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***DIRECTORSHIP OF OPERATION AND MAINTENANCE***  
***Operation Directorate of Access Networks***

# **INDOOR PHONE INSTALLATION (CONCEALED) TECHNICAL SPECIFICATION**

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## **1. INTRODUCTION**

*In buildings that do not have indoor telephone system (concealed); the number of faults increase, these kinds of connections allow illicit calls from outside and cause visual pollution.*

*As a result of the attempts made by the Ministry of Environment Ministry of Public Works and Housing on this regard;*

*According to Article 69 of the Electrical Interior Facilities Regulation titled Weak Current Facility, the concealed installation projects for new buildings shall comply with the specifications issued by Turkish Telecommunication, building license shall not be issued without the control of the project, the application of the project shall be controlled on site, Using Building Permit shall not be issued for buildings that do not comply with the provisions of the specification, it is necessary to improve the conceals in old buildings that are not in compliance with the standards.*

*In this regard, necessary decisions have been taken in the Provincial Environment Committee and technical support is provided by Turkish Telecommunication to have telephone installation in old buildings and reasonable periods of time are given in accordance with the decision.*

*Electricians installing indoor telephones are being informed by ensuring the necessary coordination with relevant vocational institutions in provinces and electricians given participation certificates are announced to subscribers.*

*Transfer works are being done in the buildings with completed works without delay by Turkish Telecommunication; collected cables in the form of the fringes outside the building are being terminated in a box.*

## **2. DESCRIPTIONS:**

**INDOOR TELEPHONE SYSTEM (CONCEALED)** : It is the system that ensures the connection between the devices of the subscribers and the telephone network from the main entrance terminal box.

**TELEPHONE PLUG** : It is the place where the telephone is being correlated in the indoor telephone system. RJ11 connector telephone plugs that are in compliance with the TSE standard will be used.

**FLOOR TELEPHONE TERMINAL:** In extraordinary cases, it is the correlated terminal of the lines coming from the telephone outlet on the floor and lines coming from the main entrance of the building.

**INTERVAL TELEPHONE TERMINAL:** In extraordinary cases, it is the correlated terminal of the lines coming from the telephone outlet on the floor and lines coming from the main entrance of the building.

**BUILDING MAIN ENTRANCE TERMINAL:** It is the terminal correlating the telecommunication network and the building main line system.

**MAIN LINE SYSTEM** : It is the system providing the correlation between the floor of interval telephone terminal and the building main entrance terminal.

**INTERVAL TERMINAL BOX** : It is the covered terminal box serving more than one floor.

**FLOOR TERMINAL BOX:** Covered box where the floor phone terminals are installed.

**BUILDING MAIN ENTRANCE TERMINAL BOX:** Covered box where the building main entrance phone terminals are installed. These boxes will be made from a material that will provide necessary protection.

**TERMINAL BLOCK:** It is the connection element used to correlate the phone cables with the floor, interval and building main entrance terminal boxes regularly. Terminal boxes will be quick connecting type. Terminal blocks used or found appropriate by Turkish Telecommunication will be used. Screwed joint elements will not be used.

*(Two different terminal blocks are shown in Annex: 4 as an example)*

Prototype terminals will be used in building main entrance terminals. Shear terminal use is preferential. It is necessary to have the terminal of subscriber and network separated in the box.  
*(E.g.: Annex: 5)*

### **3. SORTIE OF TELEPHONE SYSTEM (TELEPHONE PLUG SYSTEM)**

3.1. The system will be done by cabling UTP (Unshielded Twisted Pair) CAT 5E complying with ANSI EIA/TIA 568B.2 standard through PVC pipe or a special channel up to floor or interval telephone terminals that will be put separately from the telephone plug. The materials will be in compliance with TSE.

3.2. Cables from the telephone plug to the floor or interval telephone terminal will be taken as monolithic and tips will be correlated to the terminal.

### **4. PARALLEL SORTIE OF TELEPHONE SYSTEM (TELEPHONE PARALLEL PLUG SYSTEM)**

4.1 The system will be done by cabling UTP (Unshielded Twisted Pair) CAT 5E complying with ANSI EIA/TIA 568B.2 standard through PVC pipe or a special channel up to floor or interval telephone terminals that will be put separately from the telephone parallel plug. The materials will be in compliance with TSE.

4.2 Parallel plug cables from the plug will be taken as monolithic and tips will be correlated to the terminal.

### **5. MAIN LINE SYSTEM**

5.1 The system will be done by cabling UTP (Unshielded Twisted Pair) CAT 5E complying with ANSI EIA/TIA 568B.2 standard through PVC pipe or a special channel up to floor or interval telephone terminals that will be put separately from the telephone parallel plug. The materials will be in compliance with TSE.

5.2 Cables from the telephone plug to the floor or interval telephone terminal will be taken as monolithic and tips will be correlated to the terminal. *(Column Distribution Scheme is shown as an example in Annex:2 and Annex: 3.)*

### **6. TELEPHONE TERMINAL BOXES**

#### **6.1. FLOOR AND INTERVAL TERMINAL BOXES**

6.1.1. Floor and interval terminal boxes, to be placed in obligatory cases, will be made of a material providing adequate protection. To terminate the cables, terminal block that will meet the phone contact compliance with the specification and project and will be placed inside this terminal box. *(Example: figures of floor and interval terminal box and terminal boxes are shown in Annex: 4 and Annex: 5)*

6.1.2. Floor and interval terminal boxes, in places appropriate to work in floors, will be done in moisture-free environment and away from heavy current installation.

6.1.3. If the floor and interval terminal boxes are installed in damp locations by necessity, waterproof material that will not leak moisture will be used.

#### **6.2. BUILDING MAIN ENTRANCE TERMINAL BOXES**

6.2.1. Building main entrance terminal boxes will be made of a material providing adequate protection. Terminal block that will meet the phone contact (taking into account the number of telephone sorties determined in Article 9.1.1) compliance with the specification and project and will be placed inside this terminal box. *(Sample pictures are shown in Annex: 4 and Annex: 5.)*

**6.2.2.** Building main entrance terminal box will be installed in the appropriate place. It is necessary to keep the boxes away from humid environment. If it is installed in damp locations by necessity, waterproof material that will not leak moisture will be used.

**6.2.3.** Building main entrance terminal box will be installed away from humidity, light, strong current installation, bell installation etc. facilities in multi-storey buildings each with an entrance and exit and by means of being unaffected of these facilities.

**6.2.4.** Building main entrance terminal box will be installed as one box. The box will be built-in and have lock system. Grounding will be the contact place and the cable entrance will be perforated.

6.2.5. Building main entrance boxes will have a schematic plan showing the subscriber connections.

6.2.6. The maintenance business responsibility regarding the services provided by the Turkish Telecommunication for these boxes will belong to Turkish Telecommunication.

## **7. NETWORK INSTALLATION OF TURKISH TELECOMMUNICATION NETWORK**

7.1. To provide the connection for the Telecommunication network in the network, an exit will be made with two 50 mm pipes in buildings with up to 200 phone plugs from the place where the building main entrance terminal box to outside the building. The pipe will be furnished to a depth of 40 cm from the ground and will be appointed in accordance with procedures. (Annex: shown schematically in Annex: 6) Further, additional pipe will be placed for other Telecommunication services if deemed necessary.

7.2. If the distance between the building cable entrance and frontage parcel boundary is more than 5 m. there will be a secondary additional room with a size of 60x80 cm from the building entrance to the pavement and a pipe with 100 mm width will be furnished to this additional room.

7.3. If the distance between the building cable entrance and frontage parcel boundary is less than 5 m. Two 50 mm pipe will be furnished from the building entrance to the pavement. (*Annex: 6 – Sample 3 drawing*)

7.4. If the building and the pavement are joint, two 50 mm pipe will be furnished from the building entrance to the pavement.

7.5. A building entrance terminal box will be placed in buildings with multiple entrances.

## **8. GROUNDING OF INDOOR TELEPHONE SYSTEM**

8.1. The grounding of building main entrance terminal box will be done in accordance with the current standards.

## **9. BASIS ON THE PREPARATION OF INDOOR PHONE INSTALLATION PROJECT**

### **9.1. EDIT MODE OF PROJECT**

The project will be established according to the following grounds.

9.1.1. When the project is being prepared, at least two telephone sorties shall be installed in dwellings. 1 CAT 5E cable will be installed for each apartment between the floor or interval telephone terminals and the building main entrance terminals. At least three telephone sorties will be installed in each workplace of building used as workplace. Independent CAT 5E cable will be furnished for each workplace.

9.1.2. The floor or interval terminal boxes will usually be installed on stair platforms. The boxes will be around 2 m. higher than the ground.

9.1.3. Cables from each floor or interval terminal box to main entrance terminal box will be taken as monolithic. Built-in stairwell installations will be taken as flush mounted and to prevent illicit communication, no installation will be made between one building to another.

9.1.4. Providing that separate pipes are furnished in each apartment from the building entrance terminal box, there will be connection to the building main entrance terminal box without placing floor and interval terminal boxes.

9.1.5. If there is more than 10 phone lines on each floor, it is advised to use a floor terminal box.

9.1.6. In adjacent duplex, triplex, etc. detached buildings, buildings main entrance terminal box will be put in place approximately 2 m. from the ground for each block

9.1.7. Pipe will be provided in accordance with the conditions of Article 7 of the specification from each building main entrance terminal box to the Telecommunication network.

**9.1.8.** Installation will take place with waterproof materials in humid places.

9.1.9. Installation will be projected away from heavy current installation, bell installation, etc. and shall not be affected from these. Also, lines such as bell, stair automatics, etc. will not be passed through the pipes where the telephone cables pass.

## **9.2. ISSUED TO BE STATED ON THE PROTECTS**

The following grounds will be stated upon the plan or the architectural project of each floor.

9.2.1 Points where phone sorties are located.

9.2.2 Point where the building main entrance terminal box is located.

9.2.3 Point where the floor or interval terminal box is located.

9.2.4. The route of the pipe where the building main entrance terminal box will be correlated with the Telecommunication network.

9.2.5. The route, length, type and amount of the cables used in the phone installation.

9.2.6. Diameter and length of PVC pipe.

## **9.3. DOCUMENTS TO BE INCLUDED IN THE PROJECT FILE**

1. The signs to be used in the project will be as shown in the Attachment 1; special signs other than these will be kept in a file as a list.
2. The projects will be filed by folding in 210x297 mm (A4) size.
3. An index will be included inside the file that will show the documents contained in the file.
4. The building's status plan will be drawn on the bottom corner of each sheet and respective parts will be scanned, adequate information will be provided for those who are preparing buildings and projects.

**9.3.5.** Projects will be given as three groups.

**10. GENERAL FEATURES OF UTP CAT TELEPHONE CABLES IN ACCORDANCE WITH ANSI EIA/TIA 568B.2 STANDARD**

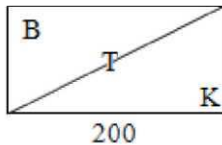
1. The cable will support communication in accordance with CAT 5E standards.
2. The cable conductor will be bare solid copper conductor.
3. The cable conductor will be of 24 (twenty four) AWG size
4. The cable will be of 4 (four) twisted pair conductor.
5. Colors of the conductors are as follows,
  - White/Blue x Blue for the first pair
  - White/Orange x Orange for the second pair
  - White/Green x Green for the third pair
  - White/Brown x Brown for the fourth pair.
6. For jacketing, Low Smoke Zero Halogen (LSOH) or PVC material will be used.
7. On the footage information provided on the cable, there will be the name of the manufacturer, standards taken basis during its manufacturing and approval, party number, length information and date of production.
8. UTP CAT 5E Cable parameters:

| Parameter                           | Range                     |
|-------------------------------------|---------------------------|
| Characteristic Impedance            | 100±6 Ohm (1-100 MHz)     |
| Twist Length                        | < 20 mm                   |
| Insulation Resistance               | > 999MO                   |
| Buckle Resistance                   | < 18 Ω/100 m              |
| Resistance Unbalance                | < % 2                     |
| Capacity between A-B                | < 50nF/Km                 |
| Capacity Unbalance between Circuits | < 200 pF/Km               |
| Attenuation                         | < 1,8 dB/ 100m ( 742 KHz) |
|                                     | < 2 dB/ 100m (1 MHz)      |
|                                     | < 22 dB/ 100m (100 MHz)   |

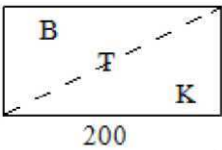
|   |                     |
|---|---------------------|
| NEXT LOSS<br>(Near-End Crosstalk Attenuation) | > 70 dB (742 KHz)   |
|   | > 68,3 dB (1 MHz)   |
|   | > 38,3 dB (100 MHz) |
| FEXT LOSS<br>(Far-End Crosstalk Attenuation)  | > 70 dB (742 KHz)   |
|   | > 67,8 dB (1 MHz)   |
|   | > 27,8 dB (100 MHz) |



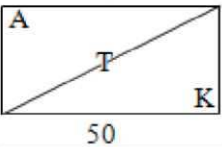
SYMBOLS USED IN THE PROJECT:



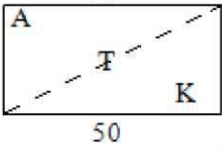
Building main entrance terminal box (200 V surface mounted)



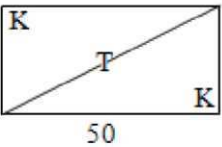
Building main entrance terminal box (200 V flush mounted)



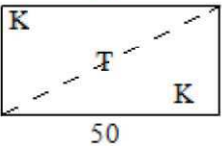
Interval terminal box (50 V surface mounted)



Interval terminal box (50 V flush mounted)



Floor terminal box (50 V surface mounted)



Floor terminal box (50 V flush mounted)

25 PVC -CAT 5E. ,~~ CAT 5E indoor telephone cable of 20 m length installed through a PVC 25 pipe

(flush mounted)

25 PVC -CAT 5E      CAT 5E indoor telephone cable of 20 m length installed through a PVC 25 pipe. (Over coating)

— .. — K 10x15- CAT 5E    —r. — CAT 5E indoor telephone cable of 20 m length installed through 10x15 cm size flush mounted channel

K 10x15-CAT 5E ----- CAT 5E indoor telephone cable of 20 m length installed through 10x15 cm size surface mounted channel.

PVC - 0 100                      Telekom underground installation route made with  
40m                                  a PVC pipe of 100 mm diameter and 40 m length.

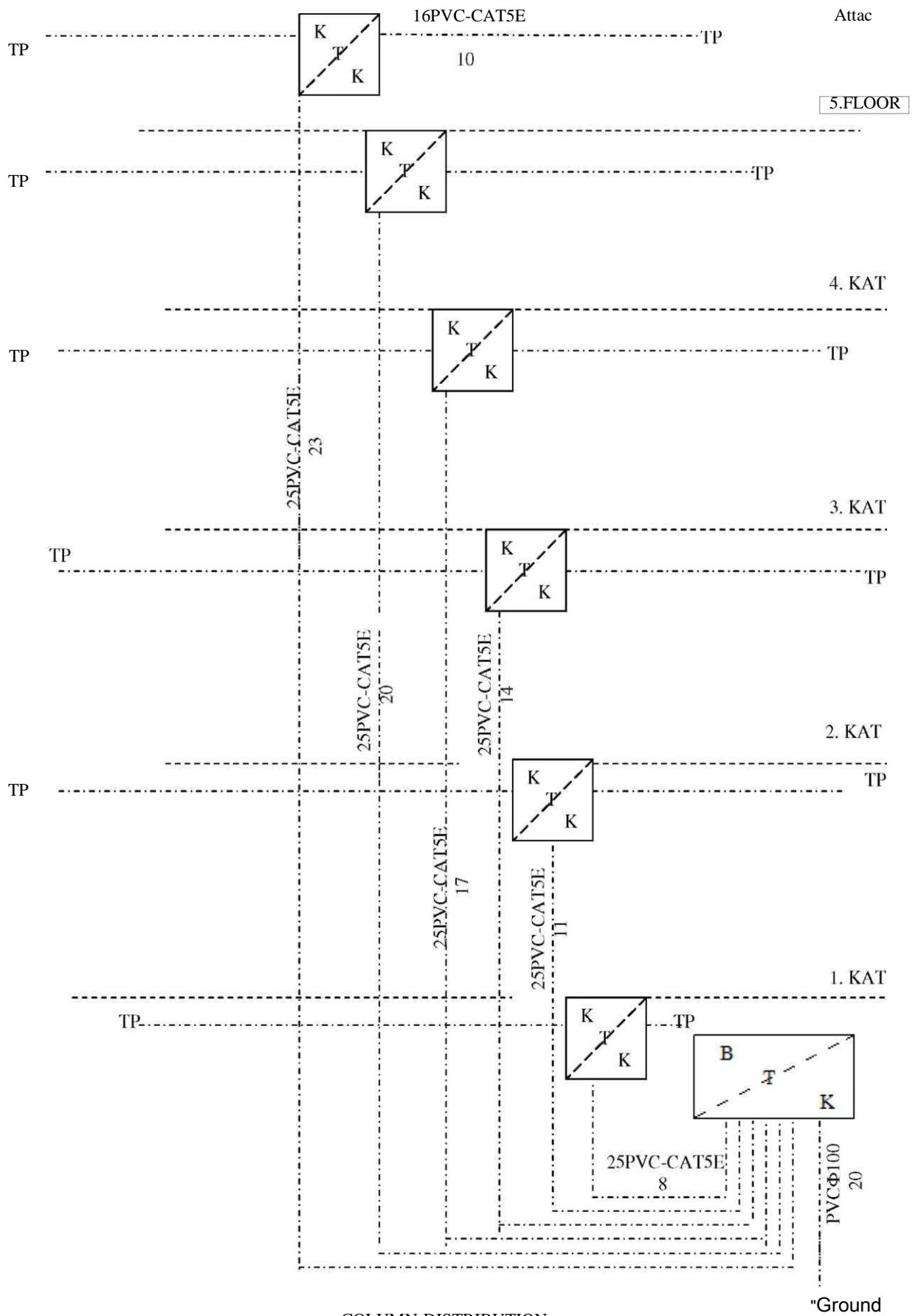
25 PVC - CAT 5E                      Telephone cable going to the top floor.

25 PVC - CAT 5E                      Telephone cable going to the ground floor.

----- ^                      Telephone cable coming from the ground floor and  
going to the top floor.  
25 PVC - CAT 5E

Telephone Plug.

Handset.



COLUMN DISTRIBUTION SCHEME

Addition room or Manhole

16PVC-CAT5E

Attachment : 3

TP

10

TP

5. FLOOR

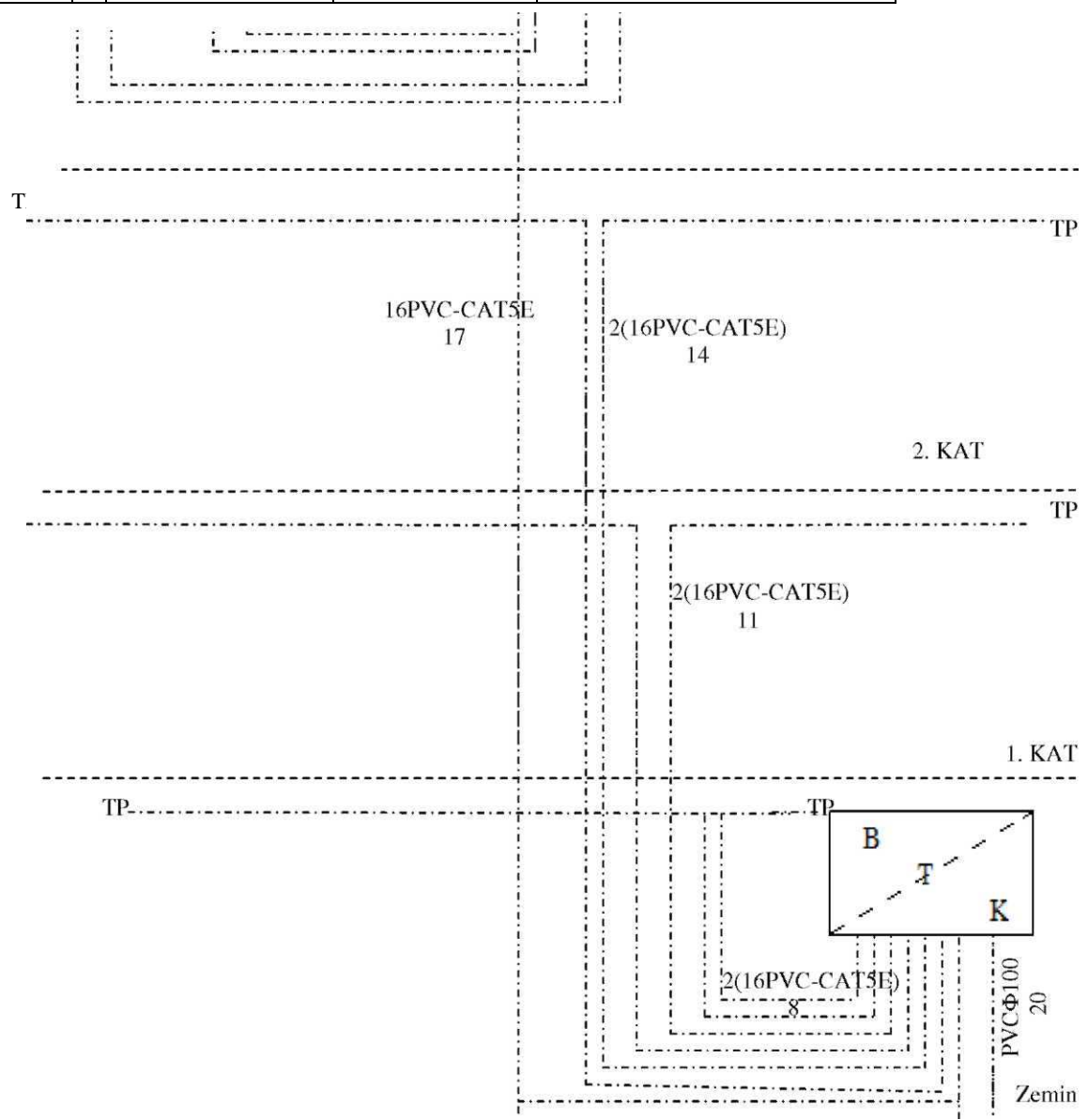
TP

2(16PVC-CAT5E)  
23

TP

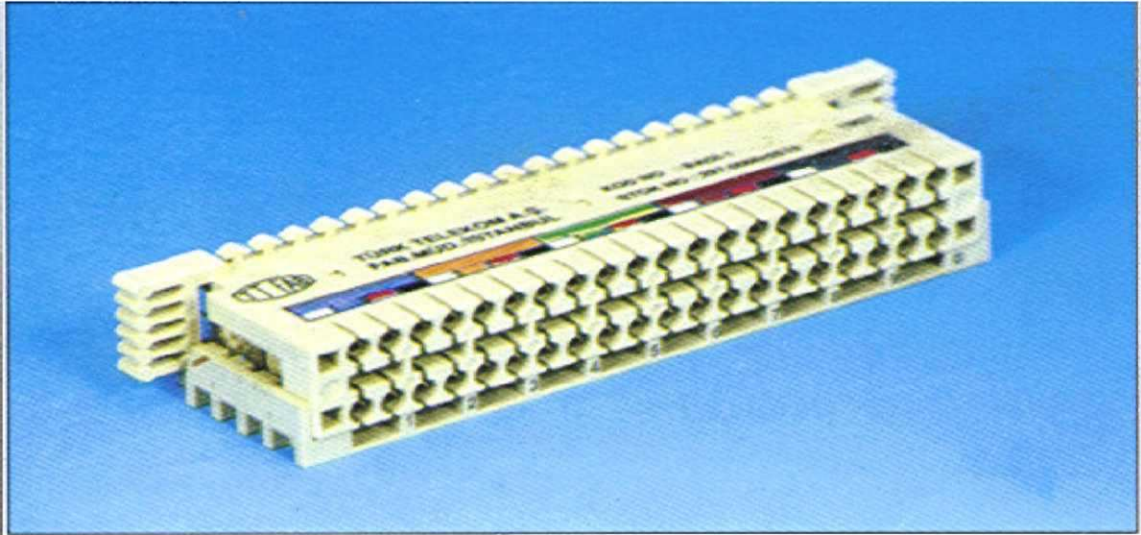
4. FLOOR

|    |  |  |  |  |   |     |         |
|----|--|--|--|--|---|-----|---------|
|    |  |  |  |  | A | - v |         |
| TP |  |  |  |  | K |     | .....TP |

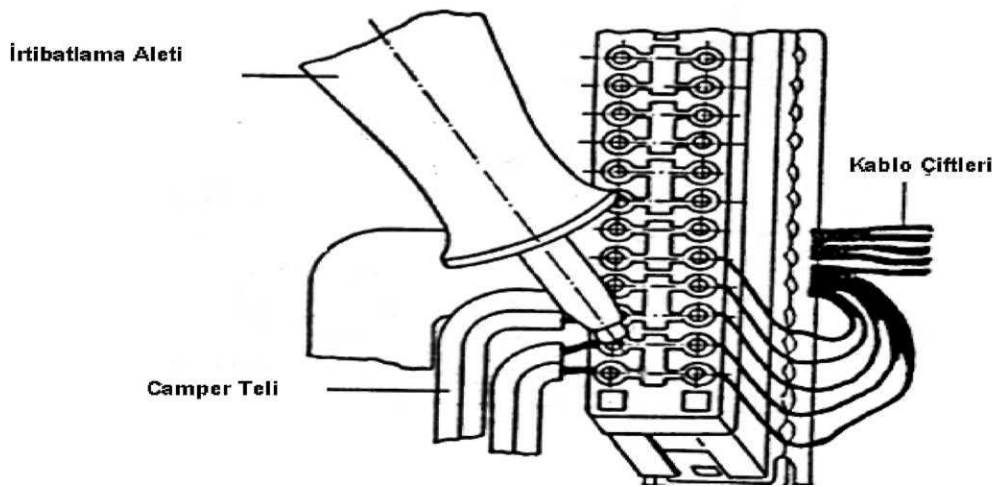


COLUMN DISTRIBUTION SCHEME

Additional Room or Mpnhl

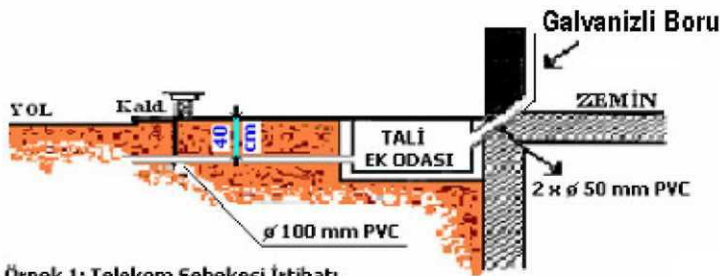


Terminal Bloęu Detayı

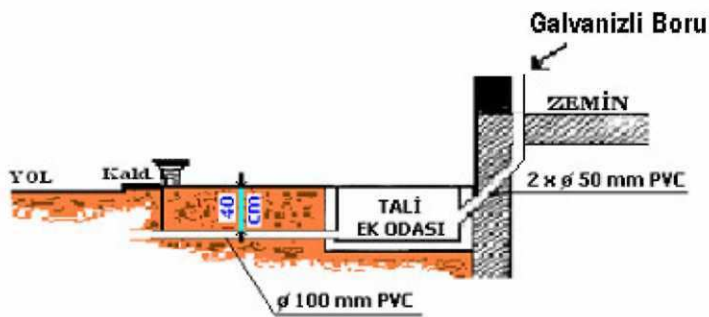




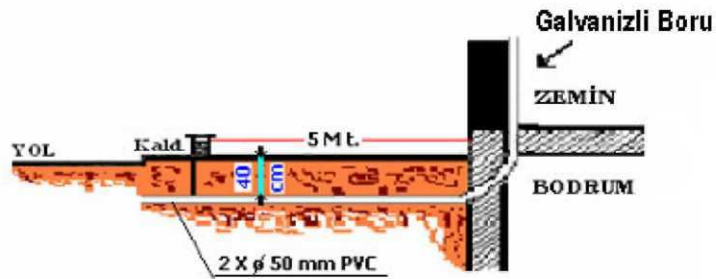
### TELEKOM ŞEBEKESİ BİNA GİRİŞ İRTİBATI:



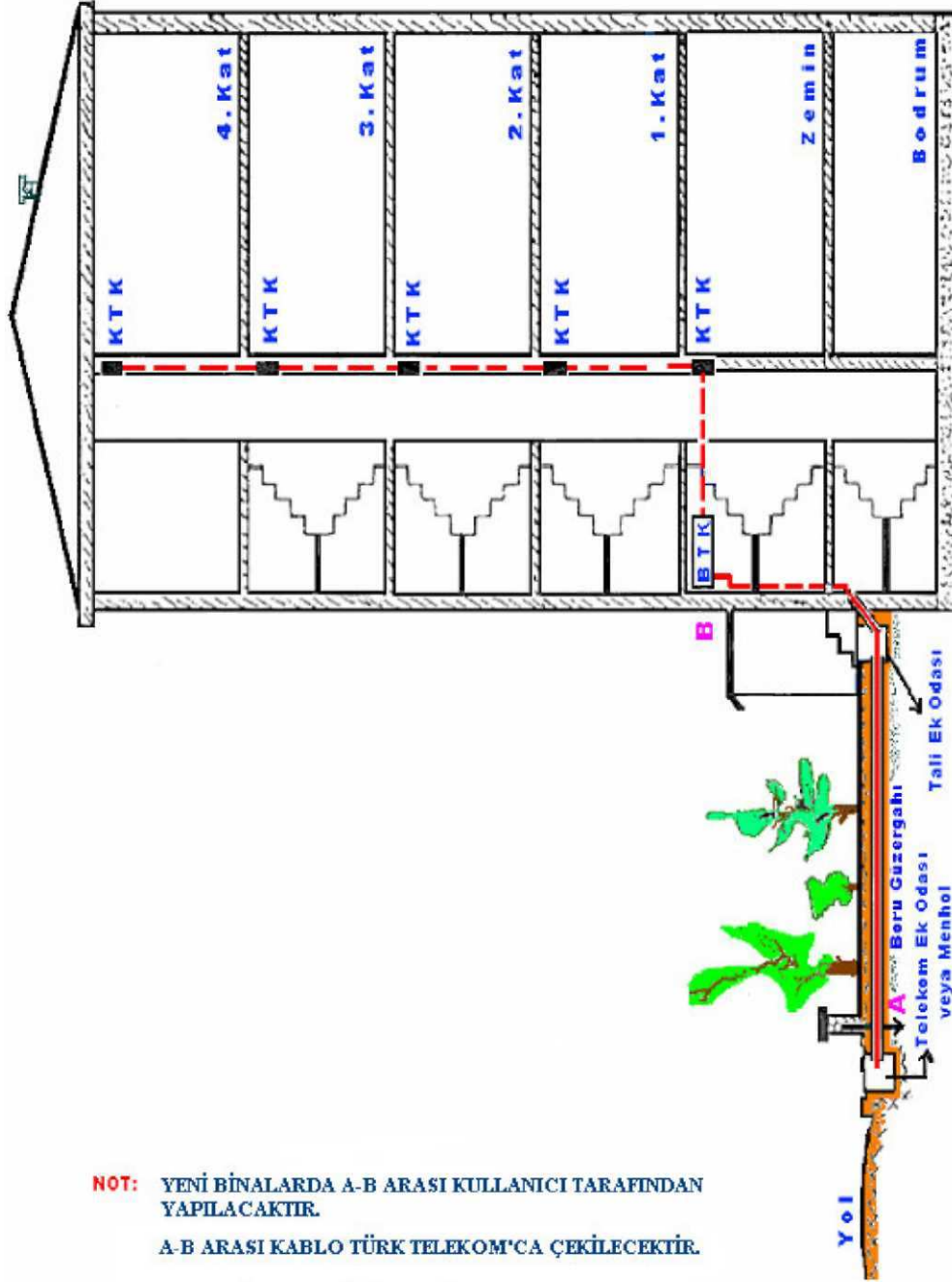
Örnek 1: Telekom Şebekesi İrtibatı.



Örnek 2: Telekom Şebekesi İrtibatı.

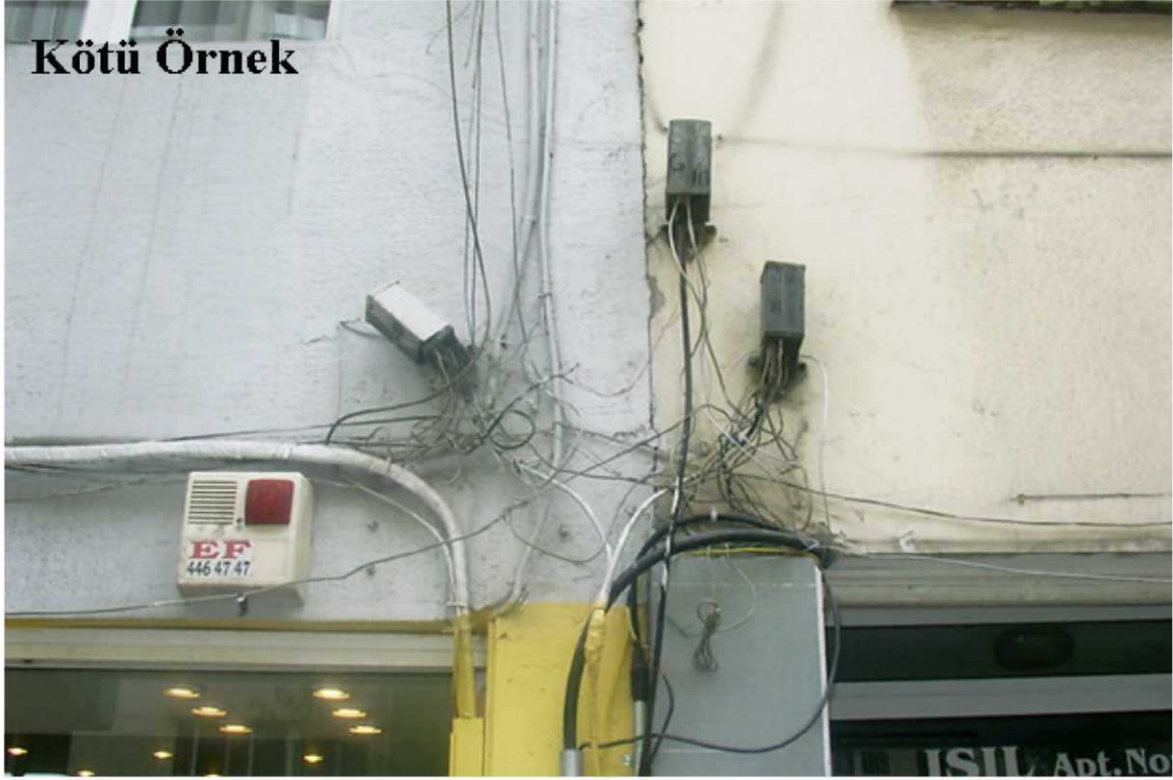


Örnek 3: Telekom Şebekesi İrtibatı.





**Kötü Örnek**



**İyi Örnek**



