minimum setback yields a higher PSO than the prescribed PSO, the prescribed PSO will prevail.
10. Indicative existing location and realignment of waterbody to be confirmed with a detailed survey. Easements and setbacks shall conform to the recommendations of the River Study Report in Nov 2017 by ADB. Exact locations of bridge crossings shall be confirmed upon detailed survey of the river bank.
11. All other information not indicated in the information plans but deemed necessary by the interested party/ies shall refer to Design Standard and Guidelines of NGAC and the National Building Code of the Philippines for additional development controls.

Block / Lot Information

Legend:

- 5m Building Setback
- 8m Building Setback
- Open Space Easement Area
- Roadway
- Local Road Easement
- Property Line
- NGAC Boundary
- Waterbody

CONSULTANTS:	PROJECT TITLE:	DRAWING TITLE:	SCALE:
PJIC SURBANA JURONG	NGAC DETAILED MASTERPLAN	Block / Lot Information Plan at D-01-06	0 5 10 20 50

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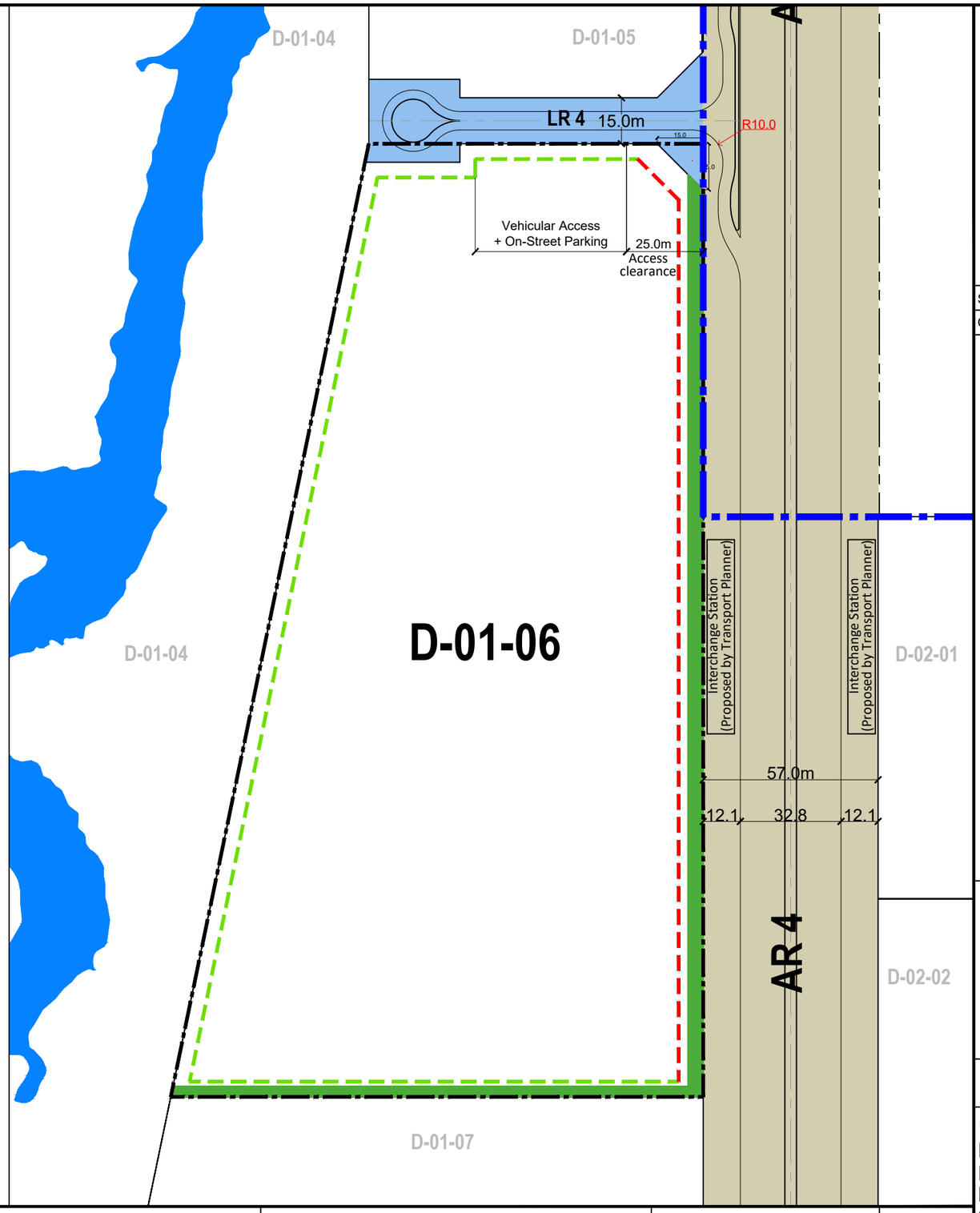
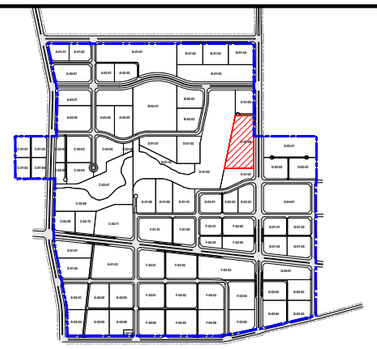


Key Plan:



Street Name	AR 4	LR 4
On-Street Parking	X	8 Total Slots (One Side)

Note:

1. Street Parking not allowed within 25 meters from edge of plot. It's also not allowed within 25 meters from vehicular access.
2. All other information not indicated in the information plans but deemed necessary by the interested party/ies shall refer to Design Standard and Guidelines of NGAC and the National Building Code of the Philippines for additional development controls.

Vehicular Access, Road & Transport

Legend:

- 5m Building Setback
- 8m Building Setback
- Primary Arterial (57m)
- Local Road (15m)
- Property Line
- NGAC Boundary
- Waterbody

CONSULTANTS:	PROJECT TITLE:	DRAWING TITLE:	SCALE:
PJIC SJ SURBANA JURONG	NGAC DETAILED MASTERPLAN	Block / Lot Information Plan at D-01-06	0 5 10 20 50

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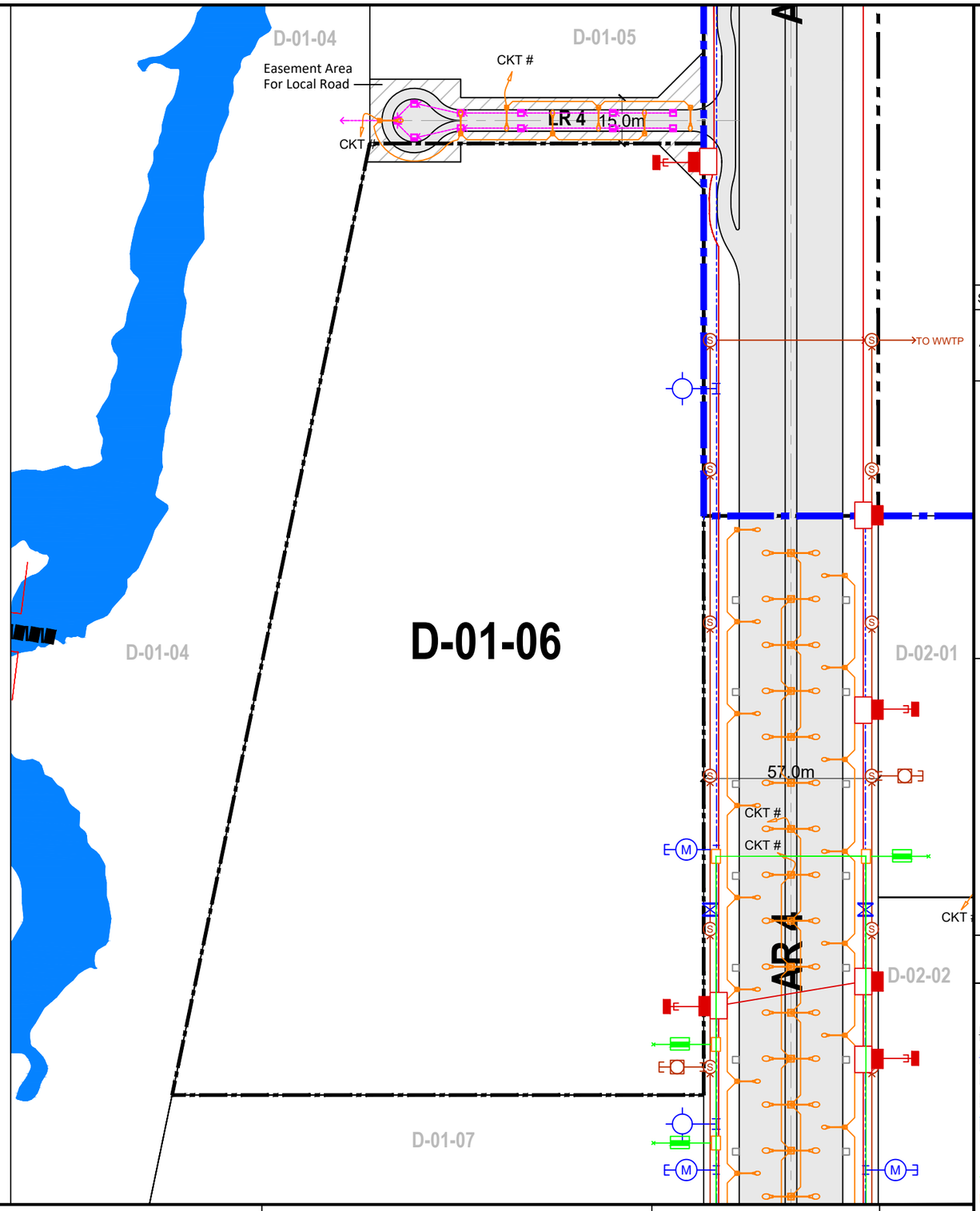

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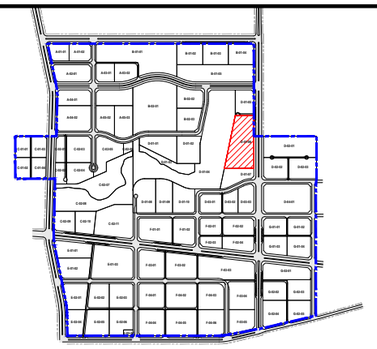


Street Name	AR 4
Area Lighting	15 NOS OF SL1 20 LUX MIN, 13 NOS OF SL2 20 LUX MIN,

Note:

1. All drainage manholes/catchbasins are indicative and is subject for approval.
2. Drainage lines along the Arterial Roads are for verification. These are existing or are under construction.
3. All streetlight locations are purely indicative and shall be subject to final approve detail design .
4. Pad mounted switchgear and electrical manhole are purely indicative and shall be subject to final approved detailed design.
5. All cellular site locations/CATV/TTC are purely indicative and shall be subject to final approval by the Telecommunications Company / CATV provider.
6. All other information not indicated in the information plans but deemed necessary by the interested party/ies shall refer to Design Standard and Guidelines of NGAC and the National Building Code of the Philippines for additional development controls.

Infrastructure and Utilities

Legend:

- Property Line
- NGAC Boundary
- Roadway
- Local Road Easement
- Waterbody
- Manhole
- Padmounted Switchgear
- Single Roadway Lamp Post
- Double Arm Roadway Lamp Post
- Power
- Lighting
- Catchbasin/ Manhole
- Drainage
- Water
- Gate Valve
- Service Connection
- Fire Hydrant
- Sewer
- Sewer Manhole
- Service Connection
- Comm Ln&Conc. Manhole
- Comm. Conduit Stubout
- Tel. Terminal Cabinet
- Tower

CONSULTANTS:	PROJECT TITLE:	DRAWING TITLE:	SCALE:
PJIC SJ SURBANA JURONG	NGAC DETAILED MASTERPLAN	Block / Lot Information Plan at D-01-06	0 5 10 20 50

Section V.

New Clark City Design Standards and Guidelines

New Clark City Phase One Area

Design Standards & Guidelines

Stage 3 Report_Revision 05

22nd July 2019

Prepared by

SURBANA JURONG

in association with:

NIPPON KOEI

PKII

Submitted to

PJIC

PHILIPPINE JAPAN INITIATIVE FOR CGC INC.

Chapter 02

Architecture and Urban Design

2.1 General Principles

2.1.1 The design of buildings within NCC must conform to the Design Standards and Guidelines detailed below, as well as all laws, ordinances, design standards, codes, rules and regulations related to land development and building construction, including the National Building Code of Philippines, the various planning and safety codes of the Philippines and any amending or new legislation.

2.1.2 The objective in drawing up the Design Standards and Guidelines is to encourage the creation of a harmonious and visually attractive NCC, with diverse architectural forms and a level of detail that is able to embody its vision and delight its residents and visitors.

2.1.3 The building massing of NCC is governed by several design standards and guidelines including Floor Area Ratio (FAR) or development density, building coverage, building setback, minimum lot size and building height.

2.2 Development Definition

2.2.1 Chapter 2.2 lists down the definition of the terms used in the Design Standards and Guidelines.

2.2.2 Zoning Plan is a planning tool that regulates the type of uses, development intensity, and building height, setback and coverage on any given plot of land to effectively guide development in a logical and orderly fashion. The Zoning Plan is meant to provide all stakeholders, including landowners and locators, with a clear picture of what can and cannot be developed on any particular plot.

Zoning regulations are segregated into three categories:

- Permitted Uses comply with the intended use for the particular zoning code, and are always permitted with or without conditions on application to the Declarant within the particular zone.
- Conditional Uses are usually activities which may create significant traffic, noise, or other impacts on the area surrounding the development in the particular zone. Such uses may be permitted with or without conditions on application to the Declarant within the particular zone.

  Each zone may allow different but compatible developments that are complementary in terms of use and scale. For example, a small-scale commercial development may be allowed in residential zones to provide convenience for residents to meet their daily shopping needs. Similarly, public facilities like schools, day care centers and religious facilities may be allowed in a residential zone if the facilities comply with standards for parking, noise, etc.

  Such conditional uses may be permitted after careful consideration and evaluation by the Declarant, and may be subject to certain conditions as deemed necessary by the review committee to ensure that the overall planning intention for the particular zone is not compromised.

- Prohibited Uses are uses that are not permitted under any condition, and includes activities that are deemed incompatible in the particular zone. For example, industrial uses are prohibited within the residential zones.

2.2.3 Ancillary Building refer to any building erected on a lot that is incidental to a primary building on the same lot, and the use of which is in connection with that primary building such as a detached garage.

2.2.4 Floor Area Ratio (FAR) refers to the ratio of a building's total permitted floor area to the total area of the plot of land upon which it is built.

2.2.5 Gross Floor Area (GFA) is the total floor area inside the building envelope, including the external walls, but excluding the areas exempted from the calculation of the GFA, as defined in Chapter 2.6.

2.2 Development Definition

2.2.6 Building Coverage is the percentage of the plot area occupied by the ground area of the primary and all ancillary buildings on the plot, inclusive of the shadow area cast by cantilevered building projections and excluding the following:

- Shadow area cast by bay windows with a projection of 0.5m or less;
- Roof eaves and sun shading projections; and
- Shadow area of a building from the third floor and above, to encourage viable landscaping at the ground level and shaded communal spaces, and promote building articulation and a variety of architectural designs.

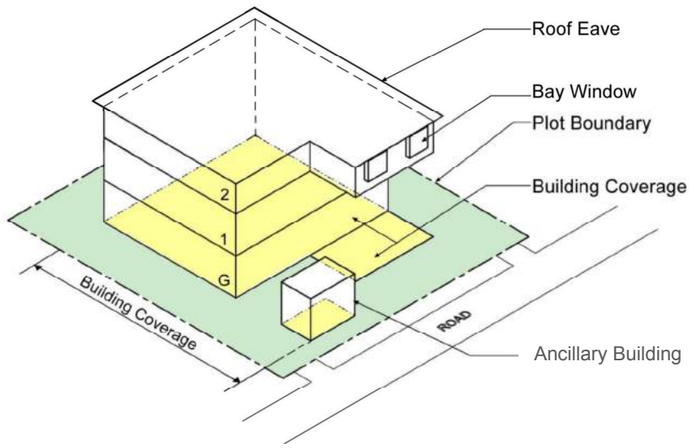


Fig. 2.1 Building Coverage

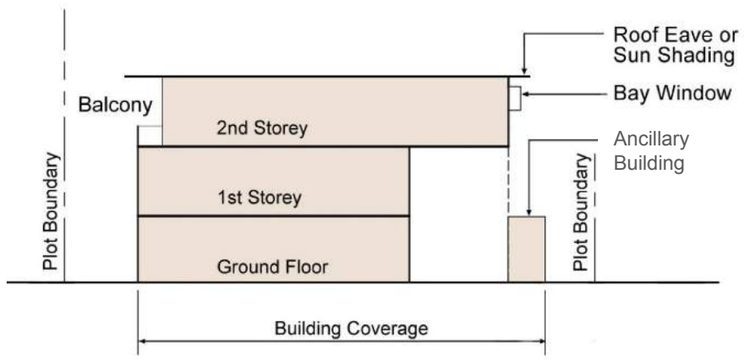


Fig. 2.2 Building Coverage Section

2.2.7 Building Height refers to the total height of a building in each facility, excluding:

- External parapets not exceeding 1.5m;
- Lift overruns;
- Antennaes not exceeding 6.0m; and
- Rooftop M&E service rooms and structures.

Along slopes or contoured topography, building height is measured as illustrated in Figure 2.4.

In all cases, building height must conform to the height restrictions of the Civil Aviation Authority of the Philippines (CAAP), National Building Code (NBC), as well as all laws and regulations.

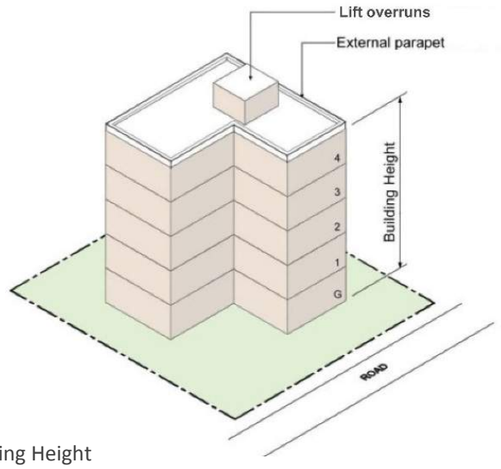


Fig. 2.3 Building Height

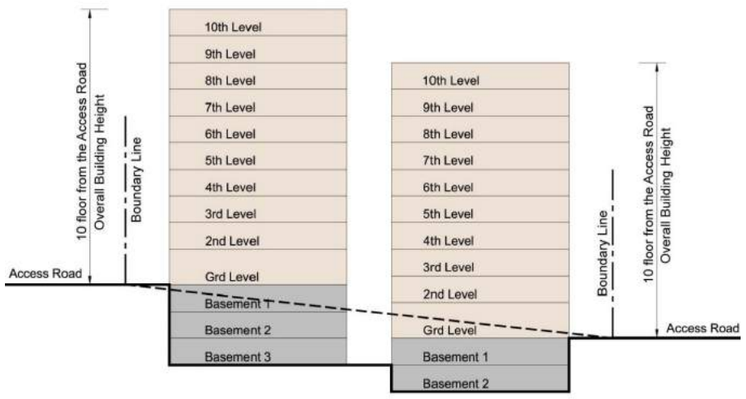


Fig. 2.4 Building Height Section

2.2.8 Building Setback refers to the minimum required distance between a building or structure and a street, road, river or other stream, shore or flood plain, or any other place that is subjected to protection.

Building Setback regulations are segregated into three categories:

- Front Setback refers to the minimum required distance as measured from the plot line fronting any road to the external main wall of any primary or ancillary building.
- Rear Setback refers to the minimum required distance as measured from the rear plot line to the external main wall of any primary or ancillary building.
- Side Setback refers to the minimum required distance as measured from the plot line that extends between the front and rear plot lines to the external main wall of any primary or ancillary building.

2.2.9 Build-to-Line refers to the requirement for a building façade, above an arcade, if any, to be built at the inner edge of the minimum setback requirement where a build-to-line is stipulated. Build-to-line is mandatory in certain areas to help generate activities along particular corridors or nodes. The objective is to integrate commercial developments with pedestrian access within the road Right-of-Way (ROW) and easement area, and to allow for building edge with some flexibility in building design, pedestrian entry, drop off canopy, landscape areas and outdoor refreshment areas.

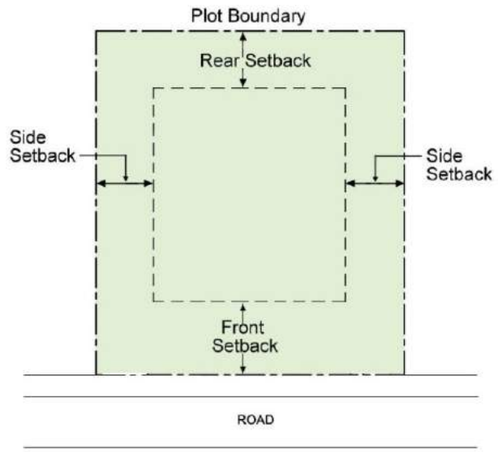


Fig. 2.5 Building Setback

2.2 Development Definition

2.2.10 Activity Generating Use (AGU) refers to commercial use that generates pedestrian footfall and improves the vibrancy of its immediate surroundings. This includes retail, entertainment, Food & Beverage outlets (e.g. restaurants, bars and lounges), sports and recreation (e.g. gymnasiums and fitness centers), and other similar uses.

2.2.11 Active Edge, also called active frontages, refers to ground floor uses that accommodate activities and provide a level of interaction between pedestrians and building uses, including AGUs, diversity of businesses, and entries to offices and apartments. The façade of ground floor uses shall have a high level of transparency, with a large proportion of windows and glazed doors. Actives edges increase casual surveillance and improve the vitality and safety of an area.

2.2.12 Commercial Façade is the façade of a building with a high level of transparency through the use of windows and glazed doors that are able to visually engage the pedestrian passing by. A commercial façade implies vibrant shopfronts that avoid the use of long blank walls.

2.2.13 Outdoor Refreshment Area (ORA) is an alfresco or outdoor dining area that is permitted within the lot, including the building setback. The allowable extent of ORA shall comply with the requirement of emergency vehicle access (EVA) and is subject to approval of the Declarant on application.

2.2.14 Amalgamation refers to the joining of two or more adjoining plots to form a single plot for development purposes. Amalgamation of plots are subject to approval of the Declarant on application. When amalgamation is permitted, the following conditions apply:

- Building setback requirements along the common boundary shall be omitted.
- Composition of permissible GFA of respective uses remain unchanged within each adjoining plot.
- Building height controls shall remain unchanged within each adjoining plot, in order to maintain the skyline.
- Other development controls shall remain unchanged within each adjoining plot.

2.2.15 Landscape Replacement Areas are landscape areas provided on the ground level or upper levels of the development. The diagram below shows the various types of LRAs that could be incorporated within a development (Fig.2.6).

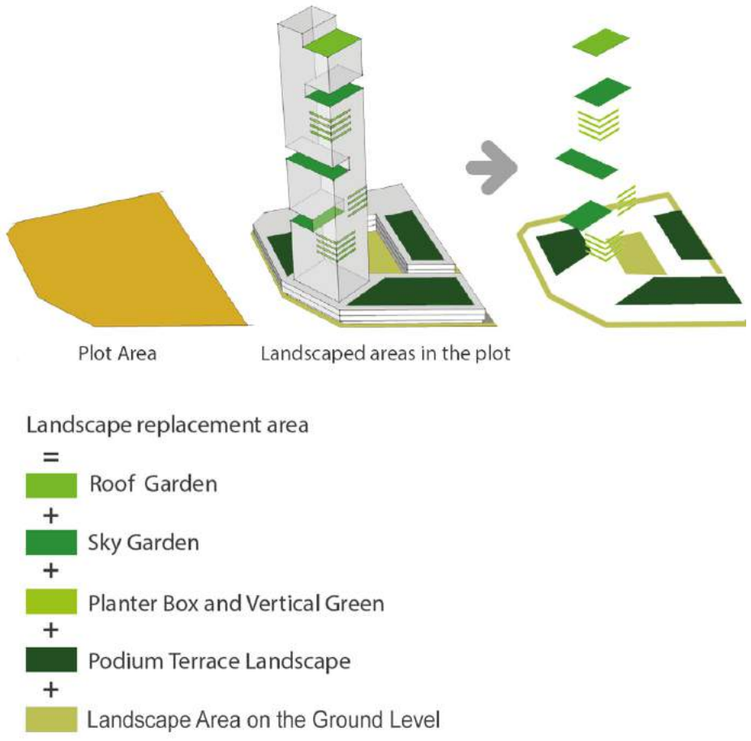


Fig. 2.6 Example of Landscape Replacement Areas

Disclaimer: The Development Definitions mentioned in the Design Standards and Guidelines are not exhaustive. More detailed and additional definitions may be provided by the Declarant, where applicable.

2.3 Outline Zoning

2.3.1 Accompanying the Master Plan is the NCC Overall Zoning Plan (Figure 1.7) and Tables 2.1 and 2.2, indicating which uses are permitted at all times with or without conditions, the uses which may be permitted by the Declarant with or without conditions on application, and the uses which are prohibited under any condition in the various zones. Where permission of the Declarant for a use is necessary, the application for such permission shall be addressed to the Declarant, from whom the appropriate forms may be obtained. The provision for application for such permission allows for greater flexibility in land use planning and better control of the development to meet changing needs.

2.3.2 Any use which may be permitted in accordance with the Design Standards and Guidelines must also conform with all other relevant legislation.

2.3.3 The types of uses have been studied and stipulated in the updated Master Plan and shall be strictly adhered to. If it is the intention to change the use of any existing land or building falling within any zone on the Plan, then such change may only be carried out if the intended use is a use which is always permitted, or if written permission for the intended use has been obtained from the Declarant. In lieu of an approval, Locators are to ensure that the overall zoning distribution still adheres to the Master Plan.

2.3.4 Temporary use of any land is permitted in all zones as long as they have received the prior written permission of the Declarant.

2.3.5 To preserve the vision of NCC, the following uses are prohibited within NCC Phase One Area:

- Cemetery
- Morgues Outside Hospitals
- Columbary
- Crematorium
- Cockfighting Arena

2.4 Land Use Zoning

Table 2.1 NCC Building Usage in Land Use Zoning (cont'd)

Zoning Category	Permitted Uses *Uses always permitted with or without conditions on application to the Declarant*	Conditional Uses *Uses that may be permitted with or without conditions on application to the Declarant*
Other Zones		
Government & Institutional Zone (G)	**Residential** • Multi-family Housing (Townhouse, Condominium, Apartment, Flat) • Ancillary Residential Facility (e.g. Ancillary Laundry Area, Ancillary Recreational Facility, Building Manager's Office, Private Swimming Pool, Refuse Disposal & Collection Point) • Dormitory **Commercial** • Small Retail Shops (e.g. Convenience Store, Supermarket/ Grocery Store, Restaurant, Bakery/ Pastry Shop/ Bake Shop, Barber shop, Beauty Parlor, Laundry/ Dry Cleaning) • Commercial Retail & Services (e.g. Fashion, Stationery Shop, Pawn Shop, Photographic Studio and Shop, Travel Agency, Hardware, Financial Institution/ Bank, ATM, Money Exchange, Service Trade, Massage Establishment, Commercial Bathhouse, Canteen, Fast Food Shop) • Office • Showroom excluding Motor-Vehicles **Public Facility** • Hospital, Health Institution • Clinic/ Polyclinic, Dental Clinic, Sports Club, Gym • Community Center • Post Office • Public Library • Museum, Art Gallery, Concert Hall & Opera House, Cultural Center • Place of Recreation, Sports or Culture, Multi-Purpose Arena • Exhibition or Convention Hall • Government Facility **Open Space & Park** • Public Park **Infrastructure** • Minor Infrastructure (e.g. Minor Electrical Substation, Road (excluding Expressway), Telecommunication Antenna, Utility Installation for Private Use of Locators) • Ancillary Car Park	**Industrial** • Warehouse **Public Facility** • Fire Station, Security Station • Place of Worship • Funeral/ Memorial Service **Open Space & Park** • Community Farm, Urban Farm
Education Zone (E)	**Residential** • Dormitory **Public Facility** • Kindergarten, Day Care Center • Primary & Secondary School • Polytechnic, University, Vocational School • Clinic/ Polyclinic, Dental Clinic, Sports Club, Gym • Post Office • Public Library • Museum, Art Gallery, Concert Hall & Opera House, Cultural Center • Place of Recreation, Sports or Culture, Multi-Purpose Arena **Open Space & Park** • Public Park **Infrastructure** • Minor Infrastructure (e.g. Minor Electrical Substation, Road (excluding Expressway), Telecommunication Antenna, Utility Installation for Private Use of Locators) • Ancillary Car Park	**Commercial** • Small Retail Shops (e.g. Convenience Store, Supermarket/ Grocery Store, Restaurant, Bakery/ Pastry Shop/ Bake Shop, Barber shop, Beauty Parlor, Laundry/ Dry Cleaning) • Commercial Retail & Services (e.g. Fashion, Stationery Shop, Pawn Shop, Photographic Studio and Shop, Travel Agency, Hardware, Financial Institution/ Bank, ATM, Money Exchange, Service Trade, Massage Establishment, Commercial Bathhouse, Canteen, Fast Food Shop) **Public Facility** • Hospital, Health Institution • Sport Complex, Stadium **Open Space & Park** • Community Farm, Urban Farm

2.6 Gross Floor Area

2.6.1 Gross Floor Area is defined as the total sum of the gross horizontal areas of all floors of a building(s) to be erected on a plot, measured from the external face of external walls (or in the absence of such walls, the external perimeters), or mid-point of common or party walls.

2.6.2 When calculating the permitted GFA of a building(s), there are building areas that the Declarant has, at his sole discretion, determined that are:

- Always included;
- Always excluded;
- In specific/special circumstances excluded; and
- In specific/special circumstances eligible for bonus FAR.

2.6.3 The following building areas are always included in the calculation of GFA:

- Administrative offices
- Air handling unit rooms not exclusively serving the entire building
- All indoor sports facility
- Balcony at building interior counted at 100%
- Bay window where the base of the bay is less than 1 meter from the floor line
- Changing room and locker room
- Escalator space at each floor
- Floor area measured to the exterior of perimeter walls and windows
- Floor space in accessory building
- Floor space in open or roof porch floor space in penthouse
- Lobby/ foyer Mezzanine
- Balcony of residential building at building exterior counted at 50%
- Balcony at all other buildings counted at 100%
- Toilet and bathroom
- Any other floor space not specifically excluded in this definition

2.6.4 The following building areas that are always excluded in the calculation of GFA, provided the Declarant is satisfied that they are constructed for this sole purpose, are:

- Covered areas used for parking and driveways, services and utilities
- Loading and unloading area for motor vehicles
- Vertical penetrations in parking floors where no residential or office units area is present
- Areas to be occupied solely by machinery or equipment for any elevator, air-conditioning or heating system, mechanical or electrical risers, or refuse collection area exclusively serving the entire building
- Elevator shaft and fire stairs at each floor.
- Enclosed fire exit and exit enclosure.
- Uncovered gardens/landscape areas, children's play areas, uncovered and unenclosed recreational and sports facilities.
- Landscaped replacement areas, such as sky garden and terraces, area to be exempted is delineated by the 45 degree line taken from the bottom soffit of the floor or overhang above the landscaped deck. (Fig.2.10)
- Areas occupied by mandatory skywalk system and vertical interchanges that are open 24 hours a day or as determined by the management
- Arcade at ground level, measured up to 6.0m wide for arcades designated as a mandatory Arcade, and up to 4.0m wide for those without mandatory requirement
- Areas occupied by a mandatory and non-commercial communal sky bridge, up to 6.0m wide, that are open 24 hours a day and linking blocks within a single development
- Areas occupied by non-commercial arcades, footways, linkways, and underground pedestrian links, to enhance design flexibility in the provision of more pedestrian thoroughfares and linkages for ease of pedestrian movement
- Bicycle supporting facilities for commercial, industrial and public facilities. Refer to Chapter 2.19 for more detail.

The Declarant may permit any floor space to be excluded from the definition of GFA through modifications of the provision of the Design Standards and Guidelines.

2.6.5 In order to facilitate the implementation of the Master Plan, some floor areas may, at the discretion of the Declarant, be excluded from the calculation of GFA.

2.6.6 There are some areas in the building that may be eligible for bonus FAR. The building areas that may be eligible for bonus FAR must be critical to the day to day functioning of NCC and well-being of the community that live and work within it. These areas shall either facilitate public pedestrian movement or other public activities. The Declarant will determine where such bonus will be given, at his sole discretion. Chapter 3 of the Design Standards and Guidelines details scenarios where a building may be eligible for bonus GFA.

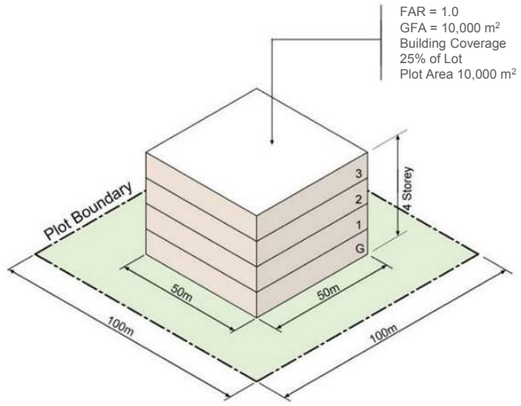


Fig. 2.8 GFA

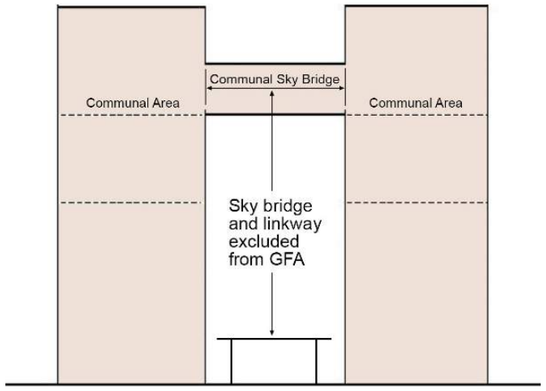


Fig. 2.9 Sky bridge and linkway

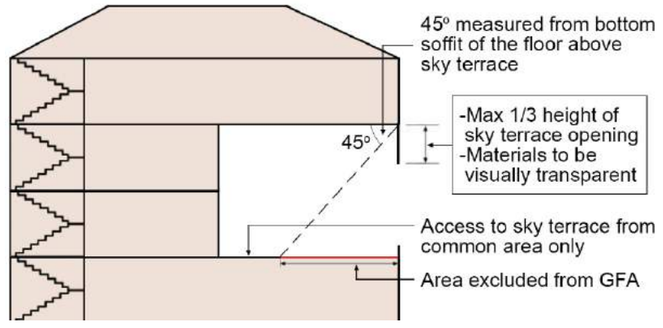


Fig. 2.10 45 degree line_GFA exemption

2.10 Landscape Replacement Areas

2.10.1 Every plot to be constructed within NCC is subject to the minimum landscape replacement areas controls.

2.10.2 The computation of the Landscape Replacement Areas will be determined by:

- Horizontal surface area of the softscape (e.g. permanent planting areas, including extensive green roofs)
- Horizontal surface area of the hardscape (e.g. communal facilities, urban farm)
- Vertical surface area of green walls (if any).

2.10.3 At least 40% of the overall required Landscape Replacement Areas shall be for permanent planting, ie. softscape. The remaining provision can be in the form of communal facilities like events plazas, water features and playgrounds, i.e. hardscape.

2.10.4 Except for rooftop urban farms, all horizontal landscaped (both softscape and hardscape) areas computed as part of the LRAs within developments have to be:

- Uncovered and exposed to the sky; or
- If covered, to be open sided, naturally ventilated and qualify for GFA exemption; and
- Communal and accessible by the public or occupants of the building

2.10.5 Rooftop urban farms can count towards up to 5% of the landscape replacement requirement as hardscape areas.

2.10.6 Vertical greenery and/or extensive green roofs can make up to 5% of the overall Landscape Replacement requirements (as a percentage of site area). They can be counted either as part of the softscape or hardscape components. The 5% for vertical greenery and extensive green roofs is allowed in addition to the 5% allowed for rooftop urban farms.

2.10.7 Requests to use vertical greenery and/or extensive green roofs, or rooftop urban farms, for more than 5% of the Landscape Replacement requirements can be considered based on the merits of the proposal.

2.10.8 The following are requirements for the 40% softscape areas:

- As a guide, a minimum soil depth of 1000mm is required for trees and palms, 500mm for shrubs and climbers and 300mm for ground covers;
- The softscape area will be determined by the horizontal area of the permanent planting bed;
- A combination of trees, palms, shrubs, ground covers and creepers is highly encouraged; and,
- Potted plants will not be counted as part of the softscape area as they can be easily removed

Table 2.7 Landscape Replacement Areas Control

	Minimum Landscape Replacement Area (as % of Plot Area)	
Zoning Category	Ground Level	Total
Residential Zones		
Low Density Residential Zone (R1)	20%	25%
Medium Density Residential Zone (R2)	20%	30%
High Density Residential Zone (R3)	20%	35%
Mixed Use Residential Zone (R4)	15%	35%
Commercial Zones		
Neighborhood Level Commercial Zone (C1)	15%	30%
City Level Commercial Zone (C2)	15%	35%
Central Business District Zone(C3)	15%	40%
Industrial Zones		
R&D Zone (I1)	15%	35%
Light Industrial Zone (I2)	15%	25%
General Industrial Zone (I3)	15%	20%
Other Zones		
Government and Institutional Zone (G)	20%	30%
Education Zone (E)	20%	30%

2.10.9 The remaining Landscape Replacement Areas can be designed as hardscape areas, including:

- Footpaths;
- Seating;
- BBQ pits;
- Events plazas;
- Water features;
- Playgrounds;
- Recreational facilities e.g. tennis courts and swimming pools;
- Vertical greenery & Extensive green roofs (up to 5%);
- Rooftop urban farms (up to 5%); and
- Communal roof gardens.

Service facilities such as vehicular ramps and surface car parks will not be computed as part of the required Landscape Replacement Areas.

Example of Rooftop Green

Example of Vertical Green

Fig. 2.11 Example of Landscape Replacement Areas

2.14 Building Design

2.14.1 Building design is governed by a range of factors and visual patterns including its massing, porosity, colors, texture and materials, etc. In determining the design of a building, it is important that it respects the character of buildings in the same block or district, and that they employ different but complementary architectural elements to avoid repetition and monotony in the city. Comparable and compatible design details shall also be employed at all sides of the building.

2.14.2 District Porosity

The height of buildings and strategic location of sky terraces shall be designed to improve porosity and views from each building. Views to major public parks and key waterbodies such as Central Park, River Park, and Forest Reserve Area shall benefit more developments, where possible. The placement and design of development blocks shall be sensitive to minimize blockage of views towards these public assets from surrounding areas as far as possible.

2.14.3 Block Porosity

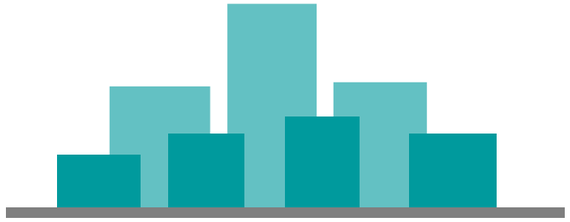
Fully enclosed building clusters shall be avoided to allow cross ventilation through internal courtyards. Block porosity shall be achieved by having sky terraces at various floors of a building and designing slender blocks with wider spacing in between.

Minimum spacing between buildings:
Spacing between buildings within the same plot is intended to visually break the massing of a building into separate blocks. Minimum spacing between buildings varies per the proposed storey heights of developments.

- 1-4 storeys (≤20.0m)(single-family house and town-house): 4.0m
- 1-4 storeys (≤20.0m): 6.0m
- 5-10 storeys (≤40.0m): 7.0m
- 11-18 storeys (≤68.0m): 10.0m
- 19-24 storeys (>68.0m-90.0m): 12.0m
- >24 storeys (>90.0m): 15.0m
- Between multi-storey car park building and other buildings: 7.0m

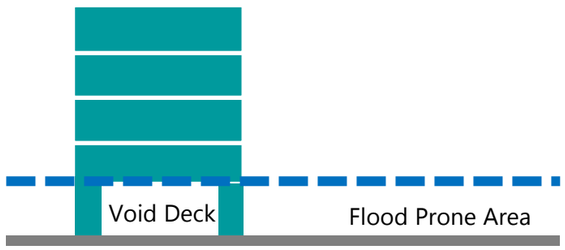
2.14.4 Building Porosity

Void decks are encouraged where possible in residential developments (R2 and R3) to enhance communal spaces planned between residential blocks, create comfortable spaces for residents and visitors alike, and to minimize the impact of flooding at flood prone areas, if any.



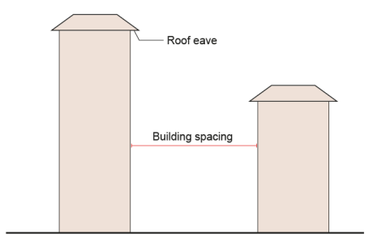
DISTRICT POROSITY

BLOCK POROSITY



BUILDING POROSITY

Fig. 2.19 Building Design_1



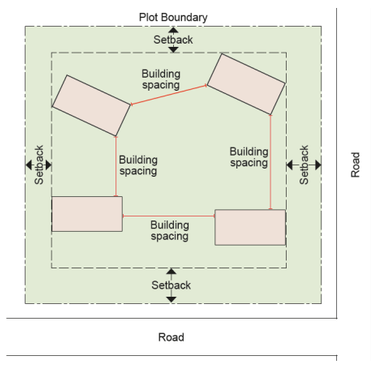


Fig. 2.20 Building Spacing

1 Skyline of NCC

2 Porous Block

3 Void Deck

Sources: (1) PJIC; (2) Hoerr Schaudt Landscape Architects; (3) Superloft;

2.14 Building Design

2.14.5 Green Infrastructure

Rain gardens and urban farms are to be integrated in each development, where possible, to provide ecosystem services, improve health and livability, provide space for local food production, as well as to mitigate heat island effect.

2.14.6 High Rise Development

High rise developments shall provide publicly accessible green spaces within the plot, as well as high rise or vertical greenery that complement the streetscape and urban landscape to create a greener environment.

2.14.7 Buildings Along Parks

Buildings along parks shall adopt building forms that 'look out' onto the park, such as incorporating upper floor balconies and deck terraces, to enhance visual connection to green open spaces. Buildings shall not act not as symbolic walls that block public access and views of parks, but as gateways with corridors that provide visual connection to the iconic skyline.

2.14.8 Local Culture and Design

Vernacular architecture, indigenous materials and plants are strongly encouraged to reflect the local culture. The design of the building shall respond to the local climate in both the overall form and materials used.

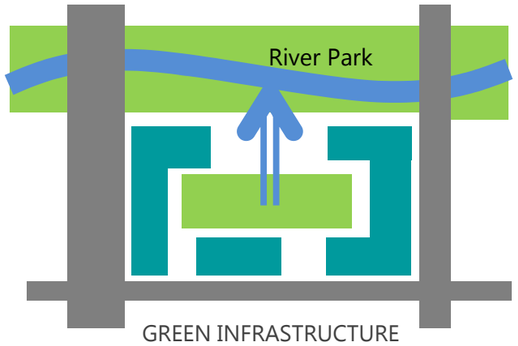


Fig. 2.21 Building Design_2


1
A Rain Garden


2
A High-rise Green Building and a Park


3
Buildings Look Out to a Park


4
A Building with Vernacular Design Elements

Sources: (1) Beckley Sanitary Board; (2) Tajawal; (3) Nanubhai Property; (4) The People's Association

2.15 Building Materials & Color

2.15.1 Buildings and other improvements, including landscaping, lighting and signage, must be consistent with the character of the environment in which they are located, as well as the requirements of the Design Standards and Guidelines.

2.15.2 Materials and colors used shall contribute to and enhance the character of the environment in which they are located.

2.15.3 The use of sustainable construction materials is encouraged. Examples of sustainable construction materials include steel, other metals, glass and recyclable substitutes of concrete, etc. High performance glass that reduce heat ingress while allowing high daylight penetration is encouraged to maximize performance and energy efficiency. External reflectance of materials shall not impair the visibility of drivers and pedestrians.

2.15.4 The selection of building materials and colors for the external finish of any building(s) constructed or to be constructed shall be capable of easy maintenance and shall be developed according to these Design Standards and Guidelines. The color, type and materials of buildings are subject to design approval of the Declarant.

2.16 Building Façade

2.16.1 All building walls, including parking structures, shall be designed with sufficient architectural details to create identity and still be in harmony with the context.

2.16.2 Buildings shall provide for a hierarchy of horizontal and vertical expression and patterns that shall relate to the particular form and proportion of a building. The purpose of detailing is to create consistency among the building frontage (tower) and other architectural features, such as the building entrance, corner, and variation in setback, etc.

2.16.3 All external laundry space for any residential unit of the building(s) constructed or to be constructed on the plot shall be recessed into such building(s) and no drying facilities shall be permitted to protrude beyond the outer face of the building(s).

2.16.4 All service areas and equipment of any building(s) constructed or to be constructed shall be fully screened and concealed from adjacent public streets, or located to the side or rear of the building(s). This includes all plumbing and other pipework, at grade or rooftop water tank, mechanical and telecommunications equipment, etc.

2.16.5 All parking above ground shall be confined in parking structures and be visually screened and from public streets. Parking structure side openings shall be concealed with grills or similar treatment of no more than 50% open and/or transparent in area.

2.16.6 Building facades fronting through-block links are encouraged to feature art work or shop windows to heighten the sense of place, and to add interest and variety to the pedestrian experience.

1 Example of Building Materials and Color

2 Example of Building Materials and Color

Fig. 2.22 Example of Building Materials and Color

3 Green façade of multiple storey car park

4 Shopfronts along Through Block Links

Fig. 2.23 Example of Facade Treatment of Buildings

5 Well screened services and equipment along the street

Sources: (1) Green City Trips; (2) PJIC; (3) Greenscreen; (4) StudyBay; (5) NLB Singapore

2.17 Entrance & Storefront

2.17.1 The main entrance to a building shall be clearly defined by its size and form as well as in the use of colors, textures, materials and lighting. Its size shall relate in scale to the overall configuration of the building.

2.17.2 The main entrance doorway shall be recessed into the façade and/or located under an arcade or canopy. Entry doors must not project beyond the property line when open and must comply with all access requirements as required by the Law to Enhance Mobility of Disabled Persons.

2.17.3 Storefronts along pedestrian routes shall be designed with at least 60% transparency, with multiple entrances into the building at ground level, to achieve an active street front.

2.17.4 The design and use of materials in the main entrance and storefront must comply with the requirements outlined in the building, fire and other relevant codes of Philippines. The materials used shall be durable and weather resistant.

2.17.5 Storefronts must also comply with the requirements detailed in Chapters 2.15, 2.16 and 5.

2.18 Roof

2.18.1 Utilities and equipment on roofs must be screened from top and sides with appropriate structures that are visually in line with the building design.

2.18.2 Roofs are encouraged to be designed with landscaping, urban agriculture and amenity space (e.g. gardens, pools and play areas, etc.), with access for tenants and residents.

2.18.3 Roofs are encouraged to be used for energy generation, including wind and solar collectors.

2.19 Fences, Walls & Gates

2.19.1 Gates shall be recessed towards the interior property, or shall not project beyond the property line when open. This is to ensure free and unimpeded movements along sidewalks and roads.

2.19.2 Fences shall act as visual screens as well as physical screens. They are to be developed according to these Design Standards and Guidelines.

2.19.3 Fences and walls are encouraged to be attractive, permeable and with a maximum height of 2 meters.

2.19.4 Fences and walls along the plot frontage, public parks and streets must have a minimum porosity of 50%. Landscape elements such as hedges are encouraged in place of fences or walls.

2.19.5 Fence and wall designs and materials are subject to design approval by the Declarant.

2.19.6 Fences are to be maintained by the Locator.

1 High transparency of shopfronts at the ground level along pedestrian ways

Fig. 2.24 Transparent Storefronts

2 Screening of utilities and equipment on roof

Fig. 2.25 Example of Roof Treatment_1

3 Green Roof

4 Solar collectors

Fig. 2.26 Example of Roof Treatment_2

5 Attractive and permeable fence

6 Fence with landscape elements

7 Hedges along a property line

Fig. 2.27 Example of Fence Treatment

2.20 Bicycle Facilities

2.20.1 All developments shall comply with the minimum bicycle parking space requirements in Table 2.9. Bicycle parking spaces should be located at convenient locations for cyclists, taking into consideration the alignment of adjacent cycling paths/ shared paths, public transportation nodes and amenities.

2.20.2 Buildings are encouraged to incorporate secure indoor bicycle storage for residents and tenants, as well as other supporting facilities like shower rooms.

2.20.3 Bicycle parking spaces provided will be exempted from Gross Floor Area (GFA) computation. The GFA exemption will also apply to surplus provision of bicycle parking spaces above minimum requirements if assessed by the declarant to be reasonable, given the context of the development.

2.20.4 Provision of the End-of-Trip facilities listed in Table 2.9. can also qualify for GFA exemption. This is to encourage locators to provide End-of-Trip facilities to better meet the needs of cyclists. Developers can submit their proposals for the declarant's evaluation.

2.20.3 The design of bicycle parking shall conform with the guidelines in Chapter 9.5

Table 2.9 Bicycle Facilities Requirement and GFA exemption

Proposed Use	Minimum Bicycle parking space requirement	End-of-Trip Facilities that will be exempted from GFA computation
Residential		
Residential Housing	1 bicycle parking space for every 6 dwelling units	No GFA exemption for bicycle supporting facilities as shower/ changing rooms are to be provided for within the home, or as part of the clubhouse facilities
Condotel		
Dormitory		
Workers' Accommodation		
Commercial		
Small Retail Shops	1 bicycle parking space for every 300m2 of floor area, for floor area up to 15,000 m^2, and 1 bicycle parking space for every subsequent 600m^2 of floor area, for floor area in excess of 15,000m^2	GFA exemption for bicycle supporting facilities, subject to: • 1 shower stall per 10 bicycle parking spaces (about 1.35sqm per shower stall) • Provision and size of lockers and PMD lockers to be subjected to evaluation • 1 toilet per cluster of facilities • Facilities should be located near the bicycle parking spaces for the convenience of cyclists
Commercial Retail & Services		
Night Club, Disco House & Dance Hall, KTV, Music Bar, Cocktail Lounge		
Shopping Center/ Mall, Hyper-mart		
Office		
Place of Public Entertainment, Amusement Hall & Parlor, Entertainment Arcade, Cinema & Theater		
Hotel		
Service Apartment		
Private Recreational Club, Holiday Chalet, Private Sports Club, Private Health Club		
Industrial		
R&D Facility	1 bicycle parking space for every 300m^2 of floor area, for floor area up to 15,000m^2, and 1 bicycle parking space for every subsequent 1,000m^2 of floor area, for floor area in excess of 15,000m^2	GFA exemption for bicycle supporting facilities, subject to: • 1 shower stall per 10 bicycle parking spaces (about 1.35sqm per shower stall) • Provision and size of lockers and PMD lockers to be subjected to evaluation • 1 toilet per cluster of facilities • Facilities should be located near the bicycle parking spaces for the convenience of cyclists
Automotive Repair Workshop		
Motor Vehicle Showroom		
Warehouse		
Non-Pollutive Industrial Use		
Industrial Uses Not Specified Above		
Public Facilities		
Hospital, Health Institution	1 bicycle parking space for every 150m^2 of floor area, for floor area up to 15,000m^2 and 1 bicycle parking space for every subsequent 500m^2 of floor area, for floor area in excess of 15,000m^2	GFA exemption for bicycle supporting facilities, subject to: • 1 shower stall per 10 bicycle parking spaces (about 1.35sqm per shower stall) • Provision and size of lockers and PMD lockers to be subjected to evaluation • 1 toilet per cluster of facilities • Facilities should be located near the bicycle parking spaces for the convenience of cyclists
Clinic/ Polyclinic, Dental Clinic, Sports Club, Gym		
Community Center		
Post Office		
Public Library		
Museum, Art Gallery, Concert Hall & Opera House, Cultural Center		
Public Transport Hub (Rail Station, Terminal, Bus Interchange)		
Exhibition or Convention Hall		
Government Facility		
Place of Worship		
Sports and Recreation		
Place of Recreation, Sports or Culture, Multi-Purpose Arena	1 bicycle parking space for every 150m^2 of floor area, for floor area up to 15,000m^2 and 1 bicycle parking space for every subsequent 500m^2 of floor area, for floor area in excess of 15,000m^2	No GFA exemption for bicycle supporting facilities as shower/ changing rooms/ lockers should be provided as part of the development
Sport Complex, Stadium		

Chapter 03

Building Incentives

3.1 Introduction

3.1.1 This chapter highlights three types of developments that may be eligible for bonus GFA:

- Transit Oriented Developments
- Landmark Developments
- Sustainable Developments

3.1.2 All developments eligible for bonus GFA are required to submit applications to the Declarant and are subject to the approval of the Declarant.

3.2 Transit Oriented Developments

3.2.1 Public transport use shall be promoted by densifying developments around transport stations and providing good connectivity between developments and stations.

3.2.2 In Mixed Use Residential Zone (R4) and all Commercial Zones (C1, C2, C3), buildings or structures that are within a 300-meter radius from a planned Rail, BRT or LRT station may apply for bonus GFA of up to 5% of total GFA, and easing of building height regulations.

3.2.3 Buildings in the City Level Commercial Zone (C2) and Central Business District Zone (C3), and buildings directly adjacent to a rail, BRT or LRT station that build and maintain a direct at grade, above grade or below grade covered walkway to a Rail, BRT or LRT station, at the cost of the Locator, may apply for bonus GFA of up to 15% of total GFA, and easing of building height regulations.

Example

Bonus GFA for Buildings in the City Level Commercial Zone (C2) and Central Business District Zone (C3), and buildings directly adjacent to a rail, BRT or LRT station

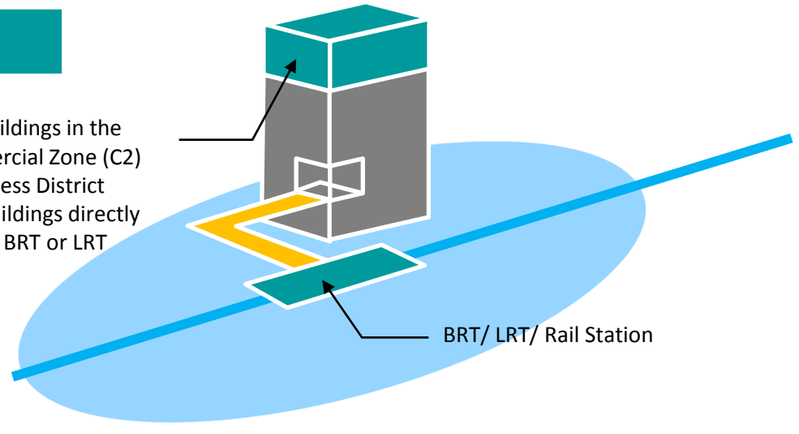
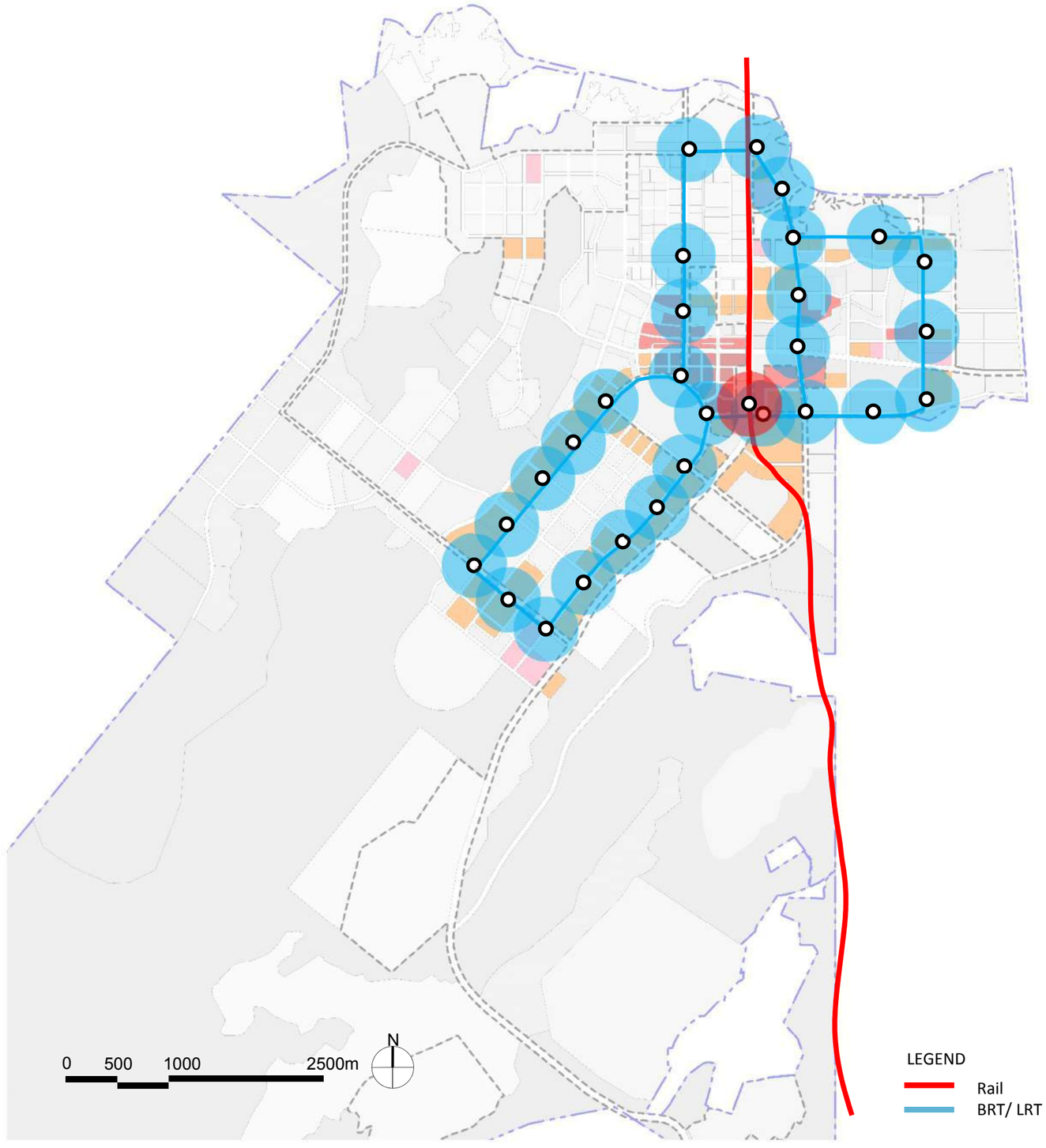


Fig. 3.1 Transit Lines and Stations



Note: Rail and BRT/ LRT alignment and the location of stations is subject to the final transport plan and design

3.4 Sustainable Developments

3.4.1 Buildings that fulfil criteria from any recognized green or sustainable building certification may apply for bonus GFA of up to 5% of total GFA.

Examples of Recognized Green/ Sustainable Building Certification

BERDE
(Building for Ecological Responsive Design Excellence)
Philippines

Source: BERDE

LEED
(Leadership in Energy & Environmental Design)
US

Source: LEED

BREEAM
(Building Research Establishment Environmental Assessment Method)
UK

Source: BREEAM

BCA Green Mark Scheme
Singapore

Source: BCA Green Mark Scheme

CASBEE
(Comprehensive Assessment System for Built Environment Efficiency)
Japan

Source: CASBEE

Fig.3.4 Examples of Recognized Green/ Sustainable Building Certification

Chapter 04

Parking & Vehicular Access

4.1 Introduction

4.1.1 Objectives of the Parking & Vehicular Access Guidelines are as follow:

- To create consistent and attractive street and park edges.
- To minimize the visual impact of parking and loading/ unloading space on the streetscape
- To integrate parking areas within the landscape for more visually appealing at grade parking areas
- To provide future-proof car parking provisions & incentives to be a 'Car-Lite City'

4.2 Parking

4.2.1 All required car parking lots are to be provided within the plot boundary to ensure the smooth flow of vehicles along adjacent roads.

4.2.2 Car parking spaces are encouraged to be located:

- Underground
- Above the second floor
- Surrounded by buildings

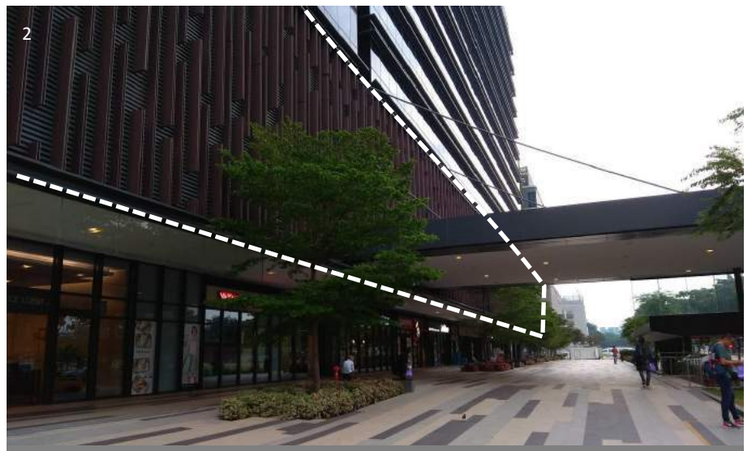
4.2.3 Car Parking Design

- To maintain an attractive streetscape, any at grade or above grade car park and loading/ unloading bays are to be fully integrated within the overall building form, and visually screened from above and on all sides.
- At grade car parking areas are encouraged to have semi-permeable surface and provide adequate drainage.

4.2.4 Parking and Loading Space Provision

All developments shall comply with the required car parking and loading space requirements in the Building Code of Philippines (Rule XIX).

Underground Car Park



Car Park above the second floor

Car Park Surrounded by Buildings

Fig. 4.1 Types of Car Parking Facilities

Green façade along the multiple storey car park

Green façade along the multiple storey car park

Semi-Permeable Car Park Ground

Fig. 4.2 Design of Car Parking Facilities

Sources: (1) MaxTracker; (2) Paya Lebar Squre; (3) Wikimedia Commons; (4) SJ; (5) Greenscreen; (6) Specification Product Update Blog

4.2 Parking

4.2.5 Parking Incentives

A reduction of up to 10% in car parking standards may be permitted by the Declarant for office, retail, F&B, Hotel, Private condominiums and apartments if:

- The development is within 300m radius of a Rail, LRT or BRT Station; and

A reduction of up to 5% in car parking standards may be permitted by the Declarant for office, retail, F&B, Hotel, Private condominiums and apartments if:

- An automated vehicle station, shared car or bike station, or any other smart mobility solution is integrated within the development to contribute to a Car-Lite City.

This will enable locators to better match parking provision with their assessment of demand based on operational and business considerations.

Other reduction in car parking standards may be considered by the Declarant if it can be clearly demonstrated, through detailed traffic impact and car parking study, that a relaxation in the standards of provision is beneficial.

4.2.6 District Parking structures, with combined parking requirements for multiple buildings and lots are allowed within a 200m radius of such buildings and lots.

Example

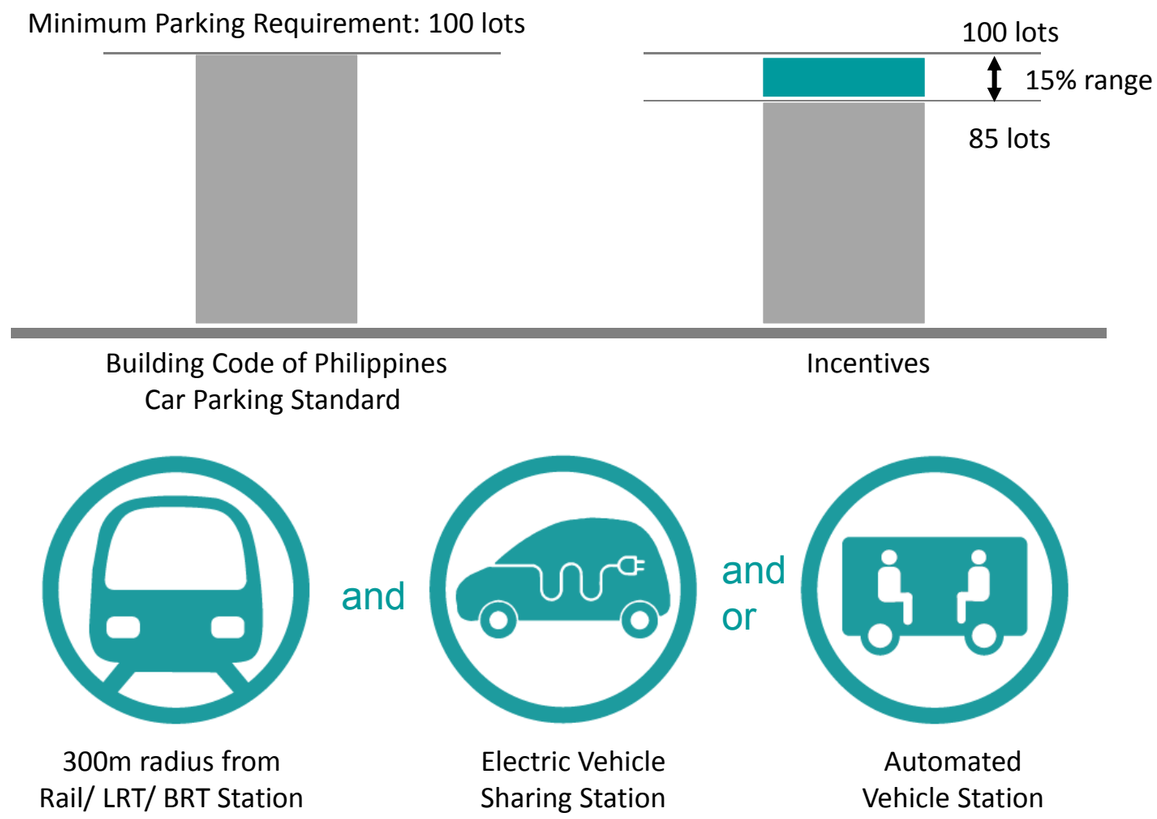


Fig. 4.3 Example of Parking Incentives

Example

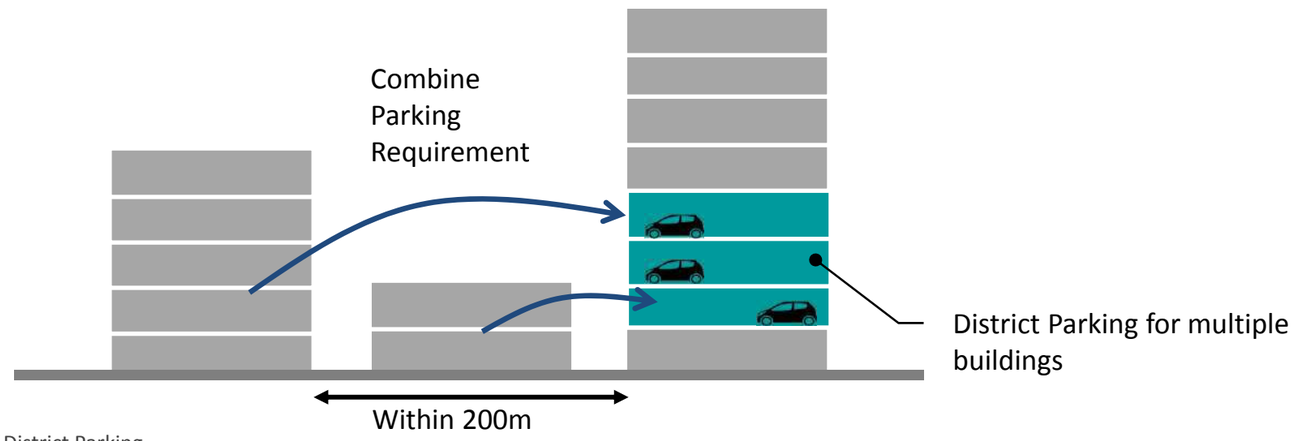


Fig. 4.4 Example of District Parking

4.3 Loading & Unloading

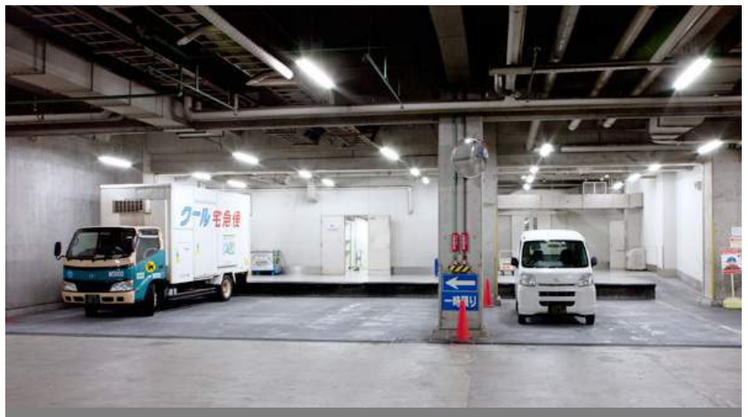
4.3.1 All loading and unloading requirements are to be provided within the plot boundary.

4.3.2 Where possible, loading/ unloading spaces shall be accommodated inside the building or underground. Otherwise, it shall be visually screened from all sides.

4.3.3 For Commercial use, except hotels, the point of access for loading/ unloading activities shall not interrupt any main shopping frontage.

The maneuvering of lorries shall be within the lot except where access is onto a vehicular service lane.

4.3.4 For Hotel/ Other use, loading/ unloading bays shall be located close to the service entrance.



Loading/ Unloading Area

Fig. 4.5 Loading/ Unloading Bay

4.4 Vehicular Access

4.4.1 Vehicular access from the public street to the plot leading to service areas, car parking areas, and passenger drop-off and pick-up points, etc., are to be provided by the Locator.

4.4.2 Curb cuts for vehicular access must be no greater than 7 meters wide for residential developments, and 9 meters wide for all other developments.

4.4.3 In determining location of an access point, consideration shall be given to the following:

- Access points are to be located at least 12 meters away from bus stops/ bay, taxi bays, pedestrian crossings, property line corner and other access points to the plot and neighboring plots.
- The Locator may provide more than one access points, if it can be demonstrated that the number of access points is technically reasonable based on the actual need of the development, subject to the approval of the Declarant.
- Provision of access points on top of utility services is strongly discouraged and require permission from the Declarant. In unavoidable cases, the Locator must install removable pavers above the utility services to allow for maintenance works.
- Disruption to street infrastructure, facilities and furniture, such as street lights, on-street parking, benches, planting, and pavement, etc., is strongly discouraged and require permission from the Declarant. In unavoidable cases, modification works and reinstatement of affected items shall be appropriately carried out by the Locator.
- All service access, including to refuse bin centers, and loading/ unloading bays, etc., shall be provided within the plot boundary. Separate access directly from the public street is prohibited.

4.4.4 Emergency Vehicular Access (EVA)

- EVA is allowed within the building setback area and shall not be overlapped by outdoor refreshment areas.
- EVA shall be provided within 18 meters direct sight from the breeching inlet.
- The width of an EVA shall not be less than 6 meters and must be kept clear at all times.
- Any overhead structure above any part of an EVA must maintain minimum height clearance of no less than 4.5 meters.

4.4.5 All other safety requirements related to vehicular access shall be provided in accordance with the National Building Code.

4.5 Vehicular Service Lane

4.5.1 A vehicular service lane is required for plots containing commercial uses so as to remove the need for any on-street servicing, and shall be accommodated within the plot boundary. The vehicular service lane may be shared between two adjacent plots, with a width of 3.5 meters on each side of the two adjacent plots. The lane may be covered on top, subject to agreement being reached between the Locators of the two plots and the Declarant. shall there be any overhead structure above the service lane, a minimum height clearance of 4.5 meters is required.

4.5.2 Where adjacent lots have been amalgamated, the vehicular service lane may, upon approval of the Declarant, be re-aligned or replaced with other means of vehicular service access. shall amalgamated parcels be re-sold and sub-divided again, the original requirements, as stated in this chapter, must be reinstated.

4.5.3 The lot shall enjoy a right of way for vehicular service lanes over adjacent lots, to permit free and unrestricted access 24 hours a day and shall be exclusively for private and service vehicles servicing and accessing the subject lots.

4.5.4 The vehicular service lane in each particular plot will be constructed at the cost of the individual Locator. The repair and maintenance of vehicular service lanes will be shared pro rata by the Locator and the adjacent Locator enjoying the right of way over the vehicular service lanes mentioned. In case of failure of the Locator to contribute to the maintenance of the vehicular service lane, the other Locator may advance the share of the defaulting Locator, subject to the right of reimbursement and/ or damages for any and all amounts advanced.

4.6 Service Vehicle Parking

4.6.1 Space for maneuvering, parking and loading of refuse collection vehicle or any other service vehicles shall be provided inside the building or underground, where possible. If provided on the ground floor, it shall be visually screened on all sides.

4.6.2 The space provided shall be designed to allow vehicles to enter and leave the lot without reverse movement. Exceptions to this provision must be with the prior written approval of the Declarant.

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Chapter 05

Pedestrian System

5.1 Introduction

5.1.1 Objectives of the Pedestrian System Guidelines are as follow:

- To create a pedestrian-friendly district with a comprehensive network of pedestrian walkways, arcades, covered walkways, elevated pedestrian links (EPLs), through-block links and underground pedestrian links (UPLs)

- To allow people to move easily and comfortably. Permeability at the ground level is important in larger scale developments to allow pedestrians to walk through buildings. Accessibility and continuity of a pedestrian system is important to establish a well-connected neighborhood. Pedestrian and cyclist safety, convenience and comfort shall be foremost in the planning and design of the pedestrian and Non-Motorized Transport (NMT) route

5.1.2 Developments within NCC are encouraged to adopt an integrated pedestrian network that accommodates pedestrian circulation on and between three levels:

- Above grade – Elevated pedestrian link (EPL)
- At grade – Through-block link, walkway and arcade
- Below grade – Underground pedestrian link (UPL)

5.2 General Guidelines

5.2.1 Pedestrian and Non-Motorized Transport Network

The pedestrian and Non-Motorized Transport (NMT) Network on all levels shall have minimum interruptions and obstructions to allow seamless pedestrian movement.

5.2.2 Universal Design

The pedestrian network on all levels shall be designed for universal access. GFA exemption is eligible for public spaces, arcades, through-block links, EPLs, and UPLs that are developed according to the principles of universal assess, subject to approval of the Declarant.

5.2.3 Active Street Edge along Pedestrian Routes

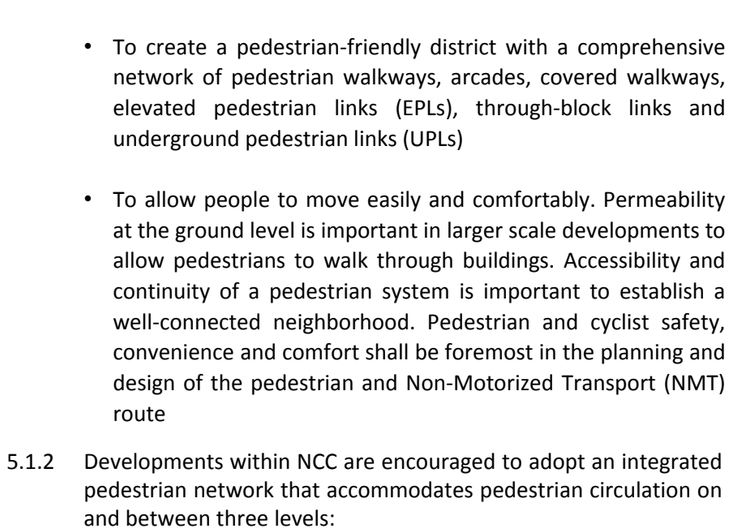
Activity Generating Uses (AGUs), such as retail, F&B, entertainment, and other similar uses shall be provided at the ground level fronting key pedestrian thoroughfares and public green open spaces, such as the River Park and Central Park, to encourage walkability and active vibrant streets.

5.2.4 Façade

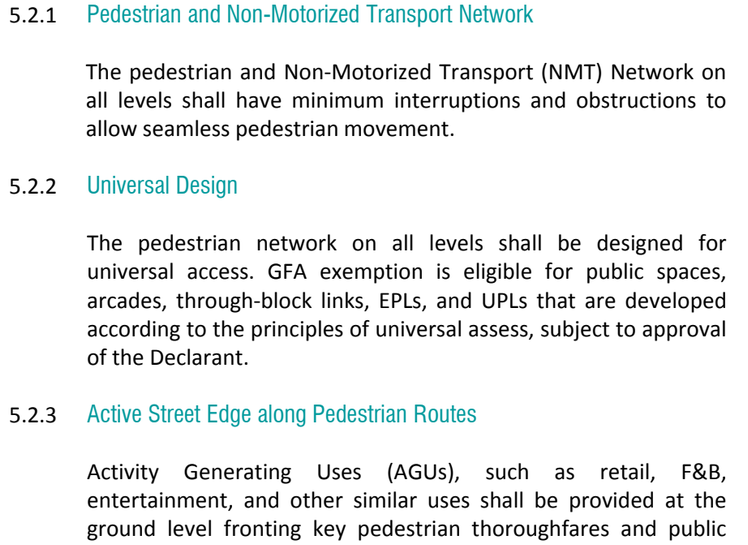
Storefronts along major pedestrian networks shall be designed with at least 60% of transparency, with multiple entrances into the building at the ground level to achieve an active street front.
If a façade extends along a side walk, no more than 40% of its length or 15m, whichever is less, is blank (without doors or windows).

5.2.5 Material

Covered and open walkways shall be paved with materials in line with the urban landscape theme of the district.



1 Universal design



2 Activity generating uses

3 Shopfronts with high level of transparency

1 Covered walkway in a residential area

1 Covered walkway in a commercial area

Fig. 5.1 General Guidelines

Sources: (1) SJ; (2) Joanne Levesque (Moment Mobile/Getty Images); (3) Meritus Hotels

5.3 Above Grade Linkage

5.3.1 Elevated Pedestrian Links (EPLs)

- An EPL is a covered pedestrian passageway located above grade that forms part of the pedestrian circulation network.
- EPLs are encouraged to link developments or BRT/ LRT and rail stations to adjacent developments at the podium level. Where possible, the EPL must be integrated into the internal circulation system of the individual developments into which it links. This is to create a convenient and functional pedestrian circulation network throughout NCC.
- EPLs shall complement at grade pedestrian networks and connect commercial developments across major arterial roads, especially across LRT/ BRT routes.
- Development locations that are encouraged to provide for and link into an EPL/ UPL system are indicated in the EPL and UPL Plan (Figure 5.2).
- EPLs shall include vertical pedestrian circulation points within the building envelope to connect to the walkway at the ground floor. Each vertical circulation point must include staircases and a passenger lift. Provision of two-way escalators is encouraged. The entire EPL and the associated vertical circulation points are to be kept open for public access 24 hours a day, unless otherwise specified. Where possible, EPLs shall also link into UPLs.

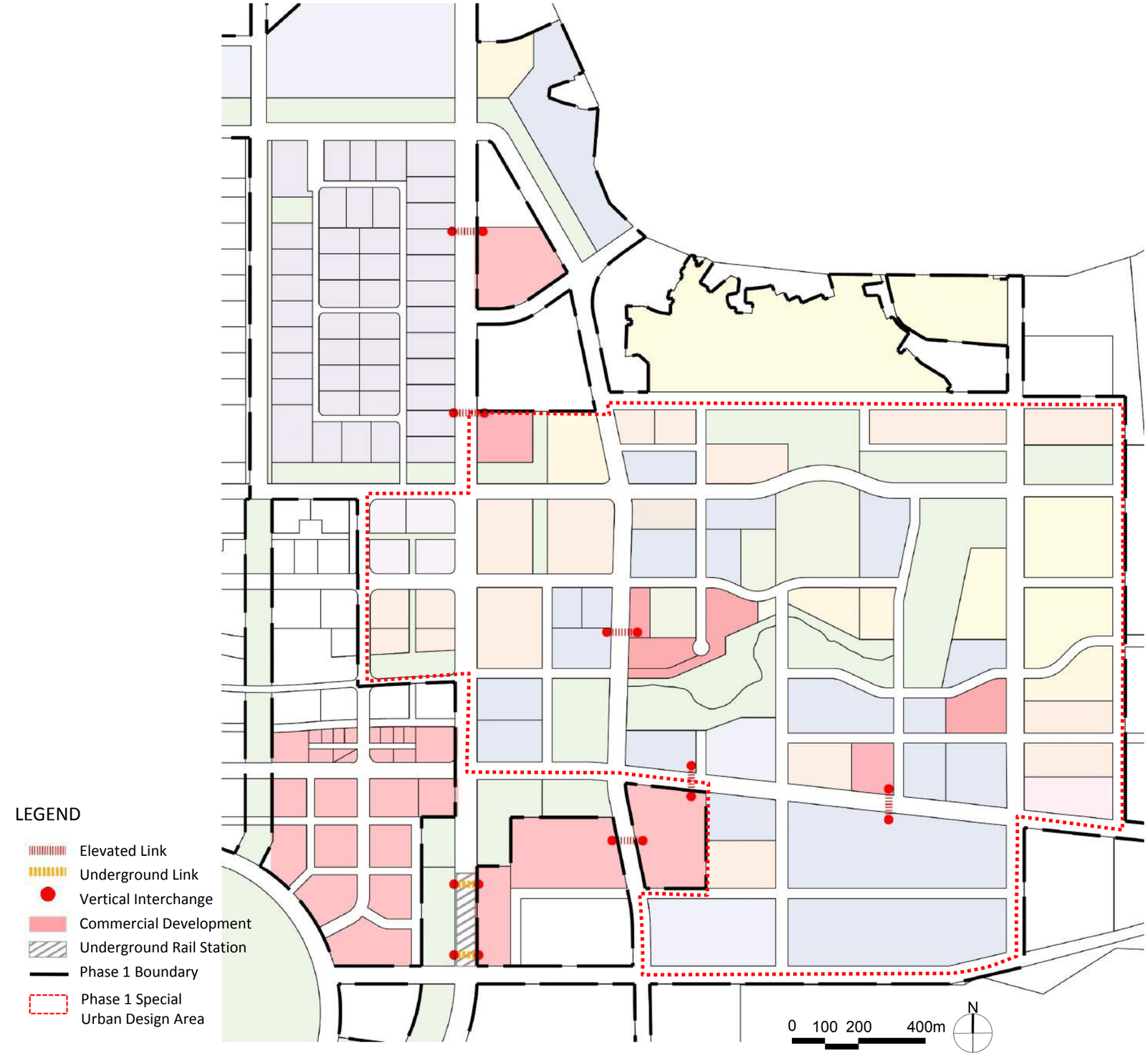


Fig. 5.2 EPL and UPL Plan

5.3 Above Grade Linkage

- Any commercial activities within/ on EPLs shall require the prior written approval of the Declarant.
- Adjoining Locators are encouraged to coordinate their plans so that the connection point is mutually agreeable. In case of conflict, the parties shall submit the issue for the Declarant's resolution.
- An EPL shall be funded, constructed and maintained pro rata by the adjoining Locators.
- The design of the EPL must be compatible with the overall character of the neighborhood in which it is located and with the architectural treatment of the building(s) that they form part of and/ or connect into. The design of the EPL must comply with the following guidelines:

Width	3.0 meters minimum interior clearance
Height	3.5 meters minimum interior height
Clearance	Minimum height clearance from the street surface to the bottom of the EPL is subject to the Filipino Design Standard (DPWH)'s Bridge Vertical Clearance Guidelines
Cover	The entire system of EPL shall be covered overhead
Lighting	Lighting shall be provided throughout the entire EPL, in accordance to chapter 6

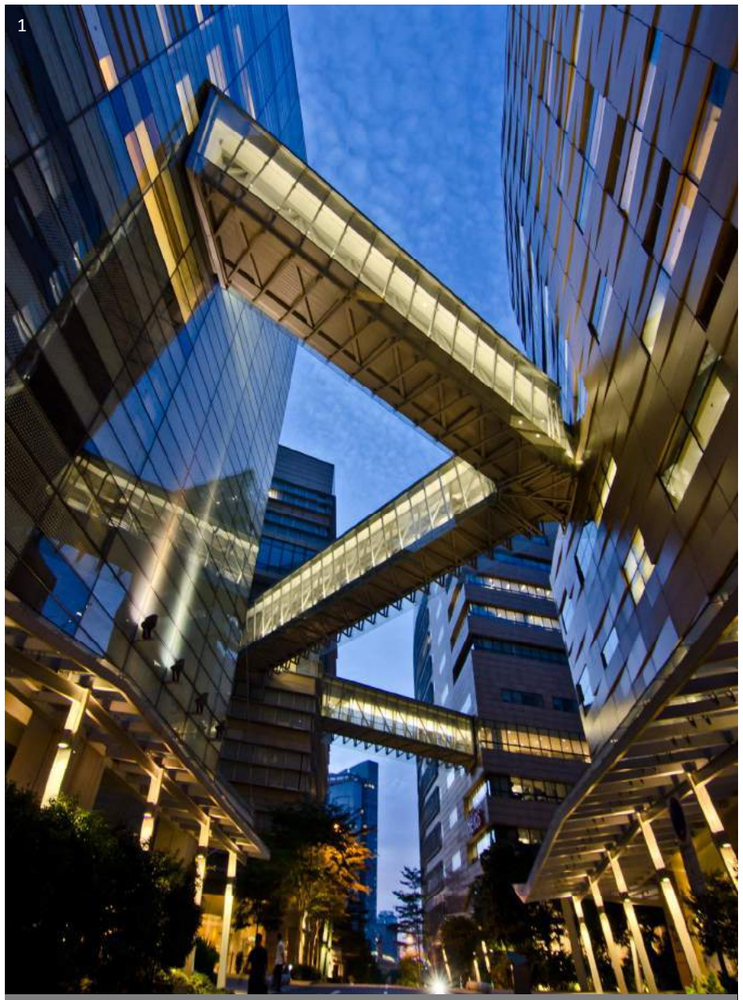


Fig. 5.3 Examples of Elevated Pedestrian Links Sources: (1) One North; (2) Amy Lam

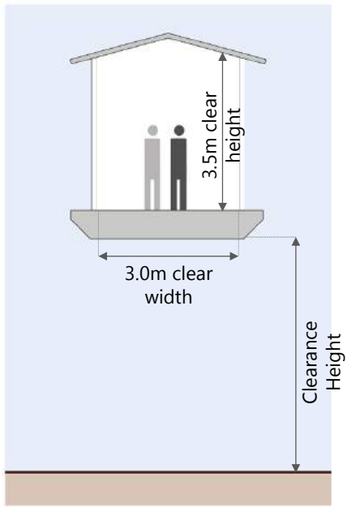


Fig. 5.4 Section of Elevated Pedestrian Link

5.4 At Grade Linkage

5.4.1 Through-Block Link

- Through-block Link are linkages running through a block that allow pedestrians to move directly through large building blocks so as to improve ground floor permeability and pedestrian connectivity.
- Through-block links shall be provided to link different buildings and uses to neighboring parks and open spaces, such as River Park.
- Through-block links shall also connect to proposed LRT/ BRT stations.
- Development locations that are required to provide for a through-block link are indicated in the At Grade Linkage Plan (Figure 5.5).
- Art works or display windows shall be featured along building facades fronting through-block links to heighten the sense of place, and to add interest and variety to the pedestrian experience.
- The design of the through-block links must comply with the following guidelines:

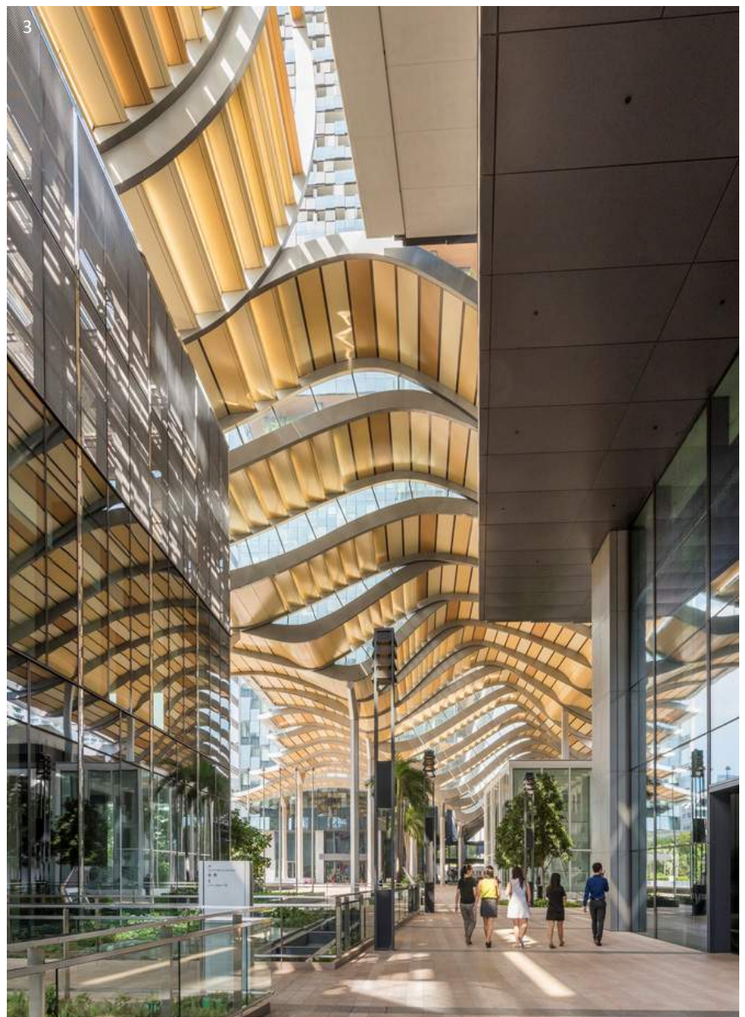
Width	6.0 meters minimum interior clearance, unless otherwise specified. Laneways shall not be obstructed by parking or other service mechanical units
Height	10.0 meters minimum interior height
Cover	Through-block links may be open to the sky or covered
Lighting	Skylight or lighting shall be provided throughout the entire though-block link, shall it be enclosed

Fig. 5.5 At Grade Linkage Plan

5.4 At Grade Linkage

Through-Block Link (Indoors)

Through-Block Link (Open to sky)



Through-Block Link (Covered)

Fig. 5.6 Examples of Through Block Links Sources: (1) Wikimedia Commons; (2) SJ; (3) Nigel Young

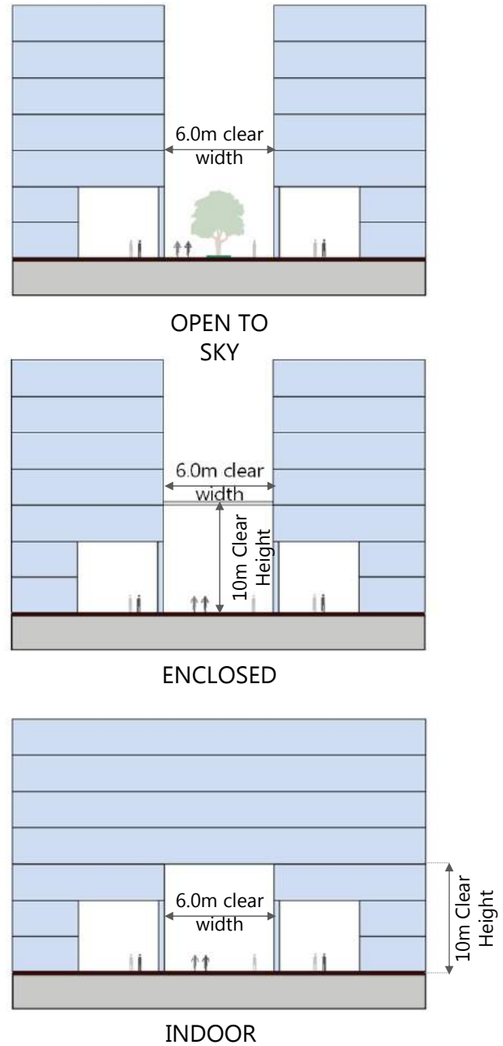


Fig. 5.7 Sections of Through-Block Links

5.4 At Grade Linkage

5.4.2 Arcade

- An arcade is a ground level covered pedestrian way that runs parallel to and in between buildings/ storefronts and the property lines.

- All developments are encouraged to provide arcades. Development locations that are required to provide for and link into an arcade system are indicated in Figure 5.8.

- Arcades must be provided at the ground level and shall link continuously into the arcade of an adjacent development as they are intended to ensure adequate weather protection to pedestrians during inclement weather.

- Along major arterial roads, where build-to-line is required as indicated in the Build-to-Line Plan (Figure 2.18), the arcade is to abut at the inner edge of the minimum setback line. Along the other streets, the arcade may be setback from the Road Reserve line following the articulation of the building form. When a building is required to build to the setback line but will not be able to comply due to its small building footprint relative to the overall size of the plot, the Locator shall submit a request for such deviation and seek the approval of the Declarant, subject to conditions that may be imposed on the Locator.

- An arcade shall be funded, constructed and maintained by the Locator of the site.

- No commercial activity is allowed within the arcade zone unless approved by the Declarant. Retail activity and display windows are encouraged at areas fronting arcade zones to add interest to the pedestrian experience.

Fig. 5.8 Arcade, Canopy and Covered Walkway Plan

5.4 At Grade Linkage

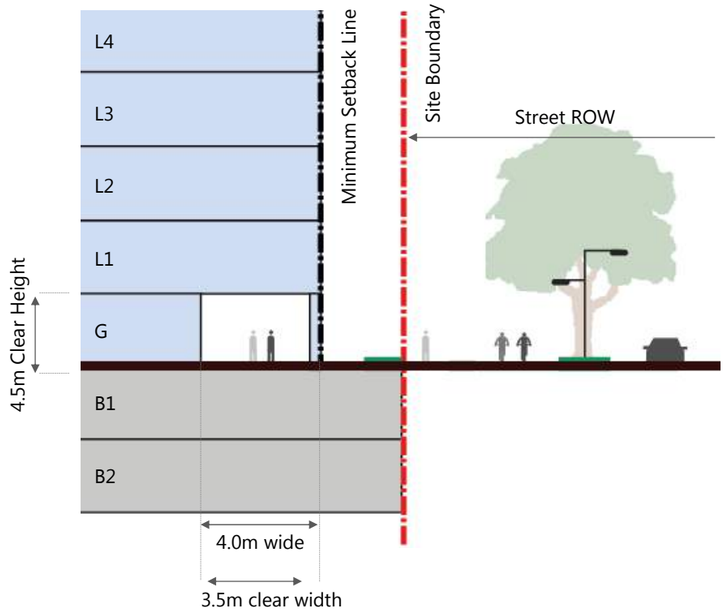
- An arcade shall be solely used for the purpose of pedestrian movement, unless approved by the Declarant.
- The design of the arcade must be compatible with the character of the building which it forms part and of the neighborhood in which it is located. The design of the arcade must comply with the following guidelines:

Width	For single height arcade, 4.0 meters minimum interior clearance; 3.5 meters minimum continuous clear zone, free of columns and other obstruction, unless otherwise specified For double height arcade, 6.0 meters minimum interior clearance; 5.5 meters minimum continuous clear zone, unless otherwise specified
Height	Interior height of the arcade must match with at least that of the ground floor of the building into which it links. The minimum interior height to the base of the ceiling is 4.5 meters for single height arcade and 7.0 meters for a double height arcade
Cover	Arcades must be continuously covered overhead; minimum distance between columns on the street side shall be 4.5 meters. Vertical clearance for such openings shall be 4.0 meters
Lighting	Lighting shall be provided throughout the entire arcade, in accordance to Chapter 6

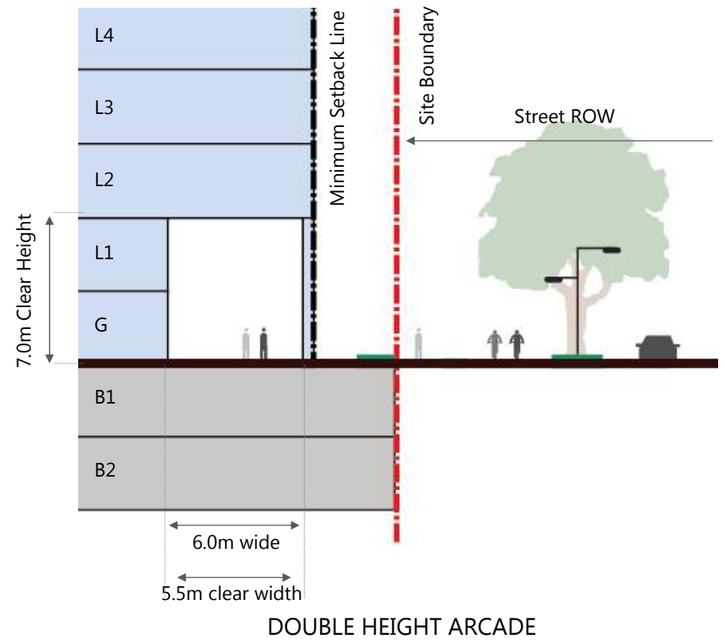
Single Height Arcade

Double Height Arcade

Fig. 5.9 Examples of Arcades



SINGLE HEIGHT ARCADE



DOUBLE HEIGHT ARCADE

Fig. 5.10 Section of Arcades

Sources: (1) Nora Davis; (2) GMP Architekten

5.4 At Grade Linkage

5.4.3 Pedestrian and Non-Motorized Transport Passageways

- All developments shall include designated off-road multi-use paths/ sidewalks at the ground level, which may include pedestrian walkways, jogging trail, open passageways and clearly marked bicycle lanes.

- Public green open spaces shall provide pedestrian and non-motorized transport (NMT) routes for easy movement and connection.

- All passageways shall be accommodated within the plot boundary.

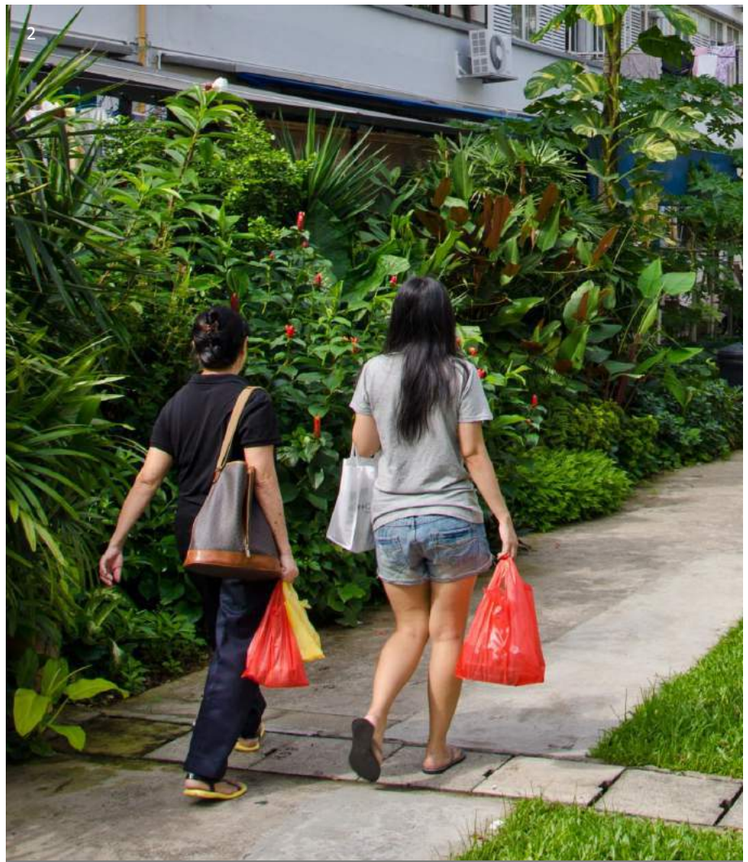
- The passageway may be constructed as an open or covered passageway. Covered passageways must comply with guidelines detailed in Chapter 5.4.4.

- Development locations that are required to provide for a public easement are indicated in the At Grade Linkage Plan (Figure 5.8).

- The design of all passageways must comply with the following guidelines:

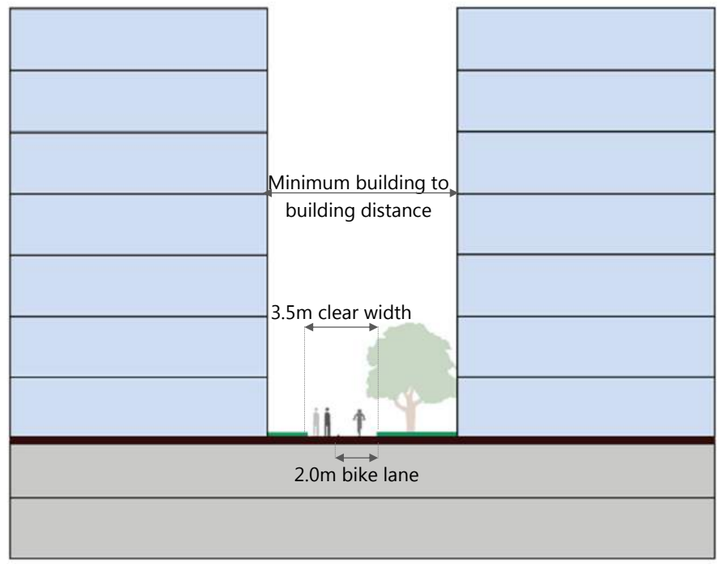
Width	3.5 meters minimum interior clearance, including a minimum 2.0 meters bicycle lane
Height	3.5 meters minimum interior height for a covered passageway, if provided
Cover	Passageways may be open or covered
Lighting	Lighting shall be provided along passageways to illuminate the area, in accordance to Chapter 6

Clearly marked Pedestrian and NMT Lane



Pedestrian Walkway through Residential area

Fig. 5.11 Examples of open passageways



WITHIN DEVELOPMENT LOT

Fig. 5.12 Section of open passageway

Source: (1) & (2): SJ

5.4 At Grade Linkage

5.4.4 Covered Walkways

- Covered walkways are covered linkages connecting adjacent buildings or across plots and property lines is classified. All developments are encouraged to provide covered walkways that link continuously to an adjacent development and/ or transit station to provide pedestrian refuge from sun and rain.

- Development locations that are required to provide and link into covered walkways are indicated in Arcade, Canopy and Covered Walkway Plan (Figure 5.8).

- Covered walkways shall be funded, constructed and maintained pro rata by the adjoining Locators.

- The design of the covered walkway must be compatible with the overall character of the neighborhood in which it is located and with the architectural treatment of the building(s) that they form part of and/ or connect into. The design of the covered walkway must comply with the following guidelines:

Width	4.0 meters minimum interior clearance; 3.5 meters minimum continuous clear zone, free of columns and other obstruction, unless otherwise specified
Height	3.5 meters minimum interior height between the sidewalk and the lowest portion of the fascia
Cover	Covered walkways must be continuously covered overhead. They cannot be enclosed and must be accessible by the public
Lighting	Lighting shall be provided throughout the entire covered walkway, in accordance to Chapter 6

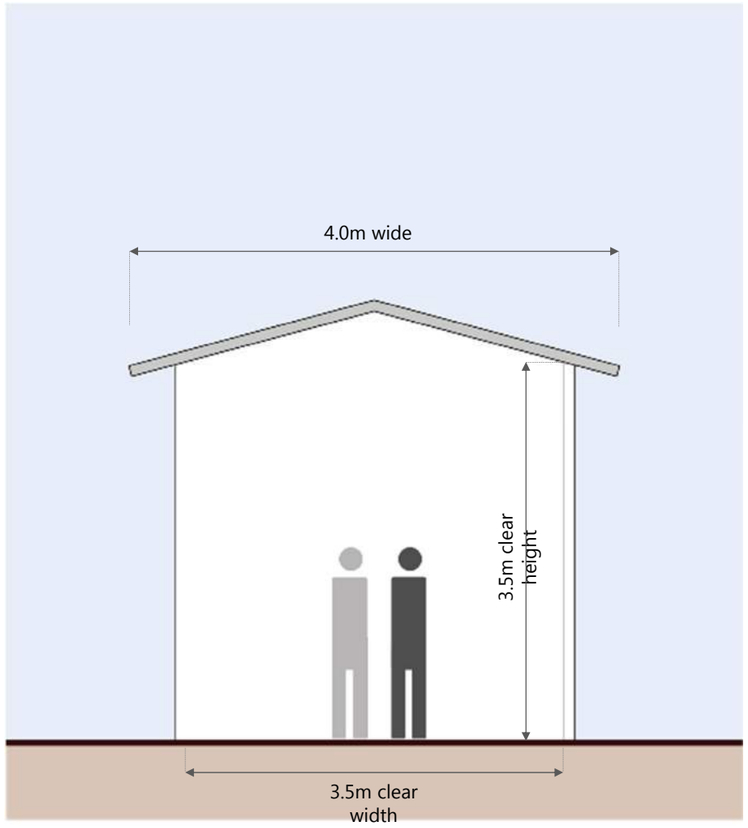
Covered Walkway linking to Transit Station

Covered Walkway linking Adjacent Buildings

Covered Walkway along Streets

Fig. 5.13 Examples of Covered Walkways

Covered Walkway across Plots



Note: Roof may be pitched, slanted or flat; Columns may be on one or both sides.

Fig. 5.14 Section of Covered Walkways

Sources: (1): Darren Soh (FARM); (2) National University of Singapore; (3) D Jules Gianakos

5.4 At Grade Linkage

5.4.5 Canopies

- In order to provide pedestrians a degree of protection from the elements, some pedestrian passageways and plazas shall be required to provide canopies or awnings for pedestrian use.
- Development locations that are required to provide canopies are indicated in Arcade, Canopy and Covered Walkway Plan (Figure 5.8).
- Awnings and canopies shall only cover storefronts, entrances and related openings.
- Awnings and canopies shall be funded, constructed and maintained at the cost of the Locator whose building it is attached.
- No commercial activity is allowed within the canopy zone unless approved by the Declarant. Retail activity and display windows are encouraged at areas fronting the canopy zone to add interest to the pedestrian experience.
- Awnings and canopies must be compatible with the main structural elements of the lower façade of the building which it forms a part of, as well as the overall design of the storefront. The design of awnings and canopies are subject to the approval of the Declarant and must comply with the following guidelines:

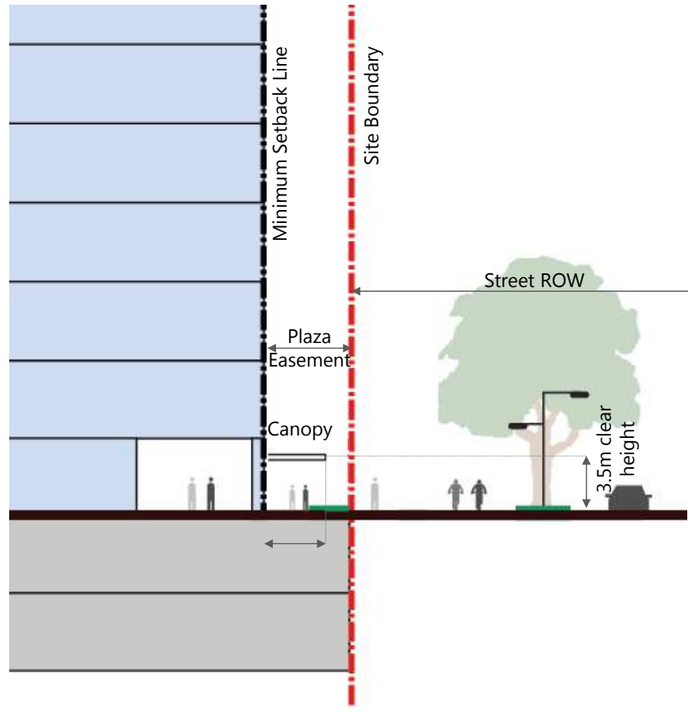
Width	3.5 meters minimum continuous horizontal clear zone; and overhang that is free of columns and other obstructions for canopies
Height	3.5 meters minimum interior height between the sidewalk and the lowest portion of the fascia
Cover	Awnings and canopies cannot be enclosed and must be accessible by the general public
Lighting	Lighting shall be provided along canopies, in accordance to Chapter 6
Awnings and canopies shall not encroach closer than 1.0 meter from a light post or street tree	
Awnings and canopies shall be cantilevered and anchored to the main structure or development project on the saleable lot	

Building Canopy

Building Canopy

Awning over Storefront

Fig. 5.15 Examples of Awnings and Canopies



PLAZA EASEMENT

Fig. 5.16 Section of Awnings and Canopies

Sources: (1): SJ; (2) Cell Code; (3) Theomoda

5.5 Below Grade Linkage

5.5.1 Underground Pedestrian Link (UPL)

- An Underground Pedestrian Link (UPL) is a subterranean connection for pedestrians that links developments, not restricted to any specific level of basement.

- UPLs are encouraged to link developments to the underground rail station. Development locations that are required to provide for and link into a UPL system are indicated in the EPL and UPL Plan (Figure 5.2).

- UPLs shall include sufficient vertical pedestrian circulation points within the building envelope to connect to the pedestrian circulation on the ground floor. Each vertical circulation point must include staircases and a passenger lift. Provision of two-way escalators is encouraged. The entire UPL and the associated vertical circulation points are to be kept open for public access 24 hours a day, unless otherwise specified. Where possible, UPLs shall also link into EPLs.

- Where there are underground utility services, UPL must cross under the utility services with minimum 1.0 meter spacing between the base slab of utility services and roof of UPL. The UPL construction drawings will be subject to approval after thorough cross-check with utility services network.

- Art work and display windows are encouraged along UPLs to create interest along the route, subject to approval of the Declarant.

- The architectural treatment of UPLs must be compatible with the character of the development in which it is part of. The design of UPLs must comply with the following guidelines:

Width	6.0 meters minimum interior clearance
Height	3.5 meters minimum interior height
Lighting	Lighting shall be provided throughout the entire UPL, in accordance to Chapter 6
Ventilation	Adequate ventilation must be provided
Signage	Clear signage indicating exits and the names or locations of where those exits emerge shall be provided, in accordance to Chapter 7

UPL connecting to transit stations

UPL with shop displays and clear signage

Fig. 5.17 Examples of UPL

Art work and displays along UPL

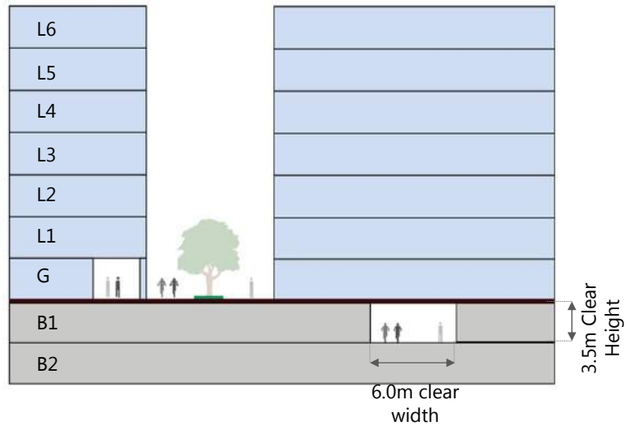


Fig. 5.18 Section of UPL

Sources: (1): The Smart Local; (2) Her World; (3) Wikimedia Commons

5.6 Vertical Circulation

5.6.1 Vertical pedestrian circulation points are essential connectors that link the different levels of the pedestrian system.

5.6.2 Developments with EPLs and/ or UPLs shall provide sufficient vertical circulation points that include staircases and a passenger lift. Provision of two-way escalators is also encouraged.

5.6.3 Vertical circulation points shall be accommodated within the plot boundary and must be within a 15-meter radius of the entry point of the EPL or UPL.

5.6.4 Where vertical circulation points are integrated in the EPL or UPL system, and open to the public 24 hours a day, the Locator may be eligible to a bonus GFA, at the sole discretion of the Declarant.

5.6.5 The design of vertical circulation points must comply with the following guidelines:

Width	1.5 meters minimum interior clearance
Material	Durable and slip resistant
Lighting	Lighting shall be provided to illuminate the vertical circulation areas, in accordance to Chapter 6
Railings	Railings shall be provided
Landings	Each flight of stairs shall have a landing at both ends and shall not be less than the width of the approach stair
Operation	Escalators shall have the same operation time as the building in which they are located

5.7 Management & Maintenance

5.7.1 All pedestrian circulation networks shall be maintained, repaired and cleaned by the respective Locator at his sole expense to the reasonable satisfaction of the Declarant.

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Chapter 06

Lighting

6.1 Introduction

6.1.1 Objectives of the Lighting Guidelines are as follow:

- To promote safety and visibility, and create a safe urban environment for movement and recreation across public spaces, including parks, open spaces and pedestrian passageways
- To minimize light pollution throughout the city
- To enhance the architectural expression of developments and complement with surrounding developments

6.2 Building Façade Lighting

6.2.1 Landmark buildings or key buildings at major intersections shall be well lit including its podium façade, all sides of the tower and top of the tower.

6.2.2 The podium façade of the buildings facing parks, plazas and public open spaces shall be well lit on all sides.

6.2.3 Buildings are to turn on lighting from Friday to Sunday, during public holidays, and during national, city and district-wide events and festivals from 1900 to 2300 hours. Lighting is also encouraged on all other days.

6.2.4 Each district in NCC is to establish uniform and distinctive lighting standards to enhance their unique identity and achieve a harmonious and well-coordinated signature nightscape within each district. This may be done by highlighting the exterior facades of buildings to reinforce the unique physical characteristics and architecture of each district.

- ### Downtown

The lighting in the Downtown shall seek to achieve a unique, three-dimensional nightscape for the CBD that is reflective of the global identity of NCC. The technical guidelines are as follows:

Illuminance (Lux)	No control on lux level but shall be executed sensitively to avoid glare, light trespass and light pollution
Color Temperature (Kelvin)	4,500 to 6,000
Color Rendition (Ra)	70

- ### Civic Center

The vision for lighting in the Civic Center is one that is subtle and elegant to reinforce the district as a cultural and civic hub. The technical guidelines are as follows:

Illuminance (Lux)	Minimum 50
Color Temperature (Kelvin)	3,000 to 6,500
Color Rendition (Ra)	85

- ### North Technopark & Clark Highlands

The vision for lighting in North Technopark & Clark Highlands is one that is contemporary to enhance the district's identity as a technological center.

Illuminance (Lux)	No control on lux level but shall be executed sensitively to avoid glare, light trespass and light pollution
Color Temperature (Kelvin)	3,500 to 6,000
Color Rendition (Ra)	70

- ### North Gate & South Gate

The vision for lighting in North Gate & South Gate is one that is refined and comfortable to maintain the amenity of residential district. The technical guidelines are as follows:

Illuminance (Lux)	No control on lux level but shall be executed sensitively to avoid glare, light trespass and light pollution
Color Temperature (Kelvin)	2,500 to 3,500
Color Rendition (Ra)	70

Downtown Lighting

Civic Center Lighting

North Technopark & Clark Highlands Lighting

North Gate & South Gate Lighting

Fig. 6.1 General Guidelines

Sources: (1): Wikimedia Commons; (2) Dista Dee; (3) Blau Journal; (4) SirHill17

6.3 Illumination

6.3.1 General

- Lighting shall not disturb the surrounding ecology.
- Lighting design shall maintain the amenity of residents and visitors. Lighting shall be indirect and executed sensitively to avoid glare, light trespass and light pollution.
- Illumination shall ensure uniform lighting throughout an area.

6.3.2 At Grade, Above Grade and Below Grade Passageways

- All at grade linkages, EPLs and UPLs are to be provided with a system of ceiling up-lighting for consistent appearance from lot to lot.
- Sources of illumination for ceiling up-lighting systems shall provide a color of light within the range of 2,500 degrees Kelvin and 3,500 degrees Kelvin.
- Illumination level on the floors of an EPL shall be a minimum of 75 lux, with an average-to-minimum uniformity ratio of 4-to-1.
- The design of light fixtures on exterior facades of the buildings facing pedestrian walkways and main streets shall be in-line with the overall theme of the urban district.

6.3.3 Arcade

- Building facades beneath an arcade are to be illuminated to a level of no less than 75 lux, with an average-to-minimum uniformity ratio of illumination of 5-to-1 or better. Color of lamps providing this illumination shall be between the range of 2,500 degrees Kelvin and 3,500 degrees Kelvin.
- Decorative ceiling or wall fixtures on exterior building walls beneath arcades shall be limited to locations flanking main building entries.
- All fixtures, except decorative ceiling or wall fixtures at main entrance, shall be deeply shielded to prevent visible fixture glare when viewed from the street or arcade on the opposite side of the street.

6.3.4 Fencing and Boundary Walls

- Fencing and boundary walls next to public open spaces are to be illuminated to a minimum of 75 lux, with an average-to-minimum uniformity ratio of 4-to-1 at night to encourage safe public environment within the entire city.

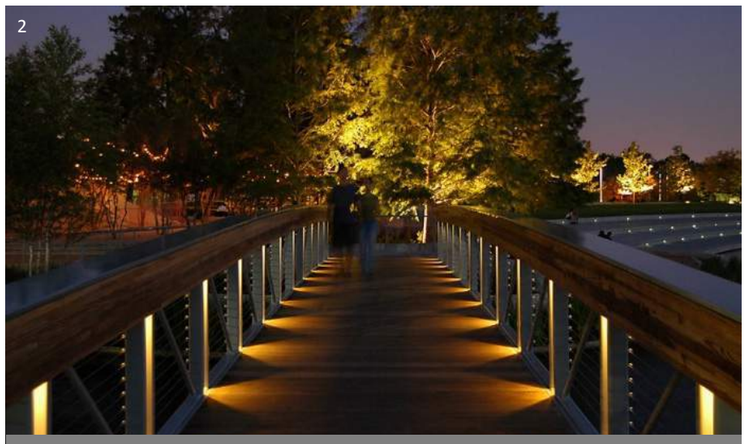
6.3.5 Exterior Art, Sculpture and Special Features

- Bridges, public art and sculptures and other landscape elements within parks shall be lit to create a rich visual experience within the park.
- Lighting equipment used to illuminate all items of art or sculpture visible to the public from streets, sidewalks, passageways, or open spaces shall be equipped with shielding devices, as necessary, to shield viewers from glare generated by fixture lamps.

6.3.6 Public Open Spaces

- Public open spaces are to be illuminated between sunset time and sunrise time to promote safety and visibility.

1 Illuminated pedestrian link



2 Illuminated park network

3 Illuminated street furniture

Fig. 6.2 Illumination

Sources: (1): One North; (2) Lam Partners; (3) Metalco

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Chapter 07

Signage

7.1 Introduction

7.1.1 Objectives of the Signage Guidelines are as follow:

- To establish identity and marketing of businesses in NCC
- To establish coordinated, distinctive and aesthetically sound graphic criteria for signs that complement and enhance the architecture and urban character of NCC
- To enhance the character, scale, architectural quality and appearance of a building, site and landscape setting
- To maximize the effectiveness of signage by minimizing and consolidating signage to avoid visual clutter
- To design a comprehensive system of signage to include infrastructure, information, way finding and orientation signage, and transit signage

7.1.2 The Declarant has designed and is responsible for implementing a comprehensive system of signage which includes infrastructure, information, orientation signage and transit signage. This system also addresses the design, use and implementation of temporary signs.

7.1.3 All signs and graphics which occur on individual properties and parcels must conform to the Design Standards and Guidelines as detailed in this chapter.

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7.1.4 The Declarant reserves the right to remove any and all such signs that do not comply with the restrictions detailed in this chapter.

7.1.5 All advertising signs, including temporary signs, are strictly prohibited, except as allowed in the Design Standards and Guidelines or with the prior written approval of the Declarant. No signs are permitted on a building, structure or street except as provided for under this chapter or as approved by the Declarant.

7.2 Sign Types

7.2.1 Building Signage

- Building Signage is an identification sign limited to the building logo and/ or name, or the logo and/ or name of the principal tenant or other organization as contracted by the building owner.
- Roof mounted signs, advertisement signs, string lights and signs with excessively bright lights are prohibited on a building or plot.
- Building signage shall complement the architectural design, form and scale of the host building or plot.
- Building signage shall not obscure a building's architectural form, features or glazed surface.
- Excessive or repetitive advertising on a building or site shall be prohibited.
- Building signage shall not protrude above the height of rooflines, beyond fascia, parapets or walls of the host building.
- Design Criteria - Free-standing

Quantity	One per building on address street, except streets having two frontages, in which case one sign per frontage is permitted
Location	Signs shall be located within the lot where the business operates, a minimum 15 meters from a street corner, and may be placed in the landscape area
Size	Face of the sign shall not exceed 10.0 square meters; maximum height of 2.0 meters; and maximum thickness of 0.5 meters
Illumination	If illuminated, halo Illuminated, internally illuminated box letters, or exterior illuminated
Material/ Color	Colors and materials used shall complement the architecture of the host building

- Design Criteria – Street Wall

Quantity	One per façade fronting on a public access
Location	Signs shall be located on the fencing wall or podium façade along the plot frontage
Size	Face of the sign shall not exceed a maximum height of 1.0 meters and 20% of the length of the building façade
Illumination	If illuminated, halo Illuminated, internally illuminated box letters, or exterior illuminated
Material/ Color	Colors and materials used shall complement the architecture of the host building

Building Signage – Street Wall

Building Signage – Frontage

Building Signage – Free-Standing

Fig. 7.1 Building Signage

Sources: (1): Sansiri; (2) Powen Group; (3) Capital Sign Solutions

7.2 Sign Types

7.2.2 Building Entrance Signage

- Building entrance signage is an identification sign limited to the building name or building address and street name.
- Design Criteria

Quantity	One per building on address street, except streets having two frontages, in which case one sign per frontage is permitted
Location	Signs shall be positioned over main entry doors or applied to architectural elements near main doors, and located within the plot
Size	Face of the sign shall not exceed 4.0 square meters; maximum height of 0.5 meters; projection beyond the property line is not permitted
Illumination	Non-illuminated
Material/ Color	Colors and materials used shall complement the architecture of the host building

7.2.3 Retail Tenant Signage

- Retail tenant signage is an identification sign limited to the tenant logo, name and address.
- Design Criteria

Quantity	One per tenant, except where tenant space fronts on two street, in which case one sign per frontage is permitted
Location	Signs shall be applied to building fascia panel
Size	Sign may extend the entire width of the storefront; maximum height of 1.0 meter
Illumination	If illuminated, halo Illuminated, internally illuminated box letters, or exterior illuminated
Material/ Color	Colors and materials used shall complement the architecture of the host building

7.2.4 Advertising Signage

- Advertising signage include temporary marketing and advertising signage in the form of free-standing or wall mounted display panels.
- Advertising signage shall be aesthetically uniform with designs that are in line with the theme and appearance of surrounding developments.
- Advertisements on electric billboards and digital screens will be considered only at locations where the display of such digital screens would not adversely affect the amenity of the nearby residents or create visual clutter along the streetscape.
- Design Criteria

Quantity	As may be approved by the Declarant
Location	As may be approved by the Declarant
Size	As may be approved by the Declarant
Illumination	Internally illuminated or externally illuminated
Material/ Color	Colors and materials used shall complement the architecture of the host building

Building Name on Entrance Canopy

Address on Entrance Canopy

Building Name on Entrance Wall

Fig. 7.2 Building Signage

Retail Tenant Signage

Fig. 7.3 Retail Tenant Signage

Free Standing Signage

Mounted Advertising Signage

Indoor Mounted Advertising Signage

Fig. 7.4 Advertising Signage

Sources: (1): DeNyse; (2) Memphite; (3) Artless Inc.; (4) WHATS Inc.;

7.2 Sign Types

7.2.5 Wayfinding Signage

- Wayfinding signage identify all major intersections and streets by providing appropriate guide information to different areas within the district.
- Wayfinding signage shall be placed at regular intervals along key pedestrian zones, at entrances/ exits of transit stations and at all intersections, with directions to key buildings and destinations within 800 meters (10 minute) walking distance. Maps are encouraged to be included in addition to directional information.
- Wayfinding signage shall be placed perpendicular to the street.
- Wayfinding signage shall clearly mark cultural, tourist, public buildings and transit stations.
- Wayfinding signage shall utilize international symbols with direction arrows. Maps shall be oriented to the viewer. This is to ensure that wayfinding signage are simple and easy to understand.
- Wayfinding signage shall be coordinated and uniform throughout NCC with designs that are complementary across districts and to the urban character of surrounding developments.
- The unique identity of each district shall be reinforced through a set color code for each district in NCC as defined in Chapter 7.3; and the designs shall be complementary to the designs of other signage in the district.
- Design Criteria

Quantity	At minimum, one at each intersection; encouraged to place signage at regular intervals
Location	Signs may be free-standing or mounted on wall or poles; top of such sign shall not exceed 3.5 meters above grade
Size	Face of sign shall not exceed 2.0 square meters; maximum height of 3.5 meters and width of 0.8 meters; maximum thickness 0.3 meters
Illumination	If illuminated, halo Illuminated, internally illuminated box letters, or exterior illuminated
Material/ Color	Colors shall be in line with the color code of the district (Chapter 7.3); texts and pictograms shall be contrasting and easy to read; materials used shall complement the architecture and urban character of the district

Free-Standing Directional Signage

Mounted Sign & Map

Mounted Directional Signage

Free-Standing Signage & Map

Fig. 7.5 Wayfinding Signage

7.2.6 Gateway Signage

- Gateway signage help identify the entry to NCC and promotes the identity of the city.
- Consistent, distinctive and visible gateway signage shall be provided at all major entry points to NCC.
- The design of the gateway signage shall support the unique identity of the district in which it is located by adopting the set color code for the district in NCC as defined in Chapter 7.3; and the design shall be complementary to the designs of other signage in the district.
- Design Criteria

Quantity	One at each major entry point to the city
Location	Signs may be placed in the landscape area
Size	Face of the sign shall not exceed 10.0 square meters; maximum height of 5.0 meters; and maximum thickness of 0.5 meters
Illumination	Halo Illuminated, internally illuminated box letters, or exterior illuminated
Material/ Color	Colors shall be in line with the color code of the district (Chapter 7.3); texts and logos shall be contrasting and easy to read; materials used shall complement the architecture and urban character of the district

Gateway Signage

Fig. 7.6 Gateway Signage

Sources: (1): Simon Fraser University; (2) Heine Jones; (3) Minale Tattersfield; (4) Stephen Uhraney (Waterloo Chronicle); (5) Speedy Signs Newton; (6) SJ; (7) Mitchell Associates

7.2 Sign Types

7.2.7 Transit Signage

- Transit signage are signages that announce the location of transit related facilities, such as BRT/ LRT stations, car parking and bicycle parking.
- Transit signage may include the transit logo and/ or name, and related information, such as bus stop routes and parking cost.
- The graphic of transit signage shall be consistent throughout NCC. All transit signage shall utilize international symbols and the appropriate transit logo, if applicable. This is to ensure consistency in the language of signage that is easy to understand.
- The design of transit signage shall be coordinated, distinctive and aesthetically sound throughout NCC. Designs shall be in line with other transit signage across districts, while remaining complementary to the designs of other signage in the district and to the urban character of surrounding developments.
- The unique identity of each district shall be reinforced through a set color code for each district in NCC as defined in Chapter 7.3.
- Design Criteria

Quantity	One per entrance, exit or transit station
Location	Signs may be free-standing or mounted on wall or pole, and the top of such sign shall not exceed 3.5 meters above grade
Size	Face of sign shall not exceed 2.0 square meters; maximum height of 3.5 meters and width of 0.8 meters; maximum thickness 0.3 meters
Illumination	If illuminated, halo Illuminated, internally illuminated box letters, or exterior illuminated
Material/ Color	Colors shall be in line with the color code of the district (Chapter7.3); texts and pictograms shall be contrasting and easy to read; materials used shall complement the architecture and urban character of the district

7.2.8 Road Traffic Signage

- Road traffic signage includes regulatory road signs, directional and information road signs, warning road signs, and road and pavement markings.
- Road traffic signage must be provided consistently as per Philippines Road Traffic Signs Guidelines.

Metro Station Signage

Bus Stop Signage

Fig. 7.7 Transit Signage

Bike Parking Sign

Parking Signage

Parking Signage

Sources: (1) Downgraf; (2) SJ; (3) Varlamov.ru; (4) Coroflot; (5) STUDIOMDA; (6) Harbinger Sign; (7) Inspiration Feed

7.3 District Signage

7.3.1 In addition to guidelines in Chapters 7.2.5 to 7.2.7, all wayfinding, transit and gateway signage shall also conform with the color code for each district. The different color codes for each district help to coordinate and make uniform the designs of these signages in each district, while establishing a distinctive set of signages in each district that is able to reinforce the unique identity of each district.

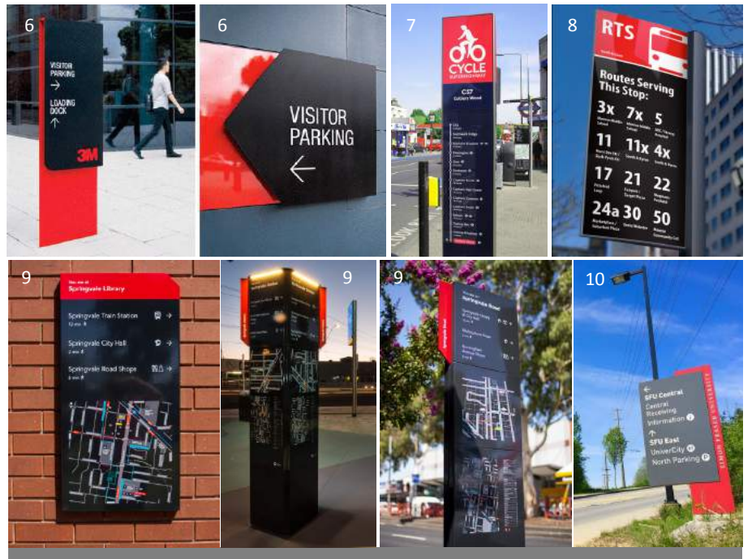
7.3.2 To ensure that the signages remain easy to understand, all signages throughout NCC shall utilize international symbols, consistent logos and design language. Designs of signages shall also be complementary across districts.

7.3.3 The following colors shall be permitted for wayfinding, transit and gateway signage in each district addition to black, white and grey. Large variations in the tint or shade of the color shall be avoided to minimize confusion.

7.3.4 Civic Center - Brown

Example of Civic Center Signage

7.3.5 Downtown - Red



Example of Downtown Signage

7.3.6 North Technopark, South Gate, Clark Hill – 3 Shades of Purple

Example of North Technopark, South Gate and Clark Hill Signage

7.3.7 North Gate - Yellow

Example of North Gate Signage

Fig. 7.8 District Signage

Sources: (1) Heine Jones; (2) Minale Tattersfield; (3) Design Communications Ltd; (4) Oran Viriyincy; (5) Speedy Signs Newton; (6) Harbinger Sign; (7) Wikimedia Commons; (8) Rochester Subway; (9) Melbourne Design Awards; (10) Simon Fraser University; (11) Walk Edmonton; (12) FreeFoto.com; (13) Lorenza Agosti; (14) Phil Riggan (Richmond Times-Dispatch); (15) Applied Wayfinding; (16) Manaus Bike Lounge; (17) Varlamov.ru; (18) Downgraf; (19) Coroflot; (20) IAMCR 2013; (21) Studio Binocular; (22) Inspiration Feed

7.4 Temporary Signage Criteria

7.4.1 All signages which are erected during the marketing phase must conform to the established standards as presented in this document.

7.4.2 Marketing sign types include:

- Construction related signage such as construction barricades
- Project identification
- Banners
- Directional
- Regulatory
- Advertisement Signs on lamp posts

7.4.3 Marketing signage include the following components which may be assembled to meet the specific requirements of each property or development:

- Background panel
- New Clark City name and logo
- Tag line or marketing slogan
- Project name
- Project description
- Project rendering or illustration
- District icon and logo
- Project Credits

7.4.4 The design of signs, including the number, size, color, typography, location and material will be subject to approval of the Declarant.

7.4.5 Marketing signage is temporary and will be removed upon the completion of the marketing phase of said project. The marketing phase is defined as the period from the beginning of construction of a project through to the issuance of the certificate of occupancy. If a project is suspended or terminated, the marketing signs will be removed. One leasing or sale sign may be permitted by the Declarant after the marketing phase has expired and until a project is sold or substantially leased.

7.4.6 Locators and developers are responsible for the cost of construction, installation and removal of marketing signs.

7.5 Review & Approval Process

7.5.1 To ensure compliance with the Design Standards and Guidelines, all signage shall be reviewed and approved by the Declarant in writing prior to its fabrication and installation. Non-conforming signs will be cited for removal by the Declarant.

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Chapter 08

Open Space, Landscape & Easement Areas

8.3 Public Parks

8.3.1 Public parks include the central park, river parks and other local parks planned within the neighborhood. These public parks are to serve as a node and focal point for the surrounding developments and to enhance the quality of the urban environment of NCC.

8.3.2 Access and Movement

- Visual and physical accessibility of parks shall be ensured from neighboring streets and building blocks.
- Pedestrian walkways and Non-Motorized Transport (NMT) passageways shall be provided to promote the connectivity of the Open Space System. These passageways shall conform to the requirements detailed in Chapter 5.4.1.
- Public parks shall be designed for universal accessibility.
- Access control of public parks during night hours is subject to the approval of the Declarant.

8.3.3 Urban Form Around Public Green Open Spaces

- Residential, commercial and institutional lots adjacent to public parks shall be oriented to front onto the parks, where possible.
- Buildings fronting public parks shall be developed to enhance views to the park.

8.3.4 Facilities

- Public parks shall accommodate both active and passive recreational facilities that reflect the requirements of the particular neighborhood. Facilities include children's playing areas, picnic areas, walking and jogging pathways, bicycling pathways, sports activity zones, etc.
- Seating, socializing and community gatherings areas shall be provided at regular intervals within public parks. These areas shall be sheltered or shaded, where possible.
- Supporting facilities such as information kiosks, wayfinding signage, trash bins and public toilets are to be provided.
- Secured Personal Mobility Device (PMD) or bicycle parking facilities are to be provided at key locations such as at entry points.

8.3.5 Lighting

- Lighting shall be designed to promote safety and visibility, in accordance to guidelines in Chapter 6.
- Fencing and boundary walls adjacent to public open spaces shall be well lit at night.

8.3.6 Landscape and Materials

- The landscape of the River Park is to be designed as an attractive and accessible public space with urban furniture.
- Features and landscape materials shall complement the urban character and architecture of the particular neighborhood. Materials used must be safe, durable, easily maintained and aesthetically pleasing.
- Proper drainage shall be provided within public parks in compliance to Chapter 12.4. Storm water drains shall be covered and flushed with the paving level. Natural drainage systems are strongly encouraged.
- Park entry points shall be defined with appropriate landmark gateway features to serve as a visual element of arrive.
- Public art and water features are encouraged to create focal points for public interest within public parks. The provision and design of public art and water features shall comply with the guidelines in Chapter 10.

8.3.7 Boundary Walls & Fences

- Boundary walls and fences shall be provided for lots adjacent to public parks. They shall be designed to be attractive, porous and low in height, in compliance to Chapter 2.19.

Park Connector Network within a public park

Neighborhood Park

Riverside Park

Fig. 8.2 Public Parks

Sources: (1) & (2) SJ; (3) Building Construction Authority

8.4 Easement Area & Plazas

8.4.1 Easement and plazas are areas of publicly accessible public open space that are encouraged, where appropriate, at the intersection of streets and green parks. Easement areas and plazas provide a spill over space for pedestrians to create a safe and comfortable urban environment, while serving a visual and amenity function within private developments. Easement areas shall be developed and maintained at the cost of the Locator.

8.4.2 The following are the types of easement areas provided within private lots in NCC:

- Plaza Easement Area – Public open spaces at the intersection of streets and public parks or green spaces
- Roadway Easement – Greenways along major roads and footpaths, key intersections and gateways
- Landscape Easement – Public landscaped areas adjacent to green spaces and greenways

8.4.3 Access and Movement

- Public plazas shall be visually and physically accessible from neighboring streets and building blocks. Plazas shall be design for universal accessibility

8.4.4 Urban Form Around Public Green Open Spaces

- Plazas shall be well-designed public spaces that are incorporated into commercial developments to extend public activity outside the building and to serve as both a functional space and attractive public space.

8.4.5 Facilities

- Easement areas and plazas shall provide seating areas, such as gathering spaces in plazas and benches along roadway and landscape easements.
- Public plazas shall provide supporting facilities such as wayfinding signages, information kiosks and PMD or bicycle parking facilities.

8.4.6 Lighting

- Lighting shall be designed to promote safety and visibility, in accordance to guidelines in Chapter 6.
- Fencing and boundary walls adjacent to plazas shall be well lit at night.

8.4.7 Landscape and Materials

- Plazas are to be developed primarily as paved areas that are pedestrian oriented. Features and landscape materials shall complement the urban character and architecture of the particular neighborhood. Materials used must be safe, durable, easily maintained and aesthetically pleasing.
- Public art and water features are encouraged within plazas to create focal points for public interest and to enhance the visual importance and significance of the surrounding area. The provision and design of public art shall comply with the guidelines in Chapter 10.
- Roadway easements are to be planted with trees to serve as a greenway and to visually define and reinforce major roads and pedestrian ways. The spacing, size and variety of tree must match those along adjacent streets and are to conform with the guidelines in Chapter 8.6, unless otherwise indicated by the Declarant.
- The landscape easements shall serve as attractive landscape areas for both passive and active recreation.

8.4.8 Boundary Walls & Fences

- Fences and walls are allowed along easement lines adjacent to buildable areas within a plot. No walls or fences are allowed within easement areas.
- Fences and walls shall be designed to be attractive, porous and low in height in compliance to Chapter 2.19. Where appropriate, fences and walls shall be avoided, to allow an extension of open spaces within the lots into the outdoor public space. Otherwise, the use of seating walls or free-standing benches is encouraged.

1

Public Plaza above the train station

2

Activity at Public Plaza

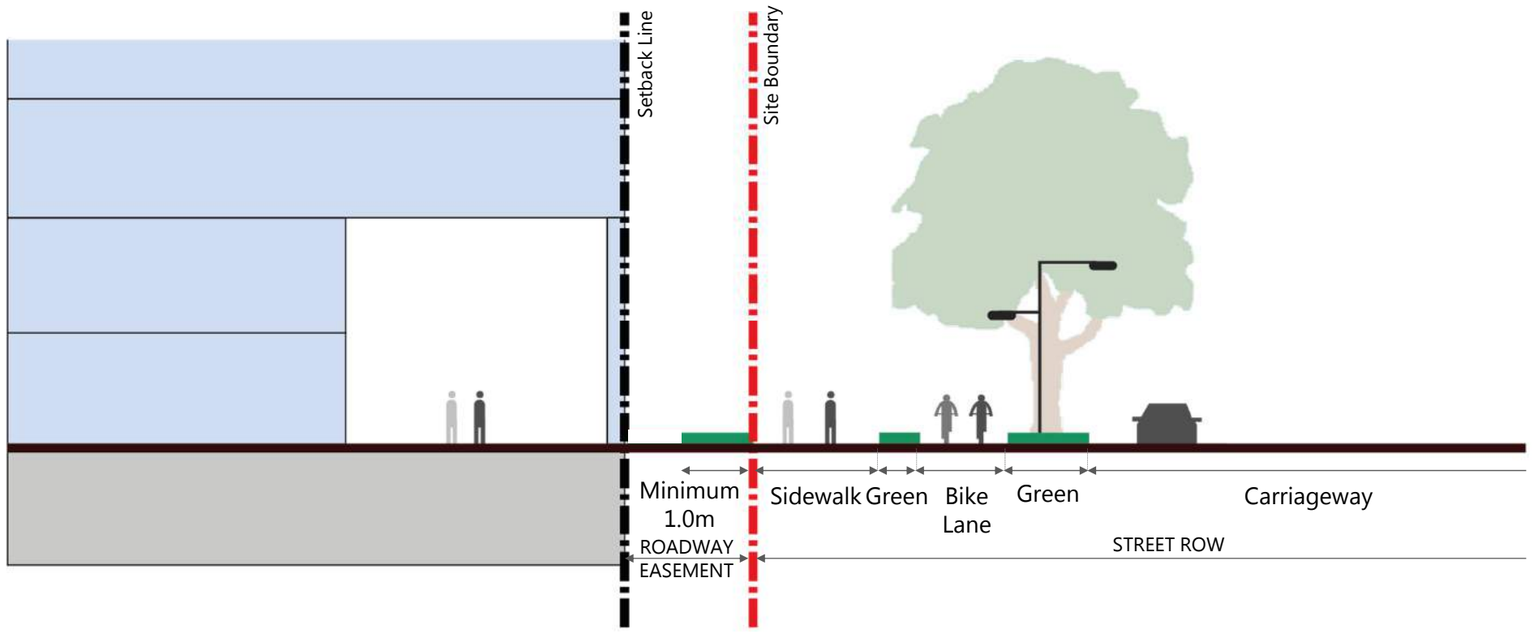
3

Public Plaza located next to the major traffic junction

Fig. 8.3 Easement Area & Plazas

Sources: (1) Mariott Hotels; (2) Zula; (3) Office of Cheryl Barton

8.4 Easement Area & Plazas



Roadway Easement

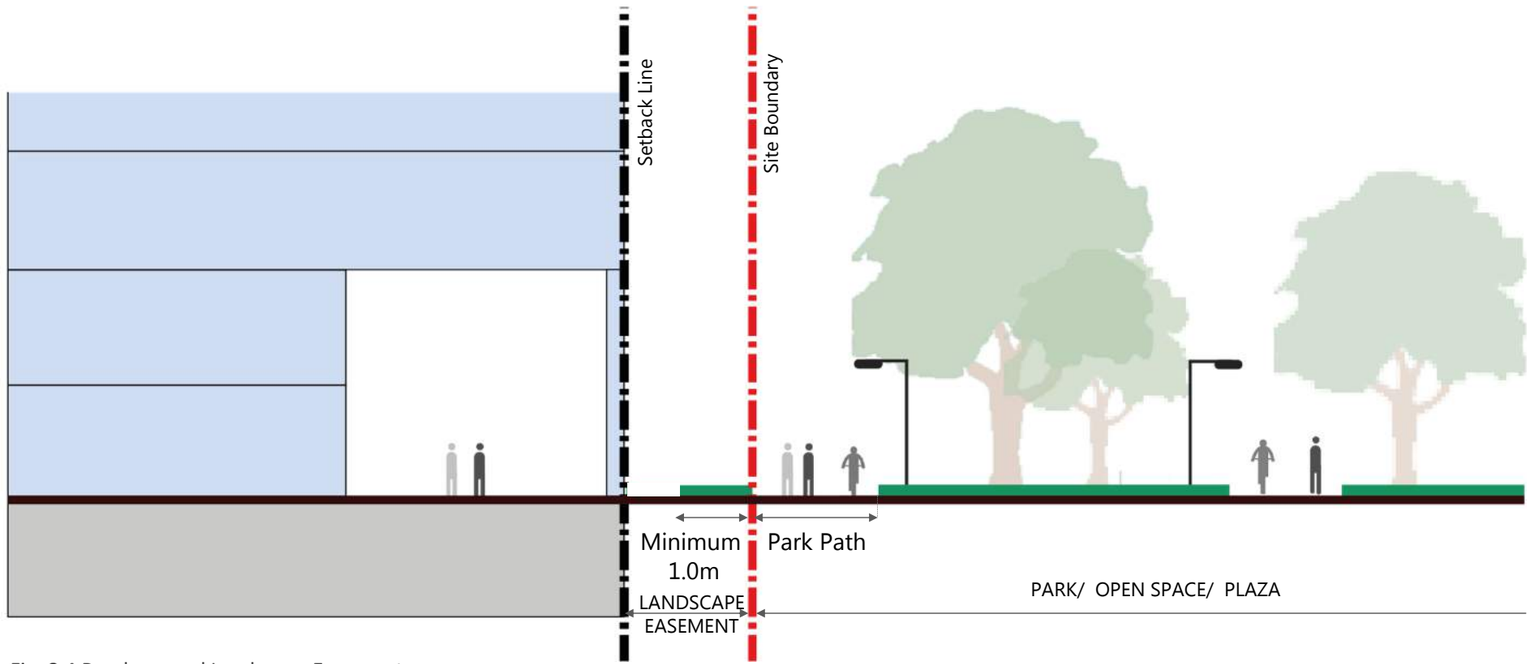
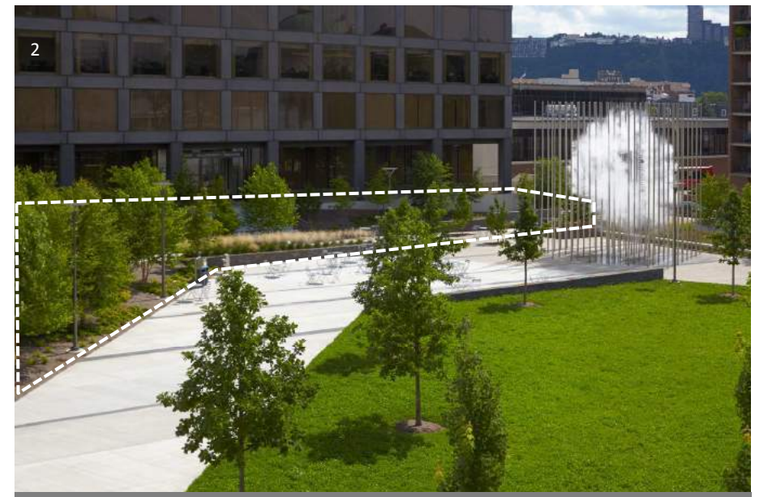


Fig. 8.4 Roadway and Landscape Easements



Landscape Easement

Sources: (1) City of Seattle Office of Planning and Community Development; (2) Landezine

8.5 Streetscape

8.5.1 Street Right-of-Way (ROW)

- The streetscape or street ROW shall include landscape areas, and pedestrian and NMT zones that prioritize the safe movement of pedestrians, cyclists and PMD users, as indicated in street sections shown in Figures 11.2 to 11.5.
- Landscape zones are intended to provide a buffer to pedestrian and cyclist zones within the ROW.
- Utility zones, required for the installation and maintenance of various utility lines, shall be integrated with the landscape zones planned within the ROW. Public use of these landscape areas may be suspended if access to utility lines so necessitates.

8.5.2 Facilities and Lighting

- The streetscape shall provide street furniture including streetlights, signage, transit stops, trash bins, benches, wayfinding signage, kiosks, bicycle racks, electric vehicle sharing stations and cigarette receptacles.
- All street furniture shall be aesthetically uniform and shall complement the urban character of the particular district.
- The design and placement of street furniture shall conform to the guidelines in Chapter 9.
- The design of street furniture, such as lighting and signages, shall conform to the Design Standards and Guidelines in Chapters 6 and 7.

8.5.3 Landscape and Materials

- Pavement, roadside railing and landscape materials shall complement the urban character of the district. Paving materials used must be safe, non-slip, durable and easily maintained, and aesthetically pleasing.
- Dedicated space for planting and bioswales designed for water drainage management shall be planned within the ROW, where feasible.
- Planting shall conform to guidelines in Chapter 8.6.

Street furniture (trash bin, bench, advertising signage and transit shelter)

Bicycle Rack

Bio swale within ROW

Fig. 8.5 Streetscape

Sources: (1) Program Contractors; (2) SJ; (3) NACTO (image cropped)

8.6 Technical Criteria

8.6.1 All landscape plans are subject to the written approval of the Declarant. All submitted plans must include detailed information regarding plant materials, paving, and other features and facilities. All design submissions shall include design for irrigation.

8.6.2 Trees shall be planted at close regular intervals to create a continuous tree canopy, while ensuring adequate soil space for root growth and long-term tree health. Large gaps in the tree canopy shall be avoided, where possible. Accounting for other relevant clearance requirements, trees are to be typically planted as follows:

Tree Type	Interval
Small Tree	Spaced at 7 to 10 meter intervals
Medium Tree	Spaced at 10 to 15 meter intervals
Large Tree	Spaced at 15 to 20 meter intervals

8.6.3 The clearance from the edge of a proposed road element to the center of a proposed street tree shall conform to the requirements indicated in Table 8.1 and Figure 8.6.

Table 8.1 Street Planting Clearance

Roadside Element	Minimum Street Tree Planting Clearance		
	Small Tree	Medium Tree	Large Tree
Streetlight	2.0m	2.0m	4.0m
Drain	1.0m	1.5m	2.5m
Traffic Light	2.0m	2.0m	2.5m
Crossings	1.5m	2.0m	4.0m
Driveway Access	1.0m	1.5m	2.5m

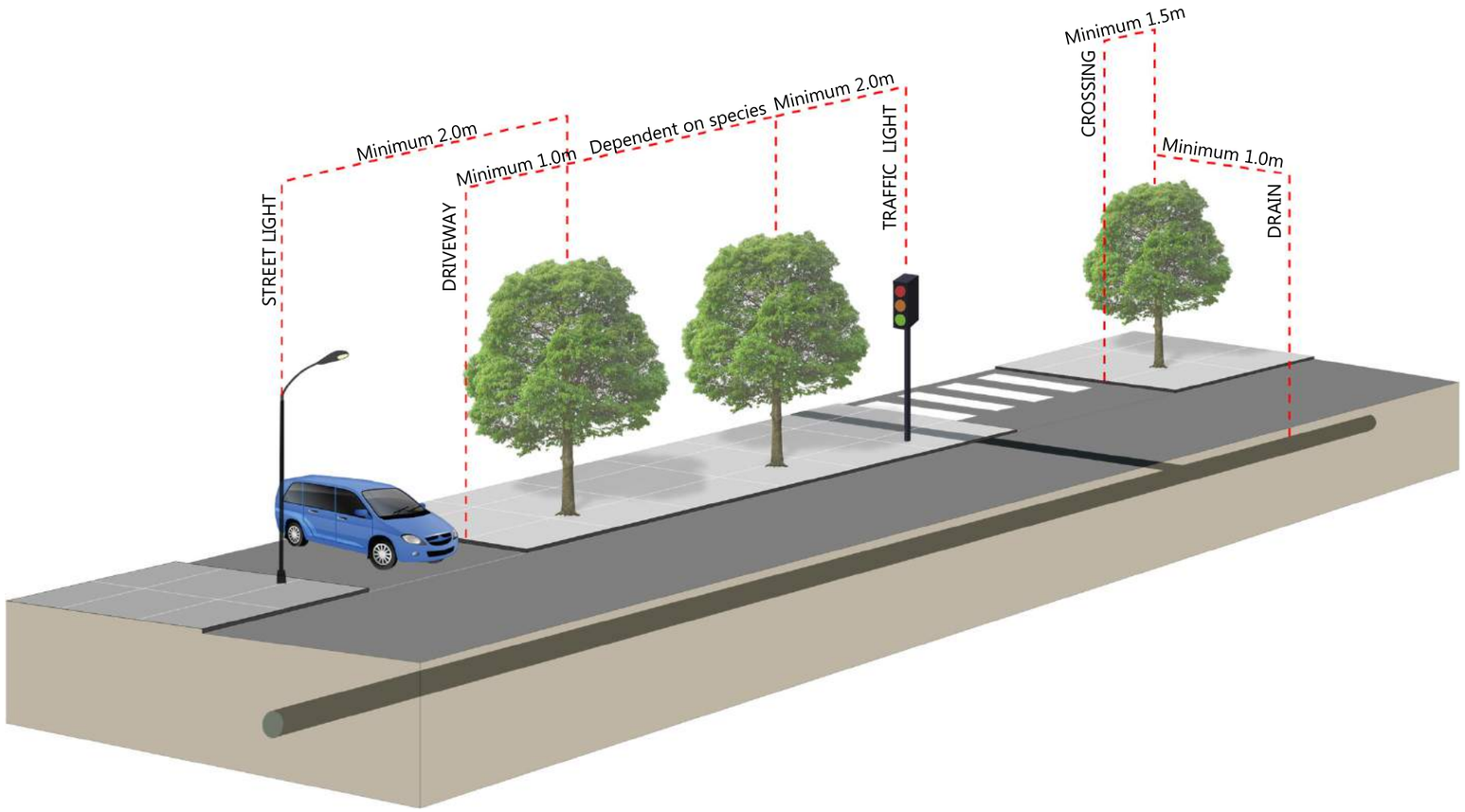


Fig. 8.6 Street Planting Clearance

8.6 Technical Criteria

8.6.4 Guidelines recommended for plant sizes during planting are as follows:

Sapling Tree	2.5m minimum total height; 1.5m clear trunk height
Instant Tree	2.0m clear trunk height
Palm Tree	2.0m minimum total height
Shrubs	0.3m to 0.5m height
Hedges	1.0m minimum height
Turfing	0.15m minimum spread; 0.05m thickness

8.6.5 The basic criteria for plant selection are as follows:

- Where possible, large street trees shall be selected to provide a larger canopy that enhances the aesthetics and environmental performance of the street.
- Utilize native, deep-rooted, drought tolerant and high-branching deciduous tree species where possible. Some species in the NCC street tree palette are shown in Figure 8.7.
- Tall dense bushes and hedges shall be avoided to prevent obstruction to visibility and accessibility. Plant species that a poisonous and spiky are also not allowed.
- Avoid the use of trees with invasive root system near utilities, pavements, curbs walls and other structures. Where such species must be used, root barriers will be required to protect existing or proposed utilities and structures.
- Avoid tree species which cannot hold up during typhoon.
- The selection of which species to plant and the exact location within the street shall be at the sole discretion of the Declarant.


Cratoxylum cochinchinense


Diospyros blancoi


Lagerstroemia speciosa


Syzygium lineatum


Filicium Decipiens


Terminalia Mantaly


Ficus benjamina


Ficus crassiramea


Acacia Mangium


Delonix Regia


Pongamia pinnata


Syzygium polyanthum


Ficus caulocarpa


Horsfieldia irya


Podocarpus neriifolius


Sterculia macrophylla


Erythroxylum cuneatum


Swietenia macrophylla

Small Tree (6m to 15m)	Medium Tree (16m to 30m)	Large Tree (>30m)
Cratoxylum cochinchinense	Ficus benjamina	Ficus caulocarpa
Diospyros blancoi,	Ficus crassiramea	Horsfieldia irya
Lagerstroemia speciosa	Acacia Mangium	Podocarpus neriifolius
Syzygium lineatum	Delonix Regia	Sterculia macrophylla,
Filicium Decipiens	Pongamia pinnata	Erythroxylum cuneatum
Terminalia Mantaly	Syzygium polyanthum	Swietenia macrophylla

Fig. 8.7 Street Tree Palette

8.9 Wild Life Crossing & Corridor

8.9.1 Habitat fragmentation is one of the major impact of NCC project on flora and fauna. Fragmentation is the process where habitats that were once continuous become divided into separate fragments isolated from each other by non forest land.

8.9.2 Wild life crossing and corridor are recommended in NCC in order to connect fragmented forest reserves and assist animals to move between fragmented forests without collisions with vehicles (figure8.12).

8.9.3 Wild life crossing and corridor shall be links of native vegetation. Wild life crossing may include underpass tunnels and/or overpasses (figure 8.11).

8.9.4 Exact location and design of wild life crossing and corridor are subject to a further study by an appointed environmental specialist.

Fig. 8.11 Example of Wild Life Crossing

Sources: http://i.imgur.com

Fig. 8.12 Wild Life Bridge & Nature Ways

Chapter 9

Public Furniture

9.1 Introduction

9.1.1 Objectives of the Public Furniture Guidelines are as follow:

- To enhance the attractiveness, liveability and character of the community, and create inclusive public areas.
- To reinforce the identity of individual districts in NCC and that of the whole city.
- To establish coordinated, distinct, functional and aesthetic design criteria for public furniture that complement the architecture and urban character of NCC while ensuring universal accessibility in public areas.
- To increase the appeal of Non-Motorised Transport (NMT) modes by enhancing the streetscape.

9.2 General Guidelines

9.2.1 Public furniture includes street elements such as seating, transit stops, bicycle parking and racks, trash and recycling bins, recreational facilities, and public toilets.

9.2.2 All Locators are encouraged to provide public furniture within their developments and along easement areas to contribute to inclusive, attractive and livable public spaces.

9.2.3 Location

- Priority locations for furniture placement include transit stations and stops, major destinations and areas of high pedestrian traffic, such as commercial and civic areas, public parks and plazas, and locations of higher urban density.
- Street furniture shall be placed such that they do not obstruct the pedestrian and NMT transport zones when used. The minimum clear width for pedestrian passageways shall be maintained and in accordance to Chapter 5.

9.2.4 Design and Material

- All public furniture shall be aesthetically uniform and shall complement the architecture and urban character of the particular district.
- Public furniture shall be designed to be comfortable and suitable for people of all ages. They shall be designed according to the principles of universal design.
- Materials used shall be durable, easily maintained, of low heat conductivity and with high quality finishes. Where possible, the use of local materials is encouraged to respect and showcase the local context.
- Public furniture that is crafted locally is encouraged to showcase local craftsmen and artists.

9.2.5 District Identity

- The design of public furniture shall enhance the unique identity of the particular district in which it is located. This may be done by adopting a unique and uniform material palette, logo, color or design that celebrates the image and overall branding of each district.
- Public furniture may serve as a unique focal point in a district by integrating with public art.
- Street furniture that is part of LRT/ BRT transit system can be uniquely differentiated with a recognizable brand identity to improve the image of transit and provide a better experience for the transit passengers, as the transit network evolves in the future.
- Around the key destinations such as the central park, river park, sports park, civic or cultural significance, more specific or targeted design solutions shall be considered. It is recommended that a context sensitive approach is undertaken to integrate street furniture with a high-quality streetscape design, to create a unique identity for special destinations in NCC.

9.2.6 Maintenance

- The continued maintenance of public furniture will be done by the respective Locator at his sole expense and to the reasonable satisfaction of the Declarant.

1 Bicycle racks made of durable local materials

2 Complementary furniture design with unique color code for district identity

3 Public seating as public art

Fig. 9.1 Public Furniture Design

Sources: (1) Streetlife.nl; (2) ArchiExpo (Mmcite); (3) Escofet.com

9.3 Seating

9.3.1 Seating shall be provided regularly along pedestrian routes and at major pedestrian nodes, gathering places and transit stops, but shall not obstruct pedestrian circulation. Preferably, seating is encouraged at 100-meter intervals, with accessible seating at every 400 meters. Seating areas shall also be non-secluded to ensure better security and public surveillance.

9.3.2 A diversity of type of seating is encouraged to accommodate groups of various sizes and a range of physical abilities and ages. For example, seating areas shall provide companion seating with spaces for wheelchair users and baby carriages. Seating shall also be arranged to facilitate social interaction.

9.3.3 Types of seating include benches, chairs, seat walls and various types of perches. Movable seating is encouraged where there is sufficient space to allow people to create their own seating areas.

9.3.4 Where possible, seating areas shall be shaded or sheltered to ensure a level of protection from the elements. Any signs or shade elements located above seating areas shall have a minimum height clearance where it is located at least 2 meters from the ground.

9.3.5 Some seating shall provide armrests and backrest to provide support for older persons.

9.3.6 Seating shall be provided at a height of between 430 mm and 470 mm.

9.3.7 Seating shall visually contrast with surrounding walls and floor surfaces so that they are readily identifiable.

9.4 Transit Stops

9.4.1 Transit stops shall be sheltered and incorporate seating to provide comfort to transit users.

9.4.2 Transit stops shall be accessible in design and access. For example, steps shall be avoided along access routes and at alighting and boarding areas.

9.4.3 Wayfinding signages and other informational signages that provide information on transit routes and timing is encouraged.

9.4.4 Where possible, adjacent developments shall provide sheltered connections to transit stops.

9.4.5 A clear width of 1.5 meter shall be maintained between benches and the street edge.

9.5 Bicycle Parking

9.5.1 Bicycle parking is encouraged at the entrances of larger developments, at parks and public facilities, and transit stations and stops.

9.5.2 Bicycle parking and racks may be integrated with other public furniture elements.

9.5.3 Where possible, bicycle parking shall be sheltered and secure, such as through the provision of bicycle shelters and bicycle lockers.

9.5.4 The provision of wayfinding signages to major destinations, transit stops and stations, and other guide maps catered to cyclists is recommended at bicycle parking areas.

Movable and varied seating help facilitate social interaction

Fig. 9.2 Public Seating

Transit stop with map, seating, shelter and public library

Fig. 9.3 Transit Stop

Bicycle Shelter

Fig. 9.4 Bicycle Shelter

Sources: (1) Street Furniture Australia; (2) Metalco; (3) Klaver Fietsparkeren

9.6 Trash & Recycling Bins

9.6.1 A combination of both trash and recycling bins are encouraged to promote recycling in NCC.

9.6.2 Trash and recycling bins may bear the logo or name of the district in which it is located to enhance the identity of the district.

9.6.3 Trash and recycling bins shall have a minimum volume of 120 liters and be emptied frequently, especially within commercial zones.

9.7 Recreational Facilities

9.7.1 Recreational elements are encouraged to add interest to the streetscape. They shall be located where they are physically and visually accessible.

9.7.2 Recreational elements shall appeal to all ages and abilities. Recreational facilities shall be sensitively designed to be barrier free and accessible, and prioritize the safety of all users. Facilities for children shall be stimulating, educational, and suitable for children of various ages, while those for adults shall be suitable for use by older persons.

9.7.3 Facilities for children shall be located close to adult activities to encourage multi-generation integration.

9.74 Where possible, shading or shelter shall be provided with a minimum 1.8-meter height clearance.

9.7.5 Examples of recreational facilities include fitness facilities, playgrounds, climbing areas, community gardens, etc.

9.7.6 Seating is encouraged near play facilities.

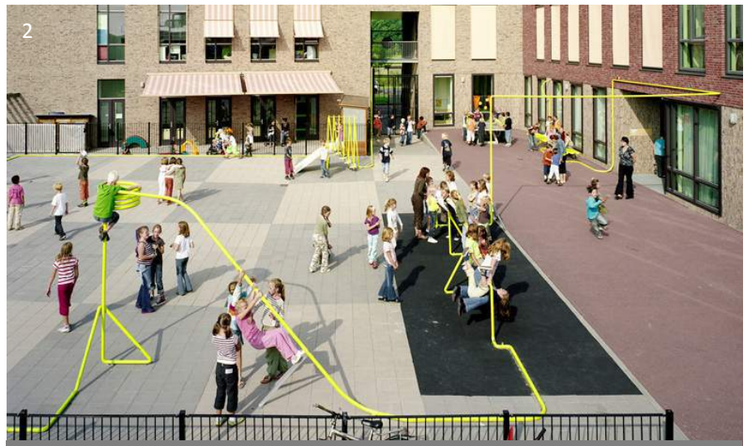
9.8 Other Facilities

9.8.1 Public toilets are encouraged near areas of attraction such as public areas of developments and at public green and open spaces to offer comfort, hygiene, accessibility and security to the public. These toilets shall be wheelchair-friendly and accessible.

9.8.2 Other facilities such as drinking fountains and stroller parking are encouraged at public parks and major gathering places, where appropriate.

1 Recycling and trash bins inspired by Central Park's iconic benches

Fig. 9.5 Trash and Recycling Bin



2 Multi-generation play facility

Fig. 9.6 Recreational Facilities

3 Wheelchair-friendly public toilet

Fig. 9.7 Public Toilet

Sources: (1) Central Park Conservancy; (2) Bas Princen; (3) Marilynn K. Yee (The New York Times)

Chapter 10

Public Art

10.1 Introduction

10.1.1 Objectives of the Public Art Guidelines are as follows:

- To reinforce the image and vision of NCC.
- To activate and enliven the urban environment with opportunities for visual stimulation, interaction and delight.
- To reflect local culture and/ or character.
- To provide a focal point in shared public spaces such as parks, plazas or seating areas.
- To encourage artistic expression, foster a sense of pride, and prevent vandalism in public spaces.

10.2 General Guidelines

10.2.1 Public art enhances the identity of a city and enriches the quality of life in the city. This is dependent on the quality of the art, its sensitivity to the social context and its relationship to the site.

10.2.2 The guidelines in the Design Standards and Guidelines are intended to clarify the process and respective roles of artists and clearly identify the avenues through which public art may be developed. In developing these guidelines, the Declarant seeks to facilitate the creation of a special local Philippine identity within the various zones in NCC through a high standard of public art.

10.2.3 Locators shall participate in the development of public art by contributing to an art fund for, and dedicated to, the development, maintenance and preservation of public art once the art fund is set up by the declarant.

10.2.4 Locators shall contribute to the Art Fund based on the permissible GFA of his lot. The Art Fund contribution shall be computed at 100 pesos per square meter of permissible GFA, subject to reasonable adjustments as deemed necessary by the Declarant.

10.2.5 Monies allocated to the fund will be spent to facilitate the creation of a distinctive urban character for each district through the incorporation of a wide range of art works. These may include special or landscape features such as fountains, street furniture (benches, lamp posts, letter boxes, etc.), as well as works of art.

10.2.6 All Locators are encouraged to work towards creating and maintaining this identity of NCC by participating in the development, maintenance and preservation of public art.

10.2.7 A selection committee for the selection of artists shall be organized by the respective Locator and shall involve the Declarant.

10.3 Public Art Criteria

10.3.1 Appropriateness

It shall be closely integrated with other streetscape elements, be appropriate in relationship to its physical site and enrich the quality of public space.

10.3.2 Relevance

It shall be sensitive to its social context so that the surrounding developments and their users and visitors may relate to it in a meaningful way.

10.3.3 Accessibility

It shall be accessible for all so that it may be experienced without complicated explanation. It is encouraged to be interactive, so that it may stimulate play and recreation. It may also be incorporated into street elements such as into the landscape or benches. Participatory design from the community is strongly recommended so that residents and users of the space may evoke a sense of ownership.

10.3.4 Visibility

It shall be highly visible from long distances or provide a sense of discovery.

10.3.5 Aesthetic Significance

It shall be of an aesthetic design and be of lasting and universal quality.

10.3.6 Uniqueness

It shall be interesting, unique and thought provoking, with artists that are well respected to attract local, national or international attention.

Public art in each zone in NCC is to adopt a precinct approach where the public art in each zone will reinforce the unique character of the particular zone in NCC in which it is located. This will help to establish a unique identity and recognizability for each zone that complements the urban character of that district.

10.3.7 Durability

It shall be constructed with high quality materials and craftsmanship to ensure durability and resistance to the climate, as well as require minimal maintenance.

Showcase local culture and character

Provide focal point for a public space

Fig. 10.1 Examples of Public Art

Source: (1) & (2) SJ

10.4 Eligible Public Art Location

10.4.7 Eligible works of art include, but are not limited to, the following:

- Sculpture
- Decorative Play Elements by artists
- Decorative Water Features by artists
- Decorative Green Wall by artists
- Decorative Pavement by artists
- Paintings
- Murals
- Glass
- Photography
- Tapestry
- Mosaic Tile
- Street furniture, including transit stops, streetlights, benches, grills, and signage by artists

10.4.8 Art works may be of any media or combination of materials appropriate to the work of art and its physical environment.

Fig. 10.3 Examples of Eligible Works of Art

Sources: (1) The Lawn on D (Yelp); (2) Landezine; (3) Escofet.com ; (4) Great-parks.com; (5) PJIC; (6) Little Day Out; (7) Telegraf; (8) Philadelphia Public Art; (9) PWP Landscape Architecture

10.5 Scale

10.5.1 Artworks may be of the following three (3) scales:

- Monumental Scale
- Human Scale
- Residential Scale

10.5.2 Monumental Scale

Monumental scale artworks are to be installed at key locations, arrival plazas, or large parks. Such artworks include significant sculptural elements that are memorable and high visible from long distances. They may be experienced both from vehicle and at the pedestrian level, and shall be interactive and well-lit at night.

10.5.3 Human Scale

Human Scale artworks include artworks dedicated to placemaking. They shall be well lit, interactive and experienced at pedestrian level.

10.5.4 Residential Scale

Residential scale artworks are dedicated to residents and include artworks such as neighborhood/ children's parks and play areas. They serve to enrich functional and architectural elements.

Monumental Scale Public Art

Human Scale Public Art

Residential Scale Public Art

Fig. 10.4 Public Art Scale

10.6 Public Art for SEA Games

10.6.1 Public art around the stadium and sports arena shall represent the spirit and theme of the SEA Games.

10.6.2 Artworks may showcase national sport or local sports in different areas of the arena.

10.6.3 Artworks shall be in different scales for variety and enrichment of public spaces around the arena.

10.6.4 Artworks shall create focal points in key areas of public movement.

Example of a Public Art in front of a stadium

A Stamp of popular sports in Philippines

Fig. 10.5 Example of Public Art for SEA Games 2019

Sources: (1) SJ; (2) Remember Singapore; (3) Arieanna Schweber; (4) The Australian; (5) Philippine Post

10.7 Maintenance

10.7.1 The continued maintenance of public art will be done through the respective Locator at his sole expense and to the reasonable satisfaction of the Declarant. The Locator shall include maintenance provisions in the artwork contract that stipulate the duration of time the artist will be responsible for repairs, urge artists to provide a maintenance manual, and will allow the artist first-refusal on repair contracts within a fair market rate of remuneration.

10.7.2 The maintenance manual shall include a statement regarding the materials from which the piece is fabricated. The Locator will be responsible for communicating this information to its custodial staff and providing any necessary additional tools or equipment to ensure proper daily maintenance of public artworks.

10.8 Implementation

10.8.1 The selection committee shall facilitate the creation of a distinctive urban character for each district through the incorporation of a wide range of art works.

10.8.2 Artist selection will be subject to one of the following forms of selection by the selection committee:

- Open Competition

  The Open Competition is a call-for-entries for a specific project. Artists will be asked to submit samples of their past work, as well as proposals for the project at hand. The types of work sought in the competition will depend on the requirements of the site as determined by the Master Plan. Proposals shall only indicate preliminary ideas and direction of the artist's concept. Artists will not be paid for this preliminary proposal.

  The call-for-entries will make clear the parameters of the art component through a thoroughly developed Request for Qualification process so that artists who are not eligible do not waste their time applying and so that the selection process is not unduly burdened with unnecessary applications.

- Invitational Competition

  The Invitational Competition is a process in which a limited number of artists will be asked to submit proposals for a specific site(s). Selected artists will be contacted and sent project specifications. They will also be asked to visit the site, if possible, and subsequently meet with key project people. The artist must understand the project and the community the project is intended to serve. A thorough briefing, including meeting and supplementary material will help candidates to understand the context of the project.

  Proposals will not need to be elaborately detailed but will have to indicate the general direction of the artist's thinking. Artists may or may not be paid for this preliminary proposal.

- Direct Selection

  An appropriate list of candidates will be developed. Several artists will be chosen and ranked by preference. A briefing session will be organized for the chosen artist to meet the project team.

10.8.3 Whichever the selection method adopted, preference shall be given to local Philippine artists to enhance the local character and identity of NCC, and to provide a platform for Philippine artists to gain international exposure.

Chapter 11

Road Design

11.4 Access Control

11.4.1 This chapter addresses the non-signalized access to and from a property along a road. This type of access points may cause traffic accidents and congestion. Thus, proper access control is critical for managing the traffic of the entire NCC. The access control from a road to each development area shall be regulated based on the classification of the road, as summarized in Table 11.2.

11.4.2 Arterial Road

The access to a property from an arterial road shall be prohibited to maintain smooth traffic flow. Access shall be tapped from lower level roads, where possible. However, if there is no other reasonable access available, right turn shall be permitted. When Locators design an unsignalized access point to their own property, they shall take measures to avoid traffic conflict in the arterial road, such as through the construction of a frontage road (Figure 11.6) or backage road (Figure 11.7).

11.4.3 Frontage Road

Frontage road shall be a one-way road. Separation of frontage roads at cross streets shall be maximized to ensure sufficient storage for cross-road traffic between frontage roads and the arterial road.

11.4.4 Collector Road

Unless where there is no reasonable access from a local road, access from a collector road shall be prohibited. When providing unsignalized access, it must be physically blocked by a median to prohibit left turns (Figure 11.8).

11.4.5 Local Road

Access from local roads are permitted as long as the design ensures traffic safety.

Table 11.2 Road Classification and Driveway Design Permission

Road classification	Driveway
Arterial Road	Generally Prohibited. Right turn is permitted if no other reasonable access exists
Collector Road	Permitted. left turn is prohibited/ it shall be blocked by a median
Others (Local Road)	Permitted

Example

An access driveway shall be tapped to lower level roads.
However, if there is no other option, frontage/ backage road shall be provided.

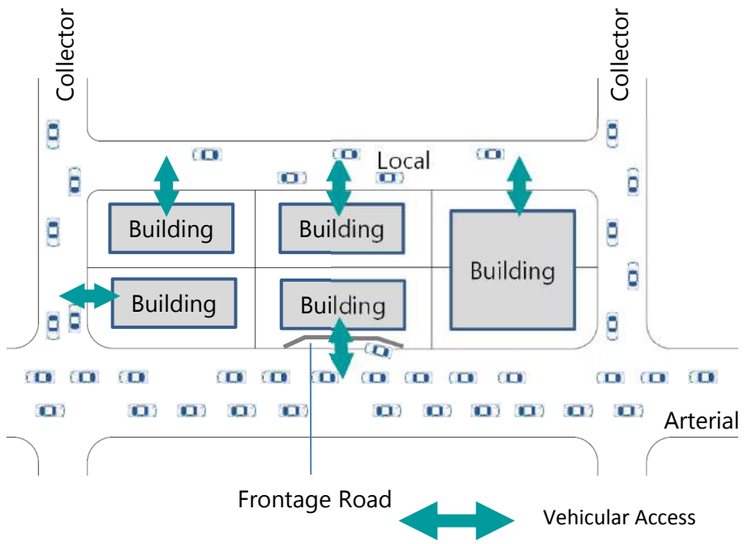


Fig.11.6 Example of Access to Each Lot

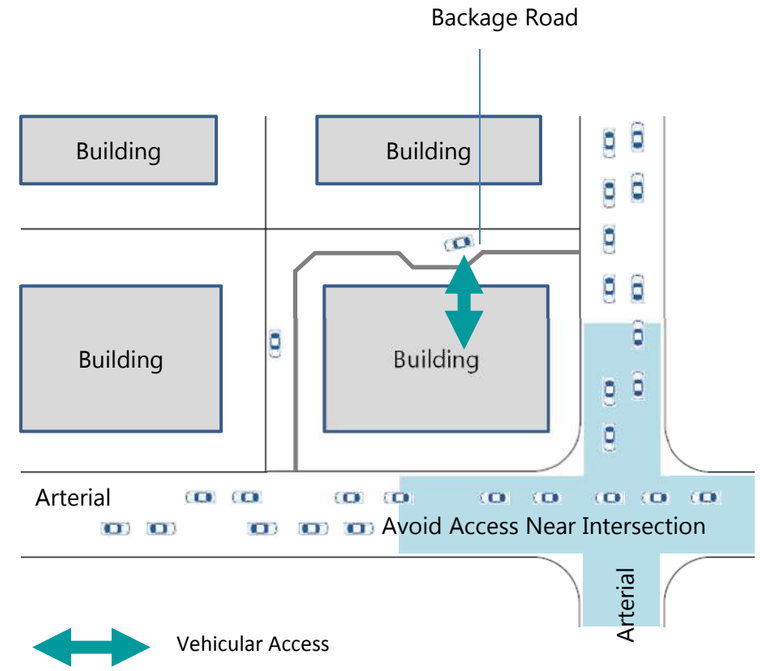


Fig.11.7 Example for Adopted Backage Road

Median blocks accesses by left-turn from collector road

Without median, too many vehicle left-turns can cause conflict on major roads

Fig. 11.8 Unsignalized Access with Median

11.5 Pedestrian Circulation

11.5.1 Pedestrian walkways shall be designed to ensure pedestrian safety. Especially where large number of pedestrians are predicted to cross the road and where pedestrians have longer crossings, pedestrian crossings are to be designed properly so that pedestrian and vehicle conflicts are minimized. The width of pedestrian crossings shall be determined based on its estimated demand.

1

Elevated Pedestrian Link

2

Elevated Pedestrian Link

Fig. 11.9 Pedestrian Crossings

Sources: (1) Big Bridge; (2) Bicycle Dutch

11.6 Intersections

11.6.1 The design criteria of intersections shall comply with the following guidelines:

- Design Speed at intersections is subject to the limits as detailed in accordance to Table 11.3.

Table 11.3 Road Classification and Design Speed

Road classification	Design Speed (km/h)
Arterial Road	60/70/80/90/100
Collector Road	50/60/70
Local Road	20/30/40

- Minimum Curve Radius shall be determined by design speed in accordance to Table 11.4.

Table 11.4 Design Speed and Minimum Radius

Design Speed (km/h)	Minimum Radius (m)
40	60
50	115
60	185
70	290
80	405

- Vertical Alignment shall be based on road classification. DPWH and AASHTO's design criteria are shown in Table 11.5.

Table 11.5 Vertical alignment in DPWH and AASHTO

Road Class (US/ Philippines)	Desirable (%)	Maximum (%)
Arterial / Provincial Road	6.0	7.0
Collector/ City Road	6.0	8.0
Local/ City Road	6.0	9.0

- Climbing Lane shall be provided when road gradient is more than the desirable gradient and the road is assumed to be used by heavy trucks or trailers to allows small cars to pass slow speed vehicles.

Climbing Lane

Fig. 11.10 Climbing lane

Chapter 12

Utilities

12.1 General

12.1.1 The Design Standards and Guidelines are a supplement to the existing National Building Code and appropriate Philippine and utility agency codes, which must be fully complied with in addition to the guidelines stated within this document.

12.2 Water Supply

12.2.1 Water Meter Chamber

The water meter chamber shall be located not more than 1m from the boundary line along internal access roads.

12.2.2 Storage Tank

The service shall be connected to storage tank(s) provided by the locator within the plot boundary.

12.2.3 Water Pump

No water pumps directly connected to a water main of the Declarant shall be permitted. Booster pumps may be installed to pump water from a ground storage tank of adequate capacity supplied by natural pressure from the Declarant's water mains. The installation of booster pumps shall require the prior written consent of the Declarant and shall comply with other applicable requirements provided in this Design Standards and Guidelines issued pursuant thereto.

12.2.4 Water Meter Room

The Locator shall provide within the plot and/ or building(s) for a meter room accessible from the outside at all times. No rent or charge for the meter room shall be charged to the Declarant and/ or the Water Supplier.

12.2.5 Utility Agency Requirement

The Locator shall accommodate the required provision of water supply and comply with the utility agency requirements.

12.3 Electricity Supply

12.3.1 General

The Locator shall accommodate the required provision of utilities and comply with the National Building Code, Philippine Electrical Code, and/ or the utility agency requirements.

12.3.2 Electricity Component Space

The Locator shall provide a space to accommodate the electrical components to the specifications of the utility agency. The Locator shall allow reasonable access to this space. It is the responsibility of the Locator to obtain design and construction criteria and building code compliance from the appropriate government and utility agencies.

1 Wind Turbine

2 Solar Panels

Fig. 12.1 Alternative Energy Sources

Sources: (1) Relex Italia; (2) The European Synchrotron

12.4 Drainage Design

12.4.1 Drainage Connection

Sewerage and storm water drainage connections shall be provided by the Declarant up to the boundary of each plot. The Locator shall construct and maintain at his own expense such drains and channels within the boundary of his lot, to intercept and convey into the nearest connection of the sewerage/ storm water drainage system.

12.4.2 Water Discharge

The Locator shall not discharge directly or indirectly, or cause or permit or suffer discharge into any public sewer, storm water drain, channel, stream-course or sea any trade effluent or foul or contaminated water or cooling or hot water without the prior written consent of the Declarant or the appropriate government agency, who may as a condition of granting its consent require the Locator to provide, operate and maintain at the Locator's own expense, within the lot or otherwise and to the satisfaction of the Declarant or the appropriate government agency, suitable works for the treatment and disposal of such trade effluent or foul or contaminated or cooling or hot water.

12.4.3 Drainage System Maintenance

The Locator shall be responsible for the maintenance of the sewerage and storm water drainage system within his own property and the individual connections to the public sewerage and storm water drainage system.

12.4.4 Drainage Network

The Locator is not allowed to change river alignment, without permission of the Declarant, because it may ruin the flood control plan of NCC. The alignment revision may be permitted if its catchment area is kept same.

12.4.5 Regulation on Development

No development is allowed before the completion of a downstream drainage facility. However, if a proper drainage control (e.g. retention pond, dam, etc.) is done and it is proved that the development will not increase the water flow in the downstream area, the construction of the development is allowed.

12.4.6 Design Criteria

Design formula, such as runoff calculation, shall be based on DPWH Standard (DPWH, 2015, Design Guidelines, Criteria & Standards Volume 3 Water Engineering Projects).

Drainage design shall be based on 25 to 50-year return period, following Table 12.1.

- Return period of major drainage (river and retention pond which are categorized as Watershed in land use plan) shall be 100 year.
- Return period of minor drainage shall be
  1. Pipes - 25 year;
  2. Culverts - 50 year; and
  3. Open channel - 25 year

Table 12.1 Drainage Design Criteria

Land Use (Note 1)	Minor System		Major Drainage System Drainage Capacity (Note 2)
	Design Capacity	Check Capacity	
Drainage Pipes	15 year flood	25 year flood	100 year flood
Culverts (Note 1)	25 year flood	50 year flood	
Esteros/ Creeks/ Drainage Channels	15 year flood	25 year flood	

Note 1: Refer to Volume 4 for highway cross drainage capacities
Note 2: Freeboards for buildings are detailed in Volume 6: Public Buildings and Other Related Structures

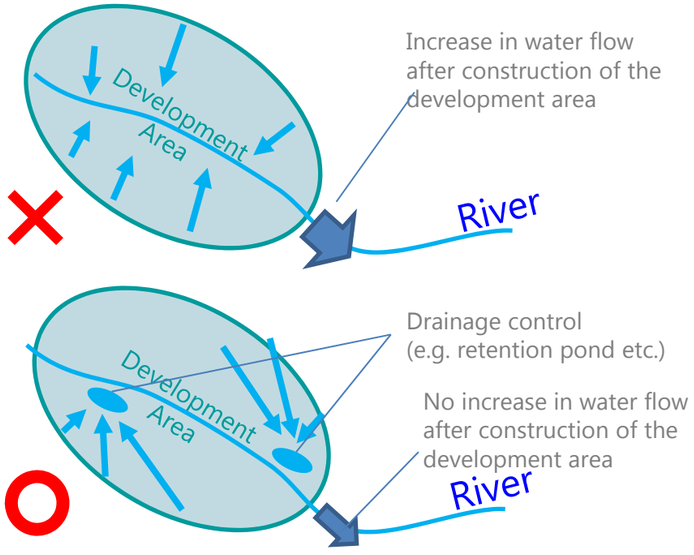
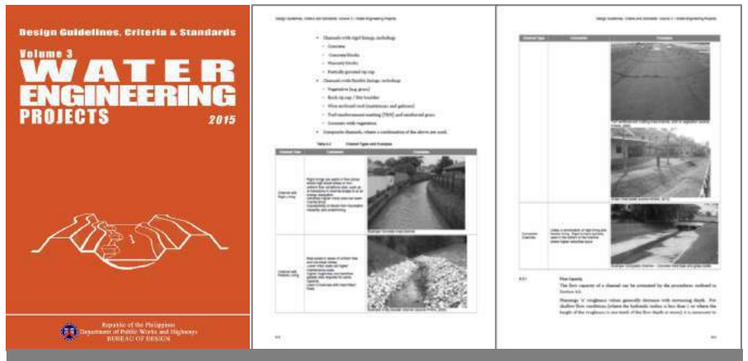


Fig. 12.2 Regulation on development

Drainage facility which reduces each development area's runoff

Fig. 12.3 Drainage Facility

Source: Abertay University



DPWH 2015 Volume 3

Fig. 12.4 DPWH 2015, Design Guidelines, Criteria & Standards

12.5 Solid Waste

12.5.1 General

The strategy for solid waste collection and disposal shall be compatible with the management plan of the Declarant.

12.5.2 Recycling

The Locator is required to comply with the recycling requirement and other requirements and guidelines of the Declarant regarding solid waste.

12.5.3 Garbage Collection Station

The Locator shall provide adequate areas within its land for garbage collection stations which have enough capacity for its residents. The following design criteria shall be considered:

- The size of a station shall be determined based on number of households and building types (i.e. single-family house or apartment)
- A station shall be located at the area which is easily accessible by a garbage truck.
- A station shall not be located at an area with traffic obstacles
- A station shall be kept sanitary

Garbage Collection Station

Fig. 12.5 Garbage Collection Station

Source: Girlschannel.net

12.6 Telecommunication

12.6.1 Design Criteria

It shall be the responsibility of the Locator to obtain design and construction criteria and building code's requirements from the appropriate government agency and service providers.

12.6.2 Telecommunication Component Space

The Locator shall provide a space to accommodate the telecommunications requirements of the service providers. The Locator shall provide reasonable access to this space.

12.6.3 Television Antenna

The Locator shall construct as an integrated component of the building, install, provide and maintain a communal television antenna on the roof of building constructed or to be constructed on the lot. No other individual television antennas shall be permitted to protrude from any part of any building constructed or to be constructed on the lot.

12.6.4 Cellular Phone Site

Any cellular phone sites constructed, installed or provided within a building to be constructed on the lot must secure the prior written endorsement of the Declarant.

12.7 Fuel Restriction

12.7.1 The Locator shall not use any fuel or store any fire hazardous materials on the lot or any part thereof or in any building or any part of any building constructed or to be constructed therein other than gas, liquefied petroleum gas, natural gas, kerosene or other conventional liquid fuel. Use of any other fuel or storage of fire hazardous materials shall require the prior written consent of Declarant.

12.8 Temporary Utilities

12.8.1 Responsibility

The supply and maintenance of temporary utilities within the lot required for the works shall be the responsibility of the Locator. The Locator shall remove all temporary utilities and services on completion of the works or when directed by the Declarant.

12.8.2 Arrangement by the Declarant

The Declarant may arrange for the utility supplies to be made available on site prior to the commencement of construction. In such instances, the Declarant shall provide a point of connection on or adjacent to the site. Subject to the approval of the Declarant, the Locator shall be responsible for connecting into this point of supply at his own cost. The cost of all the utility consumed shall also be for the account of the Locators.

12.8.3 Legal Issue on Water Use

The Locator will be allowed to use existing ground water well only when the Locator is likely to finish its development before whole NCC's water supply system is completed. However, the locator must use water supplied by the Declarant by paying designated fee after NCC's water supply system is completed.

12.8.4 Electricity

- Temporary electrical supply and distribution system including design, statutory approvals, connections and consents, fees, equipment, utility charges, cabling, and the like as required to complete the works.

- Temporary lighting supply and distribution system will be installed by the service provider as required to maintain a well-lit site during all hours of operation. The minimum levels of safety lighting as per the Philippine Code and guidelines must be provided at all times.

- Before finalizing arrangement for supply of temporary electricity, the Locator must submit, for the approval of the Declarant, any temporary overhead or underground routing of electricity cables which traverse NCC.

12.8.5 Sewage/ Drainage

Temporary sewage and surface water drainage to temporary accommodation and facilities will be installed in accordance with statutory approvals and consents. Any fees, utility charges will be to the account of the Locator. Pumps and devices to efficiently maintain the installation will be provided by the Locator.

12.9 District Cooling

12.9.1 The Declarant shall advocate a district cooling system, where applicable, especially in high density areas. This is recommended in view of the high energy conservation aspect of this technology.

SEA Games 2019 Facilities

Fig. 12.6 Temporary Utilities

Source: MTD

12.10 Liquefied Petroleum Gas

12.10.1 All plumbing and pipeworks of any building or buildings constructed or to be constructed on the plot shall be concealed accordingly. For gas pipe, concealment shall provide for free vent.

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Chapter 13

Transit Route Protection

13.2 Integrated Transit Development

13.2.1 All proposed developments adjacent to transit stations are subject to the guidelines on Transit Oriented Developments in Chapter 3.2.

13.2.2 Plots adjacent to transit stations are encouraged to be developed in integration with transit stations through maintaining a direct at grade, above grade or below grade connection between transit stations and buildings adjacent to it.

13.2.3 Integrated developments shall support intermodal connections, by facilitating transfers between multiple transport modes, such as rail, LRT/ BRT, bicycles, cars and/ or pedestrians, while prioritizing high levels of pedestrian and NMT access to the station.

13.2.4 A high intensity of mixed uses are encouraged within integrated developments to encourage high levels of transit use and provide a vibrant activity node for the community. Uses that generate high levels of pedestrian traffic are recommended along major pedestrian routes connecting to transit stations.

13.2.5 Amenities for transit users, such as pedestrian pathways, car parks, bicycle parking, wayfinding signages and other public furniture shall be provided within integrated developments.

13.2.6 Developments with the Central Business Zone (C3) and City Level Commercial Zone (C2) adjacent to transit stations are encouraged to provide a transit plaza connecting to the station to serve as a node for transit users and pedestrians, and to provide direct access to the ground level. This transit plaza shall be lined with ground level AGUs to ensure a high-quality environment. The provision of canopies over the transit plaza is encouraged to ensure pedestrians protection from the weather.

13.2.7 Buildings shall be developed as a podium-tower typology to achieve an appropriate street wall height that will help maintain a human scale for streets adjacent to transit stations while maximizing development density.

13.2.8 An example of how plots adjacent to transit stations may be developed is illustrated in the Section of Integrated Transit Development in Figure 13.2.

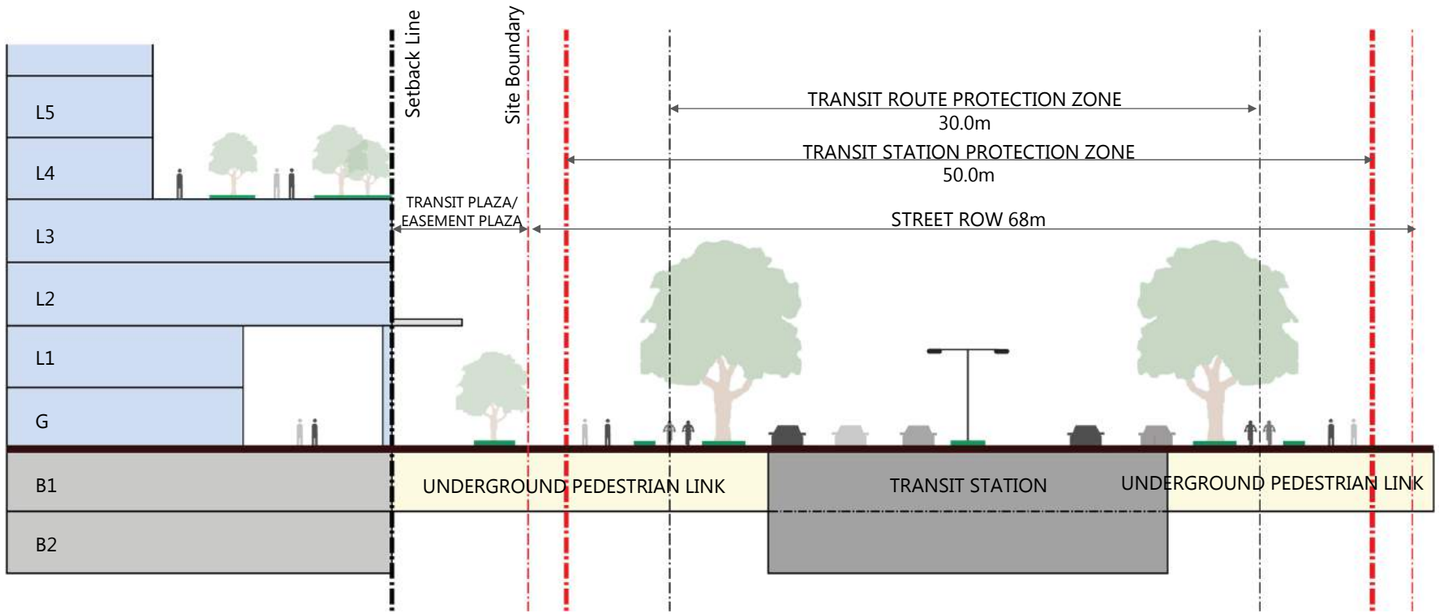

Fig. 13.2 Section of Integrated Transit Development

Transit Plazas with direct connection to underground transit station

Fig. 13.3 Section of Integrated Transit Development

Source: (1) Terri Meyer Boake (CTBUH); (2) Ion Orchard

13.3 Building Works

13.3.1 Prior to the commencement of any building works, details of the proposed works shall be submitted to the Declarant for written approval. Details submitted shall include, but not limited to, plans and sections detailing the works and showing their relative relationship to the transit route protection zone; specifications for the works; calculations detailing the stresses, ground deformations, ground water movements and vibration (both during execution and long term) that the proposed works shall impose within the reserve; proposed methods of execution; and all other details necessary for the determination of any possible impact that the proposed works may have upon existing or planned transit facilities.

13.3.2 Plans for proposed building works within the Transit Route Protection Zone shall be submitted to the Declarant. At the request of the Declarant and in order to protect the proposed transit system, any necessary protective measures shall be enforced by additional Design Standards and Guidelines.

13.3.3 The Declarant shall be entitled to reject proposal(s), which may be inconsistent with the existing or planned transit facilities, and require the Locator to modify and re-submit for approval any such plans.

13.3.4 No ground investigation, underground drainage and building works for any existing or planned building which are to be carried out in the Transit Route Protection Zone shall commence without the prior written approval by the Declarant.

13.3.5 The Declarant shall monitor settlement and vibration on transit structures where necessary. The Locator is required to inform the Declarant directly, prior to the commencement of any building works by his Contractor within the protection boundary, to enable them to plan a convenient monitoring program. In the event that any adverse situation becomes apparent the Declarant will alert interested parties, and a copy of such monitoring information prepared by the Declarant may be made available to the Locator and/ or his Contractor.

13.3.6 Any other necessary monitoring within the building site (e.g. monitoring of piezometric change) will be carried out by the Locator at his own cost. The Locator shall keep the Declarant informed of the monitoring records as necessary. The Declarant, through its authorized representative, may enter any building within the Transit Route Protection Zone for the purpose of monitoring construction.

13.3.7 There shall be no building openings such as windows, doorways, building ventilation system intake or exhaust and the like, within 5 meters from the opening of any transit vent shaft, irrespective of whether such a vent shaft is free-standing or is accommodated in a building. This distance may be reduced to 2.5 meters, provided that the exhaust air from the transit vent shaft is directed away from and is not likely to affect the opening by natural convection.

Chapter 14

Construction

14.1 Introduction

14.1.1 These construction guidelines are a supplement to the existing National Building Code which must be fully complied with in addition to the guidelines stated within this document.

14.1.2 All construction within NCC shall likewise be guided by rules and regulations as may be promulgated from time to time.

14.1.3 The site management responsibilities of the Locators for purposes of these guidelines are broken into three (3) general areas concerning Site Logistics, Site Services, Site Security and Safety.

14.1.4 Any survey works shall be in accordance with the guidelines set by the declarant.

14.2 Site Logistics

14.2.1 Within each contract work area the Locator is responsible for all operations and logistics activities. Each Locator shall provide a logistics plan describing the overall site facilities and services that he will be establishing and the operational strategy that will be followed to ensure that the construction works proceed smoothly and safely, with minimum impact on the surrounding areas. The Locator's logistics plan shall be submitted to the Declarant at least thirty (30) days prior to commencement of work and will require the Declarant's written permission before commencement of the works.

14.2.2 Each Locator shall take into account adjacent concurrent works to coordinate his activities with that being undertaken by the other Locator and allow reasonable access for the other Locator.

14.2.3 Each Locator shall designate a logistics manager who will coordinate with the Declarant and others. The logistics manager may be required to attend regular logistics coordination meetings as may be determined by the Declarant.

14.2.4 To avoid site congestion there will be a need to avoid certain access routes to NCC. Access for contractors' deliveries will be determined by the Declarant.

14.2.5 The Locator shall make provisions for all necessary control and guidance to visitors to the work site to ensure their protection and, where necessary, provide safety equipment for their use.

14.2.6 The Locator shall submit weekly schedules in advance of anticipated deliveries of materials and equipment to the Declarant. The Declarant will provide the Locator with a schedule of authorized access routes which must be strictly adhered to.

14.2.7 Deliveries not booked in may be denied access to the site.

14.2.8 In addition to Chapters 14.2.6, all deliveries of abnormal loads, such as cranes, must be included and highlighted in the booking system, at a minimum of 48 hours in advance of delivery. The Locator must consult the Declarant to check that access routes to the required site location will be available and that the proposed unloading location and possible crane positioning does not interfere with another Locator's work.

14.2.9 The Locator shall submit a crane layout plan to the Declarant for approval prior to erecting any crane on site. Any 'over sailing' of cranes over adjacent sites must be agreed with the adjacent Locator before erection. The 'over sailing' by cranes over roads will be controlled and approved by the Declarant. The Declarant will consider each circumstance on its merit, taking into account the degree of 'over sailing' proposed, the state of development of adjacent properties and visual intrusion.

14.2.10 All vehicles leaving the site shall ensure that their vehicles, especially wheels, are clean before proceeding onto the public roads. Wash bays are to be provided and situated within the Locator's lot. Locator shall be responsible for the clearance of all debris caused by his failure to adhere to this Chapter.

14.2.11 If judged necessary as a result of forecast or actual density of deliveries, the Declarant may provide a Truck Holding Area where vehicles delivering to the site will proceed and from where they will be called forward to site.

14.2.12 All vehicles must be parked in the designated parking areas. Illegally parked vehicles will be towed away and will be liable for a recovery charge.

14.2.13 Locator will not be permitted to establish ready-mix plants on their site unless approved by the Declarant.

14.2.14 The locator shall submit plans of temporary batching plants and worker's dormitories to the Declarant for approval.

14.2.15 The Locator shall provide temporary protection for all installations or construction, whether or not completed outside his property or protected easements as required to maintain existing works, existing services and service connection and finished works in an undamaged condition.

14.3 Services

14.3.1 Each Locator shall be responsible for the provision of his own site services.

14.3.2 No site accommodation will be permitted on the site unless approved in writing by the Declarant.

14.3.3 The supply and maintenance of respective office and welfare facilities will be the responsibility of the Locator. These shall include, but are not limited to, the following:

a. Canteen/ food facilities suitable to handle staff and worker population.

b. Toilet and welfare facilities suitable to handle staff and worker population.

c. Provision of sewage and waste disposal facilities from all toilets, canteens, offices, and any other welfare accommodation provided. It will not be possible to connect to the Declarant's sewage network until a later stage and until this connection is available, the Locator shall provide sewage holding tanks and arrange for these tanks to be pumped out to road tankers at regular and frequent intervals. The Locator is responsible for satisfying the Declarant and appropriate authorities that sewage disposal arrangements fully comply with current legal and environment requirements.

d. Provision and operation of a fully equipped first aid station with a qualified nurse in attendance during working hours.

14.3 Services

14.3.4 On completion of the works the Locator shall remove all temporary accommodations and facilities from his site within 14 calendar days of completion. Failure to do so entitles the Declarant to undertake the removal of the temporary facilities without prejudice to loss, penalty charges or legal suits.

14.3.5 The Locator shall maintain the site to a high standard of cleanliness at all times.

14.3.6 In the event that a Locator delays construction of his site, the site shall be maintained in a tidy condition, grass trimmed and excessive vegetation growth cut back. Failure of a Locator to comply with this requirement will result in the Declarant executing this work at the expense of the Locator.

14.3.7 The Locator shall at all times comply with current statutory and municipal regulations and requirements for the disposal of rubbish and waste.

14.3.8 The Locator shall provide rodent and pest control services including spraying/ fogging for insect control to all areas of the their site and adjacent boundaries as may be deemed necessary.

14.4 Site Security and Safety

14.4.1 The Locator shall be responsible for making his own security arrangements. The Declarant has no responsibility for any loss of property from any private lot.

14.4.2 The Locator, his contractors and sub-contractors must follow the Design Standards and Guidelines and guidelines of the Safety Organization of the Philippines (SOPI) and the National Building Code. The Locator must provide the Declarant with a copy of their safety policy, the organization, and the arrangements for implementing the policy prior to the commencement of works on site.

14.4.3 The Locator must conform to the Philippine Government regulations and the Declarant's environmental policy and comply with the requirements of its aims regarding good neighbor policy and environmental degradation control. Any environmental incidents are to be reported to the Declarant.

14.4.4 Prior to the commencement of any work on site, the Locator must submit to the Declarant a written plan to handle emergencies. This plan must be posted in the work place and must address the following areas:

a. Safe shutdown of all work activities.

b. Detailed instructions for the notification of the proper representatives and authorities (including phone numbers, etc.).

c. Listing of individuals responsible for the organization and control of emergency conditions.

d. Communication plan to ensure all the site personnel are aware of the correct response in an emergency.

e. Typhoon precautions and procedures.

f. Contractors and sub-contractors must provide their employees ID tags that must be displayed at all times.

14.4.5 All accidents occurring on site must be reported by the Locator to the Declarant and appropriate government authorities immediately. The Locator shall complete an interim Incident Report Form for each accident/ incident. A copy of the full report must be given to the Declarant within 24 hours.

14.4.6 All accidents/ incidents which occur on site are to be investigated by the Locator concerned. The investigation shall cover what went wrong and ways in which work practices can be improved to avoid such an accident/ incident in the future. In all major investigations, a representative of the Declarant and appropriate government authorities are to be present.

14.4.7 Major incidents or fatalities may result in the Declarant requiring the Locator to close the site.

Chapter 15

Fire Protection

15.1 Fire Protection

15.1.1 The Locator shall comply with the rules and regulations of the National Building and Fire Codes, the Declaration of Covenants, Conditions and Restrictions, these Design Standards and Guidelines relative to fire protection systems within the building, exterior connection for fire department equipment and required water storage for fire fighting.

15.1.2 The Locator shall provision for fire lanes within his property, as necessary, to provide access at all times to the fire department equipment. Locator shall make provision for telecommunication connection of the building's fire protection systems to the local municipality fire department communication center.

15.1.3 The Locator shall at all times permit the fire department of his representative to enter the building premises to conduct inspection and testing of the building's fire protection systems. In addition, the Declarant, shall as it deems necessary, conduct visual review of the building's fire protection systems and issue written notice to the Locator, copy furnish the fire department, of observed non-compliance to the National Fire Code.

15.1.4 Temporary fire detection and alarm system must be provided to temporary accommodation and facilities required to provide life safety warning as part of construction of buildings.

15.1.5 The safe and proper storage of flammable materials and liquids on site will be in accordance with the National Building Code and Fire Code.

15.1.6 The Locator shall maintain adequate insurance to indemnify the Declarant against claims for fire damage how so ever caused to third parties.

15.2 Emergency Access

15.2.1 Emergency exit doors when open must not project beyond the property line. The design of the exit is subject to building, fire and other relevant codes and guidelines.

15.2.2 Exist areas shall be designed with flared or bevelled corners, angle inset or with similar details in order to avoid an enclosed and box-like appearance. The doors shall be designed and decorated so as to blend with the overall design and character of the building.

15.2.3 Service access points for garbage trucks, etc., must be located away from the emergency exit areas.

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Section VI.

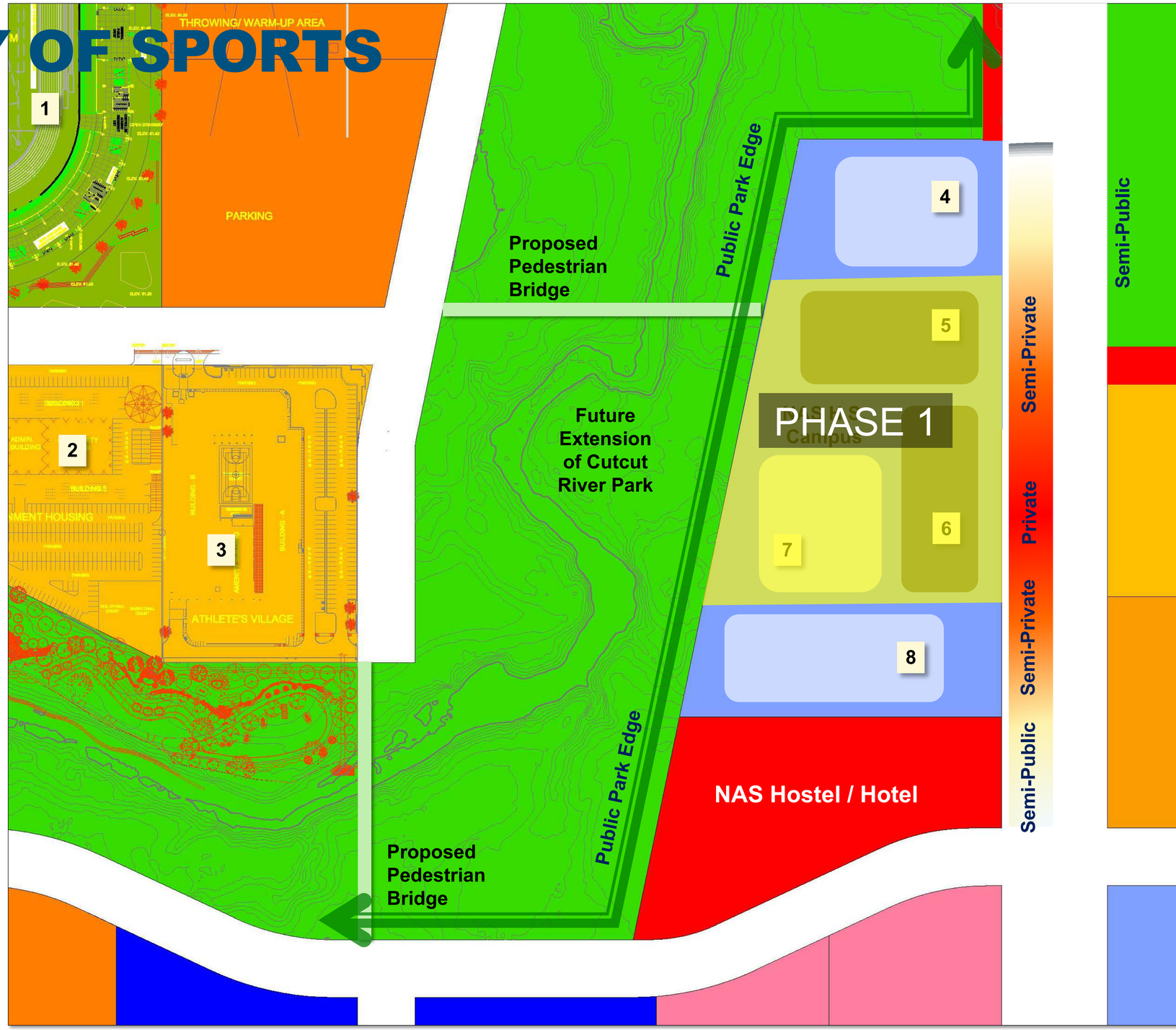
National Academy of Sports Site Development Plan

NATIONAL ACADEMY OF SPORTS

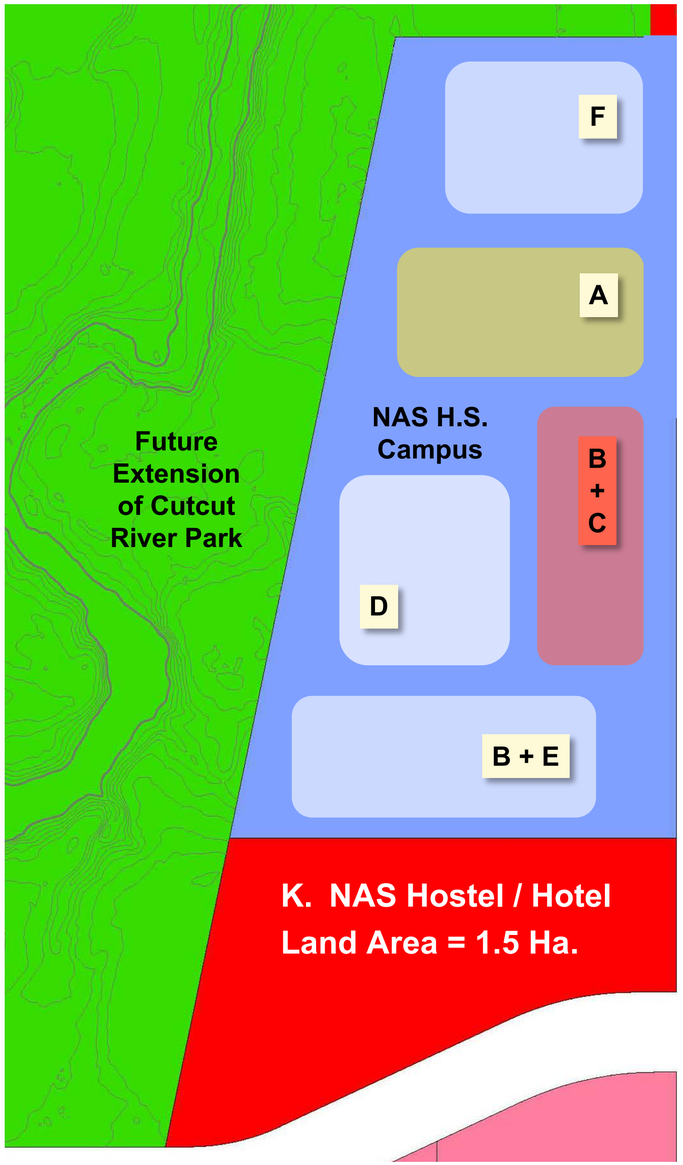
CONCEPTUAL PLAN

LOCATORS + NAS PROGRAMS

1. Stadium (built)
2. Government Dormitory (built)
3. Athletes Village (built)
4. (P) Multi-Sports Facilities
5. (P) Multi-purpose Gym
6. (P) Admin Building + Classrooms
7. (P) Dormitory
8. (P) Administration, Sports Science + Sports Medicine



NATIONAL ACADEMY OF SPORTS
CONCEPTUAL PLAN



PHYSICAL STRUCTURES

Programs		Levels	Flr to Flr height (m)	Functions	Use - Time of day/ week/ season
PHASE 1					
A	**Multi-purpose Gym**	1	15	Maple flooring, 2 basketball goals, score board, shot clock	Practice - throughout the day Competitions - evening or seasonal
B	**Administration Building**	2	4	Offices, roof deck, with landscape and pathways	Work day - daytime (M-F)
C	**Classroom Building**	3	4	20 classrooms @ 30 students per room, with roof deck	Class days - daytime and potentially night
PHASE 2					
D	**Dormitory**	6 – 8	3.5	Dining, Kitchen hall, and Living Quarters	day and night
E	**Sports Science and Sports Medicine Building**		4	Combined with Administration Building (B)	day and night
PHASE 3					
F	**Multi-Sports Facilities**	4	5	Taekwondo, Karatedo, Pencak Silat, Arnis, Boxing, Wushu, Judo, Wrestling, Table Tennis, Billiards, Chess, and lecture rooms	Practice - throughout the day Competitions - evening or seasonal
UTILITIES					
G	Powerhouse Station	1	-	Utility	
H	Water Pump Station	1	-	Utility	
J	Dining, Kitchen hall, Living Quarters, and Offices	-	-	part of B and D above	day and night
COMMERCIAL AREA					
K	**Hostel for Guests & Officials**	6 – 8	3.5	200 rooms + F&B	Seasonal day and night

NATIONAL ACADEMY OF SPORTS (NAS) HIGH SCHOOL within NGAC

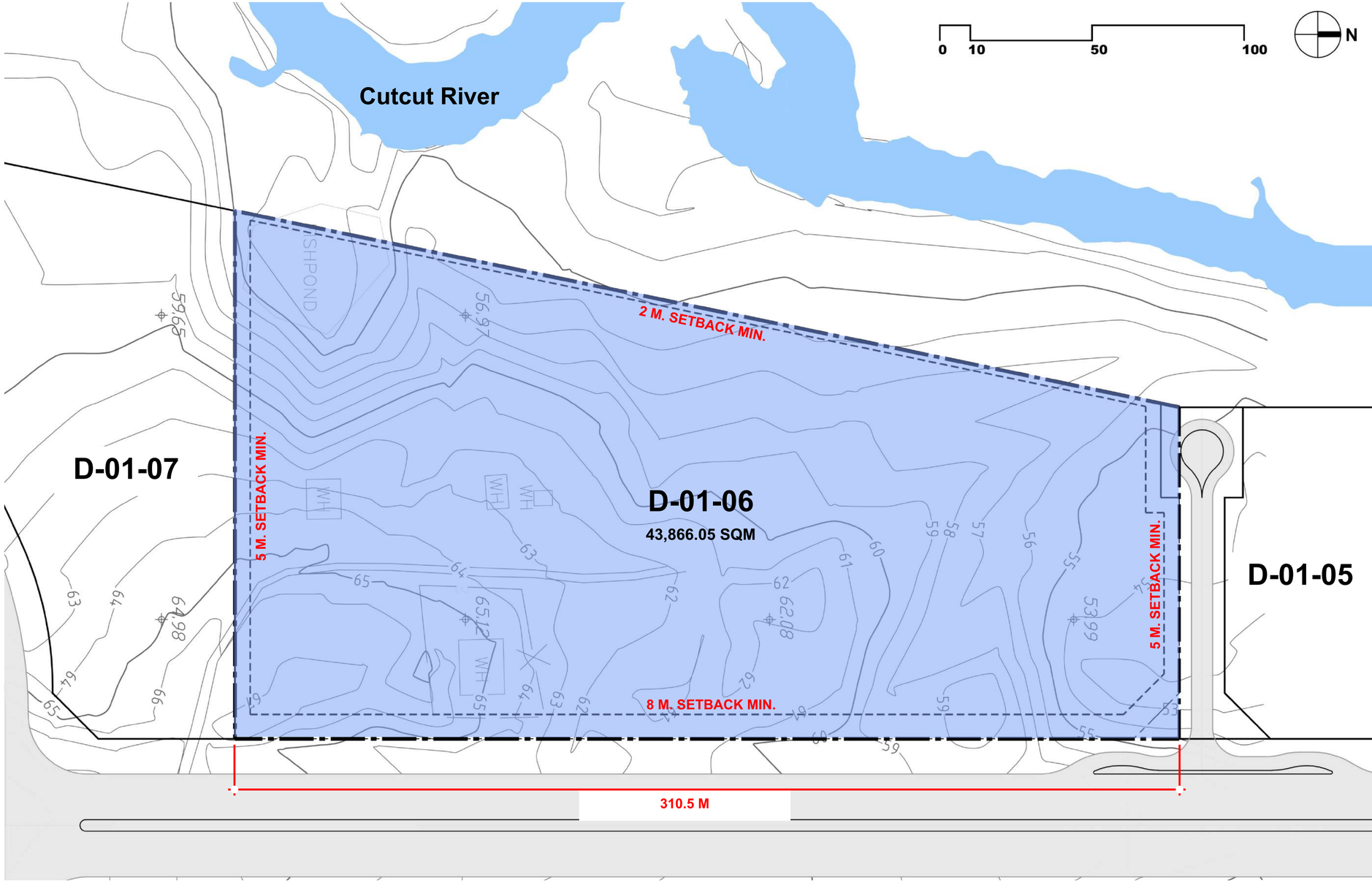
NAS Overall Site

Area = 43,866 sq.m. /
4.3 Hectares

Adjacent to commercial and recreation land-uses to complement the education function, namely:

D-01-05: Active Recreational Zone (Pre/Cul) for sports field

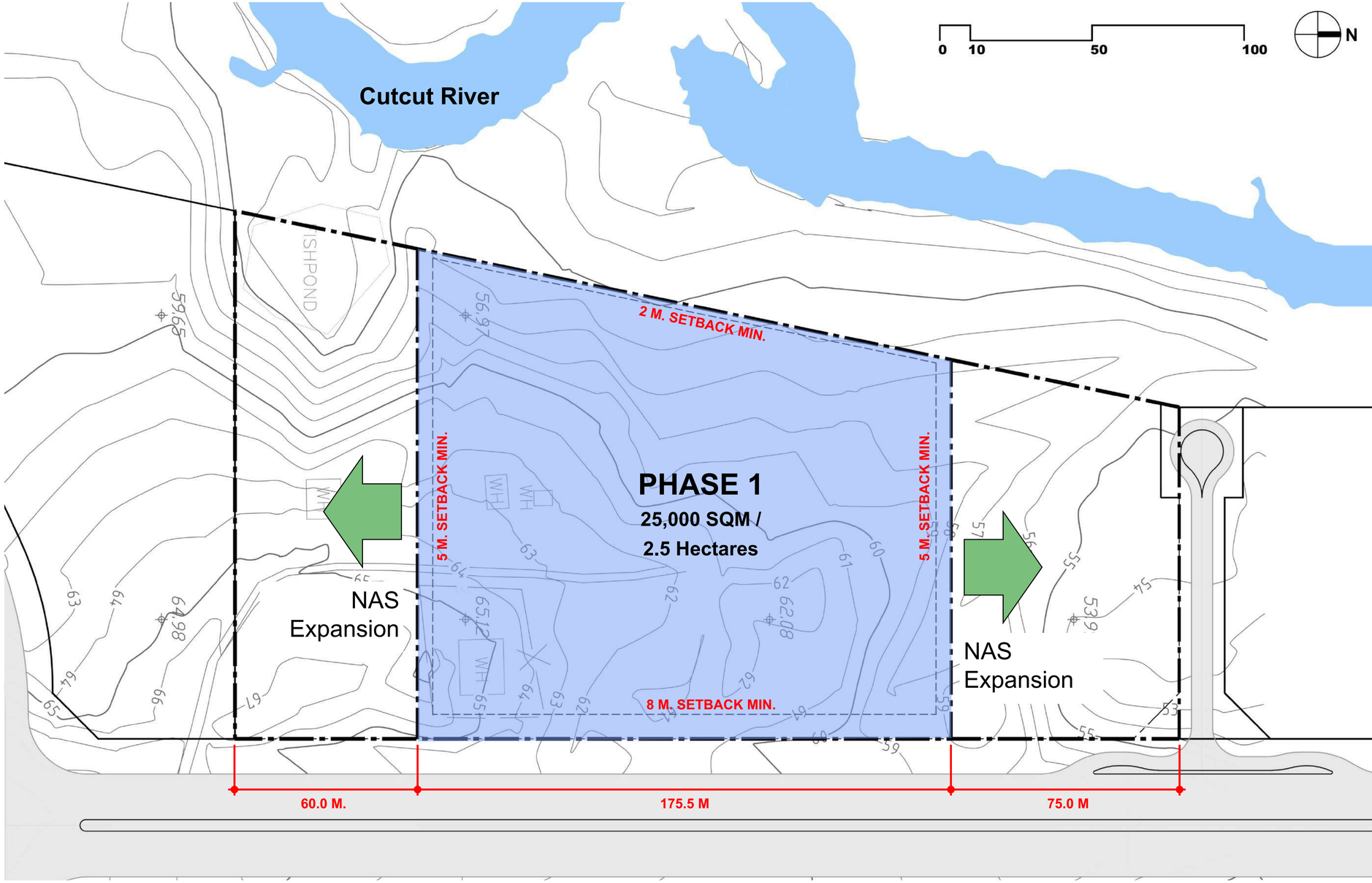
D-01-07: City Level Commercial Zone (C2) for hotel, retail, and F&B use



NATIONAL ACADEMY OF SPORTS (NAS) HIGH SCHOOL within NGAC

NAS Phase 1 Site

Approximately 2.5 hectares shall be located at the center of the NAS block to allow for future expansion of the campus facilities.

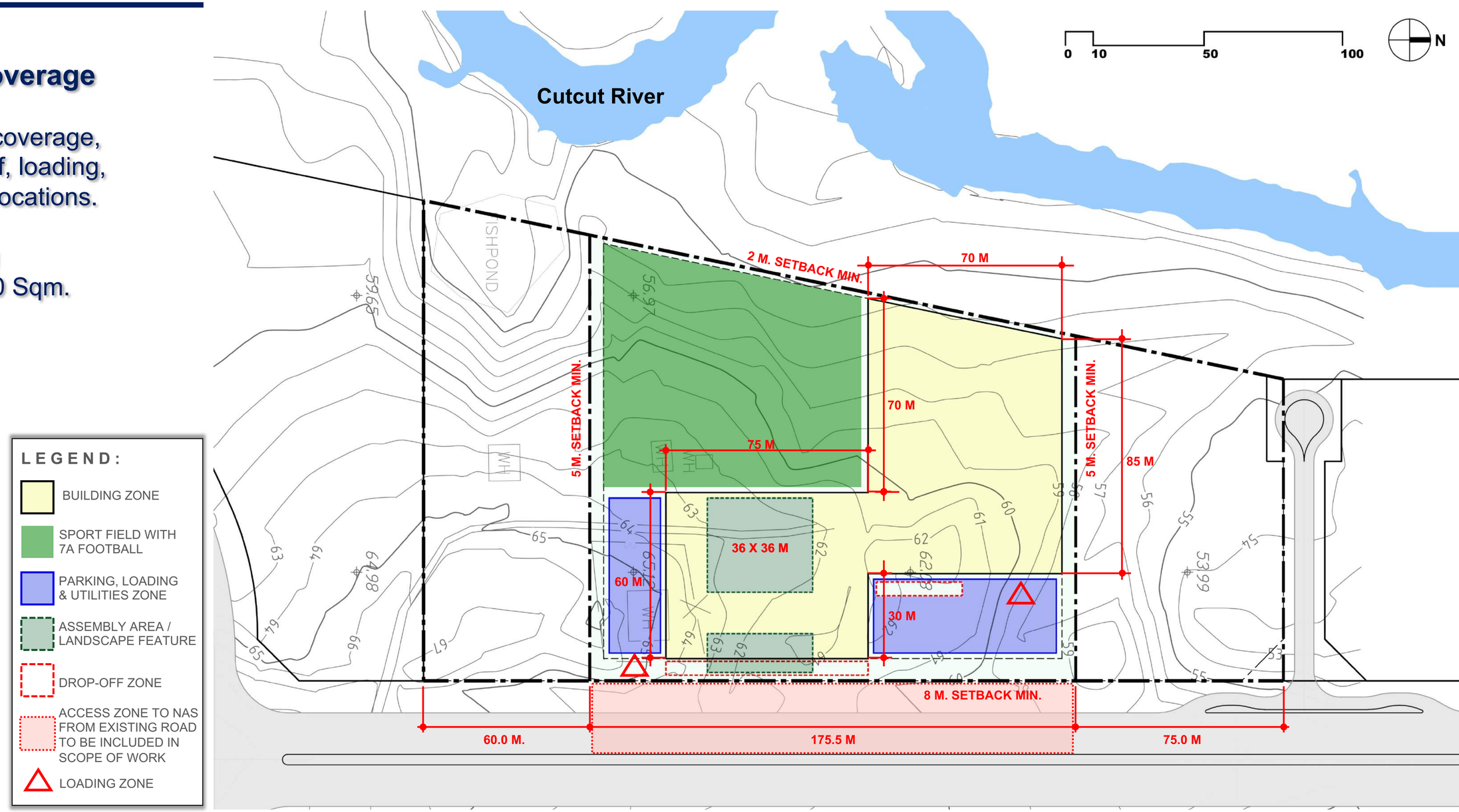


NATIONAL ACADEMY OF SPORTS (NAS) HIGH SCHOOL within NGAC

NAS Phase 1
Building Site Coverage

Proposed building coverage, sports field, drop-off, loading, parking, and utility locations.

Suggested Building
Zone Area = 10,830 Sqm.



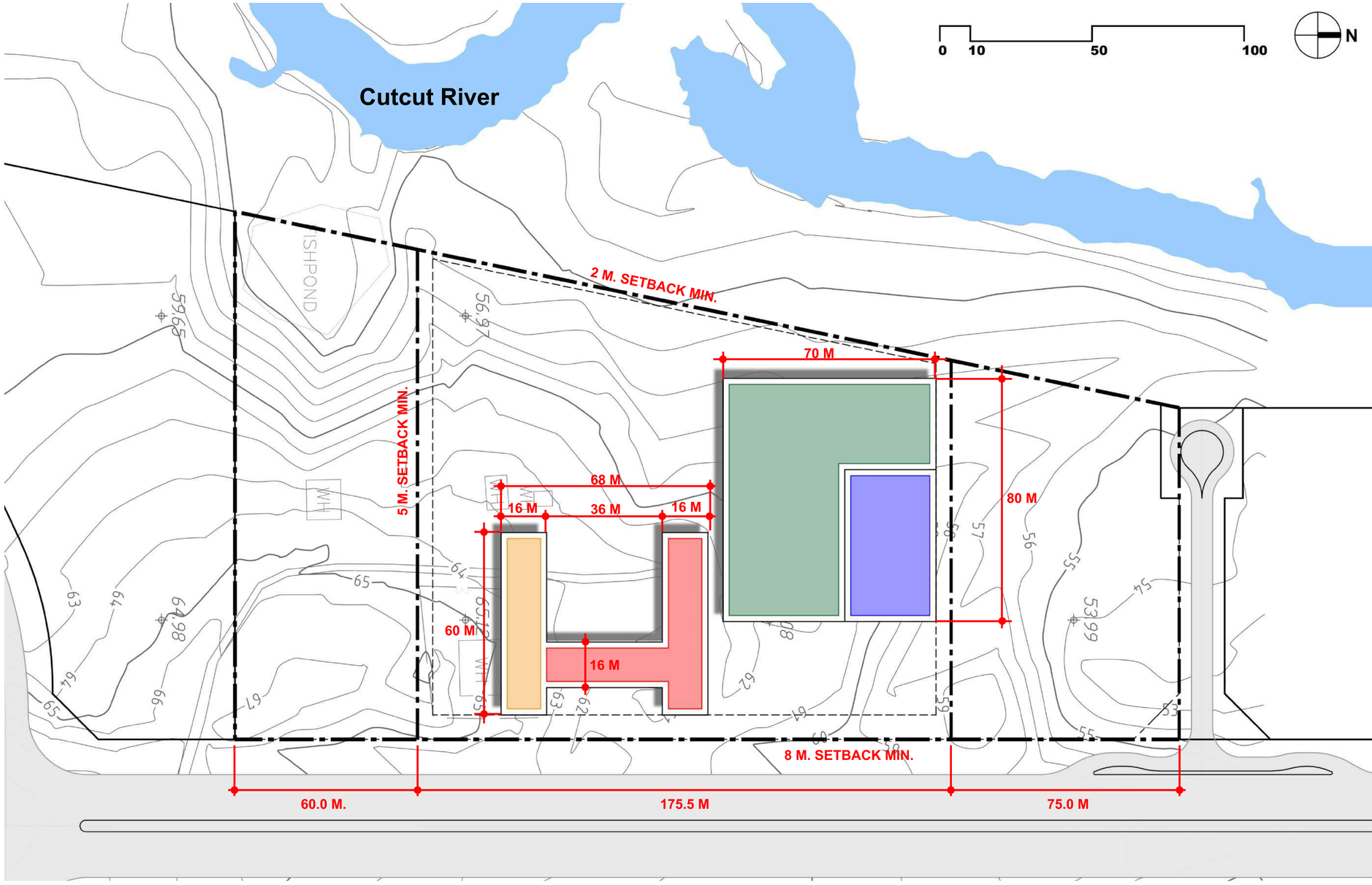
NATIONAL ACADEMY OF SPORTS (NAS) HIGH SCHOOL within NGAC

NAS Phase 1
Indicative Building Program Location

Building 1:
Multi-Sport Building
(One (1) floor, 5,620 sq.m.)

Building 2:
Administrative Building
(2 floors + roof deck, 1,327 sq.m.)
and
Academic Building
(Three (3) floors, 4,165 sq.m.)

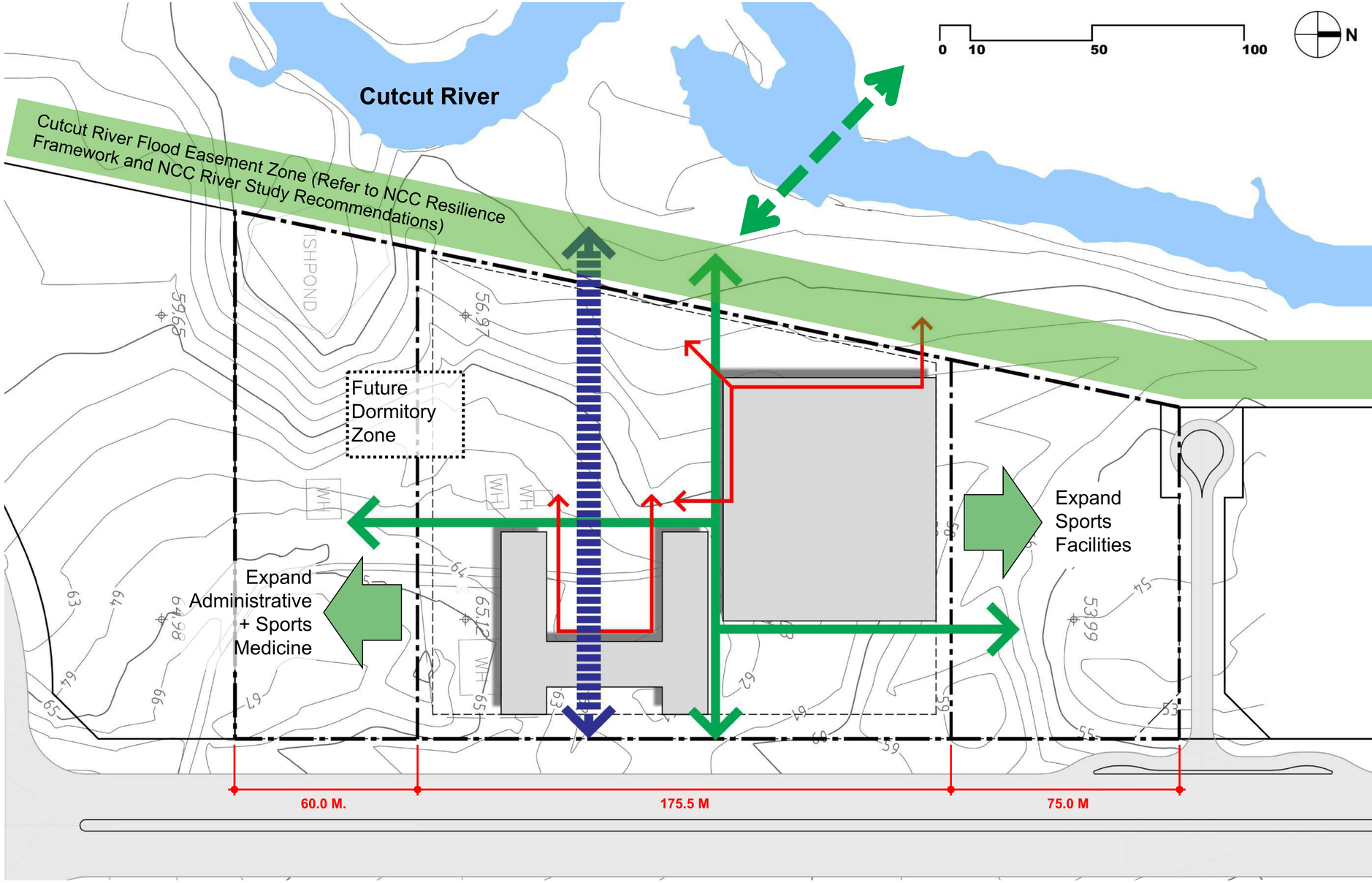
Building 1 + 2 Floor Area = 11,112 sq.m.



NATIONAL ACADEMY OF SPORTS (NAS) HIGH SCHOOL within NGAC

NAS Phase 1 – Indicative Site Plan Concepts + Strategies

- Optimize views and access to the River park
- Place sports facilities and fields closer to the river to activate the future River Park
- Restrict building footprint to allow for expansion within the Phase 1 area
- Organize drop-off, loading, parking, and utilities along the main road
- Zone building functions to be adjacent to similar future use on the final NAS campus plan
- Adhere to Climate Resilience and River Study recommendations



NATIONAL ACADEMY OF SPORTS- SPORTS FACILITIES +CLASSROOMS +ADMIN


ARWIN SANTOS
VISUALS
NATIONAL ACADEMY OF SPORTS- SPORTS FACILITIES +CLASSROOMS +ADMIN


ARWIN SANTOS
VISUALS
NATIONAL ACADEMY OF SPORTS- PUBLIC GYM