

宿舍加固及宿舍周边水电改造施工技术规范书

Technical Specification of Old Dormitory Structural

Reinforcement and Water & Electrical Redeployment

1. 总则

1. General

1.1 适用范围

1.1 Scope of Application

本方案（建议书）适用于巴厘通用能源公司（以下简称“甲方”）位于印度尼西亚巴厘岛布莱伦县（Buleleng）Celukan Bawang 厂区现有宿舍楼周边钢筋混凝土三角型加固立柱新建工程，以及配套 2 英寸 PVC 管道敷设和 MCB 电源箱迁移工程。本方案旨在说明工程背景、工作范围、实施方法、图纸与施工区域、实施进度、安全环保要求及项目效益，供甲方评审与决策；工程预算另行单独成册。

This Proposal applies to the construction of new reinforced-Triangular reinforced columns around the existing dormitories at the Celukan Bawang plant of PT. General Energy Bali (hereinafter referred to as “Party A”) in Buleleng Regency, Bali, Indonesia, together with the associated installation of 2-inch PVC piping and the relocation of one MCB power-supply box. The Proposal sets out the project background, scope of work, implementation method, drawings and work area, implementation schedule, safety and environmental requirements, and project benefits for Party A’s review and decision. The project budget is presented in a separate document.

1.2 编制依据

1.2 Compilation Basis

- 甲方提供的现场踏勘资料、宿舍区总平面布置及现场实测数据。
- Site survey data, the dormitory-area general layout and field measurements provided by Party A.

— 本方案附图：供水管道走向图、三角型加固立柱分布示意图、三角型加固立柱典型断面及立柱详图。

— The drawings attached to this Proposal: the water pipeline route, the retaining-wall distribution plan, and the typical wall section with column detail.

— 印度尼西亚共和国现行建筑结构、混凝土施工及职业健康安全（K3/OHS）法律法规与适用的国家标准（SNI）。

— Current laws, regulations and applicable Indonesian National Standards (SNI) of the Republic of Indonesia governing building structures, concrete works and occupational health and safety (K3/OHS).

— 河北省建筑工程质量检测中心有限公司出具的各栋宿舍安全性鉴定报告（冀中心检(JG)2026-2093/2108/2112/2116/2114/2113/2103/2109/2106/2115）。

— The safety appraisal reports on the dormitories issued by Hebei Construction Engineering Quality Inspection Center Co., Ltd. (Reports No. JG 2026-2093/2108/2112/2116/2114/2113/2103/2109/2106/2115).

本方案所列尺寸、标高如与现场实际不符，以现场实测结果及经甲方批准的施工图为准；混凝土强度等级、钢筋牌号及配合比均以经甲方批准的施工图为准。

Should the dimensions or elevations stated herein differ from actual site conditions, the field measurements and the construction drawings approved by Party A shall govern; the concrete strength grade, rebar grades and concrete mix design shall be as specified in the approved construction drawings.

1.3 工程概况

1.3 Project Overview

因新建宿舍楼及体育中心，需在 B 号宿舍楼附近 20m 范围内采用液压锤或柴油锤进行沉桩作业，可能对现有宿舍楼结构产生振动、土体位移及开裂等不利影响。为保护现有宿舍楼及住户安全，拟沿#1～#7 宿舍楼周边新建钢筋混凝土三角型加固立柱共 34 个单元（每单元长 1.5m、墙高 2.5m），并敷设 2 英寸 PVC 管道 300m（地面上铺设）、迁移 MCB 电源箱 1 套（不另增加电缆线路）。工程总工期为 40 日历天。主要技术参数见表 1-1。

Considering the reconstruction activities of GEB new dormitory and sport center, piling work will be done with hydraulic or diesel hammer near the area about 20m away from Dormitory rooms Row B, which may adversely affect the existing dormitory structure's safety due to shaking, soil displacement and break. To protect the existing dormitories and to ensure residence safety, the company plans to deploy a total of 34 units of new reinforced-Triangular reinforced column (each unit 1.5 m long and 2.5 m high) along Dormitories #1-#7, together with laying 300 m of 2-inch PVC pipes (Laying on the ground) and moving a set of MCB power-supply box (no extra cable laying). The total construction period is 40 calendar days. main technical descriptions are given in Table 1-1.

表 1-1 工程主要技术参数

Table 1-1 Main Technical Parameters of the Project

项目 Item	参数 Parameter	项目 Item	参数 Parameter
工程名称 Project name	宿舍楼周边三角型加固立柱新建工程 New retaining walls around the dormitories	工程地点 Location	Celukan Bawang 厂 区，巴厘岛，印度尼 西亚 Celukan Bawang plant, Bali, Indonesia
三角型加固立柱型式 Wall type	钢筋混凝土三角型加固立柱 Reinforced-Triangular reinforced column	三角型加固立柱单元 数量 Number of wall units	34 个单元 (#1~#7) 34 units (Dormitories #1-#7)
墙高 Wall height	2.5 m	单元长度/底宽 Unit length / base width	1.5 m
基础型式 Foundation type	钢筋混凝土垫块（独立）基础 RC pad (isolated) foundation	基础尺寸 Foundation size	40×40×40 cm
开挖深度 Excavation depth	±0.4 m	立柱配筋 Column reinforcement	截面 20×20cm; 4D10 主筋，箍筋 D8-200 20×20 cm; 4D10 bars, D8-200 ties
PVC 管道 PVC pipe	2 英寸，长 300m，地 面上铺设 2-inch, 300 m long, Laying on the ground	电源箱迁移 MCB box relocation	1 套（不另敷电缆） 1 set (no additional cable)
总工期 Total duration	40 日历天 40 calendar days	开工日期 Commencement	以甲方开工令为准 Subject to Party A's notice to proceed

1.4 鉴定结论与工程现状

1.4 Appraisal Conclusion and Current Condition

根据河北省建筑工程质量检测中心有限公司出具的各栋宿舍安全性鉴定报告，本项目宿舍房屋结构安全性等级为 Dsu 级，地基基础变形等级为 Bu 级。本次鉴定按中国现行国家标准进行评估，鉴定报告仅用于中方内部风险评估与加固设计依据，不作为印度尼西亚 SNI 规范及当地政府备案、验收的依据；加固改造设计除满足中国现行规范外，尚应复核并适配印度尼西亚 SNI 建筑结构相关标准。本项目加固改造目标为：改造后同时满足结构安全使用与抗震性能提升要求，改造后设计使用年限按 2 年控制，具体以经甲方批准的施工图为准。

According to the safety appraisal reports issued by Hebei Construction Engineering Quality Inspection Center Co., Ltd., the structural safety grade of the dormitory buildings is Dsu and the foundation deformation grade is Bu. The appraisal was carried out in accordance with current Chinese national standards; the reports are intended solely for internal risk assessment and strengthening design by the Chinese side, and shall not serve as the basis for Indonesian SNI compliance or local government filing/acceptance. In addition to current Chinese codes, the strengthening and reconstruction design shall be reviewed against, and adapted to, the relevant Indonesian SNI building-structure standards. The objectives of this project are to ensure structural safety and use, improve seismic performance after reconstruction, and achieve a post-reconstruction design working life of 2 years, as specified in the construction drawings approved by Party A.

1.4.1 现状主要病害

1.4.1 Main Defects of the Existing Buildings

结合鉴定报告及现场核查，本项目各栋宿舍主要存在以下共性病害（本次优先使用的 B 区房间经核查未见明显裂缝及位移，下列相关部位以现场实际核查结果为准）：

The following common defects have been identified across the dormitories based on the appraisal reports and site verification (the rooms in Zone B preferred for use have

been verified to show no obvious cracks or displacement; for the relevant items below, the actual on-site verification results shall govern):

- 墙体存在斜向裂缝；本次使用房间无裂纹。
- Walls with diagonal cracks; the rooms occupied for this project show no cracks.
- 建筑整体垂直度（侧向位移）存在超出规范限值的情况；本次使用房间无明显位移。
- Overall verticality (lateral displacement) of some buildings exceeds the code limit; the rooms used for this project show no obvious displacement.
- 砌筑砂浆强度推定值仅 0.5~0.6MPa，远低于 M2.5，为墙体加固的主要原因。
- The estimated masonry mortar strength is only 0.5–0.6 MPa, far below M2.5, which is the main reason for wall strengthening.
- 墙厚 100mm，不满足国内抗震设计对最小墙厚的要求，为墙体加固的主要原因。
- The wall thickness of 100 mm does not meet the minimum wall thickness required by domestic seismic design, which is the main reason for wall strengthening.
- 木屋架、檩条、椽子存在受潮、腐朽、风化及挠曲变形，屋面存在渗水隐患，施工前须逐件检查。
- The timber roof trusses, purlins and rafters suffer from moisture uptake, decay, weathering and deflection, and the roof has potential leakage risks; all members shall be inspected piece by piece before construction.
- 砌体高厚比不满足规范要求，为墙体加固的主要原因。
- The masonry slenderness ratio does not meet the code requirement, which is the main reason for wall strengthening.

2. 项目背景

2. Project Background

2.1 成因

2.1 Cause

新建宿舍楼及体育中心施工期间，将在距现有宿舍楼（B 号宿舍楼）不足 20m 处，使用液压锤或柴油锤进行沉桩作业。

During construction of the new dormitory and sport center, pile driving using a hydraulic or diesel hammer will be carried out at a distance of less than 20 m from the existing dormitory (Dormitory B).

2.2 潜在影响

2.2 Potential Impacts

- 振动过大，导致宿舍楼墙体及基础开裂。
- Excessive vibration causing cracks in the dormitory walls and foundations.
- 沿开挖工作面发生滑坡或土体位移。
- Landslides or soil movement along the excavation face.
- 降雨期间雨水及泥石碎屑涌入宿舍楼区域。
- Ingress of rainwater and debris into the dormitory area during rainfall.

2.3 解决方案

2.3 Solution

修建临时或永久性钢筋混凝土三角型加固立柱以稳定土体、衰减沉桩振动，并同步敷设 2 英寸 PVC 排水管道、迁移 MCB 电源箱，从而保护现有宿舍楼结构及住户安全。

Construct temporary or permanent reinforced-Triangular reinforced columns to stabilize the soil and dampen pile-driving vibration, and at the same time install the 2-inch PVC drainage pipe and relocate the MCB power-supply box, so as to protect the existing dormitory structures and the safety of their occupants.

3. 工作范围

3. Scope of Work

3.1 施工项目明细

3.1 Work Item Details

本工程工作内容包括但不限于表 3-1 所列项目。

The work includes, but is not limited to, the items listed in Table 3-1.

表 3-1 施工项目明细表

Table 3-1 Work Item Details

序号 No.	施工项目 Work Item	工作内容 Work Content	备注 Remarks
1	准备工程 Preparatory work	进场动员、测量放线、现场清理 Mobilization, surveying/setting-out and site clearing	
2	土方工程 Earthworks	基础开挖，深度约±0.4m Foundation excavation to a depth of about ±0.4 m	4.352 m ³
3	基础工程 Foundation work	钢筋混凝土垫块（独立）基础，40×40×40cm RC pad (isolated) foundation, 40×40×40 cm	68
4	三角型加固立柱结构工程 Retaining-wall structure	钢筋混凝土三角型加固立柱，墙高 2.5m、每单元长 1.5m；立柱 20×20cm，配 4D10 主筋、D8-200 箍筋 RC retaining wall, 2.5 m high and 1.5 m per unit; 20×20 cm columns with 4D10 bars and D8-200 ties	混凝土每个支撑桩 ≈0.217m ³ 钢筋每个支撑桩≈ 10KG
5	其他工程 Miscellaneous work	土方回填、压实及现场清理 Backfilling, compaction and site cleanup	5m ³
6	PVC 管道安装 PVC pipe installation	敷设 2 英寸 PVC 管道，长 300m，地面上铺设 Laying of 2-inch PVC pipe, 300 m long at Laying on the ground	300m
7	电源箱迁移 Power-supply relocation	迁移 MCB 电源箱 1 套至新位置，不另增加电缆线路 Relocate 1 set of MCB box to the new location, without additional cable	1 套 1 set
8	进退场及清洁 Mob./demob. and cleaning	进场动员、退场及竣工清洁 Mobilization, demobilization and final cleaning	

3.2 承包方式

3.2 Contracting Method

本工程由承包商包工、包料、包工期、包质量、包安全、包文明施工，按合同规定的价格承包；除甲方另有约定外，承包商自行提供施工所需的全部人工、材料、机械及工器具。

The contractor shall be responsible for providing all workforce, materials, machines and tools etc. required to perform the task, and ensure quality, safety and completion as

schedule unless otherwise agreed by Party A.

3.3 甲方职责

3.3 Responsibilities of Party A

- 提供施工场地出入条件、现场协调及相关作业许可。
- Provide site access, on-site coordination and the relevant work permits.
- 提供施工用水、用电接口（如具备），并指定 PVC 管道走向及 MCB 电源箱新位置。
- Provide construction water and power interfaces where available, and designate the PVC pipeline route and the new MCB-box location.
- 指派代表进行现场监督、技术交底、检查与验收。
- Assign representatives for site supervision, technical disclosure, inspection and acceptance.

3.4 承包商（乙方）职责

3.4 Responsibilities of the Contractor (Party B)

- 严格按本方案、经甲方批准的图纸及适用标准组织施工，对工程质量、安全、进度和环境保护全面负责。
- Construct strictly in accordance with this Proposal, the drawings approved by Party A and applicable standards, and be fully responsible for quality, safety, schedule and environmental protection.
- 负责测量放线、地下管线探查、施工围挡、安全警示及成品保护。

- Be responsible for setting-out, underground-utility investigation, barricades, safety warning and finished-product protection.
- 规范组织土方、钢筋、模板、混凝土及管道、电气作业，落实各项安全环保措施。
- Carry out earthwork, reinforcement, formwork, concrete, pipe and electrical works in a proper manner, and implement all safety and environmental measures.
- 竣工后清理现场、恢复原貌，配合验收并提交竣工资料；实际工程量以工程完结后的竣工单为准。
- Clean and restore the site on completion, cooperate in acceptance and submit as-built records; actual quantities shall be based on the completion sheet finalized after completion of the works.

4. 实施方法

4. Implementation Method

4.1 施工工序

4.1 Construction Sequence

本工程按下列工序组织施工：

The works shall be carried out in the following sequence:

- 1) 与承包商共同进行现场踏勘和复测。
- 1) Joint site survey and re-measurement with the contractor.
- 2) 分段（分步）进行基础开挖。
- 2) Staged foundation excavation.
- 3) 安装钢筋并浇筑基础混凝土。
- 3) Installation of reinforcement and pouring of foundation concrete.
- 4) 安装模板并浇筑三角型加固立柱墙身混凝土。
- 4) Installation of formwork and pouring of the wall concrete.
- 5) 浇筑三角型加固立柱立柱混凝土。
- 5) Concrete pouring for the retaining-wall columns.

- 6) 安装给排水（2 英寸 PVC）管道。
- 6) Installation of the water pipeline (2-inch PVC).
- 7) 迁移 MCB 电源箱。
- 7) Relocation of the MCB power-supply box.
- 8) 拆除三角型加固立柱模板。
- 8) Removal of the retaining-wall formwork.

4.2 主要施工方法及技术要求

4.2 Main Construction Methods and Technical Requirements

4.2.1 施工准备

4.2.1 Preparation

进场后进行测量放线，查明地下管线及障碍物，沿作业区设置围挡和安全警示标志，落实临时用水、用电及材料堆放场地。

After mobilization, carry out setting-out, identify underground utilities and obstacles, erect barricades and safety warning signs along the work area, and arrange temporary water/power supply and material storage areas.

4.2.2 土方开挖与基础

4.2.2 Excavation and Foundation

分段开挖至约 $\pm 0.4\text{m}$ 深，避免超挖和扰动基底；验槽合格后浇筑 40×40×40cm 钢筋混凝土垫块（独立）基础。

Excavate in stages to a depth of about $\pm 0.4\text{ m}$, avoiding over-excavation and disturbance of the bearing soil; after base inspection, place the 40×40×40 cm reinforced-concrete pad foundations.

4.2.3 三角型加固立柱施工

4.2.3 Retaining-Wall Construction

按图绑扎钢筋（立柱配 4D10 主筋、D8-200 箍筋）、安装模板，浇筑墙身及立柱混凝土，并按规定养护，到期后拆模。

Fix reinforcement as shown (columns with 4D10 main bars and D8-200 ties), erect formwork, pour the wall and column concrete, cure as required, and strike the formwork in due time.

4.2.4 回填与压实

4.2.4 Backfilling and Compaction

墙后土方分层回填并压实，做好排水坡，防止雨水冲刷及土体溜塌。

Backfill behind the wall in layers with compaction, and form drainage slopes to prevent rainwater erosion and soil sloughing.

4.2.5 PVC 管道敷设

4.2.5 PVC Pipe Laying

按图 5-1 路由开挖浅沟（地面上铺设），敷设 2 英寸 PVC 管道共 300m，接管完成后恢复地面。

Per the route in Figure 5-1, excavate a shallow trench (Laying on the ground), lay 300 m of 2-inch PVC pipe, and restore the ground surface after jointing.

4.2.6 MCB 电源箱迁移

4.2.6 MCB Box Relocation

停电、验电后，将 1 套 MCB 电源箱迁移至甲方指定的新位置，不新增电缆线路；迁移完成后进行通电检查。

After isolation and voltage testing, relocate one MCB box to the new position designated by Party A without adding cable; perform an energization check after relocation.

4.2.7 宿舍周边水电改造与工序界面

4.2.7 Water & Electrical Redeployment

墙体、屋面加固施工时，原有水电管线大量依附于开裂砌体及腐朽木屋架，水电改造与结构加固按下列界面执行：

As the existing water/electricity services are largely attached to cracked masonry and decayed timber roof members, the hydropower reconstruction and structural strengthening shall be carried out according to the following interface requirements:

- 管线保护：加固施工不得强行拉扯原有管线；墙体加固前应优先梳理、移位老旧管线，避免加固完成后管线被封死、无法检修。
- Service protection: strengthening works shall not forcibly pull existing services. Old services shall be identified and relocated before wall strengthening, so that they are not sealed in and become inaccessible for maintenance.
- 工序界面：结构加固优先，后开展水电布设；穿墙、穿砌体开孔位置应避开新增构造柱、圈梁及加固钢筋网；严禁在加固完成后的承重墙体上随意开大洞。
- Work sequence: structural strengthening takes precedence, followed by hydropower installation. Openings through walls and masonry shall avoid newly added structural columns, ring beams and strengthened reinforcement mesh; no large openings shall be cut arbitrarily in load-bearing walls after strengthening.
- 室外周边水电：宿舍区临近海边，电缆应增加防盐雾、防腐、防地下水腐蚀要求；室外排水应避免雨水渗入建筑基础周边，防止加剧地基沉降和墙体开裂。
- External services: as the dormitory area is near the sea, cables and buried pipes shall be specified for salt-fog, corrosion and groundwater corrosion resistance; external drainage shall prevent rainwater from infiltrating around building foundations so as not to aggravate foundation settlement and wall cracking.
- 室内电气接地：改造完成后，电气接地系统应与加固后建筑结构可靠连接。
- Indoor electrical earthing: on completion, the electrical earthing system shall be reliably connected to the strengthened building structure.

4.3 质量检验与验收

4.3 Quality Inspection and Acceptance

- 实行工序自检、互检和专检；基础、钢筋等隐蔽工程经甲方代表验收合格后方可进入下道工序。
- Conduct self-, mutual and special inspections; hidden works such as foundations and reinforcement may proceed to the next process only after acceptance by Party A's representative.
- 混凝土浇筑、拆模及回填均应留存施工记录和影像资料。
- Keep construction records and photographic evidence of concrete pouring, formwork striking and backfilling.
- 竣工后进行整体验收，验收内容包括三角型加固立柱位置与数量、外观及尺寸、管道敷设、电源箱迁移和现场清理。
- Conduct final acceptance covering the position and quantity of retaining walls, appearance and dimensions, pipe laying, MCB relocation and site cleanup.
- 验收合格后办理竣工交接，实际工程量以工程完结后的竣工单为准。
- Hand over after acceptance; actual quantities shall be based on the completion sheet finalized after completion of the works.
- 分阶段专项验收：按“地基保护验收→砌体加固验收→木屋盖系统验收→水电改造竣工验收”分阶段组织；完工后可委托第三方检测机构开展加固后安全性复核评估，并可将鉴定报告作为竣工验收依据之一。
- Phased special acceptance: acceptance shall be organized by stages—foundation protection → masonry strengthening → timber roof system → hydropower completion. After completion, a third-party inspection body may be engaged for post-strengthening safety review, and the appraisal report may serve as one basis for completion acceptance.
- 资料归档：应完整留存裂缝处置影像、构件更换记录、防腐记录、复测记录及验算报告。

— Records archiving: photographic records of crack treatment, member replacement records, preservation records, re-measurement records and calculation reports shall be fully retained.

表 4-1 关键尺寸与施工参数

Table 4-1 Key Dimensions and Construction Parameters

序号 No.	项目 Item	参数要求 Requirement	说明/允许偏差 Note / Tolerance	检验方式 Inspection
1	基础开挖深度 Foundation excavation depth	±0.4 m	不得超挖、扰动基底 No over-excavation or disturbance	水准仪、尺量 Level / tape
2	垫块（独立）基础 Pad foundation	40×40×40 cm	位置、截面按施工图 Position/section per drawings	尺量 Tape
3	墙高 Wall height	2.5 m	按图施工 Per drawings	尺量 Tape
4	单元长度/底宽 Unit length / base width	1.5 m	沿墙轴线连续布置 Along wall alignment	尺量 Tape
5	立柱 Column	20×20cm; 4D10; D8-200 20×20 cm; 4D10; D8-200	钢筋规格、间距按图 Bar size/spacing per drawings	隐蔽验收、尺量 Hidden inspection / tape
6	三角型加固立柱单元数量 Number of wall units	34 个（见表 5-1） 34 (see Table 5-1)	数量、位置按图 Quantity/location per drawings	点数 Count
7	PVC 管道 PVC pipe	2 英寸, 300m, 2-inch, 300 m,	路由见图 5-1 Route per Figure 5-1	尺量、通水检查 Tape / flow test
8	MCB 电源箱 MCB box	迁移 1 套, 不另敷电缆 1 set, no new cable	新位置经甲方确认 New location confirmed by Party A	通电检查 Energization check

4.4 安全与环保要求

4.4 Safety and Environmental Requirements

4.4.1 安全管理

4.4.1 Safety Management

遵守印度尼西亚职业健康安全（K3/OHS）法规及甲方厂区各项安全管理制度；所有人员入场前接受安全教育，电工等特种作业人员持证上岗；开挖区域设置

围挡、警示标志及夜间警示灯，严禁无关人员进入；临时用电由合格电工接线并装设漏电保护；高处作业系挂安全带，机电设备做到一机一闸一保护。

Comply with Indonesian occupational health and safety (K3/OHS) regulations and all of Party A's plant safety rules; all personnel receive safety induction before entering the site, and special trades such as electricians must hold valid certificates; barricade excavation areas with warning signs and night warning lights and keep unauthorized persons out; temporary power shall be connected by qualified electricians with earth-leakage protection; safety harnesses shall be worn for work at height, and each machine shall have its own switch and protection.

4.4.2 环境保护与文明施工

4.4.2 Environmental Protection and Civilized Construction

土方堆放覆盖并洒水降尘；建筑垃圾分类收集、及时清运，严禁随意丢弃；施工废水、废浆不得排入排水系统或污染土壤、水体；施工结束后及时平整场地、恢复原貌及绿化，做到工完料尽场地清。

Cover spoil piles and sprinkle water to suppress dust; collect construction waste by category and remove it promptly, with no random dumping; prevent wastewater and slurry from entering the drainage system or contaminating soil and water; after completion, level the site and restore its original appearance and greenery so that the site is left clean.

4.4.3 沉桩期间监测巡查

4.4.3 Monitoring During Pile Driving

沉桩作业期间，对新建三角型加固立柱及邻近宿舍楼进行振动与裂缝巡查，发现异常立即报告甲方并采取加固、停工等措施。

During pile driving, inspect the new retaining walls and adjacent dormitories for vibration effects and cracking; report any anomaly to Party A immediately and take measures such as strengthening or suspending the works.

4.4.4 属地合规性要求

4.4.4 Local Compliance Requirements

本项目位于印度尼西亚，规范书及施工方案应考虑印尼 SNI 标准相关要求；施工方案及关键技术文件应同步提供印尼文版本，以满足属地作业许可审批。热带雨季施工期间，砌体加固及木构件防腐作业遇雨天或高湿度环境时，应按材料工艺要求限制施工，必要时暂停作业。

As this project is located in Indonesia, the specification and construction method statements shall take account of Indonesian SNI requirements; the construction method statement and key technical documents shall also be provided in Bahasa Indonesia to satisfy local work-permit approval. During the tropical rainy season, masonry strengthening and timber preservation works shall be restricted in rainy or high-humidity conditions in accordance with material process requirements, and shall be suspended when necessary.

4.4.5 施工风险预防与竣工后巡检

4.4.5 Construction Risk Prevention and Post-completion Inspection

原建筑安全性为 Dsu 级，加固施工本身存在结构风险。施工前应编制专项施工方案及应急预案，严禁野蛮拆除、凿打，防止施工期间墙体坍塌。加固改造仅改善安全状况，不等同于新建建筑；完工后应建立定期巡检制度，重点检查墙体裂缝、木屋盖腐朽及屋面渗漏。

The original building is classified as safety grade Dsu, so the strengthening works themselves carry structural risk. A special construction method statement and emergency plan shall be prepared before commencement; rough demolition or chiselling is prohibited to prevent wall collapse during construction. Strengthening improves the safety condition but does not make the building equivalent to new construction; after completion, a regular inspection regime shall be established, focusing on wall cracks, timber roof decay and roof leakage.

5. 图纸、施工区域及实施进度

5. Drawings, Work Area and Implementation Schedule

5.1 供水管道走向

5.1 Water Pipeline Route

2 英寸 PVC 供水管道沿宿舍区东侧敷设，全长约 300m，走向见图 5-1。

The 2-inch PVC water pipeline runs along the eastern side of the dormitory area, with a total length of about 300 m; the route is shown in Figure 5-1.

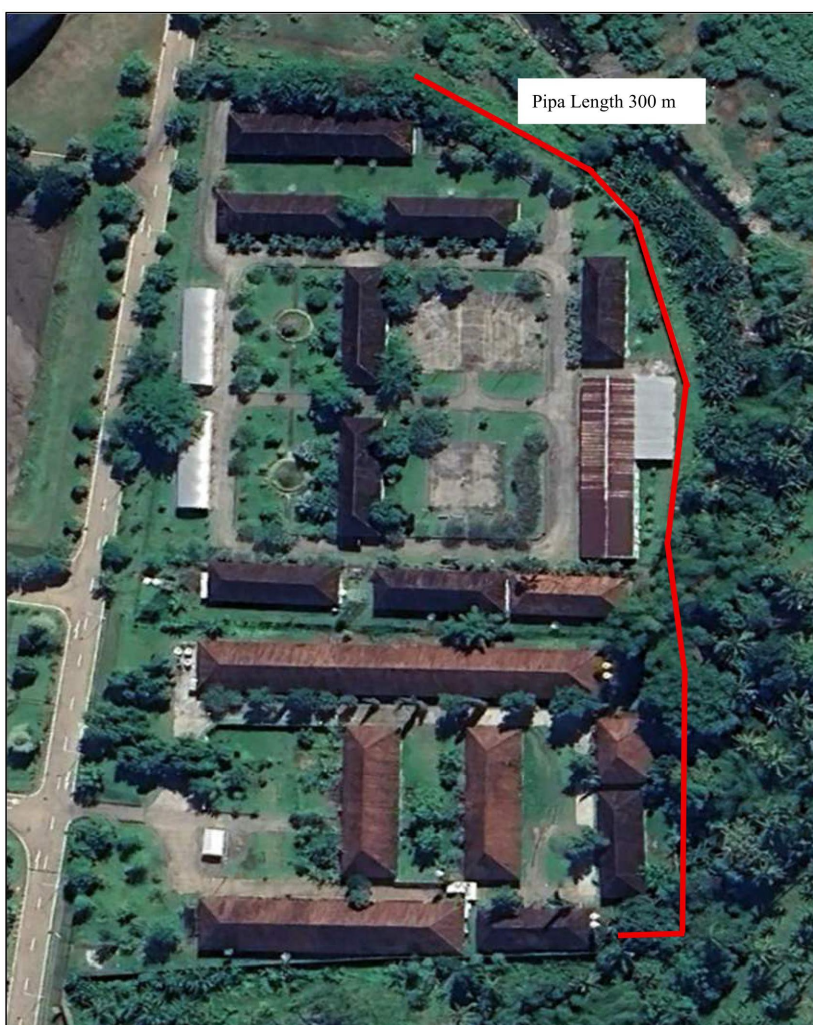


图 5-1 供水管道走向示意图（管道长 300m）

Figure 5-1 Water Pipeline Route (pipe length 300 m)

5.2 三角型加固立柱分布

5.2 Retaining-Wall Distribution

三角型加固立柱布置于#1～#7 宿舍楼周边，共 34 个单元，各宿舍楼建筑长度及三角型加固立柱单元数量见表 5-1，平面分布见图 5-2。

The retaining walls are arranged around Dormitories #1–#7, totalling 34 units. The building lengths and numbers of wall units are given in Table 5-1, and the plan distribution in Figure 5-2.



图 5-2 各宿舍楼三角型加固立柱分布示意图

Figure 5-2 Distribution of Retaining Walls by Dormitory

表 5-1 各宿舍楼三角型加固立柱数量分布表

Table 5-1 Distribution of Retaining-Wall Units by Dormitory

宿舍楼编号 Dormitory	建筑总长度 (m) Total length of building (m)	三角型加固立柱单元数 (个) Retaining-wall units (nos.)
#1	60	8
#2	25	4
#3	25	4
#4	17	3
#5	40	5
#6	40	5
#7	42	5
合计 Total	249	34

5.3 三角型加固立柱典型断面

5.3 Typical Retaining-Wall Section

三角型加固立柱典型断面及立柱详图见图 5-3：墙高 2.5m，断面底宽 1.5m；立柱截面 20×20cm，配 4D10 主筋，箍筋 D8-200。

The typical cross-section and column detail are shown in Figure 5-3: the wall is 2.5 m high with a base width of 1.5 m; the column is 20×20 cm in section with 4D10 main bars and D8-200 ties.

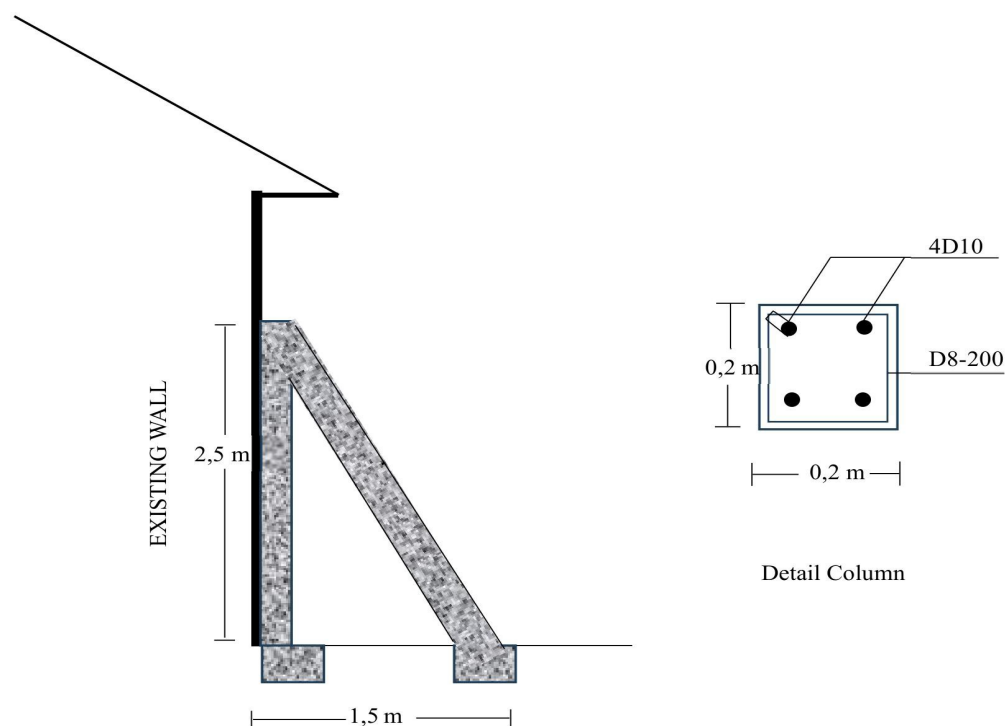


图 5-3 三角型加固立柱典型断面及立柱详图

Figure 5-3 Typical Retaining-Wall Section and Column Detail

5.4 实施进度

5.4 Implementation Schedule

本工程总工期为 40 日历天，按四周安排，建议进度见表 5-2；具体开工日期以甲方开工令通知为准，承包商应据此调整到厂及施工安排。

The total duration is 40 calendar days arranged over four weeks as indicated in Table 5-2. The actual commencement date shall be subject to Party A's notice to proceed, and the contractor shall adjust its mobilization and construction arrangements accordingly.

表 5-2 建议实施进度计划

Table 5-2 Indicative Implementation Schedule

周次 Week	主要工作 Main Work	备注 Remarks
第 1 周 1st	准备、开挖、基础工程 Preparation, excavation and foundation	
第 2 周 2nd	基础混凝土浇筑 Foundation concreting	
第 3 周 3rd	三角型加固立柱混凝土浇筑 Retaining-wall concreting	
第 4 周 4th	PVC 管道安装、MCB 电源箱迁移及收尾清理 PVC pipe installation, MCB relocation and finishing/cleaning	

附录 A 主要工程量汇总表

Appendix A Summary of Principal Quantities

表 A-1 主要工程量汇总表

Table A-1 Summary of Principal Quantities

序号 No.	项目 Item	单位 Unit	数量 Qty
1	进场动员 Mobilization	项 ls	1
2	基础开挖 Foundation excavation	m ³	8.5
3	钢筋混凝土三角型加固立柱 Reinforced-Triangular reinforced column	单元 unit	34
4	2 英寸 PVC 管道（地面上铺设） 2-inch PVC pipe (Laying on the ground)	m	300
5	MCB 电源箱迁移 MCB box relocation	项 ls	1
6	退场、现场清洁 Cleaning、Demobilization	项 ls	1