



*Embassy of the United States of America,
Jakarta, Indonesia*

SPECIFICATION

Address : GRAHA FAMILY, SURABAYA

Project title : SURABAYA MARINE SECURITY GUARD RESIDENCE WORK

Description of work : To modify room configuration, electrical & plumbing.

Number of work days : Nine (9) weeks

Warranty : 1 (one) year

Government Estimate : \$ 57,000 (\$1=Rp. 11.000,-)

Commencement date : ASAP

Funding : Special Project

**DIVISION 01
GENERAL REQUIREMENT**

011100 SUMMARY OF WORKS

Description of Work

U.S. Embassy Jakarta requires the services of a qualified contractor to provide material and services for Surabaya MSGR Work.

Summary of Work

The construction shall consist of following works detailed in the drawings and specifications:

1. Providing sufficient information: materials & technical data, shop drawings with detail and section for approval prior to construction.
2. Installation of bathrooms and toilet.
3. Installation of wall, ceiling and tiles.
4. Repair works.
5. Carpentry works.
6. Finishing works.
7. Electrical works.
8. Plumbing works.
9. Misc. masonry works.

Contractor will provide labor, materials, equipment, and other necessary items required and related to the completion of the project.

011113 WORKS COVERED BY CONTRACT DOCUMENTS

General work

1. The contractor must provide sufficient information: materials and technical data, shop drawings with detail and section for approval prior to construction. The contractor is fully responsible to submit the information in timely manner according to the project schedule to not cause delay on the completion of the project. Contractor will also be responsible for long lead item that might affect project schedule. Contractor is responsible to notify COR minimum seven days prior to Government Furnished Equipment (henceforth called GFE) material required date.
2. Modify room configuration by removing and install new masonry wall and drywall as indicated in drawing.
3. Remove and install new masonry wall, tie beam and ring beam as required as shown on the attached drawings. The quality for concrete shall be according to specification. All rebar used in the project shall be designed in accordance with the provisions of ASTM A706M or in accordance with acceptable local codes; yield strength shall be a minimum of 420 MPa (mill certificate must be presented) (example Krakatau Steel or equivalent) with size conforms or exceed the size indicated in the drawing and welding shall conform to AWS D1.1.
4. Install new double sided drywall using 12mm gypsum board with framing using 100mm 0.5mm thick steel runner and 100mm 0.5mm stud framing 600mm each apart on center. Fill the cavity inside with two layers of 2” thick rock wool density 60.

5. Repair, modify or remove existing ceilings and frame affected by work. Install new gypsum board interior ceiling per specification and drawing. New ceiling height conforms to existing. Support ceiling frame with 6mm hanger rod.
6. Repair or install new floor tiles and parquet flooring affected by work, material and color conform to existing.
7. Relocate door; install relocated door and new door in entertainment room, store, den, bedroom 2, foyer 3, and bath room 4 as indicated in drawing. Finish surface with materials conform to existing. Install new solid core door on new foyer 5 and new ERR (basement).
8. Upgrade city power supply from existing 33000 VA to 53000VA.
9. Modify and install new electrical wiring system, install additional light fixtures and power outlet as indicated in electrical plan drawing, wiring diagram drawing and specification. Contractor is responsible to provide and install accessories and supporting material according to specification.
10. Install new 18,000 Btu split pack AC unit in new TDY bedroom (basement), relocate existing split AC in existing dry kitchen (1st floor) to kitchen (1st floor), relocate existing split AC in existing foyer 3 (2nd floor) to new bedroom 5 (2nd floor). Material for new AC outdoor and indoor unit will be provided by contractor. Contractor is responsible to provide and install accessories and supporting material according to specification. Install American type outlet for AC.
11. Modify or remove existing Supply and Return Air Grilles affected by new wall or partition lines.
12. Modify and install new telephone cable according to specification from the existing KTB to each new outlet. Provide conduit buried on the wall and telephone outlet on the position as shown on the drawing T-1 to T-3.
13. Install new wooden wardrobe in new bedrooms finish with shellac natural color complete with wooden louver on door, lock and hardware. Wardrobe should have drawers, hanger rod and shelving. Install open cabinet with hangers in ERR, as indicated in drawing. Submit shop drawing for approval prior to installation.
14. Remove kitchen cabinet, wall and partition. Relocate sink, stove and hood. Modify and install wall, kitchen cabinet, relocated stove and hood in kitchen, as indicated in drawing refinish all surfaces affected by removal and work; materials conform to existing. Submit shop drawing for approval prior to installation.
15. Remove partition decoration panel, install relocated kitchen cabinet, new bar cabinet complete with granite counter top, materials conforms to existing kitchen cabinet. Submit shop drawing for approval prior to installation.
16. Install new bathroom 2 and guest bathroom (basement), install new female and male toilets (1st floor), modify existing bathroom in master bedroom into new bathroom 4 and 5 (2nd floor), as indicated in the drawing.
17. Install tempered glass partition complete with door and hardware, material conform to partition in existing bathroom.
18. Install partition with light cream color phenolic board complete with stainless steel support and accessories in female and male toilets (1st floor). Submit color sample to COR for approval prior to fabrication.
19. Install bathroom fixtures, beveled mirror, fittings and accessories as indicated in the drawing and the specification.
20. Install new GFCI outlet in all toilet, bathrooms and kitchen, as indicated in drawing. Material for GFCI outlet will be GFE.

21. Relocate electrical panel in 2nd floor to opposite wall side.
22. Install robe hanger with door stopper on all new toilet and bathroom's doors.
23. Install new ceiling mounted exhaust fan complete with zinc ducting connected to exterior.
24. Install new wall and floor tiles according to specification with 20x10cm black gold import granite as wall border in new bath rooms and toilet. Wall tiles must be installed up to ceiling height.
25. Modify and install plumbing system (freshwater, hot water, drainage, sewage line and gas system line) and fixtures in new toilet, bathroom, kitchen and laundry room according to the drawing and specification. All pipes above ceiling should be supported with 6mm hanger rod.
26. Install metal swimming pool fence complete with door as indicated in plan and detail drawing. Install 150/150mm concrete beam as fence base for fence line installed on soil. Fence door shall be equipped with self-closing, self-latching and lockable hardware, the material will be GFE. The release mechanism of the self-latching device shall be placed at a height of 54 inches from the bottom of the access point.
27. Keep and maintain work site and existing garden during construction. After the construction work, garden must be clean and tidy.
28. Repair and refinish all surfaces affected by removal and work; materials conform to existing unless on some materials as indicated in the specification.

011400 WORK RESTRICTIONS

Protection

Contractor will keep the project area cleaned and remove debris from project site at the end of each day. Loitering around the project site is not permitted.

Contractor shall be responsible for protecting U.S. Government property on site from damage, scratch, dust, water, fire or theft, and ensure caution to prevent accidents caused by various work. Install proper warning signs and protection to the site.

Contractor will provide mixture box to mix mortar or concrete to prevent damage to the mixing site.

Contractor's operations may not cause disruption of site activities. Contractor's operations shall not generate disagreeable environmental effects, including the emission of noise, fumes, or other emanations. Construction debris shall be monitored at all times. Visual or audible disturbances shall be kept to a minimum, and any work progress, which might cause such disturbances shall be discussed with the COR in advance.

Contractor is responsible to repair any damage caused by the implementation of the work. Contractor will do general rewiring and re-piping if required as a result of the various works.

011413 ACCESS TO SITE

The contractor shall permit the facilities manager and COR or any officer authorized by the COR to have access to the work at all times during the execution of work.

The contractor superintendent shall meet daily with the COR (unless waived by the COR) to review progress and plans

011423 CONDITIONS

1. Contractor to inspect and measure the project thoroughly before submitting the bid. Project inspection and measurement must be done after the site meeting unless determined otherwise. No chance for another inspection and measurement will be given to any contractor between the site meeting and bid submission time frame, unless stated otherwise. Submission of the bid is an agreement by the contractor to carry out the project in a turnkey condition.
2. Drawings and specifications are used as a general guide only. Anything not mentioned in the specifications or drawings, but related to common requirements for completion of the project in a satisfactory manner will be determined by the COR at the site meeting and becomes part of the contract.
3. After the site meeting and before submitting the bid, the contractors can ask clarification about the project by submitting a written question to Contracting Officer. The answer to the question will be distributed to all contractors invited to the site meeting and becomes part of the contract.
4. After the site meeting and commencement of the project, any unforeseen conditions that arise to ensure proper completion of the project will become the contractor's responsibility at no additional cost to the U.S. Government, unless justified otherwise or caused by the embassy.
5. Information shown on the drawings related to the existing conditions represents the present knowledge, but without guarantee of accuracy. Report conditions that conflict with the contract documents to the COR. Do not deviate from the contract documents without written direction from the COR.
6. Contractor shall not perform any additional work without prior approval from the COR.
7. Upon finding any termite infestation in any part of the building within the perimeter wall of the property, the contractor is responsible to report immediately to the COR and CO.
8. Contractor shall not work on materials containing asbestos, such as piping insulation or "Eternit" ceiling panels during construction, and must stop immediately if these materials are found during the work. The work will then be suspended by the Contracting Officer per FAR 52.242.14 (Section F) and contractor may be required to modify its operation. No work shall restart without the CO's approval.

012000 PRICE AND PAYMENT PROCEDURES

The Contractor shall complete this project according to all specifications and requirements stated in this contract. The price listed below shall include all materials, labors, equipment, tools, transportation, insurance, overhead, profit, and all expenses. The Contract Type shall be "Firm-Fixed Price".

Total Contract Price: _____ **Rupiah**

The price stated above is total contract price. Detail of prices shall be submitted in form of Bill of Quantity (BOQ). The BOQ shall consist of description, quantity, and unit price of material

and labor. Cost of labor can be submitted either Unit Price or Lump Sum.

013119 PROJECT MEETINGS

The Embassy or the contractor may request a meeting (either on-site or off-site) to clarify any part of this contract. The project manager, contractor's superintendent, COR, and other required persons will normally attend.

The contractor will keep minutes of every meeting and provide written copies (within two working days) to the COR for approval.

013213 SCHEDULING OF WORK

Contractor shall schedule work with COR prior to commencement.

Project Schedules

Format

- Prepare schedules as horizontal bar chart with separate bar for each major portion of Work or operation, identifying first workday of each week.
- Sequence of Listing: Chronological order of start of each item of Work.
- Scale and Spacing: To provide space for notations and revisions.

Content

- Show complete sequence of construction by activity, with dates for beginning and completion of each element of construction.
- Identify each item by Specification Section number.
- Provide sub-schedules for each stage of work.
- Provide sub-schedules to define critical portions of entire Schedule.
- Coordinate content with Schedule of Values.
- Submit schedule allowing for a 10-day review prior to commencing.

Revision to Schedules

- Indicate progress of each activity to date of submittal and projected completion date of each activity.
- Identify activities modified since previous submittal, major changes in scope, and other identifiable changes.
- Provide narrative report to define problem areas, anticipated delays, and impact on Schedule. Report corrective action taken, or proposed, and its effect.

Submittals:

- Submit initial Schedules within ten (5) days after date of Notice to Proceed. After review, resubmit required revised data within five days.
- Submit revised Progress Schedules with each Application for Payment.

Distribution:

- Distribute copies of reviewed Schedules to project site file, sub Contractors, suppliers, and other concerned parties.
- Instruct recipients to promptly report, in writing, problems anticipated by projections indicated in Schedules.

Liquidated Damages:

If the Contractor fails to complete the work within the time specified in the contract, or any extension, the Contractor shall pay liquidated damages to the Government in the amount of **\$120** for each calendar day of delay until the work is completed or accepted.

If the Government terminates the Contractor's right to proceed, liquidated damages will continue to accrue until the work is completed. These liquidated damages are in addition to excess costs of repurchase.

Government will determine to terminate the Contractor's right to proceed based on but not limited to the following circumstances:

- Contractor show lack of response or slow response to any procedure required to start the project. If this occur, Government has right to appoint second lowest bidder to do the project within this liquidated damages clause or totally cancel the contract and issue new contract with new contractor.
- Contractor show slow progress in one or more work item in the course of the project that could cause delay to the overall project. If this occurs, Government could either take over the execution of the work item by in-house maintenance team or appoint another contractor to continue and finish the work in timely manner within this liquidated damages clause.

013323 SHOP DRAWINGS, PRODUCT DATA AND SAMPLES SUBMITTAL PROCEDURES**General**

For each part of the construction Specified in this scope of work, submit the following as applicable, in accordance with Contract Clauses and Conditions.

- The contractor must include written specifications for the materials and a sample of material (as required) along with his/her quotation.
- Submit shop drawings showing plans/elevations/sections at not smaller than scale 1:100, and details not smaller than scale 1:20.
- Submit as built drawings showing plans/elevations/sections at not smaller than scale 1:100, and details not smaller than scale 1:20 upon the completion of the project.
- Prepare and submit check list that shows weekly construction progress.
- The contractor shall submit proposed plan and details of staging area.

Samples

Submit physical examples to illustrate materials and workmanship; and to establish standards by which completed work is judged, if requested.

Contractor Responsibilities

- Review shop drawings, material data, and samples prior to submission. Initial, sign, or stamp, certifying the Contractor's review of the submittal.
- Verify:
 - Field measurements.
 - Field construction criteria.
 - Catalog numbers and similar data.

- Coordinate each submittal with requirements of Work and Contract Documents.
- Contractor's responsibility for errors and omissions in submittals is not relieved by COR review of submittals.
- Contractor's responsibility for deviations in submittals from requirements of Contract Documents is not relieved by the COR's review of submittals, unless COR gives written acceptance of specific deviations.
- Notify COR, in writing at time of submission, of deviations in submittals from requirements of Contract Documents.
- Begin no work which requires submittals until return of submittals with COR's stamp and initials or signature indicating review and indication to proceed as noted. Work performed prior to submission and approval of submittals may be subject for rejection.
- Distribute copies after COR's approval.
- Provide submittal information data in English and dimensions in metric units.

Submission Requirements

- Schedule submissions to the COR immediately after Contract award.
- Submit three (3) copies of submittals (minimum).
- Submit three (or to be notified) of each sample requested.
- Accompany submittals with transmittal letter containing:
 - Date
 - Project title and number
 - Contractor's name and address
 - The number of each submittal
 - Notification of deviations from Contract Documents
- Provide each set of submittals bound together with a Cover and Table of Contents.

Re-Submission Requirements

- Provide adequate information; submit formal letter(s) and/or reason(s) for deviation.
 - Product Data and Samples: Submit new data and samples as required for initial submittal.
 - Shop Drawings.
 - Revise initial drawings as required and re-submit as specified for initial submittal.
 - Indicate on drawings any changes, which have been made other than those requested by the COR.
- Distribution of Submittals after review:**

013526 GOVERNMENTAL SAFETY REQUIREMENTS

1. Welding and use of open flames in or adjacent to the Embassy properties requires approval from the Facilities Manager (or supervisor). Use of explosive actuated fastening devices shall not be used without the prior permission of the Facilities Manager.
2. Observe and enforce all construction safety measures required by the Indonesia Labor Code, Local Building Codes, Workers Compensation Board, Municipal Statutes and Authorities.
3. If any personnel are injured, the contractor has sole responsible for such injury.
4. Powered equipment must be in good condition. Electrical and other utility connections must be properly made. Extension cords will be heavy-duty type suitable for the load involved.

5. The Contractor shall submit for approval a Safety Plan in accordance with the safety regulations of the U.S. Embassy, Department of State and OSHA.
6. The U.S. Embassy's safety regulation follows the U.S. Army Corps of Engineers, Safety and Health Manual EM385-1-1, available on the internet from the Army Corps of Engineers website; Indonesia Labor Code; Local Building Codes; Workers Compensation Board; Municipal Statutes and Authorities. When conflict arises, the code or statute, which is more stringent, shall apply.
7. The Contractor shall provide the appropriate number, size and composition of any and all warning signs as determined by the COR.

013553 SECURITY PROCEDURES

Security Requirements and Procedures for Contractors

Contractors who require access to any of the Embassy offices or facilities are required to comply with the following security procedures:

Coordinate with RSO to have all workers that require access to the house report for fingerprints so criminal record checks can be conducted. All workers must bring a valid identification card. Criminal records checks typically take approximately one month to complete. Thus, it is important to have contract workers report as early as possible (within 24 hours after the award of the contract) to RSO to start the process.

Upon successful completion of a criminal record check contractors shall submit working pass request to the RSO thru the COR which will allow them to access the house.

Unsuitable Workers

Upon the request of the COR, the contractor shall remove any person employed by him who, in the opinion of the COR, is incompetent or has conducted himself improperly. Workers who are found to conduct themselves in an improper manner, such as urination outside the approved toilets, foul language, improper behavior, and other such acts, shall be immediately barred from site. The contractor shall not permit a person who has been removed to return to the work site.

014113 BUILDING CODES

Perform all works in accordance with the Indonesia building codes (Electrical, Plumbing and other codes that pertain to trades involved in this project). In no instance shall a standard identified or established in this section be reduced without written permission from the COR.

014126 PERMITS

Contractor shall be responsible for any permit and administration cost required to perform and complete the project.

014216 DEFINITIONS

“Install,” means, “provide and install” unless stated otherwise. “Repair,” means, “restores to proper and satisfactorily condition using the minimum of the same material as the existing with equal or exceeds quality.” “Upgrade,” means, “correct the existing condition and replace all with

new material per U.S. Embassy standard” unless stated otherwise. “Remove,” means, “dismantle and completely remove all materials specified including other materials required to attach it to the building structure or roof or ceiling or wall or soil” unless stated otherwise.

014300 QUALITY ASSURANCE

Quality Control

Maintain quality control over suppliers, manufacturers, products, services, site conditions, and workmanship to produce work of specified quality.

Examine each phase of work and have defective conditions corrected before starting subsequent operations which include cover, or are dependent upon, work in question.

Utilize qualified personnel who have experience with the specified works to produce workmanship of specified quality. The contractor personnel responsible for the project must qualify as described below:

- Senior engineer: A professional engineer in the related field, having minimum of bachelor degree qualification (S-1) and Engineer license issued by the Government.
- Engineer: A professional engineer in the related field, having bachelor degree qualification (S-1) and Engineer license issued by the Government.
- Foreman: A professional technician, high vocational or diploma education in related field.

All electrical work will be accomplished by a License “C” electrical contractor, using American electrical code or higher. (Copy of license and qualifications of the electrical sub contractor are to be attached with the bid document).

The contractor shall apply technical knowledge and specific equipment/tools for related work in the contract. Final inspection and acceptance will be performed by the COR to meet U.S. Government standard.

015100 TEMPORARY UTILITIES

Power Supply, Water and temporary services:

The Embassy will supply free of charge temporary power supply and water for construction proposes. Contractor shall obtain COR approval for the use of utilities prior to the start of its operations. During working, any additional needs must be approved by the COR in advance. The contractor is responsible for furnishing and installing temporary services.

- The electricity supply is located at: (to be discussed during the site survey)
- The water supply (non-potable) is located at: nearest water outlet(s) (to be discussed during the site survey)
- The toilet is located at: (to be discussed during the site survey).

015116 TEMPORARY FIRE PROTECTION

- During construction, the contractor shall comply with fire safety practices as outlined in NFPA and local fire protection codes, and in addition:
- The Embassy requires portable fire extinguishers (stored pressure type, UL fire rating 10A:60B:C) to be readily available at all work sites during entire installation period.
- The contractor is responsible for properly deploying the fire extinguishers to each work area occupied by the contractor e.g. welding site, temporary structure, construction office, storage, tool, and workshop sheds. Proper deployment includes advising the COR on the number of fire extinguishers, transport to and from warehouse and work sites, worker training how to operate the fire extinguisher, etc.
- Contractor's superintendent or other assistant superintendents shall be appointed as project fire warden for entire construction period.

015219 SANITARY FACILITIES

Contractor must supply his workers with proper sanitation facilities, should they not be available on the outside locations. If the COR approves the use of office facilities for the Contractor's use, it is the responsibility of the Contractor to maintain, on a daily basis, the cleanliness of the facilities.

015400 CONSTRUCTION AIDS

Temporary ladders, scaffolds, hoists:

Furnish and maintain temporary ramps, scaffolds, or hoists as required for proper execution of work. Such apparatus, equipment, and construction shall meet requirement of applicable local safety and labor laws.

Storage and Handling Materials/Equipment/Tools:

Special care should be given to handling and storing materials/equipment/tools. The ownership of the items is passed from the contractor only upon acceptance by the COR. Equipment/tools not accepted by the COR is the contractor's sole responsibility.

015400 TEMPORARY BARRICADES

The contractor shall protect the work as its proceeds, protect the area, which is next to the construction, and protect the materials and components from damage and deterioration. Special consideration should be given to protecting sensitive areas such as hallways, entrances, walls, floors, and carpets areas from dust and construction activities.

The contractor shall provide barricades as required to protect natural resources, site improvements, existing property, adjacent property, and personnel. Where pedestrian traffic is through or adjacent to work area, the contractor shall provide necessary guardrails and barricades to protect pedestrians and to prevent pedestrian access to work areas. Remove guardrails and barricades at completion of construction.

016000 GOVERNMENT FURNISHED EQUIPMENTS

1. Security locks.

2. Door viewer.
3. GFCI outlets.
4. Pool fence locking set.

017000 EXECUTION AND CLOSEOUT REQUIREMENTS

Final Completion

After completion of the work, the contractor shall make an appointment with COR for inspection and final acceptance with the signature of COR. The work site and related areas must be in a clean and tidy condition.

DIVISION 3 CONCRETE

033000 CAST IN PLACE CONCRETE

General

1. SUMMARY

- A. This Section specifies cast in place concrete, including formwork, reinforcing, mix design, placement procedures, and finishes.

2. SUBMITTALS

- A. Product data for proprietary materials and items, including reinforcement and forming accessories, admixtures, patching compounds, and curing compounds as requested by the COR.
- B. Shop drawings: Submit shop drawings for fabrication, bending, and placement of concrete reinforcements. Comply with ACI 315 "Manual of standard Practice for Detailing Reinforced Concrete Structures" showing bar schedule, stirrup spacing, diagram of bent bars, arrangement of concrete reinforcement. Include special reinforcement required for openings through concrete structure.
- C. Laboratory test reports for concrete materials and mix design test.

3. QUALITY ASSURANCE

- B. Codes and Standards: Comply with provisions of the following codes, specifications, and standards, except where more stringent requirements are shown or specified:
 - 1. ACI 318, "Building Code Requirements for Reinforced Concrete."
 - 2. Concrete Reinforcing Steel Institute (CRSI) "Manual of Standard Practice."

Products

1. FORM MATERIALS

- A. Forms for Concrete: Plywood, lumber, metal, and other acceptable material. Provide lumber dressed on at least 2 edges and one side for tight fit.
- B. Form Ties: Factory-fabricated, adjustable -length, removable or snap-off metal form ties, designed to prevent form deflection and to prevent spalling concrete upon removal. Provide units that will leave metal no closer than 37mm to exposed surface.
 - 1. Provide ties that, when removed, will leave holes not larger than 25mm in diameter in the concrete surface.

2. REINFORCING MATERIALS

- A. Reinforcing Bars: ASTM A706M, Grade 40, $F_y = 420\text{MPa}$.
- B. Supports for Reinforcement: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars and welded wire fabric in place. Use wire bar type supports complying with CRSI specifications.

3. CONCRETE MATERIALS

- A. Portland Cement: ASTM C 150, Type I.
 - 1. Use one brand of cement throughout project unless otherwise acceptable by COR.
- B. Normal Weight Aggregates: ASTM C 33 and as herein specified. Provide aggregates

from a single source for exposed concrete.

1. Local aggregates not complying with ASTM C 33 but that actual service have shown to produce concrete adequate strength and durability may be used when acceptable to the COR.
 - C. Water: city water/PAM.
2. PROPORTIONING AND DESIGNING MIXES
- A. Prepare design mixes for each type and strength of concrete by either laboratory trial batch or field experience methods as specified in ACI 301.
 - B. Submit written reports to the COR of each proposed mix of concrete at least 15 days prior to start of Work. Do not begin concrete production until proposed mix designs have been reviewed by the COR.
 - C. Design mixes to provide normal weight concrete with the following properties as indicated on drawings and schedules:
 1. 25 MPa, 28-day compressive strength. Non air entrained water-cement ratio 0.45 maximum for footings and foundation. 320kg of cement per cubic meter of concrete minimum.
 2. 30 MPa, 28-day compressive strength. Non air entrained water-cement ratio 0.45 maximum for building structure (wall and slabs). 360kg of cement per cubic meter of concrete minimum.
 - D. Adjustment to Concrete Mixes: Mix design adjustments may be requested by Contractor when characteristics of materials, job conditions, weather, test results, or other circumstances warrant, as accepted by the COR. Laboratory test data for revised mix design and strength results must be submitted to and accepted by the COR before using in work.
3. ADMIXTURES
- A. Slump Limits: Proportion and design mixes to result in concrete slump at point of placement as follows:
 1. 100mm +/- 25mm.
4. CONCRETE MIXING
- A. Job Site Mixing: Mix materials for concrete in appropriate drum type batch machine mixer. For mixers of 3/4 cu. m or smaller capacity, continue mixing at least 1-1/2 minutes, but not more than 5 minutes after ingredients are in mixer, before any part of batch is released. For mixers of capacity larger than 3/4 cu. m, increase minimum 1-1/2 minutes of mixing time by 15 seconds for each additional cu. m or fraction thereof.

Execution

1 GENERAL

- C. Coordinate the installation of joint materials with placement of forms and reinforcing steel.

2 FORMS

- A. General: Design, erect, support, brace, and maintain formwork to support vertical, lateral, static, and dynamic loads that might be applied until concrete structure can support such loads. Construct formwork so concrete members and structures are of correct size, shape,

alignment, elevation, and position. Maintain formwork construction tolerances and surface irregularities complying with the following ACI 347.

- B. Construct forms to sizes, shapes, lines, and dimensions shown and to obtain accurate alignment, location, grades, level, and plumb work in finished structures. Provide for openings, offsets, sinkages, recesses, moldings, rustications, reglets, chamfers, blocking, screeds, bulkheads, anchorages and inserts, and other features required in the work. Use selected materials to obtain required finishes. Solidly butt joints and provide backup at joints to prevent leakage of cement paste.

3 PLACING REINFORCEMENT

- A. General: Comply with Concrete Reinforcing Steel Institute's recommended practice for "Placing Reinforcing Bars," for details and methods of reinforcement placement and supports as herein specified.
- B. Clean reinforcement of loose rust and mill scale, earth, and other materials that reduce or destroy bond with concrete.
- C. Accurately position, support, and secure reinforcement against displacement. Locate and support reinforcing by metal chairs, runners, bolsters, spacers, and hangers, as approved by the COR.
- D. Place reinforcement to maintain minimum coverage for concrete protection. Arrange, space, and securely tie bars and bar supports to hold reinforcement in position during concrete placement operations. Set wire ties so ends are directed into concrete, not toward exposed concrete surfaces.

4 INSTALLING EMBEDDED ITEMS

- A. General: Set and build into formwork anchorage devices and other embedded items required for other work that is attached to or supported by cast-in-place concrete. Use setting drawings, diagrams, instructions, and directions provided by suppliers of items to be attached thereto.

5 CONCRETE PLACEMENT

- A. Inspection: Before placing concrete, inspect and complete formwork installation, reinforcing steel, and items to be embedded or cast in. Notify other crafts to permit installation of their work; cooperate with other trades in setting such work.
- B. General: Comply with ACI 304, "Guide for Measuring, Mixing, Transporting, and Placing Concrete," and as herein specified.
- C. Deposit concrete continuously or in layers of such thickness that no concrete will be placed on concrete that has hardened sufficiently to cause the formation of seams or planes of weakness. If a section cannot be placed continuously, provide construction joints as herein specified. Deposit concrete to avoid segregation at its final location.
- D. Placing Concrete in Forms: Deposit concrete in forms in horizontal layers no deeper than 600mm and in a manner to avoid inclined construction joints. Where placement consists of several layers, place each layer while preceding layer is still plastic to avoid cold joints.
 - 1. Consolidate placed concrete by mechanical vibrating equipment supplemented by hand-spading, rodding, or tamping. Use equipment and procedures for consolidation of concrete in accordance with ACI 309.
 - 2. Do not use vibrators to transport concrete inside forms. Insert and withdraw

vibrators vertically at uniformly spaced locations no farther than the visible effectiveness of the machine. Place vibrators to rapidly penetrate placed layer and at least 150mm into preceding layer. Do not insert vibrators into lower layers of concrete that have begun to set. At each insertion limit duration of vibration to time necessary to consolidate concrete and complete embedment of reinforcement and other embedded items without causing segregation of mix.

- E. Hot Weather Placement: When hot weather conditions exist that would impair quality and strength of concrete, place concrete complying with ACI 305 and as herein specified.
 - 1. Cool ingredients before mixing to maintain concrete temperature at time of placement to below 32 deg C. Mixing water may be chilled or chopped ice may be used to control temperature, provided water equivalent of ice is calculated to total amount of mixing water. Using liquid nitrogen to cool concrete is Contractor's option.
 - 2. Cover reinforcing steel with water soaked burlap if it becomes too hot, so that steel temperature will not exceed the ambient air temperature immediately before embedding in concrete.
 - 3. Fog spray forms, reinforcing steel, and sub-grade just before concrete is placed.
 - 4. Use water reducing retarding admixture when required by high temperatures, low humidity, or other adverse placing conditions, as acceptable to the COR.

6 FINISH OF FORMED SURFACES

- A. Smooth Form Finish: For Formed concrete surfaces exposed to view or to be covered with a coating material applied directly to concrete, or a covering material applied directly to concrete, such as waterproofing, damp proofing, veneer plaster, painting, or other similar system. This is an as-cast concrete surface obtained with selected form-facing material, arranged in an orderly and symmetrical manner with a minimum of seams. Repair and patch defective areas with fins and other projections completely removed and smoothed.
- B. Rough Formed Finish: For formed concrete not exposed to view in the finish work or concealed by other construction. This is the concrete surface having texture imparted by form facing material used, with tie holes and defective areas repaired and patched, and fins and other projections exceeding 6mm in height rubbed down or chipped off.
- C. Related Unformed Surfaces: At tops of walls, horizontal offsets, and similar unformed surfaces adjacent to formed surfaces, strike off smooth and finish with a texture matching adjacent formed surfaces. Continue final surface treatment of formed surfaces uniformly across adjacent unformed surfaces unless otherwise indicated.

7 CONCRETE CURING AND PROTECTION

- A. General: Protect freshly placed concrete from premature drying and excessive hot temperatures. In hot, dry, and windy weather protect concrete from rapid moisture loss before and during finishing operations with an evaporation control material. Apply according to manufacturer's instructions after screeding and bull floating, but before power floating and troweling.
- B. Start initial curing as soon as free water has disappeared from concrete surface after placing and finishing. Weather permitting, keep continuously moist for not less than 7 days.
- C. Curing Methods: Perform curing of concrete by curing and sealing compound, by moist

- curing, by moisture retaining cover curing, and combinations thereof, as herein specified.
- D. Provide moisture curing by the following methods:
 - 1. Keep concrete surface continuously wet by covering with water.
 - 2. Use continuous water fog spray.
 - 3. Cover concrete surface with specified absorptive cover, thoroughly saturate cover with water, and keep continuously wet. Place absorptive cover to provide coverage of concrete surfaces and edges, with a 100mm lap over adjacent absorptive covers.
 - E. Provide moisture retaining cover curing as follows:
 - 1. Cover concrete surfaces with moisture retaining cover for curing concrete, placed in widest practicable width with sides and ends lapped at least 75 mm and sealed by waterproof tape or adhesive. Immediately repair any holes or tears during curing period using cover material and waterproof tape.
 - F. Curing Formed Surfaces: Cure formed concrete surfaces, including underside of beams, supported slabs, and other similar surfaces, by moist curing with forms in place for the full curing period or until forms are removed. If forms are removed, continue curing by methods specified above, as applicable.

8 REMOVAL OF FORMS

- A. General: Formwork not supporting weight of concrete, such as sides of beams, curbs, and similar parts of the work, may be removed after cumulatively curing at not less than 10 deg C for 24 hours after placing concrete, provided concrete is sufficiently hard to not be damaged by form removal operations, and provided curing and protection operations are maintained.

9 REUSE OF FORMS

- A. Clean and repair surfaces of forms to be reused in the work. Split, frayed, delaminated, or otherwise damaged form facing material will not be acceptable for exposed surfaces. Apply new form coating compound as specified for new formwork.
- B. When forms are extended for successive concrete placement, thoroughly clean surfaces, remove fins and laitance, and tighten forms to close joints. Align and secure joint to avoid offsets. Do not use "patched" forms for exposed concrete surfaces except as acceptable to the COR.

10 MISCELLANEOUS CONCRETE ITEMS

- A. Filling In: Fill in holes and openings left in concrete structures for passage of work by other trades, unless otherwise shown or directed, after work of other trades is in place. Mix, place, and cure concrete as herein specified to blend with in-place construction. Provide other miscellaneous concrete filling shown or required to complete work.

11 CONCRETE SURFACE REPAIRS

- A. Patching Defective Areas: Repair and patch defective areas with cement mortar immediately after removing forms, when acceptable to the COR.
 - 1. Cut out honeycombs, rock pockets, voids over 6mm in any dimension, and holes left by tie rods and bolts down to solid concrete but in no case to a depth less than 25mm. Make edges of cuts perpendicular to the concrete surface. Thoroughly clean, dampen with water, and brush coat the area to be patched with bonding

agent. Place patching mortar before bonding agent has dried.

12 QUALITY CONTROL TESTING DURING CONSTRUCTION

- A. General: The Contractor will employ a testing laboratory to perform tests and submit test reports at the COR approved laboratory. Testing to be according to ACI 301.
- B. Sampling and testing for quality control during placement of concrete may include the following, as directed by the COR.
- C. Sampling Fresh Concrete: ASTM C 172, except modified for slump to comply with ASTM C 94.
 - 1. Slump: ASTM C 143; one test at point of discharge for each day's pour for each type of concrete; additional tests when concrete consistency seems to have changed.
 - 2. Concrete Temperature: Test hourly when air temperature is 4° Celsius and below, when 27° Celsius and above, and each time a set of compression test specimens is made.
 - 3. Compression Test Specimen: ASTM C 31; one set of four standard cylinders for each compressive strength test, unless otherwise directed. Mold and store cylinders for laboratory-cured test specimens except when field-cure test specimens are required.
 - 4. Compressive Strength Tests: ASTM C 39; one set for each day's pour; one specimen tested at 7 days, two specimens tested at 28 days, and one specimen retained in reserve for later testing if required.
 - 5. When the strength of field-cured cylinders is less than 85 percent of companion laboratory-cured cylinders, evaluate current operation and provide corrective procedures for protecting and curing the in-place concrete.
 - 6. Strength level of concrete will be considered satisfactory if averages of sets of three consecutive strength test results equal or exceed specified compressive strength, and no individual strength test fails below specified compressive strength by more than 3.5MPa.
- D. Test results will be reported in writing to COR within 24 hours after tests. Reports of compressive strength tests shall contain the project identification name and number, date of concrete placement, name of concrete testing service, concrete type and class, location of concrete batch in structure, design compressive strength at 28 days, concrete mix proportions and materials, compressive breaking strength, and type of break for both 7-day tests and 28-day tests.
- E. Nondestructive Testing: Impact hammer, sonoscope, other nondestructive device may be permitted but shall not be used as the sole basis for acceptance or rejection.
- F. Additional Tests: The testing service will make additional tests of in-place concrete when test results indicate specified concrete strengths and other characteristics have not been attained in the structure, as directed by the COR. Testing service may conduct tests to determine adequacy of concrete by cored cylinders complying with ASTM C 42, or by other methods as directed. Contractor shall pay for such tests when unacceptable concrete is verified.

13 QUALITY CONTROL

- A. The COR will provide inspection services.

**DIVISION 7
THERMAL AND MOISTURE PROTECTION
DIVISION 8
OPENINGS**

081400 WOOD DOOR SPECIFICATION

Hollow Core Wooden door:

- Thickness: >4 cm
- The door hanging style: 15cm x 3cm
- Heavy duty polished solid brass 4” hinges with ball bearing, without plastic ring size 100x75x3mm (ex BIM or equal). Install 3 set of hinges on every door leaf.
- Door handles VARIO brass lever handle 7551 with SES lockset.
- Heavy duty door closer ex “New Star” 80 series.
- Cover the door with 4mm teakwood on both sides.
- Door jamb shall be made out of 6x15cm kiln dry Kamper Wood and shall be dried between 12%-14%.
- The edges should have minimum 10mm thick solid wood.
- Finish with shellac, natural color.

Solid Core Door:

- Thickness: at least 4.5 cm.
- The door made of 4mm teakwood; 18mm block wood; 6mm plywood; 18mm teak block.
- Heavy duty polished solid brass 4” hinges with ball bearing, without plastic ring size 100x75x3mm (ex BIM or equal). Install 3 set of hinges on every door leaf.
- Door handles VARIO brass lever handle 7551 with SES lockset.
- Heavy duty door closer ex “New Star” 80 series.
- Install YALE security lock and door viewer (material will be GFE).
- Door jamb shall be made out of 6x15cm kiln dry Kamper Wood and shall be dried between 12%-14%.
- The edges should have minimum 10mm thick solid wood.
- Finish with shellac, natural color.

DIVISION 9 FINISHES

092910 GYPSUM BOARD CEILING

Ceiling Frame

1. Install gypsum board ceiling frame using one of the option below:
 - Hollow steel with minimum size 20x40x0.7mm and 40x40x0.7mm, installed with maximum distance 610x610mm for ceiling
 - Metal furring/metal stud with minimum thickness 0.5 mm, installed with maximum distance 400 mm for ceiling
 - Attach the frame to the existing building/roof structure using galvanized suspension rod with thread and adjustable nut.
2. Make sure that all frame installed according to the drawing.
3. Check and make sure that the frame is level and strong prior to installing the board.

Preparation

1. Examine and inspect materials to which gypsum board is to be applied. Remedy all defects prior to installation of gypsum board. Any defects in the finished installation due to misaligned framing or other cause will be the responsibility of the work performer.
2. Provide adequate ventilation.
3. All boards are to be properly cleaned and dry prior to installation.

Gypsum board shall be cut by scoring and breaking or by sawing, working from the face side. Where board meets projecting surfaces, it shall be scribed neatly.

Installation

1. Gypsum board shall be applied first at right angles to framing members, then to walls.
2. Boards at maximum practical lengths shall be used so that an absolute minimum number of end joints occur. Board shall be brought into contact with each other but shall not be forced into place.
3. Gypsum board shall be held in firm contact with the framing member while fasteners are being driven. Minimum distance from board edge and screw is 10-16 mm. Maximum distance between each screw is 200 mm on the board edge or 300 mm on the board center. Use factory recommended screw. Fastening shall proceed from the center portion of the board toward the edges and ends. Fasteners shall be set with the head slightly below the surface of the board in a dimple formed by the hammer or power screwdriver. Care shall be taken to avoid breaking the face paper of the board. Improperly driven nails or screws shall be removed.
4. Fill gap between each board with compound recommended by the manufacturer until full and even for first layer. Apply paper tape in the middle and press gently to release air bubble. Use cornice adhesive with per manufacturer recommendation for base and topcoat. Apply base coat to cover first layer and leave it dry prior to applying topcoat.
5. Use sand paper # 180 to smoothen the joint. Make sure that the joint has dried prior to sanding. Sanding direction shall be aligned with the joint line.
6. Required level of finish is level 4.
7. Install 12-14% kiln dried wood molding. Finish molding with shellac natural color.

Material

1. Gypsum board
9mm thick gypsum board for interior ceiling and 9 mm thick water resistant gypsum board in bathrooms, kitchen and other wet area. Use recessed edge board for flat surface installation.
2. Joint treatment material and adhesive
Asbestos free material per manufacturer recommendation
3. Wood molding
AR 05 Camphor wood for bathrooms and storage rooms
AR 35 Camphor wood for the rest of the interior ceiling.

Warranty

The contractor shall guarantee the ceiling work for 1 (one) year against improper installation, incomplete installation, sagging and crack.

093013 FLOOR AND WALL TILES

General

Conduct detailed survey and measurement prior to submitting the bid. Submit tiles samples to COR for approval. Samples that show full range of color and texture variations expected.

Installation

1. Provide protection not to disturbed area's adjacent working area.
2. Clean and prepare concrete floor to receive new tiles.
3. Soak tiles in clean water prior to installation.
4. Install guidance for tile pattern according to the drawing. Otherwise stated, position the tile at the center of the room to prevent inconsistent tile size at floor end side. Avoid cutting the tiles less than half of its width.
5. Apply 2-5 cm thick mortar bed made from 1 cement: 3 sand for wet area or 1 cement: 4 sand for dry area. Mix mortar with additive as required by the manufacturer.
6. Soak ceramic tiles in clean water prior to installation. Put tile on top of mortar bed and hit gently with rubber hammer to adjust its position and elevation. Use waterpass to check tile level. For vertical installation, the tile surfaces must be flush with the wall surface next to it.
7. Use spacer or nail with the right diameter according to predefined distance between each tiles. Make sure that the distance line is perfectly straight and perpendicular or align with the wall or floor.
8. Clean every single installed tile from mortar stain before it dries out.
9. Provide multiplex protection on installed tiles when there will be other works to be done on top of them afterward.
10. Provide construction joint along the edge where installed tiles boundary meet wall surface. Use 10 mm thick Styrofoam as construction joint material. Make sure that construction joint material will not be visible and perfectly covered with mortar and tiles.
11. For installment that cover vast area (more than 10 m²), provide expansion joints as follows:
 - For interior: every 10 m for all directions

- For exterior: every 5 m for all directions
- Use non-sag sealant filler with color as close as possible to the tile's color.
12. Fill gap between each tile 2x24 hours after tile installation.
 13. Clean all surface from dirt, dust and oil. Use clean cloth to wipe out the newly installed tiles. Do not use strong acid to clean up the tiles without permission from the COR.
 14. Provide spare tiles minimum 10% off the total covered area to the COR after the completion of the project as part of final acceptance procedures.

Materials

The tiles must be first grade quality with the following parameters:

1. Side dimension deviation permitted: max 0.4%
2. Side straightness deviation permitted: max 0.4%
3. Rectangularity deviation permitted: max 0.3%
4. Flatness deviation permitted: max 0.4%
5. Thickness deviation permitted: max 2%
6. Water absorption level: BIa (<0.2%) Bib (<2%)
7. Bending strength: $\geq 40\text{N/mm}^2$
8. Abrasion resistance: class IV

Make sure that each tile is free from crack, scratch, stain and other impairment that will affect the material's strength, durability and appearance.

Warranty

The contractor shall guarantee the new tiles for 1 (one) year against unfit installation, uncompleted installation, displacement, stripping off, popping, and crack on tiles and joint caused by improper installation.

099113 EXTERIOR PAINTING

General

Examine the areas and conditions under which painting is to be performed. Do not proceed the work until unsatisfactory conditions have been corrected. Provide "WET PAINT" signs to protect newly painted finishes. Protect and cover all areas adjacent to painting area.

Preparation on old exterior wall surface:

1. Remove existing damp (if any) exterior plaster up to wainscot height and re-plaster using mixture of 1 cement: 2 sand. Plasterwork above wainscot may use mixture of 1 cement: 4 sand depends on the condition of the wall.
2. Check any evidence of leak problem and fix the leak source thoroughly prior continue to the next step.
3. Remove all loose and or broken exterior plasters. Clean brick and mortar surface from loose particles. Re-plaster accordingly using non-shrink plaster.
4. Remove unused nail or other unused items from the wall as well. Repair wall accordingly.
5. Big wall cracks shall be chiseled approximately 2 cm wide down to the brick and re-plastered.
6. Apply skim coat of cement as needed to smoothen the exterior plaster surface.

7. Strip off loose paint and sand uneven or bumpy surface. Remove mildew, and soot on exterior walls. Clean wall surface using pressurized water or detergent solution.
8. For wall surface with mold, fungus and algae, scrape of the wall surface and clean wall surface with aqueous chemical, low odor, non-staining and completely biodegradable fungicidal wash to inhibit mold and fungus grow. Clean surfaces with water to clean up the acid.
9. Repair damage wall surface using wall filler or re-plaster with additional high molecular resin emulsion cement additive consisting of Ethylene-Vinyl acetate copolymer (EVA).
10. Check level of alkali level of the wall surface.
11. Test surface for humidity. Moisture level shall be less than 16% measured by protimeter.
12. Conduct old wall surface cleaning with dry cleaning method.
13. Apply 1 coat of application primer paint per manufacturer recommendation.
14. Do not continue plastering and painting until wall preparation is approved by COR.

Preparation on new exterior wall surface:

1. Check the flatness of the new wall. Flat Surface Tolerances: do not deviate more than plus or minus 5 mm in 3 m from a true plane in finished plaster surfaces, as measured by a 3-m straightedge placed at any location on surface.
2. Repair area where flatness level is not acceptable using wall filler or wall putty per manufacturer recommendation.
3. Clean the wall surfaces from stain, dirt or oil. Conduct old wall surface cleaning with dry cleaning method. If oil stain found on the surface, clean with detergent diluted in water and rinse off with clean water.
4. Make sure that the wall surface is really dry (about 1 month period after skim coat application) prior to applying new paint. Test surface for humidity. Moisture level shall be less than 16% measured by protimeter.
5. Apply 1 coat of application primer per manufacturer recommendation.
6. Do not continue painting until wall preparation is approved by COR.

Preparation on wooden surface:

1. Strip off existing paint layer.
2. Remove damaged surface and replace with same quality kiln dried wood.
3. Repair damaged surface that cannot be replaced with epoxy putty.
4. Sand wood to smoothen surface.
5. Clean wooden surface from all defective or poorly adhering material, dirt, grease, wax, oil, soot, dust, etc.
6. Apply 1 coat of epoxy clear primer per manufacturer recommendation.
7. Do not continue painting until surface preparation is approved by COR.

Preparation on metal surface:

1. Strip off existing paint layer.
2. Repair damaged and corroded surface and replace with same size metal.
3. Repair damaged surface that cannot be replaced with epoxy putty.
4. Sand metal to smoothen surface.
5. Clean wooden surface from all defective or poorly adhering material, dirt, grease, wax, oil, soot, dust, etc. Clean metal surface with dry cleaning method
6. Apply 1 coat of epoxy clear primer per manufacturer recommendation.

7. Do not continue painting until surface preparation is approved by COR.

Painting applications.

1. Do not paint over dirt, dust, rust, grease, moisture or mildew.
2. Apply paint as directed by manufacturer.
3. Apply first coat of paint to the surface that has been cleaned, pre-treated with sealer or otherwise prepared for painting as soon as practicable after preparation and before subsequent surface deterioration.
4. Allow sufficient time between successive coatings to permit proper drying. Moisture level shall be less than 16%. Do not re-coat until paint has dried to where it feels firm, does not deform or feel sticky under moderate thumb pressure, and the application or another coat of paint does not cause lifting or loss of adhesion of undercoat.
5. Apply additional coats when undercoats show through the final coat of paint, until the paint film is of uniform finish.
6. Ensure all edges, corners, crevices etc, are well painted.
7. Final coating should provide full, uniform coverage with no streaking, bleeding, or evidence of thinning. There should be no bumpy or wavy wall surface when the painting work has finished.
8. Clean all adjacent or nearby areas from any paint spot and mark with appropriate cleaning method without damaging the surface.

Materials:

Materials shall be delivered to the job site in original, new, and unopened packages and containers bearing manufacturer's name and label.

1. **Wall paint** Weather proof, anti-mould, anti fungus, and anti-algae, washable, quick drying, odorless, water and alkali resistant one component, water-based acrylic matt emulsion paint, color conforms to existing (Example: Ralston or Jotun or equal).
2. **Ceiling paint** Weather proof, anti-mould, anti fungus, and anti-algae, washable, quick drying, odorless, water and alkali resistant one component, water-based acrylic matt emulsion paint brilliant white color semi gloss finish (Example: Ralston or Jotun or equal).
3. **Wood paint** Turpentine based polyurethane gloss enamel paint (Example: Ralston or Jotun or equal).
4. **Metal paint** Turpentine based polyurethane gloss enamel paint (Example: Ralston or Jotun or equal).

Applicator:

The painting work specified in this specification must be executed by painting applicator that recommended by the paint manufacturer.

Warranty

The contractor shall guarantee the painting work for 5 (five) years against peeling off, mildew and discoloration.

099123 INTERIOR PAINTING

General

Examine the areas and conditions under which painting is to be performed. Do not proceed with the work until unsatisfactory conditions have been corrected. Provide "WET PAINT" signs to protect newly painted finishes. Protect and cover all areas adjacent to painting area.

Preparation on old interior wall surface:

1. Remove existing damp (if any) interior plaster up to wainscot height and re-plaster using mixture of 1cement: 2 sand. Plasterwork above wainscot may use mixture of 1cement: 4sand depends on the condition of the wall.
2. Check any evidence of leak problem and fix the leak source thoroughly prior continue to the next step.
3. Remove all loose and or broken interior plasters. Clean brick and mortar surface from loose particles. Re-plaster accordingly using non-shrink plaster.
4. Remove unused nail or other unused items from wall as well. Repair wall accordingly.
5. Big wall cracks shall be chiseled approximately 2 cm wide down to the brick and re-plastered.
6. When required to repair wall surfaces, apply mixture of white cement, grey cement and bondcrete with following ratio 1kg: 2kg: 50ml.
7. Strip off loose paint and sand uneven or bumpy surface. Remove mildew, and soot on interior wall. Clean wall surfaces using pressurized water or detergent solution.
8. For wall surface with mold, fungus and algae, scrape of the wall surface and clean wall surface with aqueous chemical, low odor, non-staining and completely biodegradable fungicidal wash to inhibit mold and fungus grow. Clean surfaces with water to clean up the acid.
9. Check level of alkali of the wall surface.
10. Test surface for humidity. Moisture level shall be less than 16% measured by protimeter.
11. Apply 1 coat of special acrylate copolymer solvent based resin wall primer sealer per manufacturer recommendation.
12. Do not continue plastering and painting until wall preparation is approved by COR.

Preparation on new interior wall surface:

1. Test surface for humidity. Moisture level shall be less than 16% measured by protimeter.
2. Check the flatness of the new wall. Flat Surface Tolerances: do not deviate more than plus or minus 5 mm in 3 m from a true plane in finished plaster surfaces, as measured by a 3-m straightedge placed at any location on surface.
3. Repair area where flatness level is not acceptable using mixture white cement, grey cement and bondcrete with following ratio 1kg: 2kg: 50ml when required.
4. Make sure that the wall surface is really dry (about 1 month period after skim coat application) prior to applying new paint. Test surface for humidity. Moisture level shall be less than 16%
5. Clean the wall surfaces from stain, dirt or oil. Conduct old wall surface cleaning with dry cleaning method. If oil stain found on the surface, clean with detergent diluted in water and rinse off with clean water.
6. Apply 1 (one) coat of water based anti alkali primer per manufacturer recommendation.

Preparation on wooden surface:

1. Strip off existing paint layer.
2. Remove damaged surface and replace with same quality kiln dried wood.
3. Repair damaged surface that cannot be replaced with epoxy putty.
4. Sand wood to smoothen surface.
5. Clean wooden surface from all defective or poorly adhering material, dirt, grease, wax, oil, soot, dust, etc.
6. Apply 1 coat of red color solvent based sealer anti corrosive primer per manufacturer recommendation.
7. Do not continue painting until surface preparation is approved by COR.

Preparation on metal surface:

1. Strip off existing paint layer.
2. Repair damaged and corroded surface and replace with same size metal.
3. Repair damaged surface that cannot be replaced with epoxy putty.
4. Sand metal to smoothen surface.
5. Clean wooden surface from all defective or poorly adhering material, dirt, grease, wax, oil, soot, dust, etc.
6. Apply 1 coat of quick drying solvent based anti corrosive zinc chromate free primer per manufacturer recommendation.
7. Do not continue painting until surface preparation is approved by COR.

Painting applications.

1. Do not paint over dirt, dust, rust, grease, moisture or mildew.
2. Apply paint as directed by manufacturer.
3. Apply first coat of paint to surface that have been cleaned, pre-treated with sealer or otherwise prepared for painting as soon as practicable after preparation and before subsequent surface deterioration.
4. Allow sufficient time between successive coatings to permit proper drying. Moisture level shall be less than 16%. Do not re coat until paint has dried to where it feels firm, does not deform or feel sticky under moderate thumb pressure, and the application or another coat of paint does not cause lifting or loss of adhesion of undercoat.
5. Apply additional coats when undercoats show through the final coat of paint, until the paint film is of uniform finish.
6. Ensure all edges, corners, crevices etc, are well painted.
7. Final coating should provide full, uniform coverage with no streaking, bleeding, or evidence of thinning. There should be no bumpy or wavy wall surface when the painting work has finished.
8. Clean all adjacent or nearby area form any paint spot and mark with appropriate cleaning method without damaging the surface.

Materials:

Materials shall be delivered to the job site in original, new, and unopened packages and containers bearing manufacturer's name and label.

1. **Wall paint:** Water based, washable, lead and mercury free, low color fading veova copolymer emulsion paint with lightfast pigment apple white color with

- pearl sheen finish. Paint should also be resistant to alkali and adhere strongly to surfaces (example : ICI Pearl Glo or equal).
2. **Ceiling paint:** Water based, lead and mercury free, low color fading acrylic copolymer emulsion paint with smooth matt finish, brilliant white color. Paint should also be resistant to alkali and adhere strongly to surfaces (ex ICI Pentalite or equal)
 3. **Bathroom and kitchen ceiling** Weather proof, anti-mould, anti fungus, and anti-algae, washable and low dirt pick up, lead and mercury free, low color fading characteristic, water and alkali resistant, water-based 100% acrylic emulsion paint brilliant white color semi gloss finish (ex ICI Weathershield or equal).
 4. **Wood paint:** Lead and mercury free, solvent based alkyd binder lightfast pigment gloss enamel paint.
 5. **Metal paint:** Lead and mercury free, solvent based alkyd binder lightfast pigment gloss enamel paint.

Warranty

The contractor shall guarantee the painting work for 5 (five) years against peeling off, mildew and discoloration.

**DIVISION 22
PLUMBING**

221000 PLUMBING

1. Install 1" PVC water pipe schedule 40 (ex. Rucika) complete with fittings for main distribution pipeline from water purifier up to main distribution pipeline above ceiling.
2. Install 3/4" PVC water pipes schedule 40 (ex. Rucika) complete with fittings for all vertical distribution pipelines from 1" main distribution pipeline to water outlet elevation.
3. Install 1/2" PVC water pipes schedule 40 (ex. Rucika) complete with fittings for all horizontal connection between vertical distribution pipeline to plumbing fixtures.
4. Install CPVC or galvanized hot water piping or equivalent from water heater to plumbing fixtures. All hot water pipelines must be covered with 1/4"x2" cork insulation (Permagum) to prevent heat loss. Use 1" hot water pipes for main distribution pipeline; 3/4" for vertical distribution pipeline and 1/2" for connection pipeline to plumbing fixtures.
5. Install 4" PVC drain pipes AW type schedule 40 (ex. Wavin) complete with fittings for toilet drain.
6. Install 2" PVC drain pipes AW type schedule 40 (ex. Wavin) complete with fittings for drain pipeline.
7. Replace sanitary bathroom fixtures and accessories as follows:
 - Toilet fixture "TOTO" CW 704 J, white complete with jet washer TGB 500 AZRV20
 - Recessed toilet paper holder "TOTO" type S 20 V2, white
 - Stainless steel paper holder TOTO TS116R
 - Wall hung lavatory "TOTO" LW 810 CJ white
 - Lavatory faucet "TOTO" TX 101 LB
 - Shower column set "TOTO" type TX 492 SRSZ
 - Recessed soap dish "TOTO" type S 161, white
 - Shelf with soap dish "TOTO" type S 211, white
 - Towel bar "TOTO" type TS 113 W
 - Stainless steel floor drain "TOTO" type TX 1BN
 - Stop valves "TOTO" TX227SV1
 - Flexible hose 1/2" "San Ei" 40cm long
 - Coat hangers with rubber doorstopper, to be installed behind bathroom door
 - Stainless steel Paper Towel Box "Bobrick or equal"
8. Install 1/2" black iron pipes for all gas pipelines complete with valves. All gas pipelines shall be exposed under the ceiling or on the wall with proper and steady clamps. Use threaded fitting for all pipe joints.
9. Install ANSI and MSS standard brass garden faucets with 3/4" outlet thread on some location as indicated in the drawing.

Warranty

The contractor shall guarantee the plumbing work for 1 (one) year against unfit installation, uncompleted installation, improper connections, improper insulation, broken piping and leaking.

DIVISION 26 ELECTRICAL

260600 ELECTRICAL

General

1. Electricity work shall be accomplished in accordance with drawings and the latest applicable standards of the U.S. National Electrical Code (NEC), and with the local codes and standards. In cases of conflict between the requirements of the different standards and codes, US, international, or local, the most stringent shall apply.
2. Contractor shall provide COR with the requirements for developing electrical demolition plans and new work electrical plans as shop drawing prior to the commencement of electrical work and provide load calculations, and wiring layout drawings prior to final acceptance of the work. Load calculation shall reflect the existing power load as indicated in the drawing and specification.
3. The Contractor shall perform electrical site survey to investigate and determine the existing conditions and location of existing equipment to be removed or relocated, identify the electrical demolition work.
4. Install light fixtures, switches, and receptacles and run cabling accordingly. Install light fixtures as specified in drawings. The below materials will be provided by contractor:
 - Switch ex “NATIONAL”.
 - Double outlet ex “Panasonic,” install one every 4 feet distance
 - Down Light lamp conform to existing type
5. The electric cable used in this project must be conform to the highest PLN standard or SPLN 41, SNI (Indonesian National Standard) and LMK (Lembaga Masalah Kelistrikan = Electricity Problems Council) standard.
6. Reinstall CB panel. Electrical panels shall be recessed in the walls.
 - Main Panel Service Equipment: The panel shall use molded case circuit breakers and be located, accessible to qualified and authorized personnel. Working clearances, clear spaces, illumination, headroom and access to live parts shall comply with the requirements of the National Electrical Code and/or other applicable regulations.
 - The main panel shall be labeled for service equipment duty, and shall be the commercial, standard off-the-shelf equipment, with lockable cover, neutral buss and grounding bar. The panel will be the existing material and shall be equipped with 35 Amp Main Circuit Breakers (MCB) for isolation. The panel shall have 30 group circuit breakers for all branch circuit. Trip rating and number of phases (poles) shall be suitable for the intended branch circuits. All protective devices shall be coordinated such that only the protective device closest to the fault will clear. Each device shall be capable of clearing the maximum fault available. Mount panel-boards not more than 1980 mm (78 inches) from finish floor to the top of the panels. Provide the following trip rated circuit breakers for insulated copper conductor sizes: 16A – 2.5 mm sq., 20A or 25A – 4 mm sq., 30A or 32A – 6 mm sq., 40A – 10 mm sq., 50A – 16 mm sq.
7. All outlets and switch boxes shall be recessed in the walls and flush with finished surface.
8. All single phase branch circuits shall be provided with dedicated neutral conductor. Sharing of neutral conductor between single phase branch circuit shall not be permitted.
9. Circuit Breakers, Residual Current Device (RCD), Earth Leakage, or Ground Fault Circuit Interrupting (GFCI) Protection: Provide GFCI protection outlet on all wet locations indoor

- or outdoor, in bathrooms, above countertops in kitchens. GFCI outlet will be GFE. Provide circuit breakers with earth leakage protection rated for 10mA ground fault trip.
10. Ensure that all Earth Leak Circuit Breakers (ELCB) are installed for all receptacles in bathrooms, kitchen sink area, and housing exterior receptacles. One ELCB may be utilized for several of the aforementioned locations, so long as the total loading is not expected to cause nuisance breaker tripping, as calculated in the below required Load Calculations.
 11. Contractor shall ensure that lighting and receptacle loads are kept separate to the greatest extent, and that loads are balanced between phases. All breakers shall be kept to a maximum average load of no more than 50% of their nameplate rating when installed. Phase to phase, and phase to neutral loads shall be balanced.
 12. Cabling in attic spaces shall be run in a neat, coordinated manner, with groupings of conductors routed in discrete conduit runs. All terminations shall be enclosed in covered junction boxes, with cable clamps installed to prevent accidental ripping of cable from foot traffic in attic spaces. Cable shall be stapled to rafters, joists, or trusses at every transition point where a cable crosses same.
 13. Use good quality cable connector ex “3M” or equivalent.
 14. All interior cabling shall be in conduit and conduit shall be installed in walls with no exposed or surface runs. Underground cabling shall be 3x2.5mm NYY cable with rigid conduit and waterproof junction box.
 15. Conduit: Install all cabling in PVC, concealed in walls and ceilings. The raceways to be used for housing conductors shall be PVC conduit. The minimum size of PVC conduits shall be 21 mm in diameter. Where required, cut walls to conceal conduits. After installation of concealed conduit, repair, patch and repaint all damaged surfaces to match finish. Completely paint all walls and ceilings to finish surfaces, where the electrical work has occurred.
 16. Wire and Cable: Branch circuits and feeder conductors shall be copper, sized at 125% of full load capacity. Aluminum conductors are not allowed. Each circuit shall have a full sized neutral conductor and a separate ground conductor. Non-metallic sheathed cables; armored and/or metal clad cables are NOT permitted under any circumstances. Branch circuit conductors shall be solid copper size 6mm² at minimum or stranded copper conductor size 10mm² at minimum.
 17. All splices and connections shall be made in junction boxes and or pull boxes.
 18. All splices and connections shall be made securely using wire nuts in such a manner as to equally engage all conductors. Insulation shall be free rupture, cuts or other damage that will expose metal conductors.
 19. All outlets and lighting fixtures shall be properly grounded.
 20. Provide a continuous grounding conductor for each feeder serving several panel boards.
 21. Grounding conductor shall be connected to each other related grounding bar.
 22. Grounding and Bonding – For a grounded system, all electrical equipment and appliances shall be grounded. All utility convenience receptacle outlets shall be the grounding type, and shall be effectively grounded.
 - 27.1. Verify that the service equipment is grounded in accordance with the NEC Code.
 - 27.2. Connect all branch circuits, panel-boards, junction boxes, receptacles, lighting outlets and switches, metal conduit, and all other metallic components of the electrical system with copper, equipment grounding conductors (green insulation) to the service entrance ground. All utility services shall be bonded to the main ground system for the residence.

23. Provide a separate insulated equipment-grounding conductor for each single or three-phase feeder and each branch unit.
24. Switches: Mount wall switched at 1050 mm above finished floor (AFF). Control ceiling-mounted lighting fixtures in dining rooms with wall-mounted dimmer switches.
25. Provide panel board labeling which identifies all branch circuits.
26. Laundry Equipment: Provide 20 Amp electrical power for all washers and dryers, operating at 220 V, 50 Hz.
27. Provide electrical power for central air conditioning, or wall/window mounted A/C units. All mechanical equipment shall be 220 V, 50Hz
28. The contractor must submit :
 - One Line Diagram: Provide complete one-line diagram showing the utility feeder, utility metering, the main service panel, branch circuit panel boards and feeders. The one-line diagram shall also show the relative location of all panel boards, feeders and other electrical equipment. Indicate the complete ratings of each equipment, the main service panel and branch circuit panels, quantity and sizes of conductors and conduits of each feeder.
 - Specifications: Provide all the required sections of the electrical specifications for all materials, devices, fixtures, appliances and equipment required in this project.
 - The installation: contractor shall obtain the necessary construction permits from the city or local authorities as required.
 - As built drawing of Electrical plan diagrams. Provide plan drawings of the electrical lighting and power systems in the house. Provide floor plans drawn into 1:100 scale.
 - Catalog, Cut Sheets: Provide sample catalog or cut sheets of all the electrical devices, light fixtures, receptacles, panel boards, circuit breakers and others that are required in this project.
 - Light Fixture Schedule Types: as per drawing.
 - Panel Schedules: Provide complete schedules of all panels. Indicate the trip, frame size, number of poles, short circuit ampere interrupting capacities of each main and circuit breaker. Indicate the conductor sizes of all feeders, branch circuits wires and conduits which house these circuits/feeders. Indicate the load in watts or volt-amperes of each circuit. Indicate the total loads of each of the 3 phases of each panel board in watts or volt-amperes. Balance the loads across the 3 phases of each panel board as close as possible. Re-arrange circuits between the 3 phases as required.
29. Contact with electrical power provider is the responsibility of the contractor.
30. An electrical outlet is required at the Distribution Device (DD). A dedicated non-switchable duplex outlet rated at 220 V shall be provided within 1.5 m of the DD. The height of the electrical outlet should be appropriate for the DD and associated equipment being installed, and shall be in compliance with applicable codes. An electrical power outlet that is convenient to each telecommunications outlet in the residence shall also be provided. Locate the power outlet close enough to the telecommunications outlet to prevent the need for a power extension cord. Mount power outlets at the same height as telecommunications outlets.

Warranty

The contractor shall guarantee the electrical work for 10 (ten) years against unfit installation, uncompleted installation, not working properly, unsecured connections, unsecured insulation and improper grounding.

DIVISION 27 COMMUNICATIONS

273000 VOICE COMMUNICATIONS

General

1. Telecommunications work shall be accomplished in accordance with drawings and the standard of ANSI/TIA/EIA 570-C Residential Telecommunications Cabling.
2. The Contractor shall perform site survey to investigate and determine the existing conditions and location of existing equipment to be removed or relocated, identify the communications system demolition work.
3. Provide sample of cabling and outlet to the COR for approval prior to the commencement of the work.
4. Provide shop drawing showing location of the outlet that reflects the real measurement and condition on site to the COR for approval prior to the execution of the work.
5. Remove existing cabling and receptacles entirely. Keep and protect the existing KTB (Kotak Telepon Bersama).
6. Install new telephone cabling and outlet. Telephone cabling and outlets shall be installed adjacent to electrical outlets. The Contractor to install telecommunication cable equivalent to CAT 6 cable as defined by the ISO-11801 and/or ANSI/EIA/TIA 568-B specifications. All telecommunications cable is to be installed as "home runs" from the wall to the existing telecommunications room (TR). Additionally, the Contractor to terminate all cabling conforming to the T568A specifications.
7. All outlets boxes shall be recessed in the walls and flush with finished surface.
8. A minimum of one telecommunication outlet location shall be cabled within each room or according to the drawing. Outlet mounting heights shall be in accordance with applicable codes. Mount power and telecommunications outlets at the same height within a space.
9. Cabling in attic spaces shall be run in a neat, coordinated manner, with groupings of conductors routed in discrete conduit runs. All terminations shall be enclosed in covered junction boxes, with cable clamps installed to prevent accidental ripping of cable from foot traffic in attic spaces. Cable shall be stapled to rafters, joists, or trusses at every transition point where a cable crosses same.
10. All interior cabling shall be in conduit and conduit shall be installed in walls with no exposed or surface runs. The raceways to be used for housing conductors shall be PVC conduit. The minimum size of PVC conduits shall be 21 mm in diameter. Where required, cut walls to conceal conduits. After installation of concealed conduit, repair, patch and repaint all damaged surfaces to match finish. Completely paint all walls and ceilings to finish surfaces, where the communications work has occurred.
11. Contact with the voice communications provider (TELKOM) when required is the responsibility of the contractor.

Warranty

The contractor shall guarantee the voice communications work for 1 (one) year against unfit installation, uncompleted installation, not working properly, unsecured connections, unsecured insulation and improper grounding.

DRAWING ATTACHMENT

See separate PDF attachment

End of scope of works.