

	GOLGOHAR STEEL PROJECT	
	Technical Specification For Telephone System of Weighing	
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Technical Specification For Telephone System of Weighing

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1.0 SCOPE

This specification covers the requirements for the design, construction and supply of conventional telephone system in Golgohar Steel Project.

1.1. Terms and Definitions

In construing this specification following words and expressions shall have the meanings as follows:

Project	Golgohar Steel Project
Client	Golgohar Mining & Industrial Company

2.0 ABBREVIATIONS

AER: Auxiliary Equipment Room

MFR: Manufacturer of telecom equipment

DTMF: Dual Tone Multi Frequency

DP: Decade Pulse

PABX: Private Automatic Branch Exchange

MCR: Main Control Room

ACB: Automatic Central Battery

MDF: Main Distribution Frame

IDF: Intermediate Distribution Frame

UPS: Uninterruptible Power Supply

IP: Ingress Protection degree

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3.0 Conditions and Regulations

3.1. Conditions of Operation

All of the Electrical Equipment & Systems will be suitable for 24 hours, 7 days/week, 365 days/year operation.

3.2. Plant Location

The Site is located at Gol-E-Gohar Iron Ore Complex, situated in Sirjan, Province of Kerman in southern part of Islamic Republic of IRAN, approximately 285 km southwest of Kerman city and 335 km north of Bandar Abbas port, in a semi-desertic high plateau terrain, 1750 m above sea level, and flanked by mountains over 2500 m high trending northwest to southwest.

3.3. Meteorological

Ambient Temperature

Max. Temperature:	+40 deg. C (Recorded)
	+50 deg. C (Design)
Min. temperature:	-12 deg. C (Recorded)
	-10 deg. C (Design)
Average temperature:	+15.9 deg. C (Design)
Wet bulb design temperature (summer):	+25 deg C
Relative Humidity:	Max. 70%

Wind Velocity

According to National Iranian Code (6th revision):

Basic speed data:	130 Km/h
Basic pressure data:	0.845 KN/m ²
Correction factor:	

0 - 10 m:	2
10 - 20 m:	2.2
20 - 100 m:	2.4

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Rainfall

Yearly 120 mm (average)

Monthly rainfall 260mm (Max)

Barometric Pressure

820 milliards

Geological Conditions

This data is belongs to the existing palletizing plant location. For the engineering the contractor shall be study geotechnical conditions for the essential location according to the project plan.

Altitude: About 1,750 m above mean sea level

Soil bearing: approx. 20t/m²

Ground water level: approx. 60 m below ground level

Earthquake Load

Equipment in plant will be dimensioned including a safety calculation against earthquake according to the "Iranian Code for Seismic Resistant Design of Buildings

– Publication No. S253-2nd edition, autumn 1999" ("Iranian Regulations 2800") and "Minimum

Design Loads for Building and Structures" (Iranian Regulations 519).

- Design base acceleration: 0.3·g

- Classification of Buildings: Group 2

- Soil classification: soil type III-b

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4.0 CODES & STANDARDS

The systems will meet, as far as applicable the latest edition of the following recommendation:

- IEC 60065	Audio, Video and Similar Electronic Apparatus- Safety Requirement
- IEC 60529	Degrees of Protection Provided by Enclosures (IP code)
- IEC 60617-1	Guide for Graphical symbols for Electrical Power Telecommunications and Electronic Diagrams
- IEC 61938	Audio, video and audiovisual systems - Interconnections and matching values - Preferred matching values of analogue signals
- ITU-T Q.35	Technical characteristics of tones for the telephone service
- ITU-T G.711	Pulse code modulation (PCM) of voice frequencies
- EIA/TIA-568	Commercial Building Telecommunications Cabling Standards

Any other Code recognized in the country of origin of materials and equipment, will be considered when equivalent or more stringent than the specified ones above.

All the materials in safety execution will be supplied with type test certificates issued by a recognized laboratory (e.g. PTB, CESI, BASEEFA, etc.).

Supplier without ISO 9000 Quality Management and Quality Assurance Standards certification must not be accepted.

Any contracted services/supplies not covered by or not having ISO 9001/9002 certification will be subject to CLIENT audit requirements.

The general criteria for installation of the electrical and/or instrumentation systems will be followed as far as applicable.

5.0 SYSTEM OF MEASUREMENT

Supplier engineering design shall be performed using the metric system of measurements (SI system) with the exception of sizes of piping and equipment flanges & nozzles, which shall be in Imperial units "inch".

The following table indicates the normal dimensions of main properties in various systems of measurements to be used for the project.

- Temperature °C
- Pressure barg, bar abs, mbar
- Volume m³, l, BBL
- Mass or weight gramme, kg, tonne

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- Length mm, m, km
- Power W, kW, MW
- Electric Current A, mA
- Surface Area m²
- Velocity m/s
- Sound dB(A)
- Frequency Hz
- Rotational frequency RPM
- Nominal pipe diameter Inch
- Nozzle Size Inch
- Thickness mm

6.0 EQUIPMENT CHARACTERISTICS

The materials shall have characteristics suitable for the place of installation, the duty and transport conditions.

The equipment shall be fully solid-state type. Use of widely employed and easily available components shall be maximized.

All units shall be assembled and wired in accordance with the latest industry standards and techniques.

The system shall be as free as possible of circuitry requiring frequent adjustments and shall be for continuous duty operation.

7.0 TECHNICAL SPECIFICATION

7.1. Telephone System

The analog telephone system in this project shall be able to connected to upstream existing PABX. The interface cables shall be supplied by owner.

The telephone system will be used for plant operation and allow for internal and external telephone/fax.

The external exchange lines will be provided by client in control room for the Plants.

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The Telephone System will be complete with the necessary cables, conduits, trays and accessories.

The Operator switch board shall be equipped with indicators showing the state of connected extension, direct access buttons and automatic buttons.

The offered digital exchange should be flexible to any numbering plan and with the capacity of digit length of maximum 16 digits.

The telephone system shall allow automatic calls among the users of Plant as well as communications to the outside through the public switched telephone network.

Telephone sets will be keypad type with DTMF and/or DP signalling according to ITU-T Recommendations and providing compatibility with the existing telephone exchange. The telephone sets will be indoor.

Telephone system will be provided in the buildings according to the following list:

- PABX
- MDF
- Power supply
- Desk-top telephone sets
- Application manager
- Accessories

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7.1.1. PABX (not required to install in this project)

Note: PABX will be located in the control room. (It will be finalized after detail design.)

- Type: Microprocessor based with modular architecture.

Switching: Electronic digital

Exchange Unit:

- Number of external exchange lines (with Caller ID): 5

- Number of internal analog lines: 20

(Note: These quantities are as minimum and will be finalized during detail design stage)

Extension Capacity:

- 40 Analog Extensions

- 8 Exchange lines

- Simultaneous calls At least 15%

- Min. no. Of PBX Groups 10

- Min. Hot Lines 10%

Advance features:

- 1- Direct Inward dialling (DID)
- 2- Long distance dialling restriction
- 3- Outside calls
- 4- Inside consultation call
- 5- Call entering
- 6- Transfer of trunk call
- 7- Hotline (HL)
- 8- Call pick up
- 9- Conferencing
- 10- Automatic test capability
- 11- Music on hold

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- 12- Charging and printing
- 13- Group defined conferencing and paging
- 14- FAX

Minimum required capabilities:

- External connection to music source.
- External connection to fire alarm panel for warning.

7.1.2. Main distribution frame (MDF) (not required to install in this project)

The MDF should be compatible with PABX. The MDF will be fixed on wall and will include the entire frame structure and mounting materials. These will include two sides of terminations, one side to be connected to PABX and the other side to the outside cable.

The capacity of MDF will be match with the capacity of telephone switch. The number of switch side must be equal to primary capacity and subscriber side terminal must be %25 more than the capacity of the switch.

Quick connection type of terminal blocks shall be provided for terminating cable of local and trunk cable. The MDF termination shall be suitable for wires up to 0.8 mm.

All terminal blocks and terminations shall have label holder.

- Enclosure: Weather-proof
- Type of protection: IP65
- No of terminals: 50 pairs expandable up to 100 terminals for 0.8mm diameter telephone wire.
- MDF shall have 25% spare space for future expansion at least.
- MDF shall have 1 suitable MCB.

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7.1.3. Power supply

- Available power 230v ac, 50 Hz.
- Power supply
- To supply 24 VDC for the system with adequate dry accumulators (Sealed lead Acid batteries) with a battery charger and an automatic transfer switch that all installed in a free standing cubicle. The entire equipment shall comply with IEC-standards.
- The Telephone System will be provided with batteries suitable for 1 hour's operation in case of normal power failure.

- Battery Charger

The battery charger shall be a single phase 230 V (plus and minus 10 percent). 50 Hz (Plus and minus 5 percent), full redundant, duplicated, automatic constant voltage control type with current limitation, voltage regulation of plus & minus 0.5 percent from 0 to 100 percent of load, ripple voltage of less than 4 my RMS from 0 to 100 percent of load without battery, high charge & float charge mode, low-high voltage & rectifier failure alarm feature, ammeter and voltmeter back up protection, suitable for temperature of 0 to 50°C, sized adequately to charge the set of batteries automatically for a period of Six hours. This equipment shall comply with IEC 355-2-29.

- Automatic transfer switch

The automatic transfer switch shall have current and voltage rating suitable with the Dc load current of PABX equipment.

7.1.4. Cable network

External distribution network shall consist of multi pair telephone cable(s) starting from a distribution frame, up to the distribution boxes located in the buildings.

The external telephone distribution network will be sized for a minimum of 30% spare pairs.

Cable entrance to the building shall be via protective pipe up to the specified box inside the building.

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Internal distribution network shall utilise embedded or exposed pipes clamped to the wall, according to the type of installation and material used for the realisation of electrical installation in the same point.

The pipe layout shall be arranged to ensure that each pipe contains no more than 5 user's cables.

The pipe route shall have bends as less as possible and in case the pipe length exceeds 10 m, intermediate-pulling boxes shall be provided.

Each desk-top and wall mount telephone set shall dispose of two connection possibility points as a minimum, the additional connection point could be used either to change location inside the room or to add further set.

Connection points shall be as far as evenly distributed on the two opposite walls of the room and however chosen on the basis of the best utilisation in working areas and of the present and future possible arrangement of furniture and desks.

All the telephone connection points shall be wired up to the distribution box also if not utilised.

7.1.5. Telephone Sets

7.1.5.1. Indoor Telephone Sets

They will have the following basic requirements:

- Analogue type
- Desk-top sets capable of wall-mounting by proper support kit;
- Suitable for direct fixing on horizontal and/or vertical panel board; shape, dimensions and fixing details shall be submitted for consistency with panel board characteristics.

Telephone set shall have the following characteristics:

- dialling system: pulse/tone (selectable);
- pulse dialling: break/make ratio 1.5:1, 10 pps
- tone dialling: DTMF (ITU-T Q.35)
- line voltage: 24 to 66 VDC
- ringing voltage range: 30 to 90 VAC
- ID color
- ringing frequency range: 16 to 55 Hz sinusoidal.

Telephone set shall have the following features:

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- casing: light or glass-fibre reinforced polyester;
- handset: acoustic feedback type with extensible cord;
- color: MFR Standard;
- cable cord: line cord 3m long with RJ 11 plug (desk-top sets)
- ringer: with volume control
- last number redial function: required;
- recall function: earth/time break (selectable);
- time break duration: 80, 110, 250 ms (selectable)

Side-tone reference equivalent, sending reference equivalent and receiving reference equivalent will be acceptable if their values will be within accepted international standards.

7.1.5.2. Desk-top telephone sets

- Enclosure: Indoor design for office use
- Analog phone
- Desk-top
- made of impact – resistant corrosion proof plastic housing
- plug-in hand set
- bell with sound regulation
- Digital dialer
- IP42

7.1.6. Weather proof telephone sets

- Type of protection: IP65
- Analog phones
- Industrial type
- Wall mounted
- 16-key key-pad Digital dialer
- Conduit gland: pg 16

7.1.7. Acoustic Hood

- Noise attenuation: Better than -23dB
- Color: Yellow

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- Polyethylene plastic construction and flammability
- Durable, lightweight, chemical resistance body
- UV Resistance
- Fire retardant
- Resistant to mildew and rot

7.1.8. Application manager

In case of stored program control (SPC), the software shall be based on windows, full digital, partially/fully distributed control. It should consist as minimum requirements the following functions:

- Editor
- Compiler
- Transfer
- Help

Required hardware, printer & connectors shall be supplied

7.1.9. Wall telephone set for indoor use

- Analog
- made of impact resistant corrosion proof plastic
- plug-in hand set
- built-in bell
- 12 key push button set
- IP42

7.1.10.Call amplifiers

The call amplifiers may consist of one of the following type:

Bell for indoor use with volume, for approx. 80 phone 1m distances mounted in a plastic hosing.

7.1.11.Accessories

All necessary accessories and installation material as well as cables between room equipments required for operation, maintenance and assembly shall be included in the delivery.

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8.0 CABLES CHARACTERISTICS

The mechanical and electrical characteristics of the material forming the conductors, the insulating, the sheaths, the shields and the armoring shall be those indicated in the reference standards.

Such a characteristic shall be sufficiently constant during normal use.

For the communication systems the following type of cables will be employed:

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8.1. Telephone Cables

Outdoor telephone cables will confirm to applicable IEC 60708-1, 60708-3, standards, or equivalent: plain annealed copper conductors, polyethylene insulated, pair stranded, with non-hygroscopic tape wrapping, moisture barrier by aluminum coated tape bonded to inner polyethylene sheath, steel tapes or wire armoring, PVC hydrocarbons resistant jacketed.

Indoor telephone cables will confirm to applicable IEC 60189-1, 60189-2, standards, or equivalent: plain annealed copper conductors, PVC insulated, pair stranded, XLPE jacketed.

Conductor's diameter will be 0.6 for both indoor and outdoor.

Both outdoor and indoor telephone cables will be flame retardant type as per IEC 60332-1 or 60332-2 standard.

Telephone cables will be utilized for the telephone distribution network.

All cable and wire will be provided to interconnect the central telephone, telephone junction box (TJB), socket, for this purpose there are many ways that should be selected by detail designer Related to each area.

- In outdoor environment cable type **A2Y(ST)2Y**, size 0.6 mm shall be used.
- In buildings cable type JY(ST)Y, size 0.6 mm shall be used.
- The telephone system will be complete with the necessary cables, conduits, trays and accessories.
- In building telephone cables shall be laid in properly sized conduit.
- All the terminal blocks shall be screw type for up to 0.8 mm wires.

8.2. Cables Installation

Above ground cables will follow the same route of instrumentation cables, as far as possible, using the same raceways or will be installed in an open conduit system providing mechanical protection of said cable(s).

Where cables are to be installed underground, they will be normally laid in the same trench together with electrical or instrumentation cables, following the same installation criteria; minimum distance of 30 cm from the electrical cables will be kept.

Cable branches to users will usually be directly fastened to the structures and will be protected by metal conduit up to 15 cm above grade as a minimum

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Indoor distribution networks will follow the type of installation of electrical network in the same building area.

The indoor type cables will be routed in a separate way from any other electrical system, even though they work with low voltage.

9.0 TECHNICAL DOCUMENTATION

The documents which usually cover the whole project include specifications, drawings and miscellaneous documents required for material procurement, erection and operation of the Plant.

Technical documents will include the following:

- a) Technical specifications for equipment and material;
- b) Distribution layout of the systems showing:
 - equipment and distribution boxes location, power supply points for telecommunication equipment;
 - cable runs with installation details and/or sections;
 - identification tag number of equipment and cables.
- c) Systems schematic diagrams;
- d) Wiring diagrams;
- e) Cable list;
- f) List of spare parts as required by Contract;

Erection, operation and maintenance manuals, issued by the various equipment manufacturers.