# 2323 Project - Communication Civil Engineering Technological Design

## Volume 1: 2323-1 Project - Communication Civil Engineering Technological Design

Air Force Command Communication Engineering Design Institute

June 25, 2005

Claffication：TS Level：Secret

Index：S0501CJ01 Type：Design blueprint

# Project Name：2323-1 Project Communication Civil Engineering Design

Director: Zhang Wei
Design: Han Guangzhu
Review: Zhang Guocan

Project leader:
Individual project leader:

June 25, 2005

## I. Distribution of engineering Blueprints

**English translation is for reference only,**
**please refer to the original Chinese version for any discrepancies**

| Documentation name | Distributed units and number of copies | | | | | | |
|---|---|---|---|---|---|---|---|
| | Communications Department of Air Force Command | Air Force Logistics Design Bureau | Project Command | Design unit | Supervision unit | User Unit | Total |
| Full set of documents | 1 | 1 | 1 | 1 | | | 4 |
| Blueprint part | | | 2 | | | | 2 |
| | | | | | | | |
| | | | | | | | |

# Table of contents

# 2323-1 Project: Communication Civil Engineering Technological Design

## I. Project description

### 1. Project Overview

The 2323-1 project is an important part of the 2323 project and is a first-class project in the command protection communication projects. There are 22 communication equipment rooms and 20 communication elements in the communication hub in this project, with a usable area of 821.57$m^2$. Communication electricity usage is 556.3KVA. There are 185 single-shift staff on communication duty. In this project, each communication equipment room has communication channels or pipes to communicate with each other and with all the other gateways and rooms of this project, so as to facilitate the laying and layout of communication cables.

## 2. Design Basis

（1）Design tasks assigned by the Communications Department of the Air Force Command

（2）"Design Standards for Command Protection Communication Projects" (GJB4415-2002)

（3）Communications Element Requirements Published by the Communications Department of the Air Force Command

（4）Civil engineering blueprints for 2324-1 provided by Design Bureau of Air Force Logistics

（5）"Code for Design of Communication Piping and Channel Projects"（YD5007-2003）

（6）“Atlas of Communication Cables, Wiring and Piping”（YD5062-1998）

（7）"Atlas of Communication Cables and Channels"（YD5063-1998）

（8）"Communication Cable Junction Box"（YD/T740-95）

（9）Related equipment technical information provided by the manufacturer

3. Design scope

2323-1 Project communication civil engineering requirements and design of communication channels, pipes, and communication manholes.

## II. General requirements for communication civil engineering

1. Communication equipment room design and layout requirements

Please refer to Schedule 1 for the communication equipment room design and equipment configuration。

## 2. Protection standards and requirements

2.1 The command protection communication projects must be constructed in accordance with the requirements of "anti-electronic interference, anti-precision strike, anti-reconnaissance, and surveillance".

2.2 The protection level of the command protection communication projects shall be implemented in accordance with the "Tactical and Technical Requirements for the Renovation of Command Protection Projects".

2.3 The electromagnetic pulse protection requirements for command protection communication projects shall be implemented in accordance with GJB 3928.

2.4 The shielding body of the shielded equipment room must be well grounded, its grounding point must be set on the outer surface and at the same place as the grounding point of the wave filter for the power of the shielded equipment room, and it must be connected with the general

collecting ring (bar) of the common grounding body with copper bars.

2.5 There must be more than two routes for communication cables in and out of this project and corresponding anti-nuclear electromagnetic pulse interference measures.

2.6 All kinds of cables in and out of this project should be installed (set up) with anti-nuclear electromagnetic pulse interference devices.

2.7 All kinds of cables in and out of this project should be installed (set up) with wave filters and waveguides.

2.8 The camouflage level of this project is three.

3. Gateway piping requirements

3.1 This project should set more than two cable gateways, and take corresponding measures to prevent nuclear electromagnetic pulse damage to the pipelines and cables in and out of the project.

3.2 The air pipes and water pipes in and out of the project should be metal pipes, and non-metal pipes of not less than 10 meters should be used for isolation from the inside side of the protective door.

3.3 The communication optical cable in and out of the project shall use non-metallic optical cable.

3.4 Communication cables in and out of the project gateways should be introduced through steel pipes. The number of spare steel pipes should not be less than 30% of the actual number of steel pipes used.

4. Architectural and structural requirements

4.1 In addition to meeting the evacuation requirements, the main channel should also meet the handling width of communication equipment, which generally is not less than 1.6 meters; the width of the wiring channel is not less than 1 meter.

4.2 The seismic isolation requirements of the communication equipment room shall be implemented in accordance with GJB 4148-2000.

4.3 The ground, wall and ceiling should be flat, smooth, without cracks and leakage, and the surface materials should be fireproof, moisture-proof, wear-resistant, non-toxic and dust-free.

4.4 When an anti-static raised floor is laid on the ground, the surface resistance and system resistance should be between 1×105Ω ～ 1×109Ω.

4.5 Rooms with anti-noise requirements shall take measures for isolation and noise reduction, and the allowable noise level shall meet the requirements of Schedule 4.

4.6The door of each room should be opened to the aisle, and the height of the door opening should not be less than 2.1 meters; the width of the door opening should not be less than 1.0 meters

for the single door, and not be less than 1.5 meters for the double doors.

4.7 The distance between communication cables and air pipes and water pipes should be greater than 0.3 meters.

4.8 The communication technological design of architectures and structures shall meet the requirements of Schedule 2.

5. Ventilation and air conditioning requirements

5.1 The temperature and humidity of the communication equipment room should meet the requirements of Schedule 3.

5.2 The fresh air volume of the communication equipment room should not be less than 30m3/H·P.

5.3 The communication equipment room should take noise reduction and dust filtering measures, and the indoor noise and cleanliness should

meet the requirements of Schedule 2 and Schedule 3.

5.4 The communication equipment room shall be provided with an independent ventilation and air-conditioning system, and the air-conditioning equipment shall adopt an automatic temperature adjustment device.

6. Fire protection, water supply and drainage requirements

6.1 The communication area should implement a fire partition, set partition doors and fire dampers, and implement centralized and unified control.

6.2 Fire alarms and gas fire extinguishing systems or portable fire extinguishers should be installed in the equipment room. Water, carbon dioxide and foam fire extinguishing systems are strictly prohibited; closed suffocation should be used for small spaces, and halogenated alkane fire extinguishing systems can be used for rooms over 50m2.

6.3 The fire extinguishing media in the same project should be the same.

6.4 The domestic water consumption of communication duty personnel should not be less than 100L/P·D～150L/P·D, and the water quality should meet the sanitary standards for drinking water.

6.5 Water supply and drainage equipment and facilities should not be installed or passed in the communication equipment room.

7. Power supply and electrical lighting requirements

7.1 The power supply load level shall be the highest load level of the project power supply.

7.2 The power supply of communication equipment should be strictly separated from other power supply circuits such as force and lighting.

7.3 The power supply mode should be 380V/220V, TN-S three-phase five-wire system. The power distribution cabinet in the communication power

room should be guaranteed with at least two 380V/220V AC power supply routes, and the capacity of each supply route should be able to meet the maximum power load of all communication equipment. See Schedule 1 for the maximum electricity load of communication equipment.

7.4 Communication cables and power cables should be laid on separate sides. If they are laid on the same side due to certain constraints, the distance between them should be greater than 0.3 meters; when the distance is less than 0.3 meters, shielding trenches or hidden cables through steel pipes should be used.

7.5 The electrical lighting of the communication equipment room shall meet the requirements of Schedule 4.

7.6 The illuminance value of emergency lighting should not be lower than 10% of the normal lighting illuminance value, and its continuous lighting time should not be less than 0.5h.

7.7 The transition time between emergency lighting and normal lighting should not be less than 0.5s, and emergency lighting should use powered emergency lighting.

7.8 Lighting power cables entering the shielded equipment room should be concentrated at one gateway, and wave filters should be installed at the gateway.

## 8. Grounding Requirements

8.1 The grounding of the project should adopt the joint grounding method, and the grounding resistance value should be less than 1Ω.

8.2 The grounding busbar of the power system and the anti-nuclear electromagnetic pulse device must be connected to the general collecting ring (bar) of the common grounding body.

8.3 The common grounding body can be a natural foundation grounding body composed of protection layer covered steel bars such as project architecture and reservoirs. When the

resistance value of the natural foundation grounding body does not meet the requirements, an artificial grounding body should be set up.

8.4 The cross-sectional area of the connecting line of the general collecting ring (bar) of the common grounding body should not be less than 150mm2 of copper bars.

8.5 A 40mm×3mm copper bar should be laid in the trench of the communication equipment room as the ground wiring point.

8.6 The shielding body and shielding door, metal air pipe, water pipe, cable (wire), threading pipe, metal shell or base of various equipment and other non-charged metal parts of the shielded equipment room should be reliably connected to the ground wire.

## III. Blueprint design

1. Design description

1.1 Corridor trench

1.1.1 The crosspoint trench from the north entrance to the mechanical entrance port should be connected with the trench from the mechanical port communication trench to the new command hall. The mechanical port communication trench should be located on the west side of the corridor trench, and a layer of optical cable brackets should be embedded horizontally on the west side of the communication trench. A bracket should be 1m away from the next bracket and 300mm away from the bottom of the trench cover.

1.1.2 There should be a communication trench in the corridor trench from the east entrance to the communication equipment room, a layer of optical cable brackets should be embedded horizontally on one side of the trench wall in the communication trench, and a bracket should be 1m away from the next bracket and 300mm away from the bottom of the trench cover. Three 100mm steel pipes should be pre-buried where the trench

passes through the steps, their positions should be aligned with the middle of the cable brackets, and inspection wells should be set at both ends of the steel pipes.

1.1.3 The west entrance and the new west entrance should be connected by a trench to the communication equipment room, a layer of optical cable brackets should be embedded horizontally on one side of the trench wall in the communication trench, and a bracket should be 1m away from the next bracket and 300mm away from the bottom of the trench cover.

1.1.4 Install a 9-hole PVC pipe and a 4-hole PVC pipe on the optical cable bracket, and fix them on the optical cable bracket with a fixing flat steel and a fixing bolt. The dimensions of both PVC pipes are 107mm × 107mm.

1.1.5 The bracket should be made of 50mm×50mm angle steel, with an outer length of 400mm and a buried depth of 200mm. Two 8mm×20mm strip bolt connection holes should be reserved on the angle steel, their positions

should be center symmetrical on the horizontal edge of the outer long part, and the center spacing of the two holes should be 250mm.

1.1.6 Set up an inspection well every 18 meters or so on the trench cover and reserve inspection wells at the corners, the connection points with the equipment room trench, and on both sides of the protective door. The wells should be located in the middle of the communication trench. The PVC pipe should have reserved operating space at the inspection well. The bracket spacing can be adjusted appropriately under the inspection wells, so that the brackets are located at both ends of the inspection wells, with an interval of 1000mm.

1.1.7 Six 50mm steel pipes should be embedded horizontally where the PVC pipes pass through the protective door, and their position should be aligned with the middle of the cable bracket. Inspection wells should be set at both ends of the protective door.

1.2 Equipment room trench

1.2.1 Reserve a 500mm×400mm equipment room trench from the original main indoor battlefield radio management to the bottom of the wall opposite the door of the communication situation research room, 200mm away from the wall. The treach should be connected with the corridor trench at both ends. The trench should be covered with a movable cover, and the load-bearing capacity should be the same as the ground of the equipment room.

1.2.2 Reserve a 500mm×400mm equipment room trench from the air-conditioning equipment room on the east side of the original main room to the bottom of the wall opposite the door of the communication shift waiting room, 200mm away from the wall. The treach should be connected to the battlefield radio management room trench at the shift waiting room. The trench should be covered with a movable cover, and the load-bearing capacity should be the same as the ground of the equipment room.

1.2.3 Reserve a 500mm×400mm equipment room trench from the No. 24 lounge to the bottom of

the wall opposite the door of the flexible usage room, 200mm away from the wall. The treach should be connected to the communication situation research room trench at the flexible usage room. The trench should be covered with a movable cover, and the load-bearing capacity should be the same as the ground of the equipment room.

1.2.4 The air-conditioning equipment room and the No. 24 lounge trench should be connected to the corridor trench.

1.2.5 Lay a 3×40mm red copper belt on one side of the trench bottom in the equipment room as the grounding bus. Leave a bolt connection hole with a diameter of 8mm every meter apart on the red copper belt. The grounding bus should be connected to the grounding main trunk.

1.3 Entrance Manholes

1.3.1 Set a No. 2 manhole at the north entrance, the mechanical entrance and the east entrance, and pre-bury three 100mm steel pipes between

the manhole and the first explosion wave proof inspection well to lay the optical cable.

1.3.2 Set a No. 2 manhole at the west entrance and the new west entrance, and pre-bury three 100mm steel pipes between the manhole and the first explosion wave proof inspection well to lay the optical cable.

1.4 Telephone junction box

1.4.1 For details of the telephone junction box, please refer to the volume about the audio junction box.

1.4.2 The communication cable junction box shall meet the requirements of the YD/T740-95 standard.

# 2. Design

English translation is for reference only,
please refer to the original Chinese version for any discrepancies

# Table of contents