CHAPTER 7 INFRASTRUCTURE

7-1 Transportation

At present, Oman is planning to construct a new highway, which runs near the project site, from Sohar to Yanqul. Transportation of Materials and products will be conducted on this highway.

In this study, we investigated Access Road and Diversion Road, except Mining Road in the Pits.

7-1-1 Access Road

There are two Access Roads in the Project area. The access Road ① will be constructed between each pit and Copper plant while the access Road ② will be constructed between Copper plant and highway.

Fig. Ⅲ-7-1 shows the location of the access road.

(1) Access Road ①

Access Road ① will be 15m wide to facilitate the access of large dump trucks. Approximate length will be 6,500m. Box Culverts will be constructed at small wadi, where road is feared of erosion by the surface flows.

Figs. Ⅲ-7-2 and Ⅲ-7-3 show standard sections of road construction.

(2) Access Road ②

Access Road ② will 8m wide and with an approximate length of 1,700m.

Figs. Ⅲ-7-2 and Ⅲ-7-3 show standard sections of road construction.

7-1-2 Diversion Road

Part of existing public road will be closed by Tailing Dam construction. To overcome this problem, a new diversion road will be constructed to replace the public road with a width of 8m and a length of about 2,300m.

Figs. Ⅲ-7-2 and Ⅲ-7-3 show standard sections of road construction.

Costs of road construction are estimated as indicated in Table Ⅲ-7-1. Local sub contractor estimated the unit costs.

Table Ⅲ-7-1 Construction Cost of Access Road

		Access Road ①	Access Road ②	Diversion Road
Length	M	6,500	1,700	2,300
Width	M	15	8	8
Box Culverts	nos.	12	---	---
Unit Cost	US$/m	90.8	48.5	48.5
Construction Cost	US$	590,200	82,450	111,550

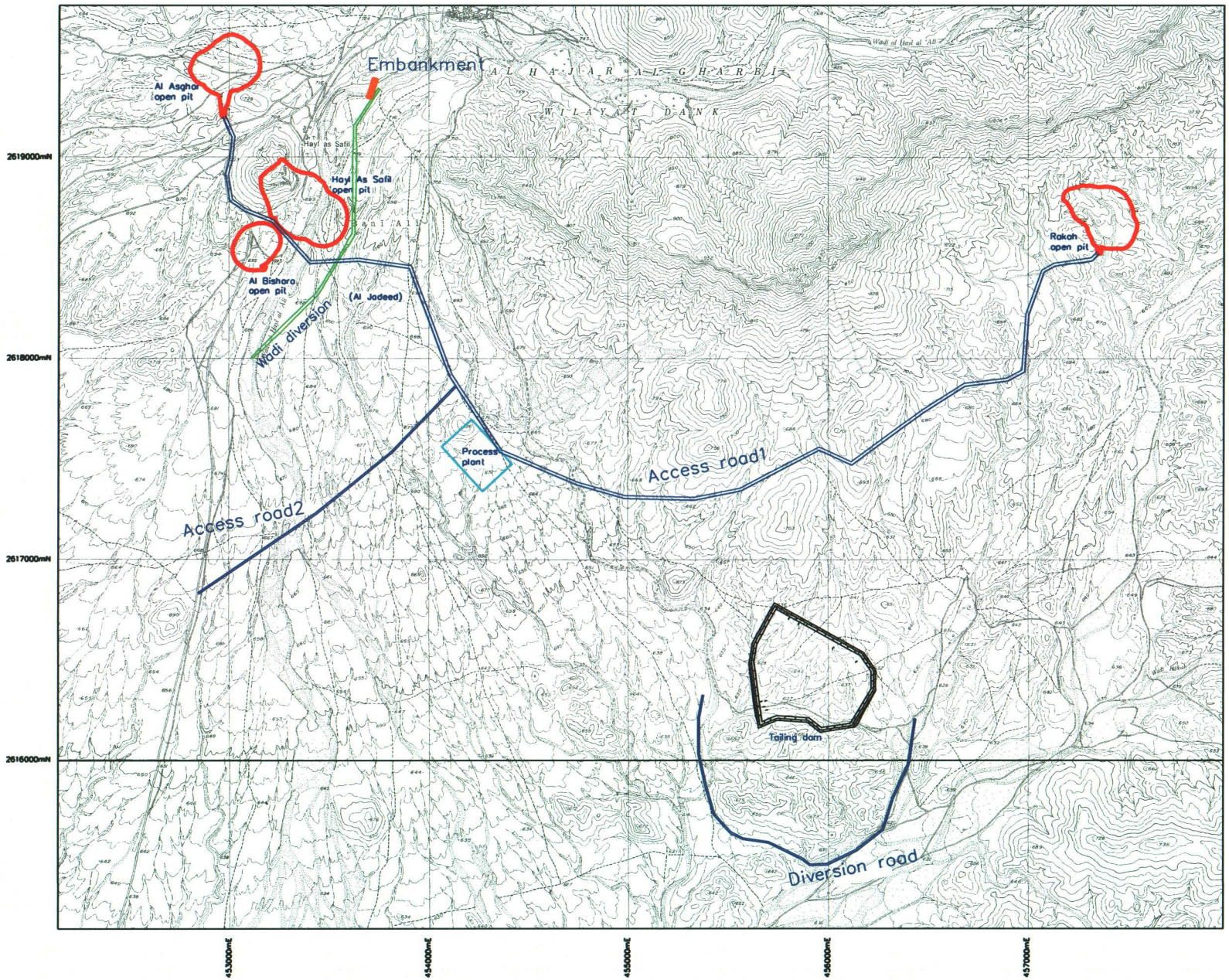


Fig.Ⅲ-7-1 Planning map for access road

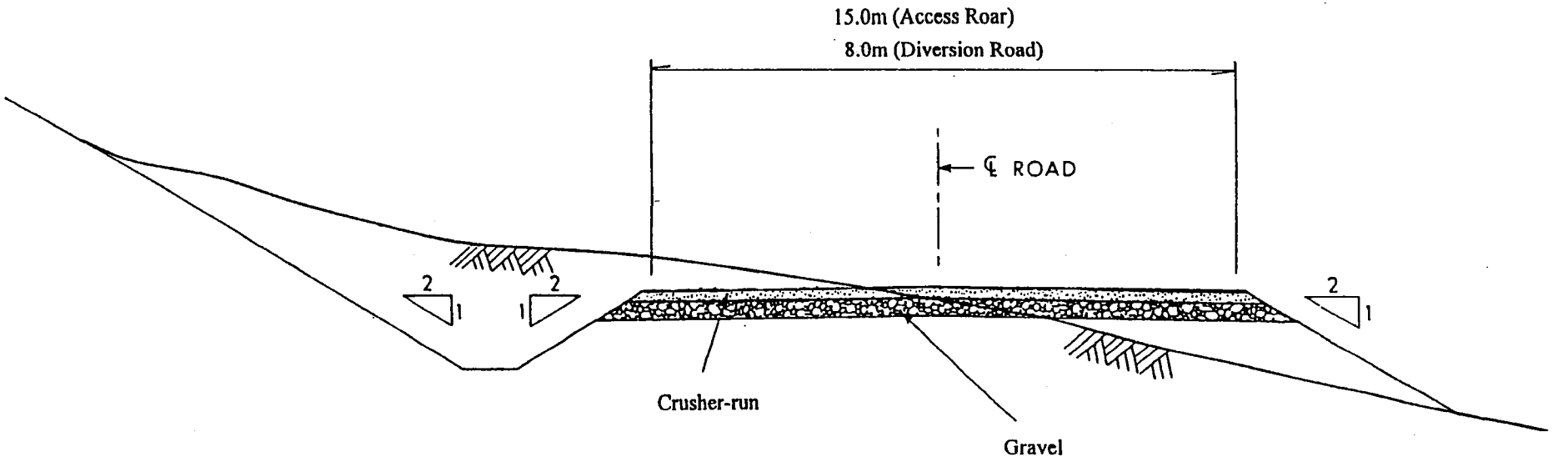
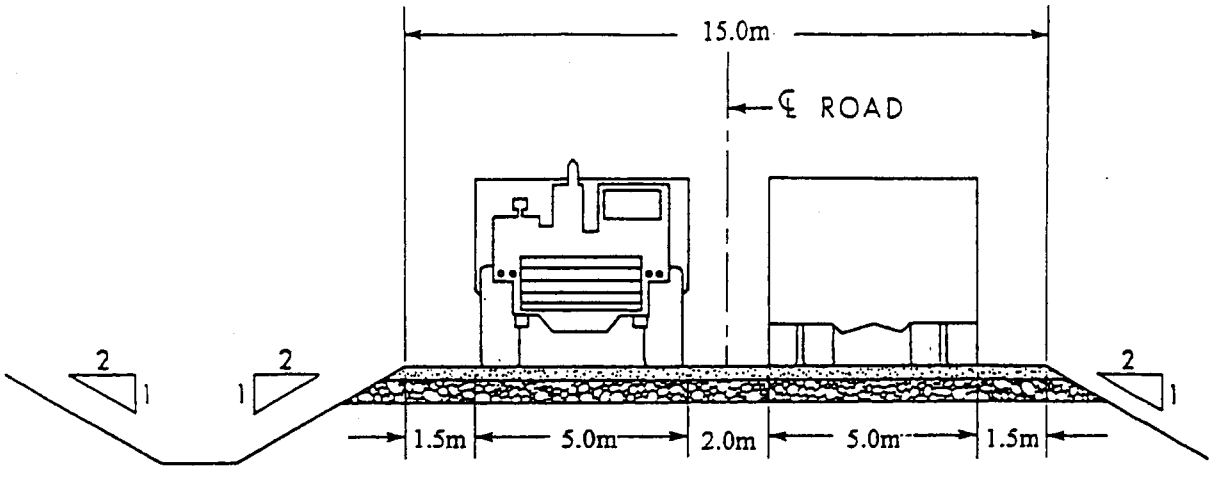
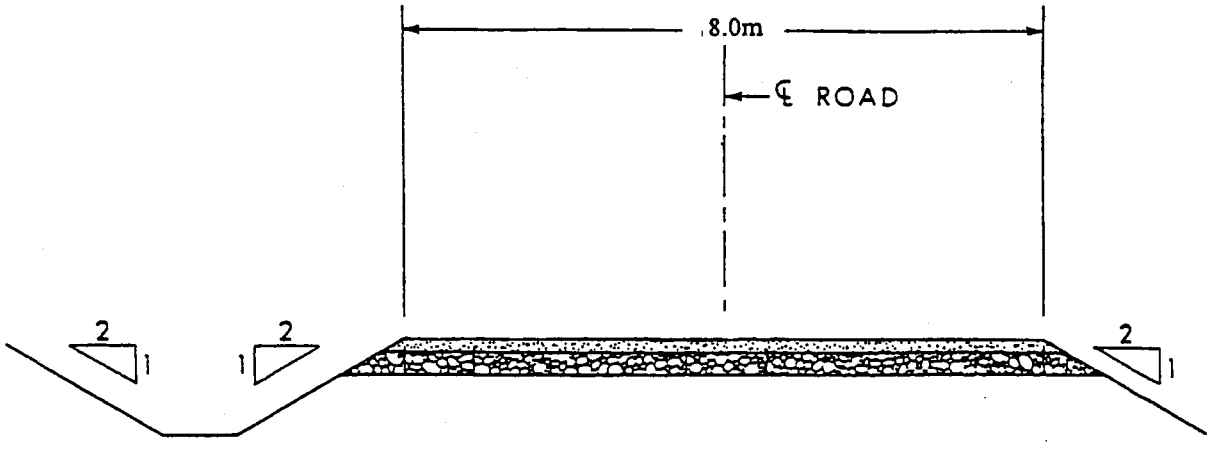


Fig. Ⅲ-7-2 Standard section of Road construction (1)



Alternative Access Road



Alternative Diversion Road

Fig.Ⅲ-7-3 Standard section of Road construction (2)

7-2 Wadi Diversion

Wadi al Hayl al Ali is located at the planned open pit for Hayl As Safil and Bishara. Wadi Diversion will be planned for the prevention of surface flows into the pits.

Starting point of the channel will be located at low terrace of left site of Wadi Hayl al Ali at about 600m from the upper site of Hayl As Safil open pit, and the end of channel will be located at approximately 600m down site of Hayl As Safil open pit. The inlet-outlet part of channel will be designed to smooth river alignments.

At starting point of channel, embankment of an approximate length of about 120m will be constructed to protect the pits from surface flows.

Standard section of channel will be designed for 50 years Rainfall Intensity.

Fig. Ⅲ-7-1 shows location of Wadi Diversion. Fig. Ⅲ-7-4 shows Standard section of channel and embankment for Wadi Diversion.

Cost of Wadi Diversion and embankment construction will be estimated as indicated in Table Ⅲ -7-2. The indicated Unit costs were estimated by a local sub contractor.

Table Ⅲ-7-2 Construction Cost of Wadi Diversion & Embankment

		Wadi Diversion	Embankment
Length	M	1600	120
Area of Cross Section	m^2	110	175
Volume of Excavation	m^3	176,000	21,000
Unit Cost	US$/$m^3$	4.2	11.8
Construction Cost	US$	739,200	247,800

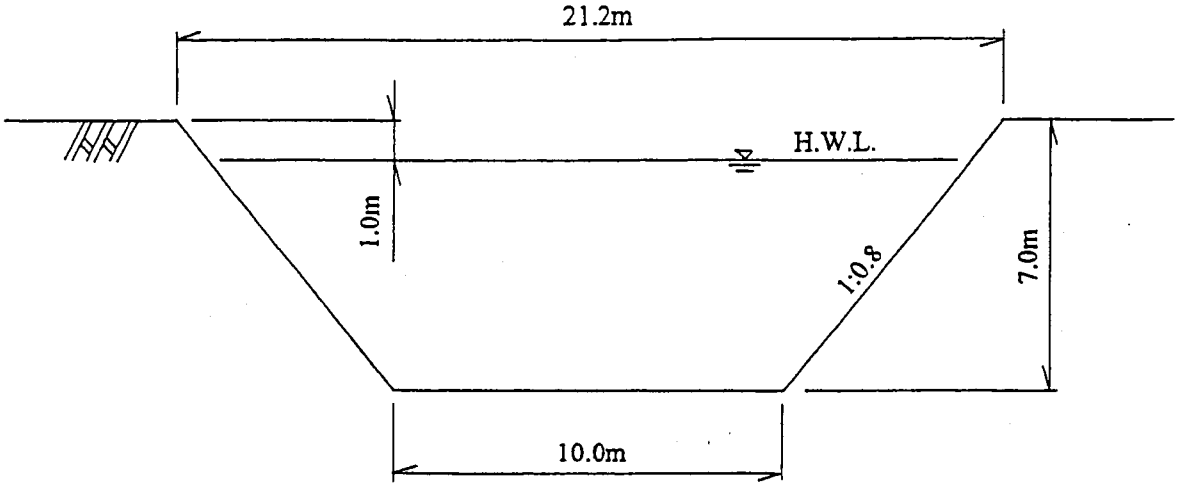
7-3 Water Supply

At present, Masarrat Water Supply Project is constructing the pipeline. This pipeline is located between mother well at Masarrat and Yanqul. This project will be completed in March 2002 while a water tank with a capacity of 5,000ton will be constructed at Yanqul city.

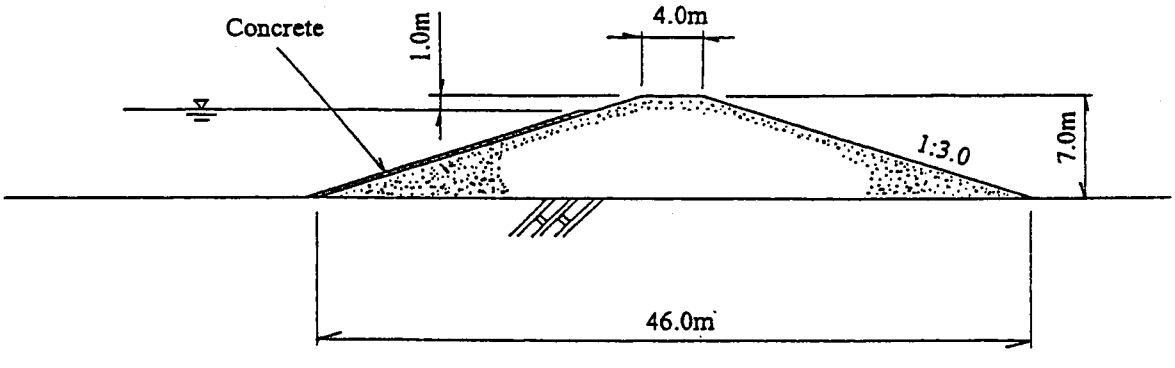
Masarrat Water Supply Project is designed for water demand of 10 years duration. In case of Yanqul,

* Demand : 150 L/day/head (2029 : 200 L/day/head)
* Population of Yanqul : 8,400 peoples (2029 : 21,400 peoples)
* Total Demand : 1,260 ton/day (2029 : 4,280 ton/day)
* Supply capacity : 10,000 ton/day

The above indicates that the water for this project (1,000～2,000 ton/day) will be supplied from Masarrat Water Supply Project.



Standard Section of Channel



Standard Section of Embankment

Fig.Ⅲ-7-4 Standard section of Channel and Embankment for Wadi diversion

7-4 Power Supply and Distribution

7-4-1 Plant Electrical Load

Table Ⅲ-7-3 Installed and Operating Electrical Loads

Motor Control Center (MCC)		Installed kW	Supplied KW
10-MC-01	Crushing Area 415V MCC	600	460
20-MC-01	Grinding Area 415V MCC	1,060	690
20-MC-02	Grinding Area 6.6kV MCC	4,150	3,990
40-MC-01	Concentrate Area 415V MCC	1,050	580
Total		6,860	5,720

7-4-2 Supply Arrangements

* 11kV supply line (By Others)
* Outdoor switchyard at site (By Others)
* 11kV main step-down transformers (Crushing, grinding and Concentrate areas)

7-4-3 Power Distribution

* Plant HV Distribution	Three Phase, 11kV, 50Hz
* LV Supply	Three Phase, 415V, 50Hz, solidly earthed neutral, 50kA for 1sec
* Control Supply	Single phase, 110V, 50Hz, neutral earthed
* Lighting and Small Power	240V single phase, 50Hz, solidly earthed neutral, 9A for 1sec design fault rating

7-5 Communications

The telephone system at the site will be connected to Oman's network via a 20 pair cable. The 20 pair cable will terminate at the main distribution frame in the Plant's administration building.

All internal phone extensions will go through a PABX, located in the administration building, while all fax and data lines will have dedicated external lines. The PABX will be equipped for:

* 20 digital extensions;
* 5 external lines, and
* operator console.
*

The following items will be included in the estimate.

* Workshop	1 phone, 0 fax
* Store	1 phone, 1 fax
* Control rooms	2 phones, 0 fax
* Laboratory	2 phones, 0 fax
* Administration Building	14 phones, 1 fax, 1 data link

7-6 Township

In this Project, accommodations for administrator and employee will be not constructed.

7-7 Other Facilities

7-7-1 Fire Alarm System

Fire alarm indicator panels will be provided in the crushing control room and the plant control room, cabled to fire detectors in the following areas:

* Each MCC switch room
* Plant control room
* Crushing control room

Fire alarm system will be connected to police office and fire station of Yanqul city.

7-7-2 Magazine Store

Magazine Store will be constructed for explosives. Magazine Store will have an area of about 40 m^2 areas. Magazine Store will be separated by 2-3m high and 12m wide (base) earthen embankment.

Cost estimate of Magazine Store is approx. US$31,000.