

# **DOKUMEN TENDER & DESIGN CRITERIA - M&E; PROJECT**

## **PROYEK: GEDUNG KANTOR 15 LANTAI - AREA 12,000 M<sup>2</sup>**

KLIENT: PT. DEVELOPER INDONESIA

NILAI TENDER: Rp 45 Miliar

DURASI: 18 Bulan

### **A. DESIGN CRITERIA MEKANIKAL**

#### ***1. HVAC DESIGN PARAMETERS:***

- Outdoor design: 33°C DB, 28°C WB
- Indoor design: 24°C ± 1°C, 50-60% RH
- Air changes: 6 ACH untuk kantor, 12 ACH untuk meeting room
- Fresh air: 10 l/s/person sesuai ASHRAE 62.1

#### ***2. PLUMBING DESIGN:***

- Water demand: 50 m<sup>3</sup>/hari untuk 400 orang
- Hot water: 45-60°C untuk domestic use
- Pump head: 40-50 meter untuk building 15 lantai
- Storage capacity: 2 hari consumption

#### ***3. FIRE PROTECTION:***

- Hydrant: 500 gpm @ 100 psi
- Sprinkler: Ordinary Hazard Group 2
- Pump capacity: 1000 gpm @ 150 psi

## **B. DESIGN CRITERIA ELEKTRIKAL**

### ***1. ELECTRICAL LOAD CALCULATION:***

- Connected load: 2,800 kVA
- Demand load: 2,100 kVA (diversity 0.75)
- Transformer: 2 × 1250 kVA dry type
- Generator: 800 kVA standby

### ***2. LIGHTING DESIGN:***

- Average maintained illuminance: 400 lux
- Uniformity ratio: 0.6 minimum
- Glare index: 19 maximum
- Color rendering: CRI >80

### ***3. VOLTAGE DROP CALCULATION:***

- Feeder: max 2% voltage drop
- Branch circuit: max 3% voltage drop
- Formula:  $VD = (2 \times L \times I \times R) / 1000$

## **C. PERHITUNGAN BIAYA (BOQ)**

### ***1. MEKANIKAL COST BREAKDOWN:***

- HVAC System: Rp 18 Miliar
- Plumbing: Rp 4.5 Miliar
- Fire Protection: Rp 3.2 Miliar
- Total Mechanical: Rp 25.7 Miliar

## **2. ELEKTRIKAL COST BREAKDOWN:**

- Main Distribution: Rp 6.8 Miliar
- Lighting: Rp 3.5 Miliar
- Low Current Systems: Rp 2.5 Miliar
- Grounding & Protection: Rp 1.5 Miliar
- Total Electrical: Rp 14.3 Miliar

## **3. GRAND TOTAL M&E:: Rp 40 Miliar**

- Contingency 10%: Rp 4 Miliar
- Engineering Fee 2.5%: Rp 1 Miliar
- TOTAL TENDER: Rp 45 Miliar

## **D. SCHEDULE & MILESTONES**

**1. DESIGN PHASE: 3 Bulan**

**2. PROCUREMENT: 4 Bulan**

**3. INSTALLATION: 8 Bulan**

**4. TESTING & COMMISSIONING: 3 Bulan**

**5. TOTAL: 18 Bulan**

## **E. TECHNICAL REQUIREMENTS**

### **1. MATERIAL STANDARDS:**

- AC Equipment: ISO 9001, Eurovent Certified

- Pipes: SNI, ASTM, JIS Standards
- Electrical: IEC, ANSI, PUIL Compliance
- Cables: SNI 04-0059-1987

## ***2. PERFORMANCE GUARANTEE:***

- HVAC: COP min 3.2, noise <45 dB
- Lighting: L70 >50,000 hours
- Pumps: Efficiency >80%
- System availability: 99.5%